中华医学会第 26 次全国放射学学术大会

论文汇编

专题发言

S-01

小儿遗传性小脑共济失调的影像学诊断思路

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小脑性共济失调，包括散发性和遗传性共济失调。症状表现类似，增加的临床诊断及鉴别诊断的困难。而神经影像学，可以清晰显示其结构变化。影像学诊断思路:小脑萎缩：小脑整体萎缩或仅累及小脑蚓部及半球；单纯小脑萎缩还是合并幕上结构的改变；需要鉴别的是小脑发育不全。以小脑萎缩为主：1、Friedreich 共济失调：常染色体隐性遗传。持续性的共济失调；伴发肥厚性心肌病和糖尿病。MRI 显示颈髓变细， T2WI 可见脊髓后索和侧索高信号；小脑蚓部及小脑半球的萎缩。2、共济失调毛细血管扩张症是常染色体隐性遗传病，是累及神经系统、免疫系统等多系统损伤的综合征，属于 DNA 修复缺陷病。临床特点是进行性共济失调、免疫功能缺陷、眼结膜和皮肤毛细血管扩张以及罹患肿瘤倾向、早老。影像学表现：MRI：小脑蚓部发育异常；小脑半球萎缩；第 4 脑室扩大。小脑萎缩累及基底节脑干：1、考坎综合征：常染色体隐性遗传病。表现为早老、身材矮小；视网膜变性、视神经萎缩、传导性耳聋；光敏感和白内障等。影像学的特点：小脑萎缩；颅内钙化。2、橄榄体桥小脑萎缩（OPCA）是一种以小脑性共济失调和脑干损害为主要临床表现的神经系统慢性变性疾病。常染色体显性遗传。CT、 MR 表现：桥脑萎缩，小脑体积变小，脑沟裂增宽加深；脑池及脑室扩大; T2WI 上桥脑的十字形高信号即“十字征”。3、肝豆状核变性：脑的病变主要位于基底节的豆状核（壳核、苍白球）及尾状核。晚期小脑齿状核也受累。4、脑腱黄瘤病：脂代谢障碍的常染色体隐性遗传病。进行性共济失调、痴呆、癫痫、腱黄瘤等。影像特点：侧脑室旁 T2WI 高信号，小脑齿状核、中脑黑质、苍白球对称性高信号。小脑萎缩。跟腱可见 T1WI 类肌肉信号毛刷样改变；T2WI 较低信号影，伴或不伴内部斑点状高信号。小脑萎缩合并进行性脑白质病变的常见疾病：1、以额叶为主的亚历山大病；2、白质病变以顶叶为主的球形细胞脑白质营养不良等。

S-02

儿童脑梗塞的病因及影像学表现分析

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目的 探讨儿童脑梗塞的病因分类、临床表现及影像学特点；
方法 回顾性分析山西省儿童医院 2016 年 7 月至 2018 年 7 月间经临床及磁共振检查确诊为脑梗塞的 21 例住院患者的临床及影像学资料。其中男性 12 例，女性 9 例，年龄：1 月-15 岁，所有患者均在发病后 7 日内行颅脑 MRI 检查；
结果 病因分类：明确病因 13 例（61.0%）：外伤 5、烟雾病 3、感染（结核性脑膜炎、EB 病毒性脑炎、化脓性脑膜炎）3、甲亢 1、术后 1，病因不明确 8 例(39.0%)。临床表现：肢体无力 12、肢体抖动 1、抽搐 6、口眼歪斜流涎 4、呕吐 2、头痛 2、发热 2、精神差睡眠增多 2；影像学表现：病变部位：单侧基底节区 11、双侧基底节区 2、单侧大脑半球 6、额叶 3、大脑脚 3、胼胝体 2、双侧背侧丘脑 1、岛叶 1、小脑半球 1；其中外伤后脑梗塞病变部位主要在基底节区，病因不明确的病例病变主要位于基底节区及一侧大脑半球，烟雾病主要集中在大脑中动脉供血区域，其它感染、甲亢及术后脑梗塞病变部位无明显好发部位；MRI 信号特点：所有病例均显示为稍长或长 T1、长 T2 信号，FLAIR 序列呈稍高或高信号，DWI 序列显示为明显高信号，ADC 图呈低信号，其内部信号可均匀或不均匀；15 例行颅脑 MRA 检查，其中 2 例未见明显异常，另 13 例均出现不同程度脑供血动脉的狭窄或闭塞，其中烟雾病主要表现为颈内动脉、大脑中动脉狭窄闭塞，以及侧支血管形成。

结论 儿童脑梗塞的病因种类多样，进展迅速，影像学表现具有一定特征性，MRI 可做为首选检查能对儿童脑梗塞做出早期诊断，另需结合其他相关检查以明确病因，对于指导临床治疗以及促进预后都有很大的帮助。

S-03

儿童后颅凹肿瘤影像诊断策略

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儿童颅内肿瘤发生率仅次于白血病,后颅凹和鞍区是其最好发部位,后颅凹肿瘤以颅高压表现为主、脑干肿瘤常表现为颅神经症状或呛咳、运动障碍等。CT 平扫非常重要，MRI 及 DWI 对良恶性鉴别很有意义。

髓母细胞瘤

髓母细胞瘤是儿童最常见的 CNS 胚胎性肿瘤，也是 CNS 最常见的恶性肿瘤，约 25%发生在成人。小脑蚓部发生率最高，其次是第四脑室

小脑半球常发生在年长儿童或成人，脑脊液播散发生率高。CT：肿瘤呈等高密度，可伴有少许钙化或囊变。MRI: T1Wl: 等低信号、

T2WI:等信号或稍高信号、DWI: 高信号，增强扫描：从轻微强化到显著强化。

儿童室管膜瘤

幕下占 70%，肿瘤主要长在脑室内，可通过侧隐窝延伸之桥小脑角或通过正中孔进入枕大池。CT: 第四脑室混杂密度灶，50%见多发斑点状或砂粒状钙化灶，MRI: T1W 不均匀等低信号,T2W 混杂高信号

增强: 中到重度强化。间变室管膜瘤和髓母细胞瘤较难鉴别。

小脑星形细胞瘤

后颅凹肿瘤中发病率仅略低于髓母细胞瘤，90%以上是毛细胞型星形细胞瘤。毛细胞型星形细胞瘤 CT：实质部分低密度为主，不典型可以等信号，MRI：T1 囊液呈低信号，壁结节呈等信号，T2 囊液呈明显高信号，壁结节稍高信号，增强后典型实质部分显著强化，不典型强化多样性，一般瘤周水肿不明显，MRS: Cho 明显升高、可出现 Lac,Lip。

脑干肿瘤

DIPG 为主 80%伴有 H3K27M 突变，脑干胶质瘤也可表现局限性或外生性肿瘤，往往是毛细胞星形细胞瘤。DIPG CT:桥脑为中心得脑干增粗明显密度减低，MRI:T1W 低信号、T2W 明显高信号或混杂信号。

生殖细胞源性肿瘤

新生儿、小婴儿小脑肿瘤需要考虑生殖细胞源性肿瘤，CT 平扫寻找肿瘤钙化及脂肪非常重要。3 个月内婴儿 AFP 意义不大。

S-04

儿童脑梗塞动脉介入溶栓若干问题探讨

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目的 了解儿童脑梗塞动脉溶栓的方法、意义、效果、并发症和预后，对术中及术后出现的若干问题进行探讨。

材料和**方法**浙江大学医学院附属儿童医院神经内科、血液科患儿 4 例动脉溶栓患者行溶栓治疗，患儿脑梗塞的时间 2-4 天，患儿均有不同程度的神经功能障碍。首先行全脑血管造影，导管尽快超选择插入初步判断责任病灶，确定动脉闭塞部位，了解侧枝循环情况。微导丝引导下将微导管送至血栓近端或血栓内，脑皮质血管闭塞者仅将微导管置入颈内动脉或椎动脉内，然后通过微导管注入尿激酶。术中全程心电监护，术后 24 小时内全程心电监护，术后及 24 小时后常规复查头颅 CT 以了解有无颅内出血。 术后即予低分子右旋糖酐 500ml 静脉点滴，以提高缺血组织周围灌注和改善局部脑组织循环。另外，给予钙通道阻滞药以防止导管或血栓刺激引起的血管痉挛。

结果 4 例动脉溶栓患者，术前通过磁共振平扫、弥散成像、灌注成像、不打药 ASL 成像，明确诊断为脑梗塞，1 例同时行不打药 ASL 成像，显示脑梗塞区域与其显示的范围有较大差异，两者的差异为缺血半暗带，为缺血区域，为溶栓治疗的非常适合的病例。有一例行脑灌注成像，也是为评价患者的缺血半暗带存在与否。全部 4 例患儿经动脉溶栓治疗，患者脑梗塞的血管均为三级分支梗塞，其中两例为大脑中动脉深穿支梗塞，1 例为小脑后下动脉梗塞，1 例为大脑中动脉皮层支梗塞。溶栓后均显示为部分再通，4 例术后 24 小时内头颅 CT 均未见出血，1 术后 17 天后颅内发生大范围出血。术后患儿神经系统症状都有所缓解。

结论 1、动脉溶栓治疗脑动脉血栓形成是一种行之有效的方法，能提高闭塞血管的再通率，改善急性期临床症状和预后。

2、术前磁共振弥散、不打药 ASL 或灌注成像必不可少，在有条件的医院审慎开展。

S-05

儿童后颅凹先天发育异常的 MRI 诊断

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目的 回顾性分析 2016.1-2018.12 诊断的后颅凹先天异常的 MRI 表现，总结后颅凹先天异常的影像学表现。

方法 总结 2016.1-2018.12 诊断的后颅凹先天性异常的患儿 58 例的 MRI 影像特点。**结果** 基于神经影像学将后颅凹先天异常分成了四大类，小脑为主型，小脑和脑干型及脑干为主型及中脑为主型，其中 DANDY-WALKER 畸形 18 例，大枕大池 5 例，后颅凹蛛网膜囊肿 11 例，孤立性小脑下蚓部发育不全 1 例。累及小脑的神经元移行异常 2 例，菱脑融合畸形 3 例。巨小脑畸形 1 例，小脑无发育 1 例，全小脑发育不全 1 例，小脑裂畸形 3 例，桥脑小脑发育不全 2 例。JOUBERT 综合 5 例。先天性肌营养不良 2 例。脑桥被盖帽发育不良 2 例。渐进性脊柱侧弯水平凝视麻痹 1 例。

结论 MRI 在鉴别小脑、脑干及中脑为主的后颅凹疾病鉴别诊断方面有较大的优势。

S-06

黏多糖病影像学表现

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目的 黏多糖病是溶酶体贮积症（LSD）的一种，因缺乏溶酶体酶而不能分解体内的黏多糖导致全身多系统受累疾病，本文分析各型黏多糖病典型影像学表现，为早诊断早治疗提供影像学依据。**材**

料与方法 分析 13 例黏多糖患者影像学表现结合文献，归纳出一型至七型黏多糖病主要累及的器官和主要影像学表现、基因类型、依据酶替代疗法后的影像学变化。
结果 黏多糖（MPS）神经系统表现，蝶鞍扩大，鞍结节变平，呈“J”形，但不特异，矢状缝早闭、头颅增大。脑室周围白质局灶性或弥漫性 T2WI 高信号，随着年龄逐渐增长，血管周围间隙增宽，脑萎缩，脑积水。血管周围间隙增宽表现为增多、减少、稳定（常见），脑白质异常高信号（双侧顶枕区）、胼胝体（特征性）、基底节、脑干，血管周围间隙增宽表现为小而圆、梭形，直径 2～8 毫米（正常血管周围间隙<2mm）；lMPS II 型脑白质内为筛子状，基底节和丘脑为蜂窝状；lMPSIH 和 IS 型灰白质交界区串珠状。lMPS 脊椎表现包括椎间盘、椎骨、齿状突、硬脊膜，颅颈交界处三大典型异常表现包括导致椎管狭窄和脊髓压迫，1、齿状突发育不良或发育不全；2、寰枢椎半脱位 C1 后弓前移；3、齿状突周围组织、硬脑膜、韧带葡萄糖胺聚糖蓄积增厚。
讨论：MPSⅠ型：颅缝早闭；呈舟状；蝶鞍前后径增大，呈仰卧的“J”形，颅骨板致密，板障增厚；MPSⅡ型蝶鞍呈“J”形扩大；MPSⅢ型颅骨异常轻微，顶骨及枕骨增厚；MPSⅣ型：头颅、蝶鞍正常；MPSⅥ型类似于 MPSⅠ型；MPSⅦ型类似于 MPSⅠ型。脑积水 MPS I、II 型最明显，原因分析黏多糖蓄积在蛛网膜粒，脑脊液再吸收障碍；MPS II 轻型枕大池增宽明显；颞极蛛网膜囊肿。颈椎不稳定最常见，脊髓压迫应在屈曲、伸展、中位评估。判断标准为屈曲和伸展位，齿状突后缘与 C1 后弓间（后寰齿间隙）差异超过 2mm。椎体病变表现为圆形、子弹形、楔形，骨质疏松。

S-07

白血病患儿颅内静脉窦血栓的影像学分析

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目的 总结 4 例白血病患儿脑静脉窦血栓的临床表现和影像学特点。
方法 通过对 2017 年 1 月至 2018 年 12 月苏州大学附属儿童医院血液科新科收治的 4 例白血病患儿出现脑静脉窦血栓的临床资料进行回顾性病例总结,了解白血病患儿脑静脉窦血栓的危险因素、临床表现、影像学改变。
结果 4 例患儿均为急性淋巴细胞性白血病，其中男 3 例、女 1 例，年龄最大 11 岁，8 月最小 5 岁 5 月。临床表现：均为准备第二疗程前出现无明显诱因突发惊厥，第一疗程三例为 VDLD 方案，一例为 VDLP 方案。磁共振及静脉成像显示颅内出血 3 例；3 例头部 CT 平扫出现上“高密度三角征”、“束带征”，4 例头部 MRI 平扫发现血液流空现象消失，静脉性脑梗死、脑出血 3 例， 4 例性 MRV 出现静脉血管充盈缺损现象，血栓位于上矢状窦 4 例， 直窦 2 例，横窦 2 例，乙状窦 1 例。
结论 急性白血病患儿静脉窦血栓与化疗药物相关，突发惊厥是脑静脉窦血栓的重要临床表现。仔细观察头部 CT 平扫可以发现“高密度三角征”、“束带征”，观察头部 MRI 平扫血肿的位置，发现血液流空信号的缺失可尽早提示脑静脉窦血栓的形成，及时 MRV 成像有助于脑静脉窦血栓早期诊断和治疗。

S-08

儿童动脉缺血性脑卒中影像诊断及临床特点

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儿童脑卒中的定义:

脑卒中是由于各种原因导致脑血液循环障碍，致使脑组织缺血、缺氧、坏死，导致神经功能障碍，是儿童终身残疾的一个重要原因
分为缺血性脑卒中和出血性脑卒中：
（1）缺血性脑卒中包括动脉缺血性脑卒中(arterial ischemic stroke,AIS)、脑静脉窦血栓形成；
（2）出血性脑卒中包括脑内出血和蛛网膜下腔出血。
儿童动脉缺血性脑卒中（AIS）常见病因:
儿童 AIS 通常是诸多因素相互作用导致，在许多情况下，卒中不止一个风险因素。
新生儿 AIS 有关的危险因素包括产前、围生期、分娩期和产后因素
儿童动脉缺血性脑卒中（AIS）临床表现:
新生儿及小婴儿临床表现极不典型，局灶神经系统受损症状少见，常表现为易激惹、嗜睡、拒食、反复呼吸暂停、抽搐等
年长儿童也常存在不典型症状，如失语、共济失调、构音障碍、颅神经麻痹、头痛等。
儿童动脉缺血性脑卒中（AIS）影像诊断:
儿童 AIS 急性期无特异性标志性临床症状，正确诊断需依赖神经影像学检查，MRI 是目前诊断儿童 AIS 的金标准。最常用的诊断图像有 T1、T2 加权像、弥散加权像（DWI）和磁共振血管造影(MRA)。
磁共振弥散加权(DWI)是目前唯一能够检测活体组织内水分子扩散运动的无创方法，对急性脑梗死的超早期诊断具有很好的敏感性和特异性，成为 AIS 首选诊断方法。
超急性期(<6h)脑梗死由于脑供血不足，T2WI 上多无异常变化，但 DWI 上能表现为清晰的高信号。
磁共振血管造影（MRA）可直接发现血管阻塞部位，对诊断脑梗塞定位更精确。MRA 仍诊断不清时，可考虑 CT 血管造影（CTA）或数字减影脑血管造影技术(DSA)。
此外，弥散张量成像技术（DTI）是在 DWI 的基础上发展起来的技术，能够直观地观察脑白质纤维束损伤情况，特异性评估脑梗塞程度，其反应组织完整性的最常用的参数是各向异性分数 FA 值，FA 值越大，代表神经传导功能越强。

S-09

儿童自身免疫性脑炎的影像诊断思路

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自身免疫性脑炎(AE)是一类由自身免疫机制介导的 CNS 炎性疾病，其临床症状主要包括癫痫发作、精神行为异常、语言运动障碍等。AE 的病理学特点虽与病毒性脑炎改变相似，与成人相比，儿童 AE 相对少见，且临床表现多样。按抗原成分分布部位不同，可以将 AE 分为细胞内抗原抗体相关脑炎和细胞表面抗原抗体相关脑炎。临床上常见的儿童 AE 主要包括抗 NMDA R 脑炎和自身免疫性边缘叶脑炎，以抗 NMDA R 脑炎最为多见。90%的抗 NMDA R 脑炎患儿不伴发肿瘤，但随年龄增长合并肿瘤的概率逐渐增大。但近些年关于非肿瘤性边缘叶脑炎的报道越来越多，并发现儿童边缘叶脑炎多以非肿瘤性为主。儿童边缘叶脑炎不仅累及边缘系统，同时小脑、新皮质也可受累。早期对自身免疫性脑炎患者实施颅脑 MRI 扫描，图像并不具有特异性，超过半数的患者 MRI 扫描结果显示正常。约 50%的患者，在 MRI 扫描时，T2WI 或者是液体衰减反转恢复图像在小脑、到脑皮质、海马、前额叶、脑干、基底核可以观察到异常的高信号病灶，脊髓中一般不会观察到病灶。依据病变部位不同，可将 AE 分为灰质受累为主型、白质受累为主型以及血管炎型。抗 NMDA R 脑炎患儿头颅 MRI 异常率较成人低，仅 31%～45%的患儿呈现异常，多表现为颞叶中部、额叶岛回及海马在 T2 Flair 上信号增高。与抗 NMDA R 脑炎的患儿相比，仅少数边缘叶脑炎患儿的头颅 MRI 正常，大部分患儿海马、杏仁核处 T2 或 Flair 像呈高信号，异常信号区在随访时经常有萎缩改变，局灶性病灶或脑膜增强也见于个别报。AE 需要与下列疾病鉴别：单纯疱疹病毒性脑炎、EB 病毒感染性脑炎、精神

病和抗精神病药后反应 AE、儿童线粒体脑病（包括 Leigh 综合征、MELAS、及 Alpers 综合征）、原发性脑血管炎、系统性红斑狼疮及桥本氏脑病等。

S-10

MRI 在儿童晚期视网膜母细胞瘤分期的应用价值

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目的 分析和探讨 MRI 在儿童晚期视网膜母细胞瘤分期的应用价值。
方法 回顾性研究。选择昆明市儿童医院 2017 年 3 月至 2018 年 12 月收治的 47 例(51 只眼)儿童晚期视网膜母细胞瘤患儿病历资料、眼球摘除术前 MRI 检查结果，参照 International intraocular retinoblas—toma classification(IIRC)对所有病例进行术前分期，对比患眼眼球摘除术后病理检查结果。采用 Kappa 一致性检验对术前 MRI 检查结果与术后病理报告的分期结果进行一致性比较。
结果 47 名(51 只眼)视网膜母细胞瘤患儿中仅有 3 例 (3 只眼)术前 MRI 检查分期与病理分期不相符。Kappa 值为 0．807(Kappa>0 说明有意义，Kappa≥0．75 说明已经取得相当满意的一致程度)。
结论 MRI 是晚期视网膜母细胞瘤病情分期的重要检查手段。确诊晚期视网膜母细胞瘤后，应行眼眶以及颅脑 MRI 检查，有助于治疗前视网膜母细胞瘤的分期和分级，避免漏诊和误诊。

S-11

儿童听小骨创伤的 CT 表现

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目的 探讨听小骨创伤的 CT 表现。
方法 回顾性分析 2015 年 9 月~2018 年 12 月经我院 CT 确诊的 12 例听小骨创伤的 CT 表现。其中，男 8 例，女 4 例。
结果 12 例患者中，发生于左侧 5 例，右侧 7 例。本组病例中最常见损伤为锤砧关节脱位，共 8 例，轴位图像上可见锤骨头与砧骨体间隙增宽，二者失去正常“冰激凌”样形态，其中 2 例合并锤骨骨折，3 例合并砧骨骨折；砧骨脱位 3 例，其中 2 例砧骨脱位至上鼓室，1 例脱位至乳突窦；砧蹬关节脱位 1 例，表现为砧骨、镫骨关节间隙增宽，砧骨向外侧移位。
结论 听小骨损伤为颞骨骨折严重的并发症，临床表现为传导性听力损失。更常见于纵行骨折，可为直接损伤，或由于镫骨肌和鼓膜张肌同时强直收缩间接导致。听小骨损伤包括锤砧关节脱位、砧蹬关节脱位、砧骨脱落、听小骨骨折、镫骨前庭关节损伤，通常为多种损伤并存。本组中以锤砧关节脱位最常见。
由于结构较小，听小骨损伤有时很难发现，特别是在急诊中，若传导性听力损失情况被忽视，患儿仅进行头颅 CT 检查时，由于层厚因素，听小骨损伤很容易漏诊。当创伤部位位于颞区，头颅 CT 发现不能解释的中耳鼓室、乳突内积液时，尤其是发现颅内积气时，应进一步进行颞骨 CT 检查，采用薄层多平面重建的方法，能提高听小骨损伤发现。

S-12

影像学检查在儿童 CND 人工耳蜗植入术中的应用价值

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目的 探讨 CT 及 MRI 在儿童蜗神经发育不良（cochlear nerve dysplasia,CND）患者人工耳蜗植入术前的诊断价值；分析 CND 耳蜗植入术后听觉康复效果与耳蜗形态正常患者之间的差异，为 CND 患者人工耳蜗植入术后效果预测提供参考方法。

方法 回顾性分析 2017-2018 年行人工耳蜗植入患者的影像及临床资料，选取手术侧诊断 CND 的患者（12 耳）及耳蜗形态正常语前重度及极重度感音神经性耳聋患者（10 耳），总结 CND 患者 CT、MRI 影像表现特点；对两组患者术后 6 个月的听觉行为分级标准（categories of auditory performance,CAP）、言语可懂度分级标准（speech intelligibility rating, SIR）得分进行分析比较。

结果 1.12 例 CND 均行颞骨高分辨力 CT（HRCT）检查，内耳道狭窄 9 耳、正常 2 耳、扩大 1 耳。蜗神经管狭窄 5 耳，闭塞 7 耳，伴发耳蜗畸形 4 耳，前庭半规管畸形 5 耳；2.CND 中 9 例行内耳 MRI 检查，蜗神经纤细 2 耳，缺如 7 耳；3.耳蜗形态正常组 HRCT 显示耳蜗骨性结构正常，1 例伴前庭半规管异常，内耳道及蜗神经管显示正常；4.CND 组术后 6 个月的 CAP 和 SIR 得分均低于耳蜗形态正常组，两组间 CAP 和 SIR 差异均具有统计学意义（$p<0.05$）。

结论 蜗神经发育不良是少见的引起先天性感音性神经性耳聋的病因。MRI 可明确诊断蜗神经发育不良；HRCT 表现为蜗神经管狭窄及闭塞高度提示 CND，内耳道形态正常者不能排除 CND。影像学检查能提供可靠的解剖信息，对选择耳蜗植入侧别、评估预后具有重要的临床意义。蜗神经发育不良耳蜗植入术后康复效果较耳蜗形态正常患者差，远期效果期待进一步随访。

S-13

儿童心肌炎的磁共振诊断

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目的 探讨心脏磁共振（CMR） 在儿童心肌炎诊断中的价值。

方法 自 2016 年 5 月至 2019 年 6 月收集 41 例心脏磁共振检查儿童，其中 27 例临床诊断心肌炎，男孩 14 例，女性 13 例，年龄中位数 10 岁（年龄范围 7-16 岁），急性期患儿 16 例，慢性期患儿 11 例； 非心肌炎患儿 14 例，男孩 6 例，女孩 8 例，年龄中位数 11 岁（年龄范围 5－12 岁）。41 例 CMR 检查序列如下：稳态自由进动（SSFP)序列进行心脏横断面、左心室二腔心、四腔心以及短轴面扫描以评估心脏功能；分别进行左心室短轴位 T2 加权三翻转恢复序列、T1 加权注射对比剂前后以及延迟强化序列扫描；进行左心室功能测定及心肌骨骼肌心肌信号比定量分析；统计方法采用 SPSS17.0 软件进行统计学分析。

结果 本组心肌炎发病年龄趋于学龄期，男女比例相当。心肌炎组射血分数（EF）60.5%(45.35%-72.05%), T2 加权(T2W)心肌异常信号与骨骼肌心肌信号比 2.5(2.04-3.79), 延迟强化(LGE)病变显示率 50%；非心肌炎组射血分数 72.25%(64.23%-75.48%) , T2 加权心肌异常信号与骨骼肌心肌信号比 1.85(1.77-2.15),延迟强化显示率 6.7%； 心肌炎组与心肌炎组之间在左心室 EF、T2W、LGE 序列显示心肌病变上有统计学差异；磁共振序列 T2 加权心肌异常信号与骨骼肌心肌信号比、延迟强化显示率、早期强化诊断心肌炎的敏感性分别为 73.2%，46.3%，58.5%；特异性分别为 56.3%，100%，86.7%；准确性分别为 84.0%，15.4%，42.3%；综合三种序列诊断心肌炎的敏感性、特异性、准确性分别为 65.9%，86.7%，53.8%。

结论 CMR 是目前诊断儿童心肌炎重要的非创伤性检查方法，各扫描扫描序列的综合评估可提高诊断的准确性。

S-14

儿童青少年异常体动脉供血肺：影像与临床

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【目的】异常体循环动脉供血肺在临床不少见，被供应的肺组织可以是完全实变的（称为肺段隔离症）或者是基本正常的（曾被称为叶内型肺段隔离症），从临床特点到病理机制，这 2 种情况还是有根本差异的，现在后者被称为异常体动脉供血的正常左肺下叶，常被忽略或与肺段隔离症混淆。其症状与治疗方式也有很大差异与争论。本文总结一组相关病例，归纳分析其影像、临床特点和治疗体会，提醒同道关注两者的诊断鉴别，提高对该类疾病的认知水平。【方法】回顾分析总结 12 例存在异常体循环动脉供血肺的病例，男 2 例，女 10 例，年龄范围 5 岁-30 岁。患者症状包括咯血及胸闷、憋气或咳嗽偶然查体发现。均行肺动脉、主动脉 CT 血管造影检查（CTA），分析其影像特点，包括肺叶状态、患侧肺动脉径线、体循环供血动脉特点、治疗方式和预后。**【结果 】4 例**左肺下叶基底段实变伴支气管缺如闭塞，8 例是异常体循环动脉供血正常左肺下叶（咯血较前者常见），均见供血动脉来自胸降主动脉前壁、较粗大迂曲，后者可见引流静脉均为肺静脉汇入左心房，所示左下肺动脉基本正常或略细或明显纤细缺如。5 例咯血者行 DSA 下体循环供血动脉介入栓塞治疗，2 例因局部肺出血合并感染行局部肺段手术切除，4 例观察随访。【结论】肺段隔离症和异常体动脉供血的正常左肺下叶均可在 CTA 上表现为异常体循环供血动脉征象，需要注意鉴别诊断，咯血常见于后者。

S-15

儿童横纹肌肉瘤的影像诊断和鉴别诊断

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横纹肌肉瘤（Rhabdomyosarcoma，RMS）是儿童期最常见的软组织肉瘤，恶性程度高，预后差，可发生于全身的任何部位，以头颈部、泌尿生殖道最常见，其次为四肢、躯干 、腹膜后和胆道等部位,临床及实验室检查缺乏特异性。依据组织学特点将 RMS 分为 4 型：胚胎性横纹肌肉瘤(embryonal RMS,eRMS)、腺泡性横纹肌肉瘤 (alveolar RMS,aRMS)、梭形细胞/硬化性横纹肌肉瘤(spindle cells/sclerosing RMS,ssRMS)及多形性横纹肌肉瘤(pleomorphic RMS,pRMS)。
随着影像学技术的不断发展，超声、CT、MRI、PET/CT 等已广泛应用于 RMS 的诊断和治疗中，超声主要用于肿块的初步评估和随访监测，CT 和 MRI 可全面显示肿块的位置、范围，结合患儿年龄和发生部位，具有一定特征性。MRI 是评价 RMS 局部浸润和区域淋巴结肿大的首选方法,而 CT 评估 RMS 的骨质破坏和肺转移更敏感，两者为 RMS 的临床分期和治疗提供了更全面的影像信息。DWI 目前主要用于头颈部 RMS 的诊断及鉴别诊断；动态对比增强 MRI 可间接帮助判断病变强化特征及性质；PET/CT 显示肿瘤的代谢活性，提高 RMS 的临床分期准确性和预测预后。DWI、DCE-MRI 及 PET/MR 等技术的快速发展和应用，将更好地反映 RMS 的影像特点及其内部生物化学信息，对 RMS 的早期诊断、后续治疗及评估预后等方面提供更有价值的依据，从而提高患儿长期生存率。

S-16

儿童腹部脏器外囊性病变的诊断价值

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目的 探讨 CT 对儿童腹部脏器外囊性病变的诊断价值。
方法 回顾性分析 45 例经手术病理证实的儿童腹部脏器外囊性病变的 CT 表现。
结果 淋巴管瘤 18 例，其中肠系膜淋巴管瘤 11 例，腹膜后淋巴管瘤 7 例，肿块形态不规则，囊壁菲薄，边缘清晰，增强扫描均未见强化，肠系膜囊肿 8 例，均为先天性肠系膜囊肿，形态规则，囊壁薄而均匀，5 例为单房，3 例为多房。2 例囊壁呈线状强化。肠重复畸形 8 例，均与肠管关系密切，4 例呈管状，4 例呈类圆形，4 例囊壁可见强化，囊性畸胎瘤 5 例。腹部脓肿 4 例。膀胱壁囊肿 2 例，大网膜囊肿 2 例，长径均大于 6cm,病灶位于腹腔前方，紧贴前腹壁，形态不规则。
结论 CT 对腹部脏器外囊性病变的形态特征，大小，范围及周围组织结构的关系显示清晰，能对大多数病变做出精确诊断。

S-17

CT 三维重建对小儿肝母细胞瘤术前评估的价值研究

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目的 利用肝母细胞瘤患儿肝脏术前的 CT 三维重建资料，评估肝脏肿瘤体积及其与周边血管关系，并结合术中所见和术后肝功能恢复状态，探讨 CT 三维重建对小儿肝母细胞瘤术前评估的应用价值。
方法 本研究为前瞻性研究，符合纳入标准的肝母细胞瘤患儿共 40 例，平均年龄 1.8±0.8 岁。所有患儿术前均接受增强 CT 检查，进行动脉期、门脉期、静脉期三期扫描，并对肝脏、肿瘤及肝内血管行三维重建。观察评估肝内血管走行、测量全肝体积、预切除肝体积、计算标准化肝脏体积以及残余肝脏体积比。术中以水浸法测量实际手术切除的肝脏体积，并与 CT 测量预切除的肝脏体积比较两者一致性。以受试者工作特征曲线（ROC）评价残余肝脏体积比与术后肝功能损伤之间的相关性。
结果 基于增强 CT 扫描，重建全部患儿的术前肝脏、肿瘤及肝内血管的三维图像。所得图像准确显示肿瘤大小与位置，显示肿瘤-血管关系的准确性达 90%。CT 测量预切除肝脏体积为 393.62±216.54cm^3，术中水浸法测量实际肝脏切除体积为 388.38±207.56cm^3，两者之间呈高度相关性，r=0.920，P<0.05，差异无统计学意义（t=1.679，P=0.101）。测量残余肝脏体积为 234.55±70.42cm^3，残余肝脏体积比为 63.64%±13.70%。ROC 曲线显示，残余肝脏体积比预测术后肝功能中重度与轻度损伤的曲线下面积（AUC）为 0.837（P=0.016），临界值为 56.32%，敏感度为 86.7%，特异度为 70.0%。
结论 CT 三维重建技术可预测切除肝脏体积、剩余肝脏体积以及残余肝脏体积比，可有效评估肝功能储备情况。在手术方案选择、术中操作以及术后肝功能评估等方面具有重要参考意义。

S-18

儿童卵巢颗粒细胞瘤 CT、MRI 诊断

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目的 探讨儿童卵巢颗粒细胞瘤的 CT、MRI 影像学特点及其诊断价值。
方法 回顾性分析我院 9 例经手术病理证实的卵巢颗粒细胞瘤的临床影像学资料，着重分析 CT、MRI 表现及特征。
结果 发病年龄 48 个月-144 个月，平均年龄 71.2 个月，可伴不同程度性早熟及骨龄提前。病理上 8 例幼年型颗粒细胞瘤、1 例成年型颗粒细胞瘤。8 例单发、1 例双发共 10 个病灶，其中左侧 7 个病灶、右侧 3 个病灶，瘤体长径 38mm-190mm、平均 94.7mm，8 个类圆形、边界较清晰，2 个分叶状、边界较模糊。病灶呈多房囊实性肿块 7 个、囊性肿块 2 个、实质性肿块 1 个。肿块密度/信号不均，囊性部分 CT 上呈低密度、MRI 上呈长 T1、长 T2 信号改变，增强后无明显强化；实性及囊间分隔呈软组织密度/信号改变，增强后轻度-中度非均质强化，血供来源于同侧增粗卵巢动脉或子宫动脉卵巢分支。子宫见不同程度异常发育及肥大改变。2 例术后 2 年左右复发。
结论 儿童卵巢颗粒细胞瘤的 CT、MRI 表现具有一定特征，结合其子宫异常发育，术前诊断非常有帮助。

S-19

胎儿脊柱脊髓发育异常的 MRI 诊断

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目的 探讨 MRI 在显示胎儿脊柱解剖及发育畸形的价值。
方法 回顾性分析我院于 2017 年 6 月至 2019 年 6 月期间收治的 72 例脊柱脊髓病变的产前 MRI 影像结果，且均结合产前超声及生后（或引产）随访，孕龄 24～31 周，平均 27.5 周。均行胎儿脊柱脊髓 MRI 常规扫描及 EPI、SWI 序列扫描。
结果 72 例胎儿脊柱脊髓 MRI 病例中，共检出椎体结构异常 25 例（其中半椎体 13 例，蝴蝶椎 5 例，多发椎体异常 6 例）；脊髓发育异常 26 例（其中脊髓低位 21 例，脊髓椎管内囊肿 3 例，脊髓纵裂 2 例）；神经管闭合不全 9 例（隐性脊柱裂 4 例，脊膜膨出 3 例，脊髓脊膜膨出 2 例）；尾退化综合征 2 例，脊柱脊髓未见异常 10 例。72 例中，4 例常规 MRI 漏诊，而 EPI、SWI 及 3D-MR 序列检出，3 例失访，其余 69 病例均由出生/引产后影像学（CT 三维重建）证实，结果均与产前 MRI 一致。
结论 胎儿脊柱脊髓病变是较常见的胎儿先天性异常，其预后不同。目前，超声是最常用的产前诊断脊柱脊髓病变的检查方式，而胎儿 MRI 在常规 T2WI 序列几乎难以发现病变，EPI、SWI 序列可较清晰的描绘出胎儿脊柱的骨质轮廓，易于鉴别；另外，3D-MRI 对脊髓解剖及发育异常具有更高的诊断价值。因此，MRI 与超声联合能提高胎儿脊柱病变的检出率及诊断符合率，是评价胎儿脊柱病变的重要检查手段。

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胎儿心脏磁共振的再思考

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胎儿磁共振检查是在上世纪八十年代中期出现，到上世纪九十年代中期国外开始应用于胎儿临床检查。胎儿磁共振作为胎儿畸形的新兴影像检查手段，已经在胎儿畸形诊断中已经显示了独特的优势。胎儿磁共振视野大，软组织对比分辨率高，不受母体情况如孕妇过于肥胖、子宫肌瘤、羊水过少和多胎等可能导致超声不能清晰显示胎儿结构改变的影响，经常能提供超声没有发现或不能完全确定的胎儿诊断信息。目前无论国内外胎儿磁共振检查效果最好的无疑是神经系统，磁共振空间分辨率高，对比分辨率高，可用多种序列来确定病变的性质和磁共振不受孕晚期颅骨影响等的特点在胎儿神经系统检查中能得到最充分的体现。胎儿心脏是难点,因为心脏小,心率快,不能用门控和对比剂，产科医院的超声室只有少数医生或主任能做胎儿心脏超声。
先心病是我国第一位的出生缺陷，发生率远高于第二、三位，疾病也远远严重于第二、三位的出生缺陷. 胎儿心脏 MR 虽普及度不高，但临床需求强烈,也是科研热点.MRI 是有效的儿童心脏病和许多胎儿诊断方法，这是共识.如同在出生后检查中一样，超声很有效，但若在超声检查后做 MRI，仍然经常会得到更多的诊断信息，胎儿也是如此。先心病产前诊断需求强烈，但诊断确实比较难.作为放射科医生要尽量去诊断这最多最重的出生缺陷,世界各国的胎儿磁共振都在向心脏方面努力.柳叶刀杂志今年 3 月发了 2 篇胎儿心脏磁共振文章。
目前美国和欧洲先心病产前超声实际检出率都在 30%左右。我国湖北省妇幼在《2010-2017 年湖北省出生缺陷发生顺位及发生率》中，发病率最高为先心病,，先心病超声产前诊断率为 65.2%. 个人认为这一数字可能比较可靠,由于湖北省妇幼保健院在这一调查前做了大量培训工作,其先心病超声产前诊断率应该是高于全国平均水平的.诊断医生是否熟悉心血管畸形对的检查效果影响明显.平心而论,虽然临床需求存在,目前我国胎儿心脏磁共振的开展还很不理想，需要进一步努力。

S-21

胎儿消化道梗阻的磁共振诊断及梗阻平面判断

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目的 探讨胎儿消化道梗阻的磁共振表现及梗阻平面的判断方法；
方法 总结我院胎儿消化道梗阻的病例，分析其磁共振表现，并与出生后磁共振表现及手术结果对照，总结不同平面胎儿消化道梗阻的磁共振表现特征，从而进行梗阻平面的判断；
结果 胎儿十二指肠，空肠，回场，结肠梗阻在磁共振上表现不同，十二指肠梗阻表现为双泡征，空肠梗阻表现为连续扩张的肠管与胃泡想通，在 T2WI 上多表现为高信号，亦可表现为低信号。回场梗阻表现为连续扩张的肠管位于中下腹部，在 T2WI 上表现为稍高信号，在 T1WI 上亦表现为稍高信号；结肠梗阻在 T2WI 上表现为低信号，在 T1WI 上表现为高信号，肠管分布表现为典型的结肠圈。
结论 胎儿不同平面的肠梗阻在磁共振上表现不同，磁共振可对胎儿肠梗阻平面进行判断，对胎儿的产前超声诊断是一个有效的补充。

S-22

特发性快动眼睡眠行为障碍脑功能成像研究进展

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快动眼睡眠期行为障碍（rapid eye movement sleep behavior disorder, RBD）是一种深睡眠异常行为状态，患者在快速动眼期（rapid eye movement, REM）骨骼肌失迟缓，频发噩梦，伴与梦境相关异常肢体动作，容易对自身及床伴造成伤害。RBD 好发于中老年男性，发病率约 0.38-0.5%。特发性 RBD（iRBD）指的是患者无明显诱因出现 RBD 症状，无伴发其他神经系统疾病，基于体素的形态测量学(voxel based morphometry, VBM)可以定量测量脑实质的灰白质体积，可无创性发现未知的脑区结构是否存在异常。而基于体素分析(voxel based analysis, VBA)方法结合了 VBM 技术，可以对 DTI 各种参数图进行全脑体素水平的统计分析，可以无创性地显示活体脑白质纤维束，探索 iRBD 患者可能的病理生理学机制。研究发现，联合使用 VBM 及 DTI 研究有利于发现 iRBD 出现结构异常的脑区，并且发现额叶前部、丘脑、颞叶前部、枕叶及海马旁回有可能参与到 iRBD 的病理生理机制中。

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甲状腺相关眼病的 MRI 诊断及进展

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甲状腺相关眼病（TAO）是临床常见的眼病。因为软组织分辨率高且没有电离辐射，磁共振成像越来越多地被应用于 TAO 的诊断和分期。
本讲座拟:
1. 介绍甲状腺相关眼病的流行病学特征
2. 甲状腺相关眼病的可能机制
3. 甲状腺相关眼病诊疗过程中需要影像学提供的信息
4. 多模 MRI 技术（脂肪抑制 T2WI（多成像方式），T2mapping，DWI（多成像方式），脂肪定量）在 TAO 诊断和分期中的研究进展。
旨在提高影像医师对 TAO 的认识，提高 TAO 的影像诊断水平，为内分泌和眼科医师提供需要的诊疗信息。

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眼眶病变 Case based review

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MSCT 及 X 线平片对人工耳蜗植入术后电极的评价

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目的 评价 MSCT 及 X 线平片在人工耳蜗植入术后电极评估中的应用价值。**资料和方法** 对 288 例已行人工耳蜗植入术的患者做 MSCT 检查及 DR 反斯氏位检查。260 例植入 Combi40＋（MED-EL，奥地利）标准型电极，28 例植入 Combi40＋短电极。对感兴趣耳以 0.1mm 重建间距、FOV＝50mm 进行重叠放大重建，将图像传至工作站以容积再现技术（volume rendering technique，VRT）对感兴趣耳进行三维重建。
结果 MSCT 横断面图像显示电极在耳蜗内呈断续点状高密度影，并见少许金属伪影。VRT 图像显示电极在耳蜗内呈螺旋状走行，与耳蜗走行一致。260 例植入 Combi40＋标准型电极患者 VRT 可清晰分辨每个电极在耳蜗内的位置，28 例植入 Combi40＋压缩电极的患者 VRT 图像上只能分辨插入耳蜗前段的 4～5 个电极，其它的插入电极相互之间难以区分。
结论 MSCT 结合 VRT 重建可清晰、直观、准确的显示电极在耳蜗内的形态和位置，能准确显示大部分病例植入电极数目，是人工耳蜗植入术后观察植入电极直观而较准确的方法。X 线片可清晰的分辨出各电极，但不能直观显示耳蜗内的插入电极的数目。

S-26

内耳畸形新分类及术前评估

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1. 耳蜗正常影像解剖关键点：蜗轴，间隔，蜗神经孔，正常耳蜗的判断。
2. 内耳畸形分类（2017 版）：8 大分类，分类依据，影像要点，临床处理要点。
3. 耳蜗畸形：关键结构-蜗轴、蜗神经孔及不同畸形的表现。
4. 蜗神经：正常及异常，MRI 表现。
5. 术前评估要点：面神经位置，内耳腔内异常。

S-27

面神经功能障碍的影像诊断

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目的 探讨正常面神经管、面神经及面神经功能障碍各节段的强化方式。
方法 选取 35 例临床诊断为面神经功能障碍的患者及 6 例无面神经症状而由于其他颞骨病变前来做 CT 及 MR 增强的患者。CT 扫描层厚 0.625mm，1024x1024 扫描。MR 横轴位快速三维扰相梯度回波序列（ 3D-FSPGR） T1WI 平扫及增强、横轴位快速自旋回波序列（ FSE） T2WI，横轴位稳态采集快速成像序列（ FIESTA） 。
结果 CT 双侧正常面神经管对称，MR 双侧正常面神经强化节段及强化程度均一致。面神经功能障碍病变可分为原发病变：面神经瘤、面神经血管瘤等；邻近病变侵犯：脑膜瘤、副神经节瘤、内淋巴囊肿瘤、成软骨性肿瘤；继发病变：转移瘤等。也可分为先天性、炎性、外伤性、肿瘤性病变，邻近组织如颞骨、腮腺等病变及术后。表现为面神经管不同程度骨质破坏及面神经强化、增粗损坏等。

结论 面神经细小、结构复杂、走行曲折 CT 成像显示面神经管及骨质破坏范围、程度，MR 增强成像显示面神经强化程度及病变范围，结合有助于明确面神经功能障碍原因、显示周围病变与面神经的关系，对术前评估、术中保护面神经具有重要临床应用价值。

S-28

走出耳聋病因诊断误区：“肯定之否定法”诊断思路浅析

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1、分析思路类型：顺向思维、逆向思维、肯定之否定法、否定之否定法。
2、耳聋病因诊断存在的问题：误诊、漏诊，后者为主要原因。
3、漏诊原因：检查方法选择不当、展示解剖结构不到位、思路中断。
4、解决**方法** 掌握正确分析思路，肯定之否定法最适合耳聋病因诊断，可有效避免漏诊。

S-29

CT 三维重建及 MR 水成像在先天性耳聋术前评估的应用价值

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鼻咽与口咽病变临床影像诊断思路

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一、 鼻腔后鼻孔息肉和内翻乳头状瘤
小气泡影，肿块边缘光滑或分叶状，平扫肿块密度低于邻近鼻咽肌肉。
二、鼻咽炎与腺样体肥大
鼻咽粘膜肿胀增厚，呈线带状，腭帆提肌正常，无肿块占位效应。
三、鼻咽结核
1、临床多有开放型肺结核。2、可局限于鼻咽浅层，亦可侵及深层。
四、鼻咽纤维血管瘤
1、反复鼻血，出血量多。2、局部大肿块，呈紫红色。3、鼻咽部大肿块，其中有钙斑。4、周围骨质膨胀性破坏。5、增强扫描强化明显。
五、鼻咽恶性淋巴瘤
1、常为全身性淋巴瘤的一部分。2、局部见苍白色肿块。3、鼻咽部边界清楚的肿块。4、累及骨质结构边缘，沿孔道蔓延。5、放射治疗肿块缩小速度较快，这与鼻咽癌放疗时肿块缩小不明显不同。
六、鼻咽癌（NPC）
1、鼻咽癌发病部位：91%发生于咽隐窝，而原发于鼻咽侧壁、顶后壁和翼腭窝者少见。2、早期鼻咽癌影像表现：咽隐窝变浅或消失，腭帆提肌肿大。3、鼻咽癌与鼻咽炎鉴别：（1）鼻咽癌：腭帆提肌增粗，粘膜线中断，咽缝间隙消失， 深层侵犯。（2）鼻咽炎：局限于鼻咽浅层，粘膜线完整，腭帆提肌正常。

七、涎腺混合瘤
患侧鼻咽腔变窄，局部粘膜正常，咽旁间
2、良性者为卵圆形、边
3、肿块呈中等密度，明显强化，可
鼻咽总结：1、鼻腔后鼻孔良性肿块突向鼻咽腔，呈间断性接触表现（“小气泡”征）。2、鼻咽良性病变多位于顶后壁，其前缘平直或凹陷，黏膜线影连续。3、鼻咽腔恶性肿块前缘多呈弧形前突，鼻咽癌多有腭帆提肌受累。4、鼻咽结核有时需结合临床、病理活检诊断。5、鼻咽壁混合瘤致同侧鼻咽腔和咽旁间隙变窄，粘膜规整
口咽总结：1、 炎性肿块一般边界模糊，T2WI 压脂周围软组织水肿。**2、**炎性肿块呈多房囊状改变，房隔薄而清楚。**3、**口咽癌肿块边界不规则，坏死区不规则并且大小不一，界限模糊。**4、**淋巴瘤多见于双侧，常伴有颈部淋巴结肿大，肿块无坏死或大的肿块伴少许坏死区。

S-31

腮腺影像解剖与良恶性肿瘤的鉴别诊断

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目的 通过对腮腺解剖与常见肿瘤的影像特征分析，应用影像解剖与检查技术提高腮腺肿瘤诊疗水平，识别血管与神经结构对指导手术有临床意义。
材料与方法
1.解剖要点：面神经、腮腺导管、下颌后静脉与筋膜与脂肪间隙、颈外动脉与静脉血管、淋巴结。
2.病变侵犯范围判断位置，基于间隙脂肪推移判断肿瘤生长方向。
2.技术显示能力
2.1 平片主要显示骨骼的变化与钙化的改变
2.2CT 主要是对血管的判断与诊断的主要方法
2.3MRI 对于导管与神经性肿瘤的转移帮助非常大
2.4 导管造影对于腮腺导管病变诊断，定性与定位帮助大。
结果
3.1 诊断与判断：如肿瘤直接征象 、间接征象、周围累及病变范围等；
3.2 合理应用影像技术方法实现诊断效益的最大与最优化。
结论 识别正常腮腺解剖结构对良恶性肿瘤定位诊断重要，观察血管神经，淋巴结侵犯，有助于良恶性肿瘤定及肿瘤分期，识别影像解剖血管与神经结构对制定手术方案有指导作用。

S-32

鼻腔鼻窦病变 Case based review

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S-33

分子探针 USPIO-PEG-sLeX 监测西咪替丁干预后鼻咽癌裸鼠移植瘤 ELAM-1 表达的价值研究（讲座）

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目的 利用磁共振分子探针 USPIO-PEG-sLeX 监测西咪替丁干预后裸鼠鼻咽癌移植瘤 ELAM-1 的表达的应用价值。
方法 制作多时间节点（尾静脉注射分子探针后 0h、1h、2h）裸鼠鼻咽癌移植瘤模型，使用 USPIO-PEG-sLeX 作为造影剂进行 3.0T 磁共振扫描，测量西咪替丁干预组与非干预组的 T2*值、ΔT2*值及强化率。扫描完成后处死裸鼠，行免疫组化染色分析移植瘤 ELAM-1 表达情况。
结果 两组荷瘤裸鼠平扫 T2*值无统计学意义（22.40±7.61 VS 29.54±9.52，P＞0.05），强化后 0h、1h、2h，两组间 T2*值无统计学意义（16.59±5.38 VS 16.81±6.08、13.44±4.57 VS 12.27±3.49、12.30±3.69 VS 12.18±3.98），P 值均＞0.05。两组ΔT2*值在增强后各时间点有统计学意义（6.08±5.65 VS 13.04±9.83、8.96±6.54 VS 17.28±9.52、10.11±6.07 VS 17.37±9.57），P 值均＜0.05。两组强化率在增强后在注射造影剂后 0h、1h 有统计学意义（21.23±14.68 VS 40.79±20.05、36.39±20.26 VS 55.37±15.54），P 值均小于 0.05。增强后 2h 差异无统计学意义（42.12±16.14 VS 55.69±16.08，P＞0.05）。干预组移植瘤 E-selectin 表达低于对照组（0.04032±0.002687 VS 0.06805±0.002305，P＜0.05），差异有统计学意义。
结论 分子探针 USPIO-PEG-sLeX 可以监测西咪替丁干预后裸鼠鼻咽癌移植瘤 ELAM-1 的表达。

S-34

鼻咽癌影像学研究体系:功能、分子及影像组学

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S-35

干燥综合征的 MR 研究进展

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腮腺是人体最大的一对唾液腺，腮腺疾病是颌面外科的常见疾病， 腮腺疾病通常累及导管系统。传统的检测手段为涎腺造影术，这种技术的是一种有创性检查，需要注入对比剂，易引起导管狭窄和感染，并且依赖操作者的插管技术和病人腺体发育等因素。随着影像学技术的发展， MRI 影像学检查在腮腺疾病中有了更广泛的应用，MRI 可以观察唾液腺的位置、形态、大小，同时 MRI 水成像技术为涎腺导管系统的观察提供了一种无创、方便的检测手段。
腮腺腺体分泌涎液经各级分支导管汇入叶间导管及主导管，主导管最终开口于口腔排泌涎液。在此基础上加上多期涎腺水成像（MRS），不仅能反应出涎腺导管结构变化，也可反应涎腺分泌功能，具有“功能”成像意义
本研究 35 例志愿者中，32 例志愿者在酸刺激后观察到腮腺导管总体积的增加，其中 16 例腮腺导管最大体积出现在酸刺激后 2 期以内，另外 16 例腮腺导管最大体积出现在酸刺激后第 3-6 期。3 例志愿者在酸刺激后表现出腮腺导管体积的下降。
动态涎腺水成像较传统的检测手段（涎腺造影术）具有无创及操作简易的优势，有望成为临床评估腮腺分泌功能的一大检查方法。本研究显示了在正常人中酸刺激引起的腮腺导管体积变化的类型，为评价病理状态下腮腺功能变化提供理论依据。动态涎腺水成像有望应用于干燥综合征患者及放疗损伤所致腮腺病变的机理研究、临床评估及疗效观察。

S-36

颈部间隙病变 Case based review

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S-37

双层探测器能谱 CT 在头颈肿瘤的初步临床应用

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目的 探讨双侧探测器能谱 CT 在头颈肿瘤的临床应用价值。
方法 收集 30 例头颈肿瘤病例，所有病人术前经双层探测器能谱 CT 平扫及增强扫描，比较虚拟平扫与常规平扫图像质量及信噪比。以手术病理为金标准，对比常规增强图与碘图，各单能图、有效原子序数图多参数图评估肿瘤的范围，细节及软骨侵犯情况。
结果 虚拟平扫与常规平扫图像质量及信噪比两组差异无显著性。对比常规增强图，结合碘图，各单能图、有效原子序数图多参数图评估肿瘤的范围，细节及软骨侵犯情况更准确。
结论 双层探测器能谱 CT 在头颈肿瘤的有广泛的应用价值。

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翼腭窝影像解剖及常见疾病 CT、MR 诊断

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目的 探讨翼腭窝及其通道和常见疾病 CT、MR 的表现。
方法 翼腭窝 CT 显示轮廓锐利，横断面形态多变，冠状面多呈四方形，重建矢状面近似漏斗形，也能清楚显示翼腭窝的通道圆孔、眶下裂、蝶腭孔、翼管、翼上颌裂、翼腭管、腭大孔及腭小孔。翼腭窝常见原发病变包括纤维血管瘤、神经鞘瘤、非特异性炎症，继发病变包括鼻咽癌等等。
结果 纤维血管瘤 CT 表现为等密度，颅底孔道扩大，临近骨质受压，可伴侵蚀性骨质破坏。T2WI 表现为胡椒-盐征，增强明显强化。神经鞘瘤表现为边界清楚、圆形肿块，密度或信号不均匀，增强不均匀强化。非特异性炎症 T2WI 表现为明显低信号。鼻咽癌是累及翼腭窝的最常见的恶性肿瘤。
结论 翼腭窝 HRCT 检查应包括横断面和冠状面，两者结合能清晰、准确地显示其本身及通道。CT 结合 MR 检查有助于翼腭窝.常见疾病的诊断和鉴别。

S-39

经鼻蝶入路手术之蝶窦-中颅窝底病变影像价值及临床关注点

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目的 本文通过内镜下经鼻蝶入路的蝶窦-中颅窝底手术患者术前 CT、MRI 等影像的精细解剖分析，为内镜下处理该区域病变术前提供影像参考，进一步明确该手术入路的重要解剖学标志，探索手术操作的安全范围，从而达到降低该区域的手术风险和术后并发症。
方法 本文回顾了 2014.3-2019.7 我院耳鼻喉科通过内镜下经鼻蝶入路的蝶窦-中颅窝底 37 例手术患者的术前影像，其中包括蝶窦囊肿 13 例，蝶窦恶性肿瘤 5 例，垂体瘤 8 例、真菌性鼻窦炎 5 例、脊索瘤 2 例、软骨肉瘤 2 例、骨化性纤维瘤 1 例、蝶窦囊肿合并脑膜脑膨出 1 例，详细分析该区域的 CT 平扫及增强、MRI 平扫、常规增强和动态增强等精细解剖的影像学表现。
结果 1 .全鞍型或鞍枕型气化的蝶窦可以选择内镜下经鼻蝶入路手术，甲介型不可以。2.蝶窦内颈内动脉隆起骨壁破坏情况，病变累及颈内动脉海绵窦段的情况。3. 蝶窦内视神经管隆起的情况。4. 病变累及海绵窦区域的情况。
结论 内镜下经鼻蝶入路进入蝶窦-中颅窝底区域的过程中涉及到的重要解剖结构主要有:蝶窦分型、蝶窦开口、鞍底、斜坡隐窝、蝶窦内颈内动脉隆起及视神经隆起、颈内动脉海绵窦段、海绵窦累及情况等。熟知该区域的精细解剖及病变累及情况对于临床手术有重要的指导意义。精细的断面影像学检查、细致的影像学征象分析有助于对该区域的结构及病变做出正确的诊断，术前详细解读患者的 CT、MRI 影像学资料，两者的充分结合可获取更多的病变解剖信息，才能提高手术的安全性和有效性。

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颈静脉孔肿瘤影像评价

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目的 颈静脉孔肿瘤在临床工作中容易误诊这漏诊。结合我科近年病例，展开回顾分析，提出诊断要点，以期提高诊断。
方法 回顾分析我科近年 26 例手术临床证实颈静脉孔区病例，观察以下内容：事先定位是否正确；病变范围累及颅外颈部时，病变观察是否漏诊颅外部分；颈静脉孔区描述和分析是否充分；病史和全身情况结合是否合理。
结果 这些病例中定位不确切 5 例，常定位桥小脑角区；当肿瘤骑跨颈静脉孔扩展到颅外是，漏诊颅外部分 5 例；颈静脉孔区描述和观察不充分误诊 4 例，与全身情况结合不恰当导致误诊 3 例。事先分析充分且诊断完全正确 9 例。
结论 颈静脉孔区肿瘤是后颅窝常见病变之一，定位不正确，漏诊颅外部分，颈静脉孔区观察不充分和不恰当结合临床，是常见的误诊和漏诊原因。

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颈静脉孔区肿瘤的 CT 和 MR 诊断

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目的 探讨颈静脉孔区肿瘤的 CT 和 MR 影像学表现，提高对其影像学特点的认识。
方法 回顾性分析 34 例经手术病理及临床证实的颈静脉孔区肿瘤影像学表现特点，34 例均行 CT 薄层扫描及面神经管多平面及曲面重建；25 例行 MR 平扫及增强扫描，13 例行面神经多平面及曲面重建。

结果 （1）颈静脉孔的扩大及骨质异常，副神经节瘤：骨质侵蚀、破坏；神经鞘瘤：压迫性骨质吸收、外观多呈膨胀性或扇贝样、边缘较清晰光滑；脑膜瘤：继发多以骨质硬化为主要表现、原发呈渗透一硬化性改变、即颈静脉孔的骨皮质消失、但是骨纹理尚可见；软骨肉瘤：不规则骨破坏及可伴有肿瘤内及肿瘤壁钙化；内淋巴囊肿瘤：骨质破坏、中心钙化、后部环状钙化。（2）密度或信号改变，副神经节瘤：T1 为低或等信号，T2 为高信号，可伴血管流空(椒盐征)；神经鞘瘤：无脑膜尾征及血管流空；脑膜瘤：脑膜尾征、无血管流空；软骨肉瘤：T1 等低信号、T2 高低信号、不均匀；内淋巴囊肿瘤：T1 可有高信号、T2 高信号、不均匀。（3）肿瘤位置、形态及生长方式，副神经节瘤：中心位于颈静脉孔的血管部；神经鞘瘤：常位于颈静脉孔前内侧部，颈静脉球部受压后移；脑膜瘤：常紧贴颅骨、硬脑膜宽基底；软骨肉瘤：以岩枕裂为中心；内淋巴囊肿瘤：常位于岩骨后缘。

结论 颈静脉孔是颅底最复杂的孔道之一，解剖变异及图象伪影常导致图像缺乏特征性，仔细分析图像表现及相关临床表现，CT 有利于显示颈静脉孔区肿瘤的骨质改变而 MRI 可很好地显示颈静脉孔区肿瘤的部位、形态、范围和内部结构特征，两者结合有助于不同类型颈静脉孔区肿瘤的鉴别诊断及其定位诊断，为临床制定手术方案和手术途径提供依据。

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多层螺旋 CT 及 MRI 在腮腺混合瘤中诊断的价值

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目的 探讨多层螺旋 CT 及 MRI 检查在腮腺混合瘤定位和定性中的诊断价值，探讨各类腮腺肿瘤的诊断指征，从而指导临床医师制订正确手术方案。

方法 对我院 2012 年 1 月至 2017 年 5 月确诊的 34 例不同性质的腮腺肿瘤进行 CT 或者 MRI 平扫及增强检查，MRI 检查行多序列并 DWI 成像。然后对肿瘤表现进行回顾性对比分析。

结果 34 例患者中，其中有 22 例 CT 或 MRI 检查呈边缘清楚、密度/信号均匀、强化均匀，形态为圆形或类圆形，其中 CT 检查的肿瘤全部密度高于正常腮腺，其内有时可伴有囊变或斑点状钙化，手术证实为良性混合瘤；其中有 8 例 CT/MRI 呈分叶、密度/信号不均匀且内有囊性密度影/信号影、边缘较清晰；其中有 4 例 CT/MRI 呈分叶状或圆形密度不均匀，边缘模糊，轮廓不清者，部分与周边组织分界不清，增强扫描表现为不均匀强化，其中部分肿块内囊变坏死区未见强化，均为恶性肿瘤。其中有 8 例既行了 CT 检查又行了 MRI 检查。

结论 CT/MRI 对腮腺混合瘤的检查，方法简便、快捷、无创及具有特异性影像学表现的优势，腮腺混合瘤 CT/MRI 特点表现为边缘清楚、肿块密度/信号均匀或不匀，其中表现密度/信号均匀、强化均匀、边缘清晰者为良性，另病灶呈分叶状圆形密度/信号不均匀、环形或均匀强化、边缘模糊、轮廓不清者为恶性。CT/MRI 检查对腮腺混合瘤具有重要的诊断价值，是目前诊断腮腺混合瘤极为重要的方法，对临床外科手术治疗有重要指导价值。

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腮腺常见良性肿瘤 CT 表现及鉴别

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目的 观察分析腮腺常见良性肿瘤 CT 表现特点及与恶性肿瘤鉴别征象，提高诊断水平。

方法 分析经手术病理证实并有完整 CT 资料腮腺病变 55 例，CT 扫描设备为 64 排螺旋 CT 及第 3 代双源 CT。多形性腺瘤 27 例，腺淋巴瘤 15 例，基底细胞腺瘤 3 例，上皮源性恶性肿瘤 10 例。主要观察多形性腺瘤及腺淋巴瘤的 CT 表现，并进行 3 组良性肿瘤组间对照，以及与恶性肿瘤对照。图像观察分析指标：3 组良性肿瘤：病变部位，形态，数目，内部结构，增强表现，包膜；良恶性肿瘤鉴别：病变界线，与周围结构关系。

结果 一般资料：腺淋巴瘤好发于男性，余性别无明显差异；腺淋巴瘤及恶性肿瘤老年为主。3 组良性肿瘤：腺淋巴瘤多位于腮腺后下极，另 2 种良性肿瘤多位于腮腺上中或前部；均可表现为类圆形、类椭圆形；病灶均可为 1 个，但腺淋巴瘤常为多个；平扫均略低于咬肌密度，多均为均匀密度，增强扫描基底细胞瘤密度多均匀，多形性腺及腺淋巴瘤多密度不均， 但腺淋巴瘤内低密度区界线清楚（穿凿样），而多形性腺瘤低密度界线欠清；增强表现：程度从高到低依次为：基底细胞瘤、腺淋巴瘤、多形性腺瘤，后二者多为不均匀强化。动态表现：腺淋巴瘤多表现为动脉期高于静脉期，多形性腺瘤多表现为静脉期高于动脉期。肿瘤边缘“贴边血管征”：贴边血管强化程度及数量从高到低依次为：基底细胞瘤、腺淋巴瘤、多形性腺瘤。“肿瘤内部血管征”：3 种肿瘤区别不明显；包膜：均可有包膜，多数增强时明显，清晰度及完整度依次为：基底细胞瘤，腺淋巴瘤及多形性腺瘤，后二者无明显区别。良恶性病变鉴别：良性肿瘤均界线清楚，均位于腮腺包膜或封套筋膜内；恶性肿瘤界线模糊，可突破腮腺包膜或封套筋膜至皮下脂肪内，可进入腮腺深叶或沿腮腺导管生长，肿瘤内血管征可明显、肿瘤血管粗细不均，无包膜、贴边血管征不明显。

结论 腮腺常见良性肿瘤 CT 表现有一定特点，某些征象可进行良恶性鉴别；增强扫描有重要价值。

S-44

大涎腺先天异常的影像诊断策略

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目的 结合临床影像诊断中的实际情况，分析大涎腺区先天性占位性病变的超声、 CT 及 MRI 表现及特点，提高对该区域先天性异常的认识及诊断水平。

方法 回顾性分析经临床及病理证实的 41 例大涎腺区先天性占位性病变的超声、CT 和 MRI 资料，结合文献，系统梳理各影像表现优势、不足，各种病变的影像特点；包括大涎腺区囊性站位、实性占位、异位甲状腺，迷走大涎腺，大涎腺发育不良或肥大、多囊腮腺等。

结果 大涎腺区的先天异常主要分为结构异常为主、组织学异常-真性占位。其超声、CT 及 MRI 表现为腮腺区肿块影，肿块位于腺体内或腺体旁，多为单发，多呈囊性，边界清晰。表皮样囊肿、鳃裂囊肿、单纯囊肿、淋巴上皮囊肿超声、CT 及 MRI 均表现为形态规则、无血供、无强化肿块，但各自又有不同影像表现，其中单纯囊肿表现为无回声，表皮样囊肿和鳃裂囊肿囊壁可强化，表皮样囊肿一般位置表浅，较鳃裂囊肿小，鳃裂囊肿内可见典型分层征象；淋巴上皮囊肿回声/密度/信号较前两者高，CT 可呈多房样改变；淋巴管瘤分叶状、可跨叶匍匐生长，边界欠清，增强无强化；血管瘤的超声、CT、MRI 多表现为不规则肿块，内回声/密度/信号不均匀，CT 内可见点状钙化，超声可见丰富血流，CT、MRI 增强可见不均匀渐进性强化。超声对囊性病变的鉴别诊断、对血管瘤的定性诊断有较大的优势。

结论 超声、CT 和 MRI 可以显示病变的位置、形态、大小、回声/密度/信号变化、与周围结构的关系，综合三种影像表现有助于提高对大涎腺区先天性占位性病变定性诊断。

S-45

中老年骨肉瘤的影像学特点与误诊分析

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目的 探讨中老年骨肉瘤的发病特点与影像学特点，分析误诊原因。
方法 回顾性分析经手术病理证实的 56 例中老年骨肉瘤的影像学表现。男 34 例，女 22 例。年龄 41 岁~76 岁，均龄 54 岁。影像资料平片、CT 和 MR 均有的 26 例，CT 和 MR 兼有的 12 例，单有平片 9 例、单有 CT 5 例、单有 MR 4 例。
结果 发病部位：长骨 33 例（其中股骨 24 例、胫骨 6 例、腓骨 2 例、肱骨 1 例）。扁骨 17 例（骨盆 8 例、肋骨 2 例、肩胛骨 2 例、颌骨 3 例、颅骨 2 例），脊柱 3 例（胸椎、腰椎和骶骨各 1 例），跗骨 1 例（跟骨、距骨各 1 例），髌骨 1 例。影像学分型：成骨型 33 例（表面骨肉瘤 2 例）、混合型 8 例、溶骨型 15 例。本组继发性骨肉瘤 6 例，其中继发骨纤维异常增殖症 3 例、Paget 病 1 例、骨母细胞瘤 1 例、继发于陈旧性骨折 1 例。27 例缺少典型的瘤骨，对肿瘤骨的显示 CT 最为优越，单有 MR 的 4 例均误诊。术前诊断情况：诊断骨肉瘤 26 例（仅占 46%），只诊断恶性骨肿瘤 3 例，误诊转移瘤 12 例、软骨肉瘤 6 例、骨巨细胞瘤 4 例、骨母细胞瘤和骨纤维异常增殖症各 1 例，误诊率 44.6%，其中长骨病变误诊率达 51%。误诊原因：1.中老年骨肉瘤溶骨型和继发性较多，约半数缺少典型瘤骨，或对碎小的瘤骨认识不足，误认为软骨钙化或被忽略；2.中老年骨肉瘤发病率低，在诊断和鉴别诊断中容易首先考虑转移瘤或软骨肉瘤。病理诊断情况：普通型骨肉瘤 44 例，骨纤恶变 3 例，特殊类型包括成纤维性骨肉瘤 3 例、纤维母细胞型 2 例、软骨母细胞型 2 例、富巨细胞型和去分化型各 1 例。
结论 中老年骨肉瘤发病部位除长骨股骨最常见外，扁骨和不规则骨较多，继发性骨肉瘤较多，长骨病变溶骨型和不典型病例约占半数，误诊率较高。因此重新认识老年骨肉瘤的特点，注意识别瘤骨，各种检查相互印证，方能减少误诊。

S-46

马拉松的影像诊断价值

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在全民健身、健康中国的号召下，马拉松热潮正席卷全国。马拉松主要有全程、半程马拉松、10 公里跑、迷你跑、超级马拉松、越野跑及团队接力跑等。
马拉松运动对人们的心、肺、肾、消化、神经和骨肌等系统都具有挑战性的影响；运动引起的猝死时有发生，运动中和运动后急性肾损伤的发生率也不少，马拉松的成瘾性和依赖性也被人们不断提及。
骨肌系统损伤在马拉松运动员中的发病率较高，软骨、半月板、肌腱、韧带及肌肉等损伤较为常见。其中，膝关节（28%）、踝关节（26%）和小腿（16%）的损伤所占比例最高。
常见的膝关节损伤有髌股疼痛综合症、半月板损伤、骨髓水肿、髌腱炎及韧带损伤等。踝关节和足也是马拉松运动的易损部位，除了上述损伤还有足底筋膜炎等。马拉松运动对髋关节的影响尚不确定，可能的损伤有髋关节炎、骶髂关节损伤、骨盆应力性骨折及肌肉过度使用损伤等。
马拉松运动对关节软骨的影响一直是研究的难点，针对跑量与关节损伤的相关性，观察相关运动数据，来指导马拉松运动十分重要和迫切。

马拉松运动中肌肉软组织损伤也很常见，主要有急性肌肉损伤、胫骨内侧压力综合症、髂胫束综合征等。长跑运动员中最常见的下肢肌肉损伤部位为腘绳肌，其次是股四头肌，且肌肉重复损伤的概率较高。
虽然有报道运动可预防骨质疏松症，但马拉松运动对骨密度影响如何尚不清楚。
另外值得注意的是，参赛经验、跑前训练、跑量、配速、足弓高度、下肢力量、甚至跑鞋的类型等都是间接引起损伤不可忽视的因素，MR 成像技术还有助于分析确定各种危险因素，为指导马拉松运动员训练、康复治疗提供有效依据。
马拉松运动的影像研究除了常规运动损伤，还要动态观察运动过程中功能形态变化，不断提供各种影像数据，为训练及比赛提供科学指导，为马拉松事业及全民健身做出应有的贡献。

S-47

手指和拇指解剖及损伤的 MR 诊断

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目的 研究手指和拇指肌腱韧带正常解剖及损伤的 MR 表现。
方法 1.利用大体标本断层解剖图像及相应的 MR 图像，详细介绍手指屈肌及伸肌断层解剖结构及 MR 表现。（1）手指正常断层解剖与影像表现的相关性。（2）介绍手指正常 MR 表现，为损伤的早期诊断奠定基础。2.研究手指损伤机制及影像学表现的相关性。（1）介绍手指和拇指肌腱韧带损伤常见的影像学表现。（2）介绍手指和拇指肌腱韧带损伤的 MR 表现与功能变化的相关性。
结论 手指和拇指损伤临床上常见，MR 可清晰显示手指肌腱韧带正常解剖结构，以及损伤的影像学表现，为损伤的早期诊断和治疗，提供精准的解剖学和影像学依据。

S-48

重视色素沉着绒毛结节性滑膜炎的早期诊断

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色素沉着绒毛结节性滑膜炎（ PVNS）1852 由 Chassaignac 首先报告手指屈肌腱发生的结节状病变；1864 Simon 描述了膝关节病例；1909 Moser 详细描述了弥漫性（diffuse）PVNS 的表现；1941 Jaffe 命名了 PVNS；Granowitz 和 Mankin 提出了局限型（LPVNS）和弥漫型（DPVNS）的分型。目前 WHO 将 PVNS 和腱鞘巨细胞瘤（tenosynovial giant cell tumor）归为同一疾病。
PVNS 的临床特点：发病率约为 1.8/百万；性别倾向性不明确；发病年龄 30-50 岁；报道最小年龄 12M；常累及单关节；局限型多累及小关节，腕关节最常见；弥漫型常累及大关节，膝关节最常见；弥漫型通常关节内累及，也可侵犯到关节外。
影像特点：X 线表现为关节面非负重部位囊样缺损；但 32~54%的患者表现正常，X 线早期诊断 PVNS 价值不大。MRI 是 PVNS 的主要诊断技术，根据病灶累及的范围分为局限型和弥漫型、关节内型和关节外型。
病例 1~10 分析。
PVNS 的治疗：治疗方法包括保守治疗、开放手术、关节镜、放疗等；合适的治疗方法却决于对病灶的准确诊断和评估。LPVNS：关节镜和开放手术效果相当，复发率<10%； DPVNS：单纯关节镜手术复发率 92~94%；联合关节镜和开放手术，复发率 19~33%。
PVNS 的早期诊断和准确影像学评估对患者的预后有重要的意义。

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管状骨皮质内少见病变的影像学诊断

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管状骨皮质内病变的定义

影像学上，包括：起源于骨皮质的膨胀性骨破坏； 与骨皮质表面相贴的膨胀性病变；伴或不伴有小于相邻皮质厚度且宽基底与原骨皮质相贴软组织肿块和（或）MR 骨髓取代，范围小于 1/2 环周的非膨胀性骨皮质破坏 。

临床及影像学特点

1.软骨母细胞瘤：皮质区膨胀性类圆形骨破坏，长轴与骨干一致，长径多≦4cm，周围髓腔和软组织可斑片状水肿信号。

2.成骨细胞瘤：骨皮质内梭形或类圆形膨胀性骨破坏，长径与骨干一致，多大于 1.5cm，周围髓腔和软组织可斑片状水肿信号。

3.骨肉瘤：骨干皮质内边界较清类圆形或不规则形膨胀性骨破坏，长径 1～4.2cm 不等 。

4.血管瘤：皮质类圆形膨胀性或不规则骨破坏，可伴有相邻皮质三角形增厚和网格状骨嵴，T2WI 多明显高信号 。

5.骨纤维异常增殖症：皮质内沿长轴走行的膨胀性破坏，内软组织密度和（或）磨玻璃密度

6.郎格汉细胞组织细胞增生症：累及皮质少见，多发病灶一部分。圆形、类圆形、分叶状或不规则形皮质破坏，边界较清楚，可轻度不规则，可伴层状或条带状骨膜增生，轻微软组织肿块 。

7.畸形性骨炎（Paget 病）：血碱性磷酸酶增高。多起于骨端软骨下区，并经干骺达骨干，边界清楚。

8.血友病假肿瘤：反复多部位出血史，化验检查凝血因子减少或缺乏。皮质表面的膨胀性病变，骨壳多不完整，相邻皮质凹陷，可累及松质骨和髓腔，相邻骨质可硬化。

9.肌腱牵拉性病变（皮质旁硬纤维瘤）：最长见股骨远侧干骺端后内侧皮质，邻近股骨髁。

10.骨皮质脓肿：局部疼痛和压痛。骨皮质圆形类圆形骨质破坏，边界清楚 。位于骨端者，破坏松质骨侧伴硬化缘。周围髓腔和软组织可轻度或明显水肿。

11.囊性结核：弥漫性多发病变,单骨或多骨受累,部分病灶位于皮质内。

12.杆菌性血管瘤病：见于 AIDS 病人，少见其它免疫抑制患者。骨皮质溶骨性破坏，边界清楚或模糊，可伴骨膜反应。

13.内固定物反应：手术病史及内植物。

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CT 碘对比剂安全使用

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目的 碘对比剂是高危药品，探讨如何安全使用碘对比剂，防止对比剂副作用及并发症发生。

方法 通过分析对比剂副作用，包括对比剂肾病、过敏样反应及对比剂外渗的临床表现，提出预防及治疗的方法。

结果 对比剂肾病预防：基础肾功能检测与水化，建议在使用碘对比剂前 4 小时至使用后 24 小时内，对患者给予水化；紧急时，可在没有评估肾功能情况下进行使用碘对比剂。

对比剂外渗处理原则：轻、中、重度对比剂外渗处理方法均不一样，重度者可能要手术治疗；对比剂外渗预防主要包括选择穿刺部位、控制注射流速等。

碘对比剂全身不良反应与应对措施：轻、中、重度对比剂不良反应包括观察、适当对症治疗等，严重者需要进行心肺复苏。一般性预防主要包括对比剂使用前加温到 37℃；患者注射对比剂后需留观 30 分钟才能离开检查室。
告知患者碘对比剂禁忌症及知情同意书。
结论 重视 CT 碘对比剂副作用及并发症的预防措施及治疗原则，有助于明显减少副作用及并发症的发生以及降低对人体的危害。

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MR 多参数成像诊断肝纤维化分期的实验研究

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目的 探讨 MR 弹性成像（MRE）、磁敏感加权成像（SWI）和 $T_1\rho$ 成像诊断肝纤维化（LF）分期的价值。
方法 将 80 只新西兰白兔采用随机区组分组法分为 LF 组（n=60）和对照组（n=20）。LF 组按 0.1 ml/kg 每周皮下注射 50%四氯化碳油溶液，第 4、5、6、15 周末任意选取 LF 组 12 只及对照组 5 只行轴面肝脏扫描，获得肝脏弹性硬度值（LS）、肝脏/肌肉信号比（$SIR_{肝/肌}$）和 $T_1\rho$ 值，取肝组织进行病理学 Scheuer 纤维化分期，并将 LF 组和对照组分为不同群组。采用单因素方差分析评价不同 LF 分期组间 LS、$T_1\rho$ 和 $SIR_{肝/肌}$值的差异，采用 Spearman 法进行各特征值与病理分期的相关性分析，采用 ROC 评价三种 MR 成像方法（单一方法，结合两种方法、结合 3 种方法）诊断 LF 分期的效能。
结果 55 只兔纳入研究，F0 期 14 只、F1 期 11 只、F2 期 10 只、F3 期 9 只、F4 期 11 只。不同 LF 分期组间，LS 值、$SIR_{肝/肌}$及 $T_1\rho$ 值差异均有统计学意义（P<0.05）。LS 值与 LF 分期呈正相关（r=0.910，P<0.01）；$SIR_{肝/肌}$值与 LF 分期呈负相关（r=－0.808，P<0.01）；$T_1\rho$ 值与 LF 分期呈正相关（r=0.512，P<0.01）。MRE 诊断效能最高，诊断≥F1、≥F2、≥F3、F4 期的 ROC 下面积分别为 0.953、0.949、0.986、0.979；结合两种成像方法，MRE+SWI 诊断≥F1、≥F2、≥F3、F4 期 LF 的 ROC 下面积分别为 0.965、0.983、0.991、0.950；3 种 MR 特征值结合在诊断≥F1、≥F2、≥F3、F4 期的 ROC 下面积分别为 0.969、0.985、0.996、1.000。
结论 MRE 作为诊断效能最高的手段，与 SWI 组合在肝纤维化早期诊断优于其他两两组合，结合 3 种方法能发挥最佳的诊断效能。

S-52

AIDS 和非 AIDS 患者并发 PCP 的临床与影像特点

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目的 探讨 AIDS 和非 AIDS 患者并发 PCP 的临床与影像特点。
方法 回顾性分析 50 例经实验室检查确诊的 PCP 患者的临床与影像资料，其中 AIDS 组 32 例，非 AIDS 组 18 例。
结果 PCP 常见的 CT 表现有双肺磨玻璃样密度影，小叶间隔增厚，肺气囊等，重症患者可发生气胸、纵隔气肿。AIDS 组以肺门为中心双肺对称分布的样密度影最为多见（26/32），其中 14 例可见月弓征；小叶间隔增厚 18 例，其中 8 例出现碎石路征；条索影 9 例；肺气囊 6 例；肺门、纵隔

淋巴结肿大 5 例；实变和气胸各 4 例；纵隔气肿和胸腔积液各 3 例。非 AIDS 组主要表现为双肺弥漫分布磨玻璃样密度影（13/18）；实变 8 例，其中 3 例可见空气支气管征；条索影 7 例；小叶间隔增厚 5 例；肺门、纵隔淋巴结肿大 3 例；气纵隔气肿 2 例，气胸 1 例。2 组患者临床表现均以发热、憋喘、干咳最为常见。AIDS 组和非 AIDS 组有 6 例和 2 例患者无任何临床表现。

结论 PCP 的 CT 表现多种多样。AIDS 和非 AIDS 患者均以双肺磨玻璃样密度影最为多见，空气支气管征仅见于非 AIDS 组。2 组患者主要临床症状均为发热、憋喘、干咳，无任何临床表现均见于 2 组患者。

S-53

早期 HIV 感染及 HAART 对脑灰白质微观结构及内在自发脑活动的影响

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目的 利用 3D T1 结构像的 VBM、弥散张量成像的 TBSS、静息态脑功能的低频振幅方法研究早期 HIV 感染及 cART 对大脑灰白质微观结构及内在自发脑活动的影响。

方法 49 名 HIV 感染者，其中 26 名接受 cART 治疗（HIV+/cART+）、23 名未接受治疗（HIV+/cART-），以及 25 名年龄、性别、受教育年限匹配的健康志愿者进行了 3D T1 结构像、DTI 及静息态脑功能 MRI 检查。利用单因素方差分析比较三组间结构（灰质体积、白质的各向异性分数 FA，平均弥散值 MD，轴向弥散值 AD，径向弥散值 RD）及功能（ALFF 值）的差异。此外，提取三组之间显示出显著差异脑区的患者的结构及功能参数分别与患者临床变量和神经心理学测试结果做 spearman 相关分析。

结果 ANOVA 分析显示，三组间结构差异（灰质体积，FA、MD、AD、RD 值）无显著性。三组间 ALFF 值差异具有显著性的脑区位于枕叶皮层。进一步进行多重均数的两两比较显示，与对照组相比，治疗组和未治疗组患者枕叶的 ALFF 值均显著降低，但治疗和未治疗两组之间枕叶的 ALFF 值差异没有显著性。此外，与对照组相比，治疗组在右侧尾状核和额顶叶皮层的 ALFF 值显著升高，未治疗组在双侧尾状核的 ALFF 值显著升高。与未治疗组相比，治疗组患者在听觉皮层的 ALFF 值显著升高。此外，相关性研究发现，未治疗组患者右枕叶皮质中的 ALFF 值与 CD4/CD8 比值和执行功能正相关。

结论 早期 HIV 感染，脑灰白质尚未发生微观结构改变，大脑功能改变可能早于结构改变；或受本研究观察方法的灵敏度所限，已发生的结构变化尚不足以被观察到。早期 HIV 感染患者自发性大脑异常活动主要在枕叶皮质，表现为自发性大脑活动减低。cART 似乎无法阻止 HIV 诱导的神经退行性变，但可能会在一定程度上延缓神经损伤的进程。ALFF 可能是监测 HIV 和 cART 对大脑功能影响的潜在生物标志物。

S-54

颅内真菌感染影像征象分析

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真菌性脑炎影像学表现

（1）40%的真菌性脑膜炎 CT 表现并没有特异性，与结核性脑膜炎相似，慢性感染者可见脑积水；

（2）MR 表现与 CT 类似，MR 增强更容易分辩脑表面软脑膜的异常强化；

（3）与结核性脑膜炎鉴别困难，但如果鞍区或鞍上发现不规则小斑点状钙化则有助于诊断。
新型隐球菌感染
CT 表现
1. 肺部：类结核样病灶或肺炎样改变
2. 头颅：弥漫性脑膜强化、脑水肿、肉芽肿、囊肿、钙化或软化坏死灶等
3. 25-30%可无明显异常
MR 表现
1. 假囊肿形成（血管周围间隙扩大）：直径≥3mm，簇状分布于基底节、中脑，长 T1、长 T2，DWI 低，不强化
2. 增强：软脑膜和脉络丛强化，脑内环形或斑片状强化
3. 可伴脑积水、脑梗死
新型隐球菌脑内感染
簇状胶质囊肿，呈皂泡样改变

S-55

如何从临床工作寻找科研亮点

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S-56

急性心肌梗死 CMR 新技术成像及并发症评估

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S-57

嗜酸性粒细胞肺病的临床和影像学诊断

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论文发言

OR-001
神经人工网络自动分割技术在评估胶质瘤分级及预后中的临床应用

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目的 应用神经人工网络(ANN)自动分割技术对胶质瘤进行肿瘤动态体积计算，并结合肿瘤动态体积变化的时间及空间相关性进行机器学习，从而预测胶质瘤分级及预后的疗效评估。
方法 对我院 232 名胶质瘤患者进行磁共振数据采集，包括 T2WI、T1WI、T2-Flair、增强 3D-T1 序列扫描，利用神经人工网络框架下开发的全自动定量分析软件对所有被试进行肿瘤增强以及非增强 T2 上的异常信号的自动识别和体积分割；将自动量化的肿瘤空间和时间体积动态计算进展时间，并与 RANO 确定的进展时间的可靠性和肿瘤分级两方面进行比较，进而评估胶质瘤的预后疗效。
结果 与 RANO 确定的进展时间的可靠性的肿瘤分级比较得出，基于神经人工网络的自动化定量分析是确定肿瘤分级以及疗效评估更好的替代方法，其置信区间分别为 RANO-[1.46-2.92]vsANN[1.86-3.60] p<0.0001;我们发现 ANN 能够以高通量对胶质瘤的分级及预后疗效评估进行客观和自动化评估，并能最终成为高通量成像生物的标志物和其他疾病的扩展应用。

OR-002
中枢神经系统胚胎性肿瘤影像学表现

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目的 探讨中枢神经系统胚胎性肿瘤影像学特点，提高对其影像学表现的认识。
方法 根据 2016 年 WHO 中枢神经系统肿瘤分类，对重新命名的肿瘤实体及新增加的肿瘤实体的影像学表现进行分析。
结果 2016 年 WHO 中枢神经系统肿瘤分类，更新增加了基因定义的髓母细胞瘤的亚型，用中枢神经系统胚胎肿瘤取代了中枢神经系统原始神经外胚层肿瘤（无特殊说明），并用遗传学定义的胚胎肿瘤伴多层菊形团取代了室管膜母细胞瘤。2016 年 WHO 中枢神经系统肿瘤分类中胚胎性肿瘤包括髓母细胞瘤（遗传学分类）：WNT 激活型、SHH 激活伴 TP53 突变型、SHH 激活伴 TP53 野生型、非 WNT/非 SHH 型、group3 型、group4 型；髓母细胞瘤（组织学分类）：经典型、多纤维性 / 结节增生型、广泛结节型、大细胞型 / 间变型；髓母细胞瘤 NOS；胚胎性肿瘤伴有多层菊形团；髓上皮瘤；中枢神经系统神经母细胞瘤；中枢神经系统节细胞神经母细胞瘤；非典型畸胎样 / 横纹肌样肿瘤。
结论 不同类型的中枢神经系统胚胎学肿瘤影像学表现具有特点，同一种肿瘤的不同亚型间，其发生部位及影像学表现均具有特点，对于鉴别诊断有一定帮助。

OR-003
三维动脉自旋标记联合扩散加权成像在儿童脑肿瘤分级中的应用

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目的 评价三维动脉自旋标记(3D-ASL) 联合扩散加权成像（DWI）在儿童脑肿瘤分级中的价值。
方法 回顾性分析 35 例经手术病理及免疫组化证实的脑肿瘤患儿，术前行 3D-ASL 及 DWI 成像。在 GE AW4.6 工作站测量肿瘤血流量(TBF)、TBF 比值(rTBF)、ADC 值，采用独立样本 t 检验比较高级别（Ⅲ、Ⅳ级）、低级别（Ⅰ、Ⅱ级）肿瘤的 TBF、rTBF 及 ADC 值，利用受试者工作特征曲线(ROC 曲线）评价各参数的诊断效能。
结果 高级别肿瘤 TBF 值显著高于低级别肿瘤（t=4.991，$P<0.001$）。高级别肿瘤 rTBF 值显著高于低级别肿瘤（t=4.687，$P<0.001$）。高级别肿瘤 ADC 值显著低于低级别肿瘤 （t=-6.362，$P<0.001$）。TBF、rTBF、ADC 值对肿瘤分级的曲线下面积(AUC) 分别为 0.892、0.918、0.971。rTBF 联合 ADC 值对肿瘤分级的 AUC 为 0.985，rTBF 联合 ADC 值诊断的敏感度和特异度分别为 100%及 95%。
结论 3D-ASL 及 DWI 对儿童脑肿瘤分级有重要价值，联合分析 rTBF 及 ADC 值能进一步提高儿童脑肿瘤分级的敏感性和特异性。

OR-004
儿童药物中毒性脑病的 MRI 表现及应用价值

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目的 探讨小儿误服药物引起的中毒性脑病的 MRI 表现及临床应用价值。
方法 回顾性分析经临床确诊的 12 例病因明确的中毒性脑病患儿，均行 MRI 平扫检查,其中 11 例行增强检查，分析其 MRI 特征。
结果 12 例患儿,11 例 MRI 检查有阳性发现，另 1 例检查为阴性。12 例药物中毒性脑病患儿的 MRI 影像表现可归纳为：①仅基底节灰质核团受累（2 例）；②基底节及脑白质同时受累（5 例）；③基底节、脑白质及脑皮层受累（2 例）；④基底节、脑白质、小脑及脑干广泛受累（2 例）；⑤阴性（1 例）。 受累区域 MRI 表现为稍长 T1 稍长 T2 信号，常为对称性分布，水抑制序列（FLAIR）均为高信号。 弥散加权成像（ＤＷＩ）表现分为高信号（10 例）。增强扫描：受累区域病灶明显强化（10 例），与 DWI 表现一致。
结论 药物中毒性脑病主要累及基底节灰质核团及大脑白质纤维，常对称性分布。MRI 检查敏感性及准确性高，能早期全面了解药物中毒患儿脑部受累情况，有助于临床医生对此类疾病发展及预后的评估。

OR-005
小儿胶质母细胞瘤影像学特征与病理亚型相关性研究

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目的 探讨小儿胶质母细胞瘤 CT、MRI 影像学表现及其与病理亚型的关系，提高其术前诊断的准确性。
方法 回顾性分析 19 例手术病理证实的胶质母细胞瘤（GBM）及其亚型的 CT（n=13）、MRI（n=17）资料，比较各型影像学所见。

结果 GBM12 例、巨细胞胶质母细胞瘤（GCG）5 例、小细胞胶质母细胞瘤及胶质肉瘤各 1 例，病灶长径 1.6cm-9.44cm，平均 4.77cm，肿瘤主体部分位于脑叶 8 例、脑干 4 例、脑室 4 例、丘脑 2 例、小脑 1 例。75%（9/12）GBM 瘤周水肿不明显但 50%（6/12）伴明显囊变，80%（4/5）GCG 出现显著瘤周水肿但囊变不明显，SCG 广泛瘤内出血但几无瘤周水肿，GSM 呈边缘条片状钙化的显著非均质强化的巨大实性分叶肿块。

结论 胶质母细胞瘤及其亚型的影像学表现有一定的特征，结合肿瘤的发病部位、水肿情况以及囊变钙化等特点，有助于该病的术前准确诊断。

OR-006

儿童低钠血症诱发的渗透性脱髓鞘综合征 MRI 表现

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目的 总结渗透性脱髓鞘综合征的 MRI 特点。

方法 分析我院 2016-2017 年期间 2 例ＯＤＳ患者临床资料和影像特点。2 例均行平扫+增强，平扫行 T1WI、T2WI、T2Flair 及 DWI 序列检查。

结果 第 1 例患儿，男，2.6 岁，因“间断发热 27 天，精神反应差 10 天”入院，其它查体正常，血常规正常。查电解质：K1.85mmol/L，Na104.0mmol/L，Cl61.0mmol/L,提示三低。MRI 示双侧尾状核和豆状核及邻近内囊前肢对称性受累，DWI 明显，脑桥正常，表现为脑桥外髓鞘溶解症。第 2 例患儿，女，4.4 月，因“发育迟缓、生长缓慢 4 月，间断呕吐 1 月余”入院。血常规正常，查电解质：Na100.6mmol/L，Cl72.4mmol/L。MRI 示桥脑、双侧大脑脚、双侧基底节及内外囊、双侧丘脑对称弥漫异常信号，表现为脑桥中央髓鞘溶解症和脑桥外髓鞘溶解症。2 例增强阴性。

结论 渗透性脱髓鞘综合征是一种少见的急性非炎性中枢脱髓鞘病变，分为脑桥中央髓鞘溶解症和脑桥外髓鞘溶解症，两者可以单独存在也可以同时发生。低钠血症纠正过快可诱发渗透性脱髓鞘综合征，以桥脑基底部、尾状核、壳核、丘脑为常见好发部位，多对称发病，ＤＷＩ序列有助于早期诊断。

OR-007

Abnormal spontaneous brain activity and functional connectivity in children with new-onset type 1 diabetes mellitus: a resting-state fMRI study

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Purpose Type 1 diabetes mellitus (T1DM) can cause visual and cognitive impairments, and depression, which may be due to deficits in brain functions. However, it is unclear whether brain activity and functional connectivity (FC) will change in T1DM children. Here, we aimed to investigate brain activity and FC changes in children with new-onset T1DM based on fractional amplitude of low-frequency fluctuation (fALFF) and subsequently seed-based FC analysis. **Materials and Methods** Thirty-five new-onset T1DM children and thirty-three age-, sex-matched healthy controls underwent resting state

functional MRI. The characteristics of fALFF and seed-based FC were analyzed in children with new-onset T1DM compared with the healthy controls. The correlations between fALFF and clinical data and intelligence quotient (IQ) were examined. **Results** Compared with control subjects, children with new-onset T1DM showed significantly increased fALFF values in left middle temporal gyrus (MTG) and right calcarine and decreased fALFF value in right thalamus ($p<0.05$, corrected for multiple comparisons). The FCs between right calcarine and right thalamus and between left MTG and right hippocampus were significantly higher, while FC between right thalamus and left superior temporal gyrus was significantly lower. In the T1DM group, fALFF value of left MTG was positively correlated with IQ, while fALFF value of right thalamus was negatively correlated with blood glucose level at imaging. **Conclusion** These results suggest that brain spontaneous activity and FC is altered in several brain regions in children with new-onset T1DM. fALFF value may be related to blood glucose level of T1DM. The altered brain spontaneous activity and FC may be potential mechanisms of visual impairment, cognitive dysfunction, and depression in T1DM patients.

OR-008

儿童肺炎链球菌性与大肠杆菌性化脓性脑膜炎 MRI 影像学特点对比分析

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目的 探讨儿童肺炎链球菌性与大肠杆菌性化脓性脑膜炎 MRI 表现特点。
方法 收集 2010 年 1 月至 2014 年 12 月我院感染科收治的肺炎链球菌性及大肠杆菌性化脓性脑膜炎共 47 例患儿病例临床资料及 MRI 影像学检查。采用 X2 检验、Fisher 精确概率法、t 检验或秩和检验进行统计学分析。P＜0.05 认为具有统计学意义。
结果 肺炎链球菌组共 34 人，1 岁以下幼儿 21 人（61.8%），1 岁以上 13 人（38.2%）；大肠杆菌组 13 人，均为 1 岁以下。 肺炎链球菌性脑膜炎多见于 9-11 月（44%），大肠杆菌性脑膜炎多见于 6-8 月（46%）。两种病原菌发病时间分布有明显统计学差异（p=0.01）。肺炎链球菌与大肠杆菌性脑膜炎临床表现中在发热、意识改变这两项（p=0.036）具有统计学差异。两细菌组硬膜下积液发生概率及分布情况无明显统计学差异（p＞0.05），大肠杆菌组较肺炎链球菌组硬膜下出血或积脓(50%:27.2%)概率略高。大肠杆菌组较肺炎链球菌组侧脑室积脓（8.3%:3.3%）、室管膜炎（16.7%:3.3%）更为多见，而肺炎链球菌组侧脑室旁水肿（30%）更为多见。肺炎链球菌组较大肠杆菌组软脑膜及硬脑膜增厚（56.7%:41.7%）概率略高，分布广泛，且伴随明显的血管流空信号增多（56.7%），但大肠杆菌组硬脑膜增厚程度略高。肺炎链球菌组较大肠杆菌组脑实质异常信号累及范围更广，脑出血（6.7%）更常见且伴有静脉窦血栓（6.7%）形成。
结论 肺炎链球菌性脑膜炎发病年龄大，冬季常见，易出现发热和意识改变，以清亮大量硬膜下积液伴脑积水、大范围脑膜受累伴大脑表面血管增多为主要特征，脑实质出血、坏死、软化、脓肿形成显著，且易伴随静脉窦血栓形成；而大肠杆菌性脑膜炎发病年龄小，夏天多见，易抽搐，以浑浊硬膜下积液伴室管膜炎、局部脑膜明显增厚为特征改变。

OR-009

儿童弥漫性中线胶质瘤伴 H3K27M 突变 MRI 表现

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目的 探讨儿童弥漫性中线胶质瘤伴 H3K27M 突变的磁共振表现。
方法 回顾性收集本院经术后病理证实的儿童弥漫性中线胶质瘤伴 H3K27M 突变 38 例。其中男 21 例，女 17 例，年龄 2~11 岁。临床症状因肿瘤部位不同而异，脑干受累者表现为饮水呛咳、四肢乏力，累及丘脑者头痛呕吐，累及脊髓者腰部疼痛、大小便失禁。分析 38 例患儿术前磁共振表现。
结果 38 例儿童弥漫性中线胶质瘤伴 H3K27M 突变患儿中，位于脑干者 34 例，丘脑 3 例，脊髓 1 例。累及脑干者旧称弥漫内生型脑桥胶质瘤，仅累及脑桥者 16 例，累及全脑干 8 例，脑干延伸至丘脑 4 例，累及脑桥、中脑 3 例，脑干延伸至桥臂、小脑半球 3 例。
34 例脑干肿瘤均表现为边界不清的浸润性肿块，最大径 6 厘米至 3.2 厘米不等。32 例没有瘤周水肿，1 例明显水肿，1 例轻度水肿。2 例内见少许出血。14 例内见范围大小不一的囊变坏死区，增强后囊变坏死边缘环形强化，6 例内见结节样实性强化。29 例有明显的占位效应，表现为幕上脑室扩张，周围脑组织受压变形。弥散加权序列仅见 1 例内有斑片状弥散受限区，其余均无弥散受限，肿瘤表现为低信号。仅 1 例播散至左侧小脑幕。
1 例表现为脑桥、中脑弥漫浸润性占位，延伸至左侧丘脑，形成肿块，且脑干与丘脑两部分肿瘤磁共振表现不一致。脑干部分与弥漫内生型脑桥胶质瘤相似，丘脑部分表现为弥散明显受限、强化明显且不均匀。1 例位于三脑室两侧丘脑、延伸至松果体区浸润性生长肿块，三脑室明显变窄，平扫信号均匀，弥散不受限，无囊变坏死区，无出血，无瘤周水肿，增强后无强化。1 例位于右侧丘脑、基底节区，延伸至右侧大脑脚，弥散明显受限，信号均匀，无囊变坏死区，无出血，轻度瘤周水肿，增强后无强化。1 例位于胸段脊髓，较长节段受累，边界不清，环形强化。
结论 儿童弥漫性中线胶质瘤伴 H3K27M 突变可位于中线任何位置，不同位置者肿瘤磁共振表现各异，明确诊断应结合组织学病理及免疫组化。

OR-010

Monitoring postoperative neurocognitive dysfunction through the use of radiomics based on MRI in children with moyamoya disease

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Purpuse *To assess the value of radiomics based on MRI in the identifcation and quantitative evaluation of postoperative neurocognitive dysfunction in Children with moyamoya disease.*
Materials and Methods *A prospective study was conducted in 13 subjects with moyamoya disease (of whom all underwent direct arterial anastomosis) in Nanjing Children’s Hospital, China in 2018. 14 normal subjects were enrolled as control group. Neurocognition was measured using Wechsler Intelligence Scale for Children (WISC) scale to estimate IQ. Histograms of apparent diffusion coefficient (ADC) and texture features of the whole brain were extracted and correlated to age, time of operation and IQ scores. Diagnostic performance of all features was then evaluated and compared through independent-samples t test and receiver operating characteristics.*

Results *In the moyamoya group, the 10th-50th ADC was negatively correlated with the age of the children, the 10th-45th ADC was negatively correlated with the duration of the disease, and the histogram value of 80th-95th was negatively correlated with the operation score of the patients, while the parameter value in the control group was not significantly correlated with the age and intelligence scale scores. In addition, the operation score of moyamoya group was lower than that of the control group, and the difference was statistically significant. The ADC mean, skewness, kurtosis, variance and 25th-95th ADC in the two groups were statistically different, and the histogram value of moyamoya group was higher than that of the control group. Texture analysis results did not differ between the two groups. ROC results showed that the area under the curve of the 75th ADC value was the largest, 0.920.*
Conclusion *Postoperative neurocognitive dysfunction exists in patients with moyamoya disease, radiomics has excellent performance in the identifcation of impaired cerebrovascular reactivity in patients with moyamoya disease, and it has the potential to serve as a noninvasive imaging analysis tool to monitor cerebrovascular reactivity in patients with moyamoya disease.*

OR-011

A spectrum of imaging findings in children with Gaucher disease

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OR-012

Quantitative diffusion tensor MRI of the premature with hypoxic-ischemic brain damage (HIBD)

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Hypoxic-ischemic brain damage (HIBD) is considered a major contributor to mortality and morbidity and leads to neurological deficits in premature infants, which has a significant negative impact on patients' quality of life, including cerebral palsy, mental retardation, and epilepsy[1]. So Early diagnosis and timely intervention can significantly improve the prognosis, so early diagnosis of HIBD in children is very important. Therefore, it is very important for pediatric patients to have an early diagnosis and timely treatment. In the present study, we examined the application of diffusion tensor imaging (DTI) in premature infants with HIBD. Our results showed that DTI was an important imaging method for early diagnosis and prognosis of premature infants with HIBD. Premature infants with HIBD and full-term infants with no HIBD (as control group) were selected from the Third Affiliated Hospital of Zhengzhou University. The conventional MRI and DTI scan was obtained at term in preterm infants. The FA of HIBD group had significantly injury within posterior limb of internal capsule (PLIC), splenium of corpus callosum (SCC), white matter of frontal

lobe (FWM), white matter of parietal lobe (PWM), white matter of occipital lobe (OWM), thalamus, lenticular nucleus (LN) and cerebral peduncle (CP) compared to the control group without HIBD. There was no significant correlation between FA of PLIC and the Apgar score (1 minutes and 5 minutes). Bayley scales of infant development (BSID) was used for follow-up at the corrective age of 7 to 8 months. We found that the higher FA of ROI, the better the prognosis. And the FA of PLIC had the largest area under the curve (AUC) in the prognosis study. These results suggest that DTI can detect latent damage and predict prognosis in HIBD of premature infants. This indicates that DTI can be used as an imaging index to evaluate the premature infants with HIBD.

OR-013

亚急性硬化性全脑炎（SSPE）的 MRI 表现

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目的 亚急性全脑炎（SSPE）早期诊断较为困难。但早期诊断及治疗对延长患儿生命尤为重要,笔者总结 SSPE 患者 MRI 图像的特征，以提高对该病的认识。
方法 对我院 2 例明确诊断为 SSPE 的患儿进行回顾性分析，对其 MRI 结果进行分析，找出该病的特征性 MRI 改变，结合以往文献，对该病进行进一步认识。
结果 MRI 均表现为双侧大脑皮层下、侧脑室前后角旁多发斑片状 T1WI 低信号、T2WI 高信号、T2FLAIR 高信号，一例患者部分病灶 DWI 呈高信号，而另一例患者还伴有脑萎缩。
结论 SSPE 的 MRI 表现具有高度敏感性，但缺乏特异性，确诊需要结合其临床表现、脑电图表现及实验室检查。

OR-014

CT 和 MR 对小儿脑性瘫痪诊断中的价值研究

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目的 对电子计算机断层扫描（CT）和核磁共振检查（MR）在小儿脑性瘫痪诊断中的应用价值进行分析和研究。
方法 以我院 2015 年 2 月—2017 年 2 月收治的 50 例经临床确诊的脑性瘫痪患儿为研究对象，入组后采用随机数表法对患儿平均分组，观察组和对照组各 40 例，分别给患儿 MR 检查和 CT 检查，以病例检查结果为金标准，比较 CT 和 MR 检查诊断本病的临床价值。
结果 观察组患儿检测阳性率为 90.00%，显著高于对照组患儿的 67.50%（P<0.05）；此外，两组均以脑软化灶，双侧额部硬膜下积液和脑白质萎缩为主要征象（P<0.05）；同时，对于脑缺血灶、脑白质变性的漏诊率，观察组明显低于对照组（P<0.05）。
结论 MR 检查小儿脑性瘫痪的阳性率高于 CT 诊断，但临床应将二者有机结合，以进一步提高检测有效和准确性。

OR-015

Congenital Nasal Pyriform Aperture Stenosis

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As we know, the pyriform aperture is a pear-shaped bony inlet of the nose bounded by the nasal bones superiorly, the nasal processes of maxilla laterally, and the horizontal processes inferiorly. The pyriform aperture is the narrowest portion of the nasal cavity. Nasal development occurs during the fifth to eighth weeks of gestation. Bony overgrowth of the nasal processes of the maxilla will result in narrowing of the pyriform aperture and usually bilateral. A pyriform aperture of less than 11mm axial width in a term infant can be diagnosed as Congenital Nasal Pyriform Aperture Stenosis(CNPAS).
We know that the neonates are obligate nasal breathers until the age of approximately 4 months. So, the CNPAS is a very important cause of neonatal nasal obstruction that occurs around 1 in 25000 births. The symptoms depend on the severity of stenosis, including labored breathing, cyclic cyanosis and apnea that can be relieved by crying. Traditionally, faliure to pass a nasogastric tube of thickness 4mm should raise the suspision of a nasal obstruction caused by CNPAS. CNPAS can present in association with other congenital anomalies such as holoprosencephaly, hypopituitarism, and up to 75% of CNPAS could coexist with median maxillary single incisor. CNPAS can be confirmed with bone CT of nasal cavity. Measurement should be performed parallel to the hard palate. Meanwhile, the hard palate is usually hypoplastic and in the shape of a triangle. AS CNPAS may associated with intracranial abnormalities above-mentioned, further evaluation with MRI of the brain is indicated in these patients.
Well, it's important
to differentiate CNPAS from choanal stenosis or atresia in this age group although they may coexist.
The latter disorder is obstruction of the posterior nasal passage, but CNPAS is the obstruction of the anterior opening of bony nasal cavity and typically with a normal caliber of choanal.
when the PA width is less than 6mm in neonate, a surgical intervention may be need for.

OR-016
小儿外中耳畸形伴感音神经性耳聋诊断的 256 排高分辨率 CT 扫描及图像后处理技术的影像诊断价值

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目的 通过对临床诊断为感音神经性耳聋患者进行高分辨率 CT 扫描，并在 CT 工作站对外中耳等结构进行多种图像后重建， 探讨高分辨率 CT 成像对小儿外中耳畸形伴感音神经性耳聋的应用价值。
方法 回顾分析我院临床诊断感音神经性耳聋患儿 32 例，患儿多自幼听力下降，全部行 256 排多层螺旋 CT，检查病人仰卧,头位摆正，以听眶上线为扫描基线自外耳道下缘扫至岩骨上缘，获得横

轴面 CT 图像。层厚、层距均为 0.67mm, 窗位 500-600Hu,窗宽 3500-4000H，并进行多平面重建（MPR），容积再现（VR）等后处理技术，依次观察外耳、中耳及面神经等结构。
结果 本组 32 例患儿中，共计 58 耳，进行多平面重组等多种图像后处理，发现外耳及中耳畸形单独或合并存在共计 21 例。其中外耳道骨性闭锁 16 耳，膜性闭锁 5 耳，骨性狭窄 11 耳，骨性狭窄伴膜性闭锁 2 耳。中耳鼓室腔狭小 9 耳，乳突窦未发育 3 耳，听小骨发育不良 1 耳。颈静脉球窝高位 28 耳，颈静脉球裸露 1 耳，中颅窝低位 2 耳。面神经鼓室段下移 4 耳；乳突段前移 17 耳。
结论 256 排高分辨率 CT 能够清晰地显示小儿伴感音神经性耳聋的外、中耳畸形，通过图像后处理重建能够进一步的诊断和分类，为临床治疗提供了重要依据。

OR-017

弯刀综合症的 CT 影像表现多样性

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目的 探讨儿童弯刀综合症 CT 影像表现的多样性。
方法 回顾性分析经本院就诊的 15 例弯刀综合症病例，其中男 7 例，女 8 例，年龄 2d～12y，中位数年龄 3.9m，体重 3.5kg～13.0kg，中位数体重 6.0kg。所有患儿均行超声心动图及多排 CT 检查，其中 5 例进行心血管造影。所有 CT 图像均由复旦大学附属儿科医院 2 名具有 5 年以上心血管影像阅片经验的放射科医师在 AW 4.5 工作站进行阅读和评估。分析 CT 图像的肺静脉异常引流部位、是否合并狭窄，是否存在体肺侧枝、隔离肺、伴发气道异常，测量左右肺体积、左右肺动脉管径，是否合并的心内外畸形情况。
结果 3 例存在右下肺静脉异位引流，12 例右侧肺静脉异位引流；1 例引流至上腔静脉，其余 14 例皆引流至下腔静脉；其中 4 例存在肺静脉回流梗阻；8 例存在体肺侧枝，隔离肺 2 例；伴发气道畸形 4 例；8 例存在心内心外畸形。
结论 CT 可以提供弯刀综合症的详细解剖信息和影像表现的多样性。

OR-018

低剂量 MSCT 血管成像在婴幼儿肺动脉吊带诊断中的临床应用

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目的 探讨低剂量多排螺旋 CT(MSCT)在婴幼儿肺动脉吊带（pulmonary artery sling，PAS）术前诊断中的临床应用价值。方法选取 2013 年 8 月—2018 年 10 月经手术证实的 9 例肺动脉吊带，回顾性分析其术前低剂量 MSCTA 影像特点。结果 9 例 PSA 患儿术前低剂量 MSCTA 均正确诊断，其中合并室间隔缺损 2 例，动脉导管未闭和房间隔缺损各 1 例，左上腔静脉 1 例，气管性支气管 1 例，气管或支气管狭窄 6 例，气管分叉角度增大 3 例；合并肺部感染 8 例。结论 应用低剂量 MSCTA 能明确诊断婴幼儿 PAS 及其合并心血管畸形，同时能清晰显示 PAS 患儿合并气管和或支气管狭窄程度及范围，有助于临床术前明确诊断并制定手术方式。

OR-019

儿童纵隔神经母细胞瘤的临床特点及磁共振成像特征分析

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目的 探讨儿童纵隔神经母细胞瘤的临床特征及磁共振成像（MRI）影像特点，旨在进一步提高其术前诊断准确水平；
方法 回顾性分析自 2012 年 1 月至 2016 年 12 月经重庆医科大学附属儿童医院收治的 16 例经病理证实的儿童纵隔神经母细胞瘤的临床及 MRI 特征，包括发病年龄、病变大小、肿瘤形态及边界、MRI 平扫及增强信号特点等，并与术后病理进行对照，对所获得数据进行分析。
结果 发病年龄：30d 至 11 岁，平均年龄：1.98 岁；发生部位：所有病例均发生于后纵隔，其中：左上后纵隔 7 例，右上后纵隔 4 例，左下后纵隔 3 例，右下后纵隔 1 例，右后纵隔 1 例，延伸至颈部 1 例，延伸至肾上腺区 2 例；病变大小：肿瘤最大径线为 3-10cm，平均为 6.4 cm；肿瘤形态、边界：形态不规则 10 例，规则 6 例；呈多结节融合状 10 例；呈纵长者 12 例；边界清 12 例；肿瘤跨越中线 1 例；肿瘤为多发者：2 例；肿瘤与椎管相交通 15 例；MRI 信号：平扫 T1WI 呈低信号 4 例，等信号 12 例；平扫 T2WI 呈均匀高信号 9 例，混杂高信号 7 例；肿瘤内部伴出血坏死囊变 11 例；增强扫描呈轻度强化 2 例，中等程度强化 5 例，明显强化 5 例；术后病理所见：肿瘤有完整包膜 9 例；侵犯周围脏器 2 例，其它部位转移 7 例，其中转移到骨骼 5 例，骨髓 2 例，淋巴结 2 例，左肺 1 例，骨及软组织多发 1 例。肿瘤切面呈灰白 4 例，灰褐 6 例，灰白灰褐 4 例；肿瘤内发生出血 2 例，钙化 2 例，坏死 3 例，囊变 1 例，出血坏死 2 例，坏死钙化 2 例，出血钙化 2 例；合并症：合并胸水 4 例，肺炎 4 例，肺实变或肺不张 1 例，Horner 综合征 4 例。
结论 儿童纵隔神经母细胞瘤的 MRI 表现具有一定特征性，结合其临床特点，可为临床早期、准确诊断提供重要的依据。

OR-020

Assessment of left ventricular subclinical dysfunction in acute myocarditis by three-dimensional cardiac magnetic resonance (CMR) feature-tracking myocardial strain analysis

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Aims: This study aimed to assess the subclinical left ventricular dysfunction in acute myocarditis with normal ejection fraction and without early or delayed enhancement by 3.0 T three-dimensional cardiac magnetic resonance feature-tracking, comparing with myocarditis patients with early or delayed enhancement and normal control.
Methods: Study population consisted of 3 groups. Group 1 included 18 consecutive acute myocarditis patients with normal ejection fraction and without early or delayed enhancement. Group 2 included 20 acute myocarditis patients with normal ejection fraction and with early or delayed enhancement. Group 3 concluded 15 normal controls. All patients underwent CMR examination within 5 days after their admission. Three-

dimensional myocardial feature-tracking strain analysis was performed according to AHA myocardial segmentation and compare among groups.
Results: There were no significant difference in age (14.0±7.0 vs 14.4±4.7 vs 17.8±5.1 years, p=0.45) and ejection fraction (61.8±7.0 vs 69.6±24.3 vs 65.6±3.2%, p=0.18) among three groups. Acute myocarditis patients with normal ejection fraction and without early or delayed enhancement demonstrated significantly lower peak circumferential displacement (PCD) (-1.6±3.8 vs 2.3±3.5 vs 4.8±1.7 mm, p=0.015), peak longitudinal displacement (PLD) (1.9±7.2 vs 9.1±1.8 vs 10.0±2.1 mm, p=0.002) and peak longitudinal systolic velocity (PLSV) (10.8±52.7 vs 61.7±18.5 vs 67.8±30.8 mm/s, p=0.008) in basal segment, lower PCD(2.6±2.8 vs 5.7±1.3 vs 6.5±1.3 mm, p=0.028) and PLD(7.1±40.1 vs 45.2±16.4 vs 49.4±24.7 mm, p=0.003) in middle segment, lower PCD (0.27±3.2 vs 3.3±2.0 vs 4.7±1.4 mm, p=0.01), PLD (1.7±4.1 vs 5.7±1.2 vs 6.4±1.4 mm, p=0.003), peak circunferential systolic velocity (PCSV) (-4.2±36.8 vs 33.0±29.3 vs 53.7±23.5 mm/s, p=0.022) and PLSV (13.5±32.4 vs 44.2±15.4 vs 48.0±23.9 mm/s, p=0.013) in global when compared with group 2 and 3, while there is no significant difference between group 2 and 3 in those parameters.
Conclusions: In patients with acute myocarditis with atypical MRI sign, three-dimensional cardiac magnetic resonance (CMR) feature-tracking myocardial strain analysis appears to be a useful tool for diagnosis, since it seems to be able to identify subclinical myocardial deformation early in the disease.

OR-021

NCE-MRA 冠状动脉成像在儿童川崎病中临床应用

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目的 探讨 NCE-MRA 在儿童川崎病中的可行性及临床应用，并评价 NCE-MRA 对儿童川崎病的诊断效能。
方法 对 2017 年 10 月至 2018 年 10 月我院临床怀疑川崎病儿童[1]均行 NCE-MRA 冠状动脉成像检查；共 43 例（男：20 例，女：23 例）因不配合检查及图像质量差排除 11 例，其中平均年龄为 6±1.15 岁，最小年龄为 2 岁；心率：90-130 次/分；所有患者均行全心冠状动脉成像及单支左、右冠状动脉成像，所有数据均进行全心 MPR 重建，由两名高年资磁共振诊断师对图像进行双盲法阅片，最后一受试者工作特性（ROC）曲线评价 NCE-MRA 的有效统计参数对儿童川崎病的诊断效能；并分析其临床可行性及其临床应用。
结果 NCE-MRA 的临床可行性较高，在川崎病的诊断当中具有较高准确性及特异性；而 ROC 曲线研究表明 NCE-MRA 有效统计参数对川崎病的诊断效能具有较高的准确性（AUC 曲线下面积为 0.65）。
结论 NCE-MRA 冠状动脉成像对儿童川崎病的诊断具有较高准确性，且其无辐射、无需对比剂等优点表明其临床可行性较高，在川崎病的临床、应用研究中具有较高的研究价值。

OR-022

儿童腺病毒肺炎的 CT 影像表现特点

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目的 以 35 例腺病毒肺炎患儿作为研究对象，分析其胸部 CT 检查影像表现的特点，以提高报告医生对腺病毒肺炎的诊断水平。
方法 回顾性分析 2019 年 5 月-2019 年 7 月我院收治的 35 例腺病毒肺炎儿童的临床资料，均行 CT 扫描检查，分析各研究对象的 CT 影像学表现特点。
结果 35 例受试患儿的呼吸道病原体抗体检测腺病毒均为阳性，且所有受试患儿均符合国家卫生健康委会同国家中医药管理局组织制定的《儿童腺病毒肺炎诊疗规范（2019 版）》。胸部 CT 检查结果显示：35 例受试患者中肺实质改变患者 35 例，其中 29 例患者为双侧受累，受累肺叶数≥3 患者 24 例，18 例患者为实变向心分布，26 例患者为团簇状影，21 例患者为斑片影，27 例患者见空气支气管征，5 例患者为肺气肿改变，4 例患者有胸膜病变，5 例患者为淋巴结肿大。另有 4 例患者在临床治疗过程或者治疗后的随访过程中出现小气道改变。
结论 儿童腺病毒肺炎的胸部 CT 检查影像表现特点为多发团簇状肺实变，向心分布，双肺受累常见，肺外表现如胸膜肥厚、胸腔积液、气胸少见。若患者在治疗的过程中发生小气道改变则可诱发患者发生闭塞性细支气管炎。提高影像报告医生对腺病毒肺炎 CT 影像表现特点的认识，对临床治疗有一定帮助作用。

OR-023

儿童常见呼吸系统单基因病的胸部影像表现

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目的 探讨儿童原发于肺部的常见单基因病的影像表现。
方法 回顾性分析 48 例临床或基因证实的原发于肺部的单基因的表现，分析其影像特点。
结果 原发性纤毛不动障碍 19 例，变异基因包括 DNAH5、DNAI1、DNAAF1 等，主要以支气管扩张、肺部斑片影、模糊影等病变为主。肺囊性纤维化 3 例，CFTR 突变引起，先主要表现为模糊影、支气管及细支气管扩张、肺气肿为为要表现，先天性肺泡蛋白沉积症 6 例，变异基因包括 SFTPB、SFTPC、ABCA3 等，主要以磨玻璃影伴小叶内线状影、小叶间隔增厚的典型铺路石征为主要表现。遗传性毛细血管扩张症 1 例，为 ACVRL1 变异，肺部表现为肺部感染合并肺栓塞，及肝脏动静脉异常分流何毛细血管扩张多发小结节、融合血管团灶。
结论 儿童常见呼吸系统单基因病的胸部影像主要以长期反复感染为主，部分有支扩、铺路石征、肺栓塞等特殊影像表现。

OR-024

Prediction of Pulmonary Pressure After Glenn Shunts by Computed Tomography-Based Machine Learning Models

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Objectives: This study aimed to develop non-invasive machine-learning classifiers for predicting post-Glenn shunt patients with low and high risk of a mean pulmonary

arterial pressure (mPAP) >15 mmHg based on preoperative cardiac computed tomography (CT).

Methods: This retrospective study included 96 patients with functional single ventricle who underwent a bidirectional Glenn procedure between November 1, 2009, and July, 31, 2017. All patients underwent post-procedure CT, followed by cardiac catheterization. Overall, 23 morphologic parameters were manually extracted from cardiac CT images for each patient. The Mann-Whitney U or chi-square test was applied to select the most significant predictors. Six machine-learning algorithms including logistic regression, Naive Bayes, random forest (RF), linear discriminant analysis, support vector machine, and K-nearest neighbor were used for modeling. These algorithms were independently trained on 100 train-validation random splits with a 3:1 ratio. Their average performance was evaluated by area under the curve (AUC), accuracy, sensitivity, and specificity.

Results: Seven CT morphologic parameters were selected for modeling. RF model obtained the best performance, with mean AUC of 0.840 (confidence interval [CI]: 0.832-0.850) and 0.787 (95% CI: 0.780-0.794); sensitivity of 0.815 (95% CI: 0.797-0.833) and 0.778 (95% CI: 0.767-0.788), specificity of 0.766 (95% CI: 0.748-0.785), 0.746 (95% CI: 0.735-0.757) and accuracy of 0.782 (95% CI: 0.771-0.793) and 0.756 (95% CI: 0.748-0.764) in the training and validation cohorts, respectively.

Conclusions: The CT-based RF model demonstrates good performance in the prediction of mPAP, which may reduce the need for right heart catheterization in post-Glenn shunt patients with suspected mPAP >15 mmHg.

OR-025

Eosinophilic gastroenteritis with involvement of the urinary bladder

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Eosinophilic gastroenteritis with eosinophilic infiltration of the urinary bladder wall is rare in children. We describe the CT findings of eosinophilic gastroenteritis accompaniedbybladder involvement inan11-year-old boy.CT imaging showed diffuse wall thickening of the entire gastrointestinaltract fromthe esophagus tothe colon and revealeda halo sign, irregular fold thickening and luminal narrowing without obstruction of the gastrointestinal wall. Another CT finding was the diffuse thickening of the bladder wall with moderate enhancement on postcontrast CT. The boy underwent endoscopic biopsy from various sites of the gut wall and histology revealed increased eosinophiliac infiltration in the mucosa. After corticosteroid therapy, the boy recovered gradually. The case emphasizes that not only the gastrointestinal tract but also the urinary bladder may be involved in children with eosinophilic gastroenteritis and that recognition of CT features of this disease aids in early diagnosis and therapy.

OR-026

CT and MRI Appearances of the malignant vaginal tumors in children: endodermal sinus tumor and rhabdomyosarcoma

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Purpose: The aim of this study is to analyze retrospectively the CT and MRI features of pediatric vaginal endodermal sinus tumor (EST) and rhabdomyosarcoma (RMS) in a case series.
Methods:7 children with vaginal EST and 2 children with vaginal RMS underwent MRI and (or) CT examination before the biopsy and treatment. Images were evaluated by two observers for the following features: (a) tumor extent; (b) margin; (c) tumor shape; (d) tumor size; (e)architecture: solid, cystic or mixed cystic-solid; (f) hemorrhage, necrosis, calcification; (g) MR T2 signal intensity ; (h) pattern of the enhancement; (i) signal intensity on DWI and ADC value.
Results: All of the 7 ESTs showed as a round-shaped solid mass with a location limited to the vagina without vulva and bladder invasion, while RMS have an irregular grape-like appearance filling the whole vagina with vulva and bladder invasion. The invasion to the cervix were not observed in EST or RMS. Both EST and RMS were heterogeneously hyperintense on T2-weighted MR images and enhanced remarkably and heterogeneously . Heterogeneous high signal on DWI were observed in vaginal EST and RMS. The ESTs showed a lower ADC value(mean,1.04× $10^{-3}mm^2$ /s), while RMSs showed a relatively high ADC value (mean,1.51× $10^{-3}mm^2$ /s).
Conclusions:CT and MRI may be useful tools in diagnosing the vaginal RMS and EST.

OR-027

MRI, MRCP characteristic of hepatic involvement by LCH inChildren

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Objective: To demonstrate imaging characteristic of hepatic involvement by LCH in children on MRI, MRCP.
Materials and methods: The institutional ethics review board approved this retrospective study. This retrospective study included seven children with hepatic involvement by LCH in our imaging database. The patient population included three boys and four girls. The mean age is 26.1 months. MRI was performed in six patients and MRCP in seven patients. Imaging findings including distributions of hepatic lesions (lesion in periportal region and parenchyma), signal intensity and enhancement pattern and bile duct abnormalities on MRCP imaging were evaluated.
Results: The abnormalities were distributed in both left and right liver lobes extending from portis to peripheral regions in all the seven patients. Bile duct

abnormalities included intrahepatic bile duct stenosis (7/7), followed by intrahepatic ductal dilatation and extrahepatic bile duct stenosis(5/7); bile duct wall irregularities(3/7) in descending incidence. Periportal lesions were found in all the seven patients (7/7). Periportal lesion appeared as bandlike abnormal signal intensity/density. On MRI T1-weighted image, they appeared as hypo signal intensity (3/6), slightly hyper signal intensity patchy co-existed with hypo signal intensity (3/6). On T2-weighted image, they appeared as hyper signal intensity (3/6), hypo to hyper signal intensity (3/6). Moderate enhancement of the peripotal lesion in the portal vein phase was found all the patients with contrast administration. Hepatic parenchymal nodular lesions were found in six patients (6/7), multiple cysts were found in two patients. Similar enhancement degree was found between periportal lesions and nodular lesions in hepatic parenchyma.
Conclusions: Our initial observation demonstrated that periportal lesions, bile duct stenosis or dilatation combined with nodular lesions in the hepatic parenchyma were the important features in children with hepatic involvement by LCH. Although these characteristics implicated hepatic involvement by LCH, further interpretation based on clinical history should be performed. Also biopsy and histiochemical analysis should be done to confirm LCH.

OR-028

儿童肠壁增厚的 MSCT 诊断分析

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目的 总结儿童肠壁增厚的 MSCT 表现，以提高对引起肠壁增厚的各类疾病的认识。
方法 收集近 3 年来我院行 CT 检查表现为肠壁增厚患儿的临床及影像学资料，共 36 例，男 22 例，女 14 例，年龄 6 天～12 岁。观察内容：①肠壁增厚部位（单发或多发、小肠和/或结肠）、范围（局灶性、节段性、弥漫性）、程度（轻中重度）、密度（较正常肠管一致、减低或增高）、强化表现及受累肠腔改变；②肠周改变；③伴发征象，如淋巴结肿大、腹腔积液、实质脏器异常。
结果 ①感染与炎症：NEC7 例，新生儿期表现出节段性肠壁增厚，典型者见肠壁积气和门静脉积气；克罗恩病 5 例，常表现为末端回肠节段性肠壁增厚，病变黏膜纵行溃疡即“卵石征”，肠系膜血管呈“梳征”，晚期肠管僵硬伴肠腔狭窄，可形成瘘道或脓肿；过敏性紫癜 7 例，最常累及空肠，单发或多节段性肠壁轻度增厚，增强前后密度均低于正常肠壁，周围伴有渗出，合并典型下肢皮疹、紫癜肾改变。②肿瘤：淋巴瘤 6 例，受累肠管较广泛，肠壁环形增厚或为肠腔内息肉样肿块，轻度均匀强化，部分肠管呈特征性的动脉瘤样扩张，很少继发肠梗阻，肠系膜淋巴结常肿大；间质瘤 2 例，肠壁来源的软组织包块，同时向腔内外生长，渐进性轻中度强化。③机械性因素：外伤致肠壁血肿 4 例，多发生在十二指肠降段及水平段的高密度肿块，向腔内外突出，肿块前沿部包膜下显示“空气裂隙征”，部分病例可同时显示其他腹部脏器的损伤。肠扭转 5 例，除肠壁增厚外，梗阻处肠管呈鸟嘴样狭窄，肠系膜脂肪密度增加。增强后扩张肠袢的肠系膜血管呈放射状向闭袢根部聚拢。
结论 无论肠道原发疾病或是肠外疾病累及肠道，肠壁增厚是一种常见而重要的病理改变。在肠道准备充分的条件下，MSCT 及其后处理技术能整体显示病变本身及肠外异常，增强后还可观察肠系膜血管的走行，进一步评价病变部位的血供情况。正确认识肠壁增厚的 CT 表现，同时结合临床有助于疾病的鉴别诊断。

OR-029
DCE-MRI 定量参数在儿童先天性胆总管囊肿所致肝纤维化中的应用

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目的 探讨 DCE-MRI 定量参数对儿童先天性胆总管囊肿（CCC）所致肝纤维化诊断并分期的价值。
方法 纳入肝纤维化患儿 33 例，正常对照组 14 例。经肝脏 DCE-MRI 扫描后，拟合 Tofts 模型获得参数 Ktrans、Kep 及 Ve。分析不同肝纤维化的定量参数差异及其相关性，ROC 曲线分析各参数诊断肝纤维化的曲线下面积和最佳截界值。此外，经常规 MRI 图像测量 Todani Ⅰ型囊肿大小。分析不同肝纤维化亚组囊肿大小差异及其相关性。P <0.05 为差异有统计学意义。
结果 不同纤维化亚组的 Ktrans、Kep 具有统计学差异(P <0.05)，且随肝纤维化程度增加而下降（r=-0.838、-0.745，P <0.05）；Ve 在不同纤维化亚组中无统计学差异（P >0.05），与肝纤维化程度无明显相关（r= -0.210，P >0.05）。Ktrans、Ke 判别正常 vs 肝纤维化和轻度 vs 重度肝纤维化的 ROC 曲线下面积分别为 0.944、0.913 和 0.839、0.772，截界值分别为 0.228、1.823 和 0.210、1.676。重度肝纤维化组的囊肿大小高于轻度肝纤维化组（P <0.05），Todani Ⅰ型（27 例）中囊肿直径与长度和纤维化程度均称正相关（r=0.0.588，0.554，P <0.05）。 结论 1 DCE-MRI 定量灌注参数 Ktrans、Kep 对儿童 CCC 所致肝纤维化诊断并分期具有一定价值。2Todani Ⅰ型囊肿越大，对肝脏损害程度越高。

OR-030
儿童胰母细胞瘤的影像特点

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目的 探讨儿童胰母细胞瘤的影像学特点。
方法 回顾性分析经手术或活检病理证实的胰母细胞瘤术前的 CT 及 MRI 表现。共 15 例患儿，其中男 9 例，女 6 例，年龄 4~10 岁（中位年龄 6 岁）。1 例仅做 CT 平扫，9 例行 CT 平扫及增强检查，5 例患者行 MRI 检查，其中 3 例完成 MRI 平扫及增强检查。
结果 8 例（8/15，占 53.3%）位于胰腺头部，3 例（3/15，占 20%）位于胰腺体尾部，4 例（4/15，占 26.7%）位于胰腺尾部。其中 10 例病变呈分叶状（10/15，占 66.7%），5 例病变呈类圆形（5/15，占 33.3%）。所有病变均表现为边界清楚，伴囊变和（或）坏死。CT 平扫表现为混杂密度实性肿块，其内坏死囊变表现为更低密度。其中 8 例（8/15，占 53.3%）有散在不同形态的钙化。增强后病变表现为不均匀强化，坏死囊变无强化，病灶内和（或）病灶周边可见小血管影。MRI 表现为混杂信号，T1WI 以等低信号为主，T2WI 以高信号为主，常合并出血坏死，病灶内和（或）病灶周边可见小血管影。DWI 病变实性部分呈高信号。其中 1 例 MRCP 显示胰管及胆管扩张。MRI 增强扫描病变实性部分明显强化，囊变坏死及出血成分不强化。
结论 胰母细胞瘤肿瘤通常较大，肿瘤内钙化多见，容易发生坏死囊变，增强肿瘤呈不均匀强化，肿瘤内部和（或）周边可见小血管影。胰母细胞瘤的影像学具有一定特征性，有利于术前做出正确的诊断，从而对临床治疗方案的制定有一定的指导作用。

OR-031
应用 Bosniak 分级系统评价儿童肾脏囊性病变的临床价值

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目的 探讨 Bosniak 分级标准在评价儿童肾脏囊性病变 CT 诊断及临床处理中的价值。
方法 由 2 位儿科放射诊断医生和 2 位儿科超声医生并按 Bosniak 分级方法共同讨论后分别对 58 个肾脏囊性病灶进行回顾并分级,然后根据其手术及病理结果(单纯囊肿 3 例,多囊性肾发育不良 23 例,多囊肾瘤 4 例, 部分囊变肾母 6 例,中胚叶肾瘤 12 例,透明细胞肉瘤 4 例,横纹肌样瘤 4 例,肾细胞瘤 2 例),计算其评价病理良恶性、决定手术与否的敏感性、特异性、符合率及阳性预测值、阴性预测值。
结果 本组病变中, 按 Bosniak 分级标准诊断为 I 级 11 个, II 级 16 个, IIF 级 20 个, III 级 5 个, IV 级 6 个。增强 CT 对肿瘤良恶性判断的敏感性、特异性、符合率、阳性预测值和阴性预测值分别是 97.9%、81.8%、79.7%、95.8%和 90%。而超声对肿瘤良恶性判断的敏感性、特异性、符合率、阳性预测值和阴性预测值分别是 93.6%、63.6%、57.3%、91.7%和 70%。
结论 按 Bosniak 分级标准的 CT 增强和超声表现, 能较准确地判断儿童囊性病变的良恶性, 而 CT 增强较超声更能显示细节情况, 从而更为准确地为病灶分级, 指导病灶的临床处理工作。

OR-032
基于 dixon 技术的肝脏脂肪分数测量方法 在诊断肥胖儿童脂肪肝的价值及其与临床指标的相关性分析的前瞻性研究

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目的 探讨基于 dixon 技术的肝脏脂肪分数用于肥胖儿童脂肪肝诊断的价值，并分析其结果与临床指标的相关性。
方法 前瞻性分析 2018 年 8 月起本院收治的肥胖儿童 100 例（5 岁以上儿童），记录年龄、身高、体重、血压，计算身体质量指数 BMI。并测定空腹血糖 FPC、总胆固醇 TC、甘油三酯 TG。行腹部横断面 dixon 水脂分离 T1WI 扫描、T2WI 压脂扫描和肝脏波谱扫描，以测量肝脏脂肪分数和肝内脂肪含量。
结论 采用 dixon 技术对肥胖儿童的肝脏脂肪分数测量方法可行，且测量结果与 BMI、血压、肝内脂肪含量以及血脂代谢指标具有一定的相关性。

OR-033
儿童 Castleman 病的影像分析

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目的 分析儿童 Castleman 病的超声、CT 及 MRI 影像学表现，结合病理情况分析，探讨其影像学特点，以提高对该病的认识水平。

方法 对我院 2009 年 3 月至 2017 年 12 月期间诊治并经病理证实的 5 例儿童 Castleman 病的患儿超声、CT 及 MRI 影像资料进行回顾性分析，总结其影像学特点。
结果 患儿男 3 例，女 2 例，年龄为 7 至 15 岁（中位年龄为 10 岁）。5 例儿童 Castleman 病中 2 例位于颈部、1 例位于纵隔、2 例位于腹部；均为单发，肿块最大径 3.5~11.0cm，平均值（4.3±2.6)cm。5 例 Castleman 病的临床分型均为局灶型，病理类型均为透明血管型。5 例患儿均行超声及 MRI 增强检查，联合采用 CT 增强检查 4 例；超声表现为低回声或中等回声肿块，边界清，内部有血流信号或血流丰富；CT 平扫表现为等密度或低密度均质肿块，未见囊变、坏死及钙化，增强后呈类似血管样强化，强化明显并有延迟，可与同层面动脉同步增强，即动脉期显著强化，门静脉期和延迟期扫描仍持续强化，可见丰富的滋养血管；MR 表现为边界清楚肿块影，肿块内或其周围可见扭曲扩张的流空血管影；T1WI 序列呈低或等信号，T2WI 序列为等或高信号，增强后均匀强化，强化模式与 CT 相仿，延迟仍中度强化。
结论 儿童 Castleman 病罕见，术前容易误诊，透明血管型 Castleman 病影像学表现有一定特征性，了解其影像特点，结合临床特征，有助于早期诊断。

OR-034
基于 MSCT 数据的 CAS 三维重建胰胆管合流部及毗邻结构在小儿 Roux-en-Y 术前初步研究

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目的 先天性胆总管囊肿是一种罕见的先天性胆道发育畸形,手术切除是先天性胆总管囊肿的唯一根治方法，我们研究的目的是探讨海信计算机辅助手术系统（Hisense CAS）在先天性胆总管囊肿患儿胰胆管合流部及毗邻结构的三维重建结果，提高患儿 Roux-en-Y 手术的精准性。
方法 回顾性分析 2016 年 1 月至 2019 年 5 月苏州大学附属儿童医院收治的 20 例先天性胆总管囊肿患儿的腹部 CT 增强影像资料，利用海信计算机辅助手术系统（Hisense CAS）对患儿腹部增强 CT 图像进行 CT 三维重建，根据三维重建结果分析胆总管囊肿类型、胰胆管合流部及其与毗邻结构的关系，从而制定个体化最佳手术方案。
结果 三维重建结果清晰显示胆总管囊肿的类型、胰胆管合流部及其毗邻结构的关系，可以多角度观察肝脏及其脉管系统、胆总管囊肿及胰腺的空间位置关系。20 例患者中，男患儿 5 例，女患儿 15 例，年龄 16 月至 12 岁，其中有 6 例为 Ia 型胆总管囊肿，3 例为 Ic 型胆总管囊肿,11 例为 IVa 型胆总管囊肿；1 例患儿胆总管囊肿较大，2 例患儿胰管扩张，胰胆管共同管明显增长，3 例患儿肝右动脉在囊肿前壁走行并形成压迫，7 例存在肝右后静脉。
结论 海信计算机辅助手术系统（Hisense CAS）有助于研究小儿复杂的肝脏解剖，可以从任意的角度对胆总管囊肿、胰胆管合流部及其毗邻结构进行观察，了解胆总管囊肿与肝脏及其脉管系统的空间关系，使影像诊断更加精准，并且能够为手术者提供直观的解剖结构信息，从而制定个体化最佳手术方案，提高小儿 Roux-en-Y 手术的精准性。

OR-035
Prenatal diagnosis of meconium peritonitis in 35 cases with fetal magnetic resonance imaging

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Background: Meconium peritonitis (MP) is a rare fetal disease that needs to be urgently identified for surgical intervention. *Objectives*: We report on a series of 35 cases with MP diagnosed prenatally on MRI and illustrate the imaging findings and investigate the predictive value for postpartum management. *Method*: A consecutive cohort of 35 cases diagnosed with MP born at Guangzhou Women and Children’s Center over 10 years (2008-2018) was enrolled retrospectively. The prenatal ultrasound and MRI findings were analyzed. Chi-square test was used to evaluate MRI’s predictive value for surgical intervention. *Results*: Ascites (30/35) was the most common prenatal MP-related finding on fetal MRI, followed by gathering bowel loops (27/35), bowel dilatation (15/35), hydroceles (13/35), micro-colorectum (13/35), peritoneal calcification (10/35) and meconium pseudocyst (7/35). Of 35 infants, 26 received surgical intervention. All fetuses with MRI scanning showing bowel dilatation and micro-colorectum required operation. The overall survival rate was 91.43% and all 9 infants with non-operative therapy were successfully treated. *Conclusion*: Ascites and gathering bowel loops were two of the most common abnormalities of MP on MRI. Bowel dilatation and micro-colorectum on MRI showed the need of surgical intervention.

OR-036

Application of MR imaging in the evaluation of fetal intestinal obstruction

xu li
APCH

Abstract Objective: To retrospectively analyze the imaging findings of fetal intestinal obstruction diagnosed by MRI in our hospital and compared with postnatal surgery, to explore the application value of MR in diagnosis of fetal intestinal obstruction. Methods: 46 cases of fetal intestinal tract obstruction were diagnosed by MRI in our hospital from April 2014 to July 2019, among which 7 cases were lost to follow-up, 11 cases were intrauterine fetal death or termination of pregnancy, and 28 cases were operated after birth. Results: 28 cases had postnatal surgery after birth, and diagnosed as annular pancreas (n=5) , duodenal atresia or stenosis (n=10), jejunal septal stenosis (n=4) or atresia(n=5), ileum atresia (n=3) , intestinal volvulus (n=4), intestinal malrotation (n=4). 2 case of duodenal stenosis with malrotation of the intestine (one case also with multiple atresia of the jejunum), 2 cases of the midgut volvulus with malrotation (one case also with ectopic pancreas); 2 cases of duodenal septal stenosis of the with 21-trisomy syndrome (one case also with anus atresia). The sensitivity of fetal MR imaging diagnosis of small intestinal obstruction was 100%(28/28), and the accuracy of pathological causes of obstruction was 91.4%(32/35).Prenatal MRI showed annular pancreatic, duodenal or jejunal septal stenosis presenting as low signal T1 and high signal T2 in the upper proximal of obstruction, filling of intestinal fluid could be seen in the distal part, and jejunal or ileal atresia presented as short T1 and other T2 signals in the proximal part. Fetal intestine volvulus showed sausage like distortion of intestine, MRI intestine

volvulus showed equal T1 and T2 signal, DWI showed uneven high signal. Malrotation of the intestine was characterized by abnormal duodenal fame. Conclusion Prenatal MRI can accurately determine the site of intestinal obstruction, and further qualitatively diagnose the possible etiology of intestinal obstruction according to the changes of MR signals in different sequences, providing guidance for postnatal counseling.

OR-037

DTI 对中晚孕周胎儿脑微结构改变的定量研究

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目的 分析中晚孕周胎儿脑微结构的改变随孕周变化的规律，并探讨使用 DTI 量化建立中晚孕期胎儿颅脑微结构改变的可行性
方法 前瞻性收集 20-40 周中晚期孕周胎儿 15 例，行常规 MRI 及 DTI 扫描，在 MRI 标准层面测量额叶白质 (FWM)、颞叶白质(TWM)、顶叶白质 (PWM)、枕叶白质(OWM)、小脑半球 (CH)、基底节区(BGR)、丘脑 (TH)、脑桥 Pons FA 值、AD 值、RD 值、MD 值，利用多因素方差分析比较不同感兴趣区之间各值之间的差异，组间均值比较采用两独立样本 t 检验，并对各指标与孕周进行 Pearson 相关分析与回归分析
结果 不同感兴趣区间 FA 值（F=41.922,P=0.000）、MD 值（F=14.628,P=0.02）存在差异且有统计学意义，AD 值（F=34.015,P=0.131）、RD 值（F=31.288,P=0.137）差异没有统计学意义。FA 值随着孕周的增加而增加，MD（r^2=0.0182，P=0.0002）、AD（r^2=0.2206，P=0.0002）、RD（r^2=0.2245，P=0.0492）值随孕周的增加而下降
结论 DTI 参数可定量测量胎儿脑发育微结构改变，建立胎儿颅脑生物学指标的 MRI 参考标准是可行的。

OR-038

3T 磁共振 3Dstarvibe 序列胎儿颅脑扫描应用研究

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目的 本研究旨在通过应用 3T 下的 3Dstarvibe 序列的胎儿神经系统成像研究，通过提高组织对比度等方法，得到参数优化且适合应用于临床的 T1 加权序列。
方法 应用 3TMR 扫描，纳入 32 例中晚孕（孕 25 周-孕 38+1 周）胎儿针对性颅脑检查，胎儿颅脑 T1WI 序列应用 3DStarvibe、TFL 序列，1）采用不同的翻转角度进行胎儿脑部 3DStarvibe 成像，分别在 5.5 度，9 度， 12 度，15 度不同的翻转角下得到的 T1WI 图像成像； 2）应用 Star-vibe 得到的 T1 加权成像与 2DTFL 得到的 T1WI 序列进行成像进行成像对照；3）根据最终图像的分析情况最确定合适的图像反转角，从而得到稳定的符合相应孕周的 T1 加权成像参数。
结果 通过优化 3TMR 的 T1 加权 3DStarvibe 成像，结果如下： 1）不同翻转角下 T1 加权成像的影像质量比较，发现通过翻转角的设置会影响图像的对比度及成像质量，在翻转角 9 度的情况下能够得到更好的图像；2）3DStarvibe 序列 9 度、12 度及 15 度翻转角下在伪影产生上均好于 TFL 序列；
结论 应用 3TMR 的 3Dstarvibe 序列 T1 加权成像能够在自由呼吸状态下，克服胎儿运动及孕妇呼吸的干扰短时间内得到优良的 T1 加权图像，小角度激发均能可以产生较好的图像质量，本研究所

得到的最适翻转角是通过多个角度的设定进行成像后的成像质量进行分析评估，最终在多个脑组织的观察成像能力水平上进行统计分析。

OR-039

Typical and atypical dural sinus malformation imaging in the fetus: based on 4 cases

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Objective: To describe the atypical imaging characteristic of dural sinus malformation in fetuses by ultrasound and MRI.
Materials and methods: We report a series of four fetuses with dural sinus malformation in Hubei Maternal and children's hospital from July, 2013 to February 2016. All the mothers undertook the prenatal MR imaging because of the intracranial space occupying lesions discovered by prenatal ultrasound.
Results: In all four cases, two of them represented the typical MR imaging of dural sinus ectasia with thrombosis in the vicinity of torcular Herophili (also known as sinus confluence), while in the other two cases lesions located mainly in superior sagittal sinus and transverse sinus separately. Two pregnancies were terminated, while the outcomes of other two cases were not available.
Conclusion: Atypical location of the dural sinus malformation, such as superior sagittal sinus and transverse sinus, should be paid special attention to. Sonographer should realize the atypical sign of dural sinus malformation, and prenatal MRI is necessary to identify the lesion.

OR-040

Diffusion weighted magnetic resonance imaging of the fetal brain in complex congenital heart disease

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Objectives: Diffusion weighted magnetic resonance imaging (DWI) is a sensitive method to evaluate brain maturation and detect brain lesions by Apparent Diffusion Coefficient (ADC) values. Abnormal ADC values are seen in ischemic brain lesions. The aim of this study was to assess whether ADC values in the fetal brain were different in a group of fetuses with complex congnital heart disease (CHD), compared to normal controls.
Methods: Fetal brain diffusion MR imaging was performed in 50 fetuses with complex CHD, Fetal brain MRI examinations with single-shot DWI (b = 0 and b = 700 s/mm²) were performed. ADC values in frontal white matter (FWM), centrum semi-ovale (CSO), thalami

(T), basal ganglia and pons were compared with 50 normal controls at the same gestational age.
Results: We found no significant differences between gestational age between our 2 groups (CHD 26.6 ± 3.2w and control 26 ±2.8w). All fetal brain morphology and signal were normal. Fetuses with complex CHD had higher ADC values in FWM (2.34 ±0.18 vs 2.19 ±0.17 x10-3 mm2/sec; p<0.05), thalami (2.20 ±0.16 vs 2.06±0.19; p<0.001), centrum semi-ovale (2.34 ±0.19 vs 2.22 ±0.19 x10-3 mm2/sec, p<0.05), basal ganglia (2.16 ±0.18 vs 2.03±0.16, p<0.001), and pons (2.14 ±0.18 vs 2.04 ±0.15 10-3 mm2/sec, p<0.05).
Conclusion: Fetal diffusion MR imaging is a feasible modality of evaluating abnormal brain diffusivity in fetuses with complex CHD.

OR-041
儿童恶性骨巨细胞瘤的影像学表现与病理对照

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目的 分析发生于儿童的恶性骨巨细胞瘤（Malignant giant cell tumor of bone，MGCTB）的影像学特征，结合病理组织学，探讨其影像表现的病理基础，提高诊断准确率。
方法 2004 年 3 月-2019 年 7 月在我院经手术病理证实为 MGCTB 的 12 例患者纳入本次研究，其中男性 5 例，女性 7 例，年龄 5-12 岁，平均年龄 9 岁。8 例患者有骨巨细胞瘤手术切除史。12 例 MGCTB 患者主要临床症状包括关节疼痛乏力伴软组织肿胀 5 例（膝关节 3 例，髋关节 2 例），伴有发热 2 例；腰背部疼痛 5 例、髋部疼痛 2 例，疼痛均呈进行性加重伴活动受限，合并双下肢麻木无力 6 例，小腿疼痛 2 例，排尿困难 2 例，大小便失禁 1 例，发热 3 例。12 例 MGCTB 患者行 X 线检查 6 例，CT 平扫检查 10 例，MRI 平扫检查 9 例，MR 增强扫描检查 5 例。回顾性分析 12 例经手术病理证实的 MGCTB 的影像学征象及病理资料。
结果 12 例 MGCTB 位于膝关节 3 例，累及骨端，横向生长；髋关节 2 例，累及骶髂骨、髋臼；脊柱 7 例，均呈偏心性生长，累及单侧附件，3 例呈压缩性改变。X 线上均呈膨胀性溶骨性骨质破坏，伴骨膜反应。CT 上肿瘤边缘示不完整骨性包壳，伴混杂密度软组织肿块，肿块内含骨嵴影。MRI 上肿呈混杂 T1、混杂 T2 信号，伴小囊状短 T1、长 T2 信号，T2WI 上伴有更高信号区；3 例并多发条索状低信号影；软组织受累范围广；肿瘤呈明显不均匀强化。
结论 发生于儿童的 MGCTB 保留有良性 GCTB 的部分特点，如典型的发病部位、皂泡状外观、肿瘤内部骨嵴及周边骨壳、膨胀性溶骨性骨质破坏等，但 MGCTB 的骨嵴排列杂乱，形态不规则，骨壳不完整且见软组织突出，可见骨膜反应，MRI 可见低信号索条影，这些特征有助于提高对本病的认识。

OR-042
磁共振 T2* mapping 诊断血友病性关节病骨的临床应用价值

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目的 探讨磁共振 T_2* mapping 成像技术技术在血友病性关节病诊断中的价值。

方法 采用临床对照研究，研究组为 32 例（膝）关节血友病性关节病患者，对照组为 25 例（膝）关节健康志愿者，采用西门子 SKYRA 3.0T 磁共振扫描仪对 57 例关节进行磁共振扫描，T_2*mapping 成像测量膝关节研究组和对照组的髌骨、股骨远端内侧面、股骨远端外侧面、胫骨近端内侧面、胫骨近端外侧面 5 处软骨的 T_2 值。同时分别测量 T_2*mapping、T1WI-SE、T_2WI-TSE-FS 序列显示关节内含铁血黄素沉积最大截面的面积，比较这三个序列在评估血友病性关节病含铁血黄素结果的差异，P<0.05 具有统计学意义。

结果 研究组膝关节的髌骨、股骨远端内侧面、股骨远端外侧面、胫骨近端内侧面、胫骨近端外侧面 T_2 值均高于对照组相应关节面软骨 T_2 值，差异具有统计学意义；T_2*mapping 显示含铁血黄素沉积最大截面面积明显大于相应层面常规 SE 序列所显示的，差异具有统计学意义。

结论 磁共振 T_2*mapping 成像通过 T_2 值的测量，可以发现血友病性关节病早期的关节软骨异常改变；T_2*mapping 序列能够敏感的发现关节内含铁血黄素沉积，对血友病性关节病的含铁血黄素沉积准确评估具有较高临床应用价值。

OR-043

儿童急性骨髓炎的影像学表现

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目的 探讨儿童急性骨髓炎的影像学表现，提高影像诊断及鉴别诊断水平，为临床治疗提供帮助。

方法 回顾性分析我院 2015 年 6 月至 2018 年 10 月诊断急性骨髓炎的 48 例患儿的影像资料，其中 48 例均行 x 线检查，29 例行 MRI 扫描，2 例行 CT 扫描，通过影像资料回顾性分析骨髓炎影像特征。

结果 本组 41 例为单发病变，7 例为多发病变，累及胫骨 16 例，股骨 11 例，肱骨 8 例，跗骨 7 例，指骨 6 例，骨盆骨 5 例，桡骨 4 例，腓骨 4 例，尺骨 1 例，趾骨 1 例，共计 63 个骨骼。长骨 44 个占 69.8%，短骨 7 个，占 11.1%，其他骨 12 个，占 19.1%。急性期 X 线表现为阴性 22 例，随诊 2～4 周后逐渐出现阳性征象，表现为局灶性骨质破坏 32 例、广泛虫蚀样骨质破坏 16 例、骨质增生硬化伴骨皮质增厚 20 例、层状或线样骨膜反应 16 例，软组织肿胀 20 例。CT 显示骨盆、跗骨等复杂部位骨质破坏较平片敏感。MRI 于疾病早期即可发现不同程度骨髓水肿及软组织肿胀，平扫 T_1WI 骨髓腔信号减低，T_2WI 脂肪抑制像呈明显高信号，增强后呈明显强化，骨破坏区可见边缘强化或无强化，周围肌群水肿明显，出现脓腔时表现为环形厚壁强化（4 处）。48 例患儿手术治疗 12 例，随诊复查半年，临床症状好转，病变区呈不同程度增生硬化；36 例抗感染治疗后复查，病变好转。

结论 儿童急性骨髓炎好发于长骨骨干及干骺端，早期 X 线可见表现为阴性，MRI 对骨髓炎具有较高敏感性，结合临床表现，MRI 可明显提高诊断率，为早期有效治疗、减少并发症提供帮助。

OR-044

人工智能在儿童骨龄评估的临床应用

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目的 应用人工智能（artificial intelligence，AI）深度学习法对儿童骨龄进行评估。

方法 收集本院 2018 年 10 月至 2019 年 7 月收集的 100 例进行骨龄 DR 摄影的儿童（2-12 岁）作为观察对象,分为 2-6 岁组，7-12 岁组）。由四名经验丰富的放射科医生采用中华 05 方法对儿童

骨龄评估，随后在人工智能辅助下进行评估，骨龄准确性和标准误差（RMSE）被用作测量准确性的指标。

结果 100 例儿童中，2-6 岁组及 7-12 岁组 AI 评估组准确率为 68.2%，95.6%，单独使用医生组准确率分别为 66.6%和 90.4%，在人工智能的帮助下，所有个体均下降，2-6 岁组差异性不明显。

结论 人工智能通过提高准确性、降低变异性和 RMSE 来提高放射科医生的骨龄评估。放射科医生利用人工智能比单独使用放射科医生组有更好的表现。这表明人工智能可以作为放射科医生评估骨龄的重要辅助手段，以提高儿童骨龄准确率。

OR-045

磁共振对儿童急性白血病与幼年特发性关节炎的四肢骨骨髓改变的鉴别诊断价值研究

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目的 探讨儿童急性白血病与幼年特发性关节炎的四肢骨骨髓改变的磁共振特征性表现，以提高其鉴别诊断能力。

方法 回顾性分析 2015 年 1 月至 2018 年 1 月，以骨关节疼痛为主诉，经临床及骨髓穿刺活检确诊为急性白血病的患儿 25 例与同时期确诊为幼年性特发性关节炎的患儿 28 例。所有患儿均行疼痛部位的磁共振扫描，分析其病变部位的形态及磁共振信号表现，并定量分析其 ADC 值。

结果 25 例急性白血病患儿疼痛部位均可见信号异常，20 例表现为骨髓浸润，呈较均匀的 T1 低信号、T2 高信号，范围较广泛；5 例呈不均匀斑片状 T2 高信号、T1 呈等低信号。28 例幼年特发性关节炎患儿疼痛部位中，21 例可见干骺端不均匀 T2 高信号、T1 低信号，范围较局限，与正常骨髓分界不清；7 例未见明显异常信号。急性白血病患儿骨髓平均 ADC 值为（0.886±0.223）$x10^{-3}mm^2/s$，幼年特发性关节炎患儿骨髓平均 ADC 值为（1.187±0.214）$x10^{-3}mm^2/s$。急性白血病组 ADC 值明显低于幼年特发性关节炎组，具有统计学差异（$P<0.05$）。

结论 以骨关节疼痛为主诉的急性白血病患儿较幼年特发性关节炎患儿骨髓改变更广泛，信号变化更显著，ADC 值更低，MRI 可作为两者临床鉴别的指标之一。

OR-046

CT 三维重建对儿童颈椎畸形的诊断价值

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目的 讨论 CT 三维重建对童儿颈椎畸形的诊断价值。

方法 回顾分析 2017 年 4 月 1 日至 2019 年 6 月 30 日期间我科 14 例颈椎畸形三维重建病例，用多平面重建（MPR）法和容积渲染成像（VR）进行三维重建。

结果 14 例患者共检出寰枕融合畸形、颅底凹陷、阻滞椎、蝴蝶椎、半椎、脊柱裂等 6 种畸形。

讨论 MPR、VR 均能对病变显示清晰，MPR 对细节显示有优势，VR 对整体形态显示有优势。

OR-047

Screening of radioactive tracer for colorectal cancer liver metastasis based on tumor-related biological behavior

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Objective: Positron emission tomography (PET) is extensively used in clinical oncology for tumor detection. This study aimed to explore the application of radiotracers ^{18}F-FDG, ^{18}F-FLT, and ^{18}F-FMISO in diagnosis and monitoring of hepatic metastasis in human colorectal cancer (CRC). **Methods:** A mouse model of human CRC with hepatic metastasis was established by intrasplenic implantation of human CRC cell lines LoVo or HCT8. Metastatic potential of these two cell lines was evaluated by wound healing assay *in vitro* and survival analysis plus liver metastasis rate determination *in vivo*. Cellular uptake of each radiotracer was compared between LoVo and HCT8 cells. Radiotracer-based micro-PET imaging was performed to examine the distribution and amount of each tracer taken up by mice. Retention of each radiotracer in hepatic metastatic lesions was quantified and compared using maximum standardized uptake value (SUVmax) and SUVmax ratio. Protein expression of multiple tumor biomarkers, including glucose transporter protein 1 (GLUT-1), hypoxia inducible factor 1 alpha (HIF-1α), Ki67, and metastasis associated in colon cancer 1 (MACC1), was determined in metastatic lesions. The correlation between tracer uptake and tumor marker expression was evaluated using linear regression. **Results:** LoVo cells exhibited a stronger metastatic potential and a higher radiotracer uptake ability than HCT8 cells, as evidenced by significantly greater wound closure percentage, shorter survival, higher incidence of liver metastases, and higher cellular radiotracer levels in LoVo cells or LoVo cell-xenografted mice. The values of SUVmax and SUVmax ratio of ^{18}F-FLT and ^{18}F-FMISO, but not ^{18}F-FDG, in LoVo cell-derived metastatic lesions were significantly greater than those in HCT8 ones. Mechanistically, the expression of MACC1, HIF-1α, and GLUT-1 in LoVo cell-derived metastatic lesions was more effectively induced than that in HCT8-derived ones. A linear regression analysis demonstrated significantly positive correlations between ^{18}F-FLT/^{18}F-FMISO uptake and tumor biomarker expression in metastatic tissues. **Conclusion:** ^{18}F-FLT and ^{18}F-FMISO-based PET imaging may server as a promising method for early detection and monitoring of hepatic metastasis in patients with CRC.

OR-048

Recurrence after curative resection of HBV-related Hepatocellular Carcinoma: Diagnostic algorithms on Gadoxetic Acid-enhanced MRI

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Background and Purpose:
Small recurrent hepatocellular carcinoma (HCC) could show more atypical imaging patterns while we lack specific diagnostic algorithm. The study aimed to better characterize postoperative recurrent HCC <20mm by gadoxetic acid-enhanced MR imaging.
Methods:
We retrospectively evaluated 373 new developed nodules after hepatectomy in 204 HCC patients with chronic hepatitis B virus (HBV) infection. Diagnostic performance of the LI-RADS v2018 were calculated for characterizing recurrence on gadoxetic acid-enhanced MRI. The modified diagnostic algorithms were proposed by combining significant imaging biomarkers respectively related to subcentimeter and 10-20mm recurrences and were then compared with the LI-RADS system.
Results:
A total of 256 recurrent HCCs (108 recurrences of <10mm; 148 recurrences of 10-19mm) were confirmed by histology or follow-up imaging. Nonrim arterial phase hyperenhancement and the three LI-RADS ancillary features (hepatobiliary phase hypointensity, mild-moderate T2 hyperintensity and restricted diffusion) were significantly related to recurrences <20mm in multivariate analyses. For subcentimeter recurrences, combining at least two of the three ancillary features achieved better diagnostic performance (sensitivity: 83.3%; specificity: 87.7%) than LI-RADS 4 criteria (sensitivity: 88.9%, P=0.211; specificity: 70.8%, P=0.006). For 10-19 mm recurrences, combining nonrim arterial phase hyperenhancement and at least one of the three ancillary features achieved significantly enhanced sensitivity of 85.1% but lower specificity of 86.5% than LI-RADS 5 criteria (sensitivity: 63.5%, P<0.001; specificity: 94.2%, P=0.134).
In conclusion:
the diagnostic algorithms for subcentimeter and 10-19mm recurrent HCCs should be stratified. Combining at least two ancillary features demonstrated comparable sensitivity with significantly enhanced specificity than LI-RADS 4 criteria for characterizing subcentimeter recurrences.

OR-049

Evaluation of multiple-arterial-phase aquisition and image quality in Gadoxetate acid disodium enhanced liver MRI using differential sub-sampling with cartesian ordering (DISCO) technique: a comparative study with single arterial phase

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Objective To investigate the application value of multiple-arterial-phase imaging technique with DISCO (differential sub-sampling with Cartesian ordering) in the Gadoxetate acid disodium enhanced liver MRI.

Methods From September 2017 to March 2018, 56 patients with suspected malignant focal liver disease diagnosed by ultrasound or CT in West China Hospital of Sichuan University were enrolled prospectively, and underwent preoperative enhanced MRI with Gadoxetate acid disodium. Patients were divided into 2 groups by random-number-table method. 29 patients in group A underwent liver multiple-arterial-phase imaging with DISCO. 27 patients in group B underwent single-arterial-phase imaging with LAVA-Flex (liver acquisition with volume acceleration-flex). The display rate of late-arterial-phase and respiratory motion artifacts of dynamic enhancement images were evaluated. The categorical variables was compared by chi-square test. The respiratory motion artifacts between the single-arterial-phase and multiple-arterial-phases was compared by Mann-Whitney U test. The artifact scores among the various phases of the multi-arterial phase were compared by Kruskal-Wallis H.

Results Compared to LAVA-Flex (74.1% [20/27]) , a higher display rate of late-arterial phase (96.6% [28/29]) was found in DISCO (Group A), and the difference was statistically significant (x^2 = 5.77, P = 0.016). In the evaluation of respiratory motion artifacts, the motion artifacts of the late-arterial images obtained by LAVA-Flex [3(3,4)] were more severe than the DISCO [2(2,3)], and the difference was statistically significant (Z =-3.250, P <0.01). Among the scores of motion artifacts in the 6 phases of DISCO, the artifact scores of phase 1, 2, 3, 4, 5, 6 were [3(3,4)], [2(2,3)], [2(2,3)], [3(2,3)], [3(3,4)] and [3(3,4)]respectively. The motion artifacts of phase 2, 3, 4 were better than phase 1, 5, 6，which difference was statistically significant (P <0.05)， but there was no statistical difference among phase 2, 3 and 4 (P>0.05).

Conclusion Compared with single-arterial-phase imaging, multiple-arterial-phases with DISCO using Gadoxetate acid disodium can improve the capture rate of late arterial phase and reduce motion artifacts.

OR-050

Small Pancreatic Ductual Adenocarcinoma (≤20 mm) of the Head: Quantitative CT imaging features Correlate with the Stroma Proportion and predicts the Prognosis after Resection

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Objectives To quantitatively analyze the volumetric tumor-parenchyma attenuation difference (Deltas) on both pancreatic and portal venous phase images, and the tumor attenuation changes across pre-contrast, pancreatic and portal venous phases (ratios), so as to evaluate the level of stroma and predict the prognosis of small head Pancreatic ductal adenocarcinoma (PDAC).

Methods We performed a retrospective study included 212 patients with pathologically confirmed head PDAC with diameter smaller than 30 mm. The pre-operative CT images were imported into the open source software 3D Slicer 4.10 for delicate image registration of the non-enhanced phase, pancreatic phase and portal venous phase for

each patient. Both rigid and deformable registration (Elastix registration toolbox) was performed using pancreatic phase images as the fixed volume and other two phases as the moving volumes.The volume of interest (VOI) of both tumor and the surrounding pancreatic parenchyma were segmented manually by one radiologist,avoiding the surrounding tissues, the pancreatic duct, and artifacts.The registered volumes (NIFTI formatted image volumes) and the VOI (binary formatted image) were saved and imported into Matlab R2018a to acquire the CT attenuation at each pixel and calculate the volumetric mean attenuation values for tumor and parenchyma at all phases.Finally, 4 Deltas, 4 ratios and Clinical-pathologic findings for predicting disease-free survival (DFS) and overall survival (OS) were identified by using a Cox proportional hazards model.

Results Tumor size was associated with both DFS and OS (hazard ratio, 1.97;95% confidence interval:1.37, 2.83; P <0.001and hazard ratio, 2.00; 95% confidence interval: 1.36, 2.95; P <0.001, respectively).Patients with high delta3 tumors was associated with worse DFS and OS(hazard ratio, 1.49; 95% confidence interval: 1.09, 2.03; P =0.011and hazard ratio, 1.49; 95% confidence interval:1.06,2.10; P=0.021,respectively).The high Delta3 tumors had more aggressive histologic tumor grades,less stroma compared with those with low Delta3 tumors(P=0.023 and P=0.018).

Conclusions Greater tumor size and high Delta3 tumors were associated with lower DFS and OS rates after completed surgical resection of head PDACs.

OR-051

The correlation between apparent diffusion coefficient and histological differentiation and microvascular invasion of hepatocellular carcinoma

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Objective To investigate the relationship between apparent diffusion coefficient (ADC) and histological grade of hepatocellular carcinoma (HCC) and microvascular invasion (MVI).

Methods Sixty-six cases with pathologically confirmed HCC were divided into three groups according to histopathology: well-differentiated, moderately differentiated and poorly differentiated. According to the MVI risk classification, they were divided into M0 (MVI negative group), M1 (MVI low risk group), And M2 (MVI high-risk group). The ADC values of different groups were measured. The Kruskal-Wallis test was used to analyze the groups and Mann-Whitney test was used for further comparison.

Results There were 10,49,and 7 cases in well,moderately,and poorly differentiated groups,respectively. The mean ADC values of each group were （1.397±0.456）$\times10^{-3}mm^2/s$, （1.186±0.292）$\times10^{-3}mm^2/s$, （1.172±0.435）$\times10^{-3}mm^2/s$, and the difference was not statistically significant (p=0.145). The minimum ADC values of each group were （1.206±0.410）$\times10^{-3}mm^2/s$, （1.022±0.263）$\times10^{-3}mm^2/s$, （1.040±0.410）$\times10^{-3}mm^2/s$, respectively,and the difference was not statistically significant (p=0.307).

There were 28, 22, and 16 cases of M0, M1, and M2, respectively. The mean ADC values of each group were （1.230±0.478）×$10^{-3}mm^2/s$,（1.195±0.295）×$10^{-3}mm^2/s$,（1.138±0.233）×$10^{-3}mm^2/s$, respectively, and the difference was not statistically significant (p=0.626). The minimum ADC values of each group were （1.090±0.372）×$10^{-3}mm^2/s$,（1.038±0.274）×$10^{-3}mm^2/s$,（0.992±0.225）×$10^{-3}mm^2/s$, respectively,and the difference was not statistically significant (p=0.820).

Conclusion The average ADC value and the minimum ADC value were not significantly different in different differentiation degree and MVI risk classification. It is still difficult to predict the presence of MVI and predict the risk classification by preoperative ADC values.

OR-052

Radiomics nomogram for the preoperative prediction of lymph node Metastasis in pancreatic ductal adenocarcinoma

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Purpose: To develop and validate a radiomics nomogram for the preoperative prediction of lymph node (LN) metastasis in pancreatic ductal adenocarcinoma (PDAC).

Materials and Methods: In this retrospective study, 180 patients with surgically resected, pathologically confirmed PDAC underwent multislice computed tomography (MSCT) between January 2014 and January 2017. Radiomics features were extracted from arterial CT scans. The least absolute shrinkage and selection operator method was used to select the features. Multivariable logistic regression analysis was used to develop the predictive model, and a radiomics nomogram was built and internally validated in 45 consecutive patients with PDAC between February 2017 and December 2017. The performance of the nomogram was assessed in the training and validation cohort. Finally, the clinical usefulness of the nomogram was estimated using decision curve analysis (DCA).

Results The radiomics signature, which consisted of 13 selected features of the arterial phase, was significantly associated with LN status (p<0.05) in both the training and validation cohorts. The multivariable logistic regression model included the radiomics signature and CT-reported LN status. The individualized prediction nomogram showed good discrimination in the training cohort [area under the curve (AUC), 0.75; 95% confidence interval (CI), 0.68-0.82] and in the validation cohort (AUC, 0.81; 95% CI, 0.69-0.94) and good calibration. DCA demonstrated that the radiomics nomogram was clinically useful.

Conclusions: The presented radiomics nomogram that incorporates the radiomics signature and CT-reported LN status is a noninvasive, preoperative prediction tool with favorable predictive accuracy for LN metastasis in patients with PDAC.

OR-053

CT radiomics signatures of Liver for predicting gastroesophageal variceal bleeding secondary to Hepatitis B related cirrhosis as given by feature analysis

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Aim: To develop liver CT radiomics model to predict gastroesophageal variceal bleeding (GVB) secondary to Hepatitis B related cirrhosis.
Materials and Methods: We retrospectively collected 295 patients with first-diagnosed cirrhosis from two hospitals. 236 and 59 patients were randomly enrolled into the training and the validation cohorts, respectively; and 75 in the training cohort and 16 patients in the validation cohort endured GVB. Radiomics features of liver were abstracted from the venous-phase CT, and clinical features came from Electronic Medical Records. We used Tree-based method and Univariate feature selection to select the useful features. Radiomics model, clinical model, and integration of both radiomics and clinical models were built using the effective image and/or clinical features. Predicting performance of the models was evaluated with area under receiver-operating characteristic curve (AUC), accuracy and F-1score.
Results: 21 radiomics useful features and/or 3 clinical features were used to build the prediction models that correlated with GVB. The AUC of the integration of radiomics and clinical models was larger than of clinical or radiomics model for the training (0.83 ± 0.09 vs. 0.64 ± 0.08 or 0.82 ± 0.10) and the validation (0.64 vs. 0.61 or 0.61) cohorts. The integration of both radiomics and clinical models obtained good performance in predicting GVB for both the training and validation cohorts (Accuracy: 0.76 ± 0.07 and 0.73, and F-1 score: 0.77 ± 0.09 and 0.72, respectively).
Conclusion: Integration of both radiomics and clinical model may be a non-invasive method to predict GVB.

OR-054

Improved display of hepatic arterial anatomy using differential subsampling with cartesian ordering (DISCO) with gadoxetic acid-enhanced MR imaging: comparison with single arterial phase MR imaging and computed tomographic angiography

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Purpose: To prospectively evaluate whether multiple arterial phase (MAP) images from patients who underwent DISCO acquisition would improve the hepatic arterial display compared with single arterial phase (SAP) and computed tomographic angiography (CTA).
Materials and methods: From 08/2017-08/2018, prospectively acquired data of 130 patients who were divided into two study parts were analyzed. Two readers independently assessed the hepatic arterial display on a four-point scale. The *kappatest* was used to determine the interobserver agreement. c^2or*Fisher's*exact test was used for the categorical variables. *Student's t*test or the *Mann-Whitney U*test was used for the comparison of the motion artifacts. *Kruskal-Wallis*test was used to compare the difference between arterial displays.
Results: A moderate-to-excellent interobserver agreement was obtained for hepatic arterial display (all *kappa*values > 0.65). For **study part I,** the mean arterial display scores for the common hepatic artery (CHA), proper hepatic artery (PHA), left hepatic artery (LHA), right hepatic artery (RHA), left gastric artery (LGA) and gastroduodenal artery (GDA) obtained with DISCO were higher than those obtained with SAP imaging (all$p$<0.01).For **study partII**, comparable image quality for the arterial display of CHA (p=0.798), PHA (p=0.935), LHA (p=0.122), RHA (p=0.809) LGA (p=0.710) and GDA (p=0.659) was obtained with DISCO and CTA.
Conclusion: In conclusion, the use of MAP acquisition with DISCO is superior to the use of SAP in hepatic arterial display and compares favorably with CTA; in the future, DISCO possibly can replace the latter ionization-related method to provide a more comprehensive evaluation of the liver lesions.

OR-055

胰腺影像诊断在临床决策中的意义及常见误诊

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目的 就多种胰腺常见误诊疾病的影像学并结合临床病理资料做一总结，提高对胰腺疾病的全面认识，为临床治疗决策指明方向。
方法 基于我院胰腺病多学科中心，总结影像学易误诊并影响到治疗方法的病例：(一)易误诊胰腺癌并行不必要手术切除：局灶性自身免疫性胰腺炎(AIP)、胰腺原发性淋巴瘤、胰腺局灶性脂肪浸润；(二)易误诊胰腺神经内分泌肿瘤(pNET)并影响不同治疗方法的胰腺富血供病种：胰腺副脾、胰岛细胞增生、实性浆液性囊性肿瘤(SCN)、肾癌胰腺转移瘤；(三)影像鉴别胰腺导管内乳头状黏液性肿瘤（IPMN）良恶性的重要性；(四)外生型胰腺癌的特征影像表现。
结果 局灶性 AIP 通过胰管非阻断性炎性狭窄、肿块渐进性强化、胰腺外 IgG4 相关表现并结合血清 IgG4 与胰腺癌鉴别，行内科激素治疗；胰腺原发性淋巴瘤体积大且质地均匀、增强后强化均匀、血管漂浮征等特征与胰腺癌鉴别，行化疗；胰腺局灶性脂肪浸润无占位效应，胰胆管无扩张，周围无浸润征象，CT 易误诊，MRI 同反相位可确诊，无需治疗。胰腺副脾多位于胰尾部、体积较小、增强各期强化与脾脏相似，热变性红细胞显像诊断的敏感性和特异性高，无需手术；胰岛细胞增生呈局灶性结节，强化较明显，多位于胰腺轮廓边缘，定期随访；实性 SCN 看似实性却富含液体，CT 难以与 pNET 鉴别，但在 MRI T2WI 呈明显高信号，即囊内清亮液体，是实性 SCN 影像学特征表现，无恶性倾向、定期随访；肾癌胰腺转移瘤平均发生于肾癌术后 120.2 个月，单纯从影像学难以与单发或多发 pNET 鉴别，病史是影像诊断的关键，首选手术切除、预后好。IPMN 是交界性肿瘤，规范的影像随访和良恶性影像评估，对治疗时机和选择具有重要意义。外生型胰腺癌多起源于

胰头钩突部，嗜神经嗜血管生长特征，多数不累及胰胆管，常误诊为腹膜后淋巴结、腹膜后纤维化，给治疗方向带来误导。

结论 精准诊断和治疗，需要影像科医生结合多学科共同努力。

OR-056

高斯分布（单指数、双指数）DWI 模型与非高斯分布 DWI 模型对低分化胰腺癌诊断价值的对比研究

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目的 探讨不同 DWI 模型（单指数、双指数 DWI 模型与非高斯分布 DWI 模型）对胰腺低分化导管细胞癌的诊断价值。

方法 收集 52 例经手术证实的低分化胰腺导管细胞癌患者，术前均行 MRI 成像，应用 ADC、IVIM 及 DKI 序列进行后处理得到相应的参数值：慢速表观扩散系数（ADC_{slow}）、快速表观扩散系数（ADC_{fast}））、快速扩散成分所占比例（f 值)、平均扩散值（MD 值）、平均峰度值（MK 值）及常规 ADC 值。采用 ANOVA 方差分析及 mann-whitney 非参数检验对数据行统计学分析并通过受试者曲线评价不同 DWI 模型的诊断效能。

结果 所有病灶均可在三种 DWI 序列（$ADC_{standard}$、DKI 及 IVIM）均可分辨病灶与非病灶组织。病灶组织 $ADC_{standard}$ 值、ADC_{fast} 值、f 值低于病灶周围正常组织；而 MD 值高于周围正常组织。 $ADC_{standard}$，MD 值、ADC_{fast} 及 f 值 ROC 曲线下面积分别为（0.705、0.665、0.648、0.614）。通过回归分析得到 $ADC_{standard}$ 值与 MD 值整合后的 ROC 曲线具有较好的诊断效能（ROC 曲线下面积约 0.754）。

结论 $ADC_{standard}$ 值、ADC_{fast} 值、f 值及 MK 值均可分辨胰腺癌的肿瘤组织与周围正常组织。磁共振 DWI 高斯分布模型与非高斯分布模型联合可以较好的区别肿瘤与非肿瘤病变。

OR-057

不同压缩感知加速因子对 3D mDIXON Quant 序列定量分析胰腺脂肪的影响

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目的 探讨不同 CS 加速因子对胰腺脂肪定量的影响，寻找最佳的 CS 加速因子。

方法 前瞻性纳入 10 名志愿者，男 4 名，女 6 名，平均年龄 24.91±1.64 岁；年龄范围 22-27 岁；平均体重指数 21.75±3.35kg/m^2；体重指数范围 17.71-28.73kg/m^2。所有志愿者行 3.0T 磁共振扫描仪（Ingenia CX，Best，The Netherlands）3D mDIXON quant 序列扫描。扫描参数为：FOV=375mm×300mm×168mm，TR=6ms，层厚= 5.0mm，层间距=2.5mm，加速因子参数分别设置为：SENSE=2、4，COMPRESSED SENSE=2、4、5、6。图像导入飞利浦 ISP 工作站进行数据测量。两名放射医师（诊断经验分别为 3 年和 5 年）在脂肪分数图像上的胰腺钩突部、胰腺头颈部、胰体部、胰尾部分别放置 3 个 ROI（面积约为 25-64mm^2），ROI 放置时尽可能避免血管、胰管和腹部脂肪组织。通过计算 ROI 的平均脂肪分数值得到全胰腺脂肪分数值。数据经 SPSS 19.0 进行统计学分析。

采用组内相关系数（ICC）评估两位观察者所测得数据的一致性。采用 Friedman 检验比较各组使用不同 CS 加速因子所测得的胰腺脂肪分数是否具有统计学差异。P<0.05 被认为具有统计学意义。
结果 两位观察者所测得的数据一致性良好。使用不同的 CS 加速因子时，胰腺钩突部、胰腺头颈部、胰体、胰尾、全胰腺平均脂肪分数均无显著差异（P>0.05）。采用 CS=6 序列扫描比 CS=2 序列，扫描时间减少了 65.54%。
结论 不同的 CS 加速因子对胰腺脂肪分数无影响，本研究认为最佳加速因子为 CS =6。CS-SENSE 6 序列可以显著缩短屏气时间，同时保证测得胰腺脂肪含量的准确性。

OR-058
基于 CT 影像的纹理分析预测原发性肝细胞癌微血管侵犯的临床研究

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目的 探讨 CT 图像纹理分析在预测原发性肝细胞癌(HCC)微血管侵犯(MVI)中的临床价值。
方法 回顾性分析 2017 年 5 月至 2018 年 11 月 102 例手术病理证实的 HCC 患者的 CT 图像。图像特征包括肿瘤边缘、有无包膜、肿瘤周围强化、低密度晕征、瘤内动脉和肿瘤-肝差值。HCC 组分为 MVI 阴性组(34 例)和 MVI 阳性组(68 例)。将术前 CT 图像导入 Mazda 软件中，人工绘制病变感兴趣区域，根据术前平扫期、动脉期、门静脉期和平衡期 CT 图像提取病变的纹理特征，采用 Fisher 系数、分类错误概率联合平均相关系数（POE+ACC）、交互信息（MI）三者联合的方法对 30 个最优纹理参数进行评价。最后，对所得参数进行受试者工作特征曲线（ROC）分析。
结果 两组患者的 Edmonson-Steiner 分级、肿瘤大小、肿瘤边缘及瘤内动脉特征有显着性差异(P=0.012，<0.001，<0.001，=0.003)。MVI 阴性和 MVI 阳性患者部分直方图、灰度共生矩阵和灰度游程矩阵参数的差异有统计学意义，共有 58 种纹理参数。通过 ROC 曲线分析比较，基于 CT 各期相最佳纹理参数都是源于灰度游程矩阵，其中基于平扫 CT 图像的最佳纹理参数 135dr_GLevNonU（AUC，0.766；截断值，1055.00；），基于动脉期 CT 图像的最佳纹理参数 Vertl_RLNonUni （AUC，0.764；截断值，5974.38）；基于门静脉期 CT 图像的最佳纹理参数 45dgr_GLevNonU（AUC，0.762；截断值，924.34）；基于平衡期 CT 图像的最佳纹理参数 Vertl_RLNonUni（AUC，0.754；截断值，4867.80）。
结论 肿瘤大小、肿瘤边缘及瘤内动脉可作为预测 HCC 微血管浸润的影像学征象，术前 CT 图像纹理分析可作为预测原发性肝细胞癌微血管侵犯的无创方法。最有价值的参数是灰色级游程矩阵。

OR-059
七期增强 CT 扫描评估肝癌血流灌注特性的可行性研究

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目的 通过对比肝癌患者七期增强 CT 与常规 CT 灌注成像所得到的灌注伪彩图、灌注参数及辐射剂量，探索七期增强 CT 评估肝癌血流灌注特性的可行性。
方法 对 30 例肝癌患者行 25 期 CT 灌注扫描，将得到的图像导入后处理工作站，获得各灌注参数的伪彩图并测量肿瘤区、肿瘤活性区及相对正常肝实质区的灌注参数，包括肝动脉灌注量（hepatic arterial perfusion,HAP）、门静脉灌注量（portal vein perfusion,PVP）、肝动脉

灌注指数（hepatic perfusion index,HPI），同时记录扫描辐射剂量；选取 25 期 CT 灌注图像中的 7 期导入 CT Kinetics 后处理软件，得到相应的灌注伪彩图及肿瘤区、肿瘤活性区、相对正常肝实质区的灌注参数，并计算辐射剂量。比较七期增强 CT 扫描与常规 CT 灌注成像灌注伪彩图质量评分的差异，探究七期增强 CT 扫描及常规 CT 灌注成像中肿瘤区、肿瘤活性区及相对正常肝实质区各灌注参数的相关性，并比较七期增强 CT 扫描与常规 CT 灌注成像辐射剂量的差异。

结果 1）七期增强 CT 与常规 CT 灌注各灌注参数伪彩图所得质量评分差异无统计学意义（P＞0.05）；2）七期增强 CT 与常规 CT 灌注在肿瘤区及肿瘤活性区的 HAP、PVP、HPI 相关性较好；相对正常肝实质区的 HAP、PVP、HPI 有一定的相关性；3）七期增强 CT 扫描的辐射剂量明显低于常规 CT 灌注扫描，差异有统计学意义（P＜0.05）。

结论 七期增强 CT 扫描可以模拟常规 25 期 CT 灌注评价肿瘤的血流灌注特征，同时显著降低辐射剂量。

OR-060
基于 11.7T Bruke MRI UTE 序列结合 QSM 技术的大鼠肝脏重度铁沉积定量测量的准确性评估

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目的 探讨 11.7T Bruke MRI UTE 序列结合 QSM 技术用于大鼠肝脏重度铁沉积的定量测量的准确性评估。

方法 将 15 只 6w 的 SPF 级 SD 大鼠随机分为 5 组，每组 3 只，腹腔内注射剂量分别为 0.9%生理盐水，25mg/kg，200mg/kg，500mg/kg，1g/kg 的右旋糖酐铁（Sigma，浓度 100mg/ml）。给药一周后处死，取部分离体肝脏组织固定于 4%多聚甲醛中，用 11.7TBruke 磁共振做 UTE 扫描，参数如下：矩阵大小为 128×128，层厚 0.47mm，TE=0.01ms，TR=4ms，ETL=1，FA=2.17°，NEX=2，扫描完成后用磁敏感行加权成像做后处理对图像重建。用等离子发射光谱技术定量测铁含量，同时取部分组织做 HE 染色，普鲁士蓝染色和 Masson 染色。

结果 ①大鼠给药剂量与肝脏铁沉积量相关性 R^2=0.94； ②ICP 测量肝铁含量与基于 UTE 序列的 QSM 后处理重建测得的肝铁含量相关性 R^2=0.99；③HE 染色示肝细胞损伤程度随着给药剂量增加而更严重，普鲁士蓝染色结果与 ICP 和 QSM 定量测量铁沉积量结果相符。

结论 UTE 序列结合 QSM 技术对肝脏铁定量测量有较高的准确性。

OR-061
低管电流联合迭代算法对上腹部 CT 扫描图像质量和辐射剂量影响的体模和临床研究

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目的 探讨低管电流联合迭代算法对上腹部 CT 扫描图像质量和辐射剂量的影响，优化上腹部 CT 扫描参数。

方法 体模实验：采用 5 种不同扫描条件(管电压 120kV，管电流 120、140、160、180、200mAs)对腹部仿真体模行 CT 扫描。分别采用 7 种不同水平 idose4 迭代算法(0、1、2、3、4、5、6)进行图像重建。比较不同管电流和不同水平 idose4 重建图像的噪声值(SD)。临床实验：连续收集行上腹

部 CT 平扫的患者 100 例，按随机数字表法分为实验组(48 例)和对照组(52 例)。实验组管电流为 120mAs，采用 idose4(6)重建获得 A 组图像。对照组管电流为 200mAs，分别采用 idose4(0)、idose4(6)重建，获得 B 组和 C 组图像。比较实验组和对照组的图像质量[对比噪声值(CNR)、SD、主观评分]和有效剂量(ED)。

结果 体模实验中，在相同管电流下，随着 idose4 水平增加，图像 SD 逐渐降低，差异均有统计学意义(P<0.05)。在相同重建算法下，随着管电流的增加，图像 SD 逐渐降低，差异均有统计学意义(P均<0.05)。120 mAs 条件下 idose4 (6)重建组的 SD 低于 200 mAs 条件下 idose4(0)重建组，高于 200 mAs 条件下 idose4 (6)重建组，差异均有统计学意义(P<0.05)。临床试验中，A 组图像的 SD 低于 B 组，高于 C 组，差异均有统计学意义(P<0.05)。A 组图像的 CNR 高于 B 组，低于 C 组，差异均有统计学意义(P均<0.05)。3 组图像主观评分均>3 分。A、B 组图像主观评分差异无统计学意义。C 组图像主观评分高于 A、B 组，差异均有统计学意义(P>0.05)。实验组的 ED 低于对照组，差异有统计学意义(P<0.05)。

结论 上腹部 CT 扫描中，采用 120 mAs 联合 idose4 (6)水平重建可获得满足诊断要求的图像质量，且有效降低辐射剂量。

OR-062
血氧水平依赖 MR 成像对兔肝热缺血后肝脏再生能力的评价

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目的 讨论血氧水平依赖磁共振成像对兔肝热缺血后肝脏再生能力的评价。

方法 12 只新西兰大白兔，随机分为 2 组，n=6。假手术组(N):解剖肝十二指肠韧带，切除肝尾叶；热缺血 20min 组(T)：用无损伤血管夹夹闭肝十二指肠韧带，阻断血流 20min，切除肝尾叶。手术当天及术后 7 天行常规 T2WI 及 BOLD-MRI 检查(Siemens Magnetom Trio Tim 3.0T MR)。将 T2WI 图像传至 IQQA-Liver 肝脏影像解读分析系统，半自动法获得全肝体积，肝再生率(LRR)＝(术后 7 天肝体积-术后初始肝体积)/术后初始肝体积×100%。西门子后处理软件后处理获得自旋-自旋弛豫时间(T2*)图像，各组 T2*值根据公式(R2*=1/T2*)计算表观自旋-自旋弛豫率(R2*)值。扫描后取耳缘静脉血，检测血清 ALT、AST、LDH 水平，处死实验兔，获取病理切片。独立样本 t 检验评价各组 R2*值及 LRR 是否存在统计学差异，Spearman 相关性分析评价 R2*值与肝功能指标的相关性。

结果 各组 R2*值：N 组术后当天 N(0)=134.95±15.04,N 组术后 7 天 N(7)=116.75±10.75,T 组术后当天 T(0)=152.09±10.61，T 组术后 7 天 T(7)=116.40±11.90(sec^{-1})。T 组 R2*值升高，N(0)与 T(0)差异有统计学意义(P<0.05)。R*与 AST、ALT 及 LDH 均呈显著正相关，r 分别为 0.680、0.692、0.618，P均小于 0.05。术后 7 天 R2*值均减低，N(0)与 N(7)差异有统计学意义(P<0.05)，T(0)与 T(7)差异有统计学意义(P<0.001)。N 组 LRR 为 24.94%，T 组 LRR 为 27.61%，两组间差异无统计学差异(P=0.823)。

结论 BOLD MRI 可用于评价热缺血损伤肝脏的再生能力，但对于热缺血时间的限度仍需进一步探索。

OR-063
基于肝泡球蚴囊泡影像特征分型与免疫指标的相关性研究

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目的 通过分析肝泡型棘球蚴病（ hepatic alveolar echinococcosis， HAE）小囊泡特征与免疫指标的相关性，评估肝泡型包虫病的 MRI 分型对 HAE 的生物学活性判断的特征。
方法 回顾性分析 45 例肝部泡型包虫病人的 MRI 影像资料，将收集的 45 例病例的包虫病灶依据 Kodama 分型将泡球蚴病灶分成 5 型，同时通过抽取病人外周血检测体内包虫的 EsCF 抗原、 EgP 抗原、 EgB 抗原、 Em2 抗原，这四个抗原的抗体水平，研究 MRI 分型特征与各项免疫指标之间的相关性；统计过程中计量资料采用均数标准差(xs)表示，计数资料组间比较采用卡方检验。
结果 结果收集肝泡球蚴病例型 2 例、型 9 例、型 22 例、型 10 例、型 2 例；肝脏泡球蚴病灶的 Kodama 三种分型与抗 EgP 抗体具有相关性（ p=0.005），抗 EsCF 抗体（ p=0.060）、抗 EgB 抗体（ p=0.181）和抗 Em2 抗体（ p=0.360）与肝泡型包虫分型无相关性。
结论 MRI 泡球蚴囊泡分型与包虫四项检查中抗 EgP 抗体具有相关性，通过分型有望对泡型包虫病的生物学活性进行评判。

OR-064
肝泡型包虫病的钙化特点及其生物学活性

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目的 探讨肝泡型包虫病（HAE）的钙化特点及其生物学活性。**材料及方法** 回顾性分析新疆医科大学第一附属医院 2016 年 6 月至 2017 年 4 月，包虫实验阳性或手术病理证实为 HAE 的 60 例患者。患者均行腹部 CT 平扫及双期增强扫描、PET-CT 检查。60 例病灶均为单发。观察 CT 与 PET-CT 表现，并测量 PET-CT 上浓聚病灶部位的最大标准摄取值（SUVmax）。根据肝泡型包虫病患者的钙化形态分为 A、B、C 型。采用 Kruskal-Wallis H检验比较不同分型肝泡型包虫病灶间 SUVmax 的差异。**结果** 60 例 HAE 分为 A、B、C 共 3 型，每型均为 20 例。A 型 CT 检查病灶内可见散在少量小结节状钙化，PET-CT 表现为病灶边缘 ^{18}F-FDG（氟代脱氧葡萄糖）摄取及浓聚弱；B 型 CT 病灶内可见弥漫分布的结节样、斑块样钙化，PET-CT 表现为病灶边缘 ^{18}F-FDG 摄取及浓聚强；C 型 CT 病灶中央液化坏死区，边缘钙化，PET-CT 表现为病灶边缘 ^{18}F-FDG 摄取及浓聚较强。A、B、C 型病灶的 SUVmax 分别为 3.41（2.17-3.75）、7.45（6.77-9.01）、6.67（6.28-9.01）），3 组间差异有统计学意义，采用 Kruskal-Wallis H检验， x^2=4.429，P<0.05）。**结论** 不同 HAE 钙化分型病变的生物学活性有所不同。

OR-065
能谱 CT 碘值测定评价肝泡状棘球蚴患者残肝功能初步研究

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目的 探讨应用宝石能谱 CT 在 HAE 患者不同肝功能分级中残余肝实质内碘浓度变化规律及其与 Child-pugh 分级评分的相关性。

方法 研究组纳入对象选取 2015 年-2017 年间的 31 例明确诊断为 HAE 的患者，具体分组依据：采用肝功能 Child-Pugh 分级标准并结合临床病例收集实际情况，其中 A 组 20 例，B 组 11 例，同时记录肝功能评分。对照组纳入对象选取 15 例经相关检查证实无肝脏疾患且临床医师开具腹部常规 CT 检查者。要求研究组及正常对照组中所有患者均行 HD 750 宝石能谱 CT 动态三期增强扫描。数据采用 GE 后处理软件重建出基于以水和碘为基础物质的能谱 CT 图像，在碘基图像上分别测量正常对照组和研究组增强扫描前两期（包括动脉期及门脉期）残余肝实质内碘含量及同期腹主动脉、门脉主干内碘含量平均值，计算肝动脉期及门脉期标准化碘含量，并对结果进行单因素方差分析，同时采用 spearman 法分析在增强扫描后前两期残余肝实质内碘含量与 Child-pugh 分级评分的相关性。

结果 门静脉期研究组和正常对照组残余肝实质内碘含量均高于动脉期，比较各组间分别在肝动脉期和门静脉期残肝实质内碘含量发现对照组最高，A 组次之，B 组为最低；研究组和对照组肝动脉期、门脉期残肝实质内碘含量的差异具有统计学意义，不同组间差异有统计学意义；spearman 法分析结果显示：肝动脉期及门脉期残肝实质内碘含量与 Child-pugh 分级评分呈负相关，且相关程度较强。

结论 HAE 患者增强后前两期残余肝实质内碘含量变化规律可以提示肝功能状态改变，并且同 Child-Pugh 分级评分相关程度较强，能成为临床常用 Child-pugh 评分系统的补充。

OR-066
体素内不相干运动在肝癌 TACE 术后随访中的初步研究

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目的 探讨体素内不相干运动扩散加权成像（IVIM-DWI）在肝癌 TACE 术后疗效评估中的应用价值。

方法 搜集本院 TACE 术后复查的患者 35 例，对所有患者行常规 MRI 平扫、IVIM-DWI 扫描（b 值 =0、 10、 20、30、50、80、150、200、400、600、800、1000s/mm ^{2}）及动态增强扫描，并在一周内行 DSA 检查。以 DSA 及 MRI 增强结果为参照，通过用 MITK-Diffusion 软件勾画肿瘤活灶 37 例、临近肝实质 37 例及坏死区域 32 例，得到相应区域的体素内不相干运动参数纯扩散系数 D 值、伪扩散系数 D*值和灌注分数 f 值，并对各参数进行统计学分析。

结果 肿瘤活灶、临近肝实质及坏死区域在参数 D 中的值分别为（0.95±0.18）×10^{-3} mm^2/s、（1.07±0.13）×10^{-3} mm^2/s、（1.31±0.33）×10^{-3} mm^2/s，两两比较均有显著性差异，P＜0.05；在 D*值中分别为（73.75±54.63）×10^{-3} mm^2/s、（73.60±41.75）×10^{-3} mm^2/s、（28.87±40.10）×10^{-3} mm^2/s，其中肿瘤活灶与坏死区域、临近肝实质与坏死区域比较均有显著性差异，P＜0.05，肿瘤活灶与临近肝实质比较统计无显著性差，p＞0.05；在参数 f 值中分别为（21.64±8.40）%、（11.88±3.99）%、(7.65±6.30)%,两两比较均有显著性差异。受试者工作特征曲线显示，f 值对鉴别肿瘤与实质（敏感度 0.963、特异度 0.833）及肿瘤与坏死组织（敏感的

0.889、特异度 0.926）的效能最高，ROC 曲线下面积分别是 0.896、0.932。D 值对鉴别肿瘤与实质及肿瘤与坏死组织的效能次之，ROC 曲线下面积分别是 0.708、0.854。
结论 体素内不相干运动有助于 TACE 术后不同组织之间的鉴别，在 TACE 术后评价中有重要作用。

OR-067

Utility of CT Radiomics Features for Estimation of Stroma Proportion and the Prognosis of Pancreatic Ductal Adenocarcinoma

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Purpose:
To determine the utility of radiomics features for estimation of stroma proportion and the prognostic value in PDAC.
Materials and Methods:
A total of 122 resected pancreatic cancer patients and 13 borderline pancreatic cancer patients were enrolled in this study according to the inclusion criteria. The 3D volume of the pancreas was manually segmented from the preoperative CT scans by four trained researchers and verified by three abdominal radiologists. Four hundred seventy-one radiomics features were extracted to express the phenotype of the pancreas. Forty-five features were selected for analysis because of redundancy of computed features. The dataset was divided into 68 training cases (61 resected pancreatic cancer patients and 7 borderline pancreatic cancer patients) and 67 validation cases (61 resected pancreatic cancer patients and 6 borderline pancreatic cancer patient). A random forest classifier was used for classification. Masson trichrome staining was used to evaluate the stromal proportion. Survival rates were calculated according to the Kaplan–Meier method and were compared using the log rank test. Multivariate analysis was performed with a Cox regression model.
Results:
The radiomics features were positively associated with the stromal proportion of pancreatic cancer ($R = 0.898$, $P < 0.001$). Radiomics features were confirmed as an independent prognostic factor for pancreatic cancer based on multivariate analysis (hazard ratio =1.921, $P = 0.017$). For borderline patients who received nab-paclitaxel and gemcitabine, high radiomics features were associated with improved prognosis (OS: 12.7 vs. 10.1 mo, $P = 0.045$), but this positive association was not observed in patients treated with other gemcitabine-based regimens (OS: 11.1 vs. 12.6 mo, $P = 0.434$).
Conclusions:
A high radiomics features were associated with poor prognosis of resected pancreatic cancer but predicted improved survival for PDAC patients treated with the nab-paclitaxel and gemcitabine regimen.

OR-068
利用 Gd-EOB-DTPA 动态增强磁共振成像术前预测肝细胞肝癌微血管侵犯

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目的 探讨术前 Gd-EOB-DTPA 动态增强 MRI 的影像学特征是否能在术前预测肝细胞肝癌（HCC）微血管浸润(MVI)的存在。
方法 回顾性分析我院 2017 年 1 月至 2018 年 12 月术前行 Gd-EOB-DTPA 动态增强 MRI 的 120 例患者，影像学特征包括肿瘤长径、形态、数目、包膜、边界、动脉期瘤周异常强化、强化方式、弥散表观系数（ADC）值、肝胆期瘤周低信号，所有患者经过术前充分评估后均行肝癌切除术，大体标本送至病理科镜下观察 MVI 情况。
结果 120 例患者 58 例行解剖性肝癌切除术，60 例患者行非解剖性肝癌切除术，2 例行 ALPPS 术，术后病理结果诊断 MVI 阳性 55 例，MVI 阴性 65 例，单变量分析肿瘤长径（P=0.002）、形态（P=0.003）、数目（P=0.008）、包膜（P=0.015）、边界（P=0.020）、动脉期瘤周异常强化（P=0.037）、肝胆期瘤周低信号（P=0.001）与 MVI 显著相关，多变量回归分析肿瘤长径、数目、动脉期瘤周异常强化、肝胆期瘤周低信号是预测肝细胞肝癌 MVI 存在的独立危险因素，其阳性预测值和阴性预测值分别为 76.8%和 87.9%。
结论 利用 Gd-EOB-DTPA 动态增强 MRI 术前评估，如果存在大的肿瘤长径、多个肿瘤、动脉期瘤周异常强化、肝胆期瘤周低信号，能够预测 HCC 是存在 MVI。

OR-069
胰腺癌伴发胰腺炎的 MRI 表现

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目的 研究胰腺癌伴发胰腺炎患者的 MRI 特征及评估其胰腺炎严重程度。
方法 回顾性分析川北医学院附属医院 2016 年 1 月至 2019 年 6 月的胰腺癌伴发胰腺炎患者。对照组为同期的非肿瘤性急性胰腺炎患者。基于 MRI 影像资料，对比分析两组患者胰腺形态，胰腺炎累及范围，胆道系统及胰管扩张情况。用 MRSI 和 APACHE II 评分预测胰腺炎的严重程度。采用卡方检验及 U 检验进行统计分析，$p<0.05$ 有统计学意义。
结果 本次研究共纳入 55 例胰腺癌伴发胰腺炎患者[男性 39 例(70.9%)，女性 16 例(29.1%)，平均年龄 63.1 岁]。同期对照组急性胰腺炎患者 62 例[男性 38 例(61.3%)，女性 24 例(38.7%)，平均年龄 50.5 岁]（p=0.274）。胰腺癌伴发胰腺炎组与对照组，胰腺实质坏死分别为 6 例（10.9%）和 22 例（35.5%）（$p<0.05$）；仅胰腺周围坏死分别为 2 例（3.6%）和 26 例（41.9%），（$p<0.001$）；右肾筋膜增厚分别为 15 例（27.2%）和 38 例（61.3%）（$p<0.001$）；左肾筋膜增厚分别为 43 例（78.2%）和 53 例（85.5%）（$p=0.304$）。胰腺癌伴发胰腺炎组主胰管扩张 49 例（89.1%），对照组 28 例（45.2%）（$p<0.001$）；分别为 32 例（58.2%）和 41 例（66.1%）（p=0.376）。胰腺癌伴发胰腺炎组 MRSI 评分（3，2~3）明显低于对照组（4，4~6），差异有统计学意义（$p<0.001$），APACHE II 评分两组差异无统计学意义（p=0.496）。
结论 胰腺癌合并胰腺炎的患者 MRI 表现有其特异性，其伴发胰腺炎严重程度与非肿瘤性胰腺炎有差异。

OR-070
基于对比增强 MR 的影像组学模型鉴别胰腺导管腺癌和慢性肿块型胰腺炎

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目的 探讨基于对比增强磁共振成像(CE-MRI)门静脉期提取的组学特征能否鉴别胰腺导管腺癌(PDAC)与慢性肿块型胰腺炎(MFCP)

方法 回顾性收集 2016.01-2019-03 川北医学院附属医院和德阳市人民医院经病理证实的 84 例 PDAC 患者与 23 例 MFCP 患者的临床资料及 CE-MRI 图像，其中训练组包括 45 例 PDAC 和 13 例 MFCP，验证组包括 39 例 PDAC 和 10 例 MFCP。收集两组不同的影像学特征(病灶大小、强化程度、胆总管直径、主胰管直径)。使用三线插值重采样进行图像预处理。于 CE-MRI 门静脉期勾画病灶的最大截面。基于灰度直方图、纹理（灰度共生矩阵和灰度游程矩阵）以及形状计算影像组学特征。使用 z-score 标准化进行数据预处理，所有的特征经信度检验后，然后采用主成分分析进行降维，用支持向量机（support vector machine）进行影像组学建模分析。然后用受试者工作特性曲线(ROC)评价模型的诊断效能。

结果：4 项 CE-MRI 影像特征，在 PDAC 组与 MFCP 组无显著性差异(P>0.05)。共提取 412 个影像组学特征，经信度检验后，56 个纹理特征在 PDAC 组和 MFCP 组之间存在显著性差异(P<0.05)。经主成分分析后，选择判别能力最强，累计频率达 90%的四个主成分特征进行建模。模型训练组的分类器准确率达 83.2%，灵敏度为 74.4%，特异性为 90.0%，ROC 曲线下面积(AUC)为 0.862，模型验证组的分类准确率达 80.0%，灵敏度为 73.4，特异性为 82.1%，ROC 曲线下面积为 0.844。

结论:基于 CE-MRI 门静脉期的影像组学模型有助于鉴别 PDAC 和 MFCP。

OR-071
不同来源肝转移瘤多层螺旋 CT 影像学特征分析

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目的 探讨肝转移瘤多层螺旋 CT 增强特点，比较不同来源肝转移瘤囊变、钙化特征性表现发生率及病灶肝内分布情况，从而来提高对不同来源肝转移灶患者诊断以及鉴别诊断能力。

方法

收集 2015 年 3 月~2016 年 12 月我院不同来源肝转移瘤患者 109 例，包括结直肠癌转移 60 例，胃癌肝转移 29 例，肺癌肝转移 20 例，分析其影像学表现，重点观察不同时相强化特点，记录不同时相病灶的 CT 值、肝转移瘤位置、数目及肝左、右叶分布情况。

结果

（1）不同来源肝转移灶三期增强特点为胃癌呈慢升慢降型；结直肠癌及肺癌则为持续上升型。（2）109 例肝转移灶患者，囊变 42 例；出现钙化 26 例。门静脉来源的消化系统恶性肿瘤（结直肠癌及胃癌）肝转移瘤的囊变率和钙化率明显高于经肝动脉转移的肺癌患者。两种不同血行途径、不同来源的肝转移瘤的囊变（c^2=5.61, *P*=0.018; c^2=11.79, *P*=0.001）、钙化（*P*=0.039）出现率不同，差异具有统计学意义。（3）60 例大肠肝转移患者，右半大肠癌肝转移病人 38 人，肝右叶优势者占 74%（28/38），肝左叶优势者占 26%（10/38）。左半大肠癌肝转移病人 22 例，肝右叶优势者占 45%（10/22），肝左叶优势者占 55%（12/22）。

结论

（1）不同来源肝转移瘤三期增强特点不同（2）囊变和钙化常见于门静脉来源的消化系统恶性肿瘤引发的肝转移瘤，此特点对判断肝转移瘤由来有一定的引导价值。（3）左、右半结肠癌肝转移在肝内位置情况不同，差异有意义（*P*=0.029），检查肝内是否存在转移灶时，除了观察特征性表现，也可根据肝内病灶的分布特点进行分析。

OR-072

基于 MRI 影像组学特征在鉴别胰腺神经内分泌肿瘤与实性假乳头状瘤中的价值

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目的: 构建基于 MRI- DKI (diffusion kurtosis imaging)和 T2WI 影像组学特征鉴别胰腺神经内分泌肿瘤和实性假乳头状瘤的最佳模型。

材料与方法: 回顾性收集本院 57 例胰腺肿瘤病人，手术病理证实胰腺神经内分泌肿瘤 25 例，实性假乳头状瘤 32 例。所有病人均行 3.0T 扫描，包括常规序列和 DWI-DKI 序列。两名经验丰富的腹部 MRI 诊断医师，独立盲法手动勾画肿瘤感兴趣区域；应用 ITK-SNAP 软件，于 T2WI 与 DWI 图像勾画肿瘤的所有层面。计算胰腺肿瘤的平均扩散系数（mean diffusivity，MD）和 平均扩散峰度（mean kurtosis，MK）。应用最小绝对收缩和选择算子-Logistic 回归模型筛选特征并构建影像组学模型。应用受试者工作特征计算曲线下面积及诊断准确性。应用 kappa 检验评估两名医师的一致性。

结果: 两名医师勾画感兴趣区域一致性较好。胰腺神经内分泌肿瘤和实性假乳头状瘤之间的 MD 和 MK 值差异有统计学意义；应用 MD 和 MK 值鉴别两种疾病的诊断效能，曲线下面积（area under curve，AUC)分别为 0.732 和 0.650。筛选出 10 个特征在鉴别两种疾病的效能优于 MD 和 MK 值，其 AUC 0.94。在训练组中，基于 T2WI 和 DKI 影像组学模型鉴别这两种疾病的效能较好，AUC 0.950，灵敏度 94.12%，特异度 85.19%。在验证组中，应用该模型鉴别这两种疾病的效能较好，AUC 0.925，敏感度 100%，特异度 80%。

结论 基于 DKI 和 T2WI 的影像组学模型鉴别胰腺神经内分泌肿瘤与实性假乳头状瘤的效能高于 MD 值和 MK 值，能够为临床治疗策略的制定提供参考。

OR-073

容积 ADC 直方图对胆囊癌的诊断价值

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目的 探讨 DWI 所得的容积 ADC 直方图对胆囊癌的诊断价值。

材料与方法 收集华中科技大学同济医学院附属同济医院 2017 年 9 月-2018 年 12 月确诊并有完整的 MRI 资料的胆囊病变患者 789 例。经过随访，排除不合格样本，最终 86 例胆囊病变患者纳入研究。由两位医师测量病理证实的 86 例胆囊疾病患者术前进行的 DWI 检查，通过第三方软件生成 ADC 值灰度直方图，并计算出胆囊癌的灰度平均值、第 10 百分位数、第 25 百分位数、第 50 百分位数、第 75 百分位数、第 90 百分位数、标准差、峰度、偏度、熵。对两位医师的测量结果采用 weighted K 检验评估一致性。用曼-惠特尼 U 检验对比两组病变均值差异的显著性，并根据受试者

操作特性曲线(ROC)下面积（AUC）来判断其诊断准确性，评价直方图参数对于良恶性病变的鉴别诊断效能。

结果 1.一致性分析：两名医师的测量数据一致性分析具有较好的可信度，ICC 为 0.715-0.872。2.胆囊癌的灰度平均值、第 10 百分位数、第 25 百分位数、第 50 百分位数、第 75 百分位数、第 90 百分位数均低于胆囊良性病变（p 均<0.001）。

3.恶性病变的 SD 和熵显著高于良性病变，但是良恶性病变间的峰度和偏度没有显著差异（p<0.05）。

4.ADC 的平均值、第 10 百分位数、第 25 百分位数、第 50 百分位数、第 75 百分位数、第 90 百分位数、标准差、峰度、偏度和熵在 ROC 曲线上对应的 AUC 分别为 0.856、0.963、0.959、0.942、0.908、0.721、0.861、0.526、0.513 和 0.612。第 10 百分位数具有较高的鉴别诊断效能，其 AUC 范围为 0.959-0.968。当临界值为 95 时具有最大的约登指数，其特异度、准确度分别为 89.5%、95.4%。

结论 ADC 容积定量直方图可以对胆囊良恶性病变鉴别诊断提供一定的帮助，直方图参数在胆囊癌诊断中具有较大价值。

OR-074
术前 CT 影像预测肝内胆管细胞癌瘤周 Glisson 鞘侵犯

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目的 探索有瘤周 Glisson 鞘侵犯（PGSI）和无 PGSI 的肝内胆管细胞癌（ICC）的临床病例特点和计算机断层扫描（CT）指标的差异，并且建立术前预测 ICC 伴有 PGSI 的诺谟图。

方法 回顾性分析了 84 个 ICC 患者的临床病理特点和 CT 指标，比较有 PGSI 的 ICC(30/84, 35.7%)和无 PGSI 的 ICC(54/84, 64.3%)的临床病理特点和 CT 指标的差异。用多因素逻辑回归分析来探索 PGSI 的术前独立危险因素。

结果 有 PGSI 和无 PGSI 的 ICC 患者在是否伴有腹痛、血清胚抗原（CEA）和糖类抗原 19-9（CA19-9）水平、TNM 分期、T 分期、肿瘤位置、肿瘤内钙化、肝内胆管扩张、肝内胆管结石、大体分型和动态增强模式具有显著差异。腹痛、血清 CEA 水平、肝内胆管扩张和大体分型是 ICC 伴有 PGSI 的独立危险因素。基于这些独立危险因素构建术前预测 PGSI 的诺谟图，受试者工作特征曲线下面积是 0.908。

结论 有 PGSI 和无 PGSI 的 ICC 患者临床病理特点和 CT 指标有显著差异。由腹痛、血清 CEA 水平、肝内胆管扩张和大体分型构建的诺谟图可以术前准确地预测 PGSI。

OR-075
急性胰腺炎相关腹壁改变的 CT/MRI 成像及尸体标本解剖学研究

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目的 探讨急性胰腺炎所致的腹壁改变的影像学表现、临床特征和解剖学机制。方法 前瞻性收集 2017 年 12 月至 2019 年 1 月期间 155 例（男 94：女 61）连续性急性胰腺炎患者且住院治疗，所有患者均在发病 24h 内入院就诊且在发病 5 天内行 CT 和（或）MRI 检查。收集所有患者的影像检查结果和实验室检查资料（包括血淀粉酶、脂肪酶、血清白蛋白水平）。在武汉大学基础医学院解剖

学教研室观测大体标本 10 具及断面标本 2 具。结果 按照新亚特兰大国际共识分类，轻度（MAP）占 38.7%[60 例（男 34，女 26）]；中度（MSAP）占 41.3%[64 例（男 40，女 24）]；重度（SAP）占 20%[31 例（男 20，女 11）]。在 CT/MRI 上，总共检查腹壁水肿患者占 56.1%（87/155）；其中，腹壁水肿在轻度、中度、重度的发生率分别为 20%（12/60）、68.8%（44/64）、100%（31/31）。CT/MRI 上腹壁水肿严重度与 CTSI/MRSI 呈中度正相关 （r = 0.64, p < 0.001）。腹壁改变程度与患者血清白蛋白水平呈中度负相关 （r = -0.63, p < 0.001）。尸检发现急性胰腺炎相关的腹壁改变存在两条重要的解剖学通路：（1）腹前外侧壁通路：右侧经由肝周腹膜腔-镰状韧带旁-腹直肌深面-膈肌中心腱-腹外斜肌与膈肌间隙-肋间肌间-皮下浅筋膜深层；（2）腹后壁通路：肾后平面-肾旁后间隙-腹横筋膜-狭窄通道-胸腰筋膜-皮下浅筋膜深层-皮肤。结论 急性胰腺炎相关的腹壁改变是一项常见且重要的临床体征和影像学征象，腹壁改变程度与胰腺炎的严重程度成正相关，即可作为反映胰腺炎严重性的简单且可靠的指标。腹壁改变一方面与低蛋白血症密切关联，另一方面为存在着两个腹壁解剖学通道机制。

OR-076
比较以不同组织为感兴趣区域测得肝脏灌注参数的异同

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目的 比较以胃壁、胰腺为感兴趣区域所得的灌注参数与以脾脏为感兴趣区域（region of interest, ROI）所得灌注参数的差异，探索对于脾脏切除患者，是否可以其他脏器为感兴趣区域替代脾脏测量肝脏灌注参数。

方法 回顾性纳入在我院进行肝脏灌注 CT 扫描的肝局灶性病变患者共 38 例。扫描采用第 3 代双源 CT（SOMATOM Definition Force, Siemens Healthcare）,患者屏气呼吸，扫描范围自肝上缘 1-2cm 起向下 20cm，共扫描 18 期图像，层厚 1.5cm。后处理采用西门子工作站 CT body perfusion 软件，勾画主动脉及门脉 ROI，之后分别利用脾脏、胃壁、胰腺为感兴趣区域处理获得 3 组灌注伪彩图。在 3 组伪彩图上，在肝右叶、肝左叶相同位置分别勾画 ROI，得到 3 组灌注参数，包括肝动脉灌注量（arterial liver perfusion, ALP）、门静脉灌注量（portal venous liver perfusion, PVP）、肝动脉灌注指数（hepatic perfusion index, HPI）。利用配对 T 检验比较三组灌注参数的异同，P<0.05 为差异有统计学意义。

结果 以胰腺为 ROI 处理测得的 ALP、PVP、HPI 与以脾脏为 ROI 处理测得的参数无统计学差异（P=0.136、0.321、0.762）。以胃壁为 ROI 处理测得的 ALP、HPI 显著高于以脾脏及胰腺为 ROI 测得的参数（胃壁 vs 脾脏，P=0.008、0.007; 胃壁 vs 胰腺，P=0.022、0.002）。以胃壁为 ROI 处理测得的 PVP 与脾脏、胰腺无统计学差异（P=0.849、0.587）。

结论 以胰腺为 ROI 测得的灌注参数与以脾脏为 ROI 测得的灌注参数无显著差异，对于脾脏切除的患者，利用胰腺作为 ROI 测得的肝脏灌注参数可一定程度上反应肝脏的灌注参数。

OR-077
多期磁共振图像的纹理特征在预测肝细胞癌组织学分级中的临床价值

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目的 探讨多期磁共振图像的纹理特征在预测肝细胞癌组织学分级中的作用，为临床术前制定治疗方案提供影像学依据。

材料与方法 连续性纳入我院 2014 年 9 月至 2017 年 12 月经组织病理确诊的肝细胞癌患者 83 例。肝细胞癌的组织学分级根据 Edmondson-Steiner 分级法分为 I-IV 级，把 I 级和 II 级归为“低级别组”，III 级和 IV 级归为“高级别组”。评估肝细胞癌形态学表现包括动脉期强化程度、肿块形态和弥散受限情况等；并将所有研究对象术前磁共振图像导入后处理软件，手工勾画感兴趣区，提取肝胆期、T2WI、动脉期及门脉期图像中病灶的纹理特征。运用统计学方法，对所得的参数进行 Spearman 相关性分析，并进行受试者工作特征曲线（ROC）分析。
结果 83 例肝细胞癌患者中男性 72 例，女性 11 例，年龄 23-85 岁，中位年龄 52 岁。其中“低级别组”54 例，“高级别组”29 例。研究结果显示年龄在低级别组及高级别组之间差异具有统计学意义（P=0.032；P＜0.001）。对于影像学特征的评估，肿瘤大小、形态不规则、出血及动脉期高强化差异均具有统计学意义（P 值均＜0.05），观察者间一致性 Kappa 值 0.631-0.888。基于肝胆期图像的纹理参数曲线下面积为 0.383-0.701，曲线下面积最大的纹理参数为 Horzl_RLNonUni；基于 T2WI 图像的纹理参数曲线下面积为 0.333-0.670，曲线下面积最大的纹理参数为 Teta3；基于动脉期图像的纹理参数曲线下面积为 0.322-0.713，曲线下面积最大的纹理参数为 WavEnLH_s-1；基于门脉期图像的纹理参数曲线下面积为 0.305-0.755，曲线下面积最大的纹理参数 Perc.10%。
结论 多期磁共振图像的纹理特征能够预测术前肝细胞癌的组织学分级，为临床评估肝细胞癌的侵袭性提供影像学依据，有助于评估患者的预后。

OR-078
肝细胞癌治疗前的 CT 纹理分析在 TACE 疗效预测中的应用研究

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【摘要】 目的 探讨肝细胞癌（hepatocellular carcinoma，HCC）治疗前 CT 图像的纹理分析预测经导管肝动脉化疗栓塞（transcatheter arterial chemoembolization, TACE）早期疗效的临床价值。 **材料与方法** 收集 67 例 HCC 病人的资料，均在 TACE 治疗前 4 周内和治疗后 4-8 周内行行 CT 检查，治疗前后 CT 检查均为三期动态增强扫描。对比 TACE 治疗前后 CT 图像，按实体肿瘤反应评价标准改良版（Modified Response Evaluation Criteria in Solid Tumors， mRECIST）标准行疗效评价，为完全缓解(CR)8 例、部分缓解(PR)15 例、 疾病稳定(SD)27 例和疾病进展(PD)17 例，缓解组（CR+PR）23 例，非缓解组（SD+PD）44 例；稳定组（CR+PR+SD）50 例，非稳定组（PD）17 例。对 TACE 治疗前 CT 三期图像进行感兴趣区(region of interest, ROI)全容积人工勾画，使用 FireVoxel 软件对 ROI 进行纹理分析，获得关于灰度直方图的 16 项纹理参数。使用 SPSS 软件比较缓解组和非缓解组之间、稳定组与非稳定组之间的各项灰度直方图参数的差异。对于有统计学意义的纹理参数，采用受试者工作特征曲线分析其诊断效能，计算各参数用于预测缓解或稳定的曲线下面积等各项数值。 **结果** 治疗前 CT 三期的 48 组纹理参数，对比缓解组与非缓解组，只有动脉期图像的熵和最大值有统计学意义；对比稳定组与非稳定组，只有门静脉期图像的峰度和熵有统计学意义。四个纹理参数的 ROC 曲线上对应的 AUC 分别为 0.663、0.720、0.686、0.673。 **结论** TACE 治疗前 CT 的纹理分析，可以获得相关灰度直方图参数，用于预测 TACE 治疗 HCC 的早期疗效。

OR-079
血管内皮抑制素联合 TACE 治疗的疗效及对纹理分析中影像特征的影响

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目的 探讨血管内皮抑制素联合 TACE 治疗 HCC 的疗效，及其对 HCC 肿瘤组织的影像特征的影响。

材料与方法 收集 70 例 HCC 病人的资料，28 例接受了血管内皮抑制素联合 TACE 治疗作为观察组，42 例接受了常规 TACE 治疗作为对照组，于治疗前 4 周内和治疗后 4-8 周内行 CT 检查，治疗前后 CT 均为三期动态增强扫描。按 mRECIST 标准评价两组疗效。使用 FireVoxel 软件对两组治疗后 CT 的门静脉期薄层图像进行全容积感兴趣区(region of interest, ROI)人工勾画，获得关于灰度直方图的 16 组参数。使用 SPSS 软件比较两组疗效和灰度直方图参数的差异。对于有统计学意义的纹理参数，采用 ROC 曲线分析其诊断效能，计算其 AUC 等各项数值。

结果 观察组 28 例中疗效为 CR、PR 和 SD 为 6 例、10 例、8 例，对照组对应疗效分别为 4 例、10 例、16 例，两组疗效的差别有统计学意义。两组的灰度直方图参数中有七项的差异有统计学意义，包括标准差、不均一性、峰度、熵、及第 75、90、95 百分位数，采用 ROC 曲线的 AUC 对其进行排序，前三位为：第 95 百分位数、熵、峰度，对应的 AUC 分别为 0.747、0.744、0.728，最大的约登指数分别为 0.440、0.500、0.405。

结论 与单纯 TACE 治疗相比，血管内皮抑制素联合 TACE 治疗可以提高疗效，并改变肿瘤组织影像特征。

OR-080
BSP TI 值与非对比剂增强 MR 门静脉成像质量关系探讨

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目的 探讨利用多翻转空间标记脉冲（spatial labeling with multiple inversion pulses，SLEEK）的非对比剂增强磁共振门静脉成像（non-contrast-enhanced magnetic resonance portography，MRP）中血流抑制翻转时间（blood suppression inversion time，BSP TI）参数设置与门静脉成像质量的关系。

材料与**方法** 纳入 25 名门静脉高压患者先后行利用多翻转空间标记脉冲的非对比剂增强磁共振门静脉成像（non-contrast-enhanced magnetic resonance portography，MRP）检查。SLEEK-MRP 序列采用不同血流抑制翻转时间（blood suppression inversion time，BSP TI）：600ms，900ms，1200ms，1500ms。由两位放射学医师对 SLEEK-MRP 序列图像门静脉显示质量以四分法进行主观评分并计算两者评分一致性。对 SLEEK-MRP 序列图像门静脉分支显示级别进行评分并对各 BSP TI 值下门静脉显示评级进行统计。

结果 两位医师对 SLEEK-MRP 序列图像门静脉显示质量主观评分显示出良好的一致性。在 BSP TI 值为 600ms、900ms 及 1200ms 时相较 1500ms 时图像质量主观评分更好。各患者门静脉分支级别显示评分随 BSP TI 值升高而呈增加趋势，BSP TI 值由 1200ms 升高至 1500ms 时在多数患者分支显示增加不明显。

结论 SLEEK-MRP 对门静脉分支的显示随 BSP TI 值的升高而增加，而 BSP TI 值达到 1500ms 时图像信噪比有所下滑，而分支显示增加不明显。对于 SLEEK-MRP 进行门静脉成像，推荐设置 BSP TI 值为 1200ms，既能得到清晰锐利的高信噪比图像，又能较大限度地对门静脉细小分支进行显示。

OR-081
LI-RADS 征象及 MRI 定量参数对肝细胞癌 MVI 术前预测价值的研究

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目的 探讨 LI-RADS 定义的影像征象、IVIM-DWI 及 DCE-MRI 的定量参数对术前预测 HCC MVI 价值。
材料与方法 收集我院 2018 年 3 月至 2019 年 3 月共 146 名临床初诊为肝占位的病人，行 T2WI、T1-VIBE-Dixon，IVIM-DWI 和 DCE-MRI。纳入术后病理为 HCC 的患者，根据 MVI 个数及位置分为 M0 组（无 MVI），M1 组（≤5 个 MVI，且发生于近癌旁肝组织），M2 组（＞ 5 个 MVI，或 MVI 发生于远癌旁肝组织区域（＞1cm））。参考 2018 版 LI-RADS 获得影像征象，包括 APHE（no-rim）、非边缘廓清、强化包膜、病灶多发、T2WI 中等或稍高信号、DWI 弥散受限、病灶内含脂质、出血、周围肝实质晕状强化、结中结、马赛克。通过后处理软件获得 D、D^*、f、 K^{trans}、K_{ep}、V_e、V_p、 TTP ，Max Concentration、Max Slope 和 iAUC。对比分析 LI-RADS 征象及 MRI 参数在 MVI 组间的差异及其预测效能。
结果 共收集 HCC 50 例（M0 组 24 例，M1 组 20 例，M2 组 6 例）。病灶多发的出现率在有 MVI 组中高于无 MVI 组（$P<0.01$）。有 MVI 组的 D、D^*、f、K^{trans}、V_e显著低于无 MVI 组（$P<0.05$）。各参数对 MVI 的预测效能由高到低依次为 $D+K^{trans}>K^{trans}>D>f>D^*>V_e$，D 和 K^{trans}联合预测 MVI 时，灵敏度 96.15%，特异度 95.83%，AUC0.99。病灶多发的出现率在 MVI 组间的差异有统计学意义（P=0.01）。D、f、K^{trans}、V_e在 M1 组显著低于 M0 组，D、D^*、f 和 K^{trans}在 M2 组中显著低于 M0 组（$P<0.01$）。
结论 LI-RADS 辅助征象中病灶多发和 MRI 定量参数中 D、D^*、f、K^{trans}、V_e对于 HCC 是否存在 MVI 有一定的预测价值。

OR-082
3.0T 磁共振钆塞酸二钠增强检查评估华支睾吸虫病胆管周围肝损伤的价值

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目的 探讨华支睾吸虫病胆管周围肝损伤的 3.0T 磁共振钆塞酸二钠增强扫描影像学特点。
方法 回顾性搜集本院 18 例经临床或病理证实的华支睾吸虫病所致肝损伤。所有患者行 3.0T 磁共振钆塞酸二钠增强扫描，两名不同年资放射科医生独立对 MRI 所有图像进行判读，包括 T1WI、T2WI、DWI 及增强扫描动脉期、静脉期、平衡期及肝胆特异期胆管及胆管周围信号的改变，胆管扩张分布的情况，对两人的判读结果进行 Kappa 分析，分析钆塞酸二钠对局灶性病灶组和弥漫性病灶组检出率并进行统计学分析。
结果 局灶性病灶组共 5 例，表现为类圆形病灶，增强扫描动脉晚期为环形强化，肝胆期为低信号，细胞内、外对比剂特性对病灶检出率无统计学差异；弥漫性病灶组 13 例，增强扫描动脉晚期明显强化，肝胆期为低信号，呈楔形分布于肝包膜下，细胞内对比剂特性对病灶的检出率明显优于细胞外对比剂特性，差异有统计学意义（P=0.003）。
结论 钆塞酸二钠具有细胞外对比剂和细胞内对比剂的双重特性，细胞内对比剂特性能明显提高病灶的检出率，对于华支睾吸虫病胆管周围肝损伤具有更高的价值。

OR-083
不典型无功能神经内分泌肿瘤与胰腺导管腺癌的鉴别诊断分析

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目的 分析不典型无功能神经内分泌肿瘤（NF-pNET）及胰腺导管腺癌（PDAC）的影像学表现及临床指标，探讨对两者鉴别有价值的征象及指标。**方法** 从 2014 年 7 月至 2017 年 12 月，回顾性收集我院经手术病理证实的 PDAC(n=55)和不典型 NF-pNET(n=45)患者。所有患者均术前 1 月内行胰腺增强 CT 检查，且术前未接受任何治疗。由两名影像科医生独立分析上述两组病例的影像学表现。同时收集其临床指标包括 CA199，CA125 和 CEA 水平。利用 kappa 值分析两名观察者间一致性。定性征象的分析采用卡方检验或 Fisher 精确概率法，定量指标的分析采用 Mann-Whitney U 检验。采用单因素和多因素分析筛选独立的实验室指标和影像学征象。采用 ROC 曲线分析、灵敏度、特异度评估鉴别诊断价值。**结果** 所有影像征象均有较好的一致性(kappa 值范围：0.758-0.937)。不典型 NF-pNET 与 PDAC 两组病例中有统计学差异的征象有：病变大小(46mmvs.36mm)，形态规则(62%vs.16%)，密度均匀(20%vs.53%),突出胰腺轮廓（89%vs.40%）,钙化（24%vs.6%）肝转移(31%vs.9%)(P 均小于 0.05)。是否包绕血管、胰胆管是否扩张和胰腺实质萎缩对于两者鉴别均不具有统计学意义(P 均大于 0.05)。联合突出胰腺轮廓，形态是否规则及 CA199 水平的鉴别 AUC 值为 0.937(95%CI: 0.913, 0.959)，灵敏度为 91.7% (95%CI:87.4%, 96.3%)，特异度为 83.9%(95%CI:79.1%, 88.6%)。**结论** 病变形态是否规则、是否突出胰腺实质及 CA199 水平可以帮助两者鉴别。是否接触血管、胰胆管扩张及胰腺实质萎缩对不典型 NF-pNET 及 PDAC 的鉴别价值有限。联合临床及影像学表现时，大多数不典型 NF-pNET 能与 PDA 进行鉴别。

OR-084
双能 CT 对早期急性胰腺炎血流灌注定量评价

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目的 评估使用双能 CT 碘浓度值定量评价早期各级急性胰腺炎的诊断性能。
方法 前瞻性收集 2018 年 12 月-2019 年 5 月早期急性胰腺炎患者 46 名（男性 29 名，女性 17 名；平均年龄 47.7±13.3），所有患者在双能 CT（SOMATOM Force，Siemens Healthcare）上行双能量增强 CT 扫描。根据 Balthazar CT 严重指数将病人分为两组：轻度 21 人（A 组），中度及重度 25 人（B 组）。测量并比较增强扫描动脉期、门脉期及延迟期碘浓度值及标准化碘浓度值的差异，绘制所有参数诊断 A 组与 B 组的 ROC 曲线并计算曲线下面积，确定各参数对各级急性胰腺炎的诊断阈值。P<0.05 时有统计学意义。
结果 1、两组门脉期碘浓度值、动脉期碘浓度值及延迟期标准化碘浓度值差异均有统计学意义（$F_{门脉期碘浓度值}$=1.51，P<0.0005；$F_{动脉期碘浓度值}$=0.63，P<0.0005；$F_{延迟期标准化碘浓度值}$=3.67，P<0.005）；其余各参数两组间差异无统计学意义（P>0.05）；2、A 组与 B 组的最佳门脉期碘浓度阈值为 2.39mg/ml，敏感度 71.4%，特异度 88.0%，ROC 曲线下面积（AUC）为 0.82；A 组与 B 组的最佳动脉期碘浓度阈值为 2.62mg/ml，敏感度 66.7%，特异度 88.0%，ROC 曲线下面积（AUC）为 0.79。
结论 双能量 CT 碘浓度值能够定量分析早期各级急性胰腺炎，其中门脉期碘浓度值在早期各级急性胰腺炎中具有最高的诊断效能。

OR-085

MRI 动态增强减影技术联合 DWI 在原发性肝 Ca 局部介入治疗术后疗效评估的应用

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目的 对比肝脏常规 MRI 动态增强、动态增强减影及 DWI 在评价经局部介入治疗术后表现为 MRI 平扫 T1 高信号的原发性肝癌治疗疗效的差异；探讨肝脏 MRI 动态增强减影技术联合 DWI 在原发性肝癌综合介入术后疗效评估的临床应用优势。**资料和方法** 收集经临床病理证实为原发性肝细胞癌未经手术治疗，仅接受射频消融、微波消融、动脉内化疗栓塞等局部介入手术且术后病灶表现为 MRI 平扫 T1 高信号的患者 56 例。由两位高年资腹部影像诊断专家，根据患者临床实验室及影像学检查，将患者治疗后 6 个月病灶分为治疗完全组（病理坏死组-强化 MRI 或 CT 病灶无强化或薄环状强化；病变范围不变或缩小)和治疗不完全组（肿瘤组织残留或复发组-病灶边缘结节状或不规则强化；病变范围扩大）。由另外三名不同年资影像诊断医生对患者介入术后 6 个月 MRI 动态增强、动态增强减影及 DWI 图像进行定性分析，比较不同方法评价疗效的信心度水平；分别测量病灶与肝实质组织在 MRI 增强动静脉期与动静脉减影图像上的信号强度值（$SI_{病灶}$、$SI_{肝实质}$）、背景噪声标准差（$SD_{背景}$），计算病灶在不同期相的图像对比信噪比（CNR）。测量病灶 ADC 值，比较组间差异。**结果** MRI 动态增强减影医师信心度水平显著高于常规动态增强与 DWI。治疗完全组病灶在动静脉期与动静脉减影图像的 CNR 分别为 13.33±9.8/41.87±25.57/14.00±11.07/53.42±17.74，治疗不完全组 47.79±29.09/34.24±22.09/77.08±35.95/44.15±21.02.治疗不完全组病灶动脉期减影 CNR 明显大于动脉期 CNR(P=0.000);两组病灶静脉期减影 CNR 均明显大于静脉期 CNR.治疗完全组/不完全组病灶 ADC 值为 1.60±0.33/1.18±0.17,两组间有显著差异.**结论** 减影技术可显著提高医师信心度水平，有效鉴别坏死与复发，不同疗效 ADC 值不同。

OR-086

Multi-parametric MR Relaxometry of Adenomyosis: Assessment of Symptom and Prediction of Response to Gonadotropin Releasing Hormone Agonists

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PURPOSE
To investigate whether MR relaxometry can evaluate symptoms of adenomyosis including dysmenorrhea and abnormal uterine bleeding, and to explore whether MR relaxometry can further predict the therapeutic response to gonadotropin-releasing hormone agonists (GnRH-a) in patients with adenomyosis.
METHOD AND MATERIALS
Between Nov 2017 and Aug 2018, 52 patients clinically diagnosed as adenomyosis underwent multi-parameter uterine MR examinations including T_1, T_2 and T_2* relaxometry on a 3T MR scanner (Ingenia CX, Philips Healthcare, the Netherlands) during the peri-ovulatory period. Visual analogue scale (VAS) of dysmenorrhea and blood haemoglobin level were collected before GnRH-a injections and 6 months after. T_1, T_2, and T_2*

relaxation times of lesions were measured blindly by two radiologists via Intellispace Portal (version 10.1.0.64190, Philips Healthcare, the Netherlands) on slices showing maximum lesion area, as well as maximum diameters of lesions on sagittal T2W images. Spearman rank correlation coefficients were calculated to determine the relationship between relaxation times and VAS. Student t-tests were performed to compare the difference of lesions' features between patients with different therapeutic responses. A p-value <0.05 was considered statistically significant.

RESULTS

A moderate, negative correlation was found between T_2* relaxation time of lesions and VAS (r=-0.4808, p=0.0004). Twenty-three patients received GnRHa injection, and 14 of them achieved complete response (CR, VAS=0 and normal Hgb) after 6 months, while 9 patients with partial response (PR, VAS>0 or anaemia). T_2* relaxation times of lesions were shorter in patients with CR than those with PR (43.73±2.019 ms vs. 55.43±5.465 ms, p=0.0295). Differences were found regarding T_2 relaxation times and lesion maximum diameters but they were not statistically significant (63.12±1.913 ms vs. 71.07±3.685ms, p=0.0501, and 61.46±6.899 mm vs. 41.69±5.721 mm, respectively).

CONCLUSION

T_2* relaxation time of lesions can quantitatively assess dysmenorrhea severity in patients with adenomyosis. Furthermore, T_2* relaxometry showed potential as a quantitative imaging marker to predict GnRHa therapeutic response in patients with adenomyosis.

OR-087

Pre-treatment multiparametric MR for disease free survival predicting in advanced cervical cancer treated by chemoradiotherapy: A radiomics approach

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Purpose: To investigate the potential value of pre-treatment multiparametric MR using radiomics analysis in predicting long-term effect presented by disease free survival (DFS) after chemoradiotherapy in advanced cervical cancer patients. **Materials and methods:** Biopsy proven uterine cervical squamous cell carcinoma patients who received chemo-radiation therapy during 2009-2013 in a single institute were followed up. Valid MR images including T2WI, diffusion (DWI) and dynamic contrast-enhanced (DCE) images were retrieved to a house-made texture analyzing software developing on 3D slicer. Region of interests were drawn manually on DWI along the rim of tumors on every slice so as to achieve whole-tumor volumetric data, with reference to T2WI on side and applied to parametric maps including ADC and eADC from DWI, SER, PEI, MSI and MSD from DCE. A total of 1026 features (including first-order, shape-and size-based, textural and wavelet) for each set of parametric map were extracted. T est and least absolute shrinkage and selection operator (LASSO) method were used to select features, and ROC curves were used to analysis the diagnostic efficiency. **Results:** The follow-up time for 73 patients were 7.1 to 94.6 months (median 50.6 months), with 55 patients free of recurrence or metastasis at the end of follow-up. 13 features were selected as having

significant association with DFS. The area under the ROC curve, the sensitivity and specificity for predicting DFS were 0.86, 0.83 and 0.85 respectively. **Conclusion:** In this long-term follow up cohort, using pre-treatment multiparametric MR and radiomics approaches, imaging derived values has good potential in predicting disease free survival for cervical cancer patients that treated with chemoradiation. However, large sample is needed for further validation and it is subject to change with improvement of radiomics models in future study.

OR-088
超高 b 值扩散加权成像及 IVIM 成像在前列腺癌诊断中的应用价值初步研究

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目的 探讨超高 b 值扩散加权成像（DWI）及体素内不相干运动（IVIM）成像在前列腺癌（PCa）诊断中的应用价值。**方法** 前瞻性纳入 2018 年 11 月～2019 年 5 月在我院行前列腺 IVIM-DWI（b=0、50、100、150、200、400、600、800、1000、1500、2000s/mm^2），且之后经病理确诊为 PCa 或前列腺增生（BPH）的 44 名患者作为研究对象。比较 ADC 值(b=0、2000s/mm^2)、D 值、D*值及 f 值在 PCa 与 BPH 组间、PCa 低分组（Gleason 评分≤6）与高分组（Gleason 评分≥7）间的差异，并绘制受试者工作特征曲线（ROC）。并分析各参数与 Gleason 评分的相关性。**结果** ① PCa 组 24 例，BPH 组 20 例，ADC 值、D 值在两组间的差异有统计学意义（P<0.05）。ADC 值及 D 值诊断 PCa 的曲线下面积（AUC）分别为 0.998、0.995，差异没有统计学意义（P>0.05）。② PCa 低分组 6 例、高分组 18 例，ADC 值、D 值在两组间的差异具有统计学意义（P<0.05）。ADC 及 D 值区分 PCa 低分组与高分组的 AUC 分别为 0.759、0.880，差异有统计学意义（P<0.05）。③ ADC 值及 D 值与 Gleason 评分均具有相关性，相关系数(r)分别为-0.441、-0.560。**结论** 超高 b 值扩散加权成像及 IVIM 成像在 PCa 诊断中均有一定价值，但二者价值有所不同。

OR-089
盆腔 MR 水成像指导梗阻性无精症患者治疗方法 的临床价值研究

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目的 梗阻性无精症在不育症男性中检出率达 6.1%-13.6%；多数患者可手术纠正，不需要额外辅助生殖技术；而对于梗阻范围广、梗阻时间长的病例，手术重建输精管的治疗方式存在远期通畅率不佳的问题。本研究尝试利用 MR 所示阴囊结构形态学差异筛选适合输精管复通术的患者，为治疗方式的选择提供依据。**方法** 回顾 2017.2 至 2019.2 因不育症于我院放射科行盆腔 MR 检查的男性患者，筛选出梗阻性无精症患者。记录患者临床资料。根据盆腔 MR 图像观察患者两侧的睾丸、附睾及输精管，评估附睾形态是否正常，附睾管是否扩张及扩张程度；输精管是否缺失或细小，输精管是否扩张及扩张程度。记录睾丸大小，计算睾丸体积，测量扩张的附睾管及输精管内径。根据后续的治疗方式分成：取精组和重建组。比较两组患者的病因及 MR 征象是否存在差异。采用 ROC 曲

线评价有统计学差异的参数在筛选梗阻性无精症患者治疗方式的临界值、敏感性、特异度、阳性预测值、阴性预测值及准确性。**结果** 本研究共纳入 23 例患者：取精组 9 例和重建组 14 例。分析患者病史、实验室检查、MR 报告及术中探查情况，将梗阻病因分成炎症、结核、先天性及医源性因素。两组患者的病因学分类有明显的统计学差异，其中结核感染和先天性发育不良患者更多采用辅助生殖技术，普通炎症和医源性所致的患者更倾向选择输精管复通术。两组间睾丸体积及输精管内径差异无明显统计学意义，而附睾管内径、附睾及输精管发育不良有统计学差异。以附睾管扩张内径作为独立指标，ROC 曲线下面积为 0.931（95%CI：0.892，0.971）；以附睾管内径 0.55mm 作为临界值，敏感性 87.5%，特异度 86.7%，阳性预测值 77.8%，阴性预测值 92.8%，准确性 87.0%。**结论** 在梗阻性无精症患者中，当观察到 MR 图像中附睾管内径＞0.55mm，附睾形态异常，输精管细小或缺失等征象时，此类患者输精管重建术效果不佳，可采用精子抽吸术。

OR-090

多频三维高分辨率 MRE 对前列腺癌病理分级的价值

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目的 探讨多频三维高分辨率 MRE 技术对前列腺癌病理分级的价值。
方法 前瞻性收集 2018 年 11 月至 2019 年 7 月经组织病理证实并行 Gleason（GS）评分的 40 例前列腺癌患者，所有病例均行多频（40HZ，50HZ，60HZ，70HZ）MRE 成像。根据 GS 评分将患者分为低危（GS≤6 分），中危（GS=7 分）及高危（GS≥8 分）三组，测量并记录三组的 MRE 参数剪切波速度（c），收集三组的血清 TPSA（Total PSA，总前列腺特异性抗原）资料。比较前列腺癌高危组、中危组及低危组 3 组间 c 及 TPSA 的差异，并评价 c、TPSA 分别鉴别高危与中危组、中危与低危组、高危与低危组的诊断效能。
结果 高危组（n=16）、中危组（n=16）及低危组（n=8）的 c 分别为 2.06±0.20m/s，2.59±0.09m/s，3.17±0.25m/s，TPSA 分别为 14.75±8.02 ng/ml，22.73±26.88ng/ml，61.43±33.74ng/ml。c、TPSA 随着前列腺癌病理分级增加而增加，且 2 者在 3 组之间的差异具有统计学意义（P 均＜0.05）。c、TPSA 鉴别高危与中危组的曲线下面积分别为 0.992、0.918（P 均＜0.05）。c、TPSA 鉴别中危与低危组的曲线下面积分别为 1.000（P＜0.05）、0.556（P＞0.05）。c、TPSA 鉴别高危与低危组的曲线下面积分别为 1.000、0.977（P 均＜0.05）。c 鉴别前列腺癌高危组与中危组、高危组与低危组的价值均优于 TPSA。TPSA 无法鉴别前列腺癌中危组与低危组，而 c 鉴别诊断前列腺癌中危组与低危组效能显著。
结论 应用多频三维高分辨率 MRE 评估硬度能预测前列腺癌病理分级，且其价值优于 TPSA，尤其在区分前列腺癌中危组与低危组方面，表明 MRE 在无创预测前列腺癌病理分级上具有良好的临床应用前景。

OR-091

未成年患者 CT 扫描后碘对比剂相关急性肾损伤（PC-AKI）的大样本回顾性研究

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目的 探讨未成年人进行 CT 扫描后碘对比剂相关急性肾损伤（PC-AKI）的发生率、与各相关危险因素及年龄相关性。**材料和方法** 回顾性分析未成年住院病例 CT 扫描前、后 SCr 值，并使用倾向值匹配进行数据处理，比较匹配前、后 PC-AKI 发生率以及各相关危险因素在增强组与平扫组中的差异，以及患 PC-AKI 与不患 PC-AKI 两组间的差异，并对年龄进行分层以研究年龄与 PC-AKI 的相关性。PC-AKI 的诊断标准 CIN（对比剂肾病）及 AKI（急性肾损伤）两种，定义分别为 CT 扫描前、后血清肌酐值（SCr）升高 0.5mg/dL 或 25%、0.3mg/dL 或 50%以上。**结果** 共搜集 1081 例平扫 CT 和 299 例增强 CT 病例，进行倾向值匹配（PSM）后平扫组及增强组各 262 例。匹配后两组之间倾向得分的分布更为相似（图 1）。匹配前，两组患者的部分危险因素有统计学差异，包括年龄、先天性心脏病、肾肿瘤、肾脏手术、心脏手术和化疗，匹配后均无统计学差异。匹配前 CIN 和 AKI 的总发生率分别为 1.2%（平扫组 1.1%，增强组 1.7%）和 6.8%（平扫组 7.4%，增强组 4.7%），无统计学差异。匹配后，总 CIN 的发生率为 1.3%（平扫组 1.1%，增强组 1.4%），AKI 为 5.9%（平扫组 7.3%，增强组 4.6%），无统计学差异。匹配前，进行心脏手术、怀疑肾脏肿瘤、进行肾脏手术、接受化疗的患儿更倾向于进行增强 CT 检查，增强组患者平均年龄更大，患先天性心脏病、进行心脏手术的患儿 CIN 发生率更高，患泌尿系结石的患儿 AKI 发生率更高。进行年龄分层后，各分层内平扫组与增强组相比、各年龄层间相比，CIN 及 AKI 发生率均无统计学差异。**结论** 碘对比剂的使用并未明显增加 PC-AKI 的发生率，部分危险因素（先天性心脏病、心脏手术、泌尿系结石）与 PC-AKI 可能有一定的相关性，不同年龄层内及层间的 PC-AKI 发生率无明显统计学差异。

OR-092

宫颈癌磁共振弥散加权成像中感兴趣区选择方法　对表观扩散系数影响的重复性研究

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目的 评价宫颈癌磁共振弥散加权成像(DWI)中相同观察者应用不同勾选感兴趣区(ROI)方法的测得表观扩散系数(ADC)的可重复性研究.
方法 15 例宫颈癌 DWI 图像采用 4 种 ROI 选取方法获得 ADC 值：10 点法,在肿瘤病灶范围内随机选取 10 处圆形 ROI, 面积 15～25mm^2.容积法,在各层面依次沿病灶内缘手动勾选感兴趣区；最大层面法,勾选病变的最大横截面.3 点法,在肿瘤最大截面及邻近层面,随机选取 3 处 15～50mm^{2}面积的圆形 ROI.均排除肿瘤内坏死及空腔,按面积计算加权 ADC 平均值.同一医生 10～15 天后同样方法再次测量.方差分析比较各方法 ADC 值差异.可重复性评价采用 Bland Altman 法,计算两次测量中不同 ROI 选取方法 ADC 值的变异系数(CV),组内相关系数(ICC)及其 95%变化区间.
结果 第一次测量中 10 点法,容积法,最大层面法,3 点法 ROI 的 ADC 值(平方毫米/秒)分别为 1.247±0.436,1.400±0.345,1.476±0.384,1.289±0.526.第二次测量的 ADC 值分别为 1.240±0.450,1.404±0.362,1.421±0.439,1.271±0.46.方差分析 F=1.594,P=0.195.四种方法前后测量的 CV(%)分别为 13.247,6.026,9.006,19.961;组内相关系数(ICC)及其 95%变化区间分别为 0.920(0.762,0.973),0.969(0.906,0.989),0.949(0.847,0.983),0.836(0.510,0.945).
结论 10 点法,容积法,最大层面法,3 点法所测得 ADC 值无统计学差异.10 点法,容积法,最大层面法的重复性好,可应用于取得宫颈癌感兴趣区 ADC 值.

OR-093

CAD 在前列腺多参数 MRI 诊断中的辅助诊断效果研究

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目的 探讨计算机辅助诊断（CAD）系统作为“第二读片者”在前列腺多参数 MRI（mpMRI）诊断中的辅助诊断效果。**方法** 从本院前列腺 MRI 数据库中筛选出临床资料及病理结果完整的前列腺疾病初诊患者 64 例（癌 36 例，非癌 28 例）。2 位读片者对入组的病例进行独立盲法读片：首先只浏览 mpMRI，按照前列腺影像报告及数据系统（PI-RADS v2）对病灶进行评分；然后读片者参考 CAD 预测图后修改评分结果。以病理结果为金标准，评价 2 位读片者使用 CAD 前、后的诊断效能。**结果** 使用 CAD 后，两位读片者诊断前列腺癌的 ROC 曲线下面积（AUC）分别从 0.79、0.81 提高到了 0.88、0.89，差异均有统计学意义（Z=2.112，*P*=0.0347；Z=2.087，*P*=0.0369）；以 PI-RADS≥3 分为诊断前列腺癌阳性，两位读片者使用 CAD 后的灵敏度、特异度及正确率均高于使用 CAD 前；两位读片者 PI-RADS 评分一致性提高（weighted kappa 系数，0.59；0.73）；诊断信心均显著提高（*P*＜0.05）。**结论** 前列腺 MR CAD 以“第二读片者”角色承担辅助诊断功能，读片者的诊断效能有一定的提高。

OR-094

MRI 在早期宫颈癌间质浸润深度判定中的价值

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目的 探讨 MRI 对早期宫颈癌间质浸润深度测量的准确性。**方法** 回顾性分析 66 例 FIGO 分期为 IA 至 IIA 期患者的术前 MRI 资料。所有患者均未行术前放化疗，直接行根治性子宫切除术。在轴位 T2WI、T1 增强图像和 DWI 图像上测量宫颈间质浸润的最大深度，并将所有病例大体分为浸润型（包括深层浸润型和双侧浸润型）和腔内生长型。两名医生测量结果之间的一致性、MRI 测量值与病理测量值之间的一致性使用 Bland-Altman 图和组内相关系数 ICC（intra-class correlation coefficient）来评价。不同生长方式的宫颈癌间质浸润最大深度测量的准确性和差异比较使用单因素方差分析，两两比较使用 bonferroni 法校正 P 值。**结果** T2WI、T1 增强和 DWI 测量宫颈间质浸润的最大深度与病理结果的差值分别为 1.0±4.0mm、1.3±4.6mm、0.6±4.3mm，三种序列上的测量值与病理测量值的一致性均为中等，ICC 无显著差别。MRI 测量结果与病理结果的差异性，三种序列之间无明显统计学差异（P=0.051）。对于不同生长方式的宫颈癌，MRI 与病理测量值的一致性存在显著差异。对于浸润型肿瘤，MRI 与病理测量一致性为很好或中等；对于腔内生长型的肿瘤，MRI 与病理测量一致性较差。**结论** MRI 对早期宫颈癌间质浸润深度测量的准确性较好，其中浸润型肿瘤测量准确性优于腔内生长型。

OR-095

体素内不相干运动（IVIM）扩散成像及弥散峰度成像（DKI）在宫颈癌中的应用

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目的 探索 IVIM 及 DKI 模型在宫颈癌诊断中的应用，同时探索 IVIM-DKI 参数 D-IVIM, D *, f, D-k, K 与宫颈癌类型、分化程度的相关性，并分析各参数间相关性。

方法 前瞻性纳入确诊宫颈癌的患者 64 例；鳞癌 54 例，腺癌 9 例，其他 1 例；病理 39 例有分化程度：高分化 9 例，中分化 18 例，低分化 12 例。同时纳入非宫颈癌患者 21 例。在 3T MR 扫描仪上进行了女性盆腔 MR 的弥散成像，应用 IVIM-DKI 模型，获得了 b= 0,10,50,100,200,800,1200 和 2000 s / mm2 的轴位图像。IVIM 参数（D, D *, f）由 b 值为 0~800 s/mm2 中信号强度经双指数模型拟合导出，DKI 参数（D, K）由 b 值为 0,800~2000 s/mm2 中信号强度经单指数模型拟合导出。计算 D 值对宫颈癌的诊断效能，采用 Spearman 相关性分析病理与各参数间相关性。

结果 D-IVIM 宫颈癌组（0.92±0.20）低于正常组（1.37±0.25）（p=0.000），D=1.145 时预测宫颈癌敏感性为 88.2%，特异性为 92.2%；f 值在宫颈癌组（0.11±0.05）低于正常组（0.20±0.09）（p=0.000）。 D-DKI 值在宫颈癌组（1.19±0.24）低于正常组（1.82±0.27）（p=0.000），D=1.47 时预测宫颈癌敏感性为 95.2%，特异性为 92.2%。K 值在宫颈癌组（1.05±0.24）高于正常组（0.89±0.18）（p=0.003）。D-DKI 值与分化呈正相关（r=0.33, p=0.05），K 值与分化呈负相关（r=-0.472）。D-IVIM 与 D-DKI 高度正相关（r=0.911）。K 值与 D-IVIM 及 D-DKI 均呈负相关（r=-0.650,-0.657）。

结论 IVIM 及 DKI 模型用于宫颈癌，显示了良好的诊断效能，IVIM-DKI 参数与宫颈癌分化程度有相关性。

OR-096
基于动脉自旋标记的功能 MR 评价肾部分切除术后残余肾功能

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背景及目的 探究 ASL 对不同类型肾细胞癌定性及诊断的价值，评估肾肿瘤患者腹腔镜部分切除术前后患侧残余肾组织及健侧肾脏血流的变化，帮助临床评估术后的残余肾功能。
材料与方法 肾细胞癌患者共 55 名，其中女性 22 名，男性 33 名，年龄 23-80 岁，平均(54.89±14.84)岁，患者术前 1 周内及术后 3 个月华西医院放射科 3.0TGE750W 磁共振仪上完成 T1WI、T2WI、ASL 扫描。两名医生采用感兴趣区勾勒测值法盲法测量 ASL 后处理数值。计量资料用“均值±标准差”表示，t’检验用于各项测量值之间的统计分析，RBF 与 GFR 间采用 spearman 相关检验。
结果 55 个肾肿瘤中含透明细胞癌 29 个，嫌色细胞癌 26 个。1.透明细胞癌平均 RBF 值（187.10±36.55ml/min/100g）高于嫌色细胞癌平均 RBF 值（151.45±33.93ml/min/100g），统计学有显著的差异（t=3.35，p<0.001）。2.55 例患者术前患侧、健侧及术后患侧、健侧肾皮质 RBF 值与 GFR 均呈显著正相关(r=0.637，P<0.001)，(r=0.783，P<0.001)，(r=0.705，P<0.001)，(r=0.737，P<0.001)。3.55 例患者术后、术前患侧残余肾组织 RBF 分别为(265.46±28.83)ml /(100g·min)、(223.43±27.63)ml /(100g·min)，差异有统计学意义(t=7.806，p<0.001)。55 例患者术后、术前健侧 RBF 值分别为(251.62±28.63)ml /(100g·min)、(268.19±28.71)ml/(100g·min)，差异有统计学意义(t=3.032，p<0.001)。
结论 ASL 可利用肾肿瘤灌注值的差别区分透明细胞癌与嫌色细胞癌，并可用于评估肾癌患者进行腹腔镜部分切除术前后肾血流灌注的变化。

OR-097
探讨 SE-EPI-T2 Mapping 技术与传统 CPMG-T2 Mapping 技术在前列腺癌侵袭性分级中的应用价值

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目的 本研究引入一种基于 SE-EPI 序列的 T2 Mapping 技术[1-3]，将其与传统的 CPMG-T2 Mapping 技术进行比较，以探讨（1）两种序列方法在不同 b 值下的 T2 值的一致性；（2）不同 b 值下的 T2 值以及不同 TE 条件下的 ADC 值对前列腺良恶性病变的诊断及鉴别中的作用；以及（3）两种序列方法在 PCa 侵袭性分级中的应用价值。
方法 目前已纳入 PCa 组及非 PCa 组各 42 例。其中 SE-EPI 扫描序列包括 8 次独立采集，b 值范围为 0~2000 s/mm²，TE 范围为 32~100 ms，使用内部软件绘制每位患者的 ROI。采用 Mann-Whitney U 检验和两样本 t 检验来分析基于 SE-EPI 序列的 T2 值（不同 b 值下）和 ADC 值（不同 TE 条件下）在 PCa 组和非 PCa 组之间的差异；不同 b 值下 CPMG 的 T2 值与 SE-EPI 的 T2 值的相关性由 Spearman’s rho 或 Pearson 分析方法来确定；采用 Bland-Altman 分析用于比较两种方法之间的一致性。计划采用 ROC 曲线分析两种序列方法在 PCa 侵袭性分级中的诊断效能，但有待于后续纳入更多的 PCa 病例。
结果 目前结论如下：基于 SE-EPI 方法和基于 CPMG 方法的两种测量结果具有较好的一致性。CPMG 的 T2 值与 SE-EPI 的 T2 值的平均相关性为中度正相关，其中相关性最好的 b 值是：非 PCa 组，b=100 s/mm²（r=0.603，P = 0.000）；PCa 组，b=0 和 100 s/mm²（r=0.513，P = 0.000；r=0.508，P = 0.000）。基于 SE-EPI 方法的 T2 值和 ADC 值（不同 TE 条件下）在 PCa 组和非 PCa 组间具有明显的统计学差异（P = 0.000）。
结论 基于 SE-EPI 的 T2 Mapping 序列对前列腺具有潜在的临床应用价值，具有替代传统的 CPMG 方法的潜能。

OR-098
膀胱癌多参数 MRI：基于 VI-RADS 评分评估膀胱癌肌层侵犯可能性的验证性研究

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目的 探讨 VI-RADS（Vesical Imaging-Reporting and Data System）评分在术前行多参数 MRI 检查的膀胱癌患者中，评估膀胱癌肌层侵犯的应用价值。材料与**方法** 回顾性分析 2011 年 11 月至 2018 年 8 月在我院行膀胱多参数 MR（T2 加权成像+扩散加权成像+动态增强成像）检查的 340 例膀胱癌患者，在 MRI 检查前均未行膀胱癌手术、放化疗或其他治疗措施。在多灶性肿瘤患者中选择负荷最大（如体积最大，或最有可能侵犯肌层）的肿瘤。由两位具有 10 年以上阅片经验的放射科医生根据 VI-RADS 评分系统对每一位患者的膀胱肿瘤进行了回顾性分析并评分，两位阅片者均不知肿瘤的病理。最后将每个肿瘤的 VI-RADS 评分与术后病理进行比较，并采用 Cochran-Armitage 检验分析 VI-RADS 评分系统对判断肿瘤侵犯肌层的诊断价值。**结果** 340 例患者(男性 296 例)中，年龄中位数为 64.0 岁，四分位数间距(IQR)为 57.0~87.0 岁。75.0%(255/340)的肿瘤被证实为肌层浸润性尿路上皮癌，25.0%(85/340)为非肌层浸润性尿路上皮癌。VI-RADS 评分及其组成序列与肿瘤的肌层浸润状态均具有相关性(p<0.001)。VI-RADS 评分对肌层侵犯的受试者工作特征曲线下面积

(AUC)为 0.94(95%可信区间[CI]：0.90，098)。VI-RADS≥3 对于诊断肌层侵犯的敏感性和特异性分别为 87.1%(95%CI：0.78，0.93)和 96.5%(95%CI：0.93，0.98)。**结论** VI-RADS 评分可有效确定膀胱癌逼尿肌侵犯的可能性，应用于肿瘤的术前评估。

OR-099

Ki67 在预测前列腺癌预后中的作用

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目的 探讨前列腺癌患者预后影响因素及 Ki67 在预后中的作用。 **方法** 收集 2008 年 1 月至 2014 年 12 月经宁夏医科大学总医院病理确诊为前列腺癌（PCa）的患者共计 141 例，并对所有患者的预后进行随访，选择 6 个(年龄、民族、PSA、Gleason 评分、临床分期、Ki67)可能影响前列腺癌患者预后的因素进行分析；采用 Kaplan-Meier 方法进行单因素分析，Cox 比例风险回归模型进行多因素分析，包含乘积项的 Cox 比例风险回归模型进行交互作用分析。 **结果** Kaplan-Meier 单因素分析显示 Ki67（ x^2=38.507，P<0.05）、临床分期（ x^2=59.486，P<0.05）、Gleason 评分（ x^2=9.062，$P<0.05$）是影响前列腺癌患者预后的主要因素；Cox 多因素分析显示 Ki67(RR=1.877, P<0.01)和临床分期（RR=1.924，P<0.01）属于影响前列腺癌患者预后的危险因素；交互作用分析显示 β>0，P<0.05；Ki67 与临床分期、Ki67 与 Gleason 评分存在协同作用。 **结论** Ki67 可作为前列腺癌患者预后的危险因素, Ki67 与临床分期、Ki67 与 Gleason 评分结合，可更好的评估前列腺癌患者预后。

OR-100

探讨 IVIM-DWI 参数值预测宫颈鳞癌 Ki-67 高低表达水平的价值

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目的 探讨 IVIM-DWI 各参数值预测宫颈鳞癌 Ki-67 高低表达水平的价值。
方法 回顾性分析我院 2016 年 1 月-2019 年 1 月经手术病理证实并行 IVIM-DWI 检查的宫颈鳞癌，入组 78 例，中位年龄为 50 岁。所有患者术前均行 MRI 检查，并行多 b 值（b=0，10，20，50，100，200，400，800，1000，2000 s/mm^2）DWI 扫描，通过 GE ADW 4.5 后处理工作站，利用双指数 IVIM 模型获得 IVIM-DWI 各参数值：ADC_{stand}、D、D^*及 f 值。按 Ki-67 表达水平将其分为低表达组(Ki-67＜50%)和高表达组(Ki-67≥50%)，比较两组间 IVIM 各定量参数值有无差异，并探究其预测 Ki-67 高低表达水平的价值。采用 SPSS 统计软件分析数据，采用独立样本 t 检验，探究两组间 IVIM-DWI 各参值数（ADC_{stand}、D、D^*、f）值与宫颈癌免疫组化指标中 Ki-67 高低表达水平之间是否具有统计学差异，对差异有统计学意义的参数值进行 ROC 曲线分析其诊断效能。
结果 两组中 D、D* 值组间差异具有统计学意义（ p＜0.05）及较高诊断效能（AUC＞0.5）。高表达组中 D、 D*值均低于低表达组（p=0.037、AUC=0.684；p=0.001、AUC=0.760 ）。高表达组中 f 值高于高表达组（p=0.011），但其诊断效能较低（AUC=0.232）。两组中 ADC_{stand}值的组间差异无统计学意义。
结论 IVIM-DWI 中 D、D*参数值对术前预测宫颈癌 Ki-67 表达水平具有一定的价值，有助于评估宫颈癌手术后复发风险和预后。

OR-101

3.0T 的体素内非相干运动扩散加权成像（IVIM-DWI）：评估糖尿病肾病早期肾功能的变化

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目的 本研究的目的是评估 IVIM-DWI 参数在鉴别早期糖尿病肾病（DN）中的效用。
方法 选择 14 例确诊为Ⅰ期 DN 的患者作为观察组，35 名健康志愿者作为对照组。在 3T 扫描仪（Skyra，Siemens Healthineers）上获得 IVIM（b = 0,50,100,150,200,400,600,800sec / mm 2）和扩散加权成像（DWI，b = 50,800sec / mm 2）序列。在上极，肾门和肾的下极的皮质和髓质区域中，每个受试者共绘制了 12 个感兴趣的区域。所有结果的平均值用于确保测量结果的一致性.ADC 执行 DWI 序列后，在 Siemens MRWP 工作站上自动生成映射。通过使用原型软件体扩散工具箱（Siemens healthineers）生成 IVIM 参数（ADC，D，f 和 D *值）。使用双样本 t 检验来比较观察组和对照组的两组皮质和髓质之间的 ADC，D，f 和 D *值的差异。 p 值小于 0.05 被认为对所有分析具有统计学意义。通过 ROC 曲线分析 ADC，D，f 和 D *值在早期 DN 诊断中的敏感性和特异性。
结果 在两组中，肾皮质的 ADC，D，f 和 D *值均高于髓质。与对照组相比，观察组肾皮质 ADC，D，F 和 D *值均降低，差异有统计学意义（p <0.05）。观察组肾皮质的 ADC，D，f 和 D *值均降低，但只有肾髓质的 D 值具有统计学意义（p <0.05）.ROC 分析后，D 值为肾皮质是区分健康志愿者和Ⅰ期 DN 的最佳参数，ROC 曲线下面积为 0.835，诊断敏感性和特异性分别为 74.3％和 92.9％。
结论 IVIM 可以为 DN 引起的肾脏损害提供有用的信息。肾皮质的 D 值可以作为区分健康志愿者和Ⅰ期 DN 的有用指标。
临床意义：IVIM 可为糖尿病患者的临床变化提供更科学的依据，反映微观结构的变化，对肾功能的评价具有潜在的应用价值。

OR-102

扩散峰度成像定量参数直方图分析鉴别子宫癌肉瘤与变性子宫肌瘤的价值

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目的 探讨扩散峰度成像（DKI）定量参数直方图分析鉴别子宫癌肉瘤（UCS）和变性子宫肌瘤（DH）的价值。**方法** 回顾性分析经手术病理证实的 11 例 UCS 和 22 例 DH 的患者资料。患者均行盆腔 DKI 扫描，经后处理获得 DKI 定量参数，包括平均弥散峰度（MK）、平均弥散系数（MD）、各向异性分数（FA），后采用 Omni-Kinetics 软件进行直方图分析，获得 DKI 各参数的中位数、平均值、标准差、偏度、峰度、25%位数、75%位数、能量、熵等直方图参数。采用独立样本 t 检验（正态分布）或 Mann-Whitney 秩和检验（偏态分布）比较 UCS 和 DH 的各直方图参数的差异，采用 ROC 评价有统计学差异的直方图参数对 UCS 和 DH 的鉴别效能。**结果** 两组间 MK（标准差、75%位数、熵）、MD（中位数、平均值、25%位数、75%位数）、FA（中位数、平均值、标准差、25%位数、75%位数、能量、熵）差异具有统计学意义（P 均<0.05），两组间 MK（中位数、平均值、偏度、峰度、25%位数、能量）、MD（标准差、偏度、峰度、能量、熵）、FA（偏度、峰度）差异无统计学

意义（*P*均>0.05），FA（中位数、75%位数）的 ROC 下面积最大（均为 0.921），FA（75%位数）的敏感度最高（100.0%），MK（标准差）的特异度最高（100.0%）。**结论** DKI 定量参数直方图分析有助于鉴别 UCS 与 DH。

OR-103
体素不相干运动多模型参数对子宫内膜癌术前风险评估的价值

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目的 探讨体素内不相干运动（Introvoxel Incoherent Motion，IVIM）多模型参数术前预测子宫内膜癌（endometrial carcinoma，EC）风险的意义。**方法** 回顾性分析 40 例行 1.5T MRI 检查（含 IVIM 序列），经手术病理证实为 EC 的影像资料。根据病理类型、病理分级、侵袭程度等因素，分为高风险组（18 例）和低风险组（22 例）。测量病灶的 IVIM 多模型参数值，包括单指数模型的 Standard ADC 值，双阶单指数模型的 D-mono、D*-mono、f-mono 值，双阶双指数模型的 D-Bi、D*-Bi、f-Bi 值，以及拉伸指数模型的 DDC、α 值。比较各参数值的差异，采用 *ROC* 曲线评估有统计学差异的参数对高、低风险组 EC 鉴别诊断的效能。**结果** 高风险组的 Standard ADC 值、D-mono 值、D-Bi 值及 DDC 值均小于低风险组，差异具有统计学意义（*P*<0.05）；两组间的 D*-mono 值、f-mono 值、D*-Bi 值、f-Bi 值及 α 值无统计学差异（*P*>0.05）。Standard ADC 值、D-mono 值、D-Bi 值及 DDC 值预估高风险组 EC 的曲线下面积（*AUC*）分别为 0.816、0.788、0.830、0.847，临界值分别为 $0.608\times10^{-3}mm^2/s$、$0.436\times10^{-3}mm^2/s$、$0.373\times10^{-3}mm^2/s$、$0.738\times10^{-3}mm^2/s$。**结论** IVIM 序列单指数模型的 Standard ADC 值、双阶单指数模型的 D-mono 值、双阶双指数模型的 D-Bi 值、拉伸指数模型的 DDC 值能够有效术前预测 EC 风险性，对临床手术方案选择及预后评估具有一定价值。

OR-104
前列腺癌患者根治术后发生早期尿失禁的盆底磁共振研究

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目的 利用磁共振检查观察前列腺癌术后发生早期尿失禁患者的盆底形态学特点，了解术前盆底结构差异对术后控尿情况的影响因素。
方法 回顾性分析 57 例 2017-2019 年在我院行腹腔镜前列腺癌根治术（RP）并完整随访的患者(年龄 65.71±7.53 岁)的术前盆腔磁共振资料。其中 32 例患者在 RP 术后 3 个月及以上仍出现尿失禁症状，作为尿失禁组；25 例患者在 RP 术后 3 月以内尿控恢复，作为尿控组。在患者术前盆腔 MRI 平扫上测量以下参数：膜性尿道长度(MUL)、膀胱颈口宽度（BN）、膀胱内前列腺突出长度（IPP）、耻骨直肠间距离（PRL）、膜性尿道角度(AMU)、耻骨直肠肌厚度(PRM)以及膀胱颈、球部尿道分别相对耻骨尾骨连线(PCL)和耻骨的距离，比较两组间各参数变化。
结果 尿失禁组 MUL8.50±2.34mm，尿控组 MUL12.75±4.40mm，两组间存在显著差异(p＜0.000)。BN、IPP、PRL、AMU、PRM、膀胱颈、球部尿道分别相对耻骨尾骨连线(PCL)和耻骨的距离，两组间均无显著差异(p=0.156、p=0.176、p=0.158、p=0.435、p=0.062、p=0.771、p=0.924、p=0.792、p=0.500)。

结论 术前膜性尿道长度较长的患者在前列腺癌根治术后尿控恢复更快，术中最大限度的保留膜性尿道长度对患者术后早期尿控功能的恢复可能有帮助。盆底磁共振检查可以清晰的观察到这些结构变化，为临床完善手术方式，并改善术后控尿症状提供客观依据。

OR-105
磁共振 DKI、DWI 及 DCE 成像在宫颈癌诊断中的价值分析

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目的 利用磁共振功能成像 DKI、DWI 与 DCE-MRI 研究宫颈癌与正常子宫壁组的影像表现及对比研究三种磁共振成像技术对宫颈癌术前诊断的准确性；同时比较 DKI 成像参数在宫颈癌与子宫肌瘤组的诊断价值。**方法** 收集确诊宫颈癌的病人 37 例，子宫肌瘤 15 例。选取宫颈癌患者的正常子宫壁参数作为正常子宫壁组。利用西门子 3.0T 超导型磁共振成像扫描仪，于 DCE-MRI 之前做 DKI 及 DWI 扫描。将 DKI 原始图像通过 DKE 软件处理后，测得 DKI 定量参数 MK 等；DCE-MRI 原始图像传输到灌注评估专业软件，利用 Tofts 血流动力学模型处理分析肿瘤感兴趣区，计算定量参数：Ktrans、Ve 和 Kep；测得 DWI 参数 ADC 的值。分别测三次，取其平均值。两组间比较利用独立样本 T 检验；利用 ROC 曲线评价三种成像参数对宫颈癌的诊断价值，采用曲线下面积分析 ADC、MK、Ktrans 值对宫颈癌的诊断效能。同时，测得子宫肌瘤组的 DKI 参数，对比其与宫颈癌组的差异。**结果** 宫颈癌组与正常子宫壁组的 K//、MK 值差异有统计学意义；D//、MD、D⊥在两者之间没有明显统计学差异，(P>0.05)；宫颈癌脉管阳性组与脉管癌栓阴性组的 MK 值分别为 0.84±0.09、0.95±0.16，有统计学差异(P<0.05)；正常子宫壁组与宫颈癌组 MK、Ktrans、ADC 值有明显统计学差异(P<0.01)。ADC、Ktrans 和 MK 评价宫颈癌的曲线下面积分别为：0.72、0.75、0.82。统计得到宫颈癌组与子宫肌瘤组的 DKI 参数 K//、MK 与 K⊥有明显统计学差异。**结论** DKI 成像可反映宫颈癌组织微环境的复杂程度，在诊断宫颈癌中优于 DCE-MRI 及 DWI 技术；MK 可以预判宫颈癌的病理特征，如脉管内是否有癌栓浸润。DKI 参数在宫颈癌的诊断中有重要的意义，其中 MK 等参数可用于鉴别诊断宫颈癌与子宫肌瘤。

OR-106
体素内不相干运动成像对宫颈鳞癌的评估：与病理对照研究

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目的 探索体素内不相关运动成像（IVIM）对宫颈鳞癌的评估价值。
材料和**方法** 经病理证实并未接受任何治疗的 42 例宫颈鳞癌患者，接受 IVIM 成像。运用双指数模型计算出不同临床分期、病理分级及不同淋巴结状态组的扩散系 D 值、灌注系数 D*值和灌注分数 f 值。运用独立样本 t 检验进行比较分析，并运用 ROC 曲线分析以上指标的诊断能力。
结果 低分化组的 D 值和 f 值低于中高分化组，差异有统计学意义（p 值分比为＜0.001 和 0.008），而 D*值无显著性差别（*P*=0.201），D 值和 f 值的曲线下面积分别为 0.830、0.712。淋巴结转移组的 D 值低于无转移组（*P*=0.007），而 D*和 f 值无显著差异，D 值的 ROC 曲线下面积为 0.851,。不同临床分期之间的 D 值、D*值和 f 值均没有统计学差异。
讨论：IVIM 对宫颈鳞癌不同病理分级和淋巴结转移状态有良好的鉴别诊断能力。

OR-107

3.0T MRI 结合血清标记物对卵巢肿瘤的定性诊断价值

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摘要： 目的 回顾性分析 3.0T MR 多序列扫描并结合血清标记物对卵巢肿瘤的定性诊断价值。**材料与方法** 经手术病理证实的 106 例，共 135 个卵巢肿瘤，采用 3.0T MRI 成像系统进行 FSE T_1WI、脂肪抑制 T_2WI；LAVA 动态增强扫描，DWI(b=0,800s/mm^2）成像。术前所有患者均行血清 CA125，AFP，β-hCG 检查。由两名医师独立分析图像，MR 影像分析评判标准为：卵巢肿块的大小，单房或多房改变，肿块中囊性或实性成分在 T_1WI、T_2WI、DWI 上的信号强度，实性成分增强后在 LAVA 上的强化曲线，实性成分的 ADC 值；盆腹膜播撒，淋巴结肿大，腹水症。并结合术前血清标记物的升高与否综合判断肿瘤的良恶性与病理分型。**结果** 135 个卵巢复杂肿瘤中，良性肿瘤 43 个，恶性或交界性肿瘤共 92 个。其中上皮性肿瘤 73 个，占比 54.1%，性索间质肿瘤 28 个，占比 20.7%，生殖细胞瘤 31 个，占比 23.0%，其它肿瘤 3 个，占比 2.22%。MRI 多序列诊断卵巢肿瘤良恶性的准确性、敏感性、特异性、阳性预测值、阴性预测值分别为 82.5%、85.3%、78.3%、85.3%、78.3%；对各组卵巢肿瘤的 ADC 值及血清 CA125 值进行均数统计，ADC 值判断肿瘤的良恶性区间值为 1.358± 0.279×10^{-3} mm^2/S vs 0.848 ± 0.286×10^{-3} mm^2/S, P < 0.001)。血清 CA125 升高患者（52-5000IU/ml）45 例占比 42.5%，判定卵巢浆液性腺癌的准确性为 85.4%（35/41），AFP 升高 2 例患者均为卵黄囊瘤， 1 例绒癌患者β-hCG 升高。**结论** MRI 多序列对卵巢肿瘤良恶性的鉴别有较高价值，ADC 值下降及血清标记物 CA125 升高可以提高卵巢恶性肿瘤的诊断准确率，AFP、β-hCG 升高对卵巢恶性生殖细胞肿瘤具有特异性价值，可为临床选择治疗方案提供可靠的信息。

OR-108

CT 增强全容积纹理分析方法 在鉴别肾脏嫌色细胞癌与嗜酸细胞腺瘤的应用价值

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目的 探索 CT 增强全容积纹理分析方法在鉴别肾脏嫌色细胞癌与嗜酸细胞腺瘤的应用价值。
方法 回顾性分析我院经病理证实的 25 例肾脏嫌色细胞癌（平均年龄 48 岁）及 16 例肾脏嗜酸细胞腺瘤（平均年龄 52 岁）CT 增强影像学资料，选取静脉期图像，手动逐层划取全肿瘤图像，避开钙化、出血、坏死及肾周脂肪，对比其纹理分析的参数特征（包括最大值、最小值、方差、均值、不均质性、偏度、峰度、熵等）。
结果 肾脏嫌色细胞癌组最小值（993.32±41.95）、均值（1115.32±36.02）、熵（3.81±0.12）低于肾脏嗜酸细胞腺瘤组（1023.94±44.51，1164.12±48.22，3.93±0.15），肾脏嫌色细胞癌组偏度（-0.05±0.22）高于肾脏嗜酸细胞腺瘤（-0.30±0.33），差异具有统计学意义（p＜0.05）；最小值、均值、偏度及熵对于鉴别肾脏嫌色细胞癌与肾脏嗜酸细胞腺瘤的 ROC 曲线下面积分别为 0.70、0.80、0.74、072。
结论 CT 增强全容积纹理分析方法有助于鉴别肾脏嫌色细胞癌与嗜酸细胞腺瘤，为临床诊疗方案的制定提供可靠依据。

OR-109

睾丸肿瘤及肿瘤样病变 69 例 CT 及 MR 表现

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摘要:目的 提高对睾丸肿瘤 CT 或 MRI 影像特征的认识及鉴别诊断的准确性。方法回顾性分析我院及外院 2015 年 6 月至 2019 年 6 月 20 日 PACS 系统上所有表现为睾丸肿物的腹部 CT 或 MRI 影像资料，排除无明确病理诊断及术前影像资料的患者。收集其临床资料（包括临床症状及肿瘤指标等），统计相关临床信息及病理结果，将睾丸肿物的病理诊断类型、肿瘤标志物、临床症状与影像特征进行对照分析。同时对我院及收集的其它医院的有病理结果的睾丸肿物病例的影像资料及病理类型进行对比分析。 结果 共收集睾丸肿物 69 例，其中睾丸肿瘤 57 例，睾丸肿瘤样病变 12 例（9 例附睾炎、2 例结核、1 例皮样囊肿）。睾丸肿瘤包括精原细胞瘤 32 例、混合型生殖细胞瘤 12 例、淋巴瘤 5 例、畸胎瘤 3 例、胚胎性癌 1 例、内胚窦瘤 1 例、间质瘤 1 例、平滑肌瘤 1 例、多形性未分化肉瘤 1 例。其中精原细胞瘤患者年龄范围为 18～60 岁，平均 34.4 岁；混合型生殖细胞瘤患者年龄范围为 18～63 岁，平均 35.7 岁；淋巴瘤患者年龄范围为 45～90 岁，平均 68.6 岁。该组病例中精原细胞瘤等生殖细胞肿瘤 20～40 岁高发，淋巴瘤、平滑肌瘤、间质瘤等非生殖细胞瘤常见于 40 岁以上患者。患者多因睾丸无痛性肿大就诊。精原细胞瘤影像表现多样，可表变为轻中度强化均匀实性肿块、也可出现不同程度坏死、囊变、纤维化改变。影像检查可以帮助与其它肿瘤或肿瘤样病变鉴别。结论 睾丸肿瘤病理类型多样且具有明显的年龄分布及标志物特征，结合患者影像资料及临床起病症状、肿瘤指标有助于睾丸肿瘤及肿瘤样病变的鉴别诊断。

OR-110

泌尿系结石成分双源双能 CT 分析及其安全性评估

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目的:探讨双源计算机断层扫描（dual source computed tomography,DSCT）双能量在泌尿系结石体内外成分分析中的可行性及安全性。
方法 将收集的 684 例泌尿系体外结石标本均行 CT 常规单能量成像、DSCT 双能量成像和红外线光谱结石成分分析，所有标本先行双源 CT 双能量成像，双能薄层影像经 MMWP 工作站中 kidneystone 选项卡处理结果作为实验组，红外线光谱分析结果作为对照组，比较分析 DSCT 双能成像在结石成分分析中的灵敏度、特异度及准确度。对比 CT 单能量常规成像与 DSCT 双能成像的容积 CT 剂量指数 (CT dose index volume，CTDvol*mGy)、剂量长度乘积 (Dose length product，DLP)和有效辐射剂量(Effective dose，ED)评估 DSCT 扫描的安全性。
结果 相同成分结石的 CT 值在散点图中分布的位置相对集中，草酸钙结石密集分布于散点图的右上方，尿酸结石主要集中分布于散点图的左下方；双源 CT 双能结石成分分析分析准确率为 94.74%（648/684）。DSCT 双能成像对泌尿系结石成分分析具有较高的灵敏度、特异度和准确度，双源 CT 双能成像结石成分分析与红外线光谱结石成分分析的准确性二者无统计学差异（c2=2.008，P=0.734）。不同成分结石双能量扫描(80kV 与 140kV)CT 值差值及 DEI 存在统计学差异（P<0.05）。DSCT 双能在体成像能全面评估结石成分，不同成分泌尿系结石 DSCT 双能量扫描体内外成分差异存在统计学意义（c2=10.252，P=0.036），双能量扫描较单能量常规扫描有效辐射剂量更小（t=40.658,P<0.001）。

结论 依据不同的 CT 值、DEI 值，双源双能 CT 能对不同成分的泌尿系结石进行在体分析，与红外线光谱结石成分分析比较，有较高的灵敏度、特异度和准确度，且辐射剂量较小。

OR-111
时间-空间反转标记脉冲序列在原发性高血压患者肾皮髓质分离中最佳黑血反转时间的优化

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目的 探讨磁共振时间-空间双重标记反转脉冲（Time-SLIP）序列在原发性高血压（EH）患者肾脏皮质和髓质分离中的初步应用及肾脏皮髓质分离时的最佳黑血反转时间（BBTI）值。**方法** 从 2017 年 4 月-2018 年 11 月，招募经我院体检健康的成年志愿者和确诊原发性高血压病 5 年以上的患者，共 65 人。分为健康成人正常对照组（C 组）、患原发性高血压但肾功能损害组（B1 组）和原发性高血压引起肾功能衰竭组（B2 组）。C 组共 31 人、62 个肾脏，志愿者在我院近期体检健康且无肾脏疾病病史及超声检查肾脏无器质性病变者；B1 组共 23 人、46 个肾脏，患原发性高血压但肾功能损害且服降压药血压控制良好的患者；B2 组共 11 人、22 个肾脏，患原发性高血压且肾功能衰竭的患者；三组受检者再逐个行 MRI T2WI 扫描；然后在 T2WI 冠状位及横断位行定位相，以肾门为定位标准，分别采用 5 组 BBTI 值（分别为：800ms、1000ms、1200ms、1400ms、1600ms）行 Time-SLIP 序列扫描，将图像传到传到 Toshiba Vantage Elan 后处理工作站进行数据测量，记录左肾和右肾的长度、宽度、皮质厚度、皮质和髓质信号强度，结合肾皮髓质信号强度（SI）计算出皮髓质对比度，从而得出肾脏皮髓质分离最佳的黑血翻转时间（BBTI 值）。**结果** 1.肾皮髓质最佳 BBTI 值：C 组和 B1 组随年龄段的增加 BBTI 值呈增长趋势；C 组和 B1 组比较，B1 组的最佳 BBTI 值更高。2.肾皮质厚度：C 组和 B1 组中年龄段最小的比年龄段大的肾皮质更厚；B1 组中高血压 1 级比高血压 2/3 级的肾皮质更厚。3.肾皮髓质分离清晰度：C 组中年龄段的增长与肾皮髓质分离清晰度呈线性关联。**结论** 一定的 BBTI 值时,Time-SLIP 技术可分别获得正常成人、原发性高血压肾功能损害的皮髓质分离图像，原发性高血压肾功能衰竭组肾功能无最佳 BBTI。

OR-112
Can Lémann Index Predict Penetrating Lesions or Surgery in Patients with Strictured Crohn's Disease?

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Purpose: To evaluate the prognosis of patients with strictured Crohn’s disease (CD) by using Lémann Index (LI) and verify whether LI and its related indices could predict penetrating lesions and surgery in CD patients with stricturing lesions.
Methods and Materials: This retrospective cohort study was performed at a single tertiary hospital. From 2007 to 2018, patients diagnosed with CD and classified as Montreal Behavior type 2 who were conducted at least 2 computed tomography enterography (CTE) or magnetic resonance enterography (MRE) with at least 3 months interval were recruited before surgery. LI_1(LI at first imaging examination), LI_2(LI at last imaging examination before surgery), LI changes between two imaging examinations

($\Delta LI = LI_2 - LI_1$) and its rate of change [ΔLI/time interval(dt)] were calculated combining imaging and endoscopy. Wilcoxon signed ranks test was applied to test difference between LI_1 and LI_2. Fisher's exact test, log-rank test, univariate Cox regression analysis and Kaplan-Meier survival curve were used for testing correlation between LI various indices and penetrating lesions as well as surgery.
Results: 92 CD patients with stricturing lesions were included in this study. The medians for LI_1 and LI_2 were 5.605 and 8.543, respectively. There were 58 cases of $\Delta LI > 0$, 18 cases of $\Delta LI < 0$ and 16 cases of $\Delta LI = 0$, accounting for 63.1%, 19.6% and 17.4% respectively. The statistical difference was significant in $LI_2 > LI_1$ with $P<0.001$. Correlations between LI_2 and incidence of penetrating lesion($P=0.029$) as well as surgery($P=0.043$) and Correlations between $\Delta LI > 0$ and penetrating lesion incidence($P=0.036$) as well as its occurrence time(hazard ratio [HR] 3.008; 95% CI, 1.015-8.921; $P=0.037$) were found. The Kaplan-Meier survival curves of $\Delta LI > 0$ and $\Delta LI \leqslant 0$ for the occurrence time of penetrating lesions and surgery were shown in Figure 1 and 2. However, there was no correlation between LI parameters (LI_1, ΔLI, $\Delta LI > 0$, ΔLI/dt) and surgery incidence as well as its occurrence time, respectively.
Conclusion: $\Delta LI > 0$ indicating the progression of bowel damage might not predict surgery but could prognose disease progression such as occurrence of penetrating lesions in patients with strictured CD.

OR-113

Detection of gastrointestinal venous malformations: comparison of MR imaging and CT enterography in patients with Blue rubber bleb nevus syndrome

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Objective Blue rubber bleb nevus syndrome (BRBNS) is a rare entity that consists of multiple venous malformations involving several organs, particularly the skin and the gastrointestinal tract. The objective of our study was to assess the utility of MR imaging (MRI) using negative oral contrast agents compared with peroral CT enterography (CTE) for the detection of bowel venous malformations in patients with BRBNS.
Methods Our study enrolled 11 patients (mean age, 20.5 years) with BRBNS. They underwent MR imaging using ferric ammonium citrate as negative oral contrast agent and peroral CTE. Datasets were reviewed independently by 2 radiologists on axial and coronal views. Inter-observer agreement for MRI and CTE was calculated. Patient comfort, convenience and test preference were assessed.
Results All venous malformations showed markedly high signal intensity on fat-suppressed T2-weighted MR images, ranging in size from 3 to 38mm. CTE demonstrated multiple contrast-enhanced polypoid bowel lesions, ranging in size from 6 to 35mm. Some lesions contained millimetric calcifications representing phleboliths. Concordance between MRI and CTE was 68.4% for lesions <10mm, 91% for lesions >10mm. However, in 3 patients, large venous malformations (>10mm) detected on MRI were not detected on CTE. Interobserver agreement was high for MRI but only fair for CTE

(k=0.83 and 0.62, respectively). Patients rated MR imaging as more comfortable than CTE. There was no significant difference between the techniques with regard to patient convenience or preference.

Conclusion MR imaging using negative oral contrast agents was useful to demonstrate the extent of bowel lesions of BRBNS. MR imaging may be less prone to missing small venous malformations and may be more reproducible in lesion detection. MR imaging using negative oral contrast agents outperformed CTE.

OR-114

CT Radiomics Nomogram for the Preoperative Prediction of Lymph Node Metastasis in Gastric Cancer

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Purpose: *To investigate the role of computed tomography (CT) radiomics for the preoperative prediction of lymph node (LN) metastasis in gastric cancer.*
Materials and methods: *This retrospective study included 247 consecutive patients (training cohort: 197 patients; test cohort: 50 patients) with surgically proven gastric cancer. A dedicated radiomics prototype software was used to segment lesions on preoperative arterial phase (AP) CT images and extract features. A radiomics model was constructed to predict the LN metastasis by using a random forest (RF) algorithm. Finally, a nomogram was built incorporating the radiomics scores and selected clinical predictors. Receiver operating characteristic (ROC) curves were used to validate the capability of the radiomics model and nomogram on both the training and test cohorts.*
Results: *The radiomics model showed a favorable discriminatory ability in the training cohort with an area under the curve (AUC) of 0.844 (95% CI: 0.759 to 0.909), which was confirmed in the test cohort with an AUC of 0.837 (95% CI: 0.705 to 0.926). The nomogram consisted of radiomics scores and the CT-reported LN status showed excellent discrimination in the training and test cohorts with AUCs of 0.886 (95% CI: 0.808 to 0.941) and 0.881 (95% CI: 0.759 to 0.956), respectively.*
Conclusions: *The CT-based radiomics nomogram holds promise for use as a noninvasive tool in the individual prediction of LN metastasis in gastric cancer.*

OR-115

The value of b-value threshold map in the evaluation of rectal adenocarcinoma

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Purpose

To investigate the value of the b-value threshold ($b_{Threshold}$) in the evaluation of rectal cancer by comparing it with diffusion-weighted images and ADC maps regarding lesion detection and the prediction of pathological features.

Materials and Methods

Thirty-five patients with rectal tumours were enrolled and underwent cross-sectional DWI using a 3-Tesla MRI system. The contrast-to-noise ratio (CNR) between the lesions and normal tissues was assessed on diffusion weighted images and $b_{Threshold}$ maps. Reproducibility for ADC and $b_{Threshold}$ values were assessed using intraclass coefficients, coefficients of variability and Bland-Altman plots. Significant differences between different groups for pathological prognostic factors, including the pathologic differentiation, T stage, N stage, cancer nodule, nerve invasion, CEA and CA199, were evaluated using independent sample t-tests. The diagnostic performance of ADC and $b_{Threshold}$ values for those factors were assessed using the receiver operating characteristic (ROC) curves.

Results

The interobserver reproducibility was excellent for the ADC and $b_{Threshold}$ values measured by the two observers, and the intra-class coefficients were 0.985 and 0.922, respectively. The CNR between lesions and normal tissues on $b_{Threshold}$ maps was significantly higher than that on diffusion-weighted images ($p < 0.05$). There were significant differences in the ADC and $b_{Threshold}$ values between different pathologic differentiation degrees and T stages ($p < 0.05$); moreover, a significant difference was observed in the $b_{Threshold}$ values between the different N stage groups ($p = 0.012$). No significant differences were observed between the ROC curves of ADC and the $b_{Threshold}$ values of rectal lesions for pathologic differentiation and T stage. However, $b_{Threshold}$ values showed good diagnostic performance for N stage.

Conclusion

$b_{Threshold}$ values could differentiate between pathologic differentiation degrees and T stages, and have a good diagnostic performance for N stage, with improved detection capability for rectal adenocarcinoma.

OR-116

The Value of Pre-/post-treatment MRI and Clinicopathological Characteristics in Predicting Survival in Locally Advanced Rectal Cancer Patients Treated with Neo-adjuvant Chemoradiotherapy

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Purpose: The aim of this study was to investigate the value of pre-/post-treatment MRI and clinicopathologic characteristics in predicting 3-year disease-free survival (DFS)

in patients with locally advanced rectal cancer (LARC) treated with neo-adjuvant chemoradiotherapy (nCRT).
Material and Method: Pre- and post-nCRT MRI and clinicopathologic characteristics were evaluated in this retrospective study. 3-year DFS was estimated using Kaplan-Meier product-limit method. The Cox proportional hazards modeling were constructed and used to determine associations between MRI or clinicopathologic variabilities and survival outcomes.
Results: 171 patients (112 males and 59 females, with a median age of 55 years; age range, 27-82 years) with LARC treated with nCRT were enrolled. With a median follow-up of 47.6 months, overall DFS in the cohort was 76.6%, 74.5% and 73.7% in 36, 48 and 60 months, respectively. During follow-up, 28 patients died, 41 patients experienced relapse (37 distant, 3 local and 1 both), and 108 patients did not experience any end point event. mrEMVI positivity was the significantly independent adverse factor of long term survival with HR was 2.589 (95% CI 1.398-4.794, P=0.002) on multivariate analysis. The 3-year DFS in patients with positive mrEMVI compared with negative were 52.6 months vs 65.1 months (P= 0.003), respectively. Post-nCRT MRI evaluated tumor regression partial response (ypmrPR) patients showed worse DFS compared to those with complete response (ypmrCR) (HR=4.914, 95% CI 1.176-20.533, P=0.029). The 3-year DFS of ypmrCR and ypmrPR were 74.3 months and 58.9 months, respectively.
Conclusion: In conclusion, mrEMVI positivity was the independent adverse prognosis indicator for 3-year DFS. And ypmrTRG may also as a biomarker for predicting prognosis of LARC patients.

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Correlation of pathological T and N staging with tumor deposits in colon cancer

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Abstract **Purpose** To investigate the association between pathological TN staging and tumor deposits in colon cancer. **Methods** Pathological data of 257 colon cancer cases from 2017 to 2018 was retrospectively analyzed. According to the 8th edition of the American Joint Committee on Cancer (AJCC) staging manual, all patients were devided into T_2, T_3 and T_4 three groups, N_0, $N_+(N_1+N_2)$ two groups, tumor deposits positive and negative group. Comparison among groups were analyzed by chi-suqare test. **Results** Of which, 2 cases (5.6%) with tumor deposits positive in T_2 group, 30 cases (14.6%) in T_3 group, 10 cases (66.7%) in T_4 group. Chi-suqare test showed that tumor deposits during three groups were statistically different (c^2 was 31.327, $P<0.05$ respectively). Pairwise comparison showed that the incidence of tumor deposits in T_2 and T_3 groups was

lower than those of the T_4 group, the difference with statistical significance(c^2 was 21.976, 25.606, respectively and P＜0.016, P＜0.016 respectively). Nevertheless, there was no significant difference between T_2 and T_3 groups (P=0.141). In the N staging, 7 cases(4.2%) with tumor deposits in N_0 group, 21 cases(22.8%) in N_1 group, 14 cases(15.2%) in N_2 group. Chi-suqare test showed significant different between N_0 and N_+ groups(c^2 was 49.360, P＜0.001 respectively). Subgroup analysis was carried by N_+ group, the difference between N_1 and N_2 groups was not statistically significant(c^2 was 3.091, P=0.079). **Conclusions** pathological T and N staging are associated with tumor deposits in colon cancer. T_4 and N_+ staging colon cancer patients have the higher risk of tumor deposits than other stages, more attention should be paied to the groups.

OR-118

Rectal gastrointestinal stromal tumors Treated with Imatinib Mesylate: Quantitative tumor T2-Wegihted Imaging in the Evaluation of Therapy Response in Patients

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Purpose: Quantitatively analyze Rectal gastrointestinal stromal tumors before and after treating by Imatinib Mesylate via 3D-volume on MRI T2-wegihted Imaging,discuss the effect on Rectal gastrointestinal stromal tumors via Imatinib Mesylate treatment

Materials and Methods: 16 patients with Rectal gastrointestinal stromal tumors in our center were included.T2-weigihted MRI was performed in all the patients before and after Imatinib Mesylate treatment,and measured the 3D-volume and LD(longest diameter)of the 20 lesions.The baseline and post-therapy percentage changes(△%) of 3D-volume and LD(longest diameter) were compared using ROC curves.Finally,good-response group and poor-response group was differentiated between those parameters and pathology which was regarded as gold standard.

Results: There were 14 lesions in good-response group and 6 leisons in poor-response group. After Imatinib Mesylate treatment to rectal GISTs,3D-volume and LD(longest diameter) percentage changes(△%) were significantly different between good-response group and poor-response group.3D-volume（%△mm^3）:68.96% VS 12.34%,F=27.953,p<0.001;LD（%△mm）32.32% VS 17.75%,F=6.137,p=0.023).The AUCs on ROC for %Δ3D-volume,%ΔLD after therapy were 0.964 and 0.869, respectively, for response differentiation.When %△mm^3 ≥45.34 was used to predict good-response,the PPV was 93.33%.

Conclusion: Quantitatively analyze by 3D-volume percentage changes after targeted therapy to predict good-response of rectal GIST was significant ,which was better than LD(longest diameter) percentage changes.

OR-119
建立回结肠克罗恩病活动度评估的 CTE 评分系统（CTEs）

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目的 建立一套客观的、操作性强的 CTE 评分系统，用以评估克罗恩病的活动度。
方法 本研究回顾性纳入了从 2015 年 3 月至 2018 年 5 月在我院治疗的 49 名根据 Lennard-Jones 标准确诊的克罗恩病患者。所有患者在 24 小时内完成了 CTE 检查及回结肠镜检查，完善 Harvey - Bradshaw 评分和 CRP 水平。研究中评估末端回肠、升结肠、横结肠、降结肠、乙状结肠和直肠 6 个节段，对每个节段及总体肠道情况进行相应评分。内镜评分依据克罗恩内镜严重度指数（CDEIS），参数包括：是否存在溃疡、溃疡或病变范围的比例及有无狭窄。CTE 评分的参数包括：肠壁强化程度、肠壁增厚程度、溃疡、假息肉、肠壁靶征强化、肠壁脂肪沉积、假憩室形成、肠腔狭窄、木梳征、爬行脂肪、肠系膜脂肪渗出。采用二元 Logistic 回归来分析判断疾病活动度和发生溃疡、采用 Tobit 回归模型分析判断肠壁 CEDIS 的独立预测因子。运用 ROC 曲线评估 CTE 评分预测疾病活动度和严重程度的准确性，并对 CDEIS、HBI、CRP 和 CTEs 进行 Spearman 秩相关分析。
结果 本研究共纳入 49 名患者，中位 HBI 为 5，中位 CRP 水平为 18.2mg/l。共评估了 279 段肠道，内镜检查发现 106 个肠道节段正常，62 个轻度病变，111 个严重病变。CTE 发现病变肠道节段数分别为溃疡 92、假息肉 37、肠壁靶征强化 128、肠壁脂肪沉积 10、假憩室 7、狭窄 2、木梳征 37、爬行脂肪 65、肠系膜脂肪渗出 16。其中肠壁厚度和靶征强化可作为 CD 活动及是否发生溃疡的独立预测因子，肠壁厚度、靶征强化和木梳征为 CDEIS 的独立预测因子（$P<0.005$）。CTE 评分与 CDEIS 高度相关（$r = 0.81$，$p=0.001$），CTE 评分对发现 CD 活动及溃疡的 ROC 曲线下面积分别为 0.857 和 0.901。
结论 CTE 评分系统对评估克罗恩病的活动度敏感且特异，将来有潜力广泛用于临床。

OR-120
MR 影像组学对直肠癌 KRAS 基因突变的预测价值

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目的 探索 MR 影像组学（radiomics）预测直肠癌患者 KRAS 基因突变的价值。
材料和方法 收集经手术和病理证实、术前行高分辨率 MR 成像、术前无放化疗的 87 例直肠癌患者，将患者按 7:3 比例随机分为训练组（60 例）和验证组（27 例）。采用 ITK-SNAP 勾画病灶感兴趣区（VOI），采用 A.K 软件提取病灶内直方图、形态及纹理特征等放射组学特征。采用独立样本 T 检验、Kruskal-Wallis 检验、Pearson 相关分析进行特征降维。采用多因素回归分析对筛选的影像组学特征参数以及相关的临床-影像特征建立最优模型，用于预测直肠癌患者 KRAS 基因突变。采用受试者工作特征曲线（ROC）、曲线下面积（AUC）以及决策曲线分析评估模型的价值。
结果 通过后处理软件提取病灶内部 385 个影像组学特征参数，经过特征降维后 6 个特征参数纳入研究，联合 2 个临床-影像特征参数，建立 KRAS 基因突变的预测模型。采用临床-影像特征参数预测淋巴结转移的诊断效能中等（训练组为 77.0%，验证组为 67.0%），联合 MR 影像组学参数后，训练组和验证组的诊断效能可分别提高至 86.0%、83.0%。经决策曲线分析后，联合 MR 影像组学参数后的预测模型亦优于仅采用临床-影像特征参数建立的模型。
结论 MR 影像组学有助于预测直肠癌 KRAS 基因突变，有助于患者术前治疗方案的选择。

OR-121
腹腔干肠系膜上动脉共干多层螺旋 CT 成像：新的解剖定义和胚胎发育机制

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目的 分析腹腔干肠系膜上动脉共干解剖变异的多层螺旋 CT 血管成像的征像，提出新的解剖定义和分类，并探讨各种类型解剖变异的胚胎发育机制。
方法 回顾性分析 5580 例腹部多层螺旋 CT 血管影像，腹腔干肠系膜上动脉共干被定义为腹主动脉发出单一共干，单一的共干发出肠系膜上动脉和腹腔干，腹腔干发出的分支至少包括胃左动脉、脾动脉、肝总动脉三支中的两支。按照新的解剖定义对腹腔干肠系膜上动脉共干解剖变异进行分型。
结果 5580 例腹部多层螺旋 CT 血管成像中，171（3.06%）例被发现存在腹腔干肠系膜上动脉共干的解剖变异。按照新的解剖定义分为 5 型。其中 I 型、II 型、III 型、IV 型和 V 型分别为 96 例(56.14%)、57 例(33.33%)、4 例(2.34%)、3 例(1.75%)和 8 例(4.68%)。按照共干的长短分为长型和短型，分别为 106 例（61.99%）和 65 例（38.01%）。171 例腹腔干肠系膜上动脉共干解剖变异按照胃左动脉起源变异对其进一步分为 a、b、c、d 四种类型，其中 3 例无法识别胃左动脉起源被排除在外。其中 a 型为 92 例（53.80%），b 型为 57 例(33.33%)，c 型为 11 例(6.43%)和 d 型为 8 例(4.68%)。
结论 基于腹部多层螺旋 CT 血管成像的征像，按照新的解剖定义及分类系统阐述了腹腔干肠系膜上动脉共干解剖变异的类型。错位中段、不完全中段、永存纵向吻合是各种类型腹腔干肠系膜上动脉共干解剖变异的胚胎发育机制。

OR-122
基于 CT 影像组学精准预测可切除性食管鳞癌无病生存期的研究

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研究目的
探讨 CT 影像组学在预测可切除性食管鳞癌无病生存期（Disease-Free Survival，DFS）的潜在价值，为临床医师术前筛选出复发高风险人群提供佐证，从而辅助临床医师制定个体化的治疗方案。
材料与方法
回顾性收集食管鳞癌患者 124 例，其中训练样本 83 例，验证样本 41 例。使用开源软件 3D-Slicer 手动分割肿瘤体积，基于 Python 3.6.2 软件中的 PyRadiomics 工具箱提取影像组学特征，每位病人共提取特征 1576 个。基于训练样本，通过 Lasso-cox 算法筛选出关键影像组学特征，用于构建影像组学分类器，并比较影像组学分类器与第 8 版 TNM 分期的预测效能。在验证样本中对分类器的效能进行验证。所有的统计分析均使用 R 语言实现，P＜0.05 被认为有统计学意义。
结果
由 6 个关键特征建立的影像组学分类器是预测 DFS 独立的风险因子（HR=2.854，p=0.004）。影像组学分类器在预测 DFS 方面表现出较高的辨别效能，在训练集和验证集中的 C-index 分别为 0.822 和 0.795。尽管在两个数据集中影像组学分类器的 C-index 高于病理分期，但差异无统计学意义（p 均大于 0.05）。
结论

影像组学分类器能在术前获取与病理分期无统计学差异的辨别度，能为病人术前危险分层及个体化治疗方案的制定提供辅助信息。

OR-123
3.0T MRI 体素内不相干运动扩散加权成像对直肠腺癌壁外血管侵犯的评估

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目的 探讨体素内不相干运动扩散加权成像（IVIM-DWI）对直肠腺癌壁外血管侵犯（EMVI）的评估价值。
方法 回顾性收集直肠腺癌患者 45 例，直肠癌 EMVI 阳性患者 21 例、EMVI 阴性患者 24 例，术前均接受 IVIM-DWI 扫描。 应用 GE ADW 4.5 工作站分别测量病灶的标准扩散系数（ADC_{stand}）、单纯水分子扩散系数（ADC_{slow}）、灌注相关的扩散系数（ADC_{fast}）和灌注分数（f）。采用统计学分析软件 SPSS 23.0 对上述参数值分别进行两两比较统计学分析；采用 ROC 曲线确定诊断阈值，评估上述参数对直肠腺癌 EMVI 诊断效能。
结果 直肠腺癌 EMVI 阳性组 ADC_{slow}、 ADC_{fast} 值参数分别是（0.69±0.21）×$10^{-3}mm^2/s$、14.10（10.70，19.70）×$10^{-3}mm^2/s$，高于阴性组 ADC_{slow}、 ADC_{fast} 值参数（0.58±0.08）×10^{-3}mm2/s、6.30（3.56，6.36）×$10^{-3}mm^2/s$，两组间具有统计学意义（$P < 0.05$）；直肠腺癌 EMVI 阳性组 ADC_{stand}、f 值分别是（0.92±0.12 ）×$10^{-3}mm^2/s$、0.48（0.21，0.52）；阴性组 ADC_{stand}、f 值分别是（0.90±0.08）×$10^{-3}mm^2/s$、0.38（0.38，0.45）；两组间无统计学意义（$P>0.05$）。在评估直肠腺癌 EMVI 阳性方面，ADC_{fast} 的 ROC 曲线下面积最大（0.948），具有较高的诊断准确性，以 6.678×10^{-3} mm^2/s 为诊断阈值时，其敏感度及特异度分别为 95.2%、91.7%。
结论 磁共振 IVIM-DWI 参数 ADC_{slow}、ADC_{fast} 对直肠腺癌 EMVI 的评估有一定价值,其中反映微循环灌注的 ADC_{fast} 具有较高的准确性，诊断效能最大。3.0T 磁共振 IVIM-DWI 参数能够为直肠腺癌 EMVI 的评估提供有价值信息。

OR-124
基于能谱 CT 成像碘（水）图的组学分析术前预测结直肠癌微卫星不稳定性的初步研究

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目的 探讨基于能谱 CT 成像碘（水）图的组学分析术前预测结直肠癌微卫星不稳定性（microsatellite instability, MSI）的价值。**方法** 回顾性收集 102 例术前使用 Revolution CT 或 Discovery CT 750HD 行腹部 GSI 扫描的结直肠癌患者，根据术后病理的免疫组化检测，获取其 MSI 信息。在 AW4.6 工作站，使用 GSI Viewer 分析软件获得静脉期碘（水）图像，将 DICOM 格式的图像导入 ITK-SNAP (version 3.6.0)软件勾画 ROI，并进一步使用 AK（Artificial Intelligent Kit）软件提取基于碘（水）图像的组学参数。将来源于 Revolution CT 扫描仪的数据用于建立预测 MSI 状态的组学模型（随机选择 70%样本作为训练集，其余样本用于验证）；来自 Discovery CT 750HD 扫描仪的数据用于外部测试。通过 Student's t 检验或 Mann-Whitney U 检验，Spearman 相关性检验，Min-Max 标准化，独热编码和 LASSO 算法进行特征降维。建立多参数逻

辑回归模型以预测 MSI 状态。通过 ROC 分析评估诊断性能。**结果** 基于训练数据集，将 9 个对结直肠癌贡献度最高的特征构建多参数 Logistic 回归模型。采用 ROC 进行评价，在训练集中，AUC 为 0.971（准确度：0.896;敏感度：0.875;特异性：0.906）; 在验证集中，AUC 为 0.908（准确度：0.810;灵敏度：0.714;特异性：0.857）。 在外部测试集中，诊断性能略低，AUC 为 0.880（准确度：0.788;灵敏度：0.909;特异性：0.727）。 三组病例 AUC 值无统计学差异（p>0.05）。**结论** 基于能谱 CT 成像碘（水）图的组学分析对术前无创预测结直肠癌 MSI 状态有一定的价值。

OR-125

扩散峰度成像预测胃癌新辅助化疗疗效研究

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目的 探讨扩散峰度成像（DKI）与化疗前胃癌病理分化程度及 Lauren 分型的相关性；预测及判断胃癌新辅助化疗疗效的价值。材料与**方法** 前瞻性纳入 52 例行 DKI 检查的局部进展期胃癌,所有患者在新辅助化疗前接受磁共振检查。经连续随访，52 例患者中 28 例患者手术前一周内行 DKI 检查。由后处理软件自动计算 DKI 定量参数（ADC、MD、MK）。在治疗前后分别测量 DKI 相应的指标（Xpre 和 Xpost），同时计算上述定量参数治疗前后的差值（△X）及变化率（%△X）。比较各基线参数在 Lauren 分型及分化程度的差异性。统计学分析采用 SPSS 22.0，双侧 P＜0.05 代表有统计学意义。采用 Mann-Whitney U 检验和 Spearman 秩检验比较有效组与反应不良组治疗前后各参数及其变化的差异及相关性。受试者工作特征曲线(ROC)用于比较诊断效能。**结果** DKI 各参数（ADC、MD、MK）评估新辅助化疗前弥漫型胃癌，曲线下面积（AUC）分别为 0.884、0.842、0.765。DKI 各参数(ADC、MD、MK)在胃癌中分化及中高分化、中低分化、低分化中具有统计学差异（P＜0.05）。28 例 DKI 患者中有效组 16 例，反应不良组 12 例。DKI 多参数值（MKpre、MKpost、ADCpost、MDpost、△MD、△MK 和%△MK）在两组间存在差异显著性(P＜0.05)。MKpre、MKpost、%△MK 与反应不良正相关，△MD、△MK、ADC_{post}、MD_{post} 与反应不良呈负相关。AUC 曲线显示 MKpost 具有最佳诊断效能，AUC 为 0.958，敏感性 83.30% ，特异性 93.80%。**结论** DKI 相关参数有助于治疗前评估胃癌生物学行为，DKI 可以多参数区分 Lauren 分型，具有较高的准确性。DKI 可以用于筛选胃癌新辅助化疗反应不良组的患者，新辅助化疗后 MK_{post} 值的预测效能最佳。

OR-126

3.0T 磁共振 IVIM-DWI 预测局部进展期直肠癌新辅助放化疗疗效的初步探究

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背景及目的

本研究的目的为初步探究治疗前 IVIM-DWI 预测 LARC 患者 nCRT 疗效的可行性，分析其定量参数在病理完全缓解（pCR）与非 pCR 患者间分布是否具有差异性。

方法

选择生成依据单指数模型的表观扩散系数（ADC）图和依据双指数模型的 IVIM-DWI 定量参数真性扩散系数（D）、假性扩散系数（D^*）和灌注分数（f）。

依据术后的病理情况将患者分为 pCR 组和 non-pCR 组。应用统计学软件对两组患者治疗前肿瘤区域 ADC 及 IVIM-DWI 定量参数结果进行比较。

结果

pCR 组和 non-pCR 组患者的一般资料无显著性差异，两组患者具有可比性；两位放射科诊断医师对多 b 值 DWI 图像后处理所得定量参数结果有良好的一致性；pCR 组 nCRT 治疗前肿瘤区域 D 值为(0.903±0.138) ×$10^{-3}$$mm^2$/s，non-pCR 组为(1.013±0.233) ×$10^{-3}$$mm^2$/s，t=-1.661，*P*=0.103，*P*>0.05，差异不具有统计学意义；pCR 组 nCRT 治疗前肿瘤区域 D*值为（42.213±26.344) ×$10^{-3}$$mm^2$/s 小于 non-pCR 组(61.452±35.495) ×$10^{-3}$$mm^2$/s，t=-1.853，*P*=0.070，*P*>0.05，差异无统计学意义；pCR 组 nCRT 治疗前肿瘤区域 f 值为 0.25±0.09 大于 non-pCR 组 0.21±0.07，t= 2.559，*P*=0.013，*P*<0.05，差异有统计学意义；pCR 组 nCRT 治疗前肿瘤区域 ADC 值为(1.157±0.255) ×$10^{-3}$$mm^2$/s，non-pCR 组为(1.311±0.287)×$10^{-3}$$mm^2$/s，t=-1.775，*P*=0.082，*P*>0.05，没有统计学意义上的差异。

结论

治疗前 IVIM-MRI 部分双指数模型定量参数在 pCR 与非 pCR 患者间分布存在统计学差异，满足预测局部进展期直肠癌患者新辅助放化疗疗效的可行性。

OR-127

基于单源双能 CT 平扫图像的纹理分析对肿块型胃癌和高风险胃间质瘤的鉴别

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目的 探讨单源双能 CT 平扫单能量图像的纹理分析相关参数在鉴别肿块型胃癌和高风险胃间质瘤的价值。**方法** 回顾性分析我院接受单源双能 CT 平扫和三期增强扫描的患者，并经病理和胃镜证实的 16 例高风险胃间质瘤和 17 例肿块型胃癌患者，在能谱 ADW4.5 后处理平台将 40～100 keV 各单能量下的胃癌和间质瘤的平扫图像导出，然后将这些单能量图像分别输入 Omni-Kinetics（OK 软件）。分别在胃间质瘤和肿块型胃癌平扫图像的最大层面放置一个感兴趣区（region of interest，ROI），ROI 的大小为全肿瘤。计算出所有的纹理参数后，从纹理分析的灰度直方图中提取出峰度值和偏度值，从共生矩阵中提取出熵值。根据是否符合正态分布，采用独立样本 t 检验或者采用 Mann-Whitney U 检验，采用 ROC 曲线分析差异有统计学意义参数的诊断效能。**结果** 40～100 keV 单能量平扫图像的纹理分析中，40keV 时胃间质瘤的平均峰度值高于胃癌，分别为 3.18（3.02，3.38） vs 3.03（2.78，3.16），差异有统计学意义（P<0.05），以 3.07 为鉴别两者的阈值时，敏感度和特异度分别为 68.8%，70.6%，曲线下面积为 0.721。40 keV 时胃间质瘤的平均熵值低于胃癌，分别为 1.93±0.07 vs 2.02±0.07，差异有统计学意义（P<0.05），以 1.96 为鉴别两者的阈值时，敏感度和特异度分别为 82.4%，68.7%，曲线下面积为 0.765。其余各个单能量下的峰度值、熵值和各个单能量下的偏度值均无统计学意义（P>0.05）。**结论** 纹理分析中的定量参数结合单源双能 CT 的平扫图像在鉴别肿块型胃癌和高风险胃间质瘤中有一定的临床价值，其中 40 keV 单能量下的熵值为最佳参数。

OR-128

建立改良影像学肿瘤退缩分级评估直肠癌新辅助治疗效果

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目的 对于局部进展期直肠癌，通过术前新辅助放化疗，近 30%的患者可达到病理完全缓解并实施“等待观察”[1-3]，因此能否准确评价新辅助放化疗效果，对于选择下一步治疗方案至关重要。2011 年 MERCURY 依据病理肿瘤退缩分级（pTRG）提出 MRI 肿瘤退缩分级（mrTRG）[4]，但由于阅片者主观经验不同，其与 pTRG 之间总体一致性低于 30%[5]，导致其临床应用受限。本研究拟通过结合其他有效评价指标，建立改良 mrTRG 以实现术前准确预测 pTRG，并精准评估远期预后。
方法 改良 mrTRG 采用分别测量疗后影像 T 分期（ymrT）、肿瘤长径缩短率、疗后 T2 信号强度变化、疗后 DWI 有无高信号，设定相应临界值并评分 0 分/1 分，最终计算累计得分。改良 mrTRG4 分认为病灶完全缓解；2-3 分为部分缓解；0-1 分为无缓解。原 mrTRG1-2 级为病灶完全缓解；3-4 级为部分缓解；5 级为无缓解。pTRG（AJCC）0-1 级为病灶完全缓解；2 级为部分缓解；3 级为无缓解。回顾性分析我院 268 例局部进展期直肠癌行新辅助治疗联合 TME 手术并评价 pTRG 的患者，按照上述方法，分别评价改良 mrTRG、原 mrTRG，并评估改良 mrTRG、原 mrTRG 与 pTRG 符合率以及与远期预后的相关性。
结果 回顾性分析我院 268 例患者，以 pTRG 为金标准，改良 mrTRG 准确率为 58%，原 mrTRG 的准确率仅为 46%。改良 mrTRG、pTRG 均可区分总生存（OS）、无病生存（DFS），但改良 mrTRG 区分的风险组优于 pTRG；然而，原 mrTRG 并不能区分 OS 及 DFS。
结论 通过纳入既往研究证实能够有效评价直肠癌新辅助治疗疗效的指标，建立的客观、定量、全面的改良 mrTRG，与原 mrTRG 相比，能够有效预测 pTRG，且其与预后具有良好的相关性，借此实现术前准确预测新辅助放化疗效果并指导下一步治疗方案，为个体化治疗提供可靠依据。

OR-129
MRI 纹理术前预测直肠癌新辅助放化疗治疗抵抗的初步研究

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目的 评估新辅助放化疗前的 MRI 纹理特征对于局部晚期直肠癌治疗抵抗的预测价值，以期尽可能避免有治疗抵抗的患者进入新辅助放化疗流程。评估新辅助放化疗后的 MRI 纹理特征对于局部晚期直肠癌治疗反应的评价价值，为完全缓解的患者避免手术提供依据。**材料与方法** 52 例术前接受了新辅助放化疗的晚期直肠癌患者纳入研究，该回顾性研究获得伦理委员会批准。于术后结合临床及病理信息评价肿瘤的退缩分期及降期。所有患者在 MR3.0 扫描仪上进行直肠标准序列扫描（T2WI STIR，T1W_ FS 增强，DWI），扫描时间点分别是初诊及术前 1-2 周。导出两次检查的动脉早期增强图像 T1_contrast 及 T2WI 图像进行纹理分析。MR 纹理分析：图像分割使用 ITK-SNAP（version 3.4.0; http://itksnap.org），采用 python 进行特征提取，采用随机森林法建立分类模型并进行验证（支持向量机，CV=10）。**结果** 偏度是区分治疗反应与治疗抵抗的最相关纹理特征，新辅助放化疗反应组的治疗前 MR T2WI 偏度显著高于治疗抵抗组（P<0.05）。新辅助放化疗前 T2WI、T1W_contrast 及新辅助放化疗后 T2WI、T1W_contrast 的纹理特征判断治疗敏感的曲线下面积分别为 0.64、0.86、0.63、0.77。**结论** 基于 MR T2WI、T1W_contrast 的纹理特征对于预测局部晚期直肠癌新辅助放化疗的治疗反应及治疗抵抗有潜在价值；相对于新辅助治疗后的 MR 纹理特征，治疗前的 MR 纹理特征的诊断效能更具潜在价值。

OR-130
Value of dual-energy CT imaging for evaluation of intestinal activity and severity in Crohn's disease

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Purpose: To investigate the clinical value of dual-energy CT imaging in assessing the activity and severity of Crohn’s disease compared with the simple endoscopic score. **Methods**:60 patients suspected to have Crohn's disease received both colonoscopy and dual-energy computed tomography (DECT) were involved in this study. The interval time between the two examinations was less than one week. According to the Simple Endoscopic Score for Crohn's Disease, 60 patients were divided into 4 groups. Mean values of the iodine concentration of lesions and surrounding adipose tissue, the fat fraction of lesions and surrounding adipose tissue were used for the evaluation. **Results**: The fat fraction of lesions and the fat fraction of surrounding adipose tissue of four groups were found statistically significant different .

OR-131
侧方淋巴结对低风险直肠癌预后的影响：一项 MRI 回顾性研究

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背景：侧方淋巴结(lateral lymph node, LLN) 转移为直肠癌患者较差的预后指标，目前对于 LLN 的处置仍存在争议。对于 MR 可见的 LLN，其不同的 MR 特征是否提示不同的预后，有待进行深入探讨。

方法 回顾性连续纳入从 2011 年 6 月到 2015 年 12 月于本院直接进行根治性全直肠系膜切除术（TME），术前未进行新辅助放化疗，术后病理证实直肠癌，术后病理分期≤pT3，pEMVI、pCRM 阴性患者共 684 例。评估所有患者 MR 检出最大 LLN 特征以及其他传统 MR 指标，与总生存（OS）、无转移生存（MFS）、无复发生存（LRFS）比较。

结果 低复发风险组（pN0）患者中，MR-T 分期，术后治疗情况，MR-LLN 的有无，以及 MR 检出最大 LLN 的短径是否≥8mm 与复发显著相关（p≤0.01）。pN0，MR-LLN（+）患者中，最大 MR-LLN 短径≥8mm 患者的 MFS 和 OS 分别为 58.3%和 35.9%，二者均显著差于最大 MR-LLN 短径<8mm 的患者（MFS 和 OS 分别为 88.8%和 85.4%，p<0.01）。与 pN1-LLN（-）患者相比，pN0-LLN（+）且 SAmax≥8 的患者的 OS 及 MFS 均显著降低（p＜0.05）。与 pN2-LLN（-）患者相比，pN0-LLN（+）且 SAmax≥8 的患者 OS 及 MFS 无显著差异。

结论 MR 显示存在 LLN 会降低低风险直肠癌人群的 OS 和 MFS，MR-LLN（+）患者中，pN0 且 MR-LLN 短径≥8mm 的病人预后与 pN2 患者无显著差异，提示 MR-LLN（+）是影响低复发风险直肠癌患者 OS 和 MFS 的潜在不良因素，应在临床诊疗中加以重视。

OR-132
256 排螺旋 CT 在诊断小肠血管畸形的临床应用

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目的 探讨肠系膜动脉 CTA 对小肠血管畸形的临床诊断价值。

方法 回顾性分析经手术病理证实并行肠系膜动脉血管 CTA 检查的 51 例小肠血管畸形患者影像资料。观察：CTA 图像表现，包括畸形血管团供血动脉、引流静脉、系膜侧直小血管情况。并由 2 名放射诊断医师分别盲法对照手术病理结果，分别采用小肠畸形供血动脉定位法和 Coles 分组定位法

对血管畸形进行定位诊断。采用 McNemar 配对 X2 检验评价医师分别采用 2 种定位诊断方法诊断准确性的差异，采用一致性检验评价 2 名医师诊断结果的一致性。

结果 小肠血管畸形 CTA 表现为供血动脉增粗 12 例，引流静脉早显 9 例，小肠系膜侧支小血管增粗 22 例，畸形血管团形成 11 例。2 名医师采用 Cole 分组法和供血动脉法定位诊断的准确率分别为 84.31％(43 / 51)和 98.03％(50 / 51)。2 名医师采用 Coles 分组法诊断具有中度一致性(Kappa=0.49，P<0.5)，采用供血动脉法诊断具有高度一致性(Kappa=1.00，P<0.01)。2 名医师分别采用 Coles 分组法和供血动脉法定位诊断的准确性差异均无统计学意义(P 值分别为 0.062 和 0.125)。

结论 肠系膜动脉 CTA 可显示小肠畸形的供血动脉和引流静脉，具有定位、定性诊断价值。

OR-133

肛瘘高分辨率 MRI 技术及图像质量影响因素分析 附 150 例图像质量分析

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目的 探讨肛瘘高分辨率 MRI 规范化扫描技术，分析影响图像质量因素

方法 分析 150 例肛瘘患者高分辨率 MR 图像，根据 P A R K 进行分型：括约肌间型；经括约肌型；括约肌上型；括约肌外型。对所有序列的图像质量进行分级及计分，分析伪影产生原因，分析内容为内括约肌、纵行肌、外括约肌、耻骨直肠肌、括约肌间隙、坐骨肛门窝、肛提肌、肛管的黏膜层、黏膜下层、肌层的显示程度，分级评价参照 BEETSTAN 等的方法并做了一些改进，将图像质量和评价及计分分为 3 个层次：甲级，显示清晰：在 MRI 图像上肛管结构尤其各肛门括约肌清晰可辨且无伪影存在，结构显示清楚，可明确诊断，计做 2 分；乙级，可显示但图像存在伪影：肛管结构尤其是各肛门括约肌可分辨但存在伪影，显示较清楚，有伪影但不影响诊断计做 1 分；丙级，显示不清：肛管结构，尤其各肛门括约肌分辨不清，伪影较严重，影响诊断计做 0 分；对 117 例横断位 T2WI 图像进行 CNR 和 SNR 检测。

结果 Ⅰ型，108 例 72%；Ⅱ型，33 例 22% ；Ⅲ型，7 例 4.6%；Ⅳ型 2 例 1.3%;肛周脓肿 18 例。150 例共 658 个序列，各序列均可显示或清晰显示肛管及肛周软组织结构。甲级 610 个，占 92.7%；乙级 48 个，占 7.3%，卷折伪影 38 个,运动伪影 6 个,异物伪影 4 个 ,无丙级片序列。计分

结果 Sag T2WI (1.919±0.274),AX T2WI (1.930±0.26), AX fsT2WI (1.918±0.275), COR T2WI (1.977±0.149), AXT1WI(1.927±0.262)。横断位 T2WI 成像序列的 SNR 和 CNR，分别为 40.768±16.074 和 111.610±48.341。

结论

肛管的高空间分辨率磁共振成像可清晰显示肛管及其肛周解剖结构，对于肛管及肛周病变具有重要的意义。各种伪影对图像质量均有不同程度的影响。消除或减少图像伪影，对提高 MRI 图像质量有重要作用。

OR-134

用于术前预测结直肠癌淋巴结转移的临床-影像组学列线图的建立和验证

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目的 开发和验证用于术前预测结直肠淋巴结转移的临床-影像组学组合模型。
方法和材料：我们收集了 767 例经临床病理证实的结直肠癌患者(训练组 537 例，验证组 230 例)。我们纳入了 9 个重要临床危险因素（年龄、性别、CEA 水平、CA19-9 水平、肿瘤位置、肿瘤大小、组织学类型、分化程度和 M 分期）来构建临床模型；采用最小绝对值收敛和选择算子（LASSO)算法构建放射组学特征（包括原发病灶和周围淋巴结的影像学特征），用以建立各自的影像组学模型（原发灶影像组学模型、周围淋巴结影像组学模型；并应用逐步逻辑回归选择重要变量来构建 3 个临床-影像组学模型（临床-原发灶影像组学模型、临床-周围淋巴结影像组学模型、临床-原发灶-周围淋巴结影像组学模型）。然后使用 Akaike 信息准则（AIC）来比较不同模型的相对强度，以及用曲线下面积（AUC）来量化预测准确性。最后应用决策曲线分析（DCA）来评估该模型的临床应用价值。
结果 临床-原发灶-周围淋巴结影像组学模型的 AUC 值最高(AUC= 0.7430)，为最佳模型。该临床-影像组学模型在训练队列和验证队列中也显示出良好的鉴别和校正能力。决策曲线分析表明，临床影像组学列线图在临床上具有应用价值。
结论 本研究提出了一种基于影像组学特征和临床危险因素的临床-影像组学列线图，可应用于结直肠癌患者术前预测淋巴结转移。

OR-135
小肠 CT 在克罗恩病与肠结核鉴别诊断中的价值

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目的
初步建立 CD 的 CTE 评分方法，与内镜、临床评分比较并观察其可行性，探讨 CTE 在克罗恩病（CD）和肠结核（ITB）诊断及鉴别中的价值。
制定综合评分系统（包含临床、内镜及 CTE），与单一评分系统比较，观察各评分系统效能。
方法
收集 CD 及 ITB 病例 84 例（CD61 例、ITB23 例），回顾性分析其临床、内镜及 CTE 资料。
求出有统计学意义指标，根据特异度高低赋予分值，按照拟定评分标准对两组患者进行评分，计算各评分结果。
绘制工作特征曲线（ROC 曲线），比较几种不同评分方法的灵敏度及特异度。
结果
临床及内镜指标中，5 项指标倾向于 CD 诊断，4 项倾向于 ITB 诊断。2.CTE 指标中，多节段病变等 10 项指标利于 CD 诊断；肠系膜对侧肠壁增厚等 5 项指标提示 ITB 可能大。
3.最终临床+内镜中纳入指标 CD、ITB 组分别为腹泻、肛周病变史、节段性病变、纵行溃疡及盗汗、PPD 强阳性、肺结核、环形溃疡、回盲瓣固定开放。CTE 中纳入 CD 诊断指标为节段性病变、肠系膜侧增厚、假憩室征、分层强化、回盲瓣闭塞、肠粘连及梳状征，纳入 ITB 诊断指标为系膜对侧肠壁增厚、回盲瓣挛缩或固定开放、淋巴结沿右半结肠动脉分布及淋巴结中心坏死。
4.通过 ROC 曲线比较得出，CTE 评分标准对 CD 诊断的灵敏度及特异度分别为 83.6%及 100%，较临床及内镜高。而联合评分时，综合评分系统曲线下面积最高（0.993），约登指数最大时其特异度及灵敏度分别为 100%及 93.4%，而临床+内镜评分分别为 78.3%及 88.5%，但均较单纯临床内镜指标高。
结论
CTE 在 CD 诊断中有较高价值，可提供肠壁以外的信息以助于判断疾病的综合情况。
CTE 评分标准对 CD 诊断的特异度及灵敏度较高，可提供较多量化指标。

综合评分系统较单一评分系统可提高 CD 诊断的灵敏度及特异度，多征象联合应用更有利于 CD 与 ITB 的鉴别诊断，为临床综合诊断提供更全面的信息。

OR-136
多层螺旋 CT 血管三维造影术前评估髂内动脉变异的临床应用价值

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目的 探讨在直肠癌腹腔镜术前，用多层螺旋 CT 血管三维重建造影评估髂内动脉分支的变异情况，以指导手术操作，避免术中严重出血的临床应用价值。
方法 搜集华西医院 2019 年 1 月-2019 年 7 月临床诊断为直肠癌且均进行 CT 髂血管三维重建造影的 69 例患者资料，使用 Yamaki 分类方法（依据髂内血管主要分支情况分为 A-D 四组）进行初步分类，在此分类基础上进行小血管分支变异情况评估。
结果 在本次研究中以 Yamaki 分类方法为基础，得出髂内血管分类中最常见的为 A 组，其次为 B 组和 C 组，研究中未能见到 D 组，双侧未见明显差异。其中闭孔动脉以髂内动脉 A 组分出臀上动脉或 B 组分出阴部内动脉后所分出的第一支动脉最为常见，其次为由髂外动脉或臀上动脉直接分出；直肠中动脉以起自阴部内动脉第一分支最为常见；直肠下动脉最常起自于阴部内动脉第二分支。我们研究发现，双侧闭孔动脉在 B 组时变异情况有明显差异，(左侧变异变异率 42.9%，右侧变异率 93.8%，P=0.003)；其余髂内动脉分支左右两侧变异未见明显差异。
结论 术前应用多层螺旋 CT 血管三维重建造影能够为临床医生提供更多髂内血管及其分支动脉起源、形态、走形等信息，对术前评估髂内血管变异情况具有较高价值。

OR-137
基于 ESGAR 和 ESPR 技术共识的 CT 肠道成像的临床实践细节

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目的 基于 2017 年欧洲胃肠和腹部放射学会(European Society of Gastrointestinal and Abdominal Radiology，ESGAR)及欧洲儿科放射学会(European Society of Paediatric Radiology，ESPR)首次联合发布 CT 肠道成像（CT enterography,CTE）技术共识, 联合本研究中心应用体会，探讨适用于国人的肠道准备及扫描技术方面的细节。
材料和方法 回顾性分析我院 2018 年 1 月至 12 月期间，符合 ESGAR 和 ESPR 技术指南推荐的 CT 肠道成像图像，与同期非肠道充盈全腹部增强 CT 对比。其中，肠道成像常规采集动脉期（膈顶水平主动脉 CT 阈值触发 25-30s）及肠期（阈值触发 55～60s）。全腹部增强 CT 增加延迟期（延迟 210s）。回顾性分析肠道充盈情况，分组评价各扫描时期对肠道不同疾病检出情况。
结果 基于 ESGAR 和 ESPR 技术指南推荐的 CT 肠道成像图像，肠腔充盈情况明显优于未对肠腔充盈严格要求的全腹部增强 CT。充盈后的 CT 肠道成像，对肠道病变检出率高于全腹部增强 CT，肠外病变检出大致相仿。CT 肠道成像动脉期对于检出隐源性消化道出血，消化道变异及富血供病变显示率较高。静脉期对于肠道炎性病变与动脉期显示率一致，部分更佳。增加了小肠疾病的诊断信心。
讨论：与 ESGAR 和 ESPR 技术指南共识相一致，本中心采用水作为肠道阴性充盈，患者接受度高，容易实施，且肠壁对比好。肠道充盈可，但对于检出活动性隐源性消化道出血效果好。基于本研究中心的经验分析表明，动脉期及肠期扫描能够满足绝大部分肠道疾病的诊断要求。目前国内暂无基

于证据的指南表明 CT 肠道成像的技术细节，不少中心仍在采用阳性对比剂充盈肠腔。肠道清洁虽然有助于增加诊断信心，但使患者接受度下降。

OR-138
MR 扩散峰度成像对伴上皮间质转化的结直肠癌早期化疗疗效的评估价值

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目的 上皮间质转化（epithelial mesenchymal transition, EMT）可促进结直肠癌（CRC）的转移和化疗耐药。本研究探讨 MR 扩散峰度成像（DKI）评估伴有 EMT 的 CRC 对 5-氟尿嘧啶（5-Fu）早期化疗疗效的价值。
方法 采用 HCT116/Control 和 HCT116/EMT 细胞建立 24 只裸鼠 CRC 皮下移植瘤模型（CRC/Control 组和 CRC/EMT 组，每组 12 只）。待瘤体体积达 250 mm^3时，将 CRC/Control 和 CRC/EMT 组裸鼠随机分成 2 组，经腹腔隔日注射 5-Fu（10mg/kg）或二甲基亚砜 14 天，隔日测量肿瘤大小，计算肿瘤相对体积（$RTV=V_{dx}/V_{d0}$）。于 Day0 和 Day7、Day14 行 T2WI 和 DKI 后得到表观弥散系数（ADC）和 DKI 相关弥散系数（D）、峰度系数（K）值，测量各组皮下移植瘤相对应的 ADC、D 和 K 值。比较各组内和组间肿瘤 ADC、D 和 K 值的差异，以及与 Ki-67 表达的相关性。
结果 5-Fu 治疗 Day14 时，CRC/Control 治疗组 RTV 显著低于 CRC/EMT 治疗组（P<0.001）。CRC/Control 治疗组肿瘤的 ADC 和 D 值在 Day0、Day7、Day14 逐渐升高，而 K 值逐渐降低，差异均具有统计学意义（P均<0.001）。治疗 Day14 时，CRC/Control 治疗组肿瘤的 ADC 和 D 值显著高于 CRC/Control 对照组，而 K 值显著低于对照组（ADC，P=0.022；D，P=0.021；K，P=0.009）。ADC 和 D 值与 Ki-67 表达呈显著负相关（P=0.003, P=0.002），K 值与 Ki-67 表达呈显著正相关（P=0.004）。
结论 CRC 皮下移植瘤伴 EMT 后对 5-Fu 化疗耐药，DKI 有助于评估 EMT 后 CRC 的 5-Fu 早期化疗疗效，有助于早期调整治疗方案。

OR-139
食管鳞癌新辅助化疗后动态对比增强 MRI 定量参数与病理分级的相关性研究

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目的 探讨食管鳞癌新辅助化疗后动态对比增强-MRI（DCE-MRI）定量参数与病理分级间的相关性。
方法 前瞻性分析 2015 年 9 月至 2017 年 12 月郑州大学附属肿瘤医院，经食管镜检查确诊为食管鳞癌，术前接受新辅助化疗，且在术前 1 周内行 DCE-MRI 扫描的 56 例患者的临床及影像资料。所有患者均行常规 MRI 和 DCE-MRI 扫描，测量 DCE-MRI 定量参数，包括容积转移常数（K^{trans}）、速率常数（K_{ep}）及血管外细胞外间隙容积比（V_e）。对手术后活体标本进行病理分级，根据病理结果分为高分化组、中分化组、低分化组及未分化组。对 2 名医师测量所得 DCE-MRI 各定量参数结果进行一致性分析，计算组内相关系数（ICC）。采用 Kruskal-Wallis H检验比较不同病理分级间 DCE-MRI 各定量参数的差异，两两比较采用 Mann-Whitney U检验。采用 Spearman 秩相关分析评价 DCE-

MRI 各参数值与食管鳞癌病理分级的相关性，采用 ROC 曲线评价各参数诊断食管鳞癌病理分级的效能。

结果 56 例患者中，高分化组 8 例、中分化组 39 例、低分化组 9 例、未分化组 0 例。不同病理分级组间平均 K^{trans}、75%K^{trans}、最大 K_{ep}、平均 K_{ep}、75%K_{ep}值的差异均有统计学意义（P均＜0.05），且与病理分级呈正相关（r值分别为 0.778、0.632、0.594、0.725、0.489，P均＜0.05）。平均 K^{trans}、75%K^{trans}诊断食管鳞癌病理分级的 ROC 曲线下面积分别为 0.750、0.856，其中 K^{trans}75%的诊断效能最佳，诊断阈值为 0.693/min，敏感度为 87.5%，特异度为 78.5%。

结论 食管鳞癌新辅助化疗后 DCE-MRI 定量参数对预测病理分级有一定的价值。

OR-140

GRASP 对术前新辅助化疗食管癌患者的 DCE-MRI 定量参数和纹理分析的影响

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摘要
目的
比较 DCE-MR 图像的两种重建方式（（GRASP）和视野共享）对药代动力学参数和纹理特征，并探讨它们在评估食管癌（EC）患者对新辅助化疗（nCT）的反应的价值。
方法和材料
该研究前瞻性地研究了在手术前接受 nCT 的 EC 患者。在 nCT 之前和手术前 1 周内进行 DCE-MRI 扫描。根据 RECIST 1.1 和肿瘤消退等级（TRG）评估化疗反应。 Mann-Whitney U 检验用于比较评估反应的 GRASP 和视野共享重建特征。对每个重要特征进行接受者操作特征（ROC）曲线以评估其预测肿瘤反应的准确性。
结果
本研究中包括 30 名患者（28 名男性,2 名女性;平均年龄 58±8 岁）。 根据实体肿瘤的疗效评价标准 1.1 版本(RECIST 1.1)评估出 18 名为反应组和 12 名为非反应组。根据术后病理肿瘤消退程度分级(TRG)标准评估出 0 例患者为 TRG1,1 例患者为 TRG2,3 例患者为 TRG3,8 例患者为 TRG4,18 例患者为 TRG5。
从每个肿瘤中提取总共 72 个药代动力学参数和纹理特征。其中，29 个新辅助化疗前的纹理特征和 24 个新辅助化疗后的纹理特征显示 GRASP 和视野共享重建参数之间存在统计学上的显着差异。在视野共享上的 1 个 nCT 前纹理特征和 37 个 nCT 后药代动力学参数和纹理特征显示反应组和非反应组之间存在显着统计学差异。
结论
GRASP 可以影响 DCE-MR 成像的药代动力学参数和纹理特征。使用 GRASP 和视野共享重建的一些 nCT 前和之后的药代动力学参数和纹理特征显示了评估 EC 中对 nCT 反应的能力。

OR-141

胃癌病理分级及其相关表型对 EMT 过程影响的 CT 表现研究

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目的 探讨胃癌不同病理分级及相关分子表达对 EMT 过程的影响及其 CT 表现。**方法** 1、回顾性收集经手术病理证实的 114 例胃癌患者的临床资料进行分析。所有患者术前均行 CT 平扫及增强扫描。术后胃癌组织标本均行 HE 染色，分析病灶位置、最大直径、肿块分叶、腔内溃疡、浸润深度、强化特点、淋巴结转移等 CT 指标，分析不同分级胃癌的 CT 表现；2、选取 31 例胃癌标本对其进行 E-cadherin、Vimentin 分子表达的免疫组化检测。结合 CT 表现，评价 E-cadherin、Vimentin 分子表达对 EMT 过程的影响。**结果** 1、 比较 114 例胃癌高分化、中分化、低分化 3 组之间 CT 表现之间的差异性，胃癌大小、肿块分叶、强化程度、淋巴结转移差异有统计学意义（p 值均＜0.05），病灶的部位、边缘、腔内溃疡差异无统计学意义，（p 值均＞0.05）。2、31 例胃癌的侵袭转移情况与其 E-cadherin、Vimentin 分子表达之间相关性，胃癌部位、最大直径、腔内溃疡、强化程度及淋巴结转移情况等 CT 征象与 E-cadherin、Vimentin 分子表达差异无统计学意义（p 值均＞0.05）；胃癌 CT 表现肿块分叶征、淋巴结转移均与 E-cadherin 分子表达差异有统计学意义（p 值均＜0.05），与 E-cadherin 表达呈正相关（r=0.437，p=0.014）；而肿块分叶征、淋巴结转移均与 Vimentin 分子表达差异无统计学意义（p 值均＞0.05）。**结论** 1、胃癌的 CT 表现与其分级具有一定的相关性，借此表现有助于术前分级、分期；2、胃癌的侵袭转移情况与 E-caderin 分子表达具有一定相关性，而与 Vimentin 分子表达无明显相关性，结合 CT 表现，对胃癌新型治疗方案研究有一定的帮助。

OR-142
利用深度学习和放射组学模型预测结直肠癌 KRAS 突变

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目的 我们提出了一个残余神经网络(ResNet)模型,使用常规预处理对比增强 CT 图像为研究 CRC 患者的 KRAS 突变状况,并与 CT-based radiomics 模型。
方法 将 157 例经病理证实的结直肠癌患者随机分为主队列(117 例)和验证队列(40 例)。治疗前进行 KRAS 突变检测和增强 CT 扫描。我们开发了一个基于 ResNet 的深度学习模型，利用门静脉期 CT 图像预测 CRC 患者在主要队列的轴向、冠状和矢状方向的 KRAS 突变，并在内部验证队列中验证了该模型。我们还探索了一种利用随机森林分类器(RFC)预测 KRAS 突变的放射组学模型。用 AUC 值评估预测性能。
结果 验证队列中，轴向 ResNet 模型 AUC 值最高(0.90)，峰值为 0.93，输入“ROI 和 20 像素”周边区域。放射组学签名包括四个放射组学特性。在验证队列中，放射组学模型的 AUC 为 0.82。
结论 利用 CRC 患者治疗前 CT 图像的深度学习(DL)和放射组学模型具有预测 KRAS 突变的潜力。ResNet 模型简化了传统放射组学从图像中提取多步信息的过程，具有较高的诊断精度。

OR-143
3D CUBE T2WI-FS 序列替代 T2WI-FS 序列作为肛瘘 MRI 常规检查序列的可行性分析

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目的 研究三维超长回波链采集 FSET2WI 抑脂序列（3D CUBE T2WI-FS）替代常规 T2WI-FS 序列作为肛瘘患者术前 MRI 检查的常规检查序列的可行性。

方法 回顾性分析 2018 年 1 月～2019 年 7 月我院收治的 46 例经手术病理证实为肛瘘患者的临床资料，所有患者术前均接受盆腔磁共振检查，分析术前 MRI 显示肛瘘瘘管、外口、内口和伴发脓肿情况，以手术所见及病理结果为标准，分析两种序列对肛瘘显示的准确率。
结果 46 例肛瘘患者手术病理检查结果发现：17 例高位肛瘘，29 例低位肛瘘；26 例单纯性肛瘘，20 例复杂性肛瘘；Parks 分型**结果** 括约肌间型 27 例，经括约肌型 17 例，括约肌上型 2 例，括约肌外型 0 例。主瘘管 47 例，分支瘘管 11 例，外口 57 例，内口 53 例，脓肿 10 例。经 MRI 诊断结果与手术病理检查结果对照，发现 3D CUBE T2WI-FS 序列与常规 T2WI-FS 序列对肛瘘分型的准确率分别为 93.4%（43/46）、78.3%（36/46），差异具有统计学意义（P ＜ 0.05）；对瘘管支数诊断的敏感性分别为 93.1%和 72.4%，对内口总数诊断的敏感度分别为 94.3%和 75.5%，差异具有统计学意义（P ＜ 0.05）。两种序列对外口数目和伴发脓肿与手术病理结果一致。
结论 磁共振 3D CUBE T2WI-FS 序列能更准确显示肛瘘瘘管、外口、内口和伴发脓肿，且对细小分支瘘道和瘘道内口的检出率明显优于常规 T2WI-FS 序列，可提供更加全面的解剖和病理信息，建议将 3D CUBE T2WI-FS 序列作为肛瘘疾病 MRI 检查的常规序列。

OR-144
基于 CT 的细胞外体积分数预测结肠癌区域淋巴结转移及肝转移

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目的
本文旨在探讨利用对比增强多层螺旋 CT （MDCT） 平衡期评估细胞外体积分数(ECV)能否作为结肠癌区域淋巴结转移及肝转移的预测因子。
方法
回顾性分析于我院行 MDCT 增强扫描及肠镜检查，并经组织学确诊为腺癌的 94 例结肠癌患者，其中 64 例患者接受手术治疗。根据有无肝转移（包括同步肝转移或异时肝转移）分为结肠癌无肝转移组（n=66）、结肠癌肝转移组（n=28）。根据术后病理分为结肠癌区域淋巴结转移组（n=27）、结肠癌无区域淋巴结转移组（n=37）。通过对 MDCT 平扫期和增强后平衡期结肠癌病灶和主动脉感兴趣区 CT 值的测量，计算肿瘤 ECV 分数，并比较组间差异。采用受试者操作特征曲线（ROC 曲线）分析 ECV 与结肠癌肝转移、淋巴结转移的关系。
结果
结肠癌肝转移组 ECV 明显高于结肠癌无肝转移组（34.5% vs 28.5% ， P= 0.000<0.05），ECV 预测结肠癌肝转移的曲线下面积（AUC）为 0.792（ P=0.000<0.001），最佳临界值为 32.9%，灵敏度、特异度、阳性预测值（PPV）、阴性预测值（NPV）、正确率分别为 57.1%、90.9%、72.7%、83.3%、80.8%。结肠癌区域淋巴结转移组 ECV 明显高于结肠癌无区域淋巴结转移组（31.3% vs 28.4% ,P=0.009<0.05），ECV 预测结肠癌区域淋巴结转移的曲线下面积（AUC）为 0.677（ P=0.016<0.05）,最佳临界值为 31.8%，灵敏度、特异度、阳性预测值（PPV）、阴性预测值（NPV）、正确率分别为 55.6%、81.1%、68.2%、71.4%、70.3%。
结论
利用对比增强 MDCT 平衡期评估细胞外体积分数(ECV)能够作为结肠癌区域淋巴结转移及肝转移的影像学预测指标。

OR-145

Differentiation intracranial hypervascular tumor with mean apparent propagator (MAP) MRI

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Purpose: To differentiate intracranial hypervascular tumors using diffusion spectrum imaging (DSI) sequence and mean apparent propagator (MAP)-MRI model, the parameters of which include the mean squared displacement (MSD), return-to-the-origin probability (RTOP), return-to-the-plane probability (RTPP), return-to-the-axis probability (RTAP), Q-space Inverse Variance (QIV) and non-Gaussianity (NG).

Methods: Four patients with brain tumors which have high intensity on contrast enhancement (CE) were recruited. The tumors were diagnosed using histopathology (2 meningeoma, 1 pituitary adenoma and 1 neurilemmoma). All the four patients underwent the DSI scan before surgery on a 3T MR scanner (MAGNETOM Prisima, Siemens Healthcare, Erlangen, Germany) with a 64-channel head-neck coil. The DSI sequence was used with following parameters: FOV = 220 × 220 mm^2, matrix = 128 × 128, slice thickness = 2 mm, slices = 66, TR/TE = 3900/72 ms, b = 0 and 3000 s/mm^2, 95 different gradient directions. The diffusion parameters derived from MAP-MRI model were calculated using an in-house developed post-processing software, which is based on an open-resource too DIPY (http://nipy.org/dipy). The calculated parameters include the RTOP, RTAP, RTPP, QIV, MSD and NG. All the parameters were calculated in Regions of interest (ROIs) which were manually drawn around the solid part of the tumor and the normal-appearing white matter (NAWM). The mean value and standard deviation of each parameter were calculated for differentiating intracranial hypervascular tumors.

Results: Figure 1 shows the maps of the CE T1W image and the parameters derived from MAP-MRI for one patient with meningeoma. The tumor can be easily recognized in all the maps. All the parameters of MAP-MRI in tumor and NAWM are listed in Table 1. For the different type tumors, the parameters have bigger differences.

Discussion: All the parameters in different diagnosis tumors showed obvious differences, as shown in Table 1. Especially, NG was more sensitive than other parameters in revealing the tumor because of its high contrast ratio. The RTAP is more stability than other parameters in the NAWM, and with a larger difference among the three kinds of intracranial hypervascular tumor. However, in this study, only four patients were recruited. So we may need more samples to verify these results.QIV and RTOP are beneficial for observing the structure of the white and gray matter, but if them helpful to observe the lesion of white matter such as multiple sclerosis (MS), microinfarcts and microbleeds is another question need to be explored.

Conclusions: MAP-MRI may be useful to observe the microstructure of the tumor, which may contribute to differentiate intracranial hypervascular tumor and reveal the intracerebral minor lesion.

OR-146

Intravoxel incoherent motion diffusion-weighted imaging for monitoring the immune response to cyclophosphamide in C57bL/6 mice with GL261 gliomas

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Aim

To assess whether IVIM-DWI can predict the immune response to anti-neoplastic agents, six C57BL/6 mice with GL261 mouse gliomas were applied using Metronomic cyclophosphamide. Our results indicated that IVIM-DWI is sensitive to detect the Cyclophosphamide-induced Immune Response.

Materials

A total of 12 mice with GL261 glioma cells were randomly allocated to either the control group (n = 6) or the CPA-treated group (n = 6). Mice in the treated group were administered with CPA monohydrate every 6 days at a dose of 140 mg/kg-body weight per injection (CPA-140) as specified. Mice bearing GL261 underwent IVIM DWI scan (Signa HDxt, GE Medical System, USA) at baseline (T0) and 6 (T6) and 12 days (T12) after treatment with Metronomic cyclophosphamide (N = 6) with a custom-built-4-channel receiver coil with 3cm inner diameter. The IVIM DWI sequence was obtained using a single-shot echo-planar imaging with 12 b-values of 0, 20, 50, 100, 150, 200, 400, 600, 800, 1200, 1600, and 2000 s/mm2 (Fig. 1). The following parameters were used for this sequence: TR/TE, 3000 ms /102.4 ms; flip angle, 90° ; matrix, 64 × 64; field of view, 80 × 80 mm2; section thickness, 2.9 mm; NEX, 4; and total scanning time, 6 mins and 35 s. After all experiments, there were two rats died in the control group. Region of interests (ROI) were placed on the lesions based on IVIM images by one experienced radiologists, then the ROIs were copied onto IVIM metrics (apparent diffusion coefficient, ADC; true diffusion coefficient, D.) and mean values were recorded. The results were then analyzed by Wilcoxon rank-sum tests.

Result

At baseline, there was no statistical significance between the two groups of the ADC and D values (Table 1). However, the ADC and D value of the treatment group were significant higher than that in control group at both T6 and T12 (Table 1). Furthermore, the ADC and D values of the treatment group showed an increasing trend, while ADC and D values in control group showed a decreasing trend. Finally, the tumor volume of the treatment group began to decrease or not increase significantly at T6, while the control group showed a significant increasing trend.

Conclusion

Our study indicate that the ADC and D parameter could predict early immune response to anti- neoplastic treatment. we can use the MRI to evaluate the immune response to anti- neoplastic treatment with clinical chemotherapy in tumor patients.

OR-147

Quantification of penumbra volume in acute ischemic stroke of middle cerebral artery using susceptibility weighted imaging mapping

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Background and Purpose Asymmetric prominent cortical veins (APCVs) is associated with ischemic penumbra but there are no quantifications its volume. We aimed to quantitatively evaluate volume of the ischemic penumbra from a new perspective on susceptibility weighted imaging mapping (SWIM) in patients with acute ischemic stroke.
Methods we randomly enrolled 41 eligible patients with acute ischemic stroke who had available MRI data and with SWI_{volume}-DWI mismatch before treatment within 12 hours from symptom onset. The volume of APCVs was quantitatively and semi-quantitatively calculated separately. Comparative analysis of the diagnostic performance of penumbra for APCVs on SWIM between quantitative volume mismatch and semi-quantitative ASPECT mismatch was performed. The mismatch volume of penumbra between SWI-DWI and PWI-DWI was quantified. Correlation between SWI-DWI mismatch and PWI-DWI mismatch was performed and both of them were analyzed with National Institute of Health Stroke Scale (NIHSS).
Results All the 41 patients had SWI_{volume}-DWI mismatch while there was only 22 cases who had $SWI_{ASPECTS}$-DWI mismatch. The accuracy of SWI_{volume}-DWI was obviously higher than $SWI_{ASPECTS}$-DWI (100% *vs* 53.66%) reference to PWI-DWI mismatch. There was significant positive correlation between SWI_{volume}-DWI mismatch and PWI-DWI mismatch ($r=0.522$, $p<0.01$) while no correlation was found between $SWI_{ASPECTS}$-DWI mismatch and PWI-DWI mismatch ($p>0.05$). There was negative correlation between SWI_{volume}-DWI mismatch, $SWI_{ASPECTS}$-DWI mismatch and NIHSS ($r=-0.315$, -0.485, $p=0.045$, 0.001, respectively).
Conclusions SWI_{volume}-DWI mismatch was more accurate than $SWI_{ASPECTS}$-DWI in evaluating the ischemic penumbra, and it was an alternative to PWI-DWI mismatch in acute ischemic stroke cases. Quantitative measurement of the volume of APCVs from SWIM was a good modality to reflect the hypoperfusion area as well as PWI.

OR-148

Structural and functional substrates underlying serum high density lipoprotein cholesterol change in major depressive disorder

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Aims: There is evidence that major depressive disorder (MDD) is related to serum lipid level alterations. However, the neural correlates underlying this association remain unclear. In this study, we aimed to identify the neurobiological underpinnings of the relationship between depression and serum lipids.
Methods: 49 patients with MDD underwent structural and resting-state functional magnetic resonance imaging (MRI) scans. Voxel-based morphometry (VBM) and functional connectivity (FC) analyses were performed to assess brain structure and function, respectively. Peripheral venous blood samples were collected to measure serum levels of lipid profiles including total cholesterol (TC), triglyceride (TG) and high density lipoprotein cholesterol (HDL-C). Correlation and mediation analyses were used to investigate the associations of serum lipid levels with brain structure and function in MDD patients.
Results: A majority of MDD patients had lower HDL-C serum level but normal serum TC and TG levels. Serum HDL-C level was positively correlated with gray matter volume (GMV) in the bilateral ventromedial prefrontal cortex, and negatively correlated with FC between the bilateral ventromedial prefrontal cortex and the left angular gyrus. Moreover, mediation analysis revealed that the ventromedial prefrontal cortex-angular gyrus FC significantly mediated the relationship between GMV in the ventromedial prefrontal cortex and serum HDL-C level.
Conclusion: These findings help to identify structural and functional substrates underlying serum HDL-C change in patients with MDD, which may provide new insight into the relationship between depression and serum lipids from the perspective of neural regulation.

OR-149

Study ofmagnetic resonance neurography in evaluating the influence of maxillofacial tumor on peripheral branches of cranial nerves

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Objective: To explore the value of magnetic resonance neurography (MRN) in evaluating the influence of maxillofacial tumor on peripheral branches of cranial nerves.
Methods: 35 volunteers and 44 patients with maxillofacial tumors confirmed by pathology were enrolled. They underwent the three-dimensional (3D) sampling perfection with application-optimized contrasts using different flip-angle evolutions (SPACE) and the short time inversion recovery (STIR) sequence as MRN method on 3.0T MRI scanner. In volunteers, the signal to noise ratio (SNR) of inferior alveolar nerve, mandible bone marrow, medial pterygoid muscle, subcutaneous fat, submandibular gland and standard deviation of background noise (σ_0) were obtained. The contrast signal-to-noise ratio (CNR) and contrast ratio (CR) of inferior alveolar nerve relative to other tissues were calculated, and the parameters between conventional MRN (cMRN) and contrast-enhanced MRN (ceMRN) group were compared. Three radiologists were used MPR and MIP on ceMRN images to evaluate the continuity of 10 major branches of the cranial nerves on ceMRN based on the 5-score (0-4) subjective score. In patients, the

relationships between maxillofacial tumors and adjacent peripheral nerves were classified as isolated, compressed, invaded, embodied or spread perineurally, the number of involved peripheral branches of cranial nerves in various relationships was recorded.

Results:16 volunteers were examined by cMRN. The $SNR_{(nerve,\ bone\ marrow,\ muscle,\ fat,\ gland)}$ of cMRN were significantly higher than those on ceMRN. The $CNR_{(nerve\text{-}bone\ marrow,\ nerve\text{-}muscle,\ nerve\text{-}fat)}$ of cMRN were significantly higher than those on ceMRN. $CR_{(nerve\text{-}bone\ marrow,\ nerve\text{-}muscle,\ nerve\text{-}gland)}$ of ceMRN were significantly higher than those on cMRN (all $P<0.05$). The interobserver consistency of all nerves across the 3 readers was excellent, with an average κ value > 0.8. According to the 44 patients, there were 17 cases of nerves isolated to tumor, a total of 63 abnormal nerves were identified, there are 25, 25, 5, 8 in relationship of compressed, invaded, embodied, and spread perineurally.

Conclusion: 3D SPACE STIR sequence can be used as a method for visualizing cranial nerves, and it can display the relationship between maxillofacial tumor and peripheral branches of the cranial nerves.

OR-150

Robust prediction of individual personality from brain functional connectome

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Neuroimaging studies have linked inter-individual variability in the brain to individualized personality traits, suggesting a neural substrate of personality. However, only one or several aspects of personality have been effectively predicted based on brain imaging features, perhaps due to small sample sizes, limited image quality, and non-specific methodologies. The objective of this study was to construct a reliable prediction model of personality in a large sample by using connectome-based predictive modeling (CPM), a recently developed machine learning approach. High-quality resting-state functional magnetic resonance imaging data of 810 healthy young participants from the Human Connectome Project dataset were used to construct large-scale brain networks. Personality traits of the five-factor model (FFM) were assessed by the NEO Five Factor Inventory. CPM with leave-one-out cross-validation was conducted to predict individual personality from whole-brain functional connectivity patterns. CPM successfully and reliably predicted all the FFM personality factors (agreeableness, openness, conscientiousness and neuroticism) other than extraversion in novel individuals. At the neural level, we found that the personality-associated functional networks mainly included brain regions within default-mode, frontoparietal executive-control, visual, and cerebellar systems. Moreover, different feature selection thresholds and parcellation strategies did not significantly influence the prediction results. Our finding of robust personality prediction from an individual’s unique functional connectome may help advance the translation of “brain connectivity fingerprinting” into real-world personality psychological settings.

OR-151

The relationship between high density lipoprotein cholesterol (HDL-C) and depressive symptoms is mediated by white matter integrity in major depressive disorder

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Background: Major depressive disorder (MDD) is a significant problem in public health issues, and approximately 340 million people are suffering from this mental illness at any time. There is great consensus that dyslipidemia including high serum levels of total cholesterol (TC) or triglyceride (TG) or low serum level of high density lipoprotein cholesterol (HDL-C) is a proven risk factor for atherosclerosis, cardio-cerebrovascular disease, metabolic syndrome, and cognitive impairment. In recent years, emerging clinical studies have shown that serum lipid level alterations occur in patients with MDD. However, the neural substrates underlying this association remain poorly understood.
Methods: 49 patients with MDD underwent diffusion tensor imaging (MRI). Multiple diffusion parameters were calculated to measure brain white matter integrity. Peripheral venous blood samples were collected to measure serum levels of lipid profiles including TC, TG and HDL-C. Correlations between serum lipid levels and white matter integrity were investigated by using tract-based spatial statistics (TBSS). Further mediation analysis was performed to determine whether micro-structural integrity in those affected white matter regions mediates the relationship between serum lipid levels and scores of Hamilton Rating Scale for Depression ($HAMD_{24}$) by using the PROCESS macro installed in SPSS.
Results: A majority of participants had lower serum level of HDL-C but normal serum levels of TC and TG. According to the established serum lipid cut-off points of Adult Treatment Panel III (ATP III), 22% of the participants had serum levels of TC > 200 mg/dL (5.17 mmol/L), 29% serum levels of TG > 150 mg/dL (1.69 mmol/L) and 88% serum levels of HDL-C < 60 mg/dL (1.55 mmol/L). There were positive correlations between serum HDL-C level and fractional anisotropy (FA) in the left anterior corona radiata (ACR) (pr = 0.561, P < 0.001), genu of corpus callosum (CC) (pr = 0.472, P < 0.01), left superior corona radiata (SCR) (pr = 0.444, P < 0.01), body of CC (pr = 0.426, P < 0.01), left external capsule (EC) (pr = 0.426, P < 0.01), right ACR (pr = 0.352, P < 0.05), right SCR (pr = 0.328, P < 0.05) and splenium of CC (pr = 0.316, P < 0.05). There were negative correlations between serum HDL-C level and radial diffusivity (RD) in the left ACR (pr = -0.514, P < 0.001), genu of CC (pr = -0.509, P < 0.001), body of CC (pr = -0.481, P < 0.01) and left SCR (pr = -0.460, P < 0.01). Moreover, the relationship between serum level of HDL-C and $HAMD_{24}$ scores was significantly mediated by the FA in the genu of CC (indirect effect = -6.6121, 95% CI = -15.4260 to -1.4320) and the RD in the genu of CC (indirect effect = -7.1874, 95% CI = -15.8293 to -1.5613).
Conclusions: In conclusion, we found that higher serum level of HDL-C was associated with greater micro-structural integrity in multiple white matter regions in patients with MDD. Moreover, white matter integrity in the genu of CC significantly mediated the relationship between serum level of HDL-C and severity of depressive symptoms.

These findings may provide new insight into intervention, treatment and prevention of MDD from the perspective of regulating serum lipids.

OR-152

Identification of specific brain regions altered in major depressive disorder with poor sleep quality

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Background: Major depressive disorder (MDD) is a prevalent psychiatric illness, affecting more than 300 million people of all ages worldwide. It is well established that sleep problems (insomnia and hypersomnia) are very common complaints in MDD and up to 90% of the patients with MDD may experience sleep problems. Importantly, sleep disturbances, a risk factor for developing depression, can increase the severity of various symptoms of depression and lead to poor response to treatment for depression. Thus, identification of the relevant features specific to sleep disturbances in MDD is important for precise clinical diagnosis, treatment, and research. However, neural mechanisms underlying sleep disturbances in MDD remain largely unknown.
Methods: 96 patients with MDD underwent polysomnography (PSG) monitoring and magnetic resonance imaging (MRI) scans. According to the value of sleep efficiency (SE), participants were divided into two groups, 42 MDD patients with SE ≥ 90% and 54 well-matched MDD patients with SE < 90%. Inter-group differences in the analyses of voxel-based morphometry (VBM) on 3D T1 structural MRI, reginal homogeneity (ReHo) and functional connectivity strength (FCS) on resting-state functional MRI were tested.
Results: Compared with MDD patients with SE ≥ 90% group, MDD patients with SE < 90% group had significant decreased ReHo in the bilateral-lingual gyri of visual network (VIS) and right-postcentral gyrus of sensorimotor network (SMN), and increased FCS in the left-angular gyrus of default mode network (DMN). There was no significant difference in gray matter volume between the two groups.
Conclusions:
The present study suggests that network dysfunction in MDD patients with poor sleep quality is independent of structural changes and, more important, that lower local connectivity and higher global connectivity in different networks may reflect imbalanced network function, which may modulate different forms of sleep, emotional and cognitive dysfunction in MDD patients with poor sleep quality.

OR-153

1H-NMR -based metabolomic study of metabolic profiling for chronic manganism

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Objective: To assess the metabolic profile of brain samples of chronic manganism rats (CHM) and magnesium-treated CHM rats.
Methods: A total of 18 female Sprague-Dawley rats were divided into three groups as follows: a control group (n = 6); the CHM group (n = 6, with Mn^{2+} administered orally at a dose of 20 mg/kg/day in the form of $MnCl_2 \cdot 4H_2O$ for 6 weeks) and the Mg-treated CHM group (oral administration, $MnCl_2 \cdot 4H_2O$ at same dose and $MgSO_4$ at a dose of 496 mg/kg/day for 6 weeks). A ^1H nuclear magnetic resonance (NMR)-based metabonomics approach was used to obtain the brain metabolic profiles of basal ganglia and cortex. For multivariate statistical analyses, the normalized data were analyzed using SIMCA-P software. The acquired data were analyzed by Principal component analysis (PCA), partial least-squares discriminant analysis (PLS-DA) and orthogonal partial least-squares discriminant analysis (OPLS-DA). The differences in metabolites among the three groups were assessed.
Results: The 600 MHz ^1H NMR spectra demonstrated resonances arising from glutamine, lactic acid, leucine, histidine, isoleucine, citrate, etc. The OPLS-DA model in basal ganglia was capable of distinguishing between the CHM rats and the control rats with an R^2Y of 0.969 and Q^2Y of 0.393, between the CHM rats and Mg-treated rats with an R^2Y of 0.946 and Q^2Y of -0.272, between the Mg-treated rats and the control rats with an R^2Y of 0.885 and Q^2Y of 0.364. Three metabolites in basal ganglia, glutamine, lactic acid and asparaginic acid were identified as the most influential factors for the difference between groups. The validation of the diagnosis prediction showed that the accuracy of the OPLS-DA model in basal ganglia was 95%. The OPLS-DA model in cortex was capable of distinguishing between the CHM rats and the control rats with an R^2Y of 0.941 and Q^2Y of 0.16, between the CHM rats and Mg-treated rats with an R^2Y of 0.889 and Q^2Y of 0.213. Three metabolites in cortex, glutamine, lactic acid and asparaginic acid were identified as the most influential factors for the difference between groups.
Conclusion: ^1H NMR spectra has the potential to be developed into a useful diagnostic tool that could contribute to a further understanding of the mechanism of manganism.

OR-154

Patient-derived orthotopic xenograft glioma models in mice can’t replicate the magnetic resonance imaging features of the original tumor

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Patient-derived orthotopic glioma xenograft models are important platforms for pre-clinical research of glioma. In this study, we explored whether the MRI biomakers obtained from patient-derived glioma xenografts are equally applicable to the original tumors. Seven pairs of original tumors and corresponding xenografts in NOD-SCID mice were performed conventional MRI, DWI and DCE-MRI. Tumor samples were collected for transcriptome sequencing, and differentially expressed genes were screened between original tumors and corresponding xenografts, GO analysis was performed to analyze the functions of those genes. Tumor boundary, edema around the tumor mass, intratumoral signals, contrast enhancement, rADC values and K_{trans} values of the original tumors were quite different from those of xenografts, so did the genes expression. GO analysis showed that expression of tumor cell characteristics and extracellular matrix-related genes, angiogenesis-related genes and immune-related genes in original tumors were higher than those of the corresponding xenografts. In conclusion, patient-derived orthotopic xenograft glioma models in mice can't replicate the MRI features of original tumors, and differential genes expression may be an important cause of the differences of MRI features between original tumors and corresponding xenografts.

OR-155

Radiomic features based on susceptibility weighted imaging can improve the grade classification of meningiomas

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Objectives: To investigate the value of radiomic susceptibility weighted imaging (SWI) features in the grade classification of meningiomas and whether the classification performance can be improved when combined with radiomic conventional magnetic resonance imaging (cMRI) and apparent diffusion coefficient (ADC) features.

Methods: This retrospectively study enrolled 249 low-grade [Grade I] and 109 high-grade [Grade II/III] patients with pathologically diagnosed meningiomas. Radiomic features were extracted from volume-based data of the entire tumor. Four machine-learning classifiers with nested cross-validation, including random forest (RF), k-nearest neighbor (KNN), support vector machine (SVM) and generalised linear models (GLM), were used to evaluate different radiomic models (SWI model, cMRI model, ADC model, SWI + cMRI model, SWI + ADC model, cMRI + ADC model and SWI + cMRI + ADC model). The classification performance of different radiomic models were assessed using receiver operating characteristic (ROC) analysis and areas under the ROC curves (AUC) of them were compared.

Result: According to RF classifier, the AUC of radiomic SWI model was significantly higher than radiomic cMRI or ADC model ($P<0.05$). Both radiomic SWI + cMRI model and SWI + ADC model showed higher AUCs than radiomic cMRI + ADC model ($P<0.05$). The radiomic cMRI + ADC + SWI model yielded the highest AUC (AUC = 0.877, 95% CI: 0.866

- 0.888) in the grade classification of meningiomas with sensitivity and specificity of 52% and 96%, respectively. For KNN, SVM and GLM classifiers, the radiomic cMRI + DWI + SWI models revealed the same trend toward the excellent grade classification performance but the lower AUC values (AUC = 0.845, 95% CI: 0.830 - 0.859; AUC = 0.859, 95% CI: 0.846 - 0.872; AUC = 0.843, 95% CI: 0.828 - 0.859, respectively), compared with RF classifier (P<0.05).

Conclusion: Radiomic SWI features can be useful for differentiating low-grade from high-grade meningiomas and can improve classification performance when combined with radiomic conventional cMRI and ADC features.

OR-156

Comparable efficacies in differentiating WHO grade II from III oligodendrogliomas with radiomic strategy and radiologist's evaluation

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Purpose
The treatment and prognosis of WHO Grade II and III oligodendrogliomas are different, and the preoperative diagnosis is very important, however, their imaging differentiation remains a challenge. The purpose of this study is to evaluate whether the strategies of combining T1-Weighted contrast enhanced image (T1CE) with radiomics can improve the effectiveness of differential diagnosis.
Materials and Methods
Thirty-six patients with histologically confirmed ODGs who underwent the T1CE MR examination before any intervention between January 2015 and July 2017 were recruited in the current study, including 19 cases of WHO grade II oligodendrogliomas, 17 cases of WHO grade III oligodendrogliomas. The volume of interest (VOI) covering the whole tumor enhancement region were manually drawn on the T1CE slice by slice using ITK-SNAP and a total of 1044 features were extracted using Analysis-Kinetics software. Random forest (RF) algorithm and 5-fold cross validation were applied to differentiate WHO grade II from III oligodendrogliomas. The diagnostic efficacies of radiomics and radiologist's assessment were also compared.
Results
WHO grade III oligodendroglioma tended to present with prominent necrosis and nodular/ring-like enhancement (P < 0.05). There was no significant difference between the anatomical locations: 10 cases of oligodendroglioma (10/19, 52.6%) and 10 cases of anaplastic oligodendroglioma (10/17, 58.8%) in the frontal lobe. In addition, there were no significant differences in other conventional imaging features and clinical characteristics of grade II and III oligodendrogliomas. The RF strategy with radiomics features produced the stable diagnostic efficiency, with an AUC, ACC, sensitivity, and specificity of 0.765, 76.3%, 82.8% and 70.0%, respectively. The AUCs of radiologists 1, 2 and 3 with intermediate titles were 0.700, 0.687, and 0.714, respectively. The efficacy of radiomics is comparable to that of radiologist.

Conclusions
T1-weighted contrast-enhanced image combined with radiomics offered comparable efficacy to that of radiologist in differentiating WHO grade II from III oligodendrogliomas; RF classifier model can assist clinicians in diagnosis.

OR-157

Altered whole-brain functional connectivity in patients with periventricular nodular heterotopia related epilepsy: A resting-state functional MRI study

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PURPOSE
Periventricular nodular heterotopia (PNH) is a neural migration disorder which often present clinically with seizures. Despite awareness of PNH-related epilepsy, the underlying functional pathophysiological bases of this disorder remain poorly understood. Thus, the current study aims to investigate the alterations of whole-brain functional connectivity (FC) in patients with PNH-related epilepsy using a novel graph-theory approach known as functional connectivity strength (FCS)[1]to identify brain regions displaying high-degree centrality of connectivity, which represents cortical hubs in the whole-brain networks[2].

METHODS AND MATERIALS
The resting-state fMRI sensitized to changes in the blood oxygen level dependent (BOLD) signal levels were obtained for 38 patients with PNH-related epilepsy and 38 healthy control subjects (HCS) using a 3.0 T MRI system. Image preprocessing was performed using DPABI software. Whole-brain functional connectivity analysis for FCS map calculation was implemented in REST toolbox running under Matlab. Additionally, regions with FCS alterations were selected as regions of interest (ROI) in the following seed-based FC analyses to explore more specific abnormalities of FC patterns related to the identified hubs. Pearson correlation analyses were performed to explore associations between these functional neural correlates and clinical features.

RESULTS
Compared with HCS, PNH patients showed lower FCS in bilateral insula ($P < 0.05$, family wise error (FWE) correction); higher FC in the default mode network and lower FC in the fronto-limbic-cerebellar circuits ($P < 0.05$, FWE correction). Pearson correlation analyses revealed FCS in bilateral insula were negatively correlated with the epilepsy duration (left insula: $r = -0.39$, $P = 0.016$; right insula: $r = -0.36$; $P = 0.028$).

CONCLUSION
Using the resting-state FCS analytical approach, we identified significant insular hypoactivation in PNH patients, which suggested the insula might represent the cortical hub of whole-brain networks in this condition. Additionally, disruption of

resting-state FC in large-scale neural networks pointed to a connectivity-based neuropathological process in PNH.

OR-158

A combination of dynamic community structure and machine learning methods in tracking Alzheimer's disease-related functional reorganization

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Purpose

To proposed a consensus modularization approach to detect functional modules for dynamic brain network and evaluated the algorithm by machine learning based classification.

Methods

A sample set of 50 adults, including 25 normal controls and 25 AD subjects was drawn from the Alzheimer's Disease Neuroimaging Initiative (ADNI) dataset. For each subject, resting state fMRI images were obtained. The raw fMRI data were preprocessed with SPM8 and DPARSF software package. Then the whole brain was partitioned into 90 regions using AAL atlas to obtain the brain static network. For each subject, we constructed a series of time-dependent brain subnetworks from resting-state functional MRI by sliding window, and then adopted a consensus algorithm to extract dynamic information and integrate multiple partitions corresponding to dynamic subnetworks into an optimized modularization partition. Based on the approach proposed, we analyzed the modularization of functional brain network of healthy individuals and patients with Alzheimer's disease (AD). To evaluate the results from the consensus algorithm, machine learning based classification was performed on a new AD data sets.

Results

At subject level, evaluations in normalized mutual information (NMI) suggested that approach proposed can get a consensus modular structure of brain network which contains dynamic variations of modular organization over time. On the other hand, analysis of network properties and simulations of module attack demonstrated that consensus modularization results are more in accordance with the mechanism of functional segregation and integration of the brain. In addition, AD classification results based on features from modularization also verified that the consensus modularization result did describe the key characteristics of modular organizations in AD. In group analysis, the results indicated that the consensus algorithm can extract more consistent modular information over individuals with differences and get a concordant and rational group-level modular pattern structure.

Discussion and Conclusion

The consensus modularization approach we proposed could capture dynamic brain network information and can be taken as an effective dynamic modular method.

OR-159

Quantitative susceptibility mapping based hybrid feature extraction for diagnosis of parkinson's disease

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Purpose: Parkinson's disease is the second largest neurodegenerative disease in the elderly after Alzheimer's disease. The aetiology and pathogenesis of Parkinson's disease (PD) are still unclear, but the loss of dopaminergic cells and the excessive iron deposition caused by the disorder of iron metabolism are one of the most significant factors. This phenomenon is particularly evident in the substantia nigra (SN) region of the midbrain. As an imaging technique that can quantitatively reflect the amount of iron deposition, quantitative susceptibility mapping (QSM) has been shown to be a promising modality for the diagnosis of PD. However, existing research mainly explores the signal intensity of images and does not extract specific unique imaging features. In the present work, we propose a hybrid feature extraction method for PD diagnosis using QSM images.

Methods: Eighty-seven cases of idiopathic PD (IPD) patients and 53 normal controls (NC) were collected at the Department of Radiology, Shanghai Ruijin Hospital. Data were collected using a 16 echo, gradient echo imaging sequence on a 3T GE Signa HDxt from an eight-channel receive-only head coil. QSM was reconstructed for each subject. First, we extracted radiomics features from the SN using QSM and employed machine learning algorithms to classify PD and NC. This approach allows us to investigate which features are most vulnerable to the effects of the disease. Then, we proposed a Convolutional Neural Network (CNN) based method which can extract a different kind of features from the QSM image for accurate diagnoses of PD. Finally, we combined these two types of features for the diagnosis of PD

Results: CNN gives the best classification performance: AUC = 0.93, Accuracy = 0.85, Sensitivity = 0.86, and Specificity = 0.83. Besides CNN, logistic regression and SVM also have comparable results. We combined the features extracted from the last convolution layer of CNN with the radiomics features extracted by RFE method, and re-train the LR and SVM models to get the classification results. The integration of the two features helps produce better performance in classification. With the help of radiomics features and deep features, we found that the SVM model provided the best results with the AUC. In the final experiment, we found that the radiomics features and CNN features are complementary to each other, which helps further improve the classification performance.

Conclusion: The findings from this work showed that hybrid features based on QSM of the SN from radiomics and CNN are consistent with previous histological and imaging studies, and provided reasonable diagnostic performance with AUC as high as 0.96. This may provide a comprehensive imaging diagnostic biomarker for PD.

OR-160

Signal intensity in dentate nucleus on unenhanced t1-weighted mr images does not always correlate with cumulative doses of linear gadolinium-based contrast agent: impact of whole-brain radiotherapy in patients with brain metastasis

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Objectives: To explore how whole-brain radiotherapy (WBRT) affected T1 signal intensity (SI) changes in the dentate nucleus (DN) in patients who suffered from brain metastasis (BM) and who underwent repeated exposure to linear gadolinium (Gd)-based contrast agents (GBCAs).

Materials and Methods: This study was approved by the institutional review board of Rui Jin hospital and written informed consent was waived because this was a retrospective study. A total of 32 patients with BM who had undergone WBRT (all of them received chemotherapy in addition to WBRT) and at least five GBCA-enhanced MR examinations and 32 control patients (received chemotherapy only) were enrolled. The SIs in the DN and cerebellar white matter (CWM) were measured on unenhanced T1-weighted image (UT1WI) or contrast-enhanced image (CEI). The DN/CWM ratio and its relative percentage change (R) for each patient were calculated and compared between groups. Associations of DN/CWM ratio or R with dependent variables including sex, age, total number of injection doses (IDs), number of IDs after WBRT, and radiation dose (RD) to the DNs were explored.

Results: Group 1 included 32 patients. Group 2 included 29 patients. In Group 1, DN/CWM ratio from the last UT1WI (DN/CWM_L ratio), R on CEI between before and after WBRT (R_{CEI}), or R on UT1WI between the first and last MR examination (R_{FL}) from WBRT group was higher than that from control group ($P < 0.001$ for both sides of DNs). There was a significant relationship between the DN/CWM_L ratio ($r = 0.5202$, $P = 0.0023$ for the left DNs; $r = 0.4046$, $P = 0.0216$ for the right DNs) or R_{FL} ($r = 0.4421$, $P = 0.0113$ for the left DNs; $r = 0.4268$, $P = 0.0149$ for the right DNs) and the total number of IDs. The DN/CWM_L ratio ($r = 0.6771$, $P < 0.0001$ for the left DNs; $r = 0.7528$, $P < 0.0001$ for the right DNs) or R_{FL} ($r = 0.5599$, $P = 0.0009$ for the left DNs; $r = 0.6148$, $P = 0.0002$ for the right DNs) also had a positive correlation with the number of IDs after WBRT. In Group 2, no correlation between DN/CWM_L ratio ($r = 0.3661$, $P = 0.0508$ for the left DNs; $r = 0.2184$, $P = 0.2549$ for the right DNs) or R_{FL} ($r = 0.2683$, $P = 0.1593$ for the left DNs; $r = 0.2441$, $P = 0.2019$ for the right DNs) and the total number of IDs was found. However, DN/CWM_L ratio ($r = 0.5741$, $P = 0.0011$ for the left DNs; $r = 0.6784$, $P < 0.0001$ for the right DNs) or R_{FL} ($r = 0.4224$, $P = 0.0224$ for the left DNs; $r = 0.5035$, $P = 0.0054$ for the right DNs) still had a positive correlation with the number of IDs after WBRT.

Conclusions: The promoted Gd enhancement after WBRT might indicate the increased permeability of blood-brain-barrier (BBB) to accelerate Gd leakage into the DN. SI in DN on UT1WI does not always correlate with the total number of IDs in patients with BM, possibly due to the uncertainty of irradiation time and the impact of WBRT on increasing T1 SI by extra Gd deposition.

OR-161

Localization of habenula and Gpi in pre DBS surgery patients and stimulating electrodes via unique geometric distortion artifacts in post DBS patients using MRI

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Purpose

Deep Brain Stimulation (DBS) of the lateral habenula or Gpi is one current treatment for movement disorder, refractory depression and other psychiatric diseases[1]. Placing the stimulating electrodes as close to the targets as possible is critical so that the physician can select appropriate stimulus parameters for the best patient response[2, 3]. Our goal was to set up the best MRI protocol for preoperative visualization of the habenula/Gpi and postoperative visualization of the DBS electrodes.

Materials and Methods

Two pre-DBS patients, three healthy controls and nine post- habenula/Gpi DBS patients were scanned using a 1.5T MRI scanner (Magnetom Aera; Siemens Healthineers, Erlangen, Germany). The study was approved by the ethics committee of our hospital. All participants provided written informed consent. The imaging parameters were: 1) Coronal 3D T1-weighted magnetization prepared rapid acquisition gradient echo (MPRAGE): TR/TE/TI=2200/1.94/900 ms, FA=8° , FOV= 240×240 mm^2, Matrix=320×320, slice thickness (TH)=1.5mm; 2) Coronal and transverse T2 WI: TR/TE =6590/95 ms, FA=150° , FOV= 240×217 mm2, Matrix=320×320, TH=1.5mm; 3) Transverse 3D gradient echo imaging (GRE): TR/TE1/TE2 =20/5/11 ms, FA=24° , FOV= 240×240 mm^2, Matrix=320×320, TH=1.5mm.The GRE sequence was used to collect both magnitude and phase data, and to generate quantitative susceptibility mapping (QSM) images.

Results

T1W MP-RAGE images provided detailed images of the whole brain in 3D and were able to clearly show the habenula. High resolution coronal T2W TSE images were able to show both left and right habenula thanks to the contrast with the cerebral spinal fluid (CSF). The transverse T2W TSE images were able to show the habenula clearly in two or three successive slices.The internal globus pallidus (Gpi) can be depicted in the QSM images. The GRE images were able to visualize the electrodes through the unique geometric distortion artifacts that highlighted each electrode and the end of the wire could be determined using the phase information highlighting the dipole effect. In all

cases with DBS treatment, the artifacts were consistently seen and both the location of the electrodes and the end of the wire were clearly identified.

Conclusion

In conclusion, 3D T1 MPRAGE, T2W TSE and GRE provided a rapid protocol for imaging the brain for the patients pre/post-DBS treatment.

OR-162

Noninvasive IDH1 status prediction in grade Ⅱ/Ⅲ gliomas based on conventional MRI images: a transfer learning strategy

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Purpose: This study was to evaluate the performance of transfer learning combined with the varied convolutional neural networks (TL-CNNs) in predicting the Isocitrate dehydrogenase 1 (IDH1) status of grade Ⅱ/Ⅲ gliomas using the conventional MR images.
Method and Materials: 110 pathologically confirmed grade Ⅱ/Ⅲ glioma patients receiving preoperative MR examinations of fluid attenuation inversion recovery (FLAIR) and contrast-enhanced T1-weighted images (T1CE), were retrospectively included. A random selection of 20% patients were leaved out as test dataset for external validation. AlexNet, GoogLeNet, ResNet and VGGNet, were pre-trained on the large scale natural image database (ImageNet) and fine-tuned with FLAIR and T1CE images, respectively. Then the FLAIR and T1CE network efficacies were integrated with three methods: (1) averaged sigmoid probabilities, (2) logistic regression (LR) and (3) support vector machine (SVM). Besides, fused FLAIR and T1CE images were used to fine-tune TL-CNNs.
Results: Using TL-CNNs, the areas under the ROC curve (AUCs) for IDH1 prediction of AlexNet, GoogLeNet, ResNet and VGGNet models achieved 0.660, 0.620, 0.710, 0.720 for FLAIR and 0.744, 0.656, 0.633, 0.700 for T1CE images, respectively. Besides, all three methods of integrating FLAIR with T1CE networks did not confer higher predictive values than the individual ones. However, improved performances were obtained by fine-tuning the four TL-CNNs using fused images with the AUC increased to 0.778, 0.733, 0.778 and 0.800 for AlexNet, GoogLeNet, ResNet and VGGNet models, respectively.
Conclusion: TL-CNNs (especially VGGNet) are promising in predicting IDH1 genotype of grade Ⅱ/Ⅲ gliomas. Image fusion improves diagnostic performance.

OR-163

Brain developmental differences between preterm twins and singletons: a multi-model MRI study

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Purpose

Twins studies allow the exploration of genetic influences on human brain development, e.g., the contribution of genetic factors and environment to human brain structure. The generalizability of those studies is based on the assumption that brain development in the twins is comparable to that of the singletons. Our purpose is to evaluate the structural and functional differences between preterm-born twins and singletons at term age.

Methods

Sixty-five preterm neonates (eighteen twins and forty-seven singletons) were scanned using a Siemens 1.5T Avanto MRI scanner at term age. 3D T1-weighted images, DTI and rsfMRI were acquired to evaluate the structural and functional differences. 3D T1-weighted images were segmented using a multi-atlas algorithm to gain the brain volumes. For structural connectivity, the degree, transitivity, local efficiency, global efficiency, modularity, characteristic path length and small-worldness were calculated, based on tensor-based probabilistic fiber tracking. For rsfMRI, ALFF and fALFF values were calculated, and functional connectivity were obtained using DIPABI toolbox.

Results

No significant difference in volume was found after multiple comparison correction. The MD value of cingulum cingular part, lateral fronto-orbital gyrus, cingulate gyrus as well as gyrus rectus in the twin group were significantly higher than the singleton group (adjusted $p < 0.05$), while no significant difference was found in FA values between groups. The twin brains showed a significantly higher transitivity of structural connectivity compared to the singletons, indicating increased local connectivity. For rsfMRI, although no difference was found in ALFF values, the twins showed greater fALFF values in several regions, e.g., the bilateral lateral fronto-orbital gyrus, gyrus rectus, inferior fronto-occipital fasciculus, genu of corpus callosum, etc., compared with the singletons, while while an opposite result was observed in the right middle frontal gyrus. No difference was found in functional connectivity.

Conclusion

At term age, preterm twins showed greater MD values, transitivity of structural connectivity and mfALFF of most regions with significant difference, which indicate that preterm twins may have a delayed brain development compared with preterm singletons.

OR-164

Wall enhancement on black blood MRI is an independent predictor of symptomatic status of unruptured intracranial saccular aneurysm

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Purpose: Aneurysmalwall enhancement (AWE) on high-resolution magnetic resonance imaging (HR-MRI) has been described in ruptured aneurysms and symptomatic unruptured intracranial saccular aneurysms(UIAs). However, the sample size of previous symptomatic UIA studies are very limited (n<30) and whether AWE is an independent predictor of symptoms is still not clear. This study aims to investigate whether AWE is independently associated with symptomatic status of UIA in a larger cohort of patients using multivariate analysis.

Methods:147 consecutive patients (71 male, mean age 58±11 years) with 87 symptomatic and 87 asymptomatic UIAs were recruited. Symptoms associated with UIA were carefully identified including oculomotor nerve deficit, visual acuity loss, acute/chronic headachewith a marked improvement after surgical intervention of the aneurysm and other symptoms such as hemiparesis due to brain parenchyma compression. All patients underwent 3T MRI and 3D rotational DSA. Pre- and post-contrast T_1-weighted 2D/3D black-blood fast-spin-echo MRI was performed. Scanning parameter: TR/TE 700-1000ms/10ms; resolution: 0.4mm*0.4mm in-plane and 2mm slice thickness (2D) and 0.5mm isotropic (3D). ***Image analysis:***The degree of AWE was categorized into 3 grades: grade 0 indicates no AWE, grade 1 represents enhancement less than that of the pituitary infundibulum, and grade 2 is greater than that of the pituitary infundibulum. The extent of AWE was assessed as four grades (0-3): none, focal, heterogeneous and complete enhancement. Aneurysm morphological parameters were measured on DSA, including size, aspect ratio and size ratio. Univariate and multivariate logistic regression analysis were performed to determine the factors associated with symptoms.

Results: In 87 UIAs with related symptoms, there were 6 oculomotor nerve deficit,11 visual acuity loss,31 acute headache, 33 chronic headache and 8 other symptoms. In symptomatic UIAs, aneurysm size, size ratio, enhancement ratio and extend are significantly larger than asymptomatic UIAs. In multivariate analysis, only aneurysm size (OR 1.1) and AWE (OR 20.7) are independently associated with symptoms. AWE has 92% specificity and 74% sensitivity for symptoms. Figure shows a patient with persistent headache and an ICA aneurysm with AWE.

Discussion and Conclusions: To our knowledge, this is the largest study of AWE of symptomatic UIAs. Our results agree with previous smaller studies that AWE is more common in symptomatic UIAs, which may indicate vasa vasorum and inflammation as shown in histology. The unique advantage of our study is we demonstrate AWE is an independent and strong predictor that provides additional value to the current clinical risk model. AWE is a promising marker that should be included in future clinical trials to study its potential value to improve patient outcome.

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Track-density imaging (TDI): Evaluating the peritumoral white matter areas of glioblastoma

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Purpose: Glioblastoma cell invasion may lead to peritumoral edema and cause the disruption of fibers, leading to changes in track density. This study evaluated the changes in track density of different peritumoral white matter areas to infer potential glioblastoma invasion.

Methods: 14 patients with pathologically confirmed IDH-wild-type glioblastoma were recruited. All patients underwent High Angular Resolution Diffusion Imaging (HARDI) on a 3T system (MAGNETOM Prisma, Siemens Healthcare, Erlangen, Germany) less than one week before surgery. The HARDI images were acquired using the following parameters: TR/TE =3800/72ms, FOV = 220×220mm^2, matrix = 128×128, slice thickness = 2.2mm, slices = 60, 64 directions, and b-value = 0, 3000 s/mm^2. Whole-brain track-density maps were generated using a post-processing prototype "syngo.via frontier TDI and Tractography" (Siemens Healthcare, Erlangen, Germany) [1] with the following parameters: number of tracks: 1000000, voxel resolution of TDI map: 0.5mm, degree of response function and fiber orientation density (FOD): 6*. Regions of interest (ROIs) were manually drawn around the peritumoral white matter areas according to the position (ENT: distance to tumor < 2mm; EFT: distance to tumor > 4mm; ORE: near to the boundary of edema; NWMD: area with doubtful normal white matter). Contralateral normal areas were chosen as standards of reference. The ratios between the contralateral normal white matter and peritumoral white matter areas were calculated, and named as rENT, rEFT, rORE, and rNWMD. All values are expressed as mean ± standard deviation. Comparative analyses between different areas were performed using paired-sample t-test with SPSS V21.0 (IBM Corp., Armonk/NY, USA). A value of $P < 0.05$ was considered to be statistically significant.

Results: Both rENT (0.49±0.17) and rEFT (0.60±0.21) were significantly lower than rORE (0.96±0.15) and rNWMD (1.0±0.23) (all $P < 0.05$). However, there were no significant differences between rENT and rEFT or between rORE and rNWMD (both $P > 0.05$).

Conclusions: The application of TDI can quantitatively evaluate the track density, which may be an important reference to assess tumor invasion.

OR-166

A radiomics nomogram based on multiregional features might predict MGMT promoter methylation of glioblastoma patients

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Purpose: To investigate multiregional features from multimodal MRI in reflecting O6-methylguanine methyltransferase (MGMT) promoter methylation status, and to establish visualized nomogram for MGMT methylation prediction of glioblastomas (GBM) patients.

Methods: Multimodal MRI data (T1C, T1, T2, FLAIR) of 139 GBM patients were retrospectively collected from TCIA and our institution respectively. After image preprocessing, four heterogenous subregions were manually drawn: **(1)**entire abnormality (rEA) on FLAIR image, **(2)**contrast-enhanced tumor (rCET) and **(3)**necrosis (rNec) on T1C

image. In addition, (4)the region of edema/non contrast-enhanced (rE/nCET) as defined by rEA－rCET－rNec. Then, 4000 radiomics features were extracted for all the subregions of each subject. Elastic Net Regression was used to determine the optimal features and to calculated a radiomics signature from each patient. The radiomics nomogram was constructed based on multivariate logistic regression, which integrated both radiomics signature and clinical factors. The C-index and calibration curves were used to validate generalization of the nomogram. Decision curve analysis (DCA) was performed to estimate the clinical utility of the radiomics nomogram.
Results: Among 139 patients, 92 and 47 were as training and validation cohort, respectively. The radiomics nomogram exhibited promising discrimination in the training (C-index, 0.854) and validation (C-index, 0.892) sets. The favorable calibration and DCA indicated the clinical usefulness of the radiomics nomogram. The regression coefficient analysis of optimal features showed that the sum of absolute coefficients of features from rEA and rNec areas were 1.597 and 0.766, respectively, which were larger than others.
Conclusion: The radiomics nomogram based on multiregional features from multimodal MRI was proposed in our study, and could individually and visually predict MGMT status of GBM patients. In addition, the rEA and rNec areas of GBM play an important role in the prediction of MGMT methylation.

OR-167

Patterns of gray matter volume, cortical thickness, and gyrification changes in olfactory brain regions in Parkinson's disease with and without cognitive impairment

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Objective: To investigate patterns of olfaction-related morphological changes in the GM of PD patients with and without cognitive impairment and reveal the roles of these changes in olfactory dysfunction.
Methods: 28 PD patients with cognitive impairment (PD-CI), 25 PD patients with normal cognition (PD-NC), and 25 healthy controls (HC) were recruited. The reformed Connecticut Chemosensory Clinical Research Center test was used to measure the odor threshold (OT). The GM volume alterations, cortical thickness and gyrification changes in olfactory brain areas were detected. The relationship between the abnormal MRI morphological changes and as well as between OT and the MMSE score were analyzed.
Results: The PD-CI patients showed significant GM volume reduction in the left hippocampus and thalamus, the right inferior orbitofrontal cortex (OFC) and insular cortex, and the bilateral parahippocampal cortex (PHC). The PD-CI patients showed more GM atrophy than the PD-NC patients in the OFC. The PD-CI patients showed significant cortical thinning in the left PHC, and the obvious cortical thinning was observed in the left PHC in PD-CI patients. The PD-CI patients showed significantly decreased gyrification in the left entorhinal cortex and the left PHC . The more decreased

gyrification was observed in the left lateral OFC, the right PHC, and the right entorhinal cortex in the PD-CI patients. Positive correlations were observed between the cortical thickness in the left PHC and the left OT, the right OT, the average OT in the PD-CI patients.

Conclusions: The PD patients had heterogeneously distributed patterns of decreased GM volume, as well as reduced cortical thickness and gyrification in olfaction-related brain areas. The PHC and the OFC may represent the key role of the primary olfactory cortex in olfactory dysfunction in PD patients.

OR-168

Elevated hemoglobin a1c is associated with intracranial plaque enhancement: novel findings from magnetic resonance imaging study in stroke patients

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PURPOSE

Few study reported the association between Hemoglobin A1c (HbA1c) level and intracranial plaque vulnerability by magnetic resonance imaging (MRI). The present study of MRI-identified intracranial atherosclerotic lesions in patients with ischemic symptom therefore sought to determine the association between HbA1c level and intracranial plaque morphological and compositional characteristics and cerebral infarction severity.

METHOD AND MATERIALS

108 patients with intracranial ischemia were recruited. All patients were stratified into high (>6.5%) and low (<6.5%) HbA1c groups and underwent both intracranial vessel wall MRI and brain MRI scans. Intracranial plaque features and intracranial ischemic lesions were assessed.

RESULTS

More intracranial plaques (2.38±1.50 vs. 0.96±0.75, P=0.001), higher incidence rate of intracranial symptomatic plaque enhancement (88.24% vs. 45.95%, P=0.001), more acute cerebral infarct (50.00% vs. 25.67%, P=0.013) and more recurrent infarct (67.65% vs. 45.95%, P=0.036) were in the high as compared to the low HbA1c group. High HbA1c was the independent risk factor for the presence of intracranial symptomatic plaque enhancement [odds ratio (OR)=7.05].

CONCLUSION

Our study suggested that an elevated HbA1c might have an adverse effect on intracranial plaque enhancement, which might induce acute cerebral infarct.

OR-169

Individualized structural radiomics biomarkers for diagnostic and prognostic prediction of alzheimer's disease

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Background: Hippocampal is an established structural marker in patients suspected with dementia disease, and its measurement has been shown to improve diagnostic confidence. Structural MRI is able to offer multi-dimensional information about the underlying pathology related to differential diagnosis. Here we tested utility of structural radiomics biomarkers in predictive modeling of AD.
Methods: Open source ADNI-2 data were used as a train set: 109 individuals with the baseline structural MRI were included (49 AD, 22 MCI-to-AD converter and 38 stable MCI). Automated hippocampal segmentation was performed by freesurfer and individualized structural radiomics biomarkers were computed by using self-developed software. Machine learning models were trained on the train set and tested on the test set which consists of 60 AD confirmed by two chief physicians of our hospital.
Results: The experimental results demonstrate that random forest model achieved an encouraging performance with accuracy (ACC) value of 89.75% (AUC=0.886, 95% CI = 0.847-0.925) for the diagnostic and prognostic prediction of AD.
Conclusions: The combination of structural MRI and radiomics can support clinical decision making in diagnostic and prognostic prediction of AD.

OR-170

A preliminary in vivo study of oxidative stress levels in multiple sclerosis (MS) lesions by proton exchange rate (Kex) MRI imaging

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Background and Purpose:Oxidative stress has been reported to play an important role in the pathogenesis of MS recent years, which requires further in vivo research to confirm. In this study, we aim to investigate the oxidative stress levels in MS lesions by proton exchange rate(Kex) MRI imaging.
Materials and Methods:16 MS patients were included in this IRB-approved study.All patients underwent T1WI,T2WI,T2FLAIR, contrast-enhanced and single-slice Kex mapping sequences on a 3.0-T MR scanner.MS lesions were identified by T2 hyperintensities.All MS lesions were classified into two groups, the enhanced group and the non-enhanced group, based on their performance on the enhanced sequence.Two neuroradiologists

reviewed all the images and evaluated the signal changes of the MS lesions on the Kex images based on visual impressions. Differences between the two groups were analyzed with the x2 test.
Results: A total of 152 MS lesions were identified in 16 MS patients, of which 77 (50.7%) were enhanced, and 75 (49.3%) were not enhanced. In the enhanced group, all lesions (100%) showed increased signal on the Kex compared to the normal white matter area.In the non-enhanced group, 53 (70.7%) lesions showed increased signal on Kex, and 22 (29.3%) lesions showed similar signals on Kex with normal white matter. There was a statistically significant difference in the performance of the two groups on Kex ($p < 0.001$).
Conclusion: In the enhanced group,all MS lesions showed an increased signal on Kex,which indirectly reflects that oxidative stress is closely related to the pathogenesis of acute active MS lesions. In the non-enhanced group, some of the MS lesions showed an increased signal on Kex,but some did not, the difference may indicate that they are in different sub-stages of non-acute MS lesions,Such as chronic active phase and chronic quiescent phase that cannot be identified on T1 enhancement sequence,which needs further longitudinal studies and pathology to confirm.

OR-171

Pineal volume in subjective cognitive decline diseases: a mr imaging study with pineal gland abnormality in SCD

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BACKGROUND:
Subjective cognitive decline (SCD) refers to the decrease of patients' subjective evaluated cognitive function level, but the objective neuropsychological examination is usually normal. SCD patients are often suffering from cognitive, irritability, sleep and language disorders. Melatonin, which is secreted by the human pineal gland, is positively related to pineal parenchymal volume. Melatonin is responsible for the regulation of the antioxidant defense, immune response, neuroprotection, antiamyloid effect, and antiapoptotic activity. The aim of the present study was to evaluate and compare pineal gland volumes in SCD patients and healthy controls as well as to correlate the results of cognitive testing and brain volumes.
SUBJECTS AND METHODS:
Pineal gland volumes of 64 cases were retrospectively evaluated, including 30 cases of SCD patients and 34 age, sex and BMI matched healthy controls (HC), in which 24 were women. The total pineal gland volume of all cases was measured via three-dimensional volumetric magnetic resonance imaging (T1-weighted magnetization-prepared rapid gradientecho sequence, sagittal view) by using 3D slicer software, and the total mean pineal volume of each group was compared. Images were segmented into gray matter (GM), white matter (WM) and cerebrospinal fluid (CSF) with a bias field correction by using Statistical Parametric Mapping 8, then total brain volumes were evaluated. Cognitive

function was evaluated by using Mini-Mental State Examination (MMSE) and Montreal Cognitive Assessment (MoCA).
RESULTS:
The mean pineal volume in patients with SCD (90.55±45.11mm³) was smaller than that in health controls (110.73±52.90 mm³). Multiple regression analyses demonstrated that the pineal volume was negatively correlated with most psychological measurements.
CONCLUSIONS:
The results of our study demonstrated that pineal volume in patients with SCD was smaller than that in healthy control subjects, and pineal gland volume is negatively related to emotional disorders. We hypothesize that volumetric changes in the pineal gland of SCD patients may be involved in the reduced melatonin secretion in these patients. Further studies will be necessary to investigate the potential role of the pineal gland in the pathophysiology of SCD.

OR-172

Whether bone marrow mesenchymal stem cell can treat the glioma growth in vivo studied by MR

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Objective To investigate whether Mesenchymal Stem Cell for the treatment of glioma in vivo is helpful.
Methods we used ferritin gene to track the BMSCs by 7.0T combined with MRI and metabolite concentration of Cholineto investigate the effect of BMSCs on tumor growth by MRS in a rat model of C6 glioma. BMSCs transfected by Ad-GFP-FTH were intertumoral injected in rats model of C6 glioma. Before, after intertumoral injections 3 and 7 day, MRS were performed on central and border of tumor.
Results After Intertumoral orthotopic injection, Ad-GFP-FTH-BMSCs were detected as hypointense signals on a 7.0T MRI of T2WI, migrated from the center to the tumor border, as confirmed by histology. The metabolite concentration of Cho is no obviously different between the experimental and control groups.
Conclusions BMSCs could migrate to the tumor border and showed no promotional impact on the progression of the tumor.

OR-173

探测基于傅里叶变换的速度选择性动脉自旋标记成像对 ATT 的敏感性：与 PCASL 和 DSC-PWI 的对比研究

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目的 基于傅立叶变换的速度选择性动脉自旋标记（Fourier-Transform based Velocity-selective ASL, FT-VSASL）是一种对灌注信号具有高灵敏度的灌注成像方法[1]，原则上可以消除动脉通过时间(ATT)延迟的问题。本研究目的是采用 DSC 残余函数的峰值时间 Tmax 参数[2]评估 FT-VSASL 对 ATT 的敏感性。
方法 前瞻性收集经病理证实的 14 例高级别胶质瘤 HGG 的 MRI 资料。除常规序列外，MRI 检查还包括 DWI 和 3 个灌注序列（VSASL、PCASL 和 DSC-PWI）。使用 Matlab 及 Olea Sphere 软件进行量化处理。在 Gd-TIWI 上选取 15 个 ROI(瘤核心区 10 个，瘤周脑区 5 个)并配准到 ASL/DSC CBF 和 DSC Tmax 图。采用配对样本 t 检验比较 HGG 瘤核心和瘤周脑区的 DSC CBF 和 Tmax 值。采用 spearman 相关系数评估瘤核心 ASL CBF 与 DSC CBF、ASL/DSC CBF 与 DSC Tmax 的关系。根据 Tmax 测定不同区域内 ASL 和 DSC-PWI 技术之间在 HGG 瘤核心区平均 CBF 值的测量误差，以评价 ASL 法对 ATT 的敏感性。
结果 瘤核心区 CBF 值明显高于瘤周脑区(P<0.001)，瘤核心区 Tmax 大于瘤周脑区，但差异无统计学意义(P=0.167)。与 PCASL 相比，VSASL 与 DSC CBF 的相关性更高(r=0.67 vs 0.65)，而 VSASL、PCASL 及 DSC CBF 均与 DSC Tmax 呈负相关(r 为-0.47、-0.57 和-0.42)。根据 Tmax 值分组，140 个 ROI 中，0-2s 区占 41.4%、2-4s 区占 50%及＞4s 区占 8.6%。VSASL CBF 的定量对 Tmax 的敏感性最小，而随着 Tmax 增加，误差趋于减小。
结论 HGG 瘤核心亦存在大部分血流缓慢区域；VSASL 对 ATT 的敏感性低于传统 ASL 技术，在慢血血流 CBF 定量具有前景。

OR-174
基于全脑白质磁共振影像组学预测脑白质高信号进展及其相关危险因素分析

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目的 基于全脑白质的 MR 影像组学预测脑白质高信号(WMH)进展及其相关危险因素分析。方法 回顾性分析行两次头颅 MRI 检查的 152 例患者资料，选取每例患者的基线 T1WI 图像使用 SPM12 软件包切割出全脑白质并导入 MTK 分析软件进行纹理特征提取和降维，最终使用最小绝对收缩与选择算子算法（LASSO）计算每例患者的影像组学标签值。依据改进 Fazekas 量表将 WMH 进展患者分为任何区域进展（AWMH）、侧脑室旁高信号进展（PWMH）和深部高信号进展（DWMH）三种状态，比较各个状态 WMH 进展亚组和非进展亚组之间各临床因素和影像组学标签值差异，使用多变量逻辑斯回归结合影像组学标签构建预测模型，使用 ROC 曲线评估模型诊断效能，同时分析独立危险因素的临床指标与构建影像组学标签纹理值的相关性。结果 预测 AWMH 进展、PWMH 进展和 DWMH 进展的影像组学模型的 ROC 曲线下面积分别为 0.818、0.778 和 0.824。其中年龄是 AWMH 进展和 DWMH 进展的独立危险因素，体质指数是 DWMH 的独立危险因素，高脂血症是 AWMH 和 PWMH 的独立危险因素。 在 AWMH 亚组中，SurfaceArea 与年龄和低密度脂蛋白呈负相关（r=-0.401, -0.312），InverseDifferenceMoment_ALLDirection_offset1_SD 与年龄呈负相关（r=-0.412）。在 PWMH 亚组中，Compactness1 与低密度脂蛋白呈负相关（r=-0.198），InverseDifferenceMoment_angle0_offset7 与低密度脂蛋白呈正相关（r=0.252）。结论 基于全脑白质影像组学可以预测 WMH 进展并确立高风险人群的危险因素，可以为常规磁共振预测 WMH 进展提供早期额外信息。

OR-175

Feasibility of diffusion tensor imaging in the evaluation of the long-term efficacy of hyperbaric oxygen therapy in rats after traumatic spinal cord injury with different degrees of injury

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Objective: This study explored the feasibility of diffusion tensor imaging (DTI) in the evaluation of the long-term efficacy of hyperbaric oxygen (HBO) therapy in rats after traumatic spinal cord injury (TSCI) with different degrees of injury.
Method: Adult Sprague-Dawley rats (totally n = 90) were randomly separated into mild, moderate and severe TSCI groups (30 rats per group). Each group was then randomly divided into sham-operated (SH), TSCI and TSCI+HBO subgroups (10 rats per subgroup). Basso Beattie and Bresnahan (BBB) scores and DTI parameters including fractional anisotropy (FA), mean apparent diffusivity (MD), radial diffusivity (RD) and axial diffusivity (AD) were collected at pre-TSCI and at 0 h, 6 h, 24 h, 3 d, 7 d, 14 d, 21 d, 28 d and 56 d post-TSCI. Two-way repeated measure analysis of variance was used for comparison between the TSCI and TSCI+HBO subgroups over time in mild, moderate and severe TSCI groups. Pearson correlation analysis was applied to analyze the correlations between BBB scores and DTI parameters.
Results: BBB scores, FA, MD and RD values showed significant differences between the TSCI and TSCI+HBO subgroups over time in mild, moderate and severe TSCI groups (all $P < 0.01$). FA, MD and RD values were positively correlated with BBB scores in all TSCI and TSCI+HBO subgroups (all $P < 0.05$).
Conclusion: DTI parameters, especially MD, could quantifiably assess the long-term efficacy of HBO therapy and reflect the functional recovery in rats after TSCI with different injured degrees.

OR-176

Alteration of brain resting state-function connectivity in patients with neuropathic pain after complete spinal cord injury: a pilot MRI study

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Purpose
To investigate brain resting-state function connectivity (FC) alterations related to neuropathic pain (NP) after complete spinal cord injury (CSCI), and to further study their associations with severity of NP.
Materials and methods

Ten patients with complete SCI (5 with NP and 5 without NP) and ten age- and sex-matched healthy controls (HCs) were recruited. Resting-state fMRI data were obtained using a 3.0 Tesla MRI system. The regional homogeneity (ReHo) value of each voxel in the brain was calculated and compared between patients with CSCI and HCs, and between the SCI sub-groups (SCI-pain and SCI-no pain). The significantly changed ReHo regions were set as regions of interest (ROIs) for the whole brain FC analysis. The correlations between the ReHo change and the severity of pain were also determined.

Results

There was no ReHo value differences in brain between HCs and patients with CSCI. Compared with the SCI-no pain (SCI-N) group, the ReHo values of the bilateral calcarine cortex and left lingual gyrus significantly increased in patients with SCI-Pain (SCI-P) (**Fig. 1**). The ReHo values of anterior cingulate cortex and right fusiform gyrus decreased (**Fig. 2**). When the changed ReHo regions were set as ROIs, the FC in right paracentral lobule, right tri-inferior-frontal gyrus, bilateral mid-frontal cortex and bilateral calcarine cortex increased (**Fig. 3**). Subsequent correlation analyses revealed that increased ReHo values in bilateral calcarine cortex and left lingual gyrus positively correlated with the VAS score (**Fig. 4**). Whereas decreased ReHo values in anterior cingulate cortex and right fusiform gyrus negatively correlated with pain intensity (**Fig. 5**).

Conclusion

In conclusion, CSCI can change the regional synchronism of brain activity in the visual network. Further, the FC between the visual network and somatosensory areas was significantly enhanced in SCI-P group. These findings may help us to understand the potential pathophysiological changes in the central nervous system under pain condition after CSCI.

OR-177

Comparison of the ultrasound and MRI in the detection of fetal corpus callosum abnormalities

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Purpose: To compare the accuracy of ultrasound and MRI in the detection of fetus corpus callosal (CC) agenesis.

Materials and methods Pregnant women with prenatally suspected with fetal CC agenesis screened by ultrasound were enrolled in this retrospective study. All the subjects underwent fetal brain ultrasound and MRI examinations, and the results were confirmed by pathology or postnatal neuroimaging. The CC abnormalities were classified into six groups, including isolated complete agenesis of the corpus callosum (CACC), isolated partial agenesis of the corpus callosum (PACC), isolated hypoplasia of the corpus callosum (HCC), CACC, PACC, and HCC respectively with additional intracranial malformations. The findings detected on ultrasound and MRI were compared to pathology or postnatal neuroimaging. Chi-square test was used to compare the diagnostic accuracy between ultrasound and MRI.

Results: A total of 375 fetuses were included in the final analysis, which comprised of 173 cases of isolated CACC, 39 cases of isolated PACC, 41 cases of isolated HCC, 45 cases of CACC with additional abnormalities, 29 cases of PACC with additional abnormalities, 11 cases of HCC with additional abnormalities, and 37 normal fetuses.The diagnostic accuracy of US for isolated CACC, PACC, HCC; CACC, PACC, HCC with additional malformations were 84.4%, 69.2%, 58.5% and 68.9%,51.7%,45.5%, respectively. The total accuracy of US was 66.1% (248/375). The diagnostic accuracy of MRI for isolated CACC, PACC, HCC; CACC, PACC, HCC with additional malformations were 100.0%, 87.2%, 90.2%,93.3%,86.2%, and 81.8%, respectively. The total accuracy of MRI was 95.2% (357/375). MRI was more sensitive than ultrasound (MRI 96.2%, ultrasound 66.1%) in the diagnosing fetal corpus callosum abnormalities. Chi-square test showed there was significant difference in the diagnostic accuracy between MRI and Ultrasound with p-value<0.0001.

Conclusion: MRI enables a precise demonstration of the normal and abnormal fetal corpus callosum,and is significantly better than ultrasound in the diagnosing of CC abnormalities, is an effective complement of ultrasound. Also, fetal MRI can be helpful to assess for associated anomalies and enhance prognostic counseling.

OR-178

基于静态 fMRI 的原发性闭角型青光眼脑功能连接密度改变的研究

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目的 利用基于体素的功能连接密度(functional connectivity density，FCD)图方法观察原发性闭角型青光眼(Primary Angle-Closure Glaucoma，PACG)患者静息状态下脑网络水平各脑区重要程度的异常改变，并评价其与各临床指标等的相关性。

材料与方法 搜集 45 例 PACG 患者(53.28 ± 10.79 岁)及 46 例年龄、性别相匹配的健康志愿者(52.67±11.01 岁)静息态功能磁共振(resting state functional MRI, rs-fMRI)数据和相关眼科检查的数据，包括眼内压、视神经纤维层厚度、垂直杯盘比和水平杯盘比。所得 fMRI 数据利用基于 Matlab 平台的 DPARSFA 软件进行预处理，利用其度中心度选项计算出长程及短程 FCD 值计算出组间差异脑区，同时取长程功能连接有显著差异的脑区为感兴趣区计算与全脑的功能连接。最后分析有差异的脑区 FCD 值与各项临床指标的相关性。

结果 PACG 组及 HC 组长程及短程 FCD 的组内空间分布基本相同。与 HC 组相比，PACG 组双侧大脑半球额下回、左侧大脑半球边缘叶、海马旁回、右侧大脑半球岛叶表现为短程 FCD 显著上升，枕叶、楔叶、楔前叶、上顶叶、中央后回表现为短程 FCD 显著减低；在右侧额中回的长程 FCD 显著增高(以上结果均经过 GRF 矫正，体素水平 $p<0.01$，簇水平 $p<0.05$)。长程 FCD 下降的脑区与右侧额中回的 rsFC 减弱。并且短程 FCD 减低脑区与视神经纤维层厚度呈正相关，双侧短程 FCD 升高脑区与水平杯盘比呈正相关。

结论 PACG 患者具有广泛的脑功能连接异常，长程和短程 FCD 具有不同的空间分布，进一步证明异常长程和短程 FCD 在 PACG 患者大脑中具有不同的意义。

OR-179

Structural MRI-based atlas of scalp-to-cortex distance: the implications for non-invasive brain stimulation

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Objective: Non-invasive brain stimulation (NIBS), including transcranial electrical stimulation (tES) and transcranial magnetic stimulation (TMS), encompass a broad array of treatments that target a variety of brain regions to achieve desired outcomes in psychiatric disorders [1]. It should be noted that NIBS use coils or electrodes placed on the scalp to deliver a magnetic or electrical current through the scalp to the cortex where the power levels are attenuated with the distance. Scalp to cortex distance (SCD), as a key parameter, has been shown to impact on the electric fields induced by NIBS. There remains a dearth of data on how SCD differs between different cortical regions. Thus, this study aimed to examine the region-specific SCD in individuals with young age, middle age and old age.
Methods: In 2018, we launched an MRI-based project named as “Localized Analysis of Normalized Distance from Scalp to Cortex and Personalized Evaluation” (LANDSCAPE) to systematically investigate the region-specific SCD [2]. We analyzed the SCD of left dorsolateral prefrontal cortex (DLPFC) and primary motor cortex (M1) in 643 cognitively normal adults from the Cam-CAN database. We localized the left M1 using the Montreal Neurological Institute (MNI) coordinates as [x=-42, y=-16, z=68], and left DLPFC using the MNI coordinates as [x=-46, y=45, z=38]. The SCD was directly measured in the Brainsight system as the distance from scalp to cortex. Computational head model was developed to simulate the impact of SCD on the electric field.
Results: Gender ratio and global brain volume among four groups were similar. We found age-related increased SCD in the left DLPFC ($p < 0.001$), but not M1 ($p = 0.134$). The electric field induced by stimulation was consequently decreased with the increased SCD across normal aging individuals.
Conclusion: Impetus for measuring SCD has largely focused on understanding and optimizing the key parameter in NIBS combined with individual MRI data. By using a localized and normalized measurement, we presented that age have differential impacts on the SCDs of left DLPFC and M1. The findings suggest that it is important to be aware of region-specific distance measures when conducting neuromodulation in individuals with old age, such as life-life depression.

OR-180

Imaging the nigrosome 1 in the substantia nigra using susceptibility weighted imaging and quantitative susceptibility mapping: application to parkinsonism and essential tremor patients

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Parkinson's disease (PD) is a clinically heterogeneous chronic progressive neuro-degenerative disease with loss of dopaminergic neurons in the nigrosome 1 (N1) territory of the substantia nigra pars compacta (SNpc). To date, there has been an effort to identify changes in the N1 territory by monitoring increases of iron in the SNpc. However, there is no standard protocol being used to visualize or characterize the N1 territory. Therefore, the purpose of this study was to determine an optimal imaging protocol, create a slice by slice characterization of the appearance of N1 (the "N1 sign") and evaluate the loss of the N1 sign in order to differentiate healthy controls (HC) from patients with PD. Firstly, 6 healthy controls (HCs) were used to determine an optimal imaging protocol. Secondly, 80 HCs were used to characterize the appearance of the N1 sign and train the raters. In this step, the magnitude, susceptibility weighted images (SWI), quantitative susceptibility maps (QSM) and true SWI (tSWI) images were all reviewed using data from a 3D gradient recalled echo sequence. A resolution of 0.67 x 0.67 x 1.34 $mm^3$was chosen based on the ability to cover all the basal ganglia, midbrain and dentate nucleus with good signal-to-noise with echo times of 11ms and 20ms.Thirdly, 80 PD patients and 80 age matched HCs were blindly analyzed for the presence or absence of the N1 sign for a differential diagnosis. Of the first 80 HCs, 76 (4 were excluded due to motion artifacts) showed the N1 sign in one form or another after reviewing the first 5 caudal slices of the SN. For the second 80 HCs, 78 showed the N1 sign in at least 2 slices. Of the 80 clinically enrolled PD cases, 32 PD and 6 PD syndrome (PDS) showed a bilateral loss of the N1 sign, 12 PD and 6 PDS showed the N1 sign unilaterally and 13 PD and 2 PDS showed the N1 sign bilaterally. Also, all 9 essential tremor (ET) patients showed the N1 sign bilaterally. The mean total structure and mean high iron content region susceptibilities for the SN for both PD and PDS patients with bilateral loss of N1 were higher than those of the HCs ($p< 0.002$). In conclusion, the N1 sign can be best visualized using tSWI with a resolution of at least 0.67 x 0.67 x 1.34 $mm^3$and can be seen in most HCs. The fact that not all PD subjects show bilateral loss of the N1 sign may help understand why some PD patients still show normal levels of iron content in the SN.

OR-181

The relationship of arterial wall enhancement ratio on MRI with the degree of inflammation in a rabbit aneurysm model: a pilot study

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Objectives: To identify the relationship between enhancement ratio (ER) of aneurysm walls and degrees of inflammation.
Materials and Methods: Twenty-five white rabbits were used in this study; all underwent surgery to isolate the right common carotid artery (RCCA). Twenty rabbits

underwent an aneurysm creation procedure, and 5 underwent a control procedure. In the aneurysm creation procedure, there was surgical exposure of the origin of RCCA and temporary occlusion with an aneurysm clip. The distal RCCA was ligated, and the trapped segment was infused with elastase for 20 minutes, after which the clip was removed. In the control procedure, the trapped segment was infused with saline. High-resolution magnetic resonance imaging (HRMRI) was performed at weeks 2, 3, 4, and 5 after the procedure, and wall ER was calculated. After MRI, aneurysms were harvested and stained with hematoxylin-eosin. Pearson correlation analysis and scatter plots were used to evaluate the relationship between wall ER and the degree of inflammation. The relationships between the wall ER, the number of inflammatory cells and time were analyzed by linear graphs.

Results: Wall ER positively correlated with inflammatory cell count of the aneurysm wall (r=0.877, P<0.001). The relationships between wall ER, the number of inflammatory cells and time increased and then decreased according linear graphs.

Conclusions: In this study, the aneurysm wall ER was confirmed to be associated with the degree of inflammation on the rabbit aneurysm model.

OR-182

Multi-delay ASL with reduced-resolution pre-scan transit time maps for assessment of cerebral perfusion in Moyamoya disease: Comparison with conventional 3D-ASL

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Background and Purpose: The cerebral hemodynamics of Moyamoya disease (MMD) is complex, and conventional arterial spin labeling (ASL) with fixed post-labeling delay (PLD) time can easily misestimate the cerebral perfusion. We aimed to explore the value of a multi-delay ASL with a reduced-resolution pre-scan transit time (TT) maps in obtaining cerebral perfusion information in MMD, compared to the conventional 3D-ASL.

Materials and methods: Forty-six patients with MMD underwent both multi-delay ASL and 3D ASL-MRI. All brain regions based on the Automated Anatomical Labeling (AAL-90) atlas were divided into five groups according to the TT values measured in TT maps from multi-delay ASL-MRI. The cerebral blood flow (CBF) values in 4140 brain regions in all patients were also measured.

Results: The CBF values in multi-delay ASL and 3D-ASL were significantly different ($p<0.001$). At TT ≤ 1000 ms, 1000 ms <TT ≤1500 ms, and 1500 ms <TT ≤ 2000 ms, the respective CBF values in multi-delay ASL were lower than the corresponding CBF values in 3D-ASL value ($p<0.001$ for all comparisons). However, at 2000 ms < TT ≤2500 ms, the multi-delay ASL value was higher than the 3D-ASL value ($p<0.001$). Although the fifth group (TT>2500 ms) included only five brain regions of three patients, the CBF values from multi-delay ASL were all higher than those from 3D-ASL.

Conclusion: The CBF can be corrected by using a series of low-resolution TT maps from the multi-delay ASL-MRI. This approach possibly provides more accurate cerebral perfusion information for assessment of MMD.

OR-183
基于磁共振影像的烟雾病直接血管重建术血流灌注定量分析

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目的 烟雾病是一种病因不明、以双侧颈内动脉末端及大脑前动脉、大脑中动脉起始部慢性进行性狭窄或闭塞为特征，并继发颅底异常血管网形成的一种脑血管疾病。颅内外血管重建手术是烟雾病和烟雾综合征的主要治疗方法。烟雾病患者脑内血流动力学的病理性改变十分复杂多变，利用多模态神经影像可以对烟雾病患者大脑血流灌注特性的改变进行检测和量化分析，这对于手术预后有重要意义。
方法 本研究针对烟雾病患者直接血管重建术的术后评估，提出了基于磁共振神经影像的精准定量评估分析方法。本研究使用 Brain Label 影像处理云平台对 T1 影像进行自动分割。基于最精细的分割粒度，对受试者的大脑中动脉流域和流域内重要功能脑区进行自动分割。通过 T1 和 ASL 影像之间的配准，可以对每个受试者的动脉流域以及流域内灌注的功能脑区血流灌注特性进行量化分析。在 ASL 使用单一标记后延迟时间参数的情境下，本研究使用空间变化系数检测局域动脉血流到达时间的异常。本研究含 47 名受试者，其中 27 名术前基线影像采集数据和基线后 8.00±3.69 天的短期随访影像数据；20 名术前基线影像采集数据和术后 164.10 ± 81.29 天的长期随访影像数据。
结果 在直接血管重建术后长期随访时间点，非术侧脑区血流灌注未呈现显著变化。在手术侧，中动脉灌注的皮层脑区，呈现显著血流灌注的改善。然而在术侧神经核团区域，呈现接近显著的灌注下降，此现象可能与该区域内代偿性增生的烟雾状异常血管网的退化有关。在术后短期随访发现，非术侧大脑中动脉区域和颞上回区域呈现接近显著的灌注下降（p 值分别为 0.07 和 0.06），在颞中回区域呈现显著的灌注灌注下降（p 值为 0.03）。而在手术侧，顶上小叶区域呈现显著血流灌注的改善（p 值为 0.02）。
结论 此结果表明 MCA 流域各功能脑区手术后灌注恢复状况并不一致，与术后量表等诊疗信息深度融合将能够更好地进行手术预后评估。

OR-184
高分辨磁敏感图加权成像（SMWI） 对帕金森病和帕金森叠加综合征的诊断价值

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目的 基于高分辨磁敏感图加权成像（SMWI）评估双侧黑质“燕尾征”对帕金森病和帕金森叠加综合征的诊断价值。**材料与方法** 2017 年 9 月-2019 年 1 月在复旦大学附属华山医院前瞻性搜集临床确诊帕金森病（PD）患者 35 例、进行性核上性麻痹（PSP）13 例、多系统萎缩（MSA）10 例、以及性别年龄相匹配的正常人 26 例，对其行高分辨定量磁敏感加权成像（QSM），并重建为高分辨（1×1×1mm）的 SMWI 图像。由两名高年资医生对双侧黑质“燕尾征”进行双盲的视觉评价，完全

消失为 0 分，部分消失（仅一个层面显示）为 1 分，清晰显示（至少两个层面显示）为 2 分。两位医生的评价一致性采用肯德尔检验，组间比较采用卡方分析及非参数 Kruskal-Wallis 检验，并以双侧黑质“燕尾征”消失作为诊断标准，对早期 PD 和 PD 叠加综合征进行敏感性、特异性和准确性的分析。统计软件采用 STATA (SE15.1),$p<0.05$ 为显著统计差异。**结果** 两位医生对左、右侧黑质“燕尾征”评价的一致性相关系数分别为 0.776 和 0.838。以双侧黑质“燕尾征”消失作为标准，诊断帕金森叠加综合征（含 PD,MSA,PSP）的敏感性、特异性及准确率分别为 63.79%， 100%，75%；诊断早期 PD 的敏感性、特异性及准确率分别为 56.25%， 100%，75.86%。双侧黑质“燕尾征”消失在 PD,MSA,PSP 三组中具有显著差异（ $p=0.011$）,比例分别为 60%，40%和 92%。单侧黑质“燕尾征”部分消失在诊断早期 PD 的敏感性、特异性及准确率分别为 96.88%，88.46%，93.10%。**结论** 双侧黑质“燕尾征”消失是一种高特异性的诊断帕金森综合征的影像学标记物，在帕金森病及帕金森叠加综合征的鉴别诊断中也具有潜在价值。单侧黑质“燕尾征”部分消失可作为诊断早期帕金森病的影像学标记物，具有很高的敏感性。

OR-185
DWI 梗死体积与体积增长在评估卒中血管再通术后预后中的价值

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【摘要】目的 探讨 DWI 梗死体积及梗死体积增长在预测卒中血管再通术后的预后中的价值。方法 前瞻性纳入在我院接受血管再通治疗的急性脑卒中患者 38 例。所有患者发病时间为 6h，均于治疗前及治疗后 24h 内接受 MRI 检查。收集治疗前弥散张量成像（diffusion-weighted imaging；DWI）梗死体积（VDWI）、治疗后 VDWI、梗死体积增长（VDWI-G）、3 个月功能功能预后（mRS 评分）及一般临床资料。统计学分析预后良好组与预后不良组间各参数差异及 DWI 梗死体积及梗死体积增长在预测卒中预后中的价值。结果 38 例患者中 23 例（60.53%）预后良好，15 例（39.47%）预后不良。与预后不良组相比，预后良好组具有较小的治疗 VDWI(13.54±15.17 vs 59.32±53.27；$p=0.000$)、较小的治疗后 VDWI(28.04±21.72 vs 107.69±90.37；$p=0.000$)及 VDWI-G 较小(14.50±17.88 vs 48.37±42.89；$p=0.010$)。Spearman 相关分析显示治疗前 VDWI($r=0.414$，$p=0.010$)、治疗后 VDWI($r=0.486$，$p=0.002$)、VDWI-G($r=0.467$，$p=0.003$)均与 3 个月 mRS 间呈正相关。ROC 分析显示当治疗前 VDWI 的最佳临界值为 33.50 时，预测卒中功能预后的敏感性和特异性分别为 60%和 95.65%；当治疗后 VDWI 的最佳临界值为 32.80 时，预测卒中功能预后的敏感性和特异性分别为 80%和 78.26%；当 VDWI-G 的最佳临界值为 13.2 时，预测卒中功能预后的敏感性和特异性分别为 86.7%和 60.87%。结论 综合评估治疗前 DWI 梗死体积、治疗后 DWI 梗死体积及 DWI 梗死体积增长可有助于预测血管再通治疗的卒中患者的功能预后。

OR-186
帕金森病扣带回结构与功能网络的改变及其代偿关系

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目的 ：帕金森病(PD)是第二大神经退行性疾病，其相关的脑改变并不局限于某个孤立的区域，而是存在于多个脑区构成的网络之中。因此探索帕金森病大尺度结构和功能网络的变化对理解疾病机制非常重要。此外，进一步探索结构网络破坏是否引起功能代偿效应具有重要意义。

方法 ：本研究纳入 104 例 PD 患者和 77 例健康对照。采用基于形变的形态学测量和独立成分分析(ICA)对 PD 患者和正常对照的大尺度结构网络进行比较。然后，对受试者的功能磁共振数据进行相同成分数（20）的 ICA 分析。选择与破坏的结构网络空间重叠性最好的组分作为相应的功能网络，评估 PD 患者功能连接的变化。并进一步评估结构网络的共变性与功能连接强度之间的关系。最后，对 37 例随访 PD 进行纵向分析（15 个月），进一步验证其结构网络和功能网络的改变。
结果 ：与健康对照相比，PD 患者扣带回网络的结构共变性下降。且扣带回结构网络和与认知密切相关的默认模式网络(DMN)具有较好的空间一致性。而 PD 患者扣带回网络前后部功能连通性增加。功能连通性的增加与扣带回结构网络共变性的降低呈负相关，说明功能网络和结构网络的变化之间可能存在代偿效应。健康对照的结构网络完整性与功能连接之间没有相关性。在纵向分析中,PD 患者在基线时前后扣带回网络之间的功能连通性增加,平均随访 15 个月后其功能连通性下降,这意味着潜在的代偿效应在疾病进展中减弱。
结论 ：本研究揭示了 PD 患者大脑退行性变过程中复杂的脑网络调控机制。我们的研究结果表明，扣带回结构网络在 PD 患者中具有较高的易感性。前后扣带结构网络共变性的降低可能是认知功能障碍的结构基础，而前后扣带功能网络之间连接的增强可能对结构网络破坏具有代偿作用。纵向研究表明，扣带回结构网络破坏引起的功能代偿在 15 个月后减弱，这可能意味着患者将来出现失代偿，临床表现为认知损伤。

OR-187
4d flow MRI 评估烟雾病患者血流动力学的应用研究

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目的 利用磁共振 4d flow 技术对烟雾病患者术前术后的血流动力学改变进行分析，本研究旨在探索其可行性与价值。

方法 回顾性分析 29 例行直接血管重建术的烟雾病患者术前术后 MRI 资料，利用 4d flow 序列的原始相位图与后处理软件得到血液流速。测量每位患者术前与术后双侧颈内动脉虹吸部、末段、大脑中动脉起始部及近段、大脑前动脉起始部及近段（每位患者共测量 10 处）的平均血流速度、最大血流速度。患者术前术后血流动力学参数的比较采用配对 t 检验，以 P＜0.05 为检验水准。

结果 患者术后主要血管的平均血流速度均较术前下降（P＜0.05），重建血管有效降低了烟雾病患者前循环血管的血流速度，在改善脑灌注的同时降低了血管破裂的风险。

结论 4d flow 作为一种无创、无辐射的成像技术，可以定量地评估脑血管血流动力学状态，在烟雾病患者的手术决策、手术疗效评估中具有较高临床价值。

OR-188
颅内静脉窦血栓的 3D-CUBE T1 管壁成像与 SWI 的对比研究

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目的

通过联合应用颅脑常规磁共振成像方法、SWI 及高分辨率血管壁成像 3D-CUBE T1 磁共振序列对颅内静脉窦及其内血栓的显像，评价 SWI 和 3D-CUBE T1 序列在对颅内静脉窦血栓诊断的诊断效能及应用价值。

方法

前瞻性纳入山东省千佛山医院 2016 年 3 月-2017 年 9 月怀疑颅内静脉血栓的 34 例患者。首先行常规磁共振扫描，包括：颅脑 MRI 平扫、MRV，同时行颅脑 SWI、3D-CUBE T1 序列平扫。将颅脑常规磁共振影像检查结果作为确诊 CVT 的参照诊断，分别评估 SWI 及 3D-CUBE T1 序列在患者及静脉窦血管节段水平诊断 CVT 的真阳性、真阴性例数，计算其对 CVT 的敏感性、特异性、阳性预测值、阴性预测值、ROC 曲线下面积。

结果

最终评价诊断 30 例可疑 CVT 的患者，共计 240 处静脉窦血管节段。将常规磁共振诊断 CVT 阳性的结果作为评价 SWI 与 3D-CUBE T1 磁共振序列对 CVT 准确性的参照标准。3D-CUBE T1 序列在患者水平诊断 CVT 的敏感性和特异性分别为 100%和 95.2%，阳性预测值和阴性预测值分别为 90%和 100%，ROC 曲线下面积为 0.98；在静脉窦节段水平诊断 CVT 的敏感性和特异性分别为 95.8%和 97.7%，阳性预测值和阴性预测值分别为 82.2%和 99.5%，ROC 曲线下面积为 0.97。SWI 在患者水平诊断 CVT 的敏感性和特异性分别为 66.7%和 76.2%，阳性预测值和阴性预测值分别为 54.6%和 84.2%，ROC 曲线下面积为 0.71；在静脉窦节段水平诊断 CVT 的敏感性和特异性分别为 70.8%和 95.4%，阳性预测值和阴性预测值分别为 63.1%和 96.7%，ROC 曲线下面积为 0.83。

结论

与 SWI 相比，3D-CUBE T1 序列对 CVT 的诊断具有更高的敏感性及特异性，准确性高，能够为 CVT 的临床诊断及治疗提供可靠的诊断信息，具有很好的临床实用价值及应用前景。

OR-189

联合 CBF 和 SWI 研究定向视觉疲劳视区改变

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目的 利用功能磁共振技术探索人视觉的三种状态（闭眼静息、自由视觉及定向视觉）视区（即布劳德曼第 17 区） 脑血流和血氧含量的变化。

方法 21 例健康志愿者参与本试验。应用磁共振脑血流速（MRI CBF）和磁敏感成像（SWI）分别测量三种视觉状态中双侧视区脑血流和血氧水平改变。 各个视觉状态试验 50 秒后开始 MRI 检测。采用单因素 ANOVA 方差分析，对组间差异进行数据分析。

结果 与闭眼静息比较，自由视觉引起视区 CBF 升高，但定向视觉容易疲劳，引起视区 CBF 显著下降（$p<0.001$）；SWI 值在依次三种状态中呈增高趋势，尽管自由视觉较比闭眼静息没有显著性增加，但定向视觉疲劳时显著升高($p<0.05$)。

结论 定向视觉视区脑血流和氧饱和度快速下降可能是其容易疲劳的病理生理基础。

OR-190

In vivo MR and fluorescence dual-modality molecular imaging of vulnerable atherosclerotic plaques with SR-AI-targeted ultrasmall nanoclusters

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Objective: Early and accurate visualization and diagnosis of vulnerable atherosclerotic plaques is extremely critical for prevention of acute cardiovascular events. However, the limitations of current imaging techniques, such as inadequate targeting specificity, deficient imaging sensitivity, and the insufficient spatial resolution, may seriously hinder their development and application for precise plaque characterization, thus greatly increased the sufferings and economic bear of patients. In order to solve the problems above, a novel multifunctional nanotechnology-based contrast agent with highly specific targeting efficiency and high-resolution imaging ability was elaborately designed for early noninvasive and accurate detection of vulnerable atherosclerotic plaques through MRI and fluorescence dual-modality imaging in this research.

Materials and Methods: Herein, scavenger receptor AI (SR-AI), a secreted biomarker associated with foam macrophages, was selected as a target for identifying vulnerable plaques. A biocompatible and high-performing molecular imaging probe (PP1-Au:Gd@GSH NCs) was synthesized via a facile and environmentally friendly strategy, through covalently conjugating the SR-AI-specific peptide PP1 to gadolinium-functionalized gold nanoclusters (AuNCs), using glutathione (GSH) as a bio-template under mild conditions. Murine atherosclerosis model was induced in $ApoE^{-/-}$ mice by high fat and cholesterol diet (HFD) for 20 weeks. During HFD feeding time, body weight and serum lipid profile were monitored and histological examinations including H&E, Oil Red O and immunofluorescent staining were carried out to verify the vulnerable plaques were successfully induced. To observe the imaging effect of the probe, in vivo MRI and NIRF imaging of atherosclerotic plaque were carried out before and after intravenous injection of PP1-Au:Gd@GSH NCs at different time points. After that, aortic artery segments aligned to the MR/NIRF imaged region were excised for histopathology and immunohistochemistry tests to confirm probe deposition.

Results: The resulting PP1-Au:Gd@GSH NCs possessed superior stability, favorable biocompatibility, as well as negligible cytotoxicity. With highly loaded Gd and Au species, it exhibited both remarkable MR and NIRF signal enhancements *in vitro*. Incubation of activated RAW264.7 foam macrophages with PP1-Au:Gd@GSH NCs led to significantly higher uptake *in vitro* than with nontargeted NCs, indicating this incremental uptake was strictly mediated by SR-AI. After fed HFD for 20 weeks, Oil Red O staining showed the plaque area was significantly increased in HFD group ($p<0.05$), immunofluorescence staining revealed that SR-AI protein was highly abundant within plaque, and almost co-localized with foam macrophage marker, demonstrating $ApoE^{-/-}$ mouse atherosclerosis model was successfully constructed. In vivo MR/NIRF imaging revealed that PP1-Au:Gd@GSH NCs presented robust and prolonged contrast enhancement in aortic vulnerable plaques of the $ApoE^{-/-}$ mice compared to nontargeted NCs. At 8 h post PP1-Au:Gd@GSH NCs injection, plaque area became extremely apparent thanks to favorable targeting efficacy, and such a single injection could render plaque macroscopic for a long period of 32 h, allowing guidance during the entire period, including pre-therapeutic detection and therapeutic intervention. Subsequent histologic staining further verified that PP1-Au:Gd@GSH NCs indeed accumulated in the atherosclerotic plaque region, where the SR-AI over-expression as well as foam macrophages infiltration were clearly seen. More importantly, the preliminary study on hematology test and H&E staining suggested no observable cell necrosis or inflammatory infiltrate after PP1-Au:Gd@GSH NCs administration. Pharmacokinetics and biodistribution analysis

demonstrated that PP1-Au:Gd@GSH NCs displayed prolonged circulation time, increased accumulation in atherosclerotic plaques and natural clearance capabilities through urinary system.
Conclusion: In summary, a sensitive, specific and biocompatible molecular probe (PP1-Au:Gd@GSH NCs) had been successfully established for noninvasive atherosclerosis dual-modality imaging. *In vitro* and *in vivo* experiments showed they could be effectively internalized within atherosclerotic lesions and enhance plaque imaging contrast because of their high affinity for SR-AI. Most importantly, no observable toxicity or side effects of PP1-Au:Gd@GSH NCs were found in a variety of toxicity studies. From our data, we can anticipate this MR/NIRF molecular diagnostic strategy with PP1-Au:Gd@GSH NCs may evolve into a clinically translational, a noninvasive tool for precisely detecting and monitoring rupture-prone atherosclerotic plaques in vivo.

OR-191
Clinical features and cardiovascular magnetic resonance characteristics in danon disease

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Abstract
Aims: Danon disease is a rare X-linked dominant disease, with lysosomal associated membrane protein 2 (LAMP2) gene mutation, causing clinical presentation like cardiomyopathy, skeletal myopathy and intelligence retardation. Yet the existing reports were based on case reports, it still lacks detailed and comprehensive description, especially in CMR tissue characterization of T1 and extracellular volume (ECV) in Danon disease. We aimed to comprehensively investigate the clinical spectrum, cardiovascular magnetic resonance (CMR) characteristics including T1 and extracellular volume fraction and outcomes of Danon disease, thus facilitate the further understanding of the phenotype of patients with Danon disease.
Methods: Our study included 6 male patients aging from 8 to 23 years old between 2014-2019. The clinical presentation, lab examinations, pathology/genetic analysis, electrogram (ECG), echocardiography and CMR characteristics were summarized.
Results: 5 out of 6 patients suffered from hypertrophic myocardiopathy (HCM) phenotype of Danon disease, while 1 patient had dilated cardiomyopathy (DCM) phenotype. The left ventricle (LV) and left atrium (LA) function were impaired to large extents from strain measurement. Diffuse and focal late gadolinium enhancement (LGE) were separately observed in LV walls of 3 patients and right ventricular (RV) insertion points of remaining 3 patients. Furthermore, native T1(mean 1313.3ms) and ECV (mean 39.17%) values of three patients were increased evidently.
Conclusions: Both dilated and hypertrophic cardiomyopathy may be the phenotypes of Danon disease. Comprehensive CMR imaging played a unique role in the diagnosis and grading severity and risk factors of Danon disease in vivo in patients, especially by using robust quantitively strain analysis, T1 mapping and further ECV calculation.

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3.0TMRI 对高原与平原地区健康正常人心脏结构及功能的对比研究

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目的 通过心脏磁共振成像（cardiac magnetic resonance imaging，CMRI）比较高原与平原地区健康正常人在心脏结构及功能方面的差异。**方法** 对 25 例高原健康正常人和 20 例平原地区健康正常人进行 CMRI 检查，测量心脏结构参数：前室间隔厚度(AWOIVS)、左房内径(LAD)、左室舒张末期内径(LVEDD)、主动脉根部内径(AOD)、主肺动脉内径（MPAD）、右房横径(RATD)、右房长径(RALD)、右室横径(RVTD)、右室长径(RVLD)，另通过心脏专用后处理工作站测量左心功能参数：左室舒张末期容积（LVEDV）、左室收缩末期容积（LVESV）、左室每搏输出量 （LVSV）及左室射血分数（LVEF）。采用独立样本 t 检验对比分析两组间各参数的差异。**结果** 高原组 AWOIVS、MPAD、RATD 和 RVTD 指标大于平原组，其中 AWOIVS 和 MPAD 两组间差异有统计学意义（$p<0.05$）；高原组 LAD、LVEDD、AOD、RALD、RVLD 指标小于平原组，其中 LVEDD 两组间差异有统计学意义（$p<0.05$）；高原组 LVEDV、LVESV 和 LVSV 小于平原组，其中 LVEDV 两组间差异有统计学意义（$p<0.05$）；高原组 LVEF 大于平原组，差异无统计学意义（$p>0.05$）。**结论** 相对于平原地区健康人，高原地区健康正常人在心脏结构及功能方面已有改变，前室间隔厚度增加，主肺动脉内径增宽，左心室容积缩小，高原地区健康正常人具有强大的心脏储备能力和摄氧能力。

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Aortic flow quantification in cardiac mri: comparison of aortic volume of 4D-flow and stroke volume derived from short-axial cine

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Background and purpose: Currently, cardiac MRI is the accepted gold standard for stroke volume (SV) with short-axis slices [1]. In addition, quantification of flow in 3D over time (4D-flow) is increasingly used to assess blood flow hemodynamics in diverse cardiovascular territories [2]. The purpose of this study was to compare aortic flow using 4D-flow and stroke volume with short-axis slices in young health adults.

Material and Methods: From June 2019 to July 2019, sixteen young health volunteers (27.4 ± 3.8 years, 6 females) were consecutively recruited and underwent cardiac MRI by using 3.0T scanner (GE, MultiSync P242W), including 4D-flow, 2D CINE phase-contrast (PC) and short-axis CINE slices. The ethics board approved the study and written informed consents were obtained from all participants. The aortic volume of 4D-flow and 2D PC were measured by using CVI^{42} (release 5.10.1). SV was the difference of left ventricular end-diastolic (EDV) and end-systolic volume (ESV) derived from short-axis

cine planes. Bland-Altman analysis and the intraclass correlation coefficient (ICC) were used to assess the correlation between aortic total volume of 4D-flow and SV.

Results: Excellent agreement was found between aortic total volume of 4D-flow and SV (ICC, 0.87; 95% confidence interval [CI]: 0.65, 0.95), and between 2D PC and SV (ICC, 0.89; 95% CI: 0.68, 0.96). Bland-Altman analysis for aortic total volume and SV agreement showed a significant variance using 4D-Flow compared to 2D PC ([mean, -3.16; 95% CI: -6.14, -0.18; p=0.039] vs. [mean, 0.36; 95% CI: -2.98, 3.76; p=0.819]).

Conclusions: 4D-flow is a noninvasive and accurate way to quantify aortic volume compared to the reference standards SV in young health adults. With multi-planes of cardiovascular territories and large coverage, 4D-flow has the potential to become an alternative imaging approach in evaluating the cardiovascular flow.

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Comparison of 4D-flow and 2D-flow sequences for aortic and pulmonary flow quantification in young health adults

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*Background and purposes:*2D-flow sequence of Cardiac Magnetic resonance imaging (CMRI) has become the standard for noninvasive quantification of blood flow. Recently, quantification of flow in 3D over time (4D-flow) is increasingly used to assess blood flow hemodynamics in diverse cardiovascular territories such as the aorta, pulmonary arteries, ventricles and atria[1,2]. In this study, we aimed to assess the accuracy of 4D-flow for quantification of aortic and pulmonary flow parameters compared to the reference standards 2D-flow in young health adults.

Material and Methods: From June 2019 to July 2019, sixteen young health volunteers (27.4 ± 3.8 years, 6 females) were consecutively recruited and underwent CMRI by using 3.0T scanner (GE, MultiSync P242W), including 4D-flow and 2D-flow sequences. The ethics board approved the study and written informed consents were obtained from all participants. The aortic and pulmonary flow of 4D-flow and 2D-flow were measured by using CVI[42] (release 5.10.1). The total volume, regurgitant fractions, and peak velocities were calculated. Pearson's correlation coefficient (r) was calculated. Linear regression analysis comparison of 4D-flow and 2D-flow hemodynamic parameters was performed. $p<0.05$ was considered significant.

Results: Linear regression analysis showed excellent agreement between 4D-flow and 2D-flow in aortic total volume ($r=0.892$, $p<0.01$), pulmonary peak velocity ($r=0.856$, $p<0.01$), and Q_P/Q_S ($r=0.854$, $p<0.01$). Good agreement was found in pulmonary total volume ($r=0.704$, $p<0.01$). Moderate agreement was found in aortic peak velocity ($r=0.574$, $p<0.01$). There was no correlation in aortic and pulmonary regurgitant fractions between 4D-flow and 2D-flow ($r=0.108$, $p=0.134$; $r=0.297$, $p=0.097$).

Conclusions: In conclusion, we found good agreement for 4D-flow in aortic and pulmonary total volume, peak velocity and Q_P/Q_S compared with 4D-flow. However, we found no correlation in aortic and pulmonary regurgitant fractions.

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3.0T 磁共振对高海拔地区正常人心肌特性的初步研究

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目的 通过心脏磁共振成像技术探讨高海拔地区健康正常成人左室心肌组织特性，对高海拔地区正常人左室心肌 T1 值 T2 值及 ECV 值范围进行初步研究以供参考。**方法** 选择长期生活在海拔 2500 米以上高原的世居健康志愿者 42 例(其中男性 23 例，女性 19 例)进心脏磁共振定位相扫描、快速自旋回波序列 T1 对比扫描、look-locker 反转恢复（Modified Look-locker Inversion Recovery，MOLLI）序列对比剂注射前 T1mapping 扫描、T2mapping 扫描、基于梯度回波的多时相电影序列扫描、T1scout 序列扫描、对比剂注射后相位敏感反转恢复的 T1WI 序列扫描、MOLLI 序列对比剂注射后 T1mapping 扫描。分别获得左室心肌不同节段的 T1 值及 T2 值，并计算出相应 ECV 值。**结果** 左室总体平均增强前 T1 值、增强后 T1 值、ECV 值和 T2 值分别为（1235.16±26.7）ms、（475.93±34.2）ms、（34.45±3.5）%、（45.28±3.8）。其中，男性增强前 T1 值高于女性[T1 值：（1322.35±20.4）ms:（1230.18±23.8）ms(P＞0.05)]；女性 ECV 值及 T2 值高于男性[ECV 值：(35.5±2.9）%:(33.4±1.5）%；T2 值：(47.31±3.1)：(43.82±2.9)(P＜0.05)]；心尖段 ECV 值及 T2 值（36.87±3.3）%、（47.21±3.3）均高于基底段（33.54±2.3）%、（43.25±2.9） 和中间段（33.7±2.5）%、（44.11±3.0）（ P＜0.05）。 **结论** 正常人左室心肌增强前 T2 值、ECV 值存在性别以及节段差异。

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Delta-flow 非增强 MR 血管成像在足部动脉病变中的应用:与 DSA 的对照研究

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目的 通过与 DSA 对比，探讨 Delta-flow 非增强 MR 血管成像在足部动脉病变中的应用价值。
材料与方法 19 例下肢动脉病变（其中 4 例为双足，2 例为介入治疗前和后）共计 25 次足部均行 8 通道足部线圈的 NCE-MRA 和 DSA 检查。两位放射科医生独立评价 NCE-MRA 的图像质量。以 DSA 为标准，动脉管腔狭窄≥50%为有临床意义的狭窄，分析 NCE-MRA 对足部动脉狭窄的诊断效能。采用 Kappa 检验评价 NCE-MRA 和 DSA 对评估狭窄程度及显示血管长度结果的一致性。
结果 图像质量优良率为 72%(18/25)。足部 125 个动脉节段中，以动脉管腔狭窄≥50％为有临床意义的狭窄，NCE-MRA 诊断的平均准确率为 90.4%，平均敏感性为 94.4%，平均特异性为 80.6%，阳性预测值为 92.3%，阴性预测值 85.3%。以 DSA 为标准，NCE-MRA 评价血管狭窄程度的符合率为 72%(90/125)，高估狭窄程度 20 条，低估 15 条，其 Kappa 值为 0.622；NCE-MRA 显示足部血管长度符合率为 71.2%(89/125)，其 Kappa 值为 0.471。

结论 使用 8 通道的足部线圈和基于 Delta-flow 技术的 NCE-MRA 可有效显示足部动脉的全貌，对有意义的动脉狭窄具有较高的诊断效能，可成为 CE-MRA 和 CTA 的重要补充。

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体素内不相干运动扩散加权成像在肺癌患者化疗效果评估中的价值

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目的 探讨体素内不相干运动扩散加权成像 IVIM 在肺癌患者化疗效果评估中的应用价值。方法 选取 2018.03-2019.07 间我院接受肺癌化疗患者 60 例为研究对象，化疗前后行 IVIM 检查(b=10,25,50,100,200,400,800,1000,1500,3000)。比较化疗前后扩散系数 D 值，伪扩散系数 D*值及灌注分数 f 值。以化疗后肿瘤最大直径减少≥30%为疗效显著；而＜30%为疗效不显著。重复测量数据方差分析 D、D*、f 值变化。独立样本 t 检验比较两组 IVIM 参数差异。ROC 曲线评价参数预测疗效准确性。结果 显著组 37 例，无效组 23 例。疗效显著组和无效组在化疗前 D、D*、f 及肿瘤大小无差异(P=0.057-0.42)。显著组化疗前 D 值为(6.09±0.46)×10-3 mm2/s，ADC 值为(1.16±0.40)×10-3 mm2/s，D*值为(5.38±2.59)×10-3 mm2/s，f 值为 54.1%±3.9%；化疗后 D 值为(6.63±0.32)×10-3 mm2/s，ADC 值为(1.45±0.32)×10-3 mm2/s，D*值为(2.85±1.22)×10-3 mm2/s，f 值为 52.4%±5.6%。ADC 值及 D 值显著高于化疗前(P＜0.01)，而 D*值及 f 值前后差异无统计学意义(P>0.05)。无效组化疗前 D 值为(6.07±0.44)×10-3 mm2/s，ADC 为(1.13±0.23)×10-3 mm2/s；化疗后 D 值为(6.12±0.41)×10-3 mm2/s，ADC 为(1.10±0.32)×10-3 mm2/s (P=0.067，0.064)。扩散系数 D 和 ADC 的 ROC 曲线下面积分别为 0.875、0.848，均有较好的疗效评估价值，D 值敏感度及特异度均高于 ADC(89.5%vs 81.3%；80.2%vs 75.3%)。结论 磁共振 IVIM 的 D 值和 ADC 值能早期定量评价肺癌化疗疗效。

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基于压缩感知的 MRI 定量灌注成像评估肺癌微血管密度

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目的 探讨基于黄金角径向稀疏采样（GRASP）动态增强 MRI 灌注成像在临床上评估肺癌血管生成的价值，以及前瞻性评价肺癌灌注参数与微血管密度（MVD）之间的相关性。
方法 前瞻性对 40 例明确有肺部占位的患者采用脂肪抑制层叠黄金角径向采样序列进行检查。对原始数据进行 GRASP 图像重建，重建的时间分辨率为 3 秒。最终 25 例经病理证实为肺癌的患者（16 男性，9 例女性）被纳入研究。采用 Tofts 模型进行定量灌注分析。对肺癌标本进行 CD34 免疫组织化学染色并测量 MVD。采用组内相关系数分析（ICC）定量灌注参数测量的可重复性。采用单因素方差分析和多重比较来分析不同组织学类型肺癌的容积转移常数（K^{trans}）值、V_e值和 MVD 之间的差异。用皮尔森相关系数分析定量灌注参数（K^{trans}和 V_e）和 MVD 之间的相关性。
结果 两次定量灌注参数测量的 ICC 分别为 0.976 和 0.964。腺癌的 K^{trans}、V_e和 MVD 的平均值分别为 0.36±0.26 min^{-1}、0.27±0.13 和 49.09±29.84 条/0.723mm²；鳞状细胞癌的 K^{trans}、V_e和 MVD

的平均值分别为 0.34±0.17 min^{-1}、0.26±0.12 和 53.85±23.53 条/0.723mm²；小细胞肺癌的 K^{trans}、V_e和 MVD 的平均值分别为 0.13±0.15 min^{-1}、0.14±0.06 和 37.20±28.28 条/0.723mm²。定量灌注参数（K^{trans}和 V_e）和 MVD 在组织学类型、肿瘤大小以及是否转移等方面均没有显著差异（P>0.05）。肺癌的 K^{trans}值与 MVD 呈显著正相关(r=0.739，P<0.001)，而 V_e值与 MVD 无显著相关(r=0.158，P=0.449)。

结论 GRASP 高分辨率 DCE-MRI 成像为临床定量评估肺癌肿瘤血管生成提供了一种简单的、无需屏气的和没有电离辐射的灌注成像选择。

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The value of IVIM-DWI in early prediction of efficacy of neoadjuvant chemotherapy for breast cancer

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Objective: To investigate the early predictive value of IVIM-DWI in neoadjuvant chemotherapy for breast cancer.

Methods: 43 cases of breast cancer confirmed by pathological biopsy in our hospital were collected. IVIM-DWI was performed after each chemotherapy. IVIM-DWI parameters included standard apparent diffusion coefficient (ADC), slow apparent diffusion coefficient (D), fast apparent diffusion coefficient (D*) and perfusion fraction (f). Referring to RECIST criteria, the study cases were divided into two groups: (1) effective group: complete remission (CR) and partial remission (PR); (2) ineffective group: progress disease (PD) and stable disease (SD). Multivariate analysis of variance was used to compare IVIM-DWI parameters before and after treatment, between effective and ineffective groups. The ROC curve was used to calculate the optimal diagnostic threshold for the effective group and the ineffective group.

RESULTS: A total of 49 lesions were studied, including 33 in the effective group (CR: 7, PR: 26) and 16 in the ineffective group (SD: 11, PD: 5). There was significant difference in the volume of tumors in the effective group of pretherapy and the third treatment course, but there was no significant difference in the ineffective group. There were significant differences in D value, D* value and F value of IVIM-DWI parameters among pretherapy, 1^{st} treatment and 3^{rd} treatment in the effective group (F value was 30.487, 6.752 and 8.983, respectively, $P < 0.05$). There were significant differences in D value, D* value and F value of IVIM-DWI parameters between effective group and ineffective group before treatment (F value was 30.487, 6.752 and 8.983 respectively, $P < 0.05$). The area under curve (AUC) of D value, D* value and F value were 0.889, 0.910 and 0.879 respectively. The diagnostic thresholds were 0.716 mm2/s (specificity and sensitivity were 75.1% and 95.2%, respectively), 37.85 mm2/s (specificity and sensitivity were 71.2% and 98.3%, respectively) and 0.292 (specificity and sensitivity were 89.4% and 81.5%, respectively). (Table 1, Figure 1-2)

Conclusion: IVIM-DWI can predict the early curative effect of neoadjuvant chemotherapy for breast cancer and evaluate its effectiveness. It can assist conventional MRI to evaluate the curative effect.

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定量化分析鉴别肝细胞癌的病理分级：DKI 和 IVIM 的诊断效能是否优于 DWI？

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目的 探讨扩散峰度成像(DKI)、体素内不相干运动扩散加权成像（IVIM）和传统弥散加权成像（DWI）技术定量化分析在肝细胞癌术前病理分级中的应用价值。**方法** 纳入本院 2017 年 8 月至 2018 年 12 月期间经手术切除或穿刺活检病理证实肝细胞癌患者 64 例，术前行常规 MRI 扫描、动态增强扫描、DKI、IVIM 及 DWI 序列扫描，应用 GE Advantage Windows 4.4 后处理工作通过相应模型进行处理；选取肿瘤实性组织层面手动勾勒感兴趣区（ROI）， 并计算扩散峰度(MK)、平均扩散系数(MD) 、纯扩散系数（D），假扩散系数（D *），灌注分数（f）以及表观扩散系数(ADC)值；组内相关系数（ICC）用于分析两名医师间一致性。采用 Kruskal-Wallis 秩合检验（非正态）或单因素方差分析（正态）比较不同病理分级间各参数的差异；应用 Spearman 相关分析各参数值与病理分级的相关性并通过受试者工作曲线(ROC)比较其诊断效能。**结果** 最终纳入 64 例 HCC 患者，在高、中、低分化 HCC 中，高分化 HCC 组 MK 值明显低于中、低分化 HCC 组（P <0.001），而 MD，D 和 ADC 值明显高于中、低分化 HCC 组（P <0.001）；D *和 f 值在各组间无统计学差异（均 P >0.05）；另外，相关性分析显示：HCC 肿瘤实性部分的 MK 值与肿瘤分化程度呈负相关((r =－0.689，P <0.001)，MD 值、D 值、ADC 值与肿瘤病理分化程度呈正相关(r = 0.534、0.729、0.428，P<0.001)；D *及 f 值不具有相关性(均 P >0.05)。MK、MD、D、ADC 值在术前判断高分化肝细胞癌 ROC 曲线下面积分别为 0.92、0.83、0.94、0.77。**结论** 在鉴别肝细胞癌的病理分级中，IVIM 及 DKI 参数值具有较好的诊断效能，并优于 DWI，有助于术前评估肝细胞癌的病理分级，且以 MK 值、D 值为最优。

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Whole-Lesion Texture Analysis of Magnetic Resonance T2 Weighted Images in T1a Renal Cell Carcinoma Subtyping

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Background
With more widespread of cross-sectional images, renal cell carcinoma (RCC) is increasingly diagnosed as low-stage incidental finding. Compared with clear cell RCC (ccRCC), non-clear cell RCC including chromophobe RCC (chRCC) and papillary RCC (pRCC) tends to have more indolent behavior and better prognosis. For T1a(≤4cm) renal cell carcinoma, accurate prediction of pathological type is an important issue. In this study, we aimed to use whole-lesion texture analysis of MR T2WI to differentiate T1a RCC subtypes.
Material and methods
This retrospective study included 115 RCC patients (42 ccRCC, 45chRCC and 28pRCC) with complete T2 weighted imaging before treatment. Axial fat-suppressed T2-weighted

imaging was acquired using FSE on a 3-T scanner. Tumor were segmented manually slice by slice by an experienced radiologist blindly to pathology. Whole-lesion texture parameters were calculated by software GE Omni-kinetics. Parameters were compared among RCC subtypes. Parameters with significant differences among groups was selected and ROC curve were plotted to analyze the diagnostic efficacy. AUC, specificity, sensitivity, were then calculated. A predictive model was established using combination of these parameters. P<0.05 was considered to be statistically significant.

Results

ChRCC had significantly more female patients than ccRCC and pRCC. Age, tumor diameter had no significant difference among subtypes. Among all these parameters, variance, kurtosis, uniformity, inertia, cluster prominence (CP), haralick correlation (HC), energy, entropy, correlation and InverseDifferenceMoment (IDM) had significant differences among subtype (p<0.05). In differentiating ccRCC with non-ccRCC, several parameters (energy, entropy, inertia, CP and HC) reached good diagnostic efficacy with AUC over 0.7. Predictive model with combining parameters had better performance with AUC 0.82(0.74~0.90), p<0.05. In differentiating ccRCC with chRCC, predictive model with combining parameters had very good performance with AUC 0.88(0.81~0.95), p<0.05.

Conclusion

Different RCC subtypes had different patterns of T2 weighted imaging showing different levels of texture parameters. Whole-lesion texture analysis is a practical, convenient, efficient method in pretreatment subtyping RCC.

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融合 MR-T2WI 和 T1 增强的影像组学特征的卵巢癌复发风险预测

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目的 探讨基于 MR-T2WI 和 T1 增强早期序列的组学特性预测进展期卵巢癌复发风险的可行性研究。

方法 本研究回顾性的搜集 116 名卵巢癌患者（28 名未复发和 88 名复发）的 T1 增强和 T2 磁共振影像。利用交互式分割方法分别提取 T1 和 T2 影像中的肿瘤区域，并量化计算 1046 种影像组学特征。选用基于 L1 的特征选择方法筛选出有效的影像特征，并利用 SMOTE 重采样方法对数据样本进行重采样，排除数据不平衡的干扰。选用 SVM 分类分别构建预测模型，并留一法交叉验证方法对模型进行测试。采用信息融合方法对 T1 和 T2 影像预测模型的预测结果进行融合，进一步提高模型的准确率。

结果 利用 T1 增强图像和 T2 影像构建模型的 AUC 值分别为 0.74±0.06（95% CI：[0.63, 0.83]）和 0.72±0.06（95% CI：[0.61， 0.81]），融合两种不同的影像特征模型的 AUC 达到 0.80±0.05，（95% CI：[0.71， 0.87]）。与使用单种影像特征的模型相比，融合模型能够有效医生卵巢癌复发风险的预测准确率（p<0.05）。

结论 本研究通过提取和分析高通量的影像信息，并融合不同种类的影像特征，有效提升了卵巢癌复发风险预测的准确率。

OR-203
MR 多模态功能成像对于宫颈癌新辅助化疗疗效的预测价值

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目的 探讨 MR 多模态功能成像对于宫颈癌新辅助化疗疗效的预测价值。
材料与**方法** 60 例接受新辅助化疗并进行手术的宫颈癌患者，年龄范围 35-65 岁。所有患者于治疗前、化疗 2 周期后手术前行常规 MR、DWI 和 DCE-MR 检查，测量病灶最大径，病灶 ADC 值和 ktrans、kep 和 Ve 值。新辅助化疗组的治疗方案：奥沙利铂（或顺铂）+多西他赛（或紫杉醇脂质体）。治疗前 MR 图像显示的宫颈癌灶大小与术后病理癌灶大小进行对比，按照实体瘤治疗评价 RECIST 标准得出有应答组（包括 CR 及 PR）和无应答组（包括 PD 及 SD）。有应答组 48 例，无应答组 12 例。使用卡方检验及 Fisher 确切检验、t 检验对治疗有应答组与无应答组的 FIGO 分期、分化程度、病理类型、治疗前和治疗后 ADC 和 DCE 相关参数进行分析。
结果 （1）两组病例的 FIGO 分期之间的差异存在统计学意义（$p<0.05$）；两组病例的病理类型及分化程度之间差异无统计学意义（$p>0.05$）。（2）有应答组和无应答组治疗前和治疗后 ADC 值相关参数均无统计学差异（p 值均>0.05）。（3）有效组治疗前 Ktrans 最大值为 3.02±1.35，大于无效组 Ktrans 最大值（1.96±1.44），差异具有统计学意义（$p<0.05$）；其他参数均无统计学意义（$p>0.05$）。（4）化疗 2 个周期手术前 DCE-MR 参数进行比较，有效组 Ktrans 最大值为 3.08±1.25，明显大于无效组 Ktrans 最大值（0.81±0.70），差异具有统计学意义（$p<0.05$）；两组病例的 Kep 平均值之间的差异存在统计学意义（$z=-2.569$，$p<0.05$）；其他参数均无统计学意义（$p>0.05$）。
结论 接受新辅助治疗的宫颈癌患者，治疗前的 Ktrans 最大值、化疗后的 Ktrans 最大值和 Kep 平均值对于反映新辅助治疗的效果有一定价值。

OR-204
Optimal Simultaneous Multislice Diffusion-Weighted Imaging of liver at 3.0T MRI: Measurement of Different Breathing Schemes in Comparison to Standard Sequences

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Purpose: To obtain the optimal simultaneous - multislice (SMS) - accelerated diffusion-weighted imaging (DWI) of liver at 3.0T MRI by systematically estimating the reproducibility of apparent diffusion coefficient (ADC), signal-to-noise ratio (SNR) and image quality of different breathing schemes in comparison to standard DWI(STD) and other SMS sequences.

Materials and Methods: In this institutional review board‐approved prospective study, hepatic DWIs (b=50, 300, 600 sec/mm^2) were performed in 23 volunteers on 3.0 T MRI using SMS and STD with breath-hold (BH-SMS, BH-STD), free breathing (FB-SMS, FB-STD) and respiratory-triggered (RT-SMS, RT-STD). Reduction of scan time with SMS-acceleration was compared. ADC and SNR were measured in nine anatomic locations and image quality were assessed on all SMS and STD sequences. An optimal SMS-DWI was

obtained by systematically comparing the ADC reproducibility, SNR and image quality of above all DWIs.

Results:
SMS-DWI sequences reduced scan time significantly by comparison with STD-DWI (27 vs. 42 sec for BH, 54 vs. 99 sec for FB and 42 vs. 97 sec for RT). In all DWIs, BH-SMS had the greatest intra-observer agreement (intraclass correlation coefficient: 0.920 ~ 0.944) and good inter-observer agreement (interclass correlation coefficient: 0.831~ 0.886) for ADC measurements, and the best ADC reproducibility in nine locations (mean ADC absolute differences : 0.046~ 0.058×$10^{-3}mm^2/s$; LOA: 0.010 ~0.013×$10^{-3}mm^2/s$). BH-SMS had the highest SNR in three representative sections (Superior: 29.81 ± 20.49 for reader1, 29.14±19.48 for reader2; Central: 38.37 ± 17.36 for reader1, 37.13 ± 21.07 for reader2; Inferior: 35.33 ± 13.84 for reader1, 34.90 ± 16.69 for reader2) except RT-STD. There were no significant differences in image quality between BH-SMS and other DWI sequences (median BH-SMS: 4.75, other DWI: 4.5-5.0; P>0.0.5).

Conclusion:
BH-SMS provides considerable scan time reduction with good image quality, sufficient SNR and highest ADC reproducibility on 3.0T MRI, which is thus recommended as the optimal hepatic DWI sequence for those subjects with adequate breath-holding capability.

OR-205

MRI-Gray Scale Ratio in Differential Diagnosis of Small Hepatocellular Carcinoma (SHCC) from Focal Nodular Hyperplasia (SFNH)

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Purpose: The objective was to explore the value of the MRI-gray scale ratio (GCR)between the lesion and the surrounding normal liver parenchyma, and the MRI-gray scale ratio (GCRL) between the enhance-lesion and the plain scan-lesion to differentiate the SHCCfrom theSFNHin the hepatic arterial (AP), portal (PP), and delayed phases (DP).
Materials and Methods: In this study, 434 SHCC lesions in 426 patients and 132 SFNH in 118 patients, confirmed by clinically and/or pathologically, were retrospectively analyzed. All the patients underwent triple-phase MRI enhanced. The lesions' MRI gray-scale values (GCV) of the plain scan (GCV-p) and the enhanced MRI scan (GCV-c), and normal liver parenchyma's GCV around the lesion (GCR-n) were measured, calculate the GCR = GCV-c / GCV-n, GCRL = GCV-c / GCV-p. The GCR and GCRL were separatelyanalyzed by the Wilcoxon rank sum test and the receiver operating curve (ROC).
Results: The medium age of 111 SHCC lesions in 434 SHCC lesions in 426 patients and 132 SFNH in 118 patients was 57(49～63) vs.35(28～44) (P< 0.01),the male/female ratio was (352 vs.74) and (44 vs.74)(P< 0.01), and the size of the lesions

was 2.1(1.5～2.675) vs. 2.1(1.5～2.5) (P = 0.09). The GCR of the AP, PP, and DP of the SHCC and the SFNH lesions 1.62 (1.34～1.88) vs. 1.90(1.69～2.22) (Z = -7.546, $P<$ 0.01), 0.89 (0.80～0.95) vs. 1.01 (1.00～1.16) (Z = -14.943, $P<$ 0.01), 2.40 (2.06～2.79) vs. 2.68 (2.27～3.08) (Z = -4.521, $P<$ 0.01),respectively. When the GCRs of the triple-phase contrast-enhanced MRI scan of SHCC and SFNH were 1.649, 0.889 and 0.983, the maximum You-den indexes were 0.331, 0.648 and 0.869, respectively. The area under the curve (AUC) values were 0.717, 0.851 and 0.929, respectively. Besides, the corresponding values of sensitivity and specificity were 80.3% and 52.8 %, 92.2% and 72.4%, 97.7% and 89.2%, respectively, and the positive likelihood ratio(+LR) and negative likelihood ratio(-LR) were 1.701 and 0.373, 3.348 and 0.105, 9.046 and0.026, respectively. The GCRL of the AP, PP, and DP of the SHCC and the SFNH lesions 0.93 (0.83～1.00) vs. 1.10 (1.03～1.22) (Z = -12.206, $P<$ 0.01), 2.78 (2.18～3.41) vs. 3.39(2.40～4.07) (Z = -6.210, $P<$ 0.01), 2.05 (1.80～2.40) vs. 2.30 (1.98～2.67) (Z = -4.461, $P<$ 0.01),respectively. When the GCRLs of the triple-phase contrast-enhanced MRI scan of SHCC and SFNH were 2.960, 2.907 and 2.190, the maximum You-den indexes were 0.290, 0.236 and 0.243, respectively. The area under the curve (AUC) values were 0.678, 0.630 and 0.628, respectively. Besides, the corresponding values of sensitivity and specificity were70.5% and 58.5 %, 40.9% and 82.7%, 61.4 % and 62.9%, respectively, and the positive likelihood ratio(+LR) and negative likelihood ratio(-LR) were 1.699 and 0.504, 2.364 and 0.715, 1.655 and 0.614, respectively.

Conclusions: GCR is more valuable than GCRL in differentiating SHCC and SFNH, and the SHCC is highlysuggestedwhen the GCR of AP, PP, and DP are no more than 1.649, 0.988, 0.983, respectively, in the middle-aged and elderly male patients.

OR-206

Characterizing Computer Tomography and Magnetic Resonance Imaging Features for detection of Struma Ovarii

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Abstract

Background: To analyze the computer tomography (CT) and magnetic resonance imaging (MRI) features of struma ovarii (SO) and explore the corresponding pathological basis to improve diagnostic accuracy.

Methods: A retrospective analysis was made on the basis of the clinical and imaging data of 28 cases of struma ovarii with pathological confirmation. The location, size, morphology, margin, configuration, attenuation/signal intensity and enhancement pattern of all cases were analyzed. Imaging features were compared with pathological results.

Results: All 28 tumors were unilateral (right, n=12; left, n=16) with well-defined margins, which were multilobulated surfaces in 20 cases and round-like in eight cases. Focal fatty tissue was present in 14 (14/28,50%), and calcification was present in ten cases (10/28,35.7%).On the CT group, the solid components of the tumors presented as

iso-densities or hyper-densities on non-contrast CT and were markedly enhanced due to abundant blood vessels and pathological fibrous tissue. The cystic component displayed multiple cysts of different sizes and varying densities, with CT values ranging from 13 to 63 HU. On the MRI group,the punctuate foci of high signal intensity inside the solid components on T1-weighted images (18/22,81.8%) represented fat tissue or mucinous material within the thyroid follicles.The areas of extremely low signal intensity with no enhancement on T2WI were recognized in 12 tumors (12/22,54.5%), representing viscid gelatinous colloid material. The solid portion of SOs showed a high apparent diffusion coefficient (ADC) value, indicating unrestricted diffusion, excepting for two showing obvious diffusion restricted with markedly enhancement and eight showing small nodule of diffusion restricted without enhancement.
Conclusion: Typical features of struma ovarii on CT scans include smooth margin cystic or cystic-solid masses with fat and calcification, hyper attenuation lesions on pre-contrast images, and marked enhancement in solid portion after enhancement. On MRI scans, the characteristic demonstrations include foci of high signal on T1WI, extremely low signal intensity on T2WI, and diffusion restricted small nodule without enhancement on DWI.

OR-207

Contrast-enhanced MR cholangiography with Gd-BOPTA: Using Biliary System Visualization to evaluate Liver Function

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Objectives: To evaluate the relationships between biliary system visualization and liver function with Gd-BOPTA-enhanced MR Imaging in the hepatobiliary phase.
Materials and Methods: In our study, 220 patients were classified into four groups: patients with normal liver function without liver cirrhosis (the NLF group); and cirrhosis patients with Child-Pugh classes A, B, and C (LCA, LCB, and LCC groups). All the patients underwent Gd-BOPTA by MR imaging. The relative enhancement ratio (RE) of the biliary system was calculated from measurements of the signal intensities (SI) of the bile duct and the SI erector spinae muscle. Statistical analysis was used to evaluate the relationship between the RE ratios of the biliary system and liver function parameters. The different RE ratios of the biliary system among the NLF, LCA, LCB, and LCC groups were analyzed.
Results: The RE ratios of the biliary system were associated with total bilirubin ($r = -0.592$, $P < 0.01$), prothrombin time([PT] [$r = -0.601$, $P < 0.01$]), and albumin ($r = 0.526$, $P < 0.01$). The RE ratios of the biliary system were significantly higher for the NLF and LCA groups compared with the LCB ($P < 0.001$) and LCC ($P < 0.001$) groups.
Conclusions: The present study showed that the lower the biliary system visualization contrast enhancement, the worse liver function on Gd-BOPTA-enhanced MR imaging in the hepatobiliary phase. Thus, biliary system visualization might be a direct and noninvasive technique for evaluation of liver function.

OR-208

The Effect of Maternal Hyperoxygenation on Placental Perfusion in Normal and Fetal Growth Restricted Pregnancies Using Intravoxel Incoherent Motion

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Abstract
Purpose: To evaluate the effect of maternal hyperoxygenation on placental perfusion in normal and Fetal Growth Restricted (FGR) pregnancies using Intravoxel Incoherent Motion (IVIM).
Methods: Ten FGR pregnancies and twenty-five normal pregnancies underwent IVIM examinations before and after maternal hyperoxygenation (95% O_2, 5% CO_2) using a 1.5T MR scanner. The IVIM parameters (fp, Dp, Dt) were determined for the placentas of both groups. The IVIM parameters within and between groups and their correlations with Doppler findings were statistically analyzed. ROC analysis was performed to evaluate the diagnostic power of IVIM derived parameters.
Results: Before maternal hyperoxygenation, the perfusion fraction was significantly lower in the FGR group than that in the normal group (22.88+—10.29 (%) vs.36.28+—9.70 (%), p = 0.000). After maternal hyperoxygenation, decreased significantly in the normal group (36.28+—9.70 (%) vs.29.93+—10.25 (%), p = 0.032), whereas it remained relatively stable in the FGR group (22.88+—10.29(%) vs.24.38+—13.67(%), p = 0.508). An increase of was found only for the normal group and did not changed significantly after maternal hyperoxygenation. There existed a negative correlation between and umbilical artery pulsatility index (PI) (r = -0.385, p < 0.05) as well as and PI (r = -0.574, p < 0.01). The displayed a best diagnostic power of all parameters with the area under curve (AUC) of 0.912.
Conclusion:
The perfusion fraction, , is able to distinguish FGR from normal pregnancies by its value pre and by its change (or lack thereof) post maternal hyperoxygenation. IVIM may potentially help improve the diagnosis of placenta function as it relates to disease.

OR-209

Comparison of amide proton transfer imaging versus diffusion weighted imaging in predicting the recurrence of early stage of hepatocellular carcinoma treated by transcatheter arterial chemoembolization

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Objective: This study aimed to compare the amide proton transfer imaging (APT) versus diffusion weighted imaging (DWI) in predicting the recurrence of early stage of hepatocellular carcinoma (HCC) treated by transcatheter arterial chemoembolization (TACE). **Methods** : APT and DWI date of 50 patients with untreated HCC and 50 patients treated by TACE were retrospectively analyzed, and MTRasym and ADC values were measured. Recurrence rate of HCC was recorded after a median follow-up of 12 months. The differences of the parameters between treated and untreated HCC groups were analyzed, as well as among different recurrence and non- recurrence groups. The predictive values of APT and DWI were analyzed using ROC curves. **Results**: MTRasym of untreated HCC group was higher than that treated HCC group, while ADC was lower than those of treated HCC group (all P<0.05). MTRasym of recurrence of TACE treated HCC group was higher than that non- recurrence group, while ADC was lower than those of non- recurrence group (all P<0.05). MTRasym had the higher AUC in predictive the recurrence of early stage of HCC treated by TACE, but combined ADC will be the best (all P<0.05). **Conclusions**: The prediction efficacy of APT for the recurrence of early stage HCC was better than that of DWI.

OR-210

Correlation of intravoxel incoherent motion parameters and computer tomography perfusion parameters in insulinoma: a preliminary study

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Purposes: To prospectively evaluate the correlation between IVIM-derived parameters and CT perfusion parameters as well as the pathological grades in insulinoma and to investigate heterogeneity of IVIM-derived parameters in different anatomical regions of the normal pancreas.

Methods: From October 2017 to September 2018, a total of 79 consecutive patients with hypoglycemia and endogenous hyperinsuliemia disorders underwent pancreas MRI and CT perfusion examination were prospectivelyenrolled. The b values for IVIM scan were as follows: b values: 0, 10, 20, 50, 100, 150, 200, 500 and 800 seconds/mm^2. The IVIM data was postprocessed using in-house-developed software script by Matlab 2014ato obtain IVIM parameters, including the value of apparent diffusion coefficient(ADC), pure diffusion coefficient (D), perfusion coefficient (D*)and perfusion fraction (f). The CT perfusion data was transferred toexternal workstation (Multi-Modality Workplace, Siemens) for analysis to obtain the perfusion parameters, including blood flow(BF), blood volume(BV) and permeability(PM). The pathological specimens were stained to obtain pathological parameters, including WHO grading, ki-67 index and the mitotic count. All the postprocessing and imaging analysis was performed independently by two radiologists. All the measurement was repeated three times and the average of them served as final results. The IVIM derived parameters of normal pancreas including head, body and tail were compared by Kruskal-Wallis H test and post hoc analysis applied. The comparison between normal pancreatic parenchyma and lesion was evaluated by Manny Whitney U test. Spearman rank correlation analysis test

was performed to evaluate the relationship between the IVIM-derived parameters and the CT perfusion parameters and the histopathological parameters. Interclass correlation coefficient (ICC) was used to measure the interobserver reliability.
Results: There was no significant difference among different anatomical regions for D* and f values, While ADC value of pancreatic tail was significant lower than that of the pancreatic head and body (tail:1.304±0.136×$10^{-3}$$mm^2$/s vs head (1.364±0.125×$10^{-3}$$mm^2$/s) and body (1.366±0.134×$10^{-3}$$mm^2$/s), both p<0.05). There were significant differences in all IVIM parameters between insulinoma (ADC: 1.045±0.227×$10^{-3}$$mm^2$/s, D:0.809±0.206×$10^{-3}$$mm^2$/s, D*: 89.500±58.608×$10^{-3}$$mm^2$/s and f: 32.2±12.3%) and normal pancreas (ADC, D: 1.133±0.099×$10^{-3}$$mm^2$/s, D*:89.500±58.608×$10^{-3}$$mm^2$/s and f: 16.7±5.1%) (all p<0.05). The ADC value of the normal pancreas was positively correlated with BF (r=0.437, p=0.003). No significant correlation was observed between the IVIM-derived parameters and the histopathological parameters including the mitosis, Ki-67 index as well as the grade(all p > 0.05). All the quantitative measurement reached good to excellent agreement (range: 0.611-0.984) for both the different anatomic regions of the normal pancreas and the lesion.
Conclusions: There are certain heterogeneities in the IVIM parameters of different anatomical parts of the normal pancreas, but this part requires consolidation by a larger sample size study. IVIM parameters can distinguish between normal pancreatic parenchyma and insulinoma. The ADC value was related to the CT perfusion parameter BF. Exact measurement of IVIM-derived parameters for normal pancreas in different anatomic regions would establish a solid foundation to help better understand the abnormal diffusion and perfusion properties in different kinds of pancreas disease. The IVIM perfusion method might be applied to clinical practice if it can be proving that IVIM perfusion correlated to standards perfusion methods, which might reduce the necessity of IV contrast injection.

OR-211

Combination of intravoxel incoherent motion imaging with diffusion kurtosis imaging and conventional DWI in predicting the chemotherapeutic response of colorectal liver metastases: an interim analysis of the FDZL-MRinCLM study

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Background and Purpose: A few previous studies have reported that intravoxel incoherent motion imaging (IVIM-DWI) has potential value for assessing the treatment response of colorectal liver metastases (CRLMs), and there has been no reported research regarding the role of diffusion kurtosis imaging (DKI) in CRLMs until recently.
Purpose: To assess the usefulness and performance of IVIM-DWI, DKI and conventional DWI for predicting the chemotherapeutic response of CRLMs.

Methods: A prospective clinical study was conducted to evaluate the value of functional MRI parameters in predicting the early efficacy of standard first-line chemotherapy for CRLMs. Up to February 2018, forty patients were enrolled, and MRI was performed within 1 week before chemotherapy, as well as one cycle and two cycles after chemotherapy. The apparent diffusion coefficient (ADC) map, IVIM and DKI parameter maps were calculated using a prototype postprocessing software. The response was assessed by the Response Evaluation Criteria in Solid Tumors. The mean values of the parameters were compared between the responding group and the nonresponding group.
Results: A total of 15 responding and 25 nonresponding patients were evaluated. Low baseline ADC, Dslow, and D values (P = 0.001, <0.001, and =0.003, respectively) and a high baseline K value (P = 0.002) were independently associated with a good response to chemotherapy with areas under the ROC curves of 0.845, 0.832, 0.819, and 0.787, respectively. The area under the curve of a predictive factor fitted by the above factors reached 0.867. After treatment, the ADC, Dslow, and D values all showed an upward trend, while the K value showed a decreasing trend, but there were no significant differences (P > 0.05).
Conclusion: The interim analyses of our study showed that the pretreatment IVIM-DWI (Dslow), DKI (D and K), and conventional DWI (ADC) parameters all demonstrated a good diagnostic performance in predicting the chemotherapeutic response of CRLMs.

OR-212

DWI and DCE-MRI for differentiating rat serous borderline ovarian tumors from ovarian cancers

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Objective: To explore the differential diagnosis value of diffusion-weighted imaging (DWI), dynamic contrast-enhanced MRI (DCE-MRI) and their combination for differentiating rat serous borderline ovarian tumors (SBOT) from serous ovarian cancers (SOC).
Materials and methods: The conventional MRI, DWI and DCE-MRI sequences were performed in 41 DMBA induced rat ovarian tumors (23 SOC and18 SBOT). The region of interest were put in the solid component or thickened septation and cystic wall. ADC value derived from DWI, TIC pattern, Ktrans, kep, ve and IAUC) derived from DCE-MRI were acquired. The differences of the parameters between SBOT and SOC were compared. The diagnostic performances of DWI and DCE-MRI parameters, and the combination of ADC value and the most effective DCE-MRI parameter were investigated.
Results:The mean ADC values of SBOT and SOC were 1.284±0.183 (10-3mm2/s) and 0.889±0.134 (10-3mm2/s), respectively, with a statistically significant difference (P = 0.000). The optimal diagnostic cutoff value was 1.160 (10-3mm2/s) with a sensitivity of 83.3%, a specificity of 100.0%, and an AUC of 0.947. Three patterns of TIC were observed: type-I, slowly rising curve; type-II, moderately rising curve; type-III, sharply rising curve with a platform or slowly washout. The TIC for SBOT mainly consisted of type-II, whereas for SOC mainly consisted of type-

III. Compared with SBOT, the Ktrans, ve value and IAUC in SOC were significantly larger (0.13±0.06 min-1 vs 0.081±0.02 min -1, P=0.000; 0.656±0.198 vs 0.421±0.284, P=0.007; 23.740±11.882 mmol.kg-1.s vs 12.288±5.318 mmol.kg-1.s, P=0. 001, respectively), with a sensitivity and specificity of 94.4% and 82.6%, 50.0% and 95.7%, 94.4%, and 69.6%, respectively. The Ktrans value was most effective with an AUC of 0.949 when the optimal cutoff value was 0.118 (min-1). The AUC for the combined ADC value and Ktrans was 0.986, with a sensitivity of 94.4% and a specificity of 95.7%. Conclusions: DWI and DCE-MRI were accurate imaging tools for differentiating serous borderline ovarian tumors from serous ovarian cancers, and the combination of both tools could achive the best differentiatial diagnostic efficiency.

OR-213
响应 MPO 的 MRI T1 对比剂 Mn-EDTA 在大鼠急性胰腺炎中的应用

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【摘要】目的 Mn 的络合物 Mn-EDTA 是一种 T1 造影剂，可潜在与中性粒细胞中的髓过氧化物酶（MPO）响应，增强磁共振图像上炎性病灶的信号对比。本研究的目的是利用 Mn-EDTA 磁共振造影剂诊断急性胰腺炎，研究其信号强度与急性胰腺炎严重程度之间的关系。
材料与方法 把 20 只 SD 大鼠分为对照组 1、对照组 2（各 3 只）和实验组 1、实验组 2（各 7 只）。实验组利用雨蛙素和 LPS 构建急性胰腺炎大鼠模型，其中根据注射雨蛙素次数将其分为轻度组（3 只）和重度组（4 只）；对照组注射同等剂量的生理盐水；各分组 1 均尾静脉注射 0.2mmol/kg 的造影剂 Mn-EDTA，各分组 2 均尾静脉注射等浓度等剂量的造影剂马根维显，通过 3.0T 磁共振 T1 加权成像测量对比噪声比（胰腺信号强度/同层面肌肉信号强度），采用病理切片及紫外光度法测量 MPO 活性。
结果 在两个分组 1 中，同样注射 Mn-EDTA 的情况下，实验组胰腺的信号比对照组的信号明显增强；在两个分组 2 中，同样注射马根维显的情况下，实验组胰腺的信号相比对照组增强不明显。在实验组中，无论轻症还是重症急性胰腺炎大鼠，注射 Mn-EDTA 的分组 1 的急性胰腺炎大鼠的对比噪声比是注射同等剂量马根维显分组 2 的对比噪声比的 1.5 倍；病理切片检测炎性细胞及紫外法测 MPO 活性结果显示，MPO 活性越高，炎性程度越重，注射 Mn-EDTA 后 T1 图像上信号越强。
结论 针对急性胰腺炎， Mn-EDTA 比马根维显具有更好的增强效果，同时 Mn-EDTA 信号强度与急性胰腺炎炎症的严重程度呈正相关。Mn-EDTA 能与 MPO 响应，在 T1 加权能增强炎症病灶的对比，MPO 活性越强，病灶信号越高。

OR-214
MRI 及 DWI 对宫颈癌正常大小盆腔淋巴结转移的诊断价值

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目的 探讨 MRI 及弥散加权成像（diffusion weighted imaging，DWI）对宫颈癌正常大小盆腔淋巴结转移的诊断价值。

方法 回顾性收集本院 2014 年 12 月至 2018 年 7 月经手术治疗的ⅠB1-ⅡA2 宫颈癌患者 90 例，共纳入 114 个淋巴结。患者在术前均行 MRI 常规扫描及 DWI 检查。测量并计算形态学标准即淋巴结短径、长径、短长比、ADC 标准即淋巴结 ADC_{max}、ADC_{mean}、ADC_{min}。采用独立样本 t 检验比较转移性淋巴结与非转移性淋巴结诊断指标的差异。采用 Logistic 回归分析淋巴结形态学指标与 ADC 指标联合的作用。采用受试者操作特征曲线（ROC）分析有统计学意义的指标诊断淋巴结转移的诊断效能。
结果 转移性淋巴结的短径、短长径比值高于非转移性淋巴结（$P<0.001$）；转移性淋巴结的长径与非转移性淋巴结无明显差异（$P>0.05$）。转移性淋巴结的 ADC_{max}、ADC_{mean}、ADC_{min}均低于非转移性淋巴结（$P<0.001$）。Logistic 回归预测模型 Logti(P1) = 2.01 +(-0.10 × ADC_{min})+ (0.49 × 短径) + (3.73 × 短长比)。淋巴结短径、短长径比、淋巴结 ADC_{max}、ADC_{mean}、ADC_{min}值和 P1 鉴别盆腔淋巴结转移的 ROC 曲线下面积分别为 0.801、0.722、0.769、0.837、0.870 和 0.913。上述有统计学意义指标鉴别盆腔淋巴结转移的敏感度分别为 79.3%、55.2%、87.1%、70.6%、65.9%和 89.7%，特异度分别为 68.2%、83.5%、55.2%、79.3%、93.1%和 80%。
结论 MRI 及 DWI 对宫颈癌正常大小盆腔淋巴结转移的鉴别具有诊断价值。淋巴结 ADC_{min}值是诊断淋巴结转移的参考价值最大的单指标，淋巴结短径、短长比与 ADC_{min}值联合在所有指标中具有最佳诊断效能。

OR-215
流入反转恢复序列在肝移植血管成像中的应用研究

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目的 探讨流入反转恢复序列（IFIR）在肝移植血管成像中的应用价值。
方法 1.肝移植术前需行肝动脉血管成像的 31 例患者纳入研究，31 例患者均依次行上腹部 IFIR 和对比增强磁共振肝动脉成像。由 2 名医师采用盲法对两组肝动脉图像质量进行评分并评估显示肝动脉最大分支级别的差异。比较 IFIR 与 CE-MRA 在肝动脉各级血管图像质量评分的一致性及最大显示分支级别上的差异；评价医师间图像质量评分和显示肝动脉最大分支级别的一致性。
2.对 26 例肝移植术后患者依次行上腹部 IFIR 和对比增强磁共振门静脉成像。由 2 名医师采用盲法对门静脉图像质量进行评分并比较 2 组图像评分的差异，测量吻合口直径并比较 2 组图像测量值的差异；评价医师间图像质量评分和测量吻合口直径的一致性。
结果 1.2 名医师对 31 例患者的腹腔干、肝总动脉、肝固有动脉、肝右动脉及肝左动脉在 IFIR 和 CE-MRA 中图像质量评分差异均无统计学意义，对肝右前动脉、肝右后动脉、肝左内叶动脉和肝左外叶动脉图像质量评分差异均有统计学意义。在 31 例患者中，2 名医师在 IFIR 和 CE-MRA 中均发现肝动脉变异 3 例，其中 1 例肝右动脉起源于肠系膜上动脉，肝左动脉起源于脾动脉；1 例肝总动脉先天发育细小，两种检查方法均显示不清；1 例肝左动脉起源于腹腔干。
2.在 IFIR 和 CE-MRA 中，26 例患者的门静脉主干及门静脉左、右支近端血管均能显示，图像质量≥3 分者分别为 92.31%和 96.15%。2 名医师对 IFIR 组与 CE-MRA 组图像质量评分差异均无统计学意义。2 组图像吻合口直径测量值间差异均无统计学意义。2 名医师图像质量评分和测量吻合口直径的一致性好。
结论 IFIR 序列作为一种无创伤、无电离辐射、无需对比剂、无需屏气扫描的磁共振肝脏血管成像技术，不仅在肝移植术前评估肝动脉解剖结构及变异中具有一定的应用价值，而且可以成为肝移植术后门静脉追踪和管理的一种有效方法。

OR-216

Diffusion tensor imaging in a rat model of preclinical diabetic nephropathy

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Objectives: The aim of this study was to investigate the value of diffusion tensor imaging (DTI) in assessment of renal injury in a rat model of preclinical diabetic nephropathy. **Materials and Methods**: Twenty-eight male Sprague-Dawley rats were divided into two groups: the normal control group (NC) of 10 rats and diabetic group (DN) of eighteen rats. Eight weeks later of diabetes induction with streptozotocin, MR imaging was performed in a 3.0-T scanner using 32-channel knee coil. Morphological images and diffusion tensor imaging were obtained (b = 0 and 600 s/mm2, 15diffusion directions). At the end of the MR scan, we collected the blood sample to exam the serum creatinine and double kidney tissues for pathological examination. Renal cortex and medulla apparent diffusion coefficient (ADC) and fractional anisotropy (FA) values were calculated for all kidneys by two experienced radiologists under blind method. Physiological parameters, laboratory parameters and imaging results were compared between the two groups. **Results**: All animals in DN group developed hyperglycemia, polyuria and emaciation. The serum creatinine were no significant difference between the two groups (p>0.05). The urinary albumin at 2,4,8 weeks of DN group were higher than those of NC group, but less than 20 ug / min, and there was statistical difference between the two groups (p<0.05). The renal pathological damages in DN rats, such as tubule disappeared, tubule epithelial cells swelling and inflammatory cell infiltration were observed. ADC value was significantly increased in DN animals in the cortex and medulla compared with NC group. FA value was significantly reduced in DN animals in the cortex and medulla compared with NC group. **Conclusions**: Diffusion tensor imaging by increase of ADC and reduction of FA value identified renal injury of preclinical diabetic nephropathy. DTI might serve a potential role in early, non-invasive and quantitative detection and therapy monitoring of diabetic nephropathy.

OR-217

MRI 纹理分析术前预测胰腺导管腺癌病理分化程度

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目的 探究 MRI 平扫及增强纹理分析能否术前预测胰腺导管腺癌病理分化程度。
方法 回顾性收集川北医学院附属医院 2016.01-2019.06 间病理诊断为胰腺导管腺癌患者 60 例（男/女=39/21，30~78y），所有患者均于术前一周行 MRI 检查；根据病理分化结果，将病人分成高、中、低分化三个组。收集患者的基本信息，包括性别、年龄、肿瘤部位、肿瘤最大径、是否有淋巴结转移及是否有血管浸润。利用拉普拉斯滤波对 MRI 图像进行预处理，逐层勾画 T1WI、T2WI

及增强扫描动脉期、门脉期及延迟期图像肿瘤感兴趣区，提取灰度直方图、灰度共生矩阵、灰度游程矩阵及形状共 174 个特征。利用主成分分析进行降维，提取累积频率达到 95%的主成分。采用人工神经网络进行建模，模型评价指标为平均受试者特征工作曲线下面积。

结果 临床指标中，年龄在胰腺导管腺癌病理分化中具有统计学意义（p＝0.046），性别、肿瘤部位、肿瘤最大径、是否有淋巴结转移及是否有血管浸润均无统计学意义（p＞0.05）。利用 MRI 纹理分析鉴别胰腺癌分化程度中，T1WI 提取了 3 个有效主成分，平均曲线下面积为 0.653；T2WI 提取了 4 个有效主成分，平均曲线下面积为 0.782；动脉期提取了 4 个有效主成分，平均曲线下面积为 0.737，门脉期提取了四个有效主成分，平均曲线下面积为 0.833，延迟期提取了 3 个有效主成分，平均曲线下面积为 0.740。

结论 MRI 纹理分析，尤其门脉期可以术前预测胰腺导管腺癌病理分化程度。

关键词：胰腺导管腺癌 纹理分析 病理分化 磁共振成像

OR-218

Whole-Tumor Histogram Analysis of Diffusion Kurtosis Imaging as A Predictive Biomarker of Tumor Response in Locally Advanced Rectal Cancer Treated with Neoadjuvant Chemoradiation

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Purpose: The purpose of this study was to explore predictive value of whole-tumor histogram analysis in diffusion kurtosis imaging to assess tumor response to neoadjuvant chemoradiation therapy in locally advanced rectal cancer.

Materials and methods: Between June 2016 and November 2017, totally 43 patients with rectal cancer were retrospectively collected in our study. All patients received neoadjuvant chemoradiation followed by total mesorectal excision. All enrolled patients were examined using MRI at two timepoints: 1-7 days before neoadjuvant chemoradiation (pre-MRI), within 1-7 days of NCRT completed (post-MRI). Pretreatment T stage, N stage, mesorectal fascia (MRF), extramural vascular invasion (EMVI), tumor location and length, pretreatment CEA and CA19-9 levels were recorded. According to tumor response, we classified the patients into pCR and non-pCR groups. Whole tumor volume of interest (VOI) was obtained by semi-automatic segmentation method in both pre- and post-MRI . Then, ADC, K and D histograms and corresponding parameters, difference histograms value between pre-MRI and post-MRI were calculated. Histograms metrics of ADC, K and D, tumor characteristics and their relationship with tumor response were evaluated by using Logistics regression.

Results: Pre-K_{ske}, post-tumor volume, and ADC_{sd} (pre-post) were correlated with tumor response by using Lasso regression model and then radiological signature score was build. Pretreatment EMVI(+) (OR=9.231 (1.015-83.938), p=0.048), MRF(+) (OR=5.317 (1.136-12.488), p=0.030), higher rectal cancer (OR=4.110 (1.234-13.688), p=0.021), CEA≥5ng/ml (OR=9.231(11.015-83.938), p=0.048) and low radiological signature score (OR=14.428(1.833-113.588), p=0.011) could be associated with non-pCR in univariate analysis. Multivariate analysis identified that the pretreatment CEA≥5ng/ml

(OR=42.311 (1.098-1630.20), p=0.044) and low radiological signature score (OR=1.312 (1.077-1.597), p=0.007) would be independent factors to indicate patient with non-pCR. **Conclusion:** Whole-tumor histogram analysis of diffusion kurtosis imaging is a valuable and easily available tool to predict tumor response. It will be helpful to stratify patients who are sensitive to neoadjuvant chemoradiation in locally advanced rectal cancer.

OR-219
原发性痛经患者子宫形态学在不同月经周期阶段的异常变化

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目的 原发性痛经（Primary Dysmenorrhea, PDM）是由于子宫肌层异常收缩导致子宫缺氧缺血而产生的痉挛性疼痛。目前关于子宫结构的检查方法不一致，研究结果尚存在争议。由于缺乏有效、非侵入性的精细检查手段，痛经的潜在病理生理机制仍不明确。本研究基于子宫磁共振 T2WI 图像运用纹理分析(Texture Analysis，TA)方法，探讨不同月经时期下原发性痛经患者与健康女性的子宫形态学特征变化差异。
方法 选取符合加拿大妇产科学会的诊断标准（Primary Dysmenorrhea Consensus Guideline）的原发性痛经患者 51 例及正常健康志愿者 49 例，分别采集排卵期、月经期子宫 T2WI 磁共振图像及疼痛评分（VAS），选择子宫内膜、子宫肌层和结合带为感兴趣区进行纹理特征分析，采用重复测量分析方法分析原发性痛经女性和健康对照在两个时间点的子宫纹理特征差异，并探讨原发性痛经患者 VAS 疼痛评分与子宫纹理特征的相关性。**结果** 子宫肌层区域百分比（ZP）、小区域重点度（SZE）均存在时期*分组的交互效应（P_{SZE}=0.001; P_{ZP}<0.001），原发性痛经组子宫肌层的 ZP、SZE 从排卵期到月经期的变化幅度较健康对照组小（P_{SZE}=0.006; P_{ZP}=0.007），排卵期与月经期的 ZP、ZSE 变化值与月经期的 VAS 呈正相关(ZSE: r = 0.371, p = 0.009; ZP: r=0.328, p=0.021)；子宫内膜、结合带的纹理参数无交互效应，仅存在时期主效应。**结论** 原发性痛经女性子宫结构在月经周期中存在异常变化模式，提示子宫结构异常可能贯穿整个月经周期，痛经不仅存在于月经期，而是发生于整个月经周期的疾病；子宫肌层的纹理特征异常变化可能作为 PDM 的有效特征标志，有可能为评估治疗效果提供客观影像学依据。

OR-220
Prostate MRI: comparison of reduced field-of-view (rFOV) and full FOV (fFOV) in clinical application of diffusion-weighted imaging at 3 T

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Purpose: Reduced field-of-view (rFOV) diffusion imaging has been suggested as an alternative to conventional single-shot echo-planar diffusion-weighted imaging (DWI) with reduced distortion[1-4]. However, clinical comparisons of rFOV and full FOV (fFOV) DWI are limited by unmatched imaging parameters and reconstruction procedures. The

purpose of this study was to compare the clinical utility of rFOV DWI with fFOV DWI for visualization of the prostate at 3.0 T MRI.
Material and Methods: The local Institutional Review Board (IRB) approved this retrospective study and waived the requirement of informed consent. Between April 2016 and October 2018, 96 consecutive patients (mean age, 62 years; range 45-87 years) were enrolled in the study. The clinical indications for prostate MRI included characterization or follow-up of prostate lesions and oncologic follow-up. All MR examinations were performed on a 3.0 T MR system (Discovery MR 750Plus, GE Healthcare, Waukesha, WI, USA). Images were obtained using rFOV and fFOV DW imaging with an identical scanning time, acceleration factor, target resolution, and image postprocessing procedure. DWI was performed with b-values of 0 and 800 s/mm^2. The two datasets were independently reviewed by two blinded urogenital radiologists. Imaging studies were evaluated for resolution, signal-to-noise ratio (SNR), contrast-to-noise ratio(CNR), distortion, lesion conspicuity, and diagnostic confidence using a 7-point Likert scale: 1, nondiagnostic; 2, poor; 3, acceptable; 4, standard; 5, above average; 6, good; and 7, outstanding. Observer agreement was assessed using a linearly weighted kappa statistic. Tests for differences in ratings between rFOV and fFOV DW imaging were performed using a two-tailed Wilcoxon signed-rank test, $p<0.05$ considered significant.
Results and Discussion: The readers were in good agreement in their scores (κ = 0.68; 95%CI, 0.56-0.79). The mean scores for rFOV and fFOV DW imaging, respectively, were as follows: resolution, 3.4/5.8; distortion level, 2.9/5.9; SNR, 3.8/4.2; CNR, 3.2/3.8; lesion conspicuity, 4.0/5.6; and diagnostic confidence, 3.2/5.1. Overall, rFOV DW imaging was superior to fFOV in resolution, distortion reduction, lesion conspicuity, and diagnostic confidence (P =0.006), whereas fFOV imaging scored better in SNR and contrast. rFOV DW imaging was considered the better sequence overall in 98.7% of the cases. Moreover, the higher spatial resolution as well as reduced blurring and distortions on rFOV imaging scans helped to better reveal important anatomic details such as central zone, peripheral zone, surgical capsule, benign hyperplastic nodule, extracapsular extension and lymph node metastasis of prostate cancer.
Conclusion: Reduced field-of-view diffusion imaging enables robust prostate imaging with an short acquisition time, providing improved resolution and reduced distortion in evaluating the prostate.

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Classify prostate transitional zone cancer and hyperplasia using deep transfer learning from disease-related images

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Purpose
The diagnosis of prostate transition zone cancers (PTZC) remains a clinical challenge due to its similarity to benign prostatic hyperplasia (BPH) on MRI. The Deep Convolutional Neural Networks showed high efficacy in medical imaging but was limited

by the small data size. A transfer learning method was combined with deep learning to overcome this challenge.

Materials and Methods

A retrospective study was conducted on 217 patients enrolled from our hospital database (208 patients) and The Cancer Imaging Archive (9 patients). Based on the T2 weighted images (T2WIs) and apparent diffusion coefficient (ADC) maps of these patients, DCNN models were trained and compared between different TL database (ImageNet vs. disease-related images) and protocols (from scratch, fine-tuning or transductive transferring).

Results

Using the model trained from scratch (TFS-model), T2WIs were associated with the AUC of 0.73 (95% CI = 0.63-0.83), as well as the sensitivity, specificity and accuracy of 69%, 75% and 81%, respectively. ADC images were associated with the AUC of 0.94 (95% CI = 0.90-0.99), as well as the sensitivity, specificity and accuracy of 84%, 97% and 89%, respectively. The diagnostic efficacy of Alex-Net DCNN model using ADC images was quite satisfying, but that using T2WI needed to be improved further.

Using the model trained from the disease-related dataset (TLR-model), T2WIs were associated with the AUC of 0.86 (95% CI = 0.79-0.93), as well as the sensitivity, specificity and accuracy of 90%, 69% and 80%, respectively. The diagnostic efficacy of TLR-model was significantly higher than that of TFS-model (P = 0.00014) or TLI-model (P = 0.00046). ADC images were associated with the AUC of 0.97 (95% CI = 0.90-0.99), as well as the sensitivity, specificity and accuracy 90%, 94% and 92%, respectively. However, there was no significant difference between AUCs of TLR-model and TLI-model (P = 0.88), or between TLR-model and TFS-model (P = 0.29).

Conclusion

Deep transfer learning from disease-related images is a powerful tool to build an automated diagnostic system for PTZC.The accurate diagnosis of PTZC can be achieved via the transductive deep transfer learning from disease-related images.

OR-222

Can we do one-stop-shop evaluation of conditions both of liver and lesion with gadoxetic acid disodium-enhanced magnetic resonance and IDEAL-IQ image?

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Purpose

To explore one-stop-shop evaluation of conditions both of liver and lesion with gadoxetic acid disodium-enhanced magnetic resonance (Gd-EOB-DTPA-enhanced MRI) and IDEAL-IQ image.

Materials and Methods

783 patients underwent Gd-EOB-DTPA-enhanced MRI and IDEAL-IQ scan. These patients either had high risk factors of hepatocellular carcinoma (HCC), history of tumor in other organs, or liver lesion found by Ultrasound. We drew interested area at each segment in the liver to avoid intrahepatic bile ducts, blood vessels, and lesions. We

evaluated lipid deposition with fat-fraction images, and evaluated liver iron deposition with R2* images. We drew interested area at the same location of the lesion at in-phase and out-of-phase images to identify if the lesion contained fat or lipid. For suspected malignant or unsure intrahepatic lesions, we evaluated vein and bile duct in liver with Gd-EOB-DTPA-enhanced MRI. We measured the signal intensity at right lobe of liver and erector spinae, respectively, in pre-enhancement and hepatobiliary phase images in cirrhosis patients.

Results

45 patients with suspected malignant or unsure lesions needed surgery, we evaluated artery, vein and bile duct in liver before surgery. Artery phase can display artery branches above grade 4 and venous phase can show venous branch above grade 4, which can provide useful information before surgery. Two patients had hepatic artery variation. For 56 patients, we spotted lesions, at hepatobiliary phase, that were not found by common enhancement scan, and changed our treatment accordingly. 24 patients could not receive surgery due to bad liver function. Among them, only one malignant lesions was found in the liver. 241 patients have no lesions, we assessed lipid and iron depositions and liver functions. 33 patients had different degrees of fatty liver and five patients had different degrees of iron deposition in the liver. The degree of enhancement in one patient due to high blood bilirubin significantly reduced like delay phase and no contrast agent in biliary tract at hepatobiliary phase.

Conclusion

One-stop-shop Gd-EOB-DTPA-enhanced MRI and IDEAL-IQ scan can provide a lot of valuable information and can increase diagnostic confidence.

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探讨基于整个肿瘤联合使用纹理特征和多变量逻辑回归分析在卵巢交界性和恶性上皮性肿瘤鉴别诊断中的价值

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目的 探讨基于整个肿瘤的 MRI 纹理特征和多变量逻辑回归分析的联合应用在卵巢交界性上皮性肿瘤（BEOTs）和恶性上皮性肿瘤（MEOTs）鉴别诊断中的价值。

材料与方法 回顾性分析从 2014 年 9 月至 2019 年 5 月 88 例经病理证实的 BEOTs 和 MEOTs。采用 MaZda 软件分别在 T2WI，DWI 及增强 TIWI 上逐层勾画整个肿瘤。每个序列分别提取出 314 个纹理特征值后再自动选择 30 个最优纹理特征值。用随机森林计算每个最优纹理特征的权重。根据权重将 3 个序列上的前五个纹理特征值各自纳入二分类逻辑回归分析。比较 4 个逻辑回归模型的诊断效能。

结果 与 BEOTs 相比，MEOTs 的 CA-125 水平和实性成分的最大径显着高于 BEOTs（$p < 0.001$）。此外，MEOTs 更常表现为境界不清和不规则增厚的分隔（$P < 0.001$），而表现为圆形或椭圆形的囊性或囊性为主则常见于 BEOTs（p 值分别为 $p = 0.001$，$p < 0.001$）。30 个最优纹理特征值主要来源于共生矩阵（25/30）。4 个二分类逻辑回归模型均具有较高的拟合优度， Hosmer-Lemeshow 检验的 P 值分别为 0.674（T2WI），0.877（DWI），0.997(增强 T1WI)和 0.959（临床资料和 MRI 特点）。模型的 AUC，敏感度和特异度分别为 T2WI（0.794, 91.2%，62.1%），DWI（0.915, 89.7%，71.4%），增强 T1WI（0.934, 91.4% and 72.4%），临床资料和 MRI 特点（0.793, 84.5% ，50.0%）。在 BEOT 和 MEOT 的鉴别诊断中，从整个肿瘤中提取的 MRI 纹理特征比临床资料和 MRI 特

征的组合诊断效能更优。 此外，与 T2WI 和 DWI 相比，从增强 T1WI 中提取的 MRI 纹理特征具有最佳的鉴别诊断性能。

结论 MRI 纹理特征和多变量逻辑回归分析的联合应用能够有效地鉴别 BEOT 与 MEOT。

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Utility of whole-volume histogram and texture analysis on T1 maps for the prediction of advanced fibrosis in NAFLD

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Purpose

To assess the utility of whole liver texture analysis on T1 maps for the prediction of advanced fibrosis in patients with suspected NAFLD.

Methods

This retrospective study was approved by Institutional Review Board and the requirement of informed consent was waived. The cases of 45 patients with suspected NAFLD were retrospectively analyzed. Quantitative parameters with texture features (Volume, Mean, SD, Median, 5%, 95%, Skewness, E.Kurtosis, Diff.Entropy, Diff.Variance, Contrast, Entropy) were calculated using T1 mapping data with a semiautomatic whole volume region of interest (ROI). A two-step approach of combining the Nonalcoholic Fatty Liver Disease Fibrosis Score or Fibrosis-4 Index with the Liver Stiffness Measurement for the Diagnosis of Advanced Fibrosis were used. Diagnostic performance was evaluated with receiver operating characteristic (ROC) analysis.

Results

16 (36%) subjects had significant fibrosis and 29 (64%) had advanced fibrosis. The following significantly different values were obtained for the low risk and high risk of advanced fibrosis groups: mean (1039 ± 309 vs. 1272 ± 348), SD (352± 196 vs. 522 ± 198), median (982± 297 vs. 1167 ± 332).5% (643±185 vs. 759± 147), 95% (1538±705vs. 2097 ± 934), DiffEntropy (1.38± 0.33 vs. 1.66 ± 0.37), DiffVariance (2.81± 2.78 vs. 4.6 ± 3.66), Contrast (6.21± 4.82 vs. 13.4 ± 10.6), Entropy (2.19± 0.44 vs. 2.67 ± 0.42) . The TA parameters with the best performance were contrast and entropy, respectively, with AUROC 0.800 (95% CI 0.663 - 0.936, p =0.000981) and 0.786 (95% CI 0.647 - 0.924, p=0.00168) for significant fibrosis.

Conclusions

Parameters obtained by histogram and texture analysis of T1 maps may be useful for noninvasive prediction of advanced fibrosis in NAFLD patients.

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The performance of magnetic resonance T1ρ imaging for monitoring liver fibrosis: compared with ultrasound elasotography in a rat model

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Purpose: To compare the performance of magnetic resonance (MR) T1ρ imaging for detecting the progression and regression of liver fibrosis with ultrasound elasotography in a rat model with carbon tetrachloride (CCl_4).
Materials and methods: All the experimental procedures were approved by the Local Animal Care and Use Committee. Twelve rats were injected with CCl_4 for 7 weeks to induce liver fibrosis and underwent MR T1ρ imaging and acoustic radiation force impulse (ARFI) to acquire T1ρ value and shear wave velocity (SWV). Then they were randomly divided into 2 groups (n=6 each group), and received CCl_4-injection/CCl_4-withdrawal for 4 weeks to make fibrosis progress or to allow fibrotic livers regress spontaneously. The 12 rats were then performed the second liver T1ρ imaging and ARFI. METAVIR system (F0–F4) was used for staging fibrosis. Wilcoxon rank test and receiver-operating characteristic (ROC) analysis was performed for statistical analysis, area under the ROC curve (AUC) and DeLong test was used to compare accuracy of two imaging method for monitoring fibrosis.
Results: Both T1ρ values and SWV increased significantly after the progression of liver fibrosis ($P \leqslant 0.045$) and decrease slightly after the regression of liver fibrosis ($P \geqslant 0.35$). The AUC of T1ρ for detecting fibrosis progression and regression respectively was 0.72 and 0.62, and the AUC of SWV for detecting fibrosis progression and regression was 0.74 and 0.6 respectively. There was no significant difference of the performance between two imaging methods for monitoring liver fibrosis ($P \geqslant 0.752$).
Conclusion: MR T1ρ imaging provides a similar accuracy for detecting the progression/regression of liver fibrosis with ultrasound elasotography.

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Advanced Gastric cancer: Functional MRI for assessment of aggressiveness—Comparison between DCE-MRI and Diffusion Kurtosis Models

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Purpose: To explore the application of functional MRI in predicting histopathological features of gastric cancers.
Materials and Methods: This study was approved by the local institute review board. Forty-three patients with biopsy proved gastric cancer were enrolled in prospective study. The DCE-MRI images were blindly determined by radiologists using Tofts -model. The DKI images (b=0,200,500, 800, 1000, 1500, 2000s/mm^2) and maps of apparent diffusion coefficient (ADC) (0-800sec/mm^2) were blindly determined by radiologists respectively using Body Diffusion Toolbox software. All region of interests was manually drawn on the specific slice showing the largest area of tumor. The following

parameters were calculated in tumors: (ADC) obtained with mono-exponential model, Diffusion(D) and Kurtosis(K)obtained with DKI, K_{trans}, K_{ep} and Ve obtained at DCE-MRI with Tofts model. Metrics were compared between diffuse , intestinal and mixed type in Lauren type, between poorly differentiated and non-poorly differentiated, by using analysis of Spearman correlation , receiver operating characteristic (ROC) analysis. **Results**: ADC,D, K_{trans} and Ve showed significantly correlations with differentiation(r=0.387,0.477,-0.341,-0.309 ,p＜0.05,respectively).ADC and K showed correlated significantly with Lauren type(r=0.343, -0.326, p＜0.05).However, no significant difference was observed in K from differentiations and all DCE-MRI parameters from Lauren type(p＞0.05). ADC and K were highly correlated (r = -0.822; p=000). ADC showed the highest area under the curve (AUC = 0.813,p=0.001), followed by D(AUC = 0.758,p=0.006),K(AUC = 0.719, p=0.014), Ktrans(AUC = 0.711, p=0.019),Ve(AUC=0.690, p=0.034),),Kep(AUC=0.510, p=0.410) for poor differentiated type versus non-poor differentiated type. All DWI parameters were higher AUC(D 0.801,K 0.817,ADC 0.876) than DCE-MRI parameters(K_{ep} 0.429,K_{trans} 0.608,Ve 0.777) for evaluation of diffuse type in Lauren type.
Conclusion: These observations did not show a clear added value of DK imaging compared with standard DW imaging for different histopathologic factors. DCE-MRI and DKI-derived parameters have similar performance compared with conventional ADC in differentiating gastric cancers.

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7.0T 磁共振波谱检测下肢腓肠肌代谢物对 SD 大鼠早期糖尿病足周围神经病变的诊断价值

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目的 利用 7.0T 磁共振波谱（MRS）研究 SD 大鼠早期糖尿病足腓肠肌代谢物浓度的变化，探讨其对 SD 大鼠早期周围神经病变（DPN）的诊断价值。**材料与方法** 将 40 只 5 周龄，体重约 150g 雄性 SD 大鼠分为对照组与实验组（每组各 20 只），其中对照组以普通饲料喂养 30d，实验组以高脂饲料喂养 30d 后按 45mg/kg 剂量于实验组 SD 大鼠腹腔注射 STZ 溶液，对照组 SD 大鼠腹腔注射等体积的柠檬酸-柠檬酸钠缓冲液，测量注射药物前及注射药物后 1d、3d、7d 实验组 SD 大鼠随机血糖，注射药物后 1d、3d、7d 实验组 SD 大鼠随机血糖稳定且均大于 16.7mmol/L 代表糖尿病大鼠模型造模成功。40 只 SD 大鼠均于实验组成模后 3d、1w、2w、3w、4w、5w、6w 行右小腿常规 MRI（T_1WI，T_2WI）、并选 SD 大鼠右小腿腓肠肌作单体素 MRS 检查。于第 6w 后行右侧坐骨神经离体电生理及病理检查。采用 LCModel 软件对右侧腓肠肌波谱结果进行定量分析，比较不同组间及组内右侧腓肠肌的肌酸复合物（Cr）、胆碱复合物（Cho）等代谢物绝对浓度及 Cho/Cr 代谢物比值的差异。应用 SPSS22.0 行统计学分析，利用双样本 t 检验及单因素方差分析行差异性分析，当 P<0.05 时表示差异有统计学意义。**结果** 成模后各时期实验组大鼠 Cho 及 Cho/Cr 值均高于对照组（P<0.05）；各时期对照组组间 Cho 及 Cho/Cr 值无统计学差异（P＞0.05）；实验组组间 Cho 及 Cho/Cr 值随时间推移呈逐渐升高，差异有统计学意义（P<0.05）；成模后 6w 实验组大鼠坐骨神经传导速度显著低于对照组（P<0.05），病理结果显示实验组大鼠坐骨神经出现早期脱髓鞘改变。**结论** MRS 可以用于 SD 大鼠早期糖尿病足周围神经病变的诊断，且具有较高的诊断价值与临床意义。

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3.0T MRI 的 T1 FSE、T1 IDEAL 与 LAVA-Flex 三种序列成像在四肢软组织增强效能对比

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摘 要：目的 评价 3.0T HDXT 磁共振成像（MRI）系统的 T1 FSE、T1 IDEAL 与 LAVA-Flex 这三种序列成像在四肢软组织增强检查的价值。方法 对 37 例患者在常规平扫检查后分别予以这三种不同的增强序列检查。计算采用 SPSS18.0 进行统计学处理对比图像质量,测量三种序列分别在同一位置四肢软组织、皮下脂肪及背景噪声信号值,运用测量公式计算信噪比(SNR)、对比噪声比(CNR) 。**结果** 在 31 个患者检查中测量 T1 FSE、T1 IDEAL 和 LAVA-Flex 序列的信噪比分别为（14.3752±3.1967、129.0486±33.0956 和 22.2052±4.29631），T1 IDEAL 序列的信噪比明显高于 FSE 和 LAVA-Flex 序列。FSE、IDEAL 和 LAVA-Flex 序列对比噪声比分别为(6.2796±1.71896、30.9083±12.6670 和 18.7348±4.49985)，T1 IDEAL 序列的对比噪声比明显高于 FSE 和 LAVA-Flex 序列。通过方差齐性检验三组数据方差均齐，采用方差分析 SNR F 值为 405.335，(P<0.01),CNR F 值为 91.655，(P<0.01),三组图像数据有统计学差异，再通过 LSD 法进行两两比较，IDEAL 序列与 FSE 及 LAVA-Flex 序列分别比较(P<0.01)均有统计学差异,而 FSE 序列与 LAVA-Flex 序列之间无统计学差异。结论 ：T1 IDEAL 序列作为一种改进的三点式 DIXON 水脂分离成像技术可以在一个像素内任意的水和脂肪比例都可以进行精确水脂分离，不仅有较高的信噪比及对比度，而且无明显的运动伪影，可以作四肢关节及软组织增强的首选序列。而 LAVA-Flex 序列采用超短的 TR、TE 和小角度的射频脉冲以及运用多种快速采集技术可以大大减少扫描时间，当病人因各种原因不耐受时可以用此序列替代。

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股骨滑车发育不良对中青年股四头肌内脂肪含量影响——mDIXON-Quant 测量

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目的 运用 mDIXON-Quant 定量 MR[1]，探讨股骨滑车发育不良（FTD）对股四头肌内脂肪含量影响，为临床提供影像学依据及后期治疗提供指导方向。

方法 收集 2016.1 -2017 .12 天津市第一中心医院 18-45 岁膝关节疼痛者，诊断为 FTD 并行股四头肌 MR 检查者 43 例（平均 30.5±7.6 岁，男 18 例，女 25 例；A 型 FTD24 例，B-D 型 FTD19 例），对照组 43 例（平均 30.4±7.2 岁，男 17 例，女 26 例）。采用 Philips Ingenia 3.0T MR 扫描仪进行膝关节常规序列及股四头肌 mDIXON-Quant 序列扫描，股四头肌影像图经飞利浦后处理系统，分别手动画取股直肌、股中间肌、股外侧肌、股内侧肌 ROI，生成相对应 ROI 脂肪分数。分别比较 FTD 组与对照组、不同 FTD 分型组内、不同性别中不同 FTD 分型组内股四头肌及其内四块肌肉脂肪分数值的差异。

结果 （1）不同 FTD 分型组间，股四头肌内脂肪分数 A 型 FTD 组（4.126±2.217%）低于对照组（4.533±2.164%），*P*=0.011；股四头肌内脂肪分数 A 型 FTD 组（4.126±2.217%）低于 B-D 型 FTD 组（4.581±2.142%），*P*=0.018。

（2）在男性组中，股四头肌内脂肪分数 A 型 FTD 组（3.411±1.859%）低于对照组（4.257±2.264%），*P*=0.000；股外侧肌内脂肪分数 A 型 FTD 组（3.676±1.928%）低于对照组

（4.799±2.591%），*P*=0.035；股直肌内脂肪分数 B-D 型 FTD 组（4.883±2.239%）高于对照组（3.828±2.013%），*P*=0.041。差异有统计学意义（*P*<0.05）。
结论　FTD 导致中青年股四头肌脂肪含量改变，在男性中有显著差异，A 型 FTD 股四头肌、股外侧肌脂肪含量减低，肌力增加；B-D 型 FTD，股直肌肌脂肪含量增加，肌力减弱。

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超短回波序列（UTE）磁共振动态增强成像评估骨皮质灌注：可行性研究

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目的　探究动态增强 IR-UTE 序列评估皮质骨灌注的可行性，促进皮质骨灌注和骨病的相关性研究。
方法　本研究对 12 只兔和 3 名健康志愿者进行实验研究，图像均在临床 3T 扫描仪上使用 2D UTE 和 IR-UTE 序列进行扫描。实验中兔子的 Gd 注射剂量为 0.06mmol / kg，而人受试者的剂量为 0.2mmol / kg。在注射 Gd 造影剂前后，均采用~0.5×0.5 mm2 的面内分辨率及 3 mm 的层厚扫描兔子的动态数据，而志愿者的图像扫描层厚为 10 mm；兔子 UTE 成像时间分辨率为 23 秒，人体 UTE 成像时间为 28 秒；兔子和志愿者的 IR-UTE 成像时间分辨率均为 60 秒。获得动态增强图像数据后，对 UTE 及 IR-UTE 进行基于 Brix 模型的动力学分析，以及最大增强（ME）和增强斜率（ES）的简单计算。
结果　12 只家兔的 2D UTE 序列股骨平均 Ktrans 为 0.36±0.07 min-1，Kep 为 8.42±3.17 min-1，ME 为 28.30±6.83，ES 为 0.35±0.18，而 2D IR-UTE 序列的股骨平均 Ktrans 为 0.45±0.10min-1，Kep 为 9.80±0.50min-1，ME 为 48.84±12.12，ES 为 0.69±0.28。与兔相比，在健康人志愿者的胫骨中轴中观察到较低的 ME 和 ES 值。
结论　上述结果表明 2D UTE 和 IR-UTE 序列能够检测兔子和健康志愿者的骨皮质的动态增强对比度，使用这些技术进行骨皮质的灌注研究将是可行的。

OR-231
单体素波谱分析与多回波 Dixon 序列定量评估慢性腰背痛患者椎旁多裂肌脂肪含量的对比研究

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目的　运用磁共振单体素波谱(Magnetic Resonance Spectroscopy, MRS)序列和多回波 Dixon 序列定量评估慢性腰背痛(Low back pain, LBP)患者 4-5 椎间盘椎旁多裂肌脂肪含量(Fat%)与最大背伸展力相关性，并与正常志愿者比较对应部位 Fat%的差异性。
方法　20 名 LBP 侧突畸形患者(4 男，16 女，平均年龄 62.40±7.63 岁)，20 名正常志愿者(4 男，16 女，平均年龄 60.85±6.75 岁)行腰椎磁共振检查，4-5 椎间盘行多回波 Dixon 序列扫描。测量 40 名纳入者左右椎旁多裂肌 MRS 和 Dixon 序列 Fat%，比较 LBP 组和正常志愿者组的差异性，计算 LBP 组多裂肌 MRS 和 Dixon 序列 Fat%与最大背伸展力的相关性。校正卡方检验分析两组间男女

分布差异性， Wilcoxon 秩和检验分析两组年龄、体重指数和多裂肌 Fat%的差异性，Spearman 相关分析 Fat%与最大背伸展力的相关性。

结果 两组纳入人群性别分布，年龄和体重指数无显著性差异(P=1, P=0.364, P=0.433)，两组间 MRS 和 Dixon 序列 Fat%无显著性差异(P=0.279, P=0.108)。MRS 序列多裂肌 Fat%和 Dixon 序列多裂肌 Fat%分别与最大背伸展力呈弱负相关和中等负相关 (R=-0.281, R=-0.325)。

结论 多回波 Dixon 序列可定量鉴别诊断 LBP 侧突畸形患者，Fat%略高于正常人，与单体素 MRS 序列相比更好地反应患者最大背伸展力变化情况。

OR-232

Whole-body diffusion-weighted MRI for evaluation of response in multiple myeloma patients following bortezomib-based therapy: A large single-center cohort study

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Objectives: To determine the feasibility of Whole-body diffusion -weighted (WB DWI) MRI for evaluation of response in multiple myeloma (MM) patients following bortezomib-based therapy and to explore the direction of apparent diffusion coefficient (ADC) changes on treatment.

Methods: Seventy-two MM patients who underwent WB-DWI MRI before and after bortezomib-based induction chemotherapy (week 21) were evaluated retrospectively. The Estimated tumour volume (eTV) and ADC values before and after chemotherapy were calculated and compared between deep (very good partial response or complete response) and non-deep responders (progressive disease, stable disease, minimal response, or partial response). Predictive value of baseline ADC_{mean} was calculated to predict the trend of ADC_{mean} change following treatment.

Results: Fifty-five patients were classified as deep responders and 17 as non-deep responders. In the per-lesion analysis, 1173 lesions from the 72 patients were included. A different trend of ADC_{mean} change following bortezomib-based treatment was observed in patients with different DWI MRI infiltration patterns. For 327 focal lesions, the ADC_{mean} value increased significantly from baseline to post-treatment ($0.93 \pm 0.26 \times 10^{-3}$ mm^2/s *vs* $1.52 \pm 0.81 \times 10^{-3}$ mm^2/s, p = 0.000). However, ADC_{mean} value decreased significantly following treatment ($0.75 \pm 0.19 \times 10^{-3}$ mm^2/s *vs* $0.60 \pm 0.41 \times 10^{-3}$ mm^2/s, p = 0.000) in 846 representative diffuse lesions. Diffuse lesions showed a significant decrease in ADC_{mean} value in deep responders, whereas no significant variation in ADC_{mean} value changes in focal lesions between deep responders and non-deep responders group. Baseline ADC_{mean} at a specific value (0.808×10^{-3} mm^2/s) yielded a maximum of specificity (68.05%) plus sensitivity (54.09%) in predicting increase of post-treatment ADC_{mean}.

Conclusions: ADC_{mean} value decreased significantly in patients with diffuse pattern MM while increased significantly in patients with focal pattern MM following bortezomib-based treatment. WB DWI MRI can be used to discriminate deep response to induction

treatment in patients with diffuse infiltration pattern MM. Baseline ADC_{mean} may have a potential to predict the trend of ADC_{mean} change following treatment.

OR-233

Impact of age and menopausal status on apparent diffusion coefficient of pelvic bone marrow in adult women

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Objective: *To evaluate the effects of age and menopausal status of pelvic bone marrow in adult women with apparent diffusion coefficient (ADC) quantification.*
Materials and Methods: *From August 2017 to January 2018, a total of 124 adult females (mean age 51.4 ± 9.2 years; age range, 31–71 years) underwent diffusion weighted imaging (DWI) of the pelvic bone marrow, who were divided into premenopausal group (n=51) (* ≤*40 years, n=19;* >40 years, n=32) and postmenopausal group(n=73) (≤60 years, n=46; >60 years, n=27). *The subjects aged between 45-55 years were further grouped into middle-aged premenopausal group (n=22) and middle-aged postmenopausal group (n=30) based on their menopausal status. The ADCs of pelvic bone marrow were measured. Clinical factors, such as age, menopausal status were recorded. The image data were analyzed to evaluate the variance of pelvic ADCs among different menstrual status and age groups. The relationships between the ADCs of pelvis and menopausal status were evaluated through Independent-sample t test or Mann–Whitney U test, and correlations of ADCs with age were analyzed through the Pearson's correlation analysis.*
Results: *Higher* ADC value was demonstrated for premenopausal women compared with postmenopausal women ($P<0.001$). The ADC of pelvic bone marrow showed significant negative correlation with age ($r= -0.581$, $P<0.001$), and a weak linear correlation had been found in premenopausal group ($r= -0.301$, $P= 0.032$), and there was no significant correlation between age and ADCs in postmenopausal women when analyzed separately. In premenopausal group, the ADC value of the ≤40 years subgroup was higher than that in the >40 years subgroup *($P = 0.031$). No significant difference was found in pelvic ADC value between the ≤60 years and* >60 years subgroups of postmenopausal women ($P> 0.05$).
Conclusion: *The ADCs in pelvic bone marrow were significantly higher in premenopausal women than in postmenopausal women, and the pelvic ADCs showed a descending trend with age which was more pronounced in premenopausal women.*

OR-234

对比分析 MRI T2-mapping 成像序列及 3D CUBE T2WI 序列在膝关节软骨损伤早期诊断中的应用价值

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目的 探讨 MRI T2-mapping 成像序列及 3D CUBE T2WI 序列在膝关节软骨损伤的早期诊断中的应用价值。**方法** 选取 2019 年 1 月至 7 月临床有外伤史疑似软骨损伤的患者 30 名。所有病例均采用 GE 1.5T Signa HDXT2012 磁共振行 T2-mapping 序列、3D CUBE T2WI 序列及常规平扫序列扫描。两名以上高年资医师比较两种序列图像显示半月板、髌软骨、股骨头软骨等关节软骨的解剖结构显示情况并进行优、良、差分级评价及统计学分析；应用 GE ADW4.6 工作站 Functool T2-Map 软件测量关节软骨正常区域及疑似损伤区域 T2 值，两组数据进行配对 t 检验，P< 0.05 被认为差异有统计学意义。MRI T2-mapping 成像序列所得 T2 值逐一与 3D CUBE T2WI 序列相应区域图像信号进行比对，探讨符合率。**结果** 正常关节软骨区域平均 T2 值为 38.35±1.68；疑似软骨损伤区域平均 T2 值为 55.28±2.74。两组关节软骨 T2 值差异有统计学意义（P< 0.05）。以图像质量为优作为满意标准，两种序列对髌软骨及股骨头软骨的满意度分别为：MRI T2-mapping 成像序列 87.5%、3D CUBE T2WI 序列 89.2%，差异无统计学意义（P>0.05）；对半月板的满意度分别为 MRI T2-mapping 成像序列 85.0%、3D CUBE T2WI 序列 56%，评分结果有显著统计学差异（P<0.05）。**结论** MRI T2-mapping 成像序列与 3D CUBE T2WI 序列对髌软骨及股骨头软骨早期损伤的诊断均具有较高应用价值；对半月板的损伤判断，MRI T2-mapping 成像序列有显著优势，而 3D CUBE T2WI 序列由于其超薄的层厚反而削弱了半月板及病变的显示，故在显示半月板的病变显示及诊断方面不及 MRI T2-mapping 成像序列。

OR-235

Characterization of the Microstructure of the Intervertebral Disc in Patients with Chronic Low Back Pain by Diffusion Kurtosis Imaging

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PURPOSE: Multivariate analysis of T2-weighted signal, diffusion ADC, and DKI parameters and tractography were used to differentiate chronic non-specific low back pain (CLBP) patients and asymptomatic controls (AC).
METHODS: 30 patients with CLBP and 23 AC underwent Diffusion Kurtosis Imaging (DKI) of lumbar spine with a 3T MRI scanner to get the ADC values and seven parameters of DKI in the nucleus pulposus (NP) of the intervertebral disc. The tractography and the tract-related parameters as other parameters were also generated to indicate the intactness of annulus fibrosus (AF). T2-grades of the discs were also quantified based on an eight-grade degeneration grading system. ADC and T2-grades were compared with DKI parameters for the differentiation of CLBP and AC groups.
RESULTS: There was no difference in the T2 grades, ADC value and multiple parameters in DKI of NP between CLBP and AC groups (P >0.05). The average FA values in NP in AC group was found significantly higher than them the CLBP group (P<0.05). The scores for the intactness of AF of the intervertebral discs was significantly different in CLBP and AC groups, with 90% of sensitivity and 70% specificity (P<0.05).

Additionally, there were significantly differences in the length and volume values of the AF in CLBP and AC groups (P <0.05).
CONCLUSION: DKI is a good noninvasive method and it might help to differentiate CLBP from AC. Particularly, the continuation of DKI tractography reflects the presence of annulus fibrosus fissures, an important character in the generation of the low back pain.
CLINICAL RELEVANCE/APPLICATION: DKI can noninvasively show the microstructural change of the degenerated intervertebral discs in humans. DKI parameters provide a quantitative measurement of the microstructural modifications in the NP, while the tractography and the tract-related parameters (length and volume) from DKT can directly show the integrity of the AF, which has been confirmed to be an important character in the generation of low back pain. Therefore, we conclude that DKI can be used to assess and monitor the status of intervertebral discs and the causes of pain in CLBP patients.

OR-236

基于信息流和机器学习的产后抑郁预测研究

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目的 构建的优势信息流方向分析产后抑郁患者大脑信息流特征。最后，基于机器学习的方法对产后抑郁患者进行临床鉴别诊断和预测评估。
方法 基于产后抑郁患者的静息态 *fMRI* 数据。首先，采用皮尔森相关构建的功能连接和图论分析了产后抑郁患者的大脑全局和局部的信息流模式改变。同时，采用 *NPMR GCA* 构建的优势信息流方向分析产后抑郁患者大脑信息流特征。最后，基于支持向量机分类和回归对产后抑郁患者进行临床鉴别诊断和预测评估。
结果 产后抑郁患者在杏仁核、扣带回、脑岛、海马、额叶、顶叶和枕叶部分区域的信息流模式发生明显改变，尤其杏仁核区域以及与颞叶和额叶之间的信息流方向与临床评估（*HAMD* 和 *EPDS*）存在显著相关。同时基于优势信息流方向的预测分析表明，信息流模式的改变对抑郁状态具有很好的评估能力。
结论 产后抑郁患者杏仁核相关信息流模式的改变是造成抑郁症状的主要神经病理机制，同时也为临床抑郁状态的评估提供稳定可靠的影像学指标。

OR-237

Differences in the brain network topology between methamphetamine and heroin use disorder individuals: A fMRI study

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Purpose Both methamphetamine and heroin cause addiction by activating the dopamine reward loop, but heroin use disorder (HUD) individuals show obvious physical symptoms and negative emotions, while methamphetamine use disorder (MAUD) individuals show psychotic symptoms. The neurological mechanism of mental impairment caused by methamphetamine is still unclear.
Methods 19 MAUD patients, 21 HUD patients and 20 healthy volunteers were participate. Using graph theory to construct the resting functional networks, comparing small world characteristics, node attributes and network connection strength among three groups. The correlation between the three variables and psychological scale was analyzed.
Result 1.The scores of hostile items in MAUD group was significantly higher than those in HUD group.
2. All three groups have small world attributes.
3. The degree centrality of drug groups is different. Compared with HUD group, the increase in MAUD group included left insular lobe, right heschl gyrus and bilateral superior temporal gyrus, and the decrease in right parahippocampal gyrus.
4. Functional connectivity: The brain network with differences of MAUD and HUD group was composed of 7 nodes and 9 edges. Compared with HUD group, the nine connections of MAUD group were significantly decreased.
5. Correlation: The functional connection between left superior frontal gyrus and left middle occipital gyrus was negatively correlated with depression, while the functional connection between right cuneus and bilateral olfactory was negatively correlated with depression and interpersonal sensitivity in MAUD group.
Conclusion MAUD group showed decreased node attributes and function connections in inhibitory control, cognitive and memory related brain areas, while increased in somatosensory, visual and auditory related brain areas. The correlation analysis further indicated that the decreased brain functional connectivity in MAUD group might be related to its stronger depression and interpersonal sensitivity.

OR-238

Integrated analysis of 13 microarray datasets reveals CCT6A as a diagnostic and prognostic biomarker in high-grade glioma

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Purpose
Through screening glioma microarray datasets in public databases, to identify diagnostic and prognostic biomarkers in high-grade glioma.
Materials and Methods
The integrated analysis was performed using MetaOmics software package in R software. The combined effect and p-value were used to screen differential expressed genes. To identify the more meaningful biomarker for high-grade glioma, 20 genes were selected for high-content screening. A total of 20 kinds of siRNA lentivirus were designed respectively and transfected into U251 cells. U251 cells with transfecting 20 kinds of

siRNAs were seeded in 96-well plates, and cell growth was monitored. Gene expressional and clinical data in TCGA database were used for validating the differential expressed genes, and performing ROC curve analysis. Kaplan-Meier survival analysis was performed using data from TCGA database, and Log-rank tests were performed.
Results
After screening, finally 13 glioma datasets were included, including 862 high-grade gliomas, 263 low-grade gliomas, and 110 non-glioma brain tissues. In three comparisons (high-grade glioma versus normal brain tissue, low-grade glioma versus normal brain tissue, and high-grade glioma versus low-grade glioma), 5575, 5300, and 2516 different probe sets were aberrantly expressed, respectively. Finally 163 genes differentially and specially over-expressed in high-grade glioma were obtained. High-content screening results showed that down-regulation of CCT6A decreased the total number of cells and cell growth rate was slowed down. The validation in TCGA showed that the expression of CCT6A were significantly different between high-garde glioma, low-grade glioma and normal brain tissues. Further analysis of the ROC curve showed that CCT6A has good predictive power for distinguishing high-grade glioma from low-grade glioma and normal brain tissues. Kaplan-Meier survival curve analysis showed that the survival time of glioma patients with high expression of CCT6A was shorter.
Conclusion
CCT6A was differentially and specially over-expressed in high-grade glioma, and patients of glioma with high expression of CCT6A had a shorter survival time. Our study provided reference value for the research of molecular imaging targeted biomarkers of glioma.

OR-239
Pineal gland alteration in smartphone addiction students receiving mindfulness therapy

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Background
Smartphone addiction in young adults is closely associated with anxiety, depression and sleep disorders. Melatonin, which is secreted by the human pineal gland, plays an important role in sleep and circadian rhythm. The aim of the present study was to evaluate and compare pineal gland volumes in smartphone addiction college students before and after mindfulness therapy in comparison with healthy control.
Methods
We prospectively evaluated the pineal gland volumes of 30 students, including 15 smartphone addiction students and 15 health control. Before and after the 8-week mindfulness therapy, the total pineal gland volume of all students was measured via magnetic resonance images using 3D slicer software, and the total mean pineal volume of each group was compared. The correlation between pineal volume and psychological measurements was also investigated.
Results

There were significant differences in mean pineal volume between students with smartphones addiction and health control before mindfulness therapy. While after the 8-week mindfulness therapy, there was no significant difference between these two groups. Meanwhile, 8-week mindfulness therapy significantly alleviated the anxiety and depressive symptoms.

Conclusion

Our data shows that smartphone addition students have smaller pineal gland volume and 8-week mindfulness therapy had significant effect on both the psychological measures and the recovered pineal gland volume.

OR-240

Dysfunctional interactions between the default mode network and the dorsal attention network in subtypes of amnestic mild cognitive impairment

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An anticorrelated relationship in the spontaneous *fluctuations* between the default mode network (DMN) and dorsal attention network (DAN) is a robust feature of intrinsic brain organization in healthy individuals. Prior studies have reported a modified anticorrelation between the DMN and the DAN in Alzheimer's disease (AD) and mild cognitive impairment (MCI). However, it is unclear how this anticorrelation changes as MCI progresses to AD. We hypothesized that dysfunctional connectivity between the DMN and DAN may reflect the gradual decline from MCI to AD. To test this hypothesis, we investigated alterations in functional connectivity between the DMN and DAN in subtypes of amnestic mild cognitive impairment (aMCI) by comparing with the same functional pattern in healthy elderly individuals and patients with AD. We retrospectively collected brain imaging and neuropsychological data from 20 AD participants, 22 participants with multiple-domain aMCI (aMCI-m), 29 participants with single-domain aMCI (aMCI-s) and 23 sex-matched normal controls (NC) in this study. Resting-state functional connectivity analysis revealed that aMCI-s and aMCI-m groups demonstrated different magnitudes of increased anticorrelation between the DMN and DAN relative to the AD group. Furthermore, in aMCI-s, aMCI-m and AD participants, hypoconnectivity was found in specific regions within the DMN, including the precuneus and angular gyrus, and hyperconnectivity was found in areas outside the typical DMN networks, including the middle occipital gyrus, lingual gyrus and visual cortex, which indicated disease-related adaptations of brain networks that may subsequently disturb functional interactions between the DMN and DAN. Our findings suggest that DMN-DAN anticorrelation may play an essential role in understanding the adaptations in brain function during the progression from MCI to AD and may serve as a potential biomarker to detect AD in the preclinical stage.

OR-241

抑郁症的多模态神经影像技术研究

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目的 应用 DKI、多体素 MRS、GLUCEST 评估单相和双相抑郁以及首发和复发抑郁脑部代谢水平和微观结构的改变情况，探索鉴别单相与双相抑郁的客观影像学指标，以及寻找指导首发抑郁患者治疗的影像学依据。

材料与方法 20 例健康志愿者，24 例单相抑郁和 12 例双相抑郁病人入组，抑郁患者又分为首发抑郁 (10 例)及复发抑郁患者 (26 例)。对照组和病例组均接受 DKI、多体素 MRS 及 GLUCEST 的检查。

结果

单相和双相抑郁病人不同脑区出现了较一致的 FA 值、MK 值、Kr 值降低，Ka 值升高，MK 值降低的脑区更加广泛，而且双相抑郁患者前扣带回、双侧背外侧前额叶白质、左侧丘脑 MK 值降低更严重。首发抑郁患者脑微观结构已经出现损伤。单相、双相抑郁患者不同脑区出现了较一致的 NAA、Ins 降低，而单相及双相抑郁 Cho、Glu 值的改变在不同脑区则有所不同。初发抑郁患者已经出现前扣带回、双侧背外侧前额叶白质、双侧丘脑 NAA、Glu 等脑代谢物的降低。单相抑郁患者不同脑区出现了较一致的 GLUCEST%降低，而双相抑郁患者 GLUCEST%改变则不一致。首发抑郁患者部分脑区已经出现谷氨酸水平的降低，复发抑郁患者谷氨酸水平降低的脑区更加广泛。

结论

1. 单相和双相抑郁患者均存在脑微观结构及代谢物的异常，而且在不同脑区 DKI 参数、MRS 和 GLUCEST 改变并不完全一致，提示二者的病理生理学不同，并有助于二者的鉴别。
2. 初发抑郁患者已经出现部分脑区 NAA、Glu 等代谢物降低，以及脑部微观结构损伤，前扣带回是首发抑郁最早累及的脑区，双侧背外侧前额叶白质纤维结构完整性较早出现损伤，这对于指导首发抑郁患者的临床治疗有重要意义。
3. GLUCEST%对单相和双相抑郁的鉴别，以及检测首发和复发抑郁患者谷氨酸水平的改变比 MRS 更敏感，前扣带回、双侧背外侧前额叶白质 GLUCEST%改变的不一致可能有助于鉴别单相和双相抑郁。

OR-242

An amyloid-β targeting chemical exchange saturation transfer probe for in vivo detection of Alzheimer's disease

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Abstract

Background and aims: A reliable and reproducible detection of Aβ deposits would be beneficial for the early diagnosis of Alzheimer's disease (AD).

Methods: In the present study, the feasibility of applying chemical exchange saturation transfer (CEST) for Aβ deposit detection using angiopep-2 as a probe was evaluated.
Results: It was demonstrated that CEST could detect angiopep-2 and Aβ-angiopep-2 aggregates in vitro. Furthermore, APP/PS1 mice injected with angiopep-2 exhibited a significantly higher in vivo CEST effect, when compared to controls. The distribution of Aβ deposits detected by CEST imaging was consistent with the histological staining results.
Discussion: The present study is the first to report a reliable exogenous CEST probe to noninvasively evaluate Aβ deposits in APP/PS1 mice. Furthermore, these results demonstrate the potential for clinical AD diagnosis and Aβ-targeted drug therapy assessment using CEST imaging with the angiopep-2 probe.

OR-243

Using Multimodal MRI to Track the D-mannose Therapeutic Effect for Multiple Sclerosis

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Purpose: To study if D-mannose is able to treat experimental autoimmune encephalomyelitis (EAE), a commonly used mouse model for multiple sclerosis using multimodal MRI with the molecular imaging agents MPO-Gd (targeting the pro-inflammatory enzyme myeloperoxidase [MPO]) and iron oxide nanoparticle (for phagocytosis).

Materials and Methods: The protocol for animal experiments was approved by the institutional animal care committee. A total of 24 female C57BL/6 mice were induced with EAE with myelin oligodendrocyte glycoprotein 35-55 peptide (200 μg/mouse) and were randomly separated into PBS control and D-mannose treatment groups (n=12 for each group). Clinical scores and weights were recorded daily blinded to treatment methods. Mice underwent MPO-Gd and iron oxide nanoparticle (cross-linked iron oxide [CLIO] enhanced MR imaging on day 15. On day 19, spinal cords were harvested from all survived mice for flow cytometric evaluation. Statistical analysis was performed. $P < 0.05$ was considered statistically significant.

Results: D-mannose improved EAE clinical symptoms ($P< 0.0001$ for clinical score, $P= 0.0023$ for weight) and reduce mortality ($P= 0.019$) compared to PBS-treated control mice. Flow cytometry showed that D-mannose treated mice had significantly fewer infiltrating macrophages/activated microglia than those of PBS control mice ($P= 0.032$), among which pro-inflammatory macrophages/microglia were greatly reduced ($P= 0.0028$) while anti-inflammatory cells increased ($P = 0.034$). MPO-Gd MR imaging demonstrated that D-mannose treated mice had significantly smaller total MPO+ (pro-inflammatory

macrophages/microglia were MPO+) lesion area than PBS control mice. CLIO MR imaging indicated that D-mannose treatment might block macrophage phagocytosis.

Conclusion:D-mannose treatment for EAE shows improved clinical symptom and reduced mortality by suppressing the inflammatory response and skewing macrophages/microglia toward anti-inflammatory subtype in CNS.

OR-244

一体化 TOF-PET/MR 检查对肺部小结节（≤10mm）的检出及 18F-FDG 代谢显示价值的探讨

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目的 ：评价一体化 TOF-PET/MR 对于肺部小结节（≤10mm）的检出能力，并探讨 TOF 技术在一体化 PET/MR 检查中对肺部小结节（≤10mm）的 ^{18}F-FDG 代谢显示的影响。
方法 ：回顾性分析 20 例患者胸部的 ^{18}F-FDG PET/CT（联影 uMI510）和胸部一体化 PET/MR 检查（联影 uPMR790）的图像，MRI 序列采用 GRE 3D T1WI 和 FSE T2WI，T1WI 层厚为 2mm，T2WI 层厚为 4mm。将 PET/CT 胸部检出的肺结节数目作为评价肺结节检出数目的金标准。统计一体化 PET/MR 中对肺部小结节 A 组（<5mm）和 B 组（5-10mm)总的检出率，比较一体化 PET/MR 中 TOF PET 和 nonTOF PET 图像上肺部小结节的 ^{18}F-FDG 代谢显示情况。
结果 ：本研究 PET/CT 共检出 156 个肺部小结节，其中 70 个小结节小于 5mm（A 组），86 个结节的最长径为 5-10mm（B 组）。一体化 TOF PET/MR 对 A 组（<5mm）肺部小结节总检出率为 2.8%(2/70)，对于 B 组（5-10mm)肺部小结节总检出率为 98.8%(85/86)。对于 A 组（<5mm）肺部小结节而言，TOF PET 图像发现 2 个小结节为 ^{18}F-FDG 高代谢，而 nonTOF PET 图像仅发现 1 个小结节为高代谢，其中 1 个小结节出现 ^{18}F-FDG 代谢假阴性。对于 B 组（5-10mm)小结节而言，TOF PET 图像上能够发现 84 个小结节为 ^{18}F-FDG 高代谢，而 nonTOF PET 图像上仅仅发现 78 个结节为 ^{18}F-FDG 高代谢，其中 6 个结节出现 ^{18}F-FDG 代谢假阴性。
结论 ：一体化 TOF-PET/MR 对肺部 5-10mm 的小结节可以较好地检出，而对于肺部＜5mm 小结节不能较好的检出；TOF 技术有助于降低一体化 PET/MR 检查中肺部小结节 ^{18}F-FDG 代谢假阴性发生。

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Contrast enhanced CT image -based radiomics analysis to predict pathological classifications and stages of thymic epithelial tumors: A retrospective study

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Objective Because of the importance of the World Health Organization (WHO) pathological classification and TNM stages when determining appropriate clinical management of thymic epithelial tumors (TETs), it is urgently needed to confirm them

by imaging diagnosis. We aimed to develop a computational approach integrating clinical factors and imaging features of modalities, especially radiomic features of contrast-enhanced Computed Tomography (CT), in order to predict pathological classifications and stages of TETs.
Methods In this retrospective study, we used 303 single-institutional patients with pathologically proven TETs to develop and validate a machine learning based model to predict pathological classifications and stages by combining contrast-enhanced CT images and clinical data. To develop the Radiographic-Radiomic (RR) model, 3726 radiomic features were quantified from the tumor region, and 4 clinical factors, 13 radiographic features were considered. L1 based feature selection was implemented, and Logistic Regression with L1 regularization were trained and validated by repeated stratified 5-fold cross validation. Area under the curve (AUC) of receiver operating characteristics was calculated as model performance value.
Results Logistic Regression models showed efficient discrimination performance for WHO pathological classification and TNM stage of simplified grades. For pathological classification task, the Radiographic-Radiomic (RR) model achieved best performance with AUC of 0.85, when using radiomic, clinicoradiologic or radiographic features separately, micro averaged AUC can only reach 0.79, 0.81 and 0.83. On the other hand, for classification task of TNM stages, the Radiographic-Radiomic (RR) model and the model using radiographic features achieved AUC of 0.96 and 0.95, which is the best performance. However, the model using radiographic or clinicoradiologic features only leaded to a micro averaged AUC of 0.84. When discriminating the pathological classification, sensitivities of Radiographic-Radiomic (RR) model for discriminating LRT, HRT and TC were 68.50%, 65.00% and 70.27%, while specificities of it were 76.27%, 71.95% and 92.43%. When discriminating the TNM stage, sensitivities of Radiographic-Radiomic (RR) model for discriminating early and advanced stage were 87.22% and 92.74%, while specificities of it were 92.74% and 87.22%.
Conclusion The Radiographic-Radiomic (RR) model achieved higher performance than radiomic or radiographic model in discriminating WHO pathological grades. However, the radiographic model and Radiographic-Radiomic (RR) model achieved best in discriminating simplified TNM stages.
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However, the radiographic model and Radiographic-Radiomic (RR) model achieved best in discriminating simplified TNM stages.

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The study of radiomics in predicting NSCLC tumor molecular marker P63

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Objective: To establish a radiomics signature based on CT images of non-small cell lung cancer (NSCLC) tumors to predict the expression of NSCLC molecular marker P63.
Methods: 245 NSCLC patients who underwent CT scans from January 2014 to March 2018 at our hospital were retrospectively included. All patients had disease confirmed by histopathological examination and had P63 expression test within 2 weeks after CT examination. Radiomics features were extracted by MaZda software and subjective image features were defined from original non-enhanced CT images. The Lasso-logistic regression model was used to select features and to develop radiomics signature, subjective image features model and combined diagnostic model, respectively. The predictive performance of each model was evaluated by the area under the curve (AUC), and Delong test was used to evaluate the difference among the three models.
Results: Among the 245 patients, 96 were P63 positive, and 149 were P63 negative. The subjective image features model consisted of six image features. Through feature selection, the radiomics signature consisted of eight radiomics features. The area under the ROC curve of the subjective image features model and the radiomics signature in predicting P63 expression statue was 0.721, 0.755, respectively., There was no significant statistic difference ($P > 0.05$). The combined diagnostic model had the best predictive power (AUC=0.821; $P < 0.05$).

Conclusions: The radiomics based on CT scan images can predict the expression status of NSCLC molecular marker P63; The combined model combining the radiomics features and subjective image features can significantly improve the predictive performance of the predictive model, which maybe helpful to provide a non-invasive means for understanding the molecular level information of lung cancer cells

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Correlation study of 18-fluordeoxyglucose positron emission tomography/computed tomography in pathological subtypes of invasive lung adenocarcinoma and prognosis

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Abstract

Purpose: To investigate correlations between 18-fluordeoxyglucose positron emission tomography/computed tomography (PET/CT) metabolic parameters among pathological subtypes of invasive lung adenocarcinoma and prognosis.

Methods: Clinical and pathological data from 176 patients with invasive lung adenocarcinoma were retrospectively analyzed. Invasive lung adenocarcinoma was divided into five pathological subtypes: lepidic predominant adenocarcinoma (LPA); acinar predominant adenocarcinoma (APA); papillary predominant adenocarcinoma (PPA); solid predominant adenocarcinoma (SPA); and micropapillary predominant adenocarcinoma (MPA). Differences in metabolic parameters (maximal standard uptake value[SUVmax]; mean standard uptake value[SUVmean] ; total lesion glycolysis[TLG]; and metabolic tumor volume [MTV]) and largest tumor diameter of the various pathological subtypes were analyzed. Patients were divided into two groups according to their prognosis: group A (good prognosis [LPA, APA, PPA]); and group B (poor prognosis [SPA, MPA]). Logistic regression was used to filter influencing factors, and multivariate analysis of predictors was used to construct an optimal model, and areas under the receiver operating curve (AUC) were calculated. Cox regression analysis was performed on prognostic factors.

Results: Metabolic parameters and the largest tumor diameter of each pathological subtype were statistically significant factors ($P<0.05$). The predictive model constructed using multi-factor (stage, thyroid transcription factor-1 [TTF-1], MTV) had good classification performance for groups A and B. The AUC for MTV was 0.681, and 0.747 when combined with clinical pathological information. Cox survival analysis revealed that staging, TTF-1, MTV, and pathological subtype were independent risk factors for patient prognosis. The hazard ratio for group B was 1.948 (95% CI 1.042–3.641) compared with group A (i.e., the risk for death in group B was higher than in group A). The mean survival times in groups A and B were 50.2621 (95% CI 47.818–52.706) and 35.8214 (95% CI 27.483–44.159) months, respectively, while the median survival time was 47.00 (95% CI 45.000–50.000) and 31.50 (95% CI 23.000–49.000) months, respectively.

Conclusion: PET/CT metabolic parameters and clinical pathological data were different among the different pathological subtypes of invasive lung adenocarcinoma, and

demonstrated good classification performance for the different pathological subtypes, and could improved evaluation of prognosis, all of which may provide a reference for treatment and prognosis of patients.

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ESWAN 对良性前列腺增生伴炎症诊断价值评价

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目的 探究单纯前列腺增生与前列腺增生伴炎症 ESWAN 不同参数的差异，探究 ESWAN 对良性前列腺增生伴炎症诊断价值。
方法 随机选取 2018 年 12 月-2019 年 4 月于我院就诊并经组织病理学证实单纯 BPH 患者 35 名，BPH 伴炎症 30 例，所有 BPH 均排除前列腺其他病变，例如前列腺癌等。患者临床症状主要为尿频、排尿困难、尿潴留等，临床指诊表现为前列腺体积增大。患者年龄在 51~83 岁之间，平均年龄为 63.5±18.6 岁。血清 PSA 水平在 0.7~23.1ng/ml 之间，平均为 6.92±0.74ng/ml。使用 GE HDxt 3.0TMR 成像仪，对所有研究对象行常规磁共振及 ESWAN 成像检查。经 ESWAN 后处理软件进行分析处理分别得到相应的磁矩值、相位值、R2*值、T2*值。统计学处理采用 SPSS 17.0 进行，对单纯 BPH 组及 BPH 伴炎症组相应磁矩值、相位值、R2*值、T2*值分析采用独立样本 t 检验，$P<0.05$ 认为差异具有统计学意义。
结果 单纯 BPH R2*值（19.521 ± 2.973）较 BPH 伴炎症（20.636 ± 2.837）减低；单纯 BPH T2*值（53.683 ± 8.752）较 BPH 伴炎症（50.980 ± 7.033）升高；单纯 BPH 磁距值（1636.408± 230.124）较 BPH 伴炎症（1711.067 ± 154.767）减低；单纯 BPH 相位值（0.035 ± 0.060）较 BPH 伴炎症（0.024 ± 0.086）升高，但均不具有统计学意义（$P>0.05$）。
结论 ESWAN 对单纯 BPH 与 BPH 伴炎症诊断及鉴别诊断价值不明显，可能与本研究样本量太少有关，需要进一步探索。

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ESWAN 与子宫肌瘤相关性分析

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目的 探讨增强型 $T2^*$加权血管成像（ESWAN）参数值与子宫肌瘤大小相关性研究。**方法** 选取 23 例子宫肌瘤患者作为研究对象，所有患者均行均行磁共振常规序列及 ESWAN 序列检查。记录感兴趣区（ROI）的磁矩值、相位值、$R2^*$和 $T2^*$值，在 T2WI 上测量子宫肌瘤病灶最长径。检验结果采用双变量相关分析。**结果** 子宫肌瘤患者病灶最长径与 ESWAN 参数值 Pearson 相关性分别为 0.536，-0.002，0.045，0.169。病灶最长径与磁矩值存在统计学意义（$P=0.008$）。**结论** 通过 ESWAN 不同参数与子宫病灶大小相关性研究表明，磁矩值与肌瘤病变大小存在正相关。

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Influence of obesity on tumor inflammation in early stages of tumor progression was observed by using new iron oxide nanoparticles

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Influence of obesity on tumor inflammation in early stages of tumor progression was observed by new iron oxide nanoparticles

Aim: Pancreatic cancer is one of the most malignant tumors, and inflammation plays an important role in tumor progression and metastasis. The effects of obesity on tumor inflammation were observed dynamically and in real time by imaging methods.

Methods:Two groups of mice: WT mice and obese mice (n=8) were studied. The disease model was in situ pancreatic cancer. Octapod-30, a novel iron nanoparticle with high r2 coefficient, was used as the T2 weighted contrast agent for magnetic resonance imaging. The target-background ratio of tumor areas after nanoparticle injection was calculated. The mice were killed at the appropriate time, and the tumors was removed, embedded and sliced. Prussian blue staining and CD68 immunohistochemical staining were performed. The tumor metastasis and related molecular biological indexes of the two groups of mice were detected.

Results:In vivo imaging showed rapid, noninvasive observation of obesity-induced macrophage proliferation and increased inflammatory response in early pancreatic cancer, which was also confirmed by histopathological analysis. In terms of metastatic foci, obese mice were more than wild-type mice, and some tumor-related molecular biological indicators were statistically significant compared with wild-type mice.

Conclusion:We have confirmed that obesity, as a metabolic disorder, releases a large number of cytokines in the early stage of tumors, recruiting more macrophages, leading to increased tumor inflammatory response, and thereby promoting the progress and invasion of tumors.

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基于硒代半胱氨酸修饰的硒化铋纳米颗粒同步实现放疗增敏与放疗防护

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目的 目前，如何开发对肿瘤放射治疗具有较强增敏效果的放疗增敏剂，已经成为科研人员的重点研究对象。已有的文献报道了众多具有放疗增敏效果的纳米放疗增敏剂，但是如何开发一种纳米放疗增敏剂，使其对肿瘤放疗增敏的同时增强正常组织的辐射抗性却未见有相关报道。
方法 本文通过使用一种简便的方法制备了一种符合上述要求的纳米放疗增敏剂——聚乙烯吡咯烷酮（polyvinyl pyrrolidone, PVP）和硒代半胱氨酸修饰的 Bi_2Se_3 纳米颗粒。通过对该纳米材料体内和体外的生物安全性进行评价，发现其具有良好的生物相容性，没有明显的细胞和动物毒性。进而研究发现，该纳米材料对 X 射线和近红外（near infrared reflection, NIR）光都具有较强的吸收能力，不但可以增强放疗效果，还可降低放疗副作用的影响。该纳米颗粒在 X 射线的照射下可以显著增强细胞内自由基的产生，同时在 808 nm 激光的照射下具有良好的光热转换效应。
结果 在动物实验中，通过瘤内注射的方式将纳米材料注入到肿瘤中，结果发现，肿瘤在 X 射线和近红外 808 nm 激光的照射下可以有效的杀死肿瘤细胞，同时发现硒可以持续不断的从肿瘤部位被释放进入血液循环系统。通过对放疗毒副作用指标的分析，发现血液中的超氧化物歧化酶（superoxide dismutase, SOD）、谷胱甘肽过氧化物酶（glutathione peroxidase, GSH-Px）、细胞因子 IL 2，IL-6，G-CSF 和 TNF-α、血液中的白细胞数（white blood count, WBC）、骨髓 DNA 含量等，相对单独 X 射线照射组都有显著升高，表明该纳米材料可以增强免疫力，降低放疗副作用。
讨论：该纳米材料以一种天然的硒代胱氨酸为硒源，实现了其在生物体中的有效转化和利用，为开发新型无机纳米放疗增敏剂提供了一种新的设计思路。

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Three-dimensional Turbo-spin-echo Amide Proton Transfer-weighted MR Imaging of cervical cancer: correlation with Ki-67 proliferation status

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Purpose: To investigate the correlation between amide proton transfer-weighted (APTw) MR imaging and Ki-67 labeling index of cervical cancer.
Materials and Methods: This prospective study was approved by the institutional review board. Between September 2017 and December 2018, 24 patients (age 46.3 ±11.6 years, range 29-73 years), who were pathologically confirmed cervical cancer, underwent three-dimensional (3D) turbo-spin-echo (TSE) APTw MR imaging with dual radiofrequency transmits interleave labelling on a 3T MR scanner (Ingenia CX, Philips Healthcare, the Netherlands). The B0 artifact was corrected in APT post processing with extra measurements near ±3.5ppm and Z-spectrum shift. The APT values, calculated based on asymmetry of resulting Z-spectrum with respect to water frequency, were independently measured by two radiologists. Inter-observer inter-class correlation coefficient was computed. Pearson's correlation analysis was performed between the APT values and Ki-67 labeling index.
Results: The APT values of cervical cancer were 2.918±0.092 with mean region of interest area of 630.7 mm^2. Inter-observer ICC was 0.986 (95% CI 0.967-0.994). The APT values were positively moderately correlated with Ki-67 labeling index ($r = 0.533$, $p = 0.007$).
Conclusion: APT values in current technology positively moderately correlates with Ki-67 proliferation status of cervical cancer.

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PD-L1 核酸适配体修饰的锆金属有机框架结构在结直肠肿瘤中的诊疗价值探究

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目的 探究 PD-L1 核酸适配体修饰的锆金属有机框架结构在结直肠肿瘤中的诊疗价值。
方法 结肠癌细胞系 CT26 与 MC38 与锆金属有机框架结构（MOF）和 PD-L1 核酸适配体修饰的锆金属有机框架结构（Aptamer@ MOF）共孵育不同时间， CCK-8 鉴定细胞毒性；CT26 与 MOF 及 Aptamer@ MOF 共孵育 4h 后，与 DCFH-DA 共孵育后近红外激光器照射，荧光显微镜测定单线态氧产生情况；CT26 与 MOF 及 Aptamer@ MOF 共孵育 4h 后，近红外照射或不照射后再培养 2h，Calcein-AM/PI 染色荧光显微镜观察细胞凋亡状态；构建 MC38 细胞系 C57BL/6N 荷瘤小鼠，尾静脉注射不同探针及 PBS，IVIS 采集注射前、注射后图像，观察肿瘤部位荧光信号；分别于注射后 72h 处死小鼠，观察各脏器荧光分布情况。
结果 CCK-8 细胞毒性试验结果表明，MOF 及 Aptamer@ MOF 与 CT26 及 MC38 共孵育 24h 内，细胞活力大于 80%；单线态氧检测试验表明，MOF 及 Aptamer@ MOF 组均可产生荧光信号；细胞凋亡试验表明，MOF+照射组及 Aptamer@ MOF+照射组引起细胞凋亡情况较非照射组及 PBS 组严重；体外靶向试验表明，肿瘤部位荧光信号：Cy5.5-Aptamer@ MOF 组>Cy5.5-non Aptamer@ MOF 组>Cy5.5-Aptamer 组；不同时间点处死小鼠后发现，Cy5.5-Aptamer@ MOF 组及 Cy5.5-non Aptamer@ MOF 组荧光信号主要聚集在肝脏，而 Cy5.5-Aptamer 组荧光信号主要聚集在肾脏。
结论 PD-L1 核酸适配体修饰的锆金属有机框架结构可实现对结直肠肿瘤的诊疗，为进一步载药研究奠定基础。

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基于芬顿反应的多功能焦糖化 Mn@USPIO 纳米球在胰腺癌磁共振成像及治疗一体化研究

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目的 探究多功能焦糖化 Mn@USPIO 纳米球（Mn@USPIO@CNSs）在胰腺癌 MR 成像及铁死亡协同化疗的增敏效果和机制。
方法 制备 Mn@USPIO 纳米材料，采用共价键结合及静电吸附的方法制备 Mn@USPIO@CNS 纳米探针；3.0T 磁共振验证不同浓度 Mn@SPIO@CNS 及 Mn@USPIO 纳米材料弛豫率；验证不同浓度纳米材料细胞成像及不同时间点经尾静脉注射小鼠胰腺癌模型在不同时间点 T2 值。利用 hTERT-HPNE 及 Pan02、PANC-1，通过 CCK-8 验证不同浓度及时间点下 Mn@USPIO@CNS 及载吉西他滨（GEM）纳米体系在对细胞活力影响。通过普鲁士蓝染色、TEM 观察不同时间材料的摄入及亚细胞定位情况；倒置显微镜检测纳米体系活性氧(ROS)产生情况进行分析；Western Blot 测定铁转运蛋白（Fpn）及葡萄糖转运体蛋白（GLUT1）等摄入蛋白受体的表达；制备 FITC 标记的 Mn@USPIO@CNS 纳米探针及 Mn@USPIO@CNS@GEM 纳米体系，荧光倒置显微镜观察肿瘤组织内分布情况；细胞刮痕实验验证纳米体系对肿瘤迁移的抑制作用;验证经尾静脉注射 balb/c 小鼠胰腺癌模型不同组织分布及肿瘤组织治疗情况。

结果 ；成功制备 Mn@USPIO@CNSs 纳米体系；普鲁士蓝显示细胞内肿瘤细胞较正常胰腺细胞对材料摄取量明显上升，CCK-8 显示纳米材料对肿瘤细胞有较强抑制作用；酶标仪及倒置荧光显微镜显示不同浓度下胰腺癌细胞内 ROS 显著增高；Western Blot 显示 Fpn 及 GLUT1 等细胞蛋白受体的表达量提高；动物实验表明该纳米体系对肿瘤组织生长有明显抑制作用。

结论 Mn@USPIO@CNSs 纳米体系具有高度生物相容性和生物降解性，可以在实现高 T2 弛豫率的同时通过芬顿反应催化肿瘤细胞内 ROS 的产生促进吉西他滨对胰腺的化疗效果，实现基于芬顿反应的胰腺癌铁死亡及凋亡协同治疗。

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3.0T 磁共振 3D TRICKS 序列前列腺动脉成像的可行性研究

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中国人民解放军总医院第一医学中心

目的 探讨 3.0T MR 扫描仪上 3D TRICKS 序列进行前列腺动脉成像的可行性。

方法 收集 2017 年 12 月-2018 年 6 月 15 例前列腺增生患者应用 3D TRICKS 序列进行前列腺动脉的磁共振增强扫描，采用 GE Discovery MR750 3.0T MRI 超导型磁共振扫描仪，8ch 心脏线圈，采集时间约 3～4min，所有患者均无磁共振扫描的禁忌症并签署增强扫描知情同意书；每位患者先以 3.0ml/s 的速率注射 20ml 钆贝葡胺后，再以 0.5ml/s 的速率注射 10ml 钆贝葡胺磁共振造影剂，随后以 2.0ml/s 的速率注射 30ml 生理盐水以冲刷血管，并在高压注射器开始工作后 8S 启动扫描 3D TRICKS 系列。将所得数据传输至 ADW4.6 工作站，在此工作站上行最大密度投影(MIP)重建，对前列腺动脉各级分支显示程度及清晰度由两位放射科医师进行双盲法评分。评分采用 5 分制：0 分：图像质量差，血管轮廓不清，完全不能用于诊断分析；1 分：图像质量差，血管轮廓不清，信号不均匀，不满足诊断要求；2 分：图像质量一般，血管轮廓毛糙，信号不均匀，不影响诊断分析；3 分：图像质量好，血管轮廓清楚或少许毛糙，信号较均匀，符合诊断要求；4 分：图像质量极好，血管轮廓清晰锐利，信号均匀，完全符合诊断要求。

结果 15 例受试者中,图像质量 4 分 13 例(86.67%，13/15)，3 分 1 例(6.67%，1/15)，2 分 1 例(6.67%，1/15)，1 分 0 例(0%，0/15)。低分(1～2 分)受试者中 1 例患者前列腺动脉发育变异，未能将动脉全部显示。

结论 3.0T 磁共振 3D TRICKS 序列可清楚显示前列腺动脉的各级分支，为临床及患者提供良好的图像质量，此技术具有很好临床应用前景。

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Integrin αvβ6-targeted USPIO nanoparticles in an application of MR molecular imaging of pancreatic cancer cell lines

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Purpose: The motif RXDLXXL-based nanoprobes allow specific imaging of integrin αvβ6, a protein overexpressed during tumorigenesis. Therefore, this study applied a novel RXDLXXL-coupled peptide conjugated with ultrasmall superparamagnetic iron oxide (USPIO)

(referred to as cFK-9-USPIO) in order to detect pancreatic cancer by magnetic resonance imaging (MRI).
Materials and methods: N-amino(-NH2)-modified ultrasmall superparamagnetic iron oxide nanoparticles (USPIO) were conjugated with integrin αvβ6-targeted peptide cFK-9 by dehydration esterification reaction to create a novel MR targeted nanoparticle probe cFK-9-USPIO. Integrin αvβ6 positive pancreatic carcinoma cell lines (BxPC3) and integrin αvβ6 negative human embryonic kidney cell lines (HEK293) were incubated respectively with cFK-9AbFlour 647 (targeting group) and then imaged using laser scanning confocal microscopy (LSCM) and 3.0 Tesla MRI (GE healthcare). The mean fluorescent intensity was applied to semi-quantitatively analyze affinity of cFK-9 targeting αvβ6 and changes of T2 values (ΔT2) were measured to evaluate targeting effect in vitro MR imaging. The in vivo imaging capability of cFK-9-USPIO was investigated in the BxPC3 xenograft models.
Results: In vitro LSCM imaging showed that the difference of fluorescent intensity between targeting group and blocking group in BxPC3 was significantly greater than in HEK293 cells($P<0.01$). In vitro MRI showed a more remarkable T2 reduction in BxPC3 cell lines than HEK293 cell lines($P<0.01$). Similar results are also showed in the BxPC3-bearing nude mice.
Conclusions: Our data demonstrated that novel nanoparticles cFK-9-USPIO can specifically bind with integrin αvβ6 overexpressed pancreatic carcinoma cell lines in vitro and in vivo, which showed great potential to be used in early detection of pancreatic cancer with MR molecular imaging.

OR-257
磁共振 DWI、IVIM 与肝癌病理学特征相关性研究

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目的 探讨体素内不相干运动（IVIM）与磁共振扩散加权成像（DWI）在鉴别肝细胞癌与正常肝组织及肝癌病理分级中的价值。
材料与**方法** 收集我院手术病理证实的 35 例肝细胞癌患者，术前行肝脏常规 MRI 及 IVIM 序列扫描，所有患者在磁共振检查前均未采取过任何治疗措施。根据术后肝癌病理分级不同，将患者分为低、中、高分化 3 组；在同层面肿瘤内与正常肝组织内勾画出感兴趣区，经图像后处理软件得到真性扩散系数（D）、假性扩散系数（D*）、灌注系数（f）及 ADC 值。通过两独立样本 t 检验对同层面不同组织的各参数值及 Kruskal-Wallis 秩和检验对高中低分化组间各参数值的差异进行统计分析；并通过 ROC 曲线显示各参数的诊断效能。
结果 1.相较于正常肝组织，肝癌组织的 D 值、ADC 值降低而 D*值、f 值升高，且各参数的变化差异均具有统计学意义（P=0.01，P＜0.001，P=0.02）；D*具有最佳诊断效能，ROC 曲线面积为 0.806（P＜0.001）。2.IVIM 参数 D 值在高、中、低分化组中分别为(1.02±0.03)×10-3mm2/s、(0.84±0.12)×10-3mm2/s、(0.81±0.12)×10-3mm2/s，在高分化与中-低分化的鉴别中差异有统计学意义(P<0.001)。ADC 值在高、中、低分化组中分别为(1.03±0.03)×10-3mm2/s、(0.94±0.13)×10-3mm2/s、(0.87±0.32)×10-3mm2/s，两两对比差异有统计学意义(P<0.001)。D 值在鉴别高、中分化肝癌具有最佳诊断效能，ROC 曲线面积为 0.75；ADC 值在鉴别中、低分化肝癌中具有最佳诊断效能，ROC 曲线面积为 0.77。**结论** 1.IVIM 各参数对鉴别肝细胞癌与正常肝组织有重要意义。2.IVIM 与 DWI 在鉴别肝癌分化程度上各有优势；D 值与 ADC 值与肝癌分化程度呈正相关。

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Superstable Homogeneous System of Drug-Iodine Oil and Its Application in Transarterial Embolization and Fluorescence Surgery of Hepatocellular Carcinoma

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Objective: To accurate distinguish cancerous from normal tissue at the edge of the solid tumor remains a challenge in the surgical therapy of cancer, this study is to develop a platform to achieve the combination of transarterial chemoembolization (TACE) therapy and the precise fluorescence-guided surgical resection. **Methods:** A superstable homogeneous iodinated formulation technology (SHIFT) was designed and indocyanine green (ICG) was sufficiently dispersed into iodized oil. Rabbit VX2 tumor model was used to evaluate the computed tomography (CT) and magnetic resonance imaging (MRI) capability of solvent. Computer-aided ICG fluorescence imaging technology is applied to evaluate the efficiency of the prepared solvent in surgical resection. **Results:** The novel pharmaceutical is designed in a green physical mixture, thereby exclude the potential toxicity of carrier introduction. The ICG-iodine solvent has a controlled morphology, long-term stability, and a sustained drug release rate. Furthermore, the viscosity of the synthetic solvent has no significant difference with iodine oil, the incorporation of ICG and the SHIFT could not affect the CT and MRI capability. Further *in vivo* evaluation shows excellent performance in the fluorescence navigation of rabbit VX2 tumor model for the three weeks of TACE-combined therapy. The solvent has a specific targeting function for tumors, even in the small lesions. **Conclusion:** The solvent with SHIFT performs enhanced fluorescence stability and excellent anti-bleaching ability. The combined of near-infrared fluorescence navigation in surgical resection and TACE could effectively improve the tumor resection rate in hepatocellular carcinoma. The developed drug-iodine solvent with SHIFT can provide a valuable platform to achieve the combined therapeutic effect of TACE and precise surgical resection.

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Evaluation the Efficacy of Superparamagnetic Iron Oxide Labeled Bone Marrow Mesenchymal Stem Cells in the Treatment of Myocardial Infarction in Rats by 7.0T MRI

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Purpose: To evaluated the efficacy of bone marrow mesenchymal stem cells (BMSCs) in the treatment of acute myocardial infarction (AMI) in rats by 7.0T MRI.
Methods and material: 14 male SD rats were randomized into experiment group (n = 7) and normal control group (n = 7). Rats were anesthetized with chloral hydrate (0.3ml/100g). Opened the rats' chest and ligated the left anterior descending coronary artery to modeled AMI. 25μg/ml Superparamagnetic Iron Oxide (SPIO) combined with 0.75μg/ml L-poly-lysine labeled BMSCs 48h, then BMSCs were collected and directly injected into the infarcted area. MRI scans were performed on D1 and D14 after modeling. Left ventricular ejection fraction (LVEF) and other cardiac function indexes, myocardial strain, the morphological changes of the infarcted area and the signal of infarcted area were used CVI^{42} software to analysis, then objectively evaluated the therapeutic effect of BMSCs on AMI. The rats were euthanized after D14 scanning, and the hearts were taken for histopathological staining to observe the presence or absence of cardiomyocytes and neovascularization.
Results: The signal intensity of SPIO-labeled area in experimental group was significantly lower than control group and muscle ($P<0.001$). The values of end diastolic volume (EDV), end systolic volume (ESV), LVEF, peak strain radial (PSR) and peak strain circumferential (PSC) on D1 were 0.35 ± 0.12ml, 0.19 ± 0.09ml, 0.46 ± 0.08, 54.93 ± 15.83 and 24.50 ± 3.82 respectively in control group and were 0.38 ± 0.13ml, 0.21 ± 0.06ml, 0.46 ± 0.05, 59.16 ± 12.23 and 26.24 ± 2.51 respectively in experiment group. Left ventricular wall thickness on D14 was significantly thinner than D1, and the values of EDV, ESV, LVEF, PSR and PSC on D14 became to 0.7 ± 0.22ml, 0.46 ± 0.18ml, 0.35 ± 0.11, 38.84±15.84 and 20.24 ± 6.43 respectively in control group and were 0.54 ± 0.12ml, 0.33 ± 0.07ml, 0.38 ± 0.05, 65.48 ± 14.35 and 27.21 ± 2.06 respectively in experiment group. The EDV, ESV and LVEF on the D1 and D14 of the control group were no significantly different from the experimental group ($P>0.05$). There was no significant difference in PSR and PSC between the experimental group and the control group on D1 ($P>0.05$), but PSR and PSC on D14 of the control group were significantly lower than the experimental group ($P<0.05$). There were no cardiomyocytes and neovascularization by histopathological staining in experimental group.
Conclusion: BMSCs have no significantly improvement in EDV, ESV and LVEF in the treatment of AMI, but delay the myocardial strain impairment. MRI can be used to evaluate the effect of SPIO-labeled BMSCs transplanted into AMI.

OR-260
基于化学交换饱和转移技术示踪纳米药在乳腺癌的初步研究

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目的：合成一种新型纳米药兼具化学交换饱和转移(chemical exchange saturation transfer, CEST)效应，并利用 CEST 技术示踪纳米药在乳腺癌肿瘤内的分布情况及治疗作用。
方法：将含有酰胺质子的丙烯酰胺在可逆加成-断裂链转移聚合作用下与丙烯腈结合并通过自组装构建一种两亲性嵌段共聚物(PEG-b-(PAM-co-PAN))。在 PEG-b-(PAM-co-PAN 基础上采用纳米沉淀

方法将化疗药阿霉素包埋在纳米粒内从而制备了一种兼具 CEST 效应的新型纳米药（PEG-PAM-PAN@DOX）。对纳米粒的表征、细胞毒性及活体毒性进行测定。20 只 BALB/c 裸鼠乳腺癌模型（原位肿瘤 12 只，异位肿瘤 8 只）用于示踪纳米药在肿瘤内的分布情况及疗效的评价。
结果 ：(1) 位于丙烯酰胺上的酰胺质子在 2.75 ppm 处产生了明显 CEST 效应，而纳米药 PEG-PAM-PAN@DOX 在 0.5ppm 具有 CEST 效应，其效应的大小与物质的浓度、pH、饱和脉冲能量及脉冲持续时间有关；（2）对 PEG-PAM-PAN@DOX 进行表征证明该方法是可行的，且纳米药呈球形稳定地分散在水中，直径在 100-120 nm 之间；（3）体内、外实验未发现 PEG-PAM-PAN 具有明显的毒副作用（$p>0.05$），生物安全性好且可降解；（4）利用 CEST 成像技术于尾静脉注射后 1 h（4 只），2h（3 只）及 2.5 h（1 只）示踪到纳米药在肿瘤内达到峰值；（5）细胞吞噬实验发现纳米药更容易进入细胞内并与细胞核结合抑制癌细胞的增殖，同时活体实验证明纳米药物具有与游离 DOX 相同的治疗效果，且副作用小。
结论 ：纳米药 PEG-PAM-PAN@DOX 不仅具有治疗的功效还可以利用 CEST 技术示踪其在肿瘤内的分布情况，为筛辨出对化疗药敏感患者并制定个体化治疗方案奠定了基础，具有广阔的应用前景。

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外源性波谱标志物进行肿瘤 MRS 分子成像初探

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[摘 要] 目的 探讨外源性波谱标志物进行肿瘤 MRS 分子成像的可能性。方法 用高场 MR 检测不同浓度苏木素溶液，分别用点解析波普法（Point Resolved Spectroscopy，PRESS）和激励回波获取法（Stimulated Echo Acquisition Mode，STEAM）法进行 MRS 成像，分析不同扫描方法和浓度苏木素 MRS 信号特点。结果 无论 PRESS 和 STEAM，苏木素均可检出特征性波谱谱线，峰位固定，但峰高和峰面积和浓度相关，浓度越高，谱线越清晰。结论苏木素有特征性 MRS 信号，有可能为肿瘤分子成像提供合适的外源性靶标物质。

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Ultrasmall Biocompatible WO 3-x Nanodots for Multi-Modality Imaging and Combined Therapy of Cancers

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Objective: With the assistance of WO_{3-x} nanoprobes, complementary multi-modal molecular iamging has been uesd to study the early breast cancer, and provide insights for the precise diagnosis and treatment of breast cancer.
Method: a novel nanotheranostic agent was developed for multi-modal imaging and therapy of early breast cancer. First, ultra-small WO_{3-x} nanoprobe with strong localized surface plasmon resonance (LSRP) in the near-infrared region was prepared by a one-pot reaction method, and their LSRP was enhanced under weak acidic and hypoxia conditions. The resultant ultrasmall biocompatible WO_{3-x} nano-probe was employed as a contrast agent for photoacoustic imaging, and as a transducer for photothermal therapy. Owing

to the high atomic number of W and strong X-ray attenuation coefficient, ultrasmall WO_{3-x} nano-probe was also as contrast agent for CT imaging, and as a radiosensitizer for radiotherapy.

Result: The experimental results show that ultrasmall biocompatible WO_{3-x} nanodots not only have excellent attenuation and sensitization to X-rays for CT imaging and radiaotherapy of breast cancer, but also exhibit high photothermal conversion efficiency for its photoacoustic imaging and photothermal therapy. Combination of photothermal therapy and radiation therapy is the most effective method for killing tumor and preventing it recurrence.

Conclusion: With the assistance of ultrasmall novel nanotheranostic WO_{3-x} nanodots, breast cancer can be detected at an early stage through multimodal imaging, and treated by combined photothermal therapy and radiotherapy. The results could provide guidance for clinical treatment of breast cancer.

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Biocompatibility Red-Emissive Carbon Dots for Fluorescent Bioimaging, Reactive Oxygen Species Produce and Accumulation property in Mice Brain

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Objective

An ideal and novel materials for tumors theranostics are still trying to explore. In this research, we are attended to report the novel biocompatibility red-emissive carbon dots, which possess good water dispersibility, strong red fluorescence emission (deeper tissue penetration). the low cytotoxicity, biochemical safety and biocompatibility, and further could be used as cell imaging agents and animals living imaging materials *in vivo*. Moreover, the excellent CDs can accumulate in brain and solid tumor, which expected to help with surgical navigation. Furthermore, CDs can produce the reactive oxygen species (ROS) once light-inspired which act as an excellent property in tumor photodynamic therapy (PDT) aspect. The as-prepared CDs nanoparticles can be used as an ideal tumor theranostics material in the future [1-2].

Methods

Preparation and Characterization of CDs. The CDs were prepared by one-step hydrothermal method with P-Phenylenediamine and thiourea were dissolved into ultrapure water, further heating at 200 ^{0}C for 10 h and immediately dialysis. The mean particle size, the morphological (TEM), An UV-vis spectrum, XRD and XPS were confirmed to the physicochemical properties of CDs.

Cellular Fluorescent Imaging *in vitro*. To explore the cellular fluorescent imaging application, A549 and MCF-7 cells were seeded in a 6-well culture plate, incubated for 24 h, CDs were added at final concentration of 100 μg/mL. After further 12 h incubation. Detected fluorescence intensity via flow cytometry. for the visual analysis, after CDs and cells 4 h incubation, fixed with 70% ethyl alcohol, and after stain with DAPI, the cells were observed by confocal laser scanning microscope.

***In Vivo* Bio-Distribution.** we collect the CDs in EP tube for fluorescence imaging *in vitro,* and further investigated the feasibility of CDs for fluorescence imaging *in vivo*. BALB/c-nu mice with subcutaneous MCF-7 human breast cancer was selected as the animal model. the mice were treated with intravenous injection of CDs (60mg/kg, 0.2mL). The certain interval fluorescence distribution of samples in mice were obtained with IVIS Lumina Series Ⅲ (excitation=480, emission=620). At 24 h, the organs were harvested for *ex vivo* imaging to tissue/organ distribution. All the reported animal experiments were performed by strictly following the IACUC-approved protocols.

CDs-promoted ROS production and cell apoptosis *in vitro*. 2, 7-Dichlorodi-hydrofluorescein diacetate (DCFH-DA), which is applied to detect ROS inside the cell of biological systems. CDs (3mg/mL) was added into MCF-7, after incubated 4 h, the DCFH-DA (10 μm) was introduced with the five groups, (1) DCF alone as blank; (2) laser only; (4) CDs only; (5) CDs with laser at 660 nm (0.9 mA/ cm^2, 2 min). The DCF fluorescence was detected by Flow Cytometry and confocal laser scanning microscope. Alexa Fluor 488 Annexin V-FITC/PI Cell Apoptosis Kit was used to quantify apoptosis, MCF-7 cells were seeded in a 6-well culture plate with a 1 x 10^5 cells/well, incubated for 24 h, reinfused into the serum-free culture medium with the sterile CDs solutions (20 μg/mL, 40 μg/mL). After 2 hs' incubation. Collect the culture as well as the cells. Annexin V-FITC/PI were detected fluorescence intensity via Flow Cytometry.

Cellular Cytotoxicity and Safety Studies *in vivo*. MTT assay was conducted on 3T3, A549 and MCF-7 to determine the cytotoxicity and biocompatibility of the CDs. Cell culture method as described above, the optical density (OD) of the samples was monitored by an ELISA micro plate reader at 570 nm (n= 6). The typical method of complete blood count (CBC) to evaluate safety about myelosuppression and blood compatibility for foreign materials. And obtain serum for blood chemistry tests (AST, ALT, ALP, TP, CRE, and BUN). Subsequently, the main organs of the mice (heart, liver, spleen, lung, and kidney) were harvested and fixed using 4% neutral paraformaldehyde for H&E stained. All the obtained biopsy samples were imaged using an optical microscope.

Results

Characterization of CDs. As is typical, the as-prepared CDs were a homogeneous and red-clear solution. As displayed in the TEM image, CDs give a uniform diameter of 7-8 nm, which also can be proved straightway by the DLS analysis, and the PDI distribute is 0.161 with a good momodispersity. In addition, the crystalline property of CDs was confirmed by XRD. A broad peak centered at 23.2° can be associated with highly disordered carbon atoms and attributed to graphite lattice spacing (002) showing a *d* spacing as to 0.38 nm. The FTIR analysis further confirmed the presence of oxygen-containing (C-O, OH, C=O, C=O-C), nitrogen-containing (NH_2, C-N) and sullied-containing (C-S) groups on the surface of CDs. The UV-vis absorbance and fluorescent property were displayed that UV–vis spectrum of C-dots shows broad absorption from 200 to 750 nm and possesses a sharp characteristic peak at 250 nm corresponding to the π－π＊ transitions of C=C in CDs, which do not generate fluorescence. Furthermore, this UV-vis spectrum exhibited distinct absorption bands at 301 nm, 511 nm, and 600 nm in the lower-energy region, demonstrating the different surface states and corresponding to fluorescent property. Moreover, the excitation-dependent nature can be discovered for each concentration of as-prepared CDs. In brief, the emission peaks are shifted from 420 nm to 620 nm with increase of excitation wavelength from 360 nm to 600 nm using 0.5 mg/mL of CDs as an example, which was similar with previous reported CDs. The full-scan XPS spectrum is further investigate the surface chemistry

of CDs. Five characteristic peaks at 160.3, 225.2, 285.5, 401.8 and 529.5 eV can be founded obviously, which are associated with the characteristic peaks of S2p, S2s, C1s, N1s, and O1s, respectively. These results revealed a small amount nitrogen atoms and sulfur doped into CDs. The high-resolution spectra of C1s, reveals three different types of carbon atoms corresponding to C-C/C=C (284.8 eV), C-N/C-O/C-S (285.9 eV) and carboxyl carbons (COOH) (288.8 eV), respectively. The detail analysis of N1s demonstrate two types of nitrogen atoms at 399.4 eV and 401.2 eV, which is accordance of pyridinic N and pyrrolic N, respectively. In addition, the O1s analysis includes two peaks at 531.6 eV and 533.2 eV, corresponding to C=O and C-O, respectively.

Cellular Fluorescent Imaging Studies. Cellular fluorescent imaging studies were conducted at the safe concentration, 12 h co-incubation with cells and sterile CDs solutions (600 μg/mL), confocal images of MCF-7 at bright field, and with DAPI together positioning the cells. At 480 nm excitation and 620 nm emission filters, it shows that most CDs distributed and agglomerated inside the cell's cytoplasm but not cell nucleus. The results are likely to the gather of CDs, which lead to the particles size increased and cannot cross nuclear pore. The qualitative results show that CDs can demonstrate the bright and enduring red fluorescence imaging for cells. Meanwhile, flow cytometry demi-quantitative analysis results reveal that CDs were uptake in cells and perform positive rate 70.67 % compared to the control group.

In Vivo Bio-Distribution Study. CDs shown strong FL intensity in tube, furthermore, *in vivo*, sterile CDs solutions (6000 μg/mL, 200 μL) was intravenously injected into tumor-bearing mice, results suggest that the CDs primarily accumulated into the brain after post-intravenous, and gradually metabolized out of the brain within 48 h. at the 2 h, the strong FL signal displayed in the kidneys suggest that the CDs can be excreted from the body by renal. The organs were harvested at 48 h post-intravenous injection for imaging analyses ex *vivo*. Only brain and tumor exhibited relatively meaningful and brighter fluorescence than other organs (kidneys, liver, cervical lymph nodes, lung, spleen, and heart). Importantly, combining the images and quantitative brain exhibit higher fluorescence intensity than the tumor, we hypothesis that CDs can pass the blood brain barrier (BBB) maybe because of its ultra-small size. what's more, the brain accumulate may contribute to the CDs were prepared by organic materials and consisted of (C, N, O, S) elements, which might reduce the rejection from BBB towards exogenous materials. And possibly owing to the brain capillary endothelial cells expressing the glucose and glutamate receptors[3].

CDs-promoted ROS production and cell apoptosis *in vitro*. For ROS generation studies[4,5], CDs exhibit excellent ability to produce ROS in MCF-7 in qualitative and quantitative. Compared with control group, which show that the positive rate of 34.15 %, and the laser only group generated only 1.26 %, co- treated cells with laser and CDs, the group generated ROS at 54 %. CDs induced the cells produce ROS, and Light-induced the CDs produce more than one times ROS. Visualization results show that CD-promoted ROS production were shown in the corresponding picture with green (DCF), with the DAPI positing cells. a laser irradiation can have the generation of reactive oxygen species, improve the tumor site of oxygen environment, leading to tumor cell apoptosis, and even death. CDs lead to 38 % MCF-7 cells early apoptosis at 20 μg/mL, and at 40 μg/mL, cell apoptosis rate increased about 15%. And at the same concentration, the laser irradiation inducement of apoptosis rate increased about 10 %. The results showed that CDs themselves cause cell apoptosis, and at the lower concentration, CDs plus laser more significantly induced cell apoptosis, the cytotoxic

effect on MCF-7 cells could be boosted by the laser irradiation. And the higher concentration showed the same trend. The ROS production and cell apoptosis property provide the potential applications on tumor photodynamic therapy *in vivo*.

Cellular Cytotoxicity and safety studies *in vivo*. MTT assay results show that the IC50 of 3T3 at 42.9 μg/mL, A549 at 432.4 μg/mL, MCF-7 at 458 μg/mL and 4T1 at 405 μg/mL, respectively. The results of hemolysis test revealed that CDs performed good blood compatibility, there is no hemolysis occurred at 800 μg/mL (hemolysis rate was less than the international level 5%). Moreover, biochemical and organization safety evaluation were also conducted, with the results that the mice complete blood count was within the normal range compared with the control group. Blood chemistry tests revealed that intravenous injection CDs lead to neither hepatic nor renal dysfunction, and no inflammatory cells were found in heart, liver, spleen, lung, and kidney cells in H&E histological stained tissues.

Conclusion

In summary, we have shown one-step hydrothermal synthesis method to prepare fluorescent CDs in pure water solution. The CDs with nanoparticle size and emit strong red light under irradiation The CDs showed good overall three-in-one properties, good fluorescence image performance, photo-produce the reactive oxygen species and bioimage in brain. The fluorescence image performance enabled CDs to be superior choice as visualize biological systems probe both *in vitro* and *in vivo*. Furthermore, the CDs across the blood brain barrier and accumulate in brain, the superior ability could be used for noninvasive brain imaging, and further for diagnosing brain diseases, such as glioma, cerebral parasitic disease, meningitis. Moreover, CDs also demonstrate photo-produce the ROS which act as an excellent property in tumor PDT therapy, which could be used for glioma therapy. The present works provide a multifunctional application of CDs in both bioimaging and PDT therapy.

OR-264

Polyphenol/MnO2 Hybrid Theranostic Agents for MRI-guided Photothermal Therapy

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Purpose:

we exploited polyphenols as direct photothermal sources and developed a epicatechin-derived polyphenolic and biomineralization incorporated nanotheranostic agents with functional magnetic resonance imaging (MRI) and photothermal therapy (PTT).

Materials and Methods:

The polymer and manganese dioxide hybrid nanoparticles were synthesized through a facile and one-step method according to our previous research.[1] For the orthotopic 4T1 tumor model, 5×10^5 cells in 200 μL PBS were injected into the mammary gland of each Balb/c mouse, and all the corresponding experiments *in vivo* were performed till the tumor volume reached about 60 mm^3. For *in vivo* MRI of orthotopic tumor, Balb/c mice bearing 4T1 tumors were intravenously injected with BME (56 μmol Kg^{-1} in terms of

Mn for each mouse). All the images were collected at predetermined timed intervals, followed by the measurement of signal intensities. For *in vivo* PTT, Balb/c mice with orthotopic 4T1-bearing tumors were randomly allocated into 4 groups (n = 5, each group): (a) PBS treated, (b) NIR laser treated, (c) BME treated, and (d) BME with NIR laser treated. Meanwhile, the tumor sizes were measured and body weight were also monitored.
Results:
The epicatechin-MnO_2-BSA (BME) nanocomposites demonstrated ultra-high MRI (longitudinal relaxivity up to 30.01 $mM^{-1}s^{-1}$) *in vitro*. Meanwhile, a greatly hyper-enhanced rim was observed around the tumor contrasted by BME in 5 min, following centripetal fill-in enhancement of the whole tumor site last for at least two hours, which provided precise differentiation between the tumor and normal tissues. The signal changes of tumor were quantitatively calculated, showing T1-wighted signal enhancement of 68% at 30 min post injection. Furthermore, the group treated with BME and laser exposure showed complete tumor ablation without recurrence, which showed excellent photothermal therapy efficacy with complete ablation of orthotopic tumors.
Conclusion:
Efficient integration of epicatechin-based polyphenols and albumin-templated biomineralization presents a promising strategy for the production of facile nanotheranostic agentswith MRI-guided PTT.

OR-265

Theranostic Mn(Ⅲ)/Mn(Ⅳ) Dual-valence MRI Nanoprobe with Ultrasensitive Tumor Microenvironment Response: Preparation and Application

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Objective To develop novel theranostic MRI nanoprobe with ultrasensitive tumor microenvironment response, investigate the effect of comprehensively alleviating tumor microenvironment and the mechanism of ultrasensitive tumor-target MRI imaging. **Methods** Theranostic Mn(III)/Mn(IV) dual-valence MRI nanoprobe was synthesized via biomineralization process, the morphological structure, average particle size and the ratio of manganese valence were detected. Then, the cell viability test and MR scanning in vitro were used to observe the biocompatibility and the sensitivity of pH changes. The MR scanning in vivo, HE and immumohistochemical staining were applied to detect the ability of rapid and sensitive imaging and the effect of alleviating tumor microenvironment. **Results** The dual-valence MRI nanoprobe was prepared, with the average size of (80.6±24.9) nm, the ratio of Mn(III) was 52.2% and Mn(IV) was 47.8% and the cell viability test demonstrated the good biocompatibility. In vitro MR scanning proved the sensitivity of detecting the pH changes. In vivo MR scanning showed the excellent ability of penetrating blood brain barrier and the rapid (15min) and lasting tumor imaging. HE staining, HIF-1α immumohistochemical staining and Western-Blot showed the ability of alleviating tumor microenvironment. **Conclusion** Due

to the combination of two valence states of manganese, the prepared theranostic Mn(Ⅲ)/Mn(Ⅳ) MRI nanoprobes via albumin biomineralization process overcome the shortcome of single valence state of manganese and exhibit the excellent capability for ultrasensitive tumor microenvironment response imaging and tumor microenvironment alleviation

OR-266

前列腺癌诊疗一体化 Fe304 纳米探针的构建与应用

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目的 探讨前列腺癌诊疗一体化 Fe_3O_4 纳米探针的构建方法和理化性质，并评价对前列腺癌细胞光动力治疗作用的体外生物学特性及 MRI 的可行性。**方法** 将超顺磁性氧化铁（SPIO）溶于水中，通过氨基化修饰组装前列腺癌特异性靶向基团叶酸，再组装可用于肿瘤治疗的光敏剂 Ce6，从而构建用于前列腺癌“诊疗一体化”的多功能纳米探针；后期经过材料表征、体外实验、体内实验对探针进行检测，得出探针诊疗效果及相关数据。**结果** 成功构建 Fe_3O_4 纳米探针，其粒径在（100±4.7）nm，电位在-8 mV；MR 扫描结果显示随着 NPs 浓度的增加，T_2 弛豫时间缩短，T_2 信号强度降低，说明探针具有良好的 MR T_2 成像效果。经体外实验得到结果如下，利用四唑盐比色法（MTT）实验结果表明探针暗毒性小，光毒性强，生物相容性高又可以用于光动力治疗；DAPI 染色和普鲁士染色结果表明探针的入胞效果好，具有准确的靶向性；经体内实验得到结果如下，进行 7.0TMR 扫描，实验组较对照组其 T_2 信号强度均有明显下降，注射 9 h 后靶向聚集效果最强，12 h 后基本代谢完毕，说明该探针在体内有较好的 MR 成像效果，并且其代谢速度较快，对体内微环境影响较小；经过光动力治疗后，肿瘤生长速度得到了明显的抑制，并且随着治疗总时间累积，肿瘤体积明显减小，具有良好的光动力治疗效果。**结论** 通过对材料进行表征、体外实验以及动物体内实验验证了该纳米探针理化性质优良，具有良好的 MR 成像效果，对前列腺癌细胞具有准确的靶向性并可结合光动力治疗准确杀伤肿瘤细胞。

OR-267

基于知识图谱的影像组学研究可视化分析

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目的 使用知识图谱的方法对影像组学领域文献分布、研究力量分布和研究热点进行分析，为相关研究
提供参考。**方法** 下载 Web of Science 数据库中影像组学文献题录。分别使用 BICOM 2.0.1 和 SATI 3.2 对发表年份、期
刊、作者、关键词、科研机构数据进行清理和频次统计；使用 CiteSpace V4.4.R1 构建国家(地区)合作网络知识图谱；
使用 Ucinet 6 构建核心著者、核心科研机构的合作网络知识图谱；使用 gCLUTO 1.0 构建高频关键词双聚类图。**结果**
共检索到 700 篇文献，自 2012 年开始论文发表数量逐年快速增长。在该领域领先的主要有美国、中国、荷兰等国家，

形成 5 个重要科研机构合作群和 10 个重要著者合作群。根据高频关键词双聚类分析发现 8 个研究热点方向。**结论** 影
像组学作为一个新兴的研究方向处于快速发展阶段，越来越多的国家、科研机构及多学科背景科研人员投入到相关
研究中，并不断有新的名词、新的方法出现在该领域。

OR-268

Alters of DTI at animal MR and expression of the CREB signaling pathway in rat models of depression

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Objective: This study was performed by establishing the accepted chronic unpredictable mild stress (CUMS) rat model,considering the hippocampus and the prefrontal lobe as the region for research. The changes in the brain of depressive rats were observed with diffusion tensor imaging (DTI). In addition, the pathogenesis of depression was analyzed and discussed from the perspective of cAMP-response element binding protein(CREB) signaling pathway combined with Western Blot(WB) .
Materials and Methods: The CUMS rat model of depression was used in this study. All model and control rats were anaesthetized and scanned using the 7.0T MRI. Axial, sagittal, and coronal images were scanned separately.The fractional anisotropy(FA) values and mean diffusivity (MD) values of cerebellar white were measured in the hippocampus and the prefrontal cortex. After scanning, the target antigen was detected by WB.
Result: The sucrose consumption in the model group was significantly decreased, compared to that of the control group ($P < 0.05$). The level and vertical scores of the model group in an open field experiment were significantly lower than those of the control group ($P < 0.05$). The FA values of cerebellar white in the left and right hippocampus and the left prefrontal cortex decreased in the model group compared to controls ($P < 0.05$). The MD values in the left hippocampus and the left prefrontal cortex of the model group were both increased compared to controls ($P < 0.05$). The expression of BDNF and p-CREB significantly decreased in the left and right hippocampus and the left and right prefrontal cortex of model group ($P < 0.05, p<0.01$).
Conclusion: The study used DTI and WB in bilateral hippocampus and bilateral prefrontal cortex of depressive rats. The alters of DTI were consistent with histological changes, therefore proving that both the hippocampus and prefrontal cortex are essential in the pathogenesis of depression. This study has shown that white matter integrity in the hippocampus and the prefrontal cortex is impaired in the rat depression model compared to the control rat.In addition, the study of DTI showed that there was a difference in the bilateral hippocampus and bilateral prefrontal cortex. Consequently, this study supports the view of the imbalance in hemispheres during the pathophysiological process of depression. This study proves that CERB signaling pathways are important targets for studying the mechanism of antidepressants.

OR-269
18F-FDG PET/MRI 与 PET/CT 在淋巴瘤诊断价值比较的初步研究

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目的 比较 PET/MRI 与 PET/CT 对成人淋巴瘤的诊断效能。次要目的是评价 ^{18}F-FDG 摄取参数与多参数功能 MRI 指标的相关性，探讨淋巴瘤糖代谢的异质性，即 PET/MR SUV 值与体素内不相干运动扩散加权成像（IVIM-DWI）的 D 值、D*值及 F 值之间的关系。
方法 收集我院 2017 年 10 月 1 日至 2019 年 3 月 31 日经病理证实的霍奇金淋巴瘤和非霍奇金淋巴瘤患者 45 例的前瞻性研究。获得 PET/MRI 与 PET/CT SUVmax 以及最高代谢病灶对应的 D 值、D*值及 F 值，评估疾病的分期及状态（缓解或者活跃期），采用 Spearman 相关分析分析两种技术 SUVmax 以及 SUVmax 与对应的 D 值、D*值及 F 值相关性。
结果 PET/CT 和 PET/MRI 均检出 71 个结节和 6 个结外点， IVIM-DWI 中测出 43 个病灶对应值，其中 3 个结外位点在 PET/CT 上不确定是否侵犯，在 PET/MRI 上确定侵犯。对于阳性病灶的检测，PET/CT 与 PET/MR 的一致性几乎完全一致(k > 0.965)。PET/CT 与 PET/MRI 在淋巴瘤分期上一致性也近乎一致 k =(0.912-1.000)。PET/CT 与 PET/MRI 的相对应的 SUVmax 呈显著相关性(相关系数 r=0.923，P < 0.001)。D 值与 SUV 值有弱相关性（相关系数 r=-0.242,P < 0.05)、F 值与 SUV 值有中等强度相关性（相关系数 r=0.520,P < 0.001）。
结论 ： PET/MR 与 PET/CT 的 SUVmax 高度相关，提示 PET/MR 对淋巴瘤的半定量分析具有很好的稳定性和准确性。功能磁共振序列参数 D 值、D*值及 F 值可以提供肿瘤缺氧状态、血液灌注、分子扩散等方面的信息，可用于评价淋巴瘤糖代谢的异质性，但数据较少，仍需要进一步研究。

OR-270
Study on targeted imaging of dual-modal albumin nanoparticles in glioma

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Objective : Preparation and characterization of dual-modal targeted albumin nanoparticles for glioma; In vitro targeting effect of mouse glioma cell G422 by dual-modal targeting albumin nanoparticles; In vivo targeting effect of glioma dual-modal targeted albumin nanoparticles on in-situ glioma mouse model.

Methods: Magnetic albumin nanoparticles loaded with indocyanine green (ICG) were prepared by dissolvation-crosslinking method, and their size, surface Zeta potential and fluorescence intensity were characterized by transmission electron microscopy (TEM), laser particle size analyzer (DLS) and fluorescence spectrometer. Fe content was detected by o-diazophane method. Angiopep2 targeted peptide was coupled to the surface of albumin nanoparticles by EDC/NHS method to prepare glioma dual-modal targeted albumin nanoparticles, and the amount of targeted peptide coupling was detected by UV-vis spectrometer. In vitro cell experiment: the targeted group and the non-targeted group were set and incubated with mouse glioma cell G422 for 24h, and

the nanoparticle targeting effect was verified by Prussian blue staining and laser confocal microscope. In vivo animal experiment: the in situ glioma model of nude mice was established, and the targeted group and the non-targeted group were set up. The distribution of nanoparticles in vivo and the glioma targeting situation were monitored by MRI and in vivo fluorescence imaging system.

Results : First, the prepared glioma dual-modal targeted albumin nanoparticles were spherical in shape, uniform in size and about 80nm for TEM detection. DLS showed hydrated particle size of about 120nm and surface zeta potential of about 20mV. The emission peak of nanoparticles was detected at 830nm by fluorescence spectrometer. The content of Fe was 1.5mg/mL by o-diazophane method. The coupling amount of the targeted peptide detected by UV-vis spectra was 0.8mg/mL. Sencond, in vitro experiments: Prussian blue staining showed that after co-incubation of the targeted group with G422 cells, there were a large number of iron nanoparticles in the cells. The non-targeted group had fewer iron nanoparticles. After co-incubation with G422 cells, the ICG fluorescence signal of the targeted group was significantly stronger than that of the non-targeted group. Third, in vivo experiment: in vivo MRI imaging results showed that after the targeted group was injected through tail vein, the T2WI signal intensity of the brain and tumor decreased significantly. There was no significant reduction in the non-targeted group. In vivo fluorescence imaging results showed that after the targeted group was injected through tail vein, the fluorescence signal was mainly concentrated in the liver and gradually enhanced in the brain. In the non-targeted group, no fluorescent signals were detected in the brain.

Conclusion: Dual-modal targeted albumin nanoparticles were successfully prepared for glioma. The dual-modal targeting albumin nanoparticles of glioma had a better targeting effect on mouse G422 cells in vitro. The dual-modal targeting of albumin nanoparticles in glioma showed a better targeting for in-situ glioma in mice.

OR-271
942 例颅内动脉瘤血管内治疗围术期出血并发症分析及防治

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目的 分析 942 例颅内动脉瘤行血管内治疗的围术期出血并发症发生情况，并探讨其处理措施。**方法** 收集 2011 年 1 月至 2019 年 4 月复旦大学附属华山医院收治的 942 例颅内动脉瘤患者（1055 个动脉瘤），分析围术期出血并发症发生原因，探讨围术期用药方案，总结防治措施。**结果** 本组 942 例患者出血性并发症共 12 例（1.27%），其中术中出血 9 例、术后出血 3 例。9 例术中出血致死率及致残率均为 0，其中因弹簧圈损伤瘤腔致动脉瘤破裂 6 例，微导管损伤瘤腔致动脉瘤破裂 2 例，微导丝损伤远端小分支导致出血 1 例。9 例患者均预后良好，出院前 mRS 评分较入院时未增加。术后出血 3 例均死亡，其中 2 例蛛网膜下腔出血可能与瘤腔栓塞不全或术后肝素化有关，1 例基底节区血肿可能与术后血压一过性增高有关。**结论** 术前不常规应用抗血小板聚集药物及肝素化可降低术中出血导致的致死率，及时识别及处理，多数患者预后良好。术后出血发生率低，但预后差，病死率高。术前充分评估危险因素，术中致密填塞瘤腔，术后慎用抗凝治疗，可改善出血患者的预后。

OR-272
Stanford B 型主动脉夹层覆膜支架腔内修复术远期疗效分析

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目的 探讨胸主动脉腔内修复术（TEVAR）治疗 Stanford B 型主动脉夹层的长期疗效。
方法 回顾性收集武汉协和医院 2008 年 3 月至 2018 年 3 月收治的 300 例行 TEVAR 治疗的 Stanford B 型主动脉夹层患者的临床及影像学资料，分析短期（在院/术后 30 天）及长期死亡率、并发症发生率及主动脉重塑情况。
结果 技术成功（覆盖主要破口）率 100%。左锁骨下动脉完全覆盖 29 例，烟囱支架重建左锁骨下动脉 11 例，烟囱支架重建左颈总动脉 7 例。术毕即刻造影发现 53 例 I 型内漏，21 例予以球囊扩张后内漏减少或消失，13 例加放 cuff；术后 30 天死亡率 0.7%（2/300），并发症发生率 14.0%（42/300）。随访截止 2018 年 9 月，中位随访时间 35 个月（6-126 个月）。1、3、5 年累积全因死亡率分别为 2.0%、6.7%、12.8%，主动脉夹层相关死亡率分别为 1.7%、4.5%、8.4%；晚期并发症发生率 14.7%（44/300），胸主动脉段假腔完全血栓化率 83.7%（251/300）。
结论 应用覆膜血管内支架行 TEVAR 是治疗 Stanford B 型主动脉夹层安全有效的方法，随访期间病死率低，长期疗效令人满意。

OR-273
基于腔内介入的下肢动脉源性溃疡个体化治疗策略

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目的 :结合腔内针对病因治疗，本院烧伤科 VSD 负压吸引、诸氏中医外科换药、我科臭氧浴换药，提高患者动脉源性溃疡愈合率。建立下肢动脉源性溃疡多学科综合治疗技术规范和临床路径。**方法** : （1）完成患者分类入组：分别选取糖尿病性溃疡 Wagner 不同分级患者组、动脉硬化闭塞性溃疡 Fontaine 不同分级患者组各 30 例进入 MDT 模式，另外选取不进入 MDT 诊疗模式的对照组 30 例。CTA 明确血供情况，拟定腔内手术方案。（2）按照治疗计划，对入选 MDT 组的不同患者，每一亚组按照不同分级进行针对性的腔内操作，开放阻塞的动脉血管后联合我科臭氧浴换药。对比测量术前、术后踝肱比指数及创面血氧分压水平。（3）介入疗效满意后转到烧伤科/诸氏中医外科进行 VSD 操作/中医换药；对照组仅执行腔内治疗联合臭氧浴换药。进行多因素方差分析，比较组间疗效。扩大样本量，对入选 MDT 组患者多学科治疗，总结其疗效影响因素，进行多因素逻辑回归分析，（4）组间对照研究，制表格分析，评价溃疡愈合疗效。**结果** :多学科治疗组溃疡愈合率明显优于仅采用腔内治疗联合臭氧浴换药对照组(P＜0. 05)。**结论** : 医学认为血管灌注不良、动脉粥样硬化、水肿和反复的局部损伤通过不断启动炎症级联反应在创面溃疡形成中有重要的致病作用。实践已经证明通过减轻创面水肿、增加富含氧份的血液灌注可以显著改善创面愈合。最常见的动脉源性溃疡存在着血流不畅、微循环障碍，这恰恰是血管腔内治疗可以发挥特长的地方。本研究基于腔内治疗微创高效优势针对病因治疗——开通堵塞的动脉血管，充分整合了我院多学科综合治疗实力，发挥特长，利用无锡市伤口治疗中心坐落我院的独特优势，创立了针对不同类型溃疡分层分级 MDT 治疗模式。我中心建立了溃疡治疗的多学科、全程、高效理念，优化了多学科诊疗流程，明确了各型患者实行血管内治疗/VSD 治疗/中医换药/臭氧治疗的最佳干预时机，明显提高了患者溃疡愈合率。

OR-274
药涂球囊对不同部位下肢动脉粥样硬化闭塞疗效观察

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【摘要】 **目的** 评价药物涂层球囊扩张术对不同部位下肢慢性动脉粥样硬化闭塞性症的安全性和有效性。**方法** 采用随机病例对照研究方法对实施药物涂层球囊扩张术治疗慢性下肢动脉硬化闭塞症的有效性和安全性进行评价，随机抽取 55 例患者，分为股-腘动脉组 32 例，腘-膝下动脉组 25 例，应用导管、导丝、普通球囊相配合行闭塞管腔开通后药物涂层球囊扩张。观察两组患者术后 3、6 及 12 个月的再狭窄率、目标病变在再干预率和保肢率及术中治疗部位相关并发症。**结果** 两组患者的年龄、性别及动脉粥样硬化危险因素构成、治疗前踝肱指数、靶病变的狭窄、闭塞状况和长度，Rutherford 分类均具有可比性($P > 0.05$)。术后 3、6 和 12 个月彩超复查股-腘动脉组与腘-膝下动脉组再狭窄率为：0（0）*vs.* 4.7%（1 例）（$X^2=1.12$, $P > 0.05$）；3.5%（1 例）*vs.* 9.5%（2 例）（$X^2=1.96$, $P > 0.05$）；10.7%（3 例）*vs.* 33.3%（7 例）（$X^2=6.59$, $P < 0.05$）；12 个月的目标再干预率 7.1%（2 例）*vs.* 33.3%（7 例）（$X^2=7.48$, $P < 0.05$）；12 个月的保肢率 100%（28）*vs* .23.8%（5 例）（$X^2=4.98$, $P < 0.05$）。围手术期两组均无死亡病例，治疗部位相关并发症无统计学意义[非限流性夹层 17.8%（5 例） *vs.* 19.0%（4 例）（$X^2=1.82$, $P > 0.05$）；急性血栓形成 3.1%（1 例）*vs.*4.0%(1 例)（$X^2=1.79$, $P > 0.05$）；远端栓塞 10.7%（2 例）*vs.*4.0%(1 例)（$X^2=1.69$, $P > 0.05$）]。**结论** 药物涂层球囊治疗股-腘动脉型和腘-膝下动脉型慢性下肢动脉硬化闭塞症的近期效果和安全性相似；股-腘动脉组中远期效果和保肢率优于腘-膝下动脉组。

OR-275
模板辅助 CT 引导放射性粒子植入治疗胰腺癌的临床应用

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目的 比较共面模板辅助 CT 引导放射性粒子植入治疗胰腺癌的术前与术后剂量学验证差异，探讨其治疗精确性。 方法 回顾性分析 22 例 CT 引导下放射性 125I 粒子植入治疗的中晚期胰腺癌患者，年龄 47-84 岁，平均（66.4±11.3）岁，其中 10 例患者为共面模板辅助粒子植入，12 例患者为非模板辅助粒子植入。所有患者进行术前计划、术后剂量学验证。采用配对 t 检验比较手术前后 90%靶体积的最小吸收剂量（D90%）、最小周边剂量（MPD）、100%处方剂量覆盖的体积占靶体积的百分比（V100%）、V150%、V200%。并比较两组患者手术操作时间的差异。 结果 22 例患者均成功完成治疗，未发生与手术相关的严重并发症。平均植入粒子 25 颗。共面模板辅助粒子植入组和非共面模板辅助粒子植入组 V100%术后较术前减小，差异有统计学意义（P＜0.05）。两组术后 D90%、V150%均值较术前减小，而 MPD、V200%均值较术前增大，但各指标手术前后比较差异均无统计学意义（P＞0.05）。共面模板辅助粒子植入组手术操作时间（44.30±12.37）min，非模板辅助粒子植入组手术操作时间（60.00±12.78）min，两组手术操作时间比较差异有统计学意义（P＜0.05）。结论 共面模板辅助 CT 引导放射性粒子植入治疗胰腺癌术后剂量验证的主要指标均较好达到了术前计划的要求，有良好的治疗精确性，且与非模板辅助植入方法比较，使用模板辅助粒子植入可以更精确地达到术前规划的优化，且缩短了手术操作时间，提高了患者的耐受度，值得临床推广。

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An early-warning model based on artificial neural network for predicting the 30-day mortality risk after stent placement for patients with malignant biliary obstruction

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Purpose: To develop, validate and compare the early-warning models of the 30-day mortality risk for patients with malignant biliary obstruction (MBO) undergoing percutaneous transhepatic biliary stent placement (PTBS).

Materials and Methods: Between January 2013 and October 2018, this multicenter retrospective study included 299 patients with MBOs who underwent PTBS. The training set consisted of 166 patients from four cohorts, and another two independent cohorts were allocated as external validation sets A and B with 75 patients and 58 patients, respectively. The logistic and artificial neural network (ANN) models were developed to predict the risk of 30-day mortality after PTBS. The predictive performance of these two models was validated internally and externally.

Results: The ANN model had higher values of area under the curve than the logistic model in the training set (0.819 versus 0.797) and especially in the validation sets A (0.802 versus 0.714) and B (0.732 versus 0.568). Both models had high accuracy in the three sets (75.9-83.1%). Along with a high specificity, the ANN model improved the sensitivity. The net reclassification improvement (12.0-16.5%) and integrated discrimination improvement (5.9-13.5%) also demonstrated that the ANN model led to improvements in predictive ability compared with the logistic model.

Conclusions: Early-warning models were proposed to predict the risk of 30-day mortality after PTBS in patients with MBO. The logistic model is easier to use, while the ANN model has higher accuracy and better generalizability.

OR-277

经皮胆道内射频消融治疗胆道支架狭窄的初步研究

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目的 采用经皮胆道射频消融的方法，治疗胆道支架狭窄，探讨该方法的可行性和有效性。**方法** 选取 43 例因胆道支架狭窄引起胆道梗阻病例，用经皮肝穿刺胆道的方法，将 EndoHPB 导管放置于胆道支架狭窄处进行射频消融，术后留置胆道引流管，经造影确认支架通畅后拔除引流管。**结果** 术后所有患者经胆道造影证实胆道支架通畅，无相关并发症发生，存活患者狭窄支架的再通畅时间中位数为 107 天（12～180 天）。**结论** 经初步临床研究表明经皮胆道内射频消融对胆道支架狭窄的治疗具有良好的有效性和安全性，但仍需有效的随机对照试验来进一步证实。

OR-278
胆道内照射支架应用于肝门部胆管癌致恶性梗阻性黄疸的初步临床研究

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目的 评估携带 ^{125}I 粒子的胆道内照射支架治疗肝门部胆管癌致恶性梗阻性黄疸的有效性及安全性。**方法** 选取 43 例因肝门部胆管癌致恶性梗阻性黄疸患者，采用经皮经肝分别穿刺左右侧胆道分支，于肝门部狭窄处植入 ^{125}I 粒子胆道内照射支架，术后留置引流管 3～5 天，经造影确认支架通畅后予以拔管，封闭穿刺道。记录患者术前与术后的肝功能变化，并观察术后患者生存时间。**结果** Bismuth Ⅰ型 5 例，植入支架 5 个；Ⅱ型 18 例，植入支架 36 个；Ⅲ型 4 例，植入支架 8 个；Ⅳ型 16 例，植入支架 25 个，患者术前血清总胆红素和直接胆红素分别为（145.54±65.35）μmol/L 和（124.73±35.04）μmol/L，术后分别为（65.91±29.43）μmol/L 和（35.50±15.12）μmol/L；与术前相比，术后丙氨酸氨基转移酶、天冬氨酸氨基转移酶、碱性磷酸酶、C-反应蛋白、γ-谷氨酸转肽酶均显著降低（P值均<0.05），乳酸脱氢酶显著升高（P=1.05）。患者中位生存期为 13 个月(3.0~22.5 个月)，未出现相关胆道穿孔、胰腺炎、严重胆道感染以及胆道出血等并发症。**结论** ^{125}I 粒子胆道内照射支架不仅可引流胆汁，减轻黄疸症状，还可近距离内照射胆道肿瘤，起到治疗作用，可延长患者生存时间，有效治疗肝门部胆管癌致恶性梗阻性黄疸。

OR-279
CT 导向下经皮纳米刀消融术在腹膜后肿瘤中的临床应用

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目的 评估 CT 导向下纳米刀消融术治疗腹膜后肿瘤的有效性及安全性。 **方法** 筛选腹膜后肿瘤 25 例，分别为胰腺癌、肾上腺嗜铬细胞瘤、结肠癌腹膜后转移瘤患者，因侵犯临近血管及肠管无法行外科手术切除，全面评估患者心脏、呼吸、肝肾功能等全身状况，术前行 CT、MRI 及 PET-CT 检查制定手术方案，并完善血液实验室检查（血常规、凝血四项、血清四项、血生化及肿瘤标记物）。手术在全身麻醉下进行，使用大孔径多层螺旋 CT（层厚 3cm，120kV，250mAs）、心电同步仪及麻醉监护装置，根据术前计划经皮适形穿刺置入纳米刀消融电极，根据电流波形判定消融程度。术后即刻行 CT 检查排除并发症，并持续全面监测患者生命体征，术后 3 天及 5 天分别行影像

学检查观察疗效及并发症，复查各项血液实验室检查。**结果** 25 例手术均顺利完成，患者生命体征平稳，无严重并发症发生。影像学检查显示消融区域完全，边界清楚，消融区域未见强化，周围可见轻度炎性改变，邻近血管、胰胆管及肠管未见损伤；实验室检查胰腺癌患者脂肪酶及淀粉酶呈一过性增高，肿瘤标记物轻度增高，其余患者实验室指标均未见异常。**结论** 纳米刀消融术在腹膜后肿瘤消融过程中，在灭活肿瘤的同时能够保护血管、胰胆管及肠管等结构，此技术安全、有效，可在临床进一步推广应用。

OR-280
肝癌分子靶向药物及免疫抑制剂治疗的研究现状及进展

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肝癌（HCC）是全球癌症发病率第六位，死亡率第三位的恶性肿瘤。肝癌发病隐匿且发展迅速，多数患者发现时病情就已经进展到中晚期，丧失了手术根治的机会。索拉非尼作为抗血管生成的分子靶向药物开启了肝癌分子靶向治疗的先河，在随后的近十年内，针对肝细胞癌的靶向药物不断涌现，瑞戈非尼、乐伐替尼、卡博替尼、雷莫芦单抗以及一些免疫抑制剂在III期临床试验上取得了不错的成绩。本文就新出现的抗血管分子靶向药物及免疫抑制剂治疗肝癌的现状、挑战以及未来的发展方向进行综述。

OR-281
Chemoembolization of liver cancer with doxorubicin-loaded CalliSpheres Microspheres: Plasma pharmacokinetics, intratumoral drug concentration and tumor necrosis in a rabbit model

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英文摘要共 264 字单词 1560 个字符，无法在此处上传，通过全文附件上传了。

Abstract

Purpose: To investigate the plasma pharmacokinetics, intratumoral drug concentration and tumor necrosis after transarterial chemoembolization (TACE) with doxorubicin-loaded CalliSpheres Microspheres (CSM).

Methods and Materials: Sixty rabbits with liver VX2 tumors were assigned into five groups of 12 rabbits each, which received 4 mg of doxorubicin via intravenous injection (IV group), hepatic arterial infusion (IA group), conventional TACE (cTACE group), CSM-TACE (CSM low dose group), and 8 mg of doxorubicin via CSM-TACE (CSM high dose group), respectively. Doxorubicin concentrations in plasma, tumor and adjacent hepatic parenchyma were measured at various timepoints after treatment, and tumor necrosis percentage and liver enzymes were also assessed.

Results:

OR-282
磁共振引导聚焦超声刀治疗器官局限性中危组前列腺癌安全性和有效性评估

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目的 评估磁共振引导高强度聚焦超声刀（MR-Guided Focused Ultrasound MRgFUS)）治疗中危组前列腺癌（prostate cancer PCa）的安全性和有效性。
材料和方法 按照全球多中心 PCA006 方案前瞻性招募中危组 PCa 患者。入组标准：年龄＞50 岁，PSA≤20ng ，Gleason 评分=7（3+4/4+3）且局限在单侧叶的中危组 PCa 患者，入组前未行任何 PCa 相关的治疗。穿刺采用经会阴 20 针模板+3 针磁共振超声融合靶向穿刺。治疗采用腰-硬联合麻醉下 MRgFUS 治疗。治疗区域依据术前穿刺结果制定，治疗区的温度控制在 75-85℃。统计分析术后即刻非灌注区体积（Non-Perfused Volume NPV），术前及术后 1 月患者 IPSS 评分、IIEF 评分、PSA 及术后 6 月治疗区穿刺病理结果。
结果 2018 年 7 月-2019 年 7 月共入组受试者 3 名，受试者平均年龄 58（55-63 岁），术前平均 IPSS 评分 7（5-8），IIEF 评分 20（18-22），PSA：9.27ng /ml（5.52-16.31ng /ml），平均阳性穿刺针数 6（4-7 针），其中 Gleason 评分=3+4 分 10 针，Gleason 评分=3+3 分 6 针。依据穿刺结果制定消融计划，术中平均超声辐照次数 10 次（9-12），辐照能量 36.4KJ（31.9-43.4KJ），治疗辐照总时间 83min（70-93min），计划治疗体积 5.9cc（3.6-9.1cc），术后即刻非灌注区域体积 7.5cc（5.2-11.2cc），术后 1 月平均 IPSS 评分 5 分、IIEF 评分 22 分，PSA：1.05ng/ml，其中 2 例满治疗后 6 月患者行治疗区域穿刺，结果均为阴性，1 例患者尚在随访中。
结论 MRgFUS 治疗中危组 PCa 安全有效，在避免手术相关并发症的同时达到了较好得短期肿瘤控制效果。

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肺癌的氩氦刀冷冻术治疗

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首先我们要对 CT 机进行预热这样会保证在治疗的过程中可以顺利的完成扫描工作。其次我们要准备好手术所需要的氩气（两瓶）和氦气（一瓶），还要将氩氦刀冷冻机准备好，将气体和冷冻机通过连接线连接好，确认连接点都已经连接好，将冷冻机开机，然后打开气体阀门，再次检查连接点是否连接好。让患者上床配合医生将患者的体位摆好，因为手术时间较长必须让患者有舒服的体位，这样才能保证患者在手术过程中保持不动。扫描患者在不影响诊断的情况下，尽可能减少扫描次数，配合医生对进针点的定位，入针的方向还有进针的深度，测量一定要准确，否则会影响手术的效果。确定好手术方案后，将针与冷冻机进行连接，确认连接好。在连接的过程中一定要与医生配合好，这个过程对无菌的要求很高，必须保证针的无菌，否则会出现感染的可能。对针进行测试，先用氦气将连接管内的空气排出来，这样保证连接管内的气体纯度较高，然后再开启氩气（冷冻模式）将针放到无菌注射用水中，当看到针尖部位出现冰球后，证明我们的连接正常，可以开始手术了。这时配合医生将针固定在所需要的位置上，（冷冻机有针固定的功能）可以保证治疗的过程中针不会出现位移，

如果是多针的情况下可以保证针的位置相对固定。否则影响治疗效果。在治疗的过程中还要密切的观察气体瓶中的压力，压力太低达不到温度也会影响效果，必须保证零下 130 度一下。再治疗的过程中 还要进行 CT 扫描，这样可以随时观察治疗效果，在治疗过程中氩氦刀冷冻机会排出一些气体，对人体是没有坏处的，最好要保持屋子通风良好。冷冻达到时间后关闭冷冻功能，待残余气体排空后，开启复温功能（打开氦气）让针尖的冰球融化，这样才能取出针。一般冷冻复温需要两三次。手术结束后必须先将气体阀门关闭，然后按冷冻机的排气键，待气体排空后才可以卸掉连接管，然后关机。

OR-284
MicroRNA-205 通过靶向血管内皮生长因子 A 对肝癌细胞的影响

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目的 ： 探讨 miR-205 在肝细胞肝癌（hepatocellular carcinoma，HCC）中的作用机制与癌症进展之间的关系，以及 miR-205 是否通过靶向血管内皮生长因子 A（vascular endothelial growth factor A，VEGF A），从而影响肝癌细胞的增殖。**方法** 通过逆转录-定量聚合酶链反应（Reverse transcription-quantitative polymerase chain reaction，RT-qPCR）检查 HCC 和相邻正常肝组织以及肝癌细胞株 HepG2、HuH-7、SMMC-7721、BEL-7402 和正常肝细胞株 LO2 中 miR-205 的表达水平。使用 RT-qPCR 检测转染了 miR-205 激动剂和空白对照的 HepG2 和 HuH-7 细胞中 miR-205 的表达水平，随后通过 Transwell 和 MTT 法检测转染后肝癌细胞的增殖、迁移和侵袭情况。使用荧光素酶测定系统了解 VEGF A 是否为 miR-205 的直接作用靶标。最后用 VEGFA siRNA 敲低 VEGFA 表达来研究 VEGFA 是不是 miR-205 在 HCC 细胞增殖、迁移和侵袭中起调控作用的关键介质。**结果** miR-205 在肝细胞癌组织和肝癌细胞株中的表达水平下降。miR-205 的过表达能够抑制肝癌细胞的增殖、迁移和侵袭。VEGFA 是 miR-205 在 HCC 中的直接作用靶标，miR-205 能够通过靶向 VEGF A 来抑制肝癌细胞的增殖、迁移和侵袭。**结论** 我们的研究表明 miR-205 能够通过下调 VEGFA 的表达来抑制 HCC 的生长、迁移和侵袭，将来可能是肝癌治疗的一个潜在靶点。

OR-285
腹主动脉球囊阻断辅助瘢痕妊娠清宫术的应用初探

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摘要 目的 瘢痕妊娠是一种特殊部位的异位妊娠，指受精卵在剖宫产瘢痕部位着床发育，是剖宫产远期并发症，可导致胎盘植入、子宫破裂、子宫出血，清宫时极易发生大出血，对患者的生命安全造成严重威胁，III型 CSP 危害更大，治疗更为棘手。近年来为防止清宫术中大出血，预先行子宫动脉栓塞（uterine artery embolization，UAE），但 UAE 术后发生月经量少甚至闭经、宫腔黏连等并发症也不容忽视。本研究通过球囊阻断腹主动脉辅助瘢痕妊娠清宫术的应用分析，探讨腹主动脉球囊阻断在清宫术中的临床应用价值。**方法** 回顾性分析郑州大学第一附属医院妇科就诊住院的瘢痕妊娠患者 42 例，其中观察组 21 例，DSA 下置入球囊导管至肾动脉下方腹主动脉，即时在宫腔镜或宫腹腔镜联合下清宫，术中间断阻断腹主动脉血流，清除胚胎及电凝止血。对照组 21 例，术前行子宫动脉栓塞，1-3 天在宫腔镜或宫腹腔镜下行清宫术。对比分析两组患者 DSA 下透视时间、患者体表辐射剂量、清宫术中出血量、手术时间、术后不良反应发生率、住院时间及术后随访月经情况。**结果** :所有患者手术顺利，成功保留子宫。观察组 1 例患者术后出血量较大，行子宫动脉

栓塞术，出血得到控制，未发生不良反应。对照组 21 例患者 UAE 术后均发生不同程度疼痛、发热等栓塞症状。观察组、对照组 DSA 下透视时间及体表辐射剂量、住院时间差异显著（P<0.05）；清宫术中出血量、清宫手术时间无明显差异（P>0.05）；随访期均大于 3 个月，观察组随访期间未出现任何不良反应，对照组随访期间发现 2 例月经量减少、1 例宫腔粘连。**结论** :腹主动脉球囊阻断、子宫动脉栓塞辅助瘢痕妊娠清宫术，均可有效减少术中出血，而腹主动脉球囊阻断术相对于子宫动脉栓塞术，可大大减少 X 线辐射剂量、缩短住院时间及更少的不良反应发生率。

OR-286

细节决定成败之前列腺增生动脉栓塞治疗

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目的 探讨前列腺增生动脉栓塞治疗的有效性和安全性，探讨前列腺动脉栓塞术的手术细节控制。
方法 回顾性分析本院 18 例前列腺增生栓塞治疗的患者，包括患者年龄、术前症状、治疗病史、术前 MRI 平扫+弥散图像、术前髂动脉 CTA 图像、术后症状、术后 MRI 平扫+弥散图像、术后反应，用 t 检验分析患者治疗前后各参数的差异。
结果 患者平均年龄 81.2 岁，术前均有下尿路症状及药物治疗史，17 例因各种原因不能行外科手术治疗。术前 MRI 显示前列腺增生，前列腺体积 12ml-327ml，平均 86ml。术前髂动脉 CTA 显示 4 例髂外动脉异常迂曲（行肱动脉入路治疗），一例显示单侧髂内动脉闭塞。一例患者因术前 CTA 显示双侧髂内动脉闭塞而放弃介入栓塞。18 例患者中，13 例完成双侧前列腺动脉栓塞，5 例完成单侧前列腺动脉栓塞。术后 18 例患者临床成功率 100%，其中 16 例拔除导尿管，2 例拔除膀胱造瘘管。术后前列腺 MRI 显示前列腺体积较术前缩小 25.6%，差异具有统计学意义。患者术后严重并发症发生率为 0%。8 例患者术后有短暂的轻度发热，持续时间 0.5-2 天。2 例较大前列腺的患者术后 2 周内有尿频的炎症表现。
结论 前列腺动脉栓塞术是前列腺增生安全且有效的治疗方式。以下 10 个细节的处理可以提高手术的成功率：1 术前术后的 MRI 检查、2 术前胸腹主动脉 CTA、3 术中 CBCT 的应用、4 纤细前列腺动脉的处理、5 非靶血管的处理、6 微导管及微导丝的选择、7 栓塞剂的选择、8 术后导尿管留置的时间、9 突破以往适应症的禁锢、10 特殊情况的处理。

OR-287

经颈静脉肝内门体分流术治疗土三七相关性肝窦阻塞综合症

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目的 研究经颈静脉肝内门体静脉分流术（Transjugular Intrahepatic Portosystemic Shunt，TIPS）治疗土三七相关性肝窦阻塞综合症（hepatic sinusoidal obstruction syndrome, HSOS）的疗效和安全性。
方法 连续性收集 2014 年 1 月-2019 年 6 月间在我院确诊为 HSOS 并行 TIPS 术治疗的 9 例患者。记录患者 HSOS 疾病严重程度，TIPS 术前、术后的 CT、肝功能及凝血指标，并随访患者生存时间。比较术前、术后的门腔压力梯度、总胆红素、腹水、肝脏大小、门脉主干直径。
结果 9 例患者 3 例为中度 HSOS、6 例为重度 HSOS。9 例患者均成功实施 TIPS 术，未出现任何技术相关并发症。TIPS 术后门腔压力梯度为 13.0±4.1，较术前 30.4±5.2 显著性减低

（P=0.008）。除 1 例患者失访外，8 例患者中位随访时间 8 月(1，35 月)，该 8 例患者至今存活。患者 TIPS 术后 5-7 天总胆红素较术前显著性增高（60.76±26.9 vs 82.8±35.0, P=0.017），但术后 1-3 个月与术前相比则降到基线水平（60.0±46.2 vs 82.8±35.0，P=0.401）。术后 1-3 个月腹水较术前显著性减少或完全吸收（P＜0.001）、肝脏大小显著性缩小（16.7±2.2 vs 13.7±1.7，P=0.018）、门脉主干直径显著性增大（10.7±2.5 vs 13.4±2.4，P=0.017）。

结论 TIPS 是治疗土三七相关性 HSOS 的安全、有效方法。

OR-288
婴幼儿颈部淋巴管畸形介入硬化治疗的安全性及疗效分析

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目的 探讨 DSA 与超声引导下经皮穿刺介入硬化治疗婴幼儿颈部淋巴管畸形临床疗效及安全性。**方法** 收集我院 2015 年 6 月至 2017 年 5 月间进行全麻下介入硬化治疗的 81 例婴幼儿颈部淋巴管畸形患儿临床资料，所有患儿术前均行超声等影像学检查，并结合术中穿刺抽液检查进一步确诊为淋巴管畸形。根据术前影像学检查及介入术中造影，将淋巴管畸形分为大囊型、微囊型以及混合型。在超声引导下经皮穿刺病灶成功后抽液，注入平阳霉素或盐酸博莱霉素、造影剂混合液。术后随访 6～18 个月。 疗效评判标准如下：①完全缓解：瘤体完全消失。②显著缓解：瘤体体积缩小≥75%，超声或 MRI 检查示病灶区无液性暗区，仅组织较对侧增厚；③部分缓解：瘤体体积缩小 50%～75%，超声或 MRI 检查显示病灶区少许散在≤0.5 ml 液性暗区；④轻微缓解：瘤体体积缩小 25%～50%；⑤病情稳定：瘤体体积缩＜25%。 **结果** 81 例淋巴管畸形患儿 34 例为大囊型，40 例为混合型，7 例为微囊型；共行介入硬化治疗 186 次，其中①完全缓解 30 例；②显著缓解 28 例；③部分缓解 10 例；④轻微缓解 7 例；⑤病情稳定 6 例。186 例次介入硬化治疗中，13 例次患儿术后因颈部淋巴管瘤较前明显肿胀，压迫上呼吸道，入我院 PICU 继续对症治疗后拔管，157 例次患儿术后 1-2 周包块较前肿大，143 例次术后第二天出现干咳，咽喉不适，136 例次术后出现发热，均给予对症治疗后明显缓解；1 例术后淋巴管瘤增大较前显著，血常规提示血红蛋白较术前显著下降，给予输红细胞治疗。无皮肤破溃、过敏反应、周围脏器损伤、神经损伤病例。 **结论**： 应用介入硬化治疗婴幼儿颈部淋巴管畸形是一种安全、有效及并发症小的治疗方法，其中大囊型淋巴管畸形疗效优于混合型与微囊型，术后需注意患儿气道压迫状况，对于体重小病例大的患儿，需特别注意介入术后淋巴管瘤囊腔出血可能，密切监测患儿血红蛋白状况。

OR-289
CT 引导下颅脑占位穿刺活检的临床应用价值分析

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目的 探讨 CT 引导下颅脑占位穿刺活检的临床应用价值及安全性。
方法 收集 2017 年 03 月至 2019 年 7 月郑州大学第一附属医院 13 例 MRI（MRI 增强+MRS）确诊颅内多发占位患者，其中男 7 例，女 6 例，年龄 22-71 岁，平均 51.9 岁。13 例患者均行 CT 引导下穿刺活检，CT 机器采用 GE Lightspeed 大孔径 CT，管电压为 120KV，管电流为智能毫安秒（Auto mAs），设置层厚为 2.5mm，扫描范围为 2cm。采用骨科专家破颅骨，安捷泰 18G 活检针取适量颅内病变组织。统计其扫描次数、手术时间及病理类型、并发症情况。

结果 13 例患者中，双侧颅内多发病变者 10 例，左侧大脑半球多发 1 例，右侧大脑半球多发 1 例，双侧丘脑多发 1 例。穿刺部位需选取避开颅内和脑膜血管、静脉窦及脑实质重要功能区。其中取右侧额叶 5 例，右侧基底节区、右侧岛叶及右侧放射冠各 1 例，右侧丘脑 1 例，左侧顶叶、左侧枕叶、左侧小脑、左侧颞叶各 1 例。病理报告弥漫大 B 细胞淋巴瘤 4 例，胶质母细胞瘤 3 例，星形细胞瘤 3 例，炎性感染性病变 2 例，转移性复合型小细胞癌 1 例。穿刺成功率 100%。所有患者平均操作时间为 27min，平均扫描 5.6 次，平均 DLP 为 201.6mGy*cm，平均辐射剂量为 0.42mSv。所有患者未出现神经功能损伤、癫痫、颅内大出血等严重并发症，4 例患者出现穿刺部位少量出血，量约 0.5～1.5ml，术后 3～5 天复查出血吸收。

结论 CT 引导下颅脑穿刺活检可灵活设计进针入路，创伤小、并发症少，辐射剂量低且病理阳性率高，在颅脑病变穿刺活检中具有很大的临床应用价值。

OR-290

大脑中动脉斑块 HRMRI 特征与急性脑缺血的相关性研究

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目的 应用高分辨率磁共振成像技术（HR-MRI）探讨大脑中动脉（MCA）粥样硬化斑块特征与急性脑缺血症状之间的关系。**方法** 共有 136 名（100 名男性；平均年龄 60.8±11.4 岁）经 HR-MRI 证实 MCA 具有粥样硬化斑块的患者被纳入本研究。根据患者两周内 MCA 供血区是否具有急性缺血症状，将其分为急性症状组与无急性症状组；比较两组之间的基本人口学特征、临床危险因素、MCA 斑块强化程度、斑块最大长度、斑块最大厚度、斑块最大长度与最大厚度的比值及管腔狭窄程度等；二元逻辑回归用于分析 MCA 斑块特征与相应血管供血区急性缺血症状之间的关系。 **结果** 与 MCA 供血区无急性缺血症状的患者相比，MCA 供血区有急性缺血症状的患者糖尿病患病率显著增加（50.7% vs.30.2%，P=0.015），明显强化斑块的发生率明显增加（87.7 % vs.46.0%，P< 0.001），并且具有更大的斑块最大长度（6.7±3.7mm vs.4.9±2.3mm，P=0.001）、斑块最大厚度（1.5±0.8mm vs.1.0±1.0mm，P =0.027）及更严重的管腔狭窄程度（66.4±31.3% vs.30.7±25.3%，P<0.001）。Logistic 回归分析显示 MCA 明显强化斑块 (OR=4.492，95%置信区间=1.762-11.449，P=0.002)及管腔狭窄程度（OR=1.032， 95%置信区间=1.018-1.047，P< 0.001）与急性缺血症状独立相关。**结论** 相对于管腔狭窄程度，明显强化斑块与急性缺血症状之间存在更强的关联，斑块明显强化可能是其不稳定性的重要指标。

OR-291

zTE ASL MRA 在颅内动脉瘤血管内治疗后随访中的研究

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目的 以 DSA 作为金标准，比较 zTE ASL MRA 和 TOF MRA 这两种磁共振血管成像技术对颅内动脉瘤栓塞术后评估的价值。

方法 研究对象为 2015 年 12 月至 2016 年 7 月在北京医院神经外科门诊及病房就诊的颅内动脉瘤介入治疗术后的患者，所有患者均同时进行颅内血管 TOF MRA 和 zTE ASL MRA 检查，并于 MR 检查后一周内进行 DSA 检查。用 Cohen’s kappa 分析比较不同影像学检查方法对动脉瘤残存的评估能力，图像判读者之间及判读者自身的可重复性检验也采用 Cohen’s kappa 分析，应用卡方检验比较两种磁共振血管成像技术对载瘤动脉支架内管腔显示的差异，

p<0.05 认为差异有统计学意
义。

结果 共入组 24 例患者、27 个动脉瘤中，金标准 DSA 检查最终确定 13 例具有瘤腔残存，zTE ASL MRA 发现有 15 例具有瘤腔残存，TOF MRA 发现 12 例有瘤腔残存，两种磁共振检查方法与 DSA 对动脉瘤残存评估结果的一致性具有统计学意义（p<0.001），Kappa 值分别为 0.702 和 0.852。与传统的 TOF MRA 相比，zTE ASL MRA 的动脉瘤评估结果与 TOF MRA 亦具有良好的一致性，Kappa 值为 0.710。对于 zTE ASL MRA 这项新技术，不同读片者之间的一致性良好，Kappa 值为 0.705。在 27 例动脉瘤中，有 23 例为支架置入的患者，zTE ASL MRA 仅 2 例由于伪影较大，无法显示支架内的通畅情况，而 TOF MRA 有 11 例由于支架内管腔无信号，或者虽然有信号，但伪影较大，而无法评估支架内的管腔，二者之间的差异具有显著统计学意义（p<0.001）。

结论 与 TOF MRA 比较，zTE ASL MRA 在动脉瘤残存的评估上与 DSA 有更好的一致性，而且与 TOF MRA 比较，zTE ASL MRA 对载瘤动脉支架内管腔的显示有更好的图像质量。

OR-292

探讨 3D Cube Flair 并压缩感知技术在颅脑皮层下微小病变诊断中的应用

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目的 探讨 3D Cube Flair 并压缩感知技术在颅脑皮层下微小病变诊断中的应用。

材料与方法 使用 MRI GE750W 设备 ,搜集 20 例来我院就诊的有颅脑病变的患者，年龄 40-80 岁，男女各半。扫描颅脑常规序列(轴位 T2WI/T1WI/DWI/冠状位 T2 Flair)及 3D Cube Flair 并压缩感知序列。扫描参数：常规冠状位层厚:5.0mm,层间距:1mm,TR:8000,TE:140,NEX:2.0,Phase:2.75,；3D Cube Flair 并压缩感知序列：层厚为 1.8mm，TR:6300,TE:105,NEX:1,Phase 为 2。扫描方式：首先为患者进行颅脑常规检查，其次加扫 3D Cube Flair 并压缩感知序列，扫描结束后，分别从主、客观比较图像质量，主观：由两名具有十年以上诊断经验的副主任医师从图形从图像有无伪影、均匀度、病变-正常脑组织对比度进行双盲主观评分。客观：主要从图像信噪比、病灶与脑实质对比度及病变检出个数三方面入手。

结果

主观评分：伪影主观评分的统计结果 4.90±0.31、2.80±0.42
（$\bar{}(X)^2$=40.83, P＜0.05），图像均匀度主观评分结果 4.70±0.48、3.80±0.63，
（$\bar{}(X)^2$=46.97, P＜0.05），病变-正常脑组织对比度主观评分结果为 5.00±0.00,、3.20±0.42
（$\bar{}(X)^2$=49.12, P＜0.05）。客观评价：图像信噪比评价（灰质）135.91±9.73、94.66±6.74（t=6.97, P＜0.05），病变与白质对比度 51.07±5.85，38.11±4.51（t=11.07, P＜0.05）病变检出个数 10.13±1.92、4,98±1.27（t=13.01, P＜0.05）。

结论

3D Cube Flair 并压缩感知技术可以提高颅脑皮层下微小病变的检出率，提高扫描速度，有效避免伪影，优化扫描流程。

OR-293

三维伪连续动脉自旋标记灌注成像评估抗 N-甲基-D-天冬氨酸受体脑炎灌注改变及其与临床评分的相关性

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目的 应用三维伪连续动脉自旋标记灌注成像（3D pCASL）灌注成像技术探讨稳定期抗 N-甲基-D 天冬氨酸（NMDA）受体脑炎患者的脑血流量（CBF）值变化，分析其与改良 Rankin 量表（mRS）评分、各临床认知量表评分的相关性。

材料与方法 （1）纳入 48 例稳定期抗 NMDA 受体脑炎患者（病例组）和 40 名年龄、性别、受教育程度相匹配的健康对照组，两组在 MRI 扫描前均行 mRS 评分和各临床认知量表评分。（2）两组被试均行全脑常规 T_2WI、FLAIR、3D-T_1WI 及 3D pCASL 扫描，平扫后常规增强扫描。（3）应用 SPM 8 软件对图像进行预处理，并以性别、年龄、受教育程度为协变量，使用 REST 软件进一步提取显著差异脑区的 CBF 值，分析其与 mRS 评分和各临床认知量表评之间的相关性。

结果 （1）与对照组相比，病例组左内侧和旁扣带脑回、左补充运动区（supplementary motor area, SMA）、左侧额上回、右侧额中回、右侧额下回三角部、右侧额下回岛盖部及中央沟盖 CBF 值下降，二者差异有显著统计学意义（P < 0.001）。（2）相关分析结果显示，病例组右侧额叶（额中回、额下回三角部、额下回岛盖部）CBF 值与 mRS 评分呈负相关（r 分别为-0.516、0.49、-0.468，P 均 < 0.05）；病例组右侧额叶（额中回、额下回三角部、额下回岛盖部）和左内侧和旁扣带脑回 CBF 值与简易智力状态检查量表（mini-mental state examination, MMSE）评分呈正相关（r 分别为 0.465、0.492、0.568、0.452，P 均 < 0.05）；这些 CBF 值显著下降脑区与其它临床认知量表评分均无相关性（P 均 > 0.05）。

结论 3D pCASL 技术显示稳定期抗 NMDA 受体脑炎患者脑灌注减低区，其 CBF 值与 mRS 评分呈负相关、与 MMSE 评分呈正相关，具有一定的临床应用前景。

OR-294

千变万化之神经梅毒的 MR 表现

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目的 通过阅读近 10 年国内外神经梅毒影像相关的文献，对神经梅毒的临床特点、影像表现进行综述。

方法 数据库搜索近 10 年国内外主题神经梅毒的文献，选取神经梅毒影像相关的文献。

结果 约 2-10%未经治疗梅毒患者会发生中枢神经系统的梅毒感染。神经梅毒可发生于梅毒感染后的任一阶段。神经梅毒根据其影像特点主要分为 4 型：脑实质型、脑膜炎型、血管炎型及梅毒树胶肿型。脑实质型：临床上表现为麻痹性痴呆、脊髓痨，MR 上常为主要累及额颞叶的萎缩以及小灶的白质病变，与一般的脑实质缺血灶相似。血管炎型：最常累及大脑中动脉及基底动脉分支，表现为与大脑中动脉走形分布一致的脑实质梗死；脑膜炎常累及脑膜小血管，表现为轻度的、慢性的软脑膜炎症；梅毒树胶肿发生于大脑凸面的软脑膜，常形成结节，增强可有“脑膜尾”征，需与脑膜瘤鉴别。神经梅毒的影像表现常没有特异性，需要鉴别的疾病有病毒性脑炎、结核性脑炎、脑白质疏松、颞叶硬化、脑膜瘤等。发生在年轻病人的脑白质病变，病灶分布不一、新旧不一，则需警惕神经梅毒的可能。

结论 神经梅毒的影像表现形式多样，常需要与一些中枢神经系统常见疾病相鉴别。目前尚无神经梅毒的特异性诊断实验，神经梅毒的诊断依赖于临床资料、CSF 检测、实验室血清检查、影像检查等多种手段的融合及综合评估。

OR-295

Differentiating radiation-induced brain injuries from glioma recurrence: using intravoxel incoherent motion (IVIM) imaging

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purpose: The study was performed to validate the value of intravoxel incoherent motion (IVIM) imaging in distinguishing radiation-induced brain injuries from glioma recurrence in patients with diagnosed glioblastoma multiforme (GBM) with an aim to see whether IVIM can be used as an alternative to DSC-MRI or DWI for the distinguishing.
Methods: The MR examinations were performed on a 3.0 Tesla scanner (Discovery MR 750, GE Healthcare, Waukesha, Wisconsin) at the Chinese PLA General Hospital. Patients with previously resected and irradiated glioma, presenting newly developed abnormal enhancement, were included in the study. Sixty-four patients who developed contrast-enhancing lesions were assessed by IVIM, and classified into groups of radiation-induced brain injuries (n.32) or tumor recurrence (n.32) based on pathologic analysis or clinical–radiologic follow-up. The IVIM indices values were quantified from the ROI region. Student independent t test was used to compare indices between groups.
Results: The IVIM indices:(the STD adc/slow adc(D)/fast adc(D*)/fraction of fast adc(f)/DDC)were significantly higher in radiation-induced brain injuries groups than in tumor recurrence groups, while the fast adc value was lower in radiation-induced brain injuries groups. On Student *t* test, all the above mentioned indices values were found to be significantly different in 2 groups. IVIM-derived indices STD adc values stronger correlated with DWI-derived ADC values.
Conclusion: intravoxel incoherent motion (IVIM) imaging appear to be a reliable technique in current form and may be a suitable imaging in differentiating radiation-induced brain injuries from glioma recurrence .

OR-296

A point-to-point biopsy study based on intraoperative MR-guided navigation:IVIM derived fast diffusion correlates with quantitative VEGF expression in gliomas

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Purpose: To expore the correlation of intravoxel incoherent motion (IVIM)-derived perfusion with vascular endothelial growth factor (VEGF) and CD34 expression in gliomas.

Methods: Twenty-one patients of newly-diagnosed gliomas with 32 biopsy samples were retrospectively enrolled, who underwent diffusion-weighted MRI with 22 b-values (0-5000 sec/mm^2) followed by intraoperative MR-guided biopsy surgery. All 32 biopsy samples were employed for immunohistochemical staining followed by quatitative analysis of CD34 and VEGF. Based on the coregistered localized biopsy, four perfusion parameters of Dfast1500, PF1500, Dfast5000 and PF5000 were developed, respectively. Dfast1500 and PF1500 were calculated by a group of 15 b-values (0-1500 sec/mm^2). Dfast5000 and PF5000 were calculated from a group of 22 b-values (0-5000 sec/mm^2).Positive expression ratios of VEGF (pVEGF) and CD34 (pCD34) were quantificated by multispectral phenotyping microscope. Correlative analyses were performed between perfusion parameters and pathological indices of pVEGF and pCD34.
Results: Significant positive correlations were revealed for Dfast5000 and pVEGF (rho=0.466, P=0.007) and Dfast1500 and pVEGF (rho=0.371, P=0.037), respectively. No significant correlatiions were shown between IVIM-derived perfusin parameters with pCD34.
Conclusions: IVIM derived fast diffusion correlates with histological pVEGF in gliomas.

OR-297

Machine learning-based analysis of magnetic resonance radiomics for classification of gliosarcoma and glioblastoma multiforme

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Objective:
We aimed to identify optimal machine-learning methods for preoperative differentiation of gliosarcoma and glioblastoma multiforme based on magnetic resonance radiomics.
Methods:
A total of 210 patients were divided into a training set and a validation set. Radiomics features were extracted from tumor mass and peritumoral edema, respectively. Three best feature selection methods (Relief, least absolute shrinkage and selection operator (LASSO) and Random Forest (RF)) and three classification methods, including generalised linear models (GLM), support vector machines (SVM) and RF, were compared for their performance in distinguishing gliosarcoma and glioblastoma multiforme. The performance of the radiomics model was investigated via area under the receiver-operating characteristic curve (AUC) and accuracy (ACC) analysis.
Results:
The selection method LASSO + classifier GLM had the highest AUC of 0.984 and ACC of 0.897 in the validating set, followed by Relief + GLM (AUC = 0.909, ACC = 0.862) and LASSO + SVM (AUC = 0.900, ACC = 0.862) based on tumor mass features. For peritumoral edema features, RF + GLM had the highest AUC of 0.889, while LASSO + GLM achieved a high ACC of 0.793 in the validating set. Regardless of the methods, tumor mass features significantly outperformed those from peritumoral edema for

the differentiation of gliosarcoma and glioblastoma multiforme (ZAUC = -3.029, ZACC = -4.553; p < 0.05).
Conclusions:
Our study demonstrated tumor mass features performed better than peritumoral edema features. The selection method LASSO + classifier GLM had the best performance in differentiation of gliosarcoma and glioblastoma multiforme, which could enhance the application of radiomics methods in fetal brain tumours preoperatively.

OR-298

A radiomics nomogram may improve the prediction of IDH genotype for astrocytoma before surgery

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Abstract Objectives: To develop and validate a radiomics nomogram to preoperative prediction of isocitrate dehydrogenase (IDH) genotype for astrocytomas, which might contribute to the pretreatment decision-making and prognosis evaluating.
Methods: One hundred five astrocytomas (Grades II - IV) with contrast-enhanced T1-weighted imaging (CE-T1WI), T2 fluidattenuated inversion recovery (T2FLAIR), and apparent diffusion coefficient (ADC) map were enrolled in this study (training cohort: n=74; validation cohort: n=31). IDH1/2 genotypes were determined using Sanger sequencing. A total of 3882 radiomics features were extracted. Support vector machine algorithm was used to build the radiomics signature on the training cohort. Incorporating radiomics signature and clinic-radiological risk factors, the radiomics nomogram was developed. Receiver operating characteristic (ROC) curve and area under the curve (AUC) were used to assess these models. Kaplan - Meier survival analysis and log rank test were performed to assess the prognostic value of the radiomics nomogram.
Results: The radiomics signature was built by six selected radiomics features and yielded AUC values of 0.901 and 0.888 in the training and validation cohorts. The radiomics nomogram based on the radiomics signature and age performed better than the clinico-radiological model (training cohort, AUC=0.913 and 0.817; validation cohort, AUC=0.900 and 0.804). Additionally, the survival analysis showed that prognostic values of the radiomics nomogram and IDH genotype were similar (log rank test, p<0.001;C-index=0.762and0.687;z-score test, p=0.062).
Conclusions: The radiomics nomogram might be a useful supporting tool for the preoperative prediction of IDH genotype for astrocytoma, which could aid pretreatment decision-making.

OR-299

Application Value of MR Radiomics in Grading of Cerebral of Gliomas

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Objective: To evaluate the value of radiomics in distinguishing grade II and III of gliomas from T2-weighted MR images.
Methods: In this study, 159 gliomas patients,who underwent non-enhanced MR from the Cancer Genome Atla (TCGA) data portal, including grade Ⅱ(n=104)and Ⅲ(n=55) of gliomas.Patients were divided into training cohorts (n=111) and validation cohorts (n=48) in a ratio of 7:3. Gliomas were imported into the ITK-SNAP to manually delineate volume of interest (VOI) on T2-weighted images. Each VOI produced 396 radiomics features including Histogram, GLCM, GLSZM, RLM, Form Factor, Haralick. LASSO regression was used for feature screening. A formula was generated using a linear combination of selected features that were weighted by their respective LASSO coefficient. A radiomics score was calculated for each patient by the formula.The predictive accuracy of radiomics signatures was quantified by the area under curve (AUC) of a ROC curve in both cohorts.The calibration degree (CD) of theradiomics was evaluated by Hosmer-Lemeshow test. The clinical usefulness of theradiomics signatures was assessed by decision curve analysis.
Result: Fourradiomics features with non-zero coefficients were chosento build a radiomics model that distinguished grade II and III of gliomas with an AUC, sensitivity,specificity and CDof0.723, 75%, 89% and 0.120 in training cohort; and 0.800, 73%, 82%and 0.561in the validation cohort, respectively. DCA for the radiomics label showed that if the threshold probability was between 0.17 and 0.99, using radiomics label to distinguish grade II and III of gliomasadded more benefit than treating either all or no patients.
Conclusion: The radiomics label can distinguish grade II and III of gliomas, providing a non-invasive technique forassessing the invasiveness and prognosis forgliomas patients.

OR-300

Novel insights into multifocal gliomas: A new evidence from the probabilistic fiber tracking by diffusion tensor imaging

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Object: Multifocal gliomas are uncommon lesions of the central nervous system; the overall incidence of multifocal gliomas is approximately 8–10% among all patients with gliomas [1]. Till now, the evolution of multifocal gliomas is poorly understood. Previous studies have grouped the tumor into one of the 2 categories (multicentric

glioma vs multiple glioma) based on whether a physical connection was presumed or not [2]. However, due to the invasive nature of glioma, it is hard to exclude the existence of a connection in cases deemed to be multicentric. As yet there remains lack of methods to elucidate the lesions are totally separated unless surgical biopsy. A non-invasive method involving a probabilistic approach may help us to identify the white matter dissemination routes. In the current study, we use probabilistic fiber tracking to depict pathway and quantify the probability connection of two lesions in patients with multicentric glioma and patients with multiple glioma.

Method: *Study type*; Retrospective. *Subjects*; Twenty-three patients with multifocal glioma divided into multicentric gliomas (group A) and multiple glioma (group B) based on classification suggested by previous study [2]. *Acquisition of neuroimaging data*; All patients underwent a diffusion tensor imaging (DTI) sequence and enhanced 3D T1-weighted MRI preoperatively (Siemens skyra 3.0T, 30 diffusion directions , b = 1000 s/mm^2 , 30 slices , thickness 3 mm), High-resolution contrast-enhanced T1 weighted images are acquired with a 3D MPRAGE sequence (TR/TE/ Flip angle =1540 ms/2.4 ms/8° , matrix =256 ×256, 1 mm thickness). *Data processing*; Firstly, the lesions served as the seeds and target for probabilistic tractography were segmented using ITK-SNAP software (www.itksnap.org) from each patient. Secondly, the DTI images for all patients were pre-processed using the FSL 5.0.9 Diffusion Toolbox (FDT) (http://fsl.fmrib.ox.ac.uk/fsl/fslwiki/FDT). Diffusion parameters at each voxel in the whole brain were first estimated using latest version of BEDPOST [3]. The resulting distributions were then used for probabilistic fiber tracking using the latest version of PROBTRACK [4]. The algorithm evaluates connectivity values between the seed and the target masks defined a priori. Finally, the probabilistic value and fractional anisotropy (FA) between multiple lesions was extracted from the probabilistic fiber tracking. *Statistical analyses;* Intergroup comparison of clinical characteristics was performed with T-statistics and Chi square test. The probabilistic value and FA between the two groups were assessed using the Mann-Whitney test.

Results: In Group A, patients were 4 glioblastomas,1 oligodendroglioma,3 diffuse astrocytomas,1 H3K27 mutant diffuse midline gliomas, 2 anaplastic astrocytoma; in Group B, patients were 4 glioblastomas, 1 anaplastic oligodendroglioma, 2 anaplastic astrocytoma,3 diffuse astrocytoma, 1 oligodendroglioma, 1 H3K27 mutant diffuse midline glioma. There was no difference between patients with group A and group B in gender, age and disease duration. There was also no difference between the two groups in status of isocitrate-dehydrogenase (IDH) mutation, ATRX, the Ki67 expression and FA value. However, their probabilistic value of multiple lesions was different (patients with multicentric gliomas =0.008658 ± 0.02643; patients with multiple gliomas = 0.266738 ± 0.194286, p = 0.000).

Conclusions: Immunohistochemical data based on IDH mutation status have redefined glioma as a whole-brain disease, while occult tumor cell invasion along white matter fibers is inapparent in conventional MRI. We used probabilistic fiber tracking to quantify the fiber connections between lesions, the results showed that the probabilistic values of the lesions in patients with multicentric gliomas were significantly lower than the lesions in patients with multiple gliomas. From a methodological point of view, the probabilistic value represents a quantitative

indication of the likelihood of a path existing between the seed and target region. The higher the value, the higher the likelihood that seed and target region are well connected, thus providing an indication of the connectivity existing between them. Thus, our preliminary investigation provides new insight and proof into multifocal gliomas which may aid in accurate classification of the multicentric glioma and the multiple glioma in vivo.

OR-301

Prediction for Grading of Stereotactic Biopsy Glioma Targets Based on Preoperative MRI Textural Analysis

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PURPOSE
To explore the value of textural analysis based on T1 BRAVO+C images for grading of glioma targets by stereotactic biopsy (WHO grade II and III).
METHOD AND MATERIALS
A total of 36 diffuse glioma cases and 64 puncture targets were included in this study. All underwent preoperative MR scanning and intraoperative MR-guided stereotactic puncture biopsy. Histopathological diagnosis was WHO grade II or III diffuse glioma. By Omni Kinetics software, regions of interest (ROIs) which were consistent with the puncture target were delineated on 3D T1 BRAVO+C images, size of which was about 10×10 mm. Texture features of each ROI were automatically calculated by the software. Mann-Whitney rank sum test was used to analyze the texture differences between WHO grade II and III ROIs. Receiver operating characteristic curve (ROC) was used to evaluate the diagnostic value of textural analysis for grading glioma targets. Cutoff value was set according to Youden index, and sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were all calculated.
RESULTS
Texture features Maxintensity (P=0.001), Quantile 95 (0.002), Range (< 0.001), Variance (< 0.001), Standard deviation (< 0.001), Sum variance (0.022) and Cluster prominence (< 0.001) were higher in WHO grade III gliomas than those of WHO grade II. While WHO grade II gliomas had higher Uniformity (P=0.001) and ShortRunLowGrayLevelEmphasis values (0.018) than WHO grade III ones. First-order features Maxintensity (area under the curve (AUC) = 0.751, sensitivity = 96.6%, NPV = 94.2%), Quantile 95 (0.737, 86.2%, 80.0%) and Range (0.801, 89.7%, 87.0%); AUC value was the highest in Variance and Standard deviation (0.826); Uniformity (AUC = 0.746, specificity = 82.8%, PPV = 76.2%). Second-order gray-level co-occurrence matrix features Cluster prominence (AUC = 0.784, specificity = 89.7%, PPV = 85.8%), and Sum variance (0.675, 96.6%, 91.0%). Diagnostic efficiency of high-order gray-level run-length matrix features was slightly lower than first-order and second-order features. AUC was 0.887 (95% confidence interval: 0.805-0.969, P<0.001) by combined ROC analysis with multiple texture features.
CONCLUSION

Textural analysis on T1 BRAVO+C images may be helpful in grading glioma targets by stereotactic biopsy (WHO II and III).

OR-302

Noninvasive IDH1 status prediction for grade Ⅱ/Ⅲ gliomas using diffusion tensor imaging: a transfer learning strategy

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Purpose: This study was to evaluate the performance of transfer learning combined with convolutional neural network (TL-CNN) in predicting the isocitrate dehydrogenase 1 (IDH1) status of grade Ⅱ/Ⅲ gliomas using diffusion tensor imaging (DTI).
Method and Materials: 73 pathologically confirmed grade Ⅱ/Ⅲ glioma patients receiving preoperative DTI examination were retrospectively included. For each patient, the eigenvalues (k1, k2, k3) of DTI data were calculated and were used to construct the p and q maps. VGGNet was pre-trained on the large scale natural image database (ImageNet) and fine-tuned with p map and q maps, respectively. The classification task was evaluated with five-fold cross-validation on patient-level split.
Results: Using TL-CNN, IDH1 predictive performance of q maps achieved 0.926 for the areas under the ROC curve (AUC) and 0.933 for accuracy. However for p maps, rather bad performance were obtained with 0.5370 for AUC and 0.667 for accuracy.
Conclusion: TL-CNN using q maps is promising in predicting IDH1 mutant status of grade Ⅱ/Ⅲ gliomas.

OR-303

3D Segmentation Based Radiomics Analysis of Multimodal MRI Combined with Quantitative Analysis in Grading Brain Gliomas

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Objective To evaluate the efficacy of 3D segmentation based radiomics analysis of multimodal MR combined with quantitative analysis in the grading of gliomas. **Methods** One hundred histologically confirmed glioma patients (50= WHO II, 24= WHO III, 26 =WHO IV) who underwent a 3T-MRI tumor protocol with conventional (T1 pre/post-contrast, T2) and advanced (Diffusion Tensor Imaging and 1H-MR Spectroscopy) techniques, were studied. Whole-tumor 3D and 2D segmentations of T1, T1+Gad, T2, ADC map, FA map were performed using freehand drawing tool. Totally 396 radiomics features, including

primary, secondary and high order features, were extracted. Logistic regression with LASSO regularization and 10-fold cross-validation was used to determine the optimal model for each sequence in differentiating high-grade gliomas (HGGs) from low-grade gliomas (LGGs). The extracted features in the model of each sequence were combined for receiver operating characteristic (ROC) curve analysis. MRS metabolic ratios, MD values, FA values were obtained. Based on the Akaike Information Criteria (AIC), a radiomics nomogram model including radiomics signature, quantitative parameters and clinical features was further presented. **Results** T1+Gad sequence performed best when used alone, with an area under the ROC curve (AUC) of 0.902 (sensitivity 84.0%; specificity 86.0%). Correlated with Ki-67, T1+Gad model showed the highest correlation coefficient (r=0.649). The combined model was significantly better with AUC of 0.966 (sensitivity, 100%; specificity 88.0%). The nomogram including the Radscore of the combined model, Cho/NAA, MD, age, sex and lesion location, was optimal in the grading of gliomas. **Conclusion** Radiomcs features combined with quantitative parameters as well as clinical features can discriminate HGG versus LGG, which may guide surgical and medical management.

OR-304

In situ formation of nanotheranostics to overcome the Blood-Brain-Barrier and enhance treatment of orthotopic glioma

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Purpose

Glioblastoma is one of the most lethal cancers with few available therapeutic options [1]. The blood-brain barrier (BBB) and Blood-Brain Tumor Barrier (BBTB) still present obstacles which stop nanomedicines reaching diseased areas of the brain, conventional therapies can often damage normal tissues and may induce drug resistance rapidly in cancer cells [2]. A safer strategy is therefore to use small particle size nanocarrier delivery system to pass through the BBB, then nanocarrier responds to stimuli in the local tumor environment so as to be integrated into a larger molecule via self-assembly in the tumor tissue, thereby increasing the retention of the drug at the tumor site for enhanced therapy. Taking advantage of RGD-mediated neovascular targeting, the Bis(DPA-Zn)-RGD selectively navigate to the tumor site, and then assembles into large nanoclusters with subsequently administered Au-ICG nanoclusters which can successfully cross the BBB due to ultrasmall particle size, with further image-guided photothermal ablation of glioblastoma without damaging the scalp and skull in an orthotopic primary mice model.

Experiment

Bis(DPA-Zn) was chemically conjugated with RGD was obtained from professor Gang Liu in Xiamen university [3]. The Au-ICG nanoparticles were synthesized by one step method, due to their particle size these particles could cross the BBB and further in situ formed Bis(DPA-Zn)-RGD-derived nanoclusters with strong NIR absorption for precise orthotopic glioma imaging. Before animal testing, ten male athymic nude mice at 5 week old were anesthetized with isoflurane and fixed on stereotaxic frame. U87 cells expressing firefly luciferase (U87-Fluc) were inoculated to the brain (5 × 103 cells in the striatum: Bregma +1.0 mm, right lateral 2.0 mm, depth 2.5mm). After 7 days, the MRI combining a bioluminescence imaging was used to monitor the tumor location and growth (Bruker, Germany). Bis(DPA-Zn)-RGD selectively navigate to the tumor site, then with subsequently administered a novel ultrasmall Au-ICG nanoparticles, Furthermore, in the case of Au-ICG triggering by Bis(DPA-Zn)-RGD in the tumor environment produces self-assembly of an R/Au-ICG nanocluster with further enhanced optical properties and targeted thermal ablation of brain tumors (Figure 1a).

Results

HAuCl4 solution was mixed with the green ICG solution, it turned red in just a few minutes. When the ICG:HAuCl4 ratio was 1:1, the size of the nanoparticles was ~7 nm, which provided excellent dispersal and crossing of the BBB, R-Au-ICG nanoclusters are achieved when Bis(DPA-Zn)-RGD interacts with the sulfonate anions of the Au-ICG, Transmission Electron Microscopy (TEM) revealed that the morphology of nanoclusters were conglobate (i.e. ball-like), with an average diameter of 114 nm. By applying the MRI and bioluminescence imaging, the formation of intracranial tumors in mice can be also determined. After the injection of Bis(DPA-Zn)-RGD and Au-ICG, mice were exposed to laser irradiation (808 nm, 1.0 W/cm2 for 5 min). MRI revealed that tumor size was much more reduced in the R/Au-ICG group.

Conclusion

In summary, a new type of nanocluster has been synthesized by Bis(DPA-Zn)-RGD instructed self-assembly of small Au-ICG nanoparticles. The Au-ICG nanoparticles were prepared by a one-step approach, crossed the BBB upon systemic administration, and were triggred by Bis(DPA-Zn)-RGD in the tumor environment to self-assemble into nanoclusters, which is suitable for image-guided photo-thermal cancer therapy. R/Au-ICG nanoparticles induced a hyperthermal effect in response to NIR laser irradiation at 808 nm, to effectively suppress brain tumor growth in mice. The high photo-thermal effect of the newly developed Au nanoclusters provides substantial opportunities for broad biomedical applications and further clinical translation.

OR-305

Comparative study of adult and pediatric diffuse midline glioma with the H3K27M mutation: Radiology, pathology and prognosis

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Purpose: Diffuse midline glioma with H3K27M mutation, which is commonly observed in children, was defined by the WHO classification of central nervous system tumors in 2016. This paper aims to explore the clinical, pathological and imaging differences between adults and children's diffuse midline glioma with the H3K27M mutation.
Materials and Methods: Forty patients with newly diagnosed diffuse midline glioma with H3K27M mutation were enrolled. After the MRI features, molecular pathological features, and individual prognoses were analyzed, differences between the adult and pediatric groups were assessed.
Results: There were 26 adults (≥18 years) and 14 children (＜18 years). The tumor location in the pediatric cohort was concentrated, in which the majority of lesions were centered in the brainstem (79%), while the adult tumors were scattered in various central locations. The differences in imaging features weren't statistically significant. However, the P53 mutation rate and prognosis were significantly different between the two. The pediatric group had more P53 mutations (P=0.009) and worse prognoses (P=0.022) than adult group did. Meanwhile, the P53 mutation group had a poorer prognosis than the P53 wild-type group did (P=0.040).
Conclusion: Diffuse midline glioma with H3K27M mutation was more common in adults. There were significant differences in anatomic location, P53 expression, and prognosis between adults and children's diffuse midline glioma with the H3K27M mutation. However, there were no significant differences in tumors' MRI imaging characteristics. The P53 mutation rate in children was higher than that in adults, which leads to a worse prognosis in the pediatric group.

OR-306

Diffusion kurtosis imaging in evaluation of gliomas: Effects of Region of Interest Selection Methods on Time Efficiency, Measurement Reproducibility, and Diagnostic Ability

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Purposes: Comparing the diagnostic efficacy of different ROIs in the tumor parenchyma to grading, predicting the *IDH-1* mutation status of glioma and correlated with its survival data.

Materials and methods: Sixty-six patients (36 HGG; 29 females; median age, 46y) with pathologically proved gliomas were prospectively included and their clinical data was collected. All cases underwent DKI examination. DKI and DTI maps of each metric was derived. Three group of ROIs (ten spots: ROI-10s, three biggest tumor slicers: ROI-3s and 3D-full tumor parenchyma: ROI-full) were manually drawn by two independent radiologists. Time spent, interobserver consistency, diagnostic efficacy and survival analysis of these three ROIs were analyzed.

Results: The intra-examiner reliability for all parameters among these three ROIs were excellent and the time spent on ROI-10s (73±10.2 s) was significantly less than those other two ROIs (ROI-full: 457±109 s; ROI-3s: 124±35 s, $P < 0.002$). For grading glioma, ROIs based on different tumor parenchyma demonstrated an comparable diagnostic value ($AUC_{ROI-10s}$: 0.81, AUC_{ROI-3s}: 0.80 and $AUC_{ROI-full}$: 0.79); Further, with the predicting of IDH-1 mutation status, the diagnostic value of ROI-10s (AUC: 0.84) slightly better than the other two methods (AUC_{ROI-3s}: 0.81 and $AUC_{ROI-full}$: 0.79), but without reach the significant point. In addition, with the survival analysis, the model based on ROI-10s included patient age and mean diffusion showed the highest prediction value, and the C index was 0.81 (95%CI: 0.73-0.89).

Conclusions: Different ROIs in tumor parenchyma demonstrated comparable diagnostic efficiency in evaluating gliomas and predicting glioma survival. However, ROI-10s is an effective way to process DKI data and it is highly recommended in clinic evaluation of glioma.

OR-307

Remodeling Tumor Microenvironment by Inhibition of Glycolytic Activator PFKFB3 to Synergize with Antiangiogenic Therapy in Glioblastoma: Insights from Multiparametric MRI and Proteome Profiling

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Purpose: To investigate whether targeting tumor glycolysis by PFKFB3 blockade is a novel potential strategy to enhance antiangiogenic therapy in glioblastoma (GBM), and to evaluate treatment-related molecular characterization and clinically translatable MR imaging biomarkers of tumor response.

Methods and Materials: Patient-derived orthotopic GBM xenografts in mice were established and imaged before and different time points(day2,day5,day8,day12,day20) after treatment with bevacizumab(BEV), 3PO(PFKFB3 inhibitor), BEV and 3PO, and saline. Tumor volume, cellularity, neovascularization, and metabolites were monitored by T_2WI, IVIM, DCE-MRI, and ^{1}H-MRS, respectively. Pathology and proteome microarray were analyzed to correlate with imaging parameters and evaluate post-treatment molecular profiling.

Results: BEV treatment induced remarkable PFKFB3 expression compared with control (P<0.05).3PO enhanced BEV therapeutic efficacy by sustained vascular normalization, improved oxygenate status and reduced expression of matrix metalloprotein-9. K^{trans} and f was positively correlated with microvascular density(r=0.8776; r=0.9177) and hypoxia(r=0.5566; r=0.5681), and negatively vascular maturation(r=-0.4898; r=-0.5884). Only co-treatment improved vascular perfusion corresponding to increased D*. Mechanismly, BEV activated glycolysis with a rising trend of Lac/Cr and Lactate dehydrogenase-A level. Co-treatment inhibited multiple proangiogenic factors by downregulating VEGF-independent pathways.

Conclusion: Targeting PFKFB3 has much potential to abate BEV-induced glycolysis by sustained tumor microenvironment remodeling and could be monitored by multiparametric MRI thoroughly. IVIM is a promising alternative to DCE-MRI to characterize tumor response.

OR-308

AIM: To preliminarily analyse the prediction efficiency of multimodal MRI-based radiomics model for preoperative glioma IDH1 gene expression type. Methods The MRI data of 108 surgery-proven glioma patients from May 2015 to January 2019 were retrospective

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AIM: To preliminarily analyse the prediction efficiency of multimodal MRI-based radiomics model for preoperative glioma IDH1 gene expression type.
Methods The MRI data of 108 surgery-proven glioma patients from May 2015 to January 2019 were retrospectively analyzed, including axial T_1WI、T_2WI、fluid attenuated inversion recovery (FLAIR)、Diffusion Weighted (DWI) imaging and enhanced T_1WI sequence.47 cases were IDH1 mutant type, 61 cases were IDH1 wild type,all patients were divided into training group and validation group according to the 7:3 ratio of random forest model. 73 cases were in training group (33 cases were IDH1 mutant type, 40 cases were wild type), and 35 cases were in validation group (14 cases were IDH1 mutant and 21 cases were wild type). Shapiro-Wilktest normality test and homogeneity test of variance were used to test the general clinical information and morphological parameters of patients with IDH1 mutation and IDH1 wild type by R language statistical software. Univariate logistic regression screening (P<0.01) was used to identify independent predictors of IDH1 expression type, in order to construct a random forest diagnosis model of General clinical information and conventional MRI morphological features.General clinical information and conventional MRI morphological features including gender,age,umbers of cases of left and right hemispheres, location of tumors, maximum diameter of tumors, peritumoral edema, intratumoral cystic degeneration, enhancement and ADC value of tumors. The ROI was manually outlined by MaZda software(MaZda forWindows, B11 version4.7, www.Eletel.p.Lodz.PI/mAzda) in the most obvious level of 5 sequences of tumor mass and the radiomics features were extracted,including GLCM (the gray-level co-occurrence matrix)、RUN (the run-length matrix)、GRA (the absolute gradient)、ARM (the auto-regressive model) and WAV (wavelets transform).The least absolute shrinkage and selection operator (LASSO)regression was used to to select image radiomics features with a method of 10 fold cross -validation and to reduce the dimensionality .The screened image radiomics labels were combined with the conventional morphological feature independent predictors to construct a multimodal MRI-based random forest model, and the validation data set was used to evaluate the accuracy and diagnostic efficiency of each model.The sensitivity and specificity of conventional MRI

morphological feature model and multimodal MRI-based radiomics prediction model were evaluated dynamically by drawing ROC curves, and the prediction efficiency of the two models was quantified by using AUC statistical indicators. The model classification error rate under different outcomes and the classification error rate of OOB (out of bag) were used to evaluate the stability of the multimodal MRI-based random forest model.The contribution rate of each variable to the model was reflected by the characteristic variables importance assessment map.Mean Decrease Accuracy and Mean Decrease Gini index were used to evaluate the importance of each variable in the multimodal MRI-based random forest model. **Results** Univariate regression analysis of conventional MRI morphological characteristics showed that peritumoral edema, cystic degeneration and enhancement were the three independent predictors of IDH1 gene expression (P<0.01).LASSO algorithm and 10-fold cross-validation selected six robust radiomic features including WavEnHH_s-4 (high frequency coefficients of wavelet transform) of T_2WI, S(4,4) InvDfMom (inverse difference of gray uniformity measurement)、S(5,0) Entropy (entropy)、WavEnHH_s-4 (high frequency coefficients of wavelet transform)of T_1WI enhancement, S(1,1) InvDfMom (inverse difference of gray uniformity measurement)、S(1, -1) DifEntrp (Entropy Difference)of Flair.The error rate of classification for different outcomes and classification error rate of random forest OOB (out-of bag) data of multimodal MRI radiomics diagnosis model finally stabilized at 10%. The results of Characteristic Variable Importance Assessment Map: Mean Decrease Accuracy and Mean Decrease Gini index were consistent which showed that besides three conventional MRI morphological predictors peritumoral edema, enhancement and cystic degeneration, the radiomics labels also played a key role in the model. The results of ROC curve showed that the accuracy, specificity, sensitivity and AUC of conventional MRI morphological feature model were 82.7%, 68.4%, 90.9% and 83.5%, and multimodal MRI-based radiomics model were 88.5%, 89.5%, 87.8% and 95.6% respectively. **Conclusion** Multimodal MRI-based radiomics random forest model can improve the predictive efficiency of preoperative glioma IDH1 gene expression type more quantitatively.

OR-309

Longitudinal Resting-State Functional MRI study in mild cognitive impairment Conversion to Alzheimer's Disease

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Objective
Individuals diagnosed as mild cognitive impairment (MCI) are at high risk of conversion to Alzheimer’s disease (AD). More than 70% of patients with MCI will eventually develop AD, and the rate of MCI conversion to AD reaches 10% to 15% annually. Given lack of effective treatment at the stage of dementia recently, it is of great significance to investigate and discover the conversion from MCI to AD. However, little is known about the functional characteristic of the conversion from MCI to AD.
Methods

In the study, the data of resting state functional magnetic resonance imaging (rs-fMRI) was acquired and analyzed in 37 MCI patients and 31 well-matched normal controls (NC) at baseline and at follow up. Functional connectivity strength (FCS) was used to assess the functional differences among the groups. Then we compared the trajectory of longitudinal rs-fMRI in the three groups and analyzed the correlation between rs-fMRI and neuropsychological assessment.
Results
The FCS in right ventral medial prefrontal cortex and orbitofrontal cortex were significantly lower in the MCI-c group at the follow-up as compared to at the baseline. While in MCI-nc group, decreased FCS in left paracentral lobule was observed at follow up, as compared to at the baseline. There was a significantly negative correlation between the score of Montreal Cognitive Assessment and the decreased FCS in right orbitofrontal cortex, and right middle occipital gyrus in MCI-c.
Conclusion
This dynamic functional change is likely to be an important characteristic of rs-fMRI for the conversion from MCI to AD dementia. It is a gradually process for the destruction of the FCS in the conversion from MCI to AD dementia, and the prefrontal cortex might be impaired at last from MCI develop AD in our study. These findings extend our understanding of the underlying indicators for the dysfunction and progression in the early stage of AD, the progressive functional changes may predict MCI-to-AD conversion and monitor disease progression.

OR-310

Structural and diffusional MRI-based predictions between multiple sclerosis (MS) and neuromyelitis optical spectrum disorder (NMOSD)

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Objective: The application of machine learning techniques to neuroimaging offers the possibility to identify robust, reliable and objective disease biomarkers. Here, we describe predictions of patients between multiple sclerosis (MS) and neuromyelitis optical spectrum disorder (NMOSD) diagnosis using structural T1-weighted and diffusion tensor imaging.

Method: Forty-six patients with MS and 38 patients with NMOSD were recruited. The brain volume was calculated using CAT12 and the maps of FA and MD value were calculated by FSL. We used a binary support vector machines (SVM) conducted in Pattern Recognition for Neuroimaging Toolbox (PRoNTo) with a reliability filter for feature selection.

Result: The SVM classifier of FA model report 71.43% accuracy with sensitivity of 67.39.0 % and specificity of 76.32 % of individual subject diagnostic prediction. The SVM classifier of MD model report 78.57% accuracy with sensitivity of 73.91 % and specificity of 84.21 %. The SVM classifier of gray matter volume model report 74.73%

accuracy with sensitivity of 74.51 % and specificity of 75 %. The area under the ROC curves (AUC) of the proposed methods about FA, MD and gray matter volume were 0.81, 0.85 and 0.88, indicating that these models can be regard as related good classification powers. In the FA model, the regions with the greater weight included the bilateral corticospinal tract and left superior cerebellar peduncle. The weight of the three regions were 4.80, 4.43 and 3.47. In the MD model, regions included the left posterior corona radiata and left tapetum. The weights were 4.80, 5.48 and 5.22. In the gray matter volume model, regions included the bilateral thalamus, left paracentral lobule and right cerebellum inferior. The weights were 3.77, 3.47, 2.14 and 2.10.

Conclusion: It is possible to use white and grey matter MR images to predict diagnostic status when comparing MS and NMOSD subjects. The bilateral corticospinal tract, left superior cerebellar peduncle, left posterior corona radiata and left tapetum of white matter and bilateral thalamus, left paracentral lobule and right cerebellum inferior of gray matter are identified as region of interest. These results provide encouragement that machine learning methods can increase the understanding of the neurobiology between the MS and NMOSD.

OR-311

Structural MRI-Based Predictions in Patients with neuromyelitis optical spectrum disorder (NMOSD)

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Objective: Regions identified using voxel-based morphometry provide information about group-level differences in previous study about patients with neuromyelitis optical spectrum disorder (NMOSD). Here, we describe predictions of patients with NMOSD diagnosis using structural T1-weighted brain scans obtained from health control.

Method: Thirty-four patients with NMOSD and twenty-nine age and sex-matched HCs were recruited. The whole brain was divided into 68 regions from the 3D T1-weighted MR images using FreeSurfer software. We used a standard nu-support vector regression (nu-SVR) model conducted in LIBSVM toolbox with linear kernel with a reliability filter for feature selection and default set of parameters. SVM analysis consisted of two stages: training the classifier, then testing the accuracy using data not used for training. Within-study replication ('leave-one-out' cross-validation, LOOCV) was used for training. To assess whether the computed classification accuracy is statistically significant, the statistical significance of the classification results is evaluated using permutation test.

Result: The linear SVM classifier report 79% accuracy with sensitivity of 79.0 % and specificity of 65 % of individual subject diagnostic prediction. The area under the ROC curve (AUC) of the proposed method was 0.79, indicating a related good

classification power. Some regions showed greater weights than others. Specifically, we defined a region having significantly higher weight if its weight was at least one standard deviation greater than the average of the weight of all the regions. The regions with the greater weight included the left rostral middle frontal, right fusiform, right pars opercularis grey matter. The weight of the three regions were 2.73, 2.24 and 2.23.

Conclusion: To summarise, it was possible to use grey matter MR images to predict diagnostic status when comparing NMOSD subjects and healthy controls. And the left rostral middle frontal, right fusiform, right pars opercularis grey matte were identified as a region of interest. These results provide encouragement that machine learning methods can increase the understanding of the neurobiology of NMOSD.

OR-312

Selective effect of cognitive status and the APOE ε4 allele on the hippocampal subfield volume and AD-signature cortical thickness in non-demented older subjects

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Purpose There is no consensus on the effect of the APOE ε4 allele on the hippocampal subfield volume or Alzheimer's disease (AD)-signature cortical thickness in both patients with mild cognitive impairment (MCI) and older subjects with normal cognition. Additionally, there exist no data on the APOE ε4 allele's effect on the association between neuropsychological scale upon testing and the hippocampal subfield volume or AD-signature cortical thickness in non-demented older subjects. This study used an automated volume analysis technique to: (1) investigate patterns of hippocampal subfield volume loss and AD-signature cortical thinning in MCI patients and APOE ε4 carriers; (2) explore the association between the neuropsychological scale and the hippocampal subfield, as well as cortical thickness; and (3) determine whether these associations were modified by the APOE ε4 gene and cognitive status.
Materials and Methods A cohort of 45 participants, including 22 MCI patients and 23 older subjects of normal cognition (normal controls, NC), were recruited from the Memory Clinic of the Geriatrics Department at the Nanjing Drum Tower Hospital. The FreeSurfer software was used for automated segmentation of bilateral hippocampal subfields and "AD-signature" cortical thickness. Hippocampal subfield volume and cortical thickness, as well as the neuropsychological scale, were compared using two sample *t*-tests between the NC and MCI groups. Several pearson correlation coefficients between the hippocampal volumes were calculated, as were the cortical thickness and memory measures. Linear regression models, controlling for eTIV (estimated total intracranial volume), were used to determine the association between the neuropsychological scale and the hippocampal subfield volume, as well as the AD-

signature cortical thickness, considering the interaction with APOE or the cognitive status.

Results. There was a reduction in the bilateral hippocampal subfield volume and some AD-vulnerable regions of cortical thickness in the MCI patients compared with the normal control group. Compared with healthy controls, MCI patients showed decreased volume of the left presubiculum and subiculum, right CA1, bilateral CA2_3 and CA4_DG, and decreased cortical thickness of the left entorhinal area (all $P < 0.05$, uncorrected). However, considering the Bonferroni corrected ($P<0.01$for hippocampal subfield volume and $P<0.0055$ for AD-signature cortical thickness), only reduced left presubiculum volume ($P=0.006$) was noted for MCI patients compared with NC group. The left presubiculum volume was positively correlated with the Mini-Mental State Examination (MMSE), Montreal Cognitive Assessment (MOCA), and Digit span backward scores (adjusting for eTIV as covariates). Of note, these associations (MMSE and left presubiculum, MOCA and left presubiculum) depended on the cognitive status but not on the APOEε4 status. The left subiculum volume was positively correlated with the MMSE and MOCA scores only in the MCI patients (P=0.025 and P=0.003, respectively).

Conclusion. Atrophy of the left presubiculum volume is a more powerful biomarker for MCI than other hippocampal subfields and AD-signature cortical thickness. Also, the deficits in total cognition (MMSE and MoCA) were associated with reduced left presubiculum volume. The association between neuropsychological tests and the hippocampal subfield volume could be modified by the cognitive status, and this association could be found only in the MCI patients, providing a window on the objective understanding of the mechanism of the AD pathological processes.

OR-313

Dynamic functional connectivity reveals altered intrinsic functional variability of thalamocortical connectivity system among patients with acute and remitting multiple sclerosis

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Objectives: Disruptions in thalamic connectivity are believed to underlie the symptoms of multiple sclerosis (MS), regardless of the stage of the disease. The dynamic functional connectivity (dFC) of the distinct thalamocortical system among in acute and remitting phase MS are poorly understood. Therefore, thalamocortical dFC may provide new insights into the mechanism of intrinsic functional plasticity in a large-scale neural network.

Methods: Using sliding window correlation to captured the dFC pattern of thalamocortical in the MS (acute MS, n=18; remitting MS, n=26) and sex- and age-matched healthy controls (HC, n=23) during rest. We quantified dFC variability between seven paired thalamic connectivity-defined regions and exclusive cortical regions using their standard deviation and to identify correlations with clinical markers.

Results: Compared with HC and remitting MS, the acute MS patients exhibited:1) excessive variability (increased dFC variability) in the left calcarine and cuneus of occipital cortices, left middle frontal gyrus of prefrontal cortices, left superior temporal pole of temporal cortices. By contrast, excessive stability (decreased dFC variability) was found in the left postcentral gyrus of primary and secondary somatosensory cortices, right superior frontal gyrus of prefrontal cortices, left superior parietal lobule of posterior parietal cortices; 2)significant decreased static functional connectivity values of the cuneus, left superior temporal pole and increased static functional connectivity values of the left superior parietal lobule. 3) In addition, we also found significant correlations between increased dFC variability of right superior frontal gyrus and slowed cognitive processing ($p=0.02, r=-0.361$) or increased the impact of fatigue (Modified Fatigue Impact Scale-5, MFIS-5)($p=0.022, r=0.574$) and also revealed that the excessive variability in the cuneus was related to MFIS-5 ($p=0.027, r=-0.461$).
Conclusion: Our finding show that an excessive variability and excessive stability thalamocortical patterns was vulnerable to acute onset of MS, and dFC may help to further understand the disease progress associated interaction of large-scale network.

OR-314

Effect of ROI methods on consistency and reproducibility of measured values in Diffusion Tensor Imaging of lumbosacral plexus nerve roots

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Abstract
Background: Diffusion tensor imaging (DTI) provides a new method for displaying and quantitatively analyzing peripheral nerves. However, previous studies often arbitrarily employed a delineation method for determining regions of interest (ROIs), ignoring the impact of the delineation method itself on results.
Objective: To investigate the effects of ROI methods on the consistency and repeatability of measured values in DTI of lumbosacral plexus nerve roots.
Material and method: Prospectively collected thirty healthy volunteers did MRI scans, and MRI sequences including DTI along with conventional MRI sequences, and 3D-Fast-Field Echo using a Philips 3.0T Ingenia. We manually delineated ROIs using the following 5 methods in lumbosacral plexus nerve root ganglions: outline method, center method (2 mm^2, 4 mm^2, 6 mm^2 in size) and 4-circle mean method. DTI parameters were measured, including fractional anisotropy (FA) values and apparent diffusion coefficient (ADC) values. One-way ANOVA was performed to detect differences among different ROIs. ICC was used to evaluate the consistency of the 2 radiologists' results. ICCs between 0.41-0.60 were considered a moderate correlation, between 0.61-0.80 were considered a high correlation, and between 0.81-1.00 were considered an extremely high correlation. The Bland-Altman method was used to evaluate the reproducibility of the results from 2 radiologists. $P<0.05$ was considered indicative of statistical significance.

Result: There were significant differences in FA and ADC values among different methods (p<0.05). In L5 nerve roots, a moderate correlation of ADC values was observed in the 4-circle mean method while high correlations of FA and ADC values were seen in other methods. In S1 nerve roots, high correlations of all methods were observed. The optimal consistency was obtained with the outline method. Bland-Altman scatter plots show outline method has small variability and good precision.
Conclusion: In DTI analysis of lumbosacral plexus nerve roots, the ROI methods using affects the consistency and reproducibility of the measurements. Of these methods, the outline method is recommended because of its superior consistency and reproducibility.

OR-315

Correlation between Hippocampus MRI Radiomic Features and Resting-State Functional Connectivity in Alzheimer's Disease

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Alzheimer's disease (AD) is a neurodegenerative disease with main symptoms of chronic primary memory loss and cognitive impairment. The study aim is to investigate the correlation between hippocampal functional connectivity (FC) and MRI radiomic features in AD. A total of 67 AD patients and 44 normal controls (NC) were enrolled in this study. Using one method of resting-state functional MRI (rs-fMRI), the whole-brain FC with bilateral hippocampus as seed was performed, and the FC values were extracted from the bilateral hippocampus respectively. We observed that AD patients demonstrated disruptive FC in some brain regions in the left hippocampal functional network, including right gyrus rectus, right anterior cingulate and paracingulate gyri, bilateral precuneus, bilateral angular gyrus, and bilateral middle occipital gyrus. In addition, decreased FC was witnessed in some brain regions in the right hippocampal functional network, including bilateral anterior cingulate and paracingulate gyri, right dorsolateral superior frontal gyrus, and right precentral gyrus. Bilateral hippocampal radiomics features were calculated and selected respectively using A.K software. Pearson correlation analysis suggested that two gray level run-length matrix (RLM) radiomic features and one gray level co-occurrence matrix (GLCM) radiomic features weakly associated with FC values in the left hippocampus. However, there were no significant correlations between radiomic features and FC values in the right hippocampus. Compared with the NC group, the AD group showed abnormalities of FC level in the bilateral hippocampal functional network. This is a prospective study revealed the correlation between the MRI radiomic features and the rs-fMRI in AD patients.

OR-316

Progressive alterations in structural topological properties in T2DM with and without mild cognitive impairment

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Introduction/Purpose

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disease. Patients with T2DM have considerably higher risk of developing cognitive impairment. Diffusion Tensor Imaging (DTI) studies have revealed widespread white-matter integrity alterations and its correlation with neuropsychological function for T2DM patients.[1] Moreover, graph theory studies have shown disrupted topological organization of both functional and structural brain networks.[2,3] However, whether the cognitive dysfunction will have impact on the topological properties of brain networks for T2DM patients is still not clear. Thus, the purpose of this study is to investigate the topological organization alterations in T2DM patients with and without cognitive impairment, and characterized its relationships with clinical measurements.

Methods:

Patients: With approval of the Institutional Review Board, 40 T2DM patients (based on diagnostic criteria of American Diabetes Association; 52-72 years) were recruited and divided into mild cognitive impairment (DM-MCI, n=20, 62.9±5.5years) and normal cognition (DM-NC, n=20, 59.1±6.4years) groups based on clinic symptoms and a battery of neuropsychological tests (Montreal Cognitive Assessment, Mini-Mental State Examination, Trail Making Tests, Auditory Verbal Learning Test, Hachinski test, and Activity of Daily Living test. These tests were performed at 2-week intervals in 10 patients, and the intra-rater reliability was 92%). Ten healthy controls (50-70 years) were also enrolled in the study for comparison. Measurement of blood biochemistry, including plasma fasting/postprandial glucose and glycated hemoglobin A1c (HbA1c) levels were recorded. *Imaging*: On a 3T MRI scanner (Discovery MR750, GE Healthcare, Waukesha, Wisconsin, USA) with a 32-channel head coil, axial DTI images were obtained using a single-shot diffusion-weighted echo planar imaging sequence (TR/TE = 8500/66.3 ms, FOV = 25.6×25.6 cm^2, 70 slices, 64 diffusion-weighted directions with a b-value of 1000 s/mm^2). *Data preprocessing* Procedures included the eddy current and motion corrections, diffusion tensor tensor (fractional anisotropy, mean diffusivity, and eigenvalues) calculation. *Brain network construction* The 90 regions of interest (ROIs) from Automated Anatomical Labeling (AAL) template[4] were defined as network nodes. The seed number was set as 2. Diffusion MRI tractography was performed using the Diffusion Toolkit software (http://www.trackvis.org/dtk/). All tracts in the DTI dataset were computed by seeding each voxel with the threshold of FA>0.2 and turned an angle < 45 degrees. As a result, all fiber pathways between the 90 ROIs in the brain were constructed using deterministic tractography method. Several common graph measurements were analyzed, including global efficiency (Eg), local efficiency (Eloc), clustering coefficient (Cp), shortest path length (Lp), and small-word parameters (λ, γ, σ). To determine the regional characteristics of the structural network, we also computed the nodal efficiency in T2DM patients with and without MCI. The network analyses were

performed and visualized using GRETNA[5] and BrainNet Viewer[6] softwares. For global parameters, a 2-tailed Student's t-test was applied with a statistical significance set at $p<0.05$; for nodal parameters, a false-discovery rate (FDR) correction was applied for multiple comparisons. The flowchart of structural network construction was showed in Fig.1.

Results:

The DM-MCI group had higher level of HbA1c (8.22±1.60%) than the DM-NC group (6.97±1.26%, p=0.003), longer duration (8.18±1.55 years) than the DM-NC group (6.83±1.07 years, p=0.040). ***Global network properties:*** All the three groups exhibited economical small-world organization (σ=2.73±0.20, 2.68±0.18, and 2.71±0.153, for DM-MCI, DM-NC and HC, respectively). No significant between-group difference was detected. Compared with the controls and DM-NC group, the DM-MCI group exhibited significant decrease in Eg (p=0.027) , Eloc (p=0.050) values, and significant increase in Lp (p=0.032) value. The DM-NC group didn't show significant difference in Eg, Eloc, or Lp than the controls. (Fig.2). ***Regional efficiency:*** Schematic drawings (Fig.3) showed brain regions with significant reduced group effect in nodal efficiency between DM-MCI and DM-NC groups (p<0.05 , FDR corrected). The most significantly decreased nodal efficiency were found in the left superior frontal gyrus(medial orbital). Other regions with decreased nodal efficiency were mainly distributed in the left gyrus rectus and the right inferior occipital gyrus. Decreased clustering coefficients has been correlated with the neuropsychological assessment and disease duration in all the T2DM patients (Fig.4).

Discussion and Conclusions:

The disrupted topological organization of structural networks (measured by Eg, Eloc, Cp and Lp) were found in T2DM patients with MCI compared with HCs. However, these topological properties were relatively preserved in those T2DM subjects with normal cognition compared with HCs. The small-world properties were exhibited preserved in T2DM patients with or without MCI. Moreover, decreased nodal properties were detected in the DM-MCI group than the DM-NC group. The structural topological properties research can contribute to understand the intrinsic alterations of diabetic encephalopathy, including cognitive impairment.

OR-317

Age and location related hemodynamic changes in the carotid artery of healthy adults assessed by 4D flow MRI

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Purpose: To evaluate the changes of normal carotid hemodynamic parameters (volume, velocity, wall shear stress, pressure gradient, energy loss) in different ages and locations using 4D flow MRI. To explore the possible influence of these factors and provide age and location matched control cohorts for the assessment of carotid artery disease.**Materials and Methods:** Sixty-two normal volunteers aging from 20 to 75 were enrolled in our study. 4D flow MRI examination was performed for each subject and analyzed using CVI42 platform to get hemodynamic parameters. Hemodynamic parameters

were then compared in different ages and locations (proximal CCA, distal CCA, proximal ICA and distal CCA, energy loss was compared across the bifurcation and not). Besides, age corrected hemodynamic parameters were also explored. ANOVA was performed in age and location groups, while paired t-test was respectively used to estimate the difference between left and right vessels. The relationship between age and hemodynamic parameters was then qualified by Pearson's correlation coefficient.**Results:** Left and right carotid artery showed no difference in hemodynamics (P>0.05), so we set each vessel as an independent sample. Proximal ICA showed significant lower volume, velocity, wall shear stress and pressure gradient than other locations (P<0.05), energy loss showed no difference in different location . Wall shear stress(except in distal ICA), velocity, pressure gradient and energy loss decreased with age (P<0.05).**Conclusion:** The multi-parameter analysis of 4D flow MRI identified age and location changes of hemodynamic parameters in carotid artery of healthy adults. Proximal ICA, where the atherosclerotic plaque happened mostly, showed significantly lower hemodynamic parameter changes, which may be associated with disease breeding . In addition, the hemodynamic parameters in different location were all inversely correlated with age may provide age matched control cohorts for carotid artery disease.

OR-318
基于定量磁化率成像(QSM)的多发性硬化病变磁化率动态演变规律

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目的 多发性硬化(MS)病变的磁化率与 MS 病变所处的时期密切相关。本研究的目的是来观察 MS 病变的动态演变规律，同时比较 QSM 图上有环形高信号（rim+）改变的 MS 病变与无环形高信号（rim-）的 MS 病变之间的动态演变差异。

材料和方法 在基线位至少有 1 个 T1+C 强化的 MS 病变，且至少含有 3 次 QSM 扫描（时间跨度 1.1-6 年）的 MS 病人纳入本研究。在任何一次 QSM 图中出现 QSM 环形高信号的 MS 病变被定义为 rim+，反之则为 rim-。采用多级增长曲线模型(multilevel growth curve model)的统计学方法来比较 rim+和 rim-之间的动态演变规律。.

结果 19 个 MS 病人中共 32 个 T1+C 强化病变纳入本研究，其中 16 个 MS 病变为 rim+（50%）。QSM rim+的病变体积大于 rim-病变（P<0.001）。在所有病变中，MS 病变的磁化率从基线位强化时开始逐渐升高，至 1~2 年达到峰值，随后逐渐减低。Rim+病变的磁化率演变曲线高度比 rim-病变高 4.27ppb（P=0.01）。Rim-病变的曲线斜率高于 rim+病变（P=0.023），但磁化率降低速度更快（P=0.005）。Rim-病变的磁化率比 rim+病变大约早 2 年开始降低。

结论 在 MS 病变形成的最初 6 年内，rim+和 rim-病变的磁化率动态演变存在很大的差异，Rim+病变在最初的几年内都存在铁沉积。

OR-319

Reliabilities of brain structures volumetric and asymmetric measurement on 3 traveling subjects: A multi-site study prospective

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Objective: Large-scale multi-site brain morphometry studies are becoming increasingly important to characterize both normal and disease groups. While previous studies have explored the reproducibility of structural MRI from various scanners and protocols, we cannot be certain which difference we detect attribute to diseases without knowing the fluctuations of a single subject in multi-site studies. Hence, a well-controlled study with structural MRI images acquisition would be necessary to understand the reliability of brain structures from multi-site studies.

Methods

We have established a well-controlled dataset to assess the reliability of brain segmentation and analysis methods in multi-site study. We firstly acquired 30 T1-weighted volumes from 3 subjects (10 volumes/subject) in 10 sites, spanning approximately from 2 weeks to 14 months, using the same type of scanners, standard 64 channel head coil and the protocol recommended by Human Connectome Project. T1-weighted volumes generated by manual tracing and the automated segmentation tool using publicly available FreeSurfer software. Statistical analyses were then conducted to assess reliabilities of structural volume and asymmetry index using the intraclass correlation coefficient.

Results

All volumes and asymmetry indexs of ROIs with manual tracing method achieved ICC scores > 0.8 across the multi-site. The results also showed that hippocampal volume and asymmetry index had ICC scores of 0.6 or higher by auto-segmentation method. Whilst, asymmetry index and bilateral volume of amygdala presented relatively low ICC scores (0.349-0.529) by auto-segmentation method.

Conclusion

The present study suggested that a well-controlled multi-site study could obtain a fairly reliable MRI dataset. However, the reliability of volume and AI varied by structure and segmentation method. Even though a well-controlled study, amygdala and entorhinal cortex presented a relatively poor between-site reliabilities by auto-segmentation method. This also suggested manual tracing should be advised for multi-site studies which require high levels of precision such as those with small sample size, especially amygdala.

OR-320
海马硬化型内侧颞叶癫痫患者静息态下大脑半球功能连接的不对称性研究

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目的 分析海马硬化型内侧颞叶癫痫患者（MTLE）静息态双侧大脑半球功能连接（FC）的不对称性特征。
方法 采集 23 例 MTLE（左侧 12 例，右侧 11 例）及 23 例健康对照的静息态功能磁共振数据。利用 FSL Harvard-Oxford Atlas 模版将大脑分区，并以左右半球各 50 个脑区作为感兴趣区（ROI），分别计算各 ROI 与左侧半球内 ROIs 的功能连接强度（lFC）及右侧半球内 ROIs 的功能连接强度（rFC），对各 ROI 的 rFC 及 lFC 进行双样本配对 t 检验，P <0.05 认为有统计学差异。另外，利用公式 AI＝100*(rFC－lFC)/［（rFC＋lFC）/2］计算各 ROI FC 的不对称指数（AI），并对三组间 AI 值进行 ANOVA 分析， P <0.05 认为有统计学差异。最后将病例组癫痫首次发作年龄，癫痫病程分别与差异脑区的 AI 值进行 Spearman 相关性分析。
结果 在 100 个 ROIs 中，对照组共有 49 个 ROIs（49/100）的 FC 存在不对称性，其中 30 个 ROIs 存在右侧化不对称（RA），19 个左侧化不对称（LA）；病例组存在不对称性的 ROIs 数量减少： LMTLE 共 36 个（36/100），其中 RA12 个，LA24 个；RMTLE 仅 23 个（23/100），其中 RA17 个，LA6 个。三组间 AI 值的 ANOVA 分析显示，共 25 个 ROIs 的 AI 值存在组间差异，以双侧岛叶、额叶皮层、颞叶皮层及颞叶内侧等结构为主，其中 LMTLE 组的癫痫首次发作年龄与右侧额下回岛盖部的 AI 值呈负相关（r=-0.621，P=0.031），RMTLE 组的癫痫病程与左侧颞极 AI 值呈正相关（r=0.633，P=0.036），癫痫首次发作年龄与额叶内侧皮层呈正相关（r=0.654，P=0.029）。
结论 MTLE 患者双侧大脑半球 FC 的不对称性减弱，且左侧与右侧 MTLE 的改变不完全一致，可为 MTLE 发病机制的解读提供新的依据。

OR-321
Early identification of schizophrenia via high-resolution MRI and machine learning

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Aims: “Living with schizophrenia,” in the words of Trevor Turner, “remains hard work,” as Barnett recently mentioned (Barnett, 2018). Evidence from neuroimaging has implicated abnormal cerebral cortical patterns in schizophrenia (Brugger and Howes, 2017). Application of machine learning techniques is required for identifying structural signature reflecting neurobiological substrates of schizophrenia at the individual level (Cui et al., 2018). We aimed to detect and develop a method for potential marker to identify schizophrenia via the features of cerebral cortex using high-resolution magnetic resonance imaging (MRI) (Cui et al., 2016; Cui et al., 2017a). **Methods:** In this study, cortical features were measured, including volumetric (cortical thickness, surface area, and gray matter volume) and geometric (mean curvature, metric distortion, and sulcal depth) features. Patients with first-episode

schizophrenia (n = 52) and healthy controls (n = 66) were included from the Department of Psychiatry at Xijing Hospital (Cui et al., 2015; Cui et al., 2017b; Cui et al., 2019a). Multivariate computation was used to examine the abnormalities of cortical features in schizophrenia. Features were selected by least absolute shrinkage and selection operator (LASSO) method. The diagnostic capacity of multi-dimensional neuroanatomical patterns-based classification was evaluated based on diagnostic tests. Mean curvature (left insula and left inferior frontal gyrus), cortical thickness (left fusiform gyrus), and metric distortion (left cuneus and right superior temporal gyrus) revealed both group differences and diagnostic capacity. **Results:** Area under receiver operating characteristic curve was 0.88, and the sensitivity, specificity, and accuracy of were 94%, 82%, and 88%, respectively. Confirming these findings, similar results were observed in the independent validation. There was a positive association between index score derived from the multi-dimensional patterns and the severity of symptoms (r = 0.40, P < .01) for patients. **Conclusions:** Our findings demonstrate a view of cortical differences with capacity to discriminate between patients with schizophrenia and healthy population. Structural neuroimaging-based measurements hold great promise of paving the road for their clinical utility in schizophrenia (Cui et al., 2018; Cui et al., 2019b).

OR-322

Observation of microstructural changes in spinal cord gray matter and white matter in patients with cervical spondylotic myelopathy and correlation of JOA scores by diffusion kurtosis imaging (DKI) values

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Objective: To explore the feasibility of the metrics of diffusion kurtosis imaging (DKI) for investigations of the microstructural changes of spinal cord injury in patients with cervical spondylotic myelopathy (CSM) and the correlation between Japan Orthopaedic Association (JOA) scores and DKI metrics.
Methods: Fifty-seven patients with CSM and thirty-eight healthy volunteers underwent 3.0T magnetic resonance (MR) imaging with routine MRI sequences and DKI from echo-planar imaging sequence. Based on the JOA score, CSM patients were divided into four subgroups. Data of DKI metrics of the CSM group and control group, including fractional anisotropy (FA) values, mean diffusivity (MD), and mean kurtosis (MK) values, were obtained and compared, separately for the white matter (WM) and the gray matter (GM).
Results: The FA and MK values in WM and GM in the CSM group were lower (P < 0.05) than those in the control group, whereas the MD values in WM and GM in the CSM group was higher (P < 0.05) than those in the control group. In the WM, the JOA scores were negatively correlated with the FA values but were positively correlated with the MD values. In GM, the JOA score was negatively correlated with the MK values but was positively correlated with the MD values.

Conclusion: DKI provides information on the microstructure of the spinal cord injury in patients with CSM. In addition, DKI metrics quantitatively assessed the degree of cervical spinal cord injury, and should thus be considered as a reference for clinical treatment plans and prognosis.

OR-323

Characteristics of temporal dynamics of intrinsic brain activity in unmedicated bipolar II disorder with suicidality

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Background: Bipolar disorder (BD) is associated with a high risk of suicide. Routine neuroimaging examination exhibited that BD with suicidality was associated with brain structural and functional changes. However, the alterations of brain dynamics are still unknown.
Purpose: To investigate the alterations of brain dynamics in unmedicated BD II depression with suicidality and to predict the severity of suicidality.
Materials and Methods: The prospective study included 106 BD II participants (20 with suicidal attempt (SA), 35 with suicidal ideation (SI), 51 without SI (NSI)) and 50 healthy controls (HCs) who underwent resting-state functional magnetic resonance imaging (rs-fMRI) between February 2016 and December 2017. We first used sliding window analysis to evaluate the dynamic amplitude of low-frequency fluctuations (dALFF). Then we predicted the severity of suicidality using a multivariate regression model.
Results: One-Way ANOVA analyses revealed that the dALFF in the right temporal pole (TP), inferior temporal gyrus (ITG), superior temporal gyrus (STG), and the bilateral precuneus/posterior cingulate cortex (PCC) was significantly different among the 4 groups. Post hoc comparisons revealed all BD groups showed decreased dALFF in the bilateral precuneus/PCC compared with HCs. Increased dALFF was found in the right STG and ITG in the SA group compared with the others, and in the right TP in the SA group compared with SI and HCs groups. Importantly, these temporal variabilities could be used to predict the severity of suicidality (r = 0.330, p = 0.036), whereas static ALFF couldn' t (r = -0.050, p = 0.532).
Conclusion: Our findings suggest that alterations of temporal variability in the precuneus/PCC is a common feature of BD participants, the right temporal lobe involved in impulsivity, social and emotional processing are associated with suicidality in BD II depression participants. This predictive model using the dynamics of intrinsic brain activity may be helpful for clinical applications.

OR-324

基于 fMRI 的首发强迫症患者动态功能连接分析

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背景和**目的** 强迫症是一种精神疾病，其特征是功能失调或远脑区域之间的异常整合。自发波动是神经信号记录的一个标志，随时间尺度发生，跨越毫秒和数十分钟。然而，传统的基于静息状态功能磁共振成像的内在脑组织研究在很大程度上没有考虑到时间变异性的存在和潜在性。本研究通过基于空间独立成分分析、滑动时间窗相关和 k-均值聚类窗相关矩阵的方法实现对强迫症患者全脑动态功能连接改变的评估。
材料**方法** 通过对 29 例首发强迫症患者和 29 例年龄和性别匹配的健康对照者进行静息状态闭眼功能成像和独立成分分析，我们将功能性脑数据分解为 28 个成分。动态功能网络使用滑动窗口（长度为 20 s）和 k 均值聚类计算，描述四种离散功能连接状态之间的动态演变。耶鲁-布朗强迫症量表（Y-BOCS）用于评估强迫症状严重程度。
结果 总共从 28 个独立成分中选择了 14 个成分，与标准的功能网络模板具有较高相似性，且位置落在灰质上，与脑室及血管有较低的空间重叠。相关的功能网络分别为默认网络（default mode network, DMN），突显网络（salience network, SAN），听觉网络（auditory network, ADN），执行控制网络（executive control network, ECN），视觉网络（visual network, VN），语言网络（language network, LAN），感觉运动网络（sensorimotor network, SMN），基底节区（basal ganglia, BG）和楔前叶（precuneus, PCUN）。在动态功能连接指标组间差异比较中发现：四种功能连接状态之间的转换次数具有显著差异，而时间分数和平均停留时间组间无显著差异。且四种状态间的转换次数与 Y-BOCS 总分呈正相关。
结论 首发强迫症患者动态功能连接演变的存在频繁切换状态的特征，且切换次数越多者强迫症状越重。

OR-325

Magnetic resonance-guided focused ultrasound thalamotomy for Essential Tremor:the first Pilot Study in China

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Background and objective: Essential tremor (ET) is the most common movement disorder and is often refractory to medical treatment. Recent advances have proved the favorable efficacy and safety in treatment of refractory ET with Magnetic resonance-guided focused ultrasound (MRgFUS) thalamotomy. The objective of this study is to verify the efficacy and safety of MRgFUS in treatment of refractory ET.
Methods: From January 2019 through April 2019, in an open-label, uncontrolled study, we used transcranial MRgFUS to target the unilateral ventral intermediate nucleus of the thalamus in 10 patients with severe, medication-refractory ET. We recorded all safety data and measured the effectiveness of tremor suppression using the Clinical Rating Scale for Tremor to calculate the total score (ranging from 0 to 160), hand

subscore (primary outcome, ranging from 0 to32), and disability subscore (ranging from 0 to 32), with higher scores indicating worse tremor.
Results: Thermal ablation of the thalamic target occurred in all patients. Scores for hand tremor improved from 21.8±5.1 at baseline to 6.0±5.6 at 3 months (P<0.001). Total tremor scores improved from 58.3±11.8 to23.3±18.0 (P<0.001). Disability scores improved from 16.0±3.4 to 3.6±7.1 (P<0.001). Adverse events that transiently occurred during sonication included short-lasting vertigo (n=2) and burning scalp sensation (n=2), vomiting (n=2). Adverse events that lasted after the procedure included gait ataxia (n=1), unsteady feeling (n=1), asthenia(n=2), lip paresthesia (n=5). No adverse event lasted beyond 3 months.
Conclusions: MRgFUS thalamotomy to relieve medication-resistant ET was safe and effective. Large randomized studies are needed to assess prolonged efficacy and safety.

OR-326

Neuropsychiatric Systemic Lupus Erythematosus(NPSLE): MRI features in 48 patients

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Purpose

To study the MRI manifestations of neuropsychiatric systemic lupus erythematous, for better improving the possibility of early detection and early diagnosis of NPSLE.

Methods

The brain MRI manifestations of 48 SLE patients were retrospectively analyzed. The medical history and imaging data of the patients who were admitted to the department of Neurology and Nephrology of Huashan Hospital affiliated to Fudan University from January 2014 to March 2019, with the diagnosis of SLE together with the positive MRI manifestations were collected.

Results

48 cases were collected in total, including 13 males and 35 females. According to the 1999 American College of Rheumatology (ACR) diagnostic criteria for NPSLE, 6 were diagnosed with NPSLE.

The main MRI manifestations of neuropsychiatric lupus are cerebral infarction (4 in NPSLE, 3 in non-NPSLE), lacunar ischemic (4 in NPSLE, 34 in non-NPSLE), malacia (1 in NPSLE, 1 in non-NPSLE), hemorrhagic foci (3 in NPSLE); brain atrophy and demyelinating could also be observed.

We noticed that the lesions involved all lobes of brain, para lateral ventricle and basal ganglia, the lesions in the frontal and parietal lobe were significantly more than others. The shape of the lesions were mostly punctate or flaky. Interestingly, most of the lesions were involved on both sides of the brain, a small number of cases involved only one side.

Conclusions
The MRI manifestations of NPSLE are varied, and brain MRI is beneficial for early diagnosis and early intervention for NPSLE, especially for those SLE patients without neuropsychiatric symptoms.

OR-327

Machine learning analysis in diagnosis of medication overuse headache: a resting-state functional Magnetic Resonance Imaging Study.

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Purpose—Medication-overuse headache (MOH) is a psychiatric comorbidity associated with chronic migraine. Although, brain functional changes have been demonstrated in MOH(1) subjects, questions if magnetic resonance imaging (MRI) could be used as a biomarker still remains unanswered. As machine learning is capable of identifying subtle disease patterns on a single subject level, we therefore sought to determine the differences between MOH patients from healthy controls by using machine learning classifier on resting state functional MRI (rs-fMRI).

Methods—Thirty-four patients with MOH, and 41 age and sex-matched healthy controls were recruited. rs-fMRI images were acquired on 3.0 T MR system. Smooth mean Regional Homogeneity (smReHo) was obtained via DPARSFA. Support Vector Machines (SVMs) algorithms based on PRoNTo toolbox(2) was used to explore the utility for smReHo in the differentiation of MOH patients and healthy controls individually. The two sample t-test was conducted to compare smReHo between patients and controls within SPM yielded. Finally, Pearson correlation between the MOH patients and clinical measurement was investigated.

Results—The balanced accuracy of correct classification of MOH and controls was 72.03% for smReHo ($p < 0.001$ during 1000 permutation testing). Areas contributing to classification accuracy mainly included in right heschl's gyrus (3.23%), left temporal pole, and right inferior temporal gyrus. The direct comparison showed that MOH patients had significantly decreased smReHo activation in the right heschl's gyrus ($p < 0.05$, FDR corrected) which was corresponding to the highest weight area by machine learning classifier. A negative correlation was observed between the duration of medication intake and smReHo activation in the right heschl's gyru ($r = -0.433$, $p< 0.05$).

Conclusion—By using machine learning computational analyses, our study was able to diagnose MOH patients on a single subject level by demonstrating decreased regional function in MOH patients at the univariate level, notably involving the right heschl's

gyrus, suggesting right heschl's gyrus might play an important role in the pathogenesis of MOH.

OR-328

Subregions of Temporal Gyrus Related Increased Functional Connectivity in Type 2 Diabetes Mellitus Patients

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Background
Type 2 diabetes (T2DM) is emerging as a major global health issue. T2DM can adversely cause mild cognitive impairment (MCI) and increase dementia risk. In our previous research, absolute neurovascular couplings in T2DM patients decreased significantly in subregions of temporal gyrus [1]. However, these subregions role in whole brain function in T2DM patients remains unknown.
Methods
To illuminate this problem, resting-state fMRI functional MRI scans were obtained from 30 T2DM patients without MCI and 30 healthy controls (well matched for age, sex and education) in this study. Subregions in temporal gyrus/hippocampus were characterized using a seed-based whole-brain correlation method and to calculate the functional connectivity (FC) between subregions in temporal gyrus/hippocampus and the other cerebral voxels. To evaluate the certain direction of altered FCs, Granger causality analysis was also performed. Correlation analysis was used to calculate the relationship between FCs and cognitive performance.
Results
Though without global group differences, T2DM patients displayed significantly increased FC between the gyrus/hippocampus and several cerebral regions, including the right superior temporal gyrus, left inferior temporal gyrus in comparison to hippocampus. Furthermore, the increased FC between subregions in temporal lobe/hippocampus and other cerebral cortex was all associated with the mini-mental state examination (MMSE) total score ($P < 0.05$).
Conclusions
Our study provides further evidence of subregions in temporal lobe/hippocampus-cerebral functional connectivity disturbances to play a pivotal role in neuropathological features and might be a promising indicator for cognitive impairment in T2DM patients.

OR-329

A Quantitative Susceptibility Mapping Study of Brain Iron Accumulation in Alzheimer's Disease

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Objective To observe the changes of iron accumulation by quantitative susceptibility mapping (QSM) in patients with Alzheimer's disease (AD) and mild cognitive impairment (MCI), and to explore if early deposition of iron could be an imaging biomarker.

Methods Thirty seven patients with AD, 20 patients with MCI, and 43 normal controls (NC) were recruited. All subjects were examined by magnetic resonance imaging (MRI) to analyze the difference of iron accumulation among groups with QSM sequence. (1) Analysis based on region of interest (ROI): Using one-way analysis of variance (ANOVA) test, the difference in iron deposition between the three groups was studied based on ROI comparison, and pairwise multiple comparison was made with the least significant difference (LSD) method. ROIs were set on bilateral caudate nucleus, putamen, hippocampus and amygdala. (2) Whole brain analysis: We applied a voxel-based analysis using one-way analysis of variance (ANOVA) followed by a post hoc analysis. A significant level of family-wise error (FWE) corrected $p < 0.05$ with a cluster size of 30 voxels was applied to locate those brain regions with significant differences among 3 groups. (3) We planned using paired sample t test within 6-month follow-up data to see if there is any difference.

Results (1) Based on ROI analysis: average susceptibility of the bilateral caudate and left putamen were significantly different among groups ($p<0.001$, respectively). Maximal susceptibility of the left caudate was significantly different among groups ($p<0.001$). Also, the average susceptibility of the bilateral caudate and the left caudate and the maximum susceptibility of the left caudate were significantly different between AD and MCI, MCI and NC, AD and NC($p<0.05$). Besides, there are poor reproducibility in hippocampus and amygdala of each subjects because the standard deviation is obviously higher than the average value, which indicates iron is very unevenly distributed in those areas. In addition, there was no significant correlation between susceptibility and age in the elderly NC group. (2) Whole brain analysis: significantly different regions of iron deposition in AD, MCI and NC brain differences include hippocampus, caudate, putamen, insula, cingulate gyrus, cuneus, precuneus, angular gyrus, thalamus, fusiform, lingual gyrus, corpus callosum, cortex and subcortical white matter, some cerebellum structure and so on. (3) There is no significantly difference in paired sample t test within 6-month follow-up data.

Conclusion This study describes the AD brain iron deposition pattern of QSM, supporting hippocampus, caudate, putamen, DMN main structure (cingulate, precuneus, angular gyrus), thalamus are increased iron deposition regions which are supported by the previous study. This sign may be useful for revealing secondary neuronal changes due to pathologic processes including oxidative stress in AD. The QSM change of left insula may be an imaging biomarker for early diagnosis of AD. This study is the first report of some certain cerebellar QSM changes, which significance needs further study to illuminate.

OR-330

The effect of lesion filling on reproducibility of brain volumetric measurements

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INTRODUCTION

Brain volumetry can be influenced by several physiopathologic factors, such as dehydration status, inflammation or clinical therapy [1-3], technical factors such as scan-rescan procedure, field strength, scanner model, imaging protocols,scanner software [4-6], and also post-processing algorithms[7]. In addition, the presence of white matter (WM) lesions may affect brain volume segmentations since they can be misclassified as grey matter (GM) or cerebrospinal fluid (CSF) [8, 9].
WM lesions are commonly found in a number of neuropsychiatric disorders, including multiple sclerosis (MS), stroke, and vascular dementia, *etc*. Understanding the effect and magnitude of lesion filling on brain volume segmentations is important to be able to take it into consideration when planning MRI studies and processing the data, particularly in high brain lesion load subjects. While the effect of lesion filling on reproducibility of brain volumetric measurements is still unknown.
In this study, we set out to compare the effects of lesion filling on brain volumetric measurements and evaluate the reproducibility on both scan-rescan, imaging protocols, scanner model and software in assisting multicenter and longitudinal study design

METHODS

Six post-stroke patients (4 Male and 2 Female; range 58-72 years) were prospectively recruited. All participants were scanned within 12 hours across four clinical MRI systems: MR1, MR2: both 1.5-T Siemens Avanto (software: syngo MR B15 and B17) ; MR3: 3.0-T Philips Ingenia, and MR4: 3.0-T Siemens Trio. 3D T1W MPRAGE MRI sequence was obtained for assisting accurate WMH segmentation. 3D T2-FLAIR and 2D T2-FLAIR were acquired twice with repositioning in-between on each MRI system, resulting in a total of eight T2-FLAIR MRIs and four T1-MRI per participant.
T1-MRI of each subject were segmented using AccuBrain®(Brainnow Medical Technology Ltd.) using a tissue probability priors based segmentation method. It employs a tissue probability map that aligned with the subject image space as a prior, the tissue segmentation is further refined with expectation maximization (EM) algorithm using a Gaussian mixture model. It segments each brain into WM, GM and CSF, with the brain volume calculated as the combination of WM and GM. Given T2-FLAIR MRI, AccuBrain®also segments WM lesions and refine the tissue segmentation results using the obtained WM lesion maps [10, 11].
The tissue segmentation results of all the scans with or without lesion filling were compared to examine the effect of lesion filling in brain tissue quantification. Paired comparisons were tested using the Wilcoxon signed ranks test with two-tailed exact significance. Correction for multiple comparisons was performed using FDR correction. Inter-scanner reproducibility of brain volumetry was compared before and after lesion filling procedure using coefficient of variation (Cov) index.

RESULTS

Figure 1 shows an example of tissue segmentation result with and without lesion filling. Table 1 shows the statistics of the tissue volumes (both absolute and ICV normalized volume). The mean and standard deviation is taken over the measurements of all the scans. It is shown that lesion filling changed the tissue volumetry with significant difference. For the six subjects, the lesion volume varies from 6.32 to 23.88 ml. It is further demonstrated in Table 2 that although lesion filling has significant effect on brain volumetry, it does not show significant effect on inter-scanner reproducibility.

DISCUSSION

Many lesion segmentation algorithms have been reported, but due to the different tissue contrasts, the results based on diverse datasets may be unpredictable[12]. Lesion filling was found mainly affected the voxel-based statistical analysis software - SPM and its extension SPM-CAT, and also registration-based brain segmentation tool-FSL-SIENAX, but no effect was seen on the FreeSurfer volumes with lesion filling [13]. In our study, different with previous software that fills WM lesions before segmentation with intensities similar to those of WM, AccuBrain® directly fills the tissue segmentation results with WM lesion maps. For comparability of the brain volumetrics from scan-rescan, different scanners, and imaging protocols, our results suggested that lesion filling procedure did change the WM and GM volumetry, but did not show significant effect on inter-scanner reproducibility.It illustrated that despite of different lesion appearances, if the software can reliably segment lesions and fill it with the tissue maps, lesions can have little effect on the inter-scanner tissue volumetry reproducibility. However, lesion filling can have large effect on the tissue volumetry accuracy.

CONCLUSION

The accuracy of brain volumetric measurements is affected by lesion filling, particularly inhigh WM lesion loadsubjects. Therefore,lesion filling is an essential step to accurately monitor the progression of brain volume change in subjects have WM lesions.

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Cerebral Damage after Carbon Monoxide Poisoning: A Longitudinal Di usion Kurtosis Imaging Study

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PURPOSE: The primary aim of this study was to assess evolution of brain damage with diffusion kurtosis imaging (DKI) in different clinical phase after CO poisoning; and the secondary aim was the correlation between DKI-derived parameters and neuropsychiatric outcomes.

MATERIALS AND METHODS: 17 patients with CO-poisoned and 30 sex- and age-matched healthy volunteers were enrolled in the study. Patients were scanned within acute

(within 1 wk), delayed neuropsychiatric (DNS, 3-8 wk) and chronic phase (> 6 mo). The DKI-derived parameters were measured in gray matter (GM) and white matter (WM) including 11 regions of interest, and further correlated with neuropsychiatric scores.

RESULTS: In WM, mean kurtosis (MK) showed a trend of increasing from acute to DNS phase, and then turned to decrease at chronic phase. Contrary to MK, mean diffusivity (MD) firstly decreased in succession and subsequently inclined to increase. In GM, from acute to chronic phase, MK showed continually decreasing while MD constantly increasing. Whether WM or GM, the value of fractional anisotropy (FA) and kurtosis fractional anisotropy (KFA) progressive reduction over time. In terms of diagnostic, KFA had the best performance to differentiate patients in DNS phase from controls with an AUC of 0.812 (P=0.000). With neuropsychiatric scores, KFA of centrum semiovale (CS) and Digit Span-Backward were most relevant (r=0.476, P=0.000).

CONCLUSION: Longitudinally, in WM and GM, the change of brain damage associated with CO intoxication was inconsistent over time. DKI provide important complementary to identify neuropathologic and neuropsychological changes. The KFA of CS was capable of reflecting the performance of cognitive and executive correlated with prognosis.

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Inconsistency between cortical reorganization and rest-state functional connectivity change in sensorimotor cortex after spinal cord injury

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To investigate possible changes in brain structure and functional connectivity (FC) after spinal cord injury (SCI) combined with voxel-based morphometry (VBM), tract-based spatial statistics (TBSS) and resting-state functional magnetic resonance imaging (rs-fMRI), and to further study their association with clinical variables.
21 traumatic SCI patients (10 with complete and 11with incomplete SCI) and 21 age- and sex-matched healthy controls (HCs) were recruited. The 3D whole-brain structural and resting-state functional images were acquired from all participants using a 3.0 Tesla MRI system. Voxel-based morphometry (VBM) and tract-based spatial statistics (TBSS) analysis were carried out to investigate the differences in gray matter volume (GMV) and white matter volume (WMV) and white matter integrity between SCI patients and HCs, separately. Seed-based FC analysis was performed to explore the whole brain functional changes using the results of VBM as seeds. Association between brain changes and clinical variables was performed.
Compared to HCs, SCI patients showed GMV decrease in the dorsal anterior cingulate cortex (dACC), bilateral anterior insular cortex (aIC), bilateral orbital frontal cortex (OFC), and right superior temporal gyrus (STG), instead of changes in areas directly related to sensorimotor function. No statistic difference in white matter was found. When the seeds were located in the left aIC, SCI patients showed decreased FC

between the seed and right primary sensorimotor cortex and between the seed and left inferior parietal lobule (IPL), separately. When chosen the right STG as seed, its FC with the left primary sensorimotor cortex decreased. Additionally, the FC value between the left aIC and the right primary sensorimotor cortex was positively correlated with the total motor score, while the FC value between the right STG and the left IPL was positively correlated with the left/right/total motor score in SCI patients.
These findings indicate that SCI can cause brain cortical reorganization in some higher cognitive areas which are not related to sensorimotor function directly. The cognitive processing-related brain regions may be a key factor in sensorimotor dysfunction through the decreased FC with sensorimotor areas after SCI.
Cognitive processing-related functional training may play an important role in rehabilitation for sensorimotor dysfunction after SCI.

OR-333
基于功能磁共振成像的乳腺癌术后抑郁患者大脑皮层活动性与临床相关量表评分的相关性研究

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目的 采用基于低频振幅(ALFF)及局部一致性(ReHo)方法的静息态功能磁共振成像技术(rs-fMRI)探讨乳腺癌术后抑郁患者大脑皮层活动性的改变及其与临床相关量表评分之间的关系。**方法** 对23 例乳腺癌术后抑郁患者行静息态功能磁共振扫描，应用低频振幅及局部一致性方法分析受试者大脑皮层活动性的改变。基于 SPSS 25.0，pearson 及 spearman 相关分析用于评估 ALFF 值及 ReHo 值与临床相关量表评分的相关性。**结果** 乳腺癌术后抑郁患者右侧楔前叶的低频振幅值与 HAMA 评分存在负相关；左侧角回及右侧缘上回的低频振幅值与综合注意力商数存在正相关；右侧后扣带回的低频振幅值与综合控制力商数存在正相关。右侧角回的 ReHo 值与 SAS 及 HAMA 评分存在正相关。**结论** 静息状态下乳腺癌术后抑郁患者多个功能脑区皮层活动性的改变与临床相关量表评分存在相关性联系，这可能与抑郁症的病理生理改变相关，并提示抑郁患者大脑活动性的改变可用来评估临床症状。

OR-334
视神经鞘直径与动脉瘤性蛛网膜下腔出血诊断和分级的相关性研究

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目的 探讨基于头颅 CT 测量的视神经鞘直径（ONSD）与动脉瘤性蛛网膜下腔出血（SAH）诊断和分级的相关性。 **方法** 回顾性分析了 2018 年 5 月至 2019 年 4 月间 132 例因颅内动脉瘤破裂导致的 SAH 患者的头颅 CT 和临床资料，并纳入同期 132 例健康人群的头颅 CT 作为对照组。测定 ONSD，及眼球最大横径（ETD），以校正 ONSD（ONSD/ETD）。 **结果** SAH 组 ONSD 和 ONSD/ETD 均

大于对照组（P ＜ 0.001）。以 ONSD ＞ 5.80mm（敏感度，81.82%；特异度，87.12%； 曲线下面积（AUC），0.920）或 ONSD/ETD ＞ 25.58%（敏感度，83.33%；特异度，88.64%；AUC，0.919）为阈值诊断 SAH 可获得最优的诊断效能。不同 Hunt-Hess 分级组间的 ONSD 和 ONSD/ETD 差异具有统计学意义（P ＜ 0.001）。高 Hunt-Hess 组患者的 ONSD 和 ONSD/ETD 均大于低 Hunt-Hess 组（P ＜ 0.001）。以 ONSD ＞ 6.45mm（敏感度，90.00%；特异度，59.82%；AUC，0.790）或 ONSD/ETD ＞ 29.07%（敏感度 80.00%；特异度 72.32%；AUC 为 0.782）预测高 Hunt-Hess 分级可以获得最优的诊断效能。 **结论** 基于头颅 CT 测量的视神经鞘直径与动脉瘤性 SAH 患者的诊断和分级相关，可以作为评估动脉瘤性 SAH 的有效影像学指标。

OR-335
锰离子增强磁共振监测视神经放射性损伤的实验研究

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目的 探讨锰离子增强磁共振（MEMRI）在视神经放射性损伤中的应用价值。
材料及方法 采用 2 次分割剂量 10Gy×2 次照射法建立大鼠放射性视神经损伤模型。照射后 5 周、10 周、20 周、30 周连续进行磁共振检测，在 MRI 扫描前 24 小时眼球内注射氯化锰溶液，剂量为 30mmol/L×2μL。视神经及视上丘进行 T1WI 成像，采用对比噪声比计算**方法**
CNR=0.655*(Smn－S0)/SDair 测量视神经和上丘的信号强度。在 30 周扫描结束后行 Western blot 检测视神经交叉部轴突运输动力相关的驱动蛋白-1（kinesin-1，-2，-3）、胞质动力蛋白-1（cytoplasm dynein 1）。免疫荧光检测轴突完整性的骨架蛋白，α-Tubulin，β-Tubulin 和 SMI 31。电镜检测轴突的形态变化。
结果 视神经 CNR 在 5 周和 10 周时无明显变化，从 10 周-30 周 CNR 呈逐渐下降（P<0.05），上丘 CNR 从 5 周-30 周呈逐渐下降，在 30 周时下降最为显著（P<0.05）。
实验组的胞质动力蛋白-1、Kinesin-1、Kinesin-2 明显下降（P<0.05），而 Kinesin-3 升高明显（Kinesin-3）。免疫荧光结果显示α-Tubulin，β-Tubulin 和 SMI 31 实验组和对照组差异不明显（P>0.05）。电镜结果显示，实验组神经出现不同程度的髓鞘空泡和髓鞘丢失、密度下降、张力下降。
结论 视神经放射性损伤后会造成轴突转运功能下降，而轴突的转运结构尚完整，MEMRI 在视神经放射性损伤中可以检测视神经轴突转运功能的变化以及观察轴突结构的完整性。

OR-336
MRI 常规联合多 b 值 DWI 扫描对眼眶淋巴组织增生病变诊断及鉴别诊断价值

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目的 探讨眼眶 MRI 常规扫描及联合多 b 值 DWI 扫描对眼眶淋巴组织增生病变的诊断、鉴别诊断能力，为临床诊断、治疗工作的开展提供更多信息。**材料与方法** 本研究收集术后病理诊断为眼眶淋巴组织增生病变患者 67 例，将所有患者分为良性组、恶性组两组，对进行 MRI 常规扫描联合多 b 值 DWI 检查的患者，在工作站上进行不同 b 值下 ADC 值的测量。通过 SPSS.25.0 统计软件，对定量结果进行分析，分析不同 b 值下 ADC 值之间是否具有差异；不同 b 值下良性肿块间、恶性肿块间

ADC 值间是否具有差异；相同 b 值间良恶性肿块间 ADC 质是否具有差异；并根据不同 b 值下 ADC 值判断眼眶淋巴组织增生病变的良恶性的敏感性（Se）、特异性（Sp）绘制 ROC 曲线，得出曲线下面积（AUC）分析判断眼眶肿块良恶性的最佳 b 值及 ADC 阈值。**结果** 在累及泪腺区、肌锥内间隙、肌锥外间隙区域 A、B 两组病变间差异存在统计学意义（P<0.05），A、B 两组间关于累及眶隔前间隙差异不存在统计学差异 P>0.05）；在病变边界、包绕结构、累及眼外肌、累及骨质、信号强度等方面，A、B 两组间差异不存在统计学差异（P>0.05）。不同 b 值下 ADC 值间差异存在统计学意义（P<0.05），且 ADC 值由小到大为 b=400<b=800<b=1000s/mm^2；不同 b 值下，良性肿块、恶性肿块 ADC 值间存在差异（P<0.05）；相同 b 值下，良性肿块与恶性肿块间 ADC 值差异存在统计学意义（P<0.05）。b=1000s/mm^{2}时，AUC（曲线下面积）最大。**结论** MRI 常规扫描对眼眶淋巴组织增生病变诊断能力有限，但某些影像特征对鉴别病种间良恶性存在统计学意义；多 b 值 DWI 扫描对眼眶肿块良恶性鉴别存在意义，当 b 值为 1000s/mm^{2}时，诊断效能最佳。

OR-337

颈静脉球区搏动的紫红球—颈静脉球瘤的影像学表现

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临床 中年女性多见；多单发且多单侧发病；搏动性耳鸣、进行性耳聋。体检发现鼓膜呈蓝色，内见搏动紫红球。
影像表现 CT 表现：颈静脉孔区不规则软组织肿块影并推压破坏周围骨质，骨质呈溶冰状骨质破坏，穿过鼓室突向外耳道表现为“冰山顶”征，增强后明显均匀强化。MRI 表现：颈静脉孔区软组织，T1WI 低或等信号，T2WI 高信号，DWI 高信号，其内可见“胡椒盐征”，盐代表慢血流和肿瘤细胞，盐代表快速血流造成的流空信号。DSA 显示肿瘤明显染色，为富血供肿瘤，由颈外动脉分支咽升动脉、耳后动脉或枕动脉供血。

OR-338

The evaluation of CT and MRI in preoperative staging of middle ear cholesteatoma based on EAONO/JOS joint consensus Statements

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Objective

To evaluate the ability of CT and MRI in preoperative staging of middle ear cholesteatoma based on EAONO/JOS joint consensus statements.

Methods

A retrospective analysis of patients undergone both ear MR(scan and non - EPI DWI and enhancement) and HRCT examination before surgery from May 2018 to December 2018 in our hospital, and 39 cases of middle ear cholesteatoma were included, we use imagings to stage the middle ear cholesteatoma based on EAONO/JOS joint consensus statements, what seen in the surgery is the gold standard, statistics of imaging for phase I to IV

of cholesteatoma in the diagnosis of sensitivity, specificity, positive predictive value and negative predictive value are analyzed respectively.

Result

The Se, Sp, PPV and NPV of the diagnosis for Ⅰ/Ⅱ/Ⅲ/Ⅳ period of cholesteatoma are 80.0%, 96.6%, 88.9%, 93.3%;93.8%, 91.3%, 88.2%, 95.5%;100.0%, 100.0%, 100.0%, 100.0%;100.0%, 100.0%, 100.0%, 100.0% respectively.

Conclusion

1. HRCT combined with MRI has a good ability in preoperative staging of middle ear cholesteatoma , and can fully accurate diagnose the intracranial and extracranial complications, roughly positioning of cholesteatoma.

2. HRCT and MR are complementary to each other in the examination of cholesteatoma and its complications. Currently, HRCT is the routine examination of the middle ear cholesteatoma before surgery, but MR examination is not paid enough attention to. MR examination should also be a routine pre-surgery examination.

3. restricted by MR scanning thickness, sometimes there are inaccurate positioning problems, so the staging accuracy for stage Ⅲ/ Ⅳ is better than stage Ⅰ/ Ⅱ .

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Ramsay-Hunt 综合征患者面神经强化程度与面神经功能预后的临床分析

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目的 探讨周围性面瘫患者面神经强化程度与面神经功能分级及预后相关性的临床分析。

方法 回顾性分析来我院就诊的 36 例临床确诊为 Ramsay Hunt 综合征的患者，所有患者均在发病 7 天内行面神经 MRI 强化扫描，观察患侧面神经各节段的强化情况，面神经强化情况包括面神经的强化程度和面神经强化后的相对信号值。将强化程度分为三度：无强化（未见强化）、轻度强化（强化程度明显低于邻近血管强化）、重度强化（强化程度接近邻近血管强化），面神经的相对信号值测量方法为测量同一患者一侧面神经每一节段增强后面神经的信号值及同层面脑干的信号值，将两者的比值定义为该段面神经的相对信号值。同时治疗前及治疗后均采用 House-Brackmann（HB）评分系统对患者面神经功能进行评价。治疗后随访 3~6 个月。

结果 （1）Ramsay Hunt 综合征患者治疗前面神经 HB 分级与患者面神经内听道底段、迷路段、膝状神经节段及鼓室段强化情况有统计学差异（$p<0.05$），面神经 HB 分级与患者面神经乳突段强化情况没有统计学差异（$p>0.05$）。（2）治疗前面神经各段强化情况与治疗后面神经 HB 分级有统计学差异，以面神经鼓室段为著（$p<0.05$）。

结论 Ramsay Hunt 综合征患者面神经强化情况与面神经功能分级及预后有相关性，这对面神经疾病的诊断和治疗有重要价值。

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结外鼻型 NK/T 细胞淋巴瘤的 MRI 表现及临床价值研究

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目的

分析结外鼻型 NK/T 细胞淋巴瘤的 MRI 影像特征及临床价值。

方法

回顾性分析 2010 年 1 月至 2015 年 12 月复旦大学附属肿瘤医院放疗科收治的 193 例首发结外鼻型 NK/T 细胞淋巴瘤患者的临床特征及 MRI 影像，总结 MRI 表现。通过卡方检验探究 MRI 表现与各项临床预后因素的关系。

结果

在 193 例患者中，原发鼻腔者 166 例（86.0%），原发非鼻腔者 27 例（14.0%）。鼻腔原发者中 72 例局限鼻腔内（37.3%）； 94 例侵犯鼻腔外（48.7%），以鼻咽、筛窦、口咽、鼻背及面部皮肤、上颌窦受累最多。193 例患者的 MRI 表现可为浸润型（104 例，53.9%）、肿块型（29 例，15.0%）和混合型（60 例，31.1%）。全部患者均为 T1WI 等信号和 T2WI 呈稍高信号。大多数边界不清（183 例，94.8%）、信号均匀（117 例，60.6%），以非鼻腔组及局限鼻腔组信号均匀较多，侵出鼻腔组最少（P=0.001）。增强后以轻度和中度强化为主（P=0.002）。骨质破坏者有 59 例（30.1%），以鼻中隔、副鼻窦壁破坏为主，侵出鼻腔组明显多于局限鼻腔组及非鼻腔组（P<0.001）。颈部淋巴结肿大者 64 例（33.2%），多为区域受累，易坏死，以 IIA 区、IIB 区、咽后淋巴结累及为主，其中以浸润型和混合型的原发灶为多。相对于局限鼻腔和非鼻腔者，原发灶侵出鼻腔者与 B 症状、ECOG 评分、LDH 升高呈正相关。淋巴结阳性者也与 B 症状、ECOG 评分、LDH 升高呈正相关。相对于肿块型，浸润型和混合型者与 B 症状呈正相关。信号不均匀者与 B 症状呈正相关。骨质破坏者与 PINK 评分相对较高呈正相关（以上 P 均<0.05）。

结论

结外鼻型 NK/T 细胞淋巴瘤 MRI 表现具有一定特征，对其早期诊断有较高价值，并能清晰显示肿瘤部位及侵犯范围，以及淋巴结受累范围，与临床特征有相关关系，对于评估疾病预后、指导临床治疗有重要的意义。

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基于双能 CT 碘图的喉癌甲状软骨侵犯相关危险因素分析

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【摘要】目的 探讨喉癌甲状软骨侵犯的相关危险因素。**方法** 纳入 2013 年 5 月-2019 年 5 月行术前双能量 CT 增强检查并经手术病理证实的喉癌 108 例，根据手术病理结果将其分为甲状软骨受侵组（49 例）和甲状软骨未受侵犯组（59 例）。记录所有患者的病程、喉癌分型、分化程度（分化良好：高分化、中高分化及中分化，分化不良：中低分化及低分化）以及前联合侵犯情况，并计算基于双能 CT 碘图的病灶体积，采用二元 logistic 回归分析喉癌甲状软骨侵犯的危险因素。进一步绘制 ROC 曲线并计算曲线下面积（AUC）及最佳诊断阈值以分析基于双能 CT 碘图的病灶体积诊断喉癌甲状软骨侵犯的效能。**结果** 甲状软骨受侵组与甲状软骨未受侵组的喉癌分型、前联合侵犯情况及病灶体积存在统计学差异（*P* 均<0.05）。Logistic 回归分析显示前联合侵犯（c*OR* 值=4.288，a*OR* 值=7.975）及病灶体积（c*OR* 值=1.943，a*OR* 值=1.849）与喉癌甲状软骨侵犯呈正相关（*P* 均<0.05)。基于双能量 CT 碘图的病灶体积诊断喉癌甲状软骨侵犯的 AUC 为 0.968，以病灶体积=3.91cm^3 为临界值诊断甲状软骨侵犯的灵敏度及特异度分别为 93.9%及 89.8%。**结论** 伴有甲状软骨侵犯的喉癌以贯声门型多见，常伴前联合侵犯，且前联合侵犯及病灶体积大是喉癌甲状软骨侵犯的危险因素。

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高级别淋巴结包膜外侵犯增加 II 期鼻咽癌患者远处转移风险的预后价值

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目的 影像学诊断的淋巴结包膜外侵（rENE）已被证实为头颈部鳞癌一个重要的预后因素。本文探讨 rENE 的影像诊断一致性以及 rENE 和融合淋巴结在 II 期鼻咽癌的预后价值。
方法 回顾性分析我院 2005-2011 年期间接受调强放疗的 II 期鼻咽癌患者。根据 rENE 等级将患者分为无 rENE 组、可疑 rENE 组、确切 rENE 组。随机选择 100 例进行诊断一致性检验。比较不同等级 rENE 的无远处转移生存率(DMFS)、无区域复发生存率(RRFS)和总生存率(OS)。
结果 入组患者(n=365)的 7 年 MDFS、OS 和 RRFS 分别为 87.76%、89.1%和 95.7%。无 rENE、可疑 rENE、侵犯周围脂肪间隙、融合淋巴结和侵犯周围结构的评分者间一致性为 0.700，0.293, 0.513, 0.861 和 1.0；评分者内部一致性为 0.820, 0.621, 0.733, 0.919 和 1.0。无 rENE 组与可疑 rENE 组之间 7 年 DMFS 无统计学差异(93.5% vs. 89.3%，p=0.306)，而确切 rENE 组对比前二者存在更差的 DMFS(84.4% vs. 92.6%, p=0.009)。在确切 rENE 亚组中，侵犯周围脂肪间隙组的 7 年 DMFS 与无 rENE 组及可疑 rENE 组无统计学差异(92.6% vs.94.7%, p=0.650)，而融合组及侵犯周围结构组的 7 年 DMFS 均较侵犯周围脂肪间隙组差 (80.4% vs.94.7%, p=0.016; 63.6% vs. 94.7%, p=0.001)。因此，将融合淋巴结和侵犯周围结构定义为高级别 rENE, 对比非高级别 rENE，二者的 7 年 DMFS 及 OS 具有显著统计学差异(DMFS: 78.5% vs.93.0%, p<0.001; OS: 81.9% vs.89.9%, p=0.048)。
结论 II 期鼻咽癌患者中，高级别 rENE 在诊断上具有良好的一致性，可作为 II 期鼻咽癌患者的一个独立预后因素。

OR-343
MSCT 在不同类型慢性鼻窦炎骨炎中的研究价值

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目的
通过 MSCT 评估慢性鼻窦炎合并鼻息肉(CRSwNP)与非鼻息肉性慢性鼻窦炎(CRSnNP)骨炎的差异。
方法
通过对 2018.1-2019.7 我院经临床及影像诊断慢性鼻窦炎伴骨炎患者，分别纳入 CRSwNP 组、CRSnNP 组和对照组三组进行研究。根据中华放射学会发布的头颈部扫描规范（2007）、改良 GOSS 评分系统，制定了鼻窦 CT 骨重建标准，并应用于三组进行评价比较。CRSnNP 和 CRSwNP 患者各 50 例，对照组 30 例，三组分别进行 CT 值、厚度的测量及改良 GOSS 评分。
结果
三组分别测量筛窦、额窦、上颌窦骨炎固定解剖位置的 CT 值、厚度及 GOSS 评分。CRSwNP 组与对照组、CRSnNP 组与对照组比较均有显著性差异（p＜0.05）；CRSwNP 组与 CRSnNP 组间，CT 值有显著差异（p＜0.05），厚度、GOSS 评分比较无显著差异（p＞0.05）。
结论

不同类型的 CRS 在骨炎的表现有一定的差异，MSCT 精确的测量与术前评估有助于治疗方式的选择，也可以为下一步探讨其发病机制提供帮助。

OR-344
治疗前扁桃体癌 MRI 影像征象对于治疗后复发及转移的预测价值

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目的 探究治疗前扁桃体癌 MRI 影像征象对于治疗后复发及转移的预测价值
材料与方法 对 36 例行同步放化疗的扁桃体癌患者进行治疗后随访，观察患者治疗后复发及转移情况。将 36 例同步放化疗的扁桃体癌患者根据是否存在复发及转移分为两组，包括疾病稳定组和疾病进展组，稳定组 26 例，进展组 10 例，通过单因素分析对比两组临床及影像资料的差异，将单因素鉴别有意义的因素纳入 Logistic 回归分析，确定影响扁桃体癌治疗后转移及复发的独立影像因素。
结果 36 例同步放化疗的扁桃体癌患者中，随访时间为 2-153 个月，中位随访时间为 50.6 个月，随访率为 100%。其中疾病稳定组共 26 例（72.2%），治疗后病灶较前明显缩小或基本消失，趋于稳定；疾病进展组共 10 例（27.8%）患者，出现治疗后复发或转移，包括单纯局部复发 4 例，局部复发伴颈部淋巴结转移 1 例，颈部淋巴结转移伴邻近皮肤受累 1 例，肺转移 2 例，多发骨转移 2 例。单因素分析两组患者年龄（P<0.001）、病灶大小（P<0.001）及临床分期（P=0.008）差异具有统计学意义，Logistic 回归分析结果显示病灶大（P<0.001,OR=24.295）、临床分期（P<0.001, OR=0.127）是影响扁桃体癌治疗后复发及转移的独立影响因素。
结论 扁桃体癌病灶大小和临床分期是影响预后的独立影像因素，扁桃体癌病灶越大、临床分期越晚，越容易出现复发与转移。

OR-345
MRI 动态增强扫描联合 DWI 序列在喉癌和下咽癌放化疗评价中的应用

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目的 探讨磁共振成像（MRI）在喉癌和下咽癌放化疗评价中的应用价值，为喉癌和下咽癌放化疗效果评价提供新的思路。
方法 收集经病理证实的喉癌及下咽癌 98 例初治患者纳入此次前瞻性研究。患者均于我院接受放化疗综合治疗，分别于治疗前、治疗后行磁共振检查，记录其扩散加权成像（DWI）半定量参数，以及 MR 动态多期增强扫描（DCE-MRI）定量参数，比较完全缓解（CR）者与非完全缓解（CR）者上述参数差异，运用患者工作特征曲线（ROC），计算各项参数预测喉癌和下咽癌放化疗效果的价值。
结果 98 例患者均顺利完成治疗，治疗结束后，CR 43 例，非 CR 55 例，CR 率为 43.88%。CR 组治疗前 ADCmean、ADCmax 低于非 CR 组，两组患者治疗后 ADCmean 均较治疗前上升，CR 组治疗后 ADCmean 高于非 CR 组，差异有统计学意义（P＜0.05）。CR 组治疗前 Kep 高于非 CR 组，两组患者治疗后 Kep 均下降，Ve 均上升，CR 组治疗后 Ktrans 下降，非 CR 组治疗后 Ktrans 上升，差异有统计学意义（P＜0.05）。以治疗前 ADCmean≤ 1.05 预测 CR 的 ROC 曲线下面积为 0.625（灵敏度为

92.64%、特异性为 53.98%），以治疗前 Kep≥1.205 min 预测 CR 的曲线下面积为 0.564（灵敏度为 94.15%、特异性为 52.36%）。

结论 治疗前 DWI 半定量参数及 DCE-MRI 定量参数均可为喉癌和下咽癌患者放化疗效果的预测提供一定参考，值得进一步研究。

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咽旁间隙多形性腺瘤和神经鞘瘤的影像学诊断

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OR-347

基于多序列 MRI 的影像组学模型预测鼻咽癌复发或转移结局的应用价值

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目的
探讨基于 MRI 影像组学模型在治疗前预测鼻咽癌复发或转移中的价值。
方法
回顾性分析 2012 年 1 月至 2015 年 12 月我院经病理证实为鼻咽癌，并且治疗前无远处转移的 166 例患者，按 9:1 比例随机分为训练集和验证集。治疗前均行 MRI 检查，在 T2WI/FS 序列和增强 T1WI 序列逐层勾画病变的体积感兴趣区（VOIs）。从每个 VOI 提取影像组学特征，先后应用基于方差(阈值：0.8)及 LASSO 方法在 T2WI/FS、增强 T1WI 序列以及两序列联合中进行特征筛选。采用 XGBoost 方法构建预测模型。模型的预测效能由受试者工作特征（ROC）曲线评估，评价指标包括灵敏度、特异性和曲线下面积（AUC）。
结果
每个 VOI 可提取 1409 个影像组学特征，从 1409 个 T2WI/FS 特征、1409 个增强 T1WI 特征和 2818 个两序列组合特征中分别筛选获得 6 个、11 个和 5 个与鼻咽癌转移或复发相关特征，分别构建 3 组模型，包括 T2WI/FS 模型、增强 T1WI 模型和最优特征模型。最优特征模型表现出更高的 AUC 值（验证集/测试集：增强 T1WI 模型 0.88/0.86；T2WI/FS 模型：0.87/0.74；最优特征模型：0.93/0.79），三个模型均表现出比较好的敏感性及特异性（敏感性：增强 T1WI 模型：0.85/0.76，T2WI/FS 模型：0.83/0.76，最优特征模型：0.82/0.67；敏感性：增强 T1WI 模型：0.76/0.71，T2WI/FS 模型：0.77/0.64，最优特征模型：0.82/0.78）。
结论
影像组学能够从治疗前无复发转移的鼻咽癌 MRI 图像中提取有临床价值的信息。利用影像组学和机器学习算法，建立一个高灵敏度、特异度的模型在治疗前预测出现复发或转移的风险是可行的。此外，基于 T2WI 压脂序列与增强 T1WI 序列提取的影像组学特征相结合建立的模型具有更高预测效能。

OR-348
甲状腺乳头状癌原发灶 CT 值 联合形态学预测中央组淋巴结转移的价值初探

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目的 探讨甲状腺乳头状癌（PTC）原发灶 CT 值联合形态学预测中央组淋巴结转移（CLNM）的价值。
方法 回顾性收集经手术病理证实为单发甲状腺乳头状癌且行中央组淋巴结清扫术患者 340 例，分为中央组淋巴结转移组（178 例）及未转移组（162 例）。测量两组间原发灶平扫、动脉和静脉期 CT 值，计算动脉及静脉期净增 CT 值、标准化 CT 值（NCT 值），利用 t 检验比较两组间上述 CT 值差异。绘制受试者工作特征（ROC）曲线，计算其曲线下面积（AUC），选取最佳敏感度及特异度的临界值；比较两组间四个形态学特征，包括原发灶位置、直径、钙化、包膜接触范围；利用二元 Logistic 回归分析有统计学意义的 CT 值参数联合形态学预测 CLNM 的敏感度与特异度。
结果 （1）两组间原发灶 CT 值：仅原发灶静脉期的 CT 值、净增 CT 值及 NCT 值差异有统计学意义（P<0.05），转移组为 112.62±14.11HU、58.95±12.09HU、0.67±0.25，未转移组为 103.59±9.68HU、50.59±13.81HU、0.52±0.23，其预测 CLNM 临界值分别为 107.5HU、53HU、0.761，敏感度、特异度分别为 71.4%、81.8%；76.2%、59.1%；71.4%、72.7%。而两组间平扫及动脉期 CT 值比较差异无统计学意义（P >0.05）；（2）原发灶形态学分析：两组间原发灶直径及包膜接触范围比较差异有统计学意义（P<0.05），且 d>2cm 或包膜接触范围≥1/2 者较易出现 CLNM（P<0.05）；（3）联合预测：原发灶静脉期 CT 值参数（静脉期 CT 值、净增 CT 值、NCT 值）联合形态学（d>2cm、包膜接触范围≥1/2）预测 CLNM，敏感度为 75.3%，特异度为 78.4%，准确度为 76.8%。
结论 甲状腺乳头状癌原发灶静脉期 CT 值参数对预测中央组淋巴结转移有一定价值，联合形态学可进一步提高预测效能。

OR-349
磁共振 IVIM 序列对大鼠急性期放射性颌下腺血管损伤的评估价值

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目的 探讨体素内不相干运动磁共振扩散加权成像（IVIM-DWI）在评估大鼠急性期放射性颌下腺血管损伤的价值。 **方法** 将 20 只雌性 SD 大鼠随机分成对照组（4 只）、照射组（16 只），照射组大鼠双侧颌下腺照射剂量为 15Gy，对照组照射剂量为 0Gy。照射组于照射 15Gy 后 2h、6h、12h、24h，每 4 只为一组行常规 MR 及 IVIM 扫描，对照组于照射 0Gy 后立即进行常规 MR 及 IVIM 扫描，观察各组大鼠之间颌下腺 IVIM 参数（D 值、D*值和 f 值）的差异。MRI 检查结束后，立即取大鼠双侧颌下腺标本，进行免疫组化染色，观察对比各组大鼠颌下腺微血管密度（MVD）的差异，并分析 MVD 与 D 值、D*值和 f 值之间的相关性。 **结果** 五组大鼠颌下腺 MVD 进行比较，差异具有统计学意义（F=8.262，P<0.001）。照射 6h 后 MVD 持续减低，照射后 6h、12h、24h 的 MVD 与对照组相比显著降低，均有统计学差异（P 值均<0.05）。五组大鼠的 ADC 值（F=3.176，P=0.027）和 D 值（F=7.694，P<0.001）差异具有统计学意义。照射后 2h、6h、12h、24h 的 ADC 值和 D 值分别与对照组进行比较：照射后 6h、12h 的 ADC 值与对照组相比，差异具有统计学意义（P 值均

<0.05）；照射后 2h、6h、12h、24h 的 D 值与对照组相比，差异均具有统计学意义（*P* 值均<0.05）。五组大鼠的 D*值（*F*=1.372，*P*=0.266）和 f 值（*F*=2.052，*P*=0.111）差异无统计学意义。五组大鼠颌下腺的 D 值与 MVD 呈正相关（*r*=0.345，*P*=0.046）；D*值与 MVD 无相关性（*r*=-0.153，*P*=0.386）；f 值与 MVD 无相关性（*r*=-0.205，*P*=0.244）。 **结论** 大鼠颌下腺急性期放射性损伤中的 MVD 会发生变化。IVIM 在一定程度上可以反映大鼠急性期放射性颌下腺微血管损伤的情况。

OR-350

Retinoblastoma

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OR-351

MRI of Parotid Gland Benign Mixed Tumor

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OR-352

MR Imaging Diagnosis of Basal Cell Adenoma of the Parotid Gland

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OR-353

“藏不住的”-Graves 病

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OR-354

III 期尘肺与尘肺合并肺癌累及纵隔淋巴结的 MSCT 影像对比研究

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目的 运用多层螺旋 CT（MSCT）增强扫描技术，探讨 III 期尘肺及尘肺合并肺癌累及纵隔淋巴结的形态特征及强化特点，以及其优势解剖分布，以提高对尘肺纤维斑块合并肺腺癌患者的检出。**材料与方法** 对本院 2016 年 3 月至 2018 年 11 月经临床及病理证实的 40 例 III 期尘肺和 13 例尘肺合并肺癌的受累纵隔淋巴结在 MSCT 上的特点及解剖分布进行回顾性总结、分析。**结果** 40 例 III 期尘肺增大淋巴结 176 个，36 例、142 个（80.7%）可见局部钙化，27 例、103 个（58.5%）呈均匀

强化，13 例、53 个（31.1%）呈不均匀强化，4 例、20 个（11.4%）呈环形强化；1、2L、9 区未见分布，累及淋巴结 2R 区 13 个(7.4%)、3 区 16 个(9.1%)、4R 区 13 个(8.5%)、4L 区 8 个(4.5%)、5 区 24 个(13.6%)、6 区 8 个（4.5%）、7 区 33 个(18.7%)、8 区 7 个（4.0%）、10R 区 31 个(17.6%)以及 10L 区 23 个(13.1%)。13 例尘肺合并肺癌的增大淋巴结 67 个，11 例、51 个（76.1%）可见局部钙化，2 例、12 个（17.9%）呈均匀强化，3 例、16 个（23.9%）呈不均匀强化，10 例、39 个（58.2%）呈环形强化； 8、9 区未见分布，累及淋巴结 1 区 3 个（4.5%）、2R 区 5 个(7.5%)、2L 区 4 个（6.0%）、3 区 5 个（7.5%）、4R 区 6 个（8.9%）、4L 区 9 个（13.4%）、5 区 2 个（3.0%）、6 区 3 个（4.5%）、7 区 11 个（16.4%）、10R 区 9 个（13.40%）以及 10L 区 10 个（14.9%）。**结论** 依据患者纵隔增大淋巴结的特点及解剖分布，MSCT 增强扫描对尘肺合并肺腺癌的检出有诊断指导价值。

OR-355

非小细胞肺癌免疫检查点抑制剂相关肺炎 CT 诊断

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前言：免疫治疗是继手术、放疗、化疗后第四类恶性肿瘤治疗手段， 其中免疫检查点抑制剂（check-point inhibitor， CPIs）是近年来肿瘤治疗领域取得的重大进展，为多种晚期恶性肿瘤的患者带来了福音。随着该类药物应用于临床，其导致的副作用，如导致免疫相关性肺炎的病例时有报道，而该类不良反应有潜在致死性、增加患者的死亡率，早期识别、及时治疗对于患者有重要意义。

材料与**方法** 回顾性分析 56 例非小细胞肺癌免疫治疗相关肺炎的 CT 表现，年龄 38-79 岁，平均年龄 57.4 岁，男性 38 例，女性 18 例。出现免疫治疗相关肺炎的时间为 2 个月-2 年。诊断依据包括：①使用 CPIs 治疗的用药史；②咳嗽，呼吸困难，伴或不伴有发热；③影像学表现为快速进展的磨玻璃影、实变影等；④除外感染、肿瘤进展、肺栓塞、心功能不全等；⑤抗菌药物无效，激素有，再次使用 CPIs 治疗或停用激素可复发。

结果 56 例免疫治疗相关肺炎中最常见表现为机化性肺炎（21 例），急性间质性肺炎（16 例），非特异性间质性肺炎（11 例），寻常性间质性肺炎（6 例），呼吸性细支气管炎（2 例）。

结论 免疫检查点抑制剂相关肺炎的 CT 表现有一定的特征性，结合临床相关信息能够做出早期诊断，从而降低这一副反应造成的不良后果。

OR-356

Systemic lupus erythematosus: Chest computed comographic findings in 89 patients, and CT visual scores as predictor of prognostic

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Purpose: To evaluate chest computed tomography(CT) findings in patients with systemic lupus erythematosus (SLE), delineate the characteristic CT features in various subsets of SLE, and investigate the prognostic factors.

Materials and methods: Retrospectively identified 89 SLE patients who underwent chest CT from 2010 through 2012 (median follow-up period, 16 months; range, 2－30 months) were included in this study. Chest CT findings were qualitatively and semiquantitatively analyzed at the initial and follow-up CT scans, and correlation with anti-Sm antibodies, anti-double-stranded DNA antibodies, and antiphospholipid antibodies. Overall changes in disease extent at the follow-up CT findings were classified as improved (i.e., ≥ 10% decrease in extent), Stable, or progressed (i.e., ≥ 10% increase in extent), we evaluated the change of the chest CT findings with logistic regression in 89 SLE patients to determine the prognostic factors.
Results: Chest CT abnormalities were identified in 77 (87%) patients, the most frequent CT
findings at the initial CT scans was axillary lymphadenopathy(60%), followed by interlobular septal thickening (45%), ground-glass opacities (39%), subpleural curvilinear line (35%),
reticulation (35%). No correlation was found between the presence of anti-Sm antibodies and the initial chest CT findings. It showed a significant association between axillary lymphadenopathy and the presence of anti-double-stranded DNA antibodies, independent and significant associations between ground-glass opacities or ill-defined centrilobular nodules and the presence of antiphospholipid antibodies were observed. The presence of anti-double-stranded DNA antibodies and the extent of axillary lymphadenopathy were significant association with the progression of chest CT abnormalities at the follow-up CT findings.
Conclusion: The presence of anti-double-stranded DNA antibodies and the extent of axillary lymphadenopathy were significant association with the progression of chest CT abnormalities, anti-double-stranded DNA antibodies seropositive and axillary lymphadenopathy might be poor prognostic factors in SLE patients with pulmonary involvement.

OR-357
呼气相 CT 定量分析肺内血管体积在慢性阻塞性肺疾病患者中的应用

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目的 基于呼、吸双气相 CT 定量分析慢性阻塞性肺疾病患者肺内血管体积（Intrapulmonary vascular volume , IPVV），研究不同严重程度 COPD 患者在呼、吸状态下 IPVV 变化情况，进一步探讨呼气相 CT 定量肺血管在 COPD 中的应用价值。**方法** 回顾性收集“数字肺”数据库中行呼、吸双相 CT 扫描肺 COPD 患者 89 例，通过计算机辅助测量双相 CT 扫描下 IPVV、肺气肿程度（LAA%-950）、3-6 代支气管壁厚（WT）及壁面积百分比（WA%）。应用独立样本 T 检验比较轻、重度 COPD 在呼、吸气相下 IPVV 参数变化。呼、吸状态下 IPVV 与 PFT 参数、LAA%-950 及支气管参数的相关性采用 Pearson 或 Spearman 相关系数及多元逐步回归分析。**结果** 不同严重程度 COPD 的 IPVV 比较，呼气相中，重度组大于轻度（P<0.05）；吸气相下无差异。在所有 COPD 患者中，吸气相下各肺叶 IPVV 与 PFT 参数呈负相关（r=-0.215～-0.292），与第 3-6 代支气管 WT 呈正相关

（r=0.233～0.557），与各肺叶 $LAA\%_{-950}$ 呈正相关（r=0.238～0.409）；呼气相下各肺叶 IPVV 与 PFT 参数呈负相关（r=-0.238～0.360），与第 3-6 代支气管 WT 呈正相关（r=0.260～0.566），与各肺叶 LAA%-950 呈正相关（r=0.241～0.362），P 值均<0.05。多元逐步回归显示，在呼气相与吸气相时，不同肺叶下 IPVV 与年龄、BMI 及各定量参数回归方程的 R^2 值最大分别为 0.426、0.505（P 值均<0.05），WT 可独立相关于 IPVV（P<0.05）。**结论** 呼气相 CT 可有效评估不同严重程度 COPD 肺内血管改变，且与 COPD 定量指标的相关性较吸气相大，对 COPD 定量评估存在一定潜在价值。支气管壁厚可能是 COPD 肺内血管体积的独立预测指标。

OR-358

Quantitative study of emphysema and airway remodeling in COPD rat model by micro-CT

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Objective To analyze the dynamic changes of COPD by quantitatively measuring emphysema and trachea related parameters with Micro-CT. Methods There were 8 rats in control group, 9 in smoked group and 9 in protease group. The control group underwent Micro-CT examinations and pathological examinations at the 4th, 8th, 12th and 24th week after modeling. The smoking group and the protease group underwent Micro-CT examinations and pathological examinations at the 4th, 12th, 24th week and the 4th, 8th, 12th week respectively. Micro-CT quantitative parameters included lung density, air volume to total lung volume radio, bronchial lumen diameter and wall thickness. Pathological quantitative parameters included (tracheal area-lumen area)/tracheal area (MA%), wall thickness/radius of the trachea (MT%), mean alveolar area, and mean liner intercept. Results In the 12th week, the lung density in smoke group and protease group was significantly lower (P<0.001, P<0.001), and $LAA\%_{-928}$ was significantly higher (P=0.031, P=0.013) than the control group. In the 24th week, the lung density in the smoke group was significantly lower (P=0.001), and $LAA\%_{-928}$ was significantly higher than the control group (P=0.028). The bronchial wall of the 4th grade bronchus in the 12th week and the 3rd, 4th grade in the 24th week of rats in the smoked group were significantly thicker than those in the control group (P=0.04, P=0.033, P=0.008). Lung density negatively correlated with mean alveolar area and mean liner intercept (P = 0.001, R = -0.838; P = 0.043, R = -0.592). $LAA\%_{-928}$ positively correlated with mean alveolar area and mean liner intercept (P <0.001, R = 0.926; P = 0.029, R = 0.629). The bronchial wall thickness measured by Micro-CT was positively correlated with MT% (P=0.026, r=0.638). Conclusion The results of Micro-CT can reflect the real condition of the rat lung. Emphysema and bronchial remodeling exist in rats with COPD in the 12th week after modeling.

OR-359

Impact of hybrid iterative reconstruction on quantitative analysis with pulmonary CT

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Objectives: This study aimed to investigate the impact of hybrid iterative reconstruction blending levels on quantitative analysis and objective image quality of pulmonary CT.
Methods: Pulmonary CT images were acquired from 52 subjects and reconstructed using different hybrid iterative reconstruction blending levels including FBP, ASIR-V30%, ASIR-V50%, ASIR-V70% and ASIR-V100%. Quantitative analysis were compared including emphysema index(EI),total lung volume, luminal area, wall area, wall thickness, diameter of airway and nodule volume. CT value and standard deviation (SD) were also measured and compared.
Results: EIs were found statistically different [FBP (3.34 %), ASIR-V30% (2.13 %), ASIR-V50% (1.46 %), ASIR-V70% (0.98 %) and ASIR-V100% (0.57 %)(P<0.001)]. SDs decreased dramatically with the increase of ASIR-V percentage [air in trachea: FBP (29.8HU), ASIR-V30% (25.5HU), ASIR-V50% (22.6HU), ASIR-V70% (19.6HU), ASIR-V100% (15.2HU), descending aorta: FBP (35.2HU), ASIR-V30% (27.6HU), ASIR-V50% (22.7HU), ASIR-V70% (18.0HU), ASIR-V100% (12.1HU) (P<0.001)]. There was no statistically significant difference of CT values, airway dimensions, nodule volumes and lung volumes among different blending levels (P>0.05).
Conclusion: With the increase of blending level of ASIR-V, EI and SD decreased significantly, while volumetric quantification of lung nodule and airway dimensions were not affected.

OR-360

超极化 129Xe 磁共振成像在 COPD 患者中的应用

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目的 ： 定性分析人体肺部超极化 ^{129}Xe MRI（hyperpolarized ^{129}Xenon magnetic resonance imaging，HP ^{129}Xe MRI）肺通气成像可行性和安全性。
方法 8 例受试者（5 例健康志愿者、3 例 COPD 患者）行低剂量 CT 扫描和及 HP ^{129}Xe MRI 肺通气成像；并与低剂量 CT 图像对照，分析 HP ^{129}Xe MRI 肺通气成像特征，分析检查前后心率、收缩压、舒张压及血氧饱和度等生理指标变化。
结果 所有受试者检查前后心率、血氧饱和度及血压等生理指标未见明显变化，受试者除 2 例主诉头昏外，无其他不适（P>0.05）。8 例受试者肺通气 HP ^{129}Xe 相肺气体信号分布呈由前向后递增趋势，反应其重力顺应性梯度。5 例健康自愿者双肺 HP^{129}Xe 分布均匀，第 1 例 COPD 患者 CT 显示左下肺片状的低密度区，HP ^{129}Xe MRI 不仅显示 CT 上已发现病变，同时还发现肺内更小通气缺损区。第 2 例 COPD 患者 CT 未见异常，而 HP ^{129}Xe MRI 显示肺内多发通气缺损区。第 3 例患者 CT 显示双上肺胸膜下低密度区，HP ^{129}Xe MRI 能显示双肺胸膜下广泛通气缺损区。
结论 HP ^{129}Xe 肺部 MRI 通气成像能安全有效评估 COPD 患者的肺通气缺陷，可视化显示 CT 未能显示的早期、多发、小灶性肺通气缺陷病变，亦能反应肺部重力顺应性梯度。

OR-361

肺结节圆度—预测纯磨玻璃结节浸润性的 CT 新征象

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目的 探讨 CT 形态学量化指标肺结节圆度在预测纯磨玻璃结节（pGGN）浸润性中的应用价值。 **方法** 回顾性分析经病理证实的 111 例患者的 116 枚 pGGN 的术前 CT 表现。根据临床管理策略将其分组为浸润前病变和浸润性病变，前者包括非典型腺瘤样增生（AAH）、原位腺癌（AIS），后者包括微小浸润性腺癌（MIA）、浸润性腺癌（IAC）。使用 Photoshop 软件测量肺结节圆度，比较两组肺结节圆度的差异，并用 ROC 曲线分析评估肺结节圆度、长-短比率、分叶征深度在两组鉴别中的最佳界值及诊断性能。肺结节圆度、长-短比率及分叶征深度间的相关性采用 Pearson 或 Spearman 相关性分析。**结果** 肺结节圆度在 pGGN 浸润前、后病变的差异具有统计学意义（P＜0.001）。ROC 分析显示肺结节圆度、长-短比率、分叶征深度的 cutoff 值分别为：73.44%、1.204、0.08，对应的 AUC 分别为：0.902、0.635、0.753。肺结节圆度与长-短比率（r=-0.498，P＜0.001）、分叶征深度（r=-0.672，P＜0.001）呈中度负相关。**结论** 肺结节圆度在预测 pGGN 浸润性中可作为 CT 形态学特征的量化指标。

OR-362

Application of a deep-learning based computer-aided diagnosis (DL-CAD) in distinguishing benign and malignant lung nodules: compared with conventional double reading by radiologists

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Purpose: To evaluate the performance of a commercial deep-learning based computer-aided diagnosis (DL-CAD) in differentiating benign and malignant lung nodules detected on baseline CT, by comparing with conventional double reading by radiologists.
Method: In this retrospective study, 233 patients (March 2017 - June 2019) with 261 pathologically confirmed lung nodules (malignant: benign = 192: 55) were selected. Blind to the results by the DL-CAD system, two radiologists finalized the diagnosis using a four-scale malignancy score system, including unlikely to be malignant (0-25%); malignancy cannot be completely excluded (25-50%); highly likely to be malignant (50-75%) and considered as malignant (75-100%). Intraclass correlation coefficients (ICC) was used to evaluate the agreement in malignancy risk rating between CAD and double reading, with ICC value of < 0.5, 0.5 to 0.75, 0.75 to 0.9, and > 0.9 indicating poor, moderate, good and perfect agreement, respectively. With malignancy likelihood > 50% as cut-off value for malignancy and the pathological result as gold standard, sensitivity, specificity and accuracy were calculated for double reading and CAD, separately.
Results: Among the 261 nodules, 247 nodules were successfully detected by DL-CAD with detection rate of 94.7%. In terms of malignancy rating, DL-CAD was in moderate agreement with double reading (ICC = 0.555, 95% confidence interval: 0.424 to 0.655). DL-CAD misdiagnosed 40 true malignant nodules as benign nodules and 30 true benign

nodules as malignant nodules with sensitivity, specificity and accuracy of 79.2%, 45.5% and 71.7%, respectively. In contrast, double readings achieved better performance with 16 true malignant nodules misdiagnosed as benign nodules and 26 true benign nodules as malignant nodules with sensitivity, specificity and accuracy of 91.7%, 52.7% and 83.0%, respectively.
Conclusion: Although DL-CAD shows high detection rate, its performance in differentiating malignant and benign nodules is still inferior to conventional double reading, which needs further improvement.

OR-363
肺内多发磨玻璃结节中主病灶的影像特征与 5 年预后的相关性研究

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目的 旨在探讨肺内多发磨玻璃结节中主病灶的影像特征与 5 年预后的相关性情况。**方法** 回顾性分析 2012 年 12 月~2013 年 12 月期间在我院手术病理证实的肺内多发磨玻璃结节（ground glass nodules，GGNs）患者 50 例，最短随访时间超过 5 年。参照 2015 年版肺腺癌病理新分类将肺内多发 GGNs 分为主病灶为浸润性腺癌（invasive adenocarcinoma，IA）组和主病灶为微浸润腺癌（minimally invasive adenocarcinoma，MIA）或原位腺癌（adenocarcinoma in situ，AIS）组。比较两组预后的差异性，分析各组内主病灶大小、是否临近胸膜、分叶征与 5 年预后的相关性情况。**结果** 主病灶为 IA 组 30 例，主病灶为 MIA 或 AIS 组 20 例，主病灶为 IA 组在 5 年随访中剩余结节存在增大和新发的病例数均高于主病灶为 MIA 或 AIS 组（$P<0.05$）。主病灶为 IA 组中，剩余结节存在增大与主病灶的大小有相关性（$r=0.455$，$P<0.05$），剩余结节存在新发与主病灶临近胸膜、分叶征有相关性（$r=0.434$、0.384，$P<0.05$）。主病灶为 MIA 或 AIS 组中，剩余结节存在增大和新发均与主病灶临近胸膜有相关性（$r=0.459$，$P<0.05$）。**结论** 肺内多发 GGNs 患者术后随访 5 年发现：主病灶为 IA 组的预后明显低于主病灶为 MIA 或 AIS 组；主病灶的大小、临近胸膜、分叶征是主病灶为 IA 组患者预后的影响因素；主病灶临近胸膜是主病灶为 MIA 或 AIS 组患者的预后影响因素。

OR-364
The implications of internal vascular and bronchial changes of pure ground-glass nodules(pGGNs) lung adenocarcinoma on CT

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Objective: To investigate the implications of vascular and bronchial changes within lung adenocarcinoma with pure ground-glass nodules (pGGNs) on CT.
Methods: From April 2014 to February 2016, 157 patients with 165 pGGNs lung adenocarcinomas were included. The patients' age, sex and the size, density, position,

bronchial changes and vascular changes of pGGN were analyzed. Univariate and multivariate analysis were used to assess the relationship between CT characteristics of pGGN and lesion invasiveness, respectively. The differences of vascular and bronchial changes among histopathological subtypes and the relations with the size and density of pGGNs were analyzed by using Pearson Chi square test, Mann-Whitney test and t-test.

Results: There were 70 non-invasive lung adenocarcinomas and 95 invasive lung adenocarcinomas, with vascular changes in 25 and 65 lesions and bronchial changes in 14 and 47 lesions, respectively. Univariate analysis revealed significant differences of patients' age, the size of pGGN, vascular and bronchial changes between non-invasive lung adenocarcinomas and invasive lung adenocarcinomas(*P<0.05*).Logistic regression analysis showed that the patients' age(≥56y), pGGNs' size (≥12mm), vascular changes were significant predictive factors for lesion invasiveness(*P<0.001*). There was a significant difference in the lesion size between vascular change and no-change groups (P<0.001), bronchial change and no-change groups (P<0.001), while no difference was found in density (P>0.05). Vascular changes were found in 90 lesions, which were pulmonary vein in 78 lesions and pulmonary artery in 15 lesions (3 invasive adenocarcinomas with both pulmonary vein and artery changes), and there was a significant difference in vascular changes between the pulmonary vein and pulmonary artery (P<0.001).

Conclusions: Vascular and bronchial changes within the lesions may indicate the invasiveness of pGGN lung adenocarcinomas and were correlated with the size of the lesions. Vascular changes are more common in pulmonary vein than in pulmonary artery

OR-365
孤立性囊腔类肺癌 CT 表现特征及病理基础对照研究

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目的 回顾性观察囊腔类肺癌 CT 和病理特征，总结该类型肺癌 CT 表现规律和探讨其囊腔形成病理机制并提高诊断水平。

方法 回顾性分析 2011 年 1 月至 2017 年 12 月收治孤立性囊腔类肺癌患者 114 例，99 例经手术、纤维支气管镜和经皮穿刺病理活检证实，另 15 例患者在胸部 CT 随访中病灶进展出现典型表现而综合诊断为囊腔类肺癌。114 例患者中男性 74 例，女性 40 例，年龄范围 30~82 岁，平均年龄 59.14±10.68 岁。全部收集患者临床资料、CT 图像和病理学资料，记录相关数据。

结果 114 例肺内孤立性囊性恶性肿瘤患者中，75 例（65.79%）病灶位于双肺周边部位；65 例（57.02%）囊腔的形态规则，其中呈圆形者 43 例（66.15%, 43/65）、类圆形者 22 例（33.85%, 22/65）。另有 104 例（91.23%）显示囊壁厚薄不均，其中 57 例（54.81%，57/104）可见壁结节；有 69 例（60.53%）囊腔内可见分隔或血管分支影；有 76 例（66.67%）囊壁外可见贴边血管征；有 59 例（51.75%）病灶含有多少不等的磨玻璃成分。99 例获得病理组织学诊断的患者中有 88 例为肺腺癌（88.89%）。此外，为探究此类肺癌的囊腔形成机制，在多方位的后处理重建 CT 图像上发现有 69 例（60.53%）囊腔病灶的边缘处可显示狭窄的细支气管与囊腔相通。镜下观察 48 例（48.48%, 48/99）显示完整的囊腔，其中特殊发现 32 例（66.67%）病灶内狭窄小支气管的管壁及其周围伴有肿瘤细胞及大量纤维组织。

结论 囊腔类肺癌具有以囊腔及相应表现为特征并有助于提示诊断的重要征象，包括囊壁不均匀增厚、囊内分隔与细小血管分支、囊壁结节、贴边血管征、细小支气管与囊腔相通及囊腔动态性增大或缩小。囊腔类肺癌中囊腔形成的可能病理机制是细支气管周围大量纤维组织及肿瘤组织包裹并压迫形成的局部狭窄导致“活瓣”效应。

OR-366
磁共振 eDWI 技术联合图像纹理特征对评估周围型肺癌的血管构筑的价值初探

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目的 探讨磁共振 eDWI 技术联合图像纹理特征对周围型肺癌的血管构筑的评估的价值，以期对肺癌的诊治及预后提供有价值的影像学依据。
材料与方法 收集我院就诊并获得术后病理的周围型肺癌患者患者 12 例，机器型号为 GE Discovery 750 3.0T，扫描序列：eDWI 序列（b 值=0、30、50、100、150、200、300、500、800、1000、1500s/mm^2）。图像传至 GE ADW 4.6 工作站，获得 Standard ADC、Slow ADC、Fast ADC、F 值；将 eWDI 图像上传至汇医慧影放射组学云平台（http://mics.radcloud.cn/），获得二阶特征（GLCM，GLRLM）和高阶特征（NGTDM，GLSZM）；采用免疫组织化学方法对肺癌标本分别行 CD31、VEGF、SMA 染色，并应用图像分析软件 Image J 进行 CD31、VEGF、SMA 表达量测定，计算 MPI。采用统计学方法对 eDWI 各参数值、图像纹理特征与 CD31、VEGF 表达量/评分、SMA、MPI 进行相关性分析。**结果** 1、12 例肺癌患者 eDWI 参数值均与 CD31、SMA、MPI 无显著相关性（P>0.05）；2、12 例肺癌患者 eDWI 参数值中 Standard ADC、Slow ADC 及 Fast ADC 均与 VEGF 表达量/评分均无显著相关性（P>0.05）。F 值与 VEGF 评分呈正相关，r=0.592，P=0.042<0.05。
3、血管构筑参数中 VEGF 和 CD31、CD31 和 SMA 呈正相关，r 值分别为 0.718、0.849，P 值分别为 0.009、0.000（P<0.05），VEGF 评分和 MPI 值呈负相关，r 值为-0.615，P 值为 0.033<0.05。4、eDWI 图像中有 7 个纹理特征与 MPI 呈负相关。
结论 磁共振 eDWI 技术联合图像纹理特征分析能间接反映周围型肺癌更多的血管构筑信息。

OR-367
18F-FDG PET 和 CT 征象对 1A 期非小细胞肺癌复发的预测价值

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目的 没有淋巴和血管侵犯的 1A 期非小细胞肺癌经手术切除后也有复发的可能性，明确有复发高风险的因素以早期选择辅助性治疗非常重要。本研究收集了 179 例 IA 期非小细胞肺癌患者的临床和影像学资料，评价肿瘤在 ^{18}F-FDG PET 的 SUV 值、薄层 CT 上的形态学征象与肿瘤复发的相关性。
方法 所有 179 例经病理证实的 1A 期非小细胞肺癌患者均在术前行 ^{18}F-FDG PET 和 MSCT 扫描，收集肿瘤的组织学分化程度、肺癌的最大 SUV 值、CT 征象包括肿瘤最大直径、最小直径、磨玻璃影所占比率、支气管束血管束增厚、分叶、肿瘤所在部位（叶）、毛刺、充气支气管征、胸膜牵拉等 CT 征象。采用单变量和多变量分析评价各个征象与肿瘤复发有无相关性，并采用 ROC 曲线以确定各 CT 征象的预测值。
结果 179 例 1A 期非小细胞肺癌中， 161 例为腺癌（89.9%），11 例为鳞状细胞癌（6.1%），7 例为其他癌。肿瘤平均直径为 2.01cm（0.6—3cm）。有 27 例（15.1%）出现复发和转移，其中 19 例

出现肺部复发，7 例次出现局部淋巴结转移，4 例出现胸膜转移，2 例出现骨转移，1 例出现肝脏转移。患者 5 年生存率为 76.3%，通过单变量分析得出最大 SUV 值、肿瘤组织学分化程度、肿瘤最大直径、支气管血管束增粗是最重要的预测因子（P < 0.05），通过多变量分析得出较高的 SUV 值（≥2.5）（P = 0.021），较低的磨玻璃影比率（≤17%） (P =0.014),支气管血管束增粗(P = 0.003)等征象是肿瘤复发独立的预测因子。通过 ROC 曲线得出 AUC 值为 0.855 (95% CI: 0.80, 0.92)，证明以上指标有更高的预测意义。

结论 ：较高的 SUV 值、较低的磨玻璃影比率和支气管血管束增粗等 CT 征象是 1A 期非小细胞肺癌复发的重要指标，该结果可为 1A 期非小细胞肺癌患者术后行化疗等辅助治疗提供重要的信息。

OR-368

不同碘定量测量方式评价非小细胞肺癌 EGFR 突变状态：截面法 vs. 体积法

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目的 探究应用最大截面法、体积法测量获得的双能量 CT 碘相关定量参数预测 NSCLC EGFR 突变状态的可行性，并探究两种方法所测碘相关定量参数之间的相关程度。

方法 58 例 NSCLC 患者于活检或手术前行动脉期双能量 CT 扫描。由两位观察者采用最大截面法及体积法勾画感兴趣区，分别获得最大截面碘浓度（areal iodine content, IC_{areal}）、最大截面标准化碘浓度（areal normalized iodine content, NIC_{areal}）以及体积碘浓度（$IC_{volumetric}$）、体积标准化碘浓度（$NIC_{volumetric}$）。比较 EGFR 突变组与 EGFR 野生组间碘相关定量参数的差异，比较最大截面法及体积法所测碘相关定量参数预测 EGFR 突变状态的诊断效能差异，并对两种碘定量测量方法行相关性分析。

结果 58 例 NSCLC 病变中，28 例 EGFR 突变阳性，30 例 EGFR 突变阴性。EGFR 突变组 NIC_{areal}（0.16±0.06）明显高于 EGFR 野生组（0.12±0.05）（t=2.869, P=0.006）。EGFR 突变组内部及内层 $NIC_{volumetric}$ 均明显高于 EGFR 野生组（t=2.415-2.699, P=0.009-0.019）。但 EGFR 突变组与野生组之间病变整体及边缘部分的体积碘相关定量参数无统计学差异。ROC 曲线示 NIC_{areal}（AUC=0.693）的诊断效能稍高于内部及内层 $NIC_{volumetric}$ （AUC=0.655-0.677）。NIC_{areal} 与内部的 $NIC_{volumetric}$ 明显相关（r=0.818-0.821）。

结论 最大截面及体积法测量碘相关定量参数可用于预测 NSCLC 的 EGFR 突变状态，最大截面碘相关定量参数测量在临床应用中更简便，推荐用于临床常规评估中。

OR-369

双能量 CT Rho/Z 在肺小结节良恶性鉴别诊断中的价值

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目的 探讨双能量 CT 电子云密度/等效原子系数(Rho/Z)在鉴别肺小姐姐良恶性中的价值。**方法** 回顾性收集 2019.1 月-2019.5 月在我院行双能量增强肺部检查并发现小结节、取得穿刺或手术病理结果的病人，其中肺部单发小结节者 45 名，2 个小结节者 11 名（22 个小结节），共 67 个小结节，良性者 26 个，恶性者 41 个。应用双能量 CTRho/Z 对所有结节进行评估，记录 90KV，Sn150KV,

混合 0.6，Rho，Z 和 DEI 值。比较良性结节和恶性结节各个值的差异。**结果** Rho 在良性结节和恶性结节之间具有显著性差异（P=0.001），Z 和 DEI 均不具有显著性差异（P=0.602,0.958），Sn150 页具有显著性差异（P=0.001）.**结论** 在双能量增强扫描中，获得的 Rho 和 Sn150 值有助于确定肺小结节的良恶性。

OR-370

Clinicopathologic features and lymph node metastatic characteristics in patients with adenocarcinoma manifesting as part-solid nodule exceeding 3cm in diameter

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Purpose: The purpose of this study was to elucidate the clinicopathologic and lymph node metastatic characteristics in patients with adenocarcinoma manifested as persistent ground glass mass (GGM, ground glass opacity [GGO] exceeding 3cm in diameter).
Materials and Methods: 304 patients with adenocarcinoma manifested as persistent GGM >3cm, who underwent complete surgical resection between November 2013 and December 2017 were included in this study. We elucidated the lymph node metastatic incidence and characteristics according to the primary tumor lobe location and extracted the associated clinicopathological factors, especially thin-section computed tomographic findings, with lymph node involvement.
Results: All of the GGMs were invasive adenocarcinoma in histopathology. The total incidence of lymph node metastasis was 2.0% (6/304). All of the 6 cases with hilar or mediastinal lymph node metastasis were manifested as solid-predominant GGM >3cm and no cases with lymph node metastasis were identified in GGO-predominant GGM >3cm. Lymph node metastases were more likely to present in younger patients (p=0.032), tumors with solid size >2.0cm (p=0.000), more advanced clinical T stage (p=0.000), radiological solid-predominant tumors (p=0.002) and acinar-predominant or papillary-predominant adenocarcinoma (p=0.002). As for solid-predominant GGMs >3cm, lymph node metastases were more likely to be found in tumors with solid size >2.0cm (p=0.026), more advanced clinical T stage(p=0.026), acinar-predominant or papillary-predominant adenocarcinoma (p=0.029). Whole tumor size was not associated with the presence of lymph node metastases. There were 2 right upper-lobe cases with upper mediastinal lymph nodes skip metastasis without intrapulmonary, interlobar, and hilar lymph node metastasis.
Conclusion: All of the GGMs were invasive adenocarcinoma. The incidence of lymph node metastasis in GGO-predominant GGMs >3cm was extremely low . Solid size would be a

better predictor of lymph node metastasis than whole tumor size in sold-predominant GGMs >3cm.

OR-371
能谱 CT 影像组学在鉴别肺癌结节与炎性结节中的价值

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目的 探讨能谱 CT 影像组学特征在鉴别肺癌结节与炎性结节中的价值。**方法** 回顾性分析在我院行肺部能谱 CT 扫描的 96 例肺癌结节和 45 例炎性结节患者的资料。按照 2：1 的比例随机分配为训练组和验证组。利用 MaZda 软件对训练组动脉期和静脉期 70keV 单能量图像进行影像组学分析。提取特征包括灰度共生矩阵（GLCM）、灰度游程矩阵（GLRLM）等六大类特征。采用费希尔参数法（Fisher）、分类错误率联合平均相关系数法（POE+ACC）和相关信息测度法（MI）对提取的特征进行筛选，得到三组最优特征子集。然后用线性（LDA）和非线性判别分析法（NDA）对最优特征子集进行分析，计算其鉴别肺癌结节和炎性结节的准确率、敏感性和特异性。利用人工神经网络（ANN）建立预测模型，并对验证组两种病变进行鉴别。利用两样本 t 检验和 ROC 曲线分析确定最佳定量参数。**结果** 在动脉期，MI-NDA 法选择的最优特征子集鉴别训练组肺癌结节和炎性结节的准确率最高，为 87.69%，其敏感性和特异性分别为 87.5%和 88.0%。最佳定量参数对比度 S(1,-1)鉴别两者的敏感性和特异性为 87.5%和 60%。两者敏感性的差异无统计学意义（P=1.00），而两者特异性的差异有统计学意义（P<0.001）。在静脉期，（POE+ACC）-NDA 法选择的最优特征子集鉴别训练组肺癌结节和炎性结节准确率最高，为 86.15%，其敏感性和特异性分别为 92.5%和 76.0%；最佳定量参数差分方差 S(0,1)鉴别两者的敏感性和特异性为 72%和 57.5%。两者敏感性和特异性的差异均有统计学意义（P<0.05）。利用 ANN 算法对 MI-NDA 法选择的动脉期最优特征子集建立预测模型，其鉴别验证组肺癌结节与炎性结节的准确率、敏感性和特异性分别为 80.85%、81.25%和 80.0%。**结论** 能谱 CT 影像组学定量特征可用于鉴别肺癌结节与炎性结节，具有较高的诊断价值。

OR-372
探讨神经网络诊断模型预测纯磨玻璃样肺腺癌浸润程度的价值

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目的 本研究旨在建立一种诊断模型，以利用计算机断层扫描（CT）数据区分肺腺癌的浸润程度，识别浸润前病变（PIL）和浸润性腺癌（IAC）可以辅助临床治疗方式的选择。
方法 由 2015 年 1 月至 2018 年 10 月期间，本市内 3 家大学附属三甲医院行手术治疗的纯磨玻璃结节样肺腺癌及其癌前病变（不典型腺瘤样增生）共 442 例作为诊断模型建立组，建立基于 SPSS 统计软件的神经网络诊断模型。由 2019 年 6 月行手术治疗共 89 例 pGGN 病灶作为模型验证组验证神经网络预测模型的诊断效能。利用受试者操作特征（ROC）曲线下面积及模型总体预测准确率、敏感性及特异性评估其诊断效能。
结果 神经网络预测模型建立组的 AUC 值（ROC 曲线下面积）、总体预测准确率、敏感性，特异性分别为 0.900、82.1%、75.5%和 87.0%。神经网络预测模型验证组的 AUC 值（ROC 曲线下面积）、总体预测准确率、敏感性，特异性分别为 0.883，89.8%，83.3%和 93.2%。

结论 基于 SPSS 统计软件建立的神经网络预测模型对于区分纯磨玻璃结节样肺腺癌中 PIL 和 IAC 有着较高的诊断价值，是 pGGN 患者术前规划的重要指导方式之一。

OR-373
增强 CT 术前预测肺腺癌脉管癌栓及神经侵犯的价值

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目的 探讨手术切除的肺腺癌脉管癌栓及神经侵犯与 CT 特征之间的关系，为判断预后及调整临床治疗提供指导。**方法** 回顾性分析 143 例手术切除的肺腺癌患者术前胸部增强 CT 图像，共评估 16 个 CT 分类变量及 7 个连续变量。采用 ROC 曲线分析 CT 参数对脉管癌栓及神经侵犯的诊断效能。通过拟合建立最终多参数模型提高诊断效能。**结果** 脉管癌栓多发生于实性成分，呈分叶状及有钙化的肿瘤中（P 均<0.05）；神经侵犯多见于伴支气管充气征的肿瘤中（P<0.05）。平扫 CT 值对脉管癌栓及神经侵犯的诊断效能最高。多参数模型预测脉管癌栓和神经侵犯的 AUC 值（曲线下面积）分别为 0.79、0.88，准确度分别 76.22%、81.82%，较单因素分析诊断效能更高。**结论** 增强 CT 可术前预测肺腺癌脉管癌栓及神经侵犯，多参数模型预测脉管癌栓和神经侵犯的诊断效能较单因素分析更高。平扫 CT 值是肺腺癌神经侵犯的独立危险因素，可为临床治疗提供相应参考价值。

OR-374
晕征的再认识：肺混合磨玻璃结节的 CT 鉴别征象

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目的 探讨不同表现的晕环征象在肺混合磨玻璃结节(Mixed Ground-glass Nodule, mGGN)中的诊断和鉴别诊断价值。**方法** 回顾性研究 215 例直径小于 2cm 的 mGGNs，其中良性组 60 例，浸润前组(包括非典型腺瘤样增生和原位腺癌) 22 例，微浸润腺癌组(MIA)70 例和浸润性腺癌(IAC) 63 例。根据磨玻璃内、外边界情况将晕环征分为四种类型：I 型，晕环的外边界模糊，内边界清晰；II 型，晕环的外边界清晰，内边界模糊；III 型，晕环的内外边界均模糊；Ⅳ型，晕环的内外边界均清晰。记录并分析各组结节的磨玻璃成份、实性成份大小和基本影像学特征。运用 SPSS 软件(IBM SPSS Statistics 23.0)进行统计学分析。**结果** 215 例肺结节依据晕环类型分为：I 型 24 例；II 型 84 例；III 型 81 例；VI 型 26 例。晕环分型在非浸润组、MIA 组、IAC 组间的差异具有统计学意义(x^2=45.226, P=0.000)；晕环分型在良性组和腺癌组间的差异亦具有统计学意义(x^2=54.684, P=0.000)。晕环外边界清晰在良性组和浸润前组、非浸润组和浸润组以及良性组和腺癌组之间的差异均具有统计学意义(P=0.000)，而晕环内边界是否清晰在该 3 组间差异均无统计学意义(P=0.285, P=0.330, P=0.145)。患者年龄、磨玻璃成份的比例在良性组和腺癌组之间的差异具有统计学意义。患者年龄、磨玻璃成份的比例及晕环外边界清晰在鉴别良性与腺癌的受试者工作曲线的 AUC 值分别为 0.614、0.655、0.771。**结论** 详细分析混合磨玻璃结节周围晕环的边缘特征可为肺 mGGN 的定性诊断提供帮助。

OR-375

Preliminary study of the clinical application value of energy spectrum CT in distinguishing the adherent growth main component and non-adherent growth main component of ground-glass opacity pulmonary nodules

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Objective:
To study the clinical application value of energy spectrum CT in distinguishing the adherent growth main component and non-adherent growth main component of pulmonary nodules under the conditions of mixed energy and single energy scanning.

Materials and methods:
Twenty patients with ground-glass opacity pulmonary nodules (GGO), confirmed by surgery and pathology, were collected in our study, including invasive adenocarcinoma and microinvasive adenocarcinoma. And there were 12 cases pure GGO(pGGO) and 8 cases mixed GGO(mGGO). According to the pathological results, the average proportion of adherent growth components in pulmonary nodule was calculated. All cases underwent energy spectrum CT scanning under the conditions of mixed energy and 40-140Kev single energy scanning. On the lung window image, ROI was drawn at each level of the lesion from the appearance of the lesion to the disappearance of the lesion. The ROI area was selected based on the maximum coverage of the lesion, with no less than 80% of the lesion, avoiding the vacuolar area. According to the post-processing software, every pixel point CT value of each ROI is automatically obtained on mixed energy image and single energy image.To arrange all pixel point CT values from small to large. According to the proportion of adherent growth component, all pixel points CT values arranged were divided into adherent growth group and non-adherent growth group. To compare the difference of CT values between the two groups by t test of two independent samples.To calculate the diagnostic efficiency of distinguish adherent growth component on mixed energy image and 40-140kev single energy image by ROC curves.

Results:
In the pixel points CT values analysis, there was a significant difference between the adherent growth group and the non-adherent growth group, whatever under the conditions of mixed energy and 40-140kev single energy scanning ($P < 0.05$), and the mean CT values of the adherent growth group were smaller than the non-adherent growth group under the different energy scanning .
ROC curves had the diagnostic efficiency of distinguish adherent growth component ($p=0$), whatever under the conditions of mixed energy and 40-140 kev single energy scanning. Especially, there was the most significant diagnostic efficiency under the condition of mixed energy scanning, and, the area under the curve was 0.919, the best threshold value was 613.5 HU, and specificity and sensitivity were 0.863 and 0.814 respectively.

Conclusion:
Energy spectrum CT can distinguish the adherent growth main component and non-adherent growth main component of GGO, which had certain clinical value. And the diagnostic efficiency was best under the condition of mixed energy scanning.

OR-376
基于 CT 影像组学及薄层 CT 鉴别表现为纯磨玻璃结节的微浸润性腺癌与浸润性腺癌

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目的 探讨基于 CT 影像组学特征及 TSCT 形态学表现对鉴别表现为纯磨玻璃结节的微浸润性腺癌（MIA）与浸润性腺癌（IAC）的价值。
方法 回顾性分析 2013 年 1 月～2017 年 10 月广州医科大学附属第一医院 TSCT 表现为 pGGN，并术后病理证实为 MIA（233 个）、IAC（115 个）的肺结节，比较这两组结节在 TSCT 形态学上的差异；另取同一层厚（2mm）、同一算法（I30）图像条件的 103 个 MIA 及 76 个 IAC 进行影像组学特征分析，按 7:3 随机分成训练组及测试组，用 L1 正则化 Logistic 回归模型比较两组结节的影像组学特征差异，采用 ROC 曲线及曲线下面积（AUC）评价其鉴别效能。
结果 :表现为 pGGN 的 MIA 最大直径为 10.29±4.10mm, IAC 最大直径为 16.50±5.62mm, MIA 与 IAC 最大直径的最佳截断值为 11.75mm，AUC=0.834，敏感性 80.6%，特异性 73.8%。MIA 平均 CT 值为-575.1±110.5HU，IAC 平均 CT 值为-517.1±128.7HU；平均 CT 值最佳截断值为-489.3HU，AUC=0.636，敏感性 44.7%，特异性 79.9%。MIA 与 IAC 的最大直径、平均 CT 值二者联合 ROC 曲线 AUC=0.863，敏感性 85.4%，特异性 76.9%。MIA 与 IAC 在 TSCT 形态学表现上，形状不规则、毛刺征、分叶征、胸膜牵拉征、空气支气管征的差异有统计学意义（P＜0.05）。基于影像组学特征上，MIA 与 IAC 两组比较，训练组 AUC=0.8480，敏感性 75.00%，特异性 81.13%，总精确度 77.60%；测试组 AUC=0.8289，敏感性 90.32%，特异性 65.22%，总精确度 79.63%。
结论 TSCT 形态学征象对鉴别表现为 pGGN 的 MIA 与 IAC 是有意义的，影像组学特征对其鉴别亦有一定的价值。

OR-377
DWI 在不同肺癌类型中的诊断价值及其病理对照研究

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目的 探讨扩散加权成像（DWI）在不同肺癌类型中的诊断价值。**方法** 选取 2014 年 3 月~2017 年 3 月我院收治的肺癌患者 58 例，所有患者均行 DWI 扫描，扩散敏感因子 b 值取 500 s/mm^2，比较不同类型肺癌的表观扩散系数（ADC）。**结果** 58 例患者中，中央型肺癌 19 例，周围型肺癌 39 例；小细胞肺癌（SCLC）11 例，非小细胞肺癌（NSCLC）47 例，其中 NSCLC 包括腺癌 32 例，鳞癌 15 例；肺癌实性部分在 T1WI 上呈等信号或稍低信号，在 T2WI 抑脂上呈高或不均匀高信号；腺癌及鳞癌在 DWI 上呈等或高信号，ADC 呈低或偏低信号；SCLC 在 DWI 呈高信号，ADC 呈偏低信号；中央型肺癌 ADC 值与周围型肺癌比较，差异无统计学意义（*P*>0.05）；NSCLC 患者 ADC 值明显高于

SCLC 患者（$P<0.05$），腺癌 ADC 值明显高于鳞癌（$P<0.05$）；DWI 诊断不同病理类型肺癌的 AUC 为 0.848。**结论** 当 b 值为 500 s/mm^{2}时，DWI 在腺癌、鳞癌、SCLC 鉴别诊断中具有一定价值。

OR-378

变应性支气管肺曲霉菌病 CT 表现及与侵袭性肺曲霉菌病重叠综合征的 CT 征象分析

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目的 探讨变应性支气管肺曲霉菌病（ABPA）的 CT 表现及与侵袭性肺曲霉菌病(IPA)重叠综合征影像学特点，进一步提高对该病的认识。 **资料与方法** 回顾性分析 15 例按目前诊断标准进行诊断的 ABPA，其中 6 例临床诊断为 ABPA 与 IPA 重叠综合征患者的资料，观察 ABPA 治疗后的 CT 动态变化，及 ABPA 与 IPA 重叠综合征的影像学特点，包括：中心性支气管扩张，支气管内粘液栓，受累远端肺通气情况，经糖皮质激素治疗后支气管管径恢复情况及遗留扩张支气管形态和支气管管壁厚度。**结果** 15 例患者均有中心性支气管扩张并有气管内黏液栓形成，其中 4 例为高密度粘液栓；15 例患者病变远端肺组织通气均正常；经糖皮质激素治疗粘液栓排出后，其中 8 例患者支气扩张程度较治疗前明显改善， 13 例遗留有静脉曲张样支气管扩张；9 例患者治疗后症状消失，另外 6 例患者仍有发热咳嗽咳痰症状，复查 CT 显示粘液栓排出后支气管管壁增厚，考虑 ABPA 与 IPA 重叠，此 6 例患者接受抗真菌治疗后复查，支气管壁变薄，周围炎症吸收。 **结论** ABPA 的 CT 动态变化及与 IPA 重叠综合征的影像表现具有一定特点，可以为临床进一步治疗及疗效评价提供依据。

OR-379

3.0T MRI magnetic resonace for adult pulmonary tuberculosis

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Objectives: To optimize lung protocols of 3.0T magnetic resonance imaging(MRI) for evaluation of pulmonary tuberculosis(TB) in the clinical routine.
Methods: 42 patients who were diagnosed as pulmonary tuberculosis underwent CT and 3.0T MRI respectively. MRI lung protocols including the free-breathing T1WI StarVIBE, the multiple breath-hold VIBE, T2WI fBLADE and 3D SPACE were choosed and compared with image quality. The evaluation of image quality include SNR(signal to noise ratio), CNR(contrast to noise ratio) and 5-points scoring scale. 5-pionts scoring scale was evaluated by two radiologists and inter-observers agreement was calculated by cohen’s kappa(k). The SNR, CNR and 5-points scoring scale were compared using a two-tailed pared t-test. The detection rates and imaging findings were compared between CT and MRI. The detection rate of pulmonary abnormality was evaluated by Pearson’s Chi-square test.
Results: Inter-observers showed moderate agreement on 5-points scoring scale. T1WI free-breathing StarVIBE and multiple breath-hold VIBE performed as well with rare

artifacts.T2WI fBLADE had significantly less artifacts than 3D SAPCE. T1WI free-breathing StarVIBE had better SNR and identical CNR comparing with multiple breath-hold VIBE. T2WI fBLADE had statistically higher SNR but inferior CNR comparing with 3D SPACE. MRI performed as good as CT in detecting most of pulmonary abnormality, with overall sensitivity of 51.29%, 90.62%, 100% for non-calcified nodules of size＜5mm, 5-10mm, ≥10mm, 91.07% for calcified nodules and 78.57% for tree-in-bud sign. MRI has more advantages to show caseous necrosis, liquefaction, necrosis within cavity, alternations of lymph nodes and pleura.
Conclusions: T1WI free-breathing StarVIBE and T2WI fBLADE with satisfied image quality is feasible for lung imaging especially for patients who have poor breath and wide range of lesios. Radiation-free MRI is an alternative tool for pulmonary TB imaging, especially for children, the elderly,the pregnant and patients who need long-term follow-up.

OR-380
局限性 Castleman 病影像分型与病理相关性分析

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【摘要】 目的 对局限性 Castleman 病（LCD）进行影像分型，探讨不同分型与临床、病理的相关性。**方法** 回顾性收集确诊为 LCD 的患者 63 例，根据影像学征象进行分型，由两名放射诊断医师分别将不同分型的影像征象与临床表现、手术情况及病理特征进行对照分析。**结果** 63 例 LCD 患者影像上分为 I~IV 型：I 型，边缘光整的单发肿块（n=5）；II 型，边缘不规则或分叶状单发肿块（n=33）；III 型，边缘模糊呈浸润性单发肿块（n=20）；IV 型，边缘模糊多发融合肿块（n=5）。Ⅰ型和Ⅱ型 38 例，手术切除完整，病理均为透明血管型；Ⅲ型 20 例，手术分离较困难，其中 8 例只能部分切除，病理 17 例为透明血管型，3 例为混合型；Ⅳ型 5 例，手术无法完全切除，病理上 4 例为透明血管型，1 例为浆细胞型。**结论** LCD 临床表现无特异性，增强 CT 检查是发现和诊断 LCD 的最佳影像学检查方法，其影像分型为判断肿瘤的浸润范围和生长方式、手术方案的选择以及预测预后提供可靠的影像学依据。

OR-381
不同免疫状态下肺隐球菌感染的临床特点和影像表现

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目的 总结分析 23 例不同免疫状态下肺隐球菌感染患者的临床特点和影像表现，以提高对该病诊断能力。
方法 收集 2012.12-2019.06 我院 23 例经病理或临床证实为肺隐球菌感染病例，分析其宿主因素、临床表现和影像学表现，纳入标准：病理或临床生化检查确诊，临床及影像资料齐全；其中 16 例行胸部 CT 平扫检查，7 例行胸部 CT 平扫+增强检查。
结果 13 例男性，10 例女性，男女比 1.3:1（P>0.05）,发病年龄 31-74 岁（平均 55 岁），11 例（11/23）有宿主因素（糖尿病、肿瘤、乙肝、肾病综合征）；12 例（12/23）体检发现。有免疫

损害患者肺部大多以斑片状渗出影为主（11/23），免疫正常患者以孤立性结节/肿块为主（12/23）；绝大多数（16/23）局限于一侧肺叶，以胸膜下分布为主；病灶边缘出现晕样改变 18 例（18/23），空气支气管征阳性 11 例（11/23），2 例出现空洞，另毛刺、浅分叶、胸膜牵拉各一例，7 例强化值范围 20-34HU;其中 3 例孤立结节误诊为肺癌。

结论 免疫力损害患者肺部隐球菌感染的影像学表现类似于炎症性表现，大多以斑片状渗出影为主，而免疫力正常患者肺部影像表现以孤立性结节、肿块为主，多数边缘伴晕样改变。表现为孤立性实性结节与肺癌鉴别困难。

OR-382
感染性心内膜炎致脓毒性肺栓塞 19 例的临床及影像特点

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目的 分析感染性心内膜炎致脓毒性肺栓塞的特点，提高对该病的诊断水平。**方法** 回顾性分析 2015 年 3 月至 2019 年 5 月在广东省人民医院治疗的 19 例感染性心内膜炎致脓毒性肺栓塞患者的临床表现和心脏 B 超和胸部 CT 特点。**结果** 19 例患者平均年龄（40±22）岁，其中 5 例（26.3%）有左向右分流型先天性心脏病，3 例先天性心脏病患者合并左心感染性心内膜炎，2 例先天性心脏病患者合并右心感染性心内膜炎，其余患者均为右心感染性心内膜炎。患者主要临床表现为发热、咳嗽、胸痛、呼吸困难以及咯血。11 例（57.9%）患者血培养阳性，血培养阳性患者中，致病菌为金黄色葡萄球菌 4 例（3 例 MRSA 及 ESBL 阳性），白色念珠菌 2 例。所有患者均接受胸部 CT 扫描，其中增强扫描 17 例，CT 平扫例。CT 表现为胸膜下分布的结节影、楔形阴影，结节或楔形阴影内可伴有空洞或者“反晕”征。增强扫描可见肺小动脉栓塞、截断征象，2 例患者可见肺动脉瘤形成。1 例患者合并脓胸。**结论** 感染性心内膜炎致脓毒性肺栓塞患者多为右心心内膜炎，左心心内膜炎患者若合并左向右分流性先天性心脏病可引起脓毒性肺栓塞。脓毒性肺栓塞 CT 表现具有一定特征，具有典型 CT 表现患者应当警惕血行来源感染性病变，提示临床进行相应检查以排除感染性心内膜炎引起肺内播散可能。

OR-383
肺真菌感染与微小肺癌影像诊断及鉴别诊断

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1.目的 探讨肺真菌感染与微小肺癌鉴别诊断，旨在提高诊断水平。
2.材料与方法
胸片与肺 CT 检查，收集本院 36 例临床病例，微小肺癌 13 例，通过图像工作站随访分析及鉴别诊断。
3.结果
1.定义：肺部真菌感染由真菌感染引起支气管-肺部疾病，由不同病原体引起过敏、化脓性炎症或慢性肉芽肿。
2.病因与病理：引起下呼吸道真菌感染致病菌，包括原发性和继发性肺部真菌感染。真菌胞壁酶类，侵入宿主细胞。真菌有抗吞噬能力及致炎成分，对机体器官有倾向性侵袭作用。曲霉菌易侵犯呼吸道，隐球菌-易侵犯脑膜。

3.临床表现：肺部真菌感染继发严重原发病，临床无特异症状、体征：1.隐匿性感染无明显临床症状，可自愈。2.流感症状　　发热、畏寒、头痛、流涕、关节痛、肌痛等。

4.诊断标准：侵袭性肺真菌感染分为三级：

1.确诊：需组织学或无菌体液检测，确定微生物学证据（涂片和培养），不涉及宿主因素。2.临床诊断：综合宿主因素、临床特征、微生物学。　3.拟诊：符合宿主因素、临床特征，缺乏微生物学证据者。　免疫学检测血清中细胞壁成分（1，3）-β-D-葡聚糖抗原检测（G 试验）、半乳甘露聚糖抗原检测（GM 试验）阳性定性诊断价值。

5.微小肺癌特征：毛刺征、GGO、血管征、胸膜征等，大小 5-9 毫米、分布以肺周边为主、累及胸膜组织、少有淋巴结增大。

6.肺真菌感染特征：随机分布肺部各部，沿着支气管走形分布，成片的融合，GGO，片状影和空洞壁薄且张力高，多个病灶同时并存。晕征、曲菌球征、小空洞征等为其影像特征。容易误诊主要原因是影像征象有重叠。鉴别：1.肺炎 2.周围与中央型肺癌　3.浸润性肺结核　4.急性肺脓肿　5.肺错构瘤　6.AVM　7.类炭疽等。

4.**结论**　　肺部真菌感染影像征象无特异性，征象有重叠，结合病原学方可确诊；肺真菌轻度感染与微小肺癌鉴别困难。

OR-384

Virtual Monochromatic Dual-Energy Pulomonary CT Angiography With Reduced Iodine Dose:Quantitative and Qualitative Assessment

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Objective: The purpose of this study was to assess the feasibility of performing pulmonary angiography(CTPA) with 7.0g of iodine contrast medium acquired with low-energy(40 and 50kev) virtual monochromatic(VMC) images with rapid-kilovoltage-switching dual-energy CT.

Subjects and methods:A tatal of 123 adults with suspected pulmonary embolism were enrolled in this study performed on GE Revolution CT.Subjects were randomly assigned to a contrast medium protocol for CTPA examinations:one group(n=41)　received 14.0g iodine with an standard DE CTPA protocol,the other(n=41) received 7.0g iodine with a low CM injection DE CTPA protocol,another(n=41)received 17.5g iodine with a standard CTPA protocol. DE CTPA uses 50% ASIR-V and low mAs scanning to greatly reduce radiation dose.Two readers independently assessed the image quality of the CTPA and VMC DE CTPA datasets using the 5-point scale.CT attenuation,SNR ,CNR　and subject image quality were compared between the three groups.

Results: For the DE CTPA virtual monoenergetic spectral datasets(40-140kev)were reconstructed. The CT attenuation of the low CM DE CTPA at 50kev has no difference with the standard CTPA protocol group(low CM DE CTPA : 444.5+185.7; standard CTPA : 455.1+126.3; p=0.603).Main and lobar pulmonary arteries at 40kev datasets provided the highest signal-to-noise-ratio(SNR) and contrast-to-noise-ratio(CNR)for both the standard DE CTPA protocol and the low CM injection protocol. the standard DE CTPA protocol had significantly higher CNR and SNR values than the standard CTPA protocol($p<0.05$),which the low CM DE CTPA was slightly lower than the standard

CTPA,while its subjective score meets the diagnostic requirements.No pulmonary embolism was missed on the three protocols.
Conclusion:DE CTPA utilizing image reconstruction at 40-50kev are optimal when reducing the total iodine amount down to 7.0g(reduction of 60%) and the total radiation exposure(reduction of 78%)while maintaining adequate intravascular attenuation and diagnositic quality for pulmonary embolism evaluation.

OR-385

能谱 CT 在肺动脉、肺静脉及肺结节融合中的应用

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【摘　要】**目的**　通过对比分析探讨 CT 能谱技术在肺动脉、肺静脉与肺结节融合成像中的临床价值。**方法**　本院 56 例直径小于 3　cm 的肺磨玻璃（ground　glass　nodule，GGN）结节术前行肺血管与结节融合成像的患者，随机分为对照组和观察组，每组 28 例；对照组使用 CT 常规扫描，观察组使用 CT 能谱扫描及能谱后处理技术，对比分析 2 组血管成像图像质量的优劣，另外观察组内用能谱扫描的数据分别生成一组 60　keV 和 74　keV 的单能量数据，进行组内对比。**结果**　28 例 60keV 单能量成像观察组肺动脉、肺静脉及肺结节全部清晰显示，利用融合成像技术能明确展示三者的关系。对照组有 7 例不能完整显示远端供血及回流血管与肺结节的联系，另外 21 例虽能显示三者关系，但远端血管结构显示清晰度均不及 60keV 单能量成像观察组，通过 CT 值、信噪比(signal　noise　ratio，SNR)的客观评价和主观评分，观察组 60　keV 和对照组比较，及观察组内的 60　keV 和 74　keV 比较，差异均具有统计学意义（P<0.05）。**结论**　能谱 CT 60　keV 单能量成像在肺动脉、肺静脉与肺结节融合成像中效果优于常规 CT 扫描。
【关键词】肺动脉；肺静脉；肺结节；能谱 CT；融合成像

OR-386

Comparison of Delayed Contrast-Enhanced MR Imaging to 18F- fluorodeoxyglucose PET/CT in the Assessment of Takayasu's Arteritis with Pulmonary Artery Involvement

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Purpose
The purpose of this study was to compare delayed contrast-enhanced magnetic resonance imaging (DE-MRI) to ^{18}F-fluorodeoxyglucose positron emission tomography－computed tomography (^{18}F-FDG PET/CT) in the assessment of Takayasu’s arteritis (TAK) with pulmonary artery involvement.
Methods
Nineteen TAK with pulmonary artery involvement were recruited into a prospective, observational study. All patients underwent both thoracic DE-MRI with a 3D IR Turbo FLASH and whole-body ^{18}F-FDG PET/CT within one week. Only thoracic arteries were evaluated and divided into 15 segments per person. MRI features (DE, stenosis,

occlusion and aneurismal dilatation) were visually evaluated, and vascular ^{18}F-FDG uptake > liver uptake was considered PET-positive. In a per-segment analysis, the relationships between the ^{18}F-FDG activity and arterial features on MRI were evaluated. In a per-patient analysis, the relationships between the imaging data and clinical index and NIH criteria for active TAK were evaluated.

Results

Of 285 arterial segments in 19 patients, there was a 60% agreement (171/285; k = 0.20) between DE-MRI and ^{18}F-FDG PET/CT. Of 114 arterial segments with incosistent results, DE-MRIs demonstrated disease in more arterial segments than ^{18}F-FDG PET/CT (144 versus 58). There were statistical significances between the consistently negative group, the consistently positive group and the inconsistent group (F:87.40,P<0.001)). There were no significant differences in stenosis (x^2 =0.613, P=0.433), occlusions (x^2 =0.420, P=0.517) and aneurismal dilatation (x^2 =1.224, P=0.269) between the consistent group and the inconsistent group. The positive ratio per patient in ^{18}F-FDG PET CT and in DE-MRI were not correlated with systemic inflammation or NIH criteria. Using NIH criteria, the sensitivity and specificity of DE-MRI and ^{18}F-FDG PET CT in detecting disease activity were 100%, 44%, 80% and 100% respectively.

Conclusions

Although there is much complexity in evaluating disease activity in PTA by image methods, DE-MRI with 3D IR Turbo FLASH sequence and ^{18}F-FDG PET CT provide unique and complementary information in the assessment of patients with PTA. Overall, DE-MRI scans are better suited to assess disease activity than ^{18}F-FDG PET CT in PTA patients. In addition, arterial morphological changes are not a factor in judging PTA activity.

OR-387

Global and regional biventricular strain in idiopathic inflammatory myopathy: a cardiac MRI study

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Purpose: Subclinical cardiac involvement in idiopathic inflammatory myopathy (IIM) is difficult to detect by conventional imaging. Myocardial strain has proved more sensitive in identifying subtle heart dysfunction than conventional function parameter, i.e. ejection fraction (EF). The aim of this study was to investigate if global and regional biventricular strain, measured by cardiac MRI, can reveal subclinical remodeling in IIM patient without overt cardiac symptoms.

Materials and Methods: Fifty consecutive IIM patients (age 43±16, 70% F) without overt cardiac symptoms, and 20 age-(38±12) and sex- (70% F) matched healthy controls were enrolled in the study. All subjects underwent cardiac MRI examination on a 3.0T MR scanner. Four-chamber and short-axis steady state free precession (SSFP) cine were performed to evaluate the cardiac function and myocardial strain. Biventricular volume, mass, and EF were computed from the cine images. Global circumferential strain (GCS) and global longitudinal strain (GLS) were computed by the deformable image registration approach. Regional strain was differentiated at the left ventricular free

wall (LVFW), septal wall (SW) and right ventricular free wall (RVFW), in three sections: base, mid, and apex.

Results: Compared to the controls, biventricular volume, mass, and ejection fraction showed no significant difference in IIM (P >0.05 for all). LV GLS, RV GLS and RV GCS both reduced significantly in IIM (-13±5% vs. -16±4%, P=0.005; -10±5% vs. -15±3%, P<0.001; -10±7% vs. -15±4%, P=0.001, respectively), while LV GCS had no significant changes (P=0.452). In regional strain analysis, when compared to controls, RVFW basal LS and mid CS had significant impairment (P=0.01 and P=0.01). RVFW apical LS and CS reduced in the IIM group (P=0.036 and P=0.002). SW mid LS decreased significantly (P=0.009).

Conclusion: While LV/RV EF remained unchanged, the biventricular myocardial strain showed significant changes in IIM, indicating subclinical cardiac involvement. In particular, regional strain analysis showed that RV impairment is more pronounced in IIM compared to LV.

OR-388

Intracardiac Flow during Early and Late Left Ventricular Filling in Adolescent Volunteer: Quantitative Characterization Using 4D Flow MRI

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Background: Left ventricular(LV) intracardiac flow has been suggested to critically contribute to efficient blood pumping function. However, there are no standards for the evaluation of intracardiac blood flow. Recent improvement of the measurement on the velocity accuracy at the peak mitral inflow in 4D flow CMR analysis made it possible to establish the quantitative criteria of intracardiac blood flow. **Purpose:** The aim of the study is to assess quantitative method of intracardiac blood flow including flow component, vortex formation time, valve circularity index and index vortex size using 4D flow MRI in adolescent volunteer. **Methods:***Subjects*: 4D flow CMR data from adolescent volunteer (15 years, Male) were retrospectively identified from studies performed. The volunteer had normal blood pressure and were free of cardiovascular disease. This case-control study was approved by our institutional review board and research images was performed after signed informed consent. *CMR analysis*: CMR analysis was performed with commercially available software (Cvi42, Circle Cardiovascular Imaging, Canada). The EDV, ESV, EF and SV of the LV were determined from short-axis cine images. The mitral valve is defined as the inflow slice and the aorta is defined as the outflow slice by three-chamber cine images, its ability to track mitral valve plane motion. The flow component was calculated by different flow pattern including direct flow, delayed ejection flow, retained in flow and residual volume (Figure 1). The trans-mitral valve velocities and time to peak of E-wave and A-wave were determined from the 4D flow CMR data. The orientation of the mitral valve and the ring shape were quantified by the circularity index (CI). We defined the ratio between the valve's short to long as circularity index (Figure 2). :

where, : with the diameter of the mitral valve(D) calculated as the mean of maximum distance between the leaflet tips during the rapid filling phase, perpendicular to the flow direction, in the three-chamber view, and the distance between the commissures on a short-axis slice through the mitral valve (Figure 2). The E-wave volume (EWV) was defined as the difference in volumes of the LV at the end of the E-wave and ESV. The E/A was defined the ratio between the velocity of early phase diastole and late phase diastole. The vortex size was defined the diameter of clockwise vortex in the left ventricle center at the end of diastole phase. We use 4D flow images to measure vortex diameter by using MATLAB Laplacian filtered (Figure 3). **Results:** The results of flow components were highly related with ejection fraction (Direct Flow + Delayed Ejection Flow=Ejection fraction) . The value of vortex formation time and E/A ratio were in normal range compared with echocardiography (Figure 5). The CI of peak early filling mitral valve was lower than the peak late filling, it appeared like a circular (1.28 < 1.5).

Conclusion: The study provides quantitative characterization by 4D flow MRI which may allow early quantitative evaluation of intracardiac flow in patients with cardiac disease.

OR-389
主动脉瓣关闭不全患者心脏磁共振成像特征及其发生心肌纤维化的影响因素分析

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[摘要]目的 探讨主动脉瓣关闭不全(AI)患者心脏磁共振成像（CMR）的特征，并通过 CMR 判断此类患者心肌纤维化发生的情况，并在此基础上分析 AI 患者发生心肌纤维化的影响因素。**方法** 回顾性分析 2011 年至 2015 年在阜外医院经影像资料确诊为慢性 AI 患者 59 例，入选者均接受了心脏磁共振和经胸超声心动图检查。根据是否合并 BAV 将入选者分为 BAV 组和非 BAV 组，以手术病理为金标准判断患者是否合并 BAV；通过临床门诊及住院电子资料收集入选者的一般资料。采用 kappa 检验评估 TTE 和 CMR 检测 AI 反流程度的一致性；多因素 logistic 回归分析评估 AI 患者发生心肌纤维化的影响因素。**结果** BAV 组患者 LVEF 低于非 BAV 组，而 LVEDVi、LVESVi 和 LGE 比例均高于非 BAV 组（*P* 均＜0.05）。强化组患者合并 BAV 共 19 例，其中 L-R 型 10 例（52.6%）、R-N 型 5 例（26.3%）、L-N 型 4 例（21.1%）；强化组患者 LVEF 和 BSA 均低于非强化组，而 LVEDVi、LVESVi 和 LVMi 均高于非强化组，合并 BAV 的比例高于非强化组（*P* 均＜0.05）。BAV 组患者中 AI 反流程度Ⅱ级及以上者占比明显高于非 BAV 组（*P*=0.015）。CMR 与 TTE 对 AI 严重程度分级评价的符合率为 81.4%（48/59），*Kappa* 值为 0.624，95%*CI* 0.402~0.831，*P*＜0.001，提示二者一致性较好。多因素 logistic 回归分析结果显示，在调整了年龄、LVEF 等因素后，BAV 仍是 AI 患者发生心肌纤维化的独立影响因素（*OR*=5.050，95%*CI*=1.220~20.908，*P*=0.025）。**结论** 多参数无创 CMR 能检测 AI 患者发生心肌纤维化、心室重构的程度，BAV 是 AI 患者发生心肌纤维化的独立影响因素。

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冠状动脉周围脂肪直方图参数鉴别急性冠脉综合征及稳定性冠心病的价值初探

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目的 基于冠状动脉 CTA 图像，探讨冠状动脉周围脂肪组织直方图参数在鉴别急性冠脉综合征及稳定性冠心病中的价值。
方法 回顾性分析 93 例行冠状动脉 CTA 检查患者的临床资料及 CTA 图像。其中 39 例为急性冠脉综合征患者，54 例为稳定性冠心病患者。在狭窄冠脉周围勾画感兴趣区（ROI），取 CT 值范围为[-30HU]~[-190HU]以剔除非脂肪组织。测量剔除非脂肪后的 ROI 的 CT 值，行直方图分析，所获参数包括平均值、中位数和第 5、10、45、55、70、95 百分位数。比较两组之间的直方图参数的差异，随后基于 ROC 分析，评价各参数鉴别急性冠脉综合征和稳定性冠心病的价值。
结果 急性冠脉综合征组与稳定性冠心病组间平均值、中位数和第 5、10、45、55、70、95 百分位数差异有统计学意义（*P*均＜0.05）。其中中位数的 ROC 曲线有最高的 AUC 值 0.73。通过多元逻辑回归构建的诊断模型的灵敏度为 82.1%，特异度为 89.1%，曲线下面积为 0.9。
结论 冠周脂肪直方图分析在鉴别急性冠脉综合征和稳定性冠心病具有较高价值。

OR-391
Application of coronary CT in Primary prevention of coronary heart disease during patients with Dyslipidemia

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Abstract ***Purpose*** To investigate the role of coronary CT artery imaging in Primary Prevention of Coronary Heart Disease(CHD) in Patients with Dyslipidemia. ***Materials and Methods*** Eighty-seven patients (66 males and 21 females, mean age 61.5 ± 13.18 years)with dyslipidemia and no typical angina symptoms underwent 64-slice CT coronary imaging examination. All cases were grouped into High-risk (n=28), intermediate-risk (n=27) and low-risk (n=32) according to Chinese adult dyslipidemia Prevention Guide about Adult dyslipidemia risk stratification scheme. Observation of coronary plaque and its vulnerability and ratings, then blood Lipid risk stratification. Total cholesterol(TCh), low density lipoprotein(LDL) and plaque score values between Pearson correlation analysis; comparison between the three groups of plaque score differences. ***Results*** In patients with dyslipidemia, LDL and TCh value and the risk of coronary atherosclerotic plaques was no significant correlation (r = 0.049,0.004, P = 0.591,0.967); while dyslipidemia risk stratification and coronary plaque risks associated (r = 0.67, P = 0.000). Scores among the three groups of patients was statistically significant (F = 34.150 P = 0.000), the difference between the each two groups was also statistically significant (P<0.01). ***Conclusion*** According to Chinese adult dyslipidemia prevention guidelines in primary prevention of CHD, coronary CT

screening should be the first choice for the group of patients with intermediate-risk and should be the focus for the high-risk group patients within blood lipid risk stratification.

OR-392

Tearing Pattern of aortic dissection in descending aorta: A quantitative study

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Background: The tearing pattern of intimal tear in descending aorta may be regular.
Objective: The purpose of this study was to quantitatively analyze the distribution of intimal tear in descending aortic dissection by refering to the relative position of vertebral count, in order to clarify the tearing pattern of intramural separation.
Material and Methods: Sixty-five patients with aortic dissection were enrolled and underwent Aorta CT angiography in this retrospective study (median age: 54 years, 49 males and 16 females). The data acquisition planes were located by the vertebral counts on the midsagittal images. Axial images of vertebral counts order were used for true lumen clock direction (TLCD) calculating. The area and attenuation of true and false lumen were measured. The nonlinear least squares method as the main statistical method was used for curve fitting. P values<0.05 were considered as significant.
Results: TLCDs of different vertebrae counts for both type A and B dissections were no differences (all $P>0.05$). TLCD curves for type A and B were regression parabol. The cubic equations were $y=8.256+0.124x-0.028x^2+0.01x^3$ and $y=7.890+0.194x-0.021x^2+0.0002x^3$ for type A and B, respectively. The ROC curves showed that the area under curve of absolute area, relative area and average attenuation were 0.846, 0.950 and 0.525, P values were <0.001, <0.001 and 0.092, respectively.
Conclusions: The intimal tear in descending aorta in Stanford type A and B dissections rotated spirally in a clockwise, counterclockwise and clockwise order. The true and false lumen could be accurately distinguished by the relative area.

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CT morphological index provides incremental value to machine learning based CT-FFR for predicting hemodynamically significant coronary stenosis.

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AIMS: To study the diagnostic performance of the ratio of Duke jeopardy score (DJS) to the minimal lumen diameter (MLD) at coronary computed tomographic angiography (CCTA)

and machine learning based CT-FFR for differentiating functionally significant from insignificant lesions, with reference to fractional flow reserve (FFR). METHODS AND RESULTS: Patients who underwent both coronary CTA and FFR measurement at invasive coronary angiography (ICA) within 2weeks were retrospectively included in our study. CT-FFR, DJS/MLDCT ratio, along with other parameters, including minimal luminal area (MLA), MLD, lesion length (LL), diameter stenosis, area stenosis, plaque burden, and remodeling index of lesions, were recorded. Lesions with FFR </=0.8 were considered to be functionally significant. One hundred and twenty-nine patients with 166 lesions were ultimately included for analysis. The LL, diameter stenosis, area stenosis, plaque burden, DJS and DJS/MLDCT ratio were all significantly longer or larger in the group of FFR</=0.8 (p<0.001 for all), while smaller MLA, MLD and CT-FFR value were also noted (p<0.001 for all). CT-FFR and DJS/MLDCT ratio showed the largest AUC among all single parameters (AUC=0.85 and AUC=0.83, respectively; p<0.001 for both) for diagnosing functionally significant stenosis. Combining CT-FFR and DJS/MLDCT ratio provided incremental value for discrimination between flow-limiting and non-flow-limiting coronary lesions and yielded the best diagnostic performance (accuracy of 83.7%). CONCLUSIONS: The combination of ML-based CT-FFR and DJS/MLDCT allows accurate non-invasive discrimination between flow-limiting and non-flow-limiting coronary lesions.

OR-394
白塞病累及冠状动脉与大血管所致假性动脉瘤的 CTA 表现

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目的 评估 CTA 成像对白塞病所致冠状动脉与大血管假性动脉瘤的诊断效能。 **方法** 回顾性分析 2012 年 1 月至 2015 年 1 月我院单中心因白塞病行全身各部位 CTA 成像患者 48 例，其中 32 例存在全身不同部位的假性动脉瘤。分析 CTA 图像质量；假性动脉瘤部位、瘤颈大小、瘤体深度、瘤内附壁血栓、载瘤动脉受累情况。**结果** 32 例假性动脉瘤患者 CTA 图像质量均为优，其中 8 例为冠状动脉动脉瘤、7 例为四肢动脉动脉瘤、3 例为肺动脉动脉瘤、12 例为内脏动脉动脉瘤、2 例为头颈动脉动脉瘤。80%的动脉瘤内有附壁血栓形成。平均瘤颈大小 3.2±0.8mm、平均瘤体深 5.3±2.6mm。57%的载瘤动脉受累，表现为血管壁增厚、血管腔狭窄或串珠样改变。**结论** CTA 成像对白塞病所致冠状动脉与大血管假性动脉瘤的诊断具有定性和定量的诊断价值。

OR-395
Low-kilovolt coronary CTA imaging for low-density plaque, a Dual-Energy coronary CTA examination

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Objective: Low-kilovolt (70-90KV) imaging is widely used in the imaging of coronary CTA, and the previous studies focus only on the quality of the image. The quantification of images that can be provided is less, and the definition of low-

density patches (<30 HU) in the coronary artery disease-report and data system (CAD-RADS) is based on the 120KV image, and we use dual-Energy coronary CTA imaging to analyze non-calcified plaques, It is known whether low-density patches will be missed at low KV conditions. Method:15 subjects were prospectively registered. Dual-energy coronary CTA imaging was performed using a third-generation dual-source CT scanner (SOMATOM Force, Siemens Healthcare) at 90/ Sn150kVp. A dual energy image is reconstructed by a linear combination of a)90 and Sn150kVp data, b) a virtual single energy algorithm of 40 to 120 keV (at a 10 keV interval). The CT value of non-calcified plaque under different kev conditions and the attenuation curve of the plaque were measured manually. The results were compared using a linear mixed model that takes into account the correlation of subjects within the plaque. Results: The 40-60 keV image significantly underestimated the low-density plaque (P <0.01), the subjective score of 70-90 keV image was high, but it still underestimated the low-density plaque (P <0.05). Conclusion: Low-kilovolt imaging is likely to miss low-density plaque, and should be paid attention to in clinical diagnosis.

OR-396

Vulnerable Plaques hide in heavily Calcified Coronary arteries

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ABSTRACT

OBJECTIVES: The aim of this study was to assess the accuracy of CCTA plaque patterns *in vivo* to detect vulnerable atherosclerotic lesions in comparison with histopathological findings.

METHODS: Eight heart transplant recipients (8 male; mean age, 48.5±11.6 years; range 37-65 years) underwent CCTA exams prior to heart transplant surgery. Segment-based CCTA sections were independently evaluated for various plaque patterns including non-calcified plaque (NCP) with napkin ring sign (NCP-NRS), NCP without napkin-ring sign (NCP-non-NRS), mixed plaque with diamond-attenuation sign (MP-DAS), MP without DAS sign (MP-non-DAS), and calcified plaque (Ca-plaque).

RESULTS: NCP-NRS plaques in 6.4% (23/358), NCP-non-NRS plaques in 24.0% (86/358), MP-DAS plaques in 18.2% (65/358), MP-non-DAS plaques in 20.1% (72/358), and Ca-plaques in 7.0% (25/358) of all cases. The specificity and positive predictive values of the MP-DAS and NCP-NRS signs to identify vulnerable plaque features were excellent (97.1% vs. 98.6%, 90.8% vs. 87.0%, respectively). DAS plaques were more frequently seen on CCTA exams than that of NRS (39.3% vs. 13.3%, respectively, p=0.001). The diagnostic performance of the plaque-calcification-pattern (PCP) which include both MP and Ca-plaque to identify coronary lesions with vulnerable features was high [area under the curve (AUC), 0.883; 95% CI, 0.845-0.914, p<0.001]. The diagnostic performance of MP-DAS to identify vulnerable coronary lesions was superior compared to NCP-NRS (AUC, 0.756 vs. 0.558, respectively, p<0.001).

CONCLUSIONS: The assessment of PCP improves the diagnostic accuracy of CCTA to identify vulnerable coronary atherosclerotic lesions hiding in heavily calcified coronary arteries. Both the DAS and NRS had a high specificity and positive predictive value for the presence of vulnerable lesions.

OR-397

Feasibility of low-Dose coronary CT angiography with a 16cm Wide-detector dual-energy spectral CT: A prospective randomized controlled study

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Objective: To validate the feasibility of low-dose coronary CT angiography (CCTA) by using Revolution CT and high concentration iodinated contrast medium.
Methods: 180 patients with suspected coronary heart disease underwent CCTA scans on a 16cm wide-detector dual-energy CT (GE Healthcare). Patients were randomly divided into 3 groups: Group A, tube voltage 100 KV with noise index (NI) 25; Group B, tube voltage 80 KV with NI 25; and Group C, tube voltage 80 KV with NI 30. The total volume of contrast medium injected was set as 60 ml with a flow rate of 5ml/s, and the contrast medium for Group A, B and C were Iohexol 350, Iohexol 350, and IOM 400，respectively. The total effective radiation dose (ED) during CCTA period were recorded. The subjective image quality of CCTA was assessed by two experienced radiologists using a 4-point ranking scale. CT values and SD values of starting point of the ascending aorta, the left main trunk, the left anterior descending branch, the left circumflex branch and the right coronary artery were measured to evaluate the objective image quality of CCTA. The corresponding image quality and ED among 3 groups were compared for statistical analysis.
Results: There was no significant difference in age (33-83 years old) and body mass index (BMI, 15.6~29.7kg/m^2) ($P>0.05$)among 3 groups.Significant differences in ED of CCTA were obtained among 3 groups (1.31±0.48 mSv，1.10±0.30 mSv，and 0.76±0.18 mSv, respectively) ($P<0.05$). No significant differences were found in subjective image quality of CCTA among 3 groups ($P>0.05$). ED of group B was 37.78% lower than that of group A, and ED of group C was 10.36% lower than that of group B.
For objective image quality comparison, significant differences of signal-to-noise ratio of the starting point of the ascending aorta (AA) left main trunk (LM) were observed between group A and B and group A and C ($P<0.05$), significant differences of signal-to-noise ratio of the starting point of the right coronary artery (RCA) were also observed between group A and C ($P<0.05$), and no significant differences of signal-to-noise ratio of the starting point of AA, LM, RCA, the left anterior descending branch (LAD) , the left circumflex branch (LCX) were found among B and C groups.
Significant differences of contrast-to－noise ratio of the starting point of AA and LM and RCA were observed between group A and B and group A and C ($P<0.05$), Significant difference of contrast-to－noise ratio of the starting point of LCX were found among between A and B groups. Significant differences of contrast-to－noise ratio of the

starting point of LAD were observed among 3 groups. however no other significant difference were observed between group B and C (P>0.05).
Conclusion: The new 16cm wide-detector dual-energy CT enables low-dose CCTA. This study demonstrates that it is feasible to achieve further dose reduction of 13.8% by using IOM 400 as a routine injection protocol while still maintaining satisfactory image quality.
Clinical significance: The Low-dose CCTA simplifies the workflow, and using IOM 400 may reduce the dose to a level similar to the routine CCTA, promoting the clinical application on a large scale.

OR-398

clinical significance of coronary CT angiography myocardial flow index (CCTA-MFI) in diagnosis of ischemic calcified plaque.

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Objective To evaluate the clinical significance of coronary CT angiography myocardial flow index (CCTA-MFI) in diagnosis of ischemic calcified plaque. **Methods** 570 patients with suspected coronary artery disease (CAD) were collected from February, 2018 to December, 2018. The GRACE hospital mortality risk score was low. Heart rate, blood pressure were measured three times at intervals of 10 minutes. At the same time, BMI was calculated. Then the CCTA protocol was performed. 182 high-quality images were enrolled with obvious calcified plaque in the proximal and middle segments of coronary artery.
Left ventricular myocardial mass was calculated by post-processing software. Contrast agent tracing technique was used to calculate the cycling time, and the CCTA-MFI was completed. There were 94 patients who underwent invasive coronary angiography within 1 week after CCTA. Using ICA as the gold standard (stenosis degree > 70%), the stenosis of CCTA with a value of > 50% or CCTA-MFI with less than twice the standard deviation of average was used to predict coronary artery disease (ICA, stenosis degree > 70%). The ROC curves of CCTA and CCTA-MFI were analyzed. Chi-square test was used for nonparametric data, $P < 0.05$ showed significant statistical difference. **Results** Among 94 patients, 50 were males and 44 were females (mean age 63.3 ± 9.31 yrs). 53 (56.38%, 53/94) were diagnosed by ICA with the degree of stenosis of more than 70%. Twice the standard deviation of CCTA-MFI was 0.088. The correlation coefficients of CCTA and CCTA-MFI to ICA are -0.4351 and 0.4854, and the cutoff values are 50% and 0.097, respectively. The stenosis degree with CCTA was above 50% in 83 cases. 58 were less than 0.097 of CCTA-MFI. The sensitivity and specificity of CCTA and CCTA-MFI in evaluating CAD were 98.31%, 28.57% and 81.54%, 82.76%, respectively. The positive predictive value and negative predictive value were 69.88%, 90.91% and 91.38%, 66.67%, respectively. The accuracy was 72.34%, 81.91% respectively (χ^2 =2.429, P = 0.1191). The area under ROC curve was 0.5000, 0.732 (Z = 2.367, P = 0.0179). Of the 94 patients, 26 (49.06%) underwent successfully percutaneous coronary intervention, 2 (3.77%) underwent coronary artery bypass grafting, and the symptoms of angina pectoris were

significantly alleviated. 25 (47.17%) underwent the best drug conservative treatment with stable condition. 41 cases received primary prevention of coronary heart disease.
Conclusion CCTA-MFI can significantly improve the diagnostic accuracy of CCTA for coronary artery calcified plaques. It may be necessary to receive active clinical intervention for the patient with an obviously calcifying coronary artery and a reducing CCTA-MFI.

OR-399

New Indicators that Impact the Outcome of TEVAR in Complicated Type B Aortic Dissection

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Background: Few studies have evaluated the influence of morphological parameters obtained by dynamic CT angiography (CTA) on outcomes after thoracic endovascular aortic repair (TEVAR). Thus, we investigated the predictive roles of dynamic variables on TEVAR outcomes in patients with complicated type B aortic dissection (*cTBAD) and* the effect of TEVAR timing on prognosis.
Methods: Seventy-nine patients with cTBAD who underwent TEVAR from July 2009 to March 2018 were retrospectively enrolled. *Patients were classified into three groups by the length of time between symptom onset and TEVAR* (hyperacute: <2 days; acute: 2-14 days; subacute: 14-90 days). Dynamic morphological variables obtained by multiphase imaging were reviewed , and endpoints included early (≤30 days) and late (>30 days) outcomes after intervention.
Results: The highest mortality (13.9%, 11/79) and adverse event (24.1%, 19/79) rates occurred within 30 days after the procedure in the total cohort. Survival and event-free rates were significantly worse for TEVAR performed during the hyperacute phase than during the acute and subacute phases (all p<0.001). The time of relative true lumen area (r-TLA) <25% in one cardiac cycle (p=0.049) and differences between the maximum and minimum r-TLA (D-TLA) (p<0.001) were associated with increased early death. D-TLA (p=0.006) and TEVAR performed in the hyperacute phase (p=0.006) strongly predicted early mortality. Survival during long-term follow-up was worse for the D-TLA >21.5% group than for the D-TLA ≤21.5% group (p<0.001).
Conclusion: A larger D-TLA is associated with worse postoperative survival, and the time window associated with the worst TEVAR outcomes may be the hyperacute phase.

OR-400

Remission of “Mistletoe sign” after treatment

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We are the first to describe a 55-year-old man in whom first manifestation of retroperitoneal fibrosis (RPF) was only coronary arterial involvement, which have no periaortic or peri-iliac and urinary system retroperitoneum involvement in general and other systemic clinically manifestations. On images, the coronary manifestation was termed the “mistletoe sign.” Recent reports have shown that to some extent, that cases of idiopathic retroperitoneal fibrosis (IRPF) included immunoglobulin G4-related retroperitoneal fibrosis (IgG4-related RPF). MU et al. described a young woman in whom first manifestation of IRPF was coronary arterial involvement. Horvat et al. reported a 69-year-old woman presented with symptoms of presumed cardiac involvement of IRPF with a normal IgG4 level, and CT images demonstrated a confluent, irregularly shaped, retroperitoneal soft-tissue mass growing around the aorta and the common iliac arteries, obstructing both ureters. Yamakaw et al. demonstrated a case, which the first description of remission of retroperitoneal mass in a patient with IgG4-related RPF.We here in report a case of remission of IgG4-related RPF that was only coronary arterial involvement after treatment.

OR-401

校正的管腔内密度变化对冠状动脉支架内再狭窄的诊断价值

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目的 以侵入性冠状动脉造影（ICA）为参照标准，评价校正的冠状动脉管腔内密度变化（CCO）与冠状动脉 CT 血管成像（CCTA）在诊断冠状动脉支架内再狭窄（ISR）中的价值。
资料与方法 回顾性分析 2015 年 1 月至 2017 年 10 月重庆医科大学附属第二医院有 CCTA 和 ICA 结果的冠状动脉支架置入术后的 86 例患者，136 支血管，以 ICA 结果将支架狭窄程度分为通畅组、狭窄组和闭塞组。计算支架近远端 CCO，和 CCTA 目测法评价 ISR。计算 CCO、CCTA 和 CCO+CCTA 诊断 ISR 的敏感度、特异度和受试者工作特征（ROC）曲线下面积。
结果 通畅组 76 支，狭窄组 38 支，闭塞组 22 支，3 组的 CCO 分别是 0.222±0.083、0.317±0.085 和 0.485±0.097，差异均有统计学意义（P<0.01）。CCO、CCTA 和 CCO+CCTA 诊断 ISR 的 ROC 曲线下面积分别为 0.859、0.811 和 0.882，CCTA 与 CCO+CCTA 比较，差异有统计学意义（P=0.001）；诊断支架闭塞的 ROC 曲线下面积分别为 0.947、0.842 和 0.972，其中 CCTA 与 CCO+CCTA 比较，差异有统计学意义（P=0.006）。
结论 CCO 随支架狭窄程度增加而增高；CCO+CCTA 显著提高了 CCTA 对 ISR 的诊断准确性。

OR-402

Feasibility of epicardial fat measurement for the prediction of metabolic syndrome using screening low-dose chest CT

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Objective: To explore the feasibility of epicardial fat measurement for the prediction of metabolic syndrome (MetS) in lung cancer screening patients using low-dose chest CT.
Methods: 120 asymptomatic male lung cancer screening subjects who underwent chest nonelectrocardiography (ECG)-gated low-dose CT were randomly divided into two groups, the analysis group (Group A, N=67) and the validation group (Group B, N=53). They were further divided into 2 subgroups according to whether they have MetS or not (non-MetS), respectively. The semiautomatic quantification of epicardial fat volume (EFV) and epicardial fat area (EFA) were calculated by post-processing software. Intraclass correlation coefficient was used to test the consistency of inter- and intra-observer EFV and EFA measurements. Comparisons of measurement data between the two groups were conducted by independent sample t test, and Chi-square test was used for the comparison of counting data. The diagnostic performance of EFV and EFA were compared by the area under ROC curve. Youden index was used to calculate the best predictive values of EFV and EFA, and the sensitivity, specificity, accuracy, positive predictive value (PPV) and negative predictive value (NPV) were all calculated.
Results: There were significant differences in both EFV and EFA between the MetS and non-MetS subgroups in group A (P<0.001). The AUC of EFV was significantly larger than that of EFA (0.912 and 0.807 respectively, P<0.05). With a cutoff value of 93.67 and 4.91 for EFV and EFA respectively, the sensitivity, specificity, accuracy, PPV and NPV for the prediction of MetS were 85.1% and 84.7%, 93.2% and 65.1%, 91.2% and 69.8%, 81.2% and 45.1%, 95.2% and 92.1%, respectively. The cutoff values of EFV and EFA in group A have a good diagnostic performance in group B, and there was no significant difference in the cutoff values and diagnostic performance between the two groups.
Conclusion: The quantification measurement of epicardial fat is feasible for the prediction of MetS using chest low-dose CT, and EFV may have a higher and better diagnostic performance than EFA.

OR-403
心脏磁共振组织追踪技术评价急性心肌炎 左室整体心肌应变的应用价值

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目的 应用心脏磁共振组织追踪技术评价急性心肌炎左室整体心肌应变及其与左室射血分数和延迟强化节段数的相关性。
方法 收集 2016 年 1 月至 2018 年 8 月期间在我院住院并临床诊治为 ACM 为病例组 35 例，选取性别与年龄相符的健康志愿者为对照组 27 例；将病例组根据 CMR 影像特征分为阳性组 21 例、阴性组 14 例。所有研究对象接受心脏磁共振检查。用 Argus 后处理软件测量左室心功能参数；CVI42 软件测量左室整体心肌应变参数。按照美国心脏协会左心室心肌 17 节段划分方法，观察左心室心肌出现延迟强化的节段及数目；收集病例组临床和 CMR 影像特征。两组间定量资料比较用 t 检验或非参数检验。运用受试者操作特征曲线分析两组间存在差异的参数，左室整体心肌应变与 LVEF 和 LGE 节段数的相关性分析采用 Spearman 相关；分析左室整体心肌应变在观察者间及观察者内的一致性。
结果 病例组与对照组比较，病例组 GRSP、GLSP、GCSP 明显减小，差异均具有统计学意义（$P<0.05$）。CMR 阴性的 ACM 与对照组比较，GRSP、GCSP 明显减小，差异具有统计学意义（$P<$

0.05）。相关性分析：病例组 GRSP、GLSP、GCSP 与 LVEF 呈较强相关，病例组 GRSP、GLSP、GCSP 与 LGE 节段数呈较强相关。左室整体心肌应变对 ACM，尤其是 CMR 阴性的 ACM 有一定的预测价值。左室整体心肌应变在观察者间及观察者内均具有较好的一致性。

结论 （1）ACM 患者 LGE 多位于左室侧壁，其次是间壁，主要为心外膜下延迟强化。（2）心脏磁共振组织追踪技术能定量评估 ACM 左室整体心肌应变；与 LVEF 相比，左室整体心肌应变能早期发现心肌功能受损；且与 LVEF、LGE 节段数有较强的相关性，可成为评估心功能的新参数。（3）左室整体心肌应变对 ACM，尤其是 CMR 阴性的 ACM 有一定的预测价值；可为临床及时诊断、治疗，改善预后提供影像依据。

OR-404

Association B-type natriuretic peptide (BNP) of and Dialysis Vintage with CMRI- derived cardiac indices in Stable hemodialysis patients with Preserved Left Ventricular Ejection Fraction

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Background: Cardiovascular disease (CVD) is a major cause of morbidity and mortality in (HD) patients. Native T1/T2 mapping and tissue-tracking strain analysis by cardiac magnetic resonance imaging (CMRI) are proved to be useful as early quantitative techniques for evaluating myocardial tissue and mechanical alterations in HD patients. We aim to assess the left ventricular myocardial native T1/T2 values and systolic strains and the associations with B-type natriuretic peptide (BNP) and dialysis vintage in HD patients with a preserved left ventricular ejection fraction (LVEF).

Methods: Forty-three stable HD patients (mean age: 59±11 years; 28 males)with end-stage renal disease but a preserved LVEF (≥50%) and 28 healthy volunteers (mean age: 61±7 years; 14 males)matched for sex, age, and body mass index. The native T1/T2 values of the left ventricular myocardium were measured on the T1 and T2 maps. The left ventricular global systolic strain was evaluated on routine cine images using prototype postprocessing software. BNP was measured at the time of CMR measurements.

Results: Compared with controls, the global native T1 and T2 values were significantly higher in the HD patients than in the controls (native T1: 1056±32 ms vs. 1006±25 ms, $p<0.001$; T2: 50±3 ms vs. 46±2 ms, $p<0.001$). The mean peak global circumferential strain (GCS) and global longitudinal strain (GLS) were both significantly reduced in the HD patients compared with the controls (GCS: -13±3 vs. -16±3, $p<0.001$; GLS: -12±4 vs. -15±3, $p=0.001$). However, no significant difference was found between two groups regarding LVEF(61±8 vs 64±8, $p=0.057$). In HD patients, a significant positive correlation was found between T2 value and BNP levels ($r=0.402, p<0.001$).The GLS was independently correlated with the dialysis vintage in HD patients (standardized $\beta=-0.321$, $p=0.044$).

Conclusion: The HD patients with preserved LVEF have increased native T1/T2 value and decreased strain, with T2 values relates to high BNP. GLS may be improved in long-term HD patients.

OR-405
CT 动态负荷心肌灌注检查相对心肌血流量参数对冠状动脉粥样硬化性疾病心肌缺血的诊断价值

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目的
探讨 CT 动态负荷心肌灌注检查诊断冠心病心肌缺血的最佳相对心肌血流量（MBF）参数。
方法
前瞻性入组 86 例有临床症状的冠心病患者，所有患者均在第三代双源 CT 上接受 ATP 负荷动态心肌灌注检查。将重建图像传至西门子数据后处理工作站(Syngo.via VB10)上进行初步分析。心肌灌注节段依据美国心脏学会（AHA）的 17 节段标准，每一节段对应相应的冠状动脉供血区。在心内膜下心肌血流量牛眼图上以冠状动脉供血分布为依据，感兴趣区域勾画在不同供血区内的灌注缺损区域，获得半自动 MBF 值。相对 MBF 比值定义为半自动绝对 MBF 值除以参考 MBF 值。根据参考 MBF 值不同，定义三种相对 MBF 值。比值 1：参考 MBF 值为所有节段 MBF 的平均值；比值 2：参考 MBF 值为所有节段中最大 MBF 值的 75%；比值 3：参考 MBF 值为所有节段中最大 MBF 值。金标准为冠脉造影时测量的 FFR 值。
结果
86 例进行 CT 心肌灌注检查的患者中有 60 例患者（男性 43，女性 17）进行了冠脉造影检查并测量 FFR 值，共计 151 支血管。以所有节段中最大 MBF 值为参照的相对比值 3 诊断缺血效能最高。曲线下面积为 0.906（95% CI: 0.857-0.954），比值 1 和比值 2 的曲线下面积分别为 0.879 及 0.906，差异有统计学意义。比值 3 的敏感性、特异性、阳性预测值、阴性预测值、诊断准确率分别为 74.1%、93.6%、87.8%、85.3%、86.1%。
结论
以所有节段中最大 MBF 值为参照计算出的心内膜下心肌相对 MBF 比值诊断冠心病心肌缺血的效果最佳。

OR-406
磁共振组织跟踪技术评价心肌淀粉样变性与其他左心室肥厚疾病的左室应变

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目的 探讨心脏磁共振组织追踪技术(CMR-TT)定量评估心肌淀粉样变(CA)与其他左室肥厚疾病的心肌收缩功能及鉴别诊断价值。 **方法** 对 30 例 CA、30 例肥厚型心肌病（HCM）、29 例高血压所致左室肥厚（HLVH）及 30 例对照组（CON）行 CMR 检查，并使用 CVI42 后处理软件得到整体和各水平（基底部、中间部、心尖部）的 3D 左室径向应变(RS)、周向应变(CS)、纵向应变(LS)，计算左室心尖相对纵向应变比值（RSSR）及基底-心尖的纵向应变梯度差，并制作 ROC 曲线。 **结果** （1）CA 组、HCM 组、HLVH 组整体及各水平 RS、CS、LS 大多低于正常对照组（$P<0.05$）。（2）CA 组基底段 RS、CS、LS 均低于其他三组（$P<0.05$），中间及心尖部部分应变参数差异无统计学意义。（3）四组中基底到心尖的 LS 均是递增的，CA 组最为显著。RSSR 诊断 CA 及鉴别 CA 与 HCM、HLVH

准确度高（AUC=0.873,0.837,0.773，P<0.05）。RSSR 在＞0.7525 时，对于诊断 CA 的敏感度及特异度分别为 83.3%和 93.3%；用 RSSR 鉴别 CA 和 HCM、CA 和分别在＞0.7686 及＞0.828 时敏感度及特异度为：CA vs HCM: 83.3%和 90%；CA vs HLVH: 70%和 79.3%；基底-心尖的纵向应变梯度差在诊断 CA、鉴别 CA 与 HCM、HLVH 的准确度相对低:AUC=0.692，0.688，0.752，P<0.05。 **结论** CMR-TT 可以定量评价 CA 和其他左室肥厚疾病左室心肌收缩功能，且 RSSR 可作为鉴别 CA 较为实用的方法。

OR-407

Comparison of the T1 values of three T1 mapping sequences in native, stress and post-contrast conditions of myocardium

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Purpose;
To compare the native, stress and post-contrast T1 values obtained from different sequences for T1 mapping of the myocardium.
Materials and Methods;
We compared three T1 mapping sequences (FFM, MPI and LONG/SHORT) of 211 consecutive populations (patients and healthy volunteers) using conservative septal technique as the standardized approach. We calculated ventricular septum and related blood T1 in vivo through subsequent parametric mapping. We also analyzed the T1 differences of these sequences in native, stress and post-contrast conditions.
Results;
T1 values differed significantly depending on the sequence, with MPI providing consistently higher mean values than FFM (1310±62 ms vs. 1150±63 ms in native condition, 1327±63 ± 28 ms vs. 1153±61 ms in stress condition and 604±65 ms vs. 588±64 ms in post-contrast condition, mid-ventricular, respectively; p < 0.001), LONG providing higher and SHORT providing lower mean values than FFM (1075±109 ms vs. 1042±80 ms in native condition, 519±77 ms vs. 535±68 ms in post-contrast condition, mid-ventricular, respectively; p < 0.001) . T1 values also differed significantly depending on the stress, with stress FFM and MPI providing higher mean values than the native (1147±69 ms vs. 1135±63 ms, 1327±63 ms vs. 1302±57 ms, mid-ventricular, respectively; p < 0.001). On Passing-Bablok regression analysis, MPI is significantly correlated with FFM in native, stress and post-contrast (r=0.501, 0.450, 0.871, respectively; p < 0.001). FFM is significantly correlated with LONG, SHORT in mid-ventricular segment (r=0.805, 0.966, respectively; p < 0.001). On Bland-Altman analysis, the mean difference (95% limits of agreement) between MPI and FFM in native, stress and post-contrast is 160.1ms(48.8ms-271.4), 173.8ms(46.1ms-301.6ms), 16.8ms(42.4ms-75.9ms), respectively. The mean difference (95% limits of agreement) between FFM and LONG, SHORT in mid-ventricular segment is 32.3ms(-79.3ms-144.0), -17.2ms(-58.3ms-23.9ms), respectively.
Conclusion.

FFM and MPI showed good agreement with MPI values are much higher than FFM. FFM and LONG/SHORT showed good agreement with LONG values are higher than FFM and SHORT values are lower than FFM. Stress increase the T1 values of myocardium in FFM and MPI.
CLINICAL RELEVANCE/APPLICATION
T1 values differed significantly depending on the sequence and therefore it is necessary to respectively establish the T1 normal reference range according to different sequences.

OR-408
心脏磁共振 T2-mapping 技术在急性心肌炎中的应用价值

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目的 探讨 T2maping 定量分析急性心肌炎的心肌水肿的应用价值。**方法** 选择 2017 年 1 月至 2019 年 3 月在贵州省人民医院临床诊断心肌炎患者 36 例和 20 名健康志愿者（招募），分别行心脏磁共振常规检查、延迟强化和 T2mapping 序列成像，采用独立样本 t 检验比较心肌炎组和对照组的 T2 值差异，根据 LGE 结果将心肌炎患者分为 LGE 阳性组和 LGE 阴性组，对照组与 LGE 阳性组和 LGE 阴性组均值比较采用单因素方差分析，组间两两比较采用 Dunnett T3 检验，P<0.05 为差异具有统计学意义。**结果** 心肌炎组 T2 值（75.46±8.05） ms 明显高于对照组（65.21±11.78） ms；差异具有统计学意义（P<0.05）。 LGE 阳性组（76.95±8.41）ms、LGE 阴性组（70.23±3.71）ms 平均 T2 值均大于对照组（65.21±11.78）ms，LGE 阳性组平均 T2 值大于 LGE 阴性组，差异具有统计学意义（P<0.05）。**结论** T2mapping 能够通过测量心肌组织 T2 值、来定量评价心肌水肿的范围和损伤程度，具有良好的临床前景

OR-409
扩张型心肌病左室游离壁心肌延迟强化表型的初步研究

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【目的】探讨扩张型心肌病（Dilated Myocardiopathy, DCM）左室游离壁心肌延迟强化（Late Gadolinium enhancement, LGE）的不同表型，为进一步分析其组织学特征及病因学提供影像学依据。
【方法】回顾性分析中国医学科学院阜外医院 2018 年 1 月-12 月符合纳入标准及排除标准、且冠状动脉造影或冠脉 CTA 结果阴性的连续性 DCM 患者 134 例。所有纳入者均行 3.0 T CMR 检查，分析患者 LGE 的发生部位、左室心肌游离壁 LGE 类型、累及范围及分布特征。
【结果】134 例患者中，LGE 阴性占 30 例，单独室间隔强化占 44 例，单独游离壁强化占 3 例，室间隔和游离壁多发强化占 57 例。与 LGE 阴性患者相比，室间隔和游离壁多发强化患者 LVEF 减低，LVEDD、LVEDVi、LVESVi 明显升高。60 例游离壁强化患者中，37 例表现为单一强化；23 例合并两种强化方式。其中透壁强化 21 例，心外膜下强化 19 例，心内膜下强化 9 例，心室肌壁间强化 30 例，斑片状强化 4 例。心外膜强化患者累及心肌节段最多（6.32±3.65），其次为透壁性强化（3.81±1.83）及肌壁间强化（3.57±2.60）。心外膜强化最常累及广泛侧壁（73.6%）和心中间层及心尖区的前壁（71.1%）及下壁（52.6%），透壁性强化最常累及左室基底段和心中间层的侧壁

（67.9%）及下壁（38.1%），肌壁间强化最常累及基底段和心中间层的前壁（61.7 %）及下壁（50 %）。
【结论】DCM 患者左室心肌游离壁不同 LGE 表型的分布、累及范围存在明显的差异，准确识别各种 LGE 表型有助于进一步判断患者的组织学及病因学，为精准治疗提供影像学依据。

OR-410

Clinical application of dark blood late gadolinium enhancement imaging in patients with myocardial infarction: a study using a 3T MR scanner

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Objectives: The objective of this study is to evaluate the clinical usefulness of the segmented TRAMINER dark-blood late gadolinium enhancement (DB-LGE) technique in myocardial infarction (MI) patients on a 3.0 T MR scanner.
Methods: LGE imaging with both dark-blood or traditional bright-blood techniques were prospectively performed in fifty-nine MI patients using a 3.0 T MR scanner. Subjective (four-point grading scale) and objective (contrast-to-noise ratio) assessments of contrast among MI, blood and normal myocardium were performed. Results: There was no significant difference in subjective overall image quality ratings between two readers (p=0.162). Both of the visual and objective assessments showed that MI-blood contrast of DB-LGE technique was superior to bright blood-LGE, but MI-normal myocardium contrast and normal myocardium-blood contrast were inferior to bright blood-LGE ($p<0.05$). There was no significant difference in LGE extent and patterns between two techniques ($p>0.05$). DB-LGE technique detected four more papillary muscle enhancement, while bright blood-LGE technique detected five more midwall enhancement patterns, one more mural thrombus and three more microvascular obstructions.
Conclusions: Segmented TRAMINER DB-LGE on a 3.0 T MR scanner provides superior signal contrast between MI and blood pool and may thus act as an complementary technique to conventional bright blood-LGE. But DB-LGE should not be considered as replacement for bright blood LGE as for its limitations. Attention should be paid when assessing microvascular obstructions, mural thrombus or midwall enhancement on DB-LGE images.

OR-411

A comparative study of left and right ventricular myocardial strain in hypertensive heart disease by MR tissue tracking technique

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Objective: To explore the differences and elucidate the effect of hypertension Of left and right ventricular strain and remodeling in patients with hypertensive heart disease (HHD) by MR tissue tracking technique.

Methods:36 HHD patients and 20 healthy volunteers were grouped according to left ventricular ejection fraction (LVEF≥50%,LVEF<50%), left ventricular diameter(LVD)[whether LVD was enlarged (female LVD > 54mm, male LVD > 59mm)divided to centripetal or centrifugal remodeling group] and atrium area(atrial area > 24 cm^2:the bilateral atrium was normal, only the left atrium was enlarged,the bilateral atrium was enlarged), respectively.

Results: Overall 36 HHD patients were finally analyzed,the global radial, circumferential and longitudinal peak strain(GPSR,GPSC,GPSL) of left and right ventricles were lower than those in normal group and with the decrease of ejection fraction,all showed decreasing trends (P<0.05).Left ventricular concentric remodeling changed to acentric remodeling, LPSR 25.23±6.85vs.11.37±4.03,LPSC-12.71±3.82vs.-6.94±3.08,and RPSR 21.06±5.06vs.11.02±4.80, RPSC-9.89±2.96vs.-4.55±2.13, RPSL-16.11±4.71vs.-9.98±3.80,(P<0.05,respectively).From normal biatrium, only left atrium enlargement to biatrial enlargement, LPSR27.20±6.80vs.22.19±6.60,10.58±4.56;LPSC-13.53±4.86vs.-10.85±2.84,-7.13±1.53(P<0.05) and RPSR 23.38±5.33vs.17.43±4.71, 11.04±3.59;RPSC -11.30±4.07vs.-7.54±3.17,-4.78±1.75(P<0.05).ROC curve showed that GPSL has the best diagnostic effect.The cut-off values were - 13.43% and - 16.74%, respectively,with a sensitivity of 89% and 82%, a specificity of 90% and 89%(AUC = 0.90 and 0.86, respectively).

Conclusions:HHD not only affects the left ventricle, but also contributes to right ventricular remodeling. There are differences in left and right ventricular remodeling and synergy in the evolution process. The degree of bilateral ventricular remodeling can be determined from the perspectives of ejection fraction retention, left ventricular configuration and atrial involvement. MR myocardial strain quantification, as a sensitive index of functional remodeling, especially longitudinal strain, can provide earlier and more accurate information for ventricular remodeling in HHD.

OR-412

Identifying early stages of doxorubicin-induced cardiotoxicity in rat model using 7.0 tesla cardiac magnetic resonance and creatine kinase isoenzymes

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Objectives:the aim of this study is to identify early stages of doxorubicin (DOX)-induced cardiotoxicity in rat model using 7.0 tesla cardiac magnetic resonance (CMR) combining creatine kinase isoenzymes (CKMB).

Methods: Twenty rats included. Twelve of these rats were injected DOX (2.5mg/kg) through vena caudalis weekly and were divided into four group. First group received DOX four weeks and underwent CMR examination after 4 weeks. The other groups received DOX six weeks and underwent CMR examination after 6, 8, 10 weeks, respectively. Two rats injected physiological saline (2.5ml/kg) also performed CMR examination at the same time of each experimental group. Thus, controls contained eight rats. All these rats were sacrificed after CMR examination and were collected venous blood to detect CKMB.End-diastolic volume indexed to body surface area (EDVi) , end-systolic volume indexed to body surface area (ESVi) , stroke volume indexed to body surface area (SVi) and ejection fraction (EF) for LV were quantified from all CMR images. Global radial (GRS), circumferential (GCS) and longitudinal strain (GLS) parameters of LV were also obtained by CMR tissue tracking (CMR-TT). All these parameters above were compared between treatment groups and controls.
Results: The earliest DOX-induced cardiotoxicity CMR parameter was GCS(-18.68±0.88 vs -22.44±0.53, p=0.010) decreasing at week 6, at this time, the other CMR parameters were unaffected. However, ESVi was increased and EF and SVi were declined at week 8 and week 10 (2 and 4 weeks after final DOX treatment), as well as GCS and GRS. For CKMB, it was significantly increased at week 4 (976.00±166.55U/L vs 399.00±16.97U/L). At this early time point, all CMR parameters were not affected. CKMB continued to rise at week 6 and week 8, however it had no significantly difference between treatment groups and controls at week 10 (387.67±57.88 vs 374.50±53.03, p=0.814).
Conclusion: CKMB, as a sensitive marker, can detect DOX-induced cardiotoxicity at the earliest time. Decreased GCS during treatment identifies impaired LV mechanic as an early marker of DOX-induced cardiotoxicity, in the absence of EF. CKMB can reverse after DOX treatment, although the impairment of LV mechanic and function still existed. CKMB and CMR-TT are an effective method to evaluateDOX-induced cardiotoxicity at early stage.

OR-413
Native T1-mapping 联合定量评估儿童杜氏肌营养不良患者心肌损伤及大腿肌肉脂肪替代

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目的 通过磁共振 native T1mapping 定量评估儿童杜氏肌营养不良（DMD）患者心脏及腿部肌肉的脂肪-纤维化，并探讨心肌损伤与肌肉脂肪替代程度的相关性。
材料与方法 纳入 2018 年 3 月-2019 年 2 月经基因检测或肌肉活检确诊为 DMD 的患者 75 名（平均年龄：8.9 岁，均为男性）。所有患儿进行心脏及臀部/大腿肌肉扫描。心脏图像包括电影序列及 native T1mapping，大腿/臀部扫描包括 T1WI、T2WI 及 mapping 序列。心脏后处理分析使用后处理软件进行心功能及 Native T1 值的分析（心基底部、中间部及心尖部）。臀部/大腿肌肉分别在 native T1mapping 和 T1WI 序列相匹配的图像上选取不同程度脂肪替代的肌肉勾画感兴趣区（包括臀部肌肉、股外侧肌、大部分收肌群、缝匠肌、阔筋膜张肌、大收肌及股薄肌），记录 T1 值以及 T1WI 图像信号值量并对脂肪替代程度进行分级（0-4 级）。首先通过独立样本 T 检验对比不同程度脂肪替代的肌肉的 T1WI 信号值以及 T1 值，随后将 T1 值与 T1WI 上信号值以及心肌和臀部/大腿肌肉脂肪替代程度进行相关性分析。

结果 患者主要受累的肌肉从 1 级到 4 级 T1WI 上信号值逐渐增高，且差距有统计学意义 *(P<0.05)*；从 1 级到 4 级 T1mapping 图像上定量测量 T1 值逐渐减少 *(P<0.05)*。通过相关分析显示，T1WI 信号值与 T1ms 呈负相关(r=-0.65)，T1ms 与脂肪替代呈负相关(r=-0.73)。臀大肌、阔筋膜张肌、股直肌、缝匠肌及闭孔肌 Native T1 值与心肌 Native T1 值存在一定相关性（R：0.29-0.36，P＜0.05）

结论 Native T1mapping 技术能定量评估儿童 DMD 患者的心肌及臀部/大腿脂肪替代情况，有助于更准确的分级；其次，心脏损伤可能与肌肉病变存在联系，对早期评估疾病累及程度具有更重要的意义。

OR-414

双源 CT 心肌灌注及心功能分析评糖尿病心肌损害价值的研究

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目的 应用双源 CT 静息态心肌灌注测定糖尿病患者心肌内标准化碘浓度值（NIC），结合左心室解剖结构变化及心功能分析，探究其评估糖尿病心肌损害的价值。**方法** 前瞻性收集行第三代双源 CT 心脏双能量扫描的患者。经西门子 syngo.via 后处理工作站，获取左心功能数据及心肌灌注碘图，并按照美国心脏协会推荐的标准心肌 17 分段法，测量不同节段左心室心肌内及室间隔内 NIC。一般临床资料及测量数值组间差异采取独立样本 t 检验，性别组间差异采取卡方检验。**结果** 研究组舒张末期左室内径为 4.81±0.39cm，对照组为 5.02±0.44cm（t=2.169，P=0.034），研究组收缩末期左房内径为 3.59±0.19cm，对照组为 3.47±0.21cm（t=-3.025，P=0.004）。研究组左心室舒张末期后壁厚度为 0.82±0.09cm，对照组为 0.77±0.13cm（t= -2.079，P=0.041）。研究组心肌节段 S1、S2、S7、S11、S12、S13、S16 及室间隔 NIC 较对照组减低（P＜0.05）。**结论** 双源 CT 心肌灌注及心功能分析发现糖尿病患者心肌灌注减低，并伴有心功能减退，其中 S1、S2、S7、S11、S12、S13、S16 及室间隔段 NIC 降低最为明显，可能是糖尿病心肌损害的首发且受累最为严重的部位。

OR-415

Comparative study of diagnostic value of STIR and SPAIR technology combined with T2WI black blood technique in myocardial edema

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Objective To analysis SPAIR and STIR technology in the advantages and disadvantages of cardiac magnetic resonance imaging in the evaluation of myocardial edema.**Methods** Retrospective analysis of 34 patients with viral myocarditis cardiac magnetic resonance image characteristics, all of the patients in myocardial parameter scan using STIR technology and SPAIR technology combined with left ventricular T2WI sequences of black blood. Scores by naked eye and CNR value measurement, according to the rhythm of the cardiac group, the application of repetitive measure analysis of variance and simple effect analysis in statistics.

Results For patients with regular rate, the image quality of SPAIR was better than that of STIR,The difference between simple effect analysis is positive, $p < 0.05$. In the detection of arrhythmia in short axis, naked eye observation showed that the score of STIR was higher than that of SPAIR, but there was no difference in long axis. The score of STIR in CNR evaluation of long axis and short axis was lower than that of SPAIR technology,The difference between simple effect analysis is positive, $p < 0.05$.
Conclusion For patients suspected of myocardial edema, in order to obtain a clear and satisfactory T2 WI suppression of fat sequence in left ventricular myocardium, SPAIR scan should be preferred, and STIR technique can be used as a supplement.

OR-416

Sub-aortic Complex is Associated With Left Ventricular Outflow Tract Obstruction in Hypertrophic Cardiomyopathy: A New Parameter Predicts LVOT Obstruction

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Purpose
To investigate athe sub-aortic complex, a new cardiac magnetic resonance CMR derived parameter, for the detection and grading of left ventricular outflow tract (LVOT) obstruction in hypertrophic cardiomyopathy (HCM) patients, compared with conventional parameters.
Methods
This is an observational retrospective study of 157 consecutive patients with HCM who underwent CMR between April 2017 and January 2018. The “sub-aortic complex(SAC)” parameters including D1, D2 and D3 were measured on the LV 3-chamber steady-state free precession (SSFP) cine imaging at the end-systolic phase. HCM patients were divided into subgroups based on maximal anterobasal septal thickness≤18mm and SAC parameters.
Results
Among HCM patients, conventional CMR parameters such as LVOT diameter, anterior mitral valve leaflet (AMVL) length and SAC were significantly different between obstructive (n=87) and non-obstructive (n=70) group. Pearson correlation analysis demonstrated that these newly parameters were correlated with the conventional parameters like AMVL length and LVOT diameter. Of all the CMR parameters, ROC analysis identified that D3, defined as LVOT effective width, was able to discriminate the obstructive and non-obstructive patients with the best predictive accuracy (AUC=0.946) compared to LVOT diameter (AUC=0.773) and AMVL length (AUC=0.767). And the index defined as D3/AAD ratio was the best indicator for identifying LVOT obstruction patients. A cutoff value of D3/ aortic annular diameter (AAD) of 0.49 yielded a sensitivity and specificity of 89.66% and

90.00% respectively in detection of obstruction. Further Pearson correlation analysis demonstrated significant inverse relationship between D3 (r^2=0.623, p<0.001), D3/AAD (r^2=0.512, p<0.001) and the resting LVOT pressure gradient.

Conclusion

The SAC is an accurate, effective, reproducible and relatively simplistic parameter, which can detect and severity of LVOT obstruction in patients with HCM.

OR-417

MRI-FT 早期监测合并或不合并高血压 T2DM 患者的左房和双室心肌应力改变

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目的 是通过 CMR 特征跟踪（CMR-FT）评价 2 型糖尿病（T2DM）合并或不合并高血压患者早期左心房（LA）、左心室(LV)和右心室(RV)心肌应变及其与临床指标间存在的潜在关系。**方法** 将 50 例糖尿病患者按是否高血压分为两组。单纯糖尿病 27 例（组 1），糖尿病合并高血压 23 例（组 2）。31 名年龄、性别和体重指数相匹配的志愿者作为对照组（组 3）。结果: 三组间的左心室心肌应力值无显著差异。组 2 的 LA 周向应变（GCS）明显高于组 3（ECC:27.2±2.1% VS 33.5±2.4%，P<0.05）。组 1 的 LA 心内膜整体周向（GCS）、径向（GRS）和纵向应变（GLS）显著低于组 3（GCS:27.2±2.1% VS 33.5±2.4%；GRS:28.6±1.1% VS -31.9±1.3%；GLS:24.3±1.3% VS 31.4±1.5，P<0.05）。组 2 LAGCS、LAGRS 和 LAGSL 显著高于组 1（GCS:40.4±3.8% VS 27.2±2.1%；GRS:36.8±2.0% VS -28.6±1.1%；GLS:32.3±2.4% VS 24.3±1.3%，P<0.05）。组 1 和组 2 的 RV 心内膜纵向应（RVGLS）显著低于组 3（-21.4±1.2% VS -26.3±1.1%、-21.4±1.4% VS -26.3±1.1%；P<0.05）。此外，LAGCS 与微量白蛋白尿（MA）水平呈显著负相关，并且 LAGLS 与糖化血红蛋白之间也呈负相关。LA 心内膜应力的改善可能与应用利尿剂治疗有关。**结论** 早期糖尿病心肌病对左室心肌应力无明显变化，但左房和右室心内膜应力有明显影响，左房心内膜应力应力异常早于左室心肌应力异常。高血压对左房和双室心肌应力有不同的影响。MA 和糖血红蛋水平的降低,分别与 LAGCS 和 LAGLS 增加有关。利尿剂能够明显改善 LA 心内膜应力。

OR-418

Value of CT features for predicting EGFR mutations and positive ALK expression in patients with lung adenocarcinoma: a retrospective analysis of 827 patients

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Objectives: The associations between CT features and epidermal growth factor receptor (EGFR) mutations, anaplastic lymphoma kinase (ALK) status and lung adenocarcinoma are conflicting. The aim of this retrospective study was to identify the relationships of EGFR mutations and ALK status with CT characteristics in adenocarcinoma using the largest patient cohort to date. **Materials and Methods:** Preoperative chest CT findings were retrospectively evaluated in 827 surgically

resected lung adenocarcinomas. All patients were tested for EGFR mutations and ALK status and underwent chest CT prior to treatment. **Results:** EGFR mutations (EGFR+) were found in 489 (59.1%) patients, and ALK rearrangements (ALK+) were found in 57 (7.0%) patients. EGFR+ status was more common in females ($p<0.001$), those who had never smoked ($p<0.001$), tumors with lepidic predominant subtypes ($p<0.001$) and less lymph node metastasis ($p=0.006$), smaller tumors ($p<0.001$), peripheral lesions ($p=0.035$), tumors that presented with ground-glass opacity (GGO) ($p<0.001$), air bronchograms ($p<0.001$), pleural retraction ($p<0.001$), pleural thickening ($p=0.024$) and a well-defined margin ($p=0.022$) and those without lymphadenopathy ($p=0.001$). The most important and significant independent prognostic factors of EGFR+ for the model with both clinical and CT features were having never smoked and tumors with GGO, air bronchograms and pleural retraction. ALK+ status was found more frequently in younger patients ($p<0.001$) and was associated with solid tumors ($p=0.009$) and lesions without air bronchograms ($p<0.001$) and distant metastasis ($p<0.001$). The absence of air bronchograms was only independent predictor of ALK+. The receiver operating characteristic (ROC) curve yielded area under the curve (AUC) values of 0.758 and 0.739 for clinical and CT features, respectively, for the prediction of EGFR+ status and ALK+. **Conclusion:** Clinical and CT features can be used to predict EGFR mutation status and ALK rearrangements in lung adenocarcinoma patients.

OR-419

后纵隔髓外造血组织增生的影像诊断并文献复习

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目的 探讨后纵隔髓外造血组织增生（EMH）的 CT、MRI 影像特征。方法 回顾分析我院经病理证实的 25 例后纵隔 EMH 患者的临床资料、病理检查及 CT、MRI 表现并结合文献对其病理、影像特征分析讨论。 结果 本组后纵隔 EMH 病例 CT 和 MRI 扫描多表现为双侧胸椎旁多发或单发结节状软组织肿块，肿块边缘光滑，密度均匀，CT 增强扫描表现明显强化或轻中度强化；MRI 上多呈等 T1 信号和等长 T2 信号，增强后多呈明显均匀强化。 结论 后纵隔髓外造血组织增生（EMH）的 CT、MRI 表现有一定的影像特征，可以结合临床病史及影像学特点进行正确鉴别诊断。

OR-420

Assessment of the relationship between the coronary venous and arterial systems using 256-slice computed romography

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Objectives: To investigate the coronary venous system (CVS) and its spatial relationship with coronary arteries by using 256-slice computed tomography (CT).
Materials and Methods: 101 patients underwent coronary CT angiography by using a 256-slice CT. In each patient, the coronary venous system and its spatial relationship with coronary arteries were analyzed. We measured the diameters and angulations of the coronary sinus (CS), great cardiac vein (GCV), anterior interventricular vein (AIV), left marginal vein (LMV), posterior vein of the left ventricle (PVLV) and posterior interventricular vein (PIV), and the distances respectively from the CS ostium and from the crossing point to the ostium of corresponding tributaries.
Results: The following five pairs of veins and arteries had a higher frequency of intersecting compared with others: the CS/GCV and the left circumflex coronary artery (LCX) (97.1%), the AIV and the diagonal or ramus branch (92.1%), the PIV and the posterior branch of left ventricle artery (LPA) (88.1%), the LMV and the circumflex or circumflex marginal (73.9%), and the PVLV and the circumflex or circumflex marginal (31.6%). The other two pairs had a higher frequency of running parallel to each other: the AIV and the anterior descending artery (LAD) (76.2%) and the PIV and the posterior descending artery (PDA) (54.4%). Most tributaries were lateral to their corresponding arteries at the crossing point except for the AIV. For the PVLV and PIV, the distances from the crossing point to the ostium of corresponding veins when the veins were lateral to the arteries were smaller than that when the veins were medial to the arteries ($P<0.05$).
Conclusion: The CVS and its tributaries, and the spatial relationship between the coronary venous and arterial systems were examined with details by using a 256-slice CT. The anatomical relationship between the coronary venous and arterial systems is variable in location and proximity. Invasive procedures performed on the coronary venous system, such as cardiac resynchronization therapy, radiofrequency catheter ablation, percutaneous in situ coronary artery bypass and percutaneous in situ coronary venous arterialization, should be done with knowledge of the potential risks of injuries to the coronary arteries and awareness of anatomical variations.

OR-421
基于 CT 征象的线列图模型预测纯磨玻璃结节样浸润性肺腺癌的临床研究

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目的 回顾性分析经手术病理证实的肺纯磨玻璃结节（pGGN）CT 征象，利用二元 logistic 回归分析筛选确定浸润性肺腺癌的独立危险因素，并利用独立危险因素构建线列图模型，通过采用组内与组间数据来验证模型的预测效能。
方法 回顾性分析收集 2015 年 1 月至 2018 年 6 月间本地区两家三甲医院经手术病理证实的肺 pGGN 患者 300 例，按照 3:2 的比例随机分为模型训练组（180 例）和模型验证组（120 例），记录分析患者的一般临床信息以及 pGGN 的各种 CT 征象。利用二元 logistic 回归分析及 R 软件（rms 软件包）建立线列图模型，并采用校正曲线验证模型预测效能。

结果 在模型训练组中，浸润前病变与浸润性肺腺癌患者在病灶的大小（0.74±0.23cm vs 1.22±0.53cm，P=0.000，<0.05），平均 CT 值（-611.71±99.38HU vs -578.65±93.83HU，P=0.028，<0.05），病灶的形状（P=0.000，<0.05），边缘（P=0.000，<0.05），异常空气支气管征（P=0.000，<0.05），空泡/空腔（P=0.029，<0.05）以及病灶与血管之间的关系（P=0.000，<0.05）方面的差异均具有统计学意义。经过二元 logistic 回归分析结果显示，pGGN 病灶的大小（OR=76.96，95%CI：11.540-513.286，P=0.000）、平均 CT 值（OR=1.006，95%CI：1.002-1.011，P=0.005）是预测表现为 pGGN 样浸润性肺腺癌的独立危险因素。其组内、组间校正曲线 C-指数分别为 0.841、0.836。

结论 基于 pGGN 病灶的大小和平均 CT 值构建的线列图模型在预测表现为 pGGN 样肺腺癌的恶性浸润程度方面，具有很好的诊断效能，具有良好的临床应用前景。

OR-422

Effect of multi-model iterative reconstruction technique on imaging quality of low-dose GE revolution CT in early lung cancer

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Objective: To investigate the effect of multi-model iterative reconstruction technique on imaging quality of low-dose GE revolution CT in early lung cancer.
Methods: 240 patients with early lung cancer were collected for observation. All patients underwent low-dose GE revolution CT imaging, and the images were reconstructed by multi-model iterative reconstruction technique. The image quality of lung window, mediastinal window and image quality parameters before and after image reconstruction were compared.
Results: Compared with low-dose GE revolution CT images, the image quality of lung window and mediastinal window reconstructed by multi-model iterative reconstruction technique was improved with reduced image noise and increased signal-to-noise ratio (SNR) with statistical differences (all P < 0.05), while there's no statistical difference in the CT value (P>0.05).
Conclusion: Multi-model iterative reconstruction technique can improve the imaging quality of low-dose GE revolution CT for early lung cancer, and it has important clinical value for screening early lung cancer.

OR-423

18F-FDG PET/CT 代谢参数预测非小细胞肺癌患者 EGFR 基因突变的诊断价值

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目的 通过系统性回顾和 meta 分析，探讨 ^{18}F-FDG PET/CT 代谢参数对非小细胞肺癌患者 EGFR 基因突变的诊断价值。

方法 检索 PubMed、Embase 和 Cochrance Library 数据库，时间截止至 2019 年 4 月 20 日，评价 ^{18}F-FDG PET/CT 代谢参数对 NSCLC 患者 EGFR 基因突变的诊断价值。
结果 12 项研究共计 1913 例 NSCLC 患者被纳入，所有患者均完善 ^{18}F FDG PET/CT 检查和 EGFR 基因检测。结果显示 ^{18}F-FDG PET/CT 代谢参数诊断 EGFR 基因突变的合并敏感度为 0.65(*95%CI*: 0.59－0.70)且无异质性(I^2 = 43.98, p = 0.05)；合并特异度为 0.64(*95%CI*: 0.58－0.69)且异质性较小(I^2 = 57.39, p = 0.01)；合并的阳性似然比和阴性似然比分别为 1.80(*95%CI*: 0.58－0.69)和 0.55(*95%CI*: 0.48－0.64)；分层汇总受试者工作特征曲线（SROC），曲线下面积（AUC）为 0.69(*95%CI*: 0.65－0.73)。
结论 ^{18}F-FDG PET/CT 代谢参数是预测 NSCLC 患者 EGFR 基因突变的潜在生物标记物，但未来仍需通过多参数、多特征联合以进一步提升诊断效能。

OR-424

肺外支气管源性囊肿的影像诊断与误诊分析

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目的 探讨发生在肺外的（纵隔型和异位型）支气管囊肿的影像表现特征，分析导致误诊的原因。**方法** 回顾性分析 66 例经手术病理证实、发生在肺外的支气管囊肿的 CT、MRI 资料。35 例行 CT 增强扫描，28 例行 CT 平扫，3 例行 MRI 平扫。总结影像表现特点，并寻找导致误诊的原因。**结果** 纵隔型 54 例，分别为前纵隔 27 例、中纵隔 11 例、后纵隔 16 例；异位型 12 例，分别为颈部 5 例、胸壁 1 例、腹部 6 例。纵隔型中，3cm 以下 29 例，3cm 及以上 25 例；49 例为圆形或椭圆形，2 例锥形、3 例不规则形；7 例为液性密度，44 例为软组织密度，2 例呈 T1 低 T2 高信号、1 例双高信号；8 例伴有钙化。异位型中，3cm 以下 4 例，3cm 及以上 8 例；圆形或椭圆形 9 例，锥形、葫芦形和不规则形各 1 例；3 例为液性密度，9 例为软组织密度，3 例伴有钙化。纵隔型中，8 例被诊断为支气管囊肿，分别为前纵隔 1 例、中纵隔 4 例、后纵隔 3 例，其余被误诊为心包囊肿 2 例、神经鞘囊肿 1 例、胸腺瘤 20 例、淋巴结肿大 5 例、神经源性肿瘤 12 例、平滑肌瘤 3 例和炎性假瘤、硬化性血管瘤各 1 例。异位型全部被误诊，包括神经源性肿瘤 6 例、淋巴管囊肿 3 例和甲状舌骨囊肿、甲状腺囊肿、间质瘤各 1 例。**结论** 。发生在肺外的支气管囊肿发生部位、影像表现不典型，影像诊断误诊率高。影像学检查能够显示病变的发生部位及形态学改变，确诊依赖于病理。

OR-425

The value of myocardial strain in heart transplant (HT) patients with normal LVEF

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Purpose: Over the decades, many papers[1,2]on myocardial strain reported that abnormal myocardial strain was associated with higher risks of adverse cardiovascular events in patients with cardiovascular diseases with normal LVEF. Nowadays there has few researches about myocardial strain in HT patients. Our aim is to investigate whether myocardial strain has difference between the HT patients and the controls with normal LVEF.

Method: Between September 2018 and July 2019, 72 HT patients were referred for CMR scan at our Hospital. The exclusion criteria included reduced LVEF (<50%), significant coronary artery stenosis, severe rejection, severe renal insufficiency. 20 controls were recruited in this study. All these subjects underwent standard CMR examinations with a 1.5T scanner (Aera, Siemens, Germany). A balanced steady-state free procession (bSSFP) sequence was performed to acquire LV long-axis cine(2-, 3-, 4-chamber) and a stack of short-axis cines. The LV epi- and endocardial borders, RV endocardial borders were traced manually from short-axis slices. Global longitudinal strain (GLS), global circumferential strain (GCS) and global radial strain (GRS) were from four-chamber long-axis view and short-axis views, RVLS was from right ventricular free wall. These parameters were based on DRA (TrufiStrain, version 2.0, Siemens Healthcare).
Result: RVEF in HT patients was smaller (47.8±7.5 vs. 52.1±3.4, p=0.01) than controls while LVEF had no significant differences (LVEF: 66.0 ± 6.8 vs. 62.1±5.3, p=0.07). Significant difference were found in the LVGLS (-10.8±2.3 vs. -14.9±1.6; P<0.001) and LVGCS (-13.7±3.8 vs. -16.9±2.2; P=0.001) while RVLS (-14.7±3.4 vs. -16.2±2.3; P=0.1) and LVGRS (32.8±9.3 vs. 36.8±8.7; P=0.1) had no significant difference, time to peak of all myocardial strain were smaller (P<0.05 for all) in two groups. AUC of the ROC for LVGLS was 0.93, the cutoff value was -12.58% and sensitivity and specificity were 75.9%, 100%. AUC of the ROC for LVGCS was 0.82, the cutoff value was -15.98% and sensitivity and specificity were 80.7%, 71.4%.
Conclusion: LVGLS and LVGCS allowed discrimination between HT patients and control when with normal LVEF. This indicated that myocardial strain may be sensitive biomarker for the early deformation change of the ventricular wall in HT patients.

OR-426
胸腺瘤瘤周结节 CT 定量特征预测其侵袭性价值研究

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目的 探讨胸腺瘤瘤周结节 CT 定量特征预测其侵袭性的价值。**方法** 回顾性分析 2013 年 3 月至 2018 年 10 月北京大学第三医院具有完整临床、影像及手术病理资料的 110 例胸腺瘤（男性 65 例，女性 45 例，中位年龄 45 岁）。根据胸腺瘤 2004 年 WHO 标准，按侵袭性程度分为高危组(男性 23 例，女性 15 例，中位年龄 52 岁)与低危组（男性 42 例，女性 30 例，中位年龄 42 岁）。分析胸腺瘤瘤周结节的长径、双期增强 CT 值、 ΔCT 值及与主瘤体距离。有预测价值的 CT 定量参数及阈值通过 Mann-Whitney U 检验和受试者特征曲线(ROC)分析和确定。**结果** 110 例胸腺瘤中，28 例增强 CT 表现有瘤周结节，B1 型 12 例，B2 型 7 例，B3 型 6 例，C 型 3 例，A 型及 AB 型中未发现瘤周结节。瘤周结节出现在高危组 16 例，低危组 12 例。高危组瘤周结节长径、双期增强 CT 值、ΔCT 值及与主瘤体距离分别为(9.8±3.7)mm、(48.5±27.2)Hu、(51.4±21.0)Hu、(16.7±10.1)Hu 及 6.3±6.5mm；低危组瘤周结节长径、双期增强 CT 值、ΔCT 值及与主瘤体距离分别为(5.5±1.6)mm、(54.6±18.4)Hu、(51.7±18.6)Hu、(13.7±10.1)Hu 及(3.9±2.2)mm。低危与高危组比较，瘤周结节的双期强化 CT 值、ΔCT 值及与主瘤距离均无显著差异(P均>0.05)，而高危瘤周结节的长径显著大于低危组(P<0.05)。ROC 曲线分析，以瘤周结节长径为 6.9mm 为阈值，预测胸腺瘤高危，相应的曲线下面积 AUC、敏感度和特异度分别为 0.862、75% 和 75%。**结论** 胸腺瘤瘤周结节长径有助于预测其侵袭性。

OR-427

胸部双能减影成像的临床应用

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目的 胸部双能减影（dual energysubtraction)在胸部的检查技术和诊断价值。**方法** 从 2016 年 11 月份开始，收集急诊室胸部外伤并送科里检查摄片的病员，从中抽取 1000 例患，利用 DDR 系统设备，进行胸部双能量减影，分别获得标准影像、骨骼影像和软组织影像并且与诊断医师一起分析起胸部外伤情况，并在临床中进一步检验。**结果** ，本组 DDR 标准胸片和能量减影胸片对胸部损伤的诊断比较明确，全肋骨影和肺组织和软组织影像结构都显得十分清楚，满足临床诊断要求。DR 标准胸片可显示骨性胸廓结构和肺纹理，图像质量优良；骨骼影像显示骨性胸廓方面优于标准影像，特别是心影和膈下结构重叠的肋骨；软组织影像在显示肺内病灶方面优于标准影像。1000 例双能量减影胸部摄影检查结果发现，616 例双侧肋骨骨折，320 例单侧肋骨骨折伴液气胸，60 例肋骨骨折伴双上肺结核，4 例肋骨骨折伴左上肺肺癌。**结论** :DR 能量减影胸部摄影可清晰显示肋骨骨折，对胸部外伤有重要诊断价值。

OR-428

左心耳功能 CT 定量评估对心房颤动 射频消融术后复发的预测价值

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目的 应用 256 层螺旋 CT 定量评估左心耳功能对房颤射频消融术后复发预测价值，为临床术前选择治疗方案提供依据。

方法 研究纳入 63 例首次进行射频消融术的房颤患者，平均年龄 59.43±10.67 岁，BMI：25.99±3.60kg/m^2，男性 38 例（60.3%），中位随访时间 19（4-24）月，20 例（31.7%）复发。根据房颤射频消融术后有无复发，分为复发组（n=20 例）和未复发组（n=43 例）。所有患者术前均行 256 层螺旋 CT 检查，将原始图像按心动周期从 5%-95%，每间隔 10%重建一个时相，测量并计算整个心动周期中左心耳最大容积（LAAVmax）、左心耳最小容积（LAAVmin）、左心耳排空分数（LAAEF），左心耳排血量（LAAEV），左心房最大容积（LAVmax）、左心房最小容积（LAVmin），左心房排空分数（LAAEF），左心房排血量（LAAEV），将获得的数据运用统计学方法进行处理。

结果 对患者临床资料进行对比，复发组 CHA_2DS_2-VASc 评分高于未复发组外（$P<0.05$）。对左心耳及左心房功能分析，复发组 LAAVmax、LAAVmin、LAVmax、LAVmin 较未复发组增大（$P<0.05$），但复发组 LAAEF、LAEF 较未复发组减小（$P<0.05$）。多因素 Cox 比例风险回归分析显示 LAAEF 是房颤射频消融术后复发的独立预测因子（*HR* :0.790 95%*CI*：0.657-0.950 *P*=0.012）。ROC 曲线分析显示，LAAEF＜44.68%对射频消融术后复发预测价值最高（曲线下面积 0.817），敏感性 90%，特异性 67.4%。

结论 心房颤动射频消融术后复发患者左心耳体积增大，功能减低。LAAEF 是房颤射频消融术后复发的预测因子。

OR-429

心胸乳腺亚专业建设：邵逸夫医院经验

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作者结合浙江大学医学院附属邵逸夫医院放射科亚专业建设实际，介绍心胸乳腺亚专业的建设过程和经验体会，得出以下**结论**
•亚专业建设：质量提升、效率提高；
•亚专业的内涵建设是根本；
•亚专业建设：医教研联动；
•团队建设：MDT、innovation group!

OR-430

Signed kinetic energy of left Intraventricular blood flow for dilated cardiomyopathy evaluation

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Purpose Two-dimensional phase-contrast flow imaging (2D flow) was used to investigate the left intraventricular hemodynamics, and the expression parameters of normal left ventricular blood flow characteristics were explored and optimized. The changes of signed kinetic energy (SKE) in left ventricular blood flow in patients with dilated cardiomyopathy (DCM) were evaluated for its cardiac function analysis.
Materials and Methods Twenty-one healthy volunteers and twenty-five DCM patients were enrolled in the study. The Philips 1.5T Multiva magnetic resonance scanner was used with an 8-channel Torso SENSE coil, electrocardiogram vector (VCG) triggering and respiratory monitoring. After completing the conventional cine imaging using with balanced steady-state fast gradient echo (b-TFE) sequence, double inversion recovery TSE black-blood sequence and late Gd-DTPA enhancement(LGE) examination on DCM patients, 2D-PC flow imaging was performed on the left ventricle short axis at the level of basal, middle-cavity and apical, as well as the left ventricular outflow track. The velocity encoding of the intraventricular flow was preset to 120 cm/s, and the flow direction was vertical imaging plane. Each cardiac cycle was divided into 24 phases. The cine data and blood flow data were post-processed using Segment software to obtain left hemodynamic parameters, including velocity, flow, blood and signed kinetic energy (SKE) as well as left ventricular ejection fraction (LVEF). The accuracy and reproducibility of each blood flow parameter measurement were analyzed, and the blood flow characteristics of the left ventricle were summarized. The changes of SKE in DCM patients were analyzed and proper hemodynamic interpretation was performed.
Results On visual inspection, the left intraventricular flow on normal volunteers showed in-and-out two-way patterns flow during the whole cardiac cycle. The flow curve showed positive and negative blood flow coexisting. This two-way blood flow characteristic gradually weakened toward the apex. Quantitatively, the measurement of blood flow velocity and flow rate was affected by endocardial irregularities and

velocity heterogeneity within the ROI range, and the reproducibility was poor. However, these effects on SKE were less than level of 10^{-3} ,making the SKE repeatability relatively stable. The blood flow velocity, peak flow rate and time-to peak (TTP) have large variation coefficient between individuals. SKE curve was close to 0 at the apex level, there was a gradient difference between the middle and the basal level. The SKE had a consistent systolic TTP of 0.21(0.21, 0.21) RR interval and diastolic TTP of 0.58 (0.54, 0.63) RR interval. For DCM patients, the ventricular volume enlarged and the LVEF significantly reduced. However, the systolic SKE peaks had no significant difference between DCM patients and the normal controls. For diastolic SKE peaks, only SKE peak at the middle cavity decreased significantly although overall values were lower than the normal group. The SKE curve of DCM patients was rather complex. According to the curve shape, synchrony and peak, the curve can be divided into I, II and III to explain the intraventricular hemodynamics of DCM.

Conclusions The intraventricular blood flow is bi-directional. The peak and TTP of SKE can be used as a simple and straightforward index for the hemodynamic characteristics at different levels in the left ventricle. The SKE curve can directly reflect the systolic and diastolic function and explain the pathophysiological mechanism of the heart failure in DCM. The SKE curve is expected to be a new indicator to grading heart failure.

OR-431
不同设备肺癌筛查低剂量 CT 图像质量标准化的探讨

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目的 使用不同的 CT 设备进行低剂量肺癌筛查时，探讨使得不同设备的扫描图像质量统一标准化的方法实践。

材料与方法 通过模体实验已设置了图像质量的客观参考标准，即 Catphone500 模体空间分辨率 7 LP/cm，低对比度分辨率 15 mm@supra-slice1.0%，并确定 iCT（Philips）、RCT（GE）及 Sensation（Siemes）在 FBP 算法、自动曝光控制下的扫描参数分别为管电压 100 kV、参考毫安秒 25 mAs，管电压 100 kV、NI 27 HU，管电压 100 kV、参考毫安秒 60 mAs；选取胸部低剂量 CT 筛查的 150 例志愿者，随机分为 A、B、C 三组，分别采用 iCT、RCT、Sensation 设备及上述参数进行扫描。所有扫描图像均采用 FBP 算法进行肺窗及纵隔窗图像的重建。比较 3 组受检者的图像质量及有效剂量。

结果 3 组受检者肺窗及纵隔窗的图像质量间差异均无统计学意义（P 均>0.05）；A、B 组的有效剂量分别为 0.82±0.21、0.76±0.20 mSv，两组间差异无统计学意义（P>0.05），C 组的有效剂量最高，为 1.22±0.27 mSv，且与 A、B 组比较差异存在统计学意义（P 均<0.05）。

结论 设置图像质量的客观参考标准，可以使不同设备的肺癌筛查低剂量 CT 的扫描图像质量统一标准化。

OR-432

原发性肺脑膜瘤的 CT 表现

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目的 原发性肺脑膜瘤(Primary Pulmonary meningioma，PPM）又称肺异位脑膜瘤 （Lung ectopic meningioma），是于中枢神经系统以外、原发于肺内的异位脑膜瘤，为肺内极罕见的肿瘤。到目前为止，文献中仅报告了 50 余例 PPM。绝大多数 PPM 无临床症状且生长缓慢，在影像学上常表现为孤立性肺结节，但伴有肺内、胸膜多发转移的原发性肺脑膜瘤尚未见报道。本文报道少见影像表现的 PPM1 例，复习既往文献报道，以提高对 PPM 的认识和诊断水平。
方法 收集 1 例住院患者（女，71 岁，）临床资料、影像资料（X 摄影、CT 检查）及穿刺活检术后组织病理形态学及免疫组化检查资料。
结果 X 线胸部摄影示右侧胸腔积液；胸部 CT 检查示右肺及胸膜见多发软组织密度结节及肿块，最大病灶位于右肺下叶后基底段，大小 5.6cm×6.0cm，边界清楚，平扫 CT 值 39HU，增强扫描动脉期 CT 值为 47HU，静脉期 CT 值为 66HU，右侧胸腔积液。最后行右肺肿块穿刺活检术，术后病理回示原发性肺脑膜瘤。
结论 原发性异位脑膜瘤极为罕见，通常见于头部、颈部皮肤和周围神经，而原发性肺脑膜瘤(PPM)更是非常罕见，由 1982 年 Kemnitz 等人首次报道。多大数 PPM 表现为良性，生长缓慢，之前仅报道了 7 例具有恶性特征的 PPM。PPM 没有临床及放射学特异性，因此需要结合胸部 CT、头颅 MRI、PET-CT、气管镜、经皮肺穿、手术切除、免疫组化等对其进行综合诊断。本文仔细分析该例影像特点，最终认为原发性肺脑膜瘤伴胸膜种植转移可能性大，体现出不同以往的影像表现形式。结合文献报道，以期提高对 PPM 的再认识。

OR-433

实性肺结节低剂量 CT 影像组学的图像质量控制-体模研究

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目的 探讨影像组学在低剂量 CT 扫描条件下实性肺结节 CT 图像质量控制中的应用价值。**方法** 使用 CT750 HD CT 分别在不同管电压及不同管电流下对胸部肺结节人体仿真模型进行扫描，记录不同扫描条件下的容积 CT 剂量指数（$CTDI_{vol}$），测量并计算图像中结节的信噪比（SNR）和对比噪声比（CNR），分析辐射剂量、噪声与管电压管电流变化的规律，将所有扫描数据通过影像组学分析软件对实性结节的全部特征进行提取，使用 R 语言统计学软件对提取的特征参数进行主成分分析，选择贡献率最大的主成分中载荷较大的特征参数进行分析。对确定的重要特征参数进行单因素方差分析，揭示不同管电压下特征参数的差异，再进一步通过事后检验对不同管电压组之间进行两两比较，找出组间差异。**结果** 辐射剂量在研究的范围内随管电压、管电流的增加而线性增加。肺结节的 SNR 和 CNR 总体变化趋势虽然与管电压及管电流的变化呈线性关系，但在低剂量下没有明确的变化趋势阈值存在，无法准确评价低辐射下图像质量。影像组学提取的所有特征参数中 Uniformity、VoxelValueSum 及 HaralickCorrelation 是 3 个主要成分，其方差累计的贡献率为 89.20%且特征值均>1。特征参数 Uniformity 曲线显示出其变化趋势与管电压及管电流变化成相关性，且稳定性和一致性较好。Uniformity 单因素方差分析结果显示在管电压 140 kVp 及 120 kVp 时，Uniformity 无显著差异（P = 0.117），而在其他管电压间 Uniformity 均有明显差异（P = 0.000）。管电压在 100 kVp 时，当管电流≥60 mA 或管电压在 80 kVp 管电流≥90 mA 时，

Uniformity 无明显变化，可以得到满意的图像质量。**结论** 影像组学分析方法可以有效定量化地评价和控制低辐射剂量下实性肺结节 CT 图像质量，其评价结果优于常规 CT 图像质量评价方法。

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同步辐射光源相衬成像显示肺部细微结构： 与病理组织学的对照研究

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目的 利用同步辐射光源相衬成像评价肺癌病人离体肺标本及 $PM_{2.5}$暴露大鼠的肺部细微结构的变化，以病理组织学为对照，明确影像特征与病理组织学间的对应关系。**方法** 共 4 例肺腺癌病人及 4 只胰蛋白酶+$PM_{2.5}$滴注 12 周暴露大鼠，于上海同步光源(SSRF) X 射线成像及生物医学应用光束线/实验站(BL13W1)进行基于同步辐射的相衬成像（PCI）。X 射线能量为 16KeV，光束大小为 45mm× 5mm，成像距离 25cm，CCD 分辨率即像素大小为 5.2×5.2μm，对应 CCD 视场 11mm。图像处理软件包括 CT 重构软件（PITRE）、三维后处理显示软件（Amira 6.1.1）。对已扫描的肺标本行 H-E 染色，观察镜下病理变化。根据扫描病理图片的改变，通过三平面重建的方法建出与扫描病理图片一一对应的图像。**结果** ：（1）肺癌组织标本的 PCI 可清楚显示局部细微结构的改变。肺肿瘤标本典型者可见沿着肺泡壁生长的条片样高密度影，病理对应沿着肺泡壁生长的肿瘤细胞；还可以点状的致密影，与病理对照，对应为肿瘤基质内的细微钙化，而常规胸部 CT 提示该肿块密度均匀。相对正常肺组织可见小血管壁的增厚，小血管腔的变窄，病理对应小血管的收缩伴管壁炎性细胞浸润及碳末或煤焦油等的沉着。（2）胰蛋白酶+$PM_{2.5}$滴注 12 周组大鼠离体相衬成像可见小气道管壁的增厚，支气管远端见少许小斑片状的渗出影；另可见胸膜下小斑片状磨玻璃密度影即肺泡间隔增厚；实性小结节，即肺间质内的碳末沉积；小气道扩张，即小气道的远端管腔较近侧扩张；肺气肿即肺泡间隔的明显扩大。 **结论** 本研究表明同步辐射光源可显示肿瘤细胞沿着腺泡结构的生长情况及较好显示小血管的改变，而且可以评价大鼠肺细微结构的改变，与病理组织学结果具有高度的一致性。

OR-435

胸腺神经内分泌肿瘤临床及 CT 特征分析

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目的 探讨胸腺神经内分泌肿瘤（TNETs）的 CT 特征性表现，提高对本病的 CT 诊断水平。

资料与方法 回顾性分析 11 例经病理证实的 TNETs 患者的临床资料、病理资料及 CT 影像学资料。分析其 C T 影像学特征（主要包括大小、形状、密度、强化程度、有无坏死、转移和邻近结构侵犯等）。并参照国际胸腺肿瘤协作组织标准术语及第 8 版美国癌症联合会和 国际抗癌联盟胸腺上皮肿瘤 TNM 分期系统，对 11 例病变进行分期。

结果 男性 8 例，女性 3 例，平均年龄 56.2 岁。组织病理学亚型：典型类癌 1 例，不典型类癌 2 例，小细胞癌 2 例，大细胞神经内分泌癌 1 例，未明确病理学亚型 5 例。病变主体均位于前纵隔，最大径 6.8~20.9 cm，平均最大径 8.5 cm。C T 影像学特征：病灶呈分叶状 7 例、类圆形 4 例，内部密度不均匀 9 例，囊变坏死 7 例，钙化 1 例，增强后多为不均匀性轻-中度强化，其中轻度强

化 4 例，中度强化 5 例，2 例胸腺典型类癌出现显著强化，6 例可见瘤内血管强化。常见肿瘤沿纵隔血管间隙生长，不同程度侵犯包绕纵隔大血管， 10 例出现纵隔结构侵犯，5 例存在上腔静脉癌栓，7 例可见纵隔肿大淋巴结， 6 例侵犯邻近肺组织， 1 例侵犯胸骨。临床分期： Ⅰ期 1 例，ⅢA 期 4 例，ⅣB 期 6 例。

结论 TNETs 以中老年男性多见， CT 表现为前纵隔较大体积肿块，多分叶状，坏死囊变常见，钙化少见，不均匀强化，具有明显侵袭性，ＣＴ对 ＴＮＥＴｓ的鉴别诊断和术前评估具有重要价值。

OR-436
人工智能肺结节筛查系统中不同分类阈值对肺结节检出效能的影响

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目的 探究基于深度学习的人工智能（Artificial Intelligence，AI）肺结节筛查系统中不同分类阈值对肺结节检出效能的影响。
方法 回顾性收集 117 例胸部 CT 平扫病例数据，层厚均为 1 至 1.25mm 的薄层扫描序列。研究入组病例中的肺结节数。即金标准由两位具有超过 15 年胸部 CT 图像阅片经验的放射科专家共同制定，共计标注 563 个肺结节。在此基础上，利用基于深度学习的 AI 肺结节筛查系统（北京推想科技有限公司）进行结节检测，记录其在不同模型分类阈值（0.65，0.75，0.85）下检测到的肺结节数。通过与金标准对比，分析不同分类阈值下，AI 系统检测到的真阳性结节（TP），假阳性结节（FP）和假阴性结节（FN）的数量。通过计算比较不同分类阈值下 AI 系统检测灵敏度，FP / TP 值和假阳性率（假阳性结节数/CT），探索最适合临床工作的模型分类阈值。
结果 AI 系统在阈值为 0.75 的情况下检测到 1285 个结节，包含 500 个 TP 和 785 个 FP， FN 个数为 63 个，检测敏感性为 88.81%，假阳性率和 FP/TP 值分别为 6.71FP/CT 和 1.57。当调整分类阈值至 0.85 时，AI 系统检测到的结节有所减少，总数降至 1085 个，其中 TP 为 478 和 FP 为 607 个，然而 FN 个数却增加至 85 个，检测敏感性降低至 84.9%（p=0.052），假阳性率和 FP/TP 值分别为 5.19FP/CT 和 1.27，有所下降。相比之下，当分类阈值调整到 0.65 时，多达 1492 个肺结节被 AI 系统预测，其中包含 510 个 TP 和 982 个 FP，虽然 FN 数目降至 53 个，但检测敏感性却提高至 90.59%（p>0.05），但假阳性率和 FP/TP 值均明显增加，分别为 8.39FP/CT 和 1.93。
结论 本研究中分类阈值为 0.75 时，AI 系统具备与低阈值相当敏感性的同时，预测了更少的假阳性结节，因此是 AI 肺结节筛查系统临床应用时的最佳选择。

OR-437
Correlation Between Gated 13N-NH3•H2O PET and 18F-FDG PET for Assessment of Left Ventricular Ejection Fraction, End-diastolic Volume, and End-systolic Volume in Patients with Myocardial Infarction

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Objective:
To evaluate myocardial electrocardiography (ECG) gated ^{13}N-ammonia positron emission tomography (^{13}N-NH_3•H2O PET) and gated ^{18}F-fluorodeoxyglucose (^{18}F-FDG) PET for the assessment of left ventricular ejection fraction (LVEF), end-diastolic volume (EDV), and end-systolic volume (ESV) in patients with myocardial infarction.
Methods:
^{13}N-NH_3•H2O and ^{18}F-FDG PET scans were performed in 50 patients (47 men and 3 women; mean age, 58.1±10.8 years) for the evaluation of myocardial perfusion and viability. For both ^{13}N-NH3•H2O and ^{18}F-FDG imaging studies, quantitative gated single photon emission computed tomography (QGS) and quantitative perfusion single photon emission computed tomography (QPS) software were used to reconstruct the images and to calculate the left ventricular parameters, namely, LVEF, EDV, and ESV.
Results:
The LVEF determined by gated ^{13}N-NH3•H2O PET and gated ^{18}F-FDG PET were 26.0 ± 12.6% and 27.4 ± 13.6%, respectively. The EDV determined by gated ^{13}N-NH3•H2O PET and gated ^{18}F-FDG PET were 236.0 ± 89.4 mL and 222.8 ± 101.4 mL, respectively. The ESV determined by gated ^{13}N-NH3•H2O PET and gated ^{18}F-FDG PET were 183.2 ± 86.7 mL and 171.5 ± 95.1 mL, respectively. The correlation between gated ^{18}F-FDG PET and gated ^{13}N-NH3 • H2O PET imaging with regard to measurement of LVEF, EDV, and ESV was excellent.(EDV determined by ^{13}N-NH3•H2O = 0.75 EDV determined by ^{18}F-FDG + 68.6, r = 0.85, $P < 0.0001$; ESV determined by ^{13}N-NH_3•H2O = 0.79 ESV determined by ^{18}F-FDG + 47.4, $r = 0.87$, $P < 0.0001$; EF determined by ^{13}N-NH_3•H2O = 0.79 EF determined by ^{18}F- FDG +4.4, $r = 0.85$, $P < 0.0001$).
Conclusion:
Gated ^{13}N-NH_3•H2O PET had good correlation with gated ^{18}F-FDG PET with regard to LVEF, LVEDV, and LVESV in patients with myocardial infarction.

OR-438
放射组学在鉴别纵隔淋巴结良恶性中的应用

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【目的】放射组学已广泛被应用于肿瘤的诊断以及评估预后等临床决策中。然而，很少有人使用放射组学的方法对纵隔增大淋巴结的良恶性进行鉴别。本研究目的是探索放射组学是否可以鉴别纵隔淋巴结的良恶性。

【方法】本研究为回顾性研究。我们从我院 PACS 系统筛选了 129 名淋巴结增大患者的 CT 影像，共有 201 个淋巴结具有 EBUS-TBNA 结果。其中 120 个淋巴结为良性，81 个淋巴结为恶性。我们对入组的淋巴结进行手动 ROI 勾画，并对 ROI 的放射组学特征进行提取，得到了 396 个特征。我们将 201 个淋巴结（研究对象）分为训练组（140 个淋巴结，70%）和测试组（61 个淋巴结，30%）。在训练组内，我们使用 LASSO 回归对 396 个特征进行降维，最终得到了 26 个特征。我们选择逻辑回归算法来进行机器学习建模，输入特征为上述 26 个放射组学特征，输出为肿瘤良性或恶性（label=0 或 1）。最后在测试组内评估模型的分类性能。

【结果】模型在训练组内的分类 ROC 曲线下面积、敏感度以及特异度分别为：0.922、0.821、0.893。模型在测试组内的分类 ROC 曲线下面积、敏感度以及特异度分别为：0.850、0.806、0.800。

【结论】本研究提示放射组学对鉴别纵隔淋巴结的良恶性具有良好的效果。

OR-439

Clinical significance of DWI and ADC values in imaging diagnosis of soft tissue tumors

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Objective To study the clinical significance of DWI and ADC values in imaging diagnosis of soft tissue tumors.
Methods 249 cases of soft tissue tumors confirmed by pathology in our hospital were retrospectively analyzed, including 85 cases of benign tumors and 164 cases of malignant tumors. 50 normal volunteers were randomly selected to measure the ADC values of lesions and quadriceps femoris.
Results The average ADC values of quadriceps femoris in 50 normal volunteers were （1.448± 0.109）×$10^{-3}mm^2/s$, and those of 85 benign soft tissue tumors were（1.805± 0.395）×$10^{-3}mm^2/s$. The average ADC values of benign soft tissue tumors with or without mucus were （1.769± 0.417）×$10^{-3}mm^2/s$ and（1.850±0.357）×$10^{-3}mm^2/s$, respectively. The average ADC value of malignant soft tissue tumors was （1.251± 0.540）×$10^{-3}mm^2/s$. The average ADC values of malignant soft tissue tumors with or without mucus were （1.908± 0.465）×$10^{-3}mm^2/s$ and（0.968 ±0.233）×$10^{-3}mm^2/s$，respectively; the average ADC values of low-grade and medium-high-grade malignant soft tissue tumors with or without mucus were （1.971±0.382）×$10^{-3}mm^2/s$、（1.137±0.274）×$10^{-3}mm^2/s$，（1.866±0.516）×$10^{-3}mm^2/s$、（0.941±0.215）×$10^{-3}mm^2/s$，respectively. There were statistical differences in ADC values between benign and malignant soft tissue tumors and normal quadriceps femoris (P=0.045, P=0.017, P=0.019, P<0.05). There were no statistical differences in ADC values between benign soft tissue tumors and those without mucus, benign and malignant soft tissue tumors with mucus, low-grade malignant and medium-high-grade malignant soft tissue tumors with mucus (P=0.061, P=0.060, P=0.055, P>0.05) , respectively. There were statistical differences in ADC values between malignant soft tissue tumors and those without mucus, benign and malignant soft tissue tumors without mucus, low-grade malignant and medium-high-grade malignant soft tissue tumors without mucus, low-grade malignant and medium-high-grade malignant soft tissue tumors (P=0.000, P=0.000, P=0.031,P=0.045,P<0.05) , respectively.
Conclusion DWI and ADC values play an important role in the diagnosis of benign and malignant soft tissue tumors, and can assist morphological diagnosis. Mucous components can improve the average ADC values of malignant soft tissue tumors.

OR-440

Accuracy evaluation of intraoperative imaging planning based on image registration

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Objective:
To explore the accuracy of intraoperative osteotomy in pelvic bone tumors via 3D printed individualized guides based on point-to-point registration method.

Methods:
A retrospective analysis was performed on the cases with pelvic bone tumors between January 2015 and December 2018. CT/MRI examinations were routinely performed before surgery. Medraw software was used to achieve registration of Pre- and post-operative CT images, the design prosthesis models and the postoperative prosthetic models, in order to assess the accuracy of intraoperative osteotomy. The angle and distance between the planned and the actual bone resection planes were used as the evaluation indexes.

Results:
A total of 8 patients (13 osteotomy planes) were included in the study. The median age was 44 (33-54) years, including giant cell tumor of bone (4 cases), chondrosarcoma (2 cases), metastatic tumor (1 case), and Ewing's sarcoma (1 case). The mean angle between the actual osteotomy and the planned osteotomy was 6.57±3.36 (1.05~11.88). The distance between the actual osteotomy surface and the planned osteotomy surface is 5 mm on average, the distance distribution is concentrated between ±5 mm, and the maximum distance is no more than 14 mm.

Conclusion:
Using registration method between the preoperative design prosthesis model and the postoperative prosthesis model is useful to eliminate the effect of metal artifacts on postoperative CT images in a certain extent. With the help of 3D printed individualized osteotomy guide, surgeon can achieve accuracy of osteotomy in the pelvic tumor to reconstruct the function of the limb.

OR-441

MRI 在评价韧带样纤维瘤病疗效中的价值

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目的 探讨 MRI 在不同疗效的韧带样纤维瘤病（DF）中的信号变化特征。**方法** 回顾性分析我院 2008 至 2015 年经病理证实的术后复发 DF 患者 124 例的 MRI 资料，MRI 资料包括确诊复发后发病部位的基线 MRI 图像，至少每半年随访 1 次 MRI，随访满 3 年且有第 3 年末的 MRI 扫描图像。采用基于肿瘤大小的实体瘤疗效评价标准（RECIST）评价其疗效，将患者分为进展（PD）、缓解

（PR）、稳定（SD）组。采用单因素方差分析、Kruskal-Wallis 或 x^2检验比较 PD、SD 和 PR 组中特征的差异，多重比较采用 Bonferronei 校正 P 值，采用 Spearsman 相关系数检验信号评分与肿瘤最大径的相关性。**结果** PD 组 17 例、SD 组 37 例、PR 组 70 例。3 组间患者年龄、性别分布和部位的差异无统计学意义（P>0.05），治疗方案的差异有统计学意义（P<0.05），3 组患者的基线检查病灶最大径和末次检查最大径的差异也有统计学意义（P均<0.05）。PD、SD 和 PR 组的 T_2基线评分、T_1基线增强评分差异均无统计学意义（P均＞0.05），3 组的末次随访 MRI 图像的 T_2评分、T_2评分变化、末次 T_1增强评分和 T_1增强评分变化的差异均有统计学意义（P均<0.05）。末次随访时，肿瘤最大径与 T_2评分呈中度正相关（r=0.434，P<0.01），肿瘤最大径与 T_1增强评分呈强正相关（r=0.743，P<0.01）。**结论** MRI 在评价韧带样纤维瘤病的疗效方面具有价值。

OR-442

骨巨细胞瘤影像表现的对比分析

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［摘要］目的 探究骨巨细胞瘤 X 线、CT 及 MRI 综合检查方法与影像诊断对比分析。**方法** 选取 2015 年 1 月—2019 年 2 月我院收治 22 例怀疑骨巨细胞瘤患者，其中，男性 10 例，女性 12 例，年龄范围 15 岁—48 岁，平均年龄为 32.7 岁，平均病程为 9 个月；22 例患者均进行 X 线平片检查，其中 12 例行 CT 扫描，8 例行 MRI 检查。**结果** 7 例患者为股骨，8 例患者为胫骨，1 例患者为髂骨,2 例患者为肱骨。X 线平片主要影像表现为膨胀性、偏心性及溶骨性骨质破坏；CT 显示病灶内无钙化灶，无硬化边，可见分隔样骨嵴，肿块与周围软组织分界清；MRIT1 加权肿瘤为低信号，T2 加权为高信号，MRI 能较为清晰显示骨外侵犯及关节累及程度。**结论** 平片检查为首选，检查结果准确率高， CT、MRI 检查可提供病灶内及病灶外更多信息，综合各种影像表现并进行对比分析，能够对骨肿瘤的诊断较为清晰反应，为临床制定治疗方案提供更为完整影像学信息；以上三种方法是目前骨肿瘤常用综合检查方法。

OR-443

Rapid-kilovoltage-switching dual-energy CT for differentiation of spinal osteolytic metastases from spinal infections

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Objectives To investigate the value of rapid-kilovoltage-switching dual-energy computed tomography (RDECT) for differentiating spinal osteolytic metastasis (SOM) from spinal infection (SI) during arterial phase (AP) and venous phase(VP).
Methods This study was institutional review board approved. 47 patients were examined by RDECT during AP and VP. 18 patients (median age 64 years; age range 26~77 years) had SI. Among them,11 patients had chronic non-specific infections (CNSI) and 7 patients had tuberculosis (TB) which were diagnosed after biopsy or diagnosed on basis of response to antibiotic therapy. 29 patients (median age 58 years; age range44~82 years) had pathologically confirmed spinal metastases. The iodine/water

densities for the lesion, the lesion-to-muscle ratio(LMR) and lesion-to-artery ratio(LAR) for iodine density measurements were calculated and compared between the two groups with the 2-tailed Student t test. The CT attenuation values on traditional CT images during AP and VP were measured. A P-value < 0.05 was considered statistically significant. Receiver operating characteristic (ROC) curves were used to determine the sensitivity and specificity of all the parameters for differentiating SOM from SI. ***Results*** During the AP, the iodine density, LMR and LAR for SI were 1.97±0.68 mg/ml, 6.03±2.21, and 0.23±0.07,respectively. These values were significantly different from the respective values of 2.81±1.34 mg/ml, 8.42±3.77 and 0.90±0.10 for SOM (all p＜0.05). During the VP, the iodine density, LMR and LAR for SI were 2.20±0.56 mg/ml, 4.63±1.59,and 0.46±0.14, respectively. These values were significantly different from the respective values of 3.21±0.72 mg/ml, 7.58±2.63, and 0.70±0.19 for SOM(all p＜0.05). The water densities and traditional CT attenuation values during AP and VP were not significantly different between the two groups. On ROC analysis, LAR during the VP (LAR_{VP})—with area under ROC curve (AUC) of 0.862—showed the best diagnostic performance. LAR_{VP} of 0.54 had sensitivity of 82.80% and specificity of 77.80% for differentiating SOM from SI. ***Conclusions*** RDECT may provide additional information for differentiating atypical SOM from SI.

OR-444

单、双指数模型扩散加权成像对脊柱肿瘤射波刀治疗的疗效评估及相关性分析研究

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目的 初步探究单、双指数模型扩散加权成像（DWI）在脊柱肿瘤射波刀治疗疗效评价方面的应用价值及其相关性分析。

材料与方法 收集了 2017 年 8 月至 2019 年 5 月在本院接受射波刀治疗的脊柱肿瘤患者共 15 例，其中剔除了接受过肿瘤切除手术或入院前曾经接受过放化疗的患者，每位患者治疗前及治疗后均接受了多 b 值 DWI 序列检查；感兴趣区域（ROI）由对患者治疗结果不知情的骨肌放射学专家勾画，参照抑脂 T1WI 增强图像，于病灶的最大横截面勾画 ROI，尽量避开出血、坏死、囊变以及邻近血管区域，ROI 至少包含全肿瘤范围的 2/3；利 FUNCTION TOOL 后处理软件中的单指数模型计算得到表观扩散系数(ADC)，利用双指数模型得到 D、D^*、f 值；随访时间为治疗后的第 3 个月，随访时再次进行多 b 值 DWI 序列检查，临床症状评估使用疼痛数字评分法(NRS)、QLQ-BM22 及 QLQ-C30 生存质量调查量表，每例患者均由神经外科、放射学及肿瘤放疗学专家组成的脊柱肿瘤多学科专家小组进行评审，根据患者治疗前后肿瘤体积改变、临床症状改变评定治疗是否有效；统计学方法采用配对 t 检验。

结果 12 例患者治疗有效，3 例治疗无效，治疗有效组治疗后的 ADC 较治疗前上升 24.2%（p＜0.05），D^*较治疗前下降 25.8%（p＜0.05），D 值和 f 值改变则没有统计学意义。

结论 治疗前后单指数模型 DWI 的 ADC 值以及双指数模型的 D^*改变对于脊柱肿瘤射波刀疗效评价具有指导意义，可以为临床上脊柱肿瘤患者治疗方案的个体化制订提供有价值的依据。

OR-445

骨原发性淋巴瘤影像学征像分析（附 4 例报告）

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【摘 要】 **目的** 分析骨原发性淋巴瘤的影像学征像。**方法** 复习国内外相关文献并回顾分析经我院病理证实的 4 例骨原发性淋巴瘤（PLB）的 X 线、CT 和 MR 表现。**结果** 3 例单骨病变（股骨、髋臼、髂骨），1 例多骨多部位病变（胸椎、腰椎、髂骨），临床上局部疼痛和肿胀为主要症状，而全身症状轻或无；以溶骨性破坏为主，X 线平片和 CT 可显示筛孔样骨质破坏和“浮冰征”，周围较大软组织肿块包饶尚存外形的病变骨，坏死不明显；肿瘤可破坏关节软骨侵犯关节，增强扫描显示轻、中度强化； MRI 显示信号均匀的软组织肿块，T_1WI 低信号，T_2WI 等或稍低信号。**结论** 影像学检查对骨原发性淋巴瘤诊断具有重要价值，X 线平片、CT 和 MR 应互相配合、补充，相互印证，多数骨原发性淋巴瘤可正确诊断。

OR-446

A comparative study of two MR sequences on the effect of metal artifact reduction

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Objective: To compare the effect of syngo-WARP sequences and simple parameter adjusted sequences in metal artifacts reduction on MR images of prosthesis.
Methods: MR scans with syngo-WARP sequences, simple parameter adjustment sequences and FSE sequences were performed on 3 prosthesis phantoms and 22 patients after joint replacement. The artifact area of the prosthesis was measured on the largest plane of the artifact in each sequences of MR images , and the MR image quality of patients in each sequences is evaluated. Wilcoxon signed rank test was used to evaluate the differences of image quality between syngo-WARP sequences and FSE sequences, simple parameter adjusted sequences and FSE sequences, and syngo-WARP sequences and simple parameter adjusted sequences, respectively.
RESULTS: The artifact area of the prosthesis phantom was largest in the FSE sequences, the artifact area in the simple parameter adjusted sequences was the second, the artifact area in the syngo-WARP sequences was the smallest, and the artifact area on the T1WI images was larger than the corresponding STIR images. The image quality of coronal T1WI ($P_{\text{syngo-WARP vs FSE}}<0.001$, $P_{\text{simple parameter vs FSE}}<0.001$), coronal STIR ($P_{\text{syngo-WARP vs FSE}}<0.001$, $P_{\text{simple parameter vs FSE}}<0.001$) and transverse STIR ($P_{\text{syngo-WARP vs FSE}}<0.001$, $P_{\text{simple parameter vs FSE}}<0.001$) of patients after joint replacement in syngo-WARP sequences and simple parameter adjusted sequences were significantly better than the corresponding FSE sequence. There was no statistical difference in the image quality of the coronal T1WI (P=0.642) and coronal STIR (P=0.337) between the syngo-WARP sequences and the simple parameter adjusted sequences. The image quality of transverse STIR in the syngo-WARP sequences was better than the simple parameter adjusted sequences (P=0.004).
Conclusion: Syngo-WARP sequences and simple parameter adjusted sequences can reduce the area of metal artifact and improve the image quality compared with conventional

FSE sequences. The effectiveness of the two sequences in diagnosing complications after joint replacement and its clinical value still require further exploration.

OR-447
第三代双源双能 CT 显示椎体成骨性骨转移瘤的最佳单能量水平

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目的 探讨第三代双源双能 CT 显示椎体成骨性骨转移瘤的最佳单能量水平；**材料和方法** 回顾分析 48 例恶性肿瘤患者的骨转移情况，均行双源 CT 双能成像，获得 MIxed0.5 线性融合图像（简称“融合图像”）和 40Kev—140Kev 单能量图像（间隔 10Kev），由两名医师采用双盲法独立选择融合图像椎体上的高密度病灶。以两评阅者漏诊的所有高密度病灶为研究对象，分别计算融合图像和各单能量图像的信噪比（SNR）、对比噪声比（CNR），采用配对样本 t 检验比较不同能量图像间的 SNR、CNR；根据以上结果，由同两名医师评阅 40Kev、60Kev 图像，并再次评阅融合图像椎体上的高密度病灶（每次评阅间隔 3 周），做相应评分（0 分为肯定非成骨性骨转移瘤，1 分为怀疑成骨性骨转移瘤可能，2 分为成骨性骨转移瘤可能性大，3 分为确诊为成骨性骨转移瘤），采用卡方检验比较两评阅者在不同能量图像上高密度病灶的检出率，采用加权 Kappa 分析检验在不同能量图像上两评阅者间对椎体成骨性骨转移瘤主观评分的一致性。所有统计结果均认为 $P<0.05$ 有统计学意义。**结果** 1、40Kev、50Kev、60Kev、70Kev 单能量图像的 SNR 均高于融合图像，其中 60Kev 单能量图像 SNR 最高，与其他各能量图像间存在统计学差异；40Kev、50Kev、60Kev 单能量图像的 CNR 高于融合图像，其中 60Kev 单能量图像 CNR 最高，与 40Kev 单能量图像间无统计学差异。2、比较不同能量图像两评阅者自身病灶检出率，60Kev 单能量图像的病灶检出率均高于融合图像，差异有统计学意义；Kappa 一致性分析：两评阅者对融合图像主观评分一致性差，对 40Kev 图像主观评分一致性较好,对 60Kev 图像主观评分一致性很好。**结论** 60Kev 单能量图像提高了图像质量；在 60Kev 图像上病灶检出率最高、主观评分一致性很好，研究表明 60Kev 为最佳单能量水平。

OR-448
基于 MRI-病理对照的软组织肉瘤 IVIM 及 DKI 与其组织病理学分级对照研究

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目的 在 MRI-病理对照的基础上，探讨 IVIM 及 DKI 用于判断软组织肉瘤组织病理学分级的应用价值。

材料与方法 收集经手术病理证实为软组织肉瘤患者 18 例，所有患者行常规 MRI 平扫、IVIM、DKI 及常规增强检查，并由两名放射科医师在肿瘤强化最明显及 DWI 信号最高区域勾画 ROI，获取 StandardADC、Dslow(mono)、Dfast(mono)、f(mono)、Dslow(bi)、Dfast(bi)、f(bi)、MK、MD 等参数值。采用 MRI-病理对照的方法，按照 FNCLCC 评分系统和 2 级分级系统，将 STSs 分为两组：高级别 STSs（Ⅱ级、Ⅲ级）和低级别 STSs（Ⅰ级）。分析各参数与软组织肉瘤组织病理学分级的相关性和诊断效能。

结果 18 例软组织肉瘤 IVIM 参数 StandardADC 值、Dslow(mono)值及 DKI 参数 MK 值、MD 值在鉴别高、低级别组间差异具有显著性（P<0.05），并且高级别软组织肉瘤的 StandardADC 值、Dslow(mono)值、MD 值低于低级别组；MK 值高于低级别组。IVIM 参数 StandardADC 值、

Dslow(mono)值及 DKI 参数 MK 值、MD 值对鉴别高、低级别软组织肉瘤的阈值分别为 1.442 x10^{-3}mm^2/s，1.061x10^{-3}mm^2/s，0.642，1.713 um^2/ms，该阈值对鉴别高、低级别软组织肉瘤的敏感度分别为 66.7%，91.7%，83.3%，100%，特异度分别为 100%，66.7%，100%，83.3%。

结论 IVIM 参数 StandardADC 值、Dslow(mono)值及 DKI 参数 MK 值、MD 值能够区分高、低级别软组织肉瘤。IVIM 及 DKI 两者联合应用较两者任何一种单独应用的诊断效能更好，其中 DKI 的参数 MK 值联合 IVIM 的参数 Dslow(mono)值用于鉴别高、低级别软组织肉瘤的诊断效能最好。

OR-449

粘液纤维肉瘤的 CT 及 MRI 表现

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【摘要】 目的 探讨粘液纤维肉瘤（MFS）的 CT 及 MRI 表现。方法 回顾性分析 20 例经手术病理证实的 MFS 患者的 CT 及 MRI 资料（4 例行 CT 检查，17 例行 MRI 检查，其中 1 例同时行 CT、MRI 检查），观察其形态、大小、密度/信号、强化特点及瘤周浸润等征象。结果 20 例 MFS 中 8 例为低度恶性，2 例中度恶性，10 例高度恶性。18 例位于浅筋膜下，2 例位于肌间隙内，10 例呈类圆形，7 例呈梭形，3 例呈不规则形，肿瘤最大径约 3.5~13.2cm，平均（7.58±2.76）cm；CT 扫描，3 例呈均匀等或稍低密度，增强扫描呈中重度均匀延迟强化，1 例病灶呈不均匀中度强化，内见斑片状低密度影，增强扫描呈轻度延迟强化；MRI 上，2 例呈 T_1WI 呈均匀稍高信号，15 例呈混杂等/低信号，2 例 T_2WI 呈均匀高信号，15 例呈混杂高信号，11 例病变呈 DWI 混杂高信号，10 例增强扫描呈不均匀明显强化；18 例可见“筋膜尾征”，13 例见瘤周水肿，11 例病灶内见“双低信号征”，10 例见囊变、坏死，6 例见粘液样变 结论 MFS 的 CT 及 MRI 表现具有一定特征性，有助于术前诊断，最终确诊依赖病理。

OR-450

肺癌骨转移的影像表现研究

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目的 探讨肺癌骨转移瘤的影像学特点。

方法 收集辽宁省肿瘤医院病理证实为肺癌骨转移患者的临床及影像资料。共收集 27 例患者，所有患者在检查前均未接受相关治疗，其中男性 14 名，女性 13 名，男女比例 1:1，平均年龄约为 59 岁，范围为 43-84 岁；其中 48-70 岁，大约占 81.2%。临床大多以肢体疼痛肿胀入院（20 例），少数为发现原发灶后，偶然发现转移灶。

结果 发病部位发生于右侧肱骨者共 10 例，其中肱骨上段 7 例，中段 1 例，下段 2 例；左侧肱骨 3 例，其中上段 1 例，中段 1 例，全段 1 例；右侧股骨共 5 例，全部位于上段；左侧股骨共 7 例，上段 5 例，中段 2 例；右侧胫腓骨 2 例，胫骨上段 1 例，腓骨下段 1 例。发生在骨端者共 22 例。X 线与 CT 上病灶大多位于骨端，偏心性生长(17 例)，均为溶骨性。骨皮质多为穿凿样或虫蚀样破坏，可伴一侧或四周骨质破坏（1 例患者四周骨质明显破坏，残余骨组织似苹果核样），破坏的骨皮质可轻度膨胀，其中有 5 例骨皮质与松质骨出现多发片状破坏，部分有融合，破坏骨之间伴有斑片状硬化。1 例出现梭形骨质破坏。髓腔及骨外多有软组织肿块影，范围相对局限时，可见软组织突破骨皮质到达骨外形成的类似束腰征的影像表现。横断面上骨的轮廓大致可见，较多病例可见层

状骨膜反应，当肿块较大时，骨膜反应可消失或可见骨膜三角，肿块内有时可见液性低密度影，同时可伴骨的轮廓破坏消失或病理性骨折。
MR 上骨皮质虫蚀样骨破坏较 CT 更加明显，多为斑点、片状、不规则状稍长 T1 长 T2 信号，脂肪抑制像呈高信号，肿块与髓腔间有时可在 T1、T2 上见线状低信号影。肿块较大时，其内可见片状长 T2 信号区，甚至可见液液平面。增强扫描可见片状异常强化区，有的病灶周围可见环状高信号影（2 例）。周围正常软组织常伴有炎性反应。
结论 肺癌骨转移在影像上的虫蚀样骨质破坏特征可以帮助临床诊断。

OR-451

Texture analysis based on diffusion kurtosis imaging in distinguishing benign from malignant soft tissue tumors

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Purpose: Recent studies have shown that DKI providesa new method to evaluate the non-gaussian diffusion behavior in complex biological tissues in various brain diseases and breast tumors. And the distribution of the DKI-derived parameters within the tumors might have the potential to describe the characteristics of the whole lesions. In this work, a 3D whole volume texture analysis based on DKI-derived parameter maps were carried out to investigate the application on soft tissue tumors and furtherly evaluate the ability of these texture parameters to differentiate benign and malignant tumors by using support vector machine (SVM) classifier.
Methods: Twenty-six patients (16 males and 9 females aged 38.0±20.6 years old) with soft tissue tumors (all have been diagnosed as soft tissue tumor according to pathological biopsy) were included in this study. And based on the WHO Classification of Tumors of Soft Tissue and Bone(2012) criteria, 26 patients were divided into two groups:15 for benign tumors and 11 for malignancies. All the patients were scanned by MR DKI sequence based on a 3T MR scanner (Ingenia, Philips Healthcare, Best, the Netherlands). The DKI scanning was performed with 3 b-values of 0, 600, 1,200 s/mm^2 and 15 motion-sensitive gradient directions. The DTI related parameters of mean diffusivity (MD),fractional anisotropy(FA), axial diffusivity (AD), radical diffusivity (RD) and DKI related parameters of mean kurtosis (MK), axial kurtosis(AK), radical kurtosis(RK) were calculated by using DKE software (Version 2.6.0, website:www.musc.edu/cbi).The whole volume 3D ROIs of the lesions were drawn on the b0, b600 or b1200 image and then the 3D ROI were copied to other DTI and DKI-derived parameter maps. Three dimension texture calculations were carried out by using a modified radiomics-master Matlab toolbox for each parameter map and b0, b600 and b1200 images. And for each parameter, 43 textures (Table 1)were extracted and finally 43×10 textures were obtained. Firstly, for all the 43×10 textures, Two sample student’s T test were performed to find the difference between benign and malignant groups. A P value of less than 0.05 was considered statistically significant. SVM classification with the first 100 leading features (reordered by fisher score) was performed to identify the malignant from the benign soft tissue tumors.

Results: The results revealed that many texture parameters showed a significant difference between benign and malignant soft tissue lesions ($P<0.05$) and the details were summarized in Figure 1 (because there are too much texture parameters, so we just showed the P value distribution of the features).The reordered features by using fisher score value were shown in Figure 2. The results showed that the SVM showed a good performance with a high classification accuracy of 73%, sensitivity of 76% and specificity of 72%.
Conclusions: Texture analysis based on DKI-derived parameters is helpful to provide useful information related to soft tissue tumors microstructure. And SVM classification based on textures was helpful for the diagnosis of soft tissue tumors.

OR-452
单指数、双指数、拉伸指数模型扩散加权成像及扩散峰度成像在评估软组织肉瘤组织病理学分级及 Ki-67 表达中的应用

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目的 探讨单指数、双指数、拉伸指数模型扩散加权成像（DWI）及扩散峰度成像（DKI）各参数在软组织肉瘤（STS）组织病理学分级中的应用及与 Ki-67 表达水平的相关性。
方法 回顾性分析 30 例手术病理（免疫组化指标含 Ki-67）诊断为 STS 患者，术前均行 3.0T MRI 检查（含 DWI 及 DKI 序列），测量 DWI 不同指数模型及 DKI 参数值，包括标准表观扩散系数（Standard ADC）、慢速扩散系数（D）、快速扩散系数（D*）、灌注分数（f）、分布扩散系数(DDC)、扩散异质性指数（α）、平均扩散峰度（MK）、平均扩散系数（MD）、各向异性分数（FA）值。根据法国癌症中心联合会（FNCLCC）分级系统，将 STS 分为高级别（Ⅱ级、Ⅲ级）和 STS（Ⅰ级）两组，其中高级别 19 例，低级别 11 例。采用两独立样本 t 检验比较两组各参数值差异；采用 ROC 曲线评估有鉴别价值参数的诊断效能。采用 Pearson 相关分析探讨各参数值与 Ki-67 表达指数的相关性。
结果 高级别 STS 的 Standard ADC、D、DDC、MD 值低于低级别 STS（$P<0.05$）；MK 值高于低级别 STS（$P<0.05$）。Standard ADC、D、DDC、MK、MD 值鉴别高、低级别 STS 曲线下面积（AUC）分别为 0.833、0.852、0.847、0.919、0.909，阈值分别为 1.231x10^{-3}mm^2/s、1.100 x10^{-3}mm^2/s、1.135 x10^{-3}mm^2/s、0.621、1.680um^2/ms。Standard ADC、D、DDC、MD 与 Ki-67 表达指数呈负相关（$P<0.05$），MK 值与 Ki-67 表达指数呈正相关（$P<0.05$）。
结论 单指数、双指数、拉伸指数模型 DWI 及 DKI 部分参数可预估 STS 组织病理学分级及 Ki-67 表达水平，DKI 对鉴别高低级别 STS 及预估 Ki-67 表达水平能力较不同模型 DWI 更佳。

OR-453
周围神经重组图像在评价骨肌肿瘤与邻近神经关系中的应用研究

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目的:应用曲面重组（CPR）技术得到周围神经重组图像，在其基础上观察骨肌系统肿瘤与邻近神经的关系，并探讨其在手术治疗中的价值。
方法：收集 2016 年 5 月至 2019 年 4 月间 27 例与周围神经关系密切并行手术治疗的骨肌系统肿瘤病例。术前先进行 CT 容积扫描，应用 CPR 技术对周围神经进行重建，观察病灶与邻近神经关系，根据其影像特点判断神经是否受侵，以术中所见为金标准，进行统计学分析。
结果：27 例（15 例原发软组织肿瘤、9 例原发骨肿瘤、3 例转移瘤）病例中有 25 例（25/27，92.59%）可以在同一层面显示肿瘤与邻近神经的关系，其中有 22 例术前影像判断与术中所见相符（22/25，88.00%）。在神经重组图像中，周围神经呈连续的条索状结构，并与肿瘤在同一层面上中，受侵神经增粗、边缘模糊，增强扫描可见强化。应用神经重组判断肿瘤侵犯神经的敏感性为 100%、特异性为 89.47%、阳性预测值为 75%、阴性预测值为 100%。
结论：周围神经重组图像可以帮助临床医生快速、直观的评价病灶与邻近神经的关系，指导术式的选择、减少术中神经损伤的风险，对神经是否受到侵犯有较高的敏感性和特异性。

OR-454
业余马拉松运动员足部疼痛的 MR 表现及相关因素分析

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目的 研究业余马拉松运动员足损伤的 MRI 表现及 MRI 对足损伤的诊断价值。**方法** 本研究经北京积水潭医院伦理委员会审核批准，并经患者知情同意，于 2018 年 10 月~2019 年 3 月间，招募 48 名业余马拉松运动员，对参与者足部疼痛按足踝损伤程度量表（FASS）分级表进行分级，并行双足 MRI 检查。研究业余马拉松运动员足部疼痛的 MRI 表现特点，并将性别、年龄、参加马拉松运动时间、每周跑步量、完成全程马拉松运动次数与足痛症状进行相关性研究。**结果** FASS 分级 0 级 28 侧，其中男性 8 侧，女性 20 侧，第 1 跖趾关节积液 8 侧、骨髓水肿 6 侧、软组织水肿 4 侧、腱鞘积液 4 侧、无异常发现 6 侧；FASS 分级 1 级 68 侧，其中男性 42 侧，女性 26 侧，跟腱炎 38 侧、足底筋膜炎患者 14 侧、跟腱滑囊炎 12 侧、后踝撞击综合征 4 侧。业余马拉松运动员中足部疼痛的发生率与性别相关（*OR* 值*=1.060，P*=0.043），与年龄（*OR* 值*=0.248，P*=0.078）、完成马拉松次数（*OR* 值*=1.006，P*=0.956）、参加马拉松运动时间（*OR* 值*=1.008，P*=0.944）及每周跑步量（*OR* 值*=0.971，P*=0.407）不相关。 **结论** 在业余马拉松运动员中，足痛者主要是跟腱和足底筋膜损伤，而无足痛症状者主要表现为关节积液、腱鞘积液和骨髓水肿等。性别是业余马拉松运动员足部疼痛发生率的唯一影响因素。MR 检查是明确足损伤的有效方法，在足损伤的诊断和治疗方面具有重要的临床应用价值。

OR-455
基质诱导的自体软骨细胞移植术的 MRI 评估及其与软骨下骨的相关性

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摘要 **目的** 探讨基质诱导的自体软骨细胞移植（matrix-induced autologolus chondrocytes implantation, MACI）治疗股骨滑车大面积软骨损伤的疗效以及初步探讨移植物预后是否与软骨下骨的质量相关。**方法** 选取从 2015 年 1 月至 2016 年 11 月在我院接受 MACI 手术的 30 例患者进行随访；用 Lysholm 评分及国际膝关节文献编制委员会分级评估标准（International Knee

Documentation Committee, IKDC）评分问卷行膝关节主观功能评估，在术前及术后进行；软骨移植物的磁共振结果采用软骨修复组织 MR 观察评分（magnetic resonance observation of cartilage repair tissue, MOCART）及 T2*值表示。采用两配对样本的 t 检验评估术前、术后 Lysholm 评分、IKDC 的均值差异；采用 Mann-Whitney U 检验比较分析两组别患者术区软骨移植物与术区旁 6mm 区域 T2*值的差异；采用 Pearson 检验分析软骨下骨的受损面积与移植物 MOCART 评分、T2*值评分的相关性。**结果** 30 例患者术前、术后 Lysholm 为 58.92 ± 10.41、90.15± 6.66（P <0.01），IKDC 评分术前、术后为 56.23±7.81、93.22±5.51（P < 0.01）；软骨移植物 MOCART 评分为 61.63 ±18.47 分；软骨下骨的受损面积与移植物的 MOCART 评分、T2*值有显著的负相关（r=-0.70，P < 0.01；r=-0.71，P < 0.01）；**结论** MACI 对 III-IV° 大面积软骨损伤有较好的近期疗效，可显著改善膝关节功能；软骨下骨的受损面积与移植物的 MOCART 评分及 T2*值呈显著负相关，对移植物的预后起着重要的作用。

OR-456

动态技术在颈椎动力 MRI 的应用初探

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目的：本研究通过调节成像参数，以寻求高信噪比和高分辨率的动态成像，并在颈椎过屈过伸位时观察骨质运动、椎管变化，并探讨其临床指导意义。
材料与**方法** （1）志愿者扫描，在其他所有参数保持统一、单一因素改变的条件下，以需求最佳动态扫描成像的各项参数。（2）选择 2019 年 3 月来我院骨科门诊颈椎病患者 30 例，给予颈椎正中矢状位常规扫描及动态核磁共振成像，观察其各椎体骨质及有效椎管等变化，病观察其动态下脊髓受压变化情况。
结果 （1）动态颈椎磁共振最优参数确认。颈椎病患者自由缓慢做伸屈运动，各颈椎锥体骨质清晰显示，椎间隙水平有效椎管矢径屈曲位最大，后伸位最小。（2）C1-C3 锥体与 C4-C6 锥体动态成像之间差异都有统计学意义；C1-C3 锥体椎间隙显示欠清晰。水平后伸位分别与前屈位及中立位之间差异具有统计学意义；C5/6 椎间隙水平三种体位之间差异无统计学意义；C6/7 椎间隙水平后伸位与前屈位之间差异具有统计学意义。颈椎各椎间盘水平受体位及线圈限制，缓冲空间屈曲位最大，中立位次之，后伸位最小，差异都具有统计学意义。
结论 （1）0.5 秒动态颈椎成像显示清晰，信噪比高，可以用于辅助临床诊断。（2）颈椎病患者颈椎运动时，在 C1-C3 存在运动伪影，C4-C7 显示可，两组具有显著性差异。（3）颈椎病患者运动时其椎间隙水平有效椎管矢状径三种体位之间没有变化；其在 C3/4－C6/7 间隙水平后伸位变小；在 C5/6 椎间隙水平后伸位变小，前屈位变大：在 C6/7 椎间隙水平前屈位变大。所有椎间隙水平的缓冲空间前屈位时变大，后伸位时减小。而脊髓矢状径无变化。颈椎有效椎管矢状径在 C4/5.C5/6 节段后伸时变化幅度最大。

OR-457

多层螺旋 CT 及其图像后处理技术在踝关节处隐匿性骨折中的诊断价值

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目的 分析踝关节处隐匿性骨折的多层螺旋 CT（MSCT）表现，研究 MSCT 及其图像后处理技术在诊断踝关节处隐匿性骨折的应用价值，为临床诊疗提供帮助。**方法** 收集我院 2016 年 12 月~2018 年 12 月经临床及手术证实的踝关节处隐匿性骨折病例 56 例，对所有患者的 MSCT 资料进行回顾性分析。**结果** MSCT 断层图像诊断出出踝关节处隐匿性骨折 31 例，多平面重组（MPR）诊断出 39 例，容积再现三维成像（VRT）诊断出 32 例，表面阴影显示法（SSD）诊断出 14 例，最大密度投影（MIP）诊断出 7 例，CT 仿真内镜（CT viryual endoscopy）诊断出 5 例；所有方法综合运用诊断出 47 例。MPR 的检出率最高，与其他方法对比均具有统计学意义（P＜0.05）。 **结论** MPR 是 MSCT 及其图像后处理技术中诊断踝关节处隐匿性骨折检出率最高的方法，多种方法联合运用效果最佳，能够为临床诊疗提供更加准确的影像学依据。

OR-458

肩袖损伤磁共振综合观察（专题讲座）

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目的 肩袖撕裂磁共振诊断已较完备，但时常发生误诊。分析我们失败的原因和近年的体会，提供一些拙见供大家批评指正。**方法** 回顾我院去年肩袖撕裂，手术证实病例 500 例，其中影像诊断与手术对照偏差较大的 37 例。回顾分析全部误诊病例，与手术结果对照，并回顾分析影像，以期改进诊断。肌肉萎缩定量分析，采用 Goutallier 分级。**结果** 附着点短小部分撕裂 13 例，影像表现冈上肌肿胀，裂隙观察较困难，这部分估计需要关节造影。肩袖全层撕裂误诊为部分撕裂 15 例。回顾分析这 15 例，9 例主要是老年人，累及冈上下肌腱，呈慢性陈旧性全层断裂，断端纤维化且纤细，肩峰下滑囊和盂肱关节缺乏积液。但这些患者，肱骨头-肩峰间隙明显狭窄，冈上肌腱难以辨识，更直接的征象是冈上下肌甚至肩胛下肌 Goutallier Ⅲ级以上萎缩。如果事先观察到肩袖肌Ⅲ级以上萎缩，则肩袖肌腱全层断裂诊断就迎刃而解。还有一个问题就是肌肉萎缩程度估计过高，有 10 例，主要是肌肉回缩与萎缩发生误判，这在肩胛下肌萎缩中常见，主要是萎缩程度判断过高。需要充分结合矢状面和 T1WI 横断面，后者对估计肌内脂肪浸润情况十分关键。**结论** 肩袖损伤磁共振评价需要综合观察，非但需要观察肩袖损伤程度和范围的观察，也需要肩袖肌萎缩程度的判断。同时注意区分萎缩和肌肉回缩的区别。

OR-459

T1ρ、T2-mapping 与膝骨关节炎临床评分的相关性分析

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目的 探讨 T1ρ、T2-mapping 技术与膝骨关节炎（Osteoarthritis，OA）WOMAC 评分之间的相关性。

方法 纳入 53 名符合中华医学会骨科学分会 2007 年修订的膝 OA 的诊断标准的志愿者。对所有入组的志愿者通过病例报告表的方式收集临床资料及性别、年龄等一般资料，由专业的骨科大夫使用 WOAMC 评分量表（Likert 版）评估其临床症状；所有志愿者进行 MR 常规序列和 T1ρ、T2mapping 序列扫描，由专业的放射科大夫分别评估股骨内侧、股骨外侧、胫骨内侧、胫骨外侧、髌骨侧软骨，选取各区域软骨损伤最重部分，勾画感兴趣区测取 T1ρ值和 T2 值。其中男性 16 名，女性 37 名，平均 53.66±8.31 岁。采用 Mann-Whitney U 检验不用性别之间 WOMAC 评分的差异。采用 Spearman 秩相关分析年龄、T1ρ和 T2-mapping 两个序列上的各区域软骨的核磁数值及其总和与

WOMAC 疼痛评分、僵硬评分、功能评分和 WOMAC 总评分之间的相关性。|r|> 0.7，高度相关；0.4 <|r| <=0.7，中度相关，0.2 < |r| <= 0.4，低度相关。检验水准 α 值取双侧 0.05。
结果 1、不同性别之间的 WOMAC 评分没有显著差异（P＞0.05），年龄和 WOMAC 评分未见显著的相关（P＞0.05）。2、股骨内侧髁软骨 T1ρ 值和 WOMAC 疼痛评分、僵硬评分、功能评分及 WOMAC 总评分均具有相关性，除与僵硬评分呈中度相关外，其余均呈低度相关；胫骨内侧软骨 T1ρ 值仅与 WOMAC 功能评分存在着低度相关，其它均不具有相关性。3、股骨内侧髁软骨 T2 值仅与 WOMAC 功能评分和总评分之间存在着低度相关，而其它部位软骨的 T2 值和 WOMAC 评分均不具有相关性。
结论 股骨内侧髁软骨在一定程度上可以反应 WOMAC 评分的情况，T1ρ 技术与 WOMAC 评分之间的相关性较 T2-mapping 好。

OR-460
业余马拉松运动员踝关节损伤的 MRI 特征及相关因素分析

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目的 探讨业余马拉松运动员踝关节损伤原因、特点和影像学表现。**方法** 2018 年 12 月至 2019 年 3 月按研究纳入和排除标准，收集业余马拉松运动员作为受试对象。通过问卷调查收集相关资料，并对受试者行踝关节 MRI 平扫检查，采用踝关节专用相控阵线圈，分别行快速自旋回波序列（TSE）冠状面 T1WI，质子密度加权抑脂序列（PDWI-FS)横断面、冠状面及矢状面扫描，三维-双回波稳态序列（3D-DESS）及三维-可变翻转角快速自旋回波序列(3D-SPACE)扫描。检查结果由 2 名医师对韧带、肌腱、骨髓等踝关节影像表现进行综合分析，两者意见不一致时由第 3 名医师进行判定作为最终诊断；分析不同跑姿、参加马拉松的次数及训练强度与踝关节损伤的关系 ，统计采用独立样本 x^2 检验，2 名医师的一致性采用 kappa 检验。结果 根据纳入及排除标准，最终纳入受试者 39 名，64 侧踝关节，右踝 35 侧、左踝 29 侧。2 名放射科医师有较好的一致性，Kappa 值为 0.91。跑姿中，后脚掌着地较前、中脚掌着地韧带损伤发生率明显增加，差异有统计学意义（P=0.013，x^2 值为 6.191）。前、中脚掌着地较后脚掌着地肌腱损伤发生率目明显增加，差异有统计学意义（P=0.029，x^2 值为 4.775）；训练量较大者（训练跑步量≥300 km/个月）踝关节损伤较显著（P=0.005，x^2 值为 7.844）。结论 业余马拉松志愿者踝关节运动损伤的 MRI 影像表现特征与不同的跑姿及训练强度有关。

OR-461
髌骨脱位的影像诊断及术后评估的讨论

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目的 利用 CT 和 MRI 对髌骨脱位患者进行进行术前及术后检查，对比两种检查方法的优缺点。**方法** 对 19 名髌骨脱位患者，有外伤史 17 名，无明显外伤史 2 名，年龄 11-46 岁，平均 21.5 岁，分别进行术前及术后的 CT 及 MRI 检查，结果与关节镜术中观察情况进行对比，比较其诊断髌骨脱位的准确率及术后状态的评估。**结果** CT 及 MRI 对膝关节脱位髌骨内移度的诊断准确率相仿,对于其术后状态的髌骨的复位情况，关节内积液，韧带情况及周围水肿度的比较 MRI 较 CT 有较大优势。**结论** 髌骨脱位术前诊断 CT 和 MRI 相仿，但是术后 MRI 能更准确的显示其术后状态，更有利于其术后关节功能的评价，而 MRI 术后评价与其远期疗效的评定需要进一步观察。

OR-462

Detection of Bone Marrow edema in stress injury of lower extremity by using DECT：Comparison study with MR imaging

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Abstract
Objective: To evaluate the performance of dual-energy computed tomographic (DECT) virtual noncalcium images for the detection of bone marrow edema in patients with clinically suspected stress injury of lower extremity.
Matetial and methods: This prospective study includes 24 patients who had stress injury in the lower extremity from January 2018 to July 2018. DECT and 3.0T magnetic resonance image were performed within 1 week of each other. DECT was performed with a tube voltage of 90KV and 140 KV. Two radiologists evaluated the virtual noncalcium images for bone edema in the injury of lower extremity. Reference standard was the result of the MRI images. Performance characteristics (sensitivity, specificity, accuracy) were performed to evaluate the diagnostic value between DECT and MRI.
Results: The Sensitivity was 91% and 95% and Specificity was 100% and 100% and Overall accuracy was 92% and 96% for both observers, respectively. There was near-perfect agreement between the two readers (κ = 0.89).
Conclusion: DECT virtual noncalcium images were able to demonstrate bone marrow edema of stress injury in the lower extremity.

OR-463

马拉松运动足踝关节损伤的影像学研究现状

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马拉松运动是一项在公路上举行的超长距离的（42.195 公里）比赛。近几年来，随着全民健身的普及和推广，马拉松运动越来越受到大众的欢迎。
跑步已被证明对身体的不同系统有明显的益处：可以降低患心血管疾病，糖尿病和精神疾病的风险。然而长距离跑步是否会产生不良影响仍存在争议，是否会导致急性或慢性损伤，或者是否会加速关节炎的发生，是否导致更多的运动损伤仍需进一步追踪和研究。

OR-464

Quantitative T2 mapping-based tendon healing can predict the clinical outcomes during the first year after arthroscopic rotator cuff repair (ARCR)

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Purpose: Rotator cuff repair using arthroscopic double-row technique enables a better tendon healing at the footprint region. The objective of this study was to determine whether quantitative T2 mapping-based tendon healing and muscle fatty degeneration could predict the clinical outcomes during the first year after arthroscopic rotator cuff repair (ARCR) using double-row technique.

Methods: Twenty-two patients with rotator cuff tear were prospectively recruited. Serial clinical and MRI follow-up assessments were carried out at: 1 month, 6 months and 12 months. Twenty healthy volunteers were involved and performed with MRI examinations. A standard protocol including quantitative T2 mapping sequence was used to determine repaired tendon integrity, tendon healing and fatty degeneration. Pearson's correlation coefficient was used to analyze correlations between MRI measurements and clinical outcomes.
Results: All clinical scores including functional assessments and pain ranking scale indicated significant improvement compared with preoperative scores ($P<0.001$) and all the affected shoulders returned to daily activities at 12 months. The T2 values at the healing site significantly decreased over time ($P<0.001$), and the mean T2 value at 12 months was comparable to healthy controls ($P=0.49$). Additionally, the T2 values at the healing site significantly correlated with clinical results ($P<0.05$), but the T2 values of cuff muscles didn't significantly correlate with clinical outcomes ($P>0.05$).
Conclusions: Tendon healing was featured by decreased T2 values. T2 mapping-based tendon healing could predict clinical outcomes in the first follow-up year. Furthermore, the repaired tendons at 12 months were almost mature compared to healthy controls based on biochemical T2 values. However, quantitative T2 mapping-based fatty degeneration should not be used as an objective test to evaluate the clinical outcomes. The results from this study will allow clinicians to evaluate tendon-specific health to determine whether the tendon healing is mature enough to return to activities during the first postoperative year.

OR-465

The MR appearance of spinoglenoid notch cyst

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Objective To analyze the MRI appearance of spinoglenoid notch cyst(SNC). **Methods** MRI data of 28 cases of SNC confirmed by histopathology were analyzed retrospectively. **Results** All 28 SNC located in spinoglenoid notch, 22 cases were on the right side. All of the cysts were hypointense on T1 weighted imaging(T1WI) and hyperintense on both T2 weighted imaging(T2WI) and proton density weighted imaging(PDWI). Hypointense band-like separation could be seen in 25 cases. The size and shape of SNC vary dramatically. 9 cases combined with superior labrum anterior posterior lesion(SLAP). On oblique sagittal fat-suppressed PDWI, suprascapular nerve compressed by SNC could be discovered in 12 cases. Edema of infraspinatus could be observed in 4 cases.

Conclusion MRI could provide accurate location and characteristic diagnosis of SNC. SNC could cause symptoms regardless of size and shape. SLAP lesion was closely related to the occurrence of SNC. The occurrence of low signal separation was helpful in distinguishing cysts from effusion.

OR-466
踝关节外侧副韧带急、慢性损伤 MR 与高频超声的联合诊断价值

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目的 探讨 MR 与高频超声联合诊断踝关节外侧副韧带急、慢性损伤的价值
材料与方法 回顾性分析天津医院足踝外科收治手术的 65 例急、慢性踝关节外侧副韧带损伤患者的 MR 检查与高频超声检查资料，并以踝关节镜手术结果作为“金标准”。本组病例中男性 47 例，女性 18 例，年龄 15-61 岁，平均 31.7 岁；病程从 4 小时-10 年，平均 6.3 个月；急性损伤 29 例，慢性损伤 36 例；病因：扭伤 36 例，运动损伤 15 例，交通事故 11 例，坠落伤 3 例；损伤部位：右踝 35 例，左踝 30 例。所有患者均使用美国 GE 公司 MR750 DISCOVERY 3.0T 核磁共振扫描仪行核磁检查，使用美国公司 GE LogicE9 进行彩色多普勒超声检查。
结果 MR 检查诊断单纯距腓前韧带完全断裂 8 例，大部分断裂 12 例；单纯跟腓韧带完全断裂 2 例，距腓前韧带+跟腓韧带联合损伤 31 例，陈旧性损伤 7 例，距骨软骨损伤 12 例，骨折 15 例，骨挫伤 29 例，滑膜炎伴积液 39 例。手术符合率达 93.8%。超声诊断单纯距腓前韧带完全断裂 8 例，大部分断裂 11 例；单纯跟腓韧带完全断裂 2 例，距腓前韧带+跟腓韧带联合损伤 30 例，陈旧性损伤 7 例，骨折 11 例，滑膜炎伴积液 39 例，手术符合率达 90.2%，软骨损伤及骨挫伤则未能诊断。
结论 踝关节镜手术对比，核磁与超声对距腓前韧带损伤、滑膜炎伴积液诊断符合率基本一致；诊断跟腓韧带损伤，超声较 MR 有优势，MR 检查需要精确的扫描角度，而超声可以沿着韧带走行方向检查；陈旧性韧带损伤，MR 主要表现为韧带增粗，信号异常，超声则表现为韧带厚薄不均、回声减低、张力减弱；骨折的诊断，由于超声检查视野所限，诊断不如 MR；软骨损伤和骨挫伤，核磁检查与术中所见基本一致，而超声则不能诊断；在诊断上，MR 可以多位医师会诊，超声则依靠检查医师的个人经验。综上所述，外侧副韧带损伤的诊断要依据 MR 与超声的联合检查，能对临床治疗方案提供最佳的帮助。

OR-467
应用 T2 mapping 成像评价马拉松前后膝关节软骨短中期改变

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目的 应用 T2 mapping 成像评价非专业长跑者马拉松前后膝关节软骨短中期改变。
方法 招募 12 名非专业马拉松运动员，年龄 21.0~37.0 岁，体质量指数（body mass index, BMI）17.6~27.2 kg/m2。入组受试者平均每周跑步 3 次以上，每次运动时间约 30 min，24 个膝关节在赛前 1 周、赛后 12 h 内及 2 个月时行 MR 扫描。应用 T2 mapping 成像测量膝关节股骨内髁（MFC）、股骨外髁（LFC）、胫骨内侧平台（MTP）、胫骨外侧平台（LTP）、髌骨（Patella）和滑车（Trochlea）各亚区软骨的浅层（SZ）、深层（DZ）T2 值。赛前与赛后软骨 T2 值比较选用配对 t 检验，软骨浅层与深层 T2 值比较选用独立样本 t 检验。

结果　T2 mapping 成像示关节软骨浅层 T2 值在赛前、赛后 12 h 内及 2 个月随访时均高于深层，差异有统计学意义（t=11.095、10.385、10.102，P 值均<0.01）。赛后 12 h 内关节软骨浅层 T2 值较赛前低，差异有统计学意义（t 值为 2.18,P<0.05）；关节软骨深层 T2 值与赛前相比，差异无统计学意义（t 值为 1.832,P>0.05）。赛后 12 h 内除 MTP-DZ 外，余软骨 T2 值均呈降低趋势，其中 MFC-DZ 与赛前比较差异有统计学意义（t=2.11,P 值<0.05）。赛后 2 个月随访时，2 名受试者失访，大部分亚区软骨 T2 值与赛前相比差异无统计学意义（P 值均>0.05），LFC-SZ 和 LFC-DZ 与赛前相比差异有统计学意义（t=2.378、3.147,P 值<0.05）。
结论　T2 mapping 成像 T2 值的变化可以反映马拉松长跑者关节软骨内组织结构的变化过程，在压力作用下，软骨浅层 T2 值的变化更为显著。膝关节软骨的 T2 值在跑后 2 个月可逐渐恢复到跑前水平。

OR-468

MR 对非职业马拉松运动员髋部骨髓转化的评价

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目的　通过 3.0 T MR 成像（MRI）T_1加权像（T_1WI），观察无症状非职业马拉松运动员髋臼及股骨近端骨髓信号，评价骨髓转化情况。
方法　随机选取近 2 年≥1 次/年参加并完成全程马拉松比赛，长跑训练里程不少于 1600 km，髋关节无症状、查体无异常，22~53 岁的 31 名（62 个髋）志愿者为研究组。对照组随机选取 23~53 岁的 29 名健康者（58 个髋），无髋关节痛，不常运动。受试者均进行髋关节 MR 扫描，且显示正常。MR 扫描前至少 12 h 未从事长跑及其他运动。对髋臼及股骨近端各部位骨髓 T_1WI 信号与周围肌肉及脂肪相比，将信号强度由低到高分为 0～4 级，进行分级评价；并将研究组按马拉松训练年限（跑龄）分为 2 组，跑龄大于等于 4 年为 A 组、小于 4 年为 B 组，并进行组间比较。对股骨近端骨髓信号分布采用较直观的 3 型 4 分法进行分型评价。本研究结果为等级资料，采用 Mann-Whitney U 检验进行统计分析。
结果　骨髓信号分级评价，研究组共 62 个髋 384 个部位中观察骨髓信号，对照组共 58 个髋 348 个部位中观察骨髓信号，两组间所观察髋臼、股骨头、股骨颈、粗隆间、大粗隆、股骨干上段骨髓信号等级分布差异均有统计学意义（P <0.05）。研究组组间比较，A 组 14 名、28 髋、168 个部位，B 组 17 名、34 个髋、204 个部位，骨髓信号等级分布，髋臼、股骨头、股骨颈、粗隆间、大粗隆、股骨干上段骨髓信号差异均有统计学意义（P<0.05）。对股骨近端骨髓信号分型评价，研究组与对照组分别为 62 个、58 个股骨近端骨髓信号分型结果，两组间比较差异有统计学意义（P <0.05）。
结论　无症状非职业马拉松运动员髋臼及股骨近端骨髓 T_1WI 信号强度较非马拉松运动员低；跑龄长者髋臼、股骨颈、股骨干上段骨髓 T_1WI 信号强度较低；即马拉松运动对髋臼及股骨近端骨髓信号具有一定影响，且骨髓信号改变与运动量具有一定相关性。

OR-469

椎体成形术后并发症的影像学诊断

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目的　探讨椎体成形术后的影像学表现，提高对其并发症的诊断能力。

方法 回顾性分析 2011.5-2016.5 在我院进行影像学检查的椎体成形术患者资料共 182 例，其中行 X 线平片检查者 119 例，CT 检查者 38 例，MR 检查者 25 例(同一患者前后 X 线平片检查记录为 1 例，同时做 X 线和 CT 或 MR 检查者分开记录)。分析术后椎体的形态、高度及骨水泥的位置，评价骨水泥渗漏、感染和邻近椎体继发压缩骨折等并发症的发生率及表现。
结果 发现骨水泥渗漏者共计 21 例，发生率约 11.6%，其中渗漏入椎管者 16 例、椎间孔者 8 例、椎间盘者 3 例、椎后静脉丛者 6 例、椎前静脉者 5 例、下腔静脉者 1 例，同时合并肺动脉栓塞引发肺炎者 2 例（若同时渗漏入多个部位则分开记录）。影像学表现为相应椎管内硬膜外、椎间孔区平片和 CT 可见高密度骨水泥渗漏聚集；进入血管者表现为椎体周缘高密度血管影显示，类似于血管造影；MRI 则各序列均呈低信号改变。合并感染者 2 例，发生率 1%。影像学表现平片无明显阳性发现，CT 表现为椎体骨质密度不均，散在局限性低密度区，但不易诊断；MRI 更有价值，可见椎体信号不均匀，明显增多的骨髓水肿样 T2W 高信号，1 例同时累及椎间盘，可见终板破坏，椎间盘 T2W 信号增高，周围软组织肿胀。12 例患者在随访过程中发现相邻椎体继发压缩性骨折，最短者 3 个月，最长者 1 年，发生率约 6%。
结论 椎体成形术是临床常见骨科手术之一，最常见并发症是骨水泥渗漏入椎管和血管内，若进入血管应注意并发肺动脉栓塞；椎体感染较少见，MRI 更有价值；随访过程中因注意相邻上下椎体继发压缩性骨折。

OR-470
膝关节轻度屈曲位 MR 横断面测量值对复发性髌骨脱位的诊断价值

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目的 利用 MRI 对复发性髌骨脱位患者进行横断面骨性结构定量测量分析，探讨此类患者在膝关节轻度屈曲位横断面测量指标的诊断价值。**方法** 对比分析 30 例临床诊断复发性髌骨脱位患者（病变组）及 30 例与之年龄、性别及体质量指数（Body mass index，BMI）相匹配健康志愿者（对照组）。利用八通道膝关节专用线圈，在轻度屈曲位（约 10°）MRI 横断面上测量股骨滑车面对称性、外侧滑车倾斜度、滑车深度、髌骨倾斜角、外移度、股骨滑车与胫骨结节的水平距离（Tibial tuberosity-trochlear groove distance，TTTG）。利用独立样本 t 检验比较这些测量值在病变组和对照组之间是否存在统计学差异。采用受试者工作特征（Receiver operating characterisitic，ROC）曲线观察各测量指标曲线下面积，以约登指数最大点作为诊断界值，计算各指标诊断复发性髌骨脱位的敏感度和特异度。**结果** 1、病变组股骨滑车面对称性、外侧滑车倾斜度、滑车深度较对照组显著减小，差异有统计学意义（P 值均＜0.05）。病变组髌骨倾斜角、外移度、TTTG 值较对照组显著增大，差异有统计学意义（P 值均＜0.05）。2、股骨滑车面对称性、外侧滑车倾斜度、滑车深度、髌骨倾斜角、外移度和 TTTG 值诊断复发性髌骨脱位 ROC 曲线下面积分别为 0.940、0.955、0.948、0.973、0.970、0.852，其诊断界值分别为＜56.5%、＜15.0°、＜4.5mm、＞10.7°、＞-2.4mm、＞9.7mm，诊断的敏感度分别为 90.0%、86.7%、96.7%、93.3%、93.3%、70.0%，特异度分别为 86.7%、93.3%、83.3%、93.3%、93.3%、86.7%。 **结论** 在膝关节轻度屈曲位，股骨滑车面对称性、外侧滑车倾斜度、滑车深度、髌骨倾斜角和外移度对复发性髌骨脱位具有较好的诊断价值。

OR-471
扩散张量成像在评估业余马拉松运动员跑步前后大腿骨骼肌变化的初步研究

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目的 运用 MR 扩散张量成像（diffusion tensor imaging，DTI）技术，定量分析业余马拉松运动员大腿骨骼肌在半程马拉松跑步前后的微观分子水平变化。
方法 招募符合纳入标准的业余马拉松运动员 10 名（男性 6 名，女性 4 名）。所有被试者在跑前及半程马拉松后 3h 内均行双侧大腿轴面 T1WI、T2WI 及 DTI 扫描，应用 Siemens Neuro 3D 后处理软件对图像进行后处理分析，测量双侧大腿股四头肌、内侧群骨骼肌及腘绳肌的 FA 值及 ADC 值。采用单因素重复测量检验比较跑步前后大腿骨骼肌 DTI 参数的差异性。
结果 跑步后股四头肌的 FA 值较跑前显著降低，差异具有统计学意义（F=5.843，P<0.05），而大腿内侧群骨骼肌及腘绳肌在跑步前后的 FA 值变化无明显统计学差异（P>0.05）；股四头肌、大腿内侧群骨骼肌及腘绳肌 ADC 值在跑步前后的变化无统计学差异（P>0.05）。
结论 在常规 MR 成像无阳性发现的情况下，DTI 技术能在微观分子水平早期无创地评估业余马拉松运动员跑步前后双侧大腿骨骼肌的改变。

OR-472
55-65 岁中国老年女性在隔代抚养中腰椎疲劳风险的有限元分析

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目的 在中国的 5 5 岁到 6 5 岁之间的老年妇女，约 66.47%充当带孙儿孙女的角色，而频繁的负重（抱孩子）的动作增加了腰椎慢性疲劳的风险。本文利用有限元方法 模拟中国女性抱小孩的行为，分析验证脊柱松质骨的应力集中效应，并对应力集中位置进行疲劳仿真和预测，对中国老年女性在隔代抚养时的腰椎保护具有很大的指导意义。
方法 根据无退行性临床症状的中国老年女性腰椎 CT，进行图像分割和三维重建，建立具有中国老年女性腰椎特点的腰椎三维几何模型，在三种载荷条件下计算分析脊柱松质骨局部应力和应变分布情况，选取关键位置进行疲劳仿真，预测不同疲劳载荷强度下脊柱松质骨的疲劳耐受极限。
结果 腰椎椎间盘内压受力最大部位在弯腰不抱小孩状态下，弯腰抱小孩和直立之后，都在 L5-S1 之间，分别为 3.56 Mpa，5.38 Mpa 和 1.47 Mpa ；腰椎椎体上下的终板软骨受力最大部位，在弯腰不抱小孩状态下，弯腰抱小孩和直立之后，都在 L5 的上下终板软骨的边缘，分别为 16.55 Mpa ，23.58 Mpa 和 26.55 Mpa；腰椎椎体在弯腰无负重，弯腰抱小孩和抱起孩子直立三种状态下，受力最大的位置均在 L5 的侧后方，对应的疲劳极限次数分别为 1 000 000 次以上，1 300 次，18 次。
结论 中国老年女性如果连续抱三岁孩子直立的动作次数超过 18 次，L4-L5 的椎体后部以及椎弓根松质骨将面临疲劳性损伤的风险，研究结果 对于保护老年女性的腰椎健康具有很大的意义。

OR-473
无症状业余马拉松运动员踝关节损伤的 MR 特征及相关因素分析

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目的 分析无症状业余马拉松运动员踝关节损伤的 MR 特征及损伤的影响因素。**方法** 招募本地区 63 名业余马拉松运动员作为研究对象，其中男性 38 名，女性 25 名，均无任何踝关节不适症状。所有研究对象行 MRI 踝关节扫描，采用踝关节专用相控阵线圈，扫描序列包括快速自旋回波 T_1WI 序列、脂肪抑制质子密度加权像序列(PDWI-FS)、脂肪抑制快速自旋回波 T_2WI 序列(T_2WI-FS)和三维双回波稳态序列(3D-DESS)。两个或多个独立样本率的比较采用 Fisher 精确检验。采用 Logistic 回归性检验分析损伤的影响因素。**结果** 骨质损伤主要表现为骨髓水肿、囊变及应力性骨折。其中骨髓水肿共 14 例；囊变 5 例；应力性骨折 1 例。韧带损伤主要表现为部分损伤，未见完全损伤。其中距腓前韧带损伤 41 例；距腓后韧带损伤 40 例；跟腓韧带损伤 40 例；内侧三角韧带损伤 16 例；下胫腓前韧带损伤 16 例；下胫腓后韧带未见损伤。跟腱损伤主要表现为跟腱滑囊炎及跟腱炎。其中跟腱滑囊炎 19 例；跟腱炎 22 例。其余肌腱损伤主要表现为腱鞘积液。其中踇长屈肌腱腱鞘积液 52 例；趾长屈肌腱腱鞘积液 29 例；胫骨后肌腱腱鞘积液 51 例；腓骨长短肌腱腱鞘积液 12 例；趾长伸肌腱腱鞘积液 4 例；胫骨前肌腱腱鞘积液 5 例；未发现踇长伸肌腱腱鞘积液。软组织水肿 15 例。经 Logistic 回归分析发现性别、落地模式、跑龄、周跑量及配速与损伤具有相关性（P＜0.05）。**结论** 无症状业余马拉松运动员由于长期反复的训练及比赛容易造成踝关节损伤，主要 MR 特征为外侧副韧带部分损伤、跟腱损伤及腱鞘积液。而且，性别差异、落地模式不同、跑龄高低、周跑量多少及配速高低是造成踝关节损伤的影响因素。

OR-474
基于 MR 扩散张量成像分析业余马拉松运动员大腿肌肉的性别及肌群间差异

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目的 利用 MR DTI 技术分析业余马拉松运动员双侧大腿肌肉扩散参数的性别及肌群间差异。
方法 对所有符合纳入标准的 20 例男性业余马拉松运动员及 17 例女性业余马拉松运动员行双侧大腿轴位磁共振 T1WI，T2WI 及 DTI 扫描。采用两独立样本 T 检验分析比较两组双侧大腿前群（股直肌，股内侧肌，股外侧肌，股中间肌）、内侧群（大收肌，长收肌）及后群（股二头肌长头，半腱肌，半膜肌）肌肉扩散参数值（FA 值、ADC 值）。采用 Kruskal-Wallis 检验分别分析比较男性和女性大腿前群、内侧群和后群肌肉之间的差异性。
结果 男性组股直肌、股外侧肌、大收肌、股二头肌长头、半腱肌、半膜肌 FA 值以及前群肌肉 FA 值均值、后群肌肉 FA 值均值分别为 0.28±0.06、0.22±0.06、0.22±0.03、0.25±0.05、0.29±0.05、0.27±0.04、0.23±0.03、0.27±0.04 均低于女性组[FA 值分别为 0.35±0.07、0.26±0.06、0.24±0.02、0.24±0.02、0.36±0.06、0.31±0.06、0.26±0.03、0.31±0.06]（P 值均<0.01）。两组间仅股内侧肌 ADC 值[男性组为（1.82±0.13）×$10^{-3}$$mm^2$/s，女性组为（1.71±0.08）×$10^{-3}$$mm^2$/s，P<0.01]、半膜肌 ADC 值[男性组为（1.74±0.13）×$10^{-3}$$mm^2$/s，女性组为（1.82±0.12）×$10^{-3}$$mm^2$/s，P=0.007]有统计学差异。男性组大腿前群与后群肌肉、内侧群与后群肌肉间 FA 值有差异（P<0.01），前群与内侧群肌肉间 FA 值无统计学差异，三组肌肉间 ADC 值均无统计学差异。女性组得到相同结果。

结论 DTI 技术能够无创定量反映业余马拉松运动员大腿肌肉的性别差异和肌群间差异，这有助于指导不同性别马拉松运动员的训练和比赛。

OR-475
MRI T2mapping 序列在肩袖损伤病变中的诊断价值

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目的 常规 MRI 诊断肩袖病变有一定局限性，定量 MRI T2mapping 可以敏感的显示生化改变，本研究探讨利用 T2mapping 定量评价冈上肌腱在无症状健康志愿者组、肌腱炎组及部分撕裂组的 T2mapping 值，比较冈上肌腱差异性。
方法 选取 2017 年 3 月至 2018 年 3 月冈上肌腱撕裂 15 人，肌腱炎 10 人，对照组选取无症状健康志愿者 15 人。所有研究对象行肩关节 MRI 常规序列及 T2mapping 检查。冈上肌腱评价选取斜冠状位在肱骨头的足印侧至肱骨头最内侧的范围，均分为 3 等分，即外侧部、中间部及内侧部，每一区再均分为前后两部分，共 6 区。两位影像医生分别间隔两周测量冈上肌腱在各区的 T2 值，再计算平均 T2 值。利用单因素方差分析 Welch ANOVA 及 Games-Howell 检验，比较不同解剖分区下 3 组冈上肌腱差异性。同时将测量结果进行组内及组间一致性 ICC 检验。
结果 在冠状位前外侧区，冈上肌腱 T2 值在撕裂组为 44.59±8.19，明显高于肌腱炎组 34.92±2.55（P=0.000）、无症状组 33.48±3.51（P=0.001）。在冠状位后外侧区，冈上肌腱 T2 值在撕裂组为 46.55±8.83，高于肌腱炎组 38.85±5.51（P=0.034）、无症状组 33.36±3.79（P=0.001）。但在冠状位中间及内侧区，各组间 T2 值无明显差异。组内及组间有较好的一致性（ICC＞0.75）。
结论 T2mapping 作为非侵入性方法可以定量评价早期肩袖病变。在冠状位外侧区，通过测量冈上肌腱 T2 值有助于对正常肌腱的判断，同时提高对肌腱炎及肌腱撕裂的诊断准确性。利用 T2mapping 对退变肌腱及撕裂肌腱量化分析，临床医生可以对冈上肌腱病变精准诊断，并且可为临床治疗方案的选择及疗效评估提供指导。

OR-476
业余马拉松运动员与健康志愿者膝关节软骨的 T2* 值定量研究

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目的 运用定量 T2* mapping 技术研究业余马拉松运动员与健康志愿者的膝关节软骨生成分的差异。
方法 招募 25 名男性业余马拉松运动员及 14 名健康志愿者，分别进行右膝关节 T1WI、质子密度加权像(proton density weighted image, PDWI)、三维双回波稳态（Three-Dimensional Double-Echo Steady-State, 3D-DESS）、T2* mapping 序列扫描。将膝关节软骨分为股骨髁内侧软骨、股骨髁外侧软骨、胫骨平台内侧软骨、胫骨平台外侧软骨、髌软骨及滑车软骨六部分，所有软骨再根据厚度 1/2 分为深层、浅层，勾画感兴趣区得到相应区域的 T2*值。利用独立样本 t 检验膝关节软骨的 T2*值差异。
结果 与健康志愿者相比，业余马拉松运动员的股骨外侧浅层软骨 T2*值显著减低（t=2.373，P<0.05），其余各软骨区域 T2*值差异均无统计学意义（P均>0.05）。

结论 利用 T2* mapping 定量磁共振成像技术能够间接反映关节软骨生化成分改变。长期运动引起膝关节软骨的 T2*值变化是不均匀的。

OR-477
The value of dsct identification of MSU on the diagnosis of gout

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OBJECTIVE: To know more the clinical characteristics of local gout and improve the level of clinical recognition by analyzing the clinical data of patients in Guangxi Province; To explore the value of DSCT in the diagnosis of gout and the peculiarity of MSU on DSCT. METHODS: 1. 102 cases of patients visited the Department of Rheumatology and immunology, the First affiliated Hospital of Guangxi Medical University ,who suspected gout with clinical data. 2. Examine the sensitivity and specificity of DSCT diagnosis of gout. 3. Measure the volume of MSU by DSCT and analyze the correlation with the age, course of disease, the number of nodules and the biochemical indexes; Analyze the deposition site of MSU. 4.Discuss the authenticity of the toe nails green pseudo color. 5. 20 cases of patients before and after treatment, check the MSU site and volume change by DSCT. RESULTS: Among the 102 patients, 86 cases were confirmed gout,with the mean age (55.8 ±12.7) years old, average duration of (91.7±63.6) months, average suffering age of (47.8 ± 11.8) years old, and mean serum uric acid level of (497.3± 112.9)μmol/L, mean creatinine (122.2±67.8).Positive C reaction protein was 89.7%;Positive of ESR was 85.9%; Positive RF was 42.9%. 83.7% patients had complications, the most common were hypertension, hyperlipidemia, diabetes. The uric acid salt is easer deposited in the lower limb joint, which is the foot joint, the knee joint and the ankle joint. The sensitivity and the specificity of DSCT for diagnosis of gout were 96.5% and 87.5%.The volume of MSU was from1mm3 to 279.55cm3 .The median was 2.52cm3.There was no statistically significant between the volume of MSU and the age, course of disease, serum uric acid, serum creatinine,but the number of crystals. It has statistically significant about the volume of green color on the toe nail between the gout group and the non-gout group . CONCLUSION: 1. Gout occurs in young and middle-aged men, the course of the disease involving multiple joints, often accompanied by a variety of metabolic diseases. 2. DSCT has high sensitivity and specificity on diagnosis of gout; And plays an important role in many clinical departments. 3. There was no correlation between the volume of MSU and the age, course of disease, the level of serum uric acid and creatinine. But a positive correlation with the number of crystals. 4.When the toe nails show green color, some of them are meaningful. And it should be analyzed, which can improve the accuracy of DSCT. 5. DSCT can be used to monitor the condition of gout. KEYWORDS DSCT, gout, MSU, serum uric acid

OR-478
腕关节 MR 评估类风湿关节炎病情活动度的临床价值及意义

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目的 探讨联合运用腕关节 MR 影像学指标、临床参数及实验室指标对类风湿关节炎（RA）疾病活动度的评估价值。
方法 回顾性分析 2018 年 9 月至 2019 年 7 月在我院就诊的连续性 RA 患者 64 例，按照患者 28 关节病情活动度评分（DAS28）进行分组，其中 DAS28＞3.2 组 47 例，DAS28≤3.2 组 17 例；根据腕关节滑膜强化程度及累及范围将滑膜炎、骨髓水肿、骨侵蚀进行半定量评分，腱鞘炎进行定性评估。采用独立样本 t 检验比较两组间腕关节 MR 各影像指标评分和实验室指标；采用 Spearman 相关分析评价各参数与 DAS28 的相关性，采用 ROC 评价各参数鉴别两组的诊断效能，并采用 Z 检验比较各参数 ROC 下面积的差异。将独立样本 t 检验差异有统计学意义的参数作为自变量进行线性回归分析获得 RA 病情活动度的重要预测因素。
结果 DAS28＞3.2 组与 DAS28≤3.2 组腕关节 MR 的滑膜炎、骨侵蚀、RAMRIS 及 CRP、ESR 差异均有统计学意义(P＜0.05)，而骨髓水肿、腱鞘炎、性别、年龄、RF 及抗 CCP 抗体差异均无统计学意义(P＞0.05)。RA 病情活动度与腕关节 RAMRIS、滑膜炎、骨髓水肿评分呈正相关（r=0.463，0.420，0.345，P＜0.001），RA 病情活动度与病程、抗 CCP 抗体、腱鞘炎无明显相关(P＞0.05)。RAMIRS、滑膜炎总分、骨侵蚀、骨髓水肿鉴别 DAS28＞3.2 的 ROC 曲线下面积分别为 0.737、0.706、0.701、0.608；回归分析显示 RAMRIS 是病情活动度的重要预测因素。
结论 腕关节 MR 可以用于评估类风湿关节炎的病情活动度，RAMRIS 是重要预测因素。

OR-479
中老年髋部脆性骨折患者骨性关节炎的发生率及体质指数相关分析

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目的 探究中老年髋部脆性骨折患者骨性关节炎（Osteoarthritis，OA）发生率及其身高、体重及 BMI 的关系。 **方法** 将 455 例中老年人髋部脆性骨折患者按年龄分为 2 组，50～74 岁组 207 例，男 47 例，女 160 例，≥75 岁组 248 例，男 95 例，女 153 例。依据 Kellgren-Lawrence（K/L）分级法、图谱对照，评估患者健侧髋关节 X 线平片，K/L≥2 级为 OA 诊断标准。比较各年龄组患者身高、体重和 BMI 及骨折部位的差异；评价髋部 OA 发生率与患者年龄的相关性；比较男女 OA 组与非 OA 组患者身高、体重及 BMI 的差异；比较超重组与非超重组 OA 发生率的差别。**结果** 同年龄组男女患者身高、体重差异均有统计学意义（P＜0.001），≥75 岁组男女 BMI 差异有统计学意义（P＜0.05）；K/L 分级法对中老年髋部脆性骨折患者 OA 的总体检出率为 10.33%（47/455），50-74 岁组 8.21%（17/207），≥75 岁组 12.10%（30/248）；OA 组与非 OA 组身高、体重及 BMI 差异均无统计学意义（P＞0.05）；髋部脆性骨折患者超重组与非超重组 OA 发生率无差别（P＞0.05）。**结论** 髋部脆性骨折患者 OA 发病率高龄组比低龄组高；女性高龄组粗隆间骨折发病率明显较低龄组高；髋部脆性骨折患者超重组与非超重组 OA 发生率无差别。重度 OA 在髋部脆性骨折患者中少见。

OR-480

25 例腰骶椎布氏杆菌脊柱炎的影像学表现分析

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目的　探讨 25 例腰骶椎布氏杆菌性脊柱炎（BS）的影像学特征，以提高对本病的诊断及鉴别诊断水平
方法　回顾性分析 2012 至 2017 年本院经临床和/或病理证实的 25 例腰骶椎布氏杆菌脊柱炎的 X 线、CT 及 MR 表现特点，其中 X 线平片 4 例，CT 9 例，MR 22 例。
结果　25 例患者中，病变累及单个椎体者 3 例，累及相邻 2 个椎体者 17 例，累及 3 个及 3 个以上相邻椎体者 4 例，跳跃式累及多个椎体者 1 例。X 线平片可显示椎体边缘不规整并明显骨质增生、骨桥形成，椎间隙变窄；CT 表现为受累椎体边缘性虫蚀状或小类圆形骨质破坏伴有骨质增生硬化，使椎体边缘呈“花边椎”改变，小破坏区无死骨，破坏范围较大时可见死骨，椎间盘破坏，椎间隙变窄，部分伴有小关节损伤；除上述表现外，MR 能更好的显示病变累及范围，病灶多表现为不均匀长 T1、长或混杂 T2 信号，STIR 和 FS 呈不均匀高信号，增强扫描为明显不均匀强化，部分低信号区内出现更低信号区。
结论　X 线平片对受累椎体骨质破坏的细节显示欠佳；CT 能很好地显示受累椎体骨质破坏、形成的硬化骨；MRI 对椎体及椎间盘破坏、周围组织受累、椎旁脓肿的形成有较高分辨率，能早期发现病灶。布氏杆菌脊柱炎的影像学表现具有特征性，CT 及 MRI 能为布氏杆菌脊柱炎的诊断提供影像学依据，具有较高临床价值。

OR-481

应用于腰椎 x 线影像的深度学习机会性骨质疏松和骨质减少的筛查:一项回顾性、多队列、诊断性研究

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背景:骨质疏松症和骨质减少是普遍存在的，但诊断不足。目的:通过分析腰椎 x 线图像对骨质疏松症的识别，评价深卷积神经网络(DCNN)模型辅助骨密度(BMD)评估与双能 x 线骨密度仪(DXA)相比较。设计:多中心、回顾性、诊断准确性研究。环境:在一个大都市环境中有三个三级中心。患者:982 名绝经后妇女(年龄 50 - 92 岁)在 3 个月内接受腰椎 x 线和 DXA 检查。测量:两种 DCNN 模型(模型 1 区分骨质疏松症与骨质疏松症或正常骨密度，模型 2 区分骨质疏松症与正常骨密度)的接收机工作特性曲线(AUC)下面积测量的图像诊断性能;dxa 衍生的 BMD 测量(参考标准)。结果:DCNN 模型对骨质疏松症和骨质疏松症均有较好的诊断效果。在训练队列中，模型 1 和模型 2 的 AUC 分别为 0.906(95%置信区间[CI]: 0.881, 0.927)和 0.828(95%置信区间:0.785,0.866)。在外部验证队列 1 中，模型 1 和模型 2 的 AUC 分别为 0.845 (95% CI: 0.784, 0.894)和 0.868 (95% CI: 0.810, 0.914)。在外部验证队列 2 中，模型 1 和模型 2 的 AUC 分别为 0.828 (95% CI: 0.723, 0.906)、0.806 (95% CI: 0.697, 0.888)。结论:利用腰椎 x 线片训练深度学习诊断网络，可准确筛查骨质疏松症和骨质疏松症，具有较高的临床应用价值。

OR-482

定量 CT 胸椎骨密度测量诊断骨质疏松症的初步研究

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目的 研究低剂量胸部 CT 筛查联合脊柱 QCT 测量胸椎骨密度诊断骨质疏松症的可行性并建立诊断阈值范围。**方法** :共纳入我院体检中心患者 1402 例，其中男 908 例，女 494 例，接受胸部定量 CT 扫描，并将图像传至 PACS 及 BMD 后处理工作站“QCT Pro”，分别测量 T11-L2 椎体平均骨密度，按 10 岁一年龄段统计出均数和标准差，并且行同性别、同年龄之间胸腰椎骨密度相关性及差异性分析并计算测量胸椎骨密度诊断的阈值范围。统计学应用 t 检验、Pearson 相关分析及线性回归等分析。**结果** ①T11-T12 及 L1-L2 骨密度均值峰值年龄段均是 20-30 岁，T11-T12 的峰值骨密度男性为 179mg/cm^3±26.06，女性为 184mg/cm^3±22.64；L1-L2 的峰值骨密度男性为 169mg/cm^3±26.06，女性为 180mg/cm^3±22.64，男性、女性的 T11-T12 的峰值骨密度均值比 L1-L2 的峰值骨密度均值高出约 8.08%、8.17%。②胸椎(T11-T12 骨密度均值)及腰椎（L1-L2 骨密度均值）对应 T 评分采用配对 t 检验结果显示差异性显著（男性:$p<0.01$、女性 $p<0.05$），采用线性回归方程 T’ = -6.040 + 0.971×T（男性），T’ = -10.622 + 1.003×T（女性）对 T 评分进行修正后，两者配对 t 检验结果差异性均不显著($p>0.05$)。③胸椎（T11-T12）与腰椎（L1-L2）骨密度均值显著相关（男性 r=0.958、女性 r=0.979）。**结论** ①低剂量胸部 CT 筛查联合脊柱 QCT 测量胸椎骨密度可预测骨质疏松症。②低剂量胸部 CT 筛查联合脊柱 QCT 测量胸椎 T11-T12 椎体骨密度诊断骨质疏松标准为：骨密度绝对值≥130mg / cm^3，骨密度正常 ；骨密度绝对值介于 87-130mg / cm^3 之间，低骨量；骨密度绝对值≤87mg / cm^{3}时，为骨质疏松症。

OR-483

Histogram analysis of T2*value for lumbar intervertebral disc

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Purpose: To explore the correlation between lumbar intervertebral disc degeneration and histogram-derived parameters of MR T2* mapping.
Materials and Methods: 100 lumbar intervertebral discs of 20 healthy volunteers were investigated in our study. All subjects underwent 3.0T MR with sagittal T2WI, T2* mapping. 100 lumbar intervertebral discs were graded according to Pfirrmann score. Histogram parameters including mean, standard deviation, inhomogenity , skewness, kurtosis, entropy , median, Min and Max were derived from the T2*map by FireVoxel software. Correlations between histogram parameters and Pfirrmann grade of lumbar intervertebral discs were assessed.
Results: 8 discs were graded as Pfirrmann Ⅰ, 29 in grade Ⅱ, 36 in grade Ⅲ, 26 in grade Ⅳ and only 1 in grade Ⅴ. There were correlations between Pfirrmann grade of lumbar Intervertebral discs and histogram parameters, including the mean, standard deviation, inhomogenity , kurtosis, entropy and median; the correlation coefficients were -0.875, -0.718,-0.428, 0.397, -0.525 and -0.849, respectively.

Conclusion: Histogram-derived parameters of T2* value were potentially helpful for predicting lumbar Intervertebral disc degeneration.

OR-484
磁共振增强扫描对血友病性关节病滑膜 IPSG 评分影响的初步研究

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目的 探讨 MRI 增强扫描对血友病性关节病（HA）患者滑膜增生的诊断价值及对 IPSG 评分的影响。**材料与方法** 本研究为回顾性研究，选取 2016 年 8 月到 2017 年 9 月在河南省血友病诊疗管理中心确诊为 HA 的 46 例患者的 54 个关节作为研究对象。54 个关节同时进行 3.0T MRI 平扫和增强扫描。其中，膝关节 31 个，踝关节 17 个，肘关节 4 个，髋关节 2 个。按照 IPSG 评分标准，对每个关节增强前后的滑膜增生分别进行评分，同时进行关节总的 IPSG 评分。用后处理工作站分别测量增强前后增生滑膜和同层面肌肉的信号强度，并计算滑膜、同层面肌肉的强化率。用配对秩和检验分别比较 MRI 平扫和增强扫描对滑膜增生 IPSG 评分、关节总 IPSG 评分的差异。采用 Spearman 秩相关分析，分别对增强后关节总 IPSG 评分、增强后滑膜 IPSG 评分、滑膜强化率与关节总出血次数、病程、HJHS 评分间的相关性进行统计学分析。**结果** MRI 平扫和增强对滑膜增生的 IPSG 评分、关节总的 IPSG 评分间有统计学差异，增强扫描优于平扫（$p<0.05$）。MRI 增强扫描后，54 个关节滑膜的总体强化幅度均高于同层肌肉。滑膜强化率与总出血次数、病程及 HJHS 评分间无临床相关性（$p>0.05$），增强后滑膜 IPSG 评分与 HJHS 评分间无临床相关性（$p>0.05$）。增强后关节总 IPSG 评分与关节总出血次数、病程呈高度正相关（$r=0.957$、0.835，$p=0.000$），与 HJHS 评分呈中度正相关（$r=0.578$，$p=0.000$）；增强后滑膜 IPSG 评分与关节总出血次数、病程呈低度正相关（$r=0.369$、0.357，$p=0.006$、0.008）。**结论** MRI 增强扫描较 MRI 平扫能更清晰、全面地显示增生的滑膜，并使关节总的 IPSG 评分更准确；通过 MRI 增强扫描时滑膜的强化幅度，能预估滑膜增生的类型。MRI 增强扫描能为 HA 患者的滑膜增生提供精准显影。

OR-485
3TMRI 评估人膝骨关节炎亚区域软骨下骨小梁结构与软骨的相互关系

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目的 利用 3TMRI 评价膝骨关节炎亚区域的软骨下骨小梁特征及软骨与软骨下骨的相关性，旨在阐明骨关节炎启动和进展的病理机制

方法 纳入 92 个膝关节并根据 KL 评分分为对照组，轻度 OA 组，重度 OA 组，利用 3TMRI 高分辨率梯度回波序列成像软骨及软骨下骨，采用 3D 拓扑分析方法对软骨下 12 个区的骨小梁结构特征进行分析，包括骨容积分数（BVF），骨吸收指数（EI），板杆状比值（SCR）及骨小梁的厚度。采用 ITK-snap 软件对软骨进行分割并计算四个区域的软骨厚度。分析比较各个组间的软骨及软骨下骨小梁骨参数的差别，并分析软骨厚度与软骨下骨参数的相关性，最后计算相同关节部分不同亚区域的骨小梁参数的差别。

结果 在轻度 OA 组，内外侧股骨髁呈骨质疏松改变，表现为低的 BVF 和 SCR，高的 EI 指数；内外侧胫骨平台亦呈现骨小梁的损害，表现为低的 BVF 和高的 EI。软骨厚度的丢失主要发生在内测关节（内测股骨髁及内测胫骨平台），并且软骨下骨小梁的损害早于软骨厚度的丢失。软骨厚度的丢失与双侧股骨髁及胫骨平台骨小梁参数均有相关性，主要表现为与股骨髁的 BVF 呈正相关，与胫骨平台的 SCR 呈负相关。另外，轻度 OA 组关节中心区域的骨小梁厚度存在差别，提示骨关节炎的启动可能最早出现在关节的中心区域。

结论 3TMRI 结合计算机图像分析方法可以体内显示骨小梁的结构特征。在 OA 早期，内外侧股骨髁及胫骨平台均呈骨质疏松改变，软骨厚度和骨小梁骨参数密切相关。骨小梁在 OA 的启动和进展中起着重要的作用。

OR-486

Analysis of the value of dual energy spectral CT in the diagnosis of msu deposition

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PURPOSE
Using DESCT to identify gout and the deposition of MSU in the joints of the knee, ankle and wrist of patients with gout. To understand the regularity of deposition of MSU in patients with gout on the knees, ankle joints, and wrist joints
METHOD AND MATERIALS
A total of 107 gout patients were selected according to the screening criteria. There were 90 male patients and 17 female patients. All the patients were from November 2015 to February 2018. All experiments were voluntary participants participated, detailed records of the patient's name, age, gender, duration, clinical features, and quantitative scores for clinical symptoms. All the subjects were tested on GSI scans and blood uric acid values to observe the regularity of sedimentation and distribution of MSU, such as the location of deposition, and to count the number of sites, etc., and to organize the data and perform statistical analysis on the data.
RESULTS
107 patients with gout, 57 cases of knee gout with 283 urate deposition areas, with the largest number of depositions of medial and lateral collateral ligaments, anterior and posterior cruciate ligaments, and tendons (more quadriceps tendon tendons), followed by The incidences of urate deposition in the tarsal ligament, supraorbital bursa, meniscus attachment, articular cartilage, and joint cavity were relatively low. A total of 213 urate crystal deposition sites were detected in 63 patients with foot and gout arthritis. The number of metatarsophalangeal joints, sacroiliac joints, soft tissues and tendons (with more Achilles tendons) was higher, followed by the lower rate of deposition of urate in the lower tibia, calcaneus, talus, and joint cavity; 24 cases of gout ,A total of 283 sites of urate crystal deposition were detected in patients, among which the proportion of metacarpophalangeal joints, interphalangeal joints, tendons, wrist joints, soft tissues, and ligaments was larger, followed by the distal ulnar radius, intra-articular cavity, and dorsal tendons. The incidence of MSU deposition is relatively low.

OR-487

足踝双源 CT 伪影识别对痛风诊断的临床价值

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目的 研究足踝双源 CT 检查中伪影识别对痛风诊断的临床价值。 **方法** 收集 2018 年 12 月至 2019 年 5 月于北京大学第三医院临床诊断为痛风患者 58 例为病例组，男 57 例，女 1 例，年龄 18~69（39+13）岁。对照组收集临床明确排除痛风患者 37 例，男 36 例，女 1 例，年龄为 16~76（34+14）岁。两组病例性别及年龄均无统计学差异。两组均行单侧足踝部双源 CT 扫描，病例组选取患侧/症状重侧。并利用痛风软件对所得薄层数据进行尿酸盐分析。比较两组数据在趾甲、亚毫米点、皮肤、运动影及血管钙化影等影像中检出尿酸盐阳性的差异。 **结果** 病例组与对照组阳性趾甲检出率分别为 94.8%（55/58）与 59.5%（22/37），单个个体阳性趾甲检出个数分别为（2.02+1.13）与（1.19+1.35）个，阳性趾甲尿酸盐分布评分为（1.84+0.93）与（1.05+1.12）分，差异均有统计学意义（P<0.01）。病例组与对照组伪彩阳性亚毫米点总检出率分别为 81%（47/58）与 13.5%（5/37），在肌腱韧带的检出率分别为 75.9%（44/58）与 13.5%（5/37），差异均有统计学意义（P<0.01）。且两组数据亚毫米点除在足背与小腿前群肌分布上无统计学差异外，在其他肌群分布上均有统计学差异（P<0.05）。两组数据在皮肤、运动影及血管钙化影伪彩阳性的检出率方面没有统计学差异。**结论** 趾甲与亚毫米点尿酸盐伪彩阳性对痛风诊断具有较高的临床价值，不应被简单判定为伪影。

OR-488
运用放射组学对膝关节骨性关节炎（OA）二分类的研究

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目的 运用放射组学云平台，经过机器学习的方法，对膝关节骨性关节炎进行二分类。**方法** 收集本院 2017 年 6 月-9 月共 422 例膝关节 X 线正侧位片（其中左膝 261 份，右膝 258 份，左膝平均年龄为 49±15.44，右膝平均年龄为 49±16.2），以 X 线诊断报告为金标准，分成有无骨性关节炎两类，运用汇医慧影放射组学平台，其机器学习模块使用所选数据的 80%的样本做训练集训练机器学习模型，20%的样本做测试集对模型的准确性进行评估。使用测试集的数据用准确度（score）矩阵简单对比和评估各个模型的训练结果，本研究使用 6 个监督学习分类器(KNN、SVM、XGBoost、RF、LR、DT)进行分类，ROC 曲线分析用于说明放射学特征的预测性能。**结果** 对于左膝关节，机器学习模块首先用方差阈值法从 2818 个特征中选取 717 个特征，然后使用选择 K 最佳方法选取 34 个特征，最后用 LASSO 算法选取 5 个最优特征。准确度矩阵显示 LR 学习分类器效果最佳，每个测试样本属于正样本的概率（Testing-score）为 0.74，AUC 值为 0.68。对于右膝关节，机器学习模块首先用方差阈值法从 2818 个特征中选取 694 个特征，然后使用选择 K 最佳方法选取 16 个特征，最后用 LASSO 算法选取 11 个最优特征。准确度矩阵显示 RF 学习分类器效果最佳，每个测试样本属于正样本的概率（Testing-score）为 0.72，AUC 值为 0.81。**结论** 运用放射组学（机器学习）的方法在一定程度上可以对膝关节是否患有骨性关节炎进行判断。

OR-489
3D MR 间接关节腔造影对膝关节半月板修复术后愈合评价的作用

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目的 探讨膝关节核磁共振三维间接关节腔造影成像对半月板修复术后愈合评价的作用。

方法 使用 FasT-Fix 系统进行关节镜下全内半月板修复的 26 例（29 侧）半月板进行磁共振三维间接关节腔造影成像及 MR 常规扫描，其中 10 例患者进一步行二次关节镜检查。按照 Barrett 的标准评价临床愈合情况，按照 Henning’s 标准评估 MR 间接关节腔造影图像上半月板修复后愈合情况。分别以临床预后、二次关节镜检结果为标准，比较 MR 间接关节腔造影及 MR 常规扫描评估半月板修复愈合情况的准确性。**结果** 3D MR 间接关节腔造影显示 29 侧半月板中全层愈合 20 侧(68.9%)，部分愈合 5 侧(17.2%)，全层撕裂 4 侧(13.8%)，其中有 2 侧符合临床诊断，诊断诊灵敏度为 100%，特异性为 74.1%；常规 MR 中有 21 侧仍表现为撕裂的 III 级高信号，诊断灵敏度均为 100%，特异性为 29.6%。与二次关节镜结果对比，MR 间接关节腔造影及常规 MR 平扫诊断半月板修复后愈合的灵敏度均为 100%，特异性分别为 88.9%，33.3%。**结论** 3D MR 间接关节腔造影可作为半月板修复后愈合评价的可靠手段，常规 MR 平扫不适合用于半月板修复术后的评估。

OR-490

MRI 扩散张量成像对腕管综合征的诊断价值

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目的 评价 MRI 扩散张量成像（DTI）对腕管综合征（CTS）的诊断价值，确定最佳诊断参数和测量平面。**方法** 分别纳入 CTS 患者（CTS 组）和健康志愿者（健康组）各 48 例，测量两组正中神经在三个层面（DRUJ：尺桡远端关节层面；P：豌豆骨层面；H：钩状骨层面）的部分各向异性值（FA）和表观扩散系数（ADC），并进行统计分析。**结果** CTS 组和健康组在三个层面的 FA 值差异均有统计学意义（P均＜0.05），并以豌豆骨层面 FA 值降低更明显；ADC 值在豌豆骨和钩状骨层面两组间差异有统计学意义（P＜0.05），并以豌豆骨层面 ADC 值升高更明显，但 ADC 值在 DRUJ 层面差异无统计学意义（ P＞0.05）。豌豆骨层面的 FA 值具有最高的诊断效能（AUC=0.85），FA 值和 ADC 值诊断 CTS 的阈值分别为 $0.46\times10^{-3}mm^2/s$ 和 $1.3\times10^{-3}mm^2/s$，其敏感性、特异性分别为 87.5%、66.7%和 75%、75%。**结论** CTS 患者正中神经 FA 值较健康人群降低，ADC 值明显升高。DTI 对 CTS 具有较高的诊断效能，豌豆骨层面正中神经 FA 值对 CTS 的诊断价值高于 ADC 值。

OR-491

Fast KV switching dual-energy CT HAP-water decomposition technique for identifying bone marrow edema in vertebral compression fractures

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Purpose: To assess the diagnostic performance of fast KV switching dual-energy CT hydroxyapatite (HAP)-water decomposition technique for detection of bone marrow edema in patients with vertebral compression fractures (VCFs).
Materials and Methods: Thirty-one patients with 80 VCFs who had undergone both dual-energy CT and MR of the spine between October 2018 and January 2019 were retrospectively and consecutively included in our study. MR examination served as the standard of reference. Two blinded and independent readers assessed all vertebrae

visually for the presence of abnormal edema on color-coded overlay virtual nonhydroxyapatite (VNHAP) images; inter-reader agreement, specificity, sensitivity, accuracy, and predictive values were calculated. Other two readers performed a quantitative analysis on VNHAP images; receiver operating characteristic (ROC) curve analysis was conducted, threshold was calculated.
Results: MR imaging depicted 45 edematous and 35 nonedematous VCFs. For visual analysis, VNHAP technique showed a sensitivity of 93.3%, specificity of 97.1%, positive predictive value of 97.7%, negative predictive value of 91.9% and accuracy of 95.0%. The inter-reader agreement was almost perfect (k=0.90). Significant differences in CT numbers between vertebrae with and without bone marrow edema were found in quantitative analysis (P <0.001). The area under the curve (AUC) of VNHAP images was estimated to be 0.917. The threshold of 1003.2 mg /cm^3 yielded sensitivity of 88.9%, specificity of 82.9% for the differentiation of fresh and old VCFs.
Conclusions: Fast KV switching dual-energy CT HAP-water decomposition technique had excellent diagnostic performance for identifying acute and chronic VCFs at visual and quantitative analyses.

OR-492

定量 3D 磁共振超短回波序列（3D-UTE-MRI）快速扫描骨皮质的研究

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目的 本研究旨在探讨延长 K-空间采样窗缩短超短回波磁共振（UTE-MRI）的扫描时间，将对骨皮质的定量结果产生的影响。
方法 10 个牛骨皮质和 17 个人胫骨中段样本，采用临床 3T MRI 扫描仪进行 UTE 序列成像，使用 8 通道膝关节线圈进行信号激发与采集。使用径向或不同持续时间的螺旋锥形轨迹进行 K-空间的填充，并分别采集图像、获得定量 UTE 生物标志物，包括 T1，T 2*，磁化传递比（magnetic transfer ratio，MTR）和骨皮质大分子比例（macromolecular fraction，MMF）。以径向采样的定量结果为金标准，评估延长螺旋形采样时间的生物标记物定量结果的误差。
结果 与径向采样的定量结果相比，延长采样时间窗（螺旋轨迹采集的时间从 992μs 延长至 1600μs）后，在牛和人骨皮质的 UTE 标记物的定量结果，包括 T1，T 2*，MTR 及 MMF，均未发现显著差异（P<0.05）。
结论 通过延长采样时间窗，可以大大加速 UTE-MRI 的扫描，使总扫描时间减少 76%；而与金标准相比，延长采样时间所致的 UTE 定量结果的误差不到 5%。这一加速扫描的技术将有助于磁共振 UTE 序列在临床推广使用。

OR-493

Integrated slice-specific shimming (iShim) intravoxel incoherent-motion and stretched-exponential diffusion-weighted MR imaging in the spine: the value of early

assessment in breast cancer patients with bone metastases treated with antiangiogenic drugs

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Methods: Thirty-six patients with 177 Osteolytic metastasis from breast cancer were enrolled and underwent MR imaging before and after 3-6 months' treatment on a MAGNETOM Aera 1.5T MR scanner (Siemens Healthcare, Erlangen, Germany). According to MDA criteria, laboratory examination index and clinical status of patients, 114 lesions were categorized as stable or improvement and 63 lesions were categorized as progressive group. The prototype iShim DWI sequence was obtained; b values (0, 20, 40, 60, 100, 150, 200, 400, 800) s/mm^2. The volume of interest (VOI) was segmentated and measured by a radiologists with more than 10 years of diagnostic experience with a software of ITK-SNAP. The IVIM parameter maps (D, Dstar, f) and SE parameter maps (DDC,alpha) were generated by a post-processing software called IBEX. The quantitative index about two groups before and after treatment were analyzed and the variation of DDC values was calculated as below formula: Delta DDC=DDC_{before}-DDC_{after}. Independent sample t test was used. A P-value< 0.05 was considered to indicate significant difference.

Results: The variation of DDC value between before and after treatment is lower in stable group than in progressive group, and significant difference were found for DDC sum value and DDC kurtosis between two groups(P=0.001, P=0.048). The variation of alpha value is higher in stable group than in progressive group, and significant difference were found for alpha max, min and sum between two groups(P=0.013, P=0.028, P=0.000).The variation of D value is lower in stable group than in progressive group, and significant difference were found for D sum, skewness and kurtosis between two groups(P=0.000, P=0.035, P=0.001).Significant difference were found in D* max, sum, skewness and kurtosis(P=0.002, 0.000, 0.001, 0.012).The f value was also showed significant difference, and also f min, max, sum, kewness and kurtosis showed significant difference(P=0.008, 0.020,0.000).

Conclusions: The iShim IVIM and SE-derived parameters showed a higher diagnostic performance in the early evaluation of therapy with spine metastases from breast cancer. Values of D* max, sum, skewness, kurtosis, f min, max, sum, skewness and kurtosis could be used as a valuable tool in the assessments of tumor early response to the chemotherapy.

OR-494

MRI T1rho 对下腰痛者腰椎间盘退变的定量研究

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【摘要】 目的 探讨 MRI T1rho 对下腰痛者腰椎间盘退变的定量研究价值，比较下腰痛者与正常志愿者各解剖节段腰椎间盘 T1rho 值的差异性，并分析 T1rho 值与椎间盘退变等级、年龄及 BMI 的相关性。**方法** 38 位下腰痛者（22-75 岁，平均年龄 44.1±15.4 岁）及 28 位无症状者（22-38 岁，平均年龄 25.6±3.1 岁）接受腰椎 MRI 检查，分别采集腰椎矢状位 T2WI 及矢状位 T1rho 图像，按 Pfirrmann 分级标准在 T2WI 图像上对所有腰椎间盘进行等级分级，通过后处理软件在矢状位 T1rho 伪彩图上测量髓核（NP）的 T1rho 值，比较下腰痛者与正常志愿者各解剖节段腰椎间盘 T1rho 值的差异性，并分析 T1rho 值与椎间盘退变等级、年龄及 BMI 的相关性。**结果** 下腰痛者与无症状志愿者相应各节段腰椎间盘 NP 区 T1rho 值存在显著差异性（P<0.01），且下腰痛者 L4/5、L5/S1 椎间盘 T1rho 值明显低于 L1/2、L2/3（P<0.05）；Pfirrmann I-IV 级的 NP 区 T1rho 值分别约（141.5±9.8）ms、（119.6±12.3）ms、（84.1±14.8）ms、（60.0±10.4）ms，且各腰椎间盘 T1rho 值与 Pfirrmann 分级呈负相关（r=-0.88，P<0.05），各 Pfirrmann 等级间 T1rho 值均存在显著差异（P<0.01）；各腰椎间盘 NP 区 T1rho 值与年龄、BMI 均呈负相关（r=-0.62,P<0.01 和 r=-0.39,P<0.01）。**结论** T1rho 值与椎间盘退变等级密切相关，对下腰痛者腰椎间盘退变程度的定量诊断存在潜在临床价值。

OR-495

Quantitative evaluation of pubic symphysis in late pregnancy using T2* mapping

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Background: T2* mapping is a reliable tool in articular cartilage imaging, has been widely used to evaluate the degeneration of knee joint and intervertebral discs. Degenerative joint disease of pubic symphysis is the primary cause of groin pain during late pregnancy.
Purpose: To evaluate the alterations of pubic symphyseal cartilage during late pregnancy using T2* mapping.
Materials and Methods: Sixty-one women during first pregnancy, 48 women during second pregnancy, and 64 nulliparous women underwent pubic symphysis MRI exam on a 1.5T MR scanner, including multi-echo T2* mapping sequence. ROIs were hand drawn on T2* maps along the left and right side of cartilage and anterior/middle/posterior sub-regions of each side. T2 * values were analyzed and compared among the three groups using analysis of covariance. The average pubic symphyseal width was measured, the correlation between pubic symphyseal width and T2* values of cartilage were analyzed using Pearson's correlation coefficient.
Results: Compared with nulliparous women, T2* values increased significantly in late pregnancy in left/right cartilage of pubic symphysis, the differences were mainly driven by the posterior sub-region, while no differences were found between women during first and second pregnancies. The positive linear correlation between symphyseal width and mean T2* values of cartilage was only seen in the group of women during first pregnancy (R^2=0.225, p=0.000), no correlation in the other two groups.
Conclusions: T2* mapping is a sensitive quantitative method capable of detecting the pubic symphyseal cartilage changes related to pregnancy, and the T2* values increased significantly during late pregnancy.

OR-496
磁共振去金属伪影序列 MAVRIC-SL 对于骨科金属植入物术后感染患者的诊断价值

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目的 金属植入物会在磁共振成像常规序列中形成较大伪影，影响假体周围结构的观察，易造成误诊漏诊，特别是术后可疑感染的患者。本研究磁共振去金属伪影序列 MAVRIC-SL 对于骨科金属植入术后感染患者的诊断价值。

材料与**方法** 纳入 2018 年 7 月至 2019 年 3 月的 11 例体内含有骨科金属植入物的患者（男 7 例，女 4 例），年龄 23-74 岁（54.91±19.13 岁），临床诊断均为术后可疑感染，其中锁骨 1 例、肱骨 1 例、腰椎 1 例，髋关节 5 例、膝关节 2 例、胫骨 1 例。使用 3.0T SIGNA PIONEER 磁共振，对患者进行常规序列扫描，并加扫 MAVRIC-SL 序列 T1WI、PDWI、IR。所有图像上传至 PACS 系统，由两位有经验的放射科医师共同阅片并对常规序列及 MAVRIC-SL 序列进行评分，有争议的部分商议后取得共识。评分内容：1.是否有窦道；2.是否有关节旁积液；3.窦道或积液等病灶是否与假体相连；4.是否有周围软组织水肿。评分标准：0=无法判定；1=可能存在/不存在；2=存在/不存在。对四组评分行 Wilcoxon 秩和检验，$p<0.05$ 有统计学意义。以术中所见及细菌培养为金标准，计算 MAVRIC-SL 序列的阳性符合率。

结果 对于窦道以及关节积液等病变 MAVRIC-SL 的观察得分更高（p1=0.046，p2=0.038）；对于病变是否与假体相连以及周围软组织是否水肿，MAVRIC-SL 得分更高（p3＜0.01，p4＜0.01）。11 例患者中 10 例确诊为感染，1 例实验室检查为阴性，MAVRIC-SL 的阳性符合率为 95.2%。

结论 对于骨科金属植入物术后可疑感染的患者，虽然部分窦道以及关节积液等病变可在两部分序列中同时被发现，但 MAVRIC-SL 可以较常规序列给出更多信息，包括但不限于病变是否与假体相连、周围软组织是否水肿，对于可疑感染患者有很高的诊断价值。

OR-497
多发性骨髓瘤的双能量 CT 成像：与 MRI 的相关性研究

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目的 双能量 CT 可经虚拟去钙（VNCa）对骨髓成像，本研究探讨多发性骨髓瘤（MM）的双能量 CT 成像特点与 MRI 的相关性。

方法 前瞻性收集 MM 患者 22 名，行全身双能量 CT 及全身 MRI 扫描，两种成像方法分别评估患者是否存在 MM 骨髓浸润及骨髓浸润严重程度（根据椎体 T1WI 信号强度与椎间盘信号强度关系，分为轻、中、重度骨髓浸润），并在 VNCa 及常规 CT 图像上测定椎体 CT 值，与椎体 MRI 信号强度做相关性分析。

结果 共测定 173 个椎体，椎体 VNCa CT 值与 T1WI 序列椎体与无退变椎间盘信号强度比值显著负相关（r=-0.592，P=0.000）。VNCa CT 值与 MRI 上骨髓浸润严重程度呈显著正相关（r=0.580，P=0.000）。VNCa 诊断 MM 骨髓浸润的敏感性 90.32%，特异性 87.18%。

结论 多发性骨髓瘤（MM）的双能量 CT 成像与 MRI 有较好的相关性，有望成为评估 MM 骨髓病变的新手段。

OR-498

Changes in fat and muscle contents of lumbar paraspinal muscles with aging in healthy population by using Revolution CT material decomposition techniques

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[Abstract] **Objective** To evaluate changes in muscle and fat contents of lumbar paraspinal muscles with aging in healthy subjects by using Revolution CT material decomposition (MD) technique. **Methods** A retrospective analysis of 125 healthy subjects who underwent Revolution CT gemstone spectral imaging non-enhancing scan for lumbar. The muscle and fat contents were measured for erector spinae muscle (ES) at each disc level from L1/2 to L4/5, psoas muscle (PS) and multifidus muscle (MS) from L2/3 to L5/S1 on muscle-based MD images and fat-based MD images respectively, differences of muscle and fat contents at each disc level and in each age group were statistically analyzed .**Results** In the middle group, fat content of MS was significantly higher than that of the young group at L 4/5,L5/S1(P<0.05), while muscle content lower than that of the young group at L4/5,L5/S1 (P<0.05). In the old group, fat content of MS was significantly higher than that of the young and middle groups at all levels(P<0.05), while muscle content lower than that of the young and middle groups at all levels (P<0.05). In the middle group, fat content of ES was significantly higher than that of the young group at L 4/5 (P<0.05), while muscle content lower than that of the young group at L 4/5 (P<0.05). In the old group, fat content of ES was significantly higher than that of the young and middle groups at all levels(P<0.05), while muscle content lower than that of the young and middle groups at all levels (P<0.05) There was no significant age-dependent change in the fat and muscle contents of the PS muscle at each disc level. **Conclusion** The muscle degeneration with age in healthy population occur in lumbar paraspinal multifidus muscle and erector muscle, but not in psoas muscle.
[Abstract] **Objective** To evaluate changes in muscle and fat contents of lumbar paraspinal muscles with aging in healthy subjects by using Revolution CT material decomposition (MD) technique. **Methods** A retrospective analysis of 125 healthy subjects who underwent Revolution CT gemstone spectral imaging non-enhancing scan for lumbar. The muscle and fat contents were measured for erector spinae muscle (ES) at each disc level from L1/2 to L4/5, psoas muscle (PS) and multifidus muscle (MS) from L2/3 to L5/S1 on muscle-based MD images and fat-based MD images respectively, differences of muscle and fat contents at each disc level and in each age group were statistically analyzed .**Results** In the middle group, fat content of MS was significantly higher than that of the young group at L 4/5,L5/S1(P<0.05), while muscle content lower than that of the young group at L4/5,L5/S1 (P<0.05). In the old group, fat content of MS was significantly higher than that of the young and middle groups at all levels(P<0.05), while muscle content lower than that of the young and middle groups at all levels (P<0.05). In the middle group, fat content of ES was significantly higher than that of the young group at L 4/5 (P<0.05), while muscle content lower than that of the young group at L 4/5 (P<0.05). In the old group, fat content of ES was significantly higher than that of the young and middle groups at all

levels(P<0.05), while muscle content lower than that of the young and middle groups at all levels (P<0.05) There was no significant age-dependent change in the fat and muscle contents of the PS muscle at each disc level. **Conclusion** The muscle degeneration with age in healthy population occur in lumbar paraspinal multifidus muscle and erector muscle, but not in psoas muscle.

OR-499

DWI 单指数模型、DKI 模型及 DCE-MRI 模型对脊柱肿瘤诊断价值的对比研究

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目的 探讨扩散加权成像(DWI)单指数模型、 扩散峰度成像(DKI)模型及动态增强磁共振成像(DCE-MRI)模型对于脊柱恶性肿瘤与非恶性肿瘤的鉴别诊断价值及三种模型参数值之间的相关性，并对比分析三种模型参数的诊断效能。

材料与方法 对 66 例脊柱肿瘤(39 例恶性肿瘤、27 例非恶性肿瘤)行 DWI 单指数、DKI 和 DCE-MRI 检查。图像后处理分析得到 DWI 和 DKI 模型的表观扩散系数（ADC）值、平均扩散系数(MD)值、平均扩散峰度(MK)值和 DCE-MRI 模型的容积转运常数（K^{trans}）、回流速率常数（k_{ep}）和血管外细胞外容积分数（v_e）。采用独立样本 t 检验比较脊柱恶性肿瘤和非恶性肿瘤参数值的统计学差异。采用受试者工作特性曲线(ROC)分析评价 DWI、DKI 和 DCE-MRI 鉴别诊断脊柱肿瘤的价值，并对比分析三种模型的诊断效能。采用 Pearson 相关分析评价参数值之间的相关性。

结果 MD、MK、ADC、v_e、k_{ep}值在脊柱恶性肿瘤与非恶性肿瘤中差异有统计学意义(P < 0.05)，脊柱恶性肿瘤的 ADC、MD、v_e值明显低于非恶性肿瘤，MK 和 k_{ep}值明显高于非恶性肿瘤。DKI 的 MK 具有最高的曲线下面积 0.940 和最高的敏感度 96.3%，曲线下面积显著高于 DCE-MRI 的 v_e和 k_{ep} (P=0.0012、0.0003)。v_e与 ADC、MD 呈弱正相关，Pearson 相关系数 r 分别为 0.468 、0.363，与 MK 呈弱负相关，r 为 0.469 ；k_{ep}与 MK 呈弱正相关，r 为 0.375，K^{trans}与 ADC 呈弱正相关，r 为 0.325。

结论 DWI 单指数模型、DKI 模型及 DCE-MRI 模型对于脊柱恶性肿瘤与非恶性肿瘤均具有鉴别诊断价值，三种模型参数之间存在一定的相关性。DKI 作为一种无创、新型的磁共振成像技术，在脊柱肿瘤的临床应用方面前景广阔。

OR-500

Mr compressed sense technique: evaluation of the quality and diagnosis accuracy on lumbar vertebra imaging

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Purpose:

To compare the image quality, diagnostic accuracy of compressed SENSE turbo spin echo (CS-TSE) and traditional turbo spin echo (TSE) in lumbar vertebra MRI.

Methods:
A retrospective analysis of lumbar vertebra MRI from 300 patients (male: female = 135:165; median age: 52 years) with traditional-TSE and 300 patients (male: female = 126:174; median age: 51 years) with CS-TSE, was conducted. The SENSE acceleration factor was 1.4 for T1WI, 1.7 for T2WI and PDWI was 1.7. The CS acceleration factor was 2.4 for T1WI, 3.6 for T2WI and PDWI, and 4.0 for T2WI transverse. The image objective quality for both sequences was evaluated by SNR and CNR. The subjective image quality and nerve root were evaluated by the five-point scale. Two radiologists independently diagnosed 300 cases of CS-TSE and their consistency was evaluated. The Sen, Sep, and of two sequences were compared.
Results:
The scan time of using CS-TSE was reduced from 7min28s to 4min26s. There was no significant difference between SNR, CNR and subjective evaluation of two sequences ($p>0.050$). The subjective median score of nerve roots image quality was 4 points. The Sen, Sep, and of two sequences had no difference. Two radiologists were highly consistent in diagnosing lumbar diseases($\kappa > 0.750$) by using CS-TSE.
Conclusion:
Compressed SENSE and TSE as a potential tool in lumbar vertebra and disc disease diagnosis, could provide the similar image quality, diagnostic consistency, and dramatically reduced imaging time, when compared to the traditional-TSE,especially best performance of nerve root.

OR-501

Quantitative T2 mapping accelerated by GRAPPATINI for evaluation of muscles in patients with myositis

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Objective: Dermatomyositis (DM) and polymyositis (PM) make up the largest group of potentially treatable myopathies and require early diagnosis. This study investigates whether the edema of thigh muscles in DM/PM can be quantitatively assessed by a novel accelerated T2 mapping technique—GRAPPATINI.
Methods: Three conventional MR sequences and GRAPPATINIaccelerated T2 mapping of bilateral thighs from 20 patients (7 DM and 13 PM) and 10 healthy volunteers were prospectively carried out on a 3T MR scanner. Afterwards, T2 values of 477 thigh muscles from the patients and the healthy controls were manually measured. In addition, the correlations between T2 values and serum muscle enzymes in patients were also analyzed.
Results: The new GRAPPATINI technique made quantitative T2 mapping of bilateral thighs feasible with a scanning time of only 2 min 18 s.Moreover, GRAPPATINI-generated T2 values of muscles from patients were markedly higher than those from healthy subjects ($P < 0.001$). GRAPPATINI accelerated T2 mapping appeared a more sensitive technique in

that some DM/PM muscles appearing normal per conventional MRI had increased T2 relaxation time. Furthermore, GRAPPATINI-generated T2 values of DM/PM thigh muscles positively correlated with serum enzyme levels ($P < 0.001$), which reflected the severity of myopathy.
Conclusion: GRAPPATINI can significantly shorten acquisition time of T2 mapping and may potentially be applied clinically in DM and PM.

OR-502
第三代双源 CT 腰椎间盘低剂量扫描的运用研究

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目的 探讨第三代双源 CT 低管电压联合高级建模迭代重建技术（advanced modeled iterative reconstruction ,ADMIRE）在正常体质指数（Body Mass Index BMI）腰椎间盘病变检查中的可行性。**方法** 将拟行腰椎间盘多层螺旋 CT 扫描的 BMI 正常(BMI 18～24) 的患者 60 例随机分为 A 组（30 例）常规管电压（120kVp）扫描，滤波反投影法（filtered back-projection，FBP）重建；B 组（30 例）低管电压（100kVp）扫描， ADMIRE 重建，强度选择 3 级；两组参考管电流均为 300 mAs，开启自动管电流调节技术(CARE Dose 4D)扫描。比较不同扫描条件下两组图像的客观评价指标（包括噪声、CNR、SNR）、图像主观评分及辐射剂量。
结果 两组图像客观评价指标及主观评分差异无统计学意义（P>0.05）且均达到诊断要求；两组辐射剂量比较差异有统计学意义（P<0.05），B 组较 A 组辐射剂量下降约 60.58%。
结论 运用第三代双源 CT 低管电压(100kVp)扫描联合高级建模迭代重建技术在正常体质指数患者行腰椎间盘检查，有效降低辐射剂量的同时不影响图像质量。

OR-503
羊膝关节骨性关节炎模型磁共振 T1-map 的成像研究

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目的 探讨应用 3.0T 磁共振 T1-map 成像技术（未注入造影剂）评估羊膝关节骨性关节炎（osteoarthritis，OA）早期损伤的可行性。
方法 选择健康的蒙古羊 25 只，月龄 6-8 月，雌雄不限，体重 20-30kg，标准饮食，圈养。随机分为 A、B、C、D、E 共 5 组，每组 3 只。利用膝关节内注射木瓜蛋白酶（13U）溶液制作蒙古羊左膝关节软骨退变模型。将蒙古羊麻醉后,左后腿膝关节周围剃毛,碘伏消毒后轻弯膝关节,在透视引导下从左髌骨外侧方穿刺进入关节腔，向内注入 1.6ml 木瓜蛋白酶溶液，作为处理组，右膝关节作为对照不做任何处理。A 组 1 次注药造模完成，B、C、D、E 组于第 1、4、7 天三次注药（每次 1.6ml）造模完成，每次造模麻醉清醒后正常饲养。检查采用 SIEMENS Skyra 3.0T 磁共振仪，行常规 MRI 序列及 T1-map 扫描。所有实验动物在注药前行常规 MRI 检查及 T1 map 检查，A 组造模完成后 24 小时，B、C、D、E 组于造模完成后 1 周、3 周、5 周、7 周对各组膝关节进行软骨常规 MRI、T1 map 扫描，每组动物模型检查完毕后，进行双侧膝关节软骨取材、制作标本，HE 染色观察软骨细胞形态数量及软骨层次变化，按 Mankin 分级标准评估软骨损伤情况。选取股骨内侧髁及胫骨内

侧平台两个感兴趣区，测量 T1 值，并进行图像后处理，观察 T1-map 彩图色阶变化。对两组数据进行统计学分析。

结果 正常对照组膝关节上软骨在 T1-map 上呈均匀的蓝色区域。造模组中膝关节软骨在 T1-map 出现斑片状黄色、红色区域。 膝关节正常对照组与各个造模组之间 T1 值差异均有统计学意义(P＜0.05)， T1 值随软骨退变病理分级程度的加重而升高。

结论 磁共振 T1-map 可以对 KOA 软骨损伤程度进行定量评估，随着软骨损伤程度加重，T1 值会发生不同程度的改变。T1 map 成像技术可以成为评估早期 KOA 的有效检查手段之一。

OR-504
成年男性腰椎骨密度与内脏脂肪组织的关系研究

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目的 探讨成年男性腰椎骨密度与内脏脂肪组织的关系。**方法** 收集 2018 年 6 月-9 月我院体检男性共 1374 人，年龄 30~75 岁，平均年龄（50.9±0.30）岁。所有研究对象均测定身高、体重、腰围，并计算体质指数（body mass index，BMI）；利用 QCT 测量 L1、2 椎体的平均 BMD 值及 L2 层面的腹部皮下脂肪面积（subcutaneous fat area ，SFA）与内脏脂肪面积（visceral fat area，VFA）。根据研究对象的 BMD 分为骨量正常组、低骨量组及骨质疏松组，比较各组间年龄、BMI、VFA、SFA 的差异，并分析其与腰椎 BMD 的相关性。**结果** 正常骨量组共 807 人、低骨量组 451 人及骨质疏松组 116 人。其中低骨量组年龄、VFA 高于正常组，BMI 低于正常组；骨质疏松组年龄、VFA 高于正常组，BMI 低于正常组；骨质疏松组年龄高于低骨量组，BMI 低于低骨量组；上述差异均具有统计学意义（P<0.05）；男性腰椎 BMD 与 VFA 呈负相关，且控制年龄及 BMI 因素后，男性腰椎 BMD 与 VFA 仍呈负相关。**结论** 男性腰椎骨密度与内脏脂肪组织呈负相关关系。

OR-505
基于健康人群的腰椎椎旁肌年龄相关性脂肪浸润的研究

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目的 研究我国健康女性随年龄增长腰椎椎旁肌发生脂肪性退变的变化情况，同时探讨体重指数对椎旁肌脂肪浸润的影响。

材料与**方法** 对 516 例健康女性进行腹部定量计算机断层扫描（quantitative computed tomography ，QCT）后，在 L3 椎体中间水平测量椎旁肌和肌间脂肪组织的横截面积（Cross-sectional area of paraspinal muscles （CSAmuscle） ，intermuscular adiopose tissue (CSA_{IMAT})），计算椎旁肌的脂肪浸润率 IMAT% (CSA_{IMAT}/ CSA_{IMAT}+ CSAmuscle)。使用 Spearman 相关分析评估志愿者基线信息和 QCT 测量值之间的关系。采用 Kruskal-Wallis H 检验和 LSD post-doc 校正比较不同年龄组不同体重指数亚组的 QCT 结果。校正身高和体重后计算 QCT 结果随年龄变化的趋势。

结果 20-29 岁组和 70-79 岁组的平均 IMAT 分别为 7.29%和 25.84%。CSA_{IMAT}, IMAT%随年龄增长呈强正非线性相关（r=0.648，P<0.01；r=0.660，P<0.01），而 CSAmuscle 随年龄增长呈弱负线性相关（r=-0.227，P<0.01）。体重指数与 CSA_{IMAT}, CSAmuscle 和 IMAT%呈正相关。在三个年龄组中，肥胖亚组与正常体重指数亚组的所有变量均存在显著差异。CSA_{IMAT} 随年龄变化的差异较 CSAmuscle 大。

结论 椎旁肌脂肪浸润随年龄和体重指数增加而增加，而肌萎缩可能与年龄有关。本研究为我国成年女性椎旁肌脂肪性退变提供了正常参考值，对今后的研究具有重要意义。

OR-506
骨密度定量 CT（QCT）在椎体内固定术前评估的应用价值

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[摘要] **目的** 探索腰椎椎体各部分的骨密度及其变化规律，为临床骨质疏松患者骨折的预防及内固定手术术前评估内固定钉道位置提供一定的参考依据。**方法** 回顾性分析 450 例行腰椎骨密度定量 CT（QCT）检查患者，其中骨密度正常（>120g）、骨量减低（80-119g）及骨质疏松（<80g）者各 150 例，每例患者腰椎 L2-4 椎体，每个椎体分为前、后 2 部分，每侧椎弓根分为前、中、后 3 部分，分别测量其骨密度值，每例患者可得 8 组数据，总得 3600 组数据，所得数据进行统计学分析。**结果** 统计学分析结果显示，椎体前缘骨密度与椎体后缘骨密度变化有差异性（$P<0.05$），尤其在骨量减低组及骨质疏松组较为显著；椎体前缘、椎体后缘骨密度与椎弓根前、后部分的骨密度变化有一定的相关性（$P<0.05$），与椎弓根中间部分没有相关性（$P>0.05$）；双侧椎弓根前、中、后 3 部分的骨密度变化没有显著相关性（$P>0.05$）。**结论** 椎体前缘骨密度变化较椎体后缘明显，故椎体前缘较易骨折；椎体前、后缘骨密度变化较椎弓根前、后部分明显，而椎弓根中间部由于结构的特异性，骨质较为致密，骨密度减低较为缓慢；由此可为骨质疏松患者骨折预防宣教及骨折患者行椎体内固定术前手术方案及器材选择提供一定的参考依据。

OR-507
不同性别体检者血生化指标、腹部脂肪分布与骨密度的关系

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目的 探讨不同性别健康体检人群的血生化指标、腹部脂肪分布和骨密度的关系。
方法 纳入我院体检的 1738 名健康人群，用 QCT 测量腰 1、腰 2 椎体骨密度和腹部脂肪分布。按每 10 岁一个年龄段对受检者进行分组，比较不同性别骨密度随年龄变化的关系；同时比较不同性别骨密度正常和异常组之间血生化指标、腹部脂肪分布的差异性，及腹部脂肪组织和血脂之间的关系。利用多因素 Logistic 回归分析评估不同性别影响骨密度的风险因素。
结果 骨量异常者男性为 37%，女性为 41%；年轻的男性骨密度下降较年轻女性明显，但是 50 岁以后骨密度下降在女性中更明显。腹部脂肪和血脂之间存在不同程度的相关性。在多因素 Logistic 回归分析中，年龄、总胆固醇和高密度脂蛋白是男性人群骨量异常的危险因素，年龄、腹内脂肪面积是女性人群骨量异常的危险因素。
结论 多种因素对骨密度均有不同程度的影响。年龄、总胆固醇和高密度脂蛋白是男性骨量异常的危险因素，年龄、腹内脂肪面积是女性骨量异常的危险因素。腹部脂肪和血脂之间存在相关性。

OR-508

The effect of changes in bone mineral density of temporal mandibular joint(TMJ) disorder under spectral CT on the activity of temporal jaw joint

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Objective: To investigate the effect of the changes in bone mineral density on the activity of the temporal jaw joint (TMJ) using spectral CT.
Methods: MRI were selected for diagnosis of temporomandibular joint disorders and normal patients in a total of 30 cases(BMI<30). After excluding postoperative, traumatic, tumor, hereditary diseases and other factors, patients were divided into 3 groups, 10 cases of both-sides health in group A, 10 cases of both-sides disorders in group B and 10 cases of one-side disorder in group C. All patients underwent spectral CT scan with routine mode for bone mineral density measurement and cine mode for activity evaluation. ROIs were selected on sacral joint nodules, mandibular condyle and mandibular branches. The CT values were measured under different keV level, and image series were reconstructed as described below: bone- and water-based material decomposition images and spectral curve images. All these imaging series were analyzed quantitatively and qualitatively.
Results: Spectral HU curve of ROI in Group A, B and C all showed a declining trend. The ROI measurement of bone was basically symmetrical and there was no significant difference (P>0.05). The CT values and mean values measured in each group were statistically different with the high correlation of the base matter(P<0.05). The bone marrow content of ROI on bone(water)density images was similar to the bone density of mandibular condyle and mandibular branch in group A, and the correlation coefficient r=0.93; The activity of the temporal jaw joint in group B was completely limited, and the bone marrow content of ROI on bone(water)density images was significantly lower than that of the mandibular condyle and mandibular branch, and the correlation coefficient r= 0.15; In group C, the bone marrow content of the disorder-side was significantly reduced, and the bone density was significantly reduced in the mandibular condyle and mandibular branch, and the correlation coefficient r=0.53.
Conclusion: The changes in bone mineral density in the temporal jaw joint(TMJ) disorder is an important clinical indicator for the effect of joint activity.
Clinical Value: The changes in bone mineral density can be measured with spectral CT imaging, which maybe an important indicator for depicting temporal mandibular joint disorder.

OR-509

发育性髋关节脱位患儿软骨性股骨头覆盖率的 MRI 研究

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目的 应用磁共振髋关节高分辨成像测量侧方及前方软骨性股骨头覆盖率，探讨其于儿童发育性髋关节脱位（DDH）临床复诊及进一步治疗中的应用价值。

方法 纳入 30 例手术治疗（髋关节闭合复位术或切开复位术）后 3-4 年的发育性髋关节脱位（DDH）患儿，对其双侧髋关节（包括闭合复位组、切开复位组及健侧髋关节组）行 3T 磁共振常规序列及高分辨脂肪抑制质子密度加权像（Fat Suppressed Proton Density Weighted Image, FS-PDWI）扫描，分别获得髋关节 FS-PDWI 斜冠、斜矢位图像。由 2 名高年资放射科主任医师于斜冠、斜矢位图像上分别测得各髋关节侧方（LC-）及前方软骨性股骨头覆盖率（AC-FHC），比较闭合复位组、切开复位组及健侧髋关节组各组间的 LC-FHC、AC-FHC 是否存在统计学差异；并结合临床，判断各患髋是否需要进一步行骨盆或股骨截骨术，分别计算闭合复位组及切开复位组中需再次手术的髋关节所占百分比，并对其需再次手术的原因行初步分析。

结果 侧方软骨性股骨头覆盖率（LC-FHC）：闭合复位组、切开复位组与健侧髋关节组各组间数值无显著统计学差异（P>0.05）；前方软骨性股骨头覆盖率（AC-FHC）：闭合复位组数值明显小于切开复位组及健侧髋关节组，其差异有统计学意义（P<0.05），切开复位组与健侧髋关节组之间数值无显著统计学差异（P>0.05）。且需再次手术治疗侧髋均为闭合复位组，再次手术的原因主要为前方软骨性股骨头覆盖率低下，需再次干预以提高髋关节稳定性。

结论 应用磁共振高分辨成像测得患髋的前方软骨性股骨头覆盖率（AC-FHC），可为闭合复位术后的 DDH 患儿是否需要再次手术治疗提供客观的参考依据。

OR-510

乳腺 X 线摄影不对称征像的良恶性鉴别诊断

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目的 探讨临床及影像表现对乳腺 X 线摄影不对称征像的鉴别诊断价值。
方法 收集 2014 年 1 月-2016 年 12 月经双侧乳腺 X 线摄影检出不对称征像且 BI-RADS 分类为 4-5 类共 124 例，所有患者均在行乳腺 X 摄影检查 2 周内行乳腺 MRI 检查。随访 2 年稳定或经病理证实为良性病变共 87 例，经病理证实为恶性病变共 37 例。收集临床资料包括年龄、月经状态；乳腺 X 线摄影表现分析包括乳腺腺体构成，不对称可见体位数目、不对称是否位于腺体与腺体后方脂肪交界处，是否伴有其他异常征像；乳腺 MRI 表现分析包括背景实质强化程度，不对称所在处有无异常强化以及强化方式。采用单因素及多因素分析的方法比较良恶性病变临床及影像表现的差异。
结果 经单因素及多因素 logistic 回归分析，患者已绝经，乳腺 X 线摄影上不对称位于腺体与腺体后方脂肪交界处，伴有钙化、乳头凹陷或周围皮肤增厚，乳腺 MRI 上可见异常强化为鉴别不对称良恶性的独立预测因素。联合上述 6 个特征对乳腺不对称良恶性鉴别的敏感性、特异性、准确性和曲线下面积分别为 89.2%，75.9%，79.8%，0.89。
结论 综合患者的临床及影像表现有助于鉴别乳腺 X 线摄影不对称征像的良恶性。

OR-511
基于 CESM 的影像组学构建乳腺癌组织学分级预测模型的可行性研究

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目的 探讨基于乳腺对比增强 X 线摄影（Contrast-Enhanced Spectral Mammography，CESM）的影像组学方法，构建乳腺浸润性导管癌分级预测模型方面的可行性。
方法 回顾性分析山东省烟台毓璜顶医院自 2017 年 7 月至 2018 年 12 月，经病理证实为乳腺浸润性导管癌且有明确组织学分级，术前行 CESM 影像学检查的 205 例患者，其中 I 级患者 58 例，II 级患者 83 例，III 级 64 例。对训练集的 CESM 图上对病变的乳腺头尾位（craniocaudal view，CC）低能图及减影图上的肿瘤区域均进行手动分割并提取影像学特征，从提取的 396 个特征中去除冗余的特征，最终低能图和减影中选取 28 个影像组学标签建立模型。通过机器学习的方法对低级别（I 级、II 级）、高级别（III 级）进行分类。
结果 CC 位低能图训练集及验证集模型的 AUC 分别 0.78 (95%CI, 0.73-0.84)、0.78 (95%CI, 0.66-0.91)；减影图训练集及验证集模型的 ROC 下面积（AUC）分别是 0.83 (95%CI, 0.78-0.87)、0.76 (95%CI, 0.62 -0.90)；低能图联合减影图训练集及验证集模型的 ROC 下面积（AUC）分别是 0.88 (95%CI, 0.85 - 0.92)、0.80 (95%CI, 0.67 -0.92)。
结论 基于 CESM 的影像组学分类预测模型，能有效预测乳腺浸润性导管癌组织学分级，低能图联合减影图效模型预测效能较低能图或减影图模型更高。

OR-512
基于 DCE-MRI 的聚合深度学习模型在肿块型乳腺癌区域淋巴结转移预测中的应用价值研究

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目的 探讨基于多期动态增强磁共振成像（DCE-MRI）的聚合深度学习模型在预测肿块型乳腺癌区域淋巴结转移方面的价值。
方法 收集我院 2016 年 1 月至 2018 年 8 月行乳腺 3.0T MRI 检查，MRI 表现为肿块，经手术或活检穿刺病理证实为乳腺癌，并有区域淋巴结转移信息的患者。共有 108 例符合纳入和排除标准的患者的基线 MRI 资料纳入本研究，将这 108 例患者随机分为训练集（76 例）和测试集（32 例）两组，对其五期 DCE-MRI 图像进行后处理。首先，以每个乳腺肿块的几何中心为中心，将原始图像裁剪成 80×80 像素的方形感兴趣区域（ROI）。然后，利用五期增强图像分别训练五个深度学习（DL）模型。我们的 DL 模型在 INCEPTION V3 网络基础上进行了改进，在其最后一层和输出预测结果之间添加一个具有 128 个节点的全连接层。在验证过程中，将五个 DL 模型所做的五个预测聚合后对患者的每一个切片进行预测。最后，根据少数服从多数投票法汇总所有切片预测结果，最终确定患者的转移特征。
结果 在训练集中，DCE-MRI 每一期的 DL 模型和聚合 DL 模型预测区域淋巴结转移的受试者工作曲线下面积（AUC）均接近 1。在测试集中，DCE-MRI 每一期的 DL 模型预测结果分别为 0.82, 0.92, 0.87, 0.91 和 0.91，而聚合 DL 模型的结果最高，为 0.94。

结论 DCE-MRI 每一期的 DL 模型对区域淋巴结转移都有较高的预测精度，但不同期相的 DL 模型的诊断效能不尽相同，尤其是第一期 DL 模型的 AUC 低于 0.85。通过使用聚合策略，可以获得超过任何单期 DL 模型预测精度的最高 AUC 值。

OR-513

DKI and IVIM parameters measured with different methods for breast non-mass enhancement

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Objective To investigate the value of diffusion kurtosis imaging (DKI) and intravoxel incoherent motion (IVIM) parameters measured by different methods in differentiating malignant from benign breast non-mass enhancement. **Methods** In this retrospective study, Totally 63 patients (63 non-mass enhancement) with breast mass lesions which were verified by pathologic results or follow up were enrolled. All the patients underwent MR scanning, including dynamic contrast-enhanced MRI, IVIM-DWI and DKI. The ROI were placed at the most enhanced location, and the parameters of standard ADC (ADC_{stand}), slow ADC (ADC_{slow}), mean kurtosis (MK) and mean diffusion (MD) were measured. Whereafter, the whole lesions on the maximum slice were drawn as ROI, and the ADC_{stand}-max, ADC_{slow}-max, ADC_{fast}-max, MK-max, MD-max were obtained, Care was taken to avoid cyst, hematoma, or necrosis regions. The difference of these parameters between benign and malignant breast lesions was analyzed. And the diagnostic performance of these parameters was evaluated by ROC curve, the AUC was compared between the 2 methods. **Results** There were 30 malignant lesions and 33 benign lesions. All the parameters (ADC_{stand}, ADC_{stand}-max, ADC_{slow}, ADC_{slow}-max, MK, MK-max, MD, MD-max) had significant differences between malignant and benign lesions (all P<0.001). The AUC of ADC_{slow} was biggest (0.888), with the sensitivity of 93.3% and specificity of 78.8%. The AUC of ADC_{slow} is higher than ADC_{stand}-max and MK and there is statistical difference (P=0.03, P=0.009). The differences of the AUC between ADC_{stand} and ADC_{stand}-max (Z=1.578, P=0.115), ADC_{slow} and ADC_{slow}-max (Z=1.563, P=0.118), MK and MK-max (Z=0.384, P=0.701), MD and MD-max (Z=1.038, P=0.299) had no statistical significance. **Conclusion** For breast non-mass enhancement lesions, all the DKI and IVIM DWI parameters are helpful for differentiating malignancy from benign lesions, and these parameters measured with different methods show equal diagnostic efficiency.

OR-514

Differentiation between mucinous carcinomas and fibroadenomas with high T2 signal intensity on DCE-MRI using volume-based kinetic analysis

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PURPOSE
Mucinous breast carcinoma, a malignant tumor, that cannot typically be distinguished from fibroadenoma with high T2 signal intensity based on routine MRI imaging. The purpose of this study was to explore the diagnostic value of quantitative kinetic composition analysis on dynamic contrast-enhanced MRI (DCE-MRI) of the breast for the differential diagnosis of mucinous carcinomas of breast (MCBs) from fibroadenomas (FAs) with high T2 signal intensity.
METHOD AND MATERIALS
13 patients with pathologically confirmed MCBs and 28 patients with pathologically confirmed FAs from 2015 to 2018 were enrolled, all the patients underwent breast MR imaging. Two radiologists analyzed MR imaging retrospectively, included measurements of shape, size, margins, ADC value, T2 signal intensity and internal mass enhancement pattern. The maximum diameter, volume, and percentages of voxels within the lesion representing persistent, plateau, or washout kinetics were quantified using computer-assisted diagnosis software *(DynaCAD Breast, Invivo)*. Parameters above were compared between two groups of lesions using Manny-U test, univariate and multivariable analyses were performed to investigate the differentiation between MCBs and FAs.
RESULTS
The mean volume of MCBs was significantly greater than that of FAs (2.85±1.52cm vs. 1.57±1.61cm, respectively; P=0.025). The median rate of plateau enhancement in MCBs was (8.00±14.99) %, while in FAs with high T2 signal intensity was (1.65±3.03) %, statistical difference was found between two groups (P=0.007). Area under the ROC curve (AUC) for volume and plateau enhancement was 0.752 and 0.766 respectively. In multiple factors analysis, combined with two variables showed good discrimination in differential diagnosis (AUC, 0.821, 95% CI,0.668-0.973).
CONCLUSION
The percentages of plateau kinetic voxels, combine with the size of masses may aid in differentiating MCBs from FAs with high T2 signal intensity.

OR-515
乳腺 MRI 特征对乳腺小肿块（≤1cm）的鉴别诊断价值

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目的 探讨乳腺 MRI 特征对于乳腺小肿块（≤1cm）病变的良恶性鉴别诊断价值。
材料和方法 回顾性分析术前行乳腺 MRI 检查且经病理证实的乳腺小肿块（≤1cm）病变 160 例（良性 111 例，恶性 49 例）。分析两组病灶位置，形态学特征， TIC 曲线，T2W 图像特征及 ADC 值差异。病灶位置分 2 类：完全位于纤维腺体内和位于纤维腺体及脂肪交界面（IFFA）。当肿块位于远离乳腺主要纤维腺体的区域，且周围环绕脂肪组织，则称周围脂肪征（surrounding fat sign）阳性。采用单因素及多因素分析的方法比较良恶性乳腺小肿块临床及常规 MRI 特征的差异。
结果 乳腺良性和恶性肿块均好发于 IFFA，分别占 86.5%（96/111）及 89.8%（44/49）。单因素分析显示，良性组和恶性组在周围脂肪征，肿块边缘，内部强化类型，TIC 类型，T2W 图像信号特征及 ADC 值差异均有统计学意义。多因素回归分析结果显示：年龄＞50 岁（比值比[odds ratio, OR] = 6.728），周围脂肪征阳性（OR = 5.545）、T2WI 上略低信号（OR = 31.110）及周边高信号（OR = 13.794）及 ADC 值≤1.22x10^{-3}mm^2/s（OR = 5.802）是提示小乳腺癌的 4 个独立危险特征。联合这 4 种特征对于乳腺小肿块鉴别诊断的敏感性、特异性、阳性预测值、阴性预测值及准确

率分别为 89.2%（33/37），69.4%（59/85），55.9%（33/59），93.7%（59/63）及 75.4%（92/122）。

结论 乳腺良恶性病灶均好发于 IFFA 区，结合患者年龄，周围脂肪征，T2WI 信号特征及 ADC 值有助于乳腺小肿块（≤1cm）的良恶性鉴别诊断。

OR-516
磁共振多参数成像定量图和直方图分析在三阴性乳腺癌与其他分子亚型鉴别中的价值

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目的 通过 MR 多参数定量图和全肿瘤的直方图分析，发现三阴性乳腺癌区别于其他分子亚型的影像生物学标志物。

方法 ：该研究回归地分析了 134 例乳腺导管癌患者，从弥散加权成像的 ADC 定量图和动态对比增强成像的半定量图（流入 washin 和流出 washout）中分别提取全肿瘤直方图特征。通过 t 检验或 U 检验进行单因素分析，以筛选出区分三阴性乳腺癌与其他分子亚型乳腺癌的有意义的特征值。然后使用筛选出的特征，生成接受者操作特征曲线，本文报告了三阴性乳腺癌与不同分子亚型乳腺癌的曲线下面积、敏感度和特异度。

结果 ：基于单因素筛选出的特征，区分三阴性乳腺癌与管腔 A 型乳腺癌的 AUC 为 0.710（95%置信区间：0.562～0.858）、灵敏度为 63.6%，特异度为 73.1%。区分三阴性乳腺癌与 HER2 阳性乳腺癌的 AUC 为 0.763（95%置信区间：0.608～0.917）、灵敏度为 86.4%、特异度为 72.2%。区分三阴性乳腺癌与非三阴性乳腺癌的 AUC 为 0.683（95%置信区间：0.556，0.809），灵敏度为 54.5%，特异性为 83.9%。 单因素分析未发见区分三阴性乳腺癌与管腔 B 型乳腺癌的显著特征。

结论 ：从磁共振多参数成像中 ADC、washin 和 washout 提取的全肿瘤直方图特征，提供了一种区别三阴性乳腺癌与其他分子亚型的无创性生物学特征分析方法。

OR-517
基于 MRI 动态增强图像的影像组学模型对三阴性乳腺癌基因亚型的评估价值

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目的 基于 MRI 动态增强图像（DCE）的影像组学模型对三阴性乳腺癌基因亚型的评估价值。

材料与**方法** 回顾性分析我院 2016 年 1 月至 2016 年 12 月，经乳腺穿刺活检或手术病理证实为乳腺癌的病例 89 例，且病理结果包含乳腺免疫组化结果。均与我院接受了乳腺 MRI 检查，可获得完整 DCE 图像。3D 肿瘤区域由 2 名有经验的放射科医生在 DCE 早期强化图像上手动勾画得到，并对肿瘤区域进行影像组学特征提取。基于矩阵的纹理特征包括 GLCM（灰度共生矩阵），GLRLM（灰度行程宽度矩阵），GLSZM（灰度尺寸域矩阵）和 NGTDM（领域灰度色调差距阵）。以上所有的特征提取和多模态体数据融合算法于 MATLAB 实现。以雌激素受体、孕激素受体、人表皮生长因子受体

表达状态（TN 型及非 TN 型）将病例分为两组，利用逻辑回归模型分析软件 DRESS 将所提取特征整合进多变量模型中建筑，并绘制 ROC，计算 ROC 下面积（AUC），比较各模型的诊断效能。
结果 TN 型者 45 例，非 TN 型者 44 例。经过 logistics 回归分析，选取由 8 个特征构建的最佳鉴别诊断模型，敏感度 0.838 ，特异度 0.900 ，准确度 0.853，ROC 下面积 AUC 为 0.876。
结论 基于 MRI 动态增强图像（DCE）的影像组学模型对三阴性乳腺癌基因亚型的评估具体一定价值。

OR-518

Quantitative MRI radiomics in the task of predicting of the molecular classification of invasive breast cancers in a large clinical dataset from China

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PURPOSE
To evaluate the potential of quantitative MRI radiomics in the task of predicting of the molecular classification of invasive breast cancers in a large clinical dataset from China.

METHOD AND MATERIALS
Our research involved a clinical DCE-MRI database of 998 invasive breast cancers retrospectively acquired. Immunohistochemistry molecular classification was performed including estrogen receptor, progesterone receptor, human epidermal growth factor receptor 2, and Ki-67, the molecular subtype (luminal A, luminal B, HER2-enriched, and triple-negative). The average age of the patients were 48.4 years with a standard deviation 9.6 years. Once each lesion was indicated to our radiomics workstation, the machine learning algorithm automatically segmented and extracted radiomic features on the primary lesion, including those from six categories: size, shape, morphology, enhancement texture, kinetics, and enhancement-variance kinetics. The selected feature subset was input to a support-vector machine (SVM) classifier and underwent 5-fold cross validation. The performance of the classifier model for molecular subtyping was evaluated using receiver operating characteristic analysis.

RESULTS
The resulting radiomic lesion signature from the SVM classifier yielded an AUC value of 0.57 (se = 0.05), 0.76 (se = 0.08), 0.75 (se = 0.06), 0.63 (se = 0.08), 0.63 (se = 0.06), and 0.77 (se = 0.09) in the tasks of distinguishing between luminal A versus luminal B, luminal A versus HER2-enriched, luminal A versus triple negative, luminal B versus HER2-enriched, luminal B versus triple-negative, and HER2-enriched versus triple negative.

CONCLUSION
Quantitative MRI radiomics demonstrated promising classification performance in predicting of the molecular classification of invasive breast cancers in a large clinical dataset from China.

OR-519

Radiomics analysis of dynamic contrastenhanced magnetic resonance imaging for the prediction of sentinel lymph node metastasis in breast cancer

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Purpose: To investigate whether a combination of radiomics and automatic machine learning applied to dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI) of primary breast cancer can noninvasively predict axillary sentinel lymph node (SLN) metastasis.
Methods: 62 patients who received a DCE-MRI breast scan were enrolled. Tumor resection and sentinel lymph node (SLN) biopsy were performed within 1 weeks after the DCE-MRI examinations. According to the time signal intensity curve, the volumes of interest (VOIs) were delineated on the whole tumor in the images with the strongest enhanced phase. Datasets were randomly divived intointo two sets including a training set (~80%) and a validation set(~20%).. A total of 1409 quantitative imaging features were extracted from each VOI. The least absolute shrinkage and selection operator (Lasso) and select K best were used to obtain the optimal features. Three classification models based on the logistic regression (LR), XGboost and support vector machine (SVM) classifiers were constructed. Receiver operating curve (ROC) analysis was used to analyze the prediction performance of the models. Both feature selction and models construction were firtstly performed in the training set, then were further tested in the validation set by the same thresholds.
Results: There is no significant difference between all clinical and pathological variables in breast cancer patients with and without SLN metastasis ($P > 0.05$), except histological grade ($P = 0.03$). Six features were obtained as optimal features for models construction. In the validation set, with respect to the accuracy, the SVM demonstrated the highest performance, with an accuracy, sensitivity (for positive SLN) , secificity, (for positive SLN) and Mean squared error (MSE) of 0.85, 0.71,1, 0.26 respectively.
Conclusions: We demonstrated the feasibility of combining artificial intelligence and radiomics from DCE-MRI of primary tumors to predict axillary SLN metastasis in breast cancer. This noninvasive approach could be very promising in application.

OR-520

基于 DCE-MRI 影像组学鉴别乳腺良恶性肿块的可行性研究

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目的 探讨基于动态增强磁共振成像（DCE-MRI）的影像组学特征在鉴别乳腺良恶性肿块方面的价值。**方法** 回顾性分析我院 110 例经穿刺活检或手术病理证实的乳腺肿块患者，包括良

性 40 例，恶性 70 例，随机分配到训练集与验证集，其中训练集 89 例，验证集 21 例。基于基线磁共振动态增强图像，逐层选取包括乳腺肿块最大区域的感兴趣区。提取病灶上的影像组学特征，比较各参数在乳腺良恶性肿块组间的差异，筛选出较优影像组学特征集，应用随机森林分类方法建立影像组学数学鉴别模型，分析各模型在乳腺良恶性肿块鉴别中的价值。**结果** 基于 DCE-MRI 的影像组学模型鉴别乳腺良恶性肿块的受试者工作曲线曲线下面积（AUC） 值、准确性、敏感性、特异性、阳性预测值及阴性预测值训练集分别为 0.98、0.93、0.93、0.96、0.98 和 0.81；验证集分别为 0.93、0.91、0.90、0.91、0.97 和 0.76；其中较优影像组学特征集为 Gabor、灰度共生矩阵变异数和方差。**结论** 基于动态增强磁共振成像的影像组学特征在鉴别乳腺良恶性肿块方面具有一定的价值。

OR-521

MRI 引导下乳腺可疑病灶定位活检的临床应用价值研究

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目的 探究对于仅在 MRI 可见的乳腺可疑病灶、进行经 MRI 引导下病灶定位活检操作对病灶定位及定性诊断的临床价值。
方法 回顾性收集 2016.05.01-2019.06.30 期间于我院行乳腺 MRI 引导下病灶定位活检的患者 82 例，所有患者术前乳腺 MRI 诊断为 BI-RADS 4 类或 BI-RADS 5 类、且乳腺 X 线摄影及乳腺 B 超未见对应病灶，分析不同类型病灶的 MRI 定位活检诊断价值。
结果 共纳入患者 82 例、82 个病灶，包括 2 例旋切活检、80 例钩丝定位后切除活检，病灶大小范围 0.3-1.2cm，平均 0.7cm，定位后扫描图像确认定位针尖位于病灶位置、定位准确；其中良性 71 个（包括 10 个 ADH 或 LCIS），恶性 11 个，阳性率 13.4%；术前 MRI 评估为 4A、4B、4C 及 5 类分别 65、12、3、2 个，恶性病灶分别为：3、3、3、2 个，阳性率分别为：4.6%、25%、100%、100%，与术前 MRI 诊断基本符合。
结论 MRI 引导下乳腺可疑病灶定位活检定位准确、对仅于 MRI 可见的早期乳腺癌的准确诊断有重要价值。

OR-522

Investigation of a CT-based radiomics nomogram to predict human epidermal growth factor receptor 2 status in patients with gastric cancer

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Purpose: To develop and validate a CT-based radiomics nomogram for predicting the human epidermal growth factor receptor 2 (HER2) status in patients with gastric cancer.
Method: This retrospective study enrolled 134 patients with gastric adenocarcinoma from April 2013 to March 2018. 87 HER2-negative patients combined with all 47 HER2-positive patients to constitute the study dataset (training cohort: n = 94, validation cohort: n = 40). A radiomics signature was developed with the least absolute shrinkage

and selection operator method in the training cohort and then combined with independent clinicopathologic risk predictor to build a radiomics nomogram. The univariate test was performed to reveal the association between radiomics nomogram and HER2 status. A validation cohort was applied to confirm the predictive performance.
Results: The radiomics signature, which comprised seven radiomics features, has significantly association with HER2 status. Prediction model was constituted by the radiomics signature and carcinoembryonic antigen level. The model demonstrated better discriminative performance than radiomics signature for HER2-positive and HER2-negative patients, with an AUC of 0.799 (95% confidence interval [CI]: 0.704－0.894) in the training cohort and 0.771 (95%CI: 0.607－0.934) in the validation cohort. This model was visualized as a nomogram for individualized prediction. There were no statistically significant differences in age, sex and CT-reported T stage between the training and validation cohorts. Decision curve analysis showed that the radiomics nomogram was useful in clinical practice.
Conclusions: A radiomics nomogram we developed and validated has the potential to predict HER2 status in patients with gastric cancer.

OR-523

Deep learning for diffusion kurtosis MRI predicts response of rectal cancer after neoadjuvant chemoradiotherapy

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Background: Preoperative therapy response evaluation remains a big challenge in locally advanced rectal cancer with neoadjuvant chemoradiotherapy. Recently, deep learning has been widely used in tumor diagnosis and treatment produced exciting results.
Purpose: This study proposed to develop and validated a deep learning method to predict response based on diffusion kurtosis imaging.
Methods: 383 patients were enrolled in this prospective study, and chronologically divided into 290 in the discovery cohort and 93 in the independent validation cohort. Deep learning models were constructed for predicting pathological complete response (pCR), tumor regression grade (TRG) (0-1/2-3) and T-downstage according to pathological results. The performances of deep learning models were compared with DKI-derived parameters and subjective evaluation for response evaluation.
Results: The area under receiver operating characteristic curve was 0.989 for pCR, 0.695 for TRG and 0.789 for T-downstage. The deep learning model for predicting pCR was much better than the mean value or change value of DKI-derived parameters. Subjective evaluation produced significantly higher error rate for predicting pCR than deep learning model (0.022, 0.269 and 0.248 for model, rater 1 and rater 2, $P<0.01$); the raters achieved much lower error rate (0.129 and 0.14 for rater 1 and rater 2) under the assistance of deep learning model.

Conclusions: Deep learning model potentially provides effective assistance for clinical diagnosis of response evaluation in locally advanced rectal cancer with neoadjuvant chemoradiotherapy.

OR-524
基于弱监督深度学习利用 DWI 对急性缺血性脑卒中及出血转化的自动化分析

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目的 采用弱监督深度学习对 DWI 中的弥散像、ADC 及 EPI-b_0进行分析，自动检测急性缺血性脑卒中（Acute Ischemic Stroke, AIS）位置并对是否出现出血转化进行甄别，方法上解决人工智能医学应用中图像相对较少及专家标签获得困难的问题，影像上弥补了 EPI-b_0像肉眼很难观察而 GRE 序列需要额外扫描时间的矛盾，临床上辅助医师对 AIS 的早期准确诊断并及时发现出血转化以调整治疗策略，对提高患者预后有重要的临床意义。
方法 选取 751 例 AIS（432 例训练及 319 例测试）和 311 例出血转化（246 例训练及 65 例测试）的 DWI 图像，以 GRE 作为金标准评价出血转化位置。训练组进行弱监督标记，即仅标记每层是否出现病灶，测试组进行全监督标记，即准确标记病灶范围。首先，将 AIS 组测试数据按病灶大小和位置分为大病灶组和腔隙灶组（脑桥、基底节、半卵圆中心），计算 ResNet 和 VGG 两种方法的 ROC 曲线下面积和敏感度，并使用连通区域分析的方法，计算平均误诊数（mFP）及平均漏诊数（mFN）；接着，将上一步证实的较优方法用于甄别出血转化，分别标出 AIS 及出血转化位置，并计算敏感度、mFP 及 mFN。
结果 1.ResNet 和 VGG 对 AIS 检测的 ROC 曲线下面积为 0.97 和 0.94。2.ResNet 提高了脑桥腔隙灶组的敏感度并且降低了 mFN 及 mFP （$P<0.05$），降低了大病灶组、基底节和半卵圆中心腔隙灶组的 mFP （$P<0.05$）。3.针对出血转化组，ResNet 检测 AIS 的敏感度为 87.73%、mFN 为 0.78、mFP 为 0.37，检测出血转化的敏感度为 86.20%、mFN 为 0.68、mFP 为 0.43，两者间无统计学差异（$P>0.05$）。
结论 通过弱监督深度学习可以有效检测 AIS 与出血转化，且通过网络结构的优化可以减少病灶位置对检测效率的影响，此方法有潜力提高人工智能在医学影像中的应用范围。

OR-525
基于 MRI 影像组学特征预测进展期高级别浆液性卵巢癌手术可切除性的研究

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目的 探讨基于 MRI 的影像组学特征能否准确预测进展期高级别浆液性卵巢癌（High grade serous ovarian carcinoma, HGSOC）的手术可切除性。
方法 回顾性分析 214 例 HGSOC 卵巢癌患者的多参数磁共振影像数据，其中单侧病灶患者 92 例，双侧病灶患者 122 例，根据病理结果，将患者分为术后无残留组和术后有残留组，随后由临床经验

丰富的放射科医生对肿瘤感兴趣区域（region of interest，ROI）进行勾画。然后利用影像组学方法提取病灶高通量特征，包括形状特征、一阶统计特征和纹理特征等。随后对所提的高通量特征进行筛选，剔除常量与缺失值，并利用最小冗余最大相关性（minimum redundancy maximum relevance，mRMR）算法对特征进行相关性排序，得到最优特征子集。最后我们针对单侧病灶患者和双侧病灶患者分别采用 LASSO（Least absolute shrinkage and selection operator）回归算法对患者术后残留情况构建预测模型。

结果 本研究基于影像组学方法对 HGSOC 患者多参数磁共振影像数据中肿瘤区域提取出 1682 个影像特征，剔除特征中的常量、缺失值和绝对相关性高于 0.9 的冗余特征，保留 383 个特征，随后对保留的特征做 mRMR 算法分析，筛选出最优特征子集并作为 LASSO 的输入以构建预测模型。针对单侧病灶患者预测模型，其受试者操作特性曲线下面积（area under curve, AUC）为 0.727；针对双侧病灶患者预测模型，其 AUC 为 0.733。

结论 本研究提出了一种基于影像组学的 HGSOC 患者术后残留预测模型构建方法，所建模型能较好地预测术后有无残留情况，有望为临床进行术前无创预测手术残留情况提供新的解决方案，避免不必要的开腹手术，延长患者的生存期。

OR-526
肥厚型心肌病患者左心室心肌深度纹理特征与心衰程度的相关性研究

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目的 应用心脏磁共振电影序列定量计算肥厚型心肌病患者左心室舒张末期心肌区域深度纹理特征与心衰程度的相关性。

材料与方法 回顾性分析我院 2013 年至 2016 年接受心脏磁共振检查的患者，纳入完成 Siemens Magnetom Trio 3.0T 超导 MR 扫描仪标准化扫描检查并确诊为肥厚型心肌病的患者，共 75 例，按照纽约心脏协会(New York Heart Association，NYHA) 心功能分级法分组，其中 NYHAⅠ-Ⅱ为第一组（男性 26 例，女性 23 例，平均年龄 44.44±12.12 岁），为轻度心衰组，NYHAⅢ-Ⅳ设为第二组（男性 13 例，女性 13 例，平均年龄 49.46±14.63 岁），为重度心衰组。将电影序列用 MATLAB（Matrix Laboratory）软件手动提取所有患者左室舒张末期所有心肌区域，并用经过训练测试的深度神经网络 VGG 进行纹理特征提取分析。用递归特征增加法对深度纹理特征进行选择，最终挑选出 12 个特征用机器学习的方法支持向量机（Support Vector Machine，SVM）分类学习，用留一法进行交叉验证完成心功能分级轻重度分类分析。用西门子 Argus 软件计算所有患者射血分数 EF。用 SPSS 18.0 进行 Mann-Whitney 检验两组患者之间年龄分布的差异性，利用卡方检验计算两组患者之间男女比例的分布差异性。使用受试者工作特征曲线 ROC 对深度纹理特征和 EF 的诊断效能进行分析,并进行 ROC 曲线下面积的计算。

结果 轻重度心衰两组患者平均年龄没有显著性差异(P=0.108)，男女分布比例没有显著性差异（P=0.083）。ROC 计算得出深度纹理特征曲线下面积（81.0%）明显大于 EF 的曲线下面积（51.9%）。

结论 深度纹理特征分析算法能够有效定量鉴别纽约心功能分级的Ⅰ-Ⅱ、Ⅲ-Ⅳ级差别，敏感性明显高于 EF。

OR-527
深度学习在非门控胸部 CT 平扫冠脉钙化积分危险分层的预测价值研究

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【目的】探讨深度学习在非门控 CT 平扫冠脉钙化积分危险分层的预测价值。
【方法】由推想科技有限公司搭建平台并训练非门控胸部 CT 平扫冠脉钙化积分模型，模型由上海长征医院 102 例非门控胸部 CT 平扫纵隔窗有冠脉钙化者组成，其中高危者有 32 例、中危者有 41 例、低危者有 29 例。训练集中所有病例均行非门控胸部 CT 平扫和门控 CT 平扫，以门控 CT 平扫评估的冠脉钙化积分危险分层为金标准，对非门控胸部 CT 平扫纵隔窗冠脉钙化进行标记记，输入标记后采用交替训练方法进行深度学习训练。纳入武汉同济医院 50 例非门控胸部 CT 平扫作为测试集。将深度学习法中的非门控胸部 CT 扫描所评估的钙化积分与心电门控 CT 扫描所评估的钙化积分进行比较，评价分类的准确性。
【结果】测试集 50 例，其中高危 26 例，中危 10 例，低危 14 例。采用深度学习模型确定了 26 例高危组，10 例中危组和 10 例低危组。当将阈值设置为 0.9 时，平均正确率为 93.8％。
【结论】深度学习能够评估非门控胸部 CT 平扫的冠脉钙化积分，并进行危险分层，预测价值较高。

OR-528
人工智能系统对于儿童骨龄评价的优化研究

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目的 比较在人工智能骨龄评价系统辅助下的骨龄评估与儿科放射医师人工评价骨龄的优劣，探讨人工智能在儿童骨龄中的作用。材料和**方法** 收集我院 1303 例左手腕 X 线摄片（男 675 例，女 628 例），以 3 名高年医师 G-P 图谱法骨龄评估结果的平均值作为参考标准。另选三名放射医师在无人工智能辅助下进行首次阅片，4 周后，在人工智能辅助下对摄片进行再次评估。采用骨龄准确性和根均方正误差（RMSE）作为比较指标。**结果** 在人工智能的辅助下，三位放射科医师的 RMSE 均有所下降（从 0.76 降至 0.32；从 0.57 降至 0.50；从 0.59 降至 0.45），骨龄评估准确度也高于无 AI 辅助组（准确度从 81%提高到 94.4%；从 86%提高到 91.6%；从 87%提高到 93%）。**结论** 与放射科医师单独评估骨龄比较，人工智能系统的应用可以提高医师的工作效率，减少不同观察者间主观因素的影响，提高骨龄测定准确度，降低 RMSE。人工智能系统可为儿科放射科医师测定骨龄提供有利的帮助。

OR-529
基于深度卷积神经网络实现 CT 脑萎缩自动分类的初步研究

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目的 探索深度卷积神经网络结合线性测量法，构建 CT 脑萎缩分类模型的可行性。
方法 收集 2019 年 1 月至 3 月在我院行头颅 CT 平扫的患者，按照 3∶2 的比例，提取脑萎缩 300 例，无脑萎缩 200 例，共 500 例 CT 数据。在基底节层面，人工测量前角间最大径（A）、前角间最小径（B）、三脑室最宽径（C）、侧脑室脉络丛间径（D）4 个线性指标；在侧脑室顶层面，人工测量侧脑室顶间外径（E）、头颅最大外径（F）以及头颅最大内径（G）3 个线性指标；在侧脑室顶消失以上第三层面，人工判定脑沟是否增宽。所有数据随机分为训练集 347 例，验证集 52 例和测试集 101 例。采用卷积神经网络（Convolutional Neural Networks, CNN）构建关键层面识别、线性指标测量和脑沟增宽判定模型。CNN 输出结果通过 logistic 回归，构建脑萎缩分类模型 M1，结合相关临床信息进一步构建模型 M2（M1+性别）、M3（M1+年龄），并使用观察者操作特性曲线（ROC）进行性能评价。
结果 CNN 线性指标测量的一致性较高，7 个参数的 ICC 值：A=0.81，B=0.85，C=0.65，D=0.87，E=0.90，F=0.98，G=0.98，*P* 均＜0.001。脑沟增宽判定模型的 kappa 值为 0.70，*P*＜0.001。模型 M1-3 均取得较高的脑萎缩识别率，M1 敏感性 84.8%，特异性 80.0%，准确性 82.4%；M2 敏感性 87.9%，特异性 85.7%，准确性 86.8%；M3 敏感性 91.4%，特异性 93.9%，准确性 92.6%；三者曲线下面积（AUC）为 M1=0.90、M2=0.90、M3=0.99。
结论 利用深度卷积神经网络和关键层面选取技术，可以对 CT 脑图像进行可靠的线性指标测量。我们构建的脑萎缩分类模型具有准确的识别率，如果结合患者的年龄，可以显著提升模型的性能，为临床工作和科研提供一种 CT 脑萎缩快速筛选工具。

OR-530

Assessment of Acute Pulmonary Embolism based on Computed Tomographic Pulmonary Angiography with Artificial Intelligence

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Purpose: Assessment of clot burden of acute pulmonary embolism (APE) is useful to clinical severity and treatment evaluation(1,2). This study takes advantages of the deep learning algorithms to detect and calculate clot burden of APE on computed tomographic pulmonary angiography (CTPA).
Methods: The retrospective study included a CTPA dataset containing 590 cases from two medical imaging centers between Jan 2014 and Dec 2015. A deep learning convolutional neural network (DL-CNN), called U-Net, was trained on this dataset to segment clot, and then the trained model was tested on the other 288 patients with suspected APE. The performances of our model were evaluated in terms of sensitivity, specificity, and Area Under Curve (AUC). Using the segmentation result, the volumetric assessment of clot burden in APE was subsequently provided. Meanwhile, clot burden of APE assessed with Qanadli score, Mastora score(3,4) and other imaging parameters were calculated by the residents to correlate with clot volume calculated with our model.
Results: When the probability threshold for segmentation results is setting as 0.1, the sensitivity and specificity respectively are 94.6% and 76.5%. The AUC was 0.926 (95% CI: 0.884-0.968), which indicates good discriminative power. Clot burden measured

with U-Net model at setting value of 0.1 was significantly correlated with Qanadli score (r=0.819, p<0.001) and Mastora score (r=0.874, P<0.001). The time to test clot burden by the U-Net model is significantly shorter than that of manual measurement by the 5-year residents (AI 12.9 (9.1-16.7) seconds VS Mastora score10.2 (6.7-14.3) minutes, VS Qanadli score 9.8 (4.2-11.0) minutes, P < 0.001). Moreover, Clot burden measured with DL model is correlated with parameters related to right ventricular function.
Conclusions: In comparison with resident's evaluation, deep learning convolutional neural network algorithm could be a more efficient method to evaluate APE and calculate the clot burden.

OR-531

Radiologic-Radiomic Machine Learning for Differentiation of Benign and Malignant Solid Renal Masses: Comparison to Expert Level-based Decision Performance

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OBJECTIVE. To compare radiologic-radiomic machine learning (R^2ML) and expert level-based performance (ELDP) for differentiation of benign and malignant solid renal masses during contrast-enhanced CT interpretation.
MATERIALS AND METHODS. This retrospective study included a cohort of 254 renal cell carcinomas (RCCs) (190 clear-cell RCCs, 38 chromophobe RCCs and 26 papillary RCCs), 26 fat-poor angioleiomyolipoma (fp-AML) and 10 oncocytomas with preoperative CT examination. Lesions identified by ELDP were manually segmented for radiologic-radiomic analysis. Disease-specific support vector machine R^2ML models for classification of renal masses were trained and validated using a 10-fold cross-validation. ELDPs and R^2ML were compared by using the McNemar test.
RESULTS. ELDP from four radiologists had a sensitivity 77.4-96.8% (median, 84.5%; variance, 122.7%) and specificity 48.4-71.9% (median, 61.8%; variance, 161.6%) for differentiating clear-cell RCCs from papillary/chromophobe-RCCs; a sensitivity 73.7-96.8% (median, 84.5%; variance, 122.7%) and specificity 52.8-88.9% for differentiating clear-cell RCCs from fp-AMLs/oncocytomas (median, 80.6%; variance, 269.1%); and a sensitivity 28.1-60.9% (median, 84.5%; variance, 122.7%) and specificity 75.0-88.9% for differentiating papillary/chromophobe-RCCs from fp-AMLs/oncocytomas (median, 50%; variance, 191.1%). After a 10-fold cross-validation, the R^2ML model resulted in a sensitivity 90.0%, 86.3% and 73.4%, a specificity 89.1%, 83.3% and 91.7%, respectively, for distinguishing renal masses abovementioned by ELDP.
CONCLUSION. ELDP had obviously large variances in differentiation of benign and malignant solid renal masses, while R^2ML can be potential way to improve inter-reader concordance and performance.

OR-532

Noninvasively Predicting Epidermal Growth Factor Receptor Mutation Status and Subtypes in Lung Adenocarcinoma Based on Radiomics Nomogram

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Purpose: To develop and validate radiomics-based nomograms, integrating radiomics, CT features and clinical characteristics, to noninvasively predict *EGFR* mutation status and subtypes.
Materials and Methods: We included 637 patients with lung adenocarcinomas, who performed the *EGFR* mutations analysis in the current study. The whole dataset was randomly split into a training dataset (n=322) and validation dataset (n=315). A sub-dataset of *EGFR*-mutant lesions (*EGFR* mutation in exon 19 and in exon 21) was used to explore the capability of radiomic features for predicting *EGFR* mutation subtypes. 475 radiomic features were extracted and a radiomics sore (R-score) was constructed by using the least absolute shrinkage and selection operator (LASSO) regression in the training dataset. A radiomics-based nomogram, incorporating clinical characteristics, CT features and R-score was developed in the training dataset and evaluated in the validation dataset.
Results: The constructed R-scores achieved promising performance on predicting *EGFR* mutation status and subtypes, with AUCs of 0.694 and 0.708 in two validation datasets respectively. Moreover, the constructed radiomics-based nomograms excelled the R-scores, clinical, CT features alone in terms of predicting *EGFR* mutation status and subtypes, with AUCs of 0.734 and 0.757 in two validation datasets respectively.
Conclusions: Radiomics-based nomogram, incorporating clinical characteristics, CT features and radiomic features, can noninvasively and efficiently predict the *EGFR* mutation status and thus potentially fulfill the ultimate purpose of precision medicine. The methodology is a very promising strategy to predict *EGFR* mutation subtypes, providing the support of clinical treatment scenario.

OR-533

基于 mpMRI 的影像组学预测模型对前列腺癌包膜浸润的诊断价值

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目的 本研究拟构建基于多参数磁共振（mpMRI）的影像组学预测模型用以诊断前列腺癌包膜浸润（EPE），并验证模型的诊断效能。**方法** 回顾性收集 2015.01 至 2019.03 期间本院接受前列腺根治性切除术的前列腺癌患者 95 例，所有患者都进行了术前 mpMRI 检查，且检查前未接受内分泌治疗、放化疗等。收集患者的年龄、t-PSA、f-PSA、F/T、PI-RADS 评分和穿刺病理的 Gleason 评分。由一名影像科医师分别在 T2 加权图像（T2WI）、弥散加权图像（DWI）、表观扩散系数图

（ADC）和动态增强 MRI（DCE-MRI）图像上对病灶进行逐层勾画，并由病理医师评估包膜浸润情况，最终纳入 115 例病灶进行分析。对 MRI 图像进行滤波处理后提取特征，用 10 折交叉验证方法，采用 Logistic 回归模型进行统计分析，筛选与 EPE 相关的影像组学特征并构建影像组学标签。最后选取诊断效能最高的影像组学标签与显著性临床指标结合以构建影像组学模型，通过计算曲线下面积（AUC）评估模型诊断效能。**结果** 在测试组中，T2WI、DWI、ADC 和 DCE 诊断 EPE 的 AUC 分别为 0.819、0.860、0.804、0.788。将不同序列的影像组学特征进行组合，结果表明 T2WI+DWI+DCE 的诊断效能优于 T2WI+ADC+DCE 和 T2WI+ADC+DWI+DCE，在测试组中该组合的 AUC 为 0.860，敏感性、特异性分别为 84.85%，83.67%。选取该模型与有显著性差异的临床指标（t-PSA、PI-RADS 和 Gleason 评分）进行结合构建诺莫图，该组合模型的 AUC 为 0.861。**结论** 基于 mpMRI 的影像组学标签可以很好地预测前列腺癌包膜浸润，可以为术前诊断 EPE 并指导治疗方案选择提供重要参考，有重要临床意义，而临床指标对该模型诊断效能的提高作用有限。

OR-534

Study on the effect of AI-assisted software on the detection efficiency of pulmonary nodules in fatigued intern in Radiology Department.

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PURPOSE: Previous studies have demonstrated that radiologists experience increased fatigue and decreased diagnostic accuracy for detecting pulmonary nodules after their usual workday. To explore the diagnostic efficiency improvement for fatigued intern after daily work with the help of AI-assisted pulmonary nodule detection software.
METHOD AND MATERIALS: A total of 182 patients were collected. One senior radiologist with more than 10 years' experience read CT images based on the initial diagnosis of another senior radiologist with similar experience and a final decision was subsequently conducted by deputy chief radiologist with more than 15 years' experience to determine the ground truth lung nodules. Three readings were conducted by an intern (with 4 months' chest CT experience) using different methods under different conditions: an intern in daily work (not fatigued) without AI (group A), the same fatigued intern (after routine 8 hours' working time) without AI (group B) and the fatigued intern with AI (group C). All three reading had an inter-washout period of more than 15 days. The performance of three readings regarding lung nodule detection was assessed by using sensitivity and false positive rate.
RESULTS: A total of 1281 nodules were confirmed to be gold standard nodules. Group A detected 890 nodules including 591 true positive nodules and 299 false positive nodules with a sensitivity of 46.14% and a false positive rate of 1.64 per CT scan (299/182). Group B detected 749 nodules including 517 true positive nodules and 232 false positive nodules with a sensitivity of 40.36% and a false positive rate of 1.27 per CT scan (232/182). Group C detected 1162 nodules including 995 true positive nodules and 167 false positive nodules with a sensitivity of 77.67% and a false positive rate of 0.92 per CT scan (167/182). Group A achieved a sensitivity (46.14%) 5.78% higher than group B (40.36%) and a lower false positive rate ($p<0.05$). Group C achieved the highest sensitivity (77.67%) as compared with group A (46.14%) and group B (40.36%) while the false positive rate is the lowest ($p<0.05$).

Conclusion: Fatigue can reduce the detection efficiency of pulmonary nodules for radiologists. However, fatigued intern with AI could achieve much higher diagnostic efficiency than radiologists in daily work (not fatigued).Fatigued intern aided with AI-assisted lung nodule detection system could achieve desirable detection rate for pulmonary nodules which is especially helpful for hospitals to cope with the increasing CT examination needs by involving radiologists with more working hours.

OR-535
初步探究影像组学在胃癌腹膜转移化疗疗效预测的价值

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目的 初步探究基于网膜索条影的影像组学在发生腹膜转移的晚期胃癌一期化疗中的临床应用价值。
材料与**方法** 回顾性分析经手术及穿刺活检病理证实为胃癌腹膜转移病例 28 例。其中治疗有反应组 10 例，治疗无反应组 18 例。选取层厚为 2mm 门脉期的 CT 图像进行分析，由两名有经验的放射科医生进行感兴趣区（ROI）的勾画。运用 AK 软件进行特征提取、特征选择及构建预测模型。运用 R 软件，利用 4 种不同的机器学习方法（线性判别分析、K 邻近、 朴素贝叶斯、支持向量机（SVM））使用选择出的特征组合对肿瘤进行分类，同时计算曲线下面积（AUC）或者分类准确率 AUC， 评估能力分 5 个级别： 0.50-0.59 差； 0.60-0.69 中等； 0.70-0.79 较好； 0.80-0.89 非常好； 0.90-1.0 极好。
结果 通过灰度直方图、基于灰度共生矩阵（GLCM）、灰度游程长度矩阵特征（GLRL）、灰度区域大小矩阵特征（GLZSM）四种方法共提取出 396 个特征，使用 spearm 相关进行特征降维后得到熵、偏态、聚类突（ClusterProminence_AllDirection_offset1）等 44 个共同特征。最后运用这 44 个特征进行模型构建，得到最佳预测模型为 SVM 分类器。建立 ROC 曲线得到曲线下面积为 0.7733（ 95% CI 0.6621- 0.8621），具有较好的分类能力，灵敏度、特异度分别为 0.73 和 0.79。
结论 通过构建基于网膜索条影的影像组学预测模型对预估有腹膜转移的晚期胃癌一期化疗疗效具有较好的预测价值。

OR-536
基于 MRI 影像组学特征的骨肉瘤患者的生存预测

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目的 本研究旨在开发一个基于 MRI 影像组学诺模图，用于在诊断骨肉瘤时对患者进行生存预测。
方法 收集 2011 年 1 月至 2019 年 1 月经手术病理证实的骨肉瘤患者 150 例，所有患者都曾于术前进行常规 MRI 检查。根据诊断的先后顺序，将患者分为两组：训练组和独立验证组。训练组 102 例用于构建预测模型。独立验证组 48 例用于测试模型的预测能力。治疗后存活≥5 年的患者归类于生存组，而手术后 5 年内死亡的患者归类于非生存组。最低随访时间为 5 年。同时收集临床数据，包括年龄，性别，肿瘤解剖部位，肿瘤外科分期（Enneking）和是否发生病理性骨折。使用 PACS 系统中存档的各序列图像并以 DICOM 格式导出原始图像。使用 ITK-SNAP 软件进行人工手动 ROI 分割。之后进行最佳的生存相关影像组学特征提取，包括肿瘤强度、形状和大小、纹理和小波特征。然后，利用 LASSO 逻辑回归来构造骨肉瘤患者生存预测的影像组学标签（Rad-score），并结

合临床数据进行多元分析，构造了诺模图个性化预测模型。**结果** 1.生存组患者的得分通常高于非生存组患者。在训练组和验证组中，在生存组和非生存组中的患者之间观察到放射组学评分的显着差异（p 值<.0001）。训练组的 AUC 为 0.79。验证组 AUC 为 0.76。2.影像组学列线图显示出比临床模型更好的校准和分类能力。 决策曲线分析证明了放射组学列线图对于临床的重要价值。3.在诺模图预测的生存组和非生存组的存活曲线之间观察到显着差异（p 值 b<.05;log-rank 检验）。**结论** 影像组学诺模图可以帮助临床医生定制更合适的治疗方案。

OR-537

CT Radiomic And Semantic Features Predicting Epidermal Growth Factor Receptor Mutation in Peripheral Lung Adenocarcinoma

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Objective: To predict epidermal growth factor receptor (EGFR) mutation status in those patients with lung adenocarcinoma using clinical imaging and quantitative radiomic biomarkers.
Method: 104 patients with lung adenocarcinoma, who underwent surgical excision and EGFR mutation detection of tumor tissue, were enrolled from 2016 to 2018 in our center. Radiomic and CT semantic features that reflect the heterogeneity and phenotype of tumors were extracted from pre-operative non-enhanced computed tomography (CT) scans. Afterwards, the least absolute shrinkage and selection operator (LASSO) method was applied to select the most distinguishable features. Three logistic regression models were built to predict the mutation status of EGFR by combining CT semantic with clinicopathological characteristics, the radiomic biomarkers alone and the radiomic biomarkers with clinicopathological characteristics. Meanwhile, the receiver operating characteristic curve (ROC) was plotted by using five-fold cross-validation and the AUC (area under curve) mean value was calculated and compared respectively to obtain the optimal model for predicting the EGFR mutation. In addition, radiomic nomogram was constructed to demonstrate the performance of the model.
Results: 1025 radiomic features were extracted and reduced to 13 features as the most important predictors for building the radiomics signature. The radiomic biomarkers combined with clinicopathological features model was developed based on radiomics signature, gender, smoking, vascular infiltration and pathological type, whose AUC for the training cohort was 0.88±0.03 (mean±standard deviation), the AUC for the verification cohort was 0.88±0.12 and the AUC for the test cohort was 0.913. This model was superior to the other prediction models that used the CT semantic combination with clinicopathological characteristics (AUC for test cohort: 0.768) and radiomic variables alone (AUC for test cohort: 0.837).
Conclusion: Prediction model built by radiomic biomarkers and clinicopathological features including radiomics signature, gender, smoking, vascular infiltration and pathological type, subsequently constructing radiomics nomogram, could effectively predict the EGFR mutation status in those patients with peripheral lung adenocarcinoma. This model has better predictive performance than the simple radiomic features model and CT semantic combination with clinicopathological characteristics model.

OR-538

Characterization of microvessels and parenchyma in in-line phase contrast imaging CT: healthy liver, cirrhosis and hepatocellular carcinoma

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Background: Hepatocellular carcinoma (HCC) is a cancer with a poor prognosis, and approximately 80% of HCC cases develop from cirrhosis. Imaging techniques in the clinic seem to be insufficient for revealing the microstructures of liver disease. In recent years, phase contrast imaging CT (PCI-CT) has opened new avenues for biomedical applications owing to its unprecedented spatial and contrast resolution. The aim of this study was to present three-dimensional (3D) visualization of human healthy liver, cirrhosis and HCC using a PCI-CT technique called in-line phase contrast imaging CT (ILPCI-CT) and to quantitatively evaluate the variations of these tissues, focusing on the liver parenchyma and microvasculature.
Methods: Tissue samples from 9 surgical specimens of normal liver (n=3), cirrhotic liver (n=2), and HCC (n=4) were imaged using ILPCI-CT at the Shanghai Synchrotron Radiation Facility (SSRF) without contrast agents. 3D visualization of all ex-vivo liver samples are presented. To quantitatively evaluate the vessel features, the vessel branch angles of each sample were clearly depicted. Additionally, radiomic features of the liver parenchyma extracted from the 3D images were measured. To evaluate the stability of the features, the percent coefficient of variation (%COV) was calculated for each radiomic feature. A %COV<30 was considered to be low variation. Finally, one-way ANOVA, followed by Tukey's test, was used to determine significant changes among the different liver specimens.
Results: ILPCI-CT allows for a clearer view of the architecture of the vessels and reveals more structural details than does conventional radiography. Combined with the 3D visualization technique, ILPCI-CT enables the acquisition of an accurate description of the 3D vessel morphology in liver samples. Qualitative descriptions and quantitative assessment of microvessels demonstrated clear differences among human healthy liver, cirrhotic liver and HCC. In total, 38 (approximately 51%) radiomic features had low variation, including 11 first-order features, 16 GLCM features, 6 GLRLM features and 5 GLSZM features. The differences in the mean vessel branch angles and 3 radiomic features (first-order entropy, GLCM-inverse variance and GLCM-sum entropy) were statistically significant among the three groups of samples.
Conclusions: ILPCI-CT may allow for morphologic descriptions and quantitative evaluation of vessel microstructures and parenchyma in human healthy liver, cirrhotic liver and HCC. Vessel branch angles and radiomic features extracted from liver parenchyma images can be used to distinguish the three kinds of liver tissues.

OR-539

Application of Longitudinal Transfer Learning-based Artificial Intelligence for Diagnosis and Prognosis on Mild Cognitive Impairment Patients for Alzheimer Disease with Incomplete Multi-Modality Imaging Data

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Purpose

Incomplete multi-modality images (MRI, FDG-PET, and Amyloid-PET) and other clinical variables can significantly hinder accurate diagnosis and prognosis of mild cognitive impairment (MCI) patients for Alzheimer Disease (AD). We developed a novel longitudinal transfer learning (TL)-based artificial intelligence (AI) model, LTL-AI model, using incomplete multi-modality images collected at baseline and follow-up. This study investigates the efficacy of LTL AI for diagnosis and prognosis of MCI.

Material and methods

214 MCI patients consisting of 3 modalities at baseline and follow-ups from ADNI were included: 97 are MCI due to AD and 26 converting to AD within 2 years. We randomly deleted the same image modality, forming incomplete multimodality data, into four sub-cohorts with MRI, MRI&FDG-PET, MRI&Amyloid-PET, and all 3 modalities.

We extracted commonly used imaging features for AD from 3 modalities and non-imaging like age, APOE 4 status, MMSE and CDR.

Based on expectation-maximization, we developed and applied LTL AI Model to train the incomplete longitudinal multi-modality imaging and non-imaging data to avoid the negative transfer.

Area Under ROC Curve (AUC) was used for the evaluation of the LTL AI and a traditional separate model (SM) which was trained using solely MRI modality.

Results

LTL TL yielded higher performance than SM model for diagnosis and prognosis. By applying an operating threshold to divide all testing cases into positive and normal cases, following Table lists more evaluation indices to assess performance, including AUC, Sensitivity, Specificity, p-values for both models.

Conclusion

We successfully developed a novel LTL AI model to diagnose and prognose of MCI with varying availability of imaging modalities from MRI, FDG-PET, Amyloid-PET, and other clinical variables based on knowledges instead of image features transfer from multi-modalities into single modality. The LTL AI model achieved much better accuracy than traditional SM model.

OR-540

Relationship Between Radiomics and Risk of Lymph Node Metastasis in Pancreatic Ductal Adenocarcinoma

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Objective To explore the exact relationship between the arterial radiomics score (rad-score) and lymph node (LN) metastasis in pancreatic ductal adenocarcinoma (PDAC).
Methods A total of 225 patients with pathologically confirmed PDAC who underwent multislice computed tomography within one month of resection from December 2016 to August 2017 were retrospectively studied. For each patient, 1029 radiomics features of arterial phase were extracted, which were reduced using the least absolute shrinkage and selection operator (LASSO) logistic regression algorithm. Multivariate logistic regression models were utilized to analyze the association between the arterial rad-score and LN metastasis.
Results Lymph node-negative and -positive patients accounted for 107 (47.56%) and 118 (52.44%) of the cohort, respectively. The rad-score, which consisted of 12 selected features of the arterial phase, was significantly associated with LN status (P <0.05). Univariate analysis revealed that the arterial rad-score and T stage were independently and positively associated with risk of LN metastasis (P <0.05). Multivariate analyses revealed a significant association between the arterial rad-score and the LN metastasis (P < 0.0001). Higher arterial rad-score was associated with LN metastasis (P for trend <0.0001).
Conclusion The arterial rad-score is independently and positively associated with the risk of LN metastasis in PDAC.

OR-541

Screening of Tuberculosis in a TB High-burden Large Rural Region in China with Deep Learning Multi-modality Artificial Intelligence

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Purpose

A shortage of physicians to interpret radiological and pathological images from digital radiography and sputum smear in TB high-burden (HB) rural areas of China hinders the early diagnosis of TB. We deployed Deep-learning based Multi-modality AI (DMAI) in a TB HB large rural province, Qinhai, to assist physicians in detecting TB in radiological and pathological images. Our study investigates the efficacy of DMAI to assist physicians in detecting TB at multiple hospitals located in Qinhai.

Material and methods

A DMAI system was installed in a central TB hospital to automatically screen for TB in radiological (DR) and pathological images received from more than 60 local hospitals via secured internet connection. DMAI classified each DR image into high-risk, low-risk, and no-TB and automatically generated heatmaps denoting abnormality in <10 sec. Junior physicians (~12.5 yr-experience) reviewed these cases with DMAI support. Senior physicians (>25 yr-experience) then reviewed results from junior physicians and DMAI to generate final diagnosis. A MRMC study compared diagnoses from DMAI, junior physicians, and senior physicians from multiple hospitals to determine the effectiveness of DMAI.

Results

Within 6 months, our DMAI system processed 105,558 radiographs and classified 77.7%, 6.4%, and 15.9% as no-TB, high-risk, and low-risk, respectively, with heatmaps in each abnormal image (Figures 1 and 2). For the high-prevalence group (age>50), DMAI classified 13% and 20% of the cases as high-risk and low-risk, respectively. DMAI and junior physicians agreed 96.3% on confirmed TB and 90.6% on non-TB cases. Compared to historical data, physicians using DMAI increased the sensitivity by 23% with similar specificity.

Conclusion

This is the first reported large-scale clinical application of DMAI for TB screening in China. DMAI's performance is similar to junior physicians'. DMAI assisted physicians in detecting more TB cases in rural areas in a shorter time period without needing more physicians.

OR-542
融合深度特征与手工特征术前预测结直肠癌 KRAS 基因状态的研究

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目的： 抗表皮生长因子受体(Epidermal growth factor receptor, EGFR)靶向治疗在 KRAS 突变型患者中效果较差，治疗前评价患者基因状态有重要价值。本研究融合深度影像组学特征和手工影像组学特征构建模型术前预测结直肠癌患者 KRAS 基因的突变状态。
方法： 这是一个回顾性的研究，共纳入手术证实并实施了 KRAS 基因检测的结直肠癌患者共 398 名，其中训练组纳入从 2011 年 4 月到 2015 年 4 月的患者共 279 人，验证组中纳入了从 2015 年 5 月到 2016 年 4 月的患者 119 名。术前患者均采集了门静脉期 CT 图像，从采集到的图像中提取深度卷积神经网络和传统手工影像组学特征。采用 Lasso 回归模型和最大相关最小冗余(mRMR)算法进行数据降维、特征筛选和影像组学标签构建。采用多变量 logistic 回归分析，结合深度影像组学标签、传统手工影像组学标签建立融合模型。最后从鉴别、校准和临床应用等方面对模型的性能进行了评价。
结果： 手工影像组学标签训练组中一致性指数（C-index）为 0.719，（95%CI: 0.658-0.776），验证组为 0.720(95% CI: 0.625-0.813)；深度影像组学标签训练组中一致性指数为 0.754(95% CI: 0.696-0.813)，验证组为 0.786(95% CI: 0.702-0.863)；融合预测模型进一步提高了影像组学标签的预测能力，训练组一致性指数为 0.815(95% CI: 0.766-0.868)，验证组为 0.832(95% CI: 0.762-0.905)
结论： 本研究提出一种融合手工影像组学标签和深度影像标签的模型，可用于结直肠癌患者术前个体化预测 KRAS 状态。

OR-543
Preoperative prediction of lymph node metastasis in rectal cancer by multiregional radiomics features from multiparametric MRI

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Objectives
To develop and validate a radiomics prediction model based on MRI for the preoperative individualized prediction of lymph node (LN) metastasis in patients with rectal cancer (RC).
Methods
A total of 186 rectal cancer patients who underwent high-spatial-resolution MRI and radical surgical resection with pathological results between January 2016 and December 2018 were included in this retrospective study. For radiomics, the volumes of interest (VOIs) were drawn on the tumor on high-spatial-resolution T2-weighted imaging (T2WI), diffusion-weighted imaging (DWI) images and the mesorectum on T2WI images. Spearman correlation analysis and the least absolute shrinkage and selection operator (LASSO) was used for feature dimensionality reduction. In the modeling stage, multivariate

models were trained on the training cohort through five-fold cross-validation and their performance was evaluated on the cross-validation cohort using the area under the ROC curve (AUC), accuracy, specificity, sensitivity, and F1 score.

Results

A total of 16 radiomics features were retained by Spearman correlation analysis and the LASSO algorithm to construct a predictive model. The Support Vector Classifier was found as the best predictive performance. An average AUC in training dataset, cross-validation dataset, and the testing dataset is 0.860, 0.755, and 0.746, respectively.

Conclusions

Multiregional radiomics features from multiparametric MRI of rectal cancer is a powerful tool for individualized, noninvasive prediction of lymph node metastasis and has marked discrimination accuracy.

OR-544

Individual classification of Parkinson disease with diffusion magnetic resonance imaging

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Purpose

To investigate the feasibility and performance of the PD classification using diffusion MRI of different machine learning methods.

Methods

A total of 285 PD patients and 135 healthy controls were included and underwent diffusion tensor imaging scans. DTI images were processed with the FSL toolbox to get the parameters such as fractional anisotropy (FA), mean diffusivity (MD), axial diffusivity (AD), radial diffusivity (RD). Values of each brain areas in stereotaxic white matter atlas were extracted by the ICBM template as the raw features for subsequent machine learning based classifiers. All of the PD patients and healthy controls were separated to training data sets and testing data sets. Feature optimization was performed by the LASSO and principal component analysis. And both the filter- and wrapper-based feature selection models were used to get the final features used in the last classifier. The k-nearest neighbor algorithm (KNN), naïve Bayes algorithm and support vector machine (SVM) models were trained on the training data sets and the performance of these models were evaluated by the testing data sets.

Results

Compared to healthy control subjects, PD patients showed significantly alteration of white matters in wide spread brain regions. The machine learning analyses showed that the SVM model performs best than KNN and naïve Bayes algorithm with an overall accuracy of 86.7%, sensitivity of 83.3% and specificity of 89.0% when discriminated PD patients from healthy controls.

Discussion and Conclusion

The combination of DTI and machine learning methods is a promising method to discriminate PD patients from healthy controls. These findings may be useful for

future incorporation of DTI and machine learning methods for disease classification, or as a useful tool for clinical diagnosis by diffusion MRI.

OR-545
MRI 影像组学在脑胶质瘤术前分级中的研究价值

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目的 探讨基于 MRI 影像组学对脑胶质瘤进行术前分级的预测价值。
材料与**方法** 回顾分析例经病理证实的 140 例颅内胶质瘤患者的 MRI 资料，其中 WHO Ⅱ级 （低级别胶质瘤） 70 例，WHO Ⅲ~Ⅳ级 （高级别胶质瘤）85 例。从 T2 加权和三位等体素 T1WI 增强 MRI 中提取影像学特征，包括一级统计特征、形态和大小特征、纹理特征及滤波特征。基于套索方法回归方法筛选出与胶质瘤高、低级分级最相关的 23 个影像组学特征。对支持向量机、逻辑回归（ Logistic Regression,LR)、随机森林（Random Forest,RF）三种分类方法进行比较。
结果 基于套索方法进行特征选择后，利用支持向量机方法具有最高的准确率 91.93%，受试者工作特征曲线下面积(area under the receiver operating characteristic curve，AUC)值为 0.906。LR 支持向量机方法的准确率 90.01 %，受试者工作特征曲线下面积(area under the receiver operating characteristic curve，AUC)值为 0.909。RF 支持向量机方法的准确率 89.8 %，受试者工作特征曲线下面积(area under the receiver operating characteristic curve，AUC)值为 0.889。
结论 基于磁共振影像组学方法，应用合适的分类器，可以对脑胶质瘤进行术前分级预测。

OR-546
基于深度学习的胸部平片人工智能自动诊断模型 的设计及研究

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目的 基于深度学习的方法，建立胸部平片人工智能诊断生成系统，并对其诊断性能进行初步研究。**方法** 采用人工智能深度学习的方法，建立胸部 X 线平片人工智能自动诊断生成系统，预先用已经发布的数据集 ChestX-ray8 在监督模式下训练了编码器。然后用测试集 NJDTH8 进行测试，此测试集包括了 12,219 份图像和同样数量的中文报告，CIDEr 评分法对训练集和测试集数据进行评估。最后随机抽取 100 份由影像科医生给出诊断报告数据和 100 份有由模型自动生成诊断报告数据，随机排序后，再由两位高年资的影像科医生来判读评分。**结果** 在训练集和测试集中，CIDEr 评分法结果显示训练损失持续下降，验证损失在第十轮训练中达到饱和值 5.8。在随机的 200 份报告中，模型生成报告的 5 分率达到 72%，基本达到中等年资水平的影像诊断医生水平 77%。**结论** 本研究基于深度卷积神经网络和结合注意力机制的递归神经网络开发的胸部平片人工智能自动诊断模型，能够对胸部 X 光片自动生成影像学诊断报告，且诊断性能较好，可以继续进一步使用和深入研究。

OR-547

Radiomics of pericoronary adipose tissue texture features based on coronary CTA in differential diagnosis between acute coronary syndrome and stable coronary heart disease

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Objective To establish a radiomics signature based on pericoronary adipose tissue and evaluate its value in determining the type of coronary event.
Methods The images and clinical data of 93 patients with coronary heart disease diagnosed and treated from 2013 to 2018 were retrospectively analyzed. Among them, 39 patients were acute coronary syndrome and 54 patients were stable coronary heart disease. The patients were divided into training cohort and validation cohort using stratified random sampling according the ration 6:4 (56 patients in training cohort, 37 patients in validation cohort). The pericoronary adipose tissue on each coronary CTA was segmented to extract radiomics features using AnalysisKit software, and then a radiomics signature was constructed after reduction of dimension in training cohort by the least absolute shrinkage and selection operator (LASSO). ROC analysis was conducted to assess the performance of the radiomics signature in the training group and to verify in the validation cohort. Decision curve analysis was conducted to determine the clinical usefulness of the radiomics signature.
Results A total of 396 radiomics features were extracted from the pericoronary adipose tissue. 8 most valuable features were selected after reducing the dimension by LASSO algorithm. The area under the ROC of the model to distinguish acute coronary syndrome from stable coronary heart disease was 0.86 and 0.81 in the training and validation cohorts, respectively. Using the proposed radiomics signature to predict N+ shows a greater advantage than either the scheme in which all patients were assumed to N+ or the scheme in which all patients are N-. Decision curve analysis demonstrated that the radiomics signature were clinically useful in identifying coronary heart disease types.
Conclusion The radiomics signature based on pericoronary adipose tissue can be used as a promising biomarker to identify coronary event types.

OR-548

影像组学预测局部进展期直肠癌新辅助治疗后淋巴结转移

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目的 结合原发灶与淋巴结的影像特征，建立影像组学模型预测局部进展期直肠癌新辅助治疗后的淋巴结转移状态。
方法与材料：本研究纳入 229 名进展期直肠癌患者，按照时间顺序分为训练集（n=183)和验证集（n=46）。所有患者在 3.0Tesla 的 MRI 系统上进行扫描，采用小视野 T2 加权序列，参数如下：

TR=5700ms，TE=110ms，回波数为 25，视野为 180mm。以术后病理作为金标准，区分每名患者为 N0 或 N+。由一名有经验的影像医生采用 itk-snap 软件对直肠癌原发灶和若干淋巴结进行勾画。对于每个勾画区域提取了 41 个影像特征，包括形状特征、灰度特征、纹理特征等。在训练集内采用 L1 正则化的逻辑回归算法训练模型，通过交叉验证确定超参数和最优淋巴结的选取规则，并在验证集内进行验证。

结果 联合原发灶与最优淋巴结模型的 AUC 值在训练集内为 0.840(95%CI:0.778-0.890)，在验证集内为 0.864(95%CI:0.731-0.947)。只纳入肿瘤原发灶模型的 AUC 值在训练集内为 0.580(95%CI:0.505-0.653)，在验证集内为 0.669(95%CI:0.515-0.801)。联合原发灶与最大淋巴结模型的 AUC 值在训练集内为 0.801(95%CI:0.736-0.856)，在验证集内为 0.839(95%CI:0.701-0.931)。联合原发灶与淋巴结平均特征模型的 AUC 值在训练集内为 0.741(95%CI:0.671-0.803)，在验证集内为 0.539(95%CI:0.386-0.687)。主观评价的 AUC 值在训练集内为 0.650(95%CI:0.576-0.719)，在验证集内为 0.756(95%CI:0.607-0.870)。

结论 联合原发灶与最优淋巴结特征的影像组学方法能够提高局部进展期直肠癌新辅助治疗后淋巴结转移状态预测的准确度。

OR-549
基于深度学习的儿童骨龄评估模型构建及临床应用验证

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目的 以“中华 05”骨龄评估系统下专家阅片为标准，构建基于深度学习的儿童骨龄智能评估模型（AI 模型），为儿科医师及儿影像科医师提供一个快速便捷的辅助工具。

方法 回顾性连续性纳入质量合格的儿童骨龄 DR 左手正位平片 5000 例，按照各年龄段等比例采样原则纳入 2351 例为训练组，验证组 101 例；4 位儿童放射学专家按双盲原则，采用“中华 05”RUS-CHN 法评估 13 块掌指骨骨骺发育等级，取专家骨龄评测的均值作为参考金标准；采用深度学习方法训练并建立骨龄评估模型，并在验证组比较儿影像科住院医师与 AI 模型评估之间的准确性及耗时差异。

结果 本研究构建的 AI 模型及两名儿影像科住院医师与参考金标准之间的 MAE 分别为 0.37 年、0.42 年、0.41 年，差异无统计学意义（$P>0.05$）；当误差范围在±1.0 岁、±0.7 岁及±0.5 岁以内时，AI 验证组评测准确性分别为：94.1%，89.1%，74.3%，医师验证组评测准确性分别为：（93.1%、94.1%）（78.2%、82.2%）（67.3%、68.3%），医师与 AI 模型之间差异无统计学意义（$P>0.05$）。两医师完成一份骨龄评价平均用时分别为（10.3±3.3）分钟、（8.2±3.1）分钟，显著长于 AI 模型（约 5 秒），差异均有统计学意义（均有 $P<0.05$）。

结论 本研究构建的基于深度学习的儿童骨龄评估智能模型具有准确性高以及耗时短的特点，具有快速辅助医师评估骨龄的实用价值。随着建模样本量的增加，本 AI 骨龄评估模型精度有可能进一步提高，发挥更大的临床价值。

OR-550
基于磁共振图像的影像组学在前列腺病灶良恶性鉴别中的临床研究

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【目的】
研究基于双参数磁共振图像的影像组学在前列腺病灶良恶性鉴别中的效能及临床价值。
【方法】
本研究回顾性连续性纳入 2013 年 1 月至 2016 年 11 月于我院进行磁共振检查，包括 T2 加权磁共振成像、弥散加权成像、表观扩散系数及病理检查的患者，共计 331 名。利用 ITK SNAP 软件在磁共振图像上手动勾画感兴趣区，分别勾画与病理取材相对应且包含取材组织的病灶区域、外周带、移行带，使用在 Matlab 平台上独立开发的工具对感兴趣区域进行特征。通过对随机选择的 40 名患者进行的重复性试验，筛选出组内相关系数大于 0.8 的特征。随后，将 Pearson 相关系数＞0.75 的特征归为一类，实现进一步降维。最后使用 LASSO 选择出预测效能最强的影像组学特征，使用这些特征构建相应的影像组学模型。此外还收集了患者的临床信息和实验室指标构建了临床模型。
【结果】
所有序列（T2WI、DWI、ADC）所有区域（病灶区、外周带、移行带）共提取 2916 个特征，最终筛选出 6 个关键特征。基于三种成像模式组合的双参数磁共振模型训练集上 AUC 为 0.887（95%CI，0.844～0.930），验证集上 AUC 为 0.920（95%CI，0.863～0.978）。临床模型由年龄、PSA 构建，在训练集上 AUC 为 0.748（95%CI，0.686～0.809），验证集 0.732（95%CI，0.634～0.831）。综合了双参数磁共振影像组学参数和临床因子的联合模型在训练集上 AUC 为 0.909（95%CI，0.871～0.946）；在验证集上 AUC 达到 0.933（95%CI，0.879～0.987）。在验证集上联合模型与临床模型比较 $P<0.001$，$z=5.503$，联合模型与临床模型对前列腺癌鉴别的差异有统计学意义。
【结论】
结合了影像组学特征和临床因子的联合模型鉴别对前列腺病灶良恶性鉴别的效能最佳，有助于提高前列腺病灶良恶性诊断能力。

OR-551
基于磁共振 T2 加权成像的影像组学对直肠癌 新辅助治疗疗效的评估价值

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OR-552
基于磁共振 T2 加权成像的影像组学对直肠癌新辅助治疗疗效的评估价值

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目的 探讨基于磁共振高分辨 T2WI 的影像组学对直肠癌新辅助治疗疗效的预测价值。
方法 回顾性分析 2018 年 1 月至 2019 年 3 期间，在我院经病理证实，新辅助治疗前接受 3T MRI 的 79 例直肠癌患者。在高分辨 T2WI 图像上手动勾画直肠病灶 VOI 后提取影像组学特征，采用 LASSO（least absolute shrinkage and selection operator）算法进行降维，选择出对病理完全缓解（pathologic complete remission, pCR）有价值的特征。随机分为训练集（80%）与测试集（20%）进行机器学习，与 pCR 信息建立决策树（decision tree, DT）、逻辑回归（logistic regression, LR）、随机森林（random forests, RF）、极限梯度增强树（extreme gradient boosting decision tree, XGBoost）分类器模型,获得 ROC（receiver operating

characteristic）曲线，分别计算曲线下面积（area under the curve，AUC）、敏感度、特异度及 95%置信区间，采用 DeLong test 比较 ROC 曲线差异。

结果 79 例直肠癌患者根据术后病理检查，14 例达到 pCR（17.72%）。共提取得到 1409 个影像组学特征，LASSO 算法筛选出 8 个最有价值的特征。其中 XGBoost 分类器测试集的 AUC 为 0.945，敏感度 85.71%，特异度 98.46%，95%置信区间为 0.870-0.984，优于其他三种模型（P均<0.05），其余三种模型间无显著性差异（P均>0.05）。

结论 基于磁共振高分辨 T2WI 图像的影像组学 XGBoost 模型有预判肿瘤 pCR 情况的能力，可以用于对直肠癌新辅助治疗疗效的评估。

OR-553

MR-Based Radiomics of Rectal Cancer: Predict Synchronous Liver Metastasis

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Purpose
The purpose of this study was to investigate the value of high resolution T2-weighted-based radiomics in prediction of synchronous liver metastasis (SLM) in patients with rectal cancer.
Methods
A total of 101 patients (79 men and 22 women; mean age, 57 years±9.91; range, 28-74 years) with rectal cancer who underwent rectal MR imaging in our hospital on a 3T scanner between January 2018 and May 2019 were included in this study. We used Radcloud (Huiying Medical Technology Co., Ltd, Beijing, China) to manage imaging data, clinical data, and subsequent radiomics statistics analysis. Lesions were delineated on the MR mages manually by radiologist who was blinded to the clinical information of the patients. 101 volumes of interest (VOIs) manually dropped from 101 patients' high resolution T2-weighted MR images. Assign 80% of the VOIs to the training data set and 20% of VOIs to the validation data set. Features were extracted on the Radcloud platform, then the optimal features were selected by least absolute shrinkage and selection operator (LASSO) method to best predict the SLM. The SVM (Support Vector Machine) classifier combined with clinical risk factors (CEA and CA19-9) was used for building model which could predict the SLM. The prediction performance of the models was evaluated by receiver operating characteristic (ROC) curves with area under the curve (AUC), sensitivity and specificity, and compared to the DeLong test.
Results
Of the 101 patients, 25 patients (24.75%) were accompanied by SLM. 1409 quantitative imaging features were extracted from MR images firstly, and 5 optimal features related to the SLM prediction were selected with LASSO algorithm finally. The AUC, specificity and specificity for validation set of combined model (T2WI+CEA+CA199) was 0.845 (95% CI: 0.760 - 0.910), 88.00% and 72.37%, respectively. Compared to these four models, the combined model showed significantly better prediction performance ($P_{\text{T2WI-Combined}}$ = 0.0036, $P_{\text{T2WI+CA199-Combined}}$ = 0.0069, and $P_{\text{T2WI+CEA-Combined}}$ = 0.0091). There were no significant differences among $\text{Model}_{\text{T2WI}}$, $\text{Model}_{\text{T2WI+CA199}}$, and $\text{Model}_{\text{T2WI+CEA}}$ (P > 0.05).
Conclusion

Our study demonstrated that the high resolution T2-weighted MR-based radiomics with CEA and CA19-9 can serve as a quantitative tool to predict SLM of rectal cancer.

OR-554

基于文献计量学的七年放射组学研究热点分析

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目的 从文献计量学角度，探讨近 7 年放射组学的研究热点。
方法 下载 Pubmed 数据库中 2012 年 1 月 1 日至 2018 年 12 月 31 日发表的放射组学研究文献题录，使用 Bicomb 2.0 软件统计分析文献的发表年代、来源期刊及期刊所属国家、高频主要主题词分布情况。对发表文献不小于 3 篇的第一作者所属国家进行人工逐条统计分析。将出现频次不小于 15 次的主要主题词作为高频主要主题词，建立词篇矩阵，使用 SPSS 24.0 软件进行聚类分析，得到该领域研究热点。
结果 共检索到文献 670 篇，其中 2012、2013、2014、2015、2016、2017、2018 年分别为 2(0.3%),3(0.4%),4(0.6%),28(4.2%),62(9.3%),174(26%)和 397(59.2)。670 篇文献来源于 19 个国家的 216 种期刊，将载文量不小于 15 篇的期刊划分为核心区，入选期刊共 9 种，共 194 篇文献。发表文献不小于 3 篇的第一作者共 24 个，来自于 9 个国家，其中美国有 8 个作者，中国有 6 个作者，德国有 3 个作者，荷兰有 2 个作者，加拿大、瑞士、法国、韩国和意大利均有 1 个作者。高频主要主题词共 12 个。凝聚为四大类研究热点方向，其中第一个热点是使用 CT、PET 借助图像处理、计算机辅助方法诊断肺肿瘤、乳腺肿瘤和颅脑肿瘤；第二个热点是非小细胞肺癌诊断；第三个研究热点是 CT 成像方法；第四个热点是磁共振成像方法。
结论 近 7 年放射组学研究热点集中在使用 CT、PET 借助图像处理、计算机辅助方法诊断肺肿瘤、乳腺肿瘤和颅脑肿瘤；非小细胞肺癌诊断；CT 成像方法和磁共振成像方法。

OR-555

基于深度学习的影像组学方法 鉴别肾脏良恶性肿瘤的应用研究

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目的 肾脏良恶性肿瘤的鉴别对于指导临床治疗十分关键。传统影像组学方法需要人工提取特征，效率低且适应性差。因此，本研究运用一种能自动学习图像特征并分类的基于深度学习的影像组学方法对肾脏良恶性肿瘤进行鉴别分类。
材料与方法 本研究采用基于卷积神经网络（Convolutional Neural Network，CNN）的迁移学习方法对肾脏良恶性肿瘤的 CT 图像进行分类。我们收集 153 例经病理确诊的肾脏肿瘤的增强 CT 图像。采用 InceptionV3 模型通过 ImageNet 数据集进行预处理并分类。分别在 Slice、感兴趣区域（ROI）和矩形盒区域（RBR）数据集上建立五个图像水平模型。然后，基于最优图像水平模型建立两个患者水平模型。使用 ROC 分析和交叉验证来评估网络的性能。利用从大规模自然图像训练得到的多种卷积神经网络模型提取肾脏占位图像特征，通过对最后全连接层的精细调整，实现肾脏占位性病变的良恶性分类鉴别。
结果 我们研究发现，在图像水平模型中，Slice 数据集（准确度（ACC）＝0.84 和马休斯相关系数（MCC）＝0.66）的模型训练的交叉验证结果最差。ROI 数据集（ACC＝0.95 和 MCC＝0.89）的分

析结果略优于 RBR 数据集（ACC＝0.91 和 MCC＝0.82）。与图像水平模型相比，两种级别的模型均能提高对肾脏良恶性肿瘤的鉴别诊断（ACC 增加 2%-4%，MCC 增加 2%-7%）。
结论 研究实验结果表明使用基于 CNN 的迁移学习方法对肾脏占位病变的良恶性分类有很好的效果。基于深部学习的影像组学方法可用于从 CT 图像中鉴别肾脏良恶性肿瘤，从而有效指导临床治疗方向。

OR-556

Co-trained Convolutional Neural Networks Analysis for Assessment of the Diagnostic Accuracy of Biparametric Magnetic Resonance Imaging of the Prostate

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Purpose: The study aimed to apply convolutional neural networks (CNNs) to biparametric magnetic resonance imaging (MRI) and to evaluate the diagnostic values of the prediction model generated from training CNNs in prostate cancer.
Materials and Methods: This study evaluated 56 patients with prostate cancer (PCa) and 58 benign prostatic hyperplasia (BPH). A total of 116 PCa and 148 BPH lesions were devided into a training set and a test set. Prediction models of prostate MRI were developed through a novel called CNN40bottleneck based on four different improved methods --bottlenecks, batch normalization, global average and pooling, namely, CNN40bottleneck_gap, CNN40bottleneck_nobn, and CNN40bottleneck_nogap framework. T2 weighted images and ADC images are used as training data in the post-network part. Accuracy, sensitivity, specificity and areas under the receiver operating curve (AUC) were calculated to compare the diagnostic performance of CNNs models based on T2WI, ADC and the combination of T2WI and ADC (T2WI-ADC).
Results: The six models trained with T2WI had significantly higher AUCs (0.862, 0.844, 0.854, 0.813, 0.821, 0.854) than those with ADC (0.724, 0.695, 0.702, 0.715, 0.668, 0.765) in distinguishing between PCa and BPH. When A deep $CNN40_{bottleneck}$ model, the product resulting from jointly combining T2WI with ADC, was adopted, the differential diagnostic efficiency (0.934) was significantly improved. It was remarkably obvious that $CNN40_{bottleneck}$ possessed simliar diagnostic performance and accuracy with ReNet and Inception , but the $CNN40_{bottleneck}$ framework took less training time (T2WI:5391.54s, 3574.32s, 5450.79s; ADC: 4141.76s, 2842.54s, 4220.37s) and needed fewer parameters (16.80MB, 16.50MB, 17.40MB) than the latter two(T2WI:6416.36s, 61241.32s, 10675.32s; ADC: 5085.01s, 21646.21s, 51315.27s; Parameters: 40.70MB, 180.00MB, 315.00MB).
Conclusion: The Co-trained deep CNNs framework based on MRI can effectively differentiate PCa from BPH. In addition, combining both T2WI and ADC (biparametric MRI) in the $CNN40_{bottleneck}$ framework can provide increased diagnostic accuracy. Compared with ResNet and Inception, $CNN40_{bottleneck}$ is a better choice for its advantage of taking less training time and needing fewer parameters.

OR-557

The guidance of radiomic-based quantitative CT analysis for the identification of the invasiveness of pure ground-glass-nodule-like lung adenocarcinoma

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Objective: To investigate the potential supplementary role of radiomic-based analysis on CT images in identifying invasiveness of lung adenocarcinoma manifesting as pure ground-glass nodules (pGGNs).

Methods: 322 pGGNs resected via surgical interventions and confirmed pathologically were involved in this retrospective study. Two radiologists with 3 years' (radiologist A) and 10 years' (radiologist B) experience in thoracic diagnosis performed the nodule segmentation on 3D-Slicer (http://www.slicer.org) with CT images together and accessed each nodule respectively. Random forest and Support Vector Machine (SVM) were used for feature selection and radiomic-based predictive model building. The two radiologists evaluated and made a diagnosis for each nodule again with the assistance of radiomic predictive model. Accuracy, sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated to investigate the potential value of radiomic-based predictive model in diagnosing pGGN-like lung adenocarcinoma.

Results: Among 322 pGGNs, 48(15%) were adenocarcinoma in situ (AIS), 102(32%) were minimally invasive adenocarcinoma (MIA) and 172(53%) were invasive adenocarcinoma (IVA). All nodules were split into training and test cohort randomly with a ratio of 4:1 to establish a radiomic-based predictive model. The accuracies were 72.84%, 76.54% and 92.59% for radiologist A, radiologist B and predictive model. Assisted with the predictive model, the accuracies were increased to 88.89% and 91.36% for the two radiologists.

Conclusion: Radiomic-based predictive model showed a better performance in identifying invasiveness of lung adenocarcinoma manifesting as pGGNs. Combining with the predictive model could improve radiologist's diagnostic performance.

OR-558

3.0T 磁共振无对比剂全心冠状动脉血管成像图像质量及影响因素分析

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目的 探讨 3.0T 磁共振无对比剂全心冠状动脉血管成像（Magnetic resonance angiography，MRA）的临床可行性及其图像质量影响因素。
方法 采用心电门控技术及自由呼吸导航技术，于 3.0T 磁共振行无对比剂全心冠状动脉磁共振血管成像。以冠状动脉节段为单位进行主观图像质量评分，评分采用四分制。比较同一冠状动脉血管不同节段的图像质量差异。并根据图像质量评分并将研究对象分为图像质量合格组和图像质量不合格组，对比两组受试者的年龄、体质量指数（body mass index，BMI）、心率、呼吸末膈肌位移、自由呼吸膈肌运动幅度、呼吸采集效率及扫描时间的组间差异。P＜0.05 具有统计学意义。
结果 本研究共纳入 37 例健康志愿者及 44 例临床可疑冠心病患者，冠状动脉主观图像质量评分：131 个节段为优， 314 个节段为良，181 个节段为中， 103 个节段为差。同一冠状动脉血管不同节段图像质量两两对比显示，前降支近中段图像质量高于其远段（P＜0.01），回旋支及右冠状动脉近段图像质量均高于其远段（p＜0.01）。3.0T 磁共振无对比剂冠状动脉图像质量合格者为 58 例（71.6%），不合格者为 23 例（28.4%）。研究对象年龄及扫描时间在图像质量合格组与图像质量不合格组间的分布无明显统计学差异。图像质量合格组受试者心率、BMI、呼吸末膈肌位移、最大膈肌运动幅度均低于图像质量不合格组（P＜0.05），而图像质量合格组其呼吸采集效率高于图像质量不合格组（p＜0.05）。
结论 3.0T 磁共振无对比剂 MRA 在冠状动脉近中段成像方面具有较好的可行性，呼吸及心率是影响冠状动脉 MRA 图像质量的重要因素，未来可以通过控制心率及呼吸因素进一步优化图像质量。

OR-559

GE 宝石能谱 CT 门脉成脉成像扫描方法 探讨

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回顾性分析 30 例上腹部门静脉系统能谱 CTV 检查患者资料，运用最佳单能量与混合能量分别获取图像，进行兴趣血管与肌肉间后处理的最佳对比噪声比（ CNP）比较，设定 40-80KEV 能量范围筛选图像进行观察；并应用能谱分析软件比较单能量图像及混合能量图像，分析探讨门静脉系统扫描成像方法。

OR-560

数字乳腺三维断层成像与磁共振成像技术对乳腺癌诊断的临床应用评价

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目的 比较数字乳腺三维成像与磁共振成像在乳腺癌诊断的临床应用价值。材料和**方法** 回顾性分析了 253 例临床怀疑乳腺病变的女性患者,患者分别在 Hologic 乳腺机的标准模式下进行数字化乳腺三维断层摄影和在 3.0T MR 系统上进行乳腺 DCE-MRI 及弥散加权成像(DWI)扫描，并将数字乳腺三维断层成像及磁共振成像影像的结果与手术病理诊断结果进行比较分析。**结果** 253 例乳腺检查中，数字乳腺三维断层技术诊断乳腺癌其敏感性为 90.9%，特异性为 89.7%，准确率为 89.3%；传统数字乳腺摄影诊断乳腺癌其敏感性 85.6%,特异性为 80.7%，准确率为 83.4%；MRI 检查技术诊断乳腺癌其敏感性为 94.1%，特异性为 83.3%，准确率为 89.7%；各种准确率差异有统计学意义（ P＜ 0 .05）.**结论** ；数字乳腺三维断层成像技术对乳腺癌检查的特异性优于单纯的乳腺磁共振成

像，敏感性不如 MRI 影像检查技术，但其 DBT 影像检查技术更为经济实用，对造影剂过敏患者降低其过敏风险。

OR-561
低剂量全器官动态容积 CT 检查在胰腺炎中的应用价值

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目的 探究低剂量全器官动态容积 CT 在胰腺炎诊断中的应用价值。**方法** 收集胰腺炎患者及正常胰腺的健康志愿者各 50 例的低剂量全器官动态容积 CT 检查的影像学资料，将胰腺炎患者作为观察组，胰腺正常的健康志愿者作为对照组，分析比较两组受检者的血液容量(BF)、特定区域组织(100 g)的血液容积总量(BV)。**结果** 观察组 BF 为（70.56±14.10）ml/(100 g·min),BV 为(10.66±2.39)ml/100 g；对照组 BF 为（196.33±34.50）ml/(100 g·min),BV 为(35.60±3.20)ml/100 g。观察组 BF、BV 明显低于对照组，差异具有统计学意义(P<0.05)。**结论** 低剂量全器官动态容积 CT 对胰腺组织灌注成像以及胰腺炎的诊断具有较好的临床应用价值。

OR-562
头颈部 CTA 扫描及后处理质量控制规范及优化

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头颈 CTA 检查技术是目前头颈部血管病变诊断及长期随访的首选无创影像检查方法，本科人员在对受检者进行头颈部 CTA 检查时，严格按照头颈部血管的操作规范及专家共识操作，通过对每月随机抽取 50 例头颈 CTA 受检者的检查图像进行监测并进行质控评分，结合临床医生的需求以及诊断医生的反馈，逐月进行优化改进，找到一套合适的检查方案。

将 2019 年 1-6 月的 300 例头颈 CTA 检查图像按月份分为 6 组，每组 50 人，每人图像按 100 分制评分，扫描、后处理各占 50 分，扫描由体位设计、扫描范围、异物、运动伪影、大动脉血管 CT 值（主动脉弓、颈动脉窦、颅内大动脉）以及静脉干扰、噪声干扰组成，后处理由重建范围、重建视野、显示角度、组织裁剪、血管分析、阈值调节、特殊后处理、图像排版组成，由本科的高年资技师对图像参照标准进行打分。

由于之前对头颈 CTA 检查缺乏质控，没有一套完整的方案，且后处理技师水平参差不齐，所以 1、2 月份受检者图像质量评分较低，针对此情况，通过对科室技师的规范化培训以及将质控评分纳入个人考评后，3-6 月图像质量较前明显改进，临床医生及诊断医生反馈较好。

OR-563
基于深度学习的胸部 CT 智能辅助诊断系统在胸部 CT 数据集上的应用研究

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目的 肺癌的发病率和死亡率在所有肿瘤中均居首位，肺内结节有发生肺癌的潜在风险，本研究目的应用卷积神经网络（CNN）算法模型与低剂量 CT（LDCT）图像数据集，探讨人工智能（AI）技术检测肺部结节的效能，这样可以减少诊断时间并降低患者的死亡率。
方法 连续纳入我院 2017 年 1 月至 2017 年 6 月间共 4380 例肺部 LDCT 影像数据进入人工智能辅助检测系统进行肺结节检测，系统自动标注图像数据库中每个图像序列上的结节数以及单个结节的位置、长径、体积、平均 CT 值等信息；同时 2 名资深影像专业医生独立对每个序列图像的智能检测结果逐一进行确认，包括删除和新增等处理。对所有病例依据系统和医生不同的处理方式归为真阳性、假阳性、假阴性和真阴性四类；对所有结节则分成真阳性、假阳性和假阴性三组；用卡方检验统计系统的灵敏度、阳性预测率及阴性预测率等，利用两样本 t 检验验证不同结节组别之间在长径、体积、平均 CT 值等方面是否存在显著统计学差异。
结果 智能辅助诊断系统在 LDCT 数据集上的病例数、灵敏度、正确率、阳性预测值、阴性预测值、错误率在 1 月至 6 月合计分别为 4380、92.63%、80.32%、70.64%、71.78%、29.48%。按 1 月至 6 月数据迭代时序计算，其灵敏度、正确率、阳性预测值，阴性预测值均有提升，而错误率则呈下降趋势。
结论 基于 AI 的胸部 CT 智能辅助诊断系统在检测肺结节上的主要效能指标具有可靠性和成长性，可以帮助放射科医师快速识别结节并对结节的性质做出判断。是在门诊和体检场景下针对 LDCT 肺结节检查和筛查的有效辅助工具。

OR-564
双源 CT 大螺距联合智能调制技术及低对比剂用量扫描方案在肾脏血管成像中的应用

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目的 评价双源 CTFlash 大螺距联合智能调制技术及低对比剂用量扫描方案在肾脏血管成像中的应用效果。**方法** 随机收集 50 例肾脏血管 CT 成像的患者，分为 FLASH 扫描组和常规扫描组。常规组采用单能常规扫描，参考管电压 120kv，管电流 210mAs；FLASH 组采用 flash 大螺距扫描，参考管电压 100KV，管电流为 150mAs。常规组及 FLASH 组均采用 CareDose4D 及 CareKV 技术。常规组对比剂速率及用量分别为 5.0ml/s，85ml。FLASH 组对比剂速率对比剂用量 5.0ml/s，40ml。评价两组扫描的辐射剂量、对比剂用量及图像质量。结果显示 FLASH 扫描组与常规扫描组图像质量上均能满足诊断及临床需求，在对比剂用量上及辐射剂量上存在显著差异。**结论** 在双源 CTflash 大螺距扫描低对比剂用量扫描技术在对比剂用量和辐射剂量上均明显低于常规扫描，图像质量满足诊断，可在 CT 肾脏血管成像扫描中应用。

OR-565
纽曼系统护理干预模式对提高 老年患者腹部 MRI 检查质量中的效果评价

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目的 探讨纽曼系统模式在老年患者腹部 MRI 检查中的应用效果。***方法*** 对影像科实施腹部 MRI 检查的 120 例老年患者（2017 年 1 月到 2018 年 12 月间）实施研究，按随机数表法将患者分为常

规组（n=60）和观察组（n=60），常规组运用常规护理方法，观察组采用纽曼系统模式，分析总结患者情绪状况、图像质量、检查安全性及满意度状况。***结果*** 观察组采用纽曼系统模式后 HAMA、HAMD 评分、不良反应发生率显著低于常规组，观察组图像清晰率、满意度显著高于常规组（*P*<0.05）。***结论*** 纽曼系统护理干预模式可以明显提升老年患者腹部 MRI 检查质量，改善患者检查负面情绪，提高安全性及满意度，值得进行临床广泛推广和应用。

OR-566
肝癌介入治疗患者围手术期体验与需求的质性研究

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目的：了解肝癌介入治疗患者围术期的体验与需求状况，为进一步提高患者就医体验和满意度提供依据。方法：采用质性研究中的现象学研究方法，对 16 例肝癌介入治疗患者进行半结构式深入访谈，利用 Colaizzi 分析程序进行分析、归纳、提炼和萃取主题。结果：肝癌介入治疗患者围术期的体验与需求主要归纳为七大主题：焦虑、恐惧无助；对介入治疗具体过程不了解；担忧疾病得不到预期治疗效果；对介入围手术期不良反应认识不足、无力应对；担忧医疗花费对家庭造成经济负担；担忧家属身心状况；诊疗流程有待提高。结论：肝癌介入治疗患者具有复杂的心理体验，临床工作中应注重患者的内心需求及变化，提供有针对性的心理干预、健康指导和社会支持，从而提高患者就医体验和满意度。

OR-567
耐高压输液港在肿瘤患者增强 CT 检查中应用的护理体会

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目的 探讨耐高输液港在肿瘤患者 CT 增强检查中的应用效果及护理体会。
方法 选取 2019 年 03 月至 2019 年 06 月在我院已置入耐高压输液港需进行 CT 增强扫描检查的肿瘤患者 54 例，经输液港注入造影剂进行 CT 增强扫描检查，来我科检查前患者输液港均已置入耐高压蝶翼针，我科护士按要求进行用药前评估，按标准规范消毒抽回血确认导管无异常，注药时按扫描部位要求以 2-3ml/S 速度注入，监测注射压力，实时观察患者有无药物外渗及病情变化，注药后观察有无药物反应、感染等不良事件，并对比同期外周留置针一针穿刺成功率及造影剂外渗率，分析其应用效果。
结果 54 例患者使用耐高压输液港进行 CT 增强扫描时平均压力为 120-150pis，在产品说明书所示安全压力范围，增强图像符合诊断要求，无一例药物外渗、无一例导管断裂及相关并发症发生；统计科室同期使用外周留置针的 CT 增强检查患者 3063 例，穿刺失败 121 例，一针穿刺成功率为 96.1%，造影剂外渗率为 0.09%。
结论 对已置入耐高压输液港及蝶翼针的肿瘤患者行增强 CT 扫描检查可以直接使用此装置，无需再另外置入外周留置针，能有效减轻患者痛苦，保护肿瘤患者的外周静脉，提高患者满意度，减少护理工作量，并降低造影剂外渗的发生率，节约耗材。

OR-568

Study on improving the quality of patients'life after PTBD by regular interventional nursing outpatient dressing change and drain tube maintenance

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Abstract. - **OBJECTIVE**: To study the effect of regular interventional nursing outpatient dressing change and drain tube maintenance on improving the quality of patients'life after PTBD.
MATERIALS AND METHODS: Patients with malignant obstructive jaundice treated in our hospital from March 2016 to February 2018 were divided into two groups according to the time of admission. 300 cases were treated as control group from March 2016 to February 2017, and 300 cases were treated as observation group from March 2017 to February 2018. The patients in the control group were given oral instruction to the local hospital to change the dressing simply. The patients in the observation group were all in time to the outpatient department of interventional nursing to change the wound dressing and replace the butterfly fixator and the maintenance of the drain tube.
RESULTS: Comfort, self-care ability (knowledge of related diseases), patients' satisfaction to nurse, wound infection and re-admission were compared between the two groups. Compared with the control group, the rate of wound infection and accidental removal of tube in the observation group was significantly lower than that in the control group, and the degree of comfort and the knowledge of related diseases (self-care ability) were significantly higher than those in the previous group, and the difference was statistically significant.
CONCLUSIONS: Patients after PTBD who regularly come to the interventional nursing outpatient department to change the wound dressing and maintain drain tube can obviously improve their comfort and knowledge of related diseases (self-care ability), reduce wound infection and accidental readmission rate, improve the quality of life.

OR-569

影像科院内感染危险因素及防控措施的研究与探讨

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目的:探讨影像科院内感染发生的相关危险因素及其预防管理措施。
方法:选取 2018 年 1 月至 2018 年 12 月于我院影像科接受检查发生院内感染 45 例患者为观察组,采用系统随机抽样方法，随机抽取同期于我院影像科接受检查未发生院内感染的患者 45 例作为对照组,对两组临床资料及诊疗状况进行调查分析,探讨放射科院内感染相关危险因素及管理措施。
结果:单因素分析结果显示：两组患者年龄、就诊类型、空气中菌落数、操作者洗手消毒正确性、检查室检查时间比较差异具有统计学意义($p<0.05$)。多因素 Logistic 回归分析结果显示,检查室检查时间(＞10 分钟)、检查者未正确洗手消毒、住院患者、空气中菌落数(＞80%)，进入回归方程，方程拟合度较好，差异有统计学意义($p<0.05$)。

结论 检查时间长、操作者卫生消毒不到位、住院患者、空气中菌落数超标是影像科院内感染发生的独立危险因素。因此,应加强医护人员的专业培训,做好各项防感染医疗措施,以降低院内感染发生率。

OR-570
两种肝动脉化疗栓塞术治疗肝癌的不良反应对比及护理

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目的: 对比两种化疗栓塞术治疗肝癌的不良反应，便于护士根据不同的化疗栓塞方案，理清关注的重点问题做好健康指导和症状的观察与处理，促进患者康复。方法: 选取 2018 年 4～10 月在我科行经导管动脉化疗栓塞术(Transcatheter arterial chemoembolization，TACE)的肝癌患者 160 例，其中传统的经导管动脉化疗栓塞术（Conventional transcatheter arterial chemoembolization，c-TACE）（均为表柔比星联合碘油）80 例；载药微球经导管动脉化疗栓塞术（drug eluting beads transcatheter arterial chemoembolization，DEB-TACE）（均为表柔比星联合载药微球）80 例，术后 24h 内每 4h 询问及记录过去 4h 内的不良反应， 24h 后每天询问及记录 1 次 1 天内的不良反应。**结果** DEB-TACE 组患者术后 24 小时尿量少于 c-TACE 组（$P<0.05$）、肝区疼痛发生率高于 c-TACE 组（$P<0.05$）；c-TACE 组恶心呕吐发生率高于 DEB-TACE 组（$P<0.05$）；肝功能损伤发生率、发热、便秘等不良反应发生率在两组无明显统计学差异。结论: 护士对待 TACE 术后的患者除关注的共性问题外，对于不同的肝动脉化疗栓塞方案存在差异的不良反应应做到预见性护理，积极采取有效措施和健康指导以及心理护理，降低并发症的发生、提高患者对介入治疗的依从性和生活质量。

OR-571
一次性静脉留置针在冠状动脉 CT 血管造影检查中的对比性研究

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目的 探讨两种类型一次性静脉留置针在冠状动脉 CT 血管造影检查中的穿刺使用效果对比。
方法 2018 年 3 月至 2019 年 2 月对 3900 例行冠状动脉 CT 血管造影检查的患者进行回顾性分析。使用一次性带延长管直型静脉留置针穿刺者为实验组；使用一次性直型静脉留置针穿刺者为对照组，对照组与实验组均穿刺前臂外周血管，对照组与实验组分别入组 1950 例患者。观察使用两种不同穿刺材料后患者在行冠状动脉 CT 血管造影检查后发生接口处溢血、静脉留置针移位、对比剂外渗等现象的发生情况。
结果 两种不同穿刺材料之间的差异有统计学意义（P＜0.05）。带延长管直型静脉留置针接口处溢血、静脉留置针移位、对比剂外渗低于直型静脉留置针。
结论 在冠状动脉 CT 血管造影检查中使用一次性带延长管直型静脉留置针效果明显优于一次性直型静脉留置针。

OR-572

首站电子信息采集在放射体检中的重要性

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【摘要】**目的** 探讨首站电子信息采集在放射体检中的重要性。健康信息采集是体检的开始环节，更是得出正确结论的前提条件[1]。放射体检在体检行业中，特别在预防及诊断疾病中起着非常重要的作用。我国接受放射体检的顾客不断增加[2]。人们对体检健康档案的信息化管理有着极高的认同[3]。 **方法** 随机选取 2019 年 5 月-2019 年 7 月我中心 300 名体检顾客，随机分为观察组和对照组，各 150 名。对照组不采集健康信息直接进入中心进行体检，观察组在对照组的基础上进行电子信息采集，然后再进行体检，在体检报告发出后予以一次电话随访。比较两组顾客的放射体检满意度、放射技师拍片所需时长及放射科医生诊断报告的时长。 **结果** 放射体检顾客满意度明显提高，。技师在拍片之前省去许多的提问环节，减少了拍摄时长，提高了工作效率。医生在诊断报告的过程中，可以结合病史，减少误诊或者漏诊的现象，可以给予顾客更全面的指导意见。体检顾客电子信息采集前后，顾客的满意度由对照组的平均 2 分到观察组的平均 4 分、技师的操作时长由 15min 减少到 10min、医生诊断报告的时长由 5min 减少到 3min，差异有统计学意义（$p<0.05$）。**讨论** 目前国内大部分体检中心缺少首站电子信息的采集，这样会增加放射检查的操作及诊断风险，产生不必要的医疗浪费及纠纷。如何建立一个完善的、有效的电子信息采集档案是值得大家去探讨的一个问题。

OR-573

影像专科护士核心能力分层次培训模块的建立与实施

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目的 建立影像专科护士核心能力分层次培训模块，并实施教学培训，以提高影像专科护士的专业综合能力，满足影像检查护理岗位的需求。
方法 根据影像科护理岗位的特点，构建临床核心能力和提升核心能力培训模块，其中临床核心能力模块含影像基础、专业知识、专科技能、风险管理 4 个子模块，提升核心能力模块含管理能力、教学能力、科研能力 3 个子模块。在此基础上引入重组教学模式，结合分层次培训方法，对 30 名护士进行培训，要求全部护士掌握临床核心能力模块内容，逐步进行提升核心能力模块内容的培训。采用网上理论考核、自录视频操作考核、读书交流与专题讲座等方式评价培训效果。
结果 ①评价指标：培训后护士理论与操作考核成绩、健康教育能力、教学能力评价指标、护理质量核心指标明显高于培训前（$P<0.01$）：②获得的成果：完成文档资料 1 套、多媒体资料 10 部、国内首部影像护理专著；护理组发表论文 70 篇，SCI 论文 3 篇；主持学校及省部级课题 4 项；获得省部级及学校等成果奖项 6 项。③推广应用：在全国、全军及重庆市影像诊断/技术/护理大会上发言 12 次、专题讲座 30 余次；举办国家级继续教育培训班 10 期。
结论 本研究成果紧密结合影像护理的特点和国内外发展方向，研究成果丰富，实用价值高，通过请进来：举办国家继教、学术交流会、培养进修生；走出去：参加学术讲座、大会交流、培训指导、帮带医院等形式带动和引领影像护理学术发展，积极推广和普及影像专科护理理论、护理特色技术、先进的管理理念及影像护理教学与科研方法。真正解决了当前影像科护理存在的实际问题，对提升影像护理专业水平具有重要的指导意义。

OR-574
宫颈癌腔内后装治疗患者舒适状况及影响因素的研究

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目的 调查宫颈癌腔内后装治疗患者的舒适状况，并分析其影响因素。
方法 整群抽取山西省肿瘤医院 2015 年 12 月-2016 年 1 月 117 名行腔内后装治疗的宫颈癌患者，使用患者一般情况调查表及宫颈癌腔内后装治疗患者舒适状况量表进行问卷调查。并对数据进行分析整理。
结果 调查显示：整体舒适得分为（3.79±0.418）分。心理舒适维度均值为（3.29±1.023）分，社会舒适维度均值为（3.65±0.648）分，生理舒适维度均值为（3.94±0.644）分，环境舒适维度均值为（4.16±0.623）分。其中舒适状况最差的 10 项内容中心理舒适维度占 5 项，社会舒适维度占 4 项，生理舒适维度占 1 项，分别为：①我担心家庭的经济状况；②一想到腔内治疗我就觉得紧张、害怕；③我现在情绪低落；④我担心以后的夫妻生活受到影响；⑤在进行放疗准备时，我觉得难为情；⑥我睡眠紊乱、入睡困难、易醒或失眠；⑦我愿意和他人谈论我的病情；⑧在我需要帮助时有我可以依靠的人；⑨我想了解自己更多的病情；⑩对于家人、朋友和社会来说，我是有价值的、重要的。多重回归分析显示：患者年龄、职业、文化程度、收入水平、腔内治疗次数是影响舒适水平的因素，这些因素占舒适度总影响因素的 54.5%。
结论 调查显示患者的心理舒适维度得分最低，其次是社会舒适维度，环境舒适维度得分最高。因此，在临床护理工作中，护士在减轻患者生理不适的基础上，要加强患者的心理护理及对患者社会支持系统的干预。本文在先人研究基础上，使用了科学的舒适度测量工具，对患者各维度的舒适状况进行了调查及分析研究，研究结果可为临床采取针对性护理干预提供依据，并在舒适护理质量的持续改进方面起到一定的推进作用。

OR-575
Comparative Analysis of Anaphylactoid Reaction between Four Types of Iodine Contrast Media in Enhanced CT Scanning

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Background: The anaphylactoid reaction is one of the most important side effects of iodine-based contrast media.

Purpose: To investigate the safety and applicability of four typesof iodine contrast media used in 6399 cases of enhanced CT scan in our hospital.

Material and Methods: The occurrence of anaphylactoid reactions to Iohexol, Ioversol, Iodixanol and Iopromide (as I1, I2, I3 and I4) were collected for 9 months since August, 2007. The incidence of anaphylactoid reactions was calculated in each group.

Results: Enhanced CT scans were performed in 6399 cases. Anaphylactoid reactions occurred in 9 cases, and the incidence of anaphylactoid reaction was 0.14%. Among them, 6 cases were mild anaphylactoid reaction (0.093%), 3 cases weremoderate (0.047%) and no cases were severe reactions. There was a significant difference in the incidence of anaphylactoid reaction among the 4 contrast media used (p=0.03). I3 had the highest incidence of anaphylactoid reaction at 0.46%. The incidence in I1 group was the lowest (0.04%). I2 group and I4 group had incidence rate of 0.1%, and 0.23%, respectively.

Conclusion: The overall incidence of anaphylactoid reaction was low while iodixnaol group had the highest rate and the Iohexolhad the lowest rate.

OR-576
恒温碘伏对介入手术皮肤消毒性能及效果的观察

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目的 观察将同一厂家碘伏消毒液加热至一定温度后，碘伏消毒液的有效碘含量的变化，对金黄色葡萄球菌、大肠杆菌和白色念珠球菌的杀菌率变化，以探讨不同温度碘伏用于介入手术皮肤消毒性能及效果。**方法** 1、将同一厂家碘伏消毒液加热至一定温度后，用滴定液滴定碘伏消毒液测其有效碘含量变化 2、采用介入手术室常用室温碘伏（24±0.5℃）及加温接近人体体温的碘伏（34~37℃）对介入手术病人进行手术区域皮肤消毒，然后使用无菌棉拭子分别采样培养，观察消毒效果。3、用悬液定量杀菌实验的方法观察加温后的碘伏消毒液对金黄色葡萄球菌、大肠杆菌和白色念珠球菌的杀菌率变化。**结果** 1、中和剂鉴定试验：按照中和剂鉴定标准，10g / L 的硫代硫酸钠磷酸盐缓冲液用于悬液定量杀菌实验是合适的。2、室温碘伏消毒及不同温度碘伏消毒的样本经过 48 小时培养后，均无细菌生长。3、悬液定量杀菌实验：碘伏消毒液作用 3 分钟，对金黄色葡萄球菌、大肠杆菌和白色念珠球菌的平均杀灭对数值均＞5.00，杀菌率为 100%。说明加热后的碘伏消毒液能达到杀菌效果。**结论** 1、加热后的碘伏有效碘含量较常温下有所增加。2、实验证明碘伏加温到接近人体体温时不会影响消毒效果，可以运用于临床介入手术皮肤消毒。3、碘伏加热后不影响碘伏杀菌率。

OR-577
以家庭为中心的协同护理对冠状动脉介入术后抑郁焦虑情绪和生活质量的影响

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[摘要] 目的 探讨以家庭为中心的协同护理对冠心病患者经皮冠状动脉介入治疗（PCI）术后抑郁焦虑情绪和生活质量的影响。**方法** 2017 年 10 月～2018 年 6 月行 PCI 治疗的冠心病患者 80 例为研究对象，分为观察组和对照组，每组 40 例。对照组采用常规护理干预，观察组在常规护理的基础上实施以家庭为中心的协同护理干预。护理干预前及干预 6 个月后，用 17 项-汉密尔顿抑郁量表（HAMD-17）和汉密尔顿焦虑量表（HAMA）分别评价抑郁和焦虑情绪；用健康调查简表（SF-36）评价生活质量；用社会支持评定量表（SSRS）评价患者的社会支持情况。**结果** 护理

干预后，观察组 HAMD-17 和 HAMA 评分均低于对照组（$P<0.05$）；观察组 SF-36 总体健康、社会功能、情感职能和精神健康评分均高于对照组（$P<0.05$）；观察组 SSRS 主观支持、客观支持、社会支持利用度和社会支持总分均高于对照组（$P<0.05$）。**结论** 以家庭为中心的协同护理可能通过提高社会支持而改善患者的不良情绪及生活质量。

OR-578

Investigation on the status of first urination after transcatheter arterial chemoembolization

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Objective To analyze the first urination after transcatheter arterial chemoembolization. **Methods** 112 patients with hepatic artery chemoembolization from March 2018 to September 2018 were collected.The general information of patients, the first Autonomous Urination after operation, the first Autonomous Urination time more than 4 hours after operation and the causes of dysuria after catheterization were investigated. **Results** 109 patients (97.32%) could urinate spontaneously after operation, 3 patients (2.68%) with indwelling catheter, and 39.28% patients had the first time to urinate more than 4 hours after operation. he main causes of dysuria were not timely evaluation after operation, no urination training before operation and body position change, accounting for 39.71%, 22.06% and 19.12% respectively. The waiting time for the first urination was less than 30 minutes in 14.68% of the patients and more than 30 minutes in 4.59% of the patients. The color of the first urination was red in 7.34% of the patients. **Conclusion** The patients who need indwelling catheter and the first Autonomous Urination time more than 4 hours after transcatheter arterial chemoembolization occupy a certain proportion, this part of the population needs to focus on; Lack of timely post-operative evaluation, pre-operative urination training and postural changes are the main factors leading to prolonged urination time and difficulty in urination, which should be improved.

OR-579

耳穴贴压对肝癌射频消融患者超前镇痛干预的应用效果研究

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目的 观察耳穴贴压对肝癌射频消融患者超前镇痛干预的应用效果。**方法** 使用试验病例随机编码表，对符合纳入标准的患者随机分成 A 组、B 组、C 组，每组 50 例。A 组 50 例 RFA 术前 30min 皮下注射吗啡注射液 10mg。B 组 50 例 RFA 术前 24 小时使用王不留行籽耳穴贴压，C 组 50 例采用上述吗啡注射联合联合耳穴贴压方法。记录术中疼痛程度及术后活动性疼痛及静息性疼痛强度及免疫指标：T 细胞亚群，包括 CD3+细胞、CD4+细胞、CD4+ / CD8+比值。 **结果** 三组患者 RFA 术中及术后比较，NRS 评分存在统计学差异（P<0.05），两两比较发现，A 组与 B 组相比，NRS 评分差异无统计学意义（p>0.05），C 组 RFA 术中及术后各时间点疼痛程度 NRS 评分比较 AB 两组均较低，且存在统计学差异（P<0.05）。C 组 RFA 术中及术后各时间点各时间点 FAS 评分比较 AB 两组均较

低，P<0.05。RFA 术中及术后 A 组与 B 组相比，免疫指标结果差异无统计学意义（p>0.05），C 组与 A 组治疗前后比较，结果存在统计学差异，P<0.05；与本组治疗前比较，结果存在统计学差异，P<0.05 ，C 组与 B 组治疗前后比较，结果存在统计学差异，P<0.01；与本组治疗前比较，结果存在统计学差异，P<0.05 。 **结论** 耳穴贴压超前镇痛能够有效缓解肝癌射频消融术后患者疼痛，而且安全、经济、无毒副作用，是一种能够在临床中广泛应用的中医特色治疗手段。

OR-580

TIPS 手术后非计划再住院患者相关因素分析

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目的 通过对 TIPS 术前、术后、再入院的生化指标的分析，找到患者再入院的原因，改进延续护理方案，以降低患者非计划再住院率。**方法** 选择 2017 年 1 月至 2019 年 6 月入住我院行 TIPS 手术的肝硬化门脉高压症出院后非计划性再住院患者 28 例，收集患者术前、术后 3 天及再入院生化指标作为研究参数。 **结果** 患者 TIPS 术后再入院与术后相比，APTT、血氨值升高（P<0.05），；患者 TIPS 手术术前、再入院查 APTT、血氨值升高（P<0.05）；单因素分析和多因素分析结果显示，患者早期再入院与支架血栓形成有关。**结论** 医务人员要针对患者个体情况，复查的各种指标，针对性进行用药、饮食指心理等康复指导，才能保证手术的长期疗效，减少术后并发症的发生。

OR-581

碘对比剂外渗利多卡因冷湿敷的观察及护理

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目的 探讨 2%利多卡因在治疗 CT 增强扫描所致对比剂外渗患者中的疗效与方法。**方法** 选取我院 28 例发生对比剂外渗的患者，其中 18 例用 2%利多卡因冷湿敷效果明显优于 50%硫酸镁溶液冷湿敷，对其处理效果进行观察对比。结果 2%利多卡因冷湿敷效果明显优于 50%硫酸镁溶液。**结论** 对比剂外渗应用 2%利多卡因冷湿敷，止痛、消肿快捷有效，值得推广应用。

OR-582

Preventive nursing and emergency rescue measures of adverse reactions produced by contrast agents

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[Abstract] **Objective**:To analysis the preventive nursing and emergency rescue measures of adverse reactions produced by contrast agent in radiolgy.**Methods**:Selection of 88 emergency patients with enhance scanning and contrast agent during February-December 2018 in The First Affiliated Hospital of Dalian Medical University,They were divided equally into control and experimental groups,The control group was the regular

reminder group,and the experimental group was a group that provided appropriate preventive care on the basis of regular notification,then to comparative the incidence of adverse reactions and the recovery effect of emergency rescue measures after adverse reactions between the two groups.**Results**:The incidence of adverse reactions was significantly lower in the experimental group than in the control group,and patients with adverse reactions in the two groups showed rapid,good ang stable recovery after taking timely and accurate emergency rescue measures.**Conclusion**:Reasonable preventive care and timely emergency rescue measures for patients with enhance scanning can not only greatly reduce the incidence of adverse reactions produced by contrast agent, but also effectively improve the recovery effect of adverse reation patients.

OR-583
完善.细致的准备工作对增强 CT 患者满意度的影响探析

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目的 细致的准备工作对增强 CT 患者满意度的影响。**方法** 2019 年 3~4 月在我科行增强 CT 检查患者 120 名，随机分为对照组与观察组。对照组按照常规流程进行检查，观察组则接受细致准备工作后再进行检查。对两组的满意度进行对比与分析。**结果** 观察组患者满意度 97%，对照组患者满意度 75 %。**结论** 完善.细致的准备工作对提高患者满意度效果显著，值得医技科室借鉴与推广。

OR-584
护理干预对 64 排螺旋 CT 冠状动脉 CTA 图像质量的影响研究

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目的 探讨护理干预对 64 排螺旋 CT 冠状动脉 CTA 图像质量的影响。
方法 入组 50 例在 2016 年 2 月 21 日至 2018 年 2 月 21 日期间收治的实施 64 排螺旋 CT 冠状动脉 CTA 检查患者。采用计算机随机分组法，将 50 例患者分为干预组（25 人）和对照组（25 人）。干预组在常规化护理基础上进行呼吸训练、心理疏导、用药指导等护理干预，对照组仅进行常规化护理。2 名主治职称以上的放射科医师对图像质量进行评估。采用独立样本 T 检验对两组间患者年龄进行比较。采用卡方检验对两组间患者性别和图像质量进行比较。
结果 两组间患者年龄、性别无统计学差异（P>0.05）。干预组图像质量明显优于对照组，两组间图像质量存在统计学差异（P<0.05）。
结论 通过护理干预，可以明显提高 64 排螺旋 CT 冠状动脉 CTA 图像质量，值得临床应用推广。

OR-585
针对性护理对子宫腺肌病患者行子宫动脉栓塞术的心理影响

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目的 探讨对于子宫动脉栓塞术（UAE）治疗子宫腺肌病的患者，根据患者病情、年龄、生育需求及社会背景，应用针对性护理，对患者实施个体化的护理干预对临床效果的影响，总结护理经验，以优化对于子宫腺肌病患者行介入治疗的护理。 **方法** 采用数字表随机分配的方法将我院介入科 2017 年 6 月至 2019 年 6 月收治的确诊为子宫腺肌病且药物治疗无效、有介入手术指征的患者 48 例，随机分为对照组和干预组各 24 例，对照组患者给予子宫腺肌病围手术期的常规护理，干预组在对照组护理的基础上结合患者特点，加强疾病的健康教育，施以针对性护理干预。采用焦虑、抑郁自评量表对 2 组护理前后心理状态进行评估，并对比 2 组患者对护理服务的满意度。 **结果** 对照组护理满意度 83．3%，干预组护理满意度 100%，干预组患者对护理满意度均明显高于对照组（P<0.05）。对比 2 组患者护理前后焦虑、抑郁心理情况，2 组术后后焦虑自评量表（SAS）、抑郁自评量表（SDS）均较术前明显降低，且干预组降低幅度明显大于对照组，差异有统计学意义（P<0.05）。 **结论** 针对性护理的实施可有效改善子宫腺肌病行子宫动脉栓塞术患者的心理状态，提高患者对疾病的了解和对护理的满意度，利于提高护理整体质量，有助于子宫腺肌病患者的身心康复，值得临床运用。

OR-586

心血管疾病患者增强检查风险评估与管理

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摘要：**目的** ，分析不同心血管疾病患者增强检查中重点关注的风险点及应对策略。**方法** ，回顾分析我院 2012 年 8 月-2018 年 9 月 110857 例增强患者，发生中、重度碘对比剂不良反应共计 39 例，死亡 1 例，其中 19 例患者有心血管方面的基础疾病。心血管疾病包括了冠心病、高血压、心力衰竭、结构性心脏病、心律失常、血脂异常、其他有肺动脉高压、主动脉夹层、肺栓塞等。**结果** ，增强检查前评估中的**风险点**有：1、评估项目不完善：漏项、只问了是否优高血压、心功能情况，忽略了心律失常等…，2、评估风险过高、过低:胸痛、甲亢，3、有风险后后处置不当：没有与科室负责人、临床医生等相关人员沟通、交流，4、患者提供病史不全，5、临床医生没有完善申请记录，6、信息支撑不够；输注带来的风险：1、输注工具：留置针、CVC、特殊的 PICC 管，2、输注部位选择，3、对比剂渗漏，4、管路事件:脱落、爆管、遗漏等，5、输注液体过多、过快，6、≧65 岁患者应激反应；检查中的风险：1、对不良反应及时发现、判断能力、急救能力、急救设备的配置，2、疾病加重：动脉瘤破裂、急性心梗的发生，3、没有常规心电、血氧监测，4、不能配合造成的辐射损伤：听力、呼吸、心率。检查后的风险：1、观察 30 分钟内，2、患者脱离观察视野，3、不良反应发生没有及时发现，4、应急处理能力，5、健康教育宣传不到位；**应对策略中**评估很重要：正确评估各种心血管疾病的风险，如冠心病，高血压、心力衰竭、结构性心脏病、心律失常、血脂异常、其他有肺动脉高压、主动脉夹层、肺栓塞、主动脉球囊反博患者处于什么状态，并给与风险分层管理，Ⅰ：放射科处理级（评估无已知风险）；Ⅱ：临床干预级（需要提前干预：水化、药物、家属）；Ⅲ： 团队合作级 （风险很高、放射科承担不了处理风险能力）；Ⅳ：禁忌级（致死性高的）。**结论** 当增强收益＞风险时——采用团队合作级，单独签署知情同意书、做好急救方案。

OR-587

The Application and the Effect of Treating Patients with Malignant Obstructive Jaundice who had been Treated with

Biliary Stent Implantation by Butt Joint of Self-Made Assisted I-125 particles Implantation Device Set and Abdominal I-125 particles Implanta

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[Abstract]
Objective To investigate the application and the effect of treating patients with malignant obstructive jaundice who had been treated with biliary stent implantation by butt joint of self-made assisted I-125 particles implantation device set and abdominal I-125 particles implantation protective coat made from lead. **Methods** To select 80 patients with malignant obstructive jaundice who were eligible for I-125 particles biliary stent implantation and randomly divide them into the experimental group and the control group with 40 cases each. There were no statistically significant difference in baseline data between the groups (P>0.05). During the operation of patients in the experimental group, doctors used the independently invented auxiliary I-125 particles implantation device set (patent No.ZL201620839740.9) and those patients after the operation need to put on the independently invented abdominal I-125 particles implantation protective lead (patent No.ZL201620839740.9). During the operation of patients in the control group, doctors adopted traditional seed implantation surgical instruments and those patients after the operation should dress regularly protective coat made from lead. The aim of the experiment is to compare the time spent by doctors in accurately implanting particles to two groups of patients, the radiation shielding effect of the two kinds of lead suits after the operation and the duration and comfort of patient's active protection. All statistical analysis was performed using SPSS 23.0 software package.
Results There was a statistically significant difference between the two groups in the amount of time it took for doctors to accurately implant a particle (t=-6.974, P<0.001). Besides, there were no difference between two groups of patients to wear different clothes for radioactive protection with radiation carrying capacity after the interval distance of 0 M and 0.5 M(t_{0M}=1.449, $t_{0.5M}$=0.08633, P>0.05). In addition, there was a statistically significant difference between the amount of duration time it took for two groups of patients to actively wear the protective lead coat (t=7.866, P<0.05). In the meantime, there was a statistically significant difference in comfort between the two groups of patients(Z=-2.193 , P<0.05). **Conclusion** Applying self-made assisted I-125 particles implantation device set combined abdominal I-125 particles implantation protective coat made from lead to the patients with malignant obstructive jaundice with I-125 particles stent implantation can improve the efficiency of doctors' operation, reduce the amount of time they are exposed to particles and improve compliance and comfort of patients with active radiation protection. It proved that there were clinical application value and promotion significance.

OR-588
移动健康教育在 PTBD 术后出院患者护理中的价值探索

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目的 探讨移动健康教育在经皮经肝穿刺胆道引流术(Percutaneous transhepatic bile duct drainage,PTBD)术后带管出院患者中的运用价值。**方法** 本研究选取 2017 年 1 月至 2018 年 12 月我院进行 PTBD 术后带管出院的患者 84 例作为研究对象，采用随机数列法将患者分为观察组和对照组，每组各 42 例。其中对照组给予常规健康教育。观察组在对照组基础上，给予移动健康教育。对患者带管的目的、引流胆汁总量、胆汁颜色、引流管维护、切口皮肤护理、夹闭引流管时间、带管脱落预防、导管造影、导管拔出适应症的认知情况进行评分。调查两组患者的满意度。对比两组患者的脱管、切口感染、导管堵塞的发生率和导管留置时间。**结果** 观察组患者的带管的目的、引流胆汁总量、胆汁颜色、引流管维护、切口皮肤护理、夹闭引流管时间、带管脱落预防、导管造影、导管拔出适应症评分均高于对照组，差异有统计学意义（P<0.05）。观察组的满意度高于对照组，差异有统计学意义（P<0.05）。观察组的脱管、切口感染、导管堵塞的发生率和导管留置时间比对照组低，差异有统计学意义（P<0.05）。**结论** 移动健康教育可提高 PTBD 术后带管出院患者的认知度和满意度，降低并发症的发生，缩短导管留置时间。

OR-589
前循环急性缺血性卒中血管内取栓的个体化镇静护理实践

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目的 指南指出前循环急性缺血性卒中(AIS)患者取栓时行个体化镇静或麻醉更为合适。遵循“时间即大脑，争分又夺秒”的救治原则，前循环和部分后循环的 AIS 取栓常不通知及等待麻醉师参与，患者的镇静护理由介入手术护士在医嘱下参与承担，已是国内外普遍现状。本文目的分析个体化镇静护理在保证 AIS 患者安全和缩短治疗时间的作用。
方法 遵医嘱对 106 名患者实行个体化镇静护理：(1)动态评估与调整：采用 SAS 评分和 CPOT 评分动态评估镇静状态，目标 SAS 评分 3-4 分，CPOT 评分＜3 分，未达目标时报告医生并遵医嘱调整用药；(2)用药方案：采用咪达唑仑或右美托咪定联合芬太尼作为镇静用药选择，并与医生根据患者体重个体化设计负荷剂量和泵注速度；(3)约束与安全：优化介入手术床，制作更快捷有效的约束工具，患者入室常规约束保障安全；(4)气道护理：掌握吸痰护理、口咽通气管和简易呼吸气囊使用，对呼吸抑制和呕吐采取预见性护理；(5)血压管理：持续血压监测，血管再通后遵嘱用药控制血压，以防再灌注损伤。根据用药方案不同，患者分为咪达唑仑组(n=72)和右美托咪定组(n=34)，比较入室至再通时间、芬太尼用量与不良反应发生情况。
结果 咪达唑仑组与右美托咪定组患者入室至再通时间为 52.7±10.8min 和 53.4±11.9min，均低于文献参考水平。呕吐、血压和血氧饱和度下降等不良反应发生率低。图像伪影比较上有统计学差异(P＜0.05)。
结论 个体化镇静护理利于缩短前循环 AIS 患者取栓治疗时间，并控制不良反应发生，保障安全。咪达唑仑或右美托咪定联合芬太尼可作为合适的镇静方案，但右美托咪定易产生类似睡眠的效果，导致头部摆动而造成伪影。ARIN 等组织相继建议，介入手术室在 1 名足够经验的执业护士镇静管理下，可不需要麻醉师参与。目前镇静护理在 ICU 已有成熟的护理体系，同样作为急重症部门的介入手术室，应更积极地借鉴学习。

书面交流

PU-0001

1H-MRS 对儿童 OSAHS 脑代谢变化的初步研究

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目的 用氢质子磁共振波谱(¹H magnetic resonance spectroscopy, ¹H-MRS)探讨儿童阻塞性睡眠呼吸暂停低通气综合征（OSAHS）大脑代谢及功能的变化。**方法** 对 20 例 OSAHS 患者、20 例正常者行磁共振波谱（ *¹H-MRS*）检查和多导睡眠呼吸监测（PSG），记录两组双侧额叶代谢物的比值和检测指标，比较两组间的差异，并和主要监测指标进行相关性分析，观察有无乳酸（Lac）峰出现。**结果** OSAHS 组 NAA/Cr、NAA/Cho 较对照组明显降低，Cho/Cr 较对照组明显升高，差异具有统计学意义(P＜0.05)。各被测者均未见 Lac 峰。OSAHS 组的 AHI 与双侧额叶 NAA/Cho、NAA/Cr 呈负相关（P＜0.05），而与 Cho/Cr 无相关性（P＞0.05），$MSaO_2$与双侧额叶 NAA/Cho、NAA/Cr 呈正相关（P＜0.05），而与 Cho/Cr 无相关性（P＞0.05）。**结论** *¹H-MRS* 能较早监测儿童 OSAHS 脑代谢的变化，为临床治疗和效果评价提供客观的影像学依据。

PU-0002

回顾分析新生儿化脓性脑膜炎 MRI 表现

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目的 分析新生儿化脓性脑膜炎颅脑 MRI 异常表现。
方法 随机选取医院收治的 50 例新生儿化脓性脑膜炎患儿对其影像资料进行回顾性研究。根据患儿脑脊液或血病原菌培养阳性、脑脊液糖含量降低、发生惊厥将其分为难治组(21 例)和普通组(29 例)，对新生儿化脓性脑膜炎的头颅 MRI 影像学特点进行分析.
结果 在 50 例患儿颅脑 MRI 检测中，难治组异常率明显升高,两组比较差异有统计学意义(x2=3.227,P＜0.05)。
结论 在化脓性脑膜炎患儿中若出现脑脊液或血病原菌培养阳性、脑脊液糖含量降低以及发生惊厥的情况的情况下，MRI 磁共振容易出现以下阳性征象：脑表面他像呈线条状高信号,脑膜增厚，硬膜下积液脑沟变浅消失，皮层及皮层下弥漫性长 T1/长 12 异常信号,双侧脑室前后角周围白质水肿信号，脑积水,脑梗死等表现

PU-0003

Atypical Tteratoid /Rhabdoid Tumors: Imaging Findings of Four Cases and Literature Review

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PURPOSE: To characterize the computed tomography (CT) and magnetic resonance imaging (MRI) findings of four cases pathologically proved atypical teratoid/rhabdoid tumors (AT/RTs) in children.

MATERIALS AND METHODS: We retrospectively reviewed the CT and MRI findings of four patients with brain AT/RTs. and evaluated the size, location, CT density, MR signal intensity, enhancement level, pattern, peritumoral edema, mass effect, and the presence of dissemination of this tumor.
RESULTS: The patients were three boys and one girl, with a mean age of 6.25 years (median age, 4.5 years) at diagnosis. Radiographically, three tumors were located in the supratentorial region, and one was located in the posterior fossa. Bulk, heterogeneous tumors with solid and cystic component, perifocal edema, mass effect, and varying degrees of heterogeneous enhancement were present on CT and MRI of AT/RTs. Of the four tumors, two had CSF dissemination.
CONCLUSION: To the best of our knowledge, this is the fourth literature mentioning an AT/RT extending to the right temporal lobe. At the same time, there are few AT/RTs occupying the whole anterior skull base. AT/RT remains an uncommon CNS tumor. Imaging findings with bulky, heterogeneous masses with eccentric cysts, mass effect and a bandlike rim of strong enhancement completely or partly surrounding a central cystic or necrotic area should alert the radiologist to mention AT/RT in their differential diagnosis. Immunohistochemical exam is required for a certain diagnosis of this kind of tumor.

PU-0004
胎儿轻中度侧脑室扩张合并颅脑病变的产前 MR 表现及相关预后情况

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目的 分析胎儿轻中度侧脑室扩张合并颅脑病变的产前 MR 表现及相关预后情况。**方法** 抽取从 2015 年 1 月 1 日-2018 年 3 月 1 日间在我院行胎儿颅脑磁共振检查后诊断为侧脑室扩张的 95 例孕妇作为研究对象，根据脑室扩张程度分为轻、中度，A 组为轻度 10.0mm-12.0mm，B 组为中度 12.1mm-15.0mm，并根据双侧脑室扩张差异是否大于 2mm，分为对称组及非对称组，对其磁共振影像进行回顾性分析，并电话或门诊随访妊娠结局及生长发育情况。**结果** A 组胎儿侧脑室扩张共 57 例，对称性扩张组 24 例，非对称性扩张组 33 例，B 组侧脑室扩张共 38 例，对称性扩张组 9 例，非对称性扩张组 29 例。A 组中侧脑室扩张合并中枢神经系统病变共有 14 例（25%），B 组共 9 例（24%），A 与 B 两组比较无明显统计学意义。A、B 两组中对称性脑室扩张合并中枢神经系统病变比例均高于非对称组。随访妊娠结局 A 组引产 7 例，生长发育正常 37 例，其中单纯侧脑室扩张者 34 例发育正常；生长发育迟缓 4 例（7%），其中对称组 3 例（13%），非对称组 1 例（3%）。B 组引产 4 例，生长发育正常 20 例，其中单纯侧脑室扩张者 19 例发育正常；生长发育迟缓 6 例（16%），其中对称组 2 例（22%），非对称组 4 例（14%），A 组与 B 组胎儿发育情况比较亦无明显统计学意义。**结论** MRI 在诊断胎儿轻中度侧脑室扩张合并中枢神经系统病变具有重要的临床意义，轻中度单纯性侧脑室扩张的妊娠结局及胎儿产后预后情况相对良好，侧脑室增宽合并中枢神经系统病变者其妊娠结局往往不良，患儿预后与病变严重程度密切相关。

PU-0005
儿童弥漫性中线胶质瘤伴 H3K27M 突变型的 MRI 表现（5 例报道并文献复习）

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探讨儿童弥漫性中线胶质瘤伴 H3K27M 突变型的脑部 MRI 表现，提高对本病的认识及诊断水平。**资料与方法** 回顾性分析 2018 年 6 月-2019 年 2 月武汉儿童医院收治并经临床、病理证实的弥漫性中线胶质瘤伴 H3K27M 突变型患儿 5 例的 MRI 特征。**结果** 临床表现病程较短（<2 个月），常表现为间断头痛、共济失调、运动减弱、步态失调等。4 例患儿病灶发生于脑干并沿着左侧桥小脑臂（n=1）、右侧桥小脑臂（n=3）浸润性生长，同侧小脑半球受累（n=4），背侧丘脑受累（n=1）。1 例患儿表现为双侧额颞岛叶及胼胝体弥漫性异常信号影，伴明显占位效应。常规序列中，病灶信号表现为长 T1 信号长 T2 信号影，FLAIR 序列呈高信号，增强扫描示 2 例病灶无明显强化，3 例病灶可见环形强化伴或不伴点片状强化。**结论** 儿童弥漫性中线胶质瘤伴 H3K27M 突变型常位于中线结构（脑干、丘脑），常可沿白质纤维束向周围脑组织浸润。该病 MRI 表现具有一定的特征性，并且可评测与周围脑组织浸润情况，有助于临床诊断及预后评估。

PU-0006
中枢神经系统非典型畸胎样/横纹肌样瘤 6 例及相关文献复习

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目的 探讨中枢神经系统非典型畸胎样/横纹肌样瘤的临床特点、磁共振表现及治疗进展。
方法 回顾性分析我院 2018 年 1 月-2019 年 4 月经病理及免疫组化确诊的 6 例中枢神经系统非典型畸胎样/横纹肌样瘤患者的磁共振表现及相关临床资料，并就国内外相关文献进行复习和归纳，结合上述病例特点进行讨论。
结果 6 名患者平均发病年龄约 2 岁 5 月，肿瘤位于幕上 4 例，幕下 2 例，其中 2 例为多发病变。病灶最大径为 2.7～10.9cm，所有病例中均可见短条状出血灶及脑积水并间质性脑水肿征象，囊变 4 例，4 例病例呈中重度不均匀强化，另 2 例呈轻中度均匀强化。 6 例患者均接受手术治疗，手术全切除 4 例，次全切除 2 例，术后都得到有效随访，手术全切 3 例患者术后 2-3 月内 MRI 随访提示病灶复发，次全切除 2 例 2-4 月内残留病灶较前增大。
结论 中枢神经系统 AT/RT 好发于儿童，年龄常小于 3 岁，肿瘤体积较大、占位效应明显，常合并幕上脑室扩张并间质性脑水肿，病灶内信号混杂，增强后可呈明显不均匀条带状强化。AT/RT 常预后不佳，肿瘤全切除术后 2-3 月内即可见复发，术后积极地进行放、化疗治疗，可以改善患者预后。

PU-0007
甲型流行性感冒引发急性坏死性脑病的磁共振影像

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患儿，女性，1 岁 3 月，因“发热 2 天，抽搐 5 次，意识障碍 6 小时”到四川大学华西第二医院就诊并入院。患者主要表现为高热、抽搐，最高体温 40℃，伴畏寒、寒战，偶有咳嗽，伴纳差、腹泻、喷射性呕吐，病初有烦躁不安，后表现为精神萎靡、嗜睡。抽搐形式为大发作，持续时间 10+秒。
实验室检查主要阳性指标如下，甲型流感病毒（+），血常规：白细胞 8.5×109 /L，中性粒细胞 7.84×109 /L，中性粒细胞百分比 92.2%，C 反应蛋白 31.6mg/L，肝功能：ALT 589U/L，AST 945 U/L。Glasgow 评分 5 分，Babinski 征阳性，双侧戈登征阳性，腱反射不能引出。
影像学检查 MRI 影像表现：双侧大脑半球脑沟增宽、加深，双侧半卵圆中心、双侧侧脑室旁脑白质区、壳核、脑桥、双侧小脑半球脑白质区、双侧背侧丘脑见多发片状异常信号，T1WI 呈混杂稍低信号及低信号，T2WI 呈混杂稍高信号及高信号，T2-Flair 呈中央低信号、边缘片状稍高信号，部分弥散受限，其间可见多发坏死灶，呈坏死性脑病影像学改变。
临床上予管喂、有创呼吸机辅助通气、美平抗感染，奥司他韦抗病毒，甘露醇、甘油果糖降颅压，绿汀诺保肝，B 族维生素营养神经，奥美拉唑护胃治疗后临床症状有所缓解出院。
儿童急性坏死性脑病是快速进展性脑病。最初在 1995 年由日本的 Mizuguchi 等提出，多发生在东南亚等地。其临床特点：多发生在病毒感染之后，伴随癫痫发作及快速神经功能恶化及意识水平改变。发病机制为流感、单纯疱疹病毒和支原体感染可能为潜在的病因，疾病过程由细胞因子和免疫介导。影像学表现为丘脑、脑干，壳核，脑室周围白质和小脑多发对称性长 T2 病灶，弥散受限、多发出血灶及明显病灶强化。诊断基于实验室检查及脑脊液分析，排除其他诊断。

PU-0008

SWI 对早产儿脑损伤脑出血的诊断价值研究

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目的 探讨 SWI 对早产儿脑损伤脑出血的诊断价值，并与常规 MRI 成像进行对照。
方法 38 例早产儿脑损伤脑出血的患儿均进行常规 MRI（T1WI、T2WI）及 SWI 扫描，5/例随访复查，其中 2 例复查时做了 SWI 检查。根据文献将早产儿脑出血按照出血部位及程度进行量化评分。按出血部位分为五类，分别为点状脑白质病变伴出血（0～6 分）；室管膜下/脑室内出血（0～8 分）；小脑半球出血（0～4 分）；脑实质的出血（0～4 分）；硬膜下/硬膜外出血（0～4 分），按严重程度总分为 0～26 分。
结果 SWI 发现病变总评分为 140 分,高于常规 T1、T2 序列。SWI 显示点状脑白质病变伴出血 8 例，28 分；室管膜下/脑室内出血 20 例 40 分；小脑半球出血 10 例，22 分；脑实质的出血 4 例，8 分；硬膜下/硬膜外出血 18 例，42 分。常规 T1WI 分别为点状脑白质病变 8 例，26 分；室管膜下/脑室内出血 12 例 20 分；小脑半球出血 2 例，2 分；脑实质的出血 4 例，6 分；硬膜下/硬膜外出血 18 例，40 分；T2WI 分别为点状脑白质病变 8 例，16 分；室管膜下/脑室内出血 18 例 26 分；小脑半球出血 4 例，10 分；脑实质的出血 4 例，6 分；硬膜下/硬膜外出血 18 例，40 分。5 例随访复查的患儿，常规 MRI 显示病变减小，较少；其中 2 例行 SWI 随访复查的患儿，常规 MRI 病变显示明显好转，但在 SWI 序列上仍可见较多病灶。
结论 SWI 对小脑半球、室管膜下/脑室内出血显示的例数及评分明显优于常规 T1、T2。对点状脑白质病变伴出血的显示虽然例数与常规序列无明显差别，但显示的病变数目明显多于 T1、T2，可发现更多、更广泛的病变；对硬膜下/硬膜外出血的价值与常规 MRI 结果基本一致；但对治疗后复查患儿病变的显示明显优于常规 MRI 检查。

PU-0009

The role of contrast enhanced MR imaging in young infants with Sturge-Weber syndrome

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Object: The aim of this study was to discuss whether it is indispensable in the diagnosis of Sturge-Weber syndrome in young infants (younger than 1 year) with contrast enhanced MR imaging.
Material and methods: The clinical and imaging characteristics of one newborn and seven young infants with Sturge-Weber syndrome underwent magnetic resonance imaging including IV contrast between January 2009 and December 2014.
Results: The age of the patients at diagnosis ranged from nine days to eleven months. Clinical presentation was angiomatosis involving the face in seven patients, seizure in three cases and unilateral glaucoma in one case. All patients underwent the contrast-enhanced cranial MR. Of the patients, the lesions involved unilateral cerebraland six patients and involved bilateral in two patients. We found six cases with supratentorial involvement, one case with only infratentorial involvement and one case with simultaneous supra- and infratentorial involvement. Cranial MRI revealed serpentine leptomengingeal enhancement in all patients,T2WI transient hyperperfusion in five patients, ipsilateral brain atrophy in five patients, and enlarged ipsilateral choroid plexus in four cases.
Conclusion: Contrast enhanced MR plays an important role in the diagnosis of Sturge-Weber syndrome with cranial MR, especially in young infants lack of the symptoms of T2WI "accelerated" myelination and ipsilateral atrophy.

PU-0010

MR CHARACTERISTICS OF SUPRATENTORIAL ANAPLASTIC EPENDYMOMA IN CHILDREN

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Objective: Anaplastic ependymoma is a malignant glioma of ependymal differentiation with accelerated growth and unfavourable clinical outcome,and it is not common in children. In this article, we report the MRI, including DW MRI, findings in pediatric patients with pathologically proven supratentorial anaplastic enpendymoma. DWI and ADC maps are useful in evaluation a number of different brain lesions.**Material and methods:**We reviewed the MRI features in children with pathologically proven supratentorial anaplasitc ependymomas. The preoperative cranial MRI studies at initial presentation were reviewed about tumor location, size, signal intensity and enhancement characteristics were recorded. Isotropic DW MRI was reviewed and ADC values were automatically calculated by the built-in software of the scanner by a signal operator (HQL) placing regions of interest (ROI) in the areas of abnormal

signal intensity within the solid portion of the tumor. **Result:**There were eight patients in our study. Most tumors (6/8) located in the cerebral parenchyma, one in the ventricle, one both in the ventricle and parenchyma. On T2 tirm dark-fluid images, the signals of the cystic portions had variable hyperintense to cerebrospinal fluid. DW MRI performed in all 8 patients. The solid component of the tumors was isointense and hyperintense in two patients.In other patients the solid component of the tumors were hyperintense. Mean ADC value was 0.70 ± 0.09×$10^{-3}mm^2/s$ in the hyperintense area on DW MRI of the tumors.Mural nodular enhancement was seen in one patient and heterogeneous enhancement of the solid portions was found in other patients. Conclusion: The MR contrast enhancement pattern in supratentorial ependymoma can be heterogenous enhancement of a solid lesion, heterogenous enhancement of a cystic/solid lesion and although rare, an enhancing nodule in the wall of a cyst. The solid portion of the tumor was hyperintense to the surrounding parenchyma in our patient in DW imaging. Anaplstic ependymoma showed hyperintense on DW imaging and reduced ADC, The ADC value of the solid portion of the tumor was lower than 0.9×$10^{-3}mm^2/s$ in our patients. The cut-off values to differentiate low and high grade paediatric brain tumours were 1.0 × 10^{-3} mm^2/s for average ADC values respectively. Supratentorial anaplastic ependymoma involved multiple lobes in the cerebral parenchyma in children, and had imaging appearance of solid and cystic mass, decreased ADC of the solid and the hyperintense on DW imaging.

PU-0011

积水型无脑畸形

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本病可在孕期 B 超检查发现，根据出生后患儿临床表现结合 CT 诊断。CT 扫描能客观反映出积水型无脑畸形的大体病理改变。其特征性表现为幕上双侧大脑半球、脑室不显示，整个颅腔大部分呈脑脊液密度影，仅于脑底部见残存部分脑组织，基底节、丘脑部分存在，大脑镰、蛛网膜、软脑膜完整存在，幕下结构正常，但脑干可略变细。本病需与前脑无裂畸形、脑裂畸形、脑穿通畸形、巨大蛛网膜囊肿及重度脑积水相鉴别。

PU-0012

磁共振动脉自旋标记技术在足月窒息新生儿中的应用

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目的 利用磁共振动脉自旋标记技术来探讨足月新生儿在围产期窒息后脑部灌注的变化情况，从而指导临床治疗，改善患儿预后，减少新生儿脑损伤的发生。
方法 使用 GE 3.0T 超导型磁共振对本院 12 例有窒息史的足月新生儿进行头颅常规 MRI 检查和 3D-ASL 检查，另收集 15 例正常足月新生儿作为对照组。所有受试者均使用 10%水合氯醛 0.5ml/kg 灌肠镇静，待其进入睡眠状态后进行扫描。3D-ASL 各项参数：矩阵 64×64，FOV 20cm，TR/TE 4500/10ms，激励次数 3 次，层厚 4mm，扫描层数 32，标记后延迟时间 1025ms，扫描时间 4 分钟 13

秒。利用 ADW4.6 工作站 functool 软件对图像处理获得伪彩图，将伪彩图与 T2WI 图像融合，在融合图像上分别在双侧额叶、基底节及丘脑区测量脑血流量，分析足月窒息新生儿和正常足月儿之间的差异。

结果 窒息组和对照组新生儿检查时日龄、胎龄、体重均无统计学差异。在基底节和丘脑区，窒息组 rCBF 较足月儿高，差异有统计学意义，额叶白质区 rCBF 两组数据无明显统计学差异。在窒息组中，轻度窒息 7 例，重度窒息 5 例，重度窒息新生儿额叶白质区的 rCBF 小于轻度窒息新生儿，差异有统计学意义。

结论 足月窒息新生儿基底节区和丘脑区 CBF 较正常足月新生儿增加，而在额叶白质区 CBF 没有明显差异；重度窒息患儿额叶白质区 CBF 较轻度窒息患儿减低。3D-ASL 有助于早期发现足月窒息新生儿中脑部的高灌注，从而达到预防脑损伤发生的目的，在评价足月窒息新生儿脑部灌注情况是有研究价值的。

PU-0013
27 例儿童可逆性胼胝体压部病变综合征的临床和头颅 MRI 表现分析

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目的 探讨儿童可逆性胼胝体压部病变综合征的临床和 MRI 表现特点。 **方法** 回顾性分析 2014.12 - 2018.12 收治的 27 例可逆性胼胝体压部病变综合征患儿的临床和 MRI 表现资料并进行总结分析。 **结果** 27 例患儿中男 14 例, 女 13 例，所有病例均有前驱感染史，感染部位以上呼吸道及消化道为主，临床表现主要为发热、惊厥、急性胃肠炎等，症状轻，预后较好；其中 25 例头颅 MRI 显示胼胝体压部孤立性椭圆形 DWI 高信号病灶，边界清楚，为 1 型 RESLES，2 例病灶除了胼胝体压部 DWI 高信号外，还累及半卵圆中心及脑室周围白质，为 2 型 RESLES。 **结论** 儿童可逆性胼胝体压部病变综合征多有前驱感染史，临床症状较轻，颅脑 MRI 具有特征性改变，预后较好。

PU-0014
苍白球与壳核磁共振信号比值在足月新生儿急性胆红素脑病早期诊断中的价值

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目的 探讨苍白球与壳核 T1WI、T2WI 及 ADC 比值在足月新生儿急性胆红素脑病早期诊断中的价值。**方法** 回顾性分析 95 例足月新生儿，根据血清总胆红素（TSB）及临床症状分组，测量苍白球与壳核 T1WI、T2WI 及 ADC 比值，通过采用 Sperman 等级相关及单因素方差分析（ANOVA-LSD）进行统计分析。**结果** 按 TSB 分组：T1WI-G/P 比值及 ADC-G/P 比值随胆红素水平增高而增加，相关性分析**结果** T1WI-G/P 比值为极强等级相关（r_s=0.824，P＜0.05）、ADC-G/P 比值为强等级相关（r_s=0.673，P＜0.05），且各组间均存在差异；T2WI-G/P 比值为弱等级相关（r_s=-0.054，P＞0.05），且组间无差异。按临床症状分组：T1WI-G/P 比值及 ADC-G/P 比值随临床症状加重而增加，相关性分析**结果** T1WI-G/P 比值为强等级相关（r_s=0.645，P＜0.05）、ADC-G/P 比值为中度等级相关（r_s=0.495，P＜0.05），且各组间均存在差异；T2WI-G/P 比值为弱等级相关（r_s=-

0.117，P＞0.05），且组间无差异。**结论** 苍白球与壳核 T1WI、ADC 比值与临床症状结合，能增加足月新生儿急性胆红素脑病的早期诊断准确客观性。

PU-0015

Abnormal Gray Matter Structural Covariance Networks in Children with Bilateral Cerebral Palsy

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Bilateral cerebral palsy (BCP) is a common movement disorder in children, which often results in lifelong motor disability. One main symptom of BCP shows the limitations of hand function in everyday activities and participation restrictions. However, the neuroanatomical mechanisms for the manual ability are poorly understood. Recent advances in the understanding of cerebral palsy include the development of coordinated pairwise gray matter, which is important for sensorimotor integration, and cognitive development. Here, in our study, neuroimaging with network analysis was employed to evaluate the changes of structural covariance networks (SCNs) in BCP children. We aimed to elucidate the alteration of SCNs based on cortical thickness (CT), and to reveal the relationship of CT and hand function in the participants with BCP. SCNs were constructed using covariance between regional CT, which was acquired from T1-weighted images of 19 children with BCP and 19 demographically matched healthy controls (HCs). Compared with HCs, BCP children showed increased CT in several regions involving the bilateral areas (lateraloccipital, lingual, and fusiform) and right areas (cuneus, pericalcarine, inferiortemporal, middletemporal, superiortemporal, and insula). Decreased CT was found in the left superior temporal and right superior parietal cortices. Global network analyses revealed significantly decreased normalized clustering and small-worldness in the BCP network. The area under the curve (AUC) of global network measures varied slightly between the BCP and HCs networks. The resistance of the both SCNs to the target and random attack showed no significant difference. Also, the BCP foci (right superior temporal and subtemporal cortex) showed a significantly negative correlation between the CT and manual ability. In this work, we identified the CT-based SCNs changes in children with BCP. The abnormal topological organization of SCNs was revealed, indicating abnormal CT, incongruous development of structural wiring, destructive nodal profiles of betweenness, and moved hub distribution in BCP children. This may provide a neuroanatomical hallmark of BCP in the developing brain. Therefore, our results may not only reflect neurodevelopmental aberrations but also compensatory mechanisms.

PU-0016
极低出生体重儿脑损伤和神经行为预后的影像学早期诊断价值

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【摘要】目的 研究多模态磁共振对极低出生体重儿（VLBW）神经发育障碍的早期诊断价值。**方法** 选取 2018 年 2 月至 2019 年 4 月在河南郑州大学第三附属医院新生儿重症监护室收治的极低出生体重儿（BW≤1500g）64 例，排除先天性神经系统畸形、染色体疾病、遗传代谢性疾病。在纠正胎龄 33-38 周时行磁共振检查，包括结构磁共振和扩散张量磁共振。通过磁共振检查将其分为脑损伤组（37 例）和无脑损伤组（27 例），分析两组围生期资料、颅脑损伤情况和脑白质微结构的改变。参照中国科学院心理研究所编制的婴幼儿智能发育量表（CDCC），随访 1 个月、3 个月、6 个月进行神经行为方面的测试，包括智能发育指数（MDI）和运动发育指数（PDI）。**结果** 极低出生体重儿脑损伤中，主要包括脑白质损伤和脑室周围白质软化，分别为 51.4%和 32.4%。两组围生期资料比较差异无统计学意义，在 CGA33-37 周时，磁共振的异常信号检出率高于头颅超声。完成随访后发现脑损伤组发生神经发育障碍的为 14 例，且脑白质损伤和脑室扩大程度越严重，智力发育障碍的比例越高；无脑损伤组发生神经障碍的为 4 例。**结论** 脑损伤在极低出生体重儿中较为常见，磁共振检查对其脑损伤的早期诊断有意义，且可为远期神经行为发育的评估提供依据。

PU-0017
儿童脑实质内室管膜瘤一例及文献复习

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目的 分析儿童脑实质内室管膜瘤的影像表现，提高鉴别诊断能力。 **方法** 对 1 例手术病理证实的儿童额叶室管膜瘤进行回顾性分析，观察肿瘤的发病部位、发病年龄、病灶形态、密度、信号及强化特点，复习国内外相关报道。**结果** 儿童脑实质内室管膜瘤的临床影像表现为：好发于男孩，多发生于脑凸面呈囊实性肿块，瘤内出血、瘤周水肿较成年少见，边界多较清；同时需要与毛细胞星形细胞瘤、胶质母细胞瘤、少突胶质细胞瘤等鉴别。 **结论** 幕上脑实质室管膜瘤患者术前行 CT 及 MRI 检查对评估其病理分级及具体病情具有一定意义，对临床手术治疗具有指导价值。

PU-0018
The Value of Diffusion Tensor Imaging in the Prognosis Evaluation of Preterm Infants with Hypoxic-Ischemic Brain Injury

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Objective To investigate the value of DTI in predicting the prognosis of premature infants with HIBD. **Methods** Preterm infant with HIBD in our hospital were enrolled in the study. MRI were performed on all the subjects. When the corrected age of children was 7~8 months, our hospital used the revised version of BSID to conduct

neurobehavioral development score.The subjects were divided into two groups of good prognosis and poor prognosis by results. The FA among different groups were statistically analyzed.The ROC are drawn to find the best truncation value for each ROI. **Results** The FA of most ROI in the better prognosis group were higher than those in the poor prognosis group, and the difference was statistically significant.The AUC of FA of the posterior limb of the inner capsule was the largest, and the diagnostic efficiency was the highest. **Conclusions** DTI can be used as an imaging reference index for predicting the prognosis of HIBD in preterm infants.

PU-0019

Diffusion tensor imaging of premature with hypoxic ischemic brain damage

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Objective To explore the application of DTI in premature with HIBD. **Methods** Premature diagnosed as HIBD and normal neonates were selected. All subjects underwent MRI. The FA in HIBD group and normal group were statistically analyzed by t test and one-way anova.The correlation of FA in posterior limb of internal capsule and Apgar score was examined. **Results** In case group, most ROI had statistical significance compared with control group (P<0.05); FA of parietal white matter, thalamus and cerebral peduncle in HIBD moderate group and severe group compared with the control group, the difference was statistically significant . In the group comparison, the FA of most ROI were significantly different in the three groups. There was no significant correlation between FA of the posterior limb of the internal capsule and Apgar score (1 minutes and 5 minutes) (r=-0.179, P>0.05; r=-0.201, P>0.05). **Conclusions** DTI can be used to evaluate early HIBD brain injury.

PU-0020

DTI 在早产儿 HIBD 预后预测中的应用价值

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目的 探讨扩散张量成像（diffusion tensor imaging,DTI）在早产儿缺氧缺血性脑损伤（hypoxic-ischemic brain damage,HIBD）预后预测中的应用价值。 **方法** 选取 2016 年 9 月至 2017 年 6 月入住我院新生儿科的 HIBD 早产儿 74 例为研究对象,应用 3.0T 磁共振扫描仪对所有研究对象行常规 MRI 和 DTI 扫描。待到患儿纠正年龄 7～8 个月时，到我院儿童保健科使用贝利婴幼儿发展量表（bayley scales of Infant Development,BSID）进行神经行为发育评分（剔除未到我院随访及随访时其他干扰因素较大的患儿，最终有 46 例患儿纳入研究），并根据评分结果将研究对象分为预后较好组和预后较差组两组。利用独立样本 t 检验,比较两组患儿感兴趣区（region of interest,ROI）的各向异性分数（fractional anisotropy,FA）的差异是否有统计学意义，并对各 ROI 绘制受试者工作特征曲线（receiver operating characteristic curve,ROC），寻找最佳截断值。**结果** 预后较好组的内囊后肢、胼胝体压部、额叶白质、顶叶白质、枕叶白质、丘脑、小

脑、大脑脚的 FA 值比预后较差组的 FA 值高，且差异具有统计学意义；内囊后肢 FA 值的曲线下面积（area under curve，AUC）最大，诊断效能最高。**结论** DTI 可作为预测早产儿 HIBD 预后的影像学参考指标。

PU-0021

儿童神经皮肤综合征的临床表现及颅脑 CT、MRI 的影像诊断

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目的 收集本院近 7 年来经临床确诊的神经皮肤综合征 30 例，对其影像学资料进行回顾性的总结和分析，探讨其影像特征，提高此类疾病的诊疗水平。
资料与**方法** 收集本院 2012 年 1 月至 2018 年 12 月临床确诊神经皮肤综合征 30 例，男 18 例，女 12 例，年龄 1 d 至 11 岁，平均（5±0.17 岁）。30 例中，CT 平扫 20 例，增强扫描 6 例，25 例行磁共振成像 MRI 平扫，增强 6 例。
结果 神经皮肤综合征临床大部分有神经症状和体征，以癫痫、惊厥发作为最常见的症状。本组病例 NF 6 例(Ⅰ型 5 例、Ⅱ型 1 例)，结节性硬化 18 例， 以癫痫发作为最常见的症状。脑颜面血管瘤综合征 6 例，均可见到面部鲜红斑痣可累及部分或整个面部，其他临床症状包括癫痫发作、偏瘫、偏盲和智力发育障碍。本组病例尚无神经皮肤黑素沉着症患儿。
30 例中病例 NF 6 例(Ⅰ型 5 例、Ⅱ型 1 例)，CT 和 MRI 表现：脑实质内的病变（5 例）、视通路病变（1 例）、脑积水（2 例）、头部及面颊部肿块（2 例）和颅骨、眼眶骨病变（2 例）。结节性硬化 18 例，CT 双侧侧脑室室管膜下多发高密度钙化结节（10 例）， MRI 双侧侧脑室室管膜下、颅内各叶皮层及皮层下多发结节（12 例），室管膜下巨细胞星形细胞瘤（1 例），伴肾脏多发囊肿及错构瘤（4 例）。脑颜面血管瘤综合征 6 例，CT 顶枕部沿脑回分布的弯曲的条状高密度钙化（2 例），部分延伸至侧脑室内，增强后见病灶内有扭曲的条状和结节状明显强化的血管影。MRI 病变区脑皮质 T2WI 显示飘带样改变（3 例），同侧大脑半球萎缩，脑表面可见扩张的静脉，伴脉络丛增大（3 例），局部板障增厚（2 例）。
结论 近年来许多遗传性疾病也归于斑痣性错构瘤病，如神经皮肤黑素沉着症等。此类病变，常有多系统的先天异常，临床表现复杂，就诊原因各异，容易漏诊和误诊，不同的影像学方法对此类疾病有不同的诊断价值。

PU-0022

MRI 诊断急性坏死性脑病 1 例

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目的：报道 1 例急性坏死性脑病(acute necrotizing encephalopathy, ANE)病例，探讨该病的影像特点、诊治及预后。方法：收集 1 例 ANE 患者的病历资料，回顾性分析 ANE 患者的影像资料及临床资料。**结果** 3 岁男孩，因发热、咳嗽 3 天入院，入院第 10 天出现癫痫样抽搐，随即昏迷，头部核磁共振（MRI）提示双侧丘脑、基底节区、脑干等部位出现多发对称性坏死，临床诊断为 ANE。给予重症监护、抗感染、甲泼尼龙冲击、免疫球蛋白静推、脱水、亚低温及对症支持治疗。3 月后，复查头部磁共振（MRI），可见双侧丘脑出现少量渗血，双侧基底节区病灶明显减小。患儿能听懂指令，对话欠流利，不能独走，仍在康复治疗中。**结论** ANE 是一种罕见的中枢神经系统疾病，临床表现多样，病情进展快，死亡率高，幸存者常留有神经系统后遗症。头部 MRI 具有急性对

称性坏死表现，以丘脑为中心，相对特异，对疾病的早期诊断及治疗是十分必要的。各种免疫调节治疗有效，但长期预后不理想，有待开发改善 ANE 预后的最佳治疗方案。

PU-0023
MR 特殊序列在评价新生儿缺氧缺血性脑病(HIE)脑组织损伤程度和预后情况的价值

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目的：探讨磁共振(DWI)、(DTI)、(SWI)及 FLAIR 技术在评价新生儿缺氧缺血性脑病(HIE)脑组织损伤程度和预后情况的价值.方法：对我院 2016 年 1 月～2018 年 1 月临床确诊为 HIE 的 72 例新生儿进行 MR 检查，其中早产儿 38 例，足月儿 34 例。男 35 例，女 37 例，年龄 4h～90 天，平均 47 天。临床主要病因和症状有出生时窒息、脐带绕颈、新生儿吸人性肺炎、青紫、抽搐等。 MR 检查前 10～20min 给予水合氯醛灌肠，按体重 1ml / kg 计算。采用飞利浦 1. 5 T 超导 MRI 仪、头部 16 通道相控阵线圈行头部 MRI 扫描横断位。扫描参数： 层厚 5mm. 层距 1 mm，层数 18，FoV 180 mm× 180 mm；矩阵 320×256；采用常规序列加(DWI)、 (DTI)、(SWI)及 FLAIR 序列。图像分析，由 2 位高年资影像诊断医师负责图像分析，统一计数标准，意见不一致时协商后得出结果。观察内容包括病变在常规序列和(DWI)、 (DTI)、(SWI)及 FLAIR 序列特点，记录病灶部位及数量，同时记录侧脑室旁≤ 3 mm 与>3 mm 病灶，确认病灶以多序列比对结果为准，不能确定的不计入。采用 SPSS 17. 0 统计软件，对各序列的病灶检出率行 X 平方检验，以 P<0.05 有统计学价值。结果：MR 特殊序列,显著高于常规方法(P<0.05)；MR 特殊序列基底节区核团损伤、脑室周围白质缺血损伤、胼胝体以及脑干、小脑、海马损伤比较差异无统计学意义(P>0.05)；MR 特殊序列早产儿脑室旁出血性损伤、皮层及分水岭区损伤率与常规方法相比差异有统计学意义(P<0.05);,T1WI 对基底节核团区病灶显示最佳,并且早期及稍晚期基底节核区病灶检出情况相近.DWI 序列对于室周白质区病灶显示最佳,

PU-0024
磁共振 DWI 联合 SWI 序列对于新生儿早期缺血缺氧性脑病的诊断价值

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目的 进一步分析弥散加权成像(DWI)、磁敏感加权成像(SWI)联合扫描用于新生儿缺氧缺血性脑病中的作用，以提高对本疾病的早期诊断。**方法** 回顾性分析上海市儿童医院于 2016 年 1 月至 2018 年 6 月间收治且行 MRI 扫描的 38 例新生儿缺血缺氧性脑病（HIE）的患儿资料，对比 T1WI、T2WI、T2-FLATR、DWI、SWI 序列下在出生 1～5d 和出生 6-8dHIE 病灶检出率；对比以上序列 新生儿中病灶检出率。 **结果** 38 例患儿共检出 126 枚病灶，主要分布在大脑皮质及，室管膜下。SWI 病灶检 出率为最高，DWI 为其次。DWI 对大脑皮质损伤的检出例数最多，SWI 对室管膜、硬膜外及硬膜下损伤检出例数较多。DWI 在出生 1～5d 的患儿中检出率大于出生 8～14d 的患儿。**结论** MRI 联合 SWI、DWI 能提高 HIE 诊断准确性，尤其适合用于出生 1 一 5d 的新生儿 HIE 筛查中，可做为临床怀疑 HIE 患儿的常规序列。

PU-0025
Maple Syrup Urine Disease: A Rare Metabolic Disease with Typical Imaging Findings

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PURPOSE:
We aimed to evaluate the neuroimaging features and clinical features of maple syrup urine disease (MSUD), discuss the mechanism of MSUD and enhance the knowledge of pediatricians about this disease.
METHODS:
This retrospective study consisted of 3 neonates and 1 infant with the classic subtype of MSUD. All patients underwent brain magnetic resonance imaging (MRI). We analyzed the MRI manifestations, reviewed the literature and summarized the neuroimaging characteristics.
RESULTS:
Four cases plasma BCAA (leucine, isoleucine and valine) levels were markedly elevated. MRI of the brain showed bilateral symmetrical lesions involving the cerebellar white matter, brainstem, globus pallidus, internal capsule, and thalamus, which are the typical areas that are myelinated in normal full-term neonates. We searched literature and found a total of 23 cases with the classical form of MSUD and MRI, all patients showed involvement of a wide range of brain parenchyma which are the same as the 4 cases we reported. The alterations in brain tissue were more evident on DWI images than on T2-FLAIR images.
CONCLUSION
MSUD has typical neuroimaging features, which is based on the MSUD edma in typical areas that are myelinated in neonates. MRI, especially diffusion-weighted imaging (DWI), is the preferred and best choice for diagnosing MSUD.

PU-0026
局灶性脑皮质发育不良 MRI 诊断标准的系统性评价

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目的 系统性评价局灶性脑皮层发育不良(Type II focal cortical dysplasia，FCD) 的临床与 MRI 诊断特征，以期为临床实践提供精确影像模式。
方法: 检索在 PubMed、CNKI、万方数据库收录的所有关于 MRI 诊断 FCD 相关的中英文文献，分析 FCD 临床资料及 MRI 征象发生率及其组合。
结果 最终共纳入文献 24 篇，共计 693 名 FCD 患者。有 471（67%）名患者显示 MR 成像阳性结果，其中至少可以发现三种影像征象组合，约 64%的患者合并了局灶性皮层增厚、灰白质分界模糊和 Transmantle 征。FLAIR 对显示灰白质界限、白质内异常信号较 T1WI 敏感,T1WI 显示脑回、脑沟形态有一定的价值。3.0T 较 1.5TMRI 更容易发现病变（68% VS 60%）。
结论 3 种最主要 MR 征象组合可帮助早期诊断 2 型 FCD，MRI 高场强和薄层图像更容易发现病变。

PU-0027
系统性幼年性黄色肉芽肿一例报告并文献复习

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目的 探讨系统性幼年性黄色肉芽肿的影像特征及组织病理改变。方法 回顾性分析 2018 年 8 月收治一例经病理证实为系统性幼年性黄色肉芽肿患儿的影像学资料，主要评价指标包括病灶形态、密度 / 信号特点以及鉴别诊断。结果 系统型 JXG 于 CT 表现在软组织内为大小不等实性高密度结节样密度影，增强后轻度强化，在肝脏及肾实质内表现为相对低密度肿块，强化程度低于正常肝实质，边界清晰。MRI 在颅内表现为稍短 T1 短 T2 信号，增强扫描呈明显强化，DWI 无弥散受限，在肝内 T1WI 呈低信号，于 T2WI 呈稍高信号，DWI 为高信号，无明显强化，在软组织内 T2WI 表现为高信号，抑脂序列亦呈高信号，增强后可见强化，边界清晰。结论 系统性幼年性黄色肉芽肿好发于婴幼儿，在不同系统上具有不同的影像学表现。

PU-0028
儿童脉络丛癌一例

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目的 探讨脉络丛癌的 CT、MRI 改变及其病理学基础。**方法** 对 1 例脉络丛癌患者的影像学、病理资料进行分析及文献学习。**结果** CT、MRI 检查示左侧侧脑室来源分叶状占位，侵犯周围脑实质，占位密度/信号不均，见囊变及钙化，血供丰富。**结论** 脉络丛癌是少见儿童颅内恶性肿瘤，在检查过程中使用不同的影像学检查方法，有利于判断肿瘤的来源、性质及预后。

PU-0029
复发型伴胼胝体压部可逆性病变的轻度脑炎/脑病 II 型一例

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伴胼胝体压部可逆性病变的轻度脑炎/脑病临床-影像表现特异。根据病变累及范围分为 I 型和 II 型，临床以 I 型多见，II 型少见。我们报道一例罕见的复发型伴胼胝体压部可逆性病变的轻度脑炎/脑病 II 型，结合相关文献对其临床及影像学表现进行分析，加深对该病的认识，提高诊治水平

PU-0030
T1WI 信号强度在苍白球 T1WI 高信号鉴别诊断中的应用

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目的 探讨新生儿苍白球肉眼可见 T1WI 高信号在新生儿常见颅脑疾病鉴别诊断中的临床意义。

方法 回顾性分析 2017 年 1 月至 2019 年 1 月胜利油田中心医院新生儿科收入院的异常患儿 172 例，其中高胆红素血症患儿 72 例，作为高胆红素血症组，非高胆红素血症患儿 100 例，作为非高胆红素血症组，另外选取 70 例正常新生儿作为对照组。所有研究对象均肉眼可见苍白球 T1WI 高信号。所有研究对象均行 1.5T 西门子磁共振扫描，均选用 T1WI、T2WI、DWI、T2-FLAIR 序列，分别测量双侧苍白球 T1WI 信号强度，并取其平均值，对三组的 T1WI 信号强度行单因素方差分析。另外统计高胆红素血症患儿的总胆红素值，并与其苍白球 T1WI 信号强度进行直线相关性分析。

结果 高胆红素血症组与非高胆红素血症组、正常组的 T1WI 信号强度比较，P 值分别为 0.389、0.379，差异均无统计学意义，非高胆红素血症组与正常组比较，P 值为 0.926，差异亦无统计学意义；高胆红素血症患儿的总胆红素值，与其苍白球 T1WI 信号强度之间的相关系数为 0.056，P=0.740，无统计学意义。

结论 新生儿苍白球肉眼可见 T1WI 高信号在高胆红素血症患儿、非高胆红素血症患儿及正常新生儿均可见，且其 T1WI 信号强度均无统计学差异，提示新生儿苍白球肉眼可见 T1WI 高信号这一影像征象在新生儿常见颅脑疾病鉴别诊断中并无显著临床意义。高胆红素血症患儿的总胆红素值，与其苍白球 T1WI 信号强度之间并无显著相关性，提示苍白球肉眼可见 T1WI 高信号对诊断高胆红素血症仅有一定参考价值，还需以临床生化检查为主要依据。

PU-0031

Cognitive Function Evaluation of Children with Infantile Spasms

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Purpose: To explore the alteration of neurological function of children with IS and its main impact factors by combining the results of cognitive function with clinical data.

Method: 20 children with IS including 12 males and 8 females were enrolled in IS group, ranging in age from 2.83 to 43 months old ($x \pm S$, , 15.86±9.77 months), with a median of 11.70. 18 children including 8 males and 10 females were enrolled in HC group, ranging in age from 4.33 to 12.83 months old ($x \pm S$, 7.65±2.34 months), with a median of 7.64. BSID-Ⅱ was used to evaluate cognitive function and motor development in both groups. Statistical analysis was conducted by SPSS 22.0 .

1. Comparison between groups: Rank sum test was used to test the difference between MDI and PDI, and the descriptive parameters were median, maximum, minimum and level difference. When $P<0.05$, the difference between groups was considered statistically significant.

2. Correlation analysis: (1) Spearman correlation analysis was used to detect the correlationship between MDI, PDI and metric indicators. Fisher's exact probability test was used to detect the correlationship between MDI, PDI and count indicators. (2) The correlation coefficient r was used to describe the parameters, ranging from -1 to 1. The greater of absolute value represented the stronger correlation degree. When $P<0.05$, the correlation was considered to be statistically significant.

Result: 1. Comparison between groups: (1) MDI: Compared with HC group (median 90.5, in the interval of 85-114), IS group focused on <50 interval, the difference between groups was statistically significant ($P=0.00$, < 0.05). (2) PDI: Compared with HC group

(median 94.5, in the interval of 85-114), IS group focused on <50 interval, the difference between groups was statistically significant (P=0.00, < 0.05).
2. Correlation analysis: (1) The score of PDI was negative moderately correlated with the age (r=-0.56, P=0.02), and negative strongly correlated with course (r=-0.60, P=0.009), respectively. (2) The score of MDI was negative strongly correlated with the course (r=-0.60, P=0.02).
Conclusion: 1. Patient with infantile spasms had motor impairment, which was worse as the disease course prolonged. 2. Patient with infantile spasms had intelligence impairment, which was worse as the disease course prolonged.

PU-0032

A preliminary study of decreased interhemispheric functional connectivity in ADHD

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Objective: To characterize interhemispheric functional connectivity in different subtypes with attention deficit hyperactivity disorder (ADHD) patients.
Methods: Thirty-eight patients in the ADHD-combined (ADHD-C), 26 patients in the ADHD-inattention (ADHD-I), and 52 subjects in the typically developing (TD) were recruited in this study. Resting-state fMRI data were analyzed using the voxel-mirrored homotopic connectivity (VMHC). Then the correlations between VMHC values and clinical scores were calculated.
Results: Compared with the TD group and ADHD-C, the ADHD-I group showed decreased functional connectivity (FC) in the temporal lobe and the occipital lobe.. the ADHD-C group exhibited lower VMHC values in the temporal lobe and the frontal lobe compared with TD group.. The mean VMHC values of whole brain in ADHD-I group was significantly negatively correlated with age.
Conclusion: Using VMHC to study the subtypes of ADHD, we found that the VMHC values in frontal lobe and temporal lobe decreased in ADHD-C group compared with TD group, while those in temporal lobe and occipital lobe decreased in ADHD-I group compared with TD group. Compared with ADHD-C, the ADHD-I group shown differences in frontal lobe, temporal lobe and occipital lobe. The finding that VMHC values and the age were significant correlated suggests that VMHC measurements can be used as an effective method to analyze ADHD.

PU-0033

戊二酸血症II型新生儿颅脑影像探究

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戊二酸血症(glutaric academia，GA)Ⅱ型是一种罕见的以低酮或非酮性低血糖症和代谢性酸中毒为临床特征的常染色体隐性遗传的遗传性代谢缺陷病。本文分析我院经基因证实的两例戊二酸血症Ⅱ型新生儿的颅脑核磁共振影像特点，探讨影像学检查在该疾病早期诊断中的价值。

目的 探讨新生儿期戊二酸血症Ⅱ型颅脑影像学检查在早期诊断中的价值。

方法 回顾性分析 2 例基因证实的戊二酸血症Ⅱ型新生儿颅脑核磁共振检查影像学资料。

结果 1 例为戊二酸血症Ⅱ型新生儿期发病伴轻度先天畸形（房间隔缺损），1 例为戊二酸血症Ⅱ型新生儿期发病不伴先天畸形。两例患儿常规序列图像均发现双侧颞部脑外间隙增宽及双侧大脑白质广泛 T1WI 信号异常减低及 T2WI 信号异常增高；前者还发现双侧枕叶皮层信号异常，DWI 示小脑、脑干、基底节、半卵圆区对称性高信号；后者 DWI 未见明显异常，行 MRS 发现双侧半卵圆区 NAA 峰降低伴乳酸峰出现。

结论 核磁共振能对戊二酸血症Ⅱ型新生儿期发病患儿的脑损伤程度进行评价，在该病诊断及监测中具有重要价值。对于不伴有先天畸形疑似该病的患儿进行 MRS 检查有利于该病的早期诊断。

PU-0034

MRI Diffusion Changes in Neonatal Hypoxic-ischemic Encephalopathy

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OBJECTIVE: Hypoxic-ischemic encephalopathy (HIE) in newborns is the most common central nervous system disease caused by perinatal acute hypoxic ischemia, and is prone to poor neurodevelopmental outcome. Neonatal brain development is accompanied by changes in water and myelin formation, while diffusion-weighted imaging (DWI) can sensitively reflect the diffusion characteristics of water molecules, with great significance in the discovery of abnormal changes. This study is aimed to investigate the value of DWI in the early diagnosis of neonatal HIE White matter injury.

MATERIALS AND METHODS: Newborns 2-6 days after birth in the Neonatal pediatrics were selected out, with 10 HIE as experimental group and 12 normal infants as control group. The newborns were imaged with GE HDxt 1.5T scanners without sedation and T_2WI, T_1WI, T_2 FLAIR and DWI were performed. DWI was obtained using TR/TE of 6000/90msec, flip angle of 90 and b valves of 0 and 1000 s/mm^2. Mean diffusivity maps were computed and average apparent diffusion coefficient (ADC) was measured in regions of abnormal changes. Statistical analysis was performed using SPSS and Data are expressed as mean±SD. Student t test were used to compare the differences between outcomes among groups and Two-sided p values of <0.05 were used to define statistical significance.

RESULTS: T_1WI shows low or high signal and T_2WI showed high signal intensity, while DWI showed an increase signal change. The abnormal signals mainly appeared in the thalamus and basal ganglia, posterior limbs of internal capsules and deep white matter of frontal lobe, etc. The average ADC was decreased ($p<0.05$) in HIE newborns compared with control group.

CONCLUSION: DWI combined with ADC value shows early diffusion abnormalities in HIE lesions, improving the prognosis of HIE white matter injury in neonates.

PU-0035
儿童颅内原发黑色素瘤两例临床、影像学特征分析

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目的 探讨儿童颅内黑色素瘤的临床、影像学表现特征，进一步提高对本病的认识。方法 搜集本院经组织病理学诊断的颅内原发黑色素瘤患者 2 例，结合文献进行回顾性分析其临床表现、影像学特征。结果 2 例患者临床上均以颅内压增高、脑膜刺激征、脑神经损害为主要表现，1 例骶尾部皮肤有先天性色痣。2 例均为单发肿瘤，均出现囊变坏死，病灶周围有小片水肿；T1WI 、T2WI 2 例均呈等信号为主，内见点状 T1WI 稍高信号、T2WI 稍低信号； DWI 2 例呈等低信号；经静脉注射 GdDTPA 后，2 例均明显强化。免疫表型：2 例 Melan-A 、 S100 均表达阳性。结论 临床上表现为颅内压增高，合并存在皮肤黑色素痣，影像检查肿瘤 T1WI、T2WI 等信号，混杂点片状 T1WI 稍高信号、T2WI 稍低信号有助于非色素型黑色素瘤的诊断发现。 【关键词】 颅内肿瘤；黑色素瘤；磁共振成像

PU-0036
儿童松果体区肿瘤的临床及影像学特点

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目的 通过总结儿童松果体区肿瘤的临床资料和影像学表现，提高术前诊断的准确性。
方法 回顾性分析 20 例经病理证实的儿童松果体区肿瘤。
结果 20 例儿童松果体区肿瘤中，男孩 15 例、女孩 5 例；其中生殖细胞源性肿瘤 12 例（包括生殖细胞瘤 5 例，畸胎瘤 4 例，混合性生殖细胞肿瘤 3 例），松果体母细胞瘤 5 例，中间分化松果体实质瘤 1 例，间变性星形细胞瘤 1 例，神经节细胞瘤 1 例。12 例生殖细胞肿瘤中，男孩 11 例（占 92%例），平均年龄 9.1±3.6 岁；其中 8 例患儿血 AFP 升高（>5 ng/ml）。生殖细胞源性肿瘤影像学表现多样，平均 ADC 值为 1138+407×10^{-6} mm^2/s。其中生殖细胞瘤在 CT 和 MRI 上密度和信号相对均匀，强化亦均匀，平均 ADC 值为 841±115×10^{-6} mm^2/s。而畸胎瘤和混合性生殖细胞肿瘤密度和信号不均（伴瘤内钙化和囊性成分），平均 ADC 值分别为 1376±361×10^{-6} mm^2/s 和 1316±459×10^{-6} mm^2/s。5 例松果体母细胞瘤中，男孩 3 例、女孩 2 例，平均年龄 5.3±5.2 岁；常规 CT 和 MRI 表现与生殖细胞源性肿瘤相似，松果体母细胞瘤的平均 ADC 值（646±81×10^{-6} mm^2/s）低于生殖细胞源性肿瘤（P＜0.01）。
结论 生殖细胞源性肿瘤是儿童松果体区最常见的肿瘤，大多数患儿是男孩，影像学表现多种多样，放射科医师将影像与肿瘤标志物结合起来观察是很重要的。主要鉴别诊断是松果体母细胞瘤，ADC 值有助于儿童松果体母细胞瘤与生殖细胞源性肿瘤的鉴别。

PU-0037
儿童睡眠中癫痫性电持续状态患儿的认知功能评测研究

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目的 采用韦氏儿童智力量表第四版，评估儿童睡眠中癫痫性电持续状态（Electrical status Epilepticus During sleep, ESES）的认知功能情况，探讨患儿的智力结构状况及影响因素。**方法** ESES 组患儿 25 例，8.57±1.99 岁；正常对照组 16 例，9.50±1.80 岁。采用韦氏儿童智力量表第四版进行认知功能评估。1、组间对比：（1）采用秩和检验对总量表及四大分量表智商进行组间对比；（2）采用独立样本 t 检验对项目得分进行组间对比，描述参数为平均值和标准差；当 P＜0.05 时，认为组间差异有统计学意义。2、相关性分析：（1）总量表、四大分量表智商与病程、发病年龄、检查年龄之间采用 Spearman 相关分析，描述参数均采用相关系数 r，取值范围-1 至 1，当 P＜0.05 时，认为相关性有统计学意义。**结果** 1、组间对比：（1）与正常对照组相比，ESES 组患儿总量表智商降低（P=0.01,＜0.05）；（2）言语理解量表智商及类同项目得分降低（P 值分别为 0.04 和 0.003， 均＜0.05）；（3）知觉推理量表智商及积木、图画概念、矩阵推理三个项目得分均降低（P 值分别为 0.01、0.01、0.03 和 0.03，均＜0.05）。2、相关性分析：（1）ESES 组中，言语理解量表中的词汇项目得分与检查年龄呈正相关（r=0.55, P=0.02）；（2）理解项目得分与病程（r=-0.52, P=0.04）、发病年龄（r=-0.62, P=0.008）、检查年龄（r=-0.73, P=0.001）均呈负相关。 **结论** 1、ESES 患儿存在认知功能损害，尤其在语言能力、理解能力、空间辨别与分析能力、非语言概念形成能力等方面发育落后。2、随着年龄的增长，患儿的词汇积累能力有所提高；病程越长、发病年龄和检查年龄越大，患儿的理解能力损害越明显。

PU-0038

儿童 MERRF 一例报道

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目的 分析本例 MERRF（肌阵挛癫痫伴破碎样红纤维综合征）的头颅 MRI 表现，加深对此类儿童罕见疾病的认识，探讨其诊断思路。
方法 西门子 1.5T MRI 行头颅 MRI 平扫+增强、MRS。
结果 患儿，女 2 岁，6 月龄时体检示身高、体重较同龄儿落后。现因“咳喘 4 月，加重 1 周”收治入院。入院时行走不稳，口齿不清、伴流涎，眼球运动障碍。查体：精神萎，面色苍白，两肺可及细湿罗音，心率 175 次/分，余无殊。辅助检查：乳酸波动在 1.1-8.7mmol/L（正常参考值 0.5-2.0mmol/L）。胸片示两肺渗出。心超示室间隔及左室后壁增厚，心功能尚正常，二尖瓣少量返流。脑电图：背景弥漫性慢波。入院 MRI 平扫示脑干背侧见对称性 T1WI 低、T2WI 高、T2 TIRM 低、DWI 高信号。MRS 示双侧中脑背侧、基底节区 NAA 峰减低伴少许倒置乳酸峰。入院诊断：重症肺炎，脑干脑炎？代谢性脑病？入院后对症治疗，患儿未见好转，病程中伴昏迷。1 月后复查 MRI 平扫示脑干背侧病灶内对称小囊变，双侧基底节区新发对称性 T1WI 低、T2WI 高、T2 TIRM 低、DWI 高信号，脑萎缩。2 月后复查 MRI 平扫+增强示脑干、双侧基底节区病变范围较前增大，脑萎缩加重，病灶内未见异常强化。线粒体 DNA（mtDNA）基因突变分析：mtDNA8344A→G 热点突变，突变比例 94%，疾病表型 MERRF。患儿入院 6 月后死亡，死亡诊断线粒体脑病、呼吸衰竭。
结论 MERRF 综合征是线粒体脑肌病中较为罕见的一种类型，多见于儿童。典型临床表现为：肌阵挛、癫痫、共济失调，部分患者还有身材矮小、智力低下、眼外肌麻痹等。MRI 表现为弥漫性脑萎缩，脑干、基底节区对称性异常信号，MRS 表现为 NAA 峰减低，并可检测到乳酸峰。怀疑本病时可检查血和脑脊液乳酸检查，必要时行肌肉活检，如发现破碎样红纤维，可行基因检查进一步明确属线粒体脑肌病的何种类型，预防漏诊或误诊。

PU-0039

3.0TMRI 及 256 排多层螺旋 CT 在诊断小儿病毒性脑炎的应用价值

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目的 3.0TMRI 及 256 排多层螺旋 CT 在诊断小儿病毒性脑炎的应用价值分析的探讨。
方法 选取我院 2014.10-2018.03 收治的患有病毒性脑炎的 110 例患儿进行临床诊断，将其按照数字抽签法分为两组，对照组给予 256 排多层螺旋 CT 扫描诊断，观察组给予 3.0TMRI 诊断，对比其临床诊断价值。
结果 两种诊断方式对患者病情的诊断结果存在明显差异（P<0.05），有统计学意义。
结论 病毒性脑炎患儿采用 MRI 诊断的临床敏感性和特异性显著高于 CT 扫描诊断结果，准确判断患者的病情，可在临床诊断中使用。

PU-0040

儿童病毒性脑炎的 MRI 误诊经验分享

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目的 总结儿童病毒性脑炎的 MRI 误诊经验，提高影像鉴别诊断水平。**方法** 回顾性分析我院 2010-2019 年经临床确诊的 36 例儿童病毒性脑炎的 MR 资料，其中男 17 例，女 21 例，所有病例均行头颅 MRI 扫描，包括常规 T_1WI，T_2WI 、DWI、增强扫描，8 例行波谱检查，13 例有 MRA 检查的结果，所有病例均有治疗后随访复查的结果。**结果** 头颅 MRI 最容易发生误诊的征象是深部黑质核团对称性受累的病变，有双侧苍白球、壳核对称性受累伴发白质病变，也有双侧丘脑对称性受累，还有脑干双侧黑质红核区域对称性异常信号，还有双侧侧脑室后角白质对称性片状异常信号。因为对称性病变，较容易被误诊为遗传代谢性脑病。儿童线粒体脑肌病 MELAS 病变多不具有对称性，各序列均容易与病毒性脑炎混淆，只有临床提示高乳酸血症、患儿发育迟滞或瘦小等症状，才会想到线粒体脑肌病 MELAS。关于脑脊髓炎，主要受累范围在脑干及脊髓上段，临床表现危重，当合并脑内病变要注意 EB 病毒脑炎，并注意近期的疫苗预防接种情况。自身免疫性脑炎无影像特征性，脑脊液抗 NMDAR 抗体检测多滞后于临床诊断，单纯疱疹病毒脑炎后也可以出现抗 NMDAR 脑炎。如果反复发生脑炎症状和体征，应想到此疾病可能。还有一种病毒性脑炎为胼胝体压部孤立性病变，有时伴发双侧脑室后角脱髓鞘病变，一般在 2 个月内消失，预后良好，应注意与低钠血症脑病鉴别。手足口病导致的脑炎具有特征性，一般不造成误诊。**结论** 儿童病毒性脑炎致病病毒种类繁多，发病部位对病原学有部分指导价值，较难有不同病毒致病的 MRI 影像特征，要注意与遗传代谢性疾病慎重鉴别，采用 MRS、ASL、MRA、增强等功能成像是重要的鉴别手段，避免造成患儿诊疗经济负担和延误病情。

PU-0041

磁共振氢质子波谱在儿童颅脑中的临床应用进展

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摘要：目前,国内外的医学专家对脑发育的研究越来越深入,各类医学文献也有较多介绍，从近年来越来越多的儿科临床病例看,儿童脑部疾病呈快速增长趋势,因此,深入研究磁共振氢质子波谱在儿童颅脑中的应用探索刻不容缓。对临床医生能更多的了解磁共振波谱在儿童颅脑的应用范围，对脑部疾病的预防、诊断及治疗,具有极其重要的现实意义。氢质子波谱作为目前唯一无创性进行活体组织内化学物质的检测方法,已逐渐成为一项应用于人体的诊断技术,尤其是在中枢神经系统疾病等方面更是倍受关注。

方法 笔者大量阅读中外文文献，摘取与儿童颅脑有关的氢质子波谱文献进行仔细阅读。

结果 笔者阅读了近期外文文献 30 篇，中文文献 9 篇，总结了近几年氢质子波谱在儿童颅脑中的应用范围，从而进一步帮助临床医生按需选择氢质子波谱检查儿童颅脑。

结论 ^{1}H-MRS 的化学特异性使它在中枢神经系统中的研究起十分重要的作用,不仅因为它是无创的,能从活体组织中获得神经化学信息,而且能在同一个体中重复检测,随着可测定化合物的增多,操作技术的成熟, ^{1}H-MRS 将越来越成为神经生物学领域研究细胞和分子的有力手段。当然, ^{1}H-MRS 正处于发展阶段,它的广泛应用仍然依赖于方法、技术及仪器的进一步改进和发展,随着 ^{1}H-MRS 及相关技术的不断发展和软、硬件的开发,^{1}H-MRS 必将为研究正常儿童及脑部疾患的诊断和鉴别诊断方面提供更加可靠的影像学依据。

PU-0042

DKI 评估儿童脑发育

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目的 DKI 评估新生儿期至 14 岁青少年脑发育规律。

材料和方法 收集正常儿童 218 名(136 名男性，2 天至 14 岁)。这些受试者没有中枢神经系统疾病，均无头部 MRI 表现异常。按年龄分为 8 组:1 组 2 天~ 28 天为足月新生儿组(N=24);2 组 1 个月~ 1y 组(N=40);组 3 为 1y ~ 2y 组(N=35);4 组为 2y ~ 3y 组(N=20);组 5 为 3y ~ 4y 组(N=17);6 组为 4y ~ 5y 组(N=11);7 组 5y ~ 6y 组(N=13);8 组为 6y ~ 14y 组(N=58)。数据的后处理是在 ADW 4.6 离线工作站进行。在 FA 图像上定义感兴趣的区域，然后投射到平均扩散率(MD)、轴向扩散率(Da)、径向扩散率(Dr)、平均峰度(MK)、轴向峰度(Ka)和径向峰度(Kr)图像上。感兴趣区域包括:灰质区域[尾状核头部(CN);苍白球(GP);核(PUT);丘脑(TH)];中央白质区[内囊后肢(PLIC);内囊前肢(ALIC);胼胝体压部(SCC);胼胝体膝(GCC)];外周白质区[(额白质(FWM)、顶叶白质(PWM)、半圆中心水平中央白质(CWM)]。利用非线性对数拟合得到 dki 衍生参数与年龄的关系，公式为 Y = b0 + b1 * lnX。我们假设新生儿组 DKI 参数值为基线值，各年龄组间参数变化率采用 Prate = (Pgroup - Pbaseline) / Pbaseline 计算。

结果 DKI 可以同时获得扩散参数和峰度参数。在灰白质区域峰度参数及 FA 值与 PMA 呈正相关，弥散参数呈负相关。这些参数与年龄呈非线性相关，在 2 岁以内变化迅速，2 岁以后呈下降趋势。峰度参数在白质和灰质中均表现出较高的变化率，这可能更敏感地反映了发育现象。

结论 DKI 参数能较好反应儿童脑发育，可作为脑发育成像的可靠影像标记。

PU-0043

Gray Matter Differences between Pubertal Girls With and Without the Reactivation of the Hypothalamic -Pituitary -Gonadal Axis

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The onset of puberty and related hormones exerts significant effects on brain morphometric and psychosocial development. However, the biological mechanisms underlying how puberty-related hormonal maturation sculpts human brain architecture remain elusive, especially during the early phase of hormonal maturation. To address this question, 105 young girls (age 8-11 years) without menstruation underwent brain structural scanning on a 3T MR system, and the gonadotropin-releasing hormone (GnRH) stimulation test was used to identify the reactivation of the hypothalamic -pituitary -gonadal axis (HPG). Among the 105 girls, 63 were positive for HPG axis reactivation (HPG+), while the others showed a negative reaction for HPG axis reactivation (HPG-). Cortical parameters were calculated and compared between the two groups after adjusting for age. The brain regions showing intergroup differences were then extracted and correlated with serum hormone levels. Compared to HPG- girls, HPG+ girls showed reduced cortical thickness mainly in the default mode network, including the right precuneus, right inferior temporal gyrus, right superior frontal gyrus and the left rostral middle frontal gyrus, while increased cortical thickness primarily in the executive control network, including the left superior parietal lobe and right inferior parietal lobe, and the right temporal pole, right rostral middle frontal gyrus, left lateral occipital gyrus, and left superior temporal gyrus. Subsequent linear regression analysis revealed negative correlations between the cortical thickness of several regions showing differences between the two groups and the levels of serum hormones, including plasma follicular stimulating hormones, secreting luteinizing hormone and estradiol only in HPG+ girls. These findings provide evidence to support the notion that the changes of hormones during the early phase of hormonal maturation (before menstruation) exert influences on the gray matter of widespread regions, mainly involving the default mode network and executive control network, which are vulnerable in psychiatric disorders.

PU-0044

Diffusion Kurtosis Imaging and Pathological Comparison of Early Hypoxic-Ischemic Brain Damage in Neonatal Piglets

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Objective

To investigate the application value of magnetic resonance diffusion kurtosis imaging (DKI) in the microstructural evaluation of hypoxic-ischemic brain damage (HIBD) in neonatal piglets and to compare it to pathological results.

Materials and Methods

Of 25 healthy York piglets aged 3–5 days studied, 20 were in the experimental group, and 5 were in the control group. The HIBD model was created in the experimental group; the control group (n = 5) underwent only a sham operation. Mean kurtosis (MK) and mean diffusion (MD) images were obtained by DKI scanning 3, 6, 9, 12, 16, and 24 h after the model was created, and the lesion areas and MK and MD parameters were measured. Under anesthesia, craniotomy was used to remove brain tissue, the center and edge of the lesion and the normal brain tissue were evaluated with light microscopy and electron microscopy.

Results

The MD value of the lesion area gradually decreased, and the MK value gradually increased, in the experimental group in comparison with those of the normal control group; the differences were statistically significant ($p < 0.05$). MK and MD images showed that the lesion area gradually expanded with time ($p < 0.05$), and the MK map was significantly smaller than the MD map ($p < 0.002$). Light microscopy revealed neuronal swelling, inflammatory cell infiltration, local necrosis, and other changes in the MK/MD matching area and mismatched area. Electron microscopy demonstrated different degrees of swelling of mitochondria, collapse and rupture of some mitochondrial membranes, blurred mitochondrial ridges, broken, and autophagosomes appear in the cells in the MK/MD matching area.

Conclusion

In the MK and MD map matching area, damage was greater and tended more to be irreversible than in the mismatch area. DKI can reflect the change of HIBD from the level of organelle, which is affected early in the course of HIBD.

PU-0045

Application of post labeling delay time in 3D-pseudo continuous arterial spin labeled perfusion imaging in normal children

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Objective To explore the application value of post labeling delay (PLD) in 3D-pseudo continuous arterial spin-labeled (3D-pcASL) perfusion imaging in normal children and to find the optimal PLD values for children at each age group. **Methods** Five groups of children, with fifty patients in each group, who underwent routine MRIs with normal results were included. The patients were stratified according to the following ages: <1 month, >1 month to 6 months, >6 months to 12 months, >1 year to 3 years, >3 years to 6 years and >6 years to 18 years. All patients received 3D-pcASL perfusion MR scanning. The PLD values were set to 1025 ms, 1525 ms or 2025 ms. In subjective evaluations, the signal-to-noise ratio (SNR) and cerebral blood flow (CBF) of 3D-pcASL perfusion images under different PLD values were compared and analyzed. **Results**

For patients in the <1 month group and >1 month to 6 months group, the images were mainly grade A when the PLD value was 1025 ms, which equaled 43 cases and 46 cases, respectively. The brain CBF values and SNR values were higher than those of the images with PLD values of 1525 ms and 2025 ms. For patients in the >6 months to 12 months group, >1 year to 3 years group, >3 years to 6 years group, and >6 years to 18 years group, the images were mainly grade A when the PLD value was 1525 ms, which equaled 43, 45, 43 and 46 cases, respectively. The brain CBF values and SNR values were higher than those of the images with PLD values of 1025 ms and 2025 ms. **Conclusion** The optimal PLD values for 3D-pcASL perfusion imaging are different in children of different ages. The optimal PLD value for infants who are aged ≤6 months is 1025 ms. The optimal PLD value for children >6 months to 18 years old is 1525 ms.

PU-0046

Isolated intracranial myeloid sarcoma at the age of 6 months with metastatic spread: case report and review of literature

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Isolated myeloid sarcoma (MS) is an extramedullary tumor of myeloid cells and it is quite rare in the central nervous system. Only very few cases have been reported in infant to date. We report a case of a 6-month-old infant with a primary isolated MS originated in the brain, which fails to progress with blood or bone marrow involvement but disseminates to form multiple intracranial metastases within half a month after surgery. Computed tomography (CT) of the head revealed a space-occupying lesion beside the left frontotemporal area, which involved the cerebral cortex, or gray matter mostly. Magnetic resonance imaging (MRI) examination revealed a giant irregular mass with cystic and solid appearance in the left frontotemporal region, with obscure boundary and absence of peritumoral edema, the solid portion of mass showed mildly hypointense on T1WI and isointense/mildly hyperintense on T2WI, with obvious inhomogeneous enhancement and the lesions was 8.4×3.5×7.5 cm. The diffusely thickened meninges occurred in the right temporal region and the left cerebral hemisphere with the left cerebral gyrus was enlarged at the same time. After 15 days of operation, MRI scans showed meningeal multiple enhanced nodules in the right temporal lobe, bilateral cerebral hemisphere, cerebellar hemisphere and vermis and interpeduncular cistern. We present this case to highlight the risk of metastatic spread in a short time of these tumors rather than development of leukemia which is poorly documented in the medical literature and may be significant in clinical treatment of the patient. We describe and conclude the imaging features of this rare tumor here.

PU-0047

儿童脑实质恶性脑膜瘤一例

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收集 1 例经手术病理证实的脑实质恶性脑膜瘤。患者女，7 岁，头痛 3 周，腹痛 1 周就诊。MRI 图像显示右侧外侧裂区混杂 T1W1、T2WI 信号肿块，内可见囊变区，肿块界限不清，DWI 以高信号为主，ADC 以低信号为主，SWI 示病灶内可见出血，Gd-DTPA 增强扫描肿块明显不均匀强化，右侧额颞脑膜可见多发线状和结节状强化。MRS 示 Cho 峰和 Lip 峰明显升高，NAA 峰明显降低。术前考虑为淋巴瘤并种植转移，第一次手术确诊为非典型脑膜瘤，复发再次手术后确诊为恶性脑膜瘤。

PU-0048

儿童广州管圆线虫病的临床及影像表现（附 3 例报告及文献复习）

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目的 探讨广州管圆线虫病的儿童临床特征及影像表现。**方法** 对临床确诊的 3 例儿童广州管圆线虫病的临床及影像资料进行回顾性分析。**结果** 3 例广州管圆线虫病患儿均有明确的病原体接触史，脑脊液及血常规提示嗜酸性粒细胞百分比升高。3 例患者的头颅 MRI 表现为的软脑膜线状和结节状强化，其中 2 例在脑实质内出现不强化结节状病灶。3 例肺部 CT 表现为多发胸膜下结节和大片状磨玻璃密度影。**结论** 结合典型的影像表现、明确的病原体接触史以及实验室检查，有助于确认诊断及预测预后。

PU-0049

小儿肝脏间叶性错构瘤的 CT 及 MRI 表现

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目的 探讨小儿肝脏间叶性错构瘤（Mesenchymal hamartoma of liver，MHL）的 CT 及 MRI 表现特点，以期提高该病的术前诊断正确率。
方法 回顾性分析经手术、病理证实的肝脏间叶性错构瘤的 CT 及 MRI 表现，9 例患儿中，男 6 例，女 3 例，年龄 8d～3 岁，主要病史：生后体检 B 超发现腹部包块 7 例，腹痛 2 例，9 例患儿分别行 CT 或 MRI 平扫及增强扫描。
结果 9 例病例中，病灶位于肝右叶 5 例，肝左叶 2 例，累及两个肝叶 1 例，肝尾状叶 1 例、瘤体长径约 7.8～19.2cm，平均约 13.5cm，CT 表现取决于肿瘤囊实性成分比例和分布，表现为囊性型肿瘤 5 例，囊实混合型肿瘤 3 例，实性型肿瘤 1 例。增强后肿瘤实性部分及分隔强化，囊性部分无明显强化。MRI 检查，实性为主的肿块，T1WI 为稍低信号，T2WI 为不均匀高信号，囊性为主的肿块，表现为多房分隔的囊性肿块，T1WI 为低及稍低信号，T2WI 为高信号。增强后，实性部分及肿瘤内分隔强化，囊性部分无强化。

结论 肝脏间叶性错构瘤（MHL）的 CT 及 MRI 表现，有一定特征性，结合其临床病史，并注意与肝脏其他囊实性肿瘤相鉴别，有助于提高该病术前诊断符合率。

PU-0050

Abnormal cortical neurodevelopment in children with moyamoya disease after indirect surgery

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Purpose: Children with postoperative moyamoya disease (pMMD) often accompanied with neurodevelopment impairments. Our study aimed to characterize the cortical neurodevelopment in pMMD using imaging analysis, and to explore the neurodevelopmental mechanism of this disease.

Methods: 13 pMMD children and 14 healthy controls were recruited in our hospital. We investigated cortical surface indicators including cortical fractal dimension and thickness in all subjects using high-resolution T1-weighted image and surface-based data analysis techniques. Cortical fractal dimension (FD) and cortical thickness were calculated by using the Computational Anatomy Toolbox (CAT12). Analyses were performed for the entire cortical surface followed by a complementary regions-of-interest approach.

Results: pMMD children showed significantly decreased cortical FD in right superior temporal cortex and superior parietal cortex, and increased cortical thickness in right medial orbitofrontal cortex compared with controls (FDR $p<0.05$). In addition, there was a positive correlation between cortical FD in right superior parietal cortex and performance intelligence quotient scores ($p=0.047$, $r=0.559$).

Conclusions: This study showed cortical surface abnormalities in pMMD and correlated with intelligence quotient scores, which suggested that abnormal cortical development may serve as a vulnerability marker of MMD and provide new insight into the neuropathological of pMMD.

PU-0051

垂体柄阻断综合征病因、临床表现及诊疗进展

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垂体柄阻断综合征(PSIS)的病因和发病机制目前尚不明确，围生期损伤和先天性下丘脑垂体发育不良可能是导致 PSIS 的病因，近来研究表明，有遗传因素参与 PSIS 的发生、发展。PSIS 的临床表现复杂多样，随不同年龄及不同垂体激素缺乏而表现各异，MRI 是唯一能明确此病诊断的影像学方法，及时检查有利于早期诊断和治疗，PSlS 患者确诊后的治疗是一个复杂且漫长的过程。现就 PSIS 的病因、临床表现及诊疗进展进行综述。

PU-0052

Sturge-Weber 综合征的影像诊断

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目的 探讨 CT、MRI 对 Sturge-Weber 综合征的诊断价值。**方法** 回顾性分析在我院诊治的 15 例 Sturge-Weber 综合征患儿的 CT 及 MR 资料，其中 10 例行 CT 平扫、MR 平扫及增强检查，2 例行 CT 及 MR 平扫检查，2 例行 MR 平扫及增强检查，1 例行 CT 平扫检查。**结果** ①13 例患儿行 CT 平扫检查，11 例显示大脑皮层不同程度的钙化，2 例受累脑实质密度增高，4 例伴有局部灰白质分界不清。11 例伴有不同程度的脑萎缩。7 例伴有同侧脉络丛扩大，5 例伴有同侧颅骨板障增厚。②14 例患儿行 MR 平扫检查，12 例同时行 MR 增强检查。MR 平扫 5 例示受累脑表面、脑沟回、深部白质及同侧侧脑室旁迂曲流空血管信号，3 例显示皮层钙化灶，12 例伴有不同程度的脑萎缩改变。MR 增强检查 12 例见不同程度的脑回表面、相邻脑沟及脑实质的脑回样明显强化，8 例伴同侧脉络丛扩大、明显强化。5 例伴同侧板障增厚。③MR 显示病变部位同 CT 表现，其中 2 例 MR 检查病变累及范围较 CT 更广泛。**结论** MR 检查可作为诊断 Sturge-Weber 综合征得首选检查方法。

PU-0053

完全性生长激素缺乏患儿中央沟形态变化的 3.0T MRI 研究

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目的 应用 3.0T 磁共振图像（MRI）及后处理技术分析完全性生长激素缺乏（CGHD）患儿与特发性矮小（ISS）患儿大脑皮质中央沟（CS）的形态变化。
材料与方法 30 例 CGHD 患儿（平均年龄 8.650 岁，GH 刺激实验峰值浓度小于 5 μg/l）与 30 例 ISS 患儿（平均年龄 7.767 岁，GH 刺激实验峰值浓度大于 10.0 μg/l）被纳入本研究中。在首次就诊时采集患者高分辨率、高信噪比三维（3D）T1WI MRI。利用 BrainVISA 软件图像后处理方法获得两组患儿双侧大脑半球 CS 形态学测量值，包括平均宽度（AW）、最大深度（MD）、平均深度（AD）、顶长（TL）、底长（BL）和不同位点的脑沟深度（DPP），并统计分析其组间差异。
结果 CGHD 患儿与 ISS 患儿相比，双侧 CS 的 AW（右侧 P=0.018、左侧 P=0.040）显著增大。左侧 MD（左侧 P=0.008）、右侧 AD（右侧 P=0.030）显著减低。右侧 MD，左侧 AD，双侧 TL、BL 在两组患儿半球间未发现显著性差异。两组患儿双侧大脑半球 CS 的 DPP 均呈现为山峰样外观并部分起伏交错。在左侧 CS 中部（手部躯体运动功能区）及右侧 CS 近外侧沟部（口腔运动功能区），CGHD 患儿具有显著较小的 DPP。
结论 CGHD 患儿较 ISS 患儿存在显著的 CS 形态变化，这可能是其运动、认知与语言功能发育相对落后的结构基础。

PU-0054

Brain Gray Matter Abnormalities in Treatment-Naive Children with Obsessive-Compulsive Disorder

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Purpose: Although several magnetic resonance imaging (MRI) studies have been conducted in children with obsessive-compulsive disorder (OCD), the brain structural abnormalities in OCD, especially in children, are not yet well characterized. We aimed to identify gray matter (GM) abnormalities in the early stage of pediatric OCD and examine the relationship between these structural abnormalities with clinical characteristics.
Materials and Methods: Examinations of 30 first-episode, treatment-naive pediatric OCD patients without any comorbidities and 30 matched healthy controls (HCs) were performed with 3.0 T magnetic resonance imaging (MRI). Voxel-based morphometry (VBM) following Diffeomorphic Anatomical Registration using Exponentiated Lie algebra (DARTEL) was used to conduct voxel-wise tests for group differences in regional gray matter volume (GMV).
Results: Compared to HCs, the patient group exhibited more GMV in the bilateral putamen and left orbitofrontal cortex (OFC) and less GMV in the left inferior parietal lobule (IPL). The GMV alternation in the right putamen of OCD patients was positively correlated with Hamilton Anxiety Rating Scale (HAM-A) scores, while the GMV alternation in the left IPL exhibited a trend to negatively correlate with HAM-A scores.
Conclusion: Our current results suggest that the GM abnormalities were defined in the early stage of pediatric OCD. Moreover, these findings provided further evidence of brain GM abnormalities that are not only present in the classical fronto‐striatal‐thalamic circuit but also in the default mode network (DMN), which may represent the interaction of abnormally functional organization of both network in pediatric OCD.

PU-0055

TORCH 感染的脑部 CT 表现

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目的 探讨先天性 TORCH((toxplasma；rubellavirus ；cytomegalovirus； herpes Viras；简称 TORCH)感染的脑部 CT 表现。**材料与方法** 对 35 例血清学检查证实的先天性 TORCH 感染的脑部 CT 表现进行回顾行分析。**结果** 脑内钙化伴侧脑室周围密度减低 32 例，占 91.4%。钙化呈条状、斑点状、主要分布在脑室周围及室管膜下，其次是底节区和大脑半球脑白质内。脑发育不良和脑萎缩 29 例，占 88.6%，CT 表现为脑室扩大、脑沟增宽及额顶部蛛网膜下腔增宽，常与钙化并存。脑软化及脑穿通畸形囊中 5 例。脑裂畸形或厚脑回畸形 8 例,常伴有脑室周围密度减低及钙化。严重脑萎缩、广泛性脑实质钙化 2 例。**结论** TORCH 感染对儿童神经系统的损害严重,典型的 CT 表现结合临床可提示 TORCH 感染，血清学检查具有诊断意义。

PU-0056

结节性硬化的 CT 及 MRI 表现

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目的:研究结节性硬化的 CT 及 MRI 特点及诊断价值。方法:回顾性研究 51 例结节性硬化的 CT 及 MRI 表现。**结果** 临床表现为面部皮脂腺瘤、癫痫和智力障碍三联征 23 例；室管膜下结节 39 例，双侧室管膜下多发结节状钙化 31 例，未钙化的结节 8 例，并向脑室内突入，主要分布在侧脑室前角及体部，其次是侧脑室颞角下角及四脑室；皮质及白质内结节 12 例，表现为脑皮质及白质内结节状低密度灶及长 T1、T2 信号，局部脑皮层不同程度受压变薄。增强扫描可使病变显示更清晰，常与室管膜下结节并存。结论:室管膜下钙化或未钙化结节是结节性硬化的典型征象，结合临床可以达到定性诊断。

PU-0057

婴幼儿颅脑 MRI 扫描技术及临床应用回顾性分析

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摘 要： 目的 回顾性分析婴幼儿颅脑 MRI 检查技术和临床应用价值。**方法** 收集我院 48 例婴幼儿颅脑 MRI 患者回顾性分析，序列 T1WI、T2WI、FLAIR，轴位，T2WI 矢状位，DWI，SWI，分析图像显示灰白质等结构和病变检出率。**结果** 48 例，足月婴儿 23 例；早产儿 25 例，正常者 20 例，新生儿缺血缺氧性脑损伤 15 例，高胆红素脑损伤 5 例，产伤 5 例，脑发育畸形 3 例；脑变性灶表现 T1WI 低信号、T2WI 高信号；脑出血灶表现 T1WI 高信号、T2WI 低信号，脑软化灶表现 T1WI 低信号，T2WI 高信号，边缘清。**结论** 颅脑 MRI 检查技术能显示婴幼儿脑组织解剖结构、髓鞘形成情况和病变，临床应用价值高。

PU-0058

兄弟同患 Cockayne 综合征两例并文献复习

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目的 提高临床及影像医生对 Cockayne 综合征的认识。
方法 通过对一对同胞兄弟共患经典型 Cockayne 综合征的影像学特征进行回顾性分析并进行文献复习。
结果 患儿为同胞两兄弟，分别为 4 岁和 7 岁，都因为生长和智力发育落后数年就诊。发现皮肤光敏感，小头，听力及视神经损害。
影像学检查： 兄弟俩的 CT 显示双侧大脑、小脑、脑干萎缩并双侧基底节钙化，大枕大池；MRI 显示双侧大脑、小脑、脑干萎缩，脑部成熟髓鞘形成水平明显落后，后颅窝脑脊液腔扩大，脑室周围及半卵圆中心异常信号影，T1WI 呈等信号，T2WI 及 T2WI-Flair 呈稍高信号。双侧基底节钙化；MRS 成像显示半卵圆中心的 NAA 峰下降，提示脑白质、脑灰质区有不同程度的神经元损伤或功能受损，Cho 峰下降，提示髓鞘形成不良和/或脑白质疏松。

基因检测：ERCC6 扩增产物直接测序表明存在 2 个基因位点的突变。一个是第 1357 位胞嘧啶所表达的精氨酸被终止密码子所代替，来自于患儿的母亲；另一个是第 1607 位胸腺嘧啶所表达的亮氨酸被色氨酸所代替，来自于患儿的父亲。患儿的父母均为正常临床表型携带者。
讨论：Cockayne 综合征是一种罕见的常染色体遗传性疾病，累及多个系统，主要表现为生长发育迟缓、小头畸形合并皮肤光敏感。易误诊为脑瘫、先天性小头畸形、过早衰老呈特殊鸟样外貌等，与 XPB、XPD、XPG、CSA (ERCC8)和 CSB (ERCC6)的主要致病基因有关，因此一般采用基因检测确诊。影像特征可表现为双侧基底节区钙化和颅内多发散在钙化，常伴脑萎缩和双侧弥漫性脑白质损伤，偶可见骨盆异常、骺板硬化或脊柱侧弯。本例符合典型的临床及影像学表现。
综上所述：Cockayne 综合征的临床和影像学表现典型，一般与其他早老综合征相鉴别，无特殊有效疗法，大多数预后不良。

PU-0059
小儿以中枢性尿崩症为首发症状的朗格汉斯细胞组织细胞增生症的影像学表现与临床特点分析

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目的 分析小儿以中枢性尿崩症(CDI)为首发症状的朗格汉斯细胞组织细胞增生症(LCH)的影像学表现及临床特点，提高对该疾病的诊断水平。**方法** 回顾性分析 13 例经手术和病理证实以 CDI 为首发症状的 LCH 患者的 CT 和 MRI 影像学表现及临床资料。**结果** 13 例患者中男 9 例，女 4 例，男女比例是 2.25:1，年龄 4～12 岁，平均 7.3 岁，病程 6 月～9 年。13 例患者均有不同程度的多饮多尿症状，均行禁水-加压素试验，符合 CDI 诊断标准。所有患者的危险器官（肝脏、脾脏、肺脏及造血系统）未见受累。所有患者均行 MRI 平扫和增强检查，13 例患者垂体柄增粗、垂体后叶高信号消失，1 例患者下丘脑见小结节影，增强扫描呈明显均匀强化。5 例患者生长迟缓，生长激素激发试验峰值均<5μg/L。9 例患者行 CT 检查，其中颅骨单发破坏 3 例，多发破坏 4 例，肋骨局限性破坏 2 例，边界清晰，无硬化缘。8 例患者有皮疹，呈湿疹样、脂溢性、出血性斑丘疹，白色斑疹。6 例患者浅表淋巴结肿大。所有患者均有病理诊断及免疫组化，见朗格汉斯细胞增生，其中 13 患者 CD1a（+）、Langerin（+）、S-100（+），9 例患者 CD68（+）。13 例患者予手术及联合化疗后，随访 6～24 个月，其中 11 例患者症状消失，2 例患者症状好转。9 例患者复查 MRI，其中 8 例患者垂体柄＜3mm，1 例患者垂体柄病灶缩小，下丘脑病灶消失。**结论** 小儿以 CDI 为首发症状的 LCH 起病较为隐匿，容易延误诊断，MRI 能清晰地显示垂体的解剖结构，可以为本病的早期诊断提供依据。

PU-0060
Differentiation of Low- and High-grade Pediatric Brain Tumors by Using intravoxel incoherent motion imaging and diffusion kurtosis imaging

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Purpose To demonstrate the quantitative parameters derived from intravoxel incoherent motion imaging (IVIM) and diffusion kurtosis imaging (DKI) models can be used to

improve the accuracy of MR imaging for differentiating among low- and high-grade pediatric brain tumors.

Material and Methods This study was approved by the institutional review board. Forty-nine pediatric patients with histologically proved brain tumors who underwent IVIM and DKI were recruited in this study. All the MR exams were conducted on a 3T system (MAGNETOM Skyra, Siemens Healthcare, Erlangen, Germany). 13 b values ranging from 0-2000 s/mm^2 were used the MR diffusion acquisition, The diffusion weighted images with b value of 0, 50, 100, 150, 200, 300, 400, 600, 800, 1000 s/mm^2 were used to calculate IVIM parameters, and the diffusion weighted images with b value of 0, 700, 1400, 2000 s/mm^2 were used to generate DKI parameters. The mean, minimum, and maximum value of IVIM [pure diffusion coefficient (D), pseudo-diffusion coefficient (D*) and perfusion fraction (f)] and DKI [diffusion kurtosis (K) and diffusion coefficient (Dk)] parameters were measured. The IVIM and DKI values were measured in solid tumor regions, as well as in normal-appearing gray matter as a control. These values were compared between the low-and high-grade pediatric brain tumors by using the Mann-Whitney U test. Receiver-operating characteristic (ROC) analysis and logistic regression analysis were performed to evaluate the diagnostic performance of single-parametric and multiparametric models.

Results None of the IVIM and DKI parameters exhibited significant differences in normal-appearing gray matter (P >.05). The Dk and D values were lower, whereas the K and f_{min} value was higher in high-grade pediatric brain tumors than those in low-grade pediatric brain tumors (all p <.05). The combination of DK_{min} and K_{max} provided the largest area under the ROC curve (0.955) in the ROC analysis compared with individual parameters (D_{min}, 0.891; DKmin,0.933; Kmax, 0.923 and fmin, 0.734), indicating an improved diagnostic performance for tumor grading.

Conclusions The parameters derived from IVIM and DKI can be used to distinguish low-grade pediatric brain tumors from high-grade pediatric brain tumors. The combination of DK_{min} and K_{max} value may serve as a noninvasive and quantitative imaging parameter for grading pediatric brain tumors in vivo.

PU-0061

T2WI FLAIR 增强序列及 DWI 序列对儿童感染性脑膜炎的诊断价值

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目的 分析儿童感染性脑膜炎的 MRI 特征，评价 T2WI FLAIR 增强、DWI 序列以及 T1WI 增强三种扫描序列的成像效能，探讨增强 T2WI FLAIR 序列和 DWI 联合应用对儿童感染性脑膜炎的诊断价值。**方法** 回顾性分析我院 2018 年 1 月～2019 年 5 月确诊感染性脑膜炎的儿童 42 例，所有患者均在常规磁共振成像（MRI）扫描后行增强 T2WI-FLAIR 序列及 T1WI 序列扫描，分析儿童感染性脑膜炎在不用扫描序列上的影像学特征，对比两种增强方法独立应用及联合应用诊断儿童感染性脑膜炎的敏感性及特异性。**结果** 42 例病变中，化脓性脑膜炎 25 例，病毒性脑膜炎 14 例，真菌性脑膜炎 3 例。增强 T2WI FLAIR 序列和 DWI 序列与增强 T1WI 的敏感性相似，而增强 T2WI FLAIR 序列和 DWI 联合应用的特异性高于增强 T1WI。**结论** :增强 T2WI FLAIR 序列和 DWI 序列可清晰显示儿童感染性脑膜炎脑膜强化，应作为儿童脑膜炎 MRI 检查的首选扫描序列。

PU-0062
多层螺旋 CT 与数字 X 线摄影 在儿童副鼻窦炎诊断中的价值比较

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【摘要】目的 对比分析儿童副鼻窦炎采取多层螺旋 CT 与数字 X 线摄影诊断价值。方法 选取本院 2017 年 8 月-2018 年 7 月接收的副鼻窦炎患儿 62 例为研究对象，所有患儿分别进行多层螺旋 CT 与数字 X 线摄影检查，对比两种检查方法检查结果。
结果 多层螺旋 CT 副鼻窦炎检出率及息肉、黏液囊肿、黏膜下囊肿检出率均较数字 X 线摄影更高，差异均存在统计学意义（P<0.05）。结论 儿童副鼻窦炎诊断期间，多层螺旋 CT 诊断价值更高，其可以提高疾病检出率，促进其他疾病检出率的提高。

PU-0063
低剂量多层螺旋 CT 在唇腭裂患儿术前检查及预后评估中的应用

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目的 探讨低剂量多层螺旋 CT 在唇腭裂患儿术前诊断及预后评估中的价值
方法 唇腭裂系列患儿 70 例，男 57 例，女 43 例；设备采用 Philips Brilance 64 排螺旋 CT，迭代算法，扫描条件为 100 kV、80 mA s，准直 1. 5。扫描范围从眶下至咬合平面，重组层厚 0.625 mm。数据后处理采用 MIP 多平面重建、VR 三维立体图像技术及齿科专业重建软件等。
结果 左侧 25 例；右侧 8 例；双侧 5 例；牙槽突裂 12 例；软腭裂 6 例；无骨性改变 14 例；伴发其它畸形 9 例。
结论 迭代算法低剂量螺旋 CT 扫描可明显降低扫描剂量；图像后处理技术可以准确测量并计算唇腭裂骨缺损量及形态，同时可明确判断颌面部、颅底等伴随畸形，对唇腭裂患儿术前诊断及预后评估具有重要价值。

PU-0064
多层螺旋ＣＴ检查及后处理应用对牙瘤的诊断意义

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目的 探讨多层螺旋ＣＴ检查及后处理对牙瘤的诊断意义。**方法** 回顾性分析 5 例经手术和病理证实的牙瘤的影像特点及后处理应用对牙瘤本身及对周围结构的影响。**结果** 5 例牙瘤患者 4 例为单发，其中组合性牙瘤 3 例，混合性牙瘤 1 例，1 例为多发，上颌及下颌右侧第一磨牙区混合性牙瘤各 1 例。**结论** 多层螺旋ＣＴ能够明确显示牙瘤内具体形态，周围软组织包膜形态，应用后处理可以立体直观的观察牙瘤的内部形态，是否含有牙样小体等，对牙瘤周围结构关系观察更加直观，如对周围牙的梗阻作用、周围牙根的紧密程度及牙瘤具体定位测量等具有显著优势，对疾病的定性诊断及鉴别诊断有一定价值，有助于临床治疗方案的选择。

PU-0065

窦组织细胞增生伴巨大淋巴结病一例

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目的 探讨窦组织细胞增生症伴巨大淋巴结病(sinus histiocytosis with massive lymphadenopathy,SHML,或 Rosai-Doffman disease,RDD)在淋巴结外的临床病理学特征及鉴别诊断.方法 进行常规病理学检查、苏木素-伊红染色(HE)及免疫组化染色,分析其病理学特征、免疫表型及鉴别诊断,并通过复习相关文献进行概括并探讨.结果 镜下可见浓染区和淡染区相互间隔,浓染区由大量的炎细胞主要是淋巴细胞和浆细胞的浸润,并伴有大量纤维化,伴有特征性的窦组织细胞(Rosai-Dorfman 细胞)增生和淋巴细胞的“伸入运动”.免疫组化显示吞噬性组织细胞 CD68(+),S-100(+),不表达 CD1a.结论 病理学检查在该病中优于临床及影像学检查.

PU-0066

肺外结核的影像表现与临床

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目的 探讨不同部位肺外结核的影像特点，以提高对非常见部位结核的认识。
方法 收集 2010 年 1 月－2019 年 5 月经我院临床手术和综合治疗确诊的肺外结核患者 31 例，男 16 例，女 11 例，年龄 1y~65y。CT 采用西门子 SOMATOM Definition AS 128 层螺旋 CT 行腹部 CT 平扫及增强扫描，铅皮覆盖患儿甲状腺及生殖器作好防护，MRI 采用 GE Signa Ovation EXCITE 0.35T 及 MAGNETOM Avanto 1.5T 扫描仪，对比剂为碘海醇，Gd-DPTA.。乳腺采用美国 Hologic Selenia 数字化乳腺机。
.**结果** 31 例均经手术及临床病理证实 ，其中腮腺结核 1 例，颈部淋巴结核 10 例，腋下淋巴结核 1 例，乳腺结核 4 例，胸壁结核 3 例，睾丸结核 3 例，付睾结核 1 例，子宫内膜及输卵管结核各 2 例，输尿管下端结核 1 例，肩胛骨、髋关节各 1 例，髌下囊 1 例，脾结核 1 例。
影像表现：发生在腮腺、颈部淋巴结、腋下淋巴结、乳腺、胸壁、睾丸、付睾及脾脏部位结核，共同特点 CT 平扫低密度，增强环形强化，伴周围脂肪间隙模糊，坏死者 MRIT1WI 低信号，T2WI 高信号，DWI 与 ADC 增高信号，见环形强化，周围软组织呈水肿信号。子宫内膜结核 CT、MRI 检查均表现子宫内膜增厚，轻度强化。输卵管结核表现输卵管增粗、纡曲、积水。输尿管下端结核表现局部管腔狭窄、管壁增厚。肩胛骨、髋关节结核在 X 线摄影及 CT 扫描时表现骨质破坏，伴软组织肿块，强化不明显。髌下囊结核具有淋巴等软组织结核特点，增强扫描见环形强化。
结论 肺外结核是指发生于肺部以外全身其他脏器的结核，是结核病疫情的重要组成部分，淋巴结结核是最常见的肺外结核，以颈部多见，占 91%（11/12），可根据特征性环形强化定性，其他部位结核要结合临床症状及实给室检查及病理确诊。

PU-0067

儿童紫癜性肾炎合并可逆性后部脑病综合征 MRI 诊断分析

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目的 通过分析儿童可逆性后部脑病综合征（PRES）的临床特征、影像学特点、治疗及预后，提高儿科影像科医生对儿童 PRES 的认识和早期诊断及鉴别诊断。
方法 回顾性分析南京医科大学附属儿童医院 2011 年 2 月—2018 年 3 月收治的 2 例 PRES 患儿的临床特点、影像学特点、治疗及预后，主要总结 MRI 早期表现特点。
结果 2 例患儿均确诊为紫癜性肾炎并头痛，腹部 CT 显示部分肠管管壁增厚，周围渗出。2 例患儿两侧大脑半球额叶、枕叶、后顶叶的皮质和白质多发、1 例左侧丘脑斑片状异常信号，T1WI 呈等或略低信号，T2WI 呈高信号， FLAIR 呈高信号， DWI 呈低信号、等信号；ADC 图呈高信号、等信号，随访观察异常信号基本消失。
结论 PRES 的临床表现以神经系统症状为主，MRI 表现及 DWI 表现特异，是诊断该病的主要依据，早期诊断、及时治疗是防止不可逆脑损伤的关键。临床症状及影像学改变可短期内恢复正常，大多预后良好。

PU-0068

儿少精神障碍患者伴发脑白质病变的核磁检查

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目的 认识儿少精神障碍患者伴发脑白质病变的核磁检查价值
方法 对我院 2017 年 5 月至 2019 年 3 月期间 118 例儿少精神障碍患者行颅脑 3.0TMRI 检查，所有病例均行轴位 T1WI、T2WI、冠状位 T2FLAIR、矢状位 TIWI、DWI 及 ADC 检查，重点观察并分析轴位 T2WI 及冠状位 T2FLAIR 图像上脑白质的改变，并查阅相关资料
结果 118 例儿少精神障碍患者其中 15 例儿少精神障碍患者 T2WI 及 T2FLAIR 图像均显示脑白质区异常信号
结论 MRI 检查对儿少精神障碍患者伴发脑白质病变有诊断价值

PU-0069

HRCT 和 MRI 在诊断内耳畸形中的价值

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目的 探讨 HRCT 和 MRI 对不同类型内耳畸形的诊断价值。**方法** 收集 25 例经临床诊断听力异常的患儿，进行 HRCT 和 MRI 扫描，并通过多种图像后处理技术进行分析。**结果** 双侧内耳畸形 15 例，单侧内耳畸形 10 例。耳蜗畸形 7 例，大前庭导水管畸形 12 例，半规管畸形 5 例，蜗神经异常 6 例。**结论** 综合 HRCT 和 MRI 可清晰显示各种内耳畸形，为临床治疗方案的选择提供帮助。

PU-0070

先天性颅颌面骨常见畸形的 MSCT 诊断

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【摘要】**目的** 通过总结先天性颅颌面骨常见畸形的多层螺旋 CT（MSCT）表现，提高其诊断水准，并为颅颌面部畸形的重建、修复提供影像学支持。资料与**方法** 回顾性分析 40 例先天性颅颌面骨各型畸形的 MSCT 征象。**结果** 颅面裂畸形共 14 例，MSCT 示均累及唇腭部，表现为上唇部唇弓区域软组织崩裂伴邻近硬腭部骨质缺损，鼻中隔明显偏曲，9 例同时伴有颌骨发育不良或偏颌畸形；半面短小症共 7 例，均累及单侧颅面部，MSCT 示患侧下颌骨髁突、下颌支短小变细，耳廓、咬肌缩小并周围脂肪间隙变薄，下颌骨位置上移及左右面部不对称；眶距增宽症共 9 例，MSCT 示两眼眶内侧间骨性距离增宽，双侧眶外壁夹角和视神经夹角增大伴眼球突出，鼻外形宽大扁平并软组织增厚，筛窦横径增宽、窦腔扩大伴过度气化，鼻甲肥大、颧面部骨质肥厚外凸及间距增宽；颅缝早闭症共 10 例，MSCT 示颅骨不规则状突出和凸起，其中 5 例头颅向一侧倾斜，3 例头颅呈舟状，2 例头颅前部呈三角状，7 例同时伴有颅板多发指压迹样改变。**结论** 各型先天性颅颌面骨常见畸形均具有典型的影像学征象，多层螺旋 CT 及其三维成像能清晰显示颅颌面骨畸形的特征性表现，能为临床诊断及治疗提供客观依据。

PU-0071

透明血管型巨大淋巴结增生症（Castleman 病）1 例

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目的 探讨巨大淋巴结增生症（Castleman 病）的 CT 平扫及增强扫描的影像表现及诊断要点。**方法** 对 1 例术后病理结果为巨大淋巴结增生症（透明血管型）的 CT 扫描病灶表现特点、增强后病灶强化特征进行分析,并结合临床资料复习文献。**结果** CT 平扫左侧颈部见边界清晰、密度均匀的软组织肿块;，CT 增强扫描病灶明显强化，随时间推移强化持续，呈“快进慢出”表现。**结论** 巨大淋巴结增生症的影像检查总体来说无明显特征性，但其中 UCD（单中心型）影像表现具有一定特点，该病例影像表现符合其特点

PU-0072

新生儿头皮肌纤维母细胞瘤 1 例

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目的 报告 1 例新生儿肌纤维母细胞瘤的影像学表现，提高对本病的特异影像表现认识。
方法 男，13 天，发现头部包块 13 天。体检：枕后可见约 14cm×13cm 包块，质软，边界清楚，包块上可见皮损、结痂。CT 示：枕部头皮软组织区可见一较大混杂密度灶，软组织 CT 值约 33-53Hu,其内可见钙化及液性密度灶，邻近枕骨局部骨质增生、破坏。增强扫描后，实质部分明显强化，以周边强化为著，其内边缘可见多发迂曲血管，可见双侧颈外动脉分支供血，病灶内部可见坏死灶。MRI 示：枕部头皮软组织区较大混杂信号影，在 T1 及 T2 上呈高等低信号，FLAIR 上呈高等低信号，边界尚清，大小约 7.6cm×4.5cm×5.9cm。
结果 手术所见：枕部皮下实体样包块，病变基地与颅骨粘连紧密，颅骨在枕部有明显突起，分离时出血明显。病理：瘤细胞为梭形、短梭形、呈束状交错或旋涡状排列，局部排列疏松，可见核分裂，并可见粘液变，血管丰富，可见后壁血管，局部管壁黏液变性，炎细胞散在浸润，肿瘤局部出血、钙化。病理诊断：肌纤维母细胞瘤伴出血及钙化，局部瘤细胞增生活跃。
讨论：肌纤维母细胞瘤是一种少见而独特的间叶性肿瘤，表现为交界性或低度恶性肿瘤的特点。其病因不明确，部分病例发生在手术、创伤或炎症以后，提示本病起初可能是人体对损伤的一种异常

或过度的反应，最终激活肌纤维母细胞显著生长或失控生长，直至最终发展成肿瘤。本病常见于儿童或青少年，平均年龄为 10 岁，本病例年龄为新生儿较罕见。发病部位常见部位为肺部，其他如腹腔、腹膜后、盆腔、躯干等部位也可发生。肌纤维母细胞瘤的临床表现多样性、无特异性，所以术前诊断困难，影像学检查中发现单发实质不匀质肿块，可伴有坏死、钙化，增强后早中期表现为周边强化或环形强化者，尤其是边缘强化较显著的特征，与其他儿童常见实体瘤有所不同，应引起重视，尽可能减少漏诊及误诊，为临床医生的治疗方案的选择提供有效的参考价值。

PU-0073

CT 低剂量扫描在儿童副鼻窦检查中的应用

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【摘要】 目的 讨论 64 排螺旋 CT 低剂量扫描在儿童副鼻窦检查中的应用，获得不同参数的辐射剂量并对图像质量进行评估。**方法** 对 50 例临床怀疑鼻窦炎来放射科行 CT 检查的儿童随机分组，分别行低剂量扫描和常规计量扫描，并作冠状位重建。分析两组图像质量的差异及辐射剂量。**结果** 与常规剂量组相比低剂量组的 CT 图像质量良好，无明显差异，图像颗粒略粗，但不影响诊断，而辐射剂量明显下降。**结论** 儿童 64 排螺旋 CT 低剂量扫描可以获得符合临床诊断需求的图像信息，可应用于临床。

PU-0074

多排螺旋 CT 后重建技术在儿童气管支气管异物中的应用

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目的 ：气管及支气管是呼吸的通道，假如异物较大堵住，患者可在几分钟内窒息而死亡。因此，气管及支气管异物是器官进入异物中较危险的一种，也是耳鼻喉科常见的急症之一。急需明确诊断、尽早治疗。早期准确的检查方法对临床手术异物定位起到至关重要的作用。近来多排螺旋 CT 在气管支气管病变领域中的应用越来越广泛，本研究目的在于利用多排螺旋 CT 及多种重建技术分析小儿气管、支气管异物的位置、大小、形态，证实其多种重建技术在诊断气管支气管异物中的应用价值。

2. **方法** 2.1 病例 收集医院 2016 年 7 月至 2018 年 7 月经支纤镜 (21 例)及经手术证实的气管支气管异物患者。男 15 例，女 6 例。年龄 6 个月～6 岁，就诊时间：发病后 1h～1 月。18 例有明显的异物吸人史，其余不太明确。临床症状：呛咳、咳嗽、呼吸困难等症状；听诊可闻及湿罗音、哮鸣音。2.2 检查方法使用多排螺旋 CT，扫描层厚 3.75mm，重建厚度 0.625mm，扫描条件：转速 / 螺距 0.8：1，管电压 80-140kV，管电流 100-300mA。采用多平面重建，曲面重建技术，最小强度投影、CT 仿真内窥镜等对气管支气管异物的显示情况及诊断价值的评估。不配合患者扫描前可口服水合氯醛 (50～ 100mg / kg)使其进入睡眠状态，然后进行 CT 检查。

3. **结果** CT 图像均显示清楚，21 例临床术中结果与 CT 检查一致。

4. **结论** 多层螺旋 CT 扫描及多种后重建技术相融合能直接及间接显示气道异物的位置、大小、形态、数目、局部气管、支气管狭窄程度，能进一步提高异物检出及其并发症诊断的准确性，是一种

无创、快捷、安全的术前检查方法，是指导临床医生确定治疗预案及评估疗效的最重要、最直接、最直观第一手材料，为此多排螺旋 CT 扫描应为小儿气道异物诊断的首选检查。

PU-0075

CE-MRA 技术在小儿海绵状血管瘤中的应用

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目的 ： 探讨磁共振成像(M RI)对肢体深部海绵状血管瘤的诊断价值。均经手术及病理证实， 年龄 1 ～ 9 岁,症状及体征:下肢疼痛或酸胀不适,跛行或行走不便，下肢局限性肿胀或触及柔软性肿块,肿块处皮肤轻度发蓝， 压之可褪色。**方法** ： 本组病例具有以下临床及影像学特点： 稍短 T1 长 T2WI， 信号不均匀,病灶侵及肌肉及肌肉间隙,周围肌肉组织萎缩，病灶可包绕长骨生长,骨骼无受侵表现，增强后病灶呈明显强化，CE-MRA 序列见异常强化血管团。**结论** :深部海绵状血管瘤有时向纵深广泛发展、蔓延,范围很大， 和深部血管可有广泛交通， 因此， 在选择手术治疗前应了解血管瘤与大血管的关系， 以避免术中出血过多， 手术损伤过大。MRI 及 CE-MRA 可较好地反映较大血管与病灶的关系,可了解血
管瘤病变区的血供及引流血管状况。总之， 磁共振成像可显示深部海绵状血管瘤的某些病理改变及信号特点， 可作为肢体深部海绵状血管瘤较理想的诊断手段。

PU-0076

医学影像技术未来的发展

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{摘要}医学影像技术发展的日新月异,现代医学影像技术发展促进了医学影像诊断断的准确性发展,同时也使临床诊断越来越依赖于医学影像诊断,医学影像检查技术的出现对现代临床医学的发展起到了很大的推动作用,如何规范的使用医学影像技术检查方法成为现在医院需要解决的一个现实问题。

1.一切实际存在于我们意识之外的而且能为我们感觉直接地或者间接地可以认识到的东西都是物质。宇宙的一切都是由物质组成的,物质由分子组成,而分子又是由原子核和绕原子核旋转的电子组成的,因此原子是元素的基本单位,一个分子可由一种或几种不同元素所组成。对于物质实体原子结构的概念也是我们所学过的知识。

2 医学影像技术是一门将物理学和医学相结合的新的研究、应用分支。将医学影像技术应用于医疗实践之中，要求医生、研究人员必须具备医学和物理学的相关知识，并在实践中根据具体情况进行有针对性的改造以适用。该学科方向的研究、发展为我国医疗健康卫生事业培养了数以万计的高水平专业人才，极大缓解了我国居民对医疗健康卫生相关领域人才的需求.无论医院大小,医学影像检查技术的出现是对现代临床医学的发展起到了很大的推动作用,问题是是否所有疾病都要依赖于医学影像检查。传统的中医有望、闻、问、切,西医也有听诊、触诊、叩诊等方式。但是随着医学影像技术的发展,临床诊断的准确性有了明显的提高,从而可以挽救更多人的生命,为临床治疗提供了一个更加切实可行的治疗方案,这说明医学影像的发展给我们临床诊断和治疗带来了积极有效的方面。

3.医学影像技术专业的毕业生通常都会在全国各地医院的影像科从事影像技术工作。但是近年来，各大医疗卫生机构对医学影像技术专业人才提出了更多、更高的要求，导致一些专科学生在就业时受到了限制，很难进入满意的单位
4 通过以上论述可以发现，在新形势下，医学影像技术专业面临着巨大的挑战，要求高校不断完善学科的建设，使之适应时代的发展。

PU-0077
对小儿先天性感音神经性耳聋诊断中 3.0TMRI 及多层螺旋 CT 的联合应用价值

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目的 :对小儿先天性感音神经性耳聋诊断中 3.0TMRI 及多层螺旋 CT 的联合应用价值的探讨。
材料：选取 2014 年 12 月至 2018 年 4 月间我院临床诊断为感音神经性耳聋的患儿 83 例。
方法 所有患儿均行高分辨率 CT 及 MRI 检查。并进行多种重建方法观察病变，MRI 行斜矢状位重建观察面神经、前庭蜗神经发育情况。
结果 CT 检查对耳部骨性结构显示较好,MRI 检查对耳部软组织结构显示较好，尤其是内耳膜迷路及耳部神经病变的显示较有优势。
结论 CT 与 MRI 在诊断耳部病变中各有优势，如能将两者结合将对人工耳蜗植入术提供明确的诊断依据。

PU-0078
上颌窦骨内血管瘤合并含牙囊肿 CT 表现 1 例

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目的 ： 通过该病例的 CT 表现学习骨内血管瘤合并含牙囊肿的诊断。
方法 ： 患者：男，2 岁，因头部外伤行 CT 检查发现右侧上颌窦占位病变，行右侧面部病损切除术，术后病理检查为含牙囊肿伴急慢性炎，骨血管瘤。出院后因反复出血两次入院，行右侧上颌窦骨内血管瘤介入栓塞止血术治疗。使用 GE 64 排螺旋 CT 机对该患儿行颌骨及口腔 CT 平扫+增强扫描，对比术后病理结果。
结果 ： CT 表现为右侧上颌窦壁、鼻腔、上颌骨内膨胀性骨质破坏，边界尚清，其内见放射状新生骨小梁，增强扫描呈明显强化，病灶内见牙齿影。
结论 ： 该病例因骨内血管瘤与含牙囊肿并发，较为罕见，CT 诊断具有一定困难。

PU-0079
儿童 18 例甲状舌管囊肿ＣＴ诊断分析

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目的 探讨甲状舌管囊肿的 CT 影像学分析、诊断。**方法** 回顾性分析 18 例经手术病理证实的甲状舌管囊肿的影像、临床资料。**结果** 18 例甲状舌管囊肿中，中线 10 例，中线偏左 6 例，中线偏右 2 例；舌骨上方 3 例，舌骨水平 3 例，舌骨下方 12 例；呈类圆形、类椭圆形及不规则形囊性病变。**结论** 根据甲状舌管囊肿特定部位及影像学表现可做出定性诊断。

PU-0080

Primary intra-arterial chemotherapy versus primary intra-arterial chemotherapy plus adjuvant intravenous chemotherapy for advanced retinoblastoma

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Purpose: Intra-arterial chemotherapy (IAC), which is more commonly used nowadays, does not cover the patient systemically. We aimed to investigate whether the addition of intravenous chemotherapy (IVC) as adjuvant therapy before IAC has any beneficial (or the opposite) impact in terms of survival and metastasis.
Methods: This multi-center retrospective cohort study included 213 patients with advanced intraocular retinoblastoma who received IVC plus IAC (n = 103) or IAC alone (n = 110) between April 2009 and January 2017. Eyes were grouped as per the International Intraocular Retinoblastoma Classification. Kaplan–Meier and Cox regression analyses were performed to compare survival outcomes between the two groups. In addition, details about enucleation and histopathological findings were recorded.
Results: The 2-year ocular survival rate was 68% in the IVC plus IAC group and 72% in the IAC group [hazard ratio (HR), 0.88; 95% confidence interval (CI), 0.55–1.43; P=0.61], while the 2-year overall survival rates were 97% and 96%, respectively (HR, 1.56; 95%CI, 0.41–5.90; P=0.51). Moreover, the 2-year event-free survival rates were 76% and 79%, respectively (HR, 0.96; 95%CI, 0.56–1.65; P=0.89). High-risk histopathological features were identified in 10.5% eyes in the IVC plus IAC group and 16.7% eyes in the IAC group, with no significant difference between groups (P=0.46).
Conclusions: According to this study, with relatively short follow-up, the use of IVC as adjuvant therapy before IAC, had no beneficial impact in terms of survival and metastatic spread.

PU-0081

早产儿脑损伤磁共振检查临床分析

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了解早产儿脑损伤的发生率及探讨磁共振检查对早产儿脑损伤的诊断价值。**方法** 对我院住院早产儿 100 例在生后 1 周内行头颅磁共振检查。**结果** 早产儿脑损伤的发生率为 63.8%，以出血性病灶较多见（29.2%），其次为出血合并缺血性病灶（24.6%）。弥散加权成像对脑白质损伤较敏感，磁敏感加权成像对出血较敏感。**结论** 磁共振检查对早产儿脑损伤的诊断提供了准确的影像学依据。

PU-0082

小儿轻度创伤性脑损伤的ＤＴＩ研究进展

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儿轻度创伤性脑损伤是临床常见脑外伤，由于受损部位主要分布在灰白质交界处和大脑深部中线结构，且脑损伤呈弥漫性，常规影像学检查常无阳性发现，往往低估了患者病情。本文就扩散张量成像应用于轻度创伤性脑损伤的研究进展进行综述。

PU-0083

延误治疗引发儿童肘关节骨化性肌炎

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目的 X 线平片、CT 在诊断儿童肘关节骨化性肌炎的诊断。
方法 初步选择 X 线平片（肘关节正侧位）、然后 CT 平扫（3D、MPR 重建）进行检查。
结果 患者主因“右肘外伤后肘关节功能缺失 14 月”查体右肘外观无异常，肘关节固定僵直于伸肘受限 30°位，屈伸功能无、旋后、旋前 60°，手部痛触觉及功能正常。患者因摔伤致右肘关节疼痛、活动受限，行 X 线检查示：右肱骨髁上骨折，患者家属拒绝手术治疗，当地行保守复位石膏固定 1 月，治疗期间患者手部肿胀较轻，1 月后拆除石膏行被动功能锻炼 2 次后右肘及右手肿胀，再次石膏固定 1 周拆除石膏，患者肘关节屈伸功能丢失，目前伤后 14 月，肘关节功能无改善，门诊参照 X 线平片及 CT 平扫加重建，诊断为“骨化性肌炎”。影像检查中肱骨远端与尺骨近端骨性融合，骨皮质增厚，肘关节屈曲，关节间隙未见异常的确实少见。
结论 麻醉满意后，行切开手术，以骨刀逐渐切除成熟的异位骨化，直至显露出肱骨滑车和部分冠状突，修整冠状窝和冠状突。伸肘可至 0 度，屈肘可至 140 度，肘关节稳定。

PU-0084

儿童颈胸椎疾病 MRI 检查新发现

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目的 儿童颈胸椎结合部不适，MRI 检查颈椎疾病的新发现。
方法 利用低场开放式 MRI 平扫，T1WI、T2WI 及脂肪压制序列对儿童颈椎疾病的诊断。
结果 该组病人 30 例，年龄为 12-16 岁儿童，男女比例几乎相等，在季节变换明显的地区，夏天发现儿童颈胸部软组织凸起明显，部分出现头晕、颈部及肩部不适症状，患者家属发现后及时到医院就诊，临床触诊及外部观察为软组织内肿物，建议 MRI 检查。MRI 诊断为颈椎曲度变直，椎间盘及椎体信号正常，后缘颈胸部为脂肪信号堆积所致。仔细询问病史，30 例患者均为留守儿童，父母外地打工，孩子跟着爷爷奶奶或外公外婆在家上学，由于老人溺爱孩子对其管教不严，放学后、假期内玩手机游戏，低头看视频，不正确的学习姿势等。长期低头致使颈椎曲度变化，颈胸部脂肪堆积，引发后缘软组织凸起明显。
结论 成年人引发的颈椎病在治疗中方法几乎相同，儿童引发的颈椎病需要谨慎治疗，在防范中应加强颈部肌肉的锻炼，正确的学习姿势也非常重要，严防儿童长时间玩手机和电脑游戏。

PU-0085
儿童颈椎椎间盘钙化症伴寰枢关节伴脱位一例病例报道

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摘要
目的 X 线平片、CT 在诊断儿童颈椎椎间盘钙化症伴寰枢关节半脱位的诊断。
方法 初步选定 X 线平片（颈椎正侧位、张口位）、CT 平扫（3D、MPR 重建）进行检查。
结果 颈椎生理曲度变直，寰枢关节不等宽，左侧间隙变窄右侧间隙变宽，颈第 3/4 椎间隙可见团块状密度增高影，椎间孔内团块、点状影高致密影，呈不规则改变、密度不均匀，并向后突出硬膜囊受压，CT 值约为 130HU。影像学资料报道；小儿椎间盘钙化大致可分为三型：1、消散型；急性起病，症状明显，吸收与消散快，2、潜伏期；钙化在体征出现前就消失散，而在症状出现后逐渐吸收。3、静止型；因有其他疾病做 X 线检查时发现，无症状，钙化多不消散。也可能有以下几种：1、外伤； 2、先天性因素； 3、混合型。【儿童颈椎间盘钙化是一种少见疾病，】伴寰枢关节半脱位更为少见。由于多发儿童，儿童有较强的修复愈合能力，椎间盘钙化可以自行吸收，一般正常治疗后恢复很快，数天即可消除症状，由于该患者为创伤性损伤，寰枢关节半脱位，即使有神经压迫症状非手术同样能取得满意疗效。
结论 我院给予制动颈部牵引、消炎对症治疗，1 周后症状明显消失、出院康复锻炼。

PU-0086
如何做好放射科设备的保养与维护

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随着放射科检查的数字化，使其图像分辨率、显示的层次及解剖结构有了明显提高。计算机技术与各种检查设备的融合，其性能更加稳定，操作也更加便捷，但日常工作中如何科学使用、维护保养显得尤为重要。我院 2008 年已经实现科室数字化，经过 7 年多工作实践，探索出一套使用与管理办法，现介绍如下。

1、做到日有清洁、周有维护、月有保养

每天开机前清洁设备,仔细检查是否完好；室内温度、湿度。定人定机严格交班。工程师在维修过程中做好陪查、陪修、陪维护，对设备的性能、操作、常见故障及重要部件的保养有了更深一步了解，做到大故障心有底、小故障靠自己。不仅节约了维修费用，更重要的是保证机器正常运行。

2、激光打印机是最终输出设备，其工作状态对图像质量有着至关重要的影响。机房内应保持通风干燥，室温应保持在 22℃左右。机器过滤网每季度清洁一次，每半年对其内部清洁保养一次。

3、各种设备分工到人并做好记录，一旦发现异常及时向技术组组长或科主任反映。

由于我们严格执行管理，定期维护保养，与同等使用设备的单位相比，明显减低了故障率，保证设备的正常运行。大大方便了患儿，也节约了支出费用。

PU-0087

儿童 ALL 缓解期软脑膜浸润一例

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目的 提高对儿童急性淋巴细胞白血病（ALL）缓解期软脑膜浸润的认识及早期诊断准确性。
方法 分析 1 例经脑脊液细胞学检查证实的儿童 ALL 缓解期软脑膜浸润的临床表现及 MRI 影像学特征，并进行治疗后随访。
结果 患儿系急性淋巴细胞白血病临床缓解期，近 1 月前出现头痛、无诱因呕吐等症状，可自行缓解。遂就诊于我院，行头颅 MRI 平扫仅表现为脑沟、脑裂变窄，T2FLAIR 序列上脑沟内呈线状高信号；MRI 增强扫描后局部脑膜增厚，且呈明显强化；经外院脑脊液细胞学检查及脑脊液流式检测结果显示可见大量幼稚细胞存在，且 $LAIP^{+}$细胞占脑脊液有核细胞的 85%，确诊为中枢神经系统白血病（CNSL）；经鞘内注射化疗药物治疗后，复查头颅 MRI 平扫表现为脑沟、脑裂较前增宽，T2FLAIR 序列上脑沟内异常信号影较前消失。
结论 ①由于白血病化疗药物不能有效通过血脑屏障，中枢神经系统成为白血病细胞的潜在“庇护所”，当患儿处于临床治疗缓解期时，白血病细胞更容易侵犯中枢神经系统，从而造成白血病的复发。②当患儿临床表现为颅高压及脑膜刺激征时，应警惕 CNSL 的发生，MRI 中 T2FLAIR 序列及增强扫描对于发现早期白血病细胞软脑膜浸润具有一定的价值，再结合脑脊液细胞学检查，可以进一步明确诊断。

PU-0088

婴儿鼻腔鼻软骨间叶性错构瘤 1 例

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鼻软骨性间叶错构瘤（nasal chondromesenchymal hamartoma，NCMH）是一种罕见的具有破坏性的良性肿瘤，我院于 2018 年 8 月收治 1 例，病理诊断婴儿鼻软骨间叶样错构瘤。
NCMH 是一种罕见的错构瘤性病变，好发于婴儿的鼻腔鼻窦区域。影像学上该病变可显示破坏性生长方式，高度怀疑恶性。该疾病需与发生在儿童鼻窦鼻腔具有重叠形态学特征的多种病变进行鉴别。NCMH 的正确认识和准确诊断对于避免误诊和采取适当的外科治疗有十分重要的意义

PU-0089

儿童脑动静脉畸形影像诊断新技术进展

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脑动静脉畸形（AVM）是儿童常见的血管性疾病，出血风险高，具有较高的致残率和病死率，目前该病的诊断主要依靠影像学检查。近年来发展的一些影像学新技术有助于提高儿童脑动静脉畸形的诊断符合率，包括 4D-DSA、4D-CTA、4D-MRA、动脉自旋标记（ASL）和磁敏感加权成像（SWI）。四维影像技术不仅可以清晰显示儿童脑 AVM 的供血动脉、瘤巢、引流静脉，还能显示血管从动脉早期到平衡期的完整的动态充盈过程；ASL 通过选择性标记血管，能够准确识别供血动

脉；SWI 对引流静脉高度敏感。各种新技术在儿童脑 AVM 的诊断中具有独特的价值。本文对各种新技术的研究进展进行综述。

PU-0090

新生儿衣原体肺炎影像学表现

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目的 ： 近年来新生儿期衣原体肺炎逐渐被人们重视，其临床表现不典型，本文回顾性分析新生儿衣原体肺炎临床及影像学特征，为临床诊断提供可靠的影像学检查。
方法 ： 回顾性分析 2009 年至 2019 年收治的临床诊断为衣原体肺炎的 11 例患儿的临床及影像学资料。 其中男 7 例、女 4；足月儿 10 例，早产儿 1 例。 发病年龄 3～20d。
临床 表现：咳嗽 7 例次，吐沫、呛奶各 8 例次，鼻塞、眼分 泌物增多各 2 例，气促、呼吸困难各 2 例，流涕、 纳差各 1 例。11 例患儿均无发热。体检肺部呼吸音增粗 11 例，肺部有少到中量湿啰音 5 例。11 例中顺产 9 例，剖宫产 2 例。
二、影像学检查方法 11 例患儿均行 x 线胸片及 CT 检查。
结果 ： 一、实验室检查 11 例患儿衣原体抗体 IgM 均为阳性，明确为沙眼衣原体感染 4 例，肺炎衣原体感染 7 例。其中 3 例母亲孕期有明确的阴道炎病史。

影像学表现：
(1)11 例患儿均有两肺过度充气；
(2)两肺广泛大小不等的结节影分布不均匀，粟粒肺样弥漫分布， 也可呈多发或散存分布，粟粒肺样弥漫分布占多数，分布最主要为背侧；结节影另一个特点是胸膜下分布较显著，本小结节可以融合成大 结节，还可以融合成片。
(3)可合并不同程度的肺内实变，斑片影的特点为两肺背侧近胸膜处片影较大，及散在胸膜下小片影，而靠近内带及肺门区片影大多较小或无，但无支气管充气象。
(4)支气管血管束增厚
(5)磨玻璃影，新生儿衣原体肺炎磨玻璃样改变相对较少，本研究中仅有 2 例。
(6)无胸膜渗出，无纵隔淋巴结肿大，此 2 种征象有助于与其他疾病鉴别。

结论 ： 新生儿衣原体肺炎临床症状不典型，但影像学表现具有一定的特征性，可以早期为临床提供诊断及预后随访。

PU-0091

低浓度等渗造影剂在儿童先天性心病 CTA 检查中的应用

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目的 阐述“双低”扫描技术在儿童先天性心病（congenital heart diseas,CHD）的应用价值；
材料和**方法** CHD 患儿 34 例，扫描条件：轴扫，管电压 70Kv，自动毫安，10-375mA，NI：22，探测器宽度 120-160mm，扫描时间 0.3s，Asir-V：50%，随机分为两组，A 组：17 例，碘海醇 350mgI/ml，用量 1ml/kg,B 组：17 例，碘克沙醇 270mgI/ml，用量 1ml/kg，选择升主动脉、降主动脉、肺动脉主干共同显示的层面及左心室层面，记录升主动脉、降主动脉、肺动脉主干、左心室

CT 值及同层面背部软组织标准差 SD，取 SD 值为背景噪声指数，记录每个病例的剂量长度乘积（DLP），并根据公式换算有效剂量（ED），由 20 年以上工作经验的两名副主任医师独立评片图像质量主观评分，标准：1 分，图像质量极差，无法用于诊断；2 分，图像质量较差，不能用于诊断；3 分，图像质量一般，可用于诊断；4 分，图像质量较好，可以满足诊断；5 分，图像质量非常好。图像评分≥3 分为符合临床诊断要求，2 分及以下不符合临床诊断要求，对两位阅片者阅片的一致性分析采用 Weighted Kappa 检验，**结果** A 组各兴趣区 CT 值均大于 B 组，差异有统计学意义（P<0.05），A 组各层面 SD 值与 B 组相当，差异无统计学意义（P>0.05），A 组 DLP：12.93±3.39，ED：0.48±0.15，B 组 DLP：14.13±2.34，ED：0.37±0.43，A 组与 B 组相当，差异无统计学意义（P>0.05），两位医师读片显示各病例图像质量良好，读片结果一致性良好；**结论** 低浓度等渗对比剂降低心脏大血管强化程度，但在同等用量的前提下减少碘摄入量，使用低浓度等渗对比剂可以保证图像质量并有效减少碘摄入量。

PU-0092

Bannayan-Riley-Ruvalcaba 综合征影像学观察及文献复习

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目的 探讨 Bannayan-Riley-Ruvalcaba 综合征的影像学特点。
方法 回顾性分析 1 例 BRRS 综合征患者的临床及影像学资料。
结果 患者男，6 月。查体见大面积青紫色肿块，触及多处结节样改变，局部稍压痛。阴茎及阴囊散在色斑。胸部 X 线见肋骨膨胀样密度减低。CT 平扫及 MR 平扫见双侧颈肩部、上肢、胸腹壁及背部、纵膈、双侧胸腔多发软组织弥漫增厚、结节、肿块影，MR 呈长 T1 混杂长 T2 信号，内见小流空血管影，其中部分增厚软组织中见小结节状脂肪信号影，背部、脊柱旁、双侧胸腔近背侧胸膜区软组织间脂肪成分明显增多， T2 压脂序列呈低信号，双肺膨胀不全，多发肋骨膨胀样骨质破坏，脾脏 MR 信号不均，双侧胸腔少量积液。头颈部 MR 平扫见头颅增大，小脑扁桃体下疝。基因检测示 PTEN 基因突变。BRRS 综合征是一种罕见的常染色体显性遗传性疾病，部分由 PTEN 基因突变或缺失所致。主要特征为巨头、生殖器着色斑病和肠息肉病。其他特点包括血管畸形、脂肪过多症、多发软垂疣等。本例患者出现典型的巨头、生殖器着色斑、软组织广泛多发脉管畸形，脂肪增多、脂肪瘤、多发软垂疣。此外该病例合并小脑扁桃体下疝畸形，目前尚无此合并症报道。X 线价值有限。CT 有辐射性，当可疑合并肺部、骨关节病变时，可选用。MR 作为观察软组织病变的最佳检查方法。本例患者全身多发脉管畸形，部分呈弥漫浸润型，表现为软组织增厚，部分呈团块型，T2 压脂序列观察为佳，表现为多发大小不一类圆形高信号伴混杂低信号，可见流空血管影。MR 对明确脂肪增多、脂肪瘤具有重要价值， T2 压脂序列呈信号减低，该例患者可见皮下软组织间隙、脊柱周围广泛脂肪增多。该患者双侧胸腔内背侧胸膜区见明显增多脂肪信号及软组织结节，导致双肺膨胀不全，合并肺炎，此表现在既往病例中尚未见报道。
结论 BRRS 综合征是一种罕见多系统受累疾病，影像学检查尤其 MR 对明确多系统受累情况具有重要价值。

PU-0093

Morgagni 疝四例报道并文献复习

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[摘要] 目的 探讨先天性胸骨后膈疝影像学检查（胸片、CT、消化道造影）诊断价值。 材料与方法 收集我院 2016 年 9 月~2019 年 1 月接诊的 4 例先天性胸骨后膈疝患者的影像学资料进行回顾性分析，所有病例均经外科手术证实。 结果 其中男 2 例，女 2 例，年龄 6 月~6 岁。4 例患者中左侧膈疝 1 例，右侧膈疝 1 例，双侧膈疝 2 例。疝内容物均为结肠。 结论 先天性胸骨后膈疝行影像学检查，尤其是薄层螺旋 CT 扫描或消化道造影能够早期诊断，指导临床治疗，是提高诊断率、减少误诊的可靠手段。

PU-0094

特发性婴儿动脉钙化症 1 例

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特发性婴儿动脉钙化症（Idiopathic infantile arterial calcification, IIAC）是一种罕见的常染色体隐性遗传疾病，迄今国内外报道的病例约 200 例。IIAC 病情进展迅速，约 85%的患儿在出生 6 个月内死亡。本文报道 1 例依靠 CT 确诊的特发性婴儿动脉钙化症的患儿，并就相关问题进行讨论。

PU-0095

罕见先天性支气管-胆管瘘合并气管-食管瘘 1 例并文献复习

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目的 主要探讨罕见先天性支气管-胆管瘘合并气管-食管瘘影像诊断方法及相关文献复习，提高对该病的进一步认识。**方法** 对罕见先天性支气管-胆管瘘合并气管-食管瘘 1 例的临床特征、影像诊断和治疗方法进行了论述，另外查阅国内外关于气管瘘疾病的相关研究，对这些研究进行了总结复习。**结果** 纤维支气管镜检查见较多黄色分泌物持续涌出，反复吸引不能完全清除。上腹部 MR 平扫+DWI+MRCP：肝门区见一长 T1、长 T2 液体信号条状影向上走行达食道水平偏右前方，长约 3.5cm；扫及食道末端偏右上方亦可见一条带状影，似与食道相通，向右上方走行至右下肺内，长约 4.5cm。自支气管异常开口处经纤维支气管镜分别注入气体及碘剂后行 CT 扫描，结果食道及胃腔内见高密度碘剂；肝内胆管内见低密度气体影。另外，患儿右肺实变和不张，右肺中叶支气管扩张。手术所见：术中支气管-胆道瘘瘘道造影，示支气管瘘道向膈肌下方与胆道相连，瘘管直径约 0.6cm。可见肝内外胆管显影，术中见食管下段与支气管-胆道瘘管粘连较紧密，分离困难，予处理，于支气管远端结扎、缝扎瘘管满意，切断瘘管，分离远端瘘管时可见瘘管与食道粘连紧密，分离时食道浆膜破损，见少许黄色液体渗出，予浆膜层修补缝合，考虑此处为气管食管瘘处，诊断：支气管-胆管瘘合并气管-食管瘘。**结论** 纤维支气管镜、MRCP 均能提供有效的诊断价值，但于支气管异常开口处经纤维支气管镜分别注入气体及碘剂后行 CT 扫描，若食道或胃腔内见高密度碘剂；肝内胆管内见低密度气体影，则更具有特征性。

PU-0096
多层螺旋 CT 在儿童叶外型肺隔离症诊断中的应用

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目的 探讨多层螺旋 CT 在肺隔离症诊断中的应用价值
方法 回顾性分析 61 例经手术病理证实为叶外型肺隔离症患儿的多层螺旋 CT 表现。所有患儿均行 CT 平扫及增强检查，并行图像后处理。
结果 多数位于下肺叶脊柱旁，少数位于上腔静脉后方，前纵膈、肺门下方及膈肌内，异位于腹腔 2 例，腹膜后 1 例，颈部 1 例，合并先天性肺气道畸形 47 例，支气管源性囊肿 3 例，膈疝 4 例，漏斗胸 6 例，后纵隔神经母细胞瘤 2 例，先心病脊柱侧弯伴椎体及附件畸形 2 例。叶内及叶外同时存在的隔离肺 1 例，该病例同时合并食管囊肿及胃重复畸形。颈部隔离肺合并交通性支气管肺前肠畸形。
结论 多层螺旋 CT 增强及后处理能能够清晰显示叶外型隔离肺的供血动脉、回流静脉及伴发畸形，为儿童叶外型隔离症的首选检查方法。

PU-0097
先天性肺静脉异位引流的 CTA 影像表现

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目的 分析 CTA 先天性肺静脉异位引流的诊断价值。
方法 对我院收治 60 例先天性肺静脉异位引流的心脏 CTA 检查进行分析，分别进行大血管重建。
结果 心脏大血管重建均可正确诊断肺静脉异位引流，完全性肺静脉异位引流 45 例，其中心上型 19 例，心内型 9 例，心下型 15 例，混合型 2 例；部分型肺静脉异位引流 15 例。
结论 心脏大血管 CTA 能准确诊断肺静脉异位引流及其分类，对临床手术方式提供帮助。

PU-0098
主动脉弓离断 1 例

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主动脉弓离断(Interrupted Aortic Arch,IAA)是指升主动脉与降主动脉之间连续性中断，表现为完全中断或存在闭塞的纤维条索组织或闭塞管腔结构，由胚胎发育时期 6-7 周时，第 4 对动脉弓未发育或发育障碍所致[1]。IAA 为先天性心脏病中少见的一种，约占所有先心病的 1%，在活产婴儿中约占 0.003%-0.02%，常合并有其他心血管畸形，常见合并的畸形为动脉导管未闭、室间隔缺损、主-肺动脉窗，永存动脉干、右室双出口等畸形，当同时合并“主动脉弓中断-动脉导管未闭-室间隔缺损”时，被称为主动脉弓离断三联征[2]。

PU-0099
双向格林术后选择足背静脉注射对比剂完成心脏 CTA 检查的可行性探讨

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[摘 要]**目的** ： 婴幼儿复杂先心双向格林术后选择足背静脉注射对比剂完成心脏 CTA 检查的可行性探讨 **方法** 回顾性分析 2010 年 1 月-2019 年 6 月在我院行双向格林术 30 例术后行双源 CT 心脏 CTA 检查的先天性心脏病患儿，年龄 3 个月-12 岁,其中小于 1 岁 8 例,1～3 岁 15 例,3～14 岁 17 例;体重 5～33kg;患者统一使用碘克沙醇对比剂，对比剂量 1.0-1.5ml/kg 流率 0.3-2.0ml/s 从足背静脉注入对比剂。**结果** :患儿全部完成心脏 CTA 检查，心脏结构显示清晰.**结论** 双向格林术后采用足背静脉注射对比剂能够很好的完成心脏 CTA 检查。

PU-0100
基于 lightspeedVCT 的儿童胸部 CT 扫描优化

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目的 探讨基于 GE 公司 lightspeedVCT 的儿童胸部 CT 扫描的优化方法，以期实现儿童 CT 扫描更高效率、更低剂量。
方法 以 GE 公司 lightspeedVCT 为检查设备，行儿童胸部 CT 平扫，检查技师在现行条件（该设备 2008 年投入使用，日均检查量约 200 人次，硬件和软件部分检查技师无法改变）下通过参数调节、体位设计等方法实现扫描更优化。
结果 通过以下调节可以实现儿童胸部 CT 扫描优化：
（1）标准体位。头向外，足先进，双手上举置于头部两侧，置于检查床中心；
（2）Z 轴短扫描范围。
（3）宽射线束准直。射线束准直用 40mm 代替 20mm，可以降低 CTDI。
（4）适当层厚。根据患儿情况选择 5mm 或 10mm。
（5）大螺距。有报道指出在螺距不大于 1.5 的情况下是不会影响病灶检出的。
（6）最短（机架）旋转时间。最短旋转时间可以最小化运动迷糊和伪影，尤其是纵膈处的重叠伪影。
（7）kVp。据患儿情况选择 80、100kVp，一般不超过 100kVp。
（8）mA。一般情况下选择自动管电流控制，通过设置 mA 范围以及噪声指数/剂量指数即可；若体位不正、没有居中或其他情况则用手动 mA 值。
（9）噪声指数/剂量指数调节。当前使用 10-12，根据具体情况适当加减。
（10）小 FOV。默认矩阵 512*512 情况下，小 FOV 空间分辨率更高，所需剂量更小；
（11）采用迭代重建算法。该算法相较于以往滤波反投影算法所需剂量更低。
（12）开启薄层和高分辨后重组，以弥补因层厚较大或剂量较低可能对诊断带来的不利影响。
结论 基于现有设备条件，通过摆位标准化和扫描范围、射线束准直、层厚、螺距、kVp、mA、旋转时间、FOV 等参数调节，可以实现儿童胸部 CT 扫描的更高效率和更低剂量。

PU-0101

肺母细胞瘤 1 例

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肺母细胞瘤（pulmonary blastoma，PB）又称肺胚胎瘤或胚胎性癌肉瘤，是来源于肺或胸膜的恶性肿瘤，临床罕见，病情发展迅速。发病率占肺原发恶性肿瘤的 0.25~0.5%[1]，肺母细胞瘤病变在上下、左右、性别以及年龄上无特殊性，可发生于任何年龄，发病年龄集中于 35-78 岁，平均 52 岁[2]，男性居多，大多数有长期吸烟史。临床表现无特异性，早期可无任何症状，中晚期表现为咳嗽、咳痰、咯血、胸痛、胸闷、呼吸困难，当肿瘤进展至压迫气管、颈静脉、侵犯胸膜以及心包时才出现相应症状[3]。本例患者以发热、咳嗽及颈静脉受压迫致声音嘶哑、颈静脉怒张为主要表现。

PU-0102

不同权重下多模型迭代算法（ASIR-V）在“双低”儿童胸部 CT 图像质量的影响

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目的 探究不同权重迭代重建技术（ASIR-V）对“双低”（低剂量、低 kVp）儿童胸部 CT 图像质量的影响。**方法** 随机选取 19 例儿童胸部 CT 平扫;年龄（5.82±3.47）排除标准：患有心脏病、胸廓畸形、胸部肿瘤及肥胖患儿。采用 GE Revolution CT，扫描条件与**方法** 嘱患儿自由呼吸，从胸廓入口扫至肺底，80kVp，自动毫安技术（ATCM），噪声指数（NI）为 14，前置 Pre-ASIR-V 为 0%，对图像进行不同权重 Post-ASIR-V 重建（从 0%-100%，重建间隔为 10%），重建层厚为 0.625mm，共 11 组不同权（ASIR-V）图像；测量并计算每组图像胸廓入口、气管分叉及膈肌层面感兴趣区的皮下脂肪、竖脊肌及降主动脉的 CT 值及 SD 值，计算 SNR（CT 值/SD 值）并记录 CTDI、DLP，并计算有效辐射剂量 （ED）；统计学分析：由两位住院医师采用双盲法对各组图像进行 5 分法主观评分（≥3 分被认定为临床可诊断）采用单因素方差分析比较 11 组间各组织的 CT 值及 SNR 进行统计学分析，主观评分：采用 Kappa 检验两名医生一致性良好，秩和检验对各组图像进行主观评价。**结果** 随着 Post-ASIR-V 权重由 0%~100%，SD 值逐渐降低，SNR 逐渐增加，且各组间差异具有统计学意义（p<0.05）;Post-ASIR-V 权重在 60%时图像质量最佳；有效辐射剂量较常规小孩胸部辐射剂量减少了 60%；**结论** “双低”儿童胸部 CT 扫描中，Post-ASIR-V 重建可显著降低图像噪声，提高图像质量，采用 60% Pos- ASIR-V 重建算法图像质量最好。**临床相关性与应用：**不同权重多模型迭代算法（ASIR-V）对“双低”儿童胸部 CT,采用 60% Post-ASIR-V 重建算法图像质量最好，值得临床借鉴和推广应用。

PU-0103

儿童多发性大动脉炎治疗前后 CT/MR 表现

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目的 讨论儿童多发性大动脉炎治疗前后 CT/MR 表现特点。
方法 回顾性分析临床诊断多发性大动脉炎 24 例患儿治疗前后 CT/MR 检查表现。治疗前行 CT 检查 19 例，MR 检查 5 例，经内科综合治疗后行 CT 检查 22 例，MR 检查 2 例。
结果 儿童多发性大动脉炎表现为受累主动脉及主要分支动脉管壁增厚，管腔狭窄（24 例）。最常受累主要分支动脉为左锁骨下动脉（CT 检查 18 例，MR 检查 4 例），左颈总动脉（CT 检查 8 例，MR 检查 4 例）。经内科综合治疗后受累动脉管腔狭窄均未进展加重。
结论 CT/MR 均是诊断儿童多发性大动脉炎的有效影像检查方法，对于治疗后随诊有其临床价值。

PU-0104

128 排螺旋 CT 在小儿胸部低剂量扫描的应用

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目的 运用 128 排螺旋 CT，探寻小儿胸部低剂量扫描的最优扫描参数，获得在满足诊断要求的图像前提下，尽可能减低受照着的辐射剂量。方法 (1)预实验：用体模做预实验 A 组：100kv,100mAs；B 组：100kv,80mAs；C 组：100kv,50mAs；D 组：100kv,30mAs；E 组：100Kv,15mAs，其他扫描参数：准直器宽度 64*0.625，螺距 0.6，矩阵 512*512，层厚 5mm,间隔 5mm。用 idose 技术处理，得到达诊断标准且辐射剂量最低参数：100kv，30mAs。
采集从 2019 年 3 月 1 日-2019 年 5 月 31 日来我科做胸部增强 CT 的婴幼儿（从 1m 至 3 岁）90 人，平扫为低剂量组：100kv，30mAs,按年龄分为 3 组：A 组 0<year≤1y;B 组 1y<year≤2y;C 组 2y<year≤3y，每组 30 人。增强以常规扫描条件扫描。排除标准为体重超过各年龄组平均数 30%的患儿；定位扫描发现有大量胸腔积液、肺实变、大块实质性肿瘤的患儿。标准组为回顾分析既往以常规条件 100kv,100mAs 扫描的病人资料，A 组 0<year≤1y;B 组 1y<year≤2y;C 组 2y<year≤3y，每组 30 人。采用 PHILIPS Brilliance 128 排 ICT 进行检查，患儿取仰卧位，平静呼吸，熟睡或镇静后进行扫描。扫描范围从肺尖到膈底 结果 本实验表明，随着管电流的降低，受照者接受的辐射剂量显著降低，图像质量随管电流的降低而降低。预实验得到以 100kv,30mAs 为扫描参数时，辐射剂量显著降低，而图像质量达诊断要求。
结论 PHILIPS 128 排螺旋 CT 在小儿胸部扫描时，运用 idose 技术，可以用低扫描参数 100kv，30mAs 时，使受检者既降低了辐射剂量，又能达到诊断要求。

PU-0105

支气管肺发育不良（BPD）的 X 线诊断价值

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目的 探讨支气管肺发育不良（bronchopulmonary dysplasia，BPD）的 X 线表现，旨在提高对该病的认识、早期诊断及鉴别诊断能力，为临床 BPD 的早期防治提供诊断依据。
方法 回顾性分析我院新生儿重症监护病房 20 例支气管肺发育不良患儿的临床及 X 线表现，20 例患儿临床症状表现不一，无明显临床症状 4 例，呼吸急促、咳嗽 6 例，早产儿、新生儿肺透明膜病 10 例，所有患儿均拍摄床旁胸部正位片,其中 6 例进行了胸部 HRCT 检查.
结果 20 例 X 线床旁胸片患儿，显示两肺纹理增多、模糊、紊乱，片絮状模糊影 11 例，不规则实变影 6 例，两肺透光度局限性增高 12 例，两肺见斑片状条索状影及多囊状透亮影 6 例。6 例行

HRCT 检查患儿，表现有毛玻璃样病变 3 例，斑片状模糊影 2 例，不规则致密片状影 12 例，条索状致密影 3 例，多囊状改变 1 例，肺气肿 3 例。
结论 X 线胸片是诊断 BPD 的首选，HRCT 对 BPD 诊断有一定的特征性表现，结合病史及动态观察，X 线检查可以对 BPD 先期诊断做出提示,X 线诊断对 BPD 患儿的早期临床诊断治疗具有重要价值。

PU-0106
儿童呼吸机相关性肺炎 X 线诊断与临床的相关性分析

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目的 探讨呼吸机相关性肺炎(VAP)发病原因、病理基础、X 线诊断、临床的相关性并提高对本病的认识。方法 回顾分析 2015～2018 年青海省妇女儿童医院 PICU 呼吸机治疗的 135 例危重患儿的临床资料。方法 符合呼吸机相关性肺炎诊断标准的 VAP 患者 135 例，均在气管插管或气管切开前及 48h 后行影像学检查，对病变的分布、形态、密度等进行观察、分析。**结果** 135 例病例中，呼吸机相关性肺炎(VAP)发生。

PU-0107
新生儿气胸的床旁 X 线影像学特征分析

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目的 分析新生儿气胸的床边 X 线检查影像学表现，结合患儿临床特征，以提高对新生儿气胸的认识与诊断，为临床治疗提供针对性的指导与帮助。**方法** 收集本院 2016.10-2019.04 收治的 26 例新生儿气胸患儿的床旁 X 线影像资料，所有患儿均行胸腹仰卧前后位检查，且对胸部 X 线表现随访复查。 **结果** 26 例新生儿气胸患儿中，医源性气胸 2 例（ 7.7% ），自发性气胸 5 例（ 19.2% ），病理性气胸 19 例（ 73.1% ）。26 例新生儿气胸患儿中，单侧气胸 18 例（69.2%），双侧气胸 8 例（30.8%），共 34 侧气胸，其中气体集中在前胸壁 8 例（23.5%），纵膈旁 10 例（29.4%），局限于膈上 3 例（8.8%），外侧气胸 5 例（14.7%），内侧气胸 2 例（5.9%），混合型 6 例（17.6%）。 **结论** 新生儿气胸床边 X 线表现多样化，气体可局限于胸腔多区域，常表现为“局部异常透亮征”、“深窦征”、“纵隔心缘清晰征”等。X 线检查过程中要提高优片率，准确识别气胸征象，分析气胸的具体分布及形态，减少误诊及漏诊。

PU-0108
新生儿肺透明膜病的 X 线诊断应用价值

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目的 探讨胸部 X 线平片在新生儿肺透明膜病的应用价值。**方法** 回顾性分析本院 20 例经临床证实新生儿肺透明膜病患儿 X 线及临床资料，所有患儿经肺表面活性剂经气管导管治疗并治愈出院，其中早产极低出生体重 5 例，早产适于胎龄儿 15 例。分析 X 线影像学表现特性。**结果** 20 例中，表现为肺野透亮度普遍降低 75%，以两肺内中下野广泛细颗粒状或网状密度增高影 60%，2 例可见支气管充气征 5%；18 例纵膈、心影及双膈轮廓模糊 90%；3 例两肺野呈致密“白肺”改变 5%。**结**

论 早产极低出生体重以及早产适于胎龄儿，X 线表现为肺野透亮度普遍降低，纵膈、心影及双膈轮廓模糊征、白肺征为肺透明膜病特征性影像学改变，值得临床关注。

PU-0109
低剂量前门控 CT 检查在儿童先天性心脏病中的应用

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摘要：
目的 探讨利用低剂量、前门控及迭代算法的 CT 检查在儿童先天性心脏病诊断中的应用价值。**方法** 利用 GE Revolution 256 CT，分别采用 80KV、自动毫安和 100KV、自动毫安对两组先天性心脏病患儿进行心脏 CTA 检查，评估图像的质量，利用 SPSS 17.0 对检查辐射数据进行统计学分析，得出结论。**结果** 图像质量评分实验组为 4.50±0.67，对照组为 4.77±0.54，实验组评分略低于对照组，但图像质量可以满足临床医生的要求。辐射剂量统计显示实验组 CTDIvol 为 1.179±0.713，对照组 CTDIvol 为 1.721±0.668，实验组 DLP 为 18.083±11.433，对照组 DLP 为 33.358±8.020，实验组 ED 为 0.493±0.279，对照组 ER 为 0.863±0.342。实验组的各项辐射指标均明显低于对照组。**结论** 80KV、自动毫安秒的低剂量、前门控及迭代算法的 CTA 检查，可以有效的降低患儿所接受的辐射剂量，同时可以满足临床对检查图像的要求，具有较好的应用价值。

PU-0110
幼儿胸部 CT 扫描采用智能管电压技术的体会

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目的 智能最佳管电压（CARE kV）技术和自动管电流调控技术(ATCM) 已成为剂量优化的有效方法，笔者尝试探索针对幼儿胸部的 CT 低剂量优化扫描方案。**方法** 患儿共 60 例，随机平均分成两组：A 组 30 例，男 19 例，女 11 例；B 组 30 例，男 17 例，女 13 例。其中 30 例采用管电压 100 kV(A 组)，30 例采用管电压 80kV(B 组)；另搜集既往接受固定管电流(100 kV/60mAs) 低剂量扫描检查幼儿 30 例(C 组) 作为对照。扫描参数: C 组，采用传统降低管电压及管电流的低剂量扫描方式，100 kV，60 mAs; A 组，100 kV，管电流采用自动管电流调节技术; B 组，80 kV，管电流采用自动管电流调节技术; 余扫描参数一致，所有图像均进行多平面重组和容积再现等后处理成像。**结果** 所有病例的图像质量评价均为 2 分以上，均能够满足诊断要求。A 组 CTDIvol 平均（1.20±0.05）mGy、DLP 平均（25.23±1.34）mGy·cm，ED 平均（0.40±0.07）mSv；B 组 CTDIvol 平均（1.48±0.03）mGy、DLP 平 均（32.75±1.41）mGy·cm，ED 平均（0.52±0.06）mSv，A 组 ED 比 B 组下降了 23%，差异有统计学意义（P<0.05）。
结论 适当进行管电流的补充以降低辐射剂量，提高图像质量，同时自动计算 CTDIvol 和 DLP。CARE Dose 4D 扫描技术可降低剂量 66.6%，在幼儿胸部扫描中， 采用自动管电流调节技术和智能最佳管电压技术，不但能有效降低辐射剂量，而且不影响图像质量;低电压联合 ATCM 技术可以广泛应用于儿童胸部低剂量扫描。

PU-0111
高 IgE 综合征肺部影像学表现 1 例及基因分型

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目的 报道一例基因确诊高 IgE 综合征肺部 CT 表现。 方法 分析一例确诊高 IgE 综合征患儿的临床及影像资料。 结果 胸部 CT 平扫示右肺中叶及下叶后内基底段团状高密影，右肺下叶外基底段片状高密度影，右门区团状高密度影。与院外片比较：右肺下叶外基底段囊状透亮影及片状高密魔影较前明显减少，右肺门区高密度影较前减少，右肺中叶及下叶后内基底段新增片状高密度影，考虑肺炎，金葡菌感染可能；结合患儿有反复皮肤冷脓肿的临床病史，考虑符合高 IgE 综合征肺部表现。 结论 高 IgE 综合征(hyper IgE syndrome，HIES)，又称 Job’s 综合征，是一种临床罕见的原发性免疫缺陷性疾病，以血浆 IgE 病理性增高(>2000IU / ml)为主要特点。湿疹、皮肤脓肿和肺部反复感染为主要临床特征，还可累及其他系统，包括骨骼系统、结缔组织系统、心血管系统等。基因突变是导致 HIES 发病的主要原因。目前已报道的 HIES 基因突变有三种，分别是 STAT3、DOCK8 和 Tyk2 基因突变。根据这三种基因突变的表型，可将 HIES 分为两种类型，即常染色体显性遗传类型(autosomal-dominance hyper-IgE syndrome，AD-HIES)和常染色体隐性遗传类型(autosomal-recessive hyper-IgEsyndrome，AR-HIES)，其中前者致病基因为 STAT3 基因，后者致病基因为 DOCK8、Tyk2 基因。由于基因表型的不同，两者在临床症状及发生机制方面存在显著差异。AD-HIES 感染症状主要为金葡菌所致的肺炎；AR-HIES 感染症状主要为皮肤病毒感染。本例患儿为 STAT3 杂合突变，为 AD-HIES，掌握其肺部影像表现及临床症状，对疾病的后期发展及临床治疗具有一定指导意义。

PU-0112
婴幼儿及儿童患者在 CT 增强扫描时镇静剂的选择

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目的 ：
婴幼儿及儿童患者在 CT 增强扫描时镇静剂的选择
方法 ：
回顾分析 2019 年 1 月至 8 月山西省儿童医院接受 CT 增强扫描的患儿 476 人次中，对于疾病种类对增强参数的要求所需镇静剂的选择。
结果 ：
增强扫描的 476 人次中需要镇静 385 人次，镇静患儿中水合氯醛镇静 385 人次，其中成功 309 人次，失败 76 人次。
成功的 309 人次中腹部增强 283 例，颈部增强 15 例，头部增强 8 例，心脏及冠脉 3 例。
失败的 76 人次中伴有孤独症、狂躁症等精神类疾病患儿 5 例，腹部增强 11 例，心脏、冠脉 60 人次。
失败的 76 人中隔天行鲁米那镇静成功 43 人，余 17 人请麻醉科依托咪脂或丙泊酚镇静皆成功。
分析成功和失败的患儿的增强部位的扫描参数及造影药剂的速率参数发现，增强部位对速率及单位浓度要求不高的患儿不容易失败，对速率单位浓度要求较高的部位容易失败，伴有精神类疾病患儿容易失败。
结论 ：

对速率及单位浓度较高的检查部位行更高等级的镇静剂有助于检查成功率的提高。但依托咪酯会偶有肌颤，患儿会偶有不自主的肢体颤动，所以注意对患儿的束缚以减少运动伪影。丙泊酚有可能有呼吸抑制和血压降低的风险，所以在使用丙泊酚和依托咪脂的时候必须有患儿的主管医师和麻醉医师在场并准备好抢救设备以降低患儿的检查风险。

PU-0113
新型 3 D 聚吡咯壳聚糖明胶导电复合材料研发及在心脏组织工程中的应用

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先天性心脏病（Congenital Heart Diease ,CHD）患儿的出生率已经有明显的下降；然而有研究表明，包括中国在内的亚洲地区，CHD 出生率高依然 0.9%，是严重威胁儿童健康成长的疾病之一，给个人、家庭、社会带来沉重负担;近年来心脏组织工程是一种修复心脏缺损强有力手段之一。现阶段很多非导电生物材料（如尼龙、海藻酸）可用于修复心脏的缺损或使心脏梗死区稳定和防止心脏扩张。然而，这些生物材料导不能满足心脏电传导需要，急需研发新材料来解决上述问题。本研究拟以化学氧化还原法和交联法合成 3D 复合导电材料聚吡咯壳聚糖明胶（polypyrrole-chitosan-gelfoam，Ppy-Chi-Gel）；在体内外充分研究其理化特性基础上；构建 3D 类心肌组织并应用与大鼠右心室缺损模型中，评估其体内生物安全性以及对心脏缺损修复的有效性，通过细胞存活、局部组织电阻和新生血管等研究评估其修复心脏缺损可能机制；本研究首次将具有生物活性导电补片材料应用于心脏缺损修复研究，可能成为心脏植入材料理想候选材料，拓展心脏组织工程的应用范围。

PU-0114
双源 Force CT 在婴幼儿及儿童先天性心病中的应用

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目的 探讨双源 Force CT 低剂量扫描在婴幼儿及儿童先天性心脏病中的临床应用价值。
方法 收集我院 2018 年 8 月至 2019 年 7 月经手术证实为先天性心病患儿 101 例。使用 Siemens Force CT 行心脏 CTA 检查，Turbo Flash -CARE dose 低剂量扫描。所有患儿均于 CT 检查后 1 周内经手术证实，计算检出畸形的准确率。根据辐射有效剂量转换系数 κ 值不同将患儿年龄分为四组，包括 0-1 岁组别 70 例，1-2 岁组别 14 例，2-5 岁组别 10 例，5-10 岁组别 7 例。记录患儿 CT 辐射剂量长度乘积（DLP）并计算出有效辐射剂量。所有图像均由两位高年资医师采用双盲法对图像治疗质量进行主观评分。本研究拟采用检出畸形准确率、有效辐射剂量及图像质量主观评分这 3 个指标来探究双源 Force CT 低剂量扫描对婴幼儿及儿童先心病的临床诊断价值。
结果 使用双源 Force CT 低剂量扫描所得图像诊断结果与手术后诊断的符合率为 95.4%，其中心内畸形检出率为 92.86%，心脏与大血管连接畸形及心外畸形检出率为 98.5%，有效辐射剂量分别为 0.40mSv、0.46mSv，0.34mSv，0.38mSv。图像质量良好的占 90.32%。
结论 双源 Force CT 低剂量扫描技术能清晰显示复杂性先天性心脏病的心内、外畸形，并能有效地降低辐射剂量，且图像质量良好，能够对病变进行全面、 清晰、准确的展示，为临床提供准确的术前诊断。

PU-0115

婴幼儿膈疝易误诊为膈膨升的影像学分析

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目的:通过了解婴幼儿膈疝与膈膨升的影像学特点,并探究膈疝误诊为膈膨升的原因。方法:回顾性分析我院 2018 年 9 月至 2019 年 6 月收治的接受 X 线检查并发生膈疝误诊膈膨升的 28 例患儿的临床资料。结果:①膈疝对比膈膨升患儿有较明显临床症状; ②膈疝与膈膨升具有相似的 X 线表现,平片、钡餐透视及 CT 等多种检查可减少误诊;③手术证实婴幼儿膈疝易伴发隔离肺族的发生④膈疝与膈膨升发病年龄有显著差异。**结论** 临床上须结合多种影像技术对婴幼儿膈疝进行诊断,有助于减少误诊率,指导临床早期干预与针对性治疗。

PU-0116

儿童硬化性肺细胞瘤 1 例

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方法 患儿，男，10 岁。反复腹痛、发热 10 天，咳嗽、胸痛 4 天入院。查体：一般情况差，口周稍青紫，呼吸费力，三凹征（+），胸廓不对称，左侧高于右侧，左下肺呼吸音低，余肺呼吸音粗；辅助及实验室检查：胸部 CT 检查：两侧肺炎，左下肺大片实变，合并胸膜炎两肺病灶内多发空腔样改变。血细胞分析：白细胞计数 14.12×10^9/L，淋巴细胞百分率 21.30%，中性粒细胞百分率 68.90%，红细胞计数 3.77×10^12/L，血红蛋白 104.00g/L，血小板计数 443×10^9/L，超敏 C 反应蛋白 149.21mg/L。降钙素原：0.63ng/ml。电解质、肝肾功、心肌酶：谷丙转氨酶 140U/L，谷草转氨酶 133U/L，余未见明显异常。

手术及病理：左侧胸腔内粘连严重，左下肺可见多发肺囊肿存在。病理检查：肺泡间隔充血、增宽，慢性炎细胞浸润。肺内可见多发结节，结节内肿瘤细胞呈实性、乳头状、腺样排列，小血管丰富，瘤细胞圆形，部分胞浆嗜酸性，部分空泡状，局部间质化，可见砂砾体样钙化，局部乳头状增生，上皮核大深染。胸膜增厚、血管增生。病理诊断：左肺下叶硬化性肺细胞瘤。

讨论：硬化性肺细胞瘤临床上较少见，是一种发生于肺部的良性真性肿瘤。硬化性肺细胞瘤临床及影像学表现虽均无特异性，但边界清楚的胸膜下结节或肿块，无明显分叶及毛刺，周围无卫星灶，瘤内见低密度区和钙化，有明显强化是硬化性肺细胞瘤的典型 CT 表现。确诊仍有赖于病理和免疫组织化学。本例患儿胸部 CT 扫描未做增强检查，影像表现不具特征性，以及儿童硬化性肺细胞瘤比较罕见，影像科医师对本病认识不够，因此误诊为其他肺部疾病。通过加强硬化性肺细胞瘤的认识和学习，提高本病的术前诊断率。

PU-0117

CT 在先天性心脏病肺静脉畸形引流的诊断价值

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研究背景

研究双源 CT 血管成像在先天性心脏病肺静脉畸形引流的应用价值。

评价方法

选择广州军区总医院 256 例先天性心脏病患者，其中诊断为肺静脉畸形引流的患者 40 例（其中男 19 例，女 21 例，最大者 61 岁，最小者 3 个月），回顾性分析 40 例患者的 DSCTA 资料，常规行多平面重组、薄层最大密度投影和容积再现等后处理，并与超声及手术结果进行对照。

讨论

40 例肺静脉异位引流患者均能在 DSCTA 上显示，包括 28 例完全性肺静脉异位引流和 12 例部分型异位引流患者，其中一例伴有无脾综合征。其中 36 例 DSCTA 准确显示了肺静脉畸形部位及引流位置，诊断准确率 95.4%，并可显示合并心内畸形、心外大血管及其它内脏畸形。超声对心内型肺静脉异位引流诊断敏感性较好，但心外型及部分型肺静脉异位引流容易漏诊。DSCTA 诊断敏感性高于经胸超声检查。

结论

DSCTA 能准确诊断肺静脉畸形引流，并能对患者病情进行综合评估，诊断准确率高于超声，对指导临床治疗及手术具有重要价值。

PU-0118

64 排螺旋 CT 后处理对动脉导管未闭的应用

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动脉导管未闭（PDA）

动脉导管是胎儿时期肺动脉与主动脉间的正常血流通道，由于此时肺呼吸功能障碍，来自右心室的肺动脉血经导管进入降主动脉，而左心室的血液则进入升主动脉，故动脉导管为胚胎时期特殊循环方式所必需。出生后，肺膨胀并承担气体交换功能，肺循环和体循环各司其职，不久导管因废用闭合。如持续不闭合而形成动脉导管未闭

临床表现　主要取决于主动脉至肺动脉分流血量的多少以及是否产生继发肺动脉高压和其程度。轻者可无明显症状，重者可发生心力衰竭。常见的症状有劳累后心悸、气急、乏力，易患呼吸道感染和生长发育迟缓。晚期肺动脉高压严重，产生逆向分流时可出现下半身发

目的

CT 在心血管病变领域中的应用越来越广泛，利用 64 排螺旋 CT 三维技术分析动脉导管的与形态、大小，证实其三维技术在评估 PDA 中的价值。

方法

使用美国 GE 螺旋 CT ，描层厚 3.75mm，重组厚度 0.625mm，扫描条件：电压 100~120kV，电流 100~300mA，用高压注射器从肘正中静脉注射非离子型对比剂，剂量 2ml/kg，如要观察右心室及右心房，则在动脉晚期进行第 2 期扫描，可避免右心室及右心房内对比剂浓度不均的现象。采用多平面重（multipleplannar reformation，MPR）、容积再现（volume rendering，VR）及血管（vesel analysis,VA)软件从形态分类、大小等方面对 PDA 进行评估 .

PDA 是指主动脉和肺动脉之间的一种先天性的异常通道，多位于主动脉狭部和左肺动脉根部之间，是最常见的先天性心脏病之一，约占先天性心脏病的 9%~12%。如不及时治疗，则有可能转化为阻力性肺动脉高压而失去手术机会术前评估的重要性对动脉导管的形态、大小进行精确的评估是 PDA 术前评估的重要指标，可以指导临床选择最佳治疗方案。它不仅对 PDA 治疗方式的选择而且对器械种类以及具体型号的选择均有着重要的指导意义。

PU-0119
前瞻性心电门控技术在高心率儿童冠状动脉 CT 成像中的应用

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目的 探讨前瞻性心电门控技术在高心率儿童冠状动脉 CT 成像中的应用。**方法** 对照组，回顾性分析心率为 100-120 次/min ，2018 年 1 月-12 月在我院行回顾性心电门控冠状动脉 CT 成像，检查成功 2-4 岁患儿 60 名，找出该组患儿冠状动脉成像最佳相位期相。研究组，前瞻性选取 2019 年 1 月-6 月心率为 100-120 次/min 来我院行冠状动脉 CT 检查 2-4 岁患儿 60 名，采用前瞻性心电门控多相位扫描重建技术，重建 40％、45％、50％三个相位图像，选取其中最优相位期相进行冠状动脉血管重建。两组患儿扫描参数、对比剂使用剂量、对比剂注射方式均一致。对比两组患儿接受扫描辐射剂量、冠状动脉血管成像图像质量等。**结果** 患儿接受扫描辐射剂量研究组比对照组低 61％，两组患儿最优相位下冠状动脉血管成像图像质量差异无明显区别（P＞0.05）。**结论** 前瞻性心电门控技术应用于高心率儿童冠状动脉 CT 成像，在不影响冠状动脉成像质量的条件下，可大幅度降低患儿接受的扫描辐射剂量。

PU-0120
叶外型隔离肺蒂扭转:三例报告并文献复习

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目的 探讨肺隔离症蒂扭转致腹痛引起的误诊。 **方法** 回顾性分析 3 例经手术及病理证实的肺隔离症蒂扭转 的 MSCT 增强扫描及后处理资料，记录病变特征与发展过程。 **结果** 3 个病变中，均为叶外型 ，均位 于下叶后基底段；位于左肺下叶 2 个，右肺下叶 1 个；病灶均表现为实性病灶 ，增强检查病灶强化不明显，供血动脉均显示不清，均合并有胸腔积液，积液呈渐进性增长趋势，误诊为胸内肿块。 **结论** 隔离肺蒂扭转少见，结合影像表现：双肺下叶后基底段实性病灶合并胸腔积液及临床症状需考虑蒂扭转。

PU-0121
罕见儿童肺部占位—儿童气管腺样囊性癌一例报道

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儿童肺癌非常罕见[1],国内显有报道。肺癌越来越趋于年轻化，国内 30 岁以下青年人肺癌的报道也日益增多[2]。中国医学科学院肿瘤医院报告 161 例肺癌患者中，肺癌患者最小年龄为 15 岁[3]，儿童肺癌的恶性程度高,发展快,预后较差[5],并且肺癌在年轻患者中多以非肺呼吸道症状为首发症状的约为 23.5%[6]。本例患儿除了发热外无其他症状,外院误诊为肺隔离症状。本病例经手术病例证实为气管腺样囊性癌。儿童肺癌少见而 TACC 更是罕见。文献报道提示此类肺癌十分罕见，发病率低，仅占肺部肿瘤的 0.04%-0.2%[7]。腺样囊性癌最早由 1856 年被 Billroth 命名,它常见于唾液腺,原发于肺及支气管的 ACC 罕见[8]。TACC 起源于气管黏液腺上皮细胞,好发于软骨和膜接合处附近外侧以及后外侧,并且主要于气管上 1/3 段[9]，病变好发于中老年人，约为 40- 60 岁,平均年龄 45 岁,男女发病率基本相当,与吸烟无明显相关性[10]。在影像检查方面，其在胸片上容易漏诊。CT

是发现病灶的首选影像学检查方法。多层螺旋 CT 及三维重建技术可清楚显示病灶的形态、大小、范围、生长方式、管腔侵犯情况。其特征为：好发于主支气管及隆突，常侵润性生长，表现为轻度分叶类圆形肿块，边界光整，与周围肺组织分界清楚，平扫密度较低并且均匀，常低于邻近胸壁肌肉，增强扫描后呈轻度强化，病灶内坏死不常见，少数病例可侵犯胸膜或纵隔形成巨大肿块，病理上由于肿块的间质内少有血管，易发生黏液样或透明变性，瘤组织坏死不常见，故 TACC 在 CT 上密度较低且均匀、增强后强化不明显[12]。本例患儿具有以上特征。MRI 有助于提示周围软组织的侵犯情况。 支气管镜检查是诊断气管肿瘤最直接有效的方法,其在可发现病变部位、形态、范围并进行病理活检及镜下治疗,为外科气管重建手术提供一定指导。本例患儿仅有发烧症状,在 CT 下误诊,支气管镜病理证实为 TACC.

PU-0122
儿童 CT 增强检查中留置针限速技术对降低渗漏率的应用探讨

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探讨留置针限速技术在儿童 CT 增强检查降低渗漏率中的应用优势。 **方法** 利用留置针限速技术对我院 600 例患儿行 CT 增强检查，记录全部样本的年龄、体重（kg）、造影剂量（ml）、注射速率和所选用留置针型号，以及产生的造影剂外渗发生率，进行统计学分析。**结果** 600 例患儿中，20G 留置针较少使用；312 例使用 22G 留置针穿刺；276 例使用 24G 留置针穿刺；12 例使用 26G 留置针穿刺。平均造影剂注射速率 ml/s。仅 4 例患儿发生造影剂外渗现象，外渗率为 0.67 % 。**结论** 静脉留置针限速技术降低了我们造影剂外渗率，但它不是一个绝对值，患儿身体情况也存在一定差异，我们日常工作中应该根据自身经验再参考留置针限速技术选用最恰当的注射速率做检查。

PU-0123
基于经肘静脉注射对比剂的儿童胸部 CT 增强扫描方法 改进设想

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目的 提出基于经肘静脉注射对比剂的儿童胸部 CT 增强扫描方法改进设想，以期解决常规儿童经肘静脉推注对比剂行胸部 CT 增强扫描时因肘静脉、上腔静脉尚未进入右心房的残留对比剂导致伪影问题，并且有望降低碘对比剂注射量，减轻患儿代谢压力，降低医疗风险。
方法 本科室用 Philips 公司 Brilliance iCT 行各部位增强扫描，其中胸部 CT 增强扫描所占比例居首位。常规胸部 CT 增强，扫描范围由肺底到肺尖，都采用经患儿肘静脉注入对比剂，剂量 1.5~2.0mL/kg，最低不小于 10mL，最高不多于 80mL，注射流速 0.5~3.5mL/s；对比剂注射完毕生理盐水使用量占对比剂的 1/4~4/5，流速与注射对比剂同。对比剂推注结束时间为 20~25s，根据经验，常规胸部增强在对比剂注射结束延后 5s 扫描动脉期，动静脉可同时显影；也可以采用 bolus 阈值触发智能扫描，监测层放于扫描起始层面。改进**方法** ①积累经验，减少对比剂使用量，增加生理盐水用量，以此减少对比剂注射时间，相对滞后起始扫描时间；②减少对比剂用量，扫描范围由肺尖到肺底，用 bolus 监测，将监测层置于肺尖层面，主要观察对比剂从肘静脉回血至上腔静脉结束时手动触发快速扫描。

结果 理论上而言两种改进方法都具有可行性，但实践中得以验证的数量还很少，需要进一步在实践中验证其可操作性。
结论 常规胸部 CT 增强经肘静脉注射对比剂，总是会在肺尖那几个层面出现因碘对比剂未完全进入心脏导致的高亮放射状伪影，影响图像质量，也在一定程度上影响诊断，尤其是病变出现在肺尖或胸锁等部位时。通过改进对比剂用量及起始扫描时间等，为减轻或消除此种伪影带来了理论上的可能性，同时对受检患儿能减少代谢负担，进一步降低医患风险，但尚需进一步实践加以验证。

PU-0124

婴幼儿胸部 X 线摄片技巧体会

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【摘要】一张优质的胸片，能为临床诊断及治疗提供强有力的依据。由于婴幼儿患者一般处于被动体位，不能同放射技师很好的配合，结合家长的因素，因此，拍摄出优质照片的难度加大。**目的** 探讨婴幼儿胸部 x 线投照技巧。**方法** 通过多年对婴幼儿胸部 X 线摄片工作经验的总结，从体位设计及曝光时机方面对摄片质量进行探讨。**结果** 根据不同情况设定不同的体位，结合最优的曝光时机，能提高胸部摄片质量。**结论** 对患儿高度责任心、正确的体位设定及合理的曝光时机的选择是摄出优质婴幼儿 X 线片的关键。

PU-0125

GE64 排多层螺旋 CT 对儿童气管\支气管异物的诊断价值

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摘要：目的 探讨多层螺旋 CT（MSCT）及 CT 重建对气管、支气管异物的诊断价值，提高对气管、支气管异物影像学认识及临床检出率。**方法** 对 10 例病例行 MSCT 检查及多模式重建如多平面重建（MPR）、表面遮盖显示法（SSD）、CT 仿真支气管镜（CTVB）图像分析诊断，病例均经纤维支气管镜或临床证实。**结果** 气管、支气管异物 10 例，诊断符合率 100%，与临床一致。**结论** 利用 MSCT 的多模式重建，结合轴位图像能提高诊断气管、支气管异物的准确性，可作为支气管镜检查前的筛查与定位手段。

PU-0126

儿童胸膜肺母细胞瘤 1 例

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目的 探讨儿童胸膜肺母细胞瘤的早期诊断、治疗及预后。**方法** 回顾性分析 1 例由 1 型胸膜肺母细胞瘤逐渐进展为 2 型胸膜肺母细胞瘤患儿的诊治过程。**结果** 患儿，男， 10 个月时无明显诱

因下出现发热、咳嗽，查胸片及胸部 CT 可见双侧多发大小不等的囊性占位，提示多发性肺囊肿可能。两年来患儿咳嗽、发热反复出现。2 岁 9 个月，胸部 CT 提示两肺囊性占位部分实变，手术后病理诊断(右肺)胸膜肺母细胞瘤（结合临床考虑为囊实型，Ⅱ型）。患儿手术后常规化疗，5 个月后出现左心房巨大癌栓、多器官功能衰竭而死亡。**结论** Ⅰ型胸膜肺母细胞瘤与先天性肺囊肿等囊性病变不宜鉴别,随着时间的进展，Ⅰ型胸膜肺母细胞瘤有可能演变为Ⅱ型、Ⅲ型胸膜肺母细胞瘤，胸膜肺母细胞瘤早期诊断及治疗对病人的预后非常重要。

PU-0127

新生儿先天性结核病 2 例并文献复习

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目的 分析新生儿先天性结核病的临床及影像学特点，分析致死因素，提高早期诊断准确性。**方法** 回顾性分析我院确诊 2 例先天性结核病例的临床特点，并进行文献复习。**结果** 两例患儿的胸部 X 线及 CT 表现为双肺内弥漫分布的结节样高密度影，部分结节可见融合，周围伴少许渗出；腹部 X 线示：部分肠管积气扩张并多发宽大气液平面，提示肠梗阻伴腹水；复查腹部 X 线片诊断为肠穿孔，液气腹。两例患儿的肝脾内均可见多发低密度结节影形成。随后经胃液检查，确诊为先天性结核病，最终因十二指肠穿孔死亡。**结论** 先天性结核病临床表现不典型，影像学表现出现双肺广泛播散病灶，需要考虑到本病，结合结核生化指标检测可确诊；如并发脑膜炎，肠梗阻时提示预后不良。

PU-0128

儿童腺病毒肺炎合并肠穿孔一例

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患儿，男，11 岁，主因“发热、咳嗽”入院。入院前 3 天无明显诱因出现发热，持续高热，呈稽留热，最高达 40℃，无寒战、皮疹。后出现咳嗽，偶尔咳出黄白色粘痰。入院前一天出现腹泻，为黄色稀水样便。血 PCT、CRP 明显升高。住院期间患儿诉腹痛，脐周为著，查超声提示：左侧腹腔局限性肠壁增厚，腹水。查胸部 CT 示：双肺散在大片状密度增高影，双侧胸腔内少量积液。查腹部 CT 示：腹腔内可见气体密度影，双侧肾盂增宽，腹腔内部分常规扩张积液、积气，肠系膜模糊肿胀，腹盆腔积液。急症手术探查，术中提示十二指肠穿孔。该患儿痰和肺泡灌洗液腺病毒（+），诊断为腺病毒肺炎。

腺病毒肺炎在小儿肺炎中占 5%~9%，主要由腺病毒 III、VII 型引起。病理上表现为两肺广泛支气管炎，支气管周围炎和毛细支气管炎，粘膜充血水肿，管腔内充满渗出物及坏死脱落的细胞，使管腔严重狭窄，甚至阻塞。肺实质可呈灶性或大片实变，广泛凝固性坏死为本病的特点。腺病毒感染病情比较重，还容易合并其他并发症，文献报道的有肠套叠，中枢神经系统感染等，像我们这一例，患儿合并消化道穿孔。当临床和影像学表现均比较重，而且合并有其他并发症时，要警惕腺病毒肺炎。

PU-0129

256 排 CT 在小儿先天性心脏病的应用

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【摘要】目的 研究在小儿先天性心脏病患儿中使用 256 排螺旋 CT 进行诊断的效果。**方法** 选择我院收治的先天性心脏病患儿 40 例，对其使用 256 排螺旋 CT 以及多普勒超声进行诊断，对比手术确诊结果、CT 诊断结果以及超声诊断结果。**结果** 40 例患儿经手术全部确诊为小儿先天性心脏病，CT 检查结果显示为 38 例，超声检查结果显示为 37 例，三种检查方法相比并没有明显的差异（P>0.05）。除此之外，在患儿先天性心脏病类型的诊断中，手术结果与 CT 检查结果的差异也没有统计学意义（P>0.05）。**结论** 在小儿先天性心脏病的诊断中，使用 256 排螺旋 CT 具有较高的准确性，提高先心诊断准确率。

PU-0130

睾丸畸胎瘤一例

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患者 xxx，男，5 月，发现右侧睾丸肿大 2 月余。2 月前无意中发现右侧睾丸肿大，表面不平，无红肿触痛，睾丸肿物逐渐增大。门诊 B 超提示：右侧睾丸异常回声占位。初步诊断：右侧睾丸肿物。

CT 示：右侧睾丸明显增大，密度不均匀，边界较清楚，增强扫描无明显强化，边界清楚，大小约为 2.6cm×2.9cm×3.9cm；左侧睾丸未见明显异常；盆腔未见肿大淋巴结，未见积液。CT 诊断：右侧睾丸占位性病变，考虑畸胎瘤可能性大，未除精原细胞瘤，请结合临床。

病理：右侧睾丸成熟性畸胎瘤。

按组织病理学畸胎瘤分为成熟、不成熟和恶性畸胎瘤。

本病例为 5 个月大婴儿，右侧睾丸肿大，内有小斑片状钙化灶，增强扫描无明显强化，虽然无明显脂肪密度灶，但还是应先考虑良性肿瘤。

PU-0131

囊肿型肠重复畸形的 MSCT 诊断

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目的 分析小儿囊肿型肠重复畸形的 CT 表现，以提高该病的诊断水平。**方法** 回顾性分析 11 例经手术病理证实的肠重复畸形患儿的临床资料及 CT 表现。**结果** 男 8 例，女 3 例，全部为囊肿型肠重复畸形，其中肠外型 9 例，肠内型 2 例。肠外型 CT 表现为单房低密度囊性肿块，囊壁较厚，增强扫描囊壁均匀强化；其中 5 例表现为双层状“晕轮征”。肠内型 C T 表现为肠腔内附壁囊性肿块，轴位扫描表现为“双弧征”。**结论** 囊肿型肠重复畸形临床表现缺乏特异性，CT 表现较具特征，对该病的术前诊断及鉴别诊断具有重要价值。

PU-0132

小儿卵巢蒂扭 转 64 层 MSCT 诊断

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目的：总结小儿原发性卵巢蒂扭转的64层MSCT表现，提高对本病的认识。方法：回顾性分析本院2013年1月－2019年6月经手术病理证实的21例小儿原发性卵巢蒂扭转患者的MSCT表现。年龄主要发生在两个年龄段3天～42天，8～12岁，其中主要临床表现为腹胀、腹痛、发热、呕吐等，临床疑阑尾炎或新生儿肠梗阻行腹部MSCT检查，其中21例均行平扫检查，增强检查14例。结果：21例患者中右侧卵巢蒂扭转9例，左侧13例，其中1例左右卵巢相隔两年后先后发生扭转；MSCT主要表现为子宫一侧软组织肿块影，呈椭圆形，前后径大于左右径，包膜完整，边界清楚，包膜下可见典型铺路石征13例。增强扫描示卵巢呈轻度－中度强化，包膜强化，包膜下多发圆形低密度影无强化，9例其周边强化血管增粗、增多、紊乱。结论：小儿原发性卵巢蒂扭转好发于新生儿期及8至12岁儿童；MSCT表现具有特征性，尤其是盆腔铺路石征具有特征；MSCT可用于儿童急腹症的诊断及鉴别诊断。

PU-0133

肾上腺区囊性神经母细胞瘤一例

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神经母细胞瘤（neuroblastoma，NB)是儿童罪常见的颅外实体恶性肿瘤，其年发病率在1/300万~10/100万。5岁以下为发病高峰，男多于女，恶性程度高，易转移。囊性神经母细胞瘤（cystic neuroblastoma，CNB）是NB的一种罕见类型。CNB非常罕见，影像学上诊断较困难，本文简述一例囊性神经母细胞瘤。

PU-0134

动态 DR 在小儿气道 X 线阴性异物检查中的独特价值

刘金丰
广东省中医院珠海医院

临床背景：

小儿气道异物为呼吸道阻塞的紧急情况，是小儿常见急症之一，严重威胁患儿生命健康，如果处理不及时可引起严重并发症，甚至死亡。小儿气道异物检查有X线检查、CT检查和支气管镜检查，其中X线检查是非创伤性检查的金标准，是小儿气道异物检查的首选方法。文献报导，小儿气管、支气管异物的X线检查误诊漏诊率可达44.4%，而不做胸透以及缺乏良好的深呼、吸气相胸片则是误诊漏诊的主要根源。

动态 DR 检查:

对于有异物吸入史的低龄患儿，检查设备选择动态 DR，患儿平卧于检查床上，先透视患儿的一个呼吸周期，动态观察呼吸运动、纵膈有无摆动等（可通过视频回放做细致观察）。然后选择 2 帧每秒的连续点片模式，连续点片 4-8 张，完整记录患儿一个呼吸周期的胸部动态影像。因为点片速度快，对于哭闹不配合的患儿，只需家长对其双肩及盆骨处稍加限制即可，并不影响摄片效果。通过回看呼吸周期的连续点片影像，即可根据患儿胸廓大小准确找到深吸气相和深呼气相对照观察。最后结合动静态影像，观察呼吸过程中是否存在局部肺野透亮度异常改变、纵膈和横隔运动及其位置的变化异常、心影吸气性增大等间接征象来进行诊断。

结果与**结论**

普通透视影像不能记录和重复，放射诊断医师往往在进行较长时间连续透视后仍不能观察到所有有价值的诊断征象，这种情况在低年资医师中更为普遍。患儿或因气促呼吸周期缩短，或因年幼哭闹不配合，医师常难以摄取理想的深呼、吸气相胸片，已摄取的胸片也常存在难以确定是吸气还是呼气相的问题。所以，普通 X 线透视和摄片在小儿气道异物的诊断中存在检查一次性成功率低、图像质量难以保证和细微影像不易观察的局限性，重复摄片和长时间透视不仅患儿接受 X 线照射量大，也延误救治时机。通过动态 DR 连续点片获得良好的深呼、吸气相胸片，再辅以透视，则气管、支气管异物基本可以明确诊断。

PU-0135

新生儿坏死性小肠结肠炎的 X 线表现及临床分析

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目的 分析新生儿坏死性小肠结肠炎(NEC)的 X 线征象及临床因素,提高对新生儿 NEC 的认识。方法 回顾性分析经临床及手术确诊的 21 例新生儿 NEC 患者的腹部 X 线平片、临床资料及危险因素。结果 NEC 的 X 线表现: Ⅰ 期,肠动力性改变,肠间隙增厚 ≤2mm 者 10 例; Ⅱ 期, ① 肠间隙增厚 >2mm (4 例); ② 肠壁积气(4 例); ③ 门静脉积气(3 例); Ⅲ 期, ① 明确腹腔渗液(3 例); ② 气腹(3 例)。早产儿 18 例(85%);低体重儿 16 例;新生儿呼吸窘迫综合征、感染、肺炎、败血症和机械通气是 NEC 重要的危险因素。
结论 新生儿 NEC 的 X 线征象早期缺乏特征性,中晚期具有特征性表现,明确诊断需结合临床表现及致病危险因素,必要时动态随观。

PU-0136

新生儿先天性十二指肠梗阻的 X 线诊断价值

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【摘要】目的 分析新生儿十二指肠梗阻 X 线表现，以便诊断原发疾病。**方法** 收集我院 2016 年 7 月-2018 年 10 月间手术病理证实的十二指肠梗阻患者 34 例，34 例均行腹部立位片检查,其中 32

例行胃肠道碘对比剂造影检查,16 例行结肠造影检查，就其 X 线表现进行回顾性分析。**结果** 腹部立位片见“单泡征”2 例,“双泡征”24 例,“三泡征”1 例, 腹部生理积气减少 7 例.胃肠道造影检查显示十二指肠完全梗阻 7 例,不完全梗阻 25 例,其中梗阻位于十二指肠降段中部以上 5 例，梗阻位于十二指肠降段中部以下 27 例，显示空肠位置异常 18 例.结肠造影检查显示回盲部位置异常 9 例,细小结肠 4 例。手术证实：环状胰腺 5 例，十二指肠闭锁 6 例，十二指肠狭窄 5 例，肠旋转不良 18 例伴中肠扭转 14 例。**结论** 结合临床病史及腹部立位片可对十二指肠梗阻做出诊断,胃肠道碘对比剂造影和/或结肠造影检查对新生儿先天性十二指肠梗阻及病因诊断有重要的价值。

PU-0137

儿童肝血管瘤的 CT 影像学分析

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50 例肝血管瘤儿童患者（共 60 个病灶）均行 CT 平扫及三期增强扫描。造影剂注射结束后 16~20s 后行动脉期扫描，60s 后行静脉期扫描，3~10 分钟后行行延迟期扫描。结果平扫 CT 图像上所有病例均表现为低密度或稍低密度灶，边缘清晰或较清晰。增强扫描动脉期大部分病灶呈周边强化，门脉期造影剂逐渐向中心扩展，延迟期病灶被部分或完全充填呈高密度表现。造影剂“快进慢出”或“慢进慢出”是肝血管瘤的典型 CT 表现，具有较高的诊断价值。

PU-0138

空肠浆膜下血肿影像学诊断

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方法 回顾性分析 2 例病理证实的空肠浆膜下血肿 CT 影像学表现；
结果 CT 平扫表现为肠壁内椭圆形高低混杂密度肿物，边界欠清，肠管局部狭窄，可见新月形气体裂隙征，CT 增强后肿物内未见明显强化，肿物后壁与空肠肠管关系密切，强化程度相当；
结论 CT 检查对空肠浆膜下血肿的诊断有重要价值，血肿影像表现具有一定特征性。

PU-0139

研究胰腺实性假乳头状瘤(SPTP)CT、MRI 影像学表现

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方法:回顾性分析 3 例经病理证实的胰腺实性假乳头状瘤的 临床及 CT 和 MRI 影像学表现
结果:SPTP 是好发于青少年女性的一种少见的胰腺肿瘤,胰头、体部位好发.CT 及 MRI 影 像学表现为境界清晰的类圆形肿块.CT 平扫表现为囊实性混杂密度,无钙化， MRI 表现为混杂信号，肿块周围呈实性，其内可见小片状短 T1 信号，提示肿块内部有出血灶，DWI 序列实性部分弥散明显受限呈高信号.动态增强肿块实性部分早期轻度强化,后期强化不明显.3 例肿瘤 肿块包膜完整清晰,肿块内多伴有出血及囊变

结论:CT 及 MRI 对胰腺实性假乳头状瘤诊断有重要价值,MRI 可提示病灶有无出血,囊变,包膜方面更具优势.

PU-0140
儿童 Xp11.2 易位 TFE3 基因融合相关性肾癌 CT 表现

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[摘 要] **目的** 分析儿童 Xp11.2 易位 TFE3 基因融合相关性肾癌 CT 表现，以提高该病的诊断水平。**方法** 回顾性分析湖南省儿童医院 2011 年 1 月～2019 年 6 月经手术病理确诊的 3 例 Xp11.2 易位 TFE3 基因融合相关性肾癌患儿资料，并结合相关文献复习。3 例均行 CT 平扫及增强扫描。观察分析 Xp11.2 易位 TFE3 基因融合相关性肾癌瘤体的部位、大小、形态、密度（囊实性特征、钙化、出血）、强化方式及转移等。**结果** 3 例病灶均位于左肾，2 例病灶中心位于髓质内，1 例病灶为外生型。CT 平扫 2 例呈稍高密度，1 例呈囊实性密度影，2 例合并出血，1 例出现钙化灶。2 例出现淋巴结转移。3 例呈圆形、类圆形改变，其中 2 例出现结节状、分叶状改变。动态增强扫描示病灶呈轻中度不均匀强化改变，各期强化程度均低于正常肾皮质，皮质期高于髓质期，髓质期高于延迟期，强化程度逐渐减低改变。**结论** 儿童 Xp11.2 易位 TFE3 基因融合相关性肾癌 CT 表现具有一定的特征性，当儿童肾脏肿瘤 CT 平扫密度稍高，有出血、坏死、钙化，增强轻中度强化时，应考虑 Xp11.2 易位 TFE3 基因融合相关性肾癌的可能。

PU-0141
探讨 MR 同反相位对诊断肾上腺腺瘤的价值

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目的 探讨 MRI 同相位反相位成像在小儿腹部肾上腺腺瘤诊断中的应用价值。**方法** 收集我院 2018 年 6 月-2019 年 4 月间，经超声诊断位于肾上腺，怀疑为腺瘤占位且行肾脏 MR 检查的患儿 30 例，同时收集此期间收治的肾上腺其他肿瘤患儿 30 例作为对照，分析两组病变 MRI 同反相位序列上的占位图像信号，并统计术后所有病例病理分型报告。**结果** 两组均顺利完成检查，观察组在 MR 反相位上呈现出程度不同信号降低的患儿有 28 例，对照组所有病例 MR 同反相位序列上，未出现反相位信号下降特征（P〈0.05）。**结论** MR 反相位信号下降是肾上腺腺瘤重要特征，结合 MRI 同相位反相位序列能提高肾上腺腺瘤确诊机率。

PU-0142
儿童睾丸卵黄囊瘤的 MRI 表现与病理结果 对照

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目的 分析儿童睾丸卵黄囊瘤的 MRI 表现，并与病理结果对照，提高对儿童睾丸 YST 的认识。**资料和方法** 回顾性分析我院自 2015 年 1 月至 2018 年 12 月共发现 62 例儿童睾丸占位的影像学表现，其中 8 例行 CT 检查, 54 例行 MRI 平扫及增强扫描，分析其中 15 例经 MRI 诊断为睾丸 YST 的 MRI

表现，并与手术病理结果进行对照分析。**结果** 该组 15 例患儿均为单侧睾丸发病，9 例位于左侧，6 例位于右侧，术前超声诊断 YST5 例，提示占位未给予明确占位 6 例，畸胎瘤 3 例，1 例超声结果未知；MRI 给予诊断睾丸 YST 诊断 15 例，同时侵犯附睾或精索 7 例。AFP 结果显示：>1000ng/ml 有 10 例，<1000ng/ml 有 2 例，3 例未行 AFP 检查。该组患儿均行手术并取得病理结果，MRI 诊断结果均与病理结果相符。**结论** MRI 在诊断睾丸 YST 及评估精索受侵情况具有非常高的敏感性及准确性，与病理结果具有较高的一致性，可为临床手术和评估提供准确的信息。

PU-0143

肝脏间叶性错构瘤 1 例并文献复习

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目的 探讨肝脏间叶性错构瘤的 CT 表现，以提高其诊断正确率。
方法 回顾性分析 临床资料：搜集已经获得病理证实的 1 例肝脏间叶性错构瘤的 C T 图像及临床资料，对其 CT 表现进行分析，并复习相关性文献。
结果 患者 1 月 28 天，查体腹部膨隆，右上腹可触及一大小约 6cm×5cm 包块，实验室检查 AFP 阴性。CT 检查示肝右叶见一囊实性低密度肿块，肿块体积较大，中央见斑点状稍高密度影，增强多期扫描动脉期边缘实性部分不均匀斑片状强化，门脉期及平衡期呈渐进性持续强化。病理诊断肝脏间叶性错构瘤。
结论 肝脏间叶性错构瘤 CT 表现具有一定的特征性，CT 可作为一种辅助检查，能够提供一定的诊断依据。

PU-0144

儿童脾性腺融合综合征一例并文献复习

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阴囊内脾性腺融合是一种罕见的泌尿生殖系统畸形,由 Bostroem 于 1883 年首次报道。该病多见于左侧阴囊,极少见于右侧尚无双侧同时发病的报道。据不完全统计超过 70%的病例发病年龄低于 20 岁,约 50%的病例发病年龄低于 10 岁。由于阴囊内脾性腺融合多为良性,所以儿童阴囊肿物的鉴别诊断对避免不必要的睾丸切除具有重要意义。本文以一例脾性腺融合症为背景介绍其 CT、MRI 影像表现及腹盆部联合扫描的临床诊断价值。

PU-0145

能谱 CT 在儿童疾病检查中的应用进展

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目前，能谱 CT 在成人疾病中的应用已越来越普遍，已广泛应用于全身各个器官和系统。儿童处于生长发育期，对辐射的损伤较成人更敏感，致癌风险也较成人明显增大。因此，儿童 CT 检查要尽可能使用低剂量扫描，如使用低管电压和迭代重建技术也可以减少儿童 CT 扫描的辐射剂量，能谱

纯化技术通过滤过低能级剂量，可以提高射线利用率而达到降低辐射剂量目的。学龄儿童能谱 CT 扫描未显著增加辐射剂量，能谱 CT 在降低 CT 辐射剂量方面的价值也得到了一定的认可。能谱 CT 在儿童疾病中的应用也可见报道，本文就能谱 CT 在儿童疾病中的技术及临床应用作一综述。与传统 100 kV 扫描技术相比,在儿童胸部 CT 平扫中采用第 3 代双源 CT 能谱纯化技术可以降低 92%的辐射剂量,并且同时可获得诊断能接受的肺窗图像质量。能谱分析技术还能发现病灶的组织成分，有学者利用能谱分析技术发现一例纵隔神经母细胞瘤内含脂肪成分，还对纵隔淋巴瘤和胸腺瘤的鉴别有很大的潜能。能谱 CT 的多点多参数研究有助于评价 BCS 患者的肝功能及预后，即通过能谱 CT 确定的标准碘化值（normalized iodine concentration，NIC)有助于评估布加综合征（Budd-Chiari syndrome ，BCS)患者的肝功能，不同肝功能的 BCS 患者的肝实质 NIC 值可提供一定的诊断价值，并可为 BCS 患者治疗后的复查，预后评估和随访提供影像学资料。CT 能谱成像多参数可用于分析评估血友病性滑膜炎 SHD 的严重程度，具有重要的临床意义。应用能谱成像技术和 AISR 技术联合扫描可以降低图像噪声，为脊柱融合患者术后 CT 评价提供更好的图像质量。能谱 CT 与常规 CT 相比，能够提供多种参数进行疾病的诊断及定量分析，为临床和科研更多的疾病信息。但是能谱 CT 在儿童疾病中的应用仍较成人相对少且落后，笔者相信随着技术的不断成熟，研究的逐渐深入，能谱 CT 在儿科领域的临床和科研中能发挥越来越大的作用。

PU-0146
胃肠道巨大毛发性胃石症致肠穿孔 CT 表现 1 例报道

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背景：胃石症是指因摄入异物或不能消化的食物并在胃内形成团块，进而引起的一系列临床症状。毛发性胃石症，尤其是胃肠道巨大毛发性胃石症致肠穿孔极其罕见。
病例简介：患儿，女，13 岁，因“持续性腹痛 2 小时”入院。CT 诊断:1. 腹腔积气积液，提示胃肠道穿孔可能；2. 胃、十二指肠及空肠上端肿块并扩张；3. 腹膜炎、腹腔积液。于全身麻醉下行胃穿孔修补术+腹腔引流术，术后确诊为毛发性胃石症。术后追问病史，患儿自 3 岁起捡食头发。
讨论：巨大毛发性胃石延伸至十二指肠或空肠近端并出现的临床症状，又称为“长发公主综合征”(Rapunzel Syndrome)。CT 是其首选诊断方法，可明确胃石的位置、大小、形态等，表现为胃内不强化的包块影，形成类似于“胃、肠”的形状，其内可见夹杂的斑点状气体密度影。周围可有液体及气体，且与胃石不能混合，在其周围形成独立的气-液平面，考虑本征象或许可以认为是诊断毛发性胃石及与正常胃内容物鉴别的重要指征。

PU-0147
A Huge Urinary Bladder Spindle Cell Hyperplasia : A Case Study

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Purpose: To investigate the Imaging features and pathological characteristics of urinary bladder spindle cell hyperplasia, a rare tumor.
Method and materials: Using a review in a patient who was admitted to the hospital because of hematuria for 5 days, we analyzed the Imaging features and the clinicopathological characteristics of the patient.

Results: A 1-year-old girl was admitted to the hospital because of hematuria for 5 days. The temperature was 37.5° C, the pulse was 120, and the respirations were 28. On examination: A 3cm × 2 cm mass can be touched in the lower abdomen. The results of hematologic laboratory tests : UA: 105 umol / L,HCO 3: 18.9mmol / L , mannosylated antigen CA199 / 125 / 513(-) ,carcinoembryonic antigen CEA (-), A. Fetal protein AFP (-); A Contrast-enhanced computed tomographic (CT) scan shows heterogeneous enhancing mass arising from the posterior urinary bladder wall. The size is about 4.4 cm × 5.1 cm × 6.5 cm with indistinct boundaries. And the bladder wall was thickened and irregular. The boundaries between left ureter and and the mass are unclear. The left ureter expanded, the renal pelvis and renal pelvis are dilated. All these suggestived of the mass invasion, but the ultrasound-guided biopsy: Two Gray tissues, 0.7-1.5 cm long and 0.1 cm in diameter, were fully produced. The spindle cells proliferated under the microscope, and the cells showed no atypical mitotic activity. Immunohistochemistry：Actin (-), Bcl-2(-), CD34(-), CD99(+), CD68(-/+), Desmin(-), Ki-67 (very low positive rate), GATA3 (-), Vimentin(+), S-100(-), SMA(-), CK(-), CK18(-), CK5 / 6(-). Striated muscle, smooth muscle tumor can be excluded.
Conclusion: Spindle cell lesions of the urinary bladder is a rare tumor, include inflammatory myofibroblastic tumor (IMT) and Postoperative spindle cell nodules . IMT is a rare myofibroblast overgrowth that can occur anywhere, occurring either spontaneously or after instrumentation. The CT or MRI findings of the most common inflammatory myofibroblasts were a soft tissue mass with a significant enhancement of contrast enhancement. 80% lesions is a solid mass, only 10% with calcification, and the location is multiple and uncertain. At the same time, it needs to be differentiated from malignant tumors (sarcomatoid urothelial carcinoma and leiomyosarcoma) because of its overlapping in their morphology and published immunohistochemical profil. When IMT is considered, surgical resection is first recommended. And patient need further follow-up treatment.

PU-0148

儿童胰母细胞瘤 CT 表现与病理对照分析

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目的 探讨儿童胰母细胞瘤的 CT 表现，提高对该病认识。
方法 回顾性分析 2009 年 9 月-2019 年 6 月我院 7 例儿童患者均行 CT 扫描并经手术病理证实的胰母细胞瘤的 CT 表现，并与病理结果对照分析，总结胰母细胞瘤的特点。
结果 胰母细胞瘤临床表现为消化道症状、腹部包块、不同程度的贫血及肿瘤标准物 NSE 的升高。 CT 表现为腹腔巨大占位，7 例患儿，男 5 例，女 3 例；1 例 5 月，6 例＞2 岁，平均年龄 3.2 岁。3 例位于胰腺头体部，1 例位于胰腺体尾部、3 例胰腺头体尾部，其中 6 例跨中线生长，病灶边界清晰； 6 例以实性为主，其内见坏死成分，5 例有沙粒样钙化，1 例囊实混合有分隔；增强后实性成分呈中度延迟性不均匀强化，由腹腔干分支供血，2 例包绕周围血管，5 例周围有肿大的淋巴结,1 例胰管扩张，2 例肝内胆管扩张。上皮细胞构成的巢状小体是胰母细胞瘤典型的病理改变，EMA、CK、Ki-67 和 Syn 是主要的阳性标志物。
结论 胰母细胞瘤 CT 表现较具特征性，结合临床表现及好发年龄可在术前作出诊断，但其确诊依靠病理。

PU-0149

磁共振 T2*诊断新生儿血色病一例

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目的 提高对新生儿血色病(neonatal hemochromatosis，NH)的认识，探讨磁共振 T2*在诊断新生儿血色病中的诊断价值。**方法** 患儿女，3 天，孕 38 周，G2P2，生后 Apgar 评分 9-10 分。因发现双下肢水肿 2 天，尿少 1 天入院，入院后有腹胀，胃肠减压引出血性液体表现；患儿同时有房间隔缺损，二尖瓣中量反流，三尖瓣少量反流，肺动脉高压，动脉导管未闭。**结果** 实验室检查提示患儿肝肾功能损坏，低蛋白血症，胆汁淤积，三系减少，凝血功能持续异常，动态监测铁蛋白均明显高于正常，腹部 MR 示肝脏及胰腺铁沉积，临床诊断新生儿血色病。最终患儿医治无效死亡。**结论** 新生儿血色病指早期新生儿严重肝病，以肝及肝外组织铁沉着为典型病理表现。新生儿血色病曾归为先天性铁代谢疾病，属于先天性家族性血色病。陆续散发病例报道，该病均以新生儿期严重肝损伤、甚至肝衰竭为显著临床特征的一组综合征，伴有肝外组织铁沉积，病死率极高。新生儿血色病临床表现多有肝功能衰竭、多脏器衰竭、低血糖、凝血机制明显异常、低蛋白血症、伴或无腹水水肿(非免疫性水肿)、少尿等。对产前或生后短期内即有肝病表现均应疑诊新生儿血色病。存在肝外组织铁沉着是诊断新生儿血色病必备条件，肝内铁沉着非诊断所必需。磁共振 T2*技术可以直观地展示肝脏和其他脏器的信号变化 ，无创地反映肝脏及其他脏器的铁含量，为临床诊断和进一步治疗提供必须的依据。

PU-0150

空气灌肠在治疗儿童肠套叠中的应用

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摘 要 ：目的 研究空气灌肠在治疗儿童急性肠套叠中的应用价值 。 方法：收集本院 2 0 1 6 年 1 月至 2 0 1 6 年 12 月间 20 例肠套 叠患儿样本，研究空气灌肠整复术的疗效 。 结果：总整复率 90% 。 讨论：空气灌肠是儿童肠套叠首选治疗方法 ，具有小创伤 、便利 、低成本 、高成功率等优点 ，具有临床推广意义 。

PU-0151

婴幼儿泌尿系 CT 增强扫描与静脉肾盂造影联合检查的应用

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目的 在婴幼儿泌尿系疾病检查中，采用泌尿系 CT 增强扫描与静脉肾盂造影联合检查，既可以得到 CT 与 DR 的互补影像，而且可以减少碘对比剂注入体内的次数与剂量，从而减轻患者的痛苦及经济负担。

方法 产前检查发现泌尿系异常的患儿，出生后根据病情需要作泌尿系 CT 增强扫描/静脉肾盂造影检查时，先行腹部平片 DR 摄影后，再行泌尿系 CT 增强扫描。根据患儿体重经静脉注入适量非离子型碘对比剂后进行泌尿系 CT 增强扫描，当 CT 动静脉期扫描完成后，再将患儿平躺带入 DR 室进

行，利用泌尿系 CT 增强注入的对比剂进行静脉肾盂造影，在 DR 室不再注入对比剂。当静脉肾盂造影结束后再将患儿带入 CT 室进行泌尿系 CT 增强扫描。

结果 泌尿系 CT 增强扫描与静脉肾盂造影联合检查更有利于影像的观察。在泌尿系 CT 增强扫描前行 DR 腹部平片，可观察泌尿系结石或钙化灶，在 CT 增强扫描中肾实质显影可见，但静脉肾盂造影不能显示该影像。对比剂在肾盂肾盏浓度达不到一定量时，静脉肾盂造影不能正确显示，但 CT 扫描可以根据 CT 值（密度值）进行分辨对比剂在肾盂肾盏的密度值。

结论 泌尿系 CT 增强扫描与静脉肾盂造影联合检查不仅可以提高影像诊断水平，还能减轻对比剂第二次注入对比剂肾脏的损害，也减轻患儿第二次注入对比剂的痛苦，再加减轻对比剂第二次注入的费用。

PU-0152

弥散加权成像对儿童良恶性肝脏肿瘤的鉴别诊断

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目的 探讨扩散加权成像（DWI）技术在儿童良恶性肝脏肿瘤鉴别诊断中的应用价值

资料与方法 回顾性分析 2009 年 1 月-2019 年 7 月经病理确诊的 35 例儿童肝脏肿瘤的影像学资料。由 2 名有经验的腹部影像专家分析肿瘤在 DWI 和 ADC 图上的信号特点（分为 T2 穿透效应、弥散受限、在 DWI 和 ADC 图上均呈低信号，均呈等信号），并测量肿瘤的平均 ADC 值。采用独立样本 t 检验、Fish 精确概率检验及 ROC 曲线进行统计学分析。

结果 观察者间在定量分析 DWI 信号特点和定性测量 ADC 值均具有良好一致性（Kappa=0.856；ICC=0.892）。88.9%（16/18）的肝脏恶性肿瘤呈弥散受限，而仅 5.8%（16/17）的肝脏良性肿瘤呈弥散受限，两者差异具有统计学意义（$P<0.001$）。恶性肝脏肿瘤的平均 ADC 值明显低于良性肿瘤（$1.82\pm0.40\times10^{-3}mm^2/s$ vs $1.30\pm0.53\times10^{-3}mm^2/s$，$P=0.002$）。当 ADC 值$\geqslant1.27\times10^{-3}mm^2/s$ 诊断肝脏良性肿瘤时，敏感性和特异性分别为 94.1%和 66.7%。

结论 DWI 和 ADC 值有助于儿童良恶性肝脏肿瘤的鉴别诊断。

PU-0153

过敏性紫癜肠管损伤的 CT 诊断及鉴别诊断

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摘要： **目的** 探讨过敏性紫癜腹型肠管损伤的 CT 典型影像学表现。 **方法** 回顾性分析我院自 2017 年 6 月至 2018 年 10 月间收治的腹型过敏性紫癜患儿 18 例，其中男性 11 例，女性 7 例，年龄范围在 2.1 ~ 15 岁之间，平均值（6.67 岁±3.31），其中单独进行 CT 平扫的 2 例，进行 CT 平扫和增强的 16 例。前来就诊的临床主述，多是腹痛，呕吐、腹泻等，其中出现腹痛的 18 例，出现消化道出血的 6 例，不全性肠梗阻的 9 例，肠套叠的 1 例，分析其典型的影像学表现。 **结果** 腹型过敏性紫癜的肠管损伤 CT 平扫示肠管粘膜呈稍高密度影，粘膜下肠壁增厚，呈稍低密度影，CT 增强肠管粘膜呈环状、曲线状、结节状明显持续强化，粘膜下肠壁由内向外呈渐进性中度强化。 **结论** 过敏性紫癜(Henoch-Schonlein purpura, HSP)是由于自身免疫性毛细血管变态性反应所引起的出血性疾病，好发于秋冬季，儿童及青少年过敏性紫癜侵及胃肠道时，主要表现为腹痛，通常位于脐周或上中腹，餐后加重。过敏性紫癜肠道病灶可以单发，也可以多发，下消化道以回肠为主，上消化道尤其以十二指肠降部受累最为严重。因典型的对称性紫癜样皮疹是诊断 HSP 的必要条

件，因此此类以消化道症状为首发表现的患者早期诊断困难，易发生误诊。如前来就诊的患儿腹部 CT 增强时，肠管粘膜出现这种典型的 CT 增强表现，对过敏性紫癜的早期临床诊断具有较高的提示作用，具有一定的临床应用价值。

PU-0154

儿童小肠良性淋巴样息肉病 1 例及文献复习

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目的

探讨儿童小肠良性淋巴样息肉病影像学表现及临床特征。

方法

回顾性分析我院诊治的 1 例儿童小肠良性淋巴样息肉病的 CT 表现及临床特征，结合术中所见及病理特征，以及复习相关文献，使对该病具有全面的认识。

结果

4 岁男孩，半年前出现反复脐周及右下腹疼痛，不剧烈，可自行缓解，近期疼痛逐渐加重；腹部 CT 及增强扫描示：右下腹末段回肠区域局部肠管扩张，最宽处约 2.4cm，管壁不规则增厚，最厚处约 1.0cm，近端肠管较多积液，增强扫描增厚肠壁呈明显均匀强化，浆膜面光滑，肠周可见多个肿大淋巴结。术中见：回肠末段靠近回盲部区可见长约 10cm 肠壁明显增厚段，肠管表面呈灰白色，弹性差，肠管明显扩张，直径约 8cm，内有粘稠肠内容物，肠系膜淋巴结肿大明显，较大者约 2.0×1.5cm，阑尾充血、水肿。术后病理考虑为良性淋巴性息肉病；肠周查见淋巴结 14 枚，均系反应性增生。

结论

良性淋巴样息肉病（Benign lymphoid polyp）又称为良性淋巴组织增生，为肠道较少见的良性病变，多见于儿童，尤其是 6 岁以下，好发于回肠末端；该病并非真正的肿瘤，而是黏膜正常存在的淋巴滤泡的局限性过度增生所致；典型的病理学改变：主要由分化良好的淋巴组织构成，表面被覆薄层黏膜，黏膜与黏膜下层可见大量分界清楚的淋巴滤泡；临床上多以腹痛及肠梗阻为主要表现；CT 表现为病变区肠管广泛增粗、肠壁弥漫增厚、肠腔变窄，增强扫描呈明显均匀强化，肠周多可见反应性淋巴结增生。本病需与淋巴瘤、多发性淋巴瘤性息肉病相鉴别：淋巴瘤多见于老年人，多表现为“动脉瘤样”扩张，增强扫描呈轻度强化；多发性淋巴瘤样息肉病病变多发并广泛分布于胃肠道，为结节状（多为 1cm 以下）凸向肠腔。良性淋巴样息肉病虽为良性病变，部分文献报道该病为自限性疾病，但发现时病变累及范围已较广泛，常导致肠梗阻及肠套叠，局部手术切除仍为首选治疗方式。

PU-0155

肝脏间叶性错构瘤 1 例

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患儿，男性，1 岁 11 月，因“B 超发现腹腔肿块两天”入院。一般情况良好，腹膨隆，未见腹壁静脉曲张及胃肠型蠕动波，上腹部可触及一巨大肿块，大小约 15cm*10cm*8cm，无触痛。CT 检查：上腹部可见一巨大囊状低密度影，其内密度均匀，其边界清晰，大小约 140mm*95mm*53mm，增强扫描囊壁可见明显强化，囊壁较厚，门静脉贴近其后缘受压，其左侧可见一小囊状影与其相连；肝内胆

管、肝总管及左、右肝管未见明显扩张。肝脏受压，其内密度均匀。胆囊受压，胆囊内未见异常密度影。胰腺头部及体部受压变细。其内密度均匀。脾脏及双肾未见明显异常。局部小肠受压推移至左下腹部。MR 平扫：中上腹前部可见一巨大囊状长 T_1 长 T_2 信号，其内信号尚均匀，其边界清晰，大小约 160mm*150mm*94mm，其左侧可见一类似信号小囊状影与其相连；肝内胆管、肝总管及左、右肝管未见明显扩张。肝脏左叶、门静脉受压。胰腺后缘受压，胰管未见扩张。胆囊受压，胆囊内未见异常信号。脾脏及双肾未见明显异常。肠管受压推移至两侧后下腹部。MRCP 示：上腹部一巨大囊性占位，胆囊受压位于占位下方，胆囊、胰管未见扩张。术后病理：肝脏间叶性错构瘤。
讨论：肝脏间叶性错构瘤（MHL）是一种罕见的肝脏良性肿瘤，多发生于 2 岁以内的婴幼儿，男性多于女性。患儿早期常无明显症状和体征，随着肿物增大可出现腹部膨隆、腹痛、黄疸甚至心衰等表现。实验室检查肝功能多数正常，约 1/4 患儿 AFP 可升高。CT 检查肝叶内类圆形肿块,密度不均,与周围组织界限清晰,囊性液体部分可为水样密度,实性部分、囊壁、囊内间隔呈软组织密度,可有或无钙化,增强可见分隔及包膜强化。MRI 表现为肝内类圆形信号,根据囊实性成分的不同,可有不同信号表现。实性部分常为等 T_1 或稍长 T_2 信号,囊性液体成分常为短 T_1 长 T_2 信号。本病例为囊性，须与单纯性囊肿、包虫病、肝脓肿、转移瘤囊变等相鉴别。

PU-0156

食管造影对新生儿先天性食管闭锁的诊断价值

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目的 探讨食管造影对新生儿先天性食管闭锁的诊断价值。**方法** 搜集 2013 年 2 月-2018 年 3 月在我院经手术及病理证实的 39 例先天性食管闭锁患儿的临床及影像资料进行回顾性分析，所有患儿均行胸腹联合摄片及食管造影检查。由 2 位有经验的影像诊断。**结果** 39 例先天性食管闭锁患儿，其中Ⅰ型 1 例，Ⅲ型 37 例（其中Ⅲa 型 10 例，Ⅲb 型 27 例），ⅣⅤ型 1 例，6 例合并其他畸形。**结论** 食管造影对新生儿先天性食管闭锁的诊断具有重要诊断价值。

PU-0157

婴儿型肝脏血管内皮细胞瘤的 CT 诊断

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目的 分析婴儿型肝脏血管内皮细胞瘤（IHHE）的 CT 表现特征，评估其临床诊断价值。方法 回顾性分析我院 8 例 IHHE 患儿的 CT 表现，所有病例均有手术病理或临床诊断结果。结果 8 例患儿中，2 例为单发肿块型病灶，6 例为多发病灶，CT 增强表现为肝内富血供病灶，7 例为动脉期呈周边环形强化，边缘不规则，增强程度等同于同层主动脉强化程度，中央呈星芒状低密度区，静脉期及延迟期持续向心性强化，中心区域可见条索状血管样强化及未强化区域，边缘变光滑；1 例多发病灶动脉期表现为斑片状、结节状强化，所有病例均合并有不同程度动静脉瘘。结论 IHHE 的 CT 表现具有一定特征，而 CT 增强表现对本病的诊断更具诊断价值。

PU-0158
儿童少见类型肾母细胞瘤 5 例影像学特点分析

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目的 探讨儿童特殊类型肾母细胞瘤的影像学诊断要点及鉴别诊断。**方法** 收集 5 例儿童特殊类型肾母细胞瘤病例进行临床资料、CT 影像学特征，并结合文献探讨其诊断与鉴别诊断。**结果** 5 例患儿中男童 2 例，女童 3 例，年龄 2-6 岁，中位年龄 4 岁，临床特点均因无痛性肉眼血尿、腹部包块、腹痛或发热就诊，左肾(2 例)多于右肾(3 例)。其中部分囊状分化型 2 例，肾母细胞瘤伴肾源性残余 3 例，囊性部分分化型肾母细胞瘤 CT 表现为多囊样肿块伴粗细不等间隔；肾母细胞瘤伴肾源性残余 CT 表现为肾内软织密度肿块，增强扫描 呈“快 进快出”肾透明细胞癌强化模式。**结论** 部分囊状分化的肾母细胞瘤(cystic partially differentiated nephroblastoma，CPDN)、肾母细胞瘤伴肾源性残余是少见特殊类型的肾母细胞瘤，尽管发病率很低，但是 CT 扫描具有一定的特征性；有利于为患儿治疗及预后判断提供较为可靠的依据。

PU-0159
探讨磁共振成像技术在胎儿肾囊肿上的应用价值

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目的 探讨磁共振成像技术在胎儿肾囊肿上的应用价值；
方法 收集我院 2018 年 9 月至 2019 年 7 月，临床超声诊断提示胎儿肾脏囊性病变，扫描方法采用常规 T2 序列扫描，扫描基线：沿胎儿的腹部扫描冠状以及失状，最后再扫描胎儿的腹部横断位压脂。
结论 磁共振 T2 序列对于胎儿肾脏囊性病变有较好的应用价值，而 T2 压脂序列能更好的与脂肪性病变做鉴别。

PU-0160
磁共振胰胆管成像在先天性胆总管囊肿的诊断【摘要】

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目的 探讨磁共振胰胆管成像诊断小儿先天性胆总管囊肿的价值分析。
方法 回顾性分析经临床手术及病理证实的 17 例小儿先天性胆总管囊肿，对所有病例的磁共振胰胆管成像的征象进行分析。
结果 17 例小儿先天性胆总管囊肿中，I 型 14 例，占 82.4%，II 型 1 例，占 5.8%，III 型 2 例，占 11.8%。胆总管囊肿多为囊状改变，境界清楚，边缘光整。
结论 先天性胆总管囊肿又称为先天性胆管扩张症，可以发生在肝内、外胆管的任何部位，是小儿常见的一种先天性胆道疾病，以腹痛、腹部包块、黄疸为主要临床表现。磁共振胰胆管成像为患儿提供无创无辐射的影像检查手段，为外科手术医师提供重要的术前影像资料。

PU-0161

磁共振水成像对小儿泌尿系梗阻临床诊断的意义

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目的 研究分析磁共振水成像对小儿泌尿系梗阻应用的临床诊断价值。
方法 59 例小儿泌尿系梗阻患儿， 分别采用腹部磁共振水成像、腹部超声（BUS）、静脉尿路造影（IVP）进行检查诊断， 对其诊断结果与手术病理进行比对。
结果 MRU 诊断小儿泌尿系梗阻准确率为 100.00%， BUS 诊断小儿泌尿系梗阻准确率为 71.19%，IVP 诊断小儿泌尿系梗阻准确率为 79.66%。MRU 准确率分别与 BUS、IVP 比较， 差异均有统计学意义（ $\chi 2=19.86$、13.36， $P<0.01$）。
结论 MRU 诊断小儿泌尿系梗阻准确率较高，安全无辐射， 为临床治疗方案的制订提供可靠的依据。

PU-0162

网膜轴型胃扭转 1 例

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患儿，女，4 岁，腹胀伴呕吐 2 天入院。查体：腹胀，中上腹为著，触诊质韧，未及明显压痛、反跳痛。胃泡振水音阳性。
影像学检查：立位腹部平片示胃影明显增大，考虑胃扭转可能。腹部 CT 平扫显示胃腔扩张，幽门显示不清；脾脏内下移位。上消化道造影显示胃呈球形卷曲，胃窦位于左上腹，食管胃交界处与胃窦幽门接近。诊断胃扭转（网膜轴型）。
治疗：予禁食、胃肠减压、静脉抗感染等保守治疗，并嘱增加下地活动量。患儿症状好转。7 天后复查上消化道造影检查，未见异常。
讨论：胃扭转分为器官轴型和网膜轴型。器官轴型胃扭转，即胃沿其长轴发生扭转，胃大弯的位置高于小弯且位于小弯右侧。网膜轴型胃扭转，即胃沿其短轴线折叠，结果导致胃大弯和胃小弯在其通常相对于彼此的位置，胃食管交界处与幽门之间的关系可发生倒置。
网膜轴型胃扭转，胃食管交界处与幽门位置接近，形成一个较窄的蒂，胃可沿此蒂发生闭环性梗阻、绞窄和胃缺血。上消化道造影是本病诊断的金标准。在 CT 上，异常高位的胃窦出现在食管下段层面上，形似“贲门”。MPR 冠状位显示“倒置幽门征”。
因此，急腹症急性胃扩张病例行 CT 检查时，应仔细观察确定胃扩张的原因，注意胃大小弯形态，贲门与胃窦幽门的位置。当发现胃窦位置异常，特别呈现“假贲门”征时，应考虑到胃扭转诊断。

PU-0163

Liver involvement of Langerhans Cell Histiocytosis masquerading as Caroli’s Disease. Case Report

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Langerhans cell histiocytosis (LCH), formerly known as histiocytosis X, refers to a spectrum of diseases characterized by idiopathic proliferation of histiocytes that produce either focal (localized LCH) or systemic manifestations. Liver involvement of Langerhans Cell Histiocytosis is recognized as an indicator of poor prognosis of LCH. The diagnostic imaging findings of hepatic LCH are challenging. Multiple saccular dilatations of intrahepatic bile ducts are common and characteristic magnetic resonance imaging (MRI) feature of Caroli's disease, but is rarely seen in LCH. In this report, we describe a case of LCH masquerading as Caroli's disease in a 4-year-old child based on clinical symptoms, laboratory findings, and pre-diagnostic MRI findings (multiple saccular dilatations of intrahepatic bile ducts). Therefore, the multiple saccular dilatations of intrahepatic bile ducts is not sufficient to clearly establish the diagnosis of Caroli's disease, and the differential diagnosis of hepatic LCH should be considered when a child with Caroli's disease.

PU-0164

急性胰腺炎的 CT 诊断

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通过 CT 检查诊断，及早给临床提供可靠诊治资料，减少患者痛苦，降低死亡率，提高治愈率，使患者免受不必要的痛苦。方法 收集分析我院近年来经临床证实的 21 例急性胰腺炎病例的 C T 资料，观察其 C T 表现特征、病变范围。采用东芝 16 层螺旋 CT。全部病例均行腹部 CT 平扫，层厚 5~10mm,层距 5~10mm。其中几例做了增强薄层扫描。

PU-0165

浅谈坏死性小肠结肠炎 X 线表现

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讨论新生儿坏死性小肠结肠炎的早期 X 线表现。 **方法** 回顾性分析昆明市儿童医院 40 例新生儿坏死性小肠结肠炎的早期 X 线表现。 **结果** 临床上出现新生儿坏死性小肠结肠炎的症状，首次或多次复查 X 线片发现胃泡影增大且内有网络状、条索状影：肠壁轻度扩张、紊乱、僵直、肠道充气分布不均匀，部分呈管状扩张、部分细小痉挛且肠壁有增厚、模糊，尤其在右下腹或肠腔内有液平等动力性肠梗阻改变，即应提示新生儿坏死性小肠结肠炎的早期诊断。

PU-0166

Analysis of imaging and clinical manifestations of children with Kasabach-Merritt syndrome

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Rationale and Objectives: Kasabach-Merritt syndrome (later known as Kasabach-Merritt phenomenon) is a rare disease that occurs in infants or young children with extremely high mortality. The main purpose of this paper is to analyze the imaging findings of Ka-Mei syndrome occurring in different sites and to improve the understanding of the disease.**Materials** and **Methods:**Retrospective analysis of the imaging, ultrasonography, clinical manifestations and biochemical indicators of 3 children with Kasabach-Merritt syndrome diagnosed in our hospital to explore the basic imaging findings and clinical manifestations of Kasabach-Merritt syndrome **Result:** child 1 ,3 weeks old baby girl, multiple large hemangioma respectively located in the liver and hepatic and gastric space, the number of platelets was 15 $x10^9$ / L; child 2, 3 months old boy, giant hemangioma located in the pancreas, platelet count is $11x10^9$/L; child3, 2 months old boy, the giant hemangioma located in the left axilla, and there found multiple hematomas in left iliopsoas and erector spinaecan, the minimum number of platelets is $11x10^9$/L. Tests of coagulation function showed all three children had different degrees of fibrinogen reduction, D-dimer and fibrinogen degradation products (FDP) increased.**Conclusion:** Kasabach-Merritt syndrome is a group of syndromes that occur in infants .The main clinical manifestations include large hemangioma in different organs or tissues, a decrease in platelet count and coagulopathy.Imaging performances are as follows:1. Hemangiomas are mostly located in superficial or deep subcutaneous soft tissue, only a few can occur in deep abdominal organs. Lesions distribution can be localized or diffused, while the possibility of involved both skin and abdominal organs is small, besides hemangioma rapidly enlarge in the short term is a typical feature. 2. Giant hemangioma showed soft tissue density on CT withirregular, lobulated shape. There were characteristic calcification or venous stones in the superficial lesions, if the Lesion located in the abdominal organs then no venous stones were found. After enhancement it should be progressively enhanced,surrounding the lesion large drainage vessel can be seen .Some lesions formed arteriovenous fistulas can be markedly uniformly enhanced during the arterial phase.3. MRI signals of hemangiomas located at superficial tissues and deep abdominal organs are different. The giant hemangioma located on superficial or deep subcutaneous soft tissue shows an equal/low signal on T1WI , slightly higher signal indicated fat component. The T2WI sequence signal is rather complex, the strip-like low signal represents fiber fiber stove, Sedimented hemosiderin or fluid void vessels. Hemangioma in the deep organ showed a homogenous high signal on T2WI with clear boundaries.4. Doppler ultrasound also show the lesion well, which can distinguish hemangiomas from other soft tissue tumors and vascular malformations. The giant hemangioma appears as a strong echo with unclear boundaries, and the CDFI show rich blood .Finally, the clinical mortality rate of Kasabach-Merritt phenomenon is relatively high,If there are single or multiple hemangioma in infants , accompanied by thrombocytopenia and coagulopathy, the Kasabach-Merritt syndrome should be considered immediately.It's nesessary providing effective imaging information to clinical doctors helps them to develop appropriate treatment in the early stage,which can avoid misdiagnosis and mistreatment, improve the survival rate of children.

PU-0167

多排 CT 在美克尔憩室中的诊断应用

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目的 多排 CT 在美克尔憩室中的应用价值
方法 回顾性分析 6 例经手术和病理证实的梅克尔憩室的患者的 CT 影像学特点。
结果 3 例以肠梗阻症状就诊，CT 可见小肠段出现气液平面，回肠区见靶征，盆腔可见积液，2 例以便血症状就诊，CT 可见肠管大部充气明显，见回肠区一囊性肿物，壁呈肠管样，1 例以转移性腹痛就诊，CT 可见中腹部回肠区一包块，其内密度欠均。
结论 正常人群发病率为 2%左右。卵黄管的肠端未闭所致， 回肠系膜对侧形成的袋状残留物。憩室一般位于距回盲瓣 30~100cm 的末端回肠上。有自身供血，多呈圆锥形，少数为圆柱形，口径 1~2cm，憩室较回肠腔为窄，长度 1~10cm，盲端游离于腹腔内。一般较肠重复畸形小。容易发生消化道出血、憩室炎、肠梗阻、穿孔等并发症，当小儿患者出现这些临床表现时，应考虑到美克尔憩室及其并发症的可能性，尤其是伴有脐茸、脐窦等卵黄管残留的脐部表现时，更应注意。美克尔憩室是在胚胎发育过程中卵黄管退化不全所形成的回肠远端憩室。临床上多无症状往往因憩室出现并发症表现才就诊而获诊断。多以肠梗阻、便血、憩室炎表现酷似急性阑尾炎为常见，CT 缺乏特异性表现，但有一些影像特点有助于诊断，如病变位于多回肠区，囊性病变囊壁呈肠管样结构、CT 后处理可见部分病变与肠管呈憩室样改变等。对疾病的定性诊断及鉴别诊断有一定价值。

PU-0168

新生儿肠旋转不良的消化道造影表现

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目的 探讨新生儿肠旋转不良消化道造影的 X 线表现，旨在提高对本病的认识及诊断。**方法** 对我院 2013 年 1 月一 2018 年 12 月，经消化道造影并手术证实的 38 例新生儿肠旋转不良的影像学表现及临床特点进行回顾性分析。**结果** 消化道造影诊断肠旋转不良 38 例患儿中，术中确诊为肠旋转不良并发中肠肠扭转 33 例，伴环状胰腺 2 例，十二指肠闭锁 3 例，伴有腹膜索带压迫十二指肠 2 例。婴幼儿儿肠旋转不良的典型 X 线表现为“螺旋征”、“漩涡征”、回盲部位置异常，肠旋转不良可合并中肠扭转、胃扭转、十二指肠隔膜、十二指肠闭锁、胃隔膜、食道裂孔疝等。**结论** 泛影葡胺上消化道造影、钡灌肠造影是诊断本病首选方法。
关键词：新生儿；肠旋转；X 线

PU-0169

先天胆总管囊肿的 MRI 表现

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目的 探讨胆总管囊肿的 CT 表现及鉴别要点。**方法** 36 例手术证实的胆总管囊肿患儿(9 名男孩和 27 名女孩，年龄 7 天至 7 岁，平均 3.5 岁)回顾性分析。**结果** 1)肝外胆管囊肿Ⅰ型 25 例。囊肿位于肝门至胰头之间，平扫呈水样密度囊性肿块，其大小不一。最小直径 1.5cm,最大者

直径达 15cm 以上。胆囊增大 8 例，所有病例伴有不同程度肝内胆管扩张及胰头弧形受压移位和十二指肠环扩大。2）胆总管单发性憩室Ⅱ型 1 例，MRI-T1WI 表现为胆总管外侧壁见囊性低信号影、信号均匀、边缘光滑，胆囊及肝内胆管无异常征象。3）多发性囊肿Ⅳ型 4 例，MRI 表现为肝内胆管及肝外胆管多个大小不等囊性扩张的长 T1WI,长 T2WI 信号，囊壁光滑，胆囊无异常征象。4）肝内胆管囊肿型(Caroli’S 病)5 例。胆管囊肿位于肝内近水样信号，囊肿直径大小不一，可有“中心点征”，为异常扩张的胆管包绕相伴的门静脉小分支的投影强化所致。囊状与柱状扩张的胆管相连接，呈“串珠状”或“分节状”。**结论**　小儿先天性胆总管囊肿的 MRI 表现有一定特征性，为本病治疗提供可靠信息。

PU-0170

64 排螺旋 CT 泌尿系成像对输尿管先天畸形的诊断价值

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目的:探讨 64 排螺旋 CT 泌尿系成像对输尿管先天畸形的诊断价值。方法:收集我院五年来经手术及临床证实的先天性输尿管畸形患者 50 例,所有病例均行 64 排 CT 平扫、双期增强及延时扫描,并在 ADW4.4 工作站中利用 MPR、CPR、MIP、VR 技术进行后处理。结果:50 例患者中,肾盂输尿管重复畸形 20 例,先天性输尿管狭窄 16 例,下腔静脉后输尿管 3 例,输尿管囊肿 6 例,输尿管异位开口 2 例,先天性巨输尿管 3 例,所有病例经手术及临床证实。结论:64 排螺旋 CT 泌尿系成像及后处理能清楚显示异常输尿管的形态、走形及周围结构关系,是先天性输尿管疾病诊断的一种重要检查方法。

PU-0171

小婴儿副脾扭转伴坏死 1 例

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目的　报道小婴儿副脾扭转伴坏死 1 例
方法　回顾性分析病例。患儿，女，2 月龄，入院前 2 天因发热伴腹泻就诊于当地医院，超声发现腹腔肿物。CT 增强示：左肾前下方不规则囊性占位性病变，包膜强化。MRI 示左腹部不规则形稍长 T_1长 T_2信号为主的包块影，边缘可见不规则短 T_1短 T_2信号影。诊断为腹部肿物，腹腔镜手术探查并切除。
结果　镜下见左上腹暗紫色实性肿物，以穿刺针抽出 200ml 淡黄色清凉液体，切除残留组织并送病理。病理回报：副脾扭转坏死。
讨论：副脾扭转坏死较为罕见，临床多表现为急腹症。当弥漫性梗死时，副脾内可见大面积坏死囊变，周围边缘可见强化，在 MRI 上呈长 T_1长 T_2液体信号影。主要需与左上腹部囊性肿块相鉴别。通过对该病例的复习，我们意识到当小婴儿左上腹部出现囊性占位性病变且没有明确急腹症病史时，还需考虑该病的可能性。

PU-0172

后肾腺瘤 1 例

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患者 女，2 岁 2 个月，B 超发现左肾下极包块 10 天余。为进一步治疗到我院就诊。超声：左肾下份探及一包块，大小约 2.5cm×2.1cm×2.0cm，椭圆形，边界清，内部呈中等回声，CDFI:其内可见短棒状血流信号。超声诊断：左肾下份实性包块声像 CT 检查：平扫左肾下极可见一类圆形稍低密度包块，边界清楚，大小约 1.9cm×1.7cm，密度欠均匀，CT 值约 19-38Hu，增强扫描成不均匀强化，动脉期病灶中心明显强化，后期逐渐减退，病灶外周强化不明显。CT 诊断：左肾下极肿瘤，性质待定。手术及病理：行左肾下极肿瘤切除术+肾周围粘连松解术+肾固定术，术中见左肾下极囊实性包块，质韧，显露部分光滑，包膜呈紫红色与灰白色相间，包膜内未见明显异常增生曲张静脉。病理切片：肿瘤细胞呈筛状、网状及乳头状分布,部分区似肾小球结构,细胞核圆形或椭圆形,大小一致,核仁不明显,未见核分裂,散在沙砾体,局部呈多囊性扩张,边缘见纤维包膜及残余肾脏组织。免疫组织化学染色:S100(-)、CK7(散+)、CK8/18(+)、CD56(散+)、CD57(散-)、WT1(+)、eMA(-)、CD10(+)、Glypican- Vimentin(-)、Ki-67(+,3-5%)、CK(+)。病理诊断：(左肾肿瘤)考虑后肾腺瘤。

PU-0173

儿童卵巢横纹肌肉瘤一例

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患者，女，6 岁。3 月前出现间断腹痛，加重 2 天就诊。B 超提示：左中腹混合回声占位，CT 提示：左侧卵巢来源恶性肿瘤并瘤内出血。临床诊断：腹部包块性质待查。2018 年 11 月 9 日行左卵巢肿瘤切除术。病理检查：肿瘤细胞疏松排列，部分区域密集，细胞短梭形或星形，胞浆淡染，细胞核梭形或圆形，核分裂易见，部分可见小核仁，局灶见软骨组织，边缘区见少量卵泡结构。免疫组织化学染色：Vim（+）、CD117（+）、Nestin（+）、S-100（部分+）、Bcl-2（+）、CyclinD1（+）、CD10（+）、CD99（+）、Myogenin（灶性+）、Dog1（灶+）、Ki-67（+，70%）、WT-1（±）、CK（-）、Syn（-）、EMA（-）、SMA（-）、CR（-）、a-inhibin（-）、CgA（-）、CD34（-）。病理诊断：胚胎型横纹肌肉瘤伴软骨分化。

PU-0174

胎儿卵巢囊肿 MRI 表现及临床治疗转归

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目的 探讨胎儿卵巢囊肿 MRI 表现及临床治疗转归。方法 报道 3 例胎儿卵巢囊肿 MRI 表现，使用 SSFSE 及 FIRM 序获得胎儿 MRI 图像。结果 MRI 示：病例 1 胎儿腹腔可见一类圆形混杂信号肿块，呈长 T1 稍短 T2 信号，内可见斑片状、线条样长 T2 高信号影，肿块大小约 70mm×66mm×65mm，边界较清，边缘光整。病例 2 胎儿腹腔可见一类圆形长 T1 稍长 T2 信号肿块，大小约

59mm×51mm×51mm。病例 3 胎儿膀胱两侧分别可见一类圆形长 T1 长 T2 信号肿块，右侧大小约 26mm×26mm×26mm，左侧大小约 20mm×20mm×20mm。病例 1 患儿出生后，肿块明显缩小，术后病理为滤泡囊肿；病例 2 术后病理为卵巢囊肿伴扭转；病例 3 生后随访囊肿消失。结论 胎儿时期卵巢囊肿主要受激素作用形成，较小的囊肿可于产后自行消失；较大的囊肿或复杂囊肿多需手术切除。随着 MRI 在产前诊断的不断应用，胎儿卵巢囊肿信号可有不同表现，掌握胎儿卵巢囊肿的信号特点，对产前诊断、胎儿预后及手术评估具有重要意义。

PU-0175

胎儿磁共振检查技术探讨

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目前常用的胎儿影像学检查方有超声检查及磁共振检查，MRI 具有无电离辐射的特点，安全性高；软组织对比分辨率较高，不受骨骼影响，对胎儿各系统解剖结构及异常的显示明显优于超声；视野大，可以精确地进行各种不同切面扫描，从而显示胎儿全貌；能比较精确地进行胎儿发育及母体、胎盘等各种测量；对胎儿组织的定性较好，可做胎儿脑组织及肺功能等频谱，对于胎儿病变诊断提供更多的信息。

PU-0176

MRI 对超声发现的胎儿颅后窝池增宽的再评价

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目的 探讨快速 MRI 对超声所发现的胎儿颅后窝池增宽的诊断价值。**方法** 选取超声在大排畸检查中（孕龄 20W-24W）发现的胎儿颅后窝池增宽（宽≥10mm），并在 1 周之内接受产前 MRI 检查的胎儿 60 例，得出 MRI 诊断结果，并与超声诊断结果进行比较评价。**结果** 60 例胎儿中，超声诊断均为数值性诊断，无明确意义的定性诊断，胎儿 MRI 诊断**结果** 颅后窝池单纯性增宽 45 例，大枕大池 6 例，蛛网膜囊肿 3 例，典型 *Dandy-Walk*er 畸形 2 例，非典型 *Dandy-Walk*er 畸形 1 例，Black 囊肿 1 例，右侧小脑半球发育不良及半球缺如各 1 例。**结论** 快速 MRI 较超声在胎儿颅后窝疾病的诊断中具有一定的优势，可作为超声检查的有力补充。

PU-0177

磁共振在胎儿侧脑室增宽中的应用及进展

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一、磁共振在胎儿侧脑室扩张诊断上的优势及不足。
胎儿磁共振是任意层面成像，视野大、解剖细节好，对胎儿侧脑室扩张合并脑发育异常和畸形，比如灰质异位、结节性硬化、胼胝体发育异常等做到比较确切的诊断。通过功能序列检查对胎脑病灶组织成分进行大致区分，为胎儿先天性疾病诊断提供一些比较有效的信息。但是成像过程中难以克服胎动的影响。
二、常规胎儿磁共振检查所运用的序列。

胎儿磁共振所运用的主要是两个快速扫描序列：单次激发快速自旋回波序列（SSFSE）以及快速稳态激动采集序列（FIESTA）。不同的磁共振产家命名不同：单次激发快速自旋回波序列序列 GE 公司命名为 SSFSE 序列，西门子公司命名为 HASTE 序列，飞利浦公司命名为 SSTSE 序列。快速稳态激动采集序列 GE 公司命名为 2D-FIESTA 序列，西门子公司命名为 True FISP 序列，飞利浦公司命名为 Balance FEE 序列。在临床实践中，一般还会增加扫描 DWI 序列以及 T1 序列，得以进一步大致区分胎儿的组织成分。

三、胎儿磁共振检查技术进展。

1、三维磁共振成像技术。运用这种技术检查后期可以重建出胎儿侧脑室三维图像。

2、胎儿磁共振功能成像技术。

2.1 弥散加权成像（DWI）。胎儿脑组织以及肾脏在 DWI 上表现较高信号，DWI 对胎儿脑组织以及肾脏的观察上很有优势。

2.2 弥散张量成像（DTI）。DTI 技术可以显示皮质层状结构、脑白质纤维束以及髓鞘的发育成熟过程等。

2.3 磁共振波谱成像（MRS）。MRS 可以检测胎儿脑不同代谢物来反映胎脑发育成熟度及过程，通过检测这些代谢产物的峰值变化来评估胎脑的发育情况以及是否存在病理情况。

2.4 磁敏感成像（SWI）。SWI 可以显示微小静脉以及微小出血灶，因此对胎儿脑内微小出血灶的检出具有一定的价值。

2.5 血样水平依赖（BOLD）成像。BOLD 是基于血红蛋白氧饱和度变化而进行成像的 MR 技术。

PU-0178

胎儿颅脑磁共振成像在产前诊断中的应用价值

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目的 探讨胎儿颅脑 MR 功能成像联合优化常规检查的临床应用价值。**方法** 选择具有产前超声检查、产前和新生儿期 MR 胎脑检查平均孕龄为 31±3 周的 96 例为研究对象。MR 常规序列 2D T2W-TSE 及 3D T1WI-TFE 或 2D T1W Balance TFE 序列；功能序列包括 DWI、选择性 SWI 序列。将产前 UCG、MR 检查结果与新生儿期 MR 结果分别进行对比分析。**结果** 1、MRI：单胎 95 例、双胎 1 例；胎脑正常 32 例、胎脑异常 65 例。异常主要包括脑室不同程度扩张 23 例、后颅窝池增宽 10 例、胼胝体发育不良或缺如 13 例、透明隔增宽或缺如 8 例、室管膜下囊肿 5 例、脑实质出血 3 例、脑室血肿 3 例等。2、胎脑产前 US 与产前 MR 诊断结果对照：完全符合 62 例（64.5%）；胎脑产前 US 与新生儿期颅脑 MR 诊断结果对照：完全符合 60 例（62.5%）；产前 MR 与产后 MR 结果对照：诊断完全符合 86 例（89.6%）。**结论** 常规 MRI 对胎脑疾病诊断具有明显优势，显著弥补超声学对胎脑检查的不足，可为临床提供更详细、更精准的影像信息，减低畸形及缺陷儿出生。

PU-0179

Haste-Flair 序列对胎儿 MR 侧脑室增宽的诊断价值

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目的

胎儿侧脑室增宽占胎儿神经系统疾病中的大部分，单纯的侧脑室增宽和侧脑室室管膜下囊肿用传统的快速扫描序列很难鉴别。而磁共振 Haste-FLAIR 序列有助于对一些孕妇产前 B 超提示胎儿侧脑室增宽的神经系统疾病鉴别诊断的价值。

方法

筛选 2017.9 年至 2019.8 年浙江大学医学院附属邵逸夫医院产科门诊的孕妇，并且产前 B 超提示具有单侧或双侧胎儿脑室增宽的 120 人，为鉴别诊断进行胎儿 MR 平扫，所有孕妇扫描前均签署孕妇磁共振安全告知书。所扫描的机器为西门子 Avanto，1.5Telsa，扫描序列为半傅里叶单发射快速 SE *序列*Haste 和真性快速稳态序列 Trufi 扫描胎儿的头颅、体部等三平面图像；用 T1WI、DWI 和 Haste-FLAIR 序列扫描胎儿头颅标准轴位图像；用磁敏感加权成像 SWI 序列扫描胎儿脊柱；用 3D-trufi 扫描头颅和四肢三维。扫描所获得的 MR 图像由两位经验丰富的儿科影像学医生进行诊断及结果评估。

结果

总共选择 120 例孕妇，平均年龄 29.9 岁， MR 平均成像妊娠 30 周。 Haste-FLAIR 序列总共检测到侧脑室内室管膜下囊肿 9 例,其中 2 例单侧侧脑室室管膜下囊肿，7 例双侧侧脑室室管膜下囊肿。在 Haste、3D-Trufi 序列上脑室内囊肿跟脑脊液一样呈高信号， Haste-Flair 上信号比脑脊液高。

结论

Haste-FLAIR 序列可用于胎儿侧脑室增宽的鉴别诊断，尤其适合鉴别室管膜下囊肿，特别是当大孕周、胎位或母体肥胖妨碍超声影像诊断时。

PU-0180

胎儿体蒂异常并中央性前置胎盘 MR 影像一例

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孕妇，47 岁，孕 2 产 1，因“中期妊娠，胎儿畸形，中央性前置胎盘”于 2019 年 6 月 27 日入院江西省妇幼保健院。患者既往月经规律，否认毒物、放射性物质接触史，否认家族遗传病史、近亲婚配。患者自述 2019 年 03 月余因月经未来自测验孕棒阳性，当地医院行彩超提示宫内妊娠，2019-06-23 本院彩超提示：胎儿腹壁连续性回声中断，腹腔内脏器（肝、肠道）漂浮羊水中，胎儿脊柱前突，胎儿仅见一侧下肢，胎儿脐带长约 40 mm，考虑体蒂异常。2019-06-27 日我院 MRI 提示：胎儿体蒂异常（腹裂畸形、脊柱侧弯、左侧下肢缺如、脐带过短），中央型前置胎盘。入院体格检查：一般情况可，血压 140 / 81 mmHg(1 mmHg=0.133 kPa)，宫体：前位，脐耻之间，质中，活动可。患者剖宫取胎，以足位牵引娩出一胚胎，内脏外翻，脐带短。死胎检查：（1）影像学检查：MRI 平扫显示胎儿脊柱侧弯，腹壁缺损（肝脏及大部肠管游离至胎儿腹腔外），胎儿左下肢缺如；CT 平扫提示脊柱侧弯，胎儿左下肢缺如，腹壁缺损，所示肝脏及大部肠管游离至胎儿腹腔外。所示胎儿左下肢缺如；DR 显示胎儿脊柱侧弯，左下肢缺如，腹腔脏器疝出。（2）死胎检查：胎儿左下肢缺如，腹壁缺损，肝脏、肠管及膀胱膨出，脐带短小（约 40 mm），脊柱侧弯。**最终诊断：**胎儿体蒂异常。

PU-0181

胎儿 MRI 诊断胎儿颅内出血的价值

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目的
产前诊断胎儿颅内出血具有重要的病因分析，治疗和预后意义。超声和磁共振成像（MRI）可被用于该病的诊断。本文总结了胎儿颅内出血的 US 和 MRI 表现，评价 MRI 对胎儿颅内出血的产前诊断价值
方法 5 例孕妇产前行常规 US 检查发现异常后 24~48h 内行 MRI 检查，采用半傅里叶采集单次继发 RARE 序列（T2-HASTE）、平衡式稳态自由进动序列（T2-Trufi）、扩散加权成像（DWI）序列、扰相回波 T1 序列，将产前 MRI、US 表现及 1 胎引产后尸检结果对照。
结果 5 例胎儿 MRI 诊断脑室内出血 3 胎，室管膜下出血 1 胎，硬膜外血肿 1 胎。其中 2 例脑室内出血及 1 例室管膜下出血超声已诊断，MRI 进一步证实。1 例脑室内出血超声漏诊，MRI 的 T1WI 及 DWI 序列对出血的发现发挥了重要作用。硬膜外血肿的 1 胎超声表现为颅内囊性回声，其内可见分隔及密集点状回声，未见血流信号。超声诊断为颅内占位。MRI 表现为颅内巨大类圆形异常信号，T1WI 呈高信号，T2-HASTE 及 T2-trufi 均呈高及稍高信号，其内并见与母体平行的液液平面，脑组织呈受压改变。T1WI 的高信号对这例患者的诊断具有重要提示意义。
结论　目前 MRI 是胎儿颅内出血的较理想检查手段,各种序列联合更直接清晰显示出血的不同时期及范围,减少胎儿颅内出血的漏诊及误诊率。胎儿硬膜外血肿罕见。目前，还没有已知的有效的宫内治疗手段。

PU-0182

Prenatal Diagnosis of Joubert Syndrome by ultrasound and MRI

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Objective: To describe the imaging characteristic of Joubert syndrome in fetuses by ultrasound and MRI.
Materials and methods: We report a series of three fetuses with Joubert syndrome in Hubei Maternal and children' s hospital from January, 2012 to March 2015. All the mothers undertook the prenatal ultrasound. Two of the babies undertook prenatal MRI and were aborted subsequently; one live delivering baby took MRI after birth.
Results: One baby was correctly diagnosed by both ultrasound and prenatal MRI. One baby was diagnosed only by MRI. And one living baby was misdiagnosed by ultrasound.
Conclusion: Prenatal ultrasound could discover the Joubert syndrome in the case of paying special attention to. But in most cases, Joubert syndrome could be missed. Sonographer should realize the typical sign of Joubert syndrome, and prenatal MRI is necessary when the imaging is atypical.

PU-0183

产前 1.5T 磁共振成像上睾丸的下降情况

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estis was not observed in scrotum on prenatal 1.5T MRI prior to 23 weeks' gestation. Unilateral testicular descent was firstly observed at 24+1 weeks of pregnancy, and the earliest bilateral testicular descent showed at 25+3 weeks. The descent of testicles mainly occurred in the gestation of 25-28 weeks, 82.6% of 28-week fetuses showed bilateral descent and 93.0% showed the descent of at least one side. Bilateral descent was observed in 100% of cases at 33 weeks

PU-0184

西门子 Avanto 1．5T 超导磁共振在新生儿 HIE 中的应用

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新生儿缺氧缺血性脑病（HIE）是产科围产期常见病，主要见于各种原因导致宫内窘迫窒息患儿、大部分早产儿，是临床致死主因之一，存活患儿中部分遗留智力低下、偏瘫、癫痫等并发症，影响患儿发育。早期确诊 HIE，并予以积极的治疗干预是改善患儿预后的关键。对于 HIE 的诊断，除依据临床诊断标准，CT 及 MRI 等影像学辅助检查越来越成为重要依据。就检查方法而言，MRI 有其很高的软组织分辨率优势，相对 CT 消除了骨骼伪影又无辐射，同时能多序列、多方位成像，加之特殊序列如磁敏感加权成像（SWI）及弥散加权成像（DWI）技术更进一步提高了 HIE 早检率，从而为临床及时正确治疗提供了有效帮助。

PU-0185

MRI 定量分析胎儿脑干-小脑蚓部夹角与脑干-小脑幕夹角及其在胎儿单纯后颅窝池增宽中的应用价值

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目的 利用 MRI 测量正常胎儿脑干-小脑蚓部夹角（BVA）与脑干-小脑幕夹角（BTA），分析其随与孕周的变化规律，并探讨其在胎儿单纯后颅窝池增宽中的应用价值。
方法 本研究共纳入 139 例胎龄为 24～38 周的正常胎儿，行胎儿颅脑 1.5T MRI 检查，选取胎儿小脑蚓部正中矢状面在三维后处理工作站（OsiriX 软件）上测量胎儿脑干-小脑蚓部夹角（BVA）与脑干-小脑幕夹角（BTA），分析其随与孕周的变化规律；同期选取 75 例单纯后颅窝池增宽胎儿利用相同方法测量的结果进行对比分析。
结果 ①160 例正常胎儿 MRI 测得的 BVA 正常值范围为 1.6°～9.7°，平均值为（4.62±1.34）°，BTA 正常值范围为 16.0°～43.1°，平均值为（28.34±5.58）°，由散点图得出 BVA 及 BTA

与孕周均不存在相关关系；②75 例单纯后颅窝池增宽，BVA 平均值（4.70±1.18）°，BTA 平均值（29.40±6.23）°，与正常胎儿相比均不具有统计学差异（*P*均＞0.05）。
结论 MRI 测量正常胎儿 BVA、BTA 与孕周无明显相关性，且对于胎儿后颅窝发育异常的判定及分类提供可参考的量化指标。

PU-0186
儿童。骨朗格汉斯细胞组织细胞增生症的 CT 表现

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目的 总结骨朗格汉斯细胞组织细胞增生症的 CT 表现及影像学特点，探讨其在 LCH 中的诊断价值，提高对其的诊断水平。**方法** 回顾性分析 2014 年 12 月至 2019 年 7 月重庆三峡中心医院妇女儿童分院经手术及病理证实的 10 例骨朗格汉斯细胞组织细胞增生症患者的 CT 表现。**结果** 9 例为单发病灶，其中颅骨 4，颌面部 1 例，髂骨 2 例，股骨 2 例。1 例为多发病变，其多发病灶位于颅骨、髂骨、耻骨上支。其 CT 表现为不同程度的骨质破坏及软组织肿胀或肿块，因部位不同而异。**结论** 对骨朗格汉斯细胞组织细胞增生症，CT 均能准确显示病变范围及邻近的组织病变，其较好的显示 LCH 的分布范围，且 CT 的检查结果集合临床有助于对该病的诊断

PU-0187
骨龄与骨密度关系的初步探讨

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目的 探讨儿童骨龄与骨密度的关系，为骨龄的评估提供一种新方法。**方法** 收集我院 300 名 6—14 岁儿童左手腕部骨密度数据（采用双能 x 线吸收法测定)和左手腕骨骨龄数据（采用 TW2 平片计算法）。**结果** 儿童骨龄与骨密度、年龄均呈正相关关系。**结论** 对儿童进行骨密度的测量可以初步评估儿童骨龄。

PU-0188
儿童朗格汉斯细胞组织细胞增生症累及股骨头骨骺 1 例并文献复习

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目的 分享及探讨朗格汉斯细胞组织细胞增生症（LCH）累及长骨、骨骺的影像学表现及影像学检查（X 线、CT、MRI）诊断价值。 材料与方法 回顾性分析我院 2018 年 8 月收治 1 例 3 岁女性患儿的影像学资料。结果 术后病理证实为朗格汉斯组织细胞增生症。结论 LCH 骨骼病变的 X 线诊断有时缺乏定位准确性，结合薄层螺旋 CT 扫描或 MRI 能够更准确地诊断病变是否累及骺板和骨骺，从而指导临床治疗。

PU-0189

骨软骨瘤继发假性 Madelung 畸形一例

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患儿，男性，8 岁，两年前发现左前臂中远段内侧无痛性肿物，未予治疗。后随生长发育肿物逐渐增大，左腕关节活动稍受限，遂入我院。家族史无异常。体格检查：左侧前臂内侧触及质硬肿物，无压痛，无活动，左腕活动度差。同时于左小腿近端及右侧胸壁亦触及类似肿物。左前臂向桡背侧稍弯曲。行四肢 X 线检查示左侧尺骨距远端干骺端 3.5cm 处广基底骨性凸起向桡侧及掌侧突出，皮质与左侧尺骨皮质相延续。左侧尺骨远端短小，左侧桡骨干向外稍弯曲，远端骨骺及干骺端增宽，骨骺尺侧变薄，下尺桡关节关系紊乱，腕骨角约 109° 。符合骨软骨瘤继发假性 Madelung 畸形。患儿后接受手术切除骨软骨瘤，术后恢复可，嘱康复科定期复诊。
骨软骨瘤，也称外生性骨疣，是最常见的良性骨肿瘤，占全部骨肿瘤的 20%~50%。肿瘤骨外表面覆盖软骨帽骨性赘疣，内含髓腔与正常骨髓腔相同。最常见起自长骨干骺端，股骨远端、胫骨近端多见，其次为桡骨及腓骨等。骨骼未发育成熟时，与骨骺生长板一样，软骨帽下发生软骨内骨化使骨软骨瘤体积不断增大，或导致并发症，如骨折、滑囊炎、神经血管损伤，同时也出现骨骼与关节的变形。骨软骨瘤会出现骨骼重塑异常，干扰骨骺生长板骨化导致肢体短小。前臂的远端的骨软骨瘤将导致尺骨短缩、肿瘤突出推挤继发桡骨弯曲变形。
Madelung 畸形一种少见的先天性畸形，系因桡骨远端掌内侧 1/3 骨骺生长障碍而外 2/3 骨骺及尺骨生长正常，导致桡骨远端尺偏，尺骨小头半脱位。女性多见，70%以上为双侧发病。假性 Madelung 畸形系由于肿瘤、创伤、感染或内分泌异常等导致。与 Madelung 畸形相比，假性 Madelung 畸形相对更为常见。出生时病变不会显现，而是随着随着年龄增长逐渐表现出症状，发病年龄通常在 2-10 岁。骨软骨瘤通常行 X 线检查即可明确诊断。重要的是在发现骨软骨瘤的同时，也要注意有无继发骨骼畸形形成，提示临床综合评估患肢功能。

PU-0190
儿童骨骼朗格汉斯细胞组织细胞增生症 X 线片诊疗分析

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目的 分析儿童骨骼朗格汉斯细胞组织细胞增生症（Langerhans cell histiocytosis，LCH）X 线表现，提高 X 线片影像诊断 LCH 的认识，有助于临床早期诊断和治疗。
方法 收集总结我院 2010 年~2015 年确诊 18 例朗格汉斯细胞组织细胞增生症的临床资料及 X 线片影像特点。男性 10 例，女性 8 例，男女病例 1.25:1。年龄 8 个月~12 岁，平均年龄 4.5 岁。本组病例中，临床表现差异较大，轻者仅表现为孤立性无痛性骨骼病变，重者则累及全身多器官系统，同时伴发热、贫血和消瘦等表现。其中，单一系统（或器官）受累 11 例（61.11%），两个或两个以上的多系统受累 7 例(38.88%)。局部软组织肿块 12 例，皮疹贫血、伴发热 3 例，外伤后偶然发现局部病灶 1 例，反复发热伴局部疼痛 2 例，所有病例均予病变部位 X 线平片。
结果 单一系统（或器官）受累 11 例中，病变位于颅骨 4 例，位于肋骨 2 例，位于颈椎 1 例，位于胸椎 1 例，位于四肢骨 3 例，单发病灶伴软组织肿块 5 例，不伴软组织肿块 6 例，多发病例中，累及两处骨骼 4 例，累及 3 处及多处骨骼 3 例。
结论 儿童骨骼朗格汉斯细胞组织细胞增生症常累及全身骨骼，X 线平片作为一项基础影像检查，可较准确显示儿童骨骼 LCH 病变范围及邻近组织病变，是临床诊断 LCH 病变的重要方法之一。

PU-0191

浅谈儿童 X 线防护问题

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浅谈儿童 X 线防护问题

1.目的 通过了解 X 线对儿童的辐射危害，增强医患双方的防护意识。

2 材料与方法:(1) X 线对儿童的辐射影响
X 线照射生物体时，与机体细胞、组织、体液等物质互相作用，儿童是辐射损伤的高危人群之一。儿童处于生长发育高峰期，细胞分裂活跃，生命周期长，较成年人敏感得多,相关资料显示 CT 辐射导致终身癌症死亡率相关风险在 1 岁儿童腹部 CT 检查是 0.18%，头部 CT 检查是 0.07%。低辐射水平就可导致潜在致癌效应和基因变异，并遗传给受辐射者的下一代。因此，合理应用儿童 X 线检查，不断加强和完善患儿的防护，防止和减少照射损害等成了亟待解决研究的重要课题。
(2). 儿童 X 线防护存在的问题
1.儿科医生过分依赖客观的检查手段;
2. 放射科医生责任心不强;
3. 家长对 X 线检查的危害性认识不足.
(3)儿童 X 线防护问题的解决方法
1 儿科医生要加强专业知识,严格掌握儿童 X 线检查适应症,避免不必要的 X 线检查;
2 提高放射科医生的能力素质;
3 加大对公众放射防护知识的宣传,认识到 X 线检查在诊断疾病的同时所具有的危害性。
3.**结果** 尽管 X 线检查存在辐射危险，加强 X 线辐射危害方面的学习了解，一般 X 线检查的辐射剂量表，检查名称平均剂量（mSV）等同拍几张正面胸片：头部 0.15、颈椎 0.210、胸椎 150、腰椎 1.575、胸部正面与侧面 0.15、胸部正面 0.021、腹部 0.735、骨盆 0.630、髋关节 0.735、肩膀 0.010.5、膝关节 0.0050.25、四肢 0.0010.05。临床医生尤其儿科医生能够在 X 线检查前进行评估，权衡利弊，做出正确选择;

PU-0192

多发性内生软骨瘤病一例

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多发性内生软骨瘤(multiple enchondromatosis)，又称 Ollier 病，是一种罕见的非遗传性良性肿瘤。发病率约为 1/100 000，以多部位软骨发育异常为特征，易累及指 / 趾骨、长管状骨等部位，受累部位有膨胀、缩短、畸形及骨折等表现，并有单侧受累的倾向。该病可发生恶变，常合并其他系统肿瘤，需要长期密切随访。现报道我院诊治的 1 例 Ollier 病。
患儿 男，3 岁，因发现双下肢异常 2 年余来我院就诊。体格检查：步态不良，左侧下肢明显成角畸形，膝内翻，左下肢体稍细。足月产，产时无窒息，按时预防接种。否认家族性遗传性疾病及畸形，父母体健。影像检查：双肱骨近端、肩胛骨、双髋关节诸骨及双侧股骨、胫腓骨干骺端见多发大小不一囊样灶，局部骨皮质变薄、破坏，左股骨干骺端及右侧股骨远端干骺端膨大，见少量骨膜反应。双膝关节关节面与重力线欠垂直，左股骨形态弯曲（图 1-4）。病理检查**结论** 结合临床及影像学，考虑非典型多发性内生性软骨瘤（Ollier 病），软骨细胞增生活跃。

PU-0193

儿童左胫骨干非骨化性纤维瘤 1 例

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病例：患者男性，8 岁 7 月，因“左小腿疼痛 5 日”入院。入院查体见一般情况良好，行走步态无明显跛行，左小腿表面无肿胀，未触及明显肿块，有明显压痛，余肢体关节未见异常。X 线片示：左胫骨中段见片状骨质破坏区，中央呈椭圆状稍高密度影，周圈环以环状透亮影，外围呈稍高密度影，破坏区大小 23mm*43mm*22mm，略呈膨胀性改变，边缘骨皮质变薄，硬化边不明显，软组织未见明显肿胀；CT 检查示：左胫骨中段见团块状高密度影，呈磨玻璃样改变，外缘见硬化边，内部见更高密度影，见低密度影环绕，后外侧骨皮质略菲薄，周围软组织未见明显肿胀,左侧腓骨及右胫腓骨骨质连续，未见明显骨质异常。MRI 检查示：左胫骨干局部稍膨胀，可见信号异常，总体呈长 T1 短 T2 信号，STIR 不均匀高信号影，境界欠清，病灶内可见各序列类环形高信号影，与胫骨长轴平行。邻近肌肉可见条状 STIR 高信号影。左腓骨形态及信号未见明显异常。病理分析发现:该肿瘤组织以梭形细胞为主，其中有较多散在分布的多核巨细胞，局部有较多淋巴细胞、粒细胞浸润。

讨论：非骨化性纤维瘤（NOF）多见于 8-20 岁的青少年，是一种罕见的良性骨肿瘤，多发于下肢长骨的干骺端，发生于骨干者少见。NOF 发病缓慢，症状轻，病灶较大可因未被发现的病理性骨折引起明显疼痛，一般为孤立病灶。NOF 的 X 线典型表现为病灶位于长骨干骺端,圆形或椭圆形缺损,略偏心性,侵犯骨的大部分横径,向长轴方向扩展，单囊病灶密度较均匀,多囊者其分隔较细,伴边缘锐利的反应性骨硬化边,且髓腔侧硬化边往往比皮质侧硬化边厚。可发生病理性骨折引起骨膜反应。CT 可更清楚的显示侵犯程度。本例患者为儿童，因左小腿疼痛入院发现左胫骨干占位。术中见髓腔内肉芽组织丰富，刮除后可见肿瘤中部有骨性分隔，病理检查可见镜下细胞呈梭形，符合 NOF 诊断。表现不典型者需要与骨纤维发育不良、骨样骨瘤、嗜酸性肉芽肿等鉴别。

PU-0194

低龄儿童肘关节侧位 X 线摄影的方法　探讨

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目的　通过比较两种体位的肘关节摄影成像效果，探讨适合低龄儿童肘关节侧位 X 线摄影方法。
方法　用两种不同的 X 线拍摄方法各拍摄 50 名患儿，比较肘关节侧位片解剖结构及病变显示效果，并评估两种方法在实际操作中的可行性。上举法：幼儿仰卧于摄影床上，被检侧上臂外展，前臂上举使肘关节屈曲 90 度，桡侧贴近床面，肱骨外上髁置于探测板中心，掌面垂直于床面，中心线垂直肘关节摄入，家长辅助固定患儿体位。外展法：幼儿仰卧于摄影床上，被检侧上臂外展，前臂下举使肘关节屈曲 90 度，尺侧贴近床面，肱骨内侧髁置于探测板中心，掌面垂直于床面，中心线垂直肘关节摄入，家长辅助固定患儿体位。
结果　上举法可清楚显示肱骨小头骨骺、桡骨头及尺骨冠突和鹰嘴，并可清楚展示肱桡关节及肱尺关节。外展法，肱骨小头骨骺多处于斜位，肱尺关节显示欠佳，但桡骨头，肱桡关节间隙情况可显示清楚。实际操作中患儿及家属比较容易执行上举法。
结论　上举法比外展法能提供更多的肘关节信息而且实际工作中更容易实施。

PU-0195
64 排螺旋 CT 气管三维重建在小儿 气管异物中的应用价值

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探讨 64 排螺旋 CT 气管三维重建在小儿气管异物中的应用价值。方法 对 2018 年 6 月~2019 年 6 月行 64 排螺旋 CT 扫描诊断为支气管异物患儿 45 例的影像学资料进行回顾性**分析。结果** 64 排螺旋 CT 三维重 建及仿真内窥镜可准确、直观地显示气管支气管异物的位置、大小、形态、密度及阻塞程度。其直接 CT 征象为气 管、支气管内的结节状、条状软组织密度影或高密度影;间接 CT 征象为阻塞性肺气肿、肺不张及纵隔移位。45 例气 管异物患儿，右侧支气管异物 29 例，左侧支气管异物 16 例，合并肺炎 22 例,肺不张 7 例,肺气肿 32 例，纵隔、皮下 气肿 4 例。结论 64 排螺旋 CT 三维重组及仿真内窥镜可准确评价气管支气管异物，是一种准确无创性诊断方法，为临床诊治提供直观的影像学资料，具有较高的临床诊断及指导价值。

PU-0196
CT 三维重建在儿童肱骨远端骨折的应用价值

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目的 分析儿童肱骨远端骨折的 CT 三维重建应用价值。方法 42 例儿童肱骨远端骨折 患者行 X 线,CT 扫描三维重建，并与 X 线正侧位对照。结果 42 例患者 X 线显示 30 例，而通过 CT 扫 描三维重建均能显示。CT 三维重建的检出率有显著意义(P<0.01)o 结论 CT 扫描三维重建为儿童肱骨远端骨折患者早期诊治的一种准确的放射检查手段。

PU-0197
Ullrich 型先天性肌营养不良 1 例 MRI 表现

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目的 探讨 1 例 Ullrich 型先天性肌营养不良（UCMD）患儿的临床及核磁共振成像（MRI）特点。**方法** 分析我院就诊的 1 例 Ullrich 型先天性肌营养不良患儿的临床资料及双侧臀部、盆底及双下肢 MRI 表现并复习相关文献。**结果** 患儿男性，6 岁，出生后肌张力低下，运动发育落后合并关节挛缩。MRI 显示双侧臀部及盆底、双侧大腿及小腿诸肌群均存在肌纤维发育不良合并脂肪化，弥漫性双侧对称。单块肌肉脂肪化可见“三明治”征，以大腿肌群更为显著，小腿肌群中以腓肠肌明显，T_1WI 序列显示最佳，与既往文献报道相符合。**结论** UCMD 具有典型的 MRI 特点，结合临床症状可对该病做出初步诊断。

PU-0198
0-1 岁儿童双下肢全长 X 片不同体位设计比较

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目的 比较在日常工作中 0-1 岁儿童双下肢全长 X 片不同体位设计，作简要分析。
方法 本科室拍片检查使用的 DR 设备主要有 GE 的 Discovery 650、Diffinium 6000、西门子 Ysio 和岛津 Rad speed PLUS 等，所采用的 FPD 平板探测器长边都为 17 英寸（约 43.18 厘米）。临床上对于 0-1 岁怀疑双下肢骨折、骨质异常\破坏、发育异常（X 型腿、O 型腿等） 、佝偻病等会要求行 X 双下肢正位片检查和(或)测量长度。患儿检查双下肢需要去除裤子鞋子等遮挡物，尤其是尿不湿必须去掉。通常在两个家属陪检情况下，检查技师设计体位并做检查。
结果 不同影像技师对 0-1 岁儿童双下肢全长摄片体位的设计有所不同：⑴将双下肢全长分为股骨段和胫腓骨段分两次投照。这种方法摆位简单，利于家属固定，但是会使患儿及家属受到更多辐射，测量长度更显复杂且误差增大；⑵一次投照，一家属将患儿上半身拉住，另一家属将患儿脚尖拉住，采用抓拍。此法成功率相对低，患儿下肢会不停挣扎反抗，抓拍困难、图像会出现几何失真（尤其是膝关节翘起状态下）、测量误差大；⑶一次曝光，一家属用一次性中单取部分材料将患儿股骨双膝压住，防止弹起，另一家属将患儿脚尖固定。此法成功率很高、使用频率最高；⑷有三个家属情况下，一人固定患儿肩部摆正，另两家属按⑶执行。此种体位最好，但一般陪检家属没有三个人在场或也无此必要性。
结论 0-1 岁儿童双下肢长度一般都不超过 43cm，因此采用上述方法⑷最好，⑶次之，⑴备选，⑵不推荐。标准的体位对于影像诊断至关重要，而体位固定技巧需要一线技师在实践中不断尝试和总结，尤其是当婴幼儿作为被检查对象时，运用更多的技巧可以极大提高检查效率还可让患者家属对技师工作水平刮目相看从而利于医患关系。

PU-0199
磁共振扩散加权成像对儿童颈部淋巴病变和颈部蜂窝织炎的诊断作用

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目的 儿童因免疫系统尚不完善，颈部好发一些感染性疾病，颈部淋巴病变和颈部蜂窝织炎临床特征有所重叠，本研究目的是应用磁共振扩散加权成像(DWI)鉴别二者，探讨 DWI 的作用。

资料和方法 回顾性分析经病理证实临床诊断颈部淋巴病变（32 例）和颈部蜂窝织炎（27 例）患儿颈部 DWI 图像和 ADC 值，通过测量病例组 ADC 值和健康儿相应部位 ADC 值进行分析。使用 GE 1.5T 磁共振扫描仪，应用头颈部线圈，患者仰卧，行轴位、冠状、矢状位位扫描，层厚 5mm，总扫描时间约 6min。在后处理平台使用标准化的兴趣区域（ROI），测量 ADC 值进行统计分析。

结果 我们发现颈部淋巴病变和颈部蜂窝织炎之间 DWI 强度显著差异，颈部淋巴病变比颈部蜂窝织炎亮，颈部淋巴病变 ADC 值低于颈部蜂窝织（$P<0.05$）。

结论 磁共振扩散加权成像有助于鉴别颈部淋巴病变和颈部蜂窝织炎，因此成为有用的工具，为临床提供一个有力的影像学依据。

PU-0200
不同评测方法 对单纯性肥胖儿童骨龄的情况分析

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目的 观察单纯性肥胖儿童骨骼发育情况，探讨肥胖因素对儿童骨龄的影响。**材料与方法** 选取 50 为肥胖儿童作为实验组（其中男 25 例，女 25 例），50 例体重正常儿童作为对照组（其中男 25 例，女 25 例），所有病例均来自于我院青春期门诊及遗传保健科门诊肥胖患儿及健康体检儿童。对所有病例应用图谱法、计分法及 CHN 法进行骨龄测定。**结果** 运用不同方法对两组儿童骨龄进行测定，显示肥胖儿童的骨龄与实际年龄之间的差异有显著性，而正常组儿童的骨龄与实际年龄无显著性差异。**结论** 肥胖组儿童的骨龄显著高于对照组，并且肥胖组儿童的骨龄显著高于其实际年龄，而对照组的骨龄和实际年龄差异无显著性。随着肥胖度的增加骨龄提前的幅度也在增加，导致成年预期身高的降低，对于肥胖儿童有必要监测骨龄，在控制体重的同时对于骨龄提前的儿童如预计会造成成年终身高损失的患儿应该及时给予治疗及干预，以达到控制骨龄成熟的速度及追赶损失的身高。

PU-0201

胰腺导管内乳头状黏液性肿瘤 MR 影像诊断的研究

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目的 通过影像学的方法提高胰腺囊性肿瘤检出率，提高胰腺囊性肿瘤的诊断率
方法 利用 3.0T MRI 的多期动态增强表现及时间-病变强化曲线技术，将数据归纳总结，结合影像学直接征象，得出综合诊断依据，判断胰腺囊性肿瘤的分类、分型；并针对导管内乳头状黏液性肿瘤（IPMN）的影像表现和强化程度分析，能够对病变的良恶性进行早期评估。所有患者均采用平扫及 6 期动态增强检查技术（包括动脉早期、动脉期、动脉晚期、静脉期、平衡期及延迟期）。
结果 。①胆总管扩张提示恶性可能，研究发现胆总管扩张在恶性 IPMN 中较多，其病理基础可能是肿瘤分泌大量黏液栓在乳头部阻塞胆总管开口 也可能是肿瘤侵犯胰头部胆总管致使狭窄或梗阻，其近侧胆总管扩张相对明显。②分支胰管型相对于主胰管型和混合型恶性比例较低。③病灶或壁结节越大 胰管扩张越宽 提示恶性的可能性越大。肿瘤直径≥30㎜， 壁结节直径≥5㎜，主胰管扩张≥7㎜， 提示可能恶性。④发生于胰头或钩突部的 IPMN 通常提示恶性或侵袭性，而发生于胰腺体尾部的 IPMN 多为提示良性。⑤十二指肠扩张及软组织肿块均提示恶性或侵袭性 IPMN 此外淋巴结转移 血管侵犯及远处转移是恶性或侵袭性 IPMN 的间接征象。时间-病变强化曲线针对具有囊壁强化和壁结节强化的导管内乳头状黏液性肿瘤，反映了囊壁或壁结节血液灌注和廓清情况，是对比剂在病变组织内分布变化的直观描述，可间接揭示病变组织的血流动力学情况。Ⅰ型渐增型，曲线逐渐上升，说明病变内造影逐渐填充，可以判定为良性病变；Ⅱ型平台型，曲线速升平台，诊断恶性病变的敏感性和特异性为 87.5%和 75%；Ⅲ型流出型，曲线速升速降，表明病变内血运为迅速填充迅速排出，尤其显示壁结节的强化过程，诊断恶性病变的特异性为 90%。

结论 3.0T 磁共振的 6 期动脉增强技术能够对导管内乳头状黏液性肿瘤的良恶性进行定性分析和诊断，并做出正确的术前评估。

PU-0202

Quantitative Assessment of Liver Function before and after TIPS by Using T1 mapping on Gadoxetic Acid-enhanced MR imaging

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PURPOSE
To determine whether T1 mapping of the liver on gadoxetic acid-enhanced magnetic resonance imaging (MRI) can be used to quantitatively estimate the liver function and evaluate the prognosis before and after transjugular intrahepatic portosystemic shunt (TIPS) placement.
METHOD AND MATERIALS
Between September 2018 and March 2019, 21 patients with liver cirrhosis and portal hypertension underwent liver MRI at 3.0T including T1 mapping before and after TIPS placement. T1 maps were obtained by using the Look-Locker sequence before and 20 minutes after Gd-EOB-DTPA or before and 3 hours after Gd-BOPTA. Following MRI parameters was evaluated: pre-and post-contrast T1 values of the liver parenchyma, reduction rates of T1 relaxation times(ΔT1). ΔT1 between before and after TIPS were calculated as $[(T1_{pre}-T1_{post})/T1_{pre}\times100\%]$. Paired samples T test was used to compare ΔT1 before and after TIPS.
RESULTS
$T1_{pre}$、$T1_{post}$ and ΔT1 before TIPS were (813.70±152.19)ms、(403.49±229.97)ms、(50.61±25.58)%, $T1_{pre}$、$T1_{post}$ and ΔT1 three days later after TIPS were (876.46±179.10)ms、(484.47±227.11)ms and (44.52±24.93)%. ΔT1 were significantly different ($P<0.05$) before and after TIPS.
CONCLUSION
Evaluation of hepatic uptake using T1 mapping of the liver on gadoxetic acid-enhanced MRI is of potential in quantitatively accessing liver function and can provide clinically relevant information which may help to evaluate the treatment effect and prognosis after TIPS placement.

PU-0203
肝脏特异性对比剂普美显增强 MRI 在小结直肠癌肝转移瘤诊断中的作用

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目的 探讨肝脏特异性对比剂普美显增强 MRI 在诊断小结直肠癌肝转移瘤的价值。
方法:收集 2015 年 1 月至 2018 年 12 月来我院就诊结直肠癌患者，同时行上腹部 MRI 平扫+动态增强扫描，对比剂选取肝脏特性对比剂普美显，选取目标病灶小于等于 2cm 纳入研究。共 80 例患者 126 个病灶纳入研究，其中 38 病灶经穿刺活检证实，88 个病灶在随后随访过程大小改变证实。对比 MRI 平扫联合常规动态增强扫描（动脉期、门脉期及延迟期）及 MRI 平扫联合动态增强及肝胆期图像对小转移瘤的检出率及诊断正确率。

结果：MRI 平扫联合常规动态增强扫描及 MRI 平扫联合动态增强及肝胆期图像对小于 2cm 肝脏转移瘤检出率 84.13%(106/126)，100%(126/126),差异有统计学意义(P＜0.05)。 126 个病灶中，105 个病灶经病理所访证实为结直肠癌肝转移瘤。MRI 平扫联合常规动态增强扫描及 MRI 平扫联合动态增强及肝胆期图像对小转移瘤的诊断正确率分别为 81.13%(86/106)，85.85%(91/106)，二者无统计学差异(P＞0.05)。
结论:普美显增强 MRI 在诊断结直肠癌小肝转移瘤中，可以提高对病灶检出率，及早发现小病灶，指导临床个性化治疗。但是，由于普美显单支剂量过小、代谢速度过快等原因，不能提高对肝转移瘤的诊断正确率。

PU-0204

腹膜后粘液囊腺瘤的影像学特点

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目的 分析腹膜后粘液囊腺瘤的 CT、MRI 特点，以提高认识及诊断水平。
方法 回顾性分析 3 例经手术证实为腹膜后囊腺瘤的影像资料。总结其分布、密度及信号特点。
结果 本组 3 例均位于右侧结肠旁沟，CT 为囊性密度，部分隐约见间隔影，MRI 上可见分隔信号。
结论 腹膜后粘液囊腺瘤在影像学上有一定特点，MRI 能很好显示病变信号特点。

PU-0205

胆道几何结构与胆囊结石相关性的 MRI 研究

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利用 MRI 探讨胆总管几何结构与胆囊结石的相关性。**方法** 回顾性连续搜集我院 2018 年 08 月至我院 2018 年 12 月间行上腹部 MRI 及 MRCP 检查的 817 例病例，按照纳入与排除标准入选胆囊结石 55 例(其中男 32 例，女 23 例)，同期共纳入 40 例正常对照组(其中男 26 例，女 14 例)。数据上传至 PACS 系统并行图像分析，在最投影角度及弯曲度最大的层面分别测量胆囊管与肝总管夹角、胆总管直线距离、胆总管长度、胆总管最大偏离距离、胆总管最大管径并计算胆总管最大偏离程度及胆总管弯曲度。**结果** 胆囊管与肝总管夹角、胆总管最大偏离程度、胆总管最大管径、胆总管弯曲度在胆囊结石组中与对照组间无统计学意义；胆总管直线距离、胆总管长度在胆囊结石组中与对照组间有统计学意义（45.51±12.23，41.32±8.57，*P*=0.04；49.01±12.29，44.51±8.46，*P*=0.03）。**结论** 胆囊结石的发生与肝总管夹角、胆总管最大偏离程度、胆总管最大管径无关，与胆总管长度、胆总管直线距离有关，AUC 分别为 0.619、0.612。

PU-0206

磁共振成像对自身免疫性胰腺炎的优势分析

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目的 探讨磁共振各序列对自身免疫性胰腺炎（AIP）的诊断优势。**方法** 回顾性分析 2015 年 1 月~2018 年 12 月在我院确诊的 AIP 患者 14 例临床资料，所有患者均行常规平扫、弥散加权成像（DWI）、磁共振胰胆管成像（MRCP）及动态增强扫描。**结果** 常规平扫示胰腺局部受累 5 例，胰腺弥漫性受累者 9 例，胰周有少量积液，胰腺实质信号稍欠均匀，T_1WI 信号等或稍低，T_2WI 信号普遍稍增高；5 例患者胰腺呈“剑鞘状”，胰腺病变周围有假包膜样结构包绕。DWI 信号普遍增高。MRCP 示胆总管胰腺段呈“鸟嘴状”，变窄、变细，以上肝外胆管呈不规则扩张，胰管显示欠清，肝内胆管呈“残根状”；2 例胆总管扩张，5 例肝内、外胆管均呈不同程度扩张。动态增强扫描示肿大胰腺动脉期强化并不明显，门脉期开始逐渐强化，强化信号均匀一致，胰腺周围可见环状影，8 例患者呈渐进性延迟强化。**结论** MRI 在 AIP 的鉴别诊断方面有较好的应用价值，结合实验室检查有助于早期诊断 AIP，避免不必要的胰腺切除术，为后续治疗提供可靠保障。

PU-0207
MR IDEAL-IQ 评价急性胰腺炎状态下脾脏铁沉积、脂肪和水含量变化

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目的 探讨急性胰腺炎（AP）状态下脾脏组织内铁沉积、脂肪及水含量变化。**方法** 44 例 AP 患者和 21 例健康受检者分别作为实验组和对照组，进行 MR 上腹部常规扫描，并采用 IDEAL-IQ 序列扫描，在后处理工作站多点测量脾脏驰豫率图（R2*）、水像图（Water）、脂像图（Fat）及脂肪分量图（FF）值并行统计学分析。**结果** 实验组和对照组的脾脏 R2*值（P=0.011）、Water 值（P=0.003）、Fat 值（P=0.022）具有统计学意义差异，FF 值（P=0.861）无统计学意义差异。脾脏在轻、中、重度 AP 状态下 R2*、Water、Fat 值组间差异无统计学意义差异（P＞0.05）。青年组（14～44 岁）、中年组（45～59 岁）、老年组（≥60 岁）脾脏在 AP 状态下 R2*、Water、Fat 值组间差异无统计学意义差异（P＞0.05）。**结论** AP 状态可导致脾脏组织内铁沉积、脂肪及水含量变化，IDEAL-IQ 技术能定量测定其铁、脂肪及水含量变化。

PU-0208
探讨普美显 MRI 增强成像在肝脏疾病中的诊断价值

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目的 探讨普美显 MRI 增强成像在肝脏疾病中的诊断价值。**方法** 对我院行普美显 MRI 增强的 30 例肝脏疾病患者进行回顾性分析总结，所有病例均行 MRI 平扫、普美显动态增强及肝胆期扫描，排除临床及病史因素干扰，分析平扫、动态增强扫描及肝胆期病灶的信号特点并与术后病理进行对照。**结果** 在平扫中发现病变 21 例，未发现病变者 9 例；21 例中有 13 例患者常规动态增强可以鉴别出典型肝癌和血管瘤，肝癌呈“快进快出”型，血管瘤呈“渐进性强化”，影像诊断与病理结果一致；有 8 例患者对不典型肝癌及 FNH 难以鉴别，行普美显肝胆期扫描后，有 3 例患者在肝胆期呈低信号影，诊断为肝癌，有 5 例患者在肝胆期呈高信号影，诊断为 FNH；普美显是钆(Gd+)与 EOB-DTPA 螯合物的二钠盐，是新型的磁共振 T1 增强对比剂，不仅具有一般非特异性细胞外间隙对比剂的性能，还兼有肝细胞特异性对比剂的特性，与一般钆类对比剂具有同样的增强效果，并且于静脉注射 10～20 分钟后大约有 50%可被正常的肝细胞所摄取，因此在行 T1 增强肝胆期扫描时，正常肝实质信号强度呈渐进性增高，而对于仅有很少功能性肝细胞存在或者是完全没有的病灶，则极

少甚至无法摄取普美显，可有轻度强化或者是没有强化效果而表现为低信号；肝癌不含有正常肝细胞，不未摄取造影剂呈低信号影，而 FNH 含有正常肝细胞，摄取造影剂呈高信号影，术后随访与病理诊断一致；9 例未发现病变患者中 2 例有肝硬化病史，行常规动态扫描后看到多发结节，难以定性，而行普美显肝胆期扫描后呈低信号影，诊断为癌前病变；7 例患者均有原发肿瘤病史，行常规动态增强后，3 例发现微小转移病变，而行普美显肝胆期扫描后，均有多发的低信号影，诊断多发微小转移灶。**结论** 普美显 MRI 增强成像能较好的鉴别诊断肝脏病变—FNH、血管瘤、小肝癌、肝硬化结节、癌前病变及多发微小转移瘤等，特别是普美显 MRI 增强肝胆期信号特点对肝脏病变诊断具有重要价值。

PU-0209

不同位置及大小肝癌癌灶介入术后疗效对比研究

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目的 探讨 TACE 治疗不同大小原发性肝癌的近期疗效及安全性.
方法:对比分析我科行 TACE 治疗的不同大小及不同原发部位的原发性肝癌患者术前、术后的 AFP 定量、影像学改变及生存期、并发症.
结果:经 TACE 治疗,38 例患者瘤体都有不同程度缩小、肿瘤血供不同程度减少;肿瘤≤3 cm 组的碘油几乎完全沉积，沉积完全率为 88%，1 年生存率 91.7%,2 年生存率 83.5%;3～5 cm 组完全沉积病例占 68.1%,1 年生存率 85.7%,2 年生存率 57.1%;>5 cm 组完全沉积率仅为 33%,1 年生存率 20%,无 1 病例存活 2 年。位于左内叶及右前叶瘤体碘油沉积率较高，而位于肝门区及左外叶、右后叶、肝下缘及肝顶部等部位的原发性癌灶碘油沉积率较低。
结论:TACE 是一种疗效可靠、安全性较高的治疗原发性肝癌的方法,尤其对肿瘤≤3 cm 的原发性肝癌更为有效。同时，位于肝脏左内叶及右前叶癌灶的碘油沉积率较好，而位于边缘部位的癌灶碘油沉积完全率较低，要注重随访，必要时进行多次 TACE 治疗。

PU-0210

腹膜后节神经细胞瘤的 MSCT 特征分析

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目的 探索腹膜后节神经细胞瘤的 MSCT 表现特点，以提高腹膜后节神经细胞瘤的诊断准确性。**方法** 回顾性分析 2010 年 2 月 1 日到 2019 年 2 月 1 日之间西南医科大学附属中医医院及西南医科大学附属医院经手术病理证实的 39 例腹膜后节神经细胞瘤患者的临床及影像资料，所有患者均行 CT 平扫+增强扫描，记录患者的性别、年龄、临床症状、发病部位、大小、形态、密度、强化程度等情况，分析其特征性。**结果** 29 例直径≥5cm，10 例＜5cm，其中 13 例位于肾上腺，形态不规则 12 例，类圆形 27 例；28 例沿长轴生长；4 例有伴随影像（血管受包绕）；钙化者 10 例；25 例均为轻度强化，14 例无强化。**结论** 腹膜后节神经细胞瘤虽少见，但具有一定的 CT 特征性，MSCT 增强扫描具有很好的诊断价值，便于临床制定治疗方案。

PU-0211

肝癌术后复发 CT 增强强化方式与 CK19 变化之间的关系

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目的 探讨肝癌术后复发患者的计算机体层摄影（CT）增强强化特点与细胞角蛋白 19（CK19）免疫组化指标的表达变化之间的规律与联系。**方法** 回顾性分析 31 例肝癌术后复发并再次行手术治疗（包括多次）患者的影像学资料及病理结果，比较两次术后病理 CK19 表达情况，分析两次术前 CT 平扫+增强扫描的影像学表现，主要为病灶三期增强强化特点、边界、包膜情况，比较 CK19 表达变化与 CT 影像学变化之间的关系。**结果** 31 例肝癌术后复发患者 CK19 表达：15 例无变化（13 例均为-，1 例均为+，1 例均为+/-），12 例有变化（7 例从-到+或从+到+3,5 例从+3 到-或从+3 到+），无变化组中强化方式出现改变 4 例，11 例两次强化方式大致相同，有变化组中强化方式出现改变 8 例，4 例两次强化方式大致相同。**结论** CK19 表达在复发患者中变化较大，可出现多种变化，因此不能单凭首次手术病理而直接评判复发病理 CK19 表达情况，而增强强化特点的转变可以起到一定的提示作用。

PU-0212
多层螺旋 CT 在诊断急性胰腺炎及并发症中的价值

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【摘要】目的 探讨多层螺旋 CT 诊断急性胰腺炎及其并发症的价值。**方法** 回顾分析 2014 年 12 月至 2017 年 4 月我院临床确诊的 10 例急性胰腺炎患者的 CT 影像。**结果** 10 例急性胰腺炎中 8 例急性水肿型胰腺炎，1 例沟槽型胰腺炎，1 例出血坏死型胰腺炎。**结论** 多层螺旋 CT 不仅可以明确诊断急性胰腺炎，还可鉴别其类型，对其并发症能清晰显示，是目前诊断急性胰腺炎的重要和主要的影像检查方法。

PU-0213
腹膜后节神经细胞瘤的 MSCT 特征分析与鉴别诊断

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目的 探索腹膜后节神经细胞瘤的 MSCT 表现特点，以提高腹膜后节神经细胞瘤的诊断准确性。**方法** 回顾性分析 2010 年 2 月 1 日到 2019 年 2 月 1 日之间西南医科大学附属中医医院及西南医科大学附属医院经手术病理证实的 39 例腹膜后节神经细胞瘤患者的临床及影像资料，所有患者均行 CT 平扫+增强扫描，记录患者的性别、年龄、临床症状、发病部位、大小、形态、密度、强化程度等情况，分析其特征性。**结果** 29 例直径≥5cm，10 例＜5cm，其中 13 例位于肾上腺，形态不规则 12 例，类圆形 27 例；28 例沿长轴生长；4 例有伴随影像（血管受包绕）；钙化者 10 例；25 例均为轻度强化，14 例无强化。**结论** 腹膜后节神经细胞瘤虽少见，但具有一定的 CT 特征性，MSCT 增强扫描具有很好的诊断价值，便于临床制定治疗方案。

PU-0214

3.0T MRI 肝胆特异性对比剂增强扫描与多排螺旋 CT 增强扫描对肝细胞癌的诊断价值研究

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目的 探讨 3.0T MRI 肝胆特异性对比剂增强扫描与多排螺旋 CT 增强扫描对于肝细胞癌诊断中的应用价值研究。**方法** 选取我院 2016 年 1 月至 2018 年 12 月临床收治且临床资料、影像数据完整的肝细胞癌患者共 38 例为研究对象，所有患者均接受 MRI 肝胆特异性对比剂增强扫描和多排螺旋 CT 增强扫描检查，分析两种检查方法对于肝细胞癌的强化方式、包膜检出率及检验效能。**结果** 38 例患者中共检出 45 个病灶。MRI 肝胆特异性对比剂增强扫描肝细胞癌的包膜检出和多排螺旋 CT 增强扫描肝细胞癌的包膜检出组间比较差异无统计学意义(p>0.05)。两种检查方法的各期影像学的表现特点及相同期相中不同检查方法的检验效能差异性对比，MRI 肝胆特异性对比剂增强扫描在门脉期的检验效能与多排螺旋 CT 增强扫描在门脉期的检验效能比较，有差异性(p＜0.05)。两种检查方法的各期影像学的表现特点及同一种检查方法在不同期相中检验效能差异性对比，MRI 肝胆特异性对比剂增强扫描在 20 分钟时肝胆特异期对肝细胞癌的检验效能最显著。**结论** MRI 肝胆特异性对比剂增强扫描及多排螺旋 CT 增强扫描两种影像学检查方法均能较好显示肝细胞癌的强化特征及对肝细胞癌包膜的检出，但 MRI 肝胆特异性对比剂增强扫描对肝细胞癌病变的检出有更好的检验效能，尤其是肝胆特异期检验效能显著。

PU-0215

Intravoxel incoherent motion (IVIM) diffusion-weighted imaging DWI) in patients with liver dysfunction of chronic viral hepatitis - relationship with Child-Turcotte-Pugh class at 3 Tesla

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Purpose: The aim of the study was to evaluate the differences of liver IVIM parameters among different group of CTP class in cirrhotic livers (chronic viral hepatitis).
Material and Methods: This was a retrospective study of 142 consecutive patients with chronic liver disease who underwent MRI examination at the XXX Hospital between January 2015 and December 2016. IVIM DWI (seven different b values) was performed on a Siemens 3.0-T MRI scanner. Pure molecular diffusion (D), pseudo-diffusion (D*), and perfusion fraction (f) in different liver segments were evaluated.
Results: f, D, and D* were different among the liver segments (all P<0.05), indicating heterogeneity in IVIM parameters among liver segments. f was consistently higher in Child-Turcotte-Pugh (CTP) class A compared with CTP Class B+C (all P<0.01). D was higher in CTP class A compared with CTP class B+C in EL (extra segment of the left lobe), PR (posterior segment of the right lobe), and whole liver (all P<0.05). D* was higher in CTP class A compared with CTP class B+C in EL, ML (medial segment of the left lobe), PR, and whole liver (all P<0.05). In patients with mean f-value of >0.29,

the AUC was 0.88 (95%CI: 0.81-0.96), with 86.8% sensitivity and 81.8% specificity for predicting CTP class A from CTP class B+C.
Conclusion: Liver IVIM could be a promising method for classifying the severity of segmental liver dysfunction of chronic viral hepatitis as evaluated by the CTP class.

PU-0216
磁共振弹性成像(MRE)对肝纤维化分级诊断优势及临床适用价值研究

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目的 肝纤维化是各种慢性肝病向肝硬化过度的共同病理基础，肝纤维化的发现及准确判断肝纤维化分期对临床治疗意义重大[1]。磁共振弹性成像（MRE）作为一种新型的影像技术，可以通过探测弹性改变对肝纤维化进行分级，其诊断效能及临床适用性还处于探索阶段。国内外已有多个研究通过临床实验对其诊断效能进行了客观评价[2-15]，但评价结果不一，另外由于肝纤维化病理检查患者接受程度较低，常规临床实验纳入患者数相对较少，为了客观地评价 MRE 对肝纤维分级的诊断价值，并避免常规研究中样本量小的缺点，本文利用荟萃（Meta）分析循证医学方式对有关 MRE 和肝纤维化分级的文献进行质量评价及数据合并分析，旨在为临床诊断、治疗提供参考。
方法 1.收集磁共振弹性成像对肝纤维化诊断及分级价值的国内外文献； 2.提取数据，制成表格；3.进行异质性检验，选用效应模型，合并诊断指标；4.评价诊断效能及临床适用性，分析异质性来源；5.得出结论，为临床提供参考
结果与**结论** 磁共振弹性成像（MRE）被称作“影像触诊”，近年来已经大量应用到临床研究中[16-18]，并在肝脏等器官中广范应用，显示出其良好的应用前景。由于 MRE 能直接测量肝组织弹性的变化，其准确诊断可以避免行病理创伤性检查。同时由于 MRE 检查的重复好，能检测全肝弹性程度，MRE 在肝纤维化分级、了解疾病进展方面具有巨大的临床应用价值。
综上所述：肝纤维化诊断目前病理仍是肝纤维化检查的金标准，但仍存在很多不足和局限。无需造影剂、示踪剂引入的功能影像成像技术成为肝纤维化分级研究的方向。磁共振弹性成像肝纤维化分级的展现出了良好的应用前景。

PU-0217
肝硬化结节转变成肝癌过程中病理改变与 MRI 的关系

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目的 探讨肝硬化良性结节（RN）转变成肝癌的过程中，不同阶段的病理学改变和与之相对应的 MRI 表现特征，为早期肝癌的诊断提供有价值的诊断思路和参考依据。
材料与方法 肝硬化背景，影像检查与病理学资料齐全的肝硬化结节（RN）、非典型增生（DN）、早期肝癌（HCC）以及进展期 HCC 患者的影像学与病理学进行回顾性研究。MRI 序列包括 T 1WI 同反相位、T2WI、DWI、动态多期增强扫描，增强使用肝胆特异性造影剂。
结果 大多数 RN 在 MRI 上表现为与正常肝脏等信号而不易察觉，少部分 T1WI 表现为稍高信号，T2WI 表现为低信号；DWI 不表现高信号；增强程度与正常肝组织相似，少数有轻度、延迟的低信号，肝胆期呈等或稍高信号。DN 的 T1WI 的信号改变较复杂，与结节内铜或铁的沉积（T1WI 与 T2WI 低信号），以及脂肪（T1WI 高信号）的沉积量有关。有些 DN，特别是 HG-DN，由于脂肪聚

集，在 T1WI 表现为高信号，T2WI 呈等或略高信号；肝胆期呈略低信号；DWI 不表现为高信号；增强扫描多不表现出强化特征。早期肝癌在 T1WI 表现为低或高信号（含脂），T2WI 与 DWI 多呈高信号。早期肝癌通常表现为乏血供结节，“结中结”具有特征性（但不多见），肝胆期呈低信号。进展期肝癌的典型 MRI 表现为 T1WI 低信号、T2WI 与 DWI 高信号，增强扫描呈特征性的动脉期血供丰富，静脉期和/或平衡期洗脱；肝胆期呈低信号。
结论　病理学上 RN－DN－早期 HCC－进展期肝癌的转变过程中具有以下趋势：肝门静脉供血逐渐减少，肝动脉供血逐渐增加；细胞密度逐渐增加；细胞内脂肪由少到多，至早期肝癌达高峰，进展期肝癌由于脂肪消耗增加而又逐渐减少；铁的聚集自 LG-DN 由多逐渐减少；胞膜上有机离子转移多肽功能由正常逐渐丧失。这就为通过观察 MRI 不同序列的信号特征以及随访过程中的信号变化，区分结节的良、恶性成为可能。

PU-0218
对比与改良肝门部胆管癌肝动脉侵犯的术前 CT 诊断标准

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目的　比较三种 CT 标准和两种征象对肝门部胆管癌肝动脉侵犯的诊断价值。
方法　回顾性分析 61 例肝门部胆管癌的 CT 表现。以术中诊断和/或术后病理诊断为标准，评估改良 Loyer、Lu 标准和 Li 标准、动脉迂曲和接触长度对肝门部胆管癌肝动脉侵犯的诊断效能。
结果　评估肝门部胆管癌肝动脉受侵的改良 Loyer、Lu 标准和 Li 标准的敏感度分别为 88.9%，87.0%，72.2%，特异度为 93.8%，93.8%，94.6%，准确度为 92.4%，91.8%和 88.0%。改良 Loyer、Lu 标准的诊断效能较 Li 标准好（P = 0.049）。与左、右肝动脉相比，CT 标准对肝固有动脉侵犯的诊断效能最佳。Loyer 标准结合 10.9 mm 的接触长度，可避免 3 例假阴性病例。
结论　Loyer、Lu 标准在术前 CT 评估肝门部胆管癌肝动脉侵犯的诊断效能最佳，尤其是肝固有动脉的评估。接触长度和 Loyer 标准相结合可提高诊断性能。

PU-0219
胰腺 SPNP 的性别差异：临床表现和 MSCT 特征对比

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目的　回顾性分析男性胰腺实性假乳头状瘤(SPNP)的临床特征及多层螺旋 CT(MSCT)表现，并与女性 SPNP 病例进行对照研究。**方法**　收集 2010 年 8 月至 2018 年 12 月行 MSCT 检查并经手术病理证实的 29 例胰腺 SPNP 病例（男 7 例，女 22 例），分析男性与女性胰腺 SPNP 的临床特征和 MSCT 表现。**结果**　男性 SPNP 患者中位年龄为 56 岁，明显大于女性患者的 29 岁，差异有统计学意义(P=0.012)，男性与女性胰腺 SPNP 患者的临床表现和肿瘤部位之间差异均无统计学意义(P均＞0. 05)；男性胰腺 SPNP 患者中肿瘤最大径（3.9cm）明显小于女性患者(7.0cm)，差异有统计学意义（P<0.001）；钙化比例男性较女性多见，差异有统计学意义（P=0.013）；实性肿瘤男性较女性多见，差异有统计学意义(P=0.036)。**结论**　男性胰腺 SPNP 影像学特征较女性患者有差异，其 MSCT 表现为病灶较小，实性成分较多，钙化比例较多，具有典型 SPNP 典型的强化特征。

PU-0220

黄色肉芽肿性胆囊炎的 CT 影像讨论

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目的 探讨黄色肉芽肿性的胆囊炎(XGC)的 CT 影像表现。
方法 回顾性分析 33 例经手术病理证实的 XGC，总结其 CT 表现。
结果 CT 表现：33 例(100.0%)均有胆囊壁增厚，且 33 例(100.0%)均有腔面增强，其中弥漫性增厚 31 例(93.9%)，局限性增厚 2 例(6.1%)，18 例(54.5%)壁内有低密度结节，21 例(63.6%)表现为黏膜线完整，25 例(75.8%)伴胆石症，18 例(54.5%)表现为肝胆浸润，15 例(45.5%)在动脉期肝脏有一过性强化。
结论 弥漫性胆囊壁增厚、壁内低密度结节、连续的黏膜线、腔面增强，胆石症，肝周有一过性强化和肝内外胆管无扩张共同存在强烈提示 XGC。

PU-0221

胰腺囊性肿瘤的诊断及鉴别诊断指标

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目的 ：回顾性分析常见胰腺囊性肿瘤 (pancreatic cystic neoplasms, PCNs) 的诊断及鉴别诊断指标。
方法 ：收集哈尔滨医科大学附属第二医院自 2013 年 1 月至 2019 年 1 月经手术病理证实为 PCNs 的 68 例患者的影像学及临床资料进行回顾性分析，其中影像学资料包括 64 排多层螺旋 CT 平扫及增强扫描图像与 MRI 常规 TIWI 及 T2WI 平扫及增强扫描图像。采用 t 检验、 $x2$ 检验、*Logistics* 回归模型从年龄、部位、囊腔、胰管等角度评价浆液性囊性肿瘤 (Serous cystadenoma, SCN)、黏液性囊性肿瘤 (Mucinous cystadenoma, MCN) 、导管内乳头状黏液性肿瘤 (Intraductal papillary mucinous neoplasm, IPMN)的诊断与鉴别诊断指标。
结果 ：本研究所选 68 名患者中， SCN22 例，MCN26 例，IPMN20 例。当肿瘤囊腔数目≥6 个、不与主胰管相通、可见中央星状纤维瘢痕、增强扫描囊壁无强化时诊断 SCN 更有利 (P<0.05)，后者是鉴别 SCN 的独立因素 ；当肿瘤囊腔数目＜6 个、平均直径 72.90 mm、肿瘤不与主胰管相通、常见于胰尾时诊断 MCN 更有利 (P<0.05)；当肿瘤发病平均年龄 66.70 岁、肿瘤与主胰管相通时诊断 IPMN 更有利 (P<0.05)。
结论 发现 SCN 囊腔数目多、可见中央星状纤维瘢痕、极少见囊壁强化；MCN 肿瘤好发于胰尾、直径较大且与主胰管不相通；IPMN 老年患者多发，肿瘤与主胰管相通。

PU-0222

1756 例肝棘球蚴感染的 CT 诊断分析

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目的 探讨肝棘球蚴感染的 CT 表现特征及误诊原因，提高肝棘球蚴感染 CT 诊断的影像学特征的综合认识。

方法 回顾性分析 2000 年至 2018 我院放射科诊断的肝脏棘球蚴感染 1756 例，所有图像均经 2 名医生阅片，所有患者均经手术、并经病理证实。
结果 所有患者中， 1746 例为棘球蚴感染，9 例是肝囊肿，1 例是肝癌， 1742 病例中，肝细粒棘球蚴感染 1725 例，泡状棘球蚴感染 21 例。1756 例均行 CT 平扫及薄层重建后发现，肝细粒棘球蚴和泡状棘球蚴感染各有典型 CT 影像，CT 扫描对绝大部分棘球蚴感染病变能早发现、早诊断，但肝囊肿偶尔可能错误诊断为细粒棘球蚴，肝癌偶尔可能泡状棘球蚴不易鉴别。
结论 CT 扫描能清楚的显示肝棘球蚴感染病灶，具有较快的检查速度和极高的诊断准确率。

PU-0223
肝脏上皮样血管平滑肌脂肪瘤的影像学表现及误诊分析

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目的 探讨肝脏上皮样血管平滑肌脂肪瘤 (epithelioid angiomyolipoma, EAML) 的影像学表现，以提高对其的认识及影像诊断准确率。
方法 回顾性分析 2017 年 6 月—2019 年 5 月经中国科学技术大学附属第一医院诊治的 7 例经病理学证实的肝脏 EAML 患者的 MRI、CT 影像学资料及临床资料，上述病例中有 3 例行 MRI 检查，3 例行 CT 检查,1 例行 MRI 和 CT 检查。
结果 7 例 EAML 中女 7 例,男 1 例，平均年龄 41.6 岁，均为单发病灶，边界清楚，均无肝硬化病史。4 例位于肝左叶，2 例位于肝右叶，1 例位于肝左右叶交界区，最短径均大于 3cm。术前仅 1 例诊断正确，其余均误诊,其中 1 例误诊为肝癌，,1 例误诊为海绵状血管瘤，2 例误诊为局灶性结节增生(FNH)，1 例误诊为腺瘤，1 例 CT 误诊为肝癌，MRI 误诊为 FNH。MRI 平扫 T1WI 呈稍低信号,T2WI 呈稍高信号，同反相位未见明显信号改变，均未见明显脂肪信号。增强扫描 4 例肿瘤动脉期呈不均匀或均匀明显强化，门静脉和延迟期 3 例持续强化, 呈“快进慢出”模式, 1 例强化减弱,呈“快进快出”模式。CT 平扫呈稍低密度,3 例密度均匀，1 例密度不均，边界欠清晰。增强模式为“快进慢出”型 3 例、“快进快出”型 1 例。上述病灶中有 5 例在动脉期可见“早期引流静脉”，1 例见假包膜明显强化。
结论 EAML 临床较为罕见，其影像学表现具有一定特征性,病灶内部或边缘出现粗大畸形的静脉有助于该病的诊断,可借此其他肝脏肿瘤相鉴别。

PU-0224
能谱技术在转移性肝癌中的应用

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目的 肝脏是转移瘤的好发部位，全身各种器官的恶性肿瘤有 30%-50%可转移到肝脏，其发病率仅次于淋巴结转移。CT 检查对>2cm 的肝转移灶敏感性几乎为 100%，1-2cm 的病灶则为 74%，<1cm 的病灶敏感性很低。因此，提高辅助检查的敏感性，是早期发现转移性肝癌、提高治愈率、延长生存期的关键。CT 能谱图像可以实现物质的分离和鉴别，通过选择合适的基物质和调整不同的能量水平，能谱 CT 物质图像和单能量图像能特征性的显示一些病灶。本文诣在了解能谱技术在脊柱内固定术后影像随访中的应用。

方法 转移性肝癌能谱 CT 扫描通常采用上腹强化三期扫描。能谱扫描方式选择 Helical-musculoskeletal-large-40mm,根据患者体型大小选择机架转速为 0.5-0.8s/r,首先重建混合能量图像，采用标准算法；然后重建单能量图像，一般选择 68kev，将单能量图像载入 GSI viewer，选择病灶区得出能谱曲线和直方图。
结果 将能谱图像载入能谱分析浏览器（GSI），依次观察单能量及多平面重建图像，找到感兴趣区依次得出能谱曲线、CT 直方图可发现能够客观的显示不同病灶的能谱曲线是否具有一致性以及 CT 值分布是否具有同一性。
结论 能谱 CT 单能量成像在肝转移癌的鉴别中效果显著。

PU-0225
采用 IDEAL-IQ 定量评估糖尿病患者腹部脂肪分布和内脏脂肪沉积

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目的 采用磁共振 IDEAL-技术量化糖尿病患者的腹部脂肪组织分布及内脏脂肪含量，并评估它们之间的关系。
方法 43 例志愿者纳入本项研究（男性 22 例，女性 21 例；年龄范围，20-69 岁），包括 20 例糖尿病患者和 23 例年龄与 BMI 相匹配的健康志愿者。所有志愿者都进行了 3.0T 磁共振扫描，并且行 IDEAL-IQ 扫描得到脂肪分数（fat fraction）图像。在脂肪分数图像上测量肝脏、椎体、两肾实质和肾窦以及胰腺的质子密度脂肪分数（PDFF）。同时也测量腹腔内脂肪组织（VAT）面积和皮下脂肪组织（SAT）面积。
结果 糖尿病组的肝脏、胰腺和椎体的 PDFF 值显著高于对照组（*P* 值分别为 0.002， 0.003，0.049），然而两肾窦及肾实质的 PDFF 值在两组中无统计学差异（*P*>0.05）。糖尿病组的腹腔内脂肪组织（VAT）面积显著高于对照组（*P*=0.039），而皮下脂肪组织（SAT）面积在两组中无统计学差异（*P*=0.758）。同时，腹腔内脂肪组织面积分别与胰腺和椎体 PDFF 值呈显著正相关（*P* 值分别为 0.020，0.032）。
结论 IDEAL IQ 可以准确、简捷地量化糖尿病患者的腹部脂肪组织分布及内脏脂肪沉积。糖尿病会影响腹部脂肪分布及内脏脂肪沉积，腹腔内脂肪组织（VAT）会影响椎体和胰腺的脂肪含量。

PU-0226
脾脏窦岸细胞血管瘤的临床特点及影像表现（附 6 例病例）

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目的 结合文献总结脾脏窦岸细胞血管瘤（LCA）的临床特点及影像表现，从而提高对本疾病的认识。
方法 回顾性对 6 例脾脏窦岸细胞血管瘤的临床资料、CT 平扫加增强检查及超声、PET 检查影像表现进行分析、总结。
结果 本组病例中 3 例因腹部不适就诊，5 例伴有不同程度贫血；1 例单发病灶呈明显均匀强化，另 5 例均为多发病灶，其中部分强化方式呈由内向外，其余呈向心性强化。4 例 LCA 患者行超声检查，其中 3 名多发病灶呈高或稍高回声，内均未见明显血流信号；另 1 例脾门单发 LCA 病灶呈实性低回声，且可及较丰富的血流信号。1 例多发 LCA 患者行 PET-CT 检查放射性分布未见异常。

结论 对于贫血伴有或不伴腹部不适患者，影像学检查提示脾脏多发占位，LCA 应被考虑在内。

PU-0227

飞利浦极速 CT 检查肾上腺的研究探讨

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目的 探讨使用飞利浦极速 CT 扫描肾上腺占位检查的应用研究。
方法 回顾分析我医院 2019 年 1 月 ～ 2019 年 7 月收治的患者 20 例，并行肾上腺增强检查的志愿者作为研究对象，使用随机数字表法，将其分为动态组和常规组，每组 10 例。两组受检者的一般资料比较，差异无统计学意义(P ＞ 0. 05) ，组间具有可比性。
检查方法
使用 Philips Brilliance 256iCT 扫描。参数:管电压 120 kV.毫安秒 300mAs/slice。扫描前叮嘱患者检查时不要动，听机器口令配合好憋气。使用对比剂延迟扫描技术，扫描范围自膈向下，至肾门水平（L2 水平），屏气后扫描。造影剂使用优维显(碘普罗胺注射液)370(碘浓度 370mg/ml)。造影剂剂量 85 ml 从肘静脉注射，注射速度 3. 5 ml /s; 然后追加生理盐水 30 ml，注射速度 3. 5 ml /s。常规组扫描时间 30s 60s 150s 动态组加扫 5min、 7min 两组患者除扫描延迟时间不同，其它固定扫描参数不变。根据测得的各个时间点的 CT 绝对值逐一绘制时间-密度（T-D）曲线，分析曲线走势.
结果
通过绘制多期动态增强时间-密度曲线，观察曲线类型从而确定肿瘤性质。肾上腺动态增强 CT，对腺瘤的诊断率明显高于肾上腺常规增强 CT (P<0.05)具有统计学意义。
结论
通过资料研究与病理结合证实,肾上腺 CT 动态增强扫描检查能够对腺瘤和非腺瘤鉴别诊断具有较大价值。但因为扫描时间与剂量方面也有其不足,所以最好的方法就是在临床治疗过程中,将两种诊断方式进行结合诊断,可以提高诊断率.

PU-0228

256 层 CT 进行多期扫描对慢性胰腺癌的诊断准确性的价值分析

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目的 256 层 CT 进行多期扫描对慢性胰腺癌的诊断准确性的价值分析。
方法 选取我院于 2017 年 3 月至 2019 年 3 月就诊的慢性胰腺癌患者 120 例，作为观察组进行 256 层 CT 多期扫描，另选取我院于 2018 年 3 月至 2019 年 3 月的慢性胰腺癌患者 110 例，作为对照组进行 MRCP（磁共振胰胆管成像技术）检查，对比两组患者的超声检查效果，分析诊断结果的准确性。
结果 256 层 CT 多期扫描对慢性胰腺癌的诊断准确性要优于 MRCP 检查方式，且两组之间的差异（P<0.05）具有统计学意义。结论 采用 256 层 CT 进行多期扫描对于慢性胰腺癌的诊断具有非常好的准确度，对胰腺癌范围以及手术切除方案设计、治疗、预后等具有重要意义，建议在临床推广使用。

PU-0229

the Imaging Feature—Vessel Floating Sign in Hepatic Lymphoma and Hepatic Inflammatory Pseudotumor

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Objective：Our retrospective study sought to compare the vessel floating sign and the other features between the hepatic lymphoma and hepatic inflammatory pseudotumor on the enhanced CT. **Method**：A retrospective analysis was conducted on 25 patients with pathologically proven HL and HIP who underwent enhanced CT between January 2009 and December 2018, there were 10 cases of hepatic lymphoma and 15 cases of hepatic inflammatory pseudotumor . Two radiologists evaluated the morphological features—number, size of lesion, the mode of enhancement, vessel floating sign and counted the numbers of vessels and ducts in the lesions of vessel floating sign. These parameters were analyzed in in these two diseases. **Result**：Among investigated parameters, only the bile ducts and the numbers of arteries penetrating through lesion shows a significant variation of values(c2=1.500，P=0.221; c2=1.632，P=0.201) between HL and HIP, and a significant statistically difference for the number of floating signs(c2=4.900，P=0.027).Also there are differences in total number of lesions in HL and HIP(c2=7.272，P=0.007) and homogeneous enhanced((c2=11.003，P=0.001) . **Conclusion**：The vessel floating signs are different in hepatic Lymphoma and hepatic pseudotumor, particularly, on the arteries and bile ducts.

PU-0230

原发肝外胆管神经内分泌癌 1 例报告附文献复习

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背景：神经内分泌肿瘤最常见于消化系统，而来自肝外胆管的神经内分泌癌极为罕见。本报告介绍了肝外胆管的神经内分泌癌的临床病理特征、影像特点。
病例报告：一名 45 岁的女性患者术前被诊断为肝外胆管神经内分泌癌。根据组织病理学结果，肿瘤诊断为胆管低分化神经内分泌癌，伴有淋巴结转移。我们对其影像特征进行总结并做文献复习。
结论 肝外胆管神经内分泌癌是一种非常罕见且高度恶性的疾病，预后较差，影像诊断缺乏特异性，最终诊断依赖病理诊断。

PU-0231

基于 MACC1-SPON2 诊断结直肠癌肝转移的放射性示踪剂的筛选

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目的 探究 ^{18}F-FDG、^{18}F-FLT 和 ^{18}F-FMISO Micro-PET 显像在监测不同转移潜能结直肠癌细胞系 LoVo 和 HCT8 肝转移模型及核素体外细胞摄取中的价值，从体内、体外两方面分析放射性示踪剂的摄取率与 MACC1 和 SPON2 蛋白表达的相关性。

方法 培养人 CRC 细胞系 LoVo 和 HCT8 两种细胞进行体外放射性核素摄取实验及迁移实验，比较不同转移潜能结直肠癌细胞之间的分子影像学特征。并将两种细胞注射到裸鼠脾脏中以建立肝转移模型。接种 8 周后进行 PET 成像，注射三种示踪剂后评估具有高低不同肝转移潜能结直肠癌模型的活体 PET 成像特征。使用免疫组织化学和 Western blot 技术检测组织中结肠癌转移相关基因-1（MACC1）和 Spondin2 蛋白（SPON2）的表达水平。通过线性回归分析评估肝转移灶中示踪剂摄取与 MACC1 和 SPON2 表达之间的相关性。

结果 体外 ^{18}F-FDG、^{18}F-FLT 和 ^{18}F-FMISO 摄取实验 4 小时摄取率为：LoVo>HCT8。Micro-PET 扫描显示两种细胞 ^{18}F-FDG SUV 值之间无统计学差异（P>0.05）；而 ^{18}F-FLT 和 ^{18}F-FMISO SUV 值之间均差异显著（P<0.05）。并且所有体内 FLT 和 FMISO SUV 值 LoVo 肿瘤均显著高于 HCT8 肿瘤。Western blot 实验结果显示：LoVo 肝转移病灶中 MACC1 和 SPON2 的蛋白表达水平均高于 HCT8，差异有统计学意义（P<0.05），这与免疫组化结果相一致。^{18}F-FLT SUVmax ratio 与肝转移瘤组织中 MACC1 和 SPON2 的表达均有显著相关性。^{18}F-FMISO SUVmax ratio 值仅与肝转移瘤组织中 MACC1 的表达有显著相关性。

结论 筛选出 ^{18}F-FLT 和 ^{18}F-FMISO 两种示踪剂对结直肠癌肝转移的早期、高效诊疗具有重要临床价值。

PU-0232

Assessment of liver fibrosis in early stage with perfusion CT in a mini-swines model

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PURPOSE

This work aims to assess the performance of perfusion CT in diagnosis of liver fibrosis in the early stage in a mini-swines model

METHOD AND MATERIALS

Diethylnitrosamine (DEN) were injected into the peritoneum of 7 mini-swines to establish mini-swines models of liver fibrosis. Perfusion CT were performed at before and 4-, 8-, 12-, 16- week after injection. The parametric perfusion indices of blood volume (BV), hepatic blood flow (BF), hepatic arterial perfusion (HAP), portal venous perfusion (PVP), and hepatic perfusion index (HPI), time to peak (TTP), mean transit time (MTT), area of curve (AUC) on perfusion maps were measured. Histological examination of the liver tissues with hematoxylin and eosin staining was performed after CT scan. Liver samples were scored as F0, F1, F2, F3, F4 for fibrosis. The perfusion parameters were compared between 2 groups of mini-swines (F0 vs F1) and analyzed with ROC curves.

RESULTS

35 samples were observed. 10 samples were histopathologically scored as F0, 12 were F1, 8 were F2, 3 were F3 and 4 were F4. A statistically significant difference was observed in PVP, BF, HAP and HPI between F0 vs. F1. In the early stage of liver fibrosis PVP decreased with the progression of liver fibrosis, whereas HPI, HAP and BF increased with the progression of liver fibrosis. The area under the ROC curve of PVP was 0.89, which was the highest, the corresponding optimal cut-offs was 35.968. PCT

parameters did not correlate with laboratory findings including AST-platelet ratio index.

CONCLUSION
CT perfusion combined with ROC curve analysis is a new diagnosis model for assess liver fibrosis in the early stage. PVP was the ideal reference index.

PU-0233

Prognostic significance of PD-L1 expression and 18F-FDG PET/CT metabolic parameters in colorectal cancer

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Objectives: ^{18}F-FDG PET is an effective method for assessing tumor glucose metabolism. It has been rarely reported whether ^{18}F-FDG uptake in colorectal cancer cells is associated with the expression of PD-L1. We performed a clinical pathology study to evaluate PD-L1 expression in patients undergoing surgical resection of colorectal cancer (CRC) with preoperative ^{18}F-FDG PET/CT imaging, with the aim of predicting immunological testing in patients with CRC The response of point inhibitors is critical for the successful advancement of PD-L1 immunotherapy in CRC patients. **Methods:** A retrospective analysis of 65 patients with CRC who underwent ^{18}F-FDG PET/CT imaging before surgery was performed to measure the parameters of ^{18}F-FDG PET/CT imaging: the maximum standardized uptake value (SUVmax), the metabolic tumor volume (MTV), and the total lesion glycolysis (TLG) were evaluated to determine whether each parameter was associated with clinical pathology. Tumor specimens were stained with PD-L1 by immunohistochemistry, and whether PD-L1 expression was correlated with the parameters of ^{18}F-FDG uptake in CRC was explored, investigate whether ^{18}F-FDG PET/CT imaging can be used to predict PD-L1 expression status and the impact of these indicators on prognosis prediction of CRC patients. **Results:** PD-L1 was highly expressed in 68% of CRC patients, and its expression level was significantly correlated with SUVmax, MTV3.0 and TLG3.0. Multivariate analysis showed that PD-L1 and TLG3.0 were independent predictors of poor DFS in patients with CRC, PD-L1 expression is closely related to the patient's lesion (TLG3.0), which may be an important indicator for poor prognosis in patients with CRC who have a high level of complete glycolytic level. An important indicator of poor prognosis in patients with CRC. **Conclusion:** The results of this study indicate that high PD-L1 expression levels and tumor vascular invasion are independent risk factors for OS differences in CRC patients. High PD-L1 expression levels and high TLG3.0 are independent risk factors for DFS differences in CRC patients. There was a significant correlation between PD-L1 expression and TLG3.0, which helped to explore the usefulness of TLG3.0 as a predictor of PD-L1 inhibitor activity to determine the optimal therapeutic strategy for CRC.

PU-0234

肝细胞腺瘤 1 例误诊分析并文献复习

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目的 提高对肝细胞腺瘤不典型影像学表现的认识，减少误诊。
方法 通过对我院 1 例肝细胞腺瘤的临床及影像、病理资料进行回顾性分析，并复习国内外相关文献。
结果 当肝细胞腺瘤发生于脂肪肝背景并且病变周围肝细胞炎性水肿的情况下，术前定性诊断有一定难度，MRI 增强肝胆期扫描有一定鉴别诊断价值。
结论 肝细胞腺瘤是起源于肝细胞的一种少见的良性肿瘤，通常发生在没有肝硬化的基础上，影像学表现通常较为典型，但也要认识到不典型的影像表现，早期明确定性诊断有助于患者治疗方法的个性化选择。
【主题词】 肝细胞腺瘤；MRI

PU-0235
多层螺旋 CT 增强检查及重建对肝脏泡状棘球蚴病累及脉管及胆道系统的临床应用

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目的 应用多层螺旋 CT 增强扫描及重建技术，对肝脏泡状棘球蚴病患者脉管系统损害情况进行评价。
方法 所有病例均行多层螺旋 CT 平扫加增强扫描，分析原始图像及重建图像，评价脉管系统受累情况，并将肝血管受累情况与手术所见行对照分析。
结果 MSCT 图像显示 117 例患者中 59 例病变累及肝动脉、肝静脉或门静脉，与手术所见对比研究，多层螺旋 CT 对肝血管评价的敏感度、特异度及阳性预测值分别为 96%、93%和 93%。另外 31 例患者存在肝内胆道系统不同程度扩张。
结论 MSCT 增强扫描可用于分析肝脏泡状棘球蚴病患者脉管系统受累情况，为正确诊断及合理治疗提供影像学依据。

PU-0236
Hepatobiliary phase hypointensity on MRI could improve the detection of hepatocellular carcinoma.

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Objective: To determine the clinical value of hepatobiliary phase (HBP) hypointensity for the detection of hepatocellular carcinoma (HCC) in high-risk patients.

Materials and methods: 235 consecutive patients who were at high-risk for HCC with 251 selected nodules (113 HCCs, 138 non-HCCs) undergoing GD-BOPTA enhanced MRI were included. Imaging-based diagnoses of HCCs were made using any of the following four criteria: 1. arterial phase hyper-enhancement (APHE) plus hypointensity on the portal venous phase (PVP); 2. APHE plus hypointensity on the PVP and/or transitional phase (TP); 3. APHE plus hypointensity on the PVP and/or TP and/or HBP; 4. criterion 3 plus non-LR-1/2/M. Sensitivity, specificity, positive-predictive values, negative-predictive values and accuracy of each criterion were calculated. Sensitivities and specificities of those criteria were compared.
Results: Among diagnostic criteria for HCCs, both criterion 3 and 4 showed significantly higher sensitivities (99.1% and 96.5%, respectively) than criterion 1 and 2 (69.9% and 87.6%, respectively) ($p < 0.001$ for all). In comparison to criterion 3 (54.3%), criterion 4 (89.9%) showed significantly higher specificity ($p < 0.001$). In addition, the specificity of criterion 4 was comparable to criterion 1 (94.9%, $p = 0.065$). Criterion 4 also showed the highest accuracy among these imaging criteria (92.8%).
Conclusion: In the non-invasive diagnosis of HCCs based on hepatobiliary contrast enhanced MRI, HBP hypointensity has definitive clinical value when combined with ancillary features.

PU-0237
定量分析多时相 MRI 图像预测小肝细胞癌的组织病理学分级

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目的 探讨多相磁共振图像的术前定量分析是否有助于预测小肝细胞癌的病理分级。
材料与方法 回顾性分析 49 例行多期相磁共振成像的患者，患者在术前进行常规平扫 MRI 和钆高酸二甲基葡胺（Gd-BOPTA）增强 MRI。 在指定的感兴趣区域（ROI）内测量信号强度（SI），包括病变和竖脊肌。 分别计算在 T2W，DWI 和动态 Gd-BOPTA 增强 T1W 成像上，病变 /竖脊肌的相对信号比，并进行统计分析以确定组织学分级的预测能力。
结果 49 例患者包括 3 例高分化 HCC，36 例中分化 HCC 和 10 例低分化 HCC。动脉期图像上相对信号比与小肝癌病理分级呈负相关（$\rho = -0.305$，$P < 0.05$）。 然而，其他期相的相对信号比与小肝细胞癌的病理分级无统计学意义（所有 $P > 0.05$）。 此外，肿瘤边缘、肿瘤部位、囊性/坏死性改变、瘤内脂肪、强化模式、肿瘤包膜、肿瘤边界或肿瘤大小在任何组织病理学分级之间也没有相关性（所有 $P > 0.05$）。
结论 Gd-BOPTA 增强的 T1W 显像显示，病灶/竖脊肌的相对信号比可作为预测小肝癌组织学特征的依据。

PU-0238
钆贝葡胺增强 MRI：肝胆期低信号可以提高肝细胞癌的诊断效能

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目的 探讨在所有患者及有高危因素的患者中，肝胆期低信号对肝细胞癌的无创性诊断价值。
材料与方法 本研究纳入 369 例行上腹部 GD-BOPTA 增强 MRI 的患者，共 391 个病灶(133 例肝细胞癌，258 例非肝细胞癌)。以下影像标准被用于肝细胞癌的诊断：1. 动脉期高强化（APHE）+门静脉期低信号（PVP）；2. APHE+PVP 和/或平衡期（TP）低信号；3. APHE+PVP 和/或 TP 和/或 HBP 低信号；4. 标准 3+非血管瘤/肝内胆管细胞癌（ICC）；5. HBP 低信号+非血管瘤/ICC；6. 5. HBP 低信号+非血管瘤/ICC+T2WI 轻度-中度高信号+非 ADC 高信号。此外，对上述含有高危因素的患者另设 4 个标准行诊断分析。计算所有标准的诊断敏感性、特异性、阳性预测值、阴性预测值、准确性，并比较这些标准的敏感性和特异性。
结果 在肝细胞癌的诊断标准中，在所有患者中，标准 3、4、5、6 的敏感性分别为 85.0%、82.0%、90.2%、88.7%，明显高于标准 1 和 2。标准 5 和 6 的特异性（分别为 88.4%和 92.6%）与标准 1（97.3%）相近，尽管 p 值<0.05，并且标准 6 的准确度最高（91.%）。在高危患者组中，结果与上述相似。
结论 无论是高危患者还是所有患者，用 GD-BOPTA-MRI 诊断肝细胞癌时，肝胆期低信号结合辅助特征具有明确的临床价值。

PU-0239

34 例原发性肝癌患者 TACE 术后疗效分析

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目的 TACE 在肿瘤的治疗中具有重要的作用，尤其是在复发肿瘤及转移瘤的治疗中发挥着不可替代作用,本文着重研究 TACE 对原发性肝癌的治疗效果及其影响因素。
方法 2011-2014 年共有 34 例原发性肝癌的患者在我院行 TACE 治疗，治疗完成后对 34 例病人进行临床随访，收集病人临床资料及影像学资料，利用 Kaplan－Meier 法进行生存率的计算机分析，利用 Cox 模型分析影响病人预后的因素。
结果 34 例病人中 1 年、2 年、3 年的生存率分别为 82%、71%、47%，AFP 值、肿瘤体积、肿瘤的 TNM 分级不同的病人，其生存率不同（p<0.001）。
结论 TACE 为一种安全有效的原发性肝癌的治疗方法，AFP 值、肿瘤体积、肿瘤的 TNM 分级均为影响预后的危险因素。

PU-0240

肝脏镰状韧带旁假性病灶的 MRI 分型及表现

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目的 探讨两种类型肝脏镰状韧带旁假性病灶(简称肝假病灶)的 MRI 平扫及增强表现。
方法 回顾性分析 152 例肝假病灶的 MRI 表现特点，并依据影像表现分型。
结果 152 例患者中共检出肝假病灶 173 个，位于肝左叶内侧段 127 个，肝左叶外侧段前缘 46 个；单发肝假病灶 131 个，21 例肝假病灶为双发共 42 个，对称分布于肝左叶内侧段和肝左叶外侧段前

缘。MRI 动态增强扫描动脉期 113 个病灶呈等信号，60 个病灶呈低信号；静脉期 173 个病灶均呈低信号；延迟期 110 个病灶呈等信号，63 个病灶呈低信号。
结论 肝假病灶有特征的好发部位，两种类型 MRI 表现有一定差异，应避免误诊为真性病变。

PU-0241

Effect of low tube current combined with iterative algorithm on image quality and radiation dose of upper abdominal CT scan: a phantom and clinical study

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Objective To explore the effect of low tube current combined with iterative algorithm on the image quality and radiation dose of upper abdominal CT scan, and optimize the parameter of upper abdominal CT scan.
Methods Phantom experiment:the abdominal phantom was scanned with 5 different tube currents (200, 180, 160, 140, 120mAs). All data were reconstructed using filtered back projection(FBP) and iterative algorithm [idose4 (Level 1～6)]. The image noise under different tube currents and reconstruction algorithms were compared. Clinical trial: 100 consecutive cases with upper abdominal CT scan were collected and divided into experimental group (48 cases) and control group (52 cases) according to random digital table method. The experimental group was scanned with 120 mAs, and the image (group A) was reconstructed with idose4 (Level 6). The control group was scanned with 200 mAs, and the image of group B and group C was reconstructed with FBP and idose4 (Level 6) respectively. Objective evaluation indexes [contrast noise value(CNR) and image noise], subjective score and effective dose (ED) were compared between experimental group and control group.
Results In phantom experiment, the image noise of FBP, idose 4 (Level 1), idose 4 (Level 2), idose 4 (Level 3), idose 4 (Level 4), idose 4 (Level 5), idose 4 (Level 6) were gradually decreased under the same tube current, and the differences were statistically significant(P<0.05). With the increase of tube current, image noise were gradually decreased under the same reconstruction algorithm, the differences were statistically significant(P<0.05). The image noise of 120 mAs with idose4 (Level 6) group was lower than 200 mAs with FBP group, and higher than 200 mAs with idose4 (Level 6) group, the differences were statistically significant(P<0.05). In clinical experiment, the image noise of group A was lower than group B, and higher than group C, the differences were statistically significant (P<0.05). The CNR of liver in group A was higher than group B, and lower than group C, the differences were statistically significant (P<0.05). Subjective scores of the three groups were >3 points, there was no significant difference in subjective score between group A and B(P>0.05). The subjective score of group C was higher than group A and B, and the differences were statistically significant (P<0.05). The ED of the experimental group was lower than control group, the difference was statistically significant (P<0.05). **Conclusions** In upper abdominal CT scan, the image quality which meets the diagnostic requirement can be obtained by using low tube current combined with iterative algorithm, and the radiation dose can be effectively reduced.

PU-0242

The experience of diagnosis and treatment in solitary giant hepatic lymphangioma

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Hepatic lymphangioma was a kind of rare benign tumors, which was characterized by cystic dilation of lymphatic vessels in the hepatic parenchyma. Clinically, hepatic lymphangioma usually had non-specific clinical signs or symptoms and often was discovered during physical examination. Although, the imaging features of hepatic lymphangioma could appear as a cystic or multi-cystic mass with internal septa, it was difficult to differentiate it from other cystic diseases. So, the exact diagnosis was confirmed by pathological examination. In this study, we reported on a case of hepatic lymphangioma in a 29-year-old male. A giant lymphangioma in his right lobe was detected by Imageological examinations. The imaging results and histopathological examinations collectively supported the diagnosis of hepatic lymphangioma. The aim of this article was to report on the experience in diagnosis and treatment of hepatic lymphangioma, which was confirmed by pathology. We also reviewed the literatures of hepatic lymphangiomas in order to improve the understanding of this disease.

PU-0243

探究 T2*在输血性铁过载中的应用价值

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目的 探究磁共振 T2*技术对慢性输血患者肝脏中铁沉积的评估价值。
方法 搜集我院近两年因血液系统疾病长期输血患者，入组者排除肝脏肿瘤史，以及促红细胞生成药物服用史、铁剂服用史。抽出患者静脉血，测出血清铁蛋白，c 反应蛋白，并计算出校正血清铁蛋白；利用磁共振设备对肝脏进行最大横断面扫描，用软件测量肝脏 T2*值以及竖脊肌 T2*值，计算出 $SIR_{肝脏/竖脊肌}$，并进行相关性分析;同期收集正常志愿者作为对照组，将输血组根据铁过载程度分为轻中重组，并进行组间差异性分析。
结果 $SIR_{肝脏/竖脊肌}$与血清铁蛋白、校正铁蛋白、输血量均具有相关性,具有统计学意义（$P<0.05$）。组间均具有差异性。
结论 T2*技术在评估慢性输血的患者肝脏铁含量方面有一定价值。

PU-0244

基于 CT 图像的 3D 纹理分析鉴别肾细胞癌的初步价值

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目的 探讨基于 CT 图像的 3D 纹理分析技术及其相关参数在鉴别不同病理类型肾癌中的应用价值。材料与方法 回顾性分析未经过手术、放化疗及其他抗肿瘤治疗的 73 例肾癌（其中 54 例肾透明细胞癌，19 例肾非透明细胞癌）患者的临床、影像资料。所有患者行 CT 平扫以及动态增强扫描，采用 3DQI 纹理分析软件，在不同扫描时期图像上逐层勾画出肿瘤的边界，获取整个瘤体的纹理参数特征。分析、比较两种不同病理类型肾癌相关纹理参数值（平均灰度值、标准差、偏度、峰度、熵）之间的差异，认为 *P<0.05* 的纹理参数差异具有统计学意义，并通过绘制 ROC 曲线评价各纹理参数的诊断效能。 结果 不同扫描时期，肾透明细胞癌的 CT 定量纹理参数平均灰度值、标准差、熵高于肾非透明细胞癌，峰度低于非透明细胞癌。平均灰度值与标准差在髓质期、实质期、排泄期的差异有统计学意义（*P<0.05*）；熵与峰度在平扫期、髓质期、实质期差异有统计学意义（*P<0.05*）；偏度参数在肾透明细胞癌与非透明细胞癌的不同扫描时期差异均无统计学意义（*P>0.05*）。髓质期，峰度参数 ROC 曲线下面积为 0.87，敏感度 95%，特异度 72%，其最佳阈值为 1.09，对鉴别肾透明细胞癌与肾非透明细胞癌具有较高的诊断价值。结论 基于 CT 图像的 3D 纹理分析技术在鉴别两种不同病理类型肾细胞癌中具有一定价值，可以成为初步诊断肾细胞癌病理分型的新方法。

PU-0245
乏血供胰腺神经内分泌肿瘤的 MR 影像表现及鉴别诊断

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目的 分析乏血供胰腺神经内分泌肿瘤在 MR 中的影像学特征以及鉴别诊断，以提高对其诊断水平 **方法** 对 20 例经手术病理证实的胰腺神经内分泌肿瘤 MR 表现进行回顾性分析 结果 20 例胰腺神经内分泌肿瘤患者行 MR 平扫及增强扫描，其中 7 例病理证实为胰岛细胞瘤患者 4 例边界清楚，3 例边界不清，T2WI 呈高信号，T1WI 呈低信号，增强后动脉期和静脉期均呈中度强化；13 例病理证实为神经内分泌癌患者均表现为边界不清，T2WI 呈不均匀高信号，T1WI 呈稍低或低信号，增强后病变均呈轻度强化，静脉期较动脉期增强幅度稍减低，所有患者各期增强幅度均未超过胰腺实质。20 例患者，病理证实为胰岛细胞瘤患者动脉期表现为中度强化，病理证实为神经内分泌癌患者动脉期均以轻度强化为主，差异有统计学意义（P＜0.05）。结论 边界清楚明显增强以及包膜强化被认为是胰腺神经内分泌肿瘤的典型影像学表现，但其影像学表现多样，乏血供胰腺神经内分泌肿瘤与胰腺癌在影像学表现上有很多相似之处，二者很难鉴别。

PU-0246
结肠癌肝转移 PD-1 治疗后影像疗效评估误诊一例

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患者，女，71 岁，因间断腹泻就诊，便潜血阳性，结肠镜示升结肠低分化腺癌，免疫组化 HER2（-）、PD-1 / PD-L1（-）、MLH1 / PMS2（-）、MSH2 / MSH6（+）；PCR：MSI-H。腹部 MR 增强检查示肝脏 S7、S4/8 两个稍长 T1 稍长 T2 信号结节，DWI 高信号，动脉期明显高强化，门脉及延迟期强化稍减低，考虑转移。患者经两周期 PD-1 单抗治疗后复查腹部增强 CT，提示肝脏转移灶增大，并

且新见一转移结节，综合评效 PD。之后患者行肝 TACE 术及第三周期 PD-1 单抗治疗、第 1 周期 XELOX 方案化疗及第 4 周期 PD-1 单抗治疗，再次行腹部 MR 增强检查，示肝脏转移灶均缩小，DWI 信号减低，边缘呈延迟强化，考虑仍具有活性，综合评效 PR。患者行右半肝切除加右半结肠切除术后，病理示肝脏三处肿物均为坏死组织，ypCR。患者术后随访 1 年余，未见复发。

PU-0247

胆囊大细胞神经内分泌癌一例

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本文汇报一名男性患者，53 岁，体检超声发现胆囊占位半月余，上腹部增强 MR 提示胆囊壁可见等 T1 短 T2 信号小结节，大小约 16x9mm，DWI 呈高信号，增强扫描可见强化，延迟期持续强化，考虑恶性。术后病理为胆囊大细胞神经内分泌癌（pT3N1）。查阅中外文献可知，原发于胆囊的大细胞神经内分泌癌十分罕见，目前尚无系统性报道，本文讨论部分通过综合分析中外个案报道，总结其影像学特点，辅助临床诊断及治疗。

PU-0248

特异性对比剂普美显磁共振成像在鉴别肝硬化结节与小肝癌中的诊断价值分析

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目的 探讨特异性对比剂普美显磁共振成像在鉴别肝硬化结节与小肝癌中的诊断价值及普美显动态增强肝胆期扫描对小肝癌应用效果，为肝硬化结节与小肝癌的鉴别诊断提供理论依据。
方法 选取 2016 年 7 月-2017 年 12 月我院 30 例接受治疗的肝硬化患者作为研究对象，患者男 17 例，女 13 例，年龄 33-77 岁，平均（56.1±3.4）岁，所入选的病例术前均为均有乙肝病史，每一位患者肝内至少发现一个肝硬化病灶，所入选的患者均自愿参与本次研究，并签署知情同意书。对以上患者分别进行 MRI 平扫、普美显动脉增强扫描及普美显动态增强肝胆期扫描。在影像学检查结束之后的 4 周内对以上所有患者进行手术检查或是穿刺活检等病理学检查，将影像学检查结果与病理学结果进行对比，并对 MRI 平扫、普美显动脉增强扫描、普美显动态增强肝胆期扫描三种检查方法的灵敏度、特异度、阳性预测值、阴性预测值、诊断正确率。
结果 经过病理学检查与影像学检查后，结果发现 3 例患者中一共存在 90 个肝硬化结节。其中，58 个病灶并确诊为肝硬化再生结节或是肝硬化增生结节，32 个病灶被确诊为小肝癌。普美显增强扫描诊断原发性肝细胞癌的灵敏度、特异度、阳性预测值、阴性预测值、诊断正确率明显高于 MRI 平扫，差异具有统计学意义（P＜0.05）；普美显动态增强肝胆期扫描小肝癌诊断的敏感性、特异性明显高于普美显增强扫描，差异具有统计学意义（P＜0.05）。
结论 特异性对比剂普美显磁共振成像在鉴别肝硬化结节与小肝癌中的诊断价值显著，能够大大提高临床对于肝硬化再生结节、肝硬化增生结节及小细胞癌诊断的敏感性，其诊断正确率明显高于 MRI 平扫。同时，能够在早期将具有恶化倾向的肝硬化结节与小肝癌进行鉴别诊断。

PU-0249

高分化肿块型肝内胆管细胞癌的 MRI 特征

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分析高分化肿块型肝内胆管细胞癌的 MRI 表现，以提高影像认识。
方法 回顾性收集 33 例经手术病理证实的肝内胆管细胞癌，根据其病理分级不同将其分为高分化组（n=11）及非高分化组（n=22），对比分析 2 组 MRI 表现差异。
结果 高分化肿块型肝内胆管细胞癌多为类圆形肿块（10/11，90.9%），边界清晰（11/11，100.0%），非高分化组多为边缘不清晰（14/22，63.6%）、不规则软组织肿块（16/22，72.7%），两者比较有统计学意义（*P＜0.05*）；多期增强扫描，高分化组以Ⅰ型及Ⅱ型强化为主，非高分化组以Ⅱ型及Ⅲ型为主，与非高分化组相比有统计学意义（*P＜0.05*）；高分化组 DWI 靶征 6 例（6/11，54.5%），伴随征象 3 例（3/11，27.3%），与非高分化组相比有统计学意义（*P＜0.05*）。
结论 高分化肿块型肝内胆管细胞癌多表现为类圆形、边界清晰的软组织肿块，强化模式多为Ⅰ型及Ⅱ型，伴随征象少见，DWI 可见靶征。

PU-0250

能谱 CT 碘定量评估肝硬化肝、脾血流动力变化的研究

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目的 利用飞利浦分层探测器 DECT 通过比较肝、脾实质碘浓度以探讨肝硬化患者的血流动力学变化。
方法 收集山西医科大学第一医院临床或影像确诊为肝硬化的患者 46 例（Child A 级 10 例、Child B 级 24 例及 Child C 级 12 例）及健康对照组 22 例，对所有研究对象行上腹或全腹平扫+增强三期扫描，利用能谱分析软件得到肝硬化组与对照组的肝实质、脾、腹主动脉及门脉的碘浓度并计算两组间的肝动脉碘分数。采用 SPSS 24.0 统计学软件进行分析，计量资料以均数 ± 标准差（X±s）表示，肝硬化组与对照组组间比较采用独立样本 t 检验，Child 评分与其它定量指标采用 Spearman 相关分析，以 P ＜0.05 为差异有统计学意义。
结果 肝硬化组动脉期肝实质碘浓度、静脉期脾脏浓度及肝动脉碘分数均高于对照组，而动脉期脾脏浓度低于对照组，肝动脉碘分数和动脉期肝实质碘浓度与 Child-Pugh 分级呈正相关，相关系数分别为 R=0.71、R=0.46
结论 采用碘浓度法测定肝硬化患者肝、脾实质的血流动力学变化是可行的。肝动脉碘分数和动脉期肝实质碘浓度的定量指标与 Child-Pugh 分级呈正相关，使能谱 CT 作为评估肝硬化血流动力变化的无创性工具成为可能。

PU-0251

罕见腹腔滤泡树突细胞肉瘤 1 例

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患者，男，45 岁，体检发现腹腔包块 1 月，查体无特殊，血常规检查及肿瘤标志物检查均为阴性。
多层螺旋 CT 检查：肝脏下方、胃窦胰腺间见一类圆形肿块，大小约 3.4×5.4×4.4cm，肿块边缘有小分叶，周围脂肪间隙清楚；CT 平扫显示肿块内部见不规则结节状钙化，肿瘤非钙化区域密度约高于肌肉密度，肿瘤内部无明显坏死、囊变，三期增强检查显示肿块明显强化，静脉期及延迟期强化程度降低，平扫 CT 值约 45HU，动脉期 CT 值约 120HU，静脉期 CT 值约 90HU，延迟期 CT 值约 80HU；肿块与周围组织分界清楚，肿瘤可见一较大供血或引流血管显示；首次 CT 检查误诊为 Castleman 病或肉瘤。
手术及病理：胃窦小弯侧、肝脏下缘及胃十二指肠韧带左侧，活动度好，肿块血供丰富，肿瘤完整切除，术中考虑良性肿瘤。光镜可见： 淋巴结结构破坏,大量淋巴细胞背景中肿瘤细胞呈束状、席纹状、漩涡状或弥漫性排列；瘤细胞呈梭形卵圆形，胞质丰富，可见核仁；免疫组化：瘤细胞 CD35(+)，CD21(+),CD23+),S-100(+),ALK 基因(-)。病理诊断：滤泡树突细胞肉瘤。

PU-0252

胰尾部巨大癌肉瘤 CT 表现一例

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目的 探讨临床少见病胰腺癌肉瘤的 CT 表现。【\
方法 患者，女，51 岁，因左上腹隐痛不适 7 月余，加重 20 天入院。体格检查：左上腹肋缘下可扪及质硬肿块，约 6cm×7cm 大小，活动度差，压痛明显，无肌紧张及反跳痛。为明确诊断，行上腹部 CT 平扫+增强检查确定病变性质。【结果】 上腹部 CT：左上腹见一巨大囊实性肿块影，大小约 15.3cm×9.4cm×12.3cm，以囊性为主，壁薄，其内可见分隔，平扫囊性部分呈低密度，实性部分呈等、稍高密度；增强囊壁及分隔可见强化，囊性部分未见强化，实性部分明显不均匀强化；肿块与胰腺关系密切，胰尾部呈杯口状改变，考虑来源于胰尾的肿瘤性病变。另横结肠系膜区见 3.5cm×4.0cm 的囊性肿块，考虑转移。术后病理诊断为胰腺癌肉瘤伴肠系膜转移。
结论 胰腺癌肉瘤是一种罕见的肿瘤，确诊需依靠病理及免疫组化；恶性程度高，对放疗和化疗均不敏感，所以手术为大部分病例的首选治疗方式，只有无法手术或无法切净的病例才采用放疗和化疗。

PU-0253

成人型环状胰腺的影像诊断

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目的 探讨成人型环状胰腺的影像表现及各种影像检查的价值。
方法 分析 24 例成人型环状胰腺的临床、X 线、CT 及 MR 表现。
结果 1 例腹部立位片表现“双泡征”，19 例 CT 平扫均表现为十二指肠周围软组织密度影，其上段十二指肠均有不同程狭窄，17 例增强扫描示十二指肠周围周围软组织明显均匀强化，强化与正常胰腺组织强化程度一致。4 例 MR 平扫示胰头增大，呈完全或不完全包绕十二指肠，其上段十二

指肠狭窄，均增强示肿大胰头与正常胰腺组织强化一致；MRCP 清晰显示环状胰腺的胰管的情况。结论 成人型环状胰腺的影像表现有一定的特征性，通过对病例的总结及分析提高对该病影像表现的认识。

PU-0254
“三低”技术结合 ASIR-V 在肝脏 CT 增强检查中的应用研究

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目的 探讨在低 kVp、低造影剂用量、低流速下结合 ASIR-V 技术在肝脏 CT 增强检查中的应用研究。
方法 前瞻性收集 40 例进行肝脏 CT 增强检查的患者，并随机分为 A、B 两组，造影剂种类使用碘帕醇 370mgI/ml,A 组造影剂用量=（Kg×450）/370ml，流速=造影剂用量/30ml/s；B 组造影剂用量=（Kg×350）/370ml，流速=造影剂用量/30ml/s。扫描条件：A 组管电压 120kVp，噪声指数 NI（Noise Index）为 10，自动管电流技术（Smart mA），采用 FBP 形式重建，图像后重建层厚为 1.25mm；B 组管电压 80kVp，NI 为 10，Smart mA，ASIR-V 重建分别为 0%、20%、40%、60%、80%、100%，间隔 20%，图像后重建层厚为 1.25mm。扫描**方法** 监测膈肌下 1-2cm 的腹主动脉，阈值达到 120HU 后延迟 10s 自动触发扫描动脉期，延迟 30s 扫描门静脉期，延迟 120s 扫描延迟期。
结果 两组间的年龄、体重指数均无统计学差异（p＞0.05）；客观测量值均具有统计学差异（p＜0.05）；两组间图像质量主观评分存在明显差异(P＜0.05)；造影剂用量及流速分别为 76.95±10.98 mL vs.62.55±9.77 mL、2.56±0.36 mL/s vs.2.08±0.31 mL/s（p 均为 0.000＜0.05），具有明显统计学差异，B 组的造影剂用量及流速较 A 组均减少约 22%；两组间的辐射剂量分别为 5.68±1.27 mSv vs.2.11±0.22 mSv，且 B 组辐射剂量较 A 组减少约 56%。
结论 在低 kVp、低造影剂用量、低流速条件下进行肝脏 CT 增强扫描时，随着迭代重建递增，不仅能得到优于 120kVpFBP 重建图像质量，且能大幅度降低辐射剂量。

PU-0255
Application of personalized iodine contrast agent scheme in liver enhancement scan

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Objective To study the value of personalized iodine contrast agent in liver enhancement scan. **Methods** Forty patients who underwent liver CT enhancement examination were prospectively collected. Forty patients were randomly divided into A and B groups. The contrast agent type was ibuprofen 370 mgI/ml, the dose of contrast agent A was (Kg×1.22) ml, and the flow rate was (radiography). Dosage / 30) ml / s; B dose of contrast agent = (Kg × 0.95) ml, flow rate = (contrast agent dosage / 30) ml / s. Two groups of scan conditions: tube voltage 120 kVp, noise index NI (Noise Index) 10, and automatic tube current technology (Smart mA). Group A was reconstructed with FBP and the reconstruction thickness was 1.25mm; ASIR-V reconstruction in group B was 0%, 20%, 40%, 60%, 80%, 100%, interval 20%, and post-image reconstruction Thickness is 1.25mm. Scanning method: monitoring the abdominal aorta below 1-2cm of the diaphragm.

After the threshold reaches 120HU, the arterial phase is automatically triggered after 10s delay, the portal vein phase is delayed by 30s, and the delayed phase is delayed by 120s. The ROI was placed in the liver parenchyma at the level of hepatic hilum and at the same level of back subcutaneous fat. Mean values were measured 3 times and CT and SD values were recorded. The signal-to-noise ratio of liver was calculated (SNR=CT). / SD) and contrast-to-noise ratio (CNR = (CT liver-CT fat) / SD fat. Statistical analysis of general patient data and objective measurement results, and subjective scoring of double-blind methods for image quality of each group using the 5-point method. (5 points, best image quality; 1 point, worst image quality.)
Results There was no statistical difference in age, body mass index, and CTDI between the two groups (p>0.05); there was a significant difference in subjective scores of image quality between the two groups. (P<0.05), as the weight of the iodine contrast medium increases, the image quality gradually increases. When the weight is 80%, good diagnostic requirements can be achieved, and the image quality is better than that of the high contrast agent. The image contrast agent dosage and flow rate were (76.95±10.98)/(62.30±10.20), (2.56±0.36)/(2.06±0.34) (p were all 0.000<0.05), with statistically significant difference, group B Contrast agent dosage and flow rate were reduced by about 18% compared with group A; The radiation dose between the two groups was (5.68±1.27) mSv/(4.80±1.36) mSv, respectively, and the radiation dose in Group B was reduced by about 11% compared with Group A. **Conclusions** The personalized iodine contrast agent plan for enhanced CT scanning of the liver Iterative reconstruction of incremental, can get better image quality.

PU-0256
普美显增强磁共振成像评价肝泡型包虫病的病变和肝功能

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目的 我国的青海是肝泡型包虫病的高发地，此病在组织学上具有类似恶性肿瘤的的浸润性的生长特点，导致患者的生存质量差，在此探讨普美显的肝胆期对肝泡型包虫病的生长及侵润特性的的优势，加强对此病的明确诊断。
方法 收集我院自 2017 年到 2019 年经临床确诊为肝泡型包虫病的 44 例患者应用普美显的 MRI 影像资料及评价肝功能的临床资料。
结果 在 44 例患者中，12 名（27.3%）为男性，32 名（72.7%）为女性；平均年龄为 42 岁（范围为 21 岁-66 岁）；44 例患者共检出 53 个病灶，实质型共 27 个，液化坏死 9 个，混合型 9 个，多发结节型 8 例。肝胆期、DWI(b＝0 mm/s^2、b＝800 mm/s^2)序列显示边缘浸润带的宽度分别为 0.93±0.16cm、0.73±0.11cm，差异有统计学意义（P＜0.05）。在 77.4%(41/53)个病灶中，肝胆期对病灶的显示优于或等同于门脉期；在 8 例多发结节型病例中，6 例肝胆期对小病灶显示的更清楚。44 例患者，将这些病例按照 Child-Pugh 分级分为 3 组，A 组 25 例，B 组 12 例，C 组 7 例，对病灶的显示清楚程度，肝功能 childA 级 88%（22/25）＞B 级 58.3%(7/12)＞C 级 42.9%(3/7)。
结论 1、肝胆期对病灶显示的更清楚，特别是多发结节型内的小病灶,为临床提供完全切除所有病灶的可能；2、肝胆期对病灶边缘浸润带范围显示更具有优势，为临床提供更确定的切除范围；3、通过肝胆期可以间接评估肝功能。

PU-0257

Evaluation of Portal System Flow in Response to a Meal Challenge with 4D-Flow MRI

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Purpose: This study monitors the flow changes in portal system through a meal challenge in healthy volunteers with 4D flow MRI to investigate the feasibility of non-invasively quantifying the hemodynamics changes if pathological conditions presented.
Materials and Methods: Ten healthy subjects were prospectively enrolled for MR exam at 3.0 T (Ingenia CX, Philips Healthcare, the Netherlands) with a 16-channel abdominal array coil. The MR protocol included a 2D quantitative flow measurement (axial, TR/TE = 4.4/2.7 ms, FOV = 200×200 mm^2, resolution = 1.5×1.5×8 mm^3, PC direction = RL, PC velocity = 200 cm/s, scan time = 13 s) to measure the flow velocity in portal vein as a reference for velocity encodings (VENC) and a 4Dflow sequence with compressed sensing (CS) acceleration (axial, TR/TE = 5.0/3.2 ms, FOV = 300×350 mm^2, resolution = 2.5×2.5×2.5 mm^3, PC direction = RL-AP-FH, CS =8, scan time = 370 s) for hemodynamics quantification. VENC was set to 30 cm/s for the 4D flow sequence to slightly surpass the measured velocity and avoid phase wrapping. The acquired images were processed in CVI42 (Canada Circle Cardiovascular Imaging) by a single radiologist to obtain a 3D angiogram. The places of those cut planes were put at the middle of the portal vein (PV), superior mesenteric vein (SMV), and splenic vein (SV) trunk. Flow velocity (cm/s) and volume (ml/ cardiac cycle) measurements were performed blinded to subject status (fasting/meal). The intra-class correlation coefficients (ICC) was used to check the consistency of the data measured by the two observers. Flow velocity and volume for each vessel were compared before and after the meal using paired.
Results: The consistency of the data obtained by the two observers were good (ICC value > 0. 75). After meal, significant increased blood flow velocity and volume were observed in PV and SMV and significantly decreased blood flow was observed in SV.

PU-0258

胰周血管改变在急性胰腺炎改良 CTSI 分级中的价值

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目的 观察急性胰腺炎胰周血管并发症的影像表现，并统计血管并发症出现率，探讨胰周血管 CT 成像在急性胰腺炎 MCTSI 评分分级中的价值。
方法 对 175 例 SAP 患者的增强影像资料进行回顾性分析，观察其影像学表现，统计分析胰头动静脉弓、脾动、静脉、门静脉、肠系膜上动、静脉出现的增粗、管壁毛糙、受压性改变、狭窄 / 闭塞、血栓形成以及侧枝循环形成等 CT 异常表现的频率。并将血管并发症作为 SAP MCTSI 分级评分标准之一。

结果 175 例急性胰腺炎中出现血管并发症 86 例（占 49.1%）145 次血管损伤。其中以脾静脉发生率较高，占 24.8%。血管并发症的有无在不同严重程度 AP 中具有统计学差异。所有出现血管并发症病例中，仅一例未合并其他胰周并发症。
结论 胰腺炎血管并发症常累及多支血管具有多种 CT 表现，不同严重程度 AP 中血管并发症发生频率不同，并与 CTSI 分级具有较高的一致性，详细评价血管变化有助于判断 SAP 严重程度。

PU-0259

Portal System Hemodynamics Using Highly Accelerated MRI - Compare to the Standard of Care Clinical Imaging Methods

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Purpose: To objectively evaluate the highly accelerated 4D flow magnetic resonance imaging (MRI) in portal system hemodynamics studies with Compressed SENSE (CS-SENSE).
Materials and Methods: Ten healthy volunteers (mean age 27.9±2.66 [20 - 35] years; 5 males, 5 females) were scanned on a 3.0T scanner (Ingenia CX, Philips Healthcare, the Netherlands) with a 16-channel abdominal array coil. The MR protocol included a 2D quantitative flow measurement (axial, TR/TE = 4.4/2.7 ms, FOV = 200×200 mm^2, resolution = 1.5×1.5×8 mm^3, PC direction = RL, PC velocity = 200 cm/s, scan time = 13 s) to measure the flow velocity in portal vein as a reference for velocity encodings (VENC) and a 4Dflow sequence (axial, TR/TE = 5.0/3.2 ms, FOV = 300×350 mm^2, resolution = 2.5×2.5×2.5 mm^3, PC direction = RL-AP-FH) with no-CS (scan time = 7min 24 s) and different CS (CS6 6min 10 s, CS8 4min 37 s, CS10 3min 44 s) for hemodynamics quantification. VENC was set to 30 cm/s for the 4D flow sequence to slightly surpass the measured velocity and avoid phase wrapping. The acquired images were processed in CVI42 (Canada Circle Cardiovascular Imaging) by a single radiologist to obtain a 3D angiogram, where measuring planes were manually placed to the trunk of portal vein (PV), superior mesenteric vein (SMV), and splenic vein (SV) to measure the flow velocity (cm/s), volume rate (ml/cardiac cycle), axial-wall shear stress (axial-WSS, Pa). Flow velocity, volume rate and axial-WSS for each vessel were compared between different CS acceleration rates using Kruskal-Wallis H.
Results: There was no statistically significant difference in flow velocity, volume rate, axial-WSS of portal system when compared among different CS, and all the measured parameters remained relatively consistent among the healthy volunteers with a reasonable standard deviation (Table 1).
Conclusion: In this study, Compressed SENSE has dramatically reduced the imaging time by up to 10 fold when compared to the traditional acquisition method without altering the measured flow parameters, implying the technique a potential alternate in clinical practice. Higher acceleration factors may be explored in further studies.

PU-0260

基于平扫的个体化肝 CT 增强扫描方案的临床应用

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目的 探讨基于平扫影像下，制定个体化的肝 CT 增强扫描方案，并评估其临床应用价值。
方法 根据肝脏平扫的情况，将肝硬化程度分为 5 个等级，给予每个等级相应的 CT 增强方案，采用对比研究方法，比较个体化肝 CT 增强与固定时间点肝 CT 增强的图像质量差别。
结果 实验组肝实质 CT 值 $\Delta_{门脉期-动脉期}$与对照组肝实质 CT 值 $\Delta_{门脉期-动脉期}$在轻度肝硬化中无差异（P＞0.05），在中重度肝硬化中差异有统计学意义（P＜0.05）；实验组门脉期 CT 值 $\Delta_{门静脉-肝实质}$与对照组门脉期 CT 值 $\Delta_{门静脉-肝实质}$在轻度肝硬化中无差异（P＞0.05），在中重度肝硬化中差异有统计学意义（P＜0.05）；实验组门脉期 CT 值 $\Delta_{肝静脉-肝实质}$与对照组门脉期 CT 值 $\Delta_{肝静脉-肝实质}$在轻度肝硬化中无差异（P＞0.05），在中重度肝硬化中差异有统计学意义（P＜0.05）
结论 基于平扫图像个体化扫描的扫描方式与固定时间点的扫描方式比较，正常肝与轻度肝硬化患者之间无明显差异，中重度肝硬化患者，个体化扫描的病例肝血管显像更清晰，血管/肝实质对比性更优。

PU-0261

肾上腺皮质嗜酸细胞腺瘤 1 例

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患者男，57 岁，系“左侧腰痛 3 年，体检发现左侧肾上腺占位两天”入院，腰痛时无发热、血尿、尿急、尿频、尿痛等症状。既往否认高血压、低血钾等病史。实验室检查促肾上腺皮质激素、醛固酮、血儿茶酚胺、血皮质醇、立卧位肾素血管紧张素、尿 3 一甲基-4-羟基苦杏仁酸、尿 17-羟皮质类固醇,17-酮皮质类固醇均正常。
腹部 CT 平扫+增强示：左侧肾上腺区可见团块状占位，最大层面大小约 8.5cm×9.4cm，其内密度不均，其大部呈软组织密度影，内可见裂隙样低密度液性成分及斑片状钙化灶，平扫实性部分测 CT 值约 45HU，肿块血供丰富，增强后动脉期可见多发迂曲血管影，动脉期肿块强化不显著，CT 值约 49HU，门脉期继续强化，测 CT 值约 97HU，延迟期有所减退，测 CT 值约 74HU，肿块内裂隙样液性成分无明显强化，见图 A-E；右侧侧肾上腺形态、密度未见明显异常。
手术所见：进入腹膜后显露包块，呈类圆形，约 10cm×9cm×9cm 大小，位于肾上极与胰腺之间，表面血供丰富。病理示：肿块包膜完整，肿块呈实性，切面呈灰红、灰黄、灰褐，部分区域有胶冻物呈放射状分布，部分区域有坏死。肿瘤细胞为类圆形,胞浆充满嗜酸性颗粒。免疫组化**结果** CK（弱+），Vim（+），LCA（-），Syn(少数+)，CgA(-)，CD56(+)，S-100(-)，Ki-67(约 1%)，HMB45（-），Melan-A(-),考虑肾上腺皮质嗜酸细胞腺瘤，伴广泛坏死及灶性出血，肿瘤包膜完整，细胞核分裂象罕见，但核有轻-中度非典型性，未见明确血管及包膜侵犯，目前诊断恶性依据尚不足，建议密切随访，见图 F、G。

PU-0262

肝细胞肝癌细胞外体积分数与肝脏血清肿瘤标志物相关性的探索

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目的 探索肝细胞肝癌患者肿瘤细胞外体积分数（fECV）与血清肿瘤标志物相关性及临床意义。
方法 选取我院经病理确认为肝细胞性肝癌患者 46 例，收集患者血清生化指标 AFP（甲胎蛋白）、AFU（α-L-岩藻糖苷酶）、CEA（癌胚抗原）、 CA199（肿瘤标志物）、TAP（异常糖链糖蛋白）值。 对患者进行常规肝脏多期动态增强 CT 扫描，通过平扫及平衡期（注射对比剂 3min 后）计算肝脏肿瘤（Etumor）、正常肝实质（Eliver）及主动脉（Eaorta）绝对强化值，并通过以下公式计算肿瘤和肝实质的 fECV 值：fECV1（%）=Etumor/Eaorta（100-Hct[%]）,fECV2（%）=Eliver/Eaorta（100-Hct[%]）。分析肝细胞肝癌患者细胞外体积分数与肝脏肿瘤标志物相关性。
结果 肝脏正常实质的细胞外体积分数 fECV2 与 CEA（癌胚抗原）呈正相关（r=0.299，p=0.041），肝脏肿瘤细胞外体积分数 fECV1 与 CA199（肿瘤标志物）呈正相关（r=0.333，p=0.025）。
结论 肝细胞肝癌患者肝实质的细胞外体积分数与血清 CEA（癌胚抗原）值呈正相关、肝脏肿瘤的细胞外体积分数与血清 CA199（肿瘤标志物）值呈正相关。

PU-0263

原发性肝癌 TACE 术后影像学疗效评估

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目的 探讨 MRI 和 CT 对原发性肝癌肝动脉化疗栓塞（Transcatheter arterial chemoembolization, TACE）术后疗效评估的价值。
方法 收集我院 2015 年 9 月-2016 年 12 月 128 例经 TACE 治疗的原发性肝癌患者资料予以探析，均行 MRI、CT 及数字减影血管造影（DSA）检查，以 DSA 结果为金标准，对 MRI、CT 的诊断结果进行对比。
结果 128 例患者中，DSA 显示病灶 166 个，其中 115 个病灶存在肿瘤复发或残余，51 个病灶无肿瘤复发或残余；MRI 检出 108 个复发或肿瘤残余病灶，准确率为 94.53%，敏感性为 93.04%，特异度为 100.00%。CT 检出 76 个复发或肿瘤残余病灶，准确率为 69.53%，敏感性为 66.08%，特异度为 100.00%； MRI 诊断的准确性高于 CT，比较具有统计学意义(P＜0.05)；MRI 对有包膜病灶的检出率较 CT 高，比较差异具有统计学意义(P＜0.05)。**结论** MRI 对复发及残余病灶诊断的准确性高于 CT，在原发性肝癌 TACE 术后疗效评估中具有较高价值。

PU-0264

钆塞酸二钠增强 MRI 肝胆期信号与肝细胞肝癌分化程度的相关性分析

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目的 探索钆塞酸二钠（Gd-EOB-DTPA）增强 MRI 肝胆期信号与肝细胞肝癌（HCC）分化程度的相关性。
方法 回顾性分析 2018 年 01 月至 2019 年 5 月期间笔者所在医院收治的 30 例非肝硬化 HCC 患者的 Gd-EOB-DTPA 增强 MRI 肝胆期图像，分别计算信号噪声比（SNR）、强化率（ER）和相对强化率（RER）以及相对信号强度比（RIR），并统计患者年龄、血 AFP 值及病灶最大径。比较不同分化程度 HCC 患者平扫、肝胆期各信号指标及年龄、血 AFP 值及病灶最大径的差异。

结果 30 例患者（35 个病灶）中，分化程度为高分化 5 例，中分化 22 例，低分化 8 例；高、中及低分化 HCC 的 RER（P=0.007）、年龄（P=0.02）比较差异有统计学意义（P＜0.05），而 SNR、ER、RIR 及血 AFP 值及病灶最大径比较差异均无统计学意义（*P*＞0.05）。
结论 Gd-EOB-DTPA 增强 MRI 肝胆期信号指标预测 HCC 分化程度有一定的价值。

PU-0265
全肝 CT 灌注成像评估兔 VX2 肝肿瘤经肝动脉栓塞术联合阿帕替尼治疗效果

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目的 探讨全肝 CT 灌注成像评估兔 VX2 肝肿瘤经肝动脉栓塞术联合阿帕替尼治疗效果的价值。
方法 建立 36 只兔 VX2 肝肿瘤模型,随机分为 4 组,每组 9 只。A 组行 TAE(0.4 mg 栓塞微粒球),B 组单纯强饲阿帕替尼 50 mg/(kg.d),C 组行 TAE(0.4 mg 栓塞微粒球)+强饲阿帕替尼 50 mg/(kg.d),D 组使用生理盐水行肝动脉灌注。4 组均于治疗前和治疗 7,14 d 后行 CT 灌注成像,获取灌注参数,包括血流量(blood flow,BF)、血容量(blood volume,BV)、肝动脉分数(hepatic arterial fracture,HAF)、平均通过时间(mean transit time,MTT)及毛细血管表面通透性(permeability surface,PS)。各组于第 1 次灌注扫描后分别处死 1 只兔,最后一次灌注扫描后处死剩余 8 只兔,取肿瘤边缘区组织行免疫组织化学染色。比较各组治疗前及治疗 7 d 后肿瘤边缘区 CT 灌注参数的变化,比较各组的肿瘤边缘区微血管密度(microvessel density,MVD)值,对各组灌注参数与 MVD 值行相关性分析。
结果 治疗前 4 组间肿瘤边缘区各灌注参数无明显差异(P>0.05)。与治疗前相比,治疗后 A,B,C 组 BF,HAF,PS 明显降低(P<0.05),D 组稍增高。治疗 14 d 后 MVD 值分别为 A 组 80.1±16.4,B 组 50.2±11.2,C 组 27.4±9.7,D 组 68.7±12.7,C 组 MVD 值较其他 3 组显著降低(P<0.01)。除 A 组外,其余各组兔 VX2 肝肿瘤边缘区 CTPI 参数 BF,HAF,PS 与 MVD 均呈正相关;BV,MTT 与 MVD 无明显相关性;A 组 MVD 与各 CTPI 参数无明显相关性。结论:全肝 CT 灌注可定量评估兔 VX2 肝肿瘤 TAE 治疗前后肝血流动力学变化,可替代 MVD 评价肿瘤血供生成,TAE 联合口服阿帕替尼能够有效抑制肿瘤血管生长。

PU-0266
A Initial Study of Liver Fat Quantification Using volume extraction on compressed sensing 3D mDIXON sequence

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Objective: To investigate the effect of volume in liver fat quantification on compressed sensing 3D mDIXON.
Materials and methods: The ten healthy volunteers (28.5±2.38) with CS acceleration factor of 2 were collected to perform compressed sensing 3D mDIXON sequence liver scanning under 3.0T MR scanner（Ingenia CX, Philips Healthcare, the Netherlands）in

our hospital. At the ISP workstation, two observers quantitatively measured the liver fat of the same volunteer using volumetric extraction and axial placement ROI respectively. The whole liver volume was extracted by the threshold method layer by layer from the septum top to the lower edge of the liver, avoiding the bile duct and blood vessel. The ROI were placed at the maximum level of the liver, with an area of 200±8mm^2, respectively in the left outer lobe, left inner lobe, right upper lobe and right lower lobe of the liver, avoiding the bile duct and blood vessel, and 10mm away from the liver edge, and the mean value was taken. The intraclass correlation coefficient (ICC) method was used to confirm the reliability of the volumetric extraction technique for quantitative liver fat fraction(FF), and the mean value between groups and the ROI data were used for Spearman test.
Results:The measurement of FF by volume extraction method and ROI method was consistent between the two observation groups (Table 1). There was a high correlation between volumetric extraction and ROI for liver FF (r=0.781,P=0.008).
Conclusion: The volume extraction technology can be used to measure the liver FF in the compressed sensing 3D mDIXON, which can replace the ROI method and provide an important reference for the screening, diagnosis and treatment effect evaluation of diseases.

PU-0267
第三代双源 CT 在肝脏转移瘤与血管瘤中的鉴别诊断价值

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目的 探讨第三代双源 CT 能谱衰减曲线对肝脏血管瘤及转移瘤肝脏的鉴别价值。**材料和方法** 分析我院行第三代双源 CT 检查的肝脏病变患者 29 例，共 43 个病灶，其中，转移瘤 13 例，共 25 个病灶，肝血管瘤 16 例，共 18 个病灶；获得两组病灶实质部分（即肿瘤强化明显的部分）、病灶周边肝实质（为病灶周围 2cm 范围内的部分）及正常肝脏平扫、增强扫描三期能谱曲线及 40～190keV 各单能量点的 CT 值及能谱衰减曲线形态，并计算能谱曲线斜率（K）。
结果 1.两组病灶平扫：两组病灶实质部分显示转移瘤能谱曲线呈下降型，血管瘤能谱曲线呈平直上升型，且病灶 40-80keV 间差异没有统计学意义，余差异有统计学意义；两组病灶周边肝实质部分及正常肝脏显示，能谱曲线均呈下降型，且病灶在 40～190keV 水平单能量下 CT 值差异均没有统计学意义。2.两组病灶增强扫描：增强扫描三期病灶实质部分及周边肝实质部分能谱曲线均呈下降型，40～190keV 单能量下病灶实质部分血管瘤 CT 值均高于转移瘤，差异有统计学意义，且以病灶诊断效果绘制受试者工作特征曲线（ROC）所得，静脉期 70keV 单能量曲线下面积（AUC）最大，ROC 曲线下面积为 0.990，且以能谱曲线 CT 值 123.6150 为阈值鉴别时，灵敏度及特异度分别为 100%、92.0%；增强扫描三期病灶周边肝实质部分两组病灶 40～190keV 单能量下差异均没有统计学意义；两组病灶正常肝脏增强扫描静脉期及延迟期 40～190keV 单能量下 CT 值差异没有统计学意义。3.两组病灶能谱曲线斜率：平扫病灶能谱曲线斜率差异没有统计学意义；增强扫描三期病灶实质部分能谱曲线斜裂差异均有统计学意义，且以斜率切点-1.1865 为阈值鉴别时，ROC 曲线下面积为 0.950，灵敏度及特异度分别为 96%、87.5%。
结论 第三代双源 CT 能谱衰减曲线有助于更好地鉴别肝脏良、恶性结节，为临床提供了有效的鉴别方法。

PU-0268

胃肠道异位胰腺的影像学表现并文献复习

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目的 探讨胃肠道异位胰腺（Ectopic pancreas,EP）的 CT 及 MRI 影像表现，以提高对该病的认识。
方法 回顾性分析 12 例行腹腔镜切除术或内镜粘膜下剥离术，并经病理证实为胃肠道异位胰腺的患者的临床、影像资料及病理结果，并总结其影像表现特点。
结果 12 例异位胰腺均为单发，病灶多位于黏膜下层。其中 6 例位于胃体小弯侧，3 例位于胃角，1 例位于胃窦后壁，1 例位于空肠上段，1 例位于回肠末段。病灶长径均≤3cm，长轴多与胃肠道壁平行。CT 及 MRI 密度/信号大多与胰腺类似。
结论 CT 及 MRI 可以提供异位胰腺的发生位置、形态、大小及病灶内部密度、信号等信息，有助于该病的诊断。

PU-0269

屏气 3D-MRCP 成像技术的临床应用价值

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目的 探讨屏气 3D-MRCP 成像技术的临床应用价值。
方法 对 150 例受检者同时进行两种 MRCP 成像方法的扫描:一是采用屏气 3D-MRCP 成像技术进行屏气扫描；二是单次激发快速自旋回波、厚层多角度成像（屏气 2D-MRCP），以胆总管为定位中心屏气完成扫描；最后一种成像技术为快速自旋回波三维薄层扫描，采用呼吸门控方式进行扫描。根据图像的肝内分支显示情况和图像的空间分辨率、对比度、呼吸运动伪影状况以及背景干扰因素等，对三种 MRCP 图像分别评级。x^2检验三种扫描方法图像间的差异性。
结果 屏气 3D-MRCP 维成像方法获得的图像中Ⅰ级、Ⅱ级合计 142 例,Ⅲ级 8 例；三维图像中,Ⅰ级、Ⅱ级合计 125 例,Ⅲ级 25 例。屏气 3D-MRCP 和屏气 2D-MRCP 图像运动伪影小于常规呼吸门控 3D-MRCP；两种 3D-MRCP 技术肝内胆管分支显示情况由于 2D-MRCP；x^2检验结果:x^2= 9.64, P= 0.003。结论:采用屏气 3D-MRCP 技术进行扫描既能减少扫描时间，又能很好的显示肝内胆管情况，建议临床扫描中尽量采用此技术。

PU-0270

螺旋 CT 测量肝脏及肝内肿瘤体积的临床意义

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研究对象 自 2017 年 10 至 2018 年 11 月间我院内肝脏病灶单发或病灶≤3 个的 25 例原发性肝癌、转移性肝癌或肝血管瘤（弥漫型肝癌不在此讨论）。
目的 探讨肝脏体积及肝脏肿瘤体积测量对于临床应用的价值。
方法 利用西门子 64 排 128 层螺旋 CT、层厚 2mm，螺距 8mm， 100KV，250-300MAS 进行平扫及增强三期容积扫描，取病灶边缘显示最清晰期相（一般取平衡期）利用计算机后处理及人工修正法对目标病灶测量。**意义** 肝脏体积测量不仅可以定量评价肝脏大小，还能间接反映肝功能情况，具有

广泛而重要的临床应用价值，在评估肝硬化肝功能储备、肝脏肿瘤手术方式选择和预后评价、肝移植中都有重要意义。

PU-0271
3D-FSE-Cube 在离体肝脏质量评估中的价值研究

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3D-FSE-Cube 在离体肝脏质量评估中的价值研究
背景：供肝质量评估非常重要，与肝移植术后并发症和死亡率密切相关。目前供肝评估方法主要包括穿刺活检和视检评估，穿刺活检是有创性操作，同时存在抽样误差，视检评估存在很大主观性并缺乏统一标准。磁共振成像是一种无创、客观评价离体肝脏质量的新方法。
目的 将 3D-FSE-Cube 序列应用于离体肝脏质量评估的 MR 常规扫描中，为离体肝脏质量评估提供依据。
方法 13 例离体肝脏在低温条件下行 3D-FSE-Cube 序列和常规序列扫描，分别获取 3D-FSE-Cube 序列扫描图像和常规 T1WI、T2WI 序列扫描图像。
结果 1. 肝脏在离体、低温条件下，磁共振 3D-FSE-Cube、T1WI、T2WI 序列均获得高质量图像。2. 3D-FSE-Cube 序列较常规 T2WI 序列扫描离体肝脏，对正常肝实质显示优良率的差异无统计学意义（$p>0.05$）；2. 3D-FSE-Cube 序列较 T2WI 序列扫描肝脏，对肝脏管道系统显示优良率的差异无统计学意义（$p>0.05$）。
结论 在 MRI 对离体肝脏质量评估中，应用 3D-FSE-Cube 序列代替 T2WI 序列，在不影响肝脏实质病变显示的情况下，能够显示管道系统情况，从而为离体肝脏评估提供更可靠信息。此外 3D-FSE-Cube 无间断扫描可以减少病灶的遗漏，同时可对肝脏进行三维重建，测量肝脏体积，为治疗计划制定提供可靠依据。

PU-0272
普美显 MR 增强扫描在肝硬化局灶结节增生样病变诊断中的应用

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目的 探讨肝硬化背景下局灶结节增生样病变（FNH-like）普美显 MR 增强的影像表现，以加深对此类病变影像表现的进一步认识。
方法 回顾性分析 32 例经过 5 年随访的肝硬化患者，多次行普美显 MR 增强扫描，最终经超声引导下穿刺活检病理证实，或临床长期随访观察，最终诊断为肝硬化局灶结节增生样病变的 MR 影像资料，分析 MR 平扫及普美显增强扫描各期相的影像特点，统计分析病灶在 T1WI、T2WI、DWI、ADC 图及普美显动态增强时各期相的影像特点。
结果 32 例患者共发现直径 3 毫米以上 FNH-like 病变共 155 个，结节直径大小在 3-27 毫米之间，其中 T1WI 呈等信号结节 73 个（73/155，47.0%）；呈稍低信号 47 个（47/155，30.4%）；呈稍高信号 35 个（35/155，22.6%）。T2WI 病灶或其中心呈稍高信号 46 个（46/155，29.7%）；呈等信号 109 个（109/155，70.3%）；DWI 及 ADC 图所有结节均呈等和稍高信号。普美显增强扫描结节呈四种强化及摄取方式：①动脉期、门静脉期及延时期轻度持续强化，肝胆期弥漫高摄取 23 个（23/155，14.8%）；②动脉期、门静脉期及延时期结节周围轻度持续强化，中心瘢痕区域不强化，肝胆期周围摄取，中心瘢痕区域不摄取 57 个(57/155，36.8%)； ③动脉期、门静脉期及延时

期与肝实质等强化，肝胆期稍低摄取或等摄取 25 个（25/155，16.1%）；④动脉期、门静脉期及延时期与肝实质等强化，肝胆期等或高摄取 50 个（50/155，32.3%））。
结论 肝硬化伴局灶结节增生样病变影像表现有一定的特点，应用普美显 MR 增强扫描影像表现并结合临床病史，对本病的诊断及与早期小肝癌鉴别有一定的价值。

PU-0273

3D-MRCP 与 2D-MRCP 对比的临床应用优势

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目的 探讨 3D-MRCP 与 2D-MRCP 相互对比的临床应用优势及价值。
方法 对进行胰胆管磁共振成像患者分别进行 2D-MRCP 和 3D-MRCP 的薄层扫描及容积 MIP 重建，2D-MRCP 主要使用单次激发的快速自旋回波序列 HASTE，3D-MRCP 主要使用 SPACE 序列。扫描范围包括左右肝管，肝总管，胆囊入口，胆总管，胰管，然后对两组扫描时间，图像像素大小，图像分辨率，图像背景抑制，以及容积重建的诊断效能等进行比较。
结果 两组扫描对比：两组都是在患者屏气下扫描，时间都是 16~20s，没有差异。2D-MRCP 薄层层厚一般为 3.0~4.0mm，而 3D-MRCP 薄层层厚可达 1.2~1.6mm。体素大小：2D-MRCP:1.5x1.3x4.0mm，3D-MRCP:1.5x1.2x1.6mm。分辨率：2D-MRCP: 231x256， 3D-MRCP: 231x320。容积 MIP 重建 2D 扫描图像的容积效应明显，组织结构的细节显示能力较差。背景抑制：3D-MRCP 明显优于 2D-MRCP。
结论 3D-MRCP 相对于 2D-MRCP 分辨率更高能分辨更小的组织结构和病变，图像背景抑制良好，能更好地突出肝胰胆管成像，值得临床推广应用。
【关键词】：肝胰胆管成像；2D-MRCP ；3D-MRCP；分辨率；层厚

PU-0274

MSCT 与 MRI 对胆道梗阻性疾病诊断的对比研究

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目的 探讨 64 排 128 层螺旋 CT 增强扫描胰胆管曲面成像对胆道梗阻性疾病的临床诊断价值。
方法 前瞻性收集 81 例临床诊断为梗阻性黄疸的病人，行 64 排 128 层螺旋 CT 腹部增强扫描检查，同时行 MRI、MRCP 检查，所有病例均行手术或 ERCP 检查获得病理结果。利用曲面重建技术对所得 CT 增强图像进行胰胆管曲面重建，与 MRI、MRCP 检查结果对比，并与手术病理结果对照。
结果 对于胆道梗阻在定位诊断方面，64 排 128 层螺旋 CT 增强扫描胰胆管曲面成像与 MRI+MRCP 无明显差异；在定性诊断方面，对于良性病变尤其是对结石的诊断，前者高于后者。
结论 应用 64 排 128 层螺旋 CT 增强扫描胰胆管曲面成像对于胆道梗阻性疾病具有重要诊断价值。

PU-0275

Solitary necrotic nodule of the liver: clinical and imaging findings in twelve patients

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Abstract

Purpose: Solitary necrotic nodule of the liver (SNNL) is an uncommon lesion. Since the clinical and imaging characteristics are unspecific and can mimic primary hepatic cancer or metastasis. The purpose of this study is to analyse the clinical and imaging features of SNNL in order to help the diagnosis.

Methods: We retrospectively evaluated the demographic and clinical characteristics of 12 SNNL cases. The imaging features including size, lobar location, shape, depth from the hepatic capsule, and enhancement type of lesions were assesed in 8 patients using CT and MRI.

Results: SNNL often occurred in mid-aged people without gender difference. Most patients presented with no specific symptom (82.3%) or abdominal pain (17.7%). All patients had a single nodule in the right liver lobe and most were subcapsular (62.5%). Lesions were hypo- or iso-density (87.5%), except for calcified or patchy soft tissue lesions that were hyperattenuating to the surrounding liver on unenhanced CT. On post-enhanced CT, half of them had capsule and 87.5% cases showed mild to moderate rim or patchy-like enhancement with internal hypo-density on arterial phase. The enhancement showed wash out on venous phase. Moreover, the enhancement area was slightly progress on the delay phase on both CT or MRI (62.5%). One of these patients was progressed during 4 years follow-up.

Conclusions: There are no specific clinical findings in SNNL. However, the imaging features such as location, attenuation and enhancement type of lesions on CT or MRI are considered to be helpful for SNNL diagnosis.

PU-0276

罕见脾脏硬化性血管瘤样结节性转化影像学表现一例

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脾脏硬化性血管瘤样结节性转化（sclerosing angiomatoid nodular transformation of spleen，SANT)是发生于脾脏的一种非常少见的非肿瘤血管增生性病变。2004 年 Martel[1]根据其组织特征、免疫表型首次描述 SANT，并认为病变由脾脏红髓成分组成，缺乏白髓成分，是一种错构瘤样病变，但特有的结节性血管瘤样改变和传统的错构瘤不同。

PU-0277

乏血供肝细胞癌的的 CT 及 MRI 影像学特点，1 例病例报道并文献复习

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目的 通过回顾性结分析乏血供肝细胞癌的影像学特点和临床病理特点为乏血供肝细胞癌的诊断和治疗提供参考。
方法 1 例在宁夏盐池县医院进行诊断和治疗的乏血供肝细胞癌。结合其它对乏血供肝细胞癌的文献报道，对该病的病因学，病理生理，影像学特点，诊断，鉴别诊断和治疗进行总结和讨论。
结果 通过回顾文献我们发现乏血供肝细胞癌十分罕见。肝细胞癌通常为富血供肿瘤，肝动脉血供为主。常见的影像学表现为动脉期强化明显，门脉期及平衡期强化减弱，大部分肝细胞癌存在肿瘤被膜。CT 及 MRI 检查对肝细胞癌的敏感性和特异性均较高，对大部分肿瘤可以从影像上进行定性诊断。本例肝细胞癌在肝内呈弥漫性较大范围略低密度分布，界限不清晰，增强后动脉期、门脉期及平衡期均未见明显强化。依据患者的乙肝病史、AFP 明显升高、病变短期内范围增大，再辅助于 MRI 检查最后诊断为乏血供肝细胞癌。
结论 乏血供肝细胞癌是一种罕见的肝细胞癌，因为其缺乏特征性的影像学表现不容易从影像学上进行诊断，需要辅助于患者的病史、AFP 检查等进行诊断。熟悉乏血供肝细胞癌的影像学特点和其它临床特点可以帮助我们准确地对该病进行诊断，给予合适的治疗。

PU-0278

Gadoxetate acid disodium-enhanced MRI: Multiple arterial phases using differential sub-sampling with cartesian ordering (DISCO) may achieve more optimal late arterial phases than the single arterial phase imaging

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Background: To prospectively determine whether the use of a multiple arterial phase imaging (DISCO) improve the capturing rate of late arterial phase with less motion artifact than single arterial phase obtained with gadoxetate acid disodium.
Materials and methods: From 06/2017 to 10/2018, prospectively acquired data of 132 patients who underwent either single (n=67) or multiple arterial phase (n=65) gadoxetate acid-enhanced MR imaging were analyzed. Two readers independently assessed arterial phase timing and the degree of motion artifact on a five-point scale. The *kappa*test was used to determine the agreement between the two readers, c^2 or *fisher*exact test were used for the categorical variables and *Student t*test or *Mann-Whitney U*test were used for the comparison of the motion artifacts.
Results: Good to perfect inter-observer agreement was obtained for the arterial phase timing and degree of motion artifact (all *kappa*value > 0.70). Optimal timing of arterial phase was observed in 95.4% (62/65) of multiple arterial phase compared with 73.1% (49/67) of single arterial phase (c^2=12.209, p<0.001). Motion artifact score of the late arterial phase images measured using single arterial phase acquisition (3.22±0.68) was significant higher than the multiple arterial phase (2.42±0.74) group (t=5.921, p<0.001). For the multiple arterial phase, motion artifact score of the 2^{nd}, $3^{rd}$and 4^{th} phases were also significant reduced compared with 1^{st}, $5^{th}$and 6^{th} phases (all p<0.001).
Conclusion: The use of multiple arterial phase acquisition with gadoxetate acid disodium can improve the capturing rate of well-timed late arterial phase with less motion artifact.

PU-0279
肝脏上皮样血管平滑肌脂肪瘤与原发性肝细胞癌 CT/MRI 征象的比较研究

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目的 通过比较肝脏上皮样血管平滑肌脂肪瘤（HEAML）与原发性肝细胞癌（HCC）的 CT 及 MRI 征象，探讨可供两者鉴别的影像学特点。
方法 回顾性收集 2007 年至 2018 年于中山大学附属第一医院放射科行 CT 或 MRI 检查并经病理证实的 29 例 HEAML。在同一时期，随机选取 50 例经 CT 诊断并经病理证实的单发 HCC。分析其影像资料，分别记录平扫、动脉期、门脉期肿瘤/大血管的绝对 CT 值为 Tp/Ap, Ta/Aa, Tv/Av，以及分别计算三期标准化 CT 值为 Sp=Tp/Ap, Sa=Ta/Aa 和 Sv=Tv/Av，计算肿瘤动脉期及门脉期的 CT 值差异并记录为 Ta -Tv。由两名读者回顾图像评估病变的边界、均匀度、肿瘤包膜、早期引流静脉，瘤内迂曲血管、癌栓、周围淋巴结、肝内转移，两组间的这些征象和测量值进行比较，对两种肿瘤影像征象间差异有统计学意义的征象绘制 ROC 曲线，并计算曲线下面积（AUC）及鉴别诊断的特异性及敏感性。
结果 与 HCC 相比，HEAML 更常表现为边界清楚、均质的、具有早显静脉及瘤内迂曲血管（p<0.05），而肝内转移则更常见于 HCC（p<0.05）。两者在肿瘤包膜、癌栓、瘤周淋巴结差异无统计学意义（p>0.05）。ROC 曲线分析显示早显静脉，Sp, Sa 和 Ta -Tv 的鉴别诊断能力较好(AUC>0.7)，其中早显静脉的鉴别诊断能力最好(AUC=0.93)。
结论 通过定性及定量分析显示影像学某些特定征象有助于 HEAML 与 HCC 的鉴别。

PU-0280
多期动态增强 CT 扫描及三维重建对肝癌肝外动脉供血评估的价值

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目的 应用多期动态增强 CT 分析肝细胞癌患者 TACE 术前肝外动脉供血的发生率、发生原因及发生类型。
方法 收集我院 2016 年 2 月－2019 年 5 月计划行 TACE 治疗的肝癌患者 100 例，术前采用西门子动态 800 排完成上腹部多期动态增强 CT 扫描，使用西门子 Syngo.via 后处理 系统重建提取所有患者图像的最佳动脉期，结合重建原始图、后处理 VR 及 MIP 图像，分析肝外动 脉供血的发生率、发生原因及发生类型。
结果 研究中所有肝癌患者发生肝外动脉供血 45 例，发生率为 45%。总发现肝外动脉供血血管 62 支，其中 15 例为双支肝外动脉供血，6 例为 3 支肝外动脉供血，12 例为单支肝外动脉供血。膈下动 脉分支供血占 12 例（38.7%），肠系膜上动脉分支供血 5 例，胃左动脉分支供血 9 例，胃右动脉分 支供血 1 例，右肾上腺动脉分支供血 3 例，右肾动脉分支供血 8 例，胰腺十二指肠动脉分支供血 2 例，腹腔干小分支供血 1 例。肝癌患者肝外动脉供血发生的主要原因包括：肿瘤的直径 （≥30mm）、肿瘤发生的部位（右肝、肝顶及下段）、肿瘤分期，以及肝癌 TACE 治疗的次数等。

结论 多期动态增强 CT 可以准确评估肝癌患者 TACE 术前肝外供血动脉的发生率及类型。

PU-0281
单次屏气下肝脏多期动脉期扫描图像运动伪影发生情况

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目的 研究单次屏气下的肝脏多期动脉期扫描图像运动伪影发生情况。
方法 回顾性分析 2018 年 10 月至 2019 年 6 月在我院因神经内分泌肿瘤肝转移随访患者共 22 人（共计 42 次检查）。扫描均采用西门子 Skyra 3.0T 磁共振扫描仪，采用包含多期动脉期的肝区动态磁共振扫描方案，序列包括 T2WI、T1WI、多期动脉期（1 次屏气，连续扫描 6 期，总时长约 18s）、门脉期、肝胆期，于检查前嘱患者听到声音指示进行屏气。对多期动脉期（第 1-6 期）分别进行伪影评价，采用 4 级评分（0 级：结构清晰可辨；1 级：结构稍欠清晰，但不影响诊断；2 级：结构较模糊，阅片受影响；3 级：结构模糊不清，无法阅片）。统计多期动脉期扫描运动伪影发生的比例，以及不同动脉期伪影出现的概率。
结果 在 42 个扫描病例中，22 例（52.3%）多期动脉期 6 期图像均无伪影（0 级）；14 例（33.3%）多期动脉期图像有至少 1 期图像存在 1 级伪影，其中 2 例仅发生于第 6 期（2/14,14.3%），4 例发生于第 5-6 期(4/14,28.6%)，6 例发生于第 4-6 期（6/14,42.9%），2 例发生于第 3-6 期（2/14,14.3%）；6 例（19%）存在 2 级伪影，其中 2 例发生于第 6 期（2/6，33.3%），4 例发生于第 5-6 期（4/6,66.7%）。
结论 肝脏多期动脉期成像约 85.7%的病例各期图像均无运动伪影或部分期像存在 1 级伪影，伪影主要发生于多期动脉期扫描后半程（第 4-6 期）。

PU-0282
磁共振动态增强扫描评估肝纤维化分期的实验研究

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目的 探讨磁共振动态增强扫描定量参数评估肝纤维化分期的可行性。
方法 新西兰家兔随机分为实验组 50 只，对照组 10 只，实验组采用 CCl_4复合因素法建立肝纤维化模型。3.0T 磁共振动态增强扫描获取肝脏定量灌注参数：K^{trans}（容量转移常数）、K_{ep}（速率常数）、V_e（细胞外血管外间隙容积比 ）。统计学分析灌注参数诊断肝纤维化分期的能力。
结果 ROC 分析，Ktrans 值对判别肝纤维化 F0 vs F1-4、F0 vs F1-2、F0 vs F3-4、F0-2 vs F3-4 的 ROC 曲线下的面积为 0.887、0.776、0.913、0.887；Kep 均值对判别肝纤维化 F0 vs F1-4、F0 vs F1-2、F0 vs F3-4、F0-2 vs F3-4 的 ROC 曲线下的面积为 0.719、0.573、0.820、0.831。
结论 磁共振定量参数 K trans、K ep 可用于鉴别正常肝脏与肝纤维化，也可用于鉴别非晚期肝纤维化与晚期肝纤维化， K trans 较 K ep 诊断价值高， V e 无法用于诊断肝纤维化。

PU-0283
肝静脉流出道阻塞性疾病的 CT 表现

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目的 研究探讨肝小静脉闭塞症、布-加综合征及淤血性肝病的多层螺旋 CT（MSCT）表现特征，提高相关疾病影像诊断水平，为临床诊治相关疾病提供帮助。
方法 对 11 例肝小静脉闭塞症、13 例布-加综合征、34 例淤血性肝病病例进行回顾性研究，分析其 CT 征像。
结果 肝小静脉闭塞征 CT 表现：典型特征为门脉期“地图样”强化不均匀；布-加综合征：肝静脉或下腔静脉肝段及以上管腔狭窄、阻塞或闭塞征像，增强检查肝尾状叶及肝门区明显强化，肝外周实质强化不明显，并出现肝内外侧枝循环静脉；淤血性肝病：增强检查下腔静脉逆向性对比剂充盈征像。
结论 CT 检查表现对肝淤血性疾病的诊断、鉴别诊断及病因诊断具有重要价值。

PU-0284
对比剂注射方式对 CT 门静脉成像质量的影响

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目的 探讨对比剂注射方式对 CT 门静脉成像质量的影响。
方法 选取行双源 CT 静脉血管成像,且符合纳入标准的 30 例患者进行研究,通过抽签法分为研究组(n=17)与对照组(n=13)。研究组先以 4.0mL/s 的流率注射碘佛醇(350 mg I/mL)70 mL,后以 2.0 mL/s 的流率注射碘佛醇 30 mL,再用 30 mL 生理盐水以 3.0 mL/s 的流率冲管;对照组先以 4.5 mL/s 的流率注射碘佛醇(350 mg I/mL)100 mL,再用 30 mL 生理盐水以 3.0 mL/s 的流率冲管。由两位有经验的医师对两组图像质量进行评分,并测出门静脉主干、门静脉左右支主干、脾静脉和门静脉主干-肝实质 CT 值,对比两组所测 CT 值。对两位医师的 CTV 图像质量评分的一致性行 Kappa 检验;两组测量图像质量评分及 CT 值数据比较采用两独立样本 t 检验。
结果:两位医师对两组图像质量评分一致性好。两组门静脉主干、门静脉左右支主干、脾静脉、门静脉主干-肝实质的 CT 值和图像质量评分比较,差异均有统计学意义(均 $P<0.05$)。
结论 对比剂以不同流率相结合的注射方式能够提高门静脉成像质量,减少其他血管的干扰，降低对比剂渗漏的风险。

PU-0285
肝脏特异性对比剂对肝癌术后局部肝功能的评价

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目的 GD-EOB-DTPA 增强肝脏 MR 肝胆期评价肝癌经动脉导管化疗栓塞（TACE）术后及肝癌微波固化术后对局部肝功能影响。
方法 研究对象：回顾性分析 50 例肝癌术后患者，均行 Gd—EOB—DTPA 磁共振动态增强扫描，男 45 例，女 5 例，年龄 25-76 岁，平均年龄(54.2±12.8)岁。其中肝硬化患者 45 例，非肝硬化患者 5 例。纳入标准：肝癌 TACE 术后及肝癌微波固化术后行肝脏特异性对比剂扫描患者；排除标准：严重运动伪影；肝脏弥漫性占位；严重肾功能不全。分析肝癌经动脉导管化疗栓塞（TACE）术后及肝癌微波固化术后肝胆期病灶周边肝实质与平均肝实质信号增强程度（IS%）差异。

结果 5 例肝癌介入术后病灶及 3 例肝癌微波固化术后病灶周围肝实质 IS%较平均肝实质 IS%明显减低，42 例病灶灶周肝实质 IS%较平均肝实质 IS%无明显差异（P=0.37）。
结论 GD-EOB-DTPA 磁共振增强肝胆期可以显示肝癌经动脉导管化疗栓塞（TACE）术后及肝癌微波固化术后局部肝功能情况，GD-EOB-DTPA 磁共振增强肝胆期可以反映肝细胞功能及全肝功能，亦可反映局部肝功能。

PU-0286
全模型迭代重建在 CT-Ⅲ、Ⅳ级肝硬化患者低辐射剂量 CTPV 中的应用

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目的 探讨全模型迭代重建（IMR）技术在 CT-Ⅲ、Ⅳ级肝硬化患者低辐射剂量 CTPV 中的应用价值。
方法 实验设计分为对照组（A 组）和实验组（B 组），每组随机收集 40 例 CT-Ⅲ、Ⅳ级肝硬化患者的 256 层螺旋 CT 门静脉成像数据。A 组：管电压为 100kV，剂量指数（DRI）为 19 联合 iDose4 重建，B 组：管电压为 80kV，DRI 为 17 联合 IMR 重建。对比两组患者肝实质及门静脉图像的噪声（SD）、信噪比（SNR）、对比信噪比（CNR）、主观评分、容积 CT 剂量指数（$CTDI_{VOL}$）、辐射剂量长度乘积（DLP）和有效辐射剂量（ED）的差异性。
结果 B 组肝实质及门静脉的 SD 均低于 A 组（P＜0.01），而肝实质 SNR、门静脉 SNR 及 CNR 均高于 A 组（P＜0.01）；两组肝实质主观评分差异无统计学意义（P＞0.05），而 B 组门静脉主观评分高于 A 组（P＜0.01）；B 组 $CTDI_{VOL}$、DLP 及 ED 分别为 6.28±1.38mGy、134.48±34.79mGy*cm 和 2.29±0.59mSv，较 A 组分别减低 27.5%、27.8%及 27.8%（P＜0.01）。
结论 全模型迭代重建技术联合低管电压可进一步降低 CT-Ⅲ、Ⅳ级肝硬患者 CTPV 辐射剂量并提高图像质量，可用于晚期肝硬化患者低辐射剂量 CTPV 成像之中。

PU-0287
胰腺淋巴上皮囊肿的影像表现及病理特征

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目的 探讨胰腺淋巴上皮囊肿的(Lymphoepithelial cysts ，LECs)临床、影像表现及病理特征。资料与方法 回顾性分析经手术病理证实的 4 例胰腺 LECs 患者的临床、影像学及病理学资料，4 例均行 CT 增强扫描。结果 4 例肿物均为单发，可发生于胰腺各个部位；病灶为囊性，密度较液性密度高，2 例密度均匀，2 例密度不均匀，增强扫描可呈均匀或不均匀强化。结论 胰腺淋巴上皮囊肿在影像及病理表现方面具有一定的特征性。提高对该病变的认识，可以为临床选择治疗方式提供帮助。

PU-0288
MR IVIM-DWI 预测囊性肝包虫生物学活性的价值

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目的 探讨 MR 体素内不相干运动扩散加权成像(Intravoxel incoherent motion diffusion-weighted imaging,IVIM-DWI)评价肝脏囊性包虫病生物学活性的价值。
方法 将 28 例手术后病理证实的 30 枚包虫囊，分别测量术前 CT 及 MR 检查的感兴趣区(ROI)内的 CT 值、D 值、D*、f 值，根据伊红染色判断肝脏包虫生物学活性并分为活性组和失活组，判断测量值在两组间的统计学差异及与包虫活性的相关性。
结果 D 值、f 值及 CT 值在不同包虫活性中存在统计学差异($P<0.05$)，而 D^*值不存在统计学差异($P>0.05$)。D 值和囊性肝包虫活性具有负相关($P<0.05$)，f 值、CT 值于囊性肝包虫呈正相关($P<0.05$)，但是三者相关系数不具有统计学差异。D*值与囊性肝包虫活性不具有相关性($P>0.05$)。
结论 IVIM-DWI 扫描序列及 CT 值能定量评价囊性肝包虫病生物学活性，但是 IVIM-DWI 对判断囊性肝包虫病生物学活性并不优于 CT 值。

PU-0289
肝胆胰脾增强（普美显）患者心理干预对检查结果的重要性

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目的 了解认真有效的心理干预对于肝胆胰脾 MRI 增强（普美显）患者检查效果的重要影响。
方法 总结了取得符合诊断要求图像的 50 例肝胆胰脾 MRI（普美显）增强扫描患者的护理心理干预,主要包括认真评估患者心理压力，认真直接的给予呼吸训练的指导，呼吸训练达到检查标准，可以有效的减少在检查过程中因患者的呼吸动度带来的呼吸运动伪影，从而更有利于微小病灶的诊断。有针对性的对患者对于用药不良反应进行心理疏导、密切关注对比剂注射过程和患者的反应,提前告知患者普美显药物推注后的一系列不良反应，并告知其常规性，减少患者心理压力，从而减少了患者在检查过程中因药物正常不良反应所引起的检查失败，以及患者不良反应的对症处理等。认为严格落实规章制度,认真有效的与患者沟通,密切观察整个检查流程中的患者状况,提前有效的对患者沟通检查用药后的各项不良反应，认真有效的让患者了解到有效配合的重要性，做到有效的心理干预。
结果 50 例肝胆胰脾 MRI（普美显）增强检查患者满意度高，配合度高，检查效果好，图片质量高，对于诊断效果很好，有利于一些微小病灶的早期诊断。
结论 认真有效的给予患者心理干预，严格的护理操作及有效的护患沟通是提高肝胆胰脾 MRI（普美显）检查效果的关键，提高了病灶的检出率与准确度。

PU-0290
囊性肝细胞癌的 CT 诊断及鉴别诊断（附 3 例报道及文献复习）

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目的 探讨囊性肝细胞癌的 CT 表现，提高其诊断的准确性。
方法 收集我院经病理证实的囊性肝细胞癌 3 例，回顾其临床、CT 及病理数据，并复习国内外相关文献进行讨论。
结果 本组 3 例囊性肝细胞癌，男 2 例，女 1 例，年龄 44-64 岁，均有乙肝病史，有上腹部胀痛不适等症状，2 例 AFP 明显升高，1 例 AFP 正常。CT 表现：3 例均为肝左叶单发的囊实性肿块，以囊性成分为主，肿块中央囊变坏死区呈稍低密度，增强后始终未见明显强化；肿块边缘未完全囊变坏死的肿瘤组织呈等密度，局部向腔内突起形成多发不规则的边缘壁结节，增强扫描边缘壁结节内多发迂曲供血动脉并呈现“快进快出”的强化特征；2 例肿瘤压迫周围肝组织形成不完整的环形线样稍低密度边，增强后动脉期未见明显强化，门脉期及延迟期强化，即“假包膜”征；1 例静脉早显并静脉内癌栓形成。
结论 囊性肝细胞癌的 CT 表现具有一定的特征，可为囊性肝细胞癌的诊断及鉴别诊断提供佐证。

PU-0291

MRI 对 Vater 壶腹癌的 T、N 分期诊断价值研究

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目的 通过分析 Vater 壶腹癌患者的磁共振图像，探讨磁共振对壶腹癌术前 T、N 分期的诊断价值，并评估肿瘤的可切除性，为临床治疗提供影像学依据。
方法 回顾性分析 2016 年 9 月至 2018 年 12 月期间由抚顺矿务局总医院收治的 Vater 壶腹癌患者 62 例。分析确定病灶位置、大小、平扫以及强化特点，并据 MRI 平扫及增强图片的特点确定肿瘤的 T、N 分期。分期参考第 8 版美国抗癌联合会（AJCC）vater 壶腹癌 TNM 病理分期标准。采用 SPSS17.0 软件包进行统计学处理。采用 Kappa 检验 MRI 对壶腹癌的检查结果与术后病理分期的一致性。Kappa≥0.75 为一致性较好，0.4≤Kappa<0.75 为一致性一般，Kappa<0.4 为一致性较差。计数资料采用卡方检验，计量资料采用方差分析。P<0.05 表示差异有统计学意义。
结果 MRI 和病理对 Vater 壶腹癌 T 分期的一致性检验，Kappa 值=0.763，P=0.001，表明两种诊断方法具有较高一致性。MRI 和病理对 N 分期的一致性检验，Kappa 值=0.655，P=0.001，表明两种诊断方法对淋巴结分期一致性一般。不同 T 分期肿瘤最大径比较，其 F 值=13.241，P=0.001，P<0.05，不同 T 分期肿瘤长径差异具有显著统计学意义。不同 N 分期肿瘤最大径相比，其 F 值=5.740，P=0.005，P<0.05，表明不同 N 分期肿瘤长径差异具有显著统计学意义，病灶越大越容易发生淋巴结转移。不同 T 分期肿瘤病理分化程度比较，χ^2=8.847，P=0.014，P<0.05，差异具有显著统计学意义，表明不同 T 分期肿瘤与病理分化程度相关。不同 N 分期肿瘤病理分化程度比较，χ^2=0.454，P=0.978，P>0.05，差异没有统计学意义。
结论 MRI 能够对 Vater 壶腹癌进行较准确的 T、N 分期，尤其是 T 分期与病理分期有较高的一致性，N 分期与病理分期一致性一般。

PU-0292

Gd-EOB-DTPA 增强 MRI 肝胆期不同时相在肝脏病灶显示力与胆管成像能力的分析

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目的 探讨钆塞酸二钠（Gd-EOB-DTPA）增强 MRI 合理的肝胆期延迟时间及其临床中的应用价值。
方法 因肝占位而行 Gd-EOB-DTPA 增强 MRI 检查的 68 例患者（肝炎组 52 例，非肝炎组即对照组 16 例），经静脉注射对比剂后行动态增强扫描，并在延迟 20min、1h、2h 行肝胆期扫描，在各时相的

肝胆期①测量肝胆期肝脏、竖脊肌和病灶的信号强度（SI），分别计算肝脏信号噪声比（SNR）、肝脏与竖脊肌信号比值（liver muscle ratio）、病灶对比噪声比（CNR），比较组内及组间差异。②分析肝局灶性病变的检出率。③分析胆囊全部充盈率及肝内胆管显影情况。

结果 1.延迟 20min、1h、2h，组内肝脏的 SNR、肝脏与竖脊肌 SI 比值均无差异（P＞0.05）；延迟 20min，两组间肝脏 SNR 无差异，延迟 1h、2h，两组间肝脏 SNR 有差异（P＜0.05）。延迟 20min、1h、2h，两组间肝脏与竖脊肌 SI 比值均有差异。2.HCC、硬化结节、血管瘤分别在延迟 20min、1h、2h 后 CNR 均无差异。3.延迟 20min、1h、2h，对照组胆囊全部充盈所占比分别为 18.8%、25.0%、75.0%，肝炎组分别为 1.9%、32.7%、75.0%；延迟 20min，两组胆囊的显示率有差异，延迟 1h、2h，两组胆囊的显示率均无差异。延迟 20min、1h、2h，对照组肝内胆管显影评分均为 2.12±0.81；肝炎组肝内胆管显影评分为 1.81±0.97、2.02±0.87、1.96±0.88，肝内胆管显影评分无差异。

结论 1.Gd-EOB-DTPA 增强 MRI 延迟 20min、1h、2h 的肝胆期均能提供良好的 SNR 及 CNR，为肝占位性病变的诊断提供有效诊断依据。

2.较短的 Gd-EOB-DTPA 肝胆期延迟时相对判断胆道功能的评估更有帮助。

PU-0293

自发性孤立性肠系膜上动脉夹层的 MSCT 表现及对临床治疗的指导价值

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目的 探讨 MSCT 成像对自发性孤立性肠系膜上动脉夹层（SISMAD）的诊断及临床治疗的指导价值。

方法 搜集 19 例 SISMAD 患者的临床资料，其中 1 例经 DSA 证实并行内支架治疗，其余 18 例由临床随访证实，所有患者均行 MSCTA 检查，并采用 MPR、CPR、MIP 和 VR 技术进行图像后处理，并按 Yun 分型进行 MSCT 诊断，探讨各型 SISMAD 的影像特征，并分析其临床特点。

结果 本组 19 例 MSCT 及后处理图像均可以良好的显示夹层破口位置、内膜片、真假腔及假腔内血栓；夹层开口处距离肠系膜上动脉（SMA）起始部（25.2±6.5）mm；夹层范围（75.4±4.3）mm。sISMAD 按 Yun 分型 I 型 7 例（真假腔均通畅，可见假腔的入口和出口），Ⅱ型 12 例（真腔通畅，假腔无血流），其中Ⅱa 型 4 例（假腔无出口），Ⅱb 型 8 例（假腔内血栓形成，伴真腔狭窄）；Ⅲ型 0 例（夹层并肠系膜上动脉闭塞）；同时显示合并有急性胰腺炎 2 例，大动脉粥样硬化 11 例，内脏动脉瘤 2 例，髂总动脉瘤样扩张 3 例。其中 1 例经 DSA 内支架治疗，其余保守治疗，均取得良好疗效。

结论 MSCT 能准确诊断 SISMAD，并对临床治疗具有重要的指导价值。

PU-0294

Ectopic thyroid presenting as liver mass

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Introduction:

This case report presents an ectopic thyroid situated in the liver. Very few reports have described detailed imaging findings at such an atypical location.

Presentation of case:

A 63 years old female patient revealed a mass at the Porta Hepatis at a local hospital during a routine general medical check-up. On 20/10/2018, the patient attended our hospital for a definitive diagnosis and its subsequent management. Physical examination and blood tests, including tumor markers were unremarkable except for an increase in Surface antibody [SAb] at a value of 34.91 IU/L and Nuclear antibody at a value of 4.28 S/CO. MRCP was performed which did not reveal any abnormality. On 23/10/218, CT scans of the upper abdomen and pelvis (enhanced) were done with the following report and images: Group of high-density nodules (at the Porta Hepatis) with calcification and expansive radius of 43 x 38mm; greatly enhanced in the arterial phase and prolonged enhancement with decreasing intensity in the venous phase. Low-density round-shaped mass was observed in the intra-hepatic region with no apparent enhancement with an area of 10mm.On 27/10/2018, an MRI of the upper abdomen was done with the following abnormality observed: enhancement in T1 and T2 at the hepatic entrance with mixed attenuation signal with an area of 49 x 35mm. The observed mass is well demarcated from the liver with diminished attenuation signal in both arterial and venous phase.

Diagnosis:

Ectopic Thyroid in Liver with nodules.

Discussion:

Ectopic Thyroid is defined as the presence of benign thyroid tissues at sites other than anterior or lateral to the second, third, and fourth tracheal rings. Most cases can be explained by an arrest of migration or excessive descent of the thyroid anlage at any point along its migratory path during development. Ectopic Thyroid remains a rare disease. Prevalence of this condition is reported to be between 1 per 100,000-300,000 persons. This is a reported case of ectopic Thyroid within the liver itself. This case report highlights the medical imaging features that were observed to improve diagnosis of ectopic Thyroid, even as an incidental finding.

PU-0295

Correlation between clinicopathological features and prognosis in patients with colorectal cancer with simultaneous liver metastasis

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Objective： To investigate the clinicopathological features of patients with colorectal cancer with simultaneous liver metastasis, and to analyze the related factors affecting their prognosis. **Methods：** A retrospective analysis of 60 patients with colorectal cancer simultaneous liver metastases from January 2017 to January 2019 in the Second Affiliated Hospital of Harbin Medical University was conducted to analyze the relationship between prognosis and clinicopathological factors. **Results：** The 1, 3,

and 5-year survival rates of patients with liver metastases at the time of diagnosis were 67.5%, 19.8%, and 9.4%, respectively. The median survival time was 16 months. Univariate analysis showed that serosal invasion, stage of liver metastasis, depth of invasion, and degree of tumor differentiation affect the prognosis of patients. Multivariate analysis of Cox regression model showed that only liver metastases were independent prognostic factors for patients with liver metastases from colorectal cancer. **Conclusion：** The stage of liver metastasis of colorectal cancer affects the prognosis and should be detected and diagnosed early.

PU-0296

The significance of thin-layer dynamic CT in preoperative evaluation of malignant biliary obstruction

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Objective： To investigate whether thin-layer dynamic CT can be used as a reliable method for resection of malignant biliary obstructive lesions. **Methods：** 53 cases of malignant biliary obstruction (32 cases of pancreatic cancer, 13 cases of high cholangiocarcinoma and 8 cases of ampullary carcinoma) were collected for thin-layer dynamic CT examination one week before operation. **Results：** Liver metastasis was adjacent to 46 cases of organ invasion, 17 cases of direct invasion of blood vessels, and 12 cases of ascites and retroperitoneal lymph node metastasis. **Conclusion：** Direct invasion of blood vessels, invasion of organs adjacent to liver metastasis, ascites and retroperitoneal lymph node metastasis are reliable evidence of unresectable tumors, and the combined use of lymph node enlargement and fat pad invasion is also reliable evidence of unresectable tumors.

PU-0297

Spiral CT and MRI findings of focal nodular hyperplasia of the liver

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Objective: To investigate the CT and MRI features and characteristics of focal nodular hyperplasia (FNH) in the liver. **Methods:** A total of 23 lesions were collected from 20 patients with pathologically confirmed FNH. Among them, 15 patients underwent CT plain scan and dynamic enhanced scan before operation, and 4 underwent preoperative MRI plain scan and dynamic enhanced scan. One of them underwent CT and MRI. **Results：** The mean age of the patients was 30.4 years, 17 patients had single lesions, and 3 patients had multiple lesions. The average diameter of the lesions was 2.6 cm. All FNH

lesions were significantly enhanced in the arterial phase. FNH showed a central scar of 52.2% (12/23), FNH showed a vascular shift of 60.9% (14/23), and FNH showed a vascular "ball" sign of 34.8% (8/23). **Conclusion:** FNH has characteristic and atypical signs on CT and MRI. Comprehensive recognition of CT and MRI signs is of great value in the diagnosis and identification of FNH.

PU-0298
胰腺神经内分泌肿瘤 CT 影像表现在预测其病理分级方面的研究

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目的 分析术前胰腺神经内分泌肿瘤 CT 增强影像表现，探讨其影像表现对胰腺神经内分泌肿瘤病理分级预测。
方法 收集经病理证实 43 例的胰腺神经内泌肿瘤术前影像学资料，采用回顾性分析方法，两名放射科医师观察 PNET 动静脉期 CT 影像表现，包括肿瘤最大直径，边界、囊变、钙化、同时测量动静脉期病变 CT 值和同层正常胰腺实质 CT 值。根据 2010 年 WHO 胰腺神经内分泌肿瘤的病理分级，比较不同级别的胰腺神经内分泌肿瘤影像表现和参数差异是否存在统计学意义(P<0.05)。
结果 43 例患者中 G1、G2、G3 级分别为 19 例、8 例、16 例。G3 级胰腺神经内分泌肿瘤最大直径(4.26±1.76cm)大于 G1 级最大直径(2.05±1.25cm)差异有统计学意义(P<0.05)，G3 级与 G1 级间动脉期 CT 值、静脉期 CT 值、动脉期相对强化 CT 值和静脉期相对强化 CT 值差异均有统计学意义(P<0.05)；G3 与 G1 级在钙化、囊变方面差异存在统计学意义(P<0.05)。G2 级最大直径(4.35±1.22cm)大于 G1 级最大直径(2.05±1.25cm)差异有统计学意义(P<0.05)，G2 级动脉期 CT 值低于 G1 级，差异有统计学意义（P<0.05），G2 与 G1 级在钙化、囊变方面差异存在统计学意义(P<0.05)。G3 级与 G2 级间动脉期 CT 值、静脉期 CT 值差异均有统计学意义(P<0.05)，G2 与 G3 级在钙化方面差异存在统计学意义(P<0.05)。
结论 胰腺神经内分泌肿瘤增强 CT 表现中的病灶最大直径，病灶动静脉期 CT 值和动静脉期相对强化 CT 值对病理分级有一定预测价值。

PU-0299
不典型肝细胞癌的临床及影像表现

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目的 探讨不典型肝细胞癌(HCC)的临床表现及影像特点。
方法 回顾性分析经手术病理以及随访复查证实的不典型 HCC 的临床及影像学表现，8 例均为肝硬化患者，均完善各项肿瘤标记物检查，并全部行 MSCT 及 MRI 平扫+增强扫描，5 例行普通 B 超检查，3 例行 B 超造影检查，3 例行 TACE 治疗，5 例行手术切除病理检查。
结果 3 例患者短期内多次检查甲胎蛋白（alpha fetoprotein，AFP）均大于 1000 ng/mL，在 MSCT 平扫+增强扫描上均未发现病灶；在 MRI 扫描上仅在 DWI 序列可见一枚点状弥散受限微小结节，在其余各序列及增强扫描上均未见显示；B 超造影均未见显示；行 TACE 手术时，未见动脉期早期显影，未见碘油沉积；TACE 术后短期多次复查 AFP 呈逐渐下降趋势，6 个月~1 年复查 AFP 正常，复查 MRI 原病灶无增大，未见新增病灶。5 例 B 超提示肝占位患者，AFP 正常或轻微升高；在

MSCT 平扫上肝占位密度不均匀；而在 MRI 各序列均不可见或仅在 DWI 序列呈轻微高信号、ADC 信号无降低，增强扫描呈典型快进快出征象；病理结果为高分化肝细胞癌。

结论 AFP 明显升高患者，在常规 MSCT、MRI 检查及 B 超造影均未发现明显病灶时，需警惕点状 HCC 的可能，此时在多 b 值上仔细观察可能有所发现，及时采用 TACE 治疗可有效防止 HCC 的进展。部分表现为典型快进快出强化模式的肝占位，在 MRI 平扫时可能不具备典型 HCC 表现，此时需考虑高分化 HCC 的可能；肝硬化患者仅仅采用 MRI 平扫筛检可能并不能发现不典型高分化 HCC。

PU-0300

A comparative study of respiratory motion artifacts caused by Gd-EOB-DTPA ,Gd-BOPTA and Gd-DTPA in dynamic enhanced

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Objective: To investigate the distribution of respiratory motion-related artefacts and the incidence of moderate-severe artifacts at different phases of the patient's liver during dynamic contrast-enhanced scans of Gd-EOB-DTPA, Gd-BOPTA and Gd-DTPA.

Materials and methods: Select MRI images of outpatients or inpatients from the Philips 3.0T MRI Liver Enhanced scan at the Affiliated Hospital of Beihua University from June 2017 to January 2018 according to the standard. A total of 290 cases (90 cases of Gd-EOB-DTPA,Each of 100 cases of Gd-BOPTA and Gd-DTPA.).Using a double-blind method, two senior doctors evaluated the respiratory motion-related artifacts generated by T1-weighted images (nonenhanced, arterial , venous , and delay phases) using the 5-point method,≥3 point is divided into moderate and severe artifacts. The distribution of respiratory motion-related artifacts and the incidence of moderate-severe artifacts in each phase were compared. SPSS 24.0 software package was used for statistical analysis. The image arterial phase artifact scores of each group were tested by the rank sum test, and the comparisons between the two groups were compared.

Results:

Gd-EOB-DTPA, Gd-BOPTA and Gd-DTPA had different probability distributions of arterial phase respiratory motion-related artifacts, and the difference was statistically significant ($P<0.05$); Gd-EOB-DTPA had a different probability of arterial phase respiratory motion-related artifacts than Gd-BOPTA and Gd-DTPA ($P<0.017$).

2.The probability of moderate-to-severe respiratory motion-related artifacts (40%) in the arterial phase of Gd-EOB-DTPA was significantly higher Gd-BOPTA (21%) and Gd-DTPA (17%) were statistically significant ($P < 0.017$).

3.There was no significant difference in the probability of distribution of respiratory motion-related artefacts and the incidence of moderate-severe respiratory motion-related artifacts between Gd-EOB-DTPA, Gd-BOPTA and Gd-DTPA in the nonenhanced, venous, and delayed phases($P >0.05$).

Conclusion:

The arterial phase artifact distribution of Gd-EOB-DTPA is different from that of Gd-BOPTA and Gd-DTPA. The arterial phase of Gd-EOB-DTPA has a significantly higher

probability of occurrence of moderate-to-severe respiratory motion-related artifacts than Gd-BOPTA and Gd-DTPA, which has a certain influence on image quality.
2. The motion-related artifacts of Gd-EOB-DTPA, Gd-BOPTA, and Gd-DTPA in the nonenhanced, venous, and delayed phases did not affect the liver dynamic enhanced image quality.

PU-0301

Correlation between AFP Expression and MRI Diagnosis in Primary Hepatocellular Carcinoma

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Objective:To help clarify the diagnostic value of different expression of AFP in hepatocellular carcinoma, and to explore the correlation between MRI and MRI in the diagnosis of hepatocellular carcinoma. To provide a reference for clinical diagnosis of hepatocellular carcinoma. Methods:The high-risk population of hepatocellular carcinoma in our hospital from January 2013 to September 2017 and earlier diagnosis and treatment of 203 cases of patients with hepatocellular carcinoma were 346 cases, were confirmed by serological AFP examination within one week after the MRI scan, with pathology as the gold standard, review the patient Mr report, pathological findings, serological examination and medical records to track patients according to the final results. AFP was divided into different cut value is compared with the pathological evaluation of the gold standard, the diagnostic value of different cutting value, the optimal cut-off for AFP diagnosis of primary hepatocellular carcinoma. With the optimal cut-off value as the standard of 514 patients were divided into AFP positive and negative two group, and the pathological results as the gold standard, AFP analysis MRI, alone or in combination with the diagnosis of hepatocellular carcinoma and the sensitivity, specificity and accuracy of diagnostic efficiency
Results:
1. when the AFP value is 20 ng / ml, the sum of specificity and sensitivity corresponding to this value is up to 1.410). The area under the ROC curve was 0.745%, the Yorden index was 0.4306 ($p < 0.05$), the sensitivity was 51.11% and the specificity was 78.03%. The diagnostic coincidence rate was 71. 03%.
2. The sensitivity of MRI in the diagnosis of hepatocellular carcinoma was 83.01% and the specificity was 82.35%. The diagnostic coincidence rate was 82.86%.
3. The sensitivity of MRI combined with AFP examination (one side is positive and positive) was 78.30% and the specificity was 88.23%. Thediagnostic coincidence rate was 80.71%.
4. The sensitivity of MRI combined with AFP examination (both positive and positive) was 88.68%, the specificity was 79.41%, and the diagnostic coincidence rate was 86.42%.
5. The sensitivity and specificity of MRI combined with AFP examination (both positive and negative were negative) were 97.91% and 96.77% respectively,and the diagnostic coincidence rate was 97.63%.6. The sensitivity, specificity and diagnostic conformance of the five groups were compared with each other, $p<0.005$, and the difference was statistically significant.

Conclusions:
1. Serological examination of 20ng/ml can be used as a screening indicator for the diagnosis of hepatocellular carcinoma.
2. When AFP was inconsistent with MRI diagnosis, it was believed that MRI diagnosis was more reliable.
3. When MRI and AFP were both diagnosed as hepatocellular carcinoma (HCC) or non-hepatocellular carcinoma at the same time, the results were consistent with pathological results.

PU-0302

螺旋 CT 诊断腹部神经鞘瘤的临床价值

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目的 分析腹部神经鞘瘤的 CT 表现特点，探讨 CT 对本病的诊断价值。
方法 收选 2018 年 6 月～2019 年 6 月本院经手术病理证实的腹腔神经鞘瘤住院病人 5 例 ， 其中男性 3 例，女性 2 例，年龄 23～56 岁，平均年龄 41.2 岁。肿瘤位于盆腔 2 例，腹膜后 2 例 ，肾上腺 1 例。4 例良性，1 例恶性。5 例均以螺旋 CT 行平扫加增强扫描。测量肿块的最大径及增强前后 CT 值。图像分析诊断采取讨论方式进行，重点观察病变形态、密度及边缘，并与手术及病理结果对照。
结果 所有肿块 CT 值 14～67HU 不等，4 例形态规则，1 例形态欠规则。4 例密度较均匀者为良性；1 例混杂密度(实质呈略高密度伴有明显的液化)者为恶性。良、恶性肿块均可见实质呈不同程度强化。4 例良性有完整包膜，平均最大径(77.4±44 .3)mm；1 例恶性包膜不完整或粘连，最大径(61.2)mm。
结论 腹部神经鞘瘤的 CT 表现具有一定特征，依据其特定部位的肿块，有无包膜及其密度分布特征可提示诊断。定位以肿块边缘及其周围结构关系为主要依据。边缘不规则，包膜不完整、密度不均匀可提示恶性可能。良恶性需结合临床病理。鉴别诊断尚需考虑其他多种间叶源性(包括其他神经源性)、泌尿生殖源性肿瘤和淋巴瘤 。

PU-0303

肝细胞癌射频消融术后短期侵袭性复发与功能磁共振成像的相关性分析研究

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目的 探讨并明确肝细胞癌射频消融术后短期内侵袭性分段复发（Aggressive intrasegmental recurrence，AIR）与功能磁共振成像的相关性。
方法 回顾性分析 2012 年 1 月至 2018 年 6 月期间在我院行射频消融术（RFA）治疗的肝细胞癌患者 1262 例，所有患者均通过病理证实为肝细胞癌，其中 30 例患者在术后 3 个月内影像学随访发现 AIR 现象，同时，随机筛选 35 例疾病进程在短期内得到了控制的患者作为对照组。入组的所有患者均在术前行动态增强磁共振成像（DCE-MRI）以及弥散加权成像（DWI）扫描，比较两组患者的临床资料、病灶位置以及各功能磁共振参数之间的差异，并分析其与 RFA 术后 AIR 的相关性。

结果 研究发现肝细胞癌患者 RFA 术后短期 AIR 出现的频率为 2.4%（30/1262）。两组患者的一般临床资料均无统计学差异，具备可比性；AIR 组病灶在 I 段和 IV 段明显多于对照组（P<0.05），在其他肝段的病灶数量并无统计学差异；两组患者的病灶形态并无统计学差异，而病灶动脉早期强化方式存在明显区别（P<0.05），且 AIR 组的动脉早期强化率和 ADC 值均显著低于对照组（P<0.05）；进一步相关性分析发现病灶动脉早期强化方式、动脉早期强化率、ADC 值和病灶位置均与 AIR 具有相关性，且均呈正相关。

结论 肝癌射频消融后短期内的 AIR 与病灶功能成像参数（动脉早期强化方式、动脉早期强化率、ADC 值）及其所在肝段（I 段和 IV 段）高度相关。

PU-0304
CT 测量腹腔内脂肪面积/皮下脂肪面积比值与急性冠脉综合征相关性研究

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目的 探讨腹腔内脂肪面积（VAT）与皮下脂肪面积（SAT）的比值（VAT/SAT）与急性冠脉综合征(acute coronary syndromes,ACS)相关性。

方法 选取 2018 年 1 月~2019 年 1 月我院收治的急性冠脉综合征患者 258 例患者作观察组，其中包括 ST 段抬高型心肌梗死（ST elevation myocardial infarction,STEMI）102 例，非 ST 段抬高型心肌梗死(non ST elevation myocardial infarction,NSTEMI)45 例，非稳定性心绞痛(unstable angina,UA)111 例，同时选取健康体检者 250 名作为对照组。全部参加人群采用 GE 公司 64 排螺旋 CT 行腹部扫描，选定 CT 值范围为（-200HU）-(0HU)，测量肚脐水平腹腔内脂肪面积及皮下脂肪面积并计算其比值。同时进行体格检查、测定空腹血糖（FPG）、尿酸（UA）、血脂等生化检查。对两组比值、体格及生化检查结果进行统计,分析腹腔内脂肪面积与皮下脂肪面积的比值与急性冠脉综合征的相关性。

结果 观察组与对照组的 VAT、VAT/SAT、BMI 差异有显著统计学意义（P＜0．01），观察组的腰围、UA、FINS、TG、FFA、舒张压、收缩压明显高于对照组（P＜0．05），HDL 明显低于对照组（P＜0．05）,腰围、舒张压、收缩压、BMI、FINS、UA、TG、FFA 与 VAT/SAT 值呈正相关（P＜0．05），HDL 与 VAT/SAT 值呈负相关（P＜0．05）。

结论 随着 VAT/SAT 值增加，急性冠脉综合征风险明显增加，糖尿病风险亦增加，并出现血压、尿酸、脂肪酸、胰岛素等多项代谢指标的异常。

PU-0305
姜黄素脂质体抑制肝癌栓塞后血管生成的实验研究

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目的 探讨 VX2 兔肝癌模型栓塞后残存肿瘤组织中乏氧诱导因子 1-α（HIF-1α）和血管内皮生成因子（VEGF）的相关性；探讨姜黄素脂质体联合肝动脉栓塞在抑制栓塞后肿瘤血管生成中的作用。

方法 建立 VX2 兔肝癌模型，分为 3 组。第一组（对照组 n=18）：给予 0.9%生理盐水假栓塞；第二组（栓塞组 n=18）：给予碘化油和 90-180um 聚乙烯醇颗粒（PVA）栓塞； 第三组（姜黄素脂质体联合栓塞组 n=18）：给予姜黄素脂质体（20mg/kg body weight）与碘化油乳液和 90-180 nm 聚乙烯醇颗粒（PVA）栓塞。基于栓塞后 VX2 兔模型猝死时间再将每组分为 3 个亚组，第一亚组

（n=6）：栓塞后 6 小时处死；第二亚组（n=6）：栓塞后 24 小时处死；第三亚组（n=6）：栓塞后 3 天处死。免疫组化测定 HIF-1α， VEGF 和 MVD 的表达。

结果 ⑴ 对照组 VX2 兔在假栓塞治疗后，肿瘤体积呈上升趋势。坏死肿瘤边缘残存肿瘤组织 HIF-1α 呈现强染色表现， VEGF 呈强阳性染色表现， MVD 呈现明显的上升趋势(P＜0.05)；姜黄素脂质体联合栓塞组栓塞后肿瘤体积呈现减小趋势，HIF-1α 表达明显降低（P＜0.05)。VEGF 表达低于栓塞组（P＜0.05）， MVD 表达则呈现明显下降趋势。⑵ HIF-1α 蛋白与 VEGF mRNA 具有显著正相关性（r=0.705, P=0.001）；与 VEGF 蛋白的相关性为（r=0.655, P=0.003）；与 MVD 的相关性为（r=0.521, P=0.027），同时 VEGF 蛋白与 MVD 也具有良好的相关性（r=0.519, P=0.027）。

结论 VX2 肝癌模型栓塞后残存肿瘤组织中 HIF1-α 与血管生成因子具有较强相关性，姜黄素脂质体能够明显下调 HIF-1α 蛋白表达水平，从而有效抑制 VX2 兔肝癌栓塞后残存肿瘤组织由于乏氧诱导导致的肿瘤血管生长。

PU-0306

CT and MRI findings of large undifferentiated embryonal sarcoma of the liver in children

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1 Case

The 6-year-old female patient was admitted to hospital with abdominal distension for 1 week. Physical examination: body temperature 36.7℃, pulse 86 times/min, respiration 24 times/min, blood pressure 90/54mmhg. Specialist examination: abdominal distention and touching mass. Lower boundary reach two horizontal fingers above umbilicus, medial reach anterior median line, hard texture.

Auxiliary examination: (1) Laboratory examination showed no significant increase in alpha-fetoprotein (1.76ng/ml), and CA199 was significantly increased (265.04IU/ml). (2) Total abdominal CT enhancement: large cystic solid mass shadows were seen in the liver, the size was about 13.3×11.5×13.0cm, multiple septa and a few nodular shadows were seen in the liver, the septa and capsule were significantly enhanced in the enhanced scan. (3) Total abdominal MRI enhancemen: a large round cystic mass with a size of 12.8×10.5×12.0cm was observed in the liver, with multiple septa and a few nodules, showing low signal on T1WI. The signals of liquid components in the lesion were uneven, and T2WI and SAPIR showed high signals. DWI showed slightly higher mixed signal. Enhanced scan septa and capsule markedly enhanced. (4) Surgical findings: the liver was enlarged and the tumor was located in the right half of the liver, about 13.0×12.0×12.0cm in size. The cystic component accounted for about 80%, showing multilocular septa. (5) Pathological examination: spindle cell tumor was found in the right liver. Combined with immunohistochemistry, the pathological diagnosis accorded with undifferentiated embryonal sarcoma (UES) of the liver.

2 Discussion

UES is a malignant tumor in the primitive mesenchymal tissue of the liver, which mainly occurs between 6 and 10 years old [1-2]. UES's clinical manifestations are not specific, mainly liver enlargement or epigastral mass [3].

UES is mainly presented as a huge cystic lesion with clear boundaries, and there are solid parts in it to varying degrees, which are mostly distributed on the edges, and

much space can be seen within the lesion. UES is a tumor with little blood supply, and the parenchyma is often slightly enhanced in CT and MRI enhanced scans, with obvious edges[4].The differential diagnosis includes hepatoblastoma, primary hepatocellular carcinoma, and hepatic mesenchymal hamartoma.

PU-0307
多层螺旋 CT 成像技术在胃肠道肿瘤诊断的应用价值

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目的 探讨胃及小肠、结肠一次成像的多层螺旋 CT 造影检查技术对胃肠道肿瘤病变的应用价值。
方法 选取本院接受检查的疑似小肠肿瘤性疾病患者 96 例,所有患者均经腹部准备后，接受胃及小肠、结肠一次成像的多层螺旋 CT 造影检查的技术，口服 2.5%甘露醇 45 分钟扫描时胃、小肠、结肠，并进行相关病理检查。比较 CT 与病理检查结果。
结果 以病理检查为“金标准”,统计分析 CT 检查的特异度、灵敏度、准确度分别为 100.00%、96.71%、98.02%，两者差异无统计学意义(P>0.05)。
结论 胃及小肠、结肠一次成像的多层螺旋 CT 造影检查的技术是诊断小肠肿瘤性疾病有效方式,有着高度的准确性,此项检查提供内镜所不能提供的优势,包括观察全层肠壁的结构和肠外的并发症及腹腔情况,值得临床应用。

PU-0308
胰腺炎型左侧门静脉高压 23 例影像学分析

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目的 评估胰腺炎型左侧门静脉高压(LSPH)的影像学特点，提高对该病的认识。
方法 回顾性分析 300 例胰腺炎患者的临床和影像学资料，统计 LSPH 的发生率，总结并分析其影像学特征。依据胰腺炎和左侧门静脉高压的影像学特征对患者进行分类评估，统计每组伴随情况下 LSPH 的发生率。
结果 （1）300 例胰腺癌患者中 21 例具有不同程度的 LSPH，发生率达 29.9%；（2）胰腺炎分类描述　　病变位于头颈部的患者（70 例）较体尾部的患者（47 例）多，两者 LSPH 的发生率分别约 22.0%、44.7%，差异具有统计学意义（P=0.007）；（3）病灶中 2-4cm 的患者（58 例）多于≤2cm（17 例）、＞4cm（42 例）的，三者 LSPH 的发生率分别约 11.8%、22.4%、47.6%，差异具有统计学意义（P=0.006）；（4）胰腺癌是否伴有胰腺体尾部萎缩与 LSPH 的发生无统计学差异（P=0.315），发生率分别约 25.0%、34.4%；（5）胰腺癌中伴有胰管扩张的患者（79 例）LSPH 的发生率（34.2%）高于未见明显扩张者（38 例，21.1%），两者差异无统计学意义（P=0.196）；（6）病变侵犯胰周血管，LSPH 的发生率明显增高（58.3% vs 0.000%），差异具有统计学意义（P=0.000）；（7）胰腺癌 LSPH 的发生与胰周淋巴结转移与否无关，差异无统计学意义（P=0.201），淋巴结转移的患者 LSPH 的发生率（33.8%）高于未转移者（21.6%）。
结论 LSPH 或可成为评估胰腺癌病变情况的参考依据之一。

PU-0309

影像组学在原发性肝癌领域的最新研究进展

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目的 影像组学作为 2012 年提出的新概念，被认为是精准医疗的重要组成部分，也已经成为了医学影像学发展的必然趋势。近年来，影像组学在各种疾病领域的研究和应用得到了人们的广泛关注。原发性肝癌作为我国病发率、致死率最高的肿瘤之一，及时早发现、早诊断、早治疗能够有效提高患者的疗效，改善预后，降低复发及死亡率。但是由于各个研究所采用的影像组学方法不同、图像质量的差异、病灶分割重组的主观性以及各种参数缺乏标准化等因素，研究的可重复性较差，研究结果的临床作用也有待进一步验证。
因此，本文就影像组学在原发性肝癌领域的最新研究进展进行综述。
方法 通过综合分析近年影像组学领域的文献报道，阐述影像组学的几个基本步骤，分别是图像的采集和重建、图像分割及重组、图像特征的提取和量化、数据库的建立及共享、个体数据的解析病灶。并就最新的影像组学腹部疾病研究进展进行分析，阐述影像组学在病灶分割、诊断与鉴别诊断、治疗方案选择及预后评价等方面取得的成就及最新发展。
结果 影像组学通过获取影像学图像、分割和重组病变图像、提取和量化纹理特征、建立数据库及患者的个人数据解析等步骤，为疾病的诊断、病理分型、治疗方案选择及疗效预测提供了新的思路。目前影像组学在颅内肿瘤、肺癌及小结节、胃肠道肿瘤等方面的研究与应用正在快速发展。虽然目前影像组学处理流程已经比较完善，但是许多流程仍然存在许多缺陷。
结论 通过影像组学的五个基本步骤，原发性肝癌研究在病灶分割、诊断与鉴别诊断、治疗方案选择及预后评价等方面均得到推动和发展。

PU-0310

能谱 CT 最佳单能量成像结合门静脉流入期对提高门静脉图像质量的应用

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目的 探讨能谱 CT 单能量成像技术结合门静脉流入期对提高门静脉图像质量的价值。
方法 收集临床诊断肝硬化并行腹部 CT 增强患者 31 例，对门静脉流入期及门静脉期采用 GSI 模式扫描，并重建出四组图像（A、B、C、D）。分别测量四组图像中门静脉、肝脏 CT 值、SD 值（$CT_{门}$、$SD_{门}$、$CT_{肝}$、$SD_{肝}$），计算出 $SNR_{门}$、$CNR_{门}$、$SNR_{肝}$，并对图像主观质量进行评价，进行统计学分析。
结果 B、D 组 $CT_{门}$、$SD_{门}$、$CT_{肝}$差异无统计学意义，余各组间差异均有统计学意义（$P<0.05$）；A、C 两组间及 B、D 两组间 $SD_{肝}$、$SNR_{门}$差异无统计学意义（$P=0.418$，$P=0.838$；$P=0.169$，$P=0.283$），A、C 组 $SD_{肝}$、$SNR_{门}$值高于 B、D 组（$P<0.05$）；B、C 组间 $CNR_{门}$及图像主观质量评分差异无统计学意义（$P=0.793$，$P=0.991$），余各组间 $CNR_{门}$差异均有统计学意义（P 均<0.05），其中 A＞B=C＞D。
结论 能谱 CT 最佳单能量成像技术结合门静脉流入期能有效提高门静脉图像质量。

PU-0311

脾脏海绵状淋巴管瘤的影像学表现及病理学特征

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目的 探讨脾脏海绵状淋巴管瘤的 CT、MRI 表现及病理学特征。
方法 收集我院经手术和病理证实的 6 例脾脏海绵状淋巴管瘤临床和影像学资料，其中行 CT 增强检查 5 例，MRI 增强检查 1 例。回顾性分析其 CT、MRI 表现及病理学特征。
结果 脾脏海绵状淋巴管瘤的影像学表现：可为单发、多发结节或肿块，亦可弥漫累及整个脾脏，边界清楚或不清楚，有分隔及分叶；CT 平扫为低密度灶，有时病灶中心可见斑点状或结节状钙化灶，MRI 平扫，T2WI 呈高信号、分隔呈等或稍低信号，T2WI 压脂序列信号更高、灶内分隔显示更加清楚，T1WI 以低信号为主、灶内分隔亦呈稍低或等信号且显示较为模糊；CT 和 MRI 增强扫描各期囊性成分均未见强化，动脉期囊壁及分隔轻度强化，门脉期和延迟期分隔呈“蜂窝状”或“网格状”持续强化。病理学特征：海绵状淋巴管瘤为多发迂曲扩张的较大淋巴管形成，聚集而呈蜂窝状结构。
结论 脾脏海绵状淋巴管瘤影像学表现具有一定的特征性，有利于定性诊断。

PU-0312
Evaluation of hepatic perfusion in pancreatitis patients by 3rd-generation dual-source computed tomography

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PURPOSE
A number of studies have demonstrated that acute pancreatitis (AP)can result in liver damage, which is often without obvious clinical symptoms, but plays an important role in the progression of AP and other organ damage.Fewer studies published about the difference in hepatic perfusion parameters in patients with AP, Therefore, we quantitatively investigated hepatic perfusion in patients with mild AP(MAP) and severe AP (SAP)compared to control group using perfusion CT.
METHOD AND MATERIALS
The clinical and abdominal CT data on all patients were retrospectively analyzed, including 61 patients with AP and 15 cases as a control group,and the AP group further classified into mild AP(26 cases)and severe AP(35 cases) according to CT severity index (CTSI).Upper abdomen perfusion CT imaging was performed in all cases by 3rd-generation dual-source CT. Perfusion CT imaging was obtained for 82.5s beginning with a bolus injection of 60 ml of contrast agent (400 mgI/kg) at a flow rate of 5 ml/s. Perfusion data were analyzed by the deconvolution method to obtain blood flow(BF, mL/100mL/min),blood volume(BV, mL/100mL),arterial liver perfusion (ALP, mL/100mL/min) , portal venous liver perfusion (PVP, mL/100mL/min),mean transit time(MTT,s) and hepatic perfusion index(HPI,%). Finally, hepatic perfusion parameters were compared for any significant ($P < 0.05$) differences among mild AP patients, severe AP patients and control group.
RESULTS

Various perfusion parameters was significantly higher in the control group than severe AP patients (BF:p=0.002 BV:p=0.000, PVP:p=014,MTT:p=0.000,HPI:p=0.039, p < 0.05 ; ALP: p=964>0.05). There was no significant difference in various perfusion parameters between mild AP patients and the control group ,except in MTT(8.53±0.92s vs 7.59±1.30s,p=0.018).

CONCLUSION

Using quantitative analysis on hepatic perfusion CT, we demonstrated the decrease of various hepatic perfusion parameters ,namely hepatic blood perfusion in SAP, responding to the changes in hepatic hemodynamics in SAP,hepatic perfusion CT is useful for evaluation and prediction of liver damage in patients with SAP.

PU-0313

胆囊肉瘤样癌一例

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胆囊肉瘤样癌（gallbladder sarcomatoid carcinoma,GBSC）是一种同时含有上皮和间叶（肉瘤样）成分的恶性侵袭性肿瘤，由 Landsteiner 于 1907 年首次报道[1]。GBSC 非常罕见，据 Liu 等[2]和宋等[3]统计，其分别占同期胆囊癌的 4．3%和 0.9%，且该病好发于老年女性，男女发病率约为 1:3.25[4]，患者常伴有腹痛、黄疸、发热、恶性、呕吐及腹部包块[5]等症状。文献表明，胆石症是本病最主要的危险因素，其次混合细菌或沙门菌感染、肥胖、瓷化胆囊等也与本病的发生有关[6]。

本例 CT 平扫表现为不规则低密度肿块沿腔内生长，密度不均、中央见片状更低密度，这可能与肿瘤细胞分化低、生长快，滋养动脉无法充分供血导致的坏死有关，增强扫描肿块实质呈持续明显强化，与文献[6, 7]报道一致。T_1WI 表现为低信号，T_2WI 呈高、稍高及低信号，增强后中央区无明显强化，提示病灶可能含出血、坏死及含铁血黄素等成分，肿瘤周围实质及不规则纤维样分隔表现为明显延迟强化，较具特征，与贺[8]等所报道的肝肉瘤样癌 MRI 强化方式相似，贺[8]等认为这可能与肿块周边增殖的癌组织内含有纤维间质有关。笔者推测肿瘤内部滋养动脉分化不良及血管上皮不完整，也可导致对比剂填充延迟。鉴别诊断：（1）肿块型胆囊癌，表现为腔内软组织肿块，可伴坏死，但肿块大小及坏死范围均不及 GBSC 大，增强扫描为不均匀明显强化，无特征性纤维样分隔延迟强化。（2）胆囊息肉，多为直径小于 1cm 的良性结节，常多发，无明显坏死。

综上，GBSC 缺乏特异性，确诊仍需依靠术后病理，免疫组化显示 CK、EMA 等上皮性标志物及 Vimentin 等间叶源性标志物都可为阳性，且电镜下可见张力微丝、桥粒样连接等超微结构[9]。该病恶性程度高、转移早、预后差，放化疗效果不确定，彻底的手术切除是当前首选的治疗方法

PU-0314

胰腺实性假乳头状瘤 CT 影像学特征分析

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目的 分析胰腺实性假乳头状瘤的多层螺旋 CT 影像学特征,探讨 CT 对其诊断价值。

方法 回顾性分析经手术及病理证实的 62 例胰腺实性假乳头状瘤的 MSCT 影像特征及临床特点。

结果 24 例可见钙化，其中 16 例成蛋壳样钙化，8 例斑片状及结节样钙化；2 例可见胰管扩张。62 例实性假乳头状瘤增强扫描后，实性部分动脉期呈轻度不均匀强化、门脉期及延迟期强化也呈渐进性增加，囊性及坏死部分不强化。62 例均未见腹膜后淋巴结转移。
结论 胰腺实性假乳头状瘤以 CT 特征性表现，诊断具有重要价值。

PU-0315
3.0T 磁共振钆塞酸二钠增强扫描在鉴别肝硬化结节与结节型肝癌的临床诊断价值

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目的 探讨钆塞酸二钠(Gd-EOB-DTPA) MRI 增强肝胆期对肝硬化结节与结节型肝癌进行评估和分析。
方法 52 例存在肝硬化结节患者进行 3.0TMRI 平扫、钆塞酸二钠动态增强扫描及肝胆期扫描，对磁共振图像进行分析，行穿刺活检或手术得出病理结果，影像诊断与病理结果对照。
结果 52 例经磁共振平扫加常规三期增强共发现肝内结节 102 个，初步诊断癌灶者 31 例，增强扫描肝特异期共发现癌灶 35 例，最终病理结果检查癌灶 35 例，磁共振平扫加三期增强与之符合 27 例（77%），钆塞酸二钠增强特异期扫描与之符合 31 例（88%），数据差异有统计学意义（P ＜ 0.05）。
结论 将钆塞酸二钠磁共振增强扫描应用于肝硬化结节与结节型肝癌的鉴别诊断当中，大幅度提高了对 肝内结节性质的敏感性，诊断准确率优于动态 MRI 增强扫描，值得推广应用。

PU-0316
Uncinate Process Cancer and Non-Uncinate Process Pancreatic Head Cancer: Relationship to Survival Outcomes

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Background Few reports have compared the radiopathological characteristics of uncinate process pancreatic cancer (UP-PC) and non-uncinate process pancreatic head cancer (nonUP-PC), and their exact relationship with prognosis is unclear. This study investigated the exact relationship between the two locations of pancreatic head cancer and OS.
Methods We enrolled 150 patients with pathologically confirmed pancreatic ductal adenocarcinoma who underwent multislice computed tomography within 1 month of resection from October 2014 to December 2017. All patients were divided into the UP-PC group or the nonUP-PC group based on tumor location, and their all characteristics were retrospectively analyzed. Multivariable Cox proportional hazards models were used to analyze associations with overall survival (OS).

Results Patients with UP-PC and nonUP-PC accounted for 48% (72) and 52% (78) of the study cohort, respectively. The median OS in the UP-PC group and the nonUP-PC group was significantly different (19.3 months vs. 24.0 months). Lymphovascular space invasion (LVSI) played an interactive role in the association between the tumor location and OS. Multivariate analyses revealed a significant association between tumor location and OS. UP-PC had a higher mortality risk than nonUP-PC (hazard ratio [HR] 1.75). Similar results were found in the minimally adjusted model (HR 1.76) and the fully adjusted model (HR 2.03).
Conclusion UP-PC patients had significantly worse survival than those with nonUP-PC patients.

PU-0317
肾脏上皮样血管平滑肌脂肪瘤的病理特征及 CT 表现

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目的 探讨肾脏上皮样血管平滑肌脂肪瘤（renal epithelioid angiomyolipomas,EAML)的病理学特征及 MDCT 的影像学表现。
资料与方法 回顾性分析 10 例术后病理证实的 EAML 的临床、病理及 CT 图像资料。10 例均行 CT 平扫及三期增强扫描，观察及分析其影像学特征。
结果 10 例病灶最大径 2.8-13.5cm，平均 6.7cm；9 例平扫呈相对高密度（>45HU）；7 例瘤内含脂肪成分；3 例可见坏死灶，10 例均未见明显囊性及钙化灶；增强扫描 9 例皮-髓质交界期明显强化，实质期呈持续强化；1 例皮-髓质交界期及实质期均呈轻度强化；病灶主要表现为“快进慢出”模式；4 例瘤内可见畸形血管。
结论 EAML 并非为绝对的乏脂性肿瘤，其 CT 表现多样，与病理成分密切相关。病灶表现为体积较大、平扫高密度、瘤内出血，可见坏死灶而囊变及钙化罕见时有一定的特征性，确诊仍依赖病理。

PU-0318
2018 版 LI-RADS 在原发性肝脏恶性肿瘤中的鉴别诊断价值

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目的 探讨 2018 版 CT/MRI 肝脏影像报告及数据系统（LI-RADS v2018）在原发性肝脏恶性肿瘤中的鉴别诊断价值。
材料和方法 回顾性分析经病理证实的肝细胞癌（HCC）48 例，胆管细胞癌（iCCA）39 例以及混合性肝细胞胆管细胞癌（cHCC-CCA）9 例。将病例分为两组：HCC 组（48 例 HCC）、非 HCC 组（共 48 例，包括 39 例 iCCA 以及 9 例 cHCC-CCA）。两组病例在患者年龄、性别、病灶大小及肝病背景（乙型病毒性肝炎或肝硬化）等特征上匹配。所有患者均临床资料证实有 HCC 高危因素，且在手术或病理穿刺活检前已进行 MR 平扫,动态增强及弥散加权成像。在不知病理结果的情况下，由两名有

经验的腹部影像诊断医师采用 LI-RADS v2018 对所有病例的影像资料进行分析。记录各个病例影像征象的出现情况及 LI-RADS 分类结果。应用统计软件，分析两名医师评估结果的一致性及 LI-RADS v2018 对 HCC 准确分类的敏感性、特异性及准确性。

结果 两名医师 LI-RADS 分类的一致性高。若 LR-4、LR-5 及 LR-TIV(HCC)视为阳性（HCC 组），将 LR-M 及 LR-TIV(M)视为阴性（非 HCC 组）。则两名医师应用 LI-RADS v2018 将 HCC 正确归类为 LR-4、LR-5 或 LR-TIV(HCC)的敏感性、特异性、准确性分别为 91.6%、72.9%、82.3%（医师 1）及 89.6%、79.2%、84.4%（医师 2）。

结论 LI-RADS v2018 能将大多数 HCC 准确归类为 LR-4、LR-5 或 LR-TIV(HCC)。然而，应用 LI-RADS v2018 时仍需注意，cHCC-CCA、少数不典型 HCC 及 iCCA 可能会被错误分类。

PU-0319
MDCT 联合血管形态定量分析在胰腺导管腺癌累及门静脉-肠系膜上静脉术前评估中的应用

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目的 研究多排螺旋 CT 联合血管形态定量分析对胰腺导管腺癌（PDAC）累及门静脉-肠系膜上静脉（PV-SMV）进行术前评估的应用价值。

方法 对 103 例经手术和病理证实的 PDAC 患者的增强 CT 图像进行回顾性分析。2 位阅片者采用 CT 后处理工作站中的血管分析软件对 PDAC 累及 PV-SMV 状况进行血管管腔狭窄率（luminal narrowing rate, LNR）的定量分析，并行相关分析评价 2 位阅片者的评估结果。行 ROC 图像分析及 Kappa 检验，取敏感性和特异性均较高的 LNR 值作为判断手术中血管与肿瘤可直接分离的最佳临界阈值。将 PV-SMV 的 LNR 评价结果及 TVC 联合 LNR 评价结果与手术结果相对照，评价两者一致性。使用 LNR 方法进行 PV-SMV 侵犯相关的手术肿瘤-血管可分离性预测，对照手术结果，得出各预测方法的敏感性、特异性、阳性预测值（positive predictive value，PPV）、阴性预测值（negative predictive value , NPV）和准确性。

结果（1）LNR = 29%为最佳临界阈值。使用该阈值时，2 位阅片者的 LNR 分级评估结果一致性很高（r = 0.861，P = 0.000）。（2）在 PV-SMV 侵犯相关的手术肿瘤-血管可分离性预测中，使用 LNR 方法的诊断敏感性、特异性、PPV、NPV 和准确率分别为 93.9%、84.6%、92%、88%和 90.7%。

结论 MDCT 联合血管定量分析获得的 LNR 数据可对 PDAC 侵犯 PV-SMV 进行术前评估且不同诊断经验医师评估结果的一致性高。LNR 是预测 PDAC 累及 PV-SMV 独立因素，其最佳临界阈值为 29%。

PU-0320
肝脏上皮样血管平滑肌脂肪瘤的影像学表现

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目的 分析肝脏上皮样血管平滑肌脂肪瘤 (Hepatic epithelioid angiomyolipoma, HEAML) 的 CT 和 MRI 表现，加深对 HEAML 的认识。

方法 对手术后病理证实的 10 例 HEAML 患者的资料进行回顾性分析。10 例患者中, 3 例同时行 CT 平扫及多期增强扫描与 MRI 平扫及动态增强扫描, 2 例行 CT 平扫及双期增强扫描，5 例行 MRI 平扫及动态增强扫描。对病灶的形态、大小、平扫密度或信号特点、血管情况、包膜及增强特征等进行记录并分析。

结果 12 枚病灶均为椭圆形或圆形；病灶大小 1.5-20.0 cm；6 枚病灶均为低密度，10 枚病灶 T1WI 呈低信号、T2WI 呈高信号；动态增强 6 枚表现为“快进快出”型，6 枚表现为“快进慢出”型；2 枚含脂肪成分；12 枚病灶中心可见条状强化血管影；9 枚见环形强化的假包膜。
结论 富血供肿块、瘤体中心血管影、动脉期出现强化假包膜是 HEAML 具有一定特征性的影像学表现。

PU-0321
CT 纹理分析在预测肝细胞性肝癌病理分级及无病生存期中的应用

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目的 探讨 CT 纹理分析(CTTA)在预测肝细胞癌(HCC)术后病理分级及无病生存期（DFS）中的应用价值。
方法 回顾性分析 2015 年 1 月至 2018 年 12 月间行肝脏多期 CT 检查且经病理结果证实为肝癌，且排除图像有伪影干扰和病灶直径小于 1.0 cm 的患者，共 246 例。两名评估者分析了肿瘤的 CT 表现，包括肿瘤大小、边缘、瘤周强化、包膜、强化形式、卫星结节等；术前 CT 图像上肿瘤的纹理分析使用 MaZda 软件进行，从灰度直方图、共生矩阵、绝对梯度、自回归模型及小波变换中提取纹理特征值，得到了像素分布直方图的均值、正像素的均值、熵、峰度、偏度和标准差。然后根据组织学分级比较各组间的纹理特征。多变量 Logistic 回归分析方法分析纹理特征及临床参数与病理分级的关系，采用 Kaplan-Meier 和 Cox 比例危害分析，确定纹理特征与 DFS 之间的关系。
结果 动脉期 CT 图像纹理的 SD 和 MPP 与 HCC 组织学分级呈显著正相关($p < 0.05$)。卫星结节、瘤周低密度是预测肿瘤分级的重要指标($P < 0.05$)，卫星结节的敏感性和特异性分别为 51.9%和 96.4%。Cox 比例危害分析确定肿瘤大小($p = 0.001$)，显微血管浸润($p = 0.026$)，边缘动脉增强($p = 0.001$)和瘤周实质强化($p = 0.010$)作为 DFS 的独立预测因子。
结论 CTTA 除了提供其他有价值的影像学和临床病理参数外，还能提供与肿瘤分级及 DFS 显著相关的纹理特征。

PU-0322
比较钆塞酸二钠增强磁共振成像与白蛋白-胆红素评分、前白蛋白胆红素评分肝功能评估结果的研究

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目的 本研究围绕钆塞酸二钠（Gd-EOB-DTPA）增强磁共振成像（MRI）评估肝功能的可行性，探讨其局段性肝功能评估结果与白蛋白-胆红素（ALBI）评分、前白蛋白-胆红素（mALBI）评分间的差异，并计算 Gd-EOB-DTPA 增强 MRI 诊断不同肝功能组患者的诊断效能。
方法 本研究为回顾性研究，经湖北省荆州市中心医院研究伦理委员会通过。筛选 2017.5 至 2019.1 于湖北省荆州市中心医院放射科接受 1.5T Gd-EOB-DTPA 增强 MRI 检查者 36 例纳入研究。入组者均收集临床病史、实验室检查资料及影像学检查资料，根据 ALBI 评分、mALBI 评分进行肝

功能分组。入组者 Gd-EOB-DTPA 增强 MRI 检查均测量增强前肝实质的信号强度（SIpre）和肝细胞特异期肝实质的信号强度（SI_{post}），计算相对强化程度 $RE_{肝}$=$SI_{肝}$post/ $SI_{肝}$pre。比较（1）入组者的实验室检查资料与三种肝功能分级间的差异；（2）不同肝功能组间肝脏各段 $RE_{肝}$差异；（3）$RE_{肝}$诊断不同肝功能组患者的诊断效能。数据采用 SPSS 22.0 软件、MedCalc 15.8 软件分析，测量资料用均数±标准差（`x±s）表示，$P<0.05$ 具有统计学差异。

结果 （1）不同肝功能组间实验室检查指标如血清总胆红素、白蛋白、前白蛋白以及凝血酶原时间差异具有统计学意义。（$P<0.05$）

（2）不同肝功能组间多数肝段 $RE_{肝}$差异具有统计学意义。（$P<0.05$）

（3）$RE_{肝}$能诊断肝功能正常组与肝功能受损组、轻度肝功能损伤组与中重度肝损伤组。（AUC 分别为 0.828、0.812、0.823 以及 0.923）

结论 Gd-EOB-DTPA 增强 MRI 可作为局段性肝功能评估的方法，可采用 $RE_{肝}$作为评价指标，$RE_{肝}$对不同肝功能组患者具有较高诊断价值。

PU-0323
LI-RADS(v2013)对肝脏病变的诊断价值初步研究

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目的 探讨 LI-RADS 对有 HCC 发病风险人群的肝脏病变的诊断价值。

方法 2 名医生独立双盲地阅读 813 名有 HCC 发病风险患者共 1115 处病变的 CT/MRI 征象，运用 LI-RADS(v2013)的分级诊断标准进行诊断。

①比较两名医生对肝脏良性病变、HCC 病变诊断的可重复性。

②比较 LI-RADS(v2013)分级诊断结果与金标准的一致性及敏感度、特异度等。

结果 ① 两名医生对 HCC、良性病变的 LI-RADS(v2013)分级诊断结果的一致性均介于显著和最佳之间，kappa 系数分别为 0.80、0.84。

② LI-RADS(v2013)与金标准的一致性为最佳，kappa 系数为 0.85；LI-RADS(v2013)的敏感度、特异度、阳性预测值和阴性预测值分别为 100%、80.2%、91.4%、100%，LI-RADS(v2013) LR 3 至 5 级的阳性预测值分别为 67.8%、84.2%、98.2%。

结论 ① 两名医生对 HCC、良性病变的分级诊断结果的一致性均介于显著和最佳之间。

② LI-RADS(v2013)与金标准一致性为最佳，LI-RADS(v2013)的敏感度、特异度均较高。

PU-0324
肝脏上皮样血管周细胞瘤的 CT 和 MRI 特征分析

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目的 探讨肝脏上皮样血管周细胞瘤(PEComas)的 CT 和 MRI 影像学特征，提高诊断的准确性。

方法 回顾性分析 10 例经手术病理证实的肝脏上皮样血管周细胞瘤的 CT 和 MRI 影像资料，包括发病部位、直径、包膜、强化特点和病灶周围情况等，并复习相关文献。

结果 肿瘤位于肝左叶 6 例，右叶 3 例，尾状叶 1 例；瘤灶最大直径： 3cm 以下 3 例，3cm 以上 7 例；平扫表现：密度(信号)不均 7 例，含脂肪成分 6 例，有完整包膜 7 例，有钙化 2 例，病灶内出血 1 例；增强表现：动脉期明显强化 9 例（均质强化 3 例，边缘向中心性强化 6 例），强化不明显

1 例，肝动脉穿行于肿瘤内 1 例；门脉期及延迟期强化程度减低呈等或稍低密度（信号）10 例，门静脉左支受累 3 例。

结论 CT 和 MRI 对肝脏上皮样血管周细胞瘤有一定的诊断价值，但仍需与肝癌、肝血管瘤等鉴别。

PU-0325

Three-Year MR and CT Imaging Follow-Up of Primary Pancreatic Leiomyosarcoma: A Case Report and Literature Review

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We are reporting a 73-year-old female patient with primary pancreatic leiomyosarcoma. In April 2013, MRI and CT revealed an indeterminate lesion in the pancreatic body. In November 2014, an ultrasound imaging follow up showed the significant enlargement of the tumor mass. The following computed tomography and MRI demonstrated an enlarged heterogeneous tumor mass mixed with solid and cyst components in the body-tail of pancreas. Contras-enhanced CT and MRI further characterized the tumor as an inhomogeneous tumor with slight enhancement of solid comments and non-enhanced cyst-like components and calcification. Pathology and immunohistochemical examination of surgically excised tumor showed the histologic characteristics of pancreatic leiomyosarcoma. The patient underwent pancreatectomy with splenectomy and lymph node dissections. Sixteen months after the tumor resection, CT and MRI remonstrated the tumor metastasis in the liver and lung. Primary pancreatic leiomyosarcoma is a rare malignant neoplasm. If a patient has a large mass with a cystic necrotic component, pancreatic leiomyosarcoma should be considered in the differential diagnosis list after excluding other common differential diagnoses.

PU-0326

256 排 CT 三期扫描及三维血管成像重建在原发性肝癌诊断中的价值

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目的 探讨 256 排 CT 三期扫描及三维血管成像重建技术在原发性肝癌诊断中的应用价值。方法 从 2011 年 9 月至 2015 年 9 月收治的原发性肝癌患者中随机选择 205 例，给予 256 排 CT 三期扫描及三维血管成像重建 ，并与同期行肝动脉 DSA 的 158 例患者进行对比分析。 结果 肝动脉期 MSCTA 可以良好的显示出腹腔干及其主要分支、肝动脉解剖变异，VR 对血管的立体显示效 果优于 MIP，但在肝内动脉显示方面存在差异。MIP 和 VP 法检查在供血动脉显 示方面存在差异，但差异无统计学意义（P>0.05）；在肿瘤血管显示方面 ，差异有统计学意义 （P<0.05）。 在显示肝动脉 3 级 以下分支以及肿瘤供血动脉和肿瘤血管方面，MIP 与 DSA 间差异无统计学意义（均 P>0.05）。在显示 4 级 以上分支方 面，DSA 优于 MIP 且经比较差异有统计学意义（P<0.05）。在门静 脉 4 级以上分支显示方面，MIP 和 VR 经比较差异均无统计学意义（均 P>0.05）。 结 论 256 排 CT 三期扫描及三维血管成像重建在原发性肝癌诊断中具较高 的应用价值 。

PU-0327

MSCT 对壶腹周围癌的诊断价值

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目的 探讨 MSCT 对壶腹周围癌的诊断价值。
方法 回顾分析我院经手术病理证实的 17 例壶腹周围癌患者的 MSCT 资料，所有病例均行动态增强并对图像进行分析。
结果 17 例中胰头癌 9 例，十二指肠癌 4 例，胆总管下段癌 4 例。胰头癌、十二指肠癌、胆总管癌有较典型的 CT 征象，表现为连接区软组织肿块，同时伴有低位胆道及胰管梗阻。多种重建后处理可显示十二指肠壶腹周围的解剖结构、胰胆管扩张及病灶位置、形状、大小情况。16 例表现低位胆道梗阻，3 例表现胆总管截断征，1 例表现胆总管下段偏心性狭窄；16 例表现双管征；1 例仅胰管扩张；病灶全部不同程度强化，其中不均匀强化 12 例，实心圆强化 5 例。
结论 MSCT 增强检查并结合多种重建后处理对壶腹周围癌的诊断有较高准确性,多种后处理方法可直观显示壶腹周围癌的直接和间接征象。

PU-0328

The correlation of nutcracker syndrome and superior mesenteric artery syndrome

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Objective: To investigate the correlation of nutcracker syndrome and superior mesenteric artery syndrome. **Methods:** Collected 29 cases of patients with superior mesenteric artery syndrome; calculated the transverse diameter ratio of the left renal vein between the extended segment and the narrow segment on CT. Collected 30 cases of patients without superior mesenteric artery syndrome; calculated the transverse diameter ratio of the left renal vein between the extended segment and the narrow segment on CT. Collected 28 cases of patients with nutcracker syndrome, the distance between SMA and aorta, at the location where the duodenum passes from, was measured on CT. **Results:** Among the 29 patients with superior mesenteric artery syndrome, 26 were complicated with nutcracker syndrome. Among the 30 patients without superior mesenteric artery syndrome, no patient was complicated with nutcracker syndrome. Among the 28 patients of nutcracker syndrome, all patients complicated with superior mesenteric artery syndrome. According to the spearman rank correlation analysis, r = 0.928, P = 0.000, it can be considered that the nutcracker syndrome and the superior mesenteric artery presented syndrome significant correlation. **Conclusions:** Nutcracker syndrome complicated with superior mesenteric artery syndrome. Individual anatomical reasons can lead to the superior mesenteric artery syndrome alone.

PU-0329

Diffusion kurtosis imaging in predicting the recurrence of early stage of hepatocellular carcinoma treated

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Objective: This study aimed to analyze the diffusion kurtosis imaging (DKI) in predicting the recurrence of early stage of hepatocellular carcinoma (HCC) treated. **Methods** : DKI and DWI date of 50 patients with untreated HCC was retrospectively analyzed, and MD,MK and ADC values were measured. Recurrence rate of HCC was recorded after a median follow-up of 12 months. The differences of the parameters between recurrence and non- recurrence HCC groups were analyzed. The predictive values of DKI were analyzed using ROC curves. **Results**: hepatocellular carcinoma tissue MK of untreated HCC group was higher than that Para-carcinoma tissue group, while MD, ADC was lower than those of Para-carcinoma tissue group (all $P<0.05$). MK of recurrence of treated HCC group was higher than that non- recurrence group, while MD, ADC was lower than those of non- recurrence group (all $P<0.05$). The MK value of Para-carcinoma tissue had the higher AUC in predictive the recurrence of early stage of HCC treated, The MK value of hepatocellular carcinoma tissue was the next (all $P<0.05$). **Conclusions**: Diffusion kurtosis imaging (DKI) can provide a new way to predict the prognosis of hepatocellular carcinoma.

PU-0330

胰腺非高强化神经内分泌肿瘤与导管腺癌的 MR 鉴别诊断

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目的 分析动脉期非高强化的胰腺神经内分泌肿瘤 （pancreatic neuroendocrine tumors，PNET）的 MR 成像特点，探讨 MR 平扫及动态增强扫描在鉴别非高强化 PNET 和胰腺导管腺癌（ pancreatic ductal adenocarcinoma， PDAC）的鉴别诊断价值。方法 回顾性分析经过病理证实的 35 例 PNET（共 45 个病灶）和 52 例 PDAC（共 53 个病灶）的 MR 平扫及动态增强扫描。 记录 PNET 和 PDAC 组病变的位置、大小、数量及边缘、平扫及增强信号特点。观察胰管、胆管及胰腺形态、血管侵犯及周围浸润情况及其他脏器转移情况。结果 根据动脉期强化程度将 PNET 病灶分为两组：高强化组共 20 个病灶，非高强化病灶共 25 个病灶。（1）非高强化 PNET 组病灶动脉期、静脉期、延迟期强化程度均高于 PDAC 组（P＜0.01）；静脉期等高强化病灶数量（20/25）和延迟期等高强化病灶数量（23/25）多于 PDAC 组（P＜0.05）；（2）非高强化 PNET 组病灶边缘多数（17/25）较规则，而 PDAC 多数（47/53）病灶边缘不规则（P＜0.05）；（3）非高强化 PNET 组主胰管狭窄（8/25）明显少于 PDAC 组（43/53）；继发远端胰管扩张（6/25）亦较少，扩张程度较轻，远端胰腺萎缩（5/25）较少；仅 2 例累及胆总管；（4）非高强化 PNET 组胰周浸润（8/25）及血管侵犯（8/25）较 PDAC 组少（P＜0.05）。结论 边缘规则，门静脉期及延迟期高或等强化，胰管无扩张或轻度扩张、胰腺无萎缩更支持动脉期非高强化 PNET 的诊断，有助于和 PDAC 鉴别。

PU-0331

Revolution CT 虚拟平扫替代常规平扫的可行性研究

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目的 探讨 Revolution CT 虚拟平扫替代常规平扫的可行性。
方法 回顾性分析 2017 年 11 月至 2018 年 7 月于我院行 Revolution CT 全腹或上腹扫描的肝脏正常者 43 例，均行腹部常规真实平扫（TNC）及动脉期、静脉期、平衡期增强的双能量能谱成像扫描，对三期增强图像进行虚拟平扫（VUE）重建。在 TNC 及增强三期 VUE 图像上分别测量肝实质 CT 值，在肝脏的右后叶、右前叶及左外叶各取一圆形感兴趣区域（ROI），直径 10mm，避开肉眼可见血管区域，距离肝被膜≥10mm，距肝门≥10mm，记录三个 ROI 的 CT 值。间隔 2 周以上由同一名测量者按相同方法重复测量。计算平均值，以非参数秩和检验（Friedman Test）分析 TNC 及三期增强图像的 VUE 共四组的 CT 值是否有差异。
结果 动脉期 VUE（61.27（56.47，64.10） Hu）、静脉期 VUE（61.00（58.43，63.83） Hu）、平衡期 VUE（60.43（57.03，62.73） Hu）及 TNC（62.30（59.17，64.23） Hu）四组 CT 值差异无统计学意义（P = 0.571）。
结论 动脉期 VUE、静脉期 VUE、平衡期 VUE 及 TNC 对正常肝实质 CT 值的测量结果无区别,有望取代 TNC 用于正常肝实质的测量。

PU-0332

DWI 及 IVIM 在肝外胆管癌与胆管炎的鉴别诊断价值

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目的 探讨 DWI 及 IVIM 在肝外胆管癌与胆管炎的鉴别诊断价值。
方法与资料 收集经病理证实或临床证实 28 例肝外胆管癌患者和 17 例胆管炎患者。所有病灶均行轴位 T1WI、T2WI、DWI、IVIM 序列。在 ADW4.6 工作站上，两名观察者采用双盲分别测量两组病灶弥散扩散系数（ADC）、真性扩散系数（D）、灌注相关扩散系数（D*）值及灌注系数（f）值。使用组内相关系数（ICC）分析两名观察者测量结果一致性，采用独立样本 T 检验或 Mann-Whitney U 检验分析两组病变各参数的差异，并使用诊断效能的受试者工作特征曲线（ROC 曲线）评估有统计学意义参数的诊断效能。
结果 两位医师测量数据一致性良好（ICC 均>0.9）。肝外胆管癌组病灶的 ADC、D、D*及 f 值低于胆管炎组，差异有统计学意义（P<0.05）。ADC、D、D*及 f 值相应的 AUC 分别为 0.748、0.778、0.769、0.712，灵敏度分别为 70.6%、76.5%、76.5%、64.7%，特异度分别为 67.%、67.9%、82.1%、67.9%。
结论 DWI 及 IVIM 成像为肝外胆管癌与胆管炎鉴别诊断提供了重要信息。

PU-0333

Differentiation of chronic mass-forming pancreatitis from pancreatic ductal adenocarcinoma using contrast-enhanced computed tomography

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Purpose: Both chronic mass-forming pancreatitis (CMFP) and pancreatic ductal adenocarcinoma (PDAC) are focal pancreatic lesions and share very similar clinical symptoms and imaging performance. There is great clinical value in preoperative differentiation of those two lesions. The purpose of this study was to investigate the value of computed tomography (CT) features in discriminating CMFP from PDAC.
Patients and methods: Forty-seven patients with pathologically confirmed PDAC and 21 patients with CMFP were included in this study. Demographic and CT features, including tumor location, size, margin, pancreatic or bile duct dilatation, vascular invasion, cystic necrosis, pancreatic atrophy, calcification, and tumor contrast enhancement, were retrospectively analyzed and compared. Multivariate logistic regression analyses were adopted to identify relevant CT imaging features to discriminate CMFP from PDAC.
Results: There were significant differences between CMFP and PDAC with respect to main pancreatic duct dilatation, vascular invasion, cystic necrosis, pancreatic atrophy, calcification, and tumor contrast enhancement. Delayed contrast enhancementda(＞70.5HU) showed high sensitivity and specificity of 84.2% and 84.7%. The areas under the curve (AUCs) of the predicting models based on qualitative and quantitative variables were 0.770 [95% confidence interval (CI): 0.660 - 0.880] and 0.943 (95%CI: 0.888 - 0.999), respectively. When all significant variables were used in combination to build a predicting model, the AUC was 0.969 (95%CI: 0.930 - 1.000) with 84.2% sensitivity and 94.7% specificity.
Conclusion: Main pancreatic duct dilatation, vascular invasion, cystic necrosis, pancreatic atrophy, calcification, tumor size, and tumor contrast enhancement were shown to be useful CT imaging features in discriminating CMFP from PDAC.

PU-0334

影像学检查在胃癌 TNM 分期中的研究进展

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胃癌(Gastric Cancer)是位居全球第 5 的常见恶性肿瘤，流行病学研究表明其发病率与病死率均较高，在恶性肿瘤死亡中居第二位[1,2]。WHO 国际癌症机构显示，胃癌在中国癌症顺位排名为第 2 位，5 年生存率仅为 20%-30%[3]，而一旦发生转移，患者存活时间仅为 9-10 个月[4,5]。胃癌主要采用以手术治疗为主的综合治疗，而术前准确的影像学分期对患者诊治与预后至关重要，明确各项影像检查技术在胃癌术前分期中的优势与不足，有助于提高胃癌术前 TNM 分期的准确性，有利于胃癌患者术

前及时制定准确治疗方案，改善患者预后。笔者就近年来多种影像学检查技术在胃癌术前 TNM 分期中的研究进展展开综述。

PU-0335
体素内不相干运动扩散加权成像在胰腺癌分化程度中的价值

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目的 探讨磁共振体素内不相干运动扩散加权成像(IVIM-DWI)评价胰腺导管腺癌（PDAC）分化程度的价值。方法 收集 30 例经病理证实的胰腺导管腺癌患者，术前一周内均行 3.0TIVIM—DWI 检查及术后评价 PDAC 分化程度（中/高分化 21 例，低分化 9 例），由两名具有 5 年以上腹部影像诊断经验的放射科医师于胰腺癌灶处绘制感兴趣区(ROI)，测得真实扩散系数(D)，假性扩散系数(D*)及灌注分数(f)值，采用独立样本 t 检验比较 PDAC 中/高分化组与低分化组 D、D*、f 值差异，P<0.05 具有统计学意义；受试者工作特性曲线(ROC)分析 D、D*、f 值评估 PDAC 分化程度的效能。结果 中/高分化 PDAC 的平均 D 值显著低于低分化 PDAC（P〈0.001）。 中/高分化 PDAC 的平均 f 值明显高于低分化 PDAC（P〈0.001）。f 值在区分中/高分化的 PDAC 和低分化 PDAC 的曲线下面积略高于 D 值（0.894〉0.865）。结论 IVIM—DWI 成像可无创性预测胰腺导管腺癌组织学分级，并有助于鉴别中/高分化 PDAC 与低分化 PDAC，其中 D 值和 *f*值诊断效能最高。

PU-0336
多层螺旋 CT 及 MRI 对胰腺癌的影像学诊断分析

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目的 比较分析多层螺旋 CT(MSCT)、MRI 对胰腺癌的诊断价值。
方法 收集本院 2018 年 4 月-2019 年 4 月 56 例临床怀疑胰腺癌患者的 MSCT、MRI 影像学资料进行回顾性分析，以手术病理结果为对照，比较 MSCT、MRI 对胰腺癌诊断敏感度、特异度、准确度，及对胰腺癌早期分期确诊率。
结果 手术病理证实胰腺癌 34 例，MSCT 诊断胰腺癌敏感度 85.1%，特异度 78.0%，准确率 82.3,较 MRI 的 93.2%、73.4%、86.1%差异无统计学意义(P＞0.05)。CT、MRI 对早期胰腺癌确诊率比较差异也无统计学意义(P＞0.05)。胰腺癌在 CT 图像上表现出胰腺肿大、形态不规则特点，增强扫描可见胰腺实质内低密度肿块；胰腺癌 MRI 呈 T1WI 低或略低信号、T2WI 混杂或略高信号特点。
结论 MSCT 与 MR 在胰腺癌诊断中均具有良好的准确性、敏感度和特异性以及较高的应用价值,但在不同时期的显示方面,MR 优于多排螺旋 CT。

PU-0337
肝脏血管周上皮样细胞肿瘤 1 例报告并文献复习

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目的 探讨肝血管周上皮样细胞肿瘤 的 CT 表现特点，以提高对该病的诊断水平。
方法 回顾性复习 1 例经手术证实为肝血管周上皮样细胞肿瘤的 CT 平扫及增强表现，并结合文献复习，分析其 CT 特点，尤其是脂肪成份在诊断及鉴别诊断的价值及意义。
结果 肝血管周上皮样细胞肿瘤在 CT 上动脉期多呈周边或局部明显强化、延迟期强化程度减低或呈低密度影，不同文献病例脂肪成份多少有差异。

结论 肝血管周上皮样细胞肿瘤 CT 有一定特点，脂肪成份较多时需要脂肪瘤等相鉴别。

PU-0338

Quantifying Non-alcoholic Fatty Liver: Liver-Spleen CT Ratio or Fat Concentration in Dual-Energy Spectral CT? Accuracy Comparison with Magnetic Resonance Q-dixon Technique

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Objective: *To compare the accuracy of using conventional liver-spleen (LS) CT ratio or fat concentration (FC) in spectral CT to quantify non-alcoholic fatty liver using the fat fraction (FF) determined using magnetic resonance Q-dixon (MRQd) technique as a reference standard.*
Methods: *Retrospectively analyzed 80 liver patients with both MRQd and spectral CT within one week. Using MRQd results, patients were divided into normal and fatty liver groups (normal: n=20, FF<5%; mild: n=26, FF=5%-10%; moderate: n=20, FF=11%-25%; and severe: n=14, FF>25%). The liver FC was measured on the lipid-based material decomposition images in spectral CT by 2 senior abdominal radiologists by placing regions of interest in two different hepatic lobes over 7 image slices centered at the hepatic portal level. Final FC values were obtained by averaging the measurements. The two doctors also measured the LS CT ratio on the 70keV images. Measurements were repeated three times weekly to evaluate the repeatability using intra-group or inter-group correlation coefficient (ICC). The correlation between MRQd and spectral CT results was analyzed. The diagnostic efficacy of using FC in spectral CT for differentiating normal and mild fatty livers was tested by ROC curve.*
Results: *The ICC values were high indicating consistent measurements. There were differences in FC between any groups* (P<0.05), while the LS ratio was not significantly different between the normal and mild fatty liver group (p>0.05). There was a positive correlation between FC in spectral CT and FF in MRQd (r=0.959, P<0.001), and a negative correlation between LS ratio and FF (r=-0.848, P<0.001). ROC curve analysis showed that with a FC cut-off value of 351.19mg/ml, the sensitivity, specificity and area under curve were 95%, 100% and 0.990, respectively in differentiating the normal and fatty liver group.
CONCLUSION: *The fat concentration in spectral CT has excellent correlation with the fat fraction by MR Q-dixon and is better than that determined by liver-spleen CT ratio. FC in spectral CT has high accuracy to differentiate normal and fatty livers for non-alcoholic fatty liver patients.*
Clinical Application/Relevance: *The fat concentration measurement in spectral CT can replace the Liver-Spleen CT Ratio as an imaging method for the diagnosis of fatty liver, and its accuracy is high.*

PU-0339

不典型增强 HCC 的 CT 与 MRI 诊断

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目的 初步分析不典型增强原发性肝细胞肝癌（primary hepatocellular carcinoma，HCC）的 CT 及 MRI 表现，提高对不典型增强 HCC 影像表现认识。
方法 收集 3 例经临床及手术病理证实的不典型增强 HCC，2 例行 MSCT 及 MRI 检查，1 例行 MSCT 检查及随访，结合文献资料，分析不典型增强 HCC 的 CT 及 MRI 表现。
结果 3 例不典型增强 HCC 平均直径 24.5mm；MSCT 多期增强扫描无快进快出表现，无典型肝硬化表现；MRI 病灶示不均匀强化，DW 呈高信号，肝内多发再生结节可见；1 例不典型 HCC 包埋血管，1 例位于胆囊旁，1 例强化类似炎性假瘤。
结论 不典型增强 HCC 病灶较小、无典型快进快出型强化方式、无明确肝硬化病史等容易导致误诊；MRI 多期增强扫描及 DWI 成像有利于不典型增强 HCC 特征及肝硬化背景显示，较 MSCT 更具优势。

PU-0340

Gd-EOB-DTPA 增强 MRI 肝胆期不同延迟时间对肝细胞肝癌诊断价值的研究

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目的 保证肝细胞肝癌病灶检出和肝储备功能评估的前提下，为不同肝功能状态患者选择最佳的肝胆期延迟时间。
方法 回顾性分析 50 例肝癌患者(实验组)及 30 例对照组患者的 Gd-EOB-DTPA 增强影像资料及临床资料，根据临床资料对实验组进行 Child-Pugh 分组。通过选择 ROI 采集平扫、动脉期、门脉期、平衡期、延迟 5 分钟、10 分钟、15 分钟、20 分钟的肝脏、脾脏、竖脊肌及病灶的 SI，将肝脏与竖脊肌信号比定义为 LMR，肝脏与脾脏信号比定义为 LSR，肿瘤病灶与肝脏信号比定义为 LLR。采用重复测量方差分析处理数据。
结果 NLF 组、LCA 组及 LCB+LCC 组的 LMR 随时间呈上升趋势。10 分钟、20 分钟时 LCB+LCC 组的 LMR 与 LCA 组、NLF 组有明显差异，且高于后者。各组在延迟 20 分钟时达 LMR 峰值；延迟 20 分钟时，NLF 组、LCA 组 LMR 值与其余各延迟时相的 LMR 存在显著差异， LCB+LCC 组的 LMR 与其余各延迟时相 LMR 无明显差异。LCA 组及 LCB+LCC 组的 LLR 随时间呈上升趋势；LCB+LCC 组的 LLR 值与 LCA 组存在差异（p=0.015），且低于后者；LLR 值在 LCA 组延迟 15 分钟与 20 分钟无统计学差异，在 LCB+LCC 组动脉期、延迟 15 分钟与 20 分钟无统计学差异。
结论 Gd-EOB-DTPA 在延迟 20 分钟时达到肝实质强化的峰值，随着肝功能状况下降，强化程度也相应减低。Gd-EOB-DTPA 增强扫描动脉期时就有很强的检出肝癌病灶的能力，在肝功能状况较好的情况下，可将延迟扫描缩短至 15 分钟，肝功能状态不佳时，为获得更好的检出能力，需要延迟超过 20 分钟。

PU-0341

Is pleural effusion volume quantitative by CT correlated to the severity of acute pancreatitis?

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Purpose: To study the volume quantitative by CT for pleural effusion in evaluating the severity of acute pancreatitis (AP).
Methods: 273 patients with AP performed thorax-abdominal CT examinations were recruited in this study. The volume quantitative of pleural effusion was derived from CT volume evaluation software tool. The severity of AP was graded using the CT severity index (CTSI), the Acute Physiology And Chronic Healthy Evaluation Ⅱ (APACHE Ⅱ) scoring system and modified Marshall system. The pleural effusion on CT was correlated to CTSI, APACHE Ⅱ and modified Marshall system.
Results: In 273 patients with AP, 36.7% had pleural effusion. Bilateral pleural effusion is much more often ($P < 0.05$). The prevalence of the right pleural effusion was 0.9%, 42.8%, 46.2% and the left was 0.9%, 56.6%, 76.9% in mild, moderate and severe AP according CTSI. According to APACHE Ⅱ scores, the prevalence of the right pleural effusion was 18.5%, 47.9% and the left was 28.0%, 56.0% in mild and severe AP. The prevalence of the right pleural effusion was 23.3%, 58.3% and the left was 32.5%, 66.7% in AP patients without and with organ failure (OF) according modified Marshall system. The volume of pleural effusion was correlated with CTSI, APACHE Ⅱ scores and the Marshall scores ($P < 0.05$).
Conclusion: Pleural effusion on CT in AP is common. The volume quantitative of pleural effusion is correlated to the severity of AP, which may be a supplementary indicator in determining the severity of AP.

PU-0342

肝脏上皮样血管平滑肌脂肪瘤 CT/MRI 表现

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目的 探讨肝脏上皮样血管平滑肌脂肪瘤（EAML）的 CT/MRI 表现，旨在提高本病的诊断水平。
方法 回顾性分析经手术病理证实 9 例 EAML 的影像学表现，其中 8 例行 CT 平扫+增强，3 例 MRI 平扫+增强。观察病灶的部位、形态、大小、密度/信号、内部成分、边界、假包膜、强化方式、畸形静脉、侵犯及转移特点。
结果 4 例位于肝右叶，4 例位于肝左叶，1 例位于肝尾状叶。6 例类圆形，3 例椭圆形。肿瘤最大径 1.5cm～7.7cm。3 例密度均匀，6 例密度不均，有 5 例脂肪成分，4 例无脂肪成分，9 例内均无坏死、囊变、出血及钙灶。3 例在 MRI 上均呈长 T1、长 T2 信号，DWI 呈高信号，ADC 呈低信号。增强分隔样强化 1 例，不均匀明显强化 8 例，其中 5 例呈“快进快出”的强化方式，另 3 例呈“快进慢出”的强化方式，典型瘤中央有扩张迂曲引流静脉者 3 例。9 例均未无侵犯转移征象。
结论 肝脏 EAML 的影像学表现具有一定的特征性，CT 和 MR 检查有助于提高肝 EAML 的术前诊断及鉴别诊断能力。

PU-0343

3D-VIBE 增强扫描不同时期诊断小肝癌的临床价值

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目的 定量分析 3D-VIBE 增强扫描各时期对于肝硬化背景上原发性小肝癌的诊断准确性，分析甲胎蛋白（AFP）与小肝癌强化程度之间相关性。

方法 连续性纳入疑似 SHCC 的肝硬化患者 70 例，共 91 个病灶，患者均行 3.0T 容积式插入屏气（3D-VIBE）检查，注射 GD-EOB-DTPA 26s 后扫动脉期，73.0s 门脉期，180s 延迟期，600s,1200s 肝胆期。通过测量信号强度（SI）与背景噪声标准差(SD)，计算信噪比（SNR）、对比噪声比（CNR）。独立样本 t 检验比较图像质量，卡方检验比较病灶检出率。Spearman 秩相关分析 SHCC 患者 AFP 值与动脉期及肝胆期强化程度间相关性。

结果 1. 3D-VIBE 动脉期 SHCC 检出率 100%，10min、20min 肝胆期病灶检出率均为 96.08%，差异无明显统计学意义（P =0.113）。2. 3D-VIBE 动脉期与 10min、20min 肝胆期相比，SNR、CNR 无统计学差异（P=0.097，P=0.770；P=0.346，P=0.810），10min 肝胆期与 20min 肝胆期相比，SNR、CNR 无统计学差异（P=0.062，P =0.560）。3.AFP 与动脉期、肝胆期平均强化程度之间无相关性，Spearman 相关系数 r_s分别为 0.066，0.092。

结论

1.对于肝硬化背景上原发性小肝癌的检出，动脉期及肝胆期无明显统计学差异；2. 10min 及 20min 肝胆期其病灶检出率无差异，图像质量无统计学差异，所以临床工作中延长肝胆期时间无意义；3. 日本学者提出肝胆期 HCC 强化程度与血清 AFP 呈反比，但本研究显示血清 AFP 与 SHCC 动脉期、肝胆期强化程度间均无统计学相关性，原因可能为 SHCC 处于 HCC 早期，癌细胞还未大量增殖，AFP 分泌少且不稳定，故而 AFP 参考价值不高。

PU-0344

肝脏罕见肿瘤的 MRI 表现

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目的 探讨肝脏罕见肿瘤的 MRI 表现。

方法 回顾性分析我院 2014 年 1 月到 2019 年 6 月收治的 24 例罕见肿瘤患者的 MRI 表现。

结果 24 例患者中肝脏局灶性结节增生 5 例，肝脏血管平滑肌脂肪瘤和肝母细胞瘤各 3 例，肝脏炎性假瘤、肝脏弥漫性大 B 细胞淋巴瘤、上皮样血管内皮瘤、肝脏错构瘤各 2 例，肝脏粘液性囊腺瘤、肝脏血管肉瘤、肝脏孤立性纤维瘤、肝胆管绒毛状腺瘤、肝原发间质瘤各 1 例。MRI 检查敏感性 100%，但特异性不高，诊断较困难。但部分肝脏罕见肿瘤仍有相对较特征性表现。肝细胞母细胞瘤内含裂隙状影，可伴瘤内出血、纤维瘢痕，MRI 表现为混杂信号，患者血清 AFP 及绒毛膜促性腺激素显著增高；肝脏局灶性结节性增生显示中央瘢痕，且延迟强化；肝脏炎性假瘤 MRI 显示病灶呈 T1WI 底信号，T2WI 高信号，部分呈 T2WI 低信号，增强扫描多呈边缘强化；肝脏孤立性纤维瘤 MRI 实性成分呈 T1WI 及 T2WI 低信号的纤维成分，增强扫描呈渐进性向心性强化；上皮样血管瘤表现为肝内多发病灶主要发布于肝包膜下，出现棒棒糖征及靶征或晕征；肝绒毛状腺瘤多位于胆管内；肝胆管囊腺瘤为多囊性液性信号，囊内见分隔；肝脏错构瘤 MRI 显示肝内多房囊泡影。

结论 肝脏罕见肿瘤种类繁多，术前诊断比较困难，熟悉它们的 MRI 特征性表现，可提高其诊断准确率。

PU-0345

Multifocal Nodular Fatty Infiltration of the Liver with Mass Effect Associated with Nonalcoholic Steatohepatitis: A case study and Literature Review

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Multifocal nodular fat infiltration of the liver is a special and rare manifestation of fatty liver. Although it is a non-tumor disease, misdiagnosed easily as multiple benign and malignant tumors in the liver. The specific mechanism of formation is not clear,but it can occur in many diseases. We report a case of multifocal nodular fat infiltration of the liverwith mass effect in a 26-year-old asymptomatic female diagnosed as nonalcoholic steatohepatitis. It poses a great challenge to diagnosis. We show it in a varieties of imaging methods and correlate with pathological stages. And a review of a literature was conducted. Detailed medical history and imaging examinations will help us to diagnose.

PU-0346

胆管病变的磁共振检查优势

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随着现代影像技术的飞速发展，设备越来越先进，应用越来越普及，许多疾病的早期诊断成为可能。作为一名临床医生，如果能够了解和掌握现代化影像检查手段，将“魅力四射”的影像检查及时应用到临床，无异于长了 “第三只眼睛”，工作起来会更加得心应手。核磁共振在肝胆胰疾病的诊断中，不仅图像显示清晰，立体直观，诊断的准确性高；而且还可以为外科医生治疗方案的选择提供依据；为手术提供“导航图”。外科医生如果不很好利用核磁共振，就很可能出现“闪失”，导致医疗纠纷。

PU-0347

The predictive value of Gd-EOB-DTPA- enhanced MRI for the expression of Ki67 and CD34 in hepatocellular carcinoma

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Objectives

To explore the predictive value of gadolinium-ethoxybenzyl-diethylenetriamine pentaacetic acid (Gd-EOB-DTPA)-enhanced MRI for Ki67 and CD34 expression in HCC.

Methods

We retrospectively collected the data of 180 patients (age, 23–79 years), between January 2017 and December 2018. All patients underwent Gd-EOB-DTPA-enhanced MRI; the T1 relaxation time (T1rt), reduction rate of T1rt (rrT1rt), and signal intensity (SI) of the lesion were measured, and the Ki67 and CD34 expressions were evaluated by immunohistochemistry. Spearman's coefficient was used to analyze the correlation between T1rt and SI and the Ki67 and CD34 expressions. ROC curves were used to analyze the diagnostic efficacy of T1rt for high Ki67 expression (≥50%) and hypervascular (microvessel density≥100).

Results

The T1rt of HCC at pre-enhancement (T1rt-Pre) was 717.43±157.85 ms and at 20 min after enhancement (T1rt-20min) was 581.06±173.23 ms; the expression of Ki67 was 27.5% (range, 2.0%–75.0%) and of CD34 was 41.07±19.43 vessels/field. The T1rt, rrT1rt, and SI were strongly correlated with Ki67 20 min post enhancement, the r values were 0.846, -0.765 and -0.760 ($P<0.05$), respectively. There were moderate correlations with CD34, with r values -0.444, 0.336, and -0.463 ($P<0.05$), respectively. The T1rt-Pre, T1rt-20min, SI-Pre, and SI-hepatobiliary phase were significantly different both between the high and low ki67 expression groups and between the hypervascular and hypovascular groups. There were longer T1rt and lower SI in HCC tissues with high ki67 expression. T1rt-20min was found to have high diagnostic efficiency for high ki67 expression; the AUC was 0.937, with 91.18% sensitivity and 90.41% specificity ($P<0.05$). T1rt-20min also had moderate diagnostic value for hypervascular (AUC, 0.716; $P<0.05$).

Conclusions

The T1rt and SI of Gd-EOB-DTPA-enhanced MRI were correlated with Ki67 and CD34 expression. T1rt-20min can predict high ki67 expression and hypervascular in HCC tissues.

PU-0348

Ruptured hepatoblastoma in an adult

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Aim: Hepatoblastoma (HB) is the most primary hepatic tumor in children, but very rare in adult and presented with spontaneous rupture in extremely rare occasions. Here, we reported a rare case of one adult HB with spontaneous rupture.

Methods: A51-year-old man suffered from sudden onset of presistent abdominal pain with no obvious reasons accompanied by nausea and emsesis. Hepatic tumor with rupture was diagnosed on the basis of imaging studies. Surgical resection was performed, an incomplete rupture was found in the diaphragmatic surface of the tumor which was limited by the surrounding omentum during the operation.

Results: The histopathology diagnosis was of a hepatoblastoma. It is difficult to distinguish adult HB from malignant primary liver neoplasm in radiology because they presented with similar image.

Conclusions: the diagnosis is always postoperative. Surgery is the only accepted treament, which can improve survival rate of patient.

PU-0349

以肝肾损害为主要表现的轻链淀粉样变性 1 例

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目的 轻链淀粉样变性（light-chain amyloidosis，AL）即原发性淀粉样变性，是由于浆细胞克隆性增殖引起轻链型淀粉样蛋白前体在不同组织中形成不溶性蛋白纤维沉积，可累及全身多个器官功能衰竭，该病发病率低，临床表现复杂多样，误诊率高，常延误治疗时机，预后较差。
方法 现报道 1 例以肝肾损害为主要表现的原发性 AL 型淀粉样变性，回顾分析该病人的临床表现、实验室检查、影像学表现及诊疗方法。
结果 病人，52 岁，男性，因乏力伴双下肢浮肿 1 月余，加重伴纳差 20 天就诊。查体：可见肝掌及蜘蛛痣，肝脏肋下 8cm，质中，脾脏肋下 4cm；外院电子胃镜示：食管静脉曲张：胆汁性反流性胃炎；门脉高压性胃病。以肝硬化失代偿，原因待定入院。入院后患者肝功示白蛋白 21.8g/L,24h，ALP 444IU/L,尿蛋白定量：6003.51mg/24h，肾脏早期损伤标志物：尿轻链 kap（BN-II）30.00mg/L，尿轻链 lam（BN-II）21.10mg/L，N 乙酰 D 氨基葡萄糖苷酶 48.6U/L,尿常规 3+。
影像学表现为肝脏体积增大影，增强示肝内多发散在低密度，延迟期静脉显示不清。游离轻链：游离 kappa 轻链 20.30mg/L，游离 lamda 轻链 269mg/L。考虑为血液系统性疾病，后行骨髓检查示骨髓增生活跃，可见似骨髓瘤细胞占 7.5%。血免疫固定电泳示 IgG、Lamda 阳性。肾穿刺结果汇报：免疫荧光检查：3 个肾小球。IgG-,IgM++，IgA-，C3-，C1q-，FIB-,K-(团块样于系膜区沉积)。光镜检查刚果红染色阳性物质沉积。
根据诊疗规范，予以 PD 方案治疗，具体为硼替佐米及地塞米松治疗。患者病情稳定。治疗后无任何不适。
结论 当患者出现肝肿大、血清 ALP 升高且无法以常见的肝病明确诊断时，临床医生应该考虑肝脏淀粉样变性这以少见但致命的疾病，进而通过积极的相关检查，及早明确诊断，正确指导治疗。

PU-0350

基于 MRI mDixon-quant 技术量化胰腺脂肪沉积

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目的 探讨于 MRI mDixon-quant 技术在胰腺脂肪含量测定中的应用价值。**方法** 共纳入 237 人，其中男性 107 名、女性 130 名。所有对象均进行上腹部 3.0T MRI mDixon-quant 扫描，并分别测量胰腺头、体、尾脂肪含量，取均值作为整个胰腺的最终脂肪含量。比较头、体、尾的脂肪含量有无统计差异，并按照性别、年龄分组，并记录不同年龄段及性别下胰腺脂肪含量。**结果** 测量结果两个观察者内的 ICC 分别为 0.997 和 0.996；观察者间的 ICC 为 0.989；胰腺头、体、尾部脂肪含量无统计学差异；237 位受试者胰腺总体脂肪含量为 3.33%（25 分位值 1.82%, 75 分位值 6.16%）。
结论 采用 MR mDixon-Quant 技术可简便、精确测量胰腺脂肪含量，重复性和再现性都很高，可为胰腺脂肪沉积相关疾病的研究提供方法学基础。

PU-0351
基于 MRI mDIXON 技术评估胰腺脂肪沉积与年龄、性别的关系

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目的 探讨普通人群胰腺脂肪含量随年龄增长的变化规律，并分析同年龄段男女间胰腺脂肪含量的差异。
方法 纳入 237 名成年志愿者，其中男性 107 名、女性 130 名，年龄 21～79 岁。不同性别分别按年龄分为 5 组，组 1（21～30 岁）、组 2（31～40 岁）、组 3（41～50 岁）、组 4（51～60 岁）、组 5（61～70 岁）。以 MR 魔镜成像技术（MRI mDIXON-Quant）测量胰腺（头、体、尾）脂肪含量。比较不同性别之间每组胰腺脂肪含量的差异，以及同年龄组男女之间的差异。
结果 胰腺头、体、尾部脂肪含量无统计学差异。男性各组间胰腺脂肪含量差异具有统计学意义，胰腺脂肪含量与年龄呈正相关(r=0.336，P<0.05)；女性各组间胰腺脂肪含量差异具有统计学意义，胰腺脂肪含量与年龄呈正相关(r=0.433，P<0.05)。男性中组 2~组 5 相对于组 1，胰腺脂肪含量增长率分别为-20.87%、-1.34%、62.61%、94.41%；女性中组 2~组 5 相对于组 1，胰腺脂肪含量增长率分别为 30.46%、58.02%、205.90%、205.90%。同年龄段男女间比较，各年龄段男性胰腺脂肪含量均高于女性，但各组不同性别胰腺脂肪含量差异无统计学差异(P<0.05)。
结论 胰腺脂肪含量趋向均匀沉积，且随年龄增长整体呈上升趋势。50 岁以上胰腺脂肪沉积速度明显加快。

PU-0352
磁共振动态增强扫描结合弥散成像对肝细胞肝癌的诊断研究

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目的 分析磁共振弥散成像（DWI）及动态增强扫描成像对肝细胞癌的诊断价值。
方法 回顾性分析就诊于我院并行肝脏磁共振检查（包括有 DWI 机 Gd-DTPA 动态增强扫描）的 40 例病理证实的肝细胞癌的影像资料，记录病灶的数量和部位并对其信号特点及检出率进行统计分析。
结果 40 例患者中，DWI 及 Gd-DTPA 动态增强扫描检查发现 57 个 HCC 和 10 个良性病变。其中 46 个 HCC 在 DWI 图像上表现为高信号，11 个表现为等信号。在 Gd-DTPA 动态增强扫描中有 42 个 HCC 动脉期明显强化，在 DWI 上均表现为高信号，其中 37 个门静脉和延迟期表现为低信号；其余动脉期表现为等信号，各期增强仍为等信号，9 个 DWI 上表现为高信号，6 个表现为等信号。
结论 多数肝细胞癌在磁共振动态增强扫描图像中表现为动脉期明显强化，部分小肝细胞癌可表现为等信号。Gd-DTPA 动态增强扫描结合 DWI 扫描可有助于提高肝细胞癌的诊断准确性。

PU-0353
应用 3D mDIXON Quant 成像探讨人体胰腺体积与 BMI、性别、年龄的关系

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目的 应用 3D mDIXON Quant 成像分析健康志愿者胰腺体积与 BMI、性别、年龄的关系。
方法 前瞻性纳入 22 名志愿者（男 12 例，女 10 例，BMI 范围 17.71-34.29kg/m^2 ，平均 BMI 23.97±3.95kg/m^2，年龄范围 22-62 岁，平均年龄 38.00±16.01 岁）。所有患者行 3.0T 磁共振扫描仪（Ingenia CX, Best，the Netherlands）3D mDIXON Quant 序列扫描。扫描参数如下:FOV=375mm×300mm×168mm, TR=6ms，层厚及层间距=5.0mm/2.5mm,CS=2，Echo=6。图像导入在 ISP 工作站，在脂肪分数图像上由两名放射科医师进行胰腺体积测量。所有数据经 SPSS v19.0 (IBM, Chicago, III)进行统计分析。采用组内相关系数（ICC）检验两名观察者测量数据一致性。采用 Spearman 检验评价胰腺体积与 BMI、性别、年龄的相关性。
结果 两个观察者的测量结果 ICC 值均大于 0.75，一致性良好，测量的胰腺体积取平均值进行后续分析。胰腺体积与 BMI、性别、年龄之间无显著相关性(r = -0.142, -0.280,0.245, P>0.05)。
结论 在我们的研究中，胰腺体积不随年龄、BMI 和性别的改变而改变。

PU-0354

CT and MRI diagnosis of autoimmune pancreatitis

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Abstract: **Objective** To investigate the CT and MRI findings of autoimmune pancreatitis (AIP). **Methods** In this investigation, the CT and MRI data of 12 AIP patients diagnosed by pathology and clinical findings were reviewed retrospectively. **Results** In the 12 patients with AIP, 9 lesions showed diffuse swelling of the pancreas and 3 lesions showed pancreatic focal lesions. All lesions showed homogenous isodense or slightly hypodense on CT plain scan, and T1-weighted hypointensity and T2-weighted hyperintensity. All the lesions showed homogeneous enhancement on portal venous and delayed phase images by using CT and MRI, pancreatic duct stricture was observed in 6 patients, bile duct wall thickening was found in 4 patients, distal common bile duct stricture was noted in 3 patients. In addition, 6 lesions showed "encapsulation-like" changes around the pancreatic parenchyma, including 4 lesions of mild enhancement in the delayed phase. Moreover, 6 cases of AIP showed hyperintensity in 4 patients and isointensity in 2 patients according to DWI (b=1000), and the ADC value is (0.756±0.542)×$10^{-3}$$mm^2$/s. **Conclusion** The definite diagnosis of AIP should be combined with imaging findings, serum IgG4 levels and pathological results. The enhanced delayed imaging of AIP in the three-phase scan is helpful for the differential diagnosis of AIP and pancreatic cancer.

PU-0355

普美显 MRI 在肝癌早期影像诊断中的应用

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目的 探讨普美显核磁共振(MRI)在肝癌早期影像诊断中的应用价值。
方法 选取 2017 年 1 月至 2019 年 3 月期间在我院经组织病理学确诊的原发性肝癌患者和单纯性肝硬化患者作为研究对象,比较两组不同 Child-Pugh 分级的患者肝脏摄取分数(HEF)值的差异,并比较普美显 MRI 和 MRI 平扫诊断肝癌效能的差异,分析普美显 MRI 定量评估 HEF 值诊断肝癌的 ROC 曲线下面积。
结果 原发性肝癌组患者的 HEF 值为(84.12±7.16)%,明显高于单纯肝硬化组的(76.49±7.55)%,差异具有统计学意义(P<0.05);普美显 MRI 诊断肝癌的灵敏度、特异度、阳性预测值、阴性预测值、准确率分别为 81.82%、88.10%、85.71%、84.62%、85.11%,均高于 MRI 平扫的 50.45%、61.00%、52.00%、55.56%、53.19%,且差异均有统计学意义(P<0.05);普美显 MRI 定量评估 HEF 值诊断肝癌的 ROC 曲线下面积为 91.45%,诊断阈值为 81.0%,灵敏度为 81.81%,特异度为 92.00%,约登指数为 0.738。
结论 普美显 MRI 诊断肝癌的效能高于 MRI 平扫,且普美显 MRI 定量评估 HEF 值可作为诊断肝癌的指标。

PU-0356
能谱曲线对漏出性，渗出性和血性腹水的鉴别与诊断

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能谱 CT 是通过计算物体对 X 线的衰减来成像的，其成像的基础是组织的特异性与能量水平的差异性，而 X 线的衰减是随着其本身的能量水平的不同而不同[1]。因此，每一种物质都有其特定的 X 线衰减吸收曲线，这即是能谱成像的基本原理，通过能谱成像能够显示不同化学成分构成的组织结构随着 X 线能量水平的变化而变化的曲线(能谱曲线)[2]，主要反映了所选取的感兴趣区随着 X 线能量的变化其 CT 值的变化规律，可用于化学成分的分析。由于不同的物质其化学分子结构不同，每一种物质都有其相对应的能谱曲线，因此能谱曲线能够用于鉴别两种不同化学构成的物质，而对于能谱曲线差异的分析主要是通过曲线的形态和斜率的表现。腹水作为临床疾病中常见的并发症，其病因比较繁多复杂，依据腹水的性质可将其分为漏出液，渗出液和血性腹水。由于产生的机制不同，所含成分不同，导致其化学成分的差异性，通过能谱曲线上可以直观了解三种腹水 X 线的衰减特性，因此通过能谱曲线的斜率与形态对腹水进行鉴别诊断。

PU-0357
小肝癌的磁共振诊断与微创治疗后效果评价

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目的 总结小肝癌的磁共振诊断经验，评价小肝癌微创治疗后效果；
方法 总结 2007-20195 我院进行磁共振检查诊断小肝癌 26 例；对微创治疗后效果进行评价；设备：采用西门子 Avanto1.5T 磁共振进行扫描，常规平扫+动态增强扫描。
结果 小肝癌的磁共振表现有多种表现；微创治疗后效果评价准确可靠。

结论 磁共振平扫+动态增强扫描是小肝癌诊断的最敏感影像学检查手段，对小肝癌微创治疗后评价效果肯定。

PU-0358

少见多怪真开眼，“脾脏”长到胰里面

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作者遇到一例少见病例 。术前怀疑是胰腺肿瘤，手术结果是胰腺内异位脾组织。一般来说，副脾80%位于脾门部或者脾脏周围，诊断比较容易；20%位于其它部位。比如，胰腺、肠系膜、空肠壁等。副脾的影像特点：CT 和 MRI 扫描，平扫+动态增强扫描，其强化方式和脾的强化方式一样。当诊断困难时，可以采用脾特异性对比剂进行扫描，可以准确诊断。

PU-0359

CT 影像学对急性胰腺炎肝损伤的诊断价值及影像特征分析

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目的 为了明确急性胰腺炎与脂肪肝之间内在联系，分析和探讨 CT 评价急性胰腺炎后肝损伤的影像学征象。
方法 按照入组条件，搜集 2016 年 1 月 1 日-2018 年 12 月 31 日就诊于吉林大学第一医院的急性胰腺炎合并胰源性肝损伤患者 196 例，所有患者均接受上腹部（包括以下及肝脏）CT 扫描，收集和整理病人的临床及影像资料，并以此分析急性胰腺炎合并胰源性肝损伤的影像学特征表现。
结果 在此次研究中，胰腺炎的病人在 CT 影像学上表现出肝脏密度减低发生率为 100%，其中肝脏体积增大发生率为 82.5%，门静脉周围轨道样低密度发生率为 55.67%，且肝脏的 CT 值与血淀粉酶水平呈负相关（P<0.05），血清总胆红素、丙氨酸氨基转移酶(ALT)均与血淀粉酶水平呈现一定相关性（P<0.05）。
结论 CT 检查有效评估胰腺炎引起的胰源性肝损伤，各项影像学征象具有评价意义。

PU-0360

胆管损伤真的就不可避免吗？

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目的 研究腹腔镜胆管损伤的原因，提出预防胆管损伤的具体措施；
方法 采用西门子 1.5Tavanto 磁共振设备进行检查。收集本院 2016-2019 年 4 例腹腔镜胆管损伤病例资料，分析每一例患者胆管损伤的原因。
结果 4 例患者均没有在术前做过 MRCP 检查。4 例手术医生的职称在副高以上；

结论 腹腔镜胆管损伤高年资医师多见，胆管变异是导致胆管损伤的主要原因。术前进行 MRCP 检查是避免胆管损伤的有效措施。

PU-0361
DWI 背景抑制技术结合磁化转移技术在肝脏疾病的应用价值

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目的 探讨 DWI 背景抑制技术（DWIBS）结合磁化转移技术(MTC)对提升肝脏疾病显示率和 DWI 图像信噪比的应用价值。
方法 搜集我院 2019 年 3 月-2019 年 6 月行上腹部核磁共振检查的 30 例患者作为研究资料，此 30 例患者均采用西门子 Aera 1.5T 超导磁共振扫描仪进行扫描，线圈采用 16 通道体部相控阵线圈。此 30 例患者行肝脏核磁共振检查 DWI 序列扫描时，均先采用常规 DWI 序列进行扫描，再采用 DWI 背景抑制技术（DWIBS）结合磁化转移技术(MTC)进行扫描。得出的图像分为常规组和改进组两组，主观上两组图像质量高低由我科高年资医师进行评估，两组计数资料行卡方检验。客观上分别测量两组图像的信噪比进行自身对比比较。
结果 肝脏 DWI 序列成像改进组图像质量从主观上观察明显优于常规肝脏 DWI 图像质量，改进组图像优秀率为 83.3%，常规组图像优秀率为 40%；并且改进组对肝脏细小病变的显示也明显优于常规组，两组计数资料行卡方检验，P＜0.05，差别具有统计学意义。从客观上分别测量改进组和常规组肝脏病变信噪比，分别进行自身对比比较，改进组信噪比（115.56±105.86）明显高于常规组信噪比（79.6±65.68）。
结论 肝脏 DWI 检查技术结合背景抑制技术和磁化转移技术可以明显提高肝脏 DWI 图像质量和信噪比，其不但提高了对肝脏细小病变显示率，还明显提高了肝脏病变的信噪比，进而也提高了医生的正确诊断率，从而更加有利于临床医生对患者进行诊治和评估，值得临床进行推广。

PU-0362
Pancreatic schwannoma: CT, MR manifestations and pathological correlation

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Objective: This study aimed to describe the computed tomography (CT), magnetic resonance imaging (MRI) imaging features of pancreatic schwannoma and to correlate imaging findings with histopathologic findings.
Materials and Methods: The findings from multiphase CT or MRI examinations of seventeen patients with histopathologically confirmed pancreatic schwannoma were reviewed. The imaging criteria included shape, size, margin, attenuation, signal intensity, secondary degeneration, internal mass enhancement pattern and peripancreatic lymph node.
Results: All cases were unilateral, round or oval solitary tumors, with diameters ranging from approximately 2.5 to 10.8 cm (median=6.5 cm). Of the eleven cases assessed using CT, pancreatic schwannoma appeared as well-circumscribed round or oval low-density suprarenal masses with a mean attenuation values of 30.1 HU of

solid portions during unenhanced phase. Ten cases exhibited heterogeneous cyst formation, and one case showed calcification. Internal septa were noted in 8 cases. All solid areas displayed early mild heterogeneous enhancement and delayed progressive enhancement. Regarding MRI, solid portions of six masses were hypointense to the liver parenchyma on T1-weighted imaging (T1WI) and were heterogeneously hyperintense on T2-weighted imaging (T2WI). The enhanced pattern of solid areas of pancreatic schwannoma on MRI is similar to that of CT. Cystic or hemorrhagic changes were noted in 4 cases and internal septa were noted in 3 cases. Among all cases, peripancreatic lymph node is noted in 10 patients.
Conclusion: Although pancreatic schwannoma is really a rare event in the pancreas, we believe that the following signs may suggest the diagnosis of this entity: a non-lipid containing mass, a well-defined border, a unilateral mass with cystic degeneration, septa with delayed enhancement, a characteristic progressive contrast enhancement pattern of the solid portions and reactive hyperplasia of peripancreatic lymph node.

PU-0363
双源 CT 双能量虚拟平扫在肝癌 TACE 术后成像中的应用研究

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目的 探讨双源 CT 双能量虚拟平扫在肝癌经导管化疗栓塞(TACE) 术后成像中的图像质量及辐射剂量。
方法 本文回顾性分析 51 例肝癌 TACE 治疗后复查的患者的影像资料，对本组病例进行第三代 Flash 双源 CT 行常规平扫及增强三期(动脉期、门脉期及延迟期)扫描，动脉期采用双能量扫描，记录扫描中患者所接受的辐射剂量。将获得的图像数据传送到 Siemens syngo via client 工作站上，采用肝脏虚拟平扫后处理软件(Liver VNC)生成虚拟平扫(VNC)的图像，对常规平扫与虚拟平扫从图像硬化伪影、肝实质噪声及碘油形态显示情况三个方面进行观察，测量计算 CT 值、噪声和信噪比，并对整体图像质量进行主观综合评分。
结果 肝脏在虚拟 CT 平扫图像上的 CT 值高于常规 CT 平扫，差异具有统计学意义($P<0.05$)，常规 CT 平扫噪声高于虚拟 CT 平扫，SNR 均低于虚拟 CT 平扫，差异有统计学意义（$P<0.05$），肝脏常规平扫与虚拟平扫辐射剂量分别为（14.9±4.2）、（8.6±1.1）mSv，具有统计学差异($P<0.05$)，图像整体综合主观评分无统计学差异($P>0.05$)。
结论 肝脏常规平扫与双能量虚拟平扫相比，图像噪声高、信噪比低，在肝脏检查中肝脏双能量虚拟平扫可替代常规平扫，可减低辐射剂量。

PU-0364
A comparative study of diagnostic value of DWI MRI bewteewn mono-exponential, bi-exponential and non-Gaussian kurtosis models in pancreatic ductal adenocarcinoma

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Objective: To investigate the diagnostic value of different DWI models(monoexponential,biexponentialmodels multiple b values diffusion weightedimaging and non-Gaussian diffusion-weighted MRI) in poorly differentiated pancreatic ductal adenocarcinoma. **Materials and Methods:** 52 patients with poorly differentiated pancreatic ductal adenocarcinoma which confirmed by surgery were collected. All patients underwent DWI (1.5T, Multi-b values：0, 50, 100, 150, 200, 500, 800, 1000, 1500, 2000 s/mm2). Mean values of DWI-derived metrics $ADC_{standard}$, ADC_{slow},ADC_{fast}, f,MK and DK were calculated from regions of interest in all tumours and non-tumorous parenchyma and compared. ROC was used to evaluate the diagnostic efficiency. **Results:** All lesions could be distinguished from non-lesions by three DWI sequences (ADC-DWI, DKI and IVIM). The $ADC_{standard}$, ADC_{fast} , f values and MK showed significant differences between tumours and non-tumorous parenchyma (both $P < 0.05$). Area under the curve for ADC, D, D*, f, K, and DK were (0.705, 0.665, 0.648, 0.614), respectively. The ROC curve integrated with $ADC_{standard}$ and MD has better diagnostic efficiency (the area under ROC curve is about 0.754).**Conclusion:** $ADC_{standard}$、ADC_{fast}、f and MK could differentiate tumours from non-tumorous parenchyma. The combination of Gaussion distribution model and non-Gaussion distribution model has the potential to increase the diagnostic accuracy of DWI in patients with pancreatic ductal adenocarcinoma.

PU-0365

一站式增强联合灌注在肝细胞肝癌中的应用价值

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目的 优化肝细胞肝癌（HCC）一站式增强联合灌注 CT 扫描方案并进一步评估增强与灌注参数间的关系。
方法 回顾性分析 20 例 HCC 患者一站式增强联合灌注扫描数据中的时间密度曲线（TDC）获得 HCC 显示的最佳时间点和前瞻性一站式最佳扫描方案。前瞻性收集 33 例 HCC 患者行最佳方案扫描后分别获得灌注及动静脉期图像。选取肿瘤最大截面进行勾画，记录灌注动脉期不同时间点 HCC 与正常肝实质的 CT 值、HCC 灌注参数、增强双期 HCC CT 值(CT_{HCC}-AP, CT_{HCC}-VP)和正常肝实质 CT 值，并计算 HCC 与正常肝实质比值(λCT-AP, λCT-VP)和差值绝对值(△CT-AP, △CT-VP)，进一步分析灌注与增强参数间的相关性。
结果 打药后 29 秒开始动脉期扫描病灶显示最佳，33 例患者中 20 例最佳扫描时间与回顾性研究一致，有 6 例患者扫描最佳时间点为 24 秒，另 5 例为 35 秒，2 例为 38 秒。CT_{HCC}-AP, CT_{HCC}-VP 与平均上升斜率（MSI）、血容量（BV）、平均通过时间（MTT）正相关（r 值分别为 0.6065 和 0.6221、0.4723 和 0.4085、0.4329 和 0.5859），λCT-VP 与 MSI、MTT 正相关（r 值为 0.4288 和 0.3857），其他增强参数与灌注参数之间无相关性。
结论 通过回顾性分析 HCC 灌注数据可以优化一站式增强联合灌注扫描方案，且增强参数与灌注参数间有一定相关性。

PU-0366

Amiodarone-induced hepatotoxicity: quantitative measurement of iodine density in the liver using dual-energy CT (report of three cases)

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Background: Amiodarone is the drug most commonly used to manage arrhythmias. Long-term amiodarone administration causes hepatotoxicity due to iodine accumulation in the liver. Here, we present three cases of amiodarone-induced hepatotoxicity in patients on long-term oral amiodarone therapy who underwent dual-energy computed tomography (DECT).
Case presentation: We report the clinical and iodine density in the liver using dual-energy CT of three Chinese patients with amiodarone-induced hepatotoxicity. Liver enzymes were increased in these three patients, and abdominal DECT without contrast medium showed highly increased attenuation in the liver. Furthermore, the iodine concentration in the liver was increased. First patient with amiodarone-induced reversible hepatotoxicity, showed a reversible course of liver function and CT values after discontinuation of amiodarone; the second patient with long-term oral amiodarone induced an increased iodine concentration in the liver and liver damage, eventually, the patient suffered from rapidly progressive pneumonia and died of multiple organ failure; the third patient, an increased iodine concentration in the liver and elevated liver enzymes were observed, however, the patient refused radiofrequency ablation and continued administration of oral amiodarone to control atrial fibrillation, routine liver function testing was required every 3-6 months for monitoring in this patient.
Conclusion: DECT is a potentially noninvasive diagnostic tool for quantifying the iodine concentration in liver and monitoring adverse reactions to amiodarone.

PU-0367

The characteristics of acute pancreatitis based on age : an MRI and clinical study

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Objective: To study the MRI and clinical characteristics of acute pancreatitis (AP) in Chinese and to obtain a better understanding of its variations in different age stages.
Methods: MR imaging and clinical charts of 1059 adult patients with AP was retrospectively reviewed. On MRI, acute necrotic pancreatitis (ANP) and AP-associated gastrointestinal abnormalities

were intuitively evaluated. Clinical charts included age, gender, etiology of AP, pre-existing diabetes mellitus (DM) and new-onset prediabetes/DM after AP. Each admission was assigned a subgroup based on ten year age ranges, and these characteristics of AP were compared among the different age groups.

Results: Biliary-related was still the primary etiology of AP (62.0%); however, hyperlipidemia (18.9%) took the place of alcohol (6.7%) as the second most common cause of AP. Biliary AP occurred more frequently in older female patients, whereas hyperlipidemic and alcoholic AP were more common in young male patients. A total of 19.0% (179/940) of the patients developed new-onset prediabetes/DM during hospitalization, of which the prevalence was higher in the younger age group (54[28.4%] out of 190 patients aged 18-40 yrs and 125[16.7%] out of 748 patients aged >40 yrs; p<0.001). On MRI, 204 patients (19.3%) had ANP. The patients aged >70 yrs were at a higher risk of developing ANP than those patients aged ≤70 yrs (26.8% vs 17.9%; p=0.008). In addition, age was associated with the prevalence of AP-associated gastrointestinal abnormalities (Cramer's V=0.487), which occurred most frequently in the 18-30 yrs age group (84.5% vs 43.2%; p<0.001).

Conclusion: There is close correlation between characteristics of AP and age. Certain age brackets should be considered a group of special concern in clinical practice.

PU-0368
基于磁共振 T2WI 的刻度化信号强度应用于前列腺癌诊断和侵袭性评价研究

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目的 探讨基于磁共振 T2WI 的刻度化信号强度在前列腺癌诊断和侵袭性评价的价值。

方法 回归性分析手术或超声引导下穿刺病理证实的 46 例连续性前列腺癌 MRI 和病理资料，其中 12 例仅累及外周带，28 例同时外周带和移行带，6 例累及全叶；通过对照研究确定出前列腺癌癌区（N=46）和对应非癌区（N=40），同时根据病理学指南将 46 例患者分为中高级别组（Gleason 评分≧4+3,N=25）和低级别组（Gleason 评分≦3+4,N=21）。然后以闭孔内肌（设为 0）和臀部皮下脂肪（设为 100）的信号值为参考，将前列腺癌癌区和非癌区 T2WI 信号强度刻度化为 0-100；最后独立样本 t 检验和 ROC 曲线对癌区、非癌区及病理组别分别进行分析评价。

结果 (1)前列腺癌癌区刻度化信号强度（24.60±7.70）低于非癌区（44.35±16.81），差异有模型统计学差异（t=-6.830，P<0.001）,刻度化信号强度鉴别前列腺癌癌区和非癌区 ROC 曲线下面积为 0.917，最佳临界值为 31.77，敏感性为 82.5%，特异性 87%。（2）前列腺癌中高级别组刻度化信号强度（23.53±7.20）略低于低级别组（25.90±8.23），差异无明显统计学差异（t=-1.041，P=0.303）。

结论 基于磁共振 T2WI 的刻度化信号强度可以为诊断前列腺癌提供一种新的定量参考，并且在判断前列腺癌侵袭性方面也有一定价值。

PU-0369

Correlation of ADC and T2 measurements with Ki-67 labeling index in peripheral zone prostate cancer at 3.0 T

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Objectives: Prostate cancer (PCa) incidence rates have risen dramatically over the last few years with a particularly marked increase evident in the under 65 age group[1]. A noninvasive method to predict aggressiveness of PCa would be desirable because it would help anticipate tumor recurrence and improve tumor management and the treatment outcomes. The Ki-67 protein is a marker of tumor proliferation, and apparent diffusion coefficient (ADC) and T2 relaxation time are related to tumor cellularity[2]. The purpose of this study was to assess the relationship between MRI derived parameters (ADC and T2 value) and Ki-67 labeling index (LI) as determined from whole mounted radical prostatectomy specimens in peripheral zone prostate cancer. *Materials and Methods:* The local Institutional Review Board (IRB) approved this retrospective study and waived the requirement of informed consent. Between April 2016 and October 2018, fifty-two patients (mean age: 61.4 years, range: 42-76 years) who underwent preoperative MRI and radical prostatectomy were included in our study. Diffusion and T2 imaging were performed on a 3.0 T MR scanner to enable subsequent ADC and T2 calculation. A radiologist and pathologist located the dominant tumor on the MR images based on histopathologic correlation. Ki-67 LI was then determined using an immunohistochemical staining technique. The relationship between MR and histopathologic parameter was assessed using scatter-plots and the *Pearson* correlation coefficient. *Results:* The mean tumor diameter was 15.2 mm(range, 5-28 mm). Of the 52 peripheral zone prostate tumors, four (7.7%) had a Gleason score of 6, 33 (63%) had a Gleason score of 7, and 15 (28.8%) had a Gleason score of greater than 7. ADC, T2 and Ki-67 LI in peripheral zone prostate cancer were $(1.43\pm0.19)\times10^{-3}mm^2/s$, (99 ± 20) milliseconds, and $33.8\%\pm5.3\%$, respectively. A significant negative correlation with Ki-67 LI was noted for both ADC($r= -0.696$, $P<0.0001$) and T2($r= -0.512$, $P<0.001$). Trends for increased Ki-67 LI, decreased ADC, and decreased T2 with increasing Gleason score were also noted. *Discussion & conclusion:* A correlation between proliferation activity, PCa T2 relaxation time, and ADC values has been investigated. Increases in cellular density and disruption of ductal architecture in PCa can result in decreased ADC values. The Ki-67 protein functions as a nuclear antigen that is only expressed in proliferating cells. Noninvasive determination of parameters reflecting cell density may be important as some clinical studies have noted increased metastatic activity in highly cellular tumors suggesting that cellularity may be indicative of tumor aggressiveness. ADC and to a lesser extent T2 are good indicators of Ki-67 labeling index. Because of the potential link with Gleason score, multiparametric MRI may have a prognostic role with regard to potential metastatic activity and tumor aggressiveness. These results warrant further investigation on the potential of multiparametric MRI to facilitate noninvasive assessment of prostate cancer aggressiveness and proliferative activity.

PU-0370
对鉴别诊断肾嫌色细胞癌与嗜酸细胞腺瘤最佳单能量 CT 值的价值初探

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目的 初探单源双能 CT 对肾嫌色细胞癌与肾嗜酸细胞腺瘤的鉴别诊断价值。
方法 回顾性收集本院 2015 年 1 月-2019 年 2 月应用单源双能 CT 行双肾三期增强扫描、经手术病理证实为肾嫌色细胞癌（Chromophobe cell renal carcinoma, CCRC）与肾嗜酸细胞腺瘤（Renaloncocytoma, RO）的单发肿瘤患者共计 33 个病灶（CCRC 13 个，RO 20 个）。在 GE ADW4.6 工作站，两名影像诊断医师采用双盲法分别在 5mm 层厚图像上测量，在肿瘤的最大层面放置类圆形 ROI，避开动静脉血管、出血、钙化、坏死囊变区。分别测量两组病灶实质区各期 40keV-140keV 单能量下 CT 值（以 10 keV 为间隔，共计 11 个），计算能谱曲线斜率 K 值， K=（40keV-140keV）/100。两观察者测量数据行组内相关系数（ICC）检验，若一致性良好取高年资医师数据，采用独立样本 t 检验，分析两组病灶不同单能量（40-140keV）CT 值、能谱曲线斜率 K 值的差异。选择有差异指标进行受试者工作特征（receiver operating characteristic，ROC）曲线分析，获得曲线下面积（area under curve，AUC），同时得到相对应的阈值、敏感度和特异度。
结果 两位观察者所测数据的一致性良好（ICC>0.75）。CCRC 组和 RO 组皮质期 40-60 keV 单能量 CT 值、K 值的差异具有统计学意义（P<0.05）。其中，皮质期 60keV 单能量 CT 值诊断效能最高，当阈值为 151.37 时，AUC 最大为 0.804，此时敏感度和特异度分别为 70.0%，84.6%。除此之外，两者间其他参数间差异均无统计学意义（P>0.05）。
结论 单源双能 CT 能谱成像皮质期 60keV 单能量 CT 值能有效鉴别肾嗜酸细胞腺瘤与肾嫌色细胞癌。

PU-0371
女性盆腔囊性病变的 CT、MRI 表现及其病理基础

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目的 分析女性盆腔囊性病变的 CT 和 MRI 表现，提高对其诊断及鉴别诊断水平。
方法 回顾性分析 69 例经手术病理证实的女性盆腔囊性病变的 CT 和 MRI 表现。其中 59 例行 CT 检查，其中 53 例行 CT 增强检查，13 例行 MRI 平扫检查，其中 7 例行 MRI 增强检查，其中 3 例同时例行 CT、MRI 检查。
结果 50 例良性病变，1 例交界性肿瘤，18 例恶性病变。61 例来源于卵巢，其中囊腺瘤 18 例，囊腺癌 14 例，畸胎瘤 8 例（1 例恶性），卵巢甲状腺肿 3 例，性索间质类肿瘤 2 例，囊肿 15 例，转移瘤 3 例；卵巢结核 1 例；3 例输卵管副中肾囊肿；5 例盆腔病变中，包括 1 例盆腔畸胎瘤、2 例盆腔积脓；2 例盆腔神经源性肿瘤。
结论 女性盆腔囊性病变大部分来源卵巢，CT、MRI 检查相结合在发现病变内部细微结构及其与周围器官关系方面有很大的诊断价值，术前可做出正确诊断，为临床治疗方案的选择及预后判断提供理论依据。

PU-0372

血氧水平依赖磁共振对糖尿病肾病的初步研究

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目的 利用血氧水平依赖磁共振成像评估 2 型糖尿病所致慢性肾病者的 BOLD 图像特点及其与肾功能受损程度的相关性，拟探寻一种无创的评价肾功能的方法。
方法 选取川北医学院附属医院 2018 年 7 月至 2019 年 7 月间确诊为 2 型糖尿病的患者 20 例作为观察组，另选取年龄、性别相匹配的健康志愿者 20 例作为对照组，均行 BOLD-MRI 检查，对比两组间肾脏皮髓质 R2*值的差异。
结果 与糖尿病肾病患者相比，健康志愿者的平均肾髓质 R2*值(13.6±2.4)1/s 较观察组 R2*值(19.2±1.2)1/s 低。两组之间的皮质 R2*值没有显著差异 11.1±0.9sec^{-1} vs.11.6±0.7sec^{-1},p=0.6）。髓质 R2*值诊断 2 型糖尿病患者的的敏感性、特异性、准确性、漏诊率和误诊率分别为 86.43%、100.00%、93.28%、13.52%和 0，可见糖尿病患者肾功能受损程度与髓质 R2*值的具有相关性（p＜0.005）。
结论 糖尿病肾病患者骨髓 R2*值低于健康志愿者，BOLD-MRI 可以反映糖尿病肾病的肾脏功能损伤,具有潜在的临床应用价值。

PU-0373

Imaging features of renal myomatous angiomyolipomas

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Objectives: To review the imaging features of renal myomatous angiomyolipomas (mAML).
Methods: Fourteen patients were pathologically diagnosed as mAML. Two radiologists reviewed all images to evaluate CT attenuation, magnetic resonance imaging (MRI) signal intensity (SI), enhancement features (ie, homogeneity and degree of enhancement, enhancement pattern), homogeneity on unehancement scans, tumor size, margin, location, intratumoral fat, cystic degeneration, seudocapsule, hemorrhage and intratumoral vessels. Mean attenuation on unenhanced CT of mAML, normal renal parenchyma and skeletal muscle, were compared by the paired-sample t tests, respectively.
Results: The mean unenhancement CT values of every tumor lesions were similar to that of skeletal muscle (P>0.05). 71.43% lesions were hyperattenuating on unenhanced CT. All tumors were hypo-intensity on T2WI. 61.54% cases were homogeneous or slightly heterogeneous on unenhancement scans. Eleven cases were categorized as a slightly heterogeneous or heterogeneous enhancement type with a weak degree. Tumor enhancement pattern on MRI was various, an early washout enhancement pattern , a gradual and prolonged enhancement pattern was observed in 46.15%, 23.08%, 30.77% of the cases, respectively. Nine of tumors were intracapsular. Intratumoral fat was detected in the four cases.

Conclusions: The radiological appearance of mAML has a tendency to locate in intracapsular, without macroscopic fat, to be hyperattenuating on unenhanced CT images, with hypo-
intense on T2WI, could be homogeneous or slightly heterogeneous on unenhancement scans. After the injection of contrast agent, mAML tend to have a weakly lightly heterogeneous to heterogeneous enhancement, and could demonstrate various enhancement pattern.

PU-0374
Bosniak 分级系统在肾脏囊性病变 MSCT 诊断中的应用价值

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目的 探讨 Bosniak 分级系统在肾脏囊性病变 MSCT 诊断中的应用价值，并分析其 CT 表现特点。
方法 随机选取 2016 年 7 月—2018 年 11 月广西医科大学第一附属医院手术及病理确诊的肾脏囊性病变共 37 例，年龄 2 月至 72 岁，男性 21 例，女性 16 例。回顾性分析其 CT 表现(包括囊的大小、囊壁厚度、有无分隔、分隔多少及厚度、囊壁及分隔强化、钙化、实性成分形态及其强化)，分别由两名医师对其进行 Bosniak 分级，并与术后病理结果进行对照。
结果 Bosniak 分级越高，病理恶性病变所占比例越高。37 例患者均行 CT 平扫及增强扫描，其中: Bosniak Ⅰ级 11 例，病理结果均为良性，10 例单纯性肾囊肿，1 例为肾结核；Bosniak Ⅱ级 5 例，病理结果均为良性；Bosniak ⅡF 级 3 例，病理结果均为良性；Bosniak Ⅲ级 9 例，病理结果为 4 例恶性，恶性率为 44.44%；Bosniak Ⅳ 级 9 例，病理结果均为恶性，恶性率为 100%。
结论 Bosniak 分级系统对肾脏囊性病变的 CT 诊断有较高的应用价值，对临床的诊断及治疗具有较高的的参考作用。

PU-0375
基于 CT 三期增强扫描的输尿管梗阻患者肾灌注改变研究

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目的 应用 CT 三期增强扫描技术，评估输尿管梗阻时肾脏灌注功能。
方法 回顾性分析 50 例单侧输尿管梗阻患者 CT 三期增强扫描图像资料，分别测量患侧与健侧肾脏皮质、髓质在动脉期、静脉期、排泄期的 CT 值及动脉期相对强化程度值，应用配对计量资料 t 检验比较患侧与健侧 CT 值的差异。
结果 健侧肾脏皮质动脉期、静脉期、排泄期 CT 值分别为：169.6±30.7HU HU，149.5±32.2 HU，128.5±29.1 HU；健侧肾脏髓质动脉期、静脉期、排泄期 CT 值分别为：63.9±19.1 HU，117.7±36.0 HU， 200.2±31.8 HU；患侧肾脏皮质动脉期、静脉期、排泄期 CT 值分别为：150.2±35.9 HU， 145.2±25.8 HU， 118.8±26.0 HU；患侧肾脏髓质动脉期、静脉期、排泄期 CT 值分别为：49.2±17.5HU， 93.6±38.8 HU， 158.2±50.0 HU；健、患侧肾皮质动脉期相对强化程度值分别为 142.1±61.0HU， 161.6±69.7 HU。患侧肾皮、髓质动脉期、排泄期、髓质静脉期 CT 值均低于健侧，患侧肾皮质相对强化程度值高于健侧，且差异具有统计学意义（$p<0.05$）；患、健侧肾皮质静脉期 CT 值间无显著差异（ $P>0.05$）。

结论 通过 CT 三期增强扫描技术，测量肾脏皮髓质不同期相 CT 值、皮质动脉期相对强化程度值，可以判断肾脏血流灌注改变情况，初步评价输尿管梗阻后肾脏灌注功能。

Renal perfusion changes in ureteral obstruction patients :based on tri-phase enhancement CT scan

PU-0376
常规 CTU 延迟扫描与等待期间排尿后检查的对比与研究

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目的 1 减少患者在 CTU 检查时等待排泄期的时间，增加患者的舒适度。
2 减少因患者因憋尿而导致的不适。减少膀胱不充盈现象，降低漏诊的可能。

方法 针对 70 例 CTU 检查者（未做膀胱全切手术），检查前 20 分钟，嘱咐患者多喝水（500ml 以上），自觉有尿感告知检查人员，然后进行泌尿系常规检查。检查分为平扫、皮质期、实质期、排泄期。在扫完肾盂期后，告知患者下床等待排泄期检查。这时把患者分为两组 A 组 38 人，下检查床后立即排尿后再饮水，等待 20-30 分钟，或自觉有尿感以后进行排泄期扫描。B 组 32 人，下床之后继续胀尿。20-30 分钟以后或自觉有尿感时进行排泄期扫描。

结果 A 组 38 人平均年龄 46 岁；平均延迟时间 25 分钟；平均膀胱充盈体积 144ml；平均 CT 值 680。且膀胱全部由造影剂充盈。B 组 32 人，平均年龄 51 岁；平均延迟时间 30 分钟；平均膀胱充盈体积 437ml；均 CT 值 158。其中膀胱全部充盈 12 例，充盈不足 20 例，尿液与造影剂在膀胱内出现分层现象。

结论 B 组优势：膀胱充盈程度优于 A 组，膀胱体积是 A 组的两倍多。B 组缺点：过于充盈的膀胱会导致检查者等待时感到不适。老龄患者和前列腺增生患者无法完全配合。

A 组优势：与 B 组相比，缩短了排泄期平均等待时间，提高了平均 CT 值，并保证膀胱全部充盈。不会出现因病人无法坚持配合，而出现的造影剂与尿液分层的情况，降低漏诊的可能性。

PU-0377
肾透明细胞癌 CT 强化特征与病灶体积的相关性

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目的 探讨肾透明细胞癌 CT 强化特征与病灶体积的相关性。

方法 回顾性分析 2017 年 5 月至 2018 年 6 月 18 例有穿刺或病理结果肾癌患者,观察不同亚型肾癌 CT 表现和强化特点情况。

结果 1、血供丰富的肿瘤 11 例，11 例均为透明细胞癌（长径＞3cm），以坏死囊变最明显,和其他病理类型比较差异显著,2、乏血供肿瘤 7 例，4 例透明细胞癌（长径≤3cm），1 例嫌色细胞癌及 2 例乳头状细胞癌在坏死、囊变、钙化表现不明显，平扫时肿瘤呈圆形或卵圆形等密度影,边界欠清,增强时,病灶强化程度明显低于肾实质（CT 值升高＜40Hu）,增强后肿瘤边界较清，与其他病理类型比较差异不明显。

结论 1.肾癌体积较大（长径＞3cm），透明细胞癌与其他亚型肾癌在 CT 平扫及增强表现中有一定的差异；2.肾癌体积较小（长径≤3cm），强化程度往往较低，CT 平扫及增强与其它类型肾细胞癌鉴别困难。

PU-0378
多模态 MRI 检查在产后胎盘植入的诊断价值分析

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目的 探讨多模态 MRI 检查的表现在产后胎盘植入的诊断价值。
方法 回顾性分析 17 例高度怀疑产后胎盘植入患者的临床资料。所有患者均行 MRI 平扫、DWI 及增强扫描，综合其影像征象与临床或术后病理对照，并对诊断效能进行统计学分析。
结果 以临床或手术病理为金标准，17 例患者中， 3 例为胎盘残留，未发生胎盘植入，磁共振全部诊断正确（3/3）；5 例为粘连性胎盘，磁共振将 1 例诊断为胎盘植入，其余全部诊断正确（4/5）；9 例证实为植入性胎盘，磁共振均诊断正确（9/9）；0 例证实为穿透性胎盘。
结论 磁共振平扫、DWI 及增强多模态成像能很好的显示产后胎盘植入及肌层受累情况，对产后胎盘植入的诊断有重要价值。

PU-0379
不典型子宫阔韧带平滑肌瘤 CT 和 MRI 诊断与病理对照分析

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目的 探讨不典型阔韧带平滑肌瘤(BLL)在高场 MRI 及 CT 中的影像学表现及其病理学基础，以提高 BLL 的诊断及鉴别诊断水
平。
方法 回顾性分析经手术病理证实的 18 例 BLL 患者的 MRI 或 CT 表现和病理资料。
结果 18 例不典型 BLL，6 例为 CT 检查，11 例为 MRI 检查，1 例同时做了 CT 和 MRI 检查。1 例以囊性成分为主，包绕不规则实性成分(实性成分 T2WI 呈高信号)，病理证实为平滑肌瘤伴脂肪花生；1 例周边 T2WI 明显环形高信号，病理为平滑肌瘤伴玻璃样变性；15 例呈混杂密度或信号，病理上肿瘤由较多平滑肌细胞构成，且细胞胞体大，合并水肿 2 例，玻璃样变 6 例，红色样变 1 例，粘液样变 2 例，5 例为平滑肌瘤。
结论 不典型 BLL 在 MRI 及 CT 上具有多种不典型的表现，熟悉其病理学基础有助于提高 BLL 的诊断与鉴别诊断水平。

PU-0380
纹理分析在 CT 增强扫描鉴别肾细胞癌亚型中的应用研究

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目的 探讨 CT 增强纹理分析鉴别透明细胞肾细胞癌(clear cell renal cell carcinoma，ccRCC)、乳头状肾细胞癌(papillary renal cell carcinoma，pRCC)和嫌色肾细胞癌(chromophobe renal cell carcinoma，ChRCC)的价值。

方法 回顾性分析经病理证实的 95 例 ccRCC、22 例 pRCC 和 17 例 ChRCC 患者资料，分别提取肾皮髓质期、实质期及延迟期增强 CT 肿瘤纹理特征，筛选后应用原始数据分析、主成分分析、线性判别分析和非线性判别分析方法进行分类分析，计算诊断准确率、敏感度、特异度及受试者工作特征曲线下面积(area under the curve，AUC)。
结果 增强 CT 纹理分析鉴别 ccRCC 与 pRCC 的诊断准确率、敏感度、特异度达 87.54%、90.89%、76.27% (AUC=0.826)；鉴别 ccRCC 与 ChRCC 的诊断准确率、敏感度、特异度达 94.60%、98.30%、85.24% (AUC=0.923)；鉴别 pRCC 与 ChRCC 的诊断准确率、敏感度、特异度达 78.49%、71.73%、85.24% (AUC=0.815)。非线性判别分析方法均获得较高的诊断效能(AUC 0.717～0.938)。
结论 增强 CT 纹理分析有助于鉴别 ccRCC、pRCC 和 ChRCC。

PU-0381

3.0 T 磁共振 3D CUBE T2WI 序列在 MR 移植肾成像中的应用

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目的 将 3D CUBE T2WI 序列应用于移植肾的 MR 常规扫描中，为移植肾评估提供依据。
方法 26 例肾移植术后患者，行冠位 3D CUBE T2WI 序列和常规轴位序列扫描移植肾，分别获取冠位 3D CUBE T2WI 序列扫描图像和常规 T2WI 序列扫描图像，分别获取移植肾常规轴位 T1WI 图像及 MRU 图像。
结果 1. 3D CUBE T2WI 序列较常规 T2WI 序列扫描移植肾，对肾实质显示优良率的差异无统计学意义（$p>0.05$）；2. 3D CUBE T2WI 序列较传统 MRU 序列扫描移植肾，对肾盂及输尿管显示优良率的差异无统计学意义（$p>0.05$）。
结论 在常规移植肾的扫描中，应用 3D CUBE T2WI 序列代替 T2WI 序列，在不影响肾实质病变显示的情况下，能够显示肾盂情况，从而为临床进行移植肾评估提供重要依据。此外 3D CUBE T2WI 无间断扫描可以减少病灶的遗漏，同时可对移植肾进行三维重建，测量体积，为移植肾评估提供可靠依据。

PU-0382

The value of the apparent diffusion coefficient in differentiating Type II From Type I Endometrial Carcinoma

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Objectives:To investigate the value of apparent diffusion coefficient (ADC) values in predicting patients with Type II endometrial carcinoma (EC), and to evaluate the diagnostic accuracy of ADC in differentiating type II from type I EC.
Materials and Methods: Ninety-four patients with endometrial carcinoma who underwent diffusion-weighted imaging (DWI) were retrospectively included and divided into type I and type II groups based on postoperative pathologic results. Clinical features, conventional MRI manifestations, mean ADC values (ADCmean), minimum ADC values (ADCmin), max ADC values (ADCmax) and standard deviation(SD) of ADC values were

analyzed. To differentiate type II from type I tumors, optimal ADC measurements were established. Receiver operating characteristic curve analysis was used to determine optimal cutoff values.
Results: The tumor size, endometrial status, ADCmean and ADCmin differed significantly between type I and type II EC. The area under the curve (AUC) values for ADCmean and ADCmin were 0.787 (95% CI, 0.692－0.882; P = 0.001) and 0.835 (95% CI, 0.751－0.919; P = 0.001), respectively, for predicting type II endometrial carcinoma. The optimal cut-off value of ADCmean and ADCmin for prediction were 0.757×10^{-3} mm^2/s (sensitivity: 91 %, specificity: 58%, and accuracy: 74%) and 0.637×10^{-3} mm^2/s (sensitivity: 82 %, specificity: 73%, and accuracy: 75%), respectively.
Conclusion: Endometrial carcinoma with lower ADCmean and ADCmin is suggestive of type II endometrial carcinoma. The ADC value may have the potential to differentiate type II from type I tumors.

PU-0383

腹膜后纤维化临床诊断

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腹膜后纤维化临床诊断
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目的 探讨腹膜后纤维化的临床表现及影像学特征，提高对此病的认识，提高早期诊断率、减少误诊率。
方法 收集我院经病理证实的 RPF 患者 10 例，详细分析其临床特点及影像学特征。10 例患者均行 CT 增强扫描；5 例行 MRI 检查；3 例行静脉肾盂造影检查。
结果 （1）10 例患者早期均表现为腰骶部或下腹部钝性疼痛不适，8 例患者出现邻近脏器受压，少尿、无尿症状。5 例患者实验室检查结果 IgG4、C 反映蛋白升高，2 例患者血沉增快。（2）影像学表现：9 例患者病变位于腹膜后，其中 7 例为肿块型，2 例为弥漫型，1 例位于骶前及髂动脉走行区。CT 平扫肿块型显示腹膜后密度均匀的软组织密度肿块，肿块大多与腹主动脉紧密相连,并包绕输尿管和下腔静脉，并可见双侧肾盂肾盏及输尿管扩张积液。弥漫型肾周脂肪囊内见弥漫分布的索条状、斑片状软组织密度影。增强扫描 7 例呈明显强化，2 例呈轻度强化。MRI 检查显示，4 例呈稍长 T1、稍长 T2 信号，增强扫描后病灶强化较明显；1 例呈等 T1、短 T2 信号。IVP 检查中 6 例患者表现为双肾及双侧中上段输尿管扩张积液，下段输尿管变细。
结论 影像学检查在发现病变方面具有重要价值，通过 CT 密度及 MRI 信号的不同表现，并结合临床检查，可以对疾病的分期和疗效提供参考。

PU-0384

前列腺癌多参数 MRI 检查与经直肠超声穿刺活检相关性研究

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目的　本研究的目的是确定活检前多参数核磁共振成像（mpMRI）检测前列腺癌的准确性，以评估我院标准 MRI 检查方案与经直肠超声（TRUS）活检在诊断前列腺癌的临床意义和临床意义上的敏感性和特异性。
方法　筛选 2016 年 1 月 1 日至 2017 年 12 月 31 日期间临床怀疑前列腺癌并行 3.0TMR 检查患者。要求患者既往没有确诊前列腺癌并行前列腺穿刺活检等有创性检查。针对临床高度怀疑前列腺癌或前列腺特异性抗原(PSA)水平明显升高患者行 TRUS 系统性穿刺。统计分析 mpMRI 检查和活检对前列腺癌检出的特异性及敏感性。
结果：共 165 名患者符合纳入标准： 103 例（62.4%）患者在 MRI 上检测到病变，其中 84 例经 TRUS 证实为前列腺癌（TRUS 穿刺证实总例数为 124 例）。MRI 对前列腺癌检出准确率为 64.2%。MRI 显示前列腺癌对前列腺 TRUS 活检的敏感性为 67.7%，特异性为 53.7%，阳性预测值为 81.2%，阴性预测值为 35.5%。同时，MRI 检出的病变与临床诊断显著的前列腺癌以及 NCCN 高风险分类相关（P<0.001）。MRI 检出 54 例 NCCN 高危患者中的 53 例，其中 14 例 Gleason 评分为 8-10 分。
结论：MRI 的敏感性和特异性似乎不足以在临床上避免所有男性的 TRUS 活检。对临床怀疑患有前列腺癌，需要标准化的 MRI 检查和综合临床其他资料来进行综合分析。

PU-0385
子宫平滑肌肉瘤恶性潜能预测：CT 与临床病理特征相关性研究

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目的　分析子宫平滑肌肉瘤（uLMS）CT 增强强化程度与 Ki-67 增值指数是否具有相关性。
方法　回顾性分析 14 例 uLMS 的临床表现、CT 特点、肿瘤标志物及病理特点，所有病例均经过病理证实。本文分析 uLMS CT 增强强化程度与 Ki-67 增值指数的相关性。
结果　uLMS 实性成分 CT 呈中度至明显强化，且与 Ki67 增殖指数具有明显的相关性 (p ＜ 0.05)。 另外，大部分病人 CA125 值明显升高，且 Desmin 及 SMA 表达阳性。
结论　对于 uLMS CT 强化程度及 Ki67 增值情况可能可以预测其恶性转化过程，CA125 升高也能预测 uLMS 的恶性程度。

PU-0386
T2-tirm 序列对卵巢子宫内膜异位囊肿的诊断价值

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目的　探讨 T2-tirm 序列对卵巢子宫内膜异位囊肿的诊断价值。
方法　回顾性分析 66 例（83 个病灶）经手术病理证实为卵巢囊性病变，且行盆腔 MRI 扫描的患者，根据病理结果将患者分为卵巢子宫内膜异位囊肿组（A 组，29 例 43 个病灶）和其它卵巢囊性病变组（B 组，37 例 40 个病灶）。患者均行盆腔横轴面 T1WI、T2WI、T2-fs、冠状面 T2-tirm、横轴面、冠状面、矢状面脂肪抑制 T1WI 增强序列检查，采用 X^2 比较两组病灶 T2-tirm 低信号。
结果　A 组病灶 T2-tirm 低信号阳性率为 95.35%，B 组病灶 T2-tirm 低信号阳性率为 2.50%，两组病变的 T2-tirm 低信号差异具有统计学意义（P＜0.01）。
结论　T2-tirm 序列对于鉴别卵巢子宫内膜异位囊肿与其它附件囊性病灶具有很高的应用价值。

PU-0387

Assessment of embolization effect with temperature-sensitive nano-gel p(N-isopropyl-acrylamide-co-butyl methylacrylate) in rabbit renal artery by CT perfusion and pathology

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Objective: To assess the effect of embolization with new temperature-sensitive nano-gel p(N-isopropyl-acrylamide-co-butyl methylacrylate) (PIB) in rabbit renal artery by CT perfusion and pathology, and evaluate the feasibility of the nano-gel as a blood vessel embolization agent.
Methods: Ten healthy adult Japanese rabbits received right renal arterial embolization with PIB hydrogel. CT perfusion scans were performed pre and post-treatment at different time points(1, 4, 8, and 12 weeks), two rabbits were euthanized and received histological examinations each time, and the remaining rabbits were sacrificed at 12 weeks after the embolization. The efficacy was further confirmed by a pathological examination after the CT perfusion.
Results: Significant differences were found in renal volume ($P < 0.05$) and renal blood flow ($P < 0.05$) between the right kidney pre- and post-treatment during the 12-week CT re-examination. No recanalization or collateral circulation was observed in the right kidney during this period for PIB dispersed blood all levels of vessels. The CT perfusion outcome showed the change of kidneys in different time, similar to the pathological result.
Conclusion: CT perfusion imaging and pathological examination show the changes of right kidney before and after embolization from renal morphology, the quantification of right renal blood flow, as well as histocyte. It indicated the effect of embolization with PIB was good not only dispersion but also permanency, which supported PIB is a good blood vessel embolic material.

PU-0388

多排螺旋 CT 上肢血管造影对血液透析自体动静脉内瘘评估的临床意义

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动静脉内瘘形态改变是影响透析的首要原因，及早发现能改善血液透析，同时延长内瘘使用寿命。我们采用多排螺旋 CT 血管成像评估动静脉内瘘形态，取得较好的效果

、对象和方法

I.病例资料：维持性血液透析（MHD）患者 40 例，男女各 20 例，年龄 23-80 岁，平均 63 岁；每周透析 2-3 次。内瘘使用时间平均 21.3 个月；34 例吻合口位于腕部；6 例吻合口位于鼻烟窝。40 例患者共进行 59 次 CT 血管重建检查，原因为内瘘功能不良 31 例次；可疑狭窄 18 例次；血管瘤形成 5 例次；使用前检查 5 例次。
2．CT 血管重建**方法** 采用 GE 64 层螺旋 CT （Discovery 750 HD），扫描条件为 100 kV，120-250 mA，层厚 1.25 mm，螺距 0.975。用高压注射器自非内瘘侧肘前静脉或颈外静脉以 3-3 • 5 ml/s 注入 300 mgI/ml 的碘海醇 60 ml，延时 25、30 s 扫描。扫描范围从吻合口到胸廓入口。数据通过 GE ADW4.4 工作站进行处理分析。
结果
所有病例内瘘动脉吻合口和引流静脉均显示清晰。3 例次无异常；26 例次吻合口狭窄；4 例次引流静脉狭窄；5 例次吻合口和引流静脉同时狭窄；21 例次动脉狭窄。动脉或引流静脉狭窄表现为串珠样或线状狭窄；狭窄远端的血管可局部扩张，扩张部位和狭窄段形成明显的分界，部分显著扩张的血管伴有明显的迂曲。临床根据 CTA 检查结果，对 33 例患者制订了相应的手术干预方案。术中，发现 CTA 定位准确，直视血管狭窄程度和范围与 CTA 检查结果相符。
讨论
本研究证实，多排螺旋 CT 血管成像应用于内瘘的形态检查可以从不同的角度、直观和完整地评价内瘘的形态，能发现隐蔽的问题，对异常内瘘的处理有积极的指导意义。内瘘形态异常不仅表现为狭窄还表现为瘤样扩张，这与目前采用的动静脉内瘘的穿刺法有关。为减少造影剂的损害，在 CT 血管重建后立即进行血液透析治疗排出造影剂。

PU-0389

探讨 MSCT 的 CTU 的临床应用价值

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目的 探讨 CTU 的临床应用价值，提高泌尿系统疾病诊断率
方法 用曲面成像可以显示泌尿系统影像，并针对重点部位进行手动操作，沿泌尿系统走行进行重建，即肾脏（起始端）向膀胱（终端）进行，重建曲线位置要求必须位于泌尿系统脏器的长轴中心位置，以保证肾脏、输尿管、膀胱的完全、无偏差的全程显示。
结果 1、泌尿系结石：显示结石的位置、大小、数目及形态，主要呈高密度影，周围管壁水肿增厚，梗阻端以上输尿管腔内对比剂充盈较差伴梗阻性积水；患侧肾功能较对侧差，肾周有渗出改变。2、输尿管狭窄：显示狭窄位置；输尿管节段性狭窄、扭曲变形，伴尿路扩张积水。3、肾脏、输尿管肿瘤：显示病变本身的范围，位置和近段扩张积水的输尿管；输尿管腔内软组织影，管壁不规则增厚，有异常强化，周围脂肪间隙不清，伴输尿管梗阻。4、外压性病变致输尿管扩张：输尿管、膀胱外的病变使输尿管受压移位伴同侧肾积水。5、感染性疾病：肾及输尿管结核等显示肾及输尿管全程形态，肾实质内有空洞形成与肾盏相通，肾盂输尿管壁广泛不规则增厚，异常强化，输尿管腔不规整，管腔节段性狭窄与扩张并存。6、先天性改变：肾盂、输尿管畸形，MSCTU 可以显示肾及输尿管全程形态。
结论能及时准确的显示梗阻性泌尿系统病变，明确显示积水扩张的肾盂、肾盏、输尿管等主要表现，并进一步明确梗阻端的病因（先天性、感染性病变、肿瘤性病变、结石性病变、外压性等），并且具有检查时间短、检查费用容易被病人接受确等优点。

PU-0390

CT 诊断腹壁子宫内膜异位症

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目的 研究腹壁子宫内膜异位症的 CT 表现，以提高对此病的诊断水平。
方法 回顾性分析 8 例经手术病理证实的腹壁子宫内膜异位症的 CT 平扫及增强影像资料。
结果 8 例腹壁子宫内膜异位症，年龄 30-39 岁，平均年龄 32.5 岁。8 例均有明确手术史，7 例行剖宫产手术，1 例行肝血管瘤手术。其中 2 例腹壁肿块会随经期有所变化并伴有疼痛。最大者大小 35mm×25mm，最小者大小约 8mm×7mm。病变均位于前腹壁，手术切口位置或附近。3 例位于皮下脂肪层，5 例位于腹壁肌肉内或与肌肉分界不清。平扫表现为等密度灶，增强扫描轻度均匀强化，强化幅度略高于周围肌肉组织。本病需与炎症包块、腹壁纤维组织肿瘤等鉴别。炎症包块局部及全身症状明显，无周期性表现，平扫呈略低密度包块，形成脓肿后，可见环状增强。纤维组织肿瘤以韧带样瘤多见，表现与本病类似，为单发或多发等密度肿块，但增强扫描时肿块只有轻度增强，可有囊变，临床症状轻或无。此外还应与纤维瘤、疤痕瘤等相鉴别。
结论 CT 检查能发现腹壁子宫内膜异位症，但缺乏特异性表现，诊断必须密切结合临床。

PU-0391

Ⅰ型和Ⅱ型乳头状肾细胞癌的影像表现特点

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目的 探讨Ⅰ型和Ⅱ型乳头状肾细胞癌(papillary renal cell carcinoma,PRCC)的 CT 表现的差异性。
方法 回顾性分析 2010 年 1 月至 2019 年 1 月经手术病理证实的 31 例 PRCC 患者资料，其中Ⅰ型 19 个病灶，Ⅱ型 12 个病灶。所有患者术前均行肾脏 CT 平扫及动态增强检查。收集患者基本临床信息、病灶的最大径、生长方向、平扫及增强的密度（＜20HU，20-40HU，＞40HU）、是否有包膜、钙化、囊变坏死、出血以及病灶的外侵情况，如是否侵犯肾窦、淋巴结及静脉。统计学**方法** 采用独立样本 t 检验对患者年龄、病灶最大径进行比较；采用卡方检验对病灶的分类特征进行比较。
结果 Ⅰ型、Ⅱ型 PRCC 平均年龄，性别，病灶大小，是否钙化、出血，平扫密度，有无包膜均无统计学差异（P＞0.05）；Ⅱ型 PRCC 的强化程度较Ⅰ型高(χ2=23.4，P=0.000)。Ⅱ型 PRCC 的囊变较Ⅰ型常见(χ2=10.8，P=0.002）。在生长方向方面，Ⅱ型 PRCC 更易向肾盂方向生长，Ⅰ型更易向肾轮廓外生长，二者（(χ2=8.3，P=0.007）；在肿瘤外侵表现方面，Ⅱ型较Ⅰ型 PRCC 更易发生淋巴结转移、肾窦侵犯以及静脉癌栓形成(P<0.05)。
结论 Ⅰ型和Ⅱ型 PRCC 在病灶强化、囊变、生长方向及肿瘤外侵情况上有一定差异，Ⅱ型 PRCC 更易囊变、强化更明显、具有向肾盂方向生长的趋势，并且更具有侵袭性以及更易发生转移。

PU-0392

肾上腺外副神经节瘤的 CT 影像表现

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目的 探讨肾上腺外副神经节瘤的 CT 影像表现特点，提高其诊断准确率。

方法 回顾性分析经病理确诊的 15 例肾上腺外副神经节瘤的部位、大小、密度、增强特点、有无钙化及囊变坏死，探讨 CT 诊断肾上腺外副神经节瘤的的价值。
结果 男 11 例，女 4 例，年龄 13-61 岁，平均年龄 38 岁，3 例肿瘤位于腹膜后占(3/15)，2 例位于左侧腹膜后，1 例位于骶前正中腹膜后；6 例位于头颈部占（6/15），均位于颈动脉体部，其中 2 例为双侧颈动脉体均可见病变；3 例位于内脏占（3/15）(2 例位于膀胱，1 例位于膀胱右侧壁，1 例位于膀胱后壁；1 例位于右下肺)，1 例（1/15）位于右后纵隔；1 例位于肝门区；1 例（1/15）为左侧颈动脉体、纵隔及肝脏多处病变。肿瘤以囊实性为主，与周围组织分界清晰，平扫肿瘤密度不均匀，增强扫描实性部分明显强化。最大径小于 30mm 肿瘤密度较均匀，无液化、坏死，无钙化，最大径大于 30mm 肿瘤均出现不同程度囊变、坏死，肿瘤越大，囊变坏死越明显，部分肿瘤内出现斑点钙化。
结论 肾上腺神经节细胞瘤的 CT 表现具有一定特征性，在肿瘤的定位、定性诊断及血供特点、浸润程度及鉴别诊断方面可互相补充,对肾上腺外副神经节瘤患者临床术前诊断具有重要价值。

PU-0393

To Explore the Optimal Concentration of Contrast Agent for CT Peritoneography and Evaluate its Safety

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Objectives This study is aimed to find the contrast protocol with appropriate concentration, which could result in best peritonaography and in the mean time, have minimal side effects on the residual renal function.
Material Sprague-Dawley uremic rats were divided into five groups for peritoneography injected with 40ml different contrast concentration (group A: 0mL/2L; B: 25mL/2L; C: 50mL/2L; D:75mL/2L; E:100mL/2L, n=5 for each group). And the ratio of the concentration was calculated as: iohexol/peritoneal dialysate. After 30 minutes of the injection, CT peritoneography was performed. And the quality of peritoneography were blindly graded in a nine-point scale by two experienced radiologists in terms of the depiction of abdominal organs and cavity. The residual renal function was decided as rat serum creatinine value and the hematoxylin and eosin (HE) staining of the residual renal. And peritoneal morphology and thickness was also assessed by HE and Masson staining. And the values before and after the procedure were both recorded for all parameters mentioned above. ANOVA and wilcoxon sign rank test were used to do the comparison. Intra-class correlation was used to assess the agreement between readers.
Results Uremic rat model was successfully established. The rating of quality on CT peritoneography images was 6.90±0.82 for group C, which was the highest (Group A: 2.40±0.42/ B:4.10±0.42/ D:4.30±1/ E:2.50±0.35, all $p<0.0001$, respectively). As demonstrated, along with increase concentration of the contrast, cell and peritoneal thickness significantly increased. There was no statistically significant change in serum creatinine and HE staining of the residual renal before and after CT peritoneography procedure.
Conclusions At the concentration of 50ml/2L, the preference of CT peritoneography image for both reader is the highest. Furthermore as shown, the thickness of the peritoneum and the number of cells increase along with the increase of concentration.

Thus in order to obtain the best image with minimal effect on the peritoneum, 50ml/2L might be suggested to use as a standard contrast protocol in the study.

PU-0394

泌尿系统类癌的 CT 与 MRI 表现

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目的 探讨泌尿系统原发类癌的 CT 与 MRI 表现，加强对该病的认识。
方法 搜集 4 例经手术病理证实的泌尿系统类癌的临床、影像及病理资料，3 例行 CT 平扫及增强，另外 1 例行 MRI 平扫及增强检查。 结果 右肾类癌 3 例，膀胱类癌 1 例，其中 3 例边界清楚，1 例边界欠清，平扫肿块呈实性（1/4）或囊实性（3/4）密度/信号，增强扫描动脉期（皮质期）3 例明显强化，1 例轻度强化，静脉及延时期（实质期及排泄期）3 例出现延迟强化，1 例为持续性强化。
结论 泌尿系统类癌肾临床上很罕见，影像上多以实性肿块或囊实性肿块形式存在，密度/信号均匀或不均，内有钙化，增强扫描动脉期明显强化，静脉及延时期持续性或延迟性强化,并且出现心血管或胃肠道等临床症状时，可以考虑类癌可能，但确诊任靠病理诊断。

PU-0395

Leiomyomatosis peritonealis disseminata: A case report and review of the literature

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Leiomyomatosis peritonealis disseminata(LPD) is a rare smooth muscle pathology, characterized by the presence of multiple tumors inperitoneal cavity mimicking a malignant process with metastases. The diagnosis may be difficult in some cases as the results of ultrasonography and MR imaging may suggest malignancy. The final diagnosis was made on biopsy and pathologic examination performed during surgery. Exposure to estrogens probably plays the main etiologic role. In this report we describe the diagnostic difficulties and the clinical course of LPD in 43 year old women. The surgical treatment consisted on hysterectomy and removal of multiple nodules located in intestinal serosa. This report documents the image findes of MRI and review of the literature, objective to further improve the recognition of image manifestation in LPD.

PU-0396

The Diagnostic Value of Intravoxel Incoherent Motion Diffusion-Weighted Imaging in Different Histological Types of Cervical Carcinoma

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Objective. To explore the diagnostic value of intravoxel incoherent motion diffusion-weighted imaging (IVIM-DWI) for different histological types of cervical carcinoma.
Methods. 101 patients with pathologically proved (cervical squamous cell carcinoma, 87; cervical adenocarcinoma, 11; cervical small cell carcinoma, 3) underwent the IVIM-DWI examinations with 10 b values (b = 0, 10, 20, 50, 100, 200, 400, 800, 1200, 2000 s/mm^2), obtaining the ADC_{stand}, D, D* and f values. All variables were analyzed by the steps of normality test, homogeneity test for variance, analysis of variance or nonparametric test. Then the receiver operating characteristic curve was extracted.
Results. For different histological types of cervical carcinoma, the comparison of ADC_{stand} and D values reached statistically significant differences ($p<0.05$). The cut-off values of ADC_{stand} and D values between cervical squamous cell carcinoma and cervical adenocarcinoma were $0.75*10^{-3}$ mm^2/s and $0.66*10^{-3}$ mm^2/s , and the sensitivity, specificity and the area under the curve(AUC) were 59.8%, 100%, 0.812 and 88.5%, 90.9%, 0.929, respectively. The cut-off values of ADC_{stand} and D between cervical squamous cell carcinoma and cervical small cell carcinoma were $0.61*10^{-3}$ mm^2/s and $0.49*10^{-3}$ mm^2/s, and the sensitivity, specificity and the AUC were 90.8%, 100%, 0.962 and 65.5%, 100%, 0.807, respectively.
Conclusion. The ADC_{stand} and D values had better diagnostic value than D* and f values for differential diagnosis of histological types of cervical carcinoma. Furthermore, IVIM-DWI might provide non-invasive and quantitative molecular imaging basis to evaluate different histological types of cervical cancer, and it may be helpful to the individual treatment.

PU-0397
CT 值对肾上腺嗜铬细胞瘤和肾上腺乏脂肪腺瘤的鉴别诊断价值

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目的 探讨各期 CT 值对肾上腺嗜铬细胞瘤和肾上腺乏脂肪腺瘤的鉴别诊断价值。
方法 回顾 33 例肾上腺嗜铬细胞瘤和 32 例肾上腺乏脂肪腺瘤（平扫 CT 值>15HU）病例，测量其各期 CT 值，利用箱型图和 ROC 曲线进行比对分析，分别选取了平扫（29HU、34HU、39HU）、动脉期 67HU、门脉期（87HU、97HU）、延迟期（70HU、74HU、79HU），作为诊断参考阈值，≥阈值即可诊断为肾上腺嗜铬细胞瘤，得出相应 AUC 值及灵敏度、特异度。
结果 以平扫 CT 值≥34HU 诊断效果最优，AUC 值 0.922、灵敏度 100%、特异度 84.375%，其次也可参考延迟期 CT 值≥70HU 的诊断结果，其 AUC 值 0.859、灵敏度 100%、特异度 71.875%。
结论 肾上腺嗜铬细胞瘤与肾上腺乏脂肪腺瘤影像学表现有重叠，参考平扫 CT 值≥34HU 及延迟期 CT 值≥70HU 提示嗜铬细胞瘤的诊断有一定的价值，有助于提高肾上腺嗜铬细胞瘤的诊断符合率。

PU-0398
不同类型乳头状肾细胞癌的 CT 表现及其差异

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目的 探讨Ⅰ型和Ⅱ型乳头状肾细胞癌(papillary renal cell carcinoma，PRCC)的CT表现及其差异。 方法 回顾性分析经手术病理证实的27例PRCC患者资料，其中Ⅰ型10个病灶，Ⅱ型17个病灶。所有患者术前均行肾脏CT平扫及动态增强检查。对PRCC的形态学特征、肿瘤外侵征象、增强CT表现进行定性和定量分析。采用独立样本t检验对病灶最大径、三期CT值及皮髓交界期△CT、实质期△CT进行比较；采用Pearson x^2检验或Fisher确切概率法对分类变量进行比较。
结果 一般形态学上，Ⅱ型PRCC平均最大径大于Ⅰ型(t=一2.504，P=0.012)，密度更不均匀(x^2=15.318，P=0.000),更易出现囊变或坏死(x^2=5.628，P=0.016)，且程度更明显(x^2=4.296，P=0.027)；在CT图像上，两型之间出血和钙化征象的差异均无统计学意义。在肿瘤外侵表现方面，除边界征象外，Ⅱ型较Ⅰ型PRCC更易发生肾周脂肪侵犯、‘肾窦侵犯及转移(P<0.05)。在增强CT表现方面，两型在皮髓交界期CT值、皮髓交界期△CT 的差异均有统计学意义(t=一2.562，P=0.014；t=一3.203，P=0. 006)，而在平扫期CT值、实质期CT值、实质期△CT上的差异均无统计学意义。结论 Ⅰ型和Ⅱ型PRCC在形态学特征、肿瘤外侵征象及强化程度上有一定差异，部分Ⅱ型肿瘤具有侵袭性生物学行为，预后更差。

PU-0399
磁共振及弥散加权成像对卵巢颗粒细胞瘤的诊断价值

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目的 分析卵巢颗粒细胞瘤的MRI及DWI(弥散加权成像)特点，以提高对其的断价值。
方法 回顾性分析经手术证实的14例卵巢颗粒细胞瘤患者的临床及MRI影像资料，对所有病例行常规MRI及DWI（b=0，800）检查，并行增强扫描。
结果 本组14例患者，仅3例合并子宫内膜增厚。其中幼年型卵巢颗粒细胞瘤(OAGCT)3例，成年型卵巢颗粒细胞瘤(OJGCT)11例。囊性2例，囊实性11例，实性1例。实性成份T1WI呈等或稍高信号，T2WI呈稍高或等信号，DWI上呈不同程度高信号；囊性成份因囊液性质不同T1WI呈低等或稍高信号，T2WI呈高信号，DWI上部分囊液呈等或稍高信号，部分呈低信号，以低信号为主；增强扫描实性部分中等-明显强化，囊性部分未见强化。其中13例肿瘤囊变区均可见数量不等的出血信号，1例实性肿瘤未见明确出血信号。
结论 卵巢颗粒细胞瘤的临床特点可不典型，但具有特征性MRI表现，以囊实性居多，且均有不同程度出血信号，有助对其做出较为准确的术前诊断。

PU-0400
Primary vaginal Ewing sarcoma with uterine fibroid:A case report

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Background: Extra osseous Ewing sarcoma (ES) , an uncommon malignant neoplasm ,account for about 25% of Ewing sarcoma, and mainly affects paravertebral region, lower extremity, chest wall, retroperitoneum, pelvis, and hip. Here is a rare case of primary vaginal Ewing sarcoma with uterine fibroid,the imaging findings of which have been fewly known or reported.
Case presentation: A 54-year-old woman was admitted to our hospital due to complaints of pain in the vagina.The uterus showed as parallel position and enlarged as about 3 months of pregnancy size,with no tenderness.Magnetic resonance imaging(MRI) and ultrasonography(US) demonstrated 2 large, heterogeneous masses in the vagina and uterus,respectively. Ultrasound-guided puncture biopsy revealed a malignant tumor in the right lateral vaginal wall. The patient was treated by hysterectomy,bila-teral salpingo-oophorectomy and tumors excision,with the subsequent treatment of chemotherapy. The patient has been closely followed-up after discharge.
Conclusions: Primary vaginal Ewing sarcoma is extremely rare.Few literatures have been found concerning the imaging appearance of the tumor. Vaginal ES and uterine fibroid have certain manifestations and imaging features in MRI and US, but not specific. Ultrasound-guided puncture biopsy is useful to confirm the pathologic diagnosis.The treatments of uterine fibroid include uterine artery embolization and surgical options ,While wide local excision followed by adjuvant chemotherapy and/or radiotherapy is recommended for the vaginal ES.

PU-0401

左肾上腺神经束膜瘤 1 例 CT 表现及文献复习

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目的 报道 1 例罕见肾上腺神经束膜瘤，探讨其影像学表现及组织病理学特点，提高对该病的认识。方法 回顾分析左侧肾上腺神经束膜瘤的 CT 表现及病理学特点。仔细阅读其 CT 平扫及增强扫描影像学资料，同时通过矢状位、冠状位多平面成像多方位观察神经束膜瘤的影像学特点，分析、总结本病例的影像学表现。结果 男性患者，50 岁，左侧肾上腺结合部结节，边界清楚，密度均匀，平扫 CT 值约 14HU，动脉期 CT 值约 38HU，静脉期 CT 值约 80HU，延迟期 CT 值约 76HU；镜下见良性梭形细胞；免疫组化 VIM（+），EMA（+），Ki67（+）。结论 神经束膜瘤是一种罕见的良性肿瘤，常发生于外周神经。神经束膜瘤影像学表现报道较少，还有待更多病例进一步分析、总结。发生于肾上腺的神经束膜瘤应与肾上腺腺瘤、神经鞘瘤等鉴别。

PU-0402

128 层螺旋 CT 在透析患者上肢 CT 血管成像中的临床应用价值

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目的 研究 128 层螺旋 CT 在透析患者上肢 CT 血管成像中的临床应用价值。

方法 回顾性分析 30 例患者的 64 层 CT 图像（64 层组）与 39 例患者 128 层 CT 图像（128 层组），对扫描数据进行三维重建后比较两组患者的动脉分支级别、血管边缘、静脉干扰评分及瘘口显示情况的差异。
结果 128 层组前臂与手部动脉分支级别显示评分高于 64 层组，差异有统计学意义（P<0.05）；128 层组肩部、上臂及前臂的血管边缘光滑度显示评分高于 64 层组，差异有统计学意义（P<0.05）。
结论 128 层螺旋 CT 在透析患者上肢血管成像中血管、内瘘口以及流入流出道等细节方面显示效果更理想。

PU-0403
扩散张量成像和血氧水平依赖性磁共振成像在碘海醇诱导家兔双侧肾功能评估中的应用

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背景
扩散张量成像（DTI）和血氧水平依赖（BOLD）磁共振成像（MRI）序列用于评估兔子模型中碘海醇肾动脉注射的双侧肾扩散，各向异性和氧合作用。
方法
将 42 只新西兰白兔分成两组。通过右肾动脉给予盐水和碘海醇（1g 碘/ kg，1ml / 秒）。在基线和给药后 1,24,48 和 72 小时纵向获取 MR 图像，以分别评估表观扩散系数（ADC），分数各向异性（FA），相对横向弛豫率（R2 *）。在每个时间点进行 MR 扫描后，在每组中处死 3 只兔子并评估血清肌酸酐，组织学和缺氧诱导因子-1α（HIF-1α）免疫表达的变化。
结果
给予碘海醇 24 小时后，ADC 和 FA 值显着下降（P <0.05），而 R2 *值在皮质（CO），外髓质（OM）和内髓（IM）中显着增加（P <0.05），右肾的变化比左肾明显。在 CO，OM 和 IM 中，ADC，FA 和 R2 *之间观察到显着的负相关（所有 P <0.001，r = -0.654-0.828）。
结论
DTI 和 BOLD 可以同时和非侵入性地评估双侧肾脏中不同程度的造影剂引起的急性肾损伤（CI-AKI）。

PU-0404
双肾粘液性纤维瘤一例

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临床病史 患者因“双下肢乏力 3 月”入院，患者于 3 个月前开始无明显诱因开始出现双下肢乏力，当时无明显下肢麻木，无行走不稳，无跛行，休息后未见明显好转，外院腹部彩超示：肝内多发实性团块，考虑为血管瘤可能，双肾包膜下异常回声，考虑为实性占位性病变，右肾结石，右肾小囊肿。肾功能：肌酐：133.9umol/L，UA：757umol/L,CO2:29.5mmol/L；肝功能：白蛋白

35.5g/L；血脂：甘油三酯：2.39mmol/L,总胆固醇：4.78mmol/L,低密度脂蛋白胆固醇：4.04mmol/L。外院泌尿系 MR 检查示：双肾淋巴瘤可能性大，不排除其他结构复杂黄色肉芽肿等其他病变可能。我院泌尿外科住院治疗。由于肾动、静脉与占位关系密切，患者接受了保守治疗并定期随诊复查。截止到目前，患者情况稳定。

PU-0405

肾占位性病变的 CT 诊断分析

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目的 分析肾占位性病变的 CT 表现,探讨 CT 对肾占位行病变的鉴别诊断价值。
方法 回顾性分析经对手术证实的 50 例肾占位性病变的影像表现，所有病例均行 CT 平扫和增强扫描。
结果 肾透明细胞癌 24 例，乳头状肾癌 6 例，嫌色细胞癌 4 例，肾血管平滑肌脂肪瘤 12 例，嗜酸细胞腺瘤 2 例，纤维肉瘤 1 例，肾炎性假瘤合并化脓性炎症 1 例。不同肾占位病变 CT 表现不同。
结论 CT 平扫及增强扫描对典型的肾脏占位性病变具有重要诊断及鉴别诊断价值。

PU-0406

肾上腺罕见疾病的影像学诊断

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目的 分析 6 种肾上腺罕见疾病患者的临床资料及影像学表现，旨在增强对该类罕见疾病的认识，提高其术前诊断的准确性。
方法 回顾性分析 27 例经病理证实的 6 种肾上腺罕见疾病的临床及影像学资料，包括肾上腺结核、21-羟化酶缺陷症、肾上腺节细胞神经瘤、肾上腺皮质嗜酸细胞腺瘤、肾上腺淋巴瘤及肾上腺皮质腺癌。
结果 23 例患者病灶为单发,18 例为功能性，其中血压增高者 16 例。21 例患者病灶为良性，多呈椭圆形或类圆形，边界清楚，6 例恶性，其中 1 例侵犯邻近下腔静脉。
肾上腺结核：有 TB 病史，根据影像学病灶有无环形强化、钙化推测病程长短指导临床治疗；
21-羟化酶缺陷症是先天性肾上腺皮质增生的一种最常见类型，根据实验室检查确诊，患者临床可伴有两性畸形，影像学表现为肾上腺增生或肾上腺髓质脂肪瘤；
肾上腺节细胞神经瘤影像学特点为嵌入式生长，密度低，渐进性强化；
肾上腺皮质嗜酸细胞腺瘤表现为出血、坏死少见，星芒状强化；
肾上腺淋巴瘤表现为钻缝样生长，轻度强化，伴有肿大淋巴结，穿刺活检确诊；
肾上腺皮质腺癌表现为体积大，好发出血及坏死，钙化，邻近侵犯，远处转移。
结论 肾上腺罕见疾病具有一定的影像学特征,与临床特点相结合,能提高此类疾病术前诊断的准确性。

PU-0407

左侧肾上腺淋巴结 Castleman 病 1 例

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Castleman 病又称巨大淋巴结增生症或血管滤泡性淋巴组织增生，由 Castteman 于 1954 年首先报告[1]，是一种介于良、恶性之间的不典型淋巴结增生症。

病史摘要

患者，男性，39 岁，慢性病程；2 年前患者无明显诱因出现左侧腰部胀痛不适，呈间歇性胀痛不适，休息可缓解，无发热、畏寒，无胸闷、气促，无血尿、脓尿等不适，因疼痛不严重，未予作检查治疗，近期患者感上述症状加重。既往有半年高血压病史，一直口服药物（降压灵）降压治疗，自诉血压控制尚可。否认冠心病、肾病等慢性病史，否认肝炎、伤寒、结核、疟疾等传染病史；预防接种史：不详；过敏史：否认；外伤史：否认；输血史：否认。

PU-0408
多层螺旋 CT 在女性盆腔非生殖源性肿块定位诊断中的价值

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目的 探讨多层螺旋 CT 在女性盆腔非生殖源性肿块定位诊断中的价值。

方法 回顾性分析我院 26 例经手术病理证实盆腔非生殖源性肿块患者的术前多层螺旋 CT（MSCT）资料，重点观察肿瘤供血动脉来源（看血供）、肿块中心位置以及与肿块与周围邻近器官的关系（看细节）及病侧正常卵巢显示情况（看病侧卵巢），评估上述征象在非生殖源性肿瘤定位诊断中的价值。

结果 26 例盆腔肿块中，其中胃肠道间质瘤 12 例，小肠黑色素瘤 1 例，小肠未分化圆形细胞肉瘤 1 例、乙状结肠癌肉瘤 1 例，直肠梭形细胞肿瘤 1 例 ，直肠高分化肉瘤 1 例，乙状结肠粘液纤维肉瘤 1 例，神经源性肿瘤 3 例，阑尾粘液囊腺瘤 2 例，盆腔小圆细胞型恶性肿瘤 2 例，盆腔腹膜恶性间皮瘤 1 例，根据供血动脉判断病灶起源准确性为 75%（20/26），肿块中心位置以及与周围器官的关系判断病灶起源的准确性为 80%（21/26），病变侧正常卵巢显示对非卵巢源性肿瘤判断的准确性为 54%（14/26）。

结论 MSCT 能清楚显示肿块供血动脉，判断肿块与周围毗邻结构的关系及病侧正常卵巢显示情况，综合运用三个指标（病变细节、血供、病侧卵巢）对肿瘤起源的判断具有重要意义。

PU-0409
能谱 CT 虚拟平扫技术在 CT 泌尿系造影检查中的 应用价值探讨

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目的 探讨宝石能谱 CT 虚拟平扫技术（Virtual Non-Contrast scan，VNC）在 CT 泌尿系造影检查中的应用价值。

方法 选取 2018 年 6 月至 2019 年 2 月我院门诊疑泌尿系梗阻病变到我科行 CTU 的病人 80 例，随机均分为 A、B 两组。A 组行常规 CTU 扫描：真实平扫（TNC）、动脉期、实质期、延时期。B 组动脉期使用 GSI 扫描模式，其他时相均扫描与 A 组相同。比较 A、B 两组的总有效辐射剂量、A 组与 B 组增强三期有效辐射剂量、B 组内 TNC 图像和 VNC 图像的图像质量。以同一部位的图像信噪比(Signal to Noise Ratio，SNR)和对比噪声比(Contrast to Noise Ratio，CNR)作为客观图像质量评价标准，主观图像质量评价由 3 名高、中、初级放射科医师对总体图像质量、锐利度、噪声、病灶显示情况 4 个方面进行双盲评估。利用 SPSS 软件对实验结果进行统计学分析。
结果 B 组总有效辐射剂量（31.39±1.74）mSv 高于 A 组总有效辐射剂量（24.66±0.97）mSv（P＜0.001），但 B 组应用 VNC 的增强三期总有效辐射剂量（20.18±1.56）mSv 显著低于 A 组总有效辐射剂量（P＜0.001）；图像质量的客观评价中，TNC 和 VNC 的 SNR 无统计学差异（4.82±0.55 和 4.69±0.44，P=0.08），CNR 亦无统计学差异（2.62±0.46 和 2.50±0.37，P=0.21）。图像质量的主观评价中，VNC 的整体图像质量、噪声水平、病灶显示情况与 TNC 图像比较均无统计学差异（P＞0.05）；但 VNC 图像的锐利度不如 TNC 图像的锐利度，差异有统计学意义（P=0.02）。
结论 在泌尿系梗阻性病变的 CTU 检查中，能谱 CT VNC 能替代 TNC，其不仅能满足临床诊断的需求，还能大大减少患者所受的辐射剂量，缩短检查时间，具有较大的临床应用价值。

PU-0410

动态数字化 DR 在泌尿系结石中的诊断价值

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目的 探讨动态数字化 DR 在泌尿系结石中的诊断价值。
方法 于 2015 年 1 月到 2016 年 1 月间，在我院选取 90 例泌尿系结石患者作为研究对象，对所有患者进行动态数字化 DR 和常规腹部 X 线检查，对比两种检测方法的检测效果。
结果 90 例泌尿系结石患者实际结石状况为：肾结石 24 例，输尿管结石 38 例，尿路结石 28 例。动态数字化 DR 检测结果为：肾结石 23 例，输尿管结石 36 例（35 例符合），尿路结石 26 例。动态数字化 DR 检测检出率为 93.3%。常规腹部 X 线检测结果为：肾结石 24 例（22 例符合），输尿管结石 40 例（30 例符合），尿路结石 26 例（14 例符合）。动态数字化 DR 检测检出率为 73.3%。动态数字化 DR 检测泌尿系结石检出率与常规腹部 X 线检测相比明显较高，P＜0.05。
结论 动态数字化 DR 检测泌尿系结石效果显著，结石检出率高，可在泌尿系结石诊断中推广运用。

PU-0411

子宫瘢痕早期妊娠的比较影像学分析

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目的 比较子宫瘢痕早期妊娠的磁共振成像、超声影像学表现及其诊断价值；分析 MRI 是否能够判断胚胎死活。

方法 选择临床拟诊为瘢痕妊娠的患者 55 例，MRI 结合人绒毛膜促性腺激素(HCG）阳性、有子宫手术史和病理综合诊断，作为诊断瘢痕妊娠的金标准，确诊子宫瘢痕妊娠 47 例，比较 MRI 图像及超声图像，分析影像学征象并测量相关数据。另对综合诊断为非瘢痕妊娠的 8 例，进行图像及其原因分析。以超声诊断作为判断胚胎死活的金标准，评价 MRI 诊断死胚的效能。
结果 MRI 可清晰显示子宫瘢痕、妊娠囊以及二者关系，显示率 100%；以综合诊断 47 例为金标准，MRI 诊断的敏感度和特异度均为 100%；超声诊断敏感度 87.2%，特异度 62.5%，阳性预测值 93.2%、阴性预测值 45.5%；临床拟诊 55 例病例中，超声误诊和漏诊共 9 例，将宫内妊娠误诊为瘢痕妊娠 3 例，将瘢痕妊娠误诊为宫内妊娠 5 例，漏诊 1 例；经超声判断的死胚 27 例中，MRI 显示妊娠囊形态不规则 23 例，妊娠囊径线小于正常孕周的 23 例，不能显示妊娠囊三层结构的 24 例，胚芽组织未显示（孕周 > 6 周）10 例，与活胚组差异有显著性意义（P<0.05）；综合诊断的 47 例中，妊娠囊形态不规则、大小较正常孕周小、胚芽组织未显示（孕周 > 6 周）和不能显示妊娠囊三层结构四种表现，MRI 图像中出现四种任一表现作为 MRI 诊断死胚的依据，共 37 例，与超声诊断比较符合率为 61.7%，MRI 与超声诊断死胚比较差异具有统计学意义（P<0.05）。
结论 MRI 结合 HCG 阳性、有子宫手术史和病理可诊断瘢痕妊娠，尤其适用于超声显示不清楚者。MRI 对显示子宫瘢痕位置、子宫瘢痕与妊娠囊的位置关系等信息，优于超声；对判断胚芽的死活虽然不及超声，有一定的诊断价值。

PU-0412

增强 CT 误诊罕见肾实质占位 1 例

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异位脾脏在临床上较为常见，但是肾实质的异位脾脏极为罕见，且 CT 检查无明显特征性表现，故很难与常见的肾实质良、恶性肿瘤相鉴别，极易误诊（本病例亦误诊）。超声检查具备一定的提示作用。在临床工作中，结合增强 CT 及超声检查，排除其他常见的肾脏肿瘤后，应考虑到异位脾脏的可能；必要时建议超声引导下肾脏穿刺以明确诊断，进而规避过多的外科干预，改善疾病预后。

PU-0413

宝石能谱 CT 分次团注对比剂在肾动静脉血管成像及辐射剂量中的研究

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目的 探讨宝石能谱 CT 分次团注对比剂单期扫描在肾动静脉血管成像及辐射剂量中的应用。
方法 收集临床需行肾动静脉血管成像患者 80 例，将患者随机分为实验组和对照组。实验组采用分次团注对比剂单期扫描宝石 CT 能谱成像，对照组采用单次注射对比剂常规双期扫描。实验组扫描方案：先团注 60 ml 对比剂，注入对比剂后 25 s 再注射 40 ml 对比剂并以相同流率跟注 30 ml 生理盐水。 在第一次注射对比剂开始后 70 s 行能谱 CT 扫描。 在后处理工作站上获得肾动脉和肾静脉的最佳单能量 keV，并重组图像。对照组扫描方案：一次性注入对比剂 100 ml 并以相同流率跟注 30 ml 生理盐水，行多层螺旋 CT 双期扫描。分别测量并记录两组病例肾动静脉 CT 值、噪声、SNR、CNR 及图像质量主观评价得分。统计学分析采用 t 检验。
结果 两组患者在年龄、体重、性别和 BMI 指数均无统计学差异。 显示肾动脉的最佳单能量为 58 keV ，显示肾静脉最佳单能量为 67 keV 。实验组 58 keV 单能量图肾动脉 CT 值与常规组动

脉期肾动脉 CT 值无明显差异（ P＞0. 05）。 实验组 67 keV 单能量图肾静脉 CT 值高于常规组肾静脉 CT 值（ P＜0. 05 ）。实验组与常规组噪声、SNR、CNR 无统计学差异（P＞0.05）。实验组与常规组图像质量主观评分无统计学差异（P＞0.05）。实验组辐射剂量明显小于常规组（P＜0.01）。

结论 对比剂分次团注技术在相同对比剂用量的前提下，宝石能谱 CT 单期扫描在肾动静脉的显示等同于或优于常规双期增强扫描，同时辐射剂量明显减少。

PU-0414

卵巢透明细胞癌的 CT 影像表现

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目的 分析卵巢透明细胞癌（OCCC）的 CT 影像特征。

方法 回顾性分析 10 例手术病理证实的 OCCC 患者平扫和三期增强影像资料，总结影像学特征（位置、形态、分隔、大小及囊实性成分、囊实性特征及强化方式）。

结果 10 例 OCCC 均为单侧，呈圆形或椭圆形，单房多见（3 例多房），以囊性成分为主多伴有实性成分（1 例为实性），肿瘤平均最大直径 14.7cm(9.7-24.4cm)，囊性部分密度均匀，平均 CT 为 24.7HU（10-43HU），未见明显强化。实性部分呈乳头状或结节肿块状，平均最大直径 4.0cm（2.1-12.7cm），平均 CT 为 41.0HU(26HU-56HU)，增强示动脉期强化，静脉期及延迟期呈明显持续强化。

结论 腹盆腔较大边界清晰的单房囊实性肿块，实性部分呈明显渐进性强化是 OCCC 特征性的影像学表现。

PU-0415

卵巢实性肿瘤的 MRI 鉴别诊断

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目的 通过分析不同病理类型卵巢实性肿瘤的 MRI 表现，评价 MRI 对卵巢实性肿瘤的定性诊断价值。

方法 收集 42 例经手术病理证实的卵巢实性肿瘤，回顾分析其 MRI 表现。

结果 原发卵巢癌 13 例，呈分叶状或不规则实性肿块，MRI 表现为长 T1、不均匀长 T2 信号，增强扫描明显不均匀强化；卵巢转移瘤 6 例，原发肿瘤病史明确，MRI 呈不均匀稍长 T1、T2 软组织信号结节，增强扫描为不均匀强化，其中 5 例为双侧发病；卵泡膜细胞瘤 7 例，MRI 表现为 T1WI 稍低信号，其中 4 例肿瘤内含脂质丰富的卵泡膜细胞较多，T2WI 为稍高信号，且反相位信号减低，其中 3 例瘤内含纤维细胞较多，呈 T2WI 稍低信号，增强扫描均呈渐进性轻-中度持续强化，肿瘤周围环绕不同程度腹腔积液，临床实验室检查均有雌激素升高；卵巢纤维瘤 6 例，呈圆形或卵圆形，MRI 表现为长 T1、稍短 T2 信号，增强后轻度延迟强化或不强化，其中 3 例肿块内散在不定形片状水肿信号，DWI 显示弥散受限；卵巢无性细胞瘤 2 例，为分叶状、有包膜，MRI 为稍长 T1、稍长 T2 信号，增强扫描肿瘤轻度强化，内部有较明显强化的纤维血管间隔，其中 1 例 LDH 升高；卵巢颗粒细胞瘤 7 例，均为实性肿块内多发蜂窝样囊变，MRI 表现为 T1WI 呈等、稍低信号，T2WI 呈稍高信号，增强后实性部分中等强化，囊性部分不强化；卵巢淋巴瘤 1 例，表现为双侧卵巢肿块，信号均匀，MRI 为等信号，增强轻-中度强化。

结论 大部分卵巢实性肿瘤 MRI 征象具有特异性，结合临床表现及实验室检查可作出较准确的定性诊断。

PU-0416
DCE-MRI 成像技术评价宫颈癌同步放化疗疗效的应用价值

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目的 探究磁共振动态增强（Dynamic contrast-enhanced MRI，DCE-MRI）成像技术其定量参数评价宫颈癌同步放化疗的疗效。
方法 收集 2018 年 12 月-2019 年 6 月我院经病理证实为宫颈癌 30 例，患者在化疗前后分别行盆腔磁共振动态增强，测定肿瘤组织在同步放化疗前后的 Ktrans、Ve、Kep 值，采用独立样本 t 检验比较肿瘤组不同时期各定量参数的差异。
结果 宫颈癌组织在同步放化疗前后各定量参数值之间进行比较，肿瘤组织的 Ktrans、Ve、Kep 值的变化有统计学意义(P<0.05)。肿瘤组在治疗后的 Ktran 值、Ve 值、Kep 值明显低于治疗前。
结论 DCE-MRI 各定量参数对宫颈癌同步放化疗的疗效评估具有重要价值。

PU-0417
囊性肾癌影像学表现及病理分型间对照分析

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目的 分析囊性肾癌的临床特点、影像学表现并与手术病理结果对比，以提高对囊性肾癌诊断的准确率。
方法 回顾性分析 30 例经手术病理证实的囊性肾癌的临床表现、影像学征象及病理结果。
结果 30 例患者临床表现上有 17 例无明显症状、体检发现，13 伴有患侧腰背部不适，其中 7 例伴有肉眼血尿，3 例伴有排尿困难。影像表现上为单房囊性、多房囊性和囊实性病灶，CT、MRI 增强后囊壁、分隔及实性部分强化，彩色多普勒可见较丰富血流信号，部分囊液信号、密度复杂，可伴有囊壁结节、囊壁蛋壳样钙化、囊内钙化及同侧、对侧或双肾多发囊肿、肾结石，部分同侧肾周筋膜增厚、腹膜后肿大淋巴结。病理上 6 例肾透明细胞癌，8 例多房囊性肾癌，5 例单房囊性肾癌，1 例肾肉瘤样癌，4 例乳头状肾癌并出血、坏死、囊变， 3 例肾嫌色细胞癌，1 例浸润性尿路上皮癌，2 例肾透明细胞管状乳头状肾细胞癌。术前影像诊断复杂囊肿 2 例，分隔囊肿 5 例，肾囊肿可疑肾癌 6 例，感染病变 1 例，囊性肾瘤 2 例，囊性肾癌 8 例，肿瘤 6 例。影像诊断与病理诊断契合率达 73%。
结论 影像学 CT、MRI 及超声综合检查手段能够最大程度降低囊性肾癌的误诊率。

PU-0418
The correlation between diffusion-weighted imaging parameters and immunohistochemical factors and pathological classification of endometrial carcinoma

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Objective: To investigate the correlation between the apparent diffusion coefficient of MRI diffusion weighted imaging (DWI) and the Immunohistochemistry prognostic factors and pathological types of endometrial carcinoma.**Methods:** From the pathology database, among the patients who had been proved endometrial carcinoma through biopsies and surgeries from January 2013 to May 2017 were collected.All patients underwent pelvic enhanced MRI and DWI scan, and the apparent diffusion coefficient (ADC) and relative apparent diffusion coefficient (rADC) were measured. To observe the expression of estrogen receptor (ER), progesterone receptor (PR), human epidermal growth factor receptor type II (Cerb-2) and prognostic factor Ki-67, and to classify the pathological types of the patients. Of the 49 patients, ER was positive in 38 cases, negative in 11 cases, PR positive in 36 cases, negative in 13 cases, Cerb-2 positive in 18 cases, negative in 22 cases (some patients did not receive ER, PR and Cerb-2 receptor expression results at the same time). The pathological types of 49 cases of endometrial carcinoma were 11 cases of lowly differentiated, 22 cases of moderately differentiated and 16 cases of highly differentiated. The expression of receptor in different conditions and different pathological types of endometrial carcinoma in patients with ADC and rADC values are used Mann-Whitney U test, The correlation between ADC values, rADC values and Ki-67 positive expression rate was evaluated by Spearman method. Results: the ADC value of the lowly differentiated group endometrial carcinoma patients was lower than that of the highly differentiated group, the difference was statistically significant ($P<0.05$). The ADC and rADC values of PR positive patients was higher than that of ER, PR negative patients, the difference was statistically significant ($P<0.05$). There was no significant difference between ADC values of Cerb-2 positive and negative patients ($P>0.05$), the ADC and rADC values of endometrial carcinoma patients were negatively correlated with the expression of Ki-67 ($r=-0.76$ and -0.66, $P<0.05$). Conclusion: MR DWI examination may indicate the different pathological types of endometrial carcinoma to a certain extent, and has the potential to evaluate the malignancy from the molecular level.

PU-0419

Solitary Fibrous Tumor of the Urinary Bladder in an 85-year-old Woman: Case Report and Review of Literature

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Solitary fibrous tumor of the urinary bladder is an extremely rare type of mesenchymal tumor. We present a case of an 85-year-old woman with a protruding intravesical mass detected by CT and MRI, which was proven to be a solitary fibrous tumor through histopathological examination. The clinicopathologic and radiological features are here discussed, and the published literature on this topic is reviewed. Solitary fibrous tumors of the urinary bladder are more common in men (75%), with a peak incidence in people 40–60 years old. Most such tumors show heterogeneous intensity

with a complete capsule. A decrease in the T2WI signal with an increase in collagen tissue content and gradual enhancement on CT/MRI images are their main features. Most such tumors are positive for CD34 under immunohistochemistry (approaching 100%). The majority of tumors (87.5%) studied have been benign and most patients (95.2%) showed favorable prognosis after a long-term follow-up.

PU-0420

螺旋 CT 诊断卵巢甲状腺肿的临床价值

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目的 分析卵巢甲状腺肿的 CT 表现特点，探讨 CT 对本病的诊断价值。
方法 回顾性分析 6 例经手术后病理证实为卵巢甲状腺肿患者影像学资料，分析其发生部位、病变形态、密度、成分及强化方式，复习相关文献，总结其 CT 特点。
结果 6 例患者均为单侧附件区（3 例位于右侧附件，3 例位于左侧附件）囊实性占位，囊壁光整，边界清晰，呈类圆形，长径约 4.3cm-14.5cm 不等；实性部分密度较高，CT 值约 55-77Hu，囊性部分密度较低，CT 值约 2-39Hu。5 例囊性部分可见分隔，成多房样，1 例无分隔。4 例囊壁壳样、斑点状钙化，1 例点状钙化，1 例无钙化。增强扫描 5 例实性部分轻-中度强化，1 例不强化。1 例可见脂肪成分。2 例合并对侧附件区畸胎瘤（不含甲状腺组织），1 例合并腹水。
结论 卵巢甲状腺肿是卵巢囊性成熟畸胎瘤的一种少见的特殊类型，CT 表现为单侧附件区囊实性占位，实性部分密度较高，囊性部分分隔多见，囊壁壳样钙化多见，增强扫描实性部分可强化，含脂肪成分少见，具有一定特征性，对疾病诊断有一定帮助。

PU-0421

Measurement of pelvic characteristics of Han and Tibetan nationality young female based on CT

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Objective Female pelvis is an important part of the birth canal, its size, shape directly affect situated the smooth delivery. In addition to the development of the pelvis, which is affected by the influence of nutrition, it is also related to ethnicity, genetics, geographical environment, habits of life and labor methods. Through linear measurement, this paper explores the normal pelvic morphology characteristics of Han and Tibetan female.
Method The study subjects selected 89 young female (35 Hans, 42 Tibetans) from January 2017 to December 2018 at the Tibet Military Region General Hospital (Tibet University Teaching Hospital) for various indications of pelvic CT examination, aged 18-44 years, with an average age of 24.6±3.5 years, and normal limb development. Exclude pathological pelvis. The GE Discovery CT 750 was used to perform a pelvic routine dose scan on 83 patients. Apply Mimics 10.01 software (Belgian Materialise company products) to build a digital three-dimensional model of the pelvis, measuring

the three-dimensional model pelvic entrance diameter, diameter of pelvic inlet, posterior sagittal diameter of pelvicinlet, anteroposterior diameter of pelvic inlet, diagonal conjugate diameter, posterior sagittal diameter of midpelvis, anteroposterior diameter of midpelvis, angle of pubic arch, agittal outlet, sacrum length, sacrum curvature. Statistical analysis is performed using SPSS Statistics (V. 21.0, IBM Corp., USA, 2012) .

Results Tibetan female in the following measurements are greater than the Han , Tibetan female diameter of pelvic inlet (130.88±1.61) mm, Han female diameter of pelvic inlet (127.67±1.00) mm, the difference between the two is statistically significant (t=4.318, P＜0.01). Tibetan female posterior sagittal diameter of pelvicinlet (50.21±2.14) mm, Han female posterior sagittal diameter of pelvicinlet (47.37±2.62) mm, the difference between the two is statistically significant (t=2.490, P＜0.01). Tibetan female sacrum length (117.25±2.90) mm, Han female sacrum length (107.70±1.50) mm, the difference between the two is statistically significant (t=-2.811, P＜0.01).Tibetan female in the following measurements are smaller than the Han , Tibetan female posterior sagittal diameter of midpelvis (36.10±1.75) mm, Han female posterior sagittal diameter of midpelvis (44.10±0.71) mm, the difference between the two is statistically significant (t=-3.719, P＜0.01). Tibetan female sacrum curvature (129.80±2.31), Han female sacrum curvature (139.11±2.65), the difference between the two is statistically significant (t=1.743, P＜0.01). Anteroposterior diameter of pelvic inlet,diagonal conjugate diameter,anteroposterior diameter of midpelvis,angle of pubic arch,sagittal outlet,the comparative difference between the different ethnic groups is not statistically significant (P＞0.05)

Conclusion Tibetan female have their own unique living habits and labor methods, resulting in Tibetan female's pelvis than Han female's pelvis deeper, side wall cohesion and the lower pelvis narrow, resulting in adverse factors for childbirth. Understanding the morphological characteristics of the pelvis will be helpful in choosing the mode of delivery and can provide effective measures to reduce maternal mortality and neonatal mortality.

PU-0422

少见部位的海绵状血管瘤 3 例误诊分析

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目的 海绵状血管瘤是一种常见的良性肿瘤。以往报告多位于肝脏、脾脏、眼眶及脑等典型部位，对少见部位影像学特征分析不足易导致误诊。本研究旨在分析经手术病理评估证实的 3 例非典型部位的海绵状血管瘤的影像学特征，以提高对这一常见肿瘤少见部位的认识。
方法 回顾性研究了 3 例不典型部位的血管瘤的影像学特点，并根据影像学表现探讨相应鉴别诊断。3 名患者包括男 1 例，女 2 例，年龄 40～71 岁。临床表现包括腰痛并镜下血尿 1 例，反复头晕 1 例，腹痛 1 例，患者均接受了 CT 及 MRI 平扫加增强扫描。
结果 3 例血管瘤，1 例位于左肾，误诊为肾癌，2 例位于左肾上腺，1 例误诊为腹膜后占位，1 例误诊为嗜铬细胞瘤，3 例病灶均边界光整，CT 平扫为等密度，2 例密度不均匀，MRI 平扫 T1WI 上 2 例呈低信号 ，1 例呈高低混杂信号，在 T2WI 上 2 例呈高信号 ，1 例呈高低混杂信号，3 例病灶

CT 及 MRI 增强早期均以边缘不均匀强化为主 ，后期强化逐渐向中心充填 ，1 例最后肿块达均匀明显强化，呈典型“快进慢出”强化形式 。

结论 由于海绵状血管瘤在肾及肾上腺发病率特别低，易误诊为该部位的其他常见肿瘤，仔细分析病灶影像学表现和临床特征可能有助于更准确的诊断特殊部位的海绵状血管瘤，减少误诊的发生。

PU-0423

Application of ASIR-V Technique in Reduction of Radiation Dose in Renal Artery CT Imaging

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Objective To study the clinical application of ASIR-V technology in reducing radiation dose in CT imaging of renal artery. **Methods** Forty consecutive patients who underwent continuous CT angiography of renal artery were randomly divided into A and B groups. The contrast agent was ibuprofen 370 mgI/ml and injected by bolus follow-up. Scan conditions: tube voltage 100 kVp, noise index NI (Noise Index) 10, automatic tube current technology (Smart mA). A group was reconstructed with FBP and the image reconstruction layer thickness was 1.25mm; group B tube pre-ASIR-V was 40%, and post-reconstruction was 0%, 20%, 40%, 60%, 80%, 100%, respectively. the thickness of the image after reconstruction is 1.25mm. Scanning method: Monitor the abdominal aorta below 1-2 cm of the diaphragm and trigger a delay of 10 s after the threshold reaches 120 HU. Objectively measure the subrenal artery and subcutaneous fat in the same plane, record the CT value and SD value, calculate the signal-to-noise ratio (SNR=CT/SD) and contrast noise ratio (CNR=(CT renal artery-CT fat)/SD fat), The 5-point method was used to subjectively score the image quality of each group by double-blind (5 points, the best image quality; 1 point, the worst image quality). Statistical analysis was performed on general patient data and objective measurement results, and subjective scores were scored on a 5-point scale for each group of image quality (5 points, best image quality; 1 point, worst image quality). **Results** The general data between the two groups were not statistically different ($p>0.05$). There was a significant difference in subjective scores of image quality between the two groups ($P<0.05$). Except for no statistical difference in CT values, there was a statistically significant difference in the objective measurements ($p<0.05$) . The radiation doses between the two groups were $(4.14\pm0.64)/(2.46\pm0.63)$, respectively, and the radiation dose in group B was reduced by about 36% compared with group A; with the pre-ASIR-V being 40%, the iteration weights were increasing. The image quality is also gradually improved. When the weight is 80%, good diagnostic requirements can be achieved, and the image quality is better than that of the pre-ASIR-V 0% reconstruction image. **Conclusion** With ASIR-V technique, CT imaging of renal artery can be performed with increasing iterative reconstruction, which can not only obtain better image quality than FBP reconstruction, but also can significantly reduce radiation dose.

PU-0424

妊娠合并附件扭转 MRI 表现及其临床特点

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目的 探讨妊娠期附件扭转（AT）MRI 表现及临床特点。
方法 回顾性分析 14 例经病理证实的妊娠期 AT 患者的 MRI 表现及临床资料。
结果 14 例 AT 中，原发性 2 例，继发性 12 例（卵巢囊肿 5 例、卵巢畸胎瘤 4 例、输卵管积水 2 例、输卵管间皮囊肿 1 例）。右侧 5 例,左侧 9 例。扭转角度 180～1720°。MRI 示，除 3 例孤立性输卵管扭转之外，其余 11 例均见卵巢增大，12 例于盆腔或腹腔内见异常信号肿块，包括 8 例囊性肿块、4 例囊实性肿块；肿块旁见扭转蒂 7 例，其中 6 例呈“鸟嘴征”，1 例呈漩涡征，DWI 均呈混杂高信号。附件区出血 6 例，盆腔积液 8 例。6 例孕妇分娩足月健康胎儿，8 例分娩早产儿。
结论 妊娠期 AT 的 MRI 表现有一定特征性，结合临床有助于诊断。

PU-0425
ASIR-V 联合低 kVp 在肾动脉 CT 成像中降低辐射剂量的临床应用

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目的 研究基于多模型的迭代重建算法（ASIR-V）联合低 kVp 在肾动脉 CT 成像中降低辐射剂量的应用。
方法 对 60 例怀疑肾动脉疾病并行肾动脉成像检查的患者，根据管电压不同分为 A、B、C 三组（120kVp、100kVp、80kVp），每组 20 例。A 组管电压 120kVp，采用 FBP 重建；B 组管电压 100kVp，后迭代重建权重为 80%；C 组管电压 80kVp，后迭代重建权重为 80%，重建层厚均为 1.25mm。客观测量双肾动脉及同层面皮下脂肪，记录其 CT 值及 SD 值，计算信噪比（SNR=CT/SD）及对比噪声比(CNR=（CT 肾动脉-CT 脂肪）/SD 脂肪)，采用 5 分法对各组图像质量进行双盲法主观评分（5 分，图像质量最好；1 分，图像质量最差）。对患者一般资料及客观测量结果进行统计学分析，并对各组图像质量进行 5 分法主观评分（5 分，图像质量最好；1 分，图像质量最差）。
结果 三组患者一般差异均无统计学意义（P＞0.05）；图像质量主观评分存在明显差异(P＜0.001)；客观测量的 CT 值无统计学差异（P＞0.05），而 SD 值、SNR 及 CNR 均存在明显差异(P＜0.001)；三组间的辐射剂量分别为（4.80±1.36）mSv、（4.14±0.64）mSv、（2.11±0.22）mSv，存在明显统计学差异（P＜0.001），80kVp 较 100kVp 与 120kVp 辐射剂量分别降低了 49%、56%。
结论 在肾动脉 CT 成像中，低 kVp 联合 ASIR-V 技术在保证优质的利于诊断的图像质量前提下，能大幅度降低辐射剂量。

PU-0426
肾透明细胞癌的 CT 表现与 Ki-67 表达程度的相关性研究

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目的 探讨肾透明细胞癌表达程度与 CT 表现的相关性，为术前治疗方案的选择及预后评估提供参考。

方法 回顾性分析 68 例经病理证实为肾透明细胞癌的患者，所有肿瘤组织病理标本均切片行 Ki-67 免疫组织化学染色。病例分为弱阳性组（Ki-67<10%）38 例，阳性组（ Ki-67>10%）30 例，统计囊变/坏死及周围组织侵犯情况，对 Ki-67 表达水平与其的关系进行相关性分析。
结果 Ki-67 弱阳性组及阳性组肿瘤的囊变/坏死分别为（24/38，25/30），周围组织侵犯分别为（2/38，13/30），P 均<0.05，差异具有统计学意义。
讨论：随着 Ki-67 在肾透明细胞癌中表达程度的增加，肿瘤的囊变/坏死及周围组织侵犯增加。

PU-0427

气肿性膀胱炎 CT 表现

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目的 观察盆腔 CT 及多平面重建技术诊断气肿性膀胱炎的价值。
方法 检索中文数据库气肿性膀胱炎的相关文献报道。回顾性分析临床参数（糖尿病病史、高血压病史、长期卧床史、尿路感染）、实验室参数（血白细胞、中性粒细胞比率、尿潜血、尿白细胞、尿酸）、盆腔 CT 特征（膀胱壁增厚、膀胱壁溃疡、膀胱壁积气）在气肿性膀胱炎中的诊断价值。
结果 糖尿病病史、长期卧床史是气肿性膀胱炎的重要危险因素。膀胱壁积气在气肿性膀胱炎病例中具有典型特征，CT 多表现为膀胱壁增厚、壁内积气。多平面技术矢状位、冠状位重建可以满意显示膀胱壁积气的多少、分布。
结果 盆腔 CT 及多平面重建技术在气肿性膀胱炎的诊断中具有重要的价值。膀胱壁积气形成的抱球征是气肿性膀胱炎的特征性表现。

PU-0428

数字化隔室遥控双腔球囊导管子宫输卵管造影术的临床应用

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目的 探讨数字化隔室遥控双腔球囊导管子宫输卵管造影术的临床应用价值。
方法 选取延安市人民医院 2017 年～2018 年 300 例不孕症患者，应用数字化双腔球囊导管子宫输卵管造影术进行检查的资料进行分析。具体方法如下：选在月经干净后 5～7 天进行检查，排除禁忌症，患者仰卧于数字胃肠机检查床上，取膀胱截石位，常规消毒、铺巾，操作医生将一次性使用子宫造影通水管（湛江事达实业有限公司）置入患者宫腔内，气囊内注入 1.5～2.5 mL 空气或生理盐水，轻拽造影管不能脱出，使球囊封堵宫颈管内口，一次性注射器吸入造影剂排净空气后与造影管相连，递入患者手中，卸掉阴道扩张器，让患者小骨盆腔对准数字胃肠 X 线机球管，操作医生迅速离开进入隔室控制室，利用对讲系统遥控指挥患者推注造影剂，在透视监视下观察并适时点片，造影过程中要注意球囊的大小及造影管头的位置,并适时调整，管头靠近一侧输卵管间质部时，会导致局部痉挛不显影；球囊太大，影响宫腔显影，球囊太小，造影管容易脱出宫颈口，造影满意后结束检查。
结果 本组 300 例,造影成功 297 例(99%),1 例宫颈管过度弯曲置管失败,造影未能成功(0.3%),2 例出现逆流(0.67%),双侧输卵管通畅 58 例,单侧输卵管通畅 62 例,双侧输卵管梗阻 19 例,单侧输卵管通而不畅 75 例,双侧输卵管通而不畅 86 例。
结论 该法操作简单、安全可靠,患者简单的操作配合能分散注意力可更好地配合完成检查,而且操作医师不用接受射线的辐射，建议临床推广应用。

PU-0429
多层螺旋 CT 对于诊断成年人 Xp11.2 易位 /TFE3 基因融合相关性肾癌的价值

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目的 探讨多层螺旋 CT 在成年人 Xp11.2 易位/TFE3 基因融合相关性肾癌的诊断和鉴别诊断中的价值。
方法 回顾性分析总结经手术病理证实为 Xp11.2 易位/TFE3 基因融合相关性肾癌 24 例成年患者的临床资料、多层螺旋 CT 资料并复习文献。
结果 24 例 Xp11.2 易位/TFE3 基因融合相关性肾癌患者中，女性 7 例（29.2%），男性 17 例（70.8%），年龄 19～77 岁，中位年龄 45.3 岁，位于左侧 20 例（83.3%），位于右侧（16.7%）；24 例患者中 19 例有螺旋 CT 扫描资料，形态呈圆形及类圆形，平扫病变显示为混杂密度，CT 值高于对侧正常肾实质，灶内合并出血 2 例，钙化 6 例，囊变 11 例，增强后皮质期呈不均匀强化，CT 强化程度低于对侧肾实质，4 例出现血管样强化，5 例出现囊变区边缘结节样强化，髓质期及肾盂期呈轻度造影剂退出，髓质期 CT 值高于肾盂期 CT 值；24 例中 3 例术前考虑腰大肌受侵，4 例考虑伴同侧肾门淋巴结转移，术后均经病理证实，余所有患者术前经影像学检查淋巴结及远处均无转移征象。
结论 成人 Xp11.2 易位/TFE3 基因融合相关性肾癌 CT 平扫及增强扫描有一定的特征性改变，结合临床资料可以考虑诊断本病。

PU-0430
Imaging Features of Deep Aggressive Angiomyxoma with Pathologic Correlations

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Objective: To analyze the computed tomography and magnetic resonance imaging findings of deep aggressive angiomyxoma with pathologic correlation.
Methods: Seven deep aggressive angiomyxoma confirmed by histopathologic examination were analyzed retrospectively. Image characteristics were analyzed and correlated with the pathologic features.
Results: Four CT and four MRI studies were available for 7 patients (2 males, 5 females), mean age 44.3 years, range 38 -65. Locations were including: 3 cases located at abdominal and pelvic cavity (including 2 males with one of them arises from the peritoneum and the small mesentery and another arises from the small mesentery, 1 female with tumor arises from posterior cervical and left broad ligament), 3 cases located at vulva, and 1 case at pelvic floor (ischiorectal fossa). All cases show heterogeneous mass (n=7), all cases show myxoid in mass and companied by varied Vascular components, hemorrhage was seen in 2 cases. The tumors were soft in 6 cases and mild hardness, cystic and solid (n = 4), predominantly cystic (n =1),

predominantly solid (n=2). The largest diameter of tumors was 7-28 cm, with round or oval regular morphology (n=4), irregular morphology (n=3). 4 cases were encapsulated, 3 cases were without capsule or with incomplete capsule. Growth patterns: invasive growth (n=3), expansive growth (n=4). On CT, 3 cases showed hypodensity or isodensity tumors at noncontrast CT, with water-like density lesion with strip soft tissue density in it, and 1 case showed soft tissue density with small focal cystic areas. On MRI,The tumors show inhomogeneous hypointense on T1WI and hyperintense on T2WI, and DWI and ADC maps show hyperintense (n=3). At contrast enhanced images, all cases show heterogeneous enhancement, with stripy, patchy or swirling internal enhancement pattern varying from mild to evident extent. In 3 cases, the tumors invade the adjacent organs, companied by ascites (n=2), distant metastasis (n=2). No lymphatic metastasis (n=0) is observed. Important complications including: intraductal mucosal papilloma of the pancreas (n=1), mesenteric low grade malignant myofibroblastoma (n=1).
Conclusion: There are some characteristic imaging manifestations of deep aggressive angiomyxomas. A mucinous stromal mass with varied striated or swirling blood vessels may suggest the diagnosis of aggressive angiomyxomas.

PU-0431
R2 * MFGRE 序列在盆腔子宫内膜异位诊断中的附加价值

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目的 探究 R2*MFGRE 序列在盆腔子宫内膜异位诊断中的附加价值
方法 本文回顾性分析 2017.5 月-2019.3 月期间 55 名患者经常规 MRI 序列及 R2*MFGRE 序列检查、经病理证实的子宫腺肌病或子宫内膜异位患者的 MRI 图像，比较常规 MRI 序列及联合常规 MRI 序列+R2*MFGRE 序列所显示的病灶数目。
测量所有病灶的 R2*值，去掉部分偏差较大及病灶较小不易测量的病灶，比较不同类型子宫内膜异位症的 R2*值。
结果 55 名子宫内膜异位症及/或子宫腺肌病患者，经 MRI 常规序列共发现病变 103 处，其中子宫内膜异位在子宫肌层 44 处、卵巢 39 处、深部子宫内膜异位症 9 处、腹壁 11 处。联合 R2 * MFGRE 序列后新显示病 30 变处，子宫腺肌病新增 0 处，卵巢新增 6 处，DIE 24 处，腹壁 0 处。应用 SPSS 20.0 配对 t 检验对常规序列和常规序列+R2*MFGRE 序列检出病灶数目进行比较，在检出病变方面，常规序列+R2*MFGRE 序列联合应用更有优势（$P<0.05$）。

子宫腺肌病 R2*值为 24.39±3.45，卵巢子宫内膜异位症 R2*值为 12.98±4.02，深部浸润型子宫内膜异位症 R2*值为 71.61±18.5，腹壁型子宫内膜异位症 R2*值为 13.55±3.33，应用 SPSS 20.0 方差分析显示 DIE 与子宫腺肌病组间存在统计学差异（$P<0.05$），而卵巢巧克力囊肿与腹壁子宫内膜异位症组间无统计学意义（$P>0.05$）。
结论 R2*MFGRE 序列作为子宫内膜异位症常规 MRI 序列的补充，可以提高卵巢子宫内膜异位症、深部浸润子宫内膜异位症的检出率，但是对子宫腺肌症、腹壁子宫内膜异位帮助不大。深部浸润型子宫内膜异位症与子宫腺肌病由于周围结构及病理成分不同造成了 R2*值的不同，而腹壁子宫内膜异位症与卵巢巧克力囊肿发病部位单一，病理成分类似，无明显差异。

PU-0432
嫌色细胞肾癌和乳头状肾细胞癌的 MSCT 诊断和鉴别诊断

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目的 探讨嫌色细胞癌(ChRCC)和乳头状肾癌(pRCC)多排螺旋 CT 的特征及其鉴别诊断。
方法 收集 7 例 ChRCC 和 14 例 pRCC，经手术病理证实的患者临床资料，分析 MSCT 形态学和多期增强扫描的特征。
结果 7 例 ChRCC 肿瘤体积均较大，平均直径 8.2 cm，呈类圆形，膨胀性生长，大部分可见完整包膜，边界清晰。肿瘤内均可见囊变坏死，但以多发边界清晰小囊变为主，共 4 例伴有钙化，以病变边缘斑点状为主。13 例 pRCC 平均直径 5.8 cm，10 例呈膨胀性生长，包膜完整，3 例形态不规则，呈分叶状，边界不清，侵犯周边组织。13 例病灶中仅 2 例（直径小于 3cm）密度均匀，其余 11 例伴有囊变坏死、出血。共 5 例伴有钙化，以病变边缘斑点状、结节状钙化多见。增强后 ChRCC 动脉期强化明显，静脉期和排泄期下降不明显，pRCC 表现为轻中度持续强化，排泄期略有下降。
结论 ChRCC 及 PRCC 多以膨胀性生长为主，伴有完整包膜。部分 PRCC 形态不规则，呈侵袭性。ChRCC 多以边界清楚小囊变为主，钙化多见，增强后呈中等程度强化,少数强化明显。pRCC 囊变坏死多见，可见钙化，增强后呈轻中度持续强化。 ChRCC 及 PRCC 的 MSCT 表现具有一定特征，鉴别两者难度不大。

PU-0433
动态增强 MRI（DCE-MRI）在临床显著前列腺外周带癌中的应用价值

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目的 动态增强 MR 成像（DCE-MRI）在 PI-RADS 2.0 版中被应用于进一步评估扩散加权成像（DWI）得分为 3（DWI3）的外周带病例，如果 DCE-MRI 为阳性结果，将要则 DWI3 将增加至 4，提示临床显著前列腺癌（clinically significant prostate cancer，csPCa）。然而，DCE 在 DWI3 的前列腺外周带病例中预测 csPCa 的准确性尚不清楚。本研究旨在评估 DCE 改变 PI-RADS 2.0 版本中 DWI3 评估类别的评率，并确定 DCE-MRI 在可疑外周带 DWI3 病变中的总体准确性。
方法 研究回顾性分析 2016 年 1 月 1 日至 2017 年 12 月 31 日之间，来我院就诊的行 3.0 T 前列腺 mpMRI、经直肠超声引导下穿刺证实的前列腺癌患者，所有患者均行根治性前列腺切除术。由经验丰富的放射科医师采用盲法并根据 PI-RADS 2.0 版进行评分。csPCa 被定义为 Gleason 评分≥7 分，或在病理学结果中有其他的恶性特征。统计分析 DCE 在 DWI3 病变中对 csPCa 诊断准确性。
结果 共有 71 名患者纳入分析，平均年龄为 65±5 岁，平均 PSA 为 7.3ng/mL。csPCa 在手术病理检查中发现 53 例（74.6%，53/71），其中 49 例位于外周带。其中 DWI3 患者共 19 例，对这些患者进一步用 DCE-MRI 分析，其中 13 例（13/19）为阳性，将最终的 PI-RADS 2.0 版本评分为 4；其中 6 例（6/19）DCE-MRI 结果为阴性。与最终病理学相比，在所有 DCE-MRI 阳性结果中，有 11 例（11/13）例临床诊断为 csPCa。
结论 DCE-MRI 提高了外周带病变中 csPCa 检测的准确性，应用 PI-RADS 2.0 版可更高的对前列腺癌进行诊断。

PU-0434

Associations between Uterine Peristalsis in Women with Adenomyosis and Findings from Quantitative and Cine MR Imaging in lesions

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Purpose: To investigate the associations between uterine peristalsis in women with adenomyosis and the results quantitative and cine MR Imaging, including T1, T2 and T2* mapping.
Materials and Methods: This prospective study was approved by institutional review board. Between November 2017 and April 2018, 20 patients clinically suspected of adenomyosis underwent MR scanning in ovulatory phase (Ingenia CX, Philips Healthcare, Best, the Netherlands). T1, T2 and T2* relaxation times of lesions were obtained from quantitative MR and number of uterine peristalsis in 3 minutes was observed on cine sequence. Spearman correlation analysis were performed to compute r for each relaxation time vs. number of peristalsis.
Results: The T1, T2 and T2* relaxation times of lesions were 1418±26.19ms, 63.81±2.235ms, 46.67±2.844ms (mean±standard error of mean), respectively. Number of uterine peristalsis in 3 minutes and peristalsis frequency were 4.65±0.8623 and 1.55±0.2874/min, respectively. A positive moderate correlation was found between T1 values vs. peristalsis frequency (r=0.534, p≈0.0186). While correlations between T2 and T2* values vs. peristalsis frequency were not statistically significant (r=0.438, p≈0.0534, and r=0.3218, p≈0.1791, respectively).
Conclusion: Uterine peristalsis frequency in women with adenomysosis was positively correlated with T1 relaxation time of lesions. No statistical significance was found in correlations between T2 and T2* values vs. peristalsis frequency.
Clinical Relevance: Correlation between uterine peristalsis and T1 values of lesions could help clinicians assess lesion degree and evaluate therapeutic effect in patients with adenomyosis, and might become prediction of prognosis.

PU-0435

慢性精囊炎 MRI 诊断及鉴别诊断价值探讨

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目的 分析慢性精囊炎的 MRI 表现，提高对血精性精囊炎的认识，探讨 MRI 在血精性精囊炎的诊断及鉴别诊断价值。
方法 回顾性分析了科室 PACS 系统里血精性精囊炎 MRI 病例 36 例。 分别采用常规 T1WI 横轴位、T2WI 横轴位、T2WI 抑脂序列横轴位、冠状位及矢状位及增强扫描。

结果 精囊炎 MRI 主要表现为单侧或者双侧精囊扩张，扩张的精囊囊壁增厚、不规则，间隔模糊。T1WI 可呈等低信号，也可呈高信号，T2WI 可呈信号，也可呈高信号，可见液-液平面，T2WI 上还可见低信号沉积物影。增强后精囊囊壁轻度强化，部分病例囊内容物无强化，部分病例可出现强化（出血时期不同）。可以合并或者不合并精囊囊肿或者精囊扩张。 MRI 能有效鉴别精囊肿瘤、结核、前列腺占位。

结论 MRI 是慢性精囊炎的诊断及鉴别诊断可靠影像学检查方法。

PU-0436

Renal Cell Carcinoma: Preoperative Evaluate the Grade of Histological Malignancy Using Volumetric Histogram Analysis Derived from Magnetic Resonance Diffusion Kurtosis Imaging

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To investigate the value of histogram analysis of magnetic resonance (MR) diffusion kurtosis imaging (DKI) in assessment of renal cell carcinoma (RCC) grading before surgery. **Methods:** A total of 73 RCC patients who underwent preoperative MR imaging and DKI were classified into low- grade group and high-grade group. Parametric DKI maps of each tumor were obtained using an in-house software, and histogram metrics between the two groups were analyzed. Receiver operating characteristic (ROC) curve analysis was used for obtaining the optimum diagnostic thresholds, area under the ROC curve (AUC), sensitivity, specificity and accuracy of the parameters. **Result:** Significant difference were observed in 3 metrics of ADC histogram parameters and 8 metrics of DKI histogram parameters ($p<0.05$). ROC curve analyses showed that K_{app} mean had the highest diagnostic efficacy in differentiating RCC grades. The AUC of the K_{app} mean, sensitivity, and specificity were 0.889, 87.9% and 80%, respectively. Conclusions: DKI histogram parameters can effectively distinguish high and low- grade RCC. Kapp mean is the best parameter of differentiating RCC grades. **Keywords:** renal cell carcinoma; Magnetic resonance imaging; Diffusion kurtosis imaging; Histogram analysis

PU-0437

表观扩散系数及影像组学对去势抵抗性前列腺癌诊断的初步研究

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目的 探讨表观弥散系数(ADC)与影像组学对诊断去势抵抗性前列腺癌的临床意义。双参数 MRI（bpMRI）T2WI 和弥散加权成像（DWI）是一种精确定位前列腺癌的工具，但在附加雄激素剥夺治疗（ADT）中价值不太明确。本研究目的是探讨 ADC 值与影像组学对 ADT 前列腺癌复发诊断价值.

方法 回顾性分析 30 例去势抵抗性前列腺癌，行 T2WI 和 DWI 的 bpMRI 检查。病变、中央带(CG）、周围带(PZ)的感兴趣区由经验丰富的泌尿生殖放射科医生根据局部治疗前组织病理学描绘。计算 ADC 值及 T2WI 上肿瘤与 CG、肿瘤与 PZ 的差异，提取 T2WI 的 396 个组学特征。采用受试者操作特征（ROC）分析 ADC 值及影像组学特征在鉴别前列腺癌复发与良性组织的能力。
结果 在 ADC 图中，肿瘤与 CG、肿瘤与 PZ 的差异明显，ROC 曲线下面积均＞0.99，p＜0.05。在 T2WI 组学特征中肿瘤与 CG 差异明显，ROC 曲线下面积为 0.91，并且 VoxelValueSum、LongRunEmphasis 这两个特征表现出最佳鉴别能力。肿瘤与 PZ 差异明显，ROC 曲线下面积为 0.87，并且 GLCME-Entropy、LongRunEmphasis、LongRunHighGrey Emphasis 这两个特征表现出最佳鉴别能力.
结论 ADC 值及 T2WI 的组学特征在去势抵抗性前列腺癌的诊断中均表现出很好的鉴别能力，这些结果推动了进一步的研究，为患者下一步的精准放射治疗体积描绘提供条件。

PU-0438
凶险性前置胎盘术前 MRI 系统评分与手术风险及出血量相关性分析

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目的 分析凶险性前置胎盘术前 MRI 系统评分与手术风险相关性的价值，探讨 MRI 系统评分对临床治疗的指导意义。
方法 回顾性分析 2018 年 6 月一 2019 年 6 月期间本院 125 例凶险型前置胎盘植患者临床资料、手术方式及盆腔 MRI 检查资料。10 个术前评分指标包括前置胎盘类型、既往剖宫产次数 2 个临床评分，胎盘主要附着部位、T2WI 胎盘内低信号面积、胎盘内增多增粗血管直径、是否有子宫下段膨隆征象、胎盘内信号不均匀、子宫下段肌层厚度、胎盘是否突入宫颈管和胎盘是否侵犯周围组织器官等 7 个 MRI 评分，临床评分和 MRI 评分相加得到术前系统量化评分。手术风险评分依据所行所有手术方式等级（1-4 级）累计相加得到，并统计术中及术后 24 小时内出血量。分析不同胎盘植入类型术前系统量化评分、手术风险评分及出血量的差异，术前系统量化评分与手术风险评分及出血量相关性。
结果 125 例患者中手术及病理诊断有胎盘穿透 13 例，胎盘植入 77 例，胎盘粘连 24 例，无胎盘植入 11 例，术前系统量化评分分别为 17.5±3.6，13.8±4.7，8.4±3.7 及 4.2±2.5，各组间差异均有统计学意义（P<0.05）。四组手术风险评分分别为 10.5±2.6，6.1±2.3，4.5±1.9 及 3.2±1.8，各组间差异均有统计学意义（P<0.05）。四组出血量分别为 1578±487ml，1054±364ml，691±402ml 及 397ml±105ml，各组间差异均有统计学意义（P<0.05）。术前系统量化评分与手术风险评分呈正相关（r=0.785，P<0.05），术前系统量化评分与出血量呈正相关（r=0.678，P<0.05）。
结论 凶险性前置胎盘术前 MRI 系统量化评分对制定手术方案，评估手术风险具有重要意义，尤其对于伴有胎盘植入或胎盘穿透的高危孕妇。

PU-0439
肾嗜酸细胞腺瘤的影像学特点，1 例病例报道并文献复习

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目的 通过回顾性结分析肾嗜酸细胞腺瘤的影像学特点和临床病理特点为肾嗜酸细胞腺瘤的诊断和治疗提供参考。
方法 1 例在本院进行诊断和治疗的肾嗜酸细胞腺瘤。结合其它对肾嗜酸细胞腺瘤的文献报道，对该病的病因学，病理生理，影像学特点，诊断，鉴别诊断和治疗进行总结和讨论。
结果 通过回顾文献我们发现肾嗜酸细胞腺瘤比较少见。肾嗜酸细胞腺瘤通常为良性。嗜酸细胞腺瘤是由大嗜酸粒细胞组成的肿瘤，大嗜酸粒细胞是一种上皮细胞，内含有大量的线粒体，进而导致细胞浆内含有大量的嗜酸性的颗粒状物。肾嗜酸细胞腺瘤典型的影像表现为中央的瘢痕的存在，但这个特征难与肾嫌色细胞癌相鉴别。肾肿瘤活检是现有最准确的诊断方式。
结论 嗜酸细胞腺瘤是一种少见的肾脏肿瘤，因为其影像学上难与肾嫌色细胞癌相鉴别，需要进行肾肿瘤活检。影像学上怀疑肾嗜酸细胞腺瘤主要是确定其大致良性，再结合肾肿瘤活检来确定合适的治疗方式。

PU-0440
应用脑静息态功能磁共振成像研究儿童原发性单症状夜间遗尿的神经病理机制

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目的 应用静息态功能磁共振成像（RS-fMRI）研究儿童原发性单症状夜间遗尿症（PMNE）的神经病理学机制。
方法 37 名右利手 PMNE 患儿（男 20 名，女 17 名，年龄 11.3±4.1 岁）和 17 名年龄匹配的右利手对照组（男 9 名，女 8 名，年龄 11.1±2.9 岁），在西门子 3.0T Skyra 磁共振机器上进行脑功能磁共振扫描，并在 Matlab 平台上使用 DPABI 软件进行图像预处理，然后利用 REST 软件分别对低频振幅（ALFF）、区域一致性（ReHo）和丘脑种子点功能连接（FC）进行了分析。将单个体素阈值 $p<0.001$ 与最小簇大小大于 30 个体素相结合，以 $p<0.05$ 的水平用 alphasim 对结果进行多次校正。
结果 与对照组相比，PMNE 组左眶内侧额上回（额中脑）ALFF 值降低，左枕上回（枕上）ReHo 值升高。以左侧丘脑为种子点，PMNE 组左侧内侧额上回（额上内侧回）的功能连接显著降低。
结论 左眶内侧额上回、左枕上回的功能障碍与左侧内侧额上回和左丘脑之间的低水平功能连接可能是儿童 PMNE 的重要神经病理机制。本研究有助于了解 PMNE 的潜在发病机制，为有效治疗提供了客观依据。

PU-0441
磁共振扩散加权成像及动态增强扫描在宫颈癌分期中的应用

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目的 常规 MRI 联合扩散加权成像(DWI)和动态增强(DCE) MRI 在宫颈癌诊断及分期中的价值.
方法 例经手术病理或活检证实的宫颈癌患者按临床治疗方式分为手术组(20 例)和非手术组(15 例),以病理及临床分期为参照,评估常规 MRI 联合 DWI、DCE-MRI(多模态 MRI)对宫颈癌的分期诊断准确性.

结果 术组中常规 MRI 和多模态 MRI 对宫颈癌分期诊断符合率分别为 80%(16/20)和 95%(19/20).术后病理证实盆腔淋巴结转移 4 例,MRI 检出 3 例.非手术组中多模态 MRI 分期与临床分期符合率为 67%(10/15).

结论 MRI 联合 DWI 和 DCE MRI 可提高对宫颈癌分期的准确性,有助于宫颈癌治疗方案的制定.

PU-0442

宫颈小细胞神经内分泌癌的影像学特征

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目的 分析总结宫颈小细胞神经内分泌癌(small cell neuroendocrine carcinoma of the uterine cervix,SCNECC)的影像学特征.

方法 经术后病理学检查证实为 SCNECC 的患者 22 例、宫颈鳞癌患者 30 例、宫颈腺癌患者 20 例,对 SCNECC、宫颈鳞癌和宫颈腺癌组的表观扩散系数(apparent diffusion coefficient,ADC)值及淋巴结转移率进行统计学分析,并复习国内外文献,归纳总结影像学特征.

结果 NECC 在磁共振成像(magnetic resonance imaging,MRI)上通常表现为 T2 高信号或稍高信号的肿块,扩散加权成像(diffusion-weighted imaging,DWI)上呈高信号,ADC 值显著低于其他类型宫颈癌,差异有统计学意义.SCNECC 组比宫颈鳞癌组和宫颈腺癌组转移率高,差异有统计学意义.

结论 CT、超声及 MRI 检查可以帮助临床诊断 SCNECC,ADC 值有助于辅助诊断 SCNECC,在宫颈癌筛查中也有一定价值.

PU-0443

动态增强 MRI 定量参数预测高强度聚焦超声消融子宫肌瘤疗效

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目的 态增强 MRI（DCE-MRI）定量参数能否预测高强度聚焦超声（HIFU）子宫肌瘤消融术疗效。

方法 术前对 60 例子宫肌瘤患者（共 76 个子宫肌瘤）行 DCE-MRI 检查，获得定量参数 K^{trans}、V_p、K_{ep}、V_p值。将子宫肌瘤按照消融率是否大于 40%分为消融效果良好组和消融效果不佳两组，比较两组间各定量参数的差异，再绘制相关定量参数与预测疗效的 ROC 曲线找到界值为临床选取子宫肌瘤进行 HIFU 治疗提供参考。

结果 效果良好组和消融效果不佳两组肌瘤间 K^{trans}值存在统计学差异（P＜0.05），以 Ktrans=1.925min^{-1}为阈值，判断子宫肌瘤 HIFU 消融效果良好的 ROC 曲线下面积为 0.88[95%CI(0.75,0.93)]。

结论 肌瘤 K^{trans}值可预测其 HIFU 消融效果，DCE-MRI 可为子宫肌瘤 HIFU 消融术选择患者提供依据。

PU-0444

MRI 纹理分析评价前列腺癌 Gleason 评分 7 分肿瘤异质性的初步研究

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目的 探讨基于 T_2WI 和 ADC 图纹理参数鉴别诊断前列腺癌(PCa) Gleason 评分(3+4)与(4+3)的可行性。
方法 回顾性分析我院经病理证实 77 例 PCa Gleason 评分(GS) 7 分的患者，GS(3+4)组 45 例，GS(4+3)组 32 例。在轴位 T_2WI 和 ADC 图上选择肿瘤最大层面手动勾画 ROI，并提取角二阶矩(ASM)、对比、相关、逆差距及熵(entropy) 5 个纹理参数，再进行两组间纹理参数统计学分析，并对有统计学差异的纹理参数采用 ROC 曲线评价其诊断效能。
结果 GS(3+4)与(4+3)组患者年龄和 PSA 浓度差异均无统计学意义(P>0.05)；基于 T2WI 和 ADC 图提取的 5 个纹理参数中，ASM 及熵值差异均有统计学意义(P<0.05)；而对比、相关及逆差距的差异无统计学意义(P>0.05)。除 T_2WI_{ASM} 的 ROC 曲线下面积(AUC)无统计学差异外，$T_2WI_{entropy}$、ADC_{ASM} 及 $ADC_{entropy}$ 均存在统计学差异，且 ADC_{ASM} 和 $ADC_{entropy}$ 的 AUC 均大于 T_2WI_{ASM} 和 $T_2WI_{entropy}$。$ADC_{entropy}$ 的 AUC 最大，为 0.732，以 5.71 为诊断阈值，敏感度为 97.6%，特异度为 59.5%。
结论 MRI 纹理分析可用于鉴别 PCa GS(3+4)与 GS(4+3)，其中 $ADC_{entropy}$ 鉴别二者的诊断效能最佳。

PU-0445
肾嫌色细胞癌的影像学表现与临床病理分析 （附一例介绍及文献复习）

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目的 肾嫌色细胞癌的临床特征、影像学表现及病理特点，以期提高对本病的认识，从而提高诊断水平。
方法 顾性分析我院收治的 1 例肾嫌色细胞癌患者的临床、影像及病理资料，并复习相关文献。女，36 岁，因“体检发现左肾占位 5 天”入院，无尿频尿急、肉眼血尿、腹痛等临床症状，查体：腹部未触及肿块，双肾区无叩击痛。术前采用 revolution CT 及 3.0TMRI 进行平扫及增强多期扫描。
结果 泌尿系统增强 CTU 示：左肾见类圆形混合高密度影，内见多发囊状低密度影，边界清楚，大小约 4.2x3.4cm，增强后左肾占位性病变皮质期呈明显不均匀强化，髓质期及分泌期强化程度减低，病灶内囊性灶未见强化；MRI 平扫+增强示：左肾见团状等 T1 稍长 T2 信号，病灶内信号不均匀，见多发小囊状长 T1 长 T2 信号，病灶内及周边可见流空血管影，边界清晰，大小约 3.2x4.0x5.0cm，增强后病灶皮质期呈不均匀明显强化，髓质期及分泌期强化程度减低，可见血管穿行其中。患者遂于我院行腹腔镜下左侧肾根治性切除术，切除左肾、肿瘤、肾周脂肪组织及部分输尿管，手术标本：左肾一极见 4x3.5x3cm 灰白肿块。左侧输尿管断端阴性，免疫组**结果** CD117(-)CD10(-)Vimentin(+)PCK(+)CK7(+)S100(-)PAX8(+)ECA(+)。
结论 色细胞癌是一 种罕见的低度恶性肾脏肿瘤， 发病率占肾癌的 6%～8%。1997 年 WHO 对肾癌的病理类型进行了重新分类，自此肾嫌色细胞癌作为一种独立的肾癌类型得到公认。其生长缓慢，临床上多因为肿瘤增大产生局部的压迫症状而就诊，也有部分是在体检时发现，很少引起肾癌晚期所特有的三联征（疼痛、血尿、腹部肿块）以及远处转移的征象，鉴于此类肾癌与常见肾癌临床表现相似，因此了解其临床特点对指导临床诊断与治疗具有重要意义。

PU-0446
CT 对乳头状肾细胞癌的诊断价值

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目的 分析乳头状肾细胞癌的 CT 表现，提高影像诊断准确性，为制定合适的手术方案做准备。
方法 选择 2013 年 6 月至 2018 年 9 月南京医科大学附属南京医院 9 例经手术病理确诊的乳头状肾细胞癌患者，其中男性 7 例，女性 2 例；年龄 35~91 岁，平均年龄 63 岁。行 CT 平扫及增强扫描，总结 CT 影像特点。
结果 CT 平扫 7 例病灶密度较均匀，呈低密度、稍高密度，2 例病灶密度不均匀，其中 1 例病灶内部可见钙化影，病灶边缘较清。动态增强扫描 9 例中有 7 例呈轻度渐进性强化，其中 2 例强化不均匀，9 例中有 2 例强化不明显。
结论 乳头状肾细胞癌的 CT 表现具有一定特点，根据强化方式可与肾透明细胞癌和复杂囊肿等鉴别，确诊依靠手术行病理学检查和免疫组织化学检查。

PU-0447

IVP 和 CTU 检查技术的比较及选择

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目的 比较 IVP 和 CTU 检查技术在泌尿系统疾病的检出率，病人耐受情况，对临床的指导价值。
方法 1.资料与**方法**
1.1 一般资料
取我院同时进行 IVP 和 CTU 检查的患者 30 例，男 16 例，女 14 例，年龄 20~75 岁，平均年龄 35 岁，
临床症状均表现为不同程度的血尿，腰痛，膀胱刺激征等症状。
1.2 检查方法
IVP 检查**方法** 先拍摄腹平片，然后通过肘静脉注射非离子型对比剂 40~60ml，压紧压迫带，7、15、30 分钟腹部加压各摄片一张，减压后再拍摄一张，显影情况不佳可延长到 60 分钟再摄腹平片。CTU 检查**方法** 扫描参数为 120KV，350mAs，5mm 层厚螺旋扫描。扫描前空腹喝清水 800~1000ml，常规横断面扫面，扫描范围从肾上极至耻骨联合。用高压注射器经肘静脉以速率约 3mls 注入非离子型对比剂 85ml 左右，先行腹部三期扫描，观察输尿管充盈情况，充盈欠佳时，嘱咐患者不要排尿，20 分钟后行延迟扫描全尿路。
结果 2.**结果**
2.1 两组检查诊断泌尿系统疾病的准确率比较 IVP 检查诊断泌尿系疾病的准确率为 60%（20/30），CTU 检 查诊断泌尿系疾病的准确率为 97%（29/30），两种检查方法在诊泌尿系疾病的准确率方面比较 ，CTU 检查明显优于 IVP 检查。
2.2 两组检查病人耐受情况的比较 IVP 检查出现两例不能耐受，耐受率为 93%（28/30），CTU 检查患者情况良好，无不良反应，耐受率为 100%（30/30）。
结论 4.**结论**
CTU 较 IVP 有明显的优势，该检查深受临床方面的欢迎。随着低辐射计量 CT 及非离子型对比剂的发展，不久将来 CTU 将取代 IVP，从而更好应用于临床为患者服务。

PU-0448
多层螺旋 CT 三维重建技术在泌尿系梗阻性疾病中的临床应用

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目的 多层螺旋 CT 泌尿系三维重建技术对泌尿系梗阻性疾病定性、定位诊断的准确性，并与常规 CT 平扫相比较，评价多层螺旋 CT 三维重建技术在泌尿系梗阻性疾病中的临床应用价值。
方法 使用多层螺旋 CT 检查疑诊为泌尿系梗阻的患者共计 80 例，搜集完整的 CT 平扫及三维重建资料,并搜集整理所有患者的手术病理或病例追踪结果。以手术病理或病例追踪结果为金标准，将 CT 平扫结果与三维重建结果进行对比分析。
结果 1. 多层螺旋 CT 三维重建技术对 80 例泌尿系梗阻性疾病患者的定位诊断符合率为 96%，高于 CT 平扫的定位诊断符合率 83%；经过 X^2 检验，两种检查方法在诊断泌尿系梗阻性疾病之间的定位诊断符合率之间的差异有统计学意义（X^2= 7.964 P =0.005 p<0.01<0.05）。
2. 多层螺旋 CT 三维重建技术对 80 例泌尿系梗阻性疾病患者的定性诊断符合率为 93%，高于 CT 平扫的定性诊断符合率 75%；经过 X^2 检验，两种检查方法在诊断泌尿系梗阻性疾病之间的定性诊断符合率之间的差异有显著统计学意义（X^2= 9.001 P =0.003 p<0.01<0.05）。
结论 1.多层螺旋 CT 泌尿系三维重建技术方法安全、扫描快速、图像具有高分辨率，能对泌尿系统进行较全面的显示,对泌尿系梗阻性疾病的定位、定性诊断方面独具优势，提供了准确可靠的依据以满足临床上的诊治需求，是对泌尿系梗阻性疾病的检查较为理想的一种影像学检查方法。
2. 三维重建后获得的图像,能对病变进行不同方位、不同角度的观察，与常规横轴位 CT 平扫相比较，在诊断泌尿系梗阻性疾病方面具有较全面的优势。

PU-0449
Preliminary utilization of radiomics in differential diagnosis between uterine sarcoma from atypical leiomyoma

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Purpose: This study aims to quantify the differences of MRI measurements between atypical uterine leiomyoma (AUL) and uterine sarcoma (US), so as to provide the basis for computer-aided diagnosis.

Method: Thirty-five patients that were histopathologically proven to have US and fifty patients that were diagnosed with AUL by surgical operation were selected. Then, the radiomics-based features consisting of shaped, statistical and texture features have been extracted using 3D regions of interest placed on T2-weighted images. Feature selection algorithms such as univariate analysis of variance, lasso and principal component analysis were employed to determine the optimal feature subset. Classification of these features is performed with four different machine-learning such as support vector machine (SVM), Random forest (RF), Artificial neural network (ANN) and K-nearest neighbor (KNN).

Result: The experimental results demonstrate that SVM performs better in the classification of different ROIs than the other models, which obtains an accuracy of

75.49% for identifying between AUL and US, and radiomics features achieve encouraging classification results on the optimal feature subset (AUC=0.842).

Conclusion: This study demonstrates that MRI radiomics analysis is valuable in supporting differential diagnosis between AUL and US.

PU-0450

弥散加权成像在 Gleason 评分 3+4 和 4+3 前列腺癌鉴别诊断中的应用研究

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目的 研究体素内不相干运动弥散加权成像（IVIM）和体素内计算弥散加权成像（vcDWI）在鉴别 Gleason 评分 3+4 和 4+3 前列腺癌中的应用价值

方法 回顾性分析 2014 年 9 月至 2018 年 9 月期间在我院行术前多模磁共振检查，并行前列腺癌全切术 Gleason score（GS）=7 的患者，其中 GS3+4 前列腺癌 19 例，GS4+3 前列腺癌 24 例。在 ADC 图上基于阈值（ADC＜1.111 x $10^{-3}mm^2/s$）由计算机辅助选取肿瘤弥散区域（tDv）[1]，分别匹配到 IVIM 和 vcDWI 各参数图上[2-4]，计算 IVIM 乏氧相关参数分子弥散系数（Ds）、灌注分数（fp）和 vcDWI 相应 tDv 内的各参数值[5, 6]，包括均数， 标准差(STD)， 中位数， 峰度， 偏度和第 10 百分位数值。组间比较单因素分析 p＜0.1 的变量纳入逻辑回归模型，使用 ROC 曲线分析 IVIM 和 vcDWI 鉴别 GS3+4 和 GS4+3 前列腺癌的效能。

结果 GS3+4 组的 Ds 偏度值比 GS4+3 组低（p=0.015），而 fp 峰度值则比 GS4+3 组高（p=0.049）。vcDWI 图中 GS4+3 组 tDv 内的均数，中位数和 STD 值均比 GS3+4 组高。结合 IVIM 和 vcDWI，鉴别 GS3+4 和 GS4+3 前列腺癌的 ROC 曲线下面积为 0.844（准确率=81.4%，灵敏度=68.42%，特异度=95.83%）。

结论 1，IVIM 乏氧相关参数值在 GS3+4 和 GS4+3 组前列腺癌之间是存在差异的。2，联合 IVIM 和 vcDWI，有助于鉴别 GS3+4 和 GS4+3 组前列腺癌。

PU-0451

The exponential apparent diffusion coefficient derived from diffusion-weighted magnetic resonance imaging is associated with progression-free survival in patients with stage I/II cervical cancer treated surgically

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Purpose: To explore the prognostic utility of exponential apparent diffusion coefficient (eADC) derived from diffusion-weighted MRI in patients with cervical cancer

Methods: This retrospective study included patients with stage I/II cervical cancer treated surgically in our hospital (August 2011 to June 2014). Patients underwent preoperative MRI (T1-weighted, T2-weighted and DWI). Baseline parameters recorded were:

age, menopause, stage, tumor dimensions, differentiation, pathology, lymph node involvement, mean ADC (ADC_{mean}), normalized ADC (nADC), eADC, DWI signal intensity (SI_{DWI}), T2-weighted imaging signal intensity (SI_{T2}), and postoperative adjuvant therapy. Baseline and MRI parameters associated with recurrence were identified by Cox regression analysis.

Results: Thirty-three patients were included (low eADC group, n=17; high eADC group, n=16). The high eADC group had higher ADC_{mean}, nADC and eADC and lower SI_{DWI} than the low eADC group (all P<0.001). PFS was longer in the low eADC group than in the high eADC group (P=0.010). In univariate analysis, ADC, nADC and eADC were associated with recurrence (all P<0.05). In multivariate analysis, only eADC (HR, 3.610; 95%CI, 1.467–8.886; P = 0.005) was associated with recurrence.

Conclusion: Preoperative eADC has comparable utility to ADC at predicting PFS in patients with stage I/II cervical cancer treated surgically, and eADC mapping may have an advantage over ADC mapping in terms of improved tissue contrast.

PU-0452
多层螺旋 CT 血管三维重建技术在女性生殖系统巨大肿瘤 定位诊断中的应用

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目的 探讨多层螺旋 CT 血管三维重建技术在女性生殖系统巨大肿瘤定位诊断中的应用价值。
方法 回顾性分析我院 2018 年 1—6 月经病理证实的 18 例女性生殖系统巨大肿瘤来源，采用多层螺旋 CT 血管三维重建技术寻找肿瘤供血动脉，进行定位诊断，并与病理结果对照分析。
结果 18 例女性生殖系统巨大肿瘤，将卵巢动脉单独供血 3 例、子宫动脉卵巢支单独供血 2 例、子宫动脉卵巢支与卵巢动脉共同供血 5 例，定位为卵巢来源的肿瘤。将子宫动脉单独供血 5 例、由子宫动脉供血为主，卵巢侧支动脉供血为辅的 3 例，定位为子宫来源的肿瘤。其结果与病理结果完全吻合。
结论 多层螺旋 CT 血管三维重建技术可以显示女性生殖系统巨大肿瘤的供血动脉来源，为定位诊断提供了依据。

PU-0453
3.0TMRI 在卵巢上皮良恶性肿瘤诊断中的应用价值

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目的 探讨 3.0TMRI 平扫、弥散加权成像（DWI）及多期动态增强成像（DCE-MRI）在卵巢上皮肿瘤良恶性诊断中的应用价值。
方法 回顾性分析 2018 年 1 月至 2019 年 6 月 48 例卵巢肿瘤患者均行手术切除治疗及病理对照，年龄为 14 岁-71 岁，主要症状为腹部或盆腔包块、腹水、腹痛，月经紊乱，阴道不规则流血，每位患者均行盆腔常规 MR 平扫包括 T2WI 矢状位、T1WI 及 T2WI 压脂序列轴位、DWI 及动态增强扫描。两名主治医师职称以上影像诊断医生观察并分析病灶的大小、形态、信号、边界、质地、囊实性比例以及强化方式、病变与周围组织的关系、有无腹水及肿大淋巴结。

结果 术前 48 例患者行 MRI 检查经术后病理证实，共 56 个肿瘤；囊性病变 22 例 26 个病灶，MRI 诊断与病理诊断均为良性；囊实性病变 22 例 30 个病灶，囊性为主伴有少部分实性成分变 12 例 16 个病灶（交界性肿瘤 8 例，透明细胞癌 4 例），MR 表现较大囊样长 T1 长 T2 信号，实性成份较少，呈稍长 T1 稍长 T2 信号，DWI 为较高信号，增强呈明显强化，部分伴少量腹水，MR 诊断交界性肿瘤，病理诊断 8 例交界性肿瘤 4 例低度恶性肿瘤，4 例双侧病变；实性成分为主并伴有大小不等囊性病变 12 例患者 14 个病灶，MRI 表现实性成分较多呈稍长 T1 稍长 T2 信号，DWI 呈高信号，增强呈明显强化，囊性部分较少呈长 T1 长 T2 信号，囊壁可见强化（子宫内膜样腺癌 4 例，高级别囊腺癌 6 例，转移性腺癌 2 例，2 例双侧病变）。对肿瘤良恶性判断中，卵巢单纯囊性病变组与囊实性病变组差异有统计学意义（P<0.05）；囊实性病变中，实性成分所占病变并比例越大恶性程度越高，具有统计学意义（P<0.05）；囊实性病变中，囊性成分的分布无统计学意义（P<0.05）。
结论 3.0TMRI 高场强磁共振对卵巢上皮肿瘤良恶性的诊断及恶性程度的术前评估在临床方面具有较大临床意义很高的应用的价值。

PU-0454
高分辨率 CT 靶扫测量输尿管壁厚度作为预测输尿管镜下治疗输尿管下段梗阻性结石的应用研究

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目的 测量输尿管壁厚度预测输尿管镜下治疗的输尿管下段结石是否为梗阻性结石。
方法 顾性分析自 2014 年 2 月至 2018 年 2 月共计 320 例接受输尿管镜手术的患者资料，通过高分辨 CT 平扫测量结石周围输尿管管壁厚度，通过 ROC 曲线分析输尿管管壁厚度，通过不同诊断分界点的灵敏度和特异度确定最佳诊断分界点。
结果 20 例患者中，梗阻性结石的患者为 119 例，患者所患结石是否合并肾周渗出、结石的数量、大小、输尿管管壁厚度均具有明显统计学意义（P＜0.001），通过 ROC 曲线分析得出分界点 3.15mm 对应的诊断指数最大。
结论 尿管管壁厚度可以预测输尿管下段梗阻性结石，从而预测输尿管镜碎石术的难易度。

PU-0455
不典型子宫脂肪平滑肌瘤 MR 误诊一例

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目的 探讨子宫脂肪平滑肌瘤的影像学表现。
方法 患者行盆腔 MRI 平扫、DWI 序列、增强扫描。团注 Gd-DTPA 0.2mmol/kg 后行轴位、矢状位抑脂增强扫描。
结果 CT 或 MRI 上发现瘤体内的脂肪密度或信号，从局灶性到弥漫性分布，甚至完全由脂肪成分构成，MRI 抑脂序列其信号丢失，病灶包膜完整，增强后软组织部分呈轻-中度强化，而脂肪成分无强化，瘤体内多无钙化及脂-液平面，无液化及囊变。
结论 子宫脂肪平滑肌瘤临床较为罕见，瘤体内含有特征性的脂肪成分，提示我们在日常工作中正确诊断。

PU-0456

磁共振联合超声对异位妊娠的诊断价值

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目的 探讨磁共振联合超声对异位妊娠的诊断价值。
方法 回顾性分析 33 例经手术病理证实的异位妊娠的 MRI 及超声表现，结合临床进行分析。
结果 3 例宫角妊娠，7 例输卵管间质部妊娠，11 例子宫瘢痕妊娠，2 例卵巢妊娠，5 例子宫颈妊娠，2 例子宫残角妊娠，1 例肌壁间妊娠、1 例阔韧带妊娠。MRI 诊断准确率为 95%，超声诊断正确率 92%。
结论 MRI 联合超声对异位妊娠临床早期明确诊及治疗具有重要价值。

PU-0457

肾血管性病变的双源 CT 诊断

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目的 双源 CT 对肾血管性病变的诊断与临床使用价值
方法 回顾性分析 2013-2016 年来双源 CT 肾血管成像 120 例，其中男 73 例，女 47 例，年龄 14-78 岁，临床有高血压、腰酸、腰痛、血尿、尿频、尿急等。将原始扫描数据传输至后处理工作站进行图像后处理，应用最大密度投影 MIP、多平面重建 MRP、曲面重建 CPR、容积再现 VR 对肾脏血管进行分析。
结果 **血管正常表现及解剖变异**：肾动脉变异：1 肾副动脉（44 例）2 肾动脉过早分支（8 例）肾静脉变异：1 肾副静脉 （3 例）2 主动脉后左肾静脉（1 例）3 环主动脉左肾静脉（2 例）4 左肾静脉汇合较晚（5 例）**肾动脉病变**：1.肾动脉狭窄（58 例）a 动脉粥样硬化（45 例）b 纤维肌性发育不全（1 例）c 大动脉炎（3 例）d 其他原因 2.肾动脉瘤(6 例)3.肾动静脉畸形（4 例）4.主动脉夹层累及肾动脉（7 例）5.肾栓塞及肾梗死（15）6 肾癌（13）**肾静脉病变**：1.“胡桃夹”现象（5 例）2.肾静脉栓子（血栓、癌栓 9 例）
结论 A 具有很高的空间分辨率，但需行动脉插管、注射造影剂剂量较大，接受 X 线辐射量较多、具有一定的危险性，不能完全提供满意的血管信息
双源 CTA1、经济、方便、无创，准确度等于 DSA2、获得的图像类似血管造影图像 3、三维重建可以从不同角度显示血管结构 4、成像速度快，不受呼吸、搏动、蠕动等影响 5、可以识别管壁的钙化斑块

PU-0458

囊性卵巢甲状腺肿的 CT 表现分析

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目的 探讨囊性卵巢甲状腺肿的影像表现，提高诊断准确率。

方法 回顾性分析 7 例囊性卵巢甲状腺肿的临床、病理和影像资料。分析指标包括位置、肿块大小、外形、边界、内部成份、强化情况以及肿瘤标志物和甲状腺功能等生化指标。
结果 7 例囊性卵巢甲状腺肿左侧 4 例（57.14%），右侧 3 例。肿块大小 3.3-5.8 cm，平均 5.1 cm；囊壁均表现为光滑且边界清晰，多分叶囊（分叶≥3 个）4 例（占 57.14 %），囊壁弧形、线样钙化 7 例（100%）；囊内钙化 3 例（42.86%），肿块内含脂肪成份 3 例（42.86%）；内见结节高密度 4 例（57.14%）；7 例患者均未发现特异性临床症状。
结论 囊性卵巢甲状腺肿临床症状不典型。CT 图像上附件区多分叶囊性结构、点线样钙化的囊壁、贴壁生长的高密度实性成份是诊断该病的重要依据，增强扫描后实性结节明显强化有助于确定诊断。

PU-0459
单源双能 CT 碘定量鉴别膀胱良性肿瘤与膀胱尿路上皮癌的价值初探

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目的 单源双能 CT 碘定量对膀胱良性肿瘤（Benign Bladder Neoplas，BBN）与膀胱尿路上皮癌（Urothelial Carcinoma of the Bladder，UCB）的鉴别诊断价值。
方法 性分析经手术病例证实，且术前行盆腔单源双能 CT 能谱成像检查的膀胱良性肿瘤 8 例（内翻性乳头状瘤 7 例，平滑肌瘤 1 例），膀胱尿路上皮癌 15 例。采用能谱扫描模式进行三期动态增强扫描。应用 GSI 综合分析平台，生成动、静脉期碘（水）浓度图。由两位观察者分别测量两组病灶动、静脉期的碘（水）浓度值（Iodine Concentration，IC），记为 ROI_T，同时测量同层面髂动脉的碘（水）浓度值，记为 ROI_A，并计算两期标准化碘水浓度值（Normalized Iodine Concentration，NIC，$NIC = ROI_T/ROI_A$）。采用组内相关系数（ICC）检验两位观察者测量各期数据结果的一致性，采用单个样本 K-S 检验分析数据正态性，采用曼-惠特尼 U 检验分析分析两组病灶增强两期的 NIC 的差异，采用 ROC 曲线分析有统计学差异参数的诊断效能。
结果 观察者获得的各项数据一致性良好（ICC>0.8）。动脉期 UCB 的标准化碘（水）浓度值显著高于 BBN，差异具有统计学意义（$P<0.05$）；静脉期两组病灶的标准化碘（水）浓度值之间均无统计学差异（$P>0.05$）。动脉期标标准化碘（水）浓度值诊断 UCB 的 AUC 为 0.817，敏感度和特异度分别为 100%与 75%。
结论 双能 CT 动脉期标准化碘（水）浓度值可定量鉴别膀胱良恶性肿瘤，具有一定临床应用价值。

PU-0460
腹部和盆腔恶性孤立性纤维瘤/血管外皮细胞瘤的影像学表现

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目的 探讨腹部和盆腔恶性孤立性纤维瘤/血管外皮细胞瘤(solitary fibrous tumor/Heman - giopericytoma,STF/HPC)的影像学表现，以提高其诊断准确率。

方法 回顾性分析 10 例经手术病理证实的腹部和盆腔 STF/HPC 患者的影像、临床及病理资料，其中 2 例行 CT 平扫，7 例行 CT 平扫及增强检查，1 例仅行 MR 平扫。分析 CT、MR 影像学特征，并与病理学结果进行对照研究。
结果 10 例中，男性 7 例，女性 3 例，平均年龄 49.7 岁，中位年龄为 50 岁，9 例单发，1 例多发，分别位于膀胱 4 例，阴囊 1 例，盆腔 1 例，腹膜后 2 例，膈肌 1 例，肝脏 1 例。肿瘤最大径范围约 3.5-13.2cm 中位数为 8.0cm，7 例边界清楚，3 例与周围组织分界不清，4 例呈分叶状，6 例呈圆形或类椭圆形；1 例行 MR 扫描，内部信号不均匀，TIWI 呈低信号，T2WI 呈稍高信号，并可见血管影；9 例行 CT 扫描，CT 平扫密度不均匀，内见不规则的片状低密度影，7 例增强扫描后呈中度-明显不均匀强化，4 例肿瘤内可见血管影。
结论 腹部和盆腔恶性 STF/HPC 的影像学表现具有一定特征性，当腹部及盆腔 STF/HPC，信号/密度不均匀，增强后中度-明显不均匀强化、肿瘤内部有血管影，并出现与周围组织分界不清等影像学特征时，高度提示恶性 STF/HPC 可能。

PU-0461

胃肠外间质瘤 1 例

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患者，男，57 岁，以进行性排尿困难 4 年，小便不能自解 13 小时入院。膝胸位肛诊：前列腺双侧叶Ⅲ度大，中央沟消失，右侧叶质硬，与周围界限不清，左侧叶质中，表面光滑，无压痛，未及硬结。

病理诊断：双侧前列腺组织梭形细胞性肿瘤，结合形态学及免疫组化，考虑胃肠道外胃肠间质瘤。
讨论：胃肠间质瘤可以发生于消化道任何一个部位，但临床发现一些定位于胃肠道外间叶源性肿瘤其形态学、免疫表型及分子生物学特征也与 GIST 相同，为区别胃肠道来源间质瘤，医学上目前将这些非胃肠来源间质瘤称之为胃肠外间质瘤 。EGIST 较为罕见,仅占 GIST 的 5% 。EGIST 可发生于网膜、肠系膜及腹膜后，也可罕见于肝脏、胰腺及膀胱等部位。临床上多见于中老年男性，以 45~ 65 岁为其好发高峰。临床表现无特异性，常表现为腹痛、腹胀、便秘、食欲缺乏、恶心、呕吐、消瘦和腹水，而无明显消化道及肠梗阻症状。肿瘤多在腹腔内或腹膜后生长,当发展至较大时,因推挤、侵犯邻近器官而引起相应症状。EGIST 具有 GIST 类似的病理特征与免疫表型，GIST 最具有特征的免疫组织化学标记物是 CD117。
影像学上，EGIST 多呈类圆形或分叶状，较巨大，具有侵袭性，与周围组织及器官粘连紧密，周围组织多呈推压、移位改变。CT/MR 平扫肿瘤多呈囊实性软组织密度/信号，肿瘤易黏液样变性或出血、坏死、囊变等，钙化少见。增强扫描，动脉期肿块实性部分轻度不均匀强化，静脉期则呈中度到明显不均匀强化，静脉期强化程度高于动脉期，肿瘤内坏死，黏液变区未见明显强化。因本例 EGIST 位于前列腺区，需与前列腺癌相鉴别。但本例患者 PSA 在正常范围，而前列腺癌 PSA 均见不同程度升高。

PU-0462

Quantitative Assessment of Prostate Cancer Aggressiveness in Diffusion Kurtosis imaging: Comparison of Two Methods of Delineating ROI

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Purpose: To determine the impact of two different methods for delineating region of interest(ROI) from ADC map derived from conventional monoexponential DWI, Dapp and Kapp maps derived from diffusion kurtosis imaging (DKI) on the assessment of prostate cancer aggressiveness in a preliminary study.
Materials and Methods: A total of 60 patients with prostate cancer who underwent MRI Scan were enrolled in this study. The PCa patients were divided into low grade group (L-PCa) and intermediate-/high-grade group (I/H-PCa). ADC , D_{app} and K_{app} values were respectively measured by two radiologists blind to patients' clinicopathological data based on the following two different methods to delineating ROIs: three slices ROIs (three-ROIs) and whole-tumor volume ROIs (WTV) Interobserver variability was analyzed by calculating intraclass correlation coefficient (ICC). Paired-Samples T Test, ROC curve analysis, Delong test were used. Pearson correlation analysis was used to evaluate the correlation between the values of these parameters and the Gleason score (GS).
Results: 60 patients with prostate cancer were included, including 19 cases of GS≤3+4 (31.67%) and 41 cases of GS≥4+3 (68.33%). The ICCs of all the parameters between two radiologists were higher than 0.75. The ADC, D_{app} and K_{app} values based on three-ROIs and WTV were significantly different between L-PCa and I/H-PCa groups ($P<0.001$). The AUCs of ADC, D_{app} and K_{app} values using three-ROIs and WTV were 0.823, 0.839, 0.829, 0.854, 0.779 and 0.791, respectively (all $P\leq0.001$). There were no significant difference in AUCs using three-ROIs and WTV (all $P>0.05$). Nonetheless, the assessment results of prostate cancer aggressiveness demonstrated that the AUCs of ADC, D_{app} and K_{app} values of WTV exhibited an increasing tendency, compared to three-ROIs. There was a median to significantly negative correlation between the ADC, D_{app} values based on three-ROIs and WTV and Gleason score (-0.573, -0.619, -0.599, -0.616, all $P < 0.01$), and a median positive correlation between the K_{app} value and Gleason score (0.441, 0.476, $P < 0.01$).
Conclusion: The pilot study demonstrated that two methods of drawing ROI can both evaluate prostate cancer aggressiveness. There is a slightly higher trend in WTV in PCa grading, Therefore, WTV may be desirable to define an optimal delineating method for the assessment of tumor heterogeneity.

PU-0463

增强 T2*加权血管成像（ESWAN）序列多定量参数鉴别子宫肉瘤与变性子宫肌瘤的价值初探

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目的 探讨增强 T_2^*加权血管成像（ESWAN）序列多定量参数鉴别子宫肉瘤（US）与变性子宫肌瘤（DH）的价值。
方法 回顾性分析经手术病理证实的 17 例 US 和 33 例 DH 的患者资料，术前均行 1.5T MRI 检查（含 ESWAN 序列），由两位观察者分别测量两组病例 ESWAN 序列后处理参数，包括幅度值、相位值、R_2^*值、T_2^*值。采用组内相关系数（*ICC*）检验两位观察者对各参数值测量结果的一致性，采用独立样本 *t* 检验或 *Mann-Whitney* 秩和检验比较两组病例各参数值的差异，采用 *ROC* 曲线评估有统计学差异的参数对两组病例鉴别诊断的效能。

结果 两位观察者测量两组病灶各参数的一致性均很好（*ICC*>0.75）。US 组的幅度值、相位值、R_2^*值、T_2^*值分别为 921.54±278.30、[0.025（0.012,0.056）] 弧度、（14.04±3.99） Hz、[96.95（82.14,113.23）] ms，DH 组的上述参数分别为 959.32±325.98 、[0.007（-0.002,0.016）]弧度、（22.45±5.47）Hz、[48.15（40.19,56.80）] ms，US 组的相位值、T_2^*值大于 DH 组，R_2^*值小于 DH 组，差异均有统计学意义（*P*<0.05）；两组间幅度值差异无统计学意义（*P*>0.05）。相位值、R_2^*值、T_2^*值对 US 诊断的 *AUC* 分别为 0.854、0.900、0.961，阈值分别为 0.007 弧度、14.28 Hz、73.46 ms。

结论 ESWAN 序列的相位值、R_2^*值、T_2^*值能够有效鉴别 US 与 DH，具有一定临床应用价值。

PU-0464

MRI 对胎物残留的诊断及临床价值

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目的 探讨 MRI 对胎物残留的诊断和指导临床治疗的作用。

方法 对 14 例经病理证实的胎物残留患者进行回顾性研究。所有患者接受了核磁共振成像，分析病灶的大小、T1WI 及 T2WI 信号强度、动态强化方式、附着子宫肌层范围及浸润肌层深度，并将 MRI 结果与临床治疗经过进行对比分析。

结果 胎物残留的大小在 2.2×3.4×1.9cm ~ 18.2×21.4×10.0mm。T1WI 环形高信号者 3 例，高信号者为 3 例，混杂信号者 6 例，低信号者 1 例，等信号者 1 例；T2WI 呈高信号者 5 例，高、低混杂信号者为 5 例，低信号者为 4 例。 富血供者 7 例，乏血供者 3 例。4 例与子宫接触面积达半圆，所有胎物残留浸润肌层处不同程度变薄。3 例富血供患者经高强度聚焦超声（HIFU）治疗后，在动态增强 MRI 上表现为完全梗死的胎物残留，2 例经子宫动脉栓塞后行清宫术，2 例行子宫次全切除术，余患者中 1 例行宫腔镜下宫腔占位电切术，6 例行米非司酮及甲氨蝶呤杀胚治疗。

结论 MRI 对评价胎物残留附着肌层范围、深度及血供情况有助于临床评估及治疗。MRI 对胎物残留的诊断和指导临床治疗具有重要意义。

PU-0465

探讨能谱 CT 平扫鉴别肾盂旁囊肿与非结石性肾积水的最佳单能量水平

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目的 能谱 CT 单能量成像提供了 101 组单能量图像用于不同的临床需求，本研究探讨能谱 CT 平扫鉴别肾盂旁囊肿与非结石性肾积水的最佳单能量水平。

方法 回顾性分析本机构经能谱 CT 动态增强扫描及 CT 尿路造影（CTU）确诊的肾盂旁囊肿患者 42 例，肾积水患者 46 例。在连续三个层面测量 40-140keV（间隔 10keV）单能量图像上肾盂旁囊肿或扩张的肾盂肾盏 CT 值。比较 11 组单能量水平的差别，绘制受试者特征曲线，并计算曲线下面积。

结果 两组病灶同侧肾实质 40-140keVCT 值差异均无统计学意义(all p>0.05)。肾盂旁囊肿及非结石性肾积水 40-140keVCT 值差异均有统计学意义(p<0.01)，其中以 60keV 的曲线下面积最大，为 0.810（95%CI：0.716-0.904），敏感性及特异性分别为：71.74%%和 88.10%。
结论 能谱 CT 平扫单能量图像的 CT 值对鉴别肾盂旁囊肿与非结石性肾积水具一定价值，对于无症状的肾盂旁囊肿患者可避免 CT 增强或 CTU 检查而降低电离辐射剂量及对比剂负荷，其中 60keV 的 CT 值对鉴别肾盂旁囊肿与非结石性肾积水表现出最高的诊断效能。

PU-0466
能谱 CT 影像组学构建肾透明细胞癌 WHO/ISUP 分级的预测模型

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目的 能谱 CT 影像组学构建肾透明细胞癌(ccRCC)WHO/ISUP 分级的预测模型。
方法 回顾性收集本院行 CT 增强扫描并经病理确诊的 ccRCC 患者 104 例。采用分层抽样将患者分为训练组(73 例)和验证组(31 例)。根据肾癌 WHO/ISUP 分级将 I 级及 II 级定义为低级别组，III 级及 IV 级定义为高级别组。皮质期图像被导入 ITK-Snap 及 A.K.软件中用于肿瘤分割及影像组学特征提取。采用 Lasso 回归对训练组影像组学特征进行降维，并建立影像组学风险评分。以 WHO/ISUP 分级为金标准，采用逻辑回归选择预测肾 ccRCC 分化程度的独立危险因素，并构建预测模型。将该预测模型用于验证组数据中。采用 Bootstrap 法对模型进行内部验证，分别计算 C 统计量、敏感度及特异度。采用 Hosmer-Lemeshow 拟合优度检验(HL-test)评价模型的校准度。采用决策曲线分析不同概率阈值下的患者净获益情况。
结果 LASSO 回归后的 19 个特征及其系数的线性加权建立影像组学风险评分。二元逻辑回归结果表明仅影像组学风险评分是预测 ccRCC 分化程度的独立危险因素,OR 值为 3.576。影像组学风险评分在训练组经 Bootstrap 法内部验证 C 统计量为 0.940，灵敏度为 95.5%，特异度为 88.2%。HL-test 表明该预测模型的校准度较好(p=0.813)。影像组学风险评分在验证组 C 统计量为 0.859，灵敏度为 77.8%，特异度为 81.8%。HL-test 结果表明该预测模型的校准度较好(p=0.068）。验证组决策曲线分析显示，概率阈值在 2%～95%时，影像组学预测 ccRCC 病理分级优于将所有患者都认为高级别，也优于将所有患者认为低级别。
结论 基于 ccRCC 能谱 CT 动态增强皮质期虚拟单能量图像的影像组学构建的预测模型，对预测高、低级别具有一定的临床价值，可为患者术前治疗及预后提供参考依据。

PU-0467
增强后 T2WI 反转恢复压脂序列对膀胱癌 T 分期的应用价值

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目的 探讨 T2WI-Flair-FS 增强扫描序列在膀胱癌 T 分期中的应用价值，为制定治疗方案提供可靠依据。
资料和方法 收集 28 例行盆腔增强 MRI 检查的膀胱癌患者，扫描 T1WI、DWI、小野高清 T2WI、T2WI-Flair-FS 和增强后的 DCE-LAVA、T2WI-Flair-FS 序列。由 1 名放射科副主任医师分别以 DWI+T2WI+DCE 组合、增强后 T2WI-Flair-FS 序列两种方法进行 T 分期，并与病理进行比较。分期

方法为：非肌层浸润型膀胱癌（Non-Muscle Invasive Bladder Cancer，NMIBC），主要包括 Tx~T1 期；肌层浸润性膀胱癌(Muscle Invasive Bladder Cancer，MIBC)主要包括 T2~T4 期。两种方法的敏感性及特异性比较采用 x^2 检验，以 P＜0.05 为差异有统计学意义。

结果 28 例 45 个病灶中，单发 18 例，2 个病灶 5 例，3 个病灶 3 例,4 个病灶 2 例。经手术或病理证实，确诊为 NMIBC(T 分期＜T2a 期)14 个(31.1%)、MIBC（T 分期≥T2a)31 个(68.9%)。DWI+T2WI+DCE 组合诊断为 NMIBC、MIBC 分别为（11/45）、（34/45），增强后 T2WI-Flair-FS 诊断为 NMIBC、MIBC 分别为（13/45）、（32/45）。由于样本量不足，采用 Fisher 精准检验，结果显示 P＜0.001，提示增强后 T2WI-Flair-FS 序列诊断膀胱癌肌层侵犯与否的敏感性与特异性优于 DWI+T2WI+DCE 组合。

结论 增强后 T2WI-Flair-FS 对于诊断膀胱癌肌层侵犯有较高的诊断效能，是鉴别 NMIBC、MIBC 的有效方法。

PU-0468

肾肉瘤样癌的 CT 特征分析

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目的 肾肉瘤样癌(sarcomatoid renal cell carcinoma，sRCC)是肾细胞癌(renal cell carcinoma， RCC)亚型的一种变异，它可以发生在任何肾细胞癌亚型，具有恶性程度高、浸润性强、预后差的特点。本文回顾性分析 4 例肾肉瘤样癌患者的 CT 图像，并复习相关文献，探讨肾肉瘤样癌的 CT 特征。

方法 收集病理证实为肾肉瘤样癌患者 4 例术前 CT 检查资料，分析其 CT 表现。

结果 4 例病灶位于左肾 3 例，右肾 1 例。4 例均为囊实性病灶，密度不均，形状不规则，边界不清。4 例均未见到钙化及出血改变。病灶直径 32mm～117mm，平均 81.5±39.03mm。多期增强扫描病灶不均匀强化，强化程度低于肾皮质；2 例肾周筋膜增厚并见肾周积液；1 例肾周见多发结节；2 例腹膜后淋巴结转移；2 例肺转移。

结论 肾肉瘤样癌的 CT 表现有一定特征性，正确认识肾肉瘤样癌的 CT 特征性表现，将为临床制定治疗计划和判断预后提供更可靠的参考依据。

PU-0469

80%ASIR-V 在 CTU 成像中的应用价值

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目的 Revolution CT 机(80%ASIRV)与 HD750CT 机(30%ASIR)对比，探讨高权重 ASIRV 在 CT 尿路造影(CT urography, CTU)中的应用价值。

方法 回顾性分析 2017 年 5 月和 10 月 Revolution CT 机进行 CTU 检查的患者，为 A 组；以及同时期在 HD750 CT 机进行 CTU 检查的患者，为 B 组。所有入组病例均未发现器质性病变。两台 CT 机扫描层厚/层间隔 5mm，重建层厚/层间隔 1.25mm。由两位医师(分别工作 5 年，3 年)分别选择 1.25mm 图像进行数据测量，包括两组图像的膀胱 CT 值、SD 值，两侧臀大肌 CT 值、SD 值。计算对比噪声比(CNR)、信噪比(SNR)和有效辐射剂量(effective dose, ED)，记录容积 CT 剂量指数(volume CT dose index, $CTDI_{vol}$)及平脐层面图像的长径（a）、短径（b）。由两位医师(分别工作 5 年，3 年)

共同对两组图像进行主观评价。采用组内相关系数(ICC)比较两位观察者所测量数据的一致性，选择高年资医师所测数据进行后续统计学分析。膀胱 SD 值、有效辐射计量的比较采用独立样本 t 检验，臀大肌 SD 值、SNR、CNR 的比较采用 Mann-Whitney U 检验，P<0.05 具有统计学差异。
结果 两位医师测量数据一致性良好(ICC 均>0.8)。A 组的 CNR 及 SNR 均高于 B 组，差异具有统计学意义(P<0.05)；A、B 组的膀胱 SD 值及 $CTDI_{vol}$ 无统计学差异(P>0.05)。
结论 80%ASIRV 能够保证同等辐射剂量条件下，提高 CTU 图像质量。

PU-0470

Diffusion and perfusion MRI in the assessment of tumor grade in endometrial carcinoma

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Objective: Our purpose was to evaluate the diagnostic performance of preoperativedynamic contrast-enhanced magnetic resonance imaging (DCE-MRI) and diffusion-weighted imaging (DWI) in discriminating tumour grades of endometrial carcinoma (EC). **Methods**: Fifty-one patientswith EC who underwent DCE-MRI and standard DWI before confirmation by histopathology were enrolled in this study. Parameters derived from DCE-MRI and DWI were measured, the optimal cut-off values for differential tumour grades of EC were determined, and the combinations of the two methods were evaluated. MRI parameter differences between high-grade (grade 3) and low-grade (grade 1 and 2) tumours were tested using Wilcoxon signed-rank tests.The diagnosticperformance of the (combined) parameters for differentiation between different EC tumour grades was determined using ROC analysis. **Results**: Significantly higher K^{trans}, $K_{ep}$and ADC values were found in high-grade EC than in low-grade EC (all $p < 0.001$). There was no significant difference in theVe values between the two groups. The area under the curve (AUC) of thecombined DWI and DCE-MRI model was significantly larger than that of theDCE-MRI model andthat of thesingle parameters of DWI (ADC) and DCE-MRI ($K^{trans}$and K_{ep})(0.95 vs. 0.79, 0.88, 0.78 and 0.72; $p < 0.05$, respectively). **Conclusion**: DCE-MRI and DWI, particularly when used in combination, are promising methods for the assessment of EC tumour grade.

PU-0471

影像组学结合临床指标在肾脏嫌色细胞癌和嗜酸性细胞腺瘤中的鉴别诊断价值

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目的 探讨肾脏增强 CT 的纹理分析与临床指标相结合的影像组学在鉴别肾脏嫌色细胞癌（Chromophobe cell renal carcinoma; CCRC）和嗜酸性细胞腺瘤（Renal oncocytoma，RO）中的价值。

方法 回顾性分析 64 例 CCRC 和 31 例 RO 肾脏肿瘤病灶的 CT 图像，采用 ITK-SNAP version 4.11.0 软件进行感兴趣区勾画并使用 A.K.Version V3.0.0.R 软件提取纹理特征。通过随机森林算法纳入的纹理特征建立影像组学标签。采用 Logistic 回归评价影像组学标签结合临床指标在 CCRC 和 RO 中的鉴别效能。
结果 随机森林算法构建的影像标签对于鉴别 CCRC 和 RO 具有较好的预测效能，所构建的三个模型中皮质期模型的预测准确性为 0.876；实质期模型的预测准确性为 0.861；两期混合后模型的预测准确性为 0.945。结合肌酐、尿素氮后，三个模型的 AUC 值分别地提高到 0.930，0.932 和 0.968。
结论 基于 CT 图像的影像组学结合临床指标研究对 CCRC 和 RO 的鉴别诊断具有临床价值。

PU-0472

Multislice spiral computed tomography signs of invasion of the renal capsule by renal cell carcinoma

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Purpose:Capsular invasion is frequently detected in localized renal cell carcinoma (RCC) specimens and is associated with a poor prognosis, but the pretreatment imaging features are poorly known. This study aimed to explore the positions and margin types of RCC and various computed tomography (CT) signs, as well as the correlations with the presence/absence of RCC invasion of the renal capsule.
Medthod:This was a retrospective study of 158 consecutive patients treated for pathologically confirmed RCC between January 2013 and December 2016 at the Nantong University Affiliated Hospital. The patients were divided into the capsule invasion and noninvasion groups. The CT signs were analyzed (position type, margin type, and CT findings in the perirenal fat).
Result:There were 92 (58.2%) men and 66 (41.8%) women; mean age was 59.1±12.8. Renal capsule invasion was confirmed in 45 cases. There was no difference in the position types between the 2 groups (all P>.05). The smooth margin was more common in the noninvasion group (53.1% vs 15.6%, P<.01). The deep lobulated type and the saw tooth sign were more common in the invasion group (57.8% vs 7.1%; and 40.0% vs 6.2%; both P<.01). The deep lobulated (OR=2.03, 95%CI: 1.21–3.39, P=.007) and saw tooth (OR=1.036, 95%CI: 1.008–1.065, P=.011) signs were independently associated with renal capsule invasion.
Conclusion:Smooth tumor margin suggests the absence of renal capsule invasion, while the deep lobulated and the saw tooth signs strongly suggest the presence of renal capsule invasion in patients with RCC.

PU-0473
数字断层融合技术（DTS）结合静脉肾盂造影（IVP）在泌尿系结石诊断中的影响因素及诊断效能分析

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目的 探讨数字断层融合技术（DTS）结合静脉肾盂造影（IVP）在诊断泌尿系结石中的影响因素和分析各种影响因素的危险度及诊断相关性，进而分析 DTS +IVP 在泌尿系结石的诊断效能。
方法 回顾性分析并收集 2015 年 10 月至 2018 年 10 月同时行静脉肾盂造影（IVP）及数字断层融合技术+静脉肾盂造影（DTS+IVP）检查，并经临床随访或 CT 证实输尿管结石的病人，共 500 例。由三个高年资医师二次阅片对其影响因素进行提取，获取与影响检出泌尿系结石相关性高的因素，使用全变量 logistic 回归分析对其危险度进行分析。再基于两种诊断方式诊断效能获取 AUC 值，建立 ROC 曲线并进行方差分析。
结果 共提取 27 个影响因素，一般情况 5 个，临床症状 5 个，影像学特征 17 个，经分析得其中 4 个有统计学意义，分别为：结石形态、大小、位置及密度。其中为危险因素（有利检出）：IVP 为结石形态（OR=3.61）、大小（OR=1.12）、位置（OR=5.82）及密度（OR=16.56）；DTS 为结石形态（OR=12.71）及密度（OR=11.91）；DTS+IVP 为结石形态（OR=13.11）、位置（OR=4.27）、大小（OR=7.57）及密度（OR=16.94）。IVP、DTS 及 IVP+DTS 的 AUC 值分别为 0.87、0.90 及 0.93，方差分析 P<0.001，其 AUC 值之间对比有统计学意义。
结论 IVP 上输尿管全程显影时加摄 DTS，可降低结石形态、位置、密度及大小的影响，消除重叠、阴性结石及骨性结构的遮挡，提高输尿管结石检出率，对于双肾区结石，DTS 独特消除重叠的效果能更好的帮助诊断医师。DTS+IVP 的多模态融合检查方式能进一步提高泌尿系结石检出敏感性，IVP+DTS 的诊断效能与单纯 IVP 的相近，但结合临床经验，IVP+DTS 能较好的检出小结石及消除输尿管中段的遮挡因素。

PU-0474
Assessment of Delayed Graft Function Using Susceptibility-Weighted Imaging in the Early Period after Kidney Transplantation: A Feasibility Study

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Purpose: This study aimed to explore the feasibility of susceptibility-weighted imaging (SWI) for evaluating delayed graft function (DGF) during the early post-transplantation period.
Methods: Sixty-nine recipients who accepted allograft renal transplantation underwent SWI during the second post-transplantation week. Renal allograft function was estimated via the glomerular filtration rate. Recipients with and without DGF were identified. For each transplanted kidney, the presence of abnormal signal intensity lesions (ASILs), excluding benign lesions, on SWI was assessed. Renal allograft function was compared between the recipients with and without ASILs. The correlation

between ASILs and renal allograft function was tested by Spearman's rank correlation analysis.
Results: Thirty-four recipients were diagnosed with DGF, while 35 recipients showed no DGF. In the DGF group, 16 recipients had low-intensity ASILs, primarily at the corticomedullary junction of transplanted kidneys on SWI, and no ASILs were found in 18 recipients. In the non-DGF group, none of the recipients showed ASILs on SWI. In the DGF group, the renal allograft function among the 16 recipients with low-intensity ASILs was significantly lower than that among the other 18 recipients (8.5±4.2 vs. 19.7±9.7 mL/min, P<0.001). The presence of low-intensity ASILs on SWI showed a moderate negative correlation with renal allograft function in recipients with DGF (r=-0.553, P=0.001).
Conclusion: SWI can be used to evaluate DGF in the early post-kidney transplantation period.

PU-0475
CTU 三维重建技术在上尿路病变中的诊断价值分析

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目的 探讨 CTU 三维重建技术在上尿路疾病中的诊断价值。
方法 收集 2017 年 1 月～2019 年 1 月连续性临床疑似上尿路病变的住院病人，排除单纯肾结石、泌尿系和泌尿系外肿瘤未累及肾盂、肾盏和输尿管的 139 例 CTU 检查资料。扫描数据传至影像工作站，由两名放射学医师行 MIP、MPR 和 CPR 重建分析。CTU 三维重建技术在上尿路病变中的意义以诊断敏感度、特异度、准确度、阳性预测值、阴性预测值、阳性似然比、阴性似然比表示。上尿路各类疾病所占比及各种疾病诊断正确率以百分数表示。
结果 男 97 例，女 42 例，年龄 16～90 岁，平均 57.37 岁。CTU 上尿路异常表现共 123 例，其中 117 例 CTU 异常表现和临床随访结果一致，5 例 CTU 疑似上尿路病变（肾盏 2 例，输尿管 3 例），输尿管镜检查正常；肾盏、输尿管微小病灶各 1 例 CTU 诊断正常，输尿管镜检查为息肉样增生和局部炎症；CTU 和随访结果上尿路均正常 16 人。CTU 三维重建技术对上尿路病变诊断敏感度为 98.32%、特异度 76.19%、准确度 95.68%、阳性预测值为 95.90%、阴性预测值 88.89%、阳性似然比 4.13、阴性似然比 0.02。主要阳性病例中输尿管结石占 47.01%，其中单纯输尿管结石、输尿管结石伴局部炎症、输尿管结石伴局部息肉诊断正确率 100%（34/34）、84.62%（11/13）、37.50%（3/8）。上尿路尿路上皮癌占 23.93%，诊断正确率为 89.29%（25/28），输尿管壁炎性病变占 9.4%，诊断正确率为 90.90%（10/11），肿瘤侵犯上尿路占 9.4%，诊断正确率 100%（11/11）。其他病例，如输尿管单纯息肉、良性肿瘤和输尿管畸形等占 10.26%（12/117）。
结论 CTU 三维重建技术可以全面显示上尿路整体情况、准确显示病变形态、范围及其 CT 表现，对上尿路病变的诊断和鉴别诊断有很好的临床价值。

PU-0476
肾脏少见良性肿瘤 CT 及 MRI 诊断

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目的 肾脏肿瘤的发现逐年增多，肾良性肿瘤往往被过度的干预和治疗，部分患者失去了保留肾脏的机会。因此；有必要提高肾良性肿瘤的术前 CT、MRI 诊断水平，避免过度诊疗。
方法 结合文献对我院手术病理证实的 14 例肾脏良性肿瘤的 CT 和 MRI 表现进行回顾性分析，并与病理结果进行对照。
结果 肾嗜酸细胞腺瘤 CT 平扫与正常肾实质相比呈等或稍高密度为主的肿块，密度均匀或稍不均匀，边界清楚，增强扫描 3 例皮质期、髓质期呈不均匀明显持续强化，2 例瘢痕样延迟强化，1 例反转强化。MRI 扫描与正常肾实质相比信号均匀或不均匀，边界清楚，增强扫描皮质期、髓质期不均匀强化高于肾皮质，2 例瘢痕样延时强化；1 例反转强化。
囊性肾瘤表现为肾脏囊性占位，边界清楚，无钙化，1 例病灶内部及周边肾实质可见密度增高影，1 例呈多囊样结构，壁明显稍增厚。增强扫描 2 例囊壁未见明显强化，囊内可见轻度分隔样强化影；1 例壁明显稍增厚者呈持续延迟明显强化。T2WI 呈高信号，T1WI 呈低信号，其内可见多发分隔信号，增强扫描包膜及分隔渐近性强化。
混合型上皮和间质肿瘤 CT 呈稍高密度影，边界清楚，较大病灶位于肾内，膨胀性生长，1 例为囊实性病变，多囊厚壁样病灶，呈膨胀性生长，实性及厚壁成分 CT 呈稍高密度，T2WI 呈低和极低信号影，T1WI 呈等信号，增强扫描实性及厚壁成分呈渐进性明显强化。
后肾腺瘤 1 例 CT 呈稍高密度影，未见钙化。增强扫描周边轻中度强化；MRI 呈囊实质占位，实质成分 T2WI 和 T1WI 均比肾实质信号稍低，囊性成分 T2WI 和 T1WI 均呈高信号，增强扫描呈中等度强化，强化程度始终低于皮质。
结论 肾脏良性肿瘤的 CT、MRI 表现具有一定的特异性，常见人群为以成年女性及未成年男性为主，无包膜多见，少数有包膜，增强扫描以持续的轻中度强化为主。

PU-0477

宫角妊娠的 MRI 诊断价值

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目的 总结宫角妊娠 MRI 表现特征，探讨 MRI 在宫角妊娠诊断及鉴别诊断中的价值。
方法 手术或病理证实的 15 例宫角妊娠患者，全部行盆腔 MRI 检查，回顾分析其 MRI 表现。
结果 妊娠物呈孕囊型 10 例，包块型 5 例。妊娠物全部位于单侧宫角，其中位于左侧宫角 8 例，位于右侧宫角 7 例。妊娠物呈类圆形或椭圆形 11 例，呈梭形或其他形状 4 例。9 例孕囊全部位于宫角结合带内侧缘，其中孕囊周围蜕膜增厚 6 例，局部蜕膜增厚并胎盘植入 2 例。5 例包块型妊娠物全部与宫腔相通，伴有胎盘植入 4 例。孕囊型妊娠物呈较均匀 T_1WI 低信号，T_2WI-SPAIR 高信号 6 例；包块型妊娠物呈混杂信号 5 例。
结论 宫角妊娠 MRI 表现有一定特征性，宫角妊娠与输卵管间质部妊娠的鉴别主要为位置不同，MRI 能清楚显示病灶的位置、形态、信号特点及侵犯周围结构情况，对宫角妊娠诊断及鉴别诊断有重要价值。

PU-0478

ASIR-V 联合低 kVp 在肾动脉 CT 成像中降低辐射剂量的应用

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目的 研究基于多模型的迭代重建算法（ASIR-V）联合低 kVp 在肾动脉 CT 成像中降低辐射剂量的应用。
方法 对 60 例怀疑肾动脉疾病并行肾动脉成像检查的患者，根据管电压不同分为 A、B、C 三组（120kVp、100kVp、80kVp），每组 20 例。A 组管电压 120kVp，采用 FBP 重建；B 组管电压 100kVp，后迭代重建权重为 80%；C 组管电压 80kVp，后迭代重建权重为 80%，重建层厚均为 1.25mm。客观测量双肾动脉及同层面皮下脂肪，记录其 CT 值及 SD 值，计算信噪比（SNR=CT/SD）及对比噪声比(CNR=（CT 肾动脉-CT 脂肪）/SD 脂肪)，采用 5 分法对各组图像质量进行双盲法主观评分（5 分，图像质量最好；1 分，图像质量最差）。对患者一般资料及客观测量结果进行统计学分析，并对各组图像质量进行 5 分法主观评分（5 分，图像质量最好；1 分，图像质量最差）。
结果 三组患者一般差异均无统计学意义（P＞0.05）；图像质量主观评分存在明显差异(P＜0.001)；客观测量的 CT 值无统计学差异（P＞0.05），而 SD 值、SNR 及 CNR 均存在明显差异(P＜0.001)；三组间的辐射剂量分别为（4.80±1.36）mSv、（4.14±0.64）mSv、（2.11±0.22）mSv，存在明显统计学差异（P＜0.001），80kVp 较 100kVp 与 120kVp 辐射剂量分别降低了 49%、56%。
结论 在肾动脉 CT 成像中，低 kVp 联合 ASIR-V 技术在保证优质的利于诊断的图像质量前提下，能大幅度降低辐射剂量。

PU-0479

后肾腺瘤影像及病理对照分析

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目的 探讨后肾腺瘤(MA)的 CT/MRI 影像学特征。
方法 回顾性分析了经术后特殊病理证实的 11 例 MA 患者影像资料,归纳肿瘤的大小、形态、密度或信号强度及强化方式。
结果 11 例 MA,男 3 例,女 8 例,均为单侧单发,其中 6 例位于右肾,5 例位于左肾。11 例病灶均呈圆形或类圆形,其中 8 例病灶为实性,3 例为囊实性(1 例以囊性为主)。CT 平扫病灶实性成分呈等或稍高密度,增强扫描病灶边界清晰,实性成分呈延迟性轻中度强化,强化程度低于正常肾皮质。MRI 平扫 1 例信号强度与肾实质相似;另外 1 例病灶信号欠均匀,呈稍长 T1,稍长 T2,两例 DWI 均为高信号。
结论 MA 的影像学表现具有一定的特征性,CT 及 MRI 对其诊断及鉴别诊断有重要意义。

PU-0480

Low-dose CT with adaptive statistical iterative reconstruction for evaluation of urinary stone: a pilot study

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PURPOSE
To evaluate the feasiblity of low-dose CT combined with adaptive statistical iterative reconstruction (ASIR) in the diagnosis of urinary calculi

METHOD AND MATERIALS

70 patients with clinically suspected urolithiasis were included.Followed by both conventional-dose CT scans (CDCT) and low-dose CT scans (LDCT).Automatic tube current modulation scanning was used, with a noise index setting of 13 in CDCT and 25 in LDCT.Image were reconstructed with filtered back projection (FBP) and different settings of ASIR (40%、60%、80%).Calculi (size、location、number) 、image quality (scale, 1-5) 、image noise (scale, 1-3) and confidence levels for urolithiasis diagnose (scale, 1-3) were evaluated and measured by two radiologists independently.Radiation dose by dose length product (DLP) were recorded,and effective dose (ED) was calculated.Statistical analysis was performed with Mann-Whitney U test and paired t tests

RESULTS

Mean ED was 2.07 mSv in LDCT compared with 6.12 mSv in CDCT (P<0.05),.which decreased by 66.1%.LDCT-80%ASIR images showed great image quality (score, 4.09),which was similar to CDCT-FBP images (score,4.17) (P>0.05),but higher than LDCT-FBP images (score,2.77) (P<0.05)

CONCLUSION

Combined with automatic tube current modulation scanning and ASIR,radiation dose can be significantly reduced with image quality maintained.

PU-0481

CT 与 MRI 对合并出血肾占位性病变的诊断与鉴别诊断

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目的 探讨 CT 与 MRI 对合并出血的肾脏占位性病变的诊断及鉴别诊断价值，提高诊断的准确性。
方法 回顾性分析经病理或随访证实的我院 2015 年 1 月至 2019 年 1 月收治的 75 例合并出血的肾脏占位性病变患者的临床资料及影像表现，其中，血管平滑肌脂肪瘤合并出血 31 例，囊肿并出血 26 例，肾癌合并出血 18 例。所有病灶行 CT（平扫和增强）或 MRI（平扫和增强）扫描，分析比较病灶的影像学征象，包括病灶的发生部位及位置、大小（平均直径）、形态、肾瘤界面边界及形态、病灶内成分、增强形式及肿瘤内血管影等。
结果 三种病变在病变发生位置及性别差异无统计学意义。在病灶发生部位、大小、形态、肾瘤界面边界及形态差异有统计学意义，血管平滑肌脂肪瘤较后两者出血更易破向肾外且平均直径更大，血管平滑肌脂肪瘤与囊肿合并出血形态更规则、边界清楚、肾瘤界面以喇叭口或杯口状为主，肾癌形态不规则或分叶形，边界不清，肾瘤界面以不规则或分叶状为主。含脂肪成分是血管平滑肌脂肪瘤的诊断标准，对乏脂肪成分的血管平滑肌脂肪瘤合并出血在强化方式及程度、肿瘤内血管影与肾癌合并出血差异无统计学意义，囊肿合并出血病灶内无实性成分及无强化特点与其余两者差异有统计学意义。
结论 CT 和 MRI 可以准确地诊断合并出血的肾脏占位性病变，明确不同性质的占位性病变的影像学特点，有重要的临床应用价值。

PU-0482
原发性子宫内膜癌 MRI 非结构式报告与结构式报告对比研究

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目的 本文通过研究原发性子宫内膜癌 MRI 非结构式报告与结构式报告，比较两类报告的影像报告信息完整性、临床价值，进一步讨论书写报告及阅读报告的效率。
方法 对 41 例经组织病理学证实的子宫内膜癌患者的盆腔 MRI 增强非结构式报告和结构式报告进行比对研究。非结构式报告是在正常临床工作流程中书写生成的。非结构式报告书写完成 3 个月后，由同样的影像科医生使用结构式报告系统对同样的病例进行书写，相同的上级医生审核报告。由一位未参与病例书写的放射科医生分析非结构式报告和结构式报告中与肿瘤分期相关的关键特征描述的完整性和书写时间，并进行比较。招募两名妇科医生独立填写问卷，问卷内容包括报告满意度、临床价值、报告质量和阅读时间，并对问卷结果进行比较。
结果 两位临床医生关于非结构式报告和结构式报告内容、语言质量满意度、临床价值和报告质量评估的一致性均较好（k>0.5)。与非结构式报告相比，结构式报告中包含的与肿瘤分期相关的关键特性量明显增多(双样本配对 t 检验，11.44±1.34 和 14.76±0.73，p< 0.001)，两名临床医生对结构式报告的语言质量满意度优于非结构式报告 (Wilcoxon 符号秩和检验，第一位临床医生：4.02 vs.4.63, p= 0.002；第二位临床医生：3.86 vs.4.02，p= 0.035)。影像科医生完成结构式报告的时间明显少于非结构式报告（双样本配对 t 检验，727.22±38.42s vs.616.44±60.00s，p= 0.037)。
结论 原发性子宫内膜癌 MRI 结构式报告提升了子宫内膜癌分期报告的完整性，增加了临床医生对影像报告的满意度，并减少了诊断用时，结构式报告的应用明显提高了原发性子宫内膜癌 MRI 报告的价值。

PU-0483
肾上腺少见肿瘤 CT 表现及鉴别诊断

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目的 分析肾上腺少见肿瘤的 CT 表现，提高对肾上腺病变的 CT 诊断与鉴别诊断水平。
方法 回顾性分析 51 例经手术病理确诊有完整资料的肾上腺肿瘤 CT 图像，其中神经母细胞瘤 10 例，转移瘤 8 例，皮质癌 6 例，髓质脂肪瘤 3 例，囊肿 5 例，神经鞘瘤 5 例，海绵状血管瘤 2 例，节神经细胞瘤 3 例，神经节细胞瘤 1 例，副神经节细胞瘤 1 例，囊性淋巴管瘤 2 例，畸胎瘤 3 例，纤维肉瘤 1 例，平滑肌肉瘤 1 例，从病变大小、形态、密度、内部结构、强化程度等方面分析 CT 图像。
结果 神经母细胞瘤为不均较大肿块，有钙化，呈明显不均匀强化；转移瘤表现各异，有原发灶病史；皮质癌为较大不均肿块，边界欠清，见大片坏死，1 例见少许点状钙化，呈明显不均匀强化；髓质脂肪瘤为边清含脂肿块，混杂软组织密度，脂肪密度不强化，软组织轻、中度强化，1 例以软组织成分为主，少许脂肪，有坏死、囊变和钙化；囊肿为边清均匀囊性肿块，不强化，囊壁可有钙化；神经鞘瘤为边清软组织肿块，囊变、钙化，呈轻、中度强化，1 例囊性为主；海绵状血管瘤为不均软组织肿块，易出血、钙化，中心延迟填充强化；节神经细胞瘤为边清均匀软组织肿块，点状

钙化，呈轻度强化；神经节细胞瘤为边清较大软组织肿块，见颗粒状钙化及小片状囊变区，明显不均匀强化；副神经节细胞瘤为巨大软组织肿块，边界欠清，中心大片不规则坏死区，边缘明显不均匀强化；囊性淋巴瘤为边清单囊或多囊肿块，囊壁斑点状钙化，囊内不强化，壁轻度强化；未成熟实性畸胎瘤为实性不均匀肿块，不均匀强化；良性囊性畸胎瘤为囊性成分为主，有分隔，见脂肪、钙化，囊内不强化，分隔明显强化；肉瘤为分叶状巨大软组织肿块，密度不均，见不规则大片坏死区，呈明显不均匀强化。

结论 肾上腺少见肿瘤的 CT 图像具有一定特征性，认真分析其 CT 表现，可提高诊断与鉴别诊断水平。

PU-0484

前列腺动脉磁共振增强血管成像的前瞻性研究

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目的 探索研究前列腺动脉增强 MR 成像的可行性,为前列腺介入术前评估提供指导。

方法

1、7 例经前列腺动脉介入栓塞术，术前均行 3.0 T 磁共振增强血管成像。

2、依扫描方法分两组：透视触发成像组（FT 组）和对比动力学时间分辨率成像组（TR 组）。检查后一周内前列腺动脉栓塞术。

3、两位放射科医师独立分析 MRA，确认前列腺动脉起源、走形、影像表现，并与 DSA 造影结果对比分析。

结果

1）7 例患者中 1 例病理证实前列腺癌并前列腺增生, 6 例经 MR 诊断为前列腺增生。

2）7 例中 FT 组 4 例，TR 组 3 例。经 DSA 证实共 17 条前列腺动脉（PA），左侧 8 支，右侧 9 支。FT 组 4 例显示率 60%（6/10），TR 组 57.14%（4/7）。

3）MRA 双侧正确显示率为 58.82%（10/17）。左侧 PA-MRA 正确显示率 87.5%（7/8），右侧 PA-MRA 显示率 33.33%（3/9）。10 支 PA 平均直径 1.39±0.46 mm。典型 MRA 表现为螺旋形迂曲血管影并延伸入前列腺内。

4）起源于闭孔动脉及阴部内动脉各 29.41%。1 例左侧有三支 PA 供血，右侧双支 PA 供血；1 例右侧两支 PA 供血，左侧单支 PA。双侧对称性 3 例，不对称性 4 例。

5）除右髂总动脉和右髂内动脉信号强度、左髂总动脉 SNR 和 CNR 差异有统计学意义，余两组图像质量均无显著性差异。

结论

前列腺动脉增强 MR 成像具有可行性，可为前列腺介入栓塞术提供导航作用。

PU-0485

前置胎盘诊断中的磁共振序列优化及与 SAR 值关系的初步研究

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目的 探讨前置胎盘诊断中的磁共振序列优化及与 SAR 值关系的初步研究。

方法 对 50 例术前确诊为前置胎盘及前置胎盘伴植入患者进行 T2W 及 T1W 多序列扫描，对照手术及病理，分析 MRI 多序列诊断的诊断准确性、敏感度、特异度，并与 SAR 值一起分析，进行 MRI 序列的优化。

结果 对 50 例前置胎盘术前进行 MRI 扫描，快速成像 Haste 序列和常规 T2W 脂肪抑制序列，外加 T1-vibe 容积扫描序列，其诊断准确性、敏感度、特异度均无显著差异，但不同序列间的 SAR 值相差明显，有统计学差异。

结论 由于 SAR 值对患者的影响，建议进行 MRI 快速 Haste 序列加 T1-vibe 容积扫描序列三维重建，能最大程度上满足临床诊断需求，又保护了患者的利益，值得临床推广应用。

PU-0486

基于血氧水平依赖成像的功能 MR 评价肾部分切除术后残余肾功能

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目的 血氧水平依赖（BOLD）是目前可评价组织氧含量的唯一的非侵入性检查，研究 BOLD 对不同类型肾细胞癌定性及诊断的价值，对比肾细胞癌患者术前及术后的 R2*值,评价腹腔镜部分切除术前后肾肿瘤患者残余肾组织及健康肾脏氧合水平的变化。

材料与方法 肾细胞癌患者共 55 名，其中女性 22 名，男性 33 名，年龄 23-80 岁，平均(54.89±14.84)岁，患者术前 1 周内及术后 3 个月均在华西医院放射科 3.0TGE750W 磁共振仪上完成 T1WI、T2WI、BOLD 扫描。计量资料用“均值±标准差”表示，t’检验分析各项测量值之间的差异。

结果 55 个肾肿瘤中含透明细胞癌 29 个，嫌色细胞癌 26 个。1.透明细胞癌、嫌色细胞癌平均 R2*值分别为 83.95±15.46$seconds^{-1}$，69.78±11.31$seconds^{-1}$，差异有统计学意义（t=3.841，p<0.001），透明细胞癌平均 R2*值较高。2.55 例患者术前患侧、健侧肾皮质 R2*值与 GFR 呈显著正相关(r=0. 786，P<0. 001)，(r=0. 726，P<0. 001)，55 例患者术后患侧、健侧肾皮质 R2*值与 GFR 呈正相关(r=0. 725，P<0. 001)，(r=0. 715，P<0. 001)。3.55 例患者术后、术前患侧残余肾组织 R2*为(32.88±5.74)$seconds^{-1}$，(25.56±3.86)$seconds^{-1}$，差异有统计学意义(t=8.194，p<0.001)。55 例患者术后、术前健侧 R2*值为(28.22±7.02)$seconds^{-1}$，(31.21±6.56)$seconds^{-1}$，差异有统计学意义(t=2.413，p=0.017)。

结论 BOLD 可进行透明细胞癌与嫌色细胞癌的鉴别诊断，并定量评估肿瘤血氧水平。肾皮质 R2*值与 GFR 正相关，评价肾癌患者经腹腔镜肾部分切除术治疗前后肾功能的变化。

PU-0487

Bilateral giant ovarian luteinized follicular cysts: case report

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Abstract
Background:

The bilateral ovarian luteinized follicular cysts are rarely described, not to mention full-term natural labour without cystectomy beforehand. One case will be reported in our report.
Case:
A 29-year-old woman had pelvic masses detected at 12 weeks of pregnancy. The main worry was the safety of pregnancy, conservative management and close review were adopted. She was admitted to our hospital again 30 days after childbirth. Ultrasound examination was performed as well as CT. CT imaging showed that there was multilocular cystic low density in abdomen without calcification. She accepted bilateral ovarian cystectomy and reconstruction. Postoperative pathological results led to the diagnosis of bilateral ovarian luteinized follicular cysts.
Conclusion:
The CT imaging feature combined with medical history, HCG level or other imaging modality can be used for diagnosing it initially. The case we report will provide useful experience for the diagnosis of ovarian luteinized follicular cyst.

PU-0488

Highly accelerated prostate water/fat 3D MRI with compressed sensing and SENSE, compared to the standard of care

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Purpose: To explore the feasibility of prostate 3D MRI with two point spectral resolution, improved spatial resolution, and reduced imaging time, highly accelerated by a combination of compressed sensing and parallel imaging (CS-SENSE). ***Materials and Methods:*** Ten healthy volunteers (mean 27.3 years) were prospectively involved for 3.0T MRI (Ingenia CX, Philips) with 3D GRE sequences (6-point Dixon water/fat) on prostate. A clinical routine protocol was scanned with SENSE factor 2, followed by a SENSE 4 to stretch the acceleration capability. CS-SENSE with acceleration factors 2 and 5 were then prescribed to approximately match the scan times with SENSE 2 and 4. Other parameters were kept same: TR/TE 3.7/1.3 ms, resolution 1.5×1.7×3.00 mm^3. Scan times were 17.7s, 11.2s, 15.5s and 12.7s for SENSE 2, SENSE 4, CS-SENSE 2, and CS-SENSE 5. All image analysis was performed independently by two radiologists on ISP workstation (Philips), blind to the imaging sequence. ROIs with fixed area were placed as in Figure 1 for SNR and CNR calculations. These two radiologists also scored on the overall image impression, anatomical distortion and detail display according to Likert 5, which were analyzed for consistency using Kappa coefficient. The SNR and CNR were analyzed for consistency using intraclass correlation coefficient (ICC). The SNR and CNR of images among four imaging protocols were tested using Friedman-test. ***Results:*** The SNR, CNR, and subjective scoring agreed well between the two radiologists (Kappa>0.75, ICC>0.75, Tables 1&2), and the data from the senior observer was chosen for the final statistical analysis. The average

scores among these different acceleration factors were 3.8, 3.3, 3.5 and 3.5, without statistical difference (P=0.375). There was no statistical difference in SNR between CS-SENSE 2 and CS-SENSE 5, nor between CS5 and SENSE2. The SNRs of CS-SENSE 2 and 5 were both higher than that of SENSE 4 (Table 3). There was no significant difference in CNR among the four protocols. ***Conclusion:*** CS-SENSE 5 yielded similar SNR and CNR in prostate water/fat imaging to those of SENSE 2, the clinical routine, while the imaging time was cut by 28%. ***Clinical Relevance:*** CS-SENSE with acceleration factor 5 is demonstrated a potential replacement for the clinical routine protocol for prostate water/fat imaging, given the retained image quality and the reduced imaging time, and these benefits are expected to increase with further improved resolution.

PU-0489

子宫腺肉瘤 1 例及文献复习

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目的 探讨子宫腺肉瘤的 MRI 表现及相关文献复习，以提高对该疾病的诊断及鉴别诊断能力。
方法 回顾性分析经手术病理证实的 1 例子宫腺肉瘤的 MRI 表现并复习相关文献。
结果 平扫 T1WI 呈等或稍低信号，T2WI 呈高于外肌层不均匀信号，肿块信号不均，可见囊变，DWI 提示病灶弥散受限呈明显高信号影。增强扫描早期病灶实质部分明显强化，后期持续强化。
结论 MRI 平扫及动态增强多参数扫描并结合临床资料可以提高子宫腺肉瘤的诊断，但确诊仍需依靠病理学检查。

PU-0490

不同对比剂用量在能谱 CT 肾脏增强扫描中的应用研究

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目的 探讨能谱 CT 在肾脏增强中降低对比剂用量的可行性。
方法 收集需肾脏增强的患者 60 例，随机分为对照组 A、研究组 B 和 C 三组各 20 例，对比剂用量为 A 组：600mgI/kg 体重，B 组：450mgI/kg 体重，C 组:300mgI/kg 体重。对比剂为 350mgI/ml,流速(
ml/s)=对比剂总量÷30s,扫描延迟时间：注射对比剂后 40s 扫描皮质期，70s 扫描髓质期。A 组采用常规扫描：管电压 120kVp,智能毫安,噪声指数为 12,扫描层厚 5mm。B、C 组采用能谱扫描，扫描协议根据患者常规 120 kVp、NI10-5 mm 的平均毫安秒进行个性化选择。扫描后 A 组皮质期、髓质期均重建 1.25mm、40%ASIR 图像，B 组双期分别重建 65keV 单能量、C 组双期分别重建 50keV 单能量、层厚均为 1.25mm、40%ASIR 图像。分别测量皮质期双肾皮质、双肾动脉、腹主动脉及同层面竖脊肌的 CT 值及 SD 值，髓质期双肾髓质、双肾静脉、下腔静脉及同层面竖脊肌的 CT 值及 SD 值，其中 SD 值代表测量噪声，计算肾皮质、肾髓质、腹主动脉、肾动脉、肾静脉、下腔静脉信噪比（SNR）和对比噪声比（CNR）：SNR=CT 值$_{组织}$/SD 值$_{组织}$,CNR=CT 值$_{组织}$-CT 值$_{肌肉}$/SD 值$_{肌肉}$。采用单因素方差分析对三组图像的 CT 值、SD 值、SNR、CNR 进行统计分析，$P<0.05$ 具有统计学意义。

结果 三组的有效剂量相同（P＞0.05），B 组和 C 组的对比剂量分别比 A 组降低 31%和 52%（P<0.001）。所有图像均可接受诊断。A 组肾皮质 CT 值最高，C 组肾动脉 CT 值最高。除 B 组腹主动脉皮质期外，B 组各期均低于 A 组和 C 组。B 组皮质和髓质期的信噪比和 CNR 均高于 A 组和 C 组。
结论 在 CT 肾脏增强中，采用能谱模式和 ASIR 算法，在保持诊断图像质量的同时降低对比剂量用量是可行的，可在患者肾功能异常时选择性使用。

PU-0491

The application of Cinematic rendering of Force computed tomography in the diagnosis of Ovarian cancer

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Ovarian cancer is the second most common gynecologic malignancy. When patients are treated, the ovarian cancer is often in the later-stage.CT is established as the primary imaging modality for characterization of ovarian tumors and ovarian cancer staging. Cinematic rendering (CR) is a new 3D post-processing tool that produces photorealistic images, and it has the potential to more accurately depict anatomic detail compared to traditional volume rendering.The purpose of this article is to describe the potential application of CR to imaging of Ovarian cancer. CR has the potential to improve visualization of Ovarian cancer, differentiation of solid and cystic Ovarian cancer, assessment of Peripheral tissue and vascular invasion, and visualization of Peripheral lymph node metastasis and peritoneal metastases.
The application of Cinematic rendering in the diagnosis of Ovarian cancer. which has good clinical value and more helpful on preoperational evaluation.

PU-0492

卵巢卵泡膜细胞瘤的 MRI 表现及病灶大小的特征分析

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目的 探讨卵巢卵泡膜细胞瘤的 MRI 表现，重点分析病灶大小的特点，提高该病的术前诊断率。
方法 回顾性分析我院 25 例经手术病理证实为卵巢卵泡膜细胞瘤的病例，分析病灶的 MRI 表现，根据病灶大小分为＜5cm 组和≥5cm 组，＜5cm 组 4 例，≥5cm 组 21 例，用统计学方法分析病灶大小与盆腔积液、囊变、绝经及 CA125 之间的关系。
结果 25 例均单侧发生，边缘清晰，左侧 15 例，右侧 11 例；病灶实性成分 T1WI 呈等信号 15 例，稍低信号 10 例，T2WI 呈稍高信号 8 例，等信号 7 例，稍低信号 10 例，DWI 呈高信号 18 例，混杂高信号 7 例，增强后均呈轻度不均匀强化；囊变 T1WI 呈低信号，T2WI 呈高信号，DWI 呈低信号，增强后未见强化；病灶合并盆腔积液共 20 例，其中＜5cm 组 1 例，≥5cm 组 19 例，两组间差异有统计学意义（P＜0.05）；病灶合并囊变共 19 例，其中＜5cm 组 1 例，≥5cm 组 18 例，两组间差异有统计学意义（P＜0.05），所有囊变范围较小，边界均不规则，絮状囊变最常见；已绝经患者 19 例，其中＜5cm 组 2 例，≥5cm 组 17 例，两组间差异无统计学意义（P＞0.05）；CA125 升高 10 例，其中＜5cm 组 1 例，≥5cm 组 9 例，两组间差异无统计学意义（P＞0.05）。

结论 病灶实性成分 DWI 呈高信号及增强呈轻度不均匀强化是该病 MRI 的特征性表现，囊变多见且范围较小，结合单侧附件单发较大病灶，边缘清晰，可提高术前诊断符合率。

PU-0493

卵巢肿瘤的影像特征及多 b 值 DWI 的应用

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目的 探讨探讨卵巢良恶性病变与 MRI 影像表现及多 b 值 DWI 的应用价值，为卵巢肿瘤的良、恶性鉴别提供无创、可复性及一定的参考依据。
方法 分析所有 45 例患者术前磁共振扫描仪行常规扫描、多 b 值扫描，分析病变的影像学特征作出定性诊断，与术后组织病理结果进行对照得出敏感性(Se)、特异性(Sp)、阳性预测值(PPV)、阴性预测值(NPV)及准确度；其次分别测量卵巢肿瘤实性与囊性部分的 ADC 值，进行统计分析。最后，利用 ROC 曲线分析得出各个参数值对鉴别卵巢肿瘤良、恶性的最优参数值及最佳诊断阈值，及相对应的敏感性、特异性、阳性预测值及阴性预测值。
结果 45 例患者中良性 30 例，恶性 15 例，其中双侧者良性 8 例，恶性 5 例，占位病变共 55 个。(1)各组卵巢肿瘤良性组所测实性部分的 ADC 值(ADC1、ADC2、ADC3、ADC4)均明显高于恶性组，差异存在显著统计学意义(P<0.01)，两者之间基本无重叠部分。另外，卵巢肿瘤良性组的实性部分的 ADC 值跨越范围均较恶性组宽。(2)各 b 值扫描下卵巢肿瘤所测实性部分的各组间 ADC 值具有明显统计学意义，将这些参数值利用 ROC 曲线进行统计分析，ADC1、ADC2、ADC3、ADC4 的 ROC 的曲线下面积(area under the curve，AUC)分别为 0．922、0．922、0．937、0．932，可知，当 b=1200s／mm2 时曲线下面积最大，具有较其他三组更高的诊断效能。（3）利用 ROC 曲线分析，参考 Youden 指数的最大值得出诊断卵巢肿瘤良、恶性的临界值，当 b 值为 1200s／mm2 时具有最佳诊断效能，ADC 值的 AUC 为 0．937，阈值为 1.17
×103/s，敏感性为 90.5%，特异性为 89.5%，阳性预测值为 89.6%，阴性预测值为 90．4%。
结论 b 值为 1200s／mm2 是鉴别卵巢肿瘤良、恶性的最佳扫描参数，ADC 值对卵巢肿瘤的定性具有肯定的诊断价值。

PU-0494

腺性膀胱炎的 CT 和 MRI 诊断及鉴别诊断

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目的 分析和探讨腺性膀胱炎（cystitis glandularis,CG）的 CT 和 MR 影像表现。
方法 搜集 8 例经病理证实的腺性膀胱炎的 CT 和 MR 资料，3 例行 MRI 平扫+增强+DWI，1 例行 MR 平扫，4 例行 CT 平扫+增强。
结果 发生部位：侧顶壁 3 例，膀胱三角区 4 例，三角区-侧壁 1 例；病灶形态：局部扁平状增厚型 2 例，局部扁平状增厚并局部结节样隆起混合型 6 例；强化情况：4 例明显强化（强化高于肌层），3 例轻度强化，1 例未行增强检查；DWI 高信号 2 例，稍高信号 2 例；ADC 值平均（1.63）$\times 10^{-3}mm^2/s$,范围（1.56～1.73）$\times 10^{-3}mm^2/s$。
结论 腺性膀胱炎主要表现为局部扁平和/或伴局部小结节样隆起状膀胱壁增厚,增强后轻度或明显均匀强化，ADC 值相对较高；病灶形态、ADC 值定量、强化均匀有助于和膀胱癌鉴别。

PU-0495
T2WI 结合 MRS、DWI 对前列腺癌与前列腺增生的鉴别诊断价值

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目的 探讨 T2WI 结合磁共振波谱成像（magnetic resonance spectroscopy, MRS）、弥散加权成像（diffusion weighted imaging，DWI）对前列腺癌与前列腺增生的鉴别诊断价值。
方法 回顾性分析 2014 年 8 月至 2017 年 11 月在我院经病理证实为前列腺病变患者的 54 例完整临床资料，所有患者均行 T2WI、MRS 及 DWI 检查。在工作站进行数据测量，单体素法测量病变区胆碱(Choline, Cho) 、枸橼酸盐(Citrate, Cit) 、肌酸(Creatine, Cre) 的峰值；ADC 值测量方法为测量病灶最大层面中心区 ADC 值，测量 3 次取平均值。应用 SPSS 19.0 软件进行统计学分析，前列腺癌和前列腺增生组(Cho + Cre) / Cit 比值及 ADC 值数据经 K-S 检验证实为正态分布后，采用独立样本 t 检验进行比较，以 $P < 0.05$ 为差异有统计学意义。
结果 前列腺癌病例 21 例（74.5±7.4 岁），前列腺增生病例 33 例（71.7±8.4 岁），年龄无统计学差异（t=1.257，P=0.214＞0.05）。前列腺癌病例共选取 97 个体素，MRS 主要表现为 Cho 峰显著升高, Cit 峰明显降低,两者波峰可呈现倒置。前列腺增生病例共选取 172 个体素，MRS 主要表现为 Cho 峰及 Cre 峰较低，Cit 峰高耸。前列腺癌及前列腺增生组(Cho + Cre) / Cit 平均值分别为 3.96±5.41、0.90±1.82，两组间差异有统计学意义（t=5.397，P=0.000＜0.05)。b=800 时，前列腺癌及前列腺增生组 ADC 值分别为（0.841±0.189）×$10^{-3}mm^2/s$、（1.436±0.196）×$10^{-3}mm^2/s$，两组间差异有统计学意义（t=-11.019，P=0.000＜0.05）。
结论 T2WI 结合 MRS、DWI 对前列腺癌与前列腺增生均具有较高的诊断和鉴别诊断价值。

PU-0496
双源 CT 泌尿系统 CTU 技术和临床应用

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【摘要】目的 探讨双源 CT 在泌尿系统造影中的技术与应用。 **方法** 收集在 2011-2012 年有临床症状并行泌尿系统螺旋 CT 扫描的病例 56 例，采用西门子双源螺旋 CT 机，连续容积增强扫描，造影剂用量为 1.5～2ml/Kg,注射速率 2.5～3ml/s,根据造影剂在图像中的显示来决定延时的时间，包括常规薄层平扫、动脉期、静脉期、延迟期扫描。所有数据传输到西门子后处理工作站进行处理，重建方法包括 MPR（多平面重建），MIP（最大密度投影），VR（容积再现技术）等。**结果** 对影像资料进行归纳总结：所有病例均成功重建出双肾、输尿管和膀胱三维图像，能旋转、切割、放大等清晰显示泌尿系统整体和局部细微结构、形状、走形及与周围组织关系。双侧输尿管正常的 20 例，左侧输尿管闭塞的 8 例，右侧输尿管闭塞的 5 例，左侧输尿管扩张的 11 例，右侧输尿管扩张的 5 例，输尿管占位的 7 例。**结论** 采用适当的扫描方法和重建方法，双源螺旋 CT 泌尿系统 CTU 具有快速、高分辨成像的优势，满足临床的需求，为临床治疗提供详细的影像学依据。

PU-0497

前列腺恶性间质瘤一例并文献复习

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目的
提高对前列腺恶性间质瘤的临床表现、影像诊断及治疗的认识。
方法
通过对 1 例前列腺恶性间质瘤临床病例资料及影像图像的分析，并结合文献讨论
结果
患者行前列腺穿刺术及肿瘤切除术，诊断为前列腺来源恶性间质瘤
结论
间质瘤常发生于胃肠道，前列腺间质瘤的罕见，是来源于间叶组织非定向分化的肿瘤，多见于中老年男性，发病高峰为 45-65 岁；恶性程度高，与前列腺癌相比，更易侵润和破坏性生长；MRI：瘤体大，球形或分叶状，坏死囊变明显，T1WI、T2WI 呈高、低混杂信号。

PU-0498

嗜酸细胞肾癌两例影像学表现并文献复习

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摘要：**目的** 探讨嗜酸细胞肾癌的影像学表现。**方法** 回顾性分析两例嗜酸细胞肾癌的 CT 与 MRI 平扫与增强，结合手术病理。**结果** 嗜酸细胞肾癌平扫表现为边缘清楚的类圆形肿块，CT 等或略低密度，T1WI 等、略低信号，T2WI 略高信号。增强后轻度强化，质均均匀，周围间隙清楚。肾静脉与腹膜后淋巴结未见明显异常。讨论：嗜酸细胞肾癌的影像学表现有一定特点，可为临床保留肾单位切除肿瘤提供依据。

PU-0499

Split-Bolus dual energy computed tomography(DECT) Urography with Synchronous Nephrographic and Excretory Phase Enhancement：Comparison image quality of iterative reconstruction and filtered back projection.

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Objective : To assess the effect of different levels of iterative reconstruction techniques and filtered back projection on Synchronous Nephrographic and Excretory Phase Enhancement images with split-bolus dual source dual-energy CT.
Methods: Institutional review board approval was obtained. 30 patients received split-bolus DECT; FBP and SAFIR images were reconstructed from Synchronous Nephrographic and

Excretory Phase Enhancement. Energy spectrum analysis software(MMWP) was used to find the optimum single energy value of renal pelvis and adjacent tissure. CT values of the ranal parenchyma, pelvis, upper ureters, middle ureters, lower ureters, bladder, psoas and standard deviation of subcutaneous fat were measured on the optimum level to calculate signal-to-noise ratio and contrast-to-noise for image quantitative analysis. Results: of these patients, 22 were women and 18 were men. The average age was 61.5±14.3years. The optimum kev of FBP and SAFIR is 66.57±0.93，66.76±0.89，there is no statistical difference(p=0.500). SNR、CNR of all measured sites, except the lower ureters（p=0.278，p=0.323） showed a statistically significant correlation (p < 0.001) between the FBP and SAFIR images. There was no statistical difference among three groups of ureters regarding CT density, SNR, CNR and all mean CT density. Conclusion: Synchronous Nephrographic and Excretory Phase Enhancement using split-bolus DECT urography, there was no difference in CT values of all groups. the image quality of SAFIR reconstruction was superior to that of FBP reconstruction.

PU-0500

IVP 与 CTU 在泌尿系统疾病的诊断价值对比分析

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1.目的 对比分析静脉肾盂造影（IVP）与 CT 泌尿系成像(CTU)技术对泌尿系疾病的诊断价值。
2.资料与方法
2.1 一般资料 取本院均行 IVP 和 CTU 患者 32 例，男 17 例，女 15 例，年龄 13-65 岁，平均 45 岁。
2.2 仪器与方法 **IVP**：常规肠道准备后，使用 MRAD_50S RADREX 数字化摄片机器，先摄尿路平片，然后用两个压迫器放置于脐下两旁，用连有血压计的气袋覆盖，腹带束紧。静脉注射 350mgI/ml 碘海醇注射液，按 1.5ml/Kg 给药。注射完毕后 7、15 、30 分钟摄两肾区片，后放松腹带，摄全尿路片，膀胱充盈后摄全尿路片。
CTU ：采用 Toshiba Aquilion ONE 640 扫描，常规准备,采用足先进仰卧位，先行常规横断面平扫。扫描方式：螺旋扫描；扫描范围：肾上极至耻骨联合下缘；扫描参数：100-120KV 250-300mA,转速 05.-0.8s,层厚 8mm。增强：经肘静脉以 2.5ml/s 注入 350mgI/ml 碘海醇注射液，按 1.5ml/Kg 给药。分别在 30s 50s 180s 6min 扫描。结束后嘱患者不排尿，30min 后再扫描一次。然后用 1mm 软组织窗行 CPR VR 处理
3.结果 肾输尿管结石患者共 16 例，**IVP** 和 **CTU** 都能清楚的显示结石；肿瘤患者 10 例，**CTU** 对病灶的定位明确，可清楚显示肿瘤大小，边界。**IVP** 不能明确诊断。其他病变 6 例，包括双肾畸形，双肾盂双输尿管畸形等，**IVP** 检查显示双肾盂双输尿管畸形比较清楚， **CTU** 结合平扫均能清晰显示。
4. 结论:IVP 可以直接显示泌尿系统整体形态，其空间分辨率有很大的优势，但是易受准备条件影响，肾功能受损时往往显影不良。**CTU** 既能显示泌尿系正常解剖，病变，又能通过各种图像处理技术来观察病变，如 CPR VR 等，在泌尿系肿瘤诊断方面有很大的优势。
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PU-0501

The study of high b value DWI using different mathematical models in the diagnosis of prostate cancer.

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PURPOSE
To explore the diagnostic value of four mathematical models (monoexponential model: ADC; intravoxel incoherent motion model: D, D*, f; stretched-exponential model: α, DDC; diffusion kurtosis model: ADC_{kurt}, K) in diffusion weighted imaging (DWI) for prostate cancer (PCa) in peripheral and transitional zone.
METHOD AND MATERIALS
Thirty-six patients with histologically confirmed prostate cancer (PCa) and twenty patients with benign prostatic hyperplasia (BPH) in our hospital were included. All patients underwent the routine prostate MRI and high b value (0, 100, 200, 300, 400, 500, 700, 800, 1000, 1100, 1500, 1500, 1500, 1100, 1100, 1500, 1100, 1100, 1500, 1900, 2000, 2500, and 3000) DWI examination. The quantitative parameters were calculated using monoexponential, kurtosis, stretched exponential, and intravoxel incoherent motion models. The differences were analyzed between peripheral zone (PZ) PCa and PZ BPH, transitional zone (TZ) PCa and TZ BPH. The ROC curve analysis was used to evaluate the value of these parameters in identifying PZ PCa and PZ BPH, TZ PCa and TZ BPH. The linear discriminant analysis (LDA) was used to evaluate the performance of the comprehensive parameters of the models in diagnosing PCa.
RESULTS
There were significant differences in all parameters between PZ PCa and PZ BPH, TZ PCa and TZ BPH except parameter D*. Parameter ADC, D, DDC and ADCkurt demonstrated excellent diagnostic performances for PZ PCa, and the AUC of them were similar, range from 0.939-0.967. Parameter ADC, D, DDC, ADCkurt and K demonstrated good diagnostic performances for TZ PCa, and the AUC of them were similar, range from 0.887-0.941. The comprehensive parameters of kurtosis model have high specificity(100%) in diagnosing PZ PCa, and have great sensitivity(91.3%) and specificity(90.7%) in diagnosing of TZ PCa.
CONCLUSION
The water molecular diffusion coefficients in all models were of high value in diagnosing both PZ and TZ PCa, the monoexponential model for DWI was sufficient for PCa detection, but the kurtosis model can be used as an auxiliary method.

PU-0502

前列腺少见病变的 MRI 诊断

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目的 探讨前列腺少见病变的 MRI 表现，提高对此类疾病病的诊断水平，更好地指导临床治疗。

方法 收集我院 2012 年至 2015 年经手术病理或临床证实的前列腺肉瘤 3 例、前列腺上皮内瘤 5 例、前列腺囊腺瘤 2 例、不典型前列腺癌 4 例、前列腺小囊结石、前列腺结核各 1 例，年龄 50-73 岁。全部患者接受了前列腺 3.0T MR 常规及 DWI 序列检查，回顾性分析其 MRI 表现。

结果 前列腺肉瘤 3 例，表现为肿瘤体积较大，呈分叶状，易出血，DWI 肿瘤实质呈高信号，ADC 图弥散受限。前列腺上皮内瘤 5 例，表现为前列腺巨大增生并中央腺体多发小囊状病变；前列腺囊腺瘤 2 例，肿瘤多较大，呈大小不等多发囊状结构，境界清楚，囊液信号多样，长 T1 长 T2、短 T1 短 T2 信号、短 T1 长 T2（粘液蛋白、出血等成分），增强扫描囊壁中度强化；不典型前列腺癌主体位于前列腺外，类似于盆腔内前列腺与直肠间隙恶性占位，易与盆腔内肉瘤相混淆；前列腺小囊结石表现为前列腺小囊扩张，其内点状短 T1 短 T2 信号；前列腺结核结节型表现为结节样 T2WI 极低信号，弥漫型表现为多发斑片状或弥漫性 T2WI 低信号。

结论 高场强 MRI 对前列腺不常见病变的诊断具有很高的敏感性及特异性，同时 MRI 可清晰显示前列腺病变的部位、侵犯范围及周围结构等。有助于临床医生对前列腺少见病变的 MRI 表现及其侵犯范围有一个直观、全面的认识，对临床治疗方案的制定提供客观依据。

PU-0503
卵巢甲状腺肿 CT 和 MRI 的影像征象与病理相关性分析

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目的 通过分析卵巢甲状腺肿的多层螺旋 CT 和 MRI 的表现特点，探讨其影像特征与病理的关系，提高对本病的认识，为临床制定手术方案提供影像支持。

方法 回顾性分析 28 例经手术病理证实的卵巢甲状腺肿的 CT 和 MRI 征象，包括（1）病灶的部位、最大径、形态、结构、边界；（2）病灶密度/信号（有无坏死、出血、囊变、钙化及脂肪成分等；（3）病灶的强化方式及程度；（4）病灶与周围结构的关系，有无盆腔积液，有无合并其他病变。全面分析患者临床病史资料，并结合术后病理结果，进一步探讨其影像表现与病理特征的关系。

结果 患者平均年龄 49.5 岁，临床症状均无甲状腺功能亢进的表现，实验室检查 3 例 CA125 升高，1 例 TPOAb、TGAb 升高。28 例中有 23 例 SO 为单侧多囊型肿块，5 例为单囊型，境界清楚，呈分叶状 21 例，类圆形 7 例；病灶平均直径约 8.3cm。8 例患者有盆腔积液，均无肿瘤包膜破裂、盆腔转移淋巴结或腹膜播散灶。病灶实性部分平扫呈稍高密度，CT 值约 50-100HU，增强明显强化；囊性部分呈边界清晰、大小不等的囊腔，均有完整的囊壁，囊壁较厚，一般大于 2mm，内壁光整，增强明显强化，同一患者多个囊内容物密度不一，CT 值约 13-63HU；病灶内可伴有钙化或脂肪组织。MRI 表现为大小不等的囊内 T1 信号高低不一；其中 11 例可见 T2 极低信号灶，对应区域的 T1 呈等稍高信号，增强无强化；9 例表现为囊壁明显强化，5 例表现为实性组织明显强化，明显强化区域弥散明显受限者 3 例；3 例见小结节状弥散高信号，增强无强化。术后病理提示明显强化的区域镜下见到大小不一的成熟甲状腺滤泡样的结构；密度/信号不一的囊内为淡黄色透明液体的胶样物，部分为清亮液体；病灶内 T2 极低信号及弥散受限但无强化的区域镜下见多少不等的嗜伊红胶质样的物质。

PU-0504
基于 PI-RADS V2 评分联合 DCE-MRI 定量分析对前列腺癌的 诊断价值

雷颖

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目的 探讨磁共振动态对比增强定量分析对 PI-RADS V2 评分在评估前列腺癌的诊断价值。**方法** 筛选前列腺 MRI 检查并经手术或穿刺活检病理证实的 129 例患者，采集前列腺癌病灶区及外周带非癌区和中央腺体非癌区的磁共振动态对比增强定量参数值，并采用 Pearson 相关分析检验 PI-RADS V2 评分组、PI-RADS V2 评分联合 LAVA 组。**结果** PI-RADS V2 评分联合 LAVA 序列对诊断前列腺癌具有较高的诊断价值。**结论** 磁共振动态对比增强定量分析诊断前列腺癌具有可行性，有助于 PI-RADS V2 评分精准评估前列腺癌病变，能更加精准、更加完善的指导临床决策。

PU-0505
磁共振扩散张量成像定量参数鉴别Ⅰ期子宫内膜癌与子宫内膜息肉

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目的 探讨磁共振扩散张量成像（diffusion tensor imaging, DTI）定量参数对 I 期子宫内膜癌（endometrial carcinoma, EC）与子宫内膜息肉（endometrial polyp, EP）的鉴别价值。方法 回顾性分析经手术病理证实的 I 期 30 例 EC 患者和 27 例 EP 患者，术前均行 1.5TMRI 检查（含 DWI 和 DTI 序列）。由两位观察者分别测量两组病灶实质区 DWI 的表观弥散系数（ADC）值、DTI 的表观弥散系数（ADC^{T}）值和各向异性（FA）值，采用组内相关系数（ICC）检验两位观察者测量结果的一致性，根据是否符合正态分布，采用两独立样本 t 检验或者 Mann-Whitney 秩和检验比较两组病灶间各参数值的差异，有统计学差异的参数利用 ROC 曲线评估对两组病灶的鉴别效能，采用 DeLong 检验比较 ADC^{T}、FA 和 ADC 值之间 AUC 的差异。结果 两位观察者测量各组数据的一致性良好（ICC>0.75）；EC 组的 ADC^{T}、ADC 值均小于 EP，EC 组的 FA 值大于 EP 组，分别为 (1.062±0.232)$X10^{-9}$ vs （1.656±0.305）$X10^{-9}mm^{2}/s$、（0.987±0.199）$X10^{-3}$ vs （1.285±0.355）$X10^{-3}$ mm^{2}/s、0.153±0.054 vs. 0.118±0.050，差异有统计学意义（P<0.05）。以 ADC^{T}、ADC、FA 值分别为 1.368$X10^{-9}$mm2/s、1.03$X10^{-3}$ mm^{2}/s、0.135 作为鉴别诊断阈值，敏感度和特异度分别为 88.9%和 100%、100%和 66.7%、63.3%和 80.5%，AUC 值分别为 0.985、0.896 和 0.746。ADC^{T}和 ADC 值的 AUC 具有统计学意义，FA 和 ADC 值的 AUC 没有统计学意义。结论 DTI 定量参数有效鉴别 I 期 E C 和 EP，其中 DTI 的 ADC 值较 DWI 的 ADC 值具有更好的诊断效能。

PU-0506
DCE-MRI 联合多 b 值 DWI 对结直肠癌肝转移化疗后疗效早期评估价值

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目的 探讨 DCE-MRI 结合多 b 值 DWI 对结直肠癌肝转移化疗后疗效早期评估的应用价值。**方法** 收集 2019 年 1 月-2020 年 1 月就诊于天津市人民医院的结直肠癌肝转移患者 30 名，共有肝内病灶约 100 个。对每一个病灶选取 ROI，ROI 分别选取在病变全部（最大范围覆盖肿瘤全部，不包括肿瘤周围肝实质）、病变中心位置（面积约肿瘤全部面积的 10%）及病变周围（面积约肿瘤全部面积的

10%），并分别在入院化疗前及两个周期及四个周期化疗后对病灶的 DCE-MRI 参数（病变形态、强化特点、峰值时间、最大增强斜率、容量转移 Ktrans、速率常数 Kep 及血管外细胞外间隙体积百分比 Ve）及多 b 值 DWI 参数 ADC 图进行分析。患者治疗效果根据四个周期实体肿瘤疗效评价分为应答组及非应答组。**结果** DCE-MRI 参数及多 b 值 DWI 参数 ADC 图参数值的变化可以早期评估肿瘤化疗后效果。**结论** DCE-MRI 结合多 b 值 DWI 可以早期预测结直肠癌肝转移化疗后效果，并可能成为一种高效的且临床切实可行的 MRI 疗效评估方案。

PU-0507

Adult intestinal malrotation: An easily overlooked but important fact

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Intestinal malrotation is generally considered as a pediatric pathology and is rare in adults, so the adult patients always fail to draw the attention of clinicians. **Objective:** Here we emphasize the importance of correct diagnosis of intestinal malrotation in adults and the value of CT in it. **Methods:** We reported two patients with malrotation of the intestine, both of whom suffered from diagnostic delays due to atypical clinical manifestations, and all of whom underwent abdominal CT examination. **Results:** CT shows that superior mesenteric vein was located to the left of superior mesenteric artery and the “Whirlpool sign” of the mesentery, which has the value of qualitative diagnose. **Conclusion:** CT has certain advantages in the diagnosis of malrotation in adults, and It can help to formulate reasonable treatment plan and evaluate the prognosis .

PU-0508

腹盆增强 CT 对右半结肠癌 TN 分期准确性的研究

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目的 研究增强 CT 对右半结肠癌术前 TN 分期的准确性。
方法 前瞻性入组病理确诊的右半结肠癌患者，术前行增强 CT 检查，根据第八版 AJCC 指南进行 TN 分期，详细描述可疑转移淋巴结特征及个数（包括短径/长径≥0.8；≥3 个淋巴结聚集，淋巴结间脂肪间隙消失；短径≥1cm；淋巴结形态欠规则、边缘毛糙），测量病灶中心位置、长径、厚度、累及环周百分比、平扫及门静脉期 CT 值，参照手术病理为金标准，计算增强 CT 术前分期的准确性、特异性及敏感性，分析相关影响因素。
结果 本研究共纳入 82 名结肠癌患者，病理 pT1-2 期 5 例（6.1%），pT3 期 61 例（74.4%），pT4a 期 16 例（19.5%），N0 期 50 例（61.0%），N+期 32 例（39.0%）。T 分期诊断准确率为 80.49%（66/82），区分 T1-2 及 T3-4 期准确率为 97.56%（80/82）。N 分期诊断准确率为 63.4%（52/82），敏感性 75%（24/32），特异性 56%（28/50）。对于真阳性淋巴结（24 例）和假阳性

（22 例），满足一个标准的是 10 例（33.75%）和 19 例（86.36%），满足两个标准是 7 例（29.17%）和 2 例（9.09%），满足三个标准的是 7 例（29.17%）和 1 例（4.54%），两者分布具有统计学差异（*P=0.0067*），病变长度、厚度、累及环周百分比、平扫及门静脉期 CT 值及变化均与 T、N 分期无显著相关性（*P>0.05*）。

结论 增强 CT 对于右半结肠术前 T 分期准确性较高，特别是区分 T1-2 与 T3-4 期；针对 N 分期，满足 2 个及以上形态学标准，可提高诊断淋巴结转移的特异性。

PU-0509

MSCT 对腹内疝分型和分级的应用研究

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目的 探讨多层螺旋 CT（MSCT）对腹内疝分型、分级的临床应用价值。材料与**方法** 30 例手术病理证实的腹内疝患者，其临床和影像资料被回顾性分析，然后，将 MSCT 对腹内疝分型和分级的结果与手术病理表现进行对照，并对腹内疝的共同病理基础和主要 MSCT 征象进行统计分析。**结果** ①先天性腹内疝中，十二指肠旁疝最常见，后天性腹内疝中，肠粘连束带疝最常见。②CT 对腹内疝的诊断准确率为 66.7%（20/30），分型准确率为 53.3%（16/30），其中，先天性腹内疝容易诊断，如网膜孔疝、十二指肠旁疝和盲肠周围疝 CT 诊断准确率为 100%，CT 分型准确率为 81.1%（9/11）。获得性腹内疝，特别是肠粘连束带疝，易误诊和漏诊，多以闭袢性肠梗阻收入住院。③肠粘连束带疝与传统腹内疝共同病理基础相比，CT 对肠管异位积聚征的诊断后者不及前者；后者多为闭袢征，前者多为囊袋征；CT 对绞窄征象的诊断两者相近。④肠管异位征对腹内疝定位，囊袋征和闭袢征对腹内疝定量，靶征、漩涡征、血性渗液征对腹内疝定性。以上 6 种征象的诊断也就构成了腹内疝 CT 诊断的一般流程。⑤肠管换位征和网膜脂肪异位征是肠管异位积聚征的特殊表现形式；簇状分布和蘑菇状肠管分别是囊袋征和闭袢的早期表现形式；囊袋征是闭袢征的特殊类型，也是腹内疝特有的典型征象，多见于先天性腹内疝。⑥与病理结果相比较，MSCT 分期总的准确性为 83.3%(25/30)。MSCT 对腹内疝分期结果与手术病理结果评定一致（Kappa=0.759，Z=5.000，P<0.05）。**结论** MSCT 对腹内疝共同病理基础和主要 CT 征象的探讨为建立腹内疝 MSCT 诊断程序提供依据。肠粘连束带疝是对传统腹内疝分型和流行病学的重要补充。MSCT 对腹内疝分期的探讨有助于准确评估病情，指导手术治疗。

PU-0510

MSCT 及后处理技术在消化道枣核诊断中的应用价值

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目的 探讨 MSCT 及后处理技术在消化道枣核诊断中的应用价值。

方法 回顾性分析 24 例经内镜、手术证实的消化道枣核患者的资料。19 例行胸部平扫，3 例行全腹部平扫，2 例行全腹部增强扫描。所有病例均在工作站行多平面重建(MPR)、最大密度投影(MIP)、容积再现(VR)。

结果 食道入口处枣核 16 例，其中 2 例合并食道穿孔，1 例食道周围感染；食道第二生理狭窄处枣核 2 例；胃窦处枣核 2 例；十二指肠水平段枣核 1 例，伴感染；回肠中段枣核 2 例，其中 1 例伴肠管周围感染；乙状结肠枣核 1 例。MSCT 容积扫描均清晰显示枣核；后处理技术对枣核位置、形态、大小及消化道损伤程度、周围感染均清晰显示。

结论 MSCT 对消化道枣核检出率高，后处理技术可清楚评价枣核形态、位置、消化道损伤程度及并发症，以及周围结构的关系；其检查安全、便捷、无痛苦，较钡餐造影有明显优势，可作为消化道枣核诊断最有效的检查手段。

PU-0511
十二指肠神经内分泌肿瘤的 CT 影像学特点，1 例病例报道并文献复习

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目的 通过回顾性分析十二指肠神经内分泌肿瘤的影像学特点和临床病理特点，为十二指肠神经内分泌肿瘤的诊断和治疗提供参考。
方法 1 例在宁夏医科大学总医院进行诊断和治疗的十二指肠神经内分泌肿瘤。结合其它对十二指肠神经内分泌肿瘤的文献报道，对该病的病因学，病理生理，影像学特点，诊断，鉴别诊断和治疗进行总结和讨论。
结果 通过回顾文献我们发现十二指肠神经内分泌肿瘤比较少见。胃肠道神经内分泌肿瘤分为功能性和无功能性肿瘤，功能性肿瘤通常在发现时较小，无功能肿瘤和恶性神经内分泌肿瘤在发现时通常较大，容易发现。上消化道神经内分泌肿瘤通常位于胃和十二指肠。CT 检查胃肠道对无功能性胃肠道神经内分泌肿瘤敏感性非常高，可以在术前对病变进行很好的评估，包括病变的范围，对邻近器官的侵犯，淋巴结的肿大等。胃肠道神经内分泌肿瘤通常缺乏特定的影像学特征，诊断主要依靠特定的部位和医生的意见。本例胃肠道神经内分泌肿瘤位于十二指肠降部，体积较大引起了十二指肠降部腔的狭窄，同时伴有肝脏的多发转移，患者因肿瘤出血致上消化道出血到医院就诊。
结论 十二指肠神经内分泌肿瘤是一种少见的肿瘤，无功能及恶性肿瘤因其体积较大容易发现，但因为其缺乏特征性的影像学表现不容易从影像学上进行诊断，主要依靠病理诊断。熟悉胃肠道神经内分泌肿瘤的影像学特点和其它临床特点可以帮助我们准确地对该病进行诊断，给予合适的治疗。

PU-0512
MSCT 对肠梗阻病因诊断的价值

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【摘要】目的 探讨多排螺旋 CT 对肠梗阻病因诊断的价值。**方法** 回顾分析经临床诊断为肠梗阻的患者，再筛选出术前 CT 资料完善的患者，最后选取经手术确诊为肠梗阻的患者 238 例，对本组病例的 CT 图像（全腹平扫）进行分析并结合临床表现，对肠梗阻做出病因诊断并探讨其价值。**结果** 238 例均有不同程度的腹痛、呕吐、腹胀、停止肛门排气排便的临床表现，其中梗阻部位发生于小肠 203 例，结肠 18 例，直肠 5 例，未能精确定位 2 例。MSCT 全部显示肠梗阻征象，阳性率 100%。238 例手术治疗患者中，其 MSCT 肠梗阻表现均与手术结果相符，肠粘连 158 例，肿块 36 例，其中 17 例伴肠套叠，疝 13 例，回肠挫伤 4 例，腹膜炎 10 例，慢性炎伴灶性腺上皮增生 1 例。**结论** MSCT 不仅能较为准确的诊断肠梗阻，在其病因的诊断方面还具有一定的价值与意义。

PU-0513
右半结肠癌伴阑尾炎的 CT 影像特点及其相关性分析

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摘要：目的 分析右半结肠癌伴阑尾炎的 CT 表现及其临床特征，降低误诊率及漏诊率。**方法** 回顾性分析 2017 年 5 月至 2019 年 3 月在锦州医科大学第一附属医院接受全腹增强 CT 检查的右半结肠癌患者的临床资料，共计 114 例，将这些患者分为结肠癌伴阑尾炎组和结肠癌不伴阑尾炎组，分析两组 CT 及临床特点。（收集患者性别、年龄、肿瘤部位、肿瘤生长方式、肿瘤厚度、狭窄程度，有无排便习惯或性状改变、肠梗阻、慢性腹痛等临床因素）。**结果** 单因素分析显示肿瘤位置、肿瘤生长方式和管腔狭窄程度均有统计学意义（ P<0.05），多元回归分析显示肿瘤位置及管腔狭窄程度有统计学意义（ P<0.05）。**结论** 结肠癌 CT 检出的结肠癌位置、管腔狭窄程度与阑尾炎的发生有关，因此，当怀疑有阑尾炎时，应进行全腹增强 CT 检查，以减少误诊、漏诊。

PU-0514
3D MRI texture analysis based on T2WI in differential diagnosis of benign and malignant presacral lesion after resection of rectal carcinoma

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Objective: To evaluate the diagnostic value of 3D MRI texture analysis based on T2WI in differential diagnosis of benign and malignant presacral lesion after resection of rectal carcinoma
Materials and methods: Postoperative MRI and clinical data of 26 patients with histopathologically confirmed presacral lesion (12 postoperative granulation or fibrous tissue and 14 local recurrence tumors) were retrospectively analyzed. The regions of interest (ROIs) covering the entire lesion were manually delineated on axial slices using O.K. (Omni Kinetics, GE Healthcare, China) software; and the histogram and GLCM features based on T2WI sequence were automatically generated. Statistical package for social science (SPSS) 12.0 and R language (RStudio Version 1.0.143 2009-2016 RStudio, Inc.) were used for data analysis.
Results: In texture analysis of T2WI features, min-intensity, max-intensity, mean value, standard deviation, variance, RMS, range, skewness, quantile5, quantile10, quantile50, quantile90, quantile95 and correlation were significantly increased in benign group compared to malignant group; while volumecount, entropy and inertia of benign group were significantly decreased (P=0.003~0.044). According to ROC analysis, the entropy (cutoff value=0.69, area under the curve (AUC) = 0.833) was considered the best parameter for the diagnosis of two groups, with the sensitivity of 85.7% and specificity of 83.3%, respectively. Multivariate logistic regression was used for modeling. The modeling formula of T2WI was as follow: f_{T2WI}=-7.857+18.553×entropy-0.065×volumecount-168.287×skewness.

Conclusion: MRI texture analysis based on T2WI could be used as a new noninvasive method for identification of benign and malignant presacral lesion for the patients of rectal cancer after operation.

PU-0515

进展期胃癌术前多期增强 CT 预测脉管侵犯的价值

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摘要 目的 探讨多期增强 CT 对进展期胃癌(AGC)术前淋巴、血管浸润（LVI）的术前预测作用。**方法** 回顾性分析 150 例术前 2 周内行多期增强 CT 扫描的 AGC 患者的临床资料。测量肿瘤平扫 CT 值（Value $_{NON}$）、动脉期 CT 值（Value $_{AP}$）、静脉期 CT 值（Value $_{PP}$）、延迟期 CT 值（Value $_{DP}$）,并计算各期 CT 值与平扫 CT 值的强化 CT 差值（ Δ_{AP}、 Δ_{PP}、 Δ_{DP}），以及肿瘤静脉期 CT 值（ Value $_{PP}$）与脊柱旁竖脊肌的 CT 值（ Value $_{Muscle}$）的差值 Δ_{T-M}。对比 LVI 阳性组及阴性组 CT 观察参数和临床基本信息、病理变量的差异，对存在统计学意义的参数进行多因素 logistic 回归分析和受试者工作特征曲线（ROC）分析。**结果** LVI 阳性组与阴性组在组织学分化、劳伦分型均具有统计学意义（分别为 P<0.030，P<0.035）。CT 观察参数中 Value $_{PP}$、 Value $_{DP}$、 Δ_{PP}、 Δ_{DP}及 Δ_{T-M}均具有统计学意义（均为 P<0.000）。多因素 Logistic 回归分析结果显示：Δ_{PP}（OR=1.062）、Δ_{T-M}（OR=1.053）是脉管侵犯的独立预测因素。Δ_{PP}，Δ_{T-M}预测 LVI 正确率分别为为 78.7%（ AUC，0.752；灵敏度，86.5%；特异度 57%），和 78.6%（AUC，0.786；敏感度，69.3%；特异度 79.2%）。**结论** 多期增强 CT 检查中通过观察值 Δ_{PP}、Δ_{T-M}可初步评估进展期胃癌 LVI 的状态，从而为临床治疗提供参考。

PU-0516

Value of CT morphologic features with pT1-2 gastric cancer in predicting lymph node metastasis

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Purpose
To investigate the value of CT tumor volume and enhancement features of pT1-2 gastric cancer in assessing lymph node metastasis (LNM) with pathologic results as the reference standard.
Materials and methods
This retrospective study included 86 patients with consecutive pathologically proven T1–2 stage gastric cancer. Tumor volume, CT values in plain and portal-venous phase (PVP) were measured and percent enhancement of PVP were calculated. The correlations between tumor volume, CT values in plain and PVP, percent enhancement of PVP and pathologic N stages were analyzed. Receiver operator characteristics (ROC) analyses were further performed to assess diagnostic performance for prediction of LNM in T1-2 stage gastric cancers.
Results

Tumor volume, CT value in PVP and percent enhancement of PVP were significantly correlated with the histopathologic N stage (rho: 0.307, 0.558, 0.586, respectively). Tumor volume were significantly smaller in LNM- group in comparision with LNM+ group (P=0.004). The differences between LNM+ and LNM- groups in CT value in PVP and percent enhancement of PVP were also statistically significant (P<0.001, P<0.001, respectively). The area under the ROC curves (AUCs) for identification of LNM+ group were 0.693 for tumor volume, 0.865 for CT value in PVP, 0.883 for percent enhancement of PVP, respectively. The percent enhancement of PVP of 129.27% predicted LNM+ with 82.14% sensitivity, 79.31% specificity, the CT value in PVP of 76HU predicted LNM+ with 89.29% sensitivity, 75.86% specificity, the tumor volume of 17.35ml predicted LNM+ with 82.14% sensitivity, 58.62% specificity.

Conclusion

CT tumor volume and enhancement features of pT1-2 gastric cancer had potentially value for predicting lymph node metastases.

PU-0517

小肠间质瘤术前 CT 征象与术后病理危险程度分级对照研究

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目的探讨小肠间质瘤术前 CT 征象以评估其病理危险程度。**方法**选取 2012 年 6 月至 2018 年 2 月本院收治的经手术及病理证实的 64 例小肠间质瘤患者，根据术后病理危险程度结果将患者分为危险程度较高组和危险程度较低组，其中危险程度较高组占 71.9%（46/64），危险程度较低组占 28.1%（18/64），回顾性分析患者术前影像学表现与肿瘤危险程度的关系。**结果**单因素分析结果显示两组间患者病灶边缘是否清楚、病灶与周围组织分界是否清楚、病灶有无分叶、平扫密度是否均匀、是否合并溃疡、是否合并囊变、病灶大小、病变增强动脉期增值及静脉期增值差异有统计学意义（P<0.05）；两组间患者性别、年龄、病灶是否合并钙化、病变部位、生长方式、强化方式及延迟期强化增值、是否合并消化道出血差异无统计学意义（P＞0.05）。多因素分析结果显示病灶越大（*P*=0.002，*OR*：4.718，95% *CI*：1.788～12.454）、病灶与周围组织分界不清（*P*=0.024，*OR*：24.336，95% *CI*：1.531～386.957）小肠间质瘤危险程度越高。病灶大小的 ROC 曲线结果为 AUC=0.938，P<0.001，说明病灶大小对于小肠间质瘤危险程度分级准确性高，且病灶≥4.80cm 肿瘤为高危险程度。病灶与周围组织分界 AUC 为 0.694，P=0.016，说明病灶与周围组织分界对于小肠间质瘤危险程度分级具有较低准确性。**结论**小肠间质瘤的 CT 征象具有一定特征性，根据其特征，可协助术前对小肠间质瘤危险程度分级。

PU-0518

Impact of a structured report template on the quality of MSCT reports for small bowel diseases

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Objective: To develop a structured report of small bowel diseases (SBDs) based on multi-slice computed tomography (MSCT) enterography and evaluate its superiority over free text reporting in radiologists with different seniority.
Methods: Radiologists, gastroenterologists, gastrointestinal surgeons and oncologists were involved in developing a structured report template for small bowel imaging. Six radiologists were divided into inexperienced group (< 5 years, n = 3) and experienced group (≥ 5 years, n = 3), and 60 cases of small intestinal MSCT data were available for free text reports and another 60 cases for structured reports after training. The accuracy and satisfaction of reports as well as the completion time between two reporting methods was compared.
Results: The completion time of structured reports was significantly less than that of free text reports. Using free text reports, the positive accuracy of five kinds of diseases in the experienced group was higher than that in the inexperienced group, but the misdiagnosis rate except for bone diseases was lower in the experienced group. After using structured reports, the accuracy of the above diseases in inexperienced group and the positive diagnostic accuracy of bone lesions were significantly enhanced in experienced group. Besides, the total missed diagnosis rate of the two groups was significantly declined, and the satisfaction scores of structured reports in two groups was superior to those of free text reports, although no obvious difference of satisfaction scores was observed between two groups.
Conclusions: Structured reporting was superior to free text reporting in writing efficiency, accuracy and satisfaction, and thus could improve the report quality of SBDs for physicians, especially for the inexperienced radiologists.

PU-0519
多层螺旋 CT 血管造影与单纯 CT 平扫对小肠梗阻患者的临床诊断价值

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[摘要] 目的 分别探讨多层螺旋 CT 血管造影与单纯 CT 平扫对小肠梗阻患者的临床诊断价值。方法 回顾性分析 2016 年 8 月至 2018 年 6 月在我院治疗的 103 例小肠梗阻患者的临床资料，所有入选者均需接受多层螺旋 CT 血管造影检查以及 CT 平扫检查，分析不同检查方式的诊断结果。结果 两种检查方式对动力性肠梗阻、血运性肠梗阻的诊断符合率对比，差异无统计学意义（P＞0.05）；多层螺旋 CT 血管造影检查对机械性小肠梗阻的诊断符合率以及总诊断符合率均高于单纯 CT 平扫结果，差异有统计学意义（P＜0.05）；两种检查方式对机械性小肠梗阻中高位小肠梗阻、完全性梗阻的诊断符合率对比，差异无统计学意义（P＞0.05）；多层螺旋 CT 血管造影检查对机械性小肠梗阻中低位小肠梗阻以及不完全性梗阻的诊断符合率均高于单纯 CT 平扫检查结果，差异有统计学意义（P＜0.05）；多层螺旋 CT 血管造影对小肠梗阻病因总诊断符合率为 86.41%。结论 与单纯 CT 平扫相较而言，多层螺旋 CT 血管造影检查对小肠梗阻病因、梗阻程度、位置等均具有较高诊断准确性。

PU-0520

Histogram analysis of ADC from high-resolusion diffusion-weighted imaging with clinical characteristics in rectal cancer

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Purpose: To elucidate possible associations between ADC histogram parameters obtained using readout-segmented echo-planar imaging (rs-EPI) diffusion weighted magnetic resonance and several clinical features in rectal cancer.
Methods: Eighteen patients with pathologically confirmed rectal cancer were enrolled. ADC histogram analysis was performed on the rs-EPI based ADC maps. The patients were grouped according to the degree of differentiation, TN stage, and the plasmatic CEA level. The correlation between each clinical feature and the ADC histogram parameters were evaluated.
Results: Spearman's correlation analysis revealed a strong correlation between degree of differentiation and skewness. Tumors with lower differentiation grades corresponded to higher skewness values (r= -0.578, P=0.01). However, ADC parameters differences were not observed in different clinical T and N stage (P>0.05) and plasmatic CEA level (P> 0.05).
Conclusion: Skewness value was significantly different in different differentiation grade of rectal cancer. Skewness in the higher differentiation grade has lower skewness value. There was no significant difference in ADC parameters between different TN stages and plasmatic CEA level. The quantitative description of rs-EPI sequence-based ADC parameters has potential to be used to assess the biological behaviors of rectal cancer.

PU-0521

肠白塞 MRE 表现两例

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例 1：患者男，37 岁，因 “间断腹痛 1 年余，加重伴便血 5 天”就诊。既往口腔溃疡十余年，其舅有肺结核病史。体格检查：脐周及右下腹明显压痛，可触及包块。肠镜于回盲部见环周巨大溃疡，回盲部活检见呈中度活动性炎伴溃疡形成，未见明显肉芽肿。MRE 检查示（图像见附件）：回盲部不均匀管壁增厚伴管腔局限性变形扩张，系膜对侧增厚为著。增强及 DWI 见回盲部及肠周小淋巴结呈较均匀强化，弥散明显受限。患者要求转外科手术。术后病理：回盲部巨大溃疡伴广泛静脉血管炎及纤维化，符合肠白塞之诊断。
例 2：患者女，28 岁，因“间断右下腹隐痛不适 4 月余”就诊。 既往发现白塞病 9 月余，有激素治疗及生殖器溃疡史。体格检查：右下腹压痛。肠镜示回盲部环周溃疡，占据整个管腔，表面凹凸不平；回盲瓣明显变形，肿胀。取活检：送检组织未见明显炎症性肠病改变，未见淋巴瘤改变，但不能除外白塞病、肠结核、血管炎。 MRE（图像见附件）示：回盲部不均匀管壁增厚伴异常强化及弥散受限，脂肪间隙多发稍大淋巴结，结合病史考虑肠白塞病可能。家属要求行外科手术解除肠穿孔风险。术后病理：小肠溃疡边缘腺体轻度不规则，包括绒毛变短与幽门腺化生。未见明显血管

炎、透壁性炎。结合临床患者有生殖器溃疡病史，以及激素治疗史，虽未见活动静脉周围炎、诊断仍考虑为白塞氏病（Behcet 病）治疗后。
讨论：典型肠白塞肠镜表现为回盲部单发或少发、深大、圆形或椭圆形的溃疡。本研究中 2 例均有较典型的肠镜表现。2 例 MRE 检查均显示回盲部肠壁显著增厚，肠腔变形，部分可显示深大溃疡。相对于克罗恩病肠壁增厚逐渐进展为肠腔狭窄，肠白塞病变肠段增厚程度更重却表现为肠腔柔软，未见梗阻症状。克罗恩病分层强化多见，而肠白塞则以均匀强化多见。肠白塞的 MRE 表现具有一定特点，对该病的诊断及鉴别诊断有重要的价值。

PU-0522
食管鳞癌淋巴结转移病理及影像学危险因素分析

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目的 研究食管鳞状细胞癌淋巴结转移临床病理及 CT 影像学危险因素，为评估有无淋巴结转移提供依据。**方法** 回顾性分析 2010 年 1 月至 2016 年 4 月在南京鼓楼医院行术前 CT 平扫及增强检查的 176 例食管癌患者临床病理及影像资料，分析淋巴结转移的危险因素。**结果** 176 例患者，90 例（51.14%）发生淋巴结转移。肿瘤 T 分期及肿瘤上下径是影响淋巴结转移的独立危险因素（P < 0.05）。以“T 分期≥ 3”为评估标准时，敏感度及特异度分别为 71.9%、52.3%，以“肿瘤长径≥ 4.95cm”为评估标准时，敏感度及特异度分别为 48.3%、77.9%。**结论** 术前食管鳞癌除行常规 CT 轴位扫描测量轴位长径外，还应补充多平面重建，测量肿瘤上下径值，从而对易发生淋巴结转移患者进行有效评估。

PU-0523
低剂量 CTC 联合 iDose4 迭代重建技术在结直肠癌术前 TNM 分期中的应用

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摘要：目的 探讨低剂量 CT 结肠成像（CTC）联合 iDose^{4}迭代重建技术在结直肠癌术前分期的临床应用价值。**方法** 回顾性分析本院 2017 年 102 例结直肠癌患者术前采用常规剂量 CTC 扫描联合滤波反投影（FBP）技术重建的影像资料，与 2018 年 102 例结直肠癌患者术前采用低剂量 CTC 扫描联合 iDose^{4}迭代重建技术重建的影像资料，由两名高年资放射科医生采用双盲法进行术前影像学分期，以手术病理结果为金标准，判断术前 TNM 分期的准确性；分别记录每次扫描的 CT 容积剂量指数、剂量长度乘积，估算出有效剂量进行对比。**结果** 常规剂量和低剂量 CTC 扫描对结直肠癌术前 TNM 分期判断的总体准确率分别为 78.43%（80/102）和 86.27%（88/102）、69.61%（71/102）和 63.72%（65/102）、M 分期均为 97.05%（99/102）；两种扫描方法对结直肠癌术前 TNM 分期诊断准确率的差异无统计学意义（均 P>0.05）。低剂量组的辐射剂量比常规剂量组降低了约 68.65%。**结论** 低剂量 CTC 联合 iDose^{4}迭代重建技术对结直肠癌术前 TNM 分期与术后病理具有良好的相关性，既能明显降低患者接受的辐射剂量，又能很好的满足临床医师对结直肠癌的术前评估要求和手术方案的制定，具有较好的临床应用价值。

PU-0524

绞窄性肠梗阻增强 CT 征象分析

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目的 分析绞窄性肠梗阻 CT 征象，提高绞窄性肠梗阻诊断准确性。
方法 统计分析诊断明确的 42 例绞窄性肠梗阻和 60 例单纯性肠梗阻患者的增强 CT 图像， 查阅文献，选取 9 种提示绞窄性肠梗阻的 CT 征象:
(1) 肠壁强化减弱；(2)肠壁无强化；(3)肠壁持续强化；(4) 肠壁、肠系膜静脉、门静脉积气；(5)漩涡征；(6)肠系膜血管充血；(7) 肠壁增厚呈双晕征；(8) 肠系膜水肿(9) 血性腹腔积液。
对比分析绞窄性肠梗阻与单纯性肠梗阻的 CT 增强特征。
结果 上述 9 种 CT 征象在绞窄性肠梗阻病例中出现概率明显高于单纯性肠梗阻病例(P 均 ＜ 0. 05) ; 前 5 种征象只出现在绞窄性肠梗阻病例中， 42 例绞窄性肠梗阻患者中同时具备 2 项以上征象者占 87. 6% ， 60 例单纯性肠梗阻患者中具备 2 项以上征象者仅 4 例， 两组差异有明显统计学意义(P＜ 0. 05) 。
结论 肠梗阻时，出现肠壁强化减弱、无强化、肠壁持续强化、肠壁、肠系膜静脉、门静脉积气、漩涡征等征象之一或至少其他 2 种以上 CT 征象，则强烈提示绞窄性肠梗阻。

PU-0525

不同位置结肠癌术前 T 分期策略的区别：MSCT 与病理对照研究

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目的 探讨不同位置结肠癌术前 T 分期的不同诊断策略。
材料与方法 回顾性搜集 2017 年 1 月-2019 年 7 月期间入住我院的结肠癌患者 550 例（男性 310 例，女性 240 例；平均年龄 62 岁）。所有患者均经肠镜穿刺活检病理证实为结肠癌，并于术前行全腹部平扫+增强 CT 检查。由 3 名工作 5 年以上的腹盆部专业影像诊断医师对所有图像进行评估，采集并记录以下影像征象：病变肠段位置、累及长度、肿物类型（肠壁增厚/隆起型肿物）、占据肠管周径、是否累及系膜侧、强化程度及方式、脂肪线征、结节状外突、是否与周围有腹膜覆盖的结构粘连，评估肿瘤影像 T 分期。以术后病理 T 分期作为参考标准，分别计算影像 T 分期的敏感性、特异性、阳性预测值（PPV）、阴性预测值（NPV）和诊断准确性，并行多因素分析。
结果 多因素分析显示，脂肪线征、结节状外突、是否累及系膜侧、是否与周围有腹膜覆盖的结构粘连是 T 分期的独立危险因素。对于腹膜内位的横结肠和乙状结肠，脂肪线征对 T3 期肿瘤的 PPV、NPV 分别为 0.89、0.95，结节状外突对 T4 期肿瘤的 PPV、NPV 分别为 0.84、0.92。而对于腹膜间位的升结肠和降结肠，脂肪线征对 T3 期肿瘤的 PPV、NPV 分别为 0.72、0.95，结节状外突对 T4 期肿瘤的 PPV、NPV 分别为 0.31、0.96。联合脂肪线征与结节状外突对 T4 期横结肠和乙状结肠癌的诊断准确性高达 94%，而对 T4 期升、降结肠仅为 26%。对升、降结肠癌累及系膜侧组，结节状外突对 T4 期的诊断准确性为 85%，联合脂肪线征与结节状外突对 T4 期的诊断准确性为 89%。与周围有腹膜覆盖的结构粘连对判断各位置结肠癌 T4 期的诊断准确性差异无统计学意义（P>0.05）。
结论 不同位置结肠癌应采用不同的术前分期策略，对于腹膜间位的升、降结肠癌，判断肿瘤是否累及系膜侧是准确诊断 T 分期的关键。

PU-0526

X 线射线技术对急性肠梗阻诊断的临床价值

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【摘要】目的　分析腹部 X 线片在急性肠梗阻诊断中的应用价值，采用超声检查技术和 X 线检查技术的对比。

方法　选择在我院就诊急性肠梗阻患者 80 例，随机分为研究 1 组和研究 2 组，平均每组 40 例。第一组用超声技术对患者的病情进行诊断，扫描过程中患者去平卧位，对患者的腹部进行全面检查。第二组采用 X 线射线技术进行诊断，扫描过程中患者取站立位，对腹部进行摄影。这两组进行对比。（2）观察指标：选择 2 组研究对象诊断结果与病理学检验结果的符合率等作为观察指标进行对比。

结果　X 线组诊断肠梗阻部位的准确率明显高于超生，两组比较有统计学意义。

结论　X 线片技术对急性肠梗阻疾病进行诊断准确率较高,是目前临床上首选诊断方法，但也有可能出现误诊和漏诊，因此术后进行病理学检验非常必要。

PU-0527

Inverted ileal diverticulum with mesentery comorbid with lipoma: A case report

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objective:Inversion of the diverticulum into the lumen is rare, we report a case of inverted ileal diverticulum comorbid with lipoma and describe the radiological features that enable the preoperative diagnosis of inverted diverticulum.
Methods: Clinical analysis of 1 cases of inverted ileal diverticulum comorbid with lipoma as a clinical manifestation and review of clinical literature in recent years.
Results:Enhanced MSCT (multi-slice CT) scanning revealed a fatty density nodule and thickened vessel in a section of underfilled ileum and a lipoma in the distal ileum. Iohexol CT enterography showed that the fatty density nodule was mesenteric fat. We diagnosed invaginated mesentery combined with lipoma and performed surgery. pathology revealed a diverticulum and a lipoma in the resected small intestine.
Conclusion: The invaginated mesentery fat may be mistaken for lipoma. Increased awareness of this disease and its imaging findings will help doctors make the correct diagnosis. Elongated filling defects and thickened vessels in the intestinal bowel on CT images suggest this possibility.

PU-0528

以下腹痛为主诉的急诊 CT 诊断思路

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目的
探讨以下腹痛为主诉的急诊 CT 的影像诊断思路。
方法
研究对象为 128 例急性起病的下腹痛患者作了 CT 检查，年龄 20~80 岁，男性 78 例，女性 50 例，均为我院 2017 年 1 月—2018 年 6 月收治，其中 62 例单纯作了螺旋 CT 平扫检查，38 例作了螺旋 CT 平扫+增强扫描检查，28 例作了螺旋 CT 平扫+CTA 检查，CT 扫描过程中对非检查部位（尤其是甲状腺、性腺）作了防护处理。对平扫及增强/CTA 图像进行阅片观察，其中平扫图像常规采用肝窗、腹部窗、脂肪窗观察，增强/CTA 图像结合 MPR/cMPR、MIP 及 VR 重组图像观察，记录影像表现及予以分析和比较。
结果
平扫检查可以诊断以下疾病：①胆系/泌尿系结石，部分阑尾炎、憩室炎及肠脂垂炎等感染性疾病；②胃肠道穿孔所致气腹的诊断，但对穿孔病因诊断显示不确切；③提示肠梗阻，但对梗阻原因（比如是黏连、肿瘤、绞窄等）单靠平扫检查诊断有限，进一步明确梗阻原因需要结合增强检查；④CT 平扫+增强/CTA 检查，可明确实质/空腔脏器损伤、腹主动脉瘤或夹层、胃肠憩室出血，胃肠道动静脉畸形等出血性疾病及肠系膜动脉血栓、绞窄性肠梗阻等缺血性疾病。
结论
MSCT 平扫+增强/CT 可早期明确引起下腹痛的病因诊断，为无创、安全快捷的检查方法。

PU-0529
应用能谱 CT 成像对结直肠肿物分化程度及良恶性肿物的鉴别

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目的:评估动态能谱 CT 成像定量参数对结直肠癌分化程度及结直肠良恶性肿物鉴别的诊断价值。**方法** 收集 84 例结直肠肿物患者行术前一站式动态能谱扫描，同时获得能谱及灌注成像数据。根据手术病理结果分为 A 组（腺瘤，n=15）,B 组（腺癌，n=69），C 组（高分化腺癌,n=36）,D 组（中低分化腺癌,n=33）。将不同组间的一般资料、病灶碘值（IC）、标准化碘值（NIC）、动脉期血流量（AF）、血容量（BV）、表面渗透性（PS）进行统计学分析， ROC 曲线用于评估其诊断效能。**结果** 静脉期 IC 和 NIC 对鉴别腺瘤和腺癌存在显著差异（P <0.001）。 ROC 分析显示，静脉期 NIC 为 3.52 时鉴别腺癌与腺瘤的敏感性为 72.0%，特异性为 91.9%。腺瘤和腺癌组之间的 AF，BV 和 PS 均存在显着差异（P <0.001）。ROC 分析表明， AF 值为 175.13 ml·min·100 g 时鉴别腺癌和腺瘤的敏感性为 80.0%，特异性为 86.4%；高分化腺癌和中低分化腺癌之间的 AF、BV 和 PS 均存在显着差异（P< 0.001）。BV 值为 7.76 ml / 100 g 时鉴别低级别癌症和高级别癌症的灵敏度为 90.9%，特异性为 77.7%。**结论** 一站式动态能谱 CT 扫描能同时得到能谱参数及灌注参数对鉴别结直肠良恶性肿物及肿瘤的分化程度有重要诊断价值。

PU-0530
65 例小肠肿瘤就诊情景、术前影像检查方法选择及结果分析

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目的
回顾性分析经手术病理证实的 65 例小肠肿瘤临床就诊情景、影像检查方法选择及结果。
方法
复习病案资料，搜集 2013 年 1 月至 2018 年 12 月本院经手术病理证实的 65 例小肠肿瘤，对就诊情景、术前影像检查方法选择及影像检查结果回顾性分析。
结果
男性 37 例，女性 28 例。年龄 29-91 岁，平均 60.4 岁。以消化道症状就诊 62 例， 其中一般性腹部症状（腹痛、腹胀等）40 例，占 61.5%；发热、消瘦、贫血，黑便，便血 19 例，占 29.3%。体检偶然发现 3 例。术前临床医师影像检查方法选择：65 例患者术前影像检查均选择了 CT，其中平扫 21 例，平扫+增强 28 例，直接增强扫描 9 例，CTE7 例。术后病理**结果** 小肠腺癌 10 例，淋巴瘤 7 例，转移瘤 12 例，间质瘤 32 例，脂肪瘤 3 例，腺瘤 1 例。对比手术所见及病理结果:平扫定位准确率 14.3%，定性小肠肿瘤准确率 23.8%；常规增强扫描定位小肠肿瘤准确率 71.1%，定性小肠肿瘤准确率 68.4%；小肠 CTE 定位小肠肿瘤准确率 85.7%，定性小肠肿瘤准确率 71.4%。
结论
CT 仍是目前临床首选的小肠疾病检查方法。患者就诊情景影响临床医生对影像检查方法的选择，而选择不同检查方法是影响小肠肿瘤术前影像诊断病灶定位、定性准确率的重要因素。

PU-0531

胃神经鞘瘤的 CT 表现

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目的 探讨胃神经鞘瘤（GS）的 CT 表现特点，以提高对该病的认识以及正确术前影像诊断。 **方法** 选择经手术病理及免疫组化证实的 12 例 GS，均行 全腹 CT 平扫及增强扫描，分析病灶的大小、密度、部位、强化方式及有无坏死、囊变、出血以及钙化，并总结其影像学表现。 **结果** 12 例均为单发、圆形或类圆形病灶；直径 2．5～6．5 cm；胃体部 10 例，胃窦部 2 例；向腔内生长者 4 例，向腔外生长者 3 例，腔内外生长者 5 例。 2 例肿块内部发现小片状低密度区，增强扫描强化不均匀；10 例均呈均匀密度，动脉期轻度强化，静脉期轻中度强化。 所有患者均未发现钙化灶及出血，1 例伴胃周淋巴结肿大。 **结论** GS 的 CT 表现具有一定特征，对部分病例可作出提示，有助于临床术前的诊断及治疗决策。

PU-0532

能谱 CT 多参数成像在胃腺癌分化程度中的应用价值

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目的 通过对不同分化程度胃腺癌在能谱 CT 成像上的参数及特征进行对比分析，研究 CT 能谱成像在不同分化程度胃腺癌诊断中的应用价值。方法 选择 60 例胃腺癌影像资料进行回顾性分析，将其依据分化程度进行分组，其中低分化组 28 例，中高分化组 32 例，全部的研究对象都进行 CT 能谱平扫及动静脉双期扫描。得到图像后确定出感兴趣区域，对所得结果进行处理，计算出不同扫描期相所有病灶在不同单能量水平下 CT 值、碘-水浓度等相关参数，并进行独立样本 t 检验。结

果　静脉期 40～90 kev 各单能量水平下低分化组的 CT 值均高于中高分化组，且低分化组的能谱曲线斜率（3.92±1.04）明显高于中高分化组（3.17±0.53），结果存在统计差异，静脉期低分化组标准化碘基值（0.50±0.14）高于中高分化组标准化碘基值（0.40±0.06），动脉期仅 60　kev 单能量水平下低分化组的 CT 值（80.47±13.80）高于中高分化组（68.35±13.20），差异具有统计学意义（P＜0.05）；余平扫及动静脉双期相关的参数差异较小，不存在统计学意义。结论　能谱 CT 多参数成像能够对不同分化程度胃腺癌进行定量分析，40-90kev 下单能量 CT 值、标准化碘浓度及能谱曲线斜率有助于术前胃癌分化程度评估。

PU-0533
早期胃癌 CT 影像特征与组织分化程度的对照研究

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目的　探讨早期胃癌（EGC）CT 影像特征与组织分化程度的相关性。**方法**　收集我院 87 例 EGC 患者的 CT 图像，按照术后病理分为分化组及未分化组，分析两组间基线资料（性别、年龄、病变部位、病变方位、淋巴结转移）、胃壁形态（黏膜厚度、胃壁厚度、黏膜下层完整性）、肿瘤密度（肿瘤平扫及增强 CT 值、ΔCT 值、肿瘤强化方式）、区域淋巴结（淋巴结数目及短径）之间的差异。**结果** 两组在性别（x^2=7.889，P=0.005）、病变部位（x^2=8.500，P=0.014）、黏膜下层完整性（x^2=5.631，P=0.018）、平扫 CT 值（t=-3.763，P=0.000）、动脉期 CT 值（t=-3.532，P=0.001）、动脉期ΔCT 值（t=-2.367，P=0.020）、门脉期ΔCT 值（t=2.698，P=0.008）、延迟期ΔCT 值（t=3.352，P=0.001）、峰ΔCT 值（t=3.437，P=0.001）、小淋巴结短径（t=-3.607，P=0.000）间有统计学差异；在年龄（t=1.615，P=0.110）、病变方位（x^2=1.695，P=0.638）、淋巴结转移（x^2=0.708，P=0.400）、黏膜厚度（t=-0.420，P=0.675）、胃壁厚度（t=-0.013，P=0.990）、门脉期 CT 值（t=1.273，P=0.206）、延迟期 CT 值（t=1.959，P=0.053）、峰 CT 值（t=1.737，P=0.086）、肿大淋巴结数量（x^2=2.582，P=0.108）、肿大淋巴结短径（z=-0.346，P=0.730）间无统计学差异；分化组强化方式以抛物线及上升型为主，未分化组以抛物线及下降型为主（x^2=2.325，P=0.000）；联合平扫 CT 值、动脉期ΔCT 值及门脉期ΔCT 值判断未分化型 EGC 的 AUC 可达 0.829。结论　EGC 的部分 CT 特征一定程度上可以反映其组织分化。

PU-0534
多层螺旋 CT 后重建技术在诊断小肠肠梗阻中的应用价值

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摘要:目的:探讨多层螺旋 CT 后重建技术在诊断小肠不全性肠梗阻中的应用价值。**方法:**搜集 64 例经手术治疗及随访观察明确诊断为肠梗阻的患者。通过观察　肠系膜血管聚集、拉伸、牵拉、扭曲，小肠狭窄及扩张程度，并进行统计学处理。**结果:**（1）MPR 显示 肠道显示肠道肿块 18 例，肠道浸润性狭窄 6 例，肠道炎性狭窄 23 例，肠套叠 9 例，漩涡征 11 例。显示肠系膜上动脉钙化斑块 9 例，非钙化斑块 6 例。肠壁增厚 35 例，肠壁呈环形强化 20 例，肠壁内点状积气 5 例，肠系膜水肿 8 例，肠系膜静脉内积气 1 例，肠壁无强化 5 例。腹腔积液 13 例。（2）CTA 显示　肠系膜上动脉旋转 11 例，肠系膜上动脉移位 45 例，肠系膜血管聚集 15 例，肠系膜血管分散 18 例，肠系膜上动脉闭塞 14 例。 **结论:**利用 128 层螺旋 CT 扫描，联合血管容积再现（VR）及

多平面重建（MPR）后重建技术，可以早期确定梗阻的具体部位、梗阻的原因；客观地分析判断病变肠管缺血程度。

PU-0535

Can iodine concentration of Spectral CT non-invasively assess angiogenesis in colon cancer?

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Aim To investigate the correlation of iodine concentration (IC) generated by spectral CT with micro-vessel density (MVD) and vascular endothelial growth factor (VEGF) expression in patients with colon cancer.

Methods Twenty-two patients who were diagnosed colon cancer in T3 and T4a by colonoscopy from October 20 to March 2019 underwent abdomen enhanced spectral CT scan, CT value, iodine concentration (IC), normalized iodine concentration ratio (nIC) during arterial phase (AP), venous phase (VP) were measured by two experienced radiologists at primary lesion and fat around the lesion. And Patients were confirmed as T4a group (with serosal infiltration) and T3 group (with no serosal infiltration) by pathology results after operation . The microvessel density (MVD) and Endothelial growth factor (VEGF) of the two groups were detected by immunohistochemistry.

Correlation of nIC with MVD, VEGF and clinicopathological features were analyzed. The total RNA of the two primary lesions was extracted from the tissue samples excised during the operation, and VEGFA and other related factors were detected by RT-PCR. The relative expression level of the ligand angiogenesis index.

Results

1. IC and nIC in tumors at stage T4a were significantly higher than those in T3,and there was statistical difference ($P<0.05$).
2. NICs in both groups were positively correlated with MVD, and were significantly during AP, but NICs had no significant correlation with VEGF.
3.The results of RT-PCR showed that the expression of VEGFA in the primary lesion was higher in tumors at stage T4a than in T3 group, and showed a positive correlation between nIC and VEGFA expression.

Conclusions

Iodine concentration can reflect the infiltration of the serosa around the colon and the angiogenesis of colon cancer to some extent, so that the colon cancer stage can be evaluated non-invasively before operation. The IC detected by spectral CT correlated with the MVD.

PU-0536

磁共振弥散加权成像在直肠癌术前分化程度中的应用价值

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目的 评价磁共振弥散加权成像在直肠癌术前分化程度中的预测价值。**方法** 回顾性分析 2018 年 1 月至 2019 年 4 月经我院病理组织学检查确诊为直肠癌患者 50 例，对比术后病理结果，将 50 例患者分为高分化 9 例、中分化 33 例、低分化 8 例。所有研究对象行盆腔磁共振检查，收集所有研究对象 MRI 图像，在后处理工作站独立进行图像分析和测量。参照薄层 T2WI 图像，在 ADC 图像上对肿块进行勾画，感兴趣区选择为肿瘤最大层面区域勾画三个小圆形测量相应的 ADC，避开坏死、囊变、出血等区域，取其平均值为测量值（图 1）；用于评估直肠癌术前分化程度。采用 SPSS17.0 软件进行分析，P＜0.05 为差异有统计学意义。**结果** 50 例直肠癌患者，男性 24 例（47.62%），女性 26 例（52.38%），平均年龄 65.48±10.79 岁。根据术后病理结果，将肿瘤分化程度分为高分化 9 例、中分化 33 例、低分化 8 例。ADC 值在高中低分化直肠癌中差异有统计学意义 P＜0.001，高分化直肠癌 ADC 为 1.030±0.045（$10^{-3}mm^2/s$），中分化直肠癌 ADC 为 0.941±0.059（$10^{-3}mm^2/s$）；低分化直肠癌 ADC 为 0.821±0.079（$10^{-3}mm^2/s$）。每两组之间比较差异有统计学意义 P＜0.001。**结论** ADC 值能准确的反映水分子在肿瘤细胞内外的运动情况。肿瘤分化程度越低，ADC 值越低，恶性程度越高；ADC 值在鉴别高分化与中分化、中分化与低分化的直肠癌中有一定价值。总之，
磁共振弥散加权成像能准确评估直肠癌患者术前分化程度，对患者的治疗、预后提供重要的影像依据。

PU-0537
磁共振成像评估局部进展期直肠癌新辅助治疗疗效

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目的 探究磁共振成像（MRI）在新辅助治疗进展期直肠癌疗效评估中的价值。**方法** 将 2017 年 1 月至 2019 年 6 月中国医学科学院肿瘤医院深圳医院收治的Ⅱ～Ⅲ期 58 例直肠癌患者纳入回顾性队列研究，所有患者术前均行新辅助治疗，治疗方法为局部放疗配合同步化疗，治疗后 6-8 周内手术，最长不超过 10 周。治疗后磁共振评估的时间为前 1 周以内。研究本组患者 MRI 影像资料，比较其治疗前后肿瘤大小，分析其治疗后的影像学 T 分期，并与术后病理分期进行比较。采用 Kappa 检验新辅助治疗后影像学分期和术后病理分期一致性。**结果** 58 例Ⅱ～Ⅲ期直肠癌患者中男性 32 例，女性 26 例，中位年龄 53.4（32～80）岁。新辅助治疗前影像分期 T3 期者 36 例（62%），T4 期者 22 例（38%）。新辅助治疗后，28 例（48%）患者发生 T 分期降期（包括完全缓解），30 例（52%）患者 T 分期未降期（其中 3 例患者发生 T 分期进展）。按照实体瘤疗效评价标准（RECIST）方法进行评估，缓解者（包括完全缓解和部分缓解）占 83%（48/58），未缓解者（包括疾病稳定和疾病进展）占 17%（10/58）。比较新辅助治疗后影像 T 分期与术后病理分期，T 分期再分期的准确率为 71%（41/58），对 T0～2 期、T3～4 期诊断的敏感度和特异度分别为 62%（20/32）和 77%（20/26），79%（27/34）和 59%（14/24），影像及病理一致性差（Kappa 值＝0.391，P＝0.002）。**结论** 新辅助治疗在肿瘤的降期与缓解、缩小病变的范围中具有重要的作用。MRI 作为一种重要的评估手段，通过比较治疗前后的肿瘤大小能够初步判断疗效，而单纯通过比较治疗前后肿瘤的影像 TNM 分期判断疗效，其准确性不高。从临床的角度看，新辅助治疗后 T 分期低估的情况应予以重视。

PU-0538
炎症性肠病的临床表现及影像学表现综述

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炎症性肠病(inflammatory bowel disease。IBD)是一类可由不同病因所引起的非特异性慢性肠道炎症性疾病，主要分类为溃疡性结肠炎(ulcerative colitis，UC)和克罗恩病(Crohn’8 disease，CD)，另外还有少部分病人因无法明确诊断，则称之为“不确定性大肠炎”。该病病因目前尚不清楚，但是，近来来，越来越多的国人开始患上此病，为了能够明确诊断炎症性肠病， 减少临床工作的困难，同时提高该类疾病诊断的可靠性，降低漏诊率、误诊率，对于溃疡性结肠炎和克罗恩病的临床表现、病理表现、尤其是影像学表现的比较的掌握至关重要，非常有利于两种疾病的鉴别诊断，同时随着近代影像学技术的发展，CT、核磁共振、肠镜、超声等技术在对于两种炎症性肠病的诊断和治疗中都扮演着不可替代的角色。本文是基于本人阅读的多篇文献，从而对溃疡性结肠炎和克罗恩病两种炎症性肠病的诊断、比较、鉴别诊断有了一个系统的概念而写就，目的是为了深入了解两种疾病，寻找最为简便可靠的治疗方法，辅助临床诊断和治疗，提高诊断效率，减少痛苦。

PU-0539

原发性消化道黑色素瘤的影像表现

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目的 分析原发性消化道黑色素瘤的 CT、MRI 及 PET/CT 表现，探讨其影像表现学特征及诊断价值。**方法** 回顾性分析 11 例经病理组织学和免疫组织化学证实的原发性消化道黑色素瘤的影像及临床资料，其中 MRI5 例，CT6 例，PET/CT5 例。**结果** 11 例原发性消化道黑色素瘤中，肿瘤位于食管 1 例、胃 1 例、同时发生于食管和胃 1 例、小肠 2 例、大肠 6 例，以直肠肛管最为多见。原发性消化道黑色素瘤多表现明显蕈伞型肿块充满管腔(n=7)，多大于 2.0cm，部分呈管壁明显增厚(n=4)，通常不伴肠梗阻，7 例伴周围脂肪浸润、淋巴结转移。典型性恶性黑色素瘤有 MRI 特征性表现，MRI 表现为 T1 和 T2 驰豫时间缩短，T1WI 呈稍高信号，T2WI 呈低信号。CT 检查病变多表现为中等软组织密度灶，大部分平扫密度较均匀，注射造影剂后大部分病变中度强化。PET/CT 均表现为葡萄糖代谢增高。本组病例均经组织病理学检查并免疫组化确诊，其中 HMB45、Vimentin 均为阳性，S-100(+)82%（9/11），Melan-A（+）91%（10/11）。**结论** 原发性消化道黑色素主要依靠病理组织学和免疫组织化学的综合诊断，但其影像表现有一定的特征性，MRI 检查对其鉴别诊断有提示价值。影像学检查能很好地显示原发性消化道黑色素瘤的部位、与邻近组织的关系，进一步指导临床治疗及评估预后。

PU-0540

CT 在胃肠道穿孔的诊断及定位穿孔位置的价值分析

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目的 回顾性分析 CT 在胃肠道穿孔的诊断及穿孔部位定位的价值。
方法 选取 2018 年 1 月～2019 年 5 月我院收治的 98 例胃肠道穿孔患者,所有患者均经过手术病理诊断证实,按穿孔时间分为 0-24h、24-48h、＞48h 组，并分析游离气体体积等影像征象与穿孔位置、穿孔大小及时间的相关性。

结果 0-24h 为诊断穿孔的准确率达 98%，穿孔定位准确率达 66%；23-48h 诊断穿孔的准确率达 65%，穿孔定位准确率达 45%；＞48h 诊断穿孔的准确率达 10%，穿孔定位率达 0%；差异具有诊断学意义。局限性腹膜炎伴周围不规则形空气影对穿孔的定位有诊断意义。
结论 CT 对于穿孔时间小于 24h 的穿孔部分定位具有显著意义。

PU-0541
CT 门静脉成像预测肝硬化食管下段静脉曲张程度的价值评估

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目的
食管下段静脉曲张是肝硬化患者门静脉高压症的常见并发症，本研究目的是评估 CT 门静脉成像（CT Portography, CTP）在预测食管下段静脉曲张程度的诊断效能和临床价值。
方法
选取我院 2016 年 1 月-2018 年 8 月临床上诊断为肝硬化食管下段静脉曲张（esophageal varices，EV）患者 53 例，所有患者均在内镜检查 4 周内接受 CTP 检查。以内镜检查为金标准，53 例患者分为非显著性食管静脉曲张（EV）组（轻度+中度 EV）（n = 28），显著性 EV 组（重度 EV）（n = 25）。观测曲张静脉的直径，曲张静脉的截面总面积以及曲张静脉的体积，所有数据均采用 3D-slicer 软件测量，计算纳入指标的灵敏度和特异性，拟合 ROC 曲线，计算 AUC，选择截断点，评估纳入指标在预测食管下段静脉曲张的诊断效能。两组间数据采用成组设计的两样本均数的 t 检验，以 P＜0.05 为差异有统计学意义。
结果
CTP 能较好地显示食管下段的曲张静脉，非显著组 EV 平均直径为 4.65±1.38mm，显著组为 7.08±2.13mm，非显著组 EV 平均体积为 1059.84±795.97mm^3，显著组为 2440.84±1310.05mm^3，非显著组 EV 平均总面积为 30.04±20.32mm^2，显著组为 59.92±35.06mm^2，曲张静脉直径在预测重度 EV 时的 AUC 为 0.846，诊断敏感度为 92%，特异度为 73.1%，曲张静脉体积在预测重度 EV 时的 AUC 为 0.820，诊断敏感度为 88%，特异度为 65.4%，曲张静脉的截面总面积在预测重度 EV 时的 AUC 为 0.766，诊断敏感度为 72%，特异度为 76.9%。
结论
CT 门静脉成像可作为一种预测食管下段静脉曲张程度的方法，曲张静脉直径及体积对于诊断肝硬化合并食管下段静脉曲张有较高的诊断效能，其中，体积作为一种新指标，对曲张静脉的的检测具有较高价值。

PU-0542
多层螺旋增强 CT 结合血管重建技术对肠及肠系膜损伤的诊断价值

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目的 腹部创伤是目前较为常见的急诊外科常见疾病，其中肠及肠系膜损伤(bowel and/or mesenteric injuries，BMIs)在腹部创伤中的发生率为 1%～5%，早期发现、准确诊断和及时治疗是挽救患者生命的关键。笔者回顾性分析了 86 例闭合性 BMIs 患者的螺旋 CT 增强及血管重建

（multi-slice spiral computed tomography angiography，MSCTA）的影像表现，探讨其对 BMIs 疾病的诊断价值。

方法 选取浙江大学湖州医院及浙江大学医学院附属邵逸夫医院 2012 年 1 月至 2018 年 1 月间因腹部闭合性损伤来院诊治的 BMIs 患者 86 例，所有患者均行急诊腹部 CT 增强及肠系膜 CTA 检查。回顾性分析所有入选研究的肠及肠系膜损伤（BMIs）患者的 CT 增强扫描及 CTA 影像特征，来评价多层螺旋 CT 结合血管重建技术对肠及肠系膜损伤的诊断价值。

结果 在 86 例 BMIs 患者中，单纯小肠损伤共 35 例（40.7%）；小肠合并肠系膜损伤 21 例（24.4%）。单纯结肠损伤患者共 15 例(17.4%)；结肠合并小肠损伤 5 例(5.8%)；结肠合并肠系膜损伤 3 例(3.5%)。单纯肠系膜损伤 7 例（8.1%）。MSCT 及 CTA 主要表现为小肠或结肠肠壁增厚，肠管连续性中断；肠系膜损伤，肠系膜血肿形成，造影剂外渗出；腹腔、盆腔及腹膜后积液（血），腹腔内游离气体。

结论 本研究通过回顾性分析 86 例经过手术及临床保守治疗随访证实的闭合性 BMIs 患者的临床资料及影像学表现得出**结论** BMIs 的多层螺旋增强 CT 及 CTA 成像具有典型的影像学特征，利用该技术对临床精确制定治疗方案具有一定指导价值，值得临床推广。

PU-0543
青年人大肠癌 CT 和 MRI 影像学表现与病理学对照分析

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【摘要】目的 探讨青年人大肠癌的 CT 和 MRI 影像学表现及发病特点。方法 回顾性分析 26 例经病理证实为大肠癌的青年患者的 CT（24 例）和 MRI（19 例）影像学表现，并与病理进行对照分析。结果 26 例患者中直肠癌 10 例，乙状结肠癌 7 例，升结肠癌 6 例，横结肠癌 2 例，盲肠癌 1 例，其中 2 例合并肠套叠，1 例合并阑尾类癌；病理上腺癌 14 例，粘液腺癌 9 例，印戒细胞癌 3 例，伴有淋巴结转移 10 例，腹腔转移 4 例，淋巴结癌栓形成 8 例。结论 早期大肠癌在青年人中的发病容易被忽视，因病就诊时多数已达中、晚期，发病率逐年上升，恶性程度也较高，CT 扫描中尤其增强 CT 能够较好的发现病变，MRI 扫描能够显示病变侵犯程度及范围，对淋巴结转移的判断明显优于 CT，可对病变作出 TNM 分期，从而协助临床作出正确干预，以提高患者生存率。

PU-0544
结直肠癌影像检查的技术进展与挑战

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目的 回顾结直肠癌成像的现状，概述指导结直肠癌管理的各种情形中关键成像模式的优势和局限性，特别是新兴影像学技术评估肿瘤对新型疗法时面临的挑战。

材料与**方法** 近二十年来，随着新型成像技术开发和分子示踪剂的出现，影像学检查在结直肠癌中应用可谓日新月异，在疾病监测、诊断、分期、治疗选择和随访中发挥着越来越重要的作用。通过动态对比增强 CT（DCE-CT）、动态对比增强 MRI（DCE -MRI）、弥散加权 MRI（DW-MRI）等新技术可用于评价结直肠癌早期生物和功能学的变化。正电子发射断层扫描（PET）和计算机断层扫描（CT）等技术的融合，氟代脱氧葡萄糖（FDG）-PET/CT 结合代谢和解剖成像，提高了肿瘤检测的敏感性、特异性，以及肝转移病灶的检出水平，促进了直肠癌治疗策略的发展，但也并非没有局限性。

结果 当前的挑战主要体现在结直肠癌全程管理中不同的影像检查技术没有明确的使用规范，检查结果缺乏统一的评估标准，成像技术的诊断效能-经济成本仍需要进一步优化。
结论 有效结合患者个性化治疗方案和医院固有的影像检查硬件设备，影像学检查技术可能会在降低结直肠癌的死亡率方面发挥更大、更重要的作用。

PU-0545
DCE-MRI 对直肠癌周围系膜内淋巴结转移的诊断价值

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目的 探讨 DCE-MRI 对诊断直肠癌周围系膜内淋巴结转移的价值。方法 前瞻性纳入经肠镜检查确诊为直肠癌的患者 56 例，所有患者术前均行常规 MRI 及 DCE-MRI 检查且随后 1 周内行全直肠系膜切除术及术后标本病检。分析直肠系膜内可视淋巴结的边界、平扫及 T1W 增强信号特点（均匀/不均匀强化或环状强化），测量感兴趣淋巴结短径及 ADC 值，根据上述结果综合判断其是否为转移性淋巴结且与手术病理结果比较；通过 DCE-MRI 图像后处理获得定量灌注参数 Krans、Ke 及 Ve，比较直肠癌周围淋巴结转移组与非转移组间的差异性，绘制差异有统计学意义参数的 ROC 曲线并计算 AUC，并进一步确定诊断阈值。结果 ①56 例患者的 79 枚淋巴结根据手术病理结果分为转移组 44 例、非转移组 35 例。②直肠癌周围系膜淋巴结的短径、边界、平扫及 T1W 增强信号特点、ADC 值在两组间的差异均有统计学意义（P＜0.05）；Ktrans 值在两组间的差异有统计学意义（P＜0.05），而 Kep、Ve 值的组间差异无统计学意义。③常规 MRI 与病理标准诊断淋巴结转移的一致性比较中，Kappa 值=0.455、P＜0.001，诊断直肠癌周围系膜淋巴结转移的敏感度 61.4%、特异度 85.7%，阳性预测值 84.4% 、阴性预测值约为 63.8%。④常规 MRI、常规 MRI 联合 DCE-MRI 诊断直肠癌周围系膜淋巴结转移的 ROC 曲线下面积分别为 0.858、0.919，且 DCE-MRI 的 AUC 大于常规 MRI（Z 值=3.116,P=0.0018）。当 Ktrans=0.124 min^{-1}时约登指数最大，敏感度、特异度分别为 93.2%、77.1%。结论 常规 MRI 检查诊断直肠癌周围系膜淋巴结转移效能一般，常规 MRI 联合 DCE-MRI 诊断直肠癌周围系膜淋巴结转移准确性较高，且可将 Ktrans=0.124 min^{-1}作为鉴别直肠癌周围系膜淋巴结转移与非转移的阈值。

PU-0546
小肠 CT 造影多时相显示效能研究

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目的 比较 CT 造影在不同扫描时相下对小肠肠壁及血管的显示效果，确定最佳扫描时相，评价该时相的临床诊断效能。方法 将 100 例行小肠 CT 造影的患者分别进行动脉期、门脉早期及门脉晚期、延迟期扫描，测量十二指肠、空肠及回肠肠壁 CT 值、血管显示数量及血管 CT 值，比较分析后选择最佳扫描时相，评价该时相 CT 图像小肠及血管病变的诊断效能。结果 （1）十二指肠、空肠及回肠肠壁 CT 值均为门脉早期高于动脉期、门脉晚期和延迟期（P＜0.05），而动脉期和门脉晚期、延迟期差异无统计学意义。（2）回肠动脉在各时相 CT 值比较：动脉期＞门脉早期、门脉晚期及延迟期，后三者无统计学差异。回肠静脉在各时相 CT 值比较：门脉晚期＞门脉早期＞延迟期＞动脉期（P＜0.05）。（3）小肠 CT 造影证实小肠淋巴瘤 8 例、间质瘤 5 例、腺瘤 1 例、克罗恩病 8 例、小肠结核 2 例。结论 小肠 CT 造影门脉早期对小

肠肠壁有较好的显示效能，动脉期及门脉晚期对血管显示较高，利用动脉期及门期双期扫描方式进行小肠 CT 造影检查，可对大多数小肠疾病做出准确诊断。

PU-0547

胃神经内分泌癌的预后分析

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目的 本文主要通过 CT 增强及临床资料探讨胃 NEC（neuroendocrine carcinoma，神经内分泌癌）的预后相关因素。材料与方法 1、病例资料 对经病理确诊为胃 NEC 的患者进行回顾性分析，共 70 例，其中男性 57 例，女性 13 例。所有患者均行上腹部增强 CT 检查。2、CT 检查方法 采用 Siemens SomatomSensation64 层螺旋 CT 扫描仪，增强扫描采用双筒高压注射器 (German Ulrich)自肘前静脉注入非离子型对比剂碘海醇注（350mgI /L)80～100mL，注射流率 3～3.5mL/s。3、影像分析 对 79 例患者的影像资料进行观察分析，观察内容为有无淋巴结转移。4、生存分析 对确诊为胃 NEC 并实施手术的患者进行随访，随访截至 2019 年 1 月 9 日。统计的 DFS(disease-free survival，无病生存时间)为从手术结束到第一次复发或死亡的时间。复发标准：胃 NEC 复发或其他部位转移，经病理或者影像至少一项检查证实。把出现转移或死亡的患者纳入进展组，其余患者为非进展组。5、统计学方法 对患者的预后，采用 Kaplan-Meier（Log-rank 检验）进行单因素分析。检验有意义的指标采用 Cox 回归模型分析。p<0.05 为差异有统计学意义。结果 在 53 例术后的胃 NEC 患者中，发生转移的患者 12 例，死亡患者 22 例，进展组患者共 34 例，非进展组患者共 19 例。患者生存时间为 0.5~47.5 月，平均生存时间 29.6 月，中位生存时间 40.1 月 。对于手术治疗的胃 NEC 患者，年龄、淋巴结转移及 TNM 分期对患者的预后影响存在差异，差异有统计学意义（p <0.05）。其中淋巴结转移是影响预后的独立危险因素。结论 对于手术治疗的胃 NEC 患者，年龄、淋巴结转移、TNM 分期是影响预后的因素，其中淋巴结转移是影响预后的独立危险因素。

PU-0548

16 排螺旋 CT 对阑尾炎的诊断意义及附 1 例漏诊分析

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目的 探讨 16 排螺旋 CT 对急性阑尾炎的有效诊断，降低阑尾炎的误漏诊。**方法** 应用 Scope16 排螺旋 CT，对临床疑似急性阑尾炎 16 例进行薄层扫描，并冠状位矢状位重建。**结果** CT 显示急性单纯性阑尾炎者 6 例，急性化脓性阑尾炎 4 例；坏疽性并阑尾穿孔性阑尾炎 2 例；阑尾异常并阑尾炎 1 例，1 例粪石阑尾炎误诊为肠梗阻。**结论** 充分做好检查前、检查过程中的准备工作，薄层扫描的同时采用增强扫描，冠状位与矢状位重建，以及阅片医生丰富的工作经验是减少误诊漏诊的重要手段，为临床早期治疗方案制定提供有效的影像诊断依据，CT 对急性阑尾炎的正确诊断具有重要意义。

PU-0549

能谱 CT 在胃癌术前分期诊断中的应用研究进展

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胃癌是起源于胃黏膜上皮的恶性肿瘤，是常见的恶性肿瘤之一，占全球恶性肿瘤死因第 3 位。中国是胃癌的高发区域之一，每年约有 35 万人死于胃癌。胃癌患者预后和胃癌的术前分期密切相关，早期胃癌患者术后 5 年生存率已超过 90%，而进展期胃癌的 5 年生存率仍低于 30%。准确的胃癌术前分期对提高患者的生存率以及选择合理的治疗方案、评估预后等具有十分重要意义。随着各种影像技术越来越成熟，新兴技术如超声造影、能谱 CT、影像组学的运用，胃癌术前分期评估日趋完善。能谱 CT 作为一种双能量成像设备，提供了全新的多参数成像诊断模式，实现物质分离与鉴别，在胃癌诊断中具有更显著优势。能谱 CT 在胃癌 T 分期的应用研究中，赵致平等对 91 例患者进行能谱 CT 平扫及增强检查，进入最佳单能量图像，得到整个病变及其周围的能谱曲线，发现能谱 CT 对胃癌层次结构的显示与病理间存在相关性，通过最佳单能量图像 及能谱曲线的分析胃癌 T 分期的术前评估与病理结果的一致性较好，可提高早期胃癌的对比噪声比，改善图像质量，对胃癌的侵犯范围显示具有一定的应用价值。在胃癌淋巴结转移的应用研究中，王睿通过回顾性分析经病理确诊为胃腺癌并行能谱 CT 扫描的 210 例患者的临床及影像学资料，发现肿瘤原发灶的 Borrman 分型、最厚径及能谱 CT 参数静脉期 nIC 值可以评价并预测胃腺癌淋巴结转移，提高 CT 胃癌术前诊断 N 分期的准确度。能谱 CT 的定量参数 IC 值，特别是静脉期 nIC 值可以作为预测胃癌淋巴结转移的影像学指 标，为临床胃癌患者个体化治疗提供更多依据。由此可见，能谱 CT 对胃癌术前分期诊断有较高的应用价值，能谱 CT 联合多种平面重组技术在胃癌 T 分期诊断中具有较高价值,。然而，有关这方面研究方兴未艾， 能谱 CT 的多参数定量分析的结果并不一致，有关参数的诊断界值及效能尚缺乏统一的认识，因此能谱 CT 成像在胃癌分期诊疗中的应用价值尚待进一步挖掘。

PU-0550

Magnetic resonance enterography for the detection of inflammatory diseases of th e juvenile Crohn’s disease: quantifying the inflammatory activity.

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Objective:
To evaluate the accuracy of Magnetic resonance Enterography (MRE) in the diagnosis of active lesions and ulcers in juvenile Crohn’s disease (CD) against endoscopic and histopathology reference standard.
Materials and methods:
70 children (under 18 years of age) with CD, who underwent ileocolonoscopy and MR enterography within 7 days were recruited and the terminal ileum biopsy was available. The Simplified Endoscopic Activity Score for Crohn’s Disease (SES-CD), histopathologic endoscopic acute inflammation score[eAIS]) and Magnetic resonance enterography global score (MEGS) were scored in the terminal ileum. The correlation between MEGS and the reference standard (SES-CD and eAIS) was assessed by Spearman rank estimation. The diagnostic accuracy of MER for active disease and ulceration defined by endoscopic or histopathologic were calculated. Receiver operating characteristic curves (ROC) were constructed.

Results: Fifty-two adolescent CD patients were included. MEGS showed strong correlation to SES-CD (r =0.698) and weak correlation to eAIS (r= 0.31). With endoscopic as the standard of reference, the MEGS had a high accuracy for the detection of disease activity (AUC of 0.87, sensitivity 0.88 and specificity 0.86) and for ulcerative lesions (AUC of 0.85, sensitivity 0.83, specificity 0.87) in the terminal ileum. When histopathology diagnosis was chosen as the reference standard, MRE had lower sensitivity and specificity than Endoscopic in the identification of active disease and ulcers; for the detection of disease activity (AUC of 0.60, sensitivity 0.69, specificity 0.50) and for ulcerative lesions (AUC of 0.60, sensitivity 0.64, specificity 0.56) in the terminal ileum.
Conclusion: The accuracy of MRE for detecting disease activity and ulceration brings about the possibility of using MRE as an alternative to endoscopy in the evaluation of juvenile CD.

PU-0551

MR 检查在坏死性筋膜炎中的应用

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目的 探讨 MRI 检查在坏死性筋膜炎早期诊断中的价值。
方法 采用回顾性研究，汇总 4 例由于肠道肿物导致大肠埃希细菌感染引起下腹部壁坏死性筋膜炎的 MRI 影像学表现。
结果 坏死性筋膜炎是一种急性细菌性感染型疾病。主要特点是病程进展迅速且扩散广泛。累及皮下组织和深筋膜，多为需氧菌与厌氧菌协同作用造成的混合感染。免疫力低下者及使用皮质醇类药物，糖尿病患者等为高发人群。常常为感染中毒症状，严重者危及生命，因此影像学结合临床症状对于该病早期发现，协助诊断及后续治疗及预后判断就显得十分必要。MRI 影像学上表现：在 T2WI 脂质抑制序列，肌间深筋膜增厚≥3 mm，成高信号，可有单侧或双侧多处受累，可有气体存在。但 T2 高信号并非坏死性筋膜炎的特征性影像学表现，仍需排除非感染型筋膜炎以及可能存在的肌肉撕裂；另外排除类似部位的非坏死性软组织感染。这些影像学表现可能十分类似，但临床表现却迥然不同。
结论 对于肠道肿物继发感染所致坏死性筋膜炎,该病的临床表现及相关的特点应作为早期排查的首要指标，影像学如见异常或考虑该病，应协助临床医师做好早期诊断工作,协助选择清创的范围，告知累及部位，并在后续为该病治疗提供相应的影像学依据，并据此协助做出远期预后的判断。

PU-0552

高分辨磁共振在直肠癌术前分期中的应用

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目的 探讨高分辨直肠磁共振检查中序列的优化与应用

方法 使用西门子 VERIO 3.0T 磁共振对 60 例直肠癌患者进行直肠磁共振检查。其中男性 32 例，女性 28 例。随机分为两组，每组 30 例。两组检查前均为检查前禁食 4-6h，且行清洁灌肠。检查前 20min 肌注 20mg 山莨菪碱。嘱患者检查过程中平静呼吸，不能移动身体。头先进，仰卧位，腹部沙袋，相控阵线圈。A 组检查技术：行横断面 T2WI，T1WI，DWI，矢状位 T2WI，冠状位 T2WI。B 组检查技术：A 组序列基础上加扫 T2WI+FS。两组所选序列均为小 FOV（25-27cm）、薄层扫描（3mm），DWI（b=0,800）。对两组不同扫描技术所得图像进行病灶的 T 分期。

结果 两组不同检查序列对直肠癌 T 分期中 T1-2 期、T3 期、T4 期及淋巴结转移诊断的敏感性为 89.85％、94．51％、93．94％及 88．54％，与病理检查分期诊断结果具有良好的一致性。

结论 高分辨磁共振应用于直肠癌术前分期诊断具有较高的准确性，能准确评估直肠癌浸润程度和术前 T 分期.其中 T1WI+DWI 能够很好的显示周围淋巴结情况。T2WI+FS，DWI 能够很好的显示病灶本身的信号特点。T2WI 能够很好的显示病灶浸润周边情况。推荐使用 T2WI，T2WI+FS, T1WI，DWI，矢状位 T2WI，冠状位 T2WI。MRI 能够术前提供准确的分期信息以帮助临床医生制定最佳的治疗方案。

PU-0553
直肠癌磁共振与病理分期对照及其与 MVD 值的相关性分析

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目的 探讨直肠癌 MRI 与病理分期对照及其与 MVD 值的相关性。
方法 顾性分析 28 例直肠癌患者的磁共振成像(MRI)资料，结合高分辨率 MRI(HR-MRI)及弥散加权成像(DWI)的多序列 MRI 对患者进行 T、N 分期，并与术后病理对照。术后标本采用 CD34 单克隆抗体行免疫组化染色计数微血管密度(MVD)，统计 MRI 分期与 MVD 的关系及表观弥散系数(ADC)与 MVD 的相关性。
结果 显示多序列 MRI 对直肠癌 T 分期总的正确率为 85.7％(24/28)，Kappa=0.805；N 分期正确率为 82.14％(23/28)，Kappa=0.632。MRI T3-4 期的 MVD 值(27．00±4．34)较 T1-2 期(20.47±3.60)高，N1-2 期(26.35±4.06)较 N0 期(19.09±2.98)高，差异有统计学意义。ADC 与 MVD 呈负相关(r=-0.743，P<0.05)。
结论 本研究显示 MRI 分期及弥散成像的 ADC 值与 MVD 之间存在相关关系。因此，术前 MRl 分期及 ADC 值的定均可在一定程度上反映病灶微血管增生情况，从而为临床提供帮助。

PU-0554
多排螺旋 CT 在肠梗阻诊治中的价值

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目的 研究肠梗阻急诊病例的诊治过程，评估 MDCT 在肠梗阻诊治中的价值。**方法** 回顾性研究 80 例肠梗阻病例，以及 MDCT 三维重建影像学资料。**结果** 急诊病例因 CT 检查而改变治疗方案的比例为 18.7%，并且能够为肿瘤性肠梗阻提供制定治疗方案的依据，为肠梗阻手术指征提供判断依据，MDCT 判断肠绞窄的敏感性 100%，特异性 58.3%. **结论** MDCT 是诊断不明或存在并发症的肠梗阻必须的评估手段。

PU-0555
能谱 CT 在结肠癌术前鉴别 T3 和 T4a 分期中的研究

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目的
探讨能谱 CT 在结肠癌术前 T3 期和 T4a 期鉴别中的应用价值。
方法
前瞻性收集 2018 年 3 月至 2019 年 5 月期间结肠镜怀疑结肠癌病人 160 例，并对这些病人进行能谱模式下双期全腹部扫描，有两位经验丰富的放射科医生测量 40—140 keV 不同单能量下 CT 值及动脉期（AP）、静脉期（VP）原发病灶及病变周围脂肪的碘浓度（IC）、水浓度（WC），并计算标准化碘浓度比(nIC)，能谱曲线斜率（$\lambda_{(HU)}$）。经手术病理证实， 121 名患者中浆膜浸润 T4a 组为 61 例，无浆膜浸润 T3 组为 60 例，采用非参数 Mann-Whitney U 检验，比较 T3 组及 T4a 组各参数间的差异。并对定量参数进行 ROC 分析，计算曲线下面积（area under curve,AUC）,评价定量参数值鉴别 T3 及 T4a 的能力。
结果
采用非参数 Mann-Whitney U 检验得出，T3 组及 T4a 组原发病变及周围脂肪的动脉期碘浓度（ICAP）、动脉期标准碘含量（nICAP）、动脉期 40-70keV 的能谱斜率（λ_{AP}）及静脉期碘浓度（ICPP）、静脉期标准碘含量（nICPP）及静脉期 40-70keV 的能谱斜率（λ_{PP}），T4a 组病人各参数均高于 T3 期患者，具有统计学意义（P 值<0.05）。
使用 MedCalc 进行两期各参数 ROC 曲线分析，得出两期两组原发病变及周围脂肪 IC 及 nIC 的 AUC 面积，动脉期标准碘含量碘浓度临界值为 0.29mg/ml 时，ROC 曲线下面积（AUC）为 0.668，灵敏度为 50.82%，特异度为 81.67%；静脉期标准碘含量临界值为 0.2mg/ml 时，AUC 值为 0.819，灵敏度为 93.44%，特异度为 73.33%，提示静脉期对 T3 及 T4a 鉴别诊断效率较高。
结论
能谱 CT 多参数成像在结肠癌术前无创鉴别 T3 及 T4a 分期中具有临床应用潜在价值。当静脉期标准碘含量临界值为 0.2mg/ml 时，可获得较高的诊断效能。

PU-0556
双源 CT 融合图像显示直肠癌病变的初步研究

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目的 探讨不同融合系数对直肠癌双源 CT（dual source computed tomography , DSCT）融合图像质量的影响。**方法** 选择 45 例直肠癌患者行 DSCT 腹部强化扫描扫描，其中男性 25 例，女性 20 例。扫描完成后取得 6 组数据，分别为 80kVp 数据，sn140kVp 数据，融合图像数据（融合系数为 0.3、0.4、0.6、0.8）；6 组数据的图像分别测量直肠癌病变的平均 CT 值及噪声，并计算信噪比（SNR）。两名医师同时对各组图像进行质量评分。采用统计学软件 SPSS 11.5 版本进行统计学分析。**结果** 0.6 组（动脉期和静脉期）的平均噪声显著低于其他组（$P<0.05$）；0.6 组（动脉期和静脉期）的平均 SNR 显著高于其他组（$P<0.05$）。0.6 组的图像质量优于其他各组（$P<0.01$）。**结论** 融合系数 0.6 组的图像中直肠癌病变具有较高的 SNR，有较好的图像质量。

PU-0557

胃原发黑色素瘤一例

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患者，男 56 岁，因进食梗咽感 5 月，黑便 1 月入院。入院体格检查及实验室检查均未见明显异常。曾在外院行胃镜检查示贲门黏膜及坏死组织，坏死组织内见异性细胞，首先考虑低分化腺癌。既往史：房间隔缺损，于 2018 年在我院行房间隔缺损修补术。
影像表现：钡餐：食道吞钡后食管下端管腔狭窄，管壁僵硬，钡剂通过受阻，粘膜中断破坏，贲门口结构紊乱；钡剂充盈后胃呈鱼钩型，胃底、贲门口部见巨大软组织肿块，呈不规则充盈缺损改变，周围粘膜中断破坏。考虑：胃 Ca 可能。CT：胃贲门区胃壁明显增厚，平扫 CT 值约 36HU，增强后明显均匀强化，静脉期为著，三期强化 CT 值分别约 65HU、108HU、88HU；胃周见多组肿大淋巴结，较大短径约 2.3cm，明显强化；考虑胃癌并淋巴结转移可能性大（T3N3Mx）。
手术及病理所见：探查见肿物位于胃底贲门，未侵出浆膜，1-12 组淋巴结肿大，术中诊断胃癌。快速病理示胃底及胃食管交界处恶性肿瘤，考虑为淋巴瘤或恶性黑色素瘤，上切缘查见肿瘤钩，下切缘未见肿瘤。术后肿块大体检查：全胃切除标本，大弯长 23cm，小弯长 15cm，沿大弯侧剪开，紧邻食管切缘，距下切缘 13cm 于贲门处见一隆起型肿物，大小：9cm×7cm×2.5cm，肿物切面灰白灰黑色，质稍韧，鱼肉状，侵达浆膜下脂肪组织。网膜组织一堆，大小：12cm×10cm×4cm，未触及肿大结节及淋巴结。常规:病理：胃恶性黑色素瘤，侵达浆膜下脂肪组织，查见脉管内癌栓，未见明确神经侵犯，上切缘查见肿瘤，下切缘未查见肿瘤，网膜组织中未查见肿瘤；淋巴结查见肿瘤转移：4/23 。免疫组化结果示：HMB45（+），Vimentin（+），Melan-A（+）， Bcl-2（弱+），CK 高（-），CK 广谱（-），LCA（-），S-100（-）， TopoIIa（+，20%），CD31（显示脉管，查见脉管内癌栓），Ki-67（+，40%）。

PU-0558

MR 小肠造影对克罗恩病活动性及并发症的评估

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目的 探讨克罗恩病活动期在 3.0T MR 小肠造影的影像表现，以及对严重程度、肠周并发症的评价。**方法** 回顾性分析 2017 年 5 月至 2019 年 3 月期间在浙江中医药大学附属第一医院就诊，并经消化道内镜道检查证实的克罗恩病活动期患者共 56 人，所有患者检查前均行肠道准备，并行 MR 肠道造影检查。**结果** 56 例患者中，均表现为肠壁增厚，肠道 MR 造影增强均表现异常强化，T2WI 显示肠壁水肿 23 例；T2WI 及增强扫描表现肠壁溃疡 6 例，肠周水肿 13 例；梳齿征 36 例，瘘管/窦道 6 例，肛周脓肿 3 例。**结论** MR 具有高软组织分辨率，在显示克罗恩病活动性（不对称肠壁增厚、异常强化、肠壁水肿）具有明显优势，并对克罗恩病严重性（溃疡、肠周水肿、DWI 高信号）的发现具有一定价值。在肠周及系膜并发症中（梳齿征、瘘管/窦道、肛周脓肿）亦有较高的诊断价值。

PU-0559

小肠系膜神经鞘瘤 1 例

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患者女，27 岁，偶然发现左下腹肿物 10 天。CT 检查：腹主动脉左前方可见直径约 3.0CM 的类圆形低密度肿块影，病灶边界清楚。增强扫描后动脉期 CT 值约为 76HU，门脉期及延迟期病灶逐渐强化，在延迟期达到强化高峰，CT 值约为 117HU，病灶内可见空回肠动脉穿过。MRI 检查：中腹腔腹主动脉左前方见直径 3.0CM 的类圆形异常信号灶，T2WI 压脂序列成高信号，其内可见血管留空效应，T1WI 呈低信号，DWI 呈高信号，ADC 值减低。影像诊断：考虑血管瘤，巨淋巴细胞增生等良性病变。
手术及病理：术中见小肠起始部对应的系膜远端见一直径 3CM 的肿物，包膜完整，将一根肠系膜上动脉的小肠支中末端完全包绕。肿瘤病理涂片示：肿瘤主要由具有栅栏结构的梭形细胞构成。肿瘤免疫组化检测显示：S-100 蛋白阳性， DOG-1、CD117、SMA 呈阴性。细胞增殖指数（Ki67 染色）小于 5%。结合免疫组化诊断为小肠系膜神经鞘瘤。
讨论：小肠系膜神经鞘瘤相对少见，且本例中肿块包饶空回肠动脉，病灶成渐进式中度强化，结合本病影像特点应与肠系膜海绵状血管瘤，巨淋巴细胞增生及小肠平滑肌瘤相鉴别。①肠系膜海绵状血管瘤表现为圆形或椭圆形肿块，T1WI 呈低信号，T2WI 呈相对于脂肪信号的更高信号。病变内可见蜂窝状、线样分隔。增强后动脉期病灶边缘明显强化，近似血管信号，门脉期及延迟期强化逐渐向病灶中心填充，且信号强度减低，最终呈均匀高信号肿块。②巨淋巴细胞增生一般表现为边界清楚的单发类圆形肿块，少部分病灶可伴有树枝状、砂砾状钙化。增强后病灶动脉期明显均匀强化，门脉期和平衡期持续强化，强化程度与邻近大动脉强化程度相仿。③小肠平滑肌瘤边界清楚，包膜完整。肿瘤较大时可发生液化、坏死。增强扫描病灶呈均匀强化，强化程度高于且早于神经鞘瘤。小肠系膜神经鞘瘤少见，且与其他疾病影像学表现相似，确诊需要结合病理及免疫组化。

PU-0560

meta-analysis

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ABSTRACT
Background Tyrosine kinase inhibitors (TKIs) targeting the epidermal growth factor receptor (EGFR) have been evaluated in patients with metastatic and advanced non-small cell lung cancer (NSCLC).The U.S.Food and Drug Administration initially granted accelerated approval to gefitinib but subsequently rescinded the authorization. Erlotinib and afatinib are similar compounds approved for the treatment of metastatic NSCLC. The objective of this study was to compare the gastrointestinal toxicities of erlotinib, gefitinib, and afatinib in NSCLC.
Methods We searched relevant clinical trials from PubMed, EMBASE, and Web of Knowledge databases, meeting proceedings of American Society of Clinical Oncology as

well as ClinicalTrials.gov. Data was extracted from phases II, III, and IV RCTs. Statistical analysis was performed to calculate the summary incidence, relative risk (RR), and 95 % confidence intervals (CIs) using fixed effects or random effects models based on the heterogeneity of included studies.
Results Initial database search revealed 784 relevant citations. After excluding non-eligible studies, 24 trials were considered eligible for the analysis.
The relative risk (RR) of all-grade nausea , vomitting and constipation was 1.82 (95% CI: 1.42 - 2.34; p < 0.00001) 2.09 (95% CI: 1.54 - 2.83; p < 0.00001)and 1.53(95% CI=1.24 - 2.15; p < 0.00001) respectively; while for high-grade nausea and vomitting, it was 9.23 (95% CI: 5.06 - 16.85; p < 0.00001) and 1.78 (95% CI: 0.5 - 6.26; p = 0.37), respectively.
Conclusion Our meta-analysis has shown that there is an overall elevated risk of gastronomicintestinal with the use of these agents

PU-0561
多排螺旋 CT 增强扫描在胃癌术前淋巴结检出中的应用

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目的 探讨分析 MDCT 增强扫描在胃癌术前淋巴结检出中的应用价值。方法 回顾分析 2016 年 6 月至 2019 年 3 月在我院行胃癌切除术患者的多期增强 CT 检查的影像资料，共 65 例术前检出淋巴结肿大患者，其中腹腔镜手术 30 例，开腹手术 35 例，观察淋巴结肿大的大小，数目及位置，并观察强化特点和与周围结构关系，术后行病理学对照。采用 2mm 以上作为观察对象。结果 本组 65 例患者术前检出淋巴结 482 枚，其中位于幽门上区淋巴结 49 枚，幽门下区淋巴结 45 枚，胃网膜左淋巴结 38 枚，胃网膜右淋巴结 52 枚，胃左淋巴结 46 枚，胃右淋巴结 37 枚，腹腔及肝门部淋巴结 51 枚，脾门淋巴结 48 枚，腹膜后淋巴结 16 枚，2-5mm 淋巴结 280 枚，转移 80 枚，约 28.6%，5-8mm 淋巴结 180 枚，转移 92 枚，约 51%，8mm 以上淋巴结 22 枚，转移 20 枚，约 91%。结论 应用 MDCT 增强扫描和窗宽技术在胃癌术前淋巴结检出中有良好应用价值，淋巴结体积越大，转移可能性越大，并对腹膜后淋巴结有明显检出优势。

PU-0562
PET/CT-MRI 三模式对直肠癌新辅助放化疗疗效的评估价值

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目的 探讨 PET/CT-MRI 三模式对直肠癌新辅助放化疗疗效的评估价值，比较 PET/CT、MRI-DWI 及 PET/MRI 融合图像三者评估肿瘤退缩分级及反应性的准确性。**方法** 回顾性分析 30 例直肠癌患者新辅助放化疗前后 PET/CT 与盆腔 MRI 图像，并进行 PET 与 MRI 图像的融合；患者新辅助放化疗后均行根治性直肠癌切除术，根据 Dworak 肿瘤消退分级(TRG)标准将术后标本进行分级，并分为有反应组(TRG3-4)和无反应组(TRG0-2)。利用 Spearman 相关分析比较直肠癌新辅助放化疗后 PET/CT、

MRI-DWI 及 PET/MRI 融合图像评估影像肿瘤退缩分级与术后病理 TRG 分级之间的相关性，并比较三者预测反应性的准确性。**结果** 30 例患者，术后 TRG1 级 12 例，TRG2 级 6 例，TRG3 级 7 例，TRG4 级 5 例；有反应组 12 例，无反应组 18 例。PET/CT、MRI-DWI 和 PET/MRI 融合评估影像肿瘤退缩分级与术后病理 TRG 分级间均具有一定的相关性（P<0.01），相关系数 r 分别为 0.478、0.668 和 0.759，其诊断反应性的准确率、灵敏度和特异度分别为 63.3%、83.3%和 50.0%；83.3%、66.7%和 94.4%；90.0%、91.7%和 94.4%。**结论** 直肠癌新辅助放化疗后 PET/CT、MRI-DWI 及 PET/MRI 融合均可以在一定程度上评估肿瘤退缩分级及反应性，以 PET/MRI 融合价值最高，因而 PET/CT- MRI 三模式可较好预测新辅助放化疗疗效。

PU-0563
胃癌 CT 表现、临床病理特征与 HER-2 表达的相关性研究

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目的 探讨胃癌 CT 表现、临床病理特征与人表皮生长因子受体 2（HER-2）表达的关系。
方法 回顾性收集 157 例浙江大学医学院附属第二医院经手术病理证实的胃癌患者，术后均予免疫组织化学检测 HER-2 表达情况，分为 HER2 阴性组（0，1+）和 HER2 阳性组（2+，3+），分析术前 CT 表现（各期 CT 值及强化值、淋巴结特征）、临床资料（性别、年龄、BMI）、病理特征（肿瘤分化程度、Lauren 分型、Borrmann 大体分型、肿瘤大小、发生部位、TNM 分期、神经脉管侵犯）与 HER2 基因表达的相关性。
结果 中分化腺癌 HER-2 阳性表达率 64.6%，低分化腺癌 HER-2 阳性表达率 25.3%（ χ^2=23.926，P＜0.001）；肠型胃癌 HER-2 阳性表达率 63.0%，弥漫型胃癌 HER-2 阳性过表达率 17.8%（ χ^2=38.572，P＜0.001）。Borrmann 大体各分型 HER-2 阳性表达率：结节隆起型 8.0%，局限溃疡型 13.3%，浸润溃疡型 78.7%，弥漫浸润型 0.0%，组间比较差异显著，P＜0.05。HER-2 过表达与较高的静脉期 CT 值、相对较低的延迟期 CT 值、较小的动静脉期强化差值（CT_{PA}）呈正相关性，P 值均＜0.05。HER-2 过表达与患者性别、年龄、BMI、肿瘤大小、发生部位、TNM 分期、神经脉管侵犯及病灶平扫 CT 值、动脉期 CT 值、动脉期强化值 CT_A、静脉期强化值 CT_P、淋巴结影像特征（形态、边界、坏死）、腹水无关，P 均>0.05。
结论 中分化、肠型腺癌 HER-2 过表达率高，静脉期高强化、延迟期衰减较快、动静脉期强化差值较小的胃癌往往 HER-2 过表达率高。通过结合胃癌 Lauren 分型、分化程度、Borrmann 大体分型、MSCT 静脉期 CT 值及强化方式等可初步预测 HER-2 表达情况，为后续治疗提供帮助。

PU-0564
磁共振肠道造影对炎性肠病的诊断价值

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目的本研究的目的是探讨磁共振肠道造影（magnetic resonance enteroclysis，MRE）在炎性肠病（inflammatory bowel disease IBD）中的诊断效能和图像质量的评估。**方法**回顾性分析在湘雅三医院拟诊为炎性肠病并行 MRE 检查的 132 名患者。将患者的 MRE 表现与手术及内窥镜获得的组织病理学结果进行比较，计算灵敏度，特异度和诊断符合率。并使用四分法评估 MRE 的图像质量。**结果** MRE 诊断炎性肠病的灵敏度，特异度和诊断符合率分别为 94.3%，92.6%和 93.9%,其中 2 名患者

假阳性，6 名患者假阴性。本研究一共分析了 530 个肠段，其中 323 个肠段（61%）的图像质量得分为 1，8 个肠段（1.5%）图像质量得分为 4。**结论** MRE 在诊断炎性肠病中具有高度的诊断符合率，并能提供优异的图像质量。

PU-0565
多层螺旋 CT 增强扫描及三维重建技术在肠及肠系膜损伤临床精准治疗的应用价值研究

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【摘要】 目的 探讨多层螺旋 CT（MSCT）增强扫描及三维重建技术在肠及肠系膜损伤临床精准治疗的应用价值。**方法** 回顾分析经手术或临床证实的 42 例肠及肠系膜损伤患者的 CT 增强、三维重建表现和临床资料。**结果** 42 例中，肠道破裂 16 例，肠系膜损伤者 7 例，均经手术证实，余 19 例经保守治疗痊愈。MSCT 主要表现为：肠道管壁连续性中断 6 例（15%），对比剂外溢 7 例（18%），肠道腔外气体 15 例（38%），肠管壁增厚 24 例（61%），肠壁强化异常 9 例（23%），强化减弱 4 例，肠壁强化增加 5 例；肠系膜渗出 17 例（43%）。肠道管壁连续性中断、对比剂外溢、肠道腔外气体病例均行手术治疗。**结论** MSCT 增强扫描及三维重建技术可以直观、多方位的显示肠及肠系膜损伤的部位及范围，为临床精准治疗提供丰富的诊断信息。

PU-0566
胃肠道间质瘤肝转移的 CT 表现和病灶分布规律

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目的 探讨胃肠道间质瘤肝转移的 CT 表现及原发灶静脉回流对肝转移灶在肝内分布的影响。**方法** 回顾性分析中山大学附属第六医院经病理证实的 32 例无其他恶性肿瘤史的胃肠道间质瘤肝转移患者的临床资料及 CT 动态增强图像，以 GIST 原发灶经肠系膜上静脉（SMV）汇入门静脉与否分为 SMV 组及非 SMV 组；以肝转移瘤的分布分为左叶组、右叶组及全肝组。采用 SPSS 24.0 软件进行统计学分析，计数资料用百分比（%）表示。不同组间构成比的比较采用 Fisher 精确检验，以 $P<0.05$ 为差异有统计学意义。 **结果** 在 32 例患者中，CT 动态增强检出肝内转移灶共 294 个，肝左、右叶分别为 55 个（18.7%）、239 个（81.3%）；单发 5 例（15.6%）、多发 27 例（84.8%）；均呈类圆形或圆形结节、肿块，表现为环状强化 251 个（85.4%）、结节状强化 6 个（2%）和其他不典型强化 37 个（12.6%）。环状及结节状强化灶动脉期以边缘轻中度环状及结节状强化为主，门脉及延迟期强化逐渐减退，典型“牛眼征”34 个（11.6%）；不典型强化灶中伴出血坏死灶占 45.9%（17/37），直径平均 82mm。病灶内伴供血动脉穿行 42 个，不典型强化灶多见（25/37，67.6%），环状强化灶偶见（16/252，6.3%）。SMV 组共 23 例（71.9%），非 SMV 组共 9 例（28.1%），两组转移灶在肝内分布差异无统计学意义（P＞0.05）。**结论** 胃肠道间质瘤肝转移病灶常多发， CT 动态增强动脉期边缘轻中度强化，以环形强化为主，少见结节状及不典型强化，呈“快进慢出”。环形强化灶可表现为典型“牛眼征”，偶见供血动脉穿行。不典型强化灶常伴有多条供血动脉穿行，较大时易发生出血坏死。原发灶的静脉回流与转移瘤在肝内分布无明显相关性。因此，上述胃肠道间质瘤肝转移灶的血供特点，有助于提高胃肠道间质瘤肝转移瘤的检出率和诊断符合率，减少误诊率。

PU-0567
能谱 CT 诊断肌少症对于晚期胃癌病人预后的预测研究

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目的 肌少症（sarcopenia），定义为骨骼肌质量及功能的减低。常继发与各种实体肿瘤，与肿瘤预后相关。这项研究的目的是确定的晚期胃癌(AGC)患者继发肌少症对预后的影响。
材料与**方法** 纳入 100 名胃癌晚期的患者，用能谱 CT 测量 L3 椎体水平的肌肉横截面积及肌肉内脂肪含量，采用握力试验评定肌肉强度和物理性能，体重指数综合诊断肌少症。我们比较了胃癌晚期病人继发肌少症和无继发肌少症两组病人之间的总体生存率(OS)和临床生存率。
结果 中位年龄为 67 岁，其中 95%患者有转移性疾病。47.9%的患者存在肌少症，且与男性(p < 0.05) 和低体重指数(p = 0.002)显著相关。在多变量分析中，肌少症是一个独立的预后不良因子(p = 0.029)。
结论 骨骼肌减少症可用于预测 AGC 的不良预后。

PU-0568
CT 小肠成像评分对克罗恩病临床活动度的评估价值

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目的 探讨 CT 小肠成像影像学评分对克罗恩病（crohn's disease，CD）疾病活动性的判断价值。方法 收集做过 CTE 检查，经临床确诊为 CD 且具有经典克罗恩病活动指数（Crohn's disease activity index，CDAI）评分的 CD 患者 72 例，缓解组 14 例，活动组 58 例（轻度活动期 34 例，中度活动期 24 例）。记录两组患者 CTE 征象，找出对疾病活动性有统计学意义的 CTE 征象。对有意义的 CTE 征象赋值，计算综合 CTE 评分。用 Pearson 法检验此 CTE 影像学评分与经典 CDAI 评分的相关性。采用 ROC 曲线法分析 CTE 评分对于 CD 缓解组与活动组判断的诊断准确性及具体的诊断阈值。进一步用 ROC 分析分别计算轻度活动与中度活动组之间、缓解与轻度活动组之间、缓解与中度活动组之间的诊断准确性及诊断最佳阈值。结果 活动及缓解组患者中差异有意义的 CTE 征象为肠壁增厚、梳状征、肠壁分层活动性强化、肠系膜脂肪密度浑浊。CTE 评分与经典 CDAI 评分高度相关，r=0.813，p=0.000。活动及缓解组 ROC 曲线下面积为 0.926（P<0.001），诊断最佳阈值为 5.5 分，敏感度和特异度分别为 82.8%、85.7%；轻度-中度活动组 ROC 曲线下面积为 0.866，（P<0.001），最佳阈值为 6.5 分，敏感度和特异度分别为 95.8%、73.5%。缓解-轻度活动组、缓解-中度活动组其 ROC 曲线下面积（AUC）分别为 0.876（P<0.001）和 0.997（P<0.001），对应的灵敏度分别为 70.6%和 95.8%，特异度分别为 85.7%和 100%，最佳诊断阈值分别为 5.5 分和 6.5 分。结论 综合 CTE 评分判断 CD 处于活动度的灵敏度和特异度较高；对于活动期患者进一步区分轻度或者中度活动性亦有较高的灵敏度和特异度；对于 CD 缓解期和轻度活动期的判断也有很高的灵敏度和特异度。

PU-0569
MRI 在肛瘘分型及内口定位中的应用价值

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【目的】：探讨 MRI 检查在肛瘘分型与内口定位中的临床应用价值。
【材料与方法】：对 210 例经临床确诊的肛瘘患者采用 1.5 TMRI 检查，并由 2 名高年资放射科医生阅片，明确瘘管走向，内口位置，有无支管，有无脓肿、主要瘘管与肛门括约肌之间的关系，并与手术探查结果对照。结果根据 Parks 分型法分型，并采用截石位时钟法描述内口分布情况，MRI 内口显示位置与术中所见位于同一象限内认为显示正确。
【结果】：(1) 210 例肛瘘患者的肛瘘主支 Parks 分型与手术探查分型符合情况：单纯性肛瘘 161 例，复杂性肛瘘 49 例，经手术探查结果符合率均为 100%。MRI 诊断及术后诊断 Parks 分型结果分别为：括约肌间型 145 例/143 例；经肛管括约肌型 44 例/46 例；括约肌上型 13 例/14 例，括约肌外型 8 例/7 例；结果符合率分别为 98.62%、95.65%、92.86%和 87.50%。(2)内口定位与手术探查结果符合情况：MRI 诊断内口 265 个，术后诊断内口 288 个，诊断符合率 92.01%。(3) MRI 诊断肛瘘主、支管分别为 265 支、27 支，术后诊断肛瘘主、支管分别为 267 支、32 支，诊断符合率高于 84%。(4) MRI 诊断肛周脓肿 62 例，术后诊断肛周脓肿 62，诊断符合率为 100%。
【结论】：MRI 检查能准确地对肛瘘进行分型并明确内口位置，为临床治疗提供可靠影像学依据。

PU-0570
18F-FDG PET/CT 相关代谢参数与直肠癌血行转移的关系

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目的 探讨直肠癌原发灶 ^{18}F-FDG PET/CT 代谢参数与血行转移的关系。**方法** 回顾性分析 2016 年 1 月值 2019 年 6 月间云南省肿瘤医院的直肠癌患者 63 例（男 35 例、女 28 例，年龄 30～81 岁），所有患者均于术前行 ^{18}F-FDG PET/CT 检查，检查前未行任何治疗，且均有术后病理结果。应用 PET VCRA 软件以最大标准摄取值（SUVmax）的 40%为阈值自动勾画感兴趣区（ROI），软件自动测量直肠癌原发灶 SUVmax 和 MTV。采用独立样本 t 检验和受试者工作特征（ROC）曲线分析处理数据。**结果** 直肠癌发生血行转移组与无血行转移组原发灶 MTV 差异有统计学意义（$P<0.05$），两组原发灶 SUVmax 差异无统计学意义（$P>0.05$）。MTV 预测直肠癌血行转移的受试者工作特征曲线下面积为 0.631，敏感度为 45.2%，特异度为 90.6%。**结论** 直肠癌原发灶 MTV 对预测血行转移有一定的价值。

PU-0571
多层螺旋 CT 对胃癌 TN 分期的诊断应用

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目的 评价 128 层螺旋 CT（128 slice spiral CT）结合多平面重建（MPR）平扫及动态增强扫描在胃癌 TN 分期中的应用价值。**方法** 将接受胃癌根治性手术的各期胃癌患者 81 例，术前进行 MSCT 平扫及多期增强扫描，利用 CT 轴位图像和 MPR 重建图像对胃癌患者进行 TN 分期，将 CT 判断胃癌浸润程度（T 分期）及淋巴结转移情况（N 分期）与术后病理结果对照，评估 128 层螺旋 CT 对肿瘤对胃壁的浸润程度（T 分期）及淋巴结转移情况（N 分期）的准确性及其临床价值。**结果** 1.128 层螺旋 CT 诊断结果与病理结果对照，CT 对胃癌胃壁浸润深度（T 分期）准确性为 80.2%，其中各期准确性分别为 T1 期 55.6%、T2 期 77.8%、T3 期 81.5%、T4 期 88.9%。T1 期、T2 期胃癌 CT

诊断结果与病理结果具有中度一致性；T2 期、T3 期胃癌 CT 诊断结果与病理结果具有高度一致性；T3 期、T4 期胃癌 CT 诊断结果与病理结果具有极高度一致性。**2.**将胃周淋巴结短径≥5㎜作为转移的阈值，对诊断的敏感性为 85.9%，特异性为 31.7%；准确性为 56.3%；CT 诊断结果与病理结果一致性较低；将胃周淋巴结短径≥10㎜作为转移的阈值，诊断的敏感性为 47.7%；特异性为 55.4%；准确性为 51.9%，CT 诊断结果与病理结果无一致性；将胃周淋巴结短径≥5㎜及增强扫描各期 CT 值改变作为淋巴结转移的阳性指标，评估的敏感性为 94.5%；特异性为 70.4%；准确性为 79.0%，CT 诊断结果与病理结果具有高度一致性。**结论** **1.**128 层螺旋 CT 轴位结合 MPR 重建能对胃癌术前 TN 分期做出较准确的评估。CT 显示的胃壁不同分层结构进行分类，制定个体的影像诊断标准,可以提高胃癌 T 分期的 CT 诊断准确率；**2.** CT 图像显示胃周淋巴结短径≥5㎜伴增强扫描各期相密度改变作为转移淋巴结诊断标准,可明显提高检出转移淋巴结的敏感性、特异性及准确性。

PU-0572
改良保留灌肠法在结直肠癌患者螺旋增强 CT 检查前的疗效观察

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探讨结直肠癌患者全腹部增强 CT 前保留灌肠的有效方法，改善灌肠效果，使 CT 检查时充分显示结直肠肠腔，提高结
直肠癌的 CT 诊断及临床分期的准确性。
方法:选取本科室 2019 年 4 月至 2019 年 5 月需保留灌肠的患者 20 例，随机分为观察组和对照组各 10 例，其中男 10 例，女 10 例，年龄 49-88 岁，平均年龄 68 岁，两组患者在性别、年龄、病程、病变部位等方面比较无统计学意义（*P*>0.05），具有可比性。

PU-0573
西门子 64 排炫速双源螺旋 CT 增强扫描在胃癌诊断中的应用

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胃癌是最常见的恶性肿瘤之一，以往胃癌的诊断主要依靠上消化道造影和胃镜检查，但这两种诊断手段都在判断肿瘤的分期、制定治疗方案方面存在缺陷。64 排双源螺旋 CT 三期增强扫描对于胃癌的分期具有很大的优越性，是胃癌术前分期首选的、可靠的方法。多层螺旋 CT 为容积扫描，它不仅能检查出胃癌，且能判断胃癌浸润的范围及深度，发现腔外肿瘤播散，淋巴结及远处转移。并能依靠扫描后的数据进行薄层重建及多平面显示或三维重建
胃壁软组织病变局部呈肿块样，可向腔内或腔外生长，多呈分叶状，导致胃腔狭窄或胃周侵犯，肿块内部常出现坏死，增强后门静脉期和平衡期肿瘤实质强化多不均匀。肿瘤向外侵及，胃周脂肪层模糊、消失或其内见到索条状软组织密度灶，提示肿瘤已突破胃壁，胃肿块与脏器间的脂肪间隙消失，提示肿瘤侵犯周围脏器。
淋巴结转移 淋巴结大小是判断淋巴结转移的主要依据。以淋巴结直径 10㎜为阈值，一般认为大于 15㎜可认为淋巴结转移。转移性淋巴结于增强后高于非转移性淋巴结。

多层螺旋 CT 三期增强扫描在胃癌诊断方面较其它影像检查具有一定的优越性，对发现胃癌、确定有无转移及术前准确分期起着非常重要作用，多层螺旋 CT 必将成为胃癌检查中不可缺少的手段之一。

PU-0574
弥散加权成像联合外周循环肿瘤细胞对食管鳞癌病理分级的预测价值

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目的探讨弥散加权成像（diffusion-weighted imaging，DWI）及外周循环肿瘤细胞（circulating tumor cells，CTCs）总数及各亚型数目与食管鳞癌病理分级之间的的相关性。**方法**回顾性收集经活检证实为食管癌的患者，根据 2017 版美国国立综合癌症网络（NCCN）食管癌诊疗指南选择治疗方案及手术与否；入组术后病理诊断为鳞癌的 68 例患者，所有患者术前均行食管 MRI 扫描及 CTCs 检测，测量得到表观弥散系数（apparent diffusion coefficient，ADC）值及 CTCs 总数及各亚型数目。手术后病理标本分析得到肿瘤的病理分级（高、中、低分化）、局部浸润深度（T 分期）、淋巴结转移情况（N 分期）。统计分析得到组间差异有统计学意义的有效参数。采用受试者工作特征(receiver operating characteristics,ROC）曲线、二元 logistic 回归分析及 Z 检验比较有效参数对低分化食管鳞癌诊断效能。**结果**食管鳞癌高分化 5 例、中分化 43 例、低分化 20 例。ADC 值及 CTCs 各亚型数目与病理 T 分期、N 分期间差异无统计学意义。不同病理分级间 ADC 值、间质型 CTCs、CTCs 总数间差异具有统计学意义(P均＜0.05）。ADC 值、间质型 CTCs 诊断低分化食管鳞癌的 ROC 曲线下面积分别为（0.870,0.690，P均＜0.05），其中 ADC 值诊断效能优于间质型 CTCs（P＜0.05），ROC 曲线可知 CTCs 总数诊断低分化食管鳞癌效能差（P＞0.05）。ADC 值联合间质型 CTCs 诊断低分化食管鳞癌的 ROC 曲线下面积分别为(0.873，P＜0.001）。**结论** ADC 值及间质型 CTCs 与食管鳞癌病理分级有一定的相关性，两者均可以在一定程度反映食管鳞癌病理分化程度，两者结合预测低分化食管鳞癌价值更高

PU-0575
结直肠多原发癌的临床病理特征和 CT 征象分析

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目的 探讨结直肠多原发癌的临床病理特征及 CT 表现，以提高影像医生对本病的认识。方法和资料回顾性分析 62 例结直肠多原发癌患者的临床资料及结直肠癌病灶的 CT 征象。根据就诊或影像检查发现癌灶的时间先后顺序、发病部位及发病时间间隔分为先发癌和伴发癌、肠内多原发癌和肠内-外多原发癌、同时性癌和异时性癌。再随机抽取同期本院收治的 219 例单发结直肠腺癌作为对照组。然后，分别比较各组病灶 CT 征象的差异。结果 62 例符合研究标准的结直肠多原发癌中共有结直肠癌病灶 90 个。结直肠同时性双原发癌中，先发癌与伴发癌在 T 分期、肿瘤肠壁长度及厚度的差异有统计学意义（P<0.05），在发病部位、分化程度、肠壁增厚形式、强化程度的差异无统计学意义（P>0.05）。肠内多原发癌病灶和肠内-外多原发癌肠内病灶在肿瘤肠壁长度、强化程度及分化程度的差异有统计学意义（P<0.05），在发病部位、T 分期、肠壁增厚形式及肿瘤肠壁厚度的差异无统计学意义（P>0.05）。同时性癌与异时性癌中结直肠癌病灶的 CT 征象的差异均无统计学

意义。结直肠多原发癌与结直肠单发癌在是否合并息肉、肠壁增厚形式、肿瘤肠壁厚度及强化程度的差异有统计学意义（P<0.05），在性别、年龄、合并肠梗阻、发病部位、肠周浸润、淋巴结肿大、肿瘤肠壁长度的差异无统计学意义（P>0.05）。结论 结直肠同时性双原发癌中伴发癌病灶的长度、厚度及 T 分期均小于先发癌病灶。肠内-外多原发癌肠内病灶较肠内多原发病灶分化程度更低、强化更明显、肿瘤浸润肠壁长度更广。

PU-0576

成人中肠旋转不良的 CT 分型诊断与临床分析

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目的 探讨成人中肠旋转不良的 CT 分型与临床意义，提高对该病的认识。 **方法** 对中山大学附属第一医院放射科 2018 年 3 月～8 月行全腹部 CT 平扫加增强检查的成人病例进行连续性筛检。按设定的纳入与排除标准，由两位高年资的放射科医师共同阅片，判定是否存在中肠旋转不良并分型。 **结果** 共筛查全腹部 CT 平扫加增强检查的成人病例共 8778 例，排除 902 例，最终以 7876 例为基数共检出符合诊断标准的中肠旋转不良 80 例（1.0%），男 46 例，女 34 例，年龄 22～86 岁。80 例中经典型 7 例（8.8%），CT 表现为十二指肠空肠结合部（DJJ）位于胃幽门水平线以下、正中线右侧，大多数合并回盲部异位（6/7，85.7%）；可有肠系膜上动脉（SMA）与肠系膜上静脉（SMV）换位（3/7，42.9%）；1 例为多脾综合征。非典型 73 例（91.2%）， CT 表现为 DJJ 位于胃幽门水平线以下、正中线左侧，且空肠位于右腹；少部分出现回盲部异位（15/73，20.5%）、SMA 与 SMV 换位（1/73，1.4%）；10 例出现相关消化道症状（10/22，45.5%），3 例右腹部小肠肿瘤因判断出中肠旋转不良而准确定位为空肠肿瘤。CT 冠状位重建图像可清晰显示空肠和回盲部的位置；横轴位增强图像有利于观察 SMA 与 SMV 位置关系。 **结论** CT 可准确诊断成人中肠旋转不良并分型，并应认识其临床意义。

PU-0577

Can CT Texture Analysis Predict the World Health Organization Grade of Rectal Neuroendocrine Tumors?

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Objectives To investigate the diagnostic value of computed tomography texture analysis (CTTA) in predicting the world health organization (WHO) grade of rectal neuroendocrine tumors (R-NETs).

Methods and Materials A total of 50 (28 G1, 9 G2 and 13 G3) patients who underwent preoperative contrast-enhanced CT and treated with surgery to be confirmed as R-NETs were included in this study from January 2014 and May 2019. We accurately depicted the region of interest (ROI) and measured the CT texture parameters (mean, median, 5th, 10th, 25th, 75th, 90th percentiles, skewness, kurtosis and entropy) from arterial phase image by two radiologists. We calculated and compared these parameters between low grade (G1) and higher grades (G2/G3) by applying appropriate statistical method.

We obtained the optimal parameters to identify G1 and G2/G3 by using receiver operating characteristic (ROC) curves.
Results The CTTA showed a good predictive performance between G1 and G2/G3 with different texture parameters on arterial phase imaging. Mean, median, 5th, 10th, 25th, 75th and 90th percentiles demonstrated significant differences between G1 and G2/G3 (P=0.000, 0.000, 0.003, 0.001,0.001, 0.001, 0.004), however, there were no significant differences for skewness, kurtosis and entropy (P=0.805, 0.602, 0.290). Median generated the highest the area under the curve (AUC=0.819) in the ROC analysis and followed by mean (AUC=0.811).
Conclusions CT texture features, especially median and mean, can be used as an excellent method to predict the grade (G1 and G2/G3) of rectal neuroendocrine tumors.

PU-0578

肠系膜上动脉夹层病变区域相关参数的 CTA 定量分析

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目的 探讨正常人群与肠系膜上动脉夹层相关 CTA 数据的差异，为肠系膜上动脉夹层发生及治疗提供依据。**方法** 回顾性分析经 CTA 确诊为肠系膜上动脉夹层 64 例（病变组），包括自发性孤立性肠系膜上动脉夹层（SISMAD）组 42 例（男 38 例，女 4 例，年龄 40-86 岁）、主动脉合并肠系膜上动脉夹层（CASMAD)组 22 例（男 17 例，女 5 例，年龄 40-76 岁），与正常组（男性 54 例，女性 10 例，年龄 40-77 岁）进行对照。在 MPR 矢状位上测量腹主动脉-肠系膜上动脉（AA-SMA）夹角、病变处最大肠系膜上动脉（SMA）直径（D1）及肠系膜上动脉（SMA）到腹腔干（CA）距离（D2），SMA 壁 1cm 内周围脂肪密度（平均 CT 值）并观察 SMA 及 AA 管壁有无钙化。**结果** （1）病变组 AA-SMA 夹角及 D1、D2 分别为 68.48±19.66°、1.28±0.25cm、0.77±0.40m，正常组分别为 59.83±19.74°、0.77±0.12 cm、0.57±0.30cm，两组经 t 检验差异有统计学意义(P<0.05），说明病变组数值均大于正常组，但 SMA 周围脂肪密度差异无统计学意义（P>0.05）。AA-SMA 夹角及 D1、D2 ROC 曲线下面积（AUC）分别为 0.618、0.995、0.665，临界值分别为 53.5°、0.95cm、0.61cm，灵敏度分别为 78.1%、100%、68.8%，特异度分别为 45.3%、95.3%、60.9%。而 SISMAD 与 CASMAD 两组 AA-SMA 夹角、D1、D2 均无统计学差异（P>0.05）。（2）SMA 及 AA 管壁钙化病变组（14 例/43 例）与正常组（5 例/26 例），经卡方检验差异有统计学意义（P<0.05），病变组钙化多于正常组。SISMAD 组与 CASMAD 组管壁钙化无统计学差异。**结论** 正常肠系膜上动脉与肠系膜上动脉夹层的血管相关测量值及管壁钙化有差异。

PU-0579

A diagnostic nomogram for predicting lymph node metastasis in rectal cancer: what role does the chemical shift effect play?

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PurposeTo establish an effective diagnosticnomogram for predicting lymph node metastasisin rectal cancer (RC) patients by using the chemical shift effect(CSE) before surgery.
Materials and Methods A total of 324 lymph nodes from 32 RC patients were enrolled in this retrospectively study between March 2015 and May 2016 (217 in the primary cohort and 107 in the validationcohort). All patients underwent baseline MRI and radical surgery, and all lymph nodes were harvested from transverse whole-mount specimens. Experienced radiologist evaluated baseline MRI for CSE status of lymph node in addition to nodal location,border, internal structure (IS),signal intensity (SI),size, and the minimum distance to rectal wall (MinDR). A diagnostic nomogram for predicting lymph node status were developed with significant variables selected by the stepwise logistic regression. The discrimination and calibration ability of the nomogram were determined by concordance index (C-index) and calibration curve, decision-curve analysis was applied to assess the clinical usefulness.
Results On multivariate analysis of the primary cohort, independent factors for lymph node metastasis were CSE, the maximum long-axis diameter of lymph node, and nodal location, which were all selected into the nomogram. The nomogram showed good discrimination performance in the primary cohort, with a C-index of 0.934 ((95% CI, 0.892 to 0.976)). In the validation cohort, the nomogram also showed good discrimination, with a C-index of 0.838 ((95% CI, 0.678 to 0.997)), and good calibration. Decision-curve analysis demonstrated the clinical utility of the diagnostic nomogram for lymph node metastasis.
ConclusionThe study proposed a nomogram, which including CSE, the maximum long-axis diameter, and nodal location, resulted in more accurate diagnostic performance for lymph node metastasis in RC patients. And CSE play an important role in the nomogram.

PU-0580

原发性小肠淋巴瘤多层螺旋 CT 表现

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目的 探讨原发性小肠淋巴瘤的多层螺旋 CT(MSCT)的表现特征及其诊断价值。**方法** 回顾性分析 2010 年 1 月至 2017 年 12 月本院 47 例经手术、病理证实并符合 Dawson 标准的原发小肠淋巴瘤患者的 MSCT 资料。**结果** 47 例小肠原发淋巴瘤病例中，17 例位于回肠(包括回盲部)，10 例位于空肠，20 例同时发生于空、回肠。根据小肠原发淋巴瘤患者的 CT 表现，可分为 5 型：肠壁增厚型(14 例)、肠腔动脉瘤样扩张型(13 例)、息肉肿块型(9 例)、混合型(11 例)；伴腹腔或腹膜后淋巴结肿大 15 例。MSCT 表现为病变肠管肠壁环形不规则增厚，肠管仍保持一定的扩张度和柔软度，病灶轻一中度均匀强化。**结论** 小肠原发淋巴瘤的 MSCT 表现具有一定的特征性，MSCT 通过 MPR 图像重建等更能直观显示病变特征，有助于手术前治疗方案的制定。

PU-0581

Castleman 病 MSCT 及 MR 表现

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目的 探讨 Castleman 病的多层螺旋 CT(MSCT)及 MRI 影像学表现及其诊断价值。方法 回顾性分析 2010 年 1 月至 2017 年 12 月本院 31 例经手术后病理证实 Castleman 病的 CT 及 MRI 征象及病理资料。结果 病变部位：颈部 13 例，腹膜后 11 例，颈部、胸部、两侧腋窝、腹膜后及盆腔同时发生 7 例。临床分型：局限型 14 例，弥漫型 13 例，病理分型透明血管型 17 例，浆细胞型 7 例，混合型 3 例。MSCT 或 MRI 表现：透明血管型 CT 平扫 7 例伴有点状钙化，增强扫描均呈明显持续性强化，强化方式与大血管相似；MRIT1WI 呈等信号，T2WI 呈高信号，信号均匀，边界清晰；增强扫描呈明显强化。浆细胞型 CT 平扫表现为密度均匀，增强扫描呈轻度～中度强化。术前 CT、MRI 明确诊断 14 例(45%)，误诊 3 例(10%)。结论 Castleman 病的 MSCT、MRI 表现与临床类型、病理分型密切相关，尤其是透明血管型 Castleman 病表现具有一定特征，术前影像学检查，尤其是 MRI 检查，对 Castleman 病诊治具有重要价值，而浆细胞型缺乏特征性，确诊需要结合病理学检查。

PU-0582

MRI 对 SIB-IMRT 技术在直肠癌新辅助放化疗的疗效评估及预测疗效的价值

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目 的：通过高分辨 MR 体积、磁共振弥散加权成像和动态增强磁共振成像对比同步加量调强放疗（SIB-IMRT）和常规调强放疗（R-IMRT）技术应用于局部进展期直肠癌术前同步放化疗中的疗效，评价 SIB-IMRT 在局部进展期直肠癌患者术前同步放化疗中的可行性，并预测病理完全缓解的价值。

材料和**方法** 本研究共纳入 67 名患者，随机分为 SIB-IMRT 实验组 39 人和 R-IMRT 对照组 28 人，所有患者在 CRT 前、后均行 MR 检查，后均进行全直肠系膜切除术（TME）。经后处理得到参数体积、ADC 值、K^{trans} 值，同时计算治疗前后的变化率 ΔVolume%、ΔADC%、ΔK^{trans}%。术后病理 TRG 评分，改评分采用 Mandard 标准，分别将实验组和对照组分为 pCR 组和 non-pCR 组，运用 ROC 比较其预测疗效价值。

结 果：1.新辅助治疗后实验组体积缩小、K^{trans} 值降低较对照组明显。2.实验组放疗后 pCR 组的体积缩小程度高于 non-pCR 组，具有统计学意义；同为 pCR 组，SIB-IMRT 组治疗后肿瘤 ADC 值升高、肿瘤的体积缩小程度优于 R-IMRT 组；同为 non-pCR 组，SIB-IMRT 组放疗后肿瘤体积缩小及 Ktrans 值的降低优于 R-IMRT 组。3.ROC 诊断实验分别评估实验组与对照组 CRT 前后 ΔVolume%、ΔADC%、ΔK^{trans}%的诊断效能。其中，实验组的体积变化率（ΔVolume%）诊断效能较高，AUC 为 0.734，ADC 变化率 AUC 为 0.698。

结 论：1.SIB-IMRT 技术应用于局部进展期的直肠癌的术前同步放化疗效果在肿瘤体积缩小、体积缩小率、ADC 值的升高、Ktrans 值降低方面优于 R-IMRT。2.肿瘤体积缩小率（ΔVolume%）、ADC 增高率（ΔADC%）有助于预测局部进展期直肠癌新辅助放化疗后的 pCR。

PU-0583

CT 浆膜高强化征鉴别诊断 T3 期与 T4a 期胃癌

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目的 分析浆膜高强化征鉴别胃癌 T3 期与 T4a 期的价值，探索腹部 CT 增强三期扫描观察浆膜高强化征的差异。**方法** 回顾性分析 104 例经手术病理证实的胃癌 T3 期或 T4a 期患者术前腹部三期增强扫描 CT 图像，由两位高年资腹部专业组医师双盲观察每位患者的三期增强 CT 图像是否出现

浆膜高强化征，计算浆膜高强化征诊断 T4a 期的准确率、敏感度、特异度、阳性预测值、阴性预测值。对三期 CT 图像出现浆膜高强化征进行卡方检验，判断各期出现浆膜高强化征是否存在差异。**结果** 共纳入 104 例经手术病理证实的胃癌病例，其中 T3 期 34 例，T4a 期 70 例。浆膜高强化征判断 T4a 期（即浆膜浸润）的准确率、敏感度、特异度、阳性预测值、阴性预测值分别为 77.88%、81.43%、70.59%、85.07%、64.86%。T4a 期胃癌病例动脉期、静脉期及实质期浆膜高强化征出现率分别为 32.86%、75.71%、62.86%，三组数据进行两两比较，动脉期与静脉期、动脉期与实质期之间差异有统计学意义，静脉期与实质期之间差异无统计学意义（P<0.01）。**结论** 浆膜高强化征诊断胃癌 T4a 期有较高的准确率、敏感度及特异度，可用于判断胃癌浆膜受侵。浆膜高强化征在静脉期及实质期较容易观察，推荐在静脉期或实质期观察该征象。

PU-0584
继发于 Meckel 憩室异位胰腺的急性肠扭转性肠梗阻一例罕见病例报道及扭转性肠梗阻原因分析

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摘要：
Abstract:
异位胰腺是胃肠道（GI）中罕见的粘膜下肿瘤，Meckel 憩室与异位胰腺常无任何临床症状，但当它出现炎症、出血、梗阻或恶变继发性病变时可出现异常的临床症状，常尸检或偶然发现。小肠 Meckel 憩室异位胰腺引起的肠扭转性肠梗阻罕见且是偶然发现。我们在此报告一例继发于 Meckel 憩室异位胰腺的急性肠扭转性肠梗阻一例并分析其引起肠扭转性肠梗阻的原因，患者行“小肠扭转复位术+小肠憩室切除术”成功治愈。
结论
Conclusion:
综上所述，Meckel 憩室异位胰腺是罕见病症，异位胰腺跨越黏膜下层及固有肌层更是罕见，再加上引起的小肠扭转性肠梗阻是非常罕见。术前诊断几乎是不可能的，并且在一些文献报道的病例中，手术是最佳的选择[10]，尤其是怀疑恶性肿瘤时。因此为缓解症状进行剖腹手术并进行病理检查。

PU-0585
结直肠神经鞘瘤和间质瘤的 MSCT 影像学特征分析

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目的 探讨有助于结直肠神经鞘瘤和间质瘤鉴别诊断的 MSCT 影像学特征。
方法 收集 2007 年 1 月~2017 年 4 月笔者所在医院经病理确诊的 16 例结直肠神经鞘瘤和 25 例结直肠间质瘤患者 MSCT 影像资料,采用卡方检验或 t 检验分析二者影像学特征,ROC 曲线分析阳性指标用于鉴别的效能。
结果 相对结直肠间质瘤而言,结直肠神经鞘瘤 MSCT 影像学特征表现为:直径小(2.5±1.3,t=3.850,P<0.001),结肠来源(75%vs 16%,Χ2=14.272,P<0.001),圆形(68.8%vs 36%,Χ~2=4.188,P=0.041),边缘光滑(68.8%vs 32%,Χ~2=5.299,P=0.021),均质(93.8%vs 48%,Χ~2=9.081,P=0.003),较少发生囊变(12.5%vs 60%,Χ~2=9.069,P=0.003)、坏死(6.25%vs

44%,Χ~2=6.716,P=0.010),轻中度强化(87.5%vs 52%,Χ~2=5.468,P=0.019),区域淋巴结肿大(31.3%vs 0,Χ~2=8.898,P=0.003)。两者在性别、年龄、肿瘤生长方式、有无钙化、表面溃疡、远处转移方面,差异无统计学意义(P>0.05)。ROC 曲线分析发现 CT 测量的肿瘤最大径 4.4cm 为最佳界值,鉴别结直肠神经鞘瘤和间质瘤的敏感性和特异性分别为 88.0%(22/25)和 87.5%(14/16),曲线下面积(AUC)=0.915。

结论 结直肠神经鞘瘤 MSCT 特征表现为结肠来源体积较小的肿瘤,边缘光滑,均质,较少发生囊变和坏死,可伴区域淋巴结肿大。

PU-0586

Assessment of lymphovascular space invasion in endometrial cancer with preoperative histogram analysis of quantitative pharmacokinetic parameters on DCE-MRI

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Objective: To evaluate whether the dynamic contrast-enhanced MRI (DCE-MRI) quantitative pharmacokinetic parameters derived from histogram analysis could assess the lymphovascular space invasion (LVSI). **Methods:** Fifty-six patients with pathological confirmed endometrial cancer were prospectively evaluated using DCE-MRI. Histogram parameters including mean; skewness; kurtosis; uniformity; energy; entropy; and percentiles (5th, 10th, 25th, 50th, 75th, 90th) were derived from the pharmacokinetic parameters (K^{trans}, K_{ep}, and Ve). Histogram parameters were compared between endometrial cancer with and without LVSI. For significant parameters, receiver operating characteristic (ROC) curves were further plotted to compare the diagnosis performance for identifying LVSI. **Results**: The mean and percentiles (5th, 10th, 25th, 50th, 75th, 90th) of K^{trans}, the mean and percentiles (10th, 50th, 75th, 90th) of K_{ep}, the mean, percentiles (5th, 10th, 25th, 50th, 75th, 90th) and kurtosis of Ve between endometrial cancer with and without LVSI were statistically significant (all $P<0.05$). The areas under the ROC curves (AUCs) were 0.69-0.87 for pharmacokinetic parameters. The largest AUC of pharmacokinetic parameter (10th percentile of Ve) showed significantly higher accuracy than others. With a cut-off of 0.76, the 10th percentile of Ve provided a sensitivity of 81.2% and a specificity of 87.4% in the prediction of LVSI. **Conclusion**: Histogram analysis of DCE-MRI can be useful for predicting tumor cell proliferation and LVSI.

PU-0587

结直肠同时性双原发癌的 MSCT 诊断价值

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【摘要】

目的 探究 MSCT 检查在结直肠同时性双原发癌中的诊断价值，以提高认识。
方法 回顾性分析 2012 年 10 月 1 日到 2019 年 6 月 1 日因结直肠癌就诊的所有连续性病例 620 例，收集经病理证实的具有完整临床及影像资料的结直肠同时性双原发癌患者，记录患者的一般资料、肿瘤标志物、病理、部位及影像表现。
结果 结直肠同时性双原发癌患者 15 例，男性 14 例，女性 1 例，9 例患者长期饮酒史，12 例患者长期吸烟史，7 例患者肿瘤标志物升高，以癌胚抗原升高为主。术后证实均表现为双原发癌，右半结肠-左半结肠组 4 例，右半结肠-直乙状结肠组 4 例，左半结肠-直乙状结肠组 2 例，直-乙状结肠组 5 例，病理均表现为腺癌，其中 3 例粘液腺癌（2 例溃疡型，1 例隆起型），11 例溃疡型腺癌，8 例隆起型腺癌，3 例绒毛状腺瘤恶变，4 例多发性管状-绒毛状腺瘤癌变，1 例粘膜管状腺瘤恶变；术前 MSCT 检查发现双原发癌灶 9 例，漏诊 6 例（40%），分别为升结肠 1 处，横结肠 2 处，结肠脾曲 1 处，降结肠 1 处，直肠 1 处，分析其原因为 MSCT 检查前结直肠未做充分灌肠和扩张肠管准备，不利于癌灶的显示，以及影像诊断时仅满足于一处明显病灶的检出而未进一步查找结直肠其他部位是否同时存在隐匿病灶；结直肠同时性双原发癌的 MSCT 表现为结直肠壁均匀/非均匀性增厚或肿块，癌肿周围脂肪间隙可表现模糊或肠系膜血管增多增粗，增强后癌肿表现为均匀/非均匀性延迟性明显强化。
结论 结直肠同时性双原发癌比较罕见，对于临床怀疑结直肠癌患者，行 MSCT 检查前，需充分肠道准备以及详细观察，以防多原发癌灶的遗漏。

PU-0588
定量 CT 测定上海地区人群体质成分与血压的相关性

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目的 采用定量 CT（QCT）测定腹部体质成分含量，探讨体质成分与血压的相关性，确定预测高血压的切点值。 方法 选取 2018 年 5-12 月行低剂量 CT 肺癌筛查联合 QCT 体质成分测定的体检人群共 1307 例。QCT 测定腰 2 椎体中心层面体质成分包括腹部软组织面积(ASTA)、腹内脂肪面积（VAA）及皮下脂肪面积（SAA）。分别采用 Pearson 相关、多因素线性回归及多因素 Logistic 回归分析体质成分与收缩压、舒张压及高血压的相关性。绘制 ROC 曲线，确定预测高血压的切点值。
结果 ASTA 与收缩压、舒张压呈显著负相关（$P<0.05$），VAA、SAA 与收缩压、舒张压呈显著正相关（$P<0.05$）。多因素回归分析显示在调整年龄、性别、体重指数、腰围因素后，VAA 与收缩压、舒张压及高血压显著关联（$P\leq0.01$），而 ASTA、SAA 与收缩压、舒张压及高血压不关联（$P>0.05$）。ROC 曲线分析显示男性和女性的 VAA 预测高血压的切点值分别为 201.89cm^2、136.01cm^2。 结论 腹内脂肪与高血压关系密切。在高血压健康管理中，应早期筛查腹内脂肪异常增多的人群并加强预防和管理。

PU-0589
双能 CT 多模态参数对胃癌 Lauren 分型的诊断价值

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目的 探索双能 CT（Dual-Enery CT）多模态参数诊断胃癌 Lauren 分型的价值。**方法** 收集有完整双能扫描资料并经手术病理证实的 67 例胃癌患者，通过双能量后处理软件得到碘图并测得病灶

的动静脉期碘浓度、Overlay 值、病灶动脉期及静脉期 CT 值，计算动静脉期 CT 值之差。采用单因素方差分析多重比较进行统计学分析，将有统计学意义的参数绘制受试者工作特征曲线（ROC 曲线），分别评价各指标的诊断效能。**结果** 弥漫型、肠型、混合型胃癌动静脉期碘浓度、动静脉期 Overlay 值及动静脉期 CT 值之差分别为 1.61±0.68（mg/ml）、2.77±0.72（mg/ml）、38.94±18.66（HU）、66.17±18.23（HU）、41.21±13.17（HU），1.06±0.58（mg/ml）、1.53±0.44（mg/ml）、26.16±12.70（HU）、38.91±10.67（HU）、22.74±10.73（HU），1.08±0.41（mg/ml）、1.77±0.45（mg/ml）、26.38±10.31（HU）、43.37±8.03（HU）、28.40±9.58（HU）。其中弥漫型胃癌的各组数据均明显高于肠型及混合型胃癌，两两比较，弥漫型-肠型、弥漫型-混合型各组指标差异均有统计学意义，肠型-混合型各组指标差异均无统计学意义。动脉期碘浓度、动脉期 Overlay 值、静脉期碘浓度、静脉期 Overlay 值及动静脉期 CT 值之差诊断弥漫型胃癌的 AUC 分别为 0.736、0.709、0.944、0.927、0.858，诊断阈值分别为 1.05（mg/ml）、28.75HU、1.95（mg/ml）、36.70HU、30.50HU。**结论** 双能 CT 动静脉期碘浓度、Overlay 值及动静脉期 CT 值之差有助于术前评估胃癌 Lauren 分型，其中静脉期碘浓度及静脉期 Overlay 值诊断效能最佳。

PU-0590
探讨不同病理类型及分化程度胃癌宝石 CT 谱曲线及 CT 值差异

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目的:探讨不同病理类型、不同分化程度胃癌宝石谱曲线及 CT 值的差异。**方法:**收集 91 例胃癌患者术前宝石 CT 影像资料,其中粘液癌 24 例,非黏液癌 67 例,印戒细胞癌 16 例,粘液腺癌 8 例,中度分化腺癌 32 例,35 例低分化腺癌。术前行宝石 CT 光谱成像，利用 GSI Viewer 软件获得静脉期病变的光谱曲线，计算曲线斜率，测量 11 个单能 CT 值，40~140 (10 keV 区间)。比较不同病理类型和分化程度胃癌的宝石谱曲线和 CT 值。**结果:**非黏液性癌、印戒细胞癌和低分化腺癌的曲线斜率分别为-1.92±0.53、-1.73±0.37 和-2.14±0.54。其绝对值分别大于粘液癌(-1.45±0.54)、粘液腺癌(-0.90±0.34)、中分化腺癌(-1.67±0.41)，差异均有统计学意义(P<0.05)。黏液性癌与非黏液性癌在 40~140 keV 时的单能 CT 值有显著差异(P<0.05)。前者不同程度低于后者，能量越低 CT 值差异越大。在 40~100 keV 时，印戒细胞癌与粘液腺癌的单能 CT 值有显著差异(P 均<0.05);低分化腺癌与中分化腺癌在 40~90 keV 时的单能 CT 值差异有统计学意义(P<0.05)。**结论:**不同病理类型和分化程度的胃癌有其特征性静脉期频谱曲线，低能量时 CT 值存在明显显著。利用宝石 CT 的频谱曲线可能有助于术前评估胃癌的病理类型和分化程度。

PU-0591
256 层 CT 三期动态增强扫描及图像三维重建技术对胃癌术前 TN 分期的价值

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目的 分析胃癌 256 层螺旋 CT 平扫及三期动态增强扫描的影像表现，并与术前胃镜检查及术后病理 TN 分期对照，探讨 MSCT 检查在胃癌术前评估中的临床应用价值。**方法** 收集本院普外科 2017 年 1 月至 2019 年 5 月间，均行病理及胃镜检查确诊为胃癌患者 57 例。过动态增强及图像三维重建技术显示病变的位置、形态、大小、浸润深度、胃周侵犯情况及邻近淋巴结,进行术前 TN 分期,并

与术后病理进行对照。**结果** 结合胃镜检查结果可以显著提高早期胃癌的检出率。胃癌增强后病灶明显强化。以术后病理结果为标准，256 层 CT 三期动态增强图像对于胃癌 T1～T4 分期的诊断准确率分别为 51.15%、66.67%、84.62%、66.67%，对于 N0-N2 分期的诊断准确率为 75.0%、70.0%、52.94%。MSCT 对区分 T1 期与 T2 期、T2 期与 T3 期的能力相对较弱。MSCT 对区分 T1 期与 T2 期、T2 期与 T3 期的能力相对较弱。**结论** 256 层 CT 三期动态增强图像结合三维重建技术有助于提高胃癌病灶的发现及肿瘤分期评估，对于胃癌术前 TN 分期具有较高的准确性，有助于外科术前手术方案的制定。

PU-0592

恶性腹膜间皮瘤 MRI 信号特点及病理分析

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目的探讨恶性腹膜间皮瘤(MPM)的 MRI 信号的特征性表现。**方法**回顾性分析本院 6 例经病理证实的 MPM 患者的临床资料，所有病例都进行 MRI 扫描,序列包括 MR 平扫+钆剂对比增强、扩散加权成像(DWI)。分析 MRI 影像征象及信号改变，并与临床病理进行对照分析。**结果** 局限性腹膜间皮瘤(LMPM)2 例，均表现为孤立性包块，病变都位于盆腔，MRI 示 1 例呈囊实性，1 例实性，实性部分 T1WI 呈等或略低信号，T2WI 呈等或略高信号，增强扫描实性成分多呈中度以上强化。弥漫性腹膜间皮瘤(DMPM)4 例，MRI 表现为腹膜不规则增厚、腹膜多发大小不等结节及团块，增厚的腹膜及结节在 T1WI 呈稍低信号或等信号,T2 脂肪抑制序列呈稍高信号为主，增强后多呈明显强化。6 例 MM 病灶在 DWI 上均呈高信号，ADC 信号减低，表现为明显弥散受限。4 例弥漫性 MPM 都伴有淋巴结肿大。 **结论** MPM 在 MRI 信号上有一定的特点，MRI 能在肿瘤诊断、鉴别诊断中有一定的价值。

PU-0593

胃肠间质瘤危险度分级与 CT 影像学表现的关系研究

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目的 通过分析不同危险度胃肠间质瘤（GIST）的 CT 征象，探索 CT 对 GIST 术前危险度分级的临床意义。**方法** 收集 2014 年 1 月 1 日至 2017 年 12 月 31 日间，我院行手术切除的胃肠间质瘤病例 62 例及切除后复发转移的 6 例。根据病理结果将其分为极低危险、低度危险、 中度危险、高度危险四个等级,分析不同危险度与 CT 影像学表现之间的关系。**结果** 极低危险、低度危险、中度危险及高度危险分别为 5 例、20 例、11 例及 26 例。不同危险度的 GIST 在肿瘤最大径、有无液化、发病部位、强化方式方面差异均有统计学意义(P＜0.05)，而在不同危险度中钙化、生长方式、强化程度及各期 CT 值方面无统计学差异(P＞0.05)。**结论** 不同危险度的 GIST CT 征象存在一定差异，肿瘤最大径、液化和强化方式有助于 GIST 术前无创危险度分级，而钙化、生长方式及强化程度对术前 GIST 的危险度分级无明显价值。

PU-0594

Comparison of the values between high resolution MRI and Revolution CT enhanced scan imaging in diagnosing T stages of rectal cancer before surgery

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Objective: To compare the values between high resolution MRI and Revolution CT enhanced scan imaging in diagnosing T stages of rectal cancer before surgery.
Methods: 74 patients of rectal cancer who received therapy in our hospital from January 2017 to December 2017, by pathology confirmed, were collected as observational objects. All patients received examinations of high resolution MRI and Revolution CT enhanced scan imaging. Consistency between pathologic results and high resolution MRI diagnosis and between pathologic results and Revolution CT enhanced scan imaging diagnosis were analyzed respectively and diagnostic accordance rates of T stages of cancer by high resolution MRI and Revolution CT enhanced scan imaging were compared.
Results: Kappa consistency test showed that consistence between pathologic results and high resolution MRI and between pathologic results and Revolution CT enhanced scan imaging were both confirmed excellent (kappa value = 0.888, 0.820). The diagnostic accordance rate of high resolution MRI in diagnosing total T stages of rectal cancer before surgery was 93.2%, which was statistically same with that of Revolution CT enhanced scan imaging (89.2%, P>0.05).
Conclusion: The consistency of high resolution MRI and Revolution CT enhanced scan imaging with pathologic results in diagnosing T stages of rectal cancer are both excellent and both have high diagnostic accordance rates. And suitable examination can be chosen according to patients' specific situations clinically.

PU-0595

Clinical Value of Energy Spectrum Curves of Dual-energy CT in Evaluating Pathological Grading of Gastric Adenocarcinoma

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Abstract
Purpose: To explore the clinical value of energy spectrum curves of dual-source dual-energy CT in the quantitative evaluation of different pathological grades of gastric adenocarcinoma.

Methods: A total of 62 patients with 1 well, 25 moderately and 36 poorly differentiated gastric adenocarcinomas pathologically confirmed by surgery were collected, and they underwent dual-source dual-energy CT plain scanning and enhanced scanning before operation. Dual-Energy software was used to measure the slope of the energy spectrum curves (λ) in arterial and venous phases after image reconstruction. Patients were divided into two groups according to the pathological results, including well and moderately differentiated gastric adenocarcinoma group and poorly differentiated gastric adenocarcinoma group. Data of each group were analyzed by independent sample t-test. The receiver operating characteristic curve was plotted to evaluate the diagnostic efficiency of the corresponding parameters.
Results: There were significant differences in λ values of 40-50keV, 40-60keV, 40-80keV, 40-90keV, 40-100keV, 40-120keV, 40-130keV, 40-140keV and 40-150keV energy ranges in venous phase between the well and moderately differentiated group and poorly differentiated group ($P<0.05$), but no significant differences in λ values of different energy ranges in arterial phase between the two groups ($P>0.05$). And the area under curve in 40-120keV energy range was the largest in venous phase. $K_{40-120keV}=2.69$ was selected as the diagnostic threshold with the maximum Youden index, the sensitivity and specificity were 61.1% and 76%, respectively.
Conclusion: The energy spectrum curve of dual-energy CT had certain diagnostic value in the quantitative evaluation of pathological grading of gastric adenocarcinoma.

PU-0596

胃肠道柿石及其并发症的 CT 表现

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目的 探讨胃肠道柿石及其并发症的 CT 表现，以提高对该病的认识。**方法** 回顾性分析 36 例经胃镜及手术证实的胃肠道柿石患者的 CT 平扫图像。**结果** CT 所示柿石的数量和部位与胃镜和手术结果一致。胃柿石 11 例，小肠柿石 19 例，胃和小肠并发柿石 6 例。32 例单发，4 例多发。共取出 41 枚柿石，其中大部分为卵圆形，边界清楚。31 枚呈高密度包壳伴内部多发小气泡。6 枚呈多发小气泡，无包壳样结构。4 枚呈不均匀高密度。随时间推移 1 枚柿石在消化道内移动并且边界和密度均发生变化。并发症：胃和十二指肠柿石伴发胃潴留，表现为胃腔明显扩张积液积气。小肠柿石均伴有小肠梗阻，表现为柿石近端肠管明显扩张，远端肠管突然塌陷，两者之间是过渡区。**结论** 胃肠道柿石有多种 CT 表现，其中椭圆形、边界清楚、由气体和软组织组成的不均匀包块为常见表现。根据这些 CT 表现可以作出胃肠道柿石及其并发症的明确诊断。

PU-0597

腹膜后 Castleman 病 CT 表现 1 例

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目的 血管滤泡性淋巴结增生又称 Castleman 病，是一种罕见的瘤样病变。该病 70%发生于纵隔，20%发生于颈部、腋部、腹股沟、肩部及外阴部等处浅组淋巴结，极少数病例发生于肠系膜或腹膜

后。本研究报告一例罕见的腹膜后 Castleman 病并复习相关文献，分析其病理及影像学特点，探讨其病因学及鉴别诊断。**方法** 回顾分析了 1 例腹膜后 Castleman 病的 CT 检查和手术病理。一位 36 岁女性患者，门诊体检，检查包括全腹部及盆腔 CT 平扫加增强扫描。应用 CT 扫描显示腹膜后一明显强化病灶，结合病理特殊表现，对其 CT 表现进行评估。**结果** CT 示腹主动脉旁一类圆形肿块，大小约 4.7X5.9cm，边界清楚，平扫 CT 值约 34HU，增强扫描病灶呈明显均匀强化，动脉期 CT 值约 131HU，静脉期 CT 值约 88HU，病灶邻近血管迂曲扩张，周围另见多发结节状软组织密度影。术后病理（后腹膜）结合形态学及免疫组化结果，符合 Castleman 病。免疫组化：CD3 滤泡间区（+）、CD5 滤泡间区（+）、CD20 滤泡（+）、CD21 显示 FDC 网、CD23 显示 FDC 网，CD68 组织细胞（+）、CD123 组织细胞（+）、Ki67 生发中心（70%+）。
结论 Castleman 病属原因未明的反应性淋巴结病之一，其病理特征为明显的淋巴滤泡、血管及浆细胞呈不同程度的增生，临床上以深部或浅表淋巴结显著肿大为特点部分病例可伴全身症状和(或)多系统损害，多数病例手术切除肿大的淋巴结后，效果良好。Castleman 病病理上分为透明血管型和浆细胞型两种类型，透明血管型占 80%～90%。显微镜见淋巴结内许多增大的淋巴滤泡样结构，有数根小血管穿入滤泡，血管内皮明显肿胀，管壁增厚，后期呈玻璃样改变。滤泡周围由多层环心排列的淋巴细胞，形成特殊的洋葱皮样结构。浆细胞型占 10%～20%。患者常伴有全身症状，如发热、体重减轻、贫血、红细胞沉降率升高。

PU-0598

腹部 Castleman 病 MSCT 表现

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【摘要】**目的** 探讨腹部 Castleman 病影像表现及病理特点。**方法** 回顾性分析 7 例经手术病理证实 Castleman 病的增强 CT 影像学表现及临床病理特点。**结果** 男性 4 例，女性 3 例。7 例病灶均边界清楚， 28.6%的病灶存在钙化，72.4% 病灶存在不同程度囊变，28.6%的病灶密度均匀，CT 增强均表现为持续性强化，周围多发淋巴结；72.4%病例对血管呈包埋征，无明显侵犯。**结论** Castleman 病通常表现为边界清楚、密度不均匀的实性肿块，周围多发淋巴结，对血管呈包埋征，无明显侵犯，增强 CT 动脉期明显强化及静脉期、延迟期持续性强化对 Castleman 病的诊断有一定的指导意义。

PU-0599

X 线钡灌肠在慢性阑尾炎的检查应用性诊断

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目的 慢性阑尾炎是临床常见疾病，目前对于有效确诊慢性阑尾炎的方法并不多，尤其对于临床症状不典型的病人，在诊断上更加困难。本研究通过回顾性分析我院 75 例通过阑尾 X 线钡灌肠造影诊断慢性阑尾炎的病例，证明阑尾 X 线钡灌肠造影是否具有充分的慢性阑尾炎诊断价值，同时根据结果进行分析，提高慢性阑尾炎诊断水平。
方法与资料
1.一般资料：本组 75 例，男 27 例，女 48 例，年龄 14-57 岁。体征:转移性右下腹疼痛 45 例，脐周疼痛 30 例。白细胞正常 59 例，白细胞升高 16 例。75 例慢性阑尾炎均经临床手术及病理证实。

2 阑尾 X 线钡灌肠造影检查
1.2 检查前准备：所入选患者按常规钡灌肠检查准备，检查前 12h 禁食，4h 禁水，2h 清洁灌肠。
1.2
方法 本研究 75 例均常规进行常规钡灌肠检查。以低压稀钡，将钡剂灌至横结肠肝曲停止，改变体位，使钡剂沿解剖方向逐步充盈升结肠至回盲部，随即将检查床调整呈头高脚低 15°。盲肠钡剂充盈良好，回盲部区寻找阑尾，每次阑尾复查，无论阑尾是否显影，都进行 X 线摄片，作为诊断重要依据。
结果 75 例中阑尾显影 56 例，不显影 13 例，阑尾显影率为 75%，术前 X 线诊断慢性阑尾炎 67 例(显影组 52 例，不显影组 15 例)，诊断符合率为 89%。
本研究中慢性阑尾炎患者的 X 线表现有以下几种：（1）阑尾腔内壁边缘不规整，管壁僵硬:本组 55 例符合。其中阑尾蠕动减弱或消失，钡剂排空缓慢 48 例，余 4 例排空正常；（2）阑尾腔钡剂不完全充盈:表现阑尾短小呈残桩征或尖角征 10 例；（3）阑尾扭曲、分节改变:表现阑尾扭曲、僵硬，钡剂呈节段状改变，透视下观察阑尾移动性差 11 例。而阑尾未见显影患者 16 例，在透视下于回盲部下方盲肠内侧阑尾区进行指压试验，12 例病人感到阑尾区指压性疼痛，后诊断为慢性阑尾炎。
结论 阑尾 X 线钡灌肠造影具有充分的慢性阑尾炎临床诊断价值，同时根据结合患者体征，可有效提高慢性阑尾炎诊断水平。

PU-0600

Solitary fibrous tumor of the mesentery: a case report and review of literature

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Solitary fibrous tumors (SFTs) are rare mesenchymal tumors which mostly arise from pleura. Such tumors arising from the mesentery are rare. A 66-year-old man was referred to the department with a painless mass in the left abdomen, which was detected incidentally ten years ago. The patient sometimes had abdominal pain, and the physical examination revealed an irregular mass. The mass was resected, and excisional biopsy results revealed an SFT originating from the mesentery of the small intestine. He was discharged a week after surgery and remained normal in the following four-month. Through this case report and literature review, the author hopes to accumulate materials and make a more accurate diagnosis later.

PU-0601

Four-point CT scores for evaluation of occult peritoneal metastasis in patients with gastric cancer: a region-to-region comparison with staging laparoscopy

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Purpose To explore the abnormal CT signs of occult peritoneal metastasis (OPM) in patients with advanced gastric cancer, and investigate the efficacy of the "four-point CT scores" in the evaluation of OPM prospectively, through the region-to-region comparisons with staging laparoscopy.

Methods

The CT and endoscopic ultrasound diagnosed $cT_{3-4}N_{0-3}M_0$ patients were included into this study. All enrolled patients were performed staging laparoscopy before surgery or neoadjuvant chemotherapy. OPM detected during staging laparoscopy will be compared with preoperative abdominal CT to investigate whether there were abnormal signs through region-to-region comparison. The radiologist observed the OPM areas which include large omentum, transverse mesocolon, perihepatic peritonum, left sub-diaphragm area, parietal peritoneum, mesentery, falciform ligament and hepatogastric ligament areas, on standard three reconstruction planes (axial, coronal and sagittal). The abnormal signs were recorded. A four-point CT-score system was proposed to define the radiological characteristics of the OPM areas according to the severity degrees of the CT signs. The defined CT score system was then verified the diagnostic efficacy on a cohort of consecutive gastric cancer patients prospectively.

Results 33 out of 385 enrolled patients were diagnosed as OPM by staging laparoscopy, which were all missed by preoperative CT. Fifty-seven PM positive regions were confirmed in these 33 cases. The large omentum was the mostly involved areas in OPM patients (38.60%, 22/57), which usually demonstrated as smudge-like ground glass opacity (S-GGO) signs (90.91%, 20/22), with a mean CT score of 2.14. Parietal peritoneum was the second mostly involved region (22.81%, 13/57), which usually displayed as the thickening peritoneal line, with a mean CT score of 1.69. The perihepatic peritoneum was also the second mostly involved region (22.81%, 13/57), with the lowest CT score of 0.85. In the prospective study of 143 gastric cancers, it was more prone to be positive of OPM following the increase of CT scores ($p<0.001$). Taken $\geq$ score 2 as cutoff value to predict OPM positive, the area under the curve (AUC) was 0.848, with a sensitivity of 0.875 and specificity of 0.764; the false negative rate was 2% (2/99), and the true positive rate was 31.8% (14/44).

Conclusions

The four-point CT-score system has the potential to improve the pre-treatment evaluation of occult peritoneal metastasis.

PU-0602

MDCT 肿瘤优势供血动脉征鉴别胰胃间隙区肿物的价值

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目的: 评价 MDCT "肿瘤优势供血动脉征"对胰胃间隙外生型肿瘤的定位诊断价值。**方法:**回顾性研究经病理证实的 34 例位于胰胃间隙的外生型肿瘤，包括 20 例胃胃肠间质瘤（GIST），14 例胰腺肿瘤（7 例胰腺神经内分泌肿瘤 NEN，7 例胰腺实性假乳头状瘤 SPN）的 MDCT 图像,由两名放射科医生追踪肿瘤的供血动脉并作出定位诊断，用卡方检验或 Fisher 精确检验比较两组间供血动脉的差别。**结果:**19/20 例胃 GIST、13/14 例胰腺肿瘤可识别肿瘤供血动脉来源,两组在肿瘤起源血管上有显著性差异（$c^2=23.86$，$P<0.001$）。17/20 例（85%）胃 GIST、11/14 例胰腺肿瘤（78.6%）可显示"肿瘤优势供血动脉征"，两组间征象的阳性率没有统计学显著性差异（Fisher 精确检验,P =

1.000）。对于所有入组的肿瘤，该征象诊断胃 GIST 和胰腺肿瘤的敏感度、特异度、诊断准确度、阳性预测值和阴性预测值分别为 85.0%、92.9%、88.2%、94.4%、81.3%和 71.4%、100%、88.2%、100%、83.3%。**结论：** MDCT“肿瘤优势供血动脉征”可辅助胰胃间隙胃及胰腺外生性肿瘤的定位诊断。

PU-0603

CT characteristics and risk factors of isolated recurrence of peritoneal reflection following radial resection for colon cancer

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Objective: To evaluate the CT imaging characteristics and analyze risk factors of isolated peritoneal reflection recurrence (IPRR) after radial resection for colon cancer, so as to make early diagnosis and proper treatment, prolonging the survival.
Methods: BetweenJanuary 2012 and April 2019,83 patients with colon carcinomaand IPRR confirmed by surgery or/and pathology in our center were retrospectively gathered. 17 cases without preoperative CT images and 56 cases with non-IPRR peritoneal metastases were excluded and eventually 10 cases were included in this study. Clinical and pathological information were recorded as follows: preoperative complications such as intestinal obstruction and perforation, ways of operation, primary site, T stage, N stage, pathological types, the time period from radial resection to the diagnosis of IPRR and non-IPRR metastases at the time of diagnosis of IPRR. The CT information was descriptively analyzed as follows: ascites status at the time of pre-operation and diagnosis of IPRR, size of IPRR, morphological features of IPRR (three types: I,band or flake; II,nodule, maximum diameter equal or less than 2cm; III,mass, maximum diameter beyond 2cm), enhancement pattern,border and the involvement of adjacent organs.
Results:A total of 10 cases (6 men and 4 women; mean age, 60ys;age range31-78ys) were enrolled in this study.The clinical, pathological and CT imagingcharacteristics of patients with IPRR were given in **Table 1**and **Table 2**. Preoperative complications: intestinal obstruction, 3 cases, perforation, 1 case. The ways of operation: laparoscope, 7 cases, open surgery, 1 case, and 2 cases with unknown operative way. Majority of the primary tumors (7 cases, 70%) located in the right colon.All the primary tumors were of T3/T4 stage and 5 cases with lymph node metastases (N1, 3 cases and N2, 2 cases). Of 10 patients, only one mucous adenocarcinoma and one signet ring cell carcinoma.The mean period time fromradial resection to the diagnosis of IPRRwas 18.70 ms (5-76 ms). Only 2 cases withnon-IPRR metastaseswere occurred, one with liver metastasis (Fig.1) and one with liver & lung metastasis. Ascites was found in 3 cases (30%) at the time ofpre-operation and only one at the time of diagnosis of IPRR.The sizes of IPRR were as follows: <2cm, 3 cases; 2.1-4cm, 4 cases; 4.1-6cm, 2 cases; >6.1cm, 1 case. All the 7 cases of size beyond 2cm were involved with adjacent organs, including 4 seminal vesicles (Fig.2), 3 bladders, 2 rectums, and 1 uteruses. The shape of IPRR was type I in 2 cases,type II

in 3 cases and typeIII in 5 cases (Fig.3).All the cases showed slightly slow enhancementand majority of cases (90%) were of irregular border.
Conclusion: The patients with locally advanced (T3/T4) right colon cancer may be more prone to IPRRpost radial resection, as well as obstructing colon cancer may be also a risk factor for IPRR.Early diagnosis of IPRR when lesion is less than 2cm may reduce the damage of adjacent organs and distant metastases.

PU-0604

多层螺旋 CT 对胃癌侵犯浆膜诊断中的价值分析

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【摘要】 目的 探讨多层螺旋 CT 在诊断胃癌浆膜侵犯的临床价值。 **方法** 收集 2014 年～2018 年经病理证实的 160 例胃癌患者，所有患者术前均行 CT 增强动静脉期扫描，分析病灶多层螺 CT 检查的特点，判断浆膜是否侵犯，并与病理结果比较。**结果** 160 例胃癌患者的病灶术前均明确诊断，有 70 例位于胃体小弯部，胃窦部 59 例、贲门区 31 例。溃疡型胃癌 75 例，隆起型胃癌 55 例，浸润型胃癌 30 例。CT 检查图片显示 130 例浆膜侵犯，且胃周见结节影，30 例浆膜面光滑、胃周脂肪间隙清晰，均与术后病理一致。 **结论** 多层螺旋 CT 检查操作方便，术前对胃癌的检出率较高，并且可以初步分型、判断浆膜面侵犯情况，有助临床术前准备和评估疗效，值得在临床推广。

PU-0605

十二指肠球部 Brunner 腺瘤 2 例及文献复习

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【摘要】目的 探讨十二指肠 Brunner’s 腺瘤的影像学特征。材料和方法 回顾性分析 2 例 Brunner’s 腺瘤的影像表现，并与病理表现相结合，通过对文献的复习，分析总结十二指肠 Brunner’s 腺瘤的影像诊断特征。**结果** 2 例 Brunner’s 腺瘤均发生于十二指肠球部，与 brunner’s 腺的生理分布相符合。均为腔内息肉样肿块，肿块大部分边缘光整，轻度到明显强化，强化程度及均匀度与肿块的病理构成有关。胃肠造影多表现为边缘光整的息肉样充盈缺损。**结论** 十二指肠腺瘤主要发生在十二指肠球部，多呈带蒂的息肉样肿块，可引起消化道出血、肠梗阻、肠套叠等。肿块边缘清楚，强化程度不等，肿块中可分布小片状低密度囊性区。CT 扫描及薄层重建 结合内镜超声，可帮助诊断及鉴别诊断。

PU-0606

Absence of the celiac trunk: definition, classification, MDCT angiographic findings and their probable embryological mechanisms

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Purpose : To identify the types and prevalence of absence of the celiac trunk by using multidetector computed tomography (MDCT) angiography, and analyze their probable embryological mechanisms.
Materials and Methods: A retrospective study was carried out on 2,500 abdominal MDCT angiography images. The absence of the celiac trunk was defined as that the celiac trunk is not exist, more specifically, there is not such an arterial trunk containing at least two major branches of the celiac trunk. Various types of the absence of the celiac trunk were investigated.
Results: Of the 2,500 patients, 19 (0.76%) patients were identified as an absence of the celiac trunk. According to its definition and classification, the absence of the celiac trunk could be divided into five types: type I (LGA + CHA + SA + SMA), type II (HM trunk + LGA + SA), type III (SM trunk + LGA + CHA), type IV (GM trunk + CHA + SA), and type V (other type); and these types were observed in 5 patients (0.20%), 9 patients (0.36%), 3 patients (0.12%), 0 patients (0.00%) and 2 (0.08%) patients, respectively. There were more examples of the types I and II than of the types III–V (P = 0.004).
Conclusions: We systematically classified the absence of the celiac trunk based on its MDCT angiography findings. Abnormal interruptions and persistence of the longitudinal anastomosis, and regression of vascular root and emergence of replaced artery could all be the embryological mechanisms of various types of the absence of the celiac trunk.

PU-0607

MSCT 在胃肠道双原发癌诊断中的临床价值

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目的 探究 MSCT 检查对胃肠道双原发癌的诊断价值，以提高认识，减少误诊及漏诊。
方法 回顾性筛查 2012 年 1 月 1 日到 2019 年 7 月 1 日因胃肠道癌就诊的所有连续性病例 660 例，收集经手术病理证实的具有完整临床及影像资料的胃肠道双原发癌患者，记录患者的一般资料、病理、部位、影像及漏诊情况，并分析其漏诊原因。
结果 660 例患者中仅有 18 例符合胃肠道双原发癌（2.73%），男 15 例，女 3 例，年龄 33-82 岁，平均 64.28±7.72，9 例饮酒史，12 例吸烟史，3 例有家族史，临床主要因腹痛和大便性状改变就诊，其中 1 例并发肠套叠，6 例并发肠梗阻，10 例经肠镜证实为合并结直肠息肉或腺瘤；18 例患者均为双原发癌，包括胃-结肠组 2 例，小肠-结肠组 1 例，结肠-结肠组 6 例，结肠-直肠组 7 例，直-直肠组 1 例，直-肛管组 1 例，术前漏诊 8 例（44.4%），均漏诊为结肠（升结肠 1 例，横结肠 4 例，结肠脾曲 1 例，乙状结肠 1 例，直肠 1 例），分析漏诊原因包括 MSCT 检查前胃肠道未做充分准备，1 例因肠套叠漏诊横结肠癌，7 例因诊断时满足于一处病变的检出而未进一步查找胃肠道其他部位是否同时存在病变。对胃肠道多原发癌中的结直肠癌的 MSCT 进行分析，其 MSCT 表现为肿块、肠壁均匀/非均匀性增厚，癌肿周围脂肪间隙可表现为模糊及肠系膜血管增多增粗，增强后癌肿表现为均匀/非均匀性延迟性明显强化。
结论 MSCT 是胃肠道肿瘤诊疗过程中必不可少的检查方法，对于长期吸烟饮酒的中老年男性患者，特别是结直肠多发息肉或腺瘤者，胃肠道充分准备下行腹盆腔大范围 MSCT 扫描，仔细观察结直肠段，可有效减少术前漏诊，提高诊断准确性。

PU-0608

T2 mDixon MV 在颈部的应用研究

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目的 探讨 T2 mDixon MV 序列在颈部的应用
方法 第一阶段志愿者扫描：志愿者 6 个，分别扫描 T2mDIXON\ T2mDIXON MV 序列，设置好参数，使两个序列的扫描时间和空间分辨率相同。每人每个序列扫描 3 次，第一次不做任何运动，第二次每隔 30s 做一次吞咽运动，第三次每隔 10s 做一次吞咽运动，第四次每隔 30s 做一次摇头运动，第五次每隔 10s 做一次摇头运动，第六次不间断的进行摇头运动。分别由一位有 10 年以上工作经验的头颈部放射诊断副主任医师和 10 年以上工作经验的主管技师各自在工作站上分析图像，测量图像信噪比、运动伪影，并用统计法分析比较。
结果 不做运动时，T2mDIXON 序列的图像信噪比和图像整体质量评分（范围 3～4，平均值 3.85）均高于 T2mDIXON MV 序列（范围 3～4，平均值 3.42）；志愿者做吞咽运动时，T2mDIXON MV 序列图像没有运动伪影，T2mDIXON 序列口腔和喉部层面的图像运动伪影明显，且随运动频率增快增加；志愿者做摇头运动时，T2mDIXON MV 序列图像没有运动伪影，T2mDIXON 序列图像运动伪影明显，且随运动频率增快增加，图像信噪比也随运动频率增加而降低。
结论 不做运动时，T2mDIXON 序列的图像信噪比和图像整体质量评分均高于 T2mDIXON MV 序列；T2mDIXON MV 序列可以有效抑制颈部的运动伪影，明显改善图像质量。

PU-0609

IVIM-DWI 成像在脑泡型包虫病及其边缘带中的应用

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目的 探讨体素内不相干运动弥散加权成像技术(introvoxel incoherent motion diffusion-weighted imaging，IVIM-DWI)定量评价脑泡型包虫病（CAE）边缘带的研究价值。**方法** 收集 2010 年 7 月－2019 年 01 月我院就诊的共 18 例 CAE 患者(共 31 个有效病灶)；行常规 MR 及 IVIM-DWI 扫描检查，分测量 CAE 病灶实质区、边缘带、水肿区（5mm、10mm、15mm）及相对应的对侧正常区（对照区）脑实质的纯扩散系数 (ADC $_{slow}$)、假扩散系数(ADC $_{fast}$)和灌注分数(f)，并进行统计学分析。结果 病灶实质区与边缘带 ADC $_{standard}$ 值、ADC $_{fast}$ 值、ADC $_{slow}$ 值、f 值均无统计学意义；病灶实质区与水肿区 10mm 及相对应的对侧正常区（对照区）的 ADC $_{standard}$ 值差异具有统计学意义（$P<0.05$）；病灶实质区水肿区 5mm 及相对应的对侧正常区（对照区）的 ADC $_{fast}$ 值差异具有统计学意义（$P<0.05$）；病灶实质区与相对应的对侧正常区（对照区）、边缘带与相对应的对侧正常区（对照区）、水肿区（5mm、10mm、15mm）与相对应的对侧正常区（对照区）ADC $_{slow}$ 值差异均具有统计学意义（$P<0.05$）；病灶实质区与水肿区（5mm、10mm、15mm）、相对应的对侧正常区（对照区）与水肿区（5mm、10mm、15mm）的 f 值差异具有统计学意义（$P<0.05$），余组间比较差异无统计学意义（$P>0.05$）。**结论** IVIM- DWI 的部分参数(ADC $_{fast}$ 和 ADC $_{slow}$)有助于界定 CAE 浸润带的范围，为 CAE 手术方案的拟定及预后分析给予可靠的影像学依据。

PU-0610

基于氢质子磁共振波谱技术的 L 波段微波辐射对 大鼠学习和记忆影响的研究

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目的 基于氢质子磁共振波谱（^{1}H-MRS）技术，研究 L 波段微波辐射对大鼠学习和记忆功能的影响。

方法 二级雄性 Wistar 大鼠 26 只，按照体重随机分为假辐射组（Sham 组）、L 波段 30mW/cm^{2}微波辐射组（L30 组）。将 L30 组大鼠放置于有机玻璃照射盒中，使用 L 波段微波辐射源从背侧照射 10min；Sham 组大鼠除未行微波辐射外其他处理与照射组相同。采用 Morris 水迷宫方法于辐射后 1d 和 7d 对各组大鼠的学习和记忆功能进行检测。使用 ^{1}H-MRS 于辐射后 1d 和 7d 检测鼠脑中的 N-乙酰天门冬氨酸（N-acetylaspartate，NAA）、胆碱（choline，Cho）、肌酸（creatine，Cr）浓度水平。

结果 微波辐射后 1d 和 7d，与 Sham 组相比，L30 组平均逃避潜伏期（average escape latency，AEL）有延长趋势，但无统计学意义（P>0.05）。^{1}H-MRS 检测结果显示，辐射后 1d 与 Sham 组比较， L30 组 ^{1}H-MRS 波谱 NAA/Cr 值显著降低（P<0.05），Cho/Cr 值无显著差异；辐射后 7d 与 Sham 组比较，L30 组大鼠脑部 NAA/Cr 和 Cho/Cr 值均无显著差异。

结论 30mW/cm^{2} L 波段微波辐射后 1d 大鼠脑内 NAA/Cr 显著降低，而学习和记忆行为学指标无显著改变。提示利用 ^{1}H-MRS 技术能够在被试未出现显著行为学改变时检测出微波辐射对学习和记忆相关神经元的影响。

PU-0611
颈动脉斑块高分辨率磁共振扫描序列的初步探讨

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目的 随着生活水平的不断提高，高血脂高血糖高血压患者不断增加，间接导致颈动脉斑块发生率稳步升高，动脉斑块使血管狭窄甚至闭塞，从而导致脑缺血，脑梗死。本文旨在研究运用合理的 MRI 扫描方案，对斑块成份进行分析，进而有利于临床诊断与治疗。

方法 颈动脉斑块多位于颈总动脉分叉处，以分叉处为中心进行磁共振扫描，扫描序列分强化前与强化后，强化前扫描序列包括三平面定位像、Ax 3D TOF MRA、Cor 3D CUBE T1、OBL Sag 3D T1、Ax PD fs FSE、Ax T2 fs FSE,强化后扫描序列为颈部动态血管增强 Cor Tricks MRA、Cor 3D CUBE T1+C、OBL Sag 3D T1+C、Ax PD fs FSE+C. OBL Sag 3D T1 为病变侧的颈总动脉分叉处的斜矢状位，目的是不用重建更直观的观察血管分叉处斑块的影像。需要注意的是强化前后相同序列的定位保持一致，更方便对比强化前后病变信号的变化。

结果 颈动脉斑块高分辨率 MRI 扫描不仅可以直观的观察到狭窄的血管，还可以通过强化前后对比，对斑块的位置、范围、成份等进行分析。CUBE 为三维无间隔容积扫描，能重建大血管的整体走形。

结论　　颈动脉斑块高分辨率 MRI 可更好的评估管腔内斑块情况，定性判断斑块成份，定量测量管壁结构，官腔最大狭窄程度，为临床诊断与治疗提供帮助。

PU-0612
三维动脉自旋标记技术(3D-ASL）在急性缺血性脑卒中的应用

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目的　探讨三维动脉自旋标记技术（three-dimension arterial spinlabeling,3D-ASL）在急性缺血性脑卒中的应用。

方法　入院时 DWI 表现为急性缺血性脑卒中疾病的患者 40 例，男性 27 例，女性 13 例，年龄 25-85 岁，平均年龄 55.5 岁。根据 Adamas 分型，将缺血性脑卒中患者根据 DWI 图像上病灶面积大小分成两组：小面积脑梗死组(≤3 ㎡），大面积脑梗死组（＞3 ㎡，且累计两个或两个及以上脑解剖部位）。对每位患者在标记后延迟（PLD）时间分别为 1.5s 和 2.5s 时行 3D-ASL 检查，常规 T2WI、T1WI、MRI、DWI 检查。将后处理 3D-ASL 图像与 DWI 及 MRA 图像进行分析处理，并进行梗死核心 PLD=1.5s 及 PLD=2.5s 脑血流量 CBF 值的测量。

结果　小面积脑梗死组 23 例，大面积脑梗死组 17 例。小面积脑梗死组 DWI 面积 141.65±67.78㎜²，PLD=1.5s 病灶面积为 1334.48±1200.48㎜²，CBF 值 12.03±5.165ml/100g/min，PLD=2.5s 病灶面积为 731.82±810.18㎜²，CBF 值为 20.43±4.145ml/100g/min，大面积脑梗死组 DWI 面积 833.89±453.17㎜²，PLD=1.5s 病灶面积为 3177.67±1350.84㎜²，CBF 值 7.69±2.655ml/100g/min，PLD=2.5s 病灶面积为 1721.44±559.27㎜²，CBF 值 16.99±3.05ml/100g/min。

结论　3D-ASL 技术结合 DWI,能够评价缺血半暗带，对于提示临床采取合理方案挽救缺血脑组织有重要价值。3D-ASL 技术提示大面积梗死灶 CBF 更低，更加敏感。

PU-0613
应用功能性磁共振技术研究嗅觉通路的改变以及嗅觉适应机制

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目的　嗅觉是人类重要的化学感觉，而上呼吸道感染是发生嗅觉障碍的常见病因之一。研究表明，与正常人相比，有嗅觉障碍的患者的嗅球体积减小、嗅束沟深度降低。应用功能性磁共振成像技术 BOLD（血氧水平依赖）对嗅觉适应前以及恢复后早期大脑功能激活区进行研究，探讨上呼吸道感染患者中枢嗅觉通路的改变及嗅觉适应机制。**方法**　选取嗅觉障碍组 19 例（男 5 例，女 14 例），年龄与性别与之匹配的健康对照组 19 例（男 5 例，女 14 例），所有被试均为右利手，对所有被试进行了内窥镜检查以及嗅觉测试。给予无嗅觉障碍组 2 次间隔 20 分钟相同的嗅觉刺激任务(分别称为任务 1 和任务 2)，刺激剂为异戊酸，采用德国西门子 Trio Tim 3.0T 核磁扫描仪进行功能性磁共振成像，获取图像数据，包括 3D T1W 图像、BOLD（血氧水平依赖）图像等，采用 SPM8 软件进行数据处理。利用视觉模拟量表对 2 次任务进行气味强度和愉悦度评分，并将结果进行统计学分析。　**结果**　嗅觉障碍组在很多区域都有灰质体积的减少，这些区域主要包括前扣带回、梭状回、

额上回、颞上回及小脑。病程 1 年以上的患者的灰质体积减少更多。任务 1 中大脑激活区域位于双侧小脑、额叶(包括眶额回)、岛叶、丘脑、扣带回、杏仁体、梨状皮层、左侧顶下小叶、中央前回、右侧海马、苍白球、颞中回、缘上回。任务 2 中，仅见右侧额中回激活，且激活区域显著减少。对 BOLD 图像信号进行分频处理，不同 ALFF（低频振幅）下的大脑激活区域不同。 **结论** 右眶额皮层和嗅球形态学上的改变可能与上呼吸道感染患者发生嗅觉障碍的发病机制有关。大脑的嗅觉适应较主观感觉有明显的“延时现象”，主观嗅觉适应已经恢复时，而大脑敏感性仍处于较低水平。低频振幅下的激活脑区与嗅觉损伤机制有关，高频振幅下的激活脑区与嗅觉的适应机制相关。

PU-0614

Cortical Thickness Parameters for the Discrimination of Girls Showing and Not Showing Early Hormonal Maturation: A Machine-Learning Approach.

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Objective: Previous studies have shown the significant changes on cortical morphometry in girls during early hormonal maturation defined by the gonadotropin-releasing hormone (GnRH) stimulation test[1]. These morphometry changes may be neurological markers to recognize early hormonal maturation, which can be a noninvasive method to replace the invasive laboratory tests. But the accuracy of these predictions remains unclear. The current investigation is to specify the ability of whole brain cortical thickness parameters in identifying precocious puberty girls who are undergoing early hormonal maturation from those who are not.

Methods: Seventy-eight precocious puberty girls underwent structural imaging on a 3T MR system and finished GnRH stimulation test to identify hormonal manifestations of hypothalamus-pituitary-gonadal axis (HPG-axis) activation. Support vector machine (SVM) implemented in PROBID software (http://www.brainmap.co.uk/probid.htm) was adopted to investigate the discriminating accuracy of whole brain structure parameters for identifying early hormonal maturation. Based on clinical outcome, we selected two groups of undergoing hormonal maturation (n=25) and not undergoing hormonal maturation (n=25) girls matched for age, BMI and IQ to optimally train the classifier[2]. The cortical mantle thickness of each subject, derived from the preprocessing step, was selected as the feature for multivariate pattern analysis.
Results: SVM analysis showed that classification accuracy separating those with and without early signs of pubertal hormonal changes using cortical thickness maps was 84.0% (sensitivity=80.0%, specificity=88.0%). Permutation tests indicated that the accuracy of classification was statistically significant ($p \leqslant 0.001$).
Conclusion: These results indicate that cortical thickness parameters have high potential in identifying precocious puberty girls showing and not showing early

hormonal maturation. Structural neuroimaging may provide image markers to apply in the context of clinical diagnosis and treatment.

PU-0615
定量 DTI 在血管性认知障碍和阿尔茨海默病鉴别中的价值

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目的 采用全脑 DTI 定量研究方法检测脑小血管病 VCI 患者脑白质损害的特点，并对比及其与 AD 患者的不同，从而探讨 DTI 在 VCI 早期诊断和鉴别诊断中的作用。**方法：**收集经神经内科诊断脑小血管病且伴有认知功能障碍的 VCI 患者 9 例、AD 患者 11 例和健康志愿者 20 例。对所有研究对象进行全脑 DTI 扫描，采用基于纤维束示踪的空间统计分析（TBSS）方法分析全脑各向异性分数(FA)异常变化的区域。将 VCI 组和 AD 组的定量 FA 图分别与健康志愿者进行比较，寻找脑白质和深部灰质 FA 值下降区域。随后再对 VCI 组和 AD 组的定量 FA 图进行比较，寻找 VCI 患者 FA 值下降更为显著的区域。**结果** VCI 组与正常对照组比较，VCI 患者的脑白质骨架图显示广泛的 FA 值下降，包括双侧辐射冠、双侧外囊、右侧内囊、穹窿、胼胝体膝部和压部、双侧丘脑、双侧矢状层、双侧下纵行束、右侧上纵行束、双侧扣带和双侧钩束；AD 组与正常对照组比较，脑白质骨架图显示双侧辐射冠、双侧外囊、穹窿、胼胝体膝部和压部、双侧丘脑、双侧矢状层、双侧下纵行束、右侧上纵行束、双侧扣带束 FA 值的下降；与 AD 组比较，VCI 患者的脑白质骨架图显示左侧前辐射冠和上辐射冠、双侧扣带束和胼胝体体部的 FA 下降程度更明显。**结论** DTI 可以检测 VCI 患者与认知障碍相关脑区的白质损害，有助于 VCI 的诊断；VCI 患者的脑白质骨架图显示左侧前辐射冠和上辐射冠、双侧扣带束和胼胝体体部的 FA 下降程度更明显，可能有助于与 AD 患者的鉴别。

PU-0616
高分辨率 MR 血管壁成像技术在头颈部动脉瘤中的应用

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目的 探讨高分辨率 MR 血管壁成像技术在头颈部动脉瘤诊断中的应用。
方法 回顾性分析经高分辨率 MR 血管壁成像技术诊断的 6 例头颈部动脉瘤的影像资料，高分辨率血管壁成像技术主要包括 3D-T1WI，3D-T2WI，3D 增强扫描，所采集的数据经后处理和分析。同时采集了 3D-TOF MRA，部分患者也行 CTA 检查。
结果 4 例颈内动脉动脉瘤，1 例椎动脉动脉瘤，1 例发生在基底动脉；1 例为假性动脉瘤，另外 5 例为真性动脉瘤；2 例有附壁血栓，1 例内膜不完整局部形成壁间血肿。
结论 高分辨率 MR 血管壁检查技术可以对头颈部动脉瘤进行定位和定性诊断，同时提供更多的临床价值，通过对管壁完整性的分析可以鉴别真性和假性动脉瘤；真性动脉瘤壁的完整性欠缺及薄弱处预示动脉瘤破裂危险性增加；动脉瘤内血栓与缺血性脑卒中等临床事件的发生相关。

PU-0617
小脑内淋巴囊肿瘤一例及文献回顾

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摘要：目的 探讨内淋巴囊肿瘤的临床及影像学表现。方法 总结经病理证实的内淋巴囊肿瘤 1 例的诊断资料,复习文献并讨论内淋巴囊肿瘤的临床特征及影像学表现诊断进展。例，男,47 岁,因"左耳听力下降七年，反复枕额痛半年"入院。CT 表现以岩骨后缘中部为中心的虫蚀状或穿凿样骨质破坏。MR T1W I 上可见片状高信号区，T2WI 上见高低混杂信号影，其内见多发杂乱血管流空信号及含铁血黄素沉着。CTA 显示肿瘤血供丰富,主要由左颈外动脉及左锁骨下动脉分支参与供血。

PU-0618
T2*-PWI 在脑胶质瘤复发与放射性坏死鉴别诊断中的应用价值

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目的 探讨 T2*-PWI 在脑胶质瘤复发与放射性坏死鉴别诊断中的应用价值。**资料与方法** 本研究共收集 24 例经外科手术切除或活检病理并临床随访证实的脑胶质瘤复发及放射性坏死病例，其中 15 例为放射性坏死，9 例为脑胶质瘤复发，所有病例均在 3T 磁共振传统平扫及增强的基础上行 T2*-PWI,所有数据的后处理均在 Philips EWS 工作站完成。分别以病灶强化区、水肿区及正常对照区为感兴趣区，得到各感兴趣区的 nrCBV 值。以独立样本 t 检验比较脑胶质瘤复发及放射性坏死病灶的强化区、水肿区的 nrCBV 值，以 $p<0.05$ 为差异有显著统计学意义。**结果**: 脑胶质瘤复发病灶的强化区与水肿区 nrCBV 值均高于放射性坏死区。脑胶质瘤复发病灶的强化区与水肿区 nrCBV 值分别为 3.27±2.32 和 1.17±0.56；放射性坏死病灶的强化区与水肿区 nrCBV 值分别为 0.97±0.57 和 0.58±0.22。其强化区 nrCBV 值的诊断敏感性及特异性分别为 88.2%和 97.4%，而水肿区为 92.3%和 100%。**结论**: 脑胶质瘤复发病灶的强化区与水肿区 nrCBV 值均高于放射性坏死, 利用 T2*-灌注加权成像可以明显提高脑胶质瘤复发与放射性坏死的鉴别诊断的正确率。

PU-0619
MR 增强高分辨 3D-T1WI 抑脂序列联合曲面重建在非外伤性面瘫中应用价值

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目的 探讨 MR 增强高分辨 3D-T1WI 抑脂序列联合曲面重建在非外伤性面瘫中应用价值。
方法 收集非外伤性面瘫患者 58 例，男 36 例，女 22 例，中位年龄 48 岁。均在飞利浦 3.0TMR 行常规轴位 T2-mDIXON 和 T1-TSE 序列后注射钆喷酸葡胺再行高分辨 3D-T1WI 抑脂扫描，扫描范围由颅底至鼻尖部；58 例患者原始数据均行行曲面重建（CPR）。详细分析面神经及相关结构受累情况。
结果 58 例非外伤性面瘫患者中，面神经炎引起面瘫 42 例，面神经肿瘤引起面瘫 26 例。其中单侧面神经炎伴同侧面部表情肌萎缩 12 例，单纯单侧面神经炎 30 例，面神经鞘瘤 16 例。

结论 高分辨 3D-T1WI 抑脂序列可显示各段面神受累情况，CPR 可在一幅图像上清晰显示面神经全貌，推测各段结构受损情况。结合轴位图像充分利用 CPR 后处理技术，可准确诊断在非外伤性面瘫，对临床治疗选择及预后评价有重要的指导意义。
结论 高分辨 3D-T1WI 抑脂序列可显示各段面神受累情况，CPR 可在一幅图像上清晰显示面神经全貌，推测各段结构受损情况。结合轴位图像充分利用 CPR 后处理技术，可准确诊断在非外伤性面瘫，对临床治疗选择及预后评价有重要的指导意义。

PU-0620
脑小血管病认知障碍大鼠脑 FA 值的纵向研究

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目的 观察自发性高血压认知障碍大鼠全脑 FA 值的纵向变化，探讨脑小血管病认知障碍发生的可能机制及早期诊断价值。方法：50 只 SHR 随机分为非手术组和手术组，于手术组大鼠 16 周龄时采用单侧结扎颈总动脉的方法进行手术。于大鼠 16 周龄、20 周龄、28 周龄时进行 Morris 水迷宫试验，并对大鼠进行 DTI 扫描，利用基于体素分析方法分析各组大鼠 FA 值下降的脑区；利 ROI 的方法手动画出代表海马面积的 ROI，分析海马 FA 值的变化；组织病理学观察纹状体、海马、胼胝体神经细胞受损情况。
结果 VBA 方法发现 28 周龄时的 SHR 非手术组大鼠同其 16 周龄时相比：双侧纹状体、双侧海马、双侧额叶皮质区 FA 值降低（$p<0.05$）；同其 20 周龄对比双侧下丘外皮质、双侧海马、双侧纹状体、左侧皮层 FA 值下降（$p<0.05$）；同对照组相比，SHR 非手术组大鼠 20 周龄时桥脑、胼胝体、内囊、左侧纹状体 FA 值降低（$p<0.05$）；28 周龄时桥脑、右侧下丘脑中央核、双侧海马、胼胝体、左侧纹状体 FA 值下降（$p<0.05$）。对于 SHR 手术组，28 周龄 SHR 手术组大鼠同其 20 周龄时对比：皮层、双侧纹状体（尾壳核）、前联合、双侧伏隔核、胼胝体（小钳）FA 值下降（$p<0.05$）；同对照组相比，SHR 手术组大鼠 20 周龄时桥脑、胼胝体、内囊 FA 值下降（$p<0.05$）；28 周龄时桥脑、右侧下丘脑中央核、双侧海马、胼胝体、左侧纹状体 FA 值下降（$p<0.05$）。病理学发现 SHR 手术组、非手术组大鼠海马区锥体细胞排列紊乱、数量减少，尼氏小体溶解、消失，海马轴突染色变浅、数量减少，胼胝体区神经纤维束排列稀疏、数量减少。**结论** 通过纵向研究观察发现自发性高血压认知障碍大鼠胼胝体、纹状体、海马、桥脑的 FA 值存在不同程度下降，提示该区域微观白质变化有助于脑小血管病认知障碍的早期诊断。

PU-0621
功能磁共振 VBM 技术在肝硬化轻微型肝性脑病中的应用价值

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资助基金项目：
1、杭州市卫生科技计划一般（A）类项目 2017A14；
2、浙江省医药卫生一般研究计划项目 2018KY587；
3、杭州市农业与社会发展科研自主申报项目 20191203B101。

摘要：目的 利用基于体素的形态学测量分析（VBM）技术探讨肝硬化背景下轻微型肝性脑病（MHE）患者脑微观结构的变化，为 MHE 早期诊断提供参考价值。 **方法** 纳入被试 40 例 ，包括 20 例 MHE 患者及 20 例正常人，用 3.0T 磁共振获得高分辨率三维 T1WI 序列，利用 MATLAB 下 SPM8 内置工具包 VBM8 软件对扫描获得的图像进行处理，而后对 MHE 组和对照组的全脑灰质体积进行统计，比较其灰质体积的差异。 **结果** 与对照组比较 ，MHE 组双侧壳核、杏仁核、海马及海马旁回等脑区灰质体积明显减少；双侧丘脑灰质体积明显增加（FWE 校正，$P<0.05$）。而对照组、MHE 组的灰质体积变化与 NCT-A 时间、DST 评分之间无显著相关性（FWE 校正，$P<0.05$）。 **结论** VBM 技术能检测肝硬化患者脑微观结构的改变，可能有助于早期诊断 MHE。

PU-0622

MRI 对帕金森病患者丘脑底核可视化扫描的初步研究

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目的 探讨并对比研究丘脑底核（STN）的 MRI 最佳直视化扫描序列。 **方法** 对 20 例正常人及 20 例帕金森病（PD）患者深部脑电刺激术（DBS）前进行扫描，与以往常规序列对比，半定量分析各种扫描序列对于 STN 显示的情况，术后复查并确认患者微电极记录（MER）电极探针位置。 **结果** T2*flash2D 和 T2-SPACE、QSM、SWI 序列半定量评分高于常用的 T1-mprage、T2-TSE 序列及 FLAIR 序列， 并与患者术中 MER 确定的电极探针位置有较高的一致性。 **结论** 使用 T2*flash2D 和 T2-SPACE、QSM、SWI 序列可以准确预定靶点位置，能够提高定位精确度，避免并发症，提高手术效率。

PU-0623

无症状性基底动脉粥样硬化斑块的分布特征

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目的 无症状性基底动脉粥样硬化斑块的分布尚不明确，本研究旨在通过三维高分辨磁共振成像探索无症状性基底动脉粥样硬化斑块的分布特点。
方法 回顾性分析哈尔滨医科大学附属第一医院 HR-MRI 数据库的无症状性基底动脉粥样硬化斑块患者，采用四分法将斑块分为腹侧壁，左侧壁、右侧壁和背侧壁，统计患者各个壁的分布情况。
结果 研究共纳入无症状性基底动脉粥样硬化患者 30 名，斑块横向分布以多象限受累为主，分布最多的是腹侧壁。
结论 无症状性基底动脉粥样硬化斑块患者较多分布在腹侧壁，以多象限受累为主。采用三维高分辨磁共振成像分析基底动脉斑块分布有助于揭示颅内动脉粥样硬化的发展过程和评估缺血性卒中的风险。

PU-0624

急性脑梗死与颈动脉粥样硬化斑块的相关性

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目的 运用我院 3.0T 磁共振进行高分辨 MRI 成像技术，分析颈动脉粥样硬化斑块的组成成分，探讨脑梗死与颈动脉粥样硬化斑块的相关性。
方法 选取自 2017 年 9 月到 2019 年 3 月期间因脑血管病于我院就诊的患者 37 名。患者躁动、患有幽闭恐惧症、体内安装起搏器、有脑动脉瘤夹及心脏瓣膜置换术后的患者由于是 MRI 禁忌，均不在本研究之列。使用西门子 3.0T MRI 扫描机，应用 16 通道头颈部相控阵表面线圈和心电门控，对患者双侧颈动脉进行扫描，结合 3D TOF 亮血、T1 space、T2 space、 T1WI、T2WI 、PDWI 及增强序列对扫描结果进行分析，判定颈动脉斑块的组成成分。采集患者发病后血压、血糖、血脂等实验室检查资料，记录患者既往高血压史、糖尿病史、吸烟史等危险因素。应用 P 检验分析比较患者的年龄、性别、血压、血脂、糖尿病、吸烟、体重指数等危险因素与斑块组成成分的相关性。P<0.05 具有统计学意义。
结果 急性与非急性脑梗死，基线对比，两组性别、生化指标没有统计学差异，年龄、LDL、HDL、甘油三酯、总胆固醇与急性脑梗死相关，p 值分别为 0.121、0.469、0.070、0.452、0.213。年龄、狭窄程度与急性脑梗死相关，其中急性脑梗死的平均年龄 54 岁，狭窄程度约 25%；非急性脑梗死的平均年龄 64 岁，狭窄程度约 27.5%，年龄、狭窄程度的 P 值分别为 0.013、0.788。糖尿病、高血压与急性脑梗死相关，P 值分别为 0.478、1.000。斑块溃疡、斑块强化、斑块出血、纤维帽、脂质核心与急性脑梗死相关，P 值分别为 1.000、0.447、1.000、0.721、0.027。急性脑梗死患者中脂质核心发病率更高。
结论 高分辨 MRI 可清晰显示颈动脉粥样斑块的内部成分，为急性脑血管病的预防和治疗提供一种新的科学依据，且年龄、斑块内脂质坏死核心与急性脑梗死有密切相关性。

PU-0625
弥漫中线胶质瘤伴 H3 K27M 突变，6 例影像报道及文献复习

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目的 探索弥漫中线胶质瘤伴 H3 K27M 突变的 MR 影像学特征。
方法 回顾性分析经免疫组化及分子基因测序证实为 H3 K27M 突变的弥漫中线胶质瘤 6 例患者的临床、影像及病理学表现。
结果 本组研究共 6 例患者。男性 4 例，女性 2 例，年龄 10-60 岁；均位于脑中线区附近：下丘脑 1 例，延髓 2 例，丘脑 3 例；4 例（67%）T1WI 呈稍低信号、T2WI 呈等信号，6 例（100%）DWI 呈等-稍高信号、伴裂隙样囊变；33%（2 例）瘤内出血，4 例（67%）显著强化，所有肿瘤均呈不均质强化，且边界不清、瘤周无水肿，4 例（67%）在 ASL 上呈高灌注；术中提示 5 例（83%）血供丰富。术中肿瘤均未实现全切，术后辅助同步放疗和化疗。术后组织学病理诊断为低级别胶质瘤 3 例，高级别胶质瘤 3 例，免疫组化 H3 K27M 强阳性表达、H3F3A 基因 K27M 突变 6 例（100%），IDH1 野生型 6 例（100%），MGMT 启动子甲基化阴性 5 例（83%）。
结论 本组弥漫中线胶质瘤伴 H3 K27M 突变在 MRI 的典型表现为：①脑中线部位、弥漫性生长，②T2WI 及 DWI 等信号多见，增强后不均质强化，③瘤内裂隙样囊变、瘤周无或轻度水肿，④不均匀高灌注、Cho/NAA＞2。如遇到影像符合以上表现的肿瘤时，则强烈建议加做 H3 K27M 的免疫组化或分子病理检测。

PU-0626
脑磁共振波谱成像技术及临床应用

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MRS 是利用核磁共振现象在频率编码方向上获得化学位移，以分析被测组织的化学信息，甚至测量某些化学物的浓度，为临床诊断和治疗提供解剖以外的生化信息
是目前无损伤性的研究人体器官和组织代谢、生化改变及化合物定量分析的方法之一

PU-0627
各向同性三维磁共振扫描技术在视神经脊髓炎中的应用

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目的 视神经脊髓炎（NOM）是视神经与脊髓同时或相继受累的急性或亚急性脱髓鞘病变，又称 Devic 病或 Devic 综合症，其临床特征为急性或亚急性起病，单眼或双眼失明，前后数周伴发横贯性或上升性脊髓炎。该病是神经内科疾病，属于中枢神经系统脱髓鞘疾病的一种，临床表现多样，主要累及视神经及脊髓。本研究主要观察患者视神经受累后，其视神经厚度变化与正常人的对比分析。
材料与**方法** 自 2017 年 10 月至 2018 年 10 月扫描 20 例临床诊断为视神经脊髓炎的患者及 20 例志愿者，采用各向同性的三维磁共振扫描技术，轴位采集图像，范围应将双侧眼眶扫描完整，在后处理工作站对图像进行后处理，沿双侧视神经长、短径方向分别行斜矢状位及斜冠状位重建，在重建的图像上分别测量同一位置处的截面面积，两次测量数值取平均值。志愿者对照组采用完全一致的方法，测得视神经截面积数值，并进行组间对比分析。
结果 视神经脊髓炎患者的视神经截面积明显小于志愿者的视神经截面积，具有统计学差异。
结论 MRI 具有软组织分辨率高、无辐射、任意断面成像等特点,特别是近年来扫描技术的发展,能清楚显示视神经解剖细节和微小病变,是视神经病变的最佳影像检查方法。视神经的走形方向与各轴线间均存在夹角,，用常规 MRI 扫描方式,需要对两侧视神经进行多次、多角度的序列才可以完成，增加了操作步骤，延长了扫描时间，患者长时间扫描难免因头部移动而造成运动伪影，从而影响测量数据的准确性。三维磁共振扫描通过一次扫描完成双侧轴位视神经的图像采集，再经过后处理技术，可以多角度观察视神经，具有分辨率高、采集时间短，患者易于配合的优点。

PU-0628
胎儿小耳畸形的 MRI 表现

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目的 探讨胎儿小耳畸形的 MRI 表现。
方法 对山东省医学影像学研究所超声疑诊胎儿小耳畸形的 13 例孕妇行胎儿外耳 MRI 检查，包括真实稳态进动快速成像（True FISP）及半傅里叶采集单次激发快速自旋回波（Haste），分析胎儿小耳畸形的 MRI 表现，包括耳廓大小、形态、位置及颅耳角。
结果 13 例孕妇，共检出胎儿 13 例：双侧小耳畸形 3 例，单侧小耳畸形 10 例（左侧 3 例，右侧 7 例）。畸形耳廓在 MRI 上表现为体积减小、形态失常呈团块状、颅耳角增大，但耳廓位置相对正常。
结论 胎儿小耳畸形具有相对特征性的 MRI 表现，能对其作出正确诊断，为产前咨询提供指导意见。

PU-0629

基于 3. 0T 高分辨磁共振颅内血管壁成像技术对基底动脉粥样硬化斑块与后循环脑梗死关系的研究

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〔摘 要〕 目的 运用 3. 0T 高分辨磁共振颅内血管壁成像技术(HRMRI-VWI)，分析无症状性基底动脉粥样硬化斑块的形态学特征，研究其与后循环脑梗死的关系，进一步为临床工作提供有价值的信息。方法 在我院行磁共振血管成像(MRA) 发现基底动脉轻中度粥样硬化狭窄患者 60 例，均做高分辨磁共振颅内血管壁成像（HRMRI-VWI），有斑块者 45 例，然后对这些有斑块患者做磁共振头颅平扫及 DWI 检查，将患者分为两组，30 例急性联合亚急性梗死患者(A 组) 、15 例慢性及无梗死患者(B 组)，分析斑块的形态特点，研究其与后循环梗死的相关性。结果 通过分析斑块成分特征，30 例 A 组中 23 例患者斑块为不稳定斑块，7 例为稳定斑块，15 例 B 组中 10 例患者斑块为稳定斑块，5 例为不稳定斑块，得出差异有统计学意义(P ＜ 0. 005) 。结论 基于 3. 0T 高分辨磁共振颅内血管壁成像技术（HRMRI-VWI）通过对无症状性基底动脉粥样硬化斑块分析，可以预测后循环脑梗死患者，为临床工作提供有价值信息。

PU-0630

Resting-State Functional Magnetic Resonance Imaging Study of Characteristics of Brain Function and Structure in Early

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[Abstract] **Objective** Using resting-state functional magnetic resonance imaging(Rs-fMRI), we explored characteristics and significance of spontaneous brain activity in early Parkinson's disease (PD. **Methods** 29 patients with early PD (PD group) and 30 matched healthy controls(HC) underwent resting-state fMRI scanning.Methods of ALFF, ReHo and rsFC were used to analyze the state of brain functional activity in resting state of early PD. For Rs-fMRI data between groups we adopted the method by which was based on voxel two sample *t*-test with REST software.Using the partial correlation analysis to observe the UPDRS score and different brain regions of early Parkinson's disease patients.Both the differences of data were expressed by the international generic statistical parametric mapping. **Results** Compared with the HC group, mALFF in PD group decreased in the bilateral postcentral gyrus, posterior cingulate gyrus, middle occipital gyrus and cerebellum posterior lobe;left primary motor cortex, fusiform gyrus, inferior occipital gyrus, cuneus, lingual gyrus,;right superior parietal lobule; increased in the bilateral insula, right putamen and the right cerebellum anterior lobe .The left cuneus was negatively correlated with UPDRS score;the average activation strength of these regional in PD group decreased in the bilateral primary motor cortex, supplementary motor cortex, postcentral gyrus and anterior cingulate gyrus;left middle frontal gyrus, middle occipital gyrus and

precuneus;increased in the left insula and right middle temporal gyrus.These different brain regions were no correlated with UPDRS score. When the bilateral putamen as the regions of interest,compared with the HC group,PD group exhibited decreased rsFCs in left and right putamen; the bilateral anterior cingulate gyrus, inferior frontal gyrus;left middle frontal gyrus and superior temporal gyrus;increased rsFCs in the bilateral primary motor cortex, postcentral gyrus and left medial frontal gyrus. **Conclusion** The early PD patients had a wide range of the loss of brain neurons function, It may be a complex neuropathological basis for PD multi system involvement.

PU-0631

MRS 对儿童 OSAHS 脑代谢变化的初步研究

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目的 用磁共振波谱(magnetic resonance spectroscopy, MRS)探讨儿童阻塞性睡眠呼吸暂停低通气综合征（OSAHS）大脑代谢及功能的变化。**方法** 对 20 例 OSAHS 患者和 20 例正常者（NC）行磁共振波谱扫描和多导睡眠呼吸监测（PSG），记录两组双侧额叶脑白质的 NAA/Cr、NAA/Cho、Cho/Cr 比值和有无乳酸（Lac）的出现；并记录两组 PSG 监测指标。采用两独立样本 t 检验分析两组代谢物及 PSG 监测指标的变化, OSAHS 组双侧额叶脑代谢物与 PSG 监测指标进行线性相关性分析。**结果** OSAHS 组 NAA/Cr、NAA/Cho（2.1925±0.1437、1.5861±0.1713）较对照组（2.7901±0.1437、1.9745±0.1632）明显降低（P 值分别为 P＜0.0001、P=0.0001），Cho/Cr（1.2937±0.1352）较对照组（1.1823±0.1925）明显升高（P=0.0031），差异具有统计学意义(P 值均＜0.05)。各被测者均未见 Lac 峰。OSAHS 组的 AHI 与双侧额叶 NAA/Cr、NAA/Cho 呈负相关（r 值分别为-0.635、-0.617，P 值分别为 0.003、0.004），而与 Cho/Cr 无相关性（r=0.029，P=0.904），$MSaO_2$与双侧额叶 NAA/Cr、NAA/Cho 呈正相关（r 值分别为 0.630、0.640，P 值分别为 0.001、0.002），而与 Cho/Cr 无相关性（r=0.008，P=0.974）。**结论** *^1H-MRS* 能较早监测儿童 OSAHS 脑代谢的变化，为临床治疗和效果评价提供客观的影像学依据。

PU-0632

全脊柱磁共振成像诊断脊柱脊髓病变的价值

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目的 探讨全脊柱磁共振成像诊断脊柱脊髓病变的价值。
方法 使用 Philips Achieva 1.5T 双梯度超导磁共振成像系统和全神经系统组合线圈，对 78 例脊柱脊髓病变的患者进行全脊柱磁共振扫描，分析研究得到的磁共振图像。
结果 图像质量：75 例图像显示较好，2 例显示欠佳，1 例运动伪影，图像显示良好率占 96.2%。磁共振表现：本组 78 例病例中，其中正常 8 例，转移瘤 12 例, 外伤 16 例, 脊柱侧弯伴脊髓空洞 19 例，脊柱结核 3 例,脊髓肿瘤 5 例,炎症 4 例, 椎间盘病变 11 例。
结论 全脊柱磁共振成像能够清楚显示脊柱脊髓本身及周围的病变情况，对脊柱脊髓病变的诊断及后续治疗等具有重要的价值。

PU-0633

MSDE 准备后的 T1-FEE 增强序列对脑转移瘤的诊断效能的评估

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目的 通过与常规 T1-FEE 序列增强扫描对比，评价运用了磁共振黑血运动致敏驱动平衡改良技术（improved motion sensitized driven equilibrium, iMSDE）的增强扫描序列对于脑转移瘤的诊断效能。
方法 对 15 名怀疑或诊断为有脑转移瘤的病人，运用场强为 3.0T 的飞利浦 CX 磁共振机器，进行 T1-FFE-无 iMSED 准备序列增强扫描、T1-FFE-iMSDE 准备序列增强扫描。3 位放射诊断医生快速、独立对上述三项序列进行阅片，独立判定患者脑转移瘤的数量。通过灵敏度、特异度、读片时间评价三个序列的诊断效能。
结果 15 名患者均存在脑转移瘤，共发现 125 个转移瘤。T1-FFE-non iMSDE 增强、T1-FFE-iMSDE 增强对于脑转移瘤的的敏感度分别为 83%、100%，特异度分别为 100%、93%，平均每个病人快速读片时间为 81 秒、72 秒，三项评价指标有统计学差异。
结论 应用了 iMSDE 准备的增强扫描序列，相对没有应用的，有更高的灵敏度，能帮助阅片医生发现更多的脑转移瘤，并节约阅片时间。但是其假阳性率较高，需要进一步优化序列设置。

PU-0634

Histogram analysis of apparent diffusion coefficient maps for WHO grade II/III glioma molecular subtyping

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Purpose: To explore the role of histogram analysis of apparent diffusion coefficient (ADC) maps based on entire tumor volume data in differentiating molecular subtyping of WHO grade II/III glioma. **Materials and Methods:** Twenty-one patients underwent diffusion weighted magnetic resonance imaging with b values of 1000, and the corresponding ADC maps were calculated. Regions of interest containing the lesion were drawn on every section of the ADC map containing the tumor and were summated to derive volume-based data of the entire tumor. Histogram parameters were compared among subtypes. Receiver operating characteristic (ROC) curves were constructed to research the value of histogram parameter in differentiating subtypes. **Results:** The 25th, 50th and 75th percentiles of ADC values showed significant differences between IDH mutant & 1p19q intact type and IDH mutant & 1p19q co-deleted type, IDH wild type ($p<0.05$). The 25th, 50th and 75th percentiles of ADC values were highest in IDH mutant & 1p19q intact gliomas ($1312\times10^{-6}mm^2/sec$, $1629\times10^{-6}mm^2/sec$, $1889\times10^{-6}mm^2/sec$), while the first two values before showed lowest in IDH-wild type ($874\times10^{-6}mm^2/sec$, $1156\times10^{-6}mm^2/sec$). ADC histograms of IDH wild type showed a higher relative frequency at low ADCs compared with IDH mutant 1p19q co-deleted and 1p19q intact gliomas. The left shift of the cumulative histograms of it was more obvious. The 50th and 75th percentile of the ADC values histogram were accurate in differentiating IDH mutant & 1p19q intact and IDH wild type ($p<0.05$). **Conclusions:** Histogram analysis of ADC maps based on entire tumor can be a useful tool for WHO grade II/III glioma molecular subtyping. The 50th

and 75th percentile of the ADC value were valuable parameters for differentiating subtyping in grade II/III gliomas.

PU-0635
室管膜下巨细胞星形细胞瘤的影像学及病理学特征：附 1 例报告并文献复习

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目的 报告一例室管膜下巨细胞星形细胞瘤的影像表现及病理特征，以提高对脑内少见肿瘤的诊断与鉴别诊断。
方法 回顾性分析我院诊治的 1 例室管膜下巨细胞星形细胞肿瘤患者的临床、影像学及病理资料，并复习相关文献。
结果 该例患者入院前 10 天无明显诱因出现双颞叶针刺样疼痛，MR 示病灶位于双侧侧脑室前角，呈不规则团块状稍长 T1 稍长 T2 信号影，Flair 呈高信号，DWI 呈高信号，ADC 呈低信号，其内信号不均匀，内见结节状低信号影及斑片状更长 T2 信号影，病灶呈分叶状，增强后呈明显不均匀强化。本例患者行开颅病灶切除术，术后病理诊断为室管膜下巨细胞星形细胞瘤，肿瘤为边界清楚的结节生长模式，内见大量薄壁血管，瘤细胞围绕血管生长，部分胞浆丰富，部分细胞为梭形细胞，局部呈节细胞形态。术后随访 5 月余，未见肿瘤复发、进展或转移，患者自觉良好。
结论 室管膜下巨细胞星形细胞瘤是一种中枢神经系统的罕见良性肿瘤，典型的发生在侧脑室壁，WHO 分级为Ⅰ级。细胞形态学多样，诊断时需要与肥胖型星形细胞瘤、节细胞胶质瘤、胶质母细胞瘤、室管膜瘤、横纹肌样脑膜瘤等鉴别。

PU-0636
脑缺血病变中反应性星形胶质细胞增生的常规及功能磁共振成像研究

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摘要: 目的 研究脑缺血性病变中星形胶质细胞增生的磁共振成像(MRI)及功能磁共振成像 表现，并分析其特征以提高对该病的诊断价值。方法 回顾性分析 2018 年 1 月至 2019 年 1月经手术及病理检查证实、且有完整病程记录的缺血性脑血管病伴星形胶质细胞增生患者 20 例的 MRI 表现。症状为头痛、头晕 15 例，面部肌肉抽搐 1 例，反复发作性意识丧失 4 例。扫描设备用 GE Sigma 3.0 T MR 扫描仪，均行常规 MRI 、增强 MRI 扫描、功能成像弥散加权成像（DWI）、检查灌注加权成像（PWI）检查。结果 20 例患者中，病变位于右侧额叶和左侧颞叶各 5 例，左侧额叶 6 例，脑桥 1 例和右侧小脑半球 3 例。临床表现为轻度缺氧缺血细胞凋亡主要局限于皮质下白质，星形胶质细胞增生持续较久；重度缺氧缺血可致缺血侧大脑半球广泛的细胞凋亡，星形胶质细胞增生短暂且强烈。组织学表现为神经节细胞变性、神经细胞嗜节现象及胶质细胞增生。MRI 显示，病灶表现为皮质或皮质下脑组织肿胀，呈片状或条状略长 T1、长 T2 信号; 在 FLAIR 序列上病灶呈略高信号，增强扫描轻度强化，DWI 显示为稍高信号，PWI 大部分区域无血流灌注或显著低灌注。结论 MRI 及其功能序列对脑胶质细胞增生的诊断正确率较高且能综合多序列影像，对脑胶质细胞增生的基础和临床研究具有一定的指导作用。

PU-0637

Altered interhemispheric resting-state functional connectivity in type 2 diabetes patients

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Purpose: Abnormalities in structural and functional brain connectivity have been increasingly reported in Type 2 diabetes mellitus (T2DM) patients by recent neuroimaging studies. However, few studies used voxel mirrored homotopic connectivity method to investigate the changes of homotopic connectivity in T2DM. The present study aims to examine the interhemisphere functional connectivity of the whole brain in T2DM during resting-state.
Method: Resting-state functional MRI data was acquired from 29 T2DM and 33 gender-and age-matched control subjects. Indices of interhemispheric homotopic functional connectivity were derived with voxel-base whole-brain voxel-mirrored homotopic connectivity (VMHC) analysis. Pearson correlation analyses were used to explore the correlations between interhemispheric homotopic functional connectivity changes and clinical and cognitive variables of T2DM.
Results: The patients with T2DM showed lower VMHC than normal controls in the medial frontal gyrus, superior occipital gyrus, posterior cingulated cortex, lingual gyurs. There were significant correlations between the VMHC values in medical frontal gyrus, lingual gyurs and verbal fluency test.
Conclusion: These findings suggest substantial impairment of interhemispheric coordination in T2DM, which was positively correlated with cognitive function. Our results might provide powerful new insight into the neural mechanisms that underlie the diabetes-related cognitive decline.

PU-0638

应用 APT 成像鉴别高级别胶质瘤和颅内转移瘤

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目的 研究酰胺质子转移成像对颅内转移瘤和高级别胶质瘤的鉴别诊断
方法 对 2017 年 7 月-2019-5 月在山东省医学影像研究所行 MRI 检查并对病变最大横截面行 APT 成像的 50 里颅内转移瘤和高级别胶质瘤患者，对肿瘤区域勾画瘤体区、瘤周水肿区及对侧正常脑白质区域的非对称磁化转移率（MTR 值）。应用受试者特征曲线比较两者之间的区别。
结果 高级别胶质瘤的瘤体区的 MTR 值高于转移瘤的瘤体区，瘤周水肿区的 MTR 值没有明显差异。
结论 应用 APT 成像能够一定程度上鉴别高级别胶质瘤和转移瘤。

PU-0639

ASL 对脑星形细胞瘤分级辅助应用

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目的 探讨动脉自旋标记成像（ASL）灌注成像技术在星形细胞瘤分级中的应用价值。
方法 前瞻性选取医院收治颅内星形细胞瘤患者 20 例，其中 10 例高级别星形细胞瘤、10 例低级别星形细胞瘤患者。选取星形细胞瘤实质部分、对侧脑实质部分测定 r CBF，分析星形细胞瘤与正常脑组织差灌注情况及不同脑肿瘤的 ASL 灌注情况。
结果 ASL 灌注成像技术所得 r CBF 定量参数在星形细胞瘤较正常脑组织 r CBF 均有所增高，高级别星形细胞瘤较低级别星形细胞瘤 r CBF 增高更为明显。
结论 ASL 能定量反应肿瘤微循环的灌注情况，与 MRI 常规序列联合应用，多模态影像观察，对脑肿瘤定性诊断以及星形细胞瘤分级有重要参考价值。

PU-0640
产后妇女自发性神经元活动受损和认知功能障碍的关系

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目的 先前的研究已经证明产后期与认知功能障碍的风险增加有关。本研究旨在使用静息态功能磁共振成像（rs-fMRI）探讨无抑郁症的产后妇女是否存在自发性神经元活动受损以及确定这些异常和认知功能障碍之间的关系。**材料与方法** 使用 rs-fMRI 对产后妇女（n = 22）和未生育女性（n = 23）年龄和教育匹配方面进行了比较。我们计算低频震荡振幅（ALFF）和局部一致性（ReHo）值来评估自发性神经元活动以及确定 rs-fMRI 信息和认知能力之间的关系。**结果** 和未生育女性相比，产后妇女有显著异常的神经活动，主要是在后扣带回（PCC）、前额叶和小脑后叶。后扣带回 ALFF 和 ReHo 值降低与产后延迟复杂图形测试（CFT）得分呈正相关（分别 r = 0.693，P = 0.001；r = 0.569，P = 0.011）。此外，右侧额上回 ALFF 和 ReHo 值降低与画钟实验（CDT）得分呈正相关（分别 r = 0.492，P = 0.033；r = 0.517，P = 0.023）。**结论** ALFF 及 ReHo 测量反映的产后妇女自发性脑活动异常可能阐明产后认知障碍的神经生理机制。

PU-0641
颅内孤立性纤维瘤 MRI 特征及良恶性鉴别诊断

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孤立性纤维瘤是一种极少见的来源于软组织的间叶源性肿瘤，占软组织肿瘤的比例低于 2%，原发于颅内的孤立性纤维瘤(I-SFT）尤为罕见。笔者分析了 6 例颅内孤立性纤维瘤的 MR 影像学资料及病理资料，以提高该病诊断水平。
资料与**方法** I-SFT 病例 6 例，男 2 例，女 4 例。初次发病年龄 23-71 岁，平均约 47 岁。临床症状有反应迟钝、头痛、肢体乏力、视力进行性下降、呕吐、记忆力下降等，病程为 5 天至半年。6 例 I-SFT 均行外科开颅手术，手术证实病灶均起源于硬脑膜。MR 扫描**方法** 6 例 I-SFT 患者均采用 GE signal1.5T TWEEN SPEED 超导磁共振仪行 MRI 平扫及增强扫描。平扫采用横轴面、矢状位，扫描参数 T1WI(TR1700ms、TE8ms)、T2WI(TR4500ms、TE100ms)，扫描层厚 5.0mm，层间距 1.5mm。增

强扫描采用 T1WI 序列（TR300ms、TE1.9ms）行磁共振轴位、冠位及矢位增强扫描。影像分析**方法** 由两位有经验的副主任及以上医生进行磁共振征象诊断，判断肿瘤位置、大小（平均径线=（轴位最长径+最长径垂直径）/2）、信号、边界、增强程度、增强是否均匀、瘤周水肿程度、瘤内囊变、瘤内血管、脑膜尾征、颅骨或邻近结构改变。
结果 6 例 I-SFT 中，良恶性肿瘤各 3 例。肿瘤发生在幕上 5 例，跨越幕上及幕下 1 例。I-SFT 的 MRI 表现具有一定的特征性，当脑膜肿瘤呈分叶状，T2WI 信号欠均匀、增强后显著不均匀强化、特别是出现典型的“阴阳征”，脑膜尾征无或者不典型，肿瘤内见多发迂曲血管流空征象应考虑到 I-SFT 可能。根据肿瘤的部位、大小、信号、增强程度、脑膜尾征、瘤周水肿、瘤内囊变、瘤内血管等影像学征象难以判定肿瘤良恶性，如肿瘤边界不清、合并颅骨或邻近结构破坏提示恶性可能。
结论 颅内孤立性纤维瘤具有一定的 MRI 特征，但其确诊及良恶性鉴别仍需依靠组织病理学和免疫组织化学。

PU-0642

卒中后癫痫的 DKI 成像研究

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摘要：目的 探讨扩散峰度成像（DKI）对于卒中后癫痫患者的脑白质微观结构受损情况的评估。**方法** 选取符合纳入标准的 PSE 患者（病例组， n ＝39）及与之相匹配的梗塞后无癫痫者（对照组， n ＝39）作为对照组。DKI 数据分析采用 DKE 后处理后的图像划取感兴趣区测值的方法，应用 IBM SPSS25.0 将相关组内及组间参数值进行比较及相关性分析。**结果** 病例组：右侧壳核、右侧内囊前肢、后肢的 MD 值大于左侧；右侧壳核、右侧内囊前肢的 MK 值右侧大于左侧，右侧丘脑的 MK 值小于左侧；FA 值各区域间无明显统计学差异；对照组：右侧丘脑 FA 值小于左侧；右侧内囊前肢、后肢、右侧海马、右侧丘脑、右侧壳核 MD 值大于左侧；右侧壳核 MK 值大于左侧。**结论** 扩散峰度成像（DKI）可通过参数值的明显变化，进而更加敏感地检测出微细结构损伤及其偏侧性损伤。

PU-0643

卒中后癫痫的静息态脑功能磁共振成像研究

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摘要：**目的** 探讨静息态脑功能成像（rsfMRI）对于卒中后癫痫患者的脑白质微观结构受损情况的评估。**方法** 选取符合纳入标准 rsfMRI 的 PSE 患者（病例组， n ＝39）及与之相匹配的梗塞后无癫痫者（对照组， n ＝39），进行 rfMRI 成像采集数据，rsfMRI 分析采用静息态脑功能数据辅助处理（REST）及 SPM 方法。**结果** 双侧额叶、右侧海马、双侧内囊前肢 ALFF 值较对照组高。双侧枕叶、顶叶 ALFF 值病例组较对照组低；双侧额叶、颞叶、内囊前肢 ReHo 值病例组较对照组高，双侧枕叶、双侧小脑半球 ReHo 值病例组较对照组低。**结论** 静息态功能磁共振成像 rsfMRI 采用 ReHo、ALFF 算法可检出卒中后癫痫造成的局部脑组织血氧水平依赖信号同步性的改变，进而可以确定 PSE 潜在的致痫灶。

PU-0644

MR 血氧水平依赖成像评估兔 VX2 瘤转移性淋巴结放射性治疗反应的可行性研究

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目的探讨 MR 血氧水平依赖成像评估兔 VX2 瘤转移性淋巴结放疗后反应的可行性。**方法** 28 只健康新西兰大白兔建立 VX2 瘤腘窝转移性淋巴结模型，分为放疗组（n = 16）和对照组（n = 12）。放疗组接受 20Gy 放疗，对照组接受假放疗。所有实验兔于放疗前（0 天）及放疗后 3、7、14 天（4 个时间点）行 MRI 扫描，测量参数：淋巴结的大小和 R_2^*值（s^{-1}）。在各时间点，每组随机处死两只实验兔，取腘窝淋巴结行病理学检查，分析参数：微血管密度（MVD，单位：条/高倍视野）和凋亡指数（AI（%））。比较两组间，以及组内各时间点间参数的差异，分析淋巴结大小和 R_2^*值分别与 MVD 及 AI 的相关性。**结果** 淋巴结的大小在两组间、组内 4 个时间点间均无显著差异（P均 > 0.05）。放疗组淋巴结在 0、3、7 和 14 天的 R_2^* 值呈逐渐升高趋势；MVD 呈逐渐减少趋势；AI 呈逐渐增加趋势。对照组淋巴结 R_2^* 值和 AI 在 4 个时间点间均无明显变化，但 MVD 呈逐渐增加趋势。两组间淋巴结的 R_2^* 值和 MVD 在 3、7、14 天有显著差异，而 AI 在 7、14 天有显著差异（P均< 0.05）。淋巴结 R_2^*值，而不是淋巴结的大小，分别与 MVD 及 AI 有显著相关性（r 分别为-0.87 和 0.94）。**结论** MR 血氧水平依赖成像间接反映放射性治疗后转移性淋巴结内部乏氧状态，具有潜在的评价放射性治疗反应的价值。

PU-0645

失神癫痫发放状态切换下的脑功能梯度改变

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目的 失神癫痫是儿童常见的癫痫类型，其特征为发作状态下失去意识。脑功能梯度方法是当前有效刻画脑内信息通路等级信息的技术。前人研究发现长期的疾病状态下患者的脑功能等级梯度被显著破坏。脑功能梯度的改变能否在状态切换中依然体现尚未可知。本研究采用同步 EEG-fMRI 扫描技术，结合脑功能梯度处理手段，尝试验证失神癫痫患者的状态切换下的脑功能梯度改变趋势，为失神癫痫的病理生理机制提供有效信息。
材料与**方法** 研究纳入 15 例失神癫痫患者。被试采集同步 EEG-fMRI 和高清结构 T1 图像。由有经验的神经科脑电图医生进行判读，每个被试均截取失神发作和无失神发作各一段。数据预处理采用 fmriprep 平台进行，主要完成了时间校正，头动校正，ICA 噪声去除。随后滤除白质和脑脊液平均信号，并行带通滤波（0.01-0.1Hz）。最终配准到 freesurfer 空间。采用皮尔逊相关构建全脑 vertex 水平的功能连接，采用 MICAOPEN 软件包计算被试的脑功能梯度。采用两样本 T 检验对发作状态和未发作状态的脑梯度进行统计分析。
结果 在发作状态和未发作状态中均发现了前人研究的脑主梯度分布图。在发作状态下，主梯度的低级网络脑区梯度增加（枕叶区域），高级网络梯度降低（默认网络/后扣带回、前额叶）。从总体梯度的分布来看，发作状态下，梯度分布整体向高梯度偏移。
结论 本研究初步研究了失神癫痫患者在癫痫发放状态切换中脑功能梯度的改变情况，发现发作状态脑整体向高级网络偏移，高级网络的信息集中优势受到抑制，这可能与意识丧失有关。本研究为失神癫痫的脑活动机制提供了一些客观指针。

PU-0646

MRI 扩散加权成像鉴别兔良恶性淋巴结实验研究

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目的 探讨扩散加权成像（diffusion weighted imaging，DWI）鉴别良恶性淋巴结的价值。**方法** 32 只健康新西兰大白兔，随机分为两组（每组 16 只），分别建立良性（16 个淋巴结）和恶性淋巴结（16 个淋巴结）模型。对所有实验兔均行 MRI 检查。在淋巴结最大层面上选取感兴趣区，获得淋巴结表观扩散系数（$ADC_{lymph\ node}$）；同时测量同层肌肉的 ADC 值（ADC_{muscle}），计算相对 ADC(rADC = $ADC_{lymph\ node}/ADC_{muscle}$)。采用两独立样本 t 检验分别比较良、恶性淋巴结 ADC 值与 rADC 值的差异；采用受试者工作特征曲线（ROC 曲线）分析 ADC 及 rADC 定性诊断淋巴结的效能。**结果** 良、恶性淋巴结在 DWI 上均表现为相对高信号。良、恶性淋巴结 ADC 值分别为（0.92 ± 0.13）× 10^{-3} mm^2/s^{-1}和（0.76 ± 0.08）× 10^{-3} mm^2/s^{-1}；良、恶性淋巴结 rADC 值分别为 0.71 ± 0.05 和 0.63 ± 0.05，良、恶性组淋巴结的 ADC 值及 rADC 值差异均有统计学意义(P 均<0.05)。利用 ADC 值鉴别良、恶性淋巴结的 ROC 曲线下面积为 0.83（最佳阈值为 0.84 × 10^{-3} mm^2/s^{-1}），利用 rADC 值进行鉴别的 ROC 曲线下面积为 0.88（最佳阈值为 0.66），二者比较无统计学意义（P ＞0.05）。**结论** DWI 对定性淋巴结病变有一定的价值，且 rADC 未能改善淋巴结的定性诊断。

PU-0647

3D-TOF-MRA 判断脑梗死脑内血管狭窄与高同型半胱氨酸血症相关性分析

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目的 本项目旨在研究 3D-TOF-MRA 判断脑梗死脑内血管狭窄与循环酶法检测 Hhcy 的相关性，科学指导临床从提前干预病因方面，减少脑梗死及其并发症、后遗症的出现。。方法 搜集 2015 年 11 月至 2019 年 5 月在我们医院住院病例 146 例，搜集其 MRI、MRA 图像及同型半胱氨酸检测数据，通过回顾性分析所搜集病例图像及数据，总结归纳分析 MRA 诊断脑血管动脉粥样硬化性狭窄及高同型半胱氨酸血症与脑梗死的相关性。结果 本组 146 例患者磁共振显示患有脑梗死 100 例，其中急性亚急性脑梗死 8 例，脑血管狭窄 83 例，脑血管无狭窄 63 例，高 hcy 84 例，Hcy 正常 62 例。磁共振 MRA 检出脑血管狭窄组脑梗死发病高于脑血管无狭窄组，有统计学意义，(P<0.05)；循环酶法检测出高 Hcy 组脑血管狭窄发病率高于正常组有统计学意义，(P<0.05)；循环酶法检测出高 Hcy 组脑梗死发病率高于正常组有统计学意义，(P<0.05)；平均血清 Hcy 水平脑梗死组高于对照组，有显著性差异(P<0. 05)。据以上分析脑血管狭窄为脑梗死的重要致病原因，高同型半胱氨酸是导致脑血管狭窄的重要原因，高同型半胱氨酸通过导致脑动脉硬化性狭窄引起脑梗死发病率增高。血清高 Hcy 是脑血管病的独立危险因素。结论 3D-TOF-MRA 为无创性检查，具有安全、快速的特点，可以较清晰的评价颅内血管狭窄和闭塞程度，且无 X 线辐射及对比剂过敏之虞。通过循环酶法检测出同型半胱氨酸血症，为提前干预治疗 HHcy 及预防脑动脉粥样硬化性脑梗死提供科学指导依据。通过本研究发现 3D-TOF-MRA 判断脑梗死的血管狭窄程度且与 Hcy 具有良好的相关性。临床应积极将 3D-TOF-MRA 与血清 Hcy 的测定作为常规检查，应用于脑血管疾病的早期筛查及病例复查，以预防脑梗死发病及其并发症、后遗症的发生。

PU-0648
CUBE T2 FLAIR 伴和不伴压脂序列在鼓室钆注射内耳成像中的比较

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目的 鼓室内注射钆对比剂后，行内耳三维各向同性快速自旋回波快速液体衰减反转恢复磁共振成像(three-dimensional isotropic resolution fast spin-echo fluid-attenuated inversion recovery magnetic resonance imaging，3D CUBE-FLAIR MRI)扫描，对比 3D CUBE T2 FLAIR 加压脂和不加压脂序列的内耳结构显像效果。**方法** 通过收集确诊梅尼埃病（患者组）和疑似梅尼埃病诊断标准（疑似患者组）的各 25 例患者，均进行双侧鼓室内注射钆对比剂，24 小时后进行内耳 3D 水成像（fast imaging employing steady state acquisition，FIESTA）、伴和不伴压脂 3D CUBE T2 FLAIR 磁共振检查，对比两组中各序列内耳结构显像（评分标准：完整清晰显示记为 2 分；局部部分缺失记为 1 分；大部分缺失或未显示记为 0 分），并分析总结。**结果** 两组中 3D CUBE T2 FLAIR 伴和不伴压脂序列之间均有统计学意义；伴压脂的 3D CUBE T2 FLAIR 内耳结构显像优于不伴压脂的序列；且在 3D CUBE T2 FLAIR 压脂和不压脂序列上，内耳外淋巴间隙高信号、内淋巴间隙低信号。**结论** 鼓室钆注射内耳成像中，3D CUBE T2 FLAIR 压脂序列能提供更多内耳细节结构，且背景组织干扰显示更优，较 3D CUBE T2 FLAIR 不压脂序列而言。

PU-0649
静息态功能磁共振在高血压偏头痛肝阳上亢证候分型中的研究价值

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目的:评估静息态功能磁共振成像(RS-fMRI)在高血压偏头痛肝阳上亢分型中的价值。方法:选取 24 例高血压偏头痛患者(肝阳上亢证型 11 例、非肝阳上亢型 13 例)与 24 名健康对照者,行 RS-fMRI 检查,对静息态功能磁共振图像应用 DPARSF2.2 进行后处理。并用 REST 软件进行局部一致性分析(ReHo),观察默认网络并比较三组间 ReHo 值差异。结果:(1)偏头痛组和对照组 ReHo 值在左侧海马、左侧额叶直回、左侧中脑、右侧上外额叶、右侧额中回等脑区不完全相等(P <0.05,Alphasim 校正)。(2)相比肝阳上亢组,非肝阳上亢组 Re Ho 值在海马旁回、梭状回、顶下小叶、左侧脑干、右侧小脑中脑脑区明显增高;在左侧大脑半球的壳核、颞中回、顶下小叶、额叶直回、扣带回等脑区 ReHo 值则有显著减低(P <0.05,Alphasim 校正)。结论:肝阳上亢证与非肝阳上亢证高血压偏头痛患者在边缘系统、基底节区、壳核等脑区存在显著差异有助于我们更好的了解偏头痛的中医辨证分型。

PU-0650
内耳 3D 水成像

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摘要：**目的** 测量人体内耳膜迷路的大小及位置等形态学参数，探讨双侧内耳膜迷路有无偏侧化、性别差异、年龄相关的改变。**方法** 对 60 位年龄范围 1-70 岁的正常人（其中男性 30 人，女性 30 人）的内耳膜迷路的形态学参数进行测量评价，之后对其形态学参数行性别、左右侧、和位置大小的关系等进行统计学分析。**结果** ①除膜迷路大小有性别差异外，余值无显著的性别差异②主要骨性结构的形态学参数均有显著的偏侧性。余内耳膜迷路形态学参数与年龄无显著的相关性。**结论** 全面了解内耳膜迷路的形态学特征，对感音神经性耳聋的诊断及耳蜗项目的应用有极其重要。

PU-0651

Study of functional connectivity alterations of default mode network and sensorimotor network in cervical spondylotic myelopathy patients

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Objective: To evaluate the difference of brain default mode network (DMN) and sensorimotor network (SMN) functional connectivity (FC) of cervical spondylotic myelopathy (CSM) by using independent component analysis (ICA), and the correlation with clincal scores and disease duration.
Materials and Methods: A total of 36 CSM patients and 30 sex-, age- and education-matched healthy controls underwent resting-state functional MRI (rs-fMRI) examinations. The fMRI data was analyzed by using independent component analysis (ICA), and default mode network and sensorimotor network component were extracted between two groups. The differences of functional connectivity between the patient group and the control group were compared by two sample *t* test ($P<0.05$, AlphSim corrected). Correlation analysis was performed for FC value of brain areas which had statistical differences in CSM and modified Japanese orthopaedic association scores(mJOA), disease duration.
Results: Compared with the control group, the FC value of DMN in CSM group significantly increased in left inferior occipital cortex and supramarginal gyrus, while decreased in right middle cigulum gyrus, left superior parietal lobule, praecuneus and medial frontal gyrus; the FC value of SMN increased in left anterior lobe of cerebellum, bilateral postcentral gyrus, while decreased in right praecuneus and left anterior paracentral lobule. There were no correlation between FC value and mJOA scores, disease duration (both $P>0.05$).

PU-0652

磁共振同时多层成像

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在磁共振成像技术中，如何提高成像速度一直是研究者们致力解决的问题。大量的临床研究提示了，利用多通道相控阵线圈并行采集技术和线圈几何空间结构特点，磁共振可以实现对扫描区域的同步并行激励，和同时采集多层图像，这就是同时多层成像技术（Simultaneous Multi-Slice,SMS）的由来，说明了在保证图像质量的基础上，磁共振的扫描时间能够被明显缩短，或者，可以实现超高分辨率成像。近年来，该技术日臻成熟。本文就同时多层成像技术（Simultaneous Multi-Slice,SMS）的历史由来、基本原理及技术改进予以综述，以期得到更多启发，为临床和科研提供更多支持

PU-0653

3.0T MRI 联合低浓度对比剂 CE-MRA 和灌注成像 在急性缺血性脑卒中的应用价值

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目的 探讨在 3T MRI 联合低浓度对比剂增强磁共振血管成像(CE-MRA)和动态磁敏感灌注成像（DSC-PWI）在急性缺血性脑卒中的应用价值。 **方法** 收集南京市第一医院 2017 年 10 月-2018 年 3 月急性脑卒中患者 30 例，所有患者均接受低浓度对比剂 CE-MRA 和 DSC-PWI 成像，并于 24 小时内接受数字减影血管造影（DSA）检查。CE-MRA 和 DSC-PWI 均使用半剂量对比剂浓度（0.05mmol/kg）。通过与 DSA 对照，评估 CE-MRA 对血管狭窄诊断的准确性。CE-MRA 诊断血管狭窄及 DSC-PWI 诊断不匹配区的观察者间一致性检验使用 Kappa 分析。 **结果** CE-MRA 对头颈动脉低级别（<50%）及高级别（>50%）狭窄诊断的敏感性、特异性、阳性预测值、阴性预测值分别为 82.4%、100%、100%、93.8%及 100%、82.4%、93.8%、100%。CE-MRA 诊断动脉狭窄及 DSC-PWI 诊断不匹配区观察者之间一致性均好（分别为 κ=0.87、 κ=0.86）。**结论** 3T MRI 联合低浓度对比剂 CE-MRA 和 DSC-PWI 是一种可行的急性缺血性脑卒中 MRI 扫描方案。

PU-0654

Early postoperative delineation of infarction, residual tumor and edema after glioma resection using DWI and DSC-PWI combined with conventional MR imaging: comparison with independent factors analysis of infarct volume

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Abstract
Objective Postoperative infarction leads to a more aggressive recurrent pattern, and the infarct volume is also an independent factor of overall survival after glioblastoma surgery. Therefore, the aims of this study were to investigate the value of diffusion weighted imaging (DWI), dynamic susceptibility contrast perfusion weighted imaging (DSC-PWI) combined with conventional MRI (cMRI) in delineating

postoperative infarction, residual tumor and edema in glioma, and also to analysis the independent factors of postoperative infarct volume.
Methods 192 patients underwent surgeries with a newly diagnosed glioma (WHO II-IV) were retrospectively assessed. Values of the relative minimum ADC (rADCmin), relative mean T2 (rT2mean) and relative maximum CBV (rCBVmax) in early postoperative MRI (epMRI) were compared with respect to different lesion types (infarction, residual tumor and edema) by using Kruskal-Wallis H test. Receiver operating characteristic (ROC) curve was applied to evaluate diagnostic performances. Multiple linear regression analysis was used to assess the independent factors of infarct volume.
Results Among different lesion types, the rADCmin value of infarction region was the lowest with a value of 0.56±0.19 and the rCBVmax value of residual tumor was the highest with a value of 3.15±1.39. The rADCmin with the cutoff value of 1.15 could distinguish infarction region from edema with an AUC of 0.99, which is higher than that of rT2mean and rCBVmax (0.79 and 0.70, respectively). The rCBVmax with the cutoff value of 1.69 could identify residual tumor from edema with a highest AUC of 0.97 comparing with rADCmin and rT2mean (0.86 and 0.73, respectively). And the accuracy of rCBVmax and rADCmin in the differentiation between residual tumor and infarction were similar with an AUC of 0.99 and 0.98, respectively. Multivariate analysis identified that tumor grade (p=0.027) and the postoperative cavity volume (p=0.003) were independent factors of infarct volume.
Conclusions The combination of DWI, DSC-PWI and cMRI can accurately identify postoperative infarction, residual tumor and edema. Such imaging techniques are valuable and easy to perform in clinical practice with an immediate clinical effect. Tumor grade and postoperative cavity volume in patients with glioma have an important impact on postoperative infarct volume, which may provide novel and valuable information for surgery planning.

PU-0655
高分辨率磁共振在匹伐他汀对富脂核心不稳定颈动脉斑块疗效中的应用研究

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目的
利用 3.0T 高分辨率磁共振评估不同剂量的匹伐他汀对富脂核心不稳定颈动脉斑块的疗效，并探讨斑块变化与血脂及炎症指标的关系。
方法
经 3.0T 高分辨率磁共振发现有富脂核心的颈动脉斑块的患者（N=60），随机分配到高剂量（N=30，4mg/天）和低剂量（N=30，2mg/天）组中接受匹伐他汀治疗。高分辨率磁共振成像及实验室检查均在治疗前和随访结束时进行，随访时间 48 周。根据患者的血脂和炎症指标变化水平，结合磁共振特征的改变进行相关分析，为了便于比较数据变化幅度的大小，对数据并进行变化百分率的转换。
结果

①高分辨率磁共振 PT、WA、NWI、LCA 均有降低，LA 有升高（P＜0.05）；TVA 在治疗前后则无明显变化（P＞0.05）； %PT、%LA、%WA、%NWI、 %LCA 在高剂量组中较低剂量组高（P＜0.05）。②血脂及炎症指标：TC、LDL-C、TG、hsCRP、IL-6 均有降低，HDL-C 均有升高（P＜0.05）。%TC、%LDL-C、%HDL-C、%TG 在高剂量组中较低剂量组高（P＜0.05）；%hsCRP、%IL-6 在两个组别中无明显差别（P＞0.05）。③多重线性回归分析发现，%LCA 与%LDL-C、%HDL-C，%PT 、%NWI 与%LDL-C 呈多重线性回归关系。

结论

高分辨率磁共振是一种评价他汀类药物治疗富脂性颈动脉斑块疗效的有效工具。匹伐他汀能够使患者的血脂及炎症反应减低，逆转富脂核心不稳定颈动脉斑块，以脂质成分改善明显，在有效剂量范围内，相比低剂量匹伐他汀，高剂量作用更大。

PU-0656

The study of T2-weighted trace map of diffusion tensor imaging in healthy optic nerve

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Objective To quantitatively study the manifestation of T2-weighted trace (T2-WT) parameter map of Diffusion tensor imaging (DTI) in healthy optic nerve. **Methods** Sixty-eight healthy right-handed volunteers (36 men, 32 women; mean age, 38 years; range, 9-78 years) were recruited in this study. DTI and conventional MRI were performed on all subjects. The mean T2-WT, fractional anisotropy (FA), mean deviation (MD), λ//, and λ⊥were obtained for quantitative analysis. Differences between right and left eyes, and differences between males and females were both evaluated by using paired t-test and independent-samples t-test respectively. Further analyses were performed to determine the correlation of T2-WT in 68 eyes (136 optic nerves) of subjects with FA, MD, λ//, λ⊥, and age, respectively. **Results** In healthy right-handed volunteers, the value of T2-WT from left nerves was higher at 390.7±88, compared with 371.4±87 from right nerves (P<0.01), while FA, MD, λ//, λ⊥ between left and right nerves showed no significant differences (P>0.05). No significant differences between males and females were seen in T2-WT, FA, MD, λ//, and λ⊥ calculated from DTI (P>0.05). In addition, there were negative correlation of T2-WT with MD, λ//, λ⊥respectively (r=-0.374, -0.361, -0.348, respectively, P=0.000), , but no correlation with FA and age (P>0.05). **Conclusion** T2-WT of optic nerve shows left dominance in normal right-handed group. As an isotropic parameter of DTI, T2-WT has significant relationship with MD, λ//, λ⊥. In addition, values of T2-WT do not decrease with the increasing age.

PU-0657

Abnormal dynamic functional connectivity of hippocampus subregions in obstructive sleep apnea

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Objective: To determine whether aberrant dy-FC exists between the hippocampus subregions and other brain areas and whether such abnormalities are related to emotional disorders and cognitive impairment in OSA.
Methods: The resting-state functional magnetic resonance imaging (dy-fMRI) data of 20 severe OSA patients and 24 matched healthy controls (HCs) were collected. The dyFC between the hippocampus subregions and other brain areas was compared between the two groups. The correlations between aberrant dy-FC and clinical variables and neuropsychological assessments were evaluated.
Results: Intergroup differences in the dy-FC of the hippocampus subregions The rsFC patterns of the precuneus subregions The rsFC map of each hippocampus subregion for each group is depicted in Fig. 2 ($P < 0.05$, FDR corrected). Howerer, we did not find any significant difference between OSA and healthy controls in the rsFC maps. The dyFC patterns of the precuneus subregions .Compared to the healthy controls, patients with OSA had increased dyFC between the right RH and the left frontal mid ,left CH and Precentral, right CH and right Lingual left Fusiform .

Conclusion: In this study, severe OSA patients showed complex dy-FC patterns in the hippocampus subregions, which may be the result of OSA-related selective damage to the hippocampus, and abnormal dy-FC between the hippocampus subregions and brain regions associated with emotional, cognitive and executive functions may partly explain the affective defificits and cognitive impairment observed in male severe OSA patients.

PU-0658
利用 MEGA-PRESS 探索正常人上份脑干 GABA+含量的可行性研究

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背景与目的 γ-氨基丁酸(GABA)是脑内主要的抑制性神经递质，其在脑组织内的含量极低，常规磁共振波谱（MRS）技术无法测量其含量。MEGA-PRESS 采用新的编辑技术可以分离出 GABA 在 3.0ppm 处的波峰，进而测量其含量。虽然用质子磁共振波谱法(^{1}H-MRS)测定颅脑内 GABA 水平已经有一段时间，但对于上份脑干水平 GABA 是否可以测量还存在争议。本研究的目的是用质子磁共振波谱(MRS)测定健康志愿者中脑γ-氨基丁酸(GABA)水平，并探讨中脑γ-氨基丁酸(GABA)与年龄的是否具有相关性。**材料与方法** 对 22 名年龄在 20 至 76 岁之间的健康志愿者进行了 GABA+水平检测。采用 3.0T 扫描仪（型号： Philips Achieva TX, Best, Netherlands)，颅脑 8 通道线圈，MEGA-PRESS 序列检测上份脑干 GABA+水平，用 Gannet 软件进行光谱处理。检测到的 GABA+信号，是 GABA、大分子(MMS)和高碳酸钙的复合信号。在测定上份脑干 GABA+时选取了较小的 ROI(10×25×30 cm)。**结果** 用质子磁共振波谱法(^{1}H-MRS)可以测定健康志愿者上份脑干区域 GABA

水平，并且 ROI 降至 10×25×30 mm；其含量约为 2.47±0.66(ｘ±SD)，本研究发现上份脑干 GABA 含量与年龄无显着相关性。**结论** 本研究对健康志愿者上份脑干 GABA 水平的测定表明，GABA 上份脑干含量可以用较小的 ROI 来测量，并且研究发现健康志愿者的 GABA 水平与年龄无关，这可能是由样本量较小引起的。

PU-0659

Examining alterations in GABA levels in the upper brainstem of patients with Parkinson’s disease by MEGA-PRESS MRS

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Abstract Purpose: To explore the changes of gamma-aminobutyric acid (GABA) in the upper brainstem in healthy volunteers and Parkinson’s Disease (PD) patients using MEGA-PRESS magnetic resonance spectroscopy. **Methods:** 18 healthy volunteers, 30 patients with PD were included in this study. GABA+ levels in the upper brainstem were measured by using MEGA-PRESS. The GABA+ levels of healthy volunteers and PD were analyzed using analysis of covariance. The relationship between GABA+ levels and NMSQ were also analyzed. **Results:** GABA+ levels were lower in the upper brainstem regions of PD patients(2.53±0.69) compared with healthy controls(2.94±0.64) ($P < 0.05$). A significant positive correlation was found in PD between GABA levels and NMSQ (r^2=0.177, P=0.021). **Conclusion:** The GABA+ level in PD was lower than in healthy volunteers in the upper brainstem, which suggests a potential link between abnormalities of the GABAergic system and the pathogenesis of PD. This study also demonstrates a positive relationship between regional GABA levels and NMSQ in PD.

PU-0660

Magnetic resonance Propeller technique in reducing signal loss artifacts in sinus

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Purpose
iterative decomposition of water and fat with echo asymmetric and least-squares estimation(IDEAL) are often used to achieve uniform water-fat separation that is insensitive to Bo inhomogeneities. but in boundaries of different magnetic substances such as bone, gas and soft tissue surface will lead to signal loss or fat-water “swapping”. Which serious impacts on MR image quality. Periodically rotated overlapping parallel lines with enhanced reconstruction(Propeller) scanning technique, acquire images using a specific filling pattern to collect data spirally by radial

blades till all data in K space are acquired. Propeller technique reduces signal loss artifacts caused by magnetic-susceptibility at a great extent.

Methods

A total of 30 patients were performed routine sinus MR examination (17 males and 13 females, age:51.9 ± 16.5) were enrolled in this study with ethic committee approved. underwent Propeller T2WI and the images were compared with IDEAL T2WI sequence. An eight-channel head coil was used for axial Propeller T2WI sequence of the sinus: TR 4058ms, TE 115 ms, slice thickness 5 mm, slice gap 1.5 mm, bandwidth 50KHz, Field of view 24 cm×24 cm, No.of excitation 3, and scanning time 97 s; axial IDEAL T2WI sequence: TR 2225 ms, TE 69.3 ms, scanning matrix 384×224, bandwidth 62.5KHz, Field of view 24 cm×18 cm, slice thickness 5 mm, slice gap 1.5 mm, No.of excitation 3, scanning time 135 s.

Images were evaluated using a 4-point Likert scale (1, nondiagnostic; 4, outstanding).Bland-Altman analysis was used to analyze the consistency of image quality score of two observers (95% LOA) .The data were analyzed by SPSS 17.0 statistical software, and the samples were compared by non-parametric statistics. The results were compared with the Wilcoxon paired sign rank test, and the results were compared by the Friedman test. $P < 0.05$ was considered as statistically significant.

Results

The signal loss artifacts of 30 cases were significantly reduced by Propeller T2WI scanning, and the SNR and CNR, image quality were significantly improved, and pathological changes were well presented on the images (Figures 1,2).It is seen that the difference of the quality grading of sinus images obtained was within the 95% consistency interval, and the two observers showed good consistency(Figures 3). ($P < 0.001$).The total scores for Propeller T2WI and IDEAL T2WI images, respectively, were as follows: 115 and 81. Statistically significant difference was observed between Propeller T2WI and IDEAL T2WI ($Z=-4.540$, $P=0.000$).

Discussion

MRI has become an important medical imaging approach in sinus. How to reduce signal loss artifacts caused by magnetic susceptibility, and how to acquire MR images meeting the demands for diagnosis are important.

Magnetic susceptibility artifacts appear in boundaries of different magnetic substances such as the sinus,which including bone, gas and soft tissue surface. Because magnetic susceptibility is different, these substances will produce varied magnet effects after entering magnetic field, and the regional uneven magnetic fields will lead to signal loss in the tissue surfaces. and magnetic susceptibility artifacts are increased with magnetic intensity.

Propeller technique employs spiral data collection, which fills the data in k-space using a leaf blade with certain thickness. During k-space filling, the center of the blade was fixed, rotated along one direction, and connected with other blades to form an integral circle. Therefore, the data collection of every time can correct signal loss artifacts, During once data collection, although the blade only rotates a period, the data in central region of k-space is sampled for every strip. Therefore, during once data collection, the SNR and CNR of Propeller T2WI are significantly higher than IDEAL T2WI. Propeller technique producing high-resolution images with no signal loss artifacts, which are significant for clinical diagnosis.

PU-0661

RESOLVE DWI 序列在小儿垂体 MRI 中的应用

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目的 评估 RESOLVE DWI 序列在小儿垂体 MRI 检查中的图像质量及应用价值。**方法** 分析采用 RESOLVE DWI 序列进行小儿垂体扫描的 40 例病例，与采用常规 DWI 序列扫描的 40 例病例做对比，评估两者的图像质量并进行统计。**结果** 采用 RESOLVE DWI 序列扫描的小儿垂体比常规 DWI 的图像更清晰、伪影大为降低，差别有统计学差异。**结果** RESOLVE DWI 序列有效提高了小儿垂体 MRI 的图像质量，尤其在垂体占位病史的磁共振检查中，有较高的应用价值。

PU-0662

Effects of BMPER, CXCL10 and HOXA9 on neovascularization during early-growth stage of primary high-grade glioma and their corresponding MRI biomarkers

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Neovascularization is required in high-grade glioma (HGG). The objective of this study was to explore neovascularization-related genes and their corresponding MRI biomarkers during the early-growth stage of HGG. Tumor tissues from 30 HGG patients underwent perfusion MRI scanning prior to surgery were used to establish orthotopic xenograft models, pathologically analyze the tumor vasculature and perform transcriptome sequencing. The cases were divided into two groups based on whether the xenograft was successfully established. Microvascular density and BMPER, CXCL10 and HOXA9 expression of surgical specimens in the xenograft-forming group was significantly elevated and the microvascular diameter was significantly reduced, In vitro inhibition of BMPER, CXCL10 or HOXA9 in the glioma stem cell significantly suppressed its tube formation abilities. The in vivo experiment showed that BMPER was highly expressed in the early tumor growth phase (20 days), CXCL10 and HOXA9 expression was elevated with tumor progress, and spatially associated with tumor vasculature. Perfusion MRI derived parameters, rCBV, K_{trans} and V_p, were also increased in the xenograft-forming group. In conclusion BMPER, CXCL10 and HOXA9 promote early tumor growth and progression by stimulating neovascularization of primary HGG. The rCBV, K_{trans} and V_p can be used as imaging biomarkers to predict the expression of these genes.

PU-0663

3.0T MRI 3D 序列与 CS 3D 序列（Compressed SENSE）图像质量的对比讨论

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目的 探究 3.0T MRI 上使用 3D T1W 梯度回波序列与 CS 3D T1W 梯度回波序列图像质量对诊断的价值。
方法 选取了 25 例患者于 3.0T 磁共振进行头颅 MRA 检查。扫描采用 TOF 法，采用 T1W FFE TRA 序列。对同一患者分别采用 3D TOF T1 梯度回波 TRA 序列和 CS 3D TOF T1 梯度回波 TRA 序列各检查一次。随机采集多个扫描点，通过采集到的多个扫描点，选取采集到的比较重要的扫描点通过非线性重建。对比这两种序列对头颅 MRA 显示清晰程度及扫描时间。
结果:使用 3D TOF T1W 梯度 TRA 序列扫描时间 4.28min。SENSE:P reduction（RL）：2.5 S reduction （FH）:1:使用 CS 3D TOF T1W 梯度回波 TRA 序列扫描时间约为 2.42min。CS-SENSE:reduction：2：采用压缩感知技术 CS 3D TOF T1W 梯度回波 TRA 序列。
结论 CS SENSE 压缩感知成像可大幅度提高 MR 的扫描速度，增加图像空间分辨率，满足诊断要求。普通 3D TOF T1W 梯度回波 TRA 序列使用了并行采集，提高体素，来缩短扫描时间。提高了信噪比，降低了空间分辨率。CS 3D TOF T1W 梯度回波 TRA 序列通过压缩感知技术缩短扫描时间。原理：稀疏采样。

PU-0664

Population receptive field (pRF) measurements of attentional scope responses in human early visual cortex using fMRI

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Object: Visual attention is the mechanism by which attentional inputs are preferentially processed at the expense of distracters. However, how attentional scope influences spatial representations in human early visual cortex is unknown. Our study assessed the modulatory role of attentional scope on the spatial information content by using population receptive field (pRF) mothed.
Methods: In our experiment, thirteen right-handed neurologically healthy participants performed one-back tasks on identical streams of stimuli presented at either central fixation (focused attention condition) or all-around vision (distributed attention condition) while task-irrelevant mapping stimuli traversed the visual field. FMRI data were recorded at the same time. We analyze the difference of pRF size (σ), eccentricity and amplitude between conditions.
Results: We were able to reconstruct robust spatial representations across a range of eccentricities and for both attention conditions. Our result demonstrated a remarkable attentional modulation of early visual cortex on pRF size, location and amplitude. The pRF sizes increased more strongly with eccentricity under focused attention condition. Furthermore, the focused attention condition showed a smaller pRF size at foveal eccentricity in early visual area and a larger pRF size at peripheral eccentricity in V3 than distributed attention condition. In addition, attention scope also affected pRF locations in V3 area, with more eccentric at perifoveal visual degree under distributed vs. focused attention condition. While compared with distributed attention

condition, the amplitudes in early visual areas were significantly higher in the focused attention condition. Our data support that attention modulation occurs in the early visual cortex.
Conclusions: These results provide important insights into how human early visual field representations are affected by scope of attention.

PU-0665
Diagnostic Value of DWI Combined with Conventional MRI in Palatal Lesions

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Objective: To analyze the characteristics of conventional MRI and DWI sequences of palatal lesions and to explore the diagnostic value of combination in palatal lesions. **Methods and Materials:** A retrospective analysis was performed on MRI images of patients with palatal lesions which proven by pathology from January 2015 to December 2018. Each lesion was evaluated with conventional MRI characteristics, including size, location, morphology, inner texture, enhancement, capsule, bone destruction, nerve invasion and cervical lymph node. Diffusion weighted MRI were performed on a 3 tesla unit with b factors of 0 and 1000s/mm^2, and apparent diffusion coefficient (ADC) values were calculated. Statistical analyses were performed to assess the differential performance of each parameter separately and together. **Result:** A total of 86 patients (30 females and 56 males) with solitary palatal lesions were included in this study. In conditional MRI, capsule structure, nerve invasion and lymph node abnormalities were proven useful in the differential diagnoses of palatal lesions. Sensitivity and specificity of conditional MRI were 82.5% and 51.3%, respectively. The average ADC value of malignant lesions was $1\pm0.18\times10^{-3}mm^2/s$, which was lower than that of benign lesions of $1.53\pm0.34\times10^{-3}mm^2/s$, with statistical difference (P=0.001). The optimal diagnostic threshold of ADC value was $1.21\times10^{-3}mm^2/s$. Combination of conventional MRI and ADC values can increase sensitivity to 94.7% and specificity to 82.8%. **Conclusion:** DWI sequences combined with conventional MRI can contribute to accurate differentiation of benign and malignant palatal lesions. Besides, ADC value is an important diagnostic criterion.

PU-0666
双标记延迟时间 3D ASL 对急性脑梗塞取栓前后脑血流动力学的评估价值

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目的 探讨磁共振三维动脉自旋标记(three-dimensional arterial spin labeling, 3D ASL)采用双标记延迟时间(postlabeling delays,PLD)评估急性脑梗塞取栓前后脑血流动力学的应用价值。

方法 以行血管内机械取栓的急性脑梗塞患者为研究对象，所有患者均于发病 6h 内行 DWI、MRA 及 3D ASL，ASL 采用两个标记延迟时间进行扫描。取栓后 1-3 天复查 DWI 及 ASL，观察取栓前后脑血流灌注情况，计算取栓前梗塞侧晚到达逆行血流比例，评估取栓前梗塞侧晚到达逆行血流比例与取栓后 NIHSS 评分的相关性。**结果** 纳入 2017 年 7 月至 2018 年 9 月期间在我院血管介入科行急性脑梗塞机械取栓的患者 20 例，ASL 显示：PLD1.5s 均可见面积大于 DWI 高信号区的低灌注区，PLD2.5s17 例低灌注区缩小，仍可见缺血半暗带，3 例低灌注区范围无明显变化。取栓后复查造影显示责任血管灌注达 mTICI2b/3 级，ASL 显示 17 例低灌注区较取栓前明显缩小，1 例范围扩大，2 例梗塞区域出现片状高灌注区。取栓后大部分患者脑灌注明显改善，取栓前后梗塞侧脑血流量（cerebral blood flow,CBF）差异有统计学意义（$p<0.05$），取栓前梗塞侧晚到达逆行血流比例与取栓后 NIHSS 评分呈负相关。**结论** 双标记延迟时间的 3D ASL 能更客观的评价取栓前后的脑血流动力学改变，随着标记时间延长，CBF 图可以一定程度上评估侧枝循环血流储备，为急性脑梗塞的预后提供理论依据。

PU-0667

颅内孤立性纤维瘤/血管外皮瘤的影像学诊断

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摘要 **目的** 探讨颅内孤立性纤维瘤/血管外皮瘤(intracranial solitary fibrous tumor， SFT/hemangiopericytoma， HPC)的影像学特征。**方法** 分析 10 例经手术及病理确诊的颅内孤立性纤维瘤/血管外皮瘤的影像学结果。**结果** 10 例患者 9 例病变位于幕上，1 例跨越幕上及幕下，为类圆形或不规则形，有分叶，边缘清楚; CT 平扫病变表现为稍高密度影，增强扫描后病变均匀或不均匀明显强化;MRI 平扫，与脑实质相比，T1WI 上，5 例表现为等信号，2 例表现为低信号，3 例表现为混杂信号; T2WI 上 6 例表现为等信号，4 例表现为混杂信号; DWI 表现为低信号，增强扫描后病变均匀或不均匀明显强化。病变与硬脑膜呈窄基底相连 7 例(70.0%)、呈宽基底相连 3 例(30.0%); 5 例伴有脑膜尾征(50.0%); 瘤周见轻-中度水肿 7 例(70.0%); 最大径 2.5-5.6cm，平均(4.5±1.0)cm。结论 认识颅内孤立性纤维瘤/血管外皮瘤的的影像学特点，有助于患者的后续治疗和预后。

PU-0668

幕上室管膜瘤的影像学分析

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【摘要】 目的:总结分析幕上脑实质内室管膜瘤的影像学表现。方法:对经手术病理证实的 13 例幕上脑实质内室管膜瘤的影像表现及病理学结果行回顾性分析,13 例均行颅脑 CT 或 MRI 检查。结果 10 例病理分级为 II 级，病灶较小,位置表浅;3 例病理分级 III 级,病灶则多贴近脑室表面;11 例病变表现为囊实性,其中 10 例囊变位于病灶边缘,当病灶较大时,较大囊变部分多位于脑深部;所有病例均呈混杂长 T1、长 T2 信号影,实质部分内见多发点状低信号灶,实性部分 DWI 呈稍高信号;其中 5 例行 CT 检查者病变呈稍高密度。13 例扫描呈不均匀、分房分隔样强化;病灶周围的水肿程度与病理分级没有明确相关性。结论:幕上脑实质内室管膜瘤的 CT 及 MRI 表现有一定的特征性,术前诊断影应考虑到本病的可能。

PU-0669

磁共振新技术在颈神经根成像中的应用进展

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随着计算机的广泛应用，颈椎病的发病率越来越高，并且有年轻化趋势。颈椎病变可导致神经根受压迫和炎症刺激，引发一系列临床症状，严重影响患者的生活质量。因此，如何直观而清晰地显示其神经根形态和走行、并进一步明确受累神经根损伤程度等具有重大的临床意义。传统常规磁共振成像检查只能显示粗大周围神经干的大体解剖形态 ， 难以显示神经的细微结构，故在周围神经领域很少应用。随着高场强 MRI 及各种检查序列和后处理技术的开展应用，尤其是对功能成像技术的探索，使周围神经成像成为目前影像学检查中的研究热点。本文将围绕颈神经根的磁共振神经成像（MR Neurography，MRN）、DTI 成像等进行综述。

PU-0670

The relationship between patterns of remodeling and degree of enhancement in patients with atherosclerotic middle cerebral artery stenosis: a high-resolution MRI study

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Purpose: Recently, high-resolution magnetic resonance imaging (HR-MRI) has been more widely used to display characteristics of intracranial arterial vessel walls and has become a focus of research. The aim of this research was to investigate the relationship between remodeling patterns and degree of enhancement in patients with atherosclerotic middle cerebral artery (MCA) stenosis using HR-MRI.
Materials and Methods: From August 2015 to May 2016, 38 consecutive patients with unilateral MCA stenosis on time-of-flight (TOF) MR angiography were prospectively enrolled. The routine MR scan and the cross-sectional images of the stenotic MCA vessel wall on HR-MRI were performed in all patients. Among them, 17 patients displayed positive remodeling (PR) and the other 21 patients displayed negative remodeling or non-remodeling (non-PR). The patients displaying hyperintensities on diffusion-weighted imaging (DWI) in the territory of ipsilateral stenotic MCAs were considered to have had acute stroke. Subsequently, the differences in the degree of enhancement and the number of acute stroke patients between the PR group and the non-PR group were compared. The Spearman rank correlation analysis of the enhancement degree and the remodeling index was calculated.
Result: The PR group had more obvious enhancement plaques than the non-PR group (10 versus 3, P=0.006). The PR group also had a larger number of acute stroke patients than the non-PR group (15 versus 4, P=0.000). The spearman rank correlation analysis showed that the degree of enhancement had a weak positive correlation with the remodeling index (r=0.379, P=0.019).
Conclusion: The current study suggested that HR-MRI has emerged as a valuable method to reveal the characteristics of intracranial arterial walls and its association

with atherosclerotic plaques. The PR, obvious enhancement predicted vulnerable plaques that were more prone to causing acute stroke.

PU-0671
3.0TMRI 弥散权重神经成像在臂丛神经疾病与肿瘤性疾病中的应用

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目的 评价 DW—MRN 技术在臂丛神经可视化研究与臂丛神经丛性疾病的可行性以及临床应用中的的评价作用。
方法 40 例有臂丛神经性疾病的患者同时在 3.0TMRI 场强下行传统的磁共振序列与单向性 DW—MRN，对图像进行后处理，图像由两位专业的放射诊断医师独立的依从 5 分法对臂丛神经的解剖结构进行独立评价，主要需要显示臂丛神经结构的构成，走行，连续性，形态及信号，清楚显示外伤或者肿瘤性及臂丛神经疾病所致的各种征象，评价者首先使用 5 分法对常用磁共振序列进行评分，然后联合 DW—MRN 方法进行评判，同时对臂丛神经结构异常者也采用 5 分法进行评价，并使用 Kappa 分析进行资分析，最终将从单纯的依靠常用 MRI 序列与联合使用 DW—MRN 序列两种方法的比较，并且结合 ROC 分析相关性的方法来比较两种方法的诊断准确性。
结果 40 例臂丛神经的图像中，征象显示明确，主要征象包括，正常神经根消失或离断，连续性中断，创伤性脊膜囊肿，神经根形态消失或失常，神经根增殖等等。DW—MRN 联合普通臂丛神经显像法相比单纯的常规 MRI 显示方法显著的提升了臂丛神经的成像效果，（$P<0.001$），当评价臂丛神经疾病时，评价者组内对常规 MRI 序列的评分为（Kappa=0.48），但相对联合诊断的得分更高为（Kappa=0.62），DW—MRN 联合常规 MRI 扫描可以明显有效的提升单个评价者对臂丛神经疾病的诊断效能（$P<0.05$），但是与另一个评价者在同种方法下的诊断效能是相似的。
结论 DW—MRN 可以清晰的显示臂丛神经的解剖结构以及病变部位的改变，并显著提升臂丛神经性疾病的成像质量和诊断效能。

PU-0672
主观认知下降的主观性担忧与 APOE ε4 基因对皮层形态学影响

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目的:对自身感到认知下降，但是客观神经心理学测试在正常范围内的人群被定义为主观认知下降（subjective cognitive decline，SCD）。本研究通过结构 MRI 评价老年 SCD 的担忧以及客观性 APOE ε4 风险基因对其大脑皮层形态结构的影响，以期更深入理解老年 SCD 脑结构特征及其风险性评价。
材料与方法:依据中国认知障碍纵向队列（SILCODE），收集 88 名有担忧主诉的 SCD 和 48 名与之年龄、性别、教育程度匹配的无担忧 SCD。采集并分析结构 MRI，按照左右半球、全脑 7 个网络、网络内 47 个感兴趣脑区，分别得到不同尺度上的灰质体积（gray matter volume, GMV）、皮层表面积（surface area, SA）和皮层厚度（cortical thickness, Cth），通过协方差分析比较担忧主诉与 APOE ε4 基因在皮层形态指标上的作用。

结果:在半球尺度上，担忧和 APOE ε4 在全脑 GMV（p=0.001）与双侧 SA（左脑 p=0.001，右脑 p=0.003）上具有交互作用，未见 Cth 受到影响。在网络尺度上，担忧以及 APOE ε4 在左脑默认网络 GMV（p<0.001）和右脑腹侧注意网络 GMV（p=0.001）存在交互作用，同时具有两个风险因素的 SCD，比起具有单风险因素只担忧或者只携带 APOE ε4，其左脑默认网络 GMV 更小。同时发现 AVLT 再认分数与默认网络 GMV 有正相关性；抑郁分数与腹侧注意网络 GMV 有负相关性。在感兴趣脑区尺度上，右脑默认网络的颞顶联合区（p=0.027）存在担忧和 APOE ε4 的交互作用。
结论:对于老年 SCD 群体，担忧主诉和 APOE ε4 基因对 SCD 皮层形态学结构减少具有协同作用，网络尺度上的灰质体积改变与行为学表现具有显著相关性，为 SCD 中相关临床表型和基因型多种风险因素对脑结构作用的生物学机制提供了新的见解。

PU-0673

ADC 定量参数在高级别胶质瘤（HGG）与原发性中枢神经系统淋巴瘤（PCNSL）鉴别诊断中的临床应用

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摘要

目的 探讨 ADC 值在高级别胶质瘤（HGG）与原发性中枢神经系统淋巴瘤（PCNSL）鉴别诊断中的价值。

方法 回顾性分析经临床病理证实的 10 例 HGG 患者共 12 个病灶和 10 例 PCNSL 患者共 20 个病灶，分别进行常规 MRI 平扫及增强，扩散加权成像（DWI）扫描，总结两组常规 MRI 平扫、强化特点，并测量肿瘤实质区的 ADC 值，分析 PCNSL 和 HGG 两组之间囊变数量、出血、强化特点及 ADC 值有无差异。

结果 HGG 组 12 个病灶均发生囊变，6 个病灶有点状或片状出血，强化方式以花环样强化为主，部分呈片状不均匀强化。PCNSL 组 20 个病灶，3 例囊变坏死，未见出血，强化方式均明显均匀强化，部分呈握拳征。GBM 组肿瘤实质平均 ADC 值为（1.02±0.30）×$10^{-3}mm^2/s$，PCNSL 组肿瘤实质平均 ADC 值为（0.69±0.08）$10^{-3}mm^2/s$，两组肿瘤实质平均 ADC 值差异有统计学意义（t 值=3.71 ，p<0.05）。

结论 ADC 值结合 MRI 形态特点、强化方式可为 HGG 与 PCNSL 的鉴别诊断提供影像学依据。

PU-0674

The relationship between high density lipoprotein cholesterol and depressive symptoms is mediated by white matter integrity in major depressive disorder

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Aims: Major depressive disorder (MDD) has been linked to serum lipid level alterations. However, the neural substrates underlying this association remain poorly understood.
Methods: 49 patients with MDD underwent diffusion tensor imaging (DTI). Multiple diffusion parameters were calculated to measure brain white matter integrity. Peripheral venous blood samples were collected to measure serum levels of lipid

profiles including total cholesterol (TC), triglyceride (TG) and high density lipoprotein cholesterol (HDL-C). Hamilton Rating Scale for Depression was used to assess severity of depression symptoms. Correlations between serum lipid levels and white matter integrity were investigated using tract-based spatial statistics (TBSS). Further mediation analysis was performed to determine whether micro-structural integrity in those affected white matter regions mediates the relationship between serum lipid levels and depressive symptoms.
Results: A majority of patients with MDD had lower serum level of HDL-C but normal serum levels of TC and TG. There were positive correlations between serum level of HDL-C and fractional anisotropy (FA) in the genu, body and splenium of corpus callosum (CC), bilateral anterior and superior corona radiata (ACR and SCR), and left external capsule (EC), and negative correlations between serum level of HDL-C and radial diffusivity (RD) in the genu and body of CC, and left ACR and SCR. Moreover, white matter integrity in the genu of CC was a significant mediator of the association between serum level of HDL-C and severity of depressive symptoms.
Conclusions: These findings may provide new insight into intervention, treatment and prevention of MDD from the perspective of regulating serum lipids.

PU-0675

磁共振头颅 BPAS 血管扫描法的应用研究

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目的 评价磁共振头颅 BPAS 的血管扫描法（椎基底动脉系统扫描解剖成像）作为常规 TOF MRA 序列的补充序列在血管扫描中的临床意义。**方法** 收集我院头颅磁共振检查患者 36 例，采用优化参数后的 3D-TOF MRA 与优化参数后的 BPAS 血管扫描法结合对头颅进行扫描。比较分析 BPAS 血管扫描法对于椎基底动脉系统成像效果作为常规 TOF MRA 序列的补充序列在血管扫描中的临床意义，由一名主任医师评价血管图像质量整体显示情况。**结果** 在 3D-TOF MRA 序列扫描结束后，补充扫描 BPAS 成像序列可以清晰地显示椎-基底动脉，对于椎-基底动脉夹层的诊断很有意义。**结论** 在头颅 3D-TOF MRA 检查时，使用 TOF MRA 序列显示椎-基底动脉夹层效果不佳。补充扫描 BAPS 血管成像，可以提高的椎-基底动脉夹层病变的检出率，对于提高颅内血管图像质量，有很好的临床应用价值，可以作为磁共振常用序列使用。
关键词： 磁共振；并行采集技术；3D-TOF MRA；头颅血管成像;BPAS 血管成像

PU-0676

Selective micro-structural integrity impairments of the anterior corpus callosum are associated with cognitive deficits in obstructive sleep apnea

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Background: There is evidence that obstructive sleep apnea (OSA) patients have white matter integrity abnormality in the corpus callosum (CC). However, whether the CC subregions are differentially affected in OSA is largely unknown.
Methods: Twenty patients with OSA and 24 well-matched healthy controls underwent diffusion tensor imaging (DTI) and clinical and cognitive assessments. DTI tractography was used to reconstruct the CC which was divided into five subregions. Inter-group differences in multiple diffusion metrics of each CC subregion and their associations with clinical and cognitive variables were tested.
Results: In comparison to healthy controls, OSA patients exhibited white matter integrity alterations in the anterior CC, characterized by increased RD in the subregion 1 and reduced FA along with increased MD and RD in the subregion 2. Moreover, we found that the lower micro-structural integrity in the anterior CC was associated with worse performances in prospective memory and sustained attention in OSA patients.
Conclusions: These findings suggest that the selective impairments of the anterior CC may help clarify the neural correlates of cognitive deficits in OSA.

PU-0677
原发性早泄患者静息态精细脑区亚区功能连接的异常改变及其与抑郁状态的相关性

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目的 近年来，已经有一些研究表明脑结构和脑功能的异常可能在原发性早泄的病因学中起着重要的作用，包括原发性早泄患者特定脑区的皮层厚度增加（如：枕叶皮层、边缘系统等）、广泛的功能连接异常（如：颞中回、额下回、岛叶等）。然而传统的功能连接分析方法具有一定局限性，如：没有精准定位。因此，我们设计了基于中科院自动化所团队绘制 246 精细脑区亚区的脑网络组图谱以评估原发性早泄患者的精细脑区亚区静息态功能连接，并同时探讨其与抑郁状态的相关性。从 2018 年 12 月到 2019 年 6 月我们共招募了 27 例基于循证医学定义的原发性早泄患者以及 22 例年龄匹配且主诉无早泄的正常健康对照组男性。在获得医院伦理批准以后受试者签署知情同意书后，所有人都填写了一份详细的问卷，问卷内容主要包括：人口特征学数据（如年龄、身高、体重、学历、月收入、抽烟、饮酒情况等），既往疾病、手术史和性生活情况，以及 PEDT 和 Beck 抑郁量表。同时，所有人进行了全脑 MRI 的静息态 BOLD-fMRI 扫描。
结果 早泄组患者的年龄、月收入、BMI 等与对照组无显著差异，而 PEDT 评分及 Beck 抑郁量表评分显著高于对照组（PEDT：14.70±3.95 vs.2.91±2.51，P <0.001； Beck：11.78±7.55 vs.3.05±4.12，P <0.001）。而在不同亚区的静息态功能连接中，我们发现早泄组患者右侧腹侧颞中回与左侧颞中回，右侧前部颞中回与右侧海马旁回、左侧后部颞中回与双侧楔前叶的功能连接比正常组增强，同时，以上脑改变与原发性早泄患者抑郁评分无显著相关。
结论 精细脑区亚区静息态功能连接分析可以为原发性早泄患者的脑网络异常提供更精确定位。

PU-0678
探讨磁共振增强减影技术在颅脑出血性病变中的应用价值

翁强

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目的:探讨磁共振增强减影技术对颅脑出血性病变的应用价值。方法:收集 2015 年 6 月-2017 年 8 月期间 46 例行颅脑磁共振增强扫描并发现 T1WI 上有高信号出血病灶的患者，利用 3.0T MRI 扫描仪后处理工作站对增强前后的 GRE T1WI 序列进行减影。由 1 名高年资磁共振医师对常规组及减影组的图像进行分析。 结果:46 例中肿瘤出血 19 例，高血压出血 6 例，血管畸形出血 21 例。常规组 SI 相对信号强度均值为 0.27±0.241，减影组 SI 相对信号强度均值为 4.63±8.04，两者具有统计学差异（P=0.023）。常规组正确率为 50.0%（23/46），肉眼难以识别率 32.6%（15/46），错误率达 17.4%（8/46），而减影组正确率达 95.7%（44/46），错误率仅为 4.3%（2/46），两者具有统计学差异（P=0.007）。结论:磁共振增强减影技术在颅脑出血性病变具有重要的临床应用价值。

PU-0679

多次静脉注射钆对比剂后小鼠脑内钆沉积的初步研究

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目的 使用小鼠模型在病理层面上验证钆对比剂脑内沉积现象。定量比较多次静脉注射线性钆对比剂钆喷酸葡胺（Gd-DTPA）、大环类对比剂钆特酸葡胺（Gd-DOTA）后小脑组织中钆沉积是否存在差异。

方法 将 45 只昆明白鼠随机分为 2 个暴露组（Gd-DTPA 组、Gd-DOTA 组）、1 个对照组（生理盐水组），每组 n=15。暴露组每次以 2.0 mmol Gd/kg（4.0 ml/kg）剂量共进行 20 次钆对比剂尾静脉注射（每周注射 4 次，持续 5 周）。在 2 周恢复期后，处死动物、获取组织，通过电感耦合等离子体质谱（ICP-MS）技术进行钆含量测定，采用单因素方差分析比较各组间小脑组织中钆含量差别是否具有统计学意义。

结果 恢复 2 周后，使用 ICP-MS 技术检测得到 Gd-DTPA 组小脑组织内钆含量最高，约是 Gd-DOTA 组小脑组织的钆含量 9 倍以上，分别为 8.767±0.059nmol/g、0.882±0.043nmol/g；但是在 Gd-DTPA 组小鼠小脑组织中检测到的总钆量仍然很低，大约为小脑组织总注射量的 0.0029%。生理盐水组未检测到明显的钆沉积（0.201±0.040nmol/g）。经单因素方差分析显示 3 组的钆含量比较差异有统计学意义（F=1.4×105，P<0.05），两两比较结果显示 Gd-DTPA 组、Gd-DOTA 组及生理盐水组 3 组之间钆含量均有统计学意义（P<0.05）。

结论 连续多次静脉注射线性、大环类钆造影剂后，小鼠脑内均出现钆沉积现象；线性钆对比剂脑内沉积量明显高于大环类钆对比剂。

PU-0680

Primary prostate solitary neurofibroma without neurofibromatosis-I: a case report and narrative review of the literature

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Neurofibroma of the prostate is an extremely rare benign tumor, particularly when it is not associated with neurofibromatosis-I (NF-1). This study aimed to report the case

of a 44-year-old man who presented with dysuria for about 4 years. Magnetic resonance imaging (MRI) showed a mass in the prostate with “target sign” on T2-weighted imaging. The mass was surgically excised, and histopathological findings revealed a neurofibroma. No clinical or laboratorial manifestations of NF-1 were identified. Also, no local recurrence occurred after the 3-month follow-up. This was the first case of prostate solitary neurofibroma without NF-1, and the “target sign” on MRI could supply some significant implications in the diagnosis.

PU-0681

头颅磁共振灌注成像最佳注药时机的研究

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目的 头颅磁共振灌注成像（perfusion- weighted imaging，PWI）采用对比剂首过灌注成像反映脑组织微循环分布及其血流灌注情况、评估局部组织活力和功能。研究不同注药期相来获得脑组织血流灌注的信号强度-时间曲线以探究其最佳注药时机，为 MR PWI 在临床应用研究迈出重要的一步。

方法 ：收集我院进行头颅磁共振灌注成像的无明确脑血管疾病的 160 名配合患者，随机分为 8 组，每组 20 名。使用西门子 3.0T Verio 高频 MRI 扫描仪，头部线圈，头颅灌注序列，双倍剂量 MRI 对比剂（钆喷酸葡胺，0.2mmol/kg），扫描范围自枕骨大孔至颅顶，常规 T1-sag、T2-tra、T1-tra、T2-flair 扫描后行 PWI，使用高压注射器进行静脉团注，注射速率统一为 4ml/s，注射对比剂结束后立即以相同速率注入 20ml 生理盐水，8 组病例分别于第 3、4、5、6、7、8、9、10 期注射对比剂。扫描结束后，图像资料传送到西门子后处理工作站，用 perf MR 软件后处理选择感兴趣区（ROI），以单侧大脑中动脉作为研究区域，选择可靠曲线经过计算机计算得到信号强度-时间曲线。由 2 名经验丰富的磁共振成像(MRI)诊断医师评价所有患者的图像，得到 160 例中第 3-10 期所有图像符合例数分别为 3、4、17、18、18、19、12、6 例，各期符合率分别为 15%、20%、85%、90%、90%、95%、60%、30%。

结果 根据各实验组划定的 ROI 后处理所得信号强度-时间曲线得到，不同注药期相所获得图像各有差异：第 3 期、4 期大部分二次灌注效应明显；第 5-8 期各例数灌注首过效应明显，符合实验要求；第 9-10 期对比剂通过时间延长，引起低灌注现象。

结论 本实验研究结果表明，头颅 PWI 第 5-8 期既能有效地改善二次灌注效应，也能避免低灌注现象，即可参考为头颅磁共振灌注成像最佳注药期相。

PU-0682

Abnormal resting-state functional connectivity of amygdala in primary angle-closure glaucoma: A seed-based functional connectivity study.

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Background: Glaucoma is the second leading cause of blindness and affected patients are at a high risk of anxiety and depression. However, the neural mechanisms underlying glaucoma-induced anxiety and depression remain unknown.
Purpose: The purpose of this study was to investigate alterations in amygdala-based emotional processing circuits in primary angle-closure glaucoma (PACG) patients by using resting-state functional connectivity (FC) analysis.
Materials and methods: Thirty-seven patients with PACG (20 men and 17 women) and 36 healthy controls (20 men and 16 women) closely matched for age, sex, and education, underwent resting-state magnetic resonance imaging scans. A seed-based correlation analysis was performed to investigate altered FC of the amygdala. A voxel-wise FC method was used to explore differences in amygdala FC patterns between the two groups.
Results: Compared with healthy controls, PACG patients showed reduced FC from the left amygdala to the bilateral brainstem, right thalamus, and left superior frontal gyrus; they also showed enhanced FC from the left amygdala to the left middle temporal gyrus, right inferior temporal gyrus, and left cuneus. In addition, PACG patients showed reduced FC from the right amygdala to the right cerebellum_4_5 and enhanced FC from the right amygdala to the right inferior temporal gyrus and right calcarine (two tailed, voxel-level: $P<0.01$, GRF correction, cluster-level: $P<0.05$).
Conclusion: Our results highlighted that PACG patients had abnormal FC between the amygdala and each of the following: superior frontal gyrus, thalamus, temporal gyrus, and visual cortices. This offers novel insights into the understanding of neural mechanisms underlying depression in PACG patients.

PU-0683

Selective micro-structural integrity impairment of the isthmus subregion of the corpus callosum in alcohol-dependent males

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Background: Previous studies have provided evidence that alcohol-dependent patients have abnormality in corpus callosum (CC); however, it is unclear whether micro structural integrity of the CC subregions is differentially affected in this disorder.
Methods: In this study, a total of 39 male individuals, including 19 alcohol-dependent patients and 20 age-matched healthy controls, underwent diffusion tensor imaging (DTI). CC was reconstructed by DTI tractography and was divided into seven subregions. Multiple diffusion metrics of each subregion were compared between two groups.
Results: Compared to healthy controls, patients exhibited increased axial diffusivity ($P = 0.007$), radial diffusivity ($P = 0.009$) and mean diffusivity ($P = 0.005$) in the isthmus. In addition, we observed that daily alcohol intake was correlated positively with radial diffusivity and mean diffusivity and negatively with fractional

anisotropy, while abstinence time of hospitalization was negatively correlated with mean diffusivity in the patients.
Conclusion: These findings suggest a selective micro-structural integrity impairment of the corpus callosum subregions in alcohol dependence, characterized by axon and myelin alterations in the isthmus.

PU-0684
上皮样胶质母细胞瘤 5 例 MRI 表现分析并文献复习

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目的 分析、总结上皮样胶质母细胞瘤（epithelioid glioblastoma，eGBM）的 MRI 表现，提高术前诊断正确率。**方法** 回顾性分析 5 例经病理证实的 eGBM 的 MRI 图像，观察内容主要包括：病灶部位、边缘、信号、瘤周水肿及强化特点。**结果** 1 例病变多发，4 例单发，病灶主体位于颞叶 3 例，顶叶 1 例，额叶 1 例；病变边界均清楚；1 例瘤周重度水肿，4 例瘤周轻中度水肿；1 例病变呈花环样明显强化，壁厚且毛糙，3 例病变实性部分及囊壁明显强化，壁薄且光滑，未见壁结节。**结论** 上皮样胶质母细胞瘤的 MRI 表现具有一定的特征性，结合发病部位表浅、肿瘤边界清楚及年轻人多见等特点，有助于提高术前诊断正确率。

PU-0685
年龄对大脑皮质语言分区不对称性影响的 MRI 研究

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目的 应用 MRI 图像和计算机图像分析技术探讨不同年龄段大脑语言分区皮质体积、厚度及表面积的侧化差异。
方法 招募右利手汉族 20 岁以上 80 岁以下的健康志愿者 286 例，获取脑 3.0 T MRI 原始数据，选择额中回、额下回岛盖部、额下回三角部、中央前回、角回、颞上回作为感兴趣区，使用 FreeSurfer 脑成像软件分析得到语言区相关脑回皮质体积、厚度、表面积具体数值，探究青年组（21-40 岁）、中年组（41-60 岁）、老年组（61-80 岁）三个年龄段大脑皮质语言区的偏侧性。
结果 语言区的脑皮质体积、厚度、表面积与年龄皆呈负相关关系，三个形态学指标的年龄相关性相互关联；不同年龄段语言相关脑区皮质体积、厚度及表面积的不对称区域数量不同、偏侧程度不同，三个形态学指标不对称性随年龄变化而改变的模式各不相同（皮质厚度呈“抛物线”模式）；语言区皮质厚度多数呈明显右侧化。
结论 语言区皮质结构是不对称的，其不对称性随着年龄的变化而呈动态改变，不同形态学指标改变模式不同。

PU-0686

Abnormal synchronization of functional and structural networks in schizophrenia

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Synchronization is believed to play an important role in information processing of the brain. Mounting evidence supports the hypothesis that schizophrenia is related to impaired neural synchrony. However, most previous studies characterize brain synchronization from the perspective of temporal coordination of distributed neural activity, rather than network properties. Our aim was to investigate the network synchronization alterations in schizophrenia using publically available data. Resting-state functional magnetic resonance imaging (fMRI) and diffusion tensor imaging (DTI) were performed in 96 schizophrenia patients and 120 healthy controls. The whole-brain functional and structural networks were constructed and analyzed using graph theoretical approaches. Inter-group differences in network synchronization were investigated. Both the binary and weighted functional networks of schizophrenia patients exhibited decreased synchronizability (increased eigenratio) than those of healthy controls. With respect to the structural binary networks, schizophrenia patients showed a trend towards excessive synchronizability (decreased eigenratio). In addition, the excessive synchronizability of the structural binary networks was associated with more severe negative symptoms in schizophrenia patients. Our findings provide novel biological evidence that schizophrenia involves a disruption of neural synchrony from the perspective of network properties.

PU-0687

Quantitative prediction of individual cognitive flexibility using structural MRI

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Cognitive flexibility, a core dimension of executive functions, refers to one's ability to switch between multiple tasks and sets in a quick and flexible manner. However, whether objective neuroimaging can be used to quantitatively predict cognitive flexibility at the individual level remains largely unexplored. High-resolution magnetic resonance imaging data of 100 healthy young participants from the Human Connectome Project (HCP) dataset were used to calculate gray matter volume (GMV). Cognitive flexibility was assessed by the Dimensional Change Card Sort Test (DCCS). Using a multivariate machine learning technique known as relevance vector regression (RVR), we examined the relationship between GMV and cognitive flexibility performance. We found that the application of RVR to GMV allowed quantitative prediction of the DCCS scores with statistically significant accuracy (correlation = 0.41, P = 0.0001; mean squared error = 73.35, P = 0.0001). Accurate prediction was mainly based on GMV in the temporal regions. In addition, a univariate approach also revealed an inverse association between DCCS scores and GMV in the temporal areas. Our findings provide

preliminary support to the development of neuroimaging techniques as a useful means to inform the cognitive assessment of individuals. Furthermore, the significant contribution of temporal regions suggests the prominent role of temporal cortex morphology in individual differences in cognitive flexibility.

PU-0688

Altered spatial and temporal concordance among intrinsic brain activity measures in schizophrenia

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Various data-driven voxel-wise measures derived from resting-state functional magnetic resonance imaging (rs-fMRI) have been developed to characterize spontaneous brain activity. These measures have been widely applied to explore brain functional changes in schizophrenia and have enjoyed significant success in unraveling the neural mechanisms of this disorder. However, their spatial and temporal coupling alterations in schizophrenia remain largely unknown. To address this issue, 88 schizophrenia patients and 116 gender- and age-matched healthy controls underwent rs-fMRI examinations. Kendall's W was used to calculate volume-wise (across voxels) and voxel-wise (across time windows) concordance among multiple commonly used measures, including fractional amplitude of low frequency fluctuations, regional homogeneity, voxel-mirrored homotopic connectivity, degree centrality and global signal connectivity. Inter-group differences in the concordance were investigated. Results revealed that whole gray matter volume-wise concordance was reduced in schizophrenia patients relative to healthy controls. Although two groups showed similar spatial distributions of the voxel-wise concordance, quantitative comparison analysis revealed that schizophrenia patients exhibited decreased voxel-wise concordance in gray matter areas spanning the bilateral frontal, parietal, occipital, temporal and insular cortices. In addition, these concordance changes were negatively correlated with onset age in schizophrenia patients. Our findings suggest that the concordance approaches may provide new insights into the neural mechanisms of schizophrenia and have the potential to be extended to neuropsychiatric disorders.

PU-0689

Disrupted topological organization of the motor execution network in alcohol dependence

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Motor function damage is one of the most common symptoms in patients with alcohol dependence (AD). However, relatively little is known about the neuropathology of the motor impairments in AD. The aim of this study was to identify changes in the

topological organization of the motor execution network in AD. Here, a total of 39 male individuals, including 19 AD patients and 20 age-matched healthy controls, underwent resting-state functional magnetic resonance imaging (fMRI). The motor execution network was constructed and analyzed using graph theoretical approaches. Topological properties (including global, nodal and edge measures) were compared between the two groups. At the global level, AD patients exhibited increased local specialization (indexed by increased clustering coefficient and local efficiency) relative to healthy controls, indicating that the motor execution network of AD patients shifts toward regularization. At the node level, nodal degree was higher in AD patients in the cerebellum. At the edge level, we observed a cerebello-thalamo-striato-cortical circuit with altered functional connectivity strength in AD patients. These findings suggest that topological architecture of the motor execution network is disrupted in AD patients, which may provide important insights into the neurobiology of the AD-related motor impairments.

PU-0690

Abnormal coupling among spontaneous brain activity metrics and cognitive deficits in major depressive disorder

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BACKGROUND: A variety of functional metrics derived from resting-state functional magnetic resonance imaging (rs-fMRI) have been employed to explore spontaneous brain activity changes in major depressive disorder (MDD) and have enjoyed significant success in unraveling the neurobiological mechanisms underlying this disorder. However, it is unclear whether spatial and temporal coupling relationships among these rs-fMRI metrics are altered in MDD. METHODS: 50 patients with MDD and 36 well-matched healthy controls underwent rs-fMRI scans. A dynamic analysis was applied to compute multiple frequently used metrics including fractional amplitude of low frequency fluctuations, regional homogeneity, voxel-mirrored homotopic connectivity, degree centrality and global signal connectivity. Kendall's W was used to calculate volume-wise (across voxels) and voxel-wise (across time windows) concordance among these metrics. Inter-group differences in the concordance and their associations with clinical and cognitive variables were tested. RESULTS: Compared to healthy controls, patients with MDD showed decreased whole gray matter volume-wise concordance. Despite similar spatial distributions, quantitative comparison analysis revealed that MDD patients exhibited reduced voxel-wise concordance in multiple cortical and subcortical regions. Moreover, the lower concordance was associated with worse performances in prospective memory and sustained attention in the MDD group. LIMITATIONS: The study design of fairly modest sample size did not allow us to perform a full analysis of the potential effects of medication and illness duration. CONCLUSIONS: Our findings suggest that spatial and temporal decoupling of multiple resting-state brain activity metrics may help elucidate the neural mechanisms of cognitive deficits in depression.

PU-0691

Variance of the global signal as a pretreatment predictor of antidepressant treatment response in drug-naïve major depressive disorder

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Several behavioral and neuroimaging markers could be used to predict eventual antidepressant medication (ADM) outcomes in patients with major depressive disorder (MDD). However, these predictors are either subjective or complex, which has limited their clinical use. Thus, we aimed to identify an objective and easy-to-get marker to predict early therapeutic efcacy. Forty-seven drug-naïve patients with MDD and 47 age-, gender- and education-matched healthy controls underwent resting-state functional magnetic resonance imaging (fMRI) scans. We calculated the variable coefcient (VC) of the global signal for each subject. Baseline Hamilton Rating Scale for Depression (HRSD) score and that after 2 weeks of ADM were assessed for patients. Although there was no difference in VC between patients with MDD and healthy controls, we found a significant positive correlation between the VC and the decline rate of HRSD scores in the patients. Compared with the nonresponding depression (NRD) group, the treatment-responsive depression (TRD) group had a higher VC. Receiver operator characteristic curve analysis revealed that the VC exhibited a good ability to differentiate TRD from NRD. In addition, the linear and logistic regression analyses showed that the VC was a significant predictor of the decline rate of HRSD scores and the antidepressant treatment response. These findings suggest that variance of the global signal may serve as a useful marker to help clinicians find an appropriate drug for individuals with MDD at the earliest opportunity and then further to facilitate personalized therapy.

PU-0692

DKI 序列在帕金森患者中的研究应用

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帕金森病患者的病理可与神经元内和细胞外的变化相联系，从而导致神经元变性，中枢神经系统是由许多生物屏障组成的复杂结构。某部分微观结构阻碍或许受到一些病理因素的影响，具体来说，脑内显微微观结构的变化改变了水的扩散，而水的扩散可以通过扩散加权成像(DWI)技术进行非侵入性评定，弥散张量成像(DTI)是一种扩散高斯过程的 MRI 序列，没有扩散障碍。然而，脑组织的环境具有非高斯扩散的特征，因此，为了量化水扩散的非高斯分布，发展了扩散峰度成像(diffusion kurtosis imaging, DKI)作为 DTI 方法的扩展，该技术为早期诊断提供了一种很有前途的方法，本文的目的是总结目前正在进行的帕金森病临床和临床前研究，使用 DKI 并讨论该技术作为神经退行性疾病的早期生物标志物的作用，为临床及影像正确认识帕金森病提供科学依据.

PU-0693
基于 MRI 平扫 T1WI 序列多次使用对比剂后脑内核团信号改变的研究

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目的 分析多次使用钆对比剂后，MRI 平扫 T1WI 序列上齿状核、豆状核、尾状核及丘脑的信号强度变化及信号强度变化与使用对比剂次数、使用对比剂间隔时间的相关性。
方法 回顾性分析 2010 年 3 月 19 日至 2019 年 5 月 4 日 26 例曾在我院接受过 4 次以上 MR 增强检查的患者的临床及 MRI 资料。所有患者 MRI 检查在 Siemens Avanto 1.5T 及 Siemens Skyra 3T 磁共振仪上进行，将所有图像传输至 Skyra 3T 副台。由两位高年资医师分别在第一次增强扫描前及最后一次增强扫描后的平扫 T1WI 上测量齿状核、豆状核、尾状核、丘脑及脑桥的信号强度，分别计算齿状核、豆状核、尾状核、丘脑与脑桥的信号强度比值。采用配对样本 t 检验分析两名医生测得所有数据间的一致性及同一患者多次增强前后平扫 T1WI 上齿状核、豆状核、尾状核、丘脑与脑桥的信号强度比之间是否存在差异。采用线性回归分析方法分析多次增强前后齿状核／脑桥、豆状核／脑桥、尾状核／脑桥、丘脑／脑桥信号强度比变化与使用对比剂次数、使用对比剂间隔时间是否相关。
结果 多次增强后齿状核与脑桥的信号强度比（1.04±0.04）大于增强前的信号强度比（1.01±0.05），差异具有统计学意义（t=-3.475，p=0.002）；增强前后豆状核、尾状核、丘脑与脑桥的信号强度比变化不大（0.91±0.06，0.94±0.06，0.93±0.05；0.91±0.05，0.94±0.05，0.93±0.05），差异均无明显统计学意义（p>0.05）。线性回归分析结果显示齿状核/脑桥信号强度比与钆对比剂注射次数之间存在正相关(回归系数=0．144，p=0．009)；与使用对比剂间隔时间之间无明显相关性(P 值>0．05)。
结论 多次使用钆对比剂注射患者，MRI 平扫 T1WI 序列齿状核信号增高，且与增强扫描次数存在相关性。

PU-0694
女性 HPRL 患者垂体 MRI 影像表现的相关研究

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目的　探讨女性高泌乳素血症患者垂体 MRI 影像学表现与 PRL 水平的关系，以期垂体 MRI 在高泌乳素血症的病因诊断及治疗方案的选择提供影像学参考依据。方法　严格按照纳入排除标准回顾性收集女性高泌乳素患者 140 例，垂体表现正常 44 例，空泡蝶鞍 10 例，Rathke 氏囊肿 16 例，微腺瘤 44 例，大腺瘤 26 例，依据微腺瘤瘤体位置、垂体柄位置将微腺瘤分组，瘤体位于中间 10 例，位于两侧 34 例，垂体柄偏倚 19 例，居中 25 例，根据大腺瘤术后病理免疫结果将其分为泌乳素型大腺瘤（11 例）及非泌乳素型大腺瘤（15 例）。于 GEADW4.2 工作站观察垂体瘤的 MRI 表现并测量垂体瘤的长宽高各径线三次取平均值，使用多田公式法（V=xyz×π/6)计算肿瘤体积 V，并回顾性收集临近时期 PRL 水平。采用非参数秩和检验统计分析五组垂体 MRI 表现 PRL 水平差异性，微腺瘤瘤体不同位置、垂体柄不同位置 PRL 水平差异性，泌乳素型大腺瘤与非泌乳型大腺瘤瘤体体积、PRL 水平的差异性，利用非参数统计 Spearman 相关检验分析微腺瘤瘤体体积与 PRL 水平的相

关性。 结果 五组垂体 MRI 表现的 PRL 水平差异具有统计学意义，泌乳素大腺瘤与非泌乳素大腺瘤瘤体体积、PRL 水平差异具有统计学意义，P<0.05;微腺瘤瘤体体积与 PRL 水平具有相关关系，r=0.425,p<0.05;微腺瘤瘤体不同位置、垂体柄偏倚或否 PRL 水平差异无统计学意义，P>0.05；本组 44 例伴高泌乳素血症微腺瘤，有 34 例位于两侧，占 77%。结论 PRL 水平对患者是否合并垂体病变及病变亚型有预测意义；将 PRL 水平与垂体 MRI 表现结合可提高泌乳素型大腺瘤与非泌乳素型大腺瘤鉴别诊断价值，对合理选择治疗方案，改善预后有重要意义。

PU-0695

Abnormal white matter integrity in MDD patients with poor sleep quality: A Tract-Based Spatial Statistics Study

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Background: Major depressive disorder (MDD) patients with sleep disturbances represent a large proportion of depressed population. However, neural mechanisms underlying sleep disturbances in MDD remain largely unknown.
Methods: 96 patients with MDD underwent polysomnography (PSG) monitoring and magnetic resonance imaging (MRI) scans. According to the value of sleep efficiency (SE), participants were divided into two groups, 42 MDD patients with SE ≥ 90% and 54 well-matched MDD patients with SE < 90%. Inter-group differences in the analyses of tract-based spatial statistics (TBSS) on diffusion tensor imaging (DTI) were tested.
Results: Compared with MDD patients with SE ≥ 90% group, MDD patients with SE < 90% group had significant increased AD in the left superior corona radiata (L-SCR), left posterior corona radiata (L-PCR), left posterior limb of internal capsule (L-PLIC) and left retrolenticular part of internal capsule (L-RLIC).
Conclusions:
The present study suggests that MDD patients with poor sleep quality had reductions of AD in two major white matter pathways. These findings may explain the neural mechanisms underlying poor sleep quality in MDD and could lead to a potential neuroimaging biomarker for this clinical subtype of MDD.

PU-0696

DCE-MRI 对局部晚期鼻咽癌 TP 诱导化疗疗效的价值研究

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「**摘要**」**目的**：探讨动态增强磁共振（Dynamic contrast-enhanced MRI,DCE-MRI）多参数评估局部晚期鼻咽癌（III/IV 期）诱导化疗（Induced chemotherapy, IC）疗效的价值。**方法**：收集 2017 年 9 月至 2019 年 9 月于我院治疗的局部晚期鼻咽癌患者 40 人随机分为实验组和对照组。实验组分别测量诱导化疗前后及同步放化疗（CCRT）总体结束后；对照组分别测 CCRT 前后的时间-信号强度曲线（TIC）形态、最大强化率（MER）、早期强化率(SER)，肿瘤最大径（V_d）、肿瘤最大

径退缩率（Δ V_d%）达峰时间（TTP）、ΔMER %、 Δ SER %、比较各参数在组内不同治疗阶段及组间同一阶段的变化幅度及各参数之间相关性。**结果**：实验组 TP（多西他赛联合顺铂）IC 疗末 V_d、 MER、SER 较 IC 治疗前降低； Δ MER %、 Δ SER %、Δ V_d%变化幅度较同组其他阶段以及对照组同一阶段变化幅度最大，差异均有统计学意义（p 值<0.01）。肿瘤最大径退缩率与实体肿瘤治疗疗效差异有统计学意义（p<0.05），两组 TIC 曲线的形态变化与Δ V_d%差异之间（p=0.040,）有统计学意义，即诱导化疗前 TIC 曲线流入及流出速度、达峰时间（TTP）与肿瘤退缩率呈显著负相关。**结论**；鼻咽癌 TP 方案有效的减轻肿瘤负荷，DCE-MRI 各参数与实体肿瘤疗效高度相关，具有较好预测 TP 诱导化疗方案疗效及评估疗效的效能，对 TP 诱导化疗方案有效评估可使其作为局部晚期鼻咽癌综合治疗中重要阶段发挥积极作用、为临床早期完善进一步治疗提供更客观的影像学证据。

PU-0697

脊柱线圈与体部线圈联合使用在 3.0T MRI 上用 3D-SPACE 序列对肥胖患者的腰骶丛神经显示的讨论

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【摘要】目的探究脊柱线圈与体部线圈联合使用在 3D-SPACE 序列对肥胖者腰骶丛神经显示的价值。**方法**选取 20 例肥胖志愿者（BMI＞28）于 3.0T 磁共振行腰骶椎 MRI 检查。扫描包括横断位和矢状位快速自旋回波 T_2WI 序列及冠状位 3D-SPACE 序列，对同一志愿者分别仅使用脊柱线圈和使用脊柱线圈联合体部相控阵列线圈各检查一次。观察各序列中腰骶丛神经显示的情况，对比两种检查方法腰骶丛神经清晰的显示率及神经的信号强度。**结果**仅使用脊柱线圈 3D-SPACE 序列上腰骶丛神经优良率为 65%，信噪比（35.6±3.5）；T_2WI 序列优良率为 70%，信噪比（30.3±2.1）；使用脊柱线圈联合体部相控阵列线圈 3D-SPACE 序列上腰骶丛神经优良率为 95%，信噪比（55.4±5.5）；T_2WI 序列优良率为 85%，信噪比（48.9±4.5）。两者差异具有统计学意义（P<0.05）。**结论**脊柱线圈与体部相控阵列线圈联合使用较脊柱线圈单独使用对肥胖患者腰骶丛神经显示更全面、更清晰。多线圈的联合使用对肥胖患者腰骶丛神经显示中具有重要价值。

PU-0698

Directed functional connectivity of the hippocampus in patients with presbycusis

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Purpose: Presbycusis, associated with a diminished quality of life characterized by bilateral sensorineural hearing loss at high frequencies, has become an increasingly critical public health problem. This study aimed to identify directed functional connectivity (FC) of the hippocampus in patients with presbycusis and to explore the causes if the directed functional connections of the hippocampus were disrupted.
Methods: Presbycusis patients (n = 32) and age-, sex-, and education-matched healthy controls (n = 40) were included in this study. The seed regions of bilateral hippocampus were selected to identify directed FC in patients with presbycusis using Granger causality analysis (GCA) approach. Correlation analyses were conducted to

detect the associations of disrupted directed FC of hippocampus with clinical measures of presbycusis.
Results: Compared to healthy controls, decreased directed FC between inferior parietal lobule, insula, right supplementary motor area, middle temporal gyrus and hippocampus were detected in presbycusis patients. Furthermore, a negative correlation between TMB score and the decline of directed FC from left inferior parietal lobule to left hippocampus ($r = -0.423$, $p = 0.025$) and from right inferior parietal lobule to right hippocampus ($r = -0.516$, $p = 0.005$) were also observed.
Conclusion: The decreased directed functional connections of the hippocampus were detected in patients with presbycusis, which was associated with specific cognitive performance. This study mainly emphasizes the crucial role of hippocampus in presbycusis and will enhance our understanding of the neuropathological mechanisms of presbycusis.

PU-0699
不同标记后延迟时间对急性缺血性脑梗死患者侧支循环 的建立及愈后的评估

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目的探讨 3D-ASL（three-dimensional pulsed continuous arterial spin labeling,3D pCASL）中不同标记后延迟时间（post labeling delay,PLD）对急性缺血性脑梗死患者有无缺血半暗带、侧支循环的建立及愈后的初步评估。材料**方法** 选取 46 例经临床神经医生诊断为急性缺血性脑梗死患者（CT 除外脑出血及其它非缺血性脑病）行扩散加权成像（diffusion weighted imaging,DWI）以及三维准连续动脉自旋标记技术（three-dimensional pulsed continuous arterial spin labeling,3D pCASL）（PLD=1.5 s,2.5 s）序列扫描。测量脑梗死区不同 PLD 时间的血流量(CBF)值。并对 46 例患者 DWI，GE ADW4.6 Functool 自动后处理软件对不同 PLD 时间的 3D-ASL 图梗死区（ROI）统计学分析。**结果** 脑梗死区 CBF 值在 PLD=1 .5s 与 PLD=2 .5s 无变化，比较差异无统计学意义(P>0.05),脑梗死区 PLD=2 .5s 的 CBF 值明显高于 PLD=1 .5s 的 CBF 值，比较差异有统计学意义(P<0.05)。**结论** 作为一项无创性磁共振灌注成像新技术， 3DASL 中不同标记后延迟时间(1 .5s 和 2 .5s)对急性脑梗死患者有无缺血半暗带侧支循环的建立提供重要依据，对脑梗死患者的预后具有重要意义。

PU-0700
3D-ASL 联合 SWAN、DWI 序列在急性脑梗塞中的诊断价值

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【摘要】 **目的** 分析、探讨 3 D 动脉自旋标记灌注成像(3D-ASL)联合应用磁敏感加权技术(SWAN)、弥散加权成像（DWI）在急性脑梗塞诊断的应用价值。**方法** 使用美国通用 GE Optima 360 1.5T 磁共振成像系统，选取 2018 年 1 月至 2019 年 1 月接受检查扫描患者 30 例，临床诊断急性脑梗死患者均行常规 MRI 序列（T1WI、T2WI、T2FLAIR、SAG-T2WI）、DWI、SWAN、3D-ASL 检查，根据病情需要，6 例患者行增强扫描。将获得的图像数据输入 ADW4.6 工

作站进行后处理，再经 PACS 发送至医生诊断工作站，由经验丰富的诊断医师对图像进行评价分析。 **结果** 常规 MRI 序列和 DWI 扫描，结合典型的临床症状和体征，30 例病人均为急性脑梗死，其中 6 例为大面积脑梗塞，并能找到责任病灶，常规序列扫描 T1WI 表现为低信号灶，T2WI 和 T2FLAIR 表现为高信号，DWI 表现为不同范围的明显高信号区，大面积脑梗塞呈连续的大片状，单发或多发的腔隙性脑梗塞为单发或多发斑点状、团片装的高信号区，病灶可以分布在不同的脑叶；SWAN 序列成像检查 20 例急性脑梗死患者脑内有微出血灶，呈点状、圆形、椭圆形低信号，分布在病灶内及病灶以外区域，显示病灶区静脉血管形态改变，大动脉阻塞的血栓也可以显示，明显优于常规序列。 3 D-ASL 显示病灶的脑血管灌注特点和侧支循环供血情况、评价半暗带范围。**结论** SWAN 显示急性脑梗塞周围引流静脉形态学改变，反映病变区血氧饱和度水平改变的情况，以及并发的微出血及梗死区是否有侧支循坏形成和责任血管情况，对于患者治疗方案的确定起着重要的作用；3D-ASL 与 SWAN 序列联合应用应作为急性脑梗死检查的常规序列，既评价急性脑梗塞患者的脑血流灌注特点、动脉血栓，还能够评价患者是否伴发出血及潜在出血风险，对急性脑梗塞患者溶栓治疗具有重要的指导价值。

PU-0701

3D-ASL 联合 DWI、MRA 成像在脑梗塞的诊断价值

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【摘要】目的 分析磁共振 3 D 动脉自旋标记灌注成像（ 3 D-ASL）联合 DWI、MRA 成像技术对脑梗塞的临床诊断结果，评价其对急性脑梗塞诊断、治疗的指导价值。 **方法** 选择 2018 年 1 月至 2019 年 1 月在我院检查诊断患者 30 例，采用美国 GE Optima 360 1.5T 磁共振成像系统，均行常规 MRI 序列（T1WI、T2WI、T2FLAIR、SAG-T2WI），DWI、MRA、 3 D-ASL 检查，DWI 采取多 b 值扫描，ASL 检查时选取 PLD 1.5 秒和 2.5 秒进行扫描采集相关数据，将采集的数据输入工作站 ADW 4.6 后处理形成脑血流量图（CBF），对影像表现对比评价。**结果** 30 例患者中，6 例为大面积脑梗塞，常规序列表现为大范围脑实质内异常信号改变，T1WI 表现为低信号，T2WI 表现为高信号，T2FLAIR 呈高信号，常累及大脑中动脉供血区，脑回肿胀，脑沟变浅，T2WI 显示供血动脉主干远端的分支流空信号明显减少或消失，DWI 图像表现为大片的明显高信号区，同时 MRA 表现一侧大脑中动脉主干及分支闭塞，远端分支消失或减少；24 例为新发的腔隙性脑梗塞，单病灶者 18 例，多发病灶者 6 例，表现为单发或多发的长 T1 长 T2 信号灶，T2FLAIR 呈高信号，可分布在不同脑叶；DWI 表现为不同范围的斑点状、斑片状明亮高信号；ASL-CBF 表现为不同范围的血流灌注减低区，大部分病人低灌注范围大于 DWI 高信号区，部分与 DWI 高信号范围基本一致，PLD 1.5 秒 ASL-CBF 表现为明显的低灌注区，PLD 2.5 秒 ASL-CBF 上低灌注区有一定的减少或恢复，提示侧枝循环的代偿作用。**结论** 3 D-ASL 联合 DWI 、MRA 成像既能明确诊断急性脑梗塞，同时评价急性脑梗塞患者的范围大小、脑血流灌注的改变，以及半暗带和侧支循环的情况，对急性脑梗塞患者下一步的治疗方法选择具有重要的指导价值，可以作为急性脑梗塞扫描的常规扫描方法。

PU-0702

孤立椎动脉的颈部 MRA、头部平扫 CT、MRI 诊断及临床意义

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目的 研究孤立椎动脉的颈部 MRA 诊断与头部平扫 CT、MRI 的对应关系及临床意义。**方法** 对 58 例孤立椎动脉颈部 MRA 与头部平扫 CT、MRI 及临床症状对照分析。男 37 例，女 21 例；年龄 28-77 岁，平均年龄 59.5 岁。磁共振成像采用西门子 1.5T 成像系统，运用 3D-TOF 法颈部血管成像。当一侧椎动脉纤细，上端未与基底动脉汇合时，确定为孤立椎动脉。**结果** 58 例患者均有反复头迷眩晕等后循环供血不足症状。病史最长者约 20 余年，其中左侧孤立椎动脉 28 例，右侧 30 例，头部平扫 CT 或 MRI 均可发现患侧椎动脉明显变细或消失。**结论** 一侧椎动脉纤细，上端未与基底动脉汇合，我们称之为孤立椎动脉，目前尚未得到临床的广泛重视。孤立椎动脉时，椎基底动脉系统的血供全部来自于健侧椎动脉，因此，当健侧椎动脉受压或血压下降时，会产生相应临床症状，小脑后下动脉缺血可产生眩晕、呕吐、眼球震颤及头面部感觉异常。内听动脉又称迷路动脉，为一细长分支，几乎 80%以上发自小脑前下动脉，内听动脉血液供应障碍，有时可作为椎-基底动脉疾病早期信号，这是因为内听动脉供应区侧枝循环较差的缘故，半规管、椭圆囊、球囊及耳蜗对血液供应的变化反应特别敏感，只要通过的流量稍减少，就可产生平衡障碍、眩晕、恶心、呕吐及耳鸣等症状，由于早期症状很像美尼尔综合征，故临床应仔细加以鉴别。本文中有 5 例曾被诊断为耳源性眩晕；10 例因高血压服用降压药后导致血压过低，其中最严重一例导致突发椎动脉闭塞引起脑干梗塞而死亡。

综上，①孤立椎动脉是眩晕的主要原因之一，也是椎基底动脉系统闭塞的危险因素，与先天发育不良密切相关，应当得到广泛重视。②颈部 MRA 是诊断孤立椎动脉的安全、简便、准确的方法。③当眩晕患者头部平扫 CT 及 MRI 未发现确切责任病灶时，要仔细观察双侧椎动脉，如有异常应立即做颈部 MRA 检查。④对于孤立椎动脉伴高血压患者，血压不宜降至过低，应保证后循环灌注。

PU-0703
2 型糖尿病伴脑小血管病患者脑损伤与认知功能障碍关系的研究

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目的 探讨 2 型糖尿病（Type 2 Diabetes Mellitus, T2DM）伴脑小血管病(Cerebral Small Vessel Disease,CSVD)患者脑损伤与认知功能障碍的关系。

材料与方法 选取 T2DM 伴 CSVD 患者 18 例（T2DM 组）和健康体检者 18 例（对照组）行 3 维 T1 加权成像（3D T1 weighted image,3D T1WI ）和扩散张量成像（Diffusion Tensor Imaging,DTI），并利用简易智能精神状态检查量表（Mini Mental State exam,MMSE）和蒙特利尔认知评估量表（Montreal Cognitive Assessment,MoCA）对认知能力评估

结果 研究发现 T2DM 组患者存在颞叶、枕叶区域萎缩及皮层厚度减小，额中回、额极、右侧岛叶皮层厚度减小；此外，T2DM 组患者大脑各项异性值（Fractional Anisotropy, FA）的下降出现在前额叶、颞叶、枕叶、胼胝体、扣带、岛叶、丘脑、海马等，且伴随着广泛的白质纤维损伤，表现在平行扩散参数（$\lambda_{/\!/}$）、垂直扩散参数（$\lambda_{\perp}$）和 表观扩散参数（Apparent diffusion coefficient, ADC）值显著上升。FA 值结合认知能力评分的相关性分析发现，MoCA 评分与双侧上纵束（颞叶部分）的 FA 均显著正相关（左侧：r=0.485，P=0.041；右侧：r=0.523，P=0.026）；视空间执行能力与丘脑前辐射的 FA 正相关（r=0.480，P=0.044）；记忆力与左侧扣带（海马）（r=0.480，P=0.044）及左侧上纵束（颞叶部分）（r=0.592，P=0.010）的 FA 值均正相关。

结论 DTI 参数所反映的大脑微观结构的变化比 3DT1 结构像所反映的形态学改变更敏感，其提供的影像学指标有助于 T2DM 伴 CSVD 患者认知障碍的早期诊断。

PU-0704
MRI T2-IDEAL 序列对视神经病变的应用价值研究

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目的 探讨核磁共振成像(magnetic resonance imaging,MRI) T2-IDEAL 序列对视神经病变的诊断价值.
方法 回顾性分析 33 例视神经病变的患者行视神经 T2-IDEAL 序列 MRI 检查,结合临床表现、眼科学检查及手术病理结果分析各类视神经病变 T2-IDEAL 序列 MRI 表现.
结果 33 例患者中 T2-IDEAL 核磁检查均显示阳性，其中视神经脊髓炎 14 例，视神经管占位 5 例，视神经萎缩 7 例，视神经损伤 5 例，特发性脱髓鞘性视神经炎 2 例
结论 T2-IDEAL 序列可以清晰显示视神经解剖细节及相关病变,对各种类型视神经病变病因诊断具有较高的临床价值.

PU-0705

Quantitative MRI Volumetry in Detection of Hippocampal Atrophy

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Purpose: To determine the effectiveness of the magnetic resonance imaging (MRI) for detection of hippocampal atrophy (HA) and lateralization of the seizure focus in TLE patients based on volumetry and asymmetric index (AI).
Methods: Volumetric MRI data were analyzed for 17 patients with refractory TLE and 17 healthy control subjects. Structural volumes of hippocampus were measured using a 3-dimensional image reconstruction software. Outcomes of quantitative MRI analyses were compared with postoperative hippocampal histological specimens to determine its correlation with hippocampal neuronal loss and gliosis. Binary logistic regression (BLR) and receiver operating characteristic (ROC) analyses were performed to determine the optimal sensitivity and specificity of volumetry and AI for detecting HA.
Results: When hippocampal volume of 2328 mm3 was set as cut-off for 50% epilepsy probability, a sensitivity of 70.6% and a specificity of 82.4% were achieved for detecting TLE from healthy control subjects.Using a hippocampal AI of 7.82 as a cut-off, a sensitivity of 88.2% and a specificity of 89.2% were achieved for detecting TLE. There were correlations between hippocampal volume and neuronal loss, and hippocampal AI and astrocyte gliosis.
Conclusions: MRI volumetry and AI can be used as a clinical tool to assist the detection of HA in patients with TLE. Volumetry and AI also provide histopathological information associated with epilepsy.

PU-0706

简述脑网络的分析方法

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目的 总结大脑网络的分析方法，为揭示脑神经网络提供有效手段。**方法** 脑信号的处理技术主要有时域分析、频域分析、神经网络和混沌理论等，其中神经网络的研究可从结构网络和功能网络两方面进行。脑功能网络连接技术是基于脑功能整合理论，从多个脑区或全脑出发以功能连接或结构连接的角度探究脑活动。其中，大脑网络的提取方法可以采用广义线性模型、低频振幅以及局域一致性等方法；脑功能网络的连接方法有相关分析、独立成分分析、图论分析及小世界网络分析法；脑功能网络的效应连接主要有动态因果分析法和格兰杰因果分析法。**结果** 广义线性模型是一种最常用的假设驱动方法，主要研究变量之间的相关性，多用于揭示人脑功能的分离。低频振幅可以提示静息状态时神经元的自发活动。局域一致性将局部空间信息和时间序列信息同时考虑在算法之内，突破了线性时不变的理论。相关分析是通过计算相关系数来表示感兴趣区与其它脑区之间的功能连接强度，相关系数越大则脑区之间的功能连接越强。独立成分分析是一种新的盲源分析方法，目的在于从随机线性混合的观测信号中恢复出各源信号。根据网络拓扑性质的不同，图论分析将网络分为规则网络、小世界网络和随机网络，其中小世界网络模型是目前图论分析中最流行的一类。动态因果模型是一种双模型分析方法，它是将神经动力学模型和血液动力学模型结合起来建立的模型。格兰杰因果分析模型建立在多元自回归模型的基础上，它依赖于信号的时间优先性，可用来衡量信号之间相互影响的程度。**结论** 从脑功能网络的提取方法、连接方法到效应连接方法，各方法均有自身的特点及优劣势，可以从不同的角度为脑功能网络应用于疾病的研究提供理论依据。

PU-0707
痉挛型脑瘫患儿脑灰质结构与运动功能的相关性研究

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目的 利用磁共振基于体素的形态学分析方法（voxel based morphometry ，VBM）定量分析运动功能不同的痉挛型脑瘫患儿脑灰质结构评估脑瘫患儿脑灰质体积和临床表现之间的关系。**方法** 收集 36 例年龄在 2 至 15 岁的痉挛型脑瘫患儿并运用粗大运动功能分级系统(GMFCS)将所有患儿分为轻度运动功能障碍组(A 组)和重度运动功能障碍组(B 组)。对两组受试者进行常规磁共振和全脑高分辨 3D-T1WI 扫描，采用基于体素的形态学分析方法获得两组受试者的全脑灰质及局部脑灰质体积，采用双样本 t 检验比较两组脑灰质体积，运用 Spearman 相关性分析方法分别分析差异脑区灰质体积与 GMFCS 分级间的相关性。**结果** 在重度运动功能障碍组中，脑瘫患者总脑灰质体积明显低于轻度运动功能涵盖组（$P<0.001$）。与轻度运动功能障碍组相比，重度运动功能障碍组多处区域局部脑灰质减少（$P < 0.001$，未经校正），包括双侧额上回，双侧颞极，右侧梭状回，右侧颞中回，右侧颞上回，右侧扣带回，左侧顶下小叶，左侧缘上回，左侧中央前回，右侧楔前叶，右侧枕叶。其中右侧额上回（$r=-0.605$, $P=0.000$），左侧额上回（$r=-0.508$, $P=0.004$）,右侧扣带回（$r=-0.367$, $P=0.035$），右侧颞中回（$r=-0.388$, $P=0.031$），左侧中央前回（$r=-0.418$,$P=0.019$），右侧楔前叶（$r=-0.430$, $P=-0.015$）与粗大运动功能分级呈负相关。**结论** 痉挛型脑瘫患儿运动功能障碍与弥漫性的皮质损伤有关，VBM 可对脑瘫患儿的脑部结构及功能异常提供无创的影像学检查方法。

PU-0708
磁共振扩散峰度成像在脑损伤后植物状态的研究初探

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目的 探讨磁共振弥散峰度成像(DKI）技术在脑损伤后植物状态患者大脑微观结构改变的应用以及对临床的诊断价值。 **方法** 收集 13 例植物状态患者（病例组）和 20 例健康志愿者(对照组)，行常规脑磁共振检查、脑弥散峰度序列检查，分别测定非直接损伤区丘脑、胼胝体膝部、胼胝体压部、内囊、双侧颞叶皮层、脑干平均峰度（MK）和平均弥散系数（MD）。 **结果** 与对照组相比病例组的丘脑、胼胝体膝部、胼胝体压部、双侧颞叶皮层、脑干非直接损伤部位的平均峰度（MK）值较正常对照组比较显著降低，二者差异具有统计学意义（P＜0.05）。与对照组相比病例组的丘脑、胼胝体膝部、胼胝体压部、内囊、双侧颞叶皮层、脑干非直接损伤部位的平均峰度（MD）值与正常对照组比较显著升高，二者具有统计学意义（P＜0.05）。**结论** DKI 的指标可初步反映持续植物状态患者脑部神经纤维束的完整性，对于影像学判断植物状态患者的 微观结构具有一定的应用价值。

PU-0709
磁共振高分辨血管壁成像对脑卒中患者大脑中动脉粥样硬化与豆纹动脉特征分析

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目的 探讨高分辨磁共振血管壁成像技术对大脑中动脉粥样硬化狭窄（Intracranial atherosclerotic arterial stenosis ICAS）的斑块强化程度及血管重塑方面与豆纹动脉数量及深度之间的联**系。方法** 收集我院 22 名有症状 ICAS 患者与 23 名无症状 ICAS 患者参加该研究，对所有受试者行高分辨磁共振血管壁成像（High Resolution Magnetic Resonance Imaging）3D-T1WI-VISTA 序列成像，受试者高分辨血管成像数据传至后处理工作站，应用 Philips Intellispace portal 软件对的大脑中动脉斑块强化指数及管腔重构指数与豆纹动脉血管数量及深度进行统计，采用 SPSS 22.0 软件对两组受试者大脑中动脉斑块强化指数及管腔重构指数与豆纹动脉的深度及数目进行统计学分析。**结果** 有症状 ICAS 患者组与无症状 ICAS 患者组相比，有症状 ICAS 患者组大脑中动脉粥样斑块有更高的增强指数（P<0.05），有症状 ICAS 患者组豆纹动脉长度明显短于无症状 ICAS（P<0.05），有症状 ICAS 患者组与无症状 ICAS 患者组大脑中动脉管腔重塑指数与豆纹动脉数量均无统计学差异（P〉0.05）。**结论** 有症状 ICAS 患者与无症状 ICAS 患者大脑中动脉粥样斑块的强化程度与豆纹动脉长度存在一定差异，高分辨磁共振血管壁成像对大脑中动脉粥样斑块评估具有临床价值。

PU-0710
磁共振 VBM 方法评价手术对 PVL 合并脑瘫患儿脑灰质的影响

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目的 应用基于体素的形态学分析(VBM)方法研究颈总动脉交感神经网剥脱术(cervical perivascular symphathectomy）对脑室周围白质软化症(PVL)合并脑瘫患儿脑灰质的影响。 **方法** 收集在我院神经外科接受过颈总动脉交感神经剥脱术的 PVL 合并脑瘫患儿 15 例作为观察组，另外收集未经治疗的 PVL 合并脑瘫患儿 17 例作为对照组。对所有儿童均进行常规规磁共振及 3D-

T1WI 检查，采用 VBM 方法对两组患儿的全脑结构进行分割，并对分割后的脑灰质体积用双样本 t 检验比较两组灰质体积差异，并进一步分析观察组患者差异有统计学意义的脑区体积与手术后病程进行相关性分析。**结果** 观察组患儿局部脑灰质增加的区域包括双侧额上回,双侧颞极，右侧颞中回，左侧缘上回，右侧扣带回及左侧小脑前部（P＜0.001，未经校正）。双侧额上回体积与手术后病程成正相关（r=0.732，P＜0.003）。 **结论** 颈总动脉交感神经网剥脱术能引起 PVL 合并脑瘫患儿语言，运动，思维以及认知功能相相关的脑区的灰质的重塑。

PU-0711

HRMR-VWI 在椎-基底动脉病变诊断中的应用价值

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目的: 探讨高分辨磁共振血管壁成像（high-resolution magnetic resonance imaging，HRMR-VWI）在椎-基底动脉病变诊断中的应用价值。 **方法** 对 52 例经 CTA/MRA/DSA 确诊椎-基底动脉血管腔病变的患者，分别行 HRMR-VWI T1-VISTA 序列平扫加增强检查，由两位高年资医师对图像进行评估，对病变段血管壁改变及病因进行分析。**结果:** 52 例椎-基底动脉管腔病变患者中，发现 27 例动脉粥样硬化改变，占 52.9%，均表现为偏心性管壁增厚，增强扫描管壁轻度或明显强化； 6 例原发性中枢神经系统血管炎，占 11.5%，表现为管壁向心性增厚，明显强化；12 例椎基底动脉夹层，占 23.1%，可见内膜瓣，双腔征，夹层开口位置；7 例动脉瘤，占 13.4%，5 例发生于椎动脉，2 例发生于基底动脉，HRMR-VWI 清晰可见瘤壁厚度及强化特点 。**结论:** HRMR-VWI 能够为椎-基底动脉病变病因探究、治疗方案制定提供重要信息，是椎-基底动脉病变的重要检查方法。

PU-0712

Abnormality of spontaneous brain activities inpatients with chronic neck and shoulder pain: A resting-state f-MRI study

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Objectives: Chronic gneck and shoulder pain (CNSP) is a common clinical symptom of cervical spondylotic radiculopathy. Several studies using resting-state functional magnetic resonance imaging (rs-fMRI) have reported that most chronic pain diseases are accompanied by structural and functional changes in the brain. However, few rs-fMRI studies have examined CNSP. The current study investigated cerebral structural and functional changes in CNSP patients.
Methods: In total, 25 CNSP patients and 20 healthy volunteers participated in the study. 3D-T1W and rs-fMRI images were acquired. Voxel-based morphometry analysis was

applied to structural images, and regional homogeneity (ReHo) was extracted from rs-fMRI. Statistical analysis was performed on post-processing images and ReHo parameter maps.

Results: The results revealed no significant differences in brain structure between the two groups. In the patient group, ReHo values were significantly increased in the bilateral middle frontal gyrus and decreased in the left insula, superior frontal gyrus, middle cingulate gyrus, supplementary motor area, right postcentral gyrus, and superior parietal lobule.

Conclusions: This initial structural and rs-fMRI study of CNSP revealed characteristic features of spontaneous brain activity of CNSP patients. These findings may be helpful for increasing our understanding of the neuropathology of CNSP.

PU-0713

青年抑郁症患者胼胝体 MR 扩散张量成像研究

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目的 应用 DTI 技术，研究青年抑郁症患者胼胝体可能存在的细微结构异常，探讨其可能的发病机制。

方法 选取 2016 年 9 月至 2018 年 8 月心身科门诊的首次发病抑郁症患者 52 例，采用 GE Signa 1.5T 磁共振扫描仪。所有被检查者均行常规头颅 MRI 检查及 DTI 检测。

结果 胼胝体膝部和体部的 ADC 值高于正常对照组，FA 值低于对照组；差异有统计学意义（P 值均＜0.05）。但胼胝体压部的 ADC 值和 FA 值在两组间差异无统计学意义。

结论 DTI 显示青年抑郁症患者胼胝体膝部和体部的神经纤维束可能存在微细结构的改变，明显早于常规 MRI 所能观察到的形态学改变，其在揭示抑郁症的发病机理、探测病变过程、早期明确诊断和建立诊断指标以及疗效评价等方面具有巨大潜力。

PU-0714

Alteration of Functional Connectivity in Patients Suffering From Chronic Neck and Shoulder Pain Caused by Cervical Spondylotic Radiculopathy: A Resting-state fMRI Study

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Objective: This study investigates the alterations of spontaneous neural activities of patients with chronic neck and shoulder pain caused by cervical spondylotic radiculopathy (CNSP-CSR) using the method of rs-fMRI. The parameter of the functional connectivity (FC) is counted in this study.

Methods: CNSP-CSR patients (n = 25) and age-, sex-, and education- matched normal controls (n = 20) were included in this study. Both conventional MRI, the structural

(high resolution 3D T1-weight) and rs-fMRI images were acquired. Seed-based whole-brain FC analyses were performed between groups with seed regions placed in the aACC and pACC.
Results: We found that the aACC had reduced functional connectivity with left amygdala, angular gyrus and IPL. We also found that the pACC had reduced FC with bilateral caudate and left mPFC whereas increased FC with left IOG, SOG, SPL, PoCG and right MTG, ITG. $P < 0.01$ (corrected by the AlphaSim program, cluster size ≥ 18) were considered to show significant difference between groups.
Conclusion: The abnormalities of spontaneous brain activity reflected by FC measurement in patients with CNSP-CSR confirm the neuronal disturbances in CNSP. The abnormal FC is mainly associated with pain perception, cognitive execution, emotion and memory effects. The pACC, an important component of ACC, is more involved in pain processing.

PU-0715
多模态磁共振技术在胶质瘤复发与放射性脑损伤鉴别诊断中的应用价值

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目的探讨联合应用弥散加权成像(DWI)、灌注加权成像(PWI)、磁共振波谱成像(MRS)等磁共振成像技术对胶质瘤复发与放射性脑损伤的鉴别诊断价值。方法回顾性分析 2011 年 1 月-2013 年 12 月 32 例在北京军区总医院就诊的胶质瘤术后放疗患者的临床及影像学资料,其中胶质瘤复发 15 例,放射性脑损伤 17 例。分析 32 例患者的 DWI、PWI、MRS 等磁共振影像学资料,比较异常强化区与对侧正常区的磁共振表观扩散系数(ADC)、自动生成脑血容量(CBV)、脑血流量(CBF)、平均通过时间(MTT)、胆碱(Cho)/磷酸肌酸(Cr)比值及 Cho/N-乙酰天门冬氨酸(NAA)比值。结果胶质瘤复发组 ADC 值与放射性脑损伤组比较差异无统计学意义(P0.05)。胶质瘤复发组相对脑血流量(r CBF)、相对脑血容量(r CBV)的最大值和平均值明显高于放射性脑损伤组(P0.05),相对平均通过时间(r MTT)的最大值和平均值与放射性脑损伤组比较差异无统计学意义(P0.05)。胶质瘤复发组的 Cho/Cr 和 Cho/NAA 比值均明显高于放射性脑损伤组(P0.05)。对胶质瘤复发的诊断灵敏度,单用 PWI 为 80%,单用 MRS 为 73.3%,PWI 联合 MRS 为 93.3%。对放射性脑损伤的诊断灵敏度,单用 PWI 为 82.4%,单用 MRS 为 70.6%,PWI 联合 MRS 为 88.2%。结论联合应用多模态磁共振成像技术可提高胶质瘤复发及放射性脑损伤的诊断准确性,为临床治疗提供良好的指导。

PU-0716
神经根型颈椎病颈肩痛脑静息态局部一致性研究

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目的 运用静息态功能磁共振成像(resting-state functional magenetic resonance imaging, rs-fMRI)局部一致性(regional homogeneity, ReHo)方法研究神经根型颈椎病慢性颈肩痛状态下静息态脑功能改变。

方法 采用 PHILIPS 公司 Intera Achieva 3.0 T 双射频源超导扫描仪对 25 例神经根型颈椎病慢性颈肩痛患者及 20 例健康志愿者进行常规磁共振、高分辨率 3D-T1 结构像及静息态功能磁共振扫描，扫描结束对每位患者进行视觉模拟评分(visual analgesia score, VAS)。组间对比分析 ReHo 的改变，并对 ReHo 均值与 VAS 得分进行 Pearson 相关性分析。
结果 1）与正常对照组相比，神经根型颈椎病慢性颈肩痛组 ReHo 值减低的脑区位于左侧岛叶(insular cortex, IC)、海马、辅助运动区(supplementary motor area, SMA)、额上回(superior frontal gyrus, SFG)，右侧中央后回(postcentral gyrus,PoCG)、顶上小叶(superior parietal lobe, SPL)；ReHo 值增高的脑区位于双侧额中回(middle frontal gyrus, MFG)($P < 0.01$，AlphaSim 矫正，Cluster Size $\geq$ 18)。2）神经根型颈椎病慢性颈肩痛组左侧 IC 的 ReHo 均值与 VAS 得分存在显著负相关性($r = -0.552$, $P = 0.004$)。
结论 1)神经根型颈椎病慢性颈肩痛导致以额、顶叶为主的部分脑区出现 ReHo 的异常改变。2) 左侧 IC 能够感知疼痛强度。3)神经根型颈椎病慢性颈肩痛脑自发性活动异常主要与认知执行和情感、疼痛感知和及记忆等脑功能受到影响相关。

PU-0717

平山病 MR 屈曲位诊断价值

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目的 为了探讨平山病的 MR 屈曲位诊断价值。
方法 回顾性的分析了 10 例已经确诊为平山病的患者影像学资料。10 例患者均行颈椎自然位和屈曲位 MR 平扫检查。
结果 屈曲位下，有 7 例患者椎管内硬膜囊后方见条状长 T1 长 T2 信号影，有 7 例患者可见血管流空影，有 9 例患者局部脊髓及硬膜囊受压前移，有 9 例患者脊髓变细。自然位下，有 0 例患者椎管背侧硬膜囊后方见长 T1 长 T2 信号影，有 2 例患者脊髓变细，其内见斑片状长 T2 信号影。
结论 详细的影像学检查尤其是颈椎屈曲位的 MR 检查对于本病的确诊有重要的意义。

PU-0718

Quantitative Analysis of DCE-MRI and DWI at 3.0T in the differentiation of solid benign lesions from malignant lesions with jawbone

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Objective To explore the value of dynamic contrast enhanced MRI (DCE-MRI) and diffusion weighted imaging (DWI) and a combination of both techniques to differentiate solid benign lesions from malignant neoplasm with jawbone.
Methods Preoperative DCE-MRI and DWI examination was enrolled in 49 patients with pathologically confirmed mandible and maxilla lesions between January 1, 2017 and May 1, 2019. The apparent diffusion coefficients (ADC) were obtained form DWI sequences. The ADC value together with the DCE-MRI parameters (time to peak (T_{peak}), wash in rate (WIR), wash out rate (WOR), relative enhancement and, maximum enhancement) was

determined. Statistical analyses were performed to assess the differential performance of each parameter separately and together.
Results Benign group (n = 22) and malignant group (n = 25) differed in ADC value, T_{peak}, WIR and WOR (P<0.05). The ADC value displayed the most significant difference (P=0.009) with a mean value in benign and malignant group of 1.55×10^{-3} $mm^2/s\pm0.83$, 0.95×10^{-3} $mm^2/s\pm0.37$, respectively. The cut-off value of ADC was 1.05×10^{-3} mm^2/s. The WOR displayed another significant difference among the parameters of DCE-MRI (P=0.011). Malignant tumors with jawbone showed higher WOR, WIR, and lower T_{peak}, ADC value compared with the benign group (P<0.05). The AUC of the WOR combined ADC value was 0.858, and identification of combination had a high sensitivity 82.6% (95%CI 0.59, 0.91) and specificity 87.2% (95%CI 0.60, 0.96) in differentiate solid malignant lesions from benign neoplasm, which manifested better than that by using ADC value or WOR alone.

Conclusion DCE-MRI parameters combined ADC value can differentiate solid benign lesions from malignant neoplasm with jawbone better than a single parameter, and may serve as a valuable tool with regard to the preoperative delineation of jawbone lesions.

PU-0719
高热惊厥对内侧颞叶癫痫灰质结构影响的形态学研究

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目的 内侧颞叶癫痫(mTLE)是临床最常见的难治性癫痫之一，其病理基础是海马硬化。有研究表明，在伴有海马硬化的 mTLE 患者常伴有高热惊厥（FC)。本研究采用基于体素的形态学分析，观察高热惊厥对 mTLE 脑灰质体积（GMV)的影响及其与病程的相关性，探究高热惊厥对内侧颞叶癫痫脑灰质结构的损伤机制。
方法 收集 50 例有高热惊厥病史（mTLE-FC）、52 例无明显致病因素（mTLE-NO）的内侧颞叶癫痫患者，以及年龄、性别相匹配的正常对照组 50 例。对所有受试者进行全脑高分辨率 T1WI 结构 MRI 扫描。采用基于体素的形态学测量方法进行灰质结构分割，比较三组受试者各脑区灰质体积；选取杏仁核和扣带回作为兴趣区，采用 Spearmen 秩相关分析探讨内侧颞叶癫痫灰质体积变化与病程的相关性。
结果 相比于正常对照组，各 mTLE 组表现出广泛 GMV 降低；与正常对照组相比，mTLE-FC 组同侧海马、海马旁回、丘脑、小脑体积减少（p<0.01，small volume 校正）；与正常对照组相比，mTLE-NO 组双侧丘脑、同侧海马、对侧颞上回体积减小（p<0.01，small volume 校正）；与 mTLE-NO 组相比，mTLE-FC 组同侧杏仁核、额上回及对侧扣带回体积减小（p<0.01，small volume 校正）。mTLE-NO 组局部 GMV 与病程无相关性；mTLE-FC 组杏仁核 GMV 与病程呈负相关（r=-0.336，P=0.017）。
结论 mTLE 患者存在双侧大脑半球广泛灰质结构损伤；既往有高热惊厥病史的内侧颞叶癫痫(mTLE)患者脑损害更加严重，提示高热惊厥导致的 mTLE 病理生理机制不同，存在的癫痫网络也不同。

PU-0720
基于三叉神经痛体征 MRI 成像序列价值探讨

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目的 探讨基于三叉神经痛体征 MRI 成像序列的应用价值，以期为基于三叉神经痛体征 MRI 成像规范提供参考。**方法** 对临床诊断为三叉神经痛的 104 例患者行 MRI 检查，采用 T1 加权（TIWI）、T2 加权（T2WI）、T2 水抑制成像（T2Flair）、三维快速平衡稳态采集序列（3D-COMSIC）、3D-TOF 成像、弥散加权序列（DWI）、三维容积内插快速扰相梯度回波序列增强扫描行头颅的横断面、冠状面扫描，分析总结不同 MRI 成像技术应用于三叉神经痛诊断中的应用效果。**结果** 所扫描序列均能发现 8 例肿瘤引起的三叉神经痛；T1 加权（TIWI）、T2 加权（T2WI）、T2 水抑制成像（T2Flair）仅可疑发现异常血管压迫三叉神经痛 2 例，三维快速平衡稳态采集序列（3D-COMSIC）、3D-TOF 成像 95 例患者中发现 83 例存在动脉血管压迫三叉神经，漏诊异常静脉压迫三叉神经 12 例，三维容积内插快速扰相梯度回波序列增强扫描序列能发现 95 患者均存在血管压迫三叉神经；DWI 序列发现海绵窦综炎症引起的三叉神经痛 1 例，其它序列未发现。**结论** 三维快速平衡稳态采集序列（3D-COMSIC）、3D-TOF、三维容积内插快速扰相梯度回波序列增强扫描完能发现动静脉压迫三叉神经痛的原因，DWI 序列能较敏感的发现炎症引起的三叉神经痛，各序列对发现肿瘤引起的三叉神经痛无明显差异。

PU-0721
DWI 在肺癌脑转移和脑胶质瘤诊断和鉴别诊断中的应用

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目的 通过比较肺癌脑转移瘤和高级别胶质瘤实质区、坏死区、瘤周水肿区 ADC 值，探讨 DWI 在肺癌脑转移瘤与高级别胶质瘤诊断和鉴别中的价值。
方法 对 29 例肺癌脑转移瘤和 12 例Ⅲ -Ⅳ级高级别胶质瘤的 MRI 常规平扫、增强扫描和 DWI 成像进行回顾性分析。在肿瘤实质区、坏死区、瘤周水肿区及对侧相应或邻近部位正常白质分别选取 3-5 个兴趣区，测其 ADC 值并进行统计分析。
结果 肺癌脑转移瘤多发 20 例，单发 9 例， 其中 10 例病灶 DWI 图上为高信号，而 ADC 图上均呈低信号；另 19 例病灶中心 DWI 图上可见低信号，ADC 图为高信号。高级别胶质瘤均为单发， 5 例 DWI 图上病灶为高信号，ADC 图上为低信号；另 7 例未见明显高信号，而 ADC 图上可见高信号。肺癌脑转移瘤和高级别胶质瘤实质区 ADC 值分别为 0.86±0.23、1.07±0.14，差异无统计学意义；坏死区 ADC 值分别为 2.41±0.47、2.83±0.08，差异有统计学意义；近瘤水肿区 ADC 值分别为 1.58±0.18、1.41±0.16，差异有统计学意义；远瘤水肿区 ADC 值分别为 1.59±0.08、1.51±0.15，差异无统计学意义。转移瘤近瘤水肿区、远瘤水肿区 ADC 值分别为 1.58±0.18、1.59±0.08，差异无统计学意义；高级别胶质瘤近瘤水肿区、远瘤水肿区 ADC 值分别为 1.41±0.16、1.51±0.15，差异有统计学意义。
结论 DWI 在肺癌脑转移瘤与高级别胶质瘤肿瘤瘤体以及瘤周的 ADC 值不同，是诊断和鉴别诊断有效的 MRI 技术。

PU-0722
SWI 在 MRI 诊断脑微出血等的应用体会

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目的 探讨 SWI 在 MRI 诊断脑微出血（CMB）脑血管疾病中的临床意义。**方法** 选取 2014 年 12 月至 2019 年 2 月我院接诊的脑血管疾病病人 60 例，全部病例均接受 MRI 检查，MRI 序列包括常规 T1WI、T2WI、FLAIR、DWI 序列，以及磁敏感加权成像 SWI 序列，对检查结果的差别进行比较。**结果** SWI 序列发现大动脉硬化性脑梗死患者 24 例（占 40%）合并 CMB，腔隙性脑梗死 18 例（占 30%）合并 CMB，心源性脑栓塞 13 例（占 21.7%）合并 CMB，短暂性脑缺血发作 5 例（占 8.3%）合并 CMB。**结论** 磁共振 SWI 序列较常规序列在脑血管疾病微出血方面具有独特的优势，可清晰、较好发现病灶，提高检查准确率，可及时为临床治疗方案制定提供有效的影像学依据，是脑血管疾病检查的有效方法之一，值得临床推广应用

PU-0723
多参数动脉自旋标记对急性脑梗死后交叉性小脑机能联系不能评价

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目的 利用多个延时标记时间（PLD）动脉自旋标记技术（3D ASL），通过测量急性脑梗死后全脑血流灌注，评价不同 PLD 3D ASL 在诊断脑梗死后交叉性小脑机能联系不能（CCD）价值，及其与 NIHSS 评分相关性，了解梗死灶与 CCD 关系。
方法 前瞻性收集幕上急性脑梗死患者供 93 例，利用多个延时标记时间 3D ASL 分别测量梗死区、对侧镜像区、双侧小脑半球脑组织 CBF 值，计算小脑不对称指数(AI)，依据 AI 大于 10%时诊断为 CCD，分析多个 PLD 3D ALS 对 CCD 诊断价值，及其与 NIHSS 评分相关性分析。
结果 93 例幕上急性脑梗死患者中，PLD1.5S、2.0S 及 2.5S 时 CCD 的检出分别为 41 例（44.1%）、19 例（20.4%）及 12 例（12.9%），联合 1.5S 及 2.0S 时 CCD 检出为 45 例（48.3%），联合 1.5S+2.0S 及 2.5S 时 CCD 检出为 51 例（54.8%）。配对样本 t 检验显示，CCD 组 NIHSS 评分（7.44±2.57）较非 CCD 组（2.50±1.33）增高（F=10.07，t=－8.10，P＜0.001），且当 1.5S、2.0S 及 2.5S 均显示为 CCD 时（NIHSS 评分：8.79±2.58），NIHSS 评分明显较单组 PLD（NIHSS 评分：3.58±2.00）检出为 CCD 明显增高（F=1.41，t=－7.48P＜0.001），梗死区面积越大，NIHSS 评分越高，梗死区 CBF 值越低，NIHSS 评分越高。
结论 3D ASL 技术能够无创评价脑梗死后 CCD 现象发生，参数为 1.5S 时 CCD 检出率最高，联合多个 PLD 可以提高 CCD 检测率，CCD 的发生与梗死区最大面积、梗死区 CBF 及 NIHSS 评分相关。

PU-0724
MRI 在慢性酒精中毒性脑病的临床应用体会

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目的 进一步提高对慢性酒精中毒性脑病的 MR 特征及临床表现认识。**方法** 运用 MR 对临床疑及慢性酒精性脑病患者进行 MRI 检查，回顾性分析其 MR 表现。**结论** 慢性酒精性脑病有其特征性影像学表现，能早期发现慢性酒精中毒性脑病，具有重要的临床应用意义。

PU-0725

1.0T 开放式磁共振实时透视技术在颅脑病变穿刺活检中的应用

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研究 1.0-T 开放式磁共振实时透视技术引导颅脑病变穿刺活检的安全性、可行性及诊断价值。**方法** 回顾性分析 106 例 1.0-T 开放式磁共振实时透视技术引导的颅脑病变穿刺活检病例，评价穿刺活检病理的诊断率、诊断准确率、并发症发生率及手术操作时间；根据病变大小，将 106 例病例分为＞1.5cm 及≤1.5cm 两组，Fisher’s 精确检验比较两组的诊断率。**结果** 诊断率、诊断准确率分别为 95.3%、94.3%，＞1.5cm 及≤1.5cm 的两组诊断率比较无统计学差异(p>0.05)；手术操作时间为 39±4.6min （ 29-49 min)；并发症发生率为 3.8%，并发症包括 4 例少量脑出血，无严重并发症发生。**结论** 1.0-T 开放式磁共振实时透视技术引导颅脑病变穿刺活检安全、可行，具有良好的诊断价值，可缩短手术时间及简化手术流程，可作为一种新的技术选择应用于颅脑病变穿刺活检中。

PU-0726

Differential diagnosis of parkinsonian degenerative disorders using both brain manual measurements and automated volumetry

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Introduction: To examine the manual brainstem measurements and automated brain volumetry in PD, MSA, PSP and controls and evaluate thediagnostic performance of these measures.
Methods:Eighty-seven PSP patients (51 males, mean age 70.6 years), 31 MSA patients (20 females, mean age 61.2 years), 115 PD patients (57 males, mean age 64.9 years) and 50 controls (30 males, mean age 66.1 years) were included respectively. Manual brainstem measurements included the MR parkinsonism index (MRPI), midbrain short axis and midbrain-pons short axis ratio (M/P). Relative brain structural volumes adjusted for intracranial volume (ICV) of the midbrain, pons, cerebellum, putamen, pallidum, caudate, brain parenchyma, lateral ventricle, and third ventricle were quantified. Differences among and between groups were evaluated. Receiver operating characteristic curve analysis was used to assess diagnostic performance and define cutoff values of these measures.
*Results:*The manual midbrain short axis measure showed the highest diagnostic performance (AUC: 0.828) for distinguishing PSP from MSA or PD and controls with an optimal cutoff value of 9.75 mm (sensitivity 79.3%, specificity 73%). The relative volume of pons gave the highest diagnostic performance (AUC: 0.769) for differentiating MSA from PD and controls with an optimal cutoff value of 0.822% (sensitivity 90.9%, specificity 64.5%). At the optimal cutoff value of 9.08%, the relative volume of cerebellum was useful in differentiating PD from controls (AUC: 0.647, sensitivity 64.3%, specificity 62%).
*Conclusion:*Manual and automated cerebral measurements can reveal different brain atrophy features and be helpful in differential diagnosis of Parkinsonian syndromes.

PU-0727
早发性帕金森病患者脑结构体积变化及其与发病年龄的相关性分析

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目的 我们评估早发性帕金森病(EOPD)[1]和晚发性帕金森病(LOPD)患者的脑结构体积变化，以帮助早期 EOPD 诊断。材料和**方法** 我们招募了 20 名 EOPD(组 1)和 25 名 LOPD(组 2)患者，15 名年轻(YC，组 3)和 24 名老年对照组(OC，组 4)。受试者使用磁化强度预备快速梯度回波序列(MPRAGE)和标准脑形态计量学软件包在具有 64 通道头/颈部线圈的 MAGNETOM Prisma 3T 扫描仪上进行扫描。扫描后将直接自动计算脑内各个结构的体积，并使用相对体积(定义为一个脑区与总颅内总体积的体积比)进行统计分析。YC 组和 EOPD 组以及 OC 组和 LOPD 组之间的相对脑体积差异用双样本 t 检验进行分析。用 Spearman 对异常相对脑体积和发病年龄进行相关性分析。当 P＜0.05 时，认为差异有统计学意义。**结果** EOPD 组的左侧顶叶灰质(GM)、右侧颞叶 GM 和左侧岛叶体积明显小于 YC 组。LOPD 组的全脑体积、左侧尾状核、左侧苍白球、双侧丘脑和双侧额叶体积明显小于 OC 组。LOPD 组的脑脊液(CSF)体积明显大于 OC 组。EOPD 组和 LOPD 组的全脑 GM 和左侧壳核体积显著小于对照组。CSF 相对体积与发病年龄呈中度正相关(R＝0.422)，左侧苍白球、左侧顶叶 GM 和右侧颞叶 GM 相对体积与发病年龄呈中度负相关(R＝-0.313；R＝-0.374；R＝-0.403)。**结论** 在 EOPD 患者认知功能中起关键作用的几个脑区[2]有显著的体积变化。这些结果有助于早期 EOPD 诊断。

PU-0728
探索失眠伴焦虑患者与正常对照组的静息态脑功能成像差异性

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摘要 目的 探索失眠伴焦虑患者在静息态功能磁共振 （resting-stage fMRI，rs-Fmri）是研究脑功能改变，**方法** 选取取符合人选标准的失眠伴焦虑患者 34 人以及人口学各数据匹配的对照组人员 28 人，分别采集被试的结构像（3D-T1）、 静息态功能像（resting-stage fMRI，rs-Fmri），对受试者全脑的 BOLD 信号进行采集分析， 以区域一致性（regional-homogeneity，ReHo）和低频振荡振幅（amplitude of law frequency fluctua-tion ALFF）作为评价指标，比较失眠伴焦虑患者和健康对照者的大脑功能磁共振成像的差异 与认知及情绪功能相关脑区（海马旁回、扣带回、丘脑）等作为兴趣区， 综合考察脑结构 、脑功能改变。结果性失眠伴焦虑组较健康对照组 ALFF 值增高脑 区包括：左侧额内侧回、右侧额下回、右侧颞中回、左 侧小脑前叶、左侧海马旁回、右侧壳核、左侧外侧核、 左侧丘脑、左侧梭状回、左侧脑干；失眠伴焦虑组较健康对照组 ALFF 值降低的脑区包括：左侧 额中回、左侧颞上回、左侧颞中回、左侧顶上小叶、右 侧梭状回、左侧楔叶、双侧楔前叶。原发 性失眠组较健康对照组 ReHo 值升高的脑区包括： 双侧小脑后叶、左侧脑干、右侧海马旁回、右侧前扣 带回、左侧颞中回、左侧枕上回、左侧枕中回；失眠伴焦虑组较健康对照组 ReHo 值降低的脑区包 括：右侧额中回、左侧额下回、右侧枕叶、左侧后扣带回、左侧中央前回。结论，失眠伴焦虑患者颞中回、脑干、 海马旁回的局部自发活动增强，其 ReHo 和 ALFF

值均大于健康受试者，额中回局部自发活动降低，其其 ReHo 和 ALFF 值均低于健康受试者。本研究中发现发失眠伴焦虑患者与认知及情绪 功能相关脑区(海马旁回，扣带回，丘脑等)的神经活动水平发生上调，情绪的兴奋性增加最终可能会妨碍睡眠启动或维持的能力及焦虑症状的产生。

PU-0729

3DHR MRI 序列在大脑中动脉血管壁成像中的应用

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目的 探讨 3D HR MRI 序列在评估大脑中动脉血管壁成像及斑块评估中的应用价值。
方法 选择 2017 年 1- 6 月份我院行 3D HR MRI 血管壁成像的大脑中动脉狭窄患者 120 例，其中男性 69 例，女性 51 例；平均年龄 61.2±12.7 岁，平均身高 169.6±15.1 cm。对血管壁的显示情况，斑块的判断情况进行分析。
结果 大脑中动脉斑块 3D HR MRI 成像技术的成功率 97.5%。大脑中 M1 段的管壁结构能够清晰显示。对大脑中动脉斑块的判断，同一评价者间具有较高的一致性[k=0.95（95%CI=0.85-1.02）]。不同评价者间也具有较高的一致性[k=0.91（91% CI=0.81-1.02）]。
结论 3D HR MRI 序列能清晰显示大脑中动脉的狭窄程度，官腔结构，斑块的成分及易损性，为脑卒中的早期预防、早期治疗提供影像依据。

PU-0730

磁共振波谱技术在帕金森病研究中的运用

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帕金森病（Parkinson’s Diseases,PD）是较为常见的中老年神经系统退行性疾病。随着磁共振技术的发展，磁共振波谱技术（Magnetic resonance spectroscopy,MRS）以其无创性、客观性反映脑内神经生物代谢情况的优势被广泛运用于帕金森病的研究中。尽管目前多数研究结果显示出较大差异，且 MRS 技术上同样存在改进空间，但不可否认 MRS 具有良好的运用前景。本文就磁共振波谱在帕金森病中的应用作一综述。

PU-0731

亚临床肝性脑病患者 fMRI 改变的研究

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目的 采用静息态功能磁共振成像(fMRI)研究亚临床肝性脑病(SHE)患者各脑功能区及全脑功能连接的改变。
方法 收集 35 例亚临床肝性脑病患者(SHE 组)及 45 例健康志愿者(正常对照组)行静息状态下的 fMRI 扫描，利用独立成分分析方法，分离得到各自的脑功能区，采用单样本 t 检验组内分析和两样本 t 检验组间分析，观察 SHE 患者静息状态下脑功能区的改变；采用 Post-hoc 检验观察两组间脑功能连接的差异。

结果 与正常对照组相比，SHE 患者大部分脑功能区功能降低，其中包括：左侧后扣带回、双侧前扣带回、双侧额中回、左侧海马旁回，而楔前叶功能增加；且 SHE 组与正常对照组全脑脑区间的功能连接也存在巨大差异，研究发现共有 21 对脑区间的连接差异具有统计学意义（P 值<0.05），其中 18 对脑区间功能连接显著下降（P<0.01）,3 对显著升高（P<0.01），其中左侧海马与右侧杏仁核间的功能连接变化最明显，其变化与神经心理学测试存在一定相关性。
结论 静息态功能 MRI 可用于观察亚临床肝性脑病各脑功能区及脑区间连接的改变，且有助于早期诊断。

PU-0732

Magnetic resonance imaging study of cranial nerve diseases in children

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Cranial nerve disease is a rare disease in pediatric patients. It can be divided into congenital, inflammatory, traumatic or neoplastic diseases, including the disease of cranial nerve itself or the abnormality of adjacent organs. However, due to the small caliber of the cranial nerve and the small caliber of the intracranial structure, it is challenging to determine whether the cranial nerve of pediatric patients is normal, whether there are malformations and abnormalities. With the help of the newly developed magnetic resonance imaging technology, it can provide higher spatial resolution and fast imaging technology including three-dimensional images. With or without gadolinium contrast, radiologists can more easily diagnose small cranial nerves, such as oculomotor nerve, abducent nerve, facial nerve and hypoglossal nerve, as well as normal radiological anatomy, even in very small children. If cranial nerve involvement is suspected, the evaluation of cranial nerve should include specific MR imaging schemes. Location is an important consideration in cranial nerve imaging, which should cover the whole path and target organs as far as possible. Therefore, radiologists should not only be familiar with the various diseases leading to cranial nerve dysfunction, as well as the whole process of each cranial nerve, including the axonal nucleus and fibers, but also be familiar with the technical considerations of optimum imaging of pediatric cranial nerve. This paper briefly reviews the normal cranial nerve anatomy in children and the imaging manifestations of various cranial nerve dysfunction, as well as the technical considerations of cranial nerve imaging in children.

PU-0733

子痫脑病的磁共振成像研究进展

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妊高症是妊娠常见并发症，是导致孕产妇及围产儿病死率增高的主要原因之一。其发病机制尚未完全阐明，但目前已形成了多种学说，如胎盘前着床学说，遗传学说，过度灌溉理论、内皮功能受损及免疫学说等。该病具有典型的临床特点及影像学特征。提高对该病的临床特点和 MRI 特征的认识，有利于提高对该病的诊断。

PU-0734

多模 MRI 在脑卒中评估的价值研究

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本研究探讨了快速多模态 MR 检查对急性缺血性脑卒中(AIS)患者的应用价值。
方法 患者纳入标准：（1）急性脑卒中疑似患者，美国国立卫生研究院卒中量表≥3 分；（2）神经功能障碍症状开始＜24h；（3）无 MR 检查的禁忌症。共纳入 80 人为研究对象，患者同时进行了 CT 与 DSA 检查。采用 Siemens 3.0T MR 扫描仪。应用序列：头颅平扫（T1WI,T2WI,T2 WIFLAIR）,三维时间飞跃法磁共振血管成像(3D TOF MRA),弥散加权成像(DWI),磁敏感成像（SWI）,灌注成像（PWI）。由两名资深医师单独诊断，并将检查结果与 CT ，DSA 检查结果进行对比。
结果 多模 MRI 对脑卒中确诊率明显高于 CT,特别是对急性缺血性脑卒中确诊率达 100%。DWI 是在急性缺血性脑卒中(急性脑梗死)发生后数分钟内发现梗死灶的最敏感和特异性的技术，可以和 T2 WIFLAIR(液体衰减反转恢复成像)结合使用，以识别不可逆和可逆损伤的脑组织。三维时间飞跃法磁共振血管成像(3D TOF MRA)在不使用造影剂的情况下，可以判断脑血管是否存在血栓、出血、狭窄，并能确定血管狭窄与闭塞的准确部位。磁敏感成像（SWI）可以作为检测脑梗死受累血管分布区、梗死区以及梗死后出血的辅助手段，通过与 MR 灌注成像结合可判断梗死组织的预后。另外 SWI 还可以发现慢性高血压患者受损的小血管周围发生的陈旧性出血灶，即脑内微出血。发现少量微出血灶（数量 1～10 个）或大量微出血灶（数量＞10 个），从而达到指导阿替普酶静脉溶栓，减小脑出血风险。在常规 MRI 扫描中，这种微小出血点较难发现。灌注成像（PWI）用于确定早期脑梗塞，和 DWI 比较缺血范围，找出缺血半暗带等 。通过静脉注射顺磁性对比剂，计算局部脑血容量，局部脑血流量和平均通过时间。提供常规磁共振不能获得的血流和脑血管功能状态的信息，有助于缺血性脑卒中的早期诊治。

PU-0735

短 TR 对 3D-TOF-MRA 信噪比、成像时间及伪影的影响

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目的 减少 MRA 图像上的慈敏感伪影提升图像信噪比，缩短成像时间；使劲动脉虹吸部血管及头颅远端血管显示清楚；减轻固定假牙患者金属伪影提高图像质量。**方法** 1、使用 GE HD speed3.0T 选取 200 例 MRA 检查患者，其中 100 例使用常规参数作为对照组，100 例使用短 TR 参数作实验组。**结果** 实验组图像较对照组成像时间短，金属伪影及慈敏感伪影更小，组织信噪比、对比度更高，虹吸部及远端细小血管显示更清楚。**结论** 在 3D-TOF-MRA 中应用短 TR 可缩短成像时间，增加图像信噪比及对比度，减少伪影。

PU-0736
缺血脑白质病变在胼胝体 DTI 神经纤维束受损分析

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【摘要】 **目的** 采用弥散张量成像（DTI）技术，观察脑白质疏松症患者胼胝体神经纤维束的改变。**方法** 回顾性分析 60 例健康志愿者、60 脑白质疏松症患者，应用独立成分分析法分别筛选出胼胝体纤维束，并分析差异。结合临床确诊用 Extended MR WorkSpsce 工作站上的 DTI Studio 软件对所有受试者的 DTI 原始数据进行预处理，应用独立成分分析法，分别提取胼胝体神经纤维束的功能连接强度值，并对纤维束的根数、像素、FA 值、ADC 值、长度改变、网络连接进行研究。**结果** 脑白质疏松症与正常对照组显示，胼胝体纤维束有着明显改变，尤其在脑网络连接、根数、长度方面更明显。**结论** 磁共振 D T I 纤维追踪技术可以三维直观地显示胼胝体纤维束的异常改变，并能定量分析，对其诊断及判断预后具有重要价值。

PU-0737
首发抑郁症患者静息态脑功能荟萃分析

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目的 抑郁症(major depression disorder, MDD)患者静息态功能磁共振成像(resting-state functional magnetic resonance imaging, RS-fMRI)的研究结果存在异质性，迫切需要进行荟萃分析以描述其脑功能并提供可靠的生物标志物。**方法** 在 PubMed、Ovid 等数据库检索 1984 年 1 月至 2016 年 7 月未经治疗的首发单相 MDD 患者基于体素分析的 RS-fMRI 研究并进行筛选、评价质量、提取资料，采用荟萃分析软件(anisotropic effect size-signed differential mapping, AES-SDM) 分析 MDD 患者与健康对照者（healthy controls, HCs）的全脑脑功能差异，依据不同的 MRI 分析方法进行分组荟萃分析，并对患者平均年龄、受教育时间、发病持续时间、严重程度行元回归分析。**结果** 共纳入 12 项研究，总计 313 例 MDD 患者和 283 例 HCs。总汇结果和亚组分析显示左海马旁回、左杏仁核、左海马、左额中回（眶部)和辅助运动区功能亢进,左舌回、左枕中回、右楔叶皮层、右额中回（眶部)和左小脑前叶功能减退。元回归分析显示发病持续时间与左海马旁回功能亢进和左小脑半球 IV/V 叶功能减退正相关。**结论** 荟萃分析表明未经治疗的首发单相 MDD 患者的杏仁核、左海马等脑区静息态脑功能显著异常，反应了 MDD 患者认知、情绪障碍病理生理学机制，为 MDD 的诊断、评估提供了可靠的生物标志物。

PU-0738
ADC 值可以用来评价 MRI 平扫表现正常的急性一氧化碳中毒病例

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目的 探讨表观弥散系数(ADC 值)在 MRI 平扫表现急性一氧化碳中毒病例中的诊断价值。**材料与方法** 回顾分析 46 例急性一氧化碳中毒脑部 MRI 表现正常的病例。50 例 MRI 影像表现正常的健康成人志愿者的脑部 MRI 资料为正常对照组。对每一例病例均进行 DWI 检查及 ADC 值测量。在后处理工

作站上利用图像后处理软件按照半卵圆中心区、侧脑室周围白质区、苍白球区、大脑皮层区四个部位对所有（p＜0.有统计学意义）。采用独立样本双侧 t 检验对 MRI 表现正常组与正常对照组间相同部位的平均 ADC 值进行分析（p＜0.05 有统计学意义）。**结果** MRI 表现正常组与正常对照组比较：皮质区、半卵圆中心区、侧脑室周围白质区的平均 ADC 值较正常对照组减低（具有统计学差异），苍白球区的平均 ADC 值无统计学差异。**结论** 对有临床症状而常规 MRI 平扫表现正常的病例，ADC 值是评价急性 CO 中毒的一个较为敏感指标。用 ADC 值对 MRI 表现正常的病例进行量化评价，可以为临床诊断的提供依据，减少漏诊的发生。

PU-0739
儿童胚胎发育不良性神经上皮肿瘤 2 例报道并文献复习

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目的 报告 2 例儿童颅内胚胎发育不良性神经上皮肿瘤 (dysembryoplastic neuroepithelial tumor, DNET) 病例, 分析其临床病理特征、神经影像学特点、手术治疗及预后情况，以期进一步提高对本病的认识。材料与**方法** 回顾性分析 2 例经手术及病理证实的儿童 DNET 病例的临床资料、患儿术前及术后的头颅磁共振影像表现，并结合文献复习，探讨该病 MR 表现特征，提高影像诊断水平。**结果** 2 例均为 8-10 岁儿童，其中男、女各 1 例，均有反复癫痫发作病史；病灶均为单发，1 例发生于顶叶、1 例发生于颞叶，MR 平扫显示病灶均呈 T1 低、T2 高信号，T2-FLAIR 图像上 1 例呈中央低、周围高信号的“环形征”及“倒三角征”，1 例内见细小分隔，增强扫描均未见明显强化，病灶边缘清楚，无占位效应及瘤周水肿；术后随访 1 年内 1 例无癫痫发作，1 例癫痫发作频率明显减少。**结论** DNET 是中枢神经系统较少见的良性肿瘤，好发于儿童及青少年，临床表现以反复发作的癫痫为主，外科手术切除治疗效果好，术后无需放、化疗，影像学上易与低级别胶质瘤相混淆，但其 MR 表现仍具有一定特征,有助于明确对该疾病的诊断和鉴别诊断，为临床医生制定适宜的手术及诊疗方案提供可靠的影像依据。

PU-0740
Parcellation-dependent topological patterns of white matter connectivity networks in adolesecents

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Purpose: To investigate the influences of different brain parcellation atlases on the topological patterns of brain white matter connectivity networks (WMCN) in adolescents using diffusion tensor imaging (DTI).
Methods: DTI and T1 structural data of 26 health adolescent participants (age range 11-19 years; 15 males) were acquired on a 3.0 T MR scanner (Discovery MR 750; GE; USA). DTI data preprocessing and network construction were using the PANDA toolbox[1]. Then, graph theory approach was used to investigate the topological organizations of WMCN based on Automated Anatomical Labeling atlas (AAL, 90 regions) and Brainnetome atlas (BNA, 246 regions) [2], respectively. Then, both the global and nodal topological properties of weighted WMCN were analyzed using GRETNA toolbox[3]. The global properties included: clustering coefficient (Cp), shortest path length (Lp), global efficiency

(Eglob), normalized clustering coefficient (Gamma, γ), normalized shortest path length (Lambda, λ), and small world parameters (Sigmma, σ). Each nodal efficiency (Enod) was estimated as the nodal profiles. In addition, hub nodes were defined as those nodes if Enod was at least one standard deviation (SD) greater than the average Enod of the group network. To investigate the robustness of the main results corresponding to the edge weight, the network properties with edge threshold fiber number (FN)= 1, 2, 3, 4 and 5 were analyzed, respectively. Paired *t*-test was used to determine the differences of global topological properties between the two brain parcellation schemes.
Results:The global and local efficiency of AAL parcellation approach were significantly higher than those of BNA approach ($P < 0.0001$), while the Lp, σ, γ and λ of AAL approach were significantly lower than those of BNA approach ($P < 0.0001$). For Cp, only when FN threshold was greater than 3, there was a significant difference between those two parcallation approaches (FN = 4, $P = 0.028$; FN = 5, $P = 0.001$). When FN= 3, 12 hub regions were found in AAL-based network, 43 hub regions in BNA-based network, including bilateral precentral gyrus and precuneus gyrus in both networks.
Conclusion: Global properties and hub nodes of adolescent WMCN largely depended on the brain parcellation template. The stuctural network properties were relatively robust when the FN threshold was set to 3.

PU-0741

产后抑郁症患者脑白质纤维连接的弥散张量研究

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目的： 运用基于纤维束示踪的空间统计学方法(tract—based spatial statistics，TBSS)探索产后抑郁症患者脑白质微观结构的改变。

方法 纳入 20 例符合 DSM-V 产褥期抑郁症诊断标准的患者（PPD 组）和 24 例年龄、性别及受教育程度相匹配的健康产妇（HPW 组）,进行爱丁堡产后抑郁量表（Edinburgh Postnatal Depression Scale，EPDS）评分，要求 PPD 组评分≥9 分，HPW 组评分≤3 分，两组进行全脑弥散张量成像（diffusion tensor imaging，DTI）扫描，运用基于纤维束示踪的空间统计学方法（TBSS）对 PPD 组及 HPW 组的各向异性分数（fractional anisotropy,FA）值进行组间对比。

结果 产后抑郁组的大脑右侧额上回及额中回、右侧中央前回及顶上小叶、右侧中央后回、右侧扣带回、左侧内囊后支 FA 值低于健康产妇组(P<0.05)，与之相对应右上纵束、右皮质脊髓束及丘脑前辐射、左皮质顶枕颞桥束 FA 值低于健康产妇组。

结论 产后抑郁组右上纵束、右皮质脊髓束及右侧丘脑前辐射、左皮质枕颞桥束纤维连接存在损害；脑白质微结构和纤维连接异常参与产后抑郁症的发生过程，这些改变在产后抑郁早期已经出现；边缘系统-纹状体-苍白球-丘脑(limbic-cortico-striato-pallido-thalamic)神经环路异常可能是导致产后抑郁症发病的原因之一。

PU-0742

基于体素的形态测量学分析常规 MRI 阴性智力障碍儿童脑灰质容积的变化

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【摘要】 **目的** 应用基于体素的形态测量学(voxel based morphometry，VBM)技术测量常规 MRI 阴性的智力障碍儿童脑灰质容积的改变，从脑结构水平探讨智力障碍相关机制。**方法** 回顾性分析 2017 年 8 月至 2018 年 11 月在本院儿科中心确诊为智力障碍患儿 22 例，常规磁共振检查阴性，按照年龄、性别、受教育程度及利手匹配原则选择 26 名正常健康儿童作为对照组；采用高分辨率 3DT1 脑 MR 扫描，利用基于 SPM8 的 DARTEL 工具箱进行 VBM 分析，运用独立样本 t 检验比较两组儿童各脑区灰质容积差异(P＜0.01，FDR 校正，cluster size＞50)，年龄、性别、受教育程度和全脑容积为协变量。同时，对病例组的智商评分（IQ）与异常脑区灰质容积进行 Pearson 相关分析。**结果** 病例组与对照组间的年龄、性别、受教育程度及全脑容积均无统计学差异（P＞0.05）。与对照组比较，病例组灰质容积下降的脑区包括双侧海马、额上回、扣带回、右侧颞中回、左侧颞上回、海马旁回、中央前回、颞上回；Pearson 相关分析显示病例组异常脑区（左侧海马）灰质容积与 IQ 呈负相关（r=0.638，p=0.011）。**结论** 常规 MRI 表现正常的智力障碍儿童额叶、颞叶、海马部分功能区皮质灰质体积缩小；双侧海马灰质容积改变反映儿童智力障碍程度，海马损伤是导致儿童智力障碍的原因之一。

PU-0743

DWI 在新生儿缺氧缺血性脑病的应用体会

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目的 探讨 DWI 序列在诊断新生儿缺氧缺血性脑病的应用价值。**方法** 通过 86 例新生儿 MRI 常规 T1WI、T2WI 序列和加扫 DWI 序列影像分析。**结果** DWI 序列在脑皮质、脑白质、基底节区及丘脑区较早于 T1WI/T2WI 显示高信号。**结论** DWI 序列诊断新生儿缺氧缺血性脑病优于常规 T1WI 和 T2WI 序列.

PU-0744

急性和缓解期多发性硬化患者脑局部连通性改变：基于多体素水平 KCC-Reho 和 Cohe-ReHo 的 MRI 研究

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目的 采用多体素水平（7、19、27）的肯德尔系数-局部一致性（KCC-ReHo）和相干-局部一致性(Cohe-ReHo）探讨急性期和缓解期-复发缓解型发性硬化（RRMS）患者的功能改变及其与临床参数之间的关系。
方法 采集急性期 RRMS18 例、缓解期 RRMS26 例及年龄、性别相匹配的健康志愿者 20 例静息态功能磁共振（fMRI）数据，基于 matla 平台行数据预处理，计算并提取三组受试者在不同体素水平的

KCC-ReHo 和 Cohe-ReHo 值，比较三组间 Reho 值的改变，并分析患者 Reho 值的改变与扩展残疾状态量表（EDSS 评分）、连续听觉加法测试（PASAT 评分）、病程等临床参数之间的关系。

结果 不同体素下的 KCC-ReHo 和 Cohe-ReHo 分析显示三组间在额上回、额内侧回、枕中回 Reho 值升高：其中急性期与缓解期间的 Reho 值仅在枕中回存在差异但与临床参数无相关性；急性期相对于健康组额上回 Reho 值升高且与病程评分呈负相关（r＜-0.5,P＜0.05）。不同的是：KCC-ReHo 分析发现三组间楔叶 Reho 值也升高（P＜0.05，FDR 校正），急性期相对于健康组额内侧回 Reho 升高且与病程呈负相关（r＜-0.5,P＜0.05），缓解期与健康组的差异和临床参数无相关性；而 Cohe-ReHo 分析显示缓解期相对于健康组额上回 Reho 值升高且与病程呈负相关(r=-0.571, P=0.041)。此外 KCC-ReHo（7 和 9 体素）分析另显示急性期相对于健康组额上回 ReHo 值升高且与 EDSS 评分呈负相关（r＜-0.5,P＜0.05）。

结论 相对于缓解期，处于急性状态下的 RRMS 患者存在更广泛的局部功能连通性改变，这种和疾病状态有关的应对性改变反应了患者的临床功能情况。KCC-ReHo 和 Cohe-ReHo 分析可提供更多有用信息，采用不同的 Reho 计算方法可提供更多信息，有利于进一步探讨患者病理生理的改变机制。

PU-0745

颈动脉斑块内出血信号强度与急性脑梗塞风险分层的相关性

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目的

有研究表明颈动脉斑块内出血（IPH）与脑血管缺血性事件有关。目前，磁共振（MR）血管壁成像已被证明能够评估颈动脉动脉粥样硬化斑块的形态和成分特征，具有很高的敏感性和特异性。本研究的目的是通过多对比 MR 血管壁成像研究出血性颈动脉斑块患者颈动脉 IPH 的 SIR 与 ACI 之间的关系。

方法

本研究纳入颈动脉 IPH 症状患者，均使用 3.0T MR 进行颈动脉和脑组织成像。对颈动脉进行了标准化多序列协议,包括 TOF、T1W、T2W 和 MPRAGE 序列。通过扫描 T1W 和 DWI 序列获得脑的结构图像。通过 MPRAGE 图像识别 IPH，即信号强度是肌肉信号的 1.5 倍。分别测量了颈动脉 IPH 在 T1W、T2W、TOF 和 MPRAGE 图像上的 SIR。在与颈动脉 IPH 同侧大脑半球上确定是否存在 ACI。采用独立样本 t 检验或 Mann-Whitney U 检验比较有 ACI 和无 ACI 患者颈动脉 IPH 的 SIRs。采用 logistic 回归方法计算不同成像序列在校正混杂因素前后预测 ACI 时 IPH SIRs 的比值比（OR）和相应的 95%置信区间（CI）。

结果

118 例患者（平均年龄 66.9±10.2 岁；88.1%男性）中，35.6%的患者在颈动脉 IPH 的同侧半球有 ACI。与无 ACI 的患者相比，有 ACI 的患者在 T1W 时颈动脉 IPH 的 SIRs 显著升高（1.5±0.6 vs.1.3±0.3；p=0.022），而在 T2W、TOF 和 MPRAGE 图像上则没有。logistic 回归分析显示，经临床混杂因素校正后，T1W 图像上颈动脉 IPH 的 SIR 与 ACI 的存在显著相关（OR=3.535；95%CI 1.120-11.155；P=0.031）。在 TOF、T2W 和 MPRAGE 图像上，ACI 和 SIRs 之间未发现显著相关。

结论

我们的结果显示 T1WI 颈动脉 IPH 的 SIR 与 ACI 明显正相关，提示斑块内出血时间可能是急性缺血性脑血管事件风险的独立指标。

PU-0746

肝豆状核变性治疗前后的临床与 ADC 值对照

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摘要 目的:分析铜螯合剂治疗肝豆状核变性(HLD)患者的临床特征、功能障碍和包括 DWI 指标在内的 MRI 脑功能的影响。
方法与结果: 对 20 例经临床和血清学证实的，有神经损害的肝豆状核变性(HLD)患者，经铜螯合剂治疗后，持续随访，并对其临床特征、进行系列评估，治疗前后完善实验室指标（铜蓝蛋白、24H 尿铜）,MRI 及功能检查，并应用扩散加权成像(DWI)评估肝豆状核变性患者病变区域治疗前后的功能改善；在他们接受治疗后，随着随访时临床症状及实验室指标的总体改善，比较治疗前后病变区域平均扩散系数(ADC)，差异有统计学意义(p ＞ 0.05)。
结论 HLD 患者经铜螯合剂治疗治疗后，ADC 值可作为药物治疗开始后临床神经系统状态及脑功能改善的替代指标

PU-0747
腹腔注射钆对比剂评估多形性胶质母细胞瘤侵袭性与 hMSH6 基因的相关性研究

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目的 探索 hMSH6 表达对多形性胶质母细胞瘤在脑组织中形成和进展的影响，利用磁共振评估肿瘤侵袭，并探究 balb/c 裸鼠腹腔注射替代尾静脉注射对比剂的可行性，及两种方案最佳剂量和扫描时间窗。
方法 研究使用 U251 细胞系，实验组 MSH6 基因过表达，对照组正常表达。体外试验，western blot、RT-PCR、细胞划痕实验、Transwell 实验检测两组细胞蛋白、基因表达水平、迁移侵袭能力。体内实验，将两组细胞种于裸鼠皮下，待肿瘤直径大于 1.5cm 取材，Western Blot、RT-PCR 分别检测 MSH6 蛋白、基因表达水平。将两组细胞种于 24 只裸鼠颅内（12 只/组），使用 Philips 3.0T Achieva，配备小鼠专用 8 通道正交线圈，采集 T_1DIXON、T_1Mapping、T_2DIXON、T_2FLAIR 序列，种瘤后 15 日、28 日进行 MRI 扫描，获得平扫图像后分别对实验组、对照组裸鼠进行尾静脉、腹腔注射，并在注射后 15、30、60、90、120、150、180min 采集增强图像，取材、病理验证肿瘤范围，并检测各组织钆沉积情况。
结果 Western Blot、RT-PCR 结果表明实验组 MSH6、MMP2、MMP9 蛋白水平，MSH6 表达水平高于对照组，细胞划痕实验、Transwell 实验结果表明实验组细胞的迁移、侵袭能力强于对照组，小鼠肿瘤组织中实验组的 MSH6 蛋白、基因表达水平高于对照组。磁共振结果显示实验组肿瘤大小大于对照组（3.1±0.4mm×2.6±0.5mm vs 2.2±0.2mm×1.7±0.3mm, $p<0.05$），与病理结果相符。腹腔注射对比剂组和静脉注射对比剂组在注射后 60min、15min 达到最佳增强效果，静脉注射对比剂组强化程度略高于腹腔注射对比剂组。
结论 hMSH6 表达水平与多形性胶质母细胞瘤侵袭性呈正相关，腹腔注射钆对比剂可有效评价多形性胶质母细胞瘤侵袭性。

PU-0748

准连续动脉自旋标记技术在脑瘫患儿脑血流量改变中的临床应用

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脑性瘫痪（cerebral palsy，CP，简称脑瘫）是由于各种围生期因素所引起非进行性脑损伤和发育缺陷综合征。研究结果报道如下：

1 目的

探讨准连续动脉自旋标记（pseudo-continuous arterial spin labeling，pCASL）磁共振灌注成像技术在评价脑瘫患儿颈总动脉交感神经网剥脱术后脑血流量改变的应用。

2 方法

选择 2015.10-2017.3 在我院进行颈总动脉交感神经网剥脱术的 50 例 CP 患儿以及 20 例正常儿童纳入本项研究，对正常对照组受试儿童以及 CP 患儿手术前、手术后 7d 和手术后 6 个月分别进行 PCASL 磁共振灌注检查，采用 pride 软件对双侧基底节区、双侧顶叶灰质、双侧放射冠白质区的脑血流量值进行统计分析。并观察 CP 患儿术后临床症状改善情况。

3 结果

CP 患儿术前经 pCASL 评价各兴趣区 CBF 明显低于正常对照组受试儿童，有统计学差异，$p<0.05$。术后 7d，CP 患儿的 CBF 值仍然明显低于正常对照组，有统计学差异，$p<0.05$；术后 6 个月，虽然 CP 患儿的 CBF 值较术前和术后 7d 改善更加显著，有统计学差异，$p<0.05$；但是仍然低于正常受试儿童的 CBF 值，有统计学差异，$p<0.05$。另外，CP 患儿语言障碍、肌张力异常、共济失调、斜视、流涎等临床症状得到明显改善。

4 结论

pCASL 磁共振灌注成像是一种采用磁标记的动脉血水分子作为内源性示踪剂，用于测量脑组织血流灌注的非电离、非侵入式的 MR 技术，由于其无创性，安全性较高，可重复性强，在儿科具有较大的应用优势。

pCASL 磁共振灌注成像技术可以用于脑瘫患儿脑血流量的评估以及颈总动脉交感神经网剥脱术疗效的动态观察，值得临床推广。

PU-0749

基于磁共振成像的棕色脂肪检测研究进展

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【摘要】 **目的** 棕色脂肪作为治疗肥胖症糖尿病等代谢性疾病的潜在治疗靶点，准确检测其体积和代谢活性对评估其治疗潜力具有重要意义。以往临床检测棕色脂肪的诸多方法都各有弊端，目前，一种较新的检测手段-磁共振成像越发广泛地应用于棕色脂肪检测。本文就目前常用于棕色脂肪检测磁共振成像方法作一综述。**方法** 进入 PubMed、百度学术、知网、万方等数据库检索系统，采用“棕色脂肪”、“磁共振成像”、“检测”、“活性”为主要检索关键词，检索文献经筛选后纳入分析 21 篇，文献时间范围到从 2009 年至 2018 年。**结果** 棕色脂肪的检测手段日新月异，相对于其他的检测棕色脂肪的方法，磁共振成像技术具有明显的优势，有助于提高棕色脂肪的准确性。目前，磁共振检查以其无创、无辐射、软组织分辨力高、成像参数多等优势，越发广泛地应用于棕色脂肪检测。**结论** 磁共振成像在无创性检测棕色脂肪方面具有良好的应用前景。

PU-0750

自恋型人格障碍患者静息态脑功能网络拓扑属性重组改变

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目的 研究自恋型人格障碍对人脑功能网络的影响从而探索自恋型人格障碍的神经生理机制。
方法 在大连医科大学收集 20 名男性自恋型人格障碍患者及 20 名年龄、性别匹配的健康对照组，进行 3.0T 西门子磁共振头颅进行静息态序列扫描，然后经过 GRETNA 进行图像后处理计算和比较两组的大脑静息态功能网络的拓扑属性。
结果 与健康对照组相比，自恋型人格障碍患者的脑功能网络的小世界属性升高，最短路径长度和聚类系数增加，局部效率升高但全局效率减低。
结论 自恋型人格障碍患者的大脑静息态功能网络发生了异常改变，更趋向规则网络属性，这为自恋型人格障碍的神经影像学机制探索提供了重要依据。

PU-0751

MRI 动态增强扫描技术在垂体微腺瘤中的临床应用

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摘要：目的 探讨 MRI 动态增强扫描技术对垂体微腺瘤诊断价值。**方法** 选择我院放射科 2017 年 1 月至 2018 年 12 月期间确诊为垂体微腺瘤的患者 22 例，均行常规 MRI 平扫、MRI 动态增强扫描以及延迟增强扫描影像学表现。MRI 检查使用 GE BRIVO MR355 1.5T 磁共振扫描仪，使用的是头颈联合线圈。①平扫：行 CUBE T1 矢状位、冠状位扫描，ET 为 12ms；TR 为 400 ms，TE 为 35 ms；层厚层距为 3thk/osp；视野为 18 cm×18 cm；FSE-T2WI 矢状位、冠状位、横断位序列扫描，ET 为 17ms；TR 为 3108ms，TE 为 130ms；层厚层距为 3thk/osp，视野为 18 cm×18 cm；②MRI 动态增强扫描：用高压注射器取 0.1 mmol/kg 钆特酸葡胺于右前臂行静脉注射，速度为 2.5 mL/s，用 FSE-T1WI 序列进行鞍区动态增强扫描，注意保持扫描平面和垂体柄的平行；③延迟增强扫描；结束了动态增强扫描约 20 min 后，则可进行延迟增强扫描，包括进行矢状位与冠状位的 CUBE T1 序列扫描。**结果** 垂体微腺瘤好发于女性，平扫共检出 12 例阳性，检出率为 53%；延迟增强扫描共检出 15 例阳性，检出率为 65%；动态增强扫描共检出 20 例阳性，检出率为 90%。动态增强扫描的检出率均分别高出平扫及延迟增强扫描（P＜0.05）。**结论** MRI 动态增强扫描技术在垂体微腺瘤诊断中检出率较高，临床可疑垂体微腺瘤推荐动态增强 MRI 扫描。

PU-0752

探讨 T2*与 SWAN 在脑出血的对比应用

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目的 探讨 T2*与 SWAN 在脑出血的对比运用。**材料与方法:**收集本院 30 例不同时期脑出血的患者（超急性期、急性期、亚急性早期、亚急性晚期、慢性期每期各 3 例）,患者签署知情同意书。采用美国 GE 公司超导型 1.5T BRIVO MR355 扫描仪，扫描方法包括 SWAN 和 T2*序列。SWAN 扫描参数：TR Minimun ms，TE 49.7 ms,FA 20ms，序列视野 24cm×24cm，层厚层间距 1thk/2sp，Matrix=384×288,Banwidth=41.67，扫描时间 4.12 分钟。T2*扫描参数：TR 360ms，TE 15 ms,FA 20ms，序列视野 24cm×24cm，层厚层间距 6thk/2sp，

Matrix=256×192,Banwidth=15.63，扫描时间 1.47 分钟。效果评价：由 3 位放射科医师对 SWAN 序列和 T2*序列处理后的图像进行对比评分，采用 3 分制双盲法评分。对两者扫描出来的同一出血期的图像质量、信噪比、微小出血灶的显示程度进行对比。应用 SPSS22.0 统计学软件对所得资料进行分析处理。图像的信噪比、清晰度、以及显示微小病灶的成像效果进行比较，评分、信噪比的比较采用配对 t 检验，以 P＜ 0.05 为差异有显著性意义。**结果** 经三位放射科医师对比 T2*与 SWAN 两序列的信噪比、病灶检出效果，发现 SWAN 序列在显示脑卒中急性出血期的效果和在其它脑出血期检出微出血灶的能力均优于 T2*序列。两者对比的差异有统计学意义(P＜0.05)。**结论** SWAN 序列较 T2*序列在显示血肿内顺磁性物质较 T2*更突出，在早期微出血灶、静脉成像、基底节铁沉积优于 T2*，应当多推广提倡应用于脑出血筛查。

PU-0753

MRS 对 HIE 预后早期评估的临床应用价值

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目的 研究磁共振波谱分析（MRS）对新生儿缺血缺氧性脑病预后早期评估的临床应用价值。**方法** 整理 2017 年 12 月至 2019 年 6 月中国科学技术大学附属第一医院收治的 71 例足月缺血缺氧性脑病患儿纳入观察组，对照组则是无缺血缺氧性脑病的 71 例足月儿，对两组分别行 MRS 检查，分析两组 Cho 值、Cr 值、NAA 值并观察乳酸（Lac）峰
结果 观察组基底节兴趣区 Cho/Cr 及 Cho/NAA 升高，其中 30 例可见增高的乳酸（Lac）峰，观察组与对照组比较，中-重度与轻度 HIE 比较差异均有统计学意义（均 P<0.05）。**结论** 磁共振波谱成像可对 HIE 预后做出准确客观的诊断

PU-0754

3D pCASL 成像技术在亚急性期轻度创伤性脑损伤中的应用

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目的 应用三维准连续式动脉自旋标记(3D pseudo-continuous arterial spin labeling,3D pCASL)技术探讨亚急性期轻度创伤性脑损伤（mild Traumatic brain injury, mTBI）患者的脑血流量(cerebral blood flow,CBF)特点及其与神经心理学改变的关系。 **方法** 收集 2017 年 6 月至 2018 年 12 月亚急性期 mTBI 患者 40 例，所有患者均于 mTBI 后 1 个月内(11.37±5.21 天)行 MRI 及神经心理学检查，招募性别、年龄与病例组相匹配的健康志愿者 40 例作为对照组。分别测量双侧额叶、双侧颞叶、双侧枕叶及双侧顶叶灰质 CBF 值，应用独立样本 t 检验对病例组及对照组的 CBF 值进行分析；亚急性期 mTBI 的 CBF 值与各神经心理学指标之间的相关性采用 *pearson* 或 *spearman* 相关分析。 **结果** 与正常对照组相比，亚急性期 mTBI 患者的各脑叶 CBF 值均有降低，mTBI 患者左侧额叶、右侧额叶及左侧枕叶 CBF 值减低差异具有统计学意义（t=23.1,p=0.008；t=18.4,p=0.02；t=7.72,p=0.009）。左侧额叶 CBF 值与 DHI 得分呈负相关（r_s=－0.619，p=0.001），与 PCS 评分呈负相关（r=－0.638,p=0.002）；右侧额叶 CBF 值、左侧枕叶 CBF 值与 PCS 均呈负相关（r=－0.559,p=0.01；r=－0.413,p=0.021） **结论** 3D pCASL 技术作为一种无创性磁共振脑灌注成像方法，能发现亚急性期 mTBI 患者的低灌注脑区，且脑血流量的改变与脑震荡后综合征症状具有一定相关性。

PU-0755

Altered functional connectivity of anterior cingulate cortex in primary insomnia: A resting-state fMRI study

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Abstract

Objective: To explore the connectivity pattern change betweentheanterior cingulate cortex(ACC) and the voxels from the whole brain in primary insomnia (PI). **Methods:** With region of interest (ROI)-based functional connectivity , a two-sample *t*test was performed on individual FC correlation maps from two groups based on the resting-state fMRI data acquired from 57 PI patients and 46 healthy controls ($p<0.001$, AlphaSim-corrected). **Results:** Compared to the healthy controls, the PI patients show increased connectivity between the right ACC and the right middle frontal gyrus, with decreased connectivity between the right ACC and the bilateral precuneus gyrus. **Conclusion:** Our study shows the alterations of PI patients in the level of functional integration, especially the decreased connectivity between the regions of thedefault mode network(DMN). These changes may provide additional evidence to understand the possible neural mechanisms of PI.

PU-0756

Functional Brain Networks in Never-Treated and Treated Long-Term III Schizophrenia Patients

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This study compared the topological organization of brain function in never-treated and treated long-term schizophrenia patients, and whether age-related effects differed between these groups.

In a cross-sectional study, 21 never-treated schizophrenia patients with illness duration over five years, 26 illness duration-matched antipsychotic-treated patients and 24 demographically-matched healthy controls underwent a resting-state functional magnetic resonance imaging (MRI) scan. The topological properties of brain functional networks were compared across groups, and then we tested for differential age-related effects in regions with significant group differences.

Both never-treated and antipsychotic-treated schizophrenia patient groups showed reduced global functional efficacy, and altered nodal centralities in right amygdala, right olfactory cortex and bilateral putamen relative to controls. Never-treated patients demonstrated reduced global clustering coefficient and efficiency, increased shortest path length, and decreased nodal centralities in right amygdala and right

putamen relative to antipsychotic-treated patients. No significant relationships of age and altered functional metrics were seen in either patient group, and no greater alterations in the treated group were identified. These findings provide insight into brain function deficits over the longer-term course of schizophrenia independent from potential effects of antipsychotic medication. Greater functional alterations in never-treated than treated patients suggests that long-term antipsychotic treatment may partially protect or enhance brain global and nodal topological function over the course of schizophrenia, notably involving in amygdala and striatum that have long been associated with the disorder.

PU-0757
3D-TOF 结合图像融合后处理技术对颌面部肿瘤术前引导的价值研究

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摘要：目的 比较 3D-TOF、CE-MRA 技术、CT 增强分别结合图像融合后处理技术对于颌面部包块患者的手术前评估优劣，以提供更好的临床支持。**方法** 回顾性分析 2019 年 3 月～2019 年 6 月期间在我科行颌面部 MRI 检查的 11 例患者，均选择 3D-TOF（A 组）及 CE-MRA（B 组）病灶区图像采集，其中 9 例患者行颌面部 CT 增强检查（C 组）；分别比较病灶周围图像的信噪比（SNR）、对比噪声比（CNR）、血管与病灶的关系显示优良情况由两名有独立诊断经验的放射诊断医师对影像进行评价。**结果** ①SNR：A 组＞C 组＞B 组，差异有统计学意义（P＜0.05）；②CNR：A 组＞C 组＞B 组，差异有统计学意义（P＜0.05）；③影像质量评价：A 组＞C 组＞B 组，差异有统计学意义（P＜0.05）。**结论** CE-MRA 能动态的显示病灶及血管的供血过程但由于采集时间较短图像信噪比较低，对于病灶及周围血管间关系显示较差；CT 增强检查由于病灶的强化时机与周围动脉的强化时机差异较大不能在同一期相显示，导致病灶与周围血管关系显示不佳；3D-TOF 结合图像融合后处理技术对于病灶显示及病灶与周围血管间的关系显示最优，且无辐射危害、无需注射对比剂，降低了患者风险，能为临床手术引导提供更好的支持。

PU-0758
MR 磁敏感加权成像与 CT 诊断颅脑外伤微出血的价值分析

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目的 探讨 MR 磁敏感加权成像技术（SWI）与 CT 在颅脑外伤诊断中的应用价值。
方法 收集本院 2017 年 1 月-2019 年 5 月颅脑外伤患者临床资料 38 例，均接受 MR 磁敏感加权成像与 CT 检查，对图像进行回顾性分析。
结果 CT 平扫微出血灶检出率 72.20%，SWI 序列微出血灶检出率为 95.36%(P<0.05)。
结论 MR 磁敏感加权成像诊断颅脑外伤微出血的敏感性较 CT 高，有助于提高诊断阳性率，评估颅脑外伤的严重程度，为临床医师制定诊疗方案提供更多可靠信息，值得推广。

PU-0759
基于高场磁共振的肠易激综合征患者海马代谢产物变化的研究

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目的 探索高场磁共振下不伴有精神症状的肠易激综合征（IBS）患者海马代谢物水平的变化。
方法 选取 2019 年 5 月—2019 年 8 月就诊于兰州大学第二医院的不伴有精神症状的腹泻型 IBS 患者 34 例（IBS 组），同期纳入与之性别、年龄、教育程度匹配的健康志愿者作为对照组（HC 组）。利用 Siemens 3.0T 磁共振采集两组被试双侧海马单体素氢质子磁共振波谱（H^1-MRS）数据。计算各组间海马谷氨酸-谷氨酰胺（Glx）、胆碱类（Cho）、肌酸（Cre）、N-乙酰天门冬氨酸（NAA）、（肌醇）mI 的相对值，并比较两组间的差异，对得到的差异代谢物与疼痛量表进行相关分析。
结果 与 HC 相比，IBS 患者海马区 Glx 相对值降低，mI 相对值明显升高，mI/NAA 值升高，Glx 相对值与疼痛评分呈负相关。
结论 IBS 患者海马代谢存在异常，尤其是神经递质 Glx，而且 mI/NAA 情况一定程度上与临床严重程度呈负相关。

PU-0760
基于功能成像机器学在诊断首发未用药抑郁患者中的临床研究

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目的 利用功能磁共振静息态数据指标（ALFF、FC、DC 等）结合机器学习对首发未用药抑郁患者进行诊断分类研究。
方法 对我院 21 名抑郁高风险医生患者及 25 名确定抑郁症状的医生患者，以及 18 名性别年龄相匹配的正常对照分别计算其 ALFF 值、基于 AAL116 模板的 ROI-wise 全脑功能连接，动态功能连接，以及度中心度（DC）指标；利用 PRONTO 工具包对三组被试功能成像数据进行三分类机器学习，最后根据 ROC 曲线得出各个功能指标诊断效能。
结果 ALFF 值在机器学习三分类诊断效能中准确性为 65%，特异性为 68%，灵敏度为 67%; 而全脑 FC 值在机器学习三分类诊断效能中准确性为 75%，特异性为 70%，灵敏度为 71；基于动态功能连接机器学习三分类诊断效能中准确性为 75%，特异性为 78%，灵敏度为 73%; 基于度中心度的指标在机器学习三分类诊断效能中准确性为 68%，特异性为 70%，灵敏度为 71%;由此可以得出动态功能连接以及静态 FC 功能连接的诊断效能特异性最高，而功能连接也许从另一方面反应了抑郁患者的真实大脑活动情况以及异常脑活动变化。

PU-0761
不同年龄组豆纹动脉 3T 磁共振成像对比

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目的 研究各年龄层豆纹动脉的差异性

方法　　招募二组（20-40 岁 ,50-70 岁各二十位）共四十名健康志愿者,使用联影 790 磁共振分别对两组健康志愿者使用黑血序列进行豆纹动脉成像,经 mip 后处理重建出豆纹动脉，然后在 photoshop 上画出豆纹动脉的各个分支,并统计出豆纹动脉的数量,长度和形状.
结果　使用 3T 优化的黑血序列可以清楚的描绘豆纹动脉,在老年组检测到的豆纹动脉数量,长度明显减少.
结论　高分辨黑血序列为豆纹动脉可视化和量化提供了一种新的方法,其可应用于豆纹动脉损伤相关的检查中.

PU-0762
CT、MRI 在小儿病毒性脑炎诊断中的效果比较研究

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目的 ：比较研究 CT、MRI 在小儿病毒型脑炎诊断中的效果。**方法**　在我院 2017 年 12 月～2018 年 12 月间收治的经病理确诊的小儿病毒性脑炎患儿中选取 120 例进行本次研究，对所有患儿进行 CT 与 MRI 检查，就两种检查的结果进行对比分析。**结果**　120 例患儿中，MRI 扫描阳性发现 115 例，未发现 5 例，阳性率为 95.83%，其中多发病灶 93 例，占比 80.87%；CT 扫描阳性发现 99 例，未发现 21 例，阳性率为 82.5%，其中多发病灶 74 例，占比 61.67%，MRI 检查的阳性率明显高于 CT 检查，其诊断率也显著高于 CT 检查(P＜0.05)。**结论**　MRI 在小儿病毒型脑炎诊断中的阳性率较高，诊断准确性较高，较 CT 检查具有更高的诊断价值，值得临床推广与应用。

PU-0763
甲基苯丙胺成瘾者执行控制网络功能连接改变与精神症状的相关性研究

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目的　采用静息态功能磁共振（*rest-state functional magnetic resonance imaging，rs-fMRI*）技术联合运用独立成分分析（Independent component analysis，ICA）方法，研究伴有精神症状的甲基苯丙胺成瘾（methamphetamine addiction，MA）者执行控制网络 （executive control network，ECN）完整性改变，并分析其与精神症状的相关关系。
方法　对 19 例 MA 者（MA 组）和 20 例健康志愿者（HC 组）进行临床资料采集、精神症状测试及静息态 fMRI 扫描，提取执行控制网络（executive control network，ECN）并进行 2 组间功能连接差异比较，运用 Spearman 相关分析组间感兴趣差异脑区的平均 Z 值与症状自评量表（Self-reporting Inventory-90，SCL-90）评分间的相关关系。
结果　MA 组 SCL-90 各因子评分均高于 HC 组。与 HC 组相比，MA 组左执行控制网络（left executive control network，LECN）的左额叶、左枕中回功能连接增强，右执行控制网络（right executive control network，RECN）的左尾状核功能连接减弱（单体素 P<0.001，经 GRF 校正后

P<0.05，体素阈值>30；表 1，图 1—图 3）。同时，LECN 左额叶平均 Z 值与 SCL-90 的精神病性评分呈负相关（r＝－0.494，P＝0.032，图 4）。

结论 甲基苯丙胺成瘾者 ECN 内部多个脑区 FC 发生异常，提示甲基苯丙胺成瘾可导致吸食者认知功能损害，同时 ECN 大脑内部 FC 的改变与相应精神症状存在相关关系，推测甲基苯丙胺成瘾者临床精神症状的出现，可能与 ECN 内部 FC 的异常改变有关。

PU-0764

PACG 患者静息态功能磁共振成像分数低频振幅研究

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目的 应用静息态功能磁共振成像(rs-fMRI) 分数低频振幅(fALFF) 方法分析原发性闭角型青光眼（PACG）患者全脑活动改变。 方法 采用 3.0 T MRI 分别 对 PACG 组(37 例)和正常对照（HC）组(36 例)进行 rs-fMRI 扫描。运用静息态 fMRI 数据处理助手(DPARSF) 对数据进行预处理并分析 fALFF 值，采用两样本 t 检验比较 PACG、HC 组 fALFF 改变。 结果 相对 HC，PACG 患者 fALFF 值减低区左侧枕下回、距状裂、顶上小叶、右侧舌回、双侧枕中回、中央后回；PACG 患者 fALFF 值增高区位于左侧嗅裂、右侧小脑（体素＜0.05，GRF 校正，P＜0.05）结论 PACG 存在视觉、情感、认知皮质区神经元活动异常，fALFF 为理解 PACG 患者视功能丢失及情感、认知功能障碍神经机制提供了帮助。

PU-0765

引起视束水肿样变的鞍区肿瘤的 MR 诊断

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目的 探讨 MRI 在引起视束水肿样变的鞍区肿瘤中的诊断价值。**方法** 回顾性分析 31 例引起视束水肿样变的鞍区肿瘤的 MR 表现。**结果** 31 例视束水肿样变中，17 例为双侧对称性，8 例以左侧为主，6 例以右侧为主；包括垂体瘤 2 例，颅咽管瘤 11 例，脑膜瘤 3 例，生殖细胞瘤 12 例，胶质瘤 3 例，其 MR 表现各具有一定的特征性。**结论** 引起视束水肿样变的鞍区肿瘤表现各异，MRI 可提供准确的术前定位和定性诊断。

PU-0766

多模态磁共振技术对慢性颈内动脉狭窄侧支循环 定量评估研究

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目的 利用多模态磁共振联合扫描技术,定量评估 EICASS 或 EICAO 患者侧支循环代偿能力与临床表现的关系，探讨侧支循环开放情况及解剖结构对代偿能力的影响。**方法** 收集 2018-01 至 2019-01 就诊于吉大一院证实有 EICASS（>70%）或 EICAO 患者 40 例及 30 例正常志愿者。均使用 3.0T MRI 扫描设备进行检查，分析患者的一般临床资料和脑血管危险因素，按临床表现分为 TIA 组及脑梗死组。**结果** 1 性别、吸烟既、往脑梗死病史等均存在统计学差异。2TIA 组和脑梗死组 Willis 环开放情况无统计学差异。两组间二级侧支开放情况无统计学差异。3TIA 患者组内患侧与健侧 A1 段及 PcomA 统计学有差异。脑梗死组仅 A1 段直径存在统计学差异。4TIA、脑梗死两组间 Willis 环血管直径比较差异无统计学意义。5TIA 及脑梗死两组间健侧 ICA 及 VBA 代偿容积比未见明显统计学差异。两组间剪影容积比存在统计学差异。6 患者组健侧 ICA 代偿容积比无统计学差异，与对照组 A1 段缺如者比较有统计学意义。**结论** 多模态联合扫描能为定量评估 ICAS 患者侧支循环代偿能力提供可靠的诊断依据。

PU-0767

Altered amplitude and connectivity of brain function in first-degree relatives of children with autistic spectrum disorders: a resting-state fMRI study

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BACKGROUND: According to the genetic and epidemiological data, the first-degree relatives of autistic-spectrum -disorders (ASD) children may present similar but milder personality traits as compared to the defined ASD features. Herein, amplitude of low-frequency-fluctuation (ALFF) and functional-connectivity (FC) were employed to investigate the alterations in typical brain regions of unaffected parents.
METHODS: 42 unaffected parents of ASD children (pASD) and 39 matched controls underwent resting-state fMRI scanning. Spontaneous brain activity was examined using ALFF between groups. The increased/decreased regions were selected for FC analysis. Correlation analysis was calculated between FC-degree and children's Autism-Behavior-Checklist (ABC) score.
RESULTS: The ALFF increased in bilateral superior frontal gyrus (SFG), while decreased in left hippocampal- gyrus (HG) in pASD. Over-connectivity was shown between bilateral SFG and superior-temporal-gyrus (STG), along with left-HG and right posterior-cingulate-cortex, whereas under-connectivity appeared (i) between right-SFG and left superior-occipital-lobe, (ii) between right-SFG and right cerebellum-posterior-lobe, and (iii) between left-HG and bilateral TG/right para-hippocampus gyrus (PHG). For over-connectivity between right-SFG and left-STG, a positive correlation was found between fathers' Z-score and ABC-score, while to mothers, a negative correlation appeared. For under-connectivity between left-HG and right-PHG, and between right-SFG and right-CPL, positive correlations were shown between mothers' Z-score and ABC-score.
CONCLUSIONS: These findings indicated that the underlying alterations in central brain regions in unaffected parents may present similar patterns as the reported ASD adults. Meanwhile, some compensation patterns might have been generated to prevent the deterioration towards the defined ASD. Besides, FC-degree of unaffected mother might be considered as a predictor of the severity of children's disease.

PU-0768
DWI 图像分析在不同时期脑梗死诊断中的价值

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目的 探讨弥散加权成像（diffusion weighted imaging, DWI）对不同时期脑梗死的临床诊断价值。**方法** 回顾性分析我院的 80 例不同时期脑梗死患者的临床资料，均采用 MR 常规序列（T1WI、T2WI、T2-FLAIR）及 DWI 进行扫描,比较分析两种不同成像方式对病灶的检出率，以及对病灶的边界、范围的显示情况，分别测量病灶的表观弥散系数（Apparent dispersion coefficient, ADC）值。**结果** DWI 图像分析检出 76 例脑梗死患者，超急性期、急性期、亚急性期及慢性期脑梗死患者检出率分别为 87.0%、96.1%、95.7%、100%，而常规序列则分别为 19.3%、30.7%、73.9%、87.5%。76 例脑梗死患者中，68 例患者脑梗死病灶在 DWI 图像表现为高信号，其病灶中心位置的 ADC 值均明显低于对侧相应位置；8 例患者病灶在 DWI 图像显示为等信号或低信号，ADC 值明显高于对侧相同位置。DWI 对显示病灶的边界、范围均优于 MR 常规序列，差异具有统计学意义($p < 0.05$) 。

PU-0769
基于常规 MRI 图像的影像组学对高级别脑胶质瘤总生存期预测的临床价值

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【目的】
研究基于常规 MRI 图像的影像组学对高级别脑胶质瘤总生存期预测的效能及临床价值。
【方法】
回顾性收集具有完整 MRI 图像、病理和总生存期资料的高级别胶质瘤 25 例。在 MRI 图像上勾画肿瘤最大径层面的瘤体实性部分为感兴趣区，采用 Image J 软件，提取直方图和灰度共生矩阵特征，测量各序列图像标准差（standard deviation,SD）、峰度（kurtosis）、偏度（skewness）、对比度（contrast）、逆差矩（inverse different moment,IDM）、熵（entropy）等特征值。采用 pearson 相关性分析计算各特征与总生存期之间依存关系。对与总生存期存在线性相关关系的组学特征绘制受试者工作特征曲线，计算其曲线下面积和最佳临界值，其次采用 Kaplan-Meier 曲线计算平均生存期，采用 Log-rank 检验比较生存期。
【结果】
标准差、偏度、熵等参数与 OS 成负相关，最大值、峰度、逆差矩与 OS 成正相关；SD_{T2WI}低于 36.7 的患者平均生存期为 599.059 天，高于 36.7 的患者平均生存期为 109.5 天（$p<0.05$），AUC 为 0.74；$Cont_{Flair}$低于 6.514 的患者平均生存期为 854.286 天，高于 6.514 的患者平均生存期为 260.647 天（$p<0.05$），AUC 为 0.621；$Skew_{Flair}$低于-0.174 的患者平均生存期为 604.429 天，高于-0.174 的患者平均生存期为 188.6 天（$p<0.05$），AUC 为 0.743。联合患者年龄、常规影像学特征和组学特征可提高预测诊断价值，AUC 达 0.81。
【结论】
影像组学可提供更多量化信息，可为预测高级别脑胶质瘤总生存期提供重要信息。联合影像组学、患者年龄及常规 MRI 征象学，可进一步提高对高级别胶质瘤总生存期预测的效能。

PU-0770

Decreased topology properties in depressive disorder patient`s brain network

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Objective
Resting-state functional magnetic resonance imaging (rs-fMRI) is used to construct brain functional network and assess the small-world properties of brain network in depressive patients.
Background
Depression has a serious impact on human health and society.It is believed that the ability of brain information processing in patients with depression is significantly reduced. Resting-state functional magnetic resonance imaging (rs-fMRI) can assess the disturbed small-world networks, and further explore the neuroimaging mechanism of brain dysfunction in patients.
Methods
In this study, 47 depressive patients (Hamilton Depression Scale score 17-24) and 43 healthy controls were matched at age, sex, body mass index and education level. Rs-fMRI data were collected, and the brain were segmented into 90 regions by ALL template to calculate the global efficiency and local efficiency of depression related network. Pearson correlation coefficient was implemented to study the relation among global efficiency of global efficiency, age, gender, disease history.
Results
Properties of small world network nature were confirmed in Functional network in both groups. Depressive patients had a rise on node efficacy in the marginal regions, reduction on node efficacy in the executive regions and the optimal parameters of the small world network of patients decrease significantly. There was a significant relationship between neuroimaging indicators and depression level reflected by the degree of small-world decline.
Conclusions
Small-world properties in the brain regions of patients significantly reduced suggesting that disturbed small-world networks in the brain regions may be related to the mechanism of depressive mood regulation disorder.

PU-0771

3D-nerve 序列对新生儿臂丛神经的成像优势

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目的 对 3D-nerve 序列在新生儿臂丛神经损伤中的成像效果进行研究，并与 DWIBS、3D-STIR 序列显示臂丛神经损伤中的效果进行对比，同时与超声、肌电图检查做对比，为其临床诊断与治疗进行指导。**方法** 征集 15 例臂丛神经损伤的新生儿，进行臂丛神经 MRI 扫描，扫描序列包

括 3D-nerve、DWBIS、3D-STIR 序列，评估每个序列图像的血管搏动伪影、脂肪抑制均匀性及臂丛神经分支的显示效果，并测量神经-脂肪比，神经-肌肉比，同时与超声、肌电图结果进行对比。**结果** 臂丛神经在 DWIBS 序列图像上显示效果差，无法观察；血管搏动伪影、脂肪抑制不均匀在 3D-nerve、3D-STIR 分别有 1/15、5/15，3/15、7/15，两组间无明显统计学差异（P＞0.05）；3D-nerve 序列神经显示效果优于 3D-STIR 序列：神经-脂肪比、肌肉-脂肪比明显高于 3D-STIR 序列（P<0.05）；3D-nerve 序列显示臂丛神经分支能力明显优于 3D-STIR 序列；与超声及肌电图对比，虽然三者均能判断臂丛神经损伤，但是 3D-nerve 序列较心电图能直观清楚显示损伤的位置、性质，同时对于锁骨上区神经损的显示明显优于超声。**结论** 3D-nerve 序列对新生儿臂丛神经损伤中的成像效果明显优于 DWBIS 及 3D-STIR 序列，可准确诊断新生儿臂丛神经损伤。

PU-0772
三维磁共振静脉成像对窦汇区变异的研究

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目的 运用三维磁共振静脉成像对窦汇区静脉窦的解剖变异进行研究。**方法** 收集 39 例颅内静脉窦的三维磁共振静脉成像（MRV） 图像进行回顾性分析，其中三维 TOF MRV 法 29 例，CE－MRV 法 10 例，对其静脉窦的解剖变异进行观察。**结果** 显示上矢状窦、 直窦、 横窦在窦汇区相互连接的方式：上矢状窦与左右横窦的连接、直窦与左右横窦的连接各 5 种方式，左右横窦于窦汇区存在有直接连接和间接连接二种，优势侧横窦以右侧居多。**结论** 三维 TOF MRV 和 CE－MRV 法均能显示窦汇区静脉窦的连接方式并对其解剖变异形式做出有效判断，为临床的诊断和治疗提供解剖依
据。

PU-0773
颅内孤立性纤维性肿瘤/血管周细胞瘤影像表现及病理改变

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目的 探讨颅内不同分级孤立性纤维性肿瘤/血管周细胞瘤(solitary fibrous tumor /hemangiopericytoma，SFT /HPC)影像表现及病理改变。
方法 回顾性分析 8 例经病理证实的 SFT/HPC 临床、影像及病理学资料，结合文献进行探讨、分析。
结果 ①8 例均为单发肿块，7 例边界较清。幕上 3 例（1 例骑跨中线），幕下 3 例，2 例跨小脑幕生长。1 例类圆形，7 例分叶状，瘤体平均直径 7.5cm。8 例无钙化，7 例囊变、坏死，1 例出血，2 例瘤周水肿明显。4 例 CT 平扫：实性部分 3 例稍高密度（脑实质比），1 例呈等、低混杂密度。6 例 MR 平扫：4 例等 T1WI（白质比），等 T2WI（灰质比）信号，2 例呈稍长 T1WI、短 T2WI 信号，T2WI 上低信号（纤维）与高信号（囊变、坏死）混杂形成“阴阳征”。增强:血供丰富，由颈内外动脉分支双重供血，实性部分明显强化，1 例见“脑膜尾征”。4 例 MRS: NAA 峰、Cr 峰降低，Cho 增高。②镜检: 2 例 WHOI 级，5 例 WHOⅡ级，1 例 WHOⅢ级。③免疫组化及特殊染色: 8 例 STAT6（+），7 例波形蛋白（+），5 例 CD34、CD99（+），1 例 Bcl-2（+），2 例 Ki-67 标记＞5%，8 例 S-100、SMA、EMA（-）。

结论 SFT/HPC 影像表现有一定特征性：属颅内脑外肿瘤，常单发，体积较大，窄基底与脑膜相连，钙化少见，具相对较高 ADC 值和较低 DWI 信号（瘤细胞密度较低、血管丰富）。I 级大多分化良好，富含胶原纤维、薄壁血管，肿瘤生长缓慢，形态多较规则，包膜较多见，T2WI“阴阳征”及 T2WI 低信号区延迟期显著强化较具特征性。II、III级由于胶原纤维减少，细胞异型性明显，核分裂象、坏死增加，形态多不规则，囊变、坏死、出血及瘤周水肿、流空血管、骨质破坏等较多见。确诊需病理学及免疫组化检查，STAT6 为本病特异性的诊断标记。

PU-0774

常规 3D-T1 序列与 3D-DIR 序列在脑胶质瘤诊断中的应用价值比较

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目的 比较常规 3D-T1 序列与 3D-DIR（three-dimensional double inversion recovery ，三维双反转恢复）序列在评价脑胶质瘤诊断中的应用价值

方法 收集本院肿瘤科 2018 年 8 月至 2019 年 7 月收治的脑胶质瘤患者 20 例，所有患者均经病理证实。对 20 例患者行 3D-T1 序列与 3D-DIR 序列磁共振颅脑成像，得到 A（3D-T1）、B（3D-DIR）两组图像，对两组图像进行主客观评价。主观评价由两名经验丰富的诊断医师对图像质量进行评分，图像质量由高至低分别为 4 分、3 分、2 分、1 分。图像质量客观评价参数为信噪比（SNR）。使用 SPSS 20.0 对所有计量资料进行独立样本 t 检验，对两名医师进行一致性检验，P＞0.05，为无显著统计学差异，P＜0.05，则有显著统计学差异。

结果 A 组图像质量评分结果为 3.22±0.15，B 组图像质量评分结果为 3.46±0.18，p＜0.05，差异有统计学意义；A 组图像信噪比为 2.71±0.24，B 组图像信噪比为 2.82±0.17，p＞0.05，差异无统计学意义； 两名医师一致性高。

结论 与常规 3D-T1 序列相比，3D-DIR 序列以其独特的成像原理，对灰质病变及皮层下病变显像更加清晰，能有效显示胶质瘤的形态，对胞体能突出显示，可帮助诊断脑胶质瘤，对临床诊疗工作具有指导作用，为临床诊疗工作提供有效的参考 .

PU-0775

The fMRI observation on alterations of iron level and functional connectivity in the hippocampus of pateients with type 2 diabetes

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Background: To observe occurrence of the hippocampal iron deposition and functional connectivity (FC) states in patients with type 2 diabetes mellitus (T2DM) by using quantitative susceptibility mapping (QSM) and resting-state functional magnetic resonance imaging (rs-fMRI).

Methods: Twenty T2DM patients and twenty matched healthy controls (HC) were recruited. QSM and rs-fMRI data were subsequently acquired on a 3.0T MR scanner. Decrease of QSM values were used as an index of tissue iron deposition and FC measurement was

performed to calculate hippocampal FC with other brain regions, respectively. Cognitive function was evaluated by using Mini-Mental State Examination (MMSE), Montreal Cognitive Assessment (MoCA) and auditory verbal learning test(AVLT). Brain volumes were also evaluated among these participants.
Results: The QSM values significantly decreased in hippocampus of T2DM groups. Significant decreases of FC of hippocampus with other brain regions, e.g. the bilateral frontal gyri were observed . The decreased QSM values in bilateral hippocampus were closely related with the decreased hippocampal FC to caudate and frontal gyri. Significant correlation was found between the QSM values and FC of the left hippocampus and the short and long delayed free recall scores of the T2DM patients.
Conclusions: The iron deposition and abnormal FC in hippocampus of T2DM patients and QSM values and FC of left hippocampus were closely associated cognitive impairment. It suggests that abnormal iron concentration of the hippocampus may be a potential biomarker of T2DM-related cognitive impairment.

PU-0776

Altered intrinsic brain activity in patients with colorectal cancer after chemotherapy comorbid depression

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Abstract **Objectives** To characterize the pattern of altered intrinsic brain activity in patients with colorectal cancer after chemotherapy comorbid depression. **Methods** The patients with colorectal cancer who received adjuvant chemotherapy comorbid depression (CTD)(n=20) and control subjects (n=43) underwent resting-state functional MRI (rsfMRI). Amplitude of low-frequency fluctuation(ALFF) and regional homo-geneity (ReHo) were calculated and compared between the groups using the two-sample *t* test. Correlation analysis was also performed between rsfMRI values (i.e., ReHo, ALFF) and 9-item Patient Health Questionnaire (PHQ-9) and generalized anxiety disorder (GAD-7) scores. **Results** In comparison with the control subjects, patients with CTD showed decreased ALFF in the left occipital areas, left cuneus, right precuneus/cuneus and decreased ReHo in the bilateral lingual, and cuneus. There were no significant correlations between the scores of PHQ-9 and GAD-7 and altered intrinsic activity values. **Conclusions** We observed neurological abnormalities in patients with CTD and the ALFF and ReHo abnormal in these areas could be neuroimaging biomarkers for CTD.

PU-0777

Abnormal Network Connections of Autism Spectrum Disorder in Preschool Children: A resting-state Functional study

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Objectives: This study is used network-based statistics to analyze the functional brain network characteristics of preschool children in order to find Imaging biomarkers for early diagnosis of autism.
Materials and Methods: In this study, fMRI imaging technology based on brain blood oxygen level dependence (BLOD) was used to scan preschool children (aged 2－6 years, 53 children with ASD, 63 children as controls), and graph theory was used for analysis.
Results: Compared with the control group, the autism group has a wide range of abnormal connective edges, involving the frontal, parietal, temporal, occipital and subcortical structures, especially concentrated in amygdala, right hippocampus, parahippocampal gyrus, occipital lobe, lingual gyrus and cuneiform lobe, mostly located in hindbrain region. In ASD group, the node degree of right Frontal_Mid_Orb and the efficiency of right Lingual node were higher than those in control group.
Conclusion: Our study shows that autism has certain effect on the functional brain network, and the brain regions involved are related to autism symptoms, that results have strengthened our understanding of the dysfunction of autistic patients.

PU-0778

舌腺泡状软组织肉瘤 1 例

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目的 分析舌腺泡状软组织肉瘤的 MRI 表现特征，提高对该病的认识及术前影像诊断水平。
方法 回顾性分析经病理证实的我院 1 例舌体腺泡状软组织肉瘤的临床及 MRI 表现。**结果** 病灶位于右侧舌体，呈椭圆形，T1WI 等或高信号，T2WI 不均匀高信号，瘤内和瘤周有很多流空信号，增强强化明显，边界清楚，病灶跨越舌中线，右侧下颌舌骨肌及舌骨舌肌显示不清，邻近骨质结构完整，颈部未见肿大淋巴结。
结论 肿瘤内和瘤周有流空信号，对舌腺泡状软组织肉瘤具有重要的诊断价值。

PU-0779

颈动脉斑块 MRI 诊断个案分析

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目的 探讨 MRI 对颈动脉斑块成份分析、判断斑块的稳定性及病理分期。
方法 MR 成像扫描序列：2D：横断 T1、T2WIFS（黑血）、SNAP、T1WI+C（横断），3D:TOFMRA 横断（亮血）、（黑血）T1WI 冠状位（曲面重建、测量范围）；斑块成分及信号特征（与同层肌肉信号进行比较），回顾性分析经综合诊断为不稳定斑块患者的 MRI 表现。
结果 该病例右侧颈内动脉分叉处可见粥样斑块形成，内可见脂质核、钙化及出血，斑块表面纤维帽变薄，伴小溃疡形成。

结论 颈动脉粥样硬化斑块 MR 成像无电离辐射，能定量、定性分析颈动脉斑块的成份特征，较为准确测量颈动脉斑块负荷及狭窄程度。

PU-0780

磁共振 MRS 联合 ADC 值对胶质瘤分级的诊断价值

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目的 探讨磁共振波谱分析技术(MRS)联合弥散加权成像(DWI)中 ADC 值对脑胶质瘤分级的临床价值。

方法 选取 2015 年 12 月-2019 年 1 月在我院就诊的 43 例脑肿瘤患者作为研究对象,行 MRI 平扫+增强扫描,对病灶实性成份行 MRS 及 ADC 值分析,收集患者临床资料,计算患者患侧肿瘤实性成份、瘤周水肿以及健侧的 ADC 值,对 NAA、Cho、Cr 等代谢物值进行计算。

结果 低级别胶质瘤肿瘤实性成分 ADC 值及 rADC 明显高于高级别胶质瘤，肿瘤实性成份 ADC 值明显低于瘤周水肿区(P<0.05)，ADC 值与病理分级呈负相关（r=-0.72），最大曲线下面积（AUC）约为 85%，当临界值取 $1.3\times10^{-3}mm^2/s$ 时诊断效能最佳（敏感度为 87.3%，特异度为 92.5%）。低级别胶质瘤 rNAA、NAA/Cr 明显高于高级别胶质瘤,rCho、Cho/Cr、Cho/NAA 则明显低于高级别胶质瘤(P<0.05)，差异均有统计学意义(P<0.05),其中较稳定的比值是 Cho/NAA，其与病理分级呈正相关（r=0.81），最大曲线下面积（AUC）约为 88%，当临界值取 3 时诊断效能最佳（敏感度为 59.3%，特异度为 83.2%）。

结论 磁共振 DWI 联合 MRS 扫描应用于脑肿瘤患者的检查中,能对胶质瘤的分级提供帮助，并在划分肿瘤边界方面有重要的价值,在临床治疗方案的选择及确定手术切除的范围等方面有一定的指导意义，值得临床推广。

PU-0781

Severe asymptomatic carotid stenosis: Can resting fMRI signals identify patients at higher risk?

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Purpose: This study aimed to explore hemodynamic delay measured by resting-state BOLD signals in patients with severe asymptomatic carotid stenosis (SACS).

Methods: Twenty-four patients with SACS (19 males/ 5 females; 64.25 ±7.18 years) and 24 comorbidities-matched controls (19 males/ 5 females; 67.16 ±6.10 years) were included. Hemodynamic delay was assessed using resting-state fMRI. Arterial spin labeling based cerebral perfusion, susceptibility weighted imaging based micro-hemorrhagic lesions, and T2-weighted white matter hyperintensities were also quantified.

Results: Temporal-shift analysis revealed both significant hemodynamic delay in the affected side and lead in the unaffected side in patients with about 2 seconds, predominately appeared in the lateral temporal and frontal regions, and paralleling with delayed recall.

Conclusions: Temporal-shifting alterations, specifically in the somatomotor, salience, dorsal attention, and executive systems, are characteristic changes in patients with SACS. These changes suggest that lag structure of resting BOLD signals in SACS patients is significantly impaired, may echo the impairments in organizational activity and neurovascular couplings. Our results suggest that temporal-shift analysis can be used as a possible clinical utility for functional reserve assessment in brain stenosis patients.

PU-0782

Cerebral Altered Neurovascular Coupling in Patients with Sudden Deafness

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BACKGROUND:
According to statistics, the incidence of sudden deafness (SD) is 5-20/100,000, and about 150,000 people are sick every year in the world [1,2]. Previous basic studies have shown that there may be cerebral neurovascular coupling (NVC) disorder in SD patients. However, the certain NVC pattern for SD patients is still unknown. Therefore, this study intends to use multimodal magnetic resonance technology to explore the NVC function of SD patients and the relationship between it and the disease severity.
SUBJECTS AND METHODS:
In this study, 41 patients with SD and 41 matched healthy controls were recruited. Pearson correlation coefficients between cerebral perfusion map and four kinds of brain neuron activity maps were calculated at the whole brain level and brain region level respectively. Then four kinds of "NVC indicators" were obtained. The independent sample t test was used for statistical comparison to explore the intergroup alteration.
RESULTS:
NVC coefficients were significantly increased in bilateral superior temporal gyrus, straight back, left parahippocampal gyrus, bilateral precuneus, and decreased in left pillow parietal lobe, bilateral superior temporal gyrus, left cingulate gyrus, right angular gyrus, bilateral occipital, right parahippocampal gyrus, bilateral temporal side in the back. Meanwhile, most NVC indexes were significantly positively correlated with disease duration and the decreased decibel level.
CONCLUSIONS:
Cerebral altered NVCs were found in patients with SD. There was a significant correlation between the imaging changes of NVC and the disease severity. This technique may contribute to the etiology of SD.

PU-0783

病例报告：颅脑间叶性软骨肉瘤 1 例

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目的 分析颅脑间叶性软骨肉瘤的影像特点，探讨颅脑间叶性软骨肉瘤的影像学表现。**方法** 回顾性分析 1 例我院经病理证实的颅脑间叶性软骨肉瘤的临床影像资料，分析病变发生的年龄、性别和临床症状等临床特征，以及观察病灶的大小、边界、CT 和 MR 图像特征及其强化方式，总结该病变的特征性影像学表现。**结果** 患者为 59 岁女性，发现右下肢无力 1 月余，病灶位于左侧额顶部-大脑镰旁，宽基底附着于脑膜上，境界清楚，大小约为 3.1cm×2.8cm，CT 图像上病灶呈等密度，密度不均匀，内可见点状、条状粗大钙化，周围可见水肿带。MR 图像上病灶 T1WI 和 T2WI 均呈等信号，DWI 呈高信号，ADC 呈低信号，MR 增强扫描显示病灶呈明显强化，病灶侵犯上矢状窦，可见硬膜尾征。未出现远处转移。**结论** 颅脑间叶性软骨肉瘤多起源于脑膜，发生在颅脑的间叶性软骨肉瘤少见，影像上极容易被误诊为脑膜瘤，其特征性影像学特点包括 CT 图像上可见粗大钙化，MR 图像上 T1WI 和 T2WI 均呈等信号，DWI 呈高信号，ADC 呈低信号，呈明显不均匀强化。利用 CT 和 MR 技术进行联合诊断能够提高颅脑间叶性软骨肉瘤的影像诊断效能。

PU-0784

可逆性后部白质脑病综合征的影像表现分析

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目的 分析探讨可逆性后部白质脑病综合征的临床和影像表现特点，以提高诊治水平。**方法** 回顾分析我院收治的 11 例可逆性后部白质脑病综合征（RPLS）患者的临床及影像学资料。患者年龄 24 ～ 65 岁，其中女性 8 例，男性 3 例。相关发病因素包括：高血压脑病、子痫、系统性红斑狼疮、多发性动脉炎、环孢霉素治疗后、血栓性血小板减少性紫癜；临床表现有头痛、言语不清、意识障碍、抽搐、癫痫发作、视物模糊等。**结果** CT 平扫显示脑内分布于双侧顶枕叶的斑片状低密度影，边界模糊，主要位于脑白质 ；头颅 MRI 显示所有患者以大脑半球后部白质受累为主，多位于双侧顶枕叶，双侧大致对称，也可累及额叶、颞叶、基底节、小脑、脑干等部位。T1WI 病灶等或稍低信号、T2WI 及 T2FLAIR 上呈高信号， DWI 表现为等信号,病灶边缘模糊，增强扫描不强化。经治疗后患者临床症状得到有效缓解，复查 MRI 或 CT 病灶减轻或消失。 **结论** 可逆性后部白质脑病综合征具有较为特征的影像表现，头颅 MRI 是最佳检查方法。早期诊断、适当治疗可使大部分患者临床症状改善，影像学异常逆转。及时进行 CT 和 MRI 检查及治疗后复查对其诊断和疗效评价具有重要价值。

PU-0785

胶质瘤术后早期 MR 形态成像及人工智能评估生存的研究进展

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讲座摘要：胶质瘤是颅内最常见的原发肿瘤，术后早期（48h 内）MRI 影像学基线检查对于评估肿瘤残留、复发、预测无进展生存及总生存期具有重要价值。作者从常规 FLAIR、DWI、增强 T1WI 形态学及人工智能方面，并与功能影像学对照，包括 MRS、DTI、DKI 及 PWI、多模态功能成像比较，并结合胶质瘤基因表型，阐述形态学成像对于生存评估的研究进展。

PU-0786
MR 征象预测较低级别胶质瘤 1p/19q 杂合性缺失状态的初步研究

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背景和**目的**　较低级别胶质瘤（lower grade glioma, LGG）染色体 1p/19q 杂合性缺失（loss of heterozygosity, LOH）状态与化疗敏感性及预后明显相关，本研究将通过术前及术后 MR 征象预测 LGG 1p/19q LOH 状态。

方法　回顾性分析 69 例 LGG 患者的术前与术后 MR 及临床资料，术前 MR 征象包括肿瘤部位、均质性、T2-FLAIR 不匹配、室管膜下区（subventricular zone, SVZ）受累及中线移位征，术后 MR 征象包括新增强化形态、残腔周围 FLAIR 高信号范围变化趋势、残腔 FLAIR 信号强度变化、假性进展，临床资料包括性别、年龄与 WHO 肿瘤分级。通过单因素及多因素 logistic 回归分析评估各参数与 1p/19q LOH 状态的相关性并计算多因素 logistic 回归模型预测 1p/19q LOH 的灵敏度、特异度、PPV、NPV 及准确度。

结果　单因素分析显示术前征象：肿瘤部位（P＜0.001）、均质性（P=0.049）、T2-FLAIR 不匹配（P＜0.001）及 SVZ 受累（P=0.031），术后征象：新增强化形态（P＜0.001）、假性进展（P=0.026）与 1p/19q LOH 相关性有统计学意义；中线移位、术后残腔 FLAIR 信号强度变化、残腔周围 FLAIR 范围变化及临床因素无统计学差异。多因素 logistic 回归分析显示部位、T2-FLAIR 不匹配及术后新增强化形态与 1p/19q LOH 有关，多因素 logistic 回归模型预测 1p/19q LOH 的灵敏度、特异度及准确度分别为 0.88、0.85、0.86。

结论　本研究评估了常规 MR 征象与 1p/19q 基因状态的相关性，提供了一种无创预测 1p/19q LOH 的方法。

PU-0787
基于 DWI 的影像组学特征评估急性脑梗死预后的模型研究

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背景和**目的**　急性脑梗死病变具有异质性，并可能影响病人预后，常规影像学方法对此种评估不足。本研究拟建立影像组学模型，从大数据分析角度观察脑梗死病变异质性，并确定该模型评估脑梗死预后的可能性及最佳算法。

方法　回顾性分析 208 例急性大脑中动脉（MCA）区梗死病人临床和 DWI 资料，采用 ITK 软件及支持向量机、Logistic 回归分析、RF 随机森林分类器模型分别进行分析，建立影像组学模型并分析其评估预后的价值。

结果 预后良好（mRS£2）与不良（mRS>2）组的临床及人口学因素中仅年龄有统计学差异，共提取 396 个影像组学特征，套索回归降维后筛选出 8 个最强相关特征，补充可行性结果，即试验组和验证组，说明本方法的可行性， RF 随机森林模型分类器获得的影像组学模型效果最佳，ROC 曲线下面积（AUC）分别为训练组 AUC 为 0.824，敏感度 95.3%、特异度 59.2%、准确度 69.9%数字列出方法一致，两组不一样，验证组 AUC 为 0.725，敏感度、特异度及准确度分别为 77.8%、63.6%及 67.7%。

结论 影像组学方法提取的特征可用于建立基于 DWI 序列的 MCA 区急性脑梗死评估模型，其中 RF 算法模型效果最佳。

关键词：急性缺血性卒中；磁共振成像；扩散加权成像；影像组学；预后

PU-0788
探讨 3D-pCASL 技术在导水管梗阻性脑积水中的应用价值

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目的 探讨 3D-pCASL 技术在导水管梗阻性脑积水中的应用价值，并初步研究导水管梗阻性脑积水梗阻程度与脑组织灌注的相关性。

方法 搜集导水管梗阻性脑积水患者 26 例（轻型 12 例、中型 9 例、重型 5 例、极重型 0 例），将术前脑积水组分为低度和高度梗阻脑积水组（轻型归为低度组，中型与重型归为高度组），正常志愿者 30 例，均行颅脑 MR 常规序列及血管成像扫描；然后采用同一标记延迟时间（T=1525ms）行全脑 3D-pCASL 扫描，获得脑积水术前组、术后组及对照组各脑区（前外分水岭、后外分水岭、基底节区、半卵圆中心）的脑血流量 CBF。**结果** 对照组与脑积水术前组、脑积水术前与术后组前外分水岭与基底节区 CBF 相比，差异有统计学意义；后外分水岭与半卵圆中心 CBF 相比，差异无统计学意义；对照组与脑积水术后组前外分水岭、后外分水岭、基底节区及半卵圆中心 CBF 相比，差异无统计学意义。术前低度与高度梗阻脑积水组前外分水岭和基底节区 CBF 相比，差异有统计学意义；后外分水岭与半卵圆中心 CBF 相比，差异无统计学意义。前外分水岭与基底节区、后外分水岭与半卵圆中心 CBF 诊断术前低度、高度梗阻脑积水的 ROC 曲线下面积分别为 0.815、0.78、0.679、0.696，前者诊断的准确性相对较好，后者较低。前外分水岭和基底节区 CBF 术前诊断低度、高度梗阻脑积水的最佳阈值分别是 21.769、41.878ml/(100g×min)。**结论** 3D-pCASL 技术能对导水管梗阻性脑积水术后疗效进行评估，为今后前瞻性研究梗阻性脑积水提供进一步的评价指标。导水管梗阻性脑积水患者存在脑组织灌注的异常，前外分水岭及基底节区较正常人对应脑区的 CBF 低；脑积水梗阻程度与前外分水岭及基底节区的脑组织灌注呈负相关，且能通过术前脑积水组前外分水岭和基底节区 CBF 的最佳阈值来评估脑积水梗阻程度的进展情况，为临床决策及时简便地提供更为有效的信息。

PU-0789
磁共振扩散加权成像在常见腮腺肿瘤中的诊断价值

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目的 ：探讨磁共振弥散加权成像(DWI)在常见腮腺肿瘤中的诊断中的临床应用价值。

方法 ：研究对象选取接受诊疗腮腺肿瘤疑似病例 80 例。所有患者均采有和 MRI 诊断,以病检为金标准,计算患者的阳性/阴性检测度、特异度、敏感度。最后确诊病例 90 例,根据不同肿瘤类别将其

分为 A 组为多形性腺瘤(n=45)、B 组为腺淋巴瘤(n=25)、C 组为恶性肿瘤(n=20)。在受检者 MRI 图像基础上结合其 DWI 图像进一步重建 ADC 图,并对三组肿瘤患者 ADC 值进行对比分析。结果 研究结果显示,80 例疑似病例患者阳性检测度为 97. 75%,阴性检测度 50%;诊断敏感度为 96. 67%,诊断特异度为 60%。

结论 在常规 MRI 检查基础上联用磁共振弥散加权成像(DWI)对腮腺常见肿瘤诊断及鉴别诊断具有重要意义，通过测量 ADC 值，我们可以明确辨别出肿瘤的恶性程度，这对临床应用价值起到关键性作用。

PU-0790

DWI 图像分析在不同时期脑梗死诊断中的应用价值

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目的 探讨弥散加权成像（diffusion weighted imaging, DWI）对不同时期脑梗死的临床诊断价值。方法 回顾性分析我院 2016.04～2019.04 收治的 80 例不同时期脑梗死患者的临床资料，均采用 MR 常规序列（T1WI、T2WI、T2-FLAIR）及 DWI 进行扫描,比较分析两种不同成像方式对病灶的检出率，以及对病灶的边界、范围的显示情况，分别测量病灶的表观弥散系数（Apparent dispersion coefficient, ADC）值。结果 DWI 图像分析检出 76 例脑梗死患者，超急性期、急性期、亚急性期及慢性期脑梗死患者检出率分别为 87.0%、96.1%、95.7%、100%，而常规序列则分别为 19.3%、30.7%、73.9%、87.5%。76 例脑梗死患者中，68 例患者脑梗死病灶在 DWI 图像表现为高信号，其病灶中心位置的 ADC 值均明显低于对侧相应位置；8 例患者病灶在 DWI 图像显示为等信号或低信号，ADC 值明显高于对侧相同位置。DWI 对显示病灶的边界、范围均优于 MR 常规序列，差异具有统计学意义(p ＜ 0.05) 。

PU-0791

磁共振 3D T1-SPACE 高分辨率黑血管壁成像技术对颅内动脉粥样硬化斑块的应用价值

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目的

应用 3D T1-SPACE 高分辨率黑血序列对急慢性缺血性卒中患者行颅内动脉血管壁成像，评价颅内动脉粥样硬化斑块的影像特征及其与新发梗死的关系。

方法

回顾性研究 2017 年 9 月到 2019 年 5 月在我院就诊的缺血性脑卒中患者，并且在这些患者中筛选经证实有颅内动脉狭窄并行高分辨率颅内动脉磁共振血管壁成像，排除明确心源性栓塞及颈动脉显著狭窄，按照临床发病时间分为急性期（A 组），亚急性期（B 组）和慢性期（C 组）3 组。颅内动脉血管壁成像采用 3.0TMRI 扫描仪（Siemens，spectra），32 通道头线圈，3D 可变翻转角度快速自旋回波 T1 加权序列（3D T1-SPACE）。根据斑块与急性梗死的对应关系，将斑块分为症状性斑块与非症状性斑块，对不同组别的症状性与非症状性斑块的影像学特点进行比较分析。

结果

经筛选，有 32 名患者纳入实验标准，其中急性期脑卒中患者 12 人，亚急性期 10 人，慢性期 10 人，行 3D T1-SPACE 共发现 73 个斑块，在急性患者中，所有症状性斑块均发生强化，症状性斑块

与非症状性斑块相比，出现明显强化差异具有统计学意义（p<0.01）。不同时期的症状性斑块相比，三组强化程度差异具有统计学意义（p<0.01）。亚组随访研究发现，斑块强化程度随时间降低。

结论

①3D T1-SPACE 序列使用非常长的回波链，并使用可变翻转角来维持相对稳定的信号，因此其不仅可以清晰显示管壁结构，还能够显示斑块内各种成分的形态并测量其体积；

②颅内动脉斑块强化与缺血性脑卒中发生存在一定相关性，急性期斑块出现明显强化，慢性期强化程度减低；③3D T1-SPACE 技术可对颅内动脉粥样硬化进行评价分析，进一步明确动脉管壁及斑块特性，为脑卒中的一级预防和风险性评价提供参考。

PU-0792

基于 TBSS 方法的经前期烦躁障碍患者脑网络纤维束成像研究

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目的 经前期烦躁障碍（PMDD）是经前期综合征（PMS）的严重形式，约占比 5%，患者周期性出现易怒、易激惹和内心紧张等症状，对女性的生活造成严重的干扰。本研究试图通过磁共振扩散张量成像（DTI）探讨 PMDD 患者大脑白质纤维网络细微结构的变化及其与临床症状的相关性。

方法 根据美国精神病学会的《精神障碍诊断及统计手册》第 5 版（DSM-5）的诊断标准，纳入 43 例 PMDD 患者，并纳入性别、年龄、教育程度相匹配的 40 名健康志愿者作为对照。所有受试者均在月经周期的黄体期进行 3.0T 磁共振高分辨全脑 DTI 成像扫描，并对 PMDD 患者进行状态-特质愤怒表达量表（STAXI-2）进行评分。所采集的影像学数据通过 FSL6.0 进行预处理，利用基于纤维束示踪的空间统计（TBSS）方法构建纤维束网络骨架，计算脑白质的部分各向异性（FA）值及平均扩散系数（MD）值，通过独立样本 t 检验获得 PMDD 患者相对于正常人在脑纤维束网络骨架中 FA 值和 MD 值的差异，相关差异区的参数值与临床 STAXI-2 评分进行相关性分析。

结果 与正常对照组相比，PMDD 患者全脑白质纤维骨架的 MD 值未见明显统计学差异，FA 值在多个区域明显减低，主要包括左侧前辐射、左侧上纵束、左侧丘脑后辐射、左侧矢状层、胼胝体膝部及右侧内囊前肢（p＜0.05）；PMDD 患者的左侧前辐射及上纵束 FA 值与临床 STAXI-2 总分呈负相关关系（r=-0.449, p＜0.05；r=-0.4180, P<0.05）。

结论 扩散张量成像的 TBSS 方法可以发现 PMDD 患者大脑白质纤维束的细微结构变化，为其发病机制的探索及临床症状的解析提供了重要的影像学依据。

PU-0793

The Value of Diagnosing Intracranial Atherosclerotic Plaque Using 3D T1-SPACE High -Resolution MR Vessel Wall Imaging

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Objective:

Our aim was to determine the characteristic of pattern of intracranial atherosclerotic plaque and the relationship with newly onset of stroke by using 3D T1-SPACE high - resolution MR vessel wall imaging.
Methods:
Retrospective study of patients with ischemic stroke who were treated in our hospital from September 2017 to May 2019,and in these patients, screening for intracranial artery stenosis and high-resolution intracranial magnetic resonance vascular wall imaging, then Excluding of clear cardiogenic embolization and significant carotid stenosis were divided into acute phase (group A), subacute phase (group B) and chronic phase (group C) according to clinical onset time.Intracranial arterial wall imaging were used a 3.0TMRI scanner (Siemens, spectra), 32-channel head coil,and the 3D variable flip angle fast spin echo T1 weighted sequence (3D T1-SPACE).According to the corresponding relationship between plaque and acute infarction, plaques were divided into symptomatic plaques and non-symptomatic plaques, and the imaging features of symptomatic and non-symptomatic plaques in different groups were compared.
Results:
After screening, 32 patients were included in the experimental criteria, including 12 patients with acute stroke, 10 with subacute phase, and 10 with chronic phase.In acute patients, all symptomatic plaques were intensified, and there was a statistically significant difference between symptomatic plaques and non-symptomatic plaques ($p<0.01$).Compared with symptomatic plaques in different periods, the difference in the degree of enhancement between the three groups was statistically significant ($p<0.01$). A subgroup follow-up study found that the degree of plaque enhancement decreased over time.
Conclusions:
1 The 3D T1-SPACE sequence uses a very long echo chain and uses a variable flip angle to maintain a relatively stable signal, so it not only clearly shows the wall structure, but also shows the shape of various components in the plaque and measures it. volume;2 There is a certain correlation between intracranial atherosclerotic plaque enhancement and ischemic stroke, and acute plaques are obvious Strengthen,at the same time the degree of strengthening were reduced in the chronic phase.3 3D T1-SPACE technology can evaluate and analyze intracranial atherosclerosis, further define the characteristics of arterial wall and plaque, and provide reference for primary prevention and risk assessment of stroke.

PU-0794

小脑半球卵黄囊瘤一例报道

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目的 通过报道一例病理确诊的小脑半球卵黄囊瘤，提高影像医生对该病的认识。
方法 收治一例男，1 岁，以“行走不稳 1 周”为主诉入院的患儿。
结果 患儿主要表现为行走不稳。个人史、家族史无特殊。入院查体：行走不稳，共济运动检查不配合。辅助检查：血清甲胎蛋白＞1210ng/ml。头部磁共振示：左侧小脑半球可见一团块状长 T1 等-长 T2 信号灶，FLAIR 序列呈高信号，增强后明显强化。 术中见肿瘤位于四脑室旁小脑半球内，大小约 4x4x5cm，起自小脑，突向并挤压四脑室，对四脑室壁有侵犯。肿瘤质地软，血运丰

富。术后病检回报：卵黄囊瘤，免疫组化**结果** Ki67（约 85%+），CD17（+），PLAP（灶性+），β-HCG（-），AFP（+），CK-Pan（+），LIN28A（+），CD30（-），Oct-4（-），D2-40（-）。**结论** 卵黄囊瘤又名内胚窦瘤,是一种起源于生殖细胞的具有胚体外卵黄囊分化特点的生殖细胞肿瘤，占儿童及青少年恶性肿瘤的 3%。多发生于性腺，10%-20% 发生于性腺外，颅内者极为罕见，颅内好发于松果体、第三脑室及鞍区。本病多有血清、脑脊液的甲胎蛋白升高，当血清 AFP＞500ng,结合影像学表现可对其做出可能性诊断，确诊须依靠病理诊断。病理上肿瘤质地稍韧，组织结构较复杂，S-D 小体是其特征性结构。影像学上病灶呈实性或囊实性肿块，呈长 T1 稍长 T2 信号，FLAIR 序列呈稍高信号，DWI 可见轻度弥散受限；可见出血、囊变，钙化及脂肪少见；肿瘤血供丰富、增强扫描实性部分明显强化；肿瘤易直接侵犯周围组织，常随脑脊液播散。发生于小脑半球的卵黄囊瘤需与毛细胞星形细胞瘤、髓母细胞瘤、室管膜瘤等鉴别。手术、放疗或联合治疗对颅内原发卵黄囊瘤治疗欠佳，且预后极差。

PU-0795

PWI 和 DWI 在鉴别间变性多形性黄色瘤型星形细胞瘤与胶质母细胞瘤瘤周非强化区的价值

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目的 分析 MR 灌注加权成像(PWI)和扩散加权成像(DWI)在鉴别间变性多形性黄色瘤型星形细胞瘤与胶质母细胞瘤瘤周非强化区中的价值。**方法** 回顾性分析我院 2010 年 7 月至 2018 年 7 月经病理证实的 4 例间变性多形性黄色瘤型星形细胞瘤（APXA）以及 33 例胶质母细胞瘤（GBM）的常规 MR 平扫+增强、DWI 和 PWI 资料。比较肿瘤周边 1cm 以内水肿区与对侧正常脑实质区的参数比值，包括相对脑血容量(rCBV)及 ADC 比值。采用独立样本 t 检验进行统计学分析。**结果** APXA 瘤周非强化区 ADC 比值高于 GBM（分别为 2.29±0.05、2.08±0.28），差异具有统计学意义（P=0.001）。APXA 瘤周非强化区 rCBV 比值低于 GBM（分别为 0.34±0.15、0.53±0.14），差异具有统计学意义（P=0.015）。**结论** PWI 和 DWI 技术可以较好的反应瘤周非强化区的信息，对 APXA 和 GBM 的鉴别具有一定的价值。

PU-0796

TOF-MRA 与 3D CE-MRA 对脑血管显示的价值分析

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目的:探讨 TOF-MRA 与 3D CE-MRA 成像技术对脑血管的显示价值。方法:选取本院 50 例同时行 TOF-MRA 及 CE-MRA 检查的患者，采用血管原始图像、最大密度投影(MIP)、容积再现(VR)等后处理方法进行图像分析。结果:50 例患者 TOF-MRA、CE-MRA 在正常血管显示方面 2 种成像方法无显著性差异(P>0.05);2 种方法综合评价优于单一成像方法的应用(P<0.05),与 TOF-MRA 相比,CE-MRA 与综合评价方法具有更好的一致性,但差异无统计学意义(P>0.05)。结论:TOF-MRA 与 3D CE-MRA 2 种成像方法各有优势,在脑卒中患者的血管显示方面有着重要的临床价值,2 种方法的综合应用更有利于血管病变的显示。

PU-0797

不同翻转角对 3DTOF MRA 图像质量的影响

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摘要 目的:分析不同的翻转角对 3DTOF MRA 成像图像质量的影响。材料与方法: 选用本院 80 例行 3D TOF-MRA 检查的患者，分成四组选用不同的翻转角（10°，20°，30°，40°）取得图形，对 3DTOF MRA 图像上血管信号强度比值(SIR)。结果:随着翻转角角度的增大,SIR 值增大，血管饱和效应增加。结论: 翻转角直接影响血管与静止组织信号对比度,影响图像质量。20° 翻转角是最佳翻转角

PU-0798

肺癌脑转移瘤的 MRI 诊断及价值

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目的:探讨肺癌脑转移瘤的 MRI 影像特征及诊断价值。
方法:回顾性分析 72 例肺癌脑转移瘤的脑 MRI 表现，所有病例经临床及病理证实,分析转移瘤部位、大小、形态、瘤周水肿及强化特点。
结果:72 例肺癌脑转移患者中,小细胞肺癌 12 例,鳞癌 28 例,腺癌 32 例。脑部瘤体共 98 个,额叶 24 个,顶叶 35 个,颞叶 20 个,枕叶 10 个,小脑 6 个,蝶鞍 3 个。直径为 0.5-5cm ，平均直径为 1.5cm。转移瘤灶中 75 个瘤周不同程度水肿，23 个无瘤周水肿。病灶增强后呈结节状强化的 26 例、环形强化的 25 例,混合型强化的 15 例,片状强化 6 例。
结论:MRI 平扫+增强扫描联合特殊序列扫描有助于提高肺癌脑转移瘤的检出率,其影像学特征为多发结节状强化和(或)环形强化病灶、瘤周水肿为主。

PU-0799

磁共振增强 3D-FSPGR 成像技术 对静脉窦病变诊断价值的研究

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目的比较 2D-TOF-MRV 成像技术与增强 3D-FSPGR（三维扰相 GRE）成像技术对颅内静脉窦病变的诊断价值。**方法** 纳入 2014 年 3 月-2018 年 3 月间 102 例怀疑脑静脉系统疾病的患者，先行常规序列平扫和 2D-TOF-MRV 扫描，注入对比剂后行 3D-FSPGR 增强扫描进行静脉窦造影，诊断结果与经临床内科治疗、复诊或外科手术后的结果进行比较。**结果** 2D-TOF-MRV 成像技术对静脉窦病变诊断的准确率、特异性及敏感性分别为 81.4%、54.5%、94.2%；增强 3D-FSPGR 成像技术对静脉窦病变诊断的准确率、特异性及敏感性分别为 98.0%、93.9%、100%。两者在准确性和特异性的差别有统计学意义，*P<0.05*。增强 3D-FSPGR 成像技术与临床诊断一致性检验，*KAPPA* 值为 0.9；2D-TOF-MRV 成像技术与临床诊断一致性检验，*KAPPA* 值为 0.5。**结论** 3D-FSPGR 增强成像技术与 2D-TOF-MRV 成像技术比较，前者能提供更全面病变的信息，可以作为静脉窦病变的常规检查序列。

PU-0800
多次使用钆对比剂后未增强的 T1 加权 MR 图像中齿状核和苍白球高信号强度的研究价值

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目的 探讨多次使用钆对比剂后与未增强的 T1 加权像的齿状核和苍白球高信号强度之间的变化。

方法 回顾性分析 2013 至 2019 年，59 例患者，至少 6 次以上钆对比剂增强检查，分别测量首次和末次检查时未增强的 T1 加权像图像上齿状核、脑桥、丘脑和苍白球感兴趣区 ROI 平均信号强度及计算两次齿状核/脑桥、苍白球/丘脑信号强度比。采用配对样本 t 检验评估两组信号差异，采用 Pearson 相关性检验增强次数与两组信号强度之间相关性。

结果 经过多次钆对比剂增强检查的患者末次齿状核、苍白球信号强度明显高于首次未增强的信号强度（左齿状核首/末:360.8±57.8/414.7±55.3;右齿状核首/末:361.0±57.7/410.0±58.5;左苍白球首/末:366.1±65.1/411.0±63.7;右苍白球首/末:365.0±66.1/421.3±67.1）两组信号强度差异,具有统计学意义（P<0.05）。多次增强后齿状核/脑桥、苍白球/丘脑信号强度比高于增强前的信号强度比，具有统计学差异（P<0.05）。钆对比剂使用次数与齿状核、苍白球信号强度存在正相关性（齿状核 r=0.222;苍白球 r=0.127）。

结论 多次使用钆对比剂增强后齿状核和苍白球信号强度明显增高，且与钆对比剂使用次数呈正相关性。

PU-0801
A preliminary study on the value of CT and MRI in the diagnosis of sinonasal paragangliomas

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PURPOSE:
To study CT and conventional MRI findings, and further to explore the value of multi-parametric functional MRI in the diagnosis of sinonasal paragangliomas (SNPGLs).
METHODS:
Three patients with pathologically confirmed SNPGLs were included. CT and conventional MRI findings (n=3), including the location, signal intensity, enhancement presentation, necrotic/cystic changes, bony invasion, extension to the adjacent structure, were reviewed. We also explored multi-parametric functional MR imaging features obtained from diffusion-weighted imaging (DWI, n = 3), proton magnetic resonance spectroscopy (^{1}H-MRS, n=1), dynamic contrast-enhanced imaging (DCE, n=2).
RESULTS:
All SNPGLs showed heterogeneously/homogeneously isointense signal on T1WI MRI, heterogeneously/homogeneously on T2WI MRI and intense enhancement on contrast enhanced T1WI MRI. “salt and pepper” appearance on T1/T2 WI was characteristic for SNPGLs. Bony invasion on CT, and extension to the adjacent structure on MRI such as the anterior cranial fossa in patient 1, the middle cranial fossa in patient 2 and patient

3, and the pterygopalatine fossa in patient 3, were necessary for deciding the malignancy in the diagnosis of SNPGLs. Functional MRI revealed high signal on DWI with correspondingly ADC value higher than 1.0×10^{-3} mm^2/s, type III or type I pattern on DCE of two patients, and characteristic succinate peak and high ratio of choline to creatine on ^1H-MRS of one patient.
CONCLUSION:
CT, conventional MRI, and multi-parametric functional MRI could demonstrate imaging features of SNPGLs from different aspects thus helping differentiate SNPGLs from other sinonasal neoplasms.

PU-0802
探讨 T2- FLAIR 序列在脊髓肿瘤诊断方面的应用价值

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目的 探讨磁共振 T2- FLAIR 序列在婴幼儿椎管内脊髓疾病诊断中的价值。方法 收集 2018 年 6 月至今，使用 Philips Ingenia 3.0 T 超导磁共振仪对我院 32 例疑有椎管内病变的患儿进行颈椎磁共振扫描，序列分别为 T1WI、T2WI、T2-FLAIR 及 DWI。结果 1.脊髓肿瘤 12 例（髓内肿瘤 3 例，髓外硬膜下肿瘤 9 例），椎管内囊肿 15 例，脊髓炎症 3 例，脊髓空洞 2 例。2.T2- FLAIR 序列能清晰显示椎管内病变形态范围，尤其可以鉴别 T2WI 统一为高信号的病变性质。3.12 例脊髓肿瘤在 T2-Flair 上呈异常高信号同时在 DWI 上弥均散受限，其中 3 例脊髓肿瘤患儿 T1WI 信号正常。**结论** T2-FLAIR 诊断脊髓病变的敏感性高于普通 T1、T2 加权，对椎管内肿瘤定性具有显著诊断价值。

PU-0803
1.5T 磁共振 3D-pCASL 对溶栓治疗后大脑半球大面积脑梗死出血转化的相关性研究

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【摘要】
目的 探讨 1.5T 磁共振应用三维伪连续动脉自旋标记(3D-pCASL)技术在溶栓治疗后大脑半球大面积脑梗死出血转化(hemorrhagic transformation，HT)的相关性研究。
材料与方法 回顾性分析 2018 年 2 月-2018 年 12 月山西省心血管病医院 51 例经溶栓治疗后大脑半球大面积脑梗死患者，均行常规 MR 序列、SWI、3D-ASL（标记后延迟时间为 1525ms）检查，依据 3D-pCASL 伪彩图提示的梗死区灌注状态不同，分为高灌注组和非高灌注组，结合 SWI 提示 HT 的发生情况，统计分析梗死区不同灌注状态与 HT 发生之间的相关性。
结果 入组患者 51 例，梗死区高灌注组 HT 发生 27 例，未发生 HT6 例，非高灌注组 HT 发生 2 例，未发生 HT16 例，两组采用 c2 检验，两组差异有显著统计学意(P=0.000)。
结论 3D-pCASL 与 MR 常规序列、SWI 序列检查，能够更好评估溶栓治疗后大脑半球脑梗死区高灌注与 HT 的相关性，对于脑梗死患者的出血转化提供预估价值和诊断依据。

PU-0804
无症状型单侧颈内动脉重度狭窄或闭塞老年患者脑血流动力学改变及 Willis 环侧枝代偿作用的 ASL 灌注评价

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目的 通过对无症状型单侧颈内动脉重度狭窄或闭塞老年患者的全脑 ASL 灌注进行分析，对其脑血流动力学改变及 Willis 环侧枝循环代偿作用进行评价，为无症状型单侧颈内动脉重度狭窄或闭塞的老年患者早期血管再通治疗提供血流动力学的影像学依据。
材料与方法 收集山西省心血管病医院 2018 年 7 月到 2019 年 3 月份无症状型单侧颈内动脉重度狭窄或闭塞老年患者共 30 例（年龄≥60 岁），其中男 18 例，女 12 例，年龄 60～81 岁；全部患者均无症状型神经系统定位体征，其中 7 例 MRI 平扫未见明显异常．23 例 MRI 平扫发现少量腔隙性脑梗死。根据患者的 TOF-MRA，将患者分为 Willis 环完整和 Willis 环不完整两组，分别对其行全脑 ASL 检查，比较健侧与患侧大脑半球 CBF 值并予以对比分析。
结果 30 例老年患者中 17 例左侧颈内动脉重度狭窄或闭塞，13 例右侧颈内动脉重度狭窄或闭塞；30 例老年患者中有 8 例 Willis 环完整，该 8 例患者全脑 ASL 灌注示患侧、健侧大脑半球 CBF 值相近，另 22 例患者 Willis 环不完整，其中，12 例患者患侧大脑半球 ASL 灌注示 CBF 值较健侧大脑半球 CBF 值下降，另 10 例患者 Willis 环虽不完整，但患侧 Willis 环至少有前后一条侧枝血管开放，该 10 例患者患侧大脑半球 ASL 示 CBF 值下降较健侧不明显。
结论 对于无症状型单侧颈内动脉重度狭窄或闭塞老年患者，若 willis 环不完整，特别是患侧 willis 环前后侧枝血管均不完整患者，应及早积极行血管支架植入等预防性内外科治疗，以期早期预防脑梗死。全脑 ASL 灌注扫描可以早期了解脑动脉重度狭窄或闭塞后侧枝循环代偿途径和其代偿能力，对脑血管病的早期溶栓治疗、介入治疗、药物治疗、判断预后提供可靠的帮助。

PU-0805
Willis 环对颈内动脉狭窄侧支循环代偿能力的定量研究

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目的 定量研究 ICA 严重狭窄或闭塞患者 Willis 环各组成动脉解剖结构对代偿能力的影响。**方法** 收集 2018-01 至 2019-01，就诊于吉大一院神经内外科，并经 TOF-MRA、CTA、TCD 检查证实有单侧 ICA 颅外段严重狭窄或闭塞患者 40 例及 30 例正常志愿者。所有入组者均行 TOF-MRA、tASL 检查，结果由 2 名影像科医师独立处理评估。**结果** TIA 组共有 23 例，脑梗死组有 17 例。TIA 组患侧与健侧 A1 段及 PcomA 相比统计学有差异（P＜0.05），健侧 A1 段直径（2.12±0.682）大于患侧（1.49（0.00，1.79）），而患侧 PcomA 直径（1.27±0.652）大于健侧（0.00（0.00，1.35））。脑梗死组仅 A1 段存在统计学差异（P＜0.05），健侧 A1 段直径更大（2.06±0.725/1.36±0.615）。两组与正常对照组比较，TIA 组发现健侧 A1 段、双侧 PcomA 及双侧 P1 段均较正常对照组大（P＜0.05）。脑梗死组健侧 A1、患侧 PcomA 及双侧 P1 段直径较正常组相应血管直径大（P＜0.05）。AcomA 开放时健侧 ICA 代偿范围大（0..294±0.144/0.177±0.189）； PcomA 开放时，健侧 ICA 代偿容积较 PcomA 未开放者小（0.208±0.171/0.338±0.130），而 PcomA 开放时，VBA 代偿范围大（0.223（0.142，0.421）/0.056±0.042）。健侧 A1 段、患侧 PcomA 直径分别与健侧 ICA 代偿能力、VBA 代偿能力存在正相关，相关系数分别为 0.581、0.727。

结论 ICA 严重狭窄或闭塞时会造成 Willis 环各组成动脉直径发生改变，而 Willis 开放情况及解剖结构的差异对健侧 ICA 及后循环代偿能力具有不同影响。

PU-0806
磁化准备快速梯度回波序列在颅脑增强的临床应用价值

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目的 探讨磁化准备快速梯度回波（Magnetization Prepared Rapid Gradient Echo imaging，MPRAGE）序列在颅脑增强的临床应用价值。
方法 收集 MRI 平扫发现颅脑病变加作增强扫描患者 56 例，增强扫描时先使用快速自旋回波（TSE）序列行常规横轴位、矢状位、冠状位 T1WI 扫描，再用 MPRAGE 序列作 3D-T1WI 的横轴位扫描并采用多平面重组（MPR）重建出矢状位及冠状位图像，比较两种序列所得图像在观察病变内结构、病变与周围组织分界、脑血管及小病灶检出率等方面的差异。
结果 MPRAGE 序列在图像质量和对病变的显示方面均显著优于 TSE 序列，主要表现在以下方面：1 MPRAGE 横轴位薄层图像具有极高的空间分辨率；2 MPRAGE 采用薄层连续扫描，减少了部分容积效应，病变内结构显示清楚，不同组织之间对比度良好，对颅底等易出现伪影的部位也能获得清晰无干扰的图像；3 MPRAGE 薄层图像通过多平面重组（MPR）、最大密度投影（MIP）等多种方式、方向的重建；4 MPRAGE 高分辨率薄层图像对小病灶的显示比较清晰，特别对颅底处及接近脑膜边缘的小病灶显示较为确切可靠。
结论 MPRAGE 序列在颅脑增强中对病变内结构、病变与周围组织分界、脑血管及小病灶检出率等方面明显优于常规 TSE 序列，具有更高的临床应用价值。

PU-0807
MRI 3D 薄层高分辨序列在神经成像中的应用

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目的 探讨磁共振三维稳态进动快速成像(three-dimensional fast imaging employing steady state acquisition，3D-FIESTA) 及三维时间飞跃-扰相位梯度回波（3D-TOF）序列以及增强三维 T1BRAVO3D 序列在神经 MRI 成像中的应用。 方法 回顾分析临床诊断为三叉神经痛患者的磁共振成像 60 例。两名影像医师盲法分析其平扫、基础图及多平面重建图，判断三叉神经出脑干段和邻近血管的关系，比较三组序列对血管与神经显示效果。**结果** 60 例患者中，影像学阴性 8 例（13.3%），三叉神经与血管关系密切 22 例（36.7%），与血管靠近 10 例（16.7），三叉神经受压推移 20 例（33.3%），其中 7 例与肿瘤包绕、推移有关（脑膜瘤 1 例，表皮样囊肿 3 例，囊肿 1 例，听神经瘤 2 例）,三叉神经与小脑上动脉有关 16 例（26.7%），与基底动脉有关 2 例（3.3%）。（2）3D-FIESTA 序列显示三叉神经全程效果好；3D-TOF 序列显示小动脉与神经关系好；增强三维 T1BRAVO 序列显示血管与神经的关系最佳。结论 3D-FIESTA 序列信噪比高,显示三叉神经全程效果好；3D-TOF 序列显示血管为高信号,可以清楚地显示血管的走行和分支与神经的关系。增强三维 T1BRAVO 序列可以进一步发现血管分支特别是小静脉与神经的关系。可同时提供全脑组织的增强后影像。三组磁共振序列联合应用有利于对面神经、三叉神经痛的病因诊断、治疗方案制定及预后评估提供有价值的影像学参考

PU-0808
磁共振弥散序列联合 3D-ASL 技术对急性脑卒中的诊断价值

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摘　　要：　　目的　分析磁共振弥散序列联合 3D-ASL 技术对急性脑卒中的诊断价值 。**方法**　回顾分析临床 66 例急性脑卒中患者临床及影像学资料。脑卒中患者行 MRI 平扫、弥散、MRA 及 ASL 多序列常规检查。观察弥散信号联合 ASL 分析。**结果** 66 例患者弥散加权序列确诊断脑梗死 55 例（83.3%），脑梗并低灌 41 例（62.3%），左侧大面积或左侧多发脑梗 27 例（40.9%），ASL 大面积低灌 21 例（31.8%），ASL 高灌注并梗死出血 4 例（6.6%）大面积梗死并 ASL 缺血半暗带 2 例（3.3%）延迟灌注 19 例（28.8%）**结论** 弥散加权成像敏感度高。患者多为缺血性梗死并 ASL 低灌。梗死部位左侧多发及左侧大面积梗死多于右侧。弥散信号的提示联合 ASL 技术分析可以对急性脑卒中患者作出缺血或出血性梗死定性的诊断，为临床提供可视病灶面积及灌注信息。以及是否有可恢复半暗带存在，对临床诊治方向有重要价值。

PU-0809
Prediction of the grade and histological subtype in meningiomas: A comparative study on susceptibility-weighted imaging and pathological correlation

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BACKGROUND AND PURPOSE: Preoperative prediction of the meningioma grade is of importance because it influences the treatment strategy. The purpose of this study was to evaluate the role of susceptibility-weighted imaging (SWI) in the differentiation of grades and histological subtypes of meningiomas.
MATERIALS AND METHEDS: We retrospectively reviewed SWI and conventional MR imaging features of 201 patients with meningioma (122 low-grade [benign], 79 high-grade [atypical and anaplastic]). The degree of intratumoral susceptibility signal intensity (ITSS) was correlated with meningioma grades and histological subtypes using the independent t test. Receiver operating characteristic curve analysis was performed to access the capability of SWI in predicting tumor histological grade. The correlation between ITSS and the Ki-67 labeling index was evaluated by Pearson correlation coefficient analysis and linear analysis.
RESULTS: Low-grade meningiomas had a significantly lower ITSS grades than high-grade meningiomas (mean 0.89 vs 1.90, p< 0.001). The sensitivity, specificity and area under the curve were 63.3%, 77.9%, 7.1%, respectively. Meningiomas of meningothelial type had a significantly higher ITSS grades than other low-grade meningiomas (median 1.26 vs 0.74, p= 0.005). The ITSS grades exhibited close relationship with Ki-67

labeling index, showing a higher ITSS grade for increasing Ki-67 labeling index ($r=0.542$, $p<0.001$).
CONCLUSIONS: SWI is useful for differentiating meningioma grades and meningothelial meningiomas showed higher ITSS grades than the other benign meningioma subtypes.

PU-0810

Abnormal Intrinsic Brain Activity Patterns in Patients with Presbycusis: A resting-state functional MRI study

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Purpose:
Presbycusis (PC) is characterized by bilateral sensorineural hearing loss at high frequencies and speech-perception difficulties in noisy environments and has a strikingly detrimental impact on cognitive function[1]. The purpose of this study was to use amplitude of low-frequency fluctuation (ALFF) analysis[2] to elucidate whole-brain functional differences between patients with PC and age-matched normal hearing controls.

Materials and Methods:
Resting-state fMRI images of twenty-six patients with PC and twenty-six age-, sex- and education-matched healthy controls (HCs) were acquired. All participants underwent a battery of neuropsychological and auditory tests.

Results:
Compared with healthy controls, presbycusis patients manifested decreased spontaneous activity mainly in the right superior temporal gyrus, nodes of the default mode network (DMN), including the bilateral precuneus, posterior cingulate cortex, angular gyrus and right middle temporal gyrus, and the right supramarginal gyrus and middle frontal gyrus. Moreover, ALFF alterations in the nodes of the DMN were associated with cognitive impairments in PC patients. Additionally, this study provides evidence that a higher ALFF of right posterior cingulate cortex is associated with better speech perception in patients with PC.

Conclusions: Patients with presbycusis have disrupted spontaneous neural activity in several brain regions. Decreased ALFF of key nodes in the DMN may be imaging markers for PC-related cognitive decline. Moreover, this study provides evidence that a higher ALFF of right posterior cingulate cortex is associated with better speech perception in patients with PC. Our findings is likely to yield more precise information about underlying neurochemical mechanism of cognitive impairment in patients with presbycusis.

PU-0811
ＥＳＷＡＮ 序列和常规 ＦＳＥＴ２ＷＩ序列对儿童脑微出血灶检出效能的比较

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一、**目的** ＥＳＷＡＮ 是近年来发展的磁共振成像新技术，是一种全新的 Ｔ２＊权重的 ＧＲＥ 序列，对去氧血红蛋白、含铁血黄素、脑内静脉结构、铁蛋白的沉积等高度敏感。在脑 出 血 性疾病，尤其是对脑内微出血（Ｉｎｔｒａｃｅｒｅｂｒａｌ ｍｉｃｒｏｂｌｅｅｄｓ，ＩＭＢ）的诊断方面 具 有 较 高 的 临 床 应 用 价 值。本 文 通 过 ＥＳＷＡＮ序列检测患者脑内多发ＩＭＢ 并与 常 规 ＦＳＥＴ２ＷＩ序 列 进 行比较，从而为 ＥＳＷＡＮ 序列的临床应用提供客观精确的量化数，有助于临床早期发现脑内ＩＭＢ，为及早治疗提供参考探讨 ，ＥＳＷＡＮ 序列对脑多发微出血灶的检出效能
二、材料**方法** ３５例怀疑血管畸形及小静脉出血儿童。采用 ＧＥ３．０Ｔ 磁共振 ＦＳＥＴ２ＷＩ及 ＥＳＷＡＮ 序列横断位扫描，扫描方法本研究采用ＧＥ３．０Ｔ 超导型磁共振，８通道头部相控阵线圈。常规行自旋回波 Ｔ１、Ｔ２加权和 ＦＬＡＩＲ轴位扫描（１序列：ＴＲ／ＴＥ＝５００ｍｓ／１５ｍｓ，翻转角７０°。并与ＥＳＷＡＮ 序列对照。
三、**结果** ３５例患者均存在多发微出血灶，以基底节／丘脑区多发，皮质及皮质下区次之，脑干和小脑区最少，差异有统计学意义（Ｐ＜０．０１）。ＥＳＷＡＮ 序列对脑微出血灶的显示明显优于 ＦＳＥＴ２ＷＩ序列，差异有统计学意义（Ｐ＜０．０１）。
四、**结论** 在中枢神经出血性疾病，ＥＳＷＡＮ是对脑内ＩＭＢ的诊断方面具有较高应用价值。ＩＭＢ脑内微小血管病变导致的、以微出血为主要特点的脑实质亚临床损害。在其出现临床症状之前只 能 通 过 ＤＳＡ、ＣＴ、常规磁共振等相关检查获得脑部信息，而这些辅助检查只能发现较大血管 病 变，对ＩＭＢ 的 检 出 极 为 有 限。ＥＳＷＡＮ 序列对微出血敏感，有助于临床更早期发现病变，为及早治疗提供信息。

PU-0812
磁共振波谱成像在轻微型肝性脑病诊断中的意义

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目的 探讨 3T 磁共振波谱成像（MRS）在轻微型肝性脑病（MHE）诊断中的意义。**方法** 对 20 例临床确诊为轻微型肝性脑病的患者和 20 例年龄性别相匹配的正常对照组左侧苍白球采用单体素氢质子波普点分辨自旋回波序列进行扫描，后处理软件分析 MRS 结果并获得胆碱（Cho）、肌醇（mIns）、谷氨酰胺复合物（Glx）、肌酸（Cr）及 N 一乙酰天门冬氨酸（NAA）的曲线下面积，并分别计算出与 Cr 的比值。**结果** 与正常对照组相比，MHE 组 Cho/Cr、mIns/Cr 值降低（P＜0.05），Glx/Cr 值升高（P＜0.05），NAA/Cr 值无变化。**结论** 磁共振波谱成像对于轻微型肝性脑病的诊断具有一定的意义，并可为临床研究轻微型肝性脑病提供新的方法。

PU-0813

Pineal gland abnormality in sudden hearing loss patients

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BACKGROUND:
Sudden hearing loss (SHL) is a hearing loss of >30 dB in at least three consecutive frequencies that occurs in 3 days, which is accompanied with emotion and sleep disorders. Melatonin, which is secreted by the human pineal gland, plays an important role in sleep and circadian rhythm. The aim of the present study was to evaluate and compare pineal gland volumes in SHL with healthy control.
SUBJECTS AND METHODS:
We retrospectively evaluated the pineal gland volumes of 90 cases, including 45 cases of SHL and 45 cases of health control. The total pineal gland volume of all cases was measured via magnetic resonance images using 3D slicer software, and the total mean pineal volume of each group was compared. The correlation between pineal volume and psychological measurements was also investigated.
RESULTS:
Smaller pineal gland volumes were found in SHL patients. Meanwhile, The mean pineal volumes of SHL patients and the health controls were negatively correlated with most psychological measurements.
CONCLUSIONS:
Our data show that patients with SHL have smaller pineal gland volumes and pineal gland volume is negatively related to emotional disorders. We hypothesize that volumetric changes in the pineal gland of SHL may be involved in the reduced melatonin secretion in these patients.

PU-0814

Increased Cerebellar Subregions Related Functional Connectivity in Type 2 Diabetes Mellitus

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Background
Type 2 diabetes mellitus (T2DM) is a critical risk factor for mild cognitive impairment and the acceleration of MCI to dementia. Our previous study showed significantly decreased absolute neurovascular coupling (NVC) in subregions of cerebellum cortex in T2DM patients [1,2]. Besides, NVC coefficients were significantly positively correlated with the total score of Mini-Mental State Examination (MMSE). However, the role of cerebellum subregions in overall brain function remains unknown.
Methods
To assess the cerebellar functional connectivity (FC) pattern in diabetic status, 30 T2DM patients and 30 matched healthy control subjects were prospectively enrolled.

All participants completed the MMSE, the Stroop Color-Word Test (SCWT), and the California Verbal Learning Test (CVLT) to assess general cognition, executive and memory function, respectively. Then, they underwent resting state functional MRI to calculate the FC between cerebellum subregions and the other cerebral voxels. To evaluate the certain direction of altered FCs, Granger causality analysis were also performed. Correlation analysis were used to calculate the relationship between FCs and cognitive performance.

Results

Poorer performance was found in patients in 6 subitems of SCWT or CVLT. T2DM group displayed significantly increased functional connectivity between certain cerebral areas and cerebellum subregions, including left cerebellar lobule VI to left cingulate gyrus, right cerebellar lobule VIIb to right precentral gyrus, cerebellar lobule VIIIa vermis to right ventomedial parietooccipital sulcus, left and right cerebellar lobule X to left inferior occipital gyrus.

Furthermore, all those increased FCs were positively correlated with MMSE total scores ($P < 0.05$).

Conclusion

Increased cerebellum subregions related FCs were significantly correlated with general cognitive performance in T2DM patients leading FCs in cerebellum subregions to be promising indicator for cognitive impairment in T2DM patients.

PU-0815

脑内节细胞胶质瘤的 MRI 表现多样性分析--10 年确诊病例完整展现。

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目的 通过完整展现节细胞胶质瘤的整组确诊病例，全面阐述脑内节细胞胶质瘤的各种磁共振表现形式，以纠正教科书留给大家的关于此病的非常局限的认识。

材料与方法 收集最近 10 年内凡在本院经手术病例证实的节细胞胶质瘤的全部病例，共 14 例，根据其磁共振表现形式进行分组描述和讨论。

结果 全部 14 例，磁共振表现可分为 6 种类型，包括：1、弥漫型，4 例，基本特征是：T2WI 稍高信号，膨胀性，无边界，无强化或局部少量强化。2、团块型，3 例，基本特征是：T1 低、T2 高，DWI 稍高，边界清，轻强化，额叶 2 例，小脑 1 例。3、坏死囊变型，4 例

基本特征是：T1 很低、T2 很高，flair 很低，边界清，边缘强化，颞叶 3 例，小脑 1 例。4、囊壁结节型，1 例，基本特征是：囊性为主，可见一壁结节，强化较轻。5、钙化团样，1 例，基本特征是：T1 低、T2 低，信号不均匀，边界清，有强化。6、间变型（胶母样），1 例

基本特征是：占位明显，周围水肿，内部坏死，不规则花边状强化，形同高级别胶质瘤。

结论 节细胞胶质瘤表现形式多样，需要加强认识。大多数教科书上描写的囊性结节影，只是本组所见 6 种表现形式之一，且只占所有病例数的 1/14，因此认为教课书上描述的表现只是比较有特色，而非特征性，此点必须引起重视，否则受教科书影响，很难提高此病的诊断水平。

PU-0816

Mismatch between Behavioral and Resting-State Cerebral Blood Flow and Functional Connectivity in Mindfulness Intervention of Smartphone Addiction

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Objective
Smartphone addiction has become an increasingly common public mental health problem [1]. Mindfulness intervention can effectively alleviate the symptoms of smartphone addiction [2]. However, there is limited study on cerebral mechanism of the mindfulness intervention in smartphone addiction population. Previous study showed that neurovascular coupling (NVC) is the functional unit for organization of high-level information through magnetic resonance imaging . Therefore, this study attempts to explore the potential NVC dysfunction in smart-phone addiction by exploring the relationship between neuronal activity and cerebral perfusion maps.

Methods
11 smart-phone addicts were recruited. Oxygen level dependent signals, and arterial spin labeling imaging was performed. All subjects were examined with the Mobile Phone Addiction Index (MPAI). They underwent resting-state functional MRI to calculate indicators for neuroactivity and cerebral perfusion. We investigated the potential NVC dysfunction in smart-phone addiction by exploring the relationship between neuronal activity and cerebral perfusion maps. The Pearson correlation coefficients between these 2 maps were defined as the NVC biomarkers. Besides, the correlations between NVC coefficients and addiction index were also estimated.

Results
The MPAI scores of the experimental group generally decreased after the intervention. However, there were no significant different NVC between addicts at the whole brain level before and after intervention, no significant change in NVC coefficient after mindfulness intervention and no significant correlation between NVCs and addiction index. Besides, there was no significant difference in imaging manifestations among different brain regions.

Conclusion
There was no significant correlation between NVC coefficient and addiction index. Behavioral and imaging manifestations of mobile phone addiction may be asynchronous after mindfulness intervention.

PU-0817

SWI、DWI 联合 3D-ASL 在缺血性脑卒中溶栓治疗中的应用价值

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摘要:目的 探讨磁敏感加权成像（SWI）、MR 扩散加权成像（DWI）联合 3D-动脉自旋标记（ASL）在缺血性脑卒中溶栓治疗中的应用价值。**方法** 选取自我院 2018 年 7 月--2019 年 5 月急诊科收治的急性缺血性脑卒中 30 例患者为研究对象，进行 SWI、DWI 加权成像和 3D-ADL 灌注扫描。观察分析其影像学表现与溶栓治疗效果，溶栓出血和复发的关系。**结果** 所有患者在 SWI、DWI 加权成像和 3D-ADL 灌注指导下进行溶栓治疗，出血率为 10%，再复发率为 10%，均为 3D-ASL 低灌注，且低灌注面积大于 DWI 梗死面积，半暗带组织面积较大者。**结论** SWI、DWI 联合 3D-ASL 灌注成像评估能对缺血梗死部位及面积、责任血管进行准确判断，指导临床医生进行溶栓治疗，并降低治疗后出血和复发的风险。

PU-0818

The specific absorption rate in different brain regions of rats exposed to electromagnetic plane waves

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Accurate dosimetry of a specific brain region in rats exposed to an electromagnetic field (EMF) is essential for studies focusing on dose-effect relationship of the region. However, only dosimetry of whole brain or whole body were evaluated in most of previous studies. In this study, a numerical voxel rat model with 10 segmented brain regions was constructed. Then, the effects of frequency, incidence direction, and E-polarization direction of plane wave EMF on brain region averaged specific absorption rate (BRSAR) of rats were investigated. At last, the reliability of using whole-body averaged SAR (WBDSAR) and whole-brain averaged SAR (WBRSAR) as estimations of BRSAR were also evaluated. Our results demonstrated that the BRSAR depended on the frequency, incidence direction, and E-polarization direction of the EMF. Besides, the largest deviation could be up to 13.1dB between BRSAR and WBDSAR and 9.59dB between BRSAR and WBRSAR. The results suggested that to establish an accurate dose-effect relationship, the variance of the BRSAR induced by alteration of frequency, incidence direction, and E-polarization direction of EMF should be avoided or carefully evaluated. Furthermore, the use of WBDSAR and WBRSAR as estimations of BRSAR should be restricted to certain conditions such that the deviations are not too large.

PU-0819

脊髓小脑性共济失调 3 型 SCA3/MJD 患者大脑皮层微结构改变研究

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目的:首次应用局部回指数（LGI）探讨 SCA3/MJD 患者大脑皮层微结构的变化。
方法:收集基因诊断确诊为脊髓小脑共济失调 3 型（SCA3/MJD）患者 61 例（男/女=31/29，平均年龄 41.23±9.49 岁）及相匹配的健康对照组（HCs）70 例行 3.0T 高分辨 3D T1WI 扫描。使用局部回指数（LGI）分析探讨 SCA3/MJD 患者大脑皮层折叠程度及脑沟复杂程度，并采用一般线性模型，以年龄及性别作回归分析，获得 SCA3/MJD 患者与 HCs 有差异的脑区。
结果:与正常对照相比，SCA3/MJD 患者主要在左侧中央前回、中央后回、双侧楔叶、楔前叶、左侧颞上回、右侧扣带回呈现 LGI 减低，差异具有统计学意义（P＜0.05，校正）。
结论:本研究关于大脑皮层 LGI 的分析，可能有助于揭示 SCA3/MJD 的潜在神经生物学机制。

PU-0820

Correlation between characteristics of posterior artery intracranial atherosclerotic plaque and ischemic stroke

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[Objective]
To differentiate symptomatic posterior artery intracranial atherosclerotic plaque from asymptomatic plaque based on vessel wall magnetic resonance imaging and investigate its relation to ischemic events.
[Methods]
We retrospectively analyzed the imaging and clinical data of 69 patients who performed VW-MRI in XX hospital.Patients were classified as asymptomatic group and symptomatic group.Plaque characteristics, including plaque distribution,lumen area,outer wall area,vessel wall area,lumen volume,outer wall volume,vessel wall volume,plaque length,plaque thickness.Then the plaque volume,stenosis degree,remodeling partern and enhancement index were calculated.The relationship between posterior artery intracranial atherosclerotic plaque characteristics plaque region and clinical presentation was analyzed.
[Conclusion]
Compared to asymptomatic patients,the symptomatic group of posterior artery intracranial atherosclerotic had larger plaque volume,irregular plaque surface,higher stenosis degree and more lateral wall involvement,These characteristics are promising factors for stratifying stroke risk.

PU-0821

椎间盘突出所致下腰腿痛患者初级躯体感觉皮层功能连接的 fMRI 研究

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目的 探讨慢性下腰腿痛（LBLP）患者静息态初级躯体感觉皮层的功能连接情况。
方法 采用 3.0 T MRI 对 26 例椎间盘突出所致下腰腿痛（low back related-leg pain，LBLP）患者（LBLP 组）和 34 名健康志愿者（对照组）进行静息态 fMRI 扫描，使用 DPABI V3.0 对静息态 fMRI 数据进行预处理。以双侧初级躯体感觉皮层（$S1_{leg}$：初级躯体感觉皮层足代表区）作为种子点，进行功能连接分析并采用两样本 t 检验与健康对照组进行组间比较。将功能连接系数有显著性差异的脑区分别选为感兴趣区，以峰值坐标为中心提取球形区域内功能连接系数的平均值，与临床评估（视觉模拟量表评分、日本骨科协会评分、两点触觉辨别（2PD）测试等）参数进行偏相关分析。
结果 1）与对照组相比，左侧 $S1_{leg}$和左侧前扣带回（ACC）功能连接减弱（体素水平 P<0.01，簇水平<0.05，GRF 校正），而右侧 $S1_{leg}$和双侧小脑后叶（CPL）功能连接增强（体素水平 P<0.01,簇水平<0.05，GRF 校正）；2）在 LBLP 患者组，右侧 $S1_{leg}$和双侧小脑后叶的功能连接系数与 Barthel 指数呈正相关（r=0.422，P=0.040）、与左手两点触觉辨别测试评分呈负相关（r=-0.447，P=0.028）、与右足两点触觉辨别测试评分呈负相关（r=-0.510，P=0.011）。
结论 静息状态下慢性 LBLP 患者存在和临床症状相关的初级躯体感觉皮层（S1）功能连接异常。

PU-0822
椎间盘突出所致下腰腿痛患者初级躯体感觉皮层的动态功能连接研究

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目的 结合静态(static functional connectivity, sFC)与动态功能连接(dynamic functional connectivity, dFC)方法，分析慢性下腰腿痛患者初级躯体感觉皮层功能连接的改变及其与临床评估参数之间的关系。
方法 30 例椎间盘突出所致下腰腿痛（low back related-leg pain，LBLP）患者和 37 名健康志愿者（对照组）进行静息态 fMRI 扫描。以双侧初级躯体感觉皮层感觉亚区(primary somatosensory cortex, S1)（下肢，背部，胸部，上肢，手指，头面部）（$S1_{leg_L}$：初级躯体感觉皮层左侧下肢感觉亚区）为种子点，进行功能连接分析并进行组间比较。提取 LBLP 患者组差异脑区的功能连接系数，并与临床评估（视觉模拟量表评分、日本骨科协会评分、两点触觉辨别（2PD）测试等）参数进行偏相关分析。使用滑动时间窗方法，捕获两组 S1 的 dFC 变异性模式，以 dFC 的变异系数量化 S1 与全脑之间的 dFC 变异性，并确定与临床评估参数的相关性。
结果 与对照组相比，LBLP 组双侧 $S1_{chest}$、$S1_{back_R}$与右侧额上回、额中回 sFC 增强，$S1_{face_R}$与右侧额中回 sFC 增强，$S1_{face_L}$与右侧顶下小叶 sFC 增强且与 Barthel 指数呈负相关（r=-0.408，P=0.048）（体素水平 P<0.001,簇水平<0.005，GRF 校正）；$S1_{hand_L}$与左侧中央前回、中央后回 dFC 变异性增加，而 dFC 结果显示 $S1_{hand_L}$、$S1_{finger_L}$与双侧中央前回、中央后回（S1）变异性增加（体素水平 P<0.01,簇水平<0.05，GRF 校正）。
结论 慢性下腰腿痛患者存在和临床症状相关的初级躯体感觉皮层 sFC 异常，而 dFC 变异性增强可能有助于进一步了解持续性疼痛状态的病理机制。

PU-0823
应用磁共振波谱评价美多巴对原发型帕金森患者中脑 GABA 表达的影响

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目的 帕金森病是临床上一种常见的中枢神经系统退行性疾病。中脑多巴胺能神经元选择性变性死亡是帕金森病特征性的病理改变，目前对于帕金森疾病的治疗以药物治疗为主，药物治疗主要有美多巴等。随着磁共振波谱成像(MRS)技术的不断发展,越来越多的研究表明 MRS 可以清晰显示中脑的代谢物及其动态变化,因此 MRS 技术有望实现对帕金森病的精准诊断、病情评估及疾病监测。本研究应用磁共振波谱（MRS）技术，研究帕金森患者用药治疗期间短期（24h）停药前后中脑 GABA 含量变化，探讨帕金森患者的中脑 GABA 含量变化及抗帕药物临床疗效的关系。**方法** 收集 2018 年 4 月至 2019 年 4 月临床诊断为原发型帕金森病的患者 15 例，对符合标准的 15 例患者和 15 例性别、年龄、利手、受教育程度相匹配的正常对照分别进行 MRS 检查，全部被试均采用 Phillip 3.0T 超导型磁共振扫描仪采集数据，序列包括 3D-T1WI、MEGA-PRESS 序列。PD 组规律用药行 MRS 检查(PD 组用药后)，于检查前停药 24h 再次行 MRS 检查（PD 组用药前）。对 PD 组用药前后的数据及健康对照组的数据进行分析处理，采用 Gannet 软件测量中脑 GABA 含量，然后用药前后分别与健康对照进行双样本 T 检验，结果阈值取 p=0.05 进行分析。**结果** PD 组间中脑 GABA 值比较，PD 组用药前（3.084±0.34）较用药后（2.086±0.40）中脑 GABA 含量增高，差异有统计学意义(P <0.005)；PD 组用药前与对照组（2.47±0.69）比较，差异没有有统计学意义(P >0.5)；PD 组用药后与对照组（2.47±0.69）比较，差异有统计学意义(P <0.005)。**结论** MEGA-PRESS 技术可以预测帕金森患者用药治疗期间短期（24h）停药前后的中脑代谢物 GABA 改变情况，为临床客观评价治疗情况及抗帕药物的疗效提供新的见解，也对其病理生理机制的进一步研究开辟新的思路。

PU-0824
The fMRI study of Functional Connectivity of Primary Somatosensory Cortex in patients with Low Back-related Leg Pain due to Herniated Disc

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Objective To evaluated the resting-state functional connectivity of primary somatosensory cortex (S1) in patients with low back-related leg pain (LBLP).
Methods Twenty-six patients with LBLP and thirty-four healthy control subjects were recruited in our study. Siemens 3.0 T MR scanner was used to obtain resting state fMRI data. The data was processed with DPABI in MATLAB 8.4.0. Choosing the bilateral primary somatosensory cortical ([$S1_{leg}$]: representation of the leg in the primary somatosensory cortex) as a seed point. After fisher-z-transform for improve Gaussian distribution, a two-sample t-test was used to compare the differences of functional connectivity between the LBLP and healthy controls. Selecting all regions of the brain with significant differences in functional connectivity coefficients as ROI and extracting the average value of the functional connection coefficients in the ROI

centered on the peak coordinates of the signal. Finally, using partial correlation statistical analyses with clinic evaluation of visual analogue scale (VAS), Japanese Orthopaedic Association (JOA) scores, two-point discrimination (2PD) test etc. **Results** 1) Compared with control group, functional connectivity of the left $S1_{leg}$ and the left anterior cingulate was decreased in patients with LBLP, and functional connectivity of the right $S1_{leg}$ and the bilateral cerebellar posterior lobe was increased(voxel-level < 0.01,cluster level P < 0.05, Gaussian random field theory correction); 2) In the LBLP patient group, the functional connectivity coefficient between the right $S1_{leg}$ and the bilateral cerebellar posterior lobe was significantly positively correlated with the Barthel index (r = 0.422, P = 0.040), and was significantly negative correlated with the Two-point discrimination test of left hand (r = -0.447, P = 0.028) and right feet (r = -0.510, P = 0.011). **Conclusion** Functional connectivity of primary somatosensory cortex is abnormal in chronic low back pain patients.

PU-0825

磁共振头部增强序列黑血序列和增强 MRV 序列一站式检查在头颈部静脉血栓中的应用

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磁共振成像是静脉窦血栓形成的主要诊断标准之一，由于对其他颅内疾病的鉴别，需要多种类型的磁共振图像从多个方面相互验证。因此，怀疑脑静脉血栓形成的患者往往需要多次增强磁共振造影，检查周期长，诊断图像数据相互对照性差，多次注射造影剂，很容易产生不良结果。磁共振一站式多模式图像检查，注射单剂量造影剂进行多序列扫描，同时多组不同图像数据相互对照比较，提高诊断准确性。

15 例脑窦血栓疑似患者进行一站式多模式检查，注射造影剂 1 次获得磁共振黑血图像和常规头颅图像及对比增强图像，15 例脑窦血栓疑似患者分为 3 次磁共振序列扫描。磁共振黑血序列、常规头颅序列及 MRV 增强序列。统计分析两组黑血图像和常规头颅图像及对照增强 MRV 图像对血栓敏感率。

两组患者磁共振成像对窦性血栓形成的敏感性 P>0.05，两组患者磁共振成像信噪比 P>0.05。

一站式多模式检查图像与三次磁共振黑血序列、常规头颅序列和对比增强序列图像在血栓敏感性和信噪比方面无差异。脑窦血栓形成的一站式多模式检查，减少造影剂注射的数量和剂量，减少不良反应的发生率，提高检查诊断效率，提高患者护理水平。

磁共振黑血图像、常规头颅图像和增强磁共振（mrv）图像的一站式多模式检查有助于识别脑窦血栓形成信号和慢血流信号，减少误诊。同时还对区分鉴别其他颅内病变提供了有效诊断依据。

PU-0826

DKI 技术在脑胶质瘤分级中的研究

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目的：探索磁共振扩散峰度成像在脑胶质瘤分级中的价值。
方法：纳入 128 例经手术病理证实的脑胶质瘤患者。在 3.0 T 磁共振成像仪上对所有患者行磁共振扩散峰度成像序列扫描。采用 Mann-Whitney 检验分别比较对磁共振扩散峰度成像数据进行后处理获得的平均扩散系数(mean diffusivity, MD)、各向异性分数(fractional anisotropy, FA)和平均峰度值(mean kurtosis，MK) 值在高、低级别脑胶质瘤之间的差异。采用受试者工作特性曲线比较每个参数的曲线下面积。
结果 MD 值在高级别脑胶质瘤中显著低于在低级别脑胶质瘤中 ($P < 0.05$)。M 值在高级别脑胶质瘤中显著高于在低级别脑胶质瘤中 ($P < 0.05$)。FA 值在高、低级别脑胶质瘤间没有统计学差异($P > 0.05$)。MK 的曲线下面积显著大于 MD 和 FA 的曲线下面积 ($P < 0.05$)。
结论：磁共振扩散峰度成像可为脑胶质瘤分级提供更多的信息并提高分级准确性。

PU-0827
罕见成人脑室内原发原始神经外胚层肿瘤影像表现 1 例

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PNET（Primitive neuroectodermal tumors, PNET）起源于原始神经上皮细胞，是一组发生于中枢神经系统及周围肌肉、骨骼组织，由原始未分化小圆细胞构成的恶性肿瘤，1973 年由 Hart and Earle 首次报道。颅内 PNET 多见于儿童，极少见于成人，仅占成人颅内肿瘤的 0.46%。颅内 PNET 好发于大脑半球，以额、颞叶多见，极少发生于脑室内，文献仅见 4 例报道，本例位于脑室内，且呈多发结节，散在分布于脑室壁，这种影像表现未见报道。临床表现与肿瘤部位有关，常表现为高颅压症状，也可为癫痫、精神异常、轻偏瘫等。
颅内 PNET 大小多为 6cm 以上，TIWI 呈低信号，T2WI 呈高信号，增强扫描肿瘤强化明显，瘤周水肿轻。肿瘤信号不均，其内可见坏死、囊变，瘤内可伴有出血或钙化。尽管发病部位特殊，但脑室内 PNET 的 MRI 信号特点与发生在大脑半球者相同，此外，肿瘤无瘤周水肿、边界清晰的特点。增强扫描肿瘤的强化程度与肿瘤内部血管成分的多少有关。DWI 有利于识别肿瘤中的固体成分，本病例肿瘤 DWI 呈高信号，增强扫描中等程度强化。本病还需要与一些脑室内原发的肿瘤如室管膜瘤、室管膜下瘤、室管膜下巨细胞瘤等病相鉴别。
脑内 PNET 的治疗方案是手术最大限度切除肿瘤、辅以放疗及化疗。预后极差，成人 5 年存活率不超过 35%。我们主张 PNET 的治疗需要结合患者的发病部位、病理及免疫分型进行多角度评估，实施个体化的治疗方案。

PU-0828
戒断时间对海洛因成瘾者大脑大型脑网络的影响

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目的:探讨戒断时间对海洛因成瘾大脑网络核心脑区功能连接的影响.材料与方法:招募海洛因成瘾者（Heroin 组）、强制戒断 6 月者（PA6 组）、强制戒断 12 者（PA12 组）及健康对照者（HC

组）。收集所有受试者的人口学资料，并采集静息态功能磁共振数据（rs-fmri）。对 rs-fmri 进行独立成分分析，提取前默认网络（aDMN）、后默认网络（pDMN）、左侧执行控制网络（LFPN）、右侧执行网络（RFPN）及突显网络（SN），即而提取每个脑网络的核心脑区，包括内侧前额叶、楔前叶、左侧外侧前额叶、左侧顶下小叶、右侧外侧额中回、右侧角回、内侧前额叶、双侧岛叶等 9 个脑区。以核心脑区为种子点做网络的功能连接，方差分析戒断时间对脑网络功能连接的差异。**结果** 方差分析显示存在显著性差异的功能连接包括：（1）内侧前额叶与右侧楔前叶功能连接存在显著性差异，并随着戒断时间延长功能连接增强；（2）左侧后扣带与内侧前额叶、左侧背外侧前叶、右侧楔叶功能连接存在显著性差异，并随着戒断时间延长功能连接增强，且存在正相关；（3）左侧顶叶与内侧前额叶、右侧楔叶功能连接存在显著性差异，并随着戒断时间延长功能连接减弱，且存在负相关；（4）背侧前扣带与双侧侧外侧前额叶、岛叶、内侧前额叶、双侧顶叶功能连接存在显著性差异，并随着戒断时间延长功能连接增强，且存在正相关；（5）左侧岛叶与左侧内侧前扣带、左侧背外侧前叶功能连接存在显著性差异，并随着戒断时间延长功能连接增强，且存在正相关；（6）右侧岛叶与左侧内侧前扣带功能连接存在显著性差异，并随着戒断时间延长功能连接增强，且存在正相关。**结论** 默认网络内部功能连接随戒断时间延长而增强，与左侧执行控制网络连接减弱；突显网络内部功能连接增强，与双侧执行控制网络连接增强。延长强制戒断时间有利于海洛因成瘾脑功能的恢复。

PU-0829

颅内成熟型畸胎瘤的 MRI 诊断（附 4 例报告）

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【摘要】目的 分析颅内成熟型畸胎瘤的 MRI 表现，提高对本病的认识。方法 回顾性分析 4 例经手术病理证实为颅内成熟型畸胎瘤的 MRI 表现，观察病灶的数目、大小、形态、信号、强化程度和方式。4 例均可行 MRI 平扫及增强，其中 3 例行 CT 平扫。结果 4 例成熟型畸胎瘤均为单发，其中 2 例病变破裂，广泛累及蛛网膜下腔。另 2 例病变为圆形及类圆形，边界清楚。MRI 平扫 2 例病变呈等/稍长 T1、稍长 T2 信号为主混杂信号，压脂序列信号均未减低；另 2 例呈短 T1、长 T2 为主信号，压脂序列信号减低，均可见脑沟脑池多发条状、不规则短 T1 信号长 T2 信号。增强扫描仅 1 例为不均匀明显强化，其余 3 例无强化。结论 MRI 能清楚显示成熟型畸胎瘤的病变及其累及范围，对其诊断及鉴别诊断具有重要价值。

PU-0830

CVSD 患者脑白质高信号的自动及手动分割比较及其与临床数据的相关性分析

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目的

此研究的目的是通过液体反转恢复序列（DIR）及双反转恢复序列（FLAIR）检测并分析脑小血管疾病（CSVD）的脑白质高信号（WMHs）。并探究 WMHs 与 CSVD 患者临床特征的关系。

材料与方法

本研究使用 MAGNETOM Skyra 3T 扫描仪采集了 36 位二型糖尿病患者和 36 位年龄性别相仿的正常志愿者的 DIR、FLAIR 以及 T1-MPRAGE 数据。使用 MAGNETOM Prisma 3T 扫描仪采集了 24 位脑小血管疾病患者（包括糖尿病患者、高血压、高血脂等疾病）的 FLAIR 以及 T1-MPRAGE 数据。通过临床检查采集患者及志愿者的年龄、性别、血糖、血脂、血压、认知评分等数据。分别计数糖尿病患者与对照组的 WMHs 数量并比较两者之间的不同。使用 ITK-SNAP 自带的测量方法以及 Matlab 分别计算手动分割及自动分割得出的 WMHs 的体积/相对体积。计算 WMHs 体积/相对体积与各种临床数据之间的相关性。

结果

与对照组相比，二型糖尿病患者有着更多的 WMHs（p=0.0039）。与 ANTS 和 SPM 提供的配准方式相比，改良的 Elastix 配准方式有着所需时间更少，所得结果更加精确等优势。手动与自动分割两者之间的相关性相对较好（p<0.001,r=0.85）。所得相关性中呈明显正相关的有：年龄与脉压差（r=0.77）；性别与灰质体积（r=0.58）；性别与脑总体积（r=0.67）；舒张压与胆固醇（r=0.63）和低密度脂蛋白（r=0.68）等。呈明显负相关的有：年龄与灰质（r=-0.63）、白质（r=-0.73）及脑总体积（r=-0.59）；性别与脉压差（r=-0.55）；性别与 Flanker 评分（r=-0.55）等。

结论

糖尿病患者有着更多的 WMHs，提示其可能与糖尿病增加了 CSVD 的风险有关。手动 WMHs 分割与自动 WMHs 分割有着良好的一致性。部分临床数据以及影像数据之间存在一定的相关性。

PU-0831

MR 对脑梗死半暗带发生机制的探讨

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脑卒中是非外力下脑血管的栓塞和出血，导致局部脑细胞缺血、缺氧引起相近偏瘫、失语等功能障碍。从第三次全国人口健康报告调查情况来看，脑卒中的死亡率占到所有疾病死亡率第一位，而且我国是脑卒中大国，平均发病年龄是 66 岁，还出现年轻化的趋势，比西方发达国家提前 10 年。缺血脑组织的 MTT 增加，CBV 可以是正常或轻微降低，类似缺血性半暗带；而脑梗死组织则表现型为典型的峰值时间延长或 MTT 增加并明显的 CBV 降低。对于急性脑梗死中，缺血半暗带的确定有利于临床的溶栓治疗，平扫加增强的扫描方法以确定哪条血管的供血区需要溶栓治疗。并除外脑出血和大面积的脑梗死。但脑梗死治疗的时间窗定在 2 小时或 4.5 小时内或外没有影像依据，半暗带的作用及发生机制是什么？据临床观察及文献研究，用增强的 MRI、DWI、SWI、ASL 及灌注等成像方法推断半暗带应该是毛细血管网及静脉的起始端，所以，对脑梗死的病人早期采用脱水、抗缺氧等治疗保持毛细血管的通畅可有效地延长半暗带的存在时间，提高治疗成功率。而且发现大脑皮层区与基底节区和小脑的半暗带的表现明显不同。

PU-0832

复发缓解型多发性硬化患者灰质灌注与体积改变间的相关分析

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目的 应用 3D 伪连续动脉自旋标记(3D pCASL)分析复发-缓解型多发性硬化（RRMS）患者灰质脑血流量（CBF）改变及其与灰质体积、临床扩展残疾状态量表（EDSS）及病程间的相关性。**方法** 对 31 例 RRMS 患者和 37 名健康对照组（HC）行常规 MRI、3D pCASL 及 3D T_1WI 扫描，并应用 Matlab 平台的 SPM 8 和 VBM 8 软件分别对 3D pCASL 和 3D T_1WI 图像进行预处理。将灰质体积作为协变量和未将灰质体积作为协变量分别分析 RRMS 组与 HC 组间灰质 CBF 改变情况，进一步提取灰质灌注改变脑区的 CBF 值并与 EDSS 评分和病程做相关性分析。**结果** 校正灰质体积前，与 HC 组比较，RRMS 组表现出多个脑区 CBF 下降（P<0.01，Alphasim 多重比较校正，体素>93）。,校正灰质体积后，与 HC 组比较，RRMS 组上述 CBF 下降脑区仅右侧额上回、左侧三角部额下回、左侧枕中回仍存在差异（P<0.01，Alphasim 多重比较校正，体素>73）。fRRMS 组灌注下降脑区的 CBF 值与病程均呈负相关（P均<0.05），与 EDSS 均无相关性（P均>0.05）。**结论** RRMS 患者存在广泛灰质灌注下降，其中存在与灰质体积萎缩无关的灌注改变，可为 RRMS 灰质灌注的病理改变提供更多影像学依据。

PU-0833

放射学孤立综合征的研究现状

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放射学孤立综合征（RIS）是一种核磁共振成像（MRI）表现与多发性硬化（MS）高度相似，但无多发性硬化典型症状及定位体征，并有可能进展为多发性硬化的一种综合征。RIS 患者中有一半主诉头痛而接受 MRI 检查，有些患者的亚临床认知障碍与多发性硬化症相似。影像学检查显示了 RIS 与多发性硬化症之间的相似性。 约三分之二的 RIS 的患者中出现影像学进展，在平均 5 年的随访时间内，约三分之一的患者出现神经系统症状。颈髓病变是疾病进展的重要预测因子。RIS 患者的管理需个体化，但是否启动疾病修饰治疗（DMT）现在仍有很大的争议的。

PU-0834

3.0TMRI 多模态成像在阿尔兹海默症认知功能评价中的应用价值

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摘要：目的 阿尔茨海默病(AD)是一种以神经退行性变和脑功能丧失为特征的老年痴呆症，其早期表现为记忆力减退。回归分析已广泛应用于 AD 研究，以关联临床和生物标志物数据，如预测磁共振成像(MRI)措施的认知结果。**方法** 在一定程度上，容量和功能磁共振成像(fMRI)研究可以检测结构、脑血流和血氧的变化，从而将 AD 和轻度认知障碍(MCI)受试者与健康对照组(HC)区分开来。对 25 例 AD 患者、25 例 MCI 患者及 25 例 HC 患者进行 3T 高分辨率 MRI 检查。一种基于独立分量分析(ICA)的方法来研究潜在的与痴呆相关的 MR 图像特征，并结合使用支持向量机(SVM)/2 名副主任医师将扫描结果分类为 AD、MCI 和 HC 三类。定量磁化率映射（QSM）重建后，将使用 FSL 进行全脑分析，比较各组间的易感性图谱。将性别、年龄和教育程度设置为妨害变量，当 p (FEW) < 0.05 时，认为聚类显著。**结果:**ICA 方法结合 SVM 分类器可以将 AD、MCI 与 HC 区分开来，进行回归分析，以调查 QSM 分布模式与认知测量(MMSE)之间的相关性。**结论** 应用 3.0TMRI 功能成像预测阿尔兹海默症认知功能有一定的研究价值。

PU-0835

Brain GABA levels distinguish multiple sclerosis and neuromyelitis optica using edited magnetic resonance spectroscopy

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Purpose: Although immunological, clinical, and imaging measures have exhibited the potential to distinguish relapsing-remitting multiple sclerosis (RRMS) and neuromyelitis optica (NMO), no method has been able to completely differentiate MS from NMO. Thus, there is an urgent need to identify imaging markers that could be used to distinguish these two disorders. Gamma-aminobutyric acid (GABA) is the main inhibitory neurotransmitter in the central nervous system. Previous studies have demonstrated that there is a dysfunctional GABAergic neurotransmission in animal models of multiple sclerosis. Edited magnetic resonance spectroscopy (MRS), using the MEGA-PRESS sequence, is the most widely used technique for detecting GABA in the human brain. However, none of the existing studies are performed to compare the brain GABA levels between patients with MS and NMO.

Material and Methods: 39 patients with RRMS (27 males/12 females, mean age 43.7±4.9 years) and 35 patients with NMO (25 males/10 females, mean age 43.1±3.9 years) and 40 healthy controls (28 males/12 females, mean age 43.8±4.1 years) were examined on a 3T scanner and T1-weighted three-dimensional TFE images were used as a localizer. The MEGA-PRESS sequence (TR 2000 ms; TE 68 ms; 256 averages) was used to measure GABA concentrations in the posterior cingulate cortex (PCC), medial prefrontal cortex (mPFC) and left hippocampus (LHC). For quantification, a shorter measurement (8 averages) of the unsuppressed water signal was obtained. The MRS data were analyzed using 'Gannet' (GABA-MRS Analysis Tool) in Matlab with Gaussian curve fitting to the GABA peaks. 3 Hz exponential line broadening was applied. The ratios of the integrals of the GABA and water signals, making corrections for T1 and T2 relaxation times and partial volume effects, were used to calculate water-scaled GABA concentration in mmol/L (mM) using a formula.

Results: The RRMS group showed reduced GABA levels in the PCC and LHC compared to the control group (LHC: 1.20 ± 0.23 mM vs. 1.36 ± 0.23 mM, p = 0.026; PCC: 1.13 ± 0.13 mM vs. 1.22 ± 0.14 mM, p = 0.02). Importantly, The RRMS group showed reduced GABA levels in the PCC and LHC compared to the NMO group (LHC: 1.20 ± 0.23 mM vs. 1.40 ± 0.36 mM, p = 0.035; PCC: 1.13 ± 0.13 mM vs. 1.28 ± 0.16 mM, p = 0.003). No statistical difference in GABA concentrations in the MPFC region was seen among three groups.

Conclusion: In this study, we found the differences of GABA levels in the LHC and PCC between the RRMS and NMO patients, which may be helpful in distinguishing RRMS from NMO after further validation.

PU-0836

MRI findings of primary central nervous system vasculitis

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Abstract: Objective to explore the MRI characteristics of primary central nervous system vasculitis. **Methods** MRI findings of 9 patients with primary central nervous system vasculitis confirmed by pathology were retrospectively analyzed. **Results** 9 cases shows lesions on MRI, Which were slightly hypointensity on T1 and hyperintensity on T2 , high signal on FLAIR, iso or slightly hyperintensity on DWI and high signal on ADC.Enhanced scan were patchy, gyrus reinforcement, SWI were dotted low signal, ASL shows low perfusion, most of the lesions, fuzzy boundaries involvement, gray and white matter part with edema. **Conclusion** the imaging manifestations of primary vasculitis of the central nervous system have certain characteristics, SWI can be chronic bleeding products have important clinical differentiation significance, and ASL showed hypoperfusion ,which has important significance for diagnosis.

PU-0837

应用高分辨 MRI 评估颈动斑块与体质指数的相关性

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摘要 目的 通过高分辨率磁共振成像，探讨患者颈动脉粥样硬化斑块与体质指数的相关性。 **材料与方法** 选择行颈动脉磁共振检查的患者 64 例，将体质指数 BMI＜24.0kg/m² 患者分为非肥胖组（31 例），BMI≥24.0 kg/m² 分为肥胖组（33 例），比较两组患者一般资料、颈动脉斑块成分（薄或破裂纤维帽发生率、斑块内出血发生率、脂质核发生率及体积、钙化发生率及体积、IV-VI 型斑块）及负荷（管腔面积、最大管壁厚度、管壁标准化指数）的差异。结果 肥胖组缺血性脑卒中［21（63.60）vs 11（35.50），P=0.024］及高血脂［16（48.50）vs 7（22.60），P=0.031］患者较非肥胖组多。肥胖组斑块内钙化体积［（13.32±21.08）mm³ vs（3.00±11.10）mm³，P=0.017 ］及脂质核体积［（75.45±123.62）mm³ vs（18.80±62.75）mm³，P=0.026］明显大于非肥胖组。肥胖组与非肥胖组的易损斑块［9（29.00）vs 19（57.60），P=0.021］、斑块最大管壁厚度［（2.02±0.90）mm vs（2.38±0.90）mm，P=0.025 ］、管壁标准化指数［（44.69±8.81）mm³ vs（48.81±8.94）mm³，P=0.010 ］比较，差异有统计学意义。 **结论** 高分辨 MR 可评估不同体质指数患者颈动脉斑块的稳定性，为肥胖患者病情预测及临床干预提供可靠参考依据。

PU-0838

磁共振 SWI 在脑血管淀粉样变诊断中的应用价值

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目的 探讨磁共振磁敏感加权成像（SWI）在诊断脑血管淀粉样变脑出血中的应用价值。

方法 选取常规自旋回波 T1 加权像、快速自旋回波 T2 加权像、液体衰减翻转回复序列(FLAIR)及 SWI 诊断并经手术病理证实的脑血管淀粉样变脑出血患者 8 例，对常规 MRI 序列及 SWI 进行分析。

结果 SWI 显示的出血灶数目明显多于常规 MRI 序列，所有病例的出血均主要位于大脑皮质和皮质下区，合并基底节出血 1 例、丘脑出血 1 例。

结论 SWI 在检出脑微小出血灶方面有明显的优势，能显示脑血管淀粉样变多发性脑出血的特点，诊断价值大于常规 MRI 检查。

PU-0839

探讨磁共振在老年血管性痴呆诊断中的应用价值

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目的 本文探讨头颅磁共振在血管性痴呆患者中的临床诊断价值。

方法 选取 2016 年 7 月-2018 年 6 月间于我院进行磁共振的脑血管性痴呆患者 48 例作为观察组，将同期于我院进行磁共振的阿兹海默老年痴呆患者 48 例作为对照组。观察组患者均是在脑血管疾病发病后 90d 内表现异常，并经由测试确诊为痴呆。所有患者均接受头颅血管磁共振，采用 GE Signa 1.5T 磁共振成像仪，首先对 T1WI、T2W2 以及 Flair 等三个序列进行扫描，然后进行 3D-FSPGR 扫描。收集整理获得的图片，观察比较两组患者的两侧海马大小、颞叶沟回间距、大脑左右径、颞叶沟回间距与大脑左右径比值。

结果 观察组患者的左右侧海马体积均明显大于对照组，差异有统计学意义（P＜0.05）。观察组患者的颞叶沟回间距小于对照组患者的颞叶沟回间距，观察组患者颞叶沟回间距和大脑左右径比值小于对照组，以上数据差异均存在明显的统计学意义（P＜0.05）

结论 通过对患者各项数据的分析，阿兹海默症患者的双侧海马大小明显小于脑血管性痴呆患者的双侧海马大小，这也是阿兹海默症患者的最明显表现；同时能够发现两种疾病的病理表现有所不同，利用头颅磁共振能快速对痴呆患者的病情进行分型，操作简单，能为临床诊断提高依据，值得进一步推广使用。

PU-0840

肾透明细胞癌垂体转移瘤 1 例

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患者，男，57 岁，近 3 个月无明显诱因感头痛，夜尿次数增多，4-7 次/晚。既往 2015 年 10 月份明确左肾癌、右侧肾上腺转移于北京某医院行左肾及右侧肾上腺手术切除。2017 年 5 月份因左侧肾上腺转移于我院泌尿外科行手术切除。就诊我院查头颅 CT 示鞍区增大，密度较高；后完善垂体 MRI 平扫及增强检查示鞍区实性占位，大小约 19.8*22.6*24.8mm（前后径*左右径*上下径），T1WI 及 T2WI 示高低混杂信号影，增强不均匀明显强化，垂体柄略增粗向左侧偏移，与双侧海绵窦分界欠清，视交叉受压上抬，考虑垂体大腺瘤。本次以垂体瘤入院，完善泌乳素及生长激素正常，考虑无功能腺瘤。化验提示垂体性甲减，睾酮明显下降，垂体前叶功能减退症诊断明确,予优甲乐 25ug/日替代治疗。转神经外科手术治疗，行鼻碟垂体腺瘤切除术，术中见瘤体动脉性出血较严重，并非典型垂体腺瘤表现，终止手术待病理回报后进行下一步治疗。病理结果为肾透明细胞癌垂体转移，后行经额垂体病损切除术。

PU-0841

Identifying Severity of Bell's Palsy Using Whole Brain Rest State Functional Connectivity Network

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Introduction: Bell’s palsy is characterized by the unilateral facial expression muscles palsy. Until now, the evaluation of severity in patients with Bell’s palsy depends on clinical experience and is difficult to standardize. The aim of this study is to determine severity of facial palsy by using a whole brain rest state functional connectivity network (rs-FCN) model. **Methods:** The study included 67 patients with early Bell’s palsy (1-3 d after onset). Their symptoms were quantitatively assessed using the Sunnybrook facial grading system by two senior neurologist. A 3.0-T MRI system obtained sagittal 3D T1-weighted and fMRI images. Preprocessed data were used to construct a rs-FCN captured by a 116×116 matrix and a 6,670-dimensional vector space was extracted as classification features with the upper triangle of FCN matrix. The absolute value of Kendall’s tau rank correlation coefficient determined the discriminative power of a feature, and features with coefficients above a threshold were selected as the final feature set. A leave-one-out cross-validation (LOOCV) was used to estimate the generalization ability of the classifier. Region weight, defined as the occurrence number in the consensus connections, represented the relative contribution to severity identification. The data sets of features with high discriminative power was solved using support vector machine (SVM). The classifier performance was quantified using the generalization rate, sensitivity, and specificity. The statistical significance of classification accuracy was assessed using permutation tests. **Results:** The cross-validation identified 305 consensus functional connections and the final correct classification rate was 100%. Using the LOOCV, the SVM classifier achieved an accuracy of 98%. With the generalization rate as statistic, the classifier had a probability of being wrong of < 0.0001. The altered brain regions located within the different network and the 100 highest-ranking connections were obtained. **Discussion:** Most of the discriminative functional connections are located within or across the default mode network, affective network, sensorimotor cortex, and cerebellum. The psychological stress and negative emotions are heightened in patients with Bell’s palsy, accompanying their abnormal facial movements.

PU-0842

Reliability for quantifying brain morphometry using three-dimensional multi-echo magnetization-prepared rapid gradient echo at 3 tesla

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Purpose

To explore the reliability for quantifying brain morphometry using three-dimensional multi-echo magnetization-prepared rapid gradient echo (MEMPRAGE) at 3 tesla.

Materials and Methods

Thirty healthy volunteers were recruited and examined on a 3 tesla magnetic resonance imaging system using three-dimensional MEMPRAGE technique. The main imaging parameters of MEMPRAGE were as follows: TR/TE1 = 2300ms/1.69ms, FOV = 240×256 mm^2, Matrix = 240×256, Thickness = 1.2 mm, Gap = 0, Slices = 160, flip angle = 9°, inversion time = 900ms, Contrasts =4, Bandwidth = 890, number of averages =1, acquisition time=5’12”. Three scan sessions were performed, with 30 subjects in scan 1, 30 subjects in scan 2 and 8 subjects in scan 3, respectively. Brain morphometry was automatically reconstructed and output a six-page report after imaging. In all, 63 brain tissues were quantitative measured, such as grey matter (GM), white matter (WM) and cerebral spin fluid. Absolute and normalized brain volumes in different areas were documented. To evaluate short-term (Scan 1 vs. 2) and long-term (Scan 1 vs. 3) variability, intra-class coefficient (ICC), coefficient of variability (CV), Bland-Altman plots and paired student t-test were used to perform the statistical analyses.

Results

For the short-term variability, the total intracranial volume (TIV) was 1486.78±98.67 vs. 1486.99±99.50 ml for scan 1 vs. 2, with ICC = 0.999, CV = 0.25% and p-value = 0.83, respectively. There was an excellent reproducibility for assessing the absolute and normalized brain volumes except for abnormal WM and pallidum, ICC ranged from 0.794 to 0.999, CV ranged from 0.25% to 13.8% and narrow interval was observed using Bland-Altman plots. For the long-term variability, the total intracranial volume (TIV) was 1509.50±91.37 vs. 1508.13±90.26 ml for scan 1 vs. 3, with ICC = 0.999, CV = 0.16% and p-value = 1.00, respectively. There was an excellent reproducibility for assessing the absolute and normalized brain volumes except for abnormal WM, ICC ranged from 0.789 to 0.999, CV ranged from 0.16% to 7.25% and narrow interval was observed using Bland-Altman plots.

Conclusion

Brain morphometry can be measured with excellent scan and rescan reliability using MEMPRAGE technique at 3 tesla, which may serve as an alternative tool for longitudinal evaluation of brain volume.

PU-0843

PWI 对超时间窗急性脑梗塞血管内治疗的应用价值研究

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目的 运用 PWI 技术为超时间窗（6~24 小时）急性脑梗塞血管内的治疗(本研究主要为血管内取栓)提供影像学信息，观察急性脑梗塞区血液动力学改变，判断缺血半暗带病变范围。进一步根据预后分析 PWI 技术的各参数的敏感度与相关度，预测血管内治疗的预后及可能出现的风险。
方法 （1）对临床怀疑急性脑梗塞（6~24h）的患者先行头颅 CT 平扫及 CTA 检查，排除脑出血并明确为大血管闭塞引起临床症状

（2）建立绿色通道进行 PWI 检查，根据中国急性缺血性脑卒中诊治指南 2018 的推荐：测量核心梗死区和低灌注区符合（DWI<70ml,PWI>15ml）,并结合相关临床筛选指标，筛选出符合血管内取栓的患者 30 例（研究组），进行手术治疗，在研究组中通过术后随访，将其分为预后良好组（90 天 mRS 评分低于 2 分）和非预后良好组(90 天 mRS 评分大于 2 分)两个亚组。
（3）通过对研究组所采集的 PWI 图像用联影公司的 u WS-MR 脑灌注成像软件进行后处理，对脑灌注参数图分别进行定性和定量分析。
（4）定性分析由两位有经验的神经影像诊断医师对图像进行分析，观察比较脑内两侧灌注区别，然后再共同阅片，对灌注异常区达成统一意见。
（5）对所有资料进行汇总，应用受试者工作特性曲线（Receiver operator characteristic curve, ROC），对两组 PWI 各影像参数（核心梗死灶、梗死灶增大区及存活低血供区间 rADC、rrCBV、rMTT 等）之间的敏感度和相关度进行比较，判断上述各指标是否具有统计学意义。
结果 两组 PWI 各影像参数（核心梗死灶、梗死灶增大区及存活低血供区间 rADC、rrCBV、rMTT 等）之间的敏感度和相关度具有统计学意义。
结论 超时间窗（6~24h）急性脑梗塞患者进行 PWI 检查后通过统计学分析 PWI 各影像学参数的敏感度及相关度，建立一个多因素的预测模型，为临床治疗提供决定性参考。

PU-0844
抑郁症患者经计算机认知功能训练后识别面部表情的 fMRI 研究

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目的 计算机认知功能训练（CCT）可能通过激活背外侧前额叶、眶额回、背侧前扣带回等脑区来减轻抑郁症患者的情绪症状。本研究利用 fMRI 探讨 CCT 治疗对抑郁症患者识别面部表情神经基础的影响。
方法 从东南大学附属中大医院精神科纳入抑郁症患者共 29 人，对照组 14 人，治疗组 15 人。两组患者均在入组前及入组 4 周后接受飞利浦 3.0T 磁共振 BOLD 和 T1WI 轴位扫描、HAMD-17 和 MADRS 量表评估。BOLD 扫描时，患者需完成内隐性面部表情刺激范式（判断性别，所有表情来源于韩国 KOFEE 数据库）。本研究采用一套名为“捉球”的 CCT 程序对治疗组患者进行为期 4 周共计 30 小时的认知治疗。使用双样本 T 检验比较两组患者基线及 4 周后量表得分差异，利用 SPM8 比较两种表情下（喜悦-中性、悲伤-中性）治疗的交互作用（p=0.001,不校正，像素阈值>10）。
结果 两组患者年龄、性别、受教育程度间无统计学差异。治疗组与对照组患者基线期量表得分无统计学差异（HAMD:t=-0.118,p=0.907;MADRS:t=-0.310,p=0.759）;4 周后，HAMD 得分存在统计学差异（6.67±3.50 VS 11.07±7.22，t=2.115,p=0.044），MADRS 得分虽未存在统计学差异（9.07±6.63 VS 13.36±8.57，t=1.514,p=0.142）但治疗组均分<12。fMRI 表明：喜悦表情 4 周治疗交互作用体现在左侧额叶、额中回，右侧边缘叶、扣带回前部、中部（BA24、BA32），右侧顶叶、额叶、中央后回负性激活。悲伤表情 4 周治疗交互作用暂无脑区激活改变。
结论 CCT 治疗可以改善抑郁症患者临床症状。在识别喜悦表情时，CCT 治疗导致患者额叶、边缘叶、顶叶发生激活改变；而识别悲伤表情时，治疗前后未发现明显变化，提示短期 CCT 治疗虽可以改善临床症状，但患者对负性刺激的激活模式未发生明显改变。

PU-0845

鞍区原发性多形性横纹肌肉瘤 1 例

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横纹肌肉瘤(rhabdomyosarcoma,RMS)是较常见的软组织恶性肿瘤，以儿童多见，胚胎型为主，可发生于全身各个部位，原发于颅内少见，而原发于鞍区者极罕见，现将我院收治的 1 例成人鞍区原发性多形性横纹肌肉瘤报道如下。患者　　女性，77 岁，因“左眼睑下垂伴左眼视力下降 9 月余，加重伴双眼视力下降 1 月”入院。MRI 平扫矢状位示蝶鞍扩大、鞍底下陷，鞍内及鞍上见一不规则稍长 T1、稍长/长 T2 信号肿块，DWI 呈混杂等/稍低信号，肿块破坏鞍底进入蝶窦，并向前突入后组筛窦，大小约 3.4cm×2.8cm×2.9cm，增强扫描呈明显不均匀强化，邻近硬脑膜增厚强化，病灶侵犯双侧海绵窦，垂体及视交叉显示不清。病理诊断：(鞍区肿物)多形性横纹肌肉瘤。RMS 在影像上多表现为单发实性软组织肿块，易囊变坏死但钙化、出血少见，增强扫描呈均匀或不均匀明显强化，不同病理亚型的 RMS 影像学表现差异不明显，“围血管现象”是 RMS 的特征性表现。

PU-0846

MRI 诊断真性红细胞增多症所致左侧大脑后动脉栓塞一例

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关键词 真性红细胞增多症；脑梗死；脑血管病；MRI；MRA

病例 患者男性，75 岁，一周前无明显诱因出现头部不适，4 天前出血头痛、恶心、呕吐，双下肢麻木，测量血压 160/90mmhg，自行口服降压药。后头痛、双下肢麻木未缓解，出现视力模糊，记忆力减退。为求进一步治疗，就诊于我院。查体：双下肢行走不利，伸舌右偏，右侧视野偏盲。急诊查颅脑 MRI 及磁共振血管成像（MRA）（如下图）：左枕叶见斑片状 T1WI 低（图 C）、T2WI 高信号影（图 A），T2 FLAIR（图 B）及 DWI（图 D）呈高信号;MRA 示左侧大脑后动脉 P2 段见节段性未显影（图 E、图 F 黑箭头），其两端整齐，呈“截断征”，余未见明显异常。考虑左侧大脑后动脉血栓形成伴左枕叶亚急性梗死。高度怀疑心脏、静脉血栓或血液系统所致血栓形成。遂查血常规及肝、肾功能示白细胞 14.14×10^9/L,血红蛋白 217g/L,血小板 557×10^9/L，红细胞 8.36×10^{12}/L，红细胞压积 72.2%，谷丙转氨酶 55.3U/L，尿酸 470umol/L；基因检测是 JAK2 V617F 基因突变阳性；骨髓穿刺骨髓象示增生活跃，血三系均显著增生，以红系为著，综上诊断为真性红细胞增多症所致左侧大脑后动脉节段性栓塞伴左枕叶脑梗死。

PU-0847

扩散峰度成像显示肌萎缩侧索硬化异常脑微结构

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目的 肌萎缩侧索硬化（Amyotrophic lateral sclerosis, ALS）是一种以脑结构损伤为一致性特征的神经变性疾病。本研究中,我们利用扩散峰度成像（Diffusion kurtosis imaging, DKI）探索 ALS 脑微结构改变。

方法 本研究纳入 14 名 ALS 患者与 15 名健康对照，均接受 DKI 扫描。使用修订的 ALS 功能评分量表（ALSFRS-R）评估疾病严重程度，同时记录症状持续时间与疾病进展率。应用基于体素分析检测 DKI 指标的变化情况，包括灰质和白质的平均峰度（MK），轴向峰度（AK）和径向峰度（RK）。
结果 ALS 患者在双侧中央前回、双侧中央旁小叶和左前扣带回的灰质区域中 MK 降低;同时 ALS 患者还在双侧中央前回、双侧辐射冠、双侧胼胝体中部、左枕叶和右顶上小叶的白质中 MK 值降低。RK 降低区域的空间分布与 MK 降低的区域相似。ALS 组与对照组间 AK 无显著差异。相关性分析表明 DKI 指标与临床评估指标（ALSFRS-R 评分、疾病持续时间）间存在显著关联。
结论 DKI 指标降低表明 ALS 患者颅脑运动相关区域及运动外区域微结构复杂性降低。这些发现进一步支持 ALS 涉及多个系统变性的观点。MK 与 RK 指标可作为评估 ALS 疾病严重程度的潜在生物标志物。

PU-0848

Shared and Distinct Dysfunction of Dynamic Functional Connectivity Networks across Schizophrenia, Bipolar Disorder and Major Depression Disorder

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[Objective] Converging evidence indicates that nominally distinct psychiatric disorders have both broadly shared and distinct risk genes, clinical symptoms, and brain structural and functional disruptions. Some studies used the time-averaged (static) functional connectivity (FC) to examine the shared and distinct FC networks in psychiatric disorders. However, little is known about the shared and distinct dynamic FC networks across multiple major psychiatric disorders. Our aim is to study the shared and distinct dysfunction of dynamic connectivity across schizophrenia (SZ), bipolar disorder (BD) and major depression disorder (MDD).

[Methods] A total of 655 participants (125 with SZ, 121 with BD, 192 with MDD, and 217 demographically matched healthy controls (HC) completed resting-state functional magnetic resonance imaging at a single site. We used sliding-window approach to construct dynamic FC networks which were further grouped into four network states using k-means clustering. In each state, we identified shared and distinct dysconnectivity across these psychiatric disorders compared with HC.

[Results] We found dysconnectivity in psychosis were state-specific, rather than a time-invariant global abnormality. SZ, BD and MDD shared decreased intra-network FC (especially within frontoparietal control network (FPN)), whereas increased inter-network FC (especially between visual network (VN) and both default mode network (DMN) and FPN). Almost all dysconnectivity in BD and MDD were included in those in SZ, with SZ had distinct inter-network dysconnectivity that preferentially involving high-level cognitive networks. Most dysconnectivity were not detected by static FC.

[Conclusion] These findings shed new light on the current transdiagnostic knowledge, and advocate future studies use dynamic methods to study psychiatric disorders, besides use static methods.

PU-0849

Diffusion Kurtosis Imaging in the Differential Diagnosis of Parotid Gland Disease and Parotid Adenolymphoma: Preliminary Results

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Purpose
This study aimed to study the value of diffusion kurtosis imaging (DKI) in diagnosis of parotid gland disease (PGD) with different pathological patterns and parotid adenolymphoma (PAL).
Method and Materials
Fifty-seven patients with different kinds of PGD who underwent DKI and conventional diffusion-weighted imaging (DWI) were enrolled in this study. All patients were categorized into different groups according to their pathological patterns. The result of calculating the value of DKI-derived parameters (Kmean, Krad, Kax, Dmean, Drad, Dax, and FA) and apparent diffusion coefficient (ADC) of DWI were used to study their diagnostic accuracy in PGD with different pathological patterns. The binary logistic regression method was used to confirm clinical valuable diffusion parameters (obtained with DKI and DWI models) for diagnosing PAL. Using MedCalc 13.0, receiver operating characteristic (ROC) analysis was conducted to evaluate the diagnostic value of confirmed parameters based on the logistic regression equation.
Results
Both DKI parameters and conventional ADC showed statistical significance in diagnosing PGD with different pathological patterns ($P < .01$). By using the DKI model, kurtosis coefficients showed higher diagnostic capability than diffusion coefficients ([Kmean + Krad + Kax] vs [Dmean + Drad + Dax]: 22 vs 15, $P < .01$) did in the differential diagnosis among different PGD groups. In the diagnosis of PAL among all PGD patterns, the ROC analysis demonstrated that the area under curve (AUC) FA + Kax [0.881 ± 0.057 (0.824 to 0.938)] is higher than that when using FA [0.629 ± 0.095 (0.534 to 0.724)] and Kax [0.800 ± 0.070 (0.730 to 0.870)] alone ($P < .05$), with sensitivity, specificity, accuracy, and both positive and negative predictive values of 71.43%, 95.78%, 91.77%, 76.92%, and 94.44%, respectively.
Conclusion
DKI showed higher diagnostic capacity in the differential diagnosis of PGD with different pathological patterns. Combined parameters of DKI can differentiate PAL from other PGD pathological patterns with a high degree of accuracy. This technique shows great potential for DKI in the differential diagnosis of PGD within a certain pathological category.
Clinical Relevance/Application
DKI showed higher diagnostic capacity in the differential diagnosis of PGD with different pathological patterns. Combined parameters of DKI can differentiate PAL from other PGD pathological patterns with a high degree of accuracy. This technique shows

great potential for DKI in the differential diagnosis of PGD within a certain pathological category.

PU-0850

表观扩散系数直方图在胶质瘤分级中的价值

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目的 探讨基于肿瘤全域的表观扩散系数（apparent diffusion coefficient,ADC）直方图对于胶质瘤分级的价值。
方法 回顾性分析经病理证实为胶质瘤，术前接受过常规 MRI、扩散加权成像（diffusion weighted imaging,DWI）的 16 例患者，其中低级别胶质瘤 7 例（Ⅰ级 0 例、Ⅱ级 7 例），高级别胶质瘤 9 例（Ⅲ级 3 例、Ⅳ级 6 例），记录胶质瘤的 ADC 直方图参数，并采用独立样本 t 检验（正态分布）或 Mann-Whitney U 检验（偏态分布），利用受试者工作特征曲线(receiver operator characteristic curve, ROC)评价 ADC 直方图参数鉴别诊断高、低级别胶质瘤的效能。
结果 低级别胶质瘤以负偏态分布为主，高级别胶质瘤以正偏态分布为主。高、低级别胶质瘤 ADC_25th（第 25 百分位数 ADC 值）、ADC_50th（第 50 百分位数 ADC 值）、ADCmean（平均 ADC 值）值差异有统计学意义（P 均＜0.05）。低级别胶质瘤偏度值低于高级别胶质瘤，偏度值差异有统计学意义（P＜0.05）。ADC_25th、偏度值鉴别高、低级别胶质瘤的效能最高，ROC 下面积（Area under ROC，AUC）为均为 0.905。
结论 基于肿瘤全域的 ADC 直方图分析有助于胶质瘤的分级，ADC_25th、偏度值具有良好的诊断效能。

PU-0851

2 型糖尿病患者视觉网络功能的独立成分分析

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目的 探讨 2 型糖尿病患者的视觉网络在不同病程阶段的改变特点。
方法 收集 14 例 2 型糖尿病不伴视网膜病变患者（T2NDR）、13 例 2 型糖尿病伴视网膜病变患者（T2DR）及 18 例健康对照组（NC），并收集其年龄等一般资料、糖化血红蛋白等临床资料及 MoCA 评分。采用西门子 Trio 3.0T 磁共振采集大脑静息态 fMRI 及 3D T1WI 结构像扫描。利用独立成分分析法（ICA）分离提取视觉网络的 z-map，采用单因素方差分析对三组的视觉网络进行比较，并选择性进行两组间双样本 t 检验比较。
结果 三组患者的视觉网络差异具有统计学意义，主要为双侧距状回皮质、左侧舌回及布罗德曼 18 分区，T2DR 组相较于 T2NDR 组显著减低主要在左侧距状回皮质，T2NDR 组相较于 NC 组显著减低主要在双侧距状回皮质及左侧舌回。
结论 T2DR 及 T2NDR 均出现了视觉网络功能异常，而 T2DR 在初级视觉皮质的损害更加严重。

PU-0852
颞叶癫痫患者发作间期内侧颞叶磁共振动态磁敏感对比增强灌注成像研究

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目的　采用动态磁敏感对比增强（dynamic susceptibility contrast-enhanced，DSC）灌注成像探讨颞叶癫痫（temporal lobe epilepsy，TLE）患者发作间期内侧颞叶灌注改变。 方法　对经过手术病理证实的 15 例发作间期右利手 TLE 患者及相匹配 15 例正常对照者行 DSC 检查。在工作站上重建出 DSC 的相对脑血容量（relative cerebral blood volume，rCBV）图及相对脑血流量（relative cerebral blood flow，rCBF）图，结合高分辨率解剖像，选取两侧内侧颞叶作为感兴趣区（region of interest，ROI），计算病例组及正常对照组两侧内侧颞叶的 rCBV 值 、rCBF 值，比较病例组及正常对照组两侧内侧颞叶 rCBV 、rCBF 的不对称指数（asymmetry index，AI）的差异。结果　1、正常对照组双侧内侧颞叶 rCBV 值、rCBF 值差异无统计学意义（P>0.05）。2、TLE 组患侧 rCBV 值、rCBF 值均低于对侧，差异有统计学意义（P<0.05）。3、TLE 组 AIrCBV、AIrCBF 均高于正常对照组，差异有统计学意义（P<0.05）。　4、TLE 患者内侧颞叶 AIrCBF 值、AIrCBV 值均与病程呈正相关。结论　TLE 发作间期患侧内侧颞叶 rCBV 值、rCBF 值降低，TLE 患者的血流灌注改变与患者发病病程具有一定的相关性，表现为随着 TLE 患者发病病程的延长，其灌注不对称性越高。

PU-0853
基于度中心度方法评价尼古丁依赖者静息态功能网络中心性的改变

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目的 采用度中心度方法评价尼古丁依赖者静息态功能网络中心性的变化。**材料与方法** 对招募入组的 89 名尼古丁依赖者和 62 名不吸烟对照者进行常规 MRI 序列及 fMRI 序列扫描。运用 DPARSFA 软件对静息态 fMRI 数据进行预处理并作基于体素的全脑相关性分析，然后采用 Matlab 对尼古丁依赖组和对照组行双样本 t 检验，定义 p<0.05 具有统计学意义。**结果** 与对照组相比，尼古丁依赖组边缘叶（t=4.78，P=0.000）、后扣带回（t=4.86，P=0.000）及楔叶（t=4.75，P=0.000）的度中心度值升高（P<0.05，FWE 校正）；桥脑（t=-3.19，P=0.001）、岛叶（t=-3.20，P=0.001）及右侧颞叶（t=-3.18，P=0.001）的度中心度值降低（P<0.05，FWE 校正）。**结论** 尼古丁依赖者的全脑功能连接异常，尤以默认网络、边缘叶及岛叶为主；功能相关性的改变与尼古丁依赖者脑网络中心性的变化有关，可作为生物学标志物运用于临床。

PU-0854
ADC 直方图分析对鉴别胶质母细胞瘤和胶质肉瘤的价值

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目的:探讨基于 ADC 的直方图在鉴别胶质母细胞瘤和胶质肉瘤方面的价值。**材料与方法** 回顾近 6 年在我院做脑部 MRI 检查且经术后病理及免疫组织化学证实的 25 例胶质母细胞瘤和 22 例胶质肉瘤。分别在两组肿瘤轴位 ADC 图的每一肿瘤层面上采用软件 MaZda 手动勾画感兴趣区（region of interest,ROI），并行全域及针对最大层面感兴趣区的灰度直方图分析，进而对获得的直方图参数特征进行统计学分析，比较分析各参数的统计学意义。**结果** 从 ADC 全域灰度直方图中提取的 9 个特征参数均无统计学意义（P>0.05）;, 最大层面 ADC 直方图的 9 个特征参数中仅第 1 百分位数（Perc.01%）具有统计学意义（P<0.05），绘制其 ROC 曲线，曲线下最大面积（AUC）为 0.688，即鉴别胶质母细胞瘤和胶质肉瘤的最佳临界值为 77.50，特异度和敏感度分别为 70.0%和 61.0%；其余 8 个参数：均值（Mean）、偏度（Skewness）、变异度（Variance）、峰度（Kurtosis）、第 10 百分位数（Perc.10%）、第 50 百分位数（Perc.50%）、第 90 百分位数（Perc.90%）及第 99 百分位数（Perc.99%）均无显著统计学差异（P 均>0.05）。**结论** 基于轴位 ADC 图的最大层面灰度直方图分析可为鉴别胶质母细胞瘤和胶质肉瘤提供量化信息，可作为一种新的辅助诊断方法应用于临床。

PU-0855

基于 T2WI 全域直方图评价腮腺多形性腺瘤及恶性肿瘤

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目的:探讨基于轴位 T_2WI 全域灰度直方图在鉴别腮腺常见多形性腺瘤及恶性肿瘤中的价值。**方法** 回顾性分析我院 64 例经病理证实为腮腺肿瘤者的磁共振图像，其中多形性腺瘤 41 例（男 27 例、女 14 例）；恶性肿瘤 23 例（男 13 例、女 10 例）。采用 MaZda 软件在轴位 T_2WI 图像的每一肿瘤层面勾画感兴趣区并运行出各组肿瘤的全域灰度直方图，进而对两组直方图的 9 个特征参数进行统计分析。其中，样本均值、偏度、第 1 百分位数、第 90 百分位数、第 99 百分位数符合正态分布，采用两独立样本 t 检验（P＜0.05）；方差、峰度、第 10 百分位数、第 50 百分位数不符合正态分布，采用非参数检验（P＜0.05）。**结果** T_2WI 全域灰度直方图分析得到参数中，均值、偏度、第 10 百分位数、第 50 百分位数的差异有统计学意义（P 均<0.05），且具有较高的灵敏度和特异度。**结论** T_2WI 灰度直方图分析作为一种新的诊断方法，在腮腺多形性腺瘤与恶性肿瘤的鉴别中非常有用，其中均值、偏度、第 10 百分位数、第 50 百分位数具有较高诊断效能，有望实现临床诊断的智能化。

PU-0856

MRI 在胎儿颅内静脉窦血栓中的影像特征

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目的 探讨胎儿颅内静脉窦血栓中的产前 MRI 影像特征。方法 收集 2013 年 1 月至 2019 年 5 月在我院行产前诊断的 3 例胎儿 CVST 的临床资料，3 例胎儿均在产前超声发现胎儿后颅窝异常后 12-24h 内完成 MRI 检查。结果 3 例胎儿 CVST 产前超声颅脑横切面显示窦汇扩张，呈扇形，扩张的窦汇与上矢状窦相延续，窦汇内充满较密集点状回声，且缓慢流动，另与窦汇区可见点片状的高回声，超声结果提示胎儿窦汇处高回声（血栓可能）。MRI 显示发病部位均位于窦汇处，均累及上矢状窦，MRI 表现均为枕顶部中线窦汇区的信号异常，轴位呈三角形或扇形扩大，边界清晰，前缘呈尖角样朝向脑中线，T1WI 呈等、稍高信号，T2WI 呈等、稍低信号，DWI 序列弥散不受限，信号走

形与矢状窦走形一致。结论 产前 MRI 可准确诊断胎儿颅内静脉窦血栓，同时可评估大脑发育状况，有助于产前临床决策和评估胎儿预后。

PU-0857
增强全域直方图鉴别胶质母细胞瘤和胶质肉瘤的价值

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目的 探讨增强 MRI 全域直方图分析鉴别胶质母细胞瘤和胶质肉瘤的价值。**材料和方法** 回顾性分析我院经手术病理证实的胶质母细胞瘤 25 例和胶质肉瘤 22 例。在两组肿瘤轴位增强 MR 图像的每一层肿瘤层面上，用 Mazda 软件勾画感兴趣区并进行直方图分析，对两组肿瘤直方图参数特征进行统计学分析，找出两组肿瘤之间有显著性差异的参数特征。**结果** 利用直方图提取出的 9 个特征参数中,仅偏度（Skewness）具有统计学意义（P＜0.05），并绘制 kurtosis ROC 曲线，ROC 曲线下的最大面积为 0.671，即鉴别胶质肉瘤和胶质母细胞瘤的最佳 kurtosis 值是 0.52，特异性为 68.2%和敏感性为 60.0%。**结论** 增强 MRI 全域直方图分析可用于鉴别胶质母细胞瘤和胶质肉瘤，为鉴别两者提供可靠的客观依据。

PU-0858
Alterations of cortical thickness in patients with panic disorder

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Purpose: The pathophysiology of panic disorder(PD) is not well understood. In recent decades, neuroimaging studies have revealed structural abnormalities in the gray matter regions of patients with PD, but no unambiguous conclusions can be drawn regarding specifically increased or decreased volume in gray matter regions. Up to now, nearly all structural MRI studies comparing the brains of PD patients and healthy controls(HCs) have been volume-based. To further delineate the alterations of cortical thickness in PD, this study used surface-based morphometry (SBM) to investigate regional cortical thickness and its association with the severity of PD symptoms(including PDSS and HAMA). **Materal and methods:** A high-resolution T1-weighted scan (3DBRAVO) was used in 3.0 T GE MRI (GE HDXT, USA). For SBM and region of interest (ROI) morphometric analysis, we used the surface-preprocessing pipeline of the CAT 12 toolbox implemented in SPM12. The relation between the cortical thickness and the severity of PD symptoms were then further analyzed via the Pearson correlation. **Results:** Compared with HCs, PD patients exhibited decreased cortical thickness in the right fusiform (q=0.02977, FDR correction). The cortical thickness in the right fusiform were negatively correlated with the symptom severity(P<0.05,FEW correction). **Conclusion:** Less cortical thickness in the right fusiform might reflect difficulties in recognizing and distinguishing emotions in a given face. Our results indicate that PD patients may have difficulties to analyse emotional facial features.

PU-0859
ASL 鉴别诊断环形强化的高级别胶质瘤与脑单发转移瘤临床价值

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背景：由于 HGG 与转移瘤的临床过程、治疗及预后完全不同，术前对高级别胶质瘤与转移瘤的鉴别诊断具有重要意义。在传统的磁共振序列上，HGG 和转移瘤之间的可能表现表现为孤立不均匀强化的影像表现。但是病理学上不同的病理特征有助于区分 HGG 与孤立性转移瘤。两者的血流动力学存在显著差异。灌注磁共振成像（PWI），提供了肿瘤血流动力学信息，目前已在临床上得到广泛应用。但是国内外研究结果存在一定的分歧与争议，本研究旨在通过 meta 分析方法来评估 PWI 区分 HGG 与脑孤立性转移瘤的临床价值。

方法 检索 PubMed、Web of Knowledge, and Cochrane Libraries 和 CNKI（中国知网）数据库，检索截止时间为 2019 年 5 月 31 日。采用 Stata 软件对数据进行综合分析磁共振灌注成像技术鉴别 HGG 和转移瘤的敏感性和特异性、曲线下面积和阈值效应分析。采用 Deek’s 检验方法评估发表偏倚。

结果 共纳入 22 篇文献，共包括患者 1185 例，683 例为 HGG，502 例为单发转移瘤。本研究森林图显示 PWI 敏感性为 0.88（95%CI:0.65，0.96），特异性为 0.89（95%CI:0.74，0.92）。汇总受试者操作特征曲线下的面积（AUC）为 0.95。亚组分析动态磁敏感加权成像敏感性为 0.88，特异性为 0.86，AUC 为 0.94。ASL 的敏感性为 0.78，特异性为 0.88。AUC 为 0.92。基于敏感性分析表明，该研究结果是可靠的。未发现明显发表偏倚（p=0.38）。

结论 迄今为止，这是第一篇研究采用 meta 分析方法来评估磁共振灌注成像技术鉴别 HGG 和脑转移瘤。我们研究发现磁共振灌注成像在两者的鉴别上显示出较高的诊断效能，同时我们亚组分析证明动态磁敏感加权成像技术诊断的敏感性高于 ASL。

PU-0860
头颅柔性 12 通道线圈的性能评价

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目的：探讨头颅柔性 12 通道线圈（AHC12）与硬质 16 通道（HNC16）、24 通道（HC24）射频线圈在磁共振成像中的性能特点。

方法：（1）物理测试：三个线圈均采用直径为 150mm 的球形水模、联影 1.5T uMR560 磁共振进行成像，首先进行二维单自旋回波、单层序列成像，分别选取感兴趣区测量每个线圈图像的信噪比、均匀性。之后进行 SE T1WI、SE T2WI 序列并根据信噪比绘制前后方向、左右方向的体素-信噪比曲线。（2）临床测试：在健康志愿者中比较三个线圈 T1WI、T2WI 及 DWI 图像的信噪比，并进行图像主观评分。

结果 物理测试中，AHC12 线圈图像信噪比高于 HNC16 线圈 11.9%-49.7%，均匀性方面，HNC16 线圈图像的均匀性高于 HC24 和 AHC12 线圈，HC24 线圈与 AHC12 线圈图像的均匀性相仿。体素-信噪比曲线显示在 T1WI、T2WI 序列中，在图像的 L-R 方向上 AHC12 线圈图像信噪比均高于 HC24 线圈、HNC16 线圈，在 A-P 方向上，AHC12 线圈图像信噪比与 HC24 线圈存在交叉，但均高于 HNC16 线圈。在临床测试中，AHC12 线圈图像的信噪比高于 HNC16 线圈，三个线圈图像质量的主观评价无明显差异。

结论 头颅柔性 12 通道线圈（AHC12）可获得比硬质 16 通道（HNC16）、24 通道（HC24）射频线圈更好的信噪比，但均匀性略有下降。

PU-0861

HR-MRI 成像测量大脑中动脉狭窄率的准确性评价

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目的 评价 3.0T 高分辨率磁共振成像（HR-MRI）技术测量动脉粥样硬化所致大脑中动脉（MCA）狭窄的准确性。 **方法** 对滨州医学院附属医院 2017 年 9 月至 2018 年 5 月 40 例经数字减影血管造影（DSA）证实的症状性 MCA M1 段动脉粥样硬化性狭窄患者行 HR-MRI 序列（T1 加权像、T2 加权像、质子密度加权像）扫描，分别用华法林-阿司匹林症状性颅内动脉疾病实验法（WASID 法）、面积测算法在 HR-MR 图像上测量 MCA 狭窄率（定量测量），并依据狭窄率判定狭窄程度（半定量测量），以 DSA 为金标准评价两种测量方法的准确性。 **结果** 符合测量要求的 30 例患者的 HR-MRI 图像均可清晰显示血管壁结构，血管内缘清晰可辨、光滑，表现为偏心性狭窄。DSA、WASID 法、面积测算法测得的 MCA 狭窄率分别为(82±17)%、(70±12)%、(81±16)%，面积测算法测得的 MCA 狭窄率与 DSA 比较，差异无统计学意义（P>0.005），与 DSA 的相关性较好（r=0.893）；面积测算法测得的狭窄程度符合率较高（符合率为 90%）。 **结论** 高分辨 MR 成像技术能够显示管壁情况，面积测算法在测量 MCA 狭窄方面准确性高。

PU-0862

脑脊膜黑色素细胞瘤一例及其磁共振表现

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脑脊膜黑色素细胞瘤是较为罕见的一种中枢系统疾病，本文记录我院一例脑脊膜黑色素细胞瘤的临床表现及磁共振征象，简单分析该病磁共振表现的特征，并与大家分享讨论，希望在今后的临床及影像诊断中对于此类疾病能有进一步的研究。

PU-0863

MELAS 综合征的 MRI 影像表现及鉴别诊断

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目的 回顾性分析 MELAS 综合征的 MRI 征象并复习文献，探讨 MRI 新技术在 MELAS 综合征诊断中的价值。
方法 收集近 8 年进行 MRI 扫描并通过基因检测确诊的 MELAS 综合征患者共 16 例，全部患者均行头颅 MRI 平扫，其中 DWI 扫描 12 例，MRA 扫描 9 例，MRS 扫描 4 例， 3DASL 扫描 3 例，增强扫描 2 例，分析其 MRI 影像表现特点。

结果 16 例中均出现大脑皮质或皮质下长 T1、长 T2 信号异常信号影，12 例 DWI 均呈高或稍高信号，9 例 MRA 中均无明显血管狭窄，其中 3 例病灶区可见增多的分支血管，4 例 MRS 可见乳酸峰，3 例 3DASL 示病灶区呈高灌注，2 例增强扫描均未见明显强化，4 例复查时病灶出现游走性。
结论 在 MELAS 综合症的 MRI 扫描中，DWI、MRA、MRS、3DASL 及增强扫描均具有特征性，对其诊断具有重要意义。

PU-0864
基于循证方法评价酰胺质子转移加权磁共振成像对胶质瘤分级的诊断价值

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目的 早期区分高低级别胶质瘤一直是神经外科医师研究的热点问题，近年来，通过测量信号强度，酰胺质子转移加权磁共振成像（APT-MRI）可以准确区分胶质瘤的级别。不同文章诊断差异的变化可能是由于不同类型的 MRI 扫描仪、成像参数和后处理技术造成的。然而，目前还没有对 APT-MRI 鉴别高级别胶质瘤和低级别胶质瘤的准确性进行相关评价。因此，本研究的目的是评价 APT-MRI 在胶质瘤分级中的诊断价值。
方法 我们搜索了 4 个电子数据库，包括 PubMed、Web of Science、EMBASE 和 EBSCO，以获得相关研究，评估 APT 和胶质瘤分级之间的关系，截止时间为 2019 年 5 月。检索词如下：（“酰胺质子转移”或“APT”）和（“胶质瘤”或“或“脑肿瘤”）以及（ “分级”），语言不受任何限制。研究的质量由两位作者使用 QUADAS-2 版本进行评估。使用 I^2通过卡方值检验来评估合格研究之间的异质性。如果观察到异质性，则使用随机效应系数模型；否则使用固定效应系数模型。采用 Stata12.0 评估该研究的发表偏倚是否存在。
结果 总共 16 篇文章纳入该研究。研究中使用的核磁共振扫描仪来自飞利浦， GE，其余来自西门子。所包括研究中，MRI 扫描仪的磁场强度为 3.0T。森林图显示高级别胶质瘤 APT 相关参数信号强度（SI）显著高于低级别胶质瘤组（WMD=0.86（0.61-1.1），P<0.0001）；II 级和 III 级之间（WMD=0.6（0.4-0.8），P<0.0001）以及 II 级和 IV 级之间（WMD=1.07（0.65-1.49），P<0.0001）也存在显著差异。通过敏感性分析，结果变化不显著，说明该研究信息可靠。Egger’s 检验证明该研究不存在发表偏倚。
结论 APT 成像是一种潜在的鉴别低级别胶质瘤和高级别胶质瘤有效的影像新技术。

PU-0865
三维高分辨率磁共振血管壁成像（HR-VWI）联合 3D-MRA-TOF 成像评价可疑颅内血管病变

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目的:大多数血管病变病理学改变始于管壁内。如，颅内动脉粥样硬化(ICAD)始于内膜脂质沉积，导致炎症和内膜增厚然后狭窄。出现管径变化时可能已是 ICAD 末期表现。目前，颅内血管病变研究主要采用测量管径的方法，如 CTA、MRA 和 DSA。然而，这些检查可能降低了狭窄前或早期血管

变化的敏感性。MR 血管壁成像(VWI)越来越多地用于评价颅内血管病变，而且提高了颅内血管病变诊断准确性，对于指导治疗尤为重要。本研究将 VWI 联合 TOF 来观察血管病变，提供更准确评估疾病的能力。
方法:收集缺血性脑病临床症状患者 80 例，并进行 MRI 及 VWI 成像。排除 39 例，其中图像质量较差者 6 例、颈内颅外动脉中度及以上狭窄者 8 例、无斑块 25 例。最终，纳入 41 例患者行进一步数据分析。诊断类别包括:非闭塞性(ICAD、可逆性脑血管病、血管炎、夹层)和闭塞性血管病变(近端血管闭塞/原位血栓形成、栓塞)和隐源性卒中。**结果** 包括 41 例 VWI 和 TOF 检查。男性 29 例，女性 12 例(平均年龄 65 岁；41－78 岁)。分析了 164 根血管,评判者一致性良好，TOF(κ =0.64，P<0.0001)，VWI(κ=0.67，P<0.0001)以及 TOF 联合 VWI(κ=0.57，P<0.0001)。TOF 检出异常血管段仅占 12.3%，而两种方法检出的异常血管段占 20.8%(P<0.0001)，具有统计学意义。
讨论:本研究结果表明，仅使用常规模式可能低估疾病程度。一些病变血管可能存在狭窄但没有明显的管径变化。这些情况有解释为 ICAD 早期无狭窄改变。有报道在尸检中大约有 20%的管腔狭窄率小于 30%的动脉表现出组织学上的 ICAD，这种程度管腔狭窄很难通过管腔成像识别，但 VWI 可以表现为管壁强化。另一种解释是动脉壁扩张重塑，即保持正常管径的 ICAD。与 TOF 相比，VWI 可以识别出更多异常的颅内血管段，并提供更准确的疾病负担评估。

PU-0866
对轻微型肝性脑病患者大脑皮层复杂性下降的研究

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目的 已有研究报道轻微型肝性脑病（minimal hepatic encephalopathy, MHE）患者出现灰质体积减少、局部皮层变薄和局部回指数（local gyrification index, LGI）改变等脑结构性改变。分型维数（Fractal Dimensionality, FD）是另一个被广泛用于描述各种神经和精神性疾病患者的脑结构复杂性改变的形态学指标。我们首次利用 FD 这个指标来探讨 MHE 患者大脑皮层结构复杂性改变。
方法与材料：本次试验包括 20 个伴 MHE 的肝硬化患者和 21 个健康对照者。所有受试者均进行高分辨结构磁共振扫描和基于 PHES（psychometric hepatic encephalopathy score）系列量表的认知评估。采用 CATA12（Computational Anatomy Toolbox）计算局部脑区的 FD 值，并进行组间比较。我们进一步评估局部 FD 值与患者的认知表现（PHES 得分）的相关性。
结果 对比健康对照者，MHE 患者在左侧楔前叶、左侧缘上回、右侧前扣带回尾部、右侧扣带回峡部、右侧岛叶、双侧距状旁沟、双侧中央旁小叶出现局部 FD 值降低。此外，右侧扣带回峡部和右侧岛叶的 FD 值与患者的认知表现呈显著正相关关系。
结论 MHE 患者多个脑区的皮层复杂性发生改变，这可能是其出现各种神经认知障碍的另一个神经生物学机制。

PU-0867
慢性主观性耳鸣患者大脑的低频波动振幅研究

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目的 主观性耳鸣是临床上一种常见的疾病，以在无外源性声音时出现的异常听觉体验为主要症状。近些年的研究显示，耳鸣患者的大脑局部血流量以及灰质体积较正常人均有所改变。这提示中

枢神经系统在耳鸣的神经病理生理学过程中可能扮演重要角色。而耳鸣患者大脑皮层之间的功能改变与耳鸣严重程度之间的关系尚未明确。本研究即主要应用静息态功能磁共振（fMRI）探讨耳鸣患者的大脑皮层的异常功能情况。

方法 本研究选取 30 名慢性主观性耳鸣患者为耳鸣组，28 名健康受试者为对照组，两组间性别、年龄及教育程度均进行良好匹配。耳鸣组患者均进行 IOWA 耳鸣障碍量表评估（THQ）。所有受试者均进行磁共振数据采集，包括结构相 3D-T1WI 以及静息态 fMRI 数据。结构相数据经灰白质分割后的结果进行两组间比较。静息态 fMRI 数据经预处理后获得低频波动振幅(amplitude of low-frequency fluctuation，ALFF)数据，继而比较得到耳鸣组全脑内 ALFF 较对照组明显变化的脑区。将以上显著差异结果与临床特征参数如 THQ 等进行相关性分析。

结果 耳鸣组与对照组间的灰白质结构无显著差异。耳鸣患者多个大脑皮层脑区的功能均显著增强，包括感觉、运动以及认知功能脑区等，如右侧颞上回、右侧颞中回、左侧海马旁回、双侧枕下回、左侧梭状回以及右侧中央前回。右侧颞上回（r=0.567, p=0.002）以及左侧颞上回（r=0.466, p=0.004）的 ALFF 信号分别和耳鸣 THQ 评分呈正相关。

结论 慢性主观性耳鸣患者可能因中枢神经对噪声性神经活动的屏蔽作用减低或在损害出现后发生神经功能重塑，使部分脑区功能增强，直接或间接地影响感觉、运动以及认知功能，进而促进耳鸣的发生发展过程。同时部分听觉中枢的活动改变可能是决定耳鸣严重程度的关键因素之一。

PU-0868

3.0T 磁共振磁敏感成像的探讨

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目的 磁敏感加权成像 SWI 利用不同组织问磁敏感性的差异产生图像对比，通过运用高分辨率扫描、相位图像蒙片和最小密度投影等技术，清晰地显示啮内静脉系统，对含铁血黄素沉着、矿物质沉积等顺磁性物质非常敏感。在血管畸形、外伤、肿瘤、血管性疾病、神经变性疾病以及与铁沉积等有关的疾病中的应用潜力。

方法 磁敏感加权成像是一种利用组织的磁性的成像技术，实际上是一种三维采集技术，通过长 TE、高分辨率、完全流动补偿、薄层重建的梯度回波伴滤过的相位信息以增加磁矩图的对比和增加组织问的磁敏感差异，使对磁敏感效应的敏感性最大化。在临床实践中，经常用最小密度投影来帮助显示扭曲的结构和显示静脉血管系统的连续性，它还帮助区别主要静脉相邻的出血。

结果 SWI 具有以下诸多特点：高分辨率的三维梯度回波成像，在 3 个方向上的完全流动补偿，薄层厚避免信号丢失，相位图通过滤波减少不必要的场效应，产生相位蒙片，利用相位蒙片对磁矩冈进行增强处理，相对邻近层面进行最小强度投影，这种独特的数据采集和图像处理过程提高了磁矩图像的对比，对静脉血、出血和铁沉积高度敏感。**结论** 所有研究的初步临床应用，已显示在血管畸形、外伤、肿瘤、血管性疾病、神经变性疾病以及与铁沉积等有关的疾病中的应用潜力。

PU-0869

高清磁共振扩散加权成像在鉴别小脑囊性血管母细胞瘤 与转移瘤中的价值

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目的 探讨高清磁共振扩散加权成像（DWI）在鉴别小脑囊性血管母细胞瘤与转移瘤中的价值。

材料与方法 收集 2016 年 1 月至 2018 年 4 月本院经手术病理证实的小脑囊性血管母细胞瘤 12 例和转移瘤 18 例。所有患者术前两周内均行常规 MRI 增强及高清 DWI 检查。测量所有病变强化区、无强化区及正常小脑的表观扩散系数（ADC）,并分别计算病变强化区、无强化区 ADC 值与正常小脑 ADC 值的比值（rADC）。统计学分析采用 SPSS 19.0 软件，小脑囊性血管母细胞瘤和转移瘤的强化区域、非强化区域 ADC 值之间的比较采用 Mann-Whitney U test。受试者工作特征(ROC)曲线确定 ADC 和 rADC 鉴别两种病变的最佳诊断阈值。

结果 小脑血管母细胞瘤与转移瘤的强化区域平均 ADC 值分别为 $1.59\times10^{-3}mm^2.s^{-1}$ 和 $0.89\times10^{-3}mm^2.s^{-1}$，两者之间具有统计学差异，$Z$=-3.81，$P$<0.001。小脑血管母细胞瘤与转移瘤的强化区域平均 rADC 值分别为 2.41 和 1.23，两者之间具有统计学差异，Z=-4.11，P<0.001。受试者工作特征(ROC)曲线确定 ADC 和 rADC 鉴别小脑血管母细胞瘤与转移瘤的最佳诊断阈值分别为 $1.09\times10^{-3}mm^2.s^{-1}$（诊断敏感性为 100%，特异性为 83.3%）和 1.68（诊断敏感性为 100%，特异性为 83.3%）。ADC 和 rADC 值 ROC 曲线下面积(AUC)分别为：0.92 和 0.95。

结论 采用高清磁共振 DWI 成像对鉴别小脑血管母细胞瘤和转移瘤具有重要的参考价值。

PU-0870

基于静息态功能磁共振的儿童期急性淋巴细胞 白血病患者化疗后脑功能连接密度改变的研究

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目的 采用基于体素的功能连接密度(functional connectivity density，FCD)图方法观察急性淋巴细胞白血病(Acute Lymphoblastic Leukemia, ALL)经治儿童静息状态下脑网络水平各脑区的异常改变，并评价与神经认知功能检查结果的相关性，探究儿童期 ALL 患者化疗相关认知损害的可能的神经病理基础。

方法

本研究收集收集 ALL 经治儿童 20 例(ALL 组)及性别、年龄相匹配的健康儿童 18 例(health controls, HCs)采集 rs-fMRI 数据，其中 ALL 组为确诊时符合急性淋巴细胞白血病标准、完成同质化化疗方案并停疗 1 年以上的患儿。所有 ALL 经治儿童及对照组均接受神经认知功能量表检查，包括韦氏儿童智力测验第四版中文修订版、连线测试 A、数字广度测试。在本研究中，我们运用功能连接密度图的方法并结合基于感兴趣区的静息态功能连接分析方法探索 ALL 经治儿童的脑功能连接改变。

结果

ALL 组及 HC 组长程及短程 FCD 的组内空间分布基本相同。选取长程 FCD 减低的脑区为感兴趣区，相对于 HC 组，ALL 组的右侧额中回、楔叶、舌回表现为与感兴趣区连接减低，右侧小脑后叶表现为与感兴趣区连接增强。ALL 组智力商数与减低的长程 FCD 值呈正相关。数字广度测试结果与减低的短程 FCD 值呈正相关，连线测试 A 结果与增高的 FC 值呈负相关。

结论

本研究运用了基于体素的 FCD 方法，我们发现了 ALL 经治儿童的大脑网络节点重要性和异常脑区与全脑功能连接的改变，体现局部脑区对化疗相关的各种病理因素的易感性。静息态脑网络的改变与神经认知功能量表结果相关，提示静息态磁共振可以作为一种客观的无创的检查方法为 ALL 经治儿童的脑功能变化提供更多的信息。

PU-0871

采用静息态与 DTI 研究 AD 患者大脑的早期改变

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目　的　通过探究阿尔茨海默病（AD）的 ALFF 值差异相关脑区的 FA 值，为 AD 的早期诊断提供功能与分子影像学依据。
方　法　采用西门子 Trio 3.0T 磁共振对 17 例 AD 病人及 17 例对照组被试进行静息态 fmri、DTI 检查。对静息态、DTI 原始数据进行预处理，得到 ALFF 图和 FA 图，并进行组间独立双样本 t 检验，得到具有统计学意义的差异脑区，做成 mask 用于 FA 图的统计，然后进行组间独立样本 t 检验。
结　果　AD 组和健康对照组相比，AD 组患者 ALFF 值在右侧后扣带回、双侧中央前回及左侧额中回等脑区降低，在左侧丘脑、右侧海马旁回及右侧颞上回等脑区增高，同时这些脑区的 FA 值均增高。
结　论　阿尔茨海默病患者与健康对照组相比，ALFF 值异常的脑区，如右侧后扣带回、左侧额中回、右侧颞下回等默认网络脑区，FA 值也同时存在异常，说明 AD 患者功能存在异常的脑区的微观结构也同时存在异常，这为早期客观有效地诊断阿尔茨海默病提供了可能。

PU-0872

新兵适应障碍的亚频段低频振幅功能 MRI 研究

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目的:应用亚频段低频振幅(ALFF)分析方法,研究适应障碍新兵脑静息状态下自发性神经活动改变的特点。
方法:17 例适应障碍新兵及 20 例健康军人(对照组)行静息态下脑功能 MRI 扫描,成像数据经后处理,获得各频段的 ALFF 图,采用双样本 t 检验比较两组间各频段 ALFF 值的差异,并分析 ALFF 值改变与患者临床量表评分之间的相关性。
结果:与正常对照组比较,患者组在 Slow-5 亚频段 ALFF 值减低的脑区包括右侧小脑脚、左侧眶部额下回、左内侧前额叶、右侧额中回及双侧额上回(P<0.01,AlphaSim 校正),在 Slow-4 亚频段 ALFF 值减低的脑区有左内侧前额叶和左侧眶部额下回(P<0.01,AlphaSim 校正)。患者组中各 ALFF 值异常脑区的 ALFF 值与临床量表评分间的相关性均无统计学意义(P>0.05)。
结论:适应障碍新兵有多个脑区存在自发性神经活动异常,这些脑区与认知、情绪调节及执行功能有关,且不同亚频段异常活动脑区的空间分布不同。

PU-0873

Effects of region of interest sizes on apparent diffusion coefficient measurements of pleomorphic adenoma, Warthin tumor, and normal parotid parenchyma

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Background: To determine the effects of ROI size on ADC measurements for the differentiation of pleomorphic adenoma (PA), Warthin tumor (WT), and normal parotid parenchyma.
Methods: Sixty-five patients including 37 with PA (lesions, n=37) and 28 with WT (lesions, n=36) were examined with diffusion-weighted imaging(DWI). The mean ADC values and standard deviations (SDs) of the ADC (ADCSD) of 12 concentric round ROIs for tumors and normal tissue were measured by using custom-made software. One-way repeated analyses of variance (ANOVAs) were performed on the mean ADCs, ADCSDs and homogeneity indices of the 12 ROIs in each group.
Results: Among the three groups, the mean ADC of normal parotid parenchyma was significantly lower than that of both PA and WT in the 12 ROIs, whereas the PA group had the highest mean ADC values. No significant differences were found in the mean ADCSDs with each ROI between PA and WT (all $p > 0.017$). PAs had lower homogeneity indices compared with WTs and normal parotid parenchyma (all $P < 0.01$).
Conclusions: Homogeneity index was a useful parameter in discriminating the three groups.

PU-0874
3.0T MRI 神经根成像扫描序列对颈神经根病变的诊断价值

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目的 颈椎病变常累及颈神经根引发相应临床症状，近年来手术治疗偏向于微创手术，术野小、要求精准度高，术前直观而清晰地显示其神经根形态和走行具有重大的临床意义。本研究比较 3.0T MRI 3 种扫描序列对颈神经根成像的应用价值，选择最优神经根成像序列，并对影像诊断与手术诊断对比分析，探讨最优序列对颈神经根病变的诊断价值。**方法** 2017 年 7 月-2018 年 3 月我院 45 例临床需要颈椎 MRI 检查患者，均行常规序列、三维双回波稳态(3D-DESS)序列、多回波数据图像重合(MEDIC)序列、可变反转角三维快速自旋回波(3D-SPACE)序列扫描，图像均进行后处理重建，对图像质量和正常颈神经根显示、受压颈神经显示清晰度、颈神经根与邻近组织的对比噪声比(CNR)3 个方面评价；选择最优序列扫描 31 例神经根型颈椎病患者，影像诊断结果与颈神经根手术诊断结果对比分析。**结果** 3D-DESS 序列神经根-椎体 CNR 和神经根-脑脊液 CNR 均高于 MEDIC 序列；3D-DESS 序列神经根-椎体 CNR 高于 3D-SPACE 序列，而 3D-DESS 序列神经根-脑脊液 CNR 低于 3D-SPACE 序列；3D-SPACE 序列神经根-脑脊液 CNR 高于 MEDIC 序列。图像质量评分 3 种序列两两对比差异均有统计学意义($P<0.05$)，3D-DESS 序列优于 MEDIC 序列和 3D-SPACE 序列。对受压神经根清晰度的显示，3 种序列对比，差异均有统计学意义($P<0.05$)，3D-DESS 序列优于其他两种序列。应用 3D-DESS 序列扫描 31 例颈椎病患者与手术诊断结果对比分析，诊断符合率为 93.5%。**结论** 对于显示神经根结构和诊断神经根病变等方面，3D-DESS 序列明显优于 MEDIC 序列和 3D-SPACE 序列，且手术诊断符合率高，对颈神经根病变的诊断具有很高的临床应用价值。

PU-0875
慢性颈肩痛患者静息态脑功能及脑血流灌注的 MRI 研究

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目的 利用基于静息态脑功能磁共振成像（rs-MRI）的低频振幅（ALFF）分析方法和动脉自旋标记（ASL）技术观察神经根型颈椎病慢性颈肩痛患者静息态脑功能和脑血流灌注的改变，并分析异常脑区的 ALFF 值、区域脑血流量（CBF）值与临床指标的相关性，进一步探究神经根型颈椎病慢性颈肩痛的中枢神经机制。
方法 对 30 例神经根型颈椎病慢性颈肩痛患者（慢性颈肩痛组）及 25 例健康志愿者（正常对照组）进行 rs-fMRI 和 ASL 扫描，扫描后的图像采用基于 MATLAB2017b 平台的 DPABI_V4.0 及 SPM12 软件进行后处理。然后，计算 ALFF 值和 CBF 值并比较患者组与正常对照组脑区变化的差异。最后，将有差异脑区的 ALFF 平均值和 CBF 平均值与病程和 VAS 得分进行相关分析。
结果 慢性颈肩痛组与正常对照组相比，ALFF 值减低的脑区位于右侧颞中回、枕中回、扣带回、额中回、中央后回；ALFF 值增高的脑区位于左眶部额中回（P<0.01，AlphaSim 矫正，Cluster Size≥24）。慢性颈肩痛组与正常对照组相比，CBF 值增高的脑区位于左侧梭状回、顶上回，右侧梭状回、顶上回、中央后回、颞中回、扣带回；CBF 值减低的脑区位于左侧中央前回、中央后回（P<0.05，AlphaSim 矫正，Cluster Size≥284）。慢性颈肩痛组右侧额中回 ALFF 平均值与 VAS 评分呈负相关（r=-0.52，P=0.019）。
结论 神经根型颈椎病所致疼痛引起广泛的脑功能区 ALFF 和 CBF 的异常，涉及疼痛感觉、运动、情绪及记忆、认知等多个维度。rs-fMRI 和 ASL 技术相结合可以为更好地理解神经根型颈椎病慢性颈肩痛的中枢神经机制。

PU-0876
磁共振三维动脉自旋标记技术在颈动脉狭窄性脑缺血疾病中的应用价值

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目 的 应用全脑三维动脉自旋标记磁共振成像技术（3D ASL）了解颈动脉狭窄患者脑部灌注情况，探讨 ASL 的临床应用价值。**材料和方法** 使用 GE 3.0T MRI DISCOVERY 750 及 16 通道头部专用线圈对颈动脉彩超发现单侧颈动脉重度狭窄（狭窄程度＞95%）患者 30 例,，行头部常规磁共振及 ASL 检查。 将扫描扫结果在 AW4.6 工作站进行后处理，测量患侧大脑中动脉供血区及健侧大脑中动脉供血区相对脑血流量（rCBF）值并进行统计学分析。**结果** 21 例患者患侧大脑中动脉供血区出现低灌注,rCBF 值为 0.802±0.108，明显低于健侧大脑中动脉供血区 rCBF 值 1.06±0.03，有统计学差异（ P＜0.05）；9 例患者患侧大脑中动脉供血区未见异常灌注区域，考虑与其侧枝循环代偿有关。**结论** 3D ASL 是一种安全无创、能快速了解脑灌注的影像学方法，可用颈动脉狭窄性脑缺血疾病脑灌注情况的评估，为临床治疗提供依据。

PU-0877
基于多尺度的纹理分析方法在脑胶质瘤分级上的应用研究

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目的 胶质瘤的分级在临床上有指导后续治疗的作用，近年来纹理分析方法常被应用于疾病的识别分类。本文提出一种基于多尺度的纹理分析方法在脑胶质瘤分级上的应用。
材料与**方法** 首先，采集临床 60 例脑胶质瘤病例，其中Ⅱ级胶质瘤弥漫型星形细胞瘤和少突胶质细胞瘤 22 例，Ⅲ级胶质瘤间变型少突星形细胞瘤和间变星形细胞瘤 18 例，Ⅳ级胶质瘤胶质母细胞瘤例 20 例。病例图像信息包含平扫 T2 序列和 T2_flair 序列以及增强后的 T1 序列。而后，对三种序列图像做多尺度化处理，并对多尺度化后的图像做纹理分析。并以肿瘤的核心实质区域为感兴趣区，计算纹理参数，探究纹理参数与脑胶质瘤的内在关联含义，做Ⅱ级与Ⅲ级间纹理参数的 ROC 分析，以及Ⅲ级与Ⅳ级间纹理参数的 ROC 分析。最终，以支持向量机作为机器学习核心，通过留一法进行交叉验证，得出纹理分析方法在胶质瘤分级上的准确度。
结论 从整体来说随着滤波尺度变大，纹理细节被模糊后，纹理参数与胶质瘤级别之间的相关性值变小。这反过来说明不同级别胶质瘤之间存在着纹理细节的差异性。基于支持向量机的机器学习内核，通过交叉验证留一法计算出Ⅱ级和Ⅲ级间总体参数的正确率为 91.5%。在Ⅲ级和Ⅳ级间的总体参数正确率为 97.9%。这也就意味着可以通过对最常扫描序列的数据挖掘，来提供对脑胶质瘤分级的重要参考信息。

PU-0878
基于信息流和支持向量机的产后抑郁预测研究

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目的 构建的优势信息流方向分析产后抑郁患者大脑信息流特征。最后，基于支持向量机分类和回归对产后抑郁患者进行临床鉴别诊断和预测评估。
方法 基于产后抑郁患者的静息态 *fMRI* 数据。首先，采用皮尔森相关构建的功能连接和图论分析了产后抑郁患者的大脑全局和局部的信息流模式改变。同时，采用 *NPMR GCA* 构建的优势信息流方向分析产后抑郁患者大脑信息流特征。最后，基于支持向量机分类和回归对产后抑郁患者进行临床鉴别诊断和预测评估。
结果 产后抑郁患者在杏仁核、扣带回、脑岛、海马、额叶、顶叶和枕叶部分区域的信息流模式发生明显改变，尤其杏仁核区域以及与颞叶和额叶之间的信息流方向与临床评估（*HAMD* 和 *EPDS*）存在显著相关。同时基于优势信息流方向的预测分析表明，信息流模式的改变对抑郁状态具有很好的评估能力。
结论 产后抑郁患者杏仁核相关信息流模式的改变是造成抑郁症状的主要神经病理机制，同时也为临床抑郁状态的评估提供稳定可靠的影像学指标。

PU-0879
应用基于体素的形态测量学方法研究颞叶癫痫患者脑白质体积变化

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目的 运用基于体素的形态测量学(VBM)技术对颞叶癫痫(TLE)患者全脑白质体积进行分析,并探讨颞叶癫痫患者大脑内部的结构改变及其规律。

方法 收集 22 例颞叶癫痫患者(其中左侧颞叶癫痫组 11 例,右侧颞叶癫痫组 11 例)和 15 例性别、年龄匹配的正常健康志愿者,使用磁化准备快速梯度回波序列(MPRAGE)进行全脑结构像扫描,采用基于体素的形态学测量学(VBM)方法对 T1WI 3D 图像进行统计分析,计算每一组全脑白质的体积(以体素表示),提取部分脑区体积以比较组间差异,另外分别将左 TLE 组、右 TLE 组与对照组进行组间检验,以得出左 TLE 组与右 TLE 组白质体积有差异的脑区。
结果 1、左 TLE 组较对照组脑白质体积降低的脑区有:左侧海马旁回、右侧颞中回、左侧额上回、左侧丘脑、右侧岛叶、左侧顶下小叶、左侧顶上小叶;2、右 TLE 组较对照组脑白质体积降低的脑区有:右侧颞下回、左侧舌回、左侧枕中回、右侧额上回、左侧中央前回、左侧颞上回、右侧楔前叶、右侧中央后回、左侧顶下小叶。
结论 颞叶癫痫患者存在多个脑区白质结构异常,通过采用基于体素的形态测量学技术可以反映脑白质体积的变化。

PU-0880
静息态功能磁共振对产后抑郁症患者情绪网络功能连接的研究

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目的 分析静息态下产后抑郁症（PPD）患者情绪网络（AN）的功能连接（FC）特点及其意义。方法 选取符合 DSM-V 产褥期抑郁诊断的患者 23 例（PPD 组）和与之匹配的健康产妇 28 名（HPW 组）进行 rs-fMRI 扫描，以 AN 中杏仁核（AMYG）和膝下前扣带回(sgACC)为感兴趣区，采用双样本 t 检验比较 PPD 组与 HPW 组 AMYG 和 sgACC 与全脑脑区 FC 强度差异，并对 PPD 组中异常 AN-FC 与爱丁堡产后抑郁量表评分进行 Pearson 相关分析。结果 与 HPW 组相比，PPD 组左侧 AMYG 与右侧眶部额上回、左侧眶内额上回、右侧中央前回 FC 减弱，与右侧楔前叶、左侧顶上回 FC 增强；右侧 AMYG 与右侧眶部额上回、右侧背外侧额上回、左侧海马、双侧颞下回、Cerebelum_8_R、Cerebelum_6_L 间 FC 减弱，与右侧颞极颞上回、右侧岛盖部额下回 FC 增强；左侧 sgACC 与左侧距状裂周围皮层、左侧丘脑、左侧颞上回、胼胝体压部、双侧内侧和旁扣带脑回、右侧补充运动区 FC 增强；右侧 sgACC 与左侧缘上回、双侧内侧和旁扣带脑回、左侧楔前叶、右侧补充运动区、左侧舌回和左侧距状裂周围皮层 FC 增强，与 Cerebelum_6_R、Cerebelum_4_5_L 间 FC 减弱。PPD 组左侧 AMYG 与左侧眶内额上回 FC 减弱和 EPDS 评分呈负相关（r=-0.617，P=0.019）。结论 PPD 患者 AN 存在广泛 FC 异常，左侧 AMYG 与左侧眶内额上回 FC 减弱与 PDD 症状严重程度相关，这可能揭示了 PPD 神经机制的基础并提供一个潜在的特异性生物学标记。

PU-0881
Structural network topology correlates to cognitive impairment and iPTH level in End-stage renal disease patients with peritoneal dialysis

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Objective: The burden of cognitive impairment in end-stage renal disease (ESRD) undergoing peritoneal dialysis received more attention, which associated with hospitalization, mortality and quality of life. We aimed to assess the topological

alterations of brain white matter structural network in ESRD and the correlation between network metrics with Montreal Cognitive Assessment scores and clinical data. **Methods:** The study included 25 ESRD patients with secondary hyperparathyroidism (SHPT group), 25 patients without SHPT (Non-SHPT group) and 25 healthy controls (HC group) of comparable age and sex. Cognitive function was assessed using Montreal Cognitive Assessment. WM structural network constructed by diffusion tensor imaging and deterministic tractography method, and then used graph theoretical approaches to investigate alterations in the global and regional properties of the WM network in these participants.
Results: ESRD patients showed cognitive impairment compared to HC and SHPT patients was lower cognitive scores than Non-SHPT patients. The global topological organization and local efficiency of WM network was significantly disrupted in SHPT but not in Non-SHPT patients, as compared with HC group. Moreover, lower regional efficiency was found in ESRD patients mainly distributed in the frontal and parietal cortices. In addition, association was found between iPTH, shortest path length and cognitive impairment, and iPTH level was negatively correlated with small-worldness by two indexes normalized clustering coefficient and normalized shortest path length.
Conclusion: The present study indicated that brain structural connectome in ESRD patients with high iPTH level was disrupted as cognitive impairment and it has the potential connectome-based biomarkers for early detection.

PU-0882

Resting-state f-MRI study of the changes of spontaneous neural activity in postpartum depression.

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Purpose: In postpartum depression (PPD), some brain regions related to depression have displayed abnormalities by tasking-state functional magnetic resonance imaging (fMRI) in past years. In this study, we used two markers of resting-state fMRI (R- fMRI), to investigate the changes of spontaneous neural activity and the correlation with the severity level of depression. **Materials and Methods:** Sixteen PPD individuals (31.06±2.79 years) and age-matched sixteen healthy controls (HCS) were scaned by 3.0T R- fMRI. 24-item Hamilton Rating Scale (HAMD) and Edinburgh Postnatal Depression Scale(EPDS)was administered to assess subjects clinical symptoms. Two-sample t-test was used to compare the amplitude of low-frequency enablement (ALFF) and regional homogeneity (ReHo) values between groups. The correlation between the ALFF and the ReHo value of the abnormal brain region and the HAMD and EPDS scores were analyzed. **Results:** Compared with the HCS, the right cerebellum anterior lobe (culmen) and the left frontal lobule increased ALFF in PPD and decreased ALFF in the right parietal lobe. We found PPD had increased ReHo values in the left cerebrum (ORBsup, ORBinf, MFG, precuneus, IPL, and SFG) than HCS. Decreased ReHo values in the right cerebrum (OL, IFG, FL), and the left cerebellum inferior semi-lunar lobule. We found that the ALFF value of the left frontal lobe was positively correlated with the HAMD

score in PPD. (r = 0.583, p＜0.05). **Conclusion:** This R-fMRI study suggests that the changed spontaneous neural activity of these regions related to emotional response. PPD with higher ALFF values in the left frontal lobe have more severe depression.

PU-0883

基于独立成分分析的 2 型糖尿病脑网络功能连接研究

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目的　采用独立成分分析（ICA）方法探究 2 型糖尿病（T2DM）患者各脑网络功能连接（FC）变化。　方法　选取 47 例 T2DM 患者（T2DM 组）及 29 例健康对照组（HCs 组），进行静息态功能磁共振扫描、数据预处理、ICA 分析，选出默认网络（DMN）、视觉网络（VIS）、背侧注意网络（DAN）及躯体运动网络（SMN），比较组间脑网络的功能连接变化情况，分析差异脑区 FC 值与临床参数及认知评分的相关性。　结果　（1）与对照组相比，T2DM 组 DMN 功能连接减弱脑区为左侧辅助运动区及左侧额上回，功能连接增强脑区为双侧内扣带回；VIS 功能连接减弱脑区包括右侧距状回、右侧楔叶及双侧舌回，无功能连接增强脑区；DAN 及 SMN 未见明显差异脑区。（2）右侧舌回的 FC 值与体质量指数（BMI）呈负相关（r=-0.434, P=0.003）。　结论　T2DM 患者的 DMN 及 VIS 功能连接异常，提示部分脑网络受损，为临床早期诊断 T2DM 认知功能障碍提供了可能的影像学途径。

PU-0884

多模态磁共振成像监测 AQP1 在胶质瘤瘤周水肿及浸润组织中的表达的实验研究

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目的　探究多模态磁共振成像(MM-MRI)监测 AQP1 表达上调/干扰后瘤周水肿及浸润组织的影像学变化，为临床应用 AQP1 基因治疗胶质瘤并用 MM-MRI 评估疗效提供理论依据。

材料方法　选取 60 只健康成年 Wistar 大鼠，计算机随机法分为对照组、AQP1 上调组、上调空载体组、AQP1 干扰组、干扰空载体组，采用立体定位法成功建立大鼠胶质瘤模型 40 例。于造模后 15 天行 T1WI、T2WI、DTI 检查、T1WI 增强，经后处理得到肿瘤体积、瘤周水肿参数（EI 值）、瘤周 rFA 值及瘤周 rADC 值。随后观察瘤周水肿及浸润组织病理变化、Western-blot 的 AQP1 表达水平。所得实验结果均以 x(__)±s 表示，各组间进行独立样本 t 检验。

结果　C6-AQP1 组肿瘤生长迅速，肿瘤体积大于 C6 对照组，AQP1 上调组肿瘤生长缓慢，肿瘤体积小于 C6 对照组；　EI 值大于 C6 对照组，上调空载体组 EI 值小于 C6 对照组。C6-AQP1 组瘤周 rFA 值小于 C6 对照组，C6-AQP1-sh3 组瘤周 rFA 值大于 C6 对照组；而各实验组 rADC 值比较无统计学意义。HE 染色提示实验各组胶质瘤均为高级别胶质瘤；C6-AQP1 组瘤周细胞间隙增宽、间质疏松程

度较 C6 对照组明显，C6-AQP1-sh3 组瘤周细胞间隙增宽、间质疏松程度较 C6 对照组轻；C6-AQP1 组瘤周细胞浸润数目较 C6 对照组增多，C6-AQP1-sh3 组瘤周细胞浸润数目较 C6 对照组减少，而 C6-PCDH 组、C6-shRNA 组与 C6 对照组比较差异无统计学意义。C6-AQP1 组瘤周 AQP1 表达水平高于 C6 对照组，C6-AQP1-sh3 组瘤周 AQP1 表达水平低于 C6 对照组，而 C6-PCDH 组、C6-shRNA 组与 C6 对照组比较差异无统计学意义。

结论 AQP1 干扰可减轻瘤周水肿和减少瘤周肿瘤细胞浸润；多模态磁共振成像可用于评估 AQP1 基因治疗胶质瘤的疗效的影像学方法。

PU-0885

多模态 MRI 显示脑创伤半暗带的实验研究

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目的:探究多模态磁共振成像是否可以显示大鼠脑创伤半暗带（traumatic penumbra，TP）的动态变化。

方法:56 只健康成年雄性 Wistar 大鼠，分为对照组（7 只）和创伤组，按创伤后不同时间分为 7 个时相：1h、6h、12h、24h、48h、72h、7d 组（每个时间点各 7 只）。采用改良的 Feeney 氏法建立中度脑创伤模型，行头部 SE 序列及 DWI 扫描，测量 TP 区的 rADC 值，对相应区域进行病理观察，对结果进行分析。

结果:对照组组织未见异常。创伤组伤后 1h，TP 表现为血管源性水肿；6h 出现细胞内水肿；12h 两种水肿共存并明显加重，24h 水肿减轻；48h 血管源性水肿再次加重；72h 细胞内水肿占优势；7d 两种水肿均明显减轻。DWI 显示：创伤后 1h TP 区 rADC 值明显升高，6h 时下降，12h 减低为（64.37±1.07）%，之后 ADC 值逐渐上升，48h 时再次升高，72h 又降低，除 6h 与 12h、6h 与 24h 和 12h 与 24h 外，其余各时相点之间对比差异有统计学意义（$p<0.05$）。

结论: ADC 值可显示 TP 区水肿类型和程度的动态变化，从而提示 TP 区。

PU-0886

Changes of resting MRI in patients with sudden deafness based on ALFF, fALFF and ReHo

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Objective Amplitude of low frequency fluctuation (ALFF), fractional amplitude of low frequency fluctuation (fALFF) and Regional homogeneity (ReHo) were used to study the difference of resting functional magnetic resonance imaging (fMRI) between patients with severe sudden deafness and normal people and functional remodeling of other relevant brain regions. **Methods** 19 patients with moderate to severe sudden deafness who met the inclusion criteria and 22 matched healthy controls were selected. Based on the rs-fmri data, the resting fMRI data of the two groups of subjects were collected. The changes of resting functional magnetic resonance (fmri) in patients with sudden deafness were analyzed by amplitude of low frequency fluctuation (ALFF), fractional amplitude of low frequency fluctuation (fALFF) and Regional homogeneity

(ReHo).Subjects in both groups were tested by two-sample T test and corrected by Alphasim. **Results** the ALFF values of bilateral Medial cingulate gyrus and left medial superior frontal gyrus were different between the two groups($p < 0.01$).There were differences in the ReHo values of the right fusiform gyrus and the right inferior temporal gyrus ($p < 0.01$). FALFF found no functional changes in the brain area. **Conclusion** compared with the normal group, the patients with sudden deafness had abnormal activity in the brain functional area under resting state.Compared with fALFF, ALFF and ReHo could better reflect BOLD signal changes caused by abnormal data activity in the brain of patients with sudden deafness.

PU-0887

磁共振颈部血管壁多模态高分辨率成像技术及斑块分析 对临床诊疗的指导意义

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目的 血管高危斑块所引发的心脑血管疾病已成为威胁人类健康的重要疾病之一，并且有越来越年轻化的趋势。磁共振成像具有高软组织对比度、多种成像方式、任意截面成像等诸多优势，在血管壁成像方面，磁共振成像可以满足临床需求，斑块分析软件能更好的提供斑块成分的分析报告，具有广阔的发展和应用空间。

方法 应用 SIEMENS MAGNETOM Verio 3.0T 高分辨磁共振，选取颈部血管疾病患者 64 例，成像序列为对比剂引入前 T1WI-TSE、黑血（black blood）T1WI、T2WI-TSE、质子密度加权像（PDWI），3D-T1WI、3D-T2WI 及 SWI（磁敏感成像技术）成像，注入对比剂后行 T1WI-TSE 和 3D-T1WI 成像，部分序列行脂肪抑制。所得序列图像导入 MRI-PlaqueView 斑块分析软件，获得斑块成分分析报告。

结果 颈部血管 64 例患者中，钙化斑块 32 例，混合型斑块 13 例，其余为正常，偏心性斑块 41 例，对 13 例混合型斑块行斑块分析，3 例有炎性反应，斑块内出现强化。1 例斑块内出血。T1WI 最大的优势是可以反应斑块内出血。T2WI 对血管内外壁及斑块的边界显示较为清晰。PDWI 信噪比较高，相对于 T1WI 和 T2WI，PDWI 更能清晰的显示斑块的边界和血管腔。T1WI+C 对比剂强化说明斑块内新生血管或内皮细胞通透性增加，能鉴别出斑块内炎症活动，并能清晰显示斑块纤维帽的边缘。理论上纤维成分在 T1WI、T2WI、PDWI、均为高信号，纤维帽破裂在 T1WI+C 和 T2WI 易于观察，是斑块活动的标志之一。

结论 3.0 高分辨率 MRI 技术在对颈动脉的狭窄程度进行准确评估的同时，还能清楚地显示斑块的范围、形态、大小及部位，斑块分析软件能更好的对斑块内部的结构及病理成分进行更为详细的分析，从而对斑块的稳定性进行较为准确地判断。为临床的诊治提供了价值极高的影像学资料。

PU-0888

磁共振臂丛神经成像扫描技术的应用

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【摘要】**目的** 日常工作中颈椎病多伴随椎间盘突出压迫神经引起的上臂麻木疼痛，常规 MR 扫描的序列可以检测出颈椎的生理曲度、脊髓信号有无异常、而对神经根的压迫程度显示欠缺。因外伤、神经原发病变引起的臂丛神经病变显示不明显。给临床医师确立治疗方案带来了困扰。磁共振臂丛神经成像可以明确显示臂丛神经及其周边组织结构。作为一种理想的无创影像检查手段，磁共振成像对臂丛神经病变的诊断和治疗具有重要意义。

方法 选取 2018 年 1 月至 2019 年 4 月在本院行颈椎 MR 扫描患者 120 例，在常规平扫结束后，使用 IDEAL 序列联合 2DMERGE 序列扫描臂丛神经。将图像传至 Aw4.6 工作站，对图像进行 MPR、MIP、CUR 处理。扫描图像及后处理图像交由两位高年资医师独立分析,分别以常规 MR 平扫序列获取的图像和常规 MR 平扫获取的图像结合臂丛神经成像技术获取的图像分别对疾病进行诊断。然后对诊断结果进行统计学分析。

结果 仅以常规 MR 平扫获取的图像为依据，诊断结果为 120 例患者中颈椎间盘突出压迫脊髓者 40 例，颈椎间盘轻微突出未压迫脊髓者 66 例，未见明显异常者 14 例；以常规 MR 平扫获取的图像结合臂丛神经成像技术获取的图像为依据，诊断结果为 120 例患者中，颈椎间盘突出压迫脊髓的 40 例患者中有 9 例伴随臂丛神经损伤，颈椎间盘轻微突出未压迫脊髓的 66 例患者中有 17 例伴随臂丛神经损伤，未见明显异常的 14 例患者中 5 例有臂丛神经损伤。

结论 IDEAL 序列联合 MERGE 序列扫描臂丛神经，在臂丛神经成像中的应用。可以立体显示臂丛神经的走行，形态，以及其周边结构。在影像诊断上具有独特的优势，有助于临床确定治疗方案，而且 MR 检查无需借助任何造影剂，也没有 X 线辐射损伤及椎管穿刺技术的影响，操作简单方便，为目前臂丛神经疾病理想的影像检查手段。

PU-0889

ASL 灌注成像技术在急性缺血性脑卒中的应用

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【摘要】 **目的** 探讨磁共振动脉自旋标记（ASL）灌注成像技术对急性缺血性脑卒中的临床应用价值。

方法 选取自 2018 年 4 月至 2019 年 5 月在本院收治经临床拟诊为缺血性脑卒中且发病时间在一周内的 40 例患者，在医学影像科行常规颅脑 MRI 平扫及 DWI 检查后，请两位有丰富经验的影像科诊断医师进行诊断，诊断报告确诊为急性脑梗死的患者，对其均行 3DASL 扫描，观察急性脑梗死病灶在 3DASL 和常规 DWI 影像中的表现，并在 AW4.6 工作站上对数据进行后处理，测量缺血区域与对侧镜像层面的脑血流值（CBF），并计算相对脑血流值（rCBF)=缺血区域 CBF/对侧镜像层面 CBF，rCBF 在 0.9～1.1 之间定义为灌注正常，rCBF＞1.1 定义为高灌注，rCBF＜0.9 定义为低灌注。

结果:40 例脑缺血患者经随访证实脑梗死 35 例，短暂性脑缺血发作（TIA）患者 5 例，35 例脑梗死患者其 DWI 均表现为高信号，3DASL 表现为低灌注，测量患者 ASL 图像上表现为低信号的缺血区平均 CBF 值为（22.28±0.95）ml/100g*min、对侧镜像区 CBF 为（44.97±2.85）ml/100g*min、rCBF 为 0.52±0.03；5 例 TIA 患者 DWI 图像未见异常信号改变，在 ASL 上有 4 例表现为低灌注，测量患者缺血区平均 CBF 值为（37.6±4.2）ml/100g*min.对侧镜像区 CBF(50.6±9.0)ml/100g*min

结论 ASL 灌注成像技术在急性缺血性脑卒中的诊断具有非常重要的临床意义，并能部分检出在 DWI 上表现为阴性的 TIA 患者，有利于 TIA 患者的早期诊断。

PU-0890

扩散峰度成像（DKI）在胶质瘤的分级和细胞增殖评估中的价值

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目的 对胶质瘤进行分级和细胞增殖评估对于胶质瘤的治疗具有至关重要的作用，然而常规的扩散成像技术对其评估不够准确。扩散峰度成像(DKI)是一种先进的非高斯扩散成像技术，可利用其对胶质瘤进行分级和细胞增殖评估。
方法 利用扩散峰度成像（DKI）和扩散加权成像（DWI）对 68 例经病理证实为胶质瘤患者进行检查，并获得肿瘤的扩散峰度和常规扩散指标和量值，评价这些指标与胶质瘤分级及 Ki-67 表达的关系，并进一步比较这些指标在分级中的诊断效能。
结果 与常规的扩散成像技术相比，扩散峰度成像在对胶质瘤分级方面具有很大的潜能。在Ⅱ、Ⅲ、Ⅳ级胶质瘤中，峰度指标在预测 Ki-67 表达方面也显示出很大的潜力。
结论 扩散峰度成像（DKI）可以比常规扩散成像技术如 DWI 更准确的对胶质瘤进行分级和细胞增殖评估，对手术治疗具有重要意义。

PU-0891

Gadolinium Retention in the Diabetic Brain after Administrations of Gadolinium Contrast in a Rat Model

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Objectives: To evaluate gadolinium (Gd) retention and clearance in the brain of diabetic rats after administrations of gadodiamide, gadopentetate dimeglumine, and gadoterate meglumine.
Materials and Methods: Both diabetic rats (n = 52) and normal rats (n = 52) intravenously received 20 injections of 0.6 mmol Gd/kg gadodiamide, gadopentetate dimeglumine, gadoterate meglumine, or saline. Both diabetic rats and normal rats were divided into 2 subgroups of 24 and 28 rats for the 7-day and 42-day evaluations (i.e., they were sacrificed at 7 days (n = 6 per group) and 42 days (n = 7 per group)), respectively, after the last injection. For the 7-day subgroup, 6 rats were euthanized for inductively coupled plasma mass spectrometry (ICP-MS) analysis. For the 42-day subgroup, 6 rats underwent T1-weighted magnetic resonance imaging (MRI) and ICP-MS, and 1 rat was analyzed by transmission electron microscopy (TEM).
Results: The T1 enhancements in the deep cerebellar nuclei (DCNs) of diabetic rats were lower than those of normal rats in both linear Gd-based contrast agent (GBCA) groups. The average Gd concentrations in the brains of diabetic rats were significantly lower than those of healthy rats in both the short-term groups and long-term groups. The highest Gd retentions were in the olfactory bulb, DCN, and striatum with gadodiamide. Compared with the results obtained 7 days after the last injection, the residual Gd concentrations of the 42-day subgroups in the brains of diabetic rats showed no significant difference in both linear GBCA groups.
Conclusions: Compared with normal rats, the diabetic status decreased the residual Gd concentrations in the brain after multiple administrations of gadodiamide,

gadopentetate dimeglumine, and gadoteratemeglumine. The clearable fraction of Gd in the brain was eliminated faster in diabetic rats than in normal rats.

PU-0892

垂体 MRI 扫描技术规范探讨

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目的 回顾性分析垂体 MRI 扫描技术优化序列对影像诊断的价值。**方法** 回顾性收集垂体 MRI 扫描病例 90 例，将文献 1 中的检查序列归为 A 组，文献 2 中的检查序列归为 B 组，优化序列归为 C 组。**结果** A 组序列中缺乏矢状位 T2WI，对观察垂体前后位置的病变有所缺乏；B 组序列中由于垂体特殊的解剖位置及极小的形态致轴位 T1WI 对观察垂体的解剖情况不佳、可以省略，缺乏矢状位 T1WI，对垂体前后叶解剖结构显示不佳；C 组优化序列能够较全面的了解垂体微小的解剖情况以及信号改变，检查总时间较 A 组短，清醒患儿较易接受。**结论** 由于 MRI 扫描仪对软组织有较高的分辨率，那么合理的组合及优化序列对正常垂体的解剖结构、信号表现及垂体变异或微小病变显示最全面。

PU-0893

探讨 GE3.0T 磁共振多体波谱扫描兴趣区域选择方法与价值

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目的探讨 GE3.0T 磁共振多体波谱（MRS）扫描兴趣区域选择的方法与价值。**材料与方法**从我院收集 30 例（均是脑肿瘤患者，肿瘤部位均有坏死、囊变、水肿）行 GE3.0T 磁共振多体波谱扫描的患者（均可配合检查），分成 A 和 B 两组，每组患者均一样。A 组多体 MRS 扫描时所选的兴趣区域包括：肿瘤实质部分、小部分水肿区及小部分正常的脑实质；B 组多体 MRS 扫描所选兴趣区域为：肿瘤所在区域以及对侧脑组织，两组匀场方法一致。30 例患者均进行 A 组和 B 组多体 MRS 扫描，扫描完毕行谱线后处理。**结果**两组均取同样的肿瘤实质部位、水肿区以及正常脑组织处的谱线，两组进行对比。A 组谱线处理的信噪比均比 B 组谱线处理的信噪比高，同样肿瘤部位谱线信噪比 A 组比 B 组高出 0.75～1.35；同样水肿区谱线信噪比 A 组比 B 组高 0.30～0.97；同样正常脑实质部位谱信噪比 A 组比 B 组高 2.47～3.04。**结论** 行 GE3.0T 磁共振多体波谱扫描时兴趣区域的选择对谱线的信噪比有一定的影响。而多体（MRS）的优点是包括评价病灶的范围，并且可以获得未被病变累及区域的波谱，从而提供一已知代谢物的图形；缺点是容积效应，各小体素的值都会受周边体素的影响。定位时尽量不要大范围的选取兴趣区域，减少周边体素的容积效应，提高感兴趣代谢物的信噪比，其最终的结果是尽量准确的进行各代谢物的定量分析，以进行临床定性分析。因此行 GE3.0T 磁共振多体波谱扫描时兴趣区域的选择在包含肿瘤实质部分以及正常脑组织的前提下应尽可能小，以提高谱线的信噪比从而更准确提供临床定性分析。

PU-0894

磁共振 T1W FSBB 增强技术在脑部肿瘤的应用价值研究

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[摘要] **目的** 探讨磁共振 T_1加权(T_1W)流动敏感黑血(Flow Sensitive Black Blood ,FSBB)增强技术与常规 T_1W 快速自旋回波(Fast Spin Echo ,FSE)增强及 T_1W 梯度回波（Fast Field Echo ,FFE）增强技术相比对脑部肿瘤诊断的应用价值.方法:选取我院 2018 年 4 月至 2019 年 6 月，40 例经临床确诊脑部肿瘤患者,应用 1.5T 磁共振扫描仪及 13 通道头颈联合线圈，对患者注射钆喷酸葡胺(Gd-DTPA)(0.2mmol/kg)后,行 T1W FSBB, T1W FSE, T1W FFE 三种检查技术扫描全颅,获取影像数据。评价图像质量，记录病灶大小，病灶数目。对比三种检查方法对脑部肿瘤尤其是微小转移瘤的诊断检出率。**结果** 40 例患者图像质量均较好，达到诊断标准。40 例脑部肿瘤患者，T1W FSBB 增强技术检出病灶 182 个，小于 1mmX1mm 肿瘤 52 个；T1W FSE 增强技术检出病灶 130 个，小于 1mmX1mm 肿瘤 0 个；T1W FFE 增强技术检出 169 个，小于 1mmX1mm 肿瘤 39 个。常规 T1W FSE 与 T1W FSBB 相比病灶检出率 71.4%，差异有统计学意义（P<0.05）；T1W FFE 与 T1W FSBB 相比病灶检出率 92.8%，差异无统计学意义（P>0.05）。**结论** T1W FSBB 技术对于脑部肿瘤尤其是微小肿瘤诊断具有重要意义，与常规 T1W FSE 技术相比能发现无法发现的微小病灶；T1W FFE 增强技术扫描层厚可以 1mm，能够发现微小病灶，但是微小病灶强化后呈高信号，与血管高信号不容易区分，造成漏诊，T1W FSBB 通过施加流动相位损毁脉冲抑制血流信号，血管在图像上呈低信号，突出病灶显示，不会漏诊。

PU-0895
非酮症高血糖性偏侧舞蹈症的 CT 及 MRI 对比分析

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目的 分析探讨非酮症高血糖性偏侧舞蹈症的头部 CT 及 MRI 影像特征。**方法** 对 11 例符合临床及实验室诊断标准的非酮症高血糖性偏侧舞蹈症的头部 CT 及 MRI 影像表现进行分析。**结果** 所有病例头部 CT 平扫主要表现为患肢对侧基底节区斑片状稍高密度，MRI 患肢对侧基底节区 T1WI 表现为斑片状稍高信号，T2WI 为低、等或稍高信号，DWI 则为稍低信号。**结论** 非酮症高血糖性偏侧舞蹈症的头部 CT 及 MRI 具有特征影像学表现，结合临床及相关实验室检查即可诊断本病。

PU-0896
颞肌 MRI 厚度对胶质母细胞瘤患者预后的预测价值研究

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目的 探讨三维颅脑 MRI 上颞肌厚度（TMT）对胶质母细胞瘤(GBM) 患者预后的预测价值。
方法 纳入 TCGA-GBM 数据库中 95 例原发性 GBM 患者进行回顾性分析。在三维颅脑 MRI 上测量患者颞肌厚度，并随机选择 30 例病人由第二位放射医师进行重复性测量，计算组间相关系数（inter-class correlation，ICC）。然后采用 Kaplan-Meier 曲线计算患者生存期，不同因素中位生存期比较采用 Log-Rank 分析，并采用 Cox 比例风险模型进行多因素分析。
结果 三维颅脑 MRI 颞肌测量重复性较好，观察者间左右侧 TMT 的 ICC 分别为:0.878、0.895（p <0.001）。按 TMT 中位数分组，TMT>中位数组患者中位存活时间（467 天）较 TMT ≤中位数组患者存活时间（268 天）明显增加（p <0.001; Log-Rank 分析）。使用 Cox 回归模型进行多变量生存

分析显示，TMT（HR 0.511，95%CI ：0.329-0.792，p=0.003）及肿瘤诊断年龄（HR 1.032，95% CI：1.015-1.050，p＜0.001）与存活时间显著相关。
结论 颅脑 MR 测量 TMT 可重复性好，TMT 可作为胶质母细胞瘤患者生存预后的独立预测因子，有助于早期发现危险患者。

PU-0897

MRI 新技术在脑肿瘤诊断中的合理应用

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目的 探讨 MRI 新技术在脑肿瘤临床诊断中的合理应用。
方法 选取我院 2018 年 10 月至 2019 年 5 月收治的 42 例脑肿瘤患者作为研究对象，其中男性患者 23 例，女性患者 19 例，年龄 28~73 岁，平均年龄（48.96±4.25）岁。均对 42 例患者实施 MRI 检查，检查仪器均为西门子 3.0T 超导型磁共振成像机，检查操作由我院放射科两名经验丰富的医师共同进行，应用头颅相孔阵正交线圈，检查过程中应用弥散加权成像、磁敏感加权成像两种 MRI 新技术，统计 42 例患者应用两种 MRI 新技术的肿瘤、出血、血管、钙化、脑组织坏死、周围组织水肿的检出率，并将手术病理结果最为金标准，统计两种 MRI 新技术诊断结果与手术病理结果的符合率。应用统计学软件 SPSS 24.0 对研究数据进行统计学处理。
结果 42 例患者经手术病理证实均为脑肿瘤，其中额叶肿瘤 11 例，顶叶肿瘤 9 例，颞叶肿瘤 13 例，枕叶肿瘤 5 例，基底节、丘脑、胼胝体、蝶鞍部肿瘤各 1 例，39 例患者合并出血，10 例患者肿瘤内部有新生血管，19 例患者有钙化灶，9 例患者脑组织坏死，35 例患者肿瘤病灶周围组织水肿。
结论 MRI 新技术弥散加权成像和磁敏感加权成像诊断脑肿瘤均具有较高的准确率，但与弥散加权成像比较，磁敏感加权成像对肿瘤实质及脑组织的敏感性更高，肿瘤内部血管、出血、钙化的检出率更高，能够为疾病临床诊断提供的信息更多。建议医师根据患者病情选择合适的 MRI 诊断技术，必要时在联合应用两种新技术，以减少医疗资源浪费。

PU-0898

静息态局部一致性在轻度创伤性脑损伤中的研究

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目的 应用静息态局部一致性的分析方法，分析轻度创伤性脑损伤患者静息状态下神经元自发活动的程度及相邻神经元活动的一致性，以期寻找有效的影像学标记物。
方法 收集 2017 年 11 月至 2019 年 1 月就诊于我院的轻度创伤性脑损伤发生后 3-6 个月的患者 16 例（男 10 例，女 6 例），年龄 22-62 岁；并同期招募年龄、性别组成和受教育程度相匹配的正常对照者 16 例（男 10 例，女 6 例），年龄 24-60 岁，分别进行静息态功能磁共振成像数据采集及临床资料采集，临床资料包括患者主诉、MoCa 量表评分、RPSQ 量表评分。磁共振数据经 SPM8 软件进行预处理，而后通过静息态数据处理软件进行 ReHo 运算，并进行组间双样本 t 检验（$P<0.01$），得出 mTBI 患者与正常对照组之间的差异脑区，将其设为感兴趣区并进行感兴趣区信号的提取，以便进一步与临床资料进行相关性分析（$P<0.05$）。
结果 （1）mTBI 组与 NC 组间性别、年龄、受教育年限均无统计学差异（$P>0.05$）。所有 mTBI 患者及正常对照组常规 T1WI、T2WI、T2 FLAIR 脑内表现均为阴性，仅一例 mTBI 患者左额颞部可见薄层硬膜下积液。

（2）与正常对照组相比，mTBI 组 ReHo 值显著减低的脑区有：右侧颞下回、梭状回、海马旁回、枕中回、左侧前扣带和旁扣带脑回、右侧小脑。mTBI 组 ReHo 值显著升高的脑区有：右侧内侧和旁扣带回、楔前叶、中央前回。
（3）mTBI 组 ReHo 较正常对照组差异脑区信号强度未发现与 MoCa 量表评分及 RPSQ 量表评分有显著相关性（$P>0.05$）。
结论 轻度创伤性脑损伤患者静息状态下相邻神经元活动的一致性存在显著差异，但较正常对照组差异脑区信号强度未发现与 MoCa 量表评分及 RPSQ 量表评分有显著相关性（$P>0.05$）。

PU-0899
磁共振黑血三维成像序列在颈部动脉血管病变的应用价值

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目的 探讨核磁共振成像（MRI）黑血三维成像序列在颈部血管病变应用价值。
方法 收集我院 2018 年 1 月-2019 年 6 月行核磁共振（MRI） 黑血三维成像序列检查，并通过临床诊治证实颈部动脉血管斑块性狭窄阻塞塞的患者 10 例、颈部动脉血管夹层 4 例、颈部动脉血管瘤 2 例、颈部动脉血管炎 1 例，作为研究对象。年龄 32-81 岁，平均（50.8±12.1）岁。患者多因头痛、头昏、四肢无力入院。采用 SIEMENS 公司 VERIO 3.0T 超导型磁共振扫描仪，使用头颈部相控阵线圈，患者取仰卧位，平静呼吸。17 例患者均先行常规头颈部检查，然后行磁共振黑血三维序列对颈部进行扫描，层厚 0.8 mm，TR 700ms，TE 11ms，矩阵 512×512，FOV 215×215。扫描完毕后，先在薄层图像上定位病变动脉血管部位，然后将薄层图像调入西门子 3D 后处理选项卡中进行曲面重组后处理。通过曲面重组后处理技术将靶血管壁病变处全程显示在同一平面内，然后通过 3D 多平面重组技术对靶血管病变处进行横状、冠状、矢状位显示，分析血管病变。
结果 磁共振黑血三维成像序列可以清晰的显示颈部动脉血管病变，其中颈部动脉血管斑块性狭窄或阻塞 10 例、颈部动脉血管夹层 4 例、颈部动脉血管瘤 2 例、颈部动脉血管炎 1 例。此 17 例患者图像数据再通过 3D 后处理技术进行血管重组，可以进一步对血管病变进行准确分析。
结论 磁共振黑血三维成像序列通过其流空效应可清晰的显示颈部动脉靶血管壁病变及管腔狭窄情况，其也是血管壁成像的一个主要方法，再结合 3D 曲面重组后处理技术可进一步对颈部动脉靶血管病变处进行分析，也更加有利于将病变准确的呈现出来，值得临床进行推广。

PU-0900
White Matter Impairment in Type 2 Diabetes Mellitus With and Without Microvascular Disease

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Background and objective: Type 2 diabetes mellitus (T2DM) is a serious public health problem, and the phenomenon of T2DM occurring in younger people has directed more attention to functional changes in the brain[1]. In this study, the microstructural integrity of white matter (WM) was evaluated in three groups of middle-aged subjects: healthy controls (HCs) and T2DM patients with and without peripheral microvascular complications (T2DM-C and T2DM-NC patients, respectively).

Methods: Diffusion tensor imaging (DTI) and related clinical examinations were performed in 66 subjects, including 20 T2DM-C patients, 20 T2DM-NC patients, 26 age- and sex-matched HCs. Magnetic resonance imaging (MRI) at 3.0 T was used to perform DTI; then, FSL (www.fmrib.ox.ac.uk/fsl) and tract-based spatial statistics (TBSS) software were used to assess differences in the fractional anisotropy (FA) and mean diffusivity (MD) among the groups [2,3].
Results: There were no significant differences in sex or age among the groups, and the clinical data of the groups met the experimental requirements. There was no significant difference in the FA values between the HCs and T2DM-NC groups. Compared with the HCs, the T2DM-C patients showed decreased FA values and increased MD values in the corpus callosum, bilateral anterior limb of the internal capsule, right retrolenticular part of the internal capsule, bilateral posterior thalamic radiation, right superior longitudinal fasciculus, bilateral superior corona radiata and left middle frontal gyrus ($P < 0.01$) (Figure 1). Compared with the T2DM-NC patients, the T2DM-C patients showed decreased FA values and increased MD values in the corpus callosum, bilateral fornix, right retrolenticular part of the internal capsule, middle cerebral peduncle, right superior longitudinal fasciculus, right posterior thalamic radiation, and left middle frontal gyrus ($P < 0.01$) (Figure 2).
Conclusions: This study indicates that WM impairment is present in working-aged T2DM patients and that the integrity of the WM in T2DM patients with microvascular complications is compromised compared to that in patients without microvascular complications. More importantly, this study also shows that such impairment may be diagnosed using the DTI mode of functional MRI before it can be diagnosed clinically[4,5]. However, this study also has some shortcomings, including that patients with T2DM-C have hypertension which may be one of the causes of the results. We believe that after further experimental studies, WM injury in T2DM patients may be clinically diagnosed by functional MRI mode, providing new basis for early diagnosis and treatment.

PU-0901
磁共振成像在鉴别可逆性胼胝体压部病变综合征与胼胝体压部梗死中的应用价值

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目的 对可逆性胼胝体压部病变综合征与胼胝体压部梗死患者病灶的表观扩散系数进行分析，探讨磁共振成像在两者中的鉴别价值。
方法 回顾性分析 2016 年 10 月至 2018 年 11 月在河南省人民医院就诊并经临床和影像确诊的可逆性胼胝体压部病变综合征患者 11 例和胼胝体压部梗死患者 14 例，测量病灶表观扩散系数，分析两组患者表观扩散系数的差异。
结果 11 例可逆性胼胝体压部病变综合征患者病灶位于胼胝体压部中央，DWI 呈高信号，ADC 呈低信号，表观扩散系数平均为 291.59±48.30 mm^2/s；14 例胼胝体压部梗死患者病灶分布不均匀，DWI 呈高信号，ADC 呈低信号，表观扩散系数平均为 328.43±53.70 mm^2/s。两组 ADC 值差异无统计学意义（P=0.089）。
结论 可逆性胼胝体压部病变综合征和胼胝体压部梗死的表观扩散系数之间无显著差异，但稍低的表观扩散系数可辅助诊断，两者鉴别还需结合病灶位置及形态。

PU-0902
基于 LDH 值探讨终末期肾病继发性甲旁亢患者脑白质改变及认知相关性

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目的　采用一种新参数—局部弥散一致性（LDH）探讨终末期肾病继发性甲旁亢患者的脑白质改变。 方法　选取被确诊为终末期肾病并进行血液透析患者，根据是否伴有继发性甲旁亢分为两组：SHPT 组（25 例）与 Non-SHPT 组（25 例），利用 MoCA 功能量表评估认知功能；两组受检者均进行 MR 平扫及 DTI 扫描采集数据；对两组受检者全脑白质纤维的 LDH 值进行基于体素间的比较。　结果　两组间脑白质 LDH 值存在显著差异。SHPT 组较 Non-SHPT 组出现双侧大脑半球弥漫性、对称分布的 LDH 减低区，右侧小脑半球发现局灶性 LDH 减低区（P<0.01），LDH 值升高的区域集中在脑干及小脑。SHPT 组 MoCA 总评分与 iPTH 水平呈负相关，与受教育水平呈正相关（P 均<0.05）；MoCA 总评分与左侧皮质脊髓束的 LDH 值呈正相关（P<0.05）；iPTH 水平与差异脑区的 LDH 值无相关性（P>0.05）。　结论　LDH 值可以提供终末期肾病继发性甲旁亢患者脑白质局部弥散一致性信息，且这种改变和认知及临床指标具有相关性。

PU-0903
MRI 系统的设备性能比较探究

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目的 评价郎润科技有限公司研制的 SuperVan 1.5T 磁共振成像系统的安全性和有效性。 **方法** 对 41 例合格的受试者（男 14，女 27），年龄 23.9~81.6 岁，平均 55.2 岁，分别使用 SuperVan 1.5T，Philips Achieva 1.5Nova Dual 给予同部位两次磁共振检查，比较两组所获得图像的影像学指标和两种设备安全性指标。 **结果** 两组检查图像在对比度和伪影上诊断结果是一致的，在解剖结构分辨率上尽管差别有统计学意义，但并不影响诊断结果。两种设备再开机事件和故障率上基本相同。 **结论** SuperVan 1.5T 磁共振和 Philips Achieva 1.5Nova Dual 在图像质量，临床有效性和安全性方面是相当的。

PU-0904
视网膜母细胞瘤的 MRI 预测筛板后视神经侵犯与广泛脉络膜侵犯研究

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【摘要】 **目的**　探讨视网膜母细胞瘤的 MRI 预测筛板后视神经侵犯与广泛脉络膜侵犯可行性和价值。 **方法**　回顾性分析自 2010 年 1 月至 2016 年 12 月间共 60 例患儿 64 只眼，患儿均临床诊断为 RB，术前均行增强磁共振检查，且在眼球摘除后病理明确诊断为 RB，且眼球摘除与磁共振检

查之间未曾化疗（包括经眼动脉灌注化疗）的患儿。记录患儿病史、IIRC 分期，磁共振和组织病理发现等。 **结果** 23 例 RB 患儿 23 只眼纳入研究，筛板视神经侵犯 6 眼（26%），筛板后视神经侵犯 6 眼（26%），广泛脉络膜侵犯 6 眼（26%），眼前节侵犯 0 眼，巩膜侵犯 0 例，巩膜外侵犯 0 例。磁共振预测筛板后视神经侵犯 的敏感度和特异度分别为 50%和 82%。磁共振预测广泛脉络膜侵犯的敏感度和特异度分别为 85%和 870%。

结论 MRI 是一个可靠的预测筛板后视神经侵犯与广泛脉络膜侵犯的方法。

【关键词】 视网膜母细胞瘤； 组织病理学； 预测

PU-0905

磁共振弥散加权成像对良恶性腮腺肿瘤的鉴别价值

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摘要 **目的** 分析磁共振(MR)弥散加权成像(DWI)对腮腺良恶性肿瘤鉴别诊断的价值。**方法** 回顾性分析 2015 年 1 月至 2019 年 5 月徐州医科大学附属医院诊治经病理证实的 46 例腮腺上皮性肿瘤患者资料，术前均行常规 MR 及 DWI 检查。测量病变的表观扩散系数(ADC)均值，采用 t 检验分分析腮腺上皮性肿瘤 ADC 值的差异，运用受试者工作特征(ROC)曲线评价 ADC 值的诊断价值。**结果** 良性肿块边界多清晰，以腺瘤和腺淋巴瘤最常见，T2WI 呈等信号或低信号，增强扫描显著强化；恶性肿瘤形态不规则，边界模糊，信号不均匀，增强扫描均匀或不规则强化，伴周围结构侵犯和颈部淋巴结肿大。良性腮腺肿瘤中腺淋巴瘤和良性淋巴上皮病变的 ADC 值均较低，其他良性肿瘤的 ADC 值较高，恶性肿瘤的 ADC 值多数介于两者之间，三组两两比较，差异均有统计学意义(均 P<0. 05)。以病理结果为对照，其敏感度为 81%，特异度为 89%，与病理结果行一致性检验。讨论：磁共振(MR)弥散加权成像(DWI)鉴别诊断腮腺良恶性上皮性肿瘤具有一定参考价值，值得临床推广应用。

PU-0906

西门子 1.5T MRI 在头颈部血管病变方面的应用

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[摘要]目的 探讨西门子 1.5T MRI 在头颈部血管病变方面的应用。**方法** 回顾我院 2012 年 9 月至 2018 年 6 月 238 例怀疑头颈部血管病变患者，进行 MRI 与 MRA 检查，分析其影像特点。**结果** 238 例中检出血管病变 57 例，其中动脉瘤 12 例，发育变异 16 例，动静脉畸形 2 例，狭窄或闭塞（斑块或血栓引起）25 例，海绵状血管瘤 2 例。**结论** MRA 对头颈部血管病变起到无创且有效的筛查价值。

PU-0907

磁共振在臂丛神经损伤诊断中的应用

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目的 探讨磁共振常规扫描序列与神经成像技术在臂丛神经损伤诊断中的应用。
方法 选取 2018 年 3 月至 2019 年 3 月期间对 18 例怀疑臂丛神经损伤患者作为观察组，进行磁共振扫描，其中男 10 例，女 8 例，年龄最小 22 岁，最大 54 岁。选取 20 例同期在本院行头颅磁共振检查患者，通过交流作为志愿者加入对照组，其中男 11 例，女 9 例，年龄最小 24 岁，最大 49 岁。
使用西门子 1.5T Avanto 磁共振设备进行检查，使用头颈联合线圈，指导患者取仰卧位，头部置入线圈内，使颈部正中矢状面中线与床面长轴保持一致。检查前告知患者使用腹式呼吸，尽量避免吞咽动作，也可使用饱和带以避免不自主吞咽带来的伪影影响。嘱患者肩部后伸并进行固定后，定位颈 6 椎体，对自颈 4 椎体上缘至胸 2 椎体下元、椎体前缘至椎管后缘进行扫描。使用常规 T1WI 轴位、T2WI 轴位、STIR/Long TE 冠状位，以及 DWIBS 序列轴位扫描。扫描结束后，将 STIR/Long TE 序列及 DWIBS 序列原始图像进行处理，通过多平面重建，最大密度投影等方式重建图像，交由经验丰富的诊断医生进行诊断分析。
结果 观察组受检者锁骨下神经、锁骨上神经、神经根、神经节在 STIR/Long TE 序列及 DWIBS 序列的显示率均低于对照组受检者。其中观察组 18 例在 STIR/Long TE 序列下显示锁骨下神经 8 例，锁骨上神经 7 例，神经根 6 例，神经节 8 例。在 DWIBS 序列序列下显示锁骨下神经 10 例，锁骨上神经 9 例，神经根 9 例，神经节 10 例。对照组 20 例在 STIR/Long TE 序列及 DWIBS 序列下对各神经显示率都为 100%。
结论 观察组 STIR/Long TE 序列及 DWIBS 序列对臂丛神经的显示率均低于对照组，STIR/Long TE 序列对臂丛神经的显示率低于 DWIBS 序列，可见神经成像诊断臂丛神经损伤的准确率较高，能为临床提供可靠依据。

PU-0908
RS-EPI 在正常人群三叉神经成像中的初步应用

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【摘要】 **目的** 比较分段读出平面回波成像（RS-EPI）与单次激发平面回波成像（SS-EPI）对三叉神经（TGN）的成像质量，旨在满足诊断的前提下获得三叉神经的高分辨率 DTI 图像。**方法** 使用 3 组不同 b 值的 RS-EPI 及 SS-EPI 对 34 例健康志愿者进行三叉神经成像。对所得 DTI 图像进行主观评分，并计算信噪比（SNR）及对比噪声比（CNR），统计分析三组 b 值下两组 DTI 的主观及客观评价差异。**结果** RS-EPI 各组图像的优良率明显优于 SS-EPI 图像；两组图像质量评分差异有统计学意义（$P<0.0001$）。相同 b 值 SS-EPI 图像 SNR 均优于 RS-EPI（P 均<0.05）；而相同 b 值的两组序列 CNR 无明显差异（P 均>0.05）。**结论** 虽然 RS-EPI 各组 b 值 SNR 均低于 SS-EPI 图像，但 RS-EPI 的整体图像质量均优于对应组 SS-EPI，且图像伪影及扭曲变形等较 SS-EPI 少。使用 b 值 600 s/mm^{2}的 RS-EPI DTI 可获得三叉神经高分辨率图像。

PU-0909
RS-EPI DTI 对三叉神经定量参数测量的可重复性研究

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【摘要】 **目的** 使用 RS-EPI DTI 对正常人群三叉神经进行成像，分析 RS-EPI DTI 定量参数的稳定性及可重复性，旨在探讨不同 b 值 RS-EPI DTI 在三叉神经定量参数测量中的稳定性。
方法 对入组志愿者 33 人（共 66 侧）进行 RS-EPI DTI 及 T2WI 序列检查，其中 RS-EPI 中 b 值分别采取（0，300s/mm2）、（0，600s/mm2）、（0，900s/mm2）三组。A、B 两名观察者，结合 T2WI 图像，挑选三叉神经最大层面，在三组 b 值图像上分别勾勒感兴趣区域（region of interest，ROI），将所得 ROI 复制至表观扩散系数（apparent diffusion coefficient，ADC）图上，由软件自动计算得平均扩散率（mean diffusivities，MD），分别测量三次，取平均值作为研究对象的 MD 值；将 T2WI 及 RS-EPI DTI 图像融合，在所得融合图像上测量三叉神经的各向异性分数（fraction anisotropy，FA），取三次结果的平均值。 其中 B 观察者间隔两周后进行再次测量（记录为 B*）。
结果 本研究中，2 名测量者之间及同一测量者 2 次测量之间的 MD 值及 FA 值可重复性好（ICC 均＞0.4）；随着 b 值的增大，2 名观察者 3 次测量得到的 MD 值、FA 值均逐渐减小；A 与 B 两名观察者三次测量中，FA 值在三组 b 值间均无统计学差异（P 均＞0.05），而 MD 值在三组 b 值间均有统计学差异（P 均＜0.001）；各组的 MD 值、FA 值组内相关系数（ICC）也随 b 值的增大而逐渐降低。
结论 正常人群三叉神经不同 b 值的 RS-EPI DTI 的 MD 值及 FA 值组间及组内的一致性好；三叉神经 MD 值受 b 值大小的影响，b 值越小，MD 值及 FA 值越大；在不同 b 值扫描条件下，FA 值的稳定性较高。

PU-0910

血液病患者脑梗死的 MRI 分析

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目的 分析血液病患者伴发脑梗死的原因及 MRI 影像学表现，提高对血液病患者脑梗死的认识及诊断水平。
方法 回顾性分析我院 2010 年 04 月至 2015 年 11 月期间 36 例血液病脑梗死患者资料，分析受累血管、病变分布及磁共振信号的特点。
结果 血液病脑梗死患者中，12 例患者为单一动脉受累，24 例为多支动脉受累；31 例为脑内多发梗死灶，单发梗死灶仅 5 例。T2WI 病灶呈长或稍长 T2 信号，DWI 病灶呈高信号，增强扫描无强化或梗死灶边缘出现脑回样强化。
结论 MRI 诊断血液病脑梗死具有明显优势，MRI 对病变的发现、诊断具有重要价值，需要与血液病脑内早期感染及脑实质浸润等鉴别。血液病患者出现中枢神经系统症状，尤其脑梗死临床症状，首选 MRI 检查。

PU-0911

原发性干燥综合征患者发病早期海马功能连接改变的静息态功能 MRI 研究

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目的 探讨原发性干燥综合征（pSS）患者早期海马功能连接（FC）的变化，并分析其与神经精神症状的相关性。

方法 于 2017 年至 2019 年间共招募 pSS 患者 38 名和健康被试 38 名，采用 3.0T MR 采集 T2 FLAIR 序列及全脑静息态功能成像数据。以双侧海马为感兴趣区，应用基于种子点的方法分别计算其与全脑其他体素的功能连接强度，将年龄、性别及受教育年限作为协变量，应用独立样本 t 检验做组间比较 FC 差异，结果应用蒙特卡洛模拟方式进行多重比较校正。根据 T2 FLAIR 图像对患者进行白质高信号分级（WMHIs）评分。所有被试完成脑认知（NCT-A/DST/视觉再生）及精神状态（HAMA/HAMD/FS-14）相关量表。采用 Spearman 相关分析评估海马功能连接强度与临床指标及神经精神量表的相关关系。

结果 与对照组相比，pSS 患者中左侧海马与右侧枕下回及右侧颞下回间 FC 减低，右侧海马与右侧枕下回、双侧枕中回及左侧颞中回间 FC 减低。在左侧海马与左侧壳核，右侧海马与右侧小脑后叶之间 FC 增强。右侧海马与右侧枕中回及枕下回间 FC 改变与视觉再生量表评分呈正相关，左侧海马与右侧右侧枕中回及枕下回间功能连接改变与 WMHIs 评分呈负相关。

结论 pSS 患者早期阶段的功能连接减低主要位于右侧海马和枕叶及颞叶皮层之间，提示海马功能连接的改变可能作为 pSS 患者早期发现脑功能改变和指导神经保护的潜在神经影像标记物。

PU-0912
应用磁共振血管成像研究脑后循环缺血者的功能性后交通动脉血流动力学

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【摘要】目的 应用相位对比磁共振血管成像（Phase contrast magnetic resonance angiography, PC MRA）定量研究脑后循环缺血（Posterior Circulation ischemia, PCI）患者的功能性后交通动脉（Functional Posterior Communicating Artery, F-PCoA）的血流动力学特征，探讨 F-PCoA 对脑前后循环间血流代偿的临床意义。**方法** 回顾性收集 51 例 PC MRA 资料，研究组为 26 例确诊 PCI 且存在 F-PCoA 者，对照组为 25 例临床排除 PCI（10 例存在 F-PCoA、15 例不存在 F-PCoA）。分析 F-PCoA 的亚型，记录 F-PCoA 的管径、截面积、平均流量、平均流速、血流方向、前向后绝对流量，以及基底动脉的血流动力学参数，进行统计分析。**结果** 共 36 例存在 F-PCoA，可分为 3 型：⑴F-PCoA 与解剖性后交通动脉（Anatomical Posterior Communicating Artery, A-PCoA）一致，占 83.3%（30/36），⑵F-PCoA 与 A-PCoA 不一致，占 13.9%（5/36），⑶混合型，一侧 F-PCoA 与 A-PCoA 一致但另一侧不一致，占 2.8%（1/36）。F-PCoA 亚型的构成比在 PCI 者与非 PCI 者间无显著差别。F-PCoA 的流速、流量曲线形态相似，在一个心动周期内可以表现为单向或双向血流。PCI 者 F-PCoA 的前向后绝对流量增加，血流曲线在收缩期有更明显的主波峰。**结论** PC MRA 可定量分析 F-PCoA 的血流动力学特征，F-PCoA 前向后绝对分流量可为临床 PCI 的诊疗提供重要的参考信息。

PU-0913
应用相位对比磁共振血管成像研究青中年血管性头痛患者的脑血流动力学特征

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【摘要】 目的 阐述应用相位对比磁共振血管成像研究青中年血管性头痛患者的脑血流动力学特征。**材料和方法** 回顾性分析年龄 30 至 50 岁，临床确诊血管性头痛者 16 例为研究组，年龄匹配的无诉头痛者 20 例为对照组，常规头颅磁共振成像检查、脑电图、心电图检查均未见异常。分别记录基底动脉、左颈内动脉、右颈内动脉的血管截面积、平均流量、最小流量、最大流量、平均流速、最小流速、最大流速、每搏流量、每搏流距，并计算流量峰高（最大流量－最小流量）、流速峰高（最大流速－最小流速）。 **结果** 研究组女性占比较高；研究组基底动脉的平均流量、最大流量、流量峰高、最小流速、最大流速、每搏流量等 6 个参数均大于对照组，差异有统计学意义；研究组左颈内动脉的平均流量、平均流速、最小流速、最大流速等 4 个参数均大于对照组，差异有统计学意义；右颈内动脉仅平均流速的差异有统计学意义。研究组部分病例（11/16 例）可见脑血管痉挛改变，但研究组和对照组的流量曲线与流速曲线的形态特征基本一致，无特异性诊断特征。**结论** 应用相位对比磁共振血管成像研究青中年头痛者的脑血流动力学特征，可能有助于为血管性头痛的诊断提供可靠的客观指标。基底动脉可能是检测血管性头痛较为敏感的理想靶血管。

PU-0914

Dissociative changes in gray matter volume following electroconvulsive therapy in major depressive disorder: a longitudinal structural magnetic resonance imaging study

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PurposeElectroconvulsive therapy (ECT), has become a widely applied potent treatment in clinical practice for major depressive disorder (MDD) over decades. However, due to its nonspecific and spatially unfocused nature,the underlying mechanisms of ECT remain unclear.

MethodsIn this longitudinal study, eleven patients with MDD underwent magnetic resonance imaging (MRI) before and after ECT at three different time points. A longitudinal voxel-based morphology approach was performed to characterize dynamic changes in brain gray matter volume (GMV). Twelve age- and sex-matched healthy controls were recruited to identify structural brain changes of patients with MDD before and after ECT.

ResultsThe brain GMV was globally found to increase shortly after a series of ECT, and then decrease one month after ECT treatment exposure. This fluctuating tendency was localized to the bilateral inferior parietal lobes, bilateral insula and right superior temporal cortex. Afterthe global GMVwas corrected, there were only significant global effect increases in GMV in the left anterior hippocampus and right caudate, which were both significantly correlated with the improvement of depression symptoms. However, one month after ECT treatments, there was still significantly reduced GMV following patients with MDD compared to healthy controls in the left

putamen, right anterior cingulate and leftinferior temporal cortex, which was observed before ECT.

ConclusionsThese findings indicate that ECT in patients with MDD is closely associated with dissociative structural changes. The locally enhanced GMV in limbic areas may reflect the ECT-related brain compensatory mechanisms contribute to brain structure recovery in MDD.

PU-0915
静息态功能磁共振成像在脑小血管病研究中的优化应用

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目的 比较不同扫描参数和数据计算方法在脑小血管病的静息态 fMRI 研究中的应用价值。**方法** 对 11 例脑小血管病患者，一次性扫描两组不同时长的静息态 fMRI 数据 G1（近 7 分钟）和 G2(4 分钟)；对 11 例年龄、性别与患者匹配的健康正常志愿者，用另一台仪器和序列扫描一组静息 fMRI 数据 G3(6 分钟)。分别采用节点度的两种计算**方法** 度中心度（DC degree centrality）和加权度中心度（DCW degree centrality Weighted）得到三个被试组的六组 z 值化分布图（G1-DC、G1-DCW、G2-DC、G2-DCW、G3-DC、G3-DCW），使用配对 t 检验，比较患者组 G1-DC 与 G2-DC、G1-DCW 与 G2-DCW 的定量差别，使用两样本 t 检验比较 G1-DC 与 G3-DC、G2-DC 与 G3-DC、G1-DCW 与 G3-DCW、G2-DCW 与 G3-DCW，定性观察患者相对正常对照在不同扫描时长和计算方法下得到结果的差异。**结果** 患者不同扫描时长的两组图像 G1 和 G2，无论 DC 还是 DCW 计算得到的图像均无统计学差别；与正常对照组 G3 相比使用不同扫描时长（G1、G2）和不同计算方法（DC、DCW），都得到基本一致结果，患者节点度下降的脑区位于左顶内沟附近。**结论** 即便使用不同扫描仪器，4 分钟的优化扫描足以提取小血管病潜在的 fMRI 标志物，静息态 fMRI 节点度分析为小血管病的多中心研究提供了有力的支持。

PU-0916
颌面部肿瘤对颅神经外周段的影响的磁共振神经成像研究

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目的 探讨磁共振神经成像（MRN）显示颌面部肿瘤对颅神经外周段的影响的价值。
方法 收集 35 例志愿者及经病理证实为颌面部肿瘤的患者 44 例，在 3.0T 磁共振上以 3D SPACE STIR 序列进行颅神经外周段神经成像。获取志愿者常规平扫神经成像（conventional MRN, cMRN）及增强神经成像（contrast-enhanced MRN, ceMRN）图像的下牙槽神经、下颌骨骨髓、翼内肌、皮下脂肪、颌下腺腺体的信噪比（SNR）及背景噪声的标准差（σ_0），计算下牙槽神经相对其他组织的对比噪声比（CNR）及对比度（CR），由 3 名放射科医师对颅神经 10 对分支的显示程度进行 5 分法主观评分。对所有患者 ceMRN 图像的肿瘤与邻近外周神经的毗邻关系进行分类，包括分离、压迫、包绕、浸润和沿神经生长，并记录各类关系分别累及的颅神经外周段分支的数量。
结果 共 16 名志愿者进行了 cMRN 检查，cMRN 图像中的 SNR（下牙槽神经、下颌骨骨髓、翼内肌、皮下脂肪、颌下腺腺体）均高于 ceMRN 图像中所得，$P<0.05$。cMRN 图像中的 CNR（神经-下颌骨骨髓、神经-翼内肌、神经-皮下脂肪）均高于 ceMRN 图像中所得，$P<0.05$。cMRN 图像中的 CR（神经-下颌骨骨髓、神经-翼内肌、神经-颌下腺腺体）均低于 ceMRN 图像中所得，$P<0.05$。

3 名放射科医师间对 ceMRN 图像中颅神经的 10 对分支主观评分的一致性好，κ 值均＞0.8。在患者 ceMRN 图像中，肿瘤与神经分离关系 17 例，余共识别异常神经 63 支，其中 25 支神经被压迫，25 支神经被包绕，5 支神经被浸润，肿瘤沿神经生长 8 支。恶性肿瘤对外周神经常表现为压迫、包绕、浸润及沿神经生长，良性肿瘤常与外周神经表现为分离或压迫。

结论 以 3D SPACE STIR 序列作为颅神经外周段神经成像方式，可展示颌面部肿瘤与外周神经位置关系及肿瘤对神经的影响。

PU-0917
磁共振扩散峰度成像评估急性缺血性卒中大鼠的实验研究

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扩散峰度成像（diffusional kurtosis imaging，DKI）是一个非高斯的水扩散测量方法。本研究主要是利用 DKI 技术评估缺血性卒中大鼠，评价 DKI 技术测量缺血半暗带的可行性和可靠性。

研究**方法** 将 25 只 SD 大鼠利用线栓法建立大脑中动脉缺血再灌注模型后，于造模后 90min 及再灌注后 2h 进行 DKI、DWI 等序列扫描，以 24h 后 T2WI 显示的高信号作为最终梗死范围。主要通过两种方法评估缺血半暗带：①一种方法是利用 DWI 评估通过测量闭塞后 ADC 图显示异常信号范围与再灌注 24 小时后 T2WI 显示的最终梗死范围不重叠的区域作为缺血半暗带；②利用 DKI 技术测量大鼠缺血再灌注后 MD 与 MK 的不匹配区作为缺血半暗带。

结果 21 只大鼠纳入本研究中。①造模后 90min，大鼠的 MD 与 MK 之间存在不匹配区（MD/MK 不匹配区的 MD 值为 0.58±0.1 um2/ms：MD/MK 不匹配区的 MK 值为 0.85±0.19）② 再灌注后 2h，大鼠 MD 异常面积缩小（27.81±15.68 mm2），MK 范围无明显变化（27.43±15.81 mm2），MD 损伤的范围缩小直至与 MK 范围基本一致。③ ADC（半暗带区）、ADC（核心区）、MD（MD/MK 不匹配区）、MD（MD/MK 一致区域）、MK（MD/MK 一致区域）的曲线下面积 AUC 分别为 0.902（0.766-0.973）、0.915（0.783-0.980）、1.000（0.912-1.000）、1.000（0.912-1.000）、1.000（0.912-1.000），指标均有显著的诊断效果（P＜0.001）。④指标 ADC 对半暗带区的诊断曲线下面积和指标 MK（MD/MK 不匹配区）的诊断曲线下面积差异有统计学意义（P＜0.05）。

研究**结论** DKI 技术能够有效的评估大鼠超急性脑梗死。ADC 对半暗带区的诊断效果优于指标 MK（MD/MK 不匹配区）的诊断效果。

PU-0918
2 型糖尿病患者大脑 ReHo 值及脑灰质体积改变相关性的功能磁共振研究

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摘要：目的 应用基于体素的形态学测量(VBM)技术及 ReHo 值分析 2 型糖尿病（T2DM）患者和正常人大脑结构及功能异常的相关性。**方法** 采用西门子 Skyra 3.0T 磁共振对滨州医学院附属医院收治的 25 例 T2DM 患者和年龄、性别相当的 33 例正常人进行常规 MRI、脑部静息态 MRI 及 3D 全脑高分辨率解剖像扫描。通过处理静息态图像数据获得两组受试者的 ReHo 值并在 Matlab 上采用 SPM 软件包对全脑高分辨率解剖图像进行处理得到所有受试者的大脑灰质体积，然后对得到的实验组及对照组的所有受试者的 Reho 值及大脑灰质体积 **结果** 与正常对照组相比，糖尿病患者左侧海马区、左侧梭状回、左侧颞上回、左侧尾状核、右侧额上回、右侧额中回、右侧楔前叶及右顶叶区

Re Ho 值减低；左侧颞横回、左侧岛叶、左侧颞中回、右侧梭状回、右侧舌回、右侧枕叶及右侧扣带回 VBM 减低。 **结论** T2DM 患者大脑灰质体积变化的脑区域功能异常的脑区没有重叠，这说明糖尿病患者大脑灰质体积的变化与大脑功能的改变可能是相互独立的。

PU-0919

Differential impairment patterns of the corticospinal tract segments in alcohol dependence

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Aims: Previous studies have reported inconsistent findings regarding corticospinal tract (CST) changes in alcohol dependence. Here, we aimed to clarify this issue by examining the micro-structural integrity differences of distinct CST segments between alcohol-dependent patients and healthy controls.
Methods: Diffusion tensor imaging was performed in a total of 39 male individuals, including 19 alcohol-dependent patients and 20 age-matched healthy controls. CST was reconstructed using tractography and was divided into inferior and superior segments at the level of the lateral sulcus. Multiple diffusion measures of each segment were compared between two groups.
Results: For the bilateral whole CSTs, no diffusion measures showed significant between-group differences. However, compared to healthy controls, alcohol-dependent patients exhibited decreased FA and increased RD in the left-superior segment, increased FA and decreased RD/MD in the left-inferior segment, increased AD/MD in the right-superior segment, decreased RD/MD in the right-inferior segment.
Conclusion: These findings suggest that CST impairments may vary with the fiber arrangement patterns of its segments in alcohol dependence.

PU-0920

区域动脉自旋标记技术 TASL 评估单侧大脑中动脉闭塞再通术后脑灌注情况

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目的 探究区域性动脉自旋标记技术 TASL 在单侧大脑中动脉闭塞再通术后脑血流灌注显示情况，评估再通术后效果。
方法 纳入 16 例由 DSA 确诊单侧大脑中动脉闭塞患者，排除同侧颈内动脉及大脑前动脉病变，术后行 DSA 检查评估血管开通效果，并行区域性动脉自旋标记 TASL 成像检查，选择 3 根血管进行标记，分别为基底动脉及双侧颈内动脉；先在 MIP 图像上确定标记的血管，选择上下走行的一段，在横轴位图像上确定血管位置，扫描图像起始层在标记位置向上 25mm，延迟 1525ms。将 TASL 原始数据传输至 GE 工作站，采用 Functool 软件进行后处理：对平面回波成像 EPI 技术引起的图像变形进行校正，得到 CBF 参数图，由红色至蓝色表示，红色代表高灌注，提示再通术后效果良好；蓝色代

表低灌注，提示术后效果差。以 DSA 为金标准，术后管腔成形良好、远端血流通畅者为再通术后效果好；术后闭塞段仍未显影，远端血流不畅者为术后效果差。分别将 TASL 序列对开通效果的诊断结果与 DSA 检查结果对照，应用 MedCalc18.2.1 统计学软件分析，使用 Kappa 检验衡量 TASL 序列与 DSA 在诊断结果上的一致性。（＜0.40 一致性差，0.40-0.60 为具有一定的一致性、0.60-0.80 为高度一致性、0.81-1 为近乎完全一致性。）

结果　13 例单侧大脑中动脉闭塞患者中，DSA 诊断为开通术后效果良好患者 11 例，诊断为开通效果差患者 2 例。TASL 成像中 10 例患者术后同侧大脑中动脉分布区呈红色高灌注状态，诊断为开通术后效果好，3 例患者同侧大脑中动脉分布区呈蓝色低灌注状态，诊断为开通术后效果差者。与 DSA 的一致性对比中，TASL 的 Kappa 值为 0.755，提示两者具有高度一致性。

结论　TASL 是新发展的一种无需对比剂的 MR 灌注成像技术，可直观的显示单支血管血流分布及灌注情况，在诊断患者预后、指导临床治疗方案等具有重要意义，可在临床进行广泛推广。

PU-0921
DSC 灌注成像联合 DWI 在鉴别高级别脑胶质瘤假性进展和复发中的价值

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【摘要】**目的**　探讨动态磁化率对比增强 MR 灌注成像（DSC-MRI）联合磁共振扩散加权成像（DWI）在鉴别高级别脑胶质瘤假性进展和复发中的价值。**方法**　回顾性分析本院 2014 年 1 月-2019 年 1 月高级别脑胶质瘤患者术后行放疗或联合替莫唑胺化疗后 1 月内 MRI 上出现新的强化病灶或强化范围扩大者 38 例，应用 DSC-MRI 分析病灶局部血流情况，应用 DWI 分析病灶局部组织弥散受限情况，评价两种方法联合在鉴别高级别脑胶质瘤假性进展和复发中的价值。**结果**　38 例患者中，经二次手术病理或随访 6 个月以上证实 20 例为假性进展，18 例为肿瘤复发，rCBF 值在两组病变区分别为 3.60±0.63 和 0.89±0.20，t = 51.32，组间差异均有统计学意义(P＜0. 05)。单纯应用 DSC-MRI、DWI 及二者联合正确诊断假性进展者分别为 9 例、12 例及 16 例。复发的表现：DSC-MRI 病变区呈高灌注,DWI 病变区弥散明显受限，假性进展的表现：DSC-MRI 病变区呈低灌注，DWI 病变区弥散未见明显受限。**结论** DSC-MRI 和 DWI 联合应用可更好地鉴别高级别脑胶质瘤假性进展和复发，具有重要的临床应用价值。

PU-0922
腰椎 MR 检查时脊柱外异常的发现率及临床意义

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目的　回顾性分析病人腰椎 MR 检查时脊柱外异常的出现率及临床意义。

材料及**方法**　因腰疼和（或）神经根症状行腰椎 MR 检查的 2500 例病人，由 1-2 名高年资放射医生复习每例病人脊柱 MR 检查时的图像，记录脊柱外异常，结合临床资料，确定其诊治与结果。

结果　2500 例腰椎 MR 检查中，198 例影像发现有脊柱外异常。178 例病人脊柱外的异常不能确定或有重要临床意义，需结合临床或进一步检查。发现腹主动脉瘤 4 例；腹主动脉周围淋巴结转移 2 例；直肠癌 3 例；肾自截 1 例；肾癌 1 例；前列腺癌 6 例；宫颈癌 3 例。有重要临床意义的出现率为 0.8%。

结论　腰椎 MR 检查时，除可以发现脊柱本身的病变外，还可以发现少量重要的脊柱外病变。

PU-0923

Brain functional substrates underlying decreased sleep efficiency in major depressive disorder

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Aims: Poor sleep quality is one of the main symptoms in major depressive disorder (MDD). However, the neural substrates underlying poor sleep quality in MDD remain poorly understood.
Methods: Ninety-six patients with MDD underwent overnight polysomnography, resting-state functional magnetic resonance imaging (MRI) scans and then were classified into two groups: patients with poor sleep quality (sleep efficiency (SE) < 90%, n = 54), and patients without poor sleep quality (SE ≥ 90%, n = 42). Fractional amplitude of low-frequency fluctuation (fALFF) and functional connectivity (FC) were voxel-wisely compared between the two groups. Pearson correlation analyses and mediation analyses were used to investigate the associations of poor sleep quality with brain function and clinical symptoms severity in MDD patients. In addition, we compared the gray matter volume of regions with functional abnormalities between the two groups.
Results: Compared with patients without poor sleep quality, patients with poor sleep quality exhibited decreased fALFF in the right cuneus, right thalamus, and right middle temporal gyrus. There was also a decreased FC of right cuneus with right lateral temporal cortex (R-LTC). In MDD patients, the FC of right cuneus with R-LTC was positively correlated with the SE, negatively correlated with depressive and anxious severity, respectively. Moreover, mediation analysis revealed that the FC of right cuneus with R-LTC significantly mediated that the relationship between SE and clinical symptoms severity. There was no difference in the gray matter volume of regions with functional abnormalities between the two groups.
Conclusion: These findings suggest that the functional abnormalities of brain regions in MDD patients with poor sleep quality is independent of structural changes and, more important, that the decreased FC of right cuneus with R-LTC provides a neural basis for the association between depression and poor sleep quality.

PU-0924

多种磁共振成像参数与胶质母细胞瘤 P53，Ki67 表达量的相关性

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目的 探究多种磁共振参数与胶质母细胞瘤（GBM）患者肿瘤内部 P53，Ki-76 基因表达量相关性。
方法 收集 2014.08-2017.09 在我院诊断为原发胶质母细胞瘤(GBM)患者 34 例，其中男性 21 例，女性 13 例；术前采用 Siemens Verio（1.5T/3.0T）磁共振成像仪进行图像采集，收集常规 T1 增强磁共振、动态对比增强磁共振成像（DCE-MRI）、动态磁敏感增强磁共振成像(DSC-MRI)，运用 3Dslicer 对图像中肿瘤坏死、强化、水肿区域进行分割，3D 重建后统计各区域体积、表面积参

数；对灌注磁共振图像后处理后选取容积转换常数（K^{trans}）、相对脑血容量（rCBV）、相对脑血流量（rCBF）；肿瘤组织切片后进行免疫组化染色，P53 阳性细胞数量低于或等于 10%为低表达，Ki67 阳性细胞数量低于或等于 20%为低表达。

结果 P53 高表达组表面规律性高于低表达组（P=0.002），ROC 分析肿瘤表面规律性能够反映 P53 表达（AUC=0.847，P=0.005），高表达组肿瘤体积小于低表达组（P=0.016），ROC 分析显示肿瘤体积能很好反映 P53 表达量（AUC=0.783，P=0.023），两组间 K^{trans}、rCBV、rCBF 没有显著差异。Ki67 高表达组水肿体积小于低表达组（P=0.012），ROC 分析显示水肿体积可以较好的反映肿瘤内 ki67 表达（AUC=0.746，P=0.016），两组间 K^{trans}、rCBV、rCBF 同样没有显著差异。

结论 表面规律性和肿瘤体积可以反映胶质母细胞瘤患者体内 P53 表达，水肿组织体积大小可以反映 Ki67 表达情况，为患者个性化治疗方案选择、疗效评价和预后评估提供重要依据，灌注磁共振成像（DCE，DSC）参数与 P53、Ki67 表达量间没有较好的相关性。

PU-0925
原发性中枢神经系统淋巴瘤(PCNSL) 与高级别胶质瘤(WHO III～IV 级)的 MRI 鉴别诊断

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目的 探讨原发性中枢神经系统淋巴瘤(PCNSL)与高级别胶质瘤(WHO III～IV 级)的 MRI 影像特点。

方法 回顾性分析经手术病理证实为 PCNSL 和高级别胶质瘤各 10 例患者的 MRI 影像表现，患者均进行 MRI 平扫和增强扫描。

结果 大多数 PCNSL 病变均匀增强，强化形态可见多种多样；高级别胶质瘤病灶强化均欠均匀，存在明显的坏死，呈花环状、虫蚀状或斑片状强化；高级别胶质瘤部分病灶内可见囊变、坏死、出血征象；而 PCNSL 患者出血少见；两者病灶周缘均可见血管源性水肿存在，高级别胶质瘤的水肿程度较 PNSCL 的水肿程度高；PCNSL 组患者肿瘤实质 ADC 值明显低于 HGG 组。

结论 MRI 平扫及增强可以通过观察病灶部位、病灶内囊变坏死及出血情况，增强后表现等能够帮助鉴别原发性中枢神经系统淋巴瘤和高级别胶质瘤。

PU-0926
大鼠 MCAO 脑梗死后交叉性小脑神经机能联系不能的 DKI 评价

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目的 观察大鼠大脑中动脉闭塞（MCAO）模型中 NMDA 的表达、细胞凋亡及对神经功能恢复的影响。应用扩散峰度成像（DKI）评价交叉性小脑神经机能联系不能（CCD），为临床治疗提供实验依据和理论依据。

材料与方法 建立大鼠 MCAO 模型，每 12 只大鼠随机分为对照组、6h 组、12h 组、24h 组、48h 组、7d 组、14d 组。在以上时间点对大鼠进行脑扫描，MRI 扫描后处死大鼠进行 HE 染色、免疫组化染色和 TUNEL 法，分别检测核心梗死区和小脑的 NMDA 表达，并分析 MRI 参数与 NMDA 关系。

结果 MCAO 大鼠的 MD、ADC 和 FA 值皆低于对照组，且对侧小脑的参数低于同侧小脑（$P<0.05$），于 12h 达最低值，MK 值则相反。NMDA 的表达呈上升趋势，高于对照组，24h 达到最大值（$P<0.05$），且对侧小脑高于同侧小脑。

结论 NMDA 可成为治疗 CCD 的新靶点，且 MRI 参数能预测 CCD 的发生发展。

PU-0927

Neuroanatomical substrates underlying contrast sensitivity

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Background: Contrast sensitivity (CS), a measurement of the ability to discriminate an object from its background, is an essential domain of visual function. CS decline or impairment indicates one's disability to discern an object in low contrast, which has been related to poor performance in driving, face recognition, real-world mobility tasks, postural stability, reading processes, and other functions of everyday life. Aging or lesions in the eye (including the retina) as well as in thalamic or cortical locations are usually responsible for this decline or impairment. There is evidence that CS deficits are associated with several neurological and psychiatric disorders, such as Alzheimer's disease, Parkinson's disease and depression. Previous studies in animals have suggested that lesions in medial posterior thalamus and striate cortex significantly depress CS. However, whether neuroanatomical substrates are underlying CS in humans is largely unknown.

Methods: High-resolution magnetic resonance imaging data of 100 healthy young subjects (46 males) from the Human Connectome Project (HCP) dataset were used to calculate gray matter volume (GMV). These participants are healthy young adults without documented history of major psychiatric, neurological or physical disorders and within a restricted age range of 22-36 years, which corresponds to a period after the completion of significant neurodevelopment and before the onset of neurodegenerative changes. CS was assessed using the Mars Contrast Sensitivity Test. CS was assessed using the Mars Contrast Sensitivity Test. This test is a brief, valid and reliable measure that improves upon the traditional Pelli-Robson measure. The Mars test presents 48 letters of the same size, but each letter decreases in contrast by 0.04 log unit across and down the chart. The test stops when the participant makes two consecutive errors. The final score (Mars_Final) is the log contrast sensitivity of the last correct letter, minus 0.04 for any mistakes that precede the two consecutive errors. The current norms recommend by Mars Letter Contrast Sensitivity Test USER MANUAL (http://www.marsperceptrix.com) are as follows: 0.04-0.48 represents a profound loss; 0.52-1.00 a severe loss; 1.04-1.48 a moderate loss; 1.52-1.76 normal (age > 60 years); 1.72-1.92 normal middle/young adult (age between 18 and 60 years). A multiple regression analysis was used to investigate the relationship between CS and GMV in a voxel-wise manner within the whole gray matter.

Results: The range of Mars_Final scores for the 100 participants was from 1.08-1.88. Among them, one score was 1.08 (a moderate loss), 10 scores were within 1.52-1.72 (normal > age 60 years), and the remaining 89 scores were within 1.72-1.92 (normal middle/young adult). In the voxel-wise whole gray matter analysis, we found significant positive correlations (cluster-level $P < 0.05$, FWE corrected; a minimum cluster size of 1013 voxels) between the Mars_Final scores and the GMV in the

bilateral visual cortex (left: cluster size = 1109, peak MNI coordinates x/y/z = -20.5/-88.5/38.5, peak T = 4.3, partial correlation coefficient [pr] = 0.429, P < 0.001; right: cluster size = 1699, peak MNI coordinates x/y/z = 24.5/-88.5/32.5, peak T = 5.0, pr = 0.467, P < 0.001). To rule out the potential confounds due to covariates such as age, gender and visual acuity, we repeated the partial correlation analyses controlling for these additional covariates and found that the positive correlations between the Mars_Final scores and the GMV in the bilateral visual cortex remained significant (left: pr = 0.434, P < 0.001; right: pr = 0.450, P < 0.001). Precisely, the significant bilateral clusters were mainly located in bilateral V3A, with the superior parts extending to the bilateral posterior parietal cortex according to the Human PALS-12 atlas.

Conclusions: In conclusion, we found an association between contrast sensitivity and morphology in the V3A and adjacent posterior parietal cortex, suggesting the critical role of the dorsal visual stream in contrast sensitivity processing. These findings may provide insights into the neuroanatomical mechanism of contrast sensitivity and its relation to some brain disorders.

PU-0928

NODDI 在帕金森病早期诊断中的研究进展

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帕金森病（PD）是最常见的神经系统变形性疾病，典型的 PD 病理表现为黑质致密部（SNpc）中多巴胺能神经元变性的纹状体多巴胺能耗竭，但这些不能完全解释 PD 产生的临床的临床症状，目前 PD 的发病原因及机制尚不明确，尚未建立系统的早期诊断及保护治疗方式。磁共振成像(MRI)是一种很好的非侵入性活体脑评估工具。然而，常规 MRI 的空间分辨率最多只有几毫米，而大脑中微观神经组织的评估需要亚微米级的分辨率。因此，扩散磁共振成像(DMRI)被用来解决水分子在组织中扩散的微米级位移和评价神经组织的微观结构。在 dMRI 定位的组织中，水分子位移受组织中屏障(细胞膜和髓鞘)的方向、通透性和数量，以及神经元、树突、轴突、神经丝和微管中细胞内蛋白质和细胞器的差异的强烈影响。因此，dMRI 可以间接推断这些屏障和细胞器的微观结构。而今年来逐步发展起来的神经突方向分散度和密度成像（Neurite orienttation dispersion and density imaging，NODDI）对脑白质微观结构的研究更具有敏感性，它还为帕金森病早期诊断提供了一种新方法。本文对 NODDI 新技术的一些基本成像原理及在帕金森病的研究进展做以综述。

PU-0929

基于体素分析的动脉自旋标记技术在血液透析伴不宁腿综合征脑血流量的研究

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目的 血液透析导致的不宁腿综合征(HD-RLS)与神经功能、血脑屏障和铁沉积改变有关，从而影响大脑代谢和灌注。本研究采用三维动脉旋转标记技术（ASL）来识别血液透析伴不宁腿综合征相关的灌注模式和与疾病严重程度的潜在关系。

方法 纳入 26 名 HD-RLS 患者、30 名无不宁腿综合征（HD-nRLS）的血液透析患者和 30 名年龄、性别和教育相匹配的健康对照组。应用单因素协方差分析和 post-hoc 分析用于评估三组受试者的 CBF 值、人口统计学和临床数据的差异。应用 Pearson 相关分析评估在 HD-RLS 组中 CBF 值和临床数据之间的相关性。
结果 与 HD-rRLS 患者相比，HD-RLS 患者的右侧初级运动皮层（中央前回）CBF 值增加（[FDR 校正，P<0.05）。与正常对照组相比，两个 HD 亚组（即伴或不伴 RLS 的亚组）的 CBF 变化一致，包括左内侧额上回和双侧丘脑 CBF 增加，左岛叶皮质 CBF 降低（FDR 校正，P<0.05）。
结论 感觉运动皮质和基底神经节的过度灌注可能与 HD 患者的 RLS 发病机制有关，可能为进一步阐述不安腿综合征的发病机制提供研究基础。

PU-0930

高分辨率磁共振成像评估皮肤癌浸润深度

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目的 高分辨率磁共振成像评估皮肤癌浸润深度
方法 患者术前应用 3.0T 磁共振高分辨率成像技术对病灶行常规扫描，层厚为 1.5mm，层间距为 0，FOV128mm×128mm，对病灶部位进行常规 T1WI、T2WI 及增强扫描。扫描后，由具备资深经验的医师，找到病灶显示最大肿瘤浸润深度层面，从肿瘤浸润最深点到肿瘤最突出点的垂线距离为测量深度值。扩大切除术后，将原发灶标本制片后镜下找到病灶阳性边缘，测量肿瘤病理浸润深度。
结果 患者女，77 岁，左下颌肿块，表面溃疡，活检病理示高分化鳞状细胞癌，影像表现示：左下颌骨下角见类圆形肿物，信号均匀，边界清，大小约 2.26cm×1.63cm，浸润深度约为 1.84cm，突破浅筋膜层累及颈阔肌，未见肿大淋巴结及转移征象。根据影像学检查结果，拟行 0.5cm 安全切缘扩大切除术，术后病理明确阳性切缘后，测量病灶大小约 2.17cm×1.49cm，浸润深度约 1.75cm。磁共振术前测量浸润深度与术后实际差值约 0.11cm，小于安全切缘，术后半年随访，未见复发。可以认为磁共振术前测量肿瘤浸润深度与临床大体标本检测无明显性差异。据报道，特别是那些仅接受手术治疗的病人经常发生局部复发，这被认为是由于在进行 SCC 手术时，外科医生仅凭触诊就确定了手术切除的深缘。因此，为提高 SCC 治疗效果，有必要对肿瘤进行术前初步评估其浸润深度的检查；磁共振成像在软组织分辨率方面有很大优势，可通过多轴位、多序列及增强扫描来更好地显示肿瘤侵及情况。该例患者磁共振检查可清楚显示病灶浸润深度及累及情况，增强扫描更好的显示病灶血供及与邻近血管关系。
结论 磁共振并非皮肤癌术前常规检查，其软组织分辨率高，对皮肤癌肿瘤检出率高，能够更精准的确定原发灶切除范围，具有更高的可靠性及术前判断性。磁共振术前评估皮肤鳞状细胞癌浸入深度有一定的价值，可为正确的手术方案的制定提供参考。

PU-0931

颅内动脉 MR 高分辨率管壁成像新进展和应用体会

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脑血管病在我国的发病率逐年上升，已成为严重威胁国民健康的危险因素。CTA、MRA、DSA 在脑血管病的诊断中发挥着重要作用，但无法显示分支小血管结构、缺乏对血管壁结构的分析。脑血管病的转归与血管壁重构及斑块性质密切相关，因此，获得脑血管及其小分支的管壁结构或斑块特征性影像信息，对明确病变部位和发病原因具有直观及可靠的证据。高分辨率 MRI 是目前唯一无创性对动脉管壁结构进行成像及分析的影像学技术。**目的** 结合本院临床应用情况，探讨 MR 高分辨率管壁成像诊断颅内动脉病变的敏感性和特异性。**方法** 收集我院 2018.12—2019.06 进行 MR 高分辨率管壁成像患者共 32 例，成像技术包括 2D T1WI、2D T2WI、2D 质子加权成像、T1 SPACE、3D TOF。以 DSA 作为金标准。**结果** MRI 提示大脑中动脉 M1 段病变 15 例（46.8%），M2 段病变 5 例（15.6%）；基底动脉病变 15 例（46.8%），左侧椎动脉颅内段病变 8 例（25.0%），右侧椎动脉颅内段病变 7 例（21.9%）。其中轻度狭窄 10 例（31.3%），中度狭窄 18 例（56.3%），重度狭窄和闭塞 17 例（53.2%），动脉瘤 5 例（15.6%），基底动脉夹层 1 例（3.1%）。与 DSA 结果对比，MR 敏感性 100%，特异性 93.8%。**结论** MR 高分辨率动脉管壁成像能够准确显示颅内动脉各级分支管壁结构，并能显示斑块特征，为脑血管病变明确病因和定位诊断提供精准影像依据。

PU-0932

全身黑色素瘤的 CT 及 MRI 诊断

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目的 探讨全身黑色素瘤的 C T 及 MRI 表现，提高影像学诊断及鉴别诊断水平。**方法** 回顾性分析我院经病理学证实的 131 例黑色素瘤患者的临床资料，女性 65 人，男性 66 人，年龄 14~88 岁，平均年龄 59.3 岁。原发性黑色素瘤 123 例，转移性黑色素瘤 5 例，原发部位不明确的黑色素瘤 3 例。其中 70 例患者有 CT 或 MRI 检查资料，涉及全身多个部位，总结上述黑色素瘤的 C T 及 MRI 表现，并与文献对比。**结果**（1）皮肤恶性黑色素瘤共 21 例：头皮（2 例）、面部皮肤（3 例）、胸壁（2 例）、腹壁（2 例）、臀部（1 例）、上肢（5 例）、下肢（6 例），其中 CT 检查 15 例，MRI 检查 6 例。（2）非皮肤恶性黑色素瘤共 49 例，主要累及眼球及不同部位的粘膜：包括鼻腔 16 例，眼 7 例，口腔 2 例，颅内 3 例，胃肠道 9 例，泌尿生殖道 5 例，胸腔 2 例，腹腔 5 例；其中 CT 检查 29 例，MRI 检查 20 例。（3）形态、部位：皮肤恶性黑色素瘤形态不规则，与皮肤粘连，表面可见黑色素痣；13 例鼻腔病灶发生在单侧，3 例累及双侧鼻腔，主要表现为沿着鼻腔生长的不规则形软组织肿块，3 例邻近骨质吸收伴部分破坏；眼部病灶发生于脉络膜 5 例，结膜 2 例，呈蘑菇状或不规则形；颅内 2 例为多发，1 例为单发病灶，病灶位于皮髓质交界区或软脑膜下结节、肿块影；（4）CT、MRI 特点：CT 平扫稍高密度结节或肿块 41 例，稍低密度 3 例；黑色素型（T1WI 高信号，T2WI 低信号）11 例，非黑色素型（T1WI 低/等信号，T2WI 高/等信号）9 例，出血型（T1WI 高信号，T2WI 高信号）2 例，混合型 4 例；病灶多为轻中度强化，胃肠道粘膜来源恶性黑色素瘤明显强化；均匀强化 29 例，不均匀强化 41 例。**结论** 黑色素瘤的 CT 及 M R I 表现具有一定特征性，综合分析能提高影像诊断准确率；部分病灶表现不典型，诊断需依靠病理检查。早期诊断及鉴别诊断对临床治疗及判断预后有重要价值。

PU-0933

MTC 技术在胎儿头部磁共振检查中的应用

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目的 探讨 MTC（磁化传递对比）技术在胎儿头部磁共振检查中的应用价值 **方法** 前瞻性收集 20 例临床怀疑头部有病变的胎儿，在常规 MRI 检查的基础上行 T2WI+MTC 序列检查。最后，分别比较常规序列与 T2WI+MTC 序列脑脊液-脑实质的对比噪声比（CNR=SI1-SI2/SD），并对得出的结果进行两两配对 t 检验。同时，由 2 名高年资 MRI 诊断医生采用双盲法对图像进行对比分析，得出结论。**结果** 20 例胎儿中，11 例为侧脑室增宽；1 例为胼胝体发育不良者；1 例为脉络膜囊肿；4 例为正常。两类序列均可显示病变。常规 T2WI 的 CNR 值为 16.85±4.33，T2WI+MTC 序列的 CNR 值为 29.65±5.05，后者的 CNR 值均高于常规序列。且（t=6.9，p<0.01）,差异具有显著统计学意义。**结论** MTC 技术在胎儿头部磁共振检查中具有肯定的价值，能够在常规序列基础上提供新对比的图像，便于脑室的显示，提供更清晰的灰白质对比，突出病灶的显示，从而能够提升诊断的准确性和可靠性。

PU-0934
三点 DIXON 技术在颈部增强磁共振检查中的应用

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目的 探讨 DIXON 技术在颈部增强磁共振检查中的应用价值.
方法 收集 20 例， 行 MRI 颈部增强磁共振检查的患者，在增强序列中， SOG 方位上分别用三点法 DIXON 与 FS 两种方式进行成像 . 选颈部脂肪最后的层面，测量脂肪信号强度，用于评价两者脂肪抑制效果 . 对两组测量值行两两配对 t 检验
结果 20 例病例中,以 FS 压脂的信号测值为 19.24±6.44; 以三点法 DIXON 压脂的信号测值为 9.94±3.21
结论 三点法 DIXON 对脂肪的抑制效果相比于 FS 压脂效果要好许多，在颈部 MRI 增强检查中可以有效的发挥脂肪抑制作用，可以突出显示病灶，由于其自身原理的不同其抑脂效果对磁场均匀性的要求比 FS 低，故可用于颈部增强 MRI 替代 FS.

PU-0935
探讨磁共振全脊柱拼接和常规脊柱序列对诊断脊柱及椎管内病变的敏感性

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目的 探讨磁共振全脊柱拼接序列在儿童脊柱及椎管内脊髓疾病诊断中的价值，并与常规分段脊柱序列进行比较，探讨其是否可代替或作为补充扫描序列。**方法** 收集 2018 年 6 月至今，使用 Philips Ingenia 3.0 T 超导磁共振仪对我院 30 例疑有椎体/椎管内病变的患儿进行全脊柱磁共振扫描，序列分别为 T1WI、T2WI、T2-stir 及 DWI。**结果** 1、脊髓肿瘤 10 例（髓内肿瘤 3 例，髓外硬膜下肿 7 例），脊髓侧弯 8 例，椎管内囊肿 5 例，脊髓炎症 5 例，脊髓空洞 2 例。2、常规序列能清晰显示椎管内病变形态范围，尤其可以鉴别 T2WI 统一为高信号的病变性质。3、5 例脊髓炎在常规序列 T2 上呈异常高号，而全脊椎拼接序列上显示不清。4、全脊柱拼接序列更能直观的显示 8 例侧弯的位置、方向及程度，对骨科早期干预治疗意义重大。**结论** 全脊柱序列诊断脊柱侧弯优于常规序列；而常规序列对诊断椎体上或椎管内病变的敏感性高于全脊椎序列，对椎管内肿瘤定性具有显著价值。

PU-0936
腮腺嗜酸细胞瘤的 MRI 表现（附 1 例报告及文献复习）

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目的 分析腮腺嗜酸细胞瘤的 MRI 表现，以提高诊断能力。
方法 回顾性分析 1 例经手术病理证实的腮腺嗜酸细胞瘤的临床资料及 MRI 表现，并做文献复习，总结其影像特点。
结果 本例患者为 72 岁男性，无吸烟史，发现左腮腺区肿物 4 年余，查体质地稍硬，活动性良好，触及稍疼痛。MRI 上表现为左侧腮腺下极椭圆形实性肿块，大小约 2.1cm×1.2cm，边界清楚，T1WI 呈等信号，T2WI 呈等信号，弥散加权成（DWI）呈高信号，rADC=0.9(rADC=肿瘤 ADC/正常腮腺 ADC)，动态增强曲线为速升速降型。
结论 腮腺嗜酸细胞瘤的 MRI 表现具有一定特征性，T2WI 呈等信号、rADC<1 及动态增强曲线为速升速降型，支持腮腺嗜酸细胞瘤的诊断。

PU-0937
乳腺癌脑转移的 MRI 特征及 MRI 序列优化的价值分析

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目的 探讨乳腺癌脑转移的磁共振成像（Magnetic resonance imaging，MRI）特征及 MRI 序列优化的价值。**方法** 选择 2015 年 4 月至 2017 年 10 月我院接诊的 40 例乳腺癌脑转移患者为研究对象，均行 MRI 常规扫描和 MRI 序列优化扫描，记录乳腺癌脑转移 MRI 特征以及各序列病灶检出情况，对比优化扫描方案与常规扫描方案的扫描时间。**结果** 40 例乳腺癌患者中多发转移 31 例，单发转移 9 例；伴坏死、囊变 33 例，出血 7 例；MRI 各序列共检出 355 个病灶，病灶周围无水肿 87 个（24.51%），有水肿 268 例（75.49%）；幕下病灶占 16.90%（60/355），幕上病灶占 83.10%（295/355）；脑膜转移 6 例，颅骨转移 3 例；增强 T_1加权成像（T_1-Weighted imaging，T_1WI）检出率高于、T_2液体衰减反转恢复（T_2Fluidattenuated inversion recovery，T_2FLAIR）、扩散加权成像(Diffusion Weighted Imaging，DWI)、T_1WI、T_2加权成像（T_1-Weighted imaging，T_2WI），差异具有统计学意义（$P<0.05$）；肿瘤实质信号为不均匀性，T1WI 平扫多为等或低信号，T_2FLAIR、DWI、T_2WI 病灶多为等或高信号；强化方式：环形强化占 11.55%（41/355），结节型强化 62.25%（221/355），混合型强化为 26.20%（93/355）；常规方案平均扫描时间为（638.21±10.46）s，优化方案扫描时间为（575.32±7.52）s，差异具有统计学意义（$P<0.05$）。**结论** 乳腺癌脑转移以多发转移较为常见，多伴坏死、囊变，多发生于幕上转移，强化方式以结节型强化为主，肿瘤实质信号为不均匀性；MRI 序列优化能缩短扫描时间，提高脑转移瘤检出率。

PU-0938

Prevalence, CMR Characteristics and Outcomes of Hypertrophic Cardiomyopathy with Restrictive Phenotype

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Purpose Previous reports indicated that there was a subgroup of HCM defined by restrictive filling and reduced diastolic volumes. The aim was to investigate the prevalence, clinical significance, CMR characteristics and outcomes of hypertrophic cardiomyopathy (HCM) with restrictive phenotype. **Materials and Methods** A total of 2592 consecutive patients with HCM were evaluated to identify individuals who fulfilled the diagnostic criteria of restrictive phenotype. 34 patients of HCM with restrictive phenotype were retrospectively enrolled. 34 age and gender matched patients with non-obstructive HCM were randomly selected from the rest of the other HCM patients as the control group. The left and right atria diameter were 55.4±4.8 mm and 61.4±8.7 mm, which were significantly larger than those of the controls ($p < 0.001$); The cardiac index, and the left heart ejection fraction of patients with restrictive phenotype were all significantly lower than those of the controls ($p < 0.001$). The late gadolinium enhancement(LGE) volume fraction was 23.3±11.4 in restrictive phenotype group, which were significantly higher than controls (15.2±10.2, $p=0.023$). The 72-month event-free survival from any cause of death, cardiac transplantation was 60.5% in HCM with restrictive phenotype, compared with 94.4% in control group for a 91-month follow-up. **Conclusions** Restrictive phenotype is a special subtype of HCM. The CMR features of this phenotype includemild-to-moderateleft ventricular hypertrophy, severely enlarged atria, normal or small ventricles,moderate myocardial fibrosis and pericardial effusion. These patients have severe clinical symptoms and poor prognosis.

PU-0939
心脏磁共振对肥厚型心肌病患者是否合并房颤的左室形态及功能差异的研究

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目的 探究应用心脏磁共振评估肥厚型心肌病合并房颤患者的左室结构及功能参数改变。
方法 收集在我院接受 1.5T 心脏磁共振检查并确诊为的肥厚型心肌病的 78 位患者，根据有无房颤发生，分为房颤组（n=14）及非房颤组（n=64），比较两组患者代表左室结构及功能的多个磁共振参数。
结果 房颤患者的左房前后径、年龄、钆对比延迟强化百分比显著高于无房颤的肥厚型心肌病患者（p(0.05），房颤患者的左室射血分数、左室峰值充盈率显著低于无房颤患者（p(0.05），两组之间的 LVESV/BSA、LVEDV/BSA、SV、CO、LVM、LVEDD、LASID 没有显著差异（p(0.05）。
结论 肥厚型心肌病合并房颤患者的左室峰值充盈率、左室射血分数减低，合并房颤患者的年龄及左房前后径、钆对比延迟强化百分比升高。

PU-0940

CE-MRA 3D_Tricks 序列在诊断脊髓血管畸形中的应用

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目的 脊髓血管畸形是一种先天性脊髓血管病变，系先天性脊髓血管在发育上的异常或畸形，占脊髓占位性病变 3%-11%。发病年龄以青年和中年人多见，脊髓血管畸虽然少见，但致残率高，临床表现不典型，常发生漏诊、误诊，如能得到早期诊断和根治手术，许多病人可以获得较好的效果。DSA 对血管性病变分辨率较高，可以选择性插管进入各节段脊髓供血动脉显示畸形血管，是脊髓血管检查的金标准，但 DSA 为有创检查、辐射大、造影剂用量多、检查复杂、禁忌症及并发症多。我院利用 GE 3.0T MRI 3D_Tricks 序列（three-dimensiona time-resolved imaging of contrast kinetics）进行参数优化，该序列采用椭圆中心 K 空间采集 4 倍于外周 K 空间采集的方法成倍提高 CE-MRA 的时间分辨率(2～6 s)而不影响图像的质量，时间分辨率快可把动静脉各期图像分开，避免重叠，在短时间（90s）内动态连续采集 20 期血管图像，同时图像质量能够得到保证，能观察到细小的血管，多期观察，清晰显示正常血管及畸形血管。且为无创、无辐射，安全可靠的一种血管检查技术。

方法 选取临床或常规 MRI 检查怀疑血管畸形患者 11 例，行 3D_Tricks 序列脊髓 MRA 检查，然后行 MPR 及 MIP 血管重建。同时均在 1-3 天内行 DSA 检查，对比分析 MRA 与 DSA 结果。

结果 DSA 诊断 9 例血管畸形，2 例正常；MRA 诊断 9 例血管畸形，2 例无血管畸形；与 DSA 比较，9 例血管畸形中 MRA 可以准确判断血管畸形供血动脉及漏口，与 DSA 具有较好一致性。

结论 CE-MRA 3D_Tricks 序列与 DSA 对脊髓血管畸形诊断均具有较高的一致检出率，且 CE-MRA 可准确、无创、无辐射、快速清晰的显示脊髓血管畸形的供血动脉及漏口，在诊断脊髓血管畸形、术后随访等方面有重要价值。

PU-0941

The role of multiparametric cardiac MR in monitoring myocardium lymphoma infiltration evolution

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Objective: To investigate the value of Native T1 and T2 value derived from cardiac MR imaging in monitoring therapeutic evolution to chemotherapy in a patient with lymphoma infiltration of left ventricular wall.

Methods: One patient with lymphoma infiltration of mid segment of ventricular wall proven by intrathoracic biopsy was consecutively followed and monitored by multiparametric cardiac MR imaging from October 2016 to April 2017. During this period, the patient had taken five times of clinical symptom assessment and MR imaging. (21th October 2016, 7th December 2016, 28th December 2016, 8th February 2017 and 7th March 2017). Cardiac MR was performed using a 1.5T system (MAGNETON Aera, Siemens, Erlangen, Germany) with a multiparametric scan including conventional T1, T2 weighted morphology imaging, cine sequences and T1 T2mapping scan. Native T1 and T2 values of infiltration region and unaffected septum were acquired, the strain parameters were also obtained based on cine images. Clinical condition of this patient was consecutively evaluated

simultaneously at the time of imaging. The change of parameters derived from multi sequences of each time were evaluated and the relation to disease condition was analyzed.

Results: The patient showed evident relive in second follow-up but great rebound at the time of third examination due to severe side effects to new antitumor drugs, the condition returned to stability by reduced dose which remained until last follow-up. Native T1 and T2 values of infiltrated region showed irregular fluctuation during following, but the ratios to the value of septum showed same trend with illness condition change (ratio of T1 value between tumor region and septum: 1.229, 1.164, 1.223, 1.133, 1.156; ratio of T2 value between tumor region and septum: 1.568, 1.462, 1.550, 1.352, 1.192). Strain parameters in all three directions showed no evident change pattern no matter in global or segmental level.

Conclusion: Multiparametric cardiac MR imaging can play a useful role in evaluating and monitoring lymphoma affect ventricular wall evolution, especially by tissue characteristic parameters including native T1 and T2 values.

PU-0942

Diagnostic Value of T1 Mappiing and ECV for tissue characterization of cardiac masses

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Objective: This study aimed to evaluate the diagnostic value of CMR for evaluating cardiac masses using multiple techniques including CINE, T1W-TSE, T2-STIR, T1 and T2 mapping, and late gadolinium enhancement (LGE) sequences.

Method: A total of 10 patients were recruited between June and Oct 2016 and were diagnosed with a cardiac mass using routine trans-thoracic echocardiography; their diagnoses were confirmed by post-operative histopathology or extra-cardiac biopsy. CMR was performed using a 1.5T system including protocols CINE, T1W-TSE, T2-STIR, T1 mapping (pre and post contrast to calculate ECV), T2 mapping, and LGE.

Result: The 10 patients in this study had the following diagnoses: 2 thrombi, 6 benign tumors (4 myxoma,1 lipoma, and 1 leiomyoma) and 2 malignant tumors (1 metastasis and 1 lymphoma). Morphologically, thrombi were smaller, more homogeneous, and more immobile than tumors. Malignant tumors, especially metastases, demonstrated a larger size than benign tumors. Chronic thrombi exhibited isointense or hypointense signal on T1W-TSE and T2-STIR images, but lipoma and myxoma tended to be hyperintense on T2-STIR images. LGE was more common in tumors than in thrombi. LGE phenomenon was also more common in malignant than benign tumors. Compared to the myocardium, we observed significantly higher native T1 and T2 values in cardiac myxomas. T1 values of the cardiac lipoma were significantly lower than that of the myocardium. Chronic thrombi showed intermediate short T1 values. Using histology as the gold standard, CMR demonstrated an accuracy of 98% in distinguishing benign from malignant tumors.

Conclusion: Although transthoracic echocardiography is useful in initial evaluation for screening, CMR provides additional information about the morphology, location, and

extent of a cardiac neoplasm.CMR features demonstrated a high accuracy in differentiating benign from malignant tumors and can also be helpful in distinguishing thrombi from tumors. T1 and T2 mapping of masses may assist in tissue characterization, particularly in myxomas, lipoma, and thrombi. CMR plays an important role in characterizing the three-dimensional extent and tissue attachment of cardiac masses, which can help plan the surgical approach aimed at either complete removal or palliative debulking of a tumor mass.

PU-0943

MRI 评估原发性扩张型心肌病患者心室功能

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目的　研究核磁共振检查(MRI)评估原发性扩张型心肌病(IDCM)患者心室功能中的效果。
方法　回顾性分析 85 例 IDCM 患者资料，根据心功能分级标准分为Ⅰ-Ⅱ级(n=20)、Ⅲ级(n=35)和Ⅳ级(n=30)，分析 MRI 与二维超声(2DE）评价心室功能价值。
结果　85 例 IDCM 患者均存在左右心室不同程度扩张，以左侧心室扩张为主，MRI 检查中，36 例左心扩大，左室多呈球形，室壁厚度变薄，49 例双侧心室扩大，心肌运动弥漫性减弱；2DE 检查所有患者均显示全心扩大，56 例以左心室扩大为主，室间隔及左室后壁厚度变薄，室壁运动弥漫性减弱；随着 IDCM 患者心功能分级增高，MRI 检查的 LVEDV、LVESV 逐渐升高，LVSV、LVEF、LVPER、LVPFP 逐渐降低，不同等级差异显著(P<0.05)；2DE 检查的 LVESV 逐渐升高，LVEF 逐渐降低，不同等级患者间差异显著(P<0.05)；2DE 与 MRI 检查在室间隔、前壁、后壁厚度的测量上无显著性差异(P>0.05)，在侧壁与心尖部厚度检查中差异显著(P<0.05)。
结论　2DE 与 MRI 均可有效评估 IDCM 患者心室功能，但 2DE 易低估左心室容积、重复性差，而 MRI 则可提供更多左心室功能、容积等参数，可重复性高，评估心脏功能和心室壁厚度更加准确，临床应用价值更高。

PU-0944

中国人心室功能正常参数的 MRI 研究

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目的 使用 MRI 测量中国正常成人左右心室功能参数。**方法**　纳入 200 名年龄在 20-70 岁的正常志愿者，按照性别分为两组，每组 100 名，每组中再按年龄每十岁分为一个亚组，每组共 5 个亚组，每亚组内 20 名。无线矢量心电门控下，采用单次激发半傅立叶快速自旋回拨与真实稳态自由进动序列，分别获得标准心脏各长轴及短轴切面二维体层及电影图像。由两名医师独立进行心功能后处理分析，获得包括左室射血分数（EF）及心肌质量（Mass）,左右心室舒张末容积（EDV）、收缩末容积（ESV）等心功能参数。使用 SPSS 软件进行统计学分析。**结果**　男性和女性正常志愿者左室 Mass、右室 EF、EDV、ESV 有显著差异（P<0.05），而左室 EF、EDV、ESV 无明显差异；经 BSA 标准化后，两组左室 EDV、ESV、Mass，右室 ESV、SV 有明显差异，而右室 EDV 差异不大。**结论**　心功能参数随年龄、性别和 BSA 的差异而规律性发生改变，对三个变量统一化评估，可以早起识别心功能异常。

PU-0945
探讨心脏磁共振成像在致心律失常心肌病诊断中的应用价值

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【摘要】 **目的** 回顾性分析致心律失常心肌病的心脏磁共振成像(CMR)表现，探讨 CMR 在其诊断中的应用价值。**方法** 搜集 2016 年 7 月-2018 年 6 月在我院行 CMR 检查并诊断为致心律失常心肌病患者 20 例。从心脏形态结构(心肌脂肪浸润、房室大小)、功能(室壁运动功能)、心肌组织学特性等方面对心室受累程度进行分析。**结果** 20 例患者，双室受累 9 例，单纯右室受累 6 例，单纯左室受累 5 例。双室受累组 9 例中，均表现为右室流出道增宽、左右室壁变薄、左右室壁收缩运动减低，7 例左室腔扩大，出现右室壁心肌脂肪浸润、延迟强化均为 5 例，左室壁心肌脂肪浸润、延迟强化均为 7 例；单纯右室受累组 6 例均表现为右室流出道扩张，右室腔扩大及室壁收缩运动减低，2 例右室壁心肌脂肪浸润，4 例表现为右室壁与心外膜脂肪分界不清；单纯左室受累组均表现为左室壁变薄或偏薄、不同程度左室壁或室间隔脂肪浸润及延迟强化，4 例左室腔扩大。**结论** CMR 检查在致心律失常性心肌病诊断中具有重要应用价值，能较好评估心室受累情况。左心室是否受累不能用于 ARVC 病程判断，右心室受累 ARVC 患者主要表现为右心室腔扩大、室壁变薄及不同程度右室流出道扩张，而左心室受累 ARVC 主要表现为特征性左心室心肌脂肪浸润及延迟强化。

PU-0946
Early detection of myocardial fibrosis by CMR extracellular volume fraction quantitation in a hypertensive swine model

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Background: The mechanism of left ventricular hypertrophy (LVH) in the setting of hypertension is currently thought to be an adaptive hypertrophy of cardiomyocytes in response to hypertension. However, recent studies have shown that extracellular interstitial fibrosis, which can be detected by extracellular volume (ECV) fraction on CMR, also plays an important role in LVH.
Aim: To quantitatively evaluate the dynamic changes of ECV in normal and hypertensive pigs over time and determine whether ECV quantification by cardiac magnetic resonance (CMR) can demonstrate left ventricle (LV) extracellular interstitial fibrosis in a hypertensive (HTN) swine model. To determine the significance of extracellular interstitial fibrosis in left ventricular remodeling and hypertrophy secondary to hypertension.
Methods: Ten adult male Chinese miniature pigs aged 6-12 months were divided into two groups: 7 pigs were in the hypertensive (HTN) group and 3 pigs were in the normal control group. Both groups of pigs underwent cardiac MR imaging before and 1week, 1 month, 3 months, 6 months after induction of hypertension in the HTN group. The systolic and diastolic pressure of HTN group was gradually increased from 111.20/68.00 mmHg to 167.67/109.33mmHg. ECV quantification was prospectively performed in both

groups at all imaging time points. Systolic function of the left ventricle (LV) was calculated from the cine images. Individual and segmental ECV were compared to the late gadolinium enhancement (LGE) images. Histopathologic examination of the heart was performed after sacrifice.

Results: The control group ECV was 24.21±4.0%. The mean ECV fraction was higher in the HTN model group than the control group ECV fraction at 3 months (25.79±5.81; p=0.009) and 6 months (26.88±4.87;p=0.019). The LGE of both HTN and NC groups were all negative. There were no differences between the HTN group and control group in terms of LV ejection fraction (mean, 61.38±6.64 vs 63.67±4.51; P =0 .99).
Conclusion: ECV fraction calculation from CMR imaging can identify LV abnormalities secondary to myocardial fibrosis at an early stage in a HTN model before LGE abnormalities are evident. As the hypertensive disease progresses, the ECV fraction increases.

PU-0947

Multi-parametric cardiac magnetic resonance for detecting extensive skeletal muscle and subclinical myocardial involvement in immune-mediated necrotising myopathy

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Aims Immune-mediated necrotising myopathy (IMNM) is distinct from the other forms of idiopathic inflammatory myopathy (IIM), and may be associated with high risk of cardiac involvement hence poor prognosis. The aim of the study is to investigate the extent of skeletal muscle and subclinical myocardial involvement in IMNM patients using multi-parametric cardiac magnetic resonance (CMR), in comparison with other IIM subgroups.
Methods Fifteen IMNM patients (age 46±14 year, 17 female), twenty-seven polymyositis (PM) patients (age 41±16 years, 13 female), five dermatomyositis (DM) patients (age 35±22 year, 4 female), and ten age and gender matched healthy volunteer were enrolled in this study. All the patients underwent clinical, serological, and CMR assessment. The ventricular function and strain was evaluated by the short-axis and 4-chamber cine MRI. Native T1/T2 mapping were performed, and post-contrast T1 mapping and LGE were acquired after injection of contrast agent. Extracellular volume (ECV) was calculated in both myocardium and four thoracic skeletal muscle groups present in the CMR field of view.

Results Myocardial native T1/T2 and ECV, in IMNM patients compared to PM, DM patients and controls (P<0.05 for all). The percentage of LGE-positive segment in IMNM patients was markedly higher than that of the PM group (P=0.008). Compared to PM and DM patients, skeletal muscle ECV was also significantly elevated in patients with IMNM (P ＜0.05 for all), but native T1/T2 of skeletal muscle showed no significant difference. Patients with anti-SRP IMNM had significantly increased myocardial and skeletal muscle T2 value and ECV (P<0.05 for all) compared to seronegative subgroup. Skeletal muscle ECV showed significant correlation with myocardial ECV (rho=0.521, P< 0.001) and blood hs cTnI (rho=0.517, P< 0.001), respectively.
Conclusion Compared to other IIM, patients with IMNM have more extensive skeletal muscle and subclinical myocardial involvement. Within the IMNM group, patients with anti-SRP positive have more severe skeletal muscle and myocardial involvement. IMNM patients need more attention and intensive treatment than other IIM.

PU-0948

4D Flow MRI 在血管疾病的应用

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4D Flow MRI 是一种沿时间编码的三维三方向的非侵入性成像技术，可以通过流线图、矢量图及粒子图等可视化及量化血管血流动力学特征，同时也能准确测量血流速度、血流方向、血管壁面剪切应力（WSS）、脉搏波传导速度（PWV）及能量损耗等重要参数。4D Flow MRI 可用于评估不同组织区域血管正常及异常的血流动力学特征，并可能成为早期预测血管类疾病的诊断方法。本文旨在对 4D Flow MRI 在血管疾病的应用进行综述，评估 4D Flow MRI 在血管疾病的诊断及预后价值。

PU-0949

CMR 在暴发性心肌炎短期随访研究

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目的 探讨 CMR 在识别及监测暴发性心肌炎患者心肌炎性损伤价值。
材料与方法 19 例临床诊断暴发性心肌炎患者在急性期及随访三个月在 3.0 MR 进行 CMR 扫描，纳入 19 例正常志愿者作为对照组。扫描序列包括心脏电影，T2WI，延迟强化。
结果 急性期患者左室心肌质量指数及室间隔厚度明显增加，慢性期恢复正常。与急性期相比，暴发性心肌炎愈合期心肌水肿率及 LGE 质量明显减低。疾病组心肌应变值均低于对照组。在鉴别急性与慢性心肌炎，心肌水肿率及 LGE 质量诊断效能较高，AUC 分别为 0.884 与 0.809。
结论 CMR 较准确识别及监测暴发性心肌炎患者心肌炎性损伤，心肌水肿率及 LGE 质量鉴别急性期与愈合期心肌炎效能较高。

PU-0950

一项评估心脏 MR 多参数在评估重度 AS 患者左心室重构过程中心肌整体及局部功能的初步研究

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目的 利用心脏 MR 多参数评估重度 AS 患者左心室重构过程中心肌形态、组织特征及功能的改变，并进一步探讨各参数在左室心室底部、中部及心尖部水平是否有差异性及相关性，以期评估心脏 MR 多参数在定性及定量化评价重度 AS 患者心肌重构过程中的应用价值。
方法 选取符合入组标准的 31 例重度 AS 患者和 20 例无症状对照组作为对照组，分别行心脏磁共振常规序列、电影序列及改良 MOLLI T1 mapping 序列扫描，并对电影图像进行心肌 Strain 后处理分析。比较重度 AS 组及无症状对照组常规心功能指标、T1 mapping 全心肌参数（ECV）及 Strain 全心肌长轴应力参数（GLS）的差异性，并进一步对 T1 mapping（$ECV_{1、2、3}$）及 Strain（$LS_{1、2、3}$）参数进行局部分析，分别比较其在心室底部、中部及心尖部水平表达的差异性。最后分析 ECV 及 GLS 间、以及 ECV、GLS 与心室重构指标 LVEDMi 间的相关性。
结果 重度 AS 组 LVEDMi、GLS 和与无症状对照组间差异有统计学意义（t=-11.26，-5.639，$p<0.05$）;而 ECV 值并未表现出显著差异性。在心室底部、中部及心尖部水平上，各 LS 值均表现出显著差异，并显示出从心室底部至心尖部数值依次递增的规律，其值如下，$LS_{1、2、3}$（-18.20±4.31，-16.93±4.42，-14.34±5.25，$p<0.001$）。然而 ECV 值只在中部和底部表现出统计学差异（$p<0.05$）。ECV 值、GLS 值与左心室心肌质量指数之间均有良好相关性。
结论 心脏 MR 多参数可无创性评估重度 AS 引起的左心室重构过程中心肌形态、组织特征及功能的改变。重度 AS 左心室重构过程中不仅整体心肌形态及功能发生改变，而且其在不同心室水平间也有着显著差异。对于重度 AS 患者，心尖部心肌长轴应变参数也许会有助于对其进行功能评估和风险分层，进而可对临床进行早期决策治疗提供指导意见。

PU-0951
心脏磁共振 Mapping 技术定量评估免疫介导型肌病亚临床心脏损伤的研究

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研究目的 在免疫介导型肌病中，心脏损伤往往提示预后不良。传统心脏磁共振 T2 加权和延迟增强成像可以检出心脏局灶性水肿、坏死和纤维化，但其在弥漫性心脏损伤中的诊断价值有限。本研究旨在应用心脏磁共振 Mapping 定量技术检测出免疫介导型肌病的亚临床心脏损伤。
研究对象和方法 收集 2016.1-2018.12 在我院行心脏磁共振成像的免疫介导型肌病患者 40 例。排除 10 例出现心肌局灶性延迟强化的患者。另外，收集 25 例健康对照组。测量所有入试者左心室整体心肌 T1、T2 值和细胞外体积分数（ECV）。
结果 一共 30 例免疫介导型肌病患者和 25 例健康对照组纳入本研究中。健康对照组和 IMM 患者组之间的左心室容积及功能参数无显著统计学差异（$p> 0.05$）。与健康对照组相比，左心室整体心肌 T1、T2 值和细胞外体积分数均显著升高（$p <0.05$）。
结论 心脏磁共振 Mapping 心肌定量技术可以早期检出免疫介导型肌病亚临床心肌损伤。

PU-0952

临床检查技术评估免疫介导型肌病亚临床心脏损伤的初步对比研究

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研究目的 免疫介导型肌病合并心脏损伤会增加肌病患者死亡率，因此心脏损伤的早期筛查至关重要。十二导联心电图及超声心动图是临床筛查免疫介导型肌病患者心脏损伤的常规检查方法，但均存在一定的局限性。心脏磁共振成像不仅可以准确评估心脏形态及功能，而且能表征心肌组织学改变，如心肌坏死或纤维化等。我们旨在评估 与传统检测方法相比，心脏磁共振成像诊断免疫介导型肌病心脏损伤的准确性。
研究对象和方法 收集 2016.1-2018.12 在我院行心脏磁共振成像的免疫介导型肌病患者，并整理分析所有患者临床病史、十二导联心电图、超声心动图及心脏磁共振影像 资料。
结果 40 例免疫介导型肌病患者入组。免疫介导型肌病患者心电图异常率为 47.5%； 超声心动图异常率为 20%；心脏磁共振成像异常率为 52.5%。其中，10 例（25%）患者出现了局灶性坏死或纤维化。
结论 免疫介导型肌病心脏损伤的异常率较高。较超声心动图，心脏磁共振成像除能准确评估心脏形态学功能学之外，还能够提供额外的组织学信息，即心肌局灶性坏死或纤维化，对心脏损伤的早期诊断及预后评估具有一定的意义，可作为临床免疫介导型肌病心脏损伤的常规筛查方法。

PU-0953
压缩感知技术在儿童心脏磁共振中的应用研究

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目的 儿童心脏病患者具有无法闭气，心率高等特点，常规电影序列可能存在伪影重、心动周期检测不全等局限性。压缩感知电影技术具有成像速度快、无需闭气等优势。因此本研究将评价压缩感知技术在无法闭气儿科患者心脏磁共振电影序列中的应用。
方法 前瞻性纳入 2019 年 4 月到 2019 年 8 月在我院就诊的心脏疾病患者共 30 例，所有患者均行常规的心脏磁共振电影序列及基于压缩感知的心脏电影序列。对两组序列进行心功能测定及图像质量评分，评价基于压缩感知技术的心脏电影序列在儿科患者中的应用价值。
结果 患者年龄范围为 2-15 岁，其中 17 例年龄大于 7 岁；10 例患者在屏气时进行常规电影扫描，20 例患者自由呼吸状态下进行常规电影序列扫描；所有患者的压缩感知电影序列均在自由呼吸状态下采集。后处理软件处理常规电影序列及压缩感知电影序列得到心脏功能参数，进行相关性分析发现，两种技术方法所获的心功能参数具有极好的相关性（EDV：r=0.989，p=0.000；ESV：r=0.988,p=0.000; SV=0.986,p=0.000; EF=0.842,p=0.004; CO=0.805，p=0.09）；Bland-Altman 分析发现，两种技术方式具有较好的一致性。图像质量评分发现，自由呼吸状态下扫描的常规电影序列图像质量差于压缩感知序列，存在呼吸及心脏搏动伪影；但屏气状态下扫描的常规电影图像质量优于压缩感知电影图像。压缩感知电影扫描完全心的平均扫描时间为 10-20s，而常规电影扫描时间为 60-120s.
结论 基于压缩感知的电影序列可以明显缩短扫描时间，同时能在自由呼吸状态下获得较好的图像质量，其与常规电影序列所测量的心功能参数一致性较好。但对于能够屏气扫描的患儿，仍然推荐使用屏气扫描。

PU-0954

T1Mapping 序列对肥厚型心肌病(HCM)心肌纤维化的应用初探

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目的 探讨 T1Mapping 序列对肥厚型心肌病(HCM)心肌纤维化的应用。
方法 按诊断标准入选 40 例 HCM 患者和 25 名健康志愿者，分别行 T1mapping 成像和常规延迟强化(LGE) 检查，按 HCM LGE 有无及程度，分为 LGE 远处正常区、LGE 边缘区、LGE 区(分为晕状 LGE 与斑片状 LGE)，并按照（AHA）分段法分析左心室心肌 16 个心肌节段（心尖部除外），统计分析各个节段 LGE 程度。测量各节段 T1mapping 值。
结果 40 例患者 LGE 节段共有 384 个，LGE 边缘区节段共有 130 个，LGE 远处正常区节段 126 个。LGE 斑片状强化节段的 T1Mapping 值为 1333.5±109.2ms，LGE 晕状强化节段的 T1Mapping 值为 1280.5±109.2ms，LGE 边缘区 T1Mapping 值为 1202.4±69.8ms，LGE 远处正常区 T1Mapping 值为 1180.5±57.6ms。25 例志愿者无一 LGE 节段，其 T1Mapping 值为 1176.3±59.8ms。远处正常区(1180.5±57.6ms)与 LGE 周边区、晕状区及斑片区比较差异均有统计学意义（t 值分别为 17.52、18.35 和 52.14，P 值均<0. 01)；LGE 晕状区与斑片区比较差异有统计学意义（p<0.01)；LGE 周边区与 LGE 晕状区和斑片区比较差异均有统计学意义(t 值分别为 3.71 和 36.80，P 值均<0. 01)。LGE 远处正常区与对照组无统计学意义（p＞0.05）。
结论 T1Mapping 序列可以定量对肥厚型心肌病(HCM)心肌纤维化的程度分析，尤其是对早期纤维化的评估。

PU-0955

Fabry 病 MRI 个案报道

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目的 探讨 Fabry 病 MRI 表现。
方法 回顾性分析经临床综合诊断为 Fabry 病的 1 例个案心脏 MRI 表现，MRI 采用平扫+增强+延迟扫描+血清检测。
结果 患者男、60 岁，体检发现心电图：房性早搏、电轴左偏、I、avL 见病理性 Q 波，考虑急性非 ST 段抬高型心肌梗死，血清α-半乳糖苷酶减低，嘱冠脉造影患者拒绝，为进一步诊治收入我院行心脏 MR 增强扫描示：左房面积 27.14，右房面积 17.52，室间隔、左室下壁、前壁及前侧壁基底段和心尖段室壁增厚，较厚处约 25.4mm 位于室间隔，左室下侧壁变薄，上述室壁运动幅度减低，主动脉瓣、二尖瓣可见反流信号，延迟扫描：左室下侧壁、下壁基底段-中段、各壁心尖可见肌壁间及心外膜下延迟强化，左室功能 LVEF34%（减低），合并肾功能不全、心脏病家族史及血清α-半乳糖苷酶减低，综上考虑 Fabry 病诊断明确。
结论 小结：Fabry 病是罕见单基因遗传病，心脏受累为主要致死原因，影像表现为：左室下侧壁基底段-中段心外膜下/肌壁间延迟强化阳性、NativeT1 值减低，确诊需要α-半乳糖苷酶检测和基因检测，早期诊断和早期使用酶替代疗法可明显改善预后。

PU-0956

心脏 Fabry 病 MRI 个案报道

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目的 探讨 Fabry 病 MRI 表现。
方法 回归分析一例经临床综合诊断为 Fabry 病的 1 例个案 MRI 表现。
结果 患者男、60 岁，体检发现心电图：房性早搏、电轴左偏、I、avL 见病理性 Q 波，考虑急性非 ST 段抬高型心肌梗死，血清α-半乳糖苷酶减低，嘱冠脉造影患者拒绝，为进一步诊治收入我院行心脏 MR 增强扫描示：左房面积 27.14，右房面积 17.52，室间隔、左室下壁、前壁及前侧壁基底段和心尖段室壁增厚，较厚处约 25.4mm 位于室间隔，左室下侧壁变薄，上述室壁运动幅度减低，主动脉瓣、二尖瓣可见反流信号，延迟扫描：左室下侧壁、下壁基底段-中段、各壁心尖可见肌壁间及心外膜下延迟强化，左室功能 LVEF34%（减低），合并肾功能不全、心脏病家族史及血清α-半乳糖苷酶减低，综上考虑 Fabry 病诊断明确。
结论 Fabry 病是罕见单基因遗传病，心脏受累为主要致死原因，影像表现为：左室肥厚、LVMI 增加、左室下侧壁基底段-中段延迟强化阳性、NativeT1 值减低，确诊需要α-半乳糖苷酶检测和基因检测，早期诊断和早期使用酶替代疗法可明显改善预后。

PU-0957

CMR 在铁沉积所致心肌病的应用

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铁过载在遗传性血色素病、地中海贫血、镰状细胞贫血、再生障碍性贫血、骨髓增生异常综合征等患者中常有发生，其中铁沉积所致的心肌纤维化及心内膜炎最终形成心力衰竭是患者最主要的死亡原因之一。及时诊断，加强去铁治疗，不仅可以预防心肌铁沉积的发生还可以逆转早期铁沉积导致的纤维化。
利用 CMR-T2*的方法定量铁沉积是一种准确、无创且可重复的检查方法。这种方法可以明确心肌铁沉积的程度，使临床早期诊断心肌铁过载成为了可能，进而制定个性化的祛铁治疗方案，同时还可以动态评价祛铁治疗疗效，及时修改治疗方案。
CMR 还可以对心肌铁沉积患者进行心功能分析，评估是否出现心功能异常。患者出现 临床症状或心血管体征时，此时心铁过载已经十分严重，容易急速发展成心力衰竭。此时即使再加强去铁治疗，预后仍然不良。如果在临床前期诊断心肌铁沉积，加强去铁治疗，往往可以逆转病情。
CMR-T2*和心功能分析的缺陷是不能了解心肌组织病变情况。特别是当患者经过去铁治疗心肌 T2*值恢复正常后，是否存在心肌纤维化？是否还需继续治疗？使用 T1-mapping 技术测量铁过载患者心肌 ECV，可能可以了解其纤维化程度。进而指导临床祛铁治疗方案的制定。

PU-0958

Left Atrial Phasic Function Assessed by Feature Tracking CMR in Type 2 Diabetes Mellitus Patients with Preserved LVEF

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Background T2DM patients are associated with LA function abnormalities. The value of FT-CMR derived strain parameters in T2DM patients is unclear. Thus, we aim to assess left atrial (LA) phasic function in T2DM patients with preserved LVEF by using feature tracking-cardiovascular magnetic resonance (FT-CMR) imaging.
Methods One hundred consecutive patients diagnosed with T2DM and 20 age- and sex-matched controls underwent CMR imaging were prospectively enrolled. LA phasic functions were quantified by emptying fractional and CMR FT-derived strain and strain rate. εsand SRs, εeand SRe, εa and SRa were measured reflecting LA reservoir, conduit, and pump function, respectively.
ResultsLA reservoir, conduit function reflected by strains and strain rates were decreased in T2DM than controls. However, LA pump strain and strain rate were numerically higher than controls. The ROC analysis showed superiority of strain parameters (AUC of εs: 0.852, εe: 0.802, $p < 0.001$ for both) than traditional LAEF parameters (AUC of total LAEF: 0.671, $p = 0.014$; passive LAEF: 0.642, $p = 0.042$) to differentiate T2DM from controls. Multivariate linear regression analysis showed age was independent determinant of εs (β = - 0.248, $p = 0.018$) and εe (β = - 0.247, $p = 0.021$), DM duration and LV global longitudinal strain (GLS) were independent determinants of εe (DM duration: β = - 0.229 $p = 0.035$; LV GLS: β = - 0.298, $p = 0.002$) and εa (DM duration: β = 0.238 $p = 0.034$; LV GLS: β = 0.231, $p = 0.013$).
ConclusionsAside from LA pump function, LA reservoir and conduit function determined on FT-CMR are impaired in T2DM patients compared with controls regardless of LA size. FT-CMR derived strain parameters are superior in differentiating T2DM from controls. Phasic measurement of LA function using FT-CMR may add important information in clinical decisions.

PU-0959
血流储备分数为参考评价磁共振心肌灌注成像准确性的 Meta 分析

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目的 应用 Meta 分析的方法评价以血流储备分数（FFR）为参考，磁共振心肌灌注成像（MR-MPI）在诊断冠心病准确性中的价值。
方法 检索以 FFR 诊断为金标准，MR-MPI 诊断冠心病的文献，提取符合纳入标准的诊断试验数据。运用 Meta-disc1.4 和 STATA12.0 软件进行统计分析：包括异质性检验、发表偏倚检测等，合

并汇总敏感度(SEN)、特异度(SPE)、95%可信区间(95%CI)，绘制出受试者工作特性曲线(SROC)同时计算其曲线下面积(AUC)。

结果 本研究最终纳入文献 24 篇，评价了 1529 例患者和 4535 支血管。在患者水平汇总的敏感度和特异度分别为 0.88(0.85，0.90)、0.87(0.84，0.89)，在血管水平汇总的敏感度和特异度分别为 0.81(0.78，0.83)、0.89(0.88，0.90)，患者水平、血管水平对应的 AUC 分别为 0.93、0.92。

结论 以 FFR 为参考，MR-MPI 在诊断冠心病时敏感度及特异度较高，诊断能力强。

PU-0960

Evaluation of Cardiac Structure and Function in Patients with Chronic Mountain Sickness by 3.0TMRI

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Abstract:Objective:To evaluate the cardiac structure and function parameters of patients with chronic high altitude sickness (CMS) and healthy normal by cardiac magnetic resonance imaging (CMRI), and to evaluate the changes in cardiac structure and function of patients with CMS. Methods: The CMRI imaging data of 20 patients with chronic high altitude disease were retrospectively analyzed. Another 20 healthy people were selected as the control group. The 3.0T MRI instrument was used to measure and analyze the two groups of cardiac structure and functional parameters.cardiac structure parameters:AWOIVS,LVEDD,LAD,AOD,MPAD,RVOTD,RATD, RALD, RVTD and RVLD; left ventricular function parameters: LVEDV,LVESV, LVSVand LVEF; right heart Functional parameters: RVEDV,RVESV,RVSV,RVEF andRVMM. An independent sample t test was used to measure whether the difference between the two groups was statistically significant.Results: 1.The left and right ventricular structural parameters of the CMS group were larger than the control group, The difference between AWOIVS, MPAD, RVOTD,RALD and RVLD was statistically significant ($p<0.05$).2.In the left ventricular cardiac function parameters, the values of LVEDV and LVESV in the CMS group were larger than those in the control group, and the LVSV and LVEF values were smaller than those in the control group. There was no statistically significant difference in parameters between the two groups ($p>0.05$). 3. In the right ventricular cardiac function parameters, the RVEDV, RVESV and RVMM values in the CMS group were larger than those in the control group, and RVMM values were statistically significant between the two groups ($p<0.05$); RVSV and RVEF values in CMS group were lower than those in the control group, and RVSV and RVEF values were statistically significant between the two groups ($p<0.05$). Conclusion: CMRI can accurately evaluate the cardiac structure and function of patients with CMS. The heart structure and function of CMS patients have changed. The right heart structure and function change are the main factors, which will cause pulmonary hypertension,right heart enlargement, right ventricular outflow tract widened, right ventricular hypertrophy, AWOIVS thickening, right heart function decreased, and no significant effect on left heart structure and function.

PU-0961
压缩感知与传统电影序列在心功能评估方面的比较

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目的 在心血管疾病的诊断及预后判断中，心功能的评估发挥着重要的作用，而磁共振心脏电影是评估心脏功能的金标准。但是因其耗时较长且对患者呼吸配合的要求较高等原因，限制了其在临床上的使用。为了解决这一难题，科研工作者将压缩感知的技术应用于心脏磁共振领域。本次研究基于中国人群，探究压缩感知技术是否能代替传统的心脏电影序列。
方法 在 2018 年 2 月至同年 7 月间，我们选取了 28 名正常人群及 104 名有心脏基础疾病的患者，共 132 名作为研究对象，并分别对其进行传统心脏电影序列及压缩感知电影序列的扫描，扫描间隔时间不超过 10 分钟。并对其图像进行心功能定量分析。
结果 在 132 名研究对象中，有 88 名男性（平均年龄为 58±2 岁），44 名女性（平均年龄为 56±2 岁）。图像质量均较好，可做统计学分析。$LVEF_{CS}$ 与 $LVEF_{传统}$ 相比，存在统计学差异（$p<0.0001$），其平均差异为 7.0%，95%的置信区间为（6.1,7.9）。$LVEDV_{CS}$ 与 $LVEDV_{传统}$ 相比，未见统计学差异（$p=0.33$），其平均差异为 3.6ml，95%的置信区间为（-3.7,11.0）。$LVESV_{CS}$ 与 $LVESV_{传统}$ 相比，存在统计学差异（$p<0.05$），其平均差异为 4.9ml，95%的置信区间为（-9.8,0.1）。
结论 压缩感知技术会高估左室收缩末容积，致使射血分数存在明显偏差，因此压缩感知技术仍无法替代传统心脏电影。

PU-0962
心脏磁共振在心脏肿瘤与血栓中的鉴别诊断价值

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目的 心脏肿瘤与血栓的治疗方法及预后大有不同，因此在临床实践中正确鉴别诊断二者十分重要。本研究的目的是评价心脏磁共振（Cardiac Magnetic Resonance, CMR）在心脏肿块中的鉴别诊断价值。
方法 回顾性纳入 2014-2019 年期间临床怀疑心脏占位并行 CMR 检查共 50 例患者，心脏肿瘤及血栓的诊断参考标准是组织病理学结果及抗凝治疗后影像学手段随访肿块是否缩小。采集心脏肿块在 CMR 上的电影序列、IR 序列（Double /Tripple IR）、延迟增强序列（LGE）图像，对心脏肿块的位置、大小、运动性、CMR 信号、同质性及强化特征进行分析。采用 SPSS 25.0 统计学软件进行数据统计学分析。
结果 CMR 检查的 50 例患者中，未发现异常 5 例，不能明确诊断 6 例，有诊断参考标准 39 例，其中血栓 12 例，肿瘤 19 例，良性病变 8 例。心脏肿瘤组与血栓组患者性别、年龄、信号均质性及 TIWI 高信号比较，差异无统计学意义（$p>0.05$）。形态学特征上，血栓更小（5.7±2.7 vs 18.1±4.1cm^2, $p=0.017$），运动较弱或无运动（16.7% vs 68.4%, $p=0.09$）。以正常心肌信号作为参考，T2WI、DWI 及 LGE 序列上高信号在肿瘤组较血栓组更多见（分别为 89.5% vs 50%, $p=0.032$; 57.9% vs 8.3%, $p=0.08$; 89.5% vs 8.3%, $p<0.0001$）。肿瘤组各影像特征 ROC 曲线结果显示，LGE、肿块大小、肿块运动性及 DWI 高信号的 AUC 分别为 0.906、0.827、0.759、0.748。血栓多位于左室 58%（37/12），而肿瘤位置分布多变。

结论 CMR 可从形态、运动性、信号及延迟强化等特征鉴别心脏肿瘤与血栓。血栓通常更小、无运动、DWI 呈低信号且多不强化，LGE 及肿块大小在诊断心脏肿瘤方面具有很高的诊断价值，对临床诊断及治疗具有一定的指导意义。

PU-0963

Diagnostic accuracy of monoenergetic reconstruction and nonlinear blending on chronic myocardial infarction using dual-energy CT: comparison with 3T cardiac MR

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Background: Both monoenergetic reconstruction at 80Kev and non-linear blending images improves subjective image quality. However, comparative study of monoenergetic reconstruction and nonlinear blending late enhancement DECT (LE-DECT) is rare in detecting myocardial infarction.
Objective: To evaluate the image quality and diagnostic accuracy of both monoenergetic reconstruction and nonlinear blending LE-DECT in detecting myocardial infarction, as 3T cardiac MR a reference.
Methods: Twenty patients with coronary artery disease were prospectively enrolled and underwent LE-DECT and late gadolinium enhancement CMR (LGE-CMR). LE-DECT images were reconstructed as monoenergetic spectral images 40-190 Kev with 30 Kev interval and non-linear blending setting. Images were assessed for image quality, LE extent (percentile % of whole ventricle segments).
Results: Fifty-two myocardial segments (15%) showed LGE on CMR. LE-DECT detected 70 myocardial segments. The signal-noise ratio, contrast-to-noise ratio of images at 70Kev and non-linear reconstruction were better than that of other series. The sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of non-linear reconstruction in detecting myocardial infarction in per-segment level was 58%,92%,78%,90%,88%, respectively. However, LE extent detected at 70 Kev and non-linear reconstruction were overestimated 12% in comparison with CMR in per-segment level.
Conclusion: LE-DECT using monoenergetic reconstruction at 70Kev and non-linear reconstruction significantly improve image quality and diagnostic accuracy. However, LE extent of myocardial infarction detected with LE-DECT is overestimated compared with CMR.

PU-0964

CMRI 与超声心动图对高海拔地区正常人心脏结构及功能的评价研究

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目的 探讨心脏磁共振成像（CMRI）和超声心动图（UCG）对高海拔地区正常人在评价心脏结构及功能方面的应用价值。**方法** 选择世居高海拔地区 25 名健康正常人行 CMRI 检查，并将图像导入专用后处理工作站，测定前室间隔厚度、左房内径、左室舒张末内径、右房内径、右室流出道宽径、主肺动脉内径、主动脉窦部内径等心脏结构指标，并用 Argus 软件测定左室射血分数，并与超声心动图（UCG）测量结果进行比较。**结果** CMRI 与 UCG 测定右房内径、主肺动脉内径、左室射血分数分别为（40.11±4.18）mm、（33.41±2.34）mm；（22.82±1.12）mm、（22.41±1.33）mm；（52.06±9.69）%、（63.95±7.82）%，差异有显著性（p＜0.05），主肺动脉内径及左室射血分数相关性好；测定前室间隔厚度、左房内径、左室舒张末期内径、右室流出道宽径、主动脉窦部内径分别为：（9.79±1.05）mm、（9.68±0.95）mm；（34.10±3.19）mm、（33.68±3.37）mm；（49.73±4.18）mm、（48.64±3.65）mm；（30.19±2.71）mm、（29.77±2.96）mm；（29.86±2.22）mm、（29.95±2.42）mm，差异无显著性（p＞0.05），相关性好。CMRI 测定的左室射血分数低于 UCG 检测值。**结论** 对于高海拔地区人群，在测定左心结构方面 CMRI 和 UCG 均为较准确方法，在测定右心结构及心功能方面 CMRI 优于 UCG，CMRI 测量值更准确、可靠，临床应用当中 UCG 测量值会高估左室功能。

PU-0965

Value of cardiac MR strain in discriminating hypertrophic left ventricular noncompaction cardiomyopathy, isolated left ventricular noncompaction and hypertrophic cardiomyopathy

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Objective: To analyze the value of cardiovascular magnetic resonance (CMR) cine derived myocardial parameters to differentiate left ventricular non-compaction cardiomyopathy (LVNC) from hypertrophic cardiomyopathy (HCM) and controls.
Methods: We retrospectively analyzed 10 patients with isolated LVNC, 10 with hypertrophic cardiomyopathy and 10 hypertrophic LVNC, 20 sex and age matched controls were also collected. Cardiac MRI including cine steady-state free precession imaging was performed. Strain parameters were derived from longitudinal and short axial cine images using post-processing software. Global and segmental strain parameters were compared between groups.
Results: Strain parameters of hypertrophic LVNC group showed more remarkable difference with control group no matter in global (global longitudinal strain:(-7.57±3.59)% vs (-16.58±1.68) %; global circumferential strain:(-12.13±4.10)% vs (-19±2.24)%; global radial strain:(-7.57±13.55)% vs (-16.58±9.15)%, p<0.001) or segmental level which were prominent in mid and apical segmental longitudinal strain(mid longitudinal strain: (-7.27±3.77)% vs (-21.39±2.72)%; apical longitudinal strain: (-10.08±4.12)% vs (-18.34±2.85)%, p<0.001) compared with isolated LVNC or HCM group. Significant differences between isolated LVNC, HCM and hypertrophic LVNC were only shown in global circumferential strain((-16.95±2.49)% vs (-17.65±3.91)% vs (-12.13±4.10)%,p<0.01) and apical circumferential strain((-19.12±3.44)% vs (-

20.3±3.88)% vs (-13.16±5.13)%, p<0.01). Whereas no evident difference were found in other strain parameters between isolated LVNC, HCM and hypertrophic LVNC patients, so as to normal controls.
Conclusion: Hypertrophic LVNC has a remarkable different strain property derived from cardiac MR cine compared with isolated LVNC, HCM and normal controls which can be used an useful marker to differentiate between these groups.

PU-0966

Layer specific strain assessment of cardiac function in acute and chronic stages of myocarditis in a rat model

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Purpose The aim of present study was to investigate whether layer specific strain could reliably detect the characteristic of myocardial damage distribution in the course of myocarditis using cardiac magnetic resonance tissue-tracking(CMR-TT).
Methods Twenty Lewis rats were induced experimental autoimmune myocarditis (EAM) model by subcutaneously injecting with 1mg Porcine Cardiac Myosin into the footpad on days 0 and 7, respectively. Before administration, all rats underwent baseline CMR scanning(cine-FLASH sequence) on a 7.0T preclinical system, which obtained in a short-axis stack and two horizontal long-axis (2,4-chamber, 2C, 4C) views. Then, ten rats were rescanned cine-FLASH sequence on day 21 and another ten rats on day 35. Global endocardial and epicardial circumferential strain (CSendo, CSepi) were acquired on short-axis levels and longitudinal strain on two horizontal long-axis levels (2C-LSendo, 2C-LSepi, 4C-LSendo, 4C-LSepi). Next, rats were euthanized and histological evaluation was performed.
Results All rats that developed myocarditis verified by both histology and CMR. Compared with baseline, EAM subjects presented significant decreased CSendo, 2C-LSendo and 4C-LSendo on days 21 and 35(P<0.05), and significant decreased CSepi, 2C-LSepi and 4C-LSepi on day 21(P<0.05), but no difference in CSepi, 2C-LSepi and 4C-LSepi on day 35 vs baseline. CSendo, CSepi, 2C-LSendo, 2C-LSepi, 4C-LSendo and 4C-LSepi all were found statistical significance on day 21 vs day 35(P<0.05). Among them, all endocardial and epicardial strain values were lowest on day 21.
Conclusion Myocardial epicardium damage persists but endocardium gradually recovered over time in myocarditis. Myocardial layer specific strain could reliably detect the characteristic of cardiac impairment changes throughout the course of myocarditis.

PU-0967

Comparation of right ventricular myocardial deformation between cardiac amyloidosis and hypertrophic

cardiomyopathy with cardiac magnetic resonance tissue tracking

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Objectives: Left ventricular (LV) hypertrophy is an important differential diagnostic index in both patients with cardiac amyloidosis (CA) and hypertrophic cardiomyopathy (HCM). However, the diagnostic performance of right ventricular thickness (RVT) and RV deformation between CA and HCM is still lacking. This study aimed to assess RVT and RV deformation of CA and HCM patients by cardiac magnetic resonance (CMR) tissue tracking (TT) technique and determine the diagnostic accuracy of various RV parameters in differentiating CA form HCM.
Methods: Sixty CA (mean age 58±10 years; 33 males (55%)) and sixty HCM patients (mean age 55±14 years; 27 males (45%)) were retrospectively enrolled. We included 30 age- and sex-matched healthy volunteers (mean age 54±12 years, 17 males (57%) as controls. RVT and RV myocardial strain parameters including global radical peak strain (GRPS), global longitudinal peak strain (GLPS) and global circumferential peak stain (GCPS), were analyzed, respectively. To determine cutoff values of RVT and RV strain parameters for the diagnosis of CA from HCM, area under the curve (AUC) receiver operating characteristic curves were constructed.
Results: Compared with HCM patients, CA patients had significantly higher myoglobin, NT-pro BNP and Troponin-T (all $p<0.05$). Similarly, RVT of CA patients were significantly thicker than HCM patients (7.7±2.1 vs 5.9±1.3, $p=0.001$). Moreover, significantly decreased RV-GRPS (12.1±6.9 vs 23.5±12.1, $p<0.001$), RV-GCPS (-3.4±2.2 vs -5.6±3.5, $p<0.001$) and RV-GLPS (-4.6±2.3 vs -11.1±4.9, $p<0.001$) were observed in CA patients than those of patients with HCM. RVT and RV strain demonstrated comparable diagnostic accuracy to differentiate CA from HCM. Especially, RV GLPS combined RVT showed the best performance to discriminate CA (area under the curve = 0.92, 95% confidence interval: 0.85 to 0.96, $p=0.0001$).
Conclusions:
CMR-TT is a feasible technique for the analysis of RV deformation in CA and HCM patients. RV GLPS combined RVT presents the excellent diagnostic performance to differential CA form HCM.

PU-0968

Combined MR imaging for pulmonary embolism and deep venous thrombosis by contrast-enhanced MR volume interpolated body examination

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Objective: MR pulmonary artery imaging combined with MR venography was performed by using contrast-enhanced MR volume interpolated body examination (VIBE) sequence, aim of this study was to investigate the clinical value of this scanning protocol in the diagnosis of venous thromoembolism (VTE).
Materials and Methods: Thirty-four patients identified with deep venous thrombosis (DVT) by ultrasound were enrolled. Contrast-enhanced VIBE sequence was applied for visualizing pulmonary artery, abdominal veins, pelvic veins and bilateral lower extremity veins, ranging from inferior vena cava to ankle level. Two radiologists observed the MR pulmonary artery images in consensus, recorded the location and number of emboli, then observed MRV images of the abdominal, pelvis and lower extremities veins which based on per-vein segment. Cohen's kappa coefficient statistic was used to assess diagnostic agreement of DVT between MRV and ultrasound for venous segment-to-segment comparison.
Results: All patients were suffered with DVT by MRV images. MRV detected more venous segments with DVT than ultrasound based on per-vein segment analysis. The agreement rate for DVT detection between the two examinations were poor in deep femoral veins and anterior tibial veins (Kappa value <0.4), the agreement for the residual veins were good (Kappa value > 0.7). Twenty-three patients with pulmonary embolism (PE) were detected by MR pulmonary artery imaging. Twenty-one patients underwent both pulmonary CT angiography and MR imaging, consistency for PE detection between the two examinations was 100%. Total examination time of the combined MR protocol was 7 minutes for each patient.
Conclusion: The contrast-enhanced VIBE sequence can visualize the pulmonary artery, abdominal-pelvic vein and bilateral lower extremity veins simultaneously, which make it possible for detecting PE and DVT. This proved to be a promising method for VTE diagnosis in one-stop MR scanning procedure.

PU-0969

Diagnostic accuracy of true FISP, MR pulmonary angiography and volume-interpolated body examination for pulmonary embolism compared with CT pulmonary angiography

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Objective: This study evaluated the diagnostic accuracy of MR sequences for pulmonary embolism (PE) by true fast imaging with steady state precession (true FISP), contrast MR pulmonary angiography (MRPA) and volume-interpolated body examination (VIBE).
Materials and Methods: Twenty-one patients with confirmed deep venous thrombosis suspected of PE were enrolled. Emboli were analyzed on a per-patient and per-vessel basis with CT pulmonary angiography (CTPA) as reference standard. Sensitivity, specificity, PPV and NPV were calculated. ROCs were applied to compare differences in sequences by calculating the area under the curve (AUC). **Results:** Based on a per-patient and per-vessel analyses, sensitivity was 81.3% and 36.7% for true FISP, 82.4%

and 56.3% for MRPA, 94.4% and 68.1% for VIBE; specificity was 80% and 99.8% for true FISP, 100% and 99.2% for MRPA, 100.0% and 99.2% for VIBE; PPV was 92.9% and 98.3% for true FISP, 100.0% and 95.5% for MRPA, 100.0% and 96.9% for VIBE; NPV was 57.1% and 80.3% for true FISP, 50.0% and 88.2% for MRPA, 75.0% and 89.8% for VIBE. Compared with true FISP and MRPA, VIBE had the highest AUC. **Conclusion:** Enhanced VIBE was the most accurate sequence (95.2% per-patient basis; 91.1% per-vessel basis), especially for emboli in segmental pulmonary vasculature.

PU-0970
增强磁共振血管造影(CE-MRA)用于头颈部动脉狭窄

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目的 分析增强磁共振血管造影(CE-MRA)用于头颈部动脉狭窄诊断中的价值。**方法** 选择 2018 年 1 月-2019 年 3 月在本院就诊的头颈部动脉狭窄疑似患者 85 例，其中有同时行 CE-MRA、DSA 两种检查或 CE-MRA、CTA 及 DSA 三种检查的病例 29 例，以 DSA 检查为金标准，若存在动脉狭窄，以狭窄最严重段参与检查结果评估与分析。**结果** （1）29 例头颈部动脉狭窄疑似患者经 DSA 检出无狭窄或轻度狭窄者 11 例、中度狭窄 7 例、重度狭窄 7 例、完全闭塞者 4 例；（2）CE-MRA 检出无狭窄或轻度狭窄者 10 例、中度狭窄 6 例、重度狭窄 8 例、完全闭塞者 5 例，检查灵敏度分别为 90.91%、71.43%、85.14%、75.00%，检查准确率 82.76%；（3）经 CTA 检出无狭窄或轻度狭窄者 13 例、中度狭窄 6 例、重度狭窄 7 例、完全闭塞者 3 例，灵敏度分别为 72.73%、57.14%、85.14%、100.00%，检查准确率 75.86%；（4）CE-MRA、CTA 检查准确率数据差异无统计学意义（$P>0.05$）。**结论** 将 CE-MRA 用于头颈部动脉狭窄诊断中的价值良好。

PU-0971
采用磁共振心肌组织追踪技术定量评估心肌炎患者左室心肌应变力的变化

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目的:通过磁共振心肌组织追踪技术定量评估心肌炎患者左室心肌应变力的变化规律。**方法** 连续性收集我院近两年确诊为心肌炎的患者 20 例，同时招募入组健康成年志愿者 37 例，采用 CVI42 后处理软件在磁共振图像（MRI）上测量左心室 3D 全局径向峰值应变（GPRS）、全局纵向峰值应变（GPLS）、全局周向峰值应变（GPCS）及心功能，进而探讨心肌炎患者与健康成年志愿者左室全局峰值应变和心功能的变化及相关性。**结果** 与志愿者相比，心肌炎患者舒张末期容积与左室射血分数显着降低（$P<0.001$），每搏输出量、心排出量及心指数降低（$P<0.05$）；全局应变力均下降，其中 GPRS、GPLS 远低于对照组，差异具有统计学意义（$P<0.001$），且 GPLS 最具鉴别效能，曲线下面积为 0.818，最佳阈值为-12.995，敏感度和特异度分别为 75%和 75.7%；此外，GPRS 与 GPCS 呈中度负相关（$P<0.001$），与 GPLS、ESV 呈轻度负相关（P 均<0.05），与 EF 呈中度正相关（$P<0.05$）；GPCS 与 EF 呈轻度负相关（$P<0.05$），与 ESV 呈中度正相关（$P<0.001$），与 EDV 呈轻度正相关（$P<0.05$）。**结论** 全局周向、径向及纵向应变力对于区分心肌炎与正常人左心室心肌功能变化具有重要意义，可用于心肌炎的早期诊断，以提高 CMR 对心肌炎诊断的准确率。

PU-0972

二尖瓣赘生物：感染性心内膜或心脏瓣膜肿瘤？

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目的 瓣膜赘生物是诊断感染性心内膜炎（infective endocarditis IE）的主要标准，当 IE 患者临床表现及赘生物形态不典型时，通常需要与其他瓣膜受累疾病鉴别。影像学检查手段有助于瓣膜病变的定位、定性及鉴别诊断。本文报道 1 例与心脏乳头状弹力纤维瘤（Cardiac papillary fibroelastomas CPF)影像表现相似的 IE 二尖瓣赘生物，提高临床医生的诊治经验。
方法 回顾分析我院收治的 1 例感染性心内膜炎二尖瓣赘生物患者的临床表现、实验室检查、影像学资料及病理结果。
结果 男性，53 岁，因“发热 20 余天”入院，伴咳嗽、咳痰，阵发性胸痛。入院后实验室检查示白细胞 11.46*10^9/L↑，高敏心肌肌钙蛋白 I 88.8 pg/mL↑，氨基末端脑钠肽前体 493pg/mL↑，血沉 53 mm/H↑，超敏 C 反应蛋白 86.7 mg/L↑，降钙素原 0.58 ng/mL↑，神经元特异性烯醇化酶 24.89 ug/L↑，糖链抗原 72-4 62.11 U/mL↑。体格检查各瓣膜区未闻及病理性杂音。血培养/痰培养/大便培养/尿培养+药敏及寄生虫检查均未见阳性结果。经食道超声心动图示二尖瓣前叶左房侧中等回声影附着，二尖瓣开放受限，考虑为 CPF 或 IE 可能。心脏磁共振示二尖瓣前叶增厚并见大小约 14*10mm 异常信号赘生物，运动良好，收缩期脱入左室，DWI 未见明显弥散受限，mapping 序列上初始 T1 值约 1460ms，T2 值约 44ms。首过灌注呈轻度充盈缺损，延迟增强未见明显强化，晚期黑血 TIWI 序列上明显强化。初步考虑为 IE 所致可能性大，不除外 CPF。术后病理**结果**（二尖瓣赘生物）符合感染性心内膜炎病理改变。
结论 瓣膜赘生物的鉴别诊断包括 IE、钙化、血栓、心脏肿瘤（尤其是 CPF）。不同病因所致的瓣膜病变治疗手段大相径庭，临床医生应充分利用多模态影像学手段进行瓣膜赘生物的鉴别诊断并及时治疗。

PU-0973

Dynamic Deuterium MRS Imaging for Studying Rat Heart Energy Metabolism in vivo - Initial Experience

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Introduction
Assessment of energy metabolism is crucial for understanding myocardial activity and function under physiopathological conditions. Myocardium mainly obtained energy *via* aerobic oxidation of various energy substrates including fatty acids (>60%) and glucose. MR perfusion imaging and SPECT perfusion imaging are commonly used to assess blood supply of the myocardium, myocardial ischemia and viability of the myocardium (1). However, these methods are unable to evaluate the myocardial cellular activity and metabolism directly. Recently, we developed a novel Deuterium (^{2}H) MR (DMR) spectroscopic (DMRS) approach for assessing energy metabolisms in preclinical rat brain at ultrahigh field (2). This new method is advantageous since it eliminates the

radioactive tracer commonly employed in SPECT imaging of myocardial metabolism; and it allows more signal averaging to gain sensitivity per unit time owing to shorter T_1 of deuterated metabolites with quadrupolar relaxation mechanism. In this study, we aimed to develop and utilize the dynamic DMRS method for assessing myocardial energy metabolisms in the rat heart at 16.4 T.

Method

Three Sprague Dawley rats (BW=432±34 g) were anesthetized by 2% isoflurane, and their femoral arteries and veins were catheterized for blood sampling, physiological monitoring and deuterated glucose and/or acetate infusion. Rectal temperature was maintained at 37±1℃ using heated circulating water. The arterial blood pressure and heart rate were monitored during the entire experiment. The animal study protocol was approved by the Institutional Animal Care and Use Committee of University of Minnesota, and were compliance with the ARRIVE guidelines. All MR experiments were conducted at 16.4 T/26 cm bore scanner (Varian/VNMRJ) using a small (~1.2cm diameter) ^{2}H surface coil for deuterium data acquisition and a large (~3.5cm diameter) ^{1}H surface coil for anatomical imaging. The ^{2}H coil was inserted into the rat chest via thoracotomy and placed between the chest wall and the heart with the animal in prone position. The ^{1}H surface coil was placed at the left side of the chest at the same level of the heart (see Figure 1). A single-pulse-acquire sequence was applied to obtain dynamic DMR spectra with 30 s temporal resolution for 60 min. For each rat, 2 min baseline spectra were acquired followed by 5 min i.v. infusion of deuterated D-Glucose-6,6-d (d66, Cambridge Isotope Laboratories, Inc., 1.0 g/kg BW) or/and deuterated sodium acetate-d_3 (Sigma Aldrich, 1.0 g/kg BW) dissolved in 2.5 mL saline. The ^{2}H 3D-CSI data of rat hearts were also acquired before and after injection of glucose and/or acetate with 124 mL nominal spatial resolution in approximately 5 min (spectral width=3 kHz; TR = 45 ms; FOV=4′4′4 cm^3, 9′9′5 phase encodes, 15 averages). All resonance signals (deuterated water, glucose (Glc), glutamate/glutamine (Glx), acetate) were fitted using a MATLAB based program (2).

Result

We were able to successfully place the ^{2}H surface coil underneath the heart and reduce the heart motion caused by breathing during the experiment; the position of the heart and coils were illustrated in Figure 1; it also displays DMRS imaging of natural abundance Deuterium-labeled water with excellent sensitivity and spectral quality in rat heart *in vivo*. Figure 2 shows representative DMR spectra of rat hearts (black and red traces represent original and fitted spectra) under 4 min post-infusion of deuteriated-acetate (a) and 10 min post-infusion of deuteriated-glucose (b). Model-decomposed individual components of deuterated water, acetate, glucose and Glx could be characterized clearly. Figure 3a displays the time courses of deuterated glucose, Glx and water signals before, during and after infusion of d66 based on the model fitting of the *in vivo* ^{2}H spectra as shown in Figure 2a. Figure 3b showed the time courses of deuterated water with glucose and acetate infusion, respectively. Significantly higher production of the deuterated water was observed with acetate infusion as compared to the glucose infusion.

Discussion & Conclusion

Myocardium mainly produces ATP energy *via* aerobic oxidation of various substrates including fatty acids and glucose with preference on fatty acids. The observed higher deuteriated-water production under acetate infusion in the heart could be due to the

higher concentration of ^{2}H in acetate infusion than that of glucose; 1g /kg BW of acetate and glucose was used for this study, the concentration of ^{2}H in acetate is about 3.2 times higher than that of glucose. This work demonstrates the feasibility and sensitivity of the in vivo DMR imaging technique for assessing myocardial energy metabolisms, which makes it possible to image the energy metabolism and assess cardiomyocyte activity in hearts under normal and diseased states (such as myocardial ischemia&myocardial infarction) at high/ultrahigh field. Further studies and quantification modeling are needed to find more characteristics of cardiac energy metabolism.

PU-0974

Qualitative and quantitative evaluation of the cardiac magnetic resonance T1 mapping motion correction

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Purpose
To explore the clinical feasibility of motion correction based on phase sensitive inversion recovery (PSIR) in cardiac magnetic resonance (CMR) T1 mapping by evaluating quantitative parameters and image quality.
Methods and materials
Fifty-four patients with diverse cardiovascular diseases and 14 normal participants were prospectively enrolled. CMR T1 mapping using modified look-locker inversion recovery (MOLLI) sequences with (MOCO) and without (NOMOCO) motion correction technique were performed. Region of interest (ROI) were manually delineating of endocardial and epicardial borders and blood pool. The pre-/post- T1, ECV, signal-to-noise ratio (SNR) and contrast-to-noise ratio (CNR) values of two groups were measured and compared. The subjective image quality was assessed using a 4-point score scale.
Results
The Bland-Altman plots showed a good agreement between MOCO and NOMOCO images in pre-contrast T1 values and ECV values. SNR values of native T1 images in MOCO group were significantly higher than NOMOCO group (1.97±0.27 vs 1.92±0.28, P<0.01), while there were no significant differences in SNR of post T1 images (P=0.54). Both in pre-/post-contrast T1 maps, CNR values of MOCO images were significantly greater than that of NOMOCO images (pre: -1.01, -1.15 to -0.89 vs -0.98, -1.10 to -0.83; and post: 0.31, 0.26 to 0.42 vs 0.29, 0.25 to 0.38, respectively; all P<0.01). The subjective image quality was significantly improved when MOCO technique was applied.
Conclusion
T1 mapping images with MOCO technique showed a good agreement in quantitative analysis and improved image quality compared to conventional MOLLI T1. T1 mapping with a robust motion correction based on phase sensitive inversion recovery has a potential in clinical quantitative diagnosis, especially for patients with poor breath-holding.

PU-0975
动脉粥样硬化早期易损斑块 MRI 诊疗一体化纳米探针的构建及分子成像研究

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目的 制备一种靶向多功能诊疗一体化纳米探针，实现对动脉粥样硬化易损斑块的早期无创高分辨成像与精准靶向治疗。**方法** 利用易损斑块泡沫细胞高表达的清道夫受体（SR-AI）作为靶点，以介孔二氧化硅包被的超小超顺磁性氧化铁纳米颗粒（FMSNs）为载体，整合与 SR-AI 具有高亲和力的多肽 PP1 及高效治疗药物 Atorvastatin，制备可精准靶向易损斑块的高分辨磁共振诊疗一体化纳米探针（Atorvastatin@FMSNs-PP1），对其进行表征及生物相容性分析。体外培养泡沫巨噬细胞(RAW 264.7)，建立 $ApoE^{-/-}$ 鼠动脉粥样硬化模型，并进行体内外 MR 连续动态成像，根据 T2WI 信号动态变化半定量分析探针在斑块的分布聚集情况，最终进行组织学定量分析，验证其检出斑块的负荷、性质及纳米探针的靶向治疗效果。**结果** 本研究制备的 Atorvastatin@FMSNs-PP1 具有良好的生物相容性和超顺磁性，适合作为易损斑块 MR 分子成像造影剂。细胞吞噬实验显示 Atorvastatin@FMSNs-PP1 对泡沫巨噬细胞具有高度结合特异性和亲和力。体内 MR 成像结果表明，$ApoE^{-/-}$鼠尾静脉注射靶向探针 24 小时后，动脉粥样硬化易损斑块处 T2WI 信号显著降低。斑块组织切片普鲁士蓝染色证实，纳米探针 Atorvastatin@FMSNs-PP1 在高表达 SR-AI 的易损斑块高度聚集。同时，活体 MRI 连续动态监测结果证明易损斑块可被靶向递送的 Atorvastatin 药物有效抑制。**结论** 本研究制备的 MRI 诊疗一体化纳米探针 Atorvastatin@FMSNs-PP1 可准确靶向具有易损倾向的斑块，多角度精确分析早期易损斑块的性质、成分等病理信息，并同步精准投递治疗药物，从而提高早期易损斑块 MRI 检出率、减少用药频率、提高药物利用率，为实现真正意义的易损斑块早期一体诊疗及无创动态监测提供了可靠依据和实验数据支持。

PU-0976
兔颈总动脉粥样硬化斑块建模新方法及超小锰铁氧体新型对比剂 MRI 成像可行性研究

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目的探索经兔耳中央动脉穿刺入路，行球囊导管损伤颈总动脉内膜联合高脂饲料喂养，构建兔颈总动脉粥样硬化斑块的动物模型新方法。利用 3.0T 磁共振仪验证超小锰铁氧体新型对比剂对动脉粥样硬化斑块 T1 增强成像能力的可行性。
材料与方法经兔耳中央动脉穿刺入路，行球囊导管损伤右侧颈总动脉内膜，再经高脂饲料喂养 8 周，建立兔颈总动脉粥样硬化斑块的动物模型。将经球囊导管损伤的右侧颈总动脉作为斑块侧，将未经球囊导管损伤的左侧颈总动脉作为对照侧。在 3.0T 磁共振仪上，采用快速自旋回波 T1 加权序列，获得兔颈总动脉横轴位普通扫描和各个时间节点超小锰铁氧体纳米颗粒横轴位增强扫描图像。分别对 T1WI 横轴位普通扫描图像、各个时间节点超小锰铁氧体纳米颗粒 T1WI 横轴位增强扫描图像进行动脉壁信号强度和背景噪声的标准差测量，计算获得信噪比。
结果超小锰铁氧体纳米颗粒注入后斑块侧颈总动脉血管壁立即强化，在 7min 时信号强度（897.5±131.2）和信噪比（399.1±54.2）达到峰值，其维持强化超过 100min。超小锰铁氧体纳米颗粒注入后，斑块侧在不同时间节点颈总动脉血管壁信号强度（R=-0.68，P<0.01）、信噪比

（R=-0.69，*P*<0.01）的变化有显著相关性，对照侧在不同时间节点的血管壁信号强度（R=-0.59，*P*<0.01）、信噪比（R=-0.64，*P*<0.01）的变化有相关性。
结论球囊导管损伤颈总动脉内膜采用了独创的兔耳中央动脉穿刺入路，为构建兔颈总动脉粥样硬化斑块动物模型开辟了新思路。超小锰铁氧体纳米颗粒可作为 MRI 对比剂，并且可应用于颈总动脉粥样硬化斑块 T1 增强成像，为动脉粥样硬化斑块的检测提供了新选择，尤其是钆对比剂受限的患者。

PU-0977
非增强磁共振胸导管成像联合腹盆部磁共振扫描在女性生殖系统乳糜漏中的应用

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目的 探讨非增强磁共振胸导管成像（non-contrast magnetic resonance thoracic ductography MRTD）及磁共振（magnetic resonance MR）腹盆腔扫描在女性生殖系统乳糜漏中的应用价值。
方法 回顾性分析 18 例女性生殖系统乳糜漏患者 MRTD、直接淋巴管造影（direct lymphangiography DLG）、核素淋巴显像（lymphoscintigraphy LSG）中胸导管主干及出口区域的可视化，把胸导管主干分为上中下三段，对其可视化程度进行评分及统计学分析；比较 MRTD、DLG、LSG 对胸导管出口区域的显示率。回顾性分析 MR 腹盆部的异常表现。
结果 MRTD 胸导管主干全程显影（visualization of the main thoracic duct ）17 例（94.4%），DLG 胸导管主干全程显影 12 例（66.7%），LSG 不能显示胸导管。MRTD 上、中、下各段胸导管可视化程度均高于 DLG（*P*=0.00）。MRTD 成功显示胸导管出口区域 18 例（100%）;其中左侧引流 10 例，右侧 1 例，双侧 6 例。DLG 出口区显影 12 例（66.7%），均提示胸导管出口梗阻，左侧引流 9 例，右侧 1 例，双侧 2 例。LSG 静脉角区域显影 7 例（38.9%），均呈放射性持续浓聚，提示胸导管出口梗阻，左侧显影 3 例，右侧 1 例，双侧 3 例。MRI 腹盆腔平扫发现 18 例（100%）盆腔及腹膜后淋巴管均有不同程度扩张、紊乱，发现脾脏多发淋巴管瘤 6 例（33.3%），皮下多发淋巴管瘤 7 例（38.9%），多发骨质异常 6 例（33.3%）（Gorham/骨淋巴管瘤）。
结论 非增强 MRTD 作为一种无创的、便捷的影像学手段在胸导管及其出口的显示中具有优势，联合 MR 腹盆部扫描可为女性生殖系统乳糜漏患者做出更全面的评估，并为后续治疗提供指导，应把其纳入到此类患者的诊疗常规中。

PU-0978
磁共振检查对纵隔病变诊断的价值

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目的 通过对纵隔 MR 检查技术的研究，探讨 MR 不同序列在纵隔病变检出中的作用。**材料和方法** 回顾性分析纵隔磁共振检查患者 88 例，男 58 例，女 40 例。设备 1.5T 核磁共振检查仪，腹部相控阵线圈，所有患者采取平扫和增强扫描。扫描序列：SSFSE T2WI，采用屏气法扫描横轴面、冠状面和矢状面；FSE T2WI-FS 采用呼吸触发扫描横轴位；in-out phase T1WI 采用屏气扫描横轴位；三维快速梯度回波 T1WI 序列动态增强扫描。分析不同序列对不同大小病灶、不同信号特征的

病灶以及不同分布病灶的检出价值。**结果** 88 例患者，病灶<1.5cm 38 例，病灶>1.5cm 50 例；囊性病灶 26 例，实性病灶 62 例；富血供 18 例，血供不丰富或乏血供的 70 例。1 不同序列病灶的检出：in-out phaseT1WI 显示最佳；SSFSE T2WI 不抑脂横轴面、矢状面次之；再次是 T2WI-FS 序列；T1WI+C 对富血供的大病灶易检出；2 不同病灶特征病灶的检出：>1.5cm、远离大血管病、富血供、囊性灶易检出。<1.5cm、距离纵隔内大血管较近病灶不易检出。
结论 不抑脂的同反相位 T1WI 序列和不抑脂的横轴面单次激发序列由于纵隔内脂肪高信号的衬托容易检出病灶，是纵隔检出的首选序列；抑脂的横轴面 T2WI 序列对于囊性病灶、大病灶和远离血管的病灶容易检出，为诊断定性提供有帮助的信息；增强扫描对富血供的病灶有特征性的表现，也为诊断定性提供有帮助的信息。对于小于病灶、距离纵隔内大血管较近的病灶不易检出，有待于序列和参数的优化，更好的发现病灶诊断病变。

PU-0979

纵膈磁共振成像技术的临床应用研究

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目的 探讨纵膈磁共振扫描成像技术。**方法** 采用 GE 公司 3.0T 磁共振仪，对 40 例患者做纵膈磁共振成像，扫描方法及脉冲序列：横轴位 FSE T2WI、FSET1WI ，冠状位及矢状位 FSET2WI，所有 T2WI 采用脂肪抑制技术。**结果** 横轴位能清晰显示病变与周围解剖结构关系。冠状位，矢状斜位能清晰显示病变的大体轮廓及与相邻组织关系。**结论** 正确的扫描方法，合理的参数和脉冲序列有助于显示正常纵膈剖结构及病变，帮助定位和诊断。

PU-0980

A comparative study of contrast-enhanced and unenhanced MR Pulmonary Angiography in the diagnosis of pulmonary embolism

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Purpose： To evaluate detection of pulmonary embolism (PE) using conventional contrast-enhanced MR angiography and unenhanced MR angiography applying spatial labeling with multiple inversion pulses sequence (SLEEK) imaging.
Method and Material: 26 patients (15 males and 11 females) diagnosed with PE using computed tomographic(CT) a underwent contrast-enhanced MR pulmonary angiography and SLEEK MR angiography within 48 hours after CT scans. Written consent forms were obtained prior to MR scans. Images from each sequence was analyzed separately by two independent reviewers who recorded presence of emboli in categorized pulmonary artery anatomic territories. CT angiography results were analyzed by a third independent reviewer, who retrospectively recorded presence of emboli using the same format; these review results were used as reference. Sensitivity, specificity, and positive and

negative predictive values for PE detection were calculated and compared for each MR acquisition based on a per-embolus basis, and 95% confidence intervals were calculated according to the efficient-score method. A two-sample t test was used to compare values between different MR acquisitions .Weighted K values were calculated to evaluate the consistency between results from the readers.
Results: Calculated sensitivities for PE detection were 78.8% for CE-MR pulmonary angiography and 83.8% for SLEEK MR angiography respectively. However if the results from two MR sequences were simultaneously used, the overall sensitivity was improved up to 85.4%. Specificities for PE detection was 97.7% for CE-MR Pulmonary angiography and 100% for SLEEK MR angiography., if two MR sequences were simuteanously used the overall specificity was improved up to 100%. Consistency between readers was considerably high (k=0.87).
Discussion and conclusion: Contrast-enhanced MR pulmonary angiography and SLEEK MR angiography possessed relatively similar sensitivity and specificity. There were complementary benefits to combine these two MR sequences for the evaluation of PE. However, considering the non-invasive property of SLEEK MR angiography, where no contrast agent was required, it might become a potential diagnostic strategy for pulmonary embolism.

PU-0981

3.0T MRI 在食管癌 T 分期及可切除性评估的重要价值研究

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目的 运用新一代高场强磁共振最新序列（主要是 T2WI-BLADE、T1-STAR-VIBE）及动态增强扫描、延迟扫描，对食管癌进行多方位、多序列成像，评估病灶的 T 分期和可切除性。为临床诊断、治疗方案、手术方式及预后评估提供重要证据。
方法 对本院 30 例活检病理已确诊为食管癌的患者进行前瞻性评估，包括①T2WI-BLADE 对食管癌 T 分期及可切除性评估，②T1-STAR-VIBE 对食管癌 T 分期及可切除性评估，③T2WI-BLADE 联合 T1-STAR-VIBE 对食管癌 T 分期及可切除性评估；而后参照术中及最后病理结果，分别对以上三种评估方法的敏感性、特异性、准确性等进行分析统计。
结果 以上三种针对食管癌 T 分期及可切除性评估方法，均具有较高的敏感性、特异性、准确性，以 T2WI-BLADE 联合 T1-STAR-VIBE 对食管癌 T 分期及可切除性评估效果最佳。
结论 新一代高场强磁共振最新序列能够清楚的显示食管粘膜层、粘膜下层、固有肌层、纤维膜和向外侵犯情况，其 T 分期结果、可切除性评估与病理检查结果具有较高一致性，可为临床医师选择食管癌的治疗方案、预后评估提供重要依据和价值。

PU-0982

Clinical application value of diffusion weighted whole body imaging with background body signal suppression in malignant tumors

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Clinical application value of diffusion weighted whole body imaging with background body signal suppression in malignant tumors
Objective: to understand the principle of diffusion weighted whole body imaging with background body signal suppression and to explore its clinical application value in the display of malignant tumors and distant metastases. Methods: two patients who have been pathologically confirmed lung squamous cell carcinoma and systemic metastasis underwent diffusion weighted whole body imaging with background body signal suppression examination,then compared its findings with CT. Results: diffusion weighted whole body imaging with background body signal suppression can well show metastases in the rest of the body in addition to the primary tumors and distant metastases found by CT examination. Conclusion: diffusion weighted whole body imaging with background body signal has the advantages of wide coverage and no ionizing radiation. It has potencial clinical application value in the screening of malignant tumors and distant metastases.

PU-0983

MRI 对前纵隔偶发肿瘤样结节的初步评价

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目的探讨 MRI 对前纵隔偶发肿瘤样结节(最大径≤3 cm)的评价价值。方法 回顾性分析 52 例行 CT 检查时偶然发现的前纵隔肿瘤样结节的 MRI 征象，分析结节的形态、信号特征，周围脂肪间隙及结节与纵隔结构、肺组织的界面情况，化学位移成像及增强后信号变化情况及强化程度。所有病例均经手术证实。 结果 52 例偶发肿瘤样结节中，胸腺囊肿 30 例，支气管源性囊肿 9 例，心包囊肿及脉管囊肿各 1 例；胸腺增生 3 例，胸腺退化不全 2 例；淋巴结 2 例；淋巴组织增生 4 例。前纵隔偶发肿瘤样结节中囊肿占 78%，多表现为长 T1 长 T2 信号，呈圆形或椭圆形，随呼吸幅度变化具备一定塑形性，边界光整，T1WI 增强无强化或囊壁轻度强化；胸腺增生呈四边形、三角形，双锥形，化学位移成像反向位信号衰减。前纵隔淋巴组织增生呈软组织信号结节，结节内部信号不均，坏死区呈稍长 T1 较长 T2 信号，DWI 呈稍高信号。 结论 前纵隔偶发肿瘤样结节具有一定 MRI 特征，根据其 MRI 表现，多数可与肿瘤性病变区分,指导临床选择合适的诊疗路径。

PU-0984

Intratumor septum: an important imaging signfor differentiating thymic solid tumors

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Purpose: To study the types and incidences of intratumor septal signs among thymomas, thymic carcinomas and thymic lyhmphomas using MR diffusion weighted imaging (DWI) and T2 weighted imaging (T2WI).

Materials and Methods: Fifty-six patients with pathologically diagnosed thymic tumors who underwent DWI and T2WI were retrospectively enrolled. Intratumor septal signs were classified into four categories based on MR images: no septum, single line, reticulate and central patchy. Comparison was made on the types and incidences of intratumor septal signs among different thymic tumors.
Results: Among56 thymic solid tumor patients,30 were men, with the mean age of, 46 years (5 to 69 years). 23 (41.1%) patients had thymomas, 16 (28.6%) patients had thymic carcinomas, and the rest 17 (30.4%) had thymic lymphoma. Intratumor septal signs were found in all thymoma patients, and reticulate septum in 17(73.9%) cases of thymoma. Central patchy signs were identified in 13 (81.3%) thymic squamous carcinoma, and no obvious septum was found in 3 (18.8 %) cases of thymic neuroendocrine carcinoma. In thymic lymphoma, single line septal signs existed in 4 (23.5 %) patients, and central patchy signs in 3 (17.6 %) patients, and no intratumor septum was seen in 10 (58.8 %) patients.
Conclusion: The types and incidence of intratumor septumare different in different thymic solid tumors, which is of value in the differential diagnosis of thymic tumors based on MR DWI and T2WI.

PU-0985

DW-MRI for esophageal squamous cell carcinoma, correlations between ADC values with histologic differentiation and VEGF expression: A retrospective study

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Abstract. The aim of the present study was to assess the correlations between diffusion-weighted magnetic resonance imaging (DW-MRI) features with the histologic differentia-tion and the expression of vascular endothelial growth factor (VEGF) in esophageal squamous cell carcinoma (ESCC). A total of 52 patients with ESCC included in the present study received radiotherapy, and all patients underwent contrast enhanced MRI and DW-MRI prior to and following radio-therapy. The diffusion sensitivity coefficient (*b* value) was set as 800 s/mm². Apparent diffusion coefficient (ADC) values were automatically computed. VEGF expression was evaluated by immunohistochemical staining. The results demonstrated that the pathological grading of ESCC was positively correlated with ADC values (r=0.635, P=0.0007), and the VEGF expression was inversely correlated with ADC values (r=-0.321, P=0.008). However, no correlation was identified between the pathological grading and the VEGF expression (r=0.178, P=0.284). All patients were categorized as complete response (CR) or partial response (PR) and the ADC values were increased significantly following radiotherapy. The mean ADC values in the CR group were higher than the PR group prior to radiotherapy (t=5.156, P=0.0004). Therefore, we concluded that the DWI with ADC value measurement may represent the grade of tumor histologic differentiation and the degree

of VEGF expression, and may also serve as a useful marker to predict radiotherapy and anti-VEGF response in ESCC. ADC value may be a substitution for assessing tumor angiogenesis and novel prognostic factor and contribute to the treatment of ESCC.

PU-0986
肺孤立性实性病变的磁共振弥散成像技术优选

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目的
对肺孤立性实性病变的患者进行磁共振弥散加权成像（Diffusion-weighted MR Imaging，DWI），通过对比快速自旋回波弥散成像(Turbo Spin Echo Diffusion-weighted MR Imaging，TSE-DWI)与平面回波弥散成像(Echo Planar diffusion weighted imaging，EPI-DWI)对病灶的图像质量、变形率、成像效率及主观评分，寻找对肺孤立性实性病变成像较好的弥散成像技术。
材料与方法
采用 3.0T MRI 对 40 例肺孤立性病变进行 TSE-DWI 序列及 EPI-DWI 序列扫描(b 值=600 s/mm2)。分别测量常规 TSE-DWI 序列及 EPI-DWI 序列图像的信噪比，孤立性病变区及脊髓的 ADC 值，比较其变形率及成像效率，并进行统计学处理。由 2 名 5 年以上工作经验的放射科诊断医师，采用双盲 3 分法分别对 TSE-DWI 序列及 EPI-DWI 序列图像质量进行评分，并结果行一致性评价。
结果
TSE-DWI 序列的信噪比为 17.40±7.7，EPI-DWI 序列的信噪比为 13.92±7.73，两者之间有统计学意义（P=0.032＜0.05）。40 例 TSE-DWI 序列的 ADC 值为 1.88±0.99×10-3 ㎜²/s，36 例 EPI-DWI 序列病灶的 ADC 值为 1.71±0.96×10-3 ㎜²/s，两者之间有统计学意义（P=0.006＜0.05）。40 例 TSE-DWI 的变形率为 0.02±0.06×100%，36 例 EPI-DWI 的变形率为 0.41±0.38×100%，两者之间有统计学意义（P=0.00）。
结论
TSE-DWI 序列信噪比、变形率、成像效率及主观评分较 EPI-DWI 序列高，能准确反映肺孤立性病变的位置及形态，更有利于对病灶的准确测量，可以应用于胸部孤立性病变的常规扫描。

PU-0987
DCE-MRI 扫描定量参数在肺结节鉴别诊断中的应用价值

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目的：探究 DCE-MRI 扫描定量参数在肺结节鉴别诊断中的应用价值.方法对 31 例肺结节患者共 39 个结节行 3T DCE-MRI 检查，动态增强采用 TWIST-VIBE 序列行 200 期扫描(空间分辨率为 1.6 mm×1.6mm×5 mm，时间分辨率为 2s)。测得所有病灶的血流动力学参数(Ktrans、Ve、Kep、iAUC)。 对良恶性病变的定量参数进行独立样本 T 检验分析，并用 ROC 曲线对其进行诊断效能分析。**结果** 采用 TIST-VIBE 序列的 DCE-MRI 可成功应用于病人的灌注扫描。良性病变的定量参数 Ktrans、Kep、Ve、iAUC 分别为 0.287±0.182/ml、0.957±0.739/ml、0.416±0.239/ml;恶性病变的定量参数 Ktrans、Kep、Ve、iAUC 分别为 0.737±0.387/ml、2.426±3.238/ml、0.482±0.185/ml、30.467/13.698/ml。 所有定量参数在良恶性病变之间 Ktrans、Kep、iAUC 具有显著的统计学差异。Ktrans 诊断的敏感度、特异度、准确性、曲线下面积分别为 80.8%、76.9%、

79.5%、0.893；Kep 诊断的敏感度、特异度、准确性、曲线下面积分别为 84.6%、76.9%、82.1%、0.784；iAUC 诊断的敏感度、特异度、准确性、曲线下面积分别为 76.9%、61.5%、71.8%、0.772。结论：DCE-MRI 扫描定量参数能提供肺结节血流动力学方面的信息，由 VIBE 序列获取的定量参数 Ktrans、Kep、iAUC 在病变诊断方面具有较高的敏感性及准确性,其中 Ktrans 诊断效能最佳。对肺部良恶性肿瘤的鉴别诊断具有较高价值。

PU-0988

Motion-suppressed GRASP MRI for multiphase assessment of the lung: initial experiences

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Objective: This work aimed to test the performance of free-breathing dynamic contrast-enhanced MRI (DCE-MRI) of the lung using golden-angle radial sparse parallel MRI with motion suppression (Motion-Suppressed GRASP). **Methods:** Thirty-nine patients with known pulmonary lesions were recruited to participate in this prospective study. A prototype fat-statured T1-weighted stack-of-stars golden-angle radial sequence was employed for data acquisitions. Based on the data classification criteria, 20 datasets were selected into group one for testing the Motion-Suppressed GRASP reconstruction. Each radial dataset was reconstructed using both Motion-Suppressed GRASP employing a soft-weighted iterative reconstruction algorithm and standard GRASP without motion compensation. Post-contrast conventional Volumetric Interpolated Breath-Hold Examination (BH-VIBE) images were acquired for additional comparison. Corresponding breath-held post-contrast CT images was also available in three patients for comparison. Two experienced readers blinded to reconstruction and acquisition schemes independently scored the overall image quality, the conspicuity of lesion, the overall artifact level and the diagnostic confidence of four contrast phases selected from each reconstructed image-set. **Results:** Compared to standard GRASP, Motion-Suppressed GRASP achieved significant visual improvement (All $P<0.05$) in overall image quality (3.37 ± 0.28 v.s. 3.10 ± 0.32), lesion conspicuity (3.33 ± 0.35 v.s. 2.98 ± 0.51), overall artifact level (3.29 ± 0.33 v.s. 2.96 ± 0.49) and diagnostic confidence (2.54 ± 0.24 v.s. 2.31 ± 0.31). There was no significant difference (All $P>0.05$) between the post-contrast BH-VIBE and Motion-Suppressed GRASP images. The Cohen’s Kappa value was 0.80, 0.87, 0.90 and 0.83 for the overall image quality, the conspicuity of pulmonary lesions, the overall artifact level and the diagnostic confidence, respectively, suggesting good inter-reader agreement. **Conclusion:** Motion-Suppressed GRASP MRI achieves improved imaging performance for free-breathing DCE-MRI of the lung and can be used for better assessment of pulmonary lesions.

PU-0989

MR imaging of thymomas: a combined radiomics nomogram to predict histologic subtypes

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Introduction: The accurate prediction of WHO classification of thymomas is urgently needed to guide the optimal individualized therapeutic strategies. We aimed to develop and validate a combined radiomics nomogram for personalized prediction of histologic subtypes in patients with thymomas.
Methods: A total of 182 thymoma patients were divided into the training cohort (n=128) and the test cohort (n=54). Radiomics features were extracted from T2-weighted, T2-weighted with fat suppression, and diffusion-weighted images to build a radiomics signature in the training cohort. Multivariate logistic regression analysis was used to develop a combined radiomics nomogram that incorporated clinical, conventional magnetic resonance (MR) imaging variables, apparent diffusion coefficient (ADC) value, and radiomics signature. The clinical, conventional MR imaging and ADC models were also evaluated respectively. The performances of different models were compared by receiver operating characteristic (ROC) analysis and Delong test. Discrimination, calibration and clinical usefulness of the combined radiomics nomogram were assessed.
Results: The radiomics signature, consisting of 14 features, achieved favorable predictive efficacy in differentiating low-risk from high-risk thymomas, outperforming clinical, conventional MR imaging, and ADC models. The combined radiomics nomogram incorporating tumor shape, ADC value, and the radiomics signature showed the best performance (training cohort: area under the curve [AUC] = 0.946; test cohort: AUC = 0.878). The calibration curve and decision curve analysis indicated the clinical utility of the combined radiomics nomogram.
Conclusion: The radiomics signature is a useful tool to predict histologic subtypes of thymomas. The combined radiomics nomogram improved individualized subtype prediction in patients with thymomas.

PU-0990

囊性胸腺瘤的临床及 MRI 特征分析

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目的 探讨囊性胸腺瘤的 MRI 影像特征，评估 MRI 对其诊断价值。
方法 回顾性分析 17 例囊性胸腺瘤患者的临床及 MRI 影像资料，其中男 9 例，女 8 例，年龄 19~72 岁，平均 46 岁。所有病例均经组织病理学及免疫组化检查，且行常规 MRI 及 DWI 序列扫描，分析其常规 MRI 特征（主要包括大小、形态、囊腔分隔、实性成分、囊实比、包膜完整度、瘤周水肿等）及 ADC 值。
结果 组织病理学亚型：A 型胸腺瘤 2 例（11.8%），AB 型胸腺瘤 2 例（11.8%），B1 型胸腺瘤 2 例（11.8%），B2 型胸腺瘤 8 例（47.1%），B3 型胸腺瘤 3 例（17.6%）。肿瘤大小 2.3~13.6cm，

平均 7.1cm；囊液呈 T1 低/T2 高信号 12 例（70.6%），T1 高/T2 高信号 5 例（29.4%）；囊壁或分隔含有不同程度实性成分，其中单发附壁结节/肿块 9 例（52.9%），多发附壁结节/肿块 5 例（29.4%），囊壁弥漫性增厚伴结节/肿块 3 例（17.6%）；肿瘤囊实比平均为 2.6±1.6；实性成分 ADC 平均值（1.32±0.21）×$10^{-3}mm^2/s$。

结论 囊性胸腺瘤多为 B2 型胸腺瘤，其 MRI 表现具有一定特征性，肿瘤多伴有不同程度实性成分。MRI 对囊性胸腺瘤的诊断具有重要价值。

PU-0991
3D-动态增强 MRI 在肺部实性孤立结节的血管构筑评估的应用研究

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摘要 **目的**:探讨动态增强 MRI 定量参数在肺部实性孤立结节的血管构筑评估的应用价值。**方法** 前瞻性分析 32 例经病理学证实肺部占位性病变，所有患者术前均使用德国西门子 3.0TMR 行常规胸部 MRI 平扫和 DCE-MRI 扫描，术前行西门子 3.0TMRDCE-MRI 检查，将原始数据手动导入图像灌注处理软件 Tissu4D 行多参数测值，获取肺部实性孤立结节的 Ktrans、Kep 和 Ve 值最终平均数据，所有患者标本均采用 CD31、VEGF、SMA 免疫组化标记，运用图像分析软件 ImageJ 获取血管构筑各参数值。**结果** 不同良、恶性肺结节组间 Ktrans 及 Ve 值存在统计学意义（P＜0.05）；不同分化程度组别间进行分析，Ktrans 值随着分化程度降低而逐渐升高，且具有统计学意义（P＜0.05）；在不同病理 T 分期组别间进行比较，Ktrans、Kep、Ve 值随着分期增高逐渐升高，且均有统计学意义（P＜0.05）；Ktrans、Kep 与微血管参数（CD31-MVD、VEGF、MPI）均有相关性（P＜0.05）；Ve 与微血管参数（CD31-MVD、VEGF）有相关性（P＜0.05），但与表示血管成熟度参数 MPI 无相关性；经绘制 ROC 曲线分析显示，Ktrans、Kep 及 Ve 值诊断肺部恶性结节的 ROC 下面积分别为 0.922、0.521 和 0.911，其阈值可作为鉴别诊断的临界值。**结论** 磁共振动态增强扫描对于评估肺结节病理分级及分化程度具有一定的诊断价值；DCE-MRI 定量渗透性参数可以间接量化肿瘤微血管生成量、血流灌注特性，反映肿瘤微血管成熟度，进而动态、重复的观察评价肺实性孤立结节血管的构筑情况。

PU-0992
背景抑制全身弥散成像（DWIBS）在儿童肿瘤全身转移随访中的应用

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目的:探讨背景抑制全身弥散成像（DWIBS）在儿童肿瘤全身转移随访中的应用价值
方法 使用 Philips Prodiva 1.5T MR 扫描仪,信号采集使用两块 Torso 线圈，对 3 名肿瘤患者进行 DWIBS 检查，经三维最大密度投影重建及黑白反转后形成全身“类 PET”MRI 图像，对其所得影像进行分析。
结果:两名患儿均获得高质量的 DWIBS 图像，病变周围组织信号被有效抑制，Case1:神经母细胞术后，左肾缺如，双侧股骨、部分骨盆组成骨、腰骶椎骨质信号不均匀，见多发斑点状、结节状长 T2 信号，以右侧股骨颈病变明显，部分病变可见环状短 T 2 信号影，其在类 PET 序列上呈低信号；

CASE2:左后腹膜肾上腺区见软组织肿块影，信号欠均匀，在类 PET 序列上呈低信号，所见诸骨信号尚均匀，周围软组织无明显肿胀，类 PET 上未见明显异常信号.
结论 背景抑制全身弥散成像（DWIBS）在儿童肿瘤全身转移复查上有一定应用价值，减少家庭经济负担，且安全无辐射。

PU-0993
Native T1 Mapping 定量技术在乳腺癌中的初步应用研究

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目的 采用磁共振 T1 Mapping 定量技术，检测正常乳腺及乳腺癌的腺体 T1 定量值，探索 T1 Mapping 技术分析判断乳腺癌的可行性。**方法** 选取 2019 年 1 月-6 月来我院还未进行治疗前的 50 例乳腺癌女性患者与 50 例正常女性志愿者，均采用德国 Siemens 3.0T Skyra MRI 进行乳腺检查，对 MRI 扫描得到的图像进行有效地处理，利用后处理工作站测量腺体 TI 值，并重建成乳腺的 T1 值空间上的分布图，结合这些情形，对数据进行有效的分析。**结果** 乳腺癌患者的 T1 值都要远高于其正常乳腺 T1 值，这两者之间数据差异都具有显著性（P＜0.05）。**结论** 磁共振 T1 Mapping 定量技术在乳腺癌病变中的应用取得比较高的价值。

PU-0994
基于动态增强 MRI 图像的纹理分析对乳腺良恶性肿瘤的诊断价值

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目的 研究基于动态增强 MRI 图像纹理分析对乳腺良恶性肿瘤的诊断价值及临床价值。
方法 回顾性研究 2013 年 8 月至 2019 年 5 月术前行 3.0T MRI 检查（T1WI, T2WI fs, Vibrant+C, DWI）乳腺肿瘤患者共 82 例，平均年龄(49.55±12.18) 岁，良性者共 36 例（其中术后病理为乳腺纤维腺瘤 26 例，导管内乳头状瘤 11 例），恶性者 46 例（其中术后病理为浸润性导管癌 30 例，导管内癌 14 例，浸润性小叶癌 2 例）。在 Vibrant+C 图像上，勾画乳腺肿瘤最大径层面的瘤体实性部分为 ROI，利用 AK 软件，进行纹理分析，提取特征参数，并数绘制 ROC 曲线，得出乳腺良恶性肿瘤的诊断效能。
结果 1.共勾画 36 例乳腺良性肿瘤和 46 例乳腺癌，通过 AK 软件分析，共得到 175 个纹理特征，通过 LASSO 降维筛选出 5 个特征参数： Haralick 相关偏移量、灰度共生矩阵 45° 能量角偏移 、Cluster Prominence 偏倚、3Correlation_angle15 偏倚量、最小强度，这 5 个特征参数良恶性肿瘤的组间差异有统计学意义（P 值均<0.05）。
2.分别绘制 ROC 曲线，Haralick 相关偏移量、灰度共生矩阵 45° 能量角偏移量 、Cluster Prominence 偏倚量、3Correlation_angle15 偏倚量、最小强度的曲线下面积（AUC）分别为 0.696、0.252、0.683、0.325 和 0.294，其中 Haralick 相关偏移量曲线下面积最大。
结论 纹理分析可提供更多量化信息，术前诊断乳腺良恶性肿瘤有一定的价值。

PU-0995
全数字 3.0T 磁共振对乳腺良恶性肿瘤的临床研究

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目的 探讨 3.0T 磁共振对乳腺良恶性肿瘤的鉴别诊断中的作用。
方法 乳腺动态时间-信号强化曲线反映了病灶血液灌注和廓清情况，间接揭示病变组织的血流动力学情况，同时显示病变的肿瘤血管情况。Ⅰ型渐增型，曲线逐渐上身，诊断良性病变的敏感性和特异性为 52%和 71%；Ⅱ型平台型，曲线速升平台，诊断恶性病变的敏感性和特异性为 43%和 75%；Ⅲ型流出型，曲线速升速降，诊断恶性病变的特异性为 90%，敏感性不高为 20%。因此，乳腺良性病变表现为缓慢、延迟的渐进性强化；恶性病变趋向快进明显增高并快速下降。
结果 应用常规 T1、T2、DWI 和动态增强检查技术，对乳腺病变进行常规诊断和定性分析，可以对早期乳腺癌进行比较准确的诊断。动态增强磁共振是目前公认的诊断乳腺疾病最准确的影像技术，其不仅能显示病灶外部形态特征，还可以反映肿瘤的内部信号及血流动力学特点；本课题目的是应用 DCE-MRI 定量分析通过动态监测对比剂在肿瘤组织内的吸收和代谢等药代动力学过程,经过后处理分析得到相应位置的定量血流动力学参数,从而达到量化评价肿瘤组织的血管内皮通透性和血流量,实现在细胞分子水平观测肿瘤组织内血管分布和血流灌注,进一步为病变的诊断和治疗方案的选择提供有价值的信息。
结论 MRI 具有多角度、多层面扫描、多成像参数等特点，其检查技术以无创、无辐射、清晰、准确的特性在疾病的诊断和鉴别诊断中显示其突出的优势，动态增强磁共振是诊断乳腺疾病的重要手段，可通过增强后病变的强化特征不仅提供病灶的形态学特征，而且动态增强 MRI 还能提供病灶的血流动力学情况，可以提供多项参数，时间-信号强度曲线、MIP 血管成像技术，不同程地反映乳腺病变的肿瘤血管、微血管密度，通过影像检查客观地揭示肿瘤内部的情况，对乳腺癌的术前正确评估，使得外科医师对肿瘤的全面了解成为现实，为临床制定手术治疗方案及预测乳腺癌转移、复发和预后可提供重要依据。

PU-0996
3.0T 磁共振多 b 值 DWI 及其 ADC 值定量分析在乳腺良恶性病变鉴别诊断中的价值

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目的 探讨 3.0T 磁共振多 b 值弥散加权成像(diffusion weighted imaging,DWI)及表观扩散系数(apparent diffusion coeffi-cient,ADC)定量分析在乳腺良恶性病变鉴别诊断中的价值。**方法** 采用单次激发回波平面成像(echo planar imaging,EPI)技术行双侧乳腺 DWI,扩散敏感系数(b 值)分别为 0、300、800s/mm2。观察乳腺病变在 DWI 上的大小、形态及信号特征，计算 20 个正常乳腺（对照组）、手术病理证实 16 个恶性病灶（恶性病变组）、20 个良性病灶（良性病变组）分别在 b=0、300、800s/mm2 时的 ADC 值,比较三组研究对象间 ADC 值差异的统计学意义以及 b=0、300、800 s/mm2 时 ADC 值差异的统计学意义。根据恶性病变组平均 ADC 值的 95%可信区间的上界,计算 3 组不同 b 值下诊断乳腺癌的敏感性、特异性、准确性。**结果** 乳腺良、恶性病变、正常腺体间 ADC 值差异均有统计学意义（$P<0.0001$),恶性病变 ADC 值明显低于良性病变和正常腺体组织($P<0.0001$),良性病变 ADC 值明显低于正常腺体组织($P<0.0001$)；3 组 b 值间 ADC 值差异均有统计学意义($P<0.0001$),b 值越低,ADC 值越大($P<0.05$)。b=0、300、800s/mm2 时，以恶性病变组平均 ADC 值的 95%可信区间的上限诊断乳腺癌的敏感性 87.5%、85.71%、81.25%,特异性分别为 77.5%、78.57%、81.25%,准确性分别为 82.5%、82.14%、81.25%。**结论** 磁共振多 b 值 DWI 及其 ADC 值定

量分析在乳腺良恶性病变鉴别诊断中具有较高的临床诊断价值,可提高临床诊断的敏感性和准确性,对乳腺疾病的病变性质进行诊断。

PU-0997

Feasibility Study of applying Simultaneous Multi-slice technique in Diffusion Weighted Imaging of Breast Lesions

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Objective: To evaluate the feasibility of applying simultaneous multi-slice (SMS) single-shot echo planar imaging (EPI) to accelerate MR diffusion imaging for breast lesions.
Materials and Methods:60 patients (30 breast carcinoma,17 fibroadenoma of breast and 13 normal breast) who underwent breast MRI(3T,Skyra,Siemens Healthcare) were collected.The following three different diffusion weighted imaging (DWI) scan protocols were applied.The first sequence(A) is the conventional single-shot echo planar DWI (EPI-DWI):TR/TE 5200ms/72ms,FOV 360mm×227.4mm,Slices 30,Voxel size 0.9×0.9×5mm^3,b-values50s/$mm^2$and 800s/mm^2,Scan time 2:31min.For the second(B) and the third(C) DWI protocols,a SMS factor of two and three were applied,respectively.In order to compare the image quality with those acquired by sequence A,all the sequence parameters were kept the as described above,except for changing the TR of sequence B to 2600ms(scan time 75s) and the TR of sequence C to 1800ms(scan time 55s).For all sequences,image quality is evaluated on a five-point scale.The quantitative analysis for the three sequences included image signal-to-noise ratio (SNR),ADC values.Paired *t*-test was used to compare the differences of SNR and ADC values between A and B,A and C.Inter-reader reliability was analyzed by calculating the intra-class correlation coefficient (ICC).
Results: Compared with protocol A, the image quality of protocol C was significant reduced (ICC=0.4),while that of protocol B was stable (ICC= 0.9).There was no significant difference between protocol B and A (p=0.162) of the image SNR.The SNR of protocol C were significant lower than those of protocol A(p<0.001).There was no significant difference in ADC values between protocol B and A、C and A in normal breast parenchyma and lesions (all $p > 0.05$).
Conclusion: By applying SMS technique with a factor of 2, the acquisition time of breast DWI can be significantly reduced without sacrificing the image quality. However, if the SMS factor increases to 3, the image SNR decreases which affects clinical diagnosis.

PU-0998

DCE-MRI 联合 DWI 对乳腺癌新辅化疗疗效的评价作用

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目的 探讨磁共振动态增强（DCE-MRI）联合扩散加权成像（DWI）评价乳腺癌新辅化疗（NAC）疗效的临床价值。**方法** 收集我院 2017 年 2 月至 2019 年 3 月病理证实为浸润型乳腺癌患者 36 例，并行新辅化疗 4-6 疗程，以化疗前后穿刺活检病理变化为标准分为缓解组 21 例，无效组 15 例，对比分析新辅化疗前后 DCE-MRI、DWI 检查各参数的差异。**结果** 患者化疗后峰值、达峰时间、最大线性斜率变化率、最大排泄速率、流出斜率、ADC 值较化疗前有变化（P<0.05），缓解组的变化程度较无效组更显著（P<0.05），DCE-MRI 联合 DWI 检查判断乳腺癌新辅化疗的疗效的准确性 86.1%（31/36），特异性 80.00%（12/15），灵敏度 80.95%（17/21），Kappa 值 0.80。**结论** DCE-MRI 联合 DWI 检查能准确评价乳腺癌新辅化疗的疗效，为临床提供可靠信息。

PU-0999

A Meta-analysis of the Diagnostic Dynamic Contrast-enhanced MRI for Breast Lesion Characterization

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Background: Various techniques are available to assess diffusion properties of breast lesions as a marker of malignancy at MRI. The diagnostic performance of these Dynamic Contrast-enhanced (DCE) MRI markers has not been comprehensively assessed.
Purpose: To investigate the diagnostic performance of DCE-MRI to differentiate malignant and benign breast lesions.
Materials and Methods: PubMed, Embase, and Cochrane Library databases (from building to July 31, 2018) were searched to collect articles about diagnostic performance of Dynamic Contrast-enhanced MRI in the breast. Studies were reviewed according to exclusion criteria and eligibility. Publication heterogeneity and bias between studies were assessed. Pooled summary estimates for sensitivity, and specificity obtained for each parameter by using a variate model. A subanalysis investigated the effect of DCE-MRI parameters on diagnostic performance by using a Student t test or a one-way analysis of variance.
Results: From 153 eligible articles, including 3325 lesions in total, in which 2168 malignant lesions and 1157 benign lesions, considering the pathological results as the gold standard. The sensitivity and specificity in the included 20 articles of quantitative DCE-MRI (Ktrans, Kep, and ve) in comprehensively evaluating Breast Lesion Characterization were 88 percent (95% confidence interval (CI): 77-98%) and 83 per cent (95% CI: 78-87%), respectively. The sensitivity and specificity in the five articles of Ktrans evaluating lesions for breast cancer were 75.1 per cent (95% CI: 71.8-92.6%) and 79.6 per cent (95% CI: 72.9%-88.2%), respectively.
Conclusion: Our study confirmed that the quantitative DCE-MRI is able to monitor lesion Characterization for breast cancer because of its high sensitivity and specificity.

PU-1000

磁共振动态增强与钼靶 X 线对非肿块型乳腺疾病的对比研究

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目的 比较磁共振动态增强与钼靶 X 线对非肿块型乳腺癌的诊断价值。资料与**方法** 回顾性分析经临床触诊和钼靶 X 诊断为乳腺非肿块型疾病（包括不对称致密影 16 例，微钙化 35 例、结构扭曲 19 例、混合征象 12 例）患者 82 例，均为单发病灶，共 82 个病灶。其中乳腺癌 53 例（包括乳腺浸润性导管癌 41 例， 浸润性小叶癌 9 例，乳腺黏液腺癌 1 例，浸润性导管-小叶混合癌 2 例）；乳腺良性疾病共 29 例（包括乳腺纤维腺瘤 7 例，乳腺腺病 17 例， 导管内乳头状瘤 2 例，慢性炎症 3 例）。**方法** 均采用钼靶 X 线及 MRI 多参数成像扫描。对比 MRI 动态增强及钼靶 X 线诊断非肿块型乳腺癌准确率、特异性、敏感性、阳性预测值和阴性预测值，阴性预测值。 **结果** MRI 动态增强对非肿块型乳腺癌诊断的的准确性为 80.49%，敏感性 83.02%，特异性 75.86%，阳性预测值 86.27%，阴性预测值 75.86%；钼靶 X 线诊断非肿块型乳腺癌诊断的的准确性为 70.73%，敏感性为 72.22%，特异性 67.86%，阳性预测值 81.25%，阴性预测值 67.86%。**结论** MRI 动态增强诊断非肿块型乳腺疾病的准确性、敏感性和特异性均高于钼靶 X 线；尤其对于不对称致密影的乳腺疾病的诊断准确性明显高于钼靶 X 线。钼靶 X 线对于乳腺微钙化疾病诊断敏感性高于钼靶 X 线。总之，对非肿块型乳腺疾病的诊断，MRI 多参数成像可提高病变的检出率和诊断准确率，可以给临床提供更加直观清晰的图像，为临床确定治疗方案提供帮助。

PU-1001
比较 RS－EPI（分段读出回波成像）和传统 SS－EPI 在乳腺癌筛查中的诊断价值

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目的 定性和定量比较 RS－EPI（分段读出回波成像）和传统 SS－EPI 在乳腺癌筛查中的诊断价值
材料和**方法**

对 31 例女性乳腺磁共振检查患者进行回顾性研究（年龄范围： 23-69 岁 ，平均 43 岁），其中 15 例 MR－BI－RADS 为 2 级，14 例 MR－BI－RADS 为 3 级，2 例 MR－BI－RADS 为 5 级。均用西门子 VERIO 3T 磁共振扫描仪行常规 MRI 、SS－EPI 及 RESOLVE 序列扫描 (b=50、800s/mm2)。选取感兴趣区通过测量肿瘤表面的扩散系数（ADC）、信噪比（SNR）、对比度来比较两个序列之间的定量差异。由 2 名 5 年以上工作经验的放射科诊断医师，采用双盲 5 分法分别对 EPI－DWI 和 resolve 图像质量进行评分，并采用 kappa 分析对 2 名医师的结果行一致性评价。采用 Mann－Whitney U 检验比较 SS－EPI 和 RS－EPI 之间的 ADC 差异。用配对 t 检验比较两个序列的定量参数（SNR、对比度、CNR）的差异。

结果

2 名医师对 SS－EPI 和 RS－EPI 图像质量进行主观评价，SS－EPI 序列 kappa 值为 0.921，RS－EPI 序列 kappa 值为 0.813，P 值均<0.01，结果一致性良好。RS－EPI 组评分 4 分及 4 分以上约占 97.8%，而 SS－EPI 组评分均在 4 分及 4 分以下，评分 4 分仅占约 16.67%。RS－EPI 组的 SNR 明显高于常规 SS－EPI 组（53.65 对 18.078.75，P）。RS－EPI 组的 CNR 和对比度均高于常规 SS－EPI 组（P<0.001）。标准化的 ADC 在两个序列之间没有显著差异，无统计学意义（P>0.05）。

结论

RS－EPI 对比常规 SS－EPI 明显提升了图像的质量、SNR 与 CNR，对 ADC 的值的测量没有影响。在乳腺癌筛查中相较于传统的 SS－EPI 序列，RS－EPI 序列具有更高的诊断准确性和诊断价值。

PU-1002
动态增强曲线与弥散成像对乳腺良恶性占位的诊断价值

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目的 探讨动态增强曲线与弥散成像对乳腺良恶性占位的诊断价值。**方法** 测定 60 例临床怀疑乳腺占位的女性患者，年龄 36--75 岁，平均 58 岁，进行常规核磁共振检查的基础上增加横断面弥散与动态增强成像，利用后处理软件绘制动态增强曲线，分析其在乳腺占位区分良恶性的价值。**结果** 利用动态增强曲线结合弥散成像对乳腺占位区分良恶性的敏感性。18 个恶性病灶，42 个良性病灶，灵敏度 89.1%，特异度 42.8%，准确度 69%。**结论** 动态增强曲线与弥散成像对乳腺良恶性占位的诊断具有很大的参考价值。

PU-1003
磁共振在乳腺癌新辅助化疗疗效评价中的应用价值

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目的 探讨磁共振（MRI）在乳腺癌新辅助化疗（NAC）疗效评价中的应用价值。**方法** 选取本院于 2018 年 4 月-2019 年 4 月收治的 58 例乳腺癌患者，开展为期 2~4 周期的 NAC，分别于 NAC 前、后，开展 2 次 MRI 检查，并于 NAC 第 3~4 周期时，进行手术治疗。依据实体瘤反应评价标准、MRI 检查指标及术后病理检查结果，评价 NAC 疗效。**结果** NAC 后，MRI 检查评估总有效率为 72.41%（42/58），术后病理对 NAC 进行评估的有效率为 77.59%（45/58），通过检验得知，两方法相关性明显（P＜0.05）。NAC 治疗前后病灶大小、体积等 MRI 相关指标对比，差异显著（P＜0.05）。**结论** 乳腺癌 NAC 治疗后，开展 MRI 检查，能够准确的将肿瘤病灶变化情况给反映出来，在对乳腺癌 NAC 疗效评价方面，价值突出。

PU-1004
浅谈乳腺 MRI 检查技术

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磁共振检查作为目前最先进的检查技术被广泛应用于乳腺疾病的诊断和临床评估，MRI 检查作为一种无辐射、无创性的检查得到飞速发展。本文简要介绍乳腺 MRI 检查的基本技术、序列设计、主要参数、图像采集及图像后处理技术等问题进行讨论和研究。

PU-1005
MRI 动态增强联合 MRS 对乳腺癌 NAC 早期疗效的评估价值

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目的 探讨 MRI 动态增强扫描联合波谱分析（MRS）在评价新辅助化疗（NAC）治疗乳腺癌方面的价值。
资料与方法 回顾性分析我院经活检或手术病理证实的 36 例乳腺癌患者 MRI 检查资料，所有患者术前行新辅助化疗，并且化疗前、后均行 MRI 动态增强扫描及波谱分析检查。比较治疗前后病灶的时间-信号强度曲线及 ^{1}H-MRS 结果变化情况，观察分析 ^{1}H-MRS 中胆碱复合峰的峰高、峰下面积及胆碱信噪比，以评估新辅助化疗早期疗效。
结果 磁共振动态增强扫描能准确观察判断新辅助化疗后乳腺癌病灶缩小情况，同时对于化疗有效患者，病灶的时间-信号强度曲线（TIC）类型及 ^{1}H-MRS 中胆碱峰改变有统计学意义（P＜0.01）。
结论 乳腺癌新辅助化疗又称术前化疗或诱导化疗，广泛运用于肿瘤较大而有保乳愿望的患者,其目的是使肿瘤缩小、降低疾病分期以提高手术及保乳手术的成功率，通过提高病理完全缓解率改善乳腺癌病人的远期生存率，已成为乳腺癌综合治疗的手段之一。国外多中心前瞻性随机对照临床实验研究结果表明，NAC 与术后辅助化疗的无病生存率和总体生存率无统计学差异，但达到病理完全缓解者无病生存率和总体生存率得到明显改善。MRI 通过静脉注入对比剂在乳腺产生对比增强来发现病灶和对病灶的特征进行描述，动态增强乳腺 MRI 模式在推测微血管密度及对比剂渗透速度方面具有潜在作用，能较客观地反映乳腺癌的血供，有助于判断肿瘤的生物学行为及预后。MRS 是利用 MRI 的化学位移作用检测活体内代谢和生化信息的一种无创性功能成像技术，是一种能够活体定量检测病变内化学物质的无创检查方法，能从分子水平上反映组织的病理生理变化，可以鉴别肿瘤良、恶性，提高 MRI 诊断的特异性。MRI 动态增强扫描联合波谱分析在乳腺癌新辅助化疗早期疗效的无创性评价方面具有较大价值。

PU-1006
功能磁共振成像评估乳腺癌新辅助化疗疗效的应用效果

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目的:探讨功能磁共振成像在乳腺癌新辅助化疗疗效的应用效果。**方法** 选择 2014 年 1 月-2019 年 4 月通过穿刺活检或手术确诊为乳腺癌并采用新辅助化疗的患者 80 例作为对象，采用前瞻性队列研究方法，根据行新辅助化疗后肿瘤体积变化情况，分为效应组（n=64）和无效应组（n=16）；两组化疗前和化疗 2 个周期（4-6 周后）后均采用功能磁共振成像评估病灶体积的变化、最大信号衰减率及病灶退缩率，以及他们之间相关性。**结果** 效应组经新辅助化疗后肿瘤退缩率、ADC 变化值，均高于无效应组（P<0.05）；新辅助化疗前后所有患者均完成功能磁共振成像检查，并以病理结果作为“金标准”。ROC 曲线结果表明：功能磁共振成像在乳腺癌新辅助化疗中的 ROC 曲线分别为 0.801、0.933，诊断敏感性为 84.2%，特异性为 90.3%；乳腺癌新辅助化疗前、后均完成功能磁共振成像检查，患者新辅助化疗前后 32 例时间-信号曲线变化不明显，34 例患者分型得到下降。**结论** 将功能磁共振成像应用于乳腺癌新辅助化疗疗效显著，可有助于乳腺癌早期疗效评估，整体疗效得到提升，在临床中具有应用价值。

PU-1007

影像组学预测雌激素受体阳性、淋巴结阴性乳腺癌复发风险

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目的 评估雌激素受体阳性、淋巴结阴性乳腺癌患者的磁共振影像组学与复发风险之间的关系。
材料与方法 本回顾性研究经过机构审查委员会批准。该数据包括 298 例具有完整磁共振检查，以及临床、组织病理和基因组数据的乳腺癌病人。从每个病人的磁共振图像中提取影像组学特征。该组患者分为训练集和验证集。通过回归分析和受试者操作特征（Receiver operating characteristic, ROC）曲线分析，评价磁共振影像组学特征对 Oncotype DX 多基因检测结果的预测能力，用独立验证集数据评估模型的效能。
结果 多重线性回归分析显示影像组学与多基因检测复发评分之间存在显著相关性（R2=0.26-0.36，r=0.5-0.55，p<0.0001）。在训练集（AUC 0.89；95%CI，0.80-0.98）和验证集（AUC 0.87；95%CI，0.80-0.95）中，影像组学模型显示出良好的判别能力。
结论 基于磁共振成像的影像组学在评估乳腺癌复发风险中显示出良好的前景。

PU-1008

乳腺腺肌上皮瘤一例

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患者，女，41 岁，体检乳腺彩超示左乳外下象限 4-5 点近乳头、距皮肤表面约 0.7cm 见实性结节，形态欠规则，大小约 4.7mm*4.9mm*4.9mm，内部呈弱回声，分布欠均，其内可见点状强回声，CDFI 结节内及周边未见明显血流信号，双侧腋下未见肿大淋巴结。诊断左乳实性结节 BI-RADS 4b。查体：双乳可及散在片状增厚，未触及明确肿块结节。乳腺钼靶示左乳中央区见大小约 7.8mm*5.4mm 的等密度结节影，边缘较清楚，双乳中央区见小点状钙化，考虑 BI-RADS 3；乳腺 MR 平扫+动态增强扫描示左乳头后下方略偏外侧见一强化结节，距乳头约 2.9mm，形态欠规则，平扫呈等长 T1 长 T2 信号，DWI 呈高信号，直径约 6.3mm，其后方见一供血血管，动态增强扫描示病灶强化曲线呈流出型。双侧腋窝淋巴结未见明显增大。诊断左乳中央区结节 BI-RADS 5。病理检查示(左乳肿块)灰白灰黄色不规整组织，肿块直径约 0.6cm，包膜完整。免疫组化结果示：ER 部分+，PR 部分+，CK5/6（肌上皮+），HCK+，CD10 部分+，HER-2(++),Calponin(肌上皮+)，P63（肌上皮+）。符合乳腺腺肌上皮瘤（小管型），腺上皮不典型增生。

讨论

乳腺腺肌上皮瘤（AME）是由腺上皮和肌上皮细胞同时增生形成，大多为良性，恶性十分罕见。其诊断主要依据病理和免疫组织化学检查。影像学缺乏特异性表现。综合文献学习，AME 超声多表现为低回声包块，形态可规则或不规则，内部回声多不均匀。乳腺 X 线多为等密度或稍高密度影，钙化少见。乳腺 AME MRI 可表现为形态规则或不规则，边缘清楚或不清楚，平扫呈等、长 T1 等、长 T2 信号，动态增强扫描呈均匀强化，良性 AME 时间-信号强度曲线（TIC)多表现为流入型及平台型，也可为流出型，DWI 呈高信号；恶性 AME 多表现为流出型，恶性 ADC 值更低，DWI 弥散受限更严重。本例 AME 与恶性病变鉴别困难。

PU-1009

磁共振功能成像在乳腺癌新辅助化疗疗效评估应用的研究进展

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近几年来，乳腺癌已经成为我国女性发病率及死亡率第一的癌症[1]。新辅助化疗（neoadjuvant chemotherapy NAC）已广泛作为局部进展期乳腺癌患者重要的综合治疗方法[2]。NAC 能够减小乳腺癌肿块大小，降低肿瘤分期，提高根治性或保乳手术几率及改善预后[3]。常规影像学检查基于肿瘤形态学变化评估疗效，但是肿瘤治疗过程中功能学变化往往先于形态学变化[4],早期预测、评估乳腺癌 NAC 疗效将有助于及时调整化疗方案，影响治疗效果及其预后。随着 MRI 硬件、软件的改进和发展以及乳腺专用线圈的应用，磁共振检查已经广泛用于乳腺癌的诊断及疗效评估上[5]。乳腺 MRI 也从结构成像发展到功能成像，如磁共振动态增强成像(MRI dynamic contrast enhanced imaging，DCE-MRI)、灌注成像(perfusion weighted imaging，PWI)、扩散加权成像(diffusion weighted imaging，DWI)及磁共振波谱(MR spectroscopy，MRS)等，这些功能成像技术能提供乳腺肿块的血管生成、水分子扩散、药代动力学、组织微循环、病理生理学等生物学信息。现就 MR 功能成像在乳腺癌 NAC 疗效预测及评估应用的研究近况进行综述。

PU-1010
18F-FDG PET/CT 与 MRI 动态增强对乳腺癌术后复发及转移的对比研究

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目的 对比 ^{18}F-FDG PET/CT 与 MRI 动态增强在乳腺癌术后复发及转移诊断中的价值。**方法** 对 2012 年 10 月至 2017 年 10 月 55 例乳腺癌术后 5 年内临床怀疑复发或转移并接受 ^{18}F-FDG PET/CT、 MRI 动态增强和病理学检查随访的患者资料进行回顾性 分析。结果 55 例乳腺癌术后患者中，联合 PET/CT 与磁共振共在术区局部、腋窝淋巴结、远处器官发现 91 个可疑病灶，经病理学证实其中局部复发 17 个，瘢痕 12 个，淋巴结转移 35 个，远处转移 27 个。PET/CT 诊断的乳腺癌复发及转移的灵敏度、特异度、准确率为 85%、72%、87%， MRI 动态增强诊断的乳腺癌复发及转移的灵敏度、特异度、准确率为 78%、91%、83%。结论 ^{18}F-FDG PET/CT 与 MRI 动态增强在乳腺癌术后复发及转移诊断中有重要价值，其中 ^{18}F-FDG PET/CT 对诊断乳腺癌术后转移的诊断明显优于 MRI 动态增强， MRI 动态增强对诊断乳腺癌术后复发准确率高于 ^{18}F-FDG PET/CT

PU-1011
磁共振同时多层（SMS）技术在乳腺扩散加权成像中的可行性研究

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目的 探讨应用磁共振同时多层（Simultaneous Multi-slice, SMS）加速技术对乳腺扩散加权成像（DWI）的图像质量进行系统分析。
材料和方法 搜集应用 Siemens Skyra 3.0T MRI 进行乳腺磁共振扫描的 60 例患者。三套 DWI 扫描协议分别为：A 协议-单次激发平面回波 DWI（EPI-DWI）：FOV 360mm×227.4mm、TR/TE

5200ms/72ms、层数 30、分辨率 0.9×0.9×5、b 值为 50 及 800 s/mm ^{2}，扫描时间为 2min31s；B、C（SMS-DWI）协议：除 TR 时间以外其他参数均与 A 扫描协议完全一致，B 协议的为 TR2600ms、层面加速因子为 2（AF2），扫描时间为 1min15s，C 协议的 TR 为 1800ms、层面加速因子为 3（AF3），扫描时间为 55s。图像质量评估：以 A 协议为参考标准，（1）主观评价：对 B（AF2）和 C（AF3）协议图像质量进行分级评估；（2）客观评价包括图像信噪比（SNR）、乳腺正常腺体实质及病灶的 ADC 值。

结果 与 A 扫描协议相比，C（AF3）协议图像质量明显降低（ICC=0.4），B（AF2）协议表现出稳定的图像质量（ICC=0.9）。B（AF2）协议与 A 协议差异无统计学意义（p=0.162），C（AF3）协议 SNR 明显低于 A 标准协议，差异具有统计学意义（p＜0.001）。B（AF2）、C（AF3）协议分别与 A 协议乳腺正常腺体实质及病灶 ADC 值比较，差异均无统计学意义（p＞0.05）。

结论 在显著减少扫描时间且不会对图像 SNR、ADC 值产生影响的情况下，使用 SMS-DWI（AF2）扫描协议能取得很好的临床应用效果；SMS-DWI（AF3）图像 SNR 明显下降。因此，SMS 作为一种新的磁共振技术，在乳腺 DWI 中具有良好的应用前景。

PU-1012

骨盆漏斗韧带子宫平滑肌肉瘤 1 例报告与文献复习

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子宫肉瘤是女性罕见的肿瘤，占所有子宫恶性肿瘤的 3%，子宫平滑肌肉瘤占子宫肉瘤的 63%。多见于更年期及绝经后的妇女，恶性程度高，常见远处转移，且易复发，预后差。子宫平滑肌肉瘤多发于子宫体，宫颈少见，位于韧带处罕见，常见于子宫圆韧带及阔韧带，骨盆漏斗韧带更罕见。位于骨盆漏斗韧带的子宫平滑肌肉瘤常常被误诊为其他盆腔肿瘤。而对于子宫肉瘤或疑似子宫肉瘤的患者主要行子宫切除术加或不加双侧输卵管卵巢切除术。本文就骨盆漏斗韧带子宫平滑肌肉瘤患者 1 例的病例资料及 MR 表现进行分析、总结。

PU-1013

MRI 对肝癌 TACE 介入治疗术后病灶残留及疗效评估中的应用

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摘要：目的 探究 MRI 对肝癌 TACE 介入治疗术后病灶残留及疗效评估。**方法** 将 2016 年 6 月至 2017 年 6 月我院收治 86 例肝癌 TACE 介入治疗患者作为研究对象，术前、术后均实施 MRI 增强扫描，分析 TACE 介入治疗疗效。**结果** 共检查出 106 个病灶，术前平均直径 7.32 cm，术后 3 个月、6 个月，CER 动脉期、SIR 动脉期教术前显著降低（P<0.05）。经 RECIST 标准评估 67 例（77.91%）有效，19 例（22.09%）无效。术后 3 个月.6 个月 ADC 教术前显著升高（P<0.05）。TACE 术后 3 个月、6 个月有效组患者 CER 动脉期、SIR 动脉期、肿瘤直径指标均显著低于术前（P<0.05），无效组患者术后 3 个月、6 个月 CER 动脉期、SIR 动脉期指标均显著低于术前（P<0.05）；有效组患者术后 3 个月、6 个月 CER 动脉期、SIR 动脉期、肿瘤直径指标均显著低于无效组（P<0.05）。TACE 术后 3 个月、6 个月两组患者 ADC 值均显著高于术前（P<0.05），且有效组术后 3 个月、6 个月 ADC 值显著高于无效组（P<0.05）。**结论** MRI 增强扫描可有效评估肝癌 TACE 术后病灶情况及疗效，对临床持续治疗方案具有指导意义

PU-1014

基于 T2*mapping 的无创性肝脏铁浓度检测在长期输血患者肝脏铁含量评估中的价值研究

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目的 探讨基于 T_2^*的肝脏铁浓度（LIC）检测在长期输血患者肝脏铁过载评估中的价值。**方法** 收集长期输血患者 28 例，正常志愿者 10 例，均行肝脏 MRI-T_2^*map 成像及取血检测血清铁蛋白（SF）及转铁蛋白饱和度（TSAT）。测量患者及志愿者肝脏 T_2^*值，并依据公式 LIC=0.0254×R_2^*+0.202，换算成 LIC（单位 mg/g），分析输血组与正常志愿者间 SF、TSAT 及 LIC 的差异，并分析 LIC 与 SF 及 TSAT 之间的相关性。计算 LIC 对诊断肝脏铁过载的敏感度及特异度。**结果** 输血组 SF、TSAT 及 LIC 均较正常志愿者显著升高（P 均＜0.001）。LIC 与 SF 及 TSAT 均呈显著正相关，其中 LIC 与 SF 之间的相关性比与 TSAT 的相关性略高（r=0.815，P＜0.001；r=0.708，P＜0.001）。若分别以 SF、TSAT 为诊断标准，则 LIC 诊断肝脏铁过载的灵敏度分别为 77.8%、76%，特异度分别为 100%、84.6%。**结论** 基于 T_2^*的 LIC 检测是一种无创性评估长期输血患者肝脏铁负荷的有效方法。

PU-1015
肝细胞癌 VEGF 和 MMPs 的表达及其与 MRI 特征的相关性

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血管内皮生长因子（vascular endothelial growth factor，VEGF）及基质金属蛋白酶（Matrix metalloproteinases，MMPs）是重要的肿瘤血管生成相关因子，参与肿瘤血管生成的多个过程，通过多种方式影响肿瘤的生长及转移。MRI 检查在肝癌的诊断、鉴别诊断、治疗反应评价等方面均具有重要价值。这篇文章主要综述 VEGF 和 MMPS 的结构、作用机理、调控以及肝癌 VEGF 和 MMPs 的表达及其与 MRI 特征的相关性。

PU-1016
磁共振三维快速自旋回波成像技术（SPACE）对肛瘘诊断价值的研究

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目的 肛瘘属于多发病，一般由内、外口及瘘管组成。肛瘘易复发，内口及支瘘管在常规检查中显示不佳。三维快速自旋回波成像技术（SPACE），通过在回聚脉冲中使用可变翻转角的设计，可以克服 T2 衰减效应；回波间隔短，可提供快速高分辨率的三维 TSE 对比度成像。临床应用广泛。现将其用于盆腔，对比研究磁共振 SPACE 技术对肛瘘的诊断价值。
方法 收集分析 2019 年 1 月到 7 月，25 例肛瘘患者的磁共振图像资料和手术资料，由 2 名高年资放射科医生阅片,明确瘘管走向,内口位置,有无支管,有无脓肿、主要瘘管与肛门括约肌之间的关系，分析不同磁共振序列对肛瘘内口、瘘管的显示情况，内口位置采用膀胱截石位时钟判断法。比较三维 SPACE 序列、二维 T2WI 序列、二维 T1WI 序列对肛瘘诊断及瘘口定位的准确性。

结果 SPACE 能提供各向同性的高分辨图像，具有高信噪比，减轻了部分容积效应 ，支持任意平面重建，可较完整的显示内外口及瘘管，相比二维 T2WI、二维 T1WI 序列，SPACE 可提高肛瘘的诊断准确率。
结论 SPACE 技术对肛瘘显示的准确率更高，优于二维 T2WI、二维 T1WI 序列，具有重要价值。

PU-1017

多囊卵巢综合征在影像诊断中的研究进展

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多囊卵巢综合症（PCOS）是育龄期女性最常见的内分泌疾病。超声是目前诊断 PCOS 的主要方式，近年来随着 MRI 技术的发展，其解剖分辨率高及非侵入性的特点使其在 PCOS 的诊断中具有独特优势。本文就 PCOS 的影像学特别是 US 和 MR 诊断中的研究进展进行综述。

PU-1018

Correlation study between ADC value and T stage of esophageal cancer

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Objective: To analyze and discuss the correlation between the ADC (apparent diffusion coefficient) value and T-stage of esophageal carcinoma.
Methods:
Twenty patients with esophageal cancer admitted to our hospital were selected. Inclusion criteria: 1. Patients with esophageal cancer confirmed by surgery and pathology.(2) preoperative radiotherapy or chemotherapy were not given.(3) preoperative MRI examination was performed .Thirty-two patients with esophageal cancer underwent preoperative MR imaging with single-shot echo plannar imaging (EPI) diffusion-weighted sequences (b=0, 800 s/mm2). The tumor mean value of ADC staging were measured on the GE AW4.6 postprocessing workstation, Matching and grouping analysis of the tumor T-stage and ADC. Three-dimensional localization method was used to locate the tumor plane. 3 solid tumor areas were selected as ADC values to measure ROI, avoiding obvious necrosis areas. The average value of 3 ROI areas was then taken as the final ADC value of the lesion .
Results: The esophageal carcinomas were slightly high signal or high signal on DWI. According to TNM stage, the patients were divided into 4 groups: T1, T2, T3 and T4.The average ADC value of T1 (1.824±0. 443) ×10-3 mm2/s, the average ADC value of T2 (1.979±0. 199) ×10-3 mm2/s, average ADC value of T3 (1.571±0. 309) ×10-3 mm2/s, the average ADC value of T4 (1.416±0. 228) ×10-3 mm2/s, the average ADC value of esophageal cancer had significant difference in the degree of tumor differentiation and T stage group (P<0. 05) . The results of Spearson correlation analysis showed that ADC value was negatively correlated with T stage .There were statistically significant differences between the average ADC values of T2 phase and those of T3 or

T4 . The average ADC value in T3 phase was significantly higher than that in T4 phase. There was no statistically significant difference in ADC values between the T1 phase and T2/T3 phase. The difference between the average ADC values in T1 phase and T4 phase was statistically significant. Correlation analysis showed that ADC value decreased as T staging increased. We divided the patients into two groups, T1/T3 and T3/T4, and statistically compared them. The ADC values in the pT1/T2 groups were significantly higher than in the T3/T4 groups.

Conclusions： The ADC value of esophageal cancer is significantly correlated with the tumor T-stage, and it can reflect the clinical stage of esophageal cancer. Future studies with more patients are needed to confirm the clinical evidence. This non-invasive technique could be a valuable clinical tool for providing optimal treatment for patients with esophageal cancer. *The average ADC value can predict the common clinicopathological and prognostic factors of esophageal cancer, and can be used as a quantitative indicator to distinguish the malignant degree of esophageal cancer.*

PU-1019

磁共振弥散加权成像在胃癌诊治中的应用

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胃癌是全球最常见的恶性肿瘤之一，治疗仍以外科手术为主，放化疗为辅。磁共振（MRI）弥散加权成像（DWI）能够检测活体组织内水分子扩散运动，通过测量表观扩散系数（ADC）值提供定量信息。体素内不相干运动（IVIM）能将水的真性扩散与微循环灌注区分开来，获得更多的组织内部结构的信息。这些技术在胃癌的诊断与治疗反应评价中均具有重要价值。本文对 DWI 在胃癌的诊断、分期、病理、治疗反应评估中的应用现状进行综述。

PU-1020

CDI、CT 及 MRI 应用于腹腔镜切除卵巢肿物术前评估的价值

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目的 探讨 CDI、CT 及 MRI 在腹腔镜切除卵巢肿物术前评估中的应用价值。

方法 回顾性分析 2015 年 7 月至 2018 年 12 月本院收治的 121 例腹腔镜手术治疗卵巢肿物患者的 CDI、CT 及 MRI 检查资料，并与术后病理结果对照。采用 c^2检验比较术前 CDI、CT、MRI 检查及 CDI 联合 CT、CDI 联合 MRI 检查病灶检出率、肿瘤定位准确度、良恶性判定准确率及恶性肿瘤分期准确率的差异。

结果 术前 MRI 的病灶检出率、肿瘤定位准确率、良恶性判定准确率均高于 CDI 检查（$P<0.01$）。CT 及 MRI 的恶性肿瘤分期准确率均高于 CDI 检查（$P<0.01$）。CDI 联合 MRI 的病灶检出率高于 CDI 检查（$P<0.01$）。MRI 的肿瘤定位准确率高于 CDI 联合 CT 检查（$P<0.01$），CDI 联合 MRI 的肿瘤定位准确率高于 CDI、CT 及 CDI 联合 CT 检查（$P<0.01$）。CDI 联合 MRI 的良恶性判定准确率高于 CDI、CT、MRI 及 CDI 联合 CT 检查（$P<0.01$）。CDI 联合 CT 的恶性肿瘤分期准确率高于 CDI 检查（$P<0.01$），CDI 联合 MRI 的恶性肿瘤分期准确率高于 CDI、CT 及 CDI 联合 CT 检查（$P<0.01$）。

结论 MRI 在卵巢肿瘤病灶检出、定位、良恶性判定及恶性肿瘤分期评估方法均具有较高的准确性，CDI 联合 MRI 在腹腔镜切除卵巢肿物术前评估中具有较好的应用前景。

PU-1021
对比剂对腹部扩散加权成像影响的研究进展

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扩散加权磁共振成像(DWI)是诊断疾病的重要影像学检查方法之一，在腹部检查中应用广泛。DWI 和磁共振增强扫描相结合，突显病变的特征，补充病变的性质。DWI 通常在增强扫描前完成，但若注射对比剂后发现存在伪影、图像失真等影响 DWI 图像质量，则需在存有对比剂的情况下重复扫描 DWI。近来，不少学者研究注射对比剂后 DWI 参数的变化，但其影响机理未得到充分解释。本文就对比剂是否对腹部 DWI 产生影响以及研究现状予以综述。

PU-1022
流入反转恢复序列在门静脉非对比增强成像中的应用

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目的 探讨国产 1.5T MR 流入反转恢复（FIRM）序列对门静脉系统进行对比增强成像的可行性。 方法 收集我院 30 例疑似有门静脉病变的患者，在联影 1.5T MRI 上行门静脉冠状位 FIRM 序列扫描及门静脉 CTA 增强扫描，将扫描图像在工作站行 3D 和 MIP 重建，由两名影像诊断医生分析两种方法对门静脉及其分支的显示，并进行评分，比较两者对门静脉显示的差异。 结果 两种方法门静脉图像质量评分的差异无统计学意义（P<0.05），两位诊断医师对 NCE-MRA 门静脉成像质量评分的一致性较高，Kappa 值为 0.95 。 结论 国产 1.5T MRI FIRM 成像序列是一种无需使用对比剂的非侵入性血管成像方法，能在不用对比剂情况下获得与门静脉 CTA 相似成像效果的门静脉系统图像，并能有效地对肝脏门静脉进行评估。

PU-1023
对比增强扫描肾动脉 MRA 中多种钆对比剂应用对比研究

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目的 探讨三种目前临床常用的钆对比剂是否对肾动脉磁共振血管成像中血管分支显示造成差异。**方法** 对 45 名无肾脏相关病史且血肌酐正常的病例分成三组，分别为钆喷酸葡胺组（n=15）、钆双胺组（n=15）与钆贝葡胺组（n=15）。对三组病例均进行常规磁共振肾脏扫描；平扫结束后进行对比剂增强肾动脉成像。注射药品说明书规定剂量，以相同速率（2.5 毫升/秒）注射，扫描采用同一扫描方案（延迟 20 秒后进行动态三期扫描，采用肝脏容积加速采集序列）。对血管成像序列进行最大密度投影、多平面重建。对图像中血管显示情况进行评分，包括血管与背景组织对比度，肾动脉主干显示，肾动脉一级分支、二级分支显示。**结果** 三组对比剂增强肾动脉血管成像中肾动

脉主干及一、二级分支显示图像质量评分均不存在统计学差异（P＜0.05）。**结论** 三种目前临床常用的钆对比剂对肾动脉 MRA 中血管分支显示未造成差异。

PU-1024
CT 纹理特征在鉴别肾脏嗜酸细胞腺瘤与肾脏嫌色细胞癌的意义

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目的 探讨纹理分析在多层螺旋 CT（MSCT）增强扫描图像上对肾嗜酸细胞腺瘤（renal oncocytoma,RO）与嫌色细胞癌（chro-mophobe cell renal carcinoma,CCRC）的鉴别诊断价值。资料与**方法** 搜集经手术病理证实的 8 例 RO 和 11 例 CCRC 患者的资料,术前全部行 CT 平扫和三期增强扫描,勾画 ROI，获得纹理特征，采用 SPSS 16.0 软件对两种肿瘤的影像学纹理特征进行统计学处理。**结果** 纹理分析的 MDF 值差异有统计学意义（P＜0.05）。**结论** MSCT 的纹理特征对术前 RO 和 CCRC 的鉴别诊断具有一定价值。

PU-1025
磁共振对布加综合征的诊断意义

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目的 研究磁共振对布加综合征的诊断意义
方法 研究 2017 年 10 月至 2018 年 6 月期间在徐州医科大学附属医院做 MRI 平扫及增强扫描的 60 例布加综合征患者的 MRI 图像资料。
结果 56 例布加综合征患者的 MRI 直接征象为肝静脉和(或)下腔静脉狭窄或阻塞,并据此分为Ⅰa 型 8 例,Ⅰb 型 4 例,Ⅱb 型 16 例,Ⅲa 型 4 例,Ⅳa 型 4 例,Ⅳb 型 20 例。32 例急性布加综合征患者中,12 例肝内静脉形成陈旧性血栓,4 例下腔静脉内有血栓形成;32 例肝脏呈弥漫性肿大,24 例伴有腹水和脾肿大,4 例伴有胆囊水肿;20 例行 MRI 平扫示肝实质信号不均匀,增强后肝实质呈中心强化,周边强化减弱;8 例出现肝外侧支循环,1 例出现肝内侧支循环。24 例慢性布加综合征患者中,12 例肝脏体积缩小,4 例尾状叶代偿性肥大,8 例肝内出现多发再生结节;4 例伴有腹水和脾肿大,4 例伴有胆囊水肿;6 例行 MRI 平扫示肝实质信号不均匀,增强后 4 例呈“地图样”强化,2 例肝脏中央部分出现斑片状强化,而周边部分强化程度相对较低,延迟扫描时肝脏呈较均匀强化;6 例出现肝外侧支循环,其中 1 例伴有肝内侧支循环。
结论 MRI 图像能够显示布加综合征的直接或间接征像,是诊断急、慢性布加综合征重要的无创性检查方法。

PU-1026
胎儿肝上型膈疝引产前后磁共振表现及尸检结果对照 1 例

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目的 探讨胎儿肝上型膈疝磁共振检查与尸检结果的一致性。
方法 孕妇 26 岁，孕 1 产 0，唐氏筛查低危，孕 25 周超声扫查：胎儿四腔心切面：于右侧胸腔内右心房右旁探及肝右叶回声，大小约 2.9×2.0cm，心脏受压略向左移位，双肺回声强度显示正常，肺头比约 2.91。诊断：胎儿右侧膈疝（肝右叶疝入胸腔）。次日行胎儿磁共振检查，T1WI、T2WI 均示肝右叶明显抬高，右肺受压体积减小。于孕 26 周在当地医院引产，产后 2 小时内复查胎儿标本磁共振，T2WI 示右侧膈肌连续性中断，肝右叶于中断处突入右侧胸腔。随后行标本解剖，沿锁骨、双侧腋中线剪断肋骨，充分暴露胸腔。
结果 标本见右肺体积小，移除双肺及心脏，示右侧膈肌于前外侧附着于肋骨处缺如，见一破裂孔，肝叶从破裂孔突入，邻近膈肌菲薄，肌纤维交叉错落可见，后部膈肌厚度未见异常，左侧膈肌连续性好，食管裂孔、主动脉裂孔及腔静脉孔未见明显异常。诊断：胎儿右侧膈疝（肝上型、前外侧疝）。
结论 MRI 作为产科胎儿超声检查的一种重要补充方法，对胎儿膈疝病变的显示，与尸检结果具有较高吻合性，对产前诊断有一定帮助。

PU-1027
体素内不相干运动(IVIM)对健康孕妇中晚期胎盘灌注测量的可重复性

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目的 研究体素内不相干运动(intravoxel incoherent motion，IVIM)模型测量健康中晚期孕妇胎盘灌注的可重复性。
方法 收集 48 例超声检查确诊胎盘无异常的单胎正常妊娠孕妇。依不同孕龄(GA)分为 3 组包括:Ⅰ组 GA15～27 周（n=27）;Ⅱ组 GA28～33 周（n=11）;Ⅲ组 GA34～39 周（n=10）。所有孕妇均使用 3.0T 磁共振仪进行胎盘普通磁共振成像及 IVIM 成像。2 名医师分别对胎盘基蜕膜侧、胎盘中间、胎盘胎儿侧等 3 个区域的 IVIM 图灌注系数 f 值进行测量。利用组内相关系数(Interclass Correlation Coefficient，ICC)分析评价两名观察者间测量结果的一致性。
结果 48 例孕妇平均孕龄 27±3 周。在胎盘不同区域使用 IVIM 测量灌注分数观察者间具有良好的一致性（胎盘胎儿侧 ICC=0.935，胎盘中间带 ICC=0.941，胎盘基蜕膜侧 ICC=0.973，P＜0.05）。
结论 体素内不相干运动(IVIM)模型评价正常胎盘灌注系数(f)具有良好的可重复性，可为不能使用造影剂的孕妇胎盘灌注情况观察提供新选择。

PU-1028
宫颈妊娠的 MRI 诊断价值

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目的 总结宫颈妊娠的 MRI 表现特点，探讨 MRI 在宫颈妊娠中的诊断价值。**方法** 回顾分析经手术病理或临床证实的 17 例宫颈妊娠的 MRI 表现。**结果** 妊娠囊呈单纯囊状 13 例，呈混合包块 4 例。宫颈管内有妊娠囊 17 例，其中妊娠囊完全位于宫颈管 14 例，3 例位于宫颈管并局部凸向宫腔下段。宫颈管扩大 16 例，宫腔空虚 16 例，宫颈内口闭合 14 例，宫内膜增厚 7 例，宫颈胎盘植入 4 例。妊娠囊 T_1WI 呈低信号或低信号伴少许点条等信号 13 例，T_2WI 呈高及稍高信号 14 例。妊娠囊边缘 T_2WI 呈低信号 17 例，T_1WI 呈高或稍高信号 15 例。增强囊内乳头状或索条状强化 5 例，边缘

呈不均匀强化 5 例。**结论** 宫颈妊娠主要呈囊状，宫颈管内发现妊娠囊是最重要的 MR 表现。T_2WI 上妊娠囊边缘低信号影、宫颈管扩大、宫腔空虚、宫颈内口闭合是诊断宫颈妊娠的重要征象。MRI 能很好显示宫颈妊娠的位置、大小、范围、信号特点及侵犯肌层状况，结合临床资料可提示诊断。

PU-1029

卵巢子宫内膜异位囊肿的影像研究进展

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子宫内膜异位症，简称内异症，指具有活性的子宫内膜组织异位到子宫体以外的部位而引起的疾病。子宫内膜可异位至全身任何部位，最常见于卵巢及宫骶韧带。当内膜侵犯卵巢并在其内生长形成的囊肿称为卵巢子宫内膜异位囊肿，其囊液似巧克力，故又称为巧克力囊肿。主要表现为痛经、性交痛、慢性盆腔痛及不孕，是一种严重影响育龄期女性身心健康的疾病。一次性手术切除病灶是消除症状、恢复生育能力的最佳方法，但因术前病灶范围未能明确，常发生术后病灶残留，易发生不典型增生甚至恶变。因此，及时、准确的诊断及术前病灶范围评估对内异症的治疗及预后具有重要意义。磁共振成像能够准确的显示病灶部位、大小、形态、范围及与周围组织的关系，是筛选或诊断本病的最佳无创性检查方法。本文就卵巢子宫内膜异位囊肿的影像诊断做一综述。

PU-1030

磁共振 IDEAL-IQ 技术与生物电阻抗分析法对内脏脂肪定量的相关性研究

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目的 评价磁共振 IDEAL-IQ 技术与生物电阻抗分析法对腹腔内脏脂肪定量的一致性
方法 选取 32 例志愿者分别经 InBody 测量和磁共振扫描，对比分析两种方法测量脂肪含量的差异及相关性。
结果 32 例志愿者中，24 例诊断为超重（BMI≥24），超重者（24/32,75%）有统计学意义（P＜0.05）。经 InBody 人体成分测量，得到 BMI、体脂肪和内脏脂肪面积；经磁共振扫描，测量每个志愿者的肝脏脂肪分数（FF）、腹壁脂肪面积和内脏脂肪面积。Pearson 相关性分析显示经 InBody 人体成分测量的内脏脂肪面积与经磁共振测量的内脏脂肪面积呈正相关（r=0.506,P=0.012）.
结论 磁共振 IDEAL-IQ 技术与生物电阻抗分析法对腹腔内脂肪面积定量有一致性。

PU-1031

磁共振 IDEAL-IQ 技术与生物电阻抗分析法对内脏脂肪测定的相关性研究

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目的 评价核磁共振 IDEAL-IQ 技术与生物电阻抗分析法对腹腔内脏脂肪测定的一致性。**方法** 选取 32 例志愿者分别经生物电阻人体成分分析法（InBody770）测量和核磁共振扫描，对比分析两种方法测定脂肪含量的差异及相关性。**结果** 32 例志愿者中，24 例 BMI≥24 kg/m^2，超重及肥胖者占 75%。经 InBody 人体成分测量，志愿者 BMI 为 26.55±2.33 kg/m^2（22.62~30.11 kg/m^2）、体脂肪为 26.43±9.64 kg（17.4~62.9 kg）、内脏脂肪面积则为 112.78±30.63 cm^2（69.2~178.9 cm^2）。进一步经核磁共振扫描，测量每个志愿者的肝脏脂肪分数（FF）为 4.47±3.87（1.25~17.52）、腹壁脂肪面积为 259.56±74.11 cm^2（144.7~455.8 cm^2）和内脏脂肪面积则为 75.60±27.98 cm^2（34.98~127.09 cm^2）。Pearson 相关性分析显示生物电阻抗人体成分分析测量的内脏脂肪面积与经核磁共振方法测量的内脏脂肪面积呈正相关（r=0.506, P=0.012）。**结论** 核磁共振 IDEAL-IQ 技术与生物电阻抗分析法对腹腔内脂肪面积定量具有一致性。

PU-1032
剖宫产术后切口妊娠的磁共振表征与术前诊断价值

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目的 探讨子宫切口瘢痕妊娠（CSP）的 MRI 表征及术前诊断价值；**方法** 收集 45 例剖宫产瘢痕妊娠 45 例患者，年龄范围 21 岁至 47 岁，平均年龄 34.60±5.61 岁，中位年龄 35 岁。回顾性分析 45 例切口瘢痕妊娠患者的临床及 MRI 资料，包括孕育史、血 HCG、子宫瘢痕信号特征、测量瘢痕厚度、判断孕囊类型、孕囊体积、孕囊或胎盘与瘢痕之间关系。采用 2 名不同年资医师共同观察评价子宫瘢痕位置、孕囊体积大小及子宫的 MRI 特征，包括胎盘植入程度、增强强化方式及病理表现。**结果** 45 例患者资料中，5 例为胎盘低置状态或前置胎盘，孕周为 15 周至 34 周；40 例 CSP，经清宫手术获取病理标本，术前 MRI 肯定性诊断 38 例，正确率 95%。其中①囊状孕囊 25 例，孕囊呈椭圆形囊状信号，形态主要呈类圆形、哑铃形及泪滴形，MRI 表现为 T1WI 低信号，T2WI 高信号，增强呈环形薄壁强化；②包块型孕囊 15 例，表现为子宫下段宫腔内不规则包块影，形态主要呈圆形、椭圆形，MRI 表现为 T1WI 等、低信号，其 T2WI 呈高信号为主的混杂信号，增强扫描呈环形厚壁、斑片状强化。MRI 显示 40 例 CSP 妊娠囊，内生型 28 例、外生型 12 例；子宫前壁瘢痕主要表现为子宫前壁连续性中断，局部凹陷性变薄，瘢痕条状或不规则形 T1WI、T2WI 低信号，增强时瘢痕无明显强化。矢状位测量瘢痕厚度，最薄厚度 1.2mm，最大厚度 11mm，平均厚度 3.08mm;，孕囊大小，最小 9mm*13mm，最大孕囊大小 50mm×86mm，平均为 23.55mm×32.82mm。 **结论** 术前诊断孕囊类型、大小、瘢痕位置、厚度及胎盘附着于子宫瘢痕并增强明显强化是诊断 CSP 的可靠标准并具有明显术前诊断价值。

PU-1033
腹膜后 Castleman 病的 CT 和 MRI 表现

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目的 分析腹膜后 Castleman 病的 CT 和 MRI 表现，探讨其诊断要点。
方法 回顾性分析 2012 年 7 月~2019 年 1 月福建医科大学附属第一医院经病理证实的 9 例腹膜后 Castleman 病的 CT 和 MRI 影像表现。6 例只行 CT 检查，3 例均行 CT 和 MRI 检查。分析病变的数量、形态、大小、密度/信号、强化特点、边界及周围情况等。

结果 9 例患者中，男 5 例，女 4 例，年龄范围 35~65 岁，中位年龄 48.3 岁。肿瘤为透明血管型 5 例，浆细胞型 2 例。单发 7 例，多发 2 例。肿瘤呈类圆形 6 例，呈分叶状 3 例。肿瘤境界清楚 6 例，境界欠清 3 例。CT 检查肿瘤均呈软组织密度,其中伴有脂肪密度 1 例，囊变 1 例。MRI 检查信号均匀 2 例，余 1 例不均匀，与周围肌肉组织比，T1WI 均呈低信号；T2WI 呈均匀高信号 2 例，以低信号为主的高低混杂信号 1 例；弥散受限 3 例。增强扫描均呈明显较均匀强化，2 例周围可见迂曲扩张血管影。
结论:腹膜后 Castleman 病具有较特征的影像表现：CT 平扫呈软组织密度，多呈类圆形，境界清楚，增强强化明显，部分病灶周围可见扩张迂曲血管影。MRI 弥散受限，CT 与 MRI 结合能较好地显示肿瘤部位、与周围组织的关系。

PU-1034
T3 期直肠腺癌淋巴结转移 MRI 影像及临床病理相关因素分析

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摘要 目的 通过研究 T3 期直肠腺癌原发肿瘤 MRI 影像征象及临床病理因素与淋巴结转移的相关性，从而提高对淋巴结转移的诊断，指导临床选择最佳的治疗方案。**方法** 收集本院经病理证实的 T3 期原发性直肠腺癌患者 51 例，分析患者的年龄、性别、肿瘤的位置、病变长度、病变厚度、病灶中心与腹膜反折关系、绕肠周径、ADC 值、T3 分期、大体类型、分化程度、脉管侵犯、神经侵犯与淋巴结转移的相关性。**结果** 共计 T3 期直肠腺癌 51 例，其中淋巴结转移组 22 例，无淋巴结转移组 29 例，淋巴结转移率 43.1%。单因素分析显示肿瘤的厚度、病灶中心与腹膜反折关系、分化程度、神经侵犯、脉管侵犯与淋巴结转移相关，差异具有统计学意义（$p<0.05$）。多因素 Logistic 回归分析显示肿瘤的厚度和脉管侵犯是淋巴结转移的独立危险因素。**结论** 肿瘤的厚度、脉管侵犯是淋巴结转移的独立危险因素，可以提高对淋巴结转移诊断的准确率，从而指导临床选择最佳的治疗方案。

PU-1035
采用机器学习预测子宫内膜癌组织学级别高低

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目的 组织学分级是影响子宫内膜癌的一个重要预后因素，影像检查只能大致获得其影像分期，因此本研究目的是采用多参数 MRI（multiparameter Magnetic Resonance Imaging，mpMRI）的放射组学特征在术前预测其组织学分级，为临床术前个性化治疗方案的制定提供决策支持，促进临床精准医疗的发展。
材料与**方法** 本研究回顾性搜集了从 2015 年 10 月到 2019 年 1 月术前进行 MRI 检查的 140 名子宫内膜癌患者 MR 影像资料，然后采用放射组学软件 the 3D Slicer (www.slicer.org)对肿块的 T2WI、增强 T1WI (contrast-enhanced T1WI, CE-T1WI)、DWI 和 ADC 四个序列进行勾画，提取放射组学特征，最后提取出 428 个组学特征。采用 Mann-Whitney U 检验分析放射组学特征与组织学分级的相关性，对差异有统计学意义的变量进行随机森林建模，用 5 折叠法将样本分为训练集和测试集进行交叉验证，最后采用 ROC 曲线计算 AUC 值得到模型对子宫内膜癌组织学分级的诊断效能。

结果 140 例子宫内膜癌患者中，组织学分级低级别组共 108（77.1%）例，高级别组共 32 例（22.9%）。随机森林模型对于组织学分级的诊断效能 AUC 值分别为 0.871（95%CI：0.804-0.923）。
结论 基于多参数 MRI 放射组学特征和机器学习表明放射组学特征可以用于术前预测子宫内膜癌组织学分级，能达到较好的诊断效能，促进精准医疗的发展。

PU-1036

MRCP 结合 Gd-EOB-DTPA 肝脏增强 MRI 胆管造影在胆管成像中的应用

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目的 研究 MRCP 结合磁共振 Gd-EOB-DTPA 增强磁共振胆管成像(EOB-MRC)对胆管系统结构的显示。
方法 回顾性分析 46 例患者 MRI 胆管系统图像，所有患者均同时行 MRCP 扫描和 Gd-EOB-DTPA 肝脏动态增强扫描、延迟期及肝胆特异期扫描。分析 MRCP 及 EOB-MRC 胆管系统结构显示情况。
结果 MRCP 对胆囊管的显示受胃肠高信号背景干扰较大，MRC 胆道显示受肝功能影响。胆道内造影剂正常排泄者,MRCP 及 MRC 对肝总管、胆总管及肝内一级、二级胆管显示无明显差异；胆道系统扩张者,MRCP 能够显示更细的肝内胆管分支。
结论 MRCP 与 EOB-MRC 均可以清晰显示胆管系统结构，联合应用可进一步了解肝功能。

PU-1037

To investigate the value of combining MRI texture features with logistic regression analysis in differentiating borderline from malignant epithelial ovarian tumors based on the whole tumor

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Purpose: To explore the value of texture features combined with logistic regression analysis in differential diagnosis of borderline epithelial ovarian tumors (BEOTs) and malignant epithelial ovarian tumors (MEOTs) based on the whole tumor.

Materials and Methods: The clinical data and MRI characteristics of 88 patients with BEOTs or MEOTs proven by surgery and histopathology were retrospectively reviewed, the characteristics of clinical and MRI considered statistically significant were analyzed by binary logistic regression. Texture features of all tumors were extracted with MaZda software by manually delineating the entity layer by layer on T2WI, DWI and contrast-enhanced T1WI, respectively. The most optimized 30 texture parameters were chosen by Fisher's coefficient, classification error probability

combined with average correlation coefficient (POE+ACC) and interaction information (MI) method (MI+PA+F, MPF). The importance of each texture feature was automatically calculated by Random Forest using feature selection algorithm. The five texture features with the highest weights derived from T2WI, DWI and contrast-enhanced T1WI were also analyzed by binary logistic regression, respectively. Hosmer-Lemeshow test and Receiver Operating Characteristic (ROC) curve were used to assess the diagnostic performance.

Results: Compared with BEOTs, the CA-125 and maximum diameter of solid component of MEOTs were significantly higher than those of BEOTs($p< 0.001$). Furthermore, MEOTs more frequently had thickened irregular septa and ill-defined margin than in BEOTs ($P< 0.001$), whereas purely cystic and round or oval appearance were more prevalent in BEOTs than MEOTs ($p<0.001$, $p=0.001$, respectively). Most of the selected 30 optimal texture features were derived from the Gray Level Co-occurrence Matrix on T2WI ,DWI and contrast-enhanced T1WI (all of 25/30, 83.3%).The five texture features with the highest weights were S(0,1,0)DifEntrp, GrKurtosis, S(0,5,0)Correlat, S(0,0,5)DifVarnc and GrVariance on T2WI; S(0,0,4)SumAverg, S(0,0,4)Correlat, S(3,0,0)DifEntrp, S(3,0,0)Entropy and 135dr_RLNonUni on DWI; S(0,0,5)SumAverg, GrNonZeros, S(0,0,5)Correlat, S(4,0,0)DifEntrp and S(1,0,0)DifEntrp on contrast-enhanced T1WI. All Hosmer-Lemeshow statistics were greater than 0.05 showing a good fit goodness of those logistic regression models(P=0.674, 0.877, 0.997 and 0.959 of T2WI, DWI, Contrast-Enhanced T1WI and the clinical data and MRI characteristics, respectively). The AUC, sensitivity, and specificity of those logistic regression models were 0.794, 91.2% and 62.1% of T2WI; 0.915, 89.7% and 71.4% of DWI ; 0.934, 91.4% and 72.4% of Contrast-Enhanced T1WI ; 0.793, 84.5% and 50.0% of the clinical data and MRI characteristics. In the differential diagnosis of BEOTs and MEOTs, texture features extracted from the whole tumor were more preferable than the combination of clinical data and MRI characteristics. Furthermore, texture features extracted from Contrast-Enhanced T1WI of the whole tumor had the optimal differential diagnostic performance compared to T2WI and DWI.

Conclusion: MRI texture features combined with logistic regression analysis are capable of quantificationally differentiating BEOTs from MEOTs.

PU-1038

原发性肾上腺血管瘤 4 例报告并文献复习

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[摘要]**目的** 探讨肾上腺血管瘤 CT/MRI 表现特点及其病理学特征。**方法** 回顾性分析 2018 年 3 月至 2019 年 3 月南昌大学第二附属医院 4 例经病理证实的肾上腺血管瘤患者的 CT/MRI 影像资料及病理学特征。**结果** 该组病例中女性 3 例，男性 1 例，平均年龄 68 岁（65-71 岁），左侧 1 例，右侧 3 例，肿瘤最大径为 15mm-167mm，CT 扫描 4 例，MRI 扫描 2 例，囊实性 3 例，实性 1 例，4 例均可见边缘结节状及条片状明显强化，其中 1 例最大者信号混杂，T1WI 边缘为稍低信号实性成分，中央呈稍高信号，T2WI 呈花斑状高低信号。**结论** 动态增强后病灶边缘见结节状及条片状明显强化及 T2WI 信号混杂、高低信号对比明显是血管瘤特征性影像表现。

PU-1039

MRCP 在胆道系统病中的误诊原因

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目的 探讨磁共振 MRCP 在胆道系统病中的误诊原因分析。
方法 采用磁共振 MRCP 对胆道系统进行扫描。
结果 1、常见胆结石误诊原因分析；2、胆总管癌常见误诊的原因分析
结论 在利用 3DMRCP 对胰胆道系统疾病进行诊断时，必需充分了解患者病史、设备性能的同时，结合 MRI 平扫各参数扫描和增强扫描、弥散成像认真分析影像特征才能做出最好的诊断，提高诊断率，减少漏诊、误诊。

PU-1040

磁共振动脉自旋标记技术不同扫描方式正常肾脏的对比应用

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摘要:目的 分析单次激发快速自旋回波-流动敏感反转恢复序列(SSFSE-FAIR)与平面回波-流动敏感反转恢复序列(EPI-FAIR) 所测量的健康臂的相对血流量值(rBFV)，评价两种动脉自旋标记(ASL)序列在正常肾脏检查中的应用价值。方法 分析 40 例符合纳入标准的受试者的 rBFV。采用 3.0T 磁共振扫描仪扫描。按 3 种方式采集图像:EPI-FAIR 屏气法、 SSFSE-FAIR 屏气法及 SSFSE-FAIR 自由呼吸法。结果 SFSE-FAIR 自由呼吸法可定量区分肾脏皮髓质。皮质 rBFV:1148± 9.23；髓质 rBFV:94.98±3.38；SSFSE-FAIR 屏气法及 EPI-FAIR 不能定量区分肾脏皮髓质。EPI-FAIR 皮质平均 rBFV 为 178.50± 171795%置信区间:167.59～189.41。结论 SFSE-FAIR 屏气法及 EPI-FAIR 空间分辨率低，无法区分肾脏皮糖质，可粗略评价肾脏灌注情况。 SSFSE-FAIR 图像空间分辨率较高，可区分肾脏皮髓质结构，可初步评判肾脏皮髓质的灌注状态 。

PU-1041

肺炎克雷伯菌肝脓肿 MRI 表现

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目的 探讨肺炎克雷伯菌肝脓肿的 MRI 表现。**方法** 回顾性分析 30 例肺炎克雷伯菌肝脓肿患者的临床及 MRI 影像学资料，入选患者均行腹部 MRI 平扫、增强和 DWI 检查，分析其 MRI 特征。**结果** 30 例患者中共发现病灶 65 个，高毒力型 16 例，脓腔积气 17 例，分隔强化 18 例，单叶 26 例，双叶 4 例，实性 18 例，囊性 12 例，薄壁 24 例，厚壁 6 例，单房 5 例，多房 25 例，一过性灌注异常 18 例，脓肿周围无强化 22 例。全部脓肿呈明显 T1WI 低信号，T2WI 高信号，24 例 DWI 呈高信号、ADCmap 呈低信号，6 例 DWI 呈低信号、ADCmap 呈高信号。**结论** 肺炎克雷伯菌肝脓肿的 MRI 特征表现包括单发、单叶、实性、多房、薄壁、脓肿周围无强化、脓腔积气及分隔强化，且以上特征具备越多，本病的可能性越大。MRI 可准确显示早期肺炎克雷伯杆菌的影像特征，对临床决策有重要意义。

PU-1042
月经状态对不同病理类型早期宫颈癌表观弥散系数的影响初探

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目的 探讨月经状态对不同病理类型早期宫颈癌表观弥散系数的影响。材料与**方法** 回顾性分析我院 2015 年 1 月至 2016 年 12 月收治的经术后病理证实的ⅠB$_1$~ⅡA$_1$期宫颈癌 352 例，其中鳞癌 317 例和腺癌 35 例，177 例患者未绝经，175 例患者绝经。行 MR 弥散加权成像（b 值取 0、1000 s/mm^2），测量病灶最大层面的 ADC 值，记录 ADC 最大值、最小值和平均值。采用独立样本 t 检验，比较宫颈鳞癌和腺癌各 ADC 值的差异，在绝经患者和未绝经患者中，分别比较宫颈鳞癌和腺癌各 ADC 值的差异；在鳞癌和腺癌亚组中，比较绝经和未绝经患者的 ADC 值的差异。**结果** 在所有患者中，宫颈鳞癌的 ADC 平均值和最小值均低于腺癌，两者差异有统计学意义（p<0.05），两者的 ADC 最大值没有差异；对于未绝经患者，宫颈鳞癌的 ADC 平均值和最小值均低于腺癌，两者差异有统计学意义（p<0.05），ADC 最大值没有差异；而对于绝经患者，宫颈鳞癌的 ADC 平均值、最小值和最大值均与腺癌相仿，两者差异没有统计学意义（p>0.05）。未绝经患者整体宫颈癌病灶、鳞癌亚组病灶的 ADC 平均值、最大值和最小值之间均高于绝经患者，且差异具有统计学意义（p＜0.05）；腺癌亚组中，未绝经患者的 ADC 平均值和最小值也高于绝经患者，差异有统计学意义（p<0.05），而 ADC 最大值无统计学差异。**结论** 宫颈癌的病理类型和患者的月经状态对于宫颈癌病灶的 ADC 值有影响。

PU-1043
基于多参数 MRI 影像组学模型预测直肠腺瘤癌变的应用研究

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目的 探讨基于多参数 MRI 影像组学模型预测直肠腺瘤癌变的价值。
方法 回顾性分析山东省千佛山医院 2016 年 8 月至 2019 年 3 月术后病理证实为直肠腺瘤（n=25）及直肠腺瘤癌变(n=21)的患者共 46 例,所有患者均在术前两周内行盆腔 MRI 平扫检查, 利用影像组学分析工具（Radcloud,Huiying Medicial Technology Co.,Ltd）和 ITK-SNAP 分别在平扫轴面小 FOV T2WI 及 DWI 序列上分割出感兴趣区域（VOI）。分别从 T2WI、DWI 及 T2+DWI 中提取影像组学特征，利用 SVM 算法构建 3 个预测模型用于预测直肠腺瘤癌变，分别为 Model $_{T2}$、Model$_{DWI}$、Model$_{T2+DWI}$。利用受试者工作曲线（ROC）评价模型的预测效能，并通过 ROC 曲线下面积（AUC）、敏感性、特异性进行量化，利用 DE-LONG 检验比较各模型的预测效能。
结果 分别从 T2WI、DWI、T2WI+DWI 中提取 10、11、15 个影像组学特征构建模型。Model $_{T2}$、Model$_{DWI}$、Model$_{T2+DWI}$预测模型在验证组中的 AUC 分别为 0.88（95% CI0.58-1.00）、0.84（95% CI0.51-1.00）、0.96（95% CI0.66-1.00），敏感度分别为 0.80、0.80、0.80，特异度分别为 0.80、0.60、0.80。3 个预测模型对直肠腺瘤癌变的预测效能无统计学差异（p>0.05）。
结论 基于 MRI 影像组学特征构建的 SVM 回归模型在直肠腺瘤癌变预测中表现良好，Model $_{T2}$、Model$_{DWI}$、Model$_{T2+DWI}$对直肠腺瘤癌变的预测效能无统计学差异。基于单一序列的放射组学模型即可作为影像学生物标志具有诊断腺瘤癌变的潜力，辅助临床医师更好的制定治疗方案。

PU-1044
Meta 分析：普美显增强 MRI 肝胆期能否提高肝细胞癌诊断准确性

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目的 探讨增加肝胆期图像(HBP)对于诊断慢性肝病患者小肝癌(直径≤3 cm)的应用价值。**方法** 在 PubMed, Web of Science, Embase 以及 Scopus 数据库中收集 2000 年 1 月至 2017 年 12 月中，所有使用普美显增强的磁共振（MRI）诊断小肝癌（≤3cm)的相关研究。在新的诊断标准中，增加肝胆期图像增强 MRI 的诊断标准定义为在动脉期表现为高信号，在门静脉期、延迟期或肝胆期表现为低信号的结节，诊断为肝细胞癌。而对未增加肝胆期图像增强 MRI，诊断标准参照美国肝病研究学会（AASLD）肝癌诊断指南，即在增强 MRI 中表现为动脉期强化且静脉期洗脱的肝脏结节诊断为肝细胞癌。在纳入文献中提取数据，采用双变量随机效应模型，计算敏感度、特异度、诊断比值比、似然比及受试工作者特征曲线(sROC)的汇总计算。使用软件为 Stata 14.0 及 R 语言 3.5.1。**结果** 共纳入 16 篇文献，1668 例小肝癌病灶。增加 HBP 的增强 MRI 敏感度为 90% (95% CI: 78%, 96%)，特异度为 95% (95% CI: 85%, 98%)，阳性似然比为 17.7 (95% CI: 5.7, 55.5)，阴性似然比为 0.11 (95% CI: 0.05, 0.24)，诊断比值比为 168.8 (95% CI: 46.2, 615.6)，sROC 曲线下面积为 97%(95% CI: 96%, 98%)。增加 HBP 的普美显增强 MRI 的敏感度明显高于未增加 HBP 的 MRI (84% vs 62%，P = 0.04)。**结论** 在慢性肝病患者中，增加肝胆期图像的普美显增强 MRI 相对未增加肝胆期图像的增强 MRI，在诊断小肝癌上具有更高的敏感度。因此，在临床实践中应考虑在普美显增强 MRI 中增加肝胆期图像，并将肝胆期低信号纳入诊断标准中，作为诊断慢性肝病患者小肝癌的重要影像学依据。

PU-1045
MRI 双参数与多参数对前列腺癌诊断效能比较

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目的 探讨包括动态对比增强成像(dynamic enhanced imaging, DCE)的多参数相对于 T2 加权成像(T2WI)和弥散加权成像(diffusion weighted imaging, DWI)双参数对前列腺癌的诊断价值。**方法** 85 例患者因前列腺特异性抗原（PSA）水平升高及/或怀疑前列腺癌行前列腺 3.0 T MR 扫描，在 PACS 上导出图像，分为两组，第一组双参数扫描图像（T2WI+DWI），第二组采用多参数扫描图像（T2WI+DWI+ DCE），分别由具有 9 年、2 年前列腺 MR 成像经验的 2 名影像科医师根据 PI-RADS V2 评分原则进行回顾和独立评分。比较 2 名医师的评分，且一致性结果与穿刺结果对照后，采用二分法计算其敏感性、特异性、阳性预测值和阴性预测值，进行 ROC 曲线分析，计算曲线下面积(AUCs)。**结果** 2 位医师的评分一致性较高(第一组 k=0.839、第二组 k=0.901)。两组图像对前列腺癌的检测均有显著意义（P=0.000）。双参数和多参数 MR 的 AUC 分别为 0.784、0.812。**结论** 由 T2WI 和 DWI 组成的双参数 MR 扫描方案诊断前列腺癌的效能与标准多参数成像方案相当。对 PSA 升高患者 MRI 检查应优化扫描方案，即 T2WI、T1WI 及 DWI，对于需要判断盆腔有无淋巴结转移或有无盆壁转移，可进行 DCE 辅助诊断。

PU-1046

Diagnostic performance of MR imaging for evaluating prognostic factors in patients with cervical cancer: A meta-analysis

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Objectives: The study aimed to determine the diagnostic performance of conventional magnetic resonance imaging (MRI) in assessing the distance between the tumour and the internal os, stromal infiltration, lymph node metastasis and parametrial invasion in patients with cervical cancer.
Methods: A systematic English-language literature search of conventional MRI in the evaluation of human cervical cancer was performed in PubMed, Cochrane Library, Embase and Web of Science from 1995 to 2018. The pooled sensitivity, specificity, diagnostic odds ratio (DOR), and positive and negative likelihood ratios (PLR and NLR) of all studies were calculated. The results were plotted in hierarchical summary receiver operating characteristic (HSROC) plot. Meta-regression and subgroup analyses of parametrial invasion were performed.
Results: The pooled sensitivity, specificity, DOR, PLR and NLR were 86%, 97%, 167.91, 24.74, and 0.15, respectively, for evaluating the internal os involvement (6 studies, 454 patients); 87%, 91%, 73.41, 10.22, and 0.14, respectively, for evaluating the stromal infiltration (11 studies, 672 patients); 51%, 89%, 8.63, 4.72 and 0.55, respectively, for evaluating the lymph node metastasis (15 studies, 997 patients); and 75%, 92%, 34.01, 9.38 and 0.28, respectively, for evaluating the parametrial invasion (19 studies, 1748 patients). The meta-regression of parametrial invasion showed that the application of contrast enhancement was a significant factor affected the heterogeneity ($p = 0.039$).
Conclusions: Conventional MRI can accurately evaluate the distance between the tumour and the internal os, and stromal infiltration, and performs good in diagnosing parametrial invasion. However, this method exhibited a limited ability to diagnose lymph node metastasis.

PU-1047

Multiparametric MRI-based radiomics nomogram in prediction of lymph node metastasis of early-stage cervical cancer preoperatively

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Objective
To develop and validate a multiparametric MRI-based radiomics nomogram for prediction of LNM in patients with cervical cancer.

Patients and Methods
Three hundred consecutive patients with stage IB－IIB cervical cancer with or without lymph node metastases were included in this study. And 200 patients were allocated to the primary cohort and 100 patients to the validation cohort according to the ratio of 2:1. All data was gathered from January 2016 to December 2018. Radiomic features were extracted in Pyson-software from MRI examination[T1WI, fs-T2WI, dynamic contrast-enhanced (DCE), diffusion-weighted imaging (DWI) and apparent diffusion coefficient (ADC)] of patients with cervical cancer. In the process of data dimension reduction, feature selection, and radiomics signature building, LASSO method was used. Multivariable logistic regression analysis was used to develop the predicting radiomics model. The radiomics nomogram were incorporated the radiomics signature, MRI-reported LN status and clinicopathologic. The performance of the nomogram was assessed with respect to its calibration, discrimination, and clinical usefulness.
Results
In the process of feature of selection, 3940 features were reduced to 26 potential predictors on the basis of 200 patients in the primary cohort. Predictors contained in the individualized prediction nomogram included the rad-score, MRI-reported LN status, FIGO stage, and histologic subtype. The radiomic signatures allowed good discrimination between LNM and non-LNM groups. The C-index was 0.840 (95% confidence interval [CI], 0.782－0.898 in the primary cohort and 0.823 (95% CI, 0.729－0.917) in the validation cohort. Application of the nomogram still gave good discrimination(C-index, 0.865 [95% CI, 0.813 to 0.917]) (C-index, 0.832 [95% CI, 0.737 to 0.927]) in the primary and validation cohort, it yields good calibration in both two cohorts. Decision curve analysis demonstrated that the radiomics nomogram was clinically useful.
Conclusion
A radiomics nomogram is developed in this study that incorporates the MRI-reported LN status, FIGO stage, histologic subtype and radiomic signature. And the radiomics nomogram can be conveniently used to facilitate the individualized prediction of LNM in patients with early-stage cervical cancer.

PU-1048

Evaluating the clinical efficacy of magnetic resonance elastography in patients with Budd-Chiari syndrome

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Aimes : To measure liver stiffness (LS) of Budd-Chiari syndrome (BCS) patients and then to investigate the relationship between LS levels and liver function properties. Materials and Methods: Forty-six BCS patients, confirmed with ultrasonography exams, were enrolled in this study. The liver function of these patients was classified according to the Child-Pugh grading standard before treatment. As a result, 20 cases were graded as Child-Pugh A, 16 as Child-Pugh B and 7 as Child-Pugh C. Furthermore, clinical liver function parameters were also recorded, including albumin (ALB), alanine aminotransferase (ALT), aspartate aminotransferase (AST), prothrombin time

(PT), and total bilirubin (TBIL). All patients were measured with MRE before and after BCS treatment. The corresponding time interval between scans was 2-7 days. Pearson correlation analysis was performed to measure the correlation between LS and clinical liver function-related parameters (i.e., ALB, ALT, AST, PT and TBIL). Univariate analysis of variance test with a post hoc least significant difference test was used to compare LS of patients in three different Child-Pugh categories. Additionally, a paried t-test with a significant threshold of p=0.05 was used to compare LS of these patients before and after treatment.
Results: Significant correlations were, respectively, found between PT and LS (p=0.001), and between TBIL and LS (p=0.014). Liver stiffness also showed significant difference for patients with three different Child-Pugh grades (F=9.536, p<0.001). Relative to Child-Pugh C group, significantly decreased liver stiffness was found in Child-Pugh groups A (p < 0.001) and B (p=0.003), respectively. Comparable liver stiffness was observed between Child-Pugh groups A and B (p=0.166). In addition, comparing the liver stiffness before and after treatment, a significantly decreased liver stiffness was found in all three Child-Pugh grades, including for Child-Pugh A: 5.67 ± 1.15kPa vs. 4.83 ± 1.06kPa, p<0.001; for Child-Pugh B: 6.31 ± 1.13kPa vs. 5.12 ± 0.93kPa, p<0.001; for Child-Pugh C: 8.27 ± 2.22kPa vs. 7.37 ± 1.96kPa, p=0.009.
Conclusion: MRE for LS measurement has been demonstrated to act as an effective tool to evaluate liver function, and to monitor the BCS patients in follow-up treatments.

PU-1049
多模态 MRI 定量参数与前列腺癌 Gleason 评分及血清 PSA 相关性

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目的 探讨 MRI 扩散加权定量参数 ADC 值、动态增强定量参数 Ktrans、Ve、Kep 值与前列腺癌 Gleason 评分及血清 PSA 相关性。**方法** 回顾性分析我院 58 例前列腺癌患者的临床资料，所有患者穿刺前均具有血清 PSA 及前列腺多模态 MRI 检查，病理证实为前列腺癌并进行 Gleason 评分。测量其 MRI 定量参数 ADC、Ktrans、Kep、Ve 值。根据 Gleason 评分，得分为 2 至 4 的患者被归类为高分化组，5 至 7 被归类为中分化组，8 至 10 被归类为低分化组，分析多模态 MRI 定量参数与 Gleason 评分、tPSA、fPSA 值的相关性，比较多模态 MRI 定量参数及 PSA 在各组间差异。**结果** ADC 值与 Gleason 评分、tPSA、fPSA 均呈负相关（P<0.05）；Ktrans、Kep 值与 Gleason 评分、fPSA、tPSA 均呈正相关（P<0.05）；Ve 值与 Gleason 评分、血清 tPSA、fPSA 均无相关性（P>0.05）；随着分化程度的降低，ADC 值降低；Ktrans、Kep、tPSA、fPSA 随分化程度减低呈升高趋势，差异有统计学意义（P<0.05）；Ve 值在各组间无明显统计学差异（P>0.05）。**结论** 前列腺多模态 MRI 定量参数能在术前非侵入性评价前列腺癌的病理评分，对临床具有一定指导意义。

PU-1050

不同表观扩散系数对子宫肉瘤与非典型子宫肌瘤鉴别诊断价值

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目的
探讨不同 ADC 值对确子宫肉瘤与非典型子宫肌瘤鉴别诊断价值，联合不同 ADC 值提高鉴别诊断准性。
材料与方法
回顾性分析我院在 2011 年 6 月至 2016 年 12 月期间经病理证实为子宫肉瘤与非典型子宫肌瘤的患者，术前均行 3T MRI 检查。测量并记录 mADC 值、minADC 值以及 rADC 值。分析并比较两组患者不同 ADC 值的差异性以及诊断效能。通过纳入 3 种 ADC 值建立多因素 logistic 回归诊断模型，采用 ROC 曲线评估诊断模型鉴别诊断子宫肉瘤及非典型子宫肌瘤的诊断效能。
结果
mADC 值、minADC 值以及 rADC 值均可鉴别诊断子宫肉瘤及非典型子宫肌瘤，差异均具有统计学意义（P 值<0.00）。当 mADC 值取阈值为 1.21×10^{-3} mm^2/s 时，敏感度为 88.6%，特异度为 84.1%，准确度为 86.6%，阳性预测值为 43%，阴性预测值为 47%。当 minADC 值取阈值为 0.95×10^{-3} mm^2/s 时，敏感度为 87.3%，特异度为 87.3%，准确度为 86.6%，阳性预测值为 44%，阴性预测值为 53%。当 rADC 值取 0.59 为阈值时，敏感度为 69.8%，特异度为 81.0%，准确度为 37.0%，阳性预测值为 37%，阴性预测值为 22%。根据多因素 Logistic 回归模型可选取 mADC 值与 minADC 值作为诊断模型的独立因素，根据 ROC 曲线评估诊断模型诊断效能的 AUC 为 0.907（95%可信区间为 0.850～0.965），敏感度为 97.5%，特异度为 82.5%，准确度为 91.5%，阳性预测值为 40%，阴性预测值为 17%。
结论
3 种 ADC 值都可鉴别诊断子宫肉瘤及非典型子宫肌瘤，mADC 值与 minADC 值诊断准确性相差不大，当 mADC 值与 minADC 值联合诊断时准确性最高。

PU-1051

3.0T MRI 对剖宫产后子宫切口瘢痕妊娠的诊断价值

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目的 探讨剖宫产后子宫切口瘢痕妊娠(cesarean scar pregnancy，CSP)的 MRI 影像特征，分析其对 CSP 的诊断价值。
方法 ：回顾性分析 2017 年 8 月至 2018 年 6 月期间，50 例经手术及病理证实的 CSP 患者资料，将 MRI 影像表现与手术及病理结果对照，总结其 MR 影像特征。
结果 50 例 CSP 均清楚显示孕囊，并位于子宫前壁下段切口瘢痕周围。手术瘢痕表现为子宫肌层连续性中断、局部向内凹陷或变薄，以 MRI 增强时显示清晰，呈条状无强化影；50 例其中 35 例为圆形或卵圆形单纯囊性灶，紧贴子宫切口瘢痕区、部分突入切口内，T1WI 呈底信号，T2WI 呈高信号，增强呈环状强化，距峡部子宫浆膜层约 1-4mm；50 例中 13 例为不规则包块影呈混杂信号，向子宫前壁切口浸润生长同时向宫腔内、宫颈管生长，增强包块内见条片状强化影，局部子宫峡部前壁呈线状、部分欠连续；50 例中一例表现为多囊伴分隔表现，向子宫前壁下段切口内生长并向外膨突、局部子宫峡部肌层欠连续，经手术病理证实为良性葡萄胎；50 例中有一例为双胎合并切口瘢痕妊娠。上述病例中有 23 例合并孕囊周围宫腔内或宫颈管内积血。
结论 准确掌握 CSP 的 MRI 影像特征，可以为 CSP 的诊断及治疗方式的选择提供可靠的依据。

PU-1052
磁共振各序列对宫颈癌 IB1 期病灶大小精准性评估

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目的 评价磁共振 T1W 增强、T2W、表观弥散系数(ADC)、弥散加权成像（DWI）各序列对宫颈癌 IB1 期病灶大小测量的精准度 **方法** 回顾性分析 43 名经过术后病理确诊为宫颈癌 IB1 期的 MRI 常规平扫、增强及 DWI 检查资料， b 值取 0 、800、1000s/mm² 。由精通妇科影像诊断的医生分别测量 MR 图像（T1W 增强、T2W、ADC、DWI）中病灶的左右径、前后径及上下径，再将测量的各值和组织病理中对应的病灶径线进行一致性检验。**结果** T1W 增强、T2W、ADC、DWI 序列上，测得病灶左右径同组织病理左右径相比无差异（p>0.05）； T1W 增强、T2W 序列上，测得病灶前后径同组织病理前后径相比无差异（p>0.05）。在 ADC、DWI 序列上，测得病灶前后径同组织病理前后径相比有差异（p<0.05）；T1W 增强及 T2W 上，测得病灶上下径同组织病理上下径相比有差异（p<0.05），两两间差异有统计学意义。 **结论** 磁共振各序列能够对宫颈癌 IB1 期病灶大小进行相对精确的评估。

PU-1053
Prenatal MR imaging diagnosis of placental invasion

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[Abstract] **Objective** To evaluate the characteristic imaging features and performance of prenatal magnetic resonance(MR) imaging in the diagnosis of placental invasion. **Methods** 156 patients with suspected placental invasion underwent prenatal MR imaging, including 96 patients with placental invasion and 60 without. Two radiologists assessed, independently and then in consensus, the presence of MR imaging finding associated with placental invasion. The results were compared with the operation and pathological finding. Sensitivity, specificity, positive, and negative values, and accuracy were calculated. The diagnostic performance was determined by a receiver-operating-characteristic curve analysis. **Results** Uterine bulging, abnormal vessel in the placental, hypointense intraplacental bands, uterine penetration and parametria implantation, uterine recess, placental tissue into the cervical canal were significantly more common in patients with placental invasion than in those without(P£0.05). The presence of abnormal vessel in the placental, hypointense intraplacental bands, uterine penetration and parametria implantation, uterine recess, placental tissue into the cervical canal yielded a specificity, positive of 100%,respectively. **Conclusions** Prenatal placental MR can be used for accurate diagnosis of placental invasion, especially in the presence of abnormal vessel in the placental, hypointense intraplacental bands, uterine penetration and parametria implantation, uterine recess, placental tissue into the cervical canal.

PU-1054

3.0TMR 平扫对复杂性肛瘘的诊断价值及分型尝试

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目的 评价磁共振平扫对复杂性肛瘘的诊断价值，并尝试进行分型。
方法 回顾分析 26 例经手术病例证实为肛瘘患者的 MR 平扫资料，包括肛瘘内口、主管、支管、伴发脓肿的数目、位置，以及分型，与手术结果进行对照分析。
结果 MR 平扫对肛瘘内口、主管、支管、脓肿诊断的灵敏度分别为 86.2%、90.3%、86-9%、100%，与手术分型对照准确率为 85.3%。
讨论 3.0TMR 平扫能准确诊断肛瘘内口、主管、支管和伴发脓肿，并可以准确分型，对肛瘘手术有指导意义。

PU-1055

Noninvasive assessment of portal hypertension in patients with liver cirrhosis using MR elastography

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PURPOSE:
To assess the value of MR elastography (MRE) in estimating portal pressure based on liver and spleen stiffness.
Method and materials:
33 patients with cirrhosis were consecutively enrolled. All patients underwent hepatic venous pressure gradient (HVPG) measurement and MRE scan in 1 week. Liver and spleen stiffness obtained by software post-processing were compared to the HVPG with Pearson coefficients and multiple regressions. Patients with and without clinically significant portal hypertension (CSPH) or compensated cirrhosis were compared with Mann–Whitney tests, logistic regression and ROC analysis.
RESULTS:
The mean(± SD) of HVPG was15.88±5.71mmHg. Spleen stiffness correlated with the HVPG(r=0.56,p=0.001),liver stiffness in compensated cirrhosis patients correlated with HVPG(r=0.60,p=0.003), at multivariate linear regression, only spleen stiffness associated with HVPG(r^2=0.35,p＜0.001). The AUCs of liver and spleen stiffness to predict CSPH were 0.88, 0.81respectively(p＜0.05).Liver and spleen stiffness also demonstrated high diagnostic performance for indicating the decompensated cirrhosis (AUC=0.74,0.80 respectively, p＜0.05), the AUCs of combined diagnosis to predict decompensated cirrhosis were 0.84(p＜0.05), no statistical difference was found among above three AUCs.
Conclusion:
Spleen and liver stiffness correlated with HVPG and they can be used alone or unitedly to assess the degree of portal hypertension in liver cirrhosis, especially the spleen stiffness.

PU-1056

PSMA-1 靶向的多功能纳米探针在早期前列腺癌的 MRI 分子成像研究

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目的 通过构建集靶向特异性、成像敏感性与体内长循环特性于一体的多功能磁共振成像纳米探针，实现对前列腺癌的早期精确诊断与无创动态监测。
方法 以前列腺特异性膜抗原 (Prostate-specific membrane antigen, PSMA-1) 作靶点，以超小金纳米粒子 (Gold nanoclusters, AuNCs) 为载体，将 MR 成像组件 Gd 及长循环物质 PEG 进行多功能组装，构建 PSMA-1 靶向的高分辨精准磁共振分子成像纳米探针(PSMA-1-Au@Gd NCs)，并明确探针的生物相容性及生物学分布。建立荷人前列腺癌裸鼠移植瘤模型，鼠尾静脉注射纳米探针 PSMA-1-Au@Gd NCs，利用 MRI 分别从细胞、在体水平监测探针在前列腺癌的分布聚集情况，通过活体动态成像测量肿瘤区 T1WI 信号强度 (Signal intensity, SI) 及对比噪声比 (Contrast to noise ratio, CNR)，评估前列腺癌的负荷和性质，并进行组织学定量分析，验证其实际功效。
结果 本研究合成的 PSMA-1-Au@Gd NCs 探针具有良好的生物相容性，适合作早期前列腺癌 MRI 靶向分子成像造影剂。细胞实验表明，PSMA-1-Au@Gd NCs 对前列腺癌细胞 (PC3) 有高亲和力；体内动态 MR 成像结果显示，荷瘤裸鼠静脉注射 PSMA-1-Au@Gd NCs 后肿瘤组织 T1 信号强度 SI 及对比噪声比 CNR 随时间延长而显著增强，并可持续至 36 小时；组织切片免疫组化及镀银染色证实 PSMA-1-Au@Gd NCs 在 PSMA-1 受体高表达的肿瘤明显聚集。
结论 本研究构建的 MR 分子成像探针 PSMA-1-Au@Gd NCs 同时具有前列腺癌靶向特异性、成像敏感性及体内长循环特性，可从多角度精准、动态分析早期前列腺癌肿瘤区域病理信息，为实现真正意义的前列腺癌分子水平早期诊断提供了科学依据和实验证据支持，在前列腺癌临床诊疗中有非常广阔的应用前景。

PU-1057

MRI 常规序列联合 DWI 对直肠癌术前分期的价值

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目的 探讨 MR 常规序列及 DWI 对直肠癌术前分期的诊断价值。
方法 对临床首诊直肠癌的 35 例患者进行常规 MR 序列及 DWI 扫描后手术治疗并进行病理分期。
结果 MRI 常规序列能很好地显示肠壁的各层解剖结构及肿瘤对肠壁及邻近结构的侵犯范围和程度，常规 MRI、联合 DWI 行 TN 分期的准确性分别为 52%和 71%，差异有统计学意义。
讨论 MR 常规序列联合 DWI 对直肠癌术后 TN 分期较单独常规 MRI 序列更具优势。

PU-1058

MRI 征象预测肝内胆管细胞癌的微血管侵犯

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目的 微血管侵犯（MVI）与肝内胆管细胞癌（ICC）患者的术后存活率相关。本研究试图研究 ICC 患者的影像参数与 MVI 之间的相关性。
方法 回顾性分析 108 例经手术切除的单个 ICC 病灶的患者（34 个 MVI 阳性和 74 个 MVI 阴性）的术前肝脏 MRI 检查资料，包括 T1WI，T2WI，弥散加权成像（DWI）和动态增强成像。定性评估以下影像学特征：形态学特征，包括肿瘤形态，T1WI 和 T2WI 的信号特征，肝内胆管扩张，肝包膜回缩，DWI“靶征”，动态增强模式，动脉期增强模式，肿瘤内部的点/带状增强，肿瘤内部可见穿透血管（肝动脉，门静脉或肝静脉），动脉期增强边缘的完整性和外周肝脏异常灌注。定量分析评估肿瘤大小，最大增强边缘厚度，动脉期边缘增强比和延迟期增强范围。卡方检验，Fisher 精确检验和独立 t 检验用于单变量分析，以确定 MVI 的存在与这些 MR 参数之间的关系。Logistic 回归分析用于识别这些 MR 参数中 MVI 的独立预测因子。
结果 在 MRI 特征中，四个定性特征（肿瘤形态，肝内胆管扩张，动脉期增强模式和可见肝动脉穿透征）和两个定量肿瘤参数（肿瘤最大直径和动脉期边缘增强比）与 MVI 相关（P 值分别为 0.007、0.003、0.008、0.000、0.003 和 0.002）。此外，肿瘤标志物 CA19-9 和肿瘤病理分级也与 MVI 相关（P 值分别为 0.014 和 0.004）。多变量逻辑回归分析显示上述参数均不是 ICC 中 MVI 诊断的独立预测因子。
结论 对于术前预测 ICC 病灶的 MVI，术前 MRI 获得的一些定性和定量数据以及术前 CA19-9 水平均有一定的意义，此外，术后病理学肿瘤分级与 MVI 也有相关性。需要更多的研究来确定可用作独立风险因素的 MR 特征。

PU-1059
犬肝脏射频消融坏死模型的制作及磁共振弥散加权成像的参数选择

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目的 DWI 成像评价射频消融治疗反应及预测其疗效已经成为影像学研究的热点。本研究拟通过正常肝脏组织进行射频消融治疗术后 DWI 随访中图像质量进行定性和定量评价，筛选 DWI 检查时合适的扩散权重(b 值)。**方法** 正常家犬 15 只在犬肝右叶进行射频消融，制作肝脏凝固性坏死模型。给予磁共振扫描，计算 T2WI 和不同 b 值(300 s/mm^2、500 s/mm^{2}和 800s/mm^2)的 DWI (分别记为 DWI300、DWI500 和 DWI800)图像上坏死灶不同部位及坏死灶与整个正常肝脏的信号强度比值（Single Intensity Ratio, SIR ）和坏死-肝脏对比信噪比(contrast signal-noise ratio，CNR)。观察犬肝脏射频消融坏死模型 MRI 成像各参数图像的信号特点；比较坏死灶在不同 b 值的 DWI 图像中的 SIR、CNR 及 ADC 比值，选择合适的 b 值。**结果** 坏死/肝脏、坏死周边环形反应带/凝固性坏死中心的 SIR 和 ADC 比值随着 b 值的增加，均呈不同程度的逐渐上升趋势。**结论** 从坏死灶的 SIR 和坏死-肝脏 CNR 角度分析，最佳 b 值应选择 300s/mm^2，500 s/mm^{2}次之。从 ADC 值准确性角度来考虑，应该尽量选择大 b 值，但当 b 值为 800s/mm^{2}时，坏死灶和肝脏的信号值衰减均较明显，背景噪声明显，坏死-肝脏 CNR 较低，对多数坏死灶轮廓显示不清。综合考虑，应当选择 b=500 s/mm^2

PU-1060
钆布醇与钆喷酸葡胺在腹部 MRA 中的对比研究

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目的 对比钆布醇与钆喷酸葡胺在腹部动态增强 3D MRA 中的图像质量和血管显示情况。
方法 对 20 名志愿者行分两次分别用钆布醇和钆喷酸普安行上腹动态增强 3D MRA 检查，获取动脉期、门脉期血管图像以及静脉期 VIBE 图像。测量动脉期腹主动脉、腹腔干、肠系膜上动脉和肾动脉主干；门脉期门静脉汇合处、门静脉左支、门静脉右支和肠系膜上静脉；静脉期肝静脉汇合处和肾静脉的信号强度（signal intensity，SI）， 计算其信噪比（signal to noise ratio，SNR）。评价腹主动脉、肝总动脉、肝固有动脉、胃十二指肠动脉、胃左动脉、肾动脉及分支、脾动脉及分支的可视性及图像质量。
结果 所有纳入观察的目标血管图像质量均能很好地满足诊断要求，但钆布醇血管远端及分支的显示效果优于钆喷酸葡胺。钆布醇所获腹主动脉、腹腔干动脉、肾动脉主干、门静脉及左右分支、肠系膜上静脉的 SNR 明显高于钆喷酸普安所获血管图像（$p<0.05$）。肠系膜上动脉和肝静脉汇合处，两种对比剂所得血管的 SNR 无明显差异（$p=0.171$ 和 $p=0.078$）。
结论 腹部血管成像中，等摩尔量的钆布醇对小血管的显示明显优于钆喷酸葡胺，获得的血管对比更好。

PU-1061
超清弥散 RESOLVE-DWI 在直肠癌 MRI 检查中的临床应用研究

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目的 对比分析分段读出平面回波扩散加权成像与常规扩散加权成像在 1.5T 场强下直肠癌 MRI 检查中的图像质量、信噪比、对比噪声比、对比度及表观扩散系数以及在 T 分期的准确性上的差异性，以探讨 RESOLVE-DWI 在直肠癌 MRI 检查中的临床价值。
材料与方法 连续收集 2016 年 1 月至 2017 年 2 月间临床怀疑直肠癌并顺利完成 MRI 检查的 135 例患者资料,将术后病理结果证实为直肠癌的 42 位患者纳入本组研究，进行常规直肠 MRI 扫描的同时，扫描 RESOVLE-DWI 序列与常规 DWI 序列。由两位放射科诊断医师对两组 DWI 图像的解剖变形、空间分辨率、病灶细节显示、图像的总体质量 4 个指标进行主观评价,并进行 T 分期。定量测量并计算两组 DWI 图像的 SNR、CNR、C 及 ADC 值以进行客观评价。
结果 RESOLVE-DWI 与常规 DWI 在图像质量 4 项指标及 SNR、CNR 对比上差异均具有统计学意义（P 值均满足 $P<0.05$），且 RESOLVE-DWI 组 4 项指标评分和 SNR、CNR 值均高于常规 DWI 组，两组 DWI 图像的 ADC 值差异无统计学意义（P 值满足 $P>0.05$）。RESOLVE-DWI 组 T 分期的准确率 88.1%高于常规 DWI 组 T 分期的准确率 71.4%，且两组间对比病理结果进行卡方检验，$P>0.05$，具有显著性差异。
结论 RESOLVE-DWI 对比常规 DWI 提升了图像质量，明显提升了图像 SNR 与 CNR，对 ADC 值的测量没有影响，明显提升了直肠癌 T 分期的准确率，可以替代常规 DWI 用于直肠癌 MRI 扫描中。

PU-1062
婴幼儿腹部磁共振检查技术探讨

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目的 把握婴幼儿的生理特征和检查技术要点，可以安全有效的帮助患儿完成检查。

方法 一.检查前准备 1.所有需要进入磁体间的各类人员应去除一切金属，磁性及电子产品，如手机，手表，钱包，信用卡，银行卡，硬币，钥匙，打火机，假发，助听器，首饰，小刀，别针，氧气瓶所有监护设备等等。2.不同厂家，不同型号的设备噪声不一样，对于婴幼儿磁共振检查，应当选择噪声较小的机器。 3.婴幼儿的体温调节能力较差，要注意保暖，因此检查室的温度不宜过低。最好不要低于 22℃，以免小儿感冒咳嗽，惊醒，影响检查。4.婴幼儿需要熟睡方能检查。但在实践过程中，在医师的指导下适量使用安眠药效果更佳。5.摆位时，动作要轻，动作不宜过大，给患儿耳朵塞好棉球，然后轻轻的盖上腹部线圈。定位时，嘱咐家属不要东张西望，看好患儿，患儿不适时，可以及时处理。6.对于重症患儿，需要医生和家属陪同，密切关注患儿状况。二.检查过程中 1.全部检查，最好 30min 钟内完成，序列扫描次序：诊断关键序列—常规序列—科研序列。2.开始检查时，机器响起，婴幼儿往往多有不适，耐心等待，等婴幼儿适应环境，继续完成未做好的检查。3.婴幼儿与成人不同，无法憋气，但是腹部运动相对较小，可以选用单次激发快速自旋回波序以及平面运动矫正和膈肌导航技术，可以减小运动伪影。4.婴幼儿的脏器较小，层厚 4-6mm 即可，图像分辨率可以适当提高，以达到诊断要求。5.婴幼儿的腹部脂肪不多，常规脂肪抑制可以商榷。6.婴幼儿一般不做腹部增强，如果要做，可以先用快速序列扫两期，能看多少看多少，之后可以运用导航技术加扫一期。7.结束检查，安全退出检查床。

结果 在婴幼儿腹部磁共振检查中，了解婴幼儿的生理特征和检查原则，在很大的程度上可以安全有效的提高婴幼患儿检查成功率。

结论 分析学习婴幼儿腹部磁共振检查技术，不仅可以帮助患儿更好的解决问题，还对自身技术的提高也有一定的帮助。

PU-1063

3.0T 磁共振动态增强成像定量参数在前列腺癌鉴别诊断中的价值

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目的 探讨磁共振动态增强定量参数在前列腺癌鉴别诊断中的可行性及临床应用价值。

材料与方法:收集疑诊前列腺癌患者 45 例，行前列腺磁共振扫描及动态增强灌注成像，其中良性病变 23 例，前列腺癌 22 例，其中 16 例患者采用前列腺根治切除进一步证实。两名医师参照 T2WI 低信号区域，协商一致后共同在 DCE 病灶区放置 ROI，测量病灶区定量参数转运常数（K^{trans}）、血管外细胞间隙体积百分数（V e）及速率常数（Kep）。根据临床数据结果将病灶分为前列腺癌灶组和良性前列腺病灶组。采用独立样本 t 检验比较 Ktrans 、Kep、Ve 在前列腺癌与良性病灶中的差异，采用 ROC 曲线分析 DCE 定量参数鉴别前列腺癌和良性病变中的价值。

结果 前列腺癌和良性病灶组的 Ktrans、Kep、Ve 分别为(0.160±0.056)
VS(0.096±0.047)、(0.588±0.197)VS (0.395±0.182)、(0.302±0.187)
VS(0.316±0.191)，两组间 Ktrans 和 Kep 独立样本 t 检验结果差异有统计学意义
(P<0.01)，Ve 之间差异无统计学意义。Ktrans、Kep、Ve 诊断前列腺癌和
前列腺良性病变的曲线下面积分别为 0.825、0.853、0.514。Ktrans、Kep 鉴别前列腺癌和良性前列腺病灶的敏感性及特异性分别为 85.11%、81.6%和 75.32%、71.9%。

结论 动态对比增强定量参数 Ktrans、Kep 在前列腺癌与前列腺良性病变鉴别诊断中具有重要价值。

PU-1064

Discussion on the display of cortical medulla of healthy adult kidney by different flip angle of LAVA sequence

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Objective To investigate the application value of changing the magnetic reversal three-dimensional volume interpolation fast GRE sequence (LAVA sequence) with different flip angles in showing the cortical medulla of healthy adult kidney. Methods A total of 95 healthy adult volunteers were enrolled in a magnetic resonance examination using a 3.0T MR system (Discovery MR 750, GE Healthcare, Milwaukee, USA). In the breath holding mode, the LAVA-flex sequence was scanned in the transverse section of the kidney, and the inversion angle was set to 5° 10° 15° 20° 30° . The images were transferred to a workstation for processing, and the contrast of the renal cortex of each sequence was observed and scored. Select the left and right kidney kidney upper pole, the renal hilum and the inferior pole three levels, manually delineate the left and right kidney cortex, medullary region of interest (ROI), measure the signal value; measure the standard deviation of the corresponding level of the psoas muscle. The renal cortex and medullary signal values measured at three levels were averaged to calculate the contrast-to-noise ratio. The difference in cortical medullary contrast-to-noise ratio obtained from different flip angles was analyzed. Results The flip angle was 5° 10° 15° 20° 30° . The diagnostic physician showed a difference score on the cortex and medulla. The contrast ratio of renal cortex and medulla on both sides of the renal medulla was 4.21±0.42, 6.24±0.83, 4.69±0.92, respectively. 3.30±0.81, 2.89±0.31, the differences were statistically significant. Conclusion The LAVA flex sequence has a flip angle of 10° , and the cortex and medulla has a higher contrast-to-noise ratio, which can better distinguish the renal cortex.

PU-1065

IVIM-DWI and DCE-MRI in Diagnosis of StageⅡCervical Cancer With Parametrium Invasion

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Purpose: To investigate the value of intravoxel incoherent motion diffusion weighted imaging (IVIM-DWI) and dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI) in the diagnosis of stageⅡcervical cancer with parametrium invasion.
Meterials and Methods Forty-one patients with stageⅡcervical cancer confirmed by surgerical pathology were enrolled in our hospital, containing parametrium invasion (n=17) and parametrium non-invasion (n=24). Plain MRI, IVIM-DWI and DCE-MRI were

preoperatively scaned. The tumor volum of the two groups were measured. The optimal maps were reconstructed of IVIM-DWI parameters (ADC, D, D*, f) and DCE-MRI parameters (K^{trans}, K_{ep}, V_e). All parameters of the two groups were analyzed by one-way anaylsis variance. The optimal cut-off values of parameters with statistical significance were acquired by receiver operator characteristic curve.

Rusltes The difference of volum of stage Ⅱ cervical cancer with parametrium invasion and without parametrium invasion had statistical significance. There were a significant difference of D, D^* and f values of the two groups (F=30.487, 6.752, and 8.983, P＜0.05). Meanwhile, there was no defference of ADC values (P＞0.05). Areas of D, $D^*$and f values under ROC curves were 0.140, 0.680, and 0.745, respectively. The diagnostic threshold of $D^*$and f values was 33.65 mm^2/s (specificity=77.4%, sensivity=60.9%) and 0.226 (specificity=83.9%, sensivity=65.2%), respectively. There were a significant difference of K^{trans}, K_{ep} and V_e values of the two groups (F=45.20, 125.42 and 85.32, P＜0.05). Areas of K^{trans}, K_{ep} and V_e values under ROC curves in the diagnosis of cervical cancer with vaginal fornix invasion were 0.896, 0.864 and 0.885, respectively. The diagnostic threshold of them were 0.272 mm^2/s (specificity=74.2%, sensivity=95.7%), 0.554 (specificity=67.7%, sensivity=100%), and 0.558 (specificity=90.3%, sensivity=78.3%), respectively.

Conclusions IVIM-DWI and DCE-MRI parameters are helpful for the diagnosis of cervical cancer with parametrium invasion, and auxiliary conventional MRI.

PU-1066
子宫内膜间质肉瘤与子宫肌瘤变性的影像鉴别

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目的 探讨 MRI 在子宫内膜间质肉瘤（ESS）与子宫肌瘤变性中的鉴别诊断价值。方法 搜集我院经病理证实为 ESS 的病例 4 例，结合（近 5 年）国内外相关文献报道的 34 例，及我院经病理证实为子宫肌瘤变性的病例 17 例（30 个），分析两者的 MRI 影像学特征，总结 MRI 对二者的鉴别诊断要点。结果 1、ESS 的病灶大部分位于肌层，其次位于宫腔，少数位于宫外，与子宫肌瘤变性的病灶发生部位相似，其差别不具有统计学意义（*c2=1.952，P=0.400*）；2、ESS 的病灶相对较大，边界部分不清者相对较多，且常伴有出血及坏死，但二者的差别均不具有统计学意义（*t=-0.971，P=0.335，c2=2.506*、*0.167，P=0.113*、*0.092*）；我院 3 例 ESS 伴坏死的病灶，坏死面积均大于 50%以上，而 8 例子宫肌瘤变性伴坏死的病灶，坏死面积均小于 50%；3、ESS 的强化程度多高于正常子宫肌层，而子宫肌瘤变性的强化程度多低于正常子宫肌层，二者的差别具有统计学意义（*c2=34.343，P=0.000*）。结论 ESS 与变性的子宫肌瘤在发生部位、大小及信号特征上近似，在 MRI 上特征性的影像表现相对有限，但病灶坏死面积大于 50%及强化程度高于正常子宫肌层有一定的鉴别价值。

PU-1067
体素内不相干运动成像对前列腺癌盆腔淋巴结转移情况的价值研究

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目的 评估体素不相干运动成像（IVIM-DWI）定量参数对于前列腺癌盆腔淋巴结良恶性的诊断价值。
方法 对符合纳入标准的 27 例行前列腺癌根治术(RP)联合盆腔淋巴结切除术(PLND)患者行术前 IVIM-DWI 扫描，根据术后病理结果将切除淋巴结分为转移与非转移组，测量淋巴结的表关扩散系数（ADC）、单纯扩散系数（D）、伪扩散系数(D*)、灌注分数（f），分析组间各参数的差异，并采用受试者工作特征曲线（ROC）评估各参数对于前列腺癌盆腔淋巴结转移情况的诊断效能。
结果 共选取 98 枚有效淋巴结，其中 69 枚为非转移淋巴结，29 枚为转移淋巴结。转移组与非转移组在平均 ADC 值[（1.01±0.12）×$10^{-3}mm^2/s$ vs （1.46±0.24）×$10^{-3}mm^2/s$]、D 值[（0.74±0.13）×$10^{-3}mm^2/s$ vs （1.16±0.28）×$10^{-3}mm^2/s$]、f 值[（22.53±7.81）% vs （30.03±11.73）%]上差异有统计学意义（P<0.05），而在 D*值上无统计学意义（P>0.05）。各参数鉴别前列腺癌淋巴结转移的诊断效能如下：ADC 值的 AUC 值为 0.957，阈值为 1.10×$10^{-3}mm^2/s$，敏感性为 75.86%，特异性为 98.55%， D 值的 AUC 值为 0.931，阈值为 0.93×$10^{-3}mm^2/s$，敏感性为 93.10%，特异性为 78.26%，f 值的 AUC 值为 0.682，阈值为 34.5%，敏感性为 96.55%，特异性为 43.48%。
结论 表关扩散系数（ADC）、单纯扩散系数（D）对于前列腺癌转移及非转移盆腔淋巴结的诊断效果好，灌注分数（f）稍差，三者可作为行 RP 联合 PLND 的术前参考。

PU-1068

MRI 与 CT 对小肝癌诊断价值比较研究

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目的 对 MRI 与 CT 在诊断小肝癌中的应用价值进行分析。**方法** 将 2016 年 1 月至 2017 年 12 月我院收治 40 例小肝癌患者作为本次研究对象，均采取 MRI 与 CT 对其进行诊断，对诊断结果进行比较。**结果** MRI 诊断准确率 95.0%高于 CT 诊断准确率 75.0%，数据差异显著（P＜0.05）；CT 诊断漏诊率 7.5%与 MRI 诊断漏诊率 2.5%没有差异（P＞0.05）。**结论** MRI 在诊断小肝癌中有着重要的应用价值，其诊断准确率比较高，有效的显示出了小肝癌患者血供特点，值得推广。

PU-1069

磁敏感加权成像对肝纤维化的无创性临床诊断价值的应用

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摘要：目的 探讨磁敏感加权成像（susceptibility weighted imaging,SWI）幅值图（magnitude image）的信号强度值（signal intensity,SI）对肝纤维化的诊断价值，及对乙型病毒性肝炎肝纤维化患者无创诊断中的临床价值。
方法 120 例慢性乙型肝炎肝纤维化的患者为观察组,男 75 例，女 45 例,年龄（45±15）。80 例体检健康者为对照组。且肝炎标志物均阴性者为对照组，男 48 例，女 27 例，年龄(46±10)岁。分别行联影 3.0T 光梭磁共振磁敏感加权成像扫描，以肝组织活检为金标准，分析幅值图的信号强度值与肝纤维化分期的相关性。

结果 SWI 幅值图的信号强度值与肝纤维化分期呈正相关（r=-0.663、P<0.001），对肝纤维化的敏感性为 78%，特异性为 83%，阳性检出率 79%。
结论 随着肝纤维化程度的加重，SWI 信号强度呈现不同的变化，但诊断轻度肝纤维化的价值较低。

PU-1070
女性盆腔囊性占位病变应用常规序列磁共振成像扫描的实用性探究

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目的 研究探讨应用核磁共振常规序列扫描在女性盆腔囊性占位病变诊断中的实用性。
方法 对从 2015 年 1 月至 2017 年 1 月在随州市中心医院经手术病理确诊的 70 例盆腔囊性占位病变的女性患者，进行 MRI 和超声检查进而比较二者的准确率，并进一步分析通过 MRI 检查不同种类的盆腔囊性占位病变的相应特点。
结果 在 70 例病例中，共有 69 例通过 MRI 检查诊断为盆腔囊性占位病变，病灶部位与病理诊断符合，准确率达 98.55%，且这 70 例病例中经手术病理确诊出 25 例恶性肿瘤有 24 例经 MRI 检查被诊断出，准确率达 96.00%；超声检查诊断出盆腔囊性占位病变共计 63 例，准确率 90.00%，其中手术病理确诊的 25 例恶性肿瘤，经超声检查诊断出 19 例，准确率 76.00%，两种方法之间的两组数据均具有统计学意义(P<0.05)。盆腔囊性占位病变在 MRI 检查下各有特点:子宫肌瘤一般会出伴随积增大、宫旁肿块，另外会有 T1WI 低信号；子宫腺肌症除了表现为体积增大之外，低信号的 T1WI 以及混杂信号的 T2WI 亦是其重要表现；宫颈癌则伴随有宫颈增大、低信号 T1WI、中等信号 T2WI。
结论 相对目前应用更多的超声检查而言，MRI 能够更准确地诊断出盆腔囊性占位病变、更准确的定位盆腔病灶，而且能更准确的定性判断肿瘤的良恶性。

PU-1071
磁共振对卵巢良性、交界性及恶性肿瘤的鉴别诊断

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【摘要】**目的** 探讨 MRI 对卵巢原发性良性、交界性及恶性肿瘤的鉴别诊断价值。方法 分析经手术病理证实卵巢肿瘤患者（良性 64 例，交界性肿瘤 62 例，恶行肿瘤 62 例）术前的 MRI 影像表现，包括肿瘤形态、大小、单多囊、实性成份、囊壁厚度、是否有壁结节等，与病理结果对照，并在 DWI 序列测量肿瘤实性成份的 ADC 值，比较卵巢良性、交界性及恶性肿瘤单多囊、囊壁厚度、壁结节的以及 ADC 值之间的差异。结果 单多囊、囊壁或分隔增厚（≥5mm）、壁结节（≥5mm）三个征象良性与交界性及恶性肿瘤之间有统计学意义，交界性与恶性之间无统计学意义；ADC 均值：良性（2.01±0.59）×$10^{-3}$$mm^2$/s、交界性（1.57±0.46）×$10^{-3}$$mm^2$/s、恶性（0.94±0.22）×$10^{-3}$$mm^2$/s，三者之间有统计学意义（P＜0.05）。结论 MRI 可以良好的显示卵巢肿瘤的各种征象，部分征象可以用于鉴别肿瘤的病理特征，ADC 值的测定有助于良性、交界性及恶性肿瘤的鉴别，指导手术方案的术前制定。

PU-1072
犬肝脏射频消融后凝固性坏死的动态磁共振弥散加权成像研究

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目的 本实验利用 MR 弥散加权成像（DWI）技术动态观察评价犬正常肝脏射频消融后亚急性期（2 周内）的影像变化，同时与相应的病理切片进行对照研究。以探讨 RFA 后坏死组织和正常治疗反应带的功能成像表现是否存在差异及其相应的病理基础。**方法** 选择健康成年家犬 9 只制作肝脏射频消融坏死模型，分别于射频后即刻及 1 周、2 周进行 MR 平扫和 DWI 检查，测定坏死灶消融坏死中心、周边环形反应带及正常肝脏组织的 ADC 值，观察肝脏坏死灶内部不同病理组织在不同时期的 MR 影像学变化及 ADC 值的变化。并于检查后在每个时间节点各处死 3 只家犬，最后处死全部动物。剖腹取肝脏坏死灶进行大体病理学观察，测量坏死灶直径后常规甲醛固定、包埋、切片及 HE 染色后进行显微病理学检查。分别与 MR 平扫图像和弥散成像图像进行对照研究。**结果** 以 DWI 图像上正常肝组织信号作为对比，对应于病理观察到的消融组织周边环形反应带区域在 DWI 图像上表现为更高信号，而消融坏死灶中心区域表现为低信号。射频消融后即刻，1 周及 2 周时消融坏死组织周边环形反应带、消融坏死组织中心及正常肝脏组织的 ADC 值(单位：$10^{-3}mm^2/s$)分别为 2.26±0.22、0.59±0.01、1.73±0.18；1.95±0.19、0.63±0.09、1.76±0.12；1.82±0.17、0.74±0.05、1.78±0.17。各组之间的消融坏死组织周边环形反应带与消融坏死组织中心的 ADC 值存在显著性差异（P<0.05）；各组的 ADC 值呈现逐渐减小的表现，尤以环形反应带显著，各时间组间差异具有显著性(P<0.05)。而坏死中心区域与正常肝脏的 ADC 值各组间差异不具有显著性(P>0.05)。**结论** 肝脏的 MRI 成像能够很好的反映肝脏组织射频消融坏死后的病理变化过程。弥散加权成像能够有效地鉴别周边炎性反应带与中心完全坏死组织。

PU-1073
产前 MRI 预测胎盘植入患者行预防性腹主动脉球囊阻断术加剖宫产预后

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目的 评价产前 MRI 征象在预测胎盘植入患者行预防性腹主动脉球囊阻断术加剖宫产术（AABC-CS）中大出血和子宫切除预后中的价值。**方法** 回顾性分析 86 例因产科高度怀疑严重胎盘植入接受可能导致大出血行 AABC-CS 腹主动脉球囊阻断术加剖宫产术患者的产前 MR 图像，根据患者预后分为成两组，预后良好组（n=50：，术中出血量＜1 000 ml 及且未切除子宫保留），和预后不良组（n=36，：术中出血量≥1 000 ml 及或切除子宫切除），比较 2 组间 MRI 征象差异，采用 t 检验来比较两组患者临床指标，c^2检验来比较两组患者胎盘 MR 征象出现的频率，并采用多因素 Logistic 回归分析获得得出预测预后不良最有价值的危险因子素，并计算危险因子的其预测值效能。**结果** 胎盘内异常血管影、T2 低信号带、胎盘局部凹陷征、胎盘穿透在预后不良组中更常见，（P值均＜0.001），在多因素 Logistic 回归分析显示中胎盘内异常血管影（OR=15.78，P=0.015）、胎盘穿透（OR=12.25，P=0.020）是患者预后不良的危险因子，(OR 15.78，P=0.015；

OR 12.25，*P*=0.020)，其预测预后不良的敏感性度和及特异性分别为 77.78%（28/36，）、62.00%（31/50）和；44.44%（16/36）、，100%（50/50）。**结论** 产前 MRI 征象胎盘内异常血管影、胎盘穿透是胎盘植入患者行预防性 AABC-CS 术腹主动脉球囊阻断术加剖宫产术中大出血和子宫切除的危险因子。

PU-1074

MR 成像在膀胱癌 T 分期中诊断价值

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评价 MRI 在鉴别 T1 期或更低级别膀胱癌与 T2 期或更晚期膀胱癌的诊断准确性，并分析不同成像序列对其的影响。在经尿道膀胱肿瘤切除术前，膀胱壁结构完整，膀胱 MRI 对判断有无肿瘤肌肉受侵最理想。当前膀胱癌诊断和分期的标准是经尿道膀胱肿瘤切除术。膀胱镜检查由于光动力学等技术的运用对改善膀胱癌诊治有重要价值。然而，经尿道膀胱肿瘤切除术低估癌分期，因此成像作为经尿道膀胱肿瘤切除术的补充改进肿瘤分期备受关注。运用图像引导的方法识别 b 值并且同时行膀胱癌分期，从而跳过膀胱镜检查，直接行经尿道膀胱肿瘤切除术。虽然组织学确认仍然是膀胱癌诊断的金标准，但这种路径使得经尿道膀胱肿瘤切除术更快。MRI 是临床诊治中的重要手段，具有可重复性和可行性。对于非肌肉受侵性肿瘤，准确分期对于帮助选择治疗方案非常重要。对于原位癌（carcinoma in situ，CIS）检出，当前的 MRI 仍不太可靠。在非肌肉受侵性癌中，准确的分期对于 T1 肿瘤是最重要的。MRI 可以帮助了解肿瘤大小和分期，从而帮助制定治疗计划。例如对于具有明显带蒂并且没有膀胱固有肌层受累的小 T1 肿瘤，应该以经尿道膀胱肿瘤切除术为根治手段，在不需要二次经尿道膀胱肿瘤电切术的情况下，启动膀胱癌卡介苗免疫治疗。对于较深受侵的 T1（T1b/c），没有明显的带蒂或生长接近固有肌层的肿瘤，二次经尿道膀胱肿瘤电切术是必需的，可考虑进行膀胱切除术。也许在不久的未来，更多的多参数 MRI 研究提供的充足的解剖学和功能信息，可以预测对保守治疗不太可能有反应的肿瘤，对于这种肿瘤，应该使用更加激进的治疗方法。约 25%的 T1 肿瘤在二次经尿道膀胱肿瘤电切术后具有肌肉受侵的特征，这显然完全改变了治疗方法，因此，T1 肿瘤的准确分期是 MRI 在膀胱癌诊疗中非常重要的领域之一。

PU-1075

不同 b 值组合的 IVIM 成像在前列腺癌诊断中应用价值研究

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目的 探讨不同 b 值组合 IVIM 成像在前列腺癌（PCa）诊断中的应用价值。**方法** 前瞻性纳入行前列腺 IVIM-DWI 检查且随后病理确诊的 24 例 PCa 患者和 20 例前列腺增生（BPH）患者作为研究对象。所有患者的 IVIM 序列根据 b 值组合分为 A 组（b=0、50、100、150、200、400、600s/mm^2）和 B 组（b=0、50、100、150、200、400、600、800、1000、1500、2000s/mm^2）分别进行后处理，测得 D 值、D*值及 f 值，比较各个参数在 PCa 与 BPH 组间的差异并绘制 ROC 曲线。根据 Gleason 评分系统将 PCa 组分为低分组 6 例（评分≤6）、高分组 18 例（评分≥7），比较各参数的组间差异并绘制 ROC 曲线，分析各参数与 Gleason 评分的相关性。**结果** ① A 组 D 值在 PCa 组明显低于 BPH 组（P<0.05）、A 组 f 值在 PCa 组明显高于 BPH 组（P<0.05），B 组 D 值在 PCa 组明显低于 BPH 组（P<0.05）。进一步绘制差异有统计学意义参数的 ROC 曲线，AUC 分别为 0.917、0.809、0.993，敏感度和特异度分别为 83.3%和 95%、75%和 75%、91.7%和 100%，A 组 D 值和 f 值的 AUC 差异没有统计学意义（P>0.05），但二者均低于 B 组 D 值的 AUC（P<0.05）② A、B 两组 D 值在 PCa 低分组

明显高于高分组（P<0.05）。A、B 两组 D 值区分低分组 PCa 与高分组 PCa 的 AUC 分别为 0.917、0.926，且二者差异没有统计学意义（P>0.05），敏感度和特异度分别为 83%和 83%、72%和 100%。③ A、B 两组 D 值与 Gleason 评分均有相关性，r 值分别为-0.510、-0.596（P<0.05）。**结论** 低 b 值（b<200s/mm^2）为主的 IVIM 成像与高 b 值为主的 IVIM 成像在 PCa 诊断中均具有一定价值，且二者价值有所不同。

PU-1076
快速 MRI 成像技术在前置胎盘诊断中的应用价值

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目的 探讨快速 MRI 成像技术在前置胎盘以及前置胎盘并发胎盘植入诊断中的应用价值。
方法 采用单激发快速自旋回波（single shot fast spin echo, SSFSE）序列和快速稳态进动采集（fast imaging employing steady state acquisition, FIESTA）序列对 25 例前置胎盘孕妇行 MRI 扫描，观察和分析该 25 例病例前置胎盘的 MRI 表现特征。
结果 25 例病例均顺利完成检查，其中边缘型前置胎盘 1 例，表现为胎盘下缘离子宫颈内口 1.3cm，但并没有覆盖宫颈内口；部分型前置胎盘 6 例，表现为胎盘边缘覆盖了一部分宫颈内口；完全型前置胎盘 18 例，表现为宫颈内口完全由胎盘覆盖。另外，前置胎盘合并胎盘植入 9 例，其中胎盘粘连 3 例，表现为胎盘基底部局部组织增厚，内部信号混杂，胎盘与子宫肌层分界模糊，子宫肌层局部受压变薄；胎盘植入 5 例，表现为胎盘与子宫肌层分界模糊，中等信号胎盘组织部分侵入低信号的子宫肌层；胎盘穿透 1 例，表现为子宫肌层局部中断，胎盘组织由中断处完全侵入子宫肌层，子宫浆膜层与膀胱分界模糊。
结论 MRI 可以直接显示前置胎盘与子宫颈内口之间的关系，合并有胎盘植入的病例，可直观评估胎盘组织侵入到子宫肌层的程度。MRI 快速成像技术在前置胎盘以及胎盘植入的诊断中有较高的临床应用价值。

PU-1077
多参数 MRI 联合超声引导下穿刺活检术在前列腺癌诊断中的价值

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摘要：目的 通过前列腺 MRI 多参数成像联合超声引导下穿刺活检术,提高前列腺癌诊断的阳性率。**方法** 回顾性分析 100 例 PSA 升高的前列腺疾病患者，其中 50 例患者首先行前列腺 MRI 多参数成像，后在 MRI 的提示下行超声引导下穿刺活检术，其余 50 例患者直接行超声引导下穿刺活检术（12 针）。随访两组病理检查结果，将两组检查流程的诊断阳性率进行统计分析。**结果** 先经过前列腺 MRI 多参数成像提出可疑区后行重点穿刺活检组的前列腺癌诊断阳性率为，直接接受超声引导下穿刺活检术组的诊断阳性率为。我们发现在超声引导下前列腺穿刺前行前列腺 MRI 多参数成像能明显提高诊断阳性率。**结论** 前列腺 MRI 多参数成像结合超声引导下前列腺穿刺活检术能明显提高前列腺癌诊断阳性率。

PU-1078

The diagnostic value of the histogram analysis derived from T1WI enhancement MR imaging in differentiating Endometrial cancer from Uterine stromal sarcoma

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Objective To investigate the diagnostic value of the histogram analysis derived from T1WI enhancement MR imaging based on whole tumors volumme in differentiating endometrial cancer from uterine stromal sarcoma and examined by MRI. **Methods and Materials** Retrospective analysis of 53 patients which were pathologically confirmed malignant glioma, including 36cases of endometrial cancer , 17 cases of uterine stromal sarcoma . Drawing the region of interest(ROI) on each layer of enhancement MR transaxial images and going on histogram analysis, these two steps are all performed on the software named Mazda. Performed a statistical analysis on the histogram parameters to find out the characteristics of the significant differences between the two groups. **Result** In the 9 parameters which are extracted from histogram, skewness has the statistical significance ($P<0.05$) .The maximum area under the ROC curve was 0.650. The optimum skewness to distinguish endometrial cancer from uterine stromal sarcoma was 0.14 (58.33% specificity and 82.35% sensitivity). **Conclusion** Histogram analysis of enhancement MR imaging can provide reliably objective basis for differentiating endometrial cancer from uterine stromal sarcoma .

PU-1079

Value of MRI and DWI in diagnosing normal-sized pelvic lymph nodes metastases in patients with cervical cancer

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Objactive To investigate the value of MRI and diffusion weighted imaging(DWI)in differentiating metastatic from non—metastatic normal-sized lymph nodes in patients with cervical cancer.
Methods The retrospective study included 90 patients with cervical cancer who underwent both conventional MRI and DWI scan before surgical treatment. Of the total 2129 removed lymph nodes, 114 lymph nodes were included. The size-based and ADC-based criteria of lymph nodes were measured and calculated including short-axis diameter(D_S), long-axis diameter(D_L), short to long-axis diameter(D_R), ADC_{max}, ADC_{mean} and ADC_{min}. The independent sample t test was employed to compare differences in statistically significant criteria between metastatic lymph nodes (MLNs) and non-metastatic lymph

nodes (non-MLNs). Logistic regression was used to analyze combined size-based with ADC-based criteria of lymph nodes. The receiver operating characteristic (ROC) analysis was performed to compare the diagnostic performance of statistically significant criteria in the detection of lymph node metastasis.

Results The D_S, D_R, ADC_{max}, ADC_{mean} and ADC_{min} of MLNs were significantly higher than those of non-MLNs ($P<0.001$), and there was no significant difference between metastatic and non-metastatic lymph nodes in D_L of lymph nodes ($P>0.05$). A prediction model was built as Logti(P1) = 2.01 +(-0.10 × ADC_{min})+ (0.49 × D_S) + (3.73 × D_R).The AUC of D_S, D_R, ADC_{max}, ADC_{mean} and ADC_{min} of lymph nodes were 0.801, 0.722, 0.769, 0.837 and 0.870 respectively, and the AUC of P1 was 0.913. the sensitivity of statistically significant indexes and P1 were 79.3%, 55.2%, 87.1%, 70.6%, 65.9% and 89.7% respectively; specificity were 68.2%, 83.5%, 55.2%, 79.3%, 93.1% and 80% respectively.

Conclusions MRI with DWI is a valuable tool in diagnosing normal-sized pelvic lymph nodes metastases in patients with cervical cancer. The ADC_{min} of lymph nodes had the optimal reference significance as a sole index and combined the D_S, D_R with ADC_{min} of lymph node showed the best diagnostic performance among all criteria.

PU-1080

MRI 及 DWI 对于宫颈癌 Ki67 表达分数的评估-初步分析

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目的 初步分析探讨探讨 MRI 及弥散加权成像（diffusion weighted imaging，DWI）对于宫颈癌 Ki67 表达分数的评估的

方法 回顾性收集本院 2018 年 1 月至 2018 年 12 月于治疗前同时行常规 MRI 和 DWI 的患者 29 例。我们通过治疗前病理免疫组化检查了患者 Ki67 在宫颈癌原发肿瘤中的表达分数。将 Ki67 表达分数分为三组，5%-25%为第一组，26%-75%为第二组，76%-100%（全层）为第三组。通过方差分析比较宫颈癌原发肿瘤 ADC_{max}，ADC_{mean}，ADC_{min}，在 Ki67 不同表达分数组间的差异性。通过 Spearman 研究宫颈癌原发肿瘤中 Ki67 表达分数与 ADC_{max}，ADC_{mean}，ADC_{min} 的相关性。

结果 原发肿瘤 ADC_{mean}，ADC_{min} 在 Ki67 的不同表达分数组间有显著性差异。ADC_{min} 在 Ki67 表达分数 26%-75%组与 76%-100%组之间的差异存在统计学意义（P=0.046，P＜0.05）。ADC_{mean} 在 Ki67 表达分数 5%-25%与 76%-100%之间的差异存在统计学意义（P=0.019，P＜0.05）。宫颈癌原发肿瘤中 Ki67 表达分数与 ADC_{mean} 之间存在相关性（P=0.22，P＜0.05），二者呈负相关，相关系数为-0.425。

结论 初步分析 MRI 及弥散加权成像（diffusion weighted imaging，DWI）对于宫颈癌 Ki67 表达分数的评估具有一定价值。

PU-1081

全容积 ADC 预测中晚期宫颈癌放化疗疗效

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目的 探究全容积表观扩散系数（apparent diffusion coefficient, ADC）对预测中晚期宫颈癌同步放化疗后疗效的价值。

方法 36 名病理证实的中晚期宫颈鳞癌患者被纳入本前瞻性研究。分别在治疗前（2 周内）和治疗开始后 2 周进行包含扩散加权成像序列（b 值取 0、800 s/mm^2）的 3.0T 盆腔磁共振检查。通过软件获取肿瘤全容积 ADC 平均值参数。对患者进行疗效随访。
结果 治疗前和治疗早期的 ADC 平均值在不同预后组之间有统计学差异。
结论 治疗早期的全容积 ADC 平均值有潜力用于预测宫颈癌同步放化疗后疗效。

PU-1082
扩散张量成像在子宫内膜良恶性病变中的应用价值

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目的 探索扩散张量成像（diffusion tensor imaging, DTI）及其相关参数在子宫内膜良恶性病变中的应用价值。
方法 收集本院 2018 年 1 月至 2019 年 7 月临床怀疑为子宫内膜良恶性病变的患者 80 例，所有患者术前均行 MRI 扫描（包括 DTI 系列），术后均有手术病理作为金标准。测量并比较子宫内膜良恶性病灶的平均 ADC 值、平均 FA 值及相对 FA 值（以正常子宫肌层作为参比部位）。用 DTI 纤维束示踪技术判断子宫内膜良恶性病变的纤维束走形及疏密程度。
结果 子宫内膜良恶性病变中共有 55 例子宫内膜癌（其中 I_A期 25 例，I_B期 30 例）、18 例子宫内膜增生、7 例子宫内膜息肉。子宫内膜良恶性病变的平均 ADC 值分别为（0.97±0.25）×10^{-3}mm^2/s 和（1.31±0.26）×10^{-3}mm^2/s，二者差异具有统计学意义（P=0.02）。I_A期子宫内膜癌的平均 ADC 值明显高于 I_B期子宫内膜癌的平均 ADC 值（P=0.04）。子宫内膜良恶性病变的平均 FA 值和相对 FA 值分别为 0.23±0.21、0.22±0.26 和 0.78±0.71、0.97±0.71，相应 FA 值比较差异均无统计学意义（P>0.05）。 I_A期和 I_B期子宫内膜癌的平均 FA 值和相对 FA 值差异亦无统计学意义（P>0.05）。子宫内膜癌病灶中可见残存子宫纤维束，且纤维束走形欠连续；良性子宫内膜病灶内未见子宫纤维束显影。
结论 平均 ADC 值及 DTI 纤维束示踪技术在子宫内膜良恶性病变的鉴别诊断中具有重要价值，且平均 ADC 值能鉴别子宫内膜癌肌层浸润程度。

PU-1083
MRI 对女性盆腔占位性疾病的诊断价值分析

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目的 探讨 MRI 对女性盆腔占位性疾病的诊断价值。方法 150 例女性盆腔占位性疾病均进行 MRI 检查，与手术病理活检进行比较。结果 MRI 扫描诊断准确者 140 例，诊断准确率为 93.33%。结论 MRI 对于女性盆 腔占位，性疾病的诊断准确率较高。

PU-1084
肝脏局灶性结节增生的 MRI 诊断进展探讨

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采用钆塞酸二钠行肝脏局灶性结节性增生（FNH）动态增强扫描及延迟 20min 肝细胞期特异期检查，分析总结钆塞酸二钠对 FNH 诊断的意义。方法 收集我院经临床、病理证实的 7 例 FNH 病例， 1 例腹胀不适，1 例因肺炎做肺 CT 检查发现，5 例行常规体检时发现，除腹胀不适患者外，其他患者无腹部不适症状。7 例患者采用肝细胞特异对比剂钆塞酸二钠进行 MR 动态增强扫描。 **结果** 动脉增强后，动脉期明显高于肝实质信号 7 例，门静脉期 5 例仍明显高于肝实质信号，2 例等信号，平衡期 4 例呈略高信号，3 例呈等信号，平衡期呈等及稍高信号。肝细胞特异期 4 例呈高信号，3 例边缘与正常肝实质相仿，且瘢痕均未见钆塞酸二钠摄取。仅仅利用动态增强扫描分析 7 例病灶，其中两例不除外 HCC,增加延迟 20min 肝细胞特异期后分析均给出 FNH 结论，病理证实均为 FNG. **结论** 采用钆塞酸二钠行 MRI 动态增强及肝细胞特异期扫描对 FNH 的诊断有较好的诊断价值，可以提供病变形态、血供、细胞来源及功能等更多相关信息，能够提高诊断符合率。

PU-1085
MR 扩散加权成像联合肿瘤指标对宫颈癌放化疗疗效评估的预测

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目的 探讨扩散加权成像（Diffusion weighted imaging，DWI）、表观扩散系数（Apparent diffusion coefficient，ADC）以及肿瘤指标癌胚抗原（Casino embryonic antigen, CEA），糖类抗原（CA-125，CA-153）及细胞角蛋白 19 片段（Cytokeratin19 fragment antigen-2，CYFRA-2）等对中晚期宫颈癌放化疗后疗效评估的应用价值。方法 对 42 例经病理证实为 IIb 期以上的中晚期宫颈癌患者分别于放化疗前、中及后期随访复查行盆腔磁共振扫描，包括 T1WI、T2WI、DWI 及增强扫描，分别测量治疗前、后肿瘤体积，并分别测量横断位及矢状位肿瘤最大径平面的平均 ADC 值，并获得每位病人放化疗前及后期复查的肿瘤指标检查结果。 结果 放化疗前平均 ADC 值约为（0.882±0.087）×$10^{-3}$$mm^2$/s，之后约为（1.312±0.152）× $10^{-3}$$mm^2$/s，治疗后比治疗前平均 ADC 值升高（P<0.05）；放化疗前肿瘤体积约 4.5±1.3cm，之后体积约 1.7±1.2cm，治疗前后肿瘤变小（P<0.05）；治疗前各项肿瘤指标升高组 ADC 值较正常组 ADC 值高，且有统计学意义，放化疗前肿瘤升高者，治疗之后肿瘤指标降低（P<0.05），治疗前后肿瘤体积变小、ADC 值升高以及部分肿瘤指标变化三者有相关趋势。 结论 弥散加权成像中的 ADC 值联合肿瘤指标可以监测宫颈癌放化疗疗效。

PU-1086
磁共振成像在胎盘植入诊断中的应用价值

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目的 胎盘植入为妇产科严重的妊娠并发症，极大威胁母婴生命安全。超声检查因其简单操作、高普及度成为了首选的影响学检查方法，但目前就其各项指标的诊断效能仍有较大争议。本文分析在妊娠期胎盘植入的磁共振成像(MRI)表现及特征，探讨其诊断中的应用价值。
方法 回顾性分析 21 例经临床及病理证实的产后胎盘植入患者，在征求患者同意后行 MRT 检查，结合现有同行的研究结果，总结 MRI 的相关影像特征，并将之与术后病理结果进行对比。
结果 21 例胎盘植入中 18 例合并前置胎盘，粘连型 9 例，植入型 10 例，穿透型 2 例。MRI 表现为子宫体积增大，胎盘形态及植入部位子宫壁改变多表现为局部突出，植入区子宫壁变薄或中断，膀胱顶壁不光滑或不规则。植入区胎盘内见丰富的血管影，胎盘边缘或宫颈内伴有出血症状。

结论 MRI 软组织分辨率高，具有一定的特征性，对胎盘植入诊断，具有较高的应用价值。

PU-1087
3.0T 磁共振多模态成像在前列腺癌与前列腺增生鉴别诊断中的应用价值

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目的 评价 3.0T 磁共振多模态成像在前列腺癌与前列腺增生鉴别诊断中的价值。
方法 对 60 例前列腺癌及 64 例前列腺增生患者行 MR 常规扫描及 DCE、DWI 扫描,采集 DCE 相关指数(达峰时间，峰值，强化率，最大灌注率 SSmax)、表观扩散系数(ADC)值,运用双样本 t 检验，组间对比采用 x 2 检验，比较前列腺癌组与前列腺增生组之间的差异，并计算 DCE、DWI 及多种检查方法联合应用（多模态成像）的敏感度、特异度和准确性。
结果 前列腺癌与前列腺增生的 SSmax 差异有显著统计学意义(T=38.471,P=0.000)；ADC 值差异有显著统计学意义(T =22.588, P =0.000)。本研究结果显示 DCE、DWI 成像对前列腺癌诊断的准确性分别为 87.50%、86.45%,通过（多模态）多种检查方法的联合应用,其敏感度、特异度和准确性分别可以达到 96.67%、96.87%、96.77%。
结论 由于 3.0T 磁共振高软组织分辨率、时间分辨率及多功能成像，使多模态成像得以实现，其在前列腺癌诊断中具有特异性表现，为临床诊断及治疗方案的选择提供了可靠的影像学图像及数据。

PU-1088
磁共振弥散加权成像及 ADC 值鉴别胆囊良、恶性病变的价值

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目的 评估 DWI 技术并 ADC 值的测量在胆囊良、恶性病变的诊断与鉴别诊断方面的价值。
方法 (1)收因胆囊病变拟行胆囊手术切除的住院病人 22 例。(2) 使用 PHILIPS 公司 Intera Achieva 3.0 T 超导 MR，对病例进行常规序列及 DWI 扫描。(3) 对 DWI 图像首先直接观察，根据病变信号强度分组，并测量其 ADC 值。(4) 将检测结果与相应的病理学诊断结合分析：分为良性与恶性两组，并结合 DWI 信号强度再分组。(5)进行组内及组间统计学分析，首先总结胆囊良、恶性病变的 DWI 肉眼信号特征，然后根据测量的 ADC 值，进一步探讨鉴别胆囊良、恶性病变的最适 ADC 值。
结果 (1)手术后经组织病理学证实的胆囊病变共计 22 例，其中良性病变 12 例（胆囊息肉 8 例，胆囊腺瘤 4 例）；恶性病变 10 例（胆囊腺癌 8 例，胆囊鳞状细胞癌 2 例）。(2) 12 例良性病变中，10 例为低信号病变，2 例为稍高信号病变。10 例恶性病变中，3 例为稍高信号病变，7 例为高信号病变。(3)采用 two-sides Fisher's 确切概率法分析结果显示，胆囊良、恶性病变的信号强度差异有显著统计学意义(P=0.004)。(5)恶性病变组的平均 ADC 值约为$(1.12\pm0.29)\times10^{-3}$ ㎜²/s，良性病变组的平均 ADC 值约为$(1.85\pm0.36)\times10^{-3}$ ㎜²/s，采用 Mann-Whitney 检验对两组间数据进行比较，结果恶性病变的 ADC 值低于良性病变，差异有显著统计学意义(P=0.001)。
结论 不同病理类型的胆囊病变，其 DWI 信号强度有差异，其 ADC 值水平亦不相同。其中良性病变多呈现低或等信号，ADC 值多高于 1.59×10^{-3} ㎜²/s。而恶性病变多呈稍高信号或高信号，ADC 值多

低于 1.59 ×10^{-3} ㎜^{2}/s。DWI 结合 ADC 值测量，有望成为鉴别胆囊良、恶性病变的有效方法，对胆囊癌的早期检测及鉴别诊断具有一定价值。

PU-1089

妊娠早期胎盘植入的 MRI 诊断

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目的 探讨 MRI 在妊娠早期胎盘植入诊断中的临床应用价值。**方法** 回顾性分析 19 例经手术病理证实的妊娠早期胎盘植入的 MRI 表现。所有病例均行 MRI 平扫，15 例行动态增强扫描。**结果** 19 例平扫显示胎盘与子宫肌层分界不清，局部胎盘边缘不规则，相邻子宫结合带模糊或中断，T1WI 呈等低信号，T2WI 呈稍高或稍低信号，15 例增强扫描胎盘组织呈渐进性明显强化。**结论** MRI 对妊娠早期胎盘植入的诊断有重要价值，增强扫描有助于评估胎盘植入深度及范围，为临床诊疗提供重要信息。

PU-1090

PSA 及其衍生指标在第二版前列腺影像报告与数据系统 3 分病灶临床决策中的价值

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目的 探讨临床相关指标在第二版前列腺影像报告与数据系统（PI-RADS V2）3 分病灶临床穿刺活检决策中的价值，比较上述观察指标对 PCa 和 csPCa 的诊断效能。材料与**方法** 回顾性分析 2016 年 3 月至 2018 年 10 月于苏州大学附属第二医院经穿刺病理证实的 121 例主病灶 PI-RADS V2 评分为 3 分患者的 MRI、病理资料和相关临床指标［年龄、前列腺特异性抗原（PSA）、游离前列腺特异性抗原（fPSA）、f/tPSA、前列腺特异性抗原密度（PSAD）以及前列腺体积（PV）］，比较各观察指标在 PCa 组和非 PCa 组间以及 csPCa 组和非 csPCa 组间的差异，运用受试者工作特性（ROC）曲线比较有统计学意义指标对 PI-RADS 评分为 3 分的 PCa 及 csPCa 病灶的诊断价值。**结果** 主病灶 PI-RADS V2 评分为 3 分者共 121 例，其中 PCa 31 例（25.6%），csPCa 14 例（11.2%）。上述 PI-RADS 3 分病灶中 PCa 组和非 PCa 组间以及 csPCa 组和非 csPCa 组间的 PSA、f/tPSA、PSAD 值的差异均有统计学意义（P 均＜0.05），且均以 PSAD 的 ROC 线下面积最大；另一方面，中位 PSAD 值 csPCa 组（0.39 ng/ml2 ）明显高于 PCa 组（ 0.24 ng/ml2 ）和非 PCa 组（0.17ng/ml2）。若以 PSAD＞0.20ng/ml2 作为穿刺参考阈值，诊断 csPCa 的敏感度、特异度、阳性预测值、阴性预测值分别为 78.6%、58.9%、20.0%、95.4%， 54.5%（66/121）的病例可避免穿刺活检，3 例 csPCa 漏诊。**结论** PSA、f/tPSA、PSAD，尤其是 PSAD 可提高 PI-RADS 3 分病灶中 PCa，尤其是 csPCa 的检出效能，对临床决策制定具有重要参考价值。

PU-1091

直肠癌 MRI 表现与 HER2 表达的相关性研究

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目的 探讨直肠癌 MRI 征象与人类表皮生长因子受体（Her-2）基因表达之间的相关性。**方法** 回顾性分析 2017 年 1 月—2019 年 6 月于自贡市第四人民医院行 MRI 检查，并经手术病理证实的 160 例直肠癌患者。其中 Her-2 阳性组（n=54），Her-2 阴性组（n=106）。测量和记录 MRI 征象（肿瘤部位、最大厚度、最大径线、肿瘤体积、强化方式、浆膜面受侵、淋巴结转移）。使用单因素分析比较两组 MRI 征象，将存在统计学意义（P<0.05）的相关因素纳入 Logistic 回归方程分析。**结果** Her-2 阳性组最大厚度、肿瘤体积、浆膜面受侵、淋巴结转移与 Her-2 阴性组比较，差异有统计学意义（P<0.05）。Logistic 回归分析显示，肿瘤体积（OR=2.048）、浆膜面受（OR=2.032）、淋巴结转移（OR=2.064）可作为 Her-2 表达的独立预测因素（P<0.05）。**结论** MRI 检查中肿瘤体积、浆膜面受侵、淋巴结转移等征象可初步估计直肠癌 Her-2 的表达情况，为临床治疗和预后评估提供参考。

PU-1092

子宫平滑肌瘤病的临床分析及影像学特点

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目的 深入分析子宫平滑肌瘤病的临床及 MRI 特点。**方法** 收集近两年内在我院治疗的 6 例子宫静脉内平滑肌瘤病患者的临床影像学资料，分析肿瘤形态、位置、大小、信号及强化方式、DWI 信号及 ADC 值，将研究结果与病理诊断结果进行对比。**结果** 大体观察，所有患者均有子宫形态的改变，多数表现为子宫增大，多数病灶仅局限在子宫内。免疫组化实验显示平滑肌分化标志物全部呈现阳性，多数激素受体、血管源性标记物阳性。6 例均有病灶蠕虫样改变，均发现病灶内流空信号，仅病例 3 的影像学诊断与病理诊断相符。T1WI 呈等信号 3 例，等高信号 3 例；T2WI 呈高低混杂信号 2 例，稍高信号 2 例，混杂高信号 1 例，等高信号 1 例。6 例肿瘤内部或肿瘤旁可见多发迂曲血管。肿块强化方式均为快进慢出，强化程度除病例 2 为管状强化，其余均为明显强化。DWI 呈高信号 2 例、稍高信号 4 例，磁共振 ADC 值处于正常水平。**结论** 子宫静脉内平滑肌瘤病的临床特异性较差，术前检查的诊断正确率较低。T1WI 信号为等或等高，T2WI 信号为高或稍高，肿瘤内部或肿瘤旁可见多发迂曲血管。

PU-1093

浸润性宫颈癌术前 CT 及 MRI 诊断的临床价值研究

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目的 比较分析浸润性宫颈癌术前 CT、MRI 对其的诊断临床价值。**方法** 回顾性收集我院 2016 年 1 月--2016 年 12 月经影像学检查、病理学诊断证实的 61 例浸润性宫颈癌患者的影像资料，所有患者术前均先后进行 CT、MRI 检查，检查后 4 周内行手术治疗。以手术病理分期结果为依据，比较 CT、MRI 对宫颈癌术前分期诊断符合率。另外以手术病理学结果为对照，比较 CT、MRI 对阴道浸润、子宫体侵犯等相关征象，统计 CT、MRI 对上述征象诊断准确度。应用 SPSS19.0 统计软件分析数据，计数资料(%)表示， χ2 检验，P ＜0.05 为差异有统计学意义。 **结果** 以术后病理分期为对照，对于Ⅱ、 Ⅲ、Ⅳ期宫颈癌患者，术前 MRI 检查的诊断符合率明显高于 CT 检查，差异有统计学意义（P＜0.05）。MRI 对Ⅱ、 Ⅲ、Ⅳ期宫颈癌的误诊率均为 0%，CT 对Ⅱ期及Ⅲ期宫颈癌的

误诊率显著高于 MRI。且 CT 对 I B1 期及以下诊断符合率为 65%， 较 MRI 的 85.7%差异有统计学意义(P＜0.05)。对照术后病理各征象结果，术前 CT 对阴道浸润诊断准确度明显低于术前 MRI，差异有统计学意义（P＜0.05）；CT 对子宫体侵犯诊断准确度为 94.6%，显著高于 MRI 的 79.2%(P ＜0.05)。**结论** 术前 MRI 相对 CT 在浸润性宫颈癌整体术前分期诊断上有优势，即最优选择 MRI，必要时可与 CT 联合应用，提高准确率。 MRI 对阴道浸润诊断准确率明显高于 CT，而 CT 对于子宫体侵犯的诊断准确度更有价值。

PU-1094
磁敏感加权成像在鉴别诊断前列腺癌和良性前列腺增生的潜在价值

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目的 磁敏感加权成像（SWI）是一种新的功能成像序列，已被成熟应用于颅内疾病的诊断，却很少应用在前列腺疾病中。本文旨在探讨 SWI 在前列腺癌（PCa）和良性前列腺增生（BPH）中的鉴别诊断价值。材料与**方法** 回顾性分析经磁共振超声融合靶向穿刺证实的 24 例前列腺癌患者和 56 例良性前列腺增生患者的影像学资料，所有患者均行 3.0T 常规磁共振（MRI）检查序列和高分辨 SWI 检查序列，根据病理结果将靶向穿刺区和 MRI 图像进行匹配。由两位七年以上经验的诊断医师分别对常规 MRI 图像和高分辨 SWI 图像进行分析和比较，并标注前列腺组织出血点。**结果** 分析结果显示，24 例前列腺癌患者中有 20 例在 SWI 图像上表现有出血病灶，而常规 MRI 图像上只有 4 例患者有出血病灶；56 例良性前列腺增生患者中有 4 例在 SWI 图像上表现有出血病灶，而常规 MRI 图像只有 1 例出血表现。**结论** 前列腺癌相比良性前列腺增生更易引起组织出血，而相比常规 MRI，SWI 在发现出血病灶方面有着更高的敏感性、特异性和准确性，因此 SWI 在鉴别前列腺癌和良性前列腺增生中具有重要价值。

PU-1095
产后胎盘植入的 MR 诊断与评估

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目的 探讨产后胎盘植入的 MR 诊断价值。
资料与方法 回顾性分析 15 例病理证实为胎盘残留（PRT）患者的资料。全部病例经超声初筛后行 MR 平扫及动态增强检查。MR 评价指标：PRT 的大小、肌层受累程度、T1WI/T2WI 序列信号特点、PRT 小叶间隔结构及胎盘的强化方式。
结果 经病理证实 PRT 并粘连 3 例，PRT 并植入 11 例，PRT 并穿透 1 例。RPT 最大径面约 2.1×1.0cm—11.5×10.2cm，且 PRT 大小与类型无明显相关性（P＞0.05）。MRI 表现：宫体增大，受累面肌层变薄，局部结合带模糊或中断，受侵肌层厚度（d1）/未受侵肌层厚度（d2）与 PRT 分类存在相关性（P＜0.05）；T1WI 呈等低信号为主，T2WI 以高信号为主，11 例未行子宫动脉栓塞患者受累肌层内可见流空信号；1 例产后胎盘穿透动态增强曲线表现为逐渐增强，而 14 例胎盘粘连和植入动态增强曲线显示早期增强。其中 4 例行子宫动脉栓塞患者 PRT 内见节段性无强化梗死区。
结论 MR 对 PRT 诊断及预后评价有重要意义，而肌层受累程度、胎盘小叶间隔结构及胎盘强化方式的评估能够为临床决策提供帮助。

PU-1096

MRI 影像组学对直肠良恶性病变鉴别诊断的价值

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目的 探讨基于直肠 MRI 图像的影像组学模型在直肠良恶性疾病鉴别诊断中的价值。**方法** 回顾性分析山东省千佛山医院 2016 年 8 月至今有手术病理支持并具有完整的术前 MRI 影像资料的直肠病例 78 例（直肠腺瘤 n=32，直肠癌 n=46），年龄范围 38-83 岁（女性 n=34，男性 n=44），采用影像组学分析工具（Radcloud,Huiying Medicial Technology Co,Ltd）依次从 T2WI、DWI 及 T2+DWI 图像中提取组学特征，进行特征筛选并建立组学标签；利用机器学习算法支持向量机（SVM）构建 3 个模型用于预测直肠良恶性病变，分别为 $Model_{T2}$、$Model_{DWI}$、$Model_{T2+DWI}$。利用受试者工作特性曲线（ROC）评价模型的预测效能，并通过 ROC 曲线下面积（AUC）、敏感性、特异性进行量化，利用 DE-LONG 检验比较各模型的预测效能。用 IBM SPSS23.0 软件对病例临床资料（性别、年龄）进行统计学分析。

结果 ①分别从 T2WI、DWI、T2WI+DWI 序列图像筛选出 24、13、30 个影像组学特征构建模型，3 个预测模型在验证组的敏感性、特异性及 AUC 分别为 $Model_{T2}$：0.86、0.70、0.89（95% CI0.71-1）、$Model_{DWI}$：0.86、0.90、0.88（95% CI0.75-1）、$Model_{T2+DWI}$：0.86、0.60、0.85（95% CI0.66-1）。②$Model_{T2}$、$Model_{DWI}$、$Model_{T2+DWI}$对直肠良恶性病变的预测效能无统计学差异（p>0.05）。③性别、年龄组间差异无统计学意义（p>0.05）。

结论 ① 基于 MRI 影像组学特征构建的模型，在直肠良恶性疾病鉴别诊断中有应用价值。②放射组学可以利用计算机技术充分挖掘图像中隐藏的信息，尤其 DWI 序列图像的隐藏信息，能更全面地分析病灶信息，辅助临床医师选择合适的治疗方案。

PU-1097

原发性输卵管癌 2 例及 MR 诊断复习

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原发性输卵管癌是少见的女性生殖系统恶性肿瘤，占所有妇科恶性肿瘤的 0.14%~1.8%[1]。以 40~65 岁居多，平均年龄 52 岁，超过 60%的原发性输卵管癌发生于绝经后妇女[2]。因少见且早期多无症状，体征多不典型，临床较易漏诊和误诊。本文收集我院在 2018 年 8 月至 2018 年 12 月收治的 2 例经手术和病理证实的原发性输卵管癌的临床及 MRI 资料，分析总结其 MRI 图像特征，以提高对原发性输卵管癌的术前诊断的准确性。

PU-1098

高分辨 3T 磁共振评估直肠癌术前环周切缘有无累及的前瞻性研究

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目的 探讨高分辨 3.0T 磁共振对直肠癌术前环周切缘有无累及的前瞻性评估，以指导直肠癌的多学科诊断和个体化治疗方式。**材料与方法** 在 2012 年 2 月至 2017 年 7 月期间利用 GE 3.0T 磁共振对 46 例经结肠镜证实的直肠癌患者进行盆腔磁共振平扫、DWI 检查，常规序列包括失状位 FRFSE T2WI、冠位 FRFSE T2WI、轴位 FRFSE T2WI 和 DWI，并且所有 T2WI 序列都采用小视野、薄层扫描，DWI 的 b 值取 1000 s/mm²。然后综合所有序列对直肠癌病灶进行术前 MR-T、N 分期，评估直肠系膜筋膜、环周切缘有无累及，然后与手术病理结果进行对照分析。**结果** 在 46 例直肠癌中，MR-T 分期中正确诊断 40 例，错误诊断 6 例，正确率为 86.9%。N 分期中正确诊断 34 例，错误诊断 12 例，正确率为 73.9%。MRI 判断直肠系膜环周切缘（circumferential resection margin，CRM）有无累及的准确率、敏感性、特异性、阳性预测值及阴性预测值分别为 93.4%、100.0%、91.1%、80.0%及 100.0%。**结论** 高分辨率 3.0T 磁共振成像可以对直肠癌手术环周切缘有无累及进行准确的预测，还可以清楚的显示病灶及邻近组织侵犯情况，对直肠癌的个体化治疗提供有力证据。

PU-1099

扩散加权成像单指数与扩散峰度成像模型术前预测肾透明细胞癌病理分级的对比研究

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目的: 探讨扩散加权成像单指数模型和扩散峰度成像（DKI）模型在术前预测肾透明细胞癌病理分级中的价值。

资料与方法: 前瞻性收集经病理结果证实的肾透明细胞癌（ccRCC）患者 80 例，根据 Fuhrman 分级将上述患者分为四组：I 级（G1）15 例，II 级（G2）22 例，III 级（G3）24 例，IV 级（G4）19 例。患者均行肾脏常规单指数 DWI 序列和 DKI 序列扫描，测量参数包括 ADC 值、各向异性分数（FA）、平均扩散系数（MD）、平均扩散峰度（MK）、轴向扩散峰度（Ka）以及径向扩散峰度（Kr）值。利用独立样本 t 检验分别进行两组间均数的比较，使用受试者工作特征（ROC）曲线评价各参数的诊断效能。

结果: ①与正常肾实质比较，各级别 ccRCC 患者的 ADC、MD 值均减低，MK、Ka 及 Kr 值均升高，差异具有统计学意义（$p<0.05$），FA 值差异没有统计学意义（$p>0.05$）；②ADC 值在 G1/G3、G1/G4、G2/ G3、G2/G4、G3/G4 各组间差异有统计学意义($p<0.05$)，G1/G2 两组间 ADC 值差异无统计学意义（$p>0.05$)。③MD、MK、Kr 值在 G1/G2、G1/G3、G1/ G4、G2/ G3、G2/G4、G3/G4 各组间差异均有统计学意义($p<0.05$)；Ka 值在 G1/G2、G1/G3、G1/ G4、G2/G4、G3/G4 各组间差异均有统计学意义($p<0.05$)，G2/ G3 两组间 Ka 值差异无统计学意义（$p>0.05$)；FA 值在各组间差异均无统计学意义($p>0.05$)。④绘制 ROC 曲线，得出 MK 值在鉴别 G1/G2、G1/G3、G1/ G4、G2/ G3、G2/G4、G3/G4 的曲线下面积（AUC）分别为 0.96、1.00、1.00、0.87、1.00、0.94，均高于 ADC、MD、Ka 和 Kr 值。

结论: DKI 模型比单指数扩散模型更适合作为肾透明细胞癌术前病理分级预测的成像技术。

PU-1100

magnetic resonance image-based machine learning for differentiating borderline from malignant epithelial ovarian tumors: A multicenter study

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Introduction
Preoperative differentiation of borderline from malignant epithelial ovarian tumors (BEOT from MEOT) can impact surgical management. MRI has improved this assessment but subjective interpretation by radiologists may lead to inconsistent results.

Material and methods
In this multicenter retrospective study of eight clinical centers, totally 501 women with histopathologically-confirmed BEOT (n=165) or MEOT (n=336) derived over an 8-year period (January 2010 to June 2018) were enrolled. Patients underwent preoperative MRI within two weeks of surgery. Single- and multi-parameter (MP) machine learning assessment models were built for differentiating BEOT from MEOT utilizing the following four MR sequences: T2WI FS, DWI, ADC, and CE-T1WI. Diagnostic performance of models was assessed for both whole tumor (WT) and solid tumor (ST) components. Six radiologists of varying experience also interpreted the MR images. We further validate the model performance in discriminating BEOT versus early stage MEOT (n=36).

Results and Discussion
The MP-ST model performed better than the MP-WT model for both the internal validation cohort (AUC=0·932 vs. 0·917) and the external validation cohort (AUC=0·902 vs. 0·767). Among the single-parameter models in the external validation cohort, the ADC-ST model was best (AUC=0.898). The model can also discriminate BEOT versus early stage MEOT (AUC=0.909 and 0.920 in internal and external validation cohort). Radiologist performance was considerably lower for both the internal (mean AUC=0.785; range, 0·635-0·832) and external (mean AUC=0·788; range, 0·661-0·867) validation cohorts. If these models successfully implemented into clinical practice, improved preoperative prediction could potentially lead to preserved ovarian function and fertility for some women.

PU-1101

MR image-based radiomics to differentiate type Ⅰ and type Ⅰ Ⅰ epithelial ovarian cancers and identify the most critical region for sampling

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Objective
In this study, we aimed to construct an MR image-based radiomics assessment model to differentiate between type I and type II EOC, and to identify the most critical region for EOC differentiation at IFS.
Methods and materials

In this multicenter retrospective study, a total of 294 eligible patients derived over a 9-year period (January 2010 to February 2019) were enrolled. Quantitative MR imaging features were extracted from the following axial sequences: T2WI FS, DWI, ADC, and CE-T1WI. Ten models were constructed based on various combinatiuons of these four MR sequences, with or without age at the time of surgery). The diagnostic performance was evaluated by ROC-AUC. In addition, an occlusion test was carried out to identify the most crucial region for intraoperative frozen section (IFS) sampling.

Results

Combined models exhibited superior diagnostic capability over all four single-parametric models, both in internal and external validation cohorts (AUC of 0.834 and 0.847, respectively). The additional value of patient age to our model was confirmed. The occlusion test revealed that the most crucial region for IFS sampling was the border zone between the solid and cystic components, or the loose areas of solid component on direct visual inspection.

Conclusion

MR image-based radiomics modeling can objectively and accurately differentiate between type I and type II EOC, as well as identify the most appropriate area forIFS sampling.

PU-1102

Image quality analysis of rectal cancer mr patients with anal-injected coupling agent

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Objective: to explore the best method of MR scanning for rectal cancer patients, and compare the image quality between conventional method and injection coupling method. Methods: a total of 78 patients (endoscopic diagnosis of rectal cancer) from March 2018 to May 2019 in our hospital were collected and divided into 39 patients in the conventional group and 39 patients in the experimental group. After enema emptying the intestine in the experimental group, 280ml ultrasonic coupling agent was injected for scanning. Results: there was a large interference between air and free water in the intestinal cavity of patients with conventional method, especially some air interference and water interference artifacts when DWI sequence had a high B value. After the injection of the coupling agent, the tumor location was clear, and the DWI sequence reduced the excellent rate of artifact interference images by 94.8%, and the excellent rate of peripheral cutting edge and T staging images by 94.3% ($P<0.001$). Conclusion: the injected ultrasonic coupling agent can reduce artifacts in high-b-value DWI sequences, but the image excellence rate is slightly lower than that of the image without injected coupling agent due to the enlarged intestinal cavity observation peripheral cutting edge and T stage.

PU-1103

对照 CTA 评价 3D Balance FFE 序列显示肾动脉的能力

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目的 评估三维平衡全稳态快速场梯度回波序列(3D Balance FFE)对肾动脉的显示能力,探讨 3D Balance FFE 序列对肾癌局切术前评估肾脏血管分布的价值。材料与方法 收集我院 2016 年 1 月至 2019 年 1 月因肾癌术前行肾动脉 CTA 检查并行 3D Balance FFE 序列检查的患者，3D Balance FFE 序列显示肾血管及肾血管变异的能力由两名副主任医师进行评估。所有患者以 CTA 显示肾动脉的结果为对照来评估 3D Balance FFE 序列显示肾血管的准确性。结果 42 例患者接受了 CTA 和 3D Balance FFE 两项检查。3D Balance FFE 显示了 87 根肾动脉(CTA：88 根)，其中正常肾动脉 82 根(CTA：82 根)，副肾动脉 5 根(CTA：6 根)；在显示肾动脉分支方面，3D Balance FFE 显示四级分支数与 CTA 无明显差异 ($P<0.05$)。结论 3D Balance FFE 序列能较好地显示肾动脉及评价肾动脉的变异，与 CTA 显示肾动脉分支能力一致，它可以替代 CTA 成为肾癌局切术前评估肾血管的一种有效检查方法。

PU-1104
肝脏普美显强化核磁共振肝胆期胆管成像的临床应用价值

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目的 探讨肝脏普美显强化核磁共振肝胆期胆管成像的临床应用价值。 **方法** 选取 2018 年 12 月-2019 年 3 月来我院就诊或复查的小肝癌患者 62 名行肝脏普美显强化核磁检查。在患者知情同意的情况下，注射普美显对比剂前行常规胆管水成像（MRCP）检查（行屏气薄层半傅里叶采集单次激发快速自旋回波序列重 T2（HASTE）成像），注射普美显对比剂后 30min 后肝胆期（部分对比剂被肝细胞吸收摄取经胆道排泄，胆道树系统显示完整）行胆管成像检查（行屏气薄层重 T1 成像）。有两位高年资诊断医生（副主任医师）分别对注射对比剂前后图像质量进行评分（Ⅰ级为胆管树显示清晰 4 分；Ⅱ级为胆管树显示良好 3 分；Ⅲ级为存在部分背景高信号干扰，影响诊断 2 分；Ⅳ级为背景高信号使胆管树结构显示不清，严重影响诊断 1 分）。 **结果** 注射对比剂 30min 后肝胆期 MRCP 图像质量明显好于注射对比剂前（P<0.05）。但 30min 后肝胆期 MRCP 并不能显示胰管结构和走形（注射对比剂 30min 后采用 T1WI 序列扫描，对比剂能延长 T1 弛豫时间，但不经胰管排泄）。 **结果** 肝脏普美显强化核磁共振肝胆期成像能更好地显示胆管树结构，对胆道系统疾病具有重要的临床应用价值。

PU-1105
孤立性胃底静脉曲张的 CT 和 MRI 征象研究

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目的 提高对孤立性胃底静脉曲张影像表现的认识，探讨其与非孤立性胃底静脉曲张的异同点。 **方法** 在 PACS 系统中检索并调取符合入组条件的 60 例孤立性胃底静脉曲张患者的影像资料，包括 CT 平扫、CT 增强、MRI 平扫、MRI 增强，由两位高年资放射科医生阅片，分析孤立性胃底静脉曲张患者的病因、CT 及 MRI 影像特点。另外选择 60 例非孤立性胃底静脉曲张患者的 CT 和 MRI 影像资料作为对照组，比较两组的异同点。

结果 孤立性胃底静脉曲张患者的主要病因包括慢性胰腺炎、胰腺肿瘤及胰腺炎合并假性囊肿；CT 和 MRI 表现为：①下腔静脉和/或门静脉系统的大部分属支血管显示良好，但在连续数个层面上脾静脉均见局部的明显狭窄、突然中断或完全不显示；②侧枝循环血管多见于脾门-胃底之间及胃大弯侧胃结肠韧带内。其中，慢性胰腺炎多引起胃网膜右静脉曲张，胰腺肿瘤多引起胃网膜左静脉曲张。非孤立性胃底静脉曲张患者的主要病因为肝硬化；CT 和 MRI 表现为：①门静脉不同程度增宽；②侧枝循环血管多表现为食管下段-胃底静脉曲张。
结论 孤立性与非孤立性胃底静脉曲张的病因及影像表现有所不同，腹部增强 CT 及 MRI 检查可以清晰显示这些影像特征。

PU-1106
单、双指数模型 DWI 在直肠癌 T 分期中的应用价值

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摘要：目的 比较单、双指数模型 DWI 参数在术前直肠癌壁外浸润中的应用价值。方法 收集 60 例手术病理证实的直肠癌患者，其中壁外浸润 41 例，非壁外浸润 19 例。均行单指数模型（b=0,1000/mm^2）及双指数模型（b=0、50、100、150、200、400、600、800、1000、1200、1500s/mm^2）扩散加权成像（DWI）检查。利用 matlab 软件测量表观扩散系数（ADC）值、纯扩散系数（D）值、灌注相关扩散系数（D*）值及灌注分数（f）值，比较两组之间的参数是否有统计学差异，并绘制相对应的 ROC 曲线，分析其诊断效能。结果 直肠癌壁外浸润组的 D 值低于非浸润组具体值，差异有统计学意义（P＜0.05）。直肠癌壁外浸润组的 D*值高于非浸润组，差异有统计学意义（P＜0.05）。两组间 F 值及 ADC 值均无统计学差异（P>0.05）。D 值对于诊断直肠癌壁外浸润的曲线下面积（AUC）为 0.847 高于 D*值诊断直肠癌壁外浸润 AUC（0.689），差异有统计学意义（P＜0.05）。D 值诊断直肠癌壁外浸润的敏感度、特异度、阳性预测值、阴性预测值及准确度分别为（80.49%）、（89.47%）、（94.29%）、（68.00.%）、（83.33%）；D*值诊断直肠癌壁外浸润的敏感度、特异度、阳性预测值、阴性预测值及准确度分别为（70.73%）、（63.16%）、（80.56%）、（50.00%）、（68.33%）。结论 相比于单指数模型 ADC 值，双指数模型 DWI 的参数 D 值及 D*值对直肠癌壁外浸润具有较佳的诊断效能。

PU-1107
利用磁共振电影序列观察非妊娠子宫动力学特点的研究

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目的 使用磁共振电影序列轴位和矢状图像详细观察月经周期每个阶段的子宫动力学特点。
方法 从 2019 年 1 月至 2019 年 5 月，招募 7 名有自然妊娠和分娩史的志愿者。利用磁共振电影序列评估子宫肌肉收缩的动力学参数（深度，频率和方向）。
结果 在月经期间可观察到从子宫角到子宫颈平滑肌的强烈收缩。在卵泡后期，子宫颈和子宫角的反相收缩频率增加。在排卵期之前，由子宫颈的收缩传达至子宫底。排卵后，反相收缩恢复。这些收缩的频率在黄体中期逐渐降低，在排卵后 7 天可以观察到从子宫颈到子宫体中部的微小收缩。
结论 子宫动力学特点在月经周期的每个阶段根据子宫不同的生理功能而改变。此外，需要利用 MRI 电影序列针对月经周期内的每个阶段进行研究来评估子宫动力学特点和不育症之间的关系。

PU-1108

磁共振高分辨成像序列与 T1 增强扫描序列在肛瘘术前诊断中的应用对比

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目的 探讨磁共振高分辨成像序列 （3D-CUBE T2WI FS） 与 T1 增强扫描序列（LAVA+C）对肛瘘分型诊断的准确性。
方法 回顾性分析 2018 年 1 月至 2019 年 7 月我院收治的 37 例经手术病理证实为肛瘘的患者，术前均采用 GE 1.5T Signa HDXT2012 磁共振行 MRI 检查，以术中所见及病理结果为准，对比分析 3D-CUBE T2WI 抑脂序列与 LAVA 增强序列对肛瘘瘘管形态及走行诊断的准确性；采用 4 分法对二者图像进行评分。
结果 37 例患者经手术病理证实:单纯性肛瘘 20 例，复杂性肛瘘 17 例；高位肛瘘 11 例，低位肛瘘 26 例；Parks 分型**结果** 括约肌间型 24 例，经括约肌型 12 例，括约肌上型 1 例，括约肌外型 0 例；主瘘管 39 个、支管 8 支、内口 47 个、外口 38 个、脓肿 9 个。两种扫描序列对主瘘管的显示符合率分别为：3D-CUBE T2WI FS 95.1%、LAVA 增强 95.1%；对内口的显示符合率分别为：3D-CUBE T2WI FS 93.6%、 LAVA 增强 95.7%；差异均无统计学意义 （均 P ＞ 0.05）。将两种序列所得图像按照对肛瘘主瘘管、内口、分支及其多发细小瘘管、瘘管与肛门周围肌肉关系显示的清晰度进行 4 分法评分，评分结果有统计学差异（P<0.05）,以 LAVA 增强序列所得图像为佳。
结论 3D-CUBE T2WI 抑脂序列与 LAVA 增强序列均能够在术前有效定位肛瘘主瘘管、分支瘘管、内口；对肛瘘分型诊断具有高度的准确性；且 LAVA 增强序列可提供更丰富的细节，尤其是对瘘管侵犯周围组织结构的显示及对病变的累及范围、累及程度的评价；两种序列联合应用可为临床治疗方案的选择提供较高参考价值。

PU-1109

Monitoring tumor response to the vascular disrupting agent CA4P in a rabbit VX2 liver tumor model using dynamic contrast-enhanced MRI: Simultaneous evaluation of vascular and quantitative parameters

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Objectives:
To determine whether the CA4P produces a significant change in vascular and quantitative parameters in dynamic contrast-enhanced MRI (DCE-MRI), and to evaluate the correlation between quantitative parameters of DCE-MRI and microvessel density (MVD).
Materials and methods: With institutional Animal Care and Use Committee approval, Forty VX2 liver tumors were implanted in the left lobe of liver by percutaneous puncture under CT guidance. Twenty nine rabbits were successfully evaluated 2-2.5 weeks later. Serial MRI (T1WI, T2WI and DCE-MRI) were performed before, 4 hours, 24 hours,72 hours and 1-week after vascular disrupting agent, CA4P at a dose of 10 mg/kg (treated group, n = 23) or saline (control group, n = 6) administration. The

parameters of DCE-MRI (Ktrans, Kep, Ve and iAUC60) of viable tumor portions were measured. Then all the liver samples were processed for hematoxylin and eosin (*H&E*) staining to determine MVD. At last, DCE-MRI derived perfusion parameters and their interval changes were compared between the treated and control group by using the linear mixed model. Each parameter within each group was also compared by using the linear mixed model. Correlation between the DCE-MRI-derived perfusion parameters and MVD was analyzed by using the Spearman rank test or Pearson correlation analysis.
Results: Three VX2 tumor-bearing rabbits were dead during experimental period. The four parameters (Ktrans, Kep, Ve and iAUC) in the treated group at 4-hour follow-up were lower than the value of the baseline, and with significant difference (P<0.001,P=0.029,P=0.005,P=0.001) ,then the four parameters all increased gradually. while the same parameters in the control group were increased from baseline to 1 week. The metabolic tumor volume (MTV) of the two groups both increased at a 4-hour follow-up and further increased at a 1-week follow-up,and the change of MTV in the treated group was significantly smaller compared with that in the control group at 1-week follow-up (mean, +92.24% vs. +138.94%, P =0.009). For the experimental group, the parameters Ktrans (r = 0.621, P <0.01) and iAUC60 (r = 0.564, P =0.01) of 7 days in viable tumor portions were positively moderately correlated with MVD, whereas the parameters Kep(r = 0.027, P = 0.908) and Ve (r = 0.022, P = 0.927) were not correlated with MVD. For the control group, the parameters Ktrans (r = 0.852, P = 0.031) and iAUC60 (r = 0.823, P = 0.044) of 7 days in viable tumor portions were also positively moderately correlated with MVD, while the parameters Kep (r = -0.232, P = 0.658) and Ve (r = 0.306, P = 0.555) were not correlated with MVD. Ktrans, Kep, Ve, iAUC60 and MVD of residual viable tumors in the treat group 1 week later were lower than the viable tumors of the control group but no statistical difference (P > 0.05).

Conclusions: DCE-MRI could be used to evaluate the therapeutic effect induced by CA4P, The quantitative parameters Ktrans and semi- quantitative iAUC60 of DCE-MRI is correlated with MVD, which can assess tumor angiogenesis noninvasively of VX2 liver tumor model.

PU-1110

磁敏感加权成像评估慢性肝病铁沉积

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目的 SWI 幅度图值评估慢性肝病铁沉积和肝纤维化的可行性及其在诊断慢性肝病中的应用价值。

方法 磁敏感加权成像 SWI 是利用磁场中局部磁敏感差异而产生影像对比的一种梯度回波序列，目前为评估慢性肝病的首选检查手段 。

结果 慢性肝炎患者肝内常有轻至中度铁沉积，引起四型胶原细胞增生，导致肝脏纤维化包绕含铁的增生结节，故随着肝炎、肝硬化进展，SWI 信号值 随着铁沉积和肝纤维化程度加重而减低 。

结论 慢性肝炎患者肝脏常有轻至中度过量的铁沉积，肝炎性铁沉积是慢性肝病重要的危险因素。了解慢性肝病患者肝脏是否存在铁过载以及铁过载程度，对于评估病情、指导治疗以及判断预后具有重要意义 。

PU-1111

子宫静脉内平滑肌瘤一例磁共振报告

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子宫血管内平滑肌瘤是一种少见的组织学形态良好，但生物学行为呈侵袭性生长易复发等恶性表现[1]。现将我院 2019 年收治的一例报告如下。

患者女，42 岁，有子宫肌瘤病史，近来感觉下腹隆起。查体：下腹部隆起如孕三月大小，质硬。超声检查：子宫肌层不均质回声伴低阻血流。磁共振检查：子宫体积明显增大，子宫壁见大片状等长 T1 等长 T2 信号，以子宫右后上壁为主，增强扫描见明显强化。病变上达宫底，下缘达宫颈水平，双侧卵巢受累，病变与右侧髂总动脉关系密切。磁共振提示：子宫壁异常信号，考虑恶性肿瘤。

快速病理示：子宫平滑肌瘤，结合大体表现，符合静脉内平滑肌瘤。

常规病理结果示：子宫平滑肌瘤，结合大体所见，符合静脉内平滑肌瘤。

磁共振讨论：回顾本例磁共振表现，发现子宫结合带尚连续，病变沿子宫壁生长，累及范围较大，但没有突破浆膜层。

静脉内平滑肌瘤临床罕见，临床上一般无特异性症。与子宫平滑肌瘤关系密切，特点是可以在子宫内及子宫外静脉系统内生长的良性平滑肌瘤[2]。病变早期临床症状不明显，超声检查不典型，易漏诊，病变晚期肿瘤沿静脉系统生长时，临床症状明显，就诊率较高，但此时治疗复杂，对机体伤害大。因此提高对本病的认识，早期识别并全面切除，可以有效保护患者并减少复发率。

PU-1112

IDEAL-IQ 技术诊断 OSAS 患者非酒精性脂肪性肝病

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目的 探讨在磁共振扫描中采用定量非对称回波的最小二乘估算法迭代水脂分离序列（IDEAL-IQ）成像技术评价阻塞性睡眠呼吸暂停低通气综合征（OSAS）患者肝脏脂肪含量及病变程度的可行性。**方法** 选取 106 例进行多导睡眠监测的患者为研究对象，根据监测结果分为非 OSAS 组和 OSAS 组，均进行 IDEAL-IQ 成像技术检查。将两组患者间一般临床资料、肝脏脂肪含量、实验室检查结果及非酒精性脂肪性肝病（NAFLD）程度分级进行比较，同时行肝脏脂肪含量与血清丙氨酸氨基转移酶（ALT）、门冬氨酸氨基转移酶（AST）相关性分析。**结果** 106 例患者中非 OSAS 患者 47 例，OSAS 组患者 59 例。非 OSAS 组患者的肝脏脂肪含量为（13.51±10.47）%、OSAS 组患者的肝脏脂肪含量为（18.49±7.90）%，差异有统计学意义（P<0.05）；两组患者年龄、性别、血清 AST、甘油三酯（TG）、总胆固醇（TC）、高密度脂蛋白胆固醇（HDL-C）差异无统计学意义（P>0.05）；OSAS 组体质指数（BMI）、血清 ALT、低密度脂蛋白胆固醇（LDL-C）显著高于非 OSAS 组，差异均有统计学意义（P<0.05）。非 OSAS 组中 36 例患者（76.60%）诊断为 NAFLD，OSAS 组中 57 例患者（96.61%）诊断为 NAFLD，NAFLD 严重程度两者差异有统计学意义（P<0.05）。ALT 与肝脏脂肪含量呈正相关（r=0.316，P=0.000），AST 与肝脏脂肪含量呈正相关（r=0.314，P=0.000）。**结论**

OSAS 患者相对于非 OSAS 患者，NAFLD 的发病率及严重程度显著增高，肝脏损伤程度加重。IDEA-IQ 技术对诊断 OSAS 患者肝脏脂肪变性及病变程度具有较高价值。

PU-1113
多模态 MR 对早期宫颈癌病灶大小及其临床病理特征的评估价值

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目的 比较 MR 各序列及临床对宫颈癌病灶大小测量的准确度，并探讨 MRI 参数与宫颈癌患者临床病理特征的相关性。
方法 选取我院 2014—2017 年间收治的经手术证实的早期宫颈癌（IB-IIA 期）患者 175 例，所有患者术前均行 MRI 扫描（包括常规平扫，增强 T1WI 和 DWI 序列）。回顾性分析患者的临床、病理、影像资料。肿瘤大小测量：在各序列横轴位图像上测量病灶左右径与前后径，在 T2WI 及增强 T1WI 矢状位上测量病灶上下径，在经病灶最大层面的 ADC 图测量肿瘤 ADC 值。采用配对 t 检验比较 MR 及临床与病理上肿瘤大小测量值的差异；采用独立样本 t 检验或秩和检验比较病理类型不同的患者各参数值的差异；采用多组独立样本的秩和检验比较分化程度不同者各参数值的差异，并采用 Spearman 检验评价两者的相关性。
结果 T2WI、增强 T1WI 及 ADC 图病灶左右径及前后径与病理测量值差异无统计学意义（$p>0.05$）；T2WI、增强 T1WI 序列上下径与病理测量值间差异显著（$p<0.001$）。DWI 序列左右径与前后径测量值小于病理测量值（$p<0.05$）。T2WI、增强 T1WI 序列病灶最大径与病理最大径存在差异（$p<0.05$）；而横轴位上各序列所得病灶最大径与病理最大径差异均无统计学意义（$p>0.05$）。临床查体所测肿瘤大小与病理测量值差异不明显（$p>0.05$），但其相关性低于 MR 上各径线与病理测量值的相关性。宫颈鳞癌 155 例，腺癌 12 例，其他类型癌 8 例。宫颈鳞癌 ADC 平均值及最小值低于腺癌（$p<0.001$）；鳞癌与腺癌各 MR 序列病灶最大径差异无统计学意义（$p>0.05$）。病理分化程度不同的肿瘤间 ADC 值差异显著（$p<0.05$）；宫颈癌分化程度与 ADC 值存在弱正相关关系。
结论 相较临床，MR 可以较准确评估宫颈癌病灶大小，但矢状位上所测上下径与肿瘤实际大小差异较大；MRI 可通过 ADC 值可以定量反映宫颈癌的病理学特征。

PU-1114
肝脏 castleman 病误诊为肝腺瘤的一例分析

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caseleman 病是一种以淋巴滤泡增生为特征的良性淋巴组织增生性疾病，病因不明，临床少见。Castleman 病好发于 40 岁左右青年，男女发病率相当，常发生于纵隔（70%），也可见于颈部（10% -14%）、腹部（2%-10%），腋窝、腹盆腔、腹膜后和腹股沟区等。本文介绍的病例是一例体

检发现肝脏占位 3 月余，MRI 显示肝尾状叶可见一类圆形肿块，增强扫描动脉期可见明显均匀强化，实质期肿块信号与肝实质信号相当，周围似可见“假包膜”显影。在未获得病理之前酷似肝腺瘤。行肝尾状叶肿瘤切除术后，病理考虑 castleman 病（透明血管型），因此，应当加强对该病的认识，提高诊断水平，减少误诊。

PU-1115

应用体素内不相干运动评价早期慢性移植肾肾病

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目的 探讨应用体素内不相干运动扩散加权成像（intravoxel incoherent motion diffusion weighted imaging，IVIM-DWI）技术无创性评价早期慢性移植肾肾病（chronic allograft nephropathy，CAN）的可行性及临床应用价值。**方法** 收集符合本研究纳入标准的住院患者 23 例，其中经病理诊断为早期慢性移植肾肾病（CAN 组）的患者 12 例，移植肾肾功能长期稳定的志愿者（对照组）11 例。采用多 b 值 DWI 序列对移植肾进行磁共振扫描，利用 IVIM2b_new 软件获取移植肾的 IVIM-DWI 各定量参数伪彩图及测量肾实质的 IVIM-DWI 各定量参数值，包括真实扩散系数（D）、灌注相关扩散系数（D^*）和灌注分数（f）。采用独立样本 t 检验对 CAN 组和对照组的 IVIM 各定量参数值进行比较，对差异具有统计学意义的指标进行 ROC 分析，并计算曲线下面积。**结果** CAN 组的定量参数 D 值低于对照组，差异具有统计学意义（$P<0.05$），两组间 D*及 f 值的差异无统计学意义（$P>0.05$）。真实扩散系数 D 鉴别早期 CAN 的敏感度和特异度分别为 58.3%、90.9%，曲线下面积为 0.784。 **结论** IVIM-DWI 的定量参数 D 能在一定程度上无创性评价早期 CAN。IVIM-DWI 技术有望成为一种筛查早期 CAN 的新型有效、简单无创手段，以协助早期诊断与动态监测 CAN。

PU-1116

磁共振化学位移伪影的分析和解决方法

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目的 简述化学伪影的特点和解决方法。化学位移伪影：是指由于化学位移现象所导致的图像伪影。我们知道在磁共振中水和脂肪的进动频率是不一样的！脂肪中的质子的进动频率要比水中的质子慢 3.5PPM，约 150HZ/T 左右。在某同一时刻二者方向相同或者相反（如同反相位）称为化学位移现象。 化学位移伪影的特点：

1.脂肪组织的信号向频率编码梯度场强较低一侧移位；

2. 出现在频率编码方向上；

3.理论上场强越高，化学位移伪影越明显。

化学位移伪影的解决**方法**

1.使用脂肪抑制技术。脂肪信号被抑制后，其化学位移影将用时被抑制；

2.增加频率编码的带宽；

3.交换频率编码和相位编码方向。这样做并不能完全消除化学位移伪影，而是将其更改在其他解刨位置。

PU-1117

前列腺区带和毗邻结构 MRI 表现分析

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目的 观察前列腺区带及毗邻结构 MRI 表现，比较各序列价值，提高 MRI 前列腺癌灶发现率和前列腺癌分期准确率。**方法** 对 20 例前列腺 MRI 检查，正常 5 例，前列腺增生 11 例，前列腺癌 4 例。轴位 T2/TSE，压脂和不压脂，FOV200×220mm，层厚/层距 3.5/0mm，矩阵 256/192；轴位 T1/DIXON，FOV370×300mm，层厚/层距 3/0.6mm，矩阵 320×240×160；冠位 T2/FS/TSE，FOV350×298mm,层厚/层距 3.5/0mm，矩阵 256×192；DWI 序列 FOV200×200mm，层厚/层距 3.5/0mm，矩阵 112×103，b 值 50/800/mm^2；DCE 序列及参数同上 T1WI。**结果** 前列腺区带、包膜、精囊、神经血管束不压脂 T2/TSE 基本能辨认，中央腺体低信号， 移行带后上方；移行带高低混杂信号，中央带下方，外周带前方；精囊膀胱后方，前列腺上方，信号稍高或比较高，前列腺外周带前列腺后下方，对称弧形带状，信号较高或明显高，前列腺增生外周带变薄新月形或薄带形，中央叶向上后受压变扁，甚至不显示，前列腺体积增大或不明显，包膜中断与否判断可靠，肿大淋巴结门脂肪消失与否辅助判断是否为转移淋巴结；压脂 T2WI/TSE 序列外周带和精囊信号更高，癌灶显示更突出，骨质破坏显示亦较不压脂明显，盆腔转移淋巴结显示明显，不能显示淋巴结门脂肪，不能显示包膜，影响前列腺分期；T1/DIXON 序列前列腺显示分区不明显，显示前列腺出血、粘液变性区信号，FOV 大、骨转移信号低易观察，反相位勾边线判断包膜完整及与直肠分界；冠状位 T2/FS/TSE 序列 FOV 大可显示较高转移淋巴结，辅助轴位判断区带和癌灶。DWI 序列敏感发现外周带癌灶，移行带区癌灶起辅助作用；DCE 外周带癌灶定性起辅助作用。**结论** 熟悉前列腺 MRI 各区带位置及各序列信号特点是发现前列腺病变和定性诊断的基础。

PU-1118

DWI 感兴趣区的选择在宫颈癌术前分化程度鉴别的应用价值

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目的 评价磁共振弥散加权成像感兴趣区（ROI）的选择在宫颈癌术前分化程度鉴别的应用价值。**方法** 选取医院诊治的 60 例宫颈癌患者作为研究对象,以手术组织病理结果作为金标准。使用 3.0T 磁共振（GE 医疗 750w）行常规序列及 DWI（b=800）序列检查，根据术后病理分析，将宫颈癌分高、中、低分化三组。分析不同 ROI DWI 对宫颈癌分化程度的鉴别，两名不同年资医师在 DWI 图像上采用三种 ROI 法（圆形 ROI、面积 ROI、容积 ROI）独立的进行测量病灶的 ADC 值。不同组间定量资料采用 ANOVA 检验；运用受试者操作特性（ROC）曲线将存在显著差异的参数进行分析，获得相应的最佳临界值、曲线下面积（area under the curve，AUC）和诊断性能。**结果** 三种 ROI 法获得的 ADC 值差异有统计学意义（$P<0.05$），其中容积 ROI 法测得的 ADC 值更高、重复性最好。三种 ROI 法测得的 ADC 值在鉴别宫颈癌高中低分化有统计学意义（$P<0.05$）。绘制 ROC 曲线，高、中分化组容积 ROI：AUC=0.897，最佳临界值为 $1.131\times10^{-3}mm^2/s$；中、低分化组容积 ROI：AUC=0.856，最佳临界值为 $0.978\times10^{-3}mm^2/s$。 **结论** 三种 ROI 法中容积 ROI 法测得宫颈癌的 ADC 值可重复性最好；ADC 值可用于区分高中分化、中低分化，而容积 ROI 法测得的 ADC 值预测价值最好。

PU-1119
磁共振 IVIM 及 DKI 预测直肠癌 TN 分期、 分化、脉管侵犯的初步研究

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目的 探讨磁共振 IVIM 及 DKI 预测直肠癌 TN 分期、分化、脉管侵犯的应用价值。
材料与方法 对在我院就诊 52 例直肠癌患者行 IVIM 及 DKI 扫描，扫描后，患者均在一周内行手术治疗并送病理检查。IVIM 扫描采用 11 个 b 值，DKI 采用 6 个 b 值。图像通过软件处理后获得病灶的 IVIM 及 DKI 参数。分析比较两位医师测量值之间的一致性。使用 t 检验或 Mann-Whiteny U 进行直肠癌 T(1+2)期和 T（3+4）期两组之间、有无转移性淋巴结的直肠癌病变之间以及有无脉管侵犯的直肠癌病变之间差异性分析。并对上述各个有差异的参数之间的诊断效能进行评价，评价指标包括敏感性、特异性和 ROC 曲线及曲线下面积(AUC)。使用单因素方差分析各参数在病理分级之间的差异，分析各参数与病理分级之间的相关性。P<0.05 为统计学差异判定标准。
结果 1.随着 T 分期增加，D 值减低、D*值及 MK 值升高，各参数在各组患者差异均有统计学意义，f 及 MD 值无明显统计学差异，联合时诊断效能最高。2.直肠腺癌病理分化程度越低，D 值及 MD 值越低，D*及 MK 值越高，各组患者总体差异均有统计学意义，f 差异无统计学意义。3.有脉管侵犯的病例 MK 值较无脉管侵犯更大，两者间差异有统计学意义，D、D*、f、MD 值差异无统计学意义。4.MK、MD 及 D 值在是否有淋巴结转移的直肠癌两组之间差异有统计学意义，联合时诊断效能最高。
结论
1.IVIM 及 DKI 参数 D、D*及 MK 可以辅助诊断直肠癌 T 分期情况，联合时诊断效能最高。
2.D、MD 与病理分级呈负相关，D*、MK 与病理分级呈正相关，可以预测直肠癌病理分化程度。
3.DKI 参数 MK 值可以用来预测直肠癌周围脉管是否有侵犯。
4.IVIM 及 DKI 参数 MK、MD 及 D 值可以辅助诊断直肠癌是否发生淋

PU-1120
磁共振肝特异性对比剂临床使用概述

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肝特异性对比剂已应用于临床，国内应用的医院逐渐增多，对于肝脏病变有重要的鉴别诊断价值，但是部分非教学三甲医院及基层医院在临床使用中仍然欠规范，部分医务人员对肝特异性对比剂缺乏足够认识。本文主要从对比剂特点、适应症、检查技术、疾病诊断、注意事项等方面进行阐述，旨在提高对肝特异性对比剂的认识并充分发挥肝特异性对比剂在肝脏疾病诊断中的作用。

PU-1121
3.0T 薄层高分辨磁共振 T2 加权成像及 RESOLVE 弥散加权成像在直肠癌术前 TN 分期评估中的应用

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【摘要】目的　探讨 3.0T 薄层高分辨磁共振 T2 加权成像及 RESOLVE 弥散加权成像在直肠癌术前 TN 分期评估中的应用价值。方法　我院 20 例直肠癌患者，均于术前进行 3.0T 薄层高分辨 T2WI 和 RESOLVE 弥散加权扫描，分析薄层高分辨 T2WI 和 VRESOLVE 序列图像中肿瘤浸润深度（T），并测量肿瘤及周围淋巴结（N）的表观弥散系数（ADC）值。以术后送检病理结果为金标准，分析 MRI 评估 T 分期的准确性，ADC 值与肿瘤 T，N 分期及分化程度的相关性。结果　MRI 从 T1 到 T4 分期的准确性分别为 95.62%，90.21%，92.56%，99.43%，N 分期的准确性分别为 87.64%，82.51%，94.74%。结论　3.0T 薄层高分辨磁共振 T2 加权成像及 RESOLVE 弥散加权成像是术前 T，N 分期的重要方法。

PU-1122
顽固性血精症远端生殖道区域 MRI 影像学分析

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目的:探讨 MRI 在顽固性血精症病因诊断中的应用价值。方法: 回顾性分析 36 例既往诊断的顽固性血精患者和 30 例正常对照患者临床资料，重点分析双侧精囊及射精管区域的 MRI 影像学特征。**结果**　病例组患者 MRI 结果显示，36 例患者均显示精囊腺信号异常，其中精囊结石 2 例，前列腺小囊囊肿 13 例，射精管囊肿 2 例，苗勒氏囊肿 3 例，精囊囊肿 3 例，射精管扩张 11 例，2 例仅表现精囊腺出血信号。与对照组比较，病例组精囊腺宽度明显增大，而精囊长度无明显差异。结论: MRI 检查可有效显示远端生殖道区域的病变，对于顽固性血精症患者的病因诊断和临床治疗具有重要指导价值。

PU-1123
MRI 定量参数预测子宫内膜癌病理等级的临床价值

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目的　探究 MRI 定量参数对子宫内膜癌病理等级的预测价值。**方法**　对 188 例（G1：64 例；G2：68 例；G3：56 例）经手术病理证实为子宫内膜癌（endometrial cancer，EC）患者的 MR 图像（平扫、动态增强扫描及 DWI 成像）进行回顾性分析。根据椭球公式估算肿瘤及子宫的体积，并计算肿瘤/子宫体积比(neoplasm/uterus volume ratio, N/U)，分别对病灶及正常子宫肌层、闭孔内肌、臀大肌进行 ADC 值的测定（b=800s/mm^2），并计算 ADC 均值、ADC 均值的离散系数（coefficient variance，CV）及相应的 rADC 值（$ADC_{病灶}/ADC_{正常子宫肌层/闭孔内肌\ /臀大肌}$）。利用非参数检验评估 EC 三种病理等级的 MR 定量参数的差异；利用受试者工作曲线（ROC）及 Logistic 回归分析法评估不同 MR 定量参数对高级别 EC（G2、G3）的预测效能。**结果**　高级别 EC 的 N/U 明显高于低级别（$P<0.001$）；高级别 EC 的 ADC 均值及三种 rADC 均低于低级别 EC（P 均<0.001）；不同病理等级的 CV 差异无统计学意义（$P>0.05$）； Logistic 回归分析显示 N/U 及 rADC1($ADC_{病灶}/ADC_{正常子宫肌层}$)为 EC 病理等级的独立预测因子($P=0.018$；$P<0.001$)，两者联合应用所对应的曲线下面积为 0.777，灵敏度为 71.0%，特异度为 76.6%（截断点 N/U：0.11；rADC1：0.65）。**结论**　MRI 定量参数对于 EC 病理等级的预测具有一定的价值。

PU-1124
容积 ADC 直方图分析鉴别 Ia 期子宫内膜癌与子宫内膜息肉的价值

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目的 探讨基于肿瘤容积的表观扩散系数（ADC）直方图分析在鉴别 Ia 期子宫内膜癌与子宫内膜息肉中的价值。
方法 回顾性分析经病理证实为 Ia 期子宫内膜癌（20 例）与子宫内膜息肉（20 例）患者的影像资料，所有病人均在 3.0 T MRI 上进行 DWI 检查（b = 50,800 s / mm 2）。取 DWI 原始图像，分别由两位医师在病灶每一层 ADC 图像上勾画 ROI 进行测量，得到整个病灶的直方图参数，包括 ADC 平均值(ADC_{mean})、ADC 第 1 百分位数($ADC_{1\%}$)、ADC 第 10 百分位数($ADC_{10\%}$)、ADC 第 50 百分位数($ADC_{50\%}$)、ADC 第 90 百分位数($ADC_{90\%}$)、ADC 第 99 百分位数($ADC99_{\%}$)、变异度（Variance）、偏度（Skewness）、峰度（Kurtosis）。对获得的两组直方图参数特征分别进行统计学分析，应用受试者工作特征（ROC）曲线评价 ADC 直方图各个参数的鉴别诊断效能。
结果 Ia 期子宫内膜癌组的 ADC_{mean}、$ADC_{1\%}$、$ADC_{10\%}$、$ADC_{50\%}$、$ADC_{90\%}$、$ADC99_{\%}$明显低于子宫内膜息肉组，子宫内膜息肉组的偏度明显低于内膜癌组，差异有统计学意义（P <0.05）；二者的变异度、峰度值差异无统计学意义（P> 0.05）。其中 ADC_{mean} 鉴别 Ia 期子宫内膜癌与子宫内膜息肉的效能最高，ROC 曲线下面积为 0.9，以 $1.06\times10^{-3}mm^2/s$ 为截断值，敏感度、特异度分别为 80%和 95%。
结论 ADC 直方图分析对 Ia 期子宫内膜癌与子宫内膜息肉有鉴别诊断价值，其中 ADC_{mean} 诊断价值最高。

PU-1125
胰腺异位副脾 1 例

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副脾属于先天发育变异，是由于胚胎发育第 5 周时位于背侧胃系膜内胚胎脾芽的某部分融合失败所致，脾门是副脾最好发的部位，但也可发生于脾韧带、胰尾、大网膜、肠系膜、女性附件等部位。胰腺异位副脾(intrapancreatic accessory spleen,IPAS)临床罕见，IPAS 患者一般无临床症状，各项肿瘤指标均无异常，主要影像学表现为发生于胰尾，病灶较小，MRI 各序列图像信号与正常脾脏相似，增强呈花斑样或明显均匀强化。另外可结合 IPAS 与正常脾脏的 ADC 比值即可明确诊断，避免不必要的手术。

PU-1126
不同病原菌肛周脓肿 MRI 诊断的初步研究

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目的 探讨 MRI 常规序列及 DWI 在不同病原菌的肛周脓肿术前诊断中的价值。**方法** 采用回顾性方法分析，选取 79 例肛周脓肿患者，分析其脓液病原菌培养鉴定结果，对其中 24 例术前行 MRI 检查的病例进行图像分析及 ADC 值测定，并统计分析。**结果** 1.79 例肛周脓肿病例中，大肠埃希菌(47 株，55.29%)和肺炎克雷伯菌(23 株，27.06%)为主要致病菌。2.24 例行 MRI 检查的病例中，大部分为低位肌间脓肿（54.84%，17/31）和肛周皮下脓肿（25.81%，8/31）；其中，12 例大肠埃希菌主要引起低位肌间脓肿（53.33%，8/15）及肛周皮下脓肿（40.00%，6/15），7 例肺炎克雷伯菌主要引起低位肌间脓肿（55.56%，5/9）。但是，目前还不能认为本研究中 7 种病原菌所形成的 4 个肛周脓肿位置有区别。3.大肠埃希菌所致脓肿的 ADC 值为 $0.79\pm0.38\times10^{-3}mm^2/s$，肺炎克雷伯菌所致脓肿的 ADC 值为 $0.81\pm0.45\times10^{-3}mm^2/s$，这两种细菌引起脓肿的 ADC 值之间差异无统计学意义。**结论** MRI 有利于不同病原菌肛周脓肿术前定位诊断，目前尚不能认为大肠埃希菌和肺炎克雷伯菌引起脓肿的 ADC 值之间有差别。

PU-1127

胎盘植入 MRI 个案

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目的 探讨 MRI 对胎盘植入的部位、肌层及邻近器官的受累情况的影像诊断。
方法 回顾分析一例经临床综合诊断胎盘植入的 1 例个案 MRI 表现，3.0TMRI 平扫：T2- HASTE、True-FISP、FS-T1WI、DWI。
结果 患者女 24 岁，妊娠 29W+，入院诊断为瘢痕子宫，凶险性前置状态，胎盘 MR 表现：胎盘内 T2 暗带：有，部位：子宫下段右前壁约 11 点钟方向，范围≤2cm；肌层变薄：有，部位：子宫下段前壁；胎盘信号不均质：有，程度：轻微；胎盘突出宫颈内口征：无；子宫鼓胀：无；胎盘血管异常：有，部位：子宫前壁下段 11 点钟、12-1 点钟、上段 12 点钟方向可见跨界血管，其中最粗血管直径约 5.7mm；胎盘凹陷：无；穿透征：无；膀胱壁完整，周围脂肪间隙清楚；宫颈管内见出血信号；诊断：1.宫内单活胎。瘢痕子宫。子宫中下段与前腹壁粘连 2.低置胎盘。胎盘植入性病变（胎盘粘连+植入，mrFIGO 分类：2，PAS 分级：1，轻度）3.宫颈管内少量积血 4.胎儿脐带绕颈 1.5 周。剖宫产术后：瘢痕子宫，胎盘植入。
结论 超声诊断胎盘植入的敏感性为 77-93%，特异性为 71-95%，MRI 诊断胎盘植入的敏感性为 75-100%，特异性为 65-100%，2011 年英国皇家妇产科学院（RCOG）和国家临床研究所（NICE）版的指导方针，建议在超声诊断不确定的情况下利用 MRI，与超声相比,MR 的优点主要有成像范围大,受骨骼、脂肪、肠气的影响小等，其不受胎盘位置的影响,尤其对子宫后壁的胎盘植入显示优于超声。将其列为胎盘植入高风险病人的常规检查手段可以减低产妇的发病率和死亡率。MRI 表现能基本反映胎盘植入的病理特征、部分表现具有特征性，并能较准确的判断胎盘植入的部位、肌层及邻近器官的受累情况，对临床明确诊断、治疗方案的制定、疗效评估及预后随访等有一定的参考价值，熟悉以上 MR 征象,对于胎盘植入的诊断有很大帮助。

PU-1128

Longitudinal Assessment of Rabbit Renal Fibrosis Induced by Unilateral Ureteral Obstruction Using Two-Dimensional Susceptibility Weighted Imaging

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Background: Previous studies indicated that two-dimensional-susceptibility weighted imaging(2D-SWI) could serve as a useful biomarker for differentiating the grade of liver fibrosis. Purpose: To evaluate the feasibility of 2D-SWI in the dynamic quantification of renal fibrosis in a rabbit model. Study type: Longitudinal study. Animal model: Twenty-Four New Zealand White Rabbits including control group (n = 4); and renal fibrosis group (n = 20), via a unilateral ureteral obstruction (UUO) model Field strength/Sequence: 3.0 T SWI using a 2Dgradient-echo sequence. Assessment: The relative SWI signal ratio(r) of cortical and medulla (r=SIrenal/SImuscle) was longitudinally assessed before ligation and on weeks 2, 4, 6, and 8 following ligation. Sirius Red staining was used to assess the degree of fibrosis in five high-power fields. Statistical tests: The repeated measures of analysis of variance and linear regression analysis. Results: Both the cortical and medullary r values were significantly higher in the UUO kidneys at week 2 compared with the kidneys before ligation. Over the course of UUO progression, significant changes occurred in the cortical and medullary r values in vivo and fibrosis scores in vitro (all P values <0.05). The r values gradually decreased, while the fibrosis scores gradually increased over 8 weeks following ligation. The linear regression analysis showed a strong and significant correlation between cortical and medullary r values and the pathologic fibrosis scores (R2=0.91, 0.81, respectively). Conclusion: The SWI sequence could provide a quantitative evaluation of renal fibrosis during UUO progression.

PU-1129

盆腔丛状神经鞘瘤影像学误诊一例

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丛状神经鞘瘤（Plexiform Schwannoma）是一种较少见的良性周围神经鞘膜肿瘤，978 年由 Harkin 等首先报道［1］。该肿瘤比较少见，约占神经鞘瘤的 5%,平均发病年龄为 34 岁。丛状神经鞘瘤较常发生于躯干、头部、颈部和上肢，少数发生于腹膜后、直肠等，发生于盆腔者罕见报道。国内外文献报道较少，本文报道 1 例。该病影像学检查与腹膜后来源肿瘤、女性患者卵巢来源的肿瘤鉴别困难，本文结合文献分析其影像学表现，以提高对该病的认识。

PU-1130

Pre-treatment ADC image-based random forest classifier for identifying resistant rectal adenocarcinoma to neoadjuvant chemoradiotherapy

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Objective
To develop a predicting model for tumor resistance to neoadjuvant chemoradiotherapy (NCRT) in locally advanced rectal cancer (LARC) by using pre-treatment apparent diffusion coefficient (ADC) images-derived radiomics features.
Method
A set of 89 patients with LARC were randomly assigned into training (N = 66) and testing cohorts (N = 23) at the ratio of 3:1. Radiomics features were derived from manually determined tumor region of pre-treatment ADC images. Random forest algorithm was used to determine the most relevant features and then to construct a predicting model for identifying resistant tumor. Stability and diagnostic performance of the random forest model was evaluated with the testing cohort.
Results
The top ten most relevant features ($entropy_{mean}$, inverse variance, $energy_{mean}$, small area emphasis, ADC_{min}, ADC_{mean}, sdGa02, small Gradient emphasis, age and size) were determined from clinical characteristics and 133 radiomics features. In the prediction of resistant tumor of the testing cohort, the random forest model constructed based on these most relevant features achieved an area under the receiver operating characteristic curve of 0.83 ± 0.20, with the highest accuracy of 91.3%, a sensitivity of 88.9% and a specificity of 92.8%.
Conclusion
The random forest classifier based on radiomics features derived from pre-treatment ADC images have the potential to predict tumor resistance to NCRT in patients with LARC, and the use of predicting model may facilitate individualized management of rectal cancer.

PU-1131
全身弥散加权成像在初诊直肠癌患者诊断和监测中的价值

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目的 探讨全身弥散加权成像（WB-DWI）在直肠癌患者诊断和监测中的价值。
方法 回顾性分析 2013 年 9 月至 2019 年 5 月在我院就诊的 46 名初诊为直肠癌患者的临床资料。分析在治疗前进行 WB-DWI 的所有患者的结果。并讨论了 WB-DWI 在诊断和监测直肠癌患者中的作用。
结果 46 例患者中，WB-DWI 发现 44 例异常占位灶，阳性率为 96.0％。直肠癌相关的转移病变主要发生在肝脏、肺、骨、颅内、腹膜及临近区域淋巴结。通过计算机断层扫描（CT）检查未发现颅内转移及腹膜转移的 8 名患者通过 WB-DWI 检测到。同时其在直肠癌患者 TNM 分期中的价值与 PET-CT 相当。10 名患者接受了一次以上的 WB-DWI 随访。放化疗前后 10 例患者最大病灶的平均表观弥散系数（ADC）值分别为 $1.01\times10^{-3}mm^2/s$ 和 $1.26\times10^{-3}mm^2/s$。
结论 WB-DWI 对初诊为直肠癌患者的诊断和监测具有重要价值。它的灵敏度高于 CT，价值与 PET-CT 相当。放化疗后 WB-DWI 的结果与治疗效果有很好的相关性，可作为随访的首选检查。

PU-1132
枸橼酸铁铵糖浆用作 MRI 胃肠道对比剂的应用研究

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[摘要] 目的 探讨枸橼酸铁铵糖浆用作 MRI 胃肠道对比剂的应用价值。 方法 先用市售有国药准字的枸橼酸铁铵 B1 糖浆 II 加纯净温水配制成不同浓度的口服对比剂，采用超导 Philips Achieva 1.5T MRI 成像仪检查做体外试验，确定合适的对比剂浓度供人服用；然后选取自愿者，做服药前后的上腹部 MR 检查或 MR 胆胰管水成像（MRCp）。结果 口服枸橼酸铁铵糖浆后，发现自愿者胃肠腔在超导 Philips Achieva 1.5T MRI 成像仪 T1WI 像上呈现为高信号，在 T2WI 像上呈现为低信号，其有助于解决胃肠道与周围组织信号对比不足，有时难以将腹腔内病灶与胃肠道明确区分开而导致诊断困难，最大限度地避免误诊和漏诊的发生，并对口服 MRI 胃肠道对比剂安全性进行评估。结论 通过该研究，发现我们所选用的口服枸橼酸铁铵糖浆胃肠道对比剂安全性最高（如有国药准字号，副作用最小等），经济实惠，口感好多数患者易于接受。其次确定每次检查需服用的胃肠道对比剂的计量比例（对比剂＋水），达到胃肠道与腹部实质性脏器、后腹膜结构等形成鲜明对比的最小计量比例值。

PU-1133
单次屏气快速采集 3D SPACE 序列在 MRCP 成像中的应用

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目的 探讨单次屏气快速三维可变翻转角快速自旋回波序列（3D-SPACE）在磁共振胰胆管成像（MRCP）中的应用价值，对比分析呼吸触发 3D-SPACE 序列采集图像质量的差异。
方法 使用西门子 MAGNETOM Aera 1.5T 超导型磁共振扫描仪对 55 例行 MRCP 检查的患者（男性 31 名，女性 24 名，年龄范围 14-89 岁）均行呼吸触发和单次屏气 3D-SPACE-MRCP 序列扫描；对两种序列的采集时间和图像质量进行统计学分析，比较两种序列的优缺点。
结果 单次屏气 3D-SPACE 序列采集时间为 16s，常规呼吸触发 3D-SPACE 序列采集时间（232.27±46.50）s，两种序列间差异有统计学意义（t=-18.014，P=0.000）；单次屏气 3D-SPACE 序列原始图像受肠道蠕动干扰小，最大密度投影（MIP）重建图像质量差异有统计学差异（胆总管显示评分差异：P=0.000）。
结论 相比呼吸触发 3D-SPACE 序列，单次屏气 3D-SPACE 序列采集时间减少约 90%，图像质量更好，扫描成功率较高，具有一定的临床应用价值。

PU-1134
直肠癌 MRI 术前研究

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[摘 要]目的: 术前准确预测直肠癌手术切缘的状态，对于全直肠系膜切除 (TME)的开展及治疗方案的制定具有重要的价值。 探讨 MRI 对直肠癌环周切缘的价值。 **材料与方法:** 36 例术前行薄层 MRI 检查的直肠癌患者，采用超导型磁共振成像仪，体部线圈，自旋回波(SE) T1WI、T2WI。

层厚 4mm，层间距 0.1mm，先行矢状位 T1WI，然后根据矢状位肿瘤与肠壁的关系，行倾斜轴位 T1WI 及 T2WI，使扫描线垂直于肿瘤所在的肠段中轴线。整个检查时间约为 15-20 分钟,。其中 20 例肠腔内充气检查,16 例肠腔内充水检查,6 例行增强扫描。观测癌肿与直肠筋膜的关系，并与组织病理学结果相对照。**结果** 36 例组织病理学证实阳性环周切缘 13 例，术前 MRI 确诊 11 例，敏感性为 84.6 %，特异性为 87.0%，准确性为 86.1%，阳性预测值 78.6%，阴性预测值 90.9%。**结论** 直肠癌局部浸润扩散关系到术前分期和患者的预后，MR 对直肠肿瘤 CRM 的准确评价，为临床术前的总体规划及全面、合理的治疗提供了影像学依据，具有一定的价值和临床意义。

PU-1135

HIFU 刀治疗子宫肌瘤 24 例疗效评价

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【摘要】目的 探讨 HIFU 刀治疗子宫肌瘤的疗效评价，促进 HIFU 刀治疗子宫肌瘤临床推广、运用。方法 回顾性对比分析我院收治 24 例子宫肌瘤 HIFU 刀治疗前后 MRI 影像学资料，评价 HIFU 刀治疗子宫肌瘤短期临床运用价值。**结果** MRI 影像能清晰、直观显示子宫肌瘤治疗后明显液化、坏死范围及血供，对 HIFU 刀治疗子宫肌瘤短期疗效评价有较高的临床运用价值。**结论** MRI 增强扫描对 HIFU 刀治疗子宫肌瘤短期疗效评价有较高的临床运用价值。

PU-1136

腹部巨淋巴结增生症与脾脏 MR 成像对照研究

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【摘要】目的: 分析腹部巨淋巴结增生症（Castleman’s Disease，CD）的常规 MRI 和弥散成像特点，并与脾脏对照。**方法** 回顾性分析经手术病理证实的 14 例 CD 患者的 MR 影像资料，MR 图像分析包括病灶位置、大小、形状、边缘、平扫信号强度、增强特点、同步分析脾脏成像的相应特征。在 ADC 图上测量 CD 和脾脏的 ADC 值，采用配对样本 t 检验分析 CD 与脾脏的 ADC 值有无差异。**结果** 14 例 CD 患者中 9 例为透明血管型，病灶平均最大径为（5.1±2.4）cm，5 例为浆细胞型，病灶平均最大径为（4.5±1.9）cm，所有 14 例病灶均为圆形或类圆形，4 例透明血管型（4/9）及 1 例浆细胞型（1/5）外观似肾形，并见类似脐凹样的结构，透明血管型及浆细胞型各有 3 例病灶周围见条絮状模糊影；所有病例平扫均呈 T1WI 等或稍低信号，T2WI 呈高或稍高信号为主，DWI 高信号，2 例透明血管型（2/9）及 1 例浆细胞型（1/5）病灶内见钙化灶，其余 9 例病灶平扫信号均匀并与脾脏相近；14 例 CD 增强动脉期均明显强化，透明细胞型 CD 强化程度接近脾脏明显强化部分，而浆细胞型 CD 强化程度稍弱于透明细胞型 CD 以及脾脏明显强化部分，门脉及延迟期所有病例均持续强化，与脾脏接近。11 例无肝硬化背景的 CD 患者病灶与脾脏 ADC 平均值分别是（1.12±0.18）×10-3mm2/s 及（1.13±0.15）×10-3mm2/s，二者间的差异无统计学意义（p=0.836）。**结论** 腹部巨淋巴结增生症的 MR 表现具有一定特征性，病灶信号特点及强化方式类似脾脏，特别是病灶的弥散加权成像的信号特点及 ADC 值同脾脏一致，有助于诊断和鉴别。

PU-1137

Preoperative risk-stratification for stage I endometrioid adenocarcinoma: A simple method of measurement on DWI

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Objectives To explore the utility of the tumor area ratio (TAR) for predicting deep myometrial invasion (DMI) and tumor grade in stage I endometrioid adenocarcinoma (EEA).
Methods We retrospectively evaluated 86 patients with FIGO stage I EEA. All patients underwent cMRI and DWI procedures. The volume and maximum area of the tumor and uterus were obtained, and the tumor volume ratio (TVR) and TAR were calculated. The Kruskal–Wallis test and Mann–Whitney *U* test were used to compare the differences in indexes (TVR and TAR) between the different tumor grades and between superficial myometrial invasion (SMI) and DMI.
Results TVR and TAR values for DMI and high-grade (HG) EEA were significantly higher than the values for SMI and low-grade (LG) tumors. According to the ROC curve, AUC was significantly higher for TAR than for TVR for tumors with DMI. However, no significant differences in the AUCs for TVR and TAR were observed between HG and LG tumors. A TAR ≥34.6% predicted DMI with a sensitivity (SEN) and specificity (SPE) of 85.0% and 84.8%. A TAR ≥38.9% predicted HG tumors with a SEN and SPE of 83.3% and 81.1%.
Conclusion TAR is useful for predicting DMI and high-grade stage I EEA.

PU-1138

直肠癌侧方淋巴结的 MRI 分析

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目的
评估直肠癌患者侧方淋巴结(lateral pelvic lymph node, LLN)的大小、形态预测淋巴结病理转移的意义。
方法
回顾性分析在我院诊治的 60 例术前 CRT 后行根治性手术的直肠癌患者，术前一周均接受过盆腔 MRI 检查。25 例仅行全直肠系膜切除术(TME)，另 35 例临床 LLN 转移者行 TME 联合 LLN 清扫。
结果
42 位直肠癌患者清扫出 303 颗 LLN，其中有 8 人(19%)、21 枚(6.9%)淋巴结报告病理转移。CRT 前后淋巴结短轴直径 cut-off 值分别为 7.0mm 和 6.2mm，LLN 小于 7.0mm 的患者术后 5 年无复发生存率明显高于 LLN 大于 7.0mm 的患者。淋巴结形态偏圆形的转移率高于椭圆形的。
结论

CRT 前 LLN 的短径当以 7 mm 为阈值判断淋巴结是否转移，淋巴结形态偏圆形的转移率高于椭圆形的。

PU-1139

Prediction of Prostate Cancer Aggressiveness with a Combination of Radiomics and Machine Learning-Based Analysis of Dynamic Contrast-Enhanced MRI

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Objectives To investigate whether the combination of radiomics and automatic machine learning-based classification of original images from multiphase DCE-MRI can predict prostate cancer (PCa) invasiveness before biopsy.
Methods Forty consecutive biopsy-confirmed PCa patients were included from our hospital. Biopsy was performed within 4 weeks after the DCE-MRI examinations. According to the time signal intensity curve, lesion segmentation was performed on the first and on the strongest phase of the enhancement on the original DCE-MR images, and 1029 quantitative radiomics features were automatically calculated from each lesion, wherein there were three datasets available (Dataset-F, Dataset-S and Dataset-FS). The variance threshold method, select k-best method and least absolute shrinkage and selection operator (LASSO) algorithm were used to reduce the feature dimensions. Five machine learning approaches leveraging cross-validation were employed, and the clinical value of each model was evaluated by AUC. Correlation analysis was performed between the features of the machine learning model that achieved the best classification performance and the Gleason score (GS) of the PCa lesion.
Results 8, 4 and 16 features were selected as optimal subsets in Dataset-F, -S and -FS, respectively. Among all three datasets, logistic regression (LR)-based analysis with Dataset-FS had the highest predication efficacy (AUC=0.93). 10 features in Dataset-FS showed significantly positively correlation with GS. The model performance of Dataset-F was generally better than that in Dataset-S.
Conclusions Combination of radiomics and machine learning-analysis based analysis of the union of the first and strongest phases of original DCE-MR images can predict PCa aggressiveness noninvasively, accurately and automatically.

PU-1140

3D 打印技术改良动物线圈优化 KM 小鼠磁共振成像研究

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目的 探讨基于 3D 表面扫描技术改良 5cm 动物线圈，优化 KM 小鼠成像的实验研究。**方法** 采用 3D 表面扫描仪对 5cm 动物线圈扫描，并个性化设计完成线圈专用小鼠扫描支架，用于在 3T 上对 KM

小鼠进行多时间点优化成像研究。6 只荷瘤 KM 小鼠腹腔麻醉后，在 3.0T 磁共振仪上，采用 5cm 动物线圈进行扫描，对比采用支架前后 MR 图像，并记录预扫描次数，整个扫描过程和开始及结束时间。图像质量评估采用客观指标及主观指标，客观指标使用 SNR 和 CNR；主观指标由两名读片医师对前后图像出现的自主运动伪影、呼吸伪影进行 3 等级评分。**结果** 使用 3D 打印技术成功制备 2 个磁共振线圈平台支架（简称 3D 支架）。两位读片医师间对自主运动及呼吸运动伪影的判断进行一致性分析，其 κ 值均在 0.7 以上提示一致性良好。未采用 3D 打印支架时，总共预扫描需进行 21 次，成功率为 28.57%（6/21），平均每只 KM 小鼠完成扫描时间为 17.6 分钟；采用 3D 支架后，总共预扫描 6 次（每个小鼠预扫描 1 次成功），成功率 100%（6/6），平均每只 KM 小鼠完成扫描时间为 10.8 分钟，时间缩短了 38.64%。使用 3D 支架前后 SNR 分别为：2.16±0.18，2.41±0.14 ，CNR 分别为 1.48±0.11 ，1.86±0.14，进行配对 Wilcoxon’s 秩和检验，p 值均 <0.05。与未使用 3D 打印支架相比，使用 3D 打印支架后降低了对检查部位的自主运动及呼吸运动伪影，两位读片医师分别对使用 3D 打印前、后的自主运动伪影、呼吸运动伪影评分，进行配对 Wilcoxon’s 秩和检验，p 值<0.05。**结论** 利用 3D 打印技术制作的磁共振动物线圈支架，增加了扫描定位成功率和图像的信号强度，缩短了成像时间**并减少**伪影，在磁共振动物模型扫描实验中具有重要的应用价值。

PU-1141

复杂性肛瘘 MRI 影像与外科手术结果对照分析

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目的 了解复杂性肛瘘的 MRI 影像。
方法 回顾性分析外科手术证实的复杂性肛瘘的 MRI 影像。
结果 回顾性分析外科手术证实的 46 例复杂性肛瘘病例的 MRI 影像，其中 1 内口 2 出口的 18 例，2 内口 1 出口的 9 例，多内口 1 出口的 8 例，1 内口多出口的 5 例，多内口多出口的 6 例，肛瘘瘘管 T1 加权像显示低信号，T2 加权像显示高信号，弥散显示高信号，增强扫描管壁强化。
结论 MRI 可清楚显示复杂性肛瘘瘘管走向，对外科手术具有重要意义。

PU-1142

不同 b 值组合对正常志愿者胰腺 IVIM 定量参数的影响

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目的 研究不同 b 值组合下胰腺不同解剖部位的 IVIM 定量参数值的差异。
方法 前瞻性招募 32 名正常志愿者进行 IVIM-DWI 检查，采用自由呼吸的单次激发平面回波序列采集 IVIM 图像，测量 3 组不同 b 值组合(b_{10}，b_{20}和b_{50}组)的胰腺 IVIM 定量参数值(D_{slow}，D_{fast}和 f 值)，先利用 Bland-Altman 方法分析 IVIM 定量参数组内及组间重复测量的一致性，然后对 3 组间的胰腺不同解剖部位的 IVIM 定量参数进行 Kruskal-Wallis 检验，对于有统计学意义(P< 0.05)的参数采用 Bonferroni 校正法进行两两比较。
结果 胰腺 IVIM 定量参数重复测量差值的 95%LOA 与两次重复测量均值的中位数的比值分别为：组内 D_{slow} (5.42-10.12)%，D_{fast} (17.60-22.68)%，f (10.23-12.64)%，组间 D_{slow} (7.32-8.80)%，D_{fast} (13.01-24.51)%，f (9.05-11.69)%，胰腺的 IVIM 定量参数 D_{slow}和 f 值有较好的重复测量的一致性，其中胰腺头部和尾部的一致性较胰体部好。3 组间的比较，f 值在胰头、体部的 b_{20}和 b_{50}组间比较无统计学差异(P= 0.025, 0.044 > 0.017)，其余组间的两两比较均有统计学差异(P< 0.01)，b_{10}组有最低的 f 值；D_{fast}值的组间两两比较均有统计学差异(P< 0.01)，b_{10}组有最高

的 D_{fast} 值；D_{slow} 值在 b_{10} 组和 b_{50} 组间比较有统计学差异($P<0.01$)，b_{10} 组有较高的 D_{slow} 值，在其余两组间的比较无统计学差异($P>0.017$)。胰腺不同解剖部位的 D_{slow}，D_{fast} 和 f 值比较无统计学差异($P>0.05$)。

结论 不同的 b 值组合会影响 IVIM 定量参数值，胰腺 IVIM 定量参数值与胰腺的解剖部位无关。

PU-1143

MRI 诊断子宫内膜间质肉瘤 1 例及文献复习

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目的 通过探讨 1 例子宫内膜间质肉瘤的 MRI 表现，并复习文献，以提高对子宫内膜间质肉瘤的认识和诊断水平。**方法** 回顾分析经手术证实的 1 例子宫内膜间质肉瘤的 MRI 表现，复习近期国内外关于子宫内膜间质肉瘤相关文献。**结果** MRI 可见子宫内膜弥漫不均匀性增厚，增强后明显强化，MRI 诊断为恶性肿瘤性病变并侵犯宫颈及子宫肌层，术后病理证实为子宫内膜间质肉瘤。**结论** 子宫内膜间质肉瘤的诊断关键在于提高对本病征象的认识，而 MRI 在显示病变内部信号特点方面优于其他影像学方法，对本病的诊断有重要的价值。

PU-1144

宫颈癌体素不相干运动的直方图和纹理特征的可重复性研究

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目的 探讨宫颈癌 IVIM 的直方图和纹理特征的可重复性；

方法 回顾性收集 20 例我院经病理证实为宫颈癌患者的 MRI 体素内不相干运动图像，将这些图像 GE AW4.6 后处理工作站 MADC 软件中，分别生成标准扩散系数图（ADC-stand）、快速扩散系数图（ADC-fast）、慢速扩散系数图（ADC-slow）、扩散分数图（f）；将这些生成的图像及 b=1000 的 DWI 图导入然后由 3D slicer 软件，两名不同年资影像医生利用 3D slicer 软件在 b=1000 的 DWI 图分别间隔一个月两次勾画病灶最大层面的 ROI，并将该 ROI 移植到各 IVIM 衍生的参数图上，再利用该软件计算肿瘤最大层面的直方图和纹理特征，并使用 T 检验及组内相关系数（ICC）评价观察者内部、观察者之间测量的可重复性。

结果 一些直方图及纹理特征是可以从宫颈癌 IVIM 衍生图上重复测量的。另一方面，组内比较中，ADC-stand 图 A1A2 可重复数据 1 个，B1B2 可重复特征 5 个；f 图 A1A2 可重复数据 8 个，B1B2 可重复特征 6 个；ADC-fast 图 A1A2 可重复数据 10 个，B1B2 可重复特征 11 个；ADC-slow 图 A1A2 可重复数据 5 个，B1B2 可重复特征 8 个。组间比较中，ADC-stand 图 A1B1 可重复数据 3 个，A2B2 可重复数据 4 个；f 图 A1B1 可重复数据 10 个；ADC-slow 图 A1B1 可重复数据 7 个，A2B2 可重复数据 7 个。

结论 宫颈癌 IVIM 衍生图 ADC-fast、ADC-slow、f 图中提取的直方图和纹理特征可重复性优于 ADC-stand 图；随着观察者内部认知水平的提升和完善，组学特征提取的可重复性会小幅度上升。

PU-1145

MRI 弥散加权成像在腹部和盆腔肿瘤影像诊断中的应用价值探讨

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目的 综合分析 MRI(磁共振)弥散加权成像在腹部盆腔肿瘤影像诊断中的应用价值。
方法 选取本院 2018-6-2019-6 收治的 80 例腹部和盆腔肿瘤患者作为研究对象,所有患者均接受 MRI(磁共振)弥散加权成像诊断方法。采用统计学分析 80 例腹部和盆腔肿瘤患者的磁共振病灶部位评价结果(阴性、阳性)以及诊断价值(敏感度、特异性)。结果 80 例腹部和盆腔肿瘤患者中一共检测出 300 个部位,101 个瘤灶部位(占 33.67%),2 个假阳性(占 6.67%);197 个未检出瘤灶部位(占 65.67%),3 个假阴性(占 10.00%),194 个真阴性(占 64.67%),数据比较差异有统计学意义(P<0.05);80 例腹部和盆腔肿瘤患者的病灶边界较为清晰(以类圆形或者小规则分叶状肿块影为主要表现形式,其中 T1W1 主要为低信号,T2W1 呈现不均匀的高信号,肿块呈现较高信号);灵敏度为 97.06%(99/102)、特异度为 98.98%(194/196),数据比较差异无统计学意义(P>0.05)。
结论 ：MRI(磁共振)弥散加权成像在腹部和盆腔肿瘤影像诊断中的应用价值比较高。

PU-1146
剖宫产术后娠瘢痕妊娠不同类型的 MRI 表现及临床术前价值

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摘要 **目的** 探讨剖宫产术后瘢痕妊娠(CSP) MRI 表现并比较不同类型的 CSP 的影像特征、治疗手段及临床结局。**方法** 经临床确诊 CSP 60 例，回顾性分析 MRI 影像及临床资料，比较 CSP 三种类型的影像特征、治疗手段及临床结局。**结果** 60 例病变病理结果显示均含有绒毛和（或） 蜕膜组织，CSP 的病变均位于子宫前壁下段及峡部前壁，妊娠物种植在瘢痕处，MRI 对患者的病灶及周围组织结构显示清晰。MRI 表现为 41 例囊性病灶和 19 例混杂信号病灶（肿块型）。I 型 21 例，II 型 31 例,III 型 8 例，其中合并动静脉瘘有 4 例，合并绒毛植入 1 例。21 例行宫腔镜下妊娠物清除术，其中 34 例术前行子宫动脉介入栓塞术，3 例腹腔镜下盆腔粘连松解术，2 例行经腹疤痕妊娠物切除术加子宫修补术。**结论** MRI 可以清晰显示瘢痕妊娠囊、滋养细胞植入肌层情况、CSP 的不同类型、瘢痕及周围组织结构关系等，根据其分型可更好地选择 CSP 的手术方式，对临床治疗方案具有一定的指导作用。

PU-1147
剖宫产后切口妊娠的 MRI 表现及其临床价值

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目的 探讨剖宫产后切口妊娠的 MRI 表现，评价其在切口妊娠治疗中的应用价值。
方法 回顾分析经手术或病理证实的剖宫产后切口妊娠 21 例的 MRI 表现，归纳孕囊与切口憩室关系并对其进行分型，总结孕囊与切口憩室关系分型在临床的应用价值。
结果 根据孕囊与切口憩室关系可分为三种类型：1、充满型：切口憩室可见，孕囊呈”C”形嵌入其中、憩室腔消失；2、残余型：切口憩室可见，孕囊呈“鸟嘴”形部分充填其中、憩室腔部分可见；3、掩埋型：切口憩室消失，相应区域为孕囊占据。21 例中，充满型 11 例（占 11/21，52.38%），孕囊附着处子宫肌壁侵润平均深度约 0.3 士 0.23cm，行经宫腔镜下瘢痕妊娠清除术，

术中平均出血量 27 士 19ml；残余型 4 例（4/21，19.05%），孕囊附着处子宫肌壁侵润平均深度约 0.46 士 0.18cm，行可视监测下经宫腔镜子宫瘢痕妊娠清除术，术中平均出血量 225 士 175.59ml；掩埋型 6 例（6/21，28.57%），孕囊所在处子宫肌壁被掩埋，其中 5 例采用经腹腔镜行子宫剖宫产瘢痕部位妊娠病灶切除术、1 例行经腹子宫次全切除术，术中平均出血量 633.33 士 680.2ml。
结论 孕囊与切口憩室的关系在孕囊所在处子宫肌壁侵润深度、病灶清除术中出血量差异有统计学意义；术前 MRI 检查可为临床个体化治疗提供依据。

PU-1148

磁共振成像在胎儿疾病诊断中的应用

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目的 通过回顾性分析我院近两年接受 MRI 检查患儿的影像及临床资料，探讨胎儿 MRI 表现与临床病理之间的联系。
方法 收集 2016 年至 2018 年期间，于我院接受胎儿 MRI 检查的 42 例孕妇的影像及临床资料。所有的孕妇均行 1.5T 飞利浦仪器扫描检查， 并且所有病例均由怀疑患有胎儿病变的妇科医生转诊。分析先天性异常胎儿的各项生理情况，使用单因素方差分析和 Student t 检验，得到 95%置信区间。
结果 在接受 MRI 检查的 42 例胎儿中，2 例胎儿（4.8%）健康，20 例胎儿（47.6%）患有中枢神经系统病变，2 例胎儿胸腔病变（4.8%） ，12 例胎儿腹腔病变（28.6%），1 例胎儿四肢病变（2.3%），1 例胎儿脊髓病变（2.3%），2 例胎儿其它相关异常（4.8%）。 两名孕妇（4.8%）发现子宫和胎盘的病变。
结论 在由于胎儿的大小和位置特殊，超声检查不充分的情况下，产前 MRI 提供了非常有用的信息。 MRI 是决定是否继续或停止胎儿进一步发育的关键工具。

PU-1149

MRI 对卵巢颗粒细胞瘤的诊断价值

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目的 描述卵巢颗粒细胞瘤（OGCT）的磁共振（MRI）特征，并与卵巢其他性索 - 间质肿瘤（OSCs）鉴别。
方法 回顾性分析 18 例经手术证实的卵巢颗粒细胞瘤患者的 MR 表现。 所有 MR 检查均在一个月内进行。 评估 OGCT 的临床和影像学特征，并与 OSC（对照组）进行比较。
结果 在 18 名患者中，MRI 检测到 20 个卵巢颗粒细胞瘤。 16 个肿瘤表现为实性或大部分为实性（16/20），4 个肿瘤为囊性肿块。 在 1 个 OGCT（1/18）和 11 个 OSC（11/34）中检测到病理性盆腔积液（p = 0.031）。在 T2 加权成像（T2WI）中，大多数 OGCT 显示高信号和混合信号（19/20）; 在 T1 加权成像（T1WI）上，11 个 OGCT（11/20）显示与 T2WI 成像相似的信号。 OGCT 和 OSC 之间的病变信号在 T1WI（p = 0.017）和 T2WI（p = 0.002）上均显著不同。 MRI 在 6 个 OGCT 中检测到肿瘤出血。 在扩散加权成像（DWI）图像上，OGCT 主要表现为高信号（16/20）。

从 OGCT 组 DWI 图像得到的平均表观扩散系数（ADC）值（0.84±0.26×10 -3 mm2 / s）小于对照组（1.22±0.47×10 -3 mm2 / s），差异有统计学意义（p= 0.002）。
结论 MRI 可以在 OGCT 诊断中提供重要信息。 ADC 值可能有助于区分 OGCT 和 OSC。

PU-1150

MRI 对早期宫颈癌深间质浸润的术前评估价值

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目的 探讨 MR 成像技术对早期宫颈癌深间质浸润情况的术前评估价值。
方法 回顾性分析 206 例经手术证实的早期宫颈癌患者（IB-IIA 期）的临床、病理及影像资料。在横轴位 T2WI、增强 T1WI、DWI 序列和 ADC 图上分别测量肿瘤最大径。在 T2W 序列上评估宫颈癌的深间质浸润（间质浸润深度超过 1/3）状态并与病理结果对比，采用卡方检验评价 MR 判断深间质浸润的准确度。将患者按肿瘤最大径（增强 T1WI 序列）2cm 及 4cm 为界进行分组，采用行×列卡方检验比较各组间深间质浸润状态的差异。再将患者按肿瘤最大径 2cm 及 4cm 进行分层，采用独立样本 t 检验比较各层深间质浸润状态不同组间肿瘤最大径的差异。
结果 共 132 例患者存在深间质浸润，MR 判断深间质浸润的准确度为 80.1%，敏感度为 98.5%，特异度为 47.3%，阳性预测值为 77.0%，阴性预测值为 94.6%；MR 判断深间质浸润与病理结果差异无统计学意义（p>0.05）。肿瘤最大径≤2cm 组中 5 例存在深间质浸润（共 21 例，23.9%）；2-4cm 组中 133 例存在深间质浸润（共 155 例，66.5%）；肿瘤最大径≥4cm 中 24 例存在深间质浸润（共 30 例，80%）。肿瘤最大径≤2cm 组与最大径 2-4cm 组及≥4cm 组深间质浸润状态差异显著（p<0.001），而最大径 2-4cm 组与≥4cm 组间差异不明显（p>0.05）。不同深间质浸润状态组间各序列肿瘤最大径差异不明显（p>0.05）。≤2cm 者，深间质浸润状态不同组间各序列肿瘤最大径差异不明显；2-4cm 者，组间 T2WI 序列及 DWI 序列肿瘤最大径存在差异（p<0.05）；≥4cm 者增强 T1WI 序列肿瘤最大径存在差异（p<0.05）。
结论 MRI 可直接对早期宫颈癌深间质浸润情况进行较准确的评估，肿瘤最大径≤2cm 者发生深间质浸润的概率显著低于＞2cm 者。

PU-1151

MR 对早期宫颈癌淋巴血管间隙受侵的术前评估价值

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目的 探讨 MR 成像对早期宫颈癌淋巴血管间隙受侵（LVSI）的术前评估价值。
方法 回顾性分析 206 例经手术证实的早期宫颈癌患者（IB-IIA 期）的临床、病理及影像资料。在横轴位 T2WI、增强 T1WI、DWI 序列和 ADC 图上测量肿瘤最大径，在经肿瘤最大层面的 ADC 图上测量最大 ADC 值（ADCmax）、最小 ADC 值(ADCmin)、平均 ADC 值（ADCmean）和最小 ADC 率(ADCmin/ ADCmean)。以手术病理结果为金标准，比较临床及 MR 各参数对 LVSI 的预测价值。首先采用卡方检验评价手术方式对病理 LVSI 状态的影响；按肿瘤最大径（增强 T1WI 序列）2cm 及 4cm 为界分组，采用行×列卡方检验比较各组间 LVSI 状态的差异；采用独立样本 t 检验或秩和检验比较不同 LVSI 状态组间临床（年龄及绝经状态）及 MR（各序列上肿瘤最大径及 ADC 值）各参数间的差异。
结果 共 83 例患者存在 LVSI，手术方式对 LVSI 状态无显著影响（p>0.05）。不同肿瘤大小组间 LVSI 状态差异不明显（p>0.05），肿瘤最大径≤2cm 组中 7 例存在 LVSI（共 21 例，33.3%）；最

大径 2-4cm 组中 68 例存在 LVSI（共 155 例，43.9%）；最大径≥4cm 中 8 例存在 LVSI（共 30 例，26.7%）。在各 MR 序列上，LVSI 阳性组病灶最大径测量值显著高于 LVSI 阴性组（$p<0.001$）。病灶 ADC 值及各临床参数与 LVSI 状态无显著相关性（$p<0.05$）。
结论 MR 上的宫颈癌的病灶越大，存在 LVSI 的机率越大。

PU-1152
小肠 MR 灌注成像对克罗恩病临床疗效评价的初步研究

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目的 应用小肠 MR 灌注成像技术对克罗恩病（Crohn’s disease, CD）临床疗效进行研究，探讨定量参数对比剂容积转运速率（K^{trans}）及单位体积组织血管外细胞外间隙容积（V_e）与病变局部微血管灌注量及渗透性改变的关系，评价其对 CD 临床疗效评价的应用价值。**方法** 收集 35 例确诊 CD 患者，于临床治疗前及临床治疗 1 期后各行 MRE 检查及 DCE-MRI 扫描，分别计算两次扫描 CD 病灶区 K^{trans} 及 V_e 值，并比较两次扫描定量参数的差异。根据简化内镜评分（Simplified Endoscopic Score for Crohn’s Disease, SES-CD）及 CD 活动指数（Crohn’s Disease Activity Index, CDAI）进行临床疗效评价，对比两次扫描定量参数 K^{trans} 及 V_e 值的统计学差异及其与 SES-CD 评分及 CDAI 评分的相关性。**结果** 35 例 CD 患者中，13 例治疗后病情好转，10 例治疗后无明显改善或进展，12 例治疗后病情进展。CD 病灶区的 K^{trans} 及 V_e 值均随病情进展而增大，随病情好转而缩小，其中以 K^{trans} 值更为显著。定量参数值于病情好转时差异最为显著（P 均＜0.05）。各参数值均与 SES-CD 评分及 CDAI 评分呈高度正相关性（P 均＜0.05）。**结论** 小肠 MR 灌注成像定量参数可反映 CD 病变局部血管灌注量及渗透性改变，对 CD 临床疗效评价有一定价值。

PU-1153
MR 成像对早期宫颈癌深间质浸润的术前评估价值

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方法 回顾性分析 206 例经手术证实的早期宫颈癌患者（IB-IIA 期）的临床、病理及影像资料。在横轴位 T2WI、增强 T1WI、DWI 序列和 ADC 图上测量肿瘤最大径，在 ADC 图上测量最大 ADC 值（ADCmax）、最小 ADC 值(ADCmin)、平均 ADC 值（ADCmean）和最小 ADC 率(ADCmin/ ADCmean)。在 T2W 序列上评估宫颈癌的深间质浸润（间质浸润深度超过 1/3）状态并与病理结果对比，采用卡方检验评价 MR 判断深间质浸润的准确度。将患者按肿瘤最大径（增强 T1WI 序列）2cm 及 4cm 为界进行分组，采用行×列卡方检验比较各组间深间质浸润状态的差异。采用独立样本 t 检验或秩和检验比较两组间临床（年龄及绝经状态）及 MR（各序列上肿瘤最大径及 ADC 值）各参数的差异。
结果 共 132 例患者存在深间质浸润，MR 判断深间质浸润的准确度为 80.1%，敏感度为 98.5%，特异度为 47.3%，阳性预测值为 77.0%，阴性预测值为 94.6%；MR 判断深间质浸润与病理结果差异无统计学意义（$p>0.05$）。肿瘤最大径≤2cm 组中 5 例存在深间质浸润（共 21 例，23.9%）；2-4cm

组中 133 例存在深间质浸润（共 155 例，66.5%）；肿瘤最大径≥4cm 中 24 例存在深间质浸润（共 30 例，80%）。肿瘤最大径≤2cm 组与最大径 2-4cm 组及≥4cm 组深间质浸润状态差异显著（p<0.001），而最大径 2-4cm 组与≥4cm 组间差异不明显（p>0.05）。不同深间质浸润状态组间各 MR 参数（各序列肿瘤最大径，ADC 值）及临床指标（年龄和绝经状态）差异不明显（p>0.05）。

结论 MRI 可直接对早期宫颈癌深间质浸润情况进行较准确的评估，肿瘤最大径≤2cm 者发生深间质浸润的概率显著低于＞2cm 者。

PU-1154
HR-MRI 在直肠癌术前分期、评估环周切缘的应用价值

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摘要：目的 评估高分辨率核磁共振（HR-MRI）在对直肠癌术前分期、直肠系膜筋膜和环周切缘是否受累的应用价值。**方法** 选择 40 例患者，年龄 30-68 岁（平均年龄 52.32±8.21 岁）。所有患者均经病理证实为直肠癌，距肛门外边缘约 15 厘米以内。所有患者均行 HR-MRI 检查，术后分析 MRI 表现与病理及手术结果的相关性。**结果** 肿瘤位于直肠上段 25 例（62.5%），位于直肠中段 7 例（17.5%）和直肠下段 8 例（20%）。MRI 显示 T 分期的敏感性、特异性、PPV 和 NPV 分别为 95.8%、87.5%、92%和 93.3%，（Kappa=0.84，P<0.05）。MRI 评价环周切缘（CRM）的敏感性、特异性、PPV 和 NPV 分别为 90%，96.7%，90%和 96.7%，（Kappa=0.86，P<0.05）。**结论** 应用 HR-MRI 能够对直肠癌术前做出准确地分期。肿瘤是否累及环周切缘是影响手术预后的主要因素，术前行 HR-MRI 检查有助于对患者准确地选择治疗方案。

PU-1155
磁共振 IVIM-DWI 技术在肾脏肿瘤中的应用及进展

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磁共振的体素内不相干运动(intravoxel incoherent motion imaging，IVIM）技术理论在 1986 年由 LeBihan 等人提出之后，经过三十余年的发展，如今逐渐走进研究者及临床医疗工作者的视野，成为研究的热门技术之一，在肾脏中也不例外，其中，IVIM 技术在肾脏肿瘤中的应用逐渐增多。作为功能性磁共振（Functional magnetic resonance imaging，fMRI）中的一种，通过使用多 b 值进行扫描以及利用双指数模型来分析数据，可以得到三种不同的数据来尽量分别单独反映测量体素内单纯水分子弥散程度及由于毛细血管灌注导致的水分子弥散活动，从而达到更准确的反应感兴趣区的弥散特点及灌注特点的目的。作者对 IVIM 在肾脏肿瘤中的应用及其进展进行综述。

PU-1156
体素内不相干运动扩散加权成像在肝脏疾病中的研究进展

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扩散加权成像（diffusion weighted imaging, DWI）应用单指数模型获得表观扩散系数(apparent diffusion coefficient, ADC)值来反映活性组织的水分子扩散运动。体素内不相干运动扩散加权成像(intravoxel incoherent motion diffusion-weighted imaging, IVIM-DWI)应用双指数模型，能同时定量获得单纯水分子扩散和微循环灌注相关扩散的信息，弥补了传统 DWI 的不足。近年来，关于 IVIM-DWI 在肝脏疾病的应用研究逐渐增多。本文主要综述 IVIM-DWI 在肝纤维化评价、肿瘤性病变的诊断与鉴别诊断、肿瘤病理分级以及肿瘤治疗评价等方面的研究进展。

PU-1157

孕晚期正常胎儿肾脏发育磁共振研究

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目的 利用磁共振成像技术观察孕晚期正常胎儿的肾脏大小指标，及其与孕周的相关性。**方法** 选取 28-39 周孕正常单胎胎儿 209 例，通过 MRI 图像测量胎儿肾脏的长径、前后径和宽径,统计计算各参数的均值并分析其与孕周的相关性。**结果** 共收集 209 例，得到正常的胎儿肾脏 418 个：（1）双侧肾脏各径线长度随孕周增大而增长，呈直线相关；（2）双侧肾脏的各径线值对比无显著差异。（3）可近似的通过孕周计算出肾脏各径线长度。**结论** 胎儿肾脏正常发育对于胎儿正常生长过程有着重要意义，磁共振成像能准确测量胎儿肾脏大小，并依据大小初步判断晚期孕龄，为临床发现肾脏异常提供可靠数据。

PU-1158

磁共振扩散加权成像 ADC 值对女性盆腔良恶性肿瘤 鉴别诊断中的应用体会

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【摘 要】 **目的** 测量肿瘤 ADC 值的大小，对女性盆腔内良恶性肿瘤诊断及鉴别诊断，术前的评估应用价值。**方法** GE1.5T 磁共振扫描仪，8 通道体部线圈，对 215 例女性盆腔肿瘤进行横断位弥散加权成像（DWI b 值=800s/mm^2）,测量 ADC 值的大小，单位：×10^{-3}mm^2/s。**结果** 良性肿瘤的 ADC 值均显示增高，大于或等于 1.4×10^{-3}mm^2/s，恶性肿瘤的 ADC 值均显示增高，小于或等于 1.18×10^{-3}mm^2/s〈p＜0．01〉，ADC 值介于 1.18-1.4×10^{-3}mm^2/s 区间鉴别诊断有困难。**结论** ADC 值能提供数字化较清确判断女盆腔良恶性肿瘤，明显提高对恶性肿瘤的筛查能力。

PU-1159

脾脏错构瘤 1 例

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患者，男性，60 岁，体检 B 超发现脾脏占位。

影像学检查：MRI 检查发现脾脏中上极 30*25mm 大小类圆形异常信号灶，T1 加权同相位表现为低信号(图 1)，反相位病灶信号高于周围脾组织(图 2)，T2 抑脂相表现为明显低信号(相对于周围正常脾组织)，内部可见偏心性点状高信号灶(图 3)，增强扫描动脉期瘤灶强化程度低于周围脾组织(图 4)，门静脉期以及延迟期扫描病灶强化程度同周围脾组织相似，内部偏心性点状坏死区不强化(图 5)。

手术结果显示：紧靠膈面包膜下之脾实质内可见灰红色结节状肿瘤性病变，病灶大小约 3.5*4*3cm。手术病理诊断脾脏错构瘤(图 6)，免疫组织化学显示 LCA+、MPO+、CD68+、Mac387+、Ki-67—。

讨论　脾脏错构瘤(Splenic hamartoma)起源于血管周上皮细胞，是少见的间叶源性良性肿瘤，成人多见，女性略多于男性。病理上脾脏错构瘤是由多种组织成分构成的肿块，内部成分多样化，包括扩大的血管腔、淋巴网织样细胞、纤维组织和钙化组织，偶尔可见含铁血黄素沉着，可以分为红髓型和白髓型。病灶通常呈圆形或不规则形，无包膜。

脾脏错构瘤 CT 表现为脾轮廓改变，脾内单发或多发低密度、等密度灶，少数伴有钙化及脂肪组织 。伴有钙化及脂肪组织的肿块为脾脏错构瘤特征性 CT 表现[1] 。但是也有研究认为瘤灶内大多无脂肪组织[2,3]。本例病灶中未见明显脂肪组织。

文献报道脾脏错构瘤在 MRI 上 T1WI 表现为等信号，T2WI 以不均匀高信号多见，但是也可呈现低信号[4]。增强扫描早期病灶弥漫不均匀强化，随着时间推移呈现渐进性强化，并有延迟增强现象。本例 MRI 表现与文献报道[4]大致相似，与文献不同的是该例病灶 T1WI 反相位信号高于周围脾组织，增强扫描动脉期瘤灶强化程度远低于周围脾组织，门静脉期及延迟期扫描病灶渐进性强化，表现为等信号，内部点状偏心性坏死区不强化。

PU-1160
细胞外对比剂和细胞外-肝胆特异性对比剂的对比研究

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【摘要】目的　探讨细胞外对比剂（钆喷酸葡胺，GD-DTPA，钆喷酸葡胺，马根维显）和细胞外-肝胆特异性对比剂（钆塞酸二钠，GD-EOB-DTPA,普美显）在上腹部磁共振成像（MRI）上的优缺、异同。**方法**　选取 2018.12-2019.5 期间于我院 3.0T 磁共振(Magnetic resonance lmaging，MR）增强患者 26 名，共计 46 例病灶，入组患者符合下列标准：①患者既往做过磁共振检查且对 GD-DTPA 无不良反应。②既往病史均有慢性肝炎或肝硬化③肝内至少存在一个异常强化灶④临床方面能提供明确的验证结果。各患者先后用 GD-DTPA 和 GD-EOB-DTPA 行动态期增强扫描，间隔时间不超过 3 周。由两名影像医师共同商议，对比分析两种对比剂情况下各病灶的强化方式、形态特征、信号强弱及小病灶的检出。应用两种对比剂下诊断的灵敏度、特异度。计算 ROC 曲线下面积（$p<0.05$），从而比较两种对比剂下诊断的效能。所得数据使用 Medcalc 软件进行处理。**结果**　本次研究下的 46 例病灶，同时行超声造影。经过临床确诊其中 RN4 例，DN6 例，FNH2 例，肝细胞癌 20 例，胆管细胞癌 4 例，转移瘤 9 例，肝海绵状血管瘤 1 例。应用 GD-DTPA 检出 38 例（86.9%，40/46）,应用 GD-EOB-DTPA 检出 44 例（95.6%，44/46）。而对于＜1mm 结节检出，GD-DTPA 为 6 例（50%，6/12），GD-EOB-DTPA 为 10 例（83.3%，10/12）。**结论**　①GD-EOB-DTPA 可以起到动态增强和肝胆特异性增强的双重作用。②GD-EOB-DTPA 具有更高的小病灶（＜1.0cm）检出率。③GD-EOB-DTPA 能提供胆道造影成像。④GD-EOB-DTPA 有助于病灶的鉴别，其诊断能力较 GD-DTPA 更佳。

PU-1161
磁共振 IDEAL-IQ 序列评价辟谷对肝脏脂肪含量的影响

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目的:探讨磁共振 IDEAL-IQ 序列评价“辟谷”对健康人群肝脏脂肪含量影响的价值，并评估它们之间的关系。
方法:44 例志愿者（经过健康体检筛查）纳入本项研究（年龄范围：22-28 岁）我们分别在辟谷第一天、辟谷 5 天后、恢复正常饮食 1 个月后等三个时间点在武汉大学人民医院 PET 中心为志愿者进行腹部 3.0T 磁共振扫描，并且行 IDEAL-IQ 扫描得到脂肪分数(fat fraction)图像。在脂肪分数图像上测量肝脏的质子密度脂肪分数(PDFF)，记录辟谷前后 44 例受试者的身高、体重并计算身体质量指数（BMI）。
结果 辟谷 5 天后测量部分肝段（V、VI、VII、VIII）的 PDFF 值较辟谷前有所下降，恢复饮食 1 个月后测量部分肝段（V、VI、VII、VIII）的 PDFF 值较辟谷 5 天后有所上升。辟谷 5 天后 PDFF 值与辟谷前相比差异有统计学意义（P 值为 0.039，P 值< 0.05）。恢复饮食一个月后 PDFF 值与辟谷前相比，PDFF 差异无统计学意义(P 值为 0.489，P 值>0.05)。
结 论:磁共振 IDEAL IQ 序列可以量化健康人群的肝脏含量。辟谷可以降低健康人群的肝脏脂肪含量，有重要的临床应用价值。

PU-1162

病例报告：膀胱横纹肌肉瘤 2 例

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目的 分析膀胱横纹肌肉瘤的 MR 征象，并探讨 MR 对膀胱横纹肌肉瘤的诊断价值。**方法** 回顾性分析我院经病理证实的膀胱横纹肌肉瘤 2 例，2 例患者术前均行 MR 平扫及增强序列检查，根据患者的临床资料及 MR 表现，并与膀胱镜手术所见对照，回顾性分析膀胱横纹肌肉瘤的特征性 MR 表现及探讨 MR 对该病的诊断价值。**结果** 2 例膀胱横纹肌肉瘤患者均为男性儿童，分别以排尿困难和间断血尿为主要临床症状；1 例位于膀胱各壁，1 例位于膀胱三角区；2 例肿瘤体积均较大、边界清楚；2 例均呈分叶团块状；2 例中 T1WI 分别呈低信号和等-稍高信号，T2WI 均呈高信号，增强扫描均呈明显不均匀强化；2 例膀胱壁均明显增厚，均可见盆腔积液；其中 1 例肿瘤包绕尿道，侵犯前列腺，膀胱及直肠均受压推移；1 例可见双侧腹股沟区及盆腔多发淋巴结，1 例未见淋巴结转移。**结论** 膀胱横纹肌肉瘤的发病年龄及 MR 影像表现较具特征性，MR 检查可用于确定肿瘤的位置、大小、形态，也有助于观察肿瘤与周围邻近结构的关系以及转移。对于肿瘤的分期、治疗方案的制定以及预测预后疗效具有很大的价值。

PU-1163

自由呼吸触发扫描法对于肝脏 T2 加权脂肪抑制横断位图像成像质量的影响

干放
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[摘 要] **目的** 探讨提高肝脏 T_2加权脂肪抑制序列横断位图像质量的方法。**方法** 选择 2019 年 2 月-2019 年 3 月共 30 名患者，先后按 3 种不同方案行同参数 T_2加权脂肪抑制序列扫描。方案 A：选用

T_2加权脂肪抑制序列自由呼吸触发扫描；方案 B：选用 T_2加权脂肪抑制序列屏气法扫描；方案 C：选用 T_2加权脂肪抑制 haste 序列屏气法扫描。由 2 名主治医师对肝脏 T_2加权脂肪抑制序列横断位图像进行评价，采用 5 分法对图像信号均匀度、解剖清晰度进行评分。由其中 1 名主治医师计算肝脏 T_2加权脂肪抑制图像的 SNR、CNR。评价 2 名主治医师评分结果的一致性，比较 3 种方案所得图像信号均匀度、解剖清晰度评分及 SNR、CNR 的差异。**结果** 2 名主治医师间图像信号均匀度及解剖清晰度评分的一致性均较好(Kappa=0.737、0.713)。3 种方案间肝脏 T_2加权脂肪抑制图像的信号均匀度、解剖清晰度评分及图像 SNR、CNR 的总体及两两比较差异均有统计学意义(P 均<0.05),方案 A 优于方案 B，方案 B 优于方案 C。**结论** 采用自由呼吸触发扫描法能明显提高肝脏 T_2加权脂肪抑制横断位图像成像质量。

PU-1164
小视野高分辨率 T2WI、T2 压脂序列在肛瘘 诊断及分级中的应用价值

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目的 研究小视野、高分辨 T2WI 及 T2 压脂序列在肛瘘诊断中的应用价值，并初步探讨肛瘘的 HR-MRI 新分型、分级标准的可行性。**方法** 收集自 2016 年 6 月～2018 年 6 月期间于本院拟诊为肛瘘的患者 76 例（男 58 例，女 18 例）进行前瞻性研究，年龄 15～67 岁，平均 36.28 岁。采用 Siemens Magnetom Skyra 3.0T HR-MRI 成像仪对患者进行术前扫描。对比手术结果，运用 SPSS 20.0 统计学软件进行 KAPPA 一致性检验，分析高分辨率磁共振对肛瘘内口、瘘道的显示结果与手术结果的符合率，计算吻合系数。以现代盆底、肛周解剖学为基础，结合中华中医药学会肛肠分会肛瘘分类办法、Parks 肛瘘分型原则，初步探讨新的 FIA 高分辨率 MRI 分级标准的可行性。**结果** 70 例（已去除 6 例不符合要求患者）患者中 MRI 检查共检出 102 条瘘管，102 个内口，56 处肛周脓肿，其中 1 条瘘管者 44 例，2 条瘘管者 20 例，3 条瘘管者 6 例；手术结果为，1 条瘘管者 42 例，2 条瘘管者 20 例，3 条瘘管者 8 例；MRI 对肛瘘瘘管的诊断结果与手术结果的吻合系数为 0.823＞0.75，P＜0.001。MRI 共诊断出 1 个内口者 43 例，2 个内口者 22 例，3 个内口者 5 例；手术结果为，1 个内口者 42 例，2 个内口者 21 例，3 个内口者 7 例；MRI 对肛瘘内口的诊断结果与手术结果的吻合系数为 0.845＞0.75，P＜0.001。术后随访患者复发情况，初步判断其复发率与患者病情复杂程度呈正相关，从而一定程度上肯定了本研究提出的 FIA 新分级标准的可行性。**结论** 小视野、高分辨 T2WI 及 T2 压脂序列在肛瘘诊断中更具优势，尤其是内口与瘘管的数目确定，准确率更高。另一方面，本研究提出的新的肛瘘分型、分级标准，可初步判断肛瘘患者病情的复杂程度及预后情况，亦可为临床医生提供更好的手术参考和指导。

PU-1165
The diagnostic value of conventional MRI sequence in primary sclerosing cholangitis liver lesions

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Objective To analyze the routine MRI manifestations of liver lesions in patients with primary sclerosing cholangitis (PSC), so as to provide valuable information for clinical diagnosis and improve the level of disease diagnosis.
Methods Clinical and imaging data of 51 patients diagnosed with PSC in our hospital were retrospectively analyzed, including 29 females and 22 males. Two physicians read the images together, reached a consensus and then analyzed the signs and recorded the data. Morphological changes in the liver, signal changes in the liver parenchyma, portal hypertension (portal vein trunk inner diameter ≥1.4cm), intrahepatic portal venous branch edema, and signs of periportal lymph node enlargement (lymph node short diameter ≥1.0cm) were observed on cross-sectional MR images. The control group selected 40 cases of non-psc cirrhosis, observed the above signs, and compared with the PSC group.
Results Among 51 patients with PSC, 30 patients (58.82%) had abnormal hepatic lobe proportion.Right lobe atrophy was found in 14 cases (27.45%).Left lobe atrophy occurred in 6 cases (11.76%).There were 11 cases (21.57%) with left lobe compensatory increase and 15 cases (29.41%) with cauda lobe compensatory increase. Signal increase in liver parenchyma in T2WI was observed in 15 cases (29.41%).Portal hypertension was found in 21 cases (41.18%).28 cases (54.90) with hilar and periportal lymphadenopathy.Edema around the branches of intrahepatic portal vein was observed in 22 cases (43.13%).The incidence of cauda lobe enlargement and increased hepatic parenchymal signal on T2WI was higher than that of the control group, but the difference was not statistically significant.The incidence of periportal lymph node enlargement was higher than that of the control group, and the difference was statistically significant ($P < 0.05$).The incidence of portal hypertension was lower than that of the control group, and the difference was statistically significant ($P < 0.05$).
Conclusion Routine cross-sectional MRI can be used to observe liver lesions in PSC as a supplement to MRCP to observe bile ducts.Among many signs of liver lesions in PSC, compensatory enlargement in cauda lobe, increased signal in hepatic parenchyma on T2WI and enlarged lymph nodes around portal vein are considered to be characteristic.

PU-1166
磁化传递成像技术在评价健康人肾脏生理特征的初步应用

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目的 探讨磁共振磁化传递成像技术（Magnetization transfer，MT）常用指标磁化传递率（Magnetization transfer ratio，MTR）与正常健康人肾脏生理特征的相关关系。
方法 纳入健康志愿者 35 例，记录所有被试的性别、年龄、身体质量指数（Body Mass Index，BMI）、腰臀比（Waist-to-Hip Ratio,WHR）、糖尿病家族史和高血压家族史。采用西门子 Skyra 3.0T 磁共振扫描仪，体部 18 通道相控阵表面线圈对所有被试进行双肾磁共振 MT 扫描。MT 扫描采用 3D 扰相梯度回波序列，该序列扫描 2 次，第一次为不添加 MT 射频脉冲信号（MTOFF），第二次为添加 MT 射频脉冲信号（MTON）。根据公式 MTR＝（MTOFF－MTON）×100／MTOFF 计算出 MTR，以百分数表示。在双肾上极、肾门、下极肾皮髓质绘制多个感兴趣区，测量相应磁化传递率并取平均值记录。运用皮尔逊相关分析评价年龄、BMI、WHR、血压与 MTR 值的相关关系；两样本 t 检验比较不同性别、是否存在高血压、糖尿病家族史组间 MTR 值的差异。

结果 随着收缩压的升高，正常健康人肾皮质 MTR 值明显升高（P<0.05）。尽管没有统计学差异，但正常健康人肾皮髓质 MTR 值均随年龄、BMI、WHR 和舒张压的增加而升高（P>0.05）；肾髓质的 MTR 值随收缩压的升高而降低（P>0.05）；有糖尿病家族史的被试 MTR 值高于无糖尿病家族史的被试（P>0.05）。

结论 肾皮髓质 MTR 值与正常人的某些生理特征显著相关，MT 能够反映肾脏微观结构的变化，为肾脏的临床变化提供更科学的依据。

PU-1167

恶性蝾螈瘤的影像学表现

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目的 总结恶性蝾螈瘤 (malignant triton tumor，MTT)的临床及影像表现，提高临床放射科医师对该病的认识。**方法** 回顾性分析 2000-2018 年我院经病理证实的 5 例患者的临床及影像学资料。所有患者均行 CT 和（或）MRI 检查，分析病变的位置，形态，大小，密度/信号，边界，伴随征象，强化方式。**结果** 男性 4 例，女性 1 例，中位年龄 25（1-71）岁；病变分别位于腹腔、盆腔、骶椎、腹股沟区及上颌窦。位置表浅表现为形态规则，密度和信号均匀，边界清晰；位置较深时呈分叶状，密度和信号不均，坏死常见，实质部分不均匀强化，供血血管多见，肿块边界不清，周围脏器、组织受侵，邻近骨质破坏，尤其是 T2WI 表现为高信号，信号不均匀，肿块内见环形或线性低信号分割影。**结论** MTT 影像学表现具有一定特征性，结合 CT 与 MRI 表现可提高正确诊断率，但最终仍需要靠组织病理和免疫组化确诊。

PU-1168

MRI 定量评估非酒精性脂肪肝与冠状动脉钙化相关性初步研究

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目的 探讨应用 MRI 定量非对称回波最小二乘估算法迭代水脂分离（IDEAL-IQ）技术定量评估非酒精性脂肪肝（NAFLD）与冠状动脉钙化（CAC）相关性。 **方法** 收集我院 2016 年 12 月-2018 年 12 月非酒精性脂肪肝患者 47 例及 40 例健康志愿者作为对照组，两组均行常规肝脏超声、CT 检查、上腹部 MR 常规及 IDEAL-IQ 序列扫描、冠状动脉多层螺旋 CT 扫描及血生化检查，NAFLD 组中 22 例患者行细针穿刺活检术明确诊断。IDEAL-IQ 计算脂肪含量（FF），冠状动脉 CTA 计算冠状动脉钙化积分（CACS），比较 FF 与 CACS 是否存在相关性。

结果 NAFLD 组 FF 显著高于对照组，（P＜0.001）；NAFLD 组 CACS 显著高于对照组，（P＜0.001）；NAFLD 组 FF 与 CACS 具有相关性，且呈正相关（R^2=0.5743，P<0.05）。 **结论** 临床工作中除对非酒精性脂肪肝患者进行针对性诊治，还应考虑到其发生冠脉钙化的风险，及时筛查患者的冠状动脉情况，这对 CHD 的早期预防至关重要。

PU-1169

MRI 联合超声在异常双胎妊娠中的应用价值

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目的 探讨 MRI 联合超声在异常双胎妊娠中的应用价值。**方法** 回顾性分析经我院产前超声和 MRI 联合检出的 40 例异常双胎妊娠，并于分娩、引产或手术后证实，回顾性分析产前 MRI 影像图象和检查结果。**结果** 40 例双胎中，其中双绒双羊 12 例，单绒双羊有 18 例，单绒单羊 10 例。胎儿检出异常有 1 胎胎死宫内、另一胎正常有 10 例；1 胎胎死宫内、另一胎儿生发基质出血有 4 例；1 胎正常，其余胎儿合并畸形共有 26 例，其中合并一胎儿侧脑室增宽有 22 例、后颅窝池扩张 1 例、胼胝体缺如有 2 例、透明隔缺如合并胼胝体缺如有 1 例。MRI 检出母体胎盘异常有完全性前置胎盘 6 例、部分性前置胎盘 1 例、胎盘植入 2 例；母体并发症有 1 例合并母体子宫平滑肌瘤；1 例母体内脏转位。母体并发症有一侧附件区囊肿 3 例，均为黄体囊肿；1 例并发有右侧卵巢粘液性囊腺瘤和左侧卵巢成熟性畸胎瘤。**结论** 产前 MRI 联合超声能准确的检出异常双胎妊娠以及其他合并症，对尽早的指导临床干预并采取有效措施、减少不良妊娠结局具有重要的意义。

PU-1170

胎盘植入的磁共振检查技术的应用

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目的 随着剖宫产数量的增加，胎盘植入发病率明显升高，严重威胁胎儿和母体的生命健康。磁共振对软组织分辨率高，能多平面、多参数、多方位成像，视野大，能清楚显示整个胎盘而不受其位置影响，对发生于宫底、宫角及子宫后壁的胎盘植入有高度敏感性，本研究主要探讨胎盘植入的磁共振检查技术，为临床提供更加明确的诊断。

方法 选择本院 2018 年 5 月-2019 年 3 月超声检查怀疑胎盘植入的孕妇，运用 GE1.5T 磁共振的快速成像稳态进动平衡序列(FIESTA)和单次激发快速自旋回波序列(SSFSE)进行扫描，对其诊断结果进行分类总结。

结果 磁共振的快速成像稳态进动平衡序列(FIESTA)和单次激发快速自旋回波序列(SSFSE)磁共振成像的检查效果图像质量满意，相对优于超声检查，不仅时间短，而且可以多平面，多方位观察其胎盘与子宫的关系，观察胎盘是否侵入或穿透子宫肌层所致的一种异常胎盘种植状态。

结论 磁共振的快速成像稳态进动平衡序列(FIESTA)和单次激发快速自旋回波序列(SSFSE)能很好的显示胎盘植入情况，能清楚的显示整个胎盘而不受其位置影响，软组织分辨率高，对发生于宫底、宫角及子宫后壁的胎盘植入有高度敏感性，为临床提供了更加丰富的信息，是超声检查的有利补充，同时也减少了因超声检查医生水平高低不一原因造成的各种误诊、漏诊，随着磁共振检查技术的广泛应用，磁共振成像将会在临床医学中发挥更为重要的作用。

PU-1171

磁共振定量测量腹部脂肪评估子宫内膜癌生物特性的应用价值

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目的 探讨通过磁共振测量腹部脂肪量及脂肪分布评估子宫内膜癌生物特征的应用价值。**方法** 回顾性收集经手术及病理确诊子宫内膜癌患者 104 例和正常患者 53 例，获取生物特征信息包括病理分级、分期、脉管浸润和 Ki-67 表达，通过 MRI 测量入组患者腹部脂肪参数包括皮下脂肪厚度，外脂肪面积、内脂肪面积和总脂肪面积。采用 Mann-Whitney U 检验比较各组腹部脂肪参数，各腹部脂肪参数与 Ki-67 阳性表达率的相关性采用 Spearman 方法评价。**结果** 子宫内膜癌患者各腹部脂肪参数均明显高于正常患者（P<0.001）；高分化子宫内膜癌患者腹部外脂肪和总脂肪面积明显高于低分化组（P<0.05）；I 期子宫内膜癌患者各腹部脂肪参数均明显高于 II 和 III 期患者（P<0.05），IIA 和 IIB 期患者外脂肪和总脂肪面积明显高于 III 期患者（P<0.05）；无脉管浸润患者腹部外脂肪面积明显高于有脉管浸润患者（P<0.05）。Ki-67 的表达与腹部皮下脂肪厚度、外脂肪面积和总脂肪面积呈负相关性（P<0.05）。**结论** 利用磁共振定量测量腹部脂肪可用于评估子宫内膜癌生物特征，其中外脂肪面积参数意义最大，腹部脂肪含量较高者更易罹患子宫内膜癌，但其分化程度和侵犯性较低。

PU-1172

Effect of Bandwidth on Abdominal Imaging Quality with 3.0T MR

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Objective: To study the effect of imaging quality in abdomenbybandwidthadjustmentin 3.0T.Methods: A total of 38 patientswereenrolled from December 2018 to March 2019in this study. For each subject, the protocol of T_2 fast spin echo sequence with fat suppression in axial scan was repeated,acquiring two groups of images with conventional bandwidthandhigh-bandwidth.Two experienced doctors blinded to the parameter of bandwidth assigned a respiratory motion-related artifactscore[1 (nondiagnostic images) to 5 (no motion)] fortwo groups of images. Signal intensity-to-noise ratio (SNR) were evaluated inliver.Results: The SNR of the conventional bandwidth group were higher than that of high-bandwidth group (P<0.001) whereas doctors scored overall image quality the former was inferior to the latter (P<0.001).The Median, Mean Absolute Deviation,Coefficient of Dispersion,Coefficient of Variation of the SNR and the image overall quality score of twogroups were 87.40% and 115.50%, 0.12 and 0.16, 0.13 and 0.14, 19.50%and 17.80%, respectively.Conclusion: The imaging quality of T_2 fast spin echo sequence imaging of abdomen in 3.0T could be improved by increased the bandwidth of acquisition. Although this methodcan reduction of SNR of images.

PU-1173

妊娠期合并乙状结肠癌病例分析

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妊娠期合并结肠癌罕见，大约 1/13000 万孕妇（约 0.008%），因其早期症状与孕期胃肠道表现类似，故早期诊断困难，误诊率和病死率较高，严重威胁胎儿及产妇的生命健康。本文报告 1 例 23 岁孕妇合并乙状结肠癌，结合文献分析其临床及影像学特点，提高对本病的认识。

PU-1174

ADC 值在早期宫颈癌的诊断价值及病理研究

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目的 分析不同病理类型早期宫颈癌 ADC 值的差异，探讨 ADC 在早期宫颈癌病理分类上的临床应用。 **方法** 选取 131 例经病理及临床证实为早期宫颈癌的患者，其中鳞癌 100 例，腺癌 17 例，腺鳞癌 14 例；其中鳞癌组低分化 4 例，中分化 87 例，高分化 7 例；所有患者治疗前行 3.0T MRI 常规扫描检查及 DWI 检查。分别测量患者病灶的 ADC 值，分析不同病理分型及不同分化程度下的早期宫颈癌 ADC 的特征。**结果** 早期宫颈鳞癌与腺癌 ADC 均值、最小值之间差异有统计学意义（p=0.000，p=0.002），早期宫颈腺癌与腺鳞癌 ADC 均值、最小值之间差异有统计学意义（p=0.003，p=0.003）。早期宫颈鳞癌与腺鳞癌 ADC 均值及最小值之间差异无统计学意义；早期宫颈癌三种病理类型 ADC 最大值之间两两比较均无统计学差异；分化程度不同早期宫颈癌之间 ADC 平均值之间两两比较差异无统计学意义。**结论** ADC 值在早期宫颈癌的不同病理类型上具有一定的区分作用，但在不同的分化程度上诊断价值有限。

PU-1175

Diffusion-weighted imaging (DWI) versus dynamic contrast-enhanced MRI (DCE-MRI) for detecting cervical invasion in endometrial cancer: a systematic review and meta-analysis

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Objective: To compare the diagnostic accuracy of diffusion-weighted imaging (DWI) and dynamic contrast-enhanced MRI (DCE-MRI) for detecting cervical invasion in endometrial carcinoma.
Methods: An extensive search of articles about DWI or DCE-MRI in assessing cervical invasion in endometrial cancer was performed in PubMed, Embase, Cochrane Library (CENTRAL), Web of Science, and Clinical trails from January 2000 to June 2019. Quality was assessed using Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2). Pooled estimation data were obtained by statistical analysis.
Results: Nine studies using DWI and eight studies using DCE-MRI to assess cervical invasion were considered. Significant heterogeneity was found only for sensitivity, both in DCE-MRI and DWI (I^2=67.8 % and 66.4 %). For evaluating any cervical invasion, the pooled sensitivity and specifcity were 0.58 (95% CI: 0.49-0.68) and 0.96 (95% CI: 0.94-0.97) for DWI, and the pooled sensitivity and specifcity were 0.47 (95% CI: 0.37-0.57) and 0.95 (95% CI: 0.92-

0.97) for DCE-MRI. For assessing cervical stromal invasion, the pooled sensitivity and specifcity were 0.52 (95% CI: 0.41-0.60) and 0.95 (95% CI: 0.93-0.97) for DWI, and the pooled sensitivity and specifcity were 0.46 (95% CI: 0.45-0.67) and 0.95 (95% CI: 0.93-0.97) for DCE-MRI. The pooled sensitivity of DWI was significantly higher than DCE-MRI for evaluating any cervical invasion (P<0.05). There was no significant difference between DWI and DCE -MRI for assessing cervical stromal invasion (P>0.05). **Conclusion:** DWI showed a better sensitivity than DCE-MRI for detecting any cervical invasion in patients with endometrial cancer.

PU-1176

高分辨率 MRI、DWI 序列对直肠癌环周切缘及系膜血管受侵评估的价值

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目的 评价高分辨率 MRI（HR-MRI）及弥散加权成像（DWI）序列预测直肠癌是否浸润环周切缘及系膜血管的评估价值。**方法** 回顾性分析 45 例直肠癌患者的磁共振成像（MRI）资料，应用 MRI 常规序列及 HR-MRI、DWI 序列观察直肠系膜及系膜内血管的信号特点，并预测环周切缘及系膜血管是否受累，判断结果分为：肯定无侵犯、可疑无侵犯、难以确定、可疑侵犯、肯定侵犯 5 个等级，与病理结果进行比较，算出两种方法的 ROC 曲线下面积。**结果** 经 ROC 曲线分析，MRI 常规序列判断 CRM 是否受侵（曲线下面积为 0.696，P<0.05），常规序列结合 HR-MRI 及 DWI 序列判断 CRM 是否受侵（曲线下面积为 0.946，P<0.05），MRI 常规序列判断 EMVI（曲线下面积为 0.730，P<0.05），常规序列结合 HR-MRI 及 DWI 序列判断 EMVI（曲线下面积为 0.815，P<0.05），虽然常规 MRI 也可作为判断直肠系膜是否受侵的有效指标，但 HR-MRI 结合 DWI 序列曲线下面积更大，诊断效能更高。**结论** HR-MRI 联合 DWI 序列比单纯使用常规序列能够更准确地判断环周切缘及系膜血管是否受累。

PU-1177

The ability of apparent diffusion coefficient (ADC) values in differentiating the grade of endometrial cancer: a systematic review and meta-analysis

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Objective: To explore the value of apparent diffusion coefficient (ADC) values for differentiating the histological grade of endometrial cancer.
Methods: The PubMed, Embase, Cochrane Library (CENTRAL), Web of Science, and Clinical trails were searched for studies that used ADC values (b=1000 s/mm^2) to differentiate the grade of endometrial cancer. We assessed pooled data by using a random-effects model.
Results: Eleven studies were included in this meta-analysis. The pooled mean ADC values were 0.87×10^{-3} mm^2/s, 0.78×10^{-3} mm^2/s, and 0.71×10^{-3} mm^2/s for grades 1,

2 and 3, respectively. Significant statistical differences of mean ADC values were observed for the three grades (P<0.05). But there was no significant difference between low-risk grade (G1+G2) and high-risk grade (G3) (P>0.005). The pooled minimum ADC values were 0.67×10^{-3} mm^2/s, 0.61×10^{-3} mm^2/s, and 0.51×10^{-3} mm^2/s for grades 1, 2 and 3, respectively. There were significant differences of minimum ADC values among these three grades (P<0.05). The minimum ADC values were significantly lower for patients with high-risk grade than for those with low-risk grade (P<0.05). **Conclusions:** The mean ADC values and the minimum ADC values were helpful for detecting the grade of endometrial cancer. The minimum ADC values can distinguish low-risk grade from high-risk grade.

PU-1178

MRI 常规序列结合 DWI 对于卵巢良恶性囊腺类肿瘤鉴别诊断的价值

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目的 探讨 MRI 常规序列结合 DWI 对于卵巢良恶性囊腺类肿瘤鉴别诊断的价值
方法 回顾性分析 2016 年 5 月至 2017-12 月经手术病理证实的卵巢囊腺类肿瘤患者的盆腔 MRI 图像，共 30 人。纳入标准为：年龄>20 周岁、且<60 周岁；含囊性成分病灶囊壁厚度＞３ｍｍ。其中双侧卵巢患病 13 人，单侧卵巢患病 17 人，共发现病灶 43 例。分析肿瘤ＭＲＩ表现，检测 ROI 实质部分的 ADC 值，并行统计学分析。
结果 囊腺瘤囊壁厚度≤１０ｍｍ，实性成分较少；交界性囊腺瘤囊壁厚薄不均，囊 壁 布 满 细 小 乳头状结节；囊腺癌壁较厚，实性成分较多且不规则。卵巢囊腺瘤ＡＤＣ值显著高于卵巢囊腺癌（Ｐ＜0.01），而浆液性囊腺瘤与黏液性囊腺瘤、浆液性囊腺癌与黏液性囊腺癌间 ＡＤＣ值差异无统计学意义（Ｐ＞0.05）。
结论 常规 MRI 结合 DWI 对于卵巢良恶性囊腺类肿瘤的鉴别具有较高价值。

PU-1179

评估基于 3.0 T 多参数磁共振成像的 PI-RADS v2 评分联合前列腺特异性抗原密度对早期有临床意义前列腺癌的诊断价值

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[目的]：评估第 2 版前列腺影像报告与数据系统（PI-RADS v2）联合前列腺特异性抗原密度（PSAD），对早期有临床意义前列腺癌（CSPCa）的诊断价值。
[方法]：采取回顾性分析方法，以穿刺病理为金标准，先通二元 logistics 回归分析确立 CSPCa 的独立预测指标，后建立联合预测模型 Logit（P），应用 ROC 曲线分析其诊断效能。
[结果]：纳入病例共 102 例，病理证实 71 例非 CSPCa 和 31 例 CSPCa。Logistic 回归分析显示 PI-RADS v2 评分和 PSAD 为独立预测指标；建立联合预测模型为：Logit（P）=－5.27+1.34×PI-RADS v2 评分+2.1×PSAD。预测模型 Logit（P）ROC 曲线下面积为 0.84（95%CI 0.78～0.89），高于

PI-RADS v2 评分 0.78（95% 0.73～0.85）、PSAD 的 0.75（95% 0.69～0.81），差异有统计学意义（P＜0.05）。
[结论]：PI-RADS v2 评分联合 PSAD 对可提高对早期 CSPCa 的预测效能，

PU-1180
比较平衡式自由稳态进动序列与单激发快速自旋回波序列在 3.0T 磁共振胎盘检查的应用效果

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【摘要】目的 探讨 B-TFE 序列与 SSFSE 序列在 3.0T 磁共振胎盘扫描的应用效果。**方法** 对 30 例结合病史、临床表现及彩超诊断为胎盘植入或前置胎盘等胎盘相关疾病的孕妇行 B-TFE 序列与 SSFSE 序列扫描，由高年资医师对序列进行对比评分，结合 ROC 曲线对两种序列进行评价。**结果**：在 3.0T 磁共振中，B-TFE 序列由于组织的 T1 延迟，T2 缩短，导致该序列的权重 T2/T1 降低，导致信号及对比度不如在 1.5T 磁共振的效果。同时 B-TFE 序列为梯度回波序列，对磁化率伪影敏感，3.0T 比 1.5T 更敏感，在胎盘检查方面产生较大的磁化率伪影，而 SSFSE 序列没有相关问题，在 3.0T 磁共振胎盘检查时有更好效果。**结论** 经过我们对 30 例患者扫描图像的对比研究，SSFSE 序列在病变显示（部位、形态、对比度、组织分辨率、信号均匀度及去伪影等方面）优于 B-TFE 序列。

PU-1181
Research on Multi-mode Magnetic Resonance for Liver Parenchyma Around Tumors of Primary Hepatocellular Carcinoma

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Objective: To compare and analyze MR diffusion-weighted imaging (DWI) and amide proton transfer imaging (APT) in estimating the microenvironmental change of liver parenchyma around tumors of primary hepatocellular carcinoma. **Methods**: A retrospective analysis was made on 35 patients diagnosed with hepatocellular carcinoma via clinical and imaging examinations and 28 healthy volunteers as control group. Apparent diffusion coefficient (ADC), asymmetric magnetization transfer ratio (MTRasym) of hepatocellular carcinoma tissues, cancer proximal hepatocellular parenchyma (0~2 cm), cancer distal hepatocellular parenchyma (2~5 cm) and normal hepatic parenchyma were measured and analyzed. **Results**: MTRasym value was decreased with the increased distance to hepatocellular carcinoma tissues while ADC were increased with the increased distance. MTRasym was in a weak negative correlation with ADC (r=-0.368, p<0.01). APT combining with ADC had the highest estimated value in differential diagnosis of hepatocellular carcinoma tissues and normal hepatic tissues (AUC =0.914, p<0.01). **Conclusion**: APT quantitative parameter can estimate the malignant degree of liver parenchyma around

tumors of primary hepatocellular carcinoma more accurately compared with conventional DWI.

PU-1182

Can T2 mapping at magnetic resonance imaging differentiate endometrial cancer?

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Objectives
To investigate whether the T2 value obtained from magnetic resonance imaging (MRI) can differentiate endometrial cancer (ECA) from benign endometrial lesions (BEL) and is associated with the aggressiveness of ECA.
Materials and Methods
The institutional review board approved this study. Six-three patients (ECA, 51; BEL, 12) and 23 normal volunteers were included in this study. A multiecho spin-echo sequence was performed with echo time (ms) of 20, 40, 60, 80 and 100. The mean T2 value of ECA, BEL and normal endometrium (NE) was compared. The mean T2 value of type I and type II ECA was compared. The receiver operating characteristic (ROC) curve analyses and Youden index were used to determine an optimal T2 value threshold to distinguish between type I and type II ECA. The relationship between mean T2 value of ECA and pathological characteristics of tumors, including tumor grade and stage, was analyzed.
Results
The mean T2 value of ECA, BEL and NE was 109.6±30.2, 162.7±54.5 and 213.1±62.3 ($P<0.001$), respectively. The mean T2 value of type II ECA (148.0±47.0) was higher than that of type I ECA (100.2±13.6) ($P=0.011$). The area under the curve (AUC) was 0.959. When the threshold was 119.3, the sensitivity and specificity to differentiate between type I and type II ECA were 1 and 0.902, respectively. There were no significant differences among different stages ($P=0.091$) and among different grades ($P=0.686$).
Conclusion
The mean T2 value could differentiate ECA, BEL and NE. It could distinguish between type I and type II ECA. But it could not differentiate different stages of ECA or different grades of ECA.

PU-1183

MR 三维容积多期增强对乏脂型肝 EAML 的诊断价值

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【摘要】目的 探讨 MR 三维容积多期增强显示病灶供血动脉和早期引流静脉及中心血管对乏脂型肝 EAML 的诊断价值。**方法** 回顾性分析 22 例经病理及免疫组织化学证实的肝 EAML 患者资料及

MRI 影像特点，重点观察 MR 三维容积多期增强检查显示的病灶供血动脉、引流静脉及中心血管。**结果** 22 例肝 EAML 中 17 例病灶同时可见供血动脉及引流静脉（17/22），2 例仅见供血动脉（2/22），1 例仅见引流静脉（1/22），供血动脉发自肝动脉分支（9/19）、门脉分支（7/19）、肝动脉及门脉分支（3/19），引流静脉多于动脉早期或晚期提早显影，汇入下腔静脉（9/18）或肝静脉（9/18)。10 例病例于动脉期见病灶内部及周边的扭曲血管（10/22）。22 例中 15 例病灶内不含脂肪（15/22），7 例仅含少量脂肪（7/22），6 例病灶内合并出血、坏死（6/22），8 例见假包膜征（8/22）。4 例行肝细胞特异性造影剂增强检查的病灶在肝胆期均呈低信号（4/4）。**结论** MR 三维容积多期增强检查有助于显示肝 EAML 病灶的供血动脉、早期引流静脉及中心血管，对乏脂型肝 EAML 有较高的诊断价值。

PU-1184
磁共振弥散加权成像联合动态增强扫描诊断富细胞、富血供子宫肌瘤的应用价值

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【摘要】目的 探讨磁共振弥散加权成像联合动态增强扫描诊断富细胞、富血供子宫肌瘤的应用价值。**方法** 回顾性分析 102 例经病理及影像表现证实为富细胞、富血供子宫肌瘤患者的影像指标，归纳总结该类型肌瘤特征。**结果** 102 例患者共发现富细胞、富血供子宫肌瘤 138 个。其中黏膜下 3 例、肌层 70 例、浆膜下 14 例、阔韧带 4 例，多发 11 例。位于宫底 17 例，宫体 63 例，宫颈 1 例，阴道 1 例，多发 20 例。肌瘤大小在 1cm-4cm 的 50 个，4cm-8cm 的 69 个，大于 8cm 的 19 个。病灶在 T2WI 上呈等或高信号，DWI 上呈高信号，平均 ADC 值低于周围正常子宫肌层，增强扫描明显强化，多数可见粗大供血动脉。**结论** DWI、ADC 值联合动态对比增强扫描对诊断富细胞、富血供子宫肌瘤具有重要价值。

PU-1185
产前 MRI 在胎儿卵巢囊肿中的诊断价值

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目的 探讨产前 MRI 在胎儿卵巢囊肿中的诊断价值。方法 回顾性分析我院产前诊断及手术确诊的 40 例胎儿卵巢囊肿的产前、产后 MRI 影像特征。结果 胎儿卵巢囊肿发生于单侧有 35 例（其中左侧 24 例，右侧 11 例），病灶均位于膀胱与一侧肾脏之间。2 例为双侧，病灶位于膀胱两侧。病灶形态均为类圆形或椭圆形，边界光滑，囊壁较薄。肿块自行消退的有 20 例。8 例患儿因囊肿最大经线超过 4cm，且信号混杂，行腹腔镜探查手术，术后病理结果显示 7 例为卵巢单纯性囊肿伴出血，1 例卵巢囊肿合并蒂扭转。MRI 显示为病灶内部信号均匀者 32 例，内部信号混杂者 8 例。结论 胎儿卵巢囊肿 MRI 表现具有一定的影像学特征，可为产后治疗及评估预后提供重要依据。

PU-1186
剖宫产后瘢痕妊娠的磁共振表征与术前诊断价值

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目的 探讨子宫切口瘢痕妊娠的 MRI 表征及术前诊断价值；方法 回顾性分析 45 例切口瘢痕妊娠患者的临床及 MRI 资料，包括 HCG、子宫瘢痕信号特征、测量瘢痕厚度、判断孕囊类型、孕囊大小、孕囊与瘢痕之间关系。采用 2 名不同年资医师共同观察评价瘢痕、孕囊及子宫的 MRI 特征，包括胎盘植入程度、增强强化方式及病理表现。结果 45 例患者资料，包括前置胎盘 5 例，40 例 CSP，术前 MRI 肯定性诊断 38 例，正确率 95%。40 例 CSP 显示妊娠囊，内生型 28 例、外生型 12 例；囊状孕囊共 25 例，孕囊 MRI 呈椭圆形囊状信号，包块型孕囊 15 例，表现为子宫下段宫腔内不规则包块影。外生型孕囊附着子宫前壁。测量瘢痕厚度最薄厚度 1.2mm，最大厚度 11mm，平均厚度 3.08mm；孕囊大小，最小 9mm×13mm，最大 50mm×86mm，平均为 23.55mm×32.82mm。结论 术前诊断孕囊类型、大小、瘢痕位置、厚度及胎盘附着于子宫瘢痕并增强 MRI 明显强化是诊断 CSP 的可靠标准并具有明显术前诊断价值。

PU-1187
MRI 结合腔内充盈耦合剂对直肠癌术前评估的应用价值

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目的 探讨直肠 MRI 结合腔内充盈耦合剂对直肠癌术前评估的价值。**方法** 整理 2017 年 3 月至 2018 年 12 月在我院诊治的直肠癌 76 例，所有患者均经肠镜取组织病理确诊后，未行放疗及化疗并拟行外科手术治疗，于术前行直肠 MRI 检查和腔内充盈耦合剂后直肠 MRI 检查，分别评估肿瘤的 T 分期、N 分期、系膜血管受侵、环周切缘情况，并与术后病理结果进行对比分析。**结果** 直肠 MRI 对于直肠癌 T 分期、N 分期诊断的总准确率为 76.3%、72.3%，与病理结果的一致性为中等（kappa 值=0.593,0.572），系膜血管受侵、环周切缘分析的总准确率为 72.3%、89.5%，与病理结果分别为中等、较高一致（kappa 值=0.564,0.754）。腔内充盈耦合剂后直肠 MRI 后对于直肠癌 T 分期、N 分期诊断的总准确率为 86.8%、72.3%，与病理结果分别为较高、中度一致（kappa 值=0.736,0.569），系膜血管受侵、环周切缘诊断的总准确率为 77.4%、85.1%，与病理结果为较高一致（kappa 值=0.612,0.713）。**结论** 结肠 MRI 结合腔内耦合剂可提高直肠癌术前 T 分期、系膜血管受侵的病理结果符合率，对于 N 分期、环周切缘情况的总体病理结果符合率无明显影响。

PU-1188
转移性皮革状直肠的磁共振影像特征

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研究背景及目的 皮革状是指空腔器官管壁内低分化或未分化癌弥漫性环形浸润，肿瘤细胞或其产物诱导肠壁产生丰富的促结蒂组织增生反应，从而出现管壁增厚、收缩、僵硬、无弹性，常见于胃，结直肠少见。皮革状直肠以来源于胃、乳腺、前列腺、膀胱、卵巢的转移性癌常见，原发性癌罕见。内镜对皮革状直肠的诊断价值有限，常因管腔狭窄内镜无法进入而放弃，或因直肠粘膜未受肿瘤累及而活检阴性。本研究总结两例转移性皮革状直肠的磁共振影像表现，旨在提高对该病的磁共振影像认识。
材料与方法 两例患者，例 1 男性，67 岁，胃癌术后 3 年半，大便性状改变 4 月余；例 2 男性，61 岁，前列腺癌内分泌去势治疗 2 年，大便次数增多、性状改变 2 月。MR 检查设备飞利浦 3.0T

MR 机，扫描序列包括 TWI、T2WI、DWI、高分辨率 T2WI、增强 3D T1WI。分析直肠病变的长度、范围、信号、强化。例 1 经直肠活检证实，例 2 经手术病理证实。
结果 两例转移性皮革状直肠的 MR 影像表现特点相似，表现为直肠长节段性管壁环形增厚、管腔狭窄，在横轴位上，平扫 T1WI 仅表现为管壁环形增厚，无分层靶环样征，在 T2WI、DWI、增强 T1WI 上均可见三层靶环样征，病灶在 T2WI 与 DWI 上三层靶环样征部位相对应一致，而与增强 T1WI 上三层靶环样征的部位不一致。例 2 手术病理提示前列腺癌浸润直肠壁全层。
结论 虽然直肠节段性肠壁增厚的疾病包括直肠炎症性、缺血性、放射性病变等，但增厚直肠壁的三层靶环样征，及每层在 MR 不同序列上的特征性信号，有助于提示皮革状直肠的诊断，并可建议内镜深入直肠粘膜下活检，以确保活检准确性。

PU-1189
胃肠道间质瘤 MRI 表现对临床治疗方式的参考价值

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目的 分析胃肠道间质瘤（GIST）的 MRI 影像表现，制定后续的临床治疗方案。
方法 回顾性分析 2014 年 1 月~2018 年 10 月期间 136 例原发 GIST 患者的 MRI 图像及相关临床病理资料。
结果 136 例 GIST 中,发生于胃部 89 例（65.4%），十二指肠 15 例（11.1%），空回肠 25 例（18.4%），结直肠 7 例（5.1%）。瘤体最大直径 1~15cm，平均 4.36±1.35cm，其中 1~5cm 者 69 例，5~10cm 者 36 例，＞10cm 者 31 例。患者进行内镜下切除 23 例（16.9%），行外科手术切除 113 例（83.1%），术后危险度分级：极低危险度 8 例（5.8%），低危险度 45 例（33.1%），中危险度 37 例（27.2%），高危险度 46 例（33.8%）。进行甲硫酸伊马替尼辅助治疗 75 例（55.1%）。病变 MRI 表现为类圆形或不规则分叶状软组织信号影，病变内出现囊变、坏死 71 例（52.2%），其中 61 例发生于直径＞5cm 的瘤体。病变内出血 16 例（11.8%），瘤体内钙化 4 例（2.9%）。影像分型瘤体位于粘膜下 51 例（37.5%），壁间 39 例（28.7%），浆膜下 46 例（33.8%）。边缘清晰者 59 例（43.4%），边缘模糊者 77 例（56.6%），相邻脏器受侵 9 例，12 例与周围组织发生黏连（图 4）。136 例 GIST 在 DWI 序列上均表现为高信号，其中高危险度组 ADC 均值为 1.236±0.259 x10-3mm2/s，中危险度组 ADC 均值为 1.416±0.312 x10-3mm2/s，低危险度组 ADC 均值为 1.521±0.236 x10-3mm2/s。行胃肠镜下切除 23 例（16.9%），外科手术治疗 113 例（83.1%），伊马替尼辅助治疗 75 例（55.1%）。
结论 通过 GIST 的 MRI 形态学及功能性检查，可以对其后续治疗方法及疗效评估提供重要参考。

PU-1190
孤立性肠系膜上动脉夹层的影像诊断和治疗

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目的 近些年来随着影像学诊断技术和水平的增长，孤立性肠系膜上动脉夹层的检出率越来越高。本文旨在探讨孤立性肠系膜上动脉夹层的 CT、MRI 和 DSA 影像特点，以提高对本病的影像学表现认识。**方法** 回顾性 2014-2018 年供 23 例孤立性肠系膜上动脉夹层的临床表现、影像学特点以及治疗结果和随访。**结果** 其中男性 20 例，女性 3 例。年龄 43-76 岁，平均年龄 56 岁。所有患者中 15 例有高血压病史，7 例有长期吸烟史，动脉粥样硬化史 11 例。同时，有腹部外伤史 1 例，糖尿

病 3 例、结缔组织病 1 例。主要临床表现为突发性中上腹疼痛，少部分为渐进性腹痛，部分向腰背部放射，可伴有恶心、呕吐、腹泻等症状，部分重度患者可出现局部的压痛和反跳痛。本文采用 2009 年 Yun 的分型方法，根据破裂口的位置和管腔内是否伴有血栓共分为 I、IIa、IIb、III 型。其中 I 型 4 例、IIa 型 3 例、IIb 型 15 例、III 型 1 例。腹腔动脉 CTA 可以准确的显示特征性的内膜片、真假腔和血栓。腹部增强 MRI 图像因为呼吸和肠蠕动的影像，对于孤立性肠系膜上动脉夹层显示欠佳，有血栓的患者可表现为管腔的充裕缺损。DSA 是诊断腹腔动脉病变的金标准，本文的中的 DSA 病例均为 CTA 发现病变后行 DSA 明确诊断，其中 2 例患者行支架置入术，术后随访情况良好，管腔通畅。所有患者经治疗后症状均得到缓解或消失。经抗凝治疗 21 例中，夹层完全消失 1 例，血栓及假腔缩小 3 例，没有变化 17 例。**结论** 主动脉 CTA 仍是孤立性肠系膜上动脉夹层诊断的主要方法，增强 MRI 可以发现典型的病例，而 DSA 则主要是明确诊断和行血管内治疗。

PU-1191
多模态 MRI 对 T3 期直肠癌亚分期的诊断价值

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【摘要】**目的** 探讨多模态 MRI 对 T3 期直肠癌亚分期的诊断价值。**方法** 回顾性分析经手术病理证实 T3 期直肠癌患者 52 例且术前均行 MRI 直肠高分辨扫描、动态增强扫描（DCE）及扩散加权成像（DWI）检查。根据明确病理评价结果将 52 例患者按肿瘤浸润直肠系膜最大深度分为 T3I、T3II 两组，采用 χ^2 检验比较 2 组病变整体形态学指标、壁外索条形态学指标、时间信号强度曲线（TIC）类型、DWI 扩散受限分布位置指标的差异。采用独立样本 t 检验比较 2 组病变 DCE 半定量参数指标的差异。以病理结果为应变量，自变量采用上述具有统计学差异的指标，建立 Logisitc 回归模型构建联合参数并评价其诊断效能。**结果** 2 组病变整体形态学周径及壁外索条形态学指标（χ^2=6.994，p <0.01；χ^2=7.917，p <0.01）、DWI 扩散受限分布位置指标（χ^2=7.834，p <0.01）差异具有统计学意义。2 组病变在 DCE 半定量参数 EER（t 值=7.585，p<0.01）差异具有统计学意义。新构建病变$_{周径}$+壁外索条+DWI 扩散受限分布位置+EER 参数联合诊断的约登指数最高为 0.73，ROC 曲线下面积（Az）为 0.887（95% CI：0.847～0.912），诊断敏感性及特异性分别为 85.24%和 87.34%。**结论** 充分利用多参数信息，联合壁外索条形态学指标、周径、EER、DWI 扩散受限分布位置作为评价指标对 T3 期直肠癌亚分期具有较高的诊断效能。

PU-1192
对比分析扩散峰度成像与扩散加权成像诊断宫颈鳞癌分级的价值

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【摘要】 目的 对比分析扩散峰度成像（DKI)与扩散加权成像（DWI）诊断宫颈鳞癌分级的价值。资料与方法 回顾性分析 42 例宫颈鳞癌患者的 DKI 和 DWI 影像资料，以病理结果为金标准，分为高中分化组（n=27）、低分化组（n=15），分别测量两组肿瘤实质区平均扩散峰度（MK）值、平均扩散系数（MD）值及平均 ADC 值、最小 ADC 值。采用独立样本 t 检验比较低分化与高、中分化宫颈鳞癌组间 MK、MD、平均 ADC、最小 ADC 值差异；绘制 ROC 曲线评价上述各参数值的诊断效能及最佳诊断阈值，并根据约登指数确定各参数相应敏感度、特异度。以 $P<0.05$ 表示差异有统计学意义。 结果 低分化宫颈鳞癌组 MK 值高于高中分化宫颈鳞癌组（$P<0.01$），MD、平均 ADC、最小 ADC 值低于高中分化宫颈鳞癌组，差异具有统计学意义（$P<0.01$）。其中 MK 值在鉴别低分化与

高中分化宫颈鳞癌的 ROC 曲线下面积（area under curve,AUC）最大（0.877），敏感度最高（92.6%）,MD 值特异性最高（86.7%）。MK 联合 MD 值的 AUC（0.909），高于平均 ADC 联合最小 ADC 值的 AUC（0.854）。结论　DKI 与 DWI 参数值均有助于鉴别低与高中分化宫颈鳞癌，与传统 DWI 相比，DKI 可更有效地鉴别低分化与高中分化宫颈鳞癌。

PU-1193
磁共振扩散加权成像鉴别胆囊良恶性病变的 Meta 分析

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摘要　目的 对磁共振扩散加权成像鉴别诊断良恶性胆囊病变的价值进行 Meta 分析。**材料与方法** 检索自建库起至 2018 年 12 月 1 日 PubMed、 EMbase、Web of Science、The Cochrane Library、CNKI 、万方数据库、中国生物医学文献数据库、中国科技期刊数据库中有关磁共振扩散加权成像鉴别诊断良恶性胆囊病变的相关文献。2 名研究者分别按照所制定的纳入标准以及排除标准独立筛选文献、提取数据并运用 QUADAS-2 文献质量评价工具及 Review Manager 5.3 软件评价纳入文献的偏倚风险，采用运用 Meta-disc 1.4 及 Stata12.0 软件进行 Meta 分析。**结果** 最终纳入 13 篇文献，其中英文 8 篇，中文 5 篇， Meta 分析结果显示，扩散加权成像（DWI）鉴别良恶性胆囊病变的合并敏感度(Sen)为 0.88(95%CI， 0.78-0.94)、特异度(Spe)为 0.85(95%CI， 0.79-0.89)、阳性似然比(+LR)为 5.84(95%CI, 3.97-8.59)、阴性似然比(-LR)为 0.14(95%CI， 0.07-0.28)、诊断比值比(DOR)为 41.88(95%CI, 15.42-113.69)；SROC 曲线下面积为 0.93，Q*为 0.86。表观扩散系数(ADC)鉴别良恶性胆囊病变的合并 Sen 为 0.79(95%CI， 0.71-0.86)、Spe 为 0.93(95%CI， 0.83-0.97)、+LR 为 10.8(95%CI, 4.7-25.1)、 -LR 为 0.22(95%CI， 0.16-0.32)、DOR 为 48(95%CI, 18-127)；SROC 曲线下面积为 0.89，Q*为 0.82。**结论** 磁共振扩散加权成像对良恶性胆囊病变的鉴别诊断具有较高诊断准确性。

PU-1194
非对比剂增强 MR 门静脉血管成像研究

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目的　探讨非对比剂增强磁共振血管成像（NCE-MRA）在评估肝脏门静脉解剖中的临床价值，并与磁共振增强门静脉期成像（MRPV）进行对照。
方法　选择 50 例健康受试者在西门子 3.0T 磁共振扫描仪上进行 NATIVE-TrueFISP 序列和增强冠状位 T1-Vibe 门静脉期 MRPV 成像检查。两组图像均进行最大密度投影 MIP 及多平面重组 MPR，获得血管重建图像。由两位医师分别对所有患者的 NCE-MRA 和 MRPV 成像的图像质量及门脉显示情况进行评分，并进行统计学分析。
结果　在 NCE-MRA 组和 MRPV 组中，门静脉成像质量评分分别为 3.30 和 3.37。评分在 2 分及以上者分别占 92%（46/50）和 96%（48/50），两者无明显统计学差异（P>0.05）。两位诊断医师对 NCE-MRA 和 MRPV 成像质量评分的一致性较高，Kappa 值为 0.95。门静脉显示能力方面，两种方法均能显示所有受试者的 3 级及 3 级以下的肝内门静脉，符合率为 100%。3 例（6%）受试者的门静脉第 5 级分支在 NCE-MRA 上未显示，而在 MRPV 上可以显示；2 例（4%）受试者门静脉第 5 级分支在

MRPV 上未显示，而在 NCE-MRA 上可以显示。两者在门静脉显示能力方面无明显统计学差异（P>0.05）。

结论 NCE-MRA 是一种无需使用对比剂的血管成像方法，能有效地对肝脏门静脉进行显示及评估。

PU-1195
对比不同排泄类型钆造影剂在肝脏肿瘤手术前的检查意义

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目的:探究肝脏增强磁共振检查中不同排泄类型钆造影剂（经肝脏排泄为主，经肾脏排泄为主）在肝脏肿瘤手术前的检查意义明确肿瘤性质数目及肿瘤与周围血管的关系。

材料与方法 收集我院 2017 年 2 月至 2019 年 4 月诊断为肝脏肿瘤的 MRI 资料（包括使用经肝脏排泄为主钆塞酸二钠,经肾脏排泄为主的钆喷酸注射剂），依据纳入标准和排除标准（患者呼吸配合），最终获得 218 名患者资料。2 名放射科医生 1 名普外科肝脏专科医生通过 DCE-MRI 和 GE 后处理工作站软件分别获得 Ktrans,Kep,Ve 和 ADC,FastADCF 的图像及数据。对比分析一般临床资料，常规影像特征，动态增强参数在肝脏肿瘤病灶数目及血管显影强化分组中的特点。定量资料满足正态和方差齐性组间比较采用独立样本 t 检验，不满足组间比较采用非参数秩和检验，定性资料组间比较采用卡方检验。影响因素的分析采用 Logistic 回归分析，采用 ROC 曲线表示各指标的预测效能。

结果 在 218 名患者中，单独使用经肝脏排泄为主的 51 名，单独使用经肾脏排泄为主的 77 名，使用两种造影剂确诊的 90 名。均在 3.0T GE HDX 机器上使用腹部线圈做双动脉期,静脉期，延时期（横轴位冠状位 LAVA 序列成像)。在肿瘤定性分组中没有统计学差异（P=0.00）而肿瘤病灶数目在增强延时期两组之间有统计学差异（P 值分别为 0.04,0.01,0.02）。；肝脏肿瘤术前增强 MRI 检查诊断和术后病理结果比较，两组之间没有统计学差异，在增强后延时排泄期肿瘤病灶数目上存在统计学差异，经肝脏排泄为主比经肾脏排泄为主的造影剂病灶数目准确性高 17.06%。经肾脏排泄为主的造影剂在肝脏肿块与血管关系显示更清晰。

结论 增强 MRI 肝脏肿瘤术前检查对比分析两种造影剂的使用，经肝脏排泄为主钆塞酸二钠注射剂对肝脏肿瘤性质及数目检测中有明显优势；经肾脏排泄为主的钆喷酸注射剂在显示肝脏肿块与血管分段关系中更清晰。

PU-1196
流入反转恢复序列在肝移植术前肝动脉成像中的应用

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目的 探讨基于流入反转恢复序列（inflow inversion recovery，IFIR）在肝移植术前肝动脉成像中的应用价值。**方法** 肝移植术前需行血管成像的 31 例患者纳入研究，所有患者均依次行冠状位 IFIR 和增强磁共振成像（contrast enhanced magnetic resonance angiography，CE-MRA）。由 2 名影像科医师采用盲法分别对两组肝动脉图像质量进行评分并比较 IFIR 组与 CE-MRA 组在肝动脉各级血管图像质量评分的一致性及最大显示分支级别上的差异；评价医师间图像质量评分和显示肝动脉最大分支级别的一致性。**结果** 2 名医师对 IFIR 组及 CE-MRA 组中各级血管图像质量评分的一致性均为良好及以上（*Kappa* 值：IFIR 为 0.628～0.870 ； CE-MRA 为 0.620～1）。IFIR 与

CE-MRA 两种方法在腹腔干、肝总动脉、肝固有动脉、肝右动脉及肝左动脉血管成像图像质量评分上差异均无统计学意义（*P*值均≥0.05）。 CE-MRA 显示最大分支级别的能力优于 IFIR。 31 例患者中，CE-MRA 和 IFIR 均发现 3 例肝动脉变异。**结论** IFIR 序列作为一种无创伤、无电离辐射、无需对比剂的磁共振血管成像方法，在肝移植术前肝动脉血管成像中具有一定的临床应用价值。

PU-1197
磁共振弥散加权成像联合影像组学 Nomogram 图预测进展期胃癌淋巴结转移的临床研究

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摘要
目的 建立和验证基于磁共振弥散加权成像（DWI）的 Nomogram 图，用于预测进展期胃癌（AGC）患者的淋巴结转移（LNM）情况。

研究设计：对来自浙江中医药大学第一附属医院的 101 例临床病理证实为 AGC 的患者进行回顾性研究。所有患者均接受术前 3.0T MRI 检查。数据集分为训练组（n = 71）和验证组（n = 30）。从每位患者中各提取总共 1305 个影像学特征，使用最小绝对收缩和选择算子（LASSO）逻辑回归模型以及学习矢量量化方法来选择影像图像中重要的纹理特征。通过结合影像组学特征和独立临床因素建立预测性 Nomogram 图。使用接收器操作特性分析，校准曲线和决策曲线分析评估 Nomogram 图的预测性能。

结果 我们发现两个影像组学特征与 LNM 发生概率的增加有显着相关（训练组的 P <0.002，验证组的 P = 0.004）。通过结合临床最小表观扩散系数（ADC）值和 MRI 报告的 N 分期建立影像组学 Nomogram 图。该图显示了良好的分类能力，在训练队列中曲线下面积（AUC）为 0.822（95％置信区间[CI]，0.768-0.923），然后在验证队列中证实，AUC 为 0.817（95％CI，0.714-1.000）。训练组中的特异性和敏感性分别为 0.758、0.782 和验证组中的 0.816、0.805。决策曲线在 Nomogram 图中也表现出良好的效能。

结论 本研究建立了基于磁共振的 DWI 序列及影像组学 Nomogram 图，分析了病灶影像学纹理特征，最小 ADC 值和 MRI 报告 N 分期与淋巴结转移的关系，可以在 AGC 患者中有效地进行术前 LNM 的预测，为其后的治疗提供重大的指导意义。

PU-1198
基于磁共振 T2WI 影像组学在诊断低 Gleason 评分前列腺癌中的价值

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目的 探讨前列腺 T2WI 影像组学预测模型在诊断低 Gleason 评分前列腺癌中的价值。

材料与方法 收集经手术或穿刺病理证实的前列腺癌患者 60 例，其中 Gleason 评分≤6 分者 20 例，运用美国 GE Analysis Kit（AK）软件将 T2WI 图像进行标准化处理，影像科 2 名经 PI-RADS V2 培训的医师运用 ITK-SNAP 3.6 软件根据多参数磁共振（包括 T1WI、T2WI、DWI、DCE-MRI）及病理结果在标准化后的 T2WI 上进行 ROI 勾画，ROI 放置于癌灶面积最大层面，其中一名医师 1 周后再重新勾画 ROI。运用 AK 软件进行影像特征提取，随后进行观测者间与观测者内一致性检验。保留一致性较高（ICC＞0.75）的影像特征,采用 spearman 相关分析和 LASSO 方法进行特征降维。在训练集中构建低 Gleason 评分前列腺癌的诊断模型，在验证集中评估模型效能。
结果 共提取 396 个定量影像特征参数，经降维和去冗余后，剩余影像特征 6 个，构建基于 T2WI 的低 Gleason 评分前列腺癌的诊断模型。训练集的准确度为 0.9048（95% CI,0.7738-0.9734），敏感度为 0.9286，特异度为 0.8929，阳性预测值为 0.8125，阴性预测值为 0.9615。验证集的准确度为 0.8889（95% CI,0.6529-0.9862），敏感度为 0.8333，特异度为 0.9167，阳性预测值为 0.8333，阴性预测值为 0.9167。训练集诊断低 Gleason 评分前列腺癌的 ROC 曲线下面积为 0.93(0.82-*1.00)*；验证集为 0.94 (0.88-*1.00)*。
结论 运用磁共振 T2WI 影像组学模型在诊断低 Gleason 评分前列腺癌中的准确性较高。

PU-1199
胰腺导管腺癌罕见变异型——肝样腺癌的 MRI 表现

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胰腺肝样腺癌是胰腺导管腺癌一种极其罕见的变异型，预后更差，具有腺癌和肝细胞癌样分化特征的原发性胰腺上皮源性癌，大部分患者血清 AFP 增高。目前国内文献报道仅 2 例，Pubmed 报道 20 余例。目前对其认识较少，影像诊断困难。海军军医大学附属长海医院于 2019 年收治 1 例胰腺肝样腺癌，男 56 岁，入院一周前体检发现胰尾部占位，血清 AFP、CA19-9 阴性，余无明显阳性症状及体征。影像学提示胰尾部类圆形肿块，边界光整，T1WI 低信号，内见斑片状高信号（出血），T2WI 等高信号，增强后持续强化，主胰管未见扩张，术前影像误诊为胰腺实性假乳头状肿瘤。后行胰体尾+脾脏切除术，病理证实：胰腺肝样腺癌，免疫组化 AFP（部分+）。本文报道一例胰腺肝样腺癌，对其影像学诊断进行讨论，具有较好的教学意义。

PU-1200
基于磁共振 T2WI 纹理分析对低 Gleason 评分与中高 Gleason 评分前列腺癌的鉴别

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目的 探讨前列腺 T2WI 纹理分析在低 Gleason 评分与中高 Gleason 评分前列腺癌诊断中的价值。
材料与方法 收集经前列腺癌根治术或穿刺病理证实的前列腺癌患者 60 例，其中低 Gleason 评分组 20 例。术前均行多模态磁共振检查，将 T2WI 图像进行标准化处理，影像科 2 名经 PI-RADS V2 培训的医师运用 ITK-SNAP 3.6 软件根据磁共振及病理结果在标准化后的 T2WI 上进行 ROI 勾画，ROI 放置于癌灶面积最大层面，其中一名医师 1 周后再重新勾画 ROI，共得到 60 个目标区域。运用美国 GE Analysis Kit（AK）软件进行纹理特征提取，随后进行观测者间与观测者内一致性检验。保留一致性较高（ICC＞0.75）的影像特征,采用 spearman 相关分析和 LASSO 方法进行特征降维。并评判纹理分析在低 Gleason 评分与中高 Gleason 评分前列腺癌诊断中的价值。
结果 共提取 396 个定量影像特征参数，观测者间与观测者内一致性较高的纹理特征数为 176 个，经降维和去冗余后，剩余 68 个。前 4 个纹理参数单独诊断的 AUC 曲线下面积分别为：0.87（0.78-

0.96）、0.85（0.75-0.94）、0.82（0.72-0.93）、0.81（0.71-0.92）。而 68 个纹理特征共同诊断的 AUC 曲线下面积为 0.96（0.92-1.00）。纹理分析诊断低 Gleason 评分前列腺癌的准确性为 0.88（95% CI，0.77-0.95），敏感性为 0.95，特异性为 0.85，阳性预测值为 0.76，阴性预测值为 0.97。

结论 磁共振 T2WI 纹理分析在低 Gleason 评分与中高 Gleason 评分前列腺癌诊断中的价值较高。

PU-1201
增强前 T1 mapping 对肝囊肿与小肝血管瘤的鉴别诊断

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目的 探讨增强前 MR T1 mapping 技术在肝囊肿与小肝血管瘤的鉴别诊断中的应用价值。

方法 筛选临床怀疑肝囊肿和/或肝血管瘤的病例 80 例，遵医嘱行常规上腹部 MR 检查的同时，增强前行 T1 mapping 扫描，两名高年资的扫描技师选择相同层面使用一致 ROI 测量病灶及其周围正常肝组织 T1 值，每个病灶及正常肝组织均测量三次，取平均值作为该病例测量处的最终 T1 值，并对两名技师的测量结果做一致性检验；同时两名高年资诊断医师对所有入组的 80 例患者的 MR 影像进行独立诊断，无法单独诊断的讨论后出最终结果。统计学软件选择 spss19.0，根据影像及临床诊断对两组病例所测数据做统计学分析并做 ROC 曲线分析，以 p＜0.05 作为差异有统计学意义。

结果 （1）本研究 80 例病例中，诊断为肝囊肿共 43 例，50 个病灶；肝血管瘤 37 例，42 个病灶；（2）两名高年资技师测量结果一致性检验 p＞0.05，无显著性差异；（3）肝囊肿组 T1 值大于肝血管瘤组，p＜0.05，有统计学意义；（4）两组数据 ROC 曲线分析具有良好的敏感性和特异性，有诊断截点。

结论 MR T1 mapping 技术无需增强即能够对肝囊肿与小肝血管瘤进行鉴别诊断，简单易行，耗时短，具有很高的灵敏性和特异性，值得广泛推广。

PU-1202
临床结合多参数 MRI 对不同子宫肉瘤亚型的鉴别诊断价值

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背景及目的 不同子宫肉瘤亚型的手术切除方式及预后不尽相同。探讨临床参数及磁共振成像（magnetic resonance imaging，MRI）表现对子宫平滑肌肉瘤、子宫内膜间质肉瘤及子宫癌肉瘤的术前鉴别诊断价值。

方法 在 2011 年 6 月至 2018 年 12 月间，收集了 71 例经手术病理证实为子宫肉瘤的患者资料。比较不同子宫肉瘤亚型的临床特点、常规 MRI 表现、平均 ADC 值 （mean apparent diffusion coefficient，mADC）、最小 ADC 值（minimum apparent diffusion coefficient，minADC）及相对 ADC 值（relative apparent diffusion coefficient，rADC）值。

结果 子宫癌肉瘤患者的年龄及临床表现、病灶的位置、形态及 T1 信号强度与子宫平滑肌肉瘤和子宫内膜间质肉瘤相比差异均有统计学意义（*P* 均<0.01）。子宫内膜间质肉瘤可见“束带征”（*P* 均<0.001）。病灶中囊变或坏死的形状以及强化方式有助于区别子宫平滑肌肉瘤与其余肉瘤（*P* 均<0.02）。子宫平滑肌肉瘤的实质 T2 信号强度与癌肉瘤相比差异具有统计学意义（*P*<0.001）。子宫内膜间质肉瘤的 rADC 值明显较子宫癌肉瘤的 rADC 值高（*P*=0.004）。

结论 临床结合多参数 MRI 有助于术前区别不同子宫肉瘤亚型。

PU-1203

The diagnostic value of MRI for preoperative staging in patients with endometrial cancer: a meta-analysis

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Purpose: To assess the diagnostic accuracy of magnetic resonance imaging (MRI) for detecting myometrial invasion, cervical invasion, and lymph node metastases in endometrial cancer.
Materials and Methods: A systematic literature search was performed in PubMed, Embase, Cochrane Library (CENTRAL), Web of Science, and Clinical trails. The methodologic quality of each study was assessed by using the standard Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2). Statistical analysis included evaluating publication bias, assessing threshold effect, exploring heterogeneity, pooling data, meta-regression, forest plot, and summary receiver-operating characteristics (sROC) curves construction.
Results: Fourteen studies could be analyzed. For detecting deep myometrial invasion, the pooled sensitivity and specifcity were 0.79 and 0.81 respectively, and patients younger than 60 years old demonstrated higher sensitivity (0.84) and specifcity (0.90). There was low sensitivity and high specifcity in the diagnosis of cervical invasion (0.53, 0.95) and lymph node metastases (0.59, 0.95). The sensitivity for detecting cervical stromal invasion (0.50) was lower than the sensitivity for detecting cervical invasion (0.53). The sensitivity for detecting pelvic lymph node metastases (0.65) was higher than the sensitivity for detecting lymph node metastases (0.59).
Conclusion: MRI has good diagnostic performance for detecting deep myometrial invasion, and has high specificity for detecting cervical invasion and lymph node metastases in patients with endometrial cancer.

PU-1204

磁共振氨基质子转移成像与扩散加权成像模型对宫颈鳞癌分级诊断价值的对比研究

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目的 对比分析磁共振氨基质子转移成像（APT）与扩散加权成像模型[扩散加权成像(DWI)模型、扩散峰度成像（DKI）模型]在诊断宫颈鳞癌分级中的价值。**资料与方法** 回顾性分析 46 例宫颈鳞癌[高分化组（G1，n=13）、中分化组（G2，n=21）、低分化组（G3，n=12)]患者的 APT、DKI、DWI 影像资料，测量宫颈鳞癌组织的 ADC、平均扩散峰度（MK）、平均扩散系数（MD）、不对称性磁化转移率（MTR_{asym}）值。采用单因素方差分析比较各组宫颈鳞癌 ADC、MK、MD、MTR_{asym}值的差异；

采用 ROC 曲线评价各参数的诊断效能；采用 Spearman 相关分析检验各参数与组织学分级之间的相关性。**结果** ADC、MK、MD、MTR_{asym}值在 G1、G2、G3 组间差异均具有统计学意义（*P<0.01*）；两两组间比较，各参数值间差异均具有统计学差异（*P<0.01*）。在鉴别 G1/G2 及 G2/G3 组宫颈鳞癌中，MTRasym 值均具有最佳诊断效能，ROC 曲线下分别为 0.883、0.871，其次依次为 MK、MD、ADC 值，各参数间差异无统计学意义(P 均 > 0.05)。ADC 联合 MK 值、ADC 联合 MTRasym 值鉴别 G1/G2 及 G2/G3 组宫颈鳞癌的 ROC 曲线下面积分别为(0.934、0.949)、(0.883、0.964)，其中，ADC、ADC 联合 MTRasym 值诊断 G2/G3 组宫颈鳞癌 AUC 间差异有统计学意义(Z=2.004,P < 0.05)。 MK 值、MTRasym 值与病理分级呈正相关（r=0.743,0.789，P<0.01），ADC、MD 值与病理分级呈负相关（r=-0.644，0.732，P<0.01）。**结论** DWI、DKI 及 APT 的参数均有助于宫颈鳞癌分化程度的诊断，与扩散加权成像模型（DWI、DKI）对比，APT 可更有效评估宫颈鳞癌分级，联合应用 DWI 和 APT 参数的诊断效能更佳。

PU-1205

MRI 对肛瘘的诊断准确性及临床价值

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目的 探究 MRI 对肛瘘的诊断准确性及临床价值。
方法 收集铜仁市人民医院 2018 年 6 月至 2019 年 6 月进行诊断肛瘘患者 72 例，设观察组及对照组，两组各 36 例。选择 MRI 诊断的是观察组，选择肛管内超声检测诊断的是对照组。对比两组手术结果和检测结果。**结果** 在诊断肛瘘位置准确性中，观察组占 36 例（100.00%），在诊断肛瘘内口准确性中，观察组占 36 例（100.00%）；对照组患者诊断肛瘘内口准确率为 27 例（75.00%），肛瘘位置准确率为 23 例（63.89%），相较于对照组，观察组经 MRI 和超声检测结果的准确性对比差异有统计学意义（P＜0.05）。**结论** 针对肛瘘患者，采用 MRI 诊断，可显著改善患者的生活质量，明显优于腔内超声，快速、无损伤，有很高的准确性，具有临床应用价值。

PU-1206

Effect of Repeated Injection of Iodixanol on Renal Function in Healthy Wistar Rats Using Functional MRI

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Purpose. To determine the optimal time interval of repeated intravenous injections of iodixanol in rat model and to identify the injury location and causes of renal damage in vivo. Materials and Methods. Rats were randomly divided into Control group, Group 1 with one iodixanol injection, and Group 2 with two iodixanol injections. Group 2 was subdivided into 3 cohorts according to the interval between the first and second iodixanol injections as 1, 3, and 5 days, respectively. Blood oxygen level-dependent (BOLD) imaging and diffusion weighted imaging (DWI) were performed at 1 hour, 1 day, 3 days, 5 days, and 10 days after the application of solutions. Results. Compared with Group 1 (7.2%), Group 2 produced a remarkable R2* increment at the inner stripe of the renal outer medulla by 15.37% (= 0.012), 14.83% (= 0.046), and 13.53% (>

0.05), respectively, at 1 hour after repeated injection of iodixanol. The severity of BOLD MRI to detect renal hypoxia was consistent with the expression of HIF-1 and R2* was well correlated with HIF-1 expression (= 0.704).The acute tubular injurywas associated with urinaryNGAL and increased significantly at 1 day. Conclusions. Repetitive injection of iodixanol within a short time window can induce acute kidney injury, the impact of which on renal damage in rats disappears gradually 3 - 5 days after the injections.

PU-1207

子宫切口疤痕妊娠的 MRI 表现及诊断价值分析

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目的 探讨子宫切口疤痕妊娠的 MRI 表现及其应用价值分析，提高 MRI 诊断水平。**方法** 回顾性分析 10 例经手术和病理证实的子宫切口妊娠患者临床及影像资料并复习文献，患者均做 MRI 平扫及增强扫描。**结果** 年龄 25-38 岁，平均年龄 31 岁，10 例患者妊娠囊均位于子宫下段前壁宫颈内口上方，孕囊呈长 T1 长 T2 信号，增强后不均匀强化，切口疤痕厚度约 0-12mm，平均厚度 3.5mm，10 例患者切口肌层厚度均小于 2mm，1 例子宫浆膜层不完整。**结论** 子宫切口疤痕 MRI 检查具有特征性表现，在观察孕囊血供、子宫浆膜完整性及是否存在胎盘植入时具有一定的诊断价值，对患者治疗方式具有重要作用。

PU-1208

MRI 与超声在胎儿肺部疾病产前诊断中的对比研究

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目的 对比分析 MRI 与超声在胎儿肺部疾病产前诊断中的价值；

方法 收集 20 例超声怀疑肺部有问题的胎儿，利用 MRI 采集肺部图像，将超声结果与 MRI 结果分别于产后诊断结果进行对比。分析超声于 MRI 在胎儿肺部疾病中的价值；

结果 20 例病例中，超声诊断肺囊腺瘤（CCAM）10 例，肺隔离症 7 例（BPS）。先天性膈疝 3 例，MRI 示肺 CCAM 9 例，肺隔离症 7 例。先天性膈疝 3 例。支气管源性囊肿 1 例；

结论 MRI 可作为超声产前诊断的有效补充手段，在胎肺解剖结构的显示上优于超声。能为临床诊疗提供形象直观的影像参考。

PU-1209

ADC 值对前列腺增生与腺癌的鉴别及其与腺癌 Gleason 评分相关性研究

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摘要

目的 探讨磁共振 ADC 值对前列腺外周带增生与腺癌的鉴别及其与腺癌 Gleason 评分的相关性。

方法 收集 2017 年 10 月～2019 年 2 月我院（北部）临床怀疑前列腺癌的患者，以经直肠超声引导下穿刺结果为标准，确诊为腺癌 41 例，增生 43 例。所有患者于穿刺术前行磁共振检查。比较腺癌与增生 2 组间 ADC 值的差异，绘制 ROC 曲线，探求 ADC 值对于腺癌的诊断阈值，评价该 ADC 值对腺癌的诊断校能（特异性和敏感性）。根据前列腺癌的 Gleason 评分又将腺癌分为低级别（高分化）组（Gleason 评分＜7 分）、中级别（中分化）组（Gleason 评分＝7）及高级别（低分化）组（Gleason 评分＞7），比较不同分化程度腺癌 3 组间 ADC 值的差异，用 Spearman 相关性分析评价 ADC 值与 Gleason 评分的相关性。

结果:1、 比较腺癌与增生两组间 ADC 值差异具有统计学意义（t=9.228，P=0.000），绘制 ROC 曲线，测得 ROC 曲线下面积为 0.869， ADC 值阈值为 $1.39\times10^{-3}mm^2/s$，诊断腺癌的敏感性与特异性分别为 71.43%及 89.33%。2、比较腺癌低级别（高分化）组、中级别（中分化）组及高级别（低分化）组 3 组间 ADC 值差异具有统计学意义（F=35.990，P=0.000），且两两比较，组间差异均具有统计学意义（P_1=0.000，P_2=0.000，P_3=0.002）。3、腺癌 ADC 值与 Gleason 评分呈负相关关系（r=-0.701，P=0.000）。

结论 1、ADC 值对腺癌及增生的诊断阈值为 $1.39\times10^{-3}mm^2/s$，其特异性与敏感性分别为 89.33%与 71.43%。2、ADC 值对腺癌恶性程度评估具有一定的价值。3、ADC 值与腺癌 Gleason 评分呈负相关。

PU-1210

3D-SPACE 序列结合三维重建在阴道斜隔综合征诊断中的应用价值

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目的 探讨三维各向同性脂肪抑脂快速自旋回波（3D-SPACE）序列结合三维重建技术对阴道斜隔综合征术前诊断及临床分型的应用价值。

方法 回顾性分析 24 例经手术证实阴道斜隔综合征患者的的临床资料及术前 MRI 图像。由 2 名泌尿生殖系统专业放射科医生利用 3D-SPACE 序列及后处理重组图像进行双盲评价，并将诊断及分型结果与手术结果进行比较。

结果 24 例阴道斜隔综合征患者，年龄 10 ～ 23 岁，平均年龄 13.5 岁。阴道内斜隔：右侧 20 例，左侧 4 例。伴随子宫发育畸形：双子宫畸形 16 例，双角子宫 5 例，完全纵隔子宫 3 例。伴随泌尿系异常：同侧肾脏缺如 19 例，盆腔异位肾 3 例，盲端输尿管异位开口 2 例。盆腔其它病变：盆腔积液 22 例，斜隔侧隔后腔 18 例，隔后腔内混杂性血性肿块 4 例，斜隔侧隔后腔积脓 2 例，输卵管积血或积液 7 例，对侧阴道少许积血 9 例。24 例阴道斜隔综合征患中，23 例 3D-SPACE 序列结合三维重建的术前分型结果与手术结果一致，包括 I 型 12 例， II型 9 例，III型 2 例。仅 1 例术前分型结果与手术结果不一致，I 型误诊 II 型。

结论 阴道斜隔综合征是一种泌尿生殖系统发育畸形，3D-SPACE 序列结合三维重建能够准确地术前诊断及临床分型，同时提供客观的测量数据，对手术方案的选择及患者预后的评估有重要价值。

PU-1211
利用多参数定量 MRI 鉴别移行区前列腺癌及前列腺增生的研究

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目的 本研究调查了不同类型的良性前列腺增生（BPH）的多参数 MRI（mpMRI）表现以及定量 mpMRI 是否有效区分前列腺癌（PCa）和 BPH。
材料和**方法** 确诊 PCa 的患者（n = 60）接受术前 3T MRI 检查。在进行前列腺切除术之前获得 T2WI，多回波 T2WI，DWI 和动态对比增强图像（DCE）。 PCa 和 BPH（囊性，腺体或基质）在过渡区被鉴定并与 MRI 匹配。定量 mpMRI 指标：使用经验数学模型测量 T2，ADC 和 DCE-MRI 参数。
结果 与所有 BPH 类型相比，PCa 中 ADC 值显着降低（p <0.001），并且可以高精度地区分 PCa 和 BPH（AUC = 0.87，p <0.001）。与仅囊性 BPH 相比，PCa 中 T2 值显着降低（p <0.001），而腺体（p = 0.27）和基质 BPH（p = 0.99）与 PCa 无显着差异。 BPH 在 DCE-MRI 的过渡区中模拟 PCa，证明它们之间没有显着差异。腺体的 mpMRI 值（ADC = 1.31±0.22μm2/ ms，T2 = 115.7±37.3ms）和囊性 BPH（ADC = 1.92±0.43μm2/ ms，T2 = 242.8±117.9ms）有显着差异。腺体和间质 BPH 之间 ADC（p = 0.72）和 T2（p = 0.46）无显着差异。
结论 多参数 MRI 和特定定量 ADC 值可用于区分 PCa 和 BPH，改善过渡区的 PCa 诊断。然而，DCE-MRI 指标在区分 PCa 和 BPH 方面无效。如先前所认为的，腺体 BPH 在 ADC 和 T2 上不是高信号，并且对基质 BPH 具有相似的定量 mpMRI 测量值。腺体和囊性 BPH 在 mpMRI 上表现不同，组织学上不同。

PU-1212
磁共振扩散加权成像与宫颈癌细胞增殖活 Ki-67 表达的相关性研究

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目的 探讨子宫颈癌患者不同分化程度磁共振扩散加权成像(DWI)ADC 值及 rADC 值的变化及其与宫颈癌细胞增殖活性 Ki-67 的相关性。方法 经病理确诊为宫颈癌的患者 40 例，所有患者术前均行磁共振检查并进行扩散加权成像; 术中病理均进行 Ki-67 免疫组化染色。应用方差分析分析不同分化程度宫颈癌患者 Ki-67 表达情况，Pearson 相关分析法分析 Ki-67、ADC 与 rADC 值的相关性。运用 SPSS 20.0 统计学软件对数据进行统计学分析，P＜0.05 为差异有统计学意义。结果 低分化组 ADC 值以及 rADC 值低于高分化组，差异有统计学意义(t = 2.118，P＜0.05) 。低分化组与中分化组之间差异无统计学意义(P ＞0.05) 。随着分化程度降低，Ki-67 表达程度逐渐升高。随着 Ki-67 表达程度的升高，ADC 值与 rADC 低，差异均有统计学意义(P<0.05) 。Pearson 相关性检验后发现，ADC 值与 Ki-67 表达程度呈负相关(P<0.05)。结论 宫颈癌 DWI 成像 ADC、rADC 值的测量有助于评价并鉴别宫颈癌不同病理级别并有潜力作为评价肿瘤增殖程度的无创性方法。

PU-1213
卵巢碰撞瘤 MRI 表现两例

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由于字数限制仅输入部分内容。
碰撞瘤即发生在同一解部位的两种或两种以上不同组织来源的肿瘤，不同肿瘤相互邻近但绝无肿瘤组织混合。目前国内外文献报道的发生于卵巢碰撞瘤较为罕见，大多表现为囊实性肿块，其内成分混杂，可见多种密度或信号成分；且有文献报道的卵巢碰撞瘤几乎都起源于表面上皮、生殖细胞或性索间质细胞中的 2-3 种，组合形式多样；起源于生殖细胞或性索间质细胞的卵巢碰撞瘤较少见。本文报道两列卵巢碰撞瘤的临床及 MRI 表现，旨在加强人们对卵巢碰撞瘤的认识，以期更好的服务于临床。
碰撞瘤（collision tumor）即发生在同一解部位的两种或两种以上不同组织来源的肿瘤，他们分隔明确、相互邻近但不同肿瘤组织无混合[1]。碰撞瘤可以发生在肺部、中枢神经系统、消化系统、淋巴系统、子宫、卵巢、肾上腺等部位[2]，发生于卵巢的碰撞瘤较为少见，且几乎均为上皮细胞、生殖细胞、或性索间质细胞来源[3]，大多由其中的 2-3 中组织成分构成，表现形式多样。**卵巢碰撞瘤的影像学表现**：碰撞瘤中上皮源性的肿瘤体积常较大，而生殖细胞或者性索间质来源的肿瘤体积则相对较小；生殖或性索间质细胞来源的卵巢肿瘤常贴附于上皮来源肿瘤的囊壁上或位于囊变区内，但不同肿瘤成分之间相互邻近、分割明确但无混合；卵巢碰撞瘤典型的表现是囊中瘤或囊壁瘤。卵巢碰撞瘤的影像学表现与病变内部所含成分相关，它包含组成碰撞瘤的各种肿瘤的典型影像学表现：如囊腺瘤主要表现为多房囊性肿物，其内可见分隔及壁结节；畸胎瘤内可以看到脂肪或钙化；性索间质细胞来源的肿瘤多表现为较均匀强化的实性结节成分。目前国内外报道的卵巢碰撞瘤多为两种肿瘤组织的混合，由上皮细胞、性索间质细胞及生殖细胞三种成分组成的碰撞瘤极为罕见，国内外文献报道亦相对少见。本病例同时包含三种成分，且影像学表现典型。

PU-1214

Time-slip 技术在肾动脉无对比剂成像的应用价值

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目的 探讨采用时空标记动态磁共振技术(Time-Spatial Labeling Inversion Pulse ,Time-Slip)在无对比剂肾动脉的应用价值。**方法** 使用 Toshiba Elan1.5T 磁共振对 40 例患者行 Time-Slip 及对比增强（CE-MRA）肾动脉磁共振血管成像，分别测量肾动脉信噪比（SNR），肾周脂肪对比噪声比（CNR），对原始图像再进行最大密度投影（MIP）重建。由两位资深诊断医生对两组图像评价图像质量，并做统计。**结果** Time-slip 及 CE-MRA 肾动脉血管成像分别显示了 40 例患者总共 84 支肾动脉（80 支主肾动脉和 4 支副肾动脉），Time-slip 组及 CE-MRA 组的 SNR 分别为 113.4±12.7 和 92.5±11.4（t=-3.226,P<0.001），CNR 分别为 92.8±11.6 和 81.4±9.8（t=-3.557,P<0.001）Time-slip 的 MIP 图像比 CE-MRA 图像质量好，并且对于肾动脉远端分支 Time-slip 图像显示较 CE-MRA 清楚。**结论** Time-slip 技术进行肾动脉成像，无需用对比剂即能得到较高 SNR 的肾动脉图像,且图像质量较 CE-MRA 好，为临床提供一种新的可靠的影像学检查方法。

PU-1215

卵巢甲状腺肿的 MR 诊断及病理分析

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总结卵巢甲状腺肿的 MR 影像及病理特点，以提高诊断水平。**方法** 回顾性分析 10 例经过手术证实的卵巢甲状腺肿患者，观察总结病变的 MR 影像学特征及病理学表现。 **结果** 10 例患者均单侧发病，6 例位于右侧，4 例位于左侧，10 例患者全部行 MR 平扫+增强扫描检查，其中 8 例呈多房囊性，2 例呈囊实性，实性成分及囊壁、间隔强化明显，囊性成分未见明显强化。 **结论** MR 可以清楚的显示卵巢甲状腺肿的形态及内部信号特征,并具有一定特征，并有无辐射、准确率高的特点,基本可以实现诊断目的。

PU-1216

Combining clinical characteristics and specific MRI features to predict placenta accreta

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Objective: To explore the independent clinical and magnetic resonance imaging (MRI) performance risk factors for predicting placenta accreta.
Methods: From January 2012 to December 2015, We retrospectively reviewed the clinical characteristics and MRI features of 97 patients. Of these, 42 were confirmed to placenta accreta by pathological results or cesarean delivery findings. We tried to identify the independent risk factors by multivariate logistic regression model for significant differences in variables determined by univariate analysis.
Results: The multivariate logistic regression model indicated that two or more instances of previous cesarean deliveries and/or abortions, placenta previa, and placenta- myometrial interface interruption were independent risk factors for placenta accreta. The odd ratios were 3.79 for patients who had two or more instances of previous cesarean deliveries and /or abortions, 0.04 for marginal/partial placenta previa, 0.024 for complete placenta previa , and 6.56 for placenta-myometrial interface interruption. The values of accuracy and positive prediction by combination of a single clinical risk factor and placenta- myometrial interface interruption and of positive prediction by combination of all three risk factors for predicting placenta accreta were raised to 83.5%, 75% and 92.9%, respectively. We obtained three different risk groups by different combination of all three risk factors.
Conclusions: The study suggested that two or more instances of previous cesarean deliveries and/or abortion, placenta previa and placenta-myometrial interface interruption were independent risk factors for placenta accreta. Combination of a single clinical risk factor and MRI risk factor can improve the diagnosis of placenta accreta and combination of all three risk factors could help to recognize patients with placenta accreta.

PU-1217

沟槽状胰腺炎的影像诊断

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目的

沟槽状胰腺炎(groove pancreatitis,GP)是一种特殊的慢性节段性胰腺炎,由于其发病部位特殊且临床 表现与胰头部肿瘤相似,术前诊断十分困难。GP 发病率较低,目前尚无确切发病率统计,国内对此报道甚少,许多临床医师对此病仍较为陌生。现就我院一例疑似 GP 患者的临床及影像特征并结合近年相关文献报道，总结分析沟槽状胰腺炎的影像诊断思路，以提高和加强对该病的认识。

方法

回顾性分析我院疑似沟槽性胰腺炎患者，收集血清学和影像学资料并结合文献报道，研究沟槽胰腺炎的临床和磁共振成像特征。

结果

GP 主要表现为餐后腹痛,同时可伴有恶心、呕吐、体重进行性下降,通常不合并黄疸、脂肪泻、糖尿病 等症状。 查体可有上腹部压痛。GP 高危人群是既往有慢性饮酒病史的 40 ~ 50 岁男性。血清学检查方面,GP 患者可有脂肪酶、淀粉酶、转氨酶的轻度升高,CEA、 CA19-9、CA125 等肿瘤标记物在正常范围。

影像表现可见如下表现：①CT 扫描中可见“片状样”低密度、低强化肿块,胆总管可有轻度 扩张,在动态强化扫描中,呈强化延迟; ②MRI 扫描中 T1WI 为低信号,T2WI 为低信号至稍高信号; 在增强扫描中表现为一种延迟、渐进性、不均匀强化; 十二指肠降段增厚，常伴有十二指肠降段增厚壁内囊性病变。

结论

我们的研究结果表明，MR 成像具有可识别的成像特征，有助于沟槽胰腺炎诊断。 这些特征包括以下内容：①十二指肠降段的局部增厚; ②十二指肠降段的局部异常增强; ③胰腺小乳头区域（十二指肠降段）的囊性改变。

PU-1218

CT and MRI appearance of the ovarian dysgerminoma: emphasis on the laterality, calcification and ovarian vascular pedicle

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Purpose: To investigate CT and MRI appearance of the ovarian dysgerminoma,emphasis on laterality, calcification and ovarian vascular pedicle.

Method: This retrospective study included 24 primary ovarian dysgerminomas in 20 patients. The followed imaging features of the tumors were assessed: (i) location, shape, and size; (ii) fibrovascular septa; (iii) necrosis, hemor-rhage, calcification; (iv) ovarian vascular pedicle; (v) lymphadenopathy; and (vi) ascites; (vii) hydronephrosis.

Result: Fourteen of 20 (70%) patients has a dysgerminoma in the right ovary. Even in the 4 bilateral cases, the size of the right tumos was lager than that of the left tumors .Typical fibrovascular septa was observed in 12 of the 24 (50%) tumors. Calcification was present in 6 of the 10 (60%) tumors in CT. Ovarian vascular pedicle sign was showed in 20 of the 24 (83.3%) tumors. Lymphadenopathy was found in 6 of 10 (60%) patients. Hydronephrosis was present in 6 of 16 (37.5%) cases.

Conclusion: Dysgerminoma was dominantly located in the right ovary. Calcification and ovarian vascular pedicle sign is helpful in diagnosis of the ovarian dysgerminoma.

PU-1219

Quantitative analysis of multiphase magnetic resonance images may assist prediction of histopathological grade of small hepatocellular carcinoma

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ABSTRACT
OBJECTIVE: This study aimed to investigate whether preoperative quantitative analysis of multiphase magnetic resonance images may assist to predict the pathological grade of small hepatocellular carcinoma.
METHODS: Forty nine patients underwent multiphase magnetic resonance imaging and were retrospectively reviewed. Routine unenhanced MRI and post gadobenate dimeglumine (Gd-BOPTA) enhanced MRI were preoperatively performed. Signal intensities (SI) were measured within the designated regions of interest (ROI) including the lesion and paraspinous muscles. The lesion-to-paraspinous muscle relative contrast ratio on T2W, DWI, and dynamic phase Gd-BOPTA enhanced T1W imaging were calculated and statistical analysis was performed to determine predictive power for histological grade.
RESULTS: The forty nine cases included three well differentiated (WD) HCCs, 36 moderately differentiated (MD) HCCs, and 10 poorly differentiated (PD) HCCs. There was a negative correlation between the relative contrast ratio and small hepatocellular carcinoma pathological grade in the arterial phase ($\rho = -0.305$, $P < 0.05$). However, there was no correlation between relative contrast ratio in other phases and pathological grade of small hepatocellular carcinoma(all $P > 0.05$). In addition, there was also no correlation between tumor margin, tumor location, cystic/necrotic change, intratumoral fat, enhancement pattern, tumor capsule, tumor boundary or tumor size among any of the differentiation categories (all $P > 0.05$).
CONCLUSION: The lesion-to-paraspinous muscle relative contrast ratio on arterial phase Gd-BOPTA enhanced T1W imaging may be useful for the prediction of the histological characteristics of small hepatocellular carcinoma.

PU-1220

MRI 流入反转恢复序列在肾动脉成像中的应用

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【摘要】**目的** 肾动脉增强磁共振血管成像 （contrast enhancement MRA，CE -MRA）虽然是非侵入、无辐射的，曾经被认为是比较安全的血管成像方法，但随着含钆对比剂的使用与肾纤维化的相关报道增多，人们对使用磁共振对比剂的顾虑也加重，因此非对比剂增强 MRA 备受关注，本研究

运用 MRI 平衡式稳态自由进动流入反转恢复（IFIR）序列对肾动脉进行非对比剂增强成像，探讨 IFIR 技术在肾动脉成像中应用。

方法 收集我院 2018 年 4 月至 2019 年 6 月心血管内科病房有肾动脉病变临床特征的高血压患者 25 例，均运用无对比剂肾动脉血管成像 IFIR 序列和对比剂增强 LAVA-Flex 序列进行肾动脉 MRA 成像，对扫描图像在 AW4.6 工作站进行后处理，由 2 名诊断医生分析血管显示及其分支，将 IFIR 序列肾动脉 MRA 检查结果与同期对比剂增强 MRA 检查结果做对比分析，统计肾动脉成像情况及狭窄率。

结果 25 例患者均成功扫描，共获得肾动脉 58 支，其中 55 支可测量肾动脉狭窄率。IFIR 序列 MRA 与对比增强 MRA 对肾动脉显示图像质量评价结果差异无统计学意义（$p>0.05$）；IFIR 序列 MRA 与对比增强 MRA 显示肾动脉狭窄率分级评价结果差异无统计学意义（$p>0.05$）。

结论 ：IFIR 序列在评价肾动脉狭窄上与对比增强 MRA 一致性好，且简便、安全、经济及可靠，拥有广泛的应用前景。

PU-1221

磁共振注水中、低位直肠癌的检查应用

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【摘要】 目的 随着近年来，中、低位直肠癌的患病率逐年升高，以及各种多元化检查方法的普及，MRI 检查目前已成为直肠癌术前评估的重要检查方法。根据 MRI 对软组织分辨率高，能多平面、多参数、多方位成像这些优点，本研究主要探讨 MRI 注水直肠检查，加上 LAVA-FLEX 序列增强检查观察直肠壁内和盆腔的改变。尤其 MRI 注水直肠成像对直肠肿瘤的分期以及鉴别术后肿瘤的复发与盆腔淋巴结转移有一定的意义。

方法 患者在检查床上取侧卧位，向直肠内注入 300ml 生理盐水，采用 GE1.5T 或 3.0T 磁共振的 LAVA-FLEX、T2WI 序列以及两组 B 值（500-1000）DWI 序列进行扫描，之后对患者注射对比剂采用 LAVA-FLEX 序列进行增强扫描，对其诊断结果进行总结。

结果 磁共振的 LAVA-FLEX、T2WI 序列以及两组 B 值（500-1000）DWI 序列检查图像效果满意，LAVA-FLEX 序列增强能较好的显示病变的大小、部位及对邻近解剖结构的侵犯。相对优于肠镜，不仅时间短、对患者无创伤，而且还可以多平面，多方位的观察腔内及腔外的情况，并观察盆腔是否有淋巴结转移。

结论 磁共振注水直肠并且采用磁共振的 LAVA-FLEX、T2WI 序列以及两组 B 值（500-1000）DWI 序列能很好的显示直肠内壁及外壁的情况，能清楚的显示肿瘤的位置，软组织分辨率高，是评估直肠癌以及直肠癌分期的重要检查方法。

PU-1222

探讨对比口服对比剂与不口服对比剂 MRCP 检查

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目的 探讨对比口服对比剂与不口服对比剂在磁共振胰胆道成像(MRCP)检查中的图像质量。**方法** 我院 2019.3.1 至 2019.3.31 需做 MRCP 检查的患者 5 名口服对比剂和 5 名不口服对比剂分别进行 MRCP 扫描,观察并比较胃、十二指肠信号丢失情况及胆道系统图像质量。**结果** 口服对比剂扫描

胆总管、胆胰壶腹、胰管及胆囊的图像质量均优于不口服对比剂，但不口服对比剂的图像亦可清楚显示胆总管、胆胰壶腹、胰管及胆囊，达到明确诊断的要求。**结论** 口服对比剂扫描 MRCP 优于不口服对比剂，但是对于部分病重患者因不能口服对比剂和水亦可检查 MRCP 达到诊断的要求。

PU-1223
子宫腺瘤样瘤与子宫肌瘤磁共振征象的对比分析

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目的 探讨子宫腺瘤样瘤和子宫肌瘤的 MRI 征象，以提高对两病的认识和鉴别。
方法 回顾性分析、对比经手术病理证实的 25 例子宫腺瘤样瘤和 79 例子宫肌瘤的 MRI 表现。
结果 子宫腺瘤样瘤和子宫肌瘤好发年龄均为中年妇女，部位以肌壁多见，平均直径约 3.7～3.9cm，前者呈囊性病变伴实性结节或实性肿块，实性肿块 T1WI 呈等信号，T2WI 多呈均匀低信号，大部分均匀强化且强化程度多低于宫肌，较少出现假包膜；后者呈实性肿块，T1WI 呈等信号，T2WI 呈均匀或不均匀低信号，内常见斑片高信号、高信号分隔征，呈均匀或不均匀强化且强化程度多等于或高于宫肌，时常可见假包膜。
结论 子宫腺瘤样瘤 MRI 与子宫肌瘤 MRI 表现相似，T2WI 高信号分隔征、强化程度等高于宫肌及出现假包膜是肌瘤区分 AT 的特征表现，单发囊实性结节或实性结节 T2WI 呈均匀低信号、均匀强化且强化程度低于宫肌时需考虑到腺瘤样瘤可能，最后确诊依靠病理。

PU-1224
磁共振多模态扫描对 T2DM 患者治疗后肝脏、胰腺脂肪的变化的研究

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目的 评价西门子 3.0T 磁共振系统成像技术测量 2 型糖尿病患者治疗前后肝脏、胰腺脂肪含量的对比，探讨治疗 6 个月后 T2DM 患者肝脏、胰腺、腹腔内脂肪含量的变化。
材料与方法 本研究纳入 18 例临床诊断为 T2DM 的患者，依据中国 2 型糖尿病防治指南(2013 版)推荐的生活方式干预法配合药物来控制血糖和体脂，治疗周期为 6 个月。所有患者于治疗前、后分别在西门子 3.0 T 磁共振成像系统上进行水脂分离技术和 MRS 脂肪定量扫描。图像采集完成后，通过快速脂肪定量和手工勾画感兴趣区(region of interest，ROI)两种不同的方式分别对肝脏、胰腺的平均脂肪含量进行定量分析。最后采用 SPSS 20. 0 软件进行数据分析。分类资料采用百分比(%)表示。应用 Spearman 方法进行各类 FF 百分比的相关性分析。检验水准(α)为 0.05。
结果 通过比对每一位受试者在各序列测得的 FF 值，得出 Screening Dixon 与 ME Dixon 测得的 FF 值高度正相关(r=0.827、0.953、0.950，P< 0.001)；Screening Dixon 及 ME Dixon 与 Histo 测得的 FF 值高度正相关(r=0.963、0.843、0.956、0.945，P<0.001；)。
结论 运用经过改良的 ME Dixon 技术，可一次采集获得 ME 图像，并可在 FF 图中自由测得任何所需的 FF 值，此技术对于 T2MD 患者肝脏、胰腺脂肪含量的测定结果较为真实、可信。该检查快速、可靠、无创，对于 T2MD 预后的评估、随访和干预监测均具有一定的临床价值。

PU-1225
多模态 MRI 对位于子宫肌层的富于细胞型肌瘤及子宫肉瘤的鉴别诊断

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目的 探索磁共振成像(magnetic resonance imaging，MRI)定性及定量参数对位于子宫肌层的子宫肉瘤(uterine sarcomas, US)及富于细胞型肌瘤(cellular leiomyomas, CL)的鉴别价值。**方法** 回顾分析 2013 年 1 月至 2019 年 4 月间由我院病例证实的 44 例 CL 患者和 44 例 US 患者，术前均行 MRI、扩散加权成像(diffusion weighted imaging，DWI)及动态增强 MRI (dynamic contrast-enhanced MRI，DCE-MRI)检查。由 2 名有经验的放射科医生评估肿瘤的部位。将以上数据随机分为训练集及测试集。收集患者的年龄、临床表现、生育史、有无 CA125 及乳酸脱氢酶（LDH）升高，并分析并比较两组患者肿瘤在 MRI 定性图像特点、DWI 及 DCE-MRI 半定量参数方面的差异性。**结果** 训练集共纳入 22 例 CL 及 14 例 US，测试集共纳入 13 例 CL 及 10 例 US。阴道异常流血、T2WI 边界不清、实质 T2WI 混杂信号、mADC<1.029×10^{-3} mm^2/s、肿瘤内部出血、中央坏死为 US 的重要预测因子，另外 US 的时间信号强度曲线更多的表现为 III 型(P<0.001)。患者的年龄、生育史、CA125 及 LDH 水平、T2WI 相对信号强度、实质 DWI 信号、肿瘤的大小、早期强化率 (early enhancement ratio，EER)、最大对比增强率(maximum contrast enhancement ratio，MCER)无统计学差异。利用逻辑回归计算变量的参数估计值，5 个指标的总分大于等于 4 分时，诊断子宫肉瘤的敏感性、特异性、正确率、阳性预测值、阴性预测值分别为 90.91%、92.31%、95.65%、100%、92.31%。**结论** 多参数 MRI 在 US 与 CL 的鉴别诊断中具有重要价值。

PU-1226
重复使用碘对比剂对正常 wistar 大鼠肾脏功能的影响及功能磁共振评价的实验研究

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目的 研究重复注射碘克沙醇对正常大鼠肾脏影响及最短的时间间隔。材料和**方法** wistar 大鼠 42 只，随机分为 2 次注射组（15 只），1 次注射组（5 只），对照组（5 只）与注入碘克沙醇 1h 后扫描 BOLD。2 次组按重复注射间隔分为 1 天组，3 天组，5 天组。余 17 只大鼠间隔 1 天重复注射碘克沙醇后 1h、1d、3d、5d、10d 扫描 BOLD。**结果** 各组间 1h 带 R2*值比较得出，间隔 1 天组，间隔 3 天组较 1 次组 R2*差异有统计学意义（p<0.05），5 天组 R2*与 1 次组比较差异无统计学意义（p>0.05）。间隔 1 天组内不同时间点与基线相比在第 5 天 ISOM 带 R2*值差异有统计学意义（p<0.05），病理显示在第 5 天肾脏损伤仍存在。**结论** 短期内重复注射碘克沙醇会加重大鼠肾脏损伤，引起对比剂诱导的急性肾损伤的发生。

PU-1227

Resveratrol Protects against Post-contrast Acute Kidney Injury in Rabbits with Diabetic Nephropathy

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Objective: Resveratrol (Res) is known as a multi-functional polyphenol compound that has protective functions in acute kidney diseases. Here, we aimed to examine whether the resveratrol could ameliorate post-contrast acute kidney injury (PC-AKI) following diabetic nephropathy (DN), and to explore its underlying mechanism(s) *in vivo* and *in vitro*. **Materials and Methods:** Twenty-four rabbits with DN were randomly divided into four groups: control (Cont), resveratrol (Res), iohexol (PC-AKI), and resveratrol plus iohexol (Res+PC-AKI) groups. Functional magnetic resonance imaging, renal histology, blood and urinary biomarkers, silent information regulator 1 (SIRT1), peroxisome proliferator-activated receptor gamma coactivator-1 alpha (PGC-1α), hypoxia-inducible transcription factor-1α (HIF-1α), and apoptosis-associated protein expression were assessed in *ex vivo*. For *in vitro* experiments, renal tubular epithelial (HK-2) cells subjected to high glucose conditions were treated with resveratrol, Ex527, or 2-methoxyestradiol (2-MeOE2) before treatment with iohexol. **Results:** Compared to the PC-AKI group, levels of cystatin C and urinary neutrophil gelatinase-associated lipocalin were all decreased; pure molecular diffusion (*D*), and the fraction of water flowing in capillaries (*f*) increased, while the apparent relaxation rate (*R2**), renal injury score and apoptosis rate decreased; moreover, protein expression levels of SIRT1and PGC-1α increased, and those of HIF-1α and apoptosis-associated protein decreased in the Res+PC-AKI group. In addition, iohexol decreased HK-2 cell survival and increased the cell apoptosis rate; results were reversed after treating cells with resveratrol. **Conclusion:** Resveratrol reduced renal hypoxia, mitochondrial dysfunction and renal tubular cell apoptosis by activating SIRT1-PGC-1α-HIF-1α signaling pathways in PC-AKI with DN.

PU-1228
肝脏含脂质肿瘤患者的磁共振 ＤＷＩ影像应用

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目的 探讨磁共振 ＤＷＩ影像在肝脏含脂质肿瘤患者鉴别诊断中的应用价值。方法 对２０１７年１月至２０１８ 年１月在医院确诊的１２０例肝脏含脂质肿瘤患者进行回顾性分析，经病理诊断恶性肿瘤５０例，良性肿瘤７０例。采用磁共 振 ＤＷＩ影像技术对患者的表观扩散系数（ＡＤＣ）值和 ＡＤＣ 肿瘤／ＡＤＣ 肝脏（ｒＡＤＣ）值进行检测，对常规 ＭＲＩ检测患者良 恶性的比例进行记录，比较 ＭＲＩ、ＡＤＣ和ｒＡＤＣ鉴别肝脏含脂质肿瘤患者良恶性的准确度。结果 含脂质肝细胞癌患者、 肝腺瘤患者和肝脏血管平滑肌脂肪瘤患者的 ＡＤＣ值分别为（１．２１５±０．２２３）×１０－３ ｍｍ／ｓ、（１．３１９±０．２１３）×１０－３ ｍｍ／ｓ和（１．３１８±０．２９８）×１０－３ ｍｍ／ｓ，含脂质肝细胞癌患者、肝腺瘤患者和肝 脏血管平滑肌脂肪瘤患者的ｒＡＤＣ值分别为（１．００５±０．１５１）、（０．９８５±０．１４５）和（１．０２８±０．２２４），三者的 ＡＤＣ值和ｒＡＤＣ值差

异无统计学意义（摩＞０．０５）。ＭＲＩ检测 恶性肿瘤恶性４４例（８８．００％）、良性６例（１２．００％），检测良性肿瘤良性５１例（７２．８６％）、恶性１９例（２７．１４％），其数据比较 差异有统计学意义（摩＜０．０５）。ＭＲＩ鉴别肝脏含脂质良恶性肿瘤的灵敏度、特异度和准确度分别为８８．００％、７４．５０％和 ８１．００％，ＡＤＣ值鉴别肝脏含脂质良恶性肿瘤的灵敏度、特异度和准确度分别为２１．００％、８０．００％和６４．２１％， ｒＡＤＣ值鉴 别肝脏含脂质良恶性肿瘤的敏感度、特异度和准确度分别为８２．１０％、３２．１４％和６１．５０％，三者数据比较差异有统计学意 义（摩＜０．０５）。结论 ＡＤＣ值和ｒＡＤＣ值在肝脏含脂质肿瘤患者鉴别诊断中不具备诊断价值，ＭＲＩ检测能够成为鉴别诊 断肝脏含脂质良恶性肿瘤的重要依据。

PU-1229

压缩感知快速成像在肝脏动态成像中的应用

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目的 应用 3.0T 磁共振采用 Compressed Sensing（CS）技术对肝脏占位病例进行快速动态增强扫描，对所显示多组动脉期图像质量进行评估，评价其应用价值。

方法 随机选取临床诊断为肝局灶性病变患者 25 例行磁共振动态增强检查，扫描采用 United Imaging 3.0T MRI 使用压缩感知结合并采集快速成像序列完成肝脏动脉期成像。患者检查前禁食 7-8h，并在扫描前训练患者屏气，增强扫描体位选取仰卧位，扫描范围自膈顶至肝脏下极。采用 8 通道体部矩阵线圈，经肘静脉团注 Gd-DTPA, 剂量 0.1ml/kg，注射流速 1ml/s，追加生理盐水 20ml，注射流速 2ml/s 行动态增强扫描。注入造影剂后 20s 开始扫描动脉第一期，设置动脉期每期扫描平均时间 2s，整个动脉期扫描耗时 16s，时间分辨率为 2s，共获取 8 期动脉期成像。对各期相图像质量进行评分，绘制病灶及肝脏动脉强化曲线评价其临床可行性。

结果 一次屏气扫描所得 8 个动脉时相：第 1-5 期为动脉早期（只有动脉显影，门静脉不显影），后 6-8 期为动脉晚期（动脉和门静脉同时显示），所示动脉 8 期均为连续独立期相显示，动态强化曲线可描述病灶动脉早期至动脉晚期强化状态，可全程显示动脉强化过程。两名腹部磁共振医师对图像诊断一致性较好 kappa 评分为 0.915;图像质量评分为 3.67±0.48 和 3.72±0.56.

结论 CS 快速成像技术在肝脏增强的应用可以获得更多病灶血供信息，有广泛的应用前景。

PU-1230

多模态磁共振对早期宫颈癌盆腔淋巴结转移的评估

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目的:探讨多模态磁共振在评估早期宫颈癌盆腔淋巴结转移中的应用价值。材料与方法:回顾性分析经病理证实的 57 例 IB1～IIA1 期宫颈癌患者，其中 19 人存在盆腔淋巴结转移，所有患者均行常规 MR 平扫、DWI 及 DCE-MRI 增强扫描。纳入术前磁共振检查与术后病理相对应淋巴结 94 枚（转移性淋巴结 30 枚，非转移性淋巴结 64 枚）。测量各淋巴结短径、DWI 相关参数（ADC）及 DCE-MRI 定量灌注参数（Ktrans、Kep、Ve），以及原发肿瘤的 DWI 及 DCE-MRI 相关参数。通过秩和检验对各

参数进行比较分析；通过 Logistic 回归模型拟合联合预测因子；绘制淋巴结短径、DCE-MRI 定量灌注参数及联合预测因子的 ROC 曲线，获取诊断界值。结果:转移性与非转移性原发肿瘤之间 ADC 值、Ktrans、Kep、Ve 均无统计学差异。转移淋巴结短径、ADC 值、Ktrans、Kep、Ve 均大于非转移淋巴结，且差异有统计学意义（P＜0.05）；淋巴结短径、ADC 值、Ktrans、Kep、Ve 的 ROC 曲线下面积分别为 0.834、0.849、0.784、0.648、0.703；Logistic 回归表明淋巴结短径、ADC 值以及 Ktrans 值为淋巴结转移的独立影响因子，三者的联合预测因子 prel 的曲线下面积为 0.930。结论:DWI 及 DCE-MRI 无法表明早期宫颈癌患者原发肿瘤的转移潜能。淋巴结短径、DWI 及 DCE-MRI 均可用于评估早期宫颈癌患者盆腔转移淋巴结，以三者联合评估结果最佳。

PU-1231

Gd-EOB-DTPA 增强 MRI T1 mapping 及 DWI 在肝细胞癌 TACE 术后摄取碘油预测研究

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目的 探讨 Gd-EOB-DTPA-MRI T1 mapping 及 DWI 在肝癌 TACE 术后碘油沉积预测价值。
材料与**方法** 收集 TACE 术前行 Gd-EOB-DTPA-MRI T1 mapping 检查的 HCC 患者 34 例（共 46 个病灶），其中男 30 例，女 4 例，年龄 34~71 岁(平均 54.53±9.81 岁)。根据 TACE 术后上腹部 CT 评估碘油沉积的情况，将碘油沉积率≥50%的 HCC 病灶分为碘油沉积好的组（LGU），碘油沉积率<50%的为碘油沉积差的组（LPU）。测量病灶的 ADC 值（DWI b=800s/mm^2）、20min 肝胆期病灶和非瘤肝实质的 T1 值，并计算肝胆期病灶相对非瘤肝实质 T1 值增加率[$T1_{(L-H)/H}$ (%)]。用 Pearson 相关和 T 检验分析 ADC 值、$T1_{(L-H)/H}$ (%)与碘油沉积率的相关系，绘制 ROC 曲线评估以上参数对于鉴别两组不同碘油沉积率 HCC 的诊断效能。
结果 46 个 HCC 病灶中 21 个（45.65%）为 LGU 组，25 个（54.35%）为 LPU 组。LGU 和 LPU 的 ADC 值（mm^2/s）、$T1_{(L-H)/H}$ (%)分别为 940.25±156.05、935.72±138.72，265.77±91.72、173.31±94.16。LGU 和 LPU 的 $T1_{(L-H)/H}$ (%)差异有统计学意义（p<0.01），与 HCC 的碘油沉积率呈中等正相关（r=0.452，p<0.01），对于区分 LGU 和 LPU HCC 的敏感度和特异度分别为 76.0%和 85.7%，AUC 为 0.787，最佳阈值分别为 205.85%。ADC 值与碘油沉积率无统计学差异（p>0.05）。
结论 Gd-EOB-DTPA-MRI T1 mapping 的相关参数 $T1_{(L-H)/H}$ (%)对于预测 HCC TACE 术后碘油沉积有一定的价值。TACE 术前 HCC 的 ADC 值与碘油的沉积率无相关性。

PU-1232

产前 MRI 检查在胎盘植入中的诊断价值

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[摘要] 目的:分析 MRI 在胎盘植入产前诊断中的影像特征及应用价值。资料和方法:回顾性分析 44 例产前怀疑胎盘植入患者的 MRI 影像表现和临床术后资料，以分娩术后有无胎盘植入为金标准，分为 20 例无胎盘植入对照组和 24 例胎盘植入组，分别对胎盘异质性、胎盘-子宫肌层交界面分界不清、子宫下段向外膨隆伴局部胎盘明显增厚、胎盘血管增粗增多、膀胱局部“帐篷”状改变或结节状突起五种间接征象，采用二元 Logistic 回归进行单因素和多因素的分析，比较 MRI 征象在两组间的差异性。结果:胎盘的异质性诊断胎盘植入的 OR 值为 17.017（*P*=0.005）； 子宫下段膨隆伴局部胎盘明显增厚,诊断胎盘植入的 OR 值为 6.712（*P*=0.049）。多因素分析时胎盘的异质

性和子宫下段膨隆伴局部胎盘明显增厚诊断胎盘植入的 OR 值分别为 13.542（P=0.004）和 7.145（P=0.038）。**结论** 胎盘的异质性以及子宫下段膨隆伴局部胎盘明显增厚两个征象对胎盘植入的诊断具有很高的应用价值。

PU-1233
环状分子钆螯合物钆特酸葡胺 在前列腺增生的效果评价及与线状分子钆螯合物的比较

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目的 旨在评价环状分子结构钆螯合物 MRI 对比剂（钆特酸葡胺）对前列腺增生的增强效果和诊断价值，并与线状分子结构钆螯合物对比剂进行比较。**方法** 回顾性分析 75 例前列腺增生患者的多期动态增强和延迟期增强 MRI 表现，测量和观察钆特酸葡胺（观察组）和 3 个对照组：钆喷酸葡胺（Magnevist）、钆喷酸葡胺（Consun）和钆双胺（OMNISCAN）对增生结节的强化程度、对比噪声比、动态增强曲线形态及包膜显示的清晰程度，应用方差分析和 X^2 检验进行比较。**结果** 观察组和 3 个对照组的年龄、血清 PSA 水平和前列腺增生结节的大小均无显著性差异。在动态增强，观察组和 3 个对照组的前列腺增生结节基础信号强度、最大信号强度、增强幅度和上升斜率均无显著性差异。在延迟期扫描序列，观察组增生结节包膜的强化信号强度、包膜与闭孔内肌之间的 CNR 明显高于对照组（p 均<0.05）；各组结节实质的信号强度无显著性的差异，而观察组结节实质与闭孔内肌的 CNR 高于对照组 4（欧乃影）(F=6.79,p=0.00)，但与其他对照组无显著性差异。增生结节包膜显示例数在观察组明显高于 3 个对照组（X^2=127.9，p=0.00）。**结论** 环状分子结构钆特酸葡胺在 MRI 动态增强中，增强效果与线状分子结构对比剂相同，而其曲线类型更接近良性病变表现；延迟期强化所显示增生结节包膜强化更明显，表明其增强效果优于线状分子结构的对比剂。

PU-1234
磁共振 mapping 定量技术检测肩关节软骨退变的对比分析

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摘要：目的 采用 T1mapping、T2mapping 定量技术评价肩关节软骨退变程度，探讨两种技术对肩关节软骨退变的诊断价值。方法 肩关节退变的患者 50 例，正常对照组志愿者 20 例行肩关节平扫和 T1、T2 mapping 成像，后处理得伪彩图，将肩关节软骨三等分，测量每等分中心部位的 T1 值、T2 值，比较病例组与对照组间的 T1 值、T2 值差异。结果 病例组内中外带 T1 值均明显高于正常对照组，病例组内中外带 T2 值均明显低于正常对照组，两组之间 T1 值、T2 值均存在明显差异。结论 T1、T2mapping 技术可用于评价肩关节软骨成分与退变程度。

PU-1235
T1 mapping 评估足底筋膜炎体外冲击波治疗疗效的价值

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目的 探究磁共振 T1 mapping 用于定量评估足底筋膜炎患者体外冲击波治疗疗效及疗效预测的应用价值。 **方法** 对符合条件的 23 例足底筋膜炎患者进行一个疗程（三次）体外冲击波治疗，一个星期一次，分别于首次冲击波治疗前、治疗后 4 小时以及复查时进行磁共振矢状位及冠状位的 T1WI、T2WI 及 T1 mapping 序列扫描，在治疗前及复查时行视觉模拟评分法（visual analogue scale，VAS）进行疼痛评价。采用配对样本 t 检验比较治疗前与复查时筋膜、肌肉、脂肪垫 T1 值及 VAS 评分的差异，同时采用 Pearson 相关分析上述感兴趣区首次治疗前后 T1 值变化量与 VAS 变化量的相关性。 **结果** 经一个疗程体外冲击波治疗后，筋膜炎患者筋膜、肌肉、脂肪垫 T1 值及 VAS 评分均有不同程度降低。筋膜（*r=0.837，P＜0.001*）、肌肉（*r=0.560，P=0.005*）、脂肪垫（*r=0.667，P=0.001*）的 T1 值变化量与 VAS 评分变化量具有良好的相关性。 **结论** T1 mapping 技术可以有效评估体外冲击波治疗疗效，且短期治疗后的 T1 值变化能有效预测远期治疗疗效。

PU-1236

腹腔干作为胸椎 MRI 定位标志的可行性

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[摘 要] **目的** 探讨腹腔干作为胸椎 MRI 定位标志的可行性。**方法** 观察 100 例胸椎 MR 扫描定位像上腹腔干的形态特点。参考 MR 定位像腹腔干形态表现，回顾性分析 531 例行胸部及全腹部增强 CT 检查的患者。在图像后处理工作站，采用多平面重建(MPR)、容积再重建(VR)成像，观察腹腔干起始部在脊柱中的水平位置。由三组技师分别按照 L1 椎体或脊髓圆锥定位法、大视野定位法、腹腔干定位法完成定位任务，比较其准确性和耗时时间。**结果** MR 定位像腹腔干形态大多具有特定表现，多位于胸 12 椎体。531 例患者中，腹腔干起始部位置：8 例（2%）位于 T11/T12 椎间隙及以上水平，217 例（41%）位于 T12 椎体水平，170 例（32%）位于 T12/L1 椎间隙水平,136 例（25%）位于 L1 椎体及以下。三种定位测试结果与 MR 定位像观察结果大致相似。**结论** 依据 MR 定位像上腹腔干典型形态，结合三种定位测试结果位置，确定腹腔干作为胸椎 MRI 定位标志为胸 12 椎体，可以有效判断胸椎位置。尤其对于急诊胸椎外伤，腹腔干可对椎体骨折部位作出初步定位。

PU-1237

膝关节腔囊性病变的磁共振影像诊断

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膝关节解剖结构复杂，韧带、肌腱及固有滑囊较多，由于膝关节活动度大，容易受到伤害，该区域囊性病变发生率高，且种类较多。滑膜囊肿常见的有腘窝囊肿、鹅足囊肿、浅髌下滑囊囊肿、髌前滑囊囊肿等；交叉韧带囊肿属于关节内腱鞘囊肿；半月板囊肿常伴有半月板损伤。

腘窝囊肿为膝关节最常见的滑膜囊肿，由腘窝处腓肠肌内侧头与半膜肌滑囊积液形成，又称 Baker′s 囊肿。腓肠肌与半膜肌滑囊是正常解剖结构，位于腓肠肌内侧头与半膜肌肌腱之间，当发生关节炎、交叉韧带损伤、半月板损伤等关节疾病时关节积液增多，积液可从裂隙流入腘窝内滑囊引起滑囊积液，偶有滑囊破裂引起炎性病变。

浅髌下滑囊位于髌骨下方皮下，故又称髌下皮下滑囊，常因炎症、慢性劳损、外伤引起滑囊积液，MRI 多表现为椭圆形囊性病灶，当囊内出血时可见液-液平面。

交叉韧带囊肿又名交叉韧带腱鞘囊肿，是一种较为少见发生在关节内的疾病，多为单侧发病，前交叉韧带囊肿发病率多于后交叉韧带囊肿，常见于交叉韧带胫骨止点。
半月板囊肿发生于半月板内或者半月板周边，以半月板旁囊肿较为多见，其发生常与外伤、退变、半月板手术等有关。半月板旁囊肿常伴有半月板的水平撕裂，囊肿与半月板撕裂处相接，表现为半月板周围囊腔或者单纯液体聚集。

PU-1238
腰椎椎间小关节积液与腰椎稳定性的 MRI 相关性分析

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目的 通过回顾患者影像学资料，分析退变性腰椎滑脱患者腰椎椎间小关节积液是否与腰椎稳定性存在相关性。
方法 本研究回顾性分析我院脊柱外科 2016 年 9 月到 2019 年 3 月间来院就诊的 L4-5 节段腰椎退变性滑脱共 108 人。根据其滑脱节段的腰椎 MRI 中是否出现椎间小关节腔内积液将患者分为“无积液组”和“有积液组”后进行对比分析。对“有积液组”中的双侧椎间小关节积液宽度和与矢状位椎体动态滑移指数、椎体旋转度、双侧椎间小关节退变指数和及椎间盘退变指数之间进行相关性分析。
结果 “无积液组”和“有积液组”相比， “无积液组”的失稳率低于“有积液组”，“无积液组”动态滑移量及动态滑移指数小于“有积液组”，“无积液组”矢状位旋转度小于“有积液组”，“无积液组”椎间小关节及椎间盘退变程度均高于“有积液组”。对“有积液组”的相关性分析，双侧椎间小关节积液宽度和分别与矢状位椎体动态滑移指数、矢状位椎体旋转度成线性正相关；双侧椎间小关节积液宽度和分别与双侧椎间小关节退变指数和椎间盘退变指数成负相关。
结论 退变性腰椎滑脱症患者腰椎 MRI 上存在椎间小关节积液表现可提示滑脱不稳定，滑脱节段椎间小关节总积液量与腰椎的滑移不稳定性、旋转不稳定性成正相关，与双侧椎间小关节的退变程度、椎间盘的退变程度成负相关。本研究认为腰椎小关节积液量可有效预判腰椎在矢状位滑移和角度旋转上的失稳状态，能够较为全面的评估滑脱节段的稳定性，腰椎 MRI 中小关节积液量可帮助决策腰椎手术的治疗方案。

PU-1239
1.5T 场强下 3D 高分辨对比增强率磁共振臂丛神经成像的应用价值研究

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摘要：目的 探讨 1.5T 场强下，重 T2 加权 3D T2-SPACE-STIR 序列在臂丛神经走行、分布、与周围组织的对比以及相关疾病诊断的临床应用价值。
方法 连续随机搜集来我院行臂丛神经磁共振检查的患者共 85 例，随机分为两组 A 组和 B 组，分别在 3.0T 和 1.5T MRI 臂丛神经成像，采用对比增强重 T2 加权 3D T2-SPACE-STIR 序列扫描。由两位从事 10 年以上神经 MRI 诊断医生对两种场强下所得臂丛神经图像的显示及伪影进行评价
[h1] 并打分，测量特征点信噪比（SNR）,对比噪声比（CNR），计算其神经和背景组织的对比值（CR，contrast ratio），观察臂丛神经相关性疾病在该序列中的 MR 表现。**结果** （1） 3.0T 场强下所得臂丛神经图像得分较高（3.0T,18.3±1.2）；(1.5T,14.5±1.1)，两种场强下臂丛神经显

示情况均可以满足临床需求（大于 12 分）；（2）图像伪影评分，（4.1±0.7，1.5T）高于（2.9±1.4,3.0T）（P＜0.001），两者差异具有统计学意义；（3） 3.0T 场强下的 SNR 与 CNR 相较于 1.5T 为高，1.5T 场强下各对比组 CR 值均高于 3.0T，且神经相对肌肉的 CR 值有统计学差异。**结论** 1.5T 场强下对比增强重 T2 加权 3D T2-SPACE-STIR 序列臂丛神经成像可以满足临床上对臂丛神经疾病的诊断需求，且在抑制因压脂不均导致的图像伪影情况上要优于 3.0T，其各部位 CR 值相对 3.0T 均较高，说明 1.5T 图像在显示臂丛神经及分支与背景各组织间的差异性要更好，1.5T 下臂丛神经成像有其独到的优势。

PU-1240

磁共振 TWIST 技术在下肢血管中的应用

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目的 探讨磁共振 TWIST（Time-resolved angiography with stochastic trajectories）技术在下肢血管中的临床应用效果及价值。
方法 选取 2012 年 7 月到 2013 年 7 月于我院就诊的 56 例下肢血管病变患者为研究对象，其中下肢血管存在肿瘤病变者 24，血管性病变者 32 例。对参与本次研究的 56 例患者采取较为常规的核磁共振（MRI）平扫检测，静注造影剂（contrast media）后利用 TWIST 技术获取下肢动态血管造影，此后行常规磁共振增强扫描，对下肢血管疾病患者的临床资料、造影图像质量及下肢血管病变程度进行深入分析，并与数字减影血管造影（Digital subtraction angiography，简称 DSA）或术前术后病理结果进行反复比对研究。
结果 参与本次研究的 56 例患者均于我院成功接受磁共振 TWIST 检查，通过清晰的造影图像可以很直观地了解患者下肢动脉与静脉的结构状况与充盈程度，患有肿瘤性病变的患者肿瘤病变处的供血血管清晰分明，患有血管性病变的患者下肢曲折迂回的供血血管也可直观辨明。通过磁共振 TWIST 技术获得的诊断结果与相关手术病理诊断或数字减影血管造影诊断结果大致相同，仅个例存在差异。
结论 磁共振 TWIST 技术能有效提升动态血管造影图像的时间及空间分辨率，为医护人员的诊断决策提供必要的图像数据资料，使医生清晰直观地了解患者下肢血管病变情况，具有较高的临床使用价值。

PU-1241

Dante SPACE 序列在 3D 非对比增强高分辨率臂丛神经成像的临床研究

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目的 比较 Dante SPACE 序列和重 T2 加权 SPACE STIR 臂丛神经成像技术的临床应用价值
材料和**方法** 随机选取在试验时间内来我院行臂丛神经检查的患者共 60 例，随机分为两组，在同一磁共振扫描仪上行臂丛神经检查，一组采用常规重 T2 加权臂丛神经扫描方法，另一组采用全新 Dante SPCAE 序列进行非增强臂丛神经扫描，主要对比增强后 SPCAE 序列与 Dante SPCAE 序列的 SNR 、CNR 和背景小静脉的信号值，判断二者的成像效果。所有实验对象扫描完成后，由两位经验丰富的放射学专家分别对两序列的四个特征部分进行五分法评分，得到主观评分，另外测量两序列中神经和各背景组织的信号值，计算其 SNR 和 CNR。

结果 两组所得图像均可满足临床上关于臂丛神经的诊断要求。 Dante SPACE 序列所得图像中，背景小静脉抑制良好，信号降低，神经对比突出，显示效果好，神经相对各背景组织的 CNR 高，Dante SPACE 组除在背景抑制方面优于常规 SPACE 组之外，在发现早期的神经肿瘤病变方面上亦优于常规 SPACE 组， Dante SPACE 序列组避免使用造影剂，无 NSF 发生。
结论 Dante SPCAE 序列基本满足临床诊断要求，可以不用注射对比剂来三维高分辨大范围显示臂丛神经走形。

PU-1242
MR 零回波时间成像与 CT 对显示骨肿瘤性病变的骨质破坏对比研究

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目的 采用零回波时间（zero echo time，ZTE）成像对骨肿瘤或肿瘤样病变的患者进行扫描，比较 ZTE 与 CT 两种扫描方法在评价骨质破坏方面图像质量方面的差别。**方法** 选取 36 例患者，其中男 1 **目的** 采用零回波时间（zero echo time，ZTE）成像对骨肿瘤或肿瘤样病变的患者进行扫描，比较 ZTE 与 CT 两种扫描方法在评价骨质破坏方面图像质量方面的差别。**方法** 选取 36 例患者，其中男 18 人（平均年龄 35±20 岁），女 18 人（平均年龄 42±20 岁）。采用 MR 仪器（GE 公司，750 W MR）进行扫描，该机器可以进行 ZTE 成像，所有患者均行 ZTE-MR 及 CT 检查，并比较两种成像对于骨肿瘤或肿瘤样病变的骨质破坏的评价，图像质量评分采用 5 分制方法。**结果** 共发现 13 种不同类型的骨肿瘤或肿瘤样病变，ZTE-MR 及 CT 检查在图像质量评分分别为（4.47±0.76）和（4.97±0.16），两者间无统计学差异（Z=-1.83，*P*=0.067）。ZTE-MR 及 CT 评价者之间一致性较好（K=0.84， K=1）。**结论** 本研究提示 ZTE-MR 可以产生与 CT 相似的骨质影像，评价骨质破坏具有很好的一致性。

PU-1243
心电门控非对比增强静息间隔单次激发 MR 血管成像在下肢动脉狭窄中的应用价值

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目的 探讨心电门控非对比增强静息间隔单次激发 MR 血管成像（QISS MRA）在下肢动脉狭窄中的应用价值。**方法** 回顾性分析 2017 年 4 月至 12 月华中科技大学同济医学院附属协和医院，有下肢缺血表现且同时进行了下肢动脉 CTA 及 QISS MRA 检查的 30 例患者。患者均成功进行了下肢动脉 CTA 及心电门控非对比增强 QISS MRA 检查。将整个下肢动脉分成 19 段（腹主动脉下段、髂总动脉、髂内动脉、髂外动脉、股浅动脉、股深动脉、腘动脉、胫前动脉、胫后动脉、腓动脉）进行评价，2 名医师采用 4 分法对 QISS MRA 和 CTA 图像质量进行评分，并对动脉狭窄严重程度进行评估。同一患者不同检查方法狭窄程度及同一患者不同医师狭窄程度评分一致性的评价采用 Kappa 分析。**结果** 30 例患者共采集到 570 个血管段。医师 1 的 560/570（98.2%）段和 548/570（96.1%）段的图像质量被 CTA 和 QISS-MRA 评为优秀或良好（3、4 级），医师 2 的 561/570（98.4%）段和 544/570（95.4%）段的图像质量分别被 CTA 和 QISS-MRA 评为优秀或良好。医师 1 对 CTA 与 QISS MRA 的图像质量评分分别为（3.87±0.38）、（3.70±0.53）分，医师 2 分别为（3.86±0.40）、（3.68±0.54）分。QISS-MRA 上，570 个节段中仅 7 个（1.2%，7/570）节段得

到不能满足诊断图像质量的图像。2 名医师分别采用 CTA 与 QISS MRA 对不同节段血管狭窄程度评价的一致性良好，医师 1 对不同节段血管狭窄程度评价 CTA 与 QISS MRA 间的 Kappa 值为 0.714～0.939，医师 2 的 Kappa 值为 0.603～0.939；2 名医师间采用 QISS MRA 对不同节段血管狭窄程度评价的一致性良好，Kappa 值为 0.813～0.933。**结论** 在下肢动脉栓塞诊断中，QISS-MRA 具有较大价值。

PU-1244

磁共振弥散张量成像定量分析正常成人腰骶段神经根

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目的 探讨正常成人 L4、L5、S1 神经根磁共振弥散张量成像(DTI)和神经纤维束示踪成像(DTT)的可行性及量化特征。

方法 20 名正常成人志愿者接受 3.0T 多源磁共振检查，采用选择性激励技术(PROSET)及 DTI 融合图像，分别在 L4、L5、S1 神经根的节前神经根鞘硬膜囊出行处、神经节和节后脊神经前支出椎间孔外口处三个不同水平设定兴趣区(ROI)测量左、右两侧神经根的各向异性分数(FA)值和表观弥散系数(ADC)值，同时进行神经根 DTT。

结果 20 名正常成人志愿者 PROSET、DTI 及 DTT 均成功，可以清晰显示 L4、L5、S1 神经根，测量其 FA 及 ADC 的均值分别为 0.56±0.10 和(0.94±0.53)mm^2/s，0.52±0.11 和(1.07±0.50)mm^2/s，0.48±0.11 和(1.18±0.45)mm^2/s；各神经根相同水平左、右两侧的 FA 值及 ADC 值差异均无统计学意义(P＞0.05)；各神经根 ADC 值除节前神经根鞘硬膜囊出行处水平差异无统计学意义外，其它水平各神经根之间的 FA 值、ADC 值差异均有统计学意义(P＜0.05)，且 FA 值变化呈 L4＞L5＞S1 趋势，ADC 值变化趋势反之；同一神经根在三个不同水平的 FA 值、ADC 值差异均有统计学意义(P＜0.05)，且 FA 值变化呈节前＜神经节＜节后趋势，ADC 值变化趋势反之。

结论 正常成人 L4、L5、S1 神经根 DTI 及 DTT 是可行的，与 PROSET 融合图像能够显示神经根走行并进行量化分析，为研究神经根病变提供了较全面的影像学信息。

PU-1245

正常 SD 大鼠小腿 7T 磁共振扩散峰度成像序列优化研究

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摘要：目的 采用 7T 磁共振单通道表面线圈和单通道体线圈对正常 SD 大鼠小腿行常用扩散峰度成像（DKI）序列及优化 DKI 序列扫描，探究正常 SD 大

鼠小腿 7T 磁共振 DKI 序列较佳扫描方案。**材料与方法** 应用 7T 磁共振，分别以表面线圈+常用 DKI 序列、表面线圈+优化 DKI 序列、体线圈+常

用 DKI 序列、体线圈+优化 DKI 序列四种方案扫描 20 只正常 SD 大鼠（均为雄性，8 周龄，体重约 300g）右小腿，记录四种扫描方案的扫描时

间，计算图像信噪比（SNR），并由 3 名经过专业培训的影像科医师对图像几何变形及伪影严重程度进行评价，分为 0-3 级（0 级-无，1 级-轻

度，2 级-中度，3 级-重度）。应用 Matlab 软件作数据后处理， Image J 软件测量大鼠右小腿腓肠肌感兴趣区（ROI）的平均峰度（MK）、径

向峰度（RK）、平均扩散率(MD)和各向异性分数(FA)值评估四种扫描方案的稳定性。采用 SNK-q 检验分析各组间图像信噪比的差异性，

P<0.05 认为差异具有统计学意义。**结果** （1）用表面线圈+常用 DKI 序列/优化 DKI 序列扫描的图像均出现明显的几何变形和伪影，而用体线圈
+优化 DKI 序列扫描的图像几何变形和伪影程度较体线圈+常用 DKI 序列轻；（2）表面线圈扫描图像 SNR 较体线圈+常用 DKI 序列高，较体线圈+
优化 DKI 序列低，且差异具有统计学意义（P<0.05）；（3）无论表面线圈或体线圈，优化 DKI 序列扫描时间均比常用 DKI 序列缩短约 47%；
（4）四种扫描方案中，体线圈+优化 DKI 序列扫描图像的 MK、RK、MD、FA 值的标准差最小，稳定性最高。**结论** 体线圈+优化 DKI 序列扫描方
案在 7T 磁共振上对 SD 大鼠小腿进行扫描的图像质量最高，为临床上开展腿部 DKI 序列扫描提供了参考依据。

PU-1246

四肢软组织黏液样脂肪肉瘤的磁共振诊断

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目的 探讨 MRI 在四肢软组织黏液样脂肪肉瘤诊断中的临床应用价值。**方法** 回顾性分析 5 例经手术病理证实的黏液样脂肪肉瘤的 MRI 表现。所有病例均行 MRI 平扫及动态增强扫描。**结果** 5 例均位于四肢深部软组织内，平扫呈不均匀长 T1 长 T2 信号，内可见分隔，2 例可见少许条片状短 T1 长 T2 脂肪信号，DWI 呈高信号为主，ADC 呈稍高信号，增强扫描呈条索状、斑片状渐进性强化，3 例周边轻微水肿。**结论** 黏液样脂肪肉瘤的 MR 表现有一定特征性，脂肪信号对肿瘤的诊断有重要意义。

PU-1247

布氏杆菌脊柱炎的 MR 表现

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目的 通过对布氏杆菌感染引起脊柱炎的 MR 表现进行回顾性分析，提高对该病的诊断水平。
方法 对近 10 年 52 例血清凝聚试验阳性的布病患者的 MR 图像进行回顾性分析，总结布氏杆菌脊柱炎的 MR 表现特点。
结果:病变多发生在腰椎,以 L4 椎体发病率最高,受累椎体多伴有明显骨质增生。其中 50 例病变累及椎体，多呈轻度楔形变或虫噬样改变，信号以 T1WI 低信号为主，T2WI 可见混杂高信号，脂肪抑制 T2 序列病变呈高信号，增强扫描呈不均匀强化。48 例病变累及椎间盘，其中 45 例椎间隙变窄，椎间盘病变以 T1WI 低信号为主，T2WI 可见混杂高信号，脂肪抑制 T2 序列病变呈高信号，增强扫描呈不均匀强化。46 例椎旁可见条状或梭形异常信号影，位于椎前、两侧或椎体后方，T1 加权像呈低信号或中等信号，T2 加权像呈高低混杂信号，增强扫描 34 例呈条状强化，12 例呈不均匀强化，可见不规则强化的脓肿壁，中心不强化，椎体后方的脓肿压迫硬脊膜囊。
结论:布氏杆菌感染引起的脊柱炎具有特征性 MR 表现，应和脊柱结核、强直性脊柱炎和化脓性脊柱炎进行鉴别诊断。

PU-1248

基于 DCE-MRI 的四氧嘧啶诱导兔糖尿病合并外周动脉疾病（peripheral artery disease，PAD）骨骼肌微血管渗透性和纹理分析研究

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目的 探索动态对比增强磁共振成像（dynamic contrast-enhanced magnetic resonance imaging，DCE-MRI）定量评估兔糖尿病合并外周动脉疾病（peripheral artery disease，PAD）模型骨骼肌血流灌注和微血管通透性的可行性，为阐明糖尿病合并 PAD 骨骼肌病变的病理生理机制提供可视化影像依据。方法 制备兔糖尿病模型 12 只新西兰雄性大白兔随机分为实验组 6 只、假手术组 6 只将四氧嘧啶实验组、假手术组造模，在造模成功后 2 周对实验组兔行下肢单侧股动脉结扎术，假手术组取下肢腹股沟韧带中点皮肤切口，随即缝合。各组兔造模成功后分别于 1、5、10、15、20、25 天对各组行下肢大腿轴位 DCE 检查，将 DCE-MRI 数据导入 Omni Kinetics(GE Healthcare)软件分析，进行图像后处理及参数分析，定量参数包括：Ktrans、Kep、Ve、Vp、TTP、纹理分析参数。处死实验组和假手术组兔，取大腿后外侧肌群行微血管密度（microvessel density ，MVD）计数，对实验组和假手术组兔采用单因素方差分析比较同一时间点实验组和假手术组大腿后外侧肌群渗透参数差异。对不同时间点渗透参数差异比较采用重复测量的方差分析。肌肉 MVD 计数与 DCE-MRI 渗透性参数，大腿肌肉 MRI 纹理分析参数与肌肉 MVD 计数行 Pearson 相关分析。
结果 实验组 TTP 不同时间点（5d 和 10d、15d、20d、25d）在差异具有统计学意义（$P<0.05$），而在假手术组差异均无统计学意义（P 均＞0.05）。实验组与假手术组在相同时间点的差异在 10d 和 20d 具有统计学意义（$P<0.05$）。结论 DCE-MRI 定量参数 TTP、纹理分析参数可用于评估四氧嘧啶诱导兔早期糖尿病合并 PAD 骨骼肌微血管渗透性及血流灌注改变。

PU-1249

SAPHO 综合征一例影像表现及文献复习

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SAPHO 综合征（synoviltis acne pustulosis hyprotosis osteomyelitis symdrome）是一种以皮肤和骨关节受累为特征性的慢性无菌性炎症。1987 年由 Chamot 等首次提出并将以五种病变首字母的缩写作为疾病名称。包括滑膜炎(Synovitis)、痤疮(acne)、脓疱病(pustulosis)、骨肥厚(hyperostosis)和骨炎(osteitis)。SAPHO 另有脓疱病性关节炎骨炎、获得性骨肥厚综合征、前胸壁炎症综合征、胸肋锁骨骨肥厚、慢性复发性多灶性骨髓炎、慢性下颌骨骨炎、硬化性骨髓炎、痤疮相关脊柱关节炎等多个别称。临床上有一定的复发缓解倾向，多呈现慢性病程。皮肤损害主要以掌跖脓疱病和痤疮。骨关节损害主要由两部分构成，滑膜炎、骨肥厚、无菌性骨炎，附着点炎。*SAPHO 综合征诊断标准主要以*满足 4 个条件之一即可确诊：①骨关节表现 +聚合性痤疮和爆发性痤疮或化脓性汗腺炎；②骨关节表现 + 掌跖脓疱病；③骨肥厚(上胸壁、肢端骨、脊柱) 伴或不伴皮肤损害；④慢性多灶性复发性骨髓炎包含中轴或外周骨，伴或不伴皮肤损害。目前该病仍属少见病范畴，尽管近年来对于该病的认识和探究不断加深，但仍旧缺乏比较系统的大样本研究，对于疾病的发生、发展机制、临床以及病理过程仍然未有明确的认知，对于疾病的治疗规范缺乏统一的标

准，导致不少患者得不到有效的治疗或者治疗欠规范，预后较差。现将华中科技大学同济医学院附属同济医院诊治的 1 例 SAPHO 综合征患者报道如下，并复习相关文献加以分析。

PU-1250
磁共振 MRS 定量分析骨质疏松症的脂肪含量:Meta 分析

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目的 由于全球人口老龄化、骨质疏松症的流行及其与高患病率、高致残率、高死亡率的关系，整体生活质量的不断恶化，对这种骨病的诊断进行了大量的研究。磁共振波谱(MRS)作为一种测定组织中各种化学成分浓度的非侵入性检查方法，在临床中被越来越广泛的应用。本文对这一种新兴诊断技术的研究成果进行了 Meta 分析。

方法 通过以前研究骨质疏松症的病理机制发现，骨髓脂肪含量的增加(FF%)具有统计学意义。通过磁共振 MRS 测量，骨密度（MBD）降低，骨强度的主要预测因子。查阅相关文献，从过去对骨质疏松组、骨质含量减少组和健康对照组的受试者的研究中收集了 1000 多个数据点。数据点根据 MRS 位置(腰椎、股骨颈、跟骨、股骨)进行分组。进行 ANOVA 分析，然后进行 Tukey’s post-hoc tests，我们评估 MRS FF%评分对骨质疏松、骨质含量减少和健康受试者的区分能力。Welch’s t-tests 进一步验证了这些发现，解释了受试者组间差异的不一致性。

结果 表明骨质疏松组、骨质含量减少组和健康组在腰椎测量方面存在显著的统计学差异(P<0.0001)，在股骨颈骨质疏松组和健康组之间统计学差异。在股骨和跟骨的测量中没有发现这样的差异，这可能是由于后两种类型的研究和研究对象较少。

结论 MRS FF%评分在临床上作为一种无创、早期诊断骨质疏松症的工具具有很大的潜力;然而，在这些发现被广泛应用于骨骼之外之前，还需要进一步的研究。

PU-1251
动态增强 MRI 对 Ilizarov 外固架骨搬移术治 疗糖尿病足疗效评价研究

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摘要：目的:探讨 MRI 灌注对胫骨横向搬移术治疗糖尿病足疗效评估的价值。方法:1、搜集本院自 2018 年 3 月广西医科大学第一附属医院骨关节外科就诊的糖尿病足患者,且经 Ilizarov 外固定架胫骨横向搬移术治疗者,共 7 例受检者纳入研究(男性 4 例,女性 3 例),7 例糖尿病足患者均为单侧溃烂,其中 3 只位于左侧,4 只位于右侧,7 例胫骨横向搬移术均在溃烂侧进行。术前及术后 12 周均行 SE-MRI 3.0T 超导磁共振扫描仪扫描。按足部溃烂分为非溃烂组、溃烂组及糖尿病双足组三小组,三组进行术前、术后对照研究。2、扫描完成后将数据传送到工作站，使用相应灌注软件于足底选取合适感兴趣区(ROI)，要求部位尽量一致, 面积约 1.0～1.2 平方厘米, 同时避开坏死区、血管及骨骼，得到时间-信号强度曲线及相应的灌注参数，保存数据。3.统计学分析：应用 SPSS16.0 软件对糖尿病足患者术前病足与正常足、糖尿病患者术前与术后病足之间相应灌注参数进行 t 检验分析。**结果** 共 7 例 Ilizarov 外固定架胫骨横向搬移术治疗糖尿病足病例，术后 12 周后复查,7 例

受检者中溃烂足均愈合良好 2、糖尿病足 Ilizarov 外固定架胫骨横向搬移术前溃烂足 Ktrans 值较正常足低；术后溃烂足 Ktrans、值较术前增加,有统计学意义(P=0.040、0.036)，Ve 值较术前减小，有统计学意义。结论:1MR 灌注中的 Ktrans、Ve 各参数应用于评估 Ilizarov 外固定架胫骨横向搬移术治疗糖尿病足疗效具有一定的价值。

PU-1252

A Review: Magnetic Resonance Imaging Help Diagnosis of Piriformis syndrome

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Piriformis syndrome (PS), is a disorder encompassing a onstellation of symptoms including buttock or hip pain. PS accounts for approximately 6–8 % of sciatica [1], caused by compression of the sciatic nerve by the piriformis muscle. It is a relatively uncommon, but not insignificant, cause of sciatica. PS is more frequently encountered in middle-aged patients and is rarely seen in patients younger than 20 years old [2, 3]The diagnosis of piriformis syndrome is complicated by the large differential diagnosis of low back and buttock pain with many diagnoses having overlapping symptoms. It has been described for over 500 years, yet remains controversial. Proposed mechanisms for PS include anatomical variations of the course of the SN or the anatomy of the PM, damage to PM from trauma, PM hypertrophy , and PM spasm.

There are several methods for the diagnosis of PS, tenderness with palpation over the piriformis muscle , the Pace test, the Freiberg test. Ultrasound (US), computed tomography (CT), electromyography (EMG) and magnetic resonance imaging (MRI), have been used to diagnose PS. [4]This review aims to highlight the relevant anatomy, and Imagings that are used to diagnose piriformis syndrome.

PU-1253

增强 SPACE 序列在腰骶神经根中的应用价值探讨

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目的 探讨增强 SPACE 序列在显示腰骶神经根中的应用价值。方法 对 60 例腰骶部 MRI 受检者进行常规检查序列， SPACE 序列平扫和增强扫描。分别计算 SPACE 序列平扫和增强的神经根信噪比值（SNR 神经根），肌肉信噪比值(SNR 肌肉），神经根和肌肉的对比度噪声比值（CNR 神经根 / 肌肉）；将 SPACE 序列平扫和增强的原始图像分别进行 MIP 重建，最大限度显示腰骶丛神经及其分支，采用 4 等级评分比较这两个序列对腰骶丛神经解剖的显示情况。 结果 增强的 SPACE 序列 SNR 神经根值（116.092 ±69.946）高于平扫 SNR 值（ 64.721 ±22.437），增强的 SPACE 序列 SNR 肌肉值（24.181 ±17.871）高于平扫 SNR 肌肉值（17.453 ±8.084）,增强序列的 CNR 神经根 / 肌肉值（101.610 ±72.924） 高于平扫的 CNR 神经根 / 肌肉值（52.841 ±27.649）， 两者均存在统计学差异（ P＜ 0 .05）。 结论 SPACE 增强序列能清晰地观察腰骶神经丛的解剖形态，增强的 SPACE 序列受周围组织干扰较小,对周围脂肪组织及小血管等

干扰抑制得更好，能更充分清楚地显示神经的形态，走行,能为临床诊治腰骶丛神经病变提供诊断依据。

PU-1254

腰椎 MR 检查病人舒适性的体位探讨

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目的 探讨病人在 MRI 检查中的感受，最终完成符合临床诊断需求的高质量图像和提高病人的就医感受。**方法** 让病人平躺检查床上，双腿屈膝，脚轮(圆柱形海绵垫)垫在膝部下方，让腰部及下肢疼痛病人尽量放松，病人自行调整膝部屈曲角度，达到最佳舒适状态，以便检查过程中保持身体稳定不动，顺利完成检查。**结论** 腰椎 MRI 检查中脚轮应用的临床实用性很强，经实践证明，减少病人检查中的疼痛，能够顺利完成临床所需诊断要求。

PU-1255

脊柱朗格汉斯细胞组织细胞增生症 1 例

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患者男，20 岁，苗族。因“腰部疼痛 1 月余”入院。既往史及个人史无明显特殊。查体：左下肢直腿抬高试验 50 度（+），加强实验（+）。实验室检查：血沉 15mm/H，CEA10.64ng/ml，余肝肾功、血常规、感染标志物等未见明显异常。影像学检查：CT 示：L5 椎体溶骨性骨折破坏，并见软组织密度影，其内见残存骨骨嵴（图 1A），CT 值约 55HU。MRI 检查示：L5 椎体骨质结构紊乱并肿块影（图 B-D），呈稍长 T1（图 C）、稍长 T2 信号（图 B），STIR 序列为稍高信号（图 D），凸向左侧椎间孔生长，边界较清楚，范围约 3.3cm×2.6cm；增强后病灶及邻近骨质明显均匀强化（图 E）。行 L5 椎体占位清除术，术中所见：L5 椎体左侧骨质破坏较明显，有较多鱼肉样组织填充。免疫组织化学：CD68(+)、S-100(+)、CD1a(-)、Ki-67(+＜1%)、Vimentin(+)、CD3(少+)、CD20(少+)、EMA(+)。术后病理诊断：朗格汉斯细胞增生症伴 L5 椎体骨质破坏。

PU-1256

髋臼唇撕裂 MR 平扫+关节造影个案报道

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目的 探讨 MRI 关节造影对髋臼唇撕裂的诊断价值。
方法 回顾分析经综合诊断为髋臼唇撕裂的 MRI 平扫及关节造影表现，MR 关节平扫（单髋关节小 FOV 高空间分辨率扫描）+MR 关节造影（MRA）。
结果 本例病人 CT 示：股骨头颈交界区骨质隆起、增生硬化，MR 关节镜示：前上臼唇基底部见线状造影剂进入；关节镜术后诊断：髋臼撞击综合征，髋臼唇撕裂。MR 关节造影（MRA）采用 Czerny 分期：IA：盂唇内有高信号，未达关节面，盂唇旁沟存在，IB：同 IA，但是盂唇增厚，盂唇旁沟消失，IIA 盂唇内高信号累及关节面，盂唇旁沟存在，IIB：同 IIA，但是盂唇增厚，盂唇旁沟消

失，IIIA：盂唇与髋臼分离，仍保持三角形外观，IIIB：盂唇与髋臼分离，盂唇增厚，信号异常，盂唇旁沟消失。
结论 髋臼唇撕裂：MRI 平扫 vs 造影，目前多认为 MRI 平扫价值有限，MRA 通过向关节腔内注入对比剂、扩张关节囊，增加关节腔内对比，能够更好的显示撕裂口，提高臼唇撕裂的诊断敏感度和准确度，弥补常规检查的不足。

PU-1257
肩关节撞击综合症的平扫 MRI 表现

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目的 分析肩关节撞击综合征的平扫方法和 MRI 征象，提高诊断正确率。**方法** 选取图像满意的肩关节 MRI 平扫病例 33 例，使用西门子 AERA 1.5T MRI 扫描仪，肩关节专用表面硬线圈，根据患者胖瘦选择大或小线圈，FOV160×160mm，层厚/层距 3/0.6mm，矩阵 256×205。所用序列：斜冠状位 T2WI/FS/TSE、T1WI/SE 序列，轴位和斜矢状位 PD/FS/TSE 序列；定位：轴位上方包括肩锁关节，下方包括腋窝，平行向下扫描即可，斜冠状位平行岗上肌腱，斜矢状位平行关节盂。**结果** 病因表现有，勾形肩峰 8 例，肩峰前倾 3 例，肩峰骨刺 5 例，肩锁关节骨赘 3 例，无明显病因表现 14 例；撞击后表现有，肩峰下-三角肌下滑囊炎 28 例，岗上肌腱变性 21 例、撕裂 5 例，肱二头长头肌腱鞘积液 27，肱骨头糜烂 7 例。**结论** 肩关节平扫对肩关节撞击有一定的作用，必要时应行肩关节直接造影检查。

PU-1258
MRI 对股骨颈骨折术后并发股骨头坏死早期诊断的临床研究

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目的 探讨磁共振成像（MRI）对股骨颈骨折术后并发股骨头坏死早期诊断的临床效果。**方法** 回顾性分析 2017 年 3 月-2018 年 3 月本院 64 例（64 髋）股骨颈骨折术后并发股骨头坏死患者的临床资料。所有患者均分别在术后 3 个月内、4-6 个月、7-9 个月、10-12 个月时行 X 线片、MRI 检测。比较 X 线片、MRI 在术后 12 个月内及期间不同时段对股骨头坏死检出情况，分析诊断效能。**结果** 术后 12 个月内，MRI 对股骨头坏死总体检出率高于高于 X 线片（$P<0.05$）；术后 3 个月内、4-6 个月时，MRI 对股骨头坏死检出率均高于 X 线片（$P<0.05$）；术后 12 个月内，随着股骨头坏死分期的增加，MRI 检查发现时间逐渐延长。**结论** 股骨颈骨折术后并发股骨头坏死早期诊断中 MRI 检查应用价值较高，可提升早期检出率，值得推广应用。

PU-1259
磁共振 IDEAL-IQ 技术对糖尿病患者骨质疏松风险的评估价值

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目的 探讨磁共振 IDEAL-IQ 技术在糖尿病患者骨质疏松风险评估的价值。**材料和方法** 在提供知情同意后，对 16 名糖尿病患者分别进行磁共振腰椎 IDEAL-IQ 序列检查和双能 X 线吸收测量法(DXA)检测，体质量指数 BMI20.21～28.08kg/m^2。行双能 X 线吸收测量法（DXA）后将所有糖尿病患者分三组，A 组为骨量正常组，B 组为骨量减少组，C 组为骨质疏松组。IDEAL-IQ 序列通过一次扫描，系统可自动生成 6 幅图像，包括脂肪分数图、R_2*弛豫率像、水像、脂像、同相位及反相位图像，在 GE AW4.6 后处理工作站上分别测量腰 1～腰 5 腰椎椎体脂肪分数（Fat Fraction，FF）。分析比较 A、B、C 三组腰椎椎体 FF 值，采用 SPSS 19.0 进行统计分析。**结果** A、B、C 各组间年龄差异无统计学意义(P>0.05)。A、B、C 各组间腰椎椎体平均 FF 值测量结果分别为：43.65±3.91、49.78±6.67、57.85±3.84，单因素方差分析结果显示不同组间 FF 值有显著性差异(ANOVA ，F=5.515 ，P=0.036)。其中 A 组与 C 组间 FF 值差异有统计学意义(Post-Hoc LSD,P=0.013)；而 A 组与 B 组、B 组与 C 组间 FF 值差异均无统计学意义 (Post-Hoc LSD,P=0.084;Post-Hoc,P=0.171)。**结论** 磁共振 IDEAL-IQ 可定量评估腰椎椎体脂肪含量，从而对糖尿病患者中骨质疏松风险进行无创性评估，对临床诊疗有指导价值。

PU-1260
MR 弥散技术对脊柱单纯性和病理性压缩性骨折的诊断价值.

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：目的:初步评价 MR 弥散技术对脊柱单纯性和病理性压缩性骨折的诊断价值.方法:70 例脊柱椎体压缩性骨折行 X 线、MRI 平扫和弥散序列检查(35 例加作增强扫描),其中 50 例另作 CT 检查.病理性骨折 40 例(包括转移性肿瘤 30 例,骨髓瘤 6 例,嗜酸性肉芽肿 2 例,);单纯性骨折 35 例(包括单纯外伤所致 17 例,骨质疏松所致 14 例).病理性骨折者行 CT 引导下经皮骨穿刺检查或手术病理证实;外伤或骨质疏松所致椎体压缩性骨折均符合临床、实验室检查及 MRI 表现,部分经随访证实.结果:急性单纯性压缩性骨折和病理性骨折在常规 MRI 上有各自的特点.9%(3/33)单纯性压缩性骨折在 DWI 表现为等低信号混有条状高信号;24%(8/33)表现为等低信号;67%(21/32)表现为高信号.93%(36/38)病理性椎体压缩性骨折 DWI 上表现为高信号;7%(2/38)表现为等低信号.DWI 上均呈高信号的单纯性压缩和病理性压缩经统计分析无显著性意义(P>0.05).结论:单凭 MRI 弥散序列的信号改变不能非常准确地鉴别脊柱单纯性压缩性骨折和病理性骨折,需进一步深入定量研究.

PU-1261
FLAIR T2 序列与 PDWI 在显示膝关节前交叉韧带的对比研究

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目的 比较磁共振 FLAIR T2 与 PDWI 在显示膝关节前交叉韧带的优劣，尤其是在关节积液的干扰下两者间的差异。**方法** 由两位 MRI 诊断经验丰富的放射医生采取双盲法对 49 例膝关节的 FLAIR T2/PDWI 图像进行对比，以前交叉韧带轮廓显示的清晰度做为参考，结果分为：FLAIR T2 优于 PDWI（记为”>”）；FLAIR T2 与 PDWI 相当(记为”=”)；FLAIR T2 差于 PDWI(记为”<”)。膝关节积液定量依据雍刘军等[1] 及 Tai AW[2]分为无-少量-中量-大量。**结果** 49 例病例中， FLAIR T2 优于 PDWI 的有 29 例，FLAIR T2 与 PDWI 相当的有 13 例，FLAIR T2 差于 PDWI 的有 3 例.。49 例中，有 4 例在两种序列中均未显示，予以剔除，有效病例 45 例。FLAIR T2 优于 PDWI 的 29 例中，有 26 例

膝关节存在中量或大量积液，3 例少量或无明显积液。FLAIR T2 与 PDWI 显示相当的 13 例中，有 4 例是少量或无积液，8 例中量积液。FLAIR T2 差于 PDWI 的 4 例中，3 例无或少量积液，1 例中量积液。统计学分析：采取趋势卡方检验，将关节积液分为两组，无-少量做为第 1 组，中-大量为第 2 组。统计结果显示，关节积液的多少能够影响两种序列的评价结果，在关节积液较多的前提下（第 2 组），FLAIR T2 优于 PDWI，两者间的差异性统计学分析有显著性意义（P<0.05）。两位评定医师的图像判定结果符合率采用 Kappa 检验，结果显示有较高的一致性。**结论** 1、膝关节积液能够影响 FLAIR T2 序列与 PDWI 序列显示膝关节前交叉韧带的结果。2、在膝关节积液较多的前提下（中-大量），FLAIR T2 序列显示膝关节前交叉韧带优于 PDWI 序列。

PU-1262

1H MRS 评估青年男性足球运动员骨髓脂肪组成的初步研究

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目的 探讨 1H 磁共振波谱成像（MRS）评估青年男性足球运动员骨髓脂肪成分的可行性及临床应用价值。

方法 纳入 24 名青年男性足球运动员（平均年龄 19.2±1.2 岁，范围 17-22 岁、）及 21 名青年男性志愿者（平均年龄 21.2±0.7 岁，范围 20-22 岁）为研究对象。所有研究对象行常规腰椎及双下肢 MRI 序列检查及 1H MRS 检查，应用 jMRUI 软件对 1H MRS 图像进行处理并测量，观察水峰及脂质峰位置，采用峰高度及峰下面积来计算各部位骨髓脂肪分数（Fat Fraction，FC）及不饱和脂肪分数（Unsaturated lipid fraction，ULF）。比较青年足球运动员与志愿者腰椎，右侧股骨及胫骨 FC 及 ULF 值是否有统计学差异。

结果 足球运动员组腰椎、右侧股骨颈及胫骨 FF 值分别为（0.39±0.12）、（0.86±0.09）、（0.92±0.01）；志愿者腰椎、右侧股骨及胫骨 FF 值分别为（0.51±0.12）、（0.89±0.05）、（0.94±0.02）；足球运动员组右侧股骨及胫骨 ULF 值分别为（0.20±0.02）、（0.22±0.02）；志愿者右侧股骨颈及胫骨 ULF 值分别为（0.17±0.03）、（0.20±0.03）。足球运动员组腰椎及右侧胫骨 FF 值低于志愿者；足球运动员组右侧股骨及胫骨 ULF 均高于志愿者；两组间比较腰椎及右侧胫骨 FF 和右侧股骨及胫骨 ULF 值差异均有统计学意义*（P<0.05）*，足球运动员组右侧股骨 FF 值与志愿者差异无统计学意义*（P>0.05）*。

结论 青年男性足球运动员右侧股骨及胫骨骨髓不饱和脂肪分数均高于健康志愿者，提示骨髓不饱和脂肪含量与运动密切相关，加强运动可能是提高骨质量的有效途径之一。

PU-1263

肩胛骨炎性肌纤维母细胞瘤 1 例

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患者男性，75 岁,因发现右侧背部肿块 3 年入院。患者于 3 年前发现右上背部一肿块，鸡蛋大小，表面无红肿，无明显肿胀疼痛，无畏寒发热，无消瘦、乏力、盗汗等，三年来肿块逐渐增大，并感同侧上肢不适。查体：右上背部 8*9cm 大小区域皮肤稍红，皮下可见 8*7cm 大小椭圆形性肿块，质地硬，轻压痛，活动度不佳，与基底部致密粘连。CT 显示

炎性肌纤维母细胞瘤由 Symmer 于 1921 年首先报道，是一种非常少见的间叶性肿瘤，命名非常混乱[],曾被称为炎性假瘤、浆细胞肉芽肿、良性肌纤维母细胞瘤、纤维黄色瘤、炎症性纤维肉瘤、假肉瘤样肌纤维母细胞增生、炎症性肌纤维母细胞增生、粘液样错构瘤、淋巴样错构瘤等。2002 年 WHO 软组织肿瘤国际组织学分类专家组将其定义为“由分化的肌纤维母细胞性梭形细胞组成的，常伴有浆细胞和（或）淋巴细胞浸润的一种肿瘤”，并将其归为纤维母细胞/肌纤维母细胞肿瘤、中间性、少数可转移类[]。

IMT 好发于儿童和青少年，多数以无痛性包块为首发症状，平均年龄 10 岁，中位年龄 9 岁，也可发生于成人，最常发生于肺部，也可发生于肺外，据 1998 年 Coffin 等文献报道，肺外的部位包括中枢神经系统、上呼吸道、鼻窦、口腔、甲状腺、心脏、腹部及大网膜、胃肠道、肝、脾、肾、子宫、阴道、膀胱、皮肤、周围神经[3]。国内文献报道多发于肺、肝、脾、肾、腹部，年龄跨度较大，男女发病比例无明显差异，病史较长，临床症状不明显，常体检发现。骨的 IMT 非常罕见，国外文献较少[4,5],国内仅见两篇 5 例报道[6,7]。文献报道发生的部位为股干骺端、髂骨、胫骨骨髓腔、颌骨等，可侵犯骨皮质及周围邻近软组织。

PU-1264

Research on the feasibility of MR imaging of patients receiving anterior cervical surgery using MAVRIC SL-STIR sequence at 3.0T

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Objective: To investigate the feasibility of MR imaging of patients receiving anterior cervical surgery using MAVRIC SL-STIR sequence at 3.0T by comparing with bandwidth optimized STIR sequence. **Methods:** Sagittal MR images of MAVRIC SL-STIR and bandwidth optimized STIR sequences acquired in 20 patients receiving anterior cervical surgery were analyzed retrospectively. The areas of metal artifacts region, overall image quality, visibility of spinal cord and effect of fat suppression between the two sequences were compared. **Results:** The mean areas of metal artifacts regions for MAVRIC SL-STIR and bandwidth optimized STIR sequences were 422±189mm^2 and 774±394mm^2, respectively. The areas of metal artifacts from MAVRIC SL-STIR decreased significantly (P=0.000). In the aspect of overall image quality, difference between the two sequences had no statistics significance (P=0.617). But in the aspects of visibility of spinal cord and effect of fat suppression, bandwidth optimized STIR sequence was superior to MAVRIC SL-STIR (P=0.001). **Conclusion:** Despite the impaired visibility of spinal cord, the substantially reduced metal artefacts make it feasible for MAVRIC SL-STIR sequence to be applied in MR imaging of patients receiving anterior cervical surgery at 3.0T.

PU-1265

MAVRIC SL-STIR 序列在颈椎前路术后患者 3.0T MRI 中应用的可行性研究

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目的 通过与带宽优化的 STIR 序列进行比较，探讨 MAVRIC SL-STIR 序列在颈椎前路术后患者 3.0T MRI 中应用的可行性。**方法** 回顾性分析 20 例颈椎前路术后患者的矢状面 MAVRIC SL-STIR 序列和带宽优化的 STIR 序列的图像，比较两组间金属伪影面积的大小、总体图像质量、脊髓的可见性以及脂肪抑制效果。**结果** MAVRIC SL-STIR 和 STIR 序列图像的平均金属伪影面积分别为 422±189mm^2 和 774±394mm^2， MAVRIC SL-STIR 序列的金属伪影面积显著减小（*P*=0.000）。在总体图像质量方面，两个序列的差异并无统计学意义（*P*=0.617）；而在脊髓的可见性和脂肪抑制效果方面，带宽优化的 STIR 序列对脊髓的显示效果优于 MAVRIC SL-STIR 序列（*P*=0.001）。**结论** 尽管脊髓显示受限，金属伪影的显著降低为 MAVRIC SL-STIR 序列在颈椎前路术后患者 3.0T MRI 中的临床应用提供了可行性。

PU-1266
探讨动态增强扫描联合扩散加权成像在鉴别良恶性骨肿瘤中的应用价值

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目的 探讨动态增强扫描联合扩散加权成像在鉴别良恶性骨肿瘤中的应用价值
材料与**方法** 收集 2016 年 1 月至 2019 年 5 月间在我院明确诊断为骨肿瘤的患者 102 例，收集各组患者的影像学检查图像及病理结果，针对病变性质、边界、范围、侵袭性以及病变内部是否均匀等指标进行分析。**结果** (1) 57 例恶性病变中，20 例 TIC 为 I 型，17 例为Ⅱ型，20 例为Ⅲ型；55 例良性病变中，I 型 0 例，Ⅱ型 13 例，Ⅲ型 17 例，IV 型 25 例。I 型曲线仅见于恶性骨肿瘤，Ⅳ型曲线只见于良性骨肿瘤；良、恶性骨肿瘤病变的 TIC 类型分布差异有统计学意义(x=15.826，P=0.001)。TIC 取 I、Ⅱ型曲线为恶性诊断标准，诊断恶性肿瘤的敏感性为 73.68%，特异性为 69.57%，准确性为 72.13%，阳性预测值为 80%，阴性预测值为 61.54%。(2) 联合检查组对骨良、恶性肿瘤的检出率（分别为 60.0%、58.33%）要明显高于 MRI 动态检查组（分别为 17.65%、36.84%）和 DWI 扫描检查组（分别为 28.57%、14.29%），组间差异有统计学意义（P<0.05）。(3) 随着病变恶性程度的增加， ADC 值呈逐渐下降的趋势；良恶性组 ADC 值分别为 1.363±0.412；0.833±0.108。 (t = 3.119; P = 0.002)。病变的 Ktrans 值呈逐渐上升的趋势；其中良、恶性病变的 Ktrans 值分别为 0.0428±0.0031/min；0.1361±0.0047/min。两者间差异有统计学意义(t=2.831, P=0.014)。
结论 MRI 动态增强扫描联合 DWI 检查可显著提高良恶骨肿瘤的早期诊断效能，为临床提供更全面、可靠的影像资料，有利于改善患者的预后，值得临床推广。

PU-1267
磁共振脂肪抑制技术在骨关节病变检查中的应用价值

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目的:评价磁共振脂肪抑制技术在膝关节、肩关节等骨关节病变检查中的应用价值。设备材料和方法:我院的 MRI 机（SEMENS 1.5T AVANTO），MR 专用高压注射器，增强用对比剂钆喷酸葡胺注射液（GD-DTPA）。从我院骨关节科 2018 年 12 月--2019 年 6 月收治的骨关节病变患者中随机抽取

155 例,回顾性地进行 MRI 脂肪抑制、T1WI、T2WI 序列比较。结果:MRI 脂肪抑制技术序列发现骨及骨髓损伤的阳性率明显高于、T1WI、T2WI 序列,差异有统计学意义(P<0.05);对于韧带损伤的阳性发现脂肪抑制技术也明显高于 T1WI、T2WI 序列,差异有统计学意义(P<0.05);脂肪抑制技术结合 GD-DTPA 延迟强化对于发现关节软骨损伤或病变也明显高于 T1WI,T2WI。结论:磁共振脂肪抑制技术对于骨关节中骨、骨髓及软骨等病变的检查有较高的应用价值。

PU-1268
绝经后妇女腰椎脂肪含量与骨密度的相关性研究

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摘 要 **目的** 应用磁共振脂肪定量扫描技术评估绝经后妇女腰椎骨质疏松程度与 DXA 的相关性。**方法** 采用 Siemens MAGNETOM Skyra 3T 超导型成像系统对所有研究对象行腰椎 MR Vibe-DIXON 检查。Vibe-DIXON 序列一次成像能产生正相位、反相位、水相、脂肪相 4 组图像。采集完图像后,再工作站分别测量 L1~L4 各椎体中间层面水相、脂肪相的信号强度,感兴趣避开血管及韧带。最后利用公式计算脂肪分数(FF)=$I_{脂肪}$/($I_{脂肪}$+$I_{水}$)。采用 GE Healthcare Lunar Prodigy Advance 骨密度测量仪进行双能 X 线骨密度测量。检查时,研究对象仰卧位,双下肢抬高,范围从 T12 下 1/2 至 L5 椎体上 1/2。收集绝经后妇女 153 例行腰椎磁共振脂肪定量扫描检查,测量 L1-L4 椎体脂肪含量。按照腰椎 DXA 检查结果分为骨量正常组、骨量减少组和骨质疏松组。比较不同组间脂肪含量差异及骨密度值与脂肪含量的相关性。**结果** 骨量正常组、骨量减少组和骨质疏松组分别对应的椎体脂肪分数(FF) 为,组间比较差异有统计学意义(P＜0.05) ; DXA 所测量的骨密度和 mDIXON 测得的腰椎脂肪含量呈中度负相关。**结论** 综上所述,MR mDIXON 技术是一种无创、高效、精准测量腰椎椎体内脂肪含量的影像学检查手段,与 DXA 的结果具有相关性,可间接评估骨质疏松程度,丰富了骨质疏松检查手段。如果进一步实验研究,积累大样本数据,将在评估骨质疏松程度、骨折风险等方面为临床骨质疏松预警及治疗评估提供重要参考。

PU-1269
砂砾性痛风石引起的腕管综合症:20 例病人 CT 和 MR 的影像学特点

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目的 本研究的目的是通过对腕关节处痛风石 CT 和 MR 表现的研究,揭示腕关节处的痛风石为腕管综合症的一种病因。**材料和方法** 对确诊为痛风且表现出痛风相关性腕管综合症的病人腕关节 CT(n=18)和 MR(n=20)影像资料进行回顾性分析;24 份腕关节的影像资料来自 5 年时间的收集。病人总体包括 20 名男性,年龄跨度为 35～76 岁。所有的影像学资料均被两名高年资肌骨放射医师阅读审查并得到一致的诊断结论,其中 12 例诊断得到外科手术的验证。**结果** 于腕管底面发现痛风石者 18 例,腕骨处发现痛风石者 17 例,桡腕关节处发现痛风石者 17 例,腕关节伸肌肌腱或腱鞘处发现痛风石者 16 例。除腕管底面的痛风石(T2 加权像表现为低信号)外,其余所有痛风石均表现为相似的信号特点(T1 加权像表现为低到中等强度信号;T2 加权像表现为混杂强度信号)。CT 和 MR 图像上发现了不同程度的钙化影。钆强化 MR 图像表现为不均等强化。**结论** 在特定的病人总体中,痛风石应该是腕管综合症的一种致病因素,对此的认识和对其影像学特点的熟悉将给腕管综合症的诊断和外科手术治疗计划的制定带来帮助。

PU-1270

膝关节痛风石：对 30 名患者 MRI 图像特点的回顾

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目的 对膝关节内痛风石的位置和侵蚀性进行研究，重新评估膝关节内痛风石的特征性磁共振图像特点。材料和**方法** 对 30 名经组织病理学检查确诊有痛风石的患者膝关节 MRI 图像进行回顾性研究。评价每处痛风石造成的损害位置、关节变形、信号强度和相关的骨破坏或骨内损害。**结果** 痛风石沉淀主要位于髌下脂肪垫的中部和前隐窝（n=28.87%），股骨外侧踝外缘间隙（n=25.78%），髁间窝（n=22.69%）。所有痛风性损害表现为相似信号特点（T1 加权像上为低到中等信号强度，T2 加权像上为不均匀信号强度），可见三种病损形式：无定型的团块（n=27），线型晶体状沉淀（n=6），膝关节囊损害（n=3）。相关的骨破坏发生在股骨外侧踝的外缘者有 8 例，发生在髁间窝顶部者有 7 例，发生在胫骨粗隆者有 5 例，发生在胫骨粗隆中部和外侧的有 3 例，发生在髌骨的有 1 例。**结论** 对痛风石形成的位置和相关损害的认识以及对其 MR 图像表现特点的了解可以提高我们结合 MR 图像做出诊断的正确率，特别是能提高我们对于没有临床症状仅在 MR 图像上有损害表现患者的诊断正确率。

PU-1271

磁共振高清扩散加权成像对脊柱关节炎的诊断价值

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目的 探讨磁共振(MR)高清扩散加权成像(RESOLVE DWI)对脊柱关节炎的诊断价值。
方法 收集并分析临床怀疑 SpA 并行 3.0T 骶髂关节 MRI 检查患者 76 例，所有患者均行常规 MR 及 RESOLVE DWI 检查，采用 5 分法评估整体图像质量、伪影、结构扭曲，并比较急性骶髂关节炎的信噪比（SNR）及对比噪声比（CNR）。使用 Wilcoxon 符号秩检验比较整体图像质量、伪影、结构扭曲，使用配对 t 检验比较 SNR 和 CNR。
结果 RESOLVE DWI 的整体图像质量、伪影、结构扭曲评分高于常规 DWI（4.03±0.69 vs. 3.47±0.66、3.89±0.87 vs. 3.67±0.84、4.08±0.54 vs. 3.37±0.65，P 均＜0.05），RESOLVE DWI 急性骶髂关节炎的 SNR 和 CNR 高于常规 DWI（P＜0.05）。
结论 RESOLVE DWI 的图像质量及病灶显示均优于常规 DWI，有助于对脊柱关节炎的诊断。

PU-1272

腰肌劳损磁共振影像学研究现状及进展

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腰肌劳损（chronic lumbar muscle strain 或 a-cute）是指因为腰背部肌肉、筋膜、韧带等软组织的慢性损伤，导致的局部无菌性炎症，从而引起腰背部一侧或两侧的弥漫性疼痛的临床综合征，包括腰背肌筋膜炎、肌纤维织炎、肌筋膜疼痛综合征、第三腰椎横突综合征等[1]，该病好发于

30 ～ 40 岁的青壮年男性，外伤及长期劳损为该病的主要发病诱因，此外还与气候空气湿度有很大的关系[2]。随着社会的发展以及职业环境改变，越来越多的不良工作姿势以及违反人体生理规律的体育活动，促使腰肌劳损的发病率显著升高，影响患者的生活质量。

PU-1273

磁共振 T2 mapping 序列定量分析腰椎间盘疾病的价值

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摘要： 目的探讨磁共振 T2mapping 成像定量评价腰椎间盘疾病的价值。方法选择 50 例行腰椎间盘 MRI 常规扫描的患者,在扫描过程中运用 T2map 脉冲序列进行扫描。通过后处理工作站,在 T2mapping 像上测量腰 2，3,3，4，4，5 椎间盘髓核的 T2 值,分析不同性别，年龄的相关性。比较、不同分级腰椎间盘突出或膨出的 T2 值。结果最终腰椎间盘髓核 T2 值与患者年龄呈负相关。男女腰椎间盘髓核的 T2 值差异无统计学意义(P>0.05);Pfirrmann 分级Ⅱ、Ⅲ、Ⅳ、Ⅴ级椎间盘髓核 T2 值低于Ⅰ级,Ⅲ、Ⅳ、Ⅴ级椎间盘髓核 T2 值低于Ⅱ级,Ⅳ、Ⅴ级椎间盘髓核 T2 值低于Ⅲ级,Ⅴ级椎间盘髓核 T2 值低于Ⅳ级,差异均有统计学意义(P<0.05)。结论磁共振 T2mapping 定量方法可以更精确评价腰椎间盘退变的特点,腰椎间盘退变与年龄相关。

PU-1274

非小细胞肺癌骨转移瘤的 MRI 影像及免疫组化特征

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目的 探讨非小细胞肺癌骨转移的 MRI 影像及免疫组化特征。方法:回顾性分析经病理证实的 24 例非小细胞肺癌（腺癌 22 例，鳞癌 2 例）骨转移患者 MR 和病理资料。24 例均行常规 MR 平扫，其中 21 例行 MR 增强检查。24 例行免疫组化检查。**结果** 股骨、髂骨和肩胛骨多见，多为类圆形（87.5%），呈偏心性生长（66.7%）。多数病灶（83.3%）骨皮质不连续，伴软组织肿块。所有病灶在 T1WI 上均呈稍低或等信号，T2WI 及 T2WI 脂肪抑制上均呈以高信号为主混杂信号。T2WI 上病灶（91.7%）周围可见水肿或积液样弥漫高信号，增强（95.2%）呈明显不均匀强化。肺腺癌骨转移甲状腺转录因子 1（TTF-1）、胃酶样天冬氨酸蛋白酶（NapsinA）、细胞角蛋白 7（CK7）、细胞角蛋白 5/6（CK5/6）、P63 阳性率分别为 72.7%(16/22)、68.2%(15/22)、100%(22/22)、18.2%(4/22)、22.7% (5/22)。结论:非小细胞肺癌骨转移瘤为类圆形，呈偏心性生长，磁共振 T2W 信号不均，增强为明显不均匀强化，肺腺癌骨转移瘤 TTF-1、NapsinA、CK7 多高表达，CK5/6、P63 低表达。

PU-1275

肾癌长骨骨转移的 MR 影像特征及文献复习

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目的 探讨肾癌长骨骨转移的 MR 影像特点。**方法** 收集本院经手术病理证实的肾癌长骨骨转移患者，10 例患者纳入研究，6 例行 MR 平扫检查，4 例行 MR 增强检查。分析 MR 影像特征，包括病灶形态学及信号特征。**结果** 5 例在肾癌复查中发现，5 例以肢体不适为首发症状入院。8 例肾透明细胞癌（ccRCC），2 例嫌色细胞癌（chRCC）。7 例位于骨端，股骨近端 5 例，股骨远端 1 例，肱骨近端 1 例；3 例位于骨干，股骨 2 例，肱骨 1 例。病灶的纵横比范围 1.15-3.74，平均值 2.02。9 例呈膨胀性骨质破坏，1 例骨质未见明显膨胀性改变。8 例病灶 T1WI 呈稍低或等信号，T2WI 呈等高混杂信号，7 例 T2WI 另见皂泡状高信号及低信号分隔，其中 1 例低信号分隔呈轮辐样；2 例 T1WI、T2WI 呈均匀的等信号和稍高信号。4 例病灶内见流空血管影。2 例边缘明显强化，2 例轻中度强化。**结论** 肾癌长骨骨转移好发于长骨近端，多以膨胀性破坏为主，T2WI 上易出现皂泡状改变及低信号分隔，有时可见血管影。

PU-1276
晚期肺腺癌 EGFR 突变与骨转移相关性的 MR 影像组学分析

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目的 探讨采用影像组学的方法分析晚期肺腺癌骨转移 MR 影像特征预测表皮生长因子受体（EGFR）基因突变状态的可行性。**方法** 回顾性分析 2016-2018 年经病理证实的 164 例肺腺癌患者的影像和临床资料，所有患者均行 EGFR 基因检测及 MR 常规脊柱检查,经综合影像学（CT、MRI 或 ECT/PET-CT）或病理证实为脊柱骨转移。应用 ITK-SNAP 软件对 MR 发现的肺腺癌骨转移病灶进行勾画，通过 AK 分析软件提取纹理特征，然后通过训练组使用 ANOVA+MW 和 Correlation Analysis 方法进行筛选，最后根据筛选后的特征集使用随机森林法（RTree）构建影像组学模型。用受试者工作特性曲线下面积（AUC）和准确度来评价模型预测 EGFR 突变状态的性能。**结果** 164 例患者，突变组 103 例（62.8%），野生组 61 例（37.2%）。EGFR 突变组以女性、非吸烟患者多见（$p<0.05$），突变类型以 19del 和 L858R 为主，两者合计共占总突变例数的 66.0%（68/103）。T1WI 上，模型诊断准确度和 AUC 在验证组中分别为 0.638 和 0.568；T2WI 上，模型诊断准确度和 AUC 在验证组中分别为 0.681 和 0.530；T2FS 上，模型诊断准确度和 AUC 在验证组中分别为 0.618 和 0.538。**结论** 对于肺癌骨转移的患者，应用 MR 影像组学的方法，可为临床了解 EGFR 突变状态提供重要的参考价值。

PU-1277
四通道相控阵表面线圈与十二通道头颅正交线圈在踝关节 MRI 中的应用比较

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目的 比较四通道相控阵表面线圈与十二通道头颅正交线圈在踝关节 MRI 成像时，影像质量的差异。
方法 回顾性分析 2018 年 1 月～2018 年 5 月期间在我科行踝关节 MRI 检查的 89 例患者，其中 46 例选择四通道相控阵表面线圈（实验组）；43 例选择十二通道头颅正交线圈（常规组），两名高年资扫描技师选择相同 ROI 测量并计算同一扫描参数序列（PD FSE T2 fs）影像上相同位置的距骨、滑液、跟腱、肌肉的 SNR 及相邻组织的 CNR，对测量结果做一致性检验；同时两名具有独立诊

断经验的放射诊断医师根据统一标准对影像质量进行优、良、差评价，采用 spss19.0 对所有数据做统计学分析，以 p＜0.05 作为差异有统计学意义。

结果 ①SNR：实验组距骨、滑液、跟腱、肌肉的 SNR 均高于常规组，差异有统计学意义（P=0.000、0.001、0.004、0.000＜0.05）；②CNR：实验组滑液/距骨、滑液/肌肉 CNR 均高于常规组，差异有统计学意义（P=0.000、0.002＜0.05），实验组跟腱/肌肉 CNR 高于常规组，二者差异无统计学意义（P=0.11＞0.05）；③两名技师对影像的测量结果一致性检验，p＞0.05，无显著性差异；④影像的质量评价：实验组影像优良率高于常规组，二者差异有统计学意义（P=0.02＜0.05）。

结论 四通道相控阵表面线圈相较于十二通道头颅正交线圈具有更高的组织 SNR 及相邻组织的 CNR，是踝关节 MR 成像的优势线圈，可作为踝关节 MR 成像时的首选线圈。

PU-1278

DKI 应用于大鼠椎间盘微细结构的可行性分析

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目的 分析 DKI 技术应用于正常成熟大鼠及椎间盘退变模型，判断椎间盘微细结构变化的可行性。

方法 12 雌 12 雄正常成熟的 SD 大鼠，21 例雌性椎间盘退变模型大鼠使用 3T 核磁共振扫描仪进行 DWI、DKI 和 T2 序列扫描。椎间盘退变模型采用经皮穿刺椎间盘方法。21 例模型大鼠根据穿刺后扫描时间分为 7 组：0（正常对照），3 小时，48 小时，3 天，7 天，10 天和 14 天。在 T2 图像上，测量尾椎 C6/7, C7/8 椎间盘高度，利用 5 级分级法进行椎间盘分级。利用画取 ROI 的方式，测量尾椎 C6/7, C7/8 的 ADC 值、FA、MD、Da、Dr、MK、Ka 和 Kr 值。利用纤维素追踪法获取各个椎间盘的纤维追踪图像。在 24 例正常成熟大鼠中，比较不同性别和不同等级，上述参数之间的差异。在 21 例雌性椎间盘退变模型大鼠，比较在 7 个不同时间点，上述参数的差异。同时，将上述椎间盘进行病理切片分析。

结果 与 1 级椎间盘相比， 2 级椎间盘的 ADC 值减低、FA 和 MK 值增高(P<0.05)，并发现 FA 值和 MK 值的诊断准确性较高。通过 DKI 的多参数分析，病理组织图像和纤维追踪的图像比较，证明了雄性和雌性大鼠的椎间盘微观结构存在差异。在 21 例雌性椎间盘退变模型大鼠的椎间盘中，T2 分级在穿刺后 7 到 10 天呈现明显的增长趋势(R^2=0.9424, P＜0.001),而 ADC 值及 DKI 多参数的变化在不同时间点与病理改变一致，具有明显的显著性差异 (P＜0.05)。

结论 DKI 是一种非侵入性和可持续性的检测椎间盘微细结构改变的影像方法。因正常大鼠尾椎的 1 级和 2 级椎间盘之间、雌雄性椎间盘髓核存在微细结构差异。故应选择同一性别大鼠，并对大鼠椎间盘进行 T2 等级筛选后用于实验研究。同时，DKI 的多参数分析用于评估椎间盘的微细结构改变具有较好的效用，与病理组织学相一致。

PU-1279

Diffusion and Perfusion parameters Is Associated with Early Lumbar Intervertebral Disc Degeneration: A Quantitative MRI Study

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Abstract

Objective

To evaluate early intervertebral disc degeneration (IVDD) quantified by Intravoxel incoherent motion diffusion-weighted (IVIM-DWI) and T2mapping Magnetic Resonance Imaging in asymptomatic young adults.

Methods

Cross-sectional study using IVIM-DWI and T2 mapping MRI of lumbar spine in healthy adults was approve by the local ethics committee. 70 asymptomatic Adults (38 males and 32females; mean age, 25.07± 3.524years; range,20-48years) were performed lumbar MRI examinations at 3.0Tesla (Signa HDxt, GE Healthcare, Milwaukee, WI) with a spine-array coil. We analyzed the anterior annulus fbrosus (AF), nucleus pulposus (NP), and posterior AF of apparent diffusion coefficient (ADCstandard), pseudodiffusion coefficient (ADCfast), diffusion coefficient (ADCslow) and perfusion fraction(f) using IVIM-DWI MRI. The T2 values of the anterior AF, NP and posterior AF were evaluated using T2 mapping MRI. We compared the possible correlations of median ADCstandard, ADCfast, ADCslow and f values with the T2 values.
The sagittal IVIM-DWI was the following parameters: TR=2425ms, TE=88.5, Matrix=256×128, FOV=28×14cm^2, slices=4.5mm, gap=1.0mm. Ten b-values were used in IVIM acquisition (0,10,20,40,60,80,100,200,400,600s/mm^2), averages (b_0NEX=1,b_{10-100} NEX=4, $b_{200-600}$ NEX=6). acquisition time=223s. T2mapping parameters: TR=1000ms, 8 TE were used in T2mapping acquisition (9.4--75.6ms) Matrix=320×256, FOV=28×28cm2, Slicethickness=4.5mm, gap=1.0mm, NEX=1, acquisition time=548s.

Results

There was a signifcant negative correlation between ADCfast and T2 values of the anterior AF (r=-0.205, p<0.01),ADCslow and T2 values of the anterior AF (r=-0.116, p<0.05),ADCstandard and T2 values of the anterior AF (r=-0.140, p<0.05),and positive correlation between f values with the T2 values of the anterior AF (r=0.174, p<0.01). There were no signifcant correlations between IVIM-DWI parameters and T2 values of NP . ADCstandard with the T2 values of the posterior AF (r=0.154, p<0.05).
There were no signifcant correlations between ADCfast, ADCslow and f values with the T2 values of the posterior AF.

Conclusions

The results indicated that IVIM-DWI parameters might be accompanied with anterior AF degeneration. IVIM-DWI evaluation index might have the potential to identify novel technique for Diffusion and Perfusion parameters Is Associated with Early Lumbar IVDD.

PU-1280

基于压缩感知技术的 3D-MRI 在半月板损伤中的应用价值

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目的 探讨压缩感知技术在膝关节 3D 磁共振成像中应用的可行性及对半月板损伤的临床应用价值。

方法 对 30 名健康志愿者在 3.0T-MRI 仪上行右膝关节 MRI 扫描，完成常规 fs PDWI 扫描和 CS-3D 扫描常规膝关节 MRI 行矢状位、冠状位及横轴位 fsPDWI 扫描。CS 组图像按不同降噪（denosing，

DS）水平进行重建：CS-DS_{weak}（5%）、CS-DS_{medium}（10%）、CS-DS_{strong}（20%）。每位志愿者共获得 4 组图像，通过主、客观对矢状位图像质量进行评价。客观评价：选取外侧半月板后角正中矢状位层面，测量该层面外侧半月板后角 SNR 和 CNR。客观评价采用单因素方差分析，组间两两比较采用 LSD 法检验。采用 Kappa 系数对阅片者间进行一致性分析（k≥0.75 代表一致性较好），以 P<0.05 为差异有统计学意义。回顾性分析经关节镜证实的 26 个膝关节半月板撕裂的 CS-3D 图像，扫描参数如上，之后按 CS-DS_{medium}（10%）降噪水平进行重建。对每例图像进行半月板分型，采用 Kappa 系数对 CS-MRI 半月板分型结果和关节镜进行一致性分析（k≥0.75 代表一致性较好），以 P<0.05 为差异有统计学意义。

结果 1、两位高年资影像诊断医师的对图像质量的主观评价结果的评分一致性高（k=0.91），阅片者倾向将 CS-DS_{medium}组图像作为最佳诊断图像。2、客观评价中，CS-DS_{strong}在 4 组图像中 SNR 最高（p<0.05），且 CS-DS_{medium}组与常规 fsPDWI 组的 CNR 差异无统计学意义。3、26 例半月板撕裂患者 CS-3D 结果与术中关节镜结果一致性较高（k=0.94）。

结论 CS 技术可用于 3.0T MRI 仪半月板损伤进行成像，可以大大缩短扫描时间，同时能较准确的判断半月板损伤的类型，为临床提供更多指导性信息，值得推广进行常规应用。

PU-1281

非人工植入金属伪影 MRI 与 X 线诊断的价值

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摘要 目的 X 线平片、MRI 检查非人工植入金属伪影诊断。

方法 在 MRI 常规序列进行检查中发现，头颅、膝关节无手术内置入物，无外伤史，外表未见异物。2 例头颅 MRI 常规检查，3 例膝关节 MRI 常规检查，图像完全影响诊断 3 例，伪影 2 例。

结果 2 例头部不适，年龄 59 岁，临床诊断脑血管病，建议 MRI 检查，在额部、鼻窦处可见条索状高信号伪影，技师多次询问患者、无手术史、无外伤史，检查患者体表未见异物，更换患者检查后，证实线圈、机器没问题。3 例膝关节检查，平均年龄 45 岁，临床以半月板损伤为诊断检查 MRI，膝关节 2 例伪影过大不能检查，1 例不影响半月板诊断。以上 5 名患者均进行了 X 线平片检查，2 例头颅内额部、鼻窦炎皮下点状高密度金属影。3 例膝关节检查，2 例关节囊内高密度金属影，1 例皮下高密度金属影。不能 MRI 检查的为多发和异物较深。以上 5 名患者均为工地电焊工，诱因为电焊喷发的铁粉贱至体表毛孔，铁粉随血液流动等原因从浅表到深部，引发患者疾病。

结论 询问患者自述无手术史和外伤史，但 MRI 检查出现伪影时，一定要进行普通 X 线检查，严重的要 CT 扫描确定金属异物的实际方位，影响患者健康的呈度进行评估，检查前患者病史、职业进行询问，确保患者健康为第一。

PU-1282

半肢骨骺发育异常的影像学表现（附 9 例报道）

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目的 分析半肢骨骺发育异常(Dysplasia epiphysealis hemimelica, DEH) 的影像表现，以提高此疾病的认知及诊断水平。 **方法** 回顾 2013 年 1 月至 2018 年 12 月本院收治的资料完整的 9 例 DEH 病变，其中男 8 例，女 1 例，年龄 2～11 岁，临床表现为关节附近硬性肿块。 **结果** 局限性 5 例，经典型 4 例。位于踝关节 6 例，膝关节 3 例；左侧肢体受累 1 例，右侧 7 例，双侧均受累

1 例；5 例单个骨骺受累，4 例多个骨骺受累；6 例肢体内侧受累，2 例肢体外侧受累，1 例肢体内外侧均受累。1 例合并踝内翻畸形，1 例合并膝外翻畸形，1 例合并双下肢不等长。8 例 X 线和/或 CT 表现为骨骺偏心性增大，骨骺旁斑点状、结节状高密度影，3 例与固有骨骺部分/完全融合，5 例无融合；6 例骨骺偏心性增大，1 例全侧增大，1 例未见明显增大。8 例 MR 均可见关节周围数量不一的骨软骨肿物，6 例与固有骨骺间有软骨间隙，2 例无软骨间隙，8 例 DEH 病变 MRI 检查均可清晰显示骨骺受累范围及病灶表面软骨帽的异常。 **结论** DEH 特征性的影像表现为骨骺偏心性增大，骨骺旁骨软骨性肿物，可与固有骨骺融合/不融合，常伴关节面倾斜，重者造成关节畸形。

PU-1283

Imaging of Dysplasia Epiphysealis Hemimelica (9 cases report)

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Objective To deepen the understanding and improve the diagnosis level of dysplasia epiphysealis hemimelica (DEH) by analyzing the imaging performances.
Methods 9 cases of DEH with complete data admitted to our hospital from January 2013 to December 2018 were reviewed, including 8 boys and 1 girl, with ages from 2~11 years old. The clinical manifestation was a swelling hard mass around the joint.
Results 5 cases of localized and 4 cases of classical. Ankles are involved in 6 cases, and knees are involved in 3 cases.1 case involved left limb, 7 cases involved right limb, and 1 case involved both sides. Single epiphysis is involved in 5 cases, while multiple epiphyses are involved in 4 cases. 6 cases involved the medial limbs, 2 cases involved the lateral limbs, and 1 case involved both. 1 case combined with varus deformity of ankle, 1 case combined with valgum deformity of knee, and 1 case with leglength discrepancy. X ray and/or CT of 8 cases showed eccentricity enlargement of epiphysis, Spotted and nodular high density lesions around epiphysis. 3 of them fused with the epiphysis partially or completely, while 5 cases were separated from the epiphysis. 6 cases showed eccentricity enlargement of epiphysis, 1 case showed full side, and 1 case had no enlargement. There are variegated osteochondral masses around the joint in MR images. Cartilage space can be seen in 6 cases between osteochondral masses and inherent epiphysis, while 2 cases can not found. Extent of involved epiphyseal and abnormalities of surface cartilage cap can be displayed clearly in MR.
Conclusion DEH has characteristic image manifestation. It shows eccentricity enlargement of epiphysis, osteochondral masses around the epiphysis which were continuous or separated from the epiphysis. Articular surface tilt always accompanies and joint deformity will happened in severe cases.

PU-1284

肱二头肌长头肌腱损伤非增强 MRI 诊断价值

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目的
肱二头肌长头腱损伤类型临床难以精确诊断。本研究旨在探讨非增强磁共振对肱二头肌长头腱损伤类型的诊断价值，分析并找出磁共振上最有用的诊断征象。
材料与**方法**
对 2017 年 10 月至 2019 年 4 月本院因肩袖撕裂行关节镜手术 312 例患者的磁共振图像及病案记录进行了回顾性分析。纳入标准为：本院术前 6 个月内行 MRI 扫描，有完整的肱二头肌长头腱损伤手术记录及关节镜采集图像。排除标准：超过 6 个月 MRI 检查、既往手术、肱骨近端骨折或伴随炎性关节炎的患者。MRI 采用 3.0T MRI（Verio；Siemens；Germany）进行扫描，常规扫描序列：斜冠状 TSE T1WI，斜冠状 PDW，斜矢状 TSE T2WI 和横轴位 T2 压脂（STIR）。根据关节镜检查结果进行损伤类型分类，分为以下几类：I 型：肱二头肌长头腱腱鞘炎；II 型：肱二头肌长头腱变性；III 型：部分撕裂，宽度小于 50%；IV 型：部分撕裂超过肌腱宽度的 50%；V 型：肌腱完全撕裂；VI 型：肱二头肌长头腱脱位。对 MRI 图像与关节镜结果的进行了比较。MRI 扫描显示异常征象包括信号强度改变、径线改变、形态是否规则，边缘是否整齐，周边有无液体聚集、软组织肿胀等。
结果
关节镜检查显示，92 例（29.5%）患者存在肱二头肌长头腱损伤。以“至少 2 个异常征像”为诊断标准可获得较高的诊断效果。其中以信号强度及边缘是否整齐两项异常征像诊断效果最好，（敏感性 80.9%，特异性 95.6%）II 型、III 型和 IV 型损伤在横轴位信号强度异常变化的敏感性最高（分别为 50.8%,70.9%和 81.7%），VI 型损伤在横轴位位置改变观察最佳，I 型、V 型三个扫描方位均可很好显示。
结论
非增强 3.0T MRI 对术前诊断肱二头肌长头腱损伤类型具有较高的诊断价值。最敏感的单一诊断征象是横轴位信号强度的改变。

PU-1285
肺腺癌与小细胞癌骨转移的鉴别：MR 影像组学

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摘要　目的　探讨采用影像组学的方法分析肺癌骨转移 MR 影像特征预测肺癌病理类型的可行性性。**方法**　回顾性分析 2016-2018 年经病理证实的 113 例肺癌患者（腺癌 71 例。小细胞癌 42 例），所有患者经综合影像学（CT、骨扫描或 MR）或病理证实为脊柱骨转移。117 例患者均行 MR 常规脊柱扫描。利用 ITK-SNAP 软件对 MR 发现的骨转移病灶进行手动分割，利用 Python 获得肺腺癌骨转移的影像组学特征，MatLab2018a 分析其特征，用受试者工作特性曲线下面积（AUC），灵敏度，特异性和准确度来评价其性能。**结果**　影像组学预测肺癌病理类型具有较好表现，在验证数据集中，AUC 为 0.770（范围 0.741-0.820），灵敏度为 89.8%，特异度为 53.2%，准确度为 70.6%。**结论**　采用影像组学研究方法分析肺癌骨转移 MR 影像特征对预测肺癌病理类型具有一定的参考价值

PU-1286
探讨腰椎间盘退行性病变诊断中 CT 与 MRI 的应用价值

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摘要 目的 探讨腰椎间盘退行性病变诊断中 CT 与 MRI 的应用价值。方法 选取我院 2016 年 5 月至 2019 年 5 月确诊为椎间盘退行性变患者 70 例，男 51 例，女 19 例，所有病例均进行 CT 和 MRI 诊断，回顾性分析比较两种方法诊断结果。结果 CT 诊断椎间盘突出、神经根受推移的正确率稍高于 MRI，MRI 在诊断椎管狭窄，突出椎间盘与硬膜囊的分界清晰率显著高于 CT，MRI 在诊断纤维环病变有明显优势。

PU-1287
磁共振成像（MRI）在膝关节韧带损伤诊治中的临床应用

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目的 探讨磁共振成像（MRI）在膝关节韧带损伤诊断与治疗中的临床应用价值。材料与**方法** 对 46 例经关节镜、手术及临床检查证实的膝关节交叉韧带损伤的 MRI 影像资料进行回顾性分析，重点分析其 MRI 影像表现及诊断效果。**结果** 46 例膝关节韧带损伤损伤患者中，前交叉韧带损伤 37 例（完全断裂 12 例，部分撕裂 25 例），后交叉韧带损伤 9 例（均为部分撕裂），内侧副韧带损伤 10 例，外侧副韧带损伤 15 例，合并关节内骨折 24 例（其中隐匿性骨折或骨挫伤 16 例），关节软骨损伤 15 例，半月板损伤 23 例，关节囊及关节腔积液 34 例，髌上囊积脂血症 5 例；CT 诊断骨折 21 例，关节囊及关节腔积液 30 例，X 线诊断骨折 18 例。**结论** X 线只能发现较明显的骨折和关节脱位，CT 除能显示骨折外，能显示部分关节积液，MRI 能够清楚显示膝关节各种损伤的部位、性质和程度，对韧带损伤有很高的敏感性和准确性，能为临床诊断与治疗提供有效的依据，使患者得到及时的治疗，是传统 X 线和 CT 不能比似的，具有较高的临床应用价值，是膝关节韧带损伤的首选检查方法。

PU-1288
磁共振扩散峰度成像诊断 SD 大鼠早期糖尿病足周围神经病变的初步研究

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摘要：目的 探讨磁共振扩散峰度成像（DKI）对 SD 大鼠早期糖尿病足周围神经病变（DPN）的诊断价值。**材料与方法** 将 30 只 5 周龄，体重约 150g
雄性 SD 大鼠随机分为对照组与实验组（每组 15 只），其中对照组以普通饲料喂养，实验组以高脂饲料喂养，一个月后于实验组腹腔注射 STZ 溶
液（45mg/kg），对照组腹腔注射等体积的柠檬酸一柠檬酸钠缓冲液，测量注射药物前及注射药物后 1d、3d、7d 实验组大鼠随机血糖，如随
机血糖稳定且均大于 16.7mmol/L 代表糖尿病大鼠模型造模成功。30 只 SD 大鼠均于成模后 3d、1w、2w、3w、4w、5w、6w 行右小腿常规
MRI 及 DKI 扫描，并于第 6w 行离体坐骨神经电生理及病理检查。应用 Matlab 软件作数据后处理，并用 Image J 软件测量大鼠右小腿腓肠肌感兴
趣区（ROI）的平均峰度（MK）、径向峰度（RK）、平均扩散率(MD)和各向异性分数(FA)值。应用 SPSS22.0 软件进行统计学分析，采用 t 检

验比较组间 DKI 各参数值差异。**结果** 成模后 3w-6w 实验组 SD 大鼠 MK、RK、MD、FA 值均稳定高于对照组（P<0.05），成模后 6w 实验组坐
骨神经传导速度显著低于对照组（P<0.05），病理示实验组坐骨神经出现早期脱髓鞘改变。**结论** DKI 对 SD 大鼠早期糖尿病足周围神经病变的
诊断，具有较高的参考价值，为进一步研究 DKI 对糖尿病患者早期周围神经病变的诊断提供了可能性。

PU-1289
非小细胞肺癌与小细胞肺癌骨转移的鉴别：MR 影像组学

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目的 探讨采用影像组学的方法分析骨转移 MR 影像特征鉴别非小细胞肺癌与小细胞肺癌的可行性。**方法** 回顾性分析 2016-2018 年经病理证实的 80 例肺癌患者（非小细胞肺癌 40 例，小细胞肺癌 40 例）的影像及临床资料，所有患者经综合影像学（CT、骨扫描或 MR）或病理证实为脊柱骨转移。应用 ITK-SNAP 软件对 MR 发现的骨转移病灶进行手动分割，通过 AK 软件提取纹理特征，然后通过训练组使用 ANOVA+MW 和 Correlation Analysis 方法进行筛选，最后根据筛选后的特征集使用随机森林（RTree）构建影像组学模型。用受试者工作特性曲线下面积（AUC）和准确度来评价该模型在鉴别非小细胞肺癌与小细胞肺癌中的表现。**结果** T1WI 上，模型诊断准确度和 AUC 在验证组中分别为 0.722 和 0.570；T2WI 上，模型诊断准确度和 AUC 在验证组中分别为 0.631 和 0.598；T2WI 脂肪抑制上，模型诊断准确度和 AUC 在验证组中分别为 0.552 和 0.513。**结论** 采用影像组学研究方法分析骨转移 MR 影像特征对鉴别非小细胞肺癌与小细胞肺癌具有一定的参考价值。

PU-1290
在缺血性脑卒中模型鼠中活体示踪间充质干细胞来源外泌体的实验研究

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目的 外泌体是由多种细胞分泌的纳米囊泡，能够介导局部或远端的细胞间通讯。间充质干细胞来源的外泌体能调节免疫系统，促进突触再生和血管生成，修复受损组织。大量研究已经证实外泌体可以跨越血脑屏障，但它们在大脑中的迁移和归巢能力仍未得到研究。**方法** 提取并鉴定间充质干细胞来源外泌体，通过磁共振成像分子和近红外荧光成像分子修饰并对其表征，完成体外磁共振/光学成像；建立小鼠缺血性脑卒中动物疾病模型，尾静脉应用建立好的可视化间充质干细胞来源外泌体，多时间段采集磁共振图像和近红外荧光图像，定量分析，并对离体脑组织进行免疫荧光染色。**结果** 我们成功提取间充质干细胞分泌的外泌体，构建了可视化的外泌体分子，荧光基团为 Dir，在荧光显微镜下观察到红色荧光；磁性基团为 Fe_3O_4，在 MR T2 成像上观察到低信号。建立缺血性脑卒中小鼠模型后，全身应用可视化的外泌体分子，并在 1、2、3、4、5 天分别进行 T2 加权磁共振成像和近红外荧光成像，动态观察病灶处强度变化。在磁共振成像上，第 3 天可以观察到病灶周边低信号。在近红外荧光成像上，从第 1 天起右侧脑缺血部位即可出现光信号增强，表明外泌体已经开始在病灶处聚集，也由此证明近红外成像较磁共振成像灵敏度更高。随后信号逐渐增强，在第 3 天达到峰值，之后开始减弱并消失。本实验采集了对照组和实验组离体脑组织的光学信号，

在第 3 天具有显著差异（P＜0.05）。离体脑组织的免疫荧光染色可以观察到外泌体与神经元共定位。**结论** 通过磁共振/光学成像对外泌体进行活体示踪，充分证实间充质干细胞来源外泌体确实归巢至缺血部位；间充质干细胞来源外泌体能被病灶区的神经元选择性摄取，促进神经功能恢复。

PU-1291

重度抑郁症静息态 fMRI 的独立成分分析

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目的 采用功能磁共振成像（fMRI）和独立成分分析（ICA）方法，研究首发未服药重度抑郁症病人的脑功能状态。**方法** 共纳入 15 例首发未服药重度抑郁症病人和 15 例健康对照志愿者，2 组年龄[（27.80±15.44）岁和（26.07±12.19）岁]、性别（男/女：7/8 和 7/8）、受教育水平[（11.73±4.23）年和（12.73±2.58）年]均匹配。2 组均在静息状态下采用 3.0 T MR 设备进行 BOLD-fMRI 扫描。利用 ICA 方法，采用汉密尔顿抑郁量表（HAMD）24 项版本，分别对相同脑成分的两组数据进行双样本 *t* 检验，统计分析 2 组之间有差异的脑区。**结果** 静息状态下病人组的双侧额上回、双侧额中回、双侧颞中回、左侧楔前叶、左侧小脑前叶、双侧中央后回、双侧扣带回、双侧顶上小叶、双侧顶下小叶等脑区显著激活并且高于对照组[体素大小为 10 以上且差异有统计学意义的脑区（*P*<0.05，体素大小>10）]。**结论** 首发未服药重度抑郁症病人广泛的脑区激活，这些异常的脑区可能与抑郁症情绪调控机制障碍有关。

PU-1292

清甲治疗前 99mTc04-甲状腺静态显像对分化型甲状腺癌术后患者有无残甲的预测价值

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目的 手术和术后放射性 ^{131}I 清除残余甲状腺组织（简称清甲）治疗是治疗分化型甲状腺癌（differentiated thyroid carcinoma，DTC）的主要手段，因此，清甲治疗前预测 DTC 术后患者的有无残余甲状腺组织（简称残甲）是尤为重要的，而清甲前 $^{99m}TcO_4^-$ 甲状腺静态显像（简称甲扫）简单易操作，且不会影响清甲治疗疗效。本文的研究目的在于探讨清甲治疗前甲状腺静态显像在评估 DTC 术后患者有无残甲上的价值。

方法 回顾性收集分析 2016 年 3 月-2016 年 10 月满足入组条件且于本院行 ^{131}I 清甲治疗的 DTC 术后患者。清甲前 2 周内完成甲状腺静态显像，口服 131I 治疗后的 3-4d 完成全身碘扫描（简称碘扫）。图像分析均有两名核医学诊断医师分别进行定性评价，分别为阳性（即存在残余甲状腺组织显影）与阴性（即无残余甲状腺组织显影），当出现分歧时通过达成共识得出结论。以治疗后全身碘扫描结果作为金标准，采用卡方检验以及 McNemar 检验分析计算两者的符合率、敏感性、特异性、阳性预测值（positive predictivevalue,PPV）、阴性预测值（negative predictivevalue,NPV）和准确性等指标。*P*＜0.05 表示有统计学意义。

结果 共计收集满足条件患者 171 例，其中男性患者 42 例（24.56%），女性患者 129 例（75.44%），年龄范围为 11-75 岁，中位年龄 43 岁。碘扫阳性 164 例（95.9%），其中 78 例

（47.56%）同时表现为甲扫阳性。碘扫阴性 7 例，且其甲扫均为阴性。甲扫阴性，而碘扫呈阳性的患者 86 例，碘扫阴性,且甲扫阳性的患者 0 例。甲扫与碘扫结果不一致的患者总计 86 例。以碘扫结果作为金标准时，卡方检验结果显示，清甲治疗前甲状腺静态显像结果与治疗后全身碘显像结果存在统计学差异。

PU-1293
磁共振酰氨基质子转移成像及体素内不相干运动成像在术前预测胶质瘤 IDH1、MGMT 及 Ki-67 表达的应用初探

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目的 探索磁共振酰氨基质子转移成像（APT）及体素内不相干运动成像（IVIM）术前预测胶质瘤 IDH1、MGMT 及 Ki-67 表达的价值。
方法 收集我院 51 例术前行 APT 及 IVIM 序列扫描的患者，所有的病例均经病理学证实为胶质瘤。两序列的参数有：APTW，rAPTW、D 值，f 值，D*值。回顾性分析各肿瘤 IDH1、MGMT 及 Ki-67 的表达状态，利用卡方检验分析 IDH1、MGMT 不同表达状态下患者性别、肿瘤级别的差异；采用独立样本 t 检验分析 IDH1、MGMT 不同表达状态下各参数的差异及不同性别、年龄的 Ki-67 LI 的差异。运用双变量 Pearson 相关分析 Ki-67 LI 与各参数的相关性。各参数预测 IDH1、MGMT、p53 表达状态的准确性运用受试者特性曲线、曲线下面积和 cut-off 值。
结果:（1）IDH1 表达状态与年龄、性别无相关性，与胶质瘤的级别呈负相关性。APTW、rAPTW、f 值与 IDH1 表达状态呈负相关，D 值与其呈正相关。APTW、rAPTW、f 值、D 值均具有中等程度预测效能，rAPTW、f 值、D 值三者联合时预测效能最高（AUC=0.913）。（2）MGMT 表达状态与年龄、性别及胶质瘤的级别无相关性。两组间 APT 序列参数无差异，而 IVIM 参数均有差异，D 值、D*与 MGMT 表达水平呈负相关，f 值与其呈正相关。APT 序列参数预测 MGMT 蛋白表达状态时效能低，而 IVIM 各参数效能较高，D 值、f 值及 D*值联合时预测效能最高（AUC=0.907）。（3）年龄、性别、D*值与 Ki-67 LI 无相关性；肿瘤级别、APT、rAPTW、f 值与 Ki-67 LI 呈正相关，D 值与 Ki-67 LI 呈负相关。
结论 APT、IVIM 在术前能较好地预测 IDH1 的表达；APT 预测 MGMT 表达时效能差，IVIM 预测时效能较好； APT 参数、f 值与 Ki-67 LI 呈正相关，D 值与 Ki-67 LI 呈负相关。

PU-1294
偏头痛患者脑内 GABA 含量的磁共振波普研究

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目的 本实验具体检测无先兆性偏头痛病人前扣带回部位 GABA 含量与健康人群之间是否具有统计学差异。
方法 选取苏大附一院神经内科头痛门诊 17 名无先兆性偏头痛患者及 17 名年龄、性别及受教育程度相匹配的健康志愿者，临床评估包括病程、家族遗传性、焦虑自评量表（GAD-7）及抑郁自评量表（PHQ-9）及 0-10 分视觉模拟量表（VAS）。应用 3T 飞利浦 MRI 对所有无先兆偏头痛患者及志愿

者行颅脑 T1 加权 TFE 序列(T1W-TFE)扫描，得到三维高分辨率图像，并在所得的三维图像上将感兴趣区手动调整放置于前扣带回皮层。其后应用 MEGA—PRESS 序列采集 GABA 波普数据。利用 Gannet 软件对波谱数据进行自动后处理，定量分析前扣带回皮层的 GABA 含量。对无先兆性偏头痛患者和健康志愿者组的 GABA 含量用独立样本 t 检验进行统计分析，并对 GABA 水平与临床评估之间的相关性进行 Spearman 相关分析。

结果 统计分析结果显示，在脑前扣带回区域，无先兆性偏头痛患者组 GABA 含量低于对照组(0.116±0.009 VS 0.123±0.010)，有统计学差异(P=0. 048)。相关性分析结果显示，无先兆性偏头痛患者组前扣带回 GABA 含量与 VAS 分数无明显相关性（r = 0.454，p = 0.067）。

结论 无先兆性偏头痛患者组前扣带回区域 GABA 含量较健康对照组降低。这一结果提示抑制性神经递质 GABA 或可能参与无先兆性偏头痛发病的神经生物学。

PU-1295
水通道蛋白磁共振分子成像对脑缺血半暗带的评价

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目的 探讨多 b 值 DWI-MR 水通道蛋白分子成像（Aquaporin MR imaging，AQP-MRI）技术对脑缺血半暗带的诊断价值。方法 将 30 只 SD 大鼠随机分为缺血组（25 只）和对照组（5 只），缺血组经历 1 h 短暂性大脑中动脉栓塞（MCAO）建立脑缺血模型,两组分别行多模态 MR 扫描，采集 T2-FLAIR、DWI、ASL 及 AQP-MRI（18b 值 DWI）图像。将 AQP-MRI 与 T2-FLAIR 不匹配的区域与传统 T2-FLAIR 不匹配作比较，验证 AQP-MRI 对缺血半暗带的诊断价值，并结合组织病理学进行评价。结果 对照组在每个时间点各序列均未见异常信号。缺血组 24 h 内，AQP-MRI/T2-FLAIR 不匹配面积和 DWI/T2-FLAIR 不匹配面积有显著差异（P＜0.01）。6 h 内，AQP-MRI/T2-FLAIR 不匹配面积和 ASL/DWI 不匹配面积无明显统计学差异（P＞0.05）。24 h 内半暗带区相对比值 rIP 与梗死区 rIC 及正常脑组织 rNC 具有统计学差异（P=0.001 及 P＜0.05），MR 结果与组织病理学相对应。。结论 与传统的不匹配相比，AQP-MRI/T2-FLAIR 不匹配可多层次、更精准地实时动态显示缺血半暗带。AQP-MRI 与 T2-FLAIR 相结合可对缺血半暗带的评价提供有价值的影像学信息。

PU-1296
意识障碍的全脑功能神经连接网络表型及蛋白分布的三维可视化研究

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目的 意识障碍是一种严重的脑功能紊乱，对社会经济及家庭造成沉重的负担。目前针对意识障碍尚缺乏有效的治疗手段，根本原因在于人们对于意识障碍产生的神经环路机制仍然知之甚少。现有的磁共振和光学成像技术是意识障碍机理研究的重要手段，但是单纯采用磁共振成像技术或传统的光学成像技术所建立的意识障碍模型和理论只能对脑区之间的神经元功能及其连接关系进行注解，无法精确地对特定类型神经元的投射路径和功能蛋白分布模式进行分析，仍然不能从根本上解析意识障碍发生的机制。**方法** 本研究围绕意识障碍全脑功能环路与蛋白分布关系问题展开，以创伤性意识障碍动物为疾病模型，综合运用全脑三维光片荧光成像技术和磁共振成像技术的优势，对光片成像系统进行改进，首先采用侧面高斯光片激发并在垂直的方向上对激发光信号进行探测，引入振动切片技术对全脑样本进行遍历式切片成像，克服了传统光片三维成像时样品深层组织的荧光信号

经散射造成的图像质量降低。其次筛选并建立适用于微米级振动切片的高分子光透明试剂和方法，在满足切片需要的同时保持组织细胞形态结构和荧光标记信号，建立了全脑光透明新方法。最后利用脑区轮廓定位及图像提取技术对磁共振成像数据中的功能脑区进行识别和定位，并在定位脑区的基础上进行标记和三维光学成像。**结果** 结合光片成像与振动切片技术研制三维荧光成像系统，实现了鼠脑全脑甚至更大体积样品的高分辨率快速成像。筛选并设计适用于微米级振动切片的高分子光透明试剂和方法，满足了三维荧光成像系统的成像需要。利用图像提取技术对磁共振成像数据中的功能脑区进行识别和定位，可满足对相应功能区域的特定神经元及蛋白进行注解。**结论** 采用搭建的三维光片成像系统结合 fMRI 成像技术，能够获取意识障碍动物模型全脑功能环路与蛋白分布数据，为意识障碍的机理研究提供科学支撑与技术保证。

PU-1297

Amide Proton Transfer-weighted (APTw) Imaging of Intracranial Infection in Children: Initial Experience and Comparison with Gadolinium-enhanced T1-weighted Imaging and Magnetization Transfer (MT) Imaging

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Objectives To demonstrate the feasibility of using amide proton transfer-weighted (APTw) imaging to detect intracranial infection in children at 3 Tesla.
Methods Twenty-eight patients (15 males and 13 females; age range 1-163 months) with intracranial infection were recruited in this study. The patients underwent MRI scans including APTw and conventional MR sequences. Magnetization-transfer (MT) spectra over an offset range of ± 6 ppm and the conventional MT ratio (MTR) at 15.6 ppm were acquired. The APTw imaging signal was quantified using the MTR asymmetry (MTR_{asym}) at the offset of 3.5 ppm.
Results In twelve patients with brain abscesses, the enhancing rim of the abscesses on the Gd-T1w images were consistently hyperintense on the APTw images. The average APTw signals were significantly higher in the gadolinium-enhancing rim of the lesions than in the perifocal edema and contralateral normal-appearing brain tissue (CNABT) ($P<0.001$). MTR values between gadolinium-enhancing rim and perifocal edema showed no significant differences. APTw values in the gadolinium-enhancing rim and perifocal edema decreased after treatment. MTR values in all tissue types stayed stable. In eight patients with viral encephalitis, three encephalitic lesions showed slight spotted gadolinium enhancement, while the APTw image also showed slight spotted high signal. Five encephalitic lesions showed no enhancement on Gd-T1w and iso-intensity on the APTw image. The average APTw and MTR values were not significantly different between viral encephalitis and normal control groups ($P>0.05$). In eleven patients with meningitis, increased APTw signal intensities were clearly visible in gadolinium enhancing leptomeninges.
Conclusions These initial data show that APTw MRI is a noninvasive technique for the detection and characterization of intracranial infectious lesion. APTw values show potential as early response biomarker after treatment for brain abscess.

PU-1298

脊髓型颈椎病生物力学分析初步研究

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目的 构建颈部三维有限元模型（finite element model，FEM），初步分析脊髓型颈椎病（cervical spondylotic myelopathy，CSM）患者及健康受试者颈部生物力学的差异，为 CSM 发病机制提供生物力学依据。
方法 从我院临床确诊的 CSM 随机抽取 1 名患者作为力学模拟实验对象、依照患者的年龄、性别、身高、体重等参数招募类似体型的人作为对照，进行三维 CT 扫描，并构建颈部三维 FEM，比较患者和健康受试者在颈椎正常受力情况下椎体、椎间盘、韧带及脊髓的应力差异，以及后仰伸运动后最大应力的差异。
结果 CSM 患者颈椎椎体受力差异最明显为 C5-C6 节段，健康受试者和患者的最大应力部位均在椎体前缘，CSM 患者椎体前缘的最大应力小于健康受试者；CSM 患者椎间盘应力分布不均匀，最大应力部位集中在椎间盘底部后缘的两侧；CSM 患者各韧带的应力分布不均匀，其中后纵韧带应力最大。CSM 患者颈椎在后仰伸运动范围受限。
结论 CSM 患者相对于健康受试者椎体、椎间盘、韧带受力平衡发生改变，运动范围受限，这可能是引起脊髓型颈椎病的生物力学基础

PU-1299

3.0T 磁共振化学交换饱和转移成像在肺癌脑转移的应用初探

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目的 探讨 3.0T 磁共振肺癌脑转移瘤的 CEST 成像技术与评价其应用价值。
方法 收集 2018 年 1-7 月肺癌脑转移瘤 26 例、胶质瘤 15 例及正常对照组 20 例，观察采用 ASSET 技术的 GRE EPI CEST 序列成像并通过 APT 软件处理获得 3.5ppm 磁化转移率（MTR）图，测定病灶实质区、水肿区、非病灶区的 MTR 值。测量值进行方差分析和独立样本 t 检验统计学分析，检验标准为 P＜0.05。同时进行 MTR 图像与传统 MRI 图像比较。
结果 MTR 图上转移瘤组的病灶实质区、水肿区、非病灶区分别呈红黄色、黄绿色、绿蓝色；其 MTR 值分别为 3.29±1.14%、1.28±0.36%、1.26±0.31%。胶质瘤组病灶实质区、水肿区、非病灶区分别呈红色、红黄色、绿蓝色，MTR 值分别为 6.29±1.58%、2.87±0.65%、1.03±0.30%。正常组对应区均呈绿蓝色，MTR 值分别为 1.07±0.22%、1.04±0.23%、1.06±0.24%。传统 MR 图像均呈黑白对比，无代谢信息显示。统计学比较显示转移瘤组与正常组、胶质瘤组 3 个区域 MTR 值有统计学差异（P＜0.05）；转移瘤组病灶实质区与水肿区、非病灶区的 MTR 值比较均有统计学差异（P＜0.05），水肿区与非病灶区的 MTR 值无统计学差异（P＞0.05）。胶质瘤组病灶实质区与水肿区、非病灶区的 MTR 值比较有统计学差异（P＜0.05），水肿区与非病灶区的 MTR 值有统计学差异（P＜0.05）。
结论 采用 CEST 成像技术可以获得伪彩图像并能够反映蛋白代谢。转移瘤病灶实质区、水肿区呈红黄色、绿蓝色，MTR 值比胶质瘤组低，比正常组高；而非病灶区呈绿蓝色，MTR 值比胶质瘤组、正常组高。通过 MTR 图像颜色分辨及 MTR 值测定，实现脑转移瘤早期诊断与病灶的分子影像水平的转归评估。

PU-1300
ASL 联合 SWAN 对单侧大脑中动脉闭塞后侧支循环建立状态显示的应用价值

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摘要：目的 探讨磁共振动脉自旋标记成像（ASL）联合 T2*血管加权成像（SWAN）在单侧大脑中动脉（MCA）闭塞后软脑膜侧支循环建立状态显示的临床应用价值。**方法** 收集研究 2016 年 1 月至 2019 年 6 月经临床及影像学诊断为急性缺血性脑卒中（AIS）且单侧 MCA 闭塞患者 50 例，均行磁共振常规序列、三维伪连续式动脉自旋标记成像（3D pCASL），SWAN 及三维时间飞跃法磁共振血管成像（3D-TOF MRA）序列检查，通过观察分析（CBF）伪彩图，依据缺血核心区周围是否出现动脉内高信号，将患者分为观察组和对照组，分别对两组患者于入院当日及 15 日依据美国国立卫生研究院脑卒中评分量表（NIHSS）进行评分，利用 DWI 序列评估两组梗死核心区面积差异。通过 SWAN 序列显示缺血核心区周围引流静脉形态学改变。**结果** 观察组患者入院当日与 15 日 NIHSS 评分均低于对照组，同时 DWI 序列提示观察组梗死区面积小于对照组，差异有统计学意义（P<0.05）。观察组缺血梗死区周围 PVS 显示率为 27.27%（6/22），明显低于对照组 78.57%（22/28）。**结论** 软脑膜动脉侧支循环是单侧 MCA 闭塞后的主要代偿途径，通过 ASL 联合 SWAN 序列反映侧支循环建立状态有助于评估缺血梗死现状、预后以及治疗方案的选择。

PU-1301
大脑中动脉 M1 段闭塞后动脉偏侧优势和动脉内高信号对比研究

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摘要：目的 探讨大脑中动脉（MCA）M1 段闭塞后，同侧大脑前动脉（ACA）及大脑后动脉（PCA）偏侧优势与动脉内高信号之间的相关性。**方法** 收集 2016 年 1 月至 2019 年 3 月经磁共振血管成像（MRA）提示单侧 MCA M1 段闭塞患者 60 例，依据有无 ACA、PCA 偏侧优势分为偏侧优势组和对照组，通过观察三维动脉自旋标记成像（3D-ASL），对比两组动脉内高信号显示差异。同时选取急性脑梗死患者 38 例，依据 DWI 序列，测量并比较偏侧优势组及对照组梗死核心面积差异。**结果** 60 例患者中，偏侧优势组出现动脉内高信号为 87.9%（29/33），对照组患者出现动脉内高信号为 48.1%（13/27）。急性脑梗死患者 38 例，偏侧优势组脑梗死面积（226.38±56.51㎜^{2}）亦明显小于对照组（827.26±124.27 ㎜^{2}），两组差异有统计学意义（P<0.05）。**结论** 大脑动脉偏侧优势及动脉内高信号均可提示单侧 MCA M1 段闭塞后软脑膜侧支循环建立状态，但动脉内高信号更为敏感和准确，侧支循环的建立对于患者治疗方案的选择及临床预后均具有积极意义。

PU-1302
基于磁共振化学交换饱和转移成像技术对 类淋巴系统可视化的探究

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目的 类淋巴系统是人体内重要的防御系统，其与心血管系统相互沟通，密切相关。该系统以脑脊液和间质液为基础,在脑实质内由蛛网膜下腔进入血管周围间隙的循环机制将颅内代谢废物(如β-淀粉样蛋白、tau、载脂蛋白)排出颅内，,本项研究旨在运用磁共振化学交换饱和转移成像技术(CEST)验证其存在性，并且为脑类淋巴系统损伤的监测提供一种新兴的无创成像方法技术，为相关的脑部疾病（如阿尔茨海默症、认知功能障碍等）提供更加全面的诊断方法。**方法** 采集猪血液、淋巴液和脑脊液样本，以及蒸馏水作为基础对照，将四种液体分别置于四支 2ml 核磁管内，加入抗凝剂枸橼酸钠(比例 10:1)并将 pH 滴定至 7.0。随后在 7.0T 磁共振扫描仪上行 CEST 扫描。**结果** 血液、脑脊液、淋巴液和蒸馏水在 CEST 成像中，淋巴液表现出最明显的 CEST 效应，在 1.0ppm 处，经过 B0 校正后最大磁化转移率(MTR)达 32%。**结论** 运用磁共振 CEST 技术对实现淋巴系统的可视化是可行的，并对探讨脑类淋巴系统可视化的可能性甚至类淋巴系统障碍的机制具有潜在的意义。

PU-1303
首发抑郁症患者纹状体多巴胺 D2 受体改变及其与行为学的相关分析

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目的 应用 ^{11}C-Raclopride 正电子发射断层显像(PET)/计算机体层摄影(CT)扫描，结合汉密尔顿抑郁量表(HAMD)，探讨首发抑郁症患者纹状体多巴胺 D_2 受体结合状态改变及其与行为学改变之间的关系。

方法 分别对 20 例首次发病抑郁症患者与 20 例健康志愿者行脑部 PET-CT 及 MRI。应用 MIAKAT 软件计算每一例受试者双侧纹状体多巴胺 D_2 受体结合力，运用 SPSS 软件分析患者双侧纹状体多巴胺 D_2 受体结合力改变，并对患者双侧纹状体多巴胺 D_2 受体结合力及其汉密尔顿抑郁量表评分进行相关分析。

结果 1.抑郁组左右侧尾状核、左右侧壳核 D_2 受体结合力均分别低于对照组（t=4.41、3.78，p=0.00008、0.001；t=3.20、3.13，p=0.003、0.003）。2.抑郁量表总分与双侧尾状核、壳核结合力分别呈中度负相关（r=-0.688、-0.679，p=0.001、0.001；r=-0.654、-0.585，p=0.002、0.007）；焦虑/躯体化因子分与双侧尾状核、壳核结合力分别呈中度负相关（r=-0.570、-0.563，p=0.009、0.010；r=-0.605、-0.533，p=0.005、0.016）；认知障碍因子分与双侧尾状核结合力分别呈中度负相关（r=-0.588、-0.598，p=0.006、0.005），与左侧壳核结合力呈低度负相关（r=-0.489，p=0.029）；迟滞因子分与左右侧尾状核结合力分别呈中度、低度负相关（r=-0.521、-0.496，p=0.019、0.026）；睡眠障碍因子分与左侧尾状核结合力呈低度负相关（r=-0.453，p=0.045）。

结论 纹状体多巴胺受体异常可能是抑郁症患者中脑-纹状体多巴胺奖赏环路异常的重要分子机制之一。

PU-1304
多期相 CTA 联合 CTP 在脑梗塞病因学评估中的应用研究

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[摘要] 目的 多期相 CTA 联合 CTP 在评估急性脑梗塞两种病因中的应用研究。方法 回顾性分析本院 2018 年 10 月-2019 年 6 月,临床根据 TOAST 分型诊断为心源性栓塞（CE）患者 13 例，大动脉粥样硬化型（LAA）脑梗塞患者 30 例，分为 CE 组和 LAA 组，分析两组间一般资料、入院/出院时 NIHSS 评分及出院时神经功能好转率、CTA 参数、CTP 参数的相关性。结果 两组患者性别、年龄（P=0.307，P=0.162）差异无统计学意义；入院/出院时 NIHSS 评分及出院时神经功能好转率（P=0.526，P=0.850，P=0.288），梗塞累及双侧大脑半球 7.7%和 30%（P=0.112），梗塞累及 ACA、MCA、ICA 末端者分别是 8%、92%、15%和 6.7%、90%、20%（P=0.903，P=0.811，P=0.721），以上差异均无统计学意义；两组中梗塞是多节段者为 7.7%和 40%，P=0.034，差异有统计学意义；两组区域软脑膜评分为（12.46±3.20）分和（15.70±3.34）分，P=0.005，差异有统计学意义；CE 组低灌注脑组织体积、梗塞核心和缺血半暗带的体积（150.30±126.80、65.23±63.65、85.08±74.87）都大于 LAA 组（105.07±114.53、33.03±53.40、72.03±74.06），（P=0.256；P=0.094；P=0.600）；CE 组错配比（4.75±6.19）小于 LAA 组（7.82±14.77），P=0.477；但差异均无统计学意义。结论 多期相 CTA 上存在多节段血栓征患者病因更可能是动脉硬化；区域软脑膜评分（rLMC 评分）对急性前循环缺血性卒中病因有较好的预测价值。

PU-1305

Selective micro-structural integrity impairment of the sub-region of the corpus callosum associated with illness duration in major depressive disorder

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Background: Aberrant structural and functional connectivity are considered to be involved in the underlying neural mechanism of major depressive disorder (MDD). However, the relationship between illness duration and alterations in structural and functional in the bilateral hemispheres are rarely examined.
Methods: 96 patients with MDD and 73 healthy controls were enrolled in this study. Diffusion tensor images (DTI) and Resting-state Blood oxygen level-dependent were acquired for all subjects. The corpus callosum (CC) was reconstructed by DTI tractography and was divided into five sub-regions. The white matter integrity of the CC sub-regions and voxel-mirrored homotopic connectivity (VMHC) of whole brain were compared between the two groups. Their correlations with clinical measures (e.g. illness duration) were further performed.
Results: There were no significant differences in the CC sub-regions and VMHC of the whole brain between two groups. In patients with MDD, significantly negative correlations between illness duration and FA values of CC sub-region 2 and CC sub-region 5, significantly positive correlations between CPT-IP-3 and FA values of CC, CC sub-region 2 and CC sub-region 3, and significantly positive correlation between illness duration and VMHC of the supplementary motor areas, lingual gyrus, and

precuneus. Further mediation analyses demonstrated that disrupted microstructural integrity of CC partly mediated the association between illness duration and on sustained attention.
Conclusion: Our findings suggest that longer illness duration was predictive of greater white matter microstructural abnormalities of CC sub-regions and altered inter-hemispheric functional connectivity in patients with MDD. These findings provide new insights into neural mechanisms and reinforce an integrative view of the microstructural integrity of CC and inter-hemispheric brain functional of MDD.

PU-1306

多功能 Cu2(OH)PO4@PAA 纳米颗粒通过抑制 MSH6-CXCR4-TGF-β1 环治疗脑胶质母细胞瘤

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目的
脑胶质母细胞瘤（Glioblastoma multiforme，GBM）是侵袭能力最强的神经系统肿瘤。MSH6 是 DNA 错配修复系统的重要组成因子，其在 GBM 中的功能仍然不清楚。因此，本课题探究了 MSH6 在 GBM 中的功能及分子机制，并针对该靶点寻找相应的治疗方式。
方法
采用 MTT 实验、流式细胞仪、Transwell 小室分别检测 GBM 细胞的细胞活力、细胞周期、迁移和侵袭能力。在分子水平上，采用 western blot，qRT-PCR 和免疫荧光实验来检测代表性的肿瘤标志物和调节因子的表达水平。采用水热法合成 $Cu_2(OH)PO_4$@PAA 纳米颗粒；采用 JEM-2010 透射电镜观察样品的大小及形貌；采用 U-4100 型光吸收检测仪检测样品的光吸收特性；采用红外热成像仪分析 $Cu_2(OH)PO_4$@PAA 的光热转换能力。采用 T1WI 在体外和裸鼠体内检测 $Cu_2(OH)PO_4$@PAA 的 T1 加权磁共振成像效果。在 GBM 细胞中和 U251 荷瘤裸鼠体内检测 $Cu_2(OH)PO_4$@PAA 介导的 PTT 的治疗效果及分子机制。
结果
MSH6 是一个在 GBM 中异常高表达的癌基因，MSH6、CXCR4 和 TGF-β1 可以组成一个反馈环路，即 MSH6-CXCR4-TGF-β1 反馈环，通过激活 p-STAT3/Slug 和 p-Smad2/3/ZEB2 信号传导通路，来促进 GBM 细胞的增殖、迁移和侵袭，并抑制其凋亡。此外，我们成功合成了平均粒径为 4 nm 的 $Cu_2(OH)PO_4$@PAA 纳米颗粒，其具有良好的光热转换能力和 T1 加权磁共振成像能力。$Cu_2(OH)PO_4$@PAA 介导的 PTT 在体外和体内均显示出良好的治疗效果，并且与 MSH6-CXCR4-TGF-β1 反馈环的抑制有关。
结论
促进 GBM 肿瘤形成和进展的 MSH6-CXCR4-TGF-β1 反馈环是 PTT 治疗 GBM 的一个新靶点。

PU-1307

T1-weighted contrast-enhanced image combined with radiomics in predicting IDH1 mutation status of WHO grade II and III gliomas

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Purpose
Isocitrate dehydrogenase 1 (IDH1) mutation has been shown to be closely associated with the occurrence of WHO grade II and III gliomas, and also an independent predictor of prognostic evaluation for WHO grade II and III gliomas. However, the confirmation of the IDH1 mutation status requires surgical excision or biopsy. Therefore, the purpose of this study was to assess the radiomic strategies in predicting the diagnostic performance of IDH1 mutation status of WHO grade II and III gliomas.
Materials and Methods
This study retrospectively analyzed 135 patients with histologically confirmed WHO grade II and III gliomas who underwent the T1CE MR examination before any intervention between January 2015 and July 2017 were recruited in the current study, including IDH1 wild type group (WHO grade II n = 21, WHO grade III n=30), IDH1 mutation group (WHO grade II n=48, WHO grade III n=36). The VOI of whole tumor-enhanced part was manually drawn on the T1CE using ITK-SNAP, and 1044 features were extracted by using the software of A.K. software (Analysis-Kinetics, A.K., GE Healthcare). Random forest (RF) algorithm and 5 fold cross validation were used to predict the IDH1 mutation status of WHO grade II and III gliomas.
Results
The anatomical locations of tumors for IDH1 mutant and IDH1 wild-type patients were different, with significant difference ($P < 0.001$). In addition, IDH1 mutant of WHO grade II and III gliomas were strongly associated with nodular/annular enhancement ($P = 0.001$). Moreover, there were no statistically significant differences in other imaging features and clinical characteristics between the IDH1 mutant and the IDH1 wild-type patients group. Radiomic strategy produced the stable diagnostic efficiency, with an area under the curve (AUC), ACC, sensitivity, and specificity of 0.794, 70.9%, 0.614 and 76.7%, respectively. The IDH1 mutation status of WHO grade II and III glioma was evaluated by radiomic strategy, and the difference between the two groups was statistically significant ($P < 0.05$).
Conclusion
Radiomic strategy can evaluate IDH1 mutation status of WHO grade II and III gliomas, and RF classifier model is a promising machine learning method to predict IDH1 gene mutations. The development of accurate and reliable model can help patients with gliomas to diagnose early and make treatment plan.

PU-1308

PDZ 蛋白抑制胶质瘤细胞恶性表型

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胶质瘤是最常见的原发性脑恶性肿瘤，恶心胶质瘤预后不良。我们的研究发现在脑胶质瘤病人中，PDZ 蛋白 MAGI3 在 mRNA 和蛋白水平均下调。通过过国表达和敲除 MAGI3 的细胞模型研究中，我们发现 MAGI3 能够抑制胶质瘤细胞的增殖、迁移和细胞周期进程。通过 GST pull-down 和 CO-IP 实验，我们发现 MAGI3 通过其 PDZ 域和β-catenin 的 PDZ 结合基序与β-catenin 结合。MAGI3 的过度表达通过与β-catenin 的相互作用抑制β-catenin 的转录活性。胶质瘤细胞 C6 中 MAGI3 的过度

表达抑制了包括 Cyclin D1 和 Axin2 在内的β-catenin 靶基因的表达，而胶质瘤细胞 U373 和 LN229 中 MAIG3 的敲除增强了上述基因的表达。MAGI3 的过度表达降低了小鼠皮下成瘤能力，抑制了异种移植瘤中β-catenin 靶基因的表达。此外，基于 GEO 胶质瘤数据库的分析显示 MAGI3 表达与总生存率和肿瘤分级负相关。最后，我们通过三个公开的胶质瘤数据集的 GSEA 和临床胶质瘤样本的免疫组化染色证实了 MAGI3 表达与 Wnt/β-catenin 信号传导活性之间的负相关。综上所述，这些结果证实 MAGI3 是一种新的肿瘤抑制因子，并提供了对胶质瘤发病机制的深入了解。

PU-1309
47 天小婴儿脑内节细胞胶质瘤误诊一例的磁共振及 CT 影像表现

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目的 分析一例 47 天小婴儿脑内节细胞胶质瘤病例的 MRI 及 CT 影像表现，对脑内节细胞胶质瘤疾病影像学表现有进一步的认识。**方法** 回顾性分析本院 2018 年 6 月脑内节细胞胶质瘤误为脑内血管畸形伴出血患儿 1 例，并经手术及病理证实的节细胞胶质瘤的 MRI 及 CT 表现，MRI 行颅脑平扫检查，CT 行颅脑平扫加增强检查，探讨该病发病部位，肿瘤形态、边界、信号及强化特点，并文献复习。**结果** 此例病例为 47 天患儿，临床症状以一侧肢体频繁抽搐症状为主，病灶于右侧额叶近中线处，呈分叶状，边界较清晰，MRI 表现为肿瘤主体 T1WI 呈高信号，T2WI 呈低信号，FLAIR 像呈低信号，DWI 呈稍低信号，ADC 图呈低信号。SWI 病灶周边可见迂曲、受压的小静脉显示，病灶周围无明显水肿，有轻度的占位效应。CT 表现为病灶呈不均匀性稍高密度影，病灶周边密度略偏低，CT 值约 39-51Hu，病灶中央可见片条状高密度钙化影，CT 值约 73-80Hu，增强扫描病灶周围明显强化，病灶周围无明显水肿，病灶周边可见多发迂曲动静脉血管影显示。故误诊为脑内血管畸形合并出血。患儿手术病理及免疫组化结果符合节细胞胶质瘤，可见散在节细胞及钙化。**结论** 此病例临床症状符合节细胞胶质瘤典型表现，患儿年龄不符合节细胞胶质瘤的好发年龄，好发部位不符合该病的好发部位（颞叶），MRI 表现及 CT 表现、病灶内钙化符合该病特点，加强对该病影像表现的认识，对该病影像诊断及鉴别诊断提供帮助。

PU-1310
Gene expression meta-analysis in diffuse low-grade glioma and the corresponding histological subtypes

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Diffuse low-grade glioma (DLGG) is a well-differentiated, slow-growing tumour with an inherent tendency to progress to high-grade glioma. The potential roles of genetic alterations in DLGG development have not yet been fully delineated. Therefore, the current study performed an integrated gene expression meta-analysis of eight independent, publicly available microarray datasets including 291 DLGGs and 83 non-glioma (NG) samples to identify gene expression signatures associated with DLGG. Using INMEX, 708 differentially expressed genes (DEGs) (385 upregulated and 323 downregulated genes) were identified in DLGG compared to NG. Furthermore, 497 DEGs (222 upregulated and 275 downregulated genes) corresponding to two histological types

were identified. Of these, high expression of HIP1R significantly correlated with increased overall survival, whereas high expression of TBXAS1 signi cantly correlated with decreased overall survival. Additionally, network-based meta-analysis identified FN1 and APP as the key hub genes in DLGG compared with NG. PTPN6 and CUL3 were the key hub genes identified in the astrocytoma relative to the oligodendroglioma. Further immunohistochemical validation revealed that MTHFD2 and SPARC were positively expressed in DLGG, whereas RBP4 was positively expressed in NG. These findings reveal potential molecular biomarkers for diagnosis and therapy in patients with DLGG and provide a rich and novel candidate reservoir for future studies.

PU-1311

Pineal gland abnormality in patients with type 2 diabetes mellitus

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BACKGROUND:
Patients with type 2 diabetes mellitus (T2DM) are often suffered from emotion and sleep disorders. Melatonin, which is secreted by the human pineal gland, plays an important role in sleep and circadian rhythm. Because the volume of the pineal gland is directly correlated with the gland's secretory capacity for melatonin, the aim of the present study was to evaluate and compare pineal gland volumes in T2DM patients with healthy control.
SUBJECTS AND METHODS:
We retrospectively evaluated the pineal gland volumes of 58 cases, including 35 cases of T2DM patients and 23 age, sex and body mass index (BMI) matched healthy controls (HC), in which 20 were women. The total pineal gland volume of all cases was measured via magnetic resonance images (T1-weighted magnetization-prepared rapid gradientecho sequence, sagittal view), the pineal gland and pineal cysts were outlined manually by using 3D slicer software, then the total mean pineal volume of each group was compared. The total intracranial volume (gray matter + white matter + cerebrospinal fluid) was assessed by using Statistical Parametric Mapping 8 (SPM8; Ashburner, 2009) and the voxel-based morphometry toolbox (VBM8; University of Jena, Jena, Germany) in Matlab R2012b. Additional analyses were performed to examine potential associations between total intracranial volumes and pineal volumes by using SPM8 and VBM8. The correlation between pineal volume and psychological measurements was also investigated.
RESULTS:
There were no significant differences in age, gender and BMI between T2DM patients and HC groups (all $P > 0.05$). The mean pineal volumes of T2DM patients and the health controls were 83.55 ± 10.11 mm³, and 99.73 ± 12.03 mm³, respectively, the pineal gland volume in patients with T2DM was smaller than that in healthy control subjects ($P = 0.019$), even when total intracranial volume and age were used as covariates. The pineal volume was negatively correlated with most psychological measurements, especially scores in the CVLT.

CONCLUSIONS:
Our data show that patients with T2DM have smaller pineal gland volumes and pineal gland volume is negatively related to emotional disorders. We hypothesize that volumetric changes in the pineal gland of T2DM patients may be involved in the reduced melatonin secretion in these patients. Further studies will be necessary to investigate the potential role of the pineal gland in the pathophysiology of T2DM.

PU-1312
低级别胶质瘤及病理分型的基因表达谱荟萃分析

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研究**目的** 2016 版分类标准结合分子学特征和病理表现对胶质瘤进行分类，我们通过对低级别胶质瘤相关的芯片进行荟萃分析，筛选出与低级别胶质瘤及不同病理分型相关的潜在靶向标志物，为探索低级别胶质瘤的分子机制提供理论基础，为特异性分子靶点的个体化治疗提供参考。
材料与**方法** 我们使用 INMEX 对 8 个独立的芯片数据集进行荟萃分析，并对差异基因进行 GO 功能注释、KEGG 信号通路分析及网络荟萃分析，筛选出低级别胶质瘤潜在靶向基因，通过 TCGA 数据库，我们对潜在靶向基因进行了表达验证，并进行了生存分析，最后我们搜集了 6 例低级别胶质瘤及 6 例正常脑组织标本对潜在差异基因进行免疫组化检测。
结果 （1）我们筛选出的 8 块低级别胶质瘤芯片共包括 291 个低级别胶质瘤和 83 个对照脑组织，使用 INMEX 软件进行荟萃分析，发现低级别胶质瘤与脑组织相比，共有 708 个差异表达基因，包括 385 个上调基因和 323 个下调基因。进一步我们筛选出具有两种病理分型（星形细胞瘤和少突胶质细胞）的 5 块芯片进行差异分析，发现 497 个差异基因（222 个上调基因和 275 个下调基因）。（2）功能注释得出一系列与肿瘤发生发展有关的信号通路。（3）基于网络的荟萃分析得出 FN1 和 APP 为低级别胶质瘤的关键枢纽基因。（4）通过 TCGA 数据库中低级别胶质瘤的相关数据进行分析，我们验证了 6 个关键基因（SPARC，MTHFD2，PTPRZ1，RBP4，CCKBR，STX1A）的表达情况，并发现 HIP1R 的高表达与总生存期增加显著相关（P＝0.0010），而 TBXAS1 的高表达与总体生存降低显著相关（P＝0.0031）。（5）进一步免疫组化验证显示 MTHFD2 和 SPARC 在低级别胶质瘤中阳性表达，而 RBP4 在低级别胶质瘤中阴性表达。
结论 我们的研究结果揭示了一系列低级别胶质瘤中诊断和治疗的潜在分子生物学标记，为未来研究提供了丰富而新颖的基因资源库。

PU-1313
Diffusion Kurtosis Imaging for Detection of Early Brain Changes in Parkinson’s Disease

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We aimed to evaluate microscale changes in the bilateral red nucleus and substantia nigra of patients with Parkinson’s disease (PD) using diffusion kurtosis imaging

(DKI). Twenty-six patients with PD (mean age: 62.5 ± 8.7 years, Hoehn-Yahr stage: 0-4.0, Unified Parkinson's Disease Rating Scale (UPDRS) scores: 8-43) and 15 healthy controls (mean age: 59.5 ± 9.4 years) underwent DKI of the substantia nigra and red nucleus. Imaging was performed using a General Electric (GE) Signa 3.0 Tesla MR Imaging System. Patients with PD were divided into two groups consisting of 12 patients with UPDRS scores ≥30 and 14 patients with UPDRS scores <30. All DKI data processing operations were performed with commercial workstations (GE, ADW 4.6) using Functool software to generate color-coded and parametric maps of mean kurtosis (MK), fractional anisotropy (FA), and mean diffusivity (MD). MK values in the bilateral substantia nigra were significantly lower in patients with early- and advanced-stage PD than in controls. Moreover, MK values in the left substantia nigra were significantly lower in patients with advanced-stage PD than in those with early-stage PD. Patients with advanced-stage PD also exhibited significant decreases in MK values in the bilateral red nucleus relative to controls. No significant differences in FA or MD values were observed between the PD and control groups. There were no significant correlations between MK, FA, or MD values and UPDRS scores. Our findings suggest that decreased MK values in the substantia nigra may aid in determining the severity of PD and help provide early diagnoses.

PU-1314

Pineal gland abnormality in fragment reading

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BACKGROUND:
Fragmented reading has been linked to autism and depression with sleep disorders etc. Melatonin, which is secreted by the human pineal gland, plays an important role in sleep and circadian rhythm, our understanding of the mechanisms behind it have remained unclear. Studies have shown that low melatonin levels in ASD could be linked to a decrease of the pineal gland volume (PGV). The aim of the present study was to evaluate and compare pineal gland volumes in before and 1 month after fragment reading.
SUBJECTS AND METHODS:
We retrospectively evaluated the pineal gland volumes of 33 groups, including 33 cases of before fragment reading, 30 cases of 1 month after fragment reading. The total pineal gland volume of all groups was measured via magnetic resonance images using 3D slicer software, and the total mean pineal volume of each group was compared.
RESULTS:
The mean pineal volumes of people with before and 1 month after fragment reading were 87.89±53.29 mm^3, 88.49±46.90 mm^3, respectively. The mean pineal volume of 1 month after fragment reading was similar than that of before fragment reading but with borderline difference.
CONCLUSIONS:
Our data show that people with before and 1 month after fragment reading demonstrated no difference in their pineal volumes.

PU-1315

The vitro study of a novel MR and fluorescence dual-modality bioimaging nanoprobe

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Abstract **Background** In recent decades, molecular imaging, especially the study of multimodality probe, has been flourishing at an unprecedented pace and stimulating intense interest from various of discipline as it will surely offer revolutionary tools not only for fundamental studies but also for clinical applications. As an non-radiative and high resolution imaging modality, magnetic resonance imaging (MRI) has been used extensively in clinical diagnosis. Moreover, Gadolinium (Gd)-based MRI contrast agents have been successfully applied for detecting tumors by providing accurate and reliable details of the tumor. Meanwhile, optical imaging has drawn much attention for its excellent imaging sensitivity, cost effectiveness, operational simplicity and real-time imaging features. It is urgent to develop a MR and fluorescence dual-modality contrast agent by combining the superiority of different imaging modalities.

Methods we report a novel MR and fluorescence dual-modality carbon quantum dot functionalized by gadolinium chelates (named as Gd-CQDs) that is obtained through one-step pyrolysis of gadopentetate monome-glumine, which provides simultaneously a carbon and gadolinium source. Cell culture and Imaging, In vitro CCK-8 and FITC-Annexin Apoptosis Detection tests confirmed the low toxicity and high biocompatibility of Gd-CQDs. In vitro fluorescence imaging of Gd-CQDs and MR imaging of Gd-CQDs and clinical contrast agent of Omniscan and Magnevist has been made to detect the double modal imaging performance of vitro.

Results In this study, we demonstrated a new MR and fluorescence dual-modality carbon quantum dot functionalized by gadolinium chelates as Gd-CQDs, which can be easily prepared by one-step pyrolysis. In vitro test has confirmed the low toxicity and high biocompatibility and outstanding imaging performance. Even more noteworthy is that Gd-CQDs display much higher Magnetic performance with longitudinal relaxation rate of 11.2 $mM \cdot L^{-1}S^{-1}$ than the clinical MRI contrast agents of Magnevist at the same Gd^{3+} content. In vitro fluorescence imaging of Gd-CQDs has proved that they has wide range imaging and fluorescence can be observed at the excitation wavelength of 365nm (blue), 488nm (green) and 525nm (red) at the studied concentration of 50 $ug \cdot mL^{-1}$, 100 $ug \cdot mL^{-1}$ and 200$ug \cdot mL^{-1}$, In addition, time and concentration-dependent effect also can be found not in imaging but also in toxicity test. Moreover, in accordance with toxicity test, time and concentration-dependent effect also can be found in the uptake of Gd-CQDS and brightness of fluorescence.

Conclusion The new MR and fluorescence dual-modality carbon quantum dot functionalized by gadolinium chelates prepared by one-step pyrolysis could be a potential contrast agent for clinical applications owing to the favourable resolutions, outstanding imaging sensitivities and practicability, ease of preparation, higher biocompatibility and negligible toxicity.

PU-1316

A Study of the Effects of Acute Drinking on CBF and OEF in Memory-related Brain Regions of Young People

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Objective: 3D PCASL and ASE EPI were used to study the effects of different doses of acute alcohol on cerebral blood flow(CBF) and oxygen extraction fraction(OEF) in the memory-related brain regions of healthy young people, and to analysis the relationship between CBF and OEF in memory-related brain regions after different doses of acute alcohol consumption. **Method:** Twenty-nine young volunteers were fed with different doses of Chinese alcohol. After drinking, blood alcohol concentration(BAC) was measured. BAC≥0.04%was the low concentration group, BAC≥0.06%was the medium concentration group, and BAC≥0.08% was the high concentration group, respectively. All subjects were examined by the memory function test and brain MRI before drinking and 30 minutes after drinking. The data before drinking was as the control group. The values of CBF and OEF in left middle frontal gyrus, parietal lobe, occipital cortex, bilateral cingulate gyrus, hippocampus, amygdala and bilateral cerebellar hemisphere were compared before and after drinking respectively. **Results:** (1) Compared with pre-drinking, 30 minutes after drinking, the CBF of left middle frontal gyrus, parietal lobe, occipital cortex, bilateral cingulate gyrus, hippocampus, amygdala increased(P<0.05), and the CBF of bilateral cerebellar hemisphere decreased(P<0.05). The difference of CBF within mild, moderate and severe dose groups was statistically significant (P<0.05) by multiple comparison of LSD-t test. (2) Compared with pre-drinking, 30 minutes after drinking, the OEF of left middle frontal gyrus, parietal lobe, occipital cortex, bilateral cingulate gyrus, hippocampus, amygdala decreased (P<0.05), and the OEF of bilateral cerebellar hemisphere increased(P<0.05). The difference of OEF within mild, moderate and severe dose groups was statistically significant (P<0.05) by multiple comparison of LSD-t test. **Conclusion:** After different doses of drinking, the changes of CBF and OEF of left middle frontal gyrus, parietal lobe, occipital cortex, bilateral cingulate gyrus, hippocampus, amygdala and bilateral cerebellar hemisphere were helpful in explaining the brain blood flow regulation and brain metabolism information after drinking, and it is significant to reveal the mechanism of the effect of alcohol on the memory-related brain regions.

PU-1317

A Preliminary Study of the Gender Differences in the Effects of Acute Drinking on the Memory-related Brain Regions of Young People Based on 3D pcASL and ASE EPI

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Objective: 3D pcASLand ASE EPIwere used to explore the gender differences in the effects of acute alcohol consumption on CBF, OEF and vCBV in memory-related brain regions of healthy young people. **Method:** All of the 15 male and 14 female healthy volunteers were evaluated for the brain MRI scan before drinking and 30 minutes after drinking. 3D pcASL and ASE EPI data were post-processed at GE AW4.6 workstation, and the CBF, OEF and vCBV of left middle frontal gyrus, parietal lobe, occipital cortex, bilateral cingulate gyrus, hippocampus and cerebellar hemisphere of different genders were compared before and after drinking respectively. **Results:** (1) Before drinking, there were no significant differences between different gender volunteers of CBF, OEF and vCBV in left frontal gyrus, parietal lobe, occipital cortex, bilateral cingulate gyrus, hippocampus and cerebellar hemisphere ($P>0.05$). (2) 30 minutes after drinking, the CBF of left frontal gyrus, parietal lobe, occipital cortex, bilateral cingulate gyrus, and hippocampus was higher in female volunteers than that of in male volunteers respectively ($P<0.05$). The OEF and vCBV of left frontal gyrus, parietal lobe, occipital cortex, bilateral cingulate gyrus and hippocampus were lower in famale volunteers than in male volunteers ($P<0.05$). **Conclusion:** After drinking, male and female subjects showed changes and differences in CBF, OEF, vCBV in left frontal gyrus, parietal lobe, occipital cortex, bilateral cingulate gyrus, hippocampus and cerebellar hemisphere, it has a certain significance for revealing the gender difference of alcohol in the brain function related to memory-related brain regions.

PU-1318

Increased Intrinsic Default-mode Network Activity as A Compensatory Mechanism in aMCI: Resting-state Functional Connectivity MRI Study

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OBJECTIVE: Numerous studies have investigated the differences in the mean functional connectivity (FC) strength between amnestic mild cognitive impairment (aMCI) patients and normal subjects using resting-state functional magnetic resonance imaging (fMRI). However, whether the mean FC strength is increased, decreased or unchanged in aMCI patients compared with that in normal controls remains unclear. In our opinion, two factors led to inconsistent results: the determination of regions of interest (ROI) and the reliability of FC.

METHODS: In this study, for the first time, we explored the difference in FC and the degree centrality (Dc) constructed by the bootstrap method, between and within networks (default-mode network (DN), frontoparietal control network (CN), dorsal attention network (AN)), resulting from a hierarchical- clustering algorithm for aMCI and normal subjects. Meanwhile, we investigated the relationships between the Mini Mental State Examination (MMSE) scores and FC as well as Dc.

RESULTS：The current results indicated that the mean FC within the DN and CN was significantly increased (P < 0.05, uncorrected) in the patient group. Significant increases (P < 0.05, uncorrected) in the mean FC were also found in patients between DN and CN and between DN and AN. Five pairs of FC (false discovery rate (FDR) corrected) and the Dc of six regions (Bonferroni corrected) displayed a significant increase in the patient group. Finally, lower cognitive ability (lower MMSE scores) was significantly associated with a greater increase in the Dc of the left superior temporal sulcus (STS).
Figure 1: Dendogram of the hierarchical cluster analysis of the correlations and spatial distribution of the three networks. Colors in (a) indicated magnitude of correlation. In the sub-graph (b), the green, red and blue regions expressed the DN, CN and AN, respectively.
Figure 2: The comparisons of Dc. (a) and (b) illustrated the T value and the significant alteration (Bonferroni corrected) between two groups, respectively.

CONCLUSIONS：Our results demonstrate that the early dysfunctions in aMCI disease are mainly compensatory impairments. In addition, the results open doors for investigations into other brain illnesses.

PU-1319

Sample entropy and surrogate data analysis for Alzheimer's disease

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ABSTRACT: Alzheimer's disease (AD) is a neurological degenerative disease, which is mainly charac- terized by the memory loss. As electroencephalogram (EEG) device is relatively cheap, portable and non-invasive, it has been widely used in AD-related studies. We proposed a method to detect the differences between healthy subjects and AD patients, which combines classical sample entropy (SampEn) and surrogate data method. EEGs from 14 AD patients and 20 healthy subjects were analyzed. The results based on the original data showed that the SampEn of AD patients was significantly decreased (p < 0.01) at electrodes c3, f3, o2 and p4, which confirmed that AD could cause complexity loss. However, using original data could be subject to human judgement, so we generated a series of surrogate data. We found that, there were significant difference of SampEn between the original time series and their surrogate data at c3 and o2 electrodes. We believe that this approach verifies the difference between healthy subjects and AD patients at c3 and o2 electrodes in a different and more rigorous way. Our method is capable of distinguishing AD patients from healthy subjects, which is consistent with the concept of physiologic complexity, and providing insights for the understanding of AD.

PU-1320

Large-scale Granger causal brain network based on resting-state fMRI data

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OBJECTIVE: The causal connections among small-scale regions based on resting-state fMRI data have been extensively studied and a lot of achievements have been demonstrated. However, the causal connection among large-scale regions was seldom discussed.
METHODS: In this paper, we applied global Granger causality analysis to construct the causal connections in the whole-brain network among 103 healthy subjects (33M=66F, ages 20-23) based on a resting-state fMRI dataset. We further explored four large-scale cognitive networks which have been widely known: central executive network (CEN), default mode network (DMN), dorsal attention network (DAN) and salience network (SN). These four cognitive networks are particularly important for understanding higher cognitive functions and dysfunction. Based on the above research, Out-In degree were introduced to identify the driving and driven hubs. Studying the driving and driven hub of brain network is of great significance for assessing the functional mechanism of the brain network.
RESULTS: There were 817 directed edges identified as significant among the 8010 possible causal connections; seven driving hubs including the inferior frontal gyrus (IFGoperc) etc. and ten driven hubs including the bilateral precuneus (PCUN) etc. were identified in the whole-brain network. In CEN, the dorsolateral prefrontal cortex (DlPFC) and the superior parietal cortex (SPC) were the driven and driving hubs, respectively; in DMN, they were the posterior cingulate cortex (PCC) and the medial prefrontal cortex (MPFC); in DAN, they were the frontal eye fields (FEF) and the intraparietal sulcus (IPS); and in SN, they were the frontoinsular cortex (FIC) and the medial frontal cortex (MFC).
CONCLUSIONS: These findings may provide insights into our understanding of human brain function mechanisms and the diagnosis of brain diseases.

PU-1321
基于 DTI 轻度认知功能障碍患者脑结构网络研究

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目的 利用 DTI 数据，构建大脑结构网络，探讨轻度认知障碍（mild cognitive impairment, MCI）患者脑结构网络的小世界属性及相关参数变化。
方法 采集 50 例 MCI 患者（MCI 组）和 30 名正常老年人（NC 组）的大脑 DTI 数据。采用 SPM5 软件对图像进行预处理，利用自动解剖标定模板（automated anatomical labeling，AAL）模板将大脑皮质划分为 90 个区域，采用确定性纤维示踪算法示踪纤维，以纤维连接数目（FN）为阈值构建

白质纤维连接网络。若满足 $\gamma > 1$ 且 $\lambda \approx 1$，或 $\delta = \gamma / \lambda > 1$，则说明其具有小世界特性。计算最短路径长度（$L_p$）、聚集系数（$C_p$）、全局效率（$E_{global}$）及局部效率（$E_{local}$）。通过双样本 t 检验，对比研究 MCI 患者大脑结构网络小世界参数的变化。

结果 在 1≤FN≤6 范围内，MCI 组和 NC 组均符合 $\gamma > 1$ 且 $\lambda \approx 1$。MCI 患者的最短路径长度（L_p）高于 NC 组，且在各阈值范围内差异均有统计学意义（$P<0.05$）；MCI 组全局效率（E_{global}）低于 NC 组，在 FN=1、2、3、4 时差异有统计学意义（$P<0.05$）；MCI 组局部效率（E_{local}）值低于 NC 组，在 FN=1 时差异有统计学意义（$P<0.05$）。

PU-1322

近期皮质下小梗死形态学演变及影响演变结局的相关因素分析

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背景及目的 本研究旨在探索小动脉闭塞型近期皮质下小梗死（RSSI）的演变结局及影响其转归的相关因素，重点分析梗死灶直径对演变结局影响。**方法** 回顾性分析确诊的 96 例 RSSI 患者。收集临床信息包括年龄、性别、高血压病、高血脂、血清同型半胱氨酸等，基线头颅 MRI 影像资料包括梗死灶部位、数量、DWI 和 T2WI 横轴位最大直径、WMH 评分等及随访时 RSSI 演变结局。将 RSSI 结局转归分为腔化组（腔隙灶）和非腔化组（WMH 和消失）。找出可能与腔化有关的变量和独立预测因素。**结果** 96 例 RSSI 患者中位年龄 64.5 岁（四分位范围，58-73 岁），MRI 随访中位间隔时间 11.6 月（四分位范围，6.3-11.8 月）。59 例（62.5%）转化为腔隙灶，32 例（33.2%）转化为脑白质高信号（WMH），5 例（5.2%）病灶消失。在单变量分析中，腔化组 RSSI 的 DWI 和 T2WI 梗死灶最大直径、男性比例均明显高于非腔化组（$P<0.05$），提示上述变量与腔化灶形成可能相关，而年龄、高血压史、高血脂史、糖尿病史、血清同行半胱氨酸、随访 MRI 间隔时间、病灶部位、DWMH、PWMH 及总 WMH 评分、腔隙灶数量无显著差异性。在二分类 logistic 回归分析中，DWI 上梗死灶最大直径是腔化的独立预测因素（$P=0.022$, OR: 1.138, 95%CI: 1.019-1.271），并且以 DWI 上梗死灶最大直径≤10mm 组为参照，DWI 上最大直径＞15mm 组腔化风险是 DWI 上最大直径≤10mm 组约 7.5 倍（$P=0.010$，OR: 7.464，95%CI：1.621-34.371）。**结论** 约 62.5%RISS 演变为腔隙灶，约 38.2%RSSI 演变为脑白质高信号或者消失，RSSI 在 MRI 成像中的 DWI 直径越大，腔化可能性越大。

PU-1323

Primary Disruption of the Memory-Related Subsystems of the Default Mode Network in Alzheimer's Disease: Resting-State Functional Connectivity MRI study

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BACKGROUND: Recent studies have indicated that the default mode network (DMN) comprises at least three subsystems: The medial temporal lobe (MTL) and dorsal medial prefrontal cortex (DMPFC) subsystems and a core comprising the anterior MPFC (aMPFC)

and posterior cingulate cortex (PCC). Additionally, the disruption of the DMN is related to Alzheimer's disease (AD). However, little is known regarding the changes in these subsystems in AD, a progressive disease characterized by memory impairment. Here, we performed a resting-state functional connectivity (FC) analysis to test our hypothesis that the memory-related MTL subsystem was predominantly disrupted in AD.

METHODS: To reveal specific subsystem changes, we \calculated the strength and number of FCs in the DMN intra- and inter-subsystems across individuals and compared the FC of the two groups. To further examine which pairs of brain regional functional connections contributed to the subsystem alterations, correlation coefficients between any two brain regions in the DMN were compared across groups. Additionally, to identify which regions made the strongest contributions to the subsystem changes, we calculated the regional FC strength (FCS), which was compared across groups.

RESULTS: For the intra-subsystem, decreased FC number and strength occurred in the MTL subsystem of AD patients but not in the DMPFC subsystem or core. For the inter-subsystems, the AD group showed decreased FC strength and number between the MTL subsystem and PCC and a decreased number between the PCC and DMPFC subsystem. Decreased inter-regional FCs were found within the MTL subsystem in AD patients relative to controls: The posterior inferior parietal lobule (pIPL) showed decreased FC with the hippocampal formation (HF), parahippocampal cortex (PHC) and ventral MPFC (vMPFC). Decreased inter-regional FCs of the inter-subsystems were also found in AD patients: The HF and/or PHC showed decreased FC with dMPFC and TPJ, located in the DMPFC subsystem, and with PCC. AD patients also showed decreased FC between the PCC and TLC of the dMPFC subsystem. Furthermore, the HF and PHC in the MTL subsystem showed decreased regional FCS.

CONCLUSIONS: Decreased intrinsic FC was mainly associated with the MTL subsystem of the AD group, suggesting that the MTL subsystem is predominantly disrupted.

PU-1324

基于树枝状高分子的 Met 靶向分子探针在胶质瘤精确边界显示中的应用探究

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目的

c-Met 是参与肿瘤细胞生长、侵袭、转移和血管生成的酪氨酸激酶跨膜受体，在恶性胶质瘤中往往呈过度表达。因此我们探究基于树枝状高分子的 Met 靶向分子探针对于脑胶质瘤的边界显示。

方法

本实验主要采用了人胶质瘤细胞系 U87 和大鼠星形胶质细胞系。利用针对 c-Met 受体短肽 cMBP 肽合成了靶向分子探针 Den-cMBP-Gd 及对照探针 Den-PEG-Gd。通过磁共振扫描，在体内检测三种对比剂 Gd-DTPA、DEN-CMBP-Gd 和 DEN-PEG-Gd 的适用性。

结果

免疫荧光染色结果分析表明，Met 受体主要分布于胶质瘤肿瘤边缘和新生血管周围。在三种对比剂中，常规对比剂 Gd-GTPA 的 T1 弛豫时间下降率最高（57%），而 DEN-CMBP-Gd（下降 36%）和 DEN-PEG-Gd（下降 29%）的弛豫时间下降率表现出相似的程度。DEN-CMBP-Gd 在整体肿瘤的增强中无明显优势，但在肿瘤边缘区域增强更明显，其 T1 弛豫时间在肿瘤边缘区下降 53%，而在肿瘤中心区下降 30%（Gd-DTPA 组边缘区 31%，中心区 68%；DEN-PEG-Gd 组边缘区 14%。中心区 43%）。

结论

该实验研究证明基于树枝状高分子的 Met 靶向分子探针具有亲和力强，靶向性高的特点，其多位点效应有助于显示胶质瘤浸润边界,以更好地判定其生物学行为，指导临床靶向治疗。

PU-1325

胶质瘤相关基因的挖掘及预测

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胶质瘤是中枢神经系统最常见的原发性肿瘤，尽管临床采用多模式治疗，但大多数患者的总体预后很差，特别是胶质母细胞瘤（Glioblastoma,GB），这与胶质瘤的生物学特性有关。而基因的改变，如 1p / 19q 的共缺失，O^6-甲基鸟嘌呤-DNA 甲基转移酶（MGMT）基因启动子的甲基化，PTEN 的突变和 $p16^{INK4a}$ 的纯合缺失，表皮生长因子受体（EGFR）的突变/扩增等已被证实与胶质母细胞瘤的发生发展密切相关。不同基因表达对胶质瘤具有指导治疗与预后预测功能，因此深入挖掘胶质瘤背后的基因将使我们有可能为病人选择最佳的治疗方案，实现个体化医疗。

PU-1326

MRI 影像组学模型对高级别胶质瘤患者术后总生存期的预测价值

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目的 探讨 MRI 影像组学在预测高级别胶质瘤（HGGs）术后总生存期（OS）的价值，比较基于不同影像组学特征模型的预测效能，尝试建立一个基于影像组学评分（Radiomic Score, RS）的预后分析模型。

材料和方法 回顾性分析 60 例术后联合放化疗 HGGs 患者的临床影像资料，随机分为训练集 40 例，验证集 20 例。收集患者术后 1 周内和同步放化疗后 1 月内 T_1WI 增强、T_2WI 和 FLAIR 图像。使用 MATLAB 软件进行 ROI 分割、特征提取，通过组内相关系数和 LASSO 方法对特征进行筛选，筛选后的特征纳入多因素 Cox 生存分析模型，通过一致性指数（C-index）比较不同模型预测效能的差异。根据最优模型所筛选的特征计算 RS 评分，构建基于评分和临床资料列线图的预测模型，并评价其区分度和校准度。

结果 基于联合序列在肿瘤残留强化区提取的组学特征变化值有着更好的 OS 预测效能，经过筛选后共发现 4 个与 OS 相关度最高的影像组学标签（Maximum 3D diameter、Variance、Energy、Correlation），据此得出 RS 评分及 Cox 比例风险模型。在训练集中，RS 对患者 OS 的预测效能高于临床资料（C-index: 0.858 VS 0.825），将两者结合后模型的预测效能有进一步提高（C-index: 0.908），上述结果在验证集中得到验证，多因素 Cox 回归模型显示 RS 是 HGGs 术后 OS 的独立风险因素，训练集中 HR=1.534（$P = 4.95\times10^{-05}$），验证集中 HR=1.775（$P = 0.001$）。包含 RS 及

临床资料的列线图预测模型效能高于临床资料（C-index: 0.905 VS 0.825），通过校准曲线显示列线图预测结果与实际 OS 有较好的一致程度。
结论 利用 MRI 影像组学可以预测 HGGs 术后 OS，影像组学标签及 RS 评分均有较高的预测效能。

PU-1327
化学交换饱和转移技术用于体内检测阿尔茨海默病的淀粉样蛋白-β靶向探针

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背景和目的 可靠和可重复的检测 Aβ沉积物的方法将有益于阿尔茨海默病（AD）的早期诊断。
方法 在本研究中，评估了使用 angiopep-2 作为探针进行 Aβ沉积物检测的化学交换饱和转移（CEST）的可行性。
结果 我们证明了 CEST 可在体外检测 angiopep-2 和 Aβ-angiopep-2 结合物。此外，在体实验中与对照相比，注射 angiopep-2 的 APP / PS1 小鼠表现出显着更高的体内 CEST 效应。最后，通过 CEST 成像检测的 Aβ沉积物的分布与组织学染色结果一致。
讨论：本研究首次报道了一种可靠的外源性 CEST 探针，用于非侵入性评估 APP / PS1 小鼠中的 Aβ沉积物。此外，这些结果证明了使用 CEST 成像与 angiopep-2 探针进行临床 AD 诊断，并且它可能成为
Aβ靶向药物治疗评估的一种手段

PU-1328
Brain amide proton transfer imaging of rat with Alzheimer’s disease using saturation with frequency alternating RF irradiation method

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Background and aims: Amyloid-β (Aβ) deposits and some proteins play essential roles in the pathogenesis of Alzheimer’s disease (AD). Amide proton transfer (APT) imaging, as an imaging modality to detect tissue protein, has shown promising features for the diagnosis of AD disease.
Methods: In this study, we chose 10 AD model rats as the experimental group and 10 sham-operated rats as the control group. All the rats underwent Y-maze test before amide proton transfer image acquisition, using saturation with frequency alternating RF irradiation (APTSAFARI) method on a 7.0 T animal MRI scanner.
Results: Compared with the control group, APT (3.5ppm) values of brain were significantly reduced in AD models ($p<0.002$). The APT_{SAFARI} imaging is more significantly than APT imaging ($p<0.0001$). AD model mice showed spatial learning and memory loss in the Y-maze experiment. In addition, there was significant neuronal loss in the hippocampal CA1 region and cortex compared with sham-operated rats.

Conclusion: In conclusion, we demonstrated that APT imaging could potentially provide molecular biomarkers for the noninvasive diagnosis of AD. APT_{SAFARI} MRI could be used as an effective tool to improve the accuracy of diagnosis of AD compared with conventional APT imaging.

PU-1329

Angiopep-2 as an exogenous chemical exchange saturation transfer contrast agent

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Background: Chemical exchange saturation transfer (CEST) is a novel imaging modality for clinical practice and scientific researches. Angiopep-2 is an artificial peptide that can penetrate blood-brain barrier. The aim of this study was to explore the feasibility of Angiopep-2 to be used as an exogenous CEST contrast.
Methods: Phantoms of Angiopep-2 with different concentrations were prepared, which were then scanned using 7.0T small animal MRI scanner. Different parameters were used including saturation powers and saturation duration to achieve the most optimal CEST effect. Z-spectra, asymmetric spectra as well as phantom CEST imaging were used to determine the best parameters. CEST scanning of dimethyl sulfoxide (DMSO), the substance helping Angiopep-2 to be dissolved in water, was performed to exclude its contribution for the CEST effect.
Results: A broad dip was observed from 2.5 to 3.5ppm from the Z-spectra of Angiopep-2 phantoms. The most robust CEST was generated at 3.2ppm when using formula $(M_{-3.2ppm} - M_{+3.2ppm}) / M_{-3.2\ ppm}$. CEST effect of Angiopep-2 was concentration dependent. The effect increased as the concentration increased. In addition, CEST effect was more obvious as the saturation power increased and peaked at 5.0μT. For different saturation duration, the CEST effect increased as the duration increased. DMSO showed nearly 0% of CEST effect at 3.2ppm.
Conclusions: The results of our study demonstrated for the very first time that Angiopep-2 could be used as an excellent exogenous CEST contrast. As it can pass blood-brain barrier and bind amyloid-β protein, Angiopep-2 CEST could be potentially used as a novel imaging modality for early diagnosis of Alzheimer's disease by quantitative measurement of amyloid-β protein.

PU-1330

Super normal cerebrovascular responses to vasodilator stimuli in acute concussion

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Introduction: There is evidence that cerebrovascular reactivity (CVR) increases within the first week after concussion indicating disruption of normal autoregulation. We sought to extend these findings to investigate the effect of acute concussion on the speed of CVR response and to visualize global and regional impairments in individual patients with acute concussion.
Methods: We scanned twelve subjects within a week of concussion using EPI BOLD at 3T. All patients aged between 18 and 40 years old. Symptoms were assessed with the Acute Concussion Evaluation (ACE) tool. Twelve age and sex-matched healthy subjects formed the control group. In each subject, we used different analyses to provide a number of metrics including CVR magnitude (ramp and step, grey matter, white matter) and CVR response (τ). We used a separate healthy control group to create a magnitude CVR atlas (mean and standard deviation over 39 subjects at each voxel in standard space). Each subject’s CVR magnitude response map was z-scored against the atlas and the histogram of z-scores were counted. We compared these counts and also the whole brain average CVR magnitude z-scores between concussed and healthy groups. The same analysis was repeated for CVR response time.
Results: All studies were well tolerated without any serious adverse events. Anatomical MRI was normal in all study subjects. No differences in CO_2 stimulus and O_2 targeting were seen between the two participant groups during BOLD MRI. The acute concussion subjects exhibited significantly larger and faster CVR responses than the healthy control group, especially in the white matter.
Conclusion: Concussion is associated with patient-specific abnormalities in BOLD cerebrovascular responsiveness that occur in the setting of normal global CVR. This study demonstrates that measurement of CVR using BOLD MRI and precisely controlled CO_2 has shown to be a safe, reliable, reproducible, and clinically useful method for concussion patients. It has the potential to be an important tool for assessing the severity and duration of symptoms after concussion and concussion diagnosis.

PU-1331

AQP1 在胶质瘤瘤周水肿及浸润组织中表达

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目的 探究水通道蛋白-1（AQP1）表达上调/干扰后胶质瘤瘤周水肿及浸润组织的病理改变，阐明 AQP1 在大鼠脑胶质瘤瘤周水肿及浸润组织中的作用机制。
材料方法 选取 60 只健康成年 Wistar 大鼠，计算机随机法分为对照组（C6 对照组）、AQP1 上调组（C6-AQP1 组）、上调空载体组（C6-PCDH 组）、AQP1 干扰组（C6-AQP1-sh3 组）、干扰空载体组（C6-shRNA 组），采用立体定位法成功建立大鼠胶质瘤模型 40 例。于造模后 15 天，取瘤体最大层面切片并行 HE 染色，镜下观察胶质瘤分化程度、瘤周水肿及瘤细胞浸润情况。免疫组织化学及 Western blot 检测瘤周水肿区 AQP1 的表达量。
结果
AQP1 主要表达于胶质瘤细胞胞膜、胞浆，部分表达于血管内皮细胞。C6-AQP1 组瘤周 AQP1 表达水平高于 C6 对照组，C6-AQP1-sh3 组瘤周 AQP1 表达水平低于 C6 对照组，而 C6-PCDH 组、C6-shRNA

组与 C6 对照组比较差异无统计学意义。HE 染色提示实验各组胶质瘤均为高级别胶质瘤；C6-AQP1 组瘤周细胞间隙增宽、间质疏松程度较 C6 对照组明显，C6-AQP1-sh3 组瘤周细胞间隙增宽、间质疏松程度较 C6 对照组轻；C6-AQP1 组瘤周细胞浸润数目较 C6 对照组增多，C6-AQP1-sh3 组瘤周细胞浸润数目较 C6 对照组减少，而 C6-PCDH 组、C6-shRNA 组与 C6 对照组比较差异无统计学意义。

PU-1332
自身免疫性脑炎患者 18F-FDG PET/CT 影像学特征

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【摘要】**目的** 研究自身免疫性脑炎(AE)患者脑部 18F-氟代脱氧葡萄糖（2-[^{18}F]fluoro-2-deoxy-D-glucose,^{18}F-FDG)正电子发射计算机断层显像（PET/CT)影像学特征，探讨 PET/CT 在 AE 早期诊断中的应用价值。**方法** 收集 2012 年 3 月至 2017 年 12 月 16 例(男 11 例，女 5 例，年龄 11~68 岁)未经免疫治疗的脑脊液或（和）血清自身免疫抗体阳性的 AE 患者资料，分析患者 ^{18}F-FDG PET/CT、磁共振（MRI）的影像及临床特征。**结果** 16 例 AE 患者中有 9 例抗 N-甲基-D-天冬氨酸受体（NMDAR）抗体脑炎、7 例边缘性脑炎（LE），LE 组中抗γ-氨基丁酸 B 型受体（$GABA_BR$）抗体脑炎 3 例、抗富亮氨酸胶质瘤失活蛋白 1（LGI1）抗体脑炎 2 例、抗 Hu 抗体脑炎 1 例、抗 Yo 抗体脑炎 1 例。15 例显示脑内散在的 ^{18}F-FDG 代谢增高或减低灶，阳性率 93.75%(15/16）；其中抗 NMDAR 抗体脑炎表现为散在的额、颞、顶叶等高代谢灶、枕叶低代谢灶，LE 表现为颞叶海马等边缘系统的高代谢灶，同期 CT 密度均未见异常。 MRI 示为部分患者 T2、T2 液体衰减反转恢复序列（FLAIR）、扩散加权成像（DWI）的稍高信号，阳性率 43.75%（7/16）。**结论** 不同类型的 AE 患者脑 PET/CT 影像特征亦不同。18F-FDG PET/CT 对 AE 患者的早期诊断阳性率较 MRI 高

PU-1333
AQP4 在脑创伤半暗带水肿中表达的实验研究

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目的 探讨大鼠脑创伤半暗带（TP）不同时相点的水肿与水通道蛋白-4(AQP4)表达之间的关系。
方法 88 只成年雄性 Wistar 大鼠，按随机数字表法分为对照组和创伤组，创伤组，根据时相点又分 1，6，12，24，48，72 h、7 d 共 7 个亚组，每组 11 只。建立中度脑创伤模型，组织学观察脑组织水肿，免疫组化半定量 IgG 的表达检测血脑屏障（BBB）的变化，免疫荧光和 WB 观察 AQP4 表达。
结果 对照组的病理及 IgG 染色未见异常，AQP4 表达量较少。创伤 1 h 组即在创伤周边出现染色浅淡的水肿带，之后逐渐增加，12 h 组达到最宽，为（1.589±0.020）mm，之后变窄，除 24 h 与 48 h 和 72 h 与 7 d 外，余各时相点差异均有统计学意义。1 h 创伤周边呈血管源性水肿；6 h 出现细胞内水肿；12 h 血管源性水肿与细胞内水肿均明显加重；72 h 细胞内水肿占优势。IgG 染色于 1，12 ，48 h 呈 3 度强阳性；6，24，72 h 及 7 d 呈 1 度弱阳性。创伤后 1 h AQP4 表达下降，6 h 稍回升，12 h 达峰值，之后又随损伤时间降低，72 h 再次上调，伤后 7 d 时基本恢复至基线水平，除 6 h 与 7 d(P＞0.05)、12 h 和 24 h（P＞0.05）、24 h 和 72 h(P＞0.05)外，余各时相点之间比较差异有统计学意义。
结论 脑组织水肿是 TP 主要的病理改变，且水肿类型和程度随时间动态变化。AQP4 可能参与机体的防御反应。

PU-1334
基于统计参数图的脑内不对称分析在 18F-FDG PET 代谢显像对单侧颞叶癫定侧定位诊断上的应用

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目的 评价基于 SPM 的脑内不对称分析法在 18F-FDG PET 代谢显像对单侧难治性颞叶癫（TLE）患者致灶辅助定侧定位诊断中的应用价值。
方法 回顾性分析 73 例［男 42 例，女 31 例，年龄（27.10±9.78）岁］单侧 TLE 患者及 30 例［男 17 例，女 13 例，年龄（33.79±5.46）岁］健康对照组的临床及影像学资料。通过 18F-FDG PET/CT 检查对 TLE 患者主要致灶进行定侧定位， 18F-FDG PET 图像分析采用基于 SPM 的脑内不对称分析法、视觉分析法及不对称指数（AI）分析法，定侧定位结果综合术后病理及预后，对这 3 种图像分析方法在单侧 TLE 患者主要致灶检出符合率上的差异进行比较。数据分析采用 χ2 分析。
结果 运用基于 SPM 的脑内不对称分析法、视觉分析法及 AI 分析法对单侧 TLE 患者定侧定位诊断符合率分别为 87.67%(64/73)、75.34%(55/73)及 69.86%（51/73），总体差异有统计学意义（$\chi^2=6.993\ 3$，$P<0.05$）；两两比较的结果显示，脑内不对称分析法与 AI 分析法、脑内不对称分析法与视觉分析法间差异有统计学意义（$\chi^2=8.480\ 6$ 和 5.818 2，均 $P<0.05$），视觉分析法与 AI 分析法间差异无统计学意义（$\chi^2=0.5000$，$P>0.05$），脑内不对称分析法的符合率明显高于视觉分析法及 AI 分析法。
结论 基于 SPM 的脑内不对称分析法可以相对客观、准确地对单侧难治性 TLE 患者的主要致灶进行定位，有较高的临床应用价值。

PU-1335
计算机认知功能训练改善抑郁症患者工作记忆的 fMRI 研究

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目的 抑郁症患者常伴随认知功能受损如工作记忆能力的下降，而工作记忆是认知功能的中枢，信息的加工、处理、转化均需工作记忆的参与。近年来，研究表明应用计算机认知功能训练（CCT: computerized cognitive training）可有效改善抑郁症病人的工作记忆，但关于认知功能训练如何改善工作记忆的脑机制尚缺乏研究，深入了解计算机认知功能训练背后的脑机制，对改进认知训练程序，完善认知训练计划具有重要的指导意义。

方法 本研究共纳入 25 名抑郁症患者，其中对照组 9 人，治疗组 16 人。两组患者均在入组前及入组 4 周后接受 Philips Ingenia Ⅱ 3.0T 磁共振 BOLD 扫描。扫描过程中，患者需要完成数字 N-back 范式（0-back、1-back、2-back）。本研究采用一套名为“捉球”的计算机认知功能训练程序对治疗组患者进行为期 4 周共计 30 小时的认知治疗。

结果 1-back 任务：治疗组患者与对照组患者在基线期脑区激活无统计学差异；在第 4 周时，治疗组患者相比于对照组患者在左侧额上回，左侧额中回，左侧 BA9 区出现负性激活(p=0.001 ，未校正，簇阈值>20)。2-back 任务：治疗组与对照组在基线期脑区激活无统计学差异；在第 4 周时，治疗组相比于对照组在右侧额中回出现负性激活，在左侧楔前叶、左侧矩状叶、左侧胼胝体压部、左侧颞上回出现正性激活(p=0.001 ，未校正，簇阈值>20)。

结论 CCT 改善抑郁症患者工作记忆的机制可能与额上回、额中回、BA9 区、胼胝体、颞上回等脑区激活改变有关。

PU-1336

Can amide proton transfer-weighted imaging differentiate tumor grade and predict Ki-67 proliferation status of meningioma?

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Abstract

Objectives: To determine the utility of the amide proton transfer-weighted MR imaging in differentiating the WHO grade and predict proliferative activity of meningioma.

Methods: Fifty-three patients with WHO grade Ⅰ meningiomas and twenty-six patients with WHO grade Ⅱ meningiomas underwent conventional and APT-weighted sequences on a 3.0 Tesla MR before clinical intervention. The APT-weighted (APTw) parameters in the solid tumor region were obtained and compared between two grades using the t-test, the receiver operating characteristic (ROC) curve was used to assess the best parameter for predicting the grade of meningiomas. Pearson's correlation coefficient was calculated between the $APTw_{max}$ and Ki-67 labeling index in meningiomas.

Results: The $APTw_{max}$ and $APTw_{mean}$ values were not significantly different between WHO grade Ⅰ and grade Ⅱ meningiomas (*P=0.103* and *P=0.318*). The $APTw_{min}$ value was higher and the $APTw_{max-min}$ value was lower in WHO grade Ⅱ meningiomas than in WHO grade Ⅰ tumors. (*P=0.027* and *P=0.019*). But the $APTw_{min}$ was higher and the $APTw_{max-min}$ was lower in microcystic meningiomas than in WHO grade Ⅱ meningiomas(*P=0.001* and *P=0.006*). The $APTw_{min}$ combined with $APTw_{max-min}$ showed the best diagnostic performance in predicting the grade of meningiomas with an AUC of 0.772. The $APTw_{max}$ value was positively correlated with Ki-67 labeling index (r=0.817, *P*<0.001) in meningiomas, the regression equation for the Ki-67 labeling index (%) (Y) and $APTw_{max}$ (%)(X) was Y=4.9×X－12.4 (R^2=0.667, *P<0.001*).

Conclusion: As a noninvasive imaging method, the ability of APTw-MR imaging in differentiating the grade of meningiomas is limited, but the technology can be used to predict the proliferative activity of meningioma.

PU-1337

腮腺良性肿瘤磁共振波谱成像后处理技术的应用价值

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目的 探讨腮腺良性肿瘤患者磁共振波谱成像后处理技术的应用价值及作用。
方法 回顾分析 26 例病理确诊腮腺原发良性肿瘤患者行磁共振波谱成像（MRS）后得到的代谢产物信号图，测量其肿瘤代谢产物如胆碱（Choline,Cho）、肌酸(Creatine,Cr)、乳酸脂质（Lactate and Lipid,LL)峰含量及 Cho/Cr 比值的变化。比较代谢产物波峰形态的区别及其代谢产物含量与不同类型肿瘤（多形性腺瘤和腺淋巴瘤）之间的区别。
结果 经统计分析得到肿瘤区内的 Cho 峰、LL 峰明显升高且 Cho/Cr 比值均高于正常腮腺组织（P<0.01）,Cr 峰浓度含量未见明显变化（P>0.01）。这些代谢产物的含量及形态在多形性腺瘤和腺淋巴瘤的诊断中不具有鉴别价值。
结论 腮腺良性肿瘤磁共振波谱成像技术能准确地识别出兴趣区内代谢产物浓度的含量变化，是临床评价肿块占位的重要功能性检查手段之一。

PU-1338
Pineal gland abnormality in major depressive disorder

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Background: Patients with major depressive disorder (MDD) often have circadian rhythm alteration and sleep disturbance. The pineal gland regulates circadian rhythm and sleep by secretion of melatonin neurohormone. However, the relationship between pineal abnormality and MDD remains elusive. In this study, we aimed to investigate MDD-related pineal abnormality by comparing pineal cyst prevalence and PPV between patients suffering from MDD and gender- and age-matched healthy controls. We hypothesized that patients with MDD would have higher pineal cyst prevalence and reduced pineal volume relative to healthy controls.
Methods: 50 patients with MDD and 35 gender- and age-matched healthy controls (HC) underwent high-resolution structural MRI. Pineal parenchymal volume (PPV) was measured manually. Inter-group differences in prevalence of pineal cyst and PPV were examined. In addition, we investigated the correlations between PPV and symptom severity as well as sleep
variables in the patient group.
Results: The patient and control groups did not differ in gender, age, and educational years ($P > 0.05$). Compared with HC, MDD patients exhibited reduced TIV ($t = -2.055$, $P = 0.043$), and increased HAMD ($t = 13.527$, $P < 0.001$) and HAMA ($t = 11.921$, $P < 0.001$).
Patients with MDD had a higher prevalence of pineal cyst (chi-square test, $x^2 = 4.000$, $P = 0.046$) compared to HC. The *ICC* of inter-rater PPV measurement was 0.991, implying an excellent inter-rater reliability. Patients had significantly decreased PPV ($F = 4.985$, $P = 0.028$) relative to controls when controlling for age, gender, educational years and TIV. There were no significant differences between individuals with and without pineal cysts for both patient and control groups ($P > 0.05$). In patients with MDD, we did not find any significant correlations between PPV and clinical variables (HAMD, HAMA and PSQI) ($P > 0.05$). In addition, there were no

significant correlations between PPV and PSG parameters ($P > 0.05$) in the patient group.

Conclusions: In this study, we present evidence that patients with MDD had higher prevalence of pineal cyst and reduced parenchymal volume relative to healthy controls, suggesting a critical role of pineal abnormality in the interaction between sleep disturbance and depression.

PU-1339

MR Evaluation of Targeted Adoptive Immunotherapy for Glioma Using Biotinylated Adoptive T Lymphocytes

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PURPOSE

To explore biotinylation of adoptive T lymphocytes and its feasibility of targeted adoptive T cells immunotherapy (ACT) for glioma based on biotin receptor.

METHOD AND MATERIALS

Adoptive CD8+ T lymphocytes were co-cultured with Sulfo-NHS-Biotin to form biotinylated adoptive T lymphocytes in vitro, and Alexa Four 647-labeled streptavidin was further co-cultured with biotinylated adoptive T lymphocytes.The overall biotinylation efficiency of adoptive T lymphocytes was detected by FCM. The killing performance of the biotinylated adoptive T lymphocytes on glioma cells was observed at different time points, and proportion of glioma cells apoptosis and death further were analyzed by FCM. Glioma cells recruiting biotinylated adoptive T cells was observed by CLSM, and finally using enhanced MRI to observe the size changes of in situ gliomas at different time points after targeted ACT and using transferase-mediated deoxyuridine triphosphate-biotin nick end labeling (TUNEL) detected apoptosis in tumor tissues, and analyzed the proportion of glioma recruiting biotinylated adoptive T lymphocytes by FCM.

RESULTS

FCM showed that the overall biotinylation efficiency of adoptive T lymphocytes reached 96.3%. CCK-8 assay showed the biological activity of biotinylated adoptive T lymphocytes was not significantly different from that of the untreated control group. The apoptosis proportion of glioma cells induced by biotinylated adoptive T lymphocytes (34.14%) was significantly increased. FCM showed that the proportion of biotinylated CD8+ T lymphocytes in the targeted glioma area was 4.77%, and the total proportion of CD8+ T lymphocytes (8.89%) was more obvious than the control group (1.81%). Enhanced MRI found that only 20% of the individuals in the targeting group had a reducedtumor volume, but the mean value was not significantly different from the control group ($p>0.05$). In addition, the TUNEL apoptosis assay found that level of tumor cell apoptosis in the targeting group was only slightly better than the nontargeting group.

CONCLUSION

Biotinylation of adoptive T lymphocytes increases the proportion of gliomas recruited, enhancing the killing of glioma cells, but the killing performance of in situ glioma remains to be further improved.

PU-1340

Biotin-conjugated Upconversion Nanoparticles for Metabolic MR Imaging of Invasive Margin of Glioma

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PURPOSE
To prepare one stable biotinylated/polyethylene glycolylated upconversion nanoprobes (biotin/PEG-UCNPs) to study the expression level of biotin receptor in GL261 glioma and its feasibility for detection invasive margin of glioma
METHOD AND MATERIALS
Hydrophobic multifunctional upconversion nanoparticles (UCNPs) were synthesized by solvothermal method. TEM, XRD ,fluorolog-3 modular fluorescence spectrometer and other instruments were used to analyze the surface features such as uniformity and dispersion of nanoprobes. Cell counting kit-8 (CCK-8) analyzed the effect of bion-UCNPs on the activity of RAW264.7 and BCECs. CLSM was used to observe the endocytosis efficiency of GL261 glioma cells for biotinylated and non-biotinylated nanoprobes, then the distribution of nanoprobes in glioma tissues compared with pathology. GE Discovery 3.0T MR analyzed the relaxation rate of biotinylated nanoprobes and the relative signal intensity (rSI) of biotinylated nanoprobes in gliomas at different time points. HE staining of cortical, striatum, hippocampal and hematological parameters of normal C57BL/6 mice were evaluated the potential toxicity of biotinylated nanoprobes to living organisms.
RESULTS
Biotinylated nanoprobes with similar particle size (particle size of about 25 nm) possessed good dispersibility, low toxicity and single-band UCL spectrum centered at 660 nm. The relaxation rate reached 6.124 mM-1S-1. Under CLSM, the glioma cells significantly endocytosed biotinylated nanoprobes rather than the non-biotinylated nanoprobes. After biotin receptor presaturation, the glioma cell endocytosis was significantly reduced. T1 signal generated by the biotinylated nanoprobes in the glioma region could still be observed in 24 hours, and the tumor developing area was expanding. The body boundary of biotinylated nanoprobes well corresponded to the HE-stained glioma border, but the tumor cells were scattered around the boundary. No obvious adverse reactions were observed in the cortical, striatum, hippocampal.
CONCLUSION
GL261 gliomas highly express biotin receptors. Biotinylated UCNPs are able to efficiently target glioma via biotin receptors, and show a significant contrast effect on the edge of glioma invasion.

PU-1341
基于 MRI 影像组学预测脑胶质母细胞瘤 MGMT 蛋白表达的价值研究

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目的 目前研究已经证实 DNA 修复酶—O6-甲基鸟嘌呤 DNA 甲基转移酶(O6-methylguanine-DNA methyltransferase，MGMT)在脑胶质母细胞瘤组织中的表达与肿瘤的耐药性有一定的关系，并且能够影响肿瘤的化疗效果。因此本文通过分析脑胶质母细胞瘤术前磁共振影像组学特征与 MGMT 蛋白表达的关联性，以实现术前 MGMT 蛋白的表达情况及术后个性化医疗。 **方法** 回顾性收集收集徐州医科大学附属医院 2017 年 5 月至 2018 年 5 月期间，186 例患者术前 MRI 影像并人工勾画 ROI，随后在 TIWI 增强序列上提取 720 个高维 3D 影像组学特征，并采用 Pearson 相关和 LASSO 回归进行特征选择，最后用 Logistic 回归进行 MGMT 蛋白表达状态分类预测。 **结果** 在内部验证集上的 AUC 为 0.94，符合率 89.2%，敏感度 80%，特异度 100%。 **结论** 脑胶质瘤是常见的颅内恶性肿瘤。患者在患病期间常伴有较严重的认知功能障碍。并且具有较高的死亡率，胶质母细胞瘤患者具有不同程度的预后，预后程度与治疗方式与肿瘤组织病理学分型有关。随着对脑胶质瘤研究的深入，发现脑胶质瘤多存在分子异常变化，如 DNA 修复酶—O6-甲基鸟嘌呤 DNA 甲基转移酶(O6-methylguanine-DNA methyltransferase，MGMT)。通过检测 O6-甲基鸟嘌呤-DNA 甲基转移酶状态，不仅可作为诊断依据，也可用于预后评估，预测 TMZ 化疗的疗效。影像组学方法为肿瘤学的决策支持提供了强大的工具，对医学影像信息的深入挖掘将会对肿瘤的早期诊断、预后预测和疗效评估起到重要的作用，基于医学大数据影像的影像组学分析已成功应用于肿瘤学的研究。本文研究结果表明，影像组学方法可在术前无创的预测脑胶质母细胞瘤患者 MGMT 蛋白的表达状态和提供术后个性化医疗的依据。

PU-1342
Glrlm 纹理特征评估纯磨玻璃 IA 的 p-53、ki-67

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目的 探讨利用灰度级游程矩阵（Glrlm）纹理分析评价纯磨玻璃 IA 的 p-53、ki-67 情况。**方法** 回顾性收集 2015 年 1 月至 2018 年 1 月期间于大连医科大学附属第一医院经手术病理证实为肺浸润性腺癌（IA），同时薄层 CT 上呈现为肺纯磨玻璃结节（pGGN）的患者总计 40 例。所有病例均为单发 IA 病灶，总计 40 个 pGGNs。回顾性采集所有研究对象的免疫组化情况：p53 突变率，ki-67 增殖指数，观察并测量薄层 CT 上 pGGN 的 glrlm 纹理特征：ShortRunLowGrayLevelEmphasis，ShortRunHighGrayLevelEmphasis，RunVariance，GrayLevelNonUniformity，LongRunEmphasis，ShortRunEmphasis，RunPercentage，RunEntropy，RunLengthNonUniformityNormalized。将所有患者的免疫组化指标与 glrlm 纹理特征做相关性分析。**结果** p53 突变率与 glrlm 纹理特征均无相关性；ki-67 增殖指数与 RunVariance（p=0.013，r=0.448）、GrayLevelNonUniformity（p=0.041，r=0.376）、LongRunEmphasis（p=0.015,r=0.441）呈正相关；ki-67 增殖指数与 ShortRunEmphasis（p=0.021,r=-0.421）、RunPercentage（p=0.019，r=-0.426）、RunPercentage（p=0.023，r=-0.414）呈负相关。 **结论** ki-67 增殖指数与 glrlm 纹理特征具有一定相关性，其中 RunVariance 相关性最强，分析薄层 CT 上 pGGN 的 glrlm 纹理特征，对评价患者肿瘤 ki-67 增殖活性有一定的临床价值。

PU-1343

pH-Sensitive Nanoparticles for Cell Membrane Targeted Photodynamic Therapy Based on Bio-orthogonal Tumor Labeling

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Objective
To construct pH-sensitive nanoprobe based on in situ bio-orthogonal click chemistry pre-positioning system to figure out its advantages and feasibility of the integration of early diagnosis and treatment of breast cancer.
Methods
The integrated probe s-NP and ins-NP were synthesized and their physical and chemical properties were characterized. MTT assay was used to detect the toxicity of the probe and the photodynamic effect on 4T1 cells under near-infrared irradiation. The Ce6 fluorescence on the tumor cell membrane was qualitatively and quantitatively analyzed by single photon confocal microscopy and flow cytometry respectively. Ac_4ManNAz nanoparticles were injected through the tail vein of nude mice for three consecutive days, and s-NP was injected on the fourth day. In vivo fluorescence/MR imaging was performed at 2h, 4h, 6h, 12h and 24h after injection. The tumor site was irradiated with a 660 nm laser at 0.1 W/cm^2 for 30 min. The tumor volume was measured for 21 consecutive days. The main organs and tumor tissues were taken for pathological section for H&E staining and Tunel detect the proliferation and apoptosis of cells in tissues.
Results
The s-NP solution has a particle size of about 100 nm at pH 7.4, and switch to about 10 nm at pH 6.5, which shows good pH sensitivity, while the control ins-NP has a particle size of 100 nm at both pH 7.4 and 6.5. MTT experiments showed that the probe had no toxic effect on cells without near-infrared laser. Ac_4ManNAz particles were pre-administered, and the cell membrane treated with s-NP (pH 6.5) expressed Ce6 fluorescence, and the cell survival rate was significantly lower than that of the ins-NP control group after near-infrared laser irradiation. In vivo fluorescence imaging and MR imaging of Balb/c nude mice showed that the tumor site had significant fluorescence signals. The animal experiment also showed that the probe had significant inhibitory effect on tumor growth.
Conclusion
In this study, an integrated molecular nanoprobe based on tumor in situ bio-orthogonal click chemistry pre-positioning system was synthesized for photodynamic therapy of breast cancer under the guidance of "MR/fluorescence" imaging, and achieved ideal results. This study also has important reference significance for the integration of multimodal diagnosis and treatment of other tumors.

PU-1344
自载体的 pH 响应核-壳型纳米棒用于非小细胞肺癌的协同靶向诊疗

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目的 制备自载体的 pH 响应核-壳型紫杉醇-阿霉素（PTX-DOX）双药纳米棒，用于非小细胞肺癌的协同性靶向治疗，评价其临床应用效果。**方法** 采用溶剂交换法制备 PTX 纳米棒，化学偶联法制备同时包含亲水基团 PEG 和疏水基团 PMHC18 的 DOX 前药 DOX-PEG-PMHC18，按照 5:1 的体积比均匀混合两种药物，依次经超声和搅拌处理后组装并制备出核-壳型双药联合纳米棒复合体系 PTX-DOX，用扫描电镜（SEM）、透射电镜（TEM）表征纳米棒的形貌和尺寸，紫外-可见分光光度计表征两种药物的复合情况，在不同 pH 值（pH=7.4，5.0）的生理缓冲液中测试药物的释放曲线，用共聚焦激光扫描显微镜（CLSM）实时表征纳米药物的细胞内吞过程，MTT 法测试纳米药物对肿瘤细胞的协同抑制效果，并评价功能化聚合物的生物相容性。**结果** 经过严格控制实验条件，本实验中，我们可大量制备形貌尺寸均匀的核-壳型 PTX-DOX 双药纳米棒（长度 500 nm，直径 40 nm），505 nm 处的特征吸收峰验证了 DOX 的成功组装，纳米双药可在 PBS 缓冲液中稳定分散 6 个月以上而不出现团聚体，当体外释放 250 h 时，药物在 pH=7.4 的缓冲液中的释放率为 30%，而在 pH=5.0 的酸性缓冲液中的释放率大于 75%，该纳米双药可被肿瘤细胞快速内吞，当细胞与药物纳米棒共孵育 2 h 时达到内吞峰值且稳定，另外，纳米双药表现出协同增强的抗肿瘤活性，抗癌效果明显优于单药及双药混合物。**结论** 新型的自载体 pH 响应核-壳型 PTX-DOX 双药纳米棒分散性好、性能稳定、可被肿瘤细胞快速内吞并表现出酸性响应的药物释放和协同增强的抗肿瘤活性，为恶性肿瘤靶向治疗提供新的药物设计思路和用药指导。

PU-1345
TIM-3 靶向纳米金探针在小鼠肺结核模型 CT-荧光双模态成像中的初步研究

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目的 观察 TIM-3 抗体合成 CT-荧光双模态靶向对比剂在肺结核感染 BALB/c 小鼠模型体内 CT-荧光双模态成像效果，探索最佳成像时间窗，通过观察结核感染小鼠模型的 CT-荧光双模态成像效果实现结核病变的靶向动态观察。
材料及方法 合成荧光金纳米团簇（Au NCs）作为 CT-荧光双模态探针，耦联 TIM-3 抗体合成 CT-荧光双模态靶向对比剂。建立肺结核小鼠模型，将合成的 CT-荧光双模态靶向对比剂行小鼠尾静脉注射，以 Au NCs 以及碘海醇为对照，分别在注射前、注射后 2h、6h 及 12h 观察肺结核病灶的 CT 增强效果，并于注射对比机后 12h 取肺结核小鼠离体器官（心、肝、脾、肺、肾）行体外荧光成像，判断靶向探针在体内 CT-荧光双模态成像的效果。
结果 成功建立 23 个肺结核感染 BALB/c 小鼠模型，注射对比剂后 2 h 肺内病变增强率抗体组高于 2 h 的碘海醇组（$P<0.01$，$\alpha=0.05$）；抗体组在 6 h 和 12 h 肺内病变增强率均明显高于同时间的无抗体组和碘海醇组，具有显著统计学差异（$P<0.001$，$\alpha=0.05$）。抗体组及无抗体组

的肺脏、肝脏及肾脏均有不同程度的荧光显像，心脏及脾脏普遍未检测出荧光信号。抗体组的肺脏荧光强度显著强于无抗体组及碘海醇组（P＜0.001， α ＝0.05）。
结论 本研究成功制备了 CT 及荧光成像效果优秀的 Au NCs 靶向对比剂探针，实现了体、内外 CT/荧光双模态成像。观察 CT 及荧光成像的最佳成像时间点为注射对比剂后 6h 到 12h。

PU-1346
F304&IR-1061@PLGA 自组装纳米探针用于乳腺癌淋巴结 转移的多模态成像研究

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目的 探讨 FIP NPs 用于乳腺癌淋巴结转移的磁共振成像(MRI)/光学成像(OI)/光声成像(PAI)/单光子发射计算机断层成像(SPECT)多模态纳米探针的可行性。
方法 ①采用足垫注射表达荧光素酶的小鼠乳腺癌 4T1-Luc 细胞的方法建立乳腺癌淋巴结转移模型。②对不同浓度 FIP NPs 进行 MRI/OI/PAI 体外性能评估，同时对 FIP NPs 进行放射性核素 ^{99m}Tc 标记，并评估其放射性标记稳定性。③将 FIP NPs 经活体瘤内注射后，注射纳米探针前及注射后 8 h 内不同时间点进行 MRI/OI/PAI/ SPECT 体内多模态成像，观察并测量淋巴结转移瘤区各种信号值的变化。
结果 ①足垫注射建模 1 周后，在小白鼠同侧腘窝处触摸到肿大的淋巴结，并通过腹腔内注射底物 D-荧光素钠盐后行活体成像可观察到足垫原发肿瘤和同侧腘窝肿大淋巴结处有生物发光信号，离体解剖并经病理证实已发生淋巴结转移。②FIP NPs 具有较好的光学成像、光声成像及磁共振成像造影效果，磁共振横向驰豫率高达 172.73 mM^{-1} s^{-1}；不仅如此，FIP NPs 还能非常容易地实现放射性核素 ^{99m}Tc 标记，标记产物 24 h 内的放化纯维持在 95.0%以上。③活体成像结果显示 FIP NPs 瘤内注射后，转移淋巴结区域 T_2 信号较注射探针前明显降低，而 NIR-II 荧光信号、光声信号及放射性核素信号较前明显增强，且在注射探针后 2~3 h 转移淋巴结中对比剂浓度达到最高及信号最强。
结论 FIP NPs 具有良好的 MRI/OI/PAI/SPECT 多模态成像效果，实现了活体乳腺癌淋巴结转移的精确定位示踪。

PU-1347
F304&IR-1061@PLGA 自组装纳米探针用于乳腺癌淋巴结 转移的光热治疗研究

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目的 探讨 FIP NPs 用于乳腺癌淋巴结转移光热治疗的可行性。
方法 ①通过对 2 只 4T1-Luc 淋巴结转移瘤模型足垫原发肿瘤瘤内分别注射相同体积生理盐水和 FIP NPs，2 h 后给予相同功率（1.25 W/cm^2）的 808 nm 激光照射腘窝处淋巴结转移瘤部位 10 min，并用红外光热成像仪实时记录和比较淋巴结转移瘤部位温度的变化。②将 12 只 4T1-Luc 乳腺

癌淋巴结转移瘤模型随机分为单纯 FIP NPs、生理盐水+PTT 和 FIP NPs+PTT 共 3 组，之后手术切除每组原发肿瘤，治疗后监测淋巴结转移瘤的生长和生物发光信号情况以及有无远处转移。
结果 ①通过 FIP NPs 对活体乳腺癌淋巴结转移瘤的光热治疗升温效应研究，发现注射 FIP NPs 小白鼠较生理盐水具有更显著的升温效果，前者温度可升高达 54 ° C 且升高了 19.3° C，而后者仅升高了 8.7 ° C。②3 组治疗组中，通过瘤内注射 FIP NPs 后 2 h 联合 808 nm 激光照射及原发肿瘤手术切除，淋巴结转移瘤被消除并且在 45 d 内无复发和转移，而其他 2 组小白鼠淋巴结转移瘤生长未见明显抑制，并出现远处肺转移。
结论 FIP NPs 具有良好的光热治疗效果，将来有望用于乳腺癌淋巴结转移患者的光热治疗。

PU-1348

Synergistic Triple-combination Therapy with Hyaluronic Acid-shelled PPy/CPT Nanoparticles Results in Tumor Regression and Prevents Tumor Recurrence and Metastasis in 4T1 Breast Cancer

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Breast cancer is characterized by high aggression, poor prognosis, and high recurrence rate. Early detection and specific targeted treatment with less toxicity are the ultimate goals for breast cancer therapy.To improve antitumor therapeutic effects, we developed a novel polypyrrole nanoparticle using the near infrared dye IRDye800CW with camptothecin (CPT)-conjugated hyaluronic acid (HA) shell (PPy@CPT-HA-IRDye800CW) and performed a photothermal therapy(PTT), along with chemotherapy, guided by fluorescence and photoacoustic dual-modality imaging, in combination with immunotherapy.Irradiation with near infrared (NIR)light offered a strong PTT effect and promoted CPT drug release in tumors. Moreover, we found that chemo-photothermal therapywith PPy@CPT-HA-IRDye800CW NPs, in combination with immune checkpoint inhibitor anti-PD-L1 immunotherapy, synergistically enhanced the anti-tumor immune response, thereby eliminating primary breast cancer and preventing tumor metastasesand recurrencesin 4T1 tumor-bearing mice. This approach may provide important clues for the clinical managementof breast cancer and other malignant tumors.

PU-1349

NaGdF4 纳米粒子用于肿瘤靶向磁共振成像和治疗研究

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研究**目的** 被多肽修饰后的 $NaGdF_4$ 纳米粒子对 MCF-7 乳腺癌细胞的抑制作用及对皮下接种乳腺癌的裸鼠 T1 加权磁共振成像

功能。
研究**方法** 通过体外细胞实验及体内动物实验研究 $NaGdF_4$ 纳米粒子对 MCF-7 细胞的杀伤、抑制作用；通过体内实验研究对皮下接种乳腺癌的裸鼠的 T1 加权磁共振成像。
研究**结果** 实验结果表明 NaGdF4 @ bp-peptide NPs 具有 T1 加权磁共振成像（MRI）功能和肿瘤靶向作用，并且能够抑制肿瘤生长而不引起全身毒性。
结论 应用多肽的多种生物学功能，使用简便的方法制备了具有治疗与诊断功能的纳米粒子，该纳米粒子具有作为分子成像引导治疗的抗癌剂的潜力。

PU-1350

19F-MRI Monitoring Metabolism of Intratracheal Delivery of Perfluorocarbon Nanoprobe and its Biosafety Assessment

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Background and Purpose

The morbidity and mortality of lung cancer are increasing rapidly due to the lack of typical clinical symptoms and effective detection methods. Therefore, exploring new diagnostic and therapeutic strategies is of great significance for the early diagnosis and prognosis of this formidable disease. Accompanying the fast development of nanotechnology, the intratracheal (I.T.) delivery of novel nanoparticles provides a non-invasive way and a promising future because it takes advantages of the anatomic and pathological features of lung cancer. Perfluorocarbon (PFC) are widely used in molecular biology and biomedical fields as drug delivery carrier and blood substitutes due to its high gas solubility, low surface tension, high specific gravity, and stable chemical properties. Due to its high concentration of fluorine and almost no background in the body, ^{19}F-MR imaging with high sensitivity, high spatial resolution and high signal noise ratio can be realized. In our previous study, we showed that intratracheal delivery perfluorocarbon nanoprobe (PFC NP) can sustainably and significantly enhance the ^{19}F-MR signal of lung tumor in rabbits, and that $\alpha_v\beta_3$-targeted PFC NP specifically target and quantitatively assessment tumor angiogenesis using ^{19}F-MRI. Our results confirmed that the feasibility and efficiency of intratracheal delivery of PFC NP, the objective of the present research was to monitor the metabolism of intratracheal delivery PFC NP by ^{19}F-MRI and assess its biosafety on rodent models, providing experimental foundation for clinical transformation of novel imaging nanoprobes.

Methods

Three kinds of PFC NP were employed, including perfluorocarbon crown ether nanoprobe (PFCE NP), perfluorooctylbromide nanoprobe (PFOB NP) and the original PFOB molecule. 45 healthy C57BL/6 mice were selected to perform the intratracheal delivery of three kinds of PFC NP respectively. Deionized water (H_2O) was used as positive control. Bruker 9.4T Micro MRI system was employed to monitor ^{19}F-MRI signals in the lung. The general condition and food consumption of mice were daily monitored, and the body weight was monitored every the other day. Fluorescence imaging was employed to testify

the distribution of nanoparticles in the lungs at different times (days 1, 7, and 21). Lung tissue, heart, liver, spleen and kidney were isolated for histopathological H&E and Masson staining to detect pathological damage and collagen deposition. RT-PCR of lung tissue was analyzed to detect relative expression level of inflammatory cytokines.

Results

The C57BL/6 mice receiving PFOB NP had a persistence for 6 hours in ^{19}F-MR signals after I.T. delivery then significantly diminished at 36h. The PFOB molecules exhibited an even faster clearance rate. In contradistinction, the ^{19}F-MR signal was persistently high in the mice administrated PFCE NP as long as 21d. Confocal fluorescence images showed that the distribution of nanoprobes in the lung decrease over time. All the administration mice lost appetite and slightly reduced weight caused by acute exposure of exogenous nanoprobes during intratracheal delivery, then recuperated quickly. The results of RT-PCR showed that the relative expression level of inflammatory factors after administrated PFC NP was increased, compared to positive control group (H_2O). There was no obvious abnormal pathological damage in H&E and Masson staining of lung tissues. After I.T. administration, these three kinds of PFC NP were only detected in lung, without presence in any other organs such as heart, liver, kidney and spleen by detection of ^{19}F-MRI.

Conclusions

In this study, three kinds of ^{19}F-MR imaging PFC nanoprobes have different metabolic characteristics, but all exhibit good biosafety and excellent ^{19}F-MR imaging response after intratracheal delivery. This study provides favorable condition and basis for clinical transformation of PFC-based ^{19}F-MRI molecular imaging nanoprobe of lung cancer.

Keywords

^{19}F-MRI; Nanoprobe; PFC; Intratracheal delivery; Biosafety

PU-1351

PET-CT 在 T1 期肺腺癌临床分期和评估预后中的临床应用

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目的 探讨 ^{18}F-FDG PET-CT 显像指标 SUVmax 和肿瘤最大径在 T1 期肺腺癌中的特点，为更好的提高 PET-CT 在肺腺癌临床分期和评估预后中的临床应用。

方法 回顾性分析研究 126 例经过病理证实的 T1 期肺腺癌的 PET-CT 显像资料，通过不同实体肿瘤的大小（最大径）和标准摄取值 SUVmax 来分析比较无复发生存期 Recurrence-free survival (RFS)的差异性以及临床分期及转移特点的不同。

结果 在肿瘤最大径≤2cm 时 RFS 无显著差异性（P=0.12），肿瘤最大径在 2～3cm 区间时 RFS 具有明显差异性（P＜0.01）。将肿瘤最大径和 SUVmax 的不同分为 4 组，a 组：肿瘤大小≤2cm，SUVmax≤2.0；b 组：肿瘤大小≤2cm，SUVmax >2.0；c 组：肿瘤大小 2～3cm，SUVmax≤3.9；d 组：肿瘤大小 2～3cm，SUVmax > 3.9。b 组和 c 组组间表现出相似的 RFS，RFS 在多组间的差异均具有显著统计学意义，其中 a 组与 b+c 组组间比较，（P＜0.01）；b+c 组与 d 组组间比较，（P = 0.0011）。无论是 T1 期肺腺癌肿瘤最大径≤2cm 还是肿瘤最大径在 2～3cm 区间者均出现转移情况，导致临床分期改变，两者之间具有显著统计学差异（P＜0.05），T1 期肺腺癌肿瘤的 SUVmax

在ⅠA 期（2.42±1.56）和非ⅠA 期（5.45±3.44）肺腺癌患者组间亦具有显著统计学差异（P＜0.01）。

结论 SUVmax 和肿瘤最大径能够很好的反映 T1 期肺腺癌患者的预后，并能够提供准确的临床分期。

PU-1352
多巴胺应激心肌出血早期磁共振心肌应变的初步研究

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目的 结合多巴胺应激应用磁共振成像(MRI)心肌应变技术研究心肌梗死再灌注模型大鼠不同节段的心肌应变特点。**材料与方法** 10 只 SD 大鼠行冠状动脉左前降支结扎 60 min 后松开制备心肌梗死再灌注模型，在再灌注 48 h 采集 MRI 数据，首先采集 T2*mapping 序列确定心肌出血的节段，经大鼠尾静脉注入磁共振对比剂〔按 0.1 mmol/kg 体质量注入钆喷酸葡胺(Gd-DTPA)〕，10 min 后采用 Fisp-cine 序列采集对比剂延迟增强图像（LGE），确定心肌梗死的范围，同时测量心内膜心肌应变运动参数，包括径向应变（RS）、周向应变（CS）峰值，在每一层心肌选取心肌出血、完全心肌梗死、部分心肌梗死 3 个节段进行统计学分析。然后经尾静脉注射多巴胺〔按 3 mg/kg 体质量注入盐酸多巴胺注射液〕，再次采集 Fisp-cine 数据，心肌应变分析方法与注射前类似。**结果** 再灌注 48 h 出现心肌出血层面一共 19 层(n=19)，完全心肌梗死节段一共 27 层(n=27)及部分心肌梗死节段一共 30 层(n=30)，心肌出血节段与完全心肌梗死节段在多巴胺注射前 RS 及 CS 之间无统计学差异（*P*均>0.05），但在多巴胺注射后 RS（*P*<0.05）及 CS（*P*<0.01）之间出现统计学差异；心肌出血节段与部分心肌梗死节段在多巴胺注射前 RS 及 CS 之间有统计学差异（*P*均<0.05）；而完全心肌梗死节段与部分心肌梗死节段在多巴胺注射前、后 RS 及 CS 之间均无统计学差异（*P*均>0.05）。**结论** 心肌梗死再灌注早期采用多巴胺应激可以将心肌出血节段与完全梗死节段的心肌应变区分开来，但完全梗死节段及部分梗死节段心肌应变峰值在应激前后都没有差异。提示心肌梗死再灌注早期出现心肌出血比心肌梗死更加限制心肌的运动能力。

PU-1353
巨噬细胞在早期心肌缺血再灌注大鼠心肌内的分布及动态变化：USPIO 在 7T MR 的初步研究

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目的 本研究通过心脏磁共振(CMR) T2*mapping 序列，采用 USPIO 初步分析心肌缺血再灌注大鼠早期心肌内巨噬细胞的分布及动态变化。

方法 采用心梗 60min 再灌注 48h 大鼠，7T MR 扫描序列包括：T2*mapping 序列，T2mapping 序列及 LGE 技术(TR/TE：5.2/2ms，FA：25°)，首先在 USPIO 注射前采用 T2*mapping 序列、T2mapping 序列及 LGE 技术（按 0.15 mmol/kg 通过尾静脉注射 Gd-DTPA 勾画出心肌水肿(ME)、心肌出血(MH)及心肌梗死(MI)范围。6h 后通过尾静脉注射 USPIO（粒径 27nm），分别在 0.5h,2h,6h,15h,24h 行 T2*mapping 与 T2mapping 扫描，在每个时间点分析正常心肌、心肌水肿与心肌出血内信号变化。CMR 后处死大鼠，行 Prussian 蓝染色以确定 Fe 的沉积。

结果 心肌水肿在 USPIO 注射前及注射后 0.5h,2h,6h,15h,24h 的 T2 值分别为 48.7±3.4ms、30±2.3ms、40.8±0.8ms、37.1±2.6ms、35.5±4.2ms、42.4±3ms，T2*值分别为 28.5±4.0ms、

11.8±1.2ms、14.6±2.3ms、17.9±0.6ms、17.7±1.1ms、16.5±2ms。心肌出血的 T2*值分别为 30.9±3ms、11.9±1.1ms、15.5±4ms、17.7±0.4ms、18.9±1.5ms、17.1±0.4ms。Prussian 蓝染色证实心肌水肿及心肌出血内 Fe 沉积。

结论 USPIO 注射间接提示巨噬细胞在心肌内先升高后降低，其中心肌水肿较正常心肌巨噬细胞存留时间长，而心肌出血较心肌水肿巨噬细胞存留时间长。

PU-1354

Si Quantum Dots as Radiosensitizers for Lung Cancer Radiotherapy

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Abstract

Objective

Radiotherapy is one of the most widely used clinical treatment methods for cancer. While, its therapeutic effect is largely hindered by various factors, such as tumor resistance, tumor hypoxia and so on. Therefore, it is necessary for us to find effective and safe radiosensitizers to enhance the radiation therapy effect. Silicon nanomaterials can be used as photosensitizers for photodynamic therapy. However, due to the limited penetration of near-infrared light, they can only be used for the treatment of superficial tumors. Indeed, X-rays have high penetration ability. Above all Si quantum dots (SiQDs) can produce electron-hole pair by photoelectric effect, Compton scattering or electron pair annihilation under the high energy rays excitation which can make bio-molecules produce reactive oxygen species (ROS) by redox reaction. Therefore, this study uses X-ray as the illumination source to explore the synergistic therapeutic effect of silicon quantum dots as radiotherapy sensitizers for the treatment of lung cancer.

Methods

Firstly, we synthesized the semiconductor silicon quantum dots by hydrothermal method and carried out detailed physical and chemical analysis. And we detected the biocompatibility of semiconductor SiQDs by MTT method. Using PI staining, we showed the effect of SiQDs combined with radiotherapy on tumor cell cycles. In addition, we used active oxygen indicator examining the effect of SiQDs combined with radiotherapy on the production of reactive oxygen species in tumor cells. In ex vivo experiments, we verified the inhibitory effect of SiQDs combined with radiotherapy on tumor cells was. Thereafter, we established subcutaneous tumor model of NSCLC (NCI-H460) in nude mice. The SiQDs were delivered via intratumoural and intravenous approaches based on the enhanced permeability and retention effect. The tumor size was measured by vernier calipers every other day, monitoring for 16 days. On the 2nd and 16th day of treatment, the tumor-bearing mice were sacrificed and the tumor tissues were taken out. Through HE section staining and immunohistochemical section, we observed the therapeutic effect of the tumor and the influence on vital organs in the tissue level.

Results

The synthesized SiQDs were measured by DLS to have an average size of 48.78±3.78 nm and a zeta potential of -43.27±6.73 mv. In the cellular level, SiQDs can induce tumor cells to produce large amounts of ROS under radiation therapy and regulate the cell cycle. We found that the binding of SiQDs to radiation can inhibit H460 cells in the GO/G1 phase and significantly promote tumor cell apoptosis. Importantly, we also found that SiQDs combined with radiotherapy in vivo experiments significantly inhibited the growth of subcutaneous xenografts. HE staining at the tumor tissue level also confirmed that SiQD combined with radiotherapy can better promote tumor tissue apoptosis. At the same time, the vital organs of the tumor-bearing mice on the second and last day didn't have significant acute or chronic damage. However, at the tissue level, we found that SiQD combined with radiotherapy did not improve the hypoxia of tumor tissue by immunofluorescence assay.

Conclusion

This study preliminarily verified that SiQDs combined with radiotherapy have obvious radiosensitizing effect in the cellular and in vivo levels, which showed inhibiting action of tumor growth. This work presented that semiconductor SiQDs can play a role as a novel nano-radiation sensitizer in the therapeutics of tumors.

PU-1355

肺部流感嗜血杆菌感染的影像学表现

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目的 探讨肺部流感嗜血杆菌感染的 X 线及 CT 表现特征，提高临床影像诊断及鉴别诊断的能力。**方法** 回顾性分析我院经病原学确诊的流感嗜血杆菌感染患者的胸部 X 线及 CT 的影像学表现，总结其表现特点。**结果** X 线表现：
流感嗜血杆菌感染可为局限（节段性或大叶性肺炎），也可为弥漫性（支气管肺炎）分布。成人常规胸部平片表现为多样性但无特异性，肺内病变多先累及肺段，由肺间质受累逐渐转为肺泡的浸润，多表现为斑片状或节段性分布的实变影，实变可为单侧或双侧，以肺野外周带较常见，边缘多锐利；支气管炎则表现为散在多发的小结节或网状结节影，可单独存在或与肺泡实变同时出现；50%的患者可见胸腔积液，而脓胸则不是常见的胸片表现。CT 表现：CT 主要表现为单侧或双侧肺内的斑片状或肺段性实变影，多同时伴有支气管壁增厚，有时也可是磨玻璃密度病变；肺周围带的小叶中心结节和“树芽征”是支气管肺炎的常见表现，部分可见双肺弥漫性小叶中心结节，直径一般小于 5mm；多发病变则可见融合性改变；约 50%患者可见单侧或双侧胸腔积液，支气管扩张及空洞一般不常见；胸部淋巴结肿大也较为少见。**结论** 胸部 X 及 CT 对于流感嗜血杆菌感染具有较高的诊断及鉴别诊断价值，CT 能够提供更多的信息，具有更高的价值。

PU-1356

肺炎葡萄球菌感染的影像学表现

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目的 探讨肺炎葡萄球菌感染的 X 线及 CT 表现特征，提高临床影像诊断及鉴别诊断的能力。**方法** 回顾性分析我院经病原学确诊的肺炎葡萄球菌感染患者的胸部 X 线及 CT 的影像学表现，总结其表现特点。**结果** X 线表现：在常规 X 线平片上，病变呈多发性斑片、结节状影分布，进展快，常累及两个肺叶以上；出现典型蜂窝状透亮影、空洞影、肺气囊影，其中肺气囊是诊断本病的一个重要特征，小气囊呈多发，环形，位于两肺中上野的中外带，靠近肺边缘处多见，大气囊是婴幼儿原发金黄色葡萄球菌性肺炎的特征性表现。大气囊在发病的 1～2 天即可出现，数目 1 个或几个，大气囊常并发有脓气胸，其可压迫肺组织，出现肺不张；胸膜改变如肋膈角变钝；气胸、脓气胸；心影增大、心包积气及纵隔气肿等。CT 表现：（1）肺气囊：薄壁、张力高、多发成簇状分布的肺气囊是血源性金黄色葡萄球菌肺炎最具有特征性的表现之一；（2）炎性渗出性病灶：主要表现为以两肺下叶外带为主的、胸膜下小片状或楔形高密度病灶，病灶边界模糊，与血管关系密切，可伴有少许实变。病变多发展迅速，部分患者检查后数小时至 1 天内可由单一病灶迅速发展为多发病灶，炎性渗出灶大部分互相融合成大片状的高密度影或融冰样肺梗死改变；（3）胸腔积液、气胸、液气胸：血源性金黄色葡萄球菌性肺炎早期可侵犯胸膜即发生液气胸、脓胸及脓气胸等，可同时伴有胸膜增厚；（4）肺脓肿液化、坏死：坏死灶与血管的关系密切，坏死病灶周围肺组织表现为密度增高等感染的表现，中央的液化坏死灶可与支气管相通，并形成空洞，CT 表现为多发散在的圆形空洞（薄壁或厚壁）。早期表现为大片状磨玻璃密度、密度逐渐增高，经治疗后空洞可吸收或残存纤维灶；（5）纤维条索；（6）心包积液。以上表现往往是多种类型并存。**结论** 胸部 X 及 CT 对于肺炎葡萄球菌菌感染具有较高的诊断及鉴别诊断价值，CT 能够提供更多的信息，具有更高的价值。

PU-1357

NSCLC 中高表达 G6PD 通过 STAT3-GLUT1 促进 NSCLC 葡萄糖摄取且提示预后不良

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目的 研究 G6PD 与非小细胞患者预后的关系，探讨 G6PD 对非小细胞肺癌细胞葡萄糖摄取能力的影响及分子机制。

方法 收集非小细胞肺癌(NSCLC)患者及肺部良性结节患者 PET-CT 影像学资料 40 例，统计分析上述两组患者中 G6PD 表达水平与 SUVmax 及 SUVmean 的相互关系。采用肺癌及癌旁组织工程芯片，免疫组化检测 G6PD 在肺癌和癌旁组织工程芯片中的表达并评分，分析两组间 G6PD 表达水平与总生存期及无疾病进展期的关系。通过皮下移植瘤模型构建上述 3 株细胞的裸鼠荷瘤模型，检测成瘤时间、生长速度及代谢。

结果 1、NSCLC 患者 SUVmax 及 SUVmean 较肺部良性结节患者明显升高（且 G6PD 表达水平与 SUVmax 正相关。

2、NSCLC 中高表达 G6PD 的患者总生存期及无疾病进展期明显缩减。

3、G6PD 在肺癌细胞中高表达，敲减 G6PD 的肺癌 A549 细胞葡萄糖摄取减少，同时伴有 STAT3 及 GLUT1 表达下降；过表达 G6PD 之后，A549 细胞的葡萄糖摄取增加且 STAT3 及 GULT1 表达水平升高；上述两种细胞系中抑制 STAT3 的活性发现敲除或过表达 G6PD 不影响 GLUT1 的表达。

4、裸鼠荷瘤模型显示，敲除 G6PD 的小鼠成瘤能力明显下降伴代谢减低；过表达 G6PD 之后小鼠成瘤能力增加且代谢增高。

结论 1、NSCLC 患者中 G6PD 过表达且提示预后不良。2、G6PD 通过 STAT3/GLUT1 轴调控 NSCLC 葡萄糖摄取。

PU-1358

18F-FDG PET/MR 一体机成像关于非小细胞肺癌葡萄糖代谢参数与体素内不相干运动扩散加权成像参数相关性的初步研究

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目的
PET/MR 的多参数、多模态成像对于恶性肿瘤的诊断具有重要价值和广泛的应用前景，本文应用 ^{18}F-FDG PET/MR 一体机观察非小细胞肺癌糖代谢参数（SUVmax、SUVmean）与 IVIM 参数（D、D*、f ）的相关性。
材料与方法
对 31 例非小细胞肺癌患者行胸部 PET/MR 检查，包括 IVIM 序列。采用随机自带软件,利用轴位像对 PET 图像、IVIM 图像及 T2 Propeller 图像进行自动配准,并在同一层面以 T2 Propeller 图像边界为基础勾画 ROI,于 PET 图像测量肿瘤 SUV 最大值(SUVmax)和 SUV 平均值(SUVmean)，于 IVIM 图像测量 D 值、D*值、f 值。应用 Pearson 相关系数分析相关性。
结果
SUVmax 值与 f 值之间具，有相关性（r=0.395 P=0.028），SUVmean 值与 D 值及 f 值之间具有相关性（r=0.409 P=0.022，r=0.489 P=0.005）
结论
IVIM 序列参数 D 值，f 值提供的肿瘤组织水分子受限及微循环灌注信息，与 PET 图像参数 SUVmax 和 SUVmean 提供的肿瘤糖代谢信息之间存在联系。可应用 ^{18}F-FDG PET/MR 的多参数、多模态成像对非小细胞肺癌的糖代谢等病变内部信息进行评价。

PU-1359

1H-NMR spectroscopy identify potential biomarkers in serum metabolomic signatures for early stage of esophageal squamous cell carcinoma

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BACKGROUND: Esophageal squamous cell carcinoma (ESCC) is one of the prevalent types of upper gastrointestinal malignancies. Here, we used ^{1}H nuclear magnetic resonance spectroscopy (1H-NMR) to identify the potential serum biomarkers in patients with early stage ESCC.
METHODS: 65 serum samples from early ESCC patients (n=25) and healthy controls (n = 40) were analysed by ^{1}H-NMR spectroscopy. We distinguished different metabolites

through principal component analysis, partial least squares-discriminant analysis, and orthogonal partial least squares-discriminant analysis (OPLS-DA) using SIMCA-P+ version 14.0 software. Receiver operating characteristic (ROC) analysis was conducted to verify potential biomarkers.
RESULTS: Using OPLS-DA, 31 altered serum metabolites were successfully identified between the groups. Based on the area under the ROC curve (AUROC), and the biomarker panel with AUROC of 0.969, six serum metabolites (α-glucose, choline, glutamine, glutamate, valine, and dihydrothymine) were selected as potential biomarkers for early stage ESCC, especially the dihydrothymine could stand for a new feasible biomarker associated with tumor occurrence.
CONCLUSIONS: ^{1}H-NMR spectroscopy may be a useful tumour detection approach to identify useful metabolic ESCC biomarkers for early diagnosis and to explore the molecular pathogenesis of ESCC.

PU-1360

FDG PET/CT 定量参数评价前上纵隔肿瘤的代谢负荷

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目的 应用 ^{18}F-FDG PET/CT 体素基础上定量评价前上纵隔肿瘤的代谢负荷，包括肿瘤代谢体积和糖酵解总量。
材料和方法 选择 127 例来我院就诊的前上纵隔肿瘤患者，术前或穿刺活检前行 PET/CT 检查。依据组织学结果，将所有患者分为 4 组，包括胸腺上皮来源肿瘤组、淋巴瘤组、生殖细胞肿瘤组和其他组。比较 4 组患者的肿瘤代谢体积和总糖酵解量，评价体素基础上各代谢参数的诊断效能。
结果 各亚组肿瘤的代谢参数存在组间差异(F=6.72, P<0.001)，淋巴瘤组 SUVmax 最高，其次为生殖细胞肿瘤和胸腺上皮来源肿瘤。各亚组间肿瘤代谢负荷，包括肿瘤代谢体积和总糖酵解量，均存在显著差异 (F=4.96, P<0.01; F=5.08, P<0.01)，淋巴瘤组 TLG 和 MTV 均最高。其中 TLG 和 MTV 在鉴别淋巴瘤与其他前上纵隔肿瘤方面，二者具有相似的敏感性和特异性 (65.9% vs. 70.7%, and 69.7% vs. 73.8%)，ROC 曲线显示 TLG 的曲线下面积为 0.738，略高于 MTV。
结论 肿瘤代谢负荷，包括肿瘤代谢体积和总糖酵解量，能够反映肿瘤的代谢差异，可以帮助鉴别淋巴瘤和其他前上纵隔肿瘤。

PU-1361

CT quantitative analysis study for angiogenesis,and degree of ischemic necrosis and glucose metabolite in non-small cell lung cancer

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OBJECTIVE: We aimed at exploring the feasibility of noninvasive late arterial phase enhanced CT imaging in evaluating tumor angiogenesis, ischemic necrosis, and glucose

metabolism, thereby providing pathological information for the comprehensive treatment plan in non-small cell lung cancer (NSCLC).
PATIENTS AND METHODS: 52 cases of NSCLC were enrolled in this study. The mean ischemia necrosis CT quantitative value (INCTQ) and CT enhanced value (CTe) of the tumor were determined, and the immunohistochemical staining of factors relating to tumor angiogenesis, ischemic necrosis and glucose metabolism, including VEGF, VEGFR-2, HIF-1α, CAIX, GLUT1, and GLUT3, were conducted.
RESULTS: The mean INCTQ values of different expression grades of VEGF, VEGFR-2, HIF-1α, and CAIX have no significant difference, but the mean INCTQ values of different expression grades of GLUT1 or GLUT3 have significant differences ($p < 0.001$), respectively. However, INCTQ value has a positive correlation with CAIX expression. In addition, CTe value was positively correlated with VEGF. CONCLUSIONS: To sum up, late arterial phase CT enhanced images of NSCLC not only can assess the tumor angiogenesis, but also can reflect the degree of ischemic necrosis, effectively reflecting the level of glucose metabolism in tumor and tumor angiogenesis, for the comprehensive treatment program.

PU-1362
胸痛三联一站式多层螺旋 CT 扫描技术与临床应用

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目的 对肺动脉、冠状动脉及主动脉的 CT 联合扫描成像的探讨与临床引用
方法 扫描方案:患者仰卧位，脚先进，胸部扫描体位，连接静脉套管针（20G），连接心电监护。扫描时不要求强制憋气，平静呼吸即可。
扫描参数:
主动脉及肺动脉采用螺旋扫描，管电压 100KV，管电流 200-300mA，扫描层厚 0.625mm,球管旋转时间 0.28s,探测器宽度 12-16cm。
冠脉采用全部采用前门控轴扫模式，管电压 100KV,管电流 SmartmA 200-700mA，扫描层厚 0.625mm,球管旋转时间 0.28s,探测器宽度 12-16cm。
采用 Revolution CT 完成扫描,采用小剂量测试，层面选取肺动脉主干、主动脉根部，算出目标血管峰值时间，修改各血管扫描延迟时间。造影剂注射方案根据 BMI 设定，对比剂注射完成后，注射生理盐水 50ml 冲管，流速 4-5ml/s。
结果: 肺动脉、冠状动脉、主动脉数据为单独的序列，单独显示，后处理方便。
结论: 可迅速准确进行鉴别，避免了重复检查，并降低了辐射剂量及造影剂剂量。

PU-1363
基于生物正交点击化学预定位体系的乳腺癌诊疗一体化探针的构建及可视化评价

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目的

构建基于肿瘤原位生物正交点击化学反应预定位体系的酸敏感纳米探针，通过细胞及动物实验考察其在乳腺癌“MR/荧光”双模态成像及光动力治疗中的作用，评价其对乳腺癌早期诊疗一体化的优势和可行性。

方法

合成诊疗一体化探针 s-NP 与 ins-NP，并对其理化性质进行表征（不同 pH 值颗粒溶液的粒径、荧光强度、ROS 产生情况、T1 弛豫率曲线等）。MTT 法检测探针的细胞暗毒性以及近红外照射下对 4T1 细胞的光动力杀伤效果。通过单光子共聚焦显微镜、流式细胞仪分别定性和定量分析不同处理组之间肿瘤细胞膜上 Ce6 的荧光强度。建立裸小鼠乳腺癌皮下移植瘤模型，连续三天尾静脉注射 Ac4ManNAz 颗粒,第四天注射 s-NP，于注射后 2h、4h、6h、12h、24h 进行小动物活体荧光/MR 成像。注射后第 6、12 小时，用 0.1 W/cm^2的 660nm 激光照射肿瘤部位 30min，连续 21 天对小鼠肿瘤体积进行测量，结束治疗后取主要脏器及肿瘤组织做病理切片用于 H&E 染色及 Tunel 检测组织中细胞的增殖和凋亡情况。

结果

s-NP 溶液在 pH 7.4 时粒径约为 100nm，在 pH 6.5 时粒径约为 10nm，具有良好的 pH 敏感性，而对照组 ins-NP 在 pH 7.4 与 6.5 时粒径均在 100nm。MTT 实验显示，探针在无近红外激光条件下对细胞无毒性作用。预先给予 Ac4ManNAz 颗粒，经 s-NP(pH 6.5)处理后的细胞膜表达 Ce6 荧光，在近红外激光照射后细胞存活率较 ins-NP 对照组明显降低。Balb/c 裸鼠活体荧光成像与 MR 成像结果显示纳米颗粒在肿瘤部位有显著的荧光信号，小鼠治疗实验结果显示该探针对肿瘤生长具有明显的抑制作用。

结论

本研究合成了基于肿瘤原位生物正交点击化学预定位体系的诊疗一体化分子探针，用于“MR/荧光”双模态成像指导下的乳腺癌原位光动力治疗，取得良好效果。该研究对其他肿瘤的多模态诊疗一体化也有重要的借鉴意义。

PU-1364

IIIA（N2）期乳腺癌术前 18F-FDG PET/CT 双时相显像与术后腋窝淋巴结转移对比研究

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目的通过对比分析 IIIA(N2)期乳腺癌术前 18F-FDG PET/CT 双时相显像与术后腋窝淋巴结转移情况，探讨其研究价值及最佳诊断阈值。**资料与方法** 回顾性分析 23 例 IIIA(N2)期乳腺癌患者的临床资料。所有患者在术前均行 PET/CT 双时相显像，以病理结果为金标准，确定与术前 PET/CT 相匹配的淋巴结 148 枚，其中转移性淋巴结 97 枚、非转移性淋巴结 51 枚，分别测定两组淋巴结短径、两次显像 SUVmax 值，并应用 ROC 分析诊断效能。**结果** 淋巴结 SUVmax 比较：转移性淋巴结组延迟明显高于早期，差异有统计学意义（P<0.01）；非转移性淋巴结组延迟与早期差异无统计学意义（P=0.49）；转移性淋巴结组与非转移性淋巴结组间早期相和延迟相 SUVmax 差异均有统计学意义（P <0.001）。淋巴结短径比较：转移性淋巴结短径大于非转移性淋巴结，差异无统计学意义（P=0.069）。淋巴结双时相 SUVmax ROC 曲线分析：早期相曲线下面积为 0.970，（0.948-0.993），p=0.000；延迟相曲线下面积为 0.910，（ 0.866-0.953），p=0.000；早期相及延迟相曲线下面积差异有统计学意义（z=3.85，P=0.0001）。转移性淋巴结亚组 SUVmax 比较：4.00＜短径≤6.00mm 组，延迟与早期）差异无统计学意义（P=0.06）；6.00＜短径≤8.00mm 组，延迟高于

早期差异有统计学意义（P<0.01）；8.00＜短径≤10.00mm 组，延迟高于早期差异有统计学意义（P<0.01）。原发灶乳腺癌 SUVmax 比较：延迟显像高于早期显像，差异有统计学意义（P<0.01）。**结论** 18F-FDG PET/CT 早期相对乳腺癌腋窝淋巴结转移具有重要临床诊断价值；延迟相淋巴结 SUVmax 升高倾向于转移，但对较小的转移性淋巴结诊断灵敏度会降低。

PU-1365
18F-FDGPET 在肺内多发病灶穿刺部位选择中的临床价值

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目的 探讨 18F-FDG PET/CT 在选择肺内多发病灶穿刺部位中的临床价值。
方法 164 例经手术病理结果证实的经皮肺穿刺的患者，其中 60 例经 18F-FDG PET/CT 指导选择穿刺部位，104 例行 CT 增强指导选择穿刺部位。
结果 60 例患者根据 18F-FDG PET/CT 指导选择的穿刺部位，59 例获得准确病理结果，穿刺准确度 98.3%，其中 57 穿刺部位为 SUV 最浓聚处；104 例患者根据 CT 增强指导选择穿刺病灶，其中 86 例获得准确病理结果，穿刺准确度 82.7%。两组对比差异有统计学意义（Ｘ2=7.63,P＜0.05）
结论 依据 18F-FDG PET/CT 指导选择 SUVmax 最高的病灶及位点作为穿刺部位，比根据 CT 增强指导选择穿刺部位有更高的诊断准确度。

PU-1366
The diagnostic value of PET/CT radiomic features in 2 solitary pulmonary nodules with low metabolism

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Purpose To develop and validate a PET/CT radiomics model to differentiate malignant SPNs from benign ones with low-metabolism. Patients and Methods The radiomics model was built by extracting radiomic features from the retrospective dataset obtained from PET/CT center of Henan Provincial People's Hospital. The dataset included 140 patients (training set, n=98; test set, n=42) with low-metabolic SPNs. Univariate analysis and multivariate analysis were performed to screen out low metabolic SPNs-related features. A ridge-logistic regression was used to build the model. The model performance was validated by the area under corresponding the receiver operating characteristic curve (AUC). Results The radiomics model contained 8 radiomic features (4 radiomic features from CT and 4 radiomic features from PET). The AUC of the training set was 0.84 (95% CI: 0.77- 0.91) and the AUC of the test set was 0.81 (95% CI: 0.65-0.94), which implied a good forecasting result. Conclusions For patients with low-metabolic SPNs, the PET/CT radiomics model showed a great discriminatory capability between benign and malignant tumors, which adds to the diagnostic value of PET/CT.

PU-1367

Long noncoding RNA HOTAIR promotes cell injury induced by chronic intermittent hypoxia via regulating p38MAPK signaling pathway

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OBJECTIVE: Mounting evidences have illustrated an important role of HOTAIR in cancer progress. However, its function in cardiac hypertrophy induced by chronic intermittent hypoxia (CIH) remains unknown. This study aimed to investigate the regulatory mechanism of HOTAIR in H9c2 cells under CIH condition.
METHODS: H9c2 cardiomyocytes were divided into seven groups: control group, CIH, HOTAIR group (CIH cells treated with HOTAIR), NC group (CIH cells treated with empty plasmid), HOTAIR siRNA group (CIH cells treated with siRNA HOTAIR), SB203580 group (CIH cells treated with p38MAPK inhibitor), and HOTAIR+SB20358 group. RT-PCR was used to determine the expressions of HOTAIR. The content of reactive oxygen species (ROS), malondialdehyde (MDA), super oxide dismutase (SOD) and lactate dehydrogenase (LDH) was determined. Cell viability was detected by CCK8 assay. Apoptotic cells were observed by flow cytometry. Cell apoptosis related proteins bcl-2, bax and caspase-3 and roundabout 1 (Robo1) were measured using Western blot. Statistical analysis was performed using SPSS 18.0.
RESULTS: The decreased cell viability and increased expressions of HOTAIR and p-p38 were observed in CIH H9c2 cells ($P<0.05$). Besides, H9c2 cells under CIH condition had an elevation in p-p38, ROS, MDA and LDH with the increased apoptotic cells, but a reduction in SOD, and these similar changes were more obvious in those CIH cells treated with HOTAIR when compared with Controls (all $P<0.05$). However, the H9c2 cells treated with SB203580 and HOTAIR siRNA led to opposite results compared with HOTAIR group (all $P<0.05$). Importantly, SB203580 could reverse the function of HOTAIR in aggravating the CIH injury of H9c2 cells.
CONCLUSION: HOTAIR can promote the apoptosis and oxidative stress of H9c2 cells by activating p38MAPK pathway, thus aggravating the damage of H9c2 cells induced by CIH, which could add our understanding of the molecular mechanisms in OSA- induced cardiac hypertrophy.

PU-1368

临床特征联合 18F-FDG PET-CT 显像对肺腺癌表皮生长因子受体基因突变的预测

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目的 探讨临床特征联合 ^{18}F-脱氧葡萄糖（^{18}F-fluorodeoxy glucose） 正电子发射计算机断层扫描（ positron emission tomography ／computed tomography，PET-C T）的 CT 与 PET 代谢特征对肺腺癌表皮生长因子受体 EGFR 突变的预测价值

方法回顾性分析了 216 例经病理证实的肺腺癌患者的临床及 CT、PET 影像学特征，依据 EGFR 突变情况将病人分为突变型与野生型 2 组，用秩和检验、T-检验、卡方检验或 Fisher 精确检验比较 2 组间统计学差异，然后把有统计学意义的特征纳入多变量 logistic 回归模型，找出独立相关因素，画出 ROC 曲线评价检验效能。

结果 216 位肺腺癌患者分成两组，EGFR 野生组 104 例，EGFR 突变组 112 例，其中女性（P＜0.001）、无肺气肿（P=0.01）、有血管纠集征（P＜0.001）、肿瘤消失率越大（P＜0.047）的肺腺癌患者 EGFR 基因突变率高，而年龄、TNM 分期、位置、形态、分型、密度、边缘、胸腔/心包积液、肺内转移、胸膜凹陷征、钙化、支气管充气征间无统计学差异。PET 所有代谢指标 ＳＵＶｍａｘ、ＭＴＶ 和 ＴＬＧ野生组均高于突变组，有统计学意义（p=0.022、0.012、0.004、＜0.001）。Logistic 多因素回归分析结果显示 TLG、性别、血管纠集征、肺气肿为预测肺腺癌 EGFR 基因突变的独立因素。 最后我们根据预测概率与 EGFR 病理结果得到 ROC 曲线。其曲线下面积 AUC 为 0.791(95%的置信区间为 0.730-0.851)。使用最大 Youden 指数选择截断点 0.4687，预测 EGFR 突变的敏感性为 0.768 和特异性分别为 0.701。

结论 研究表明，临床联合 ^{18}F-FDG PET、CT 影像特征能提高肺腺癌 EGFR 基因突变的预测价值。

PU-1369

Expression profile of long non-coding RNAs in rat models of OSA-induced cardiovascular disease: new insight into pathogenesis

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Purpose Long noncoding RNAs (lncRNAs) have emerged as a novel class of regulatory molecules involved in numerous biological processes, but their role in a rat model of chronic intermittent hypoxia (CIH) remains unknown. Therefore, we aimed to reveal lncRNAs expression profiles and explore their potential functional roles in rat models of CIH.

Methods We applied a well-established CIH rat model and performed lncRNA microarray experiments on the left ventricular tissue of rats with CIH and under normoxia control. Differentially expressed lncRNAs and mRNAs were identified through fold-change filtering and verified by quantitative reverse transcription polymerase chain reaction (qRT-PCR). Bioinformatics analyses were applied to predict the potential biological roles of key lncRNAs. Co-expression analysis was conducted to determine the transcriptional regulatory relationship of differentially expressed lncRNAs and mRNAs between two groups.

Results We found that 157 lncRNAs and 319 mRNAs were up-regulated, whereas 132 lncRNAs and 428 mRNAs were down-regulated in the rat model of CIH compared with sham control. Pathway analyses indicated that 31 pathways corresponded to up-regulated transcripts and 28 pathways corresponded to down-regulated transcripts. Co-expression networks were also constructed to investigate the potential regulatory roles of differentially expressed lncRNAs on mRNAs. In this CNC network construction, a single lncRNA could correlate with many mRNAs and vice versa. LncRNAs, namely, XR_596701, XR_344474, XR_600374, ENSRNOT00000065561, XR_590196, and XR_597099, were validated by qRT-PCR. The qRT-PCR results were in agreement with the microarray findings and showed the same trends of up- or downregulation for each lncRNA.

Conclusions In conclusion, the present study first revealed the expression profiles of lncRNAs in a rat model of CIH, providing new insight into the pathogenesis of obstructive sleep apnea-induced cardiovascular disease.

PU-1370

原发性食管恶性黑色素瘤一例

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1 病例资料

患者男性，67 岁，因“进食哽噎 1 月余”入院。患者 1 月前无明显诱因开始出现进食时哽咽感，以进固体较硬食物时症状明显，偶有嗳气，不伴返流症状，无呕吐， 无烧心，腹痛腹胀，无声嘶，无呛咳，无呕血、黑便。1 月来患者症状未有明显变化。2 周前患者就诊于当地医院行胃镜示：食管距门齿 35cm 可见不规则隆起物，表面糜烂，取病理，活检病理为低分化鳞状细胞癌。自发病以来，精神睡眠可，大小便正常，近三个月来，体重下降 20kg。有 40 年饮酒（白酒）史，半斤/日。查体：T：36.50℃；P：80 次/分；R：20 次/分；BP：105/73mmHg；H：170cm；W：69.0Kg；S：1.80m^2；ECOG：0 级；疼痛等级：0 级。双侧锁骨上未及肿大淋巴结。视诊：呼吸运动正常，呼吸节律正常，肋间隙未见明显异常。触诊：双侧语颤正常，胸膜摩擦感未触及。叩诊：双肺叩诊清音，听诊：呼吸音音清，未闻及干湿啰音，双侧语音传导正常、对称，胸膜摩擦感未触及。

PU-1371

共负载 Fe304/AZD6244 的纳米磁性脂质体用于 MRI 介导的多靶向肿瘤诊疗

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目的 通过制备共负载超顺磁造影剂 Fe_3O_4 和 MEK 抑制剂 AZD6244 的纳米磁性脂质体载药体系，系统地表征其体内外磁靶向性、磁共振成像（MRI）特性、肿瘤抑制效果、MRI 介导的疗效追踪，同时明确药物作用机制和药代动力学过程，为恶性肿瘤的临床诊断及用药提供指导。**方法** 采用共沉淀一步法制备外包葡聚糖的 Fe_3O_4 纳米颗粒，包载 AZD6244 后得到纳米磁性脂质体，精确表征其物化性质及药物含量。测试纳米磁性脂质体的稳定性及体外释放特性，绘制药物释放曲线。采用 MTT 法评价载药体系的体外细胞毒性，蛋白免疫印迹和 RNA 干扰技术评价载药体系对 MAPK 信号通路的影响，流式细胞术分析载药体系对肿瘤细胞周期的影响，裸鼠移植瘤实验测试载药体系的体内肿瘤抑制效果，小动物活体磁共振成像系统测试载药体系的体内磁共振成像特性，进一步评价载药体系对肿瘤治疗过程的实时监测作用。**结果** 经过精确控制实验条件，可大量制备超顺磁 Fe_3O_4 纳米颗粒，将 Fe_3O_4 和 AZD6244 共负载得到纳米载药体系，该体系具有优良的磁学性质、多靶向性、储存稳定性、刺激响应药物释放特性等。选择两种 MAPK 高活化的结肠癌细胞株（Colo205，HT29），体内体外实验表明该载药体系具有优良的磁响应性、肿瘤组织内药物聚集特性、肿瘤抑制和 MRI 对抑瘤效果的实时示踪效果。机理研究发现，Pim1 的代偿性激活是导致 MEK 耐药的新型分子机制，且

该载药体系具有良好的安全性和小鼠耐受性。**结论** 本研究中所制备的纳米磁性脂质体可高效地负载药物，具有优良的体内外磁学特性、多靶向性、磁共振成像、肿瘤抑制和疗效示踪效果，将为恶性肿瘤的早期诊断、驱动治疗和疗效评估提供新的设计思路和制备策略。

PU-1372
18F-FDG PET/MR 在肝外胆管癌成像及诊断的应用价值

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【目的】评估 ^{18}F-FDG PET/MR 在肝外胆管癌成像及诊断的应用价值
【方法】回顾性分析 22 例病理证实肝外胆管癌患者 PET/CT 及 PET/MR 的成像及参数特征。患者 PET/CT 全身检查后，行 PET/MR 腹部局部加扫，磁共振序列包括 LAVA、T2 Propeller、fs T2 Propeller、DWI（b=800）、MRCP；将 T2 Propeller 序列与 PET 进行融合。将患者信息、病灶大小、病灶数量、病灶 SUVmax、ADC 值计数后，进行统计学分析。
【结果】22 例肝外胆管癌患者中，男性 15 人，女性 7 人，中位年龄 55 岁，19 名患者伴有 CA199 升高，15 人伴皮肤巩膜黄染。确诊肝门部胆管癌 10 例，肝总管胰头部胆管癌癌 12 例；PET/CT 扫描中，共发现 32 处病灶（均位于腹部，无远处转移），包括胆管原发病灶、周围淋巴结转移及肝内转移；原发灶 SUVmax 为 8.45±0.46，转移灶 SUVmax 为 6.78±0.81；PET/MR 腹部局部扫描中，除 PET/CT 确定病灶外，发现额外 6 处病灶，均为肝内转移，病灶直径为 1.2±0.13cm，SUVmax 值为 4.88±0.56；原发灶 SUVmax 为 9.67±0.55，ADC 为（0.65±0.01）×$10^{-3}$$mm^2$/s；其余转移灶 SUVmax 为 7.35±0.46，ADC 为（0.56±0.03）×$10^{-3}$$mm^2$/s；两组原发灶及转移灶具有统计学差异。
【结论】PET/MR 在胆管癌诊断中，具备同 PET/CT 的诊断效能，在此基础上，T2 压脂、LAVA 序列联合 MRCP 可以对病灶大小、形态及位置进行评估，精确诊断胆管癌类型（肿块型、管壁增厚型），结合标准摄取值，对肿瘤性质及 T 分期具有较 PET/CT 更重要的应用价值；同时，PET/MR 较 PET/CT 还可以准确定位及诊断转移灶，尤其肝内转移，确定肿瘤 N 分期及 M 分期，对患者未来治疗方案的决定具有重要意义

PU-1373
多模态影像学方法在小儿先天性肾脏及尿路畸形中应用价值

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目的 探讨多模态多参数影像学表现对于儿童先天性肾脏及尿路畸形（CAKUT）诊断价值，并对其在临床诊疗中应用进行全面评估。**方法** 收集我院 2018 年 1 月至 6 月期间临床诊断 CAKUT 232 例患儿病史资料，其中男 130 例，女 102 例，年龄 1 月至 10 岁，≤2 岁 186 例（80%）；各种肾脏畸形 42 例，重肾重输尿管畸形 17 例，肾盂输尿管连接畸形 85 例，膀胱输尿管返 80 例，后尿道瓣膜（PVU）7 例，神经源性膀胱 1 例。检查设备采用 GE Discover NM SPECT/CT 670 Pro 机、GE Healthcare Optima CT540 扫描仪及 GE Discovery MR750 3.0T MRI 设备；对于首诊发热患儿均行肾皮质显像，尿路梗阻畸形行 EC 显像，肾脏畸形行 DTPA 显像，并对显像不明确畸形患儿进行低剂量 MSCT 或 MRI 平扫，显像常规方法采集，应用 Xeleris3.1 TM 功能成像系统后处理重建图像，CT 扫描采用传统滤波反投影法进行图像重建，功能成像患儿分别计算分肾功能，对肾实质损害程度进行分级并于 CAKUT 畸形对比分析。**结果** 形态学检查方法 B 超对于 CAKUT 明显畸形能够初步筛查优于传统 X 线检查；低剂量 MSCT 或 MRI 能够清晰显示 CAKUT 畸形，优于并取代静脉尿路造影；排

泄性膀胱尿路造影对于膀胱输尿管反流特异性高，但存在较大电离辐射，检查需综合慎重选取；功能学肾脏动静态联合检查对于 CAKUT 分肾实质损害程度、瘢痕形成、GFR 功能进行精准定量诊断，并对上尿路梗阻 CAKUT 进行梗阻情况鉴别； Mann-Whitney U 轶和检验结果 CAKUT 与肾实质损害程度差异有统计学意义（$p < 0.05$）。**结论** CAKUT 多模态影像学检查方法相结合能够对于分肾功能进行定量及畸形类型定性诊断，为临床提供形态及功能影像学诊断依据，对于临床早期发现 CAKUT 并及时予以干预，选择正确治疗方法及有效预防远期肾损害，防止发展。

PU-1374

Visualization of the Biological Behavior of colorectal cancer using multimodal molecular imaging

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Objective : Molecular imaging such as PET provide a noninvasive method to assess different types of tumors in staging, prognosis, and therapy response of oncology patients. The aim of this study was to evaluate the value of ^{18}F-FDG 、3′-deoxy-3′-^{18}F-fluorothymidine (^{18}F-FLT) and ^{18}F-fluoromisonidazole (^{18}F-FMISO) PET in the identification of colorectal liver metastases xenograft model with different metastatic potential and to examine the relationship of uptake of ^{18}F-FDG 、^{18}F-FMISO and ^{18}F-FLT to tumor biology，combing with machine learning method for medical imaging

Methods: Human CRC cell lines SW480 、SW620 、LOVO、HT29 were cultured. Firstly, In vivo imaging features of colorectal cancer model with low and high metastatic potential was assessed after injection of each tracer, Region of interest (ROI) was drawn over tumor and liver to calculate SUVmax ratio (tumor/liver). Immunohistochemical and Western-Blot techniques were used to detect expression level of the biological markers related to invasion and metastasis: vascular endothelial growth factor (VEGF), proliferating cell nuclear antigen (Ki67) and leukocyte differentiation antigen cluster 44 (CD44).

Results: Micro-PET scan showed that The T / NT ratios of ^{18}F-FDG in SW480 and SW620 liver metastases were 2.84±0.72 and 3.04±0.83, respectively ($p > 0.05$); while the T / NT ratios of ^{18}F-FLT were 1.68±0.23 and 1.49±0.19, respectively ($p < 0.05$). All parameters of FLT were significantly higher in SW480 tumors than SW620 tumors.. A moderate relationship was found between metastases in liver and ^{18}F-FLT uptake in tumors （r=0.73, p=0.0019）.

Conclusion: The uptake of ^{18}F-FLT in metastatic tumor can reflect the different biological behaviors of colon cancer cells. Taking multiple radionuclide uptake values as the characteristic parameters, the machine learning method can classify and predict the four kinds of colon cancer cells with different invasiveness . Meanwhile ^{18}F-FLT can distinguish two colorectal liver metastases xenograft models and evaluate the metastatic potential of colon cancer in nude mice. The combination ^{18}F-FDG with ^{18}F-FLT can predict the prognosis the nude mice

PU-1375
基于 I 型胶原蛋白的肝纤维化 MR 分子影像研究

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肝纤维化是慢性肝病的共同转归，早期肝纤维化是可逆性病变，而晚期则不可逆。 I 型胶原蛋白是肝纤维化细胞外基质的主要成分，并与肝纤维化的严重程度呈正相关。现已证实：序列为 LRELHLNNN 的多肽可特异性识别并结合型胶原蛋白。我们课题组首次发现：基于该多肽的 MR 分子探针 TICTP1 可特异性结合并显像肝纤维化并定量研究。本研究以肝纤维化组织中过量沉积的 I 型胶原蛋白为靶点，设计研发相应 MR 多肽探针，用于多参数特异性显像早期肝纤维化。本研究实现了肝纤维化的 MR 特异性可视化显像，并进行了初的分期研究（图见附件）。实现早期肝纤维化的特异性显像及相关的定量研究，对肝纤维化的早期临床诊断、精准分期及临床治疗具有重大意义。

PU-1376
Three-dimensional Turbo-spin-echo Amide Proton Transfer-weighted MR Imaging for Cervical Squamous Cell Carcinoma

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Objective: To evaluate the clinical feasibility of amide proton transfer (APT) magnetic resonance (MR) imaging for cervical squamous cell carcinoma. **Methods:** Between September 2017 and September 2018, 27 patients with cervical squamous cell carcinoma and 27 healthy volunteers prospectively underwent pelvic APT and DWI MR imaging on a 3T MR scanner. APT and ADC values were independently measured by two radiologists on the maximum area of the cervical tumor and normal cervix. Inter-observer inter-class correlation coefficient was computed. Student's t-test was used to compare the differences of APT and ADC values between cervical squamous cell carcinoma and normal cervix, receiver operating characteristic analysis was performed. **Results:** Excellent measurement agreement was found between two observers (all ICC>0.9). APT values of cervical squamous cell carcinoma and normal cervical stroma were 2.80±0.36 and 1.81±0.38 respectively with significant difference ($p<0.0001$). ADC values of cervical squamous cell carcinoma and normal cervical stroma were $0.98\pm0.17\times10^{-3}mm^2/s$ and $1.56\pm0.32\times10^{-3}mm^2/s$ respectively with significant difference ($p<0.0001$). Area under the curve for differentiating cervical squamous cell carcinoma from normal cervical stroma was 0.996 for APT values and 0.963 for ADC values. **Conclusion:** Compared with ADC values, APT values showed similar diagnostic performance in differentiating cervical squamous cell carcinoma from normal cervix, but it provides another perspective on diagnosing cervical squamous cell carcinoma.

PU-1377
胃肠道腺癌 18F-FDG PET/CT SUV 与 DWI ADC 相关性分析

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目的 利用 PET/CT-MRI 三模式，确立胃肠道腺癌多 b 值磁共振弥散加权成像(DDWI)单指数及双指数模型表观弥散系数(ADC) 与脱氧葡萄糖(FDG) PET/CT 中标准摄取值(SUV)之间的相关性。
方法 连续选择 29 例未经治疗的胃肠道腺癌患者，该患者均行 PET/CT 及 MR 检查。利用 Pearson 相关分析胃肠道腺癌 SUV 及单指数及双指数模型 ADC 间的关系。
结果 胃肠道腺癌的 SUV 与 ADC slow 有显著负相关关系(r=-0.586, P=0.008)。
结论 胃肠道腺癌 PET 中的参数 SUV 与 DWI 中双指数模型的 ADC slow 有相关性，这种相关性提示胃肠道腺癌葡萄糖代谢及水分子弥散间有一定关系。

PU-1378
应用体素内不相干运动扩散加权成像（IVIM-DWI）评价早期慢性移植肾肾病的初步研究

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目的 探讨应用体素内不相干运动扩散加权成像（IVIM-DWI）技术无创性评价早期慢性移植肾肾病（CAN）的可行性及临床应用价值。**方法** 收集符合本研究纳入与排除标准的住院患者 16 例，其中经病理诊断为早期慢性移植肾肾病（CAN 组）的患者 8 例，移植肾肾功能长期稳定的志愿者（对照组）8 例。采用多 b 值 DWI 序列对移植肾进行磁共振扫描，利用 IVIM2b_new 软件获取移植肾的 IVIM-DWI 各定量参数伪彩图及测量肾实质的 IVIM-DWI 各定量参数值，包括真实扩散系数（D）、灌注相关扩散系数（D^*）和灌注分数（f）。采用独立样本 t 检验对 CAN 组和对照组的 IVIM 各定量参数值进行比较，对差异具有统计学意义的指标进行 ROC 分析，并计算曲线下面积。**结果** CAN 组的定量参数 D 值大于对照组，差异具有统计学意义（P<0.05），两组间 D*及 f 值的差异无统计学意义（P>0.05）。真实扩散系数 D 鉴别早期 CAN 的敏感度和特异度分别为 62.50%、87.50%，曲线下面积为 0.828。**结论** IVIM-DWI 的定量参数 D 能在一定程度上无创性评价早期 CAN。IVIM-DWI 技术有望成为一种筛查早期 CAN 的新型有效、简单无创手段，以协助移植肾活检早期诊断与动态监测 CAN。

PU-1379
靶向肝纤维化的铋基纳米材料在能谱 CT 的应用

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目的 肝纤维化目前难以用常规医学影像学技术检出，而早期诊断肝纤维化有助于逆转其向肝硬化发展。本研究旨在把靶向纳米探针 $BaBiF_5$@PDA@HA（五氟铋钡@多巴胺@透明质酸）作为宝石能谱 CT（GSCT）的造影剂，用于诊断肝纤维化。
材料与方法 合成 $BaBiF_5$纳米颗粒[1]后用 PDA 使其转换为亲水性，然后将 HA 衍生物（肝纤维化的特异性标志物）缀合到表面上，从而得到 $BaBiF_5$@ PDA @ HA 纳米探针。 使用肝纤维化小鼠模型（8 周 MCD 饮食诱导[2]）作为实验组，常规饮食的小鼠作为对照组 1，分别通过尾静脉注射 $BaBiF_5$@

PDA @ HA；为进一步验证 HA 的靶向性，注射无靶向性 $BaBiF_5$@PDA 纳米颗粒注射到另一组肝纤维化模型小鼠中，作为对照组 2。注射后对各小鼠进行 GSCT 扫描，在生成的 40 至 140keV 单能量图像测量其肝脏 CT 值。实验结束后对所有小鼠取肝病理染色验证，并对各组 CT 值进行统计学分析。
结果 注射 $BaBiF_5$@PDA@HA 纳米颗粒后 10 分钟到 80 分钟，实验组小鼠的肝脏 CT 值显着高于对照组（P <.0001）。注射后 30 分钟后纳米颗粒在肝纤维化病灶富集量最大，两组肝脏 CT 值差异达到最高点（88.33±11.00HU VS 47.78±3.53HU）；此时分析实验组肝脏的能谱 HU 曲线，发现随着单能量水平的降低，含 $BaBiF_5$ @ PDA @ HA 肝脏的 CT 值会不断升高。因此，40keV 的单能量成像时，实验组小鼠的肝脏 CT 值达到最大值 130.67±13.96HU，而且显示的肝纤维化的病灶范围更接近于病理染色结果。而两组对照组小鼠在注射后纳米材料后，其肝脏仅观察到一过性的 CT 值增高。
结论 铋的 X 射线衰减特征赋予 $BaBiF_5$@PDA@HA 更好的 GSCT 成像能力，其 HA 靶向探针提高了检测的灵敏度，因此 $BaBiF_5$@PDA@HA 纳米颗粒结合 GSCT 应用能无创早期诊断肝纤维化。

PU-1380

Age-related Changes of SUV in Blood Pool and Liver: A Decade Retrospective Study with Analysis of 2850 Asymptomatic Population Outcomes

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Objective: To record the range of variation in blood-pool and liver SUV of the asymptomatic population under different age stages and to identify possible mechanisms of variability.
Method: 2850 asymptomatic subjects receiving ^{18}F-fluorodeoxyglucose (FDG) positron emission tomography/computed tomography (PET/CT) examination were included. Pearson correlation and multivariate regression analysis were performed to assess the associations between individual factors and standardized uptake values (SUVs) of blood pool and liver and find the most related factor influencing the SUVs. Subjects were divided into eight age groups. The metabolic activity of blood pool and liver were presented as mean and maximum SUVs, trends over age were also recorded.
Results: Positive correlations in individual factors with SUVs were found and age appeared to be the most important predictor of SUVs, significantly associated with blood pool SUV_{max} (ß = 0.462, P = 0.000), SUV_{mean} (ß = 0.385, P = 0.000), and liver SUV_{max} (ß = 0.325, P = 0.000) and SUV_{mean} (ß = 0.376, P = 0.000). Blood pool and liver SUVs grew rapidly before the age of 29, slowly grew to age of 50, and then reached a platform.
Conclusion: Age was an extremely important factor for variation of blood pool and liver SUVs in asymptomatic populations. Determining the normal range of blood pool and liver SUV under various age stages will help to detect diseases more accurately. Our studies shed light on the understanding of age-related SUVs variation tendency and provide an important framework for potential connections of age- related quantity of glucose transporters.

PU-1381
前列腺影像报告和数据系统联合表观扩散系数图像定量分析 对外周带前列腺癌的诊断价值

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目的 探讨第 2 版前列腺影像报告和数据系统(prostate imaging reporting and data system version 2，PI-RA DS V2)
评分联合表观扩散系数(apparent diff usion coeffi cient，ADC)图像定量参数对外周带前列腺癌的诊断价值。**方法** 回顾性
搜集 50 例前列腺多参数磁共振成像(multiparametric MRI，mpMRI)检查提示存在外周带结节的患者，且均经穿刺活检
获得病理诊断。由两名高年资影像科医师根据 PI-RADS V2 标准对病灶进行定位及评分，分别利用后处理软件在 ADC
图像上分析、计算对应病灶区的 12 种 ADC 图像定量参数。根据病理结果将病灶分为癌灶组和良性病灶组。比较两组
病灶各 ADC 定量参数的差异，对组间差异有统计学意义的参数采用逻辑回归逐步法拟合建模，通过受试者工作特征
(receiver operating characteristic，ROC)曲线和决策曲线分析(decision curve analysis，DCA)评价不同方法的诊断效能和临床
受益。**结果** 最终共获得外周带癌灶 28 个、良性病灶 25 个。PI-RA DS V2 评分、ADC 模型及联合模型(PI-RA DS V2 评分+
ADC 模型)区分外周带癌灶和良性病灶的 ROC 曲线下面积、敏感度、特异度分别为 0.803，60.71%，92.00%；0.857，
89.29%，76.00%；0.891，71.43%，92.00%，联合模型较 PI-RA DS V2 评分的诊断效能有明显提升(P=0.012)，且在阈概率
0.05~0.27 和 0.46~0.81 范围内该联合模型具有相对最佳的总体净受益率，优于 PI-RA DS V2 评分。**结论** PI-RA DS V2 联合
ADC 图像定量分析能显著提高其区分外周带前列腺癌和良性病变的诊断效能，并改善临床受益。

PU-1382
CT 动脉增强分数评估肝硬化患者肝功能水平

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目的:探讨 CT 动脉增强分数(arterial enhancement fraction,AEF)评估肝硬化患者肝功能损伤程度的可行性及临床价值。方法:前瞻性招募符合纳入及排除标准的 52 例肝硬化患者(Child-Pugh A,B,C 级肝硬化患者组分别为 13,20 及 19 例)和 17 例无肝脏疾病者作为对照。受试者均行肝 3 期增强 CT 扫描,利用 CT Kinetics 软件进行后处理获得 AEF 彩图及其定量参数肝 AEF(hepatic AEF,HAEF)、肝与脾 AEF 比值(H/S)。比较不同 Child-Pugh 级别间 HAEF,H/S 的差异,并计算受试者工作特征曲线下面积(area under the receiver operating characteristic curve,AUROC),对肝硬化患者的 HAEF,H/S 与终末期肝病模型评分进行 Spearman 相关性分析。结果:HAEF,H/S 的观察者

间一致性高,组内相关系数分别为 0.918,0.946。对照组与 Child-PughA,B,C 级肝硬化患者组间的 HAEF,H/S 差异有统计学意义(均 P<0.001);肝硬化患者 HAEF,H/S 随 Child-Pugh 分级增加呈升高趋势,且除 Child-Pugh A 级组与 B 级组 H/S 外差异均有统计学意义(均 P<0.001)。在所有肝硬化患者中,HAEF,H/S 用于诊断 Child-Pugh A 级的 AUROC 分别为 0.933,0.821;用于诊断 Child-PughC 级的 AUROC 分别为 0.925,0.915。肝硬化患者 HAEF,H/S 与 MELD 评分呈显著正相关。结论:CT AEF 相关参数 HAEF,H/S 与肝硬化严重程度及预后密切相关,能简单、有效地评估肝功能损伤状况。

PU-1383

Machine learning-based quantitative texture analysis of CT images of small renal masses: Differentiation of angiomyolipoma without visible fat from renal cell carcinoma

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Objective To evaluate the diagnostic performance ofmachine-learning based quantitative texture analysis of CTimages to differentiate small (≤ 4 cm) angiomyolipoma with-out visible fat (AMLwvf) from renal cell carcinoma (RCC).Methods This single-institutional retrospective study in-cluded 58 patients with pathologically proven small renal mass (17 in AMLwvf and 41 in RCC groups). Texture fea-tures were extracted from the largest possible tumorousregions of interest (ROIs) by manual segmentation in pre-operative three-phase CT images. Interobserver reliabilityand the Mann-Whitney U test were applied to select fea-
tures preliminarily. Then support vector machine with re-cursive feature elimination (SVM-RFE) and synthetic mi-nority oversampling technique (SMOTE) were adopted to establish discriminative classifiers, and the performance ofclassifiers was assessed. Results Of the 42 extracted features, 16 candidate featuresshowed significant intergroup differences (P < 0.05) andhad good interobserver agreement. An optimal feature sub-set including 11 features was further selected by the SVM-RFE method. The SVM-RFE+SMOTE classifier achievedthe best performance in discriminating between small AMLwvf and RCC, with the highest accuracy, sensitivity,specificity and AUC of 93.9 %, 87.8 %, 100 % and 0.955,respectively.Conclusion Machine learning analysis of CTtexture featurescan facilitate the accurate differentiation of small AMLwvf
from RCC.

PU-1384

Radiomics and its advances in hepatocellular carcinoma

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Liver cancer is the second leading cause of cancer-related death worldwide, so early detection and treatment response prediction is of great benefit to hepatocellular carcinoma (HCC) patients. Currently, needle biopsy and conventional medical imaging play a significant and basic role in HCC patients' management, while this two approaches respectively contain the shortage of sample error and observer-dependent. Radiomics can make up for this deficiency, because radiomics is an emerging non-invasive technic to acquire comprehensive information of tumor to reflect the tumor situation across spatial-temporal limitation. This review describes the basic pipeline of radiomics including (a) image acquisition, (b) region of interest segmentation and reconstruction, (c) feature extraction, selection and classification, (d) model building and performance evaluation. This review also expounds the current advances and potential prospect of radiomics in HCC studies containing the field of diagnosis, treatment response prediction, prognosis evaluation and radiogenomics.

PU-1385
磁共振/光声双模态对比剂 MNP-Gd 的研究及其在原位肝癌成像中的应用

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目的 合成新型磁共振纳米对比剂—黑色素-钆纳米颗粒（MNP-Gd），利用原位肝癌模型，探究其作为磁共振/光声双模态对比剂的应用。
方法 1.材料的合成及表征：合成黑色素-钆纳米颗粒（MNP-Gd），并通过透射电镜，动态光散射，紫外分光光度计及电感耦合等离子体-质谱法等方法表征目标材料。2.体外实验： CCK-8 法检测细胞毒性；细胞电镜观察细胞摄取情况；激光共聚焦显微镜和流式细胞免疫荧光法分别定性和定量地检测细胞摄取情况；磁共振及光声成像系统扫描不同浓度梯度 MNP-Gd 溶液观察其成像效果。3.体内实验：建立原位肝癌裸鼠模型，鼠尾静脉注射 MNP-Gd 后，于注射前及注射后不同时间段分别进行磁共振及光声扫描，观察裸鼠肿瘤及重要脏器成像情况。在注射材料不同时间后处死裸鼠，取出其肿瘤以及肝脏、肾脏、肺、心脏、脾等重要器官，用苏木精伊红染色法做病理组织分析。
结果 1. 材料的合成及表征：MNP-Gd 是一种尺寸均一、分布均匀的纳米颗粒，尺寸在 16 纳米左右，电势在 3±0.5mV，每个黑色素纳米颗粒可以螯合大约 45 个钆离子。在 pH=7.4 和 pH=5.5 的条件下， MNP-Gd 表现出了很好的稳定性。2.体外实验：CCK-8 结果表明 MNP-Gd 对细胞没有明显毒性；透射电镜和激光共聚焦显微镜观察到在细胞质内的 MNP-Gd； MNP-Gd 弛豫率更高；光声扫描显示 MNP-Gd 成像效果较好。3.体内实验：给原位肝癌裸鼠注射 MNP-Gd 后，磁共振扫描示肿瘤信号逐渐升高，7h 信号达到最高；注射后肝脏信号在 0.5h 信号达到最高；肿瘤与肝脏信号差异大，增强时间有所不同，可区分肿瘤与正常肝脏组织；给原位肝癌裸鼠注射 MNP-Gd 后，光声扫描示肿瘤信号 8h 信号达到最高；注射后肝脏信号在 0.5h 信号达到最高；肿瘤与肝脏信号差异大，可明显区分。
结论：MNP-Gd 有望成为一种新型磁共振/光声双模态对比剂。

PU-1386
二硫键优化透明质酸介导的肝癌靶向钠米探针动物实验初步研究

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目的:初步探讨二硫键优化透明质酸介导的肝癌靶向钠米探针（HA-SS-PCL@SPIO/DOX）在体内动物水平的高效抗癌性及 MR 成像的可行性。**方法** 1）将 21 只皮下肝癌移植瘤裸鼠模型随机分成生理盐水组、HA-PCL@DOX/SPIO、HA-SS-PCL@DOX/SPIO 组，每组 7 只，实验组经尾静脉按 Fe 5 mg/kg 注射探针，对照组经尾静脉注射同等量的生理盐水，注射前及注射后不同时点(2 h、4 h、8 h)分别进行 MR 成像，测量感兴趣区(肿瘤）T_2值，计算其下降率。2）将 21 只原位肝癌移植瘤裸鼠模型随机分成生理盐水组、HA-PCL@DOX/SPIO、HA-SS-PCL@DOX/SPIO 组，每组 7 只，实验组连续 3 次间隔一天经尾静脉按 DOX 2 mg/kg 注射探针，对照组经尾静脉注射同等量生理盐水。连续观察 15 天，计算肿瘤的抑制率。**结果** 1）HA-SS-PCL@DOX/SPIO 组各时间点其 T_2值较注药前有明显下降（F=105.973，P＜0.05），较 HA-PCL@DOX/SPIO 组其 T_2值下降率更为明显。2）HA-SS-PCL@DOX/SPIO、HA-PCL@DOX/SPIO 组瘤体生长速度明显低于对照组（F=21.513，P＜0.05），前者对肝癌移植瘤抑制效果最明显。**结论** 二硫键优化透明质酸介导的肝癌靶向钠米探针在体内动物水平具有高效抗癌性及 MR 显像功能于一体，可在分子影像水平实现对肿瘤疗效的早期监测。

PU-1387
抗-PSMA×抗-CD3 双功能抗体的构建及 MRI 成像效果的初步研究

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目的 1.构建双功能抗体（抗-PSMA×抗-CD3）的基因序列并完成质粒表达及纯化。2.鉴定双功能抗体对前列腺癌细胞系的促凋亡作用；鉴定生物素化的双功能抗体与超顺磁性氧化铁纳米颗粒的偶联效果及 MRI 成像效果。
方法 1.将抗-PSMA 单链抗体与抗-CD3 单链抗体基因序列进行分析，通过 Vector NTI9 软件将基因序列重组，然后通过质粒转染并诱导表达及纯化。2.培养人前列腺癌细胞系 LNCaP 和人前列腺正常细胞 RWPE-2 以及人 T 淋巴细胞系 H9，利用 Western blot 检测 PSMA 在体外培养的前列腺癌细胞系中的表达以及 CD3 在 T 淋巴细胞系中的表达；生物素化的双功能抗体与几株细胞系孵育，通过链霉亲和素标记的 FITC 检测细胞荧光成像效果。3.将生物素化的双功能抗体与链霉亲和素标记的超顺磁性氧化铁纳米颗粒偶联并在 3.0T 磁共振设备中检测其与细胞系及荷瘤裸鼠的 MRI 成像效果。
结果 1.成功构建双功能抗体抗-PSMA×抗-CD3 基因序列，并实现原核表达及纯化。2.Western blot 证实人前列腺癌细胞系 LNCaP 高表达 PSMA；人前列腺正常细胞 RWPE-2 几乎不表达 PSMA 以及 CD3；人 T 淋巴细胞系 H9 高表达 CD3。细胞免疫荧光检测发现双功能抗体可以使 LNCaP 细胞和 H9 细胞膜显像，而 RWPE-2 细胞膜不显像。3.双功能抗体偶联超顺磁性氧化铁颗粒可以有效降低 LNCaP 细胞系的 T2 值以及荷瘤裸鼠模型的 T2 值。
结论 1.双功能抗体可以识别 PSMA 阳性细胞系与 CD3 阳性细胞系。2.生物素化的双功能抗体可以偶联链霉亲和素标记的超顺磁性氧化铁纳米颗粒并有效降低 LNCaP 细胞系及荷瘤裸鼠模型的 T2 值。

PU-1388
18F-FDG 和 18F-FLT 在预测结直肠癌肝转移模型肿瘤生物学特性方面的价值

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目的 正电子发射断层扫描（PET）提供了一种无创方法来表征肿瘤的不同代谢活动，为肿瘤患者的分期，预后和治疗反应提供信息。本研究的目的是评价 ^{18}F-脱氧葡萄糖（^{18}F-FDG）和 3'-脱氧-3'-18F-氟胸苷（^{18}F-FLT）PET 在预测结直肠癌肝转移肿瘤生物学特性中的价值。
方法 采用体外细胞摄取法测定 SW480 和 SW620 细胞对 ^{18}F-FDG 和 ^{18}F-FLT 的摄取率。将感兴趣区域（ROI）绘制在肿瘤和肝脏上，以计算肝转移模型中来自 PET 图像的最大标准摄取值（SUVmax）比值（肿瘤/肝）。通过线性回归评估肝转移灶中示踪剂摄取与 VEGF，Ki67 和 CD44 表达之间的相关性。
结果 与 SW620 荷瘤小鼠相比，SW480 荷瘤小鼠存活时间短，肝转移率高。^{18}F-FDG 在 SW480 和 SW620 细胞中的摄取率分别为 6.07±1.19%和 2.82±0.15%（t = 4.69，P = 0.04）。 ^{18}F-FLT 分别为 24.81±0.45%和 15.57±0.66%（t = 19.99，P <0.001）。 Micro-PET 扫描显示 SW480 肿瘤的 FLT 各项参数均显着高于 SW620 肿瘤。肝脏转移和肿瘤 ^{18}F-FLT 摄取之间存在中度关系（r = 0.73，P = 0.0019）。 ^{18}F-FLT 摄取与 CD44 表达呈正相关（r = 0.81，P = 0.0049）。
结论 ^{18}F-FLT 在转移瘤中的摄取可反映结肠癌细胞的不同生物学行为。同时，^{18}F-FLT 可用于评估裸鼠结肠癌的转移潜能。

PU-1389
PDZ 蛋白调节 PTEN 磷酸化进而抑制胃癌细胞增殖

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PTEN 的磷酸化在胃癌的发生和发展中起着重要作用。然而，PTEN 磷酸化调节的基本机制仍然不清。在本研究中，PDZ 蛋白 PDZK1 是通过 PDZK1 的羧基末端和 PDZ 结构域与 PTEN 结合而鉴定出的一种新的 PTEN 结合蛋白。PDZK1 通过与 PTEN 的直接作用抑制了 PTEN 在 S380/T382/T383 位点上的磷酸化，进一步增强了 PTEN 抑制 PI3K/Akt 激活的能力。PDZK1 通过抑制 PTEN 磷酸化抑制 PI3K/Akt 激活抑制胃癌细胞增殖。PDZK1 在胃癌标本中的表达经常下调，与胃癌患者的进展和预后不良有关。PDZK1 的下调与临床标本中 PTEN 失活、Akt 信号传导和细胞增殖激活有关。因此，胃癌标本中 PDZK1 水平低，通过 PTEN 在 S380/T382/T383 位点的磷酸化和 PI3K/Akt 信号的组成性激活，导致胃癌细胞增殖增加，导致胃癌患者预后不良。

PU-1390
磁共振成像对比剂 CuS 空心纳米花介导热化联合治疗肝细胞癌

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目的

肝细胞癌（Hepatocellular carcinoma，HCC）是原发性肝癌的主要类型，约 50%的 HCC 患者位于我国。多数 HCC 患者确诊时已达中晚期，失去了最佳的手术时机。如何彻底消除肿瘤病灶，进而降低原位复发和转移率已成为 HCC 治疗研究的重点及难点。本课题拟合成新型纳米载药材料，以实现磁共振成像引导下的热化联合治疗，为 HCC 的精准治疗提供理论和技术基础。

方法

采用脉冲激光烧蚀锌板技术制备出 ZnO 纳米颗粒；采用 355 nm 波长的非聚焦激光辐照技术在 ZnO 纳米颗粒表面包被 CuO，制备出 CuO 空心纳米花；采用硫化铵中的 S 元素置换 CuO 空心纳米花中的 O 元素，制备出 CuS 空心纳米花；将 CuS 空心纳米花置于 DOX 的水溶液中，搅拌 6h，使其搭载 DOX。采用扫描电子显微镜和透射电子显微镜表征样品的形态、结构和粒径；采用 Rigaku X 射线衍射仪表征样品的 X 射线衍射图谱；采用紫外-可见-近红外分光光度计检测样品的光吸收谱；采用傅立叶变换红外光谱仪检测样品的傅立叶变换红外光谱。采用 T1 mapping、T1WI 和 T2-FLAIR 磁共振成像序列检测样品的磁共振成像能力。在 HCC 细胞系中和裸鼠皮下瘤模型中检测载 DOX 的 CuS 空心纳米花对 HCC 的热化联合治疗能力。

结果

本课题采用激光烧蚀技术和离子交换反应等方法，成功制备出了由二维纳米板组成的三维 CuS 空心纳米花，粒径约为 200 nm，具有良好的光热转换能力和对化疗药物 DOX 的搭载能力。CuS 空心纳米花的纵向弛豫率为 0.49 $mM^{-1}s^{-1}$，具有良好的 T1WI 磁共振成像效果。该纳米材料的生物相容性良好，没有明显的细胞毒性和溶血性。体内和体外实验均表明该纳米材料可以使 DOX 化疗和光热治疗发挥协同抗癌作用，其抑瘤率高于单纯的光热治疗或 DOX 化疗。

结论

载 DOX 的 CuS 空心纳米花可以在 T1WI 磁共振成像引导下实现对 HCC 的热化联合治疗。

PU-1391

A GPC1-targeted and GEM-loaded biocompatible nanoplatform for pancreatic cancer multimodal imaging and therapy

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Background: Biomarker-targeted nanocarrier holds promise for early diagnosis and effective therapy of cancer. Materials & Methods: This work successfully designs and evaluates glypican-1(GPC1) targeted, gemcitabine (GEM)-loaded multi-functional gold nanocarrier for near-infrared fluorescence (NIRF)/magnetic resonance (MR) imaging and targeted chemotherapy against pancreatic cancer in vitro and in vivo. Results: Blood biochemical and histological analyses show that the in vivo toxicity of GPC1- GEM-NPs was negligible. Both in vitro and in vivo studies demonstrate that GPC1-GEM-NPs can be used as NIRF/MR contrast agent for pancreatic cancer detection. Treatment of xenografted mice with GPC1-GEM-NPs shows a higher tumor inhibitory effect compares with controls. Conclusion: This novel theranostic nanoplatform provides early diagnostic and effective therapeutic potential for pancreatic cancer.

PU-1392

新型载氧纳米材料在小鼠乳腺癌 MR 诊疗一体化的实验研究

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目的 实体肿瘤的乏氧微环境与细胞增殖过快和血管分布紊乱有关。乏氧环境限制了光动力治疗的效果。设计具有载氧功能的纳米颗粒可以提高肿瘤部位的氧含量，进而提高治疗效果。
方法 本研究设计一种具有 MR 成像功能及载氧性能的纳米颗粒。通过常规理化检测评价纳米颗粒的分散性、稳定性及弛豫性能、载氧性能。通过 MR 检测其体内、体外的成像效果，并引导光动力治疗，进一步评价治疗效果。
结果 纳米颗粒具有良好的分散性、稳定性及 MR 成像性能，并能够在肿瘤部位有效富集，同时兼具载氧功能。疗效评价显示，高效载氧的纳米颗粒具有良好的光动力治疗效果。
结论 本研究设计的载氧纳米颗粒具有载氧性能，并能实现 MR 成像引导的高效肿瘤光动力治疗及多模态评估，提供了一种新型多功能诊疗一体化平台用于肿瘤治疗。

PU-1393

Study of Targeted Delivery Systems Based on Therapeutic MiR-34a for Pancreatic Cancer Cells Suppression and Tracing

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Objective: To investigate the tumor suppressive activities of SPIO@miR-34a-cNGR in vitro and in vivo and monitory targeted delivery functionality via magnetic resonance imaging (MRI). **Methods:** We conjugate cNGRto SPIONs loading with FAM modified miR-34a to develop a novel systemic miRNA delivery platform (SPIO@miR-34a-cNGR) for treatment of pancreatic cancer. The TEM, dynamic light scattering, T2 relaxometry,qRT-PCR, western blot, flow cytometry, laser confocal microscopy, prussianblue staining and MRI were performed to detect the physicochemical property, biological specificity and the capacity for targeted delivery miR-34a to tumor site. **Results:** TEM showed that SPIO@miR-34a-cNGR was about rounded shap, and the diameter was about 12.5 nm. The hydrodynamic diameter by DSL was about (93.3±3.4) nm, zeta potential was +6.5 (mV). The r2 values was 175.35 mM-1s-1. Laser confocal microscopy and Prussian blue staining showed SPIO@miR-34a-cNGR was localized inside the PANC-1 cells and surrounded the nuclei (DAPI). Compared with liposomal transfection, qRT-PCR and western blot experiments demonstrated miR-34a and its target protein expression level was significantly regulated in SPIO@miR-34a-cNGR group. Flow cytometry results showed the relative cell apoptosis ratio in SPIO@miR-34a-cNGR group was higher than the lipo-miR-34a group and SPIO@miR-34a group (4.28% vs 3.48%, 4.86% vs 3.58%, $P< 0.05$). And a much less time-dependent increase in tumor growth was observed after consecutively intravenous injection with SPIO@miR-34a-cNGR than the control saline group. MRI showed that the T2 SNR values of PANC-1 subcutaneous xenograft had a trend of gradual decrease (21.68±0.1087 to 11.08±0.4630,$P< 0.05$). Prussian blue staining of tumor tissues from the sacrificed mice showed that the blue iron particles were identified mainly enriched in tumor tissues, and slightly uptake by liver/spleen. HE staining found cells apoptosis ratio

was significantly increased in tumor tissues after treated by SPIO@miR-34a-cNGR. **Conclusion:** SPIO@miR-34a-cNGR could provide a promising multifunctional platform for microRNAs therapeutics of PDAC.

PU-1394
基于 ESWAN 评估子宫肌瘤高强度聚焦超声治疗前后瘤周肌层的研究

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【摘要】**目的** 探讨增强型 T2*加权血管成像（ESWAN）在子宫肌瘤高强度聚焦超声(HIFU)治疗后对周围正常子宫肌层影响。**方法** 选取 18 例子宫肌瘤患者作为研究对象，所有患者术前及高强度聚焦超声治疗后均行均行磁共振常规序列及 ESWAN 序列检查。记录感兴趣区（ROI）的磁矩值、相位值、R2*值和 T2*值等指标。检验结果采用配对样本 t 检验。通过 ROC 曲线分析，计算曲线下面积(AUC)、灵敏度、特异度、最佳截止点。**结果** 子宫肌瘤患者正常子宫肌层术前及术后正常子宫肌层 ESWAN 磁矩值、相位值、R2*、T2*值 1885.00±352.13、0.02±0.09、22.55±5.47、43.24±7.84；1709.40±313.84、0.01±0.08、23.23±8.07、40.55±23.83。治疗后瘤周肌层磁矩值低于治疗前（*P*=0.046）存在统计学意义。当区分 HIFU 治疗前后肌层组织时，磁矩值、相位值、R2*值和 T2*值的 AUC 分别为 0.648（P= 0.1138）、0.500 (P= 1.0000)、0.664 (P= 0.0794)和 0.583 (P= 0.4012)。**结论** 通过 ESWAN 不同参数评价子宫肌瘤 HIFU 治疗后瘤周肌层存在一定变化，为指导临床治疗提供宝贵的资料。

PU-1395
Peptide regulated self-assembly of indocyanine green nanofibers for localized pancreatic tumor photothermal therapy

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Purpose: Pancreatic tumor is featured as low five-year survival rate. Photothermal therapy (PTT) that relies on efficient light-to-heat conversion of photothermal agents to ablate tumor cells has gained remarkable interest in tumor therapy. We present short peptide (H-His-Phe-OH, HF) modulated indocyanine green (ICG) fibril self-assemblies (HF-ICG NFs) to develop an effective therapeutic modality, using local phototherapy, and to determine the efficacy of the novel interventional photothermal

therapy using an orthotopic xenograft model of human pancreatic cancer. **Methods:** HF-ICG NFs remained their high capability of photothermal conversion and evaluated temperature induced irreversible damage to tumor cells, demonstrating highly efficacy for localized pancreatic tumor photothermal therapy. Mice bearing BxPC3-luc orthotopic xenograft pancreatic tumors were divided into three groups randomly (n=6) with different treatments (HF-ICG NFs group and PBS group) and then treated with laser irradiation. The tumor volume changes were assessed by dual-modal magnetic resonance imaging and bioluminescence imaging. After treatment, all tumor samples were analyzed by immunohistochemical staining for a-SMA to access stroma fibrosis and for ki67 to monitor the proliferation. **Results:** During the PTT, the temperature within the tumors of mice treated with HF-ICG NFs increased rapidly to more than (51.1±1.13)℃ whereas the tumors of mice treated with PBS only reached (35.4±2.29)℃. The evaluated temperature in HF-ICG NFs group showed a complete tumor suppression and consequently, the tumor volumes is only (59.6±21.2)mm^3 within the observation period, while the tumor volumes in PBS group reached to (235.0±27.6)mm^3. After treatment, no significant changes in HF-ICG NFs group mice weight. The harvested organs in this group showed lower ki67 index and expression of a-SMA. **Conclusion:** In this study, we provided a facile method for efficient photothermal nanoagents fabrication, create opportunities for pancreatic tumor photothermal therapy.

PU-1396

Preparation and preliminary molecular imaging of TTR molecular probe for specific diagnosis of liver fibrosis

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Objective:Transthyretin (TTR) is a short half-life protein synthesized mostly by the liver, which can immediately reflect the liver's synthesis ability. Studies have shown that the synthesis of TTR is different in different stages of liver fibrosis.We attempted to prepare a targeted molecular probe [^{18}F] TTR-ASO targeting at TTR mRNA and explore the effectiveness of this molecular probe in the evaluation of liver fibrosis by targeting at TTR mRNA imaging in a rat liver fibrosis animal model.
Methods: The molecular probe was prepared using transmembrane peptide and TTR-antisense oligonucleotide (TTR-ASO).(1)we added fluorescent-labeled TTR-ASO molecular probes into cultivated rat liver cells, observed the entry of the probes into liver cells with a fluorescence microscope and drew the fluorescence curve. The inhibition of TTR mRNA expression of liver cells caused by different doses of molecular probes was detected by western-blotting.(2)The [^{18}F] TTR-ASO molecular probe was prepared by labeling ^{18}F on a TTR-ASO molecular probe using benzaldehyde as a carrier. PET/CT scanning were performed in a liver fibrosis model group and a normal rat after injecting [^{18}F] TTR-ASO molecular probe to collect dynamic and delayed images.(3) The liver tissues of the scanned rats were taken and pathological analysis was done using Hematoxylin-eosin(HE) staining, Masson staining and Sirius red-staining to determine the stages of liver fibrosis. The expression of TTR in liver tissue was analyzed by immunohistochemistry and compared with PET/CT imaging information.

Results: In the cytology experiments, we observed through fluorescence microscope that TTR-ASO molecular probe had successfully entered liver cells in 80 minutes and reached its peak in 12 hours; in the animal experiments, [^{18}F] TTR-ASO molecular probe can be successfully taken in by liver tissue of normal rat and liver fibrosis rat for PET imaging; the SUV_{max} and SUV_{mean} of normal rat (S0) were significantly higher than that of liver fibrosis rat (S4) in 80 minutes after injection of probes ($P < 0.05$); the concentration difference of probes in liver tissue was consistent with the results of cytology and immunohistochemistry.
Conclusion: We successfully prepared [^{18}F]TTR-ASO molecular probe by labeling TTR-ASO.The molecule probe can be uptake by liver tissue and targeted TTR mRNA imaging in the cytoplasm of liver cells. It is hopeful to become a new type of targeted molecular probe to provide a new way for early non-invasive diagnosis of liver fibrosis.

PU-1397

Development and Validation of a Radiomics Nomogram for Prediction of Lymph Node Metastasis in Lesser curvature in CT-T(1-2) Gastric Cancer

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Purpose: Effective evaluation of lymph node metastasis (LNM) is the main basis necessary for the correct selection to select early gastric cancer (GC) treatment plan. The aim of , this study was to develop and validate a radiomics nomogram for prediction of No.3 (lesser curvature) LNM in cT-$T_{(1-2)}$ GC.
Patients and Methods: One hundred fifty nine cT-$T_{(1-2)}$ GC patients who underwent surgery between March 2012 and November 2017 were divided into a primary cohort (n = 80) and a validation cohort (n = 79). Radiomics features were extracted from venous‐phase computed tomography (CT) images of each patient, and a radiomics signature was then constructed with the minimum redundancy maximum relevance (mRMR) algorithm in the primary cohort. Combined with independent risk factors, a radiomics nomogram was built with a multivariate logistic regression model. Nomogram Performance was assessed in the primary cohort and validated in the validation cohort. Finally, Decision curve analysis was performed with the combined primary and validation cohort to estimate the clinical usefulness of the nomogram.
Results: The radiomics signature, consisting of 7 seven lymph node (LN) status-related features, achieved favorable prediction efficacy. The 7 radiomic features, which contained 6 features from primary lesions were selected as image predictors RS1, and 1 features from lymph node as RS2, for LN prediction. The radiomic nomogram, which incorporated the radiomics signature and CT-reported LN status, also showed good calibration and discrimination in the primary cohort (area under the curve (AUC) 0.943; 95% confidence interval (CI), 0.828-0.964) and the validation cohort (AUC 0.885; 95% CI, 0.765-0.928). The decision curve indicated the the nomogram's clinical usefulness.

Encouragingly, the nomogram also showed favorable discriminatory ability in the CT-reported LN-negative (LN0) subgroup (AUC 0.984; 95% CI, 0.8943-0.9847).
Conclusion: The presented Our radiomics nomogram, a non-invasive preoperative prediction tool that incorporating the radiomics signature and CT-reported LN status, shows favorable predictive accuracy for LNM in patients with early GC.

PU-1398

Underlying Pathophysiological Mechanism of ALPPS in Rabbit VX2 Liver Tumors Model: Molecular and function Imaging Finding

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Objectives: Performing systematic analyses of the pathophysiological mechanisms of associating liver partition and portal vein ligation in staged hepatectomy (ALPPS) is essential for clinical successful. In this study, an ALPPS model on rabbits with liver VX2 tumor was established, then assessed the pathophysiological mechanisms by multiplexed positron emission tomography (PET) tracers and dynamic contrast enhanced magnetic resonance imaging (DCE-MRI).
Methods: Two weeks after VX2 tumor implantation, tumor-bearing rabbits were randomly divided into the ALPPS group and the Sham group. Three rabbits were selected from each groups to receive PET/CT scan with ^{18}F-FDG,^{18}F-FCH,^{18}F-FLT and DCE-MRI scan on day 0 , 1 , 3 , 7 and 14 after surgery individually.Then the tumor and FLR samples were received immunohistochemical staining for CD31,a-SMA,ki67 and GLUT1. The FLR functional volume were calculated by PET/CT ($FLRV_{FCH}$).
Results: The actual liver function is assessed by Valid volumetric function (VVF) that is $FLR_{SUVmean}\times FLRV_{FCH}$.The tumor volume in the ALPPS group increased more rapidly on day 14 than the Sham group. The ^{18}F-FDG SUV_{max} of the tumor significantly increased on day 7, which in accordance with the GLUT1 expression. No significant changes in the ^{18}F-FLT SUV_{max} of FLR and tumor were observed in either group, although high Ki67 index were found.The VVF measured by ^{18}F-FCH showed more potential in accurately monitoring the dynamic and functional liver regeneration time window (day 3 to day 7). Quantitation of k^{trans} DCE-MRI detected changes in the vascular hyperpermeable function (tumor and FLR) , and the peaks were both on day 7. **Conclusions:** Molecular and functional imaging are promising noninvasive methods to investigate the underlying pathophysiological mechanisms of ALPPS and to determine the optimal time for the second stage of ALPPS. Based on these results, we conclude that the best time for the second stage operation should between day 3 and day 7.

PU-1399

Lipid Encapsulation of Superparamagnetic Iron Oxide and Quantum Dot Inside For Dual Modal Imaging

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Objective: To explore a novel fluorescence/magnetic dual-modal molecular probe and investigate its physicochemical properties and targeting effect on ovarian carcinoma cells in vitro.
Methods: The RGD targeting dual-modal molecular probe is synthesized in the following steps: long-circulating liposome is prepared by film dispersion method; water-soluble superparamagnetic iron oxide(SPIO) nanoparticles and Quantum dots(QDs) are loaded in the hydrophilic and hydrophobic layer of liposome, respectively; RGD polypeptides are coupled on the former functional liposomes. Transmission electron microscopy(TEM) and particles size analyzer are used to measure sizes and Zeta potential. SPIO and QDs entrapment efficiency is measured through orthopenanthroline spectrophotometric method and sephadex column. Characterization of RGD is investigated by ^{1}H-NMR, FT-IR and elemental analysis. The MRI T_2 relaxation rate of RGD-lipo(QDs)-SPIO is measured through T_2 map scanning on 3.0T MRI system. The stability of the probes in different physiological solutions is investigated. Cytotoxicity of molecular probes is assessed by MTT assay. Prussian blue staining and fluorescence imaging are carried out to determine the targeted ovarian carcinoma cells uptake of nanoparticles.
Results: The targeting fluorescence/magnetic dual-modal probes appeared spherical or para-spherical, with a mean diameter of (132.2±1.2)nm. The entrapment efficiency was up to 80%. RGD polypeptides were successfully coupled on the former functional liposomes with the bind rates of 33.05%. MRI T_2 magnetic relaxation rate is 0.6368×10^{6} $M^{-1}s^{-1}$. The probes feature the high stability in saline, PBS, DMEM and FBS after 3 months' standing. The molecular probe was shown to be low cytotoxicity on human umbilical vein endothelical cell (HUV-EC-C) by MTT study. Prussian blue staining and fluorescence imaging studies showed that the nanoparticles could target $\alpha_v\beta_3$ receptor overexpression ovarian carcinoma cells.
Conclusion: The novel RGD targeting dual-modal molecular probes are excellent physicochemical properties and stability, besides it has high T_2 relaxation rate and strong targeting effect on cancer cells. It has laid a foundation for the dual-modal tomography of tumor.

PU-1400

LP-PEI-SPION 传递系统在肿瘤诊疗中的研究

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目的 制备一种兼具核磁共振成像诊断及基因治疗双功能的基因传递系统（LP-PEI-SPION），探讨其在肿瘤诊疗中的可行性及效果。
方法 应用共沉淀法合成超顺磁性氧化铁纳米粒子（SPION），以硫脲反应将聚乙烯亚胺（PEI）修饰在其表面。利用动态光散射仪、X 射线衍射仪、红外光谱仪对 PEI-SPION 进行表征。应用热重分析仪判断 SPION 表面 PEI 的包裹率，通过振动样品磁强计检测 SPION 和 PEI-SPION 的磁性强弱。采用乙醇注入法合成阳离子脂质体 LP-PEI-SPION，并应用动态光散射仪、Zeta 电位仪及透射电子显微镜对其进行表征。通过琼脂糖凝胶电泳实验，细胞毒性实验及体外转染效率实验，筛选脂质体的

最优处方。选用 pEGFP-N2 为目的基因，在荧光显微镜下观察转染后绿色荧光蛋白的表达情况。应用普鲁士蓝染色实验检测细胞对于纳米粒子的摄取率。体外核磁共振成像实验检测 LP-PEI-SPION 传递系统的核磁共振成像效果。

结果 LP-PEI-SPION/DNA 在电镜下呈均匀类球形，水和粒径为 253.07±0.90 nm，Zeta 电位为 41.31±2.67 mV；MTT 实验表明当 LP-PEI-SPION 与 DNA 的质量比由 6 增加至 14 时，HepG2，SPC-A1 和 A549 的细胞存活率均在 80%以上；体外转染效率实验结果显示当 LP-PEI-SPION 与 DNA 的质量比为 6 时转染效率最高；普鲁士蓝染色实验可见 HepG2 细胞和 SPC-A1 细胞对 LP-PEI-SPION/DNA 的摄取后呈现的蓝染颗粒；三种细胞体外核磁共振成像图像信号均随 LP-PEI-SPION 与 DNA 的质量比增加而降低。

结论 成功制备了 LP-PEI-SPION/DNA，其细胞毒性低，转染效率高，核磁共振成像效果好。为进一步体内实验及临床研究提供依据。

PU-1401
卵泡膜细胞-纤维瘤伴囊变的 MR 影像学分型及其相关因素分析

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目的 卵泡膜细胞-纤维瘤伴囊变是引起误诊的重要原因之一。本研究旨在对囊变位置和形态学进行分型，分析与囊变相关的临床及影像学因素，提高对其非典型表现的认识和诊断。**方法** 回顾经病理证实的 38 例卵泡膜细胞-纤维瘤的 MR 影像特征，测量肿瘤的最大径，分析囊变情况，重点探讨囊变的分型及其 MR 信号特点。并对可能影响肿瘤囊变的临床及影像相关因素进行分析。**结果** 38 例卵泡膜细胞-纤维瘤 MRI 表现为实性肿块 22 例（57.89%），实性伴囊变肿块 12 例（31.58%），囊性肿块 4 例（10.53%），肿瘤最大径为 1.0~21.3cm，均值为（6.65±4.70）cm。实性伴囊变肿块分为瘤外囊变 2 例（16.67%）及瘤内囊变 10 例（83.33%）；其中周围型 4 例（33.33%））、弥漫型 5 例(41.67%)、中央型 1 例（8.33%）。卵泡膜细胞-纤维瘤伴囊变时实性成分 T_1WI 呈等低信号，T_2WI 抑脂序列呈等或稍高信号；囊性成分表现为明显的 T_2WI 高信号；增强后肿瘤实性成分轻度强化（50.0%），囊性成分无强化（42.1%）。统计分析表明肿瘤大小是影响囊变的重要因素（P=0.008），≥6cm 的肿瘤囊变率为 68.8%（11/16），＜6cm 的肿囊变率为 27.3%（6/22）。**结论** 卵泡膜细胞-纤维瘤囊变率为 42.1%（16/38），囊变表现为实性肿块伴囊变和单纯囊性肿块，其中弥漫型囊变最多（41.67%）。肿瘤大小是影响囊变的重要因素之一，直径越大的肿瘤越易囊变。认识囊变的分型，对提高对本病的认识及诊断和鉴别诊断有重要意义。

PU-1402
MPIO 对胃癌细胞示踪及早期淋巴结转移的 micro-MRI 研究

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目的
本研究的目的是评估超顺磁性氧化铁颗粒（micron-sized superparamagnetic iron oxide，MPIO）在体外及体内对人胃癌细胞的示踪作用及在胃癌淋巴结微转移中的价值。
方法

用带有绿色荧光的 MPIO 标记 SGC-7901 胃癌细胞，通过普鲁士蓝染色和流式细胞仪定量分析 MPIO 标记率，从而在多个时间点对细胞 MPIO 摄取率进行体外监测；再将 MPIO 标记的胃癌细胞植入裸鼠皮下，在不同时间点进行 MRI 扫描，观察植入区肿瘤在 T2WI 扫描序列中信号变化情况。

结果

经过 24 小时的培养，与对照组相比，MPIO 在体外对胃癌细胞的标记和吸收效率均达到 90.0%，MPIO 颗粒在 16 天内使用多种观测方法均可持续在胃癌细胞内被检测到，在小鼠体内进行为期数周的 MRI 跟踪扫描时，5 周内均可在所有进行 MRI 扫描的成瘤的裸鼠肿瘤处见到明显的信号减低区，组织学结果也可在肿瘤内发现聚集的 MPIO 颗粒，数量随着时间的增加而递减，而对照侧则无明显信号改变。3 只裸鼠在第 4 周及第 5 周 MRI 扫描时，在同侧淋巴结内发现了点样信号减低，组织学结果证实其淋巴结内存在转移的铁标记的胃癌细胞。

结论

MRI 可对 MPIO 标记的胃癌细胞进行活体示踪检测，对观察胃癌细胞在裸鼠体内的迁徙及代谢过程具有一定帮助，对细胞影像学在检测胃癌淋巴结早期微转移临床应用的探索具有意义。

PU-1403

胰腺纤维化动物模型的分子磁共振诊断

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目的 构建不同胰腺纤维化程度小鼠模型，为纤维化分子 MRI 做准备。探讨含钆 I 型胶原蛋白靶向探针（EP3533）分子 MRI 技术在胰腺纤维化的诊断和分级诊断研究的可行性与应用价值。

方法 选取 42 只雄性 C57BL/6 小鼠，随机分为对照组、轻度胰腺纤维化组、中重度胰腺纤维化组，分别腹腔注射生理盐水（对照组），雨蛙素（50 g/ kg），乙醇（3g / kg，33%）联合雨蛙素，持续注射 6 周，造模结束后三组小鼠各取 4 只，鼠尾静脉注射提前合成的 Cy5.5-EP3533(500 g Cy5.5/ kg)，1 小时后处死小鼠取出胰腺，在小动物活体光学成像系统中进行荧光定量观察。余下三组模型小鼠经尾静脉注射 EP3533(20μmol/ kg)，增强后 5-60min 内的多次采集 T1WI 图像，扫描结束后，处死小鼠取出胰腺进行病理学评估与纤维化分级,验证不同严重程度的胰腺纤维化模型是否建立。比较不同组小鼠间在 EP3533 增强后各时间点的强化程度。两相关样本的比较采用配对样本 t 检验或符号秩检验；重复测量资料采用重复测量的方差分析进行组间比较。采用 SPSS 21 进行统计分析，检验水准α取双侧 0.05。

结果 病理证实轻度胰腺纤维化组、中重度胰腺纤维化组模型均发生胰腺纤维化改变，经病理证实并且后者纤维化分级高于前者。在 EP3533 注射后 30min、40min、60min 时间点胰腺 ROI 中ΔSNR 值显示中重度纤维化>轻度纤维化>对照组，组间效应方差分析结果显示，三个组别的差异有统计学意义（p<0.001）。Cy5.5-EP3533 注射 1 小时后，正常胰腺、轻度纤维化胰腺与中重度纤维化胰腺的荧光强度依次升高。

结论 我们成功建立了两种不同胰腺纤维化程度的小鼠模型，并且发病机制模拟人类酒精性慢性胰腺炎。EP3533 在增强 30min、40min、60min 时的ΔSNR 能帮助鉴别不同纤维化程度的小鼠模型。

PU-1404

双时相 PET/CT 检查技术在膀胱癌诊断中的价值

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目的 探讨双时相 PET/CT 显像技术在膀胱癌及其术后复发中的诊断价值。
方法 回顾性分析临床可疑膀胱癌或术后复发患者 57 例,全部进行 PET/CT 常规及延迟扫描,并对双时相扫描病变 SUV 值进行比较,据双时相病灶 SUV 值摄取程度、延迟前后 SUV 值变化情况、病灶形态变化、是否有淋巴结和远处转移判断是否为恶性肿瘤,诊断以病理和临床随访结果为最终依据。
结果 延迟扫描较常规扫描诊断准确率明显提高,常规扫描准确率 71.9%,延迟扫描准确率 93.0%。常规病变 SUV 与延迟病变 SUV 差异无统计学意义。常规尿液组 SUV 与延迟尿液组 SUV 差异有统计学意义。常规病变 SUV 与常规尿液 SUV 差异有统计学意义。延迟病变 SUV 与延迟尿液 SUV 差异有统计学意义。 结论 时相 PET/CT 检查技术简单易行,对膀胱癌的诊断有较高的应用价值。

PU-1405
定量图谱磁共振成像技术（Magic 技术）在直肠癌及其周围脂肪浸润中的初步临床应用

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目的 探讨定量图谱磁共振成像技术在直肠癌及其周围脂肪浸润中的临床应用价值。
材料与方法 回顾性分析经手术及活检病理证实为直肠癌病例 38 例（年龄 24~78 岁，平均年龄 57 岁）。其中 T1、T2 期患者 12 例，T3、T4 期患者 26 例。所有患者均进行 3.0TMRI 直肠检查，包括 magic 序列（层厚 4mm，TR4500ms，TE100ms，fov384mm）。采用 signa pioneer 工作平台中 magic 技术（100.1.1 版本）测量直肠病灶、正常肠壁、周围脂肪间隙的 T1 值、T2 值、PD 值。使用 Cochran&Cox 近似 t 检验、Wilcoxon 符号秩检验、Mann-Whitney U 检验用于比较直肠癌及周围组织的 T1、T2、PD 值，使用受试者操作特征(ROC)曲线评价诊断效能。P 值＜0.05 视为具有统计学意义。
结果 直肠癌与正常直肠管壁比较，T2 值高（P=0.000462），T1 值和 PD 值未见统计学差异。采用 ROC 曲线分析**结果** T2 值（AUC=0.706；95%CI=0.591~0.822）。T3/4 期直肠癌周围脂肪与 T1/2 期直肠癌周围脂肪比较，T1 值、T2 值和 PD 值均高（P=0.00），采用 ROC 曲线分析**结果** PD 值（AUC=0.808，95%CI=0.685~0.930），T1 值（AUC=0.997，95%CI=0.998~1.000）、T2 值（AUC=0.850；95%CI=0.699~1.000）。25 例 EMVI 患者中， TI 值为 985.68±429.86ms，T2 值为 116.92±16.76ms，PD 值中位数为 90.30，四分位距为 24.40。
结论 magic 序列在直肠癌及其周围脂肪侵犯中具有较高的应用价值。其中 T2 值在直肠癌诊断中具有更高的诊断价值。其中 T1 值在周围脂肪侵犯诊断中具有更高的诊断价值。

PU-1406
CT perfusion imaging in assessing metastatic involvement of perigastric lymph nodes in patients with gastric cancer

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Purpose This study used CT perfusion imaging (CTPI) technology to evaluate the diagnostic efficacy in differentiating metastatic from inflammatory perigastric lymph nodes in patients with gastric cancer.

Methods A total of 115 perigastric lymph nodes of 60 patients with gastric cancer confirmed by gastroscopy underwent CTPI scan before operation. The scan data were postprocessed by using commercial software to calculate perfusion parameters including blood flow (BF) and permeability surface (PS), and to measure the size of lymph nodes. According to the post-operative pathology result used as a golden standard, the perigastric lymph nodes were divided into two groups: metastatic nodes and inflammatory nodes. Perfusion parameters values and the size of lymph nodes between two groups were respectively compared statistically by t test, and a receiver-operating characteristic (ROC) analysis was used to determine the optimal diagnostic cutoff value with sensitivity, specificity and area under the curve (AUC).

Results Examined perigastric lymph nodes were metastatic in 65 and flammatory in 50. Mean values of perfusion parameters in metastatic and inflammatory lymph nodes, respectively, were BF of 90.05 vs. 79.31 ml/100 mg /min ($p < 0.01$), and PS of 42.19 vs. 35.89 ml/100 mg /min ($p < 0.01$). Mean values of the size in metastatic and inflammatory lymph nodes were 1.34 cm vs. 1.16 cm ($p > 0.05$). The sensitivity of 81.5%, specificity of 66.0 % and AUC of 0.784 for BF with cutoff value of 80.76 ml/100 mg /min for differentiating metastatic from inflammatory nodes were higher than those of PS or the size of lymph nodes ($P < 0.05$).

Conclusions BF value might be a more effective marker than PS or the size of lymph nodes for differentiating metastatic from inflammatory nodes in patients with gastric cancer.

PU-1407
基于三元纳米材料硒铋铜同步实现 肝癌放疗增敏和放疗防护

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目的 已有纳米放疗增敏剂可显著增强放射线对肿瘤的治疗，但无法改善放射线对机体造成的毒副作用，同时因其难以降解和代谢，具有潜在长期毒性。本研究将制备一种新型纳米放疗增敏剂，使其不但可以增强对肿瘤组织的放疗增敏效果，还可以利用材料降解后的硒元素增强机体免疫力，显著降低放疗副作用，并降低潜在的毒副作用。

方法 利用硒代半胱氨酸可生物降解利用的特性，以硒代胱氨酸作为硒源，采用温和热解法制备一种联合热疗既可以对肿瘤组织放疗增敏，又可以降低放疗对正常组织毒副作用的可降解硒铋铜纳米放疗增敏剂。基于该纳米颗粒对 X 射线较大的衰减能力和对近红外二区光的吸收，探索 CT 和光声多模态成像指导的肿瘤精准诊疗一体化方案，实现纳米颗粒联合热疗和放疗对肿瘤的增敏治疗，通过检测硒酶、白细胞水平和骨髓 DNA 的含量等，评价放疗的副作用的降低。

结果 通过对该纳米材料体内和体外的生物安全性进行评价，发现其具有良好的生物相容性，没有明显的细胞和动物毒性。硒铋铜中的+1 价铜离子通过类芬顿和 Haber-Weiss 反应可以源源不断的产生单线态氧增加对肿瘤的杀伤效果。利用硒代半胱氨酸参与硒酶合成的特性有效提高机体的抗氧化能力，刺激细胞免疫因子释放增强机体免疫力，进而降低放疗副作用。该纳米材料联合 X 射线和近红外二区光可显著增强放疗效果。当纳米材料降解后，硒可以持续不断的被释放进入血液循环系统。通过对放疗毒副作用指标的分析，发现血液中的超氧化物歧化酶、谷胱甘肽过氧化物酶、细胞因子 IL 2，IL-6，G-CSF 和 TNF-α 、血液中的白细胞数、骨髓 DNA 含量等，相对单独 X 射线照射组都有显著升高，表明该纳米材料可以增强免疫力，降低放疗副作用。

讨论：本研究通过开发一种新型放疗增敏剂，发现了一种新的放疗增敏机制，系统性的从细胞和动物水平上系统评价该纳米颗粒的生物安全性和体内代谢转化过程，为新型纳米放疗增敏剂的开发提供一种新的设计思路。

PU-1408
双磁共振报告基因和 Deltex-1 基因修饰的人间充质干细胞治疗闭合性阴茎损伤的活体磁共振成像研究

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目的 探讨铁蛋白重链亚单位（Fth）和转铁蛋白受体（TfR）双基因磁共振成像报告基因的示踪可行性，为活体内 Deltex-1（DTX1）基因促进人间充质干细胞（hMSC）分化为平滑肌细胞（SMC）治疗闭合性阴茎骨折（CPF）的研究提供可视化依据。
方法 产生多基因共表达的 hMSC，对其表达进行评估，并对其生物学特性进行了测定和比较。评估细胞内铁的吸收，同时检测分化为 SMC 的能力。将 50 只 CPF 模型家兔随机移植 PBS、hMSC、Fth-TfR-hMSC、DTX1-hMSC 和 Fth-TfR-DTX1-hMSC。采用活体 MR 技术检测移植细胞的分布、迁移和 CPF 的愈合过程，并与与组织病理学联系。
结果 该多基因修饰 MSC 的表达水平较高。转基因不能影响 hMSC 的生物学特性。双磁共振报告基因增加了铁的积累能力，DTX1 基因促进 hMSC 向 SMC 分化。磁共振成像可明显检测双报告基因修饰的 hMSC 的分布和迁移，CPF 的愈合状态可通过组织学证实。
结论 双 MRI 报告基因能提供足够的 MRI 对比，并能在体内检测 MSC 的分布和迁移。DTX1 基因可促进 MSC 向 SMC 分化，治疗 CPF，有效抑制肉芽组织形成。

PU-1409
肝脏糖代谢的化学交换饱和转移成像：7.0T MRI 初步研究

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目的 探讨 7.0TMRI 化学交换饱和转移成像技术（chemical exchange saturation transfer,CEST）对肝脏糖代谢试管模型及正常 SD 大鼠禁食前后肝脏糖原 CEST 成像的可行性和相关影响因素。
方法 实验在安捷伦 7.0 T 动物 MR 扫描仪上完成。分别准备不同浓度糖原（10mM、20 mM、40mM、80mM、160mM、320mM）、不同 PH 值（PH 值分别为 6.8、7.0、7.2、7.4）的糖原模型及正常 SD 大鼠。采用 7.0TMRI 对模型用不同预饱和脉冲参数（从 1s 到 5s 的不同持续时间，以及从 1ut 到 6ut 的不同能量）、不同 TR 时间进行 CEST 成像，以得到糖原的 CEST 成像的最佳饱和脉冲参数。并用试管模型的最优参数对正常 SD 大鼠禁食前后进行肝脏糖原 CEST 成像，通过 CEST 效应及 Z 谱进行量化分析。
结果 7.0TMRI 可检测到不同浓度糖原之间信号（0.5-1.5ppm）有差异，信号强度随着浓度增加而增强。6 种不同浓度糖原模型的差谱峰值随浓度增高而增高。糖原的最佳 CEST 成像饱和脉冲持续时间是 4s，饱和脉冲能量 B1 为 3.0ut。不同 PH 值环境 CEST 效应也有差异，随着 PH 值降低，糖原

CEST 效应降低。浓度为 80mmol/L 的糖原模型在 PH 为 7.4 时，MTRasym 为 19.63%，而 PH 降低到 6.8 时 MTRasym 仅为 2.02%。7.0TMRI 可以进行正常 SD 大鼠的肝脏糖原 CEST 成像。正常进食的 SD 大鼠肝脏糖原 CEST 效应（MTRasym 为 9.07%）高于禁食 12h 后的 SD 大鼠（MTRasym 为 2.69%）。
结论 7.0 T MRI 进行 CEST 成像评价糖原代谢是可行的，且其 CEST 效应受糖原浓度、代谢环境 PH 值、预饱和能量和持续时间等因素影响。SD 大鼠肝脏的糖原 CEST 成像也是可行的，我们有望获得 SD 大鼠在体的肝糖原浓度分布结构图。

PU-1410

肝脏少见原发性恶性血管肿瘤的 CT 表现

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目的 探讨肝脏少见原发性恶性血管肿瘤的 CT 表现特点。
方法 对经病理证实的 20 例肝脏少见原发性恶性血管肿瘤的 CT 表现进行回顾性分析，并结合文献分析其 CT 表现特点。
结果 血管肉瘤 8 例，CT 平扫表现为肝内低密度影，可有出血、坏死及囊变，增强后强化区域呈由外向内的“向心状”和（或）由内向外的“离心状”扩大，可完全充填，部分病灶见“假包膜征”。上皮样血管内皮瘤 10 例，CT 平扫表现多发实性结节状低密度影，肝外周分布密集，典型特征为“包膜收缩征”、“晕征”及“棒棒糖征”。增强后分为“快进慢出型”（直径≤3cm）和“慢进慢出型”（直径＞3cm）向心式强化。恶性血管外皮瘤 2 例，CT 平扫为单发实性或囊实性肿块状低密度影，密度不均，可见包膜，动脉期边缘明显不均匀强化，门脉期持续强化，延迟期呈等密度。
结论 CT 三期增强扫描的不同强化特征对鉴别肝脏肿瘤的起源及病理类型具有一定的价值，结合临床资料和影像表现可提高诊断准确率,确诊仍需病理学检查。

PU-1411

18F-FDG PET/CT 在前列腺癌诊断中的应用价值

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目的 初步探讨 18F-FDG PET/CT 在前列腺癌鉴别诊断、远处转移、临床评价等方面的应用价值。
方法 回顾性分析 32 例显示放射性浓聚灶的前列腺疾病患者的 18F-FDGPET/CT 显像资料，将所得结果与病理或临床随访结论比较。
结果 经手术或穿刺活检病理证实为前列腺癌 29 例（29/32），前列腺增生 3 例（3/32）。
结论 18F-FDG PET/CT 对于前列腺癌的鉴别诊断、远处转移、临床评价等方面具有重要价值和意义。

PU-1412

肝样腺癌的 CT 表现与临床病理特征研究

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目的 分析胃肝样腺癌的 CT 影像表现，提高对胃肝样腺癌的诊断准确率。
方法 回顾性分析 14 例经病理组织学证实的肝样腺癌患者，进行 CT 扫描（10 例男性和 4 例女性；年龄 36-72 岁，平均年龄 57.9 岁），分析病灶发生部位、形态、强化特征、邻近器官侵犯范围、淋巴结肿大及远处转移、静脉癌栓形成。
结果 肿瘤形态表现为局限溃疡（n = 6）、浸润溃疡（n = 5）、肿块（n =3）；肿瘤侵犯浆膜下层结缔组织 4 例，10 例侵犯浆膜外脂肪间隙；所有肿瘤增强扫描均表现持续强化；5 例邻近器官受侵：肝脏（n =3）（其中 2 例合并胰腺受侵）、胰腺（n =1）和食管（n = 1）；11 例胃周区域淋巴结转移，其中 2 例转移淋巴结短轴小于 0.8cm；9 例远处转移（肝脏，n =8；非胃周区域淋巴结，n = 1）。3 例静脉癌栓形成（门静脉，n=2（一例同时合并脾静脉、肠系膜上静脉癌栓）；胃网膜右静脉，n=1）。**结论** CT 扫描显示胃肝样腺癌多表现溃疡形成，侵犯浆膜外脂肪间隙，增强扫描持续强化，易发生淋巴结、肝脏转移及门静脉癌栓。

PU-1413
不同前置 ASiR-V 的选择在肝门静脉 CTPV 能谱扫描中成像效果的研究

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目的 不同前置 ASiR-V 的选择在肝门静脉能谱扫描成像中效果研究。
方法 用 GE Resolution CT 能谱成像上腹部模式行三期扫描（BIM<30），临床疑附壁血栓 11 例，每组选择前置 ASiR-V0%~100%范围，间距为 10%的 A1~A11 组数据，对 11 组图像行同层面肝门静脉 CT 值和 SD 值及背景噪声（BN）计算并比较各组图像的 SNR、CNR 及 PDFI，对图像行主观评价、评分（标准：①门静脉强化明显，信噪比高，VR 重建好，利于诊断，3 分；②门静脉强化一般，信噪较好，VR 重建一般，不影响诊断，2 分；③门静脉强化差，噪声大，VR 重建失真，不利诊断，1 分）。扫描条件：探测器宽度 80mm，管电压 70Kvp，管电流自动毫安（范围 150～450mAs），噪声指数 NI 为 18，螺距 0.992mm，FOV（45cm×45cm），自动触发扫描，扫描层厚 5mm，重建层厚 1.25mm，重建层间距 1.25mm。采用组内相关系数检验（ICC）进行统计学分析。
结果 取 A1～A11 共 11 组数据，对各组肝门静脉分析，其中 8 例 ASiR-V 为 30%-50%时显示附壁血栓效果好，ASiR-V 为 70%时 1 例失败，ASiR-V 为 80、100%时 2 例不符合临床诊断，CNR 为 68~75Kvp，其敏感性及特异性分别为为 86.5%、87.0%，约登指数 0.820。11 组测量肝门静脉的强化度值范围为 72%～85%、信噪比均值范围为 78%～85%，CT 值均值范围约为 250～320HU，经 ICC 检验，ASiR-V 对不同百分比条件下肝门静脉的强化度、CT 值及信噪比等评估指标具有高度一致性，ICC 值分别为 0.972、0.953、0.932（P 均＜0.05），具统计学意义，剂量（PDFI）随 ASiR-V 增加而逐渐降低。
结论 日常能谱 CT 扫描中，合理运用不同前置 ASiR-V 的选择会对肝门静脉附壁血栓的 VR 显示效果极佳，利于临床术中引导。

PU-1414

Dynamic evaluation of endothelial progenitor cells transplantation for treatment of hepatic ischemia-reperfusion injury in rats by DCE-MRI

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OBJECTIVE: To evaluate the efficacy of endothelial progenitor cells in the treatment of hepatic ischemia-reperfusion injury in rats by quantitative parameters obtained by dynamic enhanced nuclear magnetic resonance (DCE-MRI).
METHODS: Rat model of hepatic ischemia-reperfusion was established and divided into two groups (n=48). In the experimental group, 0.2 ml (1.0×106/ml) of the primary cultured endothelial progenitor cells (EPCs)[1] were injected into the portal vein, and the control group was injected with the same amount of PBS. At 6 hours and 1, 3, and 7 days postoperatively, routine MRI and DCE-MRI scans[2, 3] were performed. After the MRI scan, serum biochemical index of the rats was measured by collecting eyelid blood sampling. HE staining and tunnel staining were performed on the lesioned liver tissue to observe and score the pathological damage of liver tissue. Correlation analysis was performed between the pathological immunohistochemical staining results and the DCE quantitative parameters obtained by post-processing software analysis.
RESULTS: In T2WI, liver ischemia-reperfusion rats showed no significant difference in liver signals between the experimental group and the control group. In the DCE-MRI images, the Ktrans values at 6 hours and 1, 3, and 7 days of the experimental group were 0.44±0.14, 1.02±0.15, 0.56±0.18, and 0.22±0.10, respectively, While the control group were 0.50. ±0.16, 1.12±0.30, 0.76±0.29, 0.33±0.12; the Ktrans values of the experimental group were lower than the control group at each time point (P<0.01).The Suzuki scores in HE staining tissues showed that the experimental group was lower than the control group at each time point (P<0.01). Serum biochemical analysis showed that ALT and ALP were lower in the experimental group than in the control group either (P<0.01). Correlation between pathological examination and DCE-MRI parameters showed that there was a positive correlation between Ktrans value with pathological HE staining Suzuki score and Tunnel index (P <0.05).
CONCLUSION: Transplantation of endothelial progenitor cells can improve liver ischemia-reperfusion injury. The DCE-MRI and Ktrans values can accurately reflect the degree of hepatic ischemia-reperfusion tissue necrosis, and play an important role in the evaluation of liver tissue damage and treatment prognosis.

PU-1415

原发性肾上腺淋巴瘤的 CT 及 MRI 特征分析

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[摘要]目的　分析原发性肾上腺淋巴瘤（PAL）的 CT 和 MRI 表现，提高对本病的认识和诊断水平。方法　回顾性分析 10 例经病理证实的 PAL 的 CT/MRI 表现，观察肿瘤大小、形态、边界、密度/信号及强化特征。结果　10 例患者中，9 例为弥漫性大 B 细胞淋巴瘤，1 例为 NK/T 细胞淋巴

瘤。双侧 3 例，单侧 7 例（左侧 5 例、右侧 2 例），共 13 个病灶，肿瘤最大径约 5.7～9.8（8.2±1.1）cm，9 个表现为椭圆形或类圆形肿块，2 个为类三角形，2 个为不规则形；边界清晰 10 个，边界不清 3 个；2 例体积较大者累及同侧肾脏和血管；5 例伴腹膜后淋巴结肿大。所有病灶 CT、MRI 动态增强呈轻中度渐进性强化。结论　原发性肾上腺淋巴瘤具有一定影像学特征，据此可提示诊断。

PU-1416

超高 b 值扩散峰度成像评估前列腺癌肿瘤组织侵袭性

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目的　采用超高 b 值扩散峰度成像（Diffusion Kurtosis Imaging，DKI）评估低、高级别前列腺癌（Prostate Cancer, PCa）肿瘤组织的侵袭性。
材料与方法　回顾性分析，经前列腺根治术后病理证实为 PCa 患者的术前 7 个 b 值（(0, 400, 800, 1200, 2000, 3000 及 4000 s/mm^2) DWI 图像。采用西门子 Prisma 3T MRI，18 通道体部线圈。感兴趣区(Region of Interest，ROI)选取外周带（Peripheral Zone, PZ）或移行带(Transitional Zone, TZ)侵袭性最强的癌灶，于 ADC 上手动勾画出整个肿瘤体积。计算 DKI 扩散系数（D_{7b}）及峰度系数（K）。采用独立样本 t 检验比较两组间（低级别组，Gleason=3+3,3+4；高级别组，Gleason≥4+3）差异。采用受试者工作特征(Receiver Operating Characteristic，ROC)曲线比较 D、K 及 $DKI_{(D+K)}$值预测 PCa 侵袭性的诊断效能。
结果　低级别组 PCa 8 例，高级别组 PCa 15 例。高级别癌灶的 D 值显著低于低级别组（0.832±0.13 vs 1.171±0.36, p=0.003），K 值显著高于低级别组（0.854±0.15 vs 0.718±0.12, p=0.001）。D 及 K 值诊断高、低级别 PCa 的灵敏度分别为 75.0%、80.0%，特异度分别为 74.33%、55.0%，ROC 曲线下面积分别为 0.767 及 0.792。$DKI_{(D+K)}$诊断高、低级别 PCa 的灵敏度为 86.7%，特异度为 61.5%，ROC 曲线下面积为 0.817。
结论　非高斯分布模型 DKI 的拟合需要较高 b 值，当 b 值最高达到 4000s/mm^{2}时， D 及 K 值可用于预测不同级别前列腺癌。K 值可提高 DKI 模型对 PCa 侵袭性评估的灵敏度及综合诊断效能，D 值的特异度最高。

PU-1417

恶性神经鞘瘤的影像学表现分析

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目的　探讨分析恶性神经鞘瘤（Malignant Neurinoma, MN）的影像学表现特点，为以提高对该病的认识，为临床诊断、治疗提供依据。**资料与方法**　回顾性分析 5 例 经病理证实的 MN 患者的 CT 及 MRI 影像学资料，分别从病灶大小、形态、密度、边缘、境界及强化方式这 5 个方面进行分析。**结果**　5 例 MN 中，分别位于椎管内、胃、大腿、降结肠及左肺门。除降结肠病灶外，病变最大径均大于 5CM，形态均呈不规则，边缘均欠光整，除发生于结肠的病灶外，其余病灶的境界均较为清晰；发生于胃的病灶密度欠均匀，呈囊实性，并以囊性为主，其他部分的病灶为等或稍低密度；发生于椎管内及股骨的病灶均伴有溶骨性骨质破坏区，骨质破坏区内见残存的骨质；胃部及降结肠病变行增强检查，增强后前者可见包膜强化，囊性区未见明显强化，后者呈持续性轻中度强化。**结论** MN 多表现为体积较大、形态不规则、边缘欠光整的软组织肿块，可发生坏死囊变，发生骨或骨周

围的可伴有溶骨性骨质破坏，CT 及 MRI 能够为我们对病变的特征、与周围结构的邻近关系及鉴别诊断提供有价值的信息，但是最终确诊需要依靠病理。

PU-1418

Evaluating the Correlation of the Impairment between Skeletal Muscle and Heart using Cardiovascular MRI in a Spontaneous Type 2 Diabetes Mellitus Rhesus Monkey Model

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Purpose: To investigate the correlation of impairment in skeletal muscle and heart in spontaneous type 2 diabetes mellitus (T2DM) rhesus monkeys using cardiovascular magnetic resonance image (MRI).
Materials and Methods: Fifteen T2DM monkeys and fourteen healthy control (HC) monkeys were included. The microcirculation of skeletal muscle (skeletal muscle blood flow [SMBF], skeletal muscle oxygen extraction fraction [SMOEF]) and the function and strain of heart were evaluated by MRI. Three regions of interests were chosen on the soleus muscle (SOL), gastrocnemius muscle (GAS) and tibialis anterior muscle (TA) for image analysis.
Results: Seven T2DM monkeys and seven HC monkeys were obtained the full data. The SMBF reserves and SMOEF reserves were found significant decreased in T2DM during inflation in SOL, GAS and TA muscles (all $p < 0.05$), and the SMBF reserves decreased during hyperemia in GAS and TA muscles (all $p < 0.05$). In these monkeys, the global peak longitudinal strain (longitudinal PS), peak systolic longitudinal strain rate (longitudinal PSSR) and peak diastolic longitudinal strain rate (longitudinal PDSR) were seen significant difference in T2DM compared to HC monkeys (all $p < 0.05$). The longitudinal PSSR were found negative correlated with SMBF reserves in SOL, GAS and TA during inflation in all monkeys.
Conclusions: A negative correlation existed between the longitudinal PSSR and the SMBF reserves in the T2DM monkeys accompanied with the impaired microcirculation of skeletal muscle and the myocardial deformation.

PU-1419

Rheumatoid Arthritis Involving the Tibialis Posterior Tendon: A Study on the Early Diagnostic Value of Power Doppler Ultrasonography and a Comparison with Surgery

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OBJECTIVE: To explore the value of power Doppler ultrasonography (PDUS) for the early diagnosis of tibialis posterior tendon (TPT) injury induced by rheumatoid arthritis (RA).
METHODS: Forty-eight patients (60 feet) with RA tendinopathy were selected as the RA tendinopathy group; 12 patients (20 feet) with non-RA tendinopathy were included in the non-RA tendinopathy group; and 10 healthy volunteers (20 feet) were selected as the control group. The blood flow signals in pannus in all the subjects were observed with PDUS to determine whether the tendon was injured and to assess the degree of injury. The detection of pannus in the tendon was considered a tendon injury. The degree of injury was determined by grading blood flow signals. In the present study, the following indexes were compared and analyzed with statistical methods: ① positive rate for a blood flow signal; ② grade of the blood flow signal; and ③ spatial distribution of the blood flow signal (diffuse or local).
RESULTS: Positive blood flow signals were detected only in the RA tendinopathy group and the non-RA tendinopathy group; the positive rates were 88.34% (53/60) and 40% (8/20), respectively. For healthy volunteers, the positive rate for a blood flow signal was 0% (0/20), indicating that there was no blood flow signal detected in the tendon (the grade of the blood flow signal was zero). There were significant differences in the positive rates for blood flow signals between the RA tendinopathy group and the non-RA tendinopathy group ($P<0.01$).The positive rate for a grade III blood flow signal in the RA tendinopathy group was 20% (12/60), while this was not observed in the non-RA tendinopathy group. The positive rates for a grade II blood flow signal in the RA and non-RA tendinopathy groups were 36.67% (22/60) and 10% (2/20), respectively. The positive rates for a grade I blood flow signal in the RA and non-RA tendinopathy groups were 31.67% (19/60) and 30% (6/20), respectively. There were significant differences in the grades of blood flow signals between the RA and non-RA tendinopathy groups ($P<0.01$). The spatial distribution of the blood flow signal in the RA tendinopathy group was significantly different from that in the non-RA tendinopathy group. In the RA tendinopathy group, blood flow signals were detected throughout the whole tendon from its origin to its scaphoid attachment. However, blood flow signals were mainly distributed around the scaphoid attachment in the non-RA tendinopathy group, encompassing a 14 mm zone, beginning 40 mm proximal to the scaphoid insertion of the tendon. In this study, three patients with grade III blood flow signals detected on preoperative PDUS were treated with surgery. The synovial sheath of the tibial tendon was remarkably thickened and surrounded by abundant neovascularization (pannus) in all three patients. The intraoperative findings were consistent with the preoperative ultrasound results, indicating that PDUS can detect the formation of microvasculature within the tendon.
CONCLUSIONS: PDUS can detect neovascular formation in tenosynovitis, which is valuable for the early diagnosis of tendon injury and determination of RA versus non-RA types of tendinopathy, which result from degeneration and strain. Power Doppler technology can detect early tendon injury before the appearance of foot deformities induced by RA, which can guide early clinical intervention to prevent the occurrence of deformities and other serious consequences.

PU-1420

非接触性急性前交叉韧带撕裂骨挫伤分布特点及与其他伴随损伤的相关性分析

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目的　探讨非接触性急性前交叉韧带（ACL）撕裂者的骨挫伤分布特点，并分析骨挫伤与内外侧半月板(MM、LM)、内外侧副韧带（MCL、LCL）及关节软骨损伤相关性。 方法　回顾性分析 201 经临床证实为非接触性 ACL 撕裂患者的 MRI 资料。201 例病例均行常规 MRI 矢状位、冠状位和横断位 T2WI、脂肪抑制 FSE 双回波序列扫描。结果　在 201 例病例中，发现骨挫伤 172 例（85.6%），其中单纯内侧间室骨挫伤 6 例（3%），单纯外侧间室骨挫伤 50 例（24.9%），联合间室均骨挫伤 116 例（57.7%），29 例未见骨挫伤（14.4%）。无骨挫伤组、单纯外侧间室骨挫伤组、联合间室骨挫伤组间伴发 LM 损伤发生率、MCL 损伤发生率和关节软骨发生率逐步提升（20.7%44%53.4%，P=0.006；10.3%24%37.9%，P=0.008；012%23.3%，P=0.006）。联合间室骨挫伤者和单纯外侧间室骨挫伤者伴发 LM 损伤发生率较无骨挫伤者均有明显差异（P=0.002，0.037），联合间室骨挫伤组和单纯外侧间室骨挫伤组间无明显差异（P=0.264）；与无骨挫伤者相比，联合间室骨挫伤者伴发 MCL 损伤和关节软骨损伤发生率间有明显差异（P=0.005，0.004），单纯外侧间室骨挫伤和无骨挫伤者、联合间室骨挫伤者间无明显差异（P 值均大于 0.05）。结论　非接触性急性 ACL 撕裂后骨挫伤常见，联合间室骨挫伤最常见，其次为单纯外侧间室，而单纯内侧间室骨挫伤罕见。骨挫伤部位分布与伴发 LM 损伤、MCL 损伤及关节软骨损伤具有一定的相关性，随着骨挫伤范围的扩大，LM、MCL 和关节软骨损伤的发生率趋向于逐步增高。联合间室骨挫伤者和单纯外侧间室骨挫伤者较无骨挫伤者更易于伴发 LM 损伤，联合间室骨挫伤者较无骨挫伤者更易于伴发 MCL 损伤和关节软骨损伤。

PU-1421

生育与未生育女性髂尾肌形态及功能的 MRI 初步研究

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目的　通过自然及增加腹压状态 MRI 分析比较生育与未生育女性髂尾肌形态及功能，探讨妊娠和自然分娩对髂尾肌有无明显损伤。
方法　对 67 名女性自愿者进行自然及增加腹压状态 MR 成像，测量髂尾肌厚度和角度，采用独立样本 t 检验比较各组间两种状态髂尾肌厚度及角度的差异。
结果　自然状态生育组矢状位右侧髂尾肌角和左右平均髂尾肌角明显大于未生育组，p=0.007、0.003；两组髂尾肌厚度、冠位左右髂尾肌角及矢位左侧髂尾肌角均无明显差异。自然分娩组矢位左右平均髂尾肌角明显大于剖宫产组，p=0.042。增加腹压状态生育组矢位左右髂尾肌角及左右平均矢位髂尾肌角明显大于未生育组，p=0.014、0.000 和 0.000，两组冠位髂尾肌角均无明显差异。自然分娩组与剖宫产组增加腹压状态下冠、矢位髂尾肌角均无明显差异。
结论:妊娠对髂尾肌后下部功能有明显的损伤，自然分娩对髂尾肌后下部可能也有轻微的损伤，而对髂尾肌的功能无明显影响。

PU-1422

18F-FDG PET/CT 在朗格汉斯细胞组织细胞增生症中的应用价值

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目的 总结朗格汉斯细胞组织细胞增生症（LCH）患者的临床特点及影像学表现，探讨 *^{18}F-FDG PET/CT* 在该病中的应用价值。
方法 回顾性分析 2013 年 8 月至 2019 年 7 月在我院行 PET/CT 检查的经病理证实的 LCH 患者的临床资料及影像学资料。
结果 共纳入 14 名患者，其中男 9 例，女 5 例，年龄 43.07±11.72 岁，主要临床表现包括骨痛、尿崩、咳嗽、乏力、局部肿块等。*^{18}F-FDG PET/CT* 影像学表现：9 例患者出现糖代谢增高的溶骨性骨质破坏，5 例单发，4 例多发，病灶共计 47 个，主要分布于颅骨、髂骨、椎体及附件等，FDG 摄取不同程度增高，SUVmax 为 7.77±3.97，MTV 为 2.76±3.21，TLG 为 13.99±18.81；2 例患者出现垂体柄增粗伴 FDG 摄取，SUVmax 为 24.36±28.81，MTV 为 0.79±0.38，TLG 为 15.27±20.03，纳入患者中 4 例出现口干、多饮、多尿症状，敏感性约为 50%；4 例患者出现肺部结节及囊状透亮影，FDG 轻度摄取，SUVmax 均小于 2.13；6 例患者出现多处肿大淋巴结伴 FDG 摄取，病灶共计 65 个，主要分布于纵隔、腋窝、腹股沟及盆壁，SUVmax 为 4.14±2.64，MTV 为 1.47±1.13，TLG 为 3.77±3.55；另见 1 例肝内多发结节患者，1 例甲状腺肿块患者，FDG 均明显摄取。其中 2 例患者治疗后进行 *^{18}F-FDG PET/CT* 复查，1 例患者表现为溶骨性骨质破坏灶密度增高，1 例表现为肿大淋巴结缩小，2 例患者 FDG 摄取均降低。
结论 *^{18}F-FDG PET/CT* 可系统性的评估 LCH 的骨病变、淋巴结病变、肺结节及囊变等特点，对于累及垂体的患者，建议结合垂体动态增强磁共振进行综合评价，因此 *^{18}F-FDG PET/CT* 对于 LCH 的诊断、活检定位、治疗效果等评估均有重要的临床价值。

PU-1423

Merging metal organic framework with hollow organosilica nanoparticles as a versatile nanoplatform for cancer theranostics

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With great potential in nanomedicine, the integration of a metal organic framework (MOF) with a
nanocarrier for smart and versatile cancer theranostics still seeks to expand. In this study, MOF was successfully merged with hollow mesoporous organosilica nanoparticles (HMONs) with a polydopamine(PDA) interlayer to form molecularly organic/inorganic hybridized nanocomposites (HMONs-PMOF).The well-defined nanostructure and favorable biocompatibility of HMONs-PMOF were demonstrated first. Doxorubicin hydrochloride (DOX) and indocyanine green (ICG) were separately loaded into the interior cavity of

HMONs and the outer porous shell of MOF with high loading efficacy, respectively. The obtained dual drug-loaded nanocomposites (DI@HMONs-PMOF) displayed favorable photothermal properties and pH/NIR-triggered DOX release manner. Furthermore, in vitro cell experiments validated that HMONs-PMOF can efficiently deliver DOX into cancer cells. Upon entry into cancer cells, the photothermal effect of DI@HMONs-PMOF can induce the lysosome rupture, thereby facilitating the “lysosome escape” process and accelerating the DOX diffusion in the cytoplasm. Benefiting from the iron ion coordinated on PDA and ICG confined in MOF, magnetic resonance (MR) and photoacoustic (PA) dualmodality imaging were performed to verify the effective accumulation of DI@HMONs-PMOF at the tumor site. Interestingly, the results also suggested that the existence of ICG can cooperatively enhance the MR imaging capability of prepared nanocomposites. In addition, the significantly improved synergistic therapeutic efficacy was confirmed both in vitro and in vivo. Thus, our results indicated that the merged nanostructure of HMONs and MOF is promising for versatile cancer theranostics.

PU-1424
基于增强分子聚集态分子运动提高光声成像和光热治疗效果

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目的 肿瘤光热治疗具有微创、毒副作用小等优点，近年来发展迅速。相较于无机材料的光热治疗剂，有机纳米材料具有更理想的生物相容性和生物降解性，因此受到广泛关注[1]。如何提高有机材料的光热转化效率是现在研究的热点。我们将分子内扭曲电荷转移（TICT）性质与聚集诱导发光（AIE）逆过程进行有机结合，将分子转子和支化长烷基链引入染料分子主干中，从而增强染料分子在聚集态时分子运动，提高 TICT 性质，增强非辐射跃迁，从而有更多的能量用于产热。
方法 苯并双噻二唑为强电子受体，噻吩为电子给体，三苯胺既作为电子给体又作为分子转子，支化长烷基链位于噻吩单元上，从而制备出带有不同长度烷基链的染料分子。通过吸收/发射光谱、聚集态发射、相对量子效率、光热转化效率等表征，研究染料分子的光物理及光热性质。利用了一种 pH 响应聚合物（PAE-b-PEG）包裹染料制成 pH 响应纳米粒子，从而增强染料分子在肿瘤部位的富集[2]。之后在体内外研究纳米粒子的光声成像效果。并且利用纳米粒子对荷瘤小鼠进行光声指导的光热治疗。
结果 相对于直链分子 NIR6、短支链分子 NIRb6 和 NIRb10、以及金纳米棒（GNR），长支链分子 NIRb14 具有更好的光热转化性能。这是因为在聚集态下，烷基链的支化作用可以有效减弱分子间强相互作用，给分子内旋转提供空间，因而有利于 TICT 态的形成，从而增强了非辐射跃迁和光热转化效率。体外光声结果表明，NIRb14 纳米粒子具有最强的光声信号。在 PAE 材料的作用下，纳米粒子在小鼠肿瘤部位聚集明显增强，且在体内循环时间增长。光热治疗结果显示，相对于对照组（生理盐水及 PEG 包裹纳米颗粒），NIRb14-PAE/PEG 纳米粒子在肿瘤部位产生更高的温度，对肿瘤生长有明显的抑制作用。
结论 我们提出一种通过调控 TICT 性质增强光热性能的新方法，进而提高有机染料对小鼠体内肿瘤的光声成像和光热治疗效果。

PU-1425

用于实时检测β-葡萄糖醛酸苷酶活性的近红外荧光探针

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目的 开发检测人体代谢酶活性的荧光探针对评估机体处置药物能力、实现临床个性化用药、疾病的早期诊断和及时干预治疗意义重大。β-葡萄糖醛酸苷酶（β-Glucuronidase，GLU）是溶酶体酶家族的一员，广泛表达于多种肿瘤组织，参与转移、侵袭等过程，并与肿瘤细胞的增殖和凋亡密切相关，是重要的肿瘤标志物[1]。快速定量检测 GLU 活性以及实时可视化分析 GLU 的分布对肿瘤的早期诊断、肿瘤组织轮廓的确认具有重要意义。
方法 将 GLU 特异性识别基团葡萄糖醛酸与具有近红外发射的荧光团 DCM 相结合，从而制备出基于 GLU 特异性葡萄糖醛酸苷键水解反应、可用于 GLU 体内成像的近红外荧光探针[2]。通过检测探针与不同浓度 GLU 反应前后的吸收/发射光谱，研究荧光探针在 GLU 作用下光学性质变化。同时检测了探针和其他酶反应后光学性质是否发生变化，从而确定探针的特异性。通过细胞毒性试验，研究探针的细胞相容性。之后在体外检测荧光探针对人肝癌细胞 HepG2 中 GLU 的成像效果，并进一步对肝癌荷瘤小鼠体内的 GLU 活性进行实时生物成像。
结果 荧光探针在 GLU 作用下，吸收光谱发生红移。以新的最大吸收峰的波长作为激发波长，发现近红外荧光明显增强。同时，该探针还表现出超高的灵敏性和选择性，可区分人体内多种具有类似水解功能的同功酶。体外细胞实验结果显示，该探针具有很好的细胞膜透过性，能够对细胞内的 GLU 进行荧光成像，并且没有细胞毒性。此外，该探针还成功对荷瘤小鼠体内的 GLU 的活性进行实时、可视化监测。
结论 我们制备出一种新型的用于实时检测体内外β-葡萄糖醛酸苷酶活性的点亮型近红外荧光探针。它具有高灵敏度和特异性，以及很好的生物相容性，可作为检测体内 GLU 活性的有力工具，为肝癌的诊断提供依据，并可作为近红外的 GLU 的工具分子应用于影像导航下的肿瘤切除术。

PU-1426
肾静态皮质显像对小儿泌尿系感染诊断价值评估

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目的 探讨 $^{99}Tc^{m}$二疏基丁二酸（DMSA）肾皮质显像在小儿尿路感染的影像表现，对其在临床诊疗中应用价值进行评估。**方法** 收集我院 2018 年 1 月至 12 月期间临床诊断上尿路感染 390 例患儿病史资料，其中男 232 例，女 158 例，年龄 1 月至 12 岁，≤2 岁 312 例（80%）。检查设备采用 GE Discover NM SPECT/CT 670 Pro 机，所有患儿均行肾皮质显像 DMSA 检查，常规方法采集，应用 Xeleris3.1 TM 功能成像系统后处理重建图像，分别计算分肾功能、计算病灶与正常摄取区比值并进行统计学分析。**结果** 390 例患儿中 67 例显像正常，诊断为下尿路感染；149 例 DMSA 显像异常诊断为上尿路感染，其中急性肾盂肾炎 261 例， VUR 导致共 101 例（左 50 例，右 27 例，双侧 24 例）；先天性肾发育畸形 55 例；肾瘢痕 30 例。下尿路感染分肾功能为 45.5%～54.5%。上尿路感染单肾受累者，分肾功能均低于 45%（7.3%～44%）。肾皮质功能受损区与正常皮质摄取区比值约为 0.2-0.70。Mann-Whitney U 轶和检验结果两组差异有统计学意义（$p < 0.05$）。**结论** 肾皮质显像能够鉴别尿路感染及其病因分析，对肾脏实质损害程度进行相对定量评估，准确诊断肾瘢痕，为诊断急性肾盂肾炎及肾瘢痕的“金标准”，有助于临床尽早明确诊断，选择正确治疗方法及有效预防远期肾损害的早期干预，提高患儿长期生存质量。

PU-1427
磁靶向介导骨髓间充质干细胞治疗大鼠肾脏缺血再灌注损伤的实验研究

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目的:
评估骨髓间充质质干细胞（BMSCs）对肾缺血再灌注损伤（RIRI）的影响，并动态监测体内移植的 BMSCs 的归巢、存活，以早期预测其在大鼠模型中的治疗效果。
方法
通过夹闭左肾动脉 45 分钟制备大鼠 RIRI 模型。在肾动脉夹闭后一周，将 2×10^6 个超顺磁性氧化铁（SPIO）标记的 BMSC 注射到肾动脉中。然后，在细胞移植后的第 1,7,14 和 21 天进行肾脏的 MR 成像。在移植后的第 21 天，评估大鼠血清肌酸酐（Scr）和尿素氮（BUN）水平，同时进行 HE 染色和 TUNEL 测定。
结果 SPIO-BMSC 组体重增长率显着高于 PBS 组（P <0.05），Scr 和 BUN 水平也显着低于 PBS 组（P <0.05）。 HE 染色显示 SPIO-BMSC 组肾小管上皮细胞的变性程度和空泡样变性明显优于 PBS 组。 TUNEL 测定显示 SPIO-BMSC 组中凋亡的肾小管上皮细胞的数量显着低于 PBS 组。肾脏病变的 T2 值在细胞移植后的第 1 天最高，并且在 PBS 和 SPIO-BMSC 组中随时间逐渐降低，但在 SPIO-BMSC 组中始终是最低的。**结论**
移植 SPIO 标记的 BMSC 的治疗方法可显著促进大鼠 RIRI 的恢复，也可以通过 MRI 对移植的 BMSC 进行无创性动态监测，以早期预测治疗效果。

PU-1428
新型 GNRs@MNPs-Gd3+纳米探针用于肿瘤光声/磁共振双模态成像引导下的光热治疗

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目的 制备新型 GNRs@MNPs-Gd^{3+}纳米探针，其中 MNPs 用于提高纳米探针生物相容性，GNRs 可以提高 MNPs 的近红外光吸收效应，提高光声成像及光热治疗效果，Gd^{3+}的加入可以产生 MRI 信号，从而实现 PAI、MRI 双模态成像引导下的光热治疗，有望成为一种新型多功能纳米制剂用于肿瘤的诊疗一体化。
方法 （1）GNRs@MNPs-Gd^{3+}纳米探针的构建及表征；以 $HAuCl_4$、CTAB 为原料制备 GNRs，将 MNP 用 PEG 进行表面修饰，后将 GNRs 与 MNP-PEG 混合，室温搅拌 24h 制得 GNRS@MNPs 纳米粒。将 GNRS@MNPs 与 $GdCl_3$ 室温孵育 30 min，离心得 GNRs@MNPs-Gd^{3+}纳米探针。采用 TEM 观察探针形貌及尺寸，使用 UV 测试吸收光谱，采用 ICP-MS 测量纳米探针中 Au 及 Gd^{3+}含量。

（2）GNRs@MNPs-Gd^{3+}纳米探针的体外实验；将 GNRs@MNPs-Gd^{3+}纳米探针与 Hep2 细胞共同孵育，采用生物 TEM 观察纳米探针细胞内分布，同时观察纳米探针被细胞吞噬后形貌是否发生改变。采用 CCK8 法检测不同浓度纳米探针细胞毒性。将不同浓度探针溶液按比例稀释，利用 MRI、PAI 成像系统检测探针和对照溶液信号强度，找出最佳成像浓度。

（3）GNRs@MNPs-Gd^{3+}纳米探针的体内实验；建立裸鼠皮下肿瘤模型，尾静脉注射纳米探针，以 PBS 作为对照，通过 PAI、MRI、PTT 进行动物活体成像及治疗效果监测。

结果 成功合成 GNRs@MNPs-Gd^{3+}纳米探针，TEM 证明其棒状结构及表面修饰的 MNP，Mapping 证明金属离子 Gd^{3+}成功引入其表面，粒径约 45-50nm.UV 吸收峰位约 780nm，可以用于 808nm 近红外光的光声及光热。体内外实验证明其良好的成像及治疗效果。
结论 成功制备一种新型 GNRs@MNPs-Gd^{3+}探针用于肿瘤诊疗一体化。

PU-1429
多模态协同治疗增强抗肝癌血管生成的可视化研究

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目的 动脉化疗栓塞等非手术疗法极易引起肿瘤局部微环境发生缺氧从而诱导残存的肝癌细胞产生适应性乏氧应答，导致病理性血管生成，引起复发及转移。因此，降低肝癌细胞的乏氧应答对于抑制血管生成、提高肝癌远期疗效具有重大意义。通过 RNAi 阻断抗血管生成是一种较为理想的治疗方法，但存在着 siRNA 的摄取量低，单通路阻断不完全、疗效评估缺乏实效性且不敏感等缺陷。为了增强抗肝癌血管生成的治疗效果，设计并构建了一种可视化的纳米基因载体，同步投递 HIF-1α 的 siRNA，增强基因水平的抗血管生成效果；联合放疗的协同效应，提高肝癌治疗效果，同时，多模态成像深入分析治疗效果，实现疗效的实时动态监测。
方法 将 PtTPTBP、HIF-1α-siRNA、纳米簇基因载体、PEG 长循环物质等进行多功能组装，实现双基因抑制抗血管生成、放疗增敏、MR/CT/荧光多模态示踪、体内长循环等多功能高效协同。
结果 所制备的纳米基因载体粒径均匀，正电性强，可高效负载/释放 siRNA。
同时具有放疗增敏、MR/CT/荧光多模态示踪的作用。通过一系列体外乏氧响应性、安全性、稳定性、多模成像实验及肝癌模型鼠活体治疗实验，成功验证了其功效。
结论 所制备的多模态纳米基因载体可高效的负载 HIF-1α-siRNA，降低其在循环过程中的降解，同时增强 HIF-1α-siRNA 的细胞摄取效率及溶酶体逃逸；基因治疗联合放疗可以有效提高肝癌的治疗效果，这是因为 HIF-1α-siRNA 的高效投递可避免“乏氧应答” 产生的血管生成的代偿性激活，使紊乱的血管网趋于正常化，减少因为局部氧分压低所造成的放疗不敏感，同时，多模态成像可深入分析治疗效果，及时反映抗血管生成的治疗效果，实现疗效的实时动态监测，对于制订个性化治疗方案及预测预后具有重要的临床意义。因此，本实验为最大程度地提高肝癌的治疗效果提供重要的科学依据。

PU-1430
Targeted probe for trimodal accurate imaging and risk-stratification of breast cancer

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PURPOSE
Extradomain-B fibronectin (EDB-FN) is a marker for epithelial-to-mesenchymal transition (EMT), a biological process associated with tumour invasion, metastasis and drug resistance. EDB-FN is highly expressed in the extracellular matrix of aggressive human breast cancers. For non-invasive accurate detection and risk-stratification of breast cancer, a peptide-targeted goldnanorods, Pep-Sq@AuNRs, is synthesised for

sensitive fluorescent/photoacoustic/computed tomography (FL/PA/CT) imaging of extradomain-B fibronectin in aggressive breast tumors.
METHOD AND MATERIALS
A EDB-FN-targeted peptide modified goldnanorods, Pep-Sq@AuNRs, was synthesized using a three-step process and this probe is composed of three moieties. The first moiety is EDB-FN-targeted peptide (Pep), preferably targeting EDB-FN. The sencond moiety is an NIR fluorescent dye (Sq), of which its essential properties of NIR FL/PA imaging and phototherapy.The third moiety is gold nanorods (AuNRs), acting as CT/PA contrast agent.
RESULTS
This complex probe can effectively target aggressive MDA-MB-231 triple negative breast cancer in mice, but not in low-risk slow-growing MCF-7 tumors. The NIR FL/PA signals were activated by EDB-FN for imaging, and the AuNRs was used for CT imaging and photothermal/ photodynamic therapy (PTT/PDT). These results demonstrate that trimodal imaging with Pep-Sq@AuNRs may provide accurate detection and risk-stratification of breast cancer.
CONCLUSION
In summary, we developed a novel platform, Pep-Sq@AuNRs, as a model to distinguish aggressive MDA-MB-231 triple negative breast cancer and low-risk slow-growing MCF-7 tumors in mice. The results demonstrate that Pep-Sq@AuNRs could effectively target the aggressive MDA-MB-231 triple negative breast cancer and kill cancer cells by PTT/PDT.

PU-1431

MRI T1 加权成像在评估过渡金属硫化物的有机-无机杂化纳米粒子 MoS2@PZAC 作为诊疗一体化纳米平台在光热治疗 PTT 领域潜在应用中的作用

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目的 利用 MRI T1 加权成像来评估基于顺磁性两性离子两亲聚合物杂化二硫化钼在 PTT 领域中的潜在应用价值。
方法 制备合成 MoS_2@PZAC，取不同浓度的 MoS_2@PZAC 于离心管中，扫描得到体外 T1 加权 MR 图像。在种有皮下 4T1 肿瘤的 balb/c 雌性小白鼠上，对小鼠肿瘤进行扫描，得到不同时间点的 T1 加权 MR 图像，并收集不同时间点肿瘤区域的信号强度。尾静脉注射 MoS_2@PZAC 1 d，7 d，14 d，取其心、肝、脾、肺、肾，固定组织 24 h，H&E 染色切片用显微镜观察。（1）只注射 300 μL（下同）PBS，（2）只注射 MoS_2@PZAC（3 000 μL/mL），（3）注射 PBS 4 h 后用 808 nm 激光（2.0 W/cm^2）辐射肿瘤部位 10 min，（4）注射 MoS_2@PZAC（3 000 μL/mL）4h 后用 2.0 W/cm^2的 808 nm 激光辐射肿瘤部位 10 min。每 2 分钟记录一次肿瘤部位的温度，特定时刻测定肿瘤体积。
结果 体外 MRI 测试结果表明 MoS_2@PZAC 的弛豫率 r_1 = 11.2 mM^{-1} s^{-1}，是临床用 Magnevist®的 2.5 倍。大分子造影剂 MoS_2@PZAC 则由于尺寸效应在体内循环时间增加，在肿瘤内聚集的更多。

结论 MoS_2@PZAC 能够迅速在肿瘤部位积累，T1 信号增强效果明显，可以用来引导 PTT。

PU-1432

Evaluation of methotrexate-conjugated gadolinium(III) for cancer diagnosis and treatment

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Purpose: In this study, a novel theranostic agent MTX-DOTA-Gd (MTX-Gd) was synthesized, which integrates magnetic resonance imaging (MRI) with anticancer treatment.
Methods: MTX-Gd was synthesized by connecting MTX and Gd through 1,4,7,10-tetraazacyclododecane-1,4,7,10-tetraacetic acid (DOTA). The characterization of MTX-Gd was detected by ultraviolet (UV) and infrared spectroscopy (IR). To confirm the antitumor effect of MTX-Gd, the cytotoxicity of MTX-Gd was examined by the MTT assay. The contrast enhancement of the MTX-Gd was measured through MRI *in vitro*. Then, nude mice bearing C6 tumor xenografts were used to study *in vivo* imaging capabilities.
Results: The ultraviolet-visible-near infrared radiation (UV-NIR) absorption curve indicated that MTX-Gd had a broad absorption in the region of 500-700 nm. The formation of MTX-Gd was confirmed from the characteristic bands of MTX-DOTA-Gd in the 1413 cm^{-1} (C-N), 1577 cm^{-1} ($-NH_2$), and 3429 cm^{-1} (N-H), in the fourier-transform infrared (FTIR) spectra. MTX-Gd showed little difference in the cell viability compared with MTX, except for the highest concentration (270 μM). *In vitro,* the imaging of MTX-Gd was significantly brighter than Gd-DOTA at the same concentration, and the brightness and signal intensity of MRI were increased followed by the increased concentration of MTX-Gd. And it also showed that MTX was not visualized on MRI. The other images revealed that the concentration of 4 mM MTX-Gd had the same imaging effect with the concentration of 10 mM Gd-DOTA. Then, MTX-Gd was injected in nude mice bearing C6 tumor xenografts through the tail vein. Significant contrast enhancement was observed at the tumor site from 0.5 h to 3 h. The signal of tumor area was strongest at 3 h due to accumulation by size effect of macromolecules.
Conclusion: A novel stable and unique theranostic agent(MTX-Gd) was successfully synthesized, and it has good stability, strong anticancer ability and excellent magnetic capacity. The methotrexate component of MTX-Gd, as a chemotherapeutic agent, played an important role in targeted therapies of cancer. The DOTA-Gd component of MTX-Gd performed as the MRI contrast agent. The superior MRI imaging performance and synergetic chemical antineoplastic ability of MTX-Gd was revealed, and it has great potential in the diagnosis and treatment of glioma and potentially other cancers, with prospects of clinical application in the near future.

PU-1433

Yb Based Nanoprobes for Tri-modal Bioimaging

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Objective:

To investigate the effect of tri-modal bioimaging (fluorescence/MR/CT) with Yb based upconversion nanocrystals.

Methods and materials:

Sub-10 nm Sr_2LuF_7:Yb/Er@Sr_2GdF_7@SrF_2 core-shell upconversion nanocrystals (NCs) were well designed and synthesized using a seed-mediated growth process. Each of parts assumes respective role and works together to achieve multimodal bioimaging.

Results:

The inert shells reduced the surface defects and increased the upconversion fluorescence intensity of the NCs so as to realize the in vitro cell imaging with low auto-fluorescence. In vivo magnetic resonance (MR) imaging was also achieved with these designed nanocrystals due to the presence of Gd^{3+}. More significantly, these specifically core-shell upconversion NCs exhibited high contrast in in-vivo X-ray computed tomography (CT) imaging because of the good X-ray absorption ability of Lu^{3+}, Gd^{3+} and doped Yb^{3+} and Er^{3+} ions.

Conclusions:

These results indicate that the core-shell upconversion NCs can be as promising contrast agents for upconversion fluorescence / MR / CT tri-modal bioimaging.

PU-1434

Synthesis of Untrasmall Bi-Based Nanoprobes for Esophageal Fluoroscopy Imaging

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Background: Fluoroscopy imaging was an important examination in diagnosis esophageal diseases, such as esophagitis and esophageal diverticulum. As an organ of esophageal tract, a positive contrast agent was used for measuring the esophagus. Nowadays, barium sulfate contrast agent is the first choice as positive contrast agent. However, barium sulfate had potential risk to other organs. Therefore, we constructed PEG-Bi_2S_3 nanoparticles for esophageal fluoroscopy imaging.

Methods: The morphology of prepared nanodots was characterized through TECNAI G2 HRTEM (high resolution transmission electron microscope). Transmission electron microscope evaluations were achieved on a JEM-2010EX TEM. XRD features were acquired on a D8 ADVANCE using Cu K radiation. X-ray photoelectron evaluations were achieved from ESCALAB-MKII spectrometer. Siemens digital gastrointestinal machine was applied to obtain the fluoroscopy imaging of PEG-Bi_2S_3. MTT test, Hematoxylin and eosin (H&E) staining and body weight were used for measuring the toxicity. The Kunming mice and Wister rats were obtained from Jilin University. concentrations were measuring through inductively coupled plasma mass spectrometry (ICP-MS).

Results: PEG-Bi_2S_3 nanoprobes were successfully prepared through a “hot injection” process. From the TEM results, PEG-conjugated Bi_2S_3 nanoprobes were showed a diameter around 3-4 nm, and nanoprobes dispersed well without further aggregation. The crystal structure of PEG-conjugated Bi_2S_3 was proved by XRD analysis. Incubation of PEG-conjugated Bi_2S_3 nanoprobes with 48 hours, the results showed that more than 80% of 4T1 cells survived, which indicating relative low cytotoxicity of PEG-conjugated Bi_2S_3

nanoprobes. H&E staining proved the no damaged evaluation of long-term toxicity. The blood compatibility was carried out to evaluate the biocompatibility of PEG-conjugated Bi_2S_3 nanoprobes. No hemolysis was observed after incubation of blood with PEG-conjugated Bi_2S_3 nanoprobes, suggesting good blood compatibility. Results of fluoroscopy imaging showed the excellent esophageal imaging effect.
Conclusions: In conclusion, we successfully synthesized PEG-conjugated Bi_2S_3 nanoprobes. The esophageal fluoroscopy imaging results indicated that the PEG-conjugated Bi_2S_3 nanoprobes exhibited better imaging features, which is feasible to potential esophageal fluoroscopy applications.

PU-1435
基于人源蛋白兼具肿瘤靶向及可代谢的 MRI 纳米探针

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目的 长期以来钆类螯合物作为临床最常用的 MRI 造影剂在磁共振影像诊断中发挥着重要作用，但此类造影剂目前仍存在着无组织特异性、弛豫率偏低、诱发肾源性系统纤维化和微量体内残留等缺陷，本研究预探索一种以人类自体蛋白——转铁蛋白为载体的全新钆类磁共振分子探针的功能。
方法 本研究结合最新分子生物和纳米技术，预合成出一种以人类自体蛋白——转铁蛋白为载体，兼具肿瘤主动靶向能力的全新钆类磁共振分子探针。
结果 经过大量表征和实验证明，该全新钆类磁共振分子探针物理性质上表现出良好的稳定性、超小的粒径（水合粒径=9nm）和优异的磁共振 T1 增强效果；细胞成像实验证实，通过生物矿化技术合成的分子探针，既实现了钆纳米粒子以蛋白为模板的“内生长”，还较好的保存了天然转铁蛋白重要的肿瘤靶向功能（由于代谢旺盛，转铁蛋白受体在大多数肿瘤细胞表面过表达）；在活体成像实验中，该探针展现出高度特异的肿瘤靶向磁共振增强效果，以及可快速进、出肿瘤组织的“shuttle-like” 特性，提示该探针未来有望作为载体被应用于药物或其他治疗元件向肿瘤组织的可视化精准“递送”，最后该探针可通过肝胆系统代谢排出体外，展现出良好的体内清除能力，有望实现未来的临床转化。
结论 本研究我们通过简单、可重复的生物矿化方法成功合成了一种具备更为良好的生物兼容性、靶向性和体内清除率的新型 MRI 造影剂——全新钆类磁共振分子探针。Gd@Tf NPs 保留了 Tf 蛋白的固有生物学功能（即，生物相容性，肿瘤靶向性和可代谢能力）以及优异的 T1 弛豫率。这些结果表明 Gd@Tf NPs 有望用于临床实施 MR 早期检测恶性肿瘤。此外，纳米材料保留的 Tf“shuttle-like”特征也使得制备的 NP 能够用作 MRI 成像引导的递送载体，诊疗应用广泛。

PU-1436
基因与纳米探针协同介导的前列腺癌靶向磁共振研究

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目的 构建在前列腺癌内特异性表达 TfR 及 Luc 蛋白的光学、磁共振双报告基因，结合磁性纳米探针 Tf-USPION，以实现在细胞及活体动物模型中，基因、分子水平上的前列腺癌多模态靶向光学及磁共振成像，为早期、定位诊断前列腺癌及前列腺癌的局部、定向治疗提供新的检查手段和研究方向

方法 设计受前列腺癌特异性启动子 DD3 promotor 调控、TfR 及 Luc 为目的基因、WPRE 为增强子的前列腺癌靶向基因探针，借助分子克隆、基因重组和腺病毒包装技术成功构建前列腺癌靶向双报告基因探针 Ad.PDD3-TfR-WPRE-PCMV-Luc (Ad.PDD3)。
结果 以 Ad.PDD3 基因探针转染不同类型细胞后，Luc 荧光检测及 Western Blotting 定量分析均表明该腺病毒载体可在前列腺癌细胞内特异性过表达 TfR 和 Luc 蛋白。在活体光学成像中，LNCaP 前列腺癌种植瘤小鼠在病毒注射 24h 后肿瘤内即出现荧光，荧光强度在第 7-10 天达到峰值，而后逐渐减弱，荧光范围与肿瘤大小成正比；全部 14 天检测，小鼠除肿瘤外全身无其他组织出现荧光；病毒注射 7 天后的 TfR 免疫组化结果证实，小鼠全身仅肿瘤内 TfR 明显过表达，且表达量明显高于未注射病毒的对照组肿瘤；在磁共振成像实验中，本课题组成功构建了 10nm 级 Tf-USPION 磁共振探针，经体循环注射该探针后，预先完成基因探针 Ad.PDD3 转染的小鼠，肿瘤区域出现明显的 T2 增强效应，显影速度明显加快，肿瘤组织的位置、大小及边界显示清晰、与肿瘤周围组织对比明显，T2 值下降迅速、显著；未经病毒处理的小鼠肿瘤区 T2 信号虽信号减低但变化缓慢，延时数小时后肿瘤区信号变化不均匀，且无法确切辨别肿瘤范围。
结论 本研究成功合成可实现前列腺癌靶向双模态分子成像纳米探针，同时，本研究借助基因探针显著提高了前列腺癌组织内的 TfR-Tf 转运系统能力，因此具备良好的临床转化前景，用于前列腺癌的早诊早治。

PU-1437
基于天然黑色素与聚氧金属氧酸盐纳米粒子的光声成像引导下的光热治疗

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目的 构建一种新型黑色素-聚氧金属氧酸盐纳米粒子（MNP-POMs），能通过光声成像达到早期诊断和监测肿瘤的目的，在成像引导下光热治疗，实现诊疗一体化。
方法 1、合成与表征 在黑色素的水溶液中滴加适量冰乙酸，使其电荷翻转，由负变正，通过静电吸引的作用将 MNP 与 POMs 连接，得到 MNP-POMs。利用透射型电子显微镜观察 MNP-POMs 的大小和形态；采用动态光散射法观察其水溶液粒径和电位；使用紫外-可见分光光度计测试吸收光谱。2、细胞实验 采用 CCK8 法检测 MNP-POMs 对乳腺癌细胞的安全性，对 MNP-POMs 标记的肿瘤细胞进行体外光声成像和光热治疗。3、活体实验 选用乳腺癌细胞建立裸鼠肿瘤模型，将 MNP-POMs 经鼠尾静脉注射到荷瘤裸鼠中，进行活体的光声成像与光热治疗评价研究。
结果 MNP-POMs 纳米颗粒水溶性良好，且具有较强的光热效应，在 CCK8 实验中，溶液浓度低于 500 μg/mL 时，标记后对细胞生存率基本无影响。材料在体内与体外均展现了良好的光声成像能力，与对照组相比，具有 MNP-POMs 的光热治疗组显示出显著的治疗功效并显著延长小鼠的寿命。
结论 MNP-POMs 纳米探针合成简单，体内生物相容性良好，能通过光声成像引导下对肿瘤进行精准治疗和疗效监测，有望作为一种新型的多功能纳米制剂用于肿瘤诊疗一体化研究。

PU-1438
Macrophage-targeted and clearable iron-based MRI/NIRF nanoprobes for atherosclerosis molecular imaging

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Objective: This study aims to explore non-invasive imaging of atherosclerotic plaque through magnetic resonance imaging (MRI) and near-infrared fluorescence (NIRF) by using Scavenger Receptor-AI (SR-AI) targeted magnetic iron oxide nanoparticles (PP1-IR820-USPIOs) as multimodality molecular imaging probe in murine model of atherosclerosis.
Materials and Methods: PP1-IR820-USPIOs were constructed by conjugating the SR-AI-specific peptide PP1 and IR820 fluorescent dye to the surface of USPIO nanoparticles via condensation reaction. Murine atherosclerosis model was induced in ApoE-/- mice by high fat and cholesterol diet (HFD) for 20 weeks. The plaque areas in arteries were detected with Oil Red O staining. Immunofluorescent staining and Western blot analysis were applied respectively to investigate SR-AI expression. In vivo MRI and NIRF imaging of atherosclerotic plaque were carried out before and 24 h after intravenous injection of USPIOs.
Results: The obtained PP1-IR820-USPIOs had favorable biocompatibility and exhibited pronounced increased fluorescence and transverse relaxivity. Oil Red O staining showed that the plaque area was significantly increased in HFD group ($p<0.05$). Immunofluorescence staining revealed that SR-AI protein was highly abundant within plaque in HFD group. In vivo MRI and NIRF imaging revealed that PP1-IR820-USPIOs accumulated in atherosclerotic plaque of arteries. There was a good correlation between the signals of MRI and fluorescence intensities of NIRF imaging in animals with USPIOs injection. Most importantly, no observable toxicity or side effects of IR820-USPIOs were found in a variety of toxicity studies.
Conclusion: PP1-IR820-USPIOs is a promising dual modality imaging probe, which may evolve into a clinically translational, a noninvasive tool for detecting and monitoring rupture-prone atherosclerotic plaques in vivo.

PU-1439
基于 BSA-Bi2S3-MnO2-Pep 纳米探针在肿瘤诊疗一体化作用的研究

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目的 制备一种新型的 BSA-Bi_2S_3-MnO_2-Pep 纳米探针。采用生物矿化法合成，它可以实现磁共振成像（MRI），光声成像（PAI）双模态成像引导下的光热治疗（PTT），并且具有低毒性。在上述纳米颗粒外连接特定肽链以增加其在肿瘤部位的聚集。
方法 1、BSA-Bi_2S_3-MnO_2-Pep 纳米探针的构建及表征。生物矿化法合成 BSA-Bi_2S_3-MnO_2 纳米探针，将所选定的肽链与 BSA-Bi_2S_3-MnO_2 纳米颗粒交联，透析后冻干，得到 BSA-Bi_2S_3-MnO_2-Pep 纳米探针。采用透射电镜、动态光散射、X 射线光电子能谱分析、X 射线衍射、紫外-可见光光度计等测试方法考察上述纳米探针的形貌、结构、粒径、Bi 和 Mn 的含量等。2、BSA-Bi_2S_3-MnO_2-Pep 纳米探针的体外实验及表征。采用 CCK-8 法检测纳米探针的细胞毒性。配置不同浓度的纳米探针溶液，加入适量的 H_2O_2 和 mmp-2 酶模拟肿瘤微环境，监测该溶液产氧量及粒径等表征。3、BSA-Bi_2S_3-MnO_2-Pep 纳米探针的体内多模态成像和光热治疗。建立肿瘤模型，尾静脉注射纳米探针，进行 MR 和 PA 扫描，观察两种成像效果。利用红外热成像仪进行测温并拍照。

结果 1、BSA-Bi2S3-MnO2-Pep 纳米探针水溶性良好，通过 TEM 和 DLS 测量平均粒径在 6-8nm 之间，具有良好的光热效应。2、CCK-8 实验表明标记后的细胞基本上无毒性；BSA-Bi2S3-MnO2-Pep 纳米探针具有良好的 MR、PA 和光热效应，并且依靠纳米颗粒的被动靶向和肽链的主动靶向效应在肿瘤部位大量聚集，能够成功标记喉癌细胞并进行在多模态成像引导下的光热治疗。
结论 BSA-Bi2S3-MnO2-Pep 诊疗一体化纳米探针合成工艺简单，低毒性，能够通过 MRI 和 PAI 成像引导肿瘤的光热治疗和疗效监测，作为一种新型多功能纳米探针用于肿瘤的诊疗一体化有广阔前景。

PU-1440

生物源对比剂在磁共振分子成像中的应用

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目的
生物源对比剂如蛋白内生型分子探针是以蛋白为基础而合成的一类新型纳米材料，本文旨在总结分析生物源对比剂-蛋白内生型分子探针在磁共振分子成像中的应用。
方法
通过几个具体案例及本课题相关研究详细介绍蛋白内生型分子探针在肿瘤诊疗中的应用
结果
1.蛋白内生型钆类对比剂可用于磁共振分子成像，且 T1WI 增强效果优于 Gd-DTPA；
2.蛋白内生型纳米材料易于表面修饰，可实现多模态成像以及诊疗一体化，有望为疾病诊断提供多种成像信息，并可被活体代谢，生物清除率高。
3.多模态分子成像探针对于临床研究是至关重要的。然而，大多数探针显示“始终在线”信号，可能导致肿瘤-背景比(TBR)较差，还不能有效地满足早期诊断恶性肿瘤的需求。日前叶德举教授课题组设计并合成了一种小分子基可激活 NIR 荧光/ MRI 双模态探针，并通过酶介导荧光反应和原位自组装将其用于体内成像。该策略利用酶的催化活性增强了 MR 特性并增加了靶组织中的探针积累。使用 ALP 作为模型酶，研究表明，可激活双模态探针能够实现皮下 ALP 阳性肿瘤的非侵入、高敏感和空间分辨成像以及 NIR 荧光引导的原位肝脏肿瘤的实时手术切除。
4.在前人工作基础上，我们以 Tf 作为靶向蛋白和合成模板，在其内部生成成像元件 Au，制备 Tf-Au NCs 纳米探针，实验结果发现 Tf-Au NCs 具有良好的靶向性、优异显像效果，并可经活体代谢，生物相容性好，因此 Tf-Au NCs 有望应用于 TfR 高表达肿瘤的靶向成像及早期诊断中。同时，通过联合应用基因与纳米探针，大幅提高了纳米探针对前列腺癌的靶向递送效果。
结论
蛋白内生型分子探针在保持蛋白生物活性和靶向能力的前提下，获得了良好的肿瘤诊疗能力，同时合成工艺简单，探针的材料学特性如粒径、水溶性等良好，同时也易于进一步用另外的配体进行靶向修饰。基于这些优点，蛋白内生型分子探针在肿瘤诊断和治疗领域备受关注。

PU-1441

Construction of a Targeted FI/MRI Multimodal Molecular Probe for Precise Image-guided Surgery in Breast Cancer

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Purposes: Breast cancer has become the most serious malignant tumor for women. It’s hard for surgeons to detect surgical margins and micrometastasis precisely, resulting in tumor relapse or surgical complication. Imaging methods capable of precisely detecting tumor boundaries and micrometastases, which can be used to guide surgery.
Methods: In this study, we present a microwave-assisted one-pot way to prepare magnetic‐fluorescent Gd- carbon hybrid nanoparticals (GCNPs). GCNPs were efficiently synthesis via one-pot, multi-component reaction of DTPA, $GdCl_3$ and ethylenediamine in water. Cluster of differentiation 44 (CD44) antibody has been modified on the surface of GCNPs as a targed ligand.
Results: The transmission electron microscopy (TEM) images showed the GCNPs were well separated with a quasi-circular shape and the size of GCNPs was 35.38±4.93 nm. The GCNP aqueous solution emitted bright blue light upon irradiation with a UV lamp (365 nm) with a high quantum yield of 62.17%.The longitudinal relaxivity (r_1) of GCNPs was much larger than that of Gd-DTPA (8.54262 for GCNPs and 2.07956 for Gd-DTPA). The cell imaging showed the 4T1 cell (the breast cancer cell) incubated with GCNPs-CD44 showed intense multicolor luminescence and a significant enhancement MRI signal. In vivo, the tumor boundaries of GCNPs-CD44 group was significantly developed and lasted for nearly 1 week.
Conclusions: This project creatied a fluorescent - magnetic resonance double modal nano-probe, constructing an integrated molecular probe for providing important clinical value for precise surgery, and detection of recurrence and metastasis of breast cancer.

PU-1442

磁共振监测 2-DG 标记的载 PTX 氧化铁纳米粒靶向三阴性乳腺癌 4T-1 诊疗效果研究

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目的 分析比较 Fe_3O_4@OA@PLA-PEG NPs、Fe_3O_4@OA@PLA-PEG-DG NPs 和 Fe_3O_4@OA-PTX@PLA-PEG-DG NPs 靶向三阴性乳腺癌的诊疗效果。**方法** 热分解法合成靶向诊疗纳米粒 Fe_3O_4@OA-PTX@PLA-PEG-DG NPs。分别经尾静脉注射 0.25 mg Fe/ml 的 Fe_3O_4@OA@PLA-PEG-DG NPs、Fe_3O_4@OA-PTX@PLA-PEG-DG NPs、Fe_3O_4@OA@PLA-PEG NPs 混悬液 250 μl 到荷 4T1 乳腺癌荷瘤裸鼠体内，间隔三天注射一次，共三次。注射前和注射后 1d、3d、6d、9d、12d、15d 行裸鼠动态 MR 快速自旋回波 T2、自旋多回波脉冲序列及 SWI 成像，计算分析各组注射前后 T2 信号强度、T2 值。**结果** 注射 Fe_3O_4@OA-PTX@PLA-PEG-DG NPs 后肿瘤生长受到抑制，瘤组织切片普鲁士蓝染色瘤内可见较多蓝染颗粒。注射 Fe_3O_4@OA@PLA-PEG-DG NPs 组未见明显肿瘤生长抑制，瘤内未见蓝染颗粒。**结论** Fe_3O_4@OA@ PLA-PEG-DG NPs、Fe_3O_4@OA-PTX@PLA-PEG-DG NPs 可被三阴性 4T1 乳腺癌主动靶向吸收。载 2-DG、PTX 的氧化铁纳米粒可有效抑制三阴性乳腺癌瘤体生长。

PU-1443

2-DG 修饰的超顺磁性氧化铁纳米粒标记人脐带间充质干细胞效率研究

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目的 探索 2-脱氧葡萄糖（2-DG）修饰的超顺磁性氧化铁纳米粒（γ-Fe_2O_3@DMSA-DG NPs）标记人脐带间充质干细胞(hUCMSCs)和体外示踪的可行性。**方法** 制备γ-Fe_2O_3@DMSA-DG NPs。采用组织块贴壁培养法分离、纯化人脐带间充质干细胞。用不同浓度(8、16、32、64、128μg/mL)纳米铁标记人脐带间充质干细胞，采用普鲁士蓝染色观察标记率，利用 CCK-8 及 Transwell 实验检测纳米铁对 hUCMSCs 活力及迁移能力的影响，用 MRI T2WI 观察磁标记细胞群信号强度，在 T2 图测量细胞群 T2 值并计算横向弛豫率 R2 值(R2=1/T2)。**结果** 普鲁士蓝染色显示标记铁浓度高于 32 μg/mL，标记率可达到 96%以上，细胞内蓝染颗粒随铁浓度升高逐级增多;铁浓度在 128μg/mL 及以下时，磁标记细胞活力未见显著下降;铁浓度在 128μg/mL 时，磁标记细胞迁移能力下降。磁标记细胞群 T2 信号随铁浓度升高逐级降低，R2 值同铁浓度呈直线相关。**结论** γ-Fe_2O_3@DMSA-DG NPs 可有效标记 hUCMSCs，最适标记铁浓度为 64μg/mL。

PU-1444

裸鼠鼻咽癌移植瘤模型对 18F-FDG 的摄取及其与 ELAM-1 基因表达的关系

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目的 检测鼻咽癌皮下及爪垫荷瘤裸鼠移植瘤组织中 ELAM-1 的表达。观察并比较转移组和非转移组荷瘤裸鼠 PET/CT 分子成像扫描的区别并研究分析荷瘤裸鼠移植瘤 SUVmax 及 T/NT 值与 ELAM-1 的相关性。
方法 建立裸鼠鼻咽癌皮下及爪垫移植瘤模型后第 8 周进行 ^{18}F-FDG PET/CT 显像，观察评估图像质量并测定瘤体及对侧肌肉的 SUVmax 并计算 T/NT 比值，分析 SUVmax 及 T/NT 比值与移植瘤体积及 ELAM-1 蛋白表达的关系；根据 HE 染色结果将 16 只爪垫模型荷瘤裸鼠分为转移组和非转移组；采用免疫组织化学法（SP）检测两组移植瘤组织中 ELAM-1 蛋白的表达并使用 Image J 软件进行定量分析。
结果 皮下移植瘤模型：平均 SUVmax 为 3.42±1.71，平均 T/NT 比值为 4.36±3.72；SUVmax 与裸鼠移植瘤体积没有明显相关性（r=0.212，P=0.557≥0.05），T/NT 比值与裸鼠移植瘤体积有明显相关性（r=0 .549，P=0.050≤0.05）；爪垫移植瘤模型：转移组与非转移组平均 SUVmax 为（3.04±1.16vs2.67±0.69，t=0.747，P=0.467≥0.05）；转移组与非转移组平均 T/NT 比值为（3.17±1.49vs2.89±0.66，t=0.515，p=0.616≥0.05）；SUVmax 与裸鼠移植瘤体积没有明显相关性（r=0.207，P=0.441≥0.05），T/NT 比值与裸鼠移植瘤体积有明显相关性（r= 0.185，P= 0.493≥0.05）； SUVmax 与裸鼠移植瘤 ELAM-1 表达无明显相关性（r=0.150，P=0.580≥0.05），T/NT 比值与裸鼠移植瘤 ELAM-1 表达无明显相关性（r=0.062，P=0.410≥0.05）。
结论 SUVmax 及 T/NT 比值指标不能有效评估鼻咽癌转移等预后情况。

PU-1445

Gastric MRI by Functionalized Nanoprobe

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Background: Gastric diseases, such as gastritis, gastric ulcer, gastric cancer and gastric stromal tumors represented a wide variety of conditions, which affecting anatomy, physiology, and motility of the stomach. Magnetic resonance imaging (MRI) can provide diagnostic information to the stomach. Therefore, we developed polydopamine conjugated (PDA) Co-P nanocomposites for gastric MR imaging.
Methods: We have successfully constructed polydopamine conjugated (PDA) Co-P nanocomposites (Co-P@PDA). XRD was applied to measure the crystalline structures of nanoprobes. FT-IR was applied to measure the conjugated PAA. MTT test was applied to measure the *In vitro* cytotoxicity of nanomaterials. Hematoxylin and eosin (H&E) staining was used to measure the In vivo cytotoxicity of nanomaterials. Kunming mice and Wister rats were obtained from Jilin University. MR imaging evaluation was carried out on a clinical GE Discovery MR750.
Results: From the results of the transmission electron microscope, the prepared Co-P@PDA owned uniform morphology and monodispersed. From the results of the XPS spectrum, the feature from the peak of N 1s further proved the successful conjugating PDA on Co-P nanocomposites. The HAADF-STEM (high angle annular dark field scanning transmission electron microscopy) showed that homogeneous distribution of N and C elements on the Co-P, which indicated the core-shell structure. The r_2 value (transverse relaxivity) was measured to be 224.61 mm^{-1} s^{-1}, which is higher than commercial agents, such as Combidex or Feridex. From results of MTT, after 24 h of incubation with Co-P@PDA, viability of cell exceeded 80%, which indicated low cytotoxicity. The results of H&E-stained organ sections also indicated low cytotoxicity. From the results of in vivo gastric MR imaging acquired through 3.0 T MRI scanner, an obvious darkening signal of the stomach can be showed.
Conclusions: Above all, PDA conjugated Co-P nanomaterials were constructed and served as contrast agents for gastric MR T_2 imaging. The results from gastric MR T_2 imaging proved that the nanocomposites showed better contrast effect than commercial agents. With low side effects, PDA conjugated Co-P nanomaterials could be a promising contrast agents for gastric MR T_2 imaging.

PU-1446
PAI/NIR-II双模态示踪干细胞移植治疗小鼠急性药物性肝损伤

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目的 本研究主要通过非侵入性的光声成像及近红外II荧光成像示踪干细胞治疗急性药物性肝损伤的动态过程。
方法 1）MNP-PEG-H2 的合成；2）表征检测：TEM、DLS 及 UV-VIS 等；3）细胞毒性（CCK-8）检测；4）细胞摄取实验：激光共聚焦及近红外II荧光显微镜观察细胞摄取情况；5）MNP-PEG-H2 标

记干细胞后 PAI/NIR-Ⅱ体外成像；6）MNP-PEG-H2 标记干细胞后 PAI/NIR-Ⅱ活体成像；6）急性药物性肝损伤模型构建；7）动态观察干细胞移植治疗后分布情况；8）治疗效果评价。
结果 1）MNP-PEG-H2 通过羧合反应成功合成，TEM 呈圆形，粒径大约为 85nm 左右，UV-VIS 显示在 750nm 左右有吸收；2）CCK8 结果显示，MNP-PEG-H2 在浓度达 200μg/ml 对细胞的活性基本上没有影响；3）激光共聚焦及近红外Ⅱ荧光显微镜均显示 MNP-PEG-H2 不需要转染，能够通过溶酶体的摄取进入细胞内；4）200、100、50、25、12.5μg/ml 不同浓度 MNP-PEG-H2 标记干细胞后能够在体外成功进行 PAI/NIR-Ⅱ双模态成像；5）裸鼠皮下注射 MNP-PEG-H2 标记好的干细胞后，能够在活体内 PAI/NIR-Ⅱ荧光成像双模态下监测细胞；6）小鼠腹腔注射对乙酰氨基酚能够成功构建急性药物性肝损伤模型；7）通过鼠尾静脉注射 MNP-PEG-H2 标记干细胞后通过 PAI/NIR-Ⅱ荧光成像双模态观察，干细胞主要在肝脏中富集；8）血液学肝功 ALT、AST 和尿素及病理学 HE 组织切片检查证实干细胞能够治疗小鼠急性药物性肝损伤。
结论 我们合成和 MNP-PEG-H2 能够成功标记干细胞，并在非侵入性 PAI/NIR-Ⅱ荧光双模态成像下观察干细胞在体内的情况，并成功治疗急性药物性肝损伤。

PU-1447

黑色素新吲哚菁绿的多模态成像和光热治疗

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目的 为了弥补单独成像技术的不足,将多种成像手段整合在一起来提高成像准确性,这将会是医学成像发展的必然趋势，,在临床应用上也具有极大的潜在价值。一般的癌症诊断和治疗是两个独立的过程,在这漫长的过程中存在着诸多的不稳定因素,会导致肿瘤治疗效果不显著。若能够将癌症的诊断与治疗有机地结合起来,实现全新的诊疗一体化医疗模式,利用诊疗一体化试剂的多种成像功能,准确地获取肿瘤相关信息,由此来制订个性化治疗方案,对癌症进行早期诊断和有效治疗,这将有机会成为癌症研究的主流。基于此,将多功能成像造影剂与癌症治疗药物装载在纳米载体上,实现多模态成像诊断疾病和治疗,这将会为癌症治疗提供新的思路和策略。
方法 ：以黑色素为载体基础，将小分子染料 IR820 作为光热剂将光能转化为热能,通过局部组织热效应来治疗癌症，聚乙二醇（PEG）的连接用来增加纳米材料的稳定性，’水溶性，以及 Mn 作为顺磁性物质的结合来形成 mnp-peg-ir820-mn 纳米颗粒，接着对所构建的纳米材料进行表征，以及进行细胞毒性，细胞摄取，肿瘤细胞杀伤试验，检测体内生物分布和 mnp-peg-ir820-mn 的体内抗肿瘤功效。 在裸鼠肿瘤模型上进行体外和体内实验。
结果 纳米颗粒传承了黑色素低毒性的特点。光热治疗效果明显。
结论 材料在体外及体内展现了良好的核磁和光声成像能力，与对照相比，具有 mnp-peg-ir820-mn 组的光热治疗显示出显著改善的治疗功效并显着延长小鼠的寿命。实现了多模态成像下引导的光热治疗。

PU-1448

REFERENCES (1) Ananta, J. S.; Godin, B.; Sethi, R.; Moriggi, L.; Liu, X.; Serda, R. E.; Krishnamurthy, R.; Muthupillai, R.; Bolskar, R. D.; Helm, L.; Ferrari, M.;

Wilson, L. J.; Decuzzi, P. Geometrical confinement of gadolinium-based contrast agents in na

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Herein, multifunctional nanoparticles (MnIO-MCP) have been constructed for active-tumor targeting T_1-weighted and T_2-weighted (T_1-T_2) dual-modal magnetic resonance imaging (MRI)-guided biological-photothermal therapy (Bio-PTT) through bioconjugation of the monocyclic peptides (MCP, the CXC chemokine receptor 4 (CXCR4) antagonist) with manganese doped iron oxide nanoparticles (MnIO NPs). MnIO-MCP displays both T_1-weighted and T_2-weighted MR contrast abilities (r_1 = 13.1 mM^{-1} S^{-1}; r_2 = 46.6 mM^{-1} S^{-1}, and r_2/r_1 = 3.56), allowing generation of enhanced T_1-T_2 dual-modal MRI. The MnIO-MCP exhibits reasonable photothermal conversion efficiency (28.8% with 200 μg mL^{-1} MnIO-MCP in H_2O) under 808 nm NIR laser irradiation, endowing them with the capacity for PTT of tumor. Moreover, MnIO-MCP affords the strong tumor targeting and inhibition of cancer cell growth by the interactions of MCP with over expressed CXCR4 in tumor. We demonstrate that MnIO-MCP can accumulate in MCF-7 tumors as high as ~15.9 %ID g^{-1} at 1 h after intravenous injection into mice with the aid of an external magnetic field (MF), creating opportunity for complete eradication of tumor by T_1-T_2 dual-modal MRI-guided Bio-PTT

PU-1449

Preliminary experimental study on intraoperative navigation of glioblastoma based on IRDye800CW targeted fluorescent probe

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Background: Glioblastoma usually shows diffuse infiltration and the intracranial anatomy is very complicated.It is difficult to distinguish the boundary between normal brain tissue and glioblastoma.Intraoperative fluorescent navigation technology can visualize the tumor in real-time.It has great advantage of determining the boundary of the tumor.Fluorescence probe technique can combine specific antibodies with fluorescent substances by means of probe synthesis technique to improve the imaging ability of tumor.

Objective:(1)To construct a fluorescent probe with biosafety performance targeting EGFR, named Cetuximab-IRDye800CW(Cet-IRD);(2)To detect the imaging efficiency of the fluorescent probe; (3)To investigate whether the probe has potential application value in guiding the resection of glioblastoma.

Methods: (1) The expression level of EGFR in glioblastoma tissues was detected by immunohistochemistry;(2)The probe Cet-IRD targeted EGFR was constructed.It's performance was determined by fluorescence spectrophotometer. (3)The biosafety of Cet-IRD was evaluated by CCK-8 and H&E staining.(4)The subcutaneous model was

constructed to detect the imaging efficiency of fluorescent probes.(5)The orthotopic implantation model was constructed to detect whether Cet-IRD could locate the tumor site in real time and guide surgical resection.

Results:(1)Immunohistochemistry results showed that EGFR is strongly positive in glioblastoma tissues.(2)Fluorescence spectrophotometer showed that the fluorescence signals of Cet-IRD and IRDye800CW can be received by the near-infrared fluorescence imaging equipment. (3)The results of CCK-8 cytotoxicity experiment showed that the cell viability of Cet-IRD incubation group was not statistically different from that of the control group.H&E staining showed that no inflammation, hemorrhage, necrosis or other obvious damage occurred in the main organs of the nude mice.(4)The subcutaneous tumor model of nude mice was successfully constructed. The average fluorescence intensity of tumors of Cet-IRD group was higher than that of the IRD group($p<0.05$).(5)The orthotopic implantation model of nude mice was successfully constructed.The tumor contour was clearly visible under intraoperative real-time fluorescence imaging,and the glioblastoma was resected under the guidance of near-infrared fluorescence equipment.

Conclusion:(1)EGFR was strongly positive in glioblastoma tissues;(2) Cet-IRD probe has a good biosecurity;(3)The imaging efficiency of Cet-IRD is better than IRD, and it has the best imaging efficiency at 24h after injection;(4)Cet-IRD has the ability to visualize glioblastoma,it can locate the tumor site,guide the surgery,and preliminarily realize the objective of intraoperative navigational on glioblastoma resection.

PU-1450

Application of Small Molecule Fluorescent Probes in Early Activation Imaging of CD8 + T Lymphocytes

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As a subset of T lymphocytes, CD8+ T lymphocytes play a vital role in the body's immune system. CD8+ T lymphocytes are responsible for the clearance of target cells through direct killing, such as cells infected with viruses, malignant transformed cells and allogeneic cells. And, it is also involved in the occurrence of transplant rejection. Activated CD8 + T lymphocyte-mediated granulocytosis is considered to be the most significant pathway for killing "alien cells". The granzyme of the serine protease family member is the main granule component that enters the target cell after immunological recognition. Among them, Granzyme B (GzB) is extremely fast and effective and rich in content, which can induce cell death in multiple pathways. Fluorescence spectrometry has been widely used in analytical chemistry, especially in biological analysis because of its high sensitivity and selectivity. Most biological molecules have no fluorescence or weak fluorescence and low detection sensitivity. In order to make them highly sensitive, people use strong fluorescence labeling reagents or fluorescence generation reagents to label the substances which are to be tested. Meanwhile covalent or non-covalent binding substances with high fluorescence intensity are produced, which greatly increases the detection rate. In recent years, with the

development of molecular imaging, fluorescence imaging has become one of the most important method to monitor biomolecules and biological processes in living cells and living organisms, and fluorescent probes with excellent performance are the material basis for imaging analysis.
Compared with the blue or green fluorophore, the deep red or near-infrared fluorophore has stronger tissue penetration and lower spontaneous fluorescence, which is more suitable for bioimaging. Therefore, this study designed a novel near-infrared small molecular probe that can be specifically recognized and cleaved by granzyme B, using fluorescence microscope, which is the main effector of cytotoxic CD8+ T lymphocytes—Granzyme B is imaged in living cell.
Acute rejection is mainly caused by cytotoxic T lymphocyte-mediated cytotoxicity, and many literatures indicate that the expression levels of perforin and granzyme b increase in the early stages of acute rejection. Therefore, granzyme b can be used as an early predictor of acute rejection, and we designed a fluorescent probe to trace granzyme b, which can more directly and dynamically observe the role of CTL activation in transplant rejection.

PU-1451

基于 MnO2 纳米片层的增效型纳米光敏剂的构建

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光动力疗法(photodynamictherapy，PDT)作为一种新型的局部治疗方法，为肿瘤的治疗提供新的方法。二氧化锰（Manganese Dioxide，MnO2）纳米片层以其均衡的理化特性及独特的生物学效应，成为了近期纳米载药系统研发的热点。我们结合前期在光敏剂改进方面取得的成果和经验，以肿瘤微环境响应及 PDT 增效型二氧化锰纳米片层为载药系统，通过自组装方式装载光敏剂，构建了增效型二氧化锰纳米光敏剂。一方面，MnO2 纳米片层可作为光敏剂的猝灭剂可以有效提高光敏剂体内外稳定性的同时增加肿瘤荧光成像效果；作为光敏剂的载体，可装载大量光敏剂并将光敏剂靶向运送到肿瘤部位，在提高 PDT 效果的同时大幅度降低药物引起的副作用；分解生成的 Mn2+还可作为磁共振造影剂为多模态成像提供思路。通过本研究，为光动力治疗能更有效地应用于肿瘤的临床治疗提供理论依据，为后续实现诊疗一体化奠定基础。

PU-1452

Affibody molecule for Positron Emission Tomography Imaging of Human Epidermal Growth Factor Receptor: Validation in Mouse Models and Human Cancer Tissues

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Purpose: To design and evaluate whether, in xenografts with NSCLC, an affibody-based radiotracer can be quantified and imaged using positron emission tomography and to evaluated the capacity of the probe to detect EGFR expression status in clinical patients' tumor samples.
Experimental Design: Affibody ($Z_{EGFR:1907}$) was conjugated to NOTA and labeled with ^{68}Ga. Cell assays, PET/CT imaging and biodistribution or western blotting were performed in cells or tumor-bearing nude mice with different EGFR expression. Human tumor samples were collected and co-incubated with radiotracers ex vivo. The binding ability was observed by autoradiography and verified by immunofluorescence and immunohistochemistry.
Results: Binding assays performed in NSCLC cells showed significantly EGFR-specific uptake ($P < 0.0001$). In vivo PET imaging showed accumulation was preferential in EGFR-positive tumor. Blocking assay significantly reduced the tumor uptake in HCC827 xenografts. EGFR-negative H520 xenografts were barely visible by PET at any time point. Western blotting, immunofluorescence and immunohistochemistry suggested that is associated with EGFR expression level ($P < 0.01$). Autoradiography of NSCLC patients' tumor samples showed heterogeneous ^{68}Ga-NOTA-$Z_{EGFR:1907}$ distribution, and EGFR immunofluorescence and immunohistochemistry showed heterogeneous staining, partly corresponding with regions of high tracer uptake. Moreover, the overall accumulation of autoradiography was positively correlated with immunohistochemical score ($R^2 = 0.62$, $P < 0.0001$).
Conclusions: Our study demonstrates that the affibody-based radiotracer ^{68}Ga-NOTA-$Z_{EGFR:1907}$ is suitable for identification of EGFR expression status in vitro, in vivo and ex vivo. It has the potential of further exploration and clinical translation for noninvasive imaging and guide the precise targeted EGFR targeted treatment of cancer.

PU-1453

肿瘤还原微环境的磁共振成像技术

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通过影像学手段无创早期诊断胶质瘤，获取准确的分子、生理及病理等方面的信息，从而制定科学的个体化治疗方案，是建立个体化精准治疗的关键基础，对于患者意义重大。而当前早期诊断主要通过病理活检，操作复杂且风险较大，而通过影像手段无创早期定性诊断仍然是临床难点。针对当前研究中造影剂无法反映病理信息的问题，本课题利用胶质瘤强还原性与胶质瘤恶性程度的关系，通过构建的还原响应启动 MRI 探针发展胶质瘤影像学无创早期定性诊断方法。本项目所设计的纳米探针具有还原性越强，触发启动成像越快，信号变化越大的特点，因此可通过探针的程序信号变化建立的胶质瘤早期定性诊断模型。本项目研究发现，通过还原敏感聚合物 S-S-peg 修饰 IONPs，制备还原敏感 IONPs 对比剂，可实现还原触发的粒径改变及 MRI 成像效果的放大及启动切换，可定量检测肿瘤组织还原性强弱，并由此判断胶质瘤性质及用于早期诊断。此外，该纳米探针具有还原性越强，触发启动成像越快，信号变化越大的特点，因此可通过探针的程序信号变化建立的胶质瘤早期定性诊断模型。并将这些纳米对比剂应用于胶质瘤的早期诊断治疗。结果表明，通过一系列体内体外的生物学评价及成像效果考察，取得了较好的效果，本项目的顺利实施，可为新型智能造影剂

的发展提供新思路，为胶质瘤的影像学无创早期诊断提供新方法，将会对胶质瘤患者具有极大的意义。

PU-1454
基于近红外二区荧光量子点的多功能纳米探针的靶向成像与治疗

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近红外二区荧光成像信噪比更高、穿透深度更深、分辨率更高[1-3]；CT 成像则可以提供高分辨率的组织解剖学信息、检测深度不受限、且成像速度快。因此，我们将光稳定性好，荧光强度高的近红外二区荧光量子点与高原子序数，强 X 射线吸收效率的 Bi 元素结合，构建了近红外二区荧光-CT 多功能纳米生物探针，实现了小鼠体内近红外二区荧光/CT 双模靶向成像，获取更为全面的影像诊断信息。构建的多功能纳米生物探针表现出优异的近红外二区荧光特性及强的近红外（NIR）吸收，表明其具有长时间术中导航和光热治疗的潜力。

PU-1455
靶向纤连蛋白 NIR-II 荧光/NIR-I 光声双模态纳米探针用于乳腺癌及其肺转移的成像及光热治疗

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目的
肿瘤转移是乳腺癌患者死亡的主要原因。早期诊断高危乳腺癌，包括转移，需要精确的肿瘤生物标志物成像，以进行适当的治疗。纤连蛋白表达增加是上皮-间充质转化的一个重要标志，与高风险乳腺癌及其转移有关。针对目前光学成像组织穿透深度和空间分辨率的不足的问题，本文合成了一种靶向纤连蛋白的近红外二区（NIR-II）荧光/近红外一区（NIR-I）光声双模态纳米探针用于乳腺癌及其肺转移的成像及光热治疗。
材料与方法
通过有机合成手段，本文开发了基于方酸菁染料的 NIR II 荧光染料（SQ），该类荧光染料在 930 nm 具有最大吸收峰，在 1000-1100 nm NIR-II 范围内具有较强的荧光发射。针对在乳腺癌细胞膜表面过表达纤连蛋白（EDB-FN）的特点，本文利用聚乙二醇磷脂（DSPE）包裹 NIR-II 荧光染料 SQ，并引入纤连蛋白特异性结合多肽（CREKA）修饰制备了 NIR 荧光纳米探针 SQ@DSPE。
结果
该纳米探针可用于小鼠深部动脉血管的 NIR-II 荧光成像。另外，由于乳腺癌肿瘤靶向多肽的引入，NIR-II 荧光纳米点 SQ@DSPE 也可用于小鼠皮下的乳腺癌肿瘤的 NIR-II 荧光/NIR-I 光声成像及其可视化的肿瘤靶向光热治疗。
结论
本文报道了靶向纤连蛋白 NIR-II 荧光/NIR-I 光声双模态纳米探针用于乳腺癌及其肺转移的成像及光热治疗的研究。该纳米探针已成功地用于 NIR 荧光成像和 NIR-I 光声成像，用于精确的无创血管成像。通过靶向纤连蛋白，该纳米探针实现了乳腺癌及其肺转移病灶的高特异性和高敏感性诊断，并利用其优异的光热转换性能用于乳腺癌的光热治疗。因此，近红外二区纳米探针在监测和可视化血管和乳腺组织异常方面具有广阔的应用前景。

PU-1456

PET-MRI 探针对结直肠癌化疗疗效评价及光热/化疗协同增敏作用的实验研究

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目的: 构建以 IGF-1R 为靶点新型 Affibody 修饰多巴胺包覆的 PET-MRI 探针；并通过细胞和动物实验应用 PET-MRI 技术分析结直肠癌 IGF-1R 表达水平，探讨 IGF-1R 表达在结直肠癌铂类化疗疗效评价中的价值。

方法 反向微乳法合成 Fe2O3-@PDA-PEG，连接放射性核素 F，对其进行表征，并将该探针应用于活体结直肠癌小鼠模型，进行 MRI 成像及肿瘤辅助治疗研究。

结果 实验结果显示 F 能成功连接到 Fe2O3-@PDA-PEG 纳米探针上，基本无生物毒性，在动物实验模型中能提高肿瘤诊断的敏感性，并且该探针在近红外光照射下具有增敏铂类药物化疗疗效的作用。

结论 IGF-1R 靶点构建多巴胺包覆新 F-PEG-Fe2O3@PDA-PEG-ZIGF1R:4551，该探针可无创评估结直肠癌 IGF-1R 表达水平与铂类化疗药物疗效之间的相关性，并且在近红外光照射下该探针具有增敏铂类药物化疗疗效的作用。

PU-1457

Differentiation of suprasellar meningiomas from non-functioning pituitary macroadenomas by 18F-FDG and 13N-Ammonia PET/CT

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Objective: Differentiation of suprasellar meningiomas (SSMs) from non-functioning pituitary macroadenomas (NFPMAs) is beneficial for clinical management. We investigated the utility of ^{13}N-ammonia combined with ^{18}F-FDG positron emission tomography (PET)/computed tomography (CT) in distinguishing SSMs from NFPMAs in this study.

Patients and Methods: Fourteen patients with histopathologic diagnosis of NFPMAs and eleven patients with SSMs were included in this study. Every patient underwent both ^{18}F-FDG and ^{13}N-ammonia PET/CT scans. The tumor to gray matter (T/G) ratios were calculated for the evaluation of tumor uptake.

Results: The uptake of ^{18}F-FDG was higher in NFPMAs than SSMs whereas the concentration of ^{13}N-ammonia was lower in NFPMAs than SSMs. There were significant differences of ^{18}F-FDG and ^{13}N-ammonia uptake between the two groups (0.92[0.46] vs 0.59[0.29], $P<0.05$, ^{18}F-FDG; 1.58±0.56 vs 2.80±1.45, $P<0.05$, ^{13}N-ammonia). Tumor classification demonstrated a high overall accuracy of 96.0% for differential diagnosis. When the two traces were combined, only 1 SSM were misclassified into the NFPMA group.

Conclusion: SSMs and NFPMAs have different metabolic characteristics on ^{18}F-FDG and ^{13}N-ammonia images. The combination of these two tracers can effectively distinguish SSMs from NFPMAs with high confidence.

PU-1458

Application of Fluorine-19 MRI in Diabetes Research

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Introduction

Diabetes remains one of the increasing threats to human health. The failure of pancreatic beta cell function to produce insulin or loss of beta cell mass may explain the cause of the disease. Hence, non-invasive imaging techniques are recognized as a high-priority field in diabetes research to monitor beta cell mass and function longitudinally[1]. Thanks to its unique feature with no background signal and possible quantification, fluorine based contrast agents together with ^{19}F MRI technique have attracted attention in the field of cellular imaging with first successful applications in immune cell tracking for immunotherapy[2]. The purpose of this study is to explore the feasiblity and application of ^{19}F MRI technique in diabetes research.

Methods

In this study, both fluorine labelled D-mannoheptulose (19FMH) and perfluoro-5-crown-ether (PFCE) have been test *in vitro* and *in vivo* as contrast agents. For *in vitro* experiment, beta cell like INS-1E cell and pancreatic islets isolated from Wistar rat were included for the determination of vability, uptake efficacy and functionality of the iselts/cells after labelling. For *in vivo* longitudinal study, different labeling strategies (*in situ* and *ex vivo*) and transplantation methods (intravenous and subcutaneous) are used on Swiss nude mice. All MRI were performed using 9.4T Biospec small animal MRI system equipped with a home-made surface coil tunable and matchable to both ^{1}H and ^{19}F.

Results

We have successfully set up a quantifiable ^{19}F MRI imaging platform for both *in vitro* and *in vivo* experiments. With optimized labelling protocol, *in vitro* results confirmed good uptake of fluorinated contrast agents by islets/ cells without affecting their functionality and morphology. Immediately after the transplatation of contrast agents, clear ^{19}F signal showed up in *in vivo* images. Follow-up scans further confirmed the feasibility of longitudinal study using ^{19}F MRI as the signal could last for up to three weeks.

Conclusions

As conclusion, ^{19}F MRI is a potential powerful tool for tracking, monitoring and quantification of pancreatic islets/ cells in diabetes research and beyond. Future work by cross validate with other imaging modalities may help to improve its limitations in terms of sensitivity, resolution and specificity of the individual ^{19}F MRI method.

PU-1459
活体生物发光成像监测 JNK/c-Jun:ATF2 信号通路 介导的肿瘤顺铂耐药

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目的 探索 JNK/c-Jun:ATF2 信号通路在肿瘤顺铂（CDDP）耐药中的作用，进一步通过活体生物发光成像监测该通路在肿瘤 CDDP 治疗后的动态变化。
方法 首先，10 μM CDDP 或 DMSO 处理 Hep 3B 肝癌细胞后，检测 p-JNK、p-c-Jun、p-ATF2 的水平，并检测 c-Jun:ATF2 结合元件 ATF 的活性以及其调控的 DNA 损伤反应（DDR）相关基因的 mRNA 水平。进一步，使用 JNK 抑制剂 SP600125 或 ATF-decoy 抑制该信号通路，检测它们能否与 CDDP 发挥协同杀伤 Hep 3B 细胞的作用。最后，分别将 CMV-Luc2（反映肿瘤细胞数目）和 ATF-Luc2（反映 ATF 元件的绝对活性）报告基因标记的 Hep3B 细胞种植到裸鼠皮下，腹腔注射 CDDP（10 mg/kg）或 PBS 后，活体生物发光成像检测 ATF 元件活性的动态变化。
结果 CDDP 处理组的 p-JNK、p-c-Jun 和 p-ATF2 的水平均高于对照组；CDDP 处理 12 h 后，ATF 元件活性增强；部分 DDR 相关基因 mRNA 水平在 CDDP 处理 12 h 或 24 h 后上调。SP600125 或 ATF-decoy 联合 CDDP 处理 Hep 3B 细胞 36 h 后，双链 DNA 损伤标志物（H2AX、p-H2AX）及细胞凋亡标志物（cleaved-caspase 3、cleaved-PARP）的蛋白水平增加。活体生物发光成像结果显示，药物处理 12 h 后，CDDP 处理组的 ATF-Luc2/CMV-Luc2 比值（反映 ATF 元件的相对活性）是 PBS 处理组的 1.7 倍。
结论 CDDP 给药导致肿瘤细胞 JNK/c-Jun:ATF2 信号通路激活、c-Jun:ATF2 结合元件 ATF 活化以及其调控的 DDR 相关基因的 mRNA 水平上调；抑制 JNK/c-Jun:ATF2 信号通路能增加肿瘤细胞对顺铂的敏感性；活体生物发光成像证实 CDDP 给药后肿瘤 JNK/c-Jun:ATF2 信号通路激活。

PU-1460
近红外荧光有机纳米颗粒用于肿瘤长期监测和光动力治疗

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目的 开发一种近红外荧光生物成像和光动力疗法结合的单分子药物，用于肿瘤长期检测和光动力治疗。
方法 设计合成新型光敏剂（TPVTR），包封在 Pluronic F127 中以制备 NIR 荧光有机纳米粒子 TPVTR dots。用 ABDA 作为指示剂检测 TPVTR 细胞外 ROS 产生能力。用 HepG2 细胞作为实验对象，进行 TPVTR dot 细胞内吞，细胞成像和长期监测实验。TPVTR dots 的细胞内 ROS 产生能力使用 DCFH-DA 检测试剂盒测定。细胞活力采用 CCK-8 法检测。用皮下荷 HepG2 肿瘤裸小鼠为动物模型评价 TPVTR dots 的体内荧光示踪和光动力治疗效果。
结果 制备了 NIR 有机纳米粒子 TPVTR dots。其荧光发射光谱范围在 600 至 900nm，峰值为 695 nm，属于近红外区。ABDA 和 TPVTR dots 混合物的吸光度照射 270 秒后减少 72%,没有混合 TPVTR dots 的 ABDA 仍然约为 90%。TPVTR dots 可以进入细胞，积聚在胞浆中，显示红色荧光。用 TPVTR dots 标记的 HepG2 细胞 16 天后仍然可以观察到荧光。TPVTR dots 标记后的 HepG2 细胞注射后 8 天，小鼠移植肿瘤细胞的部位仍然可以检测到荧光信号。HepG2 细胞和 50μMTPVTR dots 共培养，活力仍然接近 80%。HepG2 细胞用 25μMTPVTR dots 共培养后施加激光照射，存活率急剧下降至 50%以下。PDT 治疗组组的肿瘤在 21 天后明显消融。

结论 设计和合成一种近红外发光有机荧光小分子，TPVTR。制备了相应的有机荧光纳米粒子，TPVTR dots，具有近红外发射，大的斯托克斯位移（210 nm），非常出色的光稳定性，良好的生物相容性，适用于体外和体内长期细胞追踪。此外，TPVTR dots 在体内外有良好的 PDT 效果，揭示 TPVTR dots 是一种有潜力的荧光成像介导癌症治疗的试剂。

PU-1461
近红外吸收有机纳米粒子的肿瘤光声成像和光热治疗研究

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目的 构建一种基于近红外吸收有机纳米粒子用于光热治疗（PTT）和光声成像（PAI）。
方法 设计构建近红外吸收有机小分子 TPTHM。将 TPTHM 封装在 Pluronic F127 中以制备有机纳米颗粒（TPTHM NPs）。通过测量在连续 808nm 激光照射下 NPs 水分散体的温度随时间的变化而变化计算光热转换效率。用 4T1 细胞作为实验对象，进行 TPTHM NPs 的细胞内吞，PAI 和 PTT 性能测试。用皮下移植 4T1 肿瘤小鼠为动物模型，研究 TPTHM NPs 的体内 PAI 和 PTT 效果。
结果 合成并制备了近红外吸收有机纳米粒子 TPTHM NPs。其具有近红外吸收，吸收峰在 695nm 和 758nm。TPTHM NPs 的光热转换效率达到 38%。与 TPTHM NPs 共培养的 4T1 细胞表现出明显的 PA 信号，其比未处理的 4T1 细胞亮 9 倍。TPTHM NPs 注射 10 分钟后，荷瘤小鼠肿瘤区域中的 PA 信号显着增加，信号与背景比为 3。TPTHM NPs 共培养，没有 NIR 辐射条件下，细胞的代谢活性仍保持约 90%；TPTHM NPs 共培养后，NIR 照射条件下，细胞的代谢活性显著降低。小鼠接受 TPTHM NPs 注射与激光放射治疗组合显示出显着的肿瘤抑制和完全肿瘤消融。PTT 治疗组中的小鼠存活超过 50 天而没有复发。其他三组小鼠的肿瘤大小迅速增长，39 天后没有小鼠存活。
结论 合成了一种新型近红外吸收有机小分子（TPTHM）。制备了相应的有机纳米粒子，TPTHMNPs。其具有高光热转换效率（38%），近红外吸收，高光稳定性和良好的生物相容性，可以应用于体外和体内的光热治疗。此外，TPTHM NPs 在体外和体外都表现出强光声信号。这些结果表明 TPTHM NPs 是潜在的 PAI/PTT 试剂。这项研究开发了有前途的 PAI/PTT 制剂，为生物成像和进一步的图像引导临床应用提供了策略。

PU-1462
粘度响应的溶酶体靶向近红外荧光探针及其应用

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目的 开发一种新型粘度响应的溶酶体靶向近红外荧光探针，用于溶酶体的荧光成像以及检测溶酶体的粘度变化。
方法 以 4-二甲基氨基肉桂醛和苯并噻唑-2-乙腈为原料，设计合成近红外荧光探针 Lyso-BTC。表征其结构和不同粘度下的光学性能。选择 PC3 细胞作为模型细胞，采用 CCK-8 法进行细胞毒性研究。用市售的 Lyso-Tracker Green 进行共定位实验，激光共聚焦显微镜观察目标荧光探针活细胞靶向溶酶体成像。在连续激光照射下，Lyso-BTC 标记的 PC3 细胞以 30s 时间间隔拍摄图像，通过 ImageJ 软件比较每个图像的荧光强度进行光稳定性研究。用氯喹诱导细胞溶酶体粘度改变，同时用目标荧光探针进行溶酶体粘度变化的监测。
结果 合成了一种全新的近红外荧光探针 Lyso-BTC。研究发现随着体系的粘度增加，Lys-BTC 的荧光强度显着增强。yso-BTC 在含有 99%甘油的溶液中比在纯 DMSO 中的强度增强约 5.4 倍。在细胞

中共孵育的 Lyso-BTC 的浓度增加至 20μM，细胞活力仍保持在 80%以上。Lyso-BTC 的红色荧光与 Lyso-Tracker Green 的绿色荧光非常好地重叠，强度散点图显示出良好的相关性，Pearson 共定位系数为 0.91，线性 ROI 的强度分布也显示出紧密的同步性。在连续激光照射超过 8 分钟后，来自 Lyso-BTC 的红色荧光信号保持大于 89%。当细胞与氯喹一起孵育然后用 Lyso-BTC 处理，观察到红色荧光强度增加 3.1 倍。

结论 Lyso-BTC 表现出大的斯托克斯位移（~180nm），近红外（NIR）发射（685nm），良好的生物相容性，优异的光稳定性和对粘度的荧光响应。此外，体外研究的结果显示 Lyso-BTC 是溶酶体靶向的，并且可以用于检测由氯喹处理引起的溶酶体的粘度变化。这些结果证实 Lys-BTC 可用于监测活细胞中的溶酶体粘度变化，是一种新型的粘度响应的溶酶体靶向荧光探针

PU-1463
聚碘海醇-多巴胺纳米颗粒在 CT 成像引导光热治疗中的应用

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癌症已成为威胁人类健康的主要因素之一，发展可用于体内 CT 成像和抗肿瘤治疗的新型纳米粒子具有重要意义。针对目前小分子造影剂肾脏清除速度快、体内循环时间短等问题，本研究采用简单的合成方法制备了新型聚碘海醇-多巴胺纳米粒子，用于体内 CT 成像和抗肿瘤光热治疗。聚碘海醇-多巴胺纳米颗粒的制备方法较为简单，容易获取，具有良好的 CT 成像能力和光热治疗效果，可作为上消化道和下消化道 CT 成像的对比剂，能较清晰地显示消化道细节，延长对比剂在体时间；此外，该纳米粒子还可作为体内抗肿瘤光热治疗剂，通过近红外激光照射进行肿瘤治疗，控制肿瘤的生长甚至消除肿瘤。本研究制备的聚碘海醇-多巴胺纳米颗粒具有低毒性、良好的生物相容性、较好的 CT 成像能力和有效的光热治疗等特点，具有广阔的应用前景。

PU-1464
超顺磁锰铁氧化物纳米粒的合成及其在巨噬细胞中的代谢研究

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目的 合成并表征铁锰氧化物纳米粒，评价其对巨噬细胞的毒性效应，研究其在巨噬细胞内的代谢过程。

方法 采用高温热解法合成铁锰氧化物 NPs，并进行 TEM、EDS 及 ICP-AES 表征。以不同浓度的 NPs 标记 RAW264.7 巨噬细胞，采用 CCK-8 法测定 NPs 的细胞毒性、流式分析 NPs 的促细胞凋亡作用及普鲁士蓝染色分析细胞的标记率；连续传代 NPs 标记的细胞，普鲁士蓝染色及 ICP-AES 检测细胞内 Fe 和 Mn 变化趋势；抽提 NPs 标记细胞 RNA，qRT-PCR 分析细胞内金属稳态相关基因表达特点。

结果 TEM 显示其为球形颗粒，单分散性良好，平均粒径约 8.5nm，EDS 显示 NPs 由 Fe、Mn 和 O 元素，ICP-AES 显示 Fe/Mn 比例约为 2.8。CCK-8 及流式分析显示 160μM NPs 处理导致细胞倍增时间及凋亡率分别增加 10.8h 和 20.7%，在浓度低于 40μM 时，NPs 对细胞无明显毒性效应。160μM 的 NPs 标记细胞 24h 时细胞内 Fe 和 Mn 含量分别为 6.5 和 1.1pg/细胞，传至第 2 代时分别为 0.82 和 0.07 pg/细胞，在第 6~8 代时细胞内 Fe 和 Mn 水平与对照组水平一致。qRT-PCR 结果显示，在 NPs 处理的 24h 内，FPN 高表达，促进 Fe 和 Mn 的外排，而 FtH、DMT1、IRPs 和 ZIP14 表达均受抑

制，阻止摄取及存储；细胞继续培养至 48h 时，所有被测基因均高表达；在 72h 时，DMT1 和 SPCA1 表达水平受抑制，而 ZIP14 接近对照水平，FPN、Hamp2、FtH 和 IRPs 均高表达。

结论 铁锰氧化物 NPs 对细胞的存活率、凋亡率及标记率具有时间及浓度依赖性，NPs 标记巨噬细胞后培养至第 6~8 代时细胞内 NPs 可完全代谢排出，参与维持细胞内金属稳态的基因包含 FPN、Hamp2、FtH、DMT1、IRPs、ZIP14 和 SPCA1，基因表达水平的改变程度与 NPs 标记浓度相关，且随时间动态变化。

PU-1465
氧化铁纳米粒团簇的形貌控制合成及其磁共振成像性能研究

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目的：通过热分解法合成氧化铁纳米粒团簇，改变反应参数控制氧化铁团簇的形貌，并利用柠檬酸修饰纳米粒团簇，构建 MRI 纳米探针，考察所制备的 MRI 探针的体外磁共振弛豫性能，筛选出具有高弛豫率的纳米探针，并表征其生物相容性与活体成像效果。

方法：以羰基铁（$Fe(CO)_5$）为前驱体，在油酸和氟化钠的作用下，热分解法合成不同形貌的氧化铁纳米粒团簇，透射电子显微镜（TEM）表征纳米粒团簇的形貌及微观结构，X 射线衍射仪（XRD）确认纳米粒团簇的物相组成，振动样品磁强计（VSM）分析纳米粒团簇的磁性能。选用柠檬酸（CA）为配体修饰纳米粒团簇，使其具有良好的水分散性，标定浓度后，采用 3.0 T 磁共振扫描仪研究其 T_2 弛豫性能。以人肝癌细胞 HepG2 和人肺癌细胞 A549 为细胞模型，采用 cck8 法评估纳米探针的细胞毒性；以 C57 小鼠为动物模型，尾静脉注射纳米探针后，在不同时间段行 T_2 扫描，分析活体成像效果。

结果：通过改变油酸用量，可以方便地控制合成产物的形貌和尺寸，得到八足、立方和球形氧化铁纳米粒团簇；XRD 分析表明纳米粒团簇的主要物相为 Fe_3O_4 或 γ-Fe_2O_3；M-H 曲线表明，各种形貌的氧化铁团簇均为超顺磁性；体外 MRI 成像结果显示，各种形貌氧化铁团簇均具有较高的 r_2 弛豫率，其中八足团簇的 r_2 最高，达 476 $mM^{-1}s^{-1}$，均为优良的 T_2 造影剂。细胞毒性实验结果表明，被不同浓度的氧化铁纳米粒团簇孵化不同的时间以后，细胞活性始终保持 90%以上，说明氧化铁纳米粒团簇的细胞毒性较低，可以应用于生物体内。动物成像结果表明，注射后比注射前的图像明显偏暗，信号有明显的减弱，小鼠肝脏部位的信号减弱更加明显，表现出明显的造影效果。

结论：本研究通过控制反应物用量，可以方便地合成氧化铁团簇并控制其形貌；所制备的氧化铁团簇均具有较高 r_2 弛豫率，以该团簇构建的 MRI 探针，具有良好的生物相容性和活体 T_2 造影效果。

PU-1466
TARGET EFFICIENCY OF FITC-NGR-GD PROBE TO HEPG2 CELLS IN VITRO

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Objective: To construct FITC-NGR-Gd targeted contrast agents and observe its targeting efficiency to HEPG2 cells in vitro.

Methods: To use amide linkage to chemically synthesize the stable connector of FITC-NGR-Gd. To establish HEPG2 experimental group and HT-29 control group for cell fluorescence assay and observe the targeting efficiency of contrast agent to HEPG2 in vitro. To establish HEPG2 experimental group and HT-29 control group for cell in vitro MRI test, change the gadolinium concentration and observe the targeting efficiency of contrast agent to HEPG2 in vitro by measuring changes in T1 values.
Results: FITC-NGR-Gd has a higher T1 relaxivity; immunofluorescence assay shows that in the cell test, HEPG2 experimental group has more CY3 targeted red fluorescence on the surface of cell membrane and the HT-29 control group has no marked red fluorescent substance on the cell membrane; FITC-NGR-Gd cell fluorescence assay shows that HEPG2 experimental group has more green FITC targeted fluorescence on the surface of cell membrane and HT-29 control group has no marked green fluorescent substance on the cell membrane. In vitro the cell MRI test shows T1 values of HEPG2 experimental group are significantly higher than that of HT-29 control group, P <0.05. There is statistically significant difference between two groups. With the increasing concentrations of gadolinium, T1 values of experimental groups increase progressively and the intensity enhances.
Conclusion: FITC-NGR-Gd can take HEPG2 cells as target in vitro and realize targeted fluorescence imaging and MRI imaging.

PU-1467

磁共振动脉粥样硬化斑块分子成像新进展

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动脉粥样硬化是心血管疾病和死亡的主要原因。在过去的 20 年中，越来越多的研究关注于动脉粥样硬化斑块的早期检测和监测。在几种有创和无创的成像方式中，磁共振成像(MRI)是一种很有前途的选择。其优点包括它的通用性，良好的软组织对比斑块表征和缺乏电离辐射。在这篇综述中，我们将结合高分辨磁共振分子成像和分子探针技术讨论动脉粥样硬化斑块成像的最新研究进展。

PU-1468

组织蛋白酶 B 响应性纳米探针用于三阴性乳腺癌多模态成像介导下的光疗

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目的 基于组织蛋白酶 B（cathespin B，CathB）在三阴性乳腺癌（TNBC）中高表达的特性，构建集 CathB 响应性近红外荧光成像、MR 成像、光声成像、光热治疗、光动力治疗为一体的靶向探针 Pep-SQ@USPIO，并将其用于多模态成像引导下的光动力/光热治疗。
方法 制备萘二甲酰亚标记的、内含靶向肽 CREKA 序列及可被 CathB 特异性剪切的 GFLG 序列的方酸菁近红外染料多肽探针 Pep-SQ。将 Pep-SQ 与 USPIO 复合形成 Pep-SQ@USPIO，复合后 USPIO 吸收光谱可淬灭相应荧光光谱；当 CathB 剪切 Pep-SQ@USPIO 中 GFLG 序列，USPIO 与荧光基团解离，荧光恢复。体外行探针表征，验证荧光信号“开-关”响应性。激光扫描共聚焦成像、荧光酶标仪检

测等明确不同细胞系中探针定位、荧光强度。建立不同分化程度荷瘤鼠模型，通过小动物光声成像系统、活体小动物荧光成像仪、11.7T 小动物磁共振观察成像效果。体内外观察探针光动力/光热治疗效果。

结果 该纳米探针有较好的分散性、稳定性、生物相容性。吸收光谱显示探针可被 CathB 剪切分离成单体，近红外荧光恢复。探针单体具有光动力效应，聚集时光热效应增强。与探针共孵育后，高表达 CathB 的 MDA-MB-231 细胞荧光强度显著高于 CathB 低表达的 MCF-7 细胞。体内成像显示 TNBC T2 变化值、光声、荧光信号强度明显高于其他类型乳腺癌，以荧光信号强度差异最为显著。体内、外光疗结果显示，探针能显著抑制肿瘤生长。

结论 纳米探针 Pep-SQ@USPIO 能特异性靶向 TNBC 肿瘤区域并发挥 MR/光声成像效果，在 TNBC CathB 高表达环境下探针近红外荧光被“点亮”，显著提高 TNBC 检出灵敏度。该探针同时可发挥光热、光动力治疗作用，实现 TNBC MR/近红外荧光/光声成像及多模态成像引导的可视化光动力/光热治疗。

PU-1469
SR-AI 靶向的多模态纳米探针对动脉粥样硬化斑块的分子影像研究

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目的 通过构建一种靶向的双模态成像纳米探针，实现对动脉粥样硬化（atherosclerosis，AS）易损斑块形态和成分性质的早期诊断和无创动态监测。

方法 本研究利用泡沫巨噬细胞表面高表达的清道夫受体 AI（scavenger receptor-AI，SR-AI）作为分子探针靶点，以 Gd 修饰的纳米金簇（nanoclusters, NCs）作为载体，构建靶向 SR-AI 的磁共振（MR）/荧光双模态纳米探针(PP1-Au@GSH@Gd NCs)，并明确探针的表征、生物相容性和在体内组织器官的生物学分布。建立 $ApoE^{-/-}$ 小鼠动脉粥样硬化模型，利用 MR 和荧光成像分别从细胞和在体水平观察探针在斑块的分布，通过活体成像评估动脉粥样硬化斑块的负荷和性质，并进行组织学定量分析验证。

结果 本研究合成的 PP1-Au@GSH@Gd NCs 纳米探针具有良好的胶体稳定性和生物相容性，适合作为易损斑块分子成像的造影剂。体外细胞结合实验表明，PP1-Au@GSH@Gd NCs 对泡沫巨噬细胞具有很高的亲和力。体内 MR/荧光双模态成像结果显示，注射分子探针 24 小时后，$ApoE^{-/-}$鼠主动脉易损斑块处 T1WI 信号及荧光信号均显著增强。斑块组织切片镀银染色证实 PP1-Au@GSH@Gd NCs 在血管壁易损斑块处明显聚集。

结论 本研究构建的多功能纳米探针 PP1-Au@GSH@Gd NCs 可准确靶向具有易损倾向的斑块，为实现真正意义上的易损斑块分子水平早期诊断提供了理论依据和实验证据支持，在 AS 易损斑块临床诊疗中有非常广阔的应用前景。

PU-1470
靶向载药多功能脂质体对动脉硬化不稳定斑块的诊疗一体化研究

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目的 在动脉硬化（AS）靶向探针研究的基础上[1]，构建靶向不稳定斑块的多功能脂质体 CD38-US-Lip，测定该纳米载体的性质表征，并从体内及体外两个层面，评价其对不稳定斑块的影像监测和极化逆转作用，探讨其作用机制。

方法 （1）构建共载 MRI 对比剂 USPIO 和辛伐他汀的纳米脂质体，并通过 CD38 单克隆抗体进行修饰，形成靶向不稳定斑块的多功能脂质体 CD38-US-Lip。（2）测定 CD38 靶向多功能脂质体的表征。（3）评估 CD38 靶向多功能脂质体在体外对 M1 型巨噬细胞和血管内皮细胞的靶向结合能力、MRI 成像能力和巨噬细胞极性诱导作用（图 1）。（4）采用球囊损伤+高脂饲料法建立家兔 AS 模型，通过 MRI 成像及病理检测的方法测定斑块组织的 CD38 表达情况。（5）研究 CD38 靶向多功能脂质体在家兔模型中的药代动力学、体内分布以及 MRI 靶向造影诊断功能（图 2）。（6）检测 CD38 靶向多功能脂质体的体内逆转斑块炎性情况，并结合分子影像学及组织生物学评估 CD38-US-Lip 对家兔 AS 模型不稳定斑块的诊断、治疗、监测功能。

结果 新型 CD38-US-Lip 靶向载药多功能脂质体可用于 AS 不稳定斑块的磁共振成像及药物治疗后斑块变化的疗效检测，其可有效结合 M1 型巨噬细胞和血管内皮细胞并在体外使 T2WI 信号明显减低，而且载他汀类药物的多功能脂质体可诱导 M1 型巨噬细胞向 M2 型转化。体内实验表明，该多功能脂质体可与家兔 AS 模型不稳定斑块靶向结合，并作为新型多功能脂质体用于不稳定斑块的诊断、治疗、监测功能。

结论 本研究率先将不稳定斑块中 M1 型巨噬细胞的靶向造影与极化治疗相结合，综合运用分子影像学、纳米技术及免疫调节等手段，以实现对 AS 不稳定斑块的诊断、早期治疗和实时监测作用。

PU-1471

MR Ventriculography by Upconversion Nanoprobes across the Blood-CSF Barrier

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Purpose: The goal of this study was to explore a novel contrast agent to realize non-invasive MR cisternography.

Method and materials: In this work, we developed a novel dual-targeting MR imaging nanoprobe - UCNPs (ANG/PEG-UCNPs) by labeling Angiopep-2 (ANG, TFFYGGSRGKRNNFKTEEY) on UCNPs through a PEG linker. Its ventricular imaging function was demonstrated both in animal model and in vitro blood-cerebrospinal fluid barrier model while the PEG-UCNPs and Gd-DTPA group were set as control group. Moreover, the cytotoxicity of as-synthesized UCNPs was assessed by a typical 3-(4,5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide (MTT) reduction assay.

Results: T1-weighted MR signal intensity of the ventricular system was dramatically increased in the ANG/PEG-UCNPs injection group compared to the PEG-UCNPs and Gd-DTPA group under the same experimental conditions. In contrast, both PEG-UCNPs and Gd-DTPA failed to delineate the ventricular system. Besides, it showed well ability to pass through the blood–cerebrospinal fluid barrier (BCB) in vitro blood-cerebrospinal fluid barrier model, while the cell viabilities are above 80% after 24 h incubation with ANG/PEG-UCNPs at concentrations ranging from 0 to 1000 μg/mL.

Conclusion: ANG/PEG-UCNPs could cross BCB and realize cisternography in MR imaging, with a negligible toxicity. Such a MR imaging nanoprobe is believed to be able to provide a safe and effective method for locating the site of the CSF leakage correctly before operation, which can help to plan a more appropriate treatment and minimize the number of procedures. Besides, other applications in diagnosis of CSF and ventricle-related diseases remain to be explored, and even the diagnosis and treatment can be

integrated as intraventricular tumors are difficult to get well treated due to the difficulty in penetrating the BCB.

PU-1472
Survivin-Loaded Gold Nanocage Probe for Targeted Bimodal Imaging of Pancreatic Cancer

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Pancreatic cancer is one of the most common cancers of the digestive tract [1]. According to the latest statistics, pancreatic cancer accounts for 94% of the cases (n=432,000), making it the seventh most deadly cancer [2]. It is expected to rise to the fourth in the future [3]. To develop an effective approach to diagnosis pancreatic cancer in an early stage has certain economic and social significance.

Methods: In this study, a survivin-loaded gold nanocage probe (Sur-AuNC•Gd-Cy7) was constructed for targeting imaging and treatment of pancreatic cancer. As shown in Schematic 1, gold nanocages were fabricated as the carriers to load Gd-DOTA inside the holes. Polythylene glycol (PEG) was modified on the surface to increase their biocompability. Survivin oligonucleotide and Cy7 fluorescent agent endowed the probes with the ability of targeting and fluorescence imaging. In vitro and in vivo experiments were observed to evaluate its antitumor effect and targeting imaging.

Results: This survivin-loaded gold nanocage probe, with core size of around 35 nm and hydrodynamic size of about 55 nm, was an effective injectable nano-delivery System. Sur-AuNC•Gd-Cy7 probes showed superior pancreatic cancer cell apoptosis- promoting effect. The apoptosis of pancreatic cancer cells may related with the consequent intracellular ROS overload. Also, the Sur-AuNC•Gd-Cy7 probes exhibited effective target Magnetic Resonance Imaging and near-infrared fluorescence imaging.

Conclusions: Our studies demonstrated that the appropriate design and preparation of nanoprobes enables the generation of better anticancer nanomedicines, which may providing an efficient approach for pacreatic cancer diagnosis.

PU-1473
MR 靶向动脉粥样硬化斑块中 Tenascin-X 体内成像的实验研究

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目的 探讨 Tenascin-X 靶向 USPIO 分子探针在主动脉斑块中的 MR 体内成像的可行性，为分子成像的扩展进一步提供实验研究。

方法 高脂饲养雄性 40 只 $ApoE^{-/-}$小鼠建立动脉粥样硬化动物模型，分别于喂养的第 30 周进行 7.0 磁共振扫描，扫描前随机将其分为实验组和对照组，每组各 20 只，每组小鼠在未打药前均进行首次腹主动脉扫描。扫描结束后实验组通过尾静脉注射由化学偶联法合成的靶向 TNX 的磁共振成像探针（anti-TNX-USPIO），对照组注射单纯的超微超顺磁性纳米氧化铁颗粒（USPIO）。于注射 12h 后再次进行 MR 成像，采用标准化相对信号改变率来计算斑块相对信号改变量。成像结束后取出小鼠腹主动脉标本进行 TNX 免疫组化染色和普鲁士蓝染色，观察斑块内 TNX 的表达和铁颗粒的沉积并分析斑块的信号改变。

结果 实验组打药后 12h 斑块信号降低较对照组明显，并且斑块信号改变率较对照组具有统计学意义（实验组 12h：-24.98±13.54% vs 对照组 12h：-4.88 ±3.08%，F=23.152，P＜0.001＝。免疫组化染色显示实验组和对照组斑块中均存在 Tenascin-X 表达及普鲁士蓝铁颗粒沉积，并且普鲁士蓝染铁颗粒在实验组斑块中明显高于对照组。

结论 anti-TNX-USPIO 探针可活体检测动脉粥样硬化斑块中 Tenascin-X 的表达，且斑块的相对信号改变率为斑块中 TNX 的吸收提供一种定量的评估方法。为动脉粥样硬化分子成像进一步奠定了基础。

PU-1474
标记树突棘钙信号的特异型分子探针的构建及其在功能成像中的应用

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目的 构建树突棘特异性钙离子探针，实现大脑神经元单个突触水平的功能成像。**方法** 基于树突棘特异性分布的乙酰胆碱受体亚基（Dα7）和遗传型钙探针（GCaMP5G），利用基因重组的方法设计合成了一种能特异性标记树突棘钙信号的探针 Dα7-GCaMP5G。然后以果蝇运动视觉神经元为模型，使用 UAS/Gal4 基因操作系统，在果蝇运动视觉神经元中垂直感受神经元（LPTC-VSs）上测试了 Dα7-GCaMP5G 对活体果蝇神经元树突棘的标记特性。最后，采用双光子成像系统对 VS 树突棘进行在体成像研究，分析了单个树突棘对运动视觉方向刺激的响应特性，包括方向选择性、强度特性以及钙衰减动力学特性。**结果** 1）免疫荧光染色结果显示，Dα7-GCaMP5G 特异性分布在高级树突分枝的尖端区域，而胞体、树突区域只标记到少许膜结构，轴突则基本不被标记。2）双光子活体成像结果显示，当给果蝇提供垂直向下的运动视觉刺激时，被荧光标记的 VS 树突棘发生明显的荧光亮度的变化，并且其钙信号响应（ΔF/F）曲线与典型的钙信号响应曲线相符。3）功能成像分析结果展示，在方向选择性方面，VS 树突棘的方向选择偏好和其胞体的方向选择响应特征一致，即 VS 神经元的胞体和大多数 VS 树突棘都表现出对垂直向下运动的偏好性（>75%）。在钙信号响应强度方面，树突棘的平均响应强度与树突、胞体的平均响应强度没有显著差异（P<0.05）。另外，在钙信号衰减动力学分析中发现，与胞体和树突相比，树突棘钙峰的衰减时间显著较短（P<0.05）。**结论** 本研究成功合成了一种能标记树突棘钙信号的特异性探针，并利用 Gal4/UAS 系统实现了果蝇运动视觉神经元 VS 树突棘的特异性标记以及单个树突棘的功能成像。这项研究不仅对具体理解突触可塑性的分子机制及突触功能的特异性有重要意义，而且也为我们理解神经网络功能基础和脑功能提供了一个窗口。

PU-1475
磁粒子成像（MPI）的当前发展与临床应用前景

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磁粒子成像（MPI）是一种全新的基于断层影像技术检测超顺磁性氧化铁纳米颗粒（SPIONs）空间分布的示踪方法。MPI 具有三维成像，高时间分辨率、高空间分辨率和高灵敏度，且无电离辐射危害的优点。此外，使用的示踪剂不含肾毒性和造成全身系统严重副作用的物质。MPI 成像不显示解剖结构，无背景信号干扰，信号强度与示踪剂浓度成比例，是一种可以获得定量数据的检查方法。这些特性预示着 MPI 具有医学应用潜力。现在 MPI 已进入了临床前期阶段，探索其在医学中的应用因此成为了研究重点。目前主要探索研究有血管成像与介入治疗；靶向成像：干细胞追踪、标记红细胞、免疫相关影像、鉴别动脉粥样硬化易损斑块、肿瘤影像诊断；肿瘤治疗；功能性神经影像等。MPI 除了可以进行静态和动态成像外，产生的磁场还可作用于磁性材料，拉、推、折弯和扭曲磁性材料。这些可能导致全新的应用，如磁性微机械的驱动或医疗设备的导航等。相信 MPI 在今后几年一定会经历一个高速发展期，一旦成熟的理论框架形成并通过安全可靠的设备实现功能，MPI 在临床诊断和治疗等领域必将发挥重要作用。

PU-1476

9.4T 23Na MRI 监测 EGFR 突变非小细胞肺癌

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目的 肺癌目前已经成为中国发病率和死亡率双第一的癌症，以诊断的肺癌中 85%为非小细胞肺癌，由于受呼吸运动及心脏和肺动脉搏动的影响，有关肺癌的磁共振研究还很少。钠（^{23}Na）在肿瘤异常生物学行为中发挥的重要作用。^{23}Na *MRI* 可在体检测生物组织中钠离子浓度及其分布情况，可用于诊断疾病和评估疾病的预后及治疗效果。本实验旨在探究 9.4T ^{23}Na MRI 在监测 EGFR 突变非小细胞肺癌（NSCLC）中的价值。

方法 配置不同浓度的加入 4%凝胶的 Nacl 胶体液和不加凝胶的 Nacl 溶液水膜，模拟细胞内外钠离子状态，应用 9.4T 小动物磁共振成像系统，UTE-SQ/TQ 序列进行组织总钠/细胞内钠成像，应用 Matlab 绘制 TSC（组织钠浓度）、ISC（细胞内钠浓度）与 SNR（信噪比）回归曲线。在动物水平，建立 NSCLC EGFR 突变细胞系 H1975 裸鼠皮下瘤模型，肿瘤体积达到 300mm^{3}后，每三天进行一次 UTE-SQ/TQ 和 DWI 成像，对肿瘤区（避免坏死区）TSC、ISC、ADC 进行定量分析，并比较 TSC、ISC 值变化趋势与 ADC 值的关系。在细胞水平，配置不同浓度的 Nacl 溶液与 H1975 细胞共孵育进行 CoroNa 染色，通过荧光强度定量分析 H1975 细胞内钠浓度。

结果 水膜成像得到 TSC 与 SNR 的回归曲线为 y=320.66x+5512.8，R^2=0.9962,ISC 与 SNR 的回归曲线为 y=57.725x+5820.6，R^2=0.9989。在动物水平成像显示，TSC、ISC 值与肿瘤体积成正相关，TSC 增加 1.89mM/d,而 ADC 值无明显变化。CoroNa 染色得到了与 ^{23}Na *MRI* 相符合的结果。

结论 应用 UTE-SQ/TQ 进行 ^{23}Na *MRI* 得到满意的图像，并可以进行定量分析，获得钠离子浓度及细胞内外钠离子的分布进行早期监测。本实验为以后应用 ^{23}Na *MRI* 进行肺癌的临床诊断和疗效监测奠定了基础。

PU-1477

Application of dendritic nano-material loaded with 2,4,6-Triiodobenzoic acid in the CT imaging of cancer

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Prupose:

CT (computed tomography) is one of the most widely used clinical diagnostic methods in modern medicine and plays an important role in the diagnosis and treatment of cancer. At present, the most commonly used contrast agent is 2,4,6 -triiodobenzoic acid (TIBA) and its derivatives. Although it can greatly improve the diagnosis of cancer, there are still some defects: (1) it has small molecular weight and size, which resulting the metabolism in the body is too fast; (2) the in vivo distribution is not specificity, and iodine atoms density in the tumor site is low; (3) a large number of contrast agents show through serious damage on kidney, leading to serious side effects. Therefore, in view of the current insufficiency of CT iodine contrast agent, this study is aimed to further optimizae the dosage form, local density of iodine atom and the molecular weight to improve its diagnostic efficiency for cancer.

Method and materials:

Polyamidoamine (PAMAM) is one of the most widely used dendritic molecules, and as a carrier has been used in the study of CT contrast agents, whose biocompatibility has been effectively assessed. Thus, in this study, we loaded 2,4,6-TIBA on the surface of PAMAM and modificated with Polyethyleneglycol (PEG). Furthermore, the molecular structure was identified by the magnetic resonance hydrogen spectrometry, and the physical and chemical indexes such as hydration particle size and zeta potential were obtained. At last, we examined the biocompatibility of the new nano-material in vitro and in vivo.

Result:

The density of the iodine atom in nano-materials of DEN-TIBA-PEG is increased exponentially. PEG modification of DEN-TIBA-PEG have effectively evaded the identification of reticular endothelial system by PEG-modified PAMAM and significantly prolonged its half-life in blood circulation and reduced its nonspecific distribution in normal organs. Through the xenograft tumor model in vivo, it was proved that after 24 hours injection of new nano-material was injected later, there are still functional CT imaging ability.

Conclusion:

A novel nano-contrast agent, with a PEG-modified dendritic molecule PAMAM as a carrier and a surface-loaded 2,4,6-TIBA, was successfully synthesized.

PU-1478

碳纳米管载药系统用于肿瘤热疗的研究

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脑胶质瘤是颅内最常见的恶性肿瘤之一，也是死亡率最高的肿瘤之一。然而，大多数治疗药物由于受血脑屏障（BBB）限制或缺乏靶向性等因素而难以自主向胶质瘤富集，治疗效果欠佳。因此，发展高效低毒的综合治疗是攻克肿瘤难题的有效途径。首先采用氧化法处理 CNT，使其表面形成羧基（*-COOH*），然后将 PEG 修饰到*-COOH* 上，形成高亲水性、良好生物相容性的载体。通过 SEM、TEM、XRD、AFM、拉曼光谱、BTE 等表征材料特性。以改性 CNT 作为负载抗肿瘤药物载体的核心，一是改善了 CNT 的水溶性，有利于将具有肿瘤靶向作用的分子或多肽衍生到 CNT 表面，构建出同时具有光疗和热疗能力的肿瘤靶向给药系统；二是 CNT 能够进入脑组织，其较大的比表面积有助于负载更多的抗肿瘤药物，同时改性增强了 CNT 的生物相容性；三是 CNT 在近红外（near infrared, NIR）光谱范围有很强的吸收，并能将这些能量高效地转化为热量，而 NIR 范围光线对生物体有非

常好的穿透性，CNT 的这一性质使其能够用于肿瘤热疗。实验中以 π－π 堆积的方式将小分子光敏剂 HMME 修饰到 CNT-PEG-ANG 表面上（PEG：聚乙烯醇，ANG：Angiopep-2 靶向胶质瘤多肽链），通过化学反应联结上异硫氰酸荧光素（FITC），离心，超纯水重复洗涤数次，收集离心管上部溶液，得到 FITC-CNT-PEG-ANG/HMME，构建出同时具有光热疗的靶向给药系统。研究结果表明通过与 C6 细胞共同孵育 3h，荧光显微镜观察到载药系统被 C6 细胞逐渐摄取，在 808 nm 近红外激光的照射下，诱导了肿瘤细胞的死亡，达到了治疗的目的。研究结果有助于理解纳米材料的生物学效应，也有助于评价治疗脑胶质瘤的药效。

PU-1479

肿瘤微环境活性氧 磁共振成像技术

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光动力疗法(PDT)作为一种新兴的癌症治疗方法已被广泛研究。活性氧(ROS)，尤其是单线态氧(1O2)可诱导细胞凋亡或组织破坏，是治疗效果的关键。荧光法、化学发光法、电化学法等多种方法可用于体外检测活性氧。然而，由于这些方法具有如光漂白和自氧化等固有缺点，使得体内 ROS 的定量测定仍然是一个挑战，这严重限制了光动力疗法在体内的应用。本文报道了一种利用 ROS 敏感的超顺磁性氧化铁纳米粒子(RSPIONs)作为响应性磁共振(MR)成像对比剂来特异性检测活体 ROS 的磁共振成像方法，并用于 PDT 中产生的 ROS 的影像检测。该对比剂可以特异性地响应肿瘤环境中的 ROS，并通过聚集疏水性的增强将其作为 MR 信号放大。体外实验结果表明，激光照射后，RSPIONs 聚集并显著提高了横向弛豫率(R2)。体内实验证明该特异性对比剂可对光动力治疗过程中产生的 ROS 进行快速的捕获并成像，改方法可用于 PDT 在癌症治疗过程中 ROS 的磁共振可视化成像及定量分析，对 PDT 在肿瘤治疗中的应用具有极大的意义。

PU-1480

一氧化氮供体诱导谷胱甘肽消耗和乏氧缓解增强光动力疗效联合双模态成像

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目的 设计一种肿瘤靶向荧光纳米探针，消耗肿瘤区域 GSH 并释放 NO 缓解乏氧，增强肿瘤 PDT 疗效，结合 MRI 对比剂进行荧光-MR 双模态成像，实现肿瘤靶向诊疗一体化。
方法 通过化学合成方法构建一种近红外荧光纳米探针 NO-PA NPs，与单独的 PA NPs 进行对照，检测 ROS 产生及与 GSH 反应后 GSH 浓度变化，MTT 验证材料毒性，660nm 光照后验证细胞杀伤效果。与 4T1 细胞共孵育，用 GSH 探针和 NO 探针标记，CLSM 观察其在 4T1 细胞中对 GSH 消耗及释放 NO。用 ROS 及活死细胞染色荧光探针标记，在 660nm 光照后，CLSM 观察材料摄取、ROS 产生及活死细胞荧光。流式细胞仪检测材料摄取及诱导细胞凋亡效果。小动物成像仪检测体外荧光强度，MRI 检测核磁信号强度。BALB/C 裸鼠构建 4T1 乳腺癌体表移植瘤模型，尾静脉注射药物，验证材料肿瘤区域靶向富集及体内荧光、MR 成像效果，660nm 光照观察肿瘤 PDT 治疗效果。肿瘤组织病理切片染色，CLSM 观察 NO 缓解肿瘤乏氧效果。
结果 NO-PA NPs 及 PA NPs 溶液均有很强的 ROS 产生，GSH 检测试剂盒检测仅 NO-PA NPs 有 GSH 下降，MTT 显示药物均无暗毒性，光照后 NO-PA NPs 组死亡细胞更多。在激光共聚焦显微镜下可以观察到材料摄取荧光、NO-PA ROS 荧光增强、GSH 消耗后荧光减弱及 NO 产生荧光，通过活死细胞染

色可以观察到 NO-PA NPs 有更多的细胞死亡。流式细胞仪可检测出材料在细胞中摄取，NO-PA NPs 有更多的细胞凋亡。通过小动物成像仪及 MRI 可以进行小鼠体内双模成像。
结论 通过构建新型荧光纳米探针 NO-PA NPs，可以有效消耗肿瘤区域 GSH，缓解肿瘤乏氧，增强 PDT 治疗肿瘤效果，同时还可结合荧光-MR 进行肿瘤双模态成像，实现肿瘤靶向诊疗一体化。

PU-1481

诱导人骨髓间充质干细胞成脂培养基的研发

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目的 本研究旨在建立一种快速诱导脂肪分化方法

材料与方法 通过全骨髓贴壁法成功分离培养获得 hBMSCs，贴壁培养 P0 细胞，细胞呈集落生长，细胞形态多呈细长梭形，传代后，hBMSCs 呈旋涡状排列，更接近于成纤维样细胞形态。第 4 代 hBMSCs 接种于 12 孔板，每孔 10000 个细胞，细胞融合率达 90%，开始诱导成脂分化，实验分 6 组，参照试剂盒说明进行油红 O 染色，镜下观察细胞染色的分布，并计算各组成脂情况。

结果 成脂诱导阳性组形成大量脂滴，分布密集；统计分析发现阳性组成脂率明显高于阴性组（P<0.05），差异有统计学意义
结论 本研究研发了一种迅速且高效诱导 hBMSCs 成脂分化的培养基，诱导阳性组可见细胞内大量的脂滴形成

PU-1482

探讨 PETCT 高龄受检者的质量控制

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目的 提升高龄受检者检查完成率，提高图像质量。
方法 随机抽取一年内 20 例高龄受检者，其中男 14 例，女 6 例，最低年龄 80 岁，最高年龄 91 岁，均行 PETCT 检查。使用设备为西门子 Biograph Horizon PETCT 扫描仪。试剂为 18F-FDG 氟代脱氧葡萄糖试剂，半衰期为 109.6min。受检者静脉注射 18F-FDG（剂量为 0.1mCi/kg 计算注射）检查前受检者禁食 4~6h，血糖控制在 3.9~8.3mmol/L,注射后安静休息 40~60min 后上机检查。
结果 除 1 例幽闭恐惧症未能完成检查外，其余 19 例均完成 PETCT 检查，其中，轮椅进入的 2 例，平车进入的 1 例，保留导尿管 3 例，腹腔导流管 1 例，糖尿病 7 例（1 例血糖不在正常范围内）。
结论 1.高血糖容易造成图像质量变差，因此，血糖为 PETCT 检查的最重要的指标，需要工作人员提前做好干预措施。2.高龄受检者由于自身原因（如行动不便，需要轮椅、平车）容易导致无法按时到达科室开始检查，因此在到科室的时间容易出现迟到的问题。3。空腹时间较久（约 6h），高龄受检者容易产生低血糖等情况，并且身体状况较差，容易产生心慌呕吐等现象，护师应时刻注意受检者状态。4.PETCT 面向人群大多是肿瘤相关疾病，很多受检者携带便袋，导流袋等，扫描时容易造成扫描伪影，影响图像效果。

PU-1483
磁化标记胎盘间充质干细胞靶向结直肠癌的 MR 示踪研究

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目的 通过向小鼠结直肠移植瘤模型内注射磁化标记的人胎盘间充质干细胞(PMSCs)，探讨 3.0T MR 活体示踪的可行性及 PMSCs 对结直肠肿瘤生长的作用。方法 培养 PMSCs，多聚赖氨酸(PLL)转染 USPIO，用 PLL-USPIO 对 PMSCs 进行标记并鉴定其生物学特性。建立裸鼠 HT-29 皮下移植瘤模型 30 只，随机分为实验组和对照组，每 2-3 d 进行扫描，观察两组移植瘤生长情况及 MR 信号变化，描绘肿瘤生长曲线及 MR 时间信号曲线，每次扫描后随机处死实验组与对照组各 2 只小鼠取皮下移植瘤，病理切片行 HE 染色、普鲁士蓝染色及免疫组化染色，对比染色结果并计算微血管密度。结果 1、PLL-USPIO 可安全有效标记胎盘间充质干细胞，标记率大于 95% ，细胞生物学特性无明显影响。2、实验组注射 PMSCs 第 1 d MR 可监测到肿瘤内低信号，随着时间增加信号逐渐增高，信号差异有统计学意义(p<0.05)，第 14d 时与对照组信号无差异（p>0.05）。实验组与对照组移植后第 1d-第 14d 肿瘤体积组间差异无统计学意义(p>0.05)。病理染色与 MR 扫描图像相对应。结论 MRI 可有效进行胎盘间充质干细胞移植后的活体示踪，PMSCs 通过不同的抑瘤和促瘤机制影响结直肠肿瘤的生长。

PU-1484
肿瘤微环境激活的 MRI/药物递送诊疗纳米探针的构建 及其在卵巢癌靶向诊疗中的应用研究

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一、目的
我们设计具有 AS1411 适体及 ATP 适体的探针。DNA 支架由 ATP 适体及其互补的单链 DNA 构成。在 ATP 存在下，这导致 DNA 双链体解离，从双链体到适体这种结构变化导致插入的阿霉素从双链体释放。基于此，本项目拟以 MnO_2纳米片层作为纳米载体和 MRI 纳米对比剂，以阿霉素为治疗药物，制备出肿瘤微环境激活的 MRI/药物递送诊疗纳米探针，探针中含有的 AS1411 适配体作为靶分子用于卵巢癌的磁共振靶向成像及治疗。
方法
高性能肿瘤微环境激活的 MRI/药物递送诊疗纳米探针的制备、表征及其性能研究
（1）根据文献做相应调整制备 MnO2 纳米片层。
（2）Probe-cDNA 载药量的优化。
（3）肿瘤微环境激活的 MRI/药物递送诊疗纳米探针的表征及性能测试 。
1.2 卵巢癌靶向肿瘤微环境激活的 MRI/药物递送诊疗纳米探针对 HO-8910 卵巢癌细胞的体外靶向 MRI
肿瘤微环境激活的 MRI/药物递送诊疗纳米探针的磁共振成像及靶向治疗：
1.3 肿瘤微环境激活的 MRI/药物递送诊疗纳米探针对卵巢癌载瘤裸鼠的在体靶向磁共振增强成像及靶向治疗
（1）荷瘤裸鼠模型构建（2）荷瘤裸鼠在体 MR 靶向成像（3）靶向治疗效果评估
结果
1.对 MnO2 纳米片层级及纳米探针表征分析。

2.纳米探针有无肿瘤微环境存在下的 MRI 信号差别。
3.MnO2 纳米片层对细胞及纳米探针对小鼠的毒性测试。
4.HO-8910 细胞细胞体外 MRI 检测及不同细胞计数 HO-8910 细胞的体外 MRI 成像。
5.载瘤裸鼠的磁共振成像。
结论
1. 成功制备肿瘤微环境激活的磁共振成像纳米对比剂 MnO2，其具有较好的生物相容性以及较高的 T1 弛豫率的特点。
制备出肿瘤微环境激活的 MRI/药物递送诊疗纳米探针，实现对卵巢癌细胞的磁共振成像。
3.MnO2 作为肿瘤微环境激活磁共振对比剂，初步实现了载瘤裸鼠的活体磁共振增强成像。

PU-1485

Synthesis and Application of Dual Drug Delivery/Sequential Release Nanotheranostic Agent in Liver Cancer

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Purpose: To explore synthesis and Application of Dual Drug Delivery/Sequential Release Nanotheranostic Agent in Liver Cancer.material and method: Synergistic therapy and multi-mode combination therapy of two hepatocellular carcinoma drugs can overcome drug resistance and side effects in the treatment of hepatocellular carcinoma.Gold nanoparticles have been widely used in optical imaging, CT/MRI imaging, biomarkers, targeted drug therapy and other fields, and are an advanced integrated platform for nano diagnosis and treatment.Co-delivery of two drugs with diverse physicochemical properties and specific administration orders, coupled with combined cancer theranostics are vitally important for conquering drug resistance and reducing side effects. rusult: we explored a unique amphiphilic PCL-AuNC/$Fe(OH)_3$-PAA Janus nanoparticle (JNP) to simultaneously preserve the hydrophilic drug (doxorubicin) and hydrophobic drug (docetaxel) in their distinct domains. Owing to their extraordinary heterostructure and independent pH and NIR sensitive properties, the optional sequential drug release by a single inorganic JNP was realized for the first time, and the results presented the synchronous release of two drugs had 5% better therapeutic effect.In addition, the excellent CT/MR imaging capabilities from AuNC/$Fe(OH)_3$ suggested our JNPs could effectively guide the cancer therapy. Furthermore, the mice treated with dual drug loaded PCL-AuNC/$Fe(OH)_3$-PAA JNPs under near infrared (NIR) laser irradiation showed better tumor inhibition than solo drug, cocktail and dual drug treated groups, indicating the effectivity and significance of combined cancer therapy.conclusion:we synthesised PCL-AuNC/$Fe(OH)_3$-PAA Janus nanoparticle with hydrophilic drug (doxorubicin) and hydrophobic drug (docetaxel) in their distinct domains, and it has better effect in anti-lier cancer.

PU-1486
双重载药、按需释放纳米诊疗剂的合成及其在肝癌诊疗中的应用研究

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肝癌发病率和死亡率较高，其治疗策略一般需要联合治疗，如何能够做到早期发现及诊断肝癌，并达到最佳治疗效果，拯待解决。肝癌治疗的多模式联合治疗，以及两种肝癌治疗药物的协同作用，同时克服耐药性和副反应，发挥最大的治疗作用值得我们进行深入的研究。金纳米粒子在光学成像、CT 成像、MRI 成像、生物标记、靶向药物治疗等领域得到了广泛的应用，是一种先进的纳米诊疗一体化应用平台。

本文合成了一种新型的双亲性聚己内酯-金纳米笼/氢氧化铁-聚丙烯酸（定义为 PCL-AuNC / $Fe(OH)_3$-PAA）JNP 纳米粒子，具有独特的异质结构、以及 pH 值和 NIR 近红外光谱敏感特性，能够同时负载亲水药物（doxorubicin 阿霉素）和疏水药物（docetaxel 多烯紫杉醇），能够对两种负载药物进行可选择顺序释放，通过体内外实验、小鼠实验的验证，结果表明两种药物的同步释放能够提升疗效，并降低了毒副作用。

此外，本文通过表征证实合成的纳米诊疗剂稳定、可靠，生物相容性较好，毒副作用低，且由于 AuNC/$Fe(OH)_3$的具有较好的 CT 和 MRI 成像能力，通过体内及体外实验证实了其在肝癌当中出色的成像能力。此外，在小鼠肿瘤模型实验中，负载双药的 PCL-AuNC/$Fe(OH)_3$-PAA JNPs 纳米粒子在 PH 值和近红外光照刺激下产生的协同治疗效果表现出比单药治疗组、混合用药治疗组有更好的肿瘤抑制作用。因此，新型 PCL-AuNC / $Fe(OH)_3$-PAA）JNPs 纳米粒子在肝癌诊疗当中具有很好的应用前景。

PU-1487
乳腺钼靶在早期乳腺癌中的诊断价值

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（摘要）**目的** 探究乳腺钼靶在早期乳腺癌中的诊断价值。**方法** 选取 78 例早期乳腺癌患者为探究对象，分别进行乳腺钼靶检查，观察乳腺中的肿块大小，边缘改变度，钙化大小，密度改变度，结构复杂度，乳头凹陷度等特点，并分别将其进行对比。**结果** 患者在钼靶检查后，对早期的乳腺癌特点较敏感，检出率较高。**结论** 乳腺钼靶能准确有效地检测出早期乳腺癌，能起到很好的诊断效果。

PU-1488
基于 Co-P 纳米诊疗剂的构建及其在小鼠乳腺癌诊疗中的应用基础研究

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乳腺癌严重威胁女性的健康，提高其早期诊断的精确度和治疗效果能够有效的降低乳腺癌患者的死亡率。

目的 本研究旨在构建具备良好生物相容性的新型多功能纳米诊疗剂应用于小鼠乳腺癌的多模磁共振成像诊断和多模抗肿瘤治疗，从而提高其早期诊断及治疗效率。

方法 通过高温热分解法合成 Co-P 纳米材料，以其作为核，介孔二氧化硅作为壳，并载入化疗药物 DOX，用二氧化锰（MnO_2）作为封口剂，合成 Co-P@mSiO$_2$@DOX-MnO_2；通过扫描电镜、透射电镜、X 射线能量散射谱、氮气吸附/脱附实验、药物负载/释放等实验对该纳米材料进行表征；利用 MTT 法测试纳米材料的细胞毒性；通过小鼠体内实验验证纳米材料的体内毒性；使用磁共振成像仪评价纳米材料的体内、外 MR 成像效果；利用红外热像仪评价纳米材料的体内、外光热性能；通过 MTT 试验和荷瘤小鼠的抗肿瘤实验来评价纳米材料对小鼠乳腺癌的治疗效果。

结果 通过表征测试、毒性实验证明了纳米材料均一的形貌、尺寸和良好的生物相容性，通过药物释放和光热性能实验印证了纳米材料优越的 pH-响应的药物释放能力和光热转化性能，通过体内及体外 MR 成像实验和抗肿瘤治疗实验证实了纳米材料显著的 T_1 和 T_2 双模 MR 成像效果和抗肿瘤治疗效果。

结论 我们设计、合成了 Co-P@mSiO$_2$@DOX-MnO_2 纳米诊疗剂，在 Co-P 核介导 T_2 MR 增强成像及光热治疗的基础上，利用介孔二氧化硅壳的孔道装载化疗药物，在肿瘤的酸性环境中 MnO_2 快速分解成 Mn^{2+} 离子，从而释放 DOX 并发挥化疗作用，同时顺磁性的 Mn^{2+} 离子能够介导 T_1 MR 增强成像，实现了 pH 响应的 T_1 和 T_2 双模 MR 成像引导的化疗与光热协同抗肿瘤治疗。并首次将其应用于生物医学领域，在体外实验和体内动物实验中展示出了良好的生物相容性及出色的肿瘤诊断和治疗效果，实现了对小鼠乳腺癌诊断和治疗的同步进行，为今后纳米诊疗剂的临床应用提供了理论和实践依据。

PU-1489

基于 CESM 的影像组学诺莫图预测乳腺癌新辅助化疗疗效的可行性研究

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目的 探讨基于对比增强能谱 X 线摄影（CESM）的影像组学诺莫图术前预测乳腺癌新辅助化疗疗效的价值。

材料和方法 回顾性分析我院 135 名术前接受新辅助化疗的乳腺癌患者（训练组 100 ，验证组 35），按照实体瘤疗效评价标准（RECIST）评价患者新辅助化疗的疗效，并将患者分为有效组和无效组。从每个病人的 CESM 图像中提取影像组学特征。然后在训练集中用 LASSO 算法建立影像组学标签。结合独立的临床预测因子，采用多元 Logistic 回归模型建立诺莫图。诺莫图的效能在训练集中进行评估，并在验证集中进行验证。

结果 由 9 个特征组成的影像组学标签，具有良好的预测效果。包括影像组学标签、ki67、HER2 的诺莫图在训练集（AUC 0.87；95%CI，0.82-0.91）和验证集（AUC 0.85；95%CI，0.80-0.90）中也显示出良好的效能。决策曲线表明了我们列线图的临床实用性。

结论 基于术前 CESM 影像组学特征和临床预测因子建立的诺莫图模型在预测乳腺癌患者新辅助化疗疗效方面具有重要的价值。

PU-1490

Novel redox-responsive polymeric magnetosomes with tunable magnetic resonance property for in vivo drug release visualization and dual-modal cancer therapy

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Nanotheranostics provide promising strategies towards precise cancer diagnosis and therapy. However, monitoring of *in vivo* drug release from nanotheranostics by non-invasive approaches remains very challenging. In this work, we developed novel redox-responsive polymeric magnetosomes (PolyMags) with tunable magnetic resonance imaging (MRI) properties for *in vivo* drug release monitoring and effective dual-modal cancer therapy. The theranostic PolyMags were prepared by co-encapsulation of a T_2 MRI contrast agent (SPIO) and a chemotherapeutic drug (doxorubicin, DOX) in well-defined disulfide cross-linked micelles (DCM). The encapsulation of DOX significantly decreased PolyMags' T_2 MR contrast enhancement and transverse relaxation rate R_2, depending on the amount of drug payload. The T_2 MR enhancement and R_2 could be recovered once the drug was released upon the disassembly of the PolyMags in the presence of glutathione (GSH). We visualized the *in vivo* drug release pattern by virtue of such tunable MRI capacity in nude mice bearing breast cancers. Interestingly, the PolyMags possessed excellent photothermal effect, which could be further enhanced by the loading of DOX. Moreover, the PolyMags showed excellent biocompatibility and were highly efficacious to treat breast tumors on xenograft model with the combination of tumor-targeted photothermal therapy and chemotherapy, achieving a complete cure rate of 66.7%. The concept reported in this paper is generally applicable to other micellar and liposomal systems for image-guided drug delivery & release applications toward precision cancer therapy. R2*, ADC. DWI

PU-1491

A Novel novel clustered SPIO nanoplatform with enhanced magnetic resonance T2 relaxation rate for micro-tumor detection and synergistic photothermal synergistic therapy via low dose laser trigger

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Construction of micro tumor sensitive theranostic nanoagents that can increase the accuracy of imaging diagnosis and boost the therapeutic efficacy has been demonstrated for a promising approach for diagnosis and treatment of cancer. Herein, we reported a novel super-paramagnetic iron oxide (SPIO) based nanoplatform that possess significantly enhanced magnetic resonance property and photothermal effect for tumor theranostic purpose. This PEG-B4/CNTs@ph/SPIO (BCPS) nanoplatform was simply prepared via integrated super-paramagnetic iron oxide (SPIO), porphyrin (ph), and PEG-B4 on the

surface of CNTs. Subsequently, a significant T2 relaxation rate enhanced can be achieved by the reduced accessibility of water to SPIO clustering. Moreover, the synergetic enhanced photothermal from BCPS nanoplatform contributed to better photothermal effect for cancer therapy. Furthermore, the targeting ability to sialic acid overexpressed tumor was further introduced from phenylboronic acid from PEG-B4. We showed that BCPS nanoplatform could not only selectively identify solid tumors and detect micro-sized metastatic tumor (1 mm) in the liver, but also effectively ablate tumors in an xenograft model, thereby achieving a complete cure rate of 100% at low laser dose.

PU-1492

Two-way Magnetic Resonance Tuning Nanoprobe Enhanced Subtraction Imaging for in vivo Molecular Target Quantification and Small Tumour Visualization

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Distance-dependent magnetic resonance tuning (MRET) technology has many advantages over fluorescence-based Förster resonance energy transfer (FRET) in sensing/imaging biological targets. These include deeper tissue penetration and fewer undesirable interactions with the surrounding biological environment. However, the contrast enhancement and stability of current T_1-based MRET technology needs significant improvement before it can achieve broad *in vivo* applications. Here we report a new two-way magnetic resonance tuning (t-MRET) nanoprobe with dually activatable T_1&T_2 magnetic resonance signals coupled with dual-contrast enhanced subtraction imaging (DESI) to dramatically enhance contrast in targeted tissues and suppress the background signal from normal tissue. We demonstrated that this integrated platform could quantitatively image molecular targets in tumours and sensitively detect very small intracranial brain tumours (~0.75mm^3) in patient-derived xenograft models with a tumour-to-normal-tissue ratio (TNR) >10. We anticipate that the t-MRET nanoprobes and complementary DESI technology with ultra-high TNR will offer new opportunities for enhanced molecular diagnostics and image-guided biomedical applications.Distance-dependent magnetic resonance tuning (MRET) technology has many advantages over fluorescence-based Förster resonance energy transfer (FRET) in sensing/imaging biological targets. These include deeper tissue penetration and fewer undesirable interactions with the surrounding biological environment. However, the contrast enhancement and stability of current T_1-based MRET technology needs significant improvement before it can achieve broad *in vivo* applications. Here we report a new two-way magnetic resonance tuning (t-MRET) nanoprobe with dually activatable T_1&T_2 magnetic resonance signals coupled with dual-contrast enhanced subtraction imaging (DESI) to dramatically enhance contrast in targeted tissues and suppress the background signal from normal tissue. We demonstrated that this integrated platform could quantitatively image molecular targets in tumours and sensitively detect very small intracranial brain tumours (~0.75mm^3) in patient-derived xenograft models with a tumour-to-normal-tissue ratio (TNR) >10. We anticipate that the t-MRET nanoprobes and

complementary DESI technology with ultra-high TNR will offer new opportunities for enhanced molecular diagnostics and image-guided biomedical applications.

PU-1493

Intracranial Applications of Magnetic Resonance-guided Focused Ultrasound

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Purpose: Central nervous system disease is difficult to treat because of its complex internal structure. Notably the existence of the blood-brain barrier (BBB) which restricts the delivery of drugs. Chemical methods can cause complete destruction of the BBB, while physical methods are noninvasive and better able to open the BBB reversibly. Focused ultrasound (FUS) can temporarily change vascular or cell membrane permeability and release or activate various compounds for targeted drug delivery or gene therapy. Magnetic resonance guided focused ultrasound (MRgFUS) is regarded as an innovative method to be applied to remedy the limitation of ultrasound to place and treat discrete lesions within the human brain accurately.

Methods: We review each of the emerging indications for MRgFUS for both applications and highlight future directions for this promising means of treating brain-based diseases.

Results: In brain diseases, MRgFUS serves two purposes: 1) to focally ablate neural tissue or 2) to open the BBB. Therefore, MRgFUS is a great breakthrough that be used for non-invasive treatment and real-time monitoring of brain diseases, including essential tremor, brain tumor, Parkinson's disease and so on.

Conclusions: Targeting and removing a few millimetres of brain lesions through the skull with the power of MRgFUS is a remarkable technique that could potentially be a major neurotherapeutic milestone. A number of phase I studies have supported that transcranial MRgFUS is noninvasive and safe, achieving clinical and radiologic effects similar to open neurosurgery. However, large-scale, multicenter studies and long-term postoperative follow-up are still needed to better characterize and validate the safety, effectiveness and long-term durability. But, predictably, if borne out, in the future, MRgFUS will be an ideal option for patients with indications as technology advances and technological maturity.

PU-1494

NLRP3 inflammasome is involved in pig to mouse islet xenotransplantation

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Introduction: A large loss of islet cells occurred several days after islet transplantation, which is mainly mediated by nonspecific inflammatory factors. Evidences show that the release of IL-1β and High Mobility Group Box 1(HMGB1) are the major causes involved in islets loss. NLRP3 inflammasome is largely reported as a key node for the production and release of IL-1β and HMGB1 in innate immune. Here, we aim to investigate whether NLRP3 inflammasome is involved in the islet graft inflammatory response after porcine to mouse islet xenotransplantation.
Methods: NICCs were transplanted to NSG mouse under the kidney capsule. Expression of Insulin, NLRP3 and ASC in islet were examined by IHC 6 weeks after transplantation. NICC cells were exposed to hypoxia(1% O_2) in intro for indicated time to mimic the post-transplantation hypoxic condition in vivo. Releasing of IL-1β and HMGB1 was detected by ELISA. Protein level of inflammsome component NLRP3, ASC, cleaved caspase-1 and precursor/mature form of IL-1β and IL-18 was measured by Western blot. Caspase-1 inhibitor Ac-YVAD-cmk was utilized to block the Capase-1 signal.
Results: Insulin were detected in islet grafts 6 weeks after transplantation. NLRP3 and ASC expression were also detected mainly in insulin producing cells in islet grafts. In intro assay, hypoxia increased protein level of cleaved caspase-1 and mature form of IL-1β and IL-18 and decreased precursor form of them. IL-1β and HMGB1 releasing is up-regulated exposure to hypoxia.Finally, pretreated with Caspase-1 inhibitor Ac-YVAD-cmk significantly decreased hypoxia induced up-regulation of protein level of cleaved caspase-1 and mature form of IL-1β and IL-18.
Conclusions: NLRP3 inflammasome is involved in pig to mouse islet xenotransplantation. Caspase-1 inhibitor Ac-YVAD-cmk might be a potential treatment to improve islet xenotransplantation outcome.

PU-1495

Dynamic monitoring the hyperpolarized 13C metabolic signals of cells using an NMR-compatible perfusion bioreactor

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Background: Hyperpolarized (HP) ^{13}C MR is a powerful technology for monitoring real-time metabolism. The metabolic changes of [1-^{13}C]lactate and [1-^{13}C]alanine from [1-^{13}C]pyruvate is near-universally observed in many pathological changes including cancers.(1) Recently, an NMR-compatible perfusion bioreactor has been proposed as a method to dynamically monitor cell hyperpolarized ^{13}C metabolic signal.(2) **Aim:** The aim of this study is to use an NMR-compatible perfusion bioreactor to investigate the changes of intracellular and extracellular ^{13}C metabolites from [1-^{13}C]pyruvate of cells.
Methods: Embryonic kidney HEK293 cells were used in this study. These cells were

prepared for bioreactor NMR experiments by electrostatic encapsulation into alginate microspheres.[3] The cell-laden microspheres were maintained at physiological conditions by circulating DMEM media at 37℃ with continuing oxygen in the 5mm NMR tubes used in bioreactor. Experiments were conducted on a 500 MHz Varian Inova with a 5mm probe at 37℃. 7.0μL of [1-^{13}C]pyruvic acid was hyperpolarized using a HyperSense DNP polarizer operating at 3T and subsequently dissolved and neutralized for a final concentration of 50mM. 900uL of this solution was infused into the bioreactor system and NMR experiments were performed by application of a 30° degree pulse every 3s and for a total acquisition time of 300s, using a sweep width of 100ppm. Cell viability was dynamically monitored by measuring the peaks of nucleoside triose phosphate produced by the ATP molecule using ^{31}P NMR. **Results:** A simple schematic diagram of bioreactor was shown in Figure 1a. Following injection with hyperpolarized [1-^{13}C]pyruvate, the productions of intracellular and extracellular lactate, alanine and bicarbonate signals were observed(Figure 1b). And extracellular lactate was higher than intracellular lactate suggesting a rapid lactate export in cells(Figure 1c). **Conclusion:** Using a perfusion bioreactor system and cells, we were able to observe the hyperpolarized metabolic signal changes generated within cells. In the future, this system will enable better understanding of the HP ^{13}C signals of different cancer cell lines, expanding the way these changes can be used to monitor tumor treatment response in vivo.

PU-1496

新型 Mn(II)肝胆磁共振造影剂体内成像评价

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作为一种非侵入影像诊断技术，磁共振成像（MRI）具有高空间分辨率和高软组织对比度的特点。磁共振造影剂（MRI contrast agents）可以提高 MRI 灵敏度、增加成像对比度和清晰度，是 MRI 技术的重要组成部分[1]。MRI 多参数、多方位成像特点对于肝脏检查具有独特优势。肝细胞癌（HCC）是癌症相关死亡的主要原因之一，占原发性肝癌的 90％以上。肝特异性造影剂对于 HCC 的早期诊断十分重要，早期诊断和有效治疗可使 HCC 5 年生存率提高 50％-70％。**目的** 针对 Gd(III)造影剂肾源性系统纤维化[2]和短期内反复使用存在脑沉积[3]潜在风险，本文旨在以生物相容性更佳的 Mn(II)为顺磁金属中心，设计合成肝胆特异造影剂[Mn(BnO-TyrEDTA)]$^{2-}$， 并通过体内成像评价其肝靶向成像特点、体内分布与排泄。**材料与方法** 从酪氨酸（Tyrosine）出发，经多步反应合成具有疏水结构的类 EDTA 配体，与 Mn^{2+}配位得到[Mn(BnO-TyrEDTA)]$^{2-}$。以临床肝靶向造影剂普美显（Primovist®，Gd-EOB-DTPA）为对照，经小鼠尾静脉注射（0.1 mmol/kg），冠状位连续扫描成像（3.0 T，GRE-T_1WI），分析 MR 信号强度（肝脏、肾脏、血液）随时间变化的规律， ICP-MS 检测 24 h 后小鼠体内造影剂残留。**结果** 体内成像表明，[Mn(BnO-TyrEDTA)]$^{2-}$多组织器官增强明显，其肝靶向性、体内清除途径与普美显[4]相似，注射造影剂 24 小时后动物体内无残留。

PU-1497

Huc-MSCs protect procine islets from hypoxia and ROS-induced cell death via enhancing pro-survival pathways

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Background: Hypoxia and oxidative stress are major causes of damage to transplanted islets. Mesenchymal stem cells (MSCs) have been shown to enhance islet survival mainly through paracrine secretion. But mechanisms of action underlying MSC protective effects on islets have not been fully elucidated. In this study, we investigated whether human umbilical cord-derived MSC (huc-MSC) could inhibit hypoxia and ROS related cell death of neonatal porcine islet cell clusters (NICCs) and further determine the underlying molecular mechanisms.
Methods: NICCs were cultured in vitro under normoxic (20% O_2) and hypoxic (1% O_2) conditions with or without MSC-conditioned medium (MSC-CM) or MSC exosomes. Apoptosis and ROS detection assays were performed to identify potential cytoprotective effects and western blot analysis was used to detect possible pathways involved.
Results: Compared with the control group, MSC-CM suppressed hypoxia-induced cell death and oxidative stress of NICCs. Furthermore, MSC-CM activated several pro-survival pathways in NICCs under hypoxic condition. The multi-functional benefits of MSC-CM could be recapitulated by MSC derived exosomes.
Conclusions: This study showed that MSC-CM and MSC exosomes protected NICCs from hypoxia-induced cell death by regulating cell redox state and cell signaling pathways. This increased understanding may enable MSCs to become a more promising adjuvant cell therapy for islet transplantation.

PU-1498

Inlaying Radiosensitizer onto the Polypeptide Shell of Drug-Loaded Ferritin for Imaging and Combinational Chemo-Radiotherapy

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Rationale: Ferritin with unique hollow cavity is an emerging protein-based nanoplatform for anticancer-drug delivery, but the in vivo chemotherapeutic effectiveness is still unsatisfactory with such a monotherapy modality, which is urgently in need of improvement.
Methods: Here a novel ferritin nanotheranostic with anticancer-drug doxorubicin encapsulated into its hollow interior and nanoradiosensitizer bismuth sulfide nanocrystals inlayed onto its polypeptide shell was synthesized for combinational therapeutic benefits. The formation mechanism of bismuth sulfide nanocrystals based on ferritin has been analyzed. The in vitro and in vivo treatment effects were carried out on HeLa cancer cells and tumor-bearing mice, respectively. The biocompatibility

and excretion of the ferritin nanotheranostic have also been evaluated to guarantee their biosafety.

Results: The polypeptide shell of ferritin provides nucleation sites for the bismuth sulfide nanocrystals through coordination interaction, and simultaneously inhibits the further growth of bismuth sulfide nanocrystals, rendering the bismuth sulfide nanocrystals like rivets inlaying onto the polypeptide firmly, which can not only strengthen the architectural stability of ferritin to prevent drug burst leakage during systemic circulation, but also act as excellent computed tomography contrast agents and nanoradiosensitizers for in vivo imaging-guided cancer combinational treatments.

Conclusions: The design concept of inlaying bismuth sulfide nanocrystals onto the polypeptide shell of doxorubicin-encapsulated ferritin significantly inhibits the tumor growth and simultaneously further broadens the application of ferritin in nanomedicine.

PU-1499

Red/Near-Infrared Emissive Metalloporphyrin-Based Nanodots for Magnetic Resonance Imaging-Guided Photodynamic Therapy In Vivo

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Near-infrared emissive (NIR) porphyrin-implanted carbon nanodots (PCNDs or MPCNDs) are prepared by selectively carbonization of free base or metal complexes [M = Zn(II) or Mn(III)] of tetra-(meso-aminophenyl)porphyrin in the presence of citric acid. The as-prepared nanodots exhibit spontaneously NIR emission, small size, good aqueous dispersibility, and favorable biocom-patibility characteristic of both porphyrins and pristine carbon nanodots. The subcellular localization experiment of nanodots indicates a lysosome-targeting feature. And the in vitro photodynamic therapy (PDT) results on HeLa cells indicate the nanodots alone have no adverse effect on tumor cells, but display remarkable photodynamic efficacy upon irradiation. Moreover, MnPCNDs containing paramagnetic Mn(III) ions, which possesses good biocompatibility, NIR luminescence, and magnetic resonance imaging and efficient singlet oxygen production, are further studied in magnetic resonance imaging-guided photodynamic therapy in vivo.

PU-1500

Human HLA-DR+CD27+ regulatory T cells are superior to other Treg subsets in protection of porcine islet xenografts

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Aims: *To achieve effective suppression and avoid opportunistic infection and malignancy for clinical xenotransplantation, xenoantigen-specific Treg will be required. Previously, we have shown that a CD27+HLA-DR+subset of Treg separated from xenoantigen stimulated human Treg (XnTreg) were potent and xenoantigen-specific in vitro. In this study, we aim to determine their xenoantigen specificity and potency in protecting against neonatal porcine islet cell clusters (NICC) xenograft rejection in vivo.*

Methods: *Human XnTreg were separated by cell sorting, using the Treg cell surface markers CD27 and HLADR, into non-selected, CD27+HLADR+ and non-CD27+HLADR+ Treg subsets prior to cotransfer into NICC recipient NOD-SCID IL2rg-/- mice in association with autologous PBMC at a 1:25 ratio of Treg ($4x10^5$): PBMC ($1x10^7$). Serum, spleen and NICC xenografts were harvested from recipient mice at day 60 after human cell transfer for analysis of xenograft survival and Treg in vivo function.*

Results: *Recipient mice transferred with human PBMC alone rejected their xenografts completely within 35 days. Co-transfer with CD27+HLADR+ Treg prolonged NICC xenograft survival beyond 60 days with detectable serum porcine C-peptide and intact xenografts which stained positive for insulin and were surrounded but not infiltrated by a few human CD8+ effector cells. By contrast, non-selected and non-CD27+HLADR+ Treg co-transferred at the same ratio did not protect against rejection.*

Conclusions: *Human CD27+HLADR+ memory-like Treg were sufficient to suppress porcine islet xenograft rejection at a 5-fold decreased cell number compared to that previously reported for polyclonal Treg in same model, suggesting they are more potent at preventing rejection than polyclonal Treg in vivo.*

PU-1501

前列腺癌多模态诊疗一体化分子影像研究进展

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目的 前列腺癌是男性常见恶性肿瘤，也是全球男性癌症死亡的第五大原因，因此前列腺癌的早期诊断和个体化治疗十分重要。前列腺癌的复发、远处转移和对药物的抵抗，使得常规影像诊断和内、外科治疗的效果受到限制，而基于纳米探针的多模态分子影像研究为前列腺癌的诊治提供了新的潜在可行方案。

方法 通过回顾近年来超声、核素、CT、MRI 和光学等多种成像模态的纳米探针在前列腺癌诊疗方面的进展，并对其研究方向、临床应用潜力及局限性进行讨论。

结果 前列腺癌分子成像涵盖声学成像、CT 成像、MRI 成像、光学成像、PET 成像以及多模式成像等多种成像方式，且成像探针也从单模态向多模态发展。运用将成像与治疗功能结合于一体的多功能 NP，将有助于实现前列腺癌的早期诊断和同步的可视化治疗,也是纳米医学在前列腺癌诊治领域的研究热点。此外，利用 NP 的载体作用，携带成像和治疗双重材料，可使追踪药物动力学过程和释放、纳米药物的分布和代谢更加清晰直观，进一步促进肿瘤治疗发展。
结论 肿瘤诊疗一体化分子影像 NP 是多学科交叉融合的产物，得益于生物、化学、材料学和组织工程学领域的研究推进与协作互补。多功能靶向 NP 的出现，为前列腺癌的诊疗打开了崭新的视界与可期的前景。但应该正视，这一研究领域仍存在许多挑战：（1）NP 的制备方法复杂繁琐，不仅要考虑材料本身的生物相容性和安全性，还要考虑探针体积大小和细胞穿透能力的匹配性；（2）癌细胞的异质性也对 NP 的敏感性和特异性提出高要求，仍需寻找更合适的作用靶点。因此，目前这一领域的多数研究报道仍局限于临床前的阶段。尽管如此，笔者坚信，随着相关学科的快速发展，临床前研究的深入，以及多中心前瞻性研究的积极推进，基于纳米医学的肿瘤诊疗一体化新手段终将提高包括前列腺癌在内的多种恶性肿瘤的临床诊治效率，使病患获益。

PU-1502

The applications of MRI-based theranostic nanoprobes

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Owing to the better soft tissue specificity, MRI-based theranostic nanoprobes have been studied extentively. The mechanism of theranostic nanoprobes accumulating at tumor site can be classified as passive targeting and active targeting. The passive targeting utilizes the intrinsic characteristics of tumor blood vessels. And active targeting expolits the overexpressed receptors and microenvironment of tumor to guide its affinity to nanoparticles. To enhance the effiency of therapy, researchers tend to modificate nanocarriers or choose the functional ones. Functional nanocarriers serve as potential platform for imaging or therapeutic function thanks to their electronic properties, optical properties and thermal properties. Based on these special characteristics, kinds of novel therapeutic methods have emerged like photothermal therapy(PTT) and photodynamic therapy(PDT). In this review, we will show you the applications of MRI-based theranostic nanoprobes in recent years. Firstly, we will introduce the passive and negative targeting for nanopartiles acceleration in the tumor sites. Then the applications of MRI-based theranostic nanoprobes will be presented in details by the classification of normal and functional nanocarriers.

PU-1503

碳纳米管载药系统用于脑胶质瘤的靶向治疗

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脑胶质瘤是颅内常见的发生于神经外胚层的恶性肿瘤，大多数治疗药物由于受血脑屏障（BBB）限制或缺乏靶向性等因素而难以自主向胶质瘤富集，治疗效果欠佳。碳纳米管（CNT）用作抗脑胶质瘤药物载体，不仅能够进入脑组织，通过肿瘤部位渗透增强和滞留（EPR）效应还能够将药物进一

步富集于胶质瘤内。因此，以 CNT 为核心的载药系统用于治疗脑胶质瘤具有重要的意义，然而目前仍缺乏基于 CNT 的纳米载药系统靶向肿瘤细胞的系统性研究，对于深入阐述载药系统抑制肿瘤生长相关通路的调控作用需要进一步的探索。因此，在前期研究的基础上，应用细胞及动物活体荧光成像的方法，系统地考察 CNT 载药系统诱导胶质瘤细胞调亡的能力、抑制肿瘤细胞生长相关通路的调控作用。研究结果表明 CNT 表面修饰具有脑胶质瘤靶向功能的嗜神经性病毒衍生肽（RVG29），分散于 PBS 中水浴持续超声状态下联结异硫氰酸荧光素（FITC），并负载抗肿瘤药物阿霉素（DOX），与 C6 细胞共同孵育 2h，C6 细胞摄取 FITC-CNT-PEG-RVG29 的能力显著强于 FITC-CNT-PEG，说明 RVG29 修饰的载药系统更易被细胞摄取，荧光示踪揭示了组合物进入细胞后主要分布在溶酶体中。通过构建 C6 荷瘤鼠模型，FITC-CNT-PEG-RVG29 以细胞内吞的方式进入胶质瘤中并具有更强的荧光性能，同时延长了 C6 荷瘤鼠的存活时间。研究结果有助于理解 CNT 的生物学效应，为进一步的研究奠定了一定的基础。

PU-1504

DC 疫苗 MRI 及 MPI 双模态分子影像示踪的研究

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目的 探究 MRI 及 MPI 双模态成像示踪 DC 细胞的可行性。
方法 构建 MRI 及 MPI 双模态分子影像探针-Fe@OVA-TAT，通过透射电镜等进行表征；提取 C57BL/N6 小鼠骨髓细胞，诱导产生 BMDC，经 CD11c 流式细胞技术鉴定 BMDC；不同浓度 Fe@OVA@Cy5-TAT 与 BMDC 共培养，通过流式细胞仪测定 BMDC 摄取 Fe@OVA@Cy5 -TAT 的通路，激光共聚焦测定 Fe@OVA@Cy5-TAT 的溶酶体逃逸。PBS、LPS（终浓度 1ug/mL）、OVA 及 Fe@OVA-TAT（OVA 终浓度 6ug/mL）与 BMDC 共孵育，经 CD80 及 CD86 流式细胞技术鉴定 BMDC 成熟能力；Fe@OVA-TAT（铁浓度 60ug/mL）与 BMDC 共孵育 4h 后，经右侧足垫处注射 DC 疫苗，于注射前、注射后 4h、24h、48h 及 72h 利用 MRI 及 MPI 成像观察 DC 的淋巴结迁徙情况，并于 72 小时后处死小鼠，解剖腘窝及腹股沟淋巴结，HE 染色及普鲁士蓝染色观察淋巴结内 DC 迁徙。
结果 经 CD11c 流式细胞技术鉴定，可通过分离小鼠骨髓细胞的方式成功获取 BMDC；流式细胞仪测定，BMDC 摄取 Fe@OVA@Cy5 -TAT 的通路可被盐酸氯丙嗪阻断，表明 Fe@OVA@Cy5 - TAT 通过 Clathrin 通路摄取；激光共聚焦实验证实， Fe@OVA@Cy5-TAT 可通过早期核内体-晚期核内体-溶酶体通路摄取，但 4h 后探针荧光信号位于溶酶体外，表明探针可溶酶体逃逸，从而具有交叉提呈的能力；CD80 及 CD86 流式细胞技术结果表明，Fe@OVA-TAT、LPS、OVA 均可刺激 BMDC 成熟，成熟度分别为 90%、60%和 40%（$p<0.05$）。经探针标记的 DC 疫苗于足垫处注射后，4h 即可观察到腘窝及腹股沟淋巴结 MRI T2WI 信号降低，MPI 信号增高。
结论 MRI 及 MPI 双模态成像可对 DC 细胞进行示踪，为 DC 疫苗进一步开发奠定基础。

PU-1505

长余辉敏化光动力治疗

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光动力治疗（PDT）是一种利用光敏剂和光产生细胞毒性单线态氧(102)杀死肿瘤细胞的治疗方法，具有毒性低、侵袭性小等优点。传统的光敏剂水溶性较差，不能高效的用于光动力治疗。光动力治疗的光源也是影响光动力治疗效果的重要因素，长时间的激光照射往往会对机体产生损伤。长余辉纳米材料是一种在外光源停止激发后仍能发光的材料，并且可被可见光再激发，合理利用长余辉材料能有效避免外光源对机体的损伤，但传统合成的长余辉材料存在颗粒过大以及生物相容性不佳的缺点，而人血清白蛋白是一种负载能力强且生物相容性好、生物安全性极高的材料，因而本研究设计了一种具有良好光动力治疗效果的纳米探针 PLNPs@HSA-Ce6，采用具有良好生物相容性以及超高负载能力的人血清白蛋白（HSA）善了长余辉材料的水溶性及生物安全性，并负载光敏剂二氢卟吩 e6（Ce6），在外光源 LED 灯协同照射下，长余辉材料作为内在光源，对肿瘤组织进行光动力治疗。研究结果表明 PLNPs@HSA-Ce6 纳米探针具有良好的生物相容性，注射到肿瘤部位后能在特定波长照射下产生明显的治疗效果

PU-1506
卵泡膜细胞-纤维瘤伴腹水的临床及 MR 特征相关因素研究

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目的 分析卵泡膜细胞-纤维瘤组肿瘤 MR 影像特征，探讨腹水产生与肿瘤的影像特征及临床有关指标相关性，提高对本病认识及诊断水平。**方法** 回顾性分析经病理证实的 38 例卵泡膜细胞-纤维瘤的 MR 影像特征，与病理结果对照，分析肿瘤大小、囊实性、病理类型、是否绝经以及血清 CA125 水平等因素与腹水相关性。**结果** 共收集 38 例卵泡膜细胞-纤维瘤组肿瘤。患者年龄 22~92 岁，平均年龄（51.53±14.7）岁，绝经患者 22 例（57.89%），未绝经 16 例（42.11%）。病例中纤维瘤 14 例，卵泡膜细胞瘤 15 例，卵泡膜纤维瘤 9 例。MRI 表现为实性肿块 21 例，囊性肿块 7 例，囊实性肿块 10 例。肿瘤最长径为 1.0~21.3cm，均值为（6.65±4.70）cm。29 例病灶合并有腹水，占总病例的 76.3%，其中 27 例为少量腹水，仅 2 例伴有大量腹水，9 例病灶无腹水。本研究发现，腹水产生与肿瘤的大小、囊实性及 CA125 水平相关（$P<0.05$），与病理组织学类型及是否绝经无关（$P>0.05$）。**结论** 卵泡膜细胞-纤维瘤 MRI 表现具有一定特征，大部分病例常伴有少量腹水。腹水产生与肿瘤大小、囊性变及 CA125 水平有关。评估有无腹水及腹水程度对诊断及鉴别诊断具有一定价值。

PU-1507
Intratracheal Delivery of Theranostic Fe3O4 Nanoclusters for Lung Cancer Radiosensitization Based on Chemodynamic Therapy

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Lung cancer is the most frequently diagnosed malignancy and the primary reason of cancer death both in male and female. Nanoparticle-based integrate platforms represent a novel strategy to cancer theranostic. However, the diagnostic sensitivity, treatment efficacy as well as targeted tissue concentration pose huge challenges for clinical translation. Herein, a tumor pH-sensitive superparamagnetic iron oxide nanoclusters (SPIONC) were synthesized, used as a novel magnetic resonance imaging (MRI) molecular probe and a sensitizer for radiation therapy (RT) on rodent models. The SPIONC maintain the superparamagnetism of the single nanoparticles, meanwhile display sufficiently T2 relaxation enhancement offered by nanoclusters under the action of external magnetic field by self-assembling. By intratracheal delivery, the SPIONC significantly enhance the MRI signal of lung cancer in situ as a T2-MRI probe acquire by Bruker 9.4T MR scanner, demonstrating early stage diagnosis of lung cancer without targeting agents. In tumor microenvironment (TME), SPIONC disintegrate into smaller nanoparticles, resulting a greater specific surface area and tissue penetration in TME weak acid condition (pH=6.5), leading more iron ions released from larger parental nanoparticles. Under a single-dose X-ray irradiation, the hydrogen peroxide generated from mitochondria converted to ROS through Fenton reaction catalyzed by iron ions, making numerous of hydroxyl radicals accumulated inside the tumor, enhanced the intratumor permeability and radiation therapy efficacy, eventually inducing damage to DNA and obstructing tumor growth. In short, SPIONC can be used as a radiotherapy sensitizer to achieve lung cancer theranostic by intratracheal delivery, providing experimental foundation for clinical translate of novel theranostic nanoprobes.

PU-1508

Low-Intensity Focused Ultrasound(LIFU) Triggered Tumor Oxygenation and Drug Release with Nanotheranostics for Combination Therapy in Lung Cancer

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Lung cancer is the most commonly diagnosed cancer and the leading cause of cancer death. In recent years, ^{19}F magnetic resonance imaging (MRI) has attracted significant attention owing to the high sensitivity comparable to that of ^{1}H and negligible background signals. ^{19}F MRI contrast agents are suitable for real-time dynamic tracking specific biological makers. Herein, we synthesized perfluorocarbon (PFC) nanoparticles loaded with the EGFR inhibitor AZD9291 which has been shown to be effective against both EGFR tyrosine kinase inhibitor–sensitizing and T790M resistance mutations. Taking advantages of the great biocompatibility and high oxygen dissolving ability of perfluorocarbon (PFC), we develop an innovative strategy to modulate the tumor hypoxic microenvironment using nano-PFC as an oxygen shuttle and a drug carrier for low-intensity focused ultrasound (LIFU) triggered tumor-specific delivery of oxygen and drug.

In this experiment, nanodroplets of AZD9291-PFC are intravenously injected into tumor-bearing mice under hyperoxic breathing. This drug delivery system facilitated the monitoring of the biodistribution of the drug carrier by ^{19}F MRI.

As expected, an increase of more than 2- to 3-fold in the release rates of AZD9291 was observed after LIFU irradiation in vitro, demonstrating that LIFU could enhance the release of drugs from the nanoparticles. With the LIFU transducer applied on their tumor, PFC nanodroplets that adsorb oxygen in the lung would rapidly release oxygen in the tumor under ultrasound stimulation, and then circulate back into the lung for reoxygenation. Such repeated cycles would result in dramatically enhanced tumor oxygenation and thus remarkably improved therapeutic outcomes in chemotherapy of tumors.

Hence, this work presents a simple strategy to promote tumor oxygenation with great efficiency using agents and instruments readily available in the clinic, so as to overcome the hypoxia-associated resistance in cancer treatment.Combined treatment with AZD9291-PFC and LIFU showed excellent inhibition of cell proliferation in vitro, as well as a remarkable therapeutic effect in vivo. In conclusion, third generation EGFR TKI AZD9291 and nano-PFC combined with LIFU exhibited great promise for ^{19}F MRI and effective synergistic antitumor therapy.

PU-1509

Bladder PEComa: a case report and literature review

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In 1992, Bonetti et al. first defined PEComa (perivascular epithelioid cell tumor) as a tumor composed of cells with similar morphological and immune phenotypes, such as CCST, AML and LAM.The location of PEComa is rare in bladder, and the misdiagnosis rate is very high before operation.the characteristic of the bladder PEComa is that the CT is a round, elliptical or irregular cystic mass with a large volume, more than 5 cm or more, and the edge is clear. The solid part of the scanning tumor is obviously enhanced, and the rich blood supply artery and the drainage vein can be seen.

PU-1510

腹盆腔原发或转移精原细胞瘤的 CT 和 MRI 影像学表现

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目的 探讨腹盆腔原发或转移精原细胞瘤 CT 和 MRI 影像学特征。**材料与方法** 回顾性搜集经组织病理学确诊的 8 例腹盆腔精原细胞瘤患者的临床资料和影像学资料，结合文献分析其 CT 和 MRI 影像学特征，包括部位、形态、直径、密度/信号特点、强化方式、与邻近器官/血管的关系、包膜特点、有无肿大淋巴结等。**结果** 8 例病例中 4 例是隐睾原发肿瘤，1 例为正常睾丸精原细胞瘤伴转移性腹膜后精原细胞瘤，3 例为隐睾精原细胞瘤切除术后腹膜后转移性精原细胞瘤形成，原发精原细胞瘤患者的平均发病年龄为 28 岁，转移精原细胞瘤患者的平均发病年龄为 35 岁，8 例均以腹痛

伴腹部包块就诊。8 例病灶在 CT/MRI 上呈分叶状或类圆形肿块，平扫 8 例病灶密度/信号均不均匀，增强为不均、渐进性强化，7 例包膜均完整，7 例有淋巴结肿大。**结论** 精原细胞瘤好发于青年，易发生复发转移，其 CT 和 MRI 影像学表现具有一定的特征性。

PU-1511
转移性前列腺癌靶向治疗后如何影像学定量评估？

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目的 探讨晚期复发性/转移性前列腺癌靶向治疗后的影像学评估方法、要点及标准报告的 QC。
方法 基于联合雄激素 ADT 与比卡鲁他胺联合 ADT 治疗转移性激素敏感性高肿瘤负荷前列腺癌的多中心、随机、开放、三期临床研究，共 980 病例（13720 访视点）纳入 28 个多中心研究对象中，第三方独立影像中心使用精通评估标准（mPCWG3+RECIST1.1）且有 5 年以上的实际评阅经验者进行双盲一致性独立阅片（FDA 要求不一致性<10%为合格），不一致时采用第三者（资质同前）裁判阅片，此作为金标准组。在实验前，先采用每人 20 个测试病例。对照组采用各中心影像诊断医师进行非盲现场评阅，培训前、后分别采用每人相同的 20 个测试病例，观察现场评阅者前后评估与中心影像评估结果的一致率的差异，并分析其中评估要点。
结果 中心影像金标准组 2 组评阅一致率达 100%，无需裁判阅片。对照组培训前、后现场评阅者与 28 个多中心的现场影像评估结果平均一致率分别为 25.7%、92.8%。2 个多中心中仅 2 家单位（2/28）有过前列腺靶向治疗后影像学评估标准（mPCWG3+RECIST1.1）的 2 专业培训，有 9 家（9/28）仅知晓并经过 RECIST1.1 培训，余 17 家（17/28）为不精通或仅了解而无实践经验。不一致性主要在于靶病灶的测量、非靶病灶的定性以及新病灶的正确认识。
结论 转移性前列腺癌治疗后的影像学评估标准及报告规范的推广亟待提高、任重道远；影像科重视前列腺癌疗效评估标准的掌握及诊断报告的规范，有利于影像科与其它学科在 MDT 时的良性互动与协作，推动临床诊断的规范性、统一性与标准性。

PU-1512
金纳米棒表面配体置换及用于 CT、OCT 的研究

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目的 金纳米棒因其独特的光学活性(纵向和横向两个等离子体共振吸收峰，可调范围从可见光区到近红外区)、长径比可调，使得其在纳米生物学和生物医学等领域具有广泛的应用前景。但其表面配体十六烷基三甲基溴化铵（CTAB）分子能与细胞膜和线粒体膜中的磷脂质作用，具有很强的细胞毒性，因此表面由 CTAB 稳定的金纳米棒不能直接用于生物和医学。本研究通过表面配体交换，降低金纳米棒生物毒性，提高生物相容性，并将其作为对比剂应用于 CT 以及 OCT。
方法 不同于以往研究，本研究通过一种间接手段将金纳米棒表面配体 CTAB 进行去除。通过外延生长法，在金纳米棒表面包覆一层金属氧化物，金属氧化物在外延生长过程中与具有双分子层的 CTAB 存在竞争关系，将 CTAB 从金纳米棒表面移除。在去除金属氧化物壳层恢复金纳米棒原有形貌过程中添加不同表面配体，金纳米棒表面配体 CTAB 即被新添加表面配体所替换。

结果 采用紫外-可见分光光度计，透射电镜，红外光谱，离子色谱等多种手段证明该方法有效可行。将配体置换前后金纳米棒分别与人非小细胞肺癌细胞（A549）以及人肝癌细胞（HepG2）进行共孵育培养，流式细胞仪检测表明置换表面配体后金纳米棒的细胞毒性明显降低。即使与 200 ug/mL 金纳米棒溶液共培养，细胞生存率依然可达 92.5%和 86.8%。CT 和 OCT 检测表明置换配体后的金纳米棒具有更好的对比增强效果。

结论 本研究为常用于生物传感、生物成像等多种医学应用的金纳米棒提供了很好的配体置换方法，扩展了金纳米棒在 CT 以及 OCT 等医学影像学中的应用。

PU-1513

Improving Longitudinal Transversal Relaxation of Gadolinium Chelate Using Silica Coating Magnetite Nanoparticles

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Introduction and objective: Precisely and sensitively diagnosing diseases especially early and accurate tumor diagnosis in clinical magnetic resonance scanner is a high demanding but challenging task. Gadolinium (Gd) chelate is the most common T_1 MRI contrast agent and has been widely used in different diseases at present. However, traditional Gd-chelates are suffer from relatively low relaxivity, which hampers its further application on clinical diagnosis. Currently, development of nano-sized Gd based T_1 contrast agent, such as incorporating gadolinium chelate into nanocarriers, is an attractive and feasible strategy to enhance the T_1 contrast capacity of Gd chelate. The objective of this study was to improve the T_1 contrast ability of Gd-chelate by synthesizing nanoparticles (NPs) for accurate and early diagnosis in clinical diseases.

Methods: Iron oxide (IO) NPs were synthesized in a typical experiment as aforementioned and reverse microemulsion method was used to coat IO NPs with tunable silica shell and form NPs IO@SiO_2-NH_2 at step one, then Gd-chelate was loaded on the surface of silica coated iron oxide NPs by reacting the IO@SiO_2-NH_2 with p-SCN-DTPA with the molar ratio of 1:3. Finally, Gd-based silica coating magnetite NPs IO@SiO2-DTPA -Gd was developed and characterized by transmission electron microscopy (TEM) image, high-resolution TEM (HRTEM) image, X-ray powder diffraction pattern analysis (XRD), inductively coupled plasma atomic emission spectroscopy (ICP-AES) and superconducting quantum interference device magnetometer. The T_1 relaxivity of NPs was detected by MRI scanner and the cytotoxicity of IO@SiO_2-DTPA-Gd was detected via the 3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide (MTT) assay. Then the ability of detecting tumor cells was implemented on cellular level.

Results: The new synthetic MRI contrast agent IO@SiO2-DTPA-Gd NPs showed remarkable performance and the r1 values of IO@SiO2-DTPA-Gd increase with the increase of shell thickness (IO@SiO_2-DTPA-Gd with the thickness of 0, 5, and 12 nm are 9.6, 14.8, and 33.6 $mM^{-1}s^{-1}$ respectively), which was approximate 6 times higher than Gd-DTPA (5.5 $mM^{-1}s^{-1}$) when the silica shell thickness of 12 nm. Interestingly, it appears that SiO_2-DTPA-Gd (22.1 $mM^{-1}s^{-1}$) show notable higher T_1 relaxation than DTPA-Gd, which could be attributed

to the increase of molecular tumbling time. And based on its high T_1 contrast ability, IO@SiO_2-DTPA-Gd can effectively detect tumor cells on cellular level without any obvious cytotoxicity.

Conclusion: A high performance nano-sized T_1 contrast agent IO@SiO_2-DTPA-Gd was developed by loading the Gd-chelate on the surface of silica coated iron oxide NPs. The synthesized NPs IO@SiO_2-DTPA-Gd showed high r_1 value, which is approximate 6 times higher than Gd-DTPA when the silica shell thickness of ~ 12 nm. In addition to reveal the underlying mechanism, IO@SiO_2, SiO_2-DTPA-Gd and IO@SiO_2-DTPA-Gd were synthesized respectively and compared to each other. These results clearly indicate that the improved T_1 relaxation of IO@SiO_2-DTPA-Gd is not only caused by the increased molecular tumbling time, but also caused by the magnetite core of IO@SiO_2. Additionally, the increase of distance between magnetite and DTPA-Gd could reduce the quench effect and show the enhancement effect of magnetite to DTPA-Gd. Moreover, the remarkable bright signal in T_1-weighted imaging of IO@SiO_2-DTPA-Gd incubated cells indicated that IO@SiO_2-DTPA-Gd could be a potential MRI contrast agent for the future clinical application.

PU-1514

Metabolite Profiling of Serum and Tissue Extracts from Patients with Esophageal Cancer based on 1H-NMR Spectroscopy and Pattern Recognition

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Introduction Esophageal Cancer (EC) is one of the most prevalent types of cancer death worldwide. The treatment outcome of EC is far from satisfactory because it was often diagnosed at a late, incurable stage by the poor and inefficient detecting strategy. Searching the more efficient detecting technology to identify reliable cancer biomarkers is essential for its early diagnosis and therapeutic approaches. Proton Magnetic resonance Spectroscopy (1H-NMR) has been shown to be particularly useful for identifying metabolic profiles of serum specimens, and may reveal potential biomarkers of EC. In this study, 1H NMR spectroscopy-based metabolomics and pattern recognition approach was applied to identify distinguishing metabolites in serum for routine screening of EC patients, and to search the relativity with changed metabolites in tissue samples, and also to reveal the causation of altered metabolites in mechanisms involved in EC progression.

Methods Serum samples were collected from 46 EC patients and 46 healthy controls (HC), tissue samples were obtained from 29 EC patient and their corresponding adjacent noncancerous tissues (ANT, ~5 cm away from the tumor margin). All samples were detected by 1H-NMR spectroscopy and then spectras were analyzed to pattern recognition with orthogonal partial least-squares discriminant analysis (OPLS-DA) using the SIMCA-P+ program (version 14.1). Those variables with variable importance in the projection (VIP) > 1 and $p < 0.05$ from Mann-Whitney U test were considered as potential biomarker candidates for group discrimination. The area under the ROC curve (AUROC), specificity and sensitivity of the metabolites were calculated, where AUROC > 0.8 indicated

excellent diagnostic ability. Heatmap was used to illustrate correlation of altered metabolites between EC tissue samples and urine samples.
Results 1. Metabolomics analysis detected changes in metabolite levels in ECT relative to their corresponding DNT, which included elevated levels of isoleucine, valine, lysine, arginine, glutamate, glutamine, aspartic acid, choline, phosphoric acid, glycine, tyrosine, histidine, hypoxanthine, as well as depleted levels of lactate, alanine, pyruvic acid, creatine, taurine, inositol, glucose.
2. A total of 16 serum metabolites were found to be significantly changed in EC patients as compared to healthy controls, including elevated glutamate, glutamine, methanol, glycerol, inositol, glucose, histidine, methyl histidine, and reduced isoleucine, leucine, lactate, lipid, lysine, creatine, glycine, tyrosine.
3.The Spearman correlation analysis revealed that serum metabolites of EC such as lysine, glutamine, creatine, glucose were correlated to tissues metabolites, suggesting that serum metabolites of EC can reflect the metabolic changes of tissues.
4. lysine and creatine were selected as the serum biomarkers for the screening of EC through the method of the Spearman correlation analysis and Metabolic Pathway Analysis, with sensitivity, specificity and AUC values 95.65%, 93.48%, 0.979, respectively. The cross-validation methods showed good diagnostic power.
Conclusions 1.The changes of these metabolites in EC may be involved in the disruption to the pathway of glycolysis, gluconeogenesis, TCA cycle, amino acid metabolism, SCFA metabolism, glutaminolysis, choline metabolism, energy metabolism.
2.The metabolic correlation between serum and tissue of EC suggests that serum metabolism can reflect the metabolic changes of cancer tissues, and provide the potential of serum metabolomic strategy as an effective method for screening EC.

PU-1515

腰骶脊神经根损伤 18F-FDG PET-CT 影像学表现

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目的 探讨腰椎间盘突出致腰骶脊神经根损伤后 ^{18}F-FDG PET-CT 的影像学表现。**方法** 将明显腰椎间盘突出致腰腿痛患者 30 例作为观察组，正常志愿使用 ^{18}F-FDG PET-CT 体检者 30 例作为对照组，行腰骶脊神经根 ^{18}F-FDG PET-CT 检查，所有图像均经冠状位、矢状位重建和同层面 PET、CT 图像融合后处理，观察腰骶脊神经根走行，总结损伤神经根的 ^{18}F-FDG PET-CT 影像学特点及神经根与突出椎间盘、邻近组织的关系。然后采用 SPSS 19. 0 软件，利用配对 t-test 检验比较对照组 L_4、L_5 左右两侧神经根及观察组 L_4、L_5健侧与患侧神经根的 FDG 核素代谢 SUVmax 差异显著性。以 $P<0.05$ 为差异有统计学意义。**结果** 观察组 30 例患者存在不同程度的腰椎间盘突出，由此造成 30 根腰骶神经根受压损伤。其中，患侧神经根均呈 FDG 核素代谢增高（SUVmax4.30±0.16），且与健侧神经根核素代谢（SUVmax1.13±0.16）相比具有显著性差异（配对 t 检验，$P<0.05$）。此外，观察组健侧神经根和对照组双侧腰骶脊神经根（SUVmax1.13±0.09）FDG 核素代谢无增高，两者无显著统计学差异（配对 t 检验，$P>0.05$）。**结论** ^{18}F-FDG PET-CT 成像技术不但能观察腰骶脊神经根的形态学表现，而且能直观地判断腰骶脊神经根损伤与否，及受损神经根与责任椎间盘的关系。本研究为腰椎间盘突出致神经根损伤的诊断及治疗方案的确定提供了可靠依据。

PU-1516

Multifunctional Nanoparticles for the Detection and Treatment of Atherosclerotic Vulnerable Plaques

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Objective: Atherosclerosis is an important pathological basis for the occurrence and development of cardiovascular diseases. Vulnerable atherosclerotic plaques are prone to sudden rupture, leading to fatal events. In this study, we prepare a highly efficient, sensitive and specific multi-modal nanoparticle integrating diagnosis and treatment, for realizing the in vivo and non-invasive early identification of atherosclerotic vulnerable plaque, and early treatment of atherosclerotic vulnerable plaque at the molecular level.

Methods: Multifunctional Fe-PFH-PLGA/CS-DS NPs were constructed by improved double emulsification method and electrostatic adsorption method. The physicochemical properties of the NPs were characterized by dynamic light scattering detector, transmission electron microscopy, atomic absorption spectrometer, fourier transform infrared spectroscopy, confocal laser scanning microscope and flow cytometry analysis. Ultrasound and magnetic resonance imaging were performed to analyze the imaging properties of the NPs. RAW264.7 was extracted and cultured from mouse macrophages. The targeting ability of NPs to macrophages in vitro was preliminarily evaluated. The cytotoxicity of RAW264.7 was analyzed by CCK-8 method. To establish apolipoprotein E (ApoE) knockout (KO) (apoE-/-) mice model of atherosclerotic vulnerable plaque, the expression of SR-A receptor in vulnerable plaque was analyzed by pathological and immunohistochemical methods, and to explore the feasibility and accuracy of targeting diagnosis of atherosclerotic vulnerable plaque. To investigate the potential of NPs combined with low intensity focused ultrasound (LIFU) for phase change ablation of plaque in vitro and in vivo.

Results: The Fe-PFH-PLGA/CS-DS NPs were fabricated successfully, with the ability to undergo phase transition by LIFU irradiation to achieve US imaging; a high carrier rate of Fe_3O_4had a good negative enhancement effect on magnetic resonance imaging. The NPs had a high binding affinity for activated macrophages and could be endocytosed by the macrophages and notably induced apoptosis under LIFU irradiation by an acoustic droplet vaporization (ADV) effect in vitro. Furthermore, in an ex vivo atherosclerotic plaque model of apoE -/- mice induced by high cholesterol, the NPs selectively accumulated at the sites of SR-A expressed on the activated macrophages of the aortic region. This result was also confirmed by MRI in vivo, where the NPs could be targeted to the aortic plaque and reduced the T_2* signal. The LIFU-induced phase transition could lead to the apoptosis of macrophages on plaques in vivo.

Conclusion: The Fe-PFH-PLGA/CS-DS NPs may be applied as multimodal and multifunctional probes and are expected to enable the specific diagnosis and targeted therapy of vulnerable plaques.

PU-1517
应激相关内质网蛋白 1（SERP 1）在糖尿病大鼠颈动脉损伤后再狭窄中的 N-糖基化水平及其作用

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目的 胰高血糖素样肽 1（GLP-1R）的活性是预防血管损伤后再狭窄的重要因素，但 GLP-1R 糖基化功能失调的机制和提高糖尿病患者血管表面 GLP-1R 活性的途径尚不清楚。本研究旨在探讨应激相关内质网蛋白 1（SERP 1）在糖尿病大鼠颈动脉损伤后再狭窄中的 N-糖基化水平及其作用。

方法 葡萄糖处理后大鼠主动脉内皮细胞（RAOECs）和大鼠血管平滑肌细胞（VSMC）的 N-糖基化水平以浓度依赖性的方式逐渐降低。此外，共免疫沉淀（CO-IP）分析表明，SERP 1 在 RAOECs 和 VSMC 中可能与 GLP1R 相互作用。此外，SERP 1 增强了 GLP1R N-糖基化，并增加了磷酸化内皮型一氧化氮合酶（eNOS）的产生以及 RAOECs 的增殖。

结果 Serp1 还增加磷酸化腺苷一磷酸活化蛋白激酶（AMPK），并降低血管平滑肌细胞的迁移。重要的是，在球囊损伤后，SPLP1 注射的糖尿病大鼠颈动脉内膜中层厚度（IMT）和内膜增生明显减轻。我们还发现增加内皮再内皮化和减少血管平滑肌细胞增殖在糖尿病大鼠颈动脉注射 SERP 1。

结论 SERP 1 在减轻血管损伤后再狭窄方面的显著作用可能有助于治疗糖尿病血管并发症的未来进展。

PU-1518
AMD 3100 联合 SDF-1 治疗对大鼠颈动脉内膜损伤模型的治疗作用及其相关机制探讨

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本研究中我们评估了 AMD3100 及 SDF-1 对于血管损伤再内皮化以及抑制内膜过度增生的作用。并进一步评估了 CXCR4 和 CXCR7 受体在内膜修复过程中的作用。

方法 分别通过 CCK-8 以及 transwell 法评估了 AMD 3100 以及 SDF-1 治疗对于内皮干细胞的功能活性的影响。通过免疫荧光、western blot 以及流式细胞术分析了 AMD 3100 以及 SDF-1 治疗对于 EPC 细胞 CXCR4、CXCR7 表达以及胞内外蛋白表达的影响。在活体实验方面，我们评估了 AMD3100、SDF-1、AMD 3100 联合 SDF-1 治疗对于大鼠血管损伤模型的治疗效果，包括不同组之间内皮干细胞动员、归巢的情况，以及不同组之间对再内皮化以及抑制内膜过度增生的作用。

结果 AMD 3100 联合 SDF-1 治疗可以快速的动员内皮干细胞进入外周血中(108.5±2.1 VS 81±7.1, p=0.021)，促进内皮干细胞归巢至损伤部位(15.3±5.9 vs 9.0±3.9 cells/field, p=0.031)，从而有效的促进损伤血管的再内皮化(7 days: 54±5% vs 88±6%, p<0.001; 14 days: 89±6% vs 97±3%, p=0.01)，抑制内膜过度增生(7 days: 55±4% vs 21±7%, p<0.001; 14 days: 62±6% vs 26±5%, p<0.001)。

结论 AMD 3100 联合 SDF-1 治疗可以有效的动员、募集内皮干细胞进入损伤血管，并促进损伤血管内膜修复，抑制血管内膜的过度增生。

PU-1519
糖尿病（DM）诱导的内皮细胞 14-3-3β 与 DM 大鼠颈动脉内膜增生关系的研究

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目的

本研究的目的是确定糖尿病（DM）诱导的内皮细胞 14-3-3β 上调（YWHAB）是否增加 DM 大鼠颈动脉内膜增生。

方法

用细胞计数 KIT-8（CCK-8）、定量逆转录 PCR（QRT-PCR）和 Western blot 分析在不同葡萄糖浓度（5.6、10, 15, 25、或 35 毫米）处理的细胞中检测 YWHAB 表达和大鼠主动脉内皮细胞（RAOEC）活力。在体内实验中，通过尾静脉将 YHAAB 小干扰（SI）RNA 重组慢病毒载体（YWHAB-LV）或模拟 siRNA 重组慢病毒载体（模拟 LV）注射到链脲佐菌素诱导的 DM SD 大鼠中。用免疫荧光法（IF）和 hematoxylin eosin（HE）染色对损伤后 7 天的 YWHAB 表达和颈动脉形态学进行评估。用细胞划痕试验和流式细胞术检测了 25 mm 葡萄糖处理的模拟 LV 和 YHAAB LV 感染的 RAOECs 的增殖和迁移。用 IF 染色和 Western blot 分析检测用 25 mM 葡萄糖处理的 RAOECs 中 BCL2 相关的 X（Bax）分布。

结果

Western blot、qRT-PCR 和 CCK-8 分析表明，随着葡萄糖浓度的增加，YWAB 表达和细胞活力均增加（P＜0.05）。YWAB 与正常对照组相比，DM 大鼠染色增强（P＜0.05）。HE 染色显示 YWHAB 沉默 DM 大鼠内膜增生减轻（P＜0.05）。YWAB 沉默抑制 25 mM 葡萄糖对 RAOECs 增殖和迁移的影响（P＜0.05）。Western blot 和 IF 染色结果显示，YWAB 沉默可使 25 毫米葡萄糖处理的 RAOECs 细胞中 Bax 从胞浆向线粒体迁移（P＜0.05）。

结论

结果表明，高血糖诱导内皮细胞上调 YWHAB，可促进颈动脉损伤后内膜增生，促进内皮细胞增殖和迁移。YWHAB 抑制在高血糖患者中可能通过预防再狭窄成为治疗干预的潜在靶点。

PU-1520
基于超小锰掺杂氧化铁纳米粒的 T1/T2 双相 MR 成像研究

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目的 MRI 以其高软组织分辨率和高安全性的优势，在影像诊断中占据重要地位。有研究表明，传统的单一 T_1 或者 T_2 成像都具有一定的局限性，而 T_1/T_2 双相成像则能弥补这些缺陷并获得优异的诊断图像，为临床诊断提供更充足的信息。虽然当下一些研究者发现并构造了一些双相成像的对比剂，但这些对比剂通常只是一个简单的杂合，并且只有一种成像模式效果理想，而另外一种则差强人意。因此，我们实验室想寻找一种更好的 T_1/T_2 双相对比剂。 锰掺杂氧化铁纳米粒（Mn-IONPs）具有高组织相容性和比氧化铁纳米粒更高的饱和磁化强度，有研究还明确表示其粒径很小时（<5nm）会表现出很强的 T_1 增强效应。于此同时，有研究表明表面修饰也是一个可以改善纳米粒成像性能的重要途径。基于此，我们实验室对 Mn-IONPs 表面修饰进行探索研究，希冀构造出一种优异的双相对比剂。**方法** 我们根据 Huan Zhang 团队的研究，运用高温热解法合成 Mn-IONPs。在此基础上，我们用二硬脂酰基磷脂酰乙醇胺-聚乙二醇（DSPE-PEG）包覆 Mn-IONPs，并通过控制 DSPE-PEG 与 Mn-IONPs 的用量构造出了一系列的对比剂。然后，我们进行了体外和体内的 MRI 扫描，进行了细胞毒性验证。**结果** TEM 检测发现，粒径均一，平均为 3nm，形态规整，呈球形；XRD 检测图像符合标准卡片；MRI 扫描发现，用不同量的 DSPE-PEG 与 Mn-IONPs 构造出的对比剂具有不同的成像性能，随着 DSPE-PEG 用量的增加，其 T_1 效能增强，T_2 效能会减弱，其中质量比 DSPE-PEG:Mn-IONPs = 20:1 的对比剂是比较理想的双相对比剂，具有良好的驰豫效能（r_1 = 7.1 mM^{-1} S^{-1}, r_2 = 120.9 mM^{-1} S^{-1}）。**结论** 我们以超小的 Mn-IONPs 作为核心，通过合适的表面修饰，构造出了性能比较理想的双相对比剂。

PU-1521

高分辨率显微线圈磁共振成像及动态增强定量参数在皮肤占位性病变中的诊断与鉴别诊断价值

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【摘要】目的 探讨术前高分辨显微线圈动态增强磁共振成像（DCE-HRMRI）在皮肤占位性病变中的诊断与鉴别诊断价值。**方法** 前瞻性收集 2018 年 6 月至 2019 年 7 月苏州大学附属第一医院临床怀疑皮肤占位性病变的患者 40 例，均于术前 1-3 天内运用直径约 70mm 的显微线圈行 HR-MRI 平扫及动态增强扫描，最终经手术病理证实且临床及影像学资料完整的患者有 32 例，纳入本次研究样本，其中良性皮肤肿瘤 13 例，恶性皮肤肿瘤 19 例。应用 Tofts 模型获得每位患者病灶的灌注参数，包括容积转移常数（K^{trans}），运动速率常数（K_{ep}），血管外细胞外容积分数（V_e），对比皮肤良恶性占位的 K^{trans}、K_{ep}、V_e，并计算界值、敏感性以及特异性，另分析二者时间信号强度曲线（TIC）类型。**结果** 皮肤恶性占位的 K^{trans} 及 V_e 均显著高于良性占位（$P<0.05$）。K^{trans} 界值为 $0.707min^{-1}$，敏感性 93.8%，特异性 76.9%；V_e 界值为 $0.479min^{-1}$，敏感性 75.7%，特异性 58.9%。恶性肿瘤以 III 型曲线为主（17/19）；良性肿瘤以 I 型曲线（10/13）为主，两者差异具有统计学差异（$P<0.05$）。**结论** 高分辨显微线圈动态增强磁共振成像在皮肤占位性病变中具有较高的诊断与鉴别诊断价值，值得在临床进一步推广应用。

PU-1522

Emerging Delivery Strategies of Carbon Monoxide for Therapeutic Applications: From CO Gas to CO Releasing Nanomaterials

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Carbon Monoxide (CO), a colorless and odorless gas, has been mainly considered as an environmental pollutant or a ‘silent killer’ owing to its high affinity for haemoglobin for a long time.[1-3] Until 1968, Tenhunen et al. identified haem oxygenase (HO) as the enzyme responsible for haem catalysis, which leads to the production of intracellular CO.[4] CO is now reconsidered as a versatile signaling molecule in the mammalian system sharing similar biological activities with nitric oxide (NO) and hydrogen sulfide(H_2S).[5] Currently, CO has been demonstrated to orchestrate significant biological effects including vasorelaxation, anti-thrombotic, anti-inflammatory, anti-microbial, anti-apoptotic, and anti-proliferative effects.[3, 6] These intriguing biological activities from CO presented in numerous pre-clinical studies in animals have spurred tremendous research interests of developing CO-based therapy for various diseases, such as ischemia/reperfusion injury, organ transplantation, inflammation, sepsis, microbial infection, and cancer.[3, 5-12] Compared to those clinical viable gas therapeutics such as NO, CO process many advantages 1) unlike NO that interact indiscriminately with several intracellular targets, CO reacts preferentially and almost exclusively with metal-containing targets 2) CO is more stable than those of NO and H_2S due to its inherent chemical reactivity 3) It is more flexible and versatile for the development of CO-based pharmaceuticals

because CO primarily targets metals with a specific redox state such as Fe, Ru, Mn, Re and Mo.[3, 13-14] However, despite of these merits of CO, its *in vivo* application is still highly challenging because of the difficulties in handling and delivering CO gas.[3] For instance, inhalation of a gas mixture containing CO is the most direct and simplest source of exogenous CO. Nevertheless, owing to the strong affinity of CO for haemoglobin, highly concentrated CO gas may cause severe side effects.[1] In addition, this approach suffers from a lack of target selectivity and dosage control, which may cause undesirable toxic effects. Thus, the development of CO delivery system for avoiding the above-mentioned shortcomings is highly desirable. For this purpose, transition-metal carbonyl complexes or boranocarbonate compounds as CO releasing molecules (CORMs) represent a promising alternative for the safe and controlled delivery of CO.[14-17] These compounds could release CO in a spontaneous way or triggered by exogenous/endogenous stimuli, such as light, heat, H_2O_2, enzyme, pH or other factors.[5, 18-20] However, the utilization of low-molecular-weight CORMs as therapy agents remains several problems. That is, low solubility in water, short CO-releasing half-life, potential toxicity derived from metal ions, poor accumulation in the target tissue and the lack of on-demand CO release in deep tissue.[5, 18]

Advanced nanomaterials hold the great attention in the field of drug delivery because of their unique characteristics, such as enhanced solubility and stability of the drug, high drug payload, low toxicity, pronounced biocompatibility and specific drug delivery via passive (enhanced permeability and retention, EPR) or active targeting effect.[21-25] Therefore, the innovative integration of nanomaterials with various types of CORMs has emerged as a promising strategy to conquer the aforementioned drawbacks and simultaneously realize the therapeutic application of CO. On the one hand, nanomaterials allow for the loading of hydrophobic CORMs through covalent bond or noncovalent adhesion, thus resolving typical solubility issue and efficiently enhancing the pharmacokinetic properties.[26-28] Particularly, the use of porous nanomaterials and macromolecular scaffolds can not only enhance the payload of water insoluble CORMs, but also efficiently trap the potentially toxic metal fragments, which prevents possible side effects occurring.[26, 29-31] On the other hand, nanomaterials can be used as targeted CORMs delivery and controllable CO release.[5, 18, 22] The EPR effect and active targeting effect of nanomaterials are feasible for the enrichment of low-molecular-weight CORMs at disease site.[27, 32-33] This can greatly improve the bio-distribution and bio-availability of bare CORMs, and minimize their side-effects in healthy tissue. Additionally, many nanomaterials frequently show unique optical, electronic, and magnetic field responsive properties, which allow them to response to special stimuli to induce gas release.[34-40] For example, to avoid phototoxicity and the limited penetrability of UV, the NIR-sensitive nanoparticles with the capacity of transferring NIR light energy into chemical or thermal energy are used as carriers of photo-activated CORMs (termed photoCORMs) to mediate the controlled release of CO within the ideal wavelength range.[35-36, 38, 41] Therefore, nanomaterial-based CORMs are attractive candidates for the precise delivery and controllable release of CO. Within this context, there has been an enormous effort in designing and developing CO-releasing platform based on versatile nanomaterials, and significant progress has also been achieved in some biomedical applications.[18-19, 42]

Herein, we briefly introduce the main therapeutic roles and underlying functional mechanisms of CO as a viable medicinal agent in some disease models. Then, we address

several kinds of low-molecular-weight CORMs based on transition-metal or boron, which have been widely used for investigating physiological functions and therapeutic application of CO but still suffer from some inevitable drawbacks. Furthermore, we concentrate our discussion mainly on recent advancement in the synthesis of versatile CO-releasing nanomaterials which have been applied to overcome the drawbacks associated with CORMs. And we also emphasize the potential therapeutic effects of CO-releasing nanoplatforms in several diseases. Finally, the possible strategies for the development of CO releasing nanomaterials, and potential future directions for therapeutic applications of this important technology are discussed.

PU-1523

1H-NMR Spectroscopy and Pattern Recognition to Identify the Serum and Tissue Metabolic Biomarkers for Colorectal Cancer

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Introduction Colorectal cancer (CRC) is the third most common cause of cancer death worldwide[1]. CRC is often diagnosed at its later stage due to its inconspicuous symptoms. Currently, the most commonly screening method for CRC is serum tumor biomarkers, fecal occult blood test (FOBT), colonoscopy etc[2].Because of the limited sensitivity and specificity of serum tumor markers and FOBT and the invasive colonoscopy combined with histopathological examination,it' s essential to find a non-invasive and convenient method for early diagnose in CRC.In this experiment, metabolomics based on 1H-NMR spectroscopy and pattern recognition was used to profile the paralleled metabolites of CRC tissues and adjacent non-cancerous tissues alongside pre-operative serum samples from the same patients, to investigate how serum metabolomic phenotypes correlate with those of the tumor tissue, as well as to trace specific disturbed metabolic pathways across colonic tissues and serum.

Methods Colorectal cancer tissue (CCT), adjacent noncancerous tissue (ANT, ~5 cm away from the tumor), as well as preoperative serum samples were collected from 55 CRC patients. Serum samples from 50 healthy controls(HCs) were also collected. All the CRC tissues and serum samples were detected by 400MHz NMR, and the OPLS-DA model was used for pattern recognition analysis to identify the characteristic biomarkers of CRC tissues and serum. The Spearman correlation analysis was further employed to assess the associations of biomarker candidates between tissue and serum, so as to find the best biomarkers in serum that can reflect the metabolic changes of tissues. To further evaluate the diagnostic power of the potential biomarkers, receiver operating characteristic (ROC) analysis and cross-validation methods were carried out.

Results Compare with healthy controls, serum samples in CRC showed higher levels of acetate, glutamate, glutamine, succinate, citrate, glucose ($p<0.05$), as well as lower levels of leucine, isoleucine, valine, lactate, alanine, creatine, my-inositol, lysine ($p<0.05$). Compared with ANT, CCT exhibited higher levels of lactate, alanine, valine, leucine, isoleucine, glutamate, choline, taurine, succinate ($p<0.05$), and lower levels of glutamine, creatine, glucose, my-inositol ($p<0.05$).Pearson correlation

analysis showed that lactate, glutamate and succinate in CRC serum were correlated with creatine and my-inositol in CCT. Combination of the above three serum metabolites showed good diagnostic efficiency for distinguishing CRC from HCs, with the sensitivity, specificity and area under the peak of ROC curve (AUC) of 78.95%, 92.11% and 0.870, respectively.

Conclusions The serum and tissue metabolite levels of CRC were changed compared with their respective controls, suggesting that the rapid proliferation of CRC cells may lead to perturbations of metabolic pathways, including but not limited to, the disruptions of carbohydrate metabolism, TCA cycle and fatty acid metabolism.The correlation between CRC serum and tissue candidate metabolites suggests that the serum metabolic phenotype of CRC can reflect the changes of metabolites in CRC tissues, which provides valuable metabolic information for early screening of CRC.

PU-1524

双模活体示踪内皮祖细胞移植治疗缺血性脑卒中的实验研究

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研究目标：本项目拟以带有荧光素酶-增强型绿色荧光蛋白的慢病毒载体和超顺磁性氧化铁双标记内皮祖细胞，标记细胞移植治疗缺血性脑卒中的小鼠模型。在活体内通过生物发光和高场强的 7.0T 的磁共振双模成像示踪移植治疗后内皮祖细胞的时空分布、增殖分化、转归等生物学行为，为细胞移植治疗缺血性脑卒中方案的优化、条件选择提供实验依据。

研究**方法** 用携带双报告基因的慢病毒粒子感染新生儿脐带血中分离培养出 hEPCs 得到单标记的细胞（V-hEPCs），将 10^6 个 V-hEPCs 分别经左心室和经尾静脉途径移植到小鼠卒中模型中， BLI 监测不同时间点移植细胞的归巢情况。用携带双报告基因的慢病毒粒子和 SPIONs 先后标记 hEPCs 得到双标记的细胞（D-hEPCs），在卒中小鼠中通过经左心室途径输注 D-hEPCs 后进行 BLI 和 MRI 的活体示踪监测。在细胞移植前以及细胞移植后不同时间进行神经功能评分；并采用 MR T2WI 扫描评价病灶大小；组织学染色检测 MBP 新生、神经发生等变化。

研究**结果** BLI 显示经尾静脉途径与经左心室途径输注 V-hEPCs，均能够归巢到卒中小鼠的缺血脑组织，但经左心室途径输注细胞的归巢能力明显强于经尾静脉途径的移植方式。通过 BLI 和 MRI 可活体示踪 D-hEPCs 经左心室途径在卒中小鼠中的转归，脑组织病理切片染色可见梗死灶周边有普鲁士蓝染色阳性、GFP 染色阳性细胞，说明 D-hEPCs 的归巢于缺血组织。神经功能评分和 T2 扫描测定梗死灶的大小提示 D-hEPCs 移植能够减少卒中小鼠的行为学缺陷并且减少脑梗死灶的大小。在 D-hEPCs 移植组，脑组织梗死灶大小、神经新生、髓鞘新生等明显强于 PBS 对照组（$p < 0.05$）。

结论 EPCs 可作为缺血性 nao 卒中移植治疗的潜在备选细胞。

PU-1525

Mn02 coated Biodegradable Stent as pH/H202 Responsive Scaffold to Modulate Hypoxia for Effective Photodynamic Therapy

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Objective: Construction a kind of MnO2 coated Ce6 PCL fiber with the ability of inhibiting tumor, further, the capability of this biodegradable stent in terms of technical feasibility and treatment effect was investigated through subcutaneous tumor model of the nude mice in situ.

Methods: In the present study, small molecule chlorine e6(Ce6) was embedded in PCL fibers by Electrospinning method with or without MnO2 coating on the surface of the fiber 1. MTT assay was carried out to explore cell killing efficacy on ECA-109 cell line after incubated with the fibers and confocal imaging was used to reveal the ROS generation. Live/dead staining was performed for the aim of investigating the cell-killing ability of photosensitizer embedded PCL fiber. In nude mice tumor model, Ce6 embedded stent with or without MnO2 coating was implanted below the tumor side and both tumor volume and weight of nude mice was recorded for up to two weeks. In order to further investigate the hypoxia ameliorating ability of MnO2 coated Ce6 stent, hypoxyprobe immunofluorescence assay was employed on tumor slices. Apoptosis of the tumor was determined by TUNEL staining2.

Results: MTT assay and confocal imaging exhibited that MnO2 coated Ce6 fiber is superior to other groups in cell killing efficacy and ROS generation. Furthermore, live/dead staining showed that MnO2 coated Ce6 fiber group has better cell killing ability in comparison with other groups. In vivo results revealed that the tumor growth on nude mice was significantly inhibited after MnO2 coated Ce6 fiber implantation and 660 nm3 laser irradiation, indicating remarkably improved therapeutic efficacy compared to various control groups. According to the result of Hypoxyprobe immunofluorescence assay, we observed obviously reduced green fluorescence (pimonidazolestained hypoxia) in the tumor slices of mice treated with MnO2 coated Ce6 stent in comparison with that of the control groups, which indicates that the tumor hypoxia was successfully relieved. TUNEL staining also showed that tumor slices from mice treated with MnO2 coated Ce6 stent has a greater proportion of apoptosis dyeing.

Conclusion: The MnO2 coated Ce6 stent was feasible for treatment of esophageal cancer because of its ability to relieve hypoxia environment of tumor for enhanced photodynamic therapy.

PU-1526
基于 SPIO 的间充质干细胞在脊髓损伤与修复中应用的 MR 实验研究

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目的： 探讨瑞存标记脐带间充质干细胞的可行性和安全性；探讨标记干细胞移植应用于比格犬脊髓损伤模型、MR *示踪的可行性。*

方法： 以不同浓度的瑞存-PLL(SPIO)标记间充质干细胞，普鲁士蓝染色、电子显微镜观察细胞内铁，四氮噻唑蓝(MTr)比色试验比较未标记、标记细胞间生长曲线的差异，流式细胞分析检测标记、未标记细胞的细胞周期变化、细胞凋亡、表面标记物表达情况，ICP *定量细胞内铁；模型制作当时将标记细胞局部移植，模型比格犬（ｎ ＝ 6）及对照组（ｎ ＝1）体内，移植后第 3、７ 、14、21、28 天应用ＭＲ 观察脊髓信号改变情况。行* HE、普鲁士蓝、ＣＤ90、CD68 *免疫组织化学检查，并将ＭＲ 所见与病理切片行对照分析。实验所得数据，计量资料多组比较采用方差分析，两组间比较采用两样本* t *检验。*

结果： SPIO 对细胞的标记率接近 100％，铁颗粒位于细胞质内，瑞存标记不影响间充质干细胞的生物学特性，200ug/mL 是最佳的标记浓度，其生长曲线、细胞周期、细胞凋亡、表面蛋白表达等与未标记细胞相比，差异无统计学意义（P 值均>0．05）；比格犬脊髓损伤模型可稳定制作，移植标记的间充质干细胞至损伤局部后，细胞迁移至损伤部位上下段，以下段为主，MR 多参数成像可示踪移植的标记细胞，低信号呈点状、条带状，梯度回波序列最敏感。随着观察时间延长，信号改变程度减低，DTI *可半定量脊髓损伤后白质纤维束的修复情况，病理证实标记细胞归巢至损伤部位周围，沿脊髓中央管旁分布。对照组比格犬ＭＲ 成像未见明显低信号改变。*

结论： 200ug/mL 对脐带间充质干细胞的标记率接近 100％，并且对细胞的生物学特性无明显影响，可用于进一步 MRl 的研究。标记细胞可归巢至损伤脊髓上/下缘，临床应用型 3.0T *ＭＲ 可对其进行动态观察。*

PU-1527
颅内动脉瘤介入术后不同显影方式 对密网支架显影效果对比分析

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目的 探讨不同显影方式对动脉瘤治疗后密网支架显影的质量。**方法** 回顾分析我院 2018 年 5 月至 2019 年 6 月期间 5 例以密网支架（Tubrige 及 Pipeline）治疗的动脉瘤患者资料。在西门子 Artis Zeego 机器辅助下进行，患者支架释放后以三种不同造影方式进行影像扫描及重建评估。一、双容积重建组：参数设置及流程：选用 5S DSA Head 程序扫描靶血管，采用碘克沙醇造影，在 Syngo 工作站内使用 Dual Volume with Moco 模式进行双容积重建后处理，得到双容积成像图像。二、1:3 造影剂组：参数设置及流程：选用 20S DSA Head 扫描靶血管，配置并抽取 1:3 稀释比例的造影剂，颈内动脉设置为流速 3ml/s,液量 60ml，压力限制 150psi，X-ray 延迟设置为 1.5s 后进行扫描，在 Syngo 工作站内使用 Auto 3D 模式成像，调整窗宽窗值至支架显示的最佳状态。三、1:5 造影剂组：造影剂选用 1:5 稀释比例的造影剂，扫描流程同 1：3 稀释浓度。评价指标：密网支架及血管显示均较好评为 1 级；支架显示好，血管显示差评为 2 级；支架显示较差、血管显示好评为 3 级。**结果:在** 1:5 浓度组中，对 4 例患者密网支架显示评级为 1 级，1 例 Tubridge 显示评级为 2 级；在 1:3 组中，对 2 例 Pipeline 患者密网支架显示评级为 1 级，对 3 例 Tubridge 患者密网支架显示评级为 2 级；在双容积重建组中，对 1 例 Pipeline 患者密网支架显示评级为 2 级，其余 4 例患者密网支架显示评级为 3 级。**结论** 密网支架越来越多在临床得到使用，经过初步试验我们发现 20S DynaCT Head 较双容积重建技术能更好的显示密网支架影像，其中以 1:5 造影剂浓度能取得更优显影效果，能更好的了解密网支架在载瘤动脉中的位置及贴壁情况，值得推广。

PU-1528
颈动脉支架成形术规范化操作流程

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目的 分析探讨颈动脉支架成形术的规范化操作对治疗颈动脉狭窄的安全性。**方法** 分析 24 例颈动脉狭窄支架治疗并发症的发生情况。**结果** 颈动脉支架释放成功术后症状恢复满意，无 1 例患者出现脑梗塞、脑出血等严重并发症 。**结论** 颈动脉支架成形术的规范化操作在治疗颈动脉狭窄时能有效防止相应并发症的发生。

PU-1529
颅内脑膜瘤复合介入手术一期治疗临床分析

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目的 探讨脑膜瘤一期复合介入手术治疗技术及临床疗效。**方法** 回顾分析我院 2016 年 3 月至 2018 年 9 月收治的 6 例一期行供瘤血管介入栓塞术及开颅手术切除术的颅内脑膜瘤患者资料。患

者均术前行头颅 CT 及头颅增强磁共振检查确诊为颅内脑膜瘤。6 例病例中，最大径大于 7cm 的巨大脑膜瘤有 2 例，根据部位不同有额部凸面脑膜瘤 1 例，颞部凸面脑膜瘤 1 例，额颞部凸面脑膜瘤 3 例，额颞部蝶骨嵴脑膜瘤 1 例，均在复合手术间实施一期治疗。治疗时均采用气管插管全麻，右侧股动脉穿刺置鞘，首先行全脑血管造影（DSA）检查评估肿瘤供血动脉情况，确认颈外动脉参与肿瘤供血，无危险吻合血管。后置入 6F 导引导管，路图模式引导下，微导丝导引，2.7F 微导管超选择性到达脑膜中动脉参与肿瘤供血各分支血管，再次选择性造影评估，后注射混合有造影剂的 300-500um 或 500-700um 栓塞微粒球，观察有无造影剂停滞或者反流现象。术中造影评估栓塞满意后即刻开颅肿瘤切除手术。**结果** 6 例患者均成功一期实施肿瘤供血动脉的颈外动脉供血支栓塞治疗及肿瘤切除手术。术中造影 6 例患者中根据 Manelfe 分型有Ⅰ型 1 例，Ⅱ型患者 4 例，Ⅲ型患者 1 例。其中 1 例Ⅲ型患者仅选择性栓塞一支较小颈外动脉的肿瘤供血动脉，给予输血治疗，其余患者均未输血治疗。手术中切除肿瘤程度按照 Simpson 分级有 1 级者 3 例，2 级者 2 例，3 级者 1 例，4 级者 1 例。术后其中 1 例巨大脑膜瘤患者发生术区再次出血脑疝形成，再次行开颅减压手术，康复治疗后病情好转，6 月随访 GOS 达 3 分，其余 5 例患者随访 3 个月～1 年恢复良好，GOS 评分均达 5 分，未见明确复发征象。 **结论** 颅内脑膜瘤术前造影评估并实施颈外动脉供血分支介入栓塞术，降低了手术风险，传统方式往往分两期实施。复合手术间的出现为一期实施肿瘤供血动脉介入栓塞术及开颅脑膜瘤切除术提供了条件，降低患者手术出血风险的同时提高治疗的有效性及安全性。

PU-1530
脑血管支架介入手术过程中测量参数设置的探讨

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目的 探讨脑血管支架介入手术过程中以造影导管及导引导管的实际尺寸设置测量参数，测量靶血管的误差，修正后精确设置导管尺寸，为经后术中精确选取支架尺寸提供可靠依据；**方法** 回顾性分析我院神经内科 2018 年 6 月-2019 年 5 月 53 台在飞利浦 FD20 设备上脑血管支架介入手术的影像资料，分别以 5Fr 造影导管，6Fr 或 8Fr 导引导管造影剂出现在屏幕之前的导管头端外径为依据，设置测量参数，测量造影剂充盈后靶血管狭窄部位近远端尺寸,在放入球囊扩张导管或支架导管后进行设置测量，根据球囊扩张导管或在支架打开之前支架的 MARK 点之间的距离，重新测得造影导管的直径，根据所得导管直径重新测量造影剂充盈后靶血管狭窄部位尺寸，将两次测量所得数据进行比较，并对支架置入术后造影结果进行评价。**结果** 以造影导管为设置参数和以球囊扩张导管或支架的 MARK 点间距离为设置参数所得到的造影导管的直径尺寸不一致，以 MARK 点间距离为设置参数，所得的支架尺寸更准确，靶血管贴合更好。**结论** 在脑血管介入手术过程中，经过进行校准后的测量参数设置更精确，有利于脑血管支架患者获得最大受益。

PU-1531
老年脑梗塞患者实施康复护理的认知及预后的影响分析

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【摘要】目的 探讨对老年脑梗塞患者采取康复护理干预对于认知以及预后的临床影响。**方法** 抽取我院在 2018 年 1 月~2018 年 12 月收治的 104 例老年脑梗塞患者进行对比研究，根据数字随机表

法将其分为康复组和常规组，各为 52 例患者。康复组应用康复护理方案，常规组应用常规护理方案，观察两组患者的临床资料，并且对比康复组和常规组各项功能的改善情况以及护理满意度。**结果** 康复组的肢体功能、神经功能以及日常生活能力等指标均优于常规组，康复组的护理满意度（90.25±4.12）分显著高于常规组（82.31±5.37）分，且对照均存在 P＜0.05，有统计学上的意义。**结论** 对老年脑梗塞患者采取康复护理干预，对于改善患者日常生活能力、肢体功能以及语言功能的效果十分显著。

PU-1532
不同年资护士在护患纠纷中的心理应激比较分析

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摘要 目的 探究不同年资护士在护患纠纷中的心理应激。**方法** 此次研究选取的研究对象为发生护患纠纷护士共 80 例，根据护龄进行分组分为 A 组与 B 组，每组各 40 例，A 组由低于 10 年护龄护士组成，B 组由超过 10 年护龄护士组成，使用心理应激调查问卷进行调查，分析心理应激情况。**结果** 比对两组护士的负面情绪，A 组均高于 B 组，组间差异呈 P<0.05。**结论** 在护患纠纷中，低护龄护士缺乏社会经验与工作经验，极易产生负性情绪，表现为愤怒、恐惧、委屈、抑郁、焦虑等。在护患纠纷发生以后，护士需加强心理应激对策的构建，及时调整个人不良情绪，预防护患纠纷。

PU-1533
脑动静脉畸形的护理

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总结介入栓塞手术治疗 92 例脑动静脉畸形的护理经验。护理要点:术前了解有无癫痫发作史、有无出血倾向、有无手术禁忌症，心理护理及术前准备，术后预防并发症：脑出血、伤口出血及血肿，进行术后心理护理。患者均治愈出院。

PU-1534
对侧颈动脉闭塞患者颈动脉支架成形术围手术期护理分析

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目的 探讨对侧颈动脉闭塞颈动脉支架成形术围手术期护理分析。**方法** 对颈动脉支架成形术治疗的同侧颈动脉狭窄、对侧颈动脉闭塞的 11 例患者的临床资料进行回顾性分析。11 例患者，男性 9 例，女性 2 例，年龄 45～73 岁，使用 7 或 8F 导管鞘配合 0.035 泥鳅导丝（Terumo,Somerest,NJ）及 5F 造影导管，将长鞘放置于狭窄侧颈动脉近心端；小心通过狭窄段血管，将脑保护伞放置于病变远端颈内动脉颅外段平直处，选择较小规格球囊进行快速扩张，球囊选取标准是（狭窄远端血管直径+狭窄近端血管直径）/2×0.75；如狭窄节段较长，则分段多次扩张；在路途及透视引导下将支架系统放置于病变部位，根据狭窄局部改善情况选择是否进行后扩张。回收保护伞，并撤出导管，术后常规局部加压包扎，围手术期护理配合。**结果** 11 例患者经手术和护理配合，手术均获

成功，术后残余狭窄 0～30%，平均残余狭窄 15%±8%。术后 10 例患者自诉症状减轻，1 例加重。术后加重患者经磁共振证实为新发梗死，经药物治疗后好转出院。**结论** 支架成形术治疗对侧颈动脉闭塞患者的颈动脉狭窄患者是安全的，围手术期护理观察极为重要。

PU-1535
颈内动脉支架术后再闭塞后急诊再通过程中支架变形一例病例报道

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背景：支架内再闭塞为 CAS 术后并发症之一，且可能引起急性缺血性卒中。
方法 详细报道我中心一例 CAS 术后再闭塞急诊再通过程中支架变形的病例。病例资料：患者 CAS 术后 9 天后因支架内再闭塞引起急性缺血性卒中，行急诊再通术过程中由于负压抽吸力度较大发生支架严重变形，解除负压后支架形态恢复。支架内再通后行同侧大脑中动脉取栓术后完全再通。
结果 支架变形恢复后血管再通成功。
结论 CAS 术后支架内再闭塞可为急性缺血性卒中的原因之一；对于 CAS 再闭塞手术过程中，支架内的负压抽吸避免力度过大，从而降低支架变形的风险。

PU-1536
颅内动脉瘤介入术后不同显影方式 对密网支架显影效果分析

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目的 探讨不同显影方式对动脉瘤治疗后密网支架显影质量的对比，评估密网支架的位置及贴壁情况。**方法** 回顾分析我院神经外科 2018 年 5 月至 2019 年 6 月 5 例以密网支架治疗的动脉瘤患者资料。全部患者均在术前确诊为颅内动脉瘤，并行密网支架置入术。每例患者支架释放后以三种方式进行影像扫描及重建评估。一、双容积重建组：选用 5S DSA Head 扫描，使用 Dual Volume 模式进行双容积重建。二、1:3 造影剂浓度 20sDynaCT Head 扫描组：选用 20sDynaCT 扫描，配置并抽取 1:3 稀释比例的造影剂，使用 Auto 3D 模式成像，调整窗宽窗值至支架显示的最佳状态。三、1:5 造影剂浓度 20s DynaCT Head 扫描组：选用 1:5 稀释造影剂，余同上。评价指标：两名副主任医师以上共同阅片，密网支架及血管显示均较好评为 1 级；支架显示好，血管显示差评为 2 级；支架显示较差、血管显示好评为 3 级。**结果**:5 例动脉瘤密网支架治疗术中，用 1:5 造影剂扫描后，4 例患者密网支架显示评级为 1 级，1 例显示评级为 2 级；用 1:3 浓度扫描后，对 2 例密网支架显示评级为 1 级，对 3 例密网支架显示评级为 2 级；在双容积重建组中，对 1 例密网支架显示评级为 2 级，其余 4 例患者密网支架显示评级为 3 级。对三种方式进行对比分析，20S DynaCT Head 扫描较双容积重建成像对密网支架显示较好，1:5 浓组度较 1:3 浓度组对密网支架及血管显示效果更好。**结论** 动脉瘤微创介入治疗已成为大多数患者的首选治疗方法，密网支架越来越多在临床得到使用，支架的释放位置、是否充分释放及贴壁性是评估密网支架治疗效果的重要方面。经过初步试验我们发现 20S DynaCT Head 较双容积重建技术能更好的显示密网支架影像，其中以 1:5 造影剂浓度能取得更优显影效果，能更好的了解密网支架在载瘤动脉中的位置及贴壁情况，值得在临床推广。

PU-1537

关于脑动脉瘤介入栓塞术的围手术期护理体会

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研究分析脑动脉瘤介入栓塞手术的围手术期护理方式。方法：２０１４年１月至２０１８年１２月我院对１００例脑动脉瘤介入栓塞治疗围手术期患者的临床护理方式进行了回顾分析。结果：全部患者接受手术治疗后，有９５例顺利出院，恢复情况良好。有５例患者术后出现了二次出血情况，对其进行半年随访，并发症全部消失，没有复发病例。结论：脑动脉瘤介入栓塞治疗围手术期护理进行强化后可以提升介入手术治疗效果，提高患者生活水平。

PU-1538

1 例锁骨下动脉夹层动脉瘤破裂合并血气胸的抢救与护理

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【摘要】总结了 1 例锁骨下动脉夹层动脉瘤破裂出血合并血气胸患者抢救成功的护理经验。护理要点：术前进行充分的风险评估纠正休克并做好急救预案，术后细致观察穿刺部位及周围皮肤的出血、渗血情况，做好中心静脉导管，胸腔引流管，溶栓导管管道护理，控制感染，及时配合医生救治处理，避免术后并发症的发生。该患者救治快速准确，顺利度过了危险期。经过精心治疗与护理，病情稳定出院，出院后随访生活自理。

PU-1539

多学科协作模式在 1 例高空坠落复合伤患儿护理中的应用

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[摘要] 总结多学科协作模式应用于 1 例高空坠落复合伤患儿中的效果。患儿高空坠落后全身多处骨折，左肾多发挫裂伤伴肾周血肿、脾脏挫裂，腹腔积液；左肺挫伤；左桡骨远端骨折；左侧髂骨骨折；面部软组织挫伤。成立紧急护理协作小组，包括神经内科、神经外科、儿科、呼吸科、泌尿科、创伤关节科、眼科等专科护士及感控部门，针对性地处理患儿的护理问题，成功的解决了患儿的护理难题。在医护精心治疗与护理下，患儿康复出院。

PU-1540

颅内动脉瘤患者介入术后的护理

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[目的]对脑动脉瘤介入治疗手术的术前护理、术中护理和术后的状况进行观察，了解其手术护理的效果。[方法]术前做好检查和物品准备、心里建设；术中做好手术用药和监护；[结果]脑动脉瘤介入手术护理效果良好。[结论]术前、术中及术后进行有效护理才能够真正保障介入手术治疗的成功，因此需要提升护理操作的规范，来提升介入治疗的效果。

PU-1541
3D-DSA 和 Dyna CT 双容积重建影像对血管内支架的显示价值

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目的　比较三维旋转造影（3D-DSA）和 20s-DR Dyna CT 重建影像对血管内支架显示的差异。

方法　2015 年 5 月—2018.12 月期间，回顾性随机收集介入手术中植入颅内支架后分别作了 3D-DSA 或 20s-DR Dyna CT 的病人各 15 例，其中男 16 例，女 14 例，年龄 41-66 岁。3D-DSA 造影时，造影管超选到颈内动脉，造影剂速率 4 ml/s, 剂量 24ml, 压力 150 psi，曝光延时 1 秒，采集的 3D-DSA 数据作双容积透明影像重建。20s-DR Dyna CT 扫描时，造影管超选到颈内动脉，造影剂速率 2 ml/s，剂量 50ml（造影剂经生理盐水 1:7 剂量稀释），压力 150 psi，曝光延迟 5 秒，采集数据先作双容积重建后再选择 MIP 重建。对比两组重建图像支架标记点显示数目和血管内支架显示的完整程度。当支架 100%完整显示时，我们评价为 1，如果图像上支架的显示不完整，由两名手术医师共同评估支架能显示出的比例，用百分数表示。

结果　3D-DSA 和 20s-DR Dyna CT 重建影像上显示的支架标记点分别是 105 和 96，SPSS 17.0 统计学软件进行统计学分析，结果存在统计学差异（T=4.89，P<0.05）。支架的完整性比较，两者分别是 38±5%和 82±4%，结果存在统计学差异(T=9.20，P<0.05)。

结论　3D-DSA 和 20s-DR Dyna CT 数据进行不同模式的重建，对血管内支架具有不同的显示优势。在支架两端的精确定位上，3D-DSA 透明模式显示更清晰准确；而在支架整体显示上，20s-DR Dyna CT 双容积重建 MIP 影像能更加完整的显示出支架，了解支架贴壁情况和走行。介入技师可以根据手术需要，合理选择运用不同的重建方法，为手术提供更好的影像显示。

PU-1542
经皮椎体成形术治疗成骨性脊柱转移癌的临床应用

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目的 探讨 DSA 引导下经皮椎体成形术（Pecutaneous Vertebroplasty，PVP）治疗成骨性脊柱转移癌的可行性及短期临床疗效。资料与方法 2012 年 1 月---2017 年 9 月对 94 例（158 个病灶）成骨性脊柱转移癌实施 PVP 术，其中合并成骨性病理性骨折 27 例。通过 WHO 标准、视觉模拟评分（Visual Analog Scale，VAS）、体力状况评分（Karnofsky-KPS）的变化情况来评价临床效果。 结果 所有手术均获得手术成功，技术成功率 100%。术后随访至少 3 个月。资料完整的 90 例患者中 19 例完全缓解（CR），56 例部分缓解（PR），10 例轻微缓解（MR），5 例无效（NR），总有效率（CR+PR）达 83.3%。术后 24 小时 VAS 评分由术前 7.2±2.2 分降至 2.3±1.9 分，术后 1 月、3 月分别降至 2.1±1.8 分、2.1±2.1 分。术后 24 小时、1 个月、3 个月 KPS 评分由术前 78.5±11.4 分分别升至 87.5±10.8 分、88.0±11.0 分、89.2±10.8 分。17 例发生少量骨水泥渗漏，但无明显临床症状(18.9%)。 结论 DSA 引导下对成骨性脊柱转移癌患者行 PVP 术是可行、有效的，能有效缓解疼痛、稳定脊柱，改善其生活质量，并能降低截瘫发生率。

PU-1543
支架精显技术对术中 Pipeline 支架与血管壁贴合效果的评估

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颅内动脉瘤常是导致蛛网膜下腔出血（subarachnoid Hemorrhage,SAH）的主要原因之一，SAH 发生时，未经治疗的致死率高达 50%[1]。当前动脉瘤的治疗方法主要有开颅动脉瘤夹闭术及血管内介入栓塞术术等。随着介入治疗方法的日趋成熟及介入材料的不断改进，血管内介入治疗已逐渐成为动脉瘤治疗的首选[参考文献]。对于宽颈动脉瘤及梭形动脉瘤，常需要支架进行辅助弹簧圈栓塞以防止弹簧圈脱入载瘤动脉造成血管闭塞[2]，但常规支架网孔率高?，术中依靠传统数字减影血管造影（Digital Subtraction Angiography,DSA）技术不能显示支架与血管壁的贴合情况及与弹簧圈的关系。血流导向装置（Pipeline-Flex 支架）是一种低网孔率和高金属覆盖率的密网支架，它能改变血流动力学从而使动脉瘤内血栓形成，同时促进支架内的内皮细胞和新生内膜组织增生，因而依靠瘤颈的内膜化起到修复载瘤结构的完整性[3]，能达到不使用弹簧圈而栓塞动脉瘤的效果。支架精显技术是一种通过后处理技术来达到显示术中 Pipeline 支架与血管壁的贴合情况从而评估动脉瘤的栓塞程度。现将支架精显技术对术中 Pipeline 支架与血管壁的贴合效果的案例报道如下。

PU-1544
胸腹主假性动脉瘤的腔内手术治疗

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摘要:目的　介绍血管内支架技术治疗胸腹主动脉夹层动脉瘤的手术方法，对 2019 年 6 月 1 例胸腹主动脉夹层动脉瘤的手术过程进行回顾性分析。**结果**　1 例男性，年龄 82 岁。IV 型胸腹主动脉假性动脉瘤 1 例。**结论**　腔内人工血管治疗主动脉夹层动脉瘤简化了手术操作，减小了手术风险。腹主动脉夹层开窗手术是治疗主动脉夹层的辅助手段。

关键词：动脉；夹层；主动脉瘤；支架；人工血管。

1 临床资料

患者郝某某，性别男，年龄 82，双侧腰部肋弓下疼痛 40 天，于 2019 年 6 月 10 日入院。既往双肺气肿并肺大泡形成、肝多发囊肿、前列腺增生。术前诊断胸腹主动脉假性动脉瘤

2 治疗方法

患者平卧位，全麻麻醉成功后常规消毒、铺巾。分别于双侧腹股沟处及双侧肘关节处做纵行切口，显露双侧股总动脉及双侧肱动脉。探查见双侧股动脉搏动良好，可扪及硬化斑块。

根据术前 CTA 影像，左侧髂动脉条件相对较好，决定经左侧股动脉入路植入支架。直视下穿刺左侧股动脉，置入鞘管，送入导丝，撤出导丝，经导丝送入 20F 血管扩张器评估入路情况，扩张器在髂总动脉处上行困难。撤出扩张器，依次送入 8mm，10mm 球囊将左侧髂总、髂外动脉上段予以扩张。扩张后送入 22F 血管扩张器，可顺利通过左侧髂动脉进入腹主动脉。

3 结果

患者康复出院，无并发症

4 讨论

胸腹主动脉假性动脉瘤，传统的腔内隔绝术无法解决。开放手术和杂交手术虽然是潜在的治疗方法，但却有着先天的缺陷。传统手术需要开胸开腹进行主动脉阻断＋内脏重建，解剖和手术难度都

较大，出血和术后ＤＩＣ的风险高，创伤大。因此，完全腔内技术处理是该患者的理想治疗方法之一。该患者胸腹主动脉隔绝，术中及术后发生截瘫风险高

PU-1545
基于多层螺旋 CT 全肝灌注成像 部分性脾动脉栓塞术后肝脏血流状态变化研究

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目的 应用多层螺旋 CT 全肝灌注模式，探讨肝硬化脾亢患者部分性脾动脉栓塞术（PSE）后肝脏血流动力学变化情况。**方法** 本组共收集行部分性脾动脉栓塞术的肝硬化脾功能亢进患者 26 例(Child-Pugh A 级 11 例，B 级 11 例，C 级 4 例)，均在术前 3 天及术后 1 月行多层螺旋 CT 全肝灌注成像及彩色多普勒超声检查；（1）分别测定 PSE 术前后基于 Couinaud 分段肝脏五叶相关灌注参数值:肝动脉灌注量(HAP)，门静脉灌注量(PVP)，总肝灌注量(TLP) 和肝动脉灌注指数(HPI)，比较术后肝脏五叶血流灌注变化；（2）测量并比较 PSE 术前后脾静脉与门静脉内径、平均血流速度及血流量的变化；（3）观察术后相关不良反应及处理措施。所有计量资料用均数±标准差（$\bar{x} \pm s$）表示，采用配对 t 检验分析 PSE 术前及术后相关参数变化。**结果** （1）术后 1 月肝左外叶、左内叶、右前叶、右后叶 HAP 较术前明显增加，差异有统计学意义($P<0.05$)；肝左外叶、右前叶、右后叶 HPI 均高于术前，差异有统计学差异（$P<0.05$）；尾状叶 HAP、HPI 术前术后比较无明显差异（$P>0.05$）；全肝叶 PVP、TLP 差异无统计学意义($P>0.05$)；（2）术后 1 月与术前相比脾静脉内径较术前明显缩小（$P<0.01$），脾静脉血流量较术前显著减少（$P<0.05$），但平均血流速度较术前差异不明显（$P>0.05$）；门静脉血流量较术前明显减少（$P<0.05$），但门静脉内径及平均血流速度差异无统计学意义（$P>0.05$）（3）术后大部分患者出现不同程度不良反应，包括发热、腹痛、腹胀、恶心、呕吐、胸水、腹水，经对症治疗均好转，所有患者均无严重并发症。**结论** 肝硬化脾亢患者部分性脾动脉栓塞术后肝动脉血流灌注量增加，门脉血流量减少，肝脏灌注 CT 成像可用于评价 PSE 术后肝脏血流动力学变化并为临床治疗方案的选择提供帮助。

PU-1546
颈部创伤性动脉瘤间异物双介入治疗初步动物实验研究

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目的 探讨双介入治疗颈部创伤性动脉瘤间异物的技术可行性和效果。**方法** 取 2 岁龄健康比格犬 5 只，采用右侧颈静脉片移植同侧颈动脉壁上后断针贯穿、留置其间的方法，构建颈部创伤性动脉瘤间异物模型；左侧颈部采用直接断针刺入、留置方法构建颈动脉旁软组织异物模型作对照。然后在直接经 7F 血管鞘颈动脉内置入可降解覆膜支架封堵瘤口的同时，透视导向经皮经软组织钳取动脉瘤间异物；对照组在左侧颈动脉内导丝定位透视导向下经皮经软组织钳取异物。**结果** 直接经鞘法颈动脉内支架置入技术成功率 100%，双介入同时异物取出和动脉瘤解剖治愈率 100%，异物取出后颈动脉瘤出血率及覆膜支架释放后有效止血率为 100%；术后 3 月内未见动脉瘤复发，但均见局部颈动脉轻-中度狭窄。对照组介入异物取出成功率 100%，未见颈动脉出血、狭窄。**结论** 可降解

覆膜支架辅助的双介入技术可一站式同时微创取出异物和封闭创伤性动脉瘤颈口，直接经鞘法不失为一种可选择的血管支架置入实验方法。

PU-1547
动脉球囊封堵术与子宫动脉栓塞术治疗对前置胎盘产后出血不良反应及生活质量的影响

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前置胎盘属于晚期妊娠并发症,极易因病情加重导致产后大出血[1],进而威胁到母婴安全。国外前置胎盘的患病率在 0.3%～0.9%[2],而我国发病率 0.2%～1.6%。受近些年多孕多产、流产次数增加等原因的影响,造成患者子宫内膜受到损伤[1],进而增加了胎盘前置的患病率。现就我院在 2015 年 9 月至 2017 年 9 月收治的 100 例前置胎盘患者采取子宫动脉栓塞术、动脉球囊封堵术治疗的临床价值进行探析,

PU-1548
IVIM-DWI 在肝细胞癌 TACE 术疗效预测及评估中的应用价

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目的 探讨 IVIM-DWI 技术在 TACE 后疗效的预测及评估中的应用价值。
材料与**方法** 收集首次行 TACE 治疗的肝细胞癌患者 20 例，共 31 个病灶。所有病例在术前 1~3 天及首次术后 30~40 天行常规 MRI 平扫、IVIM-DWI 扫描（b=0,20,40,80,100,200,400,800,1000）及动态增强扫描。获得以下定量指标：（ADC）、（Dslow）、（Dfast）、(f)。根据 mRECIST 标准，将病例分为疗效好组和疗效差组。患者 TACE 治疗前后的 IVIM 相关参数采用配对 t 检验；肿瘤区及非瘤区（瘤周正常肝实质）组间 IVIM 相关参数使用独立样本 t 检验；疗效好组和疗效差组间相关参数比较使用独立样本 t 检验；并运用 ROC 曲线确定各参数预测 TACE 术疗效反应的效能阈值。
结果 （1）治疗前、后肿瘤区 ADC、Dslow、Dfast 值有统计学差异；治疗前、后非瘤区 Dfast 值有统计学差异。（2）治疗前，瘤区与非瘤区间 ADC、Dslow、Dfast、f 值差异均有统计学意义；治疗后，瘤区与非瘤区间 Dslow、Dfast、f 值差异有统计学意义。（3）TACE 治疗前，疗效好组和疗效差组间 ADC、Dslow、Dfast 值均有统计学差异；治疗后，疗效好组和疗效差组间的 ADC、Dfast 值有统计学差异。(4) 当 ADC、Dslow、Dfast 的阈值分别是 0.91×10-3mm2/s、0.81×10-3mm2/s、33.54×10-3mm2/s，其预测患者 TACE 术疗效反应感度分别为 100%、96.00%、100%，特异性分别为 60.00%、50.00%、80.00%，ROC 曲线下面积分别是 0.817、0.733、0.847。
结论 IVIM-DWI 成像能够作为定量指标预测及评价肝细胞癌 TACE 治疗的短期疗效，对临床医生在治疗方案的制定及后期疗效的判定有一定的指导意义

PU-1549
产后大出血介入治疗的围术期护理

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目的]探讨介入治疗产后大出血围术期护理的方法。[方法]回顾性分析 30 例产后大出血病人经产科保守治疗无效后行子宫动脉栓塞治疗的围术期护理资料。[结果]通过有效的治疗以及积极的护理配合,全部病人止血效果良好,无一例出现再次大出血和其他并发症,月经均恢复正常。[结论]充分做好介入治疗产后大出血的围术期护理,对手术顺利进行、提高介入治疗成功率、减少并发症发生具有重要意义。

PU-1550

探讨子宫动脉化疗栓塞术在中晚期宫颈癌治疗中的疗效和对根治手术的影响。

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目的 探讨子宫动脉化疗栓塞术在中晚期宫颈癌治疗中的疗效和对根治手术的影响。
方法 回顾性分析 4 年间我院收治的 26 例 IB1 期以上宫颈癌患者行子宫动脉灌注化疗栓塞术（介入组）临床资料,并与同期 26 例行放射治疗（放疗组）患者进行比较（对照组）。根据 FIGO 制定的标准,将每组病例分为:IB1 期、IB2 期、IIA 期、IIB 期，根据肿瘤病理类型每组分为鳞癌组、腺癌组。比较两组患者的临床近期有效率，近期临床症状缓解状况；治疗反应和合并症。
结果 介入组有 26 例共计行 30 次介入治疗，25 例阴道流血患者，行介入治疗后 24 例出血于 24 小时内完全消失，1 例患者于 72 小时后阴道出血完全消失；所有患者 1 周内下腹坠痛症状即可明显缓解。治疗 1 次后有 22 例临床分期逆转，其中 IB1 期逆转为 IA2 期 4 例；IB2 期逆转为 IB1 期 6 例；IIA 期逆转为 IB2 期 4 例,逆转为 IB1 期 2 例；IIB 期逆转为 IIA 期 6 例，其余 4 例行 2 次介入治疗后皆逆转为 IIA 期，全组共有 26 例（26/26）发生临床分期逆转
结论 子宫动脉化疗栓塞术治疗中晚期宫颈癌，止血效果明确，缓解临床症状迅速，临床并发症少；子宫动脉化疗栓塞术逆转肿瘤临床分期，可使 IIB 期患者临床分期逆转至 IIA 期，为无法手术的的患者创造了手术条件；子宫动脉化疗栓塞术＋根治手术临床疗效确切，大部分患者手术后无明显并发症，显著提高患者生存质量，是治疗中晚期宫颈癌的有效方法。

PU-1551

动脉栓塞治疗子宫腺肌症一例

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子宫腺肌症是子宫内膜腺体和间质侵入子宫肌层形成弥漫或局限性的病变，多发生于 30～50 岁左右的经产妇。因经量多、经期长合并逐渐加重的进行性痛经而影响患者的生活质量。子宫腺肌症病因至今不明。目前的共识是因为子宫缺乏黏膜下层，因此子宫内膜的基底层细胞增生、侵袭到子宫肌层，并伴以周围的肌层细胞代偿性肥大增生而形成了病变。而引起内膜基底层细胞增生侵袭的因素现有五种理论：①与遗传有关；②子宫损伤，如刮宫和剖宫产均会增加子宫腺肌症的发生；③高雌激素血症和高泌乳素血症；④病毒感染；⑤生殖道梗阻，使月经时宫腔压力增大，导致子宫内膜异位到子宫的肌层。根据典型病史及症状即可作出初步诊断，结合相关化验及影像学检查，如盆腔或阴道超声、MRI，CA125 等可诊断，确诊需通过手术取得病变组织行病理学检查。

本病的治疗手段较多，临床决策需结合患者的年龄、症状及生育要求进行个体化选择，各种治疗疗效不尽人意。近年来，随着介入治疗技术的不断进步，选择性子宫动脉栓塞术作为治疗子宫腺肌症的方案之一，由于安全、微创、疗效满意，受到临床医生和患者青睐。本例患者栓塞后子宫体积明显缩小，压迫症状缓解，疗效确切，无明显副作用。

PU-1552
难治性产后出血介入治疗疗效及其相关危险因素分析

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目的
探讨介入子宫动脉栓塞术治疗难治性产后出血的疗效及影响其术后再出血的危险因素。
方法
回顾性分析 2012 年 1 月~2014 年 9 月山西医科大学第一医院收治的 64 例难治性产后出血行子宫动脉栓塞术患者的临床资料。按照术后是否再出血分为止血成功组及失败组，对两组患者的一般临床资料、术中血管造影表现及栓塞情况、术后情况进行分析，并对止血失败的相关危险因素行非条件多因素 Logistic 回归分析。
结果
1、64 例患者中介入治疗成功 57 例，失败 7 例，成功率为 89%。失败病例中，4 例直接行次全子宫切除术；3 例二次介入，其中 2 例成功，1 例失败后行次全子宫切除术。5 例 B-lynch 缝合止血失败患者行介入治疗成功 4 例；两例子宫动脉假性动脉瘤栓塞后未见出血；6 例 DIC 患者介入治疗效果好，术后未见明显出血。所有患者无严重并发症，术后 3 个月及半年随访，均无异常出血，月经恢复正常；
2、术中造影示：双侧子宫动脉从髂总动脉近端、臀下动脉远端各发出一例；子宫动脉主干明显收缩 5 例；双侧髂内动脉分支参与供血 8 例；髂外动脉分支参与供血 2 例；
3、单因素分析结果显示：失败组各因素（瘢痕子宫史、宫缩剂的联合使用、宫缩乏力及胎盘因素）比例明显高于成功组， χ^2 值分别为 6.560、4.761、4.409、5.906，均 $P<0.05$；多因素 logistics 回归分析显示瘢痕子宫史、宫缩剂的联合使用是难治性产后出血介入失败的危险因素，OR 值分别为 11.23、12.83。
结论
1、介入子宫动脉栓塞术治疗难治性产后出血成功率高,并发症少,且能保留子宫及生育功能,为难治性产后出血切实、有效的止血方法；
2、瘢痕子宫史及宫缩剂的联合使用是难治性产后出血介入失败的危险因素。临床中还应注意胎盘因素及子宫出血动脉的解剖变异对介入疗效的影响，积极总结经验教训，进一步提高介入治疗的成功率。
关键词： 难治性产后出血；子宫动脉栓塞； 危险因素； 疗效

PU-1553
主-髂动脉与下肢动脉闭塞行 PVI 治疗并发症的早期预防及护理

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目的 探讨主-髂动脉与下肢动脉闭塞行外周血管介入（PVI）治疗术中和术后产生并发症的早期预防及护理。**方法** 观察并护理 2014 年 9 月－2019 年 2 月在兰州大学第一医院介入医学科行 PVI 治疗的主-髂动脉与下肢动脉闭塞患者 401 例，其中有 43 例发生并发症，对临床资料和并发症进行回顾和分析，总结并发症的早期预防和护理。**结果** 术中 4 例出现动脉夹层、2 例血管破裂出血；术后 2 例下肢深静脉血栓形成，4 例急性动脉血栓形成，3 例血栓复发、2 例动脉远端栓塞；5 例穿刺部位渗血、7 例出现血肿、6 例组织器官出血；2 例假性动脉瘤，3 例下肢再灌注损伤，1 例骨筋膜室综合征，2 例发生感染。**结论** 详细评估患者状况，提前进行充分的物品准备；医护合作，严格遵从医嘱；仔细交接班，按时巡回，密切监护并详细观察病情变化，发现异常及时报告医师，早发现、早治疗是预防并减少并发症发生的有效方式。

PU-1554
非支气管性体动脉在肺结核大咯血介入治疗中的作用

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目的探讨非支气管性体动脉(nonbronchial systemic arteries,NBSA)在肺结核大咯血介入治疗中的临床价值。方法对 24 例行支气管动脉栓塞术(bronchial artery embolization,BAE)的肺结核大咯血患者进行为期 2 年的随访观察。根据患者是否咯血复发,将 24 例患者分为未复发组和复发组,比较两组之间的临床资料并进行统计学分析。结果 24 例患者经 6 个月-2 年的随访观察,共有 11 例患者复发咯血。复发组中行主动脉造影者 6 例(54.5%),明显低于未复发组(92.3%),比较具有统计学意义(P<0.05);复发组中发现有 NBSA 参与供血的患者 10 例(90.9%),显著高于未复发组(61.5%,P<0.05);复发组患者供血 NBSA 平均数(2.87±2.70)与未复发组(1.05±1.12)比较具有统计学意义(P<0.05);复发组完全栓塞例数 5 例(45.4%)明显低于未复发组(92.3%)(P<0.05)。结论责任 NBSA 的发现和完全栓塞对于介入治疗肺结核大咯血起着重要作用,可以提高咯血的治疗效果,减少咯血复发率。

PU-1555
急性外周动脉出血的数字减影血管造影诊断及介入治疗

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：目的探讨急性外周动脉出血的 DSA 诊断及介入治疗的临床价值。方法回顾性分析 2008~2013 年我科 79 例已行介入诊疗的急性外周动脉出血患者的 DSA 表现和介入疗效。结果 79 例急性外周动脉出血患者均行 DSA 检查,75 例行动脉栓塞术,余 4 例下消化道出血患者未行栓塞术。75 例介入治疗后 66 例出血立即停止,即刻止血率 88%(66/75)。56 例平均随访 30 d 未再出血,且未出现相关严重并发症,失访 10 例;余 9 例动脉栓塞治疗效果不理想。结论对于大多数急性外周动脉出血的患者,DSA 能明确出血部位及责任动脉,介入治疗具有定位准、创伤小、疗效高等优点,有重要的临床应用价值。

PU-1556

经导管前列腺动脉栓塞治疗良性前列腺增生的疗效观察

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目的
评价药物治疗效果不明显且不可耐受或不愿意接受外科手术的良性前列腺增生患者，行前列腺动脉栓塞术的安全性及有效性。
方法
2016 年 10 月-2018 年 7 月，对 15 例药物治疗无效的伴有中重度下尿路梗阻症状的良性前列腺增生患者，统计其术前下尿路梗阻症状相关指标评分、影像学检查及尿动力学检查，术前国际前列腺症状评分为 21.80±3.36 分，生活质量评分为 4.6±0.62 分，后行经导管前列腺动脉栓塞术，术后 1，3，6，12 个月随访，观察比较手术过程、并发症及术后疗效。
结果
15 例患者均手术成功，其中双侧栓塞 14 例（93.3%），单侧栓塞 1 例（6.7%），除个别患者出现尿道烧灼感、暂时性尿潴留或低热等术后正常反应外，均未出现严重并发症，术后 1 个月、3 个月、6 个月、12 个月的 IPSS 变化分别为－4.13±1.64 分、－5.33±2.31 分、－5.44±2.96 分、－5.60±1.52 分（P＜0.001），Qol 变化分别为－1.20±0.56 分、－1.50±0.52 分、－1.44±0.88 分、－2.00±0.71 分（P＜0.001）。
结论
对于药物治疗效果不明显且不可耐受或不愿意接受外科手术的良性前列腺增生患者，经导管前列腺动脉栓塞术适应症广、成功率高、近期疗效明确、手术并发症少，是一种安全有效的治疗手段，值得被进一步推广。

PU-1557
单中心肺癌氩氦刀冷冻治疗 13 年临床疗效分析

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目的：对 65 例 NSCLC 资料完整患者术后进行 13 年临床随访分析，以期提高 NSCLC 患者氩氦刀冷冻治疗及综合的临床疗效。
材料和方法：收集我院肺癌氩氦刀冷冻治疗 90 例患者临床资料，其中腺癌 48 例，鳞癌患者 39 例，未分化癌 2 例，小细胞肺癌 5 例。对其中 65 例 NSCLC 资料完整患者进一步综合分析。男 48 例（73.84%），女 17 例（28.26.26%），年龄范围 57～ 86 岁，平均 64.8 岁。按照临床 NCCN 指南分期，Ⅰ期 16 例，Ⅱ15 例，Ⅲ17 例，Ⅳ17 例。
采用肺内病灶进行单刀或多刀组合进行氩氦刀冷冻治疗，术中取活检送病理分析和基因分型，术后进一步按照 NCCN 指南进行综合治疗，对氩氦刀术中、术后并发症进行临床随访，对 OS、PFS 进行统计分析。分别采用 Kaplan-Meier 法进行累积生存率、Binary logistic 和 Pearson’s Chi-Square test or Likelihood Ratio’s test 进行临床分期、病因与复发的相关性、复发率分析，P ＜ 0.05 认为有统计学意义。
结果：平均每个患者氩氦刀使用 1.61 把，技术成功率 100% (65/65)，冰球覆盖率达 97%。65 例患者中，术后气胸 9 例，胸腔出血 1 例，胸水 7 例，胸痛 2 例，干咳 1 例，发热 1 例。9 年生存率为 (Kaplan-Meier estimate) 按照分期 OS 分别为Ⅰ期 51 个月，Ⅱ期 24 个月，Ⅲ期 12 个月，Ⅳ期 17 个月，PFS 分别为Ⅰ期 19 个月，Ⅱ期 10 个月，Ⅲ期 5 个月，Ⅳ期 8 个月。统计学分析表明Ⅰ期 51 个月，Ⅱ期 24 个月，Ⅲ期 12 个月，Ⅳ期 17 个月。Chi-Squre 检验表明Ⅰ期与Ⅱ期、Ⅲ期、Ⅳ期 PFS、OS 有明显统计学差异<0.05，Ⅱ、Ⅲ、Ⅳ期之间无明显统计学差异>0.05.

结论:早期 NSCLC(包括Ⅰ、Ⅱ期）效果明显，达到文献同期手术治疗效果；Ⅲ、Ⅳ患者可以明显提高生活质量和生存期，值得进一步研究和推广。

PU-1558

子宫动脉化疗栓塞治疗瘢痕妊娠 25 例分析

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目的 探讨子宫动脉介入栓塞在子宫瘢痕妊娠先兆出血治疗中的作用。**方法** 对 25 例子宫瘢痕妊娠先兆出血患者行子宫动脉灌注甲氨蝶呤(MTX)和明胶海绵颗粒栓塞治疗(UAE)，24~72 h 后行清宫术。**结果** 25 例化疗栓塞成功，成功率 100%，一次清宫干净术中出血量≤50mL，所有患者监测血清β-HCG 值至术后 30d 内降至正常。**结论** 子宫动脉化疗栓塞对子宫瘢痕妊娠先兆出血患者清宫术前治疗，可有效减少术前、术中出血，是一种安全可行，值得推广的方法。

PU-1559

肝外门静脉闭塞的介入治疗

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目的 探讨肝外门静脉闭塞的介入治疗疗效及再通策略。
方法 回顾性分析 2016 年 1 月至 2019 年 4 月在我院行介入治疗的 10 位肝外门静脉闭塞患者的临床资料，其中男性 3 人，女性 7 人，原发性门静脉闭塞 3 人，肝移植术后闭塞 2 人，恶性肿瘤术后闭塞 2 人，肝硬化闭塞 3 人。所有患者均行介入再通手术，其中，经皮经门静脉穿刺引入导丝通过狭窄段置入支架 9 例，经皮经脾静脉穿刺引入导管作为靶导管定位，然后经皮经门静脉穿刺靶导管建立轨道置入支架 1 例，两例肝硬化患者同时加行经颈内静脉肝内门体静脉分流术；术后，采用超声或门静脉 CTV 定期随访观察患者的支架通畅情况及症状缓解情况。
结果 所有患者均一次置入支架成功，技术成功率 100%，围手术期未发生严重并发症；平均随访 14.5 个月，两例支架内血栓形成，支架通畅率为 80%，所有患者均未发生消化道出血等严重门脉高压症状。
结论 经皮介入治疗肝外门静脉闭塞安全、有效，靶导管定位技术可作为门静脉闭塞介入再通困难的重要方法。

PU-1560

多种设备引导下动脉临时球囊阻断技术在凶险性前置胎盘剖宫产术中的应用

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【摘要】多种设备引导下动脉临时球囊阻断技术在凶险性前置胎盘剖宫产术中疗效评定及特点。方法收集我科自 2016 年 7 月-2018 年 8 月配合产科、超声科开展不同设备引导下临时球囊阻断患者

共 26 例。26 例患者均经超声和（或）MRI 诊断凶险性前置胎盘，在不同的引导设备下行双侧髂内或髂总动脉预埋临时球囊，待胎儿取出时立即充盈球囊阻断髂动脉血流，根据产科手术进度及出血情况适时撤出球囊。结果本组 26 例患者动脉临时球囊预埋阻断均获得成功，其中 1 例患者因发现右侧子宫动脉假性动脉瘤形成，行栓塞治疗。26 例患者阻断时间 3-15 分钟，术中出血量 400-1000ml。本组病例无子宫切除及术后输血，所有新生儿均存活。结论针对凶险性前置胎盘患者在剖宫产术中行动脉临时球囊阻断，能够减少剖宫产术中出血量及相关并发症的发生率。动脉临时球囊阻断技术具有创伤小、安全性高、疗效确切等特点，近年来已在临床推广应用。

PU-1561

巴曲酶联合阿司匹林预防糖尿病下肢缺血病变介入术后再狭窄的疗效分析

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目的 常规应用阿司匹林可以减少血管成形术后再狭窄的发生。巴曲酶已被证明可以通过降低纤维蛋白原浓度有效防止血管成形术后血栓形成。本项随机临床试验假设巴曲酶联合阿司匹林相比单纯运用阿司匹林可以更有效地降低糖尿病下肢缺血病变介入成形术后再狭窄或再闭塞的发生率。
材料和方法: 110 例症状性血管闭塞的糖尿病患者随机分为实验组(n=50)和对照组(n=60)。实验组患者接受阿司匹林（100mg/d）联合巴曲酶治疗(5 IU/d* 6 次，隔天应用)，对照组单独应用阿司匹林。以 12 个月为随访终点，通过下肢血管磁共振成像(MRA)或者血管超声来评估血管再狭窄或者再闭塞的情况。统计踝以上截肢、死亡人数，以及截肢或死亡累积发生率，运用 Kaplan-Meier 生存曲线来评估保肢率和存活率。
结果 12 个月后，实验组再狭窄发生率为 28.9%，对照组为 42.8%（*P*=0.002）。MRA 及血管超声显示膝下动脉（P=0.001）和长度>10cm（P=0.010）者再狭窄发生率高。实验组较对照组再狭窄率、症状减轻程度、截肢率明显改善。Kaplan-Meier 生存曲线显示血管成形术 12 个月后，对照组和实验组保肢/存活率分别为 78.2% and 93.5% (log-rank 检验, *P*=0.0324)。
结论 巴曲酶联合阿司匹林可以有效减少血管成形术后再狭窄发生率，尤其针对膝下病变>10cm 者，有着更好的临床疗效，并且可以提高患者肢体挽救率。

PU-1562

Transjugular intrahepatic portosystemic shunt for repeated bleeding of hemorrhoids caused by severe portal hypertension with ectopic varices: report of a case

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Background: Severe portal hypertension is life-threatening and can bring adverse complications such as ascites, gastroesophageal varices, edema, etc., even cause variceal hemorrhage, which may lead to a high risk of death. There is a rare incidence in bleeding of hemorrhoids caused by severe ectopic varices.
Case presentation: We report a case concerning a female patient with 20-year history of hepatitis B virus (HBV) infection, repeated bleeding of hemorrhoids caused by

severe portal hypertension with ectopic varices of the connection between superior mesenteric vein and rectal venous plexus. Laboratory results revealed a hemoglobin level of 74 g/L in our hospital. Finally, the patient had been successfully treated with transjugular intrahepatic portosystemic shunt placement without variceal embolization after a multidisciplinary comprehensive opinion. In the two-month follow-up period, the patient hadn't developed hepatic encephalopathy or hematochezia, and a computed tomography venography indicated that the stent was unobstructed and ascites disappeared.

Conclusions: The treatment of transjugular intrahepatic portosystemic shunt (TIPS) is effective, and we hope this case can help clinicians improve the awareness of hemorrhoidal bleeding with severe portal hypertension in the diagnosis and treatment, rather than simply considering hemorrhoidal bleeding. And abdominal computed tomography venography is recommended as an effective imaging examination method to determine the stent status after the operation.

PU-1563

Nanoparticle embedded Biodegradable Stent as pH/H2O2 Responsive Scaffold to Modulate Hypoxia for Effective Photodynamic Therapy

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Objective: Construction a kind of photosensitizer nanoparticles embedded PCL fiber with the ability of inhibiting tumor, further, the capability of this biodegradable stent in terms of technical feasibility and treatment effect was investigated through subcutaneous tumor model of the nude mice in situ.

Methods: In the present study, small molecule chlorine e6(Ce6), BSA-Ce6 nanoparticles(BC), BSA-Ce6-MnO2 nanoparticles(BCM) was respectively embedded in PCL fibers by Electrospinning method. MTT assay was carried out to explore cell killing efficacy on ECA-109 cell line after incubated with the photosensitizer and confocal imaging was used to reveal the ROS generation and cellular uptake ability of free ce6, BC and BCM. Live/dead staining was performed for the aim of investigating the cell-killing ability of photosensitizer embedded PCL fiber. In nude mice tumor model, stent containing photosensitizer Ce6, BC and BCM was implanted below the tumor side and both tumor volume and weight of nude mice was recorded for up to two weeks. In order to further investigate the hypoxia ameliorating ability of BCM nanoparticles, hypoxyprobe immunofluorescence assay was employed on tumor slices. Apoptosis of the tumor was determined by TUNEL staining.

Results: MTT assay and confocal imaging exhibited that BCM is superior to other groups in cell killing efficacy, ROS generation and cellular uptake ability. Furthermore, live/dead staining showed that BCM embedded fibers group has better cell killing ability in comparison with other groups. In vivo results revealed that the tumor growth on nude mice was significantly inhibited after BCM embedded stent implantation and 660 nm3 laser irradiation, indicating remarkably improved therapeutic efficacy compared to various control groups. According to the result of Hypoxyprobe immunofluorescence assay, we observed obviously reduced green fluorescence (pimonidazolestained hypoxia) in the tumor slices of mice treated with BCM embedded stent in comparison with that of the control groups, which indicates that the tumor hypoxia was successfully relieved. TUNEL staining also showed that tumor slices from mice treated with BCM embedded stent have a greater proportion of apoptosis dyeing.

Conclusion: The BCM embedded stent was feasible for treatment of esophageal cancer because of its ability to relieve hypoxia environment of tumor for enhanced photodynamic therapy.

PU-1564

31 例糖尿病足患者下肢血管 CTA 成像效果的研究

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目的:本研究着重对糖尿病足下肢血管病变的 CTA 成像效果进行研究，探究 CTA 的成像效果。 材料与**方法** 对 31 例临床确诊糖尿病足患者的下肢血管行 CTA、DSA 检查，以 DSA 为金标准，分析 CTA 对糖尿病足患者下肢血管病变的成像效果。**结果** CTA 对于糖尿病足下肢血管病变成像的总体准确性、敏感性及特异性分别为 96.4%、94.8%、98.8%。膝上动脉组，CTA 的准确性、敏感性、特异性分别为 97.6%、98.2%、97.3%。膝下动脉组，CTA 的准确性、敏感性、特异性为 94.6%、83.2%、98.9%。**结论** CTA 为有效的糖尿病足下肢血管病变无创影像学检查方法，但 CTA 对于膝下动脉的成像效果较差。

PU-1565

经足背-足底或足底-足背动脉环逆行腔内成形术与常规顺行血管成形术治疗膝下动脉闭塞性病变的临床对照研究

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目的 对照研究经足背-足底（transdorsal-to-plantar，TDP）或足底-足背（transplantar-to-dorsal，TPD）动脉环逆行腔内成形术与常规顺行血管成形术治疗膝下动脉闭塞性病变的临床疗效。
方法 回顾性从 2009 年 10 月到 2011 年 7 月 96 例膝下（below-the-knee，BTK）动脉闭塞性病变患者，共计 112 条患肢计划接受常规顺行 BTK 血管成形术，其中 27 条手术失败患肢接受经 TDP 或 TPD 动脉环逆行腔内成形术，22 条患者取得手术成功。手术前后踝--肱指数（ABI）、基于 TIMI 的病变段血流分级评分及足背或足底动脉搏动评分在常规顺行血管腔内成形术成功患者组（常规组，71 例患者共计 85 条患肢）及经 TDP 或 TPD 动脉环逆行腔内成形术成功患者组（逆行组，20 例患者共计 22 条患肢）之间进行比较研究，随访两组术后肢体挽救率及靶血管再狭窄情况。
结果 常规组和逆行组手术技术成功率分别为 74.0%和 75.9%（P>0.05）；逆行组 ABI 从术前 0.55±0.21 升至 0.93±0.19（vs 常规组 0.56±0.14 升至 0.89±0.18，P>0.05）；TIMI 评分增加情况显示逆行组患者远侧足部组织获得更好血流灌注（逆行组 2.3±0.8 vs 常规组 1.0±0.8，p<0.05）。逆行组和常规组在 12 和 24 个月靶血管通畅率分别 63.6% (14/22)、45.5% (10/22)和 52.9% (45/85)、37.6% (32/85)（P>0.05）。24 个月后 Kaplan－Meier 评分显示逆行组和常规组肢体挽救率分别为 93.8%和 96.5%（P>0.05）。
结论 TDP 或 TPD 动脉环逆行腔内成形术治疗膝下动脉闭塞性病变较常规顺行血管成形术相比可以获得更好的即刻血流改善情况，以及相似的 ABI 改善情况、一期通畅率及肢体挽救率，其可作为顺行血管成形术失败后的有效替补技术方法。

PU-1566

Embolization for Hemorrhage and Pseudoaneurysm of Secondary to Pancreaticoduodenectomy Procedure

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[Abstract] Objective: To analyze the factors of hemorrhage and pseudoaneurysm post pancreaticoduodenectomy and evaluate the clinical efficacy and safety of digital subtraction angiography (DSA) and embolization.
Methods: 17 patients with hemorrhage post pancreaticoduodenectomy were collected because of pancreatic head cancer, choledochal carcinoma and duodenial adenocarcinoma. The definition and severity of bleeding are referred to the International Pancreatic surgery Research Group (ISGPS) standard. Abdominal aorta, celiac trunk, common hepatic artery, spleen artery, gastroduodenal artery, superior mesenteric artery and inferior mesenteric artery were performed to determine the location of bleeding, the size of pseudoaneurysm, parent artery and collateral branches. After the bleeding and pseudoaneurysm were identified, the coils were used for embolization immediately . The definition and evaluation criteria of the efficacy, technical success and clinical success of embolization refer to Society of Interventional Radiology (SIR). Signs of successful embolization include technical and clinical success. Technical success was defined as complete embolization of the target with the chosen material and an effective hemostasis at the end of the procedure. Clinical success was defined as the absence of repeat bleeding that required surgery or endoscopy and survival through the 30 days following hemorrhage.
Results: Among the 17 patients, 1 patient was active bleeding. Contrast medium overflowed in the open intestine, spasm. Irregular shape and rigidity in the common hepatic artery-proper hepatic artery junction area. 16 cases of pseudoaneurysm, including 14 cases located in the trunk and branch of gastroduodenal artery, 1 case in the stump of GDA and 1 case in the trunk of spleen artery. The angiographic findings were saccular shadow, quasi-round or irregular shape, and the boundary was clear. 1 patient showed capsule-like changes in the stump of gastroduodenum on DSA. Considering that the patient was sentinel bleeding, the stump of GDA was embolized. After embolization, the radiography showed the mark of technical success, and then the catheter was pulled out to end the operation. However, during extubation, the patient complained of abdominal pain. Blood pressure decreased rapidly, and emergency re-angiography was performed. The embolization of proper hepatic artery and common hepatic artery was performed immediately. Blood transfusion and dilatation were carried out after the operation, and symptomatic treatment was actively carried out. However, one week later, the patient died of insufficient blood volume and liver failure. The other patients achieved technical and clinical success, and no serious complications were found.
Conclusion: The causes of postoperative hemorrhage and pseudoaneurysm after pancreaticoduodenectomy are various. Pseudoaneurysm or parent artery embolization is safe and effective.

PU-1567
仰卧位逆行动脉穿刺在下肢动脉长段闭塞病变成形术中的应用体会

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【摘要】 **目的** 通过 11 例下肢动脉慢性闭塞病例采用仰卧位下患肢腘动脉 P3 段或小腿动脉逆穿技术行下肢动脉成形术的回顾性分析，总结在顺行开通闭塞段动脉失败的情况下，选择仰卧位下逆行穿刺腘动脉 P3 段或小腿动脉双通道开通闭塞动脉的可行性和安全性。**方法** 回顾性分析我科自 2017 年 1 月至 2019 年 3 月收治的 11 例行下肢动脉逆行穿刺辅助动脉成形的患者。11 例下肢动脉闭塞患者中，7 例为长段股浅动脉闭塞，4 例为股浅动脉闭塞合并腘动脉闭塞。11 例患者均经对侧股总动脉逆行穿刺“翻山”后顺行开通闭塞段动脉失败，通过翻山鞘造影了解闭塞段动脉远端流出道情况后，根据造影结果选择合适的逆穿入路。7 例患者选择穿刺腘动脉 P3 段，通过经小腿外侧胫腓骨之间间隙穿刺郭冬梅 P3 段逆行通过股浅动脉闭塞段，以穿针技术将导丝插入对侧动脉鞘中并引出体外，形成工作导丝环；再经对侧动脉鞘沿导丝依次行球囊扩张、支架释放、后扩张，完成股浅动脉开通。4 例患者合并腘动脉闭塞，选择小腿动脉逆行穿刺成功后顺利开通闭塞段动脉。**结果** 11 例患者均采用透视路途下穿刺成功，穿刺成功率 100%，治疗有效率为 100%，术中术后均未发生相关并发症。术后患者间歇性跛行症状消失或明显改善，静息痛消失，3 例伴发足趾坏疽患者术后 3 个月复查见坏死足趾均已自行脱落，创面愈合良好。 **结论** 经腘动脉 P3 段或小腿动脉逆行穿刺辅助开通股浅动脉闭塞是有效且可行的，而 P3 段血管直径较粗，穿刺成功率更高，且患者均可在仰卧位进行，不需要术中改变体位。但穿刺成功与否是对手术者手术经验和技术也是一种考验和挑战。

PU-1568

介入联合超声监测下清宫术在剖宫产术后宫颈妊娠中的应用

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目的 探讨子宫动脉化疗栓塞术联合超声监测下清宫术治疗剖宫产术后宫颈妊娠的安全性和有效性。**方法** 2017 年 4 月-2019 年 1 月收治 8 例剖宫产术后诊断为宫颈妊娠患者，采用子宫动脉化疗栓塞术治疗，术后 24-72 小时内行超声监测下清宫术。**结果** 20 例患者平均出血量为 15ml，平均住院时间为 5 天，8 例患者均未出现子宫破裂、大出血等严重并发症。**结论** 子宫动脉化疗栓塞术联合超声检测下清宫术治疗剖宫产术后宫颈妊娠安全、有效。

PU-1569

子宫动脉栓塞术在子宫腺肌症中的应用

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目的 探讨子宫动脉栓塞术治疗子宫腺肌症的安全性和有效性。**方法** 2018 年 6 月-2019 年 6 月收治 25 例子宫腺肌症患者，所有患者行子宫动脉栓塞治疗，比较术前、术后 3 个月及术后 6 个月临床指标。**结果** 25 例患者术后子宫体积均较前缩小，24 例患者痛经症状较前改善（应用 VAS 评分），1 例患者无明显改善，术后均无并发症。**结论** 子宫动脉栓塞术是治疗子宫腺肌症安全有效的治疗方法。术中选择较小的栓塞颗粒，术后患者出现栓塞后综合征情况较重，术后随访临床指标改善明显。

PU-1570

多层螺旋 CT 血管成像及全脑灌注成像对超早期脑梗死前期诊断中的的临床应用价值

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摘要 目的 探讨多层螺旋 CT 全脑血管灌注成像在超急性脑梗死缺血半暗带及部位的判断中临床应用价值。**方法** 对 60 例超急性脑梗塞疑似患者，在患者发病后 6 小时行缺血部位的多层螺旋 CT 平扫和灌注成像与 CTA 成像诊断造影观察，并分析灌注图像与 CTA 的重建后处理图像，所有患者在发病 1 周后再次行多层螺旋 CT 复查。**结果** 其中 15 例患者经普通 CT 扫描发现可疑脑缺血区，其中 45 例患者未发现明显异常；所有疑似病例患者均继续行多层螺旋 CT 全脑血管灌注成像，通过将采集到的脑血管灌注图进行分析，被发现脑组织缺血的部位与患者的临床症状相对应；并通过多层螺旋 CTA 检查，发现患者大脑中动脉闭塞 13 例，7 例大脑中动脉狭窄，4 例颈内动脉狭窄。**结论** 多层螺旋 CT 全脑血管灌注成像对临床诊断超急性脑梗塞具有良好的特异性和敏感性，可以早期发现患者脑组织中存在的缺血半暗带并为患者预后情况的评估起着极其重要的作用价值；多层螺旋 CTA 检查可以较及时的发现缺血性病变的原因，为进一步临床治疗方案的制定提供了有力的理论依据。

PU-1571

GE128 层宝石能谱螺旋 CT 血管造影技术在诊断头颈部血管病变中的临床应用价值研究

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摘要 目的 探讨 X 线数字减影血管造影技术(Digital subtraction angiography)，与 GE128 层宝石能谱螺旋 CT 血管造影技术，在头颈部血管造影检查影像资料中的评价比较，评估分析血管不同程度狭窄的相关准确性。**方法** 收集我院临床高度怀疑的颅颈内动脉狭窄患者 58 例，所有病例均进行了头颈部血管 CT 血管造影、X 线数字减影血管造影检查 (Digital subtraction angiography)；综合比较头颈部血管 CT 血管造影和 X 线数字减影血管造影检查资料进行分析，评估 GE128 层宝石能谱螺旋 CT 血管造影技术对头颈部动脉血管狭窄的诊断评价准确性。**结果** 以患者的双侧颈内、外动脉和椎动脉、基底动脉为分析研究对象，共观察血管 130 支，其中采用头颈部血管 CT 血管造影技术共显示 126 段不同程度的血管狭窄段；X 线数字减影血管造影检查 (Digital subtraction angiography)共显示不同程度的血管狭窄段 120 段。**结论** GE128 层宝石能谱螺旋 CT 血管造影技术对颈内、外动脉和椎动脉、基底动脉狭窄整体诊断的灵敏度为 98.68%，98.16%，特异度为 99.63%，99.33%；GE128 层宝石能谱螺旋 CT 血管造影技术对头颈部血管无创、快速、简便、安全，可清晰完整并 360 度旋转立体显示头颅、颈内外动脉、椎动脉、基底动脉狭窄具有很高的敏感性和特异性，可作为临床首选的影像学检查方法。

PU-1572

在颅内小型血管动脉瘤的临床诊疗中旋转 3D-DSA 成像技术的临床应用价值与展望

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摘要：目前颅内血管动脉瘤是临床上比较常见的临床疾病之一，其中特别是针对于略小于直径 3 毫米以内的细小血管动脉瘤，其在临床的诊断和治疗评估中有一定的技术性难度。随着科技时代的到来，各种全新的诊疗技术问世，特别是近几年来随着大型三维数字减影血管造影技术（3D-DSA）的迅猛发展，在很大程度上提升了显示细小颅内血管动脉瘤的临床检出性，在很大程度上为临床增加了其诊断的准确性和敏感性，大大减少了由于受到传统影像的成像技术上普通影像学检查与常规 DSA 检查技术的局限性限制，极大的降低了其漏诊率、误诊率，当前已成为临床上颅内血管动脉瘤的最新诊疗的金标准诊断。通过在本文中叙述了，目前最新的三维数字减影血管造影技术（3D-DSA 成像技术）与以往的常规影像学检查技术的对比相关性，其在颅内血管细小动脉瘤的诊断和治疗以及预后评估中的临床应用价值。

PU-1573

多层螺旋 CT 肺动脉血管造影检查在诊断肺动脉血管栓塞中的临床应用价值及进展展望

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摘要：目前临床上肺动脉血管栓塞（肺栓塞）的发病率日益增加，近年来随着医学技术的飞速发展，特别新的诊疗方法的普及，临床诊断与影像放射学诊断能力都得到很大的提高，肺动脉血管栓塞的临床确诊病例增加非常明显，也为临床制定及时有效的救治方法，提供了有力的依据。目前肺动脉血管栓塞已成为医学影像学科和相关临床学科的重点研究课题之一，但由于多数患者都缺乏敏感性和特异性的临床表现和实验室检查数据，故当前临床诊断确诊这种疾病，主要依赖于医学影像学检查。本文就多层螺旋 CT 肺动脉血管造影应用诊断及其进展展望做一系统综述。

PU-1574

7 例肺隔离症的介入治疗分析

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目的 探讨肺隔离症经动脉栓塞治疗的疗效及安全性。**方法** 回顾分析 2003 年 9 月至 2018 年 3 月 7 例在我院就诊并行介入治疗的肺隔离症的患者的临床资料，根据造影的情况选择不同的栓塞材料行介入栓塞治疗，术后随访 2～48 个月（平均 20 个月）。**结果** 所有患者均成功行介入栓塞治疗，材料包括弹簧圈及 PVA 颗粒，随访期间未见咯血复发及严重并发症发生。**结论** 介入栓塞是治疗肺隔离症安全且有效的方法。

PU-1575

创伤性主动脉夹层 20 例诊治分析

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目的　探讨外伤引起的主动脉损伤的临床特点及介入治疗的效疗。方法　回顾性分析 2010 年 1 月一 2019 年 5 月我院收治的 20 例外伤性主动脉损伤患者的临床资料。男性 16 例，女性 4 例，年龄 19～69 岁，致伤原因包括车祸伤 10 例，高空坠落伤 3 例，跌伤 3 例，撞击伤 3 例，刀刺伤 1 例。病例中主动脉夹层 18 例，主动脉破裂 1 例，主动脉假性动脉瘤 1 例，其中外伤性主动脉夹层中 1 例为 Debakey Ⅰ型，余均为 Debakey Ⅲ型。结果　18 例患者成功行覆膜支架腔内修复术，2 例行保守治疗。随访 2 个月—113 个月，所有患者均无不良事件发生。结论　介入治疗是外伤性主动脉损伤安全有效的治疗手段。

PU-1576

医用臭氧经血管介入途径治疗兔 VX2 肝癌的实验研究

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目的　探讨医用臭氧对兔 VX_2 肝癌治疗作用。**方法**　选择 18 只健康新西兰大白兔，采用开腹直接种植法制作 VX_2 肝癌模型。介入治疗：建模 2 周后行上腹部增强 CT 扫描，建模成功后，将 18 只实验兔随机分为两组进行介入治疗：生理盐水组（灌注 50ml 生理盐水，n=10），臭氧水组（灌注 50ml100ug/ml 臭氧水,n=8）。治疗后观察：一般情况的观察；术前及术后检测 ALT、AST、Cr、TNF-α、IL-6、IL-1β 水平的动态变化；术前 1 天及术后 7 天、14 天分别行上腹部增强 CT 扫描，计算肿瘤体积增长率及坏死率。术后 14 天处死实验兔，取肿瘤组织，做病理切片，HE 染色观察肝癌术后镜下表现。**结果**　（1）一般情况：术后实验兔均出现不同程度的精神萎靡、活动减低、反应迟钝、纳差等症状，术后 5-7 天症状逐渐缓解。（2）肝肾功能：臭氧水组实验兔术后 ALT、AST 水平较术前均升高，差异无统计学意义（P>0.05）；生理盐水组实验兔术后 ALT、AST 水平较术前无明显变化，差异无统计学意义（P>0.05）；两组实验兔术后 Cr 水平均较术前无明显变化，差异无统计学意义（P>0.05）。（3）炎症因子：两组实验兔的 TNF-α、IL-6、IL-1β 在术前无明显差异，术后臭氧水组实验兔的 TNF-α、IL-6、IL-1β 较生理盐水组均不同程度增高，差异有统计学意义（P<0.05）。（4）影像学表现：在 CT 平扫时病灶呈低密度，增强扫描动脉期边缘明显强化，静脉期强化程度明显增加。介入治疗后，臭氧水组肿瘤的生长率低于生理盐水组，肿瘤内部坏死率明显高于生理盐水组，差异有统计学意义（P<0.05）。（5）病理学表现：HE 染色镜下观察可见肿瘤细胞核增大、异型明显、排列紊乱，瘤组织中央大片变性、坏死；臭氧水组肿瘤细胞的坏死范围明显大于生理盐水组。**结论**　本研究发现臭氧水能抑制肿瘤的生长速度，促进细胞炎症因子的表达，诱导肿瘤细胞的坏死。

PU-1577

肝血管瘤介入治疗的疗效分析

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目的　探讨博来霉素碘化油乳剂加明胶海绵颗粒在肝血管瘤介入栓塞治疗中的疗效和安全性。　方法　收集并分析 2014 年 6 月-2018 年 8 月我院经动脉栓塞治疗的 62 例肝血管瘤患者，其中对照组 31 例，观察组 31 例。　对照组使用博来霉素碘化油乳剂行瘤体供血动脉栓塞，观察组在使用与对照组相同栓塞剂基础上加明胶海绵颗粒加强栓塞，比较两组患者临床疗效以及不良反应发生情况。　结果　观察组有效率（100%）明显高于对照组（74.1%），差异有统计学意义（P 〈

0.05）。 观察组患者治疗前总胆汁酸水平为（13.12±4.18）μmol/L，对照组为（14.17±4.13）μmol/L，两组差异无统计学意义（P ＞ 0.05）；治疗后，观察组为（5.55±1.74）μmol/L，较对照组的（12.13±3.22）μmol/L 明显降低，差异有统计学意义（P ＜ 0.05）。观察组不良反应的发生率为 37.5%，低于对照组的 40.0%，但差异无统计学意义（P ＞ 0.05）。结论 博来霉素碘化油乳剂加明胶海绵颗粒在介入治疗肝血管瘤中疗效显著，安全性高，值得临床推广应用。

PU-1578

介入栓塞对于子宫腺肌症疗效与价值

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目的 探讨介入栓塞对于子宫腺肌症疗效与价值。 **方法** 回顾性分析我院 16 例子宫腺肌症患者介入治疗的临床及影像资料，测量病变处最大子宫肌层厚度，对术前术后肌层厚度行配对 t 检验。**结果** 子宫腺肌症患者经介入栓塞治疗后临床症状改善，子宫肌层厚度有所减小（t<0.05）。 **结论** 子宫腺肌症采用介入栓塞治疗，创伤小、安全性高，疗效显著，值得推广。

PU-1579

经皮肝穿刺胃曲张静脉栓塞术联合或不联合部分脾动脉栓塞术治疗急性食管胃底曲张静脉破裂出血临床观察

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目的 观察比较经皮肝穿刺胃曲张静脉栓塞术（PTVE）联合或不联合部分脾动脉栓塞术（PSE）治疗急性食管胃底曲张静脉破裂出血的临床效果及预后。

方法：回顾性分析 2010 年 1 月至 2017 年 1 月采用单纯 PTVE 或 PTVE＋PSE 治疗的 56 例急性活动性食管胃底曲张静脉破裂出血患者临床资料，其中 PTVE 组 22 例、PTVE＋PSE 组 34 例。

结果：术后所有患者活动性上消化道出血完全停止。PTVE＋PSE 组白细胞、血小板水平升高显著高于 PTVE 组（P=0.002，P=0.032）。Log 蛳 Rank 分析表明两组无事件生存时间（EFS）差异无统计学意义（χ2=1.571，P=0.210），Cox 回归分析表明 Child 蛳 Pugh 评分与再发出血显著相关（HR=1.296，95%CI：1.130～1.488，P＜0.001）。

结论：PTVE 及 PTVE＋PSE 两种介入手术均可有效地治疗食管胃底曲张静脉破裂活动性出血，两者远期出血率无显著性差异，但 PTVE＋PSE 可显著改善患者脾亢表现。Child 蛳 Pugh 评分增高是术后再发出血的危险因素。

PU-1580
儿童肺隔离症行 DSA 下责任血管栓塞术的治疗及术中体会

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目的 探讨儿童肺隔离症介入栓塞治疗的安全性及有效性，以及栓塞术中体会。
方法 自 2016 年 2 月至 2019 年 2 月收治 3 例因反复肺部感染入院的儿童肺隔离症患儿，其中 2 例明确诊断为左下肺叶内型肺隔离症，1 例高度怀疑肺隔离症。全麻下对 3 例患儿行 DSA 下隔离肺责任血管栓塞术，观察患儿术后反应及相关并发症，并对患儿的症状改善情况进行随访。
结果 3 例患儿均成功行 DSA 下介入栓塞治疗，责任血管均栓塞完全，手术成功率 100%；其中 1 例患儿术前高度怀疑肺隔离症，术中 DSA 下造影明确诊断为此病，并发现责任血管与肺动脉存在瘘口。术中均应用弹簧圈栓塞责任血管，未出现弹簧圈阻塞末梢血管及进入肺动脉内等相关并发症。术后 3 例患儿均出现发热症状，予以抗生素及退热药物应用后，均在术后 5 天内缓解。3 例患儿出院后均未再出现反复肺部感染症状，术后 6 个月复查 CTA 均未再见原责任血管显影。随访 1 年，3 例患儿随访均未复发。
结论 DSA 下血管造影对 CT 无法明确诊断的肺隔离症有确诊的作用。儿童肺隔离症患者行 DSA 下责任血管栓塞术安全性高，效果良好，复发率低。

PU-1581
不同长度鞘管在腹主动脉球囊阻断联合剖宫产术中的对比分析

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目的 对比不同长度鞘管在凶险性前置胎盘行腹主动脉球囊阻断联合剖宫产术中的应用及相关并发症分析
方法 回顾性分析了 2017 年 4 月至 2017 年 12 月期间收治于我院的 159 例凶险性前置胎盘患者的临床资料。患者均行腹主动脉球囊阻断联合剖宫产术，83 例患者应用长鞘置入球囊（A 组），76 例患者应用短鞘置入球囊（B 组）。
结果 两组病例母婴情况（年龄、孕周、孕次、产次、新生儿 Apgar 评分）的差异无统计学意义（P＞0.05）。两组产妇术中出血量、输血比例、手术时间、球囊阻断时间、胎儿接收透视时间及放射剂量、术后行动脉栓塞率、子宫切除率上差异无统计学意义（P＞0.05）。A 组术后发现 2 例穿刺点血肿，1 例发生股总动脉血栓；B 组术后发现 1 例穿刺点血肿，6 例穿刺侧动脉血栓。形成动脉血栓上的差异有统计学意义（P＜0.05）。
结论 在凶险性前置胎盘的治疗中，应用长鞘行腹主动脉球囊阻断联合剖宫产术可有效减少球囊对血管的损伤，并降低穿刺侧下肢动脉血栓风险。

PU-1582
Dual compression is not an uncommon type of iliac vein compression syndrome

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Abstract Typical iliac vein compression syndrome (IVCS) is characterized by compression of left common iliac vein (LCIV) by the overlying right common iliac artery (RCIA). We described an underestimated type of IVCS with dual compression by right and left common iliac arteries (LCIA) simultaneously. Thirty-one patients with IVCS were retrospectively included. All patients received trans-catheter venography and computed tomography (CT) examinations for diagnosing and evaluating IVCS. Late venography and reconstructed CT were used for evaluating the anatomical relationship among LCIV, RCIA and LCIA. Imaging manifestations as well as demographic data were collected and evaluated by two experienced radiologists. Sole and dual compression were found in 32.3% (n=10) and 67.7% (n=21) of 31 patients respectively. No statistical differences existed between them in terms of age, gender, LCIV diameter at the maximum compression point, pressure gradient across stenosis, and the percentage of compression level. On CT and venography, sole compression was commonly presented with a longitudinal compression at the orifice of LCIV while dual compression was usually presented as two types: one had a lengthy stenosis along the upper side of LCIV and the other was manifested by a longitudinal compression near to the orifice of external iliac vein. The presence of dual compression seemed significantly correlated with the tortuous LCIA (p=0.006). Left common iliac vein can be presented by dual compression. This type of compression has typical manifestations on late venography and CT.

PU-1583

Atrophic inferior vena cava is a marker of chronicity of intra-filter and inferior vena cava thrombosis: based on CT findings

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Abstract
Background: A permanently indwelling filter in the inferior vena cava (IVC) may induce caval thrombosis, which could develop and evolve from an acute to a chronic phase. The differential diagnosis of acute and chronic thromboses determines the treatment strategy. The role of computed tomography (CT) in diagnosing acute and chronic intra-filter and IVC thromboses has not been well established. This retrospective study summarizes the CT signs that indicate acute and chronic phases of intra-filter and IVC thromboses.
Methods: This study included eight patients who developed a lower-extremity deep venous thrombosis (DVT) and were treated with intracaval filter placement as an alternative to anticoagulation and thrombolysis. During the follow-up, all patients developed an intra-filter thrombosis in the IVC confirmed by CT and/or CT venography (CTV). Demographic and CT data of all patients during the follow-up period were collected for analysis.

Results: All patients had normal-appearing IVCs prior to filter placement, as shown on trans-femoral venography. Eight filters (five TrapEase, three OptEase) were placed in the eight IVCs, respectively. Subsequently, IVC-CT or CTV revealed acute intra-filter or IVC thrombosis in all eight patients, manifesting as an intracaval filling defect and thickened IVC wall. Filter protrusion and secondary caval atrophy seen on CT indicated a chronically occluded IVC.
Conclusions: IVC thrombosis may result from filter placement. The chronicity of caval thrombotic occlusion is likely to be associated with filter protrusion and secondary IVC atrophy revealed on CT scans.

PU-1584
介入栓塞治疗于骨盆骨折后失血性休克中价值

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介入栓塞治疗于骨盆骨折后失血性休克中价值
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目的　探讨髂内动脉栓塞治疗骨盆骨折合并失血性休克的临床价值。**方法**　对 12 例骨盆骨折合并失血性休克行髂内动脉栓塞的病例进行回顾分析，12 例患者根据造影结果分别实施了选择性动脉栓塞；　对栓塞前和栓塞后 4 h 血流动力学指标进行比较。**结果**　造影剂自损伤血管外溢 9 例，行选择性动脉栓塞；双侧多部位有造影剂弥漫性外溢 2 例，右侧髂内动脉主干不显影 1 例，左侧多部位造影剂外溢，行双侧髂内动脉栓塞；实施动脉栓塞后 4 h，心率从(148.50±9.76) 次/min 降到(109.42±13.51) 次/min，收缩压从(90.42±11.61) mmHg 升到(124.08±8.62) mmHg，舒张压从(53.83±6.70) mmHg 升到(75.00±14.83) mmHg，同时尿量增加，从(0.31±0.06) mL/(kg·h) 升到(0.83±0.31) mL/(kg·h)，差异均具有统计学意义；去甲肾上腺素用量明显下降，从(11.04±2.79) μg/min 减到(8.17±2.19) μg/min；中心静脉压有所上升，从(3.25±1.68) mmHg 升到(3.67±1.07) mmHg，差异无统计学意义。2 例因多脏器功能衰竭死亡，其余均康复出院。**结论**　髂内动脉栓塞术是抢救骨盆骨折大出血的首选治疗方式，具有创伤小、安全有效的优点。

PU-1585
基于增强 CT 三维血管重建的急诊挽救性 TIPS 术前相关影像学个体化评估

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目的　探讨多层螺旋 CT 扫描成像及多层螺旋 CT 门静脉血管成像在急诊挽救性 TIPS 联合 GCVE 术前相关影像学个体化评估的应用价值。
方法　随机收集 2016 年 1 月至 2019 年 4 月的 45 例肝硬化门静脉高压合并上消化道出血急诊行 TIPS 联合 GCVE 患者，术前行 MSCT 增强检查。 采用最大密度投影（MIP）、多平面重建（MPR）、容积再现 （VR）等后处理技术全面了解肝脏情况，包括门静脉与腔静脉情况、侧枝循环及静脉曲张情况、肿瘤情况，并结合胃镜对主要出血责任血管进行评估，对重要分流道进行评估。

结果 MSCT 及 MSCTP 能清晰显示肝硬化肝脏形态变化、肝静脉与门静脉空间位置关系、门静脉侧支循环开放程度和范围以及腹水等情况，侧枝循环及静脉曲张情况、肿瘤情况、分流道情况，为 TIPS 联合 GCVE 术前评估提供了重要的解剖信息及对术前情况的预判。MSCT 能够检 出 100%胃底静脉曲张、72．5%胃冠状静脉曲张、81．3%胃短静脉曲张、100% 脾肾分流，对门静脉高压侧支循环的显示具有很好的优势。术前 MSCT 充分显示了门静脉系统侧支引流静脉全貌，明确了曲张静脉开口位置、直径大小、曲张程度和走行情 况等。本研究 45 例急诊成功实施 TIPS 联合 GCVE 术的 患者，术中直接门静脉造影与术前 MSCTP 相比胃冠 状静脉和脾肾分流显影符合率分别为 100%、94%， 术前 MSCTP 能提供准确的门静脉系统 曲张侧枝静脉信息，保证了 GCVE 术时导管的超选、栓塞材料的选择，避免漏栓或误栓。

结论 MSCT 强化具有无创性、操作简单、可重复性强等优势，是显示肝静脉、门静脉、腔静脉及其侧支循环的有效检查手段， 特别是为 TIPS 联合 GCVE 术前禁忌证的筛查和侧枝静脉曲张程度的评价提供了重要的解剖信息，对准确引导门静脉穿刺及曲张静脉栓塞具有重要的指导意义，提高了 TIPS 手术的实施效率，节省了手术时间，预防静脉曲张漏栓剂误栓，并在一定程度上减少了手术并发症。

PU-1586

经动脉栓塞术治疗子宫动静脉畸形的临床应用

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【摘要】 **目的** 探讨经动脉栓塞术治疗子宫动静脉畸形（AVM）临床应用的安全性与有效性。**方法** 回顾性分析昆明医科大学第一附属医院 2013 年 6 月至 2017 年 9 月因子宫 AVM 行经动脉栓塞术治疗患者的临床资料，共有 8 例患者入本研究。分析患者介入治疗的止血效果、并发症及治疗后妊娠情况。**结果** 8 例患者接受了 10 次经动脉栓塞治疗，其中 2 例患者妊娠分娩后因再发出血而行再次栓塞治疗。治疗后 8 患者均得到有效止血，2 例患者栓塞后成功妊娠，并顺产婴儿。8 例患者均出现了不同程度的栓塞后综合征表现，无严重并发症发生。 **结论** 经动脉栓塞治疗子宫 AVM 安全可行，同时为患者保留了生育能力。

PU-1587

医源性肾血管损伤的介入栓塞治疗

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目的 评价用介入栓塞技术治疗医源性肾血管损伤的安全性和疗效。**方法** 对 10 例（次）医源性肾血管损伤患者进行超选择性肾动脉栓塞治疗，损伤原因：经皮肾造瘘 1 例，肾切开取石术后 2 例，经皮肾镜取石术后 7（次）例；临床表现患侧腰痛、血尿；有失血性休克 8 例。栓塞材料：单纯明胶海绵 5 例，弹簧圈 5 例，其中一例一枚，2 例 2 枚，一例 3 枚，一例 4 枚；有一例栓塞两次。结果 6 例选择性肾动脉造影均显示血管破裂对比剂外溢，肾实质内动静脉 瘘 1 例、假性动脉瘤 3 例，一例造影剂外溢征象不明显。 本组病例均栓塞成功;治疗结束时复查造影显示异常血管消失，正常分支保留。7 例失血症状明显者，栓塞后经给予补充血容量，失血症状迅速改善；血尿 8 例，术后 2 ~ 7d 消失:除一例作第二次栓塞外，其他 8 例未再针对肾脏血管损伤进行外科或介入治疗，术后未再发生出血，血肌酐、尿素测定属正常范围。**结论** 经皮超选择性肾动脉分支栓塞术是治疗医源性肾脏血管损伤的安全、有效方法。

PU-1588

急性消化道大出血介入治疗的护理体会

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目的 探讨急性消化道出血介入治疗的护理体会。 **方法** 对 2014 年 2 月--2018 年 5 月就诊于我科经介入治疗方法治疗的 58 例急性消化道出血患者临床资料进行回顾性分析。**结果** 58 例病人中，经介入治疗及护理后出血停止，其中 55 例一次栓塞成功，3 例经二次栓塞后出血停止，所有患者经有效治疗及护理后出院。**结论** 介入治疗消化道出血时术前术中及术后的观察和护理在患者康复过程中具有重要作用。

PU-1589

经皮肾镜术后肾出血行肾动脉造影及栓塞治疗的疗效分析

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目的 探讨肾动脉造影及栓塞治疗对微创经皮肾镜取石术(MPCNL)术后肾出血的疗效，总结介入栓塞止血治疗的方法及经验。**方法** 回顾性分析 2016 年 1 月～2019 年 1 月我院 20 例肾结石患者实施了微创经皮肾镜取石术(MPCNL)术后出现大出血，我科进行超选择肾动脉造影及栓塞止血治疗，栓塞材料用明胶海绵和弹簧圈。**结果** 经超选择性肾动脉造影及栓塞止血治疗，17 例肾出血患者栓塞后出血完全停止，并保留了患肾的大部分组织和功能；1 例行介入栓塞后仍继续出血，经再次行介入治疗，疗效良好；2 例患者经介入栓塞止血治疗后，疗效不佳，术后无明显改善。**结论** 选择性肾动脉造影及栓塞治疗是 MPCNL 术后肾出血可靠的诊断方法，也是安全、有效的止血手段，并对保留肾功能有重要意义。

PU-1590

增强 CT 在检测急诊腹盆部创伤患者出血中的应用

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目的 通过与数字减影（DSA）造影对比，评价增强 CT 在急诊腹部及盆腔创伤中检测活动性出血的应用价值。**方法** 回顾性分析 2016 年 1 月至 2019 年 2 月间急诊收治的腹盆部创伤患者，所有患者入院后均行腹盆部增强 CT，并于受伤 24h 内行 DSA 造影或栓塞治疗，将 CT 与 DSA 图像（金标准）对比，得出 CT 诊断活动性出血灵敏度、特异度、阳性预测值、阴性预测值等指标。**结果** 期间共有 33 名患者同时行增强 CT 及 DSA 造影，其中 10 名患者增强 CT 与 DSA 均未发现出血，其中 20 名患者增强 CT 和 DSA 均阳性，有 1 例增强 CT 阳性而随后 DSA 未发现出血，2 例增强 CT 阴性而随后 DSA 证实有出血。与 DSA 对比，增强 CT 诊断出血的灵敏度（SE）、特异度（SP）、阳性预测值（PPV）、阴性预测值（NPV）分别为：90.9%、90.9%、95.2%和 83.3%。**结论** 增强 CT 对诊断腹盆部创伤患者活动性出血有较高灵敏性及阳性预测值，为患者后续治疗提供较好的引导作用。

PU-1591
复合手术室智能移动三维导航技术在近肾型腹主动脉瘤腔内治疗中的应用

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目的 探讨复合手术室术中智能移动三维导航技术在近肾型腹主动脉瘤腔内治疗中的应用价值。**方法** 选取 2016 年 2 月—2018 年 6 月在江苏省苏北人民医院复合手术室治疗的 7 例近肾型腹主动脉瘤患者，术中行数字减影血管造影三维成像（3D-DSA）后将 3D 重建图像和 2D 透视图像进行图像融合，标记肾动脉及其他重要血管分支。并对不同阶段不同体位的术中三维导航融合图像进行自动修正配准，根据手术需要，改善融合图像的血管、骨骼背景密度，提高叠加图像上血管可视化程度，精确指导支架释放，实现血管内治疗的准确导航。**结果** 7 例患者术中在 3D 图像导航下，导丝导管均成功导入靶血管内，单根靶血管导入时间 3～22 min，造影剂用量 150～180 ml。7 例行血管腔内腹主动脉瘤修复术均手术成功，术后即刻造影提示分支血管显影通畅，无内漏。**结论** 复合手术室三维导航技术可精准标记肾动脉及其他分支血管开口，方便术中靶血管定位超选，对近肾型腹主动脉瘤腔内治疗具有重要指导作用。

PU-1592
情景模拟教学对影响护生护患关系因素的观察

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目的 教学医院护理实习生是医院护理工作者的一部分。护理实习生与患者的关系也是护患关系的重要组成部分，对护患关系的影响很大。通过分析护生与患者关系的影响因素可以明确改进的方向，从而提升患者满意
度。 **方法** 通过 2018~2019 年在我科情景模拟教学中对实习护生与患者的互动模式的观察。
结果 学生天生的性格气质及对自身的认同感以及其知识储备和带教老师的知识储备及与他人相处的行为模式是护生实习期间护患关系的主要影响因素。**结论** 善于表达、有丰富知识储备的护生容易得到患者的亲耐，能争取到更多的动手机会；带教老师良好的人际关系可以对学生产生积极的模范效应。

PU-1593
严重扭曲入路腹主动脉瘤腔内隔绝术

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主诉：老年男性，因左下肢进行性肿胀、行走困难 1 月入院。外院发现左下肢深静脉血栓治疗，但治疗效果不佳。查体：腹部可扪及搏动性包块，搏动范围约 10*12cm，双侧股动脉可扪及，左下肢

明显肿胀，左足背动脉不能扪及，左腘，右侧腘及足背胫后可扪及。外院 CT 示腹主动脉瘤，双髂动脉瘤，瘤壁钙化严重，双侧髂动脉严重扭曲。
诊断：腹主动脉瘤伴血栓形成；双侧髂动脉瘤伴血栓形成；左侧髂股静脉血栓形成。治疗方案：拟滤器保护下动脉瘤腔内隔绝。
手术过程：右侧股动脉穿刺，路图示右侧股动脉入路扭曲。超滑导丝配合送入黄金标记猪尾导管行腹主动脉造影示：腹主动脉瘤，腹主动脉瘤右侧壁尖端突出，有较大破裂风险，双侧髂动脉扭曲变形。切开部分腹股沟韧带及部分腹内斜肌及横肌暴露右侧股动脉至髂外远段全程。左侧同样切开。栓塞双侧髂内动脉。C2 送入右侧入路腹主动脉段，Cook 超硬导丝难以进入扭曲血管，再尝试波科、绿宝石均不能通过。送入 6F 通用鞘，同时牵拉髂外动脉，矫正第一道弯。通用鞘做支撑，第一个弯折被牵拉矫型，波科硬导丝送入成功跨过两道关，至此扭曲入路的导丝支撑成功建立。
波科导丝送入支撑下，右侧股动脉送入美敦力覆膜分叉主体支架 Endurant 1 代 28-16-145mm。猪尾导管定位标记、路图下定位调整精准定位后，主体支架释放近端倒钩锚定。注意避免后续摆动影响释放主体支架左侧腿。左侧三超配合 C2 导管选入腿支架内。考虑血管扭曲，超硬导丝送入仍可能困难，尝试三超导丝植入支撑。支架送入中导丝支撑不住，髂扭曲，尾端袖套，阻力极大，支架难以送入。果断退出支架，再次使用鞘管通道。三超支撑下，送入 90cm 长鞘至腹主动脉上段，本次选择支撑性强的绿宝石导丝做支撑。导丝送入中，同样需要牵拉髂外动脉远端。直接于双侧超硬导丝支撑下分别续接美敦力 Endurant 二代 16-16-93（右）、16-13-93（左）腿支架。

PU-1594

UC-MSC paracrine, mainly due to exosomes, alleviates renal fibrosis in diabetic nephropathy by reducing myofibroblast transdifferentiation and cell proliferation and enhancing expression of MMPs

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Administration of umbilical cord mesenchymal stem cells (UC-MSCs) improves renal fibrosis from diabetic nephropathy (DN). However, the potential therapeutic mechanism is not well understood. In this study, we investigated the role of mouse UC-MSC (mUC-MSCs) paracrine in renal fibrosis in DN. We found that the repeated administration of mUC-MSCs prevent albuminuria, glomerulus injury and glomerular fibrosis in STZ-induced diabetic mice. In vitro, the coculture of high glucose-induced mesangial cells with mUC-MSCs decreased the expression of extracellular matrix (ECM), including collagen I and fibronectin. Furthermore, results from immunofluorescence assay, wound healing assay and cell proliferation test showed that mUC-MSC-conditioned medium inhibited TGF-β1/Smad2/3 signaling mediated myofibroblast transdifferentiation (MFT) and cell proliferation induced by PI3K/Akt and MAPK signal transduction in glucose-induced mesangial cells. Meanwhile, the expression of matrix metalloproteinases (MMPs) was increased. After treatment with GW4869, an exosome inhibitor, the regulatory effects of mUC-MSC paracrine on MFT, cell proliferation and MMP expression were significantly blocked by antagonizing the above three mechanisms. This study demonstrates the comprehensive mechanisms by which mUC-MSC paracrine alleviates renal fibrosis in DN

involve reducing ECM production and promoting their degradation, and provides the proof that the anti-fibrosis effect might be mainly due to the secreted exosomes.

PU-1595

子宫肌瘤介入栓塞术中配合与护理

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介入手术是利用超声、计算机断层扫描、核磁共振、X 射线、腹腔镜等现代医学影像导向技术，对病变所在器官和组织进行定向手术，以达诊断和治疗目的。目前该法已成为综合治疗不可缺少的一部分。子肌瘤介入栓塞即是经皮穿刺左右两侧股动脉置管，导管在髂动脉内成袢后造影，选择性左右两侧子动脉注药治疗，从而使之闭塞，供血中断、肌瘤萎缩而达到治疗目的的一种新技术，比较传统的手术切除方法具有微创伤、定位准确、病人痛苦小、安全有效恢复快及并发症少等优点。治疗过程中护士对患者的术前后护理、术中配合非常重要 ， 是治疗获得成功的重要基础。

PU-1596

下肢动脉硬化闭塞介入治疗的观察及护理

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目的 探讨下肢动脉硬化闭塞症在介入治疗后的观察，护理方法及并发症的临床表现。**方法** 对 30 例患者进行分析探讨，并进行观察护理。**结果** 30 例患者皮温均明显升高，静息痛及间歇性跛行较前好转，其中有 3 出现假性动脉瘤，1 人出现干性坏疽。**结论** 良好的术前宣教，严密的术后观察及护理，肢体的正确摆放都可以大大的降低并发症的发生，以便促进健康，精心的护理对术后的恢复有着非常重要的作用。

PU-1597

子宫动脉栓塞术在治疗高险子宫瘢痕妊娠中的应用

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[摘要] **目的** 探索子宫动脉栓塞术(UAE)在治疗高风险子宫切口瘢痕妊娠(CSP)中的作用和安全性。方法:回顾分析 2016 年 1 月-2018 年 12 月 35 例采用子宫动脉栓塞术(UAE)治疗的瘢痕妊娠患者资料。27 例患者均为超声证实孕囊供血丰富 、原始胚胎生长活性高、预计药物治疗难以成功者 ，其中有 5 例患者出现阴道流血。27 例患者行子宫动脉氨甲蝶呤(MTX)及明胶海绵颗粒 (条) 栓塞 ，术后立即复查超声，术后第二天复查 HCG 和孕酮，观察患者腹痛和出血情况。术后第第 3 天行清宫术。随访 3 个月以上，观察并发症和月经恢复时间 。**结果** 27 例患者 UAE 治疗均 1 次成功 ，均成功保留子宫 ，术后复查超声孕囊未见血流信号，孕囊塌陷 ，术后复查 HCG 和孕酮迅速下降。术后第三天清宫出无明显出血，出血量均在 5ml 左右。1 个月后月经恢复。**结论** 在治疗高风险 CSP 时，采用 UAE 的治疗效果好 、安全性高 ，不良反应少 ，可作为重要治疗方法 。

PU-1598
简易负压引流瓶联合猪尾巴引流导管治疗巨大淋巴管畸形的效果观察

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目的 观察简易负压引流瓶联合猪尾巴引流导管治疗巨大淋巴管畸形的临床效果。**方法** 25 例巨大淋巴管瘤患儿使用 6.3F 或 7F 猪尾巴引流管在超声引导下置入淋巴管囊腔内后通过三通旋塞连接简易负压引流瓶行负压引流，观察其临床效果。**结果** 25 例巨大淋巴管瘤患者共置管 28 例次，均一次穿刺、置管成功，保留时间 2～5d。本组患者于置管后未出现引流不畅或堵管，1 例患者出现脱管现象，重新置管后正常引流。在负压引流过程中可通过三通旋塞给予平阳霉素 8mg+0.9%生理盐水混合液囊腔内冲洗；未出现感染等相关并发症。**结论** 简易负压引流瓶联合猪尾巴引流导管治疗巨大淋巴管畸形具有操作简便、安全可靠、引流效果确切等特点，值得临床推广应用。

PU-1599
彩超引导下 5F 一次性使用引流套管针在淋巴管畸形伴出血介入治疗中的应用

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目的:观察彩超引导下经 5F 一次性引流套管针注射平阳霉素治疗颈部巨囊性淋巴管瘤疗效.方法:颈部巨囊型囊性淋巴管瘤患者 22 例,B 超动态了解瘤体内情况,B 超引导下将 5F 引流套管针穿入囊腔内，尽量将 1 个或多个囊腔内液体抽出,将配好的药液缓慢注射入瘤体,囊内最多注射 0.5～1ml 药液,完毕压迫瘤体周围针孔,直至无出血为止,注射 1～5 次,每次注射间隔时间为 7～10d,所有注射疗程结束时平阳霉素总量≤40mg.定期观察瘤体的大小变化、硬度变化或通过 B 超了解多房性瘤体内部囊腔愈合情况.注射治疗 5 次后仍未完全愈合者/无效者改行为手术治疗.结果:所有患者随访时间均≥1.5 年,B 超显示瘤体完全消失 20 例,经随访无复发.瘤体明显缩小至 50％以上的患者 17 例,B 超检查显示仅少量分隔存在,后加行局部注射治疗,达到了将淋巴管瘤基本消失.所有患者均未出现瘤体表面皮肤破溃、发热、恶心呕吐、肺纤维化、骨髓造血功能抑制等并发症.结论:B 超引导下经 5F 一次性引流套管针注射平阳霉素治疗颈部囊状淋巴管瘤安全、有效,费用低廉,易为患者接受,无明显的副作用及并发症.

PU-1600
介入溶栓治疗在急性肠系膜上动脉栓塞症的临床效果分析

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目的 探讨急性肠系膜上动脉栓塞症的诊断，分析介入溶栓治疗的效果。方法 对我院 2016 年 3 月至 2018 年 1 月收治的 6 例急性肠系膜上动脉栓塞症患者进行回顾性分析。10 例均急诊行肠系膜上动脉造影及溶栓治疗，采用 Seldinger 与同轴导管技术，动脉灌注尿激酶溶栓。结果 6 例患者溶栓成功，症状明显缓解，术后随访 5 例无复发，一例再次栓塞于外院行肠切除手术。结论 早期进行肠系膜动脉造影诊断及介入溶栓是提高肠系膜上动脉栓塞症疗效的关键，急性肠系膜上动脉血栓形成后介入溶栓治疗效果确切。

PU-1601
肝动脉化疗栓塞术的护理策略及效果观察

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目的 目前，关于肝癌的治疗手段较多，其中肝动脉化疗栓塞术 Hepatic artery chemoembolization,TACE）作为一个较为成熟、疗效确切的方法，在临床中的应用日趋广泛，已成为中晚期肝癌（hepatocellular carcinoma，HCC）
患者治疗的首选但患者术后会伴有各种并发症，降低了患者术后的生活品质，因此，给予患者合理的护理干预尤为重要。我们通过对行经皮肝动脉化疗栓塞术治疗的肝癌患者进行护理干预，分析综合护理和传统护理在该治疗术式中的应用价值，及对肝癌患者的影响。分析探讨肝癌动脉化疗栓塞术的护理策略及效果观察。**方法** 回顾分析在我科接受肝动脉化疗栓塞术治疗的 40 例肝癌患者用随机数字表法分成 2 组，试验组采用整体护理模式护理病人，对照组采用常规护理模式护理病人。比较两组患者满意度、并发症发生情况、生活质量的情况。**结果** 实验组满意度高于对照组且 P＜0.05，试验组在住院期间并发症发生率远低于对照组且 P＜0.05，实验组生活质量评分优于对照组 P＜0.05。**结论** 对肝癌行肝动脉化疗栓塞术治疗，配合有效的护理策略，能够提高护理满意度、有效的降低并发症、提高生活质量，在原发性肝癌行肝动脉栓塞化疗术中，通过引入心理护理干预辅助治疗的方式，已经成为了当前临床领域肝癌非切除手术患者的首选方案，通过这种以预防为主的护理治疗，是配合 TACE 治疗成功的重要环节，起到着关键的作用，值得在医学临床领域大力推广。

PU-1602
评估“哨兵出血”在胰十二指肠术后出血急诊介入治疗中的意义

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目的 评估“哨兵出血”在胰十二指肠术后出血中的意义，为提高胰十二指肠术后出血患者的预后情况提供参考依据。
材料和**方法** 回顾性收集本院 2015 年 7 月至 2019 年 7 月间胰十二指肠术后大出血行急诊介入患者 56 名，共 89 次介入治疗，对每位患者有无哨兵出血的情况、出血时间及出血量进行记录，比较有无哨兵出血患者之间发生大出血的患者的比例。
结果 所有发生 PPH 的患者术后 1 年生存率为 74%，发生哨兵出血的患者发生大出血的比例为 85.7%（18/21），介入止血成功比例为 66.7%（14/21），未发生哨兵出血的患者发生大出血的比例为 48.6%（17/35），介入止血成功比例为 80.0%（28/35）

结论 当胰十二指肠术后术后发生“哨兵出血”的患者具有发生急危重大出血的风险，应积极寻找出血位置对提高患者预后情况。

PU-1603
介子栓塞术在预防疤痕妊娠清宫术大出血的有效性及安全性

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【摘要】 目的 探讨介入子宫动脉栓塞术在预防疤痕妊娠清宫术大出血中的有效性及安全性。**方法** 总结 2016 年 1 月至 2019 年 5 月以在我院妇科病房住院的 326 例患者，其中孕 8 周的为 297 例，大于 8-12 周的为 29 例，术前均经超声和 MR 诊断为瘢痕子宫合并瘢痕妊娠，患者子宫前壁最薄弱处厚约 1.25±0.75mm，排除禁忌后用明胶海绵颗粒（1000-1400um）超选至双侧子宫动脉远端予以栓塞，栓塞程度以造影后子宫动脉仅主干显影为标准。介入栓塞术后 72h 后妇科予以清宫术，记录术中出血量，随访术后 1 月清宫效果，血 HCG 水平，术后 1-3 月的月经、排卵情况。
结果 326 例患者均成功行双侧子宫动脉超选后予以栓塞，介入栓塞术中出血 5±3ml，术后有 3 例患者有穿刺点部位血肿，经压迫止血后好转，1 例患者清宫后出血量较多予以急诊行子宫动脉 2 次栓塞治疗；清宫产术中出血量为 30±25ml，术中一次性清宫完毕，术后 1 个月随访，阴超检查未见宫腔内胎膜、胎盘残留，孕妇血 HCG 基本降至正常水平，术后 1-3 月患者月经正常，超声提示卵泡正常。
结论 双侧子宫动脉栓塞术在预防疤痕妊娠清宫中大出血具有创伤小、疗效好、并发症少、安全性高，可避免因大出血导致子宫切除而影响今后生育的优点，是疤痕妊娠预防大出血的理想选择。

PU-1604
中线导管在介入科的临床应用及 堵后的原因分析

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目的 探讨中线导管堵管的发生率及原因。**方法** 分析介入科 2018 年 1 月－2018 年 8 月成功置入中线导管患者 39 例，收集其住院治疗期间的临床资料，对出现堵管的患者进行原因分析。**结果** 39 例置入中线导管患者发生堵管共 2 例，堵管率 5%；堵管的原因有冲封管方法不正确，导管接头松动、患者因素、护士因素。**结论** 中线导管可以保护患者血管，减少反复穿刺；降低静脉炎；无需 X 射线，减少了确定尖端定位的费用，更经济；提高了护理工作效率，更保证了患者治疗的有效进行。

PU-1605
介入治疗下肢深静脉血栓形成患者的护理

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目的:探讨介入治疗下肢深静脉血栓形成(DVT)的护理措施。方法 45 例 DVT 患者均行深静脉置管接触性溶栓，其中 21 例行下腔静脉滤器置入术，17 例联合血管球囊扩张及血管内支架置入术;对所有介入术后患者实施针对性护理。
结果:45 例患者均介入操作成功，治疗中无严重并发症发生，患者症状与体征均有不同程度的好转。
结论:介入治疗 DVT 操作简便，安全有效，术前、术后实施合理的护理是保证治疗成功的重要环节。

PU-1606

下肢深静脉血栓的护理体会

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总结介入溶栓治疗下肢深静脉血栓的护理方法。护理措施有心理护理、饮食及生活指导、溶栓期间的护理、并发症的预
防及护理。总结出护士应做好心理护理、生活护理及健康宣教，关注患者病情，警惕肺栓塞的发生，对提高治疗效果至为重要。

PU-1607

介入法动脉灌注化疗结合放疗治疗中、晚期食管癌

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目的 探究介入法动脉灌注化疗结合放疗治疗中、晚期食管癌的临床效果。**方法** 对我院 2015 年 1 月到 2018 年 12 月间接收的 80 例中、晚期食管癌患者进行治疗，按照随机序号法将患者分为对照组和观察组，对照组采用单纯放疗治疗，观察组采用介入法动脉灌注化疗结合放疗治疗，观察两组效果并进行比较。**结果** 观察组总有效率 94.5%高于对照组总有效率 82.0%，两组比较存在明显差异，P<0.05，差异具有统计学意义。观察组患者的并发症发生率 15.0%低于对照组并发症发生率 17.5%，但两组比较不存在明显差异，P＞0.05，差异不具有统计学意义。**结论** 介入法动脉灌注化疗和放疗联合治疗中晚期食管癌，临床效果良好，因而值得临床借鉴使用。关键词：介入法动脉灌注化疗；放疗；中、晚期食管癌；临床效果 食管癌是临床中常见的一类恶性肿瘤，当患者病情发展到中晚期时，正常的吞咽会受到严重影响，此时对于患者的正常生活产生较大威胁，因此必须进行有效的治疗；目前临床最常用的治疗方法就是对患者进行放射性干预，即放疗，但是单纯的放疗多数情况下很难对患者起到良好的效果，相关研究指出，介入法动脉灌注化疗结合放疗治疗中、晚期食管癌的临床效果良好，因而我们对我院 2013 年 1 月到 2015 年 12 月间接收的 80 例中、晚期食管癌患者进行分组，对照组采用单纯放疗治疗，观察组采用介入法动脉灌注化疗结合放疗治疗，旨在提高其临床治疗效果。

PU-1608

以胸腹主动脉夹层为中心的介入手术术前、术中、术后护理的应用及效果研究

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［摘要］目的:探讨血管腔内隔绝术治疗胸、腹主动脉夹层患者的临床护理要点。

方法:我科 2015 年 12 月至 2019 年 7 月收治 52 例胸、腹主动脉夹层患者行血管腔内隔绝术治疗,手术时间选择在发病 1 周以后,对患者实施精细化术前、术中、 术后护理,包括心理护理、基础护理、专科护理及健康宣教等。

结果:51 例患者成功植入覆膜支架,病情均得到控制,恢复良好,随访 1 年生存率 100%。

结论:对胸、腹主动脉夹层支架植入的必要性及术前、术中、术后护理的重要性,做好心理护理、基础护理和专科护理,是保证手术顺利进行和患者康复的有力保障。

PU-1609
自发性脾动静脉瘘致消化道出血成功介入栓塞一例

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目的 分享一例自发性脾动静脉瘘致消化道出血的影像学及介入栓塞方法。**方法** 一例不明原因消化道出血的患者行腹部增强 CT 检查拟诊脾动静瘘致门静脉高压，后急诊行脾动脉造影确诊为脾动静脉瘘，并成功经动脉栓塞治疗止血。**结果** 介入栓塞后出血停止，后续复查腹部增强 CT 见动静脉瘘消失，脾脏未见大面积梗死。**结论** 脾动静脉瘘（splenic arteriovenous fistula SAVF）是临床中十分罕见的疾病之一，且多发生在创伤或者手术后，自发性脾动静脉瘘更属罕见，术前仔细研读腹部增强 CT 影像学资料并分析血流动力学有利于理解疾病成因，介入栓塞为治疗脾动静脉瘘的一种微创而有效的方法。

PU-1610
介入高压注射器的检测方法的探讨

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目的 探讨高压注射器的检测方法，为介入手术保驾护航。**方法** 1 材料：MARKERV 高压注射器、150ML 高压注射针筒 1 支、高压连接管 1 条、压力三通 1 个、20ML 注射器 1 只、50ML 注射器 1 只、压力泵 1 个、500ML 盐水 1 瓶、秒表 1 块。2 连接**方法** 安装 150ML 高压注射针筒，抽取 150ML 盐水，接上高压连接管，接上压力三通，排气后备用。3 注射总量和注射时间检测:将 20ML 注射器接在排好器三通一端，排气后，调整三通开关，使高压注射针筒与 20ML 注射器相通。设置高压注射器参数，流速（ML/S）、总量(ML)、时间(S)参数，分为(3、6、2）；（3、9、3)；（4、8、2）；（5、10、2）；(6、18、3）五组，分别测试，同时记录 20ML 注射器盐水的变化值（即实际注射总量）和秒表时间。更换为 50ML 注射器，将参数设置成（10、20、2）；（15、30、2）二组，分别测试。4 注射压力测试：将压力泵接在排好气三通一端，排气，调整三通开关，使高压注射器与压力泵相通。设置高压注射器参数，（2、20、10），注射压力分别设置为 200PSI、

300PSI、400PSI。分别记录压力泵的压力值。**结果** 1 在五组注射总量和注射时间检测中，记录为(6、2)；（9、3）；（8、2）；（10、2）；（18、3）。在二组注射总量和注射时间检测中，记录为（20、2）；（30、2）。**结论** 1 这台高压注射器设置值与输出值一致，符合使用要求。2 这种检测方法适用于高压注射器的日常检测，能够为检测提供准确数据。3 这种检测方法简单易行，零成本，易于推广实施。4 这种检测方法在对高压注射器检测的同时，也同时对高压注射针筒及高压连接管进行了监测。

介入高压注射器输出值的精确性，影响到造影图像质量和介入手术的安全，加强日常定期检测尤为重要。这种检测方法为高压注射器的检测提供了依据，成本低，利于推广实施。

PU-1611
全面护理在下肢动脉硬化闭塞老年患者围术期应用

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目的 探讨下肢动脉硬化闭塞症老年患者行血管腔内介入治疗的围术期全面护理方法。**方法** 回顾分析我科 2018 年 1 月~12 月 20 例下肢动脉硬化闭塞症老年患者的治疗及护理经过。**结果** 其中 15 例为下肢动脉球囊扩张联合支架植入术，5 例为下肢动脉造影联合置管溶栓术。患者入院后护士采取全面护理，18 例手术患者病情较前改善，2 例置管溶栓患者出现穿刺部位皮下出血并发症。**结论** 老年下肢动脉闭塞患者行介入手术相对安全，采取全面护理干预，降低术后并发症，对于加速患者康复、降低致残率具有重要意义。

PU-1612
改良式病员裤在行股动脉穿刺置管术后患者中的应用

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【摘要】目的 探讨改良式病员裤在行股动脉穿刺置管术后患者中的应用。方法 根据股动脉穿刺置管术后观察和护理的特殊需求，针对现有普通病员裤进行重新设计和改良制作。在介入血管外科病房中选择 100 例经股动脉穿刺置管术后患者，随机分为试验组和对照组。试验组 50 例，穿改良式病员裤，对照组 50 例，穿传统普通病员裤。患者与护士分别对两种病员裤的穿着进行满意度及方便性测评。结果 试验组患者对改良式病员裤使用的满意度明显高于对照组患者对普通病员裤的满意度，差异有统计学意义（P＜0.05）；试验组护士为患者进行管道护理及输液所需时间较对照组短，差异有统计学意义（P＜0.05） 。结论 改良式病员裤是一种新型、便捷、实用、安全的病员裤，可以提高股动脉穿刺置管术后患者满意度，缩短护理工作时间。

PU-1613
1 例急性肠系膜上动脉栓塞介入术后合并急性脑梗死的护理

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【摘要】总结了 1 例急性肠系膜上动脉栓塞行肠系膜上动脉造影+抽栓+溶栓+置管溶栓术，术后溶栓过程中并发急性脑梗死的抢救成功的护理经验。护理要点：术前系统评估、观察病情、确诊后及时完善术前准备等，术后继续观察病情，及时发现并发症急性脑梗死，并停止溶栓治疗，配合医生再次手术，并采取及时、有效的护理措施，联合多学科的会诊，经过 15d 的精心治疗与护理，患者康复出院。

PU-1614

运用品管圈降低股动脉穿刺术后 假性动脉瘤发生率

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[**摘要**] **目的** 探讨品管圈活动对降低股动脉穿刺术后假性动脉瘤发生率的作用。**方法** 成立品管圈活动小组，运动品质管理手法管理股动脉穿刺术后患者。**结果** 通过全员参与该项活动后，股动脉穿刺术后假性动脉瘤发生率由活动前 0.92%降低至活动后的 0%，差异具有统计学意义（$P<0.01$）。**结论** 正确运用品管圈可明显降低股动脉穿刺术后假性动脉瘤的发生率，同时能提高护士发现问题、解决问题的能力，增强了护士主动参与管理的意识。

PU-1615

DSA 介入治疗消化道大出血问题研究

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通过对 30 例少见原因所致的消化道出血患者经 DSA 介入治疗及护理，认为做好手术前后并发症的观察护理及穿刺部位观察护理，密切观察局部血液循环，避免术后并发症，使消化道出血得以控制。急诊行数字减影血管造影行介入治疗可挽救患者生命。

PU-1616

有效护理干预对腹主动脉瘤患者介入治疗的影响

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【摘要】**目的** 探讨对腹主动脉瘤患者在实施介入治疗过程中给予护理干预后的临床效果。**方法** 选择我科 2018 年 4 月至 2019 年 6 月收治的 8 例腹主动脉瘤患者作为此次研究对象 ， 均选择介入手术治疗，在此过程中对患者展开护理干预，主要体现为手术前、手术中以及手术后对所有腹主动脉瘤患者展开对应的护理干预, 对围术期护理效果进行分析。**结果** 所有腹主动脉瘤患者全部成功完成介入手术治疗，术后对患者实施体温监测，体温 7 例正常，1 例患者于术后出现发热，体温为 38.8℃，术后第三天，血常规结果回示：白细胞比例明显升高，给予对症治疗后未再发热。临床经 7-10d 住院后均顺利出院。完成手术后对患者实施为期 1 个月的随访，未发现死亡及同手术相关并发症出现。**结论** 有效护理干预对患者围手术期的顺利度过可以做出有效保证。

PU-1617
脑血管介入术后穿刺血管局部血管缝合器、动脉压迫器止血效果对比

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目的 比较脑血管介入术后穿刺血管局部血管缝合器、动脉压迫器的止血效果。方法 54 例脑梗死患者，均行脑血管介入术(穿刺血管选择为股动脉 31 例、桡动脉 23 例)，介入术后采用血管缝合器压迫穿刺血管局部止血者（A 组）31 例、采用动脉压迫器压迫穿刺血管局部止血者（B 组）23 例，比较两组手术时间、术后止血时间、术后出血量、患者舒适度、术侧肢体制动时间，观察两组排尿困难、腰背疼痛等并发症发生情况。结果 两组比较 A 组患者排尿困难、腰背疼痛、睡眠影响、精神紧张、伤口渗血的发生率显著低于 B 组。结论 脑血管介入术后穿刺血管局部采用血管缝合器止血迅速，患者舒适度高，并发症较少。

PU-1618
介入治疗消化道出血患者的护理体会

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通过 20 例罕见原因所致的消化道出血患者经 DSA 介入治疗的护理，认为做好术前准备及术后护理，严密观察局部血液循环，积极预防并发症，能有效提高 DSA 介入治疗消化道出血的疗效。消化道出血疾病是目前最常见的急危重症之一，起病急，止血是关键。

PU-1619
血栓的介入治疗及护理措施

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目的 探讨血栓的介入治疗及护理措施
方法 将我科介入治疗的血栓患者作为研究对象，均采用 DSA 溶栓介入治疗，总结护理经验。
结果 患者均经碎栓及溶栓治疗，术后部分即刻完全复通，1 例回病房后经尿激酶微量滴注 48h 内复通。

PU-1620
布-加氏综合征合并肝癌介入治疗

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【摘要】 目的 探讨布-加氏综合征（BCS）合并肝癌（HCC）患者的临床特征表现及相关因素，探讨介入治疗方法的选择对患者愈后的影响。方法 回顾分析收集到经影像学检查及病理证实的 9 例 BCS 合并 HCC 患者，对其临床资料、影像学表现、实验室检查、介入治疗综合治疗术后转归进行综合分析。 结果 BCS 合并 HCC 发生在下腔静脉膜性阻塞性病变 6 例，行 TACE 和下腔静脉球囊扩张术，1 例因侧支循环建立良好单行 TACE+TAI 治疗，1 例患者为布加氏综合征外科术后十年发生肝癌行 TACE+TAI 治疗。1 例患者为确诊布加综合征二十年后确诊肝癌并大量腹水放弃治疗。结论 选择适当的方法治疗布-加氏综合征及肝癌的综合治疗，对于提高 BCS 合并 HCC 患者的生存期及生存质量至关重要。

【关键词】布-加综合症；肝细胞肝癌；肝淤血；下腔静脉；球囊扩张术

PU-1621
动脉栓塞化疗对骨肉瘤中血管内皮因子影响及预后的关系

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目的 探讨动脉栓塞化疗联合静脉新辅助化疗对骨肉瘤组织中血管内皮因子（VEGF）影响及与预后的关系。
方法 通过对 38 例骨肉瘤患者进行回顾性分析，12 例骨肉瘤患者采用超选择动脉栓塞化疗加静脉新辅助化疗，20 例骨肉瘤患者只采用静脉新辅助化疗，6 例术前未采用超选择动脉栓塞化疗及新辅助化疗。比较动脉栓塞化疗加新辅助化疗组与单纯静脉新辅助化疗组、非化疗组患者的生存率和肺转移率，并利用组织学观察和免疫组织化学染色(SP 法)，检测骨肉瘤组织中 VEGF 表达。
结果 采用动脉栓塞化疗加新辅助化疗的 12 例患者中，保肢率为 （11/12）91.7%，新辅助化疗的 20 例患者中，保肢率为（16/20）80.0%，非化疗的 6 例患者中，保肢率为（2/6）33.3%；1～3 年生存率，化疗组（32/32） 100%，非化疗组（4/6）66.7%；4 年生存率，动脉栓塞化疗及静脉新辅助化疗组（10/12）83.3%，单纯静脉新辅助化疗 （15/20）75.0%，非化疗组（2/6）33.3%；5 年生存率，动脉栓塞化疗及静脉新辅助化疗组（7/12）58.3%，单纯静脉新辅助化疗（11/20）55.0%，非化疗组（1/6）16.7%。化疗组 3 年和 5 年生存率显著高于非化疗组 (P <0.05)，而肺转移率显著低于非化疗组 (P <0.05)，化疗组间无显著性差异（P>0.05）；化疗组 VEGF 表达率显著低于非化疗组 (P <0.0 5)，化疗组细胞凋亡率显著高于非化疗组 (P <0.01)；骨肉瘤组织中，细胞凋亡率与 3 年和 5 年生存率显著正相关。
结论 化疗可明显提高骨肉瘤患者的生存率,其作用主要是通过诱导细胞凋亡来实现，并可抑制内皮细胞增殖；肿瘤细胞凋亡率是影响骨肉瘤患者预后的重要因素，动脉栓塞化疗可增加保肢手术成功率，提高患者的生存质量。

PU-1622
下肢静脉注射 MSCT 造影诊断髂静脉血栓形成

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目的 探讨经患侧下肢静脉注入对比剂多排螺旋 CT 检查诊断髂静脉血栓形成的价值。**方法** 对 100 例直接由患侧下肢静脉注入对比剂多排螺旋 CT 扫描的资料进行回顾性分析。 **结果** 正常 24 例；髂静脉血栓形成 76 例。正常髂静脉 CT 造影显示为：静脉管壁光整清晰、管腔内密度均匀无明显充盈缺损及管腔狭窄、无明显侧支循环。髂静脉血栓形成 CT 影像表现为：血栓形成处出现充盈缺损，管腔变细，对比剂截然中断，在血栓近侧再显影并可见两者之间较多的侧支循环，或静脉主干完全不显影，侧支循环开放，腰升静脉、盆腔内静脉及腹壁静脉迂曲扩张。 **结论** 经疑似髂静脉病变侧的下肢静脉注入对比剂行多层螺旋 CT 髂静脉造影，能够清晰显示髂静脉血栓性病变，为临床诊断和手术提供重要依据。

PU-1623
复杂性 PCNL 术后肾出血介入治疗认识及临床应用

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【摘要】 目的 提高对 PCNL 术后复杂性肾损伤出血的认识。方法 回顾性分析 2003.3—2018.3 在我院手术发生严重肾出血和由外院手术转来进行肾动脉栓塞止血患者 685 例，其中复杂性肾损伤出血患者 61 例，均使用明胶海绵粒（条）、PVA、丝线或弹簧圈进行栓塞；超选择性肾动脉栓塞止血 50 例， 全肾动脉栓塞止血 11 例。结果 DSA 显示多支或多处肾动脉损伤出血 23 例，肾动、静脉损伤出血（肾 A-V 瘘）11 例，肾动脉损伤出血+肾 A-V 瘘 16 例，肾静脉损伤出血 6 例，弥漫性肾动、静脉损伤出血 5 例，一次性肾动脉栓塞止血痊愈出院 58 例，2 例进行了两次以上栓塞止血。结论 对 PCNL 术后复杂性肾血管损伤出血进行个体化肾动脉栓塞治疗达到微创止血目的。

PU-1624
多层螺旋 CT 多平面重建下髂静脉压迫特征和分型的研究

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【摘要】 目的 通过多层螺旋 CT(MSCT)的多平面重建技术（MPR）研究正常人群的髂静脉压迫特征和分型。**方法** 采用回顾性横断面研究方法，收集 2018 年 6 月-10 月于我院行 MSCT 增强扫描的病例，筛选符合纳入标准者 180 例。分别观察每例左、右侧髂静脉压迫情况，统计压迫类型、压迫点个数、最大压迫部位及发生率，进而对其分型；测量最大压迫部位髂静脉短径、面积、近远端髂静脉面积、压迫范围、髂总静脉汇入下腔静脉的角度，计算最大压迫部位髂静脉狭窄率。比较左、右侧髂总静脉压迫的面积、狭窄率与年龄、性别之间的关系及左、右侧髂总静脉狭窄程度与性别之间的关系。在 SPSS 25.0 软件上采用 t 检验、方差分析、秩和检验和卡方检验对数据进行统计分析。**结果** 髂静脉压迫类型可归纳为四型：Ⅰ型左髂总静脉单一压迫、Ⅱ型左髂总静脉双重压迫、Ⅲ型左右髂总静脉双侧压迫、Ⅳ型其他压迫类型，比例分别为 37 例、66 例、42 例、35 例，其最大压迫部位类型有左髂总静脉 162 例、右髂总静脉 50 例、下腔静脉分叉处 9 例、左髂外静脉 6 例、左髂总静脉分叉处 3 例和右髂外静脉 1 例。基于最大压迫部位，左髂总静脉受压发生率较右髂总静脉高，差异有显著统计学意义（P<0.01）；相比于男性，女性的左、右侧髂总静脉面积均较小，差异有统计学意义（P<0.05），左、右侧髂总静脉狭窄率男性、女性之间差异均无统计学意义（P>0.05）；162 例左髂总静脉、50 例右髂总静脉中，压缩程≥25%分别有 72 例（44.4%）、20 例

（40.0%），压缩程度≥50%分别有 14 例（8.6%）、3 例（6.0%），男性、女性构成比差异均无统计学意义（*P*>0.05）。**结论** 在 MSCT 的 MPR 重建下，髂静脉受压的正常人群可分为四种类型，其中以 II 型左髂总静脉双重压迫最为常见。

PU-1625
外周动脉疾病患者下肢动脉钙化与下肢缺血程度的相关分析

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目的 探讨外周动脉疾病（PAD）患者下肢动脉钙化（LEAC）对下肢缺血程度的影响。**方法** 回顾性收集 2017 年 9 月-2018 年 3 月在我院接受下肢 CTA 扫描检查并符合纳入排除标准的 103 例 PAD 患者，根据患者的 Rutherford 分级分为跛行组（n=56）和严重肢体缺血（CLI）组（n=47），记录患者年龄、性别、吸烟史、饮酒史、糖尿病、高血压、高脂血症、CKD 等基线资料，并且在 CT 平扫图像上测量得到下肢动脉钙化积分（LEACS）。用单因素及多因素 Logistic 回归来确定下肢缺血程度的危险因素。**结果** CLI 组的 LEACS 均高于跛行组。在单因素 Logistic 回归分析中，LRACS（OR：3.227；95%CI：1.514-6.877）是下肢缺血程度增加的危险因素，多因素分析显示 LEACS（OR：3.252；95%CI：1.405-7.523）是下肢缺血程度增加的独立危险因素。**结论** LEACS 是 PAD 患者下肢缺血程度增加的独立危险因素，但 LEAC 在下肢缺血的具体作用还需要进一步研究。

PU-1626
Study on the features and classifications of the iliac vein compression by multi-planar reconstruction imaging with multi-slice spiral CT

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【Abstract】**Objective** To study the features and classifications of iliac vein compression among normal population using multi-planner reconstruction (MPR) and multi-slice spiral CT (MSCT). **Methods** Retrospective cross-sectional study. The imaging data of 180 normal individuals who underwent enhanced MSCT examination in our hospital from June to October 2018 were collected. Following data was observed and measured : collecting the type of iliac vein compression, the number of compression point, the site of maximum compression point and then the classification was performed; measured the short diameter and area of the maximum compression of the iliac vein at the point where the iliac artery crossed, the average of the area of the iliac vein proximal and that distal to the maximum compression point, the range of compression, the angle between the common iliac vein and the inferior vena cava extension line bilaterally, and get stenosis rate of the iliac vein. Compare the incidence of the site of maximum compression point, the relationship between the area and stenosis rate of the left common and right common iliac vein compression, the relationship between left and right common stenosis degree and age, gender. Statistical significance was

tested by using Student’s t-test, One-Way ANOVA, Rank sum test, Chi-square test on the SPSS 25.0 software. **Results** The type of iliac vein compressioncould be classified into four classifications: type I the left common iliac veinsingle compression, type II the left common iliac vein double compression, type III the both left and right common iliac vein compression, type IV the other compression type, the proportion was 37/180, 66/180, 42/180, 35/180; the site of maximum compression point includesthe left common iliac vein(LCIV, 162), the right common iliac vein (RCIV, 50), the bifurcation of theinferior vena cava (IVC, 9), the left external iliac vein (LEIV, 6), the bifurcation of the left common iliac vein (LCIV, 3), the right external iliac vein (REIV, 1).The incidence of LCIV compression was higher than the RCIV(P <0.01). The mean area of the bilateralcommon iliac vein in female was less than that in the male (P <0.05), the difference of the bilateral common iliac vein stenosis rate was not statistically significant in females and males (P>0.05). The left and right common iliac vein stenosis rate was greater than25% accounted for 44.4% and 40.0%, respectively; greater than 50% compression accounted for 8.6% and 6.0%, respectively. The difference of proportion was not statistically significant in the males and females (P>0.05).**Conclusions** This study put forward the type of iliac vein compression according to the iliac vein compression in normal population by MPR method of MSCT, among which type II the left common iliac vein double compression accounted for the highest proportion, which can provide important potential evidence for clinical diagnosis and treatment of IVCS.

PU-1627
下肢动脉硬化闭塞症患者动脉钙化的危险因素及其与动脉狭窄的相关关系

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目的 探讨下肢动脉硬化闭塞症（LEASO）患者全下肢动脉钙化（LEAC）及各区段动脉钙化的危险因素，并分析其与相应区段动脉闭塞程度的相关性关系。方法 回顾性收集 2017 年 9 月到 2018 年 3 月接受下肢 CTA 扫描检查的 LEASO 患者，记录患者的基线资料，分别在 CT 平扫图像及增强图像上测量得到下肢动脉钙化积分（LEACS）及代表下肢动脉闭塞程度的下肢动脉指数（LEAI）。以钙化积分（CS）的中位数作为截止水平将患者分为高钙化积分组和低钙化积分组。将使用单因素及多因素线性回归分析总 LEACS 及各区段 CS 的危险因素；采用 Pearson 方法分析全下肢及各区段的 CS 与管腔闭塞程度的相关性，并分析总 LEACS 与下肢各区段 CS 的相关性。结果 在校正危险因素后，空腹血糖是总 LEACS（PRC：0.038，95%CI：0.002-0.073，P=0.037）及膝下动脉段 CS（PRC：0.071，95%CI：0.010-0.133，P=0.024）的独立危险因素，吸烟史（PRC：0.571，95%CI：0.142-0.999，P=0.010）及糖尿病（PRC：0.606，95%CI：0.119-1.094，P=0.015）分别是主髂动脉段 CS 和股腘动脉段 CS 的独立危险因素。总 LEACS 与总 LEAI 之间存在弱相关性（r=0.29，P=0.003），而在下肢各区段的分析中，主髂动脉段 CS 与主髂动脉段 LEAI 不存在相关性（P＞0.05），股腘动脉段（r=0.44，P＜0.001）和膝下动脉段（r=0.46，P＜0.001）的 CS 与对应区段 LEAI 间均存在中等相关性。总 LEACS 与下肢各区段动脉 CS 之间均存在显著相关性（P＜0.001）。结论 下肢动脉不同区段钙化的危险因素不尽相同，仅腹股沟韧带以下的动脉钙化与管腔狭窄程度具有相关性，提示下肢不同区段动脉钙化的病理机制及临床意义可能存在差异。

PU-1628
栓塞其他异位供血子宫动脉在各种难治性子宫出血子宫栓塞术中的临床价值

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目的
探讨栓塞其他异位供血子宫动脉对各种子宫出血子宫动脉栓塞术的临床意义。
实验材料与方法
收集本院收治的 119 例难治性子宫出血并施行了介入止血治疗患者的病历及影像学资料，其中终止妊娠 10 例，产后出血 96 例，疤痕妊娠 13 例。将病人分为仅仅栓塞子宫动脉组及除栓塞子宫动脉同时栓塞其他异位供应子宫血管（双侧卵巢动脉，双侧髂外动脉分支等），并根据出血量、血流动力学是否稳定、是否并发弥散性血管内凝血及术后是否需要切除子宫及产后月经情况等结果分析。所有统计学分析均用 SPSS 22.0 处理，出血量用两独立样本 T 检验，血流动力学是否稳定、是否并发弥散性血管内凝血及术后是否需要切除子宫采用卡方检验。
结果
收集患者的平均年龄 32 岁，年龄范围 21-47 岁。仅栓塞子宫动脉出血量较栓塞子宫动脉及其他供血动脉统计学上有差异（P＜0.05）。仅栓塞子宫动脉较栓塞子宫动脉及其他供血动脉在产后月经情况、血流动力学是否稳定、是否并发弥散性血管内凝血及术后是否需要切除子宫的发生率上无统计学差异（P＞0.05）。
结论
子宫动脉栓塞术对各种难治性子宫出血效果明显，减少出血量及并发症发生，降低切除子宫的发生率。栓塞其他异位供血子宫动脉止血效果较单纯栓塞子宫动脉效果显著。

PU-1629
螺旋 CT 静脉造影成像评价下肢静脉曲张交通静脉显影价值

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目的　评估螺旋 CT 静脉造影成像在下肢静脉曲张微创治疗交通静脉评价中的价值。方法　对 112 例(168 条患肢)下肢静脉曲张患者行静脉腔内激光闭塞联合泡沫硬化杂交微创治疗,术前检查及术后 3 个月复查应用 256 排螺旋 CT 静脉造影成像和静脉顺行造影,回顾性对比分析 2 种检查方法显示交通静脉的资料。2 名放射科医师双盲法分别对图像进行分析,采用 5 分制评价曲张交通静脉显影情况,Kappa 检验比较诊断结果的一致性;行受试者工作特征　(ROC)曲线,计算 CT 下肢静脉造影成像和下肢静脉顺行造影评价交通静脉的敏感度、特异度和准确度。结果 CT 下肢静脉造影和下肢静脉顺行造影图像质量分级中,1~2 分分别占 77.38　(260/336)、58.33　(196/336),5 分分别占　1.78　(6/336)、6.84　(23/336)。2 名阅片者 CT 下肢静脉造影成像和下肢静脉顺行造影评分的 Kappa 值分别为 0.935 和 0.821,一致性好;CT 下肢静脉造影诊断评价交通支 ROC 曲线下面积(AUC)分别为 0.962、0.948(P=0.019),下肢静脉顺行造影分别为 0.658、0.672(P= 0.021),差异均有统计学意义;3 个月后评价下肢静脉曲张残存复发交通静脉敏感度、特异度和准确度的平均值分别是 CT 下肢静脉造影成像 100 (72/72)、97.72　(258/264)、94.94　(319/336),下肢静脉顺行造影 66.67(48/72)、61.74 (163/264)、61.90 (208/336);2 种方法诊断下肢曲张静脉残存

复发的 ROC 曲线分别为 0.985、0.963(P= 0.013)和 0.684、0.587(P= 0.026),差异均有统计学意义。结论 螺旋 CT 静脉造影成像在下肢静脉曲张交通静脉检出及诊断的准确性方面都优于静脉顺行造影,能够满足临床微创介入手术需要。

PU-1630

Strategies for the diagnosis and treatment of the iliac vein compression syndrome

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Aim: To evaluate the diagnosis and treatment strategies for the iliac vein compression syndrome (IVCS) and the factors that affect the treatment outcome. **Methods:** In total, 69 patients with IVCS were enrolled in our hospital. The patients underwent computed tomography (CT) venography before treatment. CT observations included assessment of the iliac venous channel sagittal diameter (IVCSD) ahead of the lower lumbar vertebra, causes of oppression, thrombus density, and embolization range. The patients with IVCS were divided into the simple IVCS (sIVCS, n = 22), lumbar degeneration-related type IVCS (dIVCS, n = 33), and IVCS of other causes (oIVCS, n = 14) including lumbar fracture, hematoma of infection, and abscess wraps around and compressing the iliac vein, groups. The treatment methods included target venous catheter thrombolysis, a mechanical breaking and sucking treatment for the thrombus, followed by balloon dilatation and iliac vein stent implantation. The factors that may possibly affect the treatment outcomes included IVCS type, duration of disease, thrombus density, embolization length, and treatment regimen. Logistic regression was used to analyze the factors that affected the therapeutic efficacy. **Results:** Simple iliac vein catheterization thrombolysis was only effective in 15 cases (5 cases of dIVCS and 10 cases of oIVCS) and was ineffective in the remaining 54 cases, which required further mechanical breaking and sucking of the thrombi and intravenous balloon dilatation. In 26 cases, simple iliac vein catheter thrombolysis was effective at the early stage (6 cases of sIVCS, 16 cases of dIVCS, and 4 cases of oIVCS). During follow-up, treatment was considered futile for 9 recurrent cases (3 cases of sIVCS and 6 cases of dIVCS). In 28 cases wherein the primary treatment was futile and 9 cases of relapse, iliac vein stent implantation was performed. All cases were treated effectively and satisfactory iliac vein patency was achieved; these patients were followed-up for 12 months without recurrence. Logistic regression analysis showed that IVCS type (β = 4.14; Wald test, $P < 0.01$), duration of illness (β = -5.33; Wald test, $P = 0.02$), thrombus density (β = -6.46; Wald test, $P = 0.01$), embolization length (β = 2.741; Wald test, $P = 0.03$), and treatment regimens (β = 11.92; Wald test, $P = 0.01$) all had a significant effect on the treatment outcomes. **Conclusion:** The selection of a suitable intervention treatment regimen for different types of IVCS may aid in improving the curative effect.

PU-1631
血流动力不稳型骨盆骨折几种损伤控制性应急处置策略比较

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目的 探讨血流动力不稳型骨盆骨折（unstable pelvic fractures, HUPF）合适的损伤控制急救方案。
方法 横截面回顾性分析我院 77 例 HUPF 患者采用不同损伤控制措施的效果。A 组为损伤现场未进行骨盆外固定、入院急诊 CT 确定骨盆不稳定骨折后立即行支架外固定，12 例；B 组为损伤现场骨盆下肢联合木板外固定，急诊 CT 后更换为骨盆支架外固定，18 例；C 组为现场骨盆下肢联合木板外固定，急诊 CT 后进行介入栓塞术，术中卸除木板，术后更换为骨盆支架外固定，17 例；D 组为现场骨盆带外固定，急诊 CT 后行介入栓塞术，术中维持骨盆带，术后更换为支架外固定，15 例；E 组为现场骨盆带外固定，急诊 CT 后行介入栓塞术，术中维持骨盆带，术后保留骨盆带并支架外固定，15 例。各组经急诊损伤控制性术后进一步分流专科救治。选择患者平均输血量、休克指数恢复时间和存活率为观察指标，评价各指标的组间差异。
结果 A-E 组输血量依次减少，A 组 4720.00±1996.00（ml），E 组 1287.00±112.50（ml）（F=38.74，p<0.001）；A-E 组休克指数恢复时间依次缩短，A 组 21.70±18.38（h），E 组 4.73±1.10（h）（F=10.23，p<0.001）；A-E 组存活率依次为 42%，55%，59%，73%，87%。
结论 HUPF 患者合适的损伤控制急救措施是现场骨盆外固定优于未固定、急诊介入栓塞优于不栓塞、术中维持固定优于卸除固定、术后保留原固定基础上的骨盆外支架固定优于去除原固定的骨盆外支架固定。

PU-1632
经导管动脉化疗栓塞术联合微波消融治疗肝癌的临床效果及护理措施

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目的 为了分析经导管动脉化疗栓塞术联合微波消融治疗肝癌的临床效果。**方法** 选取我院 2017 年 6 月至 2018 年 12 月期间收治的 34 例肝癌患者作为研究对象，基于奇偶顺序将其分为两组，对照组 17 例患者采用经导管动脉化疗栓塞术进行治疗，试验组患者 17 例采用经导管动脉化疗栓塞术联合微波消融进行治疗，观察两组患者 2 个月后的肿瘤完全坏死率和部分坏死率，1 年以及 2 年生存率。**结果** 试验组患者 2 个月后的肿瘤完全坏死率为 88.24%（15/17），显著高于对照组患者的 17.65%（3/17），差异具有统计学意义（P<0.05）；试验组患者 1 年和 2 年的生存率分别为 82.35%（14/17）和 41.18%（7/17），均高于对照组患者的 41.18%（7/17）和 11.76%（2/17），差异具有统计学意义（P<0.05）。**结论** 对于肝癌患者采用经导管动脉化疗栓塞术联合微波消融进行治疗可以有效提高近期肿瘤完全坏死率以及远期生存率，效果显著。

PU-1633
TACE 联合微波消融治疗中晚期肝癌的临床疗效及护理措施

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目的 为了分析肝动脉化疗栓塞（transarterial chemoembolization，TACE）联合微波消融治疗中晚期肝癌的临床疗效。**方法** 选取我院 2017 年 1 月至 2018 年 12 月期间收治的 38 例中晚期肝癌患者作为研究对象，将其基于不同治疗方式分为两组，对照组患者 19 例采用 TACE 进行治疗，试验组患者采用 TACE 联合微波消融进行治疗，观察两组患者的治疗有效率以及治疗前后的肝功能评价指标以及血清甲胎蛋白指标。**结果** 试验组患者中治疗显效患者 7 例、治疗有效患者 8 例，总治疗有效率为 78.95%，对照组患者中治疗显效患者 4 例、治疗有效患者 7 例，总治疗有效率为 57.89%，差异具有统计学意义（P<0.05）。治疗前两组患者的肝功能评价指标以及血清甲胎蛋白指标差异无统计学意义（P>0.05），治疗后试验组患者的血清总胆红素、血清结合胆红素、谷丙氨酸酶、谷草转氨酶以及血清甲胎蛋白分别为（18.01±3.45）umol/L、（5.68±1.74）umol/L、（45.32±4.20）U/L、（49.26±4.58）U/L 和（572.68±54.41）ng/L，均优于对照组患者的（21.74±3.27）umol/L、（6.81±1.87）umol/L、（52.01±4.94）U/L、（57.51±4.47）U/L 和（795.12±54.28）ng/L，差异具有统计学意义（P<0.05）。**结论** 对于中晚期肝癌患者采用 TACE 联合微波治疗可以有效提高患者治疗有效率，保护肝功能。

PU-1634
左髂总静脉受压与左下肢静脉血栓形成的相关性研究

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目的 探讨 MSCT 血管成像在左髂总静脉受压与左下肢静脉血栓形成的相关性研究中的价值。**方法** 回顾性分析了 64 例左髂总静脉受压患者的 CT 影像和临床资料，测量左髂总静脉受压最窄处的矢状径、右髂总静脉及左髂总静脉远心端矢状径，分别计算受压程度（狭窄率），以左髂总静脉及其属支有无血栓为标准，绘制受试者工作特征（ROC）曲线，得出诊断左髂总静脉受压狭窄率的最佳测量方法。统计分析以最佳测量方法所得的左髂总静脉受压狭窄率与左下肢静脉血栓有无相关关系。**结果** 左髂总静脉受压最窄处矢状径约（3.79±1.56）mm，取髂总静脉分叉处以下（2-3cm）同一水平分别测量右髂总静脉矢状径约（13.10±1.92）mm、左髂总静脉远心端矢状径约（10.80±2.86）mm，分别计算左髂总静脉受压最窄处矢状径与右髂总静脉矢状径、左髂总静脉远心端矢状径的狭窄率为 0.29±0.12、0.36±0.12；以有无血栓为标准，构建 ROC 曲线，计算得出两者的 AUC 分别为 0.630、0.516；前者狭窄率的 AUC 大于后者狭窄率的 AUC，*P*＞0.05，差异无统计学意义，因此以左髂总静脉受压最窄处矢状径与右髂总静脉矢状径的比值作为判断左髂总静脉受压狭窄率的最佳测量方法；用 Spearman 相关分析，P 值＜0.05，该相关系数有统计学意义，左髂总静脉受压狭窄率与左下肢静脉血栓的形成有一定相关性。**结论** MSCT 血管成像对分析左髂总静脉受压与左下肢静脉血栓形成的相关性研究中有重要价值。

PU-1635
腹主动脉瘤介入术中导管校准法和标记导管校准法比较

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研究目的
比较导管校准法和标记点校准法在腹主动脉瘤介入诊疗中测量值的差异。

资料和方法
收集 2015 年 3 月-2019 年 5 月期间，采用血管腔内支架成形术治疗腹主动脉瘤的 32 例病人。其中，男 22 例，女 10 例，年龄 35-68 岁，均确诊为腹主动脉瘤。将直径为 5F 的标记导管送到腹主动脉作正位造影，能清晰显示腹主动脉瘤的解剖结构。在图像中心区域，选择靠近腹主动脉瘤的导管平直段作为校准标尺，分别采用导管校准法（导管两侧壁间校准为为 5F 距离）和标记点距离校准法（两个标记点间距离校准为 10mm），分别以两种校准法校准后测量正常腹主动脉近心端血管直径和瘤颈部宽度。由两名介入技师各自测量三次取平均值，结果以均值±标准差(x±s)表示。以病人术前 CTA 图像上近心端血管直径和瘤颈长度作为标准值，将 DSA 影像获得的两组数据与 CTA 测量数值进行对比。

结果
近心端血管直径测量，导管校准法和标记点校准法测量值与 CTA 测量值分别为 25.93±4.18mm、26.07±4.24mm 和 26.04±5.42mm，未存在统计学差异（F=1.35，P>0.05）；瘤颈部位测量值分别是 28.62±5.18mm、28.98±3.96mm 和 29.17±6.63mm，测量值也未出现统计学差异（F=2.06，P>0.05）。在 DSA 影像上，应用两种校准测量方法的测量值都与标准值接近。

结论
在腹主动脉瘤的 DSA 造影图像中，分别运用导管直径校准法和标记点校准法均可以准确测量出血管直径、瘤颈长度等数据，为支架、球囊的选择提供依据。影像技师在进行介入测量时，可以灵活运用不同的测量方法，完成手术中的精准化测量。

PU-1636
41 例糖尿病足患者下肢血管 MRA 与 CTA 诊断效果的对比研究

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目的 文章着重对糖尿病足下肢血管病变的 MRA 及 CTA 诊断效果进行对比研究。

方法 对 41 例临床确诊糖尿病足患者的下肢血管行 MRA、CTA、DSA 检查，以 DSA 为金标准，分析 MRA、CTA 对糖尿病足患者下肢血管病变的诊断效果。

结果 MRA 对于糖尿病足下肢血管病变成像的总体准确性、敏感性及特异性分别为 97.8%、98%、97.7%，CTA 对于糖尿病足下肢血管病变成像的总体准确性、敏感性及特异性分别为 96.7%、94.9%、98.1%。膝上动脉组，MRA 的成像准确性、敏感性、特异性均为 98.4%、98.4%、98.4%，CTA 的准确性、敏感性、特异性分别为 97.8%、98%、97.6%。膝下动脉组，MRA 的准确性、敏感性、特异性分别为 96.7%、97%、96.6%，CTA 的准确性、敏感性、特异性为 94.7%、83.3%、98.9%。

结论 MRA 及 CTA 均为有效的糖尿病足下肢血管病变影像学检查方法，且 MRA 及 CTA 对于糖尿病足下肢血管病变的整体诊断效果无明显差异，但 MRA 对糖尿病足膝下动脉病变的诊断结果优于 CTA。

PU-1637
AMD3100 及 SDF-1 联合治疗促进糖尿病大鼠血管再内皮化的作用

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评估了 AMD3100 联合 SDF-1 治疗对于大鼠糖尿病颈动脉损伤模型的治疗意义。

方法 分别通过 CCK-8 以及 transwell 法评估了 AMD 3100 以及 SDF-1 治疗对于糖尿病大鼠来源的内皮干细胞的功能活性的影响，包括增殖及粘附能力。在活体实验方面，我们评估了 SDF-1 局部注射治疗、AMD 3100 联合 SDF-1 治疗对于大鼠血管损伤模型的治疗效果，包括不同组之间内皮干细胞动员、归巢的情况，以及不同组之间对再内皮化以及抑制内膜过度增生的作用。

结果 不论是 SDF-1 单独治疗还是 AMD 3100 联合 SDF-1 治疗均可以有效的提高内皮干细胞的生物学功能，包括增殖及粘附能力。AMD 3100 联合 SDF-1 治疗可以快速的动员内皮干细胞进入外周血中(76.1±14.6 VS 37.4±12.5,P<0.001)，促进内皮干细胞归巢至损伤部位(8.7±2.4 VS 3.1±1.2，p=0.006)，从而有效的促进损伤血管的再内皮化(7 days :60.3±14.9 % VS 33.5%±3.4%, P<0.001, 14 days： 92.0 ±15.2% VS 88.6±13.1%， P=0.517)，抑制内膜过度增生(7 days: 0.46 ± 0.02 VS 0.67±0.03, P=0.016, 14 days： 0.51±0.03 VS 0.78±0.04， P<0.001)。但是单独使用 SDF-1 并不能有效的募集更多内皮干细胞(4.1±2.3 VS 3.1±1.2，p=0.287)参与到血管修复过程中，故而再内皮化过程与对照组基本相仿(7 days :49.3±5.7% VS 33.5±3.4%, P=0.473, 14 days： 89.8±14.7% VS 88.6±13.1%， P=0.639)。

结论 AMD 3100 联合 SDF-1 治疗可以有效的动员、募集内皮干细胞进入损伤血管，并促进损伤血管内膜修复，抑制血管内膜的过度增生

PU-1638
介入治疗在糖尿病外周血管病中治疗效果研究

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目的 分析介入治疗糖尿病外周血管病变的临床治疗效果。

方法 将我院收治的 96 例糖尿病外周血管病变患者分为观察组和对照组,两组患者均采用常规方法进行治疗,观察组患者在此基础上采用介入治疗,比较两组患者的临床治疗效果。

结果 治疗后,观察组疼痛麻木症状缓解、紫绀症状消失、皮肤低温改善、踝肱指数(ABI)均明显优于对照组;观察组患者治疗满意度为 83.33%,明显高于对照组的 56.25%;观察组并发症发生率为 8.33%,明显低于对照组的 18.75%,差异均具有统计学意义(P<0.05)。

结论 糖尿病外周血管病变患者采用介入治疗后,能够对病情的发展进行控制,改善患者病情。

PU-1639
单不饱和脂肪酸（FAAS）可作为介入治疗后血管再狭窄的预测指标机制的研究

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目的 单不饱和脂肪酸（FAAS）可作为介入治疗后血管再狭窄的预测指标，特别是在高脂饮食诱导的 2 型糖尿病患者中。然而，其致病机制有待进一步阐明。

方法 本研究用反转录定量法检测了不同浓度油酸（OA）对血管平滑肌细胞（VSMC）酪氨酸 3 单加氧酶/色氨酸 5 单加氧酶激活蛋白 β（14-3-3β）的水平。RT-PCR 和 Western blot 分析。采用创伤愈合和细胞迁移实验检测 VSMCs 的迁移情况。应用免疫荧光和 Western blot 技术检测 OA 治疗的 VSMC 中 B 细胞淋巴瘤 2（Bcl 2）相关死亡启动子（BAD）的蛋白分布。在体内实验中，在无损伤的超声显像后 14 天评估各组大鼠颈动脉形态，并通过组织学染色证实。

结果 在 VSMCs 中，OHAB 的表达以浓度依赖性方式上调。在体内实验中，高 FFA 糖尿病大鼠颈动脉狭窄更为严重。然而，YHAWB 的沉默显著降低了糖尿病大鼠颈动脉内膜增生的 FFA 水平升高。此外，YHAB 沉默减轻了 OA 处理过的 VSMC 的迁移，并使坏蛋白从细胞质转运到线粒体。

结论 结果表明，FFA 诱导的 YHAWB 的上调参与了颈动脉损伤后血管平滑肌细胞的迁移。YHAWB 的抑制可作为预防高 FFA 水平糖尿病患者介入治疗后血管再狭窄的新的潜在药物靶点。

PU-1640
Management of Isolated dissection of the abdominal aorta: single-center experience

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Objective: The purpose of this article is to introduce our experience in the diagnosis and treatment of isolated abdominal aortic dissection (IAAD).
Method: A cohort of 45 consecutive patients with IAAD were treated in our hospital between January 2010 to December 2018. We reviewed the clinical features, risk factors, perioperative, procedure-specific and imaging data. Follow-up included clinical and imaging examinations.
Results: There were 33 patients performed endovascular treatment and 12 patients received conservative treatment initially. In the endovascular treatment group, the primary technical success rate was 100% and no complications occurred in the perioperative period. During a follow-up of 1-84 months (average 16.6 months), 2 of the patients (6.1%) in the endovascular treatment group had slight type II leakage at 1.5 months and 6 months respectively after operation, and neither of them need re-intervention; And in the conservative group, three patients were lost to follow-up, 1 patient died 2 months later because of other disease. In the rest patients, 2 of them (25%) had small new breach in the double barrel aorta at 21months and 40months respectively but neither of them need intervention, and 1 patient (12.5%) performed endovascular treatment because of aortic rupture and others showed stable.
Conclusion: Endovascular treatment of IAAD is an effective method with a high technical success and low complications rate. For patients with conservative therapy, close surveillance is necessary.

PU-1641
128 层螺旋 CT 血管成像在周围动脉闭塞性疾病诊断中的临床应用价值研究

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目的 评价 128 层螺旋 CT 血管成像在周围动脉闭塞性疾病诊断中的临床应用价值。**方法** 前瞻性获取 21 例下肢动脉闭塞性疾病患者（42 侧肢体），平均年龄 71±12.7 岁，获得知情同意后在东芝 Aquilion One 128 层螺旋 CT 上进行下肢动脉 CTA 检查(造影剂：碘帕醇 370mgI/mL（Iopamidol，BRACCO)，双相注射，造影剂剂量按体重分组），原始图像经过 VR、MIP、CPR 后处理后获得重建图像。其中有 12 例共 12 侧下肢在 CTA 检查后 1 周内行 DSA 检查。由两位有经验的放射科医生共同分析评价 CTA 显示双下肢各支动脉段图像质量情况及各段狭窄程度，并与 DSA 比较。**结果** 21 例患者均顺利完成双下肢动脉 CTA 检查,图像显示度评分为 2.86±0.351 分，CTA 静脉重叠评分为 0.14±0.467 分，共有 38 侧下肢 CTA 未发生静脉污染，占 90.48%(38/42)；4 侧下肢 CTA 发生不同程度的静脉强化，占 9.53%(4/42)。以 DSA 为金标准，CTA 显示动脉正常及轻度狭窄的敏感性 96.30%，特异性 98.04%，阳性预测值 98.73%，阴性预测值 94.33%；显示明显狭窄的敏感性 94.44%，特异性 95.83%，阳性预测值 89.47%，阴性预测值 97.87%；显示闭塞的敏感性 86.67%，特异性 98.29%，阳性预测值 86.67%，阴性预测值 98.29%。以 DSA 为金标准，CTA 显示少许侧枝的敏感性 92.86%，特异性 99.15%，阳性预测值 92.86%，阴性预测值 99.15%，显示丰富侧枝血管的敏感性 93.75%，特异性 100%，阳性预测值 100%，阴性预测值 99.16%。 **结论** 128 层螺旋 CT 能够全面清晰显示双下肢动脉病变，为疾病诊断提供快速、有效且可靠的诊断手段，对临床诊断和治疗具有重要指导意义。

PU-1642

孤立性肠系膜上动脉夹层的治疗策略

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【目的】探讨孤立性肠系膜上动脉夹层的诊断与治疗策略。【资料与方法】分析 2010 年 7 月至 2014 年 7 月收治于武汉协和医院的 19 例 ISMAD 患者资料；12 例患者行介入治疗，其中 1 例因术中因无法成功置入支架而转行保守治疗，余 11 例成功完成介入手术（手术方式各异）；7 例患者行药物保守治疗。【结果】所有患者均未出现肠坏死等严重并发症；行支架置入术患者，支架内血流通畅，假腔闭合满意。【结论】孤立性肠系膜上动脉夹层治疗方案与分型关系密切，Yun I 型、IIb 型通过抗凝、抗血小板、扩管等保守治疗通常效果较好；IIa 型宜选择介入治疗；III 型患者如果没有肠坏死征象可以置管溶栓治疗并密切观察，必要时行外科手术。

PU-1643

腔内血栓清除技术的最新进展及临床应用

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急性下肢深静脉血栓形成是临床常见病，常导致肺栓塞及血栓后综合征，在抗凝治疗的基础上快速有效地清除血栓是当前临床主要治疗方案，而腔内血栓清除技术是目前清除血栓的主流方法，常用的有：经导管直接溶栓术、超声辅助溶栓术、药物机械联合血栓清除术、机械性血栓清除术。本文综述了腔内血栓清除技术的最新进展及临床应用。

PU-1644

中药华蟾素在部分性脾栓塞中的临床应用

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目的 探讨中药华蟾素在部分性脾栓塞介入治疗中的临床应用价值。
方法 22 例乙肝后肝硬化、脾功能亢进患者，接受部分性脾动脉栓塞介入治疗，选择性插管后经脾动脉灌注华蟾素 10—15ml，超选择性插管，以华蟾素 5ml 与生理盐水、对比剂、利多卡因混合后加入明胶海绵条（1×1×10mm）或明胶海绵颗粒（1×1×1mm），脾脏栓塞范围 30—70%。
结果 22 例患者中 18 例栓塞 1 次，4 例栓塞 2 次。患者脾动脉栓塞后 5-10 天，复查血常规，白细胞、血小板明显升高；随访 2-30 个月白细胞较术前上升 1.3 倍，血小板上升 3.8 倍。所有患者介入术后常规抗感染治疗，以新癀片、消炎痛栓等对症处理，患者均有体温上升（37.5—39.0℃），平均发烧 3.5 天；均出现左上腹疼痛，平均 4 天；7 例患者腹水增多。
结论 华蟾素可用于治疗慢性乙型肝炎，具有清热解毒、消肿止痛的功效。该药灌注及配合明胶海绵条、明胶海绵颗粒进行部分性脾栓塞，临床疗效较好，不良反应较轻。

PU-1645

大出血的急诊介入治疗——附 14 例资料分析

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目的 探讨急诊介入治疗大出血的临床价值。
方法 14 例大出血患者，男性 6 例，女性 8 例，年龄 25-70 岁。接受急诊介入治疗，经股动脉穿刺，超选择插管，以明胶海绵栓塞和/或垂体后叶素灌注相关动脉血管。其中消化道出血 3 例，肾脏破裂 3 例，瘢痕妊娠出血 2 例，宫颈癌出血 1 例，黄体破裂 1 例，外阴出血 1 例，产后出血 1 例，胆管出血 1 例，腹腔出血 1 例。
结果 所有患者经介入治疗后，短时间内均达到了出血停止或出血减少的治疗目的。1 例消化道出血患者介入治疗后 48 小时死于 DIC 和肝功能衰竭，1 例胆管出血患者 6 个月后死于胆管癌，其余患者目前健在。
结论 急诊介入治疗，责任血管的栓塞和/或药物灌注，对于大出血有确切的疗效，同时也为后续的治疗赢得了时间。

PU-1646
孤立性肠系膜动脉夹层的分型与治疗进展

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孤立性肠系膜动脉夹层（IMAD）临床上并非罕见，现有的分型方法均以影像学表现为基础，存在一定局限性。我们根据患者的症状、体征和影像学表现，将 IMAD 分为急诊型和非急诊型，并根据该分型制定 IMAD 的治疗流程图。急诊型 IMAD 患者予急诊外科手术或血管腔内治疗；非急诊型 IMAD 患者给予内科保守治疗。绝大多数非急诊型 IMAD 患者经内科保守治疗后病情稳定，少数出现疾病进展需行有创干预，腔内支架置入是首选的有创干预措施。

PU-1647
一例儿童先天性肺动静脉瘘行介入术的围手术期护理

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总结 1 例肺动静脉畸形患儿介入治疗的护理。术前分别做好患儿及家长的心理干预，训练患儿有效咳嗽；术后做好咯血的预防护理. 穿刺侧肢体制动期护理，重视并发症的观察及护理，治愈出院。肺动静脉畸形(Pulmonary arteriovenous malformation，PAVM)又被称为肺动静脉瘘，指肺动脉和肺静脉之间的异常沟通，是一种先天性肺血管畸，肺动脉血管瘤[1]。其发生机制为：内脏血管丛的血管间隔形成出现障碍，使毛细血管发育不全，造成动静脉短路，并可因血管瓣的出现而形成毛细血管瘤。主要临床表现为咯血，咯血量大时易引起窒息而危及生命，需紧急抢救。支气管动脉栓塞术已经成为治疗 PAVM 的首选疗法[2]。2018 年 10 月我科对 1 例 PAVM 患儿行支气管动脉栓塞术，取得满意效果，现将护理报告如下一。

PU-1648

微创介入治疗低辐射剂量的下肢临床应用

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【摘要】**目的** 采用西门子自带 CARE 软件包功能评价患者在 DSA 透视检查和采集过程中放射曝光接受的辐射剂量。**资料与方法** 搜集我院西院近 3 年 43 例下肢栓塞治疗术患者的检查数据，其中下肢溶栓 28 例、旋切术 3 例、支架 18 例，应用 CARE 功能分析患者累计接受的辐射剂量与图像质量和临床的应用价值。**结果** CARE vision 改变脉冲速率的透视模式可显著降低病人辐射剂量；CARE filter 改变铜滤波片，过滤构建图像所不需要的 X 射线低能部分；CARE profilter 无辐射准直；CARE position 无辐射定位；CARE monitor 功能显示当前放射病人皮肤区域的累计皮肤入射剂量（mGy），基于病人体重身高和辐射皮肤方形的内部模型提供专门的空气比释动能。综合评估下肢栓塞治疗术 DSA 接受射线剂量同比减少 32%。**结论** CARE 功能可以显著降低介入治疗病人和检查者放射曝光时接受的射线剂量。

PU-1649
一站式复合手术在脊柱肿瘤外科切除中的应用

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目的 探讨一站式复合手术在脊柱肿瘤外科切除方面的临床应用。
方法 回顾性分析 2015 年 3 月至 2019 年 2 月在我院复合手术室实施一站式复合手术的脊柱肿瘤病人 16 例（观察组）及单独行外科手术切除的病人 20 例（对照组）。观察组患者术前均先行血管造影，明确肿瘤病灶供血动脉，根据外科医生要求放置球囊阻断或栓塞肿瘤供血血管，再手术切除病灶，对照组患者在常规手术室行外科切除。比较两组患者手术创伤情况、手术后并发症和术后恢复情况。
结果 本组病例中供血动脉临时阻断 3 例，栓塞 12 例，同时行动脉主干阻断及分支栓塞 1 例。观察组患者术中出血量 412.5 ± 227.9ml 、术中输血量 150.0 ± 297.6ml 、术后并发症发生率 12.5%、术后住院时间 13.3 ± 3.1 d 均明显低于对照组，组间差异有统计学意义(P<0.05)。手术用时 198.3± 65.4 min，与对照组相比无明显统计学差异（P=0.25）。
结论 对于脊柱肿瘤特别是富血供肿瘤，采用一站式复合手术可减少手术转运时间，减少术中出血，减少术后出血，并发症的发生，有利于患者术后早期恢复。

PU-1650
Imaging performance and clinical significance of corona mortis CTA

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Abstract **Purpose:** to improve the radiologist' comprehension of the corona mortis, so as to better guide the clinicians to choose appropriate surgical methods and avoid the occurrence of accidental massive hemorrhage in pelvic or lower abdominal surgery. **Materials and methods:** The CTA manifestations and clinical data of 109 patients with lower limb angiography from October 2017 to July 2018 were retrospectively analyzed. 24 patients had corona mortis, including 19 males and 5 females, aged 14-73 years, with an average age of (49.63±13.04) years. **Results:** all patients had arterial corona mortis, of which 9 on the left, 10 on the right and 5 on both sides. The diameter was 2.15mm-4.27mm, with an average (2.77± 0.43) mm. The distance between the corona mortis and the pubic symphysis was 41mm-67mm, with an average (55.69±5.91) mm. There was no statistically significant difference in the incidence of corona mortis between the left and right sides. **Conclusion:** lower extremity angiography is of certain clinical value in the detection and diagnosis of corona mortis, so as to guide surgeons to select appropriate surgical methods.

PU-1651

肝癌介入术中奥沙利铂致过敏性休克抢救体会

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[摘要] 目的 探讨奥沙利铂过敏性休克的预防策略、抢救方法，为临床用药安全提供参考。方法 报道 1 例奥沙利铂过敏性休克，结合奥沙利铂的药物应用说明及注意事项，针对该患者个体特点对病例进行分析。 结果 一例肝细胞癌患在 TACE 术中灌注奥沙利铂后出现严重的过敏性休克（呼吸困难、血压心率下降、意识丧失等）及心律失常。立即给予补液、抗过敏、抗休克、扩容及抗心律失常治疗，患者生命体征逐渐平稳，后续监护中未出现不良反应。结论 对于在 TACE 手术计划使用奥沙利铂的患者，医务人员应提高警惕，须了解药品注意事项及不良反应，首次应用该药的患者应预防性的应用抗过敏药物。患者因使用奥沙利铂出现过敏性休克时，及时的发现、快速精准的判断是取得救治成功的关键所在。

PU-1652

Iatrogenic arteriovenous fistula of the iliac artery after lumbar discectomy surgery: A system review during the last eighteen years

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Objective: Patients with iatrogenic iliac arteriovenous fistula (IAVF) after lumbar discectomy from our hospital and published literature were evaluated, hoping for a deeper understanding of this entity. **Methods:** Literature form the main databases in China and abroad about iatrogenic IAVF after lumbar discectomy were retrieved while one patient from our hospital was retrospectively reviewed with emphasis on the patient's clinical data. **Results:** From thirty-one Chinese and English publications,

study of forty-four individuals' data revealed L4-L5 and/or L5-S1 intervertebral space levels were mostly involved (62%). Most of the patients underwent CTA and/or DSA examinations to confirm the potential diagnosis and rule out other differential diagnosis (86.4%). Most of the patients (63.6%) may develop symptoms and signs of high output heart failure from months to years after the surgery, and majority of them (88.6%) can be treated with endovascular stent-graft placement. **Conclusion:** Iatrogenic IAVF after lumbar discectomy is rare, however, more attention should be paid, for obtaining accurate diagnosis and proper treatment.

PU-1653
经颈静脉肝内门体分流术治疗吡咯生物碱相关肝窦阻塞综合征的单中心回顾性研究

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目的:评价经颈静脉肝内门体分流术（TIPS）治疗经内科保守处理无效的吡咯生物碱相关肝窦阻塞综合征（PA-HSOS）的预后。
方法 回顾性分析 2015 年 3 月至 2019 年 1 月在中国科学技术大学附属第一医院就诊的 PA-HSOS 患者，按照治疗方式不同分为 TIPS 治疗组和保守治疗组，观察两组患者肝功能、腹水量、影像学及病理学变化，比较两组生存时间。
结果 本研究共纳入 54 例患者，其中男 39 例，女 15 例，按治疗方式不同分为 TIPS 组 37 例，保守治疗组 17 例，两组基线资料比较无差异。经过上述治疗，TIPS 组腹水改善明显优于保守治疗组，至随访终点，随访时间为 3-48 个月，9 例患者死亡，其中 TIPS 组 2 例，保守治疗组 7 例，TIPS 组和保守治疗组 3、6、12、24 个月生存率分别为 94.6%、94.6%、94.6%、94.6%和 70.6%、57.8%、57.8%、57.8%，两组生存时间比较有明显差异（P=0.001）。增强 CT 随访及手术前后病理学变化提示 TIPS 组预后较好。
结论 与常规的保肝对症抗凝治疗相比，TIPS 可能会提高 PA-HSOS 患者的临床治愈率和生存时间，改善远期肝功能情况。

PU-1654
双侧髂内动脉球囊阻断在凶险性前置胎盘剖宫产中的应用

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目的:凶险性前置胎盘及胎盘植入是导致产妇术中大出血及子宫切除的最主要原因，本研究评价双侧髂内动脉球囊阻断辅助剖宫产减少术中出血及降低子宫切除率的可行性。
方法 回顾性分析 2015 年 1 月至 2019 年 6 月在中国科学技术大学附属第一医院就诊的凶险性前置胎盘患者，将接受双侧髂内动脉球囊阻断辅助剖宫产患者纳入介入组，将同期接受传统治疗方式的患者纳入对照组，观察两组患者术中出血量、子宫切除率及相关并发症（DIC、失血性休克、产褥期感染）的发生率。
结果 本研究共纳入 184 例患者，其中介入组 121 例，对照组 63 例，两组基线资料比较无差异。经过上述治疗，两组出血量（1075.76±782.08 VS 1094.59±865.04，P=0.90 ）及子宫切除率比

较均无显著差异（20.66% VS 26.98%），但在合并胎盘植入的患者中，两组术中出血量（1341.54±816.79
VS 2083.33±874.73，P＜0.01 ）存在显著差异，子宫切除率仍无明显差异（29.63% VS 34.21%），而在不合并胎盘植入患者中，两组术中出血量（610.71±211.41 VS 552.94±189.47，P=0.26）和子宫切除率均无显著差异。介入组介入相关并发症包括急性髂外动脉闭塞 2 例，穿刺点假性动脉瘤 2 例，栓塞后臀部疼痛 4 例。

结论 与传统剖宫产相比，双侧髂内动脉球囊阻断辅助剖宫产可能会减少合并胎盘植入患者术中出血量，但可能并不减少子宫切除率。

PU-1655

TIPS 术中腹腔内出血并支架移位 1 例

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患者男，61 岁。因“反复呕血、黑便 18 个月。”入院。诊断：乙型病毒性肝炎肝硬化失代偿期：门静脉高压症，食管胃底静脉曲张出血。入院后完善检查，肝胆脾 CT 增强示：1.肝硬化、脾肿大、门脉高压伴食管下段及胃底静脉曲张（图 1A、1B）；2. 少量腹腔积液；总胆红素 28.1umol/L，血白蛋白 36.6g/L，凝血酶原时间 15.8s，血色素 91g/L。同时予止血、制酸、降门脉压及输血等处理后出血控制。鉴于患者反复发作食管胃底静脉曲张出血，决定行经颈静脉肝内门体分流术（TIPS）+胃冠状静脉栓塞术。

TIPS 术中成功穿刺门静脉，交换 Cobra 导管造影示曲张的胃冠状静脉和胃后静脉及扩张的门静脉（图 2A），先后予 13 枚弹簧圈+聚桂醇空气混悬液 4ml+无水酒精 8ml 栓塞。应用 1 枚 7mm*60mm Rival 球囊扩张分流道，随后拟置入 1 枚 8mm*40mm E-Luminexx 裸支架，支架释放前经鞘管手推造影剂发现门静脉显影并造影剂外渗，患者血压由 120/74mmHg 迅速降至 65/42mmHg，立即行扩容补液及提升血压等处理，同时迅速释放 E-Luminexx 裸支架，发现支架移位并完全进入门静脉主干，而后迅速置入 1 枚 8*80mm Fluency 覆膜支架。支架置入后造影示分流道通畅，未见造影剂外渗，但肝内门静脉分支灌注消失（图 2B～F）。患者血压恢复，结束手术。术中测血色素降至 39g/L。术后继续予补液升压及输注血制品等处理，术后第 11 天患者恢复出院，长期口服华法林抗凝治疗，出院后发生肝功能损害，胆红素曾升至 288.1umol/L，考虑与门静脉分支灌注消失致肝细胞缺血有关，遂于 TIPS 术后 5 个月行 TIPS 分流道限流术。限流术后肝功能好转，胆红素逐渐稳定于 50umol/L 左右，亦未出现消化道出血，TIPS 术后 22 个月复查门静脉 CT 造影示分流道通畅（图 3）。

PU-1656

覆膜支架 TIPS 治疗食管胃底静脉曲张破裂出血的疗效总结

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目的 评价采用覆膜支架行经颈静脉肝内门体静脉分流术（transjugular intrahepatic portosystemic shunt，TIPS）治疗食管胃底静脉曲张破裂出血的疗效。

方法 回顾性分析 2010 年 12 月至 2015 年 2 月共 68 例接受 TIPS 治疗的肝硬化食管胃底静脉曲张破裂出血患者的临床资料，其中男 50 例，女 18 例，年龄 26~76 岁，平均（55±12）岁，肝功能 Child-Pugh 评分 5.0~11.0 分，平均（6.7±1.4）分。患者均采用覆膜支架行 TIPS 术。手术前后门静脉压力的比较采用 t 检验。应用 Kaplan-Meier 法绘制术后无消化道再出血率、分流道通畅率和生存率曲线。

结果 所有 TIPS 手术操作均在局部麻醉下成功完成，共置入支架 115 枚。其中覆膜支架 68 枚，裸支架 47 枚。覆膜支架直径 7~8mm，平均（7.6±0.5）mm。裸支架直径 7~8mm，平均（7.6±0.5）mm。门静脉压力从术前的（42.4±7.5）cm$H_2$0 下降为术后的（30.9±5.0）cm$H_2$0，差异有统计学意义（t=15.4，P<0.01）。术后随访 0.1~52.3 个月，平均(19.1±16.0)个月。TIPS 术后 3、6、12 及 24 个月累积无消化道再出血率为 89.6%、83.0%、78.8%及 73.0%，随访期间共有 15 例患者出现消化道再出血，发生率为 22.1%。术后 3、6、12 及 24 个月分流道累积通畅率为 95.6%、93.1%、76.9%及 72.4%。11 例出现死亡，病死率为 16.2%，术后 3、6、12、24、36 及 48 个月累积生存率为 95.6%、92.5%、90.7%、82.2%、77.9%及 69.2%。术后共发生肝性脑病 15 例，发生率为 22.1%。

结论 采用覆膜支架行 TIPS 治疗食管胃底静脉曲张破裂出血是安全、有效的。

PU-1657
经导管动脉硬化栓塞术在卡波西型血管内皮细胞瘤患儿中的应用

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目的：探讨经导管动脉硬化栓塞术在卡波西型血管内皮细胞瘤患儿中的应用价值。**方法**：2011 年 8 月 — 2017 年 6 月，共 15 例卡波西型血管内皮细胞瘤患儿行经导管动脉硬化栓塞术。观察围手术期并发症及患儿血小板变化。**结果**：手术成功率为 100% 。所有病人未发生严重并发症。术前患儿血小板为 8×10^9/L -23×10^9/L，平均 16×10^9/L，术后血小板升为 86×10^9/L -256×10^9/L，差异均有统计学意义(t 值为 22.510，P 值＜0.01)。不良反应为一过性发热及皮肤紫癜。**结论**：经导管动脉硬化栓塞术治疗卡波西型血管内皮细胞瘤安全有效。

PU-1658
经导管眼动脉灌注化疗在眼内晚期视网膜母细胞瘤患者中的应用

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探讨经导管眼动脉灌注化疗(TOAC)治疗眼内晚期视网膜母细胞瘤(RB)的价值。**方法** 对 42 例（60 眼）国际眼内视网膜母细胞瘤分级为 D 期或 E 期的 RB 患儿行 TOAC 治疗。造影确认微导管在眼动脉内且脉络膜显影清晰后，行眼动脉灌注化疗。术中化疗方案采用美法仑 5 mg 及卡铂 20 mg。每隔 4 周重复一次 TOAC 术，方法同前。每次 TOAC 术后均观察患儿一般情况及术后不良反应。每次 TOAC 术后 4 周行超声检查测量瘤体最大径(即眼球赤道平面的最长径)以及厚度(即瘤体前后径)的变化，瘤体最大径及厚度的比较采用配对样本 t 检验。**结果** 对 42 例（60 眼）术中尝试行眼动脉插管 135 次，平均(2.4±0.3)次/眼，其中 135 次操作成功。患儿 TOAC 术后随访 5～30 个月，中位随访时间为 15 个月。42 例（60 眼）RB 瘤体术前瘤体最大径和厚度分别为(10.7±2.2)和(6.1±1.5) mm，第 1 次 TOAC 术后分别为(6.4±1.4)和(3.2±1.2) mm，差异均有统计学意义(t 值分别为 22.640 和 25.421，P 值均＜0.01)。42 例（60 眼）中 44 眼瘤体完全消失，局部形成钙化斑块;其余 16 眼行眼球摘除术，其中肿瘤复发 5 眼、广泛玻璃体种植 4 眼、视网膜下种植 4 眼、玻璃体出血 3 眼。术

后不良反应包括一过性的眼周不适及轻度骨髓抑制。**结论** TOAC 术治疗眼内晚期化疗失败的 RB 患儿安全有效。

PU-1659
经导管眼动脉灌注化疗在新生儿视网膜母细胞瘤患者中的应用

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目的 探讨经导管眼动脉灌注化疗(TOAC)治疗新生儿视网膜母细胞瘤(RB)的价值。**方法** 对 6 例（7 眼）国际眼内视网膜母细胞瘤分级为 C 期或 D 期的新生儿 RB 患儿行 TOAC 治疗。术中化疗方案采用美法仑 3 mg 及拓扑替康 1 mg。每隔 4 周重复一次 TOAC 术，方法同前。每次 TOAC 术后均观察患儿一般情况及术后不良反应。每次 TOAC 术后 4 周行超声检查测量瘤体最大径(即眼球赤道平面的最长径)以及厚度(即瘤体前后径)的变化，瘤体最大径及厚度的比较采用配对样本 t 检验。**结果** 6 例患儿均为新生儿，出生时行眼底检查确诊，手术时体重 1.7Kg-3.5Kg，平均(2.2±0.2)Kg。对 6 例（7 眼）术中尝试行眼动脉插管 7 次，成功率 100%。患儿 TOAC 术后随访 2～4 个月，中位随访时间为 2.6 个月。6 例（7 眼）RB 瘤体术前瘤体最大径和厚度分别为(6.8±2.2)和(3.6±1.2) mm，TOAC 术后分别为(3.6±1.3)和(2.2±1.2) mm，差异均有统计学意义(t 值分别为 16.21 和 11.51，P 值均＜0.01)。6 例（7 眼）瘤体均钙化良好。术后不良反应包括一过性的眼周不适及轻度骨髓抑制。**结论** 新生儿视网膜母细胞瘤行 TOAC 治疗应用合适的导管安全可行，疗效显著。

PU-1660
经导管动脉化疗栓塞术在儿童肝母血管瘤中的应用

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目的 探讨经导管动脉化疗栓塞术(TACE)在儿童肝母血管瘤中的应用价值。方法 回顾性分析 2008 年 6 月-2016 年 12 月在我院的 26 例肝母细胞瘤患儿性 TACE 术的临床资料。 结果 患儿 26 例，男 19 例，女 7 例。发病中位年龄 8.4 个月（2 月-8 岁）。26 例患儿首诊后共行 TACE 术 58 次（1-3 次/例）。TACE 术后瘤体较术前明显缩小（34.1-86.6%，平均 64.5%），AFP 值下降显著（26.3-92.4%，平均 74.6%）。术后不良反应包括不同程度的发热、呕吐，一过性的肝功能损害以及轻度的骨髓移植。术后随访 5～30 个月,中位随访时间为 15 个月。20 例患儿 TACE 术后成功行外科手术切除，无瘤生存至随访，6 例患儿因疾病进展死亡。 结论 TACE 术可作为肝母细胞瘤外科手术切除前的重要辅助治疗方式，安全有效。

PU-1661
Parkes Weber 综合征的介入综合治疗

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目的 探讨 Parkes Weber 综合征的介入综合治疗的疗效及其安全性。**方法** 回顾性分析 2010 年 5 月至 2015 年 9 月我科 25 例 Parkes Weber 综合征患儿的临床资料。其中累及左下肢 11 例，

累及右下肢 10 例，累及左上肢 2 例，累及右上肢 1 例，同时累及右上肢及右下肢 1 例。患侧肢体同时行经导管动脉硬化栓塞术及影像引导经皮硬化术，动脉栓塞药物为平阳霉素+碘化油+地塞米松+造影剂，经皮硬化药物为聚多卡醇泡沫硬化剂、无水酒精、组织胶及弹簧圈，如仅有患肢动脉增粗增多现象只行经导管动脉硬化栓塞术。患者初诊时每隔 1 个月行介入治疗 1 次，共 3 次。以后定期复查，每半年至 1 年再行介入治疗。介入术后观察患肢运动情况、肤温度变化及与对侧肢体长度、周长等差异变化。 **结果** 25 例患儿共行介入治疗 112 次，其中经导管动脉硬化栓塞术 112 次，经皮硬化术 89 次。介入术后随访 17～80 个月。随访至今，25 例患儿病情均有不同程度缓解，肢体皮肤温度下降 0.6℃～1.4℃。术后不良反应：患肢肿胀 47 例（47/112，41.96%），一过性运动障碍 22 例（22/112，19.64%），局部皮肤破溃 6 例次（6/112，5.36%）。未发生患肢畸形及心肺脑疾病等严重并发症。**结论** Pakes Weber 综合征行介入综合治疗安全可靠、疗效确切。

PU-1662
一种可调节介入手术桡动脉穿刺专用搁手板

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目的 发明一种可调节的介入手术桡动脉穿刺专用搁手板。**背景知识：**随着心脏介入手术的广泛普及及手术器材和手术水平的不断升级提高，穿刺部位已由常规的平卧位股动脉穿刺渐渐改变为平卧位桡动脉穿刺，但现有设备常规的搁手板并未实现更新换代，在使用过程中存在以下缺陷：（1）医院现有的 DSA 机型厂家配备的搁手板仅具有放置和约束患者上肢的功能，但偏瘦或偏瘫的患者双手位置很低，给手术穿刺带来不便；(2)使用 DSA 配套搁手板固定穿刺桡动脉时，穿刺点下方需要无菌敷料垫起来，以方便穿刺，造成了资源浪费，同时增加了就医成本；（3）若术中桡动脉穿刺不成功就需要改为肱动脉穿刺，病人位置就要重新调整，原有搁手板位置和患者上肢的高度就要重新调节，浪费手术时间。**实施方法** 一种桡动脉穿刺专用搁手板，包括带有调节槽的底板、高度调节杆和上肢搁手板。所述高度调节杆包括栓体和螺母，栓体与螺母螺旋连接，栓体头部卡入调节槽中通过螺母固定，栓体上端还设置另外一个螺母，该螺母与上肢搁手板的一侧固定连接。上肢搁手板包括长型的主板和弧形的侧板，侧板与主板呈“L”型连接。上肢搁手板底面上设置有束缚带和垫子，调节槽设置于底板外侧，呈十字形。**实施效果：**（1）调节槽的设置可根据患者体型调节搁手板与患者的位置，增加病人舒适度；（2）高度调节杆可调节高度，可根据手术需要调整高度，提高穿刺效率；（3）上肢搁手板束缚带的设置具有保护作用，对肥胖、偏瘫病人的保护尤佳。

PU-1663
CT 血管成像在介入咯血治疗中的临床应用价值

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目的 探讨 CT 血管成像在介入栓塞治疗咯血中的临床意义。
方法 选取 2018 年 9 月至 2019 年 8 月因咯血在我科行介入栓塞治疗的 40 例患者为研究对象。随机分为 2 组，术前进行咯血责任动脉 CT 血管成像为 实验组，共 20 例，未行咯血血管重建为对照组，共 20 例。
结果 介入术中动脉造影共找到责任血管共 52 支，其中支气管动脉 46 支（90.1%），非支气管动脉 6 支（9.9%）。所有患者均成功完成介入治疗，手术操作成功率 100%，即刻止血成功率 100%。实验组中，CTA 检查共找到责任动脉 22 支，术中行 DSA 共找到责任动脉 26 支，以 DSA 检

查为标准，介入术前行咯血责任动脉 CTA 诊断敏感度为 84.6%。实验组介入术中更容易选择至出血责任动脉，超选入靶血管透视时间、总透视时间、总手术时间及对比剂用量方面，实验室组与对照组相比，结果差异均有统计学意义（P＜0.05）。CTA 对隐源性咯血无优势。
结论 咯血介入术前行血管 CTA 检查，可较全面显示明显咯血病变区责任血管开口、走行，发现部分明显非支气管动脉供血责任血管，能缩短介入手术时间、减少辐射，降低对比剂用量，减少并发症的发生率，CTA 血管重建对介入咯血治疗具有重要的临床应用价值。

PU-1664
丛状血管瘤动脉造影特征分析及介入栓塞价值探讨

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目的： 分析儿童丛状血管瘤与普通婴幼血管瘤动脉造影特征并探讨其介入栓塞价值。**方法：** 回顾性分析 2015 年 6 月至 2017 年 10 月间在我科临床及临床诊断为丛状血管瘤患儿的临床资料共 26 例，其中 23 例接受过介入栓塞治疗，介入术后继续口服糖皮质激素或西罗莫司。随访 6-18 个月，评估其治疗效果，总结丛状血管瘤患儿接受介入栓塞治疗次数及每次介入术后病灶大小、皮温、疼痛变化情况。对比分析行介入治疗的丛状血管瘤患儿与 30 例普通婴幼儿血管瘤血管造影结果。**结果：** 丛状血管瘤患儿血管造影通常表现为肿瘤样染色、染色不均或均匀，边界模糊不清，染色灶包绕正常动脉，瘤体的供血动脉自正常动脉主干发出多条，数量多且较细，供血动脉管径与肿瘤大小不成比例；普通婴幼儿血管瘤造影表现为瘤体肿瘤样染色且较深，通常为类圆形或椭圆形，境界清晰，染色较均匀，常分布于正常动脉主干的一侧或两侧，供血动脉由正常动脉主干发出，数量多为 1-5 支供血动脉，其管径与肿瘤大小多呈正比例相关。丛状血管瘤患儿接受经导管动脉栓塞术 1～3 次/例，26 例患儿共计 34 次。患儿介入术后继续口服强的松或西罗莫司 5-12 个月。26 例患儿丛状血管瘤瘤体缩小大于 75%以上 26 例，病灶颜色较前明显改善 23 例，另 3 例颜色无明显改善。瘤体均不同程度变软，其中 12 例病灶在治疗后明显出汗，治疗后出汗基本消失。2 例患儿介入术后病灶出现破溃。随访 6 个月至 18 个月，26 例患儿术后继续联合口服糖皮质激素或西罗莫司等其他综合治疗，24 例治愈，2 例好转。 **结论：** 丛状血管瘤患儿血管造影特征不同于普通婴幼儿血管瘤，瘤体的供血动脉较后者明显增多，且管径较后者纤细，瘤体染色不明显，介入术行超选择动脉栓塞难度较后者增大。丛状血管瘤经动脉介入栓塞联合口服强的松或西罗莫司疗效切确，并发症较少，但儿童口服西罗莫司仍存在血酯增高、免疫降低等并发症，临床工作中需密切关注患儿状况，及时处理。

PU-1665
门静脉海绵样变 Rex 术后血管吻合口狭窄球囊扩张术 1 例

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目的： 探讨儿童门静脉海绵样变 Rex 术后桥静脉与肝内门静脉吻合口狭窄球囊扩张术介入操作的可行性。**方法：** 患儿 4 年余前因“反复呕血 5 年余”就诊我院，诊断为“门静脉海绵样变性”，于 2014 年 11 月 11 日在我院行“Rex 术”，术后恢复可，定期门诊随访，2018.2.6 返院行“间接门静脉造影术+经皮肝脏穿刺门静脉造影术”，术中见门静脉主干及其属支显影尚清晰，使用导丝多次反复仍无法通过 Rex 吻合口狭窄段，现为行狭窄段扩张术再次入院。 血液检查显示，血小板 31X10^9/L，凝血四项正常，脏器功能血液检查正常。CT 显示肝脏异常灌注，肝内动脉右支局部扩

张，脾大。超声显示桥静脉门静脉吻合口变窄，血液流速增大。 2018-12-17 腹部超声：门静脉海绵样变、肠系膜上静脉-门静脉左支分流术后：桥静脉门静脉左支吻合口 3.0mm，最大血流速度（Vmax：138cm/s）。**结果：** 气管插管全麻后，常规消毒右下胸侧壁及周围皮肤，在 DSA 引导下将肝穿针置入肝门静脉右支，引入导管鞘，置入导管至肝门静脉左支矢状部，造影示肝门静脉左支矢状部呈囊状扩大，置入导丝，经吻合口狭窄处插至肠系膜上静脉，造影示桥静脉门静脉汇合处狭窄，测量狭窄处直径约 3mm；测肠系膜上静脉平均压为 19mmHg。经导丝送入 6mm×40mm 血管球囊扩张导管 1 枚扩张 2 次，造影示狭窄较前好转，测肠系膜上静脉平均压为 15mm；经导丝送入 8mm×40mm 血管球囊扩张导管 1 枚扩张 2 次，造影示狭窄较前好转，测肠系膜上静脉平均压为 8mm，造影示桥静脉吻合狭窄处明显改善，测量狭窄处直径约 6mm，血流通畅。拔导管，退导管鞘途中置入肝脏实质内多条明胶海绵细条止血。加压包扎。术中顺利，出血量少，安返复苏室。**结论：** 通过肝穿刺门静脉进行 Rex 术后桥静脉与肝内门静脉吻合口狭窄球囊扩张术创作少、疗效显著。

PU-1666
介入法联合中医治疗输卵管阻塞性不孕的疗效观察

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目的 观察介入法联合中医治疗输卵管阻塞性不孕的疗效。**材料、方法** 80 例患者,132 条输卵管，术前均经过子宫输卵管碘油或复方泛影葡胺造影检查，提示输卵管梗阻，均为单纯性输卵管阻塞所致的不孕。132 条输卵管均采用介入法行输卵管再通术并结合中药滴肛治疗。**结果** 80 例患者，132 条输卵管，介入法再通 121 条，8 条粘连严重无法再通，3 条输卵管远端阻塞无法再通，术后 3 月－2 年妊娠 54 例。**讨论** 单纯性输卵管阻塞所致的不孕症，采用介入法输卵管再通结合中医治疗的优点：介入法结合中医治疗输卵管阻塞性不孕，可使疗程缩短，疗效提高，减少药物副作用，减轻病人痛苦及医疗负担。

PU-1667
DSA 与超声双引导下行经皮穿刺置管引流术治疗细菌性肝脓肿疗效分析

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摘要：〈正〉细菌性肝脓肿是临床上常见的由常见致病菌引起的感染性疾病,由于其较高的发病率和致死率仍危害着公共安全,死亡率约 15%[1]。传统的治疗方法包括抗生素保守治疗和外科切开引流。前者治疗时间长,疗效差,后者创伤大、恢复时间长,影像设备引导下的经皮穿刺置管引流术目前已成为治疗细菌性肝脓肿的主要方法。本研究回顾性分析在我科接受 DSA 与超声双引导下行经皮穿刺置管引流术治疗的细菌性肝脓肿患者 39 例的疗效。

PU-1668
恶性梗阻性黄疸 PTCD 术后常见并发症及护理对策分析

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[目的]观察恶性梗阻性黄疸病人行经皮肝穿刺胆管引流术(PTCD)治疗的常见并发症,并分析其护理对策。[方法]回顾性分析 2015 年 8 月—2016 年 12 月至我院就诊的恶性梗阻性黄疸病人 56 例,均行 PTCD,随访观察病人术后并发症及采取的护理对策。[结果]在 6 个月～21 个月随访期内,引流管移位 11 例(包括移位 8 例,脱出 3 例),胆道出血 2 例,胆道感染 2 例(其中 1 例合并引流管移位),窦道感染 1 例(合并引流管脱出),无严重胆汁漏、胆汁性腹膜炎出现。[结论]PTCD 是治疗恶性梗阻性黄疸的有效方法,正确的护理方法能有效地减少术后并发症的发生。

PU-1669

胆道引流管脱管的危险因素及对策探讨

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目的 分析经皮肝穿刺胆道引流（PTCD）术后引流管脱出的原因，探讨其危险因素并制定防范对策。方法 选取我院 2017 年 1 月-2018 年 12 月收治的 260 例恶性梗阻性黄疸患者行 PTCD 术后带管回家的 20 例引流管脱出患者，回顾性分析脱管患者的临床资料。结果 患者脱管的原因与患者的年龄、性别，置管时间长短，脱管发生时间分布点，引流管固定不牢及外力、敷料粘性下降有关。结论 对患者及家属开展多种形式的健康教育、做好患者有效的心理护理、避免外力因素、妥善固定引流管及更换敷料可以减少脱管的发生率。

PU-1670

胆道引流管脱管的危险因素分析及对策探讨

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目的 分析经皮肝穿刺胆道引流（PTCD）术后引流管脱出的原因，探讨其危险因素并制定防范对策。方法 选取我院 2017 年 1 月－2018 年 12 月收治的 260 例恶性梗阻性黄疸患者行 PTCD 术后带管回家的 20 例引流管脱出患者，回顾性分析脱管患者的临床资料。结果 患者脱管的原因与患者的年龄、性别，置管时间长短，脱管发生时间分布点，引流管固定不牢固及外力、敷料粘性下降有关。结论 对患者及家属开展多种形式的健康教育、做好患者有效的心理护理、避免外力因素、妥善固定引流管及更换敷料可以减少脱管的发生率。

PU-1671

CT 引导经 皮骨穿刺活检术 的临床应用

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目的 探讨 CT 引导下经皮骨穿刺活检技术在骨骼病变中的应用价值 。方法 回顾性分析于我 院接受 CT 引导下穿刺活检术的 857 例骨骼病变患者。经扫描定位，按照病灶距离体表最近和安 全性

原 则选择最佳进针层面与路径 ，采用 8~13G 骨穿针或 16~18G 弹枪式 活检针 ，根据病变位置及性质运用不同穿刺技术获取标本行病理学检查 。结果操作过程耗时 20~40min。所有患者取得的标本量均符合病理诊断要求 ，穿刺病理与手术病理相符者 766 例 ，占穿刺总数 89.38，无假阳性病例。术后 27 例患者出现并发症，发生率为 3.15% ，包括局部血肿 22 例，神经损伤 1 例，感染 4 例。 结论 经皮骨穿刺活检安全、诊断准确率高，可用于转移性肿瘤、原发性骨肿瘤、肿瘤样病变及 炎症性病变的诊断。合理地选择穿刺路径、穿刺器械及活检方法可提高穿刺活检的成功率 。

PU-1672
经皮纵膈穿刺心脏原始神经外胚层肿瘤报告一例讨论

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原始神经外胚层肿瘤（primitive neurotodermal tumour，PNET）是一种高度恶性的神经系统肿瘤，极为罕见。由 Hart 等在 1973 年首次报道，PNET 在组织形态学属于恶性小圆细胞肿瘤，好发于儿童及青少年，可发生于神经系统及全身软组织。起源于外周神经系统的被称之为外周性 PNET，以躯干、四肢和中轴软组织多见，起源于心脏的 PNET 更为罕见。PNET 主要由原始神经上皮产生，为神经嵴衍生的较原始的肿瘤，具有多向分化的潜能，预后极差，大部分需通过病理诊断才能确诊，现将 2019 年 3 月我院经皮穿刺活检病理证实心脏原始神经外胚层肿瘤一例，讨论如下。

PU-1673
经皮骶正中入路骶骨成形术治疗多节段骶骨体转移瘤的临床应用

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目的 探讨经皮骶正中入路骶骨成形术治疗多节段骶骨体转移瘤的初步临床价值。
材料与方法 回顾性分析 2017 年 3 月到 2018 年 12 月入住我院介入科的 11 例经皮骶正中入路骶骨成形术治疗多节段骶骨体转移瘤的患者，共实施 11 个节段骶骨体成形术。其中男 7 例，女 5 例，年龄 31~75 岁，平均 60.45±13.66，共累及 11 个骶骨体节段，其中 S1-2 骶骨体节段 9 例，S2-3 骶骨体节段 2 例。通过比较患者术前及术后视觉模拟评分（VAS）、止痛药用量和 Oswesty 功能障碍指数（ODI）评分的变化来评价疼痛、日常运动功能状况的改善情况。同时，记录手术成功率、骨水泥注入量、住院时间和并发症情况。统计学数值以平均值±标准差表示。统计学软件采用 SPSS16.0 统计分析软件包（Chicago IL, USA），术前与术后 VAS、ODI 的变化采用配对 t 检验，规定 P<0.05 为差异有统计学意义。
结果 所有患者获得手术成功，手术时间为 45~55min，平均(48.45±2.81)min，注入骨水泥量 5~12ml，平均(7.82±2.32)ml，骨水泥几乎充填全部病灶，技术成功率 100%。住院天数为 3~7 天，平均(4.64±1.63)天。3 例(27.27%)发生骨水泥渗漏到邻近软组织，但患者无明显不适反应，未作特殊处理，其余患者无明显并发症。随访时间为 3~13 个月，评价随访（4.72±2.90）个月,10 例患者骶部疼痛有所缓解，1 例疼痛缓解不明显，缓解率约为 90.91%。VAS 由术前平均 7.09±1.30 分降至术后 2.82±1.33 分；ODI 指数由术前 74.91±5.47 分，术后降为 29.27±13.86 分。
结论 经皮骶正中入路骶骨成形术治疗多节段骶骨体转移瘤是一种微创、安全、有效的方法。

PU-1674

浅谈食道腐蚀伤的介入干预时机及综合治疗体会

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食管腐蚀伤是误食或者有意吞服腐蚀剂引起的食管损害性和碱性两类。强酸类如硫酸、盐酸、硝酸等；碱性类如氢氧化钠(火碱、灰水)、氢氧化钾、碳酸氢钠(食用或清洁用碱)。病变程度与腐蚀剂的性质、浓度、剂量和停留时间有关。碱性腐蚀剂有强烈的吸水性，并有脂肪皂化、蛋白质溶解作用，引起组织液化坏死，病变易向深层发展，穿透力强。酸性腐蚀剂易引起局部粘膜干性坏死，穿透力较弱，但高浓度的强酸腐蚀剂，也可引起严重损伤。急性期应在受伤后立即服用中和剂，尽早给予足量广谱抗生素以防止感染，糖皮质激素的应用可减少创伤反应，有抗休克、消除水肿、抑制成纤维肉芽组织的形成、防止瘢痕狭窄的作用，但应严格掌握适应证及用药剂量，用量过大，可使感染扩散，并有可能并发食管穿孔。3～4 周后由于局部结缔组织增生，继之瘢痕收缩而致食管狭窄，再度出现吞咽困难，逐渐加重，严重影响患者进食，目前食管扩张术在瘢痕狭窄形成早期的应用时机仍存在争议，但其总体治疗效果已得到广泛认可，一般认为急性期（一周内）扩张并发穿孔、出血可能较大，而 3～4 周后瘢痕形成后扩张效果较差，2 周左右可采用探条或球囊逐级扩张，前者近期效果较好，但远期效果两者相仿，有学者认为采用激素序贯球囊扩张术，效果比单独应用激素或球囊扩张更佳。

PU-1675
重症胰腺炎并发症穿刺引流治疗的临床应用

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目的 探讨在重症胰腺炎合并假性囊肿和感染性脓肿时经皮穿刺引流技术的技术方法和临床治疗价值。
材料与**方法** 对 2017-1 至 2019 年 6 月对重症胰腺炎合并假性囊肿和脓肿 65 例采用了经皮穿刺引流治疗。所有病例临床病史和相关化验检查均明确诊断急性胰腺炎并经医学影像学检查（CT 或 MRI）检查证实，并明确显示并发症的类型、部位和范围。经常规内科处理后多学科会诊并经患者同意行局部经皮穿刺引流处理。所有穿刺均在 CT 扫描引导下进行，部分病例借助超声辅助定位。患者仰卧位扫描定位，穿刺部位消毒铺巾局部麻醉后按设计途径穿刺，进入穿刺部位后再次扫描确认，然后固定引流管连接引流袋。常规观察引流情况并对症处理。
结果 所有病例均一次性穿刺成功，未出现肠管及血管损伤等并发症，穿刺引流后 24 小时、72 小时及一周患者自觉症状及并发症状态均不同程度好转。
结论 经皮穿刺引流是重症胰腺炎并发症的有效治疗手段之一，可以有效缓解病情、缩短病程。精确地穿刺定位和适当的穿刺途径设计是保障手术成功和避免并发症的关节环节。

PU-1676
CT 引导下经皮穿刺 125I 粒子植入治疗脊柱转移瘤

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目的 探讨 CT 引导下经皮穿刺 ^{125}I 粒子植入治疗椎体转移瘤的有效性及安全性。**方法** 对 20 例（23 个病变椎体）有严重腰背部疼痛的椎体转移瘤伴脊髓压迫患者，行 CT 引导下经皮穿刺 ^{125}I 粒子植入治疗。术后随访 2 年。评价术前及术后患者顽固性疼痛情况、神经功能，计算术后累计局部肿瘤控制率、患者生存率。**结果** 20 例患者中位随访时间 15.3 个月，随访期间无失访，未出现严重并发症。术后 1 个月患者顽固性疼痛较术前明显缓解（P<0.05）。12 例术前存在神经功能损伤的患者术后 3 个月神经功能保留率 75.00%（9/12），神经功能恢复率 50.00%（6/12）。术后 3、6、12 个月累计局部肿瘤控制率分别为 100%、95%、60%，术后 6 个月和 12 个月累计生存率分别为 100%和 78.81%。**结论** CT 引导下经皮穿刺 ^{125}I 粒子植入治疗脊柱转移瘤安全、可行，可有效缓解疼痛、改善患者神经功能。

PU-1677

MRI 三维重建在肝转移微波消融术中的应用

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目的 探讨计算机辅助 MRI 三维重建在肝转移瘤微波消融术前计划及术后随访中的作用。**方法** 2015 年 8 月至 2016 年 5 月我院收治符合肝微波消融适应症的肝转移瘤患者 16 例（21 个病灶）。术前采用 MRI 及后处理站进行多维度、多序列（T1WI 增强、T2WI 及 DWI）3D 重建观察目的病灶及周围环境，综合多方面因素考虑制定术前穿刺及消融计划；术中实时利用 3D 重建技术，以垂直于穿刺针平面进行实时追踪并评估穿刺途径及消融范围，术后采用同一平面利用 T2WI、T1WI 增强及 DWI 成像评估术后消融范围及效果。**结果** 手术均顺利完成，无明显并发症，随访至术后 1-3 个月未见明显复发征象。其中 14 例术前行肝脏 CTA 检查（检出病灶 17 个），与 CTA 相比，T1WI-MRI 3D 重建显示病灶周边血管（三级及三级以上分支）为 29/30，显示率为 99%；所有病例未见明显胆管扩张,术前 T2WI 显示病灶邻近 1cm 内二级胆管分支共 12 例。根据术前规划、模拟穿刺途径，与实际穿刺途径符合 100%，术后 3D 重建显示消融范围完全覆盖肿瘤边界。**结论** 计算机辅助 MRI 评价体系可有效评价目标病灶的大小及周边环境，为术前拟定手术方案提供依据；术中可有效引导穿刺并实施多维度展现术区变化，评估消融范围；术后及随访可有效多序列展示消融边界及信号变化，提供多方位信息。

PU-1678

CT 定位下肺穿刺活检临床应用

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目的 探讨 CT 定位下肺穿刺活检临床应用价值。
方法 根据穿刺前 CT 图像，尽量选取病变最大层面及舒适体位，避开内乳动脉、肋间动脉、肺大泡及叶间裂，短金属丝 3~4 根行病变体表定位，螺旋 CT 机关闭容积成像，提高成像速度，患者平静呼吸，部分患者术前用可待因等强止咳药、术中吸氧，16、18G 活检枪，行 2~3 次穿刺，取材组织送病检。
结果 2013 年 5 月至 2019 年 5 月经皮穿刺活检 245 例，成功 245 例，一般在 30 分钟内完成操作。病检结果肺癌 230 例，术后行化疗；基因、免疫治疗及手术治疗；炎性病变 10 例，结核 5 例，行相应治疗后好转。术后少量气胸 15 例，自行吸收；3 例肺组织压缩 40%以上，行胸腔闭式引流后消失；12 例患者术后少量痰血，未行治疗，短期消失。

结论 CT 定位下肺穿刺活检成功率高，并发症少，操作时间短，极大提高临床诊断准确率并指导治疗。

PU-1679
介入透视引导下腹膜透析导管导丝复位术的临床评价

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目的 评价经介入透视引导下导丝复位法治疗腹膜透析导管移位的有效性和安全性。**方法** 筛选 2018 年 8 月-2019 年 8 月于我院介入科的腹膜透析导管（简称导管）位置调整术患者，腹膜透析导管均使用百特公司 Tenckhoff 直管，腹膜透析患者，出现腹透液单向引流障碍（透析液进液通畅、出液缓慢、甚至出现阻塞），并经腹部正侧位 X 线片检查证实导管移位，经患者站立位跳跃活动后，复查腹部正侧位 X 线片证明导管仍移位，术前及术后沿导管造影证实导管通畅性，介入导管室行透视下导丝法调整导管位置
结果 共入选 12 例符合标准的患者，男性 8 例（66.67%），女性 4 例（33.33%），平均年龄 56.13±16.18 岁，置管方式均为外科切开法，导管移位时间发生在置管术后 10～288 天（中位时间 120 天），经介入透视引导下腹膜透析导管导丝复位术后，9 例（0.75%）复位成功，3 例（0.25%）复位失败，后者经再次外科手术再次置管，术中证实 3 例患者导管末端均有网膜包裹，所有经导丝进行复位的患者，术中患者自述腹部疼痛，停止操作后疼痛缓解，术后均无出血、脏器损伤及腹膜炎发生。
结论 介入透视引导下腹膜透析导管导丝复位术是腹膜透析患者导管移位的一种安全、方便、经济的治疗方法。

PU-1680
一例贲门癌术后并发食管空肠吻合口瘘的护理

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目的 探讨 1 例贲门癌术后并发食管空肠吻合口瘘的护理经验 方法 总结 1 例贲门癌术后并发食管空肠吻合口瘘的护理要点，促进患者康复 结果 此例患者经过针对性的护理后，患者恢复良好 结论 通过及时的治疗和精心护理是确保患者安全的保证，从而保证各项治疗顺利完成。

PU-1681
采用微信护理平台进行优质健康宣教 在携带 PTCD 管患者院外延续性护理中的应用

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[摘要]**目的** 目前,电话随访的健康宣教患者虽可满足常规护理,但因患者难以取得充足的、完整的及有效的健康支持,导致治疗依从性，并发症的发生受到不同程度的影响。而采用微信护理平台进行优质健康宣教的延续性护理模式是以患者居家治疗现状为前提构建的健康信息支撑型护理模式,探究微信护理平台进行优质健康宣教对携带 PTCD 管患者院外延续性护理干预的实施效果。**方法** 方便选取该院在 2017 年 1 月—2019 年 1 月间收治携带 PTCD 管出院患者 60 例,根据不同的情况随机分为观察组与对照组,每组均为 30 例,其中对照组对院外患者采用电话随访,观察组对院外患者采用微信护理平台进行优质健康宣教延续护理模式。比较两组患者经过干预后的情况。**结果** 观察组患者的知识掌握率及健康宣教满意度均明显优于对照组,组间比较差异有统计学意义(χ^2=12.682;P<0.05)。观察组患者的 GQLT-74 的各项指标评分明显比对照组在 GQLT-74 的各项指标评分都要高;比较两组差异有统计学意义(t=7.423,4.893,10.312,4.014;P<0.05)。**结论** 采用移动平台进行优质健康宣教的随访操作简单、便捷,通过图片与视频等方式可呈现的内容更加直观,能够有效的对患者进行针对性的自我护理的指导。提高患者的知识掌握率及健康宣教满意度，从而提升患者的生活质量和自我管理能力,够降低携带 PTCD 管院外患者并发症的发生率。

PU-1682

PTCD 术的介入护理

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目的 探讨梗阻性黄疸患者 PTCD 术的护理方法和疗效。
方法 通过研究观察 50 例梗阻性黄疸患者进行经皮肝穿刺胆道引流术的介入护理，归纳总结术前、术中和术后护理方法，观察记录疗效。
结果 对经皮肝穿刺胆道引流术患者在护理过程中，按照规范化护理要求对患者实施护理，50 例患者均成功引流，黄疸逐渐消退，肝功能逐渐恢复，生活质量得到改善。
结论 对行 PTCD 的患者，通过术前的心理护理稳定患者情绪，给予地佐辛联合右美托咪定镇静止痛；术中密切注意患者基本情况及术中并发症情况；术后完善引流管固定，观察引流情况，使引流成功，做好创口的护理工作，并预防逆行引流导致的感染。通过科学谨慎的护理，使患者病情好转。

PU-1683

CT 引导乳腺单钩穿刺定位针在肺结节胸腔镜切除术中的应用

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目的 分析应用 CT 引导乳腺单钩穿刺定位针行肺结节定位，以利于胸腔镜手术中肺结节切除的效率与安全性。方 法：收集自 2017 年 7 月至 2019 年 6 月阜阳市人民医院医院住院 60 例患者，随机分为实验组和对照组（每组 30 人）：实验组术前使用 CT 引导下乳腺单钩穿刺定位针定位肺部结节，定位完成后直接行胸腔镜下肺部病变锥形切除，再根据快速冰冻病理结果决定下一步术式；对照组直接行胸腔镜下肺部病变锥形切除，再根据快速冰冻病理结果决定下一步术式。**结果** 采用 CT 引导下乳腺单钩穿刺定位针定位成功率 100%，中位定位时间 30min。实验组与对照组对比**结果** 胸腔镜手术时间实验组优于对照组，对比 P<0.01；结节完全切除率实验组优于对照组，对比 P<0.01；进一步开胸手术实验组优于对照组，对比 P<0.01。**结论** 术前使用 CT 引导下带钩钢丝定位肺部病变的方法准确、安全性高，能够提高胸腔镜手术中肺部结节切除的准确率和安全性。

PU-1684
“互联网+” 智慧型延续护理模式在 PTCD 带管患者中的应用

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【摘要】 **目的** 探讨基于“互联网+”理念的智慧型延续性护理模式在经皮肝穿刺胆道引流（percutaneous transhepatic cholangial drainage，PTCD）带管患者中的应用价值。**方法** 采用前瞻性对照研究，将南通市第一人民医院介入科 2018 年 3 月至 12 月收治的 45 例恶性梗阻性黄疸行 PTCD 治疗留置管道的患者作为实验对象，2017 年 1 月至 10 月收治的 45 例恶性梗阻性黄疸 PTCD 治疗留置管道的患者作为对照组。对照组采用常规护理模式。实验组采用“互联网+” 智慧型延续护理模式，开展线下线上护理活动。分别于入组时、出院后 3 个月门诊复诊时对两组患者进行问卷调查，评估患者 PTCD 管相关知识知晓率、患者生活质量及患者居家护理管道并发症（管道脱落、堵塞、伤口周围皮肤损伤、胆道感染）的发生率。**结果** 实验组患者 PTCD 管道护理知晓率、引流液量色观察知晓率、并发症识别知晓率分别为 97.8%、100%、93.3%，明显高于对照组，差异具有统计学意义（P<0.05）；实验组患者居家护理管道并发症发生率（其中管道堵塞 4.4%、管道脱落或移位 2.2%、胆道感染 4.4%、伤口周围皮肤损伤 4.4%）明显低于对照组，差异具有统计学意义（P<0.05）；实验组患者躯体功能、角色功能、情绪功能、认知功能、社会功能评分依次为（75.19±6.35）、（74.22±5.14）、（73.83±4.25）、（74.36±6.22）、（72.05±5.17）高于对照组，差异具有统计学意义（P<0.05）。**结论** “互联网+” 智慧型延续护理模式解决了 PTCD 带管患者从院内到院外服务链断裂问题，明显提高了患者 PTCD 相关知识的知晓率，有效降低 PTCD 带管患者出院后居家管道并发症的发生率，保障患者安全，并提高患者的生活质量。

PU-1685
双肾造瘘联合输尿管阻断支架治疗宫颈癌 放射治疗致膀胱阴道瘘的疗效

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目的 ：探讨双肾造瘘联合输尿管尿流阻断支架治疗宫颈癌放射治疗致膀胱阴道瘘 （VVF）的疗效。

方法 前瞻性收集 2016 年 6 月至 2019 年 1 月郑州大学第一附属医院经妇科检查、膀 胱镜及影像检查确诊的宫颈癌放射治疗致 VVF 患者 20 例。均行双肾造瘘联合输尿管尿流阻断支架 植入术。观察患者症状改善情况和术后并发症。采用双侧 t 检验比较术前和术后 1 周尿白细胞数、肌 酐、尿素氮、使用尿不湿数、阴道及尿道口渗液、疼痛评分、美国东部肿瘤协作组体力状况（ECOG）评分和 Karnofsky 功能状态（KPS）评分的差异。

结果 20 例患者均一次性肾造瘘成功后植入输尿 管尿流阻断支架。术后所有患者尿瘘即刻消失。术后 1 周，8 例双肾积水消失，8 例肾功能恢复正常。 术后 1 周与术前比较，尿白细胞数、使用尿不湿数、阴道及尿道口渗液、疼痛评分、ECOG 评分和 KPS 评 分差异均有统计学意义（P 均<0.05），肌酐和尿素氮差异无统计学意义（P 均>0.05）。术后未发生严重 并发症。

结论 双肾造瘘联合输尿管阻断支架能够治疗宫颈癌放射治疗致 VVF 安全、有效，能够降低 VVF 患者疼痛，改善生活质量。

PU-1686

ERCP 术后患者的护理观察

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目的 通过对内镜下逆行胰胆管造影(ERCP)术前术后病人进行观察并进行护理，降低了病人 ERCP 术后的并发症发生的几率与程度 方法 对 52 例 ERCP 术病人进行观察，指导与护理 结果 对 ERCP 手术前后进行严密观察病情变化和针对性的护理，收效良好,其中 49 例无任何并发症痊愈出院，主要并发症为：术后轻症胰腺炎 3 例，因观察及时、抢救护理得当也痊愈出院 结论 可保证 ERCP 的顺利进行和有效防治 ERCP 术后并发症，并对术后并发症的早期诊断、及时治疗有着重要的作用

PU-1687

不同胃注气方式对 CT 引导下胃造瘘术影响的研究

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目的 研究胃管及千叶针两种胃注气方式对 CT 引导下胃造瘘术的影响。**方法** 分析在我院行 CT 引导下胃造瘘术患者 16 例，其中 7 例由千叶针向胃内注气，9 例由胃管向胃内注气。观察患者的手术时间、辐射剂量及术中并发症。**结果** 15 例患者成功实施 CT 引导下胃造瘘术，1 例患者经千叶针注气后胃壁气肿严重，未能继续实施 CT 引导下胃造瘘术。两种胃注气方式下的手术时间存在明显差异（P<0.05），辐射剂量也存在明显差异（P<0.05），术中并发症主要为胃壁气肿，发生 3 例，均为千叶针胃注气。**结论** 经胃管胃注气的 CT 引导下胃造瘘术可提高手术成功率，有效减短手术时间，减小辐射剂量及术中并发症。

PU-1688

CT-guided 125Iradioactive seeds implantation in treatment of spinal metastatic tumors

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Objective: The purpose of this study was to examine the safety and clinical efficacy of CT-guided radioactive ^{125}I radioactive seed implantation treatment in spinal metastatic tumors with spinal compression. **Methods:** We retrospectively analyzed 20 cases of spinal metastatic tumors. All the patients suffered severe pain, 12 of them accompanied with nerve function impairment .All patients were planned using treating planning system (TPS). Twenty-four spinal metastatic tumors were treated by CT -guided radioactive ^{125}I seed implantation. A median of 19 ^{125}I seeds were implanted. Numerical rating scale was used to evaluate pain relief. ASIA criteria was used to evaluate nerve function. WHO efficacy evaluation criteria was used to evaluate efficacy for treating spinal metastatic tumors. **Results:** Twenty cases were followed for a median of

15.3 months. The rate of pain relief was 95%. The median survival time for all of the patients was 16 months. The cumulative 6- and 12-month survival rates were 100% and 78.81%, respectively. The median control time for all of the patients was 12.5 months. The 3-, 6-, and 12-month cumulative local control rates were 100%, 95%, and 60%, respec-tively. The neural function recovery rate was 50% (6/12) three months after ^{125}I seeds implantation. No major complications were observed. No ^{125}I seeds were lost or migrated to other tissues or organs. **Conclusions:** CT-guided radioactive ^{125}I seed implantation is a safe, effective, and minimally invasive method for the treatment of patients with spinal metastatic tumors with spinal compression. It is a possible alternative therapy for the treatment of spinal metastases.

PU-1689

Transitional Care Interventions for Patients with Cirrhosis: a Multidisciplinary Care Model for the Prevention of Complications Post-Transjugular Intrahepatic Portosystemic Shunt

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AIMS
TIPS is an effective method for resolving the symptoms of portal hypertension. However, an increase in symptom recurrence rate and the incidence of hepatic encephalopathy after TIPS, which may adversely affect quality of life and accelerate hepatic function deterioration, is the main cause of death. New models of specialized caregiving support are necessary to optimize its management. The aim of the randomized controlled trial study was to evaluate the efficacy of transitional care interventions of multidisciplinary team for patients with cirrhosis post-TIPS.
METHODS
68 cirrhotic patients admitted to hospital underwent TIPS were allocated, after discharge, randomized to the control group, or to the intervention group, and followed prospectively as outpatients up to death or for at least 3 months.The conventional care was performed for the patients of control group. The conventional care combined with transitional care interventions were performed for intervention group. Transitional care through telephone follow-up, family visits, and WeChat guided patients to prevent gastrointestinal bleeding, infection and constipation , quality low-protein diet intake, recognize minimal encephalopathy, monitor blood ammonia, return visit regularly, deal with adverse drug reactions of anticoagulant. The compliance behavior, incidence of adverse events, Child-Pugh scores and ammonia of two groups were compared at baseline as well as 1 and 3 months post-TIPS.
RESULTS
The compliance behavior scores of patients in the intervention group were significantly higher than the control group 1(t=-2.8, P=0.007) and 3 months (t=-5.57, $P<0.001$) post-TIPS. The incidence of hemorrhage, hepatic encephalopathy, leg swelling and death of the intervention group were significantly lower than the control

group 3 months after TIPS, =5.581, P <0.05.Repeated measures analysis of variance showed significant time effects from baseline to 3 months about Child-Pugh scores of two groups, F=3.46, P=0.042, and group*time interaction, F=10.72, P< 0.001.While, the time effects and group*time interaction of the repeated measures analysis of variance showed no significant difference in blood ammonia levels between the two groups, P>0.05.

CONCLUSIONS

Transitional care interventions post-TIPS can increase the accessibility of patients to scientific nursing, significantly improve patients' compliance behaviors and health, improve postoperative hepatic function, decrease the incidence of adverse events post-TIPS.

PU-1690

A Systematic Review and Meta-Analysis of the Safety and Efficacy of Uterine Artery Embolization vs. Surgery for Symptomatic Uterine Fibroids Abstract

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Objective: The aim of this study was to systematically review the safety and efficacy of UAE vs. surgery for symptomatic uterine fibroids.

Methods: A search was conducted in the Cochrane Library, PubMed, EMbase and Web of Science databases from their inception to July of 2014 to collect randomized controlled trials (RCTs) that assessed UAE versus surgery for the treatment of symptomatic uterine fibroids; the references of the included studies were also retrieved. Two reviewers independently screened the studies according to the inclusion and exclusion criteria, extracted data and assessed the methodological quality. The meta-analysis was conducted using RevMan 5.2 software.

Results: A total of 7 RCTs involving 859 patients were used. The results of the meta-analysis showed a reduced length of stay and recovery time for UAE when compared with surgery. There was no reported that surgry was better on improving health-related quality of life in the included studies. There were no significant differences in patient satisfaction (1-2 and 5 year), intra-procedural complications or major complications (1 year). However, the rates of minor complications (1 year) and further interventions (2 and 5 year) were significantly higher in patients who underwent UAE rather than surgery. The rates of pregnancy and live births were significantly lower among patients who underwent UAE than surgery.

Conclusions: Generally speaking UAE is safe and effective and UAE has the advantages of the shorter hospital stay and recovery time compared with surgery. However, UAE has the risk of re-intervention and lower pregnancy and live births rates.

PU-1691

Uterine Artery Embolization vs. Myomectomy for Symptomatic Uterine Fibroids: A Systematic Review and Meta-Analysis

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Objective

Uterine fibroids are the most common benign gynecologic tumors. Uterine artery embolization (UAE) has become an important method of non-surgical treatment for symptomatic uterine fibroids.

Methods

A search was conducted in the Cochrane Library, PubMed, Embase and Web of Science databases to collect studies that compared UAE with MY for the treatment of symptomatic uterine fibroids, with publication dates from database inception to April 2015. Two reviewers independently screened the studies and extracted the data. The meta-analysis was conducted using RevMan 5.3 software.

Results

A total of 12 studies involving 1339 patients were included. The results of the meta-analysis showed that recovery time and length of stay were reduced for UAE compared with MY. In contrast, there were no significant differences in minor post-procedural complications within 1 year, major post-procedural complications within 1 year, patient satisfaction after 1-2 years of follow-up, the recurrence of fibroids, or the need for further interventions within 2 years of follow-up or in health-related quality of life (HR-QOL). However, for patients undergoing UAE, the serum levels of follicle-stimulating hormone (FSH) after the procedure were significantly higher. Both UAE and MY could preserve potential fertility, but MY was better than UAE in this respect.

Conclusions

Generally speaking, compared with MY, UAE is a safe and effective method for treating uterine fibroids. And UAE has the advantages of the shorter hospital stay and recovery time compared with surgery. However, UAE has a lower chance of success in women who plan to get pregnant.

PU-1692

The biological effect of pancreatic carcinoma cells in vitro with 125I seeds low dose rate irradiation

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AIM: To determine whether ^{125}I seeds continuous low dose rate irradiation caused radiation-induced biological effect of pancreatic carcinoma cells in vitro and the mechanism by which this occurred.
METHODS: In vitro, SW1990 and Panc-1 cells in exponential growth were exposed to the dose of 0, 2, 4, 6, and 8Gy with ^{125}I seeds (initial dose rate of 12.13cGy/h), respectively. After irradiation, survival fraction (SF2) were calculated and compared between the two cell lines. The ratio of apoptosis and cell cycle were assessed with the tritiated thymidine (^{3}H-TDR) incorporation experiments, and were compared between different groups of cell lines and radiation dosages.
RESULTS: No significant difference was found for the SF2 between SW1990 (0.766±0.063) and Panc-1 (0.729±0.045). The rate of apoptosis increased with radiation dosage. As the doses increased, the percentage of G2/M cell cycle arrest increased while the DNA incorporation rate decreased in both cell lines, with the peak and valley point at 6Gy.
CONCLUSION: For the continuous low dose rate irradiation in vitro with ^{125}I seed, there are no significant differences of cellular radiosensitivity between SW1990 and Panc-1 cell lines with the dosage ranging from 0Gy to 8Gy, and 6Gy is an efficient dosage. The major mechanisms of cell-killing effects for ^{125}I radioactive seeds are the apoptosis and the G2/M cell cycle arrest.

PU-1693

Clinical application of mammography -guided hook wire-localized surgical biopsy in diagnosing impalpable breast lesions

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Objective: To assess the efficacy and safety of imaging- guided hook wire-localized surgical biopsy in diagnosing impalpable breast lesions. Methods: A total of 78 female patients, who had micro-lesions on mammography but had negative mammary palpation, were enrolled in this study. Gross localization was performed in 35 cases(group A), mammography -guided hook wire localization was carried out in 43 cases(group B),guide the surgical excision biopsy. Results: In group A, one trial complete resection rate was 77.1%(27/35). In group B, one trial complete resection rate was 93.0%(40/43). The one trial complete resection rate of group B was significantly higher than group A(χ^2 =4.017,P <0. 05). The satisfaction of localization of group B was 90.7%. The mean time for puncturing localization was 14.8 minutes. No major complications such as break of guide wire, pneumothorax, massive hemorrhage, etc. Vagal response occurred in 4 cases. Symptom relieve after they had a break, and complete surgery successfully. Conclusion: mammography -guided hook wire-localized surgical biopsy has good location accuracy. It is a safe and effect method for the diagnosis of impalpable breast lesions.

PU-1694

双肾造瘘联合输尿管尿流阻断支架置入治疗复杂膀胱阴道瘘

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目的 总结膀胱阴道瘘患者经双肾造瘘联合输尿管尿流阻断支架置入术的围手术期的护理经验。**方法** 回顾性分析 2016 年 6 月至 2017 年 6 月经我科治疗的 12 例膀胱阴道瘘患者的临床资料，患者经妇科检查、影像学及膀胱镜明确诊断后，给予双肾造瘘并双侧输尿管尿流阻断支架置入术。该组患者均加强围手术期护理，总结其护理效果。**结果** 护理临床观察发现如下**结果** 12 例患者均一次性肾造瘘成功后植入输尿管尿流阻断支架，支架置入成功率 100%(24/24)。经过精心护理，12 例患者术后漏尿症状消失，会阴部失禁性皮炎得到明显改善。所有患者未再出现漏尿、肾功能不全及其他并发症，均顺利出院。**结论** 双肾造瘘联合输尿管尿流阻断支架能有效解除膀胱阴道瘘导致的尿瘘、双肾积水、泌尿系感染及肾功能不全。护理人员根据手术特点制定个体化护理方法，进行专科护理，可保障手术效果，促进患者康复。

PU-1695
恶性梗阻性黄疸患者 PTCD 术后延续性护理需求调查

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目的 了解恶性梗阻性黄疸患者 PTCD 术后的延续性护理需求现状及其影响因素。**方法** 以自制问卷为调查工具，采用便利采样法于 2017 年 7 月-2019 年 5 月对入住我科行 PTCD 术的恶性梗阻性黄疸患者进行现状调查。**结果** 恶性梗阻性黄疸患者 PTCD 术后的延续性护理需求总分为：3.77±0.47，单因素方差分析结果显示：性别、年龄、婚姻状况、文化程度、职业、工作状况、家庭月收入、医疗付费方式、患病时间、合并其它疾病情况、日常生活能力是其影响因素，将单因素方差分析有意义的变量引入多元线性回归，结果显示：年龄、婚姻状况、日常生活能力是其主要影响因素。**结论** 恶性梗阻性黄疸患者 PTCD 术后延续性护理需求主要受年龄、婚姻状况及日常生活能力的影响，我们在对患者提供延续性护理时，需重点注意这些因素的影响。

PU-1696
比较超声造影引导与增强 CT 引导经皮穿刺含坏死胸部病变

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【摘要】 **目的** 比较超声造影引导下与增强 CT 引导下经皮穿刺活检在含坏死胸部病变定性诊断中的价值。**方法** 收集 2015 年 1 月至 2018 年 6 月我院增强 CT 显示含坏死胸部病变 162 例，病变内含有无增强区，且病变与皮肤之间无骨无肺气遮挡，具有良好的透声窗，将病变分为超声造影组 76 例（超声实时造影引导下穿刺）和增强 CT 组 86 例（结合术前增强 CT 并在 CT 引导下穿刺），比较两组穿刺命中率、病理诊断符合率及并发症发生率。**结果** 超声造影组穿刺命中率[97.37%（74/76）]、病理诊断符合率[94.74%（72/76）]高于增强 CT 组[87.21%（75/86）、79.07%（68/86）]，并发症发生率[2.63%（2/76）]低于增强 CT 组[16.28%（14/86）]，差异均有统计学意义（P均＜0.05）。**结论** 超声造影引导下经皮穿刺活检定性诊断含坏死胸部病变较增强 CT 引导下更加安全、有效。

PU-1697
低剂量介入诊疗技术在子宫输卵管造影中的应用价值研究

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目的 探讨低剂量介入诊疗技术在子宫输卵管造影中的应用价值。**方法** 选取我院 2018 年 1 月 1 日—2019 年 1 月 1 日期间接收的子宫输卵管造影患者 57 例，随机分为两组,分别对其实施常规剂量介入诊疗和低剂量介入诊疗，比较其检查结果。**结果** 在子宫输卵管造影患者中宫腔及输卵管显影的检查中，常规剂量介入诊疗与低剂量介入诊疗的检出率差异有统计学意义（P ＜ 0.05）。**结论** 低剂量介入诊疗在子宫输卵管造影患者中能够在完成检查、保证诊断准确性的情况下，降低辐射剂量，使患者更容易接受，在临床上具有很大的诊断价值。

PU-1698
冷循环微波消融术治疗肺恶性肿瘤的临床疗效分析

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目的 探讨 CT 引导下经皮穿刺冷循环微波消融术治疗肺恶性肿瘤的疗效。
方法 收集 24 例行经皮穿刺微波消融术治疗的肺恶性肿瘤患者的病历资料，按 RECIST1.1 版标准对其疗效进行评估。所有患者消融术后 3d 内 CT 增强扫描复查 ，以观察瘤体坏死情况，周围组织及并发症情况。随后在第 1、3、6 个月行 CT 增强扫描复查判定肿瘤治疗效果。本研究采用改良的实体瘤疗效评价标准(RECIST)1.1 版评价疗效 。该标准分为 4 级：疾病进展 (PD;)、完全缓解 (CR)、部分缓解(VR;)、疾病稳定 (SD;)。总缓解率=CR+VR；临床获益率=CR+VR+SD。
结果 24 例共 29 个病灶成功进行了微波消融治疗，患者术后 6 个月有效缓解率为 70.8%，总体获益率为 83.3%。消融术后 3d 内出现气胸 9 例（37.5%），胸腔积液 7 例（29.2%），咯血 3 例（12.5%），肺部感染 1 例（4.2%），消融后综合征 9 例（37.5%）。
结论 CT 引导下经皮穿刺微波消融术治疗肺恶性肿瘤安全有效，有利于提高患者的生存质量。

PU-1699
X 线引导下结肠癌支架置入术的精细化操作

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目的 探讨结肠癌并发肠梗阻经内镜置入术后的临床应用，通过精细化操作，提高置入成功率，减少并发症。
方法 收集整理 2016 年 1 月-2017 年 8 月期间在我院诊治的结肠癌并发梗阻患者 26 例，均在 X 线透视下经内镜植入支架，成功解除梗阻后进行后续治疗。
结果 26 例患者中 25 例成功植入支架，成功率 96.2% ，患者肠梗阻症状明显得到改善，术后 48h 复查，肠管积气扩张程度明显减轻，液气平减少或消失，进食后无不适症状出现。5 例患者放入支架后出现肛门刺激症状，给予对症治疗后，症状好转。1 例支架放入失败患者给予急诊造瘘手术。19 例患者在放入支架 7-10d 后行腹腔镜下大肠癌根治切除术，手术切除完整，标本边缘无肿瘤浸

润或残留，患者在术后 3-5d 内肠道功能基本恢复，出现切口感染 1 例，经治疗后痊愈，未发生吻合口瘘。6 例无法手术患者，姑息性放入支架后，均有效缓解了患者的肠梗阻症状，支架未取出。随访 90d 后，未发生支架移位、出血、肠穿孔等并发症，1 例患者因肿瘤过度生长出现再梗阻，二次放入支架。

结论 通过内镜支架置入术的术前精细准备及术中细致化操作，可以有效避免并发症，为外科进一步手术治疗创造条件，提高患者术后生存率及生活质量。

PU-1700
兔肺 VX2 肿瘤微波消融术后即刻 MRI 信号变化的实验研究

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目的 研究兔肺 VX2 肿瘤微波消融前后 MRI 信号变化与病理表现的相关性，通过定量分析对比微波消融前后瘤灶、消融灶及周围正常肺组织水含量，研究 VX2 肿瘤微波消融前后 MRI 的信号变化机制。

方法 总计 23 只新西兰雄性大白兔，建立兔肺 VX2 肿瘤模型。随机分成 A、B 及 C 共 3 组，在全麻及无菌条件下对 A 组及 B 组行 CT 引导下微波消融，消融完全后处死，A 组消融灶行组织病理学检查，研究 MRI 图像上表现与病理间联系。B 组分别于原瘤灶消融区、被消融肺组织区、水肿肺组织区及正常肺组织取材，测定各部分水含量。C 组不行微波消融，直接处死瘤兔并于瘤灶及正常肺组织取材并测定其水含量。分析对照肿瘤消融前后各部分组织水含量与 MR 信号变化的关系。

结果 肺内成功种植孤立性 VX2 肿瘤，其 CT 表现为：肺内单发结节状高密度影，边缘清晰；MRI 表现为：3DT1-VIBE:呈圆形或类圆形等信号，部分病灶中央可见斑点状坏死低信号区； fs-T2WI：呈圆形或类圆形稍高信号影，部分病灶中央可见斑片状高信号影。DWI（b＝800s/mm^2）：呈圆形或类圆形高信号。

A 组及 B 组瘤兔，行 CT 引导下行微波消融术，术后原瘤灶密度较前稍减低，并可见稍高密度磨玻璃影覆盖原瘤灶；MRI 表现为：3DT1-VIBE：消融灶中央呈高信号，周围包绕环形低信号影，边缘模糊；fs-T2WI: 消融灶中央呈低信号，周围包绕高信号影，边缘模糊;DWI（b＝800s/mm^2）：DWI 上信号较术前明显减低。B 组瘤兔微波消融后取消融灶、被消融肺组织、水肿肺组织及正常肺组织，C 组瘤兔不行微波消融术，直接取未消融瘤灶及正常肺组织行水含量测定并统计分析得出，MRI 成像方法能较好的评价肿瘤微波消融治疗的即时疗效，各部分组织病理表现及水含量的变化与 MRI 影像学表现有一定相关性。微波消融术后原瘤灶区水含量较术前减少，导致消融术后瘤灶 T1WI 信号增高、T2WI 信号减低。

PU-1701
椎体强化术治疗骨质疏松性椎体骨折前后肺功能变化及相关因素分析

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目的　探讨经皮椎体强化术治疗老年骨质疏松性椎体压缩骨折前后患者的肺功能变化，并探求引起其变化的相关因素。

方法　对 45 例经皮椎体强化术患者于术前和术后 3d 进行 VAS 评分、活动能力评分，测量胸椎后凸角、局部后凸角、肺功能（VC、FEV1.0、FVC、MVV、ERV、通气储备百分比），分析肺功能的变化、探求引起其变化的相关因素及相关性。

结果　经皮椎体强化术后 3d 时患者受损的 VC、FVC、FEV1.0、MVV、ERV、通气储备百分比显著改善，胸椎后凸角在术后得到明显改善，骨折椎体局部后凸角术后明显改善，VAS 评分明显降低，术后活动能力明显增加。胸椎后凸角与 FVC、MVV 呈明显负相关性，骨折椎体局部后凸角与肺功能各指标没有明显相关性，术后 3d 胸椎后凸角改善值与 FVC、FEV1.0、MVV 提高值呈显著正相关性，局部后凸角改善值与肺功能改善值无显著统计学相关。疼痛评分在术前与 VC 呈显著负相关，在术后 3d 与 VC、FVC、FEV1.0 呈显著负相关，术后 3d VAS 改善值与 FVC、FEV1.0、MVV 提高值呈显著正相关。

结论　经皮椎体强化术后 3d 时患者疼痛显著缓解，脊柱矢状面排列改善，活动能力增加，同时受损的 VC、FVC、FEV1.0、MVV、ERV、通气储备百分比得到改善。

PU-1702
双针双平面法和单针法治疗伴有致密带形成的骨质疏松性椎体压缩骨折疗效比较

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目的　对比研究双针双平面法和单针法经皮椎体成形术（PVP）治疗伴有致密带形成的骨质疏松性椎体压缩骨折的临床疗效。

方法　回顾性分析 2011 年 1 月-2016 年 1 月采用 PVP 治疗伴有致密带形成的骨质疏松性椎体压缩骨折患者共 43 例，所有患者均只伴有单节椎体致密带形成。在透视引导下，采用双针法或单针法 PVP 向病椎内穿刺并注入骨水泥聚甲基丙烯酸甲酯（PMMA）。术后 X 线片和 CT 观察，对比分析手术时间、X 线暴露时间、X 线透视次数、骨水泥注入量、骨水泥分布情况及并发症的发生，并且采用视觉模拟疼痛评分（VAS）、及 ODI 指数、椎体前壁高度、椎体后凸 Cobb 角进行手术疗效比较。

结果　使用双针法在手术时间、X 线暴露时间、X 线透视次数、骨水泥用量及分布情况方面均显著多于单针法（P＜0.05），骨水泥渗漏率少于单针法（P＜0.05）。术后 3d、6 周及 1 年时，两组 VAS 评分及 ODI 指数较术前均有改善（P＜0.05），椎体高度恢复率、椎体后凸 Cobb 角较术前虽有改善，但差异无统计学意义（P＞0.05）。组间比较，术后 3d 两组 VAS 评分、ODI 指数有显著差异（P＜0.05），而术后 6 周及 1 年时，两组间 VAS 评分、ODI 指数均无显著差异（P＞0.05）。随访 1 年时，两组再发及邻近椎体新发骨折率差异无统计学意义（P＞0.05），均未发生脊髓神经损伤、肺栓塞等严重并发症。

结论　采用不同入路 PVP 治疗伴有致密带形成的骨质疏松性椎体压缩骨折中，尽管双针法较单针法手术时间更长，X 线暴露时间和透视次数也更多，但却能取得更理想的骨水泥分布、更好的早期疗效以及更少的近期并发症，而在中远期 VAS 评分、ODI 指数、椎体前壁高度和椎体后凸 Cobb 角恢复及长期并发症发生率方面两种方法疗效相近。

PU-1703
单侧弯角穿刺法经皮椎体成形术治疗 Kümmell 病的临床疗效分析

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目的　探讨单侧弯角穿刺法经皮椎体成形术（PVP）治疗 Kümmell 病的临床疗效。

方法　收集上海市第六人民医院东院 2015 年 1 月-2016 年 1 月采用单侧弯角穿刺法穿刺 PVP 治疗的 25 例 Kümmell 病患者的临床资料。记录所有患者术前、术后 2d、末次随访时手术透视次数、骨水泥用量，采用疼痛视觉模拟量表（VAS）评分、Oswestry 功能障碍指数（ODI）评估手术前后腰痛程度及腰椎功能；计算伤椎术前术后相对高度，并观察局部后凸 Cobb 角恢复情况；观察术中骨水泥渗漏及其他并发症发生情况。

结果　所有患者均顺利完成手术，随访（6.7±1.5）个月，术中透视（14.7±4.3）次，骨水泥用量（6.2±1.0）mL。术后 2d、末次随访时 VAS 评分及 ODI 均较术前明显改善，差异有统计学意义（P<0.05）；术后 2d 及末次随访时伤椎相对高度及局部后凸 Cobb 角较术前均明显恢复，差异有统计学意义(P<0.05)；5 例患者术中出现椎体周围骨水泥渗漏，未出现静脉渗漏、椎管内渗漏、肺栓塞及其他并发症，骨水泥渗漏率为 20.0%。

结论　采用弯角装置单侧穿刺 PVP 治疗 Kümmell 病安全、有效。

PU-1704

TACE 治疗骨与软组织恶性肿瘤的疗效研究

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目的 评估 TACE 在治疗恶性骨与软组织肿瘤患者的有效性，并评估影响恶性骨与软组织肿瘤病人的独立预后因素。

材料与**方法** 在 2010 年至 2014 年，共有 39 位恶性骨与软组织肿瘤病人在我院行 TACE 治疗。该研究收集了患者的相关临床资料，并对病人进行了系列随访，将患者的死亡作为随访的终点时间。利用 Kaplan-Meier 检验评估了该群病人的 3 年生存率，利用了多因素分析评估了影响患者生存的独立预后因素。

结果 病人的平均生存周期为 24 个月，其中 1 年、2 年及 3 年生存率分别为 71.5%, 45.8%, 及 32.5%。 肿瘤的病灶个数以及肿瘤分期是最主要的影响患者生存周期的因素。TACE 不能有效的提高患者的生存周期，但是对于减轻患者的癌痛，延长患者肿瘤无进展生存期具有重要的作用。而 TACE 所使用的 PVA（polyvinyl alcohol）颗粒的直径(p=0.03)，以及术后的影像学的变化(p=0.044)与肿瘤患者的无进展生存相关。

结论 研究表明 TACE 是一种有效的治疗恶性骨与软组织肿瘤的方法，治疗后的 3 年生存率为 32.5%。TACE 不仅可以有效的减轻患者的癌痛，并且可以延长患者的无进展生存期。此外，研究表明较小直径的 PVA 颗粒具有更好的治疗效果。

PU-1705
经皮骨水泥成形术联合介入内固定术治疗即将发生病理性骨折的股骨上段骨肿瘤的临床价值

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目的 探讨经皮骨水泥成形术联合介入内固定术治疗即将发生病理性骨折的股骨上段骨肿瘤的临床价值。

方法回顾性分析本院 2010 年 5 月至 2014 年 2 月 Mirels 评分≥8 分的 43 例即将发生病理性骨折的股骨上段骨肿瘤患者，根据治疗方法的不同分为 2 组，经皮骨水泥成形术（PCP）联合介入内固定术（IIF）组 22 例，PCP 组 21 例，分别行 PCP 联合 IIF、单独 PCP 治疗。PCP 联合 IIF 组手术的实施：骨穿针沿股骨颈方向和股骨干方向穿入病灶内后，采用同轴交换技术，将事先制作好的去尾骨穿针芯使用骨穿针芯通过针鞘术推入病灶内，按照病灶体积可植入多枚去尾骨穿针芯，随后调整骨穿针方向，调和骨水泥并在透视下完成骨水泥的注射；PC 手术的实施：仅有穿刺和骨水泥注射两步。通过观察 2 组患者术后视觉模拟评分（VAS）、卡氏生活质量评分（KPS）及四肢肌骨肿瘤术后功能状态评分（EFES）来评价患者疼痛缓解、生活质量改善、股骨稳固性、骨水泥渗漏和生存率情况。结果所有患者均顺利完成手术。PCP 联合 IIF 组较单独 PCP 组有较好的疼痛缓解率(89% v.s.57%P = 0.034)和术后股骨上段的稳固性（P 均<0.05）。PCP 联合 IIF 组 19 例疼痛缓解，6 例骨水泥渗漏，无发生骨折者，随访 6～18 个月 16 例存活；PCP 组 13 例疼痛缓解，10 例骨水泥渗漏，5 例发生骨折者，随访 3～18 个月 13 例存活。2 组间疼痛缓解和发生骨折率的差异有统计学意义（P 均<0.05），骨水泥渗漏和生存率差异无统计学意义（P 均＞0.05）。2 组患者术后 1 周 VAS、KPS 及 EFES 评分差异无统计学意义（P 均＞0.05），术后 1 个月、3 个月、6 个月和 1 年评分差异有统计学意义（P 均<0.05）。

结论 经皮骨成形术联合介入内固定术治疗即将发生病理性骨折的股骨上段骨肿瘤安全、有效，能更好地缓解疼痛、降低骨折发生率、改善患者生活质量。

PU-1706
椎体压缩性骨折 PVP 术后再发骨折危险因素的研究进展

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随着我国人口老年化的情况日益严重，骨质疏松性疾病的患者也越来越多，骨质疏松性椎体压缩性骨折（OVCFs）成为目前的主要问题之一。越来越多的患者首选 PVP 治疗，随之术后椎体再发骨折的病例也逐渐增多，椎体压缩性骨折 PVP 术后再发骨折被越来越多的人所重视。为了降低椎体再发骨折的发生率，需要对椎体再发骨折的危险因素深入研究及探索。本文将对椎体压缩性骨折 PVP 术后再发骨折的危险因素作一综述。

PU-1707
腰椎小关节积液 MRI 影像对退行性腰椎不稳诊断价值的研究

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目的 主要探讨腰椎 MRI 影像小关节积液与退行性腰椎不稳之间的关系，同时观察小关节积液量与小关节对称性及小关节方向的关系。

方法 纳入 312 例退行性腰椎疾疾病患者，并分为隐性腰椎不稳组（N=168）和腰椎不稳组（N=144），45 例无明显临床症状者为对照组，均行腰椎 X 线及 MRI 检查。分析小关节积液与退行性腰椎不稳是否有相关性，并分析小关节积液量与小关节对称性及小关节方向的关系。

结果 1.L4-5、L5-S1 节段小关节积液比例及积液量较高者均为腰椎不稳组，其次为隐性不稳组，均高于对照组（P＜0.05）；2. L4-5、L5-S1 节段，三组间小关节不对称者较对称者积液量多（P＜0.05），积液比例则无差异（P＞0.05）；3.不稳组 L4-L5 节段 I 型小关节积液量最高，其次为 III 型（P＜0.05）；L4-L5、L5-S1 节段 I 型和 III 小关节发生腰椎不稳的风险均高于 II 型。

结论 1.腰椎小关节积液量有助于对腰椎不稳的临床诊断及评估，且有助于评估隐性腰椎不稳潜在的风险；2.腰椎小关节不对称与小关节积液量有关，小关节不对称在一定程度上促进腰椎不稳的发生；3.矢状面的小关节更易发生积液，且与腰椎不稳有关。

PU-1708
经皮胃造瘘术和自膨式金属支架置入在吞咽困难的老年食管癌患者治疗中的效果比较

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【摘要】 **目的** 分析和比较经皮胃造瘘术（percutaneous gastrostomy，PG）和自膨式金属支架（self-expandable metal stent，SEMS）置入两种营养提供方式在吞咽困难的老年食管癌患者应用中的优劣。**方法** 回顾性分析郑州大学附属肿瘤医院 2014 年 2 月至 2018 年 12 月收治的 156 例伴有吞咽困难评分≥2 分的老年食管癌(≥70 岁)患者的临床资料，按照接受 SEMS 置入或者 PG 分为 PG 组和 SEMS 组，比较两组患者术后早期死亡、并发症与额外治疗情况，以及术后 2 个月时的体重质量指数、血清白蛋白、前白蛋白、血红蛋白和淋巴细胞计数的差异。**结果** 术后 PG 组的局部严重疼痛发生率明显低于 SEMS 组，差异有统计学意义（P <0.001）。两组在局部感染、消化道出血、吸入性肺炎、术后早期死亡、与额外治疗率的差异无统计学意义（P>0.05）。两组患者治疗 2 个月后，PG 组的血清白蛋白、前白蛋白和血红蛋白计数明显高于 SEMS 组，差异有统计学意义（P <0.05）。两组的体重质量指数和淋巴细胞计数的差异无统计学意义（P >0.05）。**结论** 相比 SEMS 置入，PG 术后安全性和营养状态具有优势，在伴有吞咽困难的老年食管癌患者的治疗中可以考虑优先使用。

PU-1709
吞咽困难的食管癌患者行 X 线引导下经皮胃造瘘术的疗效观察

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目的 探讨 X 线引导下经皮胃造瘘术（percutaneous radiologic gastrostomy，PRG）治疗吞咽困难的食管癌患者的安全性和临床疗效。**方法** 回顾性分析本院 2016 年 3 月至 2018 年 11 月收治的 203 例伴有吞咽困难评分 2 分以上的食管癌患者的临床资料，按照是否接受 PRG 分为 PRG 组（经 PRG 管行肠内营养支持）和非 PRG 组（经口进食），比较两组患者治疗 1 个月后的体重质量指数、血清白蛋白、前白蛋白、血红蛋白值及并发症发生率。**结果** 1 个月后， PRG 组的血清白蛋白、前白蛋白及血红蛋白值明显高于非 PRG 组，差异有统计学意义(P<0.05)；PRG 组吸入性肺炎及食管气管瘘或纵隔瘘发生率明显低于非 PRG 组，差异有统计学意义(P<0.05)；PRG 组的体重质量指数高于非 PRG 组，但差异无统计学意义(P>0.05)；两组的消化道出血、便秘及腹泻发生率差异无统计学意义(P>0.05)。**结论** 吞咽困难的食管癌患者施行 PRG 能够显著改善患者的营养状态，预防营养不良的发生，且能够显著降低吸入性肺炎、食管气管瘘、纵隔瘘的发生率，本方法临床疗效肯定，安全性高，值得临床推广应用。

PU-1710
老年与非老年食管癌患者经影像学引导下经皮胃造瘘术的临床预后分析

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摘要：目的 比较分析经影像学引导下经皮胃造瘘术（percutaneous radiologic gastrostomy，PRG）治疗老年及非老年食管癌患者的临床预后。**方法** 回顾性分析 2014 年 7 月至 2018 年 7 月间于郑州大学附属肿瘤医院行 PRG 治疗的食管癌患者 150 例，其中年龄<70 岁者 84 例为 A 组，年龄≥70 岁 66 例为 B 组。比较分析两组的的术后生存时间、手术成功率、手术并发症发生率、手术相关死亡率及术后体重、营养指标及细胞免疫指标的变化。**结果** A 组中位生存期 180 天，B 组中位生存期 170 天。Kaplan-Meier 曲线显示，不管是Ⅱ、Ⅲ期还是Ⅳ期，两组生存率差异均无统计学意义(P=0.633，P=0.908)。两组手术成功率均为 100%，两组患者均无胃造瘘术相关死亡。术后 30 天内死亡 6 例，A 组 3 例， B 组 3 例。术后发生造瘘口感染 3 例，A 组 1 例，B 组 2 例。术后消化道出血 5 例，A 组 2 例，B 组 3 例。造瘘管移位 11 例，A 组 5 例，B 组 6 例。术后吸入性肺炎共 22 例，A 组 16 例，B 组 6 例。共有 14 例需要额外治疗，A 组 7 例， B 组 7 例。术后 1-2 月血清白蛋白变化值 A 组为-2.4±8.2 g/l，B 组为-2.7±5.5 g/l，体重变化值 A 组为-0.41±1.32kg，B 组为-0.45±2.14kg，淋巴细胞变化值 A 组为-0.47±3.610^9/l，B 组为-0.45±2.910^9/l。两组的手术成功率、术后 30 天内死亡率、并发症发生率、附加治疗次数，以及术后 1~2 个月血清白蛋白、体重和淋巴细胞计数的变化均无统计学差异（P>0.05）。**结论** PRG 治疗老年与非老年食管癌人群的临床预后相仿。

PU-1711
A comparison of percutaneous gastrostomy and self-expandable metal stent insertion in the treatment of

older patients with esophageal cancer and eating disorders

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Objective In order to compare the efficacies of SEMS (self-expandable metal stent) placement with percutaneous PG (percutaneous gastrostomy) to treat older esophageal cancer patients with eating disorders. **Methods** Data of 113 cases of older esophageal cancer (≥70 years) who underwent SEMS (n=47) placement or PG (n=66) was studied from June 2014 to June 2018 in our hospital. Clinical outcomes, including overall survival (OS), procedural complications, postprocedural nutritional status and needs for additional intervention were compared between the two groups.
Results Baseline characteristics showed that the PG group had more cases of postoperative radiotherapy patients (28.8% vs. 6.4%, p=0.003) and more cases locating in the cervical esophagus (6.1% vs.2.1%, p<0.001) than the SEMS group. The Kaplan-Meier curves showed that OS of the PG group was significantly higher than that of the SEMS group, regardless of stage II+III or stage IV (p=0.034, p=0.001). Multivariate analysis showed that tumor stage, esophageal tracheal/mediastinal fistula, postoperative chemotherapy, and procedures were independent prognostic factors of survival (p<0.001, p=0.042, p=0.046, p=0.001). Besides, PG group decrease less in serum albumin levels and weight than the stent group after procedure (p=0.039, p=0.041). In addition, the incidence of local severe pain in the PG group was significantly lower than that in the SEMS group (0% vs21.3%, p<0.001).
Conclusions The results indicate that PG is a good choice in solving malnutrition caused by dysphagia resulted from esophageal stricture in older esophageal cancer patients. Compared with SEMS placement, it is related to a better survival and is not bad in terms of safety.

PU-1712
宫颈癌引起膀胱阴道瘘的 个体化介入治疗

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目的 宫颈癌的手术、放疗、复发是引起女性患者膀胱阴道瘘的主要因素，手术修补是主要治疗方法，但肿瘤复发、转移、放疗、长期慢性炎症引起的膀胱阴道瘘容易修补失败，加上手术需要全麻下操作，部分患者难以耐受或修补困难而无法治疗，给患者造成极大的痛苦，生活质量明显下降。随着介入技术的改进、设备的更新及手术的多样化，为这类患者的治疗提供了可能。本研究通过多种介入微创方法治疗难治性膀胱阴道瘘，探讨介入治疗的优势及临床应用价值。**方法** 16 例宫颈癌合并膀胱阴道瘘患者，治疗方法如下：6 例合并双肾积水，均为输尿管末端入膀胱处不同程度狭窄，其中 1 例肿瘤未做任何治疗，其余 5 例为宫颈癌术后放化疗后肿瘤复发，患者行双肾穿刺造瘘外引流尿液，均未再漏尿；8 例宫颈癌膀胱阴道瘘患者不合并双肾积水，膀胱阴道瘘发生于放疗一年后，采用双肾穿刺造瘘外引流、单子弹头覆膜支架封堵输尿管，不自主漏尿症状完全纠正；2 例宫颈癌手术损伤，一周后发生膀胱阴道瘘，近期不考虑修补，给予双肾穿刺造瘘及双侧输尿管球囊封堵，未再漏尿，15 天后 1 例瘘口自愈，另 1 例 30 天后手术修补成功。**结果** 宫颈癌患者输尿管

球囊阻断下双肾造瘘及输尿管覆膜支架封堵，长期泌尿系炎症患者经双肾造瘘及输尿管球囊封堵，阴道不自主漏尿症状完全纠正。**结论** 宫颈癌患者发生膀胱阴道瘘，如无法修补或近期不能修补，可考虑应用双肾造瘘、双肾造瘘+输尿管支架封堵、双肾造瘘+输尿管球囊封堵等介入方法彻底纠正不自主漏尿症状。根据患者不同的病情，采用不同的治疗方法，提高患者的生存质量。

PU-1713
如何降低经皮肝穿胆道引流术后引流管的护理并发症

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【摘要】 **目的** 探讨如何降低经皮肝穿引流术后引流管的护理并发症。**方法** 选取 2018 年 8 月到 2019 年 6 月我科收住需行治疗的病人共 85 例，均给予全面性护理：引流管的观察、置管护理、并发症护理。结果 85 例患者术后出现 2 例胆道出血，1 例胆道感染，并发热寒战，体温最高 39.5，未发生引流管脱落、均顺利出院。具体**方法** (1)妥善固定及明确标识;标明外露长度，班班床头交接(2)保持有效引流;是否通畅(3)观察并记录引流液的颜色、量和性状;(4)严格无菌操作;(5)（1）触：触摸引流管周围有无肿胀疼痛，皮下血肿等。（2）看：引流管周围辅料是否干燥，引流液的颜色；量、性状、标识、引流袋更换的日期（3）挤捏，检查引流管是否通畅等。

梗阻性黄疸患者可采用介入手术治疗，即经皮肝穿刺胆道引流（PTCD），在梗阻扩张的胆管内置管以作外引流或者内引流胆汁；在进行短期或者临时胆道引流时，可置入引流管以防止胆管进一步扩张。鉴于引流管的重要性，本文将探讨如何降低经皮肝穿刺胆道引流术后引流管的护理并发症。

结果 85 例患者术后出现 2 例胆道出血，1 例胆道感染，1 例堵管，未发生胆道脱管的现象，经过治疗都顺利出院。

结论 经皮肝穿胆道引流术后，引流管的护理及妥善固定，定时检查标注，是预防术后并发症发生的有效手段，正确的、全面的引流管护理使术后引流管并发症明显降低。

PU-1714
DSA 低剂量技术在经皮肝穿刺胆道引流术中的应用

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目的 探讨低剂量 DSA 技术以及荧光透视在经皮肝穿刺胆道引流术(PTCD)的临床应用的可行性。**方法** 收集本院住院患者共 86 例，随机分为标准模式剂量采集组（A 组，n=43）及低剂量模式采集组（B 组，n=43），由本科室同一医师完成 PTCD 手术。对两组患者手术平均指标对比分析并进行 t 检验。由两位放射科影像专家采取双盲法对所有图像进行评分。 **结果** 两组患者均顺利完成 PTCD 手术，应用 t 检验方法，平均曝光时间[（251±16）s、（249±20）s]、图像质量评分[（3.60±0.5）s、（3.56±0.5）s]，身高体重指数 BMI[（53.3）kg/m²、（58.6）kg/m²]数值比较，p 大于或等于 0.05，无统计学差异；累积剂量[（87.1±6.1）mGy、（54.4±7.7）mGy]、辐射剂量面积乘积[（2935.2±353）μGy• cm2、（1566.3±200）μGy• cm2]方面分析，p 小于 0.05 有显著统计学意义。**结论** 采取低剂量 DSA 采集技术在 PTCD 手术患者有效可行，并且可以显著减低患者所受辐射剂量。

PU-1715

儿童骨样骨瘤冷冻消融治疗的优势探讨

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目的 评估影像导向下冷冻消融术治疗儿童骨样骨瘤的安全性及有效性。方法 2007 年 1 月至 2019 年 6 月期间， 对 18 例病理证实的骨样骨瘤儿童患者行影像导向下冷冻消融治疗。患者男 12 例、女 6 例，年龄 8.0～15.0 岁，平均(12.0±1.6)岁，手术在局部麻醉下进行，术前均行经皮穿刺活检获得病理诊断。手术使用大孔径多层螺旋 CT（层厚 2 mm，120 kV，250 mAs）。于 CT 导向下应用 8G 或 13G 骨穿针穿刺病灶中央，拔出针芯、经外套针置入 17 G 冷冻探针，冷冻模式采用 2 次冷-热循环，术中间隔 5 min 扫描冷冻区域，了解冰球大小和形状。术后以 VAS 疼痛评分评估疗效。手术前后 VAS 评分比较采用 Kruskal- Wallis 秩和检验。结果 18 例患者手术均成功；术后疼痛均明显缓解，VAS 评分术前评分（8 分 3 例，7 分 6 例，6 分 6 例，5 分 3 例）与术后 1 个月（1 分 10 例,0 分 8 例）比较，差异有统计学意义（H=32.838,P＜0.01）。本组患者术前因长期疼痛刺激导致不同程度跛行，伴发脊柱侧弯，术后 3d 疼痛均明显减轻，无肢体功能障碍。3 例患者术后 1d 轻度发热(37.8℃)，对症处理 2d 后缓解，无其他并发症发生。随访期内所有患者疼痛无复发。结论 CT 导向下冷冻消融术治疗骨样骨瘤是一种安全、有效的微创手段，值得推广应用。

PU-1716

NHERF1 是结直肠腺癌临床预后的预测因子

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目的 寻找与结直肠腺癌侵袭和迁移相关的因子。
方法 收集 TCGA 及 GEO 数据库中结直肠腺癌相关数据进行 SAM 差异表达基因分析，将得到的差异基因过 DAVID 进行聚类分析，寻找与侵袭迁移相关的基因，并对 TCGA 数据库中的患者临床信息进行回顾性分析及生存预后分析。同时收集 50 例具有详细临床及预后信息的结直肠腺癌组织及配对癌旁组织进行免疫组化染色来验证上述结果并绘制 ROC 线（receiver reporting characteristic curves）进行评估。
结果 DAVID 聚类分析发现 6 个与迁移相关的基因集（P<0.05），其中下调的基因有 DLC1、EPB41L3、KIT、PARVA、SLC9A3R1 和 TPM1。其中 SLC9A3R1 编码的蛋白 NHERF1 是一种能与细胞骨架及多种信号蛋白相互作用的多功能连接蛋白。TCGA 数据分析显示，结直肠腺癌中 NHERF1 的 mRNA 水平较正常结直肠组织降低。独立临床队列数据的免疫组化结果显示在高级别及发生淋巴结转移的组织中 NHERF1 表达降低。
结论 NHERF1 表达降低是影响结直肠腺癌患者生存期的一个独立影响因子，可能与其促进肿瘤转移有关。NHERF1 表达降低是一个潜在的诊断和预测结直肠腺癌不良预后的良好指标。

PU-1717

肝动脉化疗栓塞联合 CT 引导下微波消融对于早期原发性肝癌治疗的疗效评价

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目的 评价单独经导管动脉化疗栓塞（TACE Transcatheter arterial chemoembolization）与 TACE 联合微波消融对于早期(早期肝癌治疗的适应症及指南如何说)原发性肝癌治疗的有效性及安全性。
方法 收集 2016 年 2 月-2017 年 8 月 41 例早期原发性肝癌患者的临床治疗资料，其中单纯 TACE 24 例，TACE 联合微波消融 17 例。分析两种手术术前、术后（术前后的时间）肝功能变化，淋巴细胞亚群等改变，（早期肝癌肝功能变化和淋巴细胞亚群改变是主要疗效吗）并随访 12 个月（早期肝癌十二个月大部分存活吧 如何比较生存期），比较无进展生存期。
结果 两组患者术前、术后肝功能变化无统计学意义（P＞0.05），两组术后 CD4+均高于术前，差异具有统计学意义（P＜0.05），联合组肿瘤无进展生存期明显高于单纯组（P＜0.05）。
结论 TACE 联合微波消融能有效的控制原发性肝癌患者早期肝内肿瘤的进展，并且能提高患者免疫功能。
关键词：原发性肝癌；经导管动脉化疗栓塞；微波消融；免疫功能

PU-1718
护理干预在肝癌介入治疗疼痛的应用

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目的 研究护理干预在肝癌介入治疗中产生疼痛的减轻效果。方法 选取本院 2018 年 1 月到 12 月收的肝癌患者 82 例肝癌患者 ，随机分为常规组与对照组。常规组在肝癌介入治疗前后进行常规护理，对照组在肝癌介入治疗前后除了日常的护理外还将得到健康教育、饮食指导、心理干预、用药护理以及疼痛护理等一系列护理干预。结果 得到护理干预的对照组肝癌患者与得到常规护理的常规组患者对比，在接受肝癌介人治疗时的依从性更高 ，负面情绪相对较少 ，肝癌患者的疼痛感明显减轻 ，肝癌并发症的发生率也明显降低 ，治疗后的恢复速度也有很大的提高。结论 护理干预在肝癌介入治疗疼痛中的应用效果显著，值得临床治疗推广。

PU-1719
超选择性肝动脉栓塞(TAE)治疗症状性多囊肝的临床疗效

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探讨超选择性肝动脉栓塞(TAE)治疗症状性多囊肝(PLD)的临床疗效，为临床治疗多囊肝提供新的方法。
方法
回顾性分析 2009 年 7 月至 2014 年 6 月山医大一院介入科采用 TAE 治疗症状性多囊肝患者 19 例，其中 18 例同时伴有多囊肾。临床症状多表现为腹胀（17 例）、腹痛（13 例）、纳差（15 例）、呼吸困难（7 例）、肝肿大（19 例）等。19 例在 TAE 前及术后 12 个月行上腹部 CT（包括平扫、动

脉期、门静脉期），并测量肝内囊肿总体积的大小，对比分析 TAE 治疗前及后 12 个月肝内囊肿总体积变化、术后肝功能（ALT、AST、TBIL、ALB）的改变及不良反应。统计学分析采用配对 t 检验。同时术后每隔 3 个月随访患者临床症状改善情况以及体力状况评分（采用 Karnofsky 评分法）。

结果

TAE 手术成功率为 100%，术后 1-5 天出现不同程度的栓塞后不良反应（包括发热、肝区疼痛等），给予积极对症治疗后好转。T

结论

1.随着微创治疗的发展，多囊肝由传统的外科手术逐渐转向微创手术， 特别是 TAE 作为治疗症状性 PLD 一种新尝试, 具有安全、有效，疗效可靠，并发症少等优点。它能够明显降低术后复发率，减轻病人痛苦，提高疗效，因此，具有较高的临床推广应用价值。

2.本课题证实多囊肝囊壁供血动脉主要为肝动脉分支参与供血，且囊肿越大近期生长越快，说明血供越丰富。

3.TAE 治疗方法主要是通过阻断囊壁供血动脉，使囊壁缺血坏死，囊液吸收，囊肿逐渐缩小或消失。

4.TAE 是治疗多囊肝一种有效、可以缓解症状、使囊肿缩小或消失的一种可靠的治疗手段。

PU-1720

CT 血管成像在动脉栓塞治疗咯血中的临床应用价值

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摘要：目的探讨 CT 血管成像在动脉栓塞治疗咯血中的临床应用价值。方法选取 2013 年 5 月至 2014 年 12 月因咯血在我科行介入栓塞治疗的 45 例患者为研究对象。分为 2 组,介入术前患者进行咯血责任动脉 CT 血管成像为 A 组、否则为 B 组。结果 2 组患者动脉造影共找到相关责任动脉 56 支,包括支气管动脉 45 支,肺外体循环动脉 11 支。所有患者均成功完成介入治疗,手术操作成功率 100%,短期止血成功率(术后连续随访 3 个月)98%(44/45)。A 组中,术前行 CTA 检查共找到责任动脉 32 支,术中行 DSA 共找到责任动脉 34 支,以 DSA 检查为标准,介入术前行咯血责任动脉 CTA 诊断敏感度为 94%。与 B 组相比,A 组介入术中更容易选择至出血责任动脉,而且在首次成功超选择至靶支气管动脉的透视时间、总透视时间、总手术时间及对比剂用量方面,2 组结果差异有统计学意义(P<0.05),A 组优势明显。结论支气管动脉栓塞术治疗咯血起效迅速,介入术前进行无创性的支气管动脉 CTA 检查,可较全面显示咯血病变区责任动脉的开口、走行、主要分支等特征,发现是否有肺外体循环相关动脉参与病变供血,缩短介入手术时间、辐射时间,减少对比剂用量,减少并发症的发生率,有效提高咯血介入治疗的效果,具有重要的临床应用价值。

PU-1721

动脉化疗栓塞治疗晚期膀胱癌伴血尿患者的临床疗效

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摘要：目的:评价动脉化疗栓塞治疗晚期膀胱癌伴血尿患者的临床疗效。方法:回顾分析在 2015 年 3 月至 2016 年 12 月期间,行膀胱动脉或选择性髂内动脉化疗栓塞治疗的 31 例晚期膀胱癌伴血尿患者。所有患者均经病理证实为尿路上皮癌。肿瘤 TNM 分期为 T3-T4,其中 T3 期 12 例,T4 期 19 例。

31 例患者中男 23 例,女 8 例,平均年龄 72.0 岁。临床症状:全部患者均有不同程度肉眼血尿;6 例尿路阻塞,其中 4 例因血凝块致排尿困难,均需导尿及持续膀胱冲洗,2 例由肿瘤阻塞输尿管口致尿路积水,1 例经皮肾穿刺造瘘术;膀胱刺激征 5 例,表现为排尿时尿道针刺感或烧灼感。介入手术均采用双侧膀胱动脉或选择性髂内动脉化疗栓塞。使用的动脉灌注化疗药物为氟尿嘧啶(500mg~750mg)、吉西他滨(500mg~1000mg)或/和奥沙利铂(50mg~150mg)。使用的栓塞剂为明胶海绵颗粒、明胶海绵条、个别患者结合使用弹簧圈。在患者经首次化疗栓塞 4 周后,观察近期临床症状改善情况及疾病控制率。结果:动脉化疗栓塞技术成功率 100%,31 例患者在 5 日内血尿均得到有效控制,血尿消失者为 90.3%(28/31),剩余 3 例患者术后尿色变淡,病情稳定,未再行进一步治疗,4 周后无复发或病情加重病例;6 例尿路阻塞患者中,4 例因血凝血块致排尿困难者均得到缓解;2 例尿路积水患者症状未见消失,但其中 1 例经治疗膀胱肿瘤体积明显缩小。5 例膀胱刺激征患者,术后均得到缓解。根据实体瘤治疗疗效评价标准:部分缓解 13 例,稳定 11 例,进展 7 例,治疗有效率为 41.9%(13/31),疾病控制率为 77.4%(24/31)。结论:动脉化疗栓塞可有效改善晚期膀胱癌伴血尿患者的临床症状,提高生活质量,并控制肿瘤生长,患者可耐受度强,近期疗效良好。

PU-1722

制备靶向载阿霉素/印度墨水多动能分子探针级体内超声/光声显像及疗效一体化评估

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目的　制备郝赛酊靶向载阿霉素/印度墨水多功能纳米造影剂，评估其物理特性、体内靶向能力、体内超声和光声显像效果及抑制移植瘤生长的效果。
方法　通过薄膜水化、碳二亚胺法制备郝赛酊靶向载阿霉素/印度墨水多功能纳米造影剂，通过马尔文粒径电位仪测量纳米造影剂粒径及电位，通过激光共聚焦显微镜观察分子探针在肿瘤组织中的靶向聚集，通过超声仪及光声仪观察分子探针在体内的多模态显像，以乳腺癌裸鼠移植瘤观察分子探针的抗移植瘤治疗效果。
结果　郝赛酊靶向载阿霉素/印度墨水多功能纳米造影剂粒径约 nm，电位约 mV，激光共聚焦显微镜显示靶向分子探针大量聚集在肿瘤组织细胞核周围，具有很好的体内超声、光声显像效果，对裸鼠移植瘤的生长起到了明显抑制的效果。
结论　这种造影剂具有靶向性、超声及光声多模态成像一体化的多功能分子探针，能成为乳腺癌早期精准显像诊断及精准治疗的理想显像治疗剂。

PU-1723

护理干预在肝癌介入治疗疼痛的应用探讨

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目的　研究护理干预在肝癌介入治疗中产生疼痛的减轻效果。方法　选取本院 2018 年 1 月到 12 月收的肝癌患者 82 例肝癌患者 ，随机分为常规组与对照组。常规组在肝癌介入治疗前后进行常规护理，对照组在肝癌介入治疗前后除了日常的护理外还将得到健康教育、饮食指导、心理干预、用药护理以及疼痛护理等一系列护理干预。结果 得到护理干预的对照组肝癌患者与得到常规护理的常规组患者对比，在接受肝癌介人治疗时的依从性更高 ，负面情绪相对较少 ，肝癌患者的疼痛感

明显减轻 ，肝癌并发症的发生率也明显降低 ，治疗后的恢复速度也有很大的提高。结论 护理干预在肝癌介入治疗疼痛中的应用效果显著，值得临床治疗推广。

PU-1724
肝静脉系统栓堵术（LVD）在二阶段根治性肝癌切除术中的应用

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目的 肝切除术是治疗肝癌首选的治疗手段，而剩余肝体积(future liver remnant，FLR)不足是造成患者切除术后肝功能衰竭等严重并发症的重要原因。FLR 一般需占肝脏估计总体积(total estimated liver volume，TELV)的 25％以上，而伴有纤维化背景肝脏的 FLR 需达 40％以上才能保证患者的安全。LVD 术诱导结直肠癌肝转移、肝门胆管癌和丙肝肝硬化背景的肿瘤患者 FLR 增生都取得了满意效果，本病例首次探讨和验证 LVD 诱导乙肝肝硬化背景的肝癌患者 FLR 增生以二阶段根治性肝切除的可行性。**方法** 1 例术前诊断为中央型肝癌（V、VIII 段交界处）的 53 岁男性患者因剩余肝脏体积（future liver remnant， FLR）不足无法行标准右半肝切除术，患者在局麻下接受 LVD 术，即同时完成经皮右肝门静脉栓塞术和经颈内静脉右肝静脉封堵术，以诱导 FLR 增生。LVD 术后 1、2、3 周评估患者一般情况并复查腹部 CT 评估 FLR 体积和剩余肝脏/体重比。**结果** 患者术前 FLR24.2%。剩余肝脏/体重比 0.459%。LVD 术后第 1、2、3 周复查 FLR 别为 29.5%、38.3%和 44.4%，剩余肝脏/体重比分别为 0.545%，0.707%和 0.820%（图 1）。连续监测患者 LVD 术后肝功能示轻度异常（表 1）。患者 LVD 术后第 4 周顺利施行标准右半肝切除术（图 2），术后安全康复出院。**结论** LVD 可使剩余肝脏体积快速增大，可让预计 FLR 不足的肝癌患者有接受二阶段根治性手术治疗的机会，是一项有效诱导 FLR 增生的新技术。

PU-1725
内脏危象 HER2 阳性晚期乳腺癌介入治疗病例 1 例分享

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乳腺癌是威胁女性健康的常见恶性肿瘤之一，乳腺癌是我国女性发病率最高的肿瘤，随着医学的进步，尤其Ⅰ、Ⅱ期乳腺癌，5 年生存率已经十分可观。但 HER2 阳性乳腺癌具有高度的侵袭性，易导致复发转移，缩短患者的生存时间。本次介绍 1 例未治疗 HER2 阳性晚期内脏危象乳腺癌，肝功能明显异常，通过给予介入动脉灌注化疗+栓塞、联合曲妥珠单抗 HER2 治疗、序贯氟维斯群内分泌治疗临床获益的病例。

PU-1726
Diagnostic value of CT-guided percutaneous core needle biopsy in anterior mediastinal masses

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Objective: The aim of this study is to explore the diagnostic value and safety of CT-guided percutaneous core needle biopsy (CT-PCNB) in anterior mediastinal masses.
Methods: 136 CT-PCNB procedures in 128 patients with anterior mediastinal masses were performed from January 2012 to March 2019 in Changhai Hospital. The patients were men in 79 cases and women in 49 cases, aged 11 to 81 years.
Results: The size of anterior mediastinal masses ranged from 2.50 to 19.50 cm, with mean size 8.94 cm. 58 cases had pleural effusion, 39 cases had pericardial effusion. Needle depth ranged from 2.00 to 7.70 cm, with mean depth 4.29 cm. Technical success was 100%. Based on the histopathological diagnosis, diagnostic accuracy of biopsy was 97.66%, sensitivity was 97.56%, specificity was 100%, positive predictive value was 100%, negative predictive value was 62.50%. After the biopsy procedure, 2 cases had mediastinal hematoma, 1case had pulmonary bleeding, 1 case had a small amount of pneumothorax.
Conclusion: CT-guided percutaneous core needle biopsy has a high accuracy in the diagnosis of anterior mediastinal masses, and it has small trauma and high safety.

PU-1727

CT 引导下经皮热消融治疗肾上腺转移瘤

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目的 评价 CT 引导下经皮热消融术（PTA）治疗肝癌肾上腺转移瘤的临床疗效和安全性。
方法 从 2004 年 1 月至 2015 年 12 月，CT 引导下对 27 例男性肝细胞肝癌患者（平均年龄 50 岁，34-77 岁）位于肾上腺的转移瘤（29 个转移病灶）进行经皮热消融术。术后记录手术的成功率、疗效以及消融相关的不良反应。使用 Kaplan-Meier 方法进行生存曲线分析,并通过 log-rank test 方法对肾上腺寡转移和多发转移的患者进行比较。采用 Cox 比例风险回归模型预测生存相关的因素。
结果 27 名患者进行了 33 次热消融手术治疗。未出现手术相关的死亡事件，但总体手术相关的并发症高达 87.9%。3 级高血压是最常见并发症,发生率为 24.2%（8/33）。消融成功率高达 93.1%（27/29），且消融有效率接近 92.6%（25/27）。所有患者的中位无进展生存率和中位总生存率(OS)分别为 6.9 个月和 16.8 个月。肾上腺寡转移患者的中位 OS(21.8 个月)长于多发转移患者的中位 OS(12.8 个月) (P=0.037)。肾上腺寡转移是 Cox 模型中影响总体生存的唯一因素(P=0.043)。
结论 经皮 CT 引导下热消融术治疗肝细胞肝癌肾上腺转移瘤是一种有效且安全的治疗手段。肾上腺寡转移的患者生存获益可能更大。

PU-1728

基于多层螺旋 CT 及磁共振成像探讨原发性肝癌经肝动脉化疗栓塞术后早期复发相关危险因素研究

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【摘要】 **目的** 基于多层螺旋 CT 动态增强及磁共振成像，探讨经皮选择性肝动脉化疗栓塞术（TACE）治疗中晚期肝癌后复发的危险因素。**方法** 选取 2014 年 6 月至 2018 年 12 月在我院接受 TACE 治疗的中晚期肝癌患者 42 例，术前均行磁共振（MRI）多期增强扫描+弥散（DWI）检查，明确肿瘤大小、数量、强化方式、门脉癌栓、肿瘤平均表关弥散系数（ADC）值；常规完善血常规、生化常规及凝血全套，测量天门冬氨酸氨基转氨酶（AST）、谷氨酰基转移酶(ALT)、丙氨酸氨基转氨酶(GGT)、甲胎蛋白(AFP)、白蛋白、总胆红素、凝血酶原时间(PT)值；术后一个月复查 CT 或 MRI,以后每两月复查半年，再每三个月复查一年，直至肿瘤复发或进行下一次 TACE 为随访终点；根据复发时间，≤6 个月定义为早期复发组（23 例），≥6 个月定义为晚期复发组（19 例）。采用独立样本 *t* 检验和卡方检验比较两组的临床资料(如年龄、性别、病因、Child-Pugh 分级、门脉癌栓、肿瘤数量、肿瘤最大直径、AST、ALT、GGT、AFP、白蛋白、总胆红素、凝血酶原时间(PT)、平均 ADC 值)等；采用多因素 *logistic* 回归分析患者复发的独立危险因素。**结果** 早期复发组的 AFP 水平、肿瘤数量、ALT 水平均高于晚期复发组，差异有统计学意义（$P<0.05$）。早期复发组的白蛋白水平、平均 ADC 值均低于晚期复发组，差异有统计学意义（$P<0.05$）。多因素 logistic 回归分析结果示肿瘤数量、ALT、AFP 水平（$OR1=1.452$，$P=0.038$；$OR2=1.107$，$P=0.049$；$OR3=0.038$，$P=0.023$）是肝癌早期复发的独立危险因素。**结论** 肿瘤数量、ALT、AFP 水平是 TACE 治疗中晚期肝癌早期复发的独立危险因素，TACE 术前评估肝癌术后复发相关危险因素有利于治疗方法的选择及判断预后。

PU-1729

电视胸腔镜手术中难以探及肺内小结节术前 CT 引导下 Hook-wire 定位的临床应用探讨

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目的 本研究探讨电视胸腔镜手术中难以探及的肺内小结节（≤10mm）术前 CT 引导下 Hook-wire 定位的临床应用价值，并初步探讨积极微创手术对微小结节的必要性和可行性。
方法与材料：2017 年 12 月-2018 年 6 月共 45 例患者行术前 CT 引导下 Hook-wire（Accura ™ BLN 21ga×10cm）定位，并在电视胸腔镜下手术。
结果 共 45 例患者 45 个微小结节，男性 22 例，女性 23 例。病灶位于左肺上叶前段 3 个，尖后段 3 例，外侧基底段 3 个，后基底段 5 个；右肺上叶前段 8 个，尖段 2 个，后段 6 个，中叶外侧段 3 个，下叶背段 4 个，外侧基底段 2 个，前基底段 2 个，后基底段 4 个。实性结节 13 个，纯磨玻璃结节 22 个，混合磨玻璃结节 10 个。5mm-10mm 17 个，5mm 以下 28 个。CT 引导下 Hook-wire 定位成功率为 95.56%，电视胸腔镜下切除率 100%。术后组织学**结果** 原位腺癌 25 例，炎性病变 8 例，良性肿瘤及肿瘤样病变 12 例。
结论 CT 引导下 Hook-wire 肺微小结节术前定位准确率高，并发症轻微，有助于临床在术中及时发现、切除病灶，减少手术时间，有利于患者的早日康复，值得临床推广。

PU-1730

论“舍近求远”特殊穿刺路径的选择对胸膜下结节的诊断价值及安全性分析

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目的 探讨两种不同穿刺路径对胸膜下结节的诊断价值及安全性分析。**方法** 回顾性分析 2015 年 8 月-2018 年 6 月行 CT 引导下经皮肺穿刺活检 147 例胸膜下结节(≤30 mm) 患者临床及病理资料。根据穿刺针与胸膜角度（≤50°，＞50°）对患者进行分组（即长路径组，短路径组），比较两组间年龄、性别、准确率、单次成功率；然后根据结节直径大小（≤10 mm，10~20 mm，≥20 mm）对上述两组患者进一步分组，再进一步计算各亚组间调针次数、穿刺时间、气胸及出血的发生率，并采用 Fisher’s 确切概率法比较各组间的差异。**结果** 147 例结节中，长路径组 83 例，短路径组 64 例，两组的准确率分别为 90.36%、92.19%，单次成功率为 97.59%、 92.19%，差异均无统计学意义（P＞0.05）；对于结节＜20mm 时，长路径组的穿刺时间、调针次数均小于短路径组，差异具有统计学差异（P＜0.05），而气胸及出血无统计学差异（P＞0.05）；对于结节≥20mm 时，两组间穿刺时间、调针次数、气胸及出血均无统计学意义（P＞0.05）；**结论** CT 引导下经皮肺穿刺活检术对胸膜下结节具有较高的准确率，且对于＜20mm 的胸膜下结节建议长路径穿刺（即穿刺针与胸膜角度＜50°斜行穿刺），以便减少穿刺次数、穿刺时间、提高穿刺有效率。

PU-1731

mPEG-PLGA 新型可降解载药微球在 VX2 肝肿瘤治疗中阿霉素缓释功能的实验研究

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目的 利用兔 VX2 肝肿瘤模型，验证 mPEG-PLGA 新型载药微球的阿霉素缓释功能及疗效。**方法** 选取 24 只瘤兔，肿瘤大小直径在 1.2cm-1.5cm，随机分成 4 组。A 组：不给任何治疗，B 组：游离阿霉素组，C 组：碘油+阿霉素，D 组：新型载药微球，每组 6 只。（1）术后 12h，3d，6d，9d 抽取耳缘静脉血，比较各组不同时间点的外周血中阿霉素药物浓度。（2）术后 3d、6d，9d 各组分别处死一只瘤兔，行冰冻切片检查，比较不同时间点阿霉素在肿瘤组织内荧光，并用 Image J 软件进行半定量分析。（3）、术后 6d，9d 行 MR 扫描，评价肿瘤治疗的疗效。取肿瘤组织，心肺肾脾组织，进行组织学 HE 检测(4)利用 HE 染色观察心肌组织的改变，说明材料对心肌组织的毒性作用。**结果** （1）术后 12h，B 组血浆中阿霉素含量最高，与其它组比较有统计学差异（P<0.05）；术后 3 天，C 组阿霉素的含量最高，与其它组有统计学差异（P<0.05）；B、C 两组血浆中阿霉素的含量呈反抛物线型，D 组阿霉素的含量较低，呈直线型。（2）3d 肿瘤组织内，B 组内未见阿霉素荧光，C 组 D 组可见少量阿霉素荧光，两组之间无统计学差异；6 天、9 天 B、C 组内未见阿霉素荧光，D 组内可见大量阿霉素荧光，与其它两组比较有统计学差异。（3）术后 6 天，C 组 D 组肿瘤体积与其它两组比较有统计学差异（P<0.05），两组之间无统计学差异（p>0.05）；术后 9 天，D 组与其它三组之间有统计学差异（p<0.05）；HE 染色 D 组内可见大量坏死的肿瘤细胞，周边可见少量肿瘤细胞。C 组内中心区可见坏死的肿瘤细胞，周边区可见大量肿瘤细胞，A 组及 B 组内可见大量的肿瘤细胞（4）治疗 3d，6d，9d 后 HE 染色，D 组心肌组织未见异常改变。**结论** 新型载药微球具有阿霉素缓释、肿瘤毒性而避免了阿霉素的心脏毒性的作用。

PU-1732

经皮氩氦刀冷冻消融治疗早期原发性肺癌的临床应用

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目的 探讨氩氦刀冷冻消融治疗早期肺癌的临床疗效及并发症。**方法** 回顾性分析在 2015 年 6 月-2017 年 6 月期间在我院行 AHC 治疗的早期肺癌患者，最终收集 22 例。对患者的年龄、性别、肿瘤大小、病理类型等基本资料进行均衡性分析。对术后近期疗效、肿瘤局部控制率、无疾病进展期，生存率、并发症发生率进行研究。**结果** 对 22 例肺癌患者行 AHC 治疗，手术成功率 100%。术后随访时间为 3-52 个月，分析患者的基本资料，均无统计学差异。近期疗效方面，术后 3 个月 CR、PR、SD、PD 分别为 11 例 、5 例、3 例、3 例，ORR 为 72.72%，DCR 为 86.36%；术后 6 个月 CR、PR、SD、PD 分别为 11 例、4 例、4 例、3 例，ORR 为 68.18%，DCR 为 86.36%。远期疗效方面，AHC 组术后 1 年、2 年、3 年局部控制率分别为 86.05%、41.87%、16.28%。 PFS 为 27.20±1.92 个月，中位 PFS 为 23.00±1.89 个月，术后 OS 为 30.97±1.76 个月，中位 OS 为 30.00±2.86 个月。术后并发症主要有气胸，其次是肺内出血、胸膜反应。**结论** 氩氦刀冷消融治疗早期肺癌近期及远期疗效确切，并发症少，值得临床进一步推广。

PU-1733
外周血 CTCs 检测在肝细胞癌 诊断与介入治疗疗效评估中的研究

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目的 评估患者外周血 CTCs 计数是否可作为辅助 HCC 诊断的有效生物学标记物。相比 AFP，CTCs 对 HCC 患者介入治疗疗效评估及预后判断的价值如何。
方法 入组 84 例 HCC 患者及对照组的 24 例肝血管瘤患者，检测治疗前外周血 AFP、CTCs 计数及 CTCs 亚型分析。84 例患者介入治疗后每 2 个月随访一次，检测外周血 AFP、CTCs 计数及 CTCs 亚型分析，根据影像学结果评价是否再行介入治疗。共随访 18 个月，记录疾病进展时间。
结果 HCC 患者外周血 AFP、CTC 计数的阳性检出率分别为 51.2%、73.8%。AFP 的 HCC 诊断敏感度为 51.2%，特异度为 100%，准确度为 62.04%。CTCs 计数的 HCC 诊断敏感度为 73.8%，特异度为 91.7%，准确度为 77.78%。CTCs 在 AFP 阴性组 HCC 的阳性率为 65.85%。 早期 HCC 患者 AFP 的阳性率为 55.56%, CTC 为 29.63%。外周血 CTC 计数与肿瘤数目、肿瘤大小、有无血管侵犯、肝癌临床分期差异均有统计学意义，且有正相关性。CTC 分型与肿瘤数目、有无血管侵犯、肝癌临床分期差异均有统计学意义，与肿瘤大小差异无统计学意义。外周血 AFP 与 CTC 计数有正相关性关系。HCC 介入后外周血 CTC 差异无统计学意义。外周血 AFP、CTC 计数在治疗后有效组的数值均明显低于治疗后无效组。CTC 上皮型亚型治疗前阳性率低于治疗后阳性率。介入前 CTC 阳性的 HCC 患者，较阴性的患者更易出现疾病进展，差异有统计学意义。
结论 外周血 CTCs 计数可作为辅助 HCC 诊断的有效生物学标记物。CTC 在肿瘤数目、肿瘤大小、有无血管侵犯、肝癌临床分期各组间有显著性差异。CTC 亚型在肿瘤数目、有无血管侵犯、肝癌临床分期各组有显著性差异。术前外周血 CTC 阳性的 HCC 更容易出现术后肿瘤进展。

PU-1734

CT 引导下氩氦刀冷冻消融治疗软组织肉瘤

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目的 评估 CT 引导氩氦刀冷冻消融治疗术后复发软组织肉瘤的临床疗效及安全性。**方法** 回顾分析郑州大学第一附属医院 2012 年 1 月至 2017 年 1 月接受 CT 引导氩氦刀冷冻消融治疗的 60 例术后复发或转移的软组织肉瘤（recurrent soft-tissue sarcomas，RSs)患者临床资料。男性 37 例，女性 23 例，平均年龄 47.0±15.6 岁（8 岁-79 岁）。根据 2010 年修改后实体瘤疗效评价标准（modified Response Evaluation Criteria in Solid Tumors ，mRECIST）标准评价局部疗效，随访无进展生存时间（progression-free survival，PFS），1、2、3 年生存率，分析影响局部疗效及 PFS 因素。观察并发症发生情况。**结果** 以氩氦刀冷冻消融术为起点，中位随访时间 17.5 个月，平均随访时间（19.15±10.14）个月。术后 1 个月、3 个月、6 个月 CR 分别为 51.7%,51.7%,43.3%，PR 分别为 43.3%,30%,26.7%。平均 PFS 为（10.53±9.12）个月，1 年、2 年、3 年生存率分别为 80.13%、36%、17.63%。平均 OS 为（20.4±10.52）个月。单因素、多因素分析显示肿瘤大小、与危险脏器距离是 PFS 的影响因素。术后并发症有发热 19 例、周围组织脏器损伤 16 例、胸腔积液 4 例、肌红蛋白尿 2 例、血小板减少 2 例，均为 1-2 级。**结论** CT 引导下经皮氩氦刀冷冻消融是一有效、安全的治疗软组织肉瘤的方法。

PU-1735

The Mechanism of Action and Efficiency of Relaxin Infusion Combined with Transcatheter Chemoembolization Through Hepatic Artery: a Rabbit VX2 Liver Cancer Model

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Purpose: To evaluate the adriamycin (ADM) pervasion distance within tumor stroma after relaxin (RLX) infusion through tumor feeding artery and further investigate the therapeutic effects of RLX infusion combined with transcatheter chemoembolization (TACE) on the rabbit VX2 liver cancer.

Materials and Methods: In the first part, rabbits received normal saline (NS), RLX or combined with TACE, and the penetration distance of ADM was measured by immunofluorescence and the matrix metalloproteinases (MMPs) was evaluated by gelatin substrate zymography in each group. In the second part, the tumor growth rates, necrosis rates and intrahepatic metastasis were measured, hematoxylin-eosin (HE), transferase-mediated dUTP-biotin nick end labelling (TUNEL) and Ki67 staining were conducted in each group.

Results: The expression of MMP-9 was increased in groups treated by RLX compared with NS group, especially three days after RLX infusion ($p=0.001$). The ADM penetration distance was significantly increased in groups treated by RLX compared with NS group ($p<0.05$), and it was farthest three days after RLX infusion. Compared with the NS and TACE groups, the tumor growth rates, the positive staining rates of Ki67 and the tumor growth rates were significantly decreased in RLX+TACE group ($p<0.05$). However, the positive staining rates of TUNEL and the tumor necrosis rates were significantly

increased (p<0.05), HE staining also revealed higher necrosis rates. The intrahepatic metastasis was no difference between the three groups (p=0.273).
Conclusions: An increased penetration distance was obtained by RLX infusion through tumor feeding artery, and better therapeutic effects were achieved by RLX combined with TACE.

PU-1736
罕见男性肝细胞腺瘤的诊治经过及体会（一例报导并文献综述）

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非外伤性肝破裂出血是肝脏肿瘤的严重并发症之一，严重时可导致患者休克甚至危及生命。常规治疗可内科保守止血或急诊外科肿瘤切除，但内科治疗往往效果不确切，而急诊手术风险巨大，围手术期死亡率较高。急诊行肝动脉栓塞治疗肝脏肿瘤破裂出血具有止血效果确切，手术创伤小等优势。此类患者以肝癌最常见，也有少数为良性肿瘤，例如肝细胞腺瘤（Hepatocellular Adenoma，HCA）。本文报告一例 HCA 伴瘤内破裂出血病例诊疗经过并进行文献资料综述。

PU-1737
Original Article miR-455-3p functions as a tumor suppressor in colorectal cancer and inhibits cell proliferation by targeting TPT1

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Increasing studies have revealed the importance of microRNAs (miRNAs) in tumorigenesis and tumor
progression. miR-455-3p is a newly identified tumor suppressive RNA in various human cancers. However, the ex-
pression pattern and clinical significance of miR-455-3p in colorectal cancer (CRC) remains unclear. We found that
expression of miR-455-3p was significantly reduced in CRC tissues and cell lines. In addition, we show that low miR-
455-3p expression is associated with larger tumor size, advanced tumor stage, and poorer overall survival of CRC
patients. Furthermore, in vitro experiments revealed that overexpression of miR-455-3p represses cell proliferation.
Importantly, we show that the tumor protein translationally controlled 1 (TPT1) is a direct target of miR-455-3p.
Moreover, expression of TPT1 was inversely correlated with the expression of miR-455-3p. Loss-of-function of TPT1
had a similar effect on CRC cell proliferation in vitro as gain-of-function of miR-455-3p. Taken together, these data

suggest that miR-455-3p functions as tumor suppressive RNA by targeting TPT1 in CRC, and it might be a potential
therapeutic target for CRC patients.

PU-1738

Multifactorial analysis of biliary infection after percutaneous transhepatic biliary drainage treatment of malignant biliary obstruction

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Background: The symptoms of patients with malignant biliary obstruction (MBO) could be effectively alleviated with percutaneous
transhepatic biliary drainage (PTBD). Postoperative infections were considered as challenging issues for clinicians. In this study, the
risk factors of biliary infection in patients after PTBD were analyzed.
Methods: From July 2003 to September 2010, 694 patients with MBO received PTBD treatment. Bile specimens were also collected
during PTBD. All relevant information and results were collected, including gender, age, obstruction time, types of primary tumor,
sites of obstruction, drainage style, tumor stage, hemoglobin, phenotype of peripheral blood monocyte (Treg), total bilirubin, direct
bilirubin, albumin, Child-Pugh score, and results of bile bacterial culture.
Results: For the 694 patients involved in this study, 485 were male and 209 were female, with a mean age of 62 years (ranged
38-78 years). For the bile culture, 57.1% patients (396/649) were negative and 42.9% patients showed positive (298/694), and
then 342 strains of microorganism were identified. The risk factors of biliary system infection after PTBD included: age ($\chi 2 = 4.621$,
$P = 0.032$), site of obstruction ($\chi 2 = 17.450$, $P < 0.001$), drainage style ($\chi 2 = 14.452$, $P < 0.001$), tumor stage ($\chi 2 = 4.741$,
$P = 0.029$), hemoglobin ($\chi 2 = 3.914$, $P = 0.048$), Child-Pugh score ($\chi 2 = 5.491$, $P = 0.019$), phenotype of peripheral blood
monocyte (Treg) ($\chi 2 = 5.015$, $P = 0.025$), and results of bile bacterial culture ($\chi 2 = 65.381$, $P < 0.001$). Multivariate analysis
suggested that high- risk factors were drainage style, Child-Pugh score, and results of bile culture.
Conclusions: The risk factors of biliary infection after PTBD included: age, site of obstruction, drainage style, tumor stage, hemoglobin,
Child-Pugh score, phenotype of peripheral blood monocyte (Treg), and results of bile culture. It was further concluded that drainage
style, Child-Pugh score, and results of bile culture were independent risk factors.

PU-1739

去势抵抗性前列腺癌患者冷冻消融治疗后 中性粒细胞与淋巴细胞比值变化的意义

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目的探讨去势抵抗性前列腺癌（CRPC）患者氩氦冷冻消融术前外周血中性粒细胞与淋巴细胞比值（NLR）变化的意义。 方法收集并分析天津医科大学肿瘤医院 33 例行氩氦冷冻消融术的 CRPC 患者的临床病理资料。 将可能影响术后总生存期（OS）的因素：年龄、基线前列腺特异抗原（PSA）水平、血红蛋白、白细胞计数、血小板计数、白蛋白、碱性磷酸酶、NLR、血小板与淋巴细胞比值（PLR）、激素敏感时间、是否化疗、有无骨转移、Gleason 评分、ECOG 评分、PSA 有效率进行单因素和多因素分析。 结果本研究共 33 例患者，平均年龄为 69 岁（50~82 岁），中位生存期为 28 个月（6~55 个月），单因素分析显示：基线 PSA 水平、碱性磷酸酶、NLR、激素敏感时间、是否化疗、有无骨转移、Gleason 评分、PSA 有效率是影响 CRPC 患者冷冻消融术后 OS 的相关因素（P＜0.05）。 多因素分析显示：基线 PSA 水平（（P=0.003）、NLR（P=0.009）、Gleason 评分（P＜0.001）是 CRPC 患者冷冻消融术后 OS 的独立预测因子。 结论 NLR 可作为 CRPC 患者行氩氦冷冻消融术的预后指标，NLR 升高提示患者预后不良。

PU-1740
原发性肝癌 DEB-TACE 术后并发碘油肺脑栓塞 1 例及文献复习

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患者男，56 岁，肝 HCC 伴下腔静脉、肝静脉、右心房癌栓，行 DEB-TACE 术，术中患者无明显诱因下昏迷，急查头颅 MRI 示脑内弥漫性散在分布新发腔隙性梗死。
TACE 术碘油异位栓塞所致并发症报道逐渐增多[2]，主要有肺、胆囊、胰腺、肠道的异位栓塞，碘油异位脑栓塞罕见，碘油异位脑栓塞在行 TACE 术患者中发病率<0.01％。
TACE 术后并发脑栓塞或肺栓塞目前发生机制尚不十分清楚 ，肝癌由于肿瘤侵蚀及解剖关系等原因，易产生肝动静脉瘘，碘油通过肝血窦和肺毛细血管进入体循环，进而进入脑内，引起脑组织损伤。本例患者瘤体较大、存在肝静脉、下腔静脉、右心房癌栓，在术中已经发现部分造影剂经肝静脉进入下腔静脉，存在动静脉瘘，术后 CT 检查显示下腔静脉、右心房内均有碘油存在。 膈下动脉（inferiorphrenic artery ，IPA ）是最常见的肝脏侧枝供血动脉，如 IPA 成为肿瘤供血 ，通过 IPA 灌注碘油 ，更易进入肺循环 ，进一步进入体循环。
由于这类并发症较罕见，治疗尚无统一意见。TACE 术中或术后 ，若患者出现急性脑缺血症状，应考虑到 CLE 可能，CT 或 MRI 可明确诊断。对 TACE 治疗中造成碘油异位脑栓塞相关因素推测并未得到循证医学的证实， 但针对以上因素的处理应该能降低碘油异位脑栓塞风险。预防**方法** (1)控制 TACE 术中碘油用量， 一次碘油用量不超过 20 ml。(2)对肝动-静脉瘘者，尽量少用或不用碘油栓塞。（3）对巨大、血管丰富的肿瘤，栓塞后加用明胶海绵条栓塞肝动脉主干，避免血流冲刷使碘油漂移。（4）对于高风险患者，用栓塞微球等固体栓塞剂替代碘油。(5)有先心病如房缺、室缺等使用碘油要慎重， 一旦怀疑碘油异位脑栓塞发生，应及时对症处理。
对于 CLE 处理 ，多主张防止脑水肿、调血压 、改善脑循环 、营养支持，由于不是血栓引起的脑栓塞，不建议溶栓治疗。

PU-1741

联合运用 CT 和超声实时在胸膜或胸膜下结节经皮穿刺活检中的应用

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［**摘要**］ **目的** 探讨 CT 精确定位联合超声实时引导经皮穿刺胸膜及胸膜下结节活组织检查技术的价值。**方法** 17 例 SPPN 采用 CT 联合超声引导的方式进行经皮穿刺活检，另以 21 例单纯 CT 引导的胸膜及胸膜下小病灶活检作为对照。比较两组穿刺活检的手术时间、占机时间、CT 引导次数、患者吸收剂量、穿刺相关并发症。**结果** 与常规 CT 引导穿刺相比，CT 联合超声组的手术时间（11.7±4.9 min 与 26.3±9.0 min，t = 5.991，*P*<0.01）、占机时间（32.4±5.5 min 与 48.7±13.5 min，t = 4.673，*P*<0.01）明显缩短，CT 引导次数减少了（1.6±0.9 次与 3.8±1.3 次，t = 5.754，*P*<0.01），及患者平均总有效辐射剂量也显著降低（7.4±1.2 mSv 与 10.1±1.6mSv，t = 5.576，*P*<0.01）。**结论** CT 联合超声实时引导经皮穿刺胸膜及胸膜下结节有助于降低穿刺的技术难度，缩短手术时间和减少患者电离辐射剂量。

PU-1742

三明治介入方法治疗肺结核大咯血的探讨

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方法 肺结核患者 12 例，男 5 例，女 7 例，年龄 36 岁-73 岁，平均 49 岁，肺结核病史 3-5 年，急诊入院，咯血量 200ml-500ml。术前胸部 CT 检查，肺结核单个病灶 3 例，其余病例均为 2-3 个病灶；含有空洞 4 例，无开放性病灶。

采用 Seldinger 技术，在美国 GE LVC 数字血管减影机监视下，分别将导管鞘、导丝和导管送入血管内，选用胃左动脉导管，将导管头端置入出血动脉开口处行动脉造影，确定出血血管后，将 2.7F 微导管超选至出血动脉 2、3 级分支，再次造影证实出血血管，采用直径 300ｕｍ 明胶海绵颗粒与直径 2mm 弹簧圈栓塞材料，用夹心面包法栓塞，直至出血血管闭塞。分别寻找寄生营养血管：血管肋间动脉、支气管动脉、胸主动脉、腹主动脉、内乳动脉、甲状腺下动脉、腋动脉和膈动脉。根据肺结核分布部位、病灶数量，部分病例术前行 CTA 检查，寻找出血血管。对于术后再次咯血量较大者，仔细寻找遗漏的出血血管，再次选用夹心面包法栓塞，直至出血血管完全闭塞。术后给予垂体后叶素静脉滴注。

结果 显效 8 例，占 66%；无效 4 例，占 33%。无效 4 例，均未行 CTA 血管成像，导致术中遗漏部分出血血管。显效 8 例中，4 例术前行 CTA 血管成像，均一次手术成功止血。另外 4 例术前未行 CTA 血管成像，术后再次出血量 20ml-30ml。

3 例支气管动脉供血，1 例多支血管供血，分别是支气管动脉、膈动脉、内乳动脉、甲状腺下动脉、肋间动脉参与供血血管；4 例支气管动脉、肋间动脉、胸主动脉供血；4 例支气管动脉、肋间动脉和腹主动脉供血。

讨论：肺结核继发大咯血是结核分枝杆菌侵犯肺组织，形成干酪样坏死，气管内膜糜烂，侵蚀毛细血管壁，形成溃疡和假性动脉瘤破裂，引起大咯血。肺组织基本单位是肺小叶，内部包括肺动脉、支气管动脉，而肺动脉很少参与供血。

PU-1743

CT 引导下碘 125 放射性粒子植入治疗转移性肺癌的动态剂量验证研究

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目的 观察 CT 引导下碘 125 放射性粒子植入治疗转移性肺癌患者的剂量动态变化情况。**方法** 回顾性分析我科 2018 年 9 月至 2018 年 11 月接受 CT 引导下碘 125 放射性粒子植入治疗的 21 例转移性肺癌患者，分别于术后 0 月，2 月，4 月行 CT 扫描并输入三维治疗计划系统（brachytherapy treatment planning system，B-TPS）行动态剂量验证，记录靶病灶体积变化，若病灶体积缩小速度小于 20%，则视为存在剂量冷点再次行粒子植入。**结果** 21 例患者分为徒手穿刺植入组 12 例，3D 打印模板（3D-print template）辅助组 9 例。共进行粒子植入 26 次，其中徒手穿刺植入组有 2 例患者在术后 2 月再次行粒子植入 16.7%（2/12），有 3 例患者在术后 4 月再次行粒子植入 25.0%（3/12），3D 打印模板辅助组有 1 例患者在术后 2 月再次行粒子植入 11.1%（1/9），该组无患者在术后 4 个月再次粒子植入 0%（0/9）。**结论** 3D 模板辅助 CT 引导下碘 125 放射性粒子植入治疗转移性肺癌安全可行，在动态剂量验证随访 2 个半衰期后，模板辅助组较徒手植入组具有一定优势。

PU-1744

纳米刀在恶性肿瘤治疗中的研究进展

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射频、微波和冷冻消融技术已被越来越多的应用于恶性肿瘤的治疗，并且获得良好的效果。每一种消融方式都有其独特的原理，纳米刀（NanoKnife）作为一门新型微创消融技术，主要是非热能细胞杀伤机制，其基本原理是不可逆电穿孔，细胞膜上形成纳米级小孔导致细胞渗透性增加，细胞内环境平衡被打破，最终发生凋亡。本文对纳米刀的原理进行简单介绍，重点阐述其在治疗恶性肿瘤中的临床应用，为临床治疗提供参考。

PU-1745

术前区域动脉灌注 5-Fu 联合奥沙利铂对于结肠癌细胞增殖和凋亡的影响及其机制研究

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目的：研究术前区域动脉灌注 5-Fu 和奥沙利铂对于结肠癌细胞增殖和凋亡的影响。
方法：选择在本院确诊为结肠癌的 60 例患者，随机分为 5-Fu 联合奥沙利铂组（A 组）、5-Fu 组（B 组）、奥沙利铂组（C 组）、对照组（D 组），每组 15 例。分别于术前区域动脉灌注相应的药物。检测各组肿瘤组织中 Ki 标记指数（Ki67LI）、凋亡细胞数目、凋亡指数（AL）、凋亡基因含量。

结果： A 组肿瘤组织中 Ki 标记指数明显低于 B 组、C 组以及 D 组；A 组肿瘤组织中的凋亡细胞数目和凋亡指数明显低于 B 组、C 组以及 D 组；A 组肿瘤组织中凋亡基因 Caspase-3、Caspase-9、Fas、FasL 的蛋白质表达量均高于 B 组、C 组以及 D 组。以上差异均具有统计学意义。
结论： 术前区域动脉灌注 5-Fu 和奥沙利铂能够显著性抑制结肠癌肿瘤细胞的增殖，促进肿瘤细胞的凋亡，这种作用的可能机制是上调 Caspase-3、Caspase-9、Fas、FasL 的蛋白质表达量。

PU-1746
胃左动脉介入灌注化疗治疗晚期贲门癌的临床观察

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目的： 探讨经胃左动脉介入灌注化疗治疗晚期贲门癌的近期疗效和 2 年生存率。
方法： 将 2008 年 10 月至 2010 年 4 月间收治的 88 例晚期贲门癌患者随机单盲分为观察组(45 例)和对照组(43 例),观察组患者采用胃左动脉介入灌注 DCF 化疗方案,对照组患者采用常规静脉输注 DCF 化疗方案,两组均用药 3 个周期,记录化疗期间两组患者的不良反应,化疗结束后 1 个月内对比两组患者的近期疗效,并进行为期 2 年的随访观察,记录 2 年生存率。
结果： (1)化疗结束后 1 个月时,观察组患者完全缓解(CR)2 例,部分缓解(PR)25 例,总有效率为 60.0%(27/45);对照组完全缓解 0 例,部分缓解(PR)17 例,总有效率为 39.5%(17/43),差异有统计学意义(P0.05)。(2)观察组患者Ⅱ度以上骨髓抑制、肝功能损害、末梢神经损害和胃肠道反应比例低于对照组(28.9%和 51.2%、17.8%和 39.5%、15.6%和 34.9%、42.2%和 67.4%),差异均有统计学意义(均 P0.05);(3)观察组患者 2 年随访期内死亡者平均存活时间为(15.1±2.9)个月,长于对照组的(13.3±2.4)个月,差异有统计学意义(P0.05)。
结论： 结论经胃左动脉介入灌注化疗药物较全身化疗能有效提高近期疗效,降低不良反应,并延长患者生存时间。

PU-1747
结直肠癌根治术前应用肝动脉联合区域动脉灌注化疗对患者预后的影响

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目的： 观察Ⅲ期结直肠癌根治术患者术前行肝动脉联合区域动脉灌注化疗(HRAIC)对癌细胞复发、转移及患者生存时间的影响。
方法： 选择 2010 年 1 月—2012 年 12 月中国医科大学肿瘤医院医学影像科介入病区收治的行结直肠癌根治术患者 157 例作为研究对象,经随机数字表法分为研究组 77 例和对照组 80 例。研究组术前行 HRAIC 新辅助化疗,7 d 后行根治术,术后行 FOLFOX4-6 全身化疗;对照组直接进行根治术及化疗;比较 2 组治疗结束后肿瘤标志物、术后随访期间癌细胞转移或复发时间、转移率、复发率及患者生存率。
结果： 研究组治疗结束后 6 个月 CEA、CA19-9 水平均低于对照组[(13.4±5.5) μg/L vs.(20.7±7.2) μg/L,(30.5±9.5)U/ml vs.(37.2±12.1)U/ml,t=7.155,P0.01;t=3.867,P0.01]。研究组随访期内肿瘤转移或复发时间长于对照组[(29.1±6.5)月 vs.(24.4±6.1)月,t=2.169,P=0.041],肝转移发生率和总转移率低于对照组(9.1%vs.21.3%,11.7%vs.23.8%,x~2=4.479、3.895,P=0.034)。研究组治疗结束后 3 年、4 年生存

率均高于对照组(87.0%vs.78.8%,83.1%vs.73.8%,x~2=1.881、2.029,P=0.170、0.154);研究组累积无瘤生存率与累积生存率均显著高于对照组(86.5%vs.64.1%,82.4%vs.66.3%,x~2=159.130、84.336,P 均 0.01)。

结论： III期结直肠癌根治术前采用 HRAIC 治疗可显著降低术后肿瘤载荷与肝转移发生率,延长转移或复发时间,并表现出改善术后生存率的趋势。

PU-1748

Evaluation of interventional therapy effect of liver cancer by Twist vibe and T1-mapping technique

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Objective： this study by applying multiphase dynamic enhanced liver (Twist-vibe) joint T1mapping technology of interventional therapy of liver cancer before and after the lesions of interventional treatment ,and multiple artery before and after strengthening way and enhance T1 values were analyzed, and the quantitative analysis of the effects of hepatocellular carcinoma after interventional therapy, and in quantitative way to assess the curative effect of interventional treatment in patients with liver cancer and prognosis.**Methods：** select 20 cases of patients diagnosed with hepatocellular carcinoma, Dynamic enhanced liver scan was performed before and after each interventional therapy, arterial used in dynamic enhanced scan of Twist vibe technology, T1mapping scanning before and after enhancement was performed at the same time , take interest in the lesions of 30, for every lesions before and after strengthening methods and arterial enhancement in the T1 values were analyzed.**Results：** 1、There were differences in the enhancement methods and T1 values of the 30 interested lesions before and after interventional therapy. 2、The arterial enhancement rate after interventional therapy was significantly lower than that before treatment, and the T1 value after treatment was lower than that before treatment, showing a significant positive correlation, with a correlation coefficient of 0.76, which was statistically significant ($P < 0.05$).3、There was significant difference in T1 value before and after enhancement of the same lesion, and the increase rate of T1 value after treatment was significantly reduced compared with that before treatment.**Conclusion：** liver multi-phase dynamic enhancement technique (Twist vibe) combined with T1-mapping technique can quantitatively determine the activity of liver lesions before and after interventional therapy for liver cancer, and effectively evaluate the efficacy and prognosis of liver cancer interventional therapy.

PU-1749

乳果糖联合凝结芽孢杆菌活菌片治疗肝癌化疗栓塞术后便秘的疗效观察

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目的 探究乳果糖联合凝结芽孢杆菌活菌片治疗肝癌化疗栓塞术后便秘的疗效。**方法** 将 80 例肝癌化疗栓塞术后患者分组研究组、对照组。各 40 例，对照组给予单纯乳果糖；研究组给予乳果糖联合凝结芽孢杆菌活菌片，均治疗两周时间，观察治疗前后大便次数、大便性状，有无排便不尽、排便费力感觉、腹部不适等等。**结果** 研究组和对照组相比，总有效率、大便频率明显高于对照组，P＜0.05，差异具有统计学意义。并且研究组患者在治疗后未有排便不尽、腹胀或不适等新症状，优于对照组。**结论** 乳果糖联合凝结芽孢杆菌活菌片治疗肝癌化疗栓塞术后便秘效果明显，值得在临床上推广运用。

PU-1750
含钽纳米粒子的海藻酸钙自显影载药微球的实验研究

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目的：载药微球化疗栓塞术是肝癌介入治疗的一大进展，为解决栓塞过程中常规载药微球无法实时监控，术后复查不可见的问题，我们与华中科技大学生命科学与技术学院的研究团队前期研究中，研制出了一种负载钽纳米粒子的海藻酸钙微球（Ta@CaAlg），该微球具有实时显影的优点，集化疗、栓塞、显影三种功能于一身。此部分研究为探究 Ta@CaAlg 微球的安全性、体内药物释放特性及疗效。
方法：体外表征实验研究载多柔比星（Doxorubicin，Dox）前后的粒径、显影性；以 BEL-7402 肝癌细胞行细胞毒性实验，以小鼠红细胞行溶血性实验，以探究 Ta@CaAlg 微球的生物学相容性；然后，每 1ml 微球载 50mg Dox，在新西兰大白兔 VX2 肝癌模型中研究 DEB-TACE 后肿瘤局部与外周血中的浓度变化，以确定 Ta@CaAlg 的药物释放特性；最后，在前述动物模型中，分为 A 组（Ta@CaAlg 微球栓塞组）、B 组（Ta&Dox@CaAlg 微球栓塞组），C 组（生理盐水假栓塞组） 三组以比较 7 天的肿瘤生长率，以研究该微球的疗效。
结果：表征实验证实 Ta@CaAlg 微球载药前后的粒径分别为 259±5μm 与 257±4μm，CT 值分别为 3070.0±0.6HU 与 3070.8±0.5HU ；体外细胞实验显示该微球良好生物相容性——细胞毒性与溶血性均在安全范围内；明确 Ta@CaAlg 微球在动物体内的药物释放特征——该微球可载 Dox 在肿瘤组织内缓释至少 3 天时间，外周血内 Dox 5 分钟以后不可测；此外， A、B 两组 7 天肿瘤生长率明显小于生理盐水组，且 A 组对肿瘤抑制效果优于 B 组(P<0.05)；HE 染色结果显示 A、B 两组可见大片凝固性坏死区，且 B 相较于 A 组的残存肿瘤细胞更少。
结论：表征实验、细胞实验及动物实验证实 Ta@CaAlg 微球可自显影、粒径均一、安全、有效、可实现选择性肿瘤内高浓度缓释。

PU-1751
肝动脉内化疗栓塞术联合射频消融术治疗中期原发性肝癌的疗效观察

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目的探讨肝动脉化疗栓塞术（transcatheter arterial chemoembolization，TACE）联合射频消融术（radiofrequency ablation，RFA）治疗原发性肝癌患者的安全性及疗效。**方法** 回顾分析 46

例原发性肝癌患者临床资料，观察联合治疗前后甲胎蛋白水平变化、治疗前后肿瘤体积变化及患者生存期。**结果** TACE 联合 RFA 治疗患者肿瘤的完全坏死率为 84.8%。联合治疗术前、术后 12 月甲胎蛋白前后比较差异有统计学意义（Z = -4.197，P <0.001）。术前瘤体体积 6.81±3.73cm³，术后瘤体体积 5.52±2.93cm³，治疗前后比较差异有统计学意义（t = -4.142，P <0.001）。患者 1 年生存率为 95.65%。不良反应多为术后短时间内发热、局部疼痛及肝功能一过性异常，总体安全性高，患者可耐受。**结论** 采取 TACE 联合 RFA 治疗原发性肝癌患者安全、有效，联合治疗的近期疗效影响患者总体生存时间。

PU-1752

1 例肺隔离症介入栓塞治疗心得体会

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目的 探讨肺隔离症介入治疗疗效差的原因分析。**方法** 1 例肺隔离症患者采用 Seldinger 技术行选择性动脉栓塞术。**结果** 治疗后复查进行疗效差。**结论** 超选择性动脉栓塞介入治疗是治疗肺隔离症的一种新的、 有效的方法，但治疗效果差的原因较多，对疗效差的原因进行分析。

PU-1753

介入护理在脑血管介入治疗患者中的应用效果及对并发症的影响探析

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摘要：目的 研究脑血管介入治疗护理干预措施及对并发症的影响。**方法** 抽取入医院行脑血管介入治疗患者 80 例作为研究对象，采用抽签法将患者分为两组，对照组行常规护理，观察组在对照组基础上予以介入治疗围手术期护理干预，观察两组患者的手术状况，并记录并发症发生率。**结果** 观察组手术成功率 97.5%较对照组 85.0%高，对比差异显著（P<0.05）；观察组术后脑血管痉挛 1 例，穿刺部位出血 2 例，并发症发生率 7.5%，对照组术后脑血管痉挛 3 例，脑灌注综合征 1 例，下肢静脉血栓 2 例，穿刺部位出血 4 例，并发症发生率 25.0%，两组对比差异显著，有统计学意义（P<0.05）。**结论** 加强对脑血管介入治疗的护理，可提高手术成功率，改善预后。

PU-1754

恶性梗阻性黄疸介入治疗并发症的临床研究

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回顾对比研究不同的介入引流方式治疗恶性梗阻性黄疸并发症发生的原因和处理措施。**方法** 收集研究恶性梗阻性黄疸病例 182 例，男性 106 例，女性 76 例，年龄 23~90 岁，平均 63.6 岁。其中胆管癌 68 例，胰头癌 46 例，壶腹部肿瘤 27 例，转移癌 21 例，胆囊癌 13 例，原发性肝癌 7 例。所有患者均有 B 超、CT、MRI（2 种以上检查）及肿瘤标志物检查结合临床确诊。对 182 例恶性梗

阻性黄疸患者分为 3 组：PTCD 组（123 例）、支架组（21 例）和 PTCD+支架组（38 例）术中、术后近期并发症的发生率、发生原因、预防及处理进行分析。**结果** 采用经皮经肝穿刺行 PTCD 或胆道支架置入术，均一次置入成功，成功率 100%，共置入胆道支架 61 枚，胆道引流管 172 根。本组术中、术后近期发生并发症 33 例，发生率 18.1%，3 组中 PTCD 组并发症较高，有 23 例，发生率 12.6%，其中引流管移位 5 例；阻塞 2 例；脱出 3 例；逆行感染 2 例；出血 3 例；胆漏 2 例；肝肾功能衰竭 4 例。支架组及 PTCD+支架组近期并发症各 5 例，发生率均为 2.7%。支架组近期严重的并发症有 3 例：1 例消化道出血，1 例腹腔内出血，1 例支架完全闭塞再次出现梗阻性黄疸。而 PTCD+支架组无严重的并发症发生。**结论** 恶性梗阻性黄疸的介入姑息性减黄减压治疗，是一种安全、有效的方法。3 组引流方式中 PTCD+支架引流方式并发症发生率最低，且无严重的并发症发生，是较理想的引流方式。同时正确选择适应症、规范操作技术可以减少并发症的发生。

PU-1755
原发性肝癌伴动静脉瘘的介入治疗策略及疗效评价

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[摘要] 目的 探讨原发性肝癌合并动静脉瘘的介入栓塞方法及疗效。 方法 回顾性分析 36 例经数字血管造影检查明确合并动静脉瘘患者的临床资料及血管造影表现，根据瘘口类型、位置、分流情况采取相应的栓塞方法，观察其疗效。 结果 36 例中 AVS 周围、肝段型 25 例，中央型 8 例，AHVF3 例，低、中等流量 30 例，高流量 6 例；第一次栓塞有 26 例一次性栓塞成功，9 例栓塞不完全，1 例失败，二次治疗有 15 例瘘口开通，8 例栓塞完全，7 例栓塞不完全；CT 复查示肿瘤内碘油沉积大于 50%的 28 例，小于 50%的 7 例，无碘油一例；肿瘤缩小 22 例，缩小不明显 9 例，增大 5 例，肿瘤治疗有效率 86.1%；无严重并发症发生。 结论 对于合并肝动静脉瘘的原发性肝癌患者，对瘘口栓塞是安全有效的，同时保证药物在肿瘤组织中的有效灌注和碘油在肿瘤组织内的良好沉积。

PU-1756
IQon 光谱 CT 多参数成像在肝细胞癌肝动脉化疗栓塞（TACE）术后疗效评估的初步研究

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目的 探讨 IQon 光谱 CT 评估肝细胞癌 TACE 术后疗效的临床应用价值。**方法** 回顾分析 2018 年 11 月至 2019 年 6 月在我院就诊的肝细胞癌病人的资料，所有病例均符合《原发性肝细胞癌经导管肝动脉化疗栓塞治疗技术操作规范专家共识》并接受 TACE 治疗，治疗后 1-3 个月复查 IQon 光谱 CT 双期增强检查。以混合能量图像代替常规 CT 检查，以光谱不同单能级 60-120Kev 每间隔 10Kev 选取图像，通过统计学分析软件采用 t 检验分析混合能量图像与不同单能级图像对比噪声比（CNR），当 P＜0.05 认为有统计学意义。通过 IQon 光谱 CT 双期增强扫描与常规 CT 增强图像对比，判断栓塞后的肿瘤的复发及残余。以 DSA 作为金标准，比较常规 CT 与光谱 CT 多参数诊断的准确性、敏感性、特异性、阳性预测值及阴性预测值，采用 SPSS21 软件 X^2 检验统计分析，P＜0.05 具有统计学意义。**结果** 混合能量图像（QC）CNR 2.06±1.68，单能级 60Kev，70 Kev，80 Kev，90 Kev，100 Kev，110 Kev，120Kev 图像 CNR 分别为 3.74±2.38，2.53±1.81，1.75±1.72，1.51±1.44，1.42±1.11，1.42±1.02，QC 与单能级采用配对 t 检验，60Kev（P=0.00），70 Kev

（P=0.01），90 Kev（P=0.04），其余无统计学差异。QC 诊断准确性 60%，敏感性 60%，特异性 60%，预测阳性率 75%，预测阴性率 42.9%。光谱多参数成像诊断病灶准确性 86.7%，敏感性 90%，特异性 80%，预测阳性率 90%，预测阴性率 80%。 **结论** 肝癌 TACE 术后，IQone 光谱 CT 单能级 60Kev 图像能够清晰显示病灶及碘油沉积情况，边缘清晰，对比度较高，提高病灶检出率。多参数光谱 CT 可提高肝癌 TACE 术后病灶残余及复发的准确诊断能力，具有较高的应用价值。

PU-1757
CalliSpheres 治疗巨块型肝癌短期的有效性及安全性

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【摘要】目的 探讨 Callispheres 经导管动脉化疗栓塞（DEB-TACE）治疗巨块型肝癌的疗效及安全性。**方法** 本研究共纳入巨块型肝癌患者 16 例，均使用 CalliSpheres 载药微球单次或多次进行治疗，根据改良实体肿瘤评价标准评估临床疗效，并回顾性分析白蛋白、总胆红素等实验室指标及相关术后并发症。**结果** 16 例患者的中位随访时间为 4 个月，术后 1 个月的客观缓解率（ORR）为 93.75%，完全缓解率（CR）为 6.25%，部分缓解率（PR）为 87.5%，疾病进展（PD）为 6.25%，其中 8 例患者多次接受 DEB-TACE 治疗，完全缓解率（CR）为 50%，部分缓解率（PR）均为 50%，疗效优于单次 DEB-TACE 治疗患者，差异有统计学意义（P<0.05）。术后 3 天、7 天总胆红素、ALT、AST 水平升高，白蛋白水平、γ-谷氨酰氨基转移酶下降，术后 1 个月肝功能可恢复至术前水平。术后无严重不良反应事件发生，并发症以腹痛、发热为主。**结论** CalliSpheres 载药微球为巨块型肝癌患者提供了一种短期的安全有效的治疗方法，但仍需大样本、多中心的长期随访进一步验证其获益。

PU-1758
CalliSpheres 联合阿帕替尼治疗肝癌的安全性与有效性

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目的 探讨 Callispheres 载药微球联合阿帕替尼治疗肝癌的安全性与有效性。**方法** 回顾性分析昆明医科大学第一附属医院 2017 年 7 月至 2018 年 10 月采用 DEB-TACE 联合阿帕替尼治疗的 37 名肝癌患者，临床疗效根据改良实体肿瘤评价标准进行评价，并采用不良事件通用术语标准评估 DEB-TACE 术后并发症与口服阿帕替尼的副反应。**结果** 患者接受治疗后 1 个月及 3 个月的总体有效率（ORR）分别为 83.7%、80.8%。其中位无进展生存期（mPFS）为 6.1 个月，中位的总体生存期（mOS）为 13.8 个月。DEB-TACE 术后不良反应主要有发热、腹痛、肝功能受损等；阿帕替尼的副作用主要为手足综合征、皮肤色素沉着症、继发性高血压等。所有不良反应均未超过 3 级且可通过对症支持治疗或减少阿帕替尼的服药剂量进行控制。**结论** CalliSpheres 载药微球联合阿帕替尼为肝癌患者提供一种效益较高的治疗方案，且不良反应轻，易耐受，值得临床进一步推广应用。

PU-1759
正常通气肺组织射频与微波消融术后早期 CT 与病理的对应性研究

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目的 正常通气猪肺模型射频及微波消融术后，观察病理与 CT 表现的对应关系,以指导临床应用。**方法** 6 只健康家猪，每侧肺各布置两个消融区，在 CT 引导下左侧行经皮射频消融，右侧行经皮微波消融。消融 10 分钟后采集消融灶 1mm 层厚 CT 图像，5mm 重建。将肺组织平行 CT 扫描层面 5mm 层厚切片。观察并比较消融灶在 CT 与大体病理的范围及细节表现。**结果** CT 图像与大体病理上射频消融灶最大纵径 L 分别为（4.23±0.35）cm，（4.19±0.47）cm；最大横径 D 分别为（3.08±0.19）cm，（2.97±0.30）cm。CT 图像与大体病理上微波消融区域最大纵径 L 分别为（5.34±0.39）cm，（5.11±0.38）cm；最大横径 D 分别为（3.83±0.44）cm，（3.39±0.56）cm。均无显著差异（$P>0.05$）。**结论** 射频及微波消融灶在大体病理和 CT 图像上具有较好的对应性。应用 CT 可以对消融效果进行早期疗效评估。

PU-1760

食管支架置入术介入护理的效果分析

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【摘要】 **目的** 探究讨论在临床上开展食管支架置入术介入护理可获得的实际效果。方法:选取 52 例在 2016 年 1 月——2018 年 1 月被本院接收并展开相关手术治疗的食管癌患者。通过完全随机方式将其平均分为观察组与对照组，护理人员对对照组提供常规的护理措施，在对照组的基础上对观察组增加整体性护理服务内容，最后比较两组患者中出现不良反应的整体情况以及对护理工作人员服务的满意水平。结果:展开护理后，观察组患者中发生不良反应情况的例数占总数的 7.7%，显著低于对照组患者中发生不良反应情况的例数占总数的 34.6%，差异具有统计学意义(P<0.05);观察组患者对护理人员工作的满意程度达到 100.0%，显著高于对照组患者对护理工作的满意程度 76.9%，差异有统计学意义 (P<0.05)。**结论** 在临床上对接受过食管癌食管支架植入术的患者来说，通过进行整体性介入护理可有效帮助提高其治疗效果，减少不良反应发生的可能性，同时还可提高患者对护理人员工作的满意水平，具有临床广泛应用价值。

PU-1761

短时间隔 TACE-RFA 序贯治疗方案治疗中晚期肝癌的疗效及安全性研究

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探索短时间隔 TACE-RFA 序贯治疗中晚期肝癌的疗效、安全性及其危险因素。**方法** 回顾性分析 2010 年 3 月至 2019 年 1 月期间在我院就诊 117 例中晚期肝癌患者的临床资料。所有入组患者均行 TACE-RFA 序贯治疗，根据 TACE 与 RFA 治疗时间间隔的长短，分为短时间隔（≤7 天）组（S 组，61 例）和长时间隔（＞7 天）组（L 组，56 例）2 组。比较两组的肿瘤局部控制率、并发症发生率的差异，Kaplan-Meier 生存曲线计算中位生存时间（OS）、中位无进展时间（PFS）和生存率，并分析影响中晚期肝癌预后的危险因素。**结果** S 组的总有效率为 72.13%（44/61），L 组总有效率

为 41.07%（23/56），S 组的总有效率显著高于 L 组（χ^2=11.50，*P*=0.00）；S 组的 PFS 中位值为 14.9 个月，L 组的 PFS 中位值为 9.1 个月，S 组的 PFS 显著长于 L 组（χ^2=5.96，*P*=0.01）；S 组的 OS 中位值为 34.7 个月，L 组 OS 中位值为 20.3 个月，S 组的 OS 显著长于 L 组（χ^2=6.66，*P*=0.01），Cox 多因素分析显示肿瘤大小（HR=2.42，95%*CI*：1.26-3.69，*P*=0.001）、肝硬化（HR=2.04，95%*CI*：1.27-3.26，*P*=0.003）、时间间隔（HR=0.44，95%*CI*：0.27-0.71，*P*=0.001）、AST（HR=1.71，95%*CI*：1.05-2.77，*P*=0.029）是影响 TACE-RFA 序贯治疗方案治疗中晚期肝癌疗效的独立危险因素。两组患者术后并发症发生率均无显著差异（*P*>0.05）。**结论** 短时间隔显著提高 TACE-RFA 序贯治疗中晚期肝癌的疗效，是中晚期肝癌患者预后的保护因素；短时间隔 TACE-RFA 序贯治疗是一种安全、有效的中晚期肝癌治疗方案。

PU-1762
基于多模态影像精准引导的肝门胆管癌性梗阻射频消融联合内外引流术

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目的 为提高肝门胆管癌介入穿刺和引流术的安全性和有效性，应用新的多模态 3D+CT 和超声影像精准引导技术，实施肝门胆管恶性梗阻腔内射频消融联合内外引流。**方法** 1.应用专门计算机影像软件（YORKTAL，深圳旭东数字医学影像技术有限公司），将中上腹部 CT 平扫+增强 DCOM 序列图像进行 3D+多维重建，制定精细的穿刺路径和综合介入治疗计划；2.结合术中高清晰彩色超声和多普勒显示技术，避开重要血管等解剖结构精准定位，应用 PTCD 细针(22G) Seldinger 法安全穿刺目标胆管，然后逐渐扩张穿刺通道，置入适当工作鞘管、射频消融电极以及引流导管，完成经皮经肝胆道微创手术（Percutaneous transhepatic cholangio-minimally invasive surgery，PTCMIS）；3.在超声、X 线透视或 CT 等观察下，进行射频消融和胆道造影等诊疗操作。**结果** 术前 3D+CT 三维重建能够精确显示肝门胆管癌原发病变及周围淋巴结情况，显示肝门胆管与门静脉、左右肝动脉、下腔静脉以及胆囊、胃十二指肠、胰腺等重要解剖结构及其相互关系，显示肿瘤三维形态和重要解剖变异，便于制定精准的介入穿刺路径和射频消融计划。术中通过超声实时显像结合多普勒等模式，精确引导穿刺和介入手术操作，实时观察消融前后病变回声变化和胆管引流冲洗情况。术中定位精准，操作顺利，无明显出血和重要解剖损伤。**结论** 采取多模态影像精准引导并将 Seldinger 血管介入穿刺技术应用于胆管微创穿刺和介入手术，明显提高了肝门胆管恶性梗阻射频消融和内外引流术的安全性和有效性。

PU-1763
一例宫颈癌介入术后并发会阴部破溃的护理体会

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目的 宫颈癌患者介入手术后，出现相关并发症的病例并不少见，但本例患者宫颈癌介入手术治疗术后出现栓塞所致会阴皮肤部坏死破溃，因会阴部位置特殊且患者为开放性创面易受到排便的感染，靠近阴道内侧壁的伤口无法用药，易造成泌尿系及全身感染，影响创面肉芽生长，或因感染而造成患者创面形成假性愈合从而影响患者疾病恢复甚至危及患者生命。**方法** 通过评估创面情况根据患者体质的特殊性选择卫生棉条将敷料及药物填充至患者阴道，改善患者阴道内创面肉芽生长环

境，减轻分泌物，促进创面愈合。配合全身抗感染治疗及病人的常规护理，使患者伤口得以愈合，**结果** 在此方法下解决患者阴道内伤口护理问题，减轻了患者疼痛感受，使患者水肿程度改善、分泌物量减少、创面愈合时间缩短，患者痛苦减轻，提高了患者的生活质量。

PU-1764

导管肝动脉灌注化疗栓塞在肝癌介入术后的护理

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【摘要】肝癌作为危害人类健康最严重的疾病之一，他给人类社会带来极大的痛苦和危害。肝癌导管肝动脉关注化疗栓塞治疗是目前减少中晚期肝癌发病率的重要治疗手段，对肝癌介入术后采取综合护理干预，可有效减少患者对癌症的恐惧，重拾生命自信心，并且能减少术后并发症，提高患者的生存质量，提高介入护理质量，对完善肝癌介入术有着重要意义。

PU-1765

原发性肝癌 TACE 术后并发症的观察与护理

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【目的】探讨肝动脉化疗栓塞治疗原发性肝癌术后并发症。 【方法】笔者收集整理 60 例肝动脉化疗栓塞（TACE）治疗原发性肝癌患者资料， 分析患者术后并发症发生情况。【结果】60 例患者在术后共有 22 例患者出现相关并发症。【结论】原发性肝癌患者 TACE 术治疗患者需进行护理干预，可降低患者并发症，提升自我护理能力，有临床应用价值。

PU-1766

原发性肝癌肝行 TACE 术后严重并发症的观察与护理

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【摘要】**目的** 总结原发性肝癌行经导管肝动脉化疗栓塞术（transcatheter arterial chemoembolization，TACE）严重并发症的观察与护理。**方法** 从 2016 年 6 月至 2018 年 6 月两年时间内，总结在两年的时间内行 TACE 的 182 例肝癌患者中在介入手术后发生严重并发症的原因，认真分析，最后制定相应的护理对策。**结果** 在统计的手术患者中，有 7 例患者发生严重并发症，发生的几率约 3.85%（7/182），其中急性肝功能衰竭 2 例、肺栓塞 1 例、急性上消化道出血 2 例、 肝脓肿 1 例、肺栓塞 1 例。**结论** TACE 术是非手术治疗中首选方法的治疗方法，也是一种微创、安全的治疗方法，同时也存在一定的风险，围手术期的密切观察与预见性的护理可降低术后严重并发症的发生率，促进患者康复。

PU-1767

放射性粒子植入在恶性肿瘤中的临床应用总结

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目的 探讨放射性粒子 ^{125}I 植入在治疗恶性肿瘤的疗效。**方法** 23 无法接受手术、化疗的恶性肿瘤中晚期患者。17 例患者过粒子植入计系统制定治疗方案，计算出有效等计量区域应植入的粒子数量，在 CT 引导下经皮穿刺永久性植入放射性粒子 ^{125}I 在肿瘤内，6 例患者通过粒子支架置入治疗恶性肿瘤。应用 VAS 评分评价治疗前后患者疼痛情况，运用 CT 影像检查评价治疗前后肿瘤大小变化，KPS 评分评价患者治疗前后身体功能状态。**结果** 经 I125 粒子植入治疗的患者术后 1 周，局部疼痛明显减轻，减少或停用镇静药、止痛药。经 I125 粒子植入患者术后 1 月 KPS 评分明显升高，患者生活质量得到有效改善。经 I125 粒子植入患者术后 1 月复查肿瘤部位 CT，肿瘤大小有缩小改变。

PU-1768

肝癌 TACE 后肠道微生态改变的实验观察

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目的 利用 VX2 肝癌模型兔，分析经动脉化疗栓塞术（TACE）后肝功能，血清内毒素、TOLL 样受体 4 及肠道通透性的改变。方法 新西兰兔 28 只，随机分为假手术组、TACE 术后 1 d 组、5 d 组、10 d 组。 分别于 TACE 术前 1d、术后 1 d、术后 5 d，术后 10 d 采集外周血，通过 ELISA 法定量测定血清 ALT、二胺氧化酶（diamine oxidase，DAO），D 乳酸（D-lactate，D-LA ），TOLL 样受体 4 (Toll-like receptor 4，TLR4),内毒素（lipopolysaccharides, LPS）变化情况以及其相关性分析，并于相应时间窗对动物处死，采集病理标本。结果 与正常对照组比较,VX2 肝癌模型兔血 ALT、DAO、D-LA、LPS，TLR4 均显著性增高(P ＜0.05),并且术后 1 d 相对于术前增加，术后 5 d 与术后 10 d 降低，术后 10 d 组低于术前 (P＜0.05);对 ALT 与 DAO，DAO 与 LPS，ALT 与 LPS 进行相关性分析，r 分别为 0.43,0.83,0.64，（P＜0.05）。结论 VX2 肝癌模型兔在行 TACE 治疗后，随着肿瘤的控制，肝肠循环的改善，能改善肠道屏障功能，能降低血 LPS 含量，下调 TLR4 水平，改善肿瘤治疗的预后。

PU-1769

肝动脉化疗栓塞治疗原发性肝癌合并门脉癌栓的疗效及影响因素分析

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目的 探讨肝动脉化疗栓塞治疗肝细胞肝癌合并门脉癌栓的疗效及影响疗效的因素；材料和方法 回顾性分析 2009 年 1 月-2015 年 12 月在我院初诊为肝细胞肝癌合并门脉癌栓患者的临床资料，其中 475 例接受 Transarterial Chemoembolization（TACE）治疗，210 例接受支持治疗，观察比较两组患者生存时间，采用 COX 模型回归分析影响其生存的因素。结果 本研究纳入 685 例患者中位生存时间为 6.0 m（1.3-58.6 m），其中 TACE 组患者的中位生存时间为 7.0 m，支持治疗

组患者的中位生存时间为 5.2 m，TACE 组和支持治疗组患者 6 个月、12 个月及 24 个月的累计生存率分别为 57%、27%、12%和 38%、13%、3%；TACE 组患者生存时间长于支持治疗组（P=0.002）。单因素分析显示 Child-Pugh 分级、肿瘤大小、GGT 水平、癌栓分级可能是影响疗效的因素，经过多元 COX 风险比例模型分析出 Child-pugh 分级和癌栓分级是影响该组患者的独立预后因素；进一步分析发现 I-II 级癌栓患者接受 TACE 术治疗后生存时间优于支持治疗（7.8 m vs 5.4 m，P=0.001）,但 III-IV 级癌栓患者是否接受 TACE 治疗的生存时间并无明显差异（5.2 m vs 4.6 m，P=0.662）、结论　肝癌伴门静脉癌栓行 TACE 术是有效的，影响其主要因素是 Child-pugh 分级和癌栓分级， 但对于 III、IV 级癌栓患者行 TACE 治疗的疗效还需进一步证实。

PU-1770
原发性肝癌患者 TACE 后生存时间影响因素分析

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目的 探讨不能手术切除中晚期原发性肝癌患者行经皮肝动脉化疗栓塞术（transcatheter hepatic arterial chemoembolization，TACE）为主要手段的综合介入治疗后生存时间影响因素。方法 回顾自 2007 年 1 月至 2013 年 12 月在我科接受 TACE 治疗中晚期肝癌患者，有较完整病历资料和随访记录者 382 例，生存时间超过三年以上中晚期原发性肝患者共 89 例，对其一般病史情况及介入治疗情况进行回顾性分析，遴选相关变量进行单因素和多因素回归分析，从而得出介入治疗后患者生存时间影响因素。结果 所有患者中生存时间超过 3 年 89 例（23.3%），其中四年以上 73 例（19.1%），五年以上 31 例(8.1%)，7 年以上 14 例(3.66%)，10 年以上 1 例（0.26%）。年龄、乙肝肝硬化背景、肿瘤分期、分型、大小、个数、肝功能分级、AFP 值、门静脉有无癌栓、有无合并其他疾病、及有无远处转移对原发性肝癌行介入治疗患者生存时间有一定影响。结论 原发性肝癌患者行介入治疗效果是肯定的，其术后生存时间受乙肝肝硬化背景、肿瘤分期、年龄等多种因素影响，合理把握适应证，根据患者不同情况制定个体化的治疗方案，定期复查，及时处理并发症等可有效延长患者生存时间。

PU-1771
个性化护理模式在老年肿瘤患者放射治疗护理中应用的效果评价

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摘要：**目的**　探讨个性化护理模式在老年肿瘤患者放射治疗护理中的应用效果。**方法**　在我院 2016 年 2 月-2019 年 2 月间收治的接受放射治疗的老年肿瘤患者中选取 84 例作为研究对象，按照患者的入院编号奇偶性对患者进行治疗分组，其中编号为奇数的 42 例划入参照组，编号为偶数 42 例则划入研究组，参照组患者接受常规护理，研究组患者则接受个性化护理，比较两种护理模式对患者心理状态及护理满意度的影响。**结果**　对两组患者护理前后的 SDS、SAS 评分进行对比分析，可以发现护理前两组患者的 SDS、SAS 评分并不存在显著差异(P＞0.05)，护理后均有所改善，且研究组患者的各项评分均明显优于参照组(P＜0.05)；对两组患者展开护理满意度评价，发现研究组患者的护理满意度高达 97.62%，与参照组患者的 76.19%相比存在显著优势(P＜0.05)。**结论**　由以上研究结果可以看出，个性化护理模式在老年肿瘤患者放射治疗护理中应用有着较为理想的效果，能够对患者的心理状态起到改善作用，且患者的护理满意度较高，能够有效改善护患之间的关系，患者在住院期间的舒适程度得到了大幅提升，是一种值得临床推广与应用的护理模式。

PU-1772

小儿肝海绵状血管瘤的介入治疗的临床探讨

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目的 探讨经肝动脉超选介入栓塞术在治疗小儿肝海绵状血管瘤中的疗效和安全性。**方法** 选取我院 2016 年 1 月-2018 年 8 月住院经 MR 诊断明确的肝海绵状血管瘤 22 例，年龄最小 15 天，最大 3 岁，其中合并 K-M 综合征的患儿 2 例，所有患儿采用微导管进入肝动脉造影，明确血管瘤供血动脉后超选成功后注入博莱霉素-碘化油+PVA 颗粒-弹簧圈序贯栓塞治疗，术后造影以肝内血管瘤无染色为标准。在术后 1、3、12 个月随访进行 CT 检查以评价疗效。**结果** 小儿血管瘤介入手术治疗成功率 100%，1 例患儿首次介入治疗无法超选进入血管瘤供血动脉，择期后第 2 次成功行了介入栓塞治疗，在术后第 1、3、12 个月复查 CT 提示肝内瘤体缩小率在 50%以上者为 19 例，瘤体缩小 20%-30%为 2 例，效果不明显的 1 例。患者术后有轻度肝功能异常，主要表现在转氨酶升高，对症处理后恢复正常，1 例 15 天患儿在术后 3 月发现右侧皮肤温度低，彩超提示穿刺的右侧股动脉处狭窄，但右下肢远端血流未见明显异常，余患者无严重并发症。患者治疗前的临床症状得到好转或消失。**结论** 经肝动脉行小儿肝内海绵状血管瘤序贯栓塞治疗安全、有效，并发症少，绝大部分患儿可以得到治愈，有利于临床推广应用。

PU-1773

兔 VX2 肝癌 TAE 术后癌旁肝组织氧化应激及细胞凋亡的研究兔 VX2 肝癌 TAE 术后癌旁肝组织氧化应激及细胞凋亡的研究

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目的 探讨兔 VX2 肝癌模型经导管动脉栓塞（TAE）治疗后癌旁肝组织中氧化应激及细胞凋亡的情况，研究其在肝组织损伤中的作用及其机制。**方法** 建立兔 VX2 肝癌模型 37 只，并随机分为 3 个组，即对照组 12 只，造影组 12 只，TAE 组 13 只，其中 TAE 组行经导管肝动脉栓塞治疗，检测各组术前及 TAE 术后 3 天肝功能指标 ALT、AST、TBI、ALB、PT。术后 3 天后处死动物，分别选取各组癌旁组织制成石蜡切片，采用生化酶学法检测超氧化物歧化酶（SOD）指标、谷胱甘肽过氧化物酶（GSH-PX）、过氧化氢酶（CAT），采用 Tunel 法检测肝细胞凋亡情况，计算凋亡指数。**结果** 术后 TAE 组 ALT、AST、TBI 升高，ALB 降低、PT 延长，与对照组和造影组相比差异显著（P＜0.05）；对照组、造影组和 TAE 组中 SOD 的浓度分别为 45.48±2.04(ng/L)、46.18±2.45(ng/L)、21.81±2.14(ng/L)，CAT 的浓度分别为 3.09±0.57(ng/L)、3.02±0.48(ng/L)、1.15±0.25(ng/L)；GSH-PX 的浓度分别为 262.47±6.96 (ng/L)、256.53±5.06(ng/L)、187.68±9.67 (ng/L)；与对照组和造影组相比，TAE 组的抗氧化指标 SOD、CAT、GSH-PX 的活力明显降低，其改变有统计学意义（P＜0.05）；Tunel 法检测肝细胞凋亡情况，在对照组、造影组和 TAE 组中的凋亡指数分别是 2.20±1.897%、25.2±1.673%、64.2±2.767%，与对照组和造影组相比，TAE 组凋亡细胞数在癌旁组织中的分布有显著增加，改变有统计学意义（ P＜0.05)。**结论** TAE 术后肝功能下降，可能与癌旁肝组织抗氧化指标活性明显降低，发生氧化应激，肝细胞凋亡增多，导致肝功能受到损伤有关。

PU-1774
CalliSpheres®载药微球在介入治疗中央型肺癌的临床应用

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目的探讨 CalliSpheres®载药栓塞微球经支气管动脉化疗栓塞术中有效性和安全性。**方法** 106 例中央型肺癌患者，所有患者均经病理证实。随机分成 3 组，载药微球栓塞组、灌注化疗组和静脉化疗组，分别为 22 例、42 例和 42 例。行支气管动脉及其他供血动脉造影确认肿瘤供血动脉后，再用同轴微导管技术将微导管超选择插至肿瘤供血动脉，依血供情况分别经每一条供血动脉灌注化疗药物，载药微球组在此基础上经微导管栓塞上述每一条供血动脉；常规组通过静脉滴注化疗药物。**结果**观察组有效率为 86.4%，对照组有效率为 54.8%，常规组有效率为 28.6%，两两之间有效率均具有统计学意义（P＜0.05）。随访 2~24 个月，观察组 1 例死亡，对照组 9 例死亡，常规组 20 例死亡。**结论** CalliSpheres®载药栓塞微球在介入治疗中央型肺癌中，其近期临床疗效优于单纯支气管动脉灌注化疗和全身静脉化疗，可显著提高近期疗效，远期效果有待进一步观察。

PU-1775
PPAR-α 激动剂 WY14643 对肝癌 TAE 术后癌旁肝组织氧化应激的作用研究

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目的 探讨 PPAR-α 激动剂 WY14643 对癌旁肝组织氧化应激损伤的作用，研究其在肝癌 TAE 术后对肝功能的保护机制。**方法** 建立兔 VX2 肝癌模型 15 只，并随机分为 3 个组，即对照组 5 只，TAE 模型组 5 只，打药组 5 只，其中 TAE 模型组行经导管肝动脉栓塞治疗，打药组连续三天给药 WY14643 1mg/(kg·d)后行 TAE 术，对照组不做处理，检测各组 TAE 术后 3 天肝功能指标丙氨酸氨基转移酶（ALT）、天冬氨酸氨基转移酶（AST）、总胆红素（TBI）、血清白蛋白（ALB）、凝血酶原时间（PT）。术后 3 天后处死动物，分别选取各组癌旁组织，采用生化酶学法检测超氧化物歧化酶（SOD）指标、谷胱甘肽过氧化物酶（GSH-PX）、过氧化氢酶（CAT）。**结果** 术后检测肝功能，打药组 ALT、AST、TBI 降低，ALB 升高、PT 缩短，与 TAE 模型组相比差异显著（P＜0.05）；对照组、TAE 模型组和打药组中 SOD 的浓度分别为 45.48±2.04(ng/L)、21.81±2.14(ng/L)、46.18±2.45(ng/L)，GSH-PX 的浓度分别为 262.47±6.96(ng/L)、187.68±9.67(ng/L)、256.53±5.06(ng/L)，CAT 的浓度分别为 3.09±0.57(ng/L)、1.15±0.25(ng/L)、3.02±0.48(ng/L)；与 TAE 模型组相比，打药组的抗氧化指标 SOD、GSH-PX 、CAT 的活力明显升高，其改变有统计学意义（*P*＜0.05）。**结论** PPAR-α 激动剂 WY14643 减轻 TAE 术后肝功能损伤，可能与抑制癌旁肝组织氧化应激有关。

PU-1776
比较不同 MR 序列在对经载药微球治疗肝癌患者术后疗效评估中的价值

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目的 比较不同 MR 序列在对经载药微球治疗肝癌患者术后疗效评估中的价值，旨在寻求评估 D-TACE 疗效的最佳 MR 序列；
材料和**方法** 收集 2016 年 10 月-2019 年 7 月间我院经载药微球治疗的 37 名肝癌患者，通过三名 5 年以上腹部影像学专家对术前及术后不同 MR 序列图像（T2 加权成像，T2WI；弥散加权成像、DWI；增强图像，PWI）进行评估，分别判断肿瘤疗效（CR,PR,SD,PD,ORR），通过介入造影图像及相关生化指标对其进行验证及分析；
结果 不同 MR 序列对经载药微球治疗的患者疗效评估的结果分别为：（T2WI：CR 4,PR 28,SD 3,PD 1,ORR 32）、（DWI：CR 3,PR 29,SD 3,PD 1,ORR 32）及增强图像（PWI：CR 3,PR 29,SD 3,PD 1,ORR 32）,与介入术中图像进行对比，三种序列判断 OR,SD,PD 的准确性无明显差异，而 T2WI 及 DWI 判断 CR 及 PR 的准确性明显低于 PWI。
结论 T2WI 及 DWI 在评估对经载药微球治疗肝癌患者时能够判断肿瘤是否进展，但 PWI 序列是对于肿瘤活性区域的判断的最佳序列，因此，通过 MR 对经载药微球治疗肝癌患者术后疗效进行评估时，增强序列图像最能够反应肿瘤的活性区域。

PU-1777

二维码在 PTCD 引流患者中的应用

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目的 探讨二维码在经皮肝穿刺胆道引流（PTCD）患者中的应用效果。 方法 编辑 PTCD 引流管护理信息，应用二维码软件生成二维码并粘贴在 PTCD 管上，向出院患者和家属推送二维码图标便于随时查对照组采用常规方式给予出院指导和 PTCD 管护理知识教育，并采用电话方式定期随访，观察组在常规护理的基础上应用二维码推送 PTCD 管护理信息。 分别调查出院当日、出院后 3 个月 2 组患者 PTCD 引流管并发症的发生率并应用自我管理量表比较 2 组患者自我管理能力得分情况。 结果 应用二维码后， 观察组患者 PTCD 引流管并发症发生率低于对照组，自我管理能力高于对照组，差异有统计学意义（P<0.05）。 结论 使用二维码进行 PTCD 引流管管理，提高患者自我管理能力。

PU-1778

肝癌栓塞术后低蛋白血症的护理

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目的:对肝癌肝动脉化疗栓塞术(Transcatheter Arterial Chemoembolization, TACE)后发生低蛋白血症风险因素及护理干预进行分析和探究。**方法**:收集本科室 2017 年 9 月-2018 年 6 月期间的 254 例肝癌行 TACE 的患者临床资料，分析引起低蛋白血症的危险因素并进行干预，观察护理结果。**结果** 本组 63 例患者发生低蛋白血症，其主要危险因素为：术后肝脏损害、放腹水治疗、大量输液、大量发热出汗、进食减少，经相应对症处理及护理干预后，57 例患者血白蛋白恢复正常，6 例患者出现病情恶化。

PU-1779

癌症患者疼痛治疗认知

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癌痛是恶性肿瘤患者最常见的症状之一，全世界每天至少有 300 万～350 万癌症患者在遭受疼痛的折磨。国外研究发现，疾病诊断初期有 20%-25%的患者出现中、重度疼痛，中期，30%～50%的患者有不同程度的疼痛，在晚期癌症患者中，70%～90%的患者承受疼痛的折磨[1-2]。癌痛可从生理、心理、社会和精神等多个方面影响癌症病人的日常生活，减低患者对工作和爱好的兴趣，影响患者的心灵和社交生活，导致其整体生命质量下降[2]。世界卫生组织的四个重点综合计划之一就是有效控制癌症疼痛，按照 WHO 推荐的“三阶梯”治疗原则，按时、个体化口服止痛药物，80%～90%的癌症疼痛是可以得到缓解[3]

PU-1780

延续护理干预对肝癌介入术后患者营养状况的影响研究

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目的 探讨微信随访干预对肝癌介入术后患者营养状况的影响 **方法** 采用自身对照的方法，建立研究对象微信群，并进行微信随访干预，在随访干预前、干预后 3 个月、干预后 6 个月分别采用健康管理知识调查问卷、自我管理能力评估量表、NRS2002 营养评估量表对研究对象进行评估。**结果** 1、微信随访干预后患者对健康管理知识掌握情况较干预前有提高，患者在自我管理能力以及 NRS2002 营养状况评分较前有提高，其中随访后 6 个月最高，其次为 3 个月，随访前最低。且任意两个不同时间点的评分差异均有统计学意义(P<0.05)。**结论** 微信随访能提高患者对疾病的认知水平，提高患者的自我管理能力和改善患者的营养状况。

PU-1781

肝癌栓塞术后低钾血症的风险评估

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评估肝癌肝动脉化疗栓塞术(Transcatheter Arterial Chemoembolization, TACE)后发生低钾血症的风险因素，并根据危险因素制定相应的护理对策。**方法**:回顾 2014 年 8 月-2015 年 2 月期间本科室 214 例肝癌行 TACE 的患者临床资料，分析引起低钾血症的危险因素。**结果** 本组 23 例患者发生低钾血症，引起低钾血症主要危险因素为：厌食、水化、呕吐、放腹水、出汗，经积极对症处理后，22 例血钾恢复正常，1 例出现肝性脑病昏迷、肝肾综合征，家属放弃治疗自动出院。**结论**:厌食、呕吐、水化、放腹水、出汗是 TACE 术后低钾血症的危险因素。低钾风险量表有利于制定护理对策。

PU-1782
CT 引导下肺穿刺活检术并发肺出血、咯血相关因素分析

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【摘要】目的探讨 CT 定位下经皮肺穿刺活检术并发肺出血、咯血的影响因素。 方法 CT 引导下应用国产 GMT 半自动活检针对 383 例患者行经皮肺穿刺活检术，将患者的年龄、性别、病灶大小、穿刺时间、病灶深度、切割组织的次数、病灶是否实性、穿刺体位、慢性肺部病变等相关因素分为不同等级资料，卡方分析不同等级资料之间并发症发生率有无差异性，Logistic 回归分析并发症发生的独立危险因素。 结果 383 例患者术后出现出血 68 例(占 25.5%)，咯血 17 例(占 24.5%)，卡方分析显示术后出血在病灶大小、病灶深度、穿刺时间、切割组织的次数及病灶是否实性之不同组别之间存在差异性(P < 0.05)；术后咯血除以上因素外，还跟穿刺体位、患者年龄大小不同存在差异，差异有统计学意义(P < 0.05)。多因素 Logistic 回归分析显示病灶大小、病灶深度、病灶是否实性在出血并发症中具独立危险因素。结论 肺出血、咯血是肺穿刺活检术常见且严重的并发症，熟悉相关影响因素，可以帮助我们尽量避免该并发症的发生。

PU-1783
TACE 术中应用三氧化二砷（ATO）载药微球与 ATO 碘化油乳液治疗肝细胞癌的安全性和有效性分析

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目的 评价 TACE 术中应用伽俐生载药栓塞微球（CB）加载三氧化二砷（ATO）与 ATO 碘化油乳液治疗肝细胞癌的安全性和有效性。**方法** 选择 2017 年 1 月至 2018 年 9 月于我科行 TACE 治疗的 86 例肝细胞癌患者，根据术中应用栓塞材料，分为 ATO 载药微球栓塞组（CBATO 组，n=38）和 ATO 碘化油乳液组（cTACE 组，n=48）。对比两组在首次 TACE 术后的不良反应程度，比较两组术前、术后 7 天、3 月、6 月血常规、肝肾功能，分析 CBATO 的安全性；记录两组患者首次治疗前、治疗后 3 月及 6 月的 CT 或 MR 结果，评估 CBATO 的有效性，比较两组总生存期和无进展生存期。**结果** 两组患者首次 TACE 术后不良反应主要表现为发热、疼痛及恶心呕吐，CBATO 组恶心呕吐程度较 cTACE 组轻（*P*=0.017）。两组患者肝功能水平在术后 7 天较术前升高，术后 3 月逐渐恢复至基线水平。两组患者术后均未出现骨髓抑制及肾功能损害。CBATO 组和 cTACE 组术后 3 月疾病缓解率（ORR）分别为 78.9%和 52.1%（*P*=0.01）；术后 6 月 ORR 分别为 60.5%和 33.3%（*P*=0.012）。CBATO 组和 cTACE 组术后 3 月疾病控制率(DCR) 分别为 78.9%和 68.8%（*P*=0.289）；术后 6 月 DCR 分别为 71.1%和 33.3%,差异具有统计学意义（*P*=0.001）。CBATO 组的中位总生存期（OS）为 548 天，cTACE 组的中位总生存期为 404 天，两组间差异具有统计学意义（*P*=0.021）；CBATO 组的中位无进展生存期（PFS）为 308 天，cTACE 组的中位无进展生存期为 148 天，两组间差异具有统计学意义（*P*=0.044）。多项 logistic 回归分析结果显示：组别、ECOG 评分及术前甲胎蛋白等因素对术后 6 月肿瘤控制水平影响较大。**结论** TACE 术中应用 CBATO 治疗肝细胞癌具备安全性且近期疗效好。

PU-1784

CT 引导下激光消融肺组织相关参数的研究

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【目的】在 CT 引导下利用不同参数进行激光消融，探索激光消融肺组织的最佳参数。【方法】取健康成年家兔 15 只，体重范围 4.09-5.21Kg，平均体重（4.23±0.65）Kg，将所有家兔完全随机分为 3 组，A 组平均体重（4.07±0.23）Kg，B 组平均体重（4.34±0.25）Kg ，C 组平均体重（4.15±0.65）Kg，将 3 组家兔分别以 CT 引导下肺穿刺的方式，对目标肺组织进行激光消融，其中，A 组参数 10W/10min，B 组参数 5W/20min，C 组参数 10W/20min。每只家兔均取仰卧位，经耳缘静脉静推水合氯荃全麻，左右入组家兔均取左侧胸壁局部脱毛备皮，采用我科自行设计的 18G 穿刺空心套管针，在 CT 引导下经皮肺穿刺，均穿刺至左肺下叶肺组织，由穿刺针空心针管置入激光光纤，采用预定参数进行激光消融。消融后处死，解剖肺组织并对消融灶进行测量。所有家兔肺组织目标区域均形成以穿刺针尖为中心的类圆形消融灶，由内向外分为空洞区、碳化区、凝固带及渗出带。对 3 组消融灶相关数据进行两两对比。【结果】A 组空洞区 6.2±0.7；碳化区 3.0±0.4；凝固坏死区 5.3±1.1；炎性渗出区 2.1±0.2，B 组四层区域直径分别为 7.1±0.8；3.2±0.3；5.7±0.5；2.6±0.1，C 组四层区域分别为 7.2±0.6；3.5±0.4；6.0±0.2；2.8±0.3【结论】使用激光消融的方法可快速、安全、有效，为激光消融肺组织提供依据。

PU-1785

CalliSpheres 载药微球 TACE 治疗中晚期肝癌的安全性及有效性分析

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[摘 要] 目的 探讨 CalliSpheres 载药微球动脉化疗栓塞术（Drug-eluting beads transarterial chemoembolization，DEB-TACE）治疗中晚期肝癌的安全性及有效性。 **方法** 回顾性分析我院 2016 年 7 月至 2018 年 7 月采取 DEB -TACE 及传统碘化油栓塞（cTACE）治疗的 79 例中晚期肝癌患者临床资料，比较两组患者术后 1 月肿瘤缓解率、术后不良反应及肝功能指标变化。**结果** 两组患者的基线数据差异无统计学意义（$P>0.05$）。术后 1 月 DEB-TACE 肿瘤缓解率高于 cTACE 组（$P<0.05$）。术后 3 天，cTACE 组谷丙转氨酶（ALT）和谷草转氨酶（AST）较 DEB-TACE 组明显升高；术后 5 天，DEB-TACE 组 ALT 较 cTACE 组明显下降；术后 1 月，两组患者各项肝功能指标均恢复正常，DEB-TACE 组间接胆红素（IBIL）及白蛋白（ALB）较 cTACE 组低，差异均有统计学意义（P均 <0.05）。DEB-TACE 组患者呕吐反应较 cTACE 组发生率低、程度更轻（$P<0.05$）。两组患者术后均无严重并发症。**结论** CalliSpheres 载药微球 TACE 治疗中晚期肝癌患者不良反应少、肝损伤小、短期疗效好，值得临床推广。

PU-1786

子宫肌瘤介入治疗的现状及研究进展

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子宫肌瘤是妇科常见良性肿瘤。部分患者有月经增多、子宫异常出血、压迫等临床症状，严重影响健康相关生活质量和生育能力，而需进一步治疗。新兴的介入治疗方式具有低侵袭性、住院时间短、并发症少等特点，并且可以在保证疗效的前提下保留女性的生殖功能，得到了越来越广泛的应用。目前，常用的介入治疗方法包括子宫动脉栓塞术（Uterine Artery Embolization, UAE）、高强度聚焦超声（High-Intensity Focused Ultrasound, HIFU）和子宫肌瘤射频/微波消融术（Radiofrequency/Microwave Ablation, RFA/MWA）。本文主要就这三种介入治疗方式的临床应用及研究进展加以综述，以期为临床提供参考。

PU-1787
循证护理在肝癌化疗栓塞术患者中的疗效观察

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目的 观察循证护理对原发性肝癌介入术后并发症的干预效果；**方法** 选取 2017 年 6 月至 2018 年 6 月我科 80 例肝癌肝动脉化疗栓塞手术患者，随机分为循证组（40 例），常规组（40 例）。循证组患者采用循证护理，常规组患者采用常规护理，对两组患者的护理效果进行比较；**结果** 循证组非常满意率 85.0%(34/40)、较为满意率 15.0%(6/40),护理满意度为 100.0%(40/40)；常规组非常满意率 55.0%(22/40)、较为满意率 32.5%(13/40),不满意度为 12.5%(5/40)，护理满意度为 87.5%(35/40)；两组护理满意度组间比较差异具有统计学意义（χ^2=7.67,P<0.05） 循证组患者肝动脉化疗栓塞术后出现并发症的概率为 17.5%，常规组为 72.5%，两组比较差异有统计学意义（p<0.05），循证组患者护理后生活质量等指标得分高于对照组（p<0.05）；**结论** 循证护理可以有效的降低肝癌患者肝动脉化疗栓塞术后并发症的发生率，提高患者生存质量并另患者的满意度增加，临床值得倡导。

PU-1788
CT 引导下碘 125 放射性粒子植入治疗肺癌并发症的回顾性临床观察

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目的 观察 CT 引导下碘 125 放射性粒子植入治疗肺癌患者的并发症。**方法** 回顾性分析我科 2018 年 9 月至 2018 年 10 月接受 CT 引导下碘 125 放射性粒子植入治疗的 17 例肺癌患者，分别于术后 0 月，2 月，4 月行 CT 扫描并剂量验证，观察气胸、咯血、粒子脱落、发热、放射性肺炎等并发症。**结果** 17 例患者共进行粒子植入 23 次，粒子植入治疗过程中发生气胸 5 例次（21.7%），其中 3 例经观察或抽气治疗，2 例放置胸腔闭式引流管，气胸患者中 1 例出现皮下气肿；咯血 6 例次（26.1%）；3 例患者在术后 2 个月随访时发现粒子脱落至胸腔（13.0%）；发热 1 例次（4.3%），所有并发症经针对性治疗后均治愈出院，未发生放射性肺炎、空气栓塞、手术相关死亡等严重并发症。**结论** CT 引导下碘 125 放射性粒子植入治疗肺癌常见并发症为气胸、咯血，少数病例发生粒子脱落，针对性的治疗可以有效减少并发症产生的严重后果。

PU-1789

TACE 联合微波消融术治疗中晚期肺癌的效果分析

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摘要：目的 分析经皮动脉灌注栓塞（TACE）联合微波消融术治疗中晚期肺癌的效果。

方法 选取 2010 年 9 月 1 日-2018 年 9 月 31 日我院介入科收治 142 例中晚期肺癌患者，根据治疗方法的不同，分为研究组及对照组两组，其中研究组患者接受肿瘤供血动脉 TACE 治疗术(化疗方案：吉西他滨 0.2g+洛铂 50mg；栓塞材料：碘油及部分明胶海绵)，术后第 7 天接受微波消融治疗肿瘤，对照组患者单纯 TACE 治疗，2 组患者术后均使用增强 CT 进行随访观察肿瘤变化，观察并记录患者临床症状变化，肿块的影像学改，术后并发症的情况。

结果 研究组患者治疗后的临床总有效率高于对照组的患者。患者术后 1、3、6 个月的客观有效率（ORP）高于对照组，研究组治疗后 12 个月的 QOL 高于对照组。发生术后并发症，包括腹痛、恶心、呕吐反应，无统计学意义（P＜0.05），均于 1 周内好转。

结论 TACE 联合微波消融术对中晚期肺癌的治疗优于单纯使用 TACE 治疗，且安全性较高。

关键词 肺动脉化疗栓塞术；微波消融；肺癌

PU-1790

子宫动脉栓塞治疗子宫肌瘤的研究现状

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子宫肌瘤是女性生殖系统常见的良性肿瘤，35 岁左右的发病人数达到了 40% 左右，常表现为经期延长、月经量增加、贫血甚至不孕等症状。子宫肌瘤的治疗方法有药物治疗、子宫切除术、肌瘤剔除术、超声消融术（High-Intensity Focused Ultrasound,HIFU）及子宫动脉栓塞术（Uterine Artery Embolization，UAE）等。但传统的外科手术治疗给患者机体造成的创伤较大，单纯肌瘤剔除术及药物治疗子宫肌瘤复发率高，子宫切除术不适用于有生育要求或者希望保留子宫的患者;HIFU 对于富血供的肌瘤疗效较差。UAE 治疗子宫肌瘤, 具有微创、有效,并发症少,可以保留子宫及其功能,可重复治疗,是临床治疗子宫肌瘤的又一重要选择,有着广泛的应用前景。
子宫肌瘤是女性生殖系统常见的良性肿瘤，35 岁左右的发病人数达到了 40% 左右，常表现为经期延长、月经量增加、贫血甚至不孕等症状。子宫肌瘤的治疗方法有药物治疗、子宫切除术、肌瘤剔除术、超声消融术（High-Intensity Focused Ultrasound,HIFU）及子宫动脉栓塞术（Uterine Artery Embolization，UAE）等。但传统的外科手术治疗给患者机体造成的创伤较大，单纯肌瘤剔除术及药物治疗子宫肌瘤复发率高，子宫切除术不适用于有生育要求或者希望保留子宫的患者;HIFU 对于富血供的肌瘤疗效较差。UAE 治疗子宫肌瘤, 具有微创、有效,并发症少,可以保留子宫及其功能,可重复治疗,是临床治疗子宫肌瘤的又一重要选择,有着广泛的应用前景。

PU-1791

Simultaneous Gemcitabine and Irreversible Electroporation Treatment for Unresectable Pancreatic

Cancer: Preliminary Experience in a Prospective Randomized Controlled Trial

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Purpose: To evaluate the safety and effectiveness of simultaneous gemcitabine administration and irreversible electroporation (IRE) for treating unresectable pancreatic cancer (UPC).
Methods: A prospective, randomized controlled trial including 60 patients with UPC and no prior chemotherapy or radiotherapy was conducted between October 2016 and January 2018. Patients with locally advanced pancreatic cancer (LAPC; n=23) and metastatic pancreatic cancer (MPC; n=37) were divided into two groups. The GEM–IRE group received gemcitabine and IRE simultaneously; whereas, the IRE–GEM group received IRE followed by gemcitabine.
Results: Median follow-up was 8.2 months (2.7–15.4 months). Technical success rates were 90.0% and 86.6% in the GEM–IRE and IRE–GEM groups, respectively. The median progression free survival (PFS) of LAPC patients in the GEM–IRE group was significantly higher than that of LAPC patients in the IRE–GEM group (12.5 versus 10.9 months; hazard ratio [HR], 0.32; P = 0.0186). There was no statistically significant difference in the median PFS for MPC patients between the two groups (6.2 versus 5.4 months; hazard ratio [HR], 0.48; P = 0.1033). The objective response rate (ORR) was higher for the GEM–IRE group than the IRE–GEM group at 3 and 6 months (83.3% versus 65.5% and 70.0% versus 53.8%, respectively). Three major adverse reactions were seen; all resolved after symptomatic treatment. There were no operative mortalities within 30 days.
Conclusion: The simultaneous use of gemcitabine and IRE is effective and well-tolerated. Therefore, this combination therapy may be a better choice for the treatment of LAPC.

PU-1792

肝糖原累积症Ⅰ型合并肝腺瘤的介入治疗

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目的 评估经动脉化疗栓塞术联合微波消融治疗肝糖原累积症 I 型合并肝腺瘤的安全性和有效性。**方法** 2012 年 1 月-2016 年 1 月，肝糖原累积症 1 型合并肝腺瘤患者 23 例（平均年龄 14 岁±8 岁，男 18 例，女 5 例），共有肝腺瘤 36 个，平均直径（4.2±2.2cm），均采用经动脉化疗栓塞术联合微波消融术治疗。术后 6 个月随访腹部动态增强 MRI，测量其肿瘤直径变化。同时，评估经动脉化疗栓塞术联合微波消融的并发症。**结果** 所有患者均成功接受了经动脉化疗栓塞术联合微波消融治疗，其中 5 例患者接受了 2 次经动脉化疗栓塞术。6 个月随访腹部动态增强 MRI 肿瘤直径平均减少 93.2%。1 例患者术后 24 小时内发生严重的代谢性酸中毒；1 例患者发生穿刺部位皮下脓肿。**结论** 经动脉化疗栓塞术联合微波消融治疗肝糖原累积症 I 型合并肝腺瘤能有效抑制腺瘤的生长，减少恶变几率，是安全有效的。

PU-1793
循证护理方法在肝癌患者介入化疗术后护理中的应用分析

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【摘要】**目的** 分析循证护理在肝癌患者介入化疗术后护理中的应用效果。**方法** 随机将我院收治的需行介入化疗手术的肝癌患者 63 例分成两组，给予 A 组 31 例患者术后实施基础护理，给予 B 组 32 例患者术后实施循证护理，对比两组肝癌患者的护理差异。**结果** 两组肝癌患者护理后的疼痛评分、焦虑评分、护理满意度评分存在差异（P＜0.05），有统计学意义；且 B 组护理后的并发症发生率（18.75%）低于 A 组（41.94%），两组相比：P＜0.05。**结论** 针对接受介入化疗手术治疗的肝癌患者给予循证护理的护理效果显著，利于患者预后。

【关键词】

肝癌主要是由于环境因素、生活饮食习惯、性激素、肝脏疾病、病毒感染、微量元素及黄曲霉素等导致的恶性肿瘤，早期肝癌临床症状并不显著，一般在患者体检或出现肝区疼痛、腹胀、纳差、消瘦、乏力及全身性的黄疸、腹泻、低热等症状后被发现[1]。发现时多数为晚期，临床中一般针对肝癌患者实施介入化疗治疗，在治疗过程中有效的护理措施尤为重要。我院针对收治的肝癌患者进行护理观察，旨在进一步探究循证护理对于肝癌患者介入化疗术后的护理效果。

PU-1794
循证护理在肝癌患者介入化疗术后的效果分析

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【摘要】**目的** 分析循证护理在肝癌患者介入化疗术后护理中的应用效果。**方法** 随机将我院收治的需行介入化疗手术的肝癌患者 63 例分成两组，给予 A 组 31 例患者术后实施基础护理，给予 B 组 32 例患者术后实施循证护理，对比两组肝癌患者的护理差异。**结果** 两组肝癌患者护理后的疼痛评分、焦虑评分、护理满意度评分存在差异（P＜0.05），有统计学意义；且 B 组护理后的并发症发生率（18.75%）低于 A 组（41.94%），两组相比：P＜0.05。**结论** 针对接受介入化疗手术治疗的肝癌患者给予循证护理的护理效果显著，利于患者预后。

【关键词】循证护理；肝癌；介入化疗；术后护理

肝癌主要是由于环境因素、生活饮食习惯、性激素、肝脏疾病、病毒感染、微量元素及黄曲霉素等导致的恶性肿瘤，早期肝癌临床症状并不显著，一般在患者体检或出现肝区疼痛、腹胀、纳差、消瘦、乏力及全身性的黄疸、腹泻、低热等症状后被发现[1]。发现时多数为晚期，临床中一般针对肝癌患者实施介入化疗治疗，在治疗过程中有效的护理措施尤为重要。我院针对收治的肝癌患者进行护理观察，旨在进一步探究循证护理对于肝癌患者介入化疗术后的护理效果。

PU-1795
护理干预在宫颈癌患者介入治疗围术期中的应用

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目的 探讨护理干预在宫颈癌患者介入治疗围术期中的应用。**方法** 选取我院 2018 年 3 月至 2019 年 3 月收治的 48 例宫颈癌介入治疗的患者随机分为两组。对照组患者 40 例，采用常规护理，包括严格遵医嘱给予护理干预和药物使用，并适当讲解疾病相关知识。观察组在对照组常规护理的基础上给予舒适护理模式，包括介入手术前、手术中和手术后的舒适护理，具体方法如下：（1）术前：为患者提供整洁、安静的病房环境，并给予适当的安慰和心理疏导。针对患者的文化程度、接受能力和年龄等因素讲解宫颈癌相关知识，告知患者及家属宫颈癌介入术后可能出现的并发症、手术目的及术后预期效果。（2）术中：调节手术室的温度湿度，术中随时监测生命体征变化，尽可能减少患者隐私部位暴露。（3）术后：病房环境适宜严密监测患者的生命体征，加压包扎期间及留置动脉导管期间，严格绝对卧床，双下肢平卧制动，告知陪护人员对双下肢进行有效按摩。关注用药副作用。预防术后感染。观察患者有无恶心呕吐情况。如若患者留置动脉和鞘管，则导管标示应清晰醒目，妥善固定。正确的饮食指导。准确评估患者发生疼痛的部位、疼痛程度及疼痛性质，遵医嘱应用止痛的药物缓解患者疼痛情况。患者术后吸收热，应多摄入水分。保持床单元清洁干燥。患者发生如若发生呕吐，则患者头部偏向一侧，及时清除口鼻腔分泌物，关注口腔清洁情况，必要时给予口腔护理。化疗栓塞后肿瘤组织会坏死并且脱落，阴道有较多血性粘液流出体外，观察分泌物的性质和量，出血及排液情况，保持外阴清洁干燥。由于髂内动脉被栓塞，会导致臀部肌肉皮肤血液供应受阻，指导患者术后勤翻身，必要时给予气垫床护理及减压贴保护，预防压疮发生。对两组患者介入术后生活质量进行对比。**结果** 观察组患者的焦虑情况、抑郁情况及满意度情况优于对照组（P<0.05）。**结论** 对宫颈癌介入治疗患者进行护理干预，给予舒适护理模式可提高护理质量及患者满意度，值得临床推广。

PU-1796
肝癌载药微球栓塞后肝脓肿形成处理对策及原因分析

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目的 鉴于肝癌载药微球栓塞术后肝脓肿形成的发生率低、死亡率高，为了引起介入医生对此类并发症的重视，从而提高治疗效果，本文通过对一例治疗成功的 D-TACE 术后肝脓肿患者的治疗情况进行总结分析，并结合既往文献报道，探讨载药微球栓塞术后肝脓肿形成的危险因素及处理策略。
材料与方法 男性患者，54 岁，肝癌切除术后半年复发。发现复发病变后 3 个月内先后行 2 次 C-TACE（超乳化碘油栓塞，奈达铂+吡柔比星+雷替曲塞灌注化疗）和 1 次 D-TACE（100-300μm 的载药微球加载吡柔比星 80mg 栓塞）。D-TACE 术后 2 周出现 40℃的高热，术后 3 周确诊手术区域肝脓肿形成。予以抗感染、穿刺置管引流及其他对症支持治疗。
结果 该肝癌患者载药微球栓塞术后肝脓肿形成，经过治疗病情得到控制，但反复发作，脓肿出现 8 个月后才基本消失。治疗过程大致分为 3 个阶段。第 1 阶段为脓肿出现后 1 个月，经过抗生素治疗及穿刺置管引流，脓肿部分控制，体温恢复正常。此阶段治疗后体温持续正常 1 个月。第 2 阶段为脓肿出现后 3-4 个月，患者再次发热，脓肿仍有脓液，出现菌血症，右侧胸水及右下肺不张，治疗后好转，体温再次正常。此阶段治疗后体温持续正常 2 个月。第 3 阶段为脓肿出现后 7-8 月，患者咳嗽咳痰伴发热，无菌血症，脓肿较前缩小，右侧胸水及右下肺不张较前加重，并出现右肺感染，痰培养阳性，对症支持治疗后脓肿基本消失后拔除引流管，右侧胸水减少并包裹，右下肺复张，右肺感染得到控制，体温正常。
结论 1、D-TACE 术后肝脓肿形成发生率低但死亡率高，对于有危险因素（如肝脏或胆道外科术后、Oddi 括约肌功能异常、糖尿病等）的患者需提高警惕。2、D-TACE 术后肝脓肿出现后应予以积极治疗，如置管引流、抗生素等，但治疗效果可能不佳，容易反复，需做好长期治疗的准备。3、肝脓肿可并发右侧胸水，进而出现右肺不张及感染，需引起重视。

PU-1797

Factors influencing MR changes associated with the pelvic fascia after high-intensity focused ultrasound ablation of uterine fibroids

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Purpose: To investigate the factors influencing MR changes associated with the pelvic fascia after high-intensity focused ultrasound ablation of uterine fibroids.
Methods: Pelvic MRI and clinical data from 134 patients with uterine fibroids who were treated with high intensity focused ultrasound (HIFU) were analyzed retrospectively. The patients were divided into a swelling group and a nonswelling group according to MRI findings before and after HIFU treatment. The relationship between uterine fibroid characteristics and treatment parameters and pelvic fascial swelling were analyzed using univariate and binary logistic regression analyses.

Results: Pelvic fascial swelling was observed in 91 (67.91%) patients. Univariate analysis revealed that fibroid location, the distance from the fibroid ventral side to the skin, the distance from the posterior edge of the fibroid to the sacrum, sonication time, treatment time, treatment intensity, treatment dose, and EEF all affected pelvic fascial swelling ($p<0.05$). Subsequently, binary logistic regression analysis revealed that distance from the posterior edge of the fibroid to the sacrum ($p=0.000$, OR=1.092, 95% CI 1.0541-1.131) and sonication time ($p=0.012$, OR=0.993, 95% CI 0.988-0.999) were significantly correlated with fascial swelling.
Conclusion: The distance from the fibroid to the sacrum, treatment dose and sonication time all play important roles in the development of pelvic fascial swelling.

PU-1798

减少微波消融治疗特殊部位肝肿瘤并发症的方法研究

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目的 探讨特殊部位肝肿瘤在经皮超声下微波消融治疗中并发症的原因及防治措施，以期降低其发生率。
方法 回顾性分析 2016 年 2 月—2018 年 3 月收治的特殊部位肝肿瘤患者 74 例，其中原发性肝癌 45 例，肝血管瘤 13 例，肝转移癌 16 例。其中近肝门部 5 个，近结肠旁 6 个，近膈肌 18 个，近心包旁 5 个，近胃小弯 9 个，下腔静脉旁 8 个，胆囊旁 11 个，尾状叶结节 5 个，肝脏边缘 25 个。采用经皮超声下微波消融进行治疗，观察其并发症发生情况并分析其原因。

结果 本组病例出现结肠穿孔并严重腹膜炎 1 例，开腹清洗腹腔后置管引流，并行结肠造瘘术，7 个月后将造瘘结肠回纳，患者最终治愈；胸腹腔积液 4 例，经保守治疗或穿刺抽液后好转；膈疝 1 例，因疝口较小未做特殊处理；胆漏 2 例，1 例保守治疗后好转，1 例并发胆汁性腹膜炎，手术开腹放置引流管 3 周后好转；肝被膜下出血 7 例，经保守治疗后均慢慢吸收；1 例患者消融过程中出现心率减慢至 30 次/min，对症治疗后恢复正常。

结论 特殊部位肝肿瘤经皮超声下微波消融难度大，并发症发生率高，需提前做好预防及处理。灵活运用多种手段规避风险，减少并发症。

PU-1799

Perforation of the duodenum because of thermal injury after microwave ablation for liver metastasis: a case for caution

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Objective: Several complications related to microwave ablation (MWA) for liver tumors causing thermal damage of adjacent organs have been reported. We report a case of duodenal perforation caused by thermal injury during MWA.

Materials and Methods: A 61-year-old man underwent radical resection of sigmoid carcinoma of the abdomen. After half a year of follow-up, imaging examination showed metastasis located in segment 6 of the liver. After treatment with liver protection and acid inhibition, percutaneous MWA of the liver tumors was performed. On the 4th day after MWA, S6 metastasis, plate-shaped abdomen, tenderness, and rebound tenderness was observed. The patient underwent contrast-enhanced computed tomography (CT) of the upper abdomen which resulted in duodenal perforation and peritonitis.

Results: At the emergency department, the patient underwent laparotomy and duodenal perforation repair. After 2 weeks of treatment with anti-inflammatories, acid-suppression, and symptomatic nutritional support, the patient was in a good general condition with stable vital signs. Three months later, enhanced CT of the upper abdomen showed a healed duodenal perforation, absorption of the upper abdominal exudate, and no evidence of metastatic recurrence.

Conclusion: Caution should be exercised when patients with a history of intraperitoneal inflammation or abdominal surgery undergo thermal ablation, as there is a risk of accidental thermal damage to organs.

PU-1800

miR-23b 通过 IL-11 对 SMMC-7721 细胞增殖的影响

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目的:探讨 HCC 组织中 miR-23b 表达与癌症进展之间的关系，以及 miR-23b 是否通过靶向白细胞介素（Interleukin，IL）-11，从而影响肝癌细胞的增殖。**方法** 通过免疫组织化学分析和用逆转

录-定量聚合酶链反应（Reverse transcription-quantitative polymerase chain reaction，RT-qPCR）检查 HCC 和相邻正常肝组织中 IL-11 和 IL-11Rα 的表达水平。使用 RT-qPCR 及蛋白印迹法检测不同 HCC 细胞株 SMMC-7721、LM3 和 Hep3B 中 miR-23b 的相对表达水平，随后检测转染了 miR-23b 激动剂、拮抗剂和对照组 SMMC-7721 细胞中 miR-23b，IL-11 和 IL-11Rα 的表达水平。通过集落形成测定及细胞凋亡分析检测转染 miR-23b 激动剂和拮抗剂的 SMMC-7721 细胞增殖和凋亡情况。使用荧光素酶测定系统了解 IL- 11 是否为 miR-23b 的直接作用靶标。最后使用集落形成和流式细胞仪测定用 pcDNA-IL-11 转染的 miR-23b 激动剂和用 siDNA 转染的 miR-23b 拮抗剂对 SMMC-7721 细胞增殖和凋亡的影响。**结果** HCC 组织中 miR-23b 表达与癌症进展之间呈负相关，与邻近正常肝组织相比，miR-23b 的表达在 HCC 组织中明显下调，而 IL-11 和 IL-11Rα 的表达明显上调，miR-23b 表达与 IL-11 和 IL-11Rα 的表达也呈负相关。IL-11 是 miR-23b 调节 HCC 进展的直接靶标，miR-23b 能够通过靶向 IL-11 来抑制 SMMC-7721 细胞的增殖并促进其凋亡。**结论** 我们的研究表明 miR-23b 能够通过调节 IL- 11 和 IL-11Rα 的表达来抑制肝癌的进展，其可能通过直接下调 IL-11 表达而在 HCC 进展中充当抑癌剂的作用，将来可能是肝癌治疗的一个潜在靶点。

PU-1801
探讨 DSA 联合彩超引导穿刺行 PTCD 治疗恶性梗阻性黄疸的临床应用价值

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目的 探讨 DSA 联合彩超引导穿刺行 PTCD 治疗恶性梗阻性黄疸的临床应用价值，提升 PTCD 的穿刺成功率及内外引流率，减少并发症。方法 36 例恶性梗阻性黄疸患者在彩超引导下穿刺进针，随后在 DSA 下推送导丝导管至目标区域，行内外引流。结果 36 例患者，一次穿刺成功率 89%，两次穿刺成功率 100%；置内外引流管一次成功率 81%，总内外引流成功率 94%；病人临床症状均明显改善，未发生严重并发症。结论 DSA 联合彩超引导穿刺行 PTCD，穿刺时安全简便、成功率高，置管时准确可靠、内外引流率高，是较为理想的姑息性治疗恶性梗阻性黄疸的方法。

PU-1802
非小细胞肺癌 EGFR-TKI 耐药后再次活检 T790M 阳性的预测因素分析

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目的:探索非小细胞肺癌 EGFR-TKI 耐药后再次穿刺活检 T790M 阳性的预测因素。**方法** 回顾性研究 2016-2018 年郑州大学第一附属医院进行的 151 例 CT 引导下非小细胞肺癌经过 EGFR-TKI 和（或）化疗治疗后再次活检患者临床特征，治疗方案及活检信息，分为 T790M 阳性组和阴性组，探索 T790M 阳性预测因素。**结果** 151 例患者平均年龄 57.7±10.7 岁，女性 103 (68.2%)例；腺癌 146（96.7%）例；TKI 单药，TKI 联合化疗分别为 73 (48.3%)例，78 (51.7%) 例；治疗平均时间 18.3±12.1 月；原发灶取材 108 (71.5%)例。T790M 突变率为 56.3%（85/151），EGFR 基因突变不一致率为 58.3%。T790M 阳性率单因素分析显示与 EGFR 突变状态（P=0.08）、治疗时间（P=0.02），活检病灶（P=0.08）有关；Logistic 多因素分析结果显示治疗时间是 T790M 阳性的独立风险因素（OR=1.06; 95%CI：1.01,1.11; P = 0.029）。**结论** EGFR 突变状态和活检病灶组间 T790M 阳性率有差异；治疗时间是 T70M 阳性的独立风险因素。

PU-1803

TACE 联合索拉菲尼对比索拉菲尼在合并微血管侵犯的肝癌术后疗效分析

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目的 对比肝动脉化疗栓塞（TACE）联合索拉菲尼对比索拉菲尼单药在合并微血管侵犯的肝癌术后的临床疗效和安全性分析

方法 回顾性分析华中科技大学同济医学院附属湖北肿瘤医院微创介入中心自 2013 年-2018 年期间收治的 179 例首次确诊后行肝切除术的有微血管侵犯肝癌患者，随机分配到联合治疗组（TACE 术后 1 周服用索拉菲尼 400mg 每天两次，出现不良反应难以耐受时剂量减半）（n＝92）和索拉菲尼治疗组（400mg 每天两次）（n＝87），主要研究终点为总生存期（OS），次要研究终点为无复发存活率（RFS）、疾病无进展生存期（PFS）和肝外转移率

结果 联合治疗组的 1 年、3 年和 5 年 OS 率显著高于索拉菲尼治疗组（93.4%VS78.5%，72.2%VS56.2%和 57.2%VS38.5%，P＜0.05）；联合治疗组的 1 年、3 年和 5 年 RFS 率显著高于索拉菲尼治疗组（71.8%VS56.1%，49.1%VS32.9%和 37.7%VS29.2%，P＜0.05）

联合治疗组 VS 索拉菲尼治疗组的中位 OS 分别为（23.9 个月 VS13.4 个月，P＜0.05）；中位 PFS（19.4 个月 VS13.8 个月，P＜0.05）

随访至 2018 年 12 月联合治疗组 VS 索拉菲尼治疗组的肝外转移率分别为（8.5%VS20.6%）7 例（肺转移 4 例，胃肠道转移 1 例，骨转移 2 例）VS19 例（肺转移 14 例，骨转移 3 例，腹腔转移 2 例）

结论 TACE 联合索拉菲尼在治疗合并微血管侵犯的肝癌术后患者具有显著的叠加效应，联合治疗可有效延长术后患者生存期，提高无进展生存时间，增加无复发存活率，降低远处转移率，使肝癌术后患者获益。

PU-1804
多模式联合治疗对比 TACE 治疗在 BCLC B 期肝癌中的临床疗效

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目的 多模式联合治疗[肝动脉化疗栓塞术(transcatheter arterial chemoembolization，TACE)序贯射频消融术（radiofrequency ablation，RFA）治疗]对比单一 TACE 治疗在巴塞罗那临床肝癌分期（Barcelona Clinic Liver Cancer, BCLC）B 期肝癌的疗效、安全性及复发率

方法 回顾性分析华中科技大学同济医学院附属湖北肿瘤医院微创介入中心自 2014-2016 年期间收治的 139 例 BCLC B 期肝癌（平均直径 5.7cm，4.6-8.7cm；多个肿瘤 2-5 个，每个直径≤3cm）。患者被随机分配到联合治疗组（n＝72）和单一 TACE 治疗组（n＝67），主要研究终点为总生存期（OS），次要研究终点为客观缓解率（ORR）、疾病进展时间（TTP）和肿瘤复发率（TR）。

结果 联合治疗组 VS 单一 TACE 治疗组的中位 OS 分别为 38.2 个月和 27.6 个月。

联合治疗组 VS 单一 TACE 治疗组 1 年、3 年和 5 年的总生存率分别为 87.4%VS67.2%、68.7%VS35.5%、30.8%VS16.9%。

联合治疗组 VS 单一 TACE 治疗组 1 年、3 年和 5 年的 ORR 分别为 56.25%VS44.4%、39.7%VS24.5%、16.8%VS8.9%。

联合治疗组 VS 单一 TACE 治疗组的 TTP 分别为 15.7 个月 VS11.5 个月。

联合治疗组 VS 单一 TACE 治疗组 1 年、3 年和 5 年的 TR 率分别为 19.5%VS32.4%、37%VS56.1 %、55.4%VS87.6%。

安全性：两组患者并发症发生率及死亡率比较无统计学差异（P＜0.05）。

结论 TACE 联合 RFA 可有效治疗 BCLC B 期肝癌患者。TACE 联合射频消融能明显增强 TACE 的疗效，延长 BCLC B 期肝癌患者的总生存期，减少术后复发率并提高生存率，降低疾病进展时间，其效果优于单纯 TACE 治疗。

PU-1805
射频热疗协同增效单纯疱疹病毒胸苷激酶/更昔洛韦基因治疗大鼠肝癌的实验研究

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目的 探索一种利用光学/超声成像监测大鼠原位癌的 RF 热疗（RFH）增强单纯疱疹病毒胸苷激酶/更昔洛韦自杀基因治疗的新方法。
材料与方法 用慢病毒/萤光素酶基因转导大鼠肝癌细胞。 （i）HSV-TK / GCV-介导的基因治疗联合 RFH 的不同处理分为四组：（1）HSV-TK / GCV 介导的基因治疗联合 RFH; （2）单独的基因治疗; （3）仅 RFH 和磷酸盐缓冲盐水（PBS）。通过 Western 印迹验证细胞和肿瘤中的 HSV-tk 基因表达，采用共聚焦显微镜和 MTS 评估细胞活力。生物发光光学成像和超声成像被用于不同时间点监测每个动物组中的肿瘤的光子信号和瘤体大小变化。
结果 在体外实验中，与单纯的基因治疗或 RFH 和 PBS 相比，MTS 结果显示联合治疗组中的细胞增殖最弱（26.1±3.2%比 50.4±4.6%比 82.9±6.3%比 100% ，p <0.01）。在体内实验中，与对照组相比，超声成像结果显示联合治疗组中肿瘤体积最小（0.28±0.11,1.28±0.23 比 4.64±0.35 比 6.37±0.36，p <0.05）。与三个对照组（0.57±0.09,1.06±0.10 比 3.43±0.27 对 3.85±0.12，p <0.05）相比，联合治疗组的生物发光光学成像进一步显示生物发光信号强度显着降低。
结论 在体外实验中， MTS 结果显示联合治疗组中的细胞增殖最弱该结果与共焦显微镜所计算的活细胞数量和光学成像所获取的光密度结果相一致。在体内实验中，超声成像结果显示联合治疗组中肿瘤体积最小与三个对照组，联合治疗组的生物发光光学成像进一步显示生物发光信号强度显着降低。这些成像结果进一步证实了联合治疗组中显着增加的凋亡细胞。

PU-1806
医-技-护联合模式在肝癌多次介入术后患者症状管理的影响

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摘要：[目的]探讨在医-技-护联合模式下，采用合理的症状管理，在肝癌多次介入患者术后不适症状的应用效果。[方法]选取 2018 年 10 月-2018 年 12 月于我院介入科行肝癌介入术（>3 次）的患者 60 例作为干预组。对照组给予常规护理，干预组在医-技-护联合模式下，实施症状管理干预。比较 2 组术后患者恶心、呕吐、发热、疼痛、疲乏、焦虑、便秘的发生率，比较有统计学意义（P<0.05）.[结论]通过医-技-护联合，在各个环节加强症状管理，可明显改善患者术后不适症状，有效帮助患者减轻症状困扰。促进患者早日康复，加强患者对疾病的治疗信心。

PU-1807

聚乙烯醇栓塞微球联合碘油介入治疗中晚期肝癌的近期疗效及对不良反应的影响

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目的 研究聚乙烯醇栓塞微球联合碘油介入治疗中晚期肝癌的近期疗效及对不良反应的影响。**方法** 选择 2017 年 1 月至 2019 年 1 月本院收治的 80 例中晚期肝癌患者，根据随机双盲法分为两组，每组各 40 例。对照组应用碘油介入治疗，观察组行聚乙烯醇栓塞微球联合碘油介入治疗。观察两组治疗 1 个月后近期疗效及不良反应。**结果** 治疗 1 个月后，观察组的疾病控制率（95.00%）高于对照组（80.00%），差异具有统计学意义（$P<0.05$）；治疗后，两组不良反应发生率相比，差异无统计学意义（$P>0.05$）。**结论** 聚乙烯醇栓塞微球联合碘油介入治疗中晚期肝癌，可提高近期疗效，减少患者不良反应，值得应用推广。

PU-1808
基于时机理论对肝癌 D-TACE 患者不同阶段疾病体验的质性研究

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【摘要】目的 以时机理论为框架，探讨肝癌 DEB-TACE（Drug-eluting bead transarterial chemoembolization）患者在疾病不同阶段的疾病体验。方法 采用质性研究中的现象学研究法，对 43 例行肝癌 DEB-TACE 术的患者进行非结构性访谈，并以 Colaizzi 现象学研究方法进行资料分析。结果 基于时机理论提炼出 5 个关于肝癌 DEB-TACE 患者不同阶段疾病体验的主题，分别是：(术前准备期：应激反应强烈；(手术期：应对态度与术中反应不一；(术后恢复期：信息与心理支持不足；④出院准备期：失助感与经济支持；⑤出院调整期：延续性支持需求。结论 肝癌 DEB-TACE 患者在疾病不同阶段的疾病体验是动态变化的，护理人员应有针对性地实施有效的动态护理干预，尽最大努力满足患者的需求，使患者获得较好疗效和提高治疗的满意度。

PU-1809
化疗栓塞联合阿帕替尼治疗进展期肝细胞癌：生存及影响因素分析

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摘要：目的 评价经动脉化疗栓塞（transarterial chemoembolization, TACE）联合阿帕替尼治疗进展期肝细胞癌（hepatocellular carcinoma, HCC）患者的生存时间，并分析影响患者生存的相关因素。**方法** 连续性收集 2015 年 6 月至 2017 年 5 月在我院确诊为 HCC 并接受 TACE 联合阿帕替尼治疗的 51 例患者。采用 Kaplan-Meier 法计算患者总生存期（overall survival, OS）和无进展生存期（progression-free survival, PFS）。采用 Log-rank 检验和 Cox 回归模型确定影响患者 OS 的因素。**结果** 本组患者中位 OS 为 15 个月（95%CI：12.380～17.620），1、2、3 年生存率分别为 64.7%，23.5%和 1.8%。中位 PFS 为 10 个月（95% CI：8.388～11.612）。单变量分析，Child-Pugh A（$P=0.006$）、无腹水（$P=0.01$）、出现手足反应（$P=0.005$）、高血压（$P=$

0.05）及肝固有动脉变化率值大（*P*＝0.016）的患者具有更好的 OS。多变量分析，有手足反应（*P*＝0.004）、有高血压（*P*＝0.038）、肝固有动脉变化率值大（*P*＝0.020）是更长 OS 的独立预测因子。**结论** TACE 联合阿帕替尼治疗进展期 HCC 具有较好的长期疗效和安全性。手足综合征、继发性高血压及肝固有动脉变化率与患者 OS 有关。

PU-1810
多功能栓塞微球联合微波消融在兔 VX2 肝肿瘤治疗作用的实验研究

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目的 探讨肝动脉注入具有阿霉素缓释、微波增敏功能的多功能栓塞微球在 VX2 肝肿瘤模型中的治疗作用。**方法** 选取 24 只瘤兔，随机分成 4 组，A 组：不给予任何治疗；B 组：单独微波消融；C 组：经肝动脉给予 mPEG-PLGA@ZrO2@(DOX+ILS)微球；D 组：经动脉给予微球合并微波消融。对 B 组及 D 组瘤兔进行微波消融，红外成像仪实时记录消融区域的温度变化。利用 CT 及 MRI DWI 序列测量术前及术后肿瘤体积大小及残留肿瘤的体积大小，肿瘤疗效的评估，利用 HE 染色，观察肿瘤组织病理改变。**结果:**（1）D 组与 B 组消融中心区域温度达到 60℃所需要的时间（5.4±0.89℃，10.4±1.14℃），两组相比较有统计学差异（P<0.001）。两组的平均温度(111.75± 17.16 ° C, 84.58 ± 17.41 ° C, P<0.01)，两组比较有统计学差异。红外成像显示 D 组的消融面积大于 B 组；(2)治疗前先对 4 组动物的基线肿瘤体积进行比较（P>0.05）,四组之间无统计学差异。治疗后 CT 图像扫描:A 组肿瘤体积明显增大，B 组及 C 组体积略增大，D 组无明显变化。D 组与其它三组比较，术后 3d、6d、9d 肿瘤体积差异均有统计学意义（P<0.01）；B 组与 C 组与 A 组之间在治疗后 3d，6d，9d 的肿块体积大小差异均有统计学意义（P<0.05)(3)术后 D 组与其它三组活性肿瘤体积大小有统计学差异（P<0.001）；B 组和 C 组与 A 组之间活性肿瘤体积有统计学差异（P<0.001）(4)HE 染色 D 组肿瘤组织内可见满视野的坏死细胞，未见明显肿瘤细胞，B 组及 C 组内可见肿瘤细胞染色，其内可见坏死区，A 组内可见大量的肿瘤细胞，坏死不明显。**结论** mPEG-PLGA@ZrO2@(DOX+ILS)多功能微球能够起到微波增敏作用，增加消融面积；联合微波消融，栓塞、化疗、消融三位一体的治疗作用，大大的提高了肿瘤的治疗疗效。

PU-1811
TACE 联合阿帕替尼治疗肝细胞癌疗效的观察研究

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目的
通过对比研究 TACE 联合阿帕替尼治疗肝细胞癌的疗效是否优于单纯 TACE,并观察血清中 VEGF-2α及 HIF-2α的变化,研究 TACE 联合阿帕替尼治疗肝细胞癌的疗效,探索适合 TACE 联合阿帕替尼治疗的患者类型.
材料与方法
第一部分:对比研究 TACE 联合阿帕替尼治疗肝细胞癌的患者临床疗效是否优于单纯行 TACE
回顾性分析行 TACE 治疗的 HCC 患者共 86 例,根据其是否口服阿帕替尼将患者分为 A、B 两组：A 组：单纯行 TACE 治疗组（64 例）；B 组 TACE 联合阿帕替尼治疗组（22 例）

第二部分:观察血清中 VEGF-2α 及 HIF-2α 的变化,探索适合 TACE 联合阿帕替尼治疗肝细胞癌的患者.
对比研究 A、B 两组患者治疗前后血清 VEGFR-2α HIF-2α 的变化情况,将 B 组血清 VEGFR-2α 、HIF-2α 初始水平高于基线或血清 VEGFR-2α 、HIF-2α 水平在联合使用阿帕替尼后明显降低的患者定为 B1 组.

结果

A、B 两组之间客观有效率（OR）无统计学差异（P＞0.05）,在肝功能（ALT、AST、总胆红素、直接胆红素）、AFP、白蛋白的变化水平上无统计学差异（P＞0.05）,术后并发症等情况也未见统计学差异（P＞0.05），但在平均手术次数方面 A 组患者高于 B 组患者，手足综合征，高血压，蛋白尿等不良反应发生率 B 组患者则高于 A 组患者（P＜0.05），且 A 组与 B1 之间客观有效率（OR）存在统计学差异（P＜0.05）

结论

TACE 联合阿帕替尼对部分 HCC 患者疗效优于单纯 TACE，主要体 现在延长其再次行介入手术的时间、减少平均手术次数.
2、当检测患者血清 VEGFR-2α 、HIF-2α 水平高于基线时（5224.3pg/ml、524.9pg/ml）或血清 VEGFR-2α 、HIF-2α 水平在联合使用阿帕替尼后明显降低的患者建议联合使用阿帕替尼，

PU-1812
化疗栓塞在恶性黑色素瘤肝转移、软组织肉瘤及骨肉瘤中的应用

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经导管动脉内治疗技术 1）经导管动脉栓塞（TAE）； 2）经导管动脉灌注化疗（TAI）； 3）经导管动脉化疗栓塞（包括常规 TACE、载药微球 TACE）； 4）经导管动脉放射栓塞（TARE）。

TACE 治疗原理 1）直接动脉内给药，提高肿瘤内药物浓度，减少全身毒副反应。 2）栓塞肿瘤血管，既可直接诱导肿瘤缺血缺氧性坏死，又能通过减少药物流失、延长药物与肿瘤细胞作用时间、改善肿瘤内药物渗透，增强化疗药物细胞毒效应。 3）载药微球 TACE，微球装载更大剂量化疗药，栓塞后持续释放化疗药，肿瘤内药物浓度更高，全身副作用更低；肿瘤周边动脉栓塞释药，可能对预防肿瘤浸润/转移有效。

恶性黑色素瘤肝转移患者平均生存时间 2-9 个月，化疗栓塞可有效延长患者总生存期且创伤小、恢复快。

TACE 是晚期软组织肉瘤的有效治疗方法，3 年 OS 率为 32.5%，与仅仅化疗相比，导致癌症疼痛 VAS 降低，复发间隔时间延长，DEB-TACE 可被视为对常规全身化疗难以治愈的无法切除的软组织肉瘤的替代治疗选择。

32 例患者进行术前 TACE 在肿瘤标本中发现了广泛的坏死，并且在 5 名 TACE 患者中获得了良好的组织学反应（坏死 90-99%），平均坏死率为 85.5%（81-93%）。治疗后未发现严重并发症。在成功随访 86 个月期间，TACE 治疗 1 年，2 年和 5 年后的存活率分别为 95.5%，72%和 42%。

PU-1813
术前经导管化疗栓塞治疗儿童中晚期肾母细胞瘤效果评估

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摘要
目的 探讨术前经导管动脉化疗栓塞治疗儿童中晚期肾母细胞瘤的效果。
方法 收集 2009 年 1 月至 2016 年 12 月收治 50 例儿童中晚期肾母细胞瘤，根据治疗方式分为两组，介入化疗组 30 例，行经导管肾动脉化疗栓塞治疗，静脉化疗组 20 例，经静脉全身化疗，疗程结束后行根治性肿瘤切除，并随访治疗效果。
结果 化疗后肿瘤体积均有所缩小，介入化疗组平均缩小约 32%，静脉化疗组平均缩小约 20%，化疗结束后手术，介入化疗组瘤体完整切除率为 87%，静脉化疗组瘤体完整切除率为 70%，手术后随访时间平均为 48 个月，介入化疗组 4 年生存率约 85%，静脉化疗组 4 年生存率约 56%。
结论 术前经动脉化疗栓塞治疗儿童中晚期肾母细胞瘤是有效的，其疗效优于经静脉全身化疗。

PU-1814
双侧视网膜母细胞瘤伴脑发育落后患儿经眼动脉灌注化疗一例报道并文献复习

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【摘要】目的 讨论视网膜母细胞瘤的 IAC 治疗方法，对经眼动脉灌注化疗的疗效进行评估分析。方法 分析一例双侧视网膜母细胞瘤患儿的 IAC 治疗经过，并结合相关文献进行复习分析。结果 经眼动脉介入灌注美法仑联合卡铂治疗眼内视网膜母细胞瘤可以取得一定的效果，且治疗基本安全，但如何减少并发症及提高保眼球几率等方面还需要大样本量、多中心及长期随访研究，以达到标准化、规范化治疗 RB 的目的，临床医师仍需要不断提高介入技术，为患儿提供更好的服务。

PU-1815
TACE 术前 HBV-DNA 载量水平与术后肝功能恢复的关系分析

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目的探讨 TACE 术前 HBV-DNA 载量水平与术后肝功能恢复的关系。方法选取我院介入科 2016 年 1 月至 2017 年 1 月收治的 60 例乙肝相关性肝癌患者，依据术前病毒载量水平分为高载量组与低载量组，比较两组术前 2 天及术后 1、3、5 天肝功能及术前 2 天及术后 5 天病毒载量，分析术前病毒载量与术后肝功能变化的关系。结果两组患者术后 1 天 ALT、AST 指标显著升高达到峰值，之后成下降趋势，术后 5 天基本恢复到术前水平。术后 3 天 TBIL 达到峰值，之后逐渐下降。而术后 ALB 指标成逐渐下降趋势，且较术前显著降低。术后肝功能变化与术前病毒载有一定关系，但两组间差异无统计学意义。两组患者术后 5 天病毒载量较术前 2 天相比稍有下降，但差异不具有统计学意义。结论 TACE 术前高 HBV-DNA 载量，会导致术后肝功能更严重的损伤；病毒载量的高低并未延长术后肝功能的恢复时间；高病毒载量并未增加术后不良反应的发生率；TACE 术不会诱发 HBV-DNA 复制活跃。

PU-1816
动态血管模型在 SonoVue 增效 HIFU 消融富血供子宫肌瘤的作用研究

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【目的】
探讨动态血管模型(DVP)在 SonoVue 联合 HIFU 消融富血供子宫肌瘤的增效时机、增效作用、有效性及安全性。
【方法】
回顾性收集 36 例患者为对照组（I 组）；随机将前瞻性收集行 HIFU 治疗的 60 例富血供子宫肌瘤患者分为非 DVP 增效组（II 组）和 DVP 组（III 组），将三组患者的超声辐照时间、手术时间、超声灰度变化时间、消融率、能效因子（EEF）、治疗效率、治疗剂量、NPV 等治疗参数进行单因素方差分析和两两比较，以评估 DVP 在 SonoVue 联合 HIFU 消融富血供肌瘤中的增效作用及增效时机。根据 SIR 分类，统计三组患者 HIFU 治疗后的不良事件，采用行×列表 x2 检验进行组间比较，评价 DVP 在 SonoVue 联合 HIFU 治疗富血供肌瘤的安全性。随访 6 个月的肌瘤体积缩小率、症状评分、生活质量评分、月经评分，评估 DVP 指导下 SonoVue 联合 HIFU 治疗富血供肌瘤的临床疗效。
【结果】
（1）三组患者的年龄、靶皮距离、肌瘤体积、肌瘤个数、子宫位置、肌瘤位置、肌瘤类型、MRI-T2WI 均无差异。
（2）治疗参数：II 组的 NPV 高于 I 组，EEF 低于 I 组；I 组与 III 组比较：III 组的消融率、治疗效率、治疗剂量和 NPV 均高于 I 组， EEF 低于 I 组；II 组与 III 组比较：III 组的消融率和治疗效率高于 II 组、EEF 低于 II 组。
（3）不良事件三组间无差异。
（4）临床疗效：治疗前症状评分、生活质量评分、月经量评分等三组无差异；治疗后 6 个月三组间的症状评分、生活质量评分、月经评分有差异。
【结论】
DVP 指导下 SonoVue 联合 HIFU 治疗富血供肌瘤具有增效作用，没有增加不良反应的发生。
在肌瘤内浓聚并在周围组织中廓清时为最佳 HIFU 消融时机。

PU-1817
TACE 联合阿帕替尼治疗中晚期肝细胞癌的回顾性临床研究

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【目的】
分析 TACE 联合阿帕替尼治疗中晚期 HCC 的近期疗效、远期预后及安全性，并对可能影响联合组患者预后的因素进行分析。
【方法】
回顾性分析 62 例中晚期 HCC 治疗患者，一组 32 例接受 TACE 联合阿帕替尼治疗，另一组 30 例仅接受 TACE 治疗。所有患者治疗后每个月均复查随访，拟随访时间为 36 个月，比较两组患者的治疗后 AFP、ORR、不良反应、PFS、OS 和生存率，并对所有可能影响联合组患者 PFS 的因素进行分析。
【结果】

治疗后 3 和 6 个月，联合组的 ORR 为 62.5%和 53.1%，TACE 组为 33.3%和 23.3%；治疗 3 个月后两组的 AFP 均明显低于治疗前；联合组 mPFS 为 14 个月，TACE 组为 7 个月；联合组 mOS 为 20 个月，TACE 组为 11 个月； 1、2 和 3 年生存率联合组为 75.0%、40.6%和 25.0%，TACE 组为 46.7%、16.7%和 3.3%；联合组中 BCLC B 期的患者， mPFS 为 18 个月， BCLC C 期的患者为 8 个月；mPFS 治疗前 AFP<400 ng/ml 的患者为 16 个月，AFP≥400 ng/ml 的患者为 11 个月。均有统计学差异。两组栓塞后综合征的发生率无差异，联合组的阿帕替尼副反应均可控。三项副反应 mPFS 对比均有统计学差异：继发性高血压阳性者为 18 个月，阴性者为 10 个月；继发性蛋白尿阳性者为 19 个月，阴性者为 12 个月；手足综合征阳性者为 16 个月，阴性者为 9 个月。

【结论】

1. TACE 联合阿帕替尼治疗中晚期 HCC 可提升患者的客观缓解率、生存率，延长无进展生存时间、总生存时间；

2. TACE 联合阿帕替尼治疗中晚期肝细胞癌具有较高的安全性；

3. BCLC 分期和 AFP 水平是影响 TACE 联合阿帕替尼治疗患者无进展生存时间的因素，BCLC C 期患者和治疗前 AFP≥400ng/ml 患者的预后较差；

4. 继发性高血压、继发性蛋白尿或手足综合征阳性患者的预后较好。

PU-1818
姑息护理在肝癌晚期介入治疗术后患者生命质量的研究

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目的 探讨姑息护理在肝癌晚期介入治疗术后患者生活质量中的应用效果。**方法** 随机选取 2019 年 1 月至 2019 年 6 月，我科收治的 98 例行介入治疗的晚期肝癌患者，分为观察组和对照组，观察组给予术后姑息护理方案，对照组则为常规术后基础护理。采用肝癌患者生命测定量表进行问卷调查，比较两组患者生命质量和护理满意度。**结果** 观察组心理功能、躯体功能、症状/副作用、社会功能等总体生命质量评分高于对照组。同时医院环境、护理态度、护理技术水平等总体满意度评价优于对照组，差异有统计学意义（P<0.05）。**结论** 姑息护理方案能够有效提高肝癌介入术后患者生命质量，提高护理质量，同时增加患者满意度。

PU-1819
介入栓塞在妊娠滋养细胞肿瘤继发子宫动静脉瘘治疗中的应用价值

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目的 探讨介入栓塞在妊娠滋养细胞肿瘤（GTN）继发子宫动静脉瘘（AVF）治疗中的应用价值。方法 回顾性收集 2014 年 1 月～2018 年 12 月 GTN 继发子宫 AVF 患者 35 例，侵袭性葡萄胎 28 例，绒毛膜癌 7 例。根据不同治疗方案分组：子宫介入栓塞或动脉灌注化疗栓塞联合多药静脉化疗（介化组）16 例，多药静脉化疗（化疗组）19 例，比较两组疗效。结果 两组在年龄、临床分期、肺转移、预后评分、血β-HCG、初始化疗方案无显著性差异（*P*>0.05）。两组血清学缓解率分别为 100%、63.2%，介化组明显好于化疗组（*P*=0.009）。当血β-HCG 降至正常水平，两组患者所用的疗程数有显著性差异（*P*=0.010），接受 3 个以上疗程的患者在介化组占比 6.2%，在化疗组占比 47.4%。两组初次化疗后血β-HCG 下降速度无显著性差异（*P*=0.109）。结论 子宫介入栓塞

或动脉灌注化疗栓塞能够提高 GTN 继发子宫 AVF 患者的化疗效果，减少静脉化疗疗程，是值得考虑的辅助治疗手段。

PU-1820
载药微球 CalliSpheres 在膀胱癌 介入栓塞治疗中的应用初探

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摘要 目的 载药微球又称药物洗脱微球 (drug-eluting bead，DEB)作为新型栓塞剂是近年来研究的热点之一，同时具有栓塞和载药的特性，是一种潜在的可以应用于临床的优良化疗栓塞材料，CalliSpheres 是可载药栓塞微球中的一种，在国内栓塞治疗肝癌领域已取得显著疗效，并取得了较高水平的科研成果，而 CalliSpheres 应用于膀胱癌的栓塞治疗，国内外未见相关报道，本研究通过 CalliSpheres 栓塞膀胱癌供血血管，观察膀胱癌出血及病灶控制情况、术后反应等，探索该方法治疗膀胱癌的可行性、可靠性及临床治疗效果，有望形成新的学术生长点，为膀胱癌的治疗提供一种新的方法和理论依据，推动膀胱癌的基础和临床研究。**方法** 选取无法行外科手术切除的肌层浸润性膀胱癌患者 22 例，均为尿路上皮癌，均为多发病灶，年龄大于 70 岁，随机分为观察组及对照组各 11 例，局麻下 DSA 下行双髂内动脉造影，观察髂内动脉-膀胱动脉参与肿瘤供血的情况，微导管超选至肿瘤供血血管，灌注化疗药物顺铂 40mg/m^2，观察组应用加载 THP40mg 的 CalliSpheres, 直径 300-500um，栓塞膀胱动脉及其他肿瘤血管，对照组应用 PVA 颗粒，直径 300-500um，均栓塞至血流完全阻断。术后 1 周观察血尿控制情况及术后反应，术后 2 月观察膀胱肿瘤体积变化。**结果** 所有患者介入手术顺利，均成功栓塞肿瘤供血血管。所有患者 3-5 天内血尿逐渐停止。栓塞反应：下腹疼痛、发热、恶心呕吐两组患者无明显差别。术后 2 月复查，观察组 10 例患者均未出现血尿，均未出现肿瘤增大或新发病灶；对照组 3 例出现血尿，2 例肿瘤进展，1 例出现新发病灶。**结论** CalliSpheres 可应用于膀胱癌的栓塞治疗，近期效果优于 PVA 颗粒，远期效果及安全性仍需扩大样本量及长时间的随访得出结论。

PU-1821
胰腺血管瘤合并卡-梅综合征经动脉介入栓塞治疗 1 例

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目的： 探讨胰腺血管瘤合并卡-梅综合征经动脉介入栓塞治疗的可行性及疗效分析。**方法：** 患儿，女，3 个月，3 周前无明显诱因出现呕吐，呕吐为胃内容物，就诊当地医院，血常规提示血小板减少 13*10^9/L，入院后予完善相关检查：D-二聚体>20ug/ml，粪便隐血阳性，予输注血小板、红细胞、新鲜冰冻血浆，甲强龙抗血小板抗体、丙球减少血小板破坏，止血等治疗，因血培养出表皮葡萄球菌，遂予万古霉素抗感染治疗，2018-12-03 复查纤维蛋白原 0.61g/L，D-二聚体>20ug/ml，血小板 48*10^9/L,患儿病情稍好转，未再排血便。出院后 2 天再次出现排黑便，转诊上级医院，上腹部 CT 增强提示：1、门静脉海绵样变 2、肝内、外胆管扩张 3、胰腺炎 4、肠壁多发水肿增厚 5、大量腹水。急诊以“门脉海绵样变”转入我肝胆外科。入院后给予输血小板、激素、营养等对症治疗。经医院 MDT 会诊后考虑胰腺血管瘤并卡-梅综合征，拟行动脉介入栓塞治疗。 **结果：** 插 4FCobra 导管选择性插管至腹腔干造影，示胰腺病灶实质期明显染色，将微导管超选择性依次插至胰十二指肠前上动脉、胰十二指肠后上动脉、脾动脉胰上动脉分支造影显示病灶实质期明显染色，经微导管共注入平阳霉素 3 毫克+碘化油 2 毫升+地塞米松 2 毫克+造影剂 3 毫升混

合液及 300uPVA 进行硬化栓塞治疗；完成后再行动脉造影，病灶染色基本消失。拔管及鞘后压迫止血 15 分钟，加压包扎。术中顺利，出血量少，安返复苏室。术后 2019.01.05 血常规五分类+CRP+手工法 血红蛋白 127g/L, 血小板 217×10^9/L。 2019.01.07 粪便分析+潜血 隐血试验阴性。出院后继续口服西罗莫司治疗。**结论：** 该例胰腺血管瘤合并卡-梅综合征经动脉栓塞治疗疗效显著，未见胰腺炎并发症。

PU-1822

桡动脉入路 CBCT 三维血管重建辅助的精准 TACE

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目的 探索桡动脉入路及 CBCT 三维血管重建在精细 TACE 中的作用
方法 在肝癌 TACE 治疗中采用桡动脉入路，评估其安全性、有效性、舒适性。TACE 术中使用 CBCT 三维血管重建来精准定位肿瘤供血动脉，以达到精细 TACE 的目的。
结果 桡动脉入路特别适合于腹主动脉以下有严重血管病变、服用抗凝药物、不能长时间平卧或者肥胖的患者。相较于传统的股动脉入路，桡动脉入路的创伤更小，局部并发症较少，出血风险低，患者术后活动不受限制，即刻就可以下床行走，舒适度高，也大大减少了护理量。各项研究也都表明桡动脉入路的 TACE 安全性和舒适性是有充分保证的。CBCT 三维血管重建弥补了传统二维 DSA 造影图像的缺陷，能够清晰显示前后重叠和扭曲的肿瘤供血动脉，明显提高肿瘤供血动脉判断的准确性，从而更高效地指导精准 TACE。三维血管重建技术不仅能为血供复杂的大肝癌治疗提供指引，在小肝癌的治疗中也能起到精确定位的作用。
结论 经桡动脉入路 TACE 操作简单、安全可靠，是 TACE 入路的很好选择；同时 CBCT 三维血管重建技术能为 TACE 治疗提供精确的指引。两者很好体现了介入治疗更加微创和精准的发展方向，能够在精细 TACE 中得到更加广阔的应用。

PU-1823

CT 引导下经皮肺穿刺活检在亚厘米结节中的临床应用

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目的 探讨 CT 引导下经皮穿刺活检在肺亚厘米结节中的穿刺技巧、诊断价值、安全性，并分析其影响因素。**方法** 收集从 2018 年-1 月-2019 年 6 月就诊于我院及郑州大学第一附属医院 158 例行 CT 引导下经皮肺穿刺活检的亚厘米结节。分别根据亚厘米结节位置、距离胸膜距离分组，分析准确率、敏感度、特异度及并发症发生率，并进行相关因素分析。**结果** 所有 158 例患者均一次性取得足够组织标本进行病理学检查，成功率为 100%，其中真阳性病变 76 例，所占比例约为 48.1%，包括腺癌 42 例，细支气管肺泡癌 22 例，不典型腺瘤样增生 12 例；真阴性病变 70 例，所占比例约为 44.3%，包括炎症 29 例，结核 16 例，机化性肺炎 15 例，错构瘤 7 例，肺出血 3 例；假阴性病变 16 例，最终均证实为腺癌。其诊断的准确率 89.9%。敏感性 85.7%，特异性 100%。整体并发症的发生率为 49.4%，11 例（7.0%）患者术中或术后给予处理，未发生严重并发症。距离胸膜＞1cm（n=85）准确率 90.7%，敏感度 85.7%，并发症发生率 52.6%；距离胸膜≦1cm（n=73），准确率 89.5%，敏感度 91.3%,并发症发生率 48.4%。**结论** CT 引导下经皮肺穿刺活检术诊断亚厘米结节具

有高的准确性，并发症发生率较高，而严重并发症很少，且需要一定的技巧，是一种安全可行的诊断技术。

PU-1824
替拉扎明靶向肝癌介入栓塞后缺氧肿瘤细胞的实验研究

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目的 本项目采用替拉扎明作为缺氧细胞毒剂，开展介入栓塞联合替拉扎明靶向缺氧细胞治疗肝癌的综合疗法提供理论及实践依据，为肝癌介入治疗提供新的治疗策略。
方法 在动物肿瘤细胞中研究替拉扎明对缺氧肿瘤细胞的毒性效应及其与药物浓度、缺氧程度和药物作用时间的关系；并制备替拉扎明栓塞微球，采用不同的联合治疗方案，在动物肝癌模型 VX2 中评价介入栓塞与替拉扎明联合治疗肝癌的疗效，优选联合治疗方案，分析其潜在的协同抗肿瘤机制
结果 (1)替拉扎明对 HepG2 肝癌细胞的细胞毒性作用随药物浓度增加和氧浓度降低呈现增加趋势 ；(2)替拉扎明对 HepG2 肝癌细胞的 DNA 损伤作用随药物浓度增加和氧浓度降低呈现增加趋势，替拉扎明诱导的 DNA 损伤可用来评价药物的细胞毒性；(3)替拉扎明/Hepasphere 栓塞微球制备过程简便，载药及传送性能良好；(4)替拉扎明/Hepasphere 栓塞微球在兔 VX2 肝癌内缓释，肿瘤内药物浓度及作用时间明显优于瘤周肝实质及血浆；(5)介入栓塞可降低肿瘤内氧合状态和血液灌注，诱导缺血缺氧性肿瘤细胞死亡；替拉扎明可诱导兔 VX2 肝肿瘤内缺氧细胞 DNA 损伤，当联合应用于介入栓塞可增强治疗效果，替拉扎明/Hepasphere 微球栓塞是优选的联合治疗方案；(6)介入栓塞与替拉扎明联合治疗以及单纯栓塞治疗可有效抑制肿瘤生长，替拉扎明药物对肝功能无明显损害作用。
结论 替拉扎明可靶向治疗缺氧肝癌细胞，介入栓塞联合替拉扎明可提高肝癌介入治疗效果，替拉扎明微球栓塞是优选的联合治疗方案。

PU-1825
冠心病介入治疗的护理

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冠心病是一种严重危害人类健康的常见心脏病，经过多年的发展，经皮冠状动脉介入(PCI)已经成为治疗冠心病过程中不可缺少的有效手段。 随着心血管介入新技术的临床应用，也面临许多新的护理问题。 主要涉及心理护理、术前、术中、术后护理及康复。

PU-1826
旋压式与弹力加压式桡动脉压迫器在冠脉介入术患者中的 应用效果比较

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目的 比较新型旋压式压迫器与弹力加压式压迫器在冠状动脉介入术后患者桡动脉压迫止血中的应用效果。
方法 依照纳排标准，选取 2018 年 1 月至 2019 年 6 月接受冠状动脉介入治疗的 213 例患者，其中 111 例患者使用新型旋压式压迫器，102 例患者使用弹力加压式压迫器。比较两组患者冠状动脉介入术后术肢血管并发症——出血（纱布称重法）、疼痛（VAS 疼痛评分）、肿胀（测量术侧掌围）的发生情况，及术后患者舒适度状况（Kotcabal 简化的舒适度量表， *CVI*=0.86，*Cronbach's α* 值为 0.92）。
结果 冠状动脉介入术后使用旋压式压迫器的患者术肢肿胀程度(P＜0.01)、VAS 疼痛评分(P＜0.01)、手术伤口出血情况（P＜0.05）均低于使用弹力加压式压迫器患者，且差异存在统计学意义；比较两组患者术后舒适状况，使用旋压式压迫器的患者术后舒适度量表总得分（84.27±10.56）高于使用弹力加压式压迫器的患者总得分（76.91±11.96），且差异存在统计学意义（P＜0.05）。
结论 冠状动脉介入术后使用旋压式桡动脉压迫器的患者在血管并发症（肿胀、疼痛、出血）及舒适度方面均优于使用弹力加压式压迫器的患者。因此，新型旋压式桡动脉压迫器在冠状动脉介入治疗术后患者中的应用效果要优于弹力加压式压迫器。

PU-1827
双源 CT 三维成像在动脉导管未闭介入治疗的指导价值

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目的 探讨 CT 三维成像对动脉导管未闭介入治疗的临床价值。**方法** 选取我院 2018-2019 年 50 例动脉导管未闭患者，进行介入封堵术，研究组采取 CT 三维成像引导治疗，对照组采取术中 DSA 造影引导。比较两组治疗效果，手术时间。**结果** 在治疗效果，差异无统计学意义，研究组手术时间短于对照组，差异有统计学意义。**结论** CT 三维成像对动脉导管未闭介入治疗有显著的指导价值，优于术中 DSA 造影

PU-1828
人文关怀对行三维房颤射频消融术患者焦虑及疼痛的影响

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摘要：目的 探讨人文关怀对行三维房颤射频消融术患者焦虑及疼痛的影响。**方法** 选取我科 2016 年 12 月—2017 年 11 月需进行择期三维射频消融手术的房颤患者 61 例，按照随机数字表法分为观察组和对照组，观察组 30 例，对照组 31 例。对照组采用常规护理，观察组在对照组基础上给予手术全程人文关怀，分别于入院当日和手术后比较两组患者焦虑状态评分，并评估术中患者疼痛程度评分。**结果** 两组患者入院当日焦虑评分无统计学差异，而术后观察组明显低于对照组（P＜0.05），差异有统计学意义，并且观察组实施人文关怀护理干预后，焦虑评分显著下降（P＜0.01）。两组患者术中疼痛比较，观察组评分明显低于对照组，差异有统计学意义（P＜0.05）。**结论** 将人文关怀运用到三维房颤射频消融手术护理工作中，有利于减轻患者焦虑、紧张情绪，值得向临床推广。

PU-1829
螺旋 CT 扫描 CTA 检查和 DSA 检查在诊断冠心病的应用价值分析

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目的 探究分析 CTA 检查和介入 DSA 检查在诊断冠状动脉粥样硬化性心脏病的应用价值分析。**方法** 选取我院 2018-2019 年到本院的 50 例疑似冠心病患者作为分析对象，对他们进行 CTA 检查和 DSA 检查，对结果进行分析。**结果** 50 例患者的检查结果进行对比，以常规冠状动脉造影作为标准，128 排螺旋 CT 在诊断冠心病的敏感度和特异度分别达到 97.6%，95.4%。**结论** 螺旋 CT 对冠心病检查效果优于 DSA 检测，具有较高的临床诊断价值

PU-1830
凝胶体位垫的使用在冠心病患者介入治疗中的应用分析

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[目的]探讨凝胶体位垫的使用在冠心病患者介入治疗中的应用效果。[方法]将 2018 年 2～10 月在介入手术室行冠心病介入治疗的 80 例肥胖患者作为研究对象，随机均分为两组（n=40），对照组常规使用盐水袋作为衬垫，实验组使用凝胶体位垫作为衬垫，均采用右手常规摆放体位，由同一术者在局麻下行右桡动脉穿刺术，回顾性分析比较两组效果。[结果]比较两组应用效果，差异具有统计学意义（p<0.05）。[结论]冠心病患者介入治疗中使用凝胶体位垫，能够有效的提高桡动脉穿刺率，增加患者肢体舒适度，缩短穿刺时间，可以在临床中推广使用。

PU-1831
1 例经导管主动脉瓣置换术术中心搏骤停的护理体会

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经导管主动脉瓣置换术（Transcatheter Aortic Valve Implantation，TAVI）是通过患者的动、静 脉系统或左心室心尖，利用介入导管将人工心脏瓣膜输送至主动脉瓣区后打开，替代原有主动脉瓣，实现瓣膜的正常生理功能。但 TAVI 术中易出现不良事件,甚至发生心搏骤停，处理不及时将导致患者死亡。本文通过回顾性分析 1 例 TAVR 手术患者术中发生心搏骤停成功抢救，总结 TAVR 手术术中护理经验。

PU-1832
医护一体医院感染预防与控制模式在老年介入治疗患者中的应用

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目的 探讨医护一体医院感染预防与控制模式在老年介入治疗患者中的应用价值。**方法** 选取行介入治疗的老年患者 1100 例进行研究；按照随机数字表法进行分组，对照组 550 例，以常规方式进行护理干预；观察组 550 例，以医护一体院感防控方式进行干预，比较两组患者的干预效果。**结果** 观察组患者医院感染发生率明显低于对照组（$p<0.05$），且两组患者感染部位均以呼吸道感染为主；观察组患者对护理管理各项满意度评分均明显高于对照组（$p<0.05$）；观察组患者住院时间（6.6±0.8）d 明显短于对照组的（8.3±1.2）d（$p<0.05$）。**结论** 医护一体医院感染预防与控制模式的应用可显著减少医院感染发生，并有利于缩短患者住院时间、提高患者满意度，可推广应用。

PU-1833

药物球囊治疗冠心病的护理策略

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摘 要 **目的** 探讨药物球囊治疗冠心病的护理策略。**方法** 选取 2015 年 3 月至 2018 年 6 月因冠心病在西京医院心内导管室接受药物球囊治疗的 1131 例患者，围术期给予积极的心理护理、术前准备、术中护理、术后交接和病情观察。**结果** 1131 例患者均顺利完成手术，围术期无明显并发症发生，患者心身感受满意。**结论** 围术期护士充分的心理护理、术前准备、熟练的术中配合及细致的术后护理是药物球囊治疗冠脉病变成功的重要保证。

PU-1834

探讨影响冠状动脉造影图像质量的因素

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目的 通过对比分析质量较差的冠状动脉 DSA 图像，找出影响 DSA 图像质量的因素并进行改善，提高图像的质量。
方法 使用 GE 公司 innova3100IQ 数字减影血管造影机对 2018 年 1000 例冠脉 DSA 造影图像进行回顾性分析，通过造影剂的种类剂量、温度、注射速度、浓度、总量、体位的选择、DSA 设备技术参数的设置、术中操作的熟练程度及患者配合程度等几方面来分析影响 DSA 图像质量的因素。
结果 优等图像 950 例占 95%，良好图像 40 例占 4%，较清楚图像 10 例占 1%，
结论 造影剂的种类剂量、温度、注射速度、浓度、总量、体位的选择、DSA 设备技术参数的设置、术中操作的熟练程度及患者配合程度均对 DSA 图像质量产生影响。因此，在采集冠状动脉 DSA 图像时应避免这些因素的影响，

PU-1835

多功能起搏器植入术用压迫固定带的设计

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目的 解决起搏器植入术后因压迫止血不当引起囊袋感染、术侧肢体过度活动引发起搏电极脱位、去除临时起搏器后股静脉穿刺点出血等问题。 **方法** 设计囊袋压迫固定带、上肢制动带、股静脉穿刺点压迫固定带三合一的简化使用工具。 **结果** 多功能起搏器植入术用压迫固定带使用肩带、腹部固定带、下肢固定带三个位置连结，有效保证囊袋压迫袋位置固定；同时可制动上肢，使外展及上肢活动度在可控范围内，有效防止起搏电极脱位；去除临时起搏器后股静脉压迫盐袋妥善固定于下肢固定带，避免穿刺点血肿及整体固定带位置上移。**结论** 专利产品（一种起搏器植入术压迫袋固定带）是针对起搏器植入术后即刻的三个护理重点研发，可提高患者舒适度改善患者焦虑，设计合理，功能全面，使用方法简单，性价比高，具有良好的市场应用前景和社会经济效益。

PU-1836
右冠状动脉不同体位造影图像测量准确性比较

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1.目的
比较右冠状动脉在左斜位 45° 和左斜位 30° + 头位 30° 造影时，影像中心区域测量值的差异。

2.材料和方法
2.1 一般资料 回顾性随机收集 2018.6-2019.3 期间行右侧冠状动脉介入手术治疗的 30 例病人，术中采用 GE Innova3100 IQ DSA 机，JR4.0 右冠指引导管，Runthrough NS 指引导丝，导丝标记段长度为 30mm。
2.2 手术操作方法 右冠状动脉进行介入治疗时，投照角度分别为左斜位 45° 和左斜位 30° + 头位 30° ，FOV 为 16X16cm，增强器尽量贴近病人，球管尽量远离检查床，射线中心线对准心脏中心，影像传至 adw4.6 后处理工作站。
2.3 介入测量 将图像平均分为九个区域，选取指引导管位于中上区域，指引导丝标记段走行平直，无反折、卷曲且位于图像中心区域的图像，应用二维定量测量软件测量指引导丝标记段长度。
2.4 统计分析 使用 SPSS 21.0 统计分析软件，采用单因素方差分析比较在两种投照体位下指引导丝标记段在中心区测量值与实际值的差异。
3. 结果
左斜位 45° 、左斜位 30° + 头位 30° 投照时中心区测量值为（30.89±3.12mm）、（27.12±4.26mm）与实际值（30±0mm）存在统计学差异（F=6.82，P<0.05），组内两两比较，左斜位 45° 与实际值无差异（P>0.05），而与左斜位 30° + 头位 30° 测量值有统计学差异（P<0.05）。

4 结论
在右冠状动脉的左斜位 45° 、左斜位 30° + 头位 30° 两个造影角度上，左斜位 45° 造影图像的中心区域的测量值更准确，接近实际值，在右冠状动脉病变的测量准确性上优于左斜位 30° + 头位 30° 造影体位。

PU-1837
支架精显技术 StentViz 在冠状动脉支架植入术中的应用

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目的探讨冠状动脉造影定量分析(QCA)、支架精显技术(StentViz)和血管内超声(IVUS)三种技术，在冠状动脉支架植入术中评价支架可视性和膨胀性中的应用。**方法**收集 2016 年 05 月至 2018 年 11 月同时接受 StentViz 和 IVUS 检查的经皮冠状动脉介入术患者 30 例。分别在 QCA、StentViz 和 IVUS 图像中，对植入的 33 枚支架测量其最小支架直径、最大支架直径，计算支架偏心指数，并进行不同方法之间的比较分析。同时对 30 例患者共 143 幅 StentViz 图像进行支架可视性分级评价。**结果** QCA 测量的最小支架直径、最大支架直径明显大于 StentViz 和 IVUS（P 均<0.05），支架偏心指数明显小于 StentViz 和 IVUS（P 均<0.05）；StentViz 测量的上述指标与 IVUS 比较无显著性差异。StentViz 与 IVUS 测量的最小支架直径的相关性优于 QCA 与 IVUS 的相关性（r 分别 0.956 和 0.776）。StentViz 测量的最小支架直径和 QCA 相比，与 IVUS 具有更好的一致性。143 幅 StentViz 图像支架可视化评价：82.1%的支架显示优，评分 4 分；15.3%支架显示良，评分 2-3 分；2.6%支架显示差，评分 0-1 分。**结论** StentViz 可显著提高冠状动脉内支架的可视性，与 QCA 相比在测量支架直径方面与 IVUS 具有更好的相关性和一致性。

PU-1838

近 5 年我国介入护理研究热点的可视化分析

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[目的]了解我国介入护理的研究现状和发展趋势,为提升介入护理质量提供参考。[方法]检索中国期刊全文数据库(CNKI)和万方数据库收录的 2012 年—2016 年有关介入护理相关文献,应用 CiteSpace 信息可视化软件及文献计量学方法进行分析。[结果]共筛选出 3 766 篇文献,文献量呈逐年递增趋势,热门关键词集中在心血管介入护理、脑血管介入护理、围术期专科护理、介入护理干预等方面。[结论]介入护理受到临床护理人员的关注,逐渐向专科化、规范化方向发展。

PU-1839

超声科乳腺癌穿刺绿色通道的建立及效果评价

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【摘要】 **目的** 探讨我院超声科开展超声引导下乳腺癌穿刺活检就诊绿色通道的必要性，提高乳腺癌患者就诊效率和患者满意度，缩短乳腺癌患者等待穿刺的时间，从而得到有效的治疗。**方法** 对我院超声科从 2018 年 1 月到 2019 年 1 月行乳腺超声检查后需要做穿刺的患者共 1160 例，将超声检查 BI-RADS 分级 4c 类及以上的 580 例患者纳入绿色通道，其中女性患者占 578 人，男性占 2 人分成实验组，另外 580 人分成对照组，对比两组患者从门诊就医流程，预约乳腺超声专科检查的时间以及患者和家属对开展乳腺癌绿色通道的整体满意度调查。**结果** 实验组 580 例绿色通道患者穿刺结果为癌的 447 例，良性为 133 例，超声引导乳腺穿刺等待时间缩短至 3 天（对照组等待穿刺的时间为 60 天左右），两组对比差异有显著统计学意义（P＜0.01），实验组患者门诊挂号时间≤ 3 天，对照组患者门诊挂号时间待定，平均≥ 30 天，两组对比差异有显著统计学意义（P＜ 0.01），预约乳腺超声专科检查的时间实验组患者为≤ 2 天，对照组患者为 21 天左右，各关键环节时间点所用时间均减少(P＜0.01),而开展绿色通道后的患者整体满意度明显高于对照组（实验组患者满意度为 99.9%，对照组为 35%），两组患者间差异具有显著统计学意义（P＜0.001）。**结论** 随着社会的进步，大家对乳腺癌知识的普及发现乳腺癌现在的发病率日趋上升，而乳腺癌的准确分

型是临床治疗的依据，能让患者得到最适合的治疗方案，而我院因就诊患者人数较多，等待时间过长，从而导致日后的手术时间延长，这不仅造成了患者心理和身体上的痛苦，也给她以后的治疗增加了难度，并且给家庭带来严重的经济负担。因此，我院超声科医护人员克服种种困难，开辟了乳腺癌诊治的绿色通道，大大缩短其就医时间，从而保障其治疗效果，避免乳腺癌患者在等待穿刺活检的期间到处奔波；绿色通道的建立值得在超声介入工作中进行推广使用。

PU-1840

硬化注射治疗儿童疣状血管瘤的临床疗效观察

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目的 探讨泡硬化注射治疗儿童疣状血管瘤的临床疗效。**方法** 回顾性分析 2017 年 7 月至 2018 年 12 月，36 例疣状血管瘤患儿行局部硬化注射治疗的临床资料。在门诊使用聚桂醇或聚多卡醇进行局部硬化注射治疗，治疗后 4 周后评估，未达到治愈标准继续接受注射治疗，术后随访 12~36 月。**结果** 本组病例 27 例患儿治疗后达到临床治愈标准，随访无复发，5 例患儿达好转标准，建议继续随访，4 例无效。总体治愈率 75%，有效率达 88.8%。术后 13 例次出现轻度局部肿胀，2 例次一过性低热，无继发感染、药物过敏等严重不良反应。 **结论** 儿童疣状血管瘤行硬化注射治疗，具有安全有效、疗效确切的特点，值得临床推广应用。

PU-1841

经导管动脉栓塞联合普萘洛尔治疗婴儿胸壁血管瘤

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目的评价婴儿胸壁血管瘤，行经导管动脉栓塞联合普萘洛尔治疗的疗效及安全性。**方法** 选择我院 2016 年至 2018 年 36 例婴儿胸壁血管瘤病例，行经股动脉插管血管瘤硬化栓塞联合普萘洛尔治疗，血管瘤供血动脉插管依次使用碘油博来霉素乳剂及聚乙烯醇泡沫颗粒栓塞，术后予口服普萘洛尔治疗。**结果** 36 例共行 TASE 术 42 次，每例行 1～3 次，平均 I. 1 次。平均住院 2.2d(2～3d)。36 例中达治愈标准 33 例(91.6%)，达显效标准 3 例(8.4%)，无效 0 例，显效率 100%，治疗结束后平均随访 13 个月，最长 18 个月，最短 6 个月，无复发病例。本组未出现肺栓塞、脑栓塞等严重并发症。**结论**婴儿血管瘤经导管动脉硬化栓塞联合普萘洛尔治疗具有创伤小、安全、住院时间短、疗效显著、大多数病例术后不留瘢痕等优点。

【关键词】血管瘤；栓塞，普萘洛尔

PU-1842

平阳霉素局部注射治疗胸壁大囊型淋巴管畸形

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目的观察平阳霉素局部注射对胸壁大囊型淋巴管畸形的临床疗效。**方法**选择我院 2017 年至 2018 年 52 例胸壁大囊型淋巴管畸形患者，行平阳霉素局部瘤体硬化注射治疗。**结果** 52 例共行硬化治疗

132 次，每例行 1～3 次，平均 2.6 次。平均住院 1.3d(1～3d)。52 例中达治愈标准 49 例(94.2%)，达显效标准 3 例(5.8%)，无效 0 例，显效率 100%，治疗结束后平均随访 10 个月，最长 16 个月，最短 4 个月，无复发病例，不良反应发生率低且轻，主要为轻度全身反应。**结论**平阳霉素局部注射对胸壁大囊型淋巴管畸形简便有效，避免了手术切除淋巴管畸形所造成的瘢痕及手术风险。

【关键词】 平阳霉素；胸壁；大囊型淋巴管畸形

PU-1843

盆腔淤血综合征的介入治疗分析

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目的 探讨盆腔淤血综合征（PCS）介入治疗的应用价值。**方法** 回顾性分析 2016 年 5 月至 2018 年 12 月在本院就诊并行介入治疗的 10 例盆腔淤血综合征患者的临床资料，分析总结其临床表现及卵巢静脉介入栓塞治疗的方法与疗效。**结果** 10 例患者经影像学检查结合临床症状诊断为盆腔淤血综合征，全部患者均经影像学检查提示盆腔静脉迂曲扩张，卵巢静脉曲张，其中 6 例患者左侧卵巢静脉曲张，4 例患者双侧卵巢静脉曲张。所有患者均成功行卵巢静脉栓塞治疗，其中 7 例患者临床症状逐渐好转，3 例患者症状得到缓解，所有患者介入卵巢静脉栓塞治疗成功率 100%，术后均未发生严重并发症。**结论** 采用介入栓塞卵巢静脉治疗盆腔淤血综合征是一种安全有效的治疗手段，有着较高的成功率和令人满意的临床疗效。

PU-1844

超声科乳腺癌穿刺的绿色通道建立及效果评价

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【摘要】 **目的** 探讨我院超声科开展超声引导下乳腺癌穿刺活检就诊绿色通道的必要性，提高乳腺癌患者就诊效率和患者满意度，缩短乳腺癌患者等待穿刺的时间，从而得到有效的治疗。**方法** 对我院超声科从 2018 年 1 月到 2019 年 1 月行乳腺超声检查后需要做穿刺的患者共 1160 例，将超声检查 BI-RADS 分级 4c 类及以上的 580 例患者纳入绿色通道，其中女性患者占 578 人，男性占 2 人分成实验组，另外 580 人分成对照组，对比两组患者从门诊就医流程，预约乳腺超声专科检查的时间以及患者和家属对开展乳腺癌绿色通道的整体满意度调查。**结果** 实验组 580 例绿色通道患者穿刺结果为癌的 447 例，良性为 133 例，超声引导乳腺穿刺等待时间缩短至 3 天（对照组等待穿刺的时间为 60 天左右），两组对比差异有显著统计学意义（P＜0.01），实验组患者门诊挂号时间≤ 3 天，对照组患者门诊挂号时间待定，平均≥ 30 天，两组对比差异有显著统计学意义（P＜0.01），预约乳腺超声专科检查的时间实验组患者为≤ 2 天，对照组患者为 21 天左右，各关键环节时间点所用时间均减少(P＜0.01),而开展绿色通道后的患者整体满意度明显高于对照组（实验组患者满意度为 99.9%，对照组为 35%），两组患者间差异具有显著统计学意义（P＜0.001）。**结论** 随着社会的进步，大家对乳腺癌知识的普及发现乳腺癌现在的发病率日趋上升，而乳腺癌的准确分型是临床治疗的依据，能让患者得到最适合的治疗方案，而我院因就诊患者人数较多，等待时间过长，从而导致日后的手术时间延长，这不仅造成了患者心理和身体上的痛苦，也给她以后的治疗增加了难度，并且给家庭带来严重的经济负担。因此，我院超声科医护人员克服种种困难，开辟了乳腺癌诊治的绿色通道，大大缩短其就医时间，从而保障其治疗效果，避免乳腺癌患者在等待穿刺活检的期间到处奔波；绿色通道的建立值得在超声介入工作中进行推广使用。

PU-1845

DSA 技师在介入诊疗中的重要性

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介入诊疗现被并为现代临床医学三大学科之一，是以医学影像为导向，介入器材为手段，集影像诊断与微创治疗为一体的高端科学技术，目前伴随越来越多的 DSA 新设备、新技术、新功能应用于介入放射学领域，图像采集、网络传输、软件处理以及复杂手术的技术支持等日益专业化，DSA 单一机器操作逐步发展为与 CT、MRI 融合，全数字化现代医学影像的发展，介入技师的工作相应地变得更为重要；技师在不断提高理论水平、实际操作技能、影像质量控制分析，提升业务能力的同时，理论与经验并重，将介入新技术、新功能及时、准确、规范的应用于临床，以帮助医生提高治疗的精准性，减少并发症，力求从单元化向多元化发展，成为复合型介入技师，成为介入影像设备的直接管理者、影像新技术的实践者、介入新技术的直接参与者。

PU-1846

主动脉弓减影路径图在脑血管造影中的临床应用

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摘要：1.**目的** 探索 DSA 脑血管造影应用主动脉弓减影路径图的临床应用价值。2.**方法** 回顾性分析 2017 年 5 月-2019 年 3 月内我科血管条件不好的 20 例行脑血管造影的病人在同时应用主动脉弓减影路径图与没有应用主动脉弓减影路径图所需要的透视时间及 X 线的辐射剂量。3.**结果** 应用主动脉弓减影路径图相较于没有应用主动脉弓减影路径图时节省手术透视时间为（7±2min）,平均透视剂量减少 40%。**结论** 在实际工作中，对于血管条件不好的病人行脑血管造影时应用主动脉弓减影路径图可指引图像清晰、操作简便，可以提高手术医师操作信心和效率，从而提高手术安全性、缩短手术时间、减少患者和医生的 X 线辐射，具有很高的临床应用价值。

PU-1847

KLIPPLE-TRENAUNAY 综合征的综合治疗。

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目的 加强了解 KT 综合征，提出综合整治策略。
材料及**方法** 分析我科 KT 综合征共 201 例，根据不同类型分别行激光消融，硬化栓塞，西罗莫司等不同方法，分析其疗效及并发症。
结果 边缘静脉腔内消融经济可行，硬化栓塞可针对不同类型 LM ，西罗莫司对红斑，出血等有效。所有治疗未出现严重并发症。
结论 KT 综合征需要多学科综合治疗，根据不同类型及病灶的主要类型采用联合的治疗策略。

PU-1848

导管室医用 X 射线防护装备的使用与管理

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随着介入放射学的迅速发展，医院患者的就诊数量的快速增长，X 线放射设备的使用数量也在逐年增加，伴随而来的辐射损伤问题日渐突出，也得到人们的普遍关注，因此对于 X 射线防护装备的合理使用和有效管理在减少辐射损伤方面显得尤为重要，本文针对我院介入导管室的一部分医用 X 射线防护装备的日常使用与管理现状进行分析，综合分析针对导管室医用 X 射线防护装备进行合理的使用科学有效的管理对有效减少辐射损伤，减少仪器损坏是十分必要的。
随着介入放射学的迅速发展，医院患者的就诊数量的快速增长，X 线放射设备的使用数量也在逐年增加，伴随而来的辐射损伤问题日渐突出，也得到人们的普遍关注，因此对于 X 射线防护装备的合理使用和有效管理在减少辐射损伤方面显得尤为重要，本文针对我院介入导管室的一部分医用 X 射线防护装备的日常使用与管理现状进行分析，综合分析针对导管室医用 X 射线防护装备进行合理的使用科学有效的管理对有效减少辐射损伤，减少仪器损坏是十分必要的。

PU-1849

CT 引导下肺穿刺活检对于孤立性肺结节的诊断价值与咯血影响因素分析

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背景和目的
由于早期肺癌缺乏特异性临床症状，往往确诊时已到了疾病的中晚期，而且中晚期 5 年生存率较低，所以人们越来越重视肺癌的早期发现和早期确诊。CT 引导下肺穿刺活检是一种创伤性小、穿刺成功率高、阳性率高的检查方式，已成为临床早期诊断肿瘤的一种重要的影像学检查方法，并获得了广泛的认可和应用。有研究认为，直径在 10~30mm 的 SPN 具有较高的恶性风险，所以应该早期诊断，确定治疗方案，但 CT 引导下肺穿刺活检作为一种有创的检查方式，各种并发症不可避免，既往文献已对常见的穿刺并发症及其影响因素做了大量研究，但对咯血的相关报道尚少。
本文主要研究 CT 引导下肺穿刺活检对直径范围在 10~30mm 的 SPN 的诊断价值,并分析咯血的发生情况,从而提高穿刺诊断效率，避免咯血的发生。
资料和方法
收集 2013 年 1 月至 2018 年 3 月在双源 CT 室进行 CT 引导下经皮肺活检的 289 例孤立性肺结节（SPN）患者的临床、影像学及病理资料。其中，男性 154 例，女性 135 例；患者年龄范围 11-87 岁，平均年龄 58.7 岁，中位年龄 59 岁。并按肺结节直径分成 A 组（20mm＜直径≤30mm）和 B 组（10mm≤直径≤20mm）。分别从以下三方面进行对比分析：1、对 A、B 两组的穿刺成功率、阳性率、恶性率及各种并发症（气胸、出血、咯血）进行对比分析。2、统计直径在 10~30mm 范围内 SPN 的各种病理类型。3、分别从单因素和多因素方面分析，求出影响咯血的独立影响因素。
结果
咯血的单因素分析，卡方检验结果显示：不同病灶大小、穿刺深度、穿刺针型号大小比较，差异有统计学意义（P＜0.05），将以上影响因子作为因变量进行多因素 logistic 回归分析结果显示病灶大小(P=0.03,OR=0.312)、进针深度(P=0.02,OR=3.622)是咯血发生的独立危险因素。
结论
可选择适宜的穿刺路径减少咯血的发生。

PU-1850

低剂量 CT 引导下经皮胃肠道占位穿刺活检的临床应用价值分析

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目的 探讨低剂量 CT 引导下经皮胃肠道占位穿刺活检的临床应用价值及安全性。
方法 收集 2016 年 05 月至 2019 年 08 月郑州大学第一附属医院 34 例胃肠道占位患者，其中男 16 例，女 18 例，年龄 27-83 岁，平均 57.4 岁。34 例患者中胃占位 10 例，小肠占位 16 例，结肠占位 8 例。其中胃及结肠患者均已行消化内镜检查并内镜下活检阴性。所有患者均行全程低剂量 CT 引导下穿刺活检，CT 机器采用 GE Lightspeed 大孔径 CT，管电压为 100KV，管电流为智能毫安秒（Auto mAs），设置层厚为 2.5mm，扫描范围为 2cm。采用全自动一次性使用活检针（17G，BioPince, ARGON MEDICAL）依情况取组织 2-4 条。统计其扫描次数、辐射剂量、手术时间及病理类型、并发症情况。
结果 所有患者均完成全程低剂量 CT 引导下经皮胃肠道占位穿刺活检。10 例胃占位患者中相比内镜均有，贲门胃底 3 例，胃体部 4 例、胃窦幽门部 3 例，病理结果为 6 例腺癌，2 例胃肠道间质瘤，1 例梭形细胞肿瘤，1 例为高级别上皮内瘤变（手术标本为腺癌）。16 例小肠患者中，空肠 10 例，回肠 6 例。病理结果为 3 例胃肠道间质瘤，5 例为弥漫大 B 淋巴瘤，2 例为平滑肌肉瘤，2 例为腺癌，4 例子为炎性肉芽肿病变，考虑为克罗恩病可能。8 例子结肠占位患者中，6 例为腺癌，1 例为炎性肌纤维母细胞瘤，1 例为粘膜相关淋巴组织结外边缘区淋巴瘤。穿刺病理阳性率为 97.1%，所有患者无严重并发症如胃肠道穿孔、腹膜炎及大出血发生。所有患者平均操作时间为 16min，平均扫描 3-4 次，平均 DLP 为 74.4mGy*cm，平均辐射剂量为 1.12mSv。
结论 低剂量 CT 引导下胃肠道穿刺活检阳性率高，辐射剂量低，安全有效，可作为小肠占位明确病理性质的主要手段，胃及结肠内镜活检失败后的重要补充手段，具有重要的临床应用价值。

PU-1851

信息化建设助推介入学科发展

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作者结合浙江大学医学院附属邵逸夫医院两院区实际，分享信息化建设在介入学科发展中的作用，最后得出以下**结论**
•信息化建设贯穿介入医教研和管理的各个环节；
•信息化建设使得介入工作更加高效、精准；
•信息化建设拉近了多院区介入工作；
•今后的思路：介入信息化平台建设！

PU-1852

CT 引导经皮肺穿刺在肺部占位性病变诊断中的应用

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目的 探讨 CT 引导经皮肺穿刺在肺部疾病诊断中的诊断成功率、并发症发生率及相关影响因素，了解其临床应用价值。**方法** 回顾分析我院 66 例肺占位性病变患者，均经 CT 引导经皮肺穿刺活检

术，按结节在肺内位置分为肺周围性病变组（52 例）和中央型病变组（14 例），再按结节最大径分为≥5cm（28 例）和＜5cm（38 例）两组，分别统计比较其诊断成功率、并发症发生率，并分析其相关影响因素。**结果** 诊断成功 58 例，诊断成功率 87.9%；肺周围性病变组中 46 例诊断成功，诊断成功率 88.5%，并发症发生率 48.1%；肺中央型病变组中 12 例穿刺成功，诊断成功率 85.7%，并发症发生率 28.6%，两组在诊断成功率和并发症发生率比较无统计学意义（P=0.725，P=0.192）。结节最大径≥5cm 组中诊断成功率 85.7%，并发症发生率 28.6%；小于 5cm 组中诊断成功率 89.5%，并发症发生率 55.3%，二者在诊断成功率比较无统计学意义（P=0.644），二者在并发症发生率比较有统计学意义（P=0.031）。**结论** 1、CT 引导经皮肺穿刺活检术具有诊断成功率高、安全、并发症少及创伤小等优点，在肺部占位性病变诊断中具有重要的临床应用价值；2、CT 引导下穿刺在≥5cm 结节较＜5cm 结节的安全性更高。

PU-1853
一例输液港导管右锁骨下静脉异位的介入复位和围术期护理

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目的 通过 DSA 引导下介入手法对 1 例静脉输液港导管锁骨下静脉异位成功复位于上腔静脉的病案，探讨静脉输液港导管锁骨下静脉异位的介入调整及护理方法。方法 通过术前准备、术中配合及术后的健康宣教，经右侧股静脉途径，通过“猪尾巴”导管远端卷曲段配合亲水膜导丝圈套住输液港导管中远段，采用轻微旋转、下拉导管尝试将输液港导管复位至上腔静脉。结果 异位的输液港导管成功复位至上腔静脉，导管得到安全的留置。结论 输液港导管左锁骨下静脉异位的介入复位联合操作安全、简便；护士围术期护理减轻了患者的紧张情绪，提高了复位的成功率。

PU-1854
人性化护理干预老年住院患者压疮护理中的效果

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目的 研究分析在老年住院压疮护理中采用人性化护理干预的应用效果。**方法** 研样本选自本院 2016 年 12 月-2018 年 12 月间收治的 120 例老年住院压疮患者当中，遵循随机的原则将其分为对照组与观察组，对照组患者采用常规护理干预，观察组患者采用人性化护理干预，对比两组患者护理结果。**结果** ①观察组患者压疮发生率低于对照组患者（P<0.05）；②观察组患者压疮发生严重程度、护理满意度优异于对照组患者（P<0.05）。**结论** 本次研究证明，在老年住院压疮护理中采用人性化护理干预，有利于提高患者护理满意度，降低压疮发生率，改善患者压疮发生严重程度。

PU-1855
介入风险管理在介入放射科介入治疗中的应用体会

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摘要：**目的** 将护理风险管理应用于介入放射科介入治疗中，并分析总结应用的体会。**方法** 2017 年 6 月份我院开始实施护理风险管理，因此选取 2016 年 6 月-2017 年 6 月在我院就诊的 214 名患者作为对照组，选取 2017 年 6 月-2018 年 6 月在我院就诊的 214 名患者作为观察组，对比护理风险管理实施前后的护理结果。**结果** 观察组的护理满意度和临床护理质量均优于另一组。**结论** 将护理风险管理应用在放射科介入治疗中，不但可以提高临床护理质量以及护理满意度，还可以在一定程度上促进患者尽早康复。

PU-1856
探讨 PDCA 循环管理中的发展在介入手术室静脉输液安全管理中的发展

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摘要**目的** 探讨 PDCA 循环在介入手术室静脉输液安全管理中的循环法.**方法** 运用 PDCA 循环法加强介入手术时，患者静脉输液安全的管理，提高护理质量，对我院 2018 年 8 月到 11 月，PDCA 循环实施前后静脉输液部位的选择，堵管的发生，转运的安全真行的选择，连接的正确性等，相关事件进行评价.**结果** PDCA 循环法师侍候上述安全事件的不良发生率均有明显下降，P 小于 0.05，结论运用 PDCA 循环法可以有效提高介入手术室静脉输液安全管理的质量。

PU-1857
流程再造在提高医院介入手术室绩效的应用效果研究

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目的 探讨介入手术室管理流程再造在提高绩效中的应用与效果。**方法** 2018 年 2 月-4 月 1433 台介入手术为干预组，实施流程再造后介入手术室护士长负责制，院级垂直管理模式；将 2017 年 10 月—12 月 1149 台介入手术为对照组，采用传统的科层化管理模式[1]。比较两组介入手术量、临床科室分布占比、全院经营管理指标占比等指标，并分析流程再造后介入手术室护士满意度，观察流程再造效果。**结果** 流程再造前后干预组比对照组手术总量增加 24.7%，介入手术科室分布具有显著性差异（$P<0.001$），流程再造后介入手术室护士满意度高于其他手术平台护士，在人员配置方面满意度高（$P<0.05$）。**结论** 流程再造有利于提高介入手术绩效，增加医院效益促进介入学科发展。

PU-1858
科主任督导制度在介入手术安全中的影响

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随着现代医疗技术水平的提高介入手术诊疗技术也不断进步，由于介入手术创口小、恢复快、疗效好等优点介入手术已成为现代医学的主流学科之一。本文在详细阐述介入手术特点的同时结合我院

介入手术室相关运转情况，统计分析科主任现场督导制度实行前后我院综合性介入手术室术中纠纷发生率，结果表明科主任督导制度在保障介入手术安全进行具有重要作用，这为完善我国医院相关管理制度提供参考，为病人得到更安全的医疗服务奠定基础。

PU-1859

介入科实习护生综合教学模式的实践与探

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目的 探讨综合教学对介入科实习护生介入放射学认知及理解的影响。方法 对在我科实习的护生进行分组教学，分为对照组（传统教学方法）、观察组（综合教学法）。采取调查问卷、技能考核和笔试对两组的教学结果进行评价。**结果** 观察组与对照组相比患者、医师及带教老师满意度较高（c^2值分别为 34.259、42.523、21.333；P<0.05）；操作技能成绩两组无统计学差异（t=1.13；P>0.05），笔试成绩观察组与对照组相比较高（t=10.17；P<0.05）。观察组护生在专科疾病护理、病情观察、患者安全管理、危重症患者抢救配合、突发事件处理和护患关系处理等能力显著高于对照组（t 值分别为 4.855、6.417、5.673、5.602、3.284、2.471；P<0.05）。观察组 SDLINS 总分高于对照组（t=5.089；P<0.05）。**结论** 观察组学生在通过综合性教学后，对介入理论知识和理念的认识更加深入，不仅可以加强护生对介入治疗知识的学习，而且有助于累积临床经验，同时提高对介入放射学的认可度，推进介入放射学学科发展，值得临床推广。

PU-1860

DSA 技师在介入手术中的术中配合

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随着现代医学的发展，科技的不断进步，再到 x 线之父伦琴先生发现 x 线，促成了临床医学与影像学的完美结合。诊疗技术也应运而生，近年来被各个医院重视起来，成为医院的重要学科之一。数字减影血管造影（DSA）是其中一项重要技术，把影像和治疗融为一体。介入医学是三大学科之一，介入医学当然离不开 DSA 大型医疗设备，所以 DSA 成了介入手术室中的主体，DSA 技师成了不可或缺的一部分，介入手术中配术中 DSA 技师的配合也至关重要。现通过多年的工作经验，DSA 技师在手术过程中的合。总结如下

PU-1861

放射介入治疗对产后及异常妊娠子宫出血患者的临床研究

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目的；采用放射介入疗法治疗产后及异常妊娠子宫出血，在治疗中探讨分析其临床改善疗效。方法；选择我院筛选出 66 例产后及异常妊娠子宫出血患者，均经临床诊断并确定，经随机数字分为治疗组及对照组，各组 33 例；对照组年龄在 24-32 岁之间，平均（27.4±2.6）岁；治疗组年龄均在 23-32 岁间，平均为（28.3±3.0）岁。纳入者均经伦理委员会审批通过并同时在知情同意书签

字。对组间病人性别、年龄、病情等基本相关信息相互比较，其 *P* 值大于 0.05 无显著差异，组间具有一定可比性。对对照组组在过程中采用宫腔水囊压迫疗法；给对照组患者实施放射介入治疗：手术步骤：在鼓动静脉部进行麻醉，采用穿刺技术和造影术，血管鞘和 5Fcobra 导管置入双侧髂内动脉，并同时行盆腔动脉血管造影，确定盆腔动脉的走形和子宫动脉开口使导管插入子宫动脉 ，采用直径 1~3 mm 的明胶海绵颗粒予以栓塞。术后注意观察记录穿刺部位渗血、血肿现象，并预防感染，留置导尿管。评价标准以按照 WHO 参照标准进行评价，对改善情况可分为显效、有效、无效进行统计。**结果** 从数据可知治疗组显效人数 18 例，有效为 13 例，治疗有效率为 93.9%；对照组中显效病人 11 例，有效人数为 8 例，经计算改善总有效率仅为 57.6%，与对照组相比有效率明显提升。经对结果进行分析可知治疗组较对照组改善程度明显。治疗组患者术后手术时间为（50.2±18.3）min、住院时间(7.1±2.0)d。与对照组相比，治疗组治疗中病人的手术时间、住院天数均较优，组间差异显著（P＜0.05）。结论；从结果可知，对产后及异常妊娠子宫出血患者进行疗效评价，治疗组中相关指标改善明显且均无死亡病例的出现。因此，采取放射介入治疗具有一定的优越性，及时把握患者的治疗时机，对控制疾病更有帮助，可合理有效的治疗产后及异常妊娠子宫出血，快速达到治愈的目的。

PU-1862
人文关怀在介入手术室护理的效果观察及 SAS 评分影响分析

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【摘要】目的 讨论分析人文关怀在介入手术室护理的效果观察及 SAS 评分情况。**方法** 将 2017 年 3 月-2018 年 10 月期间在我院准备介入手术治疗的患者从中抽取 160 例进行研究，按照随机分组原则分为 80 例对照组和 80 例观察组，给予对照组行常规的手术室护理，而观察组在手术室护理基础上增加人文关怀护理，比较两组患者护理前后的焦虑、抑郁情绪评分，以及护理满意度。**结果** 两组患者护理前的焦虑情绪评分和抑郁情绪评分比较后无统计学意义，经不同护理干预后，观察组患者的 SAS 评分以及 SDS 评分显著降低，并且低于对照组，P＜0.05；观察组患者对其护理满意度为 97.50%，远远高于对照组（ 82.50% ），P＜0.05。**结论** 在接受介入手术治疗的患者进行人文关怀护理干预可有效降低患者的不良情绪，此护理措施获得较高的护理满意度，值得临床宣传推广。

PU-1863
介入栓塞治疗 Graves 病与桥本氏甲状腺炎免疫指标的对比研究

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[研究背景与目的] 我院自 2002-2005 年开展介入栓塞治疗 Graves 病以来，共治疗 51 例，经过早期从临床到基础（病理、凋亡、免疫、血管生成因子等）再到临床的系列深入研究，发现 Graves 病栓塞治疗不同时期的 TGAb、TMAb 滴度和阳性率均高于正常，且未见明显下降，而临床若以 TGAb、TMAb 尤其是 TMAb 增高为主时，则应首先考虑桥本甲状腺炎（Hashimotos thyroiditis, HT）的诊断。因此我们将栓塞治疗 Graves 患者不同时期的 TGAb、TMAb 与 HT 的相应指标做一对比研究。

[方法] 通过对行介入栓塞治疗的 51 例患者追踪随访术前术后不同时间段甲状腺功能、TGAb、TMAb 指标与 30 例 HT 患者内科治疗前后相应时间段的相同指标进行对比研究。

[结果] 1、甲状腺功能： Graves 病甲亢栓塞治疗组，术后都能获得减量或停用抗甲状腺药，甲状腺功能逐渐控制在正常范围，无明显甲减出现，而 HT 患者随着时间的推移，甲减的出现逐渐增多；2、TGAb、TMAb：介入栓塞治疗 Graves 病与 HT 患者在治疗前后无明显统计学差异。
[结论] 甲状腺动脉栓塞治疗 Graves 病与 HT 患者 TGAb、TMAb 指标对比无明显统计学差异，但甲减发生率远低于 HT 组；甲状腺动脉栓塞术后甲状腺自身抗体与 HT 自身抗体的产生机理是否相似，有待扩大样本量进一步病理对照研究。

PU-1864

综合治疗凶险性前置胎盘伴膀胱植入一例

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本文报道一例的凶险性前置胎盘伴膀胱植入，患者以无诱因突发大量血尿为主诉急诊入院，入院后完善超声及ＭＲＩ检查，初步诊断为急诊行“腹主动脉球囊暂时封堵术+剖宫取胎术+子宫整形术+双侧输卵管结扎术”，术中证实为凶险性前置胎盘伴膀胱植入，术后再次发生血尿，急诊行“经尿道膀胱镜检+膀胱血块冲洗+电凝止血”，术中证实为膀胱植入血管活动性出血，电凝止血效果欠佳，遂急诊行“双侧髂内及髂外动脉造影并栓塞术”，术后患者出血得到有效控制，后康复出院。本病例危急，通过采用多学科综合治疗，取得了良好的临床结局。

PU-1865

浅谈介入手术室实行 KPI 管理模式的实践与体会

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目的 介入手术室通过对 8 个项目进行监控记录,并提出改进方法进行持续性改进，更好的为临床科室服务。
方法 通过数据采集、数据记录，专人专项负责，对以下 8 项内容进行检测：
一：手术医生满意度：每周发放手术医生满意度调查表，进行回收统计，手术医生对服务质量满意度进行评价，查找不满意的原因。
二、急诊手术到位的及时性：建立急诊手术登记表，记录急诊电话通知时间、通知临床医生时间、手术开始时间。全年保证急诊手术 30 分钟内可以开始手术，查找急诊手术未及时到位的原因。
三、手术预约变更率：建立手术变更登记表，记录每日手术变更的信息。查找手术变更率的原因，让手术安排更加合理和有计划性。
四、介入手术接台准时率：建立每日手术安排表，记录未按预约时间进行的手术。指通知手术医生后未及时到位，造成手术间空置 30 分钟以上的情况（除外急诊、病人特殊原因等），减少等待造成的时间浪费。
五、设备完好率/使用率：每日填写设备使用登记本，记录好设备故障的时间及填好相应的维修工单，（每月天数-每月设备故障天数）/每月天数*100%；保证大大型设备及急救设备处于完好备用状态，保证急救需要。
六、收费准确率：建立错误、漏收费登记表，记录每一例错收、漏收项目。通过分析错误、漏收的原因、提高收费准确率。
七、无菌操作合格率：每日抽查手术医生及医务人员无菌操作是否合格，并记录。医务人员在医疗护理操作过程中，保持无菌物品、无菌区域不被污染，减少感染的发生率。

八、临床沟通率：建立与临床科室沟通记录表，沟通后记录。临床医生开具手术申请单后，若对手术申请单有疑问，应及时与临床医生进行沟通解决。

结果 每月月底专人对自己负责的 KPI 项目进行 KPI 结果总结，提出存在问题、原因分析及改进方法，并与上月数据进行对比。

结论 KPI 管理模式对介入手术室有很好的改进作用，应持续有效的实施下去。

PU-1866

放射介入手术室医院感染的原因与对策分析

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为了分析放射介入手术室医院感染的原因，进而探讨相应的感染防控对策。**方法** 选取我院 2016 年 1 月至 2016 年 12 月期间收治的 350 例放射介入手术室治疗的患者为对照组，未采用感染防控对策；选取 2017 年 1 月至 2017 年 12 月期间收治的 350 例放射介入手术室治疗的患者为试验组，采用感染防控对策。观察感染发生的主要原因以及两组患者的感染发生率。**结果** 感染发生的原因主要包括三个方面，一是工作人员对感染认识不足，占比为 61.11%（22/36），二是放射介入室布局不科学，占比为 33.33%（12/36），三是医院感染监测制度不完善，占比为 5.56%（2/36）；试验组患者的感染发生率为 3.14%（11/350），对照组患者的感染发生率为 10.29%（36/350），差异具有统计学意义（P<0.05）。**结论** 通过采取积极有效的感染防控措施可以有效降低放射介入手术室医院感染发生率，效果显著。

PU-1867

老年人植入式静脉输液港体外露的临床分析

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目的 探讨老年人使用植入式静脉输液港发生港体外露的临床特点。方法 回顾性分析总结我院 2015 年 1 月至 2017 年 12 月完成的植入式静脉输液港 60 例老年患者的临床资料和随访资料，寻找发生港体外露的病例并对其临床资料进行总结和分析。结果 发生晚期港体外露 2 例，均男性，年龄分别为 75 和 90 岁，脑梗塞后和气管切开后各 1 例，分别发生在输液港术后第 8 月和 14 月，港体上方皮肤厚度由＞8㎜ 变薄为≤2㎜，患者体重下降大于 10%，外露港体上方皮肤呈干性坏疽过程。结论 港体上方皮肤变薄并发生干性坏疽可能是老年人晚期静脉输液港港体外露的重要病理过程。

PU-1868

正常及糖尿病大鼠内皮干细胞分离、鉴定及功能试验

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介入治疗引起的血管内皮损伤在术后血管不良事件的发生及进展过程中起到关键性作用。而快速内皮化可以有效的恢复血管内皮的完整性，从而抑制内膜的过度增生，但是糖尿病患者血管内皮损伤修复能力明显受损。内皮干细胞的血管内皮损伤修复的过程中发挥着关键性的作用，故而我们评估了糖尿病大鼠来源的内皮干细胞与正常大鼠来源的内皮干细胞生物学功能方面的不同。

方法 通过梯度离心法分离，培养了糖尿病大鼠来源及正常大鼠来源的内皮干细胞，分别通过 CCK-8 法以及 transwell 法评估了两种不同来源的内皮干细胞的增殖、迁移能力的不同，进一步通过粘附实验，评估了两种不同来源的内皮干细胞对纤维连接蛋白及内皮细胞的粘附功能的不同。

结果 增殖实验显示糖尿病大鼠来源的内皮干细胞增殖能力较正常大鼠来源的内皮干细胞明显减弱 。Transwell 实验结果显示，相较于正常大鼠来源的内皮干细胞，Ⅰ型糖尿病大鼠来源的内皮干细胞的迁移能力明显减弱（116.9±17.1 VS 97.1±15.4 cells/field,p=0.044）。Ⅰ型糖尿病大鼠来源的内皮干细胞不论是对内皮细胞 （37.4±11.2 VS 21.3±10.4 cells/field， P=0.031）还是对纤维黏连蛋白的粘附能力均明显减弱 （150.2±37.1 VS 113.9±32.4 cells/field， P=0.016）。

结论 研究表明相较于正常大鼠的内皮干细胞，Ⅰ型糖尿病大鼠来源的内皮干细胞的生物学活性明显的减弱，包括增殖、迁移及粘附能力。

PU-1869
博来霉素在子宫动脉栓塞治疗子宫腺肌症中的作用分析

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目的 探讨博来霉素在子宫动脉栓塞（UAE）治疗子宫腺肌症（AM）中的作用，分析其临床疗效及并发症的发生情况。
方法 回顾性分析 2012 年 1 月-2019 年 1 月在郑州大学第一附属医院介入科接受 UAE 治疗的诉有痛经、月经过多等症状的 AM 患者 82 例的临床资料，术前根据 B 超及磁共振检查诊断为弥漫型 AM（n=33）,局限性 AM（n=49）。治疗方式为博来霉素灌注联合 UAE 及单纯 UAE 治疗，分别比较每组病例中不同治疗方式患者的年龄、初潮年龄、术后有效率，及术后并发症的差异及同一治疗方式两组间是否存在差异。
结果 博来霉素联合 UAE 治疗 AM，无化疗药物相关不良反应，两组病例中不同治疗方式的术后有效率差异均具有统计学意义（P<0.05），同一种治疗方案在不同组患者的术后有效率均具有统计学意义（P<0.05）。
结论 博来霉素联合 UAE 治疗 AM 疗效安全可靠，且弥漫型 AM 疗效更好。

PU-1870
Angiography Findings and Endovascular Management of Acute Nonvariceal Gastrointestinal Bleeding: A Pictorial Essay

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Although most cases of acute nonvariceal gastrointestinal (GI) hemorrhage either spontaneously resolve or respond to medical management or endoscopic treatment, there are still a significant number of patients who require emergency angiography and endovascular management. The most common angiography finding is contrast extravasation. If a hemorrhage source is identified, endovascular treatments including intra-arterial infusion of vasopressin, embolization, covered stent-graft, or combined of them, are usually effective means of successfully controlling hemorrhage while minimizing potential complications.
Diagnostic angiography and endovascular management are excellent options for evaluating and managing acute nonvariceal GI bleeding that is refractory to medical and endoscopic therapy.The most common angiography finding is contrast extravasation.

Endovascular management including intra-arterial infusion of vasopressin, embolization, covered stent-graft, or combined of them, is minimally invasive treatment with a high successful rate.

PU-1871
DWI 评估高强度聚焦超声治疗子宫腺肌症早期疗效的价值

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【目的】：探讨 DWI 及 ADC 值在评价高强度聚焦超声（HIFU）治疗子宫腺肌症早期疗效的价值。
【方法】：回顾性分析行 HIFU 治疗的 37 例子宫腺肌症患者的年龄、身高、体重、病变类型及治疗前后病灶在 DWI 图像上的表现，在 ADC 图像上测量消融灶术前正中、术后正中、消融区边、残留区 ADC 值。术前正中与术后正中、术前正中与消融区边、术后正中与消融区边、残留区与术前正中、残留区与消融区边的 ADC 值分别进行配对 t 检验。同时手动勾画计算出术后 CE-MRI 轴位上最大消融层面无强化区面积，与相应层面 DWI 图像上高信号区面积和高信号内相对低信号区面积分别进行秩和检验。
【结果】：
1.术前子宫腺肌症病灶在 DWI 图像上较盆底肌相比，呈现出均匀或局部稍高的信号。术后 DWI 图像上显示消融区病灶信号与术前相比呈高信号表现，而消融区内呈现出周边信号高于中心信号的分布，呈现靶环样改变。
2.术前正中 ADC 值高于术后正中 ADC 值。
3.术前正中 ADC 值高于消融区边 ADC 值。
4.术前正中 ADC 值低于残留区 ADC 值。
5.术后正中 ADC 值高于消融区边 ADC 值。
6.残留区 ADC 值高于消融区边 ADC 值。
7.手动勾画系统自动测量术后 CE-MRI 上无灌注区面积低于消融后 DWI 上高信号区面积。
8.无灌注区面积与 DWI 上高信号区内相对低信号区所测量面积进行比较。
【结论】：
1、DWI 上信号差异及 ADC 值变化可以反应子宫腺肌症 HIFU 术后消融病灶的病理及生理学改变，可对病灶的范围、消融程度等进行定量评价，为治疗效果的评价提供客观依据。
2、DWI 和 CE-MRI 在早期评价 HIFU 治疗子宫腺肌症术后疗效方面无差异，DWI 可对子宫腺肌症 HIFU 治疗后早期疗效进行评价。

PU-1872
CT 引导下经皮肺穿刺活检诊断肺部占位病变的敏感性及准确率分析

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目的 探讨 CT 引导下经皮肺穿刺活检诊断肺部占位病变的敏感性及准确率。**方法** 选取 2016 年 6 月至 2018 年 5 月我院收治的肺部占位病变患者 90 例，所有患者均经手术病理组织活检确诊，患者入院后经行 CT 引导下经皮肺穿刺活检，并以病理组织活检结果为金标准，评估 CT 引导下经皮肺穿刺活检诊断肺部占位病变的敏感性及准确率。**结果** 本组 90 例患者经病理组织学活检确诊，64 例为

恶性病变，26 例良性病变。本组 90 例患者均顺利完成 CT 引导下经皮肺穿刺活检，经皮肺穿刺活检敏感性为 96.88%，特异度为 76.92%，准确率为 91.11%。本组 90 例患者中有 10 例发生并发症，发生率为 11.11%，经对症治疗后症状消失。

PU-1873
脾切除术与部分脾动脉栓塞术治疗脾功能亢进的疗效观察

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目的 观察对比脾切除术与部分脾动脉栓塞术治疗脾功能亢进的临床效果。**方法** 选取 2017 年 5 月至 2019 年 2 月在我院收治 80 例脾功能亢进患者，按随机双盲法分为对照组（40 例）与实验组（40 例）。对照组给予传统脾切除手术治疗，实验组给予部分脾动脉栓塞术治疗。对比两组术中出血量、手术时间、术后住院时间及并发症发生率等方面的差异。**结果** 实验组在术中出血量、手术时间、术后住院时间及并发症发生率等方面优于对照组，差异有统计学意义（$P<0.05$）。**结论** 脾功能亢进患者采用部分脾动脉栓塞术治疗，可以减少术中出血量、手术时间，缩短术后住院时间，促进患者术后恢复，降低并发症发生率，可在临床医疗中推广应用。

PU-1874
埋入式输注系统在儿童恶性肿瘤患者中的应用

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目的：探讨埋入式输注系统作为儿童恶性肿瘤患者长期静脉输液通路的可行性。方法：2009 年 8 月 — 2017 年 6 月，共 68 例儿童恶性肿瘤患者行埋入式输注系统置入术，其中肝母细胞瘤 14 例，视网膜母细胞瘤 54 例。全麻下行锁骨下静脉或颈内静脉穿刺术，DSA 监视下采用经导丝植入技术置入导管。观察围手术期和置入术后的并发症。结果：手术成功率为 99% 。所有病人未发生严重并发症。3 例患儿因皮肤感染将埋入式输注系统取出，有 45 例因治疗结束按计划取出输注系统。结论：埋入式输注系统是儿童恶性肿瘤患者有效和安全的输液途径。DSA 监视下采用经导丝植入技术和置管深度计算公式可以保证手术的安全性并达到预期的效果。

PU-1875
术前经导管动脉化疗栓塞术在肝母细胞瘤的临床应用

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目的 探讨术前经导管动脉化疗栓塞术（TACE）在肝母细胞瘤治疗中的疗效。**方法** 对常规估计不能切除的 20 例肝母细胞瘤患者采用经导管动脉化疗栓塞术，然后再进行外科手术切除，观察患儿的术中情况、临床疗效，并对远期效果进行随访。**结果** 术前导管动脉化疗栓塞术后 1-4 个月内复查，患儿肿瘤体积明显缩小，甲胎蛋白降低明显，且经过动脉化疗栓塞后，20 例患儿均可以接受外科切除手术，手术切除标本的病理改变显示肿瘤明显坏死。远期随访发现，动脉化疗栓塞术后 2 年死于肺转移者 7 例，2 例复发，11 例患者无瘤存活平均时间 23.6 月，随访时间 30 个月。**结**

论 经导管动脉化疗栓塞可以有效杀死肿瘤细胞，并能使患儿获得外科手术的机会，明显改善预后，延长患儿无瘤生存时间，在肝母细胞瘤的治疗中是一种安全、有效的治疗措施。

PU-1876
泡沫硬化治疗儿童淋巴管-静脉畸形的临床疗效观察

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目的 探讨泡沫硬化治疗儿童淋巴管-静脉畸形的临床疗效。**方法** 回顾性分析 2017 年 9 月至 2018 年 12 月，16 例淋巴管-静脉畸形患儿行泡沫硬化治疗的临床资料。所有患儿术前均行彩色超声及 MRI 扫描诊断为淋巴管-静脉畸形。全麻后经股动脉插管造影，未发现动脉供血来源者在影像引导下穿刺病灶，使用平阳霉素白蛋白泡沫硬化剂进行硬化治疗，治疗后 4 周后评估，未达到治愈标准继续接受硬化治疗，术后随访 9~36 月。**结果** 本组病例动脉造影均未发现动脉供血来源，共行硬化治疗 49 次，平均 3.1±1 次/例。治疗后采用影像学检查评估疗效，13 例患儿治疗后达到治愈标准，随访无复发，3 例患儿达好转标准，建议继续随访。总体治愈率 81.3%，有效率达 100%。术后 3 例次出现轻度胃肠道反应，4 例次一过性低热，6 例次局部肿胀，无继发感染、药物过敏、肺纤维化等严重不良反应。 **结论** 儿童淋巴管-静脉畸形行泡沫硬化治疗，具有安全有效、疗效确切的特点，值得临床推广应用。

PU-1877
引流导管在各类型淋巴管畸形硬化治疗中的应用及疗效分析

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探讨引流导管在各类型淋巴管畸形硬化治疗中的应用及疗效。**方法** 回顾性分析 2018 年 1 月至 2019 年 1 月我院确诊的各类型淋巴管畸形引流导管置入治疗的 16 例患儿的临床资料。所有患儿术前均行彩色多普勒超声、CT 或 MRI 扫描诊断为淋巴管畸形，结合临床特征及术中穿刺液进一步确诊。全麻下在彩超或 CT 引导下穿刺淋巴管畸形并置入引流导管，术后予多西环素溶液冲洗及硬化治疗，拔管后 4 周后未达到治愈标准，行多西环素局部注射治疗，4 周后再评估是否继续注射，术后随访 6~18 月。**结果** 本组 12 例患儿治疗后，影像学检查未瘤体或仅有少量残余硬化病灶，随访无复发，达到治愈标准，本组其余 4 例瘤体缩小 50%以上，影像学检查仍有少量囊性病灶残余，达好转标准，建议继续随访。总体有效率达 100%。 **结论** 引流导管可应用于各类型淋巴管畸形硬化治疗，并具有安全有效、创伤小、治疗周期短及复发率低的特点，值得临床推广应用。

PU-1878
多西环素硬化治疗舌部微囊型淋巴管畸形的疗效与安全性

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目的 探讨多西环素硬化治疗舌部微囊型淋巴管畸形的疗效与安全性。**方法** 回顾性分析 2017 年 7 月至 2018 年 12 月我院以多西环素硬化治疗的 12 例舌部微囊型淋巴管畸形患儿的临床资料。所

有患儿术前结合临床症状及影像学检查诊断为舌部微囊型淋巴管畸形，部分病例结合术中穿刺液进一步确诊。全麻后在影像引导下穿刺病灶，成功后用多西环素进行硬化治疗，4 周后未达到治愈标准可重复硬化治疗，术后随访 3~15 月。**结果** 12 例患儿共行硬化治疗 28 次，平均 2±0.3 次/例。9 例患儿治疗后临床症状消除，瘤体基本消失，影像学检查未见瘤体或仅有少量残余硬化病灶，随访无复发，达到治愈标准；3 例患儿治疗后瘤体缩小 50%以上，影像学检查仍有少量囊性病灶残余，达好转标准，建议继续随访，必要时再次硬化治疗。术后 3 例次出现轻至中度发热，5 例次局部肿胀，2 例次出现舌粘膜浅表破溃，经对症治疗后可恢复正常。本组患儿均无继发感染、药物过敏等严重不良反应。 **结论** 多西环素硬化治疗舌部微囊型淋巴管畸形疗效确切，创伤小，安全可靠，值得临床推广应用。

PU-1879

选择性输卵管造影联合再通术对输卵管梗阻性不孕症中术后通畅率及妊娠率的影响

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目的 研究选择性输卵管造影（SSG）联合再通术（FTR）对输卵管梗阻性不孕症中术后通畅率及妊娠率的影响。**方法** 选择 2016 年 5 月至 2019 年 1 月本院收治的输卵管梗阻性不孕症患者 60 例，根据梗阻程度分为 A 组（完全性梗阻）和 B 组（不完全性梗阻）。A 组、B 组均采用 SSG 联合 FTR 治疗。对比分析两组患者的术后通畅率情况及整体妊娠率。**结果** B 组通畅率（92.31%）比 A 组（78.05%）高，差异有统计学意义（$P<0.05$）；60 例患者中，治疗后 3 个月内妊娠 6 例（10.00%），6 个月内妊娠 19 例（31.67%）。**结论** SSG 联合 FTR 治疗输卵管梗阻性不孕症的术后通畅率和妊娠率均较高，效果较好。

PU-1880

Intra-arterial chemotherapy for treatment of very low birthweight infants with retinoblastoma: two case reports and review of literature

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Intra-arterial chemotherapy (IAC) has come to the forefront in the treatment of retinoblastoma (RB). However, reports of IAC treatment of very low birthweight (VLBW) infants with RB were rare. In the present report, we demonstrated our two cases and summarized the principal experiences of IAC treatment with literature review.We reported two VLBW infants with RB who received IAC treatment. The birth weight of the two female patients were 1.1Kg and 1.2 Kg, respectively. At about 1 month old, the two patients from different provinces were diagnosed unilateral RB of Group B (International Intraocular Retinoblastoma Classification, IIRC) at the local hospital when newborn fundus screening. There was no leucocoria, strabismus or other clinical presentation. The ophthalmologists of local hospitals refused to give patients intravenous chemotherapy (IVC), considering the risk of IVC because of low body weight

(both less than 2Kg). Then the parents of patients chose IAC treatment. Two sessions of IAC were operated respectively on two patients and the tumors were inactivation due to calcification. The average irradiation time of each patient was 6.65 min and 3.75 min and the average irradiation dose was 60.5 mGy and 22.5 mGy, respectively.These two case reports were the first report in the literature exhibiting the experience of IAC treatment of very low birthweight infants with RB. The clinical and technology experiences of operator were very important for the IAC treatment of RB. IAC treatment for RB is a possibility to replace systemic chemotherapy (and eliminate those systemic side effects including the need for a vascular port) because of the higher drug concentration attained in the eye, especially for children with low birth weight. But further more research is needed.

PU-1881

儿童先天性肝动静脉瘘的介入栓塞治疗

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目的 探讨介入栓塞治疗儿童先天性肝脏动静脉瘘的方法及其临床疗效。**方法** 2011 年 5 月至 2016 年 7 月，对 5 例我科收治的小儿先天性肝脏动静脉瘘进行全麻下介入栓塞治疗，其中 3 例为肝动脉-门静脉瘘,2 例为肝动静脉-肝静脉瘘，5 例患儿均成功采用经股动脉穿刺插管肝动脉 DSA 造影，确诊为先天性肝脏动静脉瘘后使用弹簧圈栓塞瘘口。**结果** 5 例先天性肝脏动静脉瘘均成功行介入栓塞治疗，存活并随访至今，术后均无肝脏功能异常及出血。**结论**介入栓塞治疗儿童先天性肝动静脉瘘是安全、微创有效的治疗方法，可以作为首选治疗方案。

PU-1882

经导管动脉化疗栓塞术治疗儿童肝母细胞瘤临床疗效分析

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目的:探讨动脉化疗栓塞术(Transcatheter Arterial Chemoembolization,TACE)对不能切除的小儿肝母细胞瘤治疗的临床疗效及其在综合治疗中的作用.方法:常规估计不能切除的肝母细胞瘤 35 例经动脉化疗栓塞治疗 68 次,再行Ⅱ期外科手术切除,比较分析治疗前后临床症状、体征和血 AFP 的变化、术中情况及随访远期疗效.结果:TACE 术后数天至 1 月复查,和术前相比,肿瘤体积平均缩小 62.6%(配对 t 检验,t=3.11,P=0.006),血 AFP 平均降低 52.4%(配对 t 检验,t=1.784,P=0.096),无明显的化疗毒性反应,肿瘤手术完整切除 31 例,术后病理显示肿瘤明显坏死,平均坏死区域面积为 63.1%.随访 6-30 mo,1 a 生存率为 93.3%(14/15),2 a 生存率为 66.6%(10/15),3 a 生存率为 40.0%(6/15).结论:TACE 治疗肝母细胞瘤安全有效,无严重并发症,能使部分不能Ⅰ期手术的患儿重新获得手术机会,并对减少术中肿瘤细胞的扩散和术中出血、改善预后有较大作用.

PU-1883

CTA 联合 CTA 对急性脑梗死患者再灌注治疗预后的价值

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目的 探讨全脑 CT 灌注成像(CTP)联合 CT 血管造影(CTA)对急性脑梗死患者再灌注治疗后 3 个月预后的价值。
材料与方法 选择我院 2016 年 12 月-2019 年 3 月我院收治的 51 例急性脑梗死患者的临床资料。所有患者治疗前均行全脑 CTP 和 CTA 检查，再灌注治疗后 3 月复查 CT 或磁共振影像检查。使用后处理软件于灌注参数图上选取感兴趣区 ROI，比较梗死区与对侧镜像区脑灌注参数[脑血流量(CBF)、局部血容量(CBV)、平均通过时间(MTT)、达峰时间(TTP)、通透性表面积乘积（PS）],记录头颈部动脉狭窄和闭塞情况。结局评定指标采用发病 3 个月后的 mRS 评分,不良预后定义为生活依赖(mRS 评分:3-5 分)或在 3 个月内死亡(mRS 评分:6 分)；预后良好者 mRS 评分:0-2 分。使用二元逻辑回归分析预后不良的独立预测因素。使用受试者工作曲线(receiver operating characteristics curve,ROC)分析评价指标的预测能力。
结果 51 名患者 5 例接受血管内治疗，33 例静脉静脉溶栓治疗，13 例接受静脉溶栓桥接血管内治疗；治疗后 3 月复查，24(47.06%)例患者出现预后不良。CTA 检查发现 51 例患者存在血管病变 56 处,其中轻度狭窄 11 处(19.64%),中度狭窄 21 处(37.50%),重度狭窄 18 处(32.14%),完全闭塞 6 处(10.71%)。二元逻辑回归分析表明,责任血管重度狭窄及低灌注镜像区 rPS 分别为预后不良独立预测因素。
结论 全脑 CTP 联合 CTA 检查可准确判断脑梗死区域和对应的血流动力学改变,明确血管狭窄部位和程度,对急性脑梗死有较高的临床诊断价值。责任血管重度狭窄及低灌注镜像区血脑屏障通透性高可能预示着预后不良。

PU-1884
基于 MRI 的急性缺血性脑卒中与脑白质高信号的纵向研究

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目的 建立基于 MRI-FLAIR 影像特征参数评估脑白质高信号在预测急性缺血性脑卒中的作用。
方法 回顾性分析 2011 年 1 月至 2019 年 3 月于浙江医院放射科行 MRI-FLAIR 检查的脑白质高信号患者再发急性缺血性脑卒中患者的临床资料，收集脑卒中发生前 MRI 图像中存在脑白质高信号影像表现（所有数据 MRI 随访间隔≥2 年）。脑白质高信号分级方法是用 Fazekas 评分系统。分析脑卒中与脑白质高信号的关系，同时对两组 MRI 影像特征进行单因素分析及多因素 Logistics 回归分析，获得独立预测因子并建立预测模型。
结果 收集 102 例脑白质高信号患者，其中 80 例在随访 2 年后中发生急性缺血性脑卒中，占 78.4%。男性患者占总数比例 65.7%，平均年龄为 76±12 岁，高血压 75.5%，糖尿病 34.3%，高血脂 26.5%，吸烟占 29.4%，饮酒占 18.6%，颈动脉粥样斑块占 66.7%。脑白质高信号均为多发，根据 Fazekas 评分分为轻重度脑白质高信号患者。轻度占 40.2%，重度占 59.8%。脑白质高信号发生部位与脑卒中一致占 36.2%。单因素分析结果显示，两组间的高血压、饮酒及 Fazekas 评分重度者进行比较差异具有统计学意义（$p<0.05$）。多因素 Logistics 回归分析结果显示，高血压、饮酒及 Fazekas 评分重度者为独立预测因子。
结论 基于 MRI 影像特征的模型对预测脑白质高信号患者发生急性缺血性脑卒中具有潜在价值。
关键词： MRI 急性缺血性脑卒中 脑白质高信号

PU-1885
缺血性脑卒中患者豆纹动脉改变的初步探究

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目的 大脑中动脉分支豆纹动脉供血区域是缺血性脑卒中的多发区域，本研究对单侧发病的基底节区和（或）放射冠区亚急性缺血性脑卒中患者的病变侧豆纹动脉的数量及宽度、形态进行了初步探究。

方法 ：(1)本研究共纳入单侧发病的亚急性缺血性脑卒中患者 13 例，记为实验组；双侧大脑实质无梗塞灶病例 7 例，记为对照组； (2)对实验组及对照组病例均进行了高分辨血管壁扫描，本研究采用序列为 T1WI-SPACE 序列，并所采集图像进行最小密度成像后处理，显示双侧豆纹动脉； (3)测量并记录双侧动脉动脉数量，并记录双侧豆纹动脉数量差值的绝对值，其中实验组记为 A1，对照组记为 A2； (4)测量并记录双侧动脉动脉管径最宽宽度的绝对值，并记录双侧豆纹动脉最宽宽度差值，其中实验组记为 B1，对照组记为 B2； (5)实验组与对照组的双侧豆纹动脉数量差值 A1 与 A2 及双侧豆纹动脉最宽宽度差值 B1 与 B2 的比较均采用独立样本 t 检验。

结果 （1）A1 为 0.54±0.5，A2 为 0.5±0.5，两组数据经统计学计算 P 值＞0.05，差异无统计学意义；（2）B1 为 0.05±0.01（mm），B2 为 0.02±0.01（mm），两组数据经统计学计算 P 值＜0.05，差异有统计学意义；（3）本研究发现 6 例患者病变侧豆纹动脉宽度较正常侧豆纹动脉宽度大，7 例患者病变侧豆纹动脉宽度较正常侧豆纹动脉宽度小，这前 6 例患者梗塞灶范围均较后 7 例患者大。

结论 （1）在亚急性脑卒中患者中，病变侧豆纹动脉数量没有明显变化；（2）单侧发病的基底节区亚急性患者如果其梗塞灶范围较大，其病变侧豆纹动脉宽度较正常侧增宽，提示程度较重的基底节区亚急性脑卒中患者会通过豆纹动脉的扩张代偿其血供较差区域；（3）单侧发病的基底节区亚急性患者如果其梗塞灶范围较小，其病变侧豆纹动脉宽度较正常侧较窄，提示范围较小的亚急性梗塞灶为豆纹动脉因动脉粥样硬化等原因造成管腔变窄、远端血供较差所致。

PU-1886
基于形态学分析颅内镜面后交通动脉瘤破裂的相关参数

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背景和目的 颅内镜面动脉瘤被认为是颅内多发动脉瘤的一种类型，其定义为双侧并对称地发生在同名血管上的动脉瘤。以往对颅内动脉瘤的几何参数和形态参数的研究是为了确定破裂风险，但由于患者的特殊危险因素，如性别、高血压和年龄存在差异，破裂风险仍未完全确定。为此，本文的目的是确定颅内镜面后交通动脉瘤破裂的相关形态学参数。

方法 收集 2012 年 1 月至 2019 年 6 月经脑血管造影确诊的 24 例镜面后交通动脉瘤患者，我们将这 24 例患者分成破裂组与未破裂组。镜面后交通动脉瘤的形态特征包括分叉、形状、颈宽、宽度、深度、最大尺寸、血流流入角、母血管直径、纵横比(Ar)、深度/宽度比、瓶颈因子、大小比(Sr)，动脉瘤倾斜角、动脉瘤圆顶指向(内侧、外侧、上、下、后)，动脉瘤子囊形成，PCoA 是否为胚胎型。进行单因素和多因素统计分析，确定破裂的独立危险因素。

结果 单因素分析显示，破裂组与未破裂组的动脉瘤大小、纵横比(Ar)、大小比(Sr)、不规则瘤壁、最大尺寸、动脉瘤倾斜角不同（P<0.05）。多因素分析表明，纵横比(Ar)＞1.3，大小比(Sr)＞1.4，不规则形状是动脉瘤破裂的重要预测因素。

结论 镜面后交通动脉动脉瘤破裂是研究颅内动脉瘤破裂风险的有效模型。纵横比(Ar)＞1.3，大小比(Sr)＞1.4，不规则瘤壁是预测破裂的较好指标，这些动脉瘤的形态学参数在评估、预测、预防动脉瘤破裂风险中具有一定的价值。

PU-1887
基底动脉粥样粥样斑块分布与脑桥梗死灶的高分辨血管壁 MR 成像相关性研究

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目的
基底动脉（basilar artery，BA）粥样硬化斑块导致其穿支开口堵塞是造成脑桥卒中的重要原因，因此获取基底动脉斑块分布对于更好的了解脑桥卒中病因非常重要。本研究旨在通过高分辨血管壁磁共振成像（vessel wall magnetia resonance imaging, VW-MRI）综合评估基底动粥样硬化斑块的分布特征。
方法
回顾性分析 31 例患有症状性孤立性脑桥梗死患者，根据常规 MRI 检查中 DWI 序列将这些患者分为旁正中脑桥梗死类(paramediaan pontine inarction，PPI)和腔隙性脑桥梗死类(Lacunar pontine infarct，LPI)，这些患者并且接受 VW-MRI 检查。根据 VW-MRI 把基底动脉管壁分为背侧壁、腹侧壁、左侧壁和右侧壁象限，并对 BA 粥样硬化斑块进行四个壁象限分类。BA 的责任斑块定义为斑块位于梗死的相同切面或相邻切面并且能起到因果作用的斑块。分析 PPI 和 LPI 与斑块之间的关系，并且分析 PPI 和 LPI 的 BA 斑块分布特点，计数资料采用 X^2 检验或 Fisher 确切概率法。
结果
在 31 例有症状孤立性脑桥梗死中，PPI 患者 15 例（ 48.4%）及 LPI 患者 16 例（ 51.6 %）。在有症状脑桥卒中患者中，24 例（77.4%）有症状脑桥梗死中观察到斑块，7 例（22.6%）患者无斑块。一共检测到 36 个斑块，24 个（66.7%）责任斑块，12 个（33.3%）非责任斑块；所有斑块中 14 个斑块（30.4 %）涉及一个象限，32 个斑块（69.6%）涉及两个或更多象限。PPI 的 BA 责任斑块在四个象限壁中的患病率双侧壁 87.5% 最多，其次背侧壁 12.5%，$P<0.05$。LPI 中检测 BA 斑块高达 75%，BA 斑块更常位于双侧壁 45.8%、背侧 41.7%，背侧 12.5%，$P<0.05$。
结论
PPI 和 LPI 病因与 BA 斑块形成有关，PPI 和 LPI 的基底动脉斑块分布在双侧壁最多。

PU-1888
PWI 联合 MRA 评价椎基底动脉狭窄所致后循环远端隐匿性缺血

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目的 探讨利用 PWI 联合 MRA 技术评价椎基底动脉狭窄所致后循环远端的隐匿性缺血情况。 **方法** 本研究设立三组研究对象。A 组：无症状组；B 组：症状组；C 组：健康对照组。分析三组 PWI 和 MRA 检查资料，观察后循环血管狭窄程度，侧支血管分级的显示，局部脑血流量（rCBF ）、局部脑血容量（rCBV)、平均通过时间(rMTT)指标。 **结果** 三组研究对象前后循环血管的 MRA 图像均取得满意效果；A、B、C 三组后交通动脉开放的比率分别为 15（68.1%）、17（77.2%）、15（50%），软脑膜动脉生成的比率分别为 7（31.8%）、13（59.0%）、7（23.3%）；A 组与 C 组比较，rCBF、MTT 存在差异，rBCV 无明显差异；A 组与 B 比较，B 组的 rCBF、rBCV 下降，MTT 延长，存在统计学差异。 **结论** PWI 联合 MRA，能够评价隐匿性后循环缺血的范围及侧支循环血流，可以尽早地为临床提示后循环血液动力学状况，为治疗及评价预后提供帮助。

PU-1889

Trousseau 综合征的影像学特征及临床认识

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目的 Trousseau 综合征是指癌症患者在其发病过程中因凝血和纤维蛋白溶解机制异常而出现的所有临床表现，本文探讨以急性多发性脑梗死为主要表现的 Trousseau 综合征相关性神经系统病变，总结其临床表现、实验室检查及影像学特点，旨在提高临床工作中对该病的重视和认识。
方法 回顾性分析本院 5 例以急性多发性脑梗死为主要表现的 Trousseau 综合征患者的资料，总结其临床表现、实验室检查及影像学特征。在常规图像上观察脑梗死病灶分布部位、信号/密度特点，在 CTA 图像上观察颅内血管有无狭窄或闭塞改变（包括大脑前、中、后动脉及颈内动脉颅内段），在 DWI 图像上发现超急性期或急性期脑梗死灶，在增强图像上观察梗死灶强化特点。实验室检查以 D-二聚体定性和定量检测为主、此外包括纤维蛋白降解产物、肿瘤相关标志物检测等。
结果 本组 5 例患者男性 4 例，女性 1 例，年龄为 51-81 岁，平均年龄 62 岁；原发肿瘤为肝癌 4 例，肺癌 1 例；临床多表现为意识嗜睡、乏力、言语不清、寡语、神情淡漠。肿瘤相关标志物均呈阳性；D-二聚体均显著升高，血液呈高凝状态。CT 及 MRI 影像学显示脑梗死灶呈多灶性分布，累及多个动脉供血区，多分布于两侧半卵圆中心、放射冠及基底节区、脑白质区域，以前循环为主；其中一例同时累及前后循环，病灶广泛分布于两侧大脑、小脑半球及脑干，CTA 血管成像显示颅内血管走行良好，未见明确异常；DWI 上病灶均表现为弥散受限高信号，增强扫描无强化。
结论 恶性肿瘤易激活患者凝血系统，造成系统性血栓和继发脑梗死，即肿瘤相关性多发脑梗死，是 Trousseau 综合征一种特殊表现，其特征表现为累及多个动脉供血区的多发性急性脑梗死并伴有血 D-二聚体显著升高。认识和准确诊断该疾病有助于临床选择最合理的治疗方式，稳定病情和提高生存质量。

PU-1890

FLAIR 高信号血管征对急性脑梗死患者治疗时间窗的诊断价值

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目的 研究 FLAIR 高信号血管征（FVH）对急性脑梗死患者治疗时间窗的诊断价值。方法:回顾性分析 2018 年 1 月 1 日-2019 年 3 月 1 日在我院行颅脑 MRI 检查的急性脑梗死患者的临床资料及影像资料，按照一定的入选标准和排除标准纳入研究对象。按照有无血管狭窄、有无 FVH 征、FVH 的评分高低、FVH 与 DWI 匹配与否及匹配的程度等因素将病例进行相应的分组，亚组之间比较的指标包括 CBF/DWI 不匹配区、T2WI/DWI 不匹配区、T2 信号值、DWI 信号值、ADC 值、病灶大小等。**结果** 365 例符合标准的患者纳入研究。FVH 多出现在具有大动脉狭窄的病例，在大动脉狭窄或闭塞的患者，FVH 若对 DWI 具有勾边效应，则提示存在 T2WI/DWI 不匹配区域；FVH 出现的范围若明显大于 DWI，则提示存在 CBF/DWI 不匹配区域。
结论 FVH 对急性脑梗死患者治疗时间窗存在与否具有一定的诊断价值。

PU-1891

“三低”技术联合全模型迭代重建算法在头颈部 CT 血管成像中的可行性研究

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目的 探讨 80 kV 低管电压，低对比剂注射速率和低对比剂用量的“三低”技术，联合全模型迭代重建（IMR）算法在头颈部 CT 血管成像（CTA）检查的可行性。**方法** 前瞻性连续收集 2015 年 7～11 月，行头颈部 CTA 检查的患者 60 例，采用随机数字表法将其分为 A、B 两组，每组各 30 例。A 组为常规剂量组，管电压 120 kV，滤过反投影（FBP）重建。对比剂注射速率 4.5～5.5 ml/s，注射时间 10 s。B 组为 80 kV 低管电压组，分别使用 FBP 和 IMR 进行图像重建得到 B1 和 B2 两组图像。对比剂注射速率 3.5～4.0 ml/s，注射时间 10 s。测量并计算 A 组、B1 组、B2 组图像动脉血管 CT 值、图像噪声、信噪比（SNR）和对比噪声比（CNR），并由两名放射诊断医师对图像质量按照 5 分法进行评价。3 组图像间动脉血管 CT 值、图像噪声、SNR 和 CNR 采用单因素方差分析，图像质量主观评价采用 Kruskal-Wallis 检验，两组检查的容积 CT 剂量指数($CTDI_{vol}$)和剂量长度乘积(DLP)比较采用两个独立样本 t 检验。**结果** A、B1 和 B2 组 3 组图像质量主观评分范围分别为（3～5）分、（2～4）分和（3～5）分， B1 组有 12 例患者图像评分≤2 分，图像无法诊断。A 和 B1、 A 和 B2、B1 和 B2 图像评分均有统计学差异(P<0.05)。B2 组与 A 组的图像客观指标 SNR 和 CNR 比较差异无统计学意义（P>0.05），但 B2 和 A 组图像的 SNR、CNR 均优于 B1 组，差异均有统计学意义(P<0.05)。B 组 $CTDI_{vol}$ 比 A 组降低了 80.9%, DLP 比 A 组降低了 81.3%，B 组对比剂注射速率比 A 组降低了 22.0%，B 组对比剂总量比 A 组减少 22.1%，差异有统计学意义(P<0.05)。**结论** 使用 80 kV 管电压，低对比剂注射速率和用量，并使用 IMR 算法进行图像重建，进行头颈部 CTA 扫描是可行的,使患者辐射剂量降低 81.3%。

PU-1892
不同时间间隔对 CT 颅脑灌注结果的影响研究

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【摘要】 **目的** 分析 CT 灌注扫描时间间隔与灌注参数之间的关系，探讨合适的扫描时间间隔得到满足诊断需求同时能够降低患者的辐射剂量。**方法** 对 30 例 CT 灌注成像阳性患者进行回顾性分析，患者均采用 Philips Brilliance ICT 扫描，采用头颅轴层扫描，扫描参数 80KV，150mAs，时间间隔 2s，注入造影剂后 5s 开始扫描，扫描次数共 30 次。将采集到的原始数据导入 Philips potal4.5 后处理软件，由一名高年资技师分别选取扫描时间间隔为 2s、4s、6s 的原始数据进行图像后处理，并根据间隔时间的不同将其对应分为 A、B、C 三组。由两名高年资医师对三组所得灌注伪彩图进行主观评分，将得分取平均值后进行统计。分别记录三组灌注图像感兴趣区的血流量值（CBF）、血容量值（CBV）、平均通过时间（MTT）及达峰时间（TTP），对所得的三组数据进行单因素方差分析。记录 A、B、C 三组扫描方式患者所接受的辐射剂量。**结果** B 组与 A 组相比，各项参数值及主观评价均无明显统计学差异；C 组与 A 组、B 组两两比较，具有统计学差异，且随着时间间隔的增加，灌注伪彩图图像质量呈逐渐下降趋势。A 组的辐射剂量为 705mGy*cm，B 组的辐射剂量为 A 组时的 1/2，C 组的辐射剂量为 A 组时的 1/3。**结论** CT 颅脑灌注扫描时间间隔为 4s 时，能得到满足诊断需求的图像，同时也降低患者的辐射剂量。

PU-1893
脑静脉窦血栓的影像学表现分析及临床脑实质危害预测

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【摘要】目的 通过研究脑静脉窦血栓形成（CVST）患者的临床和神经影像学特征，探讨其在脑实质病变中的预测性应用价值。方法 回顾性分析 57 例 CVST 患者的神经影像及临床资料。结果 57 例患者临床表现以头痛（47.51%）最常见，其次为癫痫发作（24.31%）； 静脉窦血栓形成部位以横窦（TS）(77.9%）最多见， 脑实质病变以出血性静脉梗死最多见（37.57%）。 脑实质病变部位以额区（25.4%）最多见，其次为额顶区（21.9%）。 女性更容易发生脑实质病变（P＜ 0.05）。 头痛是无脑实质病变、癫痫发作伴脑实质病变患者最常见的临床表现。 直窦血栓形成与脑实质病变相关（P ＜ 0.05）。结论 通过 CVST 患者的临床和神经影像学，可及时诊断和治疗 ，防止潜在严重脑实质损害。

PU-1894
ESWAN 评估脑梗死患者脑微出血及抗血小板药物影响的临床对照研究

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目的 分析脑梗死患者脑微出血灶的磁共振成像（MRI ） 表现,评价增强梯度回波重度 T2 加权血管 （(ESWAN ）序列对脑梗死患者脑微出血灶的诊断价值, 探 讨临床抗血小板药物治疗对脑梗死患者脑微出血 （CMBs ）的影响及其临床意义。 **方法** 收集 MRI 确诊脑梗死患者 86 例:男性 51 例，女性 35 例，平均年龄 67.16±9.26 岁，均接受头颅 MRI 常规检查 T1 加权成像（（T1WI ））、T2 加权成像（T2WI ）、液体抑制反转恢复（T2FLAIR ）、弥散加权成像（DWI ） 序列及 ESWAN 序列检查，并收集有关临床资料，根据是否使用抗血小板药物分组， 将 86 例患者分为用药组（n=38）及不用药（n=48），分析 CMBs 的影像学特征， 并根据脑梗死患者是否伴有 CMBs 分组，将 86 例患者分成有 CMBs 组（CMBs （+） 组）（n=58）及无 CMBs 组（CMBs （-）组）（n=28），分析 CMBs 临床相关危险 因素。**结论** ESWAN 可以清晰、准确地显示 CMBs 病灶。使用抗血小板药物的脑梗死患者伴 CMBs 明显增加，尤其是在脑干和小脑区域发生率更高。本研究表明多种因素是 CMBs 的危险因素，其中高龄和卒中史是其独立危险因素。

PU-1895
CTP 在急性脑梗塞与非急性脑梗塞性烟雾病的研究

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目的 分析急性脑梗塞与非急性脑梗塞性烟雾病(MMD)患者脑血流动力学差异。材料与**方法** 回顾性分析 32 例 MMD 患者颅脑 CTP 图像，根据 DWI 图像或临床症状，分为急性脑梗塞组及非急性脑梗塞组，测量 2 组半卵圆中心及相同侧小脑半球 CBV、CBF、MTT、TTP，再通过计算患者半卵圆中心与同侧小脑半球的比值获得各参数相对值(rCBV、rCBF、rMTT、rTTP)，通过两样本 t 检验比较急性脑梗塞组及非急性脑梗塞组各参数相对值差异，再行 ROC 曲线分析各参数相对值在鉴别两组的最佳诊断阈值。**结果** 急性脑梗组 7 例，非急性脑梗组 25 例，两组 rCBV 分别为 1.38±0.71 及 1.29±1.12（P = 0.85），rCBF 分别为 0.42±0.35 及 0.79±0.50（P = 0.08），rMTT 分别为

1.78±0.10 及 4.49±1.17（*P* = 0.00）、rTTP 分别为 1.12±0.12 及 1.47±0.31（*P* = 0.00），梗塞组 rMTT 及 rTTP 较非梗塞组延长，并达统计学差异，虽然 rCBF 较非梗素组小，但两组无差异，而 rCBV 在两组中无明显差异。通过 ROC 曲线分析，当 rMTT 及 rTTP 分别为 3.64、1.28，鉴别梗塞与非梗塞的 AUC 为 0.880、0.886。**结论** CTP 能够直观、定量地评价 MMS 患者中发生急性脑梗塞与非急性脑梗塞脑血流动力学差异，为临床提供重要的脑组织灌注信息。

PU-1896
大脑中动脉狭窄的 TCD 和 CTP 比较研究

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目的 探讨和比较经颅多普勒（TCD）和 CT 灌注成像（CTP）在诊断大脑中动脉（MCA）狭窄及血供变化中的价值。**方法** 回顾性分析 43 例行 TCD 和 CTP 检查的病例，以 CTA 诊断 MCA 狭窄为参考，将检查结果分为正常组和异常组，比较 TCD 和 CTP 诊断 MCA 狭窄的准确性，并探讨与 CTA 结果的一致性。**结果** TCD、CTP、TCD 联合 CTP 诊断 MCA 狭窄的准确率为 91%、88%、93%；TCD、CTP、TCD 联合 CTP 诊断 MCA 狭窄和 CTA 结果的一致性为 0.780、0.730、0.849。**结论** TCD 和 CTP 能较好的诊断 MCA 狭窄，将两者联合起来可提高检测的准确度。

PU-1897
高分辨率磁共振颈动脉粥样斑块形态与脂质核心相关性研究

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目的 本研究旨在通过高分辨率磁共振成像技术探究颈动脉粥样斑块形态在脂质核心形成中的作用，为预测脂质核心形成提供影像依据。
方法 本研究共纳入 10 例颈动脉粥样硬化斑块患者，运用高分辨率磁共振对颈动脉进行成像，图像由 MRI-PlaqueView 软件处理，根据所得图像及处理结果获得颈动脉粥样斑块形态以及斑块脂质核心特征。评估颈动脉粥样斑块形态的标准值有：斑块近心端斜率（$K_{proximal}$）、远心端斜率（K_{distal}）及近心端和远心端斜率的比值（$K_{proximal}/K_{distal}$）。评估脂质核心特征的标准值有：脂质核心总体积（V_{total}）、所占斑块总体积的百分比（P_{volume}）及斑块最大层面所占总面积百分比（P_{square}）。斑块斜率由人工测量，脂质核心特征由 MRI-PlaqueView 自动分析。运用 SPSS 21 进行相关性分析，$p<0.05$ 有统计学差异。
结果 在 10 例患者中（年龄：72.5±10.6 岁，男：女=6：4），8 例双侧颈动脉斑块含脂质核心，2 例单侧颈动脉含脂质核心，共计 16 例颈动脉被纳入研究。所有斑块进行分析结果是：$K_{proximal}$ 与 V_{total}(r=0.931)、P_{volume}(r=0.894)及 P_{square}(r=0.879)呈正相关，K_{distal} 与 V_{total}(r=0.601)、P_{volume}(r=0.587)及 P_{square}(r=0.769)呈正相关，$K_{proximal}/K_{distal}$ 与 V1(r=0.756)、P_{volume}(r=0.708)及 P_{square}(r=0.645)呈正相关，p 值均小于 0.05。
结论 颈动脉斑块斜率与脂质核心总体积、所占斑块总体积的百分比及斑块最大层面所占总面积百分比呈正相关，推测斑块近心端及远心端斜率在斑块脂质核心的形成过程中产生作用。

PU-1898
双源 CT 前瞻性心电门控 3D-CTA 成像对颅内动脉瘤的检测与观察

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目的 心电门控 3D-CTA 对颅内动脉瘤进行检测通常为回顾式心电门控 R-R 全周期采集。本文采用部分 R-R 周期扫描采集方式，尝试在不影响对病灶显示，测量，观察的前提下进一步降低辐射剂量的可能性。
方法 24 例未破裂动脉瘤随机分为两组，每组 12 例，分别完成 R-R 全周期采集和 R-R 部分周期（20%-70%）采集。使用二代双源 CT（Somatom Definition Flash; Siemens, Erlangen, Germany），管电压 100KV，准直为 64×0.6,旋转时间 0.5s,螺距为 0.7，层间距 1mm，扫描视野为 233mm。心率均控制在 80 以下。重建后数据传至 Syago.via 工作站，动态结合逐帧观察。第一组数据为 R-R 全时相数据，采用不同重建方式，一为全时相间隔重建，共获得 20 个期相，二为选取 20%-70%区间间隔重建，共获得 11 个期相。两次数据进行组内对比；第二组部分周期采集图像间隔重建后与第一组全周期采集重建图像进行组间比较，比较内容包括动脉瘤大小形态及异常搏动点观察。
结果 组内比较，全周期采集全时相间隔重建的 12 例中，检出动脉瘤 14 个，发现异常搏动点有 5 个（连续三帧以上动态观察）；部分周期采集间隔重建的 12 例中，检出动脉瘤 13 个，发现异常搏动点 6 个。分别位于颈内动脉颅内段，前交通动脉，大脑前动脉末端，大脑中动脉,后交通动脉等部位。组内比较，两种重建方法在动脉瘤检出数量，瘤体颈测量等方面无明显差异。两组动脉瘤组间比较，动脉瘤显示，及图像质量均无明显差异，异常搏动点均于重建时相的 25%到 65%区间观察最优。两组采集平均 DLP 分别为，260.4mGY *cm,479.8mGY*cm 。部分周期采集相当于全周期采集的 54.3%。
结论 前瞻性心电门控部分 R-R 周期 3D-CTA 检测动脉瘤及异位搏动点观察可以进一步降低辐射剂量，同时也能达到诊断要求。

PU-1899
醒后卒中的多模态 CT 影像学表现及临床特点

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目的 探讨醒后卒中的多模态 CT 影像学表现及临床特点。方法 回顾性分析 2019 年 1 月至 2019 年 7 月首都医科大学宣武医院急诊绿色通道接诊的 179 例急性缺血性卒中患者，根据发病时间是否明确分为醒后卒中组与起病时间＜6h 组，所有患者均于就诊时行多模态 CT 检查。收集患者人口学、基线临床资料及影像学表现，包括年龄、性别、起病 NIHSS 评分、TOAST 卒中病因分型；ASPECT 评分、血栓负荷评分、侧枝循环评分、梗死核心及半暗带体积，住院患者收集再灌注治疗后出血转化、院内死亡及去骨瓣减压情况，并以 DEFFUSE-3、EXTEND 入组标准评估醒后卒中患者存在再灌注治疗机会的比例。采用单因素分析比较醒后卒中组与起病＜6h 组患者在临床资料、影像学表现的差异。结果 179 例急性缺血性卒中患者中，醒后卒中 26 例，起病时间＜6h 者 17 例。单因素分析显示，醒后卒中与起病＜6h 卒中患者的危险因素、起病 NIHSS 评分、TOAST 病因分型、ASPECT 评分、大血管闭塞位置、侧枝循环评分、半暗带及梗死核心体积、出血转化率差异均无统计学意义（均 P＞0.05）。醒后卒中患者与起病＜6h 患者再通治疗率差异具有统计学意义（41.6%，88.2%，P＜0.05），但离院 NIHSS 评分在两组间差异无统计学意义（P＞0.05）。醒后卒中患者前循环血栓负荷评分低于起病＜6h 卒中，差异具有统计学意义（4.89，6.42，P＜0.05）。14 例（53.8%）醒后卒中患者符合 DEFFUSE-3 入组标准，11 例（42.3%）符合 EXTEND 标准。结论 醒后卒中与非醒后卒中具有相似的危险因素、早期缺血征象、血管闭塞情况及半暗带体积。虽然醒后卒中组具有较高的血栓负荷及较低的再通治疗率，但两组出院 NIHSS 评分无差异，提示再通治疗在进一步改善醒后

卒中患者预后中的重要意义。应用多模态 CT 检查可以为醒后卒中患者再灌注治疗提供组织学证据。

PU-1900

CT 灌注成像在颈内动脉和大脑中动脉重度狭窄或闭塞患者侧支循环评价中的应用

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目的
应用 CT 灌注成像对大脑中动脉及颈内动脉重度狭窄或闭塞患者进行多层面脑血流动力学参数评价，比较不同方式以及不同程度的侧支代偿与脑灌注结果的相关性，探讨一级与二级侧支循环所对应的 CTPI 改变，确定侧支循环分级的量化指标，为 CTPI 用于评价侧支循环提供影像学依据。
材料与**方法**
收集 2014 年 1 月至 2017 年 3 月住院的缺血性脑血管病患者，分为单侧颈内动脉及单侧大脑中动脉重度狭窄或闭塞两组。采用 Revolution CT 机，行全脑动态容积扫描。对所有入组病例进行 ASPECTS 评分，比较侧支循环良好组与不良组 CTPI-ASPECTS 的区别，计算 CTPI-ASPECTS 预测侧支循环良好的 ROC 曲线。寻找 CTPI 有效评估侧支循环的影像学指标。
结果
1. 颈内动脉重度狭窄或闭塞组，侧支循环良好组 CBF-ASPECTS 优于侧支循环不良组。CBF-ASPECTS 预测颈内动脉侧支循环良好的 ROC 最佳分割点为 5.5，敏感度为 75.0%，特异度为 66.2%。
2. 大脑中动脉重度狭窄或闭塞组，侧支循环良好组 TTP-ASPECTS、MTT-ASPECTS 优于侧支循环不良组。TTP-ASPECTS 预测大脑中动脉侧支循环良好的 ROC 最佳分割点为 2.5，敏感度为 80.6%，特异度为 79.4%。
结论
CTPI-ASPECTS 评分既能够全面反应脑组织灌注情况，又能简化评估难易程度，有望成为目测评估侧支循环的半量化指标。

PU-1901

脑梗死出血转化的 CT 及磁共振诊断

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【摘要】目的 探讨 CT 及磁共振检查诊断脑梗死出血转化。**方法** 回顾分析我院 2014 年 6 月至 2017 年 9 月期间 10 例脑梗死出血转化患者的 CT、MRI 表现。**结果** 10 例脑梗死出血转化中，表现为梗死区斑点状或点片状出血有 5 例，梗死区内血肿形成有 5 例，（其中出血面积 2cmX2cm 以上伴明显占位效应有 3 例）。**结论** CT、MRI 均为诊断脑梗死出血转化的可靠方法，MRI 更为优越。

PU-1902

3D-ASL MRI 评估 AIS 梗死后侧枝血管的临床价值研究

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目的 探讨不同反转时间（inversion time，TI）的动脉自旋标记（arterial spin labeling，ASL）灌注成像对急性缺血性脑卒中（acute ischemic stroke，AIS）梗死后侧枝血管评价的临床意义。**方法** 连续纳入单侧大脑中动脉供血区 AIS 患者 61 例，于症状发作 24 小时内,采用 Siemens Skyra 3.0T MR 扫描仪行 T_1WI、T_2WI、DWI、3D-TOF MRA 及 3D－ASL MRI 检查。根据梗死灶于 3D－ASL 脑血流图是否存在 “动脉到达伪影（Aarterial transit artifact，ATA）”，将患者分为 ASL_{ATA}组与 non-ASL_{ATA}组。于患者入院第一天行美国国立卫生院卒中量表(NIHSS)评分评估其神经受损功能，并于出院 90 天行 Rankin 修订量表（mRS）评分评估其近期预后情况。采用统计分析软件 SPSS 24.0 比较 ASL_{ATA}组与 non-ASL_{ATA}组一般临床资料、各影像参数差异。 **结果** 61 例患者中，ASL_{ATA}组 41 例，non-ASL_{ATA}组 20 例。两组间性别差异具有统计学意义（X^2=12.113， P=0.000）。ASL_{ATA}组较 non-ASL_{ATA}组入院第一天 NIHSS 评分（Z=3.239，P=0.000）、出院 90 天 mRS 评分（Z=5.119，P=0.000）、梗死体积（t=5.438，P=0.049）低。**结论** 3D-ASL MRI 出现梗死后 ATA 的 AIS 患者梗死灶体积小、神经功能受损轻、近期预后良好，这一征象有潜力成为临床评估预后的重要指标。

PU-1903
经颅直流电刺激治疗缺血性脑卒中患者肢体运动功能障碍脑功能恢复改变特征的初步研究

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【摘要】目的 利用静息态功能磁共振成像（Rs-fMRI），研究经颅直流电刺激（transcranial direct current stimulation,tDCS））结合常规康复方法治疗缺血性脑卒中肢体运动功能障碍患者，治疗前后的自发脑功能恢复的改变特征及意义，探讨 tDCS 是否对患者脑功能的恢复有显著的促进作用。**方法** （采用单盲实验）对 10 例 tDCS 组患者（采用阳极 tDCS 刺激结合常规康复治疗）及 11 例对照组（接受同疗程的常规康复治疗）行颅脑静息态功能磁共振扫描，所有研究对象治疗前后均采用 Fugl-Meyer 运动功能评分、Barthel 指数评估患者上肢功能障碍情况，采用低频振幅（fALFF）方法分析治疗前后患者静息态下脑内 M1 区局部活动激活情况同对照组的比较，研究 tDCS 治疗前后患者脑功能恢复的情况。Rs-fMRI 数据组间比较采用双样本 t 检验，以 $P<0.05$ 为具有显著性差异，数据差异采用国际通用的统计参数图表示。**结果** 治疗两组患者初级运动区及运动前区皮质 fALFF 值较治疗前有所增高，但两组的组间差异无统计学意义。阳极 tDCS 组及对照组患者在 3 周的治疗干预后，FMA 评分、BI 指数均较治疗前有不同程度的改善，而阳极 tDCS 组较对照组在 FMA 评分的改善程度明显优于对照组。**结论** 部分运动功能恢复较好的患者大脑激活区主要在患侧大脑半球，而少数运动功能恢复稍差的患者脑区功能主要表现为健侧的激活与代偿。阳极 tDCS 兴奋性刺激患侧大脑运动皮质区对卒中后患者肢体运动功能的改善具有促进作用，但其对脑功能恢复的作用机制需再扩大样本量后深入研究，对受试者进行脑功能恢复的 Rs-fMRI 纵向观察及采用多模态功能磁共振方法，进一步探讨其脑功能恢复机制。

PU-1904
双能量 CT 电子云密度/等效原子序数（Rho/Z）在急性中风取栓术后应用

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摘要：**目的** 探讨双能量 CT 电子云密度/等效原子序数（Rho/Z）在急性缺血性脑卒中机械取栓术后出血性转化中的检出价值。**方法** 回顾性收集 2017 年 11 月 - 2019 年 7 月急性缺血性脑卒中机械取栓术后经双能量 CT 扫描患者 42 例，经术后随访证实为造影剂渗出 24 例，出血性转化 18 例。两名神经系统诊断经验丰富的诊断医师使用双盲法对渗出患者选取密度最高区域、出血患者根据随访图像选取出血区域勾画并记录 Rho 值和 Z 值，分别比较 Z 值和 Rho 值在两组间的差异。运用临床受试者工作特征曲线分析两参数的鉴别诊断效能。**结果** 出血性转化患者的平均 Rho 值（31.20±11.99）高于渗出患者的平均 Rho 值（25.06±4.49）（P＞0.05）。出血性转化患者的平均 Z 值（9.43±1。01）高于渗出患者的平均 Z 值（8.58±0.63）（P＜0.05）。在临床受试者工作特性曲线中，Z 值的曲线下面积为 0.76，最佳诊断阈值为 10.6，敏感度为 65%，特异度为 97%。**结论** 在急性中风病人取栓术后，双能量 CT Rho/Z 值的运用有助于术后出血性转化的早期检出。

PU-1905
深部穿支动脉供血区梗死与皮层及皮层下区梗死病人颅内动脉斑块情况的对比研究

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目的 应用颅内高分辨 MRI（HRMRI）技术比较分析颅内深部穿支动脉供血区梗死和皮层及皮层下区梗死病人的颅内动脉管壁特征，以阐述其潜在的发病机制。**方法** 回顾性分析 25 例[男 16 例，女 9 例；平均年龄（64.8±9.78）岁]急性期深部穿支动脉供血区梗死和皮层及皮层下区梗死并行颅内 HRMRI 检查的病人，HRMRI 采用 3D 可变翻转角度快速自旋回波 T1 加权（3D T1 SPACE）序列。分析梗死供血区血管动脉粥样硬化斑块的存在情况，分别测量斑块最狭窄层面的狭窄程度、斑块最大截面积、斑块负荷及重构指数； 计量资料的组间比较采用 t 检验，计数资料的组间比较采用 x 2 检验或 Fisher 确切概率法，*P*<0.05 为差异有统计学意义。**结果** 25 例病人中，深部穿支动脉供血区梗死病人 17 例（68.0%），皮层及皮层下区梗死病人 8 例（32.0%）。其中，深部穿支动脉供血区梗死病人颅内动脉粥样硬化斑块的斑块负荷小于皮层及皮层下区梗死病人（*P*=0.040）；两组间斑块最狭窄层面狭窄程度、斑块最大截面积、和重构指数无统计学差异（*P*>0.05）。**结论** 深部穿支动脉供血区梗死相比皮层及皮层下区梗死病人斑块体积更小，其梗死机制可能与斑块直接阻塞穿支动脉开口有关。

PU-1906
磁共振血管壁成像技术对急性缺血性脑卒中颅内血管病变的评估价值

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目的：高分辨磁共振血管壁成像技术（VW-MRI）作为一项新的血管疾病诊断方法，它具有自己独特的优势和特点。本文旨在探索 VW-MRI 在疑诊急性期缺血性脑卒中患者颅内血管病变评估中的价值，为其在临床诊断与疾病研究中的应用奠定理论基础。
方法：回顾性收集了 2014 年 2 月至 2015 年 10 月怀疑急性缺血性脑卒中的患者 235 例，排除图像质量不佳，临床资料不全以及未做 DSA 或 CTA 检查的患者，入组？例。将患者按检查类型分为两组，其中 A 组为同时进行了 DSA 检查和 VW-MRI 检查，共 49 例，B 组为同时进行了 CTA 和 VW-MRI 检查，共 99 例。分析比较 VW-MRI 与传统管腔成像方法检查结果的一致性，观察其对颅内血管病变的评估能力。
结果：颅内血管病变主要分布在两侧大脑中动脉，？？。以管腔成像技术为金标准时，与 DSA 比较，VW-MRI 的敏感性为 88%，特异性 87.9%。与 CTA 比较，VW-MRI 敏感性 82.4%，特异性 91.7%。以 2 名影像科医生一致性为金标准时， VW-MRI 对管腔和管壁病变的检出率高于 DSA(22.08% vs 12.80%)及 CTA(16.34% vs 8.26%)。
结论：传统管腔成像技术（DSA 和 CTA）为金标准时，**VW-MRI 有较高的敏感性和特异性。与** DSA 和 CTA 比较，**VW-MRI 提高了管壁病变的检出率高，**可以作为颅内血管病变是有效的检查手段，为急性期缺血性脑卒中的病因分型提供诊断依据。

PU-1907
内侧丘脑背侧萎缩介导无症状颈动脉狭窄对认知障碍的影响

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目的：无症状颈动脉狭窄（ACS）增加了脑萎缩和痴呆的风险。我们的目的是结合体积和形状分析来评估皮质下核异常及其与认知缺陷的关系。
方法：本研究共纳入 29 例单侧颈内动脉严重急性冠脉综合征患者，以及 31 名年龄、性别和文化程度相匹配的对照受试者。所有参与者都接受了一个综合的神经心理学认知评估、生化测量和结构磁共振成像（MRI）。对 11 例颈动脉内膜切除术后 6 个月的患者进行了纵向认知评估和 MRI 扫描。
结果：与对照组相比，患者在所有认知领域的表现均较差，载脂蛋白 b/载脂蛋白 a1（apob/apoa1）比率较高。我们还观察到，急性冠脉综合征患者的丘脑形态和体积萎缩更多，尤其是内侧丘脑背侧，但经多次比较，其他皮质下核无明显差异。两组间白质高信号的 fazekas 评分无差异。这些生化和脑结构的变化与认知能力的下降显著相关。值得注意的是，基线时的中介分析显示，颈动脉内膜中层厚度与执行功能和处理速度之间的关系分别由内侧丘脑背侧容积和 APOB/APOA1 比值介导。颈动脉内膜切除术后，有利于认知恢复和右内侧丘脑背侧体积的增加。
结论：我们的研究首次确定了与 ACS 患者认知能力下降相关的皮质下核改变的明显萎缩。丘脑可能是脑缺血再灌注早期敏感的生物标志物。

PU-1908
探讨磁共振零回波 ZTE 技术评价支架术后脑血管的应用价值

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目的　传统无创评价脑血管支架术后疗效的磁共振评估技术为时间飞跃法-TOF 成像或有创性注射对比剂的 DSA 成像及注射对比剂的 CTA 成像，TOF 序列在复杂流速的血管部位,比如颅内的大多数血管会导致自旋散相。而自旋散相会造成 MRA 图像中真实血管的丢失,从而阻碍 TOFMRA 的广泛应用。而 DSA 作为有创且辐射剂量较高的成像方式，多用于临床手术的开展，在术后评估中应用受限，本研究应用无需注射对比剂且无辐射的磁共振零回波 ZTE 技术评价支架术后的脑动脉，旨在得到更加准确性的支架术后脑血管评价指标。材料与方法　本研究分析动脉狭窄及动脉瘤术后患者共 20 例，其中 6 例为椎动脉孤立性夹层动脉，4 例为双侧椎动脉狭窄伴夹层动脉瘤，3 例为基底动脉夹层动脉瘤，2 例为颈内动脉海绵窦段动脉瘤，2 例颈内动脉前交通动脉瘤，1 例双侧大脑中动脉狭窄，1 例基底动脉末端小动脉瘤，1 例基底动脉夹层动脉瘤。患者术前术后分别行三种扫描：磁共振零回波时间 ZTE 技术，传统时间飞跃法的 TOF，及有创注射对比剂的 DSA 成像，对于横轴位 TOF 成像及矢状位 ZTE 成像，后处理时血管行最大密度投影，对病变管腔直径及走形行对比研究，并应用 DSA 作为金标准评估两种图像对管腔直径和走形的显示是否有统计学意义。结果　8 例患者因病变处血管走形迂曲及狭窄严重导致局部血流在激励层面内长时间停留，多次被激励后血液信号降低，但 ZTE 技术的成像原理是采用连续式标记动脉血液，无需担忧由于流速，血管走形方向或激励时间而引起的信号丢失。12 例动脉瘤患者 ZTE 技术与时间飞跃 TOF 技术显示效果相仿，对病变显示无显著统计学差异。DSA 目前作为脑血管病诊断的金标准，分别与 ZTE 技术及时间飞跃 TOF 技术比较，与 ZTE 技术一致性更好。结论　零回波时间 ZTE 技术血管成像为动脉标记成像，无需外源性标记物，能客观反映动脉血流状态及血管走形，而不受动脉血流及静脉血流干扰。

PU-1909

Peri-thrombus vascular hyperintensity sign: detection of intracranial thrombus location and length in acute ischemic stroke

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Purpose The identification of intra-arterial thrombus is valuable for planning endovascular therapy in acute ischemic stroke (AIS) patients. The aim of the study was to investigate the diagnostic accuracy of peri-thrombus vascular hyperintensity sign (PVHS) on three-dimensional (3D) black-blood (BB) contrast-enhanced MRI for the detection of intracranial thrombus and its value in predicting thrombus location and length in AIS patients.

Methods Consecutive AIS patients who underwent MRI including 3D BB contrast-enhanced MRI sequence within 8 h of clinical onset were prospectively evaluated. Two readers independently reviewed the 3D BB contrast-enhanced MRI data to assess the presence and location of PVHS. Findings were compared with those of contrast-enhanced MR angiography (CE-MRA) as the reference standard. The follow-up 3D BB contrast-enhanced MRI data were also reviewed to assess the PVHS changes after treatment.

Results The PVHS was identified in 49% (63/129) of AIS patients with good agreement. The PVHS had 100% specificity, 88% negative predictive value, 89% sensitivity, and 100% positive predictive value for detection of acute arterial occlusions. Eight patients showed discordant thrombus locations between 3D BB contrast-enhanced MRI and CE-MRA. Median thrombus length in patients with complete occlusion was 9.61 mm. Twenty-two patients had follow-up 3D BB contrast-enhanced MRI. Eighteen out of 22

patients had successful vascular recanalization and PVHS disappeared on 3D BB contrast-enhanced MRI.
Conclusion The PVHS on 3D BB contrast-enhanced MRI is a highly specific tool for diagnosing occlusive arterial thrombus. It could provide precise information about the location and length of a thrombus in AIS patients.

PU-1910
多层螺旋 CT 一站式 CTP-CTA 检查对血管狭窄性缺血性脑血管病的诊断价值

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目的通过比较 MSCT 一站式 CTP-CTA 重组的 CTA 图像与 DSA 图像，以 DSA 图像为标准，检验 CTA 图像对脑血管狭窄与责任血管区域侧枝循环血管显示能力，探讨一站式 CTP-CTA 检查对血管狭窄性缺血性脑血管病诊断的临床价值。**方法**搜集 16 例发病 6 小时内先行 MSCT 全脑容积灌注成像，再行头颅 DSA 检查的患者资料；CTP 数据使用 Ge AW 工作站 Perfusion 4D 软件处理，自动计算出时间-密度曲线，选取动脉曲线峰值期像重建 CTA 图像用以观察动脉狭窄病变，选取动脉峰值-静脉峰值期多期图像重建 CTA 图像用以观察责任血管区域侧枝循环；由两位高年资放射科医师共同对图像进行判读，观察 CTP 扫描范围内的两侧颈内动脉虹吸段、大脑前、中、后动脉及基底动脉，分别记录 CTA 及对应 DSA 图像上是否显示狭窄及位置，若存在狭窄、责任血管区域是否显示侧枝循环。以 DSA 图像标准，检验 CTA 显示血管狭窄及侧枝循环的能力，两者对病变显示能力采用 Kappa 一致性检验和配对 χ^2 检验，$P<0.05$ 认为差异有统计学意义。**结果**本组病例共观察 144 处血管，CTA 见狭窄 35 处
，DSA 见狭窄 30 处，两者均为正常 106 处。有血管狭窄 30 处病变中，CTA 见责任血管区侧枝循环 4 处、DSA 见 6 处，24 处两者均未显示；CTA 与 DSA 对血管狭窄(Kappa=0.782，P<0.001)、责任血管区侧枝循环(Kappa=0.762，P<0.001)显示一致性较好，两者显示率虽有差别，但差别不具有统计学意义(P=0.227)。**结论** MSCT 一站式 CTP-CTA 检查不但能提供急性缺血性脑血管病的血液动力学信息，还能获得血管解剖学资料，对比 DSA，其对血管狭窄及侧枝循环显示的一致性较高，基本达到诊断要求。应用多层螺旋 CT 一站式 CTP-CTA 检查，有望省去单独头颅 CTA 检查，进一步减少患者的检查及等待时间、对比剂用量和所受辐射剂量。

PU-1911
Evaluation of hemodynamics before and after revascularization in hemorrhagic moyamoya disease: A CT perfusion imaging case study

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Objective: To explore the feasibility of CT perfusion imaging (CTP) for evaluating hemodynamics in hemorrhagic moyamoya disease.
Methods: The retrospective analysis included patients with hemorrhagic moyamoya disease (n=25) who underwent brain CTP examination. Two experienced radiologists manually delineated regions of interest (ROIs) in the bilateral frontal lobe, temporal lobe, brain tissue adjacent to the hemorrhagic foci, and the brainstem as a control region. The perfusion values for all ROIs were extracted, including cerebral blood flow (CBF), cerebral blood volume (CBV), mean transit time (MTT), and time to peak (TTP). Subsequently, the differences in perfusion values for different brain tissues were compared between the hemorrhagic side and the non-hemorrhagic side. For patients who underwent revascularization surgery, differences in perfusion values from before to after surgery were determined in brain tissues on the ipsilateral side.
Results: The CBF in the area around the hematoma and the lateral temporal lobe on the hemorrhage hemisphere were lower than those on the contralateral side, while the TTP and MTT were higher. Among the 14 patients who underwent revascularization, the CBF and CBV in the postoperative temporal lobes were higher than those before operation, while the TTP and MTT were lower. The CBF and CBV in the frontal lobe were higher after operation.
Conclusion: Hemorrhagic moyamoya disease results in cerebral ischemia, and CTP could be used to localize such ischemic brain tissue and to objectively evaluate the changes in cerebral hemodynamics with revascularization.

PU-1912

Multiple Anatomic features for Predicting Transverse Sinus Dominance Laterality on non-contrast CT

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Background & objective: the physiological asymmetry of bilateral transverse sinus is very common in the population, and may lead to misjudgment of magnetic resonance venography (MRV). The purpose of this study was to evaluate the ability of predicting congenital dominant transverse sinus by evaluating the various anatomical features of axial CT in the posterior fossa of the brain.

Methods: 94 cases of continuous brain plain scan CT-MRV study were reviewed and analyzed. On the non-contrast enhanced axial CT images, each reviewer measured (1) the groove inclination of the superior sagittal sinus (SSS), (2) the posterior cerebral falx angle, and (3) the inclination of the inferior occipital lobe. The cross section area of TS is measured on 3D phase contrast MRV image as a reference standard.

Results: the bony groove of superior sagittal sinus tilted to the right in 61 patients, and the right dominant transverse sinus was correctly predicted in 59 of 61 patients (the positive predictive value was 96%). The bony groove superior sagittal sinus

tilted to the left in 22 patients, and the left dominant transverse sinus was correctly predicted in 20 of 22 patients (91%). The positive predictive values of the inclination of the inferior occipital lobe and the angle of the posterior cerebral falx were 81% and 73%, respectively.

Conclusion: multiple anatomical features seen on non-contrast CT can be used to predict the laterality of congenital dominant transverse sinus.

PU-1913
多模型自适应统计迭代重建算法（ASiR-V）结合低管电流技术在头颅能谱 CTA 扫描中的临床应用

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目的 分析不同管电流及 ASiR-V 对头颅能谱 CTA 图像质量与辐射剂量的影响，探讨低管电流联合 ASiR-V 技术在头部能谱 CTA 的可行性及临床应用价值，以降低辐射剂量。**方法** （1）体模：对置入模拟脑血管的头颅仿真体模进行能谱扫描，管电流分别为 280、320、365、405、445 mA，并每组行 FBP、ASiR-V 20%、40%、60% 和 80%重建。测量各组图像模拟脑血管 CT 值及背景噪声，计算信噪比（SNR），对比噪声比(CNR)及噪声降低率，记录各组扫描的 CTDI。（2）临床：前瞻性纳入 2018 年 1 月至 6 月于我院行头颅能谱 CTA 检查的患者 40 例，随机分为 A、B 两组，每组 20 例。A 组为试验组（低管电流），其参数根据体模研究结果设定；B 组为对照组，管电流为 445 mA，采用 FBP 算法。采用 5 分法对图像进行主观评分。**结果** （1）体模：①迭代重建比例一定时，随着管电流的增加，模拟脑血管 CT 图像噪声降低（P<0.05），SNR 及 CNR 呈上升趋势；②相同管电流条件下，随着 ASiR-V 比例增加，各组图像的噪声降低，SNR 及 CNR 升高，差异均有统计学意义（P<0.05），噪声降低率在 ASiR-V 80%时可达到（46.73±4.27）%；③各组图像的 CTDI 随着管电流的提升而提高，相关分析显示两者呈显著正相关（P<0.001）。（2）临床：A 、B 两组图像主观评分无明显差异（3.76±0.44 vs. 4.05±0.51 分；Z=1.843，P=0.065）。 与 B 组相比，A 组辐射剂量降低了 39%（t=23.974，P<0.05）。**结论** 在头颅能谱 CTA 扫描中，采用低管电流（280 mA）联合 ASiR-V 80%可在有效降低辐射剂量的同时，获得满足诊断需求的图像质量。

PU-1914
探讨能谱 CT 评估颈动脉分叉处粥样斑块稳定性与急性期脑梗死的相关性

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目的 探讨颈动脉分叉处粥样斑块的稳定性与急性脑梗死（ACI）的相关性，指导临床制定个体化治疗方案 **方法** 回顾性分析本院 111 例临床具有脑缺血的临床资料，分为脑梗死组 50 例（颈内动脉供血区、单侧 ACI）和对照组 61 例（无 ACI，包括正常或陈旧性脑梗死灶），分析两组颈部血管的能谱 CT 资料，分别统计两组颈动脉分叉处粥样斑块的检出例数，并观察两组的颈动脉粥样斑块的形态和通过斑块的能谱成分分析，评估两组斑块的稳定性。**结果** 脑梗死组同侧颈动脉分叉处粥样

斑块检出率为 98.00%（49/50），对照组斑块检出率 50.82%（31/61），（P＜0.05）；49 例脑梗死组合并同侧颈动脉粥样斑块与 31 例对照组颈动脉斑块进行比较，脑梗死组颈动脉斑块不稳定性特征检出率高于对照组、脑梗死组斑块的稳定性特征低于对照组，其中，脑梗死组斑块内膜溃疡、内膜钙化检出率均高于对照组（P＜0.05）；脑梗死组斑块含纤维成分检出率低于对照组（P＜0.05），脂质成分、出血成分的检出率均高于对照组（P＜0.05）。**结论** ACI 与同侧颈动脉分叉处粥样斑块的发生及其斑块的稳定性具有相关性；能谱 CT 能够评估颈动脉粥样斑块的稳定性，对颈动脉粥样斑块患者的治疗方案具有临床指导意义。

PU-1915
3.0T 3D-TOF-MRA 对颅内破裂动脉瘤诊断效能及治疗方案的优化

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目的 评价 3.0T 3D-TOF-MRA 对蛛网膜下腔出血患者颅内破裂动脉瘤诊断效能及对治疗方案指导价值。
方法 165 例已被证实为蛛网膜下腔出血（subarachnoid hemorrhage, SAH）患者(GCS 评分 15 分)，疑似因颅内动脉瘤破裂所致而行 MRA 检查。以 VR-DSA 作为诊断的金标准，检测 3D-TOF-MRA 检出颅内动脉瘤准确性、敏感性、特异性、阳性预测值、阴性预测值。由 3D-TOF-MRA 来决定每枚动脉瘤是否适合弹簧圈栓塞、球囊或支架辅助弹簧圈栓塞、外科手术夹闭或保守治疗，并与由 DSA 确定的实际的治疗方案进行对比。
结果 VR-DSA 诊断了 136 例患者，共计 166 枚颅内动脉瘤：29 例患者无动脉瘤，诊断动脉瘤的准确性为 96.9%、敏感性为 97.6%、特异性为 93.1%、阳性预测值为 98.8%、阴性预测值为 87.1%。由 VR 3D-TOF-MRA 依据动脉瘤部位和工作位作出的治疗方案，准确性为 94.9%、敏感性为 94.0%、特异性为 100%、阳性预测值为 100%、阴性预测值为 74.4%。
结论 3.0T VR 3D-TOF-MRA 诊断颅内动脉瘤具有良好的敏感性和准确性，能够准确的识别颅内动脉瘤的存在，可以作为传统 DSA 的一种有效的替代工具，同时，能为蛛网膜下腔出血患者的手术方案的制定提供帮助。

PU-1916
t-DCS 联合常规康复干预手段在脑卒中后上肢运动功能康复中作用的 fMRI 研究

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近年来，脑卒中发病率日益升高，患者常遗留不同程度运动功能缺陷，严重地影响正常生活和工作。现代康复理论的发展和实践证明，有效的干预能够促进脑卒中患者运动功能的恢复。经颅直流电刺激（transcranial direct current stimulation，t-DCS）作为一种新型的康复治疗手段，已被证实其对于促进神经康复有巨大潜力[1,2]，但临床疗效及促进恢复的神经机制尚未明确。研究发现脑卒中后运动功能的恢复与双侧大脑半球初级运动皮层（M1 区）间的解剖连接和功能连接的改变有关[3-5]。目前，MR 技术已被广泛应用于脑卒中患者的神经机制的研究，其中扩散张量成像（DTI）可测量皮质脊髓束的结构连接性，即解剖连接，各向异性分数 FA 值可对其行定量分析[6-8]；静息态功能磁共振（resting-state functional magnetic resonance imaging，rs-fMRI）成

像技术的静息态功能连接（resting-state functional connectivity，rs-FC）可评估脑区之间的相关性，即功能连接[9-11]。
基于此，我们采用 t-DCS 联合常规康复干预手段对脑卒中后上肢运动功能障碍患者进行康复干预，并配合 DTI 联合 rs-FC 的磁共振方法观察双侧大脑半球 M1 区间解剖连接和功能连接的变化，以期为该手段的临床疗效和机制研究提供一些有益的探索。

PU-1917
全脑灌注联合多时相 CTA 在预测缺血性卒中出血转化中的价值

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目的 探讨全脑灌注联合多时相 CTA 检查在预测缺血性脑卒中出血转化中的价值。
方法 回顾性分析本院 2017 年 8 月至 2019 年 6 月治疗前行 CT 平扫、全脑 CT 灌注及 CT 血管成像检查的缺血性卒中患者 64 例，并通过 CT 灌注原始数据重组成多时相 CT 血管成像对侧支循环评分，利用后处理软件（AW 4.7）测量患侧与健侧灌注参数（CBV、CBF、TTP、MTT、Tmax 和 PS），并计算得到其比值（rCBV、rCBF、rTTP、rMTT、rTmax 和 rPS），根据 CT 复查结果分为出血组与未出血组。比较两组间各灌注参数值的差异，绘制受试者操作特征（ROC）曲线，分析有价值参数的诊断效能及与 HT 之间的相关性。多时相 CTA 评分采用卡方检验分析比较侧支不良组与侧支良好组之间的 HT 几率。
结果 出血组 CBV 值小于未出血组（p <0.05），出血组 TTP、MTT、Tmax、PS、rTTP、rMTT、rPS 值大于非出血组（p <0.05），两组之间 CBF、rCBF、rCBV、rTmax 之间差异无统计学意义（p >0.05）。PS（r=0.628）、rPS（r=0.516）与 HT 显著相关，当 PS>0.94 ml·100g^{-1}·min^{-1}或 rPS>2.128 时，对 HT 具有较好的诊断效能（PS 曲线下面积：0.881，rPS 曲线下面积：0.814）。侧支循环不良组出血几率（18/28，64.29%）大于侧支循环良好组出血几率（4/36，11.11%）。灌注参数联合多时相 CTA 评分能一定程度提高诊断效能（AUC=0.891）。
结论 PS、rPS 和多时相 CTA 评分对治疗前评估缺血性卒中患者 HT 风险具有重要的应用价值。

PU-1918
基于 CT 图像纹理分析结合机器学习随机森林模型对急性脑梗死的辅助诊断价值

刘畅
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目的 探讨基于头颅 CT 平扫图像的纹理分析结合机器学习随机森林模型对急性脑梗死早期检出的辅助诊断价值。**材料与方法** 回顾性分析 109 例经磁共振弥散加权成像 DWI 证实为急性脑梗死病例的 CT 资料，每例患者选择急性梗死灶纳入实验组，对侧相应部位正常脑组织纳入对照组。对 CT 图像进行标准化后，使用 A.K.软件对 CT 轴位图像进行预处理及特征的提取，按照 7：3 的比例分为训练组与验证组，通过单因素方差分析、Mann-Whitney U 检验或 t 检验及 Lasso 特征降维对 CT 轴位图像进行纹理特征筛选，训练组采用随机森林模型对筛选出的参数进行建模，最后采用验证组验证其诊断效能，并计算准确率、训练组及验证组的 ROC 曲线下面积。**结果** 特征筛选后获得 4 个参数，分别为均方根（Root mean square）、惯性矩(Inertia_angle135_offset1)、逆差矩(Inverse Difference Moment_angle135_offset1)及短游程因子(Short Run Emphasis_angle0_offset1)，最后得出训练组与验证组的 AUC 值分别为 0.99、0.87,验证组的准确率为 0.82。**结论** 机器学习随机

森林模型对脑梗死 CT 图像纹理特征进行筛选及建模，能够对急性脑梗死提供早期的辅助诊断，从而降低漏诊率。

PU-1919
MRI-PWI 对脑梗死前期患者微循环状态评价的研究

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【摘要】**目的** 脑梗死前期患者微循环状态应用 MRI 灌注成像进行评价的临床意义。**方法** 纳入于 2018 年 5 月～2019 年 1 月就诊于我院神经内科的症状性脑卒中患者 55 例,行常规 MRI 检查，对 DWI 图像为阴性的患者进一步行 MRI-PWI 成像，测量患者患侧与健侧的 rCBF、rCBV、MTT 及 TTP 参数值并进行对比分析。**结果** 本组纳入的 55 例患者中，16 例 MRI-DWI 结果为阴性，进行 MRI-PWI 成像发现其中 12 例脑内有低灌注区域，其中Ⅰ1 期 5 例、Ⅰ2 期 2 例、Ⅱ1 期 3 例、Ⅱ2 期 2 例，患侧与健侧对比，rCBV、rCBF、MTT、TTP 差异均具有统计学差异(P＜0.05)。**结论** MRI-PWI 成像与 MRI-DWI 相比,对脑梗死前期病变的检出率更高，为缺血性脑卒中患者的早期诊断提供重要依据。

PU-1920
多个 PLD 动脉自旋标记灌注成像对急性脑缺血的诊断研究

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目的 探讨 3D 动脉自旋标记灌注成像（ASL）在评价急性脑缺血灌注方面的价值，并选取最适 PLD 时间。**方法** 前瞻性研究，分析徐州医学院附属医院 2014 年 5 月至今诊治的 13 例急性脑缺血患者的临床及影像学资料。男 9 例，女 4 例，年龄 36-70 岁，平均 53 岁，主要临床症状为肢体无力、言语不清、口角歪斜。13 例患者均行 3D ASL（PLD 分别为 1.5s、2.0s、3.0s）及 DSC 检查。**结果** 在不同 PLD 下，分别采用镜面区、白质区作为标准化区域，CBF 与 rCBF 间均无统计学差异(*P*> 0.05)。当 PLD=2.5S 时，采用镜面区、白质区作为标准化区域，CBF 与 rCBF，rCBV，MTT，Tmax 之间的相关性高，其中 CBF 与 Tmax 之间的相关性最高。当 PLD=1.5S 及 2.0S，采用镜面区、白质区作为标准化区域，CBF 与 Tmax 之间的相关性也最高。**结论** 3D ASL 可替代 DSC 反映急性脑缺血的低灌注状态；本组病例中，PLD=2.5s 可能更好的反映灌注状态。

PU-1921
脑小血管病的脑叶体积变化和脑叶形态学协同变化

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目的 探索脑小血管病的脑叶体积变化和脑叶形态学协同变化特征。
材料与方法 本研究共收录伴轻度认知障碍的脑小血管病（cerebral small-vessel disease with mild cognitive impairment, CSVD-MCI）病例 28 例、不伴认知功能损害的脑小血管病（cerebral

small-vessel disease with no cognitive impairment, CSVD-nCI）病例 37 例和老年对照 35 例。三组受试者的年龄、性别和教育程度均匹配。对所有受试者进行高空间分辨率三维 T1 加权成像和全面的神经心理评估。使用 Accubrain 自动脑容积测量方法测量各脑叶灰质、白质的相对体积。将各脑叶灰质与白质体积之和处以该脑叶脑脊液体积得到各脑叶的脑叶萎缩指数。采用单因素方差分析对脑容积数据进行组间比较，其中使用 Bonferroni 法校正三组间的多重比较，使用 FDR 法校正多个参数的多重比较。将各脑叶的脑叶萎缩指数进行相关性分析，使用 FDR 法进行校正。
结果 与对照相比，CSVD-MCI 组的双侧额叶、顶叶的灰质体积和右侧扣带回的白质体积显著减少（Bonferroni 法和 FDR 法校正）。与对照组相比，CSVD-MCI 组在双侧颞叶、扣带回和岛叶的脑叶萎缩指数显著增高（Bonferroni 法和 FDR 法校正）。CSVD-MCI 组与 CSVD-nCI 组均存在显著的结构协同变化改变。其中，与对照组相比，CSVD-nCI 组的右侧额枕叶及左侧颞叶的脑叶萎缩指数与其它脑叶协同性显著增加（$P < 0.05$, FDR 法校正）。与对照组相比，CSVD-MCI 组的双侧颞叶和右侧扣带回的脑叶萎缩指数与其它脑叶协同性显著增加（$P < 0.05$, FDR 法校正）。
结论 脑小血管病存在脑叶水平的形态学协同变化，提示全脑水平的结构和功能调整。脑叶体积和形态学协同变化测量为探索脑小血管病的病理生理机制提供依据。

PU-1922
不同标记后延迟时间的 3D-ASL 联合 SWI 对急性缺血性脑卒中脑血流灌注的研究

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目的 探讨采用不同标记后延迟时间的 3D-ASL 动脉自旋标记灌注技术联合 SWI 应用在急性缺血性脑卒中脑血流灌注量的研究。
方法 选取 2018 年 4 月-2019 年 5 月于我院治疗的 40 例急性缺血性脑卒中患者，采用不同标记后延迟时间(PLD=1525ms，2525ms) 行 3D-ASL 及 SWI 检查。在 AW 4.6 工作站上对 3D-ASL 原始图像进行数据处理，利用 Functool-ASL 软件对脑血流量(CBF)图进行预处理，将 CBF 功能图与 T_1-BRAVO 像进行融合，分别获得不同 PLD 时间点的全脑血流量（CBF）图。感兴趣区选取额叶、顶叶、颞叶、枕叶、基底节区、小脑半球以及急性缺血梗死区，取最大层面测量其 CBF 值，并做镜像测量对侧 CBF 值，采用配对 t 检验分析不同 PLD 时间各脑区 CBF 值之间的差异，P 值小于 0.05 为有统计学显著差异。同时对不同 PLD 时间的脑血流灌注 CBF 值与 SWI 图像数据进行影像学相关分析。
结果 双侧额叶、顶叶、颞叶、基底节区 CBF 值在 1525ms 组与 2525ms 组间无统计学差异（P>0.05），双侧枕叶及小脑半球在 1525ms 组与 2525ms 组间有统计学差异（P<0.05），急性脑梗死区 CBF 值在 1525ms 组与 2525ms 组间差异无统计学意义比较(P＞0.05)，但是低灌注区域范围 1525ms 组较 2525ms 组明显增大，对侧镜像区 CBF 值在 1525ms 组与 2525ms 组间差异无统计学意义比较(P＞0.05)。SWI 在显示急性梗死区侧枝循环与脑血流代偿能力的敏感度和不同 PLD 时间的低灌注区域范围具有相关性（P<0.05）。
结论 不同标记后延迟时间的 3D-ASL 联合 SWI 检测能准确判断脑梗死的位置和 CBF 值，能够更好评估缺血半暗带范围、侧支循环代偿建立状态、责任血管等相关信息，对于了解急性脑卒中患者缺血梗死现状及近期预后评估提供客观依据。

PU-1923
CTP 灌注成像技术在早期脑卒中治疗中的价值

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目的 探讨 CTP 灌注成像技术在分析急性脑卒中缺血半暗带中的价值，为早期脑卒中的治疗提供诊断依据。
材料与**方法** 回顾性研究 2018 年 10 月至 2019 年 1 月，怀疑脑卒中行 CTP 成像扫描的患者 28 例，男性 25 例，女性 3 例，所有病例均行 CTP 灌注成像扫描。使用飞利浦 256 层 iCT，患者仰卧于检查床头部托架内，头部用绑带固定，先行 CT 平扫，然后，经患者肘静脉注射对比剂（碘帕醇 370mgI），流速=4-5ml/s，剂量=50ml，利用灌注扫描程序，覆盖扫描范围 16cm，间隔 4S，持续扫描 60s，灌注后，立即行增强期扫描。所得原始数据传输至飞利浦后处理工作站，对各期图像、及 CTA、CTP 进行分析，设置延迟时间>3s 和 rCBF<30%分别为预测半暗带和核心梗死区体积参数阈值。
结果 28 例 CT 灌注患者中，脑梗塞 17 例，动脉瘤并出血 1 例，蛛网膜下腔出血 2 例，脑膜瘤 1 例，灌注正常 3 例，其它 4 例。CT 平扫、CT 灌注、增强扫描相结合能够对急性脑卒中进行确诊，能够区分梗死区及半暗带。
讨论：缺血半暗带仅是脑血流低灌注后神经功能受损，恢复灌注后神经功能仍可恢复的区域，长时间、严重的低灌注可致半暗带进展为不可逆梗死区。CT 平扫对于急性脑梗塞难以发现，即使增强扫描也不一定可发现急性期脑梗塞，而 CT 灌注可确诊急性脑卒中，并且，可以判断脑卒中半暗带范围。本研究有 2 个病例 CT 平扫、增强扫描均不能观察到脑梗赛，而 CT 灌注显示存在低灌注区域，经重建血管，发现对应责任血管堵塞，紧急溶栓后恢复良好。CT 灌注可预测急性脑卒中，可区分梗死区和半暗带，灌注延迟时间>3s，可较好的显示半暗带的范围，与临床手术证实范围较一致。rCBF<30%确定的梗死区体积与临床实际一致性较好。特别是灌注扫描的同时还可得到 CTA 图像，能够准确的诊断急性脑卒中，确定责任血管，为临床溶栓提供全面的指导信息。

PU-1924

3D ASL 在急性缺血性脑血管病方面的临床应用

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目的 分析三维动脉自旋标记（3D-ASL）成像技术在急性缺血性脑卒中方面的临床应用价值。**方法** 收集我院 2016 年 1 月-2019 年 6 月于脑病科收治的急性缺血性脑血管病患者，均使用 GE 750W 3.0T MRI 机行头颅 T2FLAIR、DWI、MRA 及 3D-ASL 序列检查。利用 CBF 伪彩图及量化的脑血流量（CBF）值评估缺血半暗带（IP）、再灌注状态、侧支循环建立、责任血管部位及出血转化（HT）。**结果** 在急性脑梗死（AIS）缺血半暗带（IP）评估方面，利用较长 PLD（2525ms），将脑血流量（CBF）伪彩图提示的低血流灌注区与弥散加权成像（DWI）高信号区域间的不匹配提示 IP 的存在，并可定量其面积；通过测量 CBF 值评估再灌注状态，利用动脉内高信号敏感显示延迟的动脉血流到达，结合 MRA 甄别前向慢血流与逆向侧支循环；依据 CBF 伪彩图显示低灌注区范围提示大小血管病及责任血管部位；梗死核心区再灌注信号提示 HT 的高发生率。针对短暂性脑缺血发作（TIA）患者，利用较短 PLD（1525ms）导致 CBF 伪彩图显示低灌注区的放大现象，提高其检出敏感性，并反映责任血管部位。**结论** 3D-ASL 成像技术安全无创，重复性强，可敏感显示急性脑梗死 HP、侧支循环建立、再灌注状态、责任血管，并预测 HT 的发生，通过较短 PLD 提高 TIA 的检出敏感性，提示责任血管部位，这对于临床早期诊断及治疗方案精准化、个性化选择具有重要临床意义。

PU-1925

颅颈交界硬脑膜动静脉瘘

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背景：颅颈连接处的硬脑膜动静脉瘘（DAVFs）很少见。临床表现从急性或慢性脊髓病到蛛网膜下腔出血到脑干功能障碍。我们在颅颈交界处遇到 4 例伴有进行性脑干功能障碍的 DAVF，并使用 T2 加权成像，磁敏度加权成像，扩散加权成像和对比度增强成像，研究了典型的磁共振成像（MRI）特征。文献综述揭示了 10 例颅颈交界处的 DAVF 病例报告，表现为脑干功能障碍。病例描述：4 例患者在颅颈关节进行脑干功能障碍时出现 DAVF。两名患者接受了中线枕下开颅术和 C1 椎板切除术，1 名患者在全身麻醉下接受了 Onyx 18 的经动脉血管内栓塞治疗。手术后所有神经功能缺损逐渐好转。在第四种情况下，患者接受保守治疗并且未进行任何外科手术。 MRI 显示 T2 加权成像，磁共振血管造影和磁共振静脉造影的高信号强度。在磁敏感加权成像和对比度增强图像上检测到病变周围的异常扩张血管和流动标记。 2 例显示无异常，并且改善神经功能缺损的程度超过弥散加权成像。**结论** 磁共振成像患者进行脑干功能障碍的 MRI 检查中应使用磁敏感加权成像，弥散加权成像或对比增强扫描来区分 DAVFs 在其他疾病的颅颈关节，如胶质瘤或感染。使用 MRI 进行及时诊断对于产生良好的患者功能结果具有重要意义。

PU-1926
高分辨磁共振在慢性颅内动脉闭塞诊断及术前评估的应用价值

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目的 分析慢性颅内动脉闭塞在高分辨磁共振（HR-MRI）的影像学表现和特征，探讨高分辨磁共振对该病的诊断和术前评估价值。
方法 前瞻性纳入临床怀疑为慢性颅内动脉闭塞的患者 45 例，行 HR-MRI 检查和 DSA 检查。入组标准：（1）经 MRA 或 CTA 诊断为颅内动脉闭塞，且首发症状大于＞2 周，包括大脑中动脉 M1 段、颈内动脉颅内段、椎-基底动脉；（2）存在颅内动脉粥样硬化危险因素。排除标准：非动脉硬化性闭塞，如烟雾病、动脉夹层、血管炎等。其中大脑中动脉 M1 段患者 22 例，颈内动脉颅内段患者 13 例，椎-基底动脉患者 10 例。以 DSA 为标准，使用 Kappa 检验来衡量 HR-MRI 与 DSA 在诊断结果上的一致性。
结果 45 例患者中，DSA 诊断为慢性颅内动脉闭塞 36 例，诊断为非慢性颅内动脉闭塞 9 例，HR-MRI 诊断为慢性颅内动脉闭塞 38 例，非慢性颅内动脉闭塞 7 例。以 DSA 诊断结果为标准，HR-MRI 诊断慢性颅内动脉闭塞的敏感性是 100%，特异性是 77.7%，阳性预测值是 94.7%，阴性预测值是 100%，HR-MRI 与 DSA 诊断结果的 Kappa 值=0.848，提示近乎完全一致性[1]。36 例 DSA 诊断为慢性颅内动脉闭塞的患者，在 HR-MRI 上能够清晰显示闭塞段位置、走形，闭塞段血管表现为管壁增厚，管腔闭塞，其内见条形、节段形慢性血栓，在 3D CUBE T1 上呈等或略高信号，部分血栓周围因机化纤维化呈不均匀等信号，15 例血栓呈延续性分布，3 例闭塞段近端合并新鲜血栓，呈明显高信号。在 3D CUBE T1+C 图像上，有 19 例闭塞段血管有较明显的强化，提示闭塞段血管强化可能为慢性颅内动脉闭塞的特点。
结论 高分辨磁共振在诊断慢性颅内动脉闭塞上与 DSA 具有高度的一致性，还能够显示闭塞血管的内部特征、位置及走形，为血管内介入治疗提供影像依据，减少术中导丝探查发生穿孔、夹层的风险，具有较高的临床应用价值。

PU-1927

源于全脑 CT 灌注数据的动态 CTA 对侧枝循环状态及梗死生长评估的应用价值

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摘要 目的 研究一站式全脑动态容积 CTA+CTP 成像对急性脑卒中（Acute Ischemic Stroke，AIS）患者的侧支循环及血流状态的应用价值，并预测血管内治疗后梗死生长的风险。方法 回顾性分析 30 例符合 SWIFT PRIME 试验的 AIS 患者于治疗前行一站式卒中检查（CTA+CTP），将所有容积图像导入 CT perfusion 4D 进行后处理，根据动态 CTA 影像评估侧支血流的范围、速度及总体情况，并得到患侧平均相对脑血容量（rCBV）、低灌注指数比（HIR），行血管内取栓治疗后 27 小时内再行一站式卒中检查，得到再灌注率与核心梗死体积，采用 Logistic 分析和秩线性回归模型评价动态 CTA 评价得到的侧支循环状态、rCBV、HIR 与成功再灌注的关系，以 P＜0.05 视为有统计学意义。结果 rCBV、HIR 分别与侧枝循环状态有良好的相关性（P=0.038，0.035），19 例（63.3%）患者成功再灌注，良好的侧枝循环状态、高 rCBV、低 HIR 与成功再灌注有良好的相关性（P=0.03，0.03，0.04）。结论 源于全脑 CT 灌注数据得到的动态 CTA 图像对侧支循环的评价可以预测 AIS 患者血管内取栓后的梗死生长情况，高 rCBV 及低 HIR 可以作为 AIS 患者血管内取栓前侧支循环的有效指标。

PU-1928
快速高分辨率磁共振血管壁成像技术在颅内动脉狭窄疾病中的临床应用

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目的 探讨快速高分辨率磁共振血管壁成像技术在颅内动脉狭窄疾病中的临床应用价值，以期早期诊断、明确病因及指导临床治疗。

方法 经过伦理委员会批准，选择 2018 年 12 月至 2019 年 7 月在我院入院收治的颅内动脉狭窄病例 24 例，其中脑动脉粥样硬化 18 例，烟雾病 3 例，动脉夹层 1 例，动脉炎 2 例。采用 PHILIPS Ingenia CX 3.0T 设备成像。扫描序列包括：T1WI,T2WI, DWI, TOF- MRA，采用 3D 黑血磁共振成像技术 3D-VISTA 及 3D- SNAP 技术，以大脑中动脉和基底动脉为目标动脉，对经过 TOF-MRA 证实的狭窄管腔进行血管壁斑块成像。对动脉狭窄的部位、范围、程度，对管壁的厚度、斑块的体积、成份、有无合并出血等进行分析，并以 DSA 为对照。

结果 共计 53 段血管管腔狭窄。其中脑粥样硬化 18 例患者中发现斑块 26 处，合并斑块出血 2 例，狭窄程度结果与 DSA 诊断结果一致，占 94%。高分辨率磁共振血管壁成像对大脑中动脉狭窄的程度有部分高估，粥样硬化狭窄处以偏心性斑块较多见，增强后可见强化。3 例烟雾病表现为狭窄节段同心圆样管壁增厚，可见伴随的侧枝循环形成。动脉夹层 1 例位于基底动脉，可显示斑块内的出血。动脉炎 2 例，均表现为责任血管处显著、弥漫的同心圆样增厚并异常强化。

结论 磁共振黑血技术 3D-VISTA 及 3D-SNAP 序列能有效对颅内血管壁进行高分辨力成像，能有效弥补常规 TOF-MRA 在显示颅内管壁不足，提高颅内动脉狭窄疾病的诊断效率。强化特征的差异有助于鉴别颅内常见的管腔狭窄烟雾病、血管炎、动脉夹层等病变的诊断及鉴别诊断。

PU-1929
SilenZ MRA 与 3D-TOF MRA 对脑动静脉畸形诊断价值的对比研究

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目的 以 DSA 为金标准，对比评价 SilenZ MRA 与传统 3D-TOF MRA 对于脑动静脉畸形的诊断价值。**方法** 选取 2015 年 12 月至 2016 年 6 月于我院收治的脑动静脉畸形（AVM）患者 12 例，男 7 例，女 5 例，年龄范围 21-58 岁。患者均采用 GE 1.5T 静音磁共振进行头颅 MR 检查，并于同次检查中分别行 SilenZ MRA（零 TE 时间，ZTE）及 3D-TOF MRA 检查，所有患者于 3 日内行 DSA 检查证实为脑动静脉畸形。以 DSA 为金标准，分别评价 SilenZ MRA 及 3D-TOF MRA 对于 AVM 病灶的检出能力、瘤巢的大小（按小型直径<3cm，中型直径 3-6cm，大型直径>6cm 进行分型）及内部显示情况、供血动脉及引流静脉的显示能力。**结果** SilenZ MRA 及 3D-TOF MRA 对于 12 例患者的 AVM 病灶均全部检出。12 例 AVM 的瘤巢大小分型上 SilenZ MRA 及 3D-TOF MRA 均与 DSA 结果完全一致(100%)，而 SilenZ MRA 对于瘤巢大小显示的精确程度及内部结构显示的清晰程度优于 3D-TOF MRA。对供血动脉的显示，3D-TOF MRA 与 DSA 的符合率为 78.5%，而 SilenZ MRA 与 DSA 的符合率为 92.8%。对于引流静脉的显示 SilenZ MRA 及 3D-TOF MRA 均与 DSA 结果均有较高的符合率(分别为 100%和 93.3%)，与 3D-TOF MRA 相比，SilenZ MRA 对于引流静脉显示范围更大，结构更清晰。**结论** SilenZ MRA 及 3D-TOF MRA 对于 AVM 病灶均有良好的检出能力。SilenZ MRA 对于瘤巢细微结构、供血动脉及引流静脉的显示能力优于 3D-TOF MRA。

PU-1930
CTA 与 MRA 在颅内动脉瘤诊断及破裂出血风险预测的探讨

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目的 探析颅脑不同部位动脉瘤进行 CT 血管造影(CTA)与磁共振血管造影(MRA+HRMRI)检查的诊断价值，以及预测不同部位 2.0～5.0mm 的动脉瘤破裂出血及预测出血的风险评估。**方法** 回顾性收集我院 2016 年 10 月-2018 年 6 月该院 2016 年 8 月通过数位减影（DSA），C T 血管造影(CTA)及磁共振血管造影（MRA+HRMRI）。结合患者的随访资料，对已确诊颅内动脉瘤的 45 例患者（男性 33 例，女性 12 例，年龄 39-65 岁），按照动脉瘤瘤颈与邻近载瘤动脉距离，将其分为 2.0～5.0 mm 组(32 例)和≤2.0 mm 组(13 例)，分别采取 3D-CTA 及 3D-MRA+HRMRI 的方式进行检查，观察所有对象经过不同检查方式的结果。诊断结果以介入或手术结果为“金标准”，比较 MRA、CTA 及数字减影血管造影(DSA)检查方法用于不同直径颅内动脉瘤的诊断率和准确率。**结果** 所有患者均为单发肿瘤，3D-CTA 检查诊断符合 43 例(97.7%)，3D-MRA 诊断符合 39 例(71.9%)，经手术证实，动脉瘤破裂出血 38 例，3D-CTA 检查法预测动脉瘤破裂出血 34 例(87.8%)，3D-MRA 检查法预测动脉瘤破裂出血 30 例(70.0%)，两种检查方式预测动脉瘤破裂出血的准确性比较，差异有统计学意义(x2=8.54，P＜0.05)。**结论** MRA 和 CTA 检查可用于颅内动脉瘤的诊断和评估其破裂出血的风险，CTA 检查的三维形态和准确性更高，但 MRA+HRMRI 检测显示有症状颅内未破裂未来破裂的可能性较高。

PU-1931

颈总动脉双点智能追踪法头颅 CTA 的临床应用价值

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目的 探讨利用颈总动脉双点智能追踪法进行头颅 CT 血管成像（头颅 CTA）的临床应用价值。**方法** 随机选取 60 名患者进行头颅 CTA，其中 30 名采用颈总动脉双点智能追踪法进行扫描（实验组），30 名采用手动触发法进行扫描（对照组）。颈总动脉、椎动脉、基底动脉、大脑前动脉、大脑中动脉、大脑后动脉、及眼动脉作为目标动脉血管进行测量其 CT 值，上矢状窦、直窦及乙状窦作为目标静脉血管进行测量其静脉 CT 值，对两组图像质量进行主观评分，并进行统计学分析。**结果** 实验组与对照组颈总动脉、椎动脉、基底动脉、大脑前动脉、大脑中动脉、大脑后动脉、眼动脉的 CT 值分别是（458.83±80.53）vs（485.07±123.50）HU、（437.65±68.33）vs（466.19±118.31）HU、（409.30±98.21）vs（433.55±108.90）HU、（368.96±82.81）vs（365.57±124.15）HU（458.56±81.5）vs（475.65±108.80）HU（344.54±84.77）vs（387.31±134.66）HU、（204.46±63.89）vs（208.61±76.61）HU，实验组的目标血管值小于对照组，无统计学意义。实验组与对照组上矢状窦、直窦、乙状窦的 CT 值分别为（119.68±57.60）vs（154.21±63.20）HU、（148.41±65.08）vs（179.06±67.10）HU、（93.40±46.18）vs（146.38±49.72）HU，实验组目标静脉血管的 CT 值明显小于对照组，均有统计学意义。实验组与对照组的辐射剂量分别为（373.8±8.98）mGy•cm 和（365.5±8.48）mGy•cm，差异没有统计学意义。**结论** 采用颈总动脉双点智能追踪法行头颅 CTA 检查可显著降低颅内静脉污染，更加准确的凸显出目标血管，提高图像质量。

PU-1932
高血压患者脑干梗死与椎基底动脉系统斑块、狭窄的相关性研究

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［摘要］目的 探究高血压合并急性脑干梗死患者椎-基底动脉系统血管斑块、狭窄的特征及分布。方法 收集被诊断为急性脑干梗死的高血压患者及同期无脑梗塞的门诊检查者各 48 例，所有受检者均行颅脑磁共振及头颈部 CTA 检查。比较两组之间血管斑块及狭窄的差异，分析血管病变特征及病变血管分布状况与脑干不同部位梗死的相关性。结果 梗死组不稳定斑块检出率高于对照组（P＜0.05）。中脑梗死患者斑块主要位于基底动脉，延髓梗死患者斑块主要位于椎动脉（P 均＜0.05）。梗死组重度狭窄-闭塞血管段数检出率较对照组高（P＜0.05）。中脑梗死血管以重度狭窄及闭塞为主，脑桥梗死以血管轻-中度狭窄为主（P 均＜0.05）。基底动脉狭窄与脑桥梗死、椎动脉狭窄与延髓梗死具有显著相关性（P＜0.05），大脑后动脉狭窄是中脑梗死的重要因素（P＜0.01）。结论 不稳定斑块的形成及血管狭窄程度加剧与高血压患者脑干梗死的发生有关，椎基底动脉系统不同血管病变可能是脑干不同部位梗塞的重要原因。

PU-1933
大螺距和双低剂量 CT 血管成像在心脑一站式联合扫描中的应用研究

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目的 探讨大螺距和双低剂量 CT 血管成像在心脑一站式联合扫描中的应用研究。**材料与方法** 连续选取我院行大螺距和双低剂量 CT 血管成像心脑一站式检查的患者 60 例（BMI<27kg/m^2），做为实验组；随机选取我院行常规冠状动脉检查的患者 60 例（BMI<27kg/m^2），做为对照 A 组；随机选取我院行常规头颈部动脉检查的患者 60 例（BMI<27kg/m^2），做为对照 B 组。实验组使用管电压 100kVp，对比剂优维显 370；对照 A 组和 B 组使用管电压 120kVp，对比剂碘海醇（350mg I/ml）。检查方法实验组采用 FLASH 模式；对照 A 组和 B 组采用前瞻性模式扫描。对各组图像质量进行评分，测量双侧颈总动脉及椎动脉、颈内外动脉、冠状动脉发出起始部、皮下脂肪和肌肉的 CT 值及 SD 值，平均 SD 值计算为图像噪声。记录和计算图像头颈部动脉、冠状动脉最佳对比噪声比（CNR）、噪声值（SD）、头颈部动脉、冠状动脉各主要分支 CT 值的均值。计算各组的辐射剂量（ＥＤ）和平均碘摄入量，对各组间上述指标进行统计学分析。**结果** 实验组与对照 A 组和对照 B 组的图像质量评分、图像噪声、冠状动脉各主要分支 CT 值，差异均无统计学意义（P>0.05）。实验组图像的 CNR 高于对照 A 组和对照 B 组，差异有显著统计学意义（P＜0.001）。实验组的辐射剂量、平均碘摄入量均明显低于对照 A 组和对照 B 组，差异有显著统计学意义（P＜0.001）。**结论** 大螺距和双低剂量 CT 血管成像心脑一站式检查在保证诊断图像质量的同时大幅度降低了辐射剂量，同时减少了对比剂碘量的摄入，对于早期筛查、及时干预、降低心脑血管疾病的发生及发展有重要意义。

PU-1934
脑小血管病的白质髓鞘完整性及结构网络连接变化的联合研究

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目的 既往研究发现脑小血管病存在广泛的白质髓鞘完整性破坏和结构网络连接改变。本研究目的为联合评估非痴呆脑小血管病（Non-demented cerebral small-vessel disease, CSVD-ND）的白质微结构完整性及其相关的结构网络拓扑性变化。
材料及方法 前瞻性收录 37 例 CSVD-ND 病例及 34 例老年对照，两组病例年龄、性别和教育程度匹配。对所有受试者进行扩散加权成像和认知功能评估。使用 JHU-DTI-图谱进行脑白质区域扩散张量分析。使用 JHU-DTI-图谱和基于多图谱的 DTI 图像分割技术进行结构网络分析。
结果 CSVD-ND 组存在包括主要的联合纤维、投射纤维和联络纤维在内的广泛白质区域 FA 值显著减低和 trace 值显著增高（$P < 0.01$, FEW 校正）。拓扑结构上，两组受试者均存在小世界属性。CSVD-ND 组的全脑及局部效率减低（$P < 0.001$）。虽然存在广泛的白质髓鞘破坏，CSVD-ND 组仅在右侧枕上回和右侧舌回出现节点效率减低（$P < 0.05$, FEW 校正）。校正腔隙性梗塞灶和脑白质高信号的影响后，右侧楔前叶的节点效率和信息处理速度显著负相关（$r = -0.499$, $P = 0.0375$）。
结论 非痴呆脑小血管病存在广泛的白质髓鞘改变，但是结构网络连接受损不明显，提示白质髓鞘破坏不一定导致严重的结构网络连接改变。扩散加权成像和网络分析可能为研究脑小血管相关的认知功能改变提供依据。

PU-1935
颅内静脉血管壁高分辨率扫描 1 例

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目的 探究联影 United Imaging MR780 3D MATRIX（SPACE） T1WI 序列在颅内静脉血管壁高分辨率成像中的可行性。
方法 收集患者 1 例，MRV 示左侧横窦、乙状窦、颈内静脉较对侧纤细，采用联影 United Imaging MR780 3D Sag MATRIX T1WI 序列，体素大小 0.65*0.65*0.65 等体素行磁共振扫描，与常规 3D Sag MATRIX T1WI 序列相比，结合 BlackFluid 扫描因子，采用追踪法重建其大脑静脉系统。
结果 高分辨率成像发现左侧横窦、乙状窦、颈内静脉较对侧纤细，其内未发现明显信号异常，管壁形态无异常。
结论 联影 United Imaging MR780 3D MATRIX（SPACE） T1WI 序列在颅内静脉血管壁高分辨率成像存在可行性。

PU-1936

椎管内海绵状血管瘤的 MRI 征象分析

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目的 分析椎管内海绵状血管瘤的 MRI 征象，以提高诊断水平。
材料与方法 回顾性分析 2014 年 1 月～2018 年 7 月经我院手术证实的 7 例椎管内海绵状血管瘤患者的临床及 MRI 资料。男 5 例，女 2 例，年龄 18～61 岁，平均 36.1 岁。2 例表现为间歇性腰腿痛，2 例表现为双下肢无力，1 例四肢麻木伴步态不稳，1 例左上肢疼痛伴麻木，1 例表现为左下肢疼痛。MRI 扫描采用 GE 公司 MR750w 3T 核磁共振机，采用 SE 序列做矢状面 T1WI、T2WI 及横断面 T2WI 扫描。所有患者均行增强扫描，对比剂为 Gd-DTPA，选择常规 SE 序列 T_1WI 行轴位、矢状位及冠状位扫描。
结果 本组 7 例中，3 例位于胸段,1 例位于胸腰段，2 例位于腰骶段,1 例位于颈段。 髓外硬膜下 3 例，其中 1 例跨硬膜内外生长呈哑铃状；髓内 2 例，1 例位于胸髓，1 例颈髓；硬膜外 2 例，沿脊椎纵轴生长，呈梭形或长椭圆形，脊髓明显受压，1 例脊髓部分被包绕。MRI 表现为 5 例呈 T_1WI 等信号,1 例呈 T_1WI 高信号,1 例呈 T_1WI 低信号,7 例均呈 T_2WI 高信号,其中 3 例信号不均匀；增强扫描 3 例呈明显均匀强化,2 例呈不均匀强化，2 例无明显强化。因海绵状血管瘤易反复出血，在出血不同时期出血成分沉积及胶质增生、血栓形成等可导致 MRI 信号表现多样。
结论 椎管内海绵状血管瘤的 MRI 征象具有一定特点，正确分析其 MRI 征象有助于椎管内海绵状血管瘤的诊断与术前定位。

PU-1937

脑动脉瘤的 CTA 和 MRA 及 DSA 对照分析研究

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目的 比较 CTA、MRA、DSA 三种方法诊断动脉瘤的优缺点，探讨非侵入性 CTA 和 MRA 取代 DSA 的可行性。
方法 对收治的 25 例怀疑动脉瘤患者同时作 CTA、DSA 检查，比较其影像学结果，对收治的 22 例怀疑动脉瘤患者同时作 MRA、DSA 检查，比较其影像学结果。
结果 CTA 基本上可以发现大多数的动脉瘤。为后续的手术或者栓塞提供足够的影像学信息；MRA 对较小动脉瘤(直径≤10ram)的诊断仍然存在一定难度，容易漏诊。

结论 CTA 可作为蛛网膜下腔出血以及可疑动脉瘤患者的初选检查方法，必要时再行 DSA 进行确诊。随着更多三雏重建技术的推广，其敏感性和特异性会更加提高，在不久的将来 CTA 可能会成为动脉瘤术前检查的首选。

PU-1938
3D-PCASL 联合 DWI、SWI 多模态快速 MRI 成像在急性缺血性脑卒中溶栓治疗中的应用

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目的
探讨 3D-PCASL 联合 DWI、SWI 多模态快速 MRI 成像在急性缺血性脑卒中溶栓治疗中的应用价值。

方法
收集 2018 年 9 月至 2019 年 4 月我院高度怀疑为急性缺血性脑卒中患者 42 例，进行 DWI、SWI 及 3D PCASL 检查。观察是否有出血灶，DWI 病变与 3D PCASL 病变范围是否一致，测量缺血半暗带面积。按照影像学表现是否存在缺血半暗带、3D-PCASL 像高或低灌注、SWI 像是否出血，分别统计脑梗死患者例数，制定不同的治疗方案进行溶栓治疗。观察其影像学表现与溶栓治疗效果、溶栓出血和复发的关系。

结果
本组 42 例患者中，24 例患者均存在一定面积缺血性半暗带组织，3D-PCASL 为低灌注或正常患者，患者溶栓治疗后效果良好；8 例患者存在一定面积缺血性半暗带组织，但 3D-PCASL 为高灌注，溶栓治疗后出现不同程度的脑出血；7 例患者不存在缺血性半暗带组织，溶栓治疗效果较差；3 例患者不存在缺血性半暗带组织，且 3D-PCASL 为高灌注，SWI 可见出血灶，进行溶栓治疗后效果极差，最终死亡。

结论
3D-PCASL 联合 DWI、SWI 快速检查能准确判断脑梗死的位置和范围，明确是否有微出血灶，并能计算出梗死周围的缺血半暗带，为临床溶栓治疗及疗效评估提供精准的影像指导信息，降低治疗后出血和复发的风险。

PU-1939
DTI 技术在缺血性脑卒中后功能预后中的应用进展研究

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摘要：**目的** 应用弥散张量技术（DTI）技术评估缺血性卒中患者功能障碍的预后。
方法 选择急性起病的缺血性脑卒中患者 15 例,其中男性 8 例,女性 7 例;年龄 47~80 岁,平均年龄 62.6 岁。平均受教育年限 9.7 年。MRI 诊断为缺血性脑卒中，于发病后 2 周、经康复治疗 3 月时分别行 DTI,测量两侧梗死灶远端的各向异性分数(FA)、再辅以 Fugl-Meyer 评分量表、BDAE、MoCA、NIHSS 等临床评分量表为缺血性脑卒中运动、言语、认知等功能障碍的预后评估功能评分进行相关分析。

结果 发病后 2 周时患侧大脑脚 FA 值较健侧降低且经康复治疗 3 月时患侧 FA 值升高，两侧 FA 值相差越小，神经传导功能越弱，缺血性脑卒中后各种功能障碍越轻，三个月后功能预后越好。
结论 DTI 技术所显示的梗死灶与相应功能区的位置关系及梗死灶的损伤程度对缺血性卒中后可能出现的功能障碍类型、障碍程度以及相应功能障碍的预后提供可视化依据为临床医师、康复医师制定合理的临床或康复治疗方案提供重要的参考依据

PU-1940
SWI 在急性脑梗死患者出血转化风险预测中的价值

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目的 探讨 SWI 对急性脑梗死患者出血转化风险的预测作用，从而为临床制定治疗策略提供重要参考依据。
方法 选取 2016.11 至 2019.6 于成都市第五人民医院放射科行 MRI 常规扫描及 SWI 扫描的 113 例急性脑梗塞患者作为研究对象，所有研究对象病程<3 天，最短时间 30min，且均未行溶栓治疗；所有研究对象在 2 周内完成常规 MRI 及 SWI 复查；依据第一次 SWI 检查结果确认的脑微出血（ cerebral microbleeds，CMBs)数量，将研究对象分为 A 组（CMBs 数量为 0-5 个）51 例，B 组（CMBs 数量为 6-10 个）32 例，C 组（CMBs 数量为>10 个）30 例；根据 SWI 复查结果，参照 ECASS Ⅱ标准进行出血性转化(hemorrhagic transformation，HT)分型，并与首次 SWI 结果作对比分析，出现新的低信号灶及定义为 HT；各组间 HT 发生率比较采用 X^2 检验，以 $P<0.05$ 显示统计学差异。
结果 A 组研究对象中有 6 例发生 HT，发生率为（6/51，11.7%），B 组研究对象中有 11 例发生 HT，发生率为（11/31，34.3%），C 组研究对象中有 22 例发生 HT，发生率为（22/30，73.3%），HT 发生率 A 组<B 组<C 组，且各组间的 HT 发生率存在统计学差异（$P<0.05$）。
结论 SWI 能够预测急性脑梗死患者发生出血转化的风险率，能为临床治疗急性脑梗死患者提供重要的参考价值。

PU-1941
基于多学科协作（MDT）关于运用多模态磁共振对脑卒中治疗前后一站式评估的临床应用研究

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目的 探讨多模态 MR 检查对脑卒中患者治疗前后进行一站式评估的应用价值。**方法** 急性脑卒中患者时间窗内或未明确时间窗均可行多模态 MRI 检查进行评估，主要包括常规平扫、弥散加权成像（DWI）、血管成像（MRA）、灌注（PWI 即 ASL+DSC）+磁敏感加权成像（SWI）。**1.** ASL 灌注评估缺血半暗带、侧枝循环或脑储备能力、再灌注损伤，PLD1.5s 和 2.5s 结合能更好的反映侧枝循环建立或残存血流储备。2.PWI 灌注:评估缺血半暗带及二三级侧枝循环。3. MRA 评估一级侧枝循环。4. SWI 评估微出血、血管畸形、静脉窦血栓及先天变异。本次研究需进行合理扫描方案的探索，研究均以 DSA 作为金标准。**结果** 本次研究进行合理扫描方案的探索，以达到影像指导规范，实用靠谱，完善影像急诊服务，起到诊治枢纽的重要作用。**结论** 多模态 MRI 一站式被认为是脑卒中诊断和评估预后的有效方法，利用 MRI 多参数多序列特别是功能磁共振的临床应用，建立有效的评估体系，能够在早期缺血性改变、出血性转化、血管闭塞、侧支循环、缺血半暗带以及治疗

后效果评估等方面提供重要信息,从而快速准确的为患者提供一站式服务,指导患者筛选并制定治疗策略。

PU-1942
基于颅内大动脉 HR-MR 成像的新卒中风险评分模型对脑卒中再发风险预测的价值研究

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目的 基于颅内大动脉高分辨率(high resolution-MR, HR-MR)成像及 Essen 卒中风险评分模型(essen stroke risk score, ESRS)构建新卒中风险评分模型(new stroke risk score, NSRS)，研究其对脑卒中再发风险预测的价值。**方法** 回顾分析本院 50 例症状性脑卒中患者临床及影像资料，首发组 27 例，复发组 23 例，所有患者均行头颅 MRI 平扫及高分辨 MR 扫描。采用 t 检验对两组病人的临床资料及影像特征进行比较，运用 *Logstic* 多因素回归分析，筛出脑卒中独立危险因素，结合 ESRS 建立新卒中风险评分模型(NSRS)。分别对两组患者进行 ESRS 及 NSRS 评分，获得二者的 ROC 曲线，评估 ESRS 与 NSRS 对脑卒中再发风险预测的价值。**结果** 首发组与复发组吸烟、高血压、高血脂、斑块内出血(intra-plaque hemorrhage,IPH)、富含脂质坏死核心(lipid rich necrotic core ,LRNC)、管腔面积(lumen area, LA) 、管壁面积(wall area, WA)、管壁指数(normalized wall index, NWI)、IPH 指数、LRNC 指数和 IPC 指数及 Geometry_Rf、S(3,3) Contrast、WavEnHL_S_1 组间差异有统计学意义($P<0.05$)。吸烟、高血压、高血脂、IPH 是卒中患者再发脑卒中的独立危险因素。ROC 曲线显示，ESRS 及 NSRS 评分的 AUC 值分别为 0.897 和 0.961，ESRS 及 NSRS 预测脑卒中再发风险的敏感度及特异性分别为 0.783，0.852 及 0.913，0.889，即结合患者临床资料与影像学资料对卒中再发风险的预测更加精确。**结论** ESRS 和 NSRS 对脑卒中再发均有较好的预测价值，但 NSRS 模型对脑卒中风险分层更加详细，评分更加准确，其预测价值更大。

PU-1943
基于 Slicer 软件重建 CTA 对于颅内破裂动脉瘤临床诊疗的可靠性研究

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【摘要】**目的** 对比分析传统影像工作站与 Slicer 软件两种 3D-CTA 重建方法于颅内破裂动脉瘤的诊断效能以及测量结果差异,评价基于 Slicer 三维后处理对于颅内破裂动脉诊断的可靠性以及准确性。**方法** 回顾性分析 2016-2018 年在宁夏医科大总医院收治的 57 例因蛛网膜下腔出血高度怀疑颅内动脉瘤破裂患者入院后的先后所行 CTA 和 DSA 资料。将原始 CTA 数据分别经传统工作站和 Slicer 软件后处理得到 3D-CTA 图像，DSA 资料经造影工作站后处理得到 3D-DSA。以 3D-DSA 的诊断结果为金标准，由主治以上职称放射科医师和神经外科医师各一名盲发独立判阅两种方法的诊断结果。**结果** 57 例患者中,3D-DSA 检出 51 例 60 个动脉瘤, 传统影像工作及 3D-Slicer 均检出 46 例 55 个动脉瘤,其中漏诊 7 例 7 个，误诊 1 例 1 个，二者对于颅内破裂动脉瘤的诊断具有相同的诊断效能，灵敏度为 90.1%，特异度 83.3%，阳性预测值 98.2%，阴性预测值 45.5%，准确度 91%；在动

脉瘤大小方面，3D-Slicer 与传统影像工作站两种后处理 CTA 方法对于动脉瘤最大长径和瘤口半径的判断无统计学差异；Bland-Altman 图形分析证实两种方法分别所测瘤体最大长径瘤口半径及对应的 54 个点中 52 个(96.3%)于 95%一致性界限内。**结论** 基于 slicer 软件重建 3D-CTA 对于颅内破裂动脉瘤诊断效能及瘤体大小判断准确度均较高，可以作为一种有效的颅内动脉瘤重建方法使得影像资料更好的服务于临床。

PU-1944
双能 CT 对脑卒中机械取栓术后出血与造影剂外渗的鉴别

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目的 探讨双能 CT 对急性缺血性脑卒中(acute ischemic stroke, AIS)患者机械取栓术后脑出血（intracerebral hemorrhage ICH）与造影剂外渗的鉴别价值。
方法 收集 2018 年 7 月--2019 年 7 月 38 例急性缺血性脑卒中患者在我院行机械取栓术治疗，并在术后 1h 内行双能 CT 检查，术后 48h 再行双能 CT 检查进行随访的患者作为研究对象，分别获得虚拟平扫图像(virtual unenhanced non-contrast VNC)、碘覆盖图像（iodine overlay maps IOM）及单纯融合图像（mixed energy images MIX），并进行评估。将术后 48h 再使用双能 CT 检查的结果作为参考标准与之前的评估结果进行比较。

结果 38 例资料完整的患者中有 9 例患者的 MIX 图像未见明显的高密度影，余 29 例显示有高密度影的患者中首次双能 CT 图像诊断为出血者 16 例，在随访中均被证实为出血。诊断为造影剂外渗者 11 例，其中 2 例在随访中发生继发性出血转化，其余均为造影剂的外渗。诊断为出血合并造影剂外渗者 2 例，随访中均被证实。敏感度为 93%；特异性为 100%；阳性预测值为 100%；阴性预测值为 92%（P＜0.05）。

结论 双能 CT 可以准确的鉴别 AIS 患者机械取栓术后脑出血与造影剂外渗。

PU-1945
基于 CTA 评价椎动脉发育不良与临床 NIHSS 评分的相关性研究

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摘要：目的 基于 CTA 评价椎动脉发育不良在前后循环梗死的发生率间的差异，NIHSS 评分是急性脑卒中后神经功能障碍的重要定量工具，探讨 VAH 是否是后循环梗死临床 NIHSS 评分的影响因素。方法 回顾性收集神经内科住院的脑梗死病人 274 例，按梗死部位分为前循环组和后循环组，计算 ACI 组和 PCI 组的 VAH 发生率，应用卡方检验进行对比分析。在 ACI 组和 PCI 组分别比较 VAH 阳性与阴性组 NIHSS 评分是否有差异，采用两样本均数比较的 t 检验。结果 PCI 组 VAH 发生率高于 ACI 组（P＜0.05），在后循环梗死的病例中，VAH 阳性和阴性的病例 NIHSS 评分有显著性差异（P＜0.05）。结论 VAH 是常见的椎动脉发育变异，在后循环梗死中发生率更高，并且 VAH 阳性的后循环梗死病人神经功能缺损症状更严重。

PU-1946

大脑中动脉区脑梗死后丘脑神经联系不能相关的灌注和微结构改变的研究

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目的 大脑中动脉区脑梗死后会导致同侧丘脑神经机能联系不能（ITD），即梗死同侧丘脑出现功能、灌注和代谢减低，此现象可能与脑梗死后运动功能的恢复相关。本研究应用基于 MRI 的 ASL 和 DKI 成像技术评估大脑中动脉区脑梗死后丘脑的灌注和微结构随时间的改变规律，并探索两者之间的关系及其对神经功能恢复的影响。
方法 回顾性纳入 107 例单侧新发大脑中动脉区脑梗死患者，行常规头颅 MRI、ASL 和 DKI 检查，并至少行一项头颅血管成像检查，如 DSA、CTA、MRA，排除有后循环血管病变的患者。按发病时间将患者分为三组，急性期（＞6h~3d）28 例、亚急性期(＞3d~10d）49 例及慢性期（＞10d~30d）30 例。根据 ASL 图像，将同侧丘脑不对称性低灌注程度分为 3 级；同时定量分析计算两侧丘脑 CBF、MK、MD、FA 不对称指数 AI，如 AI_{CBF}=（健侧丘脑 CBF-同侧丘脑 CBF）/健侧丘脑 CBF）；记录入院 NHISS 评分，出、入院 mRS 评分及其他相关临床指标。
结果 在大脑中动脉区脑梗死患者中，急性期及亚急性期梗死同侧丘脑 MK 值较对侧显著升高（$p<0.05$）；梗死同侧丘脑 CBF 不对称指数与 MK 不对称指数呈正相关；慢性期梗死同侧丘脑 MK、MD 与 FA 值与对侧值无明显差异。急性期、亚急性期梗死同侧丘脑的 MK、CBF 不对称指数与出院时 mRS 评分显著相关 $p<0.05$。
结论 DKI 和 ASL 成像可用于评估大脑中动脉区脑梗死后丘脑灌注和弥散改变的情况，DKI 优于 DTI 技术能检测到丘脑急性和亚急性期微结构损伤性改变；急性期及亚急性期梗死同侧丘脑低灌注与微结构改变呈正相关且与早期神经功能的恢复相关。

PU-1947

多模态磁共振在亚急性脑梗死半暗带评估的应用价值

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目的探讨多模态磁共振（DWI/DSC）在亚急性脑梗死半暗带评估的应用价值。

方法本研究为回顾性临床和影像资料分析。搜集我院 2019 年 1 月 1 日至 2019 年 6 月 30 日 95 例发病时间 3～7 天的亚急性脑梗死患者，依 DWI 序列、DSC 灌注序列显示灌注-弥散不匹配（PDM）区域判定存在缺血半暗带（IP），并将患者分为 IP（-）组和 IP（+）组；2 名高年资神内医师评估的一致性好，统计患者从发病到 MR 检查期间病情好转、稳定、加重例数，分析两组患者病情变化差异。

结果 95 例患者，IP（+）29 例（30.52%），IP（-）66 例（69.48%）。IP（+）患者组中病情加重 17 例，稳定 9 例，好转 3 例。IP（-）患者中病变加重 9 例、稳定 37 例、好转 20 例。IP（+）vsIP（-）组患者的病情加重率为 58.62%vs13.63%，两组差异有统计学意义（P=0.001）。

结论亚急性期脑梗死也可能有 IP，IP 的存在对临床完善治疗有指导意义。

PU-1948

HRMR-VWI 对椎-基底动脉粥样硬化血管壁改变与急性脑梗死的关系研究

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目的 探讨高分辨率磁共振血管壁成像(high resolution magnetic resonance vessel wall imaging，HRMR-VWI)对椎-基底动脉系粥样硬化的血管重构模式、粥样硬化斑块负荷、分布特点与急性脑梗死的关系。**方法** 入组后循环急性脑梗死患者 32 例，行磁共振常规序列检查(含扩散加权成像序列)和 HRMR-VWI 检查，证实存在后循环供血区脑梗死并测量责任血管管壁，计算责任血管的重构指数(remodeling index，RI=最狭窄处血管面积/参考处血管面积)。比较正性和负性重构血管的斑块面积、负荷，观察责任斑块位置、分布及强化特点。 **结果** HRMR-VWI 发现后椎-基底动脉粥样硬化斑块患者 30 例，其中基底动脉粥样硬化斑块 18 例，椎动脉(颅内段)粥样硬化斑块 12 例，2 例脑桥旁梗死者未见明显斑块。责任血管正性重构 21 例，负性重构 7 例，无重构 2 例。正性重构组的斑块面积[(6.32±3.19)mm2]及斑块负荷[(0.51±0.13)%]均大于负性重构组的斑块面积[(2.14±1.43)mm2]及负荷[(0.28±0.19)%]。椎-基底动脉粥样硬化斑块多发生于穿支动脉分支开口周围，以背外侧多见。椎-基底动脉系粥样硬化责任斑块多呈轻度或明显强化。**结论** HRMR-VWI 能够作为后循环急性脑梗死病因诊断的重要检查方法。

PU-1949
高分辨磁共振血管壁成像对高血压患者豆纹动脉血管特征分析的应用研究

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目的 探讨高分辨磁共振血管壁成像技术对高血压患者豆纹动脉数量及深度的研究价值；**方法** 收集 70 名不同等级的高血压患者及 27 名健康志愿者，其中高血压患者分为Ⅰ、Ⅱ、Ⅲ级高血压组，27 健康志愿者为对照组，对所有受试者行高分辨磁共振血管壁成像（High Resolution Magnetic Resonance Imaging）3D-T1WI-VISTA 序列成像，受试者豆纹动脉高分辨血管成像数据传至后处理工作站，应用 Philips Intellispace portal 软件对的血管数量及深度进行统计，采用 SPSS 22.0 软件对四组受试者豆纹动脉的深度及数目进行统计学分析。**结果** 各个等级高血压组与对照组组间一般资料包括性别构成、年龄均无统计学差异，高血压Ⅱ、Ⅲ级组 51 例患者双侧豆纹动脉的深度和数目均低于对照组，差异有统计学意义（P<0.001）。Ⅰ级高血压组 25 例患者双侧豆纹动脉深度和数目与对照组比较，未见统计学差异（P〉 0.05）。**结论** Ⅱ、Ⅲ级高血压患者与正常人的豆纹动脉的数量及深度存在一定差异，高分辨磁共振血管壁成像对豆纹动脉血管特征分析具有临床价值。

PU-1950
T-ASL 灌注成像评估烟雾病颈外动脉侧枝循环的应用价值

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目的 探讨 T-ASL（Territory arterial spin labeling）灌注成像在评估烟雾病颈外动脉侧枝循环的可行性。

方法 前瞻性纳入经 DSA 诊断并按照 Mugikura 分期[1]为 3、4 期的烟雾病患者共 16 例，所有患者均行 T-ASL 灌注成像检查。同一层面选择患者双侧颈外动脉进行分别标记，共计标记颈外动脉血管 32 支，图像经过处理后，每支颈外动脉均可得到连续独立 CBF 参数图，任意一幅 CBF 图像上存在颅内脑实质灌注阳性区，即为有侧枝循环，反之则为无侧枝循环。由 2 名经验丰富的影像科医生按照独立双盲法进行图像分析，意见不一致时协商取得一致意见。以 DSA 为诊断标准，使用 Kappa 检验来衡量 T-ASL 灌注成像结果与 DSA 在结果上的一致性。

结果 以 DSA 诊断结果为标准，32 支颈外动脉中 14 支存在颈外动脉侧枝循环，18 支未见侧枝循环。T-ASL 灌注成像显示，12 支可见颈外动脉侧枝循环，20 支未见颈外动脉侧枝循环。以 DSA 诊断结果为标准，T-ASL 灌注成像诊断颈外动脉存在侧枝循环的敏感性是 85.7%，特异性是 100%，阳性预测值是 100%，阴性预测值是 90%，T-ASL 灌注成像与 DSA 诊断结果的一致性对比上，Kappa 值=0.871，提示两种技术近乎完全一致[2]。

结论:T-ASL 作为一种新型 MR 灌注技术，可以选择特定动脉进行单独标记，有利于判定责任血管和侧枝来源，在评估烟雾病是否存在颈外动脉侧枝循环与 DSA 诊断结果具有良好的相关性，对评估烟雾病侧枝循环、分期、预后和临床治疗方案上提供客观依据，具有较高的临床应用价值。

PU-1951

脑卒中与癫痫发生的相关性探究及危险因素分析

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目的 1、评估缺血性脑卒中与出血性脑卒中患者继发癫痫的特点及危险因素。2、探究脑卒中后癫痫发作患者头颅 MRI 结构性病灶与脑电图功能异常部位的一致性。

方法 1、选择缺血性脑卒中患者 190 例，符合早发性癫痫患者 31 例、迟发性癫痫患者 37 例、无癫痫发生患者 122 例。将早发性和迟发性癫痫患者的发作类别分别与无癫痫发作组患者进行比较，探讨缺血性卒中后早发性和迟发性癫痫发作的临床特征及相关危险因素。2、选择出血性脑卒中住院患者 205 例，符合早发性癫痫患者 20 例、迟发性癫痫患者 24 例、无痫性发作组 161 例，同上进行分组比较；3、脑卒中后癫痫发生患者 112 例，比较其临床发作类型与脑电图表现以及头颅 MRI 图像的相关性，分为一致组与不一致组，探讨两组患者间脑卒中类型、部位及病变数量的差异。

结果 脑卒中后癫痫多以早发性癫痫(67.17%)、单纯部分性发作(70.34%)及复杂部分性发作(50.56%)较为常见；且卒中病灶部位（皮质病变多见）、累及范围及脑卒中类型(出血性)为诱发癫痫的主要危险因素(P<0.05)。卒中后迟发性癫痫发作患者中慢波与痫性放电的比例较高；脑电图定位与 MRI 病灶部位一致的符合率为 51.21%，其中皮层病变患者脑电图表现与头颅 MRI 的病灶一致性率较高(P<0.05)，且皮层病变患者与多部位卒中患者的脑电图表现为异常脑电图的几率较大(P<0.05)。

结论 脑卒中后癫痫多以早发性、单纯部分性发作及复杂部分性发作为主要分类，且出血性卒中、卒中累及皮质以及多部位病灶为脑卒中后癫痫发生的高危因素。其中脑卒中病变位于皮质区的患者，发生异常脑电图的几率更大，且异常脑电图定位与头颅 MRI 异常信号区域的一致性更高。

PU-1952

双能 CT 定量参数对急性缺血性脑卒中血管内治疗后出血并发症的预测价值研究

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目的：探讨双能 CT（DECT）定量参数对急性缺血性脑卒中（AIS）患者血管内治疗后继发性脑出血并发症的预测价值。
方法：收集我院 2017 年 11 月至 2019 年 7 月收治的 AIS 血管内治疗后立即行头颅 DECT 扫描（80 kVp,Sn150 kVp）的 85 例患者，回顾性分析所有患者 DECT 图像（混合图+VNC 图+IOM 图）。由两名放射科医师独立评估所有患者是否存在碘外渗和早期出血（术后 VNC 图中仍存在高密度区），另外一名放射科医师测定碘图（IOM）中最大碘浓度（mg/ml）和最大 CT 值（HU）（ROI=0.3 cm^2）及混合图中高密度区的体积（ml），以术后随访 CT（24-72 h）为标准观察是否发生脑出血并发症，将患者分为未出血组与继发性出血组。采用 Mann-Whitney U 检验分析 DECT 定量参数与脑出血并发症的相关性，ROC 曲线分析用于得出两组间的临界值。
结果：85 例患者中，16 例(18.82%)于术后颅内未出现高密度区，34 例(40%)于术后随访证实仅有造影剂外渗，35 例(41.18%)于术后随访中出现脑出血并发症,其中 19 例(54.29%)患者在术后 DECT 中即存在早期出血。最大碘浓度、最大 CT 值及高密度区的体积显示曲线下面积分别为 0.783，0.776，0.915 的区域（P<0.001），用于识别术后发生继发性脑出血并发症的患者。IOM 图中最大碘浓度大于 1.95 mg / mL（敏感度为 78.9%，特异性为 70.6%），最大 CT 值大于 123HU（敏感度为 78.9%，特异性为 70.6%）及混合图中高密度区的体积大于 6.24 ml（敏感度为 94.7%，特异性为 82.4%）分别作为术后继发性脑出血并发症的临界值。
结论：双能 CT 定量参数术后高密度区体积在预测 AIS 患者血管内治疗后出血并发症中具有较高的敏感性和特异性。

PU-1953
无先兆偏头痛脑灰质结构改变及认知功能下降的相关性研究

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摘要 目的 探讨无先兆偏头痛（MWoA）患者认知功能、灰质体积的改变及与临床表征的相关性。方法 纳入 30 例无先兆偏头痛及与之年龄、性别及教育年限匹配的 30 例健康对照组（HC），问询并记录无先兆偏头痛患者病程、发作频率、头痛程度（VAS 视觉模拟评分）及头痛的影响程度（HIT 头痛影响测评）的临床评分；测查两组总体认知功能（MoCA）、语言流畅性(VFT-动物命名)评分，两组间进行比较；分析认知功能（MoCA、VFT 评分）与临床表征间的相关性；扫描 3D T1 高分辨磁共振结构像，使用 VBM 的方法计算脑区灰质体积，作两样本 t 检验；分析感兴趣脑区灰质体积与认知功能（MoCA、VFT 评分）的相关性。结果 与 HC 组比较，MWoA 患者 MoCA、VFT 评分较低（均 $p < 0.001$），且 MoCA 评分与发作频率成显著负相关（$r = -0.465$，$p = 0.011$）；MWoA 患者右侧枕中回灰质（RMOG）体积较大（$p < 0.001$），且与 VFT 评分呈显著负相关（$r = -0.448$，$p = 0.013$）。结论 无先兆偏头痛患者认知障碍风险增加，且较低语言流畅功能与视觉皮层通路的损伤重塑有关。

PU-1954
肿块型原发性中枢神经系统血管炎一例

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目的　原发性中枢神经系统血管炎（Primary Angiitis of The Central Nervous System, PACNS）是一种少见的累及中枢神经系统的免疫炎性疾病，表现为肿块型 PACNS 文献报道更加罕见。现将最近南方医科大学珠江医院收治的一例肿块型 PACNS 患者进行个案报导。
方法　收集患者临床及影像学表现，并与既往文献对比。
结果　患者，女，51 岁，因“无明显诱因突发右下肢稍乏力”入院。实验室检查 C 反应蛋白及血沉（ESR）升高。轻瘫实验示：右侧阳性，右下肢肌力 V-级，余体格检查无明显异常。头颅 MRI 检查：左侧顶叶见类圆形稍长 T1、稍短 T2 信号结节，其内另见点条状长 T1、长 T2 信号，病灶大小约 21 mm × 20 mm × 17 mm，边界清楚，伴周围脑组织大片水肿。Flair 像结节呈不均匀低信号，DWI 像见点条状高信号，增强扫描结节不均匀强化，矢状位可见一穿支血管影。MRS 示：Cho 峰及 NAA 峰无明显变化，Lip 峰及 Lac 峰明显升高。

患者行“立体定向下左顶叶占位性病变切除术”。术中所见：肿瘤与周围脑组织边界不清，血运丰富，质地韧。组织病理检查：脑组织间质血管壁和周围淋巴细胞浸润，部分血管纤维素性坏死，周围脑组织水肿，神经细胞蜕变坏死，未见恶变组织。免疫组织化学：血管 CD31 和 CD34(+)，血管周围淋巴细胞以 CD3 阳性 T 细胞为主，少数为 CD20 和 PAX5 的 B 淋巴细胞，组织细胞 CD68(+)，Ki-67 约 15%（+），MBP 和 NF 示血管周围脑组织脱髓鞘改变；PAS 示血管阳性。病理诊断：符合原发性中枢神经系统血管炎。
结论　肿块型 PACNS 非常罕见，当颅内单发占位性病变表现为不均匀强化，边缘见明显强化穿支血管，且 MRS 示：Cho 峰及 NAA 峰无明显变化，非坏死区域可见高耸 Lip 峰及 Lac 峰，需注意 PACNS 的可能性，亦需与脱髓鞘等非肿瘤性病变鉴别。

PU-1955
3D ASL 与 SWI 对 AIS 缺血半暗带评估的对比分析

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摘要
目的 探讨磁敏感加权成像（SWI）与三维动脉自旋标记技术（3D ASL）对急性缺血性脑卒中（AIS）的缺血半暗带（IP）的评估差异 **方法** 通过 SWI 显示 AIS 患者的突出皮质静脉（PCV）和 3D ASL 技术显示 AIS 患者的脑血流量（CBF）减低区来评估缺血半暗带（IP），采用修改后的艾伯塔卒中计划早期 CT 评分（ASPECTS）对两种方法显示的 IP 进行计分，对两种方法显示的 IP 评分结果进行比较，并对不同程度 IP 的临床资料进行对比分析。**结果** 不同程度 IP 组间的临床资料对比，差异均无统计学差异（P＞0.05）。PCV 对 IP 的评分低于 CBF 减低区的评分,差异有统计学意义（t=2.46,P＜0.05）。**结论** SWI 的 PCV 征能间接提示 AIS 脑 IP 的存在，而 3D ASL 显示的 CBF 减低区能更直接、全面显示脑组织的缺血情况，3D ASL 在显示 IP 方面较 SWI 更具有优势。

PU-1956
基于不同 PLD 的 3D pCASL 对急性脑梗死脑血流灌注程度的评价

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目的　急性脑梗死在我国高发，近年来出现发病年龄逐渐年轻化，该病患者会出现运动、语言、感觉等功能障碍。本研究探索 3D pcASL（three-dimensional pseudo-continuous arterial spin-

labeled）的多个 PLD（postlabeling delay，PLD）时间所得 CBF（cerebral blood flow，CBF）值对急性脑梗死患者脑血流灌注异常程度及范围的早期预估评价。

材料与方法 收集 45 例急性脑梗死患者，均发病 6 小时内接受 GE Discovery MR750 3.0T 常规 MRI、DWI 及 3D ASL，其中男性 27 例（年龄=59.6±14.69 岁），女性 18 例（年龄=63.50±9.78 岁），将健侧对称部位所测 CBF 值作为对照组。采用 AW VolumeShore 5 工作站 Functool 9.4.05 处理软件对患者的 CBF 图像进行测量，所得数据进行一致性检验、配对样本 t 检验（p＜0.05）。

结果 患侧与健侧 CBF 值比较显示：PLD 为 1.5s、2.0s 时具有显著统计学意义（p=0.003、0.006），即患侧 CBF 值低于健侧；PLD 为 2.5s 时无统计学意义，提示脑血管微循环代偿良好。患侧 CBF 值进行两两比较，所得 P 值分别 0.003（PLD=1.5s/2.0s）、0.073（PLD=2.0s/2.5s）、＜0.001（PLD=1.5s/2.5s），急性脑梗死患者的 CBF 值随着 PLD 时间的延迟，CBF 值逐渐增大。

结论 本研究证实了不同 PLD 对急性脑梗死患者脑血流灌注的预估价值。早期患侧 CBF 值低于健侧，随着 PLD 时间的延长，患侧逐渐与健侧无明显差异；对于患侧 CBF 值的比较，PLD=1.5s 和 2.5s 有显著统计学差异，均可作为评价灌注情况的标准和依据， PLD=2.0s 可以作为灌注过程的观察，不能作为评价依据。

PU-1957

颈内动脉形态学改变对认知功能影响的研究

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目的 探讨颈内动脉形态学改变（血管迂曲及狭窄）对认知功能的影响。

方法 收集 2017 年 10 月至 2018 年 6 月于本院就诊患者 39 例及对照组 20 例，根据头颈 CT 血管造影（CTA）、头颈 MR 血管造影(MRA)结果将病例组分为颈内动脉迂曲组 23 例、颈内动脉狭窄组 16 例。各组分别使用简易精神状态量表（MMSE）、蒙特利尔认知评估量表（MOCA）评定其认知功能。依据 Fazekas 分级对各组间脑白质病变进行分级评分，计算各组间腔隙灶数量。结果 MOCA 评分迂曲组 27(24,29)分；狭窄组 28(25,29)分；对照组 29(28,30)分;迂曲组评分低于对照组，P＜0.05。3 组间 MMSE 评分未有明显的统计学差异。迂曲组、狭窄组较对照组 Fazekas 分级评分均存在显著统计学差异，P<0.05；狭窄组腔隙灶(9 例)较对照组(2 例)及迂曲组(1 例)存在显著统计学差异，P<0.05。狭窄组在吸烟、饮酒、高血压及高脂血症等发生率明显高于其他两组，P<0.05。

结论 颈内动脉形态学改变（血管迂曲及狭窄）与脑白质病变发生相关，且造成一定程度的认知功能下降。

PU-1958

优化的自动去骨法与 VCTDSA 去骨效果的评价研究

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目的

对比研究优化的自动去骨法(AVA)与 VCTDSA 技术在正常头颈 CTA 中去骨效果的可靠性。

材料与方法

分析 2016 年 9 月到 2017 年 7 月重医大附一院 30 名正常头颈 CTA 受检者的影像资料。同一操作者使用 AVA 软件和 VCTDSA 对原始图像后处理，记录自动去骨、手动去骨及总去骨时间，从血管完整性、图像质量、假性血管狭窄等方面对 VR 和 MIP 图像进行评价。去骨时间比较采用非参数 Mann-

Whitney U 检验；血管完整性采用配对卡方检验；图像质量和假性血管狭窄评价采用相关样本的秩和检验。

结果

VCTDSA 自动去骨、手动去骨及去骨总时间分别为 14.5（13，20.25）s、399（353.75，501.75）s 及 415.5（371.5，516）s，AVA 自动去骨、手动去骨及去骨总时间分别为 116.5（109，123.25）s、11.5（0，71.25）s 及 140（115.5，188）s，AVA 手动去骨和去骨总时间短于 VCTDSA，（P＜0.01）； M4～M5 段、大脑桥静脉、上矢状窦、横窦、乙状窦 AVA 显示率为 0，VCTDSA 相应显示率达 93.33%（140/150），（P＜0.01）；血管图像质量比较，ICA2 及 ICA6，VCTDSAⅠ级图像分别为 86.21%（25/29）及 96.55%（28/29），Ⅱ级图像分别为 13.79%（4/29）及 0.34%（1/29），AVA Ⅰ级图像为 44.83（13/29）及 58.62%（17/29），Ⅱ级图像为 55.17%（16/29）及 41.38%（12/29），VCTDSA 优于 AVA，差异有统计学意义（P＜0.01）；假性血管狭窄发生率，VCTDSA 1.41%（10/711），AVA 1.13%（8/711）无统计学意义（P＞0.01）。

结论

VCTDSA 技术进行头颈 CTA 图像去骨的可靠性高于 AVA 自动去骨，应作为 CTA 优选去骨方法。

PU-1959

基于头颈部 CTA 分析临床特征与血管狭窄程 度的相关性

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目的 分析临床特征与头颈部 CTA 血管狭窄程度的相关性。 方法 回顾性分析 2018 年 10 月-2019 年 8 月在我院行头颈部 CTA 检查的 150 例患者的临床影像学资料。根据狭窄程度分为轻度狭窄组（管腔狭窄面积≤69%）及重度狭窄组（管腔狭窄面积＞69%）。对入组患者的性别、年龄、吸烟、糖尿病、高血压等临床特征进行单因素卡方检验。P 值＜0.1 的临床特征纳入多因素逻辑分析。结果 入组患者的平均年龄为 63.8 岁±9.7 岁。轻度狭窄组、重度狭窄闭塞组分别有 122（81.3%）、28（18.7%）例患者。单因素分析显示吸烟患者发生重度狭窄的比例为 50%，不吸烟患者发生重度狭窄患者的比例为 15%，有明显的统计学差异（P＝0.005）（表 1）。男性患者发生重度狭窄的比例为 23.4%，而女性患者发生重度狭窄的比例为 10.7%，P 值为 0.054。多因素逻辑分析结果显示吸烟是头颈部血管重度狭窄的危险因素，OR 值为 4.279（95% CI 1.287-14.235），P 值为 0.018（表 2）。 结论 吸烟是发生头颈部血管重度狭窄的危险因子，风险高于非吸烟患者。

PU-1960

颈内动脉夹层影像诊断与鉴别诊断进展

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目的 以 ICAD 影像诊断与鉴别诊断的研究进展作述评。

方法 通过文献复习，对比分析 DSA、CTA、MRA 对颈内动脉夹层的诊断价值、优势 不足，并与颈动脉粥样硬化、颈动脉蹼、颈内动脉起始处血流伪影、动脉瘤进行鉴别，分析其影像征象异同。
结果 颈内动脉夹层 DSA 表现为以局部动脉不规则狭窄为特征性表现的 ICAD 最为常见，狭窄管腔多不规则，呈玫瑰花状、线珠状或呈“波纹征”，严重时呈“线样征”或管腔完全闭塞。CTA 典型 CTA 动脉夹层征象包括“双腔征”、“内膜瓣征”、“鼠尾征”、“火焰征”及偏心性动脉瘤样膨大等。MRI 表现为动脉壁内血肿表现为动脉壁增厚，增厚管壁内缘光滑，T1、T2 加权像可见动脉壁呈新月形异常信号，壁内血肿信号演变过程与血红蛋白分解产物引起的顺磁效应相关，急性期血肿在 T1、T2 加权像表现为低信号，亚急性期随着高铁血红蛋白成分增加，T1、T2 加权像上表现为新月形高信号，2 月后大部分血肿呈等信号。鉴别诊断：颈动脉粥样硬化，其一般位于颈内动脉起始处，狭窄范围较局限，且管腔内缘不光滑，同时伴钙化常见，而 ICAD 位置一般较高，接近颅底，并且 ICAD 所致动脉狭窄多为偏心性，内缘光滑可呈螺旋形沿着管腔上行，以上特征有助于鉴别。
结论 无创性血管成像技术发展迅速，CT 血管成像(CT angiography，CTA) [3]及高分辨核磁（High-resolution magnetic resonance imaging，HR-MRI）血管壁成像[4]等影像检查技术在临床上已逐步应用于颈动脉疾病的诊断。

PU-1961
16 例妊娠相关脑静脉窦血栓患者的影像特征分析

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目的 静脉窦血栓是一种少见的以颅内压增高和局灶性神经功能障碍为主要症状的脑血管疾病，其中妊娠相关静脉窦血栓指发生于妊娠至产后 6 周内的脑静脉血栓，严重危及妊娠妇女及胎儿生命安全。通过总结妊娠相关脑静脉窦血栓患者的临床及影像特征，提高对妊娠相关脑静脉窦血栓的认识。
方法 回顾性分析 2016 年 5 月~2019 年 5 月 16 例妊娠相关静脉窦血栓患者的临床及影像资料。所有患者均接受常规磁共振平扫、对比增强磁共振静脉造影或磁共振黑血血栓成像检查。根据脑实质损伤与否分为脑实质损伤组与无脑实质损伤组，分别对患者年龄、妊娠状态、危险因素、临床症状、血栓相关特征及脑实质损伤特征进行评估，对血栓数量分节段计分。采用 t 检验比较不同妊娠相关静脉窦血栓组间血栓分数差异。
结果 16 例患者年龄 21~40 岁，平均（29±5）岁，其中人工流产术后 1 例，剖宫产术后 7 例，产褥期 4 例。16 例患者中 8 例（50%）患者感染累及乳突区，14 例（87.5%）患者首发症状为头痛，其他神经系统症状有抽搐 5 例，意识障碍 3 例，运动障碍 2 例，感觉异常 1 例，视物成双 1 例。磁共振成像显示血栓位于横窦、乙状窦 13 例（81.3%），上段颈内静脉 12 例（75.0%），皮质静脉 8 例（50.0%），上矢状窦 7 例（43.8%），直窦 4 例（25.0%），窦汇 4 例（25.0%），深静脉系统 3 例（18.8%），下矢状窦 2 例（12.5%）；11 例（68.8%）患者出现脑实质损伤，病灶位于颞顶叶 9 例，额叶 5 例，丘脑 1 例，其他深部白质 5 例，其中 5 例（45.4%）伴有出血，9 例（81.8%）病灶均累及皮质。脑实质损伤组血栓分数 3~16，平均 7.27±4.1，无脑实质损伤组血栓分数 1~8，平均 4.6±2.9，两组血栓分数差异无统计学意义（P＞0.05）。
结论 妊娠相关静脉窦血栓患者有一定影像特征，脑实质损伤的出现多预后较差。MRI 合并 MRV 是诊断妊娠相关静脉窦血栓血栓的主要手段。

PU-1962
急性缺血性脑卒中侧枝循环 CT 评价：Fast Stroke 价值

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【摘要】目的　探讨 Fast Stroke 一站式模式在缺血性脑卒中侧支循环评估中应用价值。方法 回顾性分析 2018 年 12 月至 2019 年 5 月入院的 52 例缺血性脑卒中患者，均完成 CT 平扫、CT 灌注及多期 CTA 检查，启用 Fast Stroke 一站式模式，对侧枝循环进行评分，并与 CT 灌注结果作对比。结果 缺血半暗带侧枝循环良好组 BF 高于侧枝循环不良组（P=0.032），核心梗死区侧枝循环良好组 BV 高于侧枝循环不良组（P=0.013），侧枝循环良好组 MTT 及 Tmax 升高（P=0.002,0.031）。良好的侧枝循环良好的侧枝循环与 BV、MTT、Tmax 相关。**结论**　Fast Stroke 一站式模式在缺血性脑卒中侧支循环评估中敏感度和特异度较高，可以快捷评价侧枝循环，明确责任血管，在缺血性脑卒中的预防和治疗中具有一定的价值。

PU-1963
3.0T MR 磁敏感加权成像对脑血管淀粉样变脑出血的诊断价值

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目的　分析脑血管淀粉样变脑出血（Cerebral amyloid angiopath-related hemorrhage,CAAH）　的 3.0T MR 磁敏感加权成像表现及诊断价值。
方法　回顾性分析我院 2014 年 7 月 26 日至 2019 年 8 月 20 日临床确诊的 78 例脑血管淀粉样变脑出血患者的临床资料及 3.0T MR 磁敏感加权成像表现，结合国内外相关文献，总结脑血管淀粉样变脑出血的 3.0T MR 磁敏感加权成像表现及其诊断价值。
结果　78 例患者中，男 56 例，女 22 例；平均发病年龄 62.4±8.2 岁，其中≥55 岁占 78.6%；患者中有高血压史 56 例，糖尿病史 17 例，心血管病史 17 例；以头晕头痛为首发症状 17 例，脑梗死为首发症状 50 例，既往脑梗史 28 例，精神异常为首发症状 28 例；7 8 例均行 3.0T 常规 MRI 及 SWI 检查，SWI 序列上均变现为多发低信号灶，其形状各异，多呈小圆形或点状低信号，71%(56/78)的病灶直径均＜10mm，57%(45/78)的病灶位于皮层及皮层下白质，42%(33/78)位于基底节区及丘脑，74%(58/78)同时位于以上两者。
结论　脑血管淀粉样变是引起老年人的脑叶出血的常见原因，其在临床及影像学表现具有一定特点。脑血管淀粉样变脑出血主要分布于皮层及皮层下白质，呈多发性，SWI 序列呈多发低信号灶。除此之外 3.0T SWI 检查可发现更多常规 T1WI、T2WI 及 T2 FLAIR 未能发现的较为细小出血病灶，因此且诊断价值优于常规 MRI 检查，值得临床中进一步推广应用。

PU-1964
头颈部 CTA 斑块易损性与临床特征的相关性分析

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目的 分析临床特征与头颈部 CTA 斑块易损性的相关性。 方法 回顾性分析 2018 年 10 月-2019 年 8 月在我院行头颈部 CTA 检查的 150 例患者的临床影像学资料。根据颈部斑块稳定性将斑块分为稳定斑块（钙化、混合斑块）及不稳定斑块（软斑块）。对入组患者的性别、年龄、吸烟、糖尿病、高

血压等临床特征进行单因素卡方检验。P 值＜0.1 的临床特征纳入多因素逻辑分析。结果 入组患者的平均年龄为 63.8 岁±9.7 岁。稳定斑块组、不稳定斑块组分别有 99（66.0%）、51（34.0%）例患者。单因素分析显示男性患者发生不稳定斑块的比例为 40.4%，女性患者发生不稳定斑块的比例为 23.2%，有明显的统计学差异（P＝0.023）（表 1）。吸烟患者发生不稳定斑块的比例为 57.1%，而不吸烟患者发生不稳定斑块的比例为 31.6%，P 值为 0.104。多因素逻辑分析结果显示性别是头颈部血管发生不稳定斑块的危险因素，OR 值为 2.226（95% CI 0.685-7.239），差异没有统计学意义，P 值为 0.062（表 2）。 结论 男性患者出现颈部不稳定斑块的可能性更高，多因素逻辑分析显示吸烟患者更有可能发生不稳定斑块。

PU-1965
磁共振 ASL 灌注成像在脑卒中支架植入前后的对比研究

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【摘要】**目的** 磁共振 ASL 灌注成像在急性脑卒中支架植入前后的对比研究。
方法 收集 2018 年 3 月至 2019 年 3 月期间急性脑卒中患者所做的磁共振 ASL 灌注成像患者分为两组。A 组(15 例),为支架植入行前磁共振 ASL 灌注成像患者；B 组(15 例)，为 A 组支架植入后行磁共振 ASL 灌注成像患者。结果用 x2 检验方法比较术前术后脑灌注成像的变化，P0.05 有统计学意义。收集 2018 年 3 月至 2019 年 3 月期间进行的 15 例急诊脑卒中患者，需行急诊血管腔内治疗（支架植入）的患者，记录术前行磁共振 ASL 脑灌注成像的图像；记录行常规脑血管 DSA 造影，血管腔内治疗（支架植入）后一周行磁共振 ASL 脑灌注成像的图像。根据两组不同的图像(术前急诊和术后复查)，经相同图像后处理，由影像诊断医师和神经内科医师各两名(中级职称以上)，根据灌注成像后处理图像及临床查体作出合理判断。**结果** 影像科医师对两组(A 组、B 组)图像进行对比，B 组患者经血管腔内治疗（支架植入）后，脑部灌注得到明显改善；神经内科医师对 B 组患者行临床功能性查体，B 组患者相关性功能较血管腔内治疗（支架植入）前得到显著改善。**结论** 脑卒中患者，急行血管腔内治疗（支架植入），及时恢复脑部组织的正常灌注，对患者相关性功能恢复能得到及时改善，提高患者的生活质量。

PU-1966
头颈 CTA 中基于复合体重因子的对比剂剂量研究应用

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目的 探讨基于复合体重因子的对比剂使用方法行头颈 CTA 的可行性。**方法** 对实验组 40 例和对照组 26 例患者分别采用基于体重和身高的复合体重因子法和单纯基于体重的对比剂用量计算方法，在 Toshiba Aquilion One 320 容积 CT 上行头颈 CTA 扫描。在 CTA 图像上分别测量主动脉弓、右颈总动脉、右颈内动脉、右椎动脉、基底动脉、大脑后动脉、大脑中动脉和大脑前动脉共 8 支头颈部血管的 CT 值，以及其中 6 支血管同层面颈内静脉的 CT 值，计算两者间的差值分别作为这 6 支血管的相对强化值，测量并计算各支动脉的信噪比和对比噪声比。采用独立样本 t 检验比较两组的对比剂用量、辐射剂量和各支血管的 CT 值和相对强化值。采用双盲法对图像质量进行主观评价，并采用 Mann-Whitney U检验比较两组的图像质量。**结果** 实验组和对照组中对比剂用量分别为（55.4±5.9）和（62.8±7.9）mL，两组间的差异有统计学意义（t=4.348，P<0.05）。实验组和对照组的剂量长度乘积（DLP）分别为（489.1±55.0）和（555.6±78.7）mGy•cm，两组间的差异

有统计学意义（t=4.045，P<0.05）。实验组中各支动脉的 CT 值和相对强化值均高于对照组，差异具有统计学意义（P<0.05）。实验组和对照组的图像信噪比和对比噪声比的差异无统计学意义（P>0.05）。实验组的图像质量主观评分好于对照组且差异有统计学意义（P<0.05）。**结论** 采用基于复合体重因子的对比剂使用方法结合低管电压技术在行头颅 CTA 时可以在保证图像质量、满足临床诊断需求的前提下降低对比剂用量和辐射剂量。

PU-1967

脑梗死后出血性转化的影像学研究进展

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脑梗死是危害人类健康的常见病、多发病，具有高死亡率、高致残率及高复发率的特点，目前溶栓治疗是急性脑梗死最有效的治疗方法，但出血性转化(Hemorrhagic transformation, HT)发生的风险也会相应增加。在脑缺血早期准确地预测及检测 HT，对于指导临床选择合理的治疗方案及预后的判断都具有十分重要的意义。本文就预测脑梗死后出血性转化方面的影像学研究及进展作一综述。

一、HT 的定义及分型

HT 是指脑组织在缺血缺氧的基础上，缺血区血管重新恢复血流灌注，导致缺血区内继发性出血[1]，HT 既是影响溶栓疗效和安全性的严重并发症之一，也是脑缺血进行溶栓治疗的禁忌证。

二、HT 的病理及病理生理机制

HT 表现为红色软化灶，主要有两种病理分型，分别为：小动脉型出血及毛细血管型出血。小动脉型好发生于基底节，多表现为血肿，显微镜下表现为小动脉管壁破坏而出血，病变区有大量红细胞聚集。毛细血管型出血多见于皮质以及皮质下，呈点片状出血，显微镜下表现为以毛细血管为中心，其管壁水肿，周围环绕以红细胞，呈环状出血。

三、HT 发生的危险因素

脑缺血患者发生 HT 的危险因素有多种，包括血压、血糖、血脂、溶栓因素、心房颤动、脑梗死面积等[8]。

四、HT 的影像学检查

近年来，随着 CT、MRI 技术的广泛应用，尤其是 MRI 的普及、新序列的研发，许多学者致力于对脑缺血的超早期诊断，积极寻找早期预测 HT 的可靠方法，提高 HT 的预测及诊断能力，从而指导临床为脑缺血患者选择合理的治疗方案。

PU-1968

低剂量 CT 扫描在成人脑血管意外复查中的应用价值

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目的 探讨并分析针对成人脑梗死及脑血肿疾病复查过程中使用 CT 低剂量技术的实际使用价值与临床检查效果。方法 采用统计分析访方法。近三年来在本院接受治疗并进行二次复查的成人脑梗死及脑血肿 60 例作为研究对象，随机分为实验组和对照组各 30 例，分别采用低剂量扫描方法和常规剂量扫描方法，对比分析两组患者的检查图像质量、诊断准确度、辐射程度。结果，两组患者采用本应的检查技术最终检查差异相对明显，结果存在显著水平（P＜0.05）。结论，针对成人脑梗死及脑血肿患者产生的辐射，达到国际上对成人脑梗死及脑血肿患者复查基本标准。

脑梗死及脑血肿在临床上是一种对患者造成伤害较大的疾病之一，经过相应的抢救与治疗后还需要经过多次 CT 复查才能准确三分之一疾病康复的程度，临床医生可以通过复查结果失明今后的治疗方案，但是脑部疾病极易受到外部辐射的影响面加重，多次 CT 扫描会增加辐射量，甚至强化某些体质相对较弱患者病情的严重程度。因此，在现有技术条件下不断优化 CT 扫描的辐射参数量对于疾病的有效治疗极为重要，基于此，本文采用统计分析方法以近三年来在本院接受治疗并进行二次复查的成人脑梗死及脑血肿患者 60 例作为研究对象，探讨并分析针对成人脑梗死及脑血肿疾病复查过程中使用 CT 低剂量扫描技术的实际使用价值与临床检查效果。

PU-1969
探讨脑静脉系统血栓形成相关性脑出血患者的临床及影像学表现

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脑静脉系统血栓形成相关性脑出血临床及影像学研究

摘要：探讨脑静脉系统血栓形成相关脑出血影像学特征。**方法** 收集襄阳市第一人民医院 2008 年 1 月至 2018 年 10 月期间，静脉系统血栓形成相关性脑出血的住院患者。记录所有纳入患者的一般资料、临床表现、影像学特征等临床资料，然后进行系统性分析。**结果** 共纳入 17 例患者，男性 7 例，女性 10 例，平均年龄为 37.71±11.66 岁。脑静脉系统血栓组主要发病因素为妊娠、产褥期、口服避孕药，其中不明原因占 23.5%。头痛，为首发症状。17 例患者早期均接受头颅 CT 检查，10 例静脉窦内可见条状致密度。14 例行头颅 MRI 检查，7 例静脉窦内可见条状异常信号影。17 例静脉窦血栓合并脑实质出血患者中，9 例表现为多发出血灶，平均每个病人出血灶数量为 2.41±1.77 个。6 例患者双侧大脑半球同时受累。而所有非脑静脉系统血栓组患者均为 1 个血肿，均分布在一侧大脑半球，多为不规则形，早期出血量比较大。脑静脉性系统血栓组患者血肿平均最大长径为 22.47±14.94mm，最大血肿层面水肿最大长径在两组之间无明显统计学差异（P=0.16）。脑静脉系统血栓组两种不同体积测量方法所得平均血肿和水肿体积比与非脑静脉系统血栓组比较均存在明显统计学差异（P<0.05）。结论脑静脉系统血栓形成相关的脑出血患者临床表现、危险因素复杂多样，影像表现具有一定特征性，及时积极治疗预后较好。

PU-1970
Application of resting state functional magnetic resonance imaging in vascular cognitive impairment

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Abstract: The prevalence of vascular cognitive impairment (VCI) has increased year by year and has become a major disabling factor in the middle-aged and elderly population. The pathogenesis of VCI is unclear, the diagnostic criteria are not uniform, and there are no effective treatments. Functional magnetic resonance imaging is a new type of magnetic resonance technology developed in recent years. Among them, resting-state functional magnetic resonance (rs-fMRI) can detect spontaneous brain function activity at rest, which is helpful to further explore the pathogenesis of VCI. Provide objective reference indicators for early clinical diagnosis and achieve the goal of

improving prognosis. This paper reviews the principles, main analytical methods and research progress of BOLD-fMRI in VCI.

PU-1971
MR-DSI 在评估高血压患者脑实质微结构改变中的初级应用

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目的 采用西门子 3.0T 磁共振扩散光谱(DSI)探讨高血压患者脑实质微结构改变中的可行性和临床价值。材料和**方法** 收集我院未服用过降压药的首诊高血压患者 22 例，并匹配年龄、性别相同的正常对照组 22 例。所有受检者行常规头颅 MRI 扫描均排除颅脑器质性病变后再行头颅 DSI 序列及高分辨 T1WI 扫描。DSI 序列参数如下：将 DSI 原始数据导入 MAP MRI（西门子科研部提供）软件中进行后处理。分别测量双侧红核、尾状核头、丘脑、内囊后肢、额叶白质及侧脑室后角区白质的 NG、PTOP 值，左右分别记录。所有测得双侧对称的研究值均左右相加后除以 2，得出左右两侧研究值的平均值。采用 SPSS 20.0 软件对所得数据进行统计学分析。**结果** （1）正常人左右两侧对称部分进行比较时，双侧尾状核头与双侧丘脑 RTOP 值（P<0.05）,差异有统计学意义；（2）高血压组左右两侧对称部位进行比较时，双侧丘脑、内囊后肢 NG 值（P<0.05）,差异有统计学意义；（3）两组比较尾状核头、丘脑、内囊后肢、额叶白质及侧脑室后角区白质 NG.RTOP 值（P<0.05）差异有统计学意义。**结论** DSI 序列经 MAP MRI 软件处理得到的定量参数可以发现正常成人双侧脑实质微结构的微小差异；DSI 技术或许可以早期检测出这些改变，从而为揭示高血压患者病因、发病机制及预后提供重要参考。NG、RTOP 值可能是检测脑白质改变的敏感指标。

PU-1972
多层螺旋 CT 脑血管成像低剂量扫描应用研究

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目的 利用 128 层螺旋 CT 行脑血管检查，通过调节管电压和管电流降低患者接受的辐射剂量，寻求最佳的扫描参数，分析低剂量的可能性。
材料与方法 对 100 例患有脑血管疾病行 CTA 检查的患者进行研究，按降低的不同条件分为对照组：管电压为 120KV，管电流为 170mA;研究组 1：120KV，管电流为 130mA; 研究组 2：管电压为 100KV，管电流为 170mA; 研究组 3：管电压为 100KV，管电流为 140mA;研究组 4：管电压为 80KV，管电流为 170mA; 研究组 5：管电压为 80KV，管电流为 140mA。先进行横断面的平扫和增强扫描，比较各组动脉强化 CT 值（SI）、噪声（SD）、信噪比（SNR）、对比噪声比(CNR)，对上述图像在工作站减影进行 MIP 和 VRT 三维重建，比较图像质量（优、良、差），记录其辐射剂量并进行比较。统计采用多样本的 t 检验。
结果 1、6 组图像的 CT 值、噪声、SNR、CNR 各指标差异均有统计学意义；研究组 1 同标准相比，除大脑中动脉的 CT 值外，各指标均无统计学差异；研究组 2、3、4、5 组的动脉 CT 值同对照组有差异，明显升高；研究组 4、5 组的背景噪声分别同标准组有差异，研究组 5 升高明显；研究组 2、3 组的 SNR、CNR 同标准组没有差异；而研究组 4、5 组的 SNR、CNR 同标准组有统计学差异。2、除研究组 5 的图像血管显示不清，管壁毛糙，图像质量差外其余各组图像质量均能达到诊断要求。3、研究组图像的有效剂量较对照组分别降低了 23%, 46%, 62%, 79%, 82%。

结论 128 层螺旋 CT 头部血管成像采用低管电压（１００ｋＶ）、自动管电流技术可以在不影响图像质量的前提下最大程度的降低辐射剂量，有效剂量降低了 62%。

PU-1973

3D-ASL 联合 IVIM 应用于 TIA 脑保护机制的研究

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目的 初步探讨短暂性脑缺血发作（Transient Ischemic Attack TIA）对脑组织的保护机制。
材料与方法 收集首次责任血管为大脑中动脉的脑梗死患者 120 例，按照脑梗死前有无 TIA 发作分为 TIA 组和非 TIA 组，两组患者均行 NIHSS（美国国立卫生研究院卒中量表）评分、头颅磁共振平扫、3D-ASL（三维动脉自旋标记技术）以及 IVIM（体素内不相干运动成像）的扫描，比较两组患者脑梗死面积及 NIHSS 评分差异，并应用 3D-ASL 及 IVIM 分析二者差异；统计方法采用 SPSS 21.0 对数据进行统计分析，计量资料均用均数±标准差（±S）表示。组间比较均采用独立样本 t 检验。检验水准均为 P<0.05 有统计学意义。
结果 TIA 组患者脑梗死面积（8.32±2.78cm2）较非 TIA 组（10.35±4.32cm2）小，差异有统计学意义（p<0.05）；TIA 组患者 NIHSS 评分（9.46±4.21）较非 TIA 组（11.87±3.82）患者低，差异有统计学意义（p<0.05）；TIA 组患者脑梗死核心区域 CBF 值（17.79±8.99）较非 TIA 组（11.23±7.11）高，差异有统计学意义（p<0.05）；TIA 组患者脑梗死区域及周边侧支循环的数量（5.12±2.75）较非 TIA 组（3.23±3.01）多，差异有统计学意义（p<0.05）；TIA 组患者脑梗死核心区域 f 值（0.042±0.024）较非 TIA 组（0.028±0.013）高，差异有统计学意义（p<0.05）。
结论 TIA 可以使颅脑产生缺血性预适应，即诱导产生一系列内源性保护机制来减少缺血性脑卒中对脑组织的损害，3D-ASL 及 IVIM 对 TIA 脑保护机制的研究有一定帮助。

PU-1974

MRA、3D-ASL 联合 IVIM 技术在短暂性脑缺血发作中的应用价值

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目的 探讨磁共振血管成像（MRA）、三维动脉自旋标记技术（3D-ASL）及体素内不相干运动成像（IVIM）在短暂性脑缺血发作（TIA）中的应用价值。**材料与方法** 选取 60 例 TIA 患者，临床症状均符合 TIA 诊断标准，行常规 MRI、MRA、3D-ASL 及 IVIM 扫描，后处理得到 3D-ASL 的脑血流（CBF）伪彩图及 IVIM 参数图，评估不同方法对 TIA 患者低灌注的敏感性，对结果进行卡方检验分析。**结果** MRA 阳性者 25 例（41.7%，ASL（PLD=1.5）阳性者 33 例（55.0%），D*值阳性者 23 例（38.3%）,f 值阳性者 35 例（58.3%），三种技术之间无显著统计学差异；MRA、ASL 及 f 联合应用，敏感性明显升高。**结论** MRA、3D-ASL 及 IVIM 技术可以从不同方面对 TIA 患者进行评估，同时三者联合应用可以更加准确诊断 TIA，明确 TIA 的发病机制，为临床提供影像学依据。

PU-1975

3D ASL 联合 MRI、MRA 对后循环缺血的诊断价值

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目的 探讨 3D ASL 联合 MRI、MRA 对后循环缺血的诊断价值。**方法** 经临床诊断为后循环缺血的 100 例患者均行 MRI、MRA 及 3D ASL 检查，3D ASL 序列扫描的标记延迟时间（PLD）分别为 1.5s、2.5s。基于 3D ASL 序列获得脑血流量（CBF）图，测量前循环（额、顶叶）、后循环（小脑半球、枕叶）的平均 CBF 值。**结果** 当 PLD 为 1.5s 和 2.5s 时，前循环 CBF（ml/100g•min）值均高于后循环，差异有统计学意义（*P*=0.023、*P*=0.000）。100 例患者 MRI 阳性者 54 例（54%），其中 DWI 阳性者 25 例（25%），MRA 阳性者 32 例（32%），3D ASL 阳性者 70 例（70%），均表现为后循环供血区低灌注。MRI+MRA 联合诊断后循环缺血的阳性率为 75%，MRI+MRA+3D ASL 联合诊断后循环缺血的阳性率为 89%。3 种影像学联合应用对后循环缺血的诊断率明显提高。**结论** 3D ASL 技术需要多个 PLD 时间判断 PCI 的有无，3D ASL 联合 MRI、MRA，提高后循环缺血性疾病的诊断率。

PU-1976

DWI 及 ADC 图在脑梗死不同期相中的诊断价

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目的 分析 DWI 及 ADC 图在脑梗死不同期相中的诊断价值。**方法** 选取我院 2018 年 5 月-2019 年 5 月收治的 82 例脑梗死患者，应用 DWI 及 ADC 图进行分析，了解患者期相信息，另以金标准进行对比，了解期相信息的准确率。**结果** DWI 及 ADC 图诊断下，82 例脑梗死患者，急性期患者 41 例，占比 50.00%，亚急性期 20 例，占比为 24.39%，慢性期 21 例，占比 25.61%。金标准下，82 例脑梗死患者，急性期患者 41 例，占比 50.00%，亚急性期 21 例，占比为 25.61%，慢性期 20 例，占比 24.39%。DWI 及 ADC 图诊断准确率为 97.56%。与金标准差异无统计学意义（p>0.05，X^2=0.123、0.258、0.269、0.136）。**结论** DWI 及 ADC 图能够准确进行脑梗死不同期相的诊断，可作为疾病诊治的可靠技术。

PU-1977

256 层螺旋 CT 血管重建技术研究 Wills 环变异与交通动脉瘤的相关性

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【摘要】:目的 通过 256 层螺旋 CT 血管重建技术观察并研究 Willis 环的变异情况及动脉瘤的解剖数据之间的相关性。**方法** 采集 150 例出现自发性蛛网膜下腔出血患者的 CT 血管造影影像数据，经过 DSA 或者神经外科手术确诊为动脉瘤破裂共 150 例，利用后处理工作台三维血管重建技术观察 Willis 环变异的情况。**结果** 150 例动脉瘤患者中交通动脉瘤共 61 例，占主要发病比例，其中前交通动脉瘤 28 例，后交通动脉瘤 33 例，其中前交通动脉瘤存在与 Willis 环变异的统计学差异，（P＜0.05）；后交通动脉瘤与 Wills 环变异的统计学差异（P＞0.05）；结论 前交通动脉与 Willis 变异存在关系。后交通动脉瘤与 Willis 环变异无明确关系。

PU-1978
定量评估 CTP 预测急性脑梗死患者预后的价值

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目的：定量评估急性脑梗死患者治疗前 CT 灌注成像（CTP）及治疗前后临床影像资料，确定与预后相关的临床或 CTP 影像特征。
材料和方法：前瞻性纳入临床资料完整并通过一周内 CT/MRI 随访证实的 39 例急性脑梗死（发病时间 24h 内）患者，所有患者均随访 90 天获取其 mRS 评分（平均：2.8 分）。对上述患者行 CTP 扫描，对平扫图像行 ASPECTS 评分，并获得 CTP 灌注参数图及比值。分析临床及 CTP 参数同治疗后 90 天 mRS 评分之间的相关性，并根据 90 天 mRS 评分是否≤2（预后良好），将患者分为两组，比较两组间临床及 CTP 灌注参数差异。**结果**：39 例患者中，20 例预后良好。分析发现，治疗前后 NIHSS 评分、梗死核心体积、缺血半暗带 MTT 及相应区域 delay-TTP 与随访 90 天 mRS 评分成明显正相关（$P\leqslant 0.04$）；而治疗后 ASPECTS 评分及核心梗死区 CBF 值与 90 天 mRS 评分成明显负相关（$P< 0.05$）。进一步分析发现，治疗前后 NIHSS、治疗后 ASPECTS、CTP 示梗死核心体积及梗死核心 CBF 值与患者预后明显相关并具有统计学差异（$P\leqslant 0.03$）。预后较好患者具有较低的治疗前后 NIHSS 及较低的核心梗死体积；然而预后较好患者的复查 ASPECTS 评分（7.9 vs. 3.9）及核心梗死区 CBF 值（17.9 vs. 14.3）明显高于预后较差组。ROC 分析显示治疗后 NIHSS 评分对于预测急性脑梗死患者预后有着最高的诊断效能（AUC：0.90），其中敏感度、特异度及拐点值分别为 79%，85%和 4.5；而核心梗死区 CBF 具有最佳的特异度（89%），治疗后 ASPECTS 评分在预测预后方面具有最高的敏感度（94%）。
结论：急性脑梗死患者核心梗死区体积、CBF、治疗前后 NIHSS 及治疗后 ASPECTS 评分与患者的预后密切相关。相比较 NIHSS 评分，核心梗死区 CBF 对于预测急性脑梗死预后有着更高的特异度。

PU-1979
24 h 内高血压性脑出血血肿增大与平扫 CT 征象的相关性

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摘要：目的 探讨高血压性脑出血 24 h 内血肿是否扩大与不同 CT 征象之间的相关性。**方法** 回顾性分析 185 例高血压性脑出血患者的临床资料与 CT 图像，比较血肿扩大组及未扩大组 CT 参数间的差异，对两组差异有统计学意义的指标进行组间二元 Logistic 回归分析，明确 CT 指标与血肿扩大与否之间的相关性，再以混杂征、分叶征、黑洞征为检验变量评估其对脑出血早期血肿扩大的预测能力。**结果** 血肿扩大组及血肿未扩大组的 CT 定量资料：初始体积、最大径、最小径、最大 CT 值、平均 CT 值、最大径与最小径差值的差异均无统计学意义（P均＞0.05）；CT 定性资料：混杂征、分叶征及黑洞征间差异有统计学意义（P＜0.05），血肿破入脑室差异无统计学意义。通过二元 Logistic 回归分析显示患者入院时收缩压及 CT 征象中混杂征、分叶征、黑洞征为早期血肿扩大的独立危险因素。使用诊断试验四格表法计算出混杂征、黑洞征和/或分叶征联合征象与早期血肿扩大的相关性敏感度、特异度、阳性预测值和阴性预测值分别为 78.4%、59.0%、42.1%和

87.8%，约登指数为 0.374，其约登指数比混杂征、黑洞征和分叶征更接近 1。**结论** 平扫 CT 中混杂征、分叶征、黑洞征对 24 h 内高血压性脑出血血肿增大有较好的预测价值。

PU-1980
3D-ASL 技术在心源性脑卒中早期诊断中的临床应用价值

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目的 探讨三维动脉自旋标记技术（3D-ASL）脑灌注成像技术在心源性脑卒中早期临床诊疗中的应用价值。
方法 观察 207.8～2019.7 期间我院急诊科、神经内科收治的 30 例急性脑梗死患者，所有患者治疗前均进行 MRI 常规平扫（T1WI、T2WI、T2-FLAIR）、DWI 检查，其中 17 例患者同时进行 3D-ASL、MRA 检查，13 例患者住院治疗期间 3D-ASL、MRA 检查，分析所有患者影像图像资料。
结果 21 例 DWI 显示多发散在急性梗死灶、分水岭脑梗灶，9 例 DWI 显示大面积急性脑梗灶；14 例患者同时进行 3D-ASL 检查发现大面积灌注减低区，MRA 检查提示颈动脉颅内段、大脑中动脉不同程度闭塞，16 例 MRA 检查提示颈动脉颅内段、大脑中动脉不同程度闭塞，3D-ASL 检查无明显低灌注区；根据 DWI 检查提示梗死灶类型及 3D-ASL 检查结果，诊断心源性脑卒中 11 例。
结论 心源性脑卒中影像学具有一定特点，3D-ASL 技术配合 DWI 检查对心源性脑卒中的早期临床诊疗及预后指导具有一定的应用价值。

PU-1981
大脑中动脉粥样硬化斑块特征与梗死类型的相关性

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目的 利用 3.0T 高分辨率磁共振成像(HRMRI)对大脑中动脉粥样硬化斑块的特征进行研究，探讨斑块特征与患者梗死类型的相关性。
资料与**方法** 选取 49 例行颅内动脉 HRMRI 的动脉粥样硬化患者，分析其双侧大脑中动脉的斑块形态、斑块分布及斑块强化程度。按斑块强化程度将患者分为明显强化组和非明显强化组，比较两组患者的临床资料，分析不稳定斑块的临床危险因素。根据扩散加权成像结果将大脑中动脉供血区急性梗死患者分为单穿支动脉阻塞（由于单根穿支动脉阻塞造成的梗死，DWI 图像上表现为最大径<20mm 的单发急性梗死灶）、多穿支动脉阻塞（可能由于多根穿支动脉阻塞造成的梗死，DWI 图像上表现为单发急性梗死病灶最大径≥20mm）及动脉栓塞（DWI 图像上发现 2 个或以上位于皮层或皮层下的急性梗死病灶，可能由于大脑中动脉主干管壁的不稳定斑块破裂栓子脱落所致），分析不同梗死类型的斑块特征。
结果 49 例患者共发现位于大脑中动脉粥样硬化斑块 65 处，其中 62 处(95.4%)为偏心性斑块，斑块最常见于腹侧壁(31 处，50.0%)。明显强化组中高密度脂蛋白胆固醇降低的患者比例(56.7%)明显高于非明显强化组(26.3%)，差异有统汁学意义(P<0.05)。动脉栓塞组中明显强化斑块的发生率(88.9%)明显高于非动脉栓寒组(单穿支动脉阻塞及多穿支动脉阻塞，36.4%)，差异有统计学意义(P<0.05)。
结论 大脑中动脉粥样硬化斑块的分布位置与缺血性卒中事件的发生密切相关，斑块强化程度能够反映斑块的稳定性。利用 HRMRI 能够在一定程度上预测缺血性卒中事件的发生，并推测其梗死类型。

PU-1982

容积 CT 数字减影血管造影与匹配蒙片去骨法在颅内动脉瘤头颈 CTA 减影效果的比较研究

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目的 比较容积 CT 数字减影血管造影（VCTDSA）与匹配蒙片去骨法（MMBE）对于颅内动脉瘤患者头颈 CTA 减影图像质量的差异。 **方法** 回顾性分析 2017 年 3 月—2018 年 3 月于我院行头颈 CTA 检查且确诊颅内动脉瘤的 47 名患者资料。分别使用 GE AW4.6 后处理工作站 VCTDSA 减影技术与 SIEMENS Syngovia 后处理工作站 MMBE 减影技术对这 47 名患者头颈 CTA 的原始图像进行后处理，比较不同减影技术的自动减影时间、手动减影时间和总减影时间，并评价减影后的去骨情况，血管减影效果及动脉瘤显示情况。 **结果** VCTDSA 的自动减影时间、血管减影后的显示及动脉瘤显示明显优于 MMBE（P <0.01），尤其是颈内动脉虹吸部的动脉瘤；MMBE 的去骨效果、手动减影时间和总减影时间明显优于 VCTDSA（P <0.01），但 MMBE 常因过度去骨导致靠近骨质的血管及颈内动脉虹吸部的动脉瘤不完整，总体减影效果差，不利于诊断。**结论** VCTDSA 的自动去骨速度快，对头颈部血管、动脉瘤的显示优于 MMBE，尤其是对颈内动脉虹吸部的动脉瘤减影效果较好，有助于动脉瘤的观察和诊断；MMBE 的自动去骨较好，更节约手动减影时间，但易过度去骨导致血管假性狭窄及动脉瘤显示不完整，不利于颅内动脉瘤的诊断。

PU-1983

DWI 序列结合 SWI 序列在超急性期脑出血中的诊断价值

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目的:评价磁共振弥散加权成像(DWI)及 SWI 序列对超急性期脑出血诊断的准确性.
方法:对卒中样起病,发病时间在 6h 以内,因怀疑出血性脑血管病急诊行头部 MRI 检查,按文献描述的超急性期脑出血 MRI 特征初步诊断脑出血,并随即行头部 CT 证实.10 例患者均进行 DWI、ADC 图、常规 MRI 扫描及 SWI 扫描，分析其各序列的信号改变,并与头部 CT 进行比较.
结果:10 例 MRI 初步诊断脑出血的患者均经 CT 确诊为脑出血,敏感性和特异性均为 100%,超急性期脑出血血肿 DWI 的特征性表现为高低混杂信号并病灶周缘可见伪影,SWI 序列呈局部低信号改变，T1WI 序列呈等低信号，T2WI 序列呈等高信号；磁共振 T2WI、DWI 和 ADC 图显示血肿体积均大于 CT,差异有显著性(P<0.01);而 T1WI 与 CT 的血肿体积无显著差异(P>0.05).
结论:DWI 序列结合 SWI 序列对超急性期脑出血诊断准确,有重要临床应用价值.

PU-1984

比较 CT 混杂密度征和岛征预测急性脑出血早期血肿扩大准确性的研究

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目的 比较 CT 混杂密度征和岛征预测急性脑出血早期血肿扩大的准确性。**方法** 95 例发病在 6 小时内的急性脑出血患者纳入此项研究，分别计算 CT 混杂密度征和岛征预测早期血肿扩大的灵敏度、特异度、阳性预测值和阴性预测值，采用受试者工作特征曲线（ROC）比较两者的准确性。**结果** 95 例患者中发现混杂密度征 23 例（24.2%），岛征 13 例（13.7%）。有 29 例发生早期血肿扩大，其中混杂密度征 15 例（51.7%），岛征 10 例（34.5%）。混杂密度征预测血肿扩大的灵敏度、特异度、阳性预测值和阴性预测值分别为 51.7%、87.9%、65.2%、80.6%；而岛征预测血肿扩大的灵敏度、特异度、阳性预测值和阴性预测值分别为 34.5%、95.5%、76.9%、76.8%，两者 ROC 曲面下面积分别为 0.698、0.650。**结论** CT 混杂密度征和岛征均能预测急性脑出血早期血肿扩大，而混杂密度征有更好地预测准确性。

PU-1985
大脑中动脉 M1 段闭塞后动脉偏侧优势与动脉内高信号对比研究

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目的 探讨大脑中动脉（MCA）M1 段闭塞后，三维时间飞跃法磁共振血管成像（3D-TOF MRA）提示同侧大脑前动脉（ACA）及大脑后动脉（PCA）偏侧优势与三维动脉自旋标记（3D-ASL）灌注成像技术提示动脉内高信号之间的相关性，并比较动脉偏侧优势与梗死面积之间的相关性。**方法** 收集 2016 年 1 月至 2019 年 3 月经 3D-TOF MRA 提示单侧 MCA M1 段闭塞患者 60 例。依据 3D-TOF MRA，将患侧 ACA、PCA 出现管腔增粗、延伸走行定义为大脑动脉偏侧优势，并观察 3D-ASL 脑血流量（CBF）伪彩图提示患侧 MCA 供血区是否出现皮层及皮层下迂曲走行的条状高灌注信号。将入组患者依据有无动脉偏侧优势分为偏侧优势组和对照组，对比两组动脉内高信号检出差异。选取急性脑梗死患者 38 例，依据弥散加权（DWI）序列，测量并比较偏侧优势组与对照组梗死核心面积差异。**结果** 60 例患者中，偏侧优势组出现动脉内高信号为 87.9%（29/33），对照组组患者出现动脉内高信号为 48.1%（13/27）。急性脑梗死患者 38 例，偏侧优势组脑梗死面积（226.38±56.51mm^2）亦明显小于对照组（827.26±124.27 mm^2），两组差异有统计学意义（P<0.05）。**结论** 大脑动脉偏侧优势及动脉内高信号均可提示单侧 MCA M1 段闭塞后软脑膜侧支循环的建立，但 3D-TOF MRA 成像技术应用更易推广，而 3D-ASL 对于侧支代偿建立状态的显示更为敏感和准确。缺血性脑血管病患者的临床预后与侧支循环的建立密切相关，对于患者治疗方案的个性化选择及临床预后均具有积极意义。

PU-1986
脑白质疏松患者微出血与认知功能障碍的相关性研究

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摘要：目的 分析不同程度脑白质疏松（LA）患者发生脑微出血（CMBs）的差异，并评估 CMBs 与认知功能障碍之间的相关性。**方法** 收集 2017 年 1 月-2019 年 1 月于脑病科、康复科收治的轻、中、重度 LA 患者各 20 例，均行磁共振常规序列及磁敏感加权成像（SWI）序列检查，依据 T2FLAIR 序列图像将双侧脑室旁白质区及半卵圆中心区白质高信号数目及形态，将散在斑点状局限性白质高信号定义为轻度 LA；将局限性分布、未融合或部分融合的斑片状白质高信号定义为中度 LA：将融合成片状的白质高信号定义为重度 LA。CMBs 判定依据 SWI 序列，将直径 2-5mm、边缘清楚的斑点状或圆形低信号判定为 CMBs 病灶，并排除小静脉及钙化。分别统计不同程度 LA 患者的 CMBs 病灶数量；同时依据是否合并 CMBs 病灶，将 LA 患者分为 CMBs 组与非 CMBs 组，采用蒙特利尔认知评定量表（MoCA）分别对患者进行认知功能评估，MoCA 测评内容包括：视空间执行力、抽象力、定向力、注意力、命名、语言、记忆力 7 个维度，共计 30 分，得分越高表示认知功能越好，当得分<26 分时可认为存在认知功能损害，分数越低，认知功能越差。分析 CMBs 病灶与认知功能障碍方面的相关性。**结果** 轻度 LA 患者共检出 CMRs 病灶 36 个，中度 LA 患者共检出 CMRs 病灶 137 个，重度 LA 患者共检出 CMRs 病灶 340 个，CMBs 病灶数目随 LA 程度加重而明显增多，同时检出部位以皮层及皮层下区、基底节区域最为多见；CMBs 组患者 MoCA 评分亦低于非 CMBs 组（P<0.05）。**结论** CMBs 病灶数目与 LA 程度呈正相关，且与患者认知功能障碍亦具有明显相关性，可作为 LA 程度、患者认知功能、临床预后及疗效的临床评价指标之一。临床工作中需加强 LA 患者 CMBs 的监测及评估，通过积极开展早期防治，减少 LA 患者认知功能障碍及痴呆的发生或改善其症状，提高患者的生活质量。

PU-1987

CT 联合 MRI 诊断颅骨骨膜窦（附 1 例报告并文献复习）

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目的 探讨 CT 联合 MRI 诊断颅骨骨膜窦，提高对本病的认识及诊断水平。**方法** 回顾分析铜仁市人民医院收治并经病理证实颅骨骨膜窦 1 例患者的 CT、MRI 表现，结合国内外文献总结出颅骨骨膜窦的影像诊断要点。**结果** 颅骨骨膜窦分为先天性、获得性两种类型，本例患者已行 CT 平扫、MRI 平扫及增强检查，临床表现为额部可复性包块，触及质地软，无明显边界；CT 及 MRI 平扫示额骨内外均见软组织肿块，CT 骨窗示颅骨呈针孔样或筛孔样改变，边界清楚、锐利；MRI 平扫示病灶内出血信号，增强后病灶呈明显强化，颅骨内外病灶相连，相邻脑组织未见明显异常。**结论** 颅骨内外相连占位病变、颅骨呈针孔样或筛孔样骨质缺损以及病灶明显强化对颅骨骨膜窦诊断具有一定特征性。

PU-1988

颈内动脉先天缺如 1 例

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颈内动脉（internal carotid artery，ICA）被认为是大脑最重要的供血动脉之一，也是人体最稳定的血管之一，很少发生先天变异，颈内动脉先天性缺如最早被国外学者 Tode 于 1787 年首先发现并报道，发病率不足 0.01%。笔者就日常工作中发现的 1 例颈内动脉先天性缺如报道如下。

临床资料

患者女，58 岁，反复头晕、摇晃 1 年，伴有恶心，无呕吐，无明显视物旋转。既往无高血压、糖尿病等病史。颈部 3D CE-MRA 显示左侧颈总动脉直接延续为颈外动脉，颈内动脉未见显示。头部 3D TOF MRA 示左侧颈内动脉颅内段未见显示，左侧大脑前动脉由右侧大脑前动脉通过前交通动脉供血，左侧大脑中动脉由椎动脉通过后交通动脉供血，椎、基底动脉延长、扩张。颅底 CT 薄扫：左侧颈动脉管未见。

讨论

先天性颈内动脉缺如是一种十分罕见的血管发育异常。其具体病因尚无定论，多数学者认为在胚胎发育过程中，体内相关调控机制或外界因素干扰使颈内动脉发育停止，此时侧支循环便随之出现。根据侧枝循环不同，国外学者 Lie 将颈内动脉先天缺如分为 6 型。本例患者，属于 Lie 分型中的 A 型。影像学上，先天性颈内动脉缺如与颈内动脉闭塞均表现为颈内动脉未显影，需要对此鉴别，可以通过 CT 颅底薄扫观察颈动脉管是否完整来明确诊断。本例病人 MRA 示左侧颈内动脉未见显示，随后 CT 颅底薄扫示左侧颈动脉管未见，进一步明确左侧颈内动脉先天性缺如。当颈内动脉缺如时，会引起继发性脑血流动力学改变，可合并多种血管发育异常（如：异常分支、代偿性迂曲扩张、动脉瘤、动静脉畸形等），易出现缺血或出血性卒中。

先天性颈内动脉缺如临床症状无特异性，临床易出现误诊或漏诊，影像学血管显影检查发现颈内动脉未显影，同时 CT 骨算法显示颈内动脉管缺如，应可明确诊断为此病。对于早期无症状或症状较轻患者，一旦确诊为先天性颈内动脉缺如，应定期随访，以排除因血流动力学改变引起的脑内代偿血管的异常变化。

PU-1989

磁共振三维动脉自旋标记技术应用于急性缺血性卒中诊断的价值研究

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目的 研究磁共振三维动脉自旋标记技术对于急性缺血性脑卒中的应用价值，探讨急性缺血性卒中患者脑血流量变化情况，并与磁共振弥散成像、磁共振动脉血管成像等技术进行对比，评估其诊断价值。

材料和方法 本次实验采用前瞻性的研究方法。选取 19 例无脑血管病、脑肿瘤及其他颅脑疾病或影响颅脑血流量疾病的志愿者作为对照组，其中男性 11 例，女性 8 例，平均年龄 66 岁；选取 19 例急性缺血性脑卒中患者作为实验对象，其中男性 11 例，女性 8 例，平均年龄 66 岁。

在对照组中，结合常规扫描序列，对后处理生成的脑血流量（cerebral blood flow，CBF）图像进行分析：在一侧脑干、背侧丘脑，豆状核，额、顶叶灰、白质区域划取直径约 10mm 圆形感兴趣区，并以脑中线为对称轴，在对侧生成镜像感兴趣区，获得脑内不同部位的局部脑血流量（regional cerebral blood flow，rCBF），重复测量三次，取平均值。分析脑内不同部位脑血流量分布差异，判断 3D ASL 可靠性。

结果 19 例急性脑梗死患者中，共 3 个缺血灶、31 个梗死灶；31 个梗死灶中，CBF 阳性者 16 个，阳性率为 51.6%，其中腔隙性梗死 CBF 阳性率为 25%，非腔隙性梗死 CBF 阳性率为 80%，得出 $P<0.05$，认为腔隙性脑梗死的 CBF 阳性检出率较低。3 个缺血灶在 DWI 图像中表现为阴性，CBF 图中表现为低灌注。

对 31 个梗死灶的 ADC 值及 rCBF 值进行 ROC 统计分析，ADC 的敏感度接近 100%，特异性为 97%，ROC 曲线下面积为 0.986；CBF 组的敏感度为 70.6%，特异性为 73.5%，ROC 曲线下面积为 0.734；P 值小于 0.05。

PU-1990

三代双源 CT 全脑灌注成像中不同图像采样间隔对急性脑梗塞区与半暗带体积评估影响

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摘要
目的 探究不同时间间隔（1.5s，3.0s，1.5+3.0s）选择条件与不同的半暗带体积评估方法在三代双源 CT 对于急性脑梗死期患者缺血梗死与半暗带体积计算的影响，并分析各种种时间间隔选择时发生计算差异的原因。
方法 回顾性收集云南省第一人民医院 2019 年 4 月至 2019 年 7 月于三代双源 CT 进行神经灌注成像的急性脑梗死患者的临床信息与基础灌注图像，利用 4D 灌注中的时间排除方法，将原有的 1.5s 时间间隔的灌注图像采样间隔采用 3.0s，减少一半的采样点以模拟 3.0s 间隔扫描条件，将其定义为 2 组，同理将扫描间隔更改为 0~12s 与 27~40s 为 3.0s 间隔，第 12s~27s 为 1.5s 间隔，将此组定义为 3 组，采用三种不同的图像采样间隔分别计算梗死核心体积、缺血半暗带体积与梗死/半暗带体积比等数据并进行统计学分析，以观察相同病人上述三组数据是否存在差异。
结果 纳入本次实验研究患者 40 例，经筛选后余 23 例急性大脑中动脉供血区脑缺血患者，通过统计学分析发现 1.5s 时间间隔组的梗死体积小于 3.0s 扫描时间间隔组，经过 t 检验及秩和检验发现 1.5s 间隔组与 1.5+3.0s 混合组在梗死体积与半暗带评估上没有明显统计学差异，各组间半暗带体积没有明显差异，3.0 间隔组相对于 1.5s 间隔组，梗死体积增加，梗死/半暗带比值增加。
结论 与 1.5s 时间间隔相比，采用 3.0s 的时间间隔可能增加梗死脑组织体积的评估，对缺血半暗带体积评估没有明显影响，造成梗死/半暗带比值的增加，在临床工作中如果采用 3.0s 的时间间隔进行扫描，可能造成梗死/半暗带比值的错误估计，引起治疗与干预措施差异，甚至影响病人预后；在保证扫描峰值范围内的扫描间隔 1.5s 不变，增加峰值前后时间间隔，并不影响脑缺血梗死体积评估与半暗带体积及其相关关系的评估，在之后的低剂量扫描条件探索中有一定的指导意义。

PU-1991
静音磁共振血管成像在颅内动脉瘤诊断中的可行性研究

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目的 对比性评估静音 MRA 技术的图像质量以及诊断效价，旨在探讨静音 MRA 在颅内动脉瘤病变诊断中的可行性。
方法 收集疑似脑血管病变病例。所有病例于 CTA 检查前同日行 3.0 T MRI 扫描。两位神经放射专家采用双盲法分别对两种 MRA 图像质量（信号均匀度、病灶显著性、静脉信号或干扰以及诊断可信度等四个方面）进行评估。定量测量脑动脉瘤瘤体径值并分组（依据动脉瘤长径，分为微小动脉瘤组≤3mm，较大动脉瘤组>3mm）。图像质量评分差异比较分别采用 Wilcoxon 秩和检验。动脉瘤测量数值与 CTA 测量数值的相关性分别采用 Pearson 相关系数评价。采用 ICC 检验分别评估两种 MRA 与 CTA 间测量结果的一致性。
结果 共发现颅内动脉瘤病灶 32 例。静音 MRA 图像的信号均匀度（3.38 ± 0.49 vs. 3.00 ± 0.62，P = 0.02）以及静脉信号/干扰（3.77 ± 0.42 vs. 2.65 ± 0.48，P = 0.01）均高于 TOF MRA 图像。两种 MRA 图像的病灶显著性（3.19 ± 0.56 vs. 3.15 ± 0.46，P = 0.85）以及诊断可信度（3.27 ± 0.44 vs. 3.12 ± 0.51，P = 0.37）无统计学差异。微小动脉瘤组内，静音 MRA 以及 TOF MRA 与 CTA 结果的相关系数分别为 0.95、0.82，静音 MRA 测量结果与 CTA 结果之间呈极高度一致（0.94），TOF MRA 测量结果与 CTA 结果之间呈高度一致（0.72）；较大动脉瘤组

内，静音 MRA 以及 TOF MRA 与 CTA 结果的相关系数分别为 0.98 和 0.95，静音 MRA、TOF MRA 测量结果与 CTA 结果之间均呈极高度一致（静音 MRA，0.98；TOF MRA，0.95）。
结论 相较 TOF MRA，静音 MRA 可以提供更高的图像质量、准确率，且与 CTA 具有更高的一致性，有望进一步常规应用于颅内动脉瘤患者的临床筛查及随访复查。

PU-1992

To explore clinical Value of High-resolution magnetic resonance vessel wall imaging in the Diagnosis of carotid web

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Objective To explore the MR signal characteristics with High-resolution magnetic resonance vessel wall imaging (HR-VWI). **Methods** 16 patients with carotid web diagnosed by Computed tomography angiography (CTA), Digital Substraction Angiography (DSA) or Ultrasound (US) was collected. All of them have done cervical arteries HR-VWI near the same time with CTA or DSA, within one month. This study is aim at analyzing the carotid web's morphological structure revealed in HR-MRI and to summary its feature in MRI and to discover clinical value of High-resolution magnetic resonance vessel wall imaging in the diagnosis of carotid web. **Results** The MR morphological characteristics of carotid web: 1. Carotid web, which is an intraluminal shelf-like projection within the lumen of the carotid bifurcation, shows isointense or hyperintense in T2WI Black Blood sequence, and has obvious enhancement in T1WI contrast enhancement Black Blood sequence. 2. Carotid web sometimes looks like a venous valve in axial or coronal plane. 3.Compared to CTA, HR-VWI can demonstrate more morphological details of the web. **Conclusion** HR-VWI has advantages in showing exquisite lumen structures and it provides a more comprehensive view of the carotid web than CTA.

PU-1993

高分辨力磁共振血管壁成像在颈动脉蹼诊断应用中的价值

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目的 探索颈动脉蹼（Carotid web）的高分辨力磁共振血管壁成像（High-resolution magnetic resonance vessel wall imaging, HR-VWI）的信号特点。**方法** 选取 CTA、DSA、US 诊断明确的颈动脉蹼病例，共 16 例，分析患侧颈部血管的高分辨力磁共振血管壁成像的信号特点及探讨其应用价值。**结果** 颈动脉蹼磁共振信号特点具有以下特征：（1）颈动脉蹼在 T2WI 黑血序列矢状位上显示为颈动脉窦部后壁向管腔突起的条带状高信号，在 T1WI 增强序列上蹼呈明显强化；（2）水平位或冠状位颈动脉蹼形态可类似静脉瓣形态；（3）高分辨力磁共振血管壁成像相比 CTA 能显示动脉蹼的更多结构细节信息。**结论** 高分辨力磁共振血管壁成像能多参数、多维度的展现颈动脉蹼的结构信息，相较 CTA 具有优势。

PU-1994

小动脉瘤的血管内治疗

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目的 颅内小动脉瘤（最大直径≤3 mm）仍是神经放射介入学家们面临的一个巨大的挑战，它的长期稳定性是未知的。本研究报告了我们的长期随访结果，以评估破裂的小动脉瘤的血管内治疗的有效性。

方法 73 位患者的 73 个经血管内治疗的破裂的小动脉瘤在过去的 6 年中经过回顾性评估。这些患者接受了长达 1-78 个月的多血管造影和临床随访。

结果 所有的已破裂小动脉瘤经血管内治疗均治疗成功。27 个（37.0%）小动脉瘤达到最初的完全闭塞，39 个（53.4%）残存动脉瘤颈，7 个（9.6%）残存动脉瘤。4 个（5.5%）小动脉瘤发生过程中破裂，2 个小动脉瘤发生血栓事件。59 个（80.8%）已破裂小动脉瘤在最初的血管内治疗后经过至少 12 个月的血管造影随访。有 10 个（16.9%）小动脉瘤经过再治疗，其中包括 9 个（15.3%）再通的小动脉瘤。最后完全闭塞的小动脉瘤有 43 个（72.9%），残存瘤颈的有 15 个（25.4%），残留动脉瘤的有 1 个（1.7%），渐进性闭塞的有 12 个（20.3%）。没有与手术相关的死亡率或远期再出血。

结论 长期随访血管造影结果表明血管内治疗对已破裂小动脉瘤有效，且相关的手术过程中破裂和再通发生率低，渐进性闭塞率高，尤其是支架辅助弹簧圈技术。

PU-1995

3.0T 磁共振常规 flair 序列与 SWI 序列对脑微出血的诊断价值

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目的 分析并对比 3.0T 磁共振常规 flair 序列与 SWI 对脑内微出血病灶诊断中的应用价值，提高患者微量出血病灶的检出率从而提高对患者脑微出血风险评估的准确性.方法 选择本院 2017 年 1 月至 2017 年 10 月收治的 80 例脑微出血患者,对患者进行 flair 序列及 SWI 序列分组扫描,对比 flair 序列组及 SWI 序列组扫描结果.结果 80 例脑微出血患者中,FLAIR 序列提示有 45 例脑微出血，共检出 265 个病灶，SWI 提示 80 例全为脑微出血，共检出 413 个病灶. Flair 序列的脑微出血检出率为 (45/80)56.25%,低于 SWI 的(80/80)100.00%,表明 SWI 对于脑微出血的检出率显著高于 Flair 序列,差异具有统计学意义(P＜0.05).结论 磁共振中 SWI 序列比常规 flair 序列更能客观的显示脑微出血的病灶数目、 部位,病灶大小,利于脑微出血的诊断,可利于进一步临床治疗的开展,减少脑微出血的相关并发症,进而提高患者的生活质量,如有条件可作为磁共振的常规检查序列.

PU-1996

外流角：一种诊断顶端有血管分支的脑血管突起的简便方法

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目的 通过 5 个临床案例介绍一种名为外流角的新的方法。这种方法可以提高利用 MRA 图像诊断顶端有血管分支的脑血管突起的准确率。

方法 我们选取了 5 个患者（2 男 3 女）。首先，这 5 个患者的 7 个脑血管突起分别成像在 MRA 和 DSA 图像上。然后我们通过外流角和金标准 DSA 两种方法诊断这些突起。最后我们比较通过外流角和 DSA 两种方法得到的结果以检验外流角方法的可行性。

结果 通过 DSA 诊断结果表明，这 7 个突起中有 4 个是颅内动脉瘤，3 个是圆锥。这四个颅内动脉瘤的外流角均≥90°，平均为 119.75°，3 个圆锥的外流角均<90°，平均为 58.20°。外流角的诊断结果与 DSA 的诊断结果完全吻合。

结论 外流角为诊断顶端带血管分支的突起提供了一个简便的方法，它尤其适用于缺乏临床经验的年轻医生。它可作为鉴别顶端带有血管分支的颅内动脉瘤和圆锥的判别式。

PU-1997
磁共振弥散加权成像联合血管成像对急性脑卒中血管病变的评估价值

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[摘要]目的 探讨磁共振弥散加权成像（DWI）联合血管成像（MRA）对急性脑卒中血管病变的评估价值。方法 选择 2018 年 1 月至 2018 年 9 月在经我院临床确诊的急性缺血性患者作为研究对象，所有患者均行 DWI、MRA 和 CTPI 检查，观察 DWI 联合 MRA 的检出率。结果 DWI 检出缺血性脑卒中患者 84 例，检出率 89.36%。DWI 检测显示缺血病灶平均 ADC 值、CBF、CBF 均低于健侧，TTP 高于健侧，均有统计学意义（P＜0.05）。88 例 MRA 图像存在明显的异常血管，阳性率 93.62%。DWI 联合 MRA 检出率显著高于单纯 DWI、MRA 和 CTPI 检查，差异均有统计学意义（P＜0.05）。CTPI 检查显示有 85 例患者灌注异常区，主要表现为 CBF、CBF、MTT 降低和 TTP 延长（P＜0.05）。结论 DWI 联合 MRA 对超急性期缺血性脑卒中患者进行检查，可从多角度进行综合评价分析，具有理想的早期诊断效果，有利于早期为临床医师提供明确诊断。

PU-1998
自发性脑出血血肿扩大的 CT 征象分析研究

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目的 自发性脑出血（intracerebral hemorrhage，ICH）是一种严重的神经系统疾病，血肿扩大约占 ICH 患者的三分之一，是病情恶化、预后不良的一项独立影响因素。预测 ICH 血肿扩大，有利早期进行手术等治疗干预，有助于改善患者预后。本研究主要总结 ICH 血肿扩大的 CT 征象及预测效能，分析这些征象对 ICH 血肿扩大预测的优势及局限性。**方法** 对目前国内外公开发表的关于 ICH 血肿扩大通过 CT 成像预测的文献进行综述。对斑点征、渗漏征、混合征、黑洞征和岛征等征象进行认识和评估。**结果** 这些征象简单、方便，易于评估，为部分 ICH 患者血肿扩大提供了科学的依据；但在多数医疗中心对于怀疑脑卒中（包括脑出血）的患者，CT 平扫常为首选检查，大部分患者“点征”及“渗漏征”等无法评估；上述征象出现的阳性率较低；预测性能不理想、尤其是敏感性较低，血肿扩大漏诊率高；这些征象均通过人肉眼评估，或结合简单的 CT 值测量完成，与观测者的经验密切相关，并且存在一定的主观性；这些征象没有考虑患者的凝血状态、血压等个体因素。**结论** CT 常规征象对 ICH 患者血肿扩大具有一定的价值，但通过这些征象对 ICH 血肿扩大进行预测存在较多的局限性，有待于进一步深入研究。

PU-1999
弥散加权成像评估无运动障碍脑卒中患者短期预后的应用研究

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目的 本研究旨在探讨 DWI 阳性与阴性在预测无运动障碍脑卒患者预后的意义。**方法** 从 2103 年至 2017 年，根据纳入排除标准 264 例缺血性脑卒中患者纳入到本研究中。收集患者的临床资料和 MRI 图像信息，并对所有患者进行为期 1 年的随访，并收集随访期间患者卒中复发情况、认知功能损伤情况及 mRS 评分进行相关评估。**结果** 从发病至进行 MRI 检查的平均间期为 4 天，其中接近约 1/3（76/264，29%）的无运动障碍脑卒中患者表现为 DWI 阴性，DWI 阴性率与 DWI 阳性率之间无明显差别。而在 1 年的随访过程中，76 例 DWI 阴性患者中有 11 例（14%）出现复发脑卒中或者短暂性脑缺血发作，33%患者出现认知功能障碍，40%患者 mRS 评分大于 1 分。与 DWI 阴性患者比较，DWI 阳性的患者更倾向于出现新发病灶（14% VS 2%，p=0.02）。

结论 约 1/3 无运动障碍脑卒中患者表现为 DWI 阴性。DWI 阳性患者与 DWI 阴性患者间的预后无明显差异。

PU-2000
高 b 值弥散加权成像在短暂性脑缺血发作中的应用研究

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目的 探讨与常规 b 值（b=1000s/mm2）弥散加权成像（diffusion weighted imaging, DWI）相比，高 b 值（b=2000 s/mm2 或 b=3000 s/mm2）DWI 是否对短暂性脑缺血发作（transient ischemic attack, TIA）的检测更敏感。**方法** 收集 2012 年 9 月至 2015 年 8 月在我院急诊神经内科就诊并住院治疗的 TIA 患者 60 例，TIA 的诊断依据第四届全国脑血管病会议制定的标准。所有患者于发病后 24h 内接受常规磁共振检查和不同 b 值的 DWI 扫描（b=1000 s/mm2、b=2000 s/mm2、b=3000 s/mm2）。比较不同 b 值检测的 TIA 责任病灶的数量、体积、信号强度和病灶差异。**结果** 当 b=1000 s/mm2 时，38 例 TIA 患者检测到与 TIA 症状相关的急性缺血性病灶。提高 b 值后，DWI 对急性缺血性病灶的敏感性并没有提高。随着 b 值的提高，检测到的缺血性病灶平均体积增加，b=1000 s/mm2 时，病灶体积为 0.17cm3（IQR：0.15cm3）；b=2000 s/mm2 时，病灶体积为 0.21cm3（IQR：0.18cm3）；b=3000 s/mm2 时，病灶体积为 0.29cm3（IQR：0.23cm3）。此外，我们发现随着 b 值的提高，正常的白质信号强度也随之增加，可能会造成急性缺血性病灶的假阳性率增加。**结论** 高 b 值 DWI 有助于显示 TIA 责任病灶的体积，但对 TIA 后检测急性缺血病灶的敏感性并没有提高。

PU-2001
颈动脉闭塞患者 Willis 环的完整性与 FLAIR 血管高信号征的相关性研究

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目的 探讨颈动脉闭塞患者 Willis 动脉环的完整性与磁共振 FLAIR 血管高信号征是否存在相关性。方法颈动脉闭塞患者 50 例，入院 1 h 内完成测量 NIHSS 评分，24 h 内完成头颅磁共振 T1、T2、DWI、FLAIR 序列及头颅＋颈部的磁共振血管成像检查。采用 Stephane Olindo 法对入组患者磁共振 FVH 进行评分，分为低 FV H 评分组（FVH＜4，包括 FVH＝0）和高 FVH 评分(FVH≥4)。Willis 环形态分为四型，Ⅰ型：Willis 环完整；Ⅱ型：Willis 环前循环完整后循环不完整；Ⅲ型：Willis 环前循环不完整后循环完整；Ⅳ型：Willis 环前、后循环均不完整。结果 50 例患者中低 FV H 评分组 23 例，高 FV H 评分组 27 例。两组间 Willis 环的总体形态分布比例存在差异；两组梗死体积分别为 52. 7 和 11，NIHSS 评分则分别为 9 分和 3 分，差异均有统计学意义（P＜0.05）。一般危险因素差异无统计学意义（P＞0.05）。结论颈动脉闭塞患者 Willis 环交通支的开放与 FVH 存在显著相关性，Willis 环侧支循环开放可能是 FVH 产生的重要机制。

PU-2002
CT 评价急性大脑中动脉闭塞患者侧枝循环的方法

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多项大型多中心研究证明因部分急性脑血管闭塞导致的急性缺血性脑卒中患者进行血管内治疗（机械取栓），取得血管再通后可获得良好的临床预后，这和其侧支循环情况密切相关。且侧支循环好，符合入组条件的患者可延长取栓时间窗，最长可延长至发病后 24 小时，使更多的患者获益。故对该类患者侧支循环做出正确评估至关重要，可帮助评估患者病情及临床决策。CT 成像速度快、相对无创，后处理简单，在急诊应用广泛，常用的有单相脑血管成像（CTA）、多相 CTA 及头颅灌注成像（CTP）等，评估方法也多种多样，如 Tan 评分，ASPECTS 侧枝循环评分，OIS 评分及软脑侧侧枝评分系统等。

PU-2003
毛细血管指数评估急性缺血性脑卒中患者侧枝循环

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【目的】评价毛细血管指数（capillary index score，CIS）用于 CTA 评估急性大脑中动脉闭塞患者侧枝循环与 DSA 的一致性。【材料与方法】回顾性分析我院 2016-2017 年发病十二小时以内急性缺血性脑卒中患者 33 例，同时完成头颅平扫、头颅 CTA 及 DSA 检查，根据 CIS 评分标准对患者的头颅 CTA 及 DSA 进行侧枝循环评分，CIS≥2 分定义为侧枝循环良好（gCIS），CIS<2 定义为侧枝循环不良（pCIS）。以 DSA 为金标准，检验 CTA 及 DSA 用 CIS 评分评价侧枝循环的一致性。【结果】CTA 和 DSA 评分一致的患者有 22 例，分级一致的有 29 例。CTA-CIS 分级与 DSA-CIS 分级具有较高的一致性（Kappa=0.71）。【结论】CIS 评分用于 CTA 可评估急性大脑中动脉闭塞导致的缺血性脑卒中患者的侧枝循环情况，并与 DSA 一致性较高。

PU-2004
高级血管分析软件与容积 CT 数字减影血管造影提高 CTA 去骨效果的可靠性研究

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目的 评价高级血管分析软件（AVA）与容积 CT 数字减影血管造影（VCTDSA）技术在正常头颈 CTA 中去骨效果的可靠性。**方法** 分析重庆医科大学附属第一医院 30 名正常头颈 CTA 受检者的影像资料。同一操作者使用 AVA 软件和 VCTDSA 对原始图像去骨，记录自动去骨、手动去骨及总去骨时间，从血管完整性、图像质量、假性血管狭窄三方面评价 VR 和 MIP 图像。去骨时间比较用非参数 Mann-Whitney U 检验；血管完整性用配对卡方检验；图像质量和假性血管狭窄评价用相关样本的秩和检验。**结果** VCTDSA 自动去骨、手动去骨及去骨总时间分别为 14.5（13，20.25）s、399（353.75，501.75）s 及 415.5（371.5，516）s，AVA 自动去骨、手动去骨及去骨总时间分别为 116.5（109，123.25）s、11.5（0，71.25）s 及 140（115.5，188）s，AVA 手动去骨和去骨总时间短于 VCTDSA，（P<0.01）； M4～M5、大脑桥静脉、上矢状窦、横窦、乙状窦 AVA 显示率为 0，VCTDSA 显示率达 93.33%（140/150），（P<0.01）；图像质量，ICA2 及 ICA6，VCTDSAⅠ级图像分别为 86.21%（25/29）及 96.55%（28/29），AVA Ⅰ级图像为 44.83（13/29）及 58.62%（17/29），VCTDSA 优于 AVA，（P<0.01）；假性血管狭窄发生率，VCTDSA1.41%（10/711），AVA1.13%（8/711），差异无统计学意义（P>0.01）。**结论** 与 AVA 比较，VCTDSA 技术可真实可靠去除头颈 CTA 三维图像的骨质，应作为 CTA 优选去骨方法。

PU-2005
颅脑可逆性后部脑白质病 MRI 诊断分析

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目的 探讨可逆性后部脑白质病综合征（PRES）的 MRI 及临床特点。
方法 回顾性分析 15 例 PRES 患者的 MRI 表现及临床资料，所有患者均接受 MRI 平扫检查，包括常规 T2 WI 、T1 WI 、FLAIR 序列扫描、DWI ，5 例行 MRV 检查，15 例经治疗后复查 MRI 。

结果 15 例患者均有突发性血压升高病史，其中 6 例为先兆子痫或子痫，高血压病 3 例，肾功能不全 1 例。病变主要累及顶枕叶白质区，其次为额叶、基底节区，MRI 呈对称性长 T1 长 T2 信号，FLAIR 为高信号，DWI 为等信号，ADC 图呈高信号 13 例，2 例为等信号。15 例复查 MRI 脑白质病灶完全恢复。

结论 MRI 对 PRES 可作出明确诊断，其典型征象为双侧顶枕叶白质区多发对称性血管源性水肿，FLAIR 、T2WI 序列显示病灶最佳，DWI 、MRV 在鉴别诊断中具有重要意义。

PU-2006

不同位置近期皮层下小梗死演变结局存在差异

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研究背景：

近期皮层下小梗死（RSSIs）与腔隙性梗死是两个不同的概念，腔隙性梗死特指会演变为腔隙灶的 RSSIs，而 RSSIs 除了演变为腔隙灶外，还可能转变为白质高信号，甚至消失。有研究指出演变为腔隙灶的 RSSIs 意味着更为严重的脑组织损伤，然而到目前为止，与 RSSIs 转归相关的因素尚不明确。这可能是由于先前研究没有把 RSSIs 的发生位置考虑进来。RSSIs 主要累及三个部位，包括脑桥区、皮层下白质区域和基底节区域，这三个区域的血流灌注水平和白质结构病变累及程度均存在差异，因此我们推测不同区域 RSSIs 的演变模式可能存在差异，且调控其演变的因素也可能不同。

方法学：

共纳入 140 个存在随访 MRI 且随访时间大于 3 个月的 RSSIs，根据基线 DWI 将 RSSIs 划分为三个区域即脑桥区，基底节区和皮层下白质区。根据随访 T2FLAIR 和 T1 将皮层下小梗死的转归结局划分为形成腔隙灶和未形成腔隙灶两种，分别记录病灶基线临床特征和影像学特征。

结果

皮层下小梗死在各个区域的发生率分别为：比较基线状态发生于不同位置的 RSSIs 的危险因素和病灶特征，我们发现脑干区域 RSSIs 的病人相比于另外两个区域糖尿病发生率更高（P=0.020）而发生皮层下白质区域 RSSIs 的病人全脑白质高信号相对于相比于另外两个区域更严重（ P=0.006）。结合随访影像学的 T2FLAIR 和 T1，我们发现基底节区 RSSIs 相比于脑桥和皮层下白质区更容易演变为非腔隙灶（P=0.015）。在多因素回归分析中，基底节区 RSSIs 转为为腔隙灶与基线病灶有关（P=0.010），而皮层下白质 RSSIs 和周围白质高信号越密切则更容易转变为腔隙灶（P=0.005）。

结论

不同区域 RSSIs 形成腔隙灶比例不同且影响其演变进程的因素也存在差异，皮层下白质区域 RSSIs 形成腔隙灶主要受到周围白质高信号的影响，这意味着该区域梗死后可能需要不同的预后治疗方案。

PU-2007

Care kV 联合 Care Dose 4D 和 SAFIRE 迭代重建技术在头颈部 CTA 的应用研究

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目的 探讨 Care kV 联合 Care Dose 4D 和 SAFIRE 迭代重建技术在头颈部动脉 CT 血管成像（CTA）中的应用价值。

方法 收集临床怀疑头颈部动脉狭窄的 50 例患者。随机分为 2 组，各 25 例，分别行双源 CT 对照组（固定 120 kV+固定 120 mA+FBP）和实验组（Care kV+Care Dose 4D+SAFIRE）头颈部 CTA 检查。记录双侧颈总、颈内、大脑中动脉的的 CT 值、噪声值（SD）、CT 容积剂量指数（$CTDI_{vol}$）、剂量长度乘积（DLP），并计算出图像信噪比（SNR）、对比噪声比（CNR）、图像灵敏度（FOM）及有效剂量（ED）等值。由两名高年资放射科医师采用双盲法，用 5 分法对图像质量综合评分。选用 Mann-Whitney U 非参数秩和检验或独立 t 检验对两组病例的年龄、BMI、动脉 CT 值、SNR、CNR、SD、$CTDI_{vol}$、DLP、ED、FOM 和图像质量评分进行统计分析。采用 *Kappa* 检验分析观察者间评分的一致性。

结果 $CTDI_{vol}$、DLP、ED 在两组间均有显著差异（Z=-6.32、-5.972、-5.224，P 值均小于 0.001）；其中实验组 ED 较对照组下降约 43.5%。实验组 FOM 在右颈总、右颈内动脉层面明显高于对照组（Z=-4.07、-3.189，P 值均小于 0.05），余层面未见明确统计学差异（P>0.05）。两组间的年龄、BMI、动脉 CT 值、SNR、CNR、SD 均未见明确统计学意义差异（P 值均大于 0.05）。实验组及对照组图像质量主观评分分别为（4.37±0.47）、（4.30±0.45）分；两者间无统计学差异（t=0.182，P=0.675）。两名高年资放射科医师对图像质量评分一致性较高（*Kappa*=0.778，P<0.05）。

结论 Care kV 联合 Care Dose 4D 和 SAFIRE 迭代重建技术行头颈部动脉 CTA 检查，可保证图像质量的同时，明显减低辐射剂量。

PU-2008

脑梗塞与 Willis 环完整性的相关性研究

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目的 探讨脑梗塞患者 Willis 环完整性的相关性分析。材料与**方法** 回顾性分析 70 例脑梗塞患者，根据 Willis 环的形态分型，分析脑梗死患者的 Willis 环形态特点；按梗死部位将所有患者分为前循环梗死、后循环梗死及混合性梗死，分析 Willis 环完整性与梗死部位的关系。用 SPSS19.0 建立数据库统计分析数据。**结果** 1.前循环梗死：16 例，后循环梗死：14 例，混合性梗死：40 例。2.Willis 环各型的分布在不同梗死部位间有统计学差异。3.混合梗死比前循环梗死和后循环梗死的例数都多。**结论** 1.脑梗死患者的 Willis 环整环完整者较少见。2.Willis 环 IV 型在混合性梗死中最常见。

PU-2009

子痫/子痫前期合并可逆性后部脑病综合征的磁共振成像表现及临床分析

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目的 探讨可逆性后部脑病综合症（PRES）的磁共振成像特征表现及临床特点。方法 回顾性分析鼓楼医院 2014 年 1 月-2017 年 8 月期间 22 例子痫-子痫前期合并可逆性后部脑病综合症患者的磁共振成像表现及临床资料。结果 MRI 检查显示病灶分布在小脑 3 例，脑干 2 例，枕叶 18 例，顶叶 15

例，岛叶 4 例，颞叶 7 例，额叶 11 例，基底节区 11 例，大部分为双侧累及。其中,累及至皮层 15 例,DWI 高信号 8 例。临床表现高血压 22 例,视物模糊 4 例,下肢浮肿 4 例,头痛 7 例,抽搐 3 例。所有患者经治疗后,症状均有明显好转或消失。结论 可逆性后部脑病综合症的影像学和临床表现具有一定的特征与联系，能够助于早期准确的鉴别、诊断。

PU-2010
烟雾病原发性脑室出血空间分布的磁共振成像研究

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目的 探讨烟雾病原发脑室出血点的位置及空间分布特点。
材料与**方法** 有原发性脑室内出血的烟雾病患者为入组的条件。纳入标准如下：1）在进行磁共振扫描时，无近期出血性发作至少 2 个月，并且能够独立完成日常活动（改良 Rankin 量表评分 0-2）;2）年龄<65 岁。 通过数字减影血管造影（DSA）和计算机断层扫描（CT）分别确定烟雾病和原发性脑室出血的诊断。
结果 在用初始通过 CT 扫描的 30 例患者中，通过 MRI 成像的评估了 37 个原发性脑室出血的出血位置。 仅通过 CT 的评估，评估者对于出血侧及出血位置的准确诊断的百分比分别是 33/37（89.2%）和 25/37（67.6%）。 当同时用 CT 和 3D TOF MRA-SWI 成像评估出血侧及出血位置时，评估者诊断准确的百分比分别是 37/37（100.0%）和 35/37（94.6%），评估者提供了相对准确的诊断。 两种评估方法，出血侧及出血位置的差异有统计学意义（p = 0.044，p = 0.001）。在 30 例患者的 37 处出血位置中，第四脑室及侧脑室的枕角均未发现出血，第三脑室外侧壁的室管膜下区域有 1 例（2.7%），侧脑室颞角的内侧壁 2 例（5.4%），侧脑室前角外侧壁 4 例 （10.8%），侧脑室三角部的前外侧壁 8 例（21.6%），侧脑室体部 22 例（59.5%），包括内侧壁 5 例（13.5%），外侧壁 17 例（45.9%）。 值得注意的是，与一次出血位置相比，再出血部位的患者在侧脑室后外侧壁的室管膜下区域（33.3%vs.12.0%，p = 0.183）和侧脑室三角部的前外侧壁（33.3% vs. 0.0%，p = 0.007）具有潜在的高发率。
结论 高分辨 SWI 序列可以确定出血点分析出血位置的空间分布的特点。

PU-2011
多模态磁共振成像在急性缺血性脑卒中溶栓治疗的研究

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【摘要】目的:探讨多模态磁共振扫描模式对急性缺血性脑卒中患者溶栓治疗前后的临床应用价值，早期遏制病变发展、逆转损害的神经功能。**方法** 选取 56 例急性缺血性脑卒中患者，且在溶栓前、后分别进行多模态磁共振成像扫描，包括：T1WI、T2WI、液体衰减反转恢复序列（fluid attenuated inversion recovery imaging，FLAIR）、扩散加权成像（diffusion weighted imaging，DWI）、3D 动脉质子自旋标记灌注成像（3D-Arterial Spin-Labeling magnetic resonance perfusion weighted imaging，3D-ASL）及脑血管成像（magnetic resonance angiography，MRA）检查，应用自动后处理软件对 DWI、3D-ASL 图的患侧及健侧作感兴趣区（ROI）并进行统计学分析。**结果** 3D-ASL 在急性缺血性脑梗死溶栓前、后具有显著差异性（=-6.354，=0.00，<0.05）；DWI 在急性缺血性脑梗死溶栓前、后无明显差异（=-0.232，=0.824，

>0.05）；DWI 和 FLAIR 之间不匹配可评估梗死大致发病的时间窗；MRA 可以较好的评价溶栓治疗前后脑内大血管管腔狭窄、信号缺失等影像表现或闭塞血管周围侧支循环的形成情况。**结论** 对急性缺血性脑卒中者采用多模态磁共振扫描方案，预测梗塞发病时间，评估梗塞后早期侧支循环建立及缺血半暗带的形成，为临床尽早溶栓介入治疗，提高患者生活质量具有重要意义。

PU-2012

硬脑脊膜动静脉瘘 MRI 征象分析

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目的 探讨硬脑脊膜动静脉瘘的 MRI 表现，提高对该病的诊断水平，更好地指导临床治疗。
方法 收集我院 2015 年至 2017 年经 DSA 证实的硬脑脊膜动静脉瘘 9 例，年龄 49-80 岁。全部患者接受了头颅 3.0T MR 平扫、增强及 DWI 序列检查，回顾性分析其 MRI 特点。
结果 7 例硬脑膜动静脉瘘患者脑实质病灶 T2WI 高信号，并伴肿胀；DWI 序列呈等信号，增强扫描可发现病灶周围多有异常增粗、增多小血管。4 例 MRA 及 MRV 原始图可发现病灶周围增粗小血管断面。3 例 SWI 多可发现病灶周围迂曲、增粗的小静脉，2 例硬脊膜动静脉瘘可见椎管内脊髓后方增粗迂曲血管流空信号，并可见相应节段脊髓 T2WI 高信号。
结论 高场强 MRI 对硬脑脊膜动静脉瘘的诊断具有很高的敏感性及特异性，尤其增强序列对于鉴别硬脑脊膜动静脉瘘与其它脑血管病具有独特优势；同时 MRI 可清晰显示动静脉瘘继发性脑脊髓实质病变。有助于临床医生对硬脑脊膜动静脉瘘 MRI 表现及其特点有一个直观、全面的认识，对临床治疗方案的制定提供客观依据。

PU-2013

磁敏感成像在出血性脑梗死中的临床诊断价值

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目的 针对出血性脑梗死患者进行磁敏感成像序列的临床扫描分析。方法选取 2018 年 1—12 月在我院就诊的脑梗死并发出血的患者进行 CT 和 MRI 常规及磁敏感成像序列(SWI)扫描,。结果在 60 例患者中,检查出脑梗死并发出血病灶数 210 个,其中,A 型的有 112 个,B 型的有 98 个。A 型主要是位于患者的基底节区、侧脑室旁,形状以圆形、卵圆形为主,并且边界清晰。B 型主要以不规则的小条片为主,多发生在梗死的病灶内部。在检出率结果上,也以 SWI 的检出率更高,而其他检查方式中,MRI 常规扫描有 42 例,CT 则有 32 例,均低于 SWI。通过卡方检测,不同的扫描序列的检测结果差异存在统计学意义(P <0.05)。结论采用磁敏感加权成像扫描能够检查出脑梗死并发出血病灶,能对该疾病的分型进行具体情况的分析,有利于疾病的治疗和后期的改善。

PU-2014

磁共振峰度成像在缺血性脑梗死分期的临床价值研究

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研究目的 通过运用磁共振弥散峰度成像技术（DKI）研究临床确诊缺血性脑梗死病例不同时期（急性期、亚急性期、慢性期）的平均峰度（MK）值和 rMK 值（梗塞病灶 MK 值/对侧正常组织 MK 值）的差异，探讨缺血性脑梗死脑组织细微结构的演变过程，评估 DKI 相关参数对缺血性脑梗死的量化分期价值。

材料与方法 采用 GE 3.0 T 磁共振仪，对选取的临床诊断为缺血性脑梗死（急性期）患者 27 例行常规 MR、DKI 扫描，并于亚急性期及慢性期对上述患者再次行磁共振扫描，分别测量比较三组内病灶区的平均峰度（MK）值和 rMK 值（梗塞病灶 MK 值/对侧正常组织 MK 值）的差异，了解其变化情况。

结果

（1）脑梗死急性期损伤区域的 MK 值较对侧正常组织增高，具有统计学差异(P>0.05)。

（2）脑梗死病灶急性、亚急性、陈旧性三者 rMK 值比较为急性＞亚急性＞陈旧性。

结论 运用 DKI 技术可以检测到缺血性脑梗死患者脑组织细微结构的受累改变，表现为 MK 值和 rMK 值随梗死时间进行性减低，其中 rMK 值较敏感，提示 DKI 相关参数值具有特征性的演变规律，有望对缺血性脑梗死进行量化分析，有助于临床评判脑缺血时间，为溶栓和神经保护治疗奠定基础。

PU-2015

磁敏感加权成像在脑内海绵状血管瘤诊断中的价值

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目的 探讨磁敏感加权成像(SWI)在脑内海绵状血管瘤诊断中的价值。**方法** 对 20 例海绵状血管瘤进行常规 MRI 扫描及 SWI 扫描，将 SWI 图像与常规 MR 序列对比分析。由 2 名放射科医师对 MRI 常规序列图像及 SWI 图进行独立诊断及计数，比较不同序列计数的差异性，并分析两名医师组间的一致性。**结果** 20 例海绵状血管瘤，单发 14 例，多发 6 例，SWI 检出病灶 38 个；常规扫描序列检出病灶 25 个；SWI 检出数目多于常规序列。SWI 同时检出 3 例静脉畸形，而常规 MR 序列只发现 1 例。海绵状血管瘤在常规序列上呈圆形、类圆形或不规则形，T1WI 表现为低信号或稍高的不均匀信号，T2WI 表现为中央混杂高信号，边缘低信号，呈“爆米花样”改变。SWI 序列上大多病灶为完全低信号，部分病灶中心可见斑点状略高信号（图 1）。 Wilcoxon 秩和检验：常规 MRI 序列与 SWI 发现病灶数量的差异性有显著的统计学意义（P<0.05）。ICC 评价 2 位评估者组间的一致性：两位医师应用 SWI 检出病灶的数目在组间有较高的一致性，一致性相关系数为 0.98 (95% CI 0.96 to 0.99)。

结论 SWI 对脑内海绵状血管瘤诊断的敏感性高于常规 MRI 序列，特别是对于小病灶的显示优于常规 MRI 序列。

PU-2016

CT 后处理图像增强显示系统在靠近颅底部小动脉瘤诊断中的应用

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目的 利用 CT 后处理图像增强显示系统对近颅底部小动脉瘤患者进行研究，来充分证明此系统对于近颅底部的小动脉瘤的诊断价值。
方法 选择 42 位经外科手术证实为近颅底部小动脉瘤的患者，回顾性分析传统 CT 工作站图像及图像增强显示后的 CTA 图像，并对图像做出诊断，同时测量、记录动脉瘤的直径、动脉瘤的位置。以 DSA 结果作为诊断的金标准，将所得结果与 DSA 结果进行对比分析。
结果 在 42 例患者中，共确诊 45 个动脉瘤。传统的 CT 工作站上共发现了 47 个动脉瘤，其中假阴性 1 例、假阳性 3 例；而 CT 图像增强立体显示系统上共发现了 46 个动脉瘤，其中假阳性 1 例。
结论 增强显示系统可以提高 CTA 对靠近颅底部小动脉瘤的诊断能力。另外，增强显示系统所呈现的立体效果，还可以清楚的显示小动脉瘤与周围骨质结构的三维解剖关系，从而提高对颅内动脉瘤的术前评价能力，以帮助神经外科医生进行手术入路的选择和手术方案的制定。

PU-2017
颅内动脉粥样硬化性狭窄患者斑块三维高分辨率磁共振成像强化特征与卒中发生时间的相关性研究

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目的 采用三维高分辨率(3D-HR MRI)磁共振成像技术评估颅内动脉粥样硬化性狭窄患者责任斑块的强化特征，分析斑块强化特征与卒中发生时间的相关性。方法 根据卒中发生至 HR MRI 检查的时间间隔，将 61 例脑梗死患者分为早期组(<4 周)、中期组(4～12 周)和晚期组(>12 周)，行常规头颅 MRI 检查，以及三维可变翻转角快速自旋回波 (3D-SPACE) T_1WI 及增强 3D-SPACE T_1WI 序列扫描，将斑块增强前、后信号强度进行对比，定性分析斑块的强化程度，定量计算斑块的强化率，分析斑块强化特征及其与卒中发生至 HR MRI 检查时间之间的关系。结果 3D HR MRI 上责任斑块表现为管壁心增厚，增强后呈不同程度强化或者无强化。分析 61 例斑块强化特点结果显示：早期组 26 例斑块明显强化 21 例(80.8%)，轻度强化 4 例(15.4%)，无强化 1 例（3.8%），强化率为(80.49±18.64)%；中期组 20 例斑块明显强化 2 例 (10.0%)，轻度强化 14 例 (70.0%)，无强化 4 例 (20.0%)，强化率为(52.09±18.17)%；晚期组 15 例斑块轻度强化 2 例(13.3%)，无强化 13 例(86.7%)，强化率最为(12.16±10.44)%。3 组间强化程度及强化率差异有统计学意义（均 P<0.01）。进一步分析，早期组和中期组强化程度及强化率差异有统计学意义（均 P<0.01），中期组和晚期组强化程度及强化率差异有统计学意义(P<0.05;P<0.01)，早期组和晚期组强化程度及强化率差异有统计学意义（均 P<0.01）。卒中发生至 HR MRI 检查的时间与强化率呈显著负相关（r=－0.903，P<0.01）。结论 随着发病时间间隔的延长，颅内动脉粥样硬化斑块的强化逐渐减弱，为由强化程度判断斑块的易损性提供了依据，对缺血性脑卒中的二级预防具有重要的指导意义。

PU-2018
双源 CTA 与 DSA 对颅内动脉瘤诊断的比较研究

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摘要 目的 应用双能量 CT 血管造影（DSCTA）与数字减影血管造影（DSA）的比较研究，探索和评价双源 CTA 在颅内动脉瘤诊断中的临床应用价值。 **方法** 收集 2016 年 1 月-2018 年 12 月我院 92 例怀疑颅内动脉瘤患者的 DSCTA 及 DSA 资料进行回顾性分析，所有患者均在我院双源 CT（Siemens Somatom Definition）行头颈部血管双能量成像。所有病例均采用 CTA 后处理技术容积再现（VR）、最大密度投影（MIP）和多平面重建（MPR）。**结果** DSA 和手术证实 92 例共 108 个动脉瘤，其中单发 82 例，多发 10 例（8 例 2 个动脉瘤，2 例 3 个动脉瘤）；DSCTA 发现 103 个动脉瘤，漏掉 5 个动脉瘤，直径均小于 2-3mm。DSCTA 对颅内动脉瘤的敏感度为 95.4%，特异度为 90.8%；DSA 敏感度为 97.9%，特异度为 95.9%。108 个动脉瘤中，103 个（95.4%）动脉瘤在 VR 图像上能清晰显示瘤体、瘤颈与载瘤动脉的三维空间关系，DSA 为 69 个（63.9%）。**结论** 双源 DSCTA 可无创、快速地诊断和评价颅内动脉瘤，也可以旋转，从多角度、多方位、立体展示瘤体及瘤颈，能清楚地显示颅内动脉瘤的位置、形态和大小，具有创伤小、费用低、检查时间短的特点，是检查颅内动脉瘤高度敏感的影像学方法，具有与 DSA 相当的价值，值得临床推广应用。

PU-2019
血液透析患者血管周围间隙扩张与超滤量的相关性研究

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目的 探讨血液透析患者血管周围间隙扩大(enlarged perivascular space,EPVS)及严重程度与超滤量的相关性.
方法 前瞻性收集 2018 年 10 月至 2019 年 2 月在首都医科大学附属北京友谊医院血液净化中心常规透析治疗的终末期肾病患者 50 例和年龄性别匹配的健康志愿者 50 例.所有患者均行头颅 MRI 检查(包括 T1BRAVO 序列、T2WI 序列、动脉自旋标记（ASL）序列等),分析两组患者 EPVS 数量和解剖学分布,应用 VBM 技术检测脑白质的体积情况，应用 ASL 技术观察白质灌注情况。
结果 与对照组比较，血液透析组血管周围间隙扩张更加严重，且随着透析时间的增加，EPVS 评分有增加的趋势；与对照组比较，血液透析组在半卵圆中心区及分水岭区脑 CBF 值增加，位置大体与 EPVS 分布位置一致。与对照组比较，血液透析组在半卵圆中心区及分水岭区 WMV 减低，位置大体与 EPVS 分布位置一致；与低分组（1 分、2 分）比较，高分组（3 分、4 分）的白质体积减小有差异（P＜0.05），有统计学意义。血管周围间隙扩张程度与超滤量呈正相关。
结论 血液透析患者与健康志愿者比较，EPVS 评分较重，并与透析时间，超滤量相关；导致 EPVS 的机制可能与分水岭区域脑白质灌注减低、相应区域的脑白质体积萎缩有关。

PU-2020
256 层螺旋 CT 在头颅灌注中的临床应用价值

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目的 探讨 256 层螺旋 CT 头颅灌注中的临床应用价值。
方法 本研究采用飞利浦 256 层螺旋 CT，临床医生针对病人的情况开单做头颅灌注，根据机器的性质，作相应的扫描参数，对 30 例患者其中正常 1 例，头晕 22 例，术后 3 例，脑卒中 4 例进行容积扫描。扫描方案：先行头颅平扫，再行灌注，灌注后行延时期。灌注（CTA）参数：

100KV,120mAs，16cm（间隔 4.1s，15 次）。注射参数：6.0ml/s，30ml（生理盐水），5.0ml/s，50ml（碘对比剂），5.0ml/s，30ml（生理盐水），先试注射盐水，确保患者满足注射要求。对灌注图像进行后处理（Brain Functional CT）,提取灌注图像中动脉血管最佳期进行 CTA 血管重建，包括容积再现(Volume rendering ,VR),多平面重建（Multi-planar veconstruction, MPR）及曲面重建（Curved-planar reconstruction,CPR）等多种后处理技术显示颅内血管，颈动脉上段。所有检查结果均经临床手术或血管介入造影证实，评价 256 层螺旋 CT 头颅血管灌注的临床诊断价值。

结果 发现灌注正常 4 例，其中 1 例脑动脉狭窄，1 例椎动脉狭窄，2 例灌注及 CTA 未见明显异常。灌注参数异常有 26 例，其中脑梗 7 例，大脑中动脉狭窄 3 例，颈动脉、椎动脉狭窄 4 例， 出血有 6 例，大脑后动脉狭窄 2 例，脑膜瘤 1 例，外伤 2 例。

结论 256 层螺旋 CT 头颅灌注方法能在急诊急救中快速，准确诊断颅内病变。为急性脑出血，脑梗塞，脑梗塞前期提供了可靠翔实的影像学资料，具有的较高的临床应用价值。

PU-2021

Pipeline 密网支架治疗颈动脉床突段大型动脉瘤的长期疗效及安全性分析

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目的 探讨分析应用 PIPELINE 栓塞装置（PED）治疗颈动脉床突段大型颅内动脉瘤的中长期临床疗效及安全性。

方法 回顾性分析 2014.12~2018.9 冬雷脑科医生集团采用 PIPELINE 栓塞装置（PED）治疗的 38 例颈动脉床突段大型动脉瘤资料。38 例患者，38 个动脉瘤，直径平均 15.3±5.5mm，瘤颈平均 6.5±2.5mm。其中 5 个动脉瘤采用单个 PED 治疗，32 例动脉瘤采用密网支架结合弹簧圈栓塞治疗，双密网支架治疗 1 例。其中 3 例动脉瘤为支架辅助弹簧圈栓塞后复发动脉瘤。

结果 随访 8~50 个月，DSA 随访 28 例，动脉瘤完全闭塞 26 例（93%），近全闭塞 2 例（7%）。半年随访时 PED 结合弹簧圈治疗的颅内动脉瘤已完全闭塞，治愈率高达 100%；单 PED 治疗 6 个月随访完全治愈 3 例，到最后一次 DSA 随访（40 月）治愈 4 例；双 PED1 例 8 月随访可见微小动脉瘤样显影，30 个月随访动脉瘤近全闭塞。围手术期共发生无症状性斑点状脑梗塞 10 例，脑实质出血 4 例，1 例死亡，1 例 mRS1 分，另外 2 例为无症状脑出血，动脉瘤破裂出血 1 例，予以重叠密网支架治疗，患者恢复满意，mRS0 分。1 例患者 10 个月随访 DSA 发现载瘤动脉闭塞，无任何临床症状。单因素及多因素分析提示密网支架术后出血并发症的发生与瘤内填塞弹簧圈与否无显著相关性。

结论 PIPELINE 栓塞装置治疗颈动脉床突段大型动脉瘤疗效确切，并发症少，PED 结合弹簧圈治疗动脉瘤的闭塞率高于单纯 PED 治疗，动脉瘤完全闭塞时间短。PED 术后出血并发症与瘤内填塞弹簧圈与否不相关。单纯 PED（包括单个或多个）治疗需要更长的随访时间来确定其疗效。

PU-2022

FLAIR 血管高信号征对大脑中动脉狭窄或闭塞致急性脑梗死的临床诊断价值

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目的：基于 FLAIR 血管高信号征（FLAIR vascular hyperintensity，FVH），预测大脑中动脉致急性脑梗死患者的临床预后价值。
方法：收集贵州医科大学附属医院急诊科和神经内科就诊急性脑梗死患者，排除不符合标准 56 例，最终存在大脑中动脉狭窄或闭塞的患者 244 例。所有患者的扫描序列均包括：T1WI、T2WI、DWI、FLAIR、MRA，对纳入的目标患者记录年龄、性别、高血压、胆固醇、高密度脂蛋白、低密度脂蛋白、吸烟、饮酒、冠心病及既往卒中史等相关临床指标;影像学指标包括 DWI 梗塞灶大小、位置，M1 段狭窄或闭塞位置，FVH 阳性率等。患者的预后采用电话随访方式记录 3 个月改良 mRS 评分（mRS≤2 提示预后良好，mRS＞2 提示预后不良）。
结果：大脑中动脉狭窄或闭塞致急性脑梗死患者中，82 例患者的预后良好（mRS≤2），162 例患者的预后不良（mRS＞2）。预后良好组 27 例（32.9%）存在 FVH 征象为，预后不良好组 FVH 征象为 8 例（32.9%），差异具有统计学意义（X^2=34.71，P＜0.01）。年龄、性别、高血压、胆固醇、高密度脂蛋白、低密度脂蛋白、吸烟、饮酒、冠心病及既往卒中史，DWI 梗塞灶大小、位置，M1 段狭窄或闭塞位置，均无统计学差异（P＞0.05）。
结论：大脑中动脉狭窄或闭塞致急性脑梗死患者中，FLAIR 序列存在 FVH，提示急性脑梗死的预后较好。

PU-2023
基于 CT 数据的颈动脉分叉模型的流体力学分析

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目的 结合三维 CT 成像技术和计算流体力学技术，研究局部血流动力学对粥样硬化斑块形成、发展的作用，从而探讨不同分叉角度与斑块形成分布的关系。
方法 选取 20 例具有不同分叉角度正常的颈动脉 CT 薄层数据，并获得心率、血压及血流速度曲线。基于 CT 数据采用相关软件建立颈动脉 3D 模型及网格模型。采用流固耦合的有限元方法进行数值模拟，构建流体力学模型，获得颈动脉分叉区域流场分布、压强及壁切应力。
结果 颈动脉分叉处流场分布显示低速血流区域，随着颈动脉分叉角度增大，低速区域更明显，并有涡流现象。颈动脉分叉处壁面压强分布显示：分叉脊及外侧壁附近出现高压强，并与分叉角度呈现正相关。颈动脉分叉处壁面切应力分布显示：分叉脊及外侧壁存在较低切应力区域，随着分叉角度增加，切应力下降更加明显，壁切应力与分叉角度呈负相关。
结论 通过构建实际颈动脉模型能较准确地反映人体真实的血流情况，有助于预测颈动脉粥样硬化发生及发展的风险，为临床检测和治疗提供更好的技术和理论指导。

PU-2024
单侧大脑中动脉狭窄患者 FVH 评分与 CBF 相关性研究

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目的 探讨单侧大脑中动脉（MCA）M1 段中重度狭窄后，T2FLAIR 上 FVH 评分与 CBF 之间的相关性。
材料和方法 收集单侧大脑中动脉中重度狭窄的患者 42 例（男性 28 例，女性 14 例），依据 ASPECTS 评分分别测量在 PLD=1.5 和 PLD=2.5 时血管狭窄侧大脑半球 M1-M6 区的 CBF 值。根据 FVH-

T-ASPECT 评分法分别计数 M1-M6 区的 FVH 评分，并分析 CBF 与 FVH 评分的相关性。采用 SPSS22.0 软件进行统计学处理，相关性分析采用 spearman 相关分析法，P＜0.05 有统计学意义。
结果 1.M2（PLD=1.5，r=0.38，P＜0.05; PLD=2.5, r=0.44, P＜0.05）、M4（PLD=1.5，r=0.32，P＜0.05; PLD=2.5, r=0.49, P＜0.05）、M5（PLD=1.5，r=-0.32，P＜0.05; PLD=2.5, r=-0.31, P＜0.05）区 FVH 评分与 CBF 值呈正相关；
2.M1（PLD=1.5，r=-0.32，P＜0.05）、M3（PLD=1.5，r=0.38，P＜0.05; PLD=2.5, r=0.44, P＜0.05）、M6（PLD=1.5，r=-0.39，P＜0.05）区部分 FVH 评分与 CBF 值负相关，部分没有相关性。
结论 单侧大脑中动脉（MCA）中重度狭窄后，FVH 评分与 CBF 之间存在不同程度的相关性，M2、M4、M5 区呈正相关，提示 FVH 与良好的血流灌注有关。

PU-2025
青年症状性脑梗死患者脑小血管病变及临床影响因素分析

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目的 探讨青年性脑梗死患者是否存在脑小血管病变（cerebral small vessel disease, CSVD），并分析其临床影响因素。**方法** 回顾性收集临床确诊的新近发生青年性脑梗死患者 54 例（男 43 例，女 11 例；平均年龄 38.4±4.7 岁）及新近发生老年性脑梗死患者 57 例（男 37 例，女 20 例；平均年龄 68.9±10.3 岁），征募 21 名年龄-性别与青年梗死组相匹配的健康人（男 17 例，女 4 例；平均年龄 39.7±4.2 岁）作为对照组。收集青年与老年脑梗死患者入院时的临床资料，并观察脑内各种 CSVD 的 MRI 表现并进行评分，包括双侧基底节区及半卵圆中心区血管周围间隙扩大（enlarged perivacular space, EPVS）、脑室周围及深部白质高信号（white matter hyperintense, WMH）、腔隙性梗死 （lacunar infarction, LI）以及微出血（cerebral microbleeds, CMBs），计算脑小血管病总体负担评分（total burden scores of CSVD, TBS）并进行分级。比较三组间 CSVD 差异，并通过多因素 logistic 回归分析其影响因素。**结果** 与健康对照组相比，青年性脑梗死患者 CSVD 发生率明显增高，但较老年性梗死低（*P*＜0.05）。多因素 logistic 有序回归分析显示高血压与青年性脑梗死基底节和半卵圆中心 EPVS 以及 TBS 具有独立相关性；LI 与年龄密切相关；吸烟是 CMBs 的影响因素（*P*＜0.05）。 **结论** 青年症状性脑梗死患者常同时合并脑小血管疾病改变。高血压、吸烟及年龄可能是青年性梗死患者脑小血管疾病的影响因素。

PU-2026
Carotid Web in Intravascular Ultrasound：A case report

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Objective: Carotid web has a high relationship with ischemic stroke. This paper is aimed to analyze the morphological characteristic of carotid web through Intravascular ultrasound (IVUS). **Methods** : A case of a 29-year-old man who suffered an ischemic stroke caused by carotid web. IVUS and digital subtraction angiography (DSA) were given to evaluate the morphological characteristics of carotid web and the status of blood flow, and to guide the carotid angioplasty and stenting(CAS).
Results: Intravascular ultrasound demonstrated that carotid web was a strip-liked

hypoechoic signal connected to lumen, separating blood flow into two part. Blood stagnation and retention of the contrast agent were observed behind the web. Virtual Histology-IVUS (IMAP-IVUS) indicated that the web was composed of fibrous tissue mostly, with partial necrotic tissue on its back. **Conclusion** : In this paper, Intravascular ultrasound gave a new insight of the morphological characteristic of carotid web and benefited stent deployment and optimization.

PU-2027
多模态磁共振成像技术在急性缺血性脑卒中溶栓时间窗内的应用价值

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目的 探讨多模态磁共振成像技术在急性缺血性脑卒中溶栓时间窗内的应用。
方法 对发病在 6h 之内的 58 例急性脑梗死患者先行 CT 平扫，排除有明显低密度梗死灶及出血性脑梗死后行进行多模态 MRI 扫描，成像序列包括 T1WI、T2WI、MRA、DWI 和 PWI，分析所得影像的不同序列特征，根据是否有缺血半暗带存在，分为 DWI-PWI 不匹配组与 DWI-PWI 匹配组，对所有患者行静脉溶栓治疗。溶栓后 24h 复查头颅 CT 排除有无颅内出血并随访 3 个月。
结果 所有患者行 T1WI、T2WI、MRA 及 DWI 扫描后，均能明确脑梗死病灶和责任血管。DWI-PWI 不匹配组 35 例，DWI-PWI 匹配组 23 例。两组患者 3 个月后 mRS 评分 0~1 分者分别为 24 例（68.6%）和 9 例（39.1%），差异有统计学意义（P〈0.05）。两组患者 3 个月内出现脑出血的发生率分别为 14.3%和 17.4%，死亡率分别为 5.7%和 4.3%，差异无统计学意义（P〉0.05）。
结论 基于多模态磁共振成像技术的应用不但能明确诊断急性缺血性脑卒中病灶，同时在溶栓时间窗内能指导个体化静脉溶栓治疗。

PU-2028
DTI 对缺血性脑卒中患者神经功能恢复评价的临床应用

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目的 分析缺血性脑卒中患者的磁共振扩散张量成像（DTI）参数特点，探讨 DTI 对脑卒中神经功能恢复的临床应用价值。
方法 搜集 2017 年 5 月到 2019 年 5 月就诊于山西医科大学第一医院并诊断为脑梗死患者 38 例，其中男 20 例，女 18 例，年龄 52-78 岁，平均年龄 63.8 岁，病灶部位包括：桥脑 3 例、丘脑 2 例、基底节区 21 例、胼胝体 5 例，额叶 6 例，颞叶 1 例；所有患者均为初次发病，临床表现均有一侧肢体不同程度运动功能障碍，部分患者有言语不利、同侧面部中枢性偏瘫、四肢肌力减退等。采用 GE Signa HDx 3.0T 超导型磁共振扫描仪，头颈联合线圈进行扫描，扫描序列包括 T1WI、T2WI、flair、DWI 和 DTI 序列，所得 DTI 数据传输到 GE AW4.4 工作中 Functool 软件对数据进行后处理，在病灶侧及健侧划定感兴趣区，测定 FA 值，并重建 DTT，经两名高级职称医师进行图像分析与评价，对比不同发病时期、不同部位脑梗死患者 FA 值的差异，并按照纤维束的损伤程度对重建后的 DTT 图像进行分级。

结果 1、不同部位梗死侧 FA 值均较健侧明显降低（P<0.05）；2、梗死时间呈一定规律性变化：在急性期患侧 FA 值较对侧可轻度升高或轻度降低，亚急性期、慢性期明显降低、慢性期持续降低的规律；3、皮质脊髓束走行自然、形态完整的 8 例；皮质脊髓束受压、推移、稀疏的 19 例；皮质脊髓束中断的 11 例。

结论 DTI 显示的梗死灶范围较常规 MRI 成像更加准确、清晰，DTT 分级探讨皮质脊髓束损伤程度与肌力恢复的关系，评价不同时期、不同部位脑梗死患者的预后和功能康复有重要的临床应用价值。

PU-2029

高分辨 MR 成像测量大脑中动脉狭窄率的准确性评价

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目的 评价 3.0T 高分辨率磁共振成像（High-Resolution Magnetic Resonance Imaging ,HR-MRI）技术测量动脉粥样硬化所致大脑中动脉狭窄程度的准确性。 **材料与方法** 对 40 例经数字减影血管造影（DSA）证实的症状性大脑中动脉 M1 段动脉粥样硬化性狭窄患者行 HR-MRI 序列（包括 T1WI、T2WI、PDWI）扫描，分别用 WASID 法、面积测算法在高分辨 MR 图像上测量 MCA 狭窄率，以 DSA 为金标准评价两种测量方法的准确性。 **结果** DSA、WASID 法、面积测算法测得的 MCA 狭窄率分别为(82±17)%、(70±12)%、(81±16)%，面积测算法测得的 MCA 狭窄率与 DSA 测得的 MCA 狭窄率差异无统计学意义（P>0.005）；面积测算法测得的 MCA 狭窄率与 DSA 测得的 MCA 狭窄率相关性较好（r=0.893）；面积测算法测得的狭窄程度符合率较高（符合率为 90%）。 **结论** 高分辨 MR 成像技术在测量 MCA 狭窄程度方面准确性高，并且能够显示管壁情况，具有较高的临床应用价值。

PU-2030

急性脑干缺血性脑梗死患者皮层形态学改变研究

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背景：缺血性脑梗患者的脑结构发生了变化，大多数研究都使用了基于体素的脑结构形态计量学（VBM）分析，其重点是体积/密度差异。然而，脑卒中患者不同部位的皮质厚度及皮层褶皱可能也有所改变。本研究对急性单侧脑干梗死患者的皮层厚度及皮层褶皱进行研究。

方法 共纳入 21 例右侧脑干梗死患者、27 例左侧脑干梗死患者及 30 例正常对照。使用高分辨率结构磁共振成像采集 3DT1 数据，采用 CAT12 软件，对三组两侧大脑半球的皮层厚度及皮层褶皱分别进行分析比较。

结果 左侧及右侧脑干脑梗患者在两侧大脑半球与正常对照组相比均出现广泛的额颞叶及岛叶皮层厚度减低。而在皮层褶皱方面，只有右侧脑干梗死患者的患侧大脑半球的岛叶、缘回及颞横回的皮层褶皱较正常对照组减低。

结论 急性脑干梗死患者广泛的皮层厚度减低，右侧脑干梗死患者的皮层褶皱减低，皮层形态的变化可能在梗塞前就已经发生，这为预测脑梗的发生和早期干预提供可能。

PU-2031

阿尔茨海默病脑灰质结构损害模式的 MRI 初步研究

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目的 探讨阿尔茨海默病(Alzheimer’s disease, AD)脑灰质结构损害模式。材料与方法 16 例 AD 病人及 16 名健康志愿者行头部常规 MRI 和 3DT1WI 扫描，采用基于体素的形态测量学(voxel based morphometry, VBM)分析方法对原始数据进行后处理，对 AD 组和健康对照组（healthy control，HC）灰质体积（grey matter volume, GMV）进行双样本 t 检验获得差异脑区，采用 Pearson 法分析各显著差异脑区 GMV 之间及其与 MMSE 评分的相关性。结果 与 HC 组比较，AD 组皮层灰质结构 GMV 减少脑区包括双侧扣带回、额上回、额中回、颞上回、舌回及左侧中央前/后回、海马旁回、颞极、眶回和右侧顶上小叶；皮层下灰质结构 GMV 减少脑区包括双侧壳核、苍白球、尾状核、杏仁核及海马，差异脑区扣带回与壳核 GMV 呈正相关(P 值均<0.05)。结论 AD 脑灰质结构损害可以累及皮层和皮层下结构，主要分布在边缘系统和基底节，扣带回与壳核可能存在一定的结构联系，本研究为 AD 临床早期诊疗和监测提供了结构影像学参考依据。

PU-2032
IgG4 相关肥厚性硬脑膜炎影像特征分析及诊断思路

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目的 总结 IgG４相关肥厚性硬脑膜炎（IgG４-related hypertrophic pachymeningitis ，IgG４-RHP）的临床、影像学特征。
方法 收集我院收治的 IgG４-RHP 患者资料，分析其临床表现、实验室检查、治疗前后影像学及病理学特点。同时，对照我院确诊的其他导致硬脑膜增厚疾病的影像学表现，包括：Rosai-Dorfman 病，低颅压综合征，结核性脑膜脑炎，不典型脑膜瘤和中枢神经系统白血病等。
结果 4 例 IgG４-RHP 患者均为男性，首发症状为慢性头痛等。所有患者血清和脑脊液 IgG４水平均升高，头颅 MRI 增强可见硬脑膜、脊膜弥漫性或局灶性强化，其病理学结果符合 IgG４-RHP 表现。Rosai-Dorfman 病的影像学表现与 IgG４-RHP 的极为相似，确诊需依靠血清学和脑脊液检查，甚至经手术病理证实。低颅压综合征患者常常有体位性头痛症状，脑脊液检查发现颅内压低于正常。结核性脑膜脑炎的患者可有肺结核病史，实验室检查亦可支持结核的诊断，同时，脑实质内亦可同时存在病灶。不典型脑膜瘤的患者不一定有头痛病史，且往往慢性起病或无明显临床症状，确诊需依靠手术病理结果。中枢神经系统白血病的患者可参考实验室检查结果确诊。
结论 IgG４-RD 损伤可见于包括肺、纵隔、肝和胰腺在内的多个器官。本病累及硬脑膜则引发 IgG４相关肥厚性硬脑膜炎。在特异性肥厚性硬脑膜炎患者中有相当一部分患者出现染色阳性，从而确诊为 IgG４-RHP。对于诊断肥厚性硬脑膜炎的患者应进一步行血清或脑脊液 IgG４水平检测，必要时行硬脑膜活检以助于早诊断。本研究以经病理证实的病例为基础，探讨 IgG４-RHP 的临床特征、影像学表现、治疗前后对照，同时，分析影像学特征相似的其他几类病变的临床资料，以期明确 IgG４-RHP 的诊断思路。

PU-2033
扩散加权成像对抗 N-甲基-D-天冬氨酸受体脑炎的研究价值

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目的 探讨抗 N-甲基-D 天冬氨酸（NMDA）受体脑炎脑内病灶的 DWI 特征。
材料与方法 （1）回顾性分析 66 例抗 NMDA 受体脑炎患者，均行头颅常规 MRI 和 DWI 扫描。（2）观察病灶在常规 MRI 信号、分布情况以及强化方式，同时观察其在 DWI 和表观扩散系数（ADC）图的表现；根据病灶信号特点，将其分为 T_1WI 等信号和低信号病灶、ADC 低信号和高信号病灶。（3）测量病灶和对侧脑组织的 ADC 值，比较病灶和对侧脑组织、不同 T_1WI 信号病灶及不同 ADC 图信号病灶的 ADC 值差异。（4）分析病灶 ADC 值与患者病程及改良 Rankin 量表（mRS）评分的相关性。
结果 （1）22 例常规 MRI 脑内共显示 29 个病灶，大部分病灶位于各脑叶皮层。（2）T_1WI 等信号 20 个、低信号 9 个。（3）27 例患者其病灶在 T_2WI 为稍高信号或明显高信号，对应的 DWI 为稍高或明显高信号。（4）有 7 个 T_1WI 等信号病灶在 ADC 图上为低信号，其余 22 个病灶在 ADC 图上为稍高信号或高信号；（5）7 个 ADC 图低信号病灶的 ADC 值为（0.69 ± 0.01）× 10^{-3} mm^2 / s，对侧为（0.76 ± 0.02）× 10^{-3} mm^2 / s（t = 9.62，P < 0.001）；22 个 ADC 图高信号病灶 ADC 值（（0.86 ± 0.10）× 10^{-3} mm^2 / s）高于对侧（0.74 ± 0.05）× 10^{-3} mm^2 / s）（t = 16.999，P < 0.001）；（6）20 个 T_1WI 等信号病灶的 ADC 值为（0.82 ± 0.10）× 10^{-3} mm^2 / s，9 个 T_1WI 低信号病灶为（0.95 ± 0.16）× 10^{-3} mm^2 / s（t = -5.48，P < 0.001）；（7）病灶 ADC 值与患者病程正相关（r = 0.61，P = 0.003），与 mRS 评分无相关性（r = 0.09，P = 0.68）。
结论 ADC 值有助于鉴别不同时期和不同信号抗 NMDA 受体脑炎病灶的病理改变，有助于该病的诊断。

PU-2034
T2W-FLAIR 增强扫描在颅内感染性病变的应用研究

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目的 探讨 MRI 流体衰减反转恢复序列（fluid attenuated inversion recovery，FLAIR）增强扫描在颅内孤立性环形强化结节诊断中的价值。**材料与方法** 回顾性分析 2019 年 1 月至 2019 年 12 月在桂林医学院附属医院行颅脑检查发现颅内孤立性环形强化结节的患者资料，所有患者均接受 1.5/3.0 T MR 扫描，包括矢状面和横断面 T1WI，横断面 T2WI、T2W- FLAIR，增强后矢状面和横断面 T1WI，以及横断面 T2W- FLAIR。根据病理结果及其他复查、随访结果将患者分为“感染性病变组”及“非感染性病变组”即阳性组为“感染性病变组”，阴性组为“非感染性病变组”并分析两组患者影像征象：①病灶位置、大小、形态、清晰度、周围水肿比值；②病变是否存在囊变、出血、坏死；③囊壁完整程度、厚度、内外壁光滑程度；④邻近脑膜是否有强化。使用 SPSS 统计软件进行组间差异性检测。采用单样本非参数检验计算数据是否为正态分布，符合正态分布的计量资料以 X±s 来表示，采用 t 检验；计数资料以百分数的形式表示，采用 X^2检验。非正态分布数据用 Mann-Whitne 非参数检验。分析两组患者邻近脑膜是否有强化对诊断感染性病变的灵敏度、特异度、阳性预测值、阴性预测值。**结果** 现有 10 例患者病理结果及其他复查、随访结果提示阳性,23 例患者的病理结果及其他复查、随访结果呈阴性。现因病例数量较少，无法进行数据分析。**结论** 对颅内孤立性环形强化结节观察有无脑膜强化，能够更加快速准确的对颅内感染性病变进行早期诊断，以便及时、有效地对临床合理用药进行指导。

PU-2035
原发性垂体脓肿的 MRI 表现与临床表现分析

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目的 探讨原发性垂体脓肿的 MRI 表现及临床表现，提高原发性垂体脓肿术前诊断的准确率。
方法 回顾性分析 2011 年 1 月至 2019 年 4 月北京协和医院确诊的原发性垂体脓肿患者的临床资料及 MRI 影像资料，总结其临床症状、病程、影像表现并分类。
结果 共计确诊原发性垂体脓肿 28 例。原发性垂体脓肿主要症状包括头痛或头晕（64.2%，18/28）、感染症状（78.6%，22/28）、垂体前叶功能减退(71.4%，20/28)、尿崩症或多饮多尿（67.9%，19/28）、视野或视力受损（39.3%，11/28）。患者首发症状多为头痛、发热伴随(25.0%，7/28)或不伴随(50.0%，14/28)垂体前叶功能低下、尿崩症、视力视野受损症状，不伴随这些症状的患者后期也会出现垂体前叶功能低下、尿崩症或视力视野受损症状（92.8%，13/14）。以尿崩症（10.7%，3/28）、垂体前叶功能低下（7.1%，2/28）、垂体前叶功能低下联合尿崩症（3.6%，1/28）及视野视力受损(3.6%，1/28)为单一首发症状者少见。MRI 增强扫描多显示鞍内或鞍内及鞍上囊性病变，典型征象为增强扫描环状或半环状强化。垂体柄出现增粗、结节状或囊状强化比例为 92.8%（26/28），是提示垂体脓肿的重要征象。
结论 原发性垂体脓肿典型 MRI 表现为鞍区环状或半环状强化囊性占位，垂体柄增粗、结节状或囊状强化是诊断原发性垂体脓肿的重要证据。典型症状为头痛、发热伴随或后续出现的垂体前叶功能低下、尿崩症或多饮多尿、视野视力受损。

PU-2036

淋巴细胞性漏斗神经垂体炎的 MRI 诊断

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【目的】探讨淋巴细胞性漏斗神经垂体炎的 MR 诊断价值。**【方法】**回顾性分析我院 2012 年 2 月～2019 年 7 月经手术病理证实或临床治疗确诊为淋巴细胞性漏斗神经垂体炎的 5 例患者临床及 MR 资料。所有患者均行鞍区 MRI 平扫及增强扫描。**【结果】**5 例淋巴细胞性漏斗神经垂体炎患者 MRI 均表现为垂体柄增粗，2 例下丘脑可见肿块样稍长 T1 长 T2 信号影，4 例患者神经垂体 T1WI 高信号消失，3 例弥漫性增大，2 例垂体萎缩变小。5 例患者呈明显强化，2 例强化不均匀。1 例邻近硬脑膜增厚强化，呈脑膜尾征。**【结论】**对于育龄期女性患者，垂体柄漏斗增粗，临床有尿崩及垂体功能低下时要考虑淋巴细胞性垂体炎的诊断，MRI 对淋巴细胞性垂体炎具有重要的诊断价值。

PU-2037

Inflammatory pseudotumor in the ventral junction of the medulla oblongata and cervical cistern: a case report

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Purpose: Inflammatory pseudotumor is a histologically proven benign lesion of unknown etiology . It most commonly involves lungs and orbit but also reported to occur in many site or organ system.Here we report a a 61-year-old patient with right extremities weakness and found a mass in the ventral junction of the medulla oblongata

and cervical cisten through MRI appearance and diagnosed with an IPT after surgical excision followed by histopathology.And this tumor-like lesion we report is surrounding the bilateral intracranial segment of the vertebral arteries.There have been no reports of inflammatory pseudotumor growing around arteries up to date.We provide a new reference for clinical, imaging diagnosis and surgical resection of the tumor.

Materials and Methods:A 61-year-old man, presented with complaints of 10-year history of dizziness, developed over the past 2 months and with right limb weakness was admitted to the neurosurgery department. A neurologic examination revealed that he has a bilateral tinnitus,left hearing loss and left limb paresthesia, which was hypesthesia of the lower extremity while his deep sensation was normal. Physical examination of muscle strength showed IV grade of right limb and V grade of the left. He also had right limb ataxia and a stiff neck, without choking when drinking water and no dysphagia. Physiological reflex was presented and pathological signs were negative.
Magnetic resonance imaging(MRI) of the head showed a mixed isointense mass of approximately 38*26*44mm in the ventral junction of the medulla oblongata and cervical cistern ,with clear boundary and compression of the medulla oblongata and encase of bilateral vertebral arteries. It was isointense on both T1-weighted and T2-weighted imaging. DWI sequence showed no obvious diffusion restriction. It was obviously homogeneous enhanced on post-enhancement .There was no bony abnormality or erosion seen on computed tomography (CT) correlation. CT angiography(CTA) showed the V4 segment of bilateral vertebral arteries was surrounded by the mass and the location of the left vertebral artery was moving backward and it was slightly narrowed.The preoperative diagnosis was more likely to be a meningioma.

Result:According to above all, the mass was performed a right lateral approach for the resection. After arcuate incision of the dura mater, a well-circumscribed, well-vascularized, pink and slightly tough mass was observed . The mass was located in the ventral junction of the medulla oblongata and upper cervical cistern ,about 40*27*47mm in size. Laser knife was used to excised the tumor in pieces to decrease the volume of it to make it easier for resection. Some specimen were collected and sent to pathological biopsy. The tumor tissue surrounding the bilateral vertebral arteries was carefully dissected and resected under the microscope. The bilateral vertebral arteries were visible postoperatively and were all well protected.
Histopathology examination revealed a hyperplasia of collagen fibers with a large number of lymphocytes, plasma cells and histiocyte foci and scattered distribution ,which were considered as inflammatory pseudotumor.
At follow-up MR examination 2 months postoperatively, MRI on post-contrast T1-weighted sequences showing complete resection of the tumor with no signs of recurrence and residue. Nervous system examination showed he had clear consciousness, no dizziness, and the muscle strength of right limb is III-IV, the left limb movement is normal.

Conclusion:We report for the first time an inflammatory pseudotumor growing in the ventral medullary junction of the medulla oblongatal-cervical cistern and surrounding the bilateral intracranial segment of the vertebral arteries. Complete surgical resection has a better prognosis for the lesion.

PU-2038

DIXON 序列对视神经炎的诊断价值

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摘要：目的 探讨 DIXON 序列对视神经炎的诊断价值。**方法** 研究对象 2016 年 4 月至 2019 年 1 月安徽医科大学第二附属医院眼科诊治的视神经炎病例 20 例，分别采用 dixon 序列及常规 T2WI 序列进行扫描。三维容积成像序列图像需要在后处理工作站进行图像的后处理重建及分析，由 2 名放射科诊断医生采用双盲法随机对两种序列磁共振图像共同判定并达成一致意见，主要测量指标为患侧视神经层面图像的 SNR 与 CNR、视神经边缘清晰度（清晰锐利光滑/欠清晰/边缘模糊）。用 SPSS 软件进行数据统计。采用配对样本 t 检验，检验效度 a=0.05，P 值<0.05 为差异有统计学意义。**结果** 20 例患者中女性 11 例，男性 9 例。平均发病年龄(38.1±12.1)岁(21~53 岁)。10 例患者 36 眼受累。dixon 序列及常规 T2WI 序列两组配对样本对比，P 值<0.05，差异有统计学意义。dixon 序列的 SNR 与 CNR 优于常规 T2WI 序列。**结论** Dixon 序列对视神经炎的影像诊断有重要价值。

PU-2039

磁共振 T1mapping 定量研究脑锰沉积在大鼠 B 型肝性脑病中的作用机制

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目的 探究 T1 mapping 序列定量测定 B 型肝性脑病（BHE）脑锰沉积价值。利用对氨基水杨酸钠（PAS-Na）治疗 BHE 大鼠，研究锰在 BHE 中作用机制。

材料与方法 采取部分门静脉结扎法构建 BHE 大鼠模型，造模同时使用对氨基水杨酸钠（PAS-Na）进行干预治疗。42 只 8 周龄雌性 SD 大鼠分为实验组 36 只，NC6 只。实验组根据有无 PAS-Na 治疗分为 BHEA（治疗）组和 BHEB（不治疗）组。实验组根据造模后时间分为 2、4 和 6 周 3 个亚组。每组大鼠检测血氨；进行磁共振扫描；测量脑组织 T1 值和锰含量；使用 Morris 水迷宫评估大鼠学习记忆能力；检测脑内 MPO 和 GS 活力，检测 IL-6、GSH、GLN 含量。

结果 与 NC 组比较，BHEB 组血氨升高（P<0.001）；脑组织 T1 值降低（P<0.001）；脑组织锰含量增多（P<0.001）；水迷宫头部 ROI 接触次数（P<0.01）、Right Top 进入次数（P<0.01）减少；脑内 IL-6 含量（P<0.001）、GLN 含量（P<0.01）增多；MPO 和 GS 活力均升高（P 值均＜0.001）；GSH 含量减少（P<0.001）。与 BHEB 组比较，BHEA 组脑组织 T1 值升高（P<0.01）；脑组织锰含量减少（P<0.01）；水迷宫 Right Top 进入次数增多（P<0.05）；脑内 IL-6 含量减少（P<0.05），MPO 活力（P<0.001）、GS 活力（P<0.05）降低，GSH 含量（P<0.05）增多。基底节（r=-0.744，P<0.05）、海马（r=-0.737，P<0.05）、皮层（r=-0.672，P<0.05）及小脑（r=-0.842，P<0.01）T1 值与锰含量之间存在线性负相关。

T1 mapping 可以定量检测 BHE 大鼠脑锰含量。PAS-Na 能降低脑锰含量,减轻神经性炎症，减少氧化应激，改善脑代谢，改善 BHE 大鼠认知达到治疗 BHE 作用。

PU-2040

儿童脓毒症相关性脑病 10 例影像学表现

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【目的】通过分析儿童脓毒症相关性脑病的影像学表现，回顾相关文献，加强对该疾病的影像学特征认识。【方法】回顾性分析 10 例脓毒症相关性脑病患者的影像学资料，男 6 例，女 4 例，年龄 0.5 岁-11.8 岁，其中 8 例行 CT、7 例行 MRI 检查，1 例行 1H-MRS 检查，探讨并总结其影像学特点。【结果】（1）信号改变：双侧皮层及白质区长 T1 长 T2 信号，累及至少 2 个以上脑叶（6/7），DWI 病灶弥散受限高信号（5/7），增强扫描颅内未见异常强化（3/5）；（2）脑萎缩、脑水肿表现：脑沟加深（7/10），双侧大脑皮层肿胀（2/7）；（3）累及其它脏器：如肺、脊髓(9/10、1/10)；（4）MRS:桥脑、左侧丘脑、基底节区 NAA 峰降低。【结论】当伴有全身炎症反应的危重病人出现弥漫性双侧皮层及脑白质、深部灰质核团异常改变，增强扫描未见异常强化时，应高度警惕该病，及时为临床诊治与改善预后提供指导性意见。

PU-2041

神经梅毒的常规 MRI 表现及磁共振动脉自旋标记成像的特点

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目 的 提高对神经梅毒常规 MRI 特点的认识 ， 并探讨 ASL 技术在神经梅毒的诊断和治疗中的作用。

资料与方法 分析 13 例本院经临床证实的神经梅毒患者及 20 例正常对照组常规 MRI 及 ASL 影像表现。分别在双侧额叶、顶叶、颞叶、枕叶、小脑半球皮层画兴趣区（ROI）测量 CBF 平均值。评价各部位血流灌注指标（CBF）两组之间的差别。其中 6 人在开始治疗后 1 周到 2 月内复查头颅常规磁共振及 ASL 扫描，并分析影像资料。

结果 1 常规 MRI 表现为：散在、多发或大片状异常信号，T_1WI 为稍低信号，T_2WI 高信号，DWI 为等或稍高信号。2 根据 CBF 值的升高或降低分为两组。3 6 例神经梅毒患者经正规住院治疗后 1 周-2 月内进行复查，原 CBF 值降低的部位未见明显变化，而原 CBF 值升高的部位现在减低；临床症状明显改善。

结论 神经梅毒的影像表现多样，无特异性。ASL 技术是一种无需注射对比剂的 MR 灌注方法，可以反映神经梅毒的疗效。

PU-2042

复发-缓解型多发性硬化合并症及相关临床特征的分析

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目的 探讨 RRMS 合并症种类和数量及其与临床特征的关系。**方法** 回顾性分析 141 例 RRMS 患者临床资料，分析其合并症数量与临床特征的关系。**结果** ①约 72.3%RRMS 患者合并其他疾病，其中≥3 种 34 例、2 种 26 例、1 种 42 例、0 种 39 例；②≥3 种合并症组分别与 0 种、1 种、2 种合并症组比较年龄有显著差异（$P<0.05$）；③≥3 种合并症组与 0 种、1 种合并症组比较首发年龄有显著差异（$P<0.001$）；④各合并症组之间男女性别比较无显著差异，各组间比较 EDSS 评分及复发次数无明显差异。**结论** RRMS 患者年龄、首发年龄越大，合并症越多，合并症可能导致 MS 延迟发作以及对其准确认识，因此提高对合并症的认识有助于早期诊断、治疗 MS 及其合并症，提高患者生存率及生活质量，改善临床预后。

PU-2043

急性期放射性损伤的磁共振波谱研究

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目的 磁共振波谱动态监测大鼠急性期放射性脑损伤的代谢变化规律。
材料和方法 22 只雄性成年 SD 大鼠接受 35Gy 半脑单次等中心点照射。采用 7T 小动物磁共振于照射前、照射后 3 天、2 周、3 周多个时间点进行常规 T1WI、T2WI、氢质子磁共振波谱的数据采集，观察各时间点双侧海马区的信号改变，利用 LCModel 软件进行波谱数据定量分析各时间点照射侧与非照射侧海马区组织的代谢产物变化。
结果 放射性脑损伤急性反应期 N-乙酰门冬氨酸（N-acetylaspartate, NAA）相对总肌酸的比值在照射侧与非照射侧总体上有差异（$P_{t*g}=0.036$，$P_g<0.001$，$P_t<0.001$），即照射侧与非照射侧在时间和组别上均有差异，照射侧与非照射侧随时间的变化趋势也不同，照射侧 NAA 明显下降。总胆碱（total Choline, tCh）相对总肌酸(total Creatine,tCr)的比值在照射侧和非照射侧之间存在差异（$P_{t*g}=0.018$），两者的变化趋势不同，照射侧呈上升趋势。病理结果显示照射侧出现神经元损伤，白质纤维的疏松改变。
结论 放射性脑损伤急性反应期，NAA 的显著下降和 tCh 的的上升可能反映了照射区域神经元的损伤和功能紊乱。^{1}H MRS 可以在常规 T2WI 出现异常改变前检测到损伤区域代谢物的异常。

PU-2044

长期监测大鼠放射性脑损伤的磁共振波谱研究

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目的 长期动态监测放射后局部区域代谢物的变化，探究磁共振波谱在大鼠放射性脑损伤中的诊断价值。
材料与方法 18 只成年雄性 SD 大鼠进行 35Gy 半脑垂直单次照射。采用 7.0 T 小动物磁共振于照射前、照射后 4 周、6 周、8 周、12 周、24 周、36 周多个时间点进行 T1WI、T2WI 和 ^{1}H MRS 数据采集，利用 LCModel 软件定量分析各时间点照射侧与非照射侧海马区脑组织的代谢产物变化。

结果 NAA、tCh、谷氨酸（Glutamic acid, Glu）、Glu 和谷氨酰胺（Glutamic acid and glutamine, Glx）、肌醇（inositol, Ins）、谷胱甘肽（glutathione, GSH）、牛黄酸（taurine, Tau）在照射侧和非照射侧间总体有差异。tCh 表现为代谢物比值增加，余代谢物在 12 周后表现为下降趋势，较照射前有统计学差异。

结论 放射性脑损伤迟发性反应期 MRS 出现多种代谢物的异常，可能提示放射性脑损伤的出现。

PU-2045
复发缓解型多发性硬化患者扣带皮层结构和灌注研究

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目的 采用高分辨率 3D-T1 序列和三维伪连续动脉自旋标记灌注成像(3D pCASL)序列探讨复发-缓解型多发性硬化(RRMS)患者扣带皮层的结构和灌注改变，并分析其临床相关性。

方法 纳入 RRMS 患者 28 例，健康对照者 28 例，采用 3D-T1 和 3D pCASL 序列测量扣带皮层左右共 8 个亚区的皮层厚度和脑血流量(cerebral blood flow，CBF)值，并进行组间比较。运用 *Pearson* 相关和偏相关分析评估 MR 参数值与临床数据以及认知评分之间的相关性。

结果 与正常对照组比较，RRMS 患者左侧前扣带皮层尾部，双侧扣带皮层峡部，双侧后扣带皮层的 CBF 值明显减低（$p<0.05$）；双侧扣带皮层峡部，左侧后扣带皮层萎缩，右侧前扣带皮层喙部的皮层厚度值增（$p<0.05$）。患者扣带皮层亚区的 CBF 值和皮层厚度与注意力、短时记忆能力、信息处理速度、视空间技能和视觉记忆等认知表现有相关性（$p<0.05$）。

结论 RRMS 患者存在扣带皮层亚区萎缩和灌注的改变，可能与高级认知功能的损害有关，为临床对伴有认知障碍的 RRMS 患者的治疗提供信息。

PU-2046
自身免疫性 GFAP 星形细胞病的磁共振影像特点

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目的 自身免疫性胶质纤维酸性蛋白（Glial fibrillary acidic protein，GFAP）星形细胞病是于 2016 年首次被描述命名的神经系统自身免疫性疾病，至今文献报道近 300 例，其中，中国学者报道 38 例。本研究回顾性分析 2 例自身免疫性 GFAP 星形细胞病的中枢神经系统磁共振影像表现，结合文献资料，分析其影像特点，提高对该疾病的认识。

材料与方法 2 例患者均为男性，例 1，25 岁，发热三天、四肢无力一天就诊，例 2，55 岁，发热伴大小便未解，进行性双下肢乏力 20 余天就诊；脑脊液检查：白细胞增高，蛋白增高，抗 GFAP 抗体阳性（1:10），抗 AQP4 抗体阴性，抗 MOG 抗体阴性。磁共振检查采用 1.5T（西门子）或 3.0T（飞利浦）MR 机，例 1 行头颅 MR 常规平扫与增强，例 2 行头颅、颈椎、胸椎 MR 常规平扫与增强。

结果 例 1 头颅 MR 表现为：脑干及两侧基底节区大片或斑片状 T1WI 低信号、T2WI 高信号影，DWI 低信号为主伴少许斑点样高信号，增强扫描脑干病灶内可见与脑干长轴垂直的齿梳状线样强化影，两侧基底节区病灶强化不明显。例 2 头颅 MR 表现为：两侧侧脑室旁小斑片状长 T1 长 T2 异常信号影，增强扫描两侧脑室旁见放射状线样强化影；颈椎及胸椎 MR 表现为颈胸髓内偏侧小斑片状 T2WI 高信号影，增强扫描脊髓内病灶轻度强化，脊髓周围软脊膜可见不连续轻中度强化。

结论 结合文献资料，自身免疫性 GFAP 星形细胞病的 CNS 影像表现大致总结如下：1）病灶可累及脑部（包括白质、基底节、下丘脑、脑干、小脑、脑膜、脑室甚至颅骨）、脊髓（包括软脊膜），脊髓病灶一般比 AQP4 或 MOG 抗体阳性患者更轻微、更模糊；2）增强扫描最特异的表现是，垂直于脑室的脑白质内血管样放射状线样强化，脊髓强化表现为脊髓中央近中央管旁线样强化。自身免疫性 GFAP 星形细胞病的 CNS 影像表现有相对特征性，结合临床抗 GFAP 抗体的检查，能提示诊断。

PU-2047
T2 FLAIR 增强扫描在艾滋病并发隐球菌性脑膜炎诊断中的应用

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目的 对比分析 T2 FLAIR 增强扫描及 T1 增强扫描两种检查技术对艾滋病并发隐球菌性脑膜炎诊断价值。
方法 回顾性分析我院近 1 年来 33 例艾滋病并发隐球菌性脑膜炎患者的 T2 FLAIR 增强扫描及 T1 增强扫描影像资料。应用 x 2 检验对比分析两种检查方法对病变检出阳性率。
结果 在 33 例艾滋病并发隐球菌性脑膜炎患者中，T2 FLAIR 增强扫描检出 27 例，未检出 6 例，阳性率 81.8%；T1 增强扫描检出 11 例，未检出 22 例，阳性率 33.3%。强化脑膜影像表现为局灶性或弥漫性线样高信号影。两种检查方法阳性率差异有统计学意义（ x 2=14.0625，P<0.001）。
结论 对于艾滋病并发隐球菌性脑膜炎的检出，T2 FLAIR 增强扫描敏感性优于 T1 增强扫描，且是后者的有益补充。

PU-2048
病毒性脑炎与 MELAS 的 MRI 特征分析及鉴别诊断

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【摘要】 **目的** 探讨病毒性脑炎（Viral encephalitis,VE）与线粒体脑肌病伴乳酸酸中毒和卒中样发作(mitochondrialencephalomyopathy，lactic acidosis，and stroke－like episodes，MELAS)的临床表现及 MRI 特点，提高对两者的诊断和鉴别诊断水平。**方法** 回顾性分析本院 25 例 VE 和 22 例 MELAS 患者的临床资料及影像学检查。**结果** 统计分析显示：VE 组以发热为首发症状的比例高于比 MELAS 组(P <0.05)，并且很少有听力下降、身材矮小、智力低下等表现(P <0.05)。在影像学检查中，MELAS 组病灶累及颞叶、顶叶、枕叶的比例明显高于 VE(P <0.05)，且在 DWI 序列上病灶的信号强度明显高于 VE(P <0.05)，此为本研究的独特发现。此外，MELAS 组颅脑 MRS 检查倒置乳酸峰的出现率高于 VE 组(P <0.05)。而发病年龄、性别两者间差异无统计学意义（P 值均 >0.05）。结论 VE 和 MELAS 的 MRI 表现具有一定的特征性，特别是 DWI 序列和 MRS，有助于 VE 和 MELAS 颅内病灶的检出及两者的鉴别。

PU-2049
3.0T 磁共振在蜱传脑炎早期诊断中的价值

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探讨 MR 扩散加权成像（DWI）在蜱传脑炎诊断中的临床应用价值。资料与**方法** 对 78 例蜱传脑炎患者和 20 例无蜱传脑炎的志愿者行颅脑 T1WI、T2WI 及 DWI，由 2 名放射诊断医师采用盲法随机进行 MRI 阅片后对比分析单纯 T1WI、T2WI 及 DWI 对蜱传脑炎诊断正确率。**结果** 蜱传脑炎病灶主要分布于脑白质、内囊、胼胝体、基底节、脑皮质及脑干。脑白质区域的病灶均呈双侧对称性受累。所有异常信号在 T1WI 上均呈等信号或微低信号，T2WI 上呈高或微高信号，DWI 上为相对明显高信号。DWI 序列对病灶的检出率为 100%(78/78)，显著高于 T1WI 的 58.97%（46/78）（ χ^2=40.26, P=0.00）；亦高于 T2WI 的 85.90%(67/78)（ χ^2=11.83, P=0.00）。蜱传脑炎患者病灶部位的 ADC 值较正常脑组织明显降低，且差异具有统计学意义（t＝21.25, P＝0.00）。**结论** 3.0TMR DWI 能较直观地显示蜱传脑炎患者脑组织病变，其作为常规 T1WI 和 T2WI 的补充检查序列可以明显提高对蜱传脑炎的检出率

PU-2050
以癫痫为首发症状的脑内疾病的 MRI 诊断及分析

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目的 分析、总结可引起癫痫的疾病的 MRI 表现，为临床治疗提供影像学依据。
方法 搜集 2018 年 1 月到 2019 年 5 月就诊于山西医科大学第一医院以癫痫发作为首发症状的患者 275 例，其中男 158 例，女 117 例，年龄 6-78 岁，平均年龄 56.8 岁，；所有患者均为初次发病，均行头颅磁共振扫描及海马冠状位薄层扫描，扫描序列包括 T1WI、T2WI、flair、DWI 和海马冠状位薄扫序列，扫描图像由两名主治医师进行诊断。
结果 颅内异常者 259 例，无异常者 16 例；海马硬化者 19 例，病毒性脑炎者 36 例，颅内占位者 139 例，外伤或占位术后者 60 例，脑先天发育异常者 5 例。
结论 根据 MRI 表现，对各个疾病进行精确诊断，对患者进行对症治疗及手术治疗，从而对减轻患者痛苦，更好的服务临床。

PU-2051
富于淋巴浆细胞型脑膜瘤影像表现（附 2 例报告并文献复习）

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目的 探讨富于淋巴浆细胞型脑膜瘤的 CT、MRI 表现及其与病理特点的相关性，提高对本病的认识。**方法** 回顾性分析 2 例经手术及病理证实的富于淋巴浆细胞型脑膜瘤并复习相关文献。**结果** 肿瘤多为单发，圆形或类圆形，也可沿脑膜匍匐性生长。CT 平扫多表现为等或高密度肿块，钙化少见。MRI 平扫 T_1WI 多表现为等或稍低信号，T_2WI 呈等或稍高信号，增强扫描明显强化，呈匍匐性生长，脑膜广泛增厚。本组 1 例病灶呈囊实性，信号混杂，内见出血；1 例呈不规则分叶状，内见多发小斑片状长 T_2 信号，瘤内及瘤周见多发流空血管影，邻近颞骨、蝶骨大翼骨质吸收、变薄；增强扫描 2 例实性部分均明显强化，并可见“脑膜尾征”。病理显示瘤细胞排列成编织状、旋涡状，间质内可见大量淋巴细胞、浆细胞浸润。**结论** 富于淋巴浆细胞型脑膜瘤青壮年好发，无性别差异，“匍匐性生长”和瘤内出血是其特征性影像表现，外周血异常对本病具有提示作用，当

影像学检查显示肿瘤位于颅底和/或邻近骨质破坏时需长期随访，最终确诊需依赖组织病理学检查。

PU-2052
原发性中枢神经系统淋巴瘤 MRI 表现特征、DWI 弥散特性及其病理基础

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目的 探讨中枢神经系统淋巴瘤 MRI 表现特征及其弥散特性与其病理特性的相关性，以期提高对该病诊断的准确性。
资料与方法 回顾性分析 13 例经病理证实中枢神经系统淋巴瘤完整影像学资料，分析病灶的部位、数目、大小、信号、强化特征、瘤周水肿、占位效应及扩散加权成像（DWI）表现、ADC 数值。
结果 13 例中原发性 CNSL11 例，继发性 2 例，其中原发性脑膜淋巴瘤 1 例，继发性脑膜淋巴瘤 1 例。单发病灶 8 例，多发病灶 5 例，多发者病灶 3-7 个；最多累积部位是大脑半球皮髓质交界部（9/13 例），其次是基底节区-丘脑放射冠（7/13 例），再次是胼胝体（4/13 例）；13 例中 12 例病灶强化，呈团块状、结节状均匀强化 8 例，不均匀强化 3 例，环形强化 1 例，无强化 1 例；1 例病灶表现“缺口征”，2 例表现“尖角征”；瘤周水肿轻到中度 12 例，重度 1 例。CNS 淋巴瘤组 ADC 值：0.780±0.137×10^{-3}m ㎡/sec，$rADC_L$比值：1.037±0.325；
结论 CNS 淋巴瘤通常位于脑表面或深部白质通路的单发或多发结节状、团块状异常均匀强化实性病灶；病变常与脑脊液间隙紧密接触；瘤周水肿轻，占位效应小，很少发生坏死、囊变及钙化、出血；胼胝体、脑干、放射冠等白质通路弥漫塑形性浸润病灶及“缺口征”和“尖角征”是其较为特征性影像学表现。激素冲击治疗表现为“鬼影状”强化。DWI 序列更具显示病灶高细胞密度的优越性，能提供额外的组织弥散特征信息，有助于淋巴瘤与胶质瘤的鉴别诊断。

PU-2053
磁共振功能成像在鉴别诊断脑胶质瘤复发与治疗后反应的研究进展

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脑胶质瘤是成人中枢神系统中最常见的恶性肿瘤，因其浸润性生长的特点，术后易复发，目前主要采用手术联合同步放化疗为治疗手段，但患者的生存期不容乐观，绝大多数病人在 2 年内复发，且部分患者可能在同步放化疗 3 个月后会出现一些治疗后反应，包括假性进展和放射性坏死。复发和治疗后反应出现的时间、临床症状及常规影像学表现非常相似，而预后及治疗方式截然不同，这给胶质瘤预后评估带来了极大的困难。临床上，胶质瘤复及治疗后反应均可表现为颅内高压及神经功能障碍等症状，而病理组织学基础上两者截然不同，胶质瘤复发组织学表现为肿瘤细胞迅速增殖、密度增加，血管内皮细胞增生，肿瘤血管增多，肿瘤组织代谢旺盛，侵犯正常脑组织，并伴有血脑屏障破坏；治疗后反应中的假性进展组织学基础为同步放化疗引起术区组织炎症反应、血管损伤，毛细血管透性短暂升高，不伴有肿瘤细胞增殖及组织坏死，具有一定程度的自限性。放射性坏死组织基础包括白质脱髓鞘、神经细胞坏死、纤维瘢痕组织形成、血管内皮细胞损伤及坏死，导致血脑屏障破坏。因治疗后反应与复发均可以引起血脑屏障的改变，所以常规影像学增强扫描均表现为伴

或不伴有水肿的新发强化灶，两者难以鉴别。目前，临床上仍以病理组织学检查作为诊断胶质瘤复发的金标准，但因其有创性和操作中存在的局限性使其难以在胶质瘤术后评估中广泛应用。近年来随着磁共振技术的发展，磁共振扩散成像中的 DWI、DTI、IVIM 技术，灌注成像中的 DSC-MRI、DCE-MRI 、ASL 以及磁共振波谱 MRS 技术等在胶质瘤的术后评估与检测中发挥着越来越重要的角色。

PU-2054
瘤周水肿区 DCE-MRI 对胶质瘤分级的应用价值

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目的 探讨动态对比增强磁共振成像（DCE-MRI）在脑胶质瘤患者瘤周水肿区的灌注特点及其对胶质瘤分级的临床应用价值，从而为临床提供可靠的手术切除范围。 方法 根据 2016 年 WHO 胶质瘤分类和分级标准将患者分为低级别胶质瘤组（LGG 组，Ⅱ级）17 例和高级别胶质瘤组（HGG 组，Ⅲ+Ⅳ级）27 例。 所有患者术前均行 DCE-MRI 检查，工作站进行 DCE-MRI 后处理，提取容积转运常数(Ktrans)、血管外细胞外间隙容积分数(Ve)2 个参数，选取瘤体区、肿瘤外水肿内 1cm、肿瘤外水肿内 2cm 区及对侧半球正常白质区为感兴趣区，得到各参数的测量值,比较其在 HGG 组、LGG 组中的差异。应用 Spearmann 相关系数分析 Ktrans 值、Ve 值与胶质瘤病理分级之间的相关性。结果 HGG 组瘤体区、肿瘤外水肿内 1cm、肿瘤外水肿内 2cm 区 Ktrans、Ve 分别高于 LGG 组，差异有统计学意义（P<0.05）；两组肿瘤各区域 Ktrans、Ve 从瘤体区至正常白质区呈递减趋势,两组瘤体区 Ktrans、Ve 与肿瘤外水肿内 1cm 、肿瘤外水肿内 2cm 区、正常白质区比较差异有统计学意义（P<0.05）；HGG 组肿瘤外水肿内 1cm 与肿瘤外水肿内 2cm 区、正常白质区比较差异有统计学意义（P<0.05），肿瘤外水肿内 2cm 区与正常白质区差异无统计学意义（P＞0.05）；LGG 组肿瘤外水肿内 1cm 与肿瘤外水肿内 2cm 区、正常白质区两两比较差异无统计学意义（P＞0.05）。Ktrans 值、Ve 值与胶质瘤病理分级呈正相关（P<0.05）。结论 DCE-MRI 能提高肿瘤的分级并指导临床手术切除范围。

PU-2055
大鼠 C6 脑胶质瘤瘤体 FA 值与其微结构特点的相关性研究及临床应用

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目的 探讨大鼠 C6 脑胶质瘤瘤体 FA 值与其微结构（VEGF 阳性细胞百分比，MVD 和细胞密度）的相关性及其在临床中的应用价值。
材料与方法 通过建立鼠脑胶质瘤模型并收集 30 例胶质瘤患者接受 DTI 检查，获得瘤体 FA 值及肿瘤级别、VEGF 阳性细胞百分比，MVD 和细胞密度，分析不同级别胶质瘤瘤体 FA 值的差别及瘤体 FA 值（尤其是晚期阶段荷瘤大鼠）与其微观结构的相关性。
结果 （1）鼠脑胶质瘤及脑胶质瘤患者瘤体 FA 值均低于对侧脑组织 FA 值，差异有统计学意义，而晚期阶段Ⅲ级胶质瘤的平均 FA 值低于 IV 级胶质瘤平均 FA 值，差异无统计学意义。（2）鼠脑胶质瘤瘤体 FA 值与 VEGF 阳性细胞百分比，MVD，细胞密度均呈正相关，r 值分别为 0.62、0.62 和 0.69，而晚期阶段 r 值分别为 0.67,0.65 和 0.71。（3）脑胶质瘤患者瘤体 FA 值与其 VEGF 阳性细胞百分比、MVD 和细胞密度均亦呈正相关，r 值分别为 0.68、0.65 和 0.63。

结论 胶质瘤瘤体 FA 值可以为评估胶质瘤的微观结构，推测肿瘤生物学行为，制定手术方案提供准确可靠、无创的影像监测方法，也为临床通过 FA 值评估胶质瘤微观结构提供了实验基础及临床应用依据。

PU-2056
多 b 值 DWI 在诊断 WHO III 级星形细胞瘤 IDH1 基因型的初步研究

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目的 探究多 b 值 DWI 对 WHO III级星形细胞瘤异柠檬酸脱氢酶 1(isocitrate dehydrogenase，IDH1)基因分型的诊断价值。材料与**方法** 回顾性分析 2015 年 1 月至 2018 年 12 月经手术病理确诊为星形细胞瘤III级且有基因结果的患者资料，术前均行颅脑常规 MRI 扫描及多 b 值弥散加权扫描，通过后处理工作站获得水通道蛋白相关扩散系数（AQP-ADC）、纯扩散系数（D）、灌注相关扩散系数（D*）、灌注分数（f）等伪彩图，测量肿瘤实质区及同一层面对侧正常脑实质区的各个参数值，计算获得校正后的参数值（瘤体参数值除以对侧正常脑实质值）：相对水通道蛋白扩散系数（rAQP-ADC）、相对纯扩散系数（rD）、相对灌注相关扩散系数（rD*）、相对灌注分数（rf）等，应用两样本 t 检验分析同一病理级别不同基因分型之间的参数值差异，对有统计学意义的参数值绘制受试者工作特征(receiver operating characteristic，ROC)曲线，计算敏感度及特异度。**结果** WHO III级星形细胞瘤 IDH1 突变组 AQP-ADC、rD 均高于同级别 IDH 野生型，D*以及 rf 值低于野生型，二者差异有统计学意义（$P<0.05$）。瘤体 AQP-ADC 值 ROC 曲线下面积、界值、敏感性及特异性分别为 0.826、0.156、83.33%、81.82%， rD 值分别为 0.758、 1.807、66.67%、81.82%，D*值分别为 0.856、 0.00287、100%、72.73，rf 值分别为 0.833、1.758、83.33、81.82；**结论** 多 b 值 DWI 对于术前诊断 WHO III级 IDH1 基因状态具有一定应用价值。

PU-2057
磁共振成像的直方图分析在鉴别鞍区生殖细胞瘤与颅咽管瘤中的价值

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背景与**目的** 准确的鉴别诊断对鞍区生殖细胞瘤和颅咽管瘤的治疗计划至关重要。本研究的目的是探讨磁共振的直方图分析在区分鞍区生殖细胞瘤和颅咽管瘤中的价值。
材料与**方法** 回顾性评价 5 年的病理数据库，获得经病理证实的 20 例鞍区生殖细胞瘤和 48 例鞍区颅咽管瘤的磁共振图像。使用 Mazda 软件对每位患者的 T1 和 T2 加权成像、ADC 图和对比剂增强后的 T1 加权成像进行分析。选择 9 个参数作为比较指标，包括方差、偏态、峰度、均值、1 分位数、10 分位数、50 分位数、90 分位数和 99 分位数。对有显著组间差异的参数绘制接收者操作特征曲线，计算曲线下面积。
结果 在直方图分析提取的 9 个参数中，我们选择了特异性和敏感性大于或等于 75%的指标，以准确满足临床需要。ADC 图的平均值、偏度、50 分位数和 90 分位数显示了组间比较具有统计学意义，曲线下面积分别为 0.915、0.890、0.916 和 0.808。与其相对应的区分鞍区生殖细胞瘤和颅咽

管瘤的最佳鉴别值分别为 165.73（特异性 87.5%，敏感性 80.0%），80.13（特异性 80.0%，敏感性 87.5%），170.50（特异性 83.3%，敏感性 85.0%）和 237.00（特异性为 81.3%，敏感性为 75%）。
结论 T1 和 T2 加权成像、ADC 图和对比剂增强后的 T1 加权成像的直方图分析有助于鞍区生殖细胞瘤和颅咽管瘤的鉴别。此外，ADC 图的直方图在鞍区生殖细胞瘤和颅咽管瘤的鉴别中比其他序列的直方图更有效。

PU-2058
颅内血管周细胞瘤与血管瘤型脑膜瘤的 MRI 鉴别分析

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目的 探讨颅内血管周细胞瘤(HPC) 与血管瘤型脑膜瘤(AM)的 MRI 影像征象及功能成像各参数在二者鉴别诊断中的价值。
方法 回顾性分析 2014 年 3 月至 2019 年 7 月期间经手术病理证实的 15 例 HPC 与 11 例 AM 的临床及 MRI 影像资料，包括平扫、增强、弥散张量成像（DTI）、动脉自旋标记成像（3D ASL），采用 $\chi 2$ 检验和两独立样本 t 检验对二者的临床资料、MRI 征象以及功能成像参数进行统计分析，以 $P<0.05$ 为差异有统计学意义。
结果 与 AM 比较，HPC 患者的平均 CBF 值(t= -8.998, P<0.001)及 FA 值(t= -3.666,P= 0.005)较低，ADC 值(t= 2.613,P= 0.028)较高，差异有统计学意义；其中高灌注区 CBF 值(t= -15.136, P<0.001)及低灌注区 CBF 值(t= -8.306, P<0.001)差异也均有统计学意义。另外，与 AM 比较，HPC 发病平均年龄偏小(t= -2.394,P= 0.025)、更容易出现分叶征($\chi 2$= 9.095, P=0.003)及囊变坏死($\chi 2$=9.383,P=0.002)、T1WI 以等高信号为主($\chi 2$=27.788,P<0.001)、T2WI 以等低信号为主($\chi 2$=16.330,P<0.001)、瘤周水肿程度轻($\chi 2$=19.253,P<0.001)、血管流空影更常见且更粗大($\chi 2$=9.027,P=0.011)、与硬脑膜多为窄基底相连（$\chi 2$=28.542,P<0.001）、脑膜尾征少见($\chi 2$=25.000,P<0.001)，上述差异均有统计学意义(P<0.05)；性别($\chi 2$=2.135, P=0.144)及 MDC 值(t= 2.109,P= 0.064)差异无统计学意义(P>0.05)。
结论 HPC 与 AM 的 MRI 征象及各功能成像参数值存在一定差异，对比分析其影像学特征并辅以功能成像分析有助于二者的鉴别诊断。

PU-2059
Imaging findings of atypical teratoid/rhabdoid tumors of central nervous system : report of 9 cases and literature review

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Objective: To explore the imaging features of atypical teratoid/rhabdoid tumors of central nervous system (CNS), and improve the understanding of it.
Methods: The imaging findings of 9 patients with **atypical teratoid / rhabdoid tumors of CNS** which proved by operation and pathology were retrospectively analyzed, with a review of the related literatures.

Results: There were 6 males and 3 females, the mean age of patients was 8.33 years. Tumors location at intracranial in 6 cases, and location at intraspinal 3 cases. The maximum diameter of intracranial tumors was varying from 3 to 5.1 cm, and intraspinal tumors was 4.5 to 13.2 cm. All AT/RTs showed marked heterogeneity on MRI images secondary to cystic changes in 8 cases, hemorrhage in 2 cases. 3 cases with meningeal invasion;1 case with intracerebrained metastasis. Diffused-weighted imaging (DWI) demonstrated inhomogeneous hyperintense signal, with a low ADC value.
Conclusion: AT/RT is large, signal or density is mixed, often accompanied by peripheral cystic change、hemorrhage、 low ADC value, and easily disseminated through cerebral spinal fluid. When young patients have these imaging characteristics, we should take AT/RTs into the diagnosis consideration.

PU-2060
原发中枢神经系统淋巴瘤的多模态影像学特征分析

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目的 探讨原发中枢神经系统淋巴瘤（PCNSL）的影像学特征。方法 回顾性分析经病理证实的 47 例 PCNSL 患者的临床及术前影像学资料。结果 24 例单发，23 例多发，共 117 病灶。CT 检查：61 个病灶中等/稍高密度 52 个，低密度 9 个，3 例 CT 增强均呈轻中度均匀强化。MRI 检查：117 病灶中 107 个 T1WI 上呈等/低信号，10 个呈稍高信号；113 个病灶 T2WI 上呈等/稍高信号，4 个呈低信号；89 个病灶 FLAIR 上 71 呈稍高/高信号，16 个呈等信号，2 个呈低信号；增强扫描 98 个病灶中 75 个呈团块状、结节状均匀强化，23（19+4）个呈环形、斑片状不均强化，4 个合并出血，其中“握拳征”18 个、“尖角征”14 个、“裂隙征”15 个、“蝴蝶征”4 个，出现“卫星灶”11 个 ；DWI 上 43 个病灶均呈稍高/高信号，ADC 图上低信号；磁共振波谱 15 个病灶均 Cho 峰升高、NAA 峰均降低、10 个 Cr 峰降低、5 个 Cr 峰升高，6 个见 Lip 峰升高及 5 个见倒置 Lac 峰。FDG-PET 检查病灶 SUVmax 平均值为 21.3。95 个病灶周围出现轻中度水肿。结论 PCNSL 多模态影像表现具有一定的特征，合理应用多模态影像学有助于早期精准诊断。

PU-2061
脑胶质瘤术后复发与放射性损伤影像学鉴别的进展概述

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[摘要]**目的** 胶质瘤术后复发与术后放疗导致的脑组织损伤在常规 MRI 图像上往往有较大的相似性，均可表现为术区周围水肿及异常强化灶，但这两者所采取的临床治疗方案截然不同。因此，该两者早期准确的鉴别诊断具有重要的临床意义。对采用扩散加权成像（DWI）、扩散张量成像（DTI）、波谱成像（MRS）、磁共振灌注成像（PWI）、PET 及 SPECT 等影像学方法鉴别胶质瘤复发及放射性损伤的国内外研究予以综述，以期为临床提供更有价值的指导意见。

PU-2062

伴椎体膨胀性骨质破坏的椎管内神经鞘瘤一例影像表现及误诊分析

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目的 通过分析一例伴椎体及附件膨胀性骨质破坏的椎管内神经鞘瘤的影像表现，提高对神经鞘瘤罕见影像表现的认识。
方法 回顾经手术切除病理证实、影像学误诊的一例椎管内神经鞘瘤的影像表现，文献回顾神经鞘瘤少见影像表现。
结果 该病例位于髓外硬膜下，CT 表现为椎管内及椎旁软组织密度肿块灶，邻近椎体及附件呈膨胀性骨质破坏，MRI 表现为等 T1 稍长 T2 信号，增强后呈明显强化，内可见无强化囊变区，伴一侧椎间孔扩大，影像误诊为骨源性肿瘤，骨巨细胞瘤或浆细胞瘤。回顾文献发现，神经鞘瘤少数病例可累及椎体骨质，一般表现为压迫性骨质吸收表现，膨胀性骨质破坏者罕见，极易误诊为骨巨细胞瘤。神经鞘瘤其他少见表现还包括多发病变、T1 及 T2 信号多变及轻-中度强化，易误诊为神经纤维瘤、转移瘤及脊膜瘤等。
结论 伴椎体膨胀性骨质破坏的椎管内神经鞘瘤极易误诊为骨源性肿瘤，需要综合肿瘤形态、信号/密度、强化等特点综合考虑。

PU-2063

Application of MR DWI in Differential Diagnosis of Low- and High-Grade Meningioma

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*[Abstract] **Purpose** To investigate the value of DWI and ADC in differentiating low grade from high grade meningiomas. **Methods** We retrospectively analyzed 73 patients with meningioma confirmed by postoperative pathology from 2013 to 2017 in our hospital. ADC values of the tumor parenchymal area, contralateral normal white matter and peritumoral edema area were measured and normalized ADC values (NADC) were calculated; ADC values and NADC in meningioma at each grade and subtype were statistically compared. **Results** There were 66 cases of low grade meningiomas while 7 cases of high grade meningiomas. ADC value of low grade meningiomas was higher than that of the contralateral normal white matter (P<0.05), while high grade meningiomas had the tendency towards higher than that of the contralateral white matter (P=0.72). There was no significant difference in ADC values and NADC between low and high grade meningiomas (t=0.91, P=0.36; t=1.24, P=0.21). No significant difference showed in ADC of peritumoral edema area between meningiomas at different grades (P>0.05). ADC varied among subtypes, with angiomatous meningioma and secretory meningioma was higher. **Conclusion** ADC values can be used to figure out the microstructure and the component of meningioma, but it has few significant values in differentiating low grade meningioma from the high grade one.*

PU-2064

纹理分析在预测胶质瘤患者 ki67 是否表达的应用价值

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【摘要】 目的 探讨 MRI 图像纹理分析在预测胶质瘤患者 ki67 是否表达的应用价值。**方法** 回顾性收集经手术病理证实的 116 例的胶质瘤患者，对其 T1WI 增强图像进行纹理分析，获取整个瘤体的平均值、中位数、标准差、偏度、峰度、能量和熵值等定量参数，并进行统计学分析。**结果** 对 MRI 图像纹理分析后所获得的定量参数中，平均值、中位数、标准差 3 个参数在 ki67（-）组与 ki67（+）组间的差异无统计学意义，偏度、峰度、能量和熵值 4 个参数在 ki67（-）组与 ki67（+）组间的差异有统计学意义（P＜0.001）；峰度和熵值参数鉴别效能明显优于其它参数值，有较高的敏感性、特异性及准确性。**结论** 纹理分析部分定量参数（偏度、峰度、能量和熵值）有助于预测胶质瘤患者 ki67 是否表达。

PU-2065
利用表观扩散系数 ADC 值对星形细胞瘤的分级研究

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摘要目的:评价最小表观扩散系数(ADC)和 ADC 差值在核磁共振成像中对星形细胞瘤分级的应用价值材料和方法:医院的机构审查委员会批准了这项回顾性研究，并放弃了知情同意。50 例(男 23 例)。27 岁女性患者;年龄中位数，53 岁)，新诊断为星形细胞瘤。两名对临床信息不知情的观察人员通过手工将 3 到 5 个感兴趣的区域(40-60 mm2)放置在 he 实体肿瘤中，无论有无增强对比材料的成分，独立测量 ADC，并计算平均 ADC 值。选择最小和最大 adc。将两者的差值记为 ADC 差值。这些 ADC 值作为肿瘤分级的参数，并通过 Kruskal-Wallis 检验和 receiver operating characteristic (ROC)曲线分析进行比较。结果:根据 ROC 曲线对肿瘤分级的鉴别分析，最小 adc 在 ROC 曲线下面积最大。最小 adc 最优地帮助区分界限值为 1.47 x 10-3 mm2/秒的 1 级肿瘤和界限值为 1.01 x 10-3 mm2/秒的 4 级肿瘤。001 对)。ADC 值的差异有助于区分 2 级和 3 级肿瘤，utoffi 值为 0.31 x 10-3 mm2/sec (P<.001)。采用上述最小 ADC 值和 ADC 差值联合截断值(双参数法)对肿瘤分级时，得到阳性预测值为:1 级肿瘤 73%(11 例中有 8 例);2 级肿瘤，100% (5 / 5);3 级肿瘤 67%(12 例中有 8 例)，4 级肿瘤 91%(22 例中有 20 例)结论:采用最小 ADC 值和 ADC 差值(双参数法)相结合的方法，可以准确地分级星形细胞瘤 RSNA 2009

PU-2066
颅内孤立性纤维性肿瘤/血管外皮瘤影像学表现

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目的 探讨 CT、MRI 在颅内孤立性纤维性肿瘤/血管外皮瘤（SFT/HPC）的影像学特征。方法 搜集我院经手术病理证实为颅内 SFT/HPC 15 例，结合临床、病理资料探讨其影像学特征。结果 1、基本信息：男 4 例，女 11 例，年龄 29~76 岁，平均（52.9±11.9）岁， 15 例行 MRI 平扫及增强，9 例行 CT 平扫。2、临床表现：主要表现为头痛头晕、肢体乏力，2 例分别以视力下降、耳鸣为主要表现[1]。3、影像学表现：肿瘤位于颞部 5 例、额部 2 例、小脑半球 2 例、另桥小

脑角、鞍旁、大脑镰、枕部、颞顶部、顶部各 1 例；肿瘤最大径平均值（5.1±2.1）cm；11 例边界尚清晰；2 例无灶周水肿，11 例轻度水肿，3 例重度水肿；WHO I、II、III 级分别 1 例、11 例、3 例，术后复发病例 5 例，其中 3 例 WHO III 级均为复发病例；CT 平扫病灶以稍高密度为主，较大者可伴囊变低密度；MR 平扫 T2WI 中 8 例病灶可见皂泡样小囊状高信号区；MR 增强扫描所有病例均明显强化，囊变区不强化，8 例可见脑膜尾征。4、病理学表现：肿瘤细胞呈梭形，排列密集，其间见裂隙样血管，内衬扁平内皮。结论　SFT/HPC 发病率低，好发女性，以头痛头晕为主要临床表现，多为低级别，边界尚清伴轻度灶周水肿，瘤体多较大[2]，级别高者易复发[3-6]，CT、MRI 平扫及增强与脑膜瘤有许多相似之处[3]，但 T2WI 中皂泡样改变有助于二者鉴别。

PU-2067
磁共振多期延迟增强扫描在肺癌脑转移中的对比研究

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目的:本研究选择不同延迟增强时期对颅脑转移瘤的诊断进行对比评估。为肺癌治疗前分期患者评估颅脑转移瘤提供更合理的扫描方案。

材料与方法:连续对 2019 年 3 月-2019 年 8 月就诊于我院的肺癌治疗前分期患者行飞利浦 3.0T 磁共振检查。所有病人平扫+增强扫描并在注射钆喷酸葡胺结束后立即行横断位 T1WI FFE 序列扫描及 5 分钟、8 分钟、12 分钟和 15 分钟时行轴位 TI FFE 扫描。对所有图像评估，评估内容为病灶实性、边缘及总体转移，同时对所有转移病测量大小及相对应的 SNR（信号噪声比）、CNR（强化噪声比）、CE（强化程度）、CER（强化程度比）和 CBR（强化脑比）值。将五组不同时相的颅脑转移瘤 SNR、CNR、CE、CER、CBR 的比较采用重复测量设计方差分析，评价指标间对照研究使用配对 t 检验，检验标准 α 值=0.05;所有数据采用 $\bar{x} \pm s$ 均数和标准差表示，以 P＜0.05 为差异具有统计学意义。

结果:病灶数目统计即时期、5 分钟与 8 分钟、12 分钟和 15 分钟的结果有统计学意义（P＜0.05），但 8 分钟、12 分钟 15 分钟的各期之间没有统计学意义（P＞0.05）。SNR 在各期间没有统计学意义。CNR、CE、CER 在即时期、5 分钟与其他三期有统计学意义（P＜0.05），病灶实质和边缘评分在 15 分钟时与其他各期可见统计学意义。

结论　在肺癌脑转移患者行磁共振增强扫描中，至少延迟 8 分钟扫描有利于提高病灶的显示率，延迟时间的进一步增加有利于病灶实质及边缘的显示，值得临床推广应用。

PU-2068
MRI 常规序列纹理分析预测垂体大腺瘤术后复发或进展的价值

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目的

评估垂体大腺瘤患者术前 MRI 常规序列纹理特征对于预测肿瘤术后复发或进展的价值，并探求预测垂体大腺瘤术后复发或进展的影像标志物。

方法

回顾性分析 2014 年 8 月-2018 年 10 月在本院进行手术且经 MRI 复查确诊肿瘤复发或进展的 14 例垂体大腺瘤患者的术前 MRI 资料（复发或进展组），同时收集同期在本院进行手术且在 2019 年 7 月之前经 MRI 复查未发现肿瘤复发或进展的 14 例垂体大腺瘤患者（未复发或进展组）。采用 GE 3.0T 进行扫描，选择矢状位 T2WI、冠状位 T1WI 上肿瘤的最大层面勾画 ROI，ROI 包含此层面全部肿瘤实质，并避开囊变、出血、坏死区，记录 56 个纹理特征。应用 SPSS 20.0 进行统计学分析。

结果

1、有 9 个 T1WI 信号值纹理特征在两组间有显著差异，分别是 Quantile5, Quantile10, Sum Average, Short Run Emphasis, Long Run Emphasis, Grey Level Nonuniformity, Surface Area, Compactness, Max 3D Diameter，其中以 Long Run Emphasis, Short Run Emphasis 和 Compactness 鉴别二者的 AUC 最佳，分别为 0.867、0.847 和 0.811；

2、T2WI 信号值纹理特征中，Short Run Emphasis 在两组间有显著差异，其鉴别二者的 AUC 为 0.74；

3、Logistic 多元回归分析结果显示 Quantile5, Quantile10, Short Run Emphasis, Long Run Emphasis, Max 3D Diameter 是垂体大腺瘤术后复发或进展的独立影响因素。

结论

MRI 常规序列纹理特征可以预测肿瘤术后复发或进展的风险，冠状位 T1WI 信号值 Long Run Emphasis 和 Short Run Emphasis 可以作为术后复发或进展的较好的影像标志物。

PU-2069

桥小脑角区占位性病变的 MRI 诊断分析

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目的 通过对桥小脑角区占位性病变的 MRI 表现进行分析，进一步提高对该区占位性病变的诊断及鉴别诊断水平。

方法 对手术病理证实的 35 例桥小脑角区占位性病变的 MRI 表现进行回顾性分析，对病变的形态、信号及强化情况进行系统化分析。

结果 36 例病变中，听神经瘤 18 例，MRI 表现为 T1WI 为等或等、低混杂信号,T2WI 为高信号，肿瘤边界清晰，囊变多见，增强扫描肿瘤实性部分明显强化，囊变部分无强化，肿瘤沿听神经孔向外生长。脑膜瘤 9 例，起源于岩锥尖部的脑膜，基底宽，与岩骨呈钝角相连，MRI 表现为 T1WI 等低，T2WI 等高，肿瘤边界清楚，增强扫描呈明显均匀强化，桥小脑角池有扩大。表皮样囊肿 3 例，形态不规则的囊性病变，T1WI 低，T2WI 高信号，FLAIR、DWI 呈高信号，增强扫描无强化，病变具有“见缝就钻”的生长特点。三叉神经瘤 2 例，MRI 表现为 T1WI 等或低、T2WI 高信号，囊变坏死多见，增强扫描肿瘤实性部分 明显强化，骑跨中后颅窝为其生长特点。蛛网膜囊肿 2 例，MRI 表现为 T1WI 低、T2WI 高，FLAIR 低信号，DWI 呈低信号，需与表皮样囊肿鉴别。血管母细胞瘤 1 例，典型表现为囊性灶，边缘有附壁结节，增强扫描囊性部分无强化，结节明显强化。转移瘤 1 例，有肺癌病史，MRI 表现为右侧小脑半球靠近桥小脑角区见 T1WI 低、T2WI 高信号影，增强扫描成多环形明显强化，边缘水肿明显。

结论 MRI 检查对桥脑小脑角区占位性病变的定位及定性有重要价值。

PU-2070

MRS 联合 ASL 在高级别脑胶质瘤假性进展诊断中的应用

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目的 探讨磁共振波谱分析技术(magnetic resonance spectroscopy，MRS) 联合动脉自旋标记技术(arterial spin labeling，ASL) 在高级别脑胶质瘤假性进展诊断中的应用。**方法** 回顾性分析我院 2013 年 1 月~2018 年 12 月高级别脑胶质瘤行手术及术后联合替莫唑胺放化疗 1-3 个月后 MRI 上出现水肿及增强范围扩大者 36 例，应用 MRS 分析病灶局部代谢产物及其比值情况，ASL 分析病灶局部血流情况。评价 2 种方法在高级别脑胶质瘤假性进展诊断中的意义。**结果** 36 例患者中，经二次手术病理或随访 10 月以上证实 28 例为假性进展，8 例为肿瘤复发。单纯应用 MRS、ASL 及二者联合正确诊断假性进展者分别为 19 例、23 例及 26 例。假性进展表现：MRS 图像 Cho /Cr 下降及 NAA/Cr 下降，ASL 出现病变区低灌注；肿瘤复发表现：MRS 图像 Cho /Cr 升高及 NAA/Cr 下降，ASL 出现病变区高灌注。**结论** 联合应用 MRS 及 ASL 分析可较好地诊断胶质瘤假性进展，具有良好的临床应用前景。

PU-2071

氧化石墨烯用于肿瘤成像和治疗一体化研究

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癌症，是中国城市居民的头号杀手，在农村居民死因中也位居第二。尽管有许多技术可用于诊断和治疗，但这些方法仍然具有许多缺点。传统的临床诊断成像技术，如 CT 成像、磁共振成像、核素 PET 成像等，难以实现早期微小肿瘤病灶的检测，而发现时已处于癌症的中晚期，往往救治存活率较低。因此，在癌症刚刚发生的早期阶段，准确诊断出来可以极大地提高癌症病人的存活率；肿瘤的早期成像对于癌症病人的临床诊疗具有十分重要的意义。同时，传统的化学疗法、放射疗法以及外科切除手术等在治疗癌症时往往存在许多局限，如由于到达肿瘤部位的药物剂量不足导致的疗效不佳；因非特异性的抗癌药物递送导致的毒副作用；长期单一疗法导致的药物耐受；以及不完全的外科手术切除导致的肿瘤复发。光学疗法作为一种新的抗癌方式，通过特定的光照来消除肿瘤，利用纳米载体能够将光学制剂靶向的输送到肿瘤组织，将对正常器官的损伤降到最低。氧化石墨烯及其衍生物展示出极好的作为新型肿瘤诊断、成像及治疗纳米试剂的潜能，实现肿瘤的诊断和治疗一体化。

PU-2072

成人颅内原始神经外胚层肿瘤影像诊断及鉴别诊断

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目的 探讨成人颅内原始神经外胚层肿瘤（PNET）的 MRI 特征，提高对本病的术前确诊率。**方法** 回顾性分析 7 例经病理证实的 PNET 患者的影像资料，包括 CT 平扫、MRI 平扫及增强、弥散加权成像（DWI）、三维动脉自旋标记成像（3D-ASL）、磁共振波谱成像（MRS）。**结果** 7 例均为单发，肿瘤体积较大，类圆形，可有浅分叶。2 例有明显瘤周水肿，2 例有轻度瘤周水肿，3 例无瘤周水肿。平扫呈稍长 T1 稍长 T2 信号，5 例为囊实性，2 例为实性，3 例有出血。5 例 DWI 均呈高信号，2 例 3D-ASL 呈高灌注。增强后肿瘤实质部分呈明显均一或不规则环形强化。 3 例发生颅内转移，2

例发生肺部转移。**结论** PNET 缺乏典型的影像征象，MRI 平扫及增强可准确显示肿瘤的位置、大小、信号、边缘及与周围组织的关系，而 DWI、3D-ASL 及 MRS 等多种功能成像方法的综合分析有助于 PNET 的诊断及鉴别诊断。磁共振对 PNET 的诊断及治疗有重要价值。

PU-2073
基于常规 MRI 图像的影像组学对脑胶质瘤术前分级的临床价值

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【目的】
研究基于常规 MRI 多序列图像的影像组学对脑胶质瘤术前分级的效能及临床价值。
【方法】
回顾性连续性纳入行术前常规 MRI 检查并经手术病理证实的 144 例脑胶质瘤（*WHOII* 级 45 例，III 级 52 例，IV 级 47 例）。利用 ITK-SNAP 在 MR 图像上手动勾画肿瘤容积为感兴趣区（ROI 包括了肿瘤瘤体除囊变坏死以外的实性部分及肿瘤周边的水肿部分），采用影像组学工具针对训练集病例图像提取 4432 个量化特征，删除低方差特征，对剩余特征值通过 Mann-Whitney U 检验，删除在不同级别胶质瘤之间差异无统计学意义的特征。通过绘制受试者工作特征曲线计算各特征的效能及确定胶质瘤分级的最佳临界值。选取 ROC 曲线下面积较高且经多重排列组合测试，具有较高诊断效能的数个最优特征，采用决策树模型方法，构建基于训练集病例的胶质瘤分级预测模型，采用 ROC 曲线在验证集病例上对模型进行验证。
【结果】
（1）高级别与低级别胶质瘤的鉴别：低级别胶质瘤 DWI 序列的偏度值（$Skew_{DWI}$）、Flair 序列的长期高灰度水平强调值（Emp_{Flair}）、熵值（Ent_{Flair}）、中位数（Med_{Flair}）、T1WI 增强序列的标准差值（$SD_{T1WI-CE}$） 均小于高级别胶质瘤（$p<0.05$）。（2）II 级别与 III 级别胶质瘤鉴别：II 级别胶质瘤 Flair 序列的熵值（Ent_{Flair}）低于 III 级别胶质瘤（$p<0.05$）。（3）III 级别与 IV 级别胶质瘤的鉴别：III 级别胶质瘤 T1WI 增强序列的标准差（$SD_{T1WI-CE}$）、T2WI 序列的熵值（Ent_{T2WI}）比 IV 级别胶质瘤低，III 级别胶质瘤 T1WI 增强序列的延伸率（$Elo_{T1WI-CE}$）较 IV 级别胶质瘤高，差异均有统计学差异（$p<0.05$）。

PU-2074
颅内 DWI 低信号表皮样囊肿一例

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典型 MRI 表现为 T1WI 略高于脑脊液的均匀低信号，T2WI 呈均匀高信号，增强扫描多数肿瘤无强化，其特征性表现为 DWI 高信号。此外，FLAIR 序列由于脑脊液 T2 高信号，可以显示出沿脑池形状塑形生长的表皮样囊肿，也有助于对病变的诊断。典型的表皮样囊肿根据发病部位、生长方式及 MRI 表现诊断并不困难，然而本病例中肿瘤信号与常见者完全不同，呈短 T1、T2 信号及 DWI 低信号表现

PU-2075

椎管内孤立性纤维瘤 CT/MRI 表现

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目的 探讨椎管内孤立性纤维瘤（SFT）的 CT 与 MRI 表现，旨在提高临床诊断率。 **方法** 回顾性分析 5 例经病理证实椎管内孤立性纤维瘤的临床、影像及病理资料。 **结果** 5 例椎管内 SFT，均为单发肿块，颈段 2 例，胸段 1 例，腰段 2 例。4 例位于髓外硬膜下，1 例髓外硬膜外，其中 3 例边界清楚，2 例肿块边界不清。3 例 MRI 平扫呈均匀等 T1 等 T2 信号，2 例平扫病灶信号欠均匀伴病灶内条状囊变区，其中 1 例呈等 T1 稍长 T2 信号，另 1 例呈等 T1 等稍短 T2 信号。5 例增强扫描均呈明显强化，2 例囊变区不强化。仅 1 例可见“脊膜尾征。1 例硬膜外病变 CT 平扫上示 C2-3 段椎管右侧及附件区的等密度软组织肿块，沿相应椎间孔生长，局部骨质膨胀性吸收改变。 **结论** 椎管内 SFT 在影像学上多表现为椎管内规则或不规则肿块，密度/信号较均匀，肿块 CT 上多呈等或稍高密度，临近骨质可有膨胀性吸收改变。MRI 上 T1WI 多呈等信号，T2WI 多呈等或低信号，部分可有囊变，增强表现为明显强化，部分可有“脊膜尾征”。

PU-2076
颅内多发钙化性转移的 CT 与 MRI 影像特征分析(附 6 例报告)

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目的 分析颅内多发钙化性转移的 CT、MRI 影像特征性表现和临床特点，总结提示颅内多发钙化性转移的 CT 与 MRI 影像特征以提高本病的诊断认识，为临床提供参考。**方法** 回顾性分析 6 例颅内多发钙化灶患者临床、CT、MRI 影像资料。 **结果** 病灶从点状到结节状大小不等的多发散在于颅内，分布在幕上者 1 例，幕上和幕下同时发现者 5 例，其中幕下脑干、小脑半球均可见者 2 例，位于小脑半球者 3 例。6 例患者头颅 CT 平扫中所有病灶呈稍高、高密度，CT 值最低约 42HU，最高可达 507HU，3 例增强扫描中 2 例未见强化，1 例可见强化，4 例病灶周围未见水肿，1 例于双侧顶枕叶病灶周围轻度水肿，1 例左侧侧脑室旁病灶周围轻度水肿；3 例患者复查中发现病灶大小、分布均呈再生长状态，原稍高密度灶更加致密，密度升高，CT 值升高约 10HU-110HU，病灶周围水肿未见变化。3 例患者行 MR 检查，2 例 T1WI 像呈低信号，T2WI、FLAIR 像呈稍高信号，增强见多个强化结节；另 1 例常规序列未能发现病灶，DWI 序列部分病灶呈低信号。 **结论** 颅内多发钙化性转移是一种少见的颅内转移类型， CT、MRI 表现有一定的特征性，尤其是短期内 CT 随访，结合病史资料有助于提高本病早期诊断及鉴别诊断。

PU-2077
磁共振弥散加权成像在胆脂瘤中的应用

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目的 研究 MRI-DWI 检查对胆脂瘤的诊断价值。
方法 回顾性分析我院 10 例经病理证实的胆脂瘤患者的磁共振平扫、增强和 DWl 图像表现、特征。

结果 病变的好发部位在桥小脑角区，病灶为类圆形或不规则形，平扫 8 例表现为长 T1 长 T2 信号影，2 例表现为 T1，T2 的混杂信号；增强扫描病灶均无强化病灶 DWI 均表现为高信号。
结论 胆脂瘤在 DWI 上的特征性表现，有助于胆脂瘤的诊断以及与其他肿瘤的鉴别诊断。

PU-2078

嗅神经母细胞瘤的 MRI 影像学表现

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摘要：目的探讨嗅神经母细胞瘤的 MRI 影像学表现，以提高对该病的诊断认识。
方法 收集我院 2015—2018 年期间 11 例经病理确诊为嗅神经母细胞瘤，回顾性分析嗅神经母细胞瘤的 MRI 影像资料。11 例全部行 MRI 平扫及增强扫描，采用 Siemns Trio Tim 3.0T 磁共振成像扫描仪，常规行 SE 序列，扫描方向为横断面、冠状面和矢状面。MR 对比剂为钆喷酸葡甲胺，剂量 0.1mmol / kg。根据 Kadish 分期标准，肿瘤局限于鼻腔者为 A 期，鼻腔肿瘤侵犯鼻窦者为 B 期，肿瘤超出鼻腔或鼻窦，侵及眼眶、颅内，并 / 或有颈部及远处器官转移为 C 期。对所有 MRI 资料进行回顾性分析与分期，并将分析结果与手术与病理进行对照。
结果 11 例中 8 例肿块中心位于鼻腔顶部的中后方，1 例位于鼻腔顶部的前方，1 例占据整个鼻腔，1 例位于鼻咽部。肿瘤形态和信号大小不等，形态不一，8 例形态不规则，边界不清；3 例形态规则，边界较清楚。肿块信号多不均匀，明显强化。中央夹杂可能是出血或坏死，1 例见囊变。增强后 11 例明显快速不均匀强化，2 例中度不均匀强化，1 例中度均匀强化。肿瘤侵犯筛窦 9 例、颅内 8 例、眼眶 7 例、蝶窦 5 例、鼻中隔上部 5 例、上颌窦 4 例、额窦 3 例、翼腭窝 2 例、鼻咽 2 例、斜坡 1 例。肿瘤阻塞鼻窦开口引起窦腔内黏液潴留与阻塞性炎症，增强后不强化；突入眼眶引起眼球突出 4 例；鼻咽部肿瘤阻塞咽鼓管引起中耳乳突炎 1 例；额叶水肿 2 例。与 9 例手术者的手术所见进行对照，7 例 MRI 显示额叶硬脑膜增厚强化并手术者，眼见 6 例硬脑膜粗糙受累，2 例光滑而认为未受累。
结论 鼻腔顶部的中后方肿块并穿越筛板侵犯嗅沟区，是嗅神经母细胞瘤的特征性改变；MRI 可准确显示肿瘤的部位和侵犯范围，可为临床分期和制订治疗方案提供依据。

PU-2079

中枢神经系统淋巴瘤的不典型 MRI 表现

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目的 分析中枢神经系统淋巴瘤（central nervous system lymphoma，CNSL）的不典型 MRI 表现，增加对中枢神经系统淋巴瘤不典型 MRI 表现的认识。**方法** 回顾性分析我院经手术或穿刺病理活检证实的 23 例不典型中枢神经系统淋巴瘤 MRI 资料，通过发病部位、病灶信号、强化方式以及周围水肿程度分析其特征。**结果** 23 例患者共有病灶 58 个，10 例多发，13 例单发。不典型的发病部位（大脑半球表浅区 11 个、小脑半球 10 个、脑室内 4 个）；不典型表现主要为：病灶内信号（出现坏死 21 个，出血 1 个，DWI 信号：7 个表现为等低信号，3 个表现为混杂信号）；强化方式（22 个病灶不均匀强化，其中 12 个病灶表现为环形强化）；肿瘤周围水肿（重度 18 个）。**结论** 中枢神经系统淋巴瘤不典型 MR 表现可以表现为部位、信号、水肿、强化等各个方面，具有一定的特征，随着中枢神经系统淋巴瘤的发生率增加，正确认识其不典型表现有助于提高诊断的准确率。

PU-2080
自组装药物用于双模态成像指导下的耐药肿瘤的协同治疗

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一．研究目的

多药耐药性（MDR）是肿瘤细胞耐药的常见方式，也是肿瘤化疗失败的主要原因。肿瘤细胞的多药耐药性是由于细胞膜上过度表达外排抗肿瘤药物的蛋白引起的，如 P-糖蛋白的过度表达。癌症疗的方式多种多样，包括手术，化疗，放疗，免疫治疗等等。其中，化疗由于具有高效率，依然占据主导地位。此外，光热治疗，作为新兴的治疗方式，由于具有非侵袭性，近年来受到广泛关注，其原理是利用光热材料吸收近红外光产生热对癌细胞进行杀伤。单治疗模式很难将肿瘤彻底清除，将两种及两种以上治疗方式结合，可有效的解决单治疗方式的局限性。此外，在治疗过程中，跟踪药物的递送过程，评价治疗效果是及其重要的。研究人员将关注点越来越集中在成像模式上。单模态成像仍然受到组织穿透深度、低对比度、低灵敏度等限制，多模态成像作为一种新的成像模式，有望弥补单模态成像的内在局限性，对肿瘤的治疗有潜在的指导意义。

二．研究方法

（1）吲哚菁绿均匀溶解于水中，得到吲哚菁绿水溶液。
（2）阿霉素均匀溶解于水中，得到阿霉素水溶液。
（3）TPGS 均匀溶解于水中，得到 TPGS 水溶液。
（4）将所述（1）、（2）、（3）试剂混合，避光恒温振荡 12 h.离心，纯化后采用锡箔纸包裹进行避光。

三．研究结果

ICG 和 Dox 可以自组装成一个完整的 ICG-Dox 纳米药物结构，当加入 TPGS 之后，纳米药物分散更加均匀，形态更加规则，纳米药物在 780nm 的紫外吸收明显增强，具有非常明显的荧光及光声增强效果。纳米药物具有明显的杀伤肿瘤的效果。

四．研究结论

本文中双模态成像纳米药物自递送系统，成分简单安全，结构稳定并展现出增强的荧光效果和良好的生物安全性，同时利用 TPGS 乳化的纳米药物对耐药细胞外排微环境的影响。从而达到在影像的指导下，追踪药物的递送过程，实现对耐药肿瘤的协同杀伤效果。

PU-2081
VHL 综合征影像学及临床诊断-附家族性 4 例患者报告

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目的 探讨 VHL 综合征的影像学表现及发病特点。
方法 回顾性分析家族性 4 例 VHL 综合征患者的影像学资料及临床资料。
结果 收集家族性 4 例 VHL 综合征病例。患者一，女性，19 岁，半年内多次晕厥，腹部 CT 及 MRI 检查胰腺多发囊肿，颅脑 MRI 平扫及增强检查左侧小脑半球囊实性病灶，手术病理为血管母细胞瘤。患者二，男性，42 岁，患者一父亲，外院手术病理证实右肾细胞癌，另胰腺多发囊肿，影像学资料显示十余年无明显变化。患者三，男性，37 岁，患者一叔叔，右肾细胞癌和左侧小脑半球血管母细胞瘤，均行手术切除。患者四，女性，患者一祖母，2011 年去世，病历资料显示双肾及胰腺多发囊肿，延髓血管母细胞瘤，死因为脑肿瘤复发。

结论 VHL 综合征（von Hippel-Lindau syndrome，VHL）是一种常染色体显性遗传病，表现为中枢神经系统、视网膜血管母细胞瘤及腹部脏器肿瘤性病变、囊性病变等，基因学证实由第 3 号染色体变异所致，呈家族性分布，如确诊本病，应建议其直系亲属进行相关影像学及基因学检查。

PU-2082

CT 与 MRI 检查在颞骨段面神经鞘瘤术前评估的价值

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目的 探讨 CT 及 MRI 检查对颞骨段面神经鞘瘤术前评估的应用价值。
方法 回顾性分析 17 例经手术病理证实的颞骨段面神经鞘瘤的患者临床资料，17 例患者均行 MRI 平扫及增强扫描，其中 8 例同时行 CT 平扫及增强扫描。将术前 CT 与 MRI 检查情况与术中探查情况进行对比研究。
结果 17 例面神经鞘瘤患者 11 例位于左侧，6 例位于右侧，病变单独累及迷路段 12 例，鼓室段 3 例，乳突段 2 例；累及迷路段+鼓室段 7 例，鼓室段+乳突段 5 例。3 例肿瘤与面神经可见分界，其余 10 例均未见明显分界，6 例可见乳突及外耳道软组织肿块，与手术探查情况基本相同。
结论 CT 及 MRI 相互结合可以准确地显示颞骨段面神经鞘瘤的位置和形态及周围情况，可以作为面神经鞘瘤术前评估的首要检查方法。

PU-2083

首发精神障碍的脑肿瘤患者的影像学特征

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目的 探讨首发精神障碍的脑肿瘤患者的影像学特征，加深精神科医师排查器质性疾病重要性的认识
方法 回顾总结本院 15 例首发精神障碍的脑肿瘤患者的 3T MRI 图像，所有病例均行轴位 T1、T2，冠位以及轴位 T2FLAIR，矢状位 T1WI、DWI 及 ADC、3D-ASL、MRS、SWI 及 MRI 增强检查，对其所在部位、影像学表现及精神症状进行分析，复习相关文献
结果 脑肿瘤所在的位置致使相应的脑功能区域损害或者压迫而产生相应的精神症状，额叶的肿瘤、颞叶的肿瘤、第三脑室附近的肿瘤、胼胝体肿瘤、垂体肿瘤这些部位的肿瘤多引起精神障碍而且症状出现较早或者首先出现精神症状
结论 MRI 是精神科排查器质性疾病首选的检查方法

PU-2084

探讨磁共振 3D-SAPCE 序列联合图像融合技术在垂体大腺瘤术前评估中的应用价值

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目的 评价磁共振 3D-SPACE（三维可变翻转角快速自旋回波）序列联合图像融合技术对于垂体大腺瘤术前评估中的应用价值。**方法** 收集 43 例我院术后证实为垂体大腺瘤患者 MRI 数据，包括采集常规 MRI 平扫增强序列，3D-SPACE T2WI、增强后 3D-SPACE T1WI 序列影像数据。将 3D-SPACE T2WI 与增强后 3D-SPACE T1WI 序列进行图像融合，并对融合后图像进行多平面重组。由两名放射科高级职称医生按照三级评分制对所有序列的图像进行评估。评估内容包括肿瘤的大小、边界，对海绵窦血管及颅神经的侵袭程度，并以术中显示结果作为金标准，采用配对 t 检验比较不同序列显示垂体病灶的优劣势，$P < 0.05$ 认为差异有统计学意义。**结果** 以术中观察结果为金标准，3D-SPACE 及融合后的 3D-SPACE 序列在显示肿瘤大小、边界及与周围血管及神经关系方面均优于常规 MRI（$P<0.05$，$P<0.01$）；融合后图像在显示肿瘤大小、边界与单独 3D-SPACE 序列相比无显著优势（$P>0.05$），而在显示肿瘤与血管及颅神经关系上有显著优势（$P<0.05$，$P<0.01$）。**结论** 磁共振 3D-SAPCE 序列联合图像融合技术对于垂体大腺瘤术前确定肿瘤大小、边界及评估肿瘤对血管神经的侵袭程度明显优于常规磁共振序列，显示肿瘤与血管及颅神经关系上明显优于单独的 3D-SPACE 序列，对于手术前的风险评估及手术方案制定有着良好的应用前景。

PU-2085
磁共振弥散与灌注成像技术在评估胶质瘤遗传学特征中的价值

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目的 探索单指数模型弥散加权成像（DWI）、双指数模型 DWI、拉伸指数模型 DWI、弥散峰度成像（DKI）、以及动脉自旋标记（ASL）成像的主要影像学指标与胶质瘤常见的遗传学变异间的联系。
材料与**方法** 连续收集 32 名胶质瘤患者的影像数据与组织。影像测值包括表观弥散系数（ADC）、真弥散系数（D）、伪弥散系数（D*）、灌注分数（f）、分布弥散系数（DDC）、异质性指数（α）、平均弥散率（MD）、各向异性分数（FA）、平均峰度（MK）、脑血流量（CBF）。相应组织被用于常规组织学检查以及 71 个肿瘤相关遗传学标志物的检测。变异例数达可靠统计要求者被进一步分析。Mann-Whitney U 检验用于比较遗传指标变异与未变异的胶质瘤间各影像学参数的差异，受试者工作特征曲线（ROC）分析被用于评估各参数辨别胶质瘤遗传学特征的能力。所有影像学指标与对侧影像表现正常的白质行标准化后，以同样方式进行分析。
结果 8 项遗传学指标的变异例数达到统计分析要求，除 DDC 和 CBF 外，所有参数在 IDH 突变型与野生型的肿瘤间均存在显著差异；1p/19q 联合缺失阳性与阴性的肿瘤间无参数存在显著差异；CBF 在 TERT 基因启动子突变与未突变的胶质瘤间存在显著差异；ADC、f、α、FA 在 ATRX 基因突变与未突变的肿瘤间存在显著差异；FA 在 MGMT 基因启动子甲基化阴性与阳性的肿瘤间存在显著差异；D、f、α、MD、CBF 在 TP53 基因突变与未突变的肿瘤间存在显著性差异；f、MD、FA、CBF 在 EGFR 基因正常与扩增的肿瘤间存在显著性差异；MD、CBF 在 PTEN 基因突变与未突变的肿瘤间显著性差异（上述显著性差异均指 $P < 0.05$）。所有具有显著性差异的参数在区分相应遗传学特征时均表现出可接受或更高水平的辨别力（ROC 曲线下面积 > 0.7，$P < 0.05$）。
结论 携带不同遗传学特征的胶质瘤，其组织的弥散、灌注具有不同的偏向性。

PU-2086
基于分子分型的颅内弥漫性大 B 细胞淋巴瘤 MRI 特点研究

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摘要：目的 回顾性分析 72 例颅内弥漫性大 B 细胞淋巴瘤的 MRI 资料及病理免疫组化结果，讨论其临床资料、MRI 特点与免疫组化分型的相关性。**方法** 收集病理诊断为颅内弥漫性大 B 细胞淋巴瘤，并具有完整免疫组化结果及术前 MRI 资料齐全的患者共 72 例，根据该肿瘤分子水平的 Hans 分型，将患者分为生发中心型及非生发中心型两组。讨论临床资料、一般影像学特征、定量影像学指标及分子分型之间的相关性，使用软件 SPSS 17.0 对各组指标进行统计分析。**结果** 在 72 个病例中，生发中心型组为 13 例（18.1%），非生发中心型组占 59 例（81.9%）。经 t 检验，发病年龄方面，生发中心组型平均发病年龄为 61.31±12.39 岁，非生发中心型组为 49.86±13.88 岁，差异有统计学意义($P<0.05$）。经 x^2检验，发病部位方面，生发中心型组较非生发中心型组更易累及深部结构,差异有统计学意义（$P<0.05$）。病变占位效应方面，生发中心型组较非生发中心型组轻,发生于大脑深部结构的病变轻于大脑凸面者，差异均有统计学意义（$P<0.05$）。经 *Mann-Whitney U*检验，定量影像学指标水肿指数在分子分型组间存在统计学差异（$P<0.05$）；发生于大脑深部结构与大脑凸面的病灶总体积及瘤周水肿体积存在差异（$P<0.05$）；肿瘤占位效应程度与定量影像学指标病变总体积、瘤体体积及肿瘤强化体积具有相关性（$P<0.05$）；肿瘤内是否发生坏死囊变出血改变与瘤体体积间具有相关性（$P<0.05$）。**结论** 弥漫性大 B 细胞淋巴瘤的临床及影像学特点具有一定的特征性。定量影像学方法的应用，使我们对该肿瘤分布特点、占位效应的程度、发生坏死出血囊变与否同肿瘤径线的关系有了更为直观的认识。年龄、深部结构是否受累和水肿指数三项指标与弥漫性大 B 细胞淋巴瘤的免疫组化 Hans 分型间的相关性，为我们揭示弥漫性大 B 细胞淋巴瘤影像学特点与分子病理学相关性研究的潜在价值。

PU-2087

白血病颅内浸润的 MRI 诊断价值

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目的 白血病细胞在中枢神经系统内大量繁殖为中枢神经系统白血病。白血病颅内浸润是中枢神经系统白血病的特殊类型，即影像学方法能够发现颅内白血病病灶。白血病颅内浸润仅有个案报道，且没有影像学分析。本文总结白血病颅内浸润 11 例，分析白血病颅内浸润的 MRI 影像表现，提高对白血病颅内浸润的认识及诊断水平。**方法** 回顾性分析我院 2009 年 02 月至 2016 年 7 月期间 11 例白血病颅内浸润患者资料，男性 6 人，女性 5 人，年龄 11～68 岁，平均年龄 37 岁。白血病脑实质浸润 4 例，急性淋巴细胞白血病 3 例，急性非淋巴细胞白血病 1 例；白血病脑膜浸润 7 例，急性早幼粒细胞白血病 2 例，急性淋巴细胞白血病 2 例，急性非淋巴细胞白血病、浆细胞白血病、急性髓性白血病各 1 例。11 例患者通过脑脊液检查，明确诊断中枢神经系统白血病，颅内病变通过对病灶的放疗、鞘内注射化疗药病变缩小或消失。比较病变的部位、范围及 T2WI、T1WI、DWI、T2Flair 及增强表现。**结果** 白血病颅内浸润表现为脑实质浸润或脑膜浸润，本文无脑实质及脑膜同时浸润的病例，有一例脑膜浸润伴多发颅骨浸润。脑实质浸润为多发实性病变，DWI 呈明显高信号，增强扫描明显强化，病灶周围有不同程度脑水肿。脑膜浸润大部为脑表面弥漫线样强化，部分脑膜强化较为局限，脑实质未见明确受侵。**结论** MRI 诊断白血病颅内浸润具有明显优势， MRI 对病变的发现、诊断具有重要价值，需要与白血病颅内感染鉴别。白血病患者出现中枢神经系统症状，首选 MRI 检查。

PU-2088

MR 弥散加权成像鉴定胶质母细胞瘤周高复发风险的水肿亚区的准确性研究

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目的 高级别脑胶质瘤术后容易局部复发,是造成其生存率低下的主要原因。本研究旨在评估用 MR 弥散加权成像（DWI）鉴定胶质母细胞瘤周高复发风险的水肿亚区的准确性。
方法 对手术病理确诊胶质母细胞瘤的患者，于术后两周内行常规 MR 及 DWI 检查，作为基线影像资料，并于术后每 3 个月进行规律临床随访及影像学检查，纳入由影像及临床综合信息确定为肿瘤复发的患者。在 T1W 增强、T2W、flair 及 ADC 图上手动勾画感兴趣体积（volume of interest, VOI），包含肿瘤体积和水肿体积。复发前后的 MR 图像进行严格配准后，鉴别出肿瘤复发的水肿亚区（复发前表现为水肿、复发后表现为肿瘤的区域）与无肿瘤复发的水肿亚区。用配对 t 检验比较两种水肿亚区在基线图像的 ADC 直方图特征。对有显著差异的参数用勾画曲线下面积（AUC），评估鉴别的准确性。对有病理检查结果（MR T2W 图指导下活检）的患者检测瘤周水肿区是否存在肿瘤细胞浸润。
结果 鉴定并纳入 19 名胶质母细胞瘤术后复发的患者。复发的瘤周水肿亚区体积明显大于未复发水肿亚区（$p<0.001$）。复发与未复发水肿亚区的基线图像的最大 ADC 值、最小 ADC 值、ADC 均值标准差、ADC 图峰态系数有显著差异，p 值分别为 0.010, <0.001, <0.001 and 0.021。而两种水肿亚区基线图像的 T1W 增强的信号强度无显著差异。联合最小 ADC 值和 ADC 均值鉴别上述两种水肿亚区，AUC 为 0.818。有病理检查结果的 8 例患者中均确认瘤周水肿区有肿瘤细胞浸润。
结论 ADC 直方图特征为分析胶质母细胞瘤周的水肿亚区提供了比常规影像更多的重要参数，能较准确地鉴别出瘤周高复发风险的水肿亚区，有助于胶质母细胞瘤术后复发病灶位置的准确预测和早期诊治。

PU-2089

颅内恶性淋巴瘤的 MRI、CT 诊断和鉴别诊断

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目的 中枢神经系统恶性淋巴瘤（PCNSL ）临床上少见，约占颅内肿瘤发生率的 1% ，与其他颅内肿瘤在治疗手段上有较大差异，故治疗前正确诊断显得尤为重要。颅内单发淋巴瘤由于其影像学表现与其它中枢神经系统病变有类似重叠之处，导致误诊率较高。搜集 2015 年 8 月—2018 年 10 月期间 5 例脑淋巴瘤的 MRI 、 CT 检查及临床、手术和病理结果进行回顾性分析，以提高对本病的认识。
方法 5 例磁共振扫描均采用 GE1.5T 机型，常规 MRI 平扫及增强扫描，其中 2 例同时行 CT 横断位平扫加增强扫描。
结果 4 例肿块位于幕上，额叶 1 例，顶叶 1 例，颞叶 1 例，胼胝体膝部 1 例；幕下 1 例，位于小脑蚓部。 其中额叶病例未行任何治疗肿块自行消失，而在 2 年后复查见右顶叶 又出现新病灶。3 例淋巴瘤位于颅内靠近表面或近中线的部位， 2 例位于深部白质区。 肿块 T1WI 呈等或稍低信号，T2WI 呈等、低或稍高信号，信号均匀或不均匀，弥散加权成像，呈稍高或高信号。 增强扫描肿块明显强化，2 例呈圆形或椭圆形，3 例呈分叶状或不规则形，其中 1 例出现“脐凹征”，1 例“尖角征”， 1 例出现“指套征”， 1 例呈“脑回样”、“核桃仁样”强化。肿块 1.5cm×1cm—7cm×5.5cm 大小不等。 1 例肿块较脑表面，邻近脑膜疑受累。4 例瘤周水肿明显，

同侧脑室系统受压变窄， 其中 2 例同时接受 CT 扫描， CT 平扫均呈等密度或稍高密度肿块，与周围低密度水肿区分界清晰，肿块明显较均 匀 强 化 ，1 例 呈圆形或椭圆形，例形态不规则似出现“脐凹征”，肿块位于幕上， 无明显囊变、 坏死及钙化，病灶周 围见 中 一重 度低密度水肿影。病理学证实均为 B 细胞型非霍奇金淋巴瘤。

结论 颅内淋巴瘤的 MRI 、CT 表现虽具有多样性、重叠性，在部位、形态、信号或密度改变及强化形式仍具有一定的特征性，通过正确的影像鉴别分析，在术前作出定性诊断是可能的，这对于提示临床穿刺活检进一步明确诊断及指导选择治疗方案具有重要意义。

PU-2090
回顾性分析：常规 MRI 对原发性脑内淋巴瘤和高级别胶质瘤的鉴别诊断

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摘要：目的 分析原发性脑内淋巴瘤（免疫功能正常）和高级别胶质瘤的 MRI 特征，并进行鉴别诊断，为临床诊断提供帮助。**方法** 回顾性分析我院及温州医科大学附属第二医院 2000 年至 2018 年经病理学诊断为原发性中枢神经淋巴瘤（PCNSL）和高级别胶质瘤（WHO III、IV 级）的病人的 MRI 表现，定量分析病灶的数目，大小，形态，位置，信号强度，增强特征，周边水肿及病灶坏死情况，并为其提供鉴别诊断的依据。**结果** 总共 37 例病人被确诊为 PCNSL，总共病灶 61 个。胶质瘤患者 45 例，总共病灶 48 个。病灶位置：PCNSL40.5%（15/37）为多发病灶，胶质瘤为 6.7%（3/45），P<0.001；幕上和幕下同时累及，PCNSL（24.3%，9/37），胶质瘤则无，P<0.001；大脑深部中心区累及，PCNSL 发生率为 50.8%高于胶质瘤 16.4%；大脑皮层或脑叶累及则胶质瘤的发生率为 62.1%高于 PCNSL 的 29.5%；病灶形态：两者皆表现为肿块型（直径大于 30mm）或结节型（直径小于 30mm），9.8%的 PCNSL（6/61）表现为不规则浸润型,胶质瘤则无，P<0.001；增强后 PCNSL 患者 70.1%表现为均匀强化，而 GBM 患者仅 4.3%表现为均匀强化；PCNSL 坏死率为 16.4%（10/61），胶质瘤 70.8%(34/48)存在坏死，P<0.001。 **结论** 常规形态学 MRI 能够在多数情况下能区分颅内高级别胶质瘤和 PCNSL。影像科医生仔细分析还是可以发现其中的一些特征性的改变，并以此来提高两者的鉴别诊断。

PU-2091
基于磁共振常规影像学特征评估高级别胶质瘤预后

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材料与方法

1.研究对象：2009 年 1 月至 2016 年 12 月就诊于南方医科大学南方医院神经外科，经手术全切治疗并且经过病理确诊为高级别胶质瘤的患者。

2.研究**方法** 回顾性分析上述高级别胶质瘤患者的影像特征，包括瘤周水肿程度、水肿形态、坏死程度、强化程度、囊变、卫星灶及多灶性、水肿是否跨中线，肿瘤是否跨中线，中线移位置程度以及肿瘤的最大径，临床数据包括年龄、性别、KPS 评分以及术后行放、化疗治疗。分析上述特征对 PFS 的影响。

3.统计分析：采用 R 软件，单因素分析采用 Kaplan-Meier 生存分析，对上述各影像和临床特征对 PFS 的影响逐个进行分析，并采用 Log-rank 检验进行生存率比较；进一步将 P＜0.05 的特征纳入多因素分析模型，多因素分析采用 Cox 比例风险模型，采用逐步回归分析法，将 P＜0.05 的特征认定为无进展生存期的独立影响因素，并采用一致性指数 C-index 评估模型的精度。

结果

1.单因素分析**结果** 术后放疗、化疗、MR 图像上肿瘤囊变、多灶性、强化程度、坏死程度对患者 PFS 的影响存在显著性（P＜0.05）；

2.多因素分析**结果** 基于 MR 影像学特征构建的 Cox 比例风险模型中，肿瘤中度坏死、重度坏死以及肿瘤囊变为影响患者 PFS 的显著独立影响因素；在影像学联合临床资料构建的 Cox 比例风险模型中，肿瘤重度坏死、囊变、多灶性以及化疗为影响患者 PFS 的显著独立影响因素，多因素 Cox 比例风险模型分析中获得的 C-index 为 0.6546。

结论

1.高级别胶质瘤患者术后行放疗、化疗以及 MR 图像上肿瘤伴随囊变，是判断患者预后较好的有利支持因素。而 MR 图像上肿瘤伴随多灶性、坏死程度以及强化程度越重，是影响高级别胶质瘤患者预后的不利因素。其中术后化疗、肿瘤伴随囊变、多灶性、重度坏死是影响患者预后的独立影响因素。

PU-2092
原发性中枢神经系统淋巴瘤的少见影像学表现及其误诊分析

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摘要：目的 归纳原发性中枢神经系统淋巴瘤的少见影像学表现特征，分析部分误诊病例，为临床诊断提供帮助。**方法** 回顾性分析温州市人民医院及温州医科大学附属第二医 2000 年至 2019 年经病理学诊断为原发性中枢神经淋巴瘤（PCNSL）患者 39 例，总共病灶 65 处，定量分析病灶的数目，大小，形态，位置，信号强度，增强特征，周边水肿及病灶坏死情况，总结归纳 PCNSL 的少见影像学表现，并对这些少见的、部分误诊病例进行分析。**结果** 少见的影像学表现包括：一、少见病灶位置：病灶位于皮层下 6 例，其中 4 例误诊为转移瘤；病灶位于灰质皮层 1 例；硬脑膜原发淋巴瘤 1 例；鞍区 1 例，误诊为侵袭性垂体瘤；脑室内 2 例。二、少见病灶形态、信号改变：，1、病灶呈斑片状、絮状异常信号，无具体肿块，病灶周边无或轻度水肿 3 例，均误诊为脱髓鞘疾病；2、病灶大片坏死 2 例，其中 1 例伴出血，均误诊为高级别胶质瘤；3、病灶轻度环形强化 1 例，误诊为脱髓鞘疾病。**结论** 具有不典型影像学表现的原发性中枢神经系统淋巴瘤诊断困难，极容易造成误诊，仔细分析其影像学特征、分类归纳，并总结误诊病例其鉴别诊断，可提高放射科医生对其诊断的准确性。

PU-2093
脑内神经中轴钙化性假瘤 1 例

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目的 分析 1 例脑内神经中轴钙化性假瘤影像特征。

方法 回顾性分析 1 例脑内神经中轴钙化性假瘤影像特征。患者，女，39 岁，因癫痫 9 年，头痛 2 月，加重伴左侧肢体乏力 3 周入院。查体：左侧上下肢肌力 3 级，肌张力高，腱反射亢进，病理征可疑阳性。影像学检查：头部 CT 示右侧额叶结节状钙化密度影，其边缘可见弧形囊变区，增强扫描病灶边缘及其内分隔可见强化；右侧额叶近中线区另见条形低密度影，其内见多发斑点、结节状钙化；MR 示右侧额叶两枚结节状混杂信号影，其内可见 T1W、T2W 低信号影及囊变区，范围分别约 2.5×2.4cm、1.0×0.8cm，形态不规则，周围见大片水肿带，增强扫描病灶边缘明显强化，病灶内部见多发斑片状强化；右侧侧脑室前角受压。
结果 行右额叶占位病变切除术，术中示其中一病灶位于右额叶近中线皮层下约 2cm，呈灰红色，质硬，内有大量致密钙化，边界较清楚，血供丰富；另一处病灶位于右额叶上回后份皮层下约 1cm，血供不丰富。镜下所见：送检组织示大片非折光性、嗜碱性基质物，伴有灶状间质钙盐沉着及骨化，周围有淋巴细胞、组织细胞浸润，星形细胞有增生。免疫组化：CD68(+)，EMA(+)，S-100(+)，CD34(-)，Olig-2(-)，Vim(+)，SMA(-)，NSE(+)，GFAP(+)， LCA(+)，CK(-)，CD5(-)，Bcl-2 散在(+)，CD34(-)，CD99(+)。病理诊断：纤维—骨化病变（钙化性假瘤）。
结论 神经中轴钙化性假瘤又称中枢神经系统纤维骨病变，是一种罕见的良性、非肿瘤性疾病，颅内及脊椎均可发病。患者多无特异性临床症状及体征。影像学上大部分病灶表现为单发孤立肿块，部分病灶显现为多发病变广泛累及周围组织。CT 均表现为高密度的钙化病灶。MRI 表现无特征性，多表现为 T1WI、T2WI 低信号，周围水肿不明显，增强后大多边缘或内部有不均匀强化。

PU-2094
DWI 与 DSC-MRI 联合应用鉴别脑胶质瘤术后复发与放射性坏死的诊断价值

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目的 探讨弥散加权成像及动态磁敏感对比增强 MRI 在鉴别脑胶质瘤术后复发和放射性脑损伤中的临床应用价值。**方法** 回顾性分析 2016 年 1 月—2019 年 5 月在十堰市太和医院就诊的共 54 例胶质瘤术后放疗患者的临床及影像资料，其中胶质瘤复发 34 例，放射性脑损伤 20 例。分析 54 例患者的 T1 增强、DWI、 PWI 等磁共振影像资料，比较 T1WI 异常强化区与对侧脑白质区比值的相对表观扩散系数(rADC)、相对脑血容量 (rCBV)、相对脑血流量(rCBF)等参数，分析各参数在鉴别诊断中的价值。**结果** 20 例为放射性脑损伤（37.0%），34 例为胶质瘤复发（62.9%）。胶质瘤复发组 rADC 值明显低于放射性脑损伤组(P<0.05)，胶质瘤复发组 rCBF、 rCBV 值均明显高于放射性脑损伤组(P 均<0.05)；rADC＜1.57 时诊断胶质瘤复发敏感性 86.7%，特异性 72.9%；rCBV≥3.53 时，诊断胶质瘤复发的敏感性 76.5%，特异性 94.7%；rCBF≥2.16 时，诊断胶质瘤复发敏感性 94.1%，特异性 78.9%；当联合应用 rADC 和 rCBV 时，诊断胶质瘤复发的敏感性 94.7%，特异性 100%。**结论** DWI 及 DSC-MR 有助于鉴别胶质瘤复发和放射性脑损伤，两者联合应用可提高诊断准确性。

PU-2095
少突胶质细胞瘤 MRI 表现及 ADC 值、rADC 值与 Ki-67 增殖指数相关性分析

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目的 分析 20 例少突胶质细胞瘤的 MR 表现，探讨少突胶质细胞瘤表观扩散系数（ADC）值、相对表观扩散系数（rADC）值与 Ki-67 增殖指数相关性，提高术前对该病的认识。**方法** 回顾性分析 20 例经手术病理证实的少突胶质细胞瘤，皆行常规 MR 扫描及功能扫描并测量相关 ADC、rADC 值；病理采用免疫组化染色并测量 Ki-67 表达情况，分析 ADC、rADC 值与 Ki-67 表达相关性。**结果** 20 例少突胶质细胞瘤中 7 例为Ⅱ级，13 例为Ⅲ级；随着病理等级增加，肿瘤呈向脑叶深部及跨脑叶生长，平扫肿瘤实质信号更为混杂，坏死囊变出血更为明显，周围水肿及强化更为显著。少突胶质细胞瘤瘤体实质 ADC 值与 Ki-67 增殖指数呈负相关性（r=-0.521，p=0.019），瘤体实质 rADC 值与 Ki-67 增殖指数亦呈负相关（r=-0.440，p=0.030）。**结论** 少突胶质细胞瘤 MRI 表现及 ADC 值、rADC 值在一定程度上可以反映其生物学特征，可间接评估其基因表达，可术前无创性评估肿瘤的恶性度，为临床诊疗提供依据。

PU-2096

额部副神经节瘤 1 例

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摘要：收集经手术病理证实的额部脑实质外副神经节瘤一例。患者以性格改变、头痛为主要症状。颅脑 CT 示额部正中稍高密度分叶状肿块，周围见大片状低密度影，病灶邻近颅骨破坏。MRI 示肿块大小 74mm×61mm×68mm，边界清楚，T_1WI 呈等信号为主，T_2WI 呈稍高信号为主，可见多发点条状高信号及流空血管影，提示“盐和胡椒征”。肿块侵犯硬脑膜、侵破颅骨，侵及皮下，其后缘与脑实质间可见脑脊液环绕征，脑实质受压见大片状水肿信号。DWI 呈不均匀稍高信号。增强扫描示肿块不均匀、明显强化，内见小片状无强化区，肿块内部及后下方见多发迂曲增粗血管影。颅内副神经节瘤罕见，与其他颅内肿瘤鉴别困难，需要综合临床、影像及病理检查。当 MRI 出现“盐和胡椒征”时，应考虑到此病。

PU-2097

颅内幕下生殖细胞瘤 2 例并文献复习

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目的 原发性颅内生殖细胞瘤是少见的颅内恶性肿瘤，约占所有颅内肿瘤的 0.5%-2%，多发生于儿童及青少年，肿瘤绝大多数位于中线结构，最常见发生于松果体区，其次是鞍区、丘脑和基底节区，极少发生于幕下。本文回顾分析 2 例颅内幕下生殖细胞瘤的临床及影像学表现并对相关病例报道汇总复习，旨在提高该肿瘤的术前诊断正确率。

方法 回顾性分析 2 例经病理证实的颅内幕下生殖细胞瘤临床和影像学资料，搜集幕下生殖细胞瘤病例报道汇总分析

结果 2 例颅内生殖细胞瘤均仅位于幕下，在颅内其他部位如松果体区无病灶，为原发性幕下生殖细胞瘤。幕下生殖细胞瘤的临床症状主要取决于肿瘤发生部位。CT 平扫主要表现为等/稍高密度，既往有病例发现在多次 CT 检查后病灶由于受到射线照射肿块一过性减小(Wang et al., 2017)。MR 上，生殖细胞瘤通常呈等 T1，等/长 T2 信号，而多例报道幕下生殖细胞瘤 T2 信号较低(Minami et al., 2016)，可能是其诊断线索之一，增强呈均匀或不均匀强化。通常认为生殖细胞瘤在血浆和脑脊液中β-HCG、AFP、PLAP 等肿瘤标记物为阴性，但在一些病例中，β-HCG 可以升高(Jia et al.,

2003)，亦可作为生殖细胞瘤诊断线索。生殖细胞瘤对放化疗敏感，对于影像学或肿瘤标记物高度提示为生殖细胞瘤的病例可以采用诊断性放化疗。幕下生殖细胞瘤预后较颅内常见部位生殖细胞瘤差，可能是由于肿瘤更容易侵犯脑干。

结论

生殖细胞瘤对放化疗敏感，是少数几种可以通过非手术方式治疗的颅内恶性肿瘤(Martens et al., 2014)，因此正确诊断对于治疗方案的选择和预后评估很重要。对于发生于青少年的非常见部位、影像学特异性不显著的生殖细胞瘤，可以检查血浆及脑脊液的肿瘤标记物来辅助诊断，还可以结合临床考虑采用诊断性放化疗或立体定位活检来明确诊断以避免开颅手术创伤。

PU-2098

椎管内神经鞘瘤 MRI 误诊分析

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目的 分析椎管内神经鞘瘤 MR 误诊原因，提高其影像诊断的准确率，减少误诊。**方法** 回顾分析 6 例术后病理证实为椎管内神经鞘瘤的误诊病例，4 名男性，2 名女性，年龄范围 23-72 岁，平均年龄 48.3 岁，进行详细询问病史并采集 CT 及 MR 影像资料，仔细分析其 MR 不典型征象。**结果** 4 例术前 MR 诊断为脊膜瘤，1 例诊断为血管畸形，1 例诊断为血肿，6 例患者均行椎管内肿瘤摘除术，术后病理证实为神经鞘瘤。**结论** 椎管内神经鞘瘤有其不典型的 MR 影像学表现，结合性别、发病部位及临床病史等进行综合分析，有助于提高其术前 MRI 诊断和鉴别诊断水平。

PU-2099

椎管内巨长型神经鞘瘤伴出血一例

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患者 女，54 岁。因腰及双下肢疼痛 1 年余，加重 20 余入院，无低热，盗汗等症，无鞍区麻木。门诊以“腰椎间盘突出症”收住入院。专科情况：腰椎生理曲度变直，腰部活动受限，腰 3－骶 1 棘突及椎旁压痛（+），叩击痛（+），向右下肢放射，余无殊。

MRI 检查：平扫示胸 11-腰 4 椎体水平椎管内见长条状异常信号影，大小约 27 mm×45 mm×48 mm，形状规则，边界尚清，呈 T 1 稍高信号， T 2 高号影，病灶前缘见条片状 T1 等高信号、T2 等信号影，相邻脊髓受压，椎体无侵犯，同层面椎管狭窄，增强扫描病灶边缘强化明显，病灶内部强化不明显。余无殊。

手术及病理所见：患者入院后行肿瘤切除术，见硬脊膜囊膨大，张力高，硬脊膜菲薄，色紫红。架显微镜，于后正中纵行切开硬脊膜，见酱油色液体喷射而出。硬脊膜下右侧见占位性病变，长条状，17.5*1.4*2.0cm 大小，色灰红，肿瘤实质内有暗红色陈旧血性液体。肿瘤有完整包膜，与硬脊膜及神经根粘连不重，马尾神经丛和脊髓圆锥受压明显。手术切除标本镜下可见(椎管内髓外)梭形细胞肿瘤，免疫组织化学：突触素（Syn）、神经元特异性核蛋白（Neu-N）、神经丝蛋白（NF）、CD34 均为阳性，Ki-67<5%。病理诊断：胸腰椎管内（T12-L4）脊髓外、硬膜下神经鞘瘤，伴出血。

讨论 ：神经鞘瘤是最常见的椎管内髓外硬膜内肿瘤，起源于神经鞘膜细胞的雪旺氏细胞，可发生于脊髓各个节段，多呈孤立性结节，有包膜，常与脊神经根相连，与脊髓无黏连。组织学上，肿瘤由细胞密集区(Antoni A)和细胞疏松区(Antoni B)两种结构组成。有学者认为肿瘤强化程度及发生囊变坏死的情况与这两种结构含量有关。含 AntoniB 的易发生囊变坏死，Antoni A 型较 Antoni B

型强化明显。本例神经鞘瘤较罕见，体积巨大，边界尚清，囊变并出血范围较大，组织学上倾向于 Antoni A 型。国内外罕见报道巨长型神经鞘瘤伴出血。

PU-2100

脑实质内室管膜瘤的影像表现分析

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目的 探讨脑实质内室管膜瘤影像特征，以期提高影像诊断准确率。**方法** 收集经手术病理证实的 23 例脑实质内室管膜瘤的临床和影像学资料，回顾性分析其影像学表现。**结果** 23 例脑实质室管膜瘤中 15 例位于幕上，多为长径大于 4cm 的囊实性肿块，1/2 病灶内见出血、小钙化灶。幕上病灶多无瘤周水肿，增强显示实性成分明显强化或呈环状强化，可见包绕病灶或穿行于实性部分中的血管影。8 例幕下脑实质内室管膜瘤以实性肿块多见，4 例见瘤内钙化。幕下病灶瘤周亦多无水肿，增强扫描显示不均匀或环状强化。**结论** 脑实质内室管膜瘤影像学表现缺乏特异性，易误诊。CT 及 MRI 表现对本病的术前诊断有一定的价值。

PU-2101

椎管内脊髓外神经鞘瘤与脊膜瘤的 临床和 MRI 综合诊断要点探讨

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目的 回顾性分析经手术病理证实的椎管内脊髓外神经鞘瘤、脊膜瘤的临床常见症状和体征及 MRI 的常见征象，评价各种因素在诊断和鉴别椎管内脊髓外神经鞘瘤、脊膜瘤的能力，以提高椎管内脊髓外神经鞘瘤、脊膜瘤的术前诊断和鉴别诊断能力。
材料和方法 回顾分析、总结广西医科大学第一及第八附属医院经手术及病理证实的椎管内 180 例神经鞘瘤和 50 例脊膜瘤的临床资料、MRI 影像资料，分析和统计学比较影响诊断的各种常见的临床因素和 MRI 征象因素，运用卡方检验及 Logistic 回归分析，筛选出影响二者 MRI 诊断的主要因素，运用统计学处理方法推导各影响因素的鉴别价值。
结果 二者性别分布间差异有统计学意义，脊膜瘤好发在女性。二者年龄分布差异无统计学意义。
二者以感觉障碍为首发症状差异有统计学意义，脊膜瘤比神经鞘瘤更容易引起感觉障碍。
肿瘤个数：二者均以单发常见。
肿瘤位置：（1）二者在胸段、腰段椎体分布差异间有显著统计学意义。（2）二者均以髓外硬膜下发生率最高，髓外硬膜下脊膜瘤比神经鞘瘤发生比率大，硬膜外则是神经鞘瘤发生比率高于脊膜瘤组。（3）二者在脊髓腹侧和脊髓背侧分布差异间无统计学意义。
肿瘤形态：半圆形、哑铃形组二者分布差异存在显著统计学意义。
肿瘤大小：二者最大前后径分段的 3 个等级两组间差异无统计学意义。二者最大长径的 4 个等级间只有 10mm～20mm 及≥30mm 两组分布差异具显著统计学意义。
信号表现：二者信号强度、均匀度及出现囊变差异均存在统计学意义。
瘤体与周围组织关系：二者之间出现与硬膜宽基底相接或存在硬膜尾征、邻近椎间孔扩大差异存在显著意义。

Logistic 回归分析提示，在其他变量不变的条件下，形态、有硬膜尾征或与硬膜宽基底接触是诊断脊膜瘤的对立因素。

结论 椎管内脊髓外神经鞘瘤、脊膜瘤都有特征性 MRI 表现。MRI 是临床诊断和鉴别诊断椎管内脊髓外神经鞘瘤、脊膜瘤的重要手段。

PU-2102

一例伴有钙化的鞍上区脊索样胶质瘤

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病例资料

男，32 岁，汉族。双眼实力下降 1 年余来诊。

影像表现

头颅 MRI 扫描可见病变位于鞍上区偏右侧，大小约 2.5×2.4×1.9cm，形态不规则。稍长 T1 稍长 T2 信号，DWI 呈等信号，增强扫描呈明显均匀强化。右侧视神经稍受压，病变包绕右侧颈内动脉，管壁光滑。灌注成像病变呈等信号。SWI 序列病变内可见小片状低信号，相位图呈高信号。头颅 CT 扫描病变呈稍低密度，CT 值约 27HU，内可见小片状高密度影，CT 值约 200HU。病变与周围脑组织边界欠清。

病理结果

鞍上占位，中等细胞密度的肿瘤，部分肿瘤细胞浆红染，血管内皮细胞增生较显著，间质粘液样变性，可见卢梭小体，考虑为脊索样胶质瘤。免疫组化**结果** Olig-2（＋），IDH-1（－），P53（－），GFAP（＋），MGMT（+30%），Ki-67（+3%），ATRX（＋）。

讨论

脊索样胶质瘤是一种罕见的起源于第三脑室前壁中枢神经系统原发肿瘤，1998 年 Brat 等首次报道， WHO 2007 分类将其归入神经上皮肿瘤（Ⅱ级）。临床表现一般为头痛、视觉障碍以及记忆障碍，少见情况会有下丘脑或垂体内分泌紊乱的表现（闭经，甲状腺功能减退，体重增加，多饮），其他局部症状少见。其通常定位于第三脑室前部，向蝶鞍上区和侧脑室呈不同程度的延伸，近四分之一的患者存在脑积水，这更多地取决于肿瘤的位置而不是大小。影像学表现，CT 上通常表现为高密度，在 MRI 扫描时，多数呈界限清楚的卵圆形肿物，T1WI 呈等信号，T2WI 呈高信号。增强扫描可见显著强化，可见囊变，但是罕见钙化。本文报道的病例，与周围组织边界欠清，并且其内可见片状 CT 高密度影，是脊索样胶质瘤中的罕见表现。

PU-2103

丘脑肿瘤的 MRI 诊断与鉴别诊断

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目的 探讨丘脑肿瘤的 MRI 表现特征，以提高对丘脑肿瘤诊断的准确性 方法 回顾性分析经手术病理证实的丘脑肿瘤的 MRI 表现。结果 星形细胞瘤 22 例（其中 I-II 级 10 例， III-IV 级 12 例）I-II 级轻度强化，占位效应较轻，III-IV 级坏死、囊变多见，明显不均匀强化；少突胶质细胞瘤 3 例（其中 1 例间变性少突胶质细胞瘤），多见于成年人，肿瘤呈实性，钙化常见，斑片状轻至中度强化；间变性少突胶质细胞瘤坏死明显、钙化较少、明显强化。生殖细胞瘤 10 例，好发于青春

期前后的男性，肿瘤体积较大，水肿轻，囊变、坏死、出血多见，增强呈不规则形、斑片状强化，易导致阻塞性脑积水；淋巴瘤 4 例，常见于中老年人，信号较均匀，瘤周水肿无至明显，明显强化，转移瘤 5 例，多见于中老年人，多发，在丘脑外可见其他病灶。 结论 丘脑肿瘤种类较多，MRI 检查有助于丘脑肿瘤的诊断与鉴别诊断

PU-2104

侧脑室起源神经母细胞瘤一例

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目的 通过报道 1 例经病理确诊的右侧侧脑室起源神经母细胞瘤，以提高临床医生对该病的认识。
方法 从临床、影像、手术及病理表现等方面详细分析一例右侧侧脑室起源的神经母细胞瘤。
结果 患儿女性,2 岁,因“头痛、呕吐 20 余天，伴肢体不自主抖动、缄默、双下肢无力 7 天”于医院就诊。查体：神清,言语缄默；记忆力、定向力、智力不合作，双下肢肌力及肌张力减低。影像学表现：MRI：幕上中线区巨大占位性病变, 大小约 8.2cm×7.3cm×8.0cm，呈长 T1 长 T2 信号为主 ，其内见片状短 T1 稍长 T2 信号灶，其内亦见更长 T1 更长 T2 信号，增强后病灶实性部分可见轻度强化 , 坏死囊变区未见强化，邻近大脑镰前份受累，病变与侧脑室、胼胝体体部及压部分界欠清，双侧脑室扩张并体部形态失常；CT：病灶为混杂密度灶，其内见散在斑点状钙化灶。术中见肿瘤起源附着部为右侧侧脑室壁，其供血主要来源于侧脑室脉络丛血管。病理及免疫组化**结果**(脑室内)胚胎性肿瘤(WHOⅣ级)，神经母细胞瘤。免疫组化结果:Lin28A(灶性+),INI1(+),Nestin(+),Ki67(区域达 50%+),GFAP(-),Olig2(-),Sym(+),NeuN(-)。
结论 神经母细胞瘤又称成神经细胞瘤，起源于肾上腺髓质和交感神经链神经嵴细胞，是儿童常见的肿瘤，成人罕见，原发于中枢神经系统罕见，侧脑室起源更罕见。侧脑室起源者与脑实质原发者影像学表现类似，需与脑室内室管膜瘤、多形性胶质母细胞瘤及中枢神经细胞瘤鉴别。当患者为儿童，表现为与侧脑室关系密切的巨大囊实性肿块，病灶多发钙化、出血、坏死及囊变，增强后实性部分明显不均匀强化，周围水肿不明显，需要考虑侧脑室起源中枢神经系统神经母细胞瘤的可能。其恶性程度高，容易发生早期转移，对于早期神经母细胞瘤应尽可能最大程度完全切除肿瘤并术后辅助放化疗，以提高患者的生存时间。

PU-2105

沟通性脑膜瘤两例及相关文献复习

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脑膜瘤很常见，而沟通性脑肿瘤比较少见，顾名思义，沟通性脑膜瘤，是指颅内的肿瘤经过解剖孔道或间隙，延伸向颅外生长的肿瘤，它的解剖位置多样，可以经过视神经管或者眶上裂形成颅眶沟通，或者经过鼻窦形成颅鼻沟通，也可以经过颈静脉孔形成颅颈沟通。本文就该特殊类型的脑膜瘤病例报道，并相关文献复习。

PU-2106
MR 三维颅脑容积成像增强扫描序列在内听道区病变中的诊断价值

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目的 探讨 MR 三维颅脑容积成像（3D-BRAVO）增强扫描序列在内听道区病变的诊断价值。**方法** 回顾性分析本院诊疗的 83 例累及内听道以及面听神经内听道段病例，所有患者均行 3D-BRAVO 增强扫描序列以及常规 MR 平扫、常规增强扫描序列，分析其影像表现，对比两种增强扫描序列诊断内听道周围病变的敏感性，评价 MR 三维颅脑容积成像序列在内听道区病变的诊断价值。**结果** 本组 83 例内听道区病例中，3D-BRAVO 增强序列上发现病变 115 个，常规增强序列上发现内听道周围病变 86 个（包括 3 个误诊病灶），以 3D-BRAVO 增强序列图像上发现病灶为准，常规增强发现病灶灵敏度为 71.55%，漏诊率为 28.45%。**结论** 在内听道区病变的显示中，3D-BRAVO 增强序列较常规增强序列更敏感，能够在较短时间内完成全颅脑的三维高分辨 T1 加权容积成像，具有薄层扫描及多方位成像的优势，通过在工作站上进行任意斜面的重建，可以显示更多的解剖细节，清晰的显示病灶大小、形态及范围和实现对小血管的追踪，帮助病变的判断以及与周围结构的关系评估，明显减少漏诊、误诊，提高病灶检出率。能够为临床的诊疗及预后评估提供影像学证据。

PU-2107
胶质母细胞瘤的磁共振（MR）表现及误诊分析

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【摘 要】 目的 分析我院近两年 41 例胶质母细胞瘤的磁共振（MR）表现，提高对本病的认识，减少误诊率。方法 回顾性分析 41 例经手术病理证实的胶质母细胞瘤的 MR 表现，其中男 21 例，女 20 例，年龄 30～77 岁。 均行 MRI 平扫加增强扫描，其中 10 例行 MRS 检查。 结果 MR 平扫 T1WI 呈等/低信号为主，T2WI 呈等/高信号为主，另可见 T1 及 T2 混杂高信号者。 病变弥散加权成像（DWI）以斑片状高信号多见，17 例为颅内多发病变，24 例为单发，共 60 个病灶，以颞叶病变多见，其次为额叶，病变瘤周不同程度水肿，以中重度水肿多见，占位效应明显，增强扫描呈花环样强化，强化环厚而不规则伴结节状突起，内部不规则坏死腔无强化，瘤周水肿区不强化。10 例行 MRS 检查者，病变区各波峰降低，Cho/Cr 及 Cho/NAA 值升高结合 MRS 着均正确诊断。所有病例中 6 例误诊，3 例未定性，建议复查或进一步检查，余 32 例正确诊断。对于 6 例误诊者，其中 5 例为多发病变，4 例误诊为转移瘤，1 例误诊为脑脓肿，1 例误诊为血管母细胞瘤。
结论 认真分析胶质母细胞瘤 MRI 的影像学表现，大多能作出正确的术前诊断，结合核磁波谱分析（MRS）、核磁灌注等功能成像方法，能提高胶质母细胞瘤的诊断准确率，结合病理及免疫组化分析，更有助于判断临床预后。
【关键词】 胶质母细胞瘤； 影像学 MRI； 诊断；误诊

PU-2108
原发性脑内淋巴瘤 MRI 表现与病理结果的关系

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目的 分析原发性脑内淋巴瘤 MRI 影像表现与病理的关系，提高对本病术前影像诊断的准确性。方法 回顾性分析 2009 年 4 月- 2015 年 8 月我院经手术及病理确诊为原发性脑内淋巴瘤 39 例的 MRI 影像学表现，分析其与病理的关系。结果 39 例中 23 例单发，16 例多发，共发现 79 个病灶，其中幕上 68 个，幕下 11 个，幕上病灶多位于脑实质深部或中线区域，其中额、顶、颞、枕叶脑白质深部共 33 个，基底节区 15 个，胼胝体 8 个，大脑半球灰白质交界区 7 个，丘脑 5 个。MRI 平扫于 T1WI 序列，呈等信号病灶 47 个，稍低信号 32 个；T2WI 序列呈等信号病灶 54 个，稍高信号 25 个；T2 flair 序列以等信号为主。MRI 增强扫描，均匀或较均匀团状强化病灶 25 个，不均匀团状强化 8 个，结节状强化 29 个，不规则片状或斑片状强化 9 个，病变位于胼胝体呈蝶翼状强化 8 个。其中 15 个病灶出现“握拳状”强化征象，26 个见“尖角征”，28 个病灶出现“缺口征”或“脐凹征”，3 个病灶可见邻近脑膜强化。33 个病灶瘤周轻度水肿，29 个瘤周中度水肿，17 个瘤周重度水肿。结论 原发性脑内淋巴瘤 MRI 多表现为与灰质相近的等信号，其病理基础为肿瘤细胞排列紧密、核浆比例较高、细胞间隙含水少，肿瘤围绕血管周围间隙浸润生长、破坏血脑屏障，且由于囊变坏死少见，故多呈明显均匀强化。

PU-2109
DTI 定量参数对脑胶质瘤的诊断价值及其与血管内皮生长因子、细胞核增殖相关抗原的关系

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目的:探讨扩散张量成像(DTI)定量参数对脑胶质瘤的诊断价值及其与血管内皮生长因子(VEGF)、细胞核增殖相关抗原(Ki-67)的关系。方法:选取 2014 年 6 月到 2017 年 6 月期间在我院接受治疗的 90 例脑胶质瘤患者,根据病理分级的不同分为中低级别组(n=46)和高级别组(n=44),比较两组患者表观扩散系数(ADC)值、各向异性分数(FA)值、相对表观扩散系数(rADC)值、相对各向异性分数(rFA)值、VEGF 和 Ki-67 的阳性率,分析 ADC 值、FA 值、rADC 值、rFA 值与 VEGF、Ki-67 表达的相关性。结果:高级别组的 ADC 值、FA 值、rADC 值和 rFA 值低于中低级别组(P<0.05)。高级别组病理组织中 VEGF、Ki-67 的阳性表达率高于中低级别组(P<0.05)。经 Spearman 相关分析显示,ADC 值、FA 值、rADC 值和 rFA 值与 VEGF、Ki-67 的表达水平均呈负相关(P<0.05)。结论:DTI 定量参数与脑胶质瘤病理分级和 VEGF、Ki-67 的表达水平密切相关。

PU-2110
MR 检查对冯· 希佩尔· 林道综合征诊断的意义

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目的 探讨磁共振检查对冯·希佩尔·林道(Von Hippel-Lindau，VHL) 综合征诊断的价值。方法 回顾性分析 2010 年 5 月- 2015 年 9 月第三军医大学新桥医院 16 例经病理及影像证实为 VHL 综合征的临床及多部位磁共振资料，并总结其临床及 MR 表现，探讨本病的诊断思路。结果 16 例中女性 10 例，男性 6 例，平均年龄 32.4 岁，10 例有家族患病史。16 例 MR 资料均显示为多系统病变，全部合并中枢神经系统血管母细胞瘤(MR 表现多呈“大囊肿伴壁结节”混合肿块)，5 例为首发病变；6 例合并视网膜血管母细胞瘤，其中 2 例为首发病变；9 例合并肾透明细胞癌及肾囊肿，其中 4 例为首发病变；7 例合并胰腺多发囊肿，其中 2 例为首发病变；7 例合并嗜铬细胞

瘤，其中 3 例为首发病变；其他还合并肾血管平滑肌脂肪瘤、肝血管瘤等。结合临床及多部位 MR 资料，最后诊断为Ⅰ A 型 6 例，Ⅰ B 型 3 例，Ⅱ A 型 4 例，Ⅱ B 型 3 例。结论 VHL 综合征有遗传倾向且常累及多个器官，多以中枢神经系统血管母细胞瘤及内脏病变为首发病变；联合多部位 MR 检查有利于 VHL 综合征的诊断。

PU-2111
磁共振弹性成像(MRE)评价垂体腺瘤硬度的应用价值

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目的 探讨磁共振弹性成像在评价垂体腺瘤质地硬度的运用价值。
方法 对 30 例垂体肿块经鼻神经内镜术前患者行磁共振弹性成像（MRE)检查,半定量分析肿块质硬度，避开图像伪影区域，在每个病人病灶层面取 2-3 个横断面图像勾画 ROI,取其平均值，并对照神经内镜夹取结果，评估其准确性。
结果 30 个垂体肿块有 25 例经组织病理学诊断为垂体腺瘤质，经神经内镜夹取，其中 7 例质地较硬，13 例质地较软，还有 5 例质地较韧。磁共振弹性成像半定量测量其弹性值，质地较硬者为 0.75-0.96kPa，质地较软者为 0.49-0.69kPa，质地较韧者为 0.27-0.55kPa。其准确率较高。
结论 磁共振弹性成像（MRE）在垂体腺瘤质地硬度评价具有较大价值，有助于垂体腺瘤手术方式选择的评估。

PU-2112
基于磁敏感加权成像的局部图像方差分析方法鉴别低级别胶质瘤分子分型的价值

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目的 磁敏感加权成像（SWI）低信号区主要是由神经胶质瘤中的肿瘤微血管，血液沉积和钙化引起的。局部图像方差分析（local image variance， LIV）方法是对 SWI 图像低信号量化分析的新技术。本研究目的探索 SWI-LIV 方法在术前鉴别低级别胶质瘤的分子分型的价值。
方法 2016 年至 2019 年，回顾性分析 37 例于西门子 1.5T MR 成像仪行 SWI 扫描和增强扫描的低级别（WHO II/III）级胶质瘤患者。其中分子生物学手段鉴定胶质瘤患者分子分型（IDH 野生型：*IDH^{wt}；IDHT 突变及 1p/19q 联合共缺失 IDH^{MUT}/1p/19q^{+}；IDHT 突变及 1p/19q 未有联合共缺失：IDH^{MUT}/1p/19q^{+}* ）。病理切片分析胶质瘤组织的微血管密度（MVD）。*参照 T1 增强图像在 SWI 图上肿瘤实质区提取 ROI 用于计算 LIV 值。LIV 计算按照公式：$LIV=G(X^2)-[G(X)]^2$。其中 x 为 SWI 内体素信号值，G 为低通高斯滤波器。ROC 曲线用于鉴别诊断。皮尔森相关分析 LIV 值和 MVD 的相关性*
结果 35 例患者其中：*IDH^{wt} 14 例，IDH^{MUT}/1p/19q^{+} 为 14 例，及 IDH^{MUT}/1p/19q^{-}* 共缺失 9 例。ROC 分析曲线证明 LIV 在鉴别低级别胶质瘤分子分型具有具有较高的效能（曲线下面积 AUC: *IDH^{wt}* vs IDH^{MUT}, 0.968; *IDH^{MUT}/1p/19q^{+} VS IDH^{MUT}/1p/19q^{-}*, 0.883）。LIV 值与 MVD 具有显著相关性（r=0.763， p<0.05）。

讨论：我们的研究结果表明，基于 SWI 图像的局方差分析可以可以精确鉴别 WHO II 级和 III 级胶质瘤的分子分型，并离体预测肿瘤的微血管结构改变。本研究的主要不足为样本量较小，LIV 和常规 ITSS 分析方法之间缺乏比较。

PU-2113

脊髓节细胞胶质瘤 2 例影像表现并文献复习

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目的 探讨脊髓节细胞胶质瘤的影像学表现，提高对该病的认识。 **方法** 回顾性分析 2 例经病理证实的脊髓节细胞胶质瘤，2 例均行 MRI 平扫＋增强
检查，并作手术治疗和病理检查。**结果** 本组 2 例肿瘤影像表现均较典型，病例 1 肿瘤呈囊实性，T_1WI、T_2WI 均呈混杂信号，脊髓表面强化，肿瘤下方脊髓空洞形成。病例 2 肿瘤呈实性，等 T_1、稍长 T_2 信号，脊髓表面强化，邻近脊髓水肿。**结论** 儿童或年轻人，颈段脊髓占位，累及范围广泛，增强扫描脊髓表面强化或斑片样强化，有助于本病诊断。

PU-2114

IDH 突变弥漫性胶质瘤的 MR 影像学特征研究

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目的 分析存在 IDH 突变的弥漫性胶质瘤的在传统 MR 上的影像学特点，为对 IDH 突变的胶质瘤进行无创诊断提供线索。**方法** 对 136 名来我院行 MR 检查并病理诊断为弥漫性胶质瘤的患者进行研究。分析患者的影像学特点，包括：额叶受累；皮层受累；脑室旁受累；受累脑叶个数；肿瘤多发；清晰边界；水肿程度（轻重）；囊变；T2 信号均匀；T2 信号强度；T1 高信号；增强程度（轻、中、重）。使用卡方检验对 IDH 突变型和 IDH 野生型两组胶质瘤上述影像特点的发生率进行分析。**结果** 额叶受累（p＜0.000）；脑室旁受累（p=0.002）；多发（p=0.010）；水肿程度（p=0.036）；囊变（p=0.010）；T2 信号均匀（p=0.007）；T2 信号强度（p=0.001）；增强程度（p＜0.001）存在统计学差异。皮层受累（p=0.105）；清晰边界（p=0.075）；受累脑叶个数（p=0.069）；T1 高信号（p=0.169）不存在差异。**结论** IDH 突变型和 IDH 野生型弥漫性胶质瘤的影像特点存在差异，可以利用该部分影像特点对其进行分辨。

PU-2115

鼠脑胶质瘤瘤周水肿组织 PWI 参数与 AQP1 的相关性研究

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目的 探讨 Wistar 大鼠脑胶质瘤瘤周水肿组织 AQP1 的表达与局部脑血容量(rCBV)、表面血管通透性（PS）的相关性。**方法** 将 C6 细胞株接种至 Wistar 大鼠右侧尾状核，3～4 周后行常规 MRI 及 PWI 检查，借助 Function Tool 软件对 PWI 数据后处理，获得相应部位 rCBV 值和 PS 值，处死后行

AQP1 免疫组化染色。**结果** 荷瘤大鼠瘤周水肿组织 rCBV 值（244.34±45.96）和 PS 值（1.42±0.25）较正常脑组织 rCBV 值（205.18±30.46）和 PS 值（0.25±0.23）均升高，且差异具有统计学意义（$P<0.05$）。瘤周水肿组织 rCBV 值和 PS 值分别与 AQP1 阳性表达 IOD 值间均存在正相关(r_1=0.51，r_2=0.49,$P<0.05$)。**结论** 3～4 周大鼠 C6 胶质瘤瘤周水肿组织灌注参数 rCBV 值和 PS 值均较正常侧脑组织升高，并可以体现瘤周水肿组织 AQP1 的表达水平。

PU-2116

椎管内胚胎性肿瘤 2 例影像表现并文献复习

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目的 探讨椎管内胚胎性肿瘤的影像学表现，提高对该病的认识。 **方法** 回顾性分析 2 例经病理证实的椎管内胚胎性肿瘤，2 例均行 MRI 增强
检查，并作手术治疗和病理检查。**结果** 病例 1 肿瘤位于腰骶段椎管内硬膜下，其内见斑片状长 T_2 信号，结合手术记录分析其原因可能与肿瘤侵犯导致的马尾神经变性有关。病例 2 肿瘤位于胸腰段髓外硬膜外、脊髓两侧呈“夹心”样生长，术后短期复发。**结论** 儿童或青少年，椎管内占位，“夹心”或“半包围”状生长，沿椎间孔向外生长，MRI 增强扫描中度或明显强化，需考虑本病可能。

PU-2117

Application of magnetic resonance perfusion weighted imaging in cerebral gliomas grading

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Objective To estimate the application value of MRI perfusion imaging techniques, including three dimensional pseudo-continuos arterial spin labeling (3D-pCASL), dynamic contrast-enhanced (DCE) MRI and enhanced diffusion weighted imaging (eDWI) in cerebral gliomas grading. And compare the accuracy of the parameters which derived from these technology in glioma grading, explore whether the combination of these three techniques can further improve the accuracy of identification of high and low grade gliomas, and explore the correlation between perfusion related parameters, and the correlation between them and the pathological parameter Ki-67.
Methods Thrity-three consecutive patients with pathologically confirmed gliomas, 17 high grade gliomas (HGG, WHO grade III - IV) and 16 low grade gliomas (LGG, WHO grade II). All patients underwent preoperative MRI conventional sequences, 3D-pCASL, DCE and eDWI sequences. The data of 3D-pCASL was processed to generate the cerebral blood flow(CBF) map which imply the perfusion imformation. Parametric maps of K^{trans}, K_{ep}, V_e and V_p were calculated from DCE imaging. The raw data of eDWI were processed to calculate the parametric images of fast diffusion coefficient (D*), slow diffusion coefficient (D), and fractional perfusion-related volume (f). Combined with conventional apparent diffusion coefficient (ADC) map which derived from 0 and 1000 s/mm^2 and 3D T1WI images, we manually placed the

regions of interest in the solid parts of gliomas and the parts of normal white matter contralateral to tumors. The corresponding image parameters and the relative image parameters in comparison with normal white matter (rCBF, rD*, rD, rf and rADC) were measured and compared between HGG and LGG. Then, the receiver operating characteristic (ROC) curve analyses were used to assess the sensitivity and specificity in glioma grading, and find the cut-off value. Then, in the combination of 3D-pCASL, DCE and eDWI three techniques for glioma grading, we use two classification Logistic regression and support vector machine to obtain the parameters with statistical differences between high and low grade tumors. Bivariate correlation analysis was used to explore the correlation between perfusion parameters and perfusion parameters and Ki-67. Finally, the perfusion parameters associated with Ki-67 were obtained by general linear regression.

Result rCBF, K^{trans}, V_e, V_p and rD* values were significantly higher in the high-grade gliomas, whereas rD, rf and rADC tended to be lower (all P<0.05). The analysis of ROC showed that rCBF, K^{trans}, V_e, V_p and rD* had better diagnostic value in differentiating high and low grade gliomas (AUC>0.7). In all parameters, K^{trans} has the smallest P value (P<0.001) and the largest area under the receiver (AUC=0.993), and when the threshold is 0.158, the sensitivity and specificity are 100% and 93.75%, respectively. When combined with 3D-pCASL, DCE and eDWI to identify high and low grade gliomas, two classification Logistic regression was found that only K^{trans} had the best diagnostic efficacy. But support vector machine was found that, in a single parameter, the accuracy of K^{trans} was 93.94%, which is the best diagnostic parameter, and rCBF combined with K^{trans}, K_{ep} and rD* can further improve the accuracy to 100%. There was a significant positive correlation between rCBF and rD*, K^{trans} and rD*, V_e and rD* in the perfusion parameters in different techniques (r=0.551 P=0.002, r=0.643 P<0.001, r=0.770 P<0.001). Correlation analysis between perfusion parameters and Ki-67 showed that the correlation between V_e and Ki-67 was more significant (P=0.001).

Conclusion 3D-pCASL, DCE and eDWI have good diagnostic value in differentiating high and low grade gliomas, and the parameters rCBF, K^{trans}, V_e, V_p and rD* have good diagnostic significance. Among the three perfusion related magnetic resonance imaging, the DCE shows more efficient than eDWI and 3D-pCASL in discriminating the high from low grade gliomas. The combination of 3D-pCASL, DCE and eDWI, can further improve the accuracy of identifying high and low grade gliomas. Correlation analysis showed that rCBF and rD*, K^{trans} and rD*, V_e and rD* were the parameters of correlation among the three magnetic resonance techniques. There is a good correlation between V_e the perfusion parameters of DCE and Ki-67, which can reflect the value added ability of tumor.

PU-2118

能谱 CT 定量参数碘含量在胶质瘤分级中的价值

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【摘要】**目的** 分析能谱 CT 定量参数碘含量在胶质瘤分级中的作用，探讨其在胶质瘤 WHO 分级的预测价值。**方法** 收集经组织病理证实的不同级别胶质瘤患者共 74 例，对其 CT 影像资料进行回顾

性分析；利用 K-W-H 检验不同级别胶质瘤肿瘤肿瘤内碘含量有无差异，并利用 pearson 检验判断碘含量与 KI-67 标记指数是否具有相关性。**结果** 二级胶质瘤（40 例）肿瘤内平均碘含量为 0.275±0.084mg/ml；三级胶质瘤（17 例）肿瘤内平均碘含量为 0.71±0.216mg/ml，四级胶质瘤（17 例）肿瘤内平均碘含量为 1.28±0.216mg/ml。在 II 级和 III 级（P<0.01）、III 级和 IV 级（P<0.01）以及 II 级和 IV 级（P<0.01）之间肿瘤内碘含量存在显著差异。碘含量与 KI-67 呈正相关。**结论** 肿瘤内碘含量可预测胶质瘤的组织病理学分级。

PU-2119

第三脑室内 Rosai-Dorfman 病 1 例

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目的 探讨颅内 Rosai-Dorfman 病 CT 及 MRI 影像学表现、病理特点，提高对该病的认识，拓展诊断思维。

方法 对 1 例经病理证实的 Rosai-Dorfman 病患者 CT 及 MRI、病理特点进行回顾性分析，并进行相关文献复习。

结果 影像学表现：CT 平扫第三脑室后部等、低密度影，其内密度较均匀，边界不清，周围脑组织受压水肿，其上脑室系统梗阻性积水。MRI 表现为三脑室后部不规则肿块，边界清楚，边缘呈多发浅分叶，信号欠均匀。T1WI 病灶呈等低信号，其内见条状稍高信号。T2WI 病灶呈等高信号，其中可出现聚集低信号影（可能是 Rosai-Dorfman 病较为特征性表现，研究者推测与氧自由基介导下巨噬细胞的吞噬作用有关）。病变周围丘脑明显受压水肿。增强扫描示病变明显均匀强化，邻近血管受压。MRI 功能成像：DWI 示病灶为低信号，无弥散受限；SWI 病灶内有多发短条状低信号；MRS 示病变内 NAA 峰降低，Cho 峰轻度降低，见高耸的脂质乳酸峰。 PWI 提示病变 CBV 不均匀升高。病理表现为弥漫浸润的组织细胞、浆细胞和淋巴细胞比较完整的存在于组织细胞内，即“伸入现象”，是组织病理学特征性表现。免疫组织化学中组织细胞 S－100 蛋白及 CD68 表达阳性有助于确诊。

结论 颅内 Rosai-Dorfman 病较少见，易误诊，免疫组化检查有助于鉴别诊断。在临床实践中应考虑到 Rosai-Dorfman 病的可能。

PU-2120

基底节区生殖细胞瘤的 MRI 征象分析

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目的 基底节区生殖细胞瘤（basal ganglia germinoma，BGG）是颅内一种少见的胚胎性肿瘤，该类肿瘤对放射线极其敏感，治疗首选放疗。探讨 BGG 的 MRI 特征，提高影像诊断准确性，使患者在疾病早期选择最佳的治疗方式，提高生存质量。

方法 回顾性分析经手术病理证实的 5 例 BGG 临床及影像学资料。

结果 5 例 BGG 患者均为男性，年龄 7-26 岁，平均年龄 16.8 岁。5 例患者中 3 例病灶为右侧，2 例为左侧，其中 1 例病灶较大者范围包括视交叉上方-左额叶-左丘脑，另 1 例同时发现鞍上-鞍区生殖细胞瘤。肿瘤实质部分 T1 呈略低于或接近于脑灰质信号，T2 或 Flair 呈高或稍高信号；4 例病灶内均可见 T1 高信号；肿瘤呈囊实性者 3 例，实性者 2 例；所有病例瘤周均轻度水肿或无水肿；无明显占位效应 2 例；增强后病灶边缘呈小片状或小结节状强化；其中 1 例患者行 CT 检查发

现高、低混杂密度肿块影，病灶呈囊实性，伴出血和少许钙化；其中 2 例患者同时行 SWI 检查，均可见病灶内大范围低信号影。

结论 颅内生殖细胞瘤好发于松果体区，其次为鞍上区、丘脑和基底节区。BGG 绝大多数发生于男性。该类型肿瘤好发于青少年人群，发病高峰 10-14 岁。如果病史提示青春期男性患者出现一侧的肢体肌力减退，提示考虑本病。BGG 在 CT 和 MRI 特征性表现为不规则形团块，易合并囊变、出血和坏死。CT 为高低混杂密度，常伴出血，部分病灶出现少许钙化。MRI 为等长 T1、T2 高低混杂信号，当合并出血时，SWI 呈现大范围低信号影。增强后实性部分明显均匀或不均匀强化。瘤周水肿相对较轻。肿瘤可膨胀性生长浸润邻近组织，或沿前连合纤维束向对侧基底节区扩散，还能沿脑脊液，室管膜及脑膜种植转移。如果在基底节区的病灶同时发现在鞍区或鞍上，高度提示本病。 BGG 需与淋巴瘤、胶质瘤及恶性畸胎瘤进行鉴别。BGG 的 MRI 表现具有一定的特征性，结合 CT 及 SWI 检查可提高其诊断准确率。

PU-2121

脑室外中枢神经细胞瘤影像学诊断进展

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目的 综述国内外脑室外中枢神经细胞瘤（extraventricular neurocytoma）最新影像学诊断进展，以期为临床工作中诊断这一罕见、少见病提供影像学诊断依据。

方法 检索国内外相关脑室外中枢神经细胞瘤影像学诊断文献并提取重要影像学征象进行综述。其中，中文数据库检索中国知网，检索式为：((题名&关键词&摘要=脑室外中枢神经细胞瘤) 并且 (题名&关键词&摘要=影像 或者 题名&关键词&摘要=CT 或者 题名&关键词&摘要=MR))(精确匹配)；英文数据库检索 Pubmed，检索式为：extraventricular neurocytoma and (imaging or CT or MR)，对所命中结果进行二次筛选后，提取主要影像学特点进行综述。

结果 脑室外中枢神经细胞瘤可发生位置广泛，通常累积脑室外的皮层灰质及深部白质，较多报道发生于额叶，但不具备特征性定位提示意义。实性部分在 T1WI 和 T2WI 上常与灰质信号相仿，常伴不同程度的钙化、囊变或坏死，增强后实性部分呈明显强化，但该征象亦不具备特征性提示意义。有研究指出，具有神经节样分化的病灶常倾向于有更多的囊变且增强后呈不均匀强化，具有一定的提示作用。因此，大多数文献认为，脑室外中枢神经细胞瘤的影像学诊断需结合直径≥5cm、跨脑回生长、浅分叶、边界不清、出血、囊变、坏死等多种征象。

结论 目前脑室外中枢神经细胞瘤影像学诊断困难，相关病理及影像学表现仍需进一步研究。

PU-2122

基于生物信息学方法筛选胶质母细胞瘤的关键基因和信号通路

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背景：本研究旨在通过系统的生物信息学方法挖掘胶质母细胞瘤（GBM）的关键差异基因和信号通路。

方法 从 GEO 数据库下载 GSE2223, GSE4290, GSE12657, GSE15824, GSE42656，GSE66354 数据集。这六个数据集共有 175 个 GBM 样本（165 个 GBM 肿瘤组织和 10 个 GBM 细胞样本）和 55 个非肿瘤样本（正常脑组织或正常人星形胶质细胞）。使用 RobustRankAggreg（RRA）方法和 R 软件对来自每个数据集的差异表达基因（DEG）进行分析和整合，并筛选出整合后的差异性表达基因。随

后，使用在线工具 DAVID 数据库进行 GO 和 KEGG 通路富集分析，并使用 STRING 构建 PPI 蛋白互作网络。最后，在线数据库 UALCA 用于分析关键基因的表达量与 GBM 患者预后之间的关系，使用 ONCOMINE，GEPIA 和 cBioPortal 数据库分析前 10 位的关键基因转录的相关信息。
结果 首先，从六个数据集中筛选出了 570 个差异基因（287 个上调基因和 283 个下调基因）。GO 分析显示上调基因主要参与细胞分裂，细胞外空间和蛋白质结合，下调基因主要参与化学突触传递，细胞连接和钙离子结合。KEGG 通路富集分析显示差异性基因主要集中在 GABA 能突触，细胞周期，吗啡成瘾，百日咳和金黄色葡萄球菌感染。构建 PPI 网络并筛选出其中最重要的两个模块。其中前 10 位的关键基因是 KIF2C，KIF4A，AURKA，MCM2，MELK，TPX2，ASPM，ASF1B，RRM2 和 BIRC5。最后，我们发现 GBM 组织中这 10 个基因的表达水平显著高于正常组织，并且 BDNF，P4HB，PKB 和 SST 的表达量与患者较差的预后显著相关。
结论 本研究筛选出了 GBM 中的一些关键基因和信号通路，这提高了我们对 GBM 发病和进展机制的理解，并鉴定出了几个 GBM 诊断和治疗的候选标志物。

PU-2123
小脑囊实性血管母细胞瘤与毛细胞星形细胞瘤强化程度对比分析

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目的 探讨小脑囊实性血管母细胞瘤实性成分强化程度同毛细胞星形细胞瘤之间的差异，以期提高两者的鉴别。**方法** 收集经病理证实的位于小脑的囊实性的血管母细胞瘤及毛细胞星形细胞瘤各 30 例，对其 MR 影像资料进行回顾性分析，计算病灶实性成分强化程度值，采用独立样本 t 检验(正态分布)或 Mann-Whitney U 检验（偏态分布）进行分析，绘制受试者工作特征曲线（*ROC*）,评价实性成分强化程度值对囊实性血管母细胞瘤的诊断效能。**结果** 两组病例实性成分均强化，平均强化程度值均以正偏态分布。两者强化程度值差异具有统计学意义（p=0.000），*ROC* 曲线下面积为 0.952，以实性成分强化程度值 2.58 作为阈值，诊断小脑囊实性血管母细胞瘤的特异度和敏感度分别为 88.9%和 92.9%。**结论** 肿瘤实质部分强化程度值有助于鉴别小脑囊实性血管母细胞瘤与毛细胞星形细胞瘤，可通过测定实性部分强化程度值提高对小脑囊实性血管母细胞瘤的诊断准确率。

PU-2124
多模态 MRI 在鉴别高级别胶质瘤、脑转移瘤及原发性中枢神经系统淋巴瘤中的应用

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目的 评价多模态 MRI 对高级别胶质瘤（HGG）、脑转移瘤与原发性中枢神经系统淋巴瘤（PCNSL）的诊断价值。
材料与**方法** 收集本院经临床病理证实的 HGG 25 例、脑转移瘤 36 例、PCNSL12 例的术前磁共振成像，成像序列包括 T1WI、T2WI、T2-FLAIR、T1+C、ASL、DWI 和 DCE。定量参数包括 ADC、CBF、K^{trans}、Ve。利用 ROC 曲线分析评价各个参数值的诊断效能。
结果 PCNSL 较 HGG 及脑转移瘤 ADC、CBF 值更低，Ktrans、Ve 值更高。ROC 曲线分析显示 Ktrans 和 CBF 在区分 PCNSL 与 HGG 及转移方面均具有良好的诊断性能，AUC 分别为 0.868 和 0.880。

结论 CBF 和 Ktrans 能有效鉴别 PCNSL 与 HGG 及脑转移瘤。结合多个定量参数能进一步提高了 PCNSL 的诊断性能。

PU-2125
不典型原发性中枢神经系统淋巴瘤的 MRI 表现分析

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目的 回顾性分析总结原发性中枢神经系统淋巴瘤的不典型磁共振表现，以提高放射科医生对该病的认识及诊断水平。
方法 回顾性分析经病理证实的 12 例原发性中枢神经系统淋巴瘤的 MRI 表现，总结及分析其形态、信号、生长部位、及强化方式等特征。
结果 12 例中单发病灶 7 例,多发病灶者 5 例。发生于透明隔、延髓背外侧、小脑半球等不典型生长部位各 1 例。8 例 MRI 平扫呈等或稍长 T1，等或稍长 T2 信号,4 例 T1WI、T2WI 为不均匀混杂信号。DWI 稍高信号者 11 例，1 例为等信号。8 例呈病灶均匀明显强化,1 例呈轻度条片状强化；3 例表现为不均匀环形明显强化。病变可呈不规则形、类圆形、以及条形，部分边界模糊。仅少数者磁共振波谱出血了典型脂质峰，多数表现为 NAA 明显下降及 Cho 升高。
结论 不典型形态、信号特点及生长部位的原发性中枢神经系统淋巴瘤 MRI 影像学表现多变，缺乏明显特征，鉴别诊断较困难，了解其不典型 MRI 特点有助于拓宽诊断思维及提高诊断水平。

PU-2126
64 排螺旋 CT 脑血管造影联合富士 Synapse v3.0 软件模拟切除颅内乏血供肿瘤

韦璐
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目的 颅内乏血供肿瘤的模拟立体显示一直是影像学科的难题，本研究通过 64 排螺旋 CT 脑血管造影联合富士血管后处理软件的融合成像功能，探讨如何灵活联合运用两者展示颅内乏血供肿瘤的立体观，以及肿瘤与血管及颅底关系。为外科医师制定合理的手术方案。
材料及方法 5 例 CT 或 MR 平扫发现颅内占位患者，行脑血管 CT 造影，采用荷兰 Philips 64 排螺旋 CT， 扫描范围从颅顶到颅底。扫描结束后将薄层图像传至富士 Synapse v3.0 后处理工作站，运用虚拟颅内肿瘤手术规划软件 ，重组肿瘤立体模型，形态逼真，解剖标志清楚，清晰显示颅内主要动脉及其分支、走行及与肿瘤相互毗邻关系。并且利用融合成像功能，将肿瘤、颅内动脉及颅底骨结构同时展示。针对三维影像中不同的肿瘤、颅内解剖结构的相对位置即时定义最佳曲面进行虚拟手术切割模拟，考察拟切除后的颅内结构，
结果 5 例颅内缺血供肿瘤均经手术及病理证实。其中脑膜瘤 3 例、听神经瘤 1 例，星形细胞瘤 1 例。模拟肿瘤形态显示与术中所见基本一致，5 例图像均能清楚展示肿瘤与邻近血管及骨质结构。
讨论：精准手术切除是目前外科研究的热点，该项研究能够完整、清楚的展示颅内乏血供肿瘤，暴露肿瘤与周围血管的邻近关系，立体展示肿瘤在颅内的空间位置， 模拟切除颅骨及肿瘤以及邻近脑组织成像显示，可以有效避免术中误伤血管导致大出血，避免切除过多的周围正常脑组织，从而辅助外科医师制定更加精准、合理的个体化手术方案。

PU-2127
IDH 突变型伴 1p19q 联合缺失少突胶质细胞瘤与 IDH 野生型胶质母细胞瘤单体素质子 MRS 2-HG 峰检出的比较研究

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目的 2-HG 是胶质瘤枸橼酸脱氢酶突变的代谢产物，文献报道 3.0T 磁共振扫描仪单体素质子 MRS 能直接检出 2-HG 峰。本研究拟通过 IDH 突变型伴 1p19q 联合缺失少突胶质细胞瘤与 IDH 野生型胶质母细胞瘤单体素质子 MRS 的表现特点，比较在两种肿瘤中 2-HG 峰的检出差异。材料与**方法** 所有 18 例 IDH 突变型伴 1p19q 联合缺失少突胶质细胞瘤和 31 例 IDH 野生型胶质母细胞瘤病人均经术后病理、免疫组化和基因测序证实，术前运用 GE3.0Tdiscovery 扫描仪，除常规 MRI 平扫及增强扫描，在肿瘤实性区放置 ROI 进行单体素质子 MRS 成像。按照术后分组运用统计学方法比较两种肿瘤其术前 2-HG 峰的检出差异。**结果** 2-HG 峰在 IDH 突变型伴 1p19q 联合缺失少突胶质细胞瘤与 IDH 野生型胶质母细胞瘤无明显统计学差异。**结论** 由于代谢物峰的重叠，加之信噪比低等原因，3.0T 单体素质子 MRS 对于 2HG 峰的检出尚达不到临床的需要，急需进一步改正和相关后处理软件的支持。

PU-2128
大脑多结节和空泡状神经元肿瘤 MRI 表现及文献回顾

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目的 大脑多结节及空泡状神经元肿瘤（Multinodular and vacuolated neuronal tumors，MVNT）是近年来新发现的一种少见疾病，其影像诊断尚未被大多数放射科医师熟悉，本文回顾性分析我院 5 年内所有脑部 MRI 影像资料，检索到 8 例 MVNT 病例，通过分析 MVNT 的 MRI 表现并进行分析总结，以及文献回顾，旨在提高放射科医师对 MVNT 的认识，提高诊断水平。
方法 回顾性分析 8 例大脑多结节和空泡状神经元肿瘤的临床及影像资料，并结合文献进行分析和总结。
结果 8 例均为青中年病人，平均年龄为 30.75 岁（13-53 岁），5 例为男性患者，3 例为女性患者，6 例发生于右侧，2 例发生于左侧，额叶较常见（5 例），顶叶次之（3 例），临床表现不具特征性，多为体检偶然发现，2 例为局部偶发头痛。病变多分布于皮层深部和皮层下浅表白质内的边界较清晰的离散或合并的结节，MRI 表现具有明显特征性，大部分病例表现为多发簇样小囊结构，少数病例表现为簇样小囊片状融合，病变未见明显周围水肿及占位效应，T2WI 及 T2 FLAIR 呈明显高信号，T1WI 呈等或低信号，DWI 多呈高信号，但无弥散受限，增强多数未见强化，仅一例轻度强化，其中 2 例行 MRS 序列检查均未见异常，2 例行 ASL 检查均未见异常。其中三例在我院每年随访复查头部核磁共振及增强扫描检查，影像均较前未见变化。
结论 尽管 MVNT 是少见疾病，且其临床表现无特征性，但其影像学表现具有特征性，大部分病例可通过其影像学表现确诊，而避免不必要的有创检查与手术，因此，掌握其 MRI 表现具有重要意义。

PU-2129

颅内腱鞘纤维瘤一例

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患者　　女，40 岁，以“头痛、头昏、耳鸣 10 余天”为主诉就诊。行 MRI 检查示：右侧中后颅窝可见一不规则囊实性占位，大小约 4.3x7.7x4.9cm，实性部分呈等 T1、T2 信号，囊性部分呈长 T1、T2 信号，DWI 呈高、低混杂信号，增强扫描实性部分呈明显均匀强化，囊性部分未见确切强化；病灶向外突出于外耳道，邻近骨质受累，周围脑实质内见稍长 T2 信号水肿带，第四脑室受压，向左侧移位，致幕上脑室系统积水扩张。
手术：行右侧外耳道内肿物取材活检。肿瘤呈灰白色、质硬。
病理：腱鞘纤维瘤。免疫组化：S-100（-），CD57（-），CD34（+血管），SOX10（-），SMA（+局部），WT-1（-），Desmin（-），GFAP（-），MSA（-），KI-67（0），Calponin（+）。
讨论：腱鞘纤维瘤（fibroma of tendon sheath,FTS）又叫腱鞘滑膜纤维瘤，是一种少见的良性肿瘤，由 Buxton 于 1923 年首次报道。因为发病率低，直到 1979 年才由 Chung 和 Enzinger 对 138 例 FTS 进行总结分析。该病多见于成年人，发病高峰为 30~50 岁，男女发病比例约为 3:1，绝大多数起源于四肢的肌腱或腱鞘组织，好发部位依次为手指、手、手腕、膝关节、肩关节和眼内肌部等，发生于颅内者国内至今尚未见相关报道。

PU-2130

3D-ASL 在鉴别高级别胶质瘤复发与假性进展的的价值

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【摘要】**目的**　探讨三维动脉自旋标记成像（3D-ASL）在鉴别高级别胶质瘤复发与假性进展的临床应用价值。**方法**　选取经手术病理证实的高级别胶质瘤 16 例进行 MRI 平扫及强化扫描和 3D-ASL 扫描，测量异常强化区（患侧）及对称健侧的脑血流量（CBF）值。**结果**　16 例高级别胶质瘤手术后在 MRI 平扫 及强化扫描表现为异常强化病灶，经随访证实，高级别胶质瘤术后复发的有 8 例，假性进展的有 8 例。复发患者的平均 CBF 值　患侧 为 110.5±30.96 ml/(100g* min)，健侧 48±7.38 ml/(100g* min)；假性进展患者平均 CBF 值患侧为 17.5±4.06 ml/(100g* min)，健侧 44.25±9.81 ml/(100g* min)，复 发患侧 的 平 均 CBF 值　与假性进展患侧平均 CBF 值，两者表现为有统计学意义的差异（P< 0.05）,复发组 CBF 值显著高于假性进展组。**结论**　3D-ASL 在鉴别高级别胶质瘤复发与假性进展有重要的临床应用价值

PU-2131

256 层螺旋 CT 血管成像对颅内动脉瘤的诊断价值

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目的　探讨 256 层螺旋 CT 血管造影（CT angiography，CTA）对颅内动脉瘤的诊断价值。
方法　选取 2013 年 5 月至 2014 年 12 月期间南京军区福州总医院 116 例颅内动脉瘤患者，对其影像学和临床资料进行回顾性分析。所有患者均行头颅 256 层 iCT 平扫及 CTA 检查。

结果 116 例患者，113 例阳性，发现 133 个动脉瘤，3 例阴性；瘤体最大者大小约 1.72×1.34cm，瘤颈部宽约 0.72cm，位于颈内动脉末端；最小者大小约 0.28×0.2cm，位于前交通动脉。①经手术发现 137 例动脉瘤，CTA 对脑动脉瘤的诊断符合率 97%（133/137），与金标准 DSA 或手术所见基本一致。

结论　CTA 检查是诊断颅内动脉瘤安全、快速、无创、有效的方法,具有较好的特异性和敏感性，可以确定病变范围和程度，有利于临床准确分期，可作为颅内动脉瘤筛查的首选方法，直接指导临床进一步检查和治疗。

PU-2132
高级别神经胶质瘤靶向治疗后的影像学评估标准：RANO 共识解读

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目的　探讨高级别神经胶质瘤的影像学评估标准的应用要点及影像报告规范与 QC，以提高影像科对 RANO 的认识与重视，有利于临床 MDT 的开展及临床诊断的统一性、标准化。

方法　浅析、比较肿瘤影像评估标准的发展演变过程，从 WHO 标准发展到 RECIST 和 RANO 标准及其之间的区别。解读 RANO 标准中的主要诊断术语解析及应用要点；胶质瘤影像评估实例案例分析及国内外学科应用现状对比。

结果　目前主流的肿瘤疗效影像评估标准是 RECIST 1.1，其特点是易普及、操作简便、变异性小，涵盖肿瘤本身及转移灶、淋巴结等整体性影像综合评估；但胶质瘤治疗疗效的判断一直是一个临床上的难题，2010 年由哈佛医学院提出了新的高级别胶质瘤治疗反应评价标准，即 RANO 标准。RANO 标准经过近 6 年的临床实践，得到了神经肿瘤学界的认可，也成为高级别胶质瘤临床试验研究的常用评价标准。胶质瘤应用的要点与难点在于靶病灶的选择、测量序列选择、新病灶定义及甄别、非靶病灶显著进展的掌握等；与欧美发达国家的 RANO 应用情况相比，无论是放射诊断医师/临床医师普及性还是影像报告的规范性均有明显差距。

结论　高级别神经胶质瘤治疗后的影像学评估标准及报告规范的推广亟待提高、任重道远；影像科重视 RANO 有利于肿瘤疗效评估标准的掌握及诊断报告的规范，有利于影像科与其它学科在 MDT 时的良性互动与协作，推动临床诊断的统一性与标准化，提升影像诊断学的应有地位与影响力。

PU-2133
3D-CE-TOF-MRV 对上矢状窦旁脑膜瘤术前评估的应用价值

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目的　探讨三维对比增强时间飞跃法磁共振静脉成像（three dimensional contrast enhance time of flight magnetic resonance venography，3D-CE-TOF-MRV）技术对上矢状窦旁脑膜瘤术前静脉窦侵犯评估的应用价值。**方法**　回顾性分析经手术治疗的幕上矢状窦旁脑膜瘤患者 26 例，共 26 枚肿瘤，所有患者术前行三维对比增强 MR 静脉血管成像（three dimensional contrast enhance magnetic resonance venography，3D-CE-MRV）及 3D-CE-TOF-MRV 检查。对比观察其在显示肿瘤染色、与上矢状窦关系的差异。以术中所见肿瘤侵犯静脉的程度为标准，计算诊断准确度，并采用配对 χ^2 检验比较 3D-CE-MRV 及 3D-CE-TOF-MRV 在评估肿瘤对上矢状窦侵犯程度的差异

的统计学意义。**结果** 19 枚肿瘤在 3D-CE-MRV 上可见肿瘤染色，26 枚在 3D-CE-TOF-MRV 显示清晰的肿瘤染色。术中见 5 枚肿瘤与上矢状窦分离（0 级），9 枚与窦壁黏连（1 级），9 枚突入窦腔（2 级），3 枚填满窦腔（3 级），3D-CE-MRV 假阴性 1 例，假阳性 8 例，准确度 65%，3D-CE-TOF-MRV 假阴性 2 例，假阳性 1 例，准确度 88%，差异有统计学意义，P=0.021。**结论** 3D-CE-TOF-MRV 技术清晰显示其对相邻静脉窦侵犯程度，在显示肿瘤对上矢状窦侵犯程度方面优于 3D-CE-MRV，可以为脑膜瘤术前评估提供准确的影像信息。

PU-2134

侧脑室异位神经鞘瘤的 MRI 表现及相关病理分析

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目的 探讨侧脑室异位神经鞘瘤的 MRI 表现，并与其病理结果进行对照分析，以提高对该病的认识水平，为患者的诊疗提供依据。**方法** 回顾性分析经手术病理及免疫组织化学染色证实的 2 例侧脑室异位神经鞘瘤，并结合国内外相关文献报道的 25 例患者进行分析。2 例均行 MR 平扫及增强扫描。**结果** 2 例分别为 29 岁及 51 岁的女性；病变均位于右侧侧脑室内，呈囊实性改变，瘤周脑实质可见水肿，增强后实性部分明显强化，囊性部分不强化。病理镜下可见 Antoni A 区和 Antoni B 区；免疫组化:S-100(+)、Vimentin(+)；EMA(-)、GFAP(-)、CK(-)。**结论** 侧脑室异位神经鞘瘤好发于青少年，男性多见，瘤体多位于右侧侧脑室内，囊实性改变、瘤周水肿及局灶性钙化为其特异性表现，结合病理学检查及免疫组化可以对该病进行确诊。

PU-2135

应用受试者工作特征曲线分析多模态 MRI 对原发性中枢神经系统淋巴瘤与胶质母细胞瘤鉴别诊断价值

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目的 探讨多模态 MRI 对原发性中枢神经系统淋巴瘤和胶质母细胞瘤鉴别价值。**方法** 回顾性分析经病理证实 20 例 PCNSL 和 25 例 GBM。患者术前均行扩散加权成像、磁敏感加权成像、动态磁敏感对比增强灌注成像，测肿瘤平均表观弥散系数值、磁敏感信号强度分级、脑血容量平均值比值。用独立样本 t 检验比较两者多模态 MRI 参量差异；用受试工作特性曲线（ROC）评价各参量诊断效能，获最佳阈值、敏感度、特异度、准确度等指标；用 Z 检验比较各参量间 ROC 曲线下面积（AUC）差异。**结果** PCNSL ADC_{mean}平均值（0.64 ±0.09）$\times10^{-3}$ mm^2/s、ITSS 平均值 0.75±0.64 级、$rCBV_{mean}$平均值 1.67±0.77，GBM ADC_{mean}平均值（0.86 ±0.16）$\times10^{-3}$ mm^2/s、ITSS 平均值 2.56±0.58 级、$rCBV_{mean}$平均值 3.53±0.82；各参量均有统计学差异。ROC 示：ADC_{mean}最佳阈值 0.84×10^{-3} mm^2/s，AUC0.902，敏感度 100%，特异度 72%，准确度 72%；ITSS 最佳阈值 1 级，AUC0.967，敏感度 90%，特异度 96%，准确度 86%；$rCBV_{mean}$最佳阈值 2.69，AUC0.942，敏感度 95%，特异度 92%，准确度 87%；ADC_{mean}+ITSS+$rCBV_{mean}$效能最优（AUC0.996，敏感度 100%，特异度 96%，准确度 96%），其 AUC 与 ADC_{mean}（p=0.038）间有差异，与双参量及其他单参量间无差异；双参量 AUC 与单参量相比，仅 ADC_{mean}+ITSS、ITSS+$rCBV_{mean}$与 ADC_{mean}（p=0.037、0.038）间有差异；双

参量间 AUC 无差异。**结论** 基于平扫 DWI 和 SWI 联合对 PCNSL 与 GBM 鉴别能力与多模态 MRI 联合相似，且优于单模态 MRI，有较高临床实践价值。

PU-2136

脑实质间变性室管膜瘤的 MSCT 及 MRI 表现

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目的 探讨总结脑实质间变性室管膜瘤的多层螺旋 CT(MSCT)及 MRI 表现，结合病理结果分析，期待提高对此疾病的诊断水平。
方法 收集经手术病理证实的脑实质间变性室管膜瘤，并同时行 MSCT 平扫及 MRI 的 T1WI、T2WI 及增强检查，分析其形态及信号特点。
结果 本组病人共 11 例，男 10 例，女 1 例，年龄为 3-67 岁，呈两极分布，其中小于 20 岁的病人共 5 个，大于 50 岁的病人共 5 个；肿瘤主要位于幕上，共 10 例，多位于额顶叶；幕下 1 例，累及两侧小脑半球。本组形态分 2 型，囊实性 8 例，实性 3 例。囊实性肿瘤形状多为不规则型，其中囊性部分与实性部分比例差别较大；实性肿瘤主要呈类圆形或分叶状。囊实性肿瘤边界不清或欠清，瘤周水肿较轻；实质性边界较清，多伴有轻或中度瘤周水肿。MSCT 平扫示病灶实性成分主要呈等或稍高密度，CT 值约 31-40Hu，囊性成分呈脑脊液样密度改变，CT 值约 9-16Hu；MRI 扫描示病灶实性成分于 T1WI 呈稍低或低信号，T2WI 呈等或稍高信号，MRI 增强扫描示肿瘤实性部分明显不均匀强化，囊性部分囊壁明显强化，囊内无强化。
结论 脑实质间变性室管膜瘤的 MSCT 及 MRI 表现有一定的特征性，结合病人性别、发病年龄及临床病史，对其诊断及鉴别诊断有较高的临床意义。

PU-2137

Advanced MRI Findings of 2 Anaplastic Papillary Glioneuronal Tumor: One Transform into GBM

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Papillary glioneuronal tumor (PGNT) is generally recognized as Grade Itumor, fewer anaplastic cases showing aggressive clinical course and histological characteristics were reported. In this presentation, we reported 2 anaplastic PGNT cases, one of which eventually transformed into glioblastoma (GBM, WHO IV). The first case was a 47-year-old women who mainly presented with absence seizure. MRI revealed an irregular mass with multiple cyst and mural nodule in left parietal lobe. Histological examination demonstrated an anaplastic PGNT. 19 moths later, she was readmitted and brain MRI demonstrated a mass at the previous surgical site. For the second resection, histology revealed a GBM developing from glial component of the primary tumor. The second case was a 7-year-old boy who admitted to hospital for progressive headache. MRI found a solid with cystic mass in right frontal lobe with markedly peritumoral edema. Postoperative histopathology revealed an anaplastic PGNT with a large area of necrosis.

SeveralMRI findings, such asnotable edema, ring-enhancing cyst wall, restricted diffusion and increased Lip/Lac peak, may predict aggressive nature of anaplastic PGNT. More important, this presentation suggest that anaplastic PGNT could undergo malignant transformation and turn into a more aggressive tumor.

PU-2138
MRI 对腰骶段椎管内黏液乳头型室管膜瘤及神经鞘瘤的鉴别价值

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目的 比较并分析腰骶段椎管内黏液乳头型室管膜瘤(MPEs)和神经鞘瘤(SCHs)的临床资料及影像（MRI）表现，探讨 MRI 对腰骶段椎管内 MPEs 及 SCHs 的鉴别诊断价值，为临床手术方式的选择及预后评估提供更有价值的信息。**方法** 回顾分析本院 2010 年-2018 年发生于腰骶段椎管内经手术病理证实且影像资料及手术记录完整的 5 例粘液乳头型室管膜瘤及 29 例神经鞘瘤的临床资料及影像表现，比较 MPEs 和 SCHs 的临床和影像学差异。**结果** MPEs 与 SCHs 在年龄、肿瘤纵向长度、与脊髓圆锥/马尾神经分界、T2WI 信号均匀性、坏死及囊变、T1WI 及 T2WI 信号强度、T2WI 高信号区域在 T1WI 增强表现特点上的差异具有统计学意义（$P<0.05$）。而肿瘤在性别、形态、轴向位置、边界、出血、强化方式、强化程度及邻近骨质改变情况之间的差异均无统计学意义（$P>0.05$）。**结论** 腰骶段椎管内粘液乳头型室管膜瘤（MPEs）和神经鞘瘤（SCHs）在临床特点及影像学表现上存在一定的差异，MRI 对两种肿瘤的鉴别诊断有较大的价值。

PU-2139
磁共振波谱基于检测 2-羟基戊二酸诊断 IDH1 突变型胶质瘤的临床研究。

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背景：自 2016 年最新的 WHO 胶质瘤诊断标准出现以来，胶质瘤高发病率、复发率、死亡率和低治愈率与 IDH 突变状态显著相关。本研究旨在检测 2-羟基戊二酸评估磁共振波谱（MRS）在预测胶质瘤 IDH 突变状态的诊断性能。
方法 系统搜索 Ovid-MEDLINE，Web of Knowledge 和 Google Scholar 数据库，以获得 2019 年 7 月发表的关于 MRS 鉴别胶质瘤 IDH 基因突变状态的研究。采用 Stata 和 Meta-Disc 分析工具构建汇总灵敏度和特异性，汇总受试者操作曲线（SROC）。进行 Cochran 的 Q-tset 评估研究异质性。发表偏倚分析由 Deeks 的漏斗图评估。
结果 共纳入 9 篇文献，汇总敏感性为 82%（95%CI，75-87%），特异性为 85%（95%CI，80-89%）。汇总的诊断比值比（DOR）和曲线下面积（AUC）分别为 36.3 和 0.92。通过 I2 检验评估中度异质性。基于敏感性分析表明，该研究结果是可靠的。未发现明显发表偏倚（p=0.08）。
结论 总之，目前所有证据均表明 MRS 在预测 IDH 突变型胶质瘤中具有较高特异性和敏感性。长-TE 和多体素技术可显著提高灵敏度和特异性预测 IDH 突变。但是，由于考虑的样本量较小，必须谨慎解释结果。进一步的前瞻性研究有必要验证基于检测 2-羟基戊二酸的 MRS 在预测胶质瘤 IDH 突变状态的临床价值。

PU-2140

颅内脑室外室管膜瘤影像分析

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摘要：目的　探讨颅内脑室外室管膜瘤的 CT 和 MRI 表现，以提高诊断正确率。方法　回顾性分析 19 例经病理证实颅内脑室外室管膜瘤的临床和影像学资料。19 例患者均行 MRI 平扫及增强，其中 8 例时行 CT 扫描，2 例行 DWI、PWI 检查。结果　肿瘤位于幕上脑室周围白质区 13 例，幕下脑室周围 3 例，非脑室周围区 3 例。实性肿瘤 7 例，囊实型 12 例，其中大囊为主型 2 例，大小囊混合型 10 例。肿瘤边界清楚，瘤周水肿与肿瘤体积不对称。肿瘤实质多为等、高密度，T1WI 等/稍低信号，T2WI 稍高/高信号，囊腔 T2Flair 部分呈高信号（5/12）。瘤内钙化多见（7/19），以 WHOⅡ级肿瘤多见。4 例瘤内合并出血，6 例瘤内见流空血管影。DWI 肿瘤实质呈等信号。增强扫描实质型肿瘤不同程度强化，大囊为主型囊壁均有强化，大小囊混合型肿瘤小囊表现为“虫洞”样强化。结论 颅内脑室外室管膜瘤的影像表现具有一定特征性，通过分析其征象有助于提高术前诊断正确率。同时 WHOⅡ级肿瘤更易出现钙化。

PU-2141

颅内原发黑色素瘤的磁共振与病理特征分析

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目的　探索颅内原发黑色素瘤的磁共振表现与病理特征。**方法**　回顾性分析我院 2011 年-2016 年经常规染色及免疫组化诊断的原发颅内黑色素瘤 8 例的磁共振表现与病理特征。**结果**　1、典型黑色素型黑色素瘤表现为短 T1 短 T2 信号，容易诊断；2、非典型黑色素瘤可出现以下特征，之前文献较少报道：①病灶周边及病灶内的短 T2 信号，②囊变坏死，③临近脑膜强化。**结论**　1、典型黑色素性黑色素瘤磁共振表现具有特征性；2、病灶周边及病灶内的短 T2 信号、囊变坏死、临近脑膜强化等征象有助于非典型黑色素瘤的诊断。

PU-2142

IVIM-DWI 在胶质瘤病理分级诊断及预测 IDH-1、Ki-67LI 表达的应用研究

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目的　探究 IVIM 在术前胶质瘤病理分级及预测胶质瘤 IDH1 及 Ki-67LI 表达的价值。**方法**　收集本院经病理证实的中枢神经系统胶质瘤 30 例，低级别组 13 例，高级别组 17 例。统计学方法采用独立样本 t 检验及 Mann-Whitney U 非参数秩和检验。不同级别胶质瘤 IDH-1 表达状态的差异性采用 Fisher 的精确检验；Ki-67LI 与 D 值，f 值及 D*值的相关性运用双变量 Spearson 相关分析。各个参数的诊断效能运用受试者特性曲线（ROC）进行评价。

结果 D、D*及 f 值两次测量的一致性均较强（ICC＞0.80）。D、D*及 f 值在高低级别胶质瘤组间差异性具有统计学意义（p＜0.05）。高低级别胶质瘤组间 IDH-1 的表达状态的差异性具有统计学差异（P＜0.05）。D、D*值在 IDH-1 不同表达状态时差异性具有统计学意义（P＜0.05），f 值在 IDH-1 不同表达状态时差异不具统计学意义（P＞0.05）。IVIM 的参数 D 值与 Ki-67LI 呈负相关，相关系数为-0.659，p＜0.01；D*及 f 值均与 Ki-67LI 呈正相关（p＜0.01），且 f 值相关系数较 D*值大。

结论 IVIM 诸参数 D、D*及 f 值在高低级别胶质瘤间的差异性有统计学意义，三者均具有很好的鉴别诊断效能，可用于术前胶质瘤的病理分级的定量鉴别诊断。IVIM 的 D、D*值在 IDH-1 不同表达状态时差异性具有统计学意义，两者鉴别诊断效能相类似，均能通过鉴别 IDH-1 不同表达状态，提示肿瘤的预后，而 f 值不具备这方面的价值。IVIM 的 D 值与 KI-67LI 呈中度负相关，D*及 f 值与 KI-67LI 呈中度正相关，可间接反映肿瘤细胞增殖活性，进而定量评估其预后。

PU-2143

胶质母细胞瘤 MRI 环形强化特征评价 IDH1 突变型和野生型的价值

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目的 讨论胶质母细胞瘤 MRI 环形强化特征在评价 IDH1 突变型和 IDH1 野生型的价值。

方法 回顾性分析我院 2013 年 2 月至 2018 年 4 月期间 46 例经手术证实为胶质母细胞瘤的患者 MRI 影像资料，所有患者均行 1.5T 或 3.0T 场强磁共振常规 T1WI、T2WI、Flair、DWI、SWI 及增强扫描。观察患者性别、年龄、环形强化、环形强化病灶张力、环形强化内壁是否光整、卫星灶、病灶内囊性变、壁结节、出血、肿瘤周围水肿。病例按 IDH1 突变型、IDH1 野生型分成两组，分别统计各组各征象中征象的出现频数、出现率。连续变量采用 t 检验，分类变量采用 χ^2 检验及 Fisher 确切概率法。

结果 46 例胶质母细胞瘤患者中 IDH1 突变型 9 例、IDH1 野生型 37 例。IDH1 突型、野生型平均年龄，两组间无显著统计学差异。9 例 IDH1 突变型病例中 6 例出现环形强化，3 例未形成环形强化；37 例 IDH1 野生型病例中有 35 例出现环形强化，2 例未见环形强化。环形强化（P=0.044）在 IDH1 野生型、IDH1 突变型两组间有统计学差异。另对比两组病例中其余 7 个 MRI 征象，仅肿瘤周围水肿（P=0.047）在两组间有统计学差异，其余 MRI 征象包括环形强化病灶张力（P=0.224）、环形强化内壁是否光整（P=0.161）、卫星灶（P=0.262）、病灶内囊性变（P=0.609）、壁结节（P=0.248）、出血（P=0.609）,在 IDH1 突变型及 IDH1 野生型之间没有统计学差异。

结论 胶质母细胞瘤 IDH1 野生型比 IDH1 突变型在 MRI 增强扫描中更容易出现环形强化，但环形强化病灶的张力、内壁光整度两组之间没有差异。IDH1 野生型患者较 IDH1 突变型患者更容易出现肿瘤周围水肿，但水肿程度无差异。胶质母细胞瘤的 IDH1 突
变与否在常规 MRI 上有一定影像特征。

PU-2144

原发中枢神经系统淋巴瘤不典型影像表现

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目的 探讨颅内原发淋巴瘤的不典型影像表现，提高术前正确诊断率。资料与**方法** 回顾性分析术前误诊最后经病理证实 12 例淋巴瘤的临床和影像表现，总结影像表现及分析误诊原因。女 5 例，男 7 例，年龄范围为 43-71 岁，平均年龄 543 岁。**结果** 单发 5 例，幕上 4 例，幕下 1 例。多发 7 例，累及幕上 4 例，幕上和幕下 2 例，其中 1 例累及颅内和脊髓。所有病例共 29 个病灶，幕上多见，共 21 个病灶，基底节、丘脑和胼胝体多见，其次为额叶。发生于幕下共 7 个病灶，小脑多见，其次为脑桥。脊髓 1 个病灶。MRI 表现：信号均匀 17 个病灶，混杂信号 12 个病灶。T1WI 序列上，低信号为主 17 个病灶；等信号为主 11 个病灶；高信号 1 个病灶。T2WI 序列上，高信号为主 16 个病灶；等信号为主 12 个病灶；低信号为主 1 个病灶。不均匀强化 7 个病灶，实性部分均明显均匀强化；斑片状或线状明显强化 5 个病灶；轻度强化 5 个病灶。出血 9 例，共 12 个病灶，斑片状出血多见 9 个病灶，点状和线状出血 3 个病灶。**结论** 误诊原因主要包括多发病灶，累及幕下和脊髓，信号表现不典型、多种强化方式（如轻度或无强化，不均匀强化）和瘤内出血，结合年龄、实验室检查和影像表现综合诊断。

PU-2145
单指数、双指数、拉伸指数扩散加权成像在鉴别胶质母细胞瘤术后复发及假性进展中的价值

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探讨单指数、双指数及拉伸指数扩散加权成像在胶质瘤术后复发及假性进展中的鉴别价值。 方法 本组研究纳入 38 例经病理证实为胶质母细胞瘤行术后同步放化疗的患者，所有患者均磁共振平扫、增强及体素内不相干运动扩散加权成像。分别测量胶质瘤术后复发及假性进展组病灶的单指数模型、双指数模型及拉伸指数模型参数，包括表观弥散系数，真扩散系数，伪弥散系数， 灌注分数， α 值，分布扩散系数，采用组内相关系数(intraclass correlation coefficient，ICC) 评价两名医师测量结果之间的一致性，采用两独立样本 t 检验比较胶质瘤术后复发及假性进展两组之间的差异，采用受试者工作特征(receiver operating characteristic，ROC)曲线分析各参数评估胶质瘤术后复发及假性进展两组间的诊断效能。 结果 胶质瘤术后复发组的 ADC、D、DDC、α 值小于胶质瘤假性进展组（t=6.271, t= 5.761, t=2.219, t=8.007, P< 0.05）；胶质瘤术后复发组的 D*、f 值大于胶质瘤假性进展组，差异有统计学意义（t=4.034, t= 2.947, P< 0.05）。胶质瘤患者 ADC、D、D*、f、DDC、α 判断术后复发及假性进展的 ROC 曲线下面积分别为 0.908、0.925、0.804、0.743、0.901、0.961。 结论 单指数、双指数及拉伸指数模型扩散加权成像能够较好的反应肿瘤的扩散、灌注及微观结构信息，对于鉴别胶质瘤术后复发及假性进展具有重要的应用价值

PU-2146
脑室外中枢神经细胞瘤的 CT 及 MRI 表现与病理分析

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目的 探讨总结脑室外中枢神经细胞瘤（extraventricular neurocytoma，EVN）的 CT 及 MRI 影像学表现及病理学特征。**方法** 搜集经手术病理证实的 12 例 EVN，6 例行 MRI 平扫及增强检查，2 例行 CT 平扫及增强检查，4 例同时行 MRI 和 CT 平扫及增强检查，回顾性分析其 CT 及 MRI 表现及病理学特征。**结果** 12 例均为单发病灶。位于额颞叶 10 例，其中 7 例位于左侧。实质肿块型 6 例，囊-实性 2 例，囊性 3 例。3 例伴有出血，2 例伴有钙化灶。CT 平扫呈等或稍低密度。MRI 平扫，实

性部分 T1WI 呈低或稍低信号，T2WI 呈等或稍高或高信号。增强扫描，8 例肿瘤实性部分不均匀强化，1 例囊壁中度花环型强化，1 例钙化灶临近脑膜强化，2 例未见明显强化。病理检查，3 例镜下组织切片发现钙化灶。免疫组织化学检查中 NeuN 全部阳性，SYN 阳性或强阳性 11 例，GFAP 阳性 5 例，4 例复发病例中有 3 例 Ki-67 标记指数≥2%。**结论** EVN 少见，影像表现缺乏特异性，位于额颞叶的单发实质肿块或多发囊变的囊实性占位应将该病列入鉴别诊断范围。Ki-67 标记指数≥2%的患者应定期复查 MRI 监测肿瘤复发。

PU-2147
体素内不相干运动成像（IVIM）监测脑胶质瘤复发和治疗后反应的初步探讨

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目的 探讨磁共振体素内不相干运动成像（intravoxel incoherent motion, IVIM）在监测脑胶质瘤复发和治疗后反应中的应用价值。**材料和方法** 26 例脑胶质瘤患者（15 例脑胶质瘤复发，11 例治疗后反应）在同步放化疗结束 2 月内行头部常规 MRI 扫描、增强扫描及多 b 值弥散加权扫描，通过 IVIM 软件的双指数模型，对图像后处理得到 standard ADC、slow ADC（D）、fast ADC（D^*）、fraction of fast ADC（f）的伪彩图，分别测量病例异常强化区 standard ADC 值、D 值、D^*值、f 值。采用两样本 t 检验比较两组各参数值是否存在差异，受试者工作特性曲线（ROC）评估各参数值在脑胶质瘤复发和治疗后反应鉴别诊断的效能。**结果** 复发组的强化病灶 standard ADC 值、D 值低于治疗后反应组，差异有统计学意义（$P<0.05$）。ROC 曲线分析，当 standard ADC 值、D 值曲线下面积分别为 0.703、0.788 时，其阈值分别为 1.166、0.631，敏感性分别为 54.5%、81.8%，特异性分别为 86.7%、73.3%；复发组的强化病灶 D^*值、f 值均高于治疗后反应组，差异有统计学意义（$P<0.05$）。ROC 曲线分析，当 D^*值、f 值曲线下面积分别为 0.752、0.758 时，诊断阈值分别为 2.642、0.693，敏感性分别为 66.7%、81.8%，特异性分别为 81.8%、66.7%。**结论** IVIM 可以监测脑胶质瘤复发和治疗后反应，为脑胶质瘤患者在临床的进一步治疗提供影像依据。

PU-2148
磁共振功能成像评估脑胶质瘤复发与治疗后反应的研究进展

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【摘要】 目前，脑胶质瘤术后患者的监测任务主要依靠其临床表现和磁共振的长期随访。但由于肿瘤复发和治疗后反应均可导致血脑屏障破坏，因此常规 MRI 增强扫描时可在术区及放疗照射野内出现新的强化病灶，常规磁共振表现难以对二者进行准确监测。但随着磁共振技术的发展，应用磁共振功能成像的方法对其进行研究的报道越来越多。扩散加权成像、扩散张量成像、体素内不相干运动成像、磁共振波谱成像、磁共振灌注成像[动态磁敏感对比增强 MRI、动态对比增强 MR 成像]在两者鉴别诊断中各具优势和限度，本文对近年有关影像学监测胶质瘤术后的新进展进行综述。

PU-2149
小脑半球单发原发性中枢神经系统淋巴瘤的 MRI 表现

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目的 探讨小脑半球单发原发性中枢神经系统淋巴瘤（PCNSL）的 MRI 表现。**方法** 回顾性总结我院 2009 年 5 月至 2019 年 4 月 20 例经手术病理证实的位于小脑半球单发 PCNSL 患者的影像资料，全部患者均行常规 MRI 平扫、增强扫描及 DWI 检查。**结果** 左侧小脑半球 15 例，右侧 5 例。17 例位于小脑深部白质中线部位，3 例位于小脑半球皮层。T_1WI 像上 3 例呈等信号，17 例呈稍低信号。T_2WI 像上 6 例呈等信号，14 例呈稍高信号。FLAIR 序列上 14 例呈等信号，5 例为稍高信号，1 例呈低信号。10 例中度水肿，8 例轻度水肿，2 例重度水肿。DWI 图上 14 例呈高信号，ADC 图上呈低信号；5 例呈等信号，ADC 图上呈等信号；1 例呈低信号，ADC 图上呈等信号。DWI 与增强对照，测得肿瘤实性部分的平均 ADC 值为（ 0.643±0.20 ）$\times 10^{-3}mm^2/s$。8 例呈“棘”征，5 例“缺口”征，4 例“条纹”征，2 例“脐凹征”,1 例圆形强化。所有病例中，9 例形态不规则的强化病变边缘可见“脑叶征”。**结论** 小脑半球单发 PCNSL 的 MRI 表现具有一定特征性，术前正确诊断对指导临床治疗方案具有一定参考意义。

PU-2150
椎管内占位性病变的 MRI 特点及其鉴别诊断

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目的

探讨椎管内占位性病变的 MRI 特点及其鉴别诊断。

方法

回顾性分析经病理证实的 207 例椎管内原发肿瘤性占位病变的 MRI 表现，191 例行 MRI 常规平扫加增强扫描，16 例仅行平扫扫描。病理上属神经鞘瘤 114 例，有两例神经鞘瘤患者其中一例同时患有血管脂肪瘤，另一例同时患有脊膜瘤，脊膜瘤 31 例，室管膜瘤 17 例，神经纤维瘤 3 例，副神经节瘤 3 例，节细胞性神经瘤 2 例，血管瘤 8 例，其中一例为海绵状血管瘤+毛细血管瘤，动静脉血管瘤 2 例，毛细血管瘤 2 例，动静脉血管畸形 3 例，血管脂肪瘤 3 例，脂肪瘤 2 例，血管母细胞瘤 4 例，星形胶质细胞瘤 2 例，畸胎瘤 3 例，蛛网膜囊肿 2 例，表皮样囊肿 2 例，腱鞘囊肿 1 例，陈旧性血肿 1 例，孤立性纤维性肿瘤（血管外皮瘤）1 例，脂肪纤维血管瘤样增生 1 例。

结果

MRI 检查**结果** 肿瘤部位：髓内肿瘤 25 例，髓外硬膜下肿瘤 150 例，硬膜外肿瘤 29 例。2 例硬膜外与硬膜下均受累且通过椎间孔到达椎旁，2 例椎管内外均有累及；MRI 诊断符合率 80%（167 / 207）；不同肿瘤在发病年龄、性别、形态、发病位置、累及范围、信号特点及脊髓的变化等有各自的特点。

结论

MRI 可反应不同椎管肿瘤的病理特点，据此特点可进行鉴别诊断。

PU-2151
Value of susceptibility-weighted imaging in assessing WHO grade for brain astrocytomas

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Purpose—To assess the value of combining susceptibility-weighted imaging (SWI) and dynamic susceptibility-weighted contrast-enhanced (DSC) perfusion-weighted magnetic resonance imaging (PWI) in assessing World Health Organization (WHO) grade for brain astrocytoma.
Materials and Methods—A total of 94 patients with pathologically-confirmed astrocytomas underwent SWI and DSC scans. The evaluation included intratumoral susceptibility signal intensity (ITSS) and relative cerebral blood volume (rCBV) max. The receiver operating characteristic curve (ROC) was used to assess the efficacy of combining two sequences in astrocytoma grading.
Results—ITSS within astrocytomas showed significant correlations with rCBV max (r =0.72, P <0.01) and with tumor grades (r = 0.92, P <0.01), and there was also a significant correlation between rCBV and tumor grade (r=0.77, P<0.001). The area under the ROC, SWI, PWI, SWI and PWI, in differentiation of the grades II and III astrocytomas were 0.995, 0.942 and 1.000, respectively; identifying grades III and IV were 0.773, 0.919 and 0.978, respectively; and identifying high and low-grade astrocytomas were 0.999, 0.992, 1.000, respectively.
Conclusion—ITSS was useful for assessing the WHO tumor grade in this cohort of patients with astrocytoma. The combination of SWI and PWI may improve the diagnostic accuracy of astrocytoma grading.

PU-2152

肥胖细胞型星形细胞瘤的 MRI 表现探讨

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目的 初步探讨肥胖细胞型星形细胞瘤(Gemistocytic Astrocytoma,Gem A)的 MRI 表现及功能成像特点,以提高对该病的认识及诊断水平。
方法 回顾性分析 2010 年 10 月~2015 年 12 月经手术及病理证实的 13 例 Gem A 患者的临床及影像资料,所有患者均行 MRI 平扫、增强,其中 9 例加扫磁共振波普(Magnetic Resonance Spectroscopy,MRS)、弥散张量成像(Diffusion Tensor Imaging,DTI)、动脉自旋标记技术(Arterial Spin Labeling,ASL)及灌注加权成像(Perfusion Weighted Imaging,PWI)成像,1 例加扫磁敏感加权成像(Susceptibility Weighted Imaging,SWI)序列,分析总结其 MRI 影像特征。
结果 13 例患者均为单发病灶,且均发生于幕上,其中发生于额叶 10 例,颞叶 2 例,顶叶 1 例;8 例病灶局限于单脑叶,5 例累及多个脑叶,并通过胼胝体侵犯对侧脑组织;边界不清 8 例,边界清楚 5 例;肿瘤内部有大小不等囊变成分 7 例。肿瘤的实性成分在 T1WI 呈稍低信号,T2WI 呈稍高信号,DWI 呈稍高信号,增强后肿瘤实性成分多呈中度及以上不均匀强化;MRS 表现为 Cho 峰升高,NAA 峰减低,Cr 峰基本稳定;ASL 及使用 PWI 均呈低灌注,DTI 显示患侧大脑皮质纤维束明显较对侧稀疏。
结论 Gem A 的 MRI 表现为幕上单发,额叶多见,多边界不清且内部常伴囊变,并累及胼胝体侵犯对侧脑叶,增强扫描肿块实性成分多中度及以上不均匀强化,结合 MRS、DTI、ASL、SWI 及 PWI,可对本病提供诊断帮助。

PU-2153
胚胎发育不良性神经上皮瘤的影像诊断及鉴别诊断

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目的 分析颅内胚胎发育不良性神经上皮瘤的影像表现及病理特点,提高对该类肿瘤诊断的准确性。方法 回顾性分析经手术病理证实的胚胎发育不良性神经上皮肿瘤 11 例,3 例行 CT 检查,其中 2 例行 CT 和 MR 检查,10 例行 MR 检查,其中 7 例行增强扫描,5 例加扫波普检查,3 例行 PET 检查。结果 本组均为单发病灶,位于幕上 10 例(颞叶 3 例,顶叶 1 例,额叶 3 例,岛叶 1 例、枕叶 2 例),小脑半球 1 例。11 例位于皮层或皮层下,形态呈脑回状 5 例、楔形 4 例、不规则状 2 例。CT 表现:2 例呈低密度,1 例呈混杂高密度,其中 2 例临近颅骨内板呈稍受压变薄改变。病理组织学分型:复杂型 5 例(其中 4 例见厚薄均匀的线样分隔征,3 例合并壁内结节),简单型 6 例(其中 2 例见厚薄均匀的线样分隔征)。8 例呈囊样改变,T1WI 呈低信号、T2WI 呈高信号,2 例 T1WI 呈混杂低信号,T2WI 呈混杂高信号,FLAIR 8 例病灶周围呈环状高信号,2 例呈等低信号。DWI8 例均呈等低信号,2 例呈等稍高信号,增强扫描大部分病灶无强化,壁结节呈轻度强化。2 例病灶内部可见散在小点状强化。9 例周围均无水肿,2 例周围可见片状水肿带。5 例波普均表现为胆碱(Cho)峰较对侧正常脑组织轻度升高,N-乙酰天门冬氨酸(NAA 峰)未见明显降低,3 例行 PET 检查呈低代谢。
结论 胚胎发育不良性神经上皮瘤影像学表现具有一定的特征性,运用多模态影像检查方法,可以提高诊断准确性。

PU-2154
非典型脑膜瘤的 MRI 表现及鉴别诊断

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目的 分析非典型脑膜瘤的 MRI 表现,提高其诊断及鉴别诊断的准确性。方法 回顾性分析经手术病理证实的非典型脑膜瘤 19 例,并与胶质母细胞瘤 20 例、脑内单发转移瘤 13 例进行比较。全部病例均行 MR 常规和扩散加权成像(Diffusion Weighted Imaging,DWI)检查,其中 7 例脑膜瘤、9 例脑内单发转移瘤和 16 例胶质母细胞瘤行磁共振氢质子波谱(H1-Magnetic Resonance Spectroscopy,H1-MRS)检查。结果 非典型脑膜瘤瘤周多为轻度水肿,边缘模糊;实性部分多为全瘤性强化,其强化程度较其他二者明显,瘤内囊型囊壁均强化,瘤周囊型部分囊壁强化。DWI 示:三者间在肿瘤实质区和水肿区 ADC 值均无统计学差异,但胶质母细胞瘤与转移瘤的水肿区 ADC 值有统计学差异(P=0.021);MRS 示:三者 Cho 峰均明显升高,NAA 峰均明显降低,脑膜瘤未见明显 NAA 峰,且 lip 峰和 lac 峰出现的几率明显小于其他二者。结论 非典型脑膜瘤 MRI 表现多样,但仍具有一定特征性,运用多模态影像检查方法有助于提高诊断的准确性。

PU-2155
神经上皮肿瘤放射性损伤的磁共振波谱研究

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目的 讨神经上皮肿瘤患者放疗后脑放射性损伤的磁共振波谱特点。方法 收集临床确诊的神经上皮肿瘤放疗后脑放射性损伤患者 20 例，另外收集原发神经上皮肿瘤 20 例，所有患者均在 3.0T 磁共振传统平扫及增强的基础上行磁共振多体素氢质子波谱分析扫描。分别以病灶强化区、水肿区及正常对照区为感兴趣区，测量各感兴趣区 Cho / Cr、NAA / Cr、Cho 刷 AA 的比值。以独立样本 f 检验比较原发神经上皮肿瘤和放射性损伤病灶的强化区、水肿区 cho / Cr、NA/Cr、cho/NAA 的比值，以 $p<0.05$ 为差异有显著统计学意义。结果 原发神经上皮肿瘤病灶的强化区与水肿区 cho / Cr 比值分别为(3.50±1.10)和(1.95±0.66)；其 cho / NAA 比值分别为(4.42±1.98)和(2.14±1.11)。放射性损伤病灶的强化区与水肿区 Cho / Cr 比值分别为(1.80±0.21)和(1.20±0.26)；其 cho 小 AA 比值分别为(1.69±0.37)和(0.84±0.24)。NAA/Cr 比值差异无统计学意义($p>0.05$)。结论 原发神经上皮肿瘤病灶的强化区与水肿区 Cho / Cr、Cho/NAA 比值与放射性损伤有明显差异，可作为诊断依据。

PU-2156

中枢神经细胞瘤影像学表现及病理分析

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目的 探讨中枢神经细胞瘤(CNC)的影像及病理表现,以提高其诊断准确率。
方法 回顾性分析 11 例经手术病理证实的 CNC 患者的临床、影像资料及病理表现。
结果 11 例行 MRI 检查,4 例行 CT 平扫。10 例肿瘤位于侧脑室,邻近 Monro 孔,与透明隔宽基底相连。CT 及 MRI 上肿瘤为囊实性,呈"海绵征"或"皂泡征";CT 上 3 例病灶内见不同程度钙化;9 例病灶边缘与侧脑室壁之间见多发实性条索影;增强 8 例呈轻-中度强化,3 例呈不均匀明显强化,7 例病灶内部及周边见强化血管影。10 例均伴有不同程度侧脑室积水。另 1 例位于左侧额颞叶。
结论 中枢神经细胞瘤临床、影像及病理学表现有一定特征性,结合发病年龄及典型特点,有助于与其它脑室内肿瘤鉴别。

PU-2157

传统 MRI 结合 DWI 在颅内 WHOII 级和 WHOIII 级孤立性纤维瘤/血管外皮细胞瘤中的诊断价值

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目的 探讨 WHOII 级和 WHOIII 级孤立性纤维瘤/血管外皮细胞瘤（SFT/HPC）的 MRI 和 DWI 影像学特征。
材料和方法 回顾性分析经病理证实的 WHOII 级 SFT/HPC 27 例和 WHOIII 级 SFT/HPC31 例，所有病例术前均行传统 MRI 和 DWI 检查。所有病灶在肿瘤实体测量最大 ADC 值（ADCmax），平均 ADC 值（ADCmean）和最小 ADC 值（ADCmin）。统计学方法使用卡方检验和秩和检验。
结果 肿瘤的形态（c^2=13.445）、“硬膜尾征”（c^2=10.6925）、囊变、坏死（c^2=9.810）、强化特点（c^2=13.726）、明显瘤周水肿（c^2=13.464）和骨质破坏（c^2=8.086）在 WHOII 级和 WHOIII 级 SFT/HPC 中具有明显统计学意义，P 值<0.001；DWI 信号（c^2=3.279）具有统计学意义，P 值<0.05。在 WHOII 级和 WHOIII 级 SFT/HPC 中平均 ADCmax（ADCmean and ADCmin）分别为 1.232±0.357 × 10^{-3} mm^2/s 和 0.744±0.222 × 10^{-3} mm^2/s (1.102±0.274 × 10^{-3} mm^2/s 和

0.703±0.203 × 10^{-3} mm^2/s, 0.975±0.192 × 10^{-3} mm^2/s 和 0.664±0.191 × 10^{-3} mm^2/s)，P 值均<0.001.
WHOIII 级 SFT/HPC 平均 ADCmax、ADCmean 和 ADCmin 值低于 WHOII 级 SFT/HPC。
结论 WHOII 级和 WHOIII 级 SFT/HPC 影像学表现有重叠，鉴别困难，传统 MRI 结合 DWI 有助于这两种肿瘤的鉴别诊断。

PU-2158

横纹肌样脑膜瘤 MRI 表现并文献复习

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目的 :探讨横纹肌样脑膜瘤的 MRI 表现与病理特点的相关性,结合文献报道提高对本病的影像诊断水平,减少漏诊及误诊。
方法:回顾性分析本院经手术病理证实的 2 例横纹肌样脑膜瘤患者的临床及 MRI 影像资料,并结合相关文献报道 9 例。
结果:本组病例女 7 例,男 4 例,均为单发,7 例囊实性,4 例实性,实性部分 T1WI 主要呈等信号,T2WI 主要呈稍高信号,囊性部分 T1WI 主要呈低信号,T2WI 主要呈高信号,增强扫描 2 例均匀强化,9 例不均匀强化,内有坏死囊变区,6 例有"脑膜尾征",5 例瘤周可见迂曲血管且肿瘤内可见流空信号,6 例瘤周见明显水肿区。病理显示肿瘤绝大部分由横纹肌母细胞样瘤细胞构成。瘤组织内常出现坏死、出血、血管增生。
结论:横纹肌样脑膜瘤 MRI 表现为实性或囊实性,特征是肿瘤内或瘤周可见低信号流空影及瘤周可见不同程度的水肿,但因其缺乏特异性,最终确诊还需依赖病理学检查。

PU-2159

常规 MRI 特征在预测低级别胶质瘤 1p/19q 缺失状态的应用价值

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目的 探讨应用常规 MRI 特征在预测低级别胶质瘤 1p/19q 缺失状态的价值。**资料与方法** 回顾性分析经手术和病理证实的 64 例低级别胶质瘤（WHOII、III 级）患者（31 例 IDH 突变伴 1p/19q 非联合缺失，33 例 IDH 突变伴 1p/19q 联合缺失）的常规 MR 图像资料。由两名不知道病理结果的中枢影像医师独立依据 VASARI 特征集的标准进行影像学特征的提取。运用 Kappa 检验评价 2 名医生对影像学特征评分结果的一致性。应用卡方检验或 Fisher 精确检验评价两组胶质瘤影像学特征的统计学差异。运用 Logistic 回归分析及受试者工作特性（ROC）曲线分析评价影像学特征对于预测低级别胶质瘤 1p/19q 缺失状态的诊断效能。**结果** 两名放射科医师对影像学特征评分的一致性较好（Kappa 值范围 0.718-1.000）。增强比例、T2/FLAIR 不匹配比例对于 1p/19q 缺失状态的预测具有统计学意义（P＜0.05），其中＞50%T2/FLAIR 不匹配比例对于预测 1p/19q 非联合缺失胶质瘤诊断效能最高（AUC=0.884，敏感性、特异性、阳性预测值、阴性预测值分别为 74.19%、100.0%、100%、80.51%）。**结论** 术前常规 MRI 特征可以用于非侵入性的预测低级别胶质瘤 1p/19q 缺失状态。

PU-2160
MR 成像中胶质母细胞瘤的表面形态对患者的生存期和手术疗效的预测价值

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目的 评价治疗前增强容积 T1 加权 MRI 上胶质母细胞瘤肿瘤表面形态对胶质母细胞瘤病人预后的预测价值。

方法 收集本院 2016-2018 年间经病理证实的胶质母细胞瘤患者共 59 例，其中女性占 43%，中位年龄为 65 岁。获取预处理容积 T1 加权 MR 成像序列和相关临床变量：年龄，切除类型，治疗方案和最后一次随访的生存信息。进行肿瘤分割和图像处理，计算每个患者和分割的总体积、表面特征和表面规则程度，之后计算几个几何测量值与 GBM 的存活相关的**结果** 总体积，CE 体积，坏死体积，CE 边缘宽度和 CE 边缘几何异质性。Kaplan-Meier 分析用于确定与预后相关的参数，使用 log-rank 和 Breslow 检验来评估结果的显著性。

结果 表面规律性是 GBM 患者术后生存和结局反应的独立预测因子（P =0 .005，风险比[HR] = 1.48）。年龄（P<0.001，HR = 2.554）和边缘宽度（P=0.006，HR = 2.372）对采用表面规则性分类的患者亚组之间的治疗差异有统计学意义。表面规则肿瘤确实从完全切除中获益（P=0.004，HR=2.071），而表面不规则肿瘤则没有（P=0.572，HR=1.169）。

结论 患有常规肿瘤的患者从完全切除中获得了实质性益处。 然而，不规则肿瘤的预后可能较少依赖于切除的程度。 因此，表面规则性可以与其他标准整合，作为患者通过广泛切除的潜在益处的成像生物标志物。

PU-2161
多序列 MRI 影像组学特征在胶质瘤分级的应用

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目的 比较基于多序列 MRI（T2WI-FLAIR、T1WI-CE 和 ADC 图）的影像组学特征在胶质瘤分级的能力，并通过联合多个特征来提高胶质瘤分级能力。
方法 经病理证实 66 例胶质瘤患者均行 T2-FLAIR，T1WI-CE 和 DWI 扫描。使用内部软件对三个 MRI 序列图像处理，共获得 114 个 影像组学特征。比较低级别（LGGs）和高级别胶质瘤（HGGs）各序列的所有影像组学特征值。对有显著统计学差异的特征进行接受者操作特性曲线分析，以判定鉴别 LGGs 和 HGGs 的能力。通过联合所有显著差异的特征，来确定联合特征的分类效能是否可以进一步得到提升。每个 MRI 序列中有差异的影像组学特征分别与胶质原纤维酸性蛋白（Glial Fibrillary Acidic Protein，GFAP）的表达进行 Pearson 相关性分析。
结果 FLAIR 序列 2 特征，T1-CE 序列 3 个特征，ADC 图 13 特征在 LGGs 和 HGGs 间有显 著统计学差异（P <0.05）。 FLAIR_GLCM_Cluster_Shade（ROC 曲线下面积[area under the ROC curve，AUC] = 0.838），T1-CE_GLCM_Entropy（AUC = 0.936），ADC_GLCM_Homogeneity（AUC = 0.905）分别在各 MRI 序列中具有较高地鉴别 LGGs 和 HGGs 的效能。联合特征在鉴别 LGGs 和 HGGs 具有最高的 AUC（AUC = 0.943）值，鉴别 LGGs 和 HGGs 的能力最高。GFAP 和 T1-CE_GLCM_Entropy 间呈显著负相关性，GFAP 和 ADC_GLCM_Homogeneity 呈正相关。

结论 多个 MRI 序列的特征具有鉴别 HGGs 和 LGGs 的潜力，同时通过联合多个影像组学特征可以提高胶质瘤分级准确性。

PU-2162

增强 BTFE 序列在垂体大腺瘤质地评估中的应用

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目的

大多数垂体大腺瘤的质地较软，可通过经蝶窦途径进行吸除和刮除。然而，有 5%-15％的腺瘤是坚硬和纤维状的，导致经蝶窦途径切除困难。垂体大腺瘤术前需要明确肿瘤的边界、周围结构关系及肿瘤本身的特性，基于此，术前评估肿瘤的一致性对于手术非常重要。本研究旨在应用增强 BTFE（平衡式自由稳态进动）序列评估垂体大腺瘤质地的临床价值。

方法

本研究纳入垂体占位患者 30 例（平均年龄：46.7±18.1 岁，年龄范围：25-60 岁），术后经病理证实均为垂体大腺瘤。术前使用飞利浦 Ingenia 3.0T MRI 扫描仪分布获取增强 BTFE、T2WI 和增强 T1WI 图像，所有的图像由三位经验丰富的神经放射学家根据影像特征评估垂体质地，所有的垂体大腺瘤在术中被神经外科医生分类为质软或质硬型。通过使用 Fisher 精确检验比较两组肿瘤质地类型的差异。

结果

通过术中分类，20 例肿瘤是质软型，10 例肿瘤是质硬型。影像结果表明，在 CE-BTFE 图像中，质硬型肿瘤信号均匀，肿瘤内部没有分布斑点状高信号，而质软型肿瘤信号混杂，肿瘤内部可见多个或弥漫性分布的斑点状高信号。统计结果表明肿瘤质地和 CE-BTFE 影像特征之间存在显著相关性（P ＜0.05），而肿瘤质地与 T2WI 以及 CE-T1WI 影像特征之间无显著相关性（P＞ 0.05）。

结论

增强 BTFE 序列可以有效评估垂体大腺瘤的质地类型，从而为手术方法的选择提供有效参考。

PU-2163

颅内原发性胶质肉瘤 MRI 表现及诊断价值

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目的 总结颅内原发胶质肉瘤的 MRI 影像表现，分析 MRI 对该肿瘤的诊断价值，并复习相关文献。**方法**，回顾性分析经病理证实的 25 例胶质肉瘤临床资料及 MRI 表现。**结果** 25 例患者中，男性 15 例，女性 10 例，年龄 15～71 岁（平均 46.4 岁）。24 例均位于幕上，1 例位于脑干-右侧桥臂，肿瘤边界清楚，80%肿瘤伴有明显囊变坏死以及不同程度的瘤周水肿，增强扫描均呈明显不均匀强化，20 例呈不规则厚壁环状或花环状强化，14 例内部可见栅栏样的条状不规则强化。**结论** 胶质肉瘤 MRI 表现具有一定特点，结合病人病史和年龄有助于与颅内常见肿瘤的鉴别。

PU-2164

节细胞神经瘤的影像学诊断

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【摘要】 **目的** 通过分析节细胞神经瘤的影像学表现，提高对该病诊断的准确性。 **方法** 回顾性分析 15 例经手术病理证实的节细胞神经瘤，包括病灶部位、形态、密度、边界、强化及与周围结构关系等影像学特点。结果:15 例肿瘤中，5 例位于肾上腺，3 例位于纵隔，2 例位于胸腔，2 例位于腹膜后间隙，1 例位于颈椎间孔，1 例位于腰椎间孔， 1 例位于盆腔；肿瘤边界大部分清楚，呈类圆形、梭形或不规则形，不规则形肿块多沿周围脏器呈嵌入性生长。15 例 CT 平扫表现为低或等密度，低于或等于肌肉密度，1 例病灶内见多发斑点状、结节状钙化，4 例见散在点状、小条状钙化，2 例见少许脂肪密度影，1 例伴有出血；其中 5 例 MR 扫描表现为 T1WI 呈等或低信号，T2WI 呈中高混杂信号；1 例 PET/CT 扫描表现为代谢轻微增高；14 例行增强扫描，7 例呈条片状或片絮状不均匀轻中度进行性强化，5 例各期扫描均无明显强化，2 例呈不均匀明显强化。结论:节细胞神经瘤的 CT 和 MRI 表现有一定的特征，正确认识其影像表现，有助于其诊断和鉴别诊断。

PU-2165

探讨动态磁敏感对比增强 MRI（DSC-MRI）监测脑胶质瘤复发和治疗后反应的应用价值

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目的
探讨动态磁敏感对比增强 MRI（dynamic susceptibility contrast MRI，DSC-MRI）灌注成像在监测脑胶质瘤治脑胶质瘤术后复发和治疗后反应的应用价值。
方法
26 例脑胶质瘤患者（15 例脑胶质瘤复发，11 例治疗后反应）在同步放化疗结束 2 月内行头部常规 MRI 扫描、增强扫描及 DSC 脑灌注成像，通过 DSC 软件分析，对图像后处理得到病例异常强化区、水肿区的相对脑血容量（relative cerebral blood volume,rCBV）、相对脑血流量的（relative cerebral blood flow，rCVF）的伪彩图，分别测量病例异常强化区、水肿区的 rCBV 值、rCVF 值，采用两样本 t 检验比较两组各参数值是否存在差异。
结果
复发组的异常强化区平均 rCBV 值及 rCBF 值均显著高于放射性脑损伤组［(5.62±2.01) vs (2.17±0.94)；(5.14±1.96) vs (1.96±1.25)，P＜0.05］，强化区两灌注指标在肿瘤复发和治疗后反应两组间差异有统计学意义。复发组的水肿区平均 rCBV 值及 rCBF 值均显著高于放射性脑损伤组［(4.11±1.17) vs (1.72±0.83)；(3.76±1.83) vs (1.43±0.65)，P＜0.05］，水肿区两灌注指标在肿瘤复发和治疗后反应两组间差异有统计学意义。
结论
DSC-MRI 能早期评估脑胶质瘤复发和治疗后反应，为脑胶质瘤患者在临床上的进一步治疗提供影像依据。

PU-2166
半剂量增强 T2 FLAIR 在脑转移瘤中的应用研究

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目的 探讨 1/2-dose CE-T2 FLAIR 序列在脑转移瘤中的应用价值。
方法 前瞻性我院就诊的 46 例脑转移瘤患者。扫描序列依次包括平扫 T2 FLAIR、1/2-dose CE-T2 FLAIR、1/2-dose CE-T1WI 以及 routine-dose CE-BRAVO。以病灶直径 5mm 为分界，将所有病灶按强化方式分为 ABC 三组：A 组，直径<5mm 的病灶；B 组，病灶直径≥5mm 且呈环形强化的病灶；C 组，直径≥5mm 且呈实性强化的病灶。对所有转移灶在 1/2-dose CE-T2 FLAIR、1/2-dose CE-T1WI 以及 routine-dose CE-BRAVO 三个序列上的强化程度进行评分，评分标准如下：3 分，病灶强化程度高；2 分，病灶强化程度中等；1 分，病灶强化程度低（病灶漏诊同样记为 1 分）。（I）分别计算 A 组、B 组、C 组病灶在 1/2-dose CE-T2 FLAIR 上的强化增长百分率（PI），并进行统计学比较；（II）分别在 A 组、B 组、C 组内，对病灶在不同序列上的强化程度进行统计学比较。**结果** 46 例患者共 89 个病灶被确诊为脑转移灶：A 组（n=39），B 组（n=23），C 组（n=27）。(I)病灶在 ABC 组中 1/2-dose CE-T2 FLAIR 的 PI 值比较：$PI_C<PI_A$，$PI_C<PI_B$，PI_B与PI_A无统计学差异。（II）A 组：病灶在 1/2-dose CE-T2 FLAIR 的强化程度高于 1/2-dose CE-T1WI and CE-BRAVO。B 组：病灶在 1/2-dose CE-T2 FLAIR 的强化程度高于 1/2-dose CE-T1WI；C 组：病灶在 1/2-dose CE-T2 FLAIR 的强化程度低于 1/2-dose CE-T1WI 与 routine-dose CE-BRAVO。**结论** 使用 1/2-dose CE-T2 FLAIR 不仅可以降低对比剂剂量，且对显示小转移灶或环形转移灶有明显的优势。

PU-2167
增强 T2 FLAIR 序列在复发胶质瘤与颅内放射性坏死的鉴别诊断价值

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目的 由于胶质瘤复发和放射性坏死都伴随血脑屏障的破坏，在常规进行的增强 MR 扫描中都显示出强化，因此无法有效地鉴别两者。该研究探讨在增强 T1 扫描后补充 T2FLAIR 扫描对鉴别复发与放射性坏死的诊断价值和应用。
材料和方法 回顾性分析纳入 2016 年 1 月到 2019 年 3 月期间来我院就诊的 26 例脑胶质瘤术后复发患者（共 32 个肿瘤），作为 A 组；前瞻性收集由临床确诊鼻咽癌放疗后引起颅内放射性损伤的病人 22 例（共 31 个病灶）作为 B 组。所有患者的扫描序列都有包括平扫 T1WI、平扫 T2 FLAIR、增强 T1WI 和增强 T2 FLAIR.

由两位高年资神经放射学医师对所有病灶在 CE-T1WI、 CE-T2 FLAIR 的强化程度进行评分，评分标准如下：3 分，病灶强化程度高；2 分，病灶强化程度中等；1 分，病灶强化程度低（病灶漏诊同样记为 1 分）；并在 CE-T2 FLAIR 增强区域画 3 个感兴趣区域，其平均值作为该医师测量的值，计算其 CR 值、CR 差值（difference of contrast ratio, D-CR），并对两组进行统计学比较。
结论 复发胶质瘤在增强 T1WI 序列上强化程度较高，由于高浓度的 GBCA 会在 T2 FLAIR 发生信号反转，因此病灶在紧接着增强 T1WI 后扫描的 T2FLAIR 不明显。而放射性坏死相反，T1 强化不明

显，在补充的 T2FLAIR 上强化明显。因此增强扫描后补充 T2 FLAIR 扫描对鉴别放射性坏死和胶质瘤复发有重要意义。

PU-2168
探讨增强 MR 及 DWI 在脑转移瘤早期疗效及其预后评估的价值

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目的 探讨增强 MR 及 DWI 在脑转移瘤早期疗效及其预后评估的应用价值。
方法 选择经病理诊断或临床诊断的脑转移瘤 83 例,均予以化学治疗方案，随访 2 ～10 次，行 DWI 及 MRI 增强扫描，测量肿瘤最大直径、肿瘤实质及正常脑白质的 ADC 值，计算 rADC 值。分析肿瘤治疗前后 rADC 值差值对预测疗效的可行性。采用实体瘤疗效评价标准 1.1 版本评价临床疗效，并按临床疗效不同分为缓解组和未缓解组。两组患者均在治疗前后行增强 MR 及 DWI 扫描，并对 DWI 图像测定 ADC 值及计算 rADC。观察治疗前后 ADC 值与预后的关系。
结果 缓解组 48 例，未缓解组 43 例，与治疗前相比,缓解组 ADC 值升高而未缓解组治疗后 ADC 值降低(P <0.05)。随访 32 个月，缓解组生存时间和生存率显著优于未缓解组(P <0.05)。
结论 MR 增强及 DWI 扫描在评估脑转移瘤患者早期疗效及预后有重要价值。

PU-2169
MR 常规征象结合 ADC 值对微囊型脑膜瘤与非典型脑膜瘤的鉴别

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目的 用 MR 常征象结合 ADC 值鉴别诊断微囊型脑膜瘤及非典型脑膜瘤，以提高术前诊断准确率 。
材料与方法 回顾性分析经手术病理证实的 25 例微囊型脑膜瘤患者与 50 例非典型脑膜瘤患者的术前临床、影像及病理资料。对两种病理亚型脑膜瘤的定性指标（分叶征、 肿瘤囊变、 瘤周水肿、瘤脑界面、 脑膜尾征、 邻近颅骨改变、强化均匀性、瘤内流空血管）及定量指标（肿瘤最大径、最大、最小、平均 ADC 值）进行统计学分析，并用多因素 Logistic 回归分析与两种脑膜瘤亚型鉴别相关的独立预测指标。
结果 25 例微囊型脑膜瘤与 50 例非典型性脑膜瘤相比，定性指标：分叶征（ x^2=17.033，P<0.01）、肿瘤囊变（ x^2=4.412，P<0.05）、瘤周水肿程度（ x^2=14.476，P<0.05）、 瘤脑界面（ x^2=9.000，P<0.05）、 邻近颅骨改变（ x^2=14.109，P<0.01）、瘤内流空血管（ x^2=9.925，P<0.05）6 项影像学征象差异有统计学意义；定量指标：MaxADC 值微囊型脑膜瘤（1.09±0.11）大于非典型脑膜瘤（0.85±0.17），组间有统计学意义（P<0.01），MinADC 值微囊型脑膜瘤（0.96±0.13）大于非典型脑膜瘤（0.72±0.09），组间有统计学意义（P<0.01），AvgADC 值微囊型脑膜瘤（1.01±0.12）大于非典型脑膜瘤（0.78±0.10），组间有统计学意义（P<0.01）；多因素 logist 回归分析得出分叶征在微囊型脑膜瘤和非典型脑膜瘤间有统计学差异(P<0. 05)。
结论 微囊型脑膜瘤与非典型性脑膜瘤在肿瘤分叶征、 肿瘤囊变、 瘤周水肿程度、瘤脑界面、邻近骨质改变、瘤内流空血管方面存在差异，同时，最大、最小、平均 ADC 值可以作为一种量化工具鉴别两种病理亚型脑膜瘤，提高术前诊断准确率。

PU-2170
多形性黄色瘤样星形细胞瘤的影像分型及鉴别诊断

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目的 分析总结多形性黄色瘤样星形细胞瘤的影像特征，并进行影像分型及探讨各型的鉴别诊断。
方法 回顾性分析 25 例经病理证实的多形性黄色瘤样星形细胞瘤临床资料及影像表现，术前进行癫痫序列检查 7 例，MR 增强检查 18 例。
结果 男性 10 例，女性 15 例，女性多于男性。平均年龄 36.4 岁，中位年龄 30 岁。25 例均为单发，均位于幕上。病灶发生于颞叶 13 例，顶叶 3 例，枕叶 3 例，额叶 2 例，额颞岛叶交界区 1 例，下丘脑 1 例，松果体区 1 例，杏仁核 1 例。病灶位于皮层及皮层下 13 例，仅累及皮层 5 例，位于皮层下白质而不累及皮层 4 例。影像表现可分为 3 种类型：实性 / 实性为主型（15 例，主要表现为实性为主肿块，多有明显强化），囊伴结节型（8 例，主要表现为囊伴附壁结节，结节及囊壁有较明显强化）及囊性型（2 例，主要表现为皮层及皮层下囊性结节）。
结论 多形性黄色瘤样星形细胞瘤好发于年轻人，单发且多位于幕上浅表部位，影像可表现从实性－囊伴结节－囊性不同类型，实性瘤体部分常强化明显，灶周水肿大小不一，可伴有脑膜尾征及邻近颅骨凹陷塑形，可伴钙化，病灶弥散受限不明显。主要的鉴别诊断包括毛细胞型星形细胞瘤、脑膜瘤、节细胞胶质瘤、胶质母细胞瘤，少突胶质细胞瘤。

PU-2171
磁共振功能成像在高级别脑胶质瘤复发与假性进展鉴别诊断的价值

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目的 探讨磁共振功能成像在脑胶质瘤术后复发与假性进展中的临床价值。
方法 将 2018 年 1 月—2019 年 5 月收治的 20 例高级别脑胶质瘤术后复发和 11 例高级别脑胶质瘤假性进展患者资料进行回顾性研究；并对所有患者的 DCE-MRI （磁共振动态对比增强）、DWI（扩散加权成像）和 DKI（磁共振扩散峰度成像）资料进行总结和分析。
结果 资料统计显示，高级别脑胶质瘤复发组实性强化区 Krans 值和 iAUC 值明显高于假性进展组，且差异有统计学差异（ P ＜ 0.05）；假性进展组 ADC 平均值高于复发组，差异有统计学差异（ P ＜ 0.05）；脑胶质瘤复发区 DKI 参数值与假性进展区比较有统计学差异（ P ＜ 0.05）。
结论 应用 DCE-MRI 联合 DWI、DKI 成像技术可以有效鉴别诊断高级别胶质瘤复发和假性进展，对指导临床治疗方案的选择以及预后评估具有重要价值。

PU-2172
胸椎旁黑色素性神经鞘瘤 1 例

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神经鞘瘤起源于神经鞘膜的施万细胞，是椎管内最常见的肿瘤，占所有椎管内肿瘤的 29%，以中上颈段及上胸段多见。跨脊膜生长，在 CT 及 MR 影像上可表现为典型的哑铃征，增强扫描表现为明显不均匀强化，可见囊变、出血、坏死，诊断较容易。黑色素性神经鞘瘤是一种很罕见的肿瘤，占所有神经鞘瘤的 1%以下，是一种交感神经节含有色素的肿瘤，可发生在 10-92 岁的患者，其发病高峰年龄为 30-40 岁，无性别优势。MRI 扫描时，黑色素 T1WI 上呈高信号，T2WI 上呈低信号是其特征性的表现。但由于黑色素含量及分布的不同，在 MRI 上表现的信号有时也没有特征性，同时由于神经鞘瘤可伴有出血，而出血在亚急性期和慢性期 TWI 均可表现为高信号，从而难以鉴别。

综上所述，黑色素性神经鞘瘤在 MR 上有一定的特征性表现，但仍难以诊断，需结合临床及病理相关检查明确诊断。

PU-2173

Comparing the value of DKI and DTI in detecting isocitrate dehydrogenase genotype of astrocytomas

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AIM: To compare the value of diffusion kurtosis imaging (DKI) and diffusion tensor imaging (DTI) in evaluating astrocytomas with an isocitrate dehydrogenase (IDH) genotype. MATERIALSANDMETHODS: Fifty-eight astrocytomas were divided into IDH-wild-type(IDHW) and IDH-mutant (IDH-M) groups, in all astrocytomas, low-grade astrocytomas (LGA) and high-grade astrocytomas (HGA),respectively. The DKI (mean kurtosis[MK],radial kurtosis[Kr], axial kurtosis [Ka]), and DTI (fractional anisotropy [FA], mean diffusivity [MD]) values were measured. The differences of parameter values between the IDH-W and IDH-M groups were compared by t-test. Receiver operating characteristic (ROC) curves were used to identify the best parameter and z-score tests were used to compare the performance between DKI and DTI.

RESULTS: In all astrocytomas, MK, Ka, and Kr values were significantly higher (p<0.001, p¼0.002, and p<0.001), and the MD value (p¼0.005) was lower in the IDH-W group than those in the IDH-M group. The areas under the ROC curve (AUC) of MK (0.811) and Kr (0.800) were significantly higher than that of MD (0.704). In LGA, MK, Ka, and Kr values were also significantly higher in the IDH-W group than those in the IDH-M group (p¼0.002, p¼0.008, p¼0.006), whereas MD and FA values showed no differences. In HGA, MK and Kr values were significantly higher (p¼0.008, p¼0.003), and the MD value (p¼0.031)was significantly lower in the IDH-W group than that in the IDH-M group, the AUC of MK (0.750) and Kr (0.788) were also higher than MD (0.637; p¼0.032, p¼0.025).

CONCLUSION: DKI may be a new imaging biomarker for evaluating the IDH genotype of astrocytomas, which is more accurate and stable than DTI.

PU-2174

非典型性脉络丛乳头状瘤的 MRI 诊断

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目的 分析非典型脉络丛乳头状瘤的的临床与影像学表现特点，以提高临床对本病的认识。
方法 收集经我院病理证实的 5 例非典型性脉络丛乳头状瘤，结合相关文献分析其 MRI 表现。5 例病例术前均行头颅 MRI 平扫及增强扫描，均为单发肿瘤。其中男性 3 例，发病年龄分别为 10 岁、26 岁、42 岁；女性 2 例，发病年龄分别为 1 6 岁、27 岁。临床症状包括：头痛、眩晕、走路不稳等，其中，3 例位于侧脑室， 1 例位于第四脑室， 1 例位于左侧桥小脑角区。
结果 5 例非典型性脉络丛乳头状瘤中，2 例呈囊实性改变，实性部分 T1WI 呈稍低信号，T2WI 呈稍高信号，增强后实性肿块、囊壁及分隔呈明显强化；3 例呈菜花状生长的实性肿块，T1WI 呈稍低信号，T2WI 呈稍高信号，增强后肿块呈中－重度均匀强化；位于桥小脑角区的病例呈不规则状并沿 Luschka 孔塑形生长。3 例伴瘤周水肿，2 例可见“囊泡征”。1 例 CT 表现密度稍高，可见钙化。
结论 非典型脉络丛乳头状瘤具有一定的影像学特点，表现为肿块边界较清楚，脑组织浸润、瘤内囊变、出血等恶性征象较少见。位于
脑室或桥小脑角区的“菜花状”肿块，呈塑形式生长，明显强化，肿块周围可见“囊泡征”。

PU-2175

椎管内节细胞神经瘤的 MRI 表现及文献复习

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目的 探讨椎管内节细胞神经瘤的临床表现及 MRI 特点，提高术前诊断该病的准确率。
方法 分析经本院手术病理证实的椎管内节细胞神经瘤的临床表现、影像特点，并结合文献复习，总结其诊断要点。
结果 椎管内节细胞神经瘤以颈段好发，沿椎间孔生长，与神经鞘瘤难鉴别。病灶 MRI 平扫 T1WI 呈等或稍低信号，T2WI 呈高信号，信号均匀或不均匀，增强扫描病灶强化或强化不明显。
结论 椎管内节细胞神经瘤有一定 MRI 特征性表现，进行准确诊断及鉴别诊断有重要意义。

PU-2176

The value of multi ultra high-b-value DWI in grading cerebral astrocytomas and its association with aquaporin-4

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Objective: To investigate the value of multi-ultrahighb-value diffusion-weighted imaging (UHBV-DWI) in differentiating high-grade astrocytomas (HGAs) from low-grade astrocytomas (LGAs), analyze its association with aquaporin (AQP) expression.
Methods: 40 astrocytomas divided into LGAs (N = 15) and HGAs (N = 25) were studied. Apparent diffusion coefficient (ADC) and UHBV-ADC values in solid parts and peritumoral edema were compared between LGAs and HGAs groups by the t-test. Using receiver operating characteristic curves to identify the better parameter. Using real

time polymerase chain reaction to assess AQP messenger ribonucleic acid (mRNA). Using spearman correlation analysis to assess the correlation of AQP mRNA with each parameter.
Results: ADC values in solid parts of HGAs were significantly lower than LGAs ($p = 0.02$), while UHBV-ADC values of HGAs were significantly higher than LGAs ($p < 0.01$). Area under the curve (AUC) of UHBV-ADC (0.810) was larger than ADC (0.713), and the area under the curve of UHBV-ADC was significantly higher than that of ADC ($p = 0.041$). AQP4 mRNA was significantly higher in HGAs than that in LGAs ($p < 0.01$); there was less AQP9 mRNA and no AQP1 mRNA in LGAs and HGAs groups ($p > 0.05$); ADC value showed a negative correlation with AQP4 mRNA ($r = -0.357$; $p = 0.024$). UHBV-ADC value positively correlated with the AQP4 mRNA ($r = 0.646$; $p < 0.01$).
Conclusion: UHBV-DWI allowed for a more accurate grading of cerebral astrocytoma than DWI, and UHBV-ADC value may be related with the AQP4 mRNA levels. UHBV-DWI could be of value in the assessment of astrocytoma. advances in knowledge: UHBV-DWI generated by multi UHBV could have particular value for astrocytoma grading, and the level of AQP4 mRNA might be potentially linked to the change of UHBV-DWI parameter, and we might find the exact reason for the difference of UHBV-ADC between the LGAs and HGAs.

PU-2177
基于 MRI-T2WI 纹理分析鉴别四脑室不典型髓母细胞瘤和室管膜瘤价值研究

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目的 探讨 MRI-T2WI 纹理分析在鉴别四脑室不典型髓母细胞瘤和室管膜瘤的价值。**方法** 回顾性分析病理证实 36 例四脑室肿瘤（其中 19 例髓母细胞瘤、17 例室管膜瘤）患者术前 MRI 资料，运用纹理分析软件手动勾画感兴趣区（ROI），获取直方图参数，包括均值、中位数、标准差、偏度、峰度、最大值、最小值，异质性、熵、第 5 百分位数（$T2WI_{5th}$）、第 10 百分位数（$T2WI_{10th}$）、第 25 百分位数($T2WI_{25th}$)、第 50 百分位数($T2WI_{50th}$)、第 75 百分位数($T2WI_{75th}$)、第 95 百分位数($T2WI_{95th}$)。采用独立样本 t 检验或 Mann-Whitney U 检验对两组间各参数值进行统计学分析，应用 Logistic 回归分析对有意义参数行多参数联合分析，应用受试者工作特征曲线（ROC），获得曲线下面积（AUC），确定鉴别两者的阈值和诊断效能。**结果** 参数中髓母细胞瘤组均值、中位数、$T2WI_{5th}$、$T2WI_{10th}$、$T2WI_{25th}$、$T2WI_{50th}$、$T2WI_{75th}$百分位数小于室管膜瘤组，差异有统计学意义（$P<0.05$）。其中 $T2WI_{5th}$ 诊断效能最佳，当临界值为 1343 时诊断特异度为 75%，敏感度为 92.9%。应用 Logistic 回归预测概率参数联合分析 $T2WI_{5th}$+$T2WI_{10th}$ 诊断效能最佳，AUC 为 0.928，当临界值为 0.75 时诊断特异度为 75%，敏感度为 100%。**结论** MRI-T2WI 纹理分析能为不典型髓母细胞瘤与室管膜瘤术前诊断提供量化信息，提高术前诊断准确率，具有较明显临床价值。

PU-2178
探讨磁共振灌注成像在监测脑胶质瘤复发和治疗后反应的初步研究

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目的:目的通过对脑胶质瘤术后放疗患者的磁共振灌注成像(PWI)研究,探讨其在判断胶质瘤复发与放射性损伤中的价值。材料与方法选取 30 例脑胶质瘤术后、放疗后常规 MR 增强序列出现新强化灶的患者。30 例患者均行常规 MR 平扫、增强扫描和 PWI 检查。比较异常强化区与对侧正常区的参数比值,包括相对脑血容量(rCBV)、相对脑血流量(rCBF)比值，根据病理及临床随诊结果,分析 PWI 对肿瘤复发与放射性损伤的鉴别诊断价值。结果 30 例患者最终经手术和随访证实有 20 例胶质瘤复发,10 例放射性脑损伤。胶质瘤复发组 rCBV、rCBF 比值的 M 值分别为均明显高于放射性损伤组比值 rCBV、rCBF,差异有统计学意义(P 值均<0.05)。依据 PWI 诊断胶质瘤复发与放射性损伤诊断准确率为 85.3%(26/30),常规 MR 与 PWI 诊断准确率差异具有显著性意义(P<0.001)。结论:PWI 可用于监测脑胶质瘤复发和治疗后反应,为脑胶质瘤术后患者的临床治疗提供影像依据，其灌注成像 rCBVmax 值对胶质瘤复发与放射性损伤鉴别具有重要价值。

PU-2179
DSC 灌注成像联合 MRS 在鉴别高级别胶质瘤假性进展中的应用价值

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目的 探讨动态磁化率对比增强 MR 灌注成像（dynamic susceptibility contrast MR perfusion imaging，DSC-MRI）联合磁共振波谱成像（magnatic resonance spectroscopy，MRS）在鉴别高级别胶质瘤假性进展中的应用价值。**方法** 回顾性分析我院 2013 年 1 月~2018 年 12 月高级别脑胶质瘤患者行手术及术后联合放化疗治疗后 1-3 月内 MRI 上出现新的强化病灶或强化范围扩大者 52 例，应用 DSC-MRI 分析病灶局部血流情况，应用 MRS 分析病灶局部代谢产物及其比值情况。评价两种方法联合在鉴别高级别胶质瘤假性进展中的应用价值。**结果** 52 例患者中，经二次手术病理或随访 6 个月以上证实 30 例为假性进展，22 例为肿瘤复发。单纯应用 DSC-MRI、MRS 及二者联合正确诊断假性进展者分别为 20 例、25 例及 28 例。复发的表现：DSC-MRI 病变区呈高灌注,MRS 表现为 Cho/Cr 升高，假性进展的表现：DSC-MRI 病变区呈低灌注，MRS 表现为 Cho/Cr 下降。**结论** DSC-MRI 和 MRS 联合应用可更好地诊断高级别胶质瘤假性进展，具有很大的临床应用价值。

PU-2180
颅内脑膜瘤 MRI 表现与其肿瘤分级相关性分析

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目的探讨脑膜瘤 MRI 表现与其病理分级相关性。方法回顾性分析 2009 年 9 月至 2019 年 7 月手术治疗的 207 例脑膜瘤的临床资料，根据术后病理结果分为 WHO Ⅰ级(良性组)，WHO Ⅱ、Ⅲ级(恶性组)。采用多因素 Logistic 回归分析分析不同性质脑膜瘤 MRI 特征。结果 207 例脑膜瘤中，WHO Ⅰ级 145 例，Ⅱ级 40 例，Ⅲ级 1 例。多因素 Logistic 回归分析显示，肿瘤形态不规则、肿瘤强化不均匀、瘤周水肿严重是恶性脑膜瘤的独立预测因子，而脑膜尾征是良性脑膜瘤的独立预测因子，弥散加权序列 ADC 值对良恶性鉴别无统计学意义。结论肿瘤形态、肿瘤强化、瘤周水肿、脑膜尾征等 MRI 征象与脑膜瘤分级存在相关性。

PU-2181

A Case Report: Optic Nerve Hemangioblastoma with Bilateral Frontal Lobe Edema

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Hemangioblastomas (HBLs) are benign tumors of the central nervous system, accounting for only 1-2% of the primary tumors of the central nervous system, most commonly detected in the subtentorium or spinal cord. Hemangioblastoma is an autosomaldominant inherited disease. The main ophthalmological manifestation is retinal hemangioblastoma. Optic nerve hemangioblastoma is very rare, most commonly associated with Von Hippel-Lindau (VHL) syndrome, and the tumor is genetically predisposed. At present, only 35 cases of optic nerve hemangioblastoma have been reported in the literature, 71% of which were related to VHL syndrome. The present article is a case report of hemangioblastoma of the optic nerve with bilateral frontal lobe edema, without VHL syndrome, which has not been reported previously.

PU-2182

磁共振扩散峰度成像及定量磁化率图在帕金森病诊断中的应用

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目的
探讨磁共振扩散峰度成像技术（DKI）及定量磁化率图（QSM）在帕金森病（PD）中的诊断价值。

方法
选取早期 PD 患者 17 例（早期 PD 组）、进展期 PD 患者 11 例（进展期 PD 组）、非 PD 志愿者组 17 例（对照组）同时行 DKI 及 QSM，观察 3 组在 DKI 中双侧尾状核头、壳核、苍白球、丘脑、黑质及红核的 FA 值、MD 值及 MK 值，并观察 QSM 所显示的 MS 值。

结果
3 组双侧黑质中的 MK 值从大到小依次为对照组、早期 PD 组及进展期 PD 组，且黑质中早期 PD 组及进展期 PD 组 MK 值大小与对照组差异具有统计学意义（P<0.05），3 组双侧红核中的 MK 值从大到小依次为进展期 PD 组、早期 PD 组及对照组红核中进展期 PD 组 MK 值大小与对照组差异具有统计学意义（P<0.05）。3 组双侧黑质、红核及壳核中的 MS 值从大到小依次为进展期 PD 组、早期 PD 组及对照组，且黑质、红核及壳核中早期 PD 组及进展期 PD 组 MS 值大小与对照组差异具有统计学意义（P<0.05）。进展期 PD 组双侧壳核中 FA 值较对照组小，且差异具有统计学意义（P<0.05）。3 组双侧尾状核头及丘脑各种观察指标之间差异均无统计学意义。
结论
早期 PD 患者黑质 MK 值减低，红核中 MK 值增高，黑质、红核及壳核中的 MS 值增高，并随着病程进展而改变，DKI 及 QSM 技术均能为 PD 临床早期诊断及病情监控提供一定价值。

PU-2183
不同年龄段正常人群臂丛神经的 DTI 参数变化

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目的 确定年龄相关的臂丛神经扩散张量成像(DTI)的参数变化趋势，建立健康人群臂丛神经部分各向异性(FA)的正常范围。
方法 54 名健康志愿者分为三个年龄组（21-40 岁、20 人,41-60 岁、20 人,61-以上、14 人）行 3.0TMR 成像。扫描序列包括 DTI 序列及 3D NERVE VIEW 序列，2 名阅片者独立测量 54 名志愿者臂丛神经每条神经根的 FA 值。采用组内相关系数（ICC）检验 2 名阅片者测量参数结果的一致性。用简单线性回归模型分析 FA 均值与年龄的相关性。用单因素方差分析两两比较 FA 均值的组间差异。
结果 臂丛神经 FA 均值与年龄呈负相关(R=0.897,R^2=0.800,P<0.001)。21-40 岁年龄组的 FA 均值为（0.396±0.023）,41-60 岁年龄组的 FA 均值为（0.359±0.017）,61-以上岁年龄组的 FA 均值为（0.333±0.089），三组年龄组的 FA 均值差异具有统计学意义（P=0.002）。
结论 健康人臂丛神经 FA 值存在随年龄变化而发生变化的趋势。在临床鉴别工作中，应将年龄因素考虑在内。

PU-2184
慢性酒精依赖者脑细微结构改变与认知功能损害

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目的 探讨慢性酒精依赖(chronic alcohol dependent，CAD)者脑细微结构损害的空间分布及其与认知功能的关系。**材料与方法** 19 例 CAD 者和 16 例健康志愿者（healthy control，HC）行头部常规 MRI、3DT1WI 和 DTI 扫描，分别应用基于体素的形态测量学（voxel-based morphometry，VBM）和基于纤维束示踪的空间统计（tract-based spatial statistics, TBSS）方法对原始数据进行后处理，分别采用双样本 *t* 检验和非参数检验比较两组人群灰质体积（gray matter volume, GMV）和各向异性分数（fractional anisotropy, FA）值组间差异，采用 Pearson 法对显著差异数值与 MoCA 评分进行相关分析。**结果** 与 HC 组比较，CAD 组 GMV 减少脑区包括双侧腹侧纹状体、前扣带回、背外侧前额叶、楔叶、顶下小叶，右侧梭状回及左侧眶额回、岛叶、舌回；FA 值减小脑区包括胼胝体膝部、体部及压部、双侧辐射冠和右侧大脑脚、内囊后肢、视辐射。右侧前扣带回的 GMV 和胼胝体压部的 FA 值与 MoCA 评分呈正相关（*P* 值均<0.05）。**结论** CAD 者大脑灰质和白质纤维束均存在不同程度的结构异常，奖赏环路相关脑区和胼胝体为酒精性脑损害的敏感部位，其中右侧前扣带回和胼胝体压部可能参与 CAD 者认知损害相关的神经病理学改变。

PU-2185
可逆性胼胝体压部病变综合征的病因、临床特点及 MR 表现

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目的 探讨可逆性胼胝体压部病变综合征的病因、临床特点及 MR 表现。**方法** 回顾性分析 2011 年 12 月～2018 年 04 月共 35 例患者资料，总结其特点。**结果** 男性 24 例，女性 11 例；年龄 3d～

43y。以发热或癫痫、头痛头晕为首发症状 28 例；外伤 4 例;免疫性或代谢性疾病 3 例。实验室检查电解质紊乱患者占 77.14%（27/35）；血常规异常患者占 68.57%（24/35）；脑脊液生化及常规异常患者占 37.50%（6/16）；TAOCH 系列异常患者占 66.67（8/12）。首诊头颅 MRI 示胼胝体压部异常信号，T1 呈等或稍低信号，T2 及 FLAIR 上呈等或稍高信号，DWI 上呈高信号，ADC 图呈低信号，范围约 0.22-1.27×$10^{-3}$$mm^2$/s，均值 0.40×$10^{-3}$$mm^2$/s。35 例患者中有 9 例行 MR 增强扫描，增强后病灶均无明显强化；有 2 例新生儿患者行 SWI 检查，SWI 序列未见明显异常。复诊头颅 MRI 示，原胼胝体异常信号消失 32 例；信号减低 3 例；**结论** RESLES 病因主要为感染和电解质代谢紊乱；MR 表现为胼胝体压部的可逆性异常信号，可累及邻近脑白质；预后和病因及 RESLES 病变累及范围均相关，大部分经积极治疗原发病后好转，少数患者短期遗留轻度神经系统病症，正确认识该病对临床有积极指导作用。

PU-2186
磁敏感加权成像(SWI)直方图分析帕金森病患者脑铁沉积变化及其与 Hoehn-Yahr 分级(HY 分级)的相关性

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目的 探讨采用 SWI 直方图分析帕金森病(PD)患者随疾病进展的脑铁沉积变化及其与 HY 分级的相关性，及该方法在 PD 早期诊断和分期的价值。材料和**方法** 33 例 PD 患者，分为 21 例早期 PD(EPD)组和 11 例中晚期 PD(LPD)组，22 例健康对照组(HC)组。对被试进行 SWI 序列扫描并采用统一帕金森病评定量表(UPDRS)和 HY 分级量表进行评估。在校正相位图上选取双侧尾状核头部，壳核，苍白球，丘脑，红核和黑质的最大层面，通过 Mazda 软件绘制感兴趣区域(ROI)，并用直方图进行分析。用双侧核团的平均值进行比较，单因素方差分析用于比较三组之间的直方图参数值。用 Spearman 相关分析研究有统计学意义的参数与 HY 分级之间的相关性。通过受试者操作特征(ROC)曲线评价参数的诊断效能。**结果** LPD 患者黑质(SN)的第 1、10、50 百分位数值，红核(RN)的第 1 百分位数值和苍白球(GP)的第 90 百分位数值明显高于 EPD 患者，表明这些区域的铁含量增加。在 EPD 患者中，SN 的第 50、90、99 百分位数值，RN 的第 10 百分位数值，尾状核头(PN)的偏度值和壳核(CN)的峰度值均显著高于 HC。LPD 患者 SN 的平均值、偏度值和第 1、10、50、90 和 99 百分位数值，RN 的平均值和第 1、10 百分位数值，GP 的第 90 百分位数值，PN 的偏度值和 CN 的峰度值均显著高于 HC。SN 的平均值和第 1、10、50 百分位数值，RN 的第 1 和第 10 百分位数值和 GP 的第 90 百分位数值与 HY 分级呈强正相关。RN 的第 1 百分位数值、PN 的偏度值和 SN 的第 10 百分位数值分别对区分 EPD 和 LPD、EPD 和 HC、LPD 和 HC 的诊断价值最高，灵敏度和特异度分别为 72.7%和 81.8%，73.9%和 72.7%，90.9%和 82.6%。**结论** PD 患者随疾病进展脑铁沉积分布变化并和 HY 分级呈正相关。SWI 直方图有助于 PD 早期诊断和分期。

PU-2187
MCI 患者中空间导航能力与海马亚区体积的相关性研究

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目的: 探讨轻度认知功能障碍(Mild Cognitive Impairment, MCI)患者空间导航能力的改变，及其与海马亚区体积改变的相关性。

方法：收集南京大学医学院附属鼓楼医院神经内科记忆门诊 MCI 患者 24 例，同时纳入 25 例性别、年龄匹配的认知正常老年人（Normal Control, NC）作为对照组。所有被试者均行空间导航测试及头颅磁共振检查。使用 PC 版空间导航测试软件进行空间导航能力检测，包括综合导航（自我导航+环境导航）能力（Allo-egocentric virtual，AEV）、自我导航能力（Egocentric virtual，EV）及环境导航能力（Allocentric virtual，AV）等；磁共振 3DT1W 成像序列进行颅脑高清结构相信息采集。根据空间导航测试软件计算的指标评估被试的空间导航能力，利用 FreeSurfer 软件分割及计算得到每个被试双侧海马亚区体积，分为 14 个亚区。采用两样本 T 检验分析 MCI 与 NC 组空间导航能力及海马亚区体积的差异，采用双变量相关分析及多元线性回归方法分析组间差异显著的空间导航能力及海马亚区体积的相关性，将年龄、性别、受教育程度及颅内容积作为协变量回归掉。
结果：与 NC 组相比，MCI 患者无论是环境导航（AV）还是自我导航（EV）能力均降低（P<0.05），AV 评分与左侧海马 CA2_3、CA4_DG、前下托、左侧海马总体积及右侧海马前下托体积呈负相关，而 EV 评分与海马亚区体积无相关性；进一步回归分析发现， AV 评分只与左侧海马前下托体积呈负相关，与其他海马体积不相关（P<0.05）。
结论：与 NC 组相比，MCI 组空间导航能力明显减低，说明 MCI 患者空间导航能力受损； AV 能力与海马亚区体积相关，说明早期海马亚区体积改变可能是 MCI 出现空间导航障碍的结构基础。

PU-2188
视神经脊髓炎谱系疾病患者脑白质网络拓扑属性改变研究

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目的 探讨基于病程分类为病程短期及长期视神经脊髓炎谱系疾病(Neuromyelitis optical spectrum disorder, NMOSD)患者脑白质网络拓扑属性的差异,寻找 NMOSD 患者随病程发展的网络特征改变。
材料与**方法** 纳入来自 2 个中心的 77 例 NMOSD 患者和 79 例对照组。根据 NMOSD 患者的病程分为病程短期、病程长期两组。采用确定性纤维跟踪技术构建白质网络,使用图论分析各组脑白质网络属性差异。
结果 根据纳入的 NMOSD 被试病程的中位数（48 个月）为中点，将病人分为病程短期组及病程长期组。（1）全局属性显示：与对照组相比，NMOSD 组的小世界属性减低，最短路径升高，全脑效率减低；与对照组相比，病程短期 NMOSD 组的小世界属性减低、最短路径升高以及全脑效率减低，病程长期 NMOSD 组的小世界减低、最短路径升高以及全脑效率减低；病程短期 NMOSD 组与病程长期 NMOSD 组间最短路径减低，小世界属性，聚类系数及全局效率无明显差异。(2)局部属性分析显示：与对照组相比，病程短期 NMOSD 的右背外侧额上回、颞上回、左侧补充运动区 betweenness 减低，而病程长期的 NMOSD 的右背外侧额上回、额中回、尾状核、豆状壳核、颞上回、左侧中央前回、补充运动区以及楔前叶 betweenness 减低，右侧楔叶、左侧枕上回 betweenness 升高（FDR 校正，p<0.05）。与对照组相比，病程早期 NMOSD 及病程晚期 NMOSD 存在广泛的节点 degree 减低（FDR 校正，p<0.05），而病程短期与病程长期 NMOSD 患者 betweenness 和 degree 属性无显著差异。
结论 NMOSD 患者网络小世界属性以及全局效率存在明显异常，且多个脑区的节点属性存在异常。NMOSD 的属性未随病程的延长而明显改变，这可能与该疾病反复发作后缓解的临床特征有关。

PU-2189
常规 T2 FLAIR 序列灰度游程矩阵纹理分析对帕金森病的诊断价值

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目的 探讨帕金森病（PD）患者壳核处 T2 FLAIR 序列灰度游程矩阵纹理特征参数的变化及 T2 FLAIR 序列灰度游程矩阵纹理分析对 PD 的诊断价值。
方法 回顾性分析 2017 年 2 月—2019 年 6 月锦州医科大学附属第一医院的 45 例 PD 患者（PD 组）和 45 例健康体检者 MRI 影像和临床资料。选取每例 T2 FLAIR 图像显示壳核的最大层面，用 MaZda 软件手动勾画感兴趣区并提取灰度游程矩阵特征参数。对两组的纹理特征参数进行比较，并采用受试者工作特征曲线（ROC）分析曲线下面积（AUC）、敏感度、特异度。
结果 采用灰度游程矩阵纹理分析方法提取出 20 个特征参数，组内左右壳核处比较差异无统计学意义（$P>0.05$）。PD 组与对照组的壳核处特征参数 Horzl_ShrtREmp、135dr_RLNonUni 比较，差异均有统计学意义（$P<0.05$）。以特征参数 Horzl_ShrtREmp、135dr_RLNonUni 绘制 ROC 曲线，AUC 分别为 0.76[95%CI(0.64~0.89)，$P<0.05$]和 0.64[95%CI(0.53~0.80)，$P<0.05$]。
结论 PD 患者 T2 FLAIR 壳核处灰度游程矩阵特征参数 Horzl_ShrtREmp、135dr_RLNonUni 发生改变。T2 FLAIR 灰度游程矩阵纹理分析对 PD 的诊断具有一定临床价值。

PU-2190
弥散张量成像在海马区域正常老年人、轻度认知障碍、及阿尔莫兹海默病诊断中的作用及与海马体积测量的比较

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目的 研究弥散张量成像在轻度认知障碍（MCI）、阿尔莫兹海默病（AD）诊断中的作用。
材料和**方法** 搜集了 2012 年 7 月至 2013 年 9 月在上海交通大学上海附属第六人民医院的正常人、MCI 患者、AD 患者各 30 例。进行常规扫描及 DTI、T1-3D 扫描。测量的感兴趣为双侧海马。测量 DTI 图像的感兴趣区域的 ADC 值及 T1-3D 图像的海马体积。并进行 ANOVA 进行分析比较三组人之间的差异
结果 正常人、MCI 患者、AD 患者的海马 ADC 值(正常人与 MCI 比较，P=0.0483<0.05，MCI 与 AD 比较 P=0.03632<0.05，正常人与 AD 患者比较 P =0.03542<0.05)有显著差异。正常人与 MCI 组海马体积无明显差异，正常人与 AD 比较、MCI 与 AD 海马体积均有显著性差异。
结论 弥散张量成像在轻度认知障碍的早期诊断中具有重要作用，轻度认知障碍、及阿尔莫兹海默病诊断中具有重要作用。

PU-2191
DARTEL 算法分析原发性三叉神经痛患者脑灰质体积

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目的 用 DARTEL 算法分析左面原发性三叉神经痛（ idiopathic trigeminal neuralgia, ITN）患者脑内灰质体积（gray matter volume, GMV）的变化。**方法** 用 DARTEL 算法对 21 例左面部原发性三叉神经痛患者（left idiopathic trigeminal neuralgia, LITN）和与实验组年龄、性别及受教育程度相匹配的 25 例健康对照组的 GMV 数据进行分析。**结果** 与对照组相比较，LITN 组患者在右颞下回、右颞上回、右岛盖、双额叶皮层、右侧中央前回、左前扣带回、双中扣带回、双后扣带回、双楔前叶等区域灰质体积减少。**结论** 本研究发现 LITN 患者部分脑区 GMV 减少，这些改变可能在 ITN 形成和发展过程中扮演重要角色。

PU-2192
基于因果结构谐变和方法探究阿尔茨海默病发展过程中脑萎缩的模式

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目的： 阿尔茨海默病发展过程中脑萎缩以往按照 Braak 分级等前人研究可分为几个阶段，然脑萎缩在各脑区间发展的连续、因果的模式尚未有大样本研究。结构谐变可用于在横断面样本中探究脑结构变化的个体间一致性，而因果结构谐变近期被提出，可用于检测脑区体积随某种序列（如疾病发展）的变化过程中，彼此之前的因果联系。本研究提出引入滑动时间窗方法，可进一步获取这一因果联系随疾病发展的变化过程，有助于发现阿尔茨海默病发展过程中各脑区萎缩的关键驱动脑区和扩散模式。
方法： 本研究使用了国际阿尔茨海默病影像数据库（ADNI）共 463 名被试，每名被试均有 3D-T1w 结构磁共振数据。首先采用基于源的形态学（source based morphometry）分析将所有被试的体积个体差异分解为 20 个成分，对其进组间差异分析。然后，对其中 213 个具有脑脊液生理指标测量的被试，我们以 tau 蛋白和 A-β 蛋白指标进行标准化和平均，得到 AD 发展从轻到重的序列，并根据该序列进行因果结构谐变分析，统计每个成分的驱动其他脑区和被其他脑区驱动的分数，找到脑萎缩发展的重要驱动节点。
结果： 我们发现这些成分绝大部分在阿尔茨海默(AD）、轻度认知障碍(MCI)和正常对照(NC)之间存在体积萎缩。构成的结构谐变网络以双侧海马和左侧颞中回为中心，存在显著的组间差异。在因果结构谐变分析中，默认网络、双侧海马和丘脑是重要驱动节点。
结论： 阿尔茨海默病发展过程中的脑萎缩存在特定的关键脑区如丘脑、默认网络和海马。这些脑区的脑萎缩可作为重要标记，可分别预测其它重要功能脑区的萎缩，这一不同驱动脑区的模式，可能也是阿尔茨海默病不同类型的重要区分特征。

PU-2193
POC 亚区-海马-DMN 的功能连接在正常年轻人特征的研究

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目的： 默认网络和嗅觉神经网络是阿尔茨海默病早期受损的重要目标脑区。以往研究提示这二者可能存在功能上的重要相关性，然并未有研究直接系统报告。本研究目的为探寻正常年轻人静息态嗅觉网络（ON）和默认模式网络（DMN）之间的联系，揭示嗅觉网络的神经机制。
方法： 研究纳入 65 名健康的右利手受试者，所有被试进行了结构磁共振和静息态功能磁共振（fMRI）扫描。我们人工定义了初级嗅觉皮层的感兴趣区（ROI），采用独立成分分析对 POC 进行

亚区分割。然后根据独立成分分析的结果，定义 POC 亚区，并使用每个 POC 的亚区为种子点分期全脑功能连接分析。最后，通过全脑脑网络分析，探讨 ON 与 DMN 之间的连接。

结果：独立成分分析可以稳定的把 POC 分割成内嗅皮层、嗅前核、以及梨状皮层，以 POC 亚区为种子的静息态功能网络和 DMN 默认网络在海马、内侧颞叶和后扣带回的区域有着巨大的空间重叠，这表明 POC 和 DMN 实际上是交换信息并且彼此交互。脑网络分析发现， POC 通过海马与 DMN 之间存在功能连接。海马在 ON 与 DMN 功能连接之间的关键节点。

结论：目前的研究发现了 POC 的功能异质性，并揭示了 POC 中的亚区与高阶认知相关脑网络（DMN）之间的显著功能连接性。POC，海马和 DMN 被证明彼此紧密连接，海马作为 POC 和 DMN 之间的连接脑区。该模型将来可以进一步用于 AD 研究，解释 AD 病理变化及其进展。

PU-2194
1 例关于 CIDP 患者臂丛神经 MRI 成像特点的报道

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［摘要］慢性炎症性脱髓鞘多发性神经根神经病（Chronic inflammatory Demyelinating Polyneuropathy, CIDP）, CIDP 是一种获得性周围神经根神经病。其临床表现为慢性进展性、阶梯样加重或复发性对称性四肢远端和近端无力伴感觉障碍，运动症状重于远端症状，肢体远端重于近端。本病可累及任何年龄的人群，但以老年男性最为常见。本病诊断的金标准为周围神经活检，以腓肠神经活检为多，但具有创伤性，故临床极少应用。目前公认欧洲神经病学会联盟和周围神经病学会（EFNS-PNS）2005 年发布的 CIDP 诊治指南，该指南将周围神经电生理特征作为确诊的关键指标，而影像学指标未被纳入。目前为止，CIDP 影像学表现相关的国内外文献报道较少。随着核磁共振在中枢及周围神经系统成像技术的发展与成熟，MRI 以其无创高效、成像清晰全面、可获得成分相关信息等优势逐渐在 CIDP 患者的临床诊断中的价值日益显现。本文选取近期我院 1 例经神经电生理检查证实，符合 2005 EFNS-PNS 关于 CIDP 确诊标准的病例，对其进行头颅及臂丛神经的 MRI 扫描，脑实质及所扫颅神经 MRI 平扫未见明显阳性发现，但臂丛神经 MRI 成像，STIR 成像见双侧臂丛神经广泛对称性增粗，呈稍高或高信号，外形不规则，走行僵硬。增强扫描内见斑片状强化影。具有典型的周围神经改变，但缺乏特异性，仍须与神经根增粗的疾病如淋巴瘤、结节病、神经纤维瘤病 1 型等鉴别；当累及脑实质，须与 MS 及其他传染病和炎症性疾病相鉴别。

PU-2195
脑淀粉样血管病多模态 MR 表现及其与 AD 的关系

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目的 分析淀粉样脑血管病（CAA）的影像学表现，对比影像特征与病理学改变，并探讨 CAA 与阿尔兹海默病（AD）的关系。**方法** 回顾分析 40 例 CAA 的 SWI 检查图像，其中 5 例 3D-ASL 成像、2 例 QSM 成像；分析病变分布及形态学特点，并与年龄、性别作相关性分析；CAA 的 SWI 图像特征与病理学对比分析；勾画感兴趣区 ROI，测量 3D-ASL 图像血流量（CBF）、QSM 图像的磁化率值。 **结果** 病变与年龄呈正相关关系，r 值＝0.526，P＜0.05，与性别无相关；SWI 及 QSM 可清晰显示病变形态学特征，SWI 发现多数病变呈黑环白点征象，部分病灶周围可见稍高信号晕环；3D-ASL 发现

高灌注病灶占 9.71%，余大多数呈低灌注；QSM 较好显示脑铁沉积，发现病灶最高磁化率值超过 0.5 ppm。 **结论** CAA 与年龄高度相关，磁共振 SWI、QSM 及 ASL 可较好地显示病变特征；3D-ASL 及 QSM 检查对灌注异常、铁过载脑区监测具有重要意义；CAA 与 AD 互为疾病发展的促进因素，合并发生可加快病情发展。

PU-2196

Can thickness asymmetry of entorhinal cortex help distinguish different subtypes of amnestic mild cognitive impairment?

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Purpose:
To use structural magnetic resonance imaging (MRI) to investigate whether asymmetry of entorhinal cortex (ERC) can help distinguish two subtypes of amnestic mild cognitive impairment (aMCI), including single domain and multiple domain of aMCI (aMCI-s, aMCI-m).
Methods and Materials:
A total of 95 participants were recruited: 26 normal controls (NC), 29 with aMCI-s, 22 with aMCI-m and 18 with Alzheimer's disease (AD). They were scaled according to the Clinical Dementia Rating (CDR), Mini-Mental State Examination (MMSE) and Montreal cognitive assessment (MoCA). In addition, the diagnosis of aMCI-s and aMCI-m were met Petersen's diagnostic criteria. FreeSurfer was applied to T1WI images for measuring thickness, surface and volume of ERC corresponding to the Talairach standard brain atlas. The asymmetry index was defined as AI=(Li-Ri)/(Li+Ri), where Li and Ri represented value of ERC of the left and right hemisphere. Analysis of covariance (ANCOVA) was performed to analysis the difference among four groups, in which thickness, surface and volume of ERC were dependent variables respectively. Subject gender, age, years of education and estimated total intracranial volume were used as covariates.
Results:
The thickness of right ERC and the thickness asymmetry of ERC presented significant difference between aMCI-s and aMCI-m. Meanwhile, the alteration of thickness asymmetry in aMCI-s reached a trend towards significance compared to NC. In addition, there was a trend involving the ERC thickness and volume: NC>aMCI-s>aMCI-m>AD. However, the surface of ERC was fairly preserved in patients with aMCI and AD.
Conclusion:
Our findings suggested that the thickness asymmetry of ERC had an advantage in distinguishing aMCI-s from NC and aMCI-m.

PU-2197
MiR-146a 经 Aβ 环节干预中晚期 APP/PS1 双转基因小鼠的神经影像对照研究

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【目的】
运用 GE Signa Excite HD 3.0T 磁共振对 APPswe / PSEN1de9 基因突变型小鼠、非转基因野生型小鼠、经 miR-146a 干预治疗后的转基因小鼠进行磁共振常规序列扫描。通过后处理计算小鼠海马区的 T2WI 信号强度比值，半定量分析海马区的铁含量，判断双转基因小鼠在 miRNA-146a 干预治疗下的疗效改变。
【方法】
使用 GE Signa Excite HD 3.0T 超导磁共振扫描仪对中期（12 月）的 APP/PS1 双转基因小鼠正常组、AD 组、干预组各 5 只和对应的晚期（18 月）的各组小鼠各 4 只行 T2WI 冠状位扫描。应用 GE Medical Systems Functool 4.4 工作站软件进行图像后处理，并测得 1mm² ROI 下的海马与同侧肌肉的 T2WI 信号强度比值。采用方差分析比较中晚期双转基因小鼠正常组、AD 组、干预组的试验数据，P<0.05 为差异有统计学意义。
【结果】
12 月 AD 组小鼠的 T2WI 信号强度比值为(1.8120±0.3080),正常组(2.2631±0.2859),干预组(2.3414±0.2002)；18 月 AD 组小鼠的 T2WI 信号强度比值为（2.0887±0.1395），正常组（2.9474±0.1121），干预组（2.6549±0.0366）；中晚期小鼠的 AD 组 T2WI 信号强度比值均较正常组减低（P=0.021，P=0.0004），随着 miRNA-146a 干预治疗，中晚期小鼠中干预组的 T2WI 信号强度比值均较 AD 组增高（P=0.009，P=0.00003），两者间的差异均具有统计学意义（P<0.05）。
【结论】
运用 3.0T 磁共振 T2WI 成像对海马区的 T2 信号强度比值进行对比分析，有助于判断 APP/PS1 双转基因小鼠的成模情况及其在 miRNA-146a 干预治疗下的疗效，为临床阿尔茨海默病患者的新型诊疗方案提供更多的支持。

PU-2198
高度疑似神经元核内包涵体病一例

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目的 神经元核内包涵体病（neuronal intranuclear inclusion disease，NIID）是一种罕见的神经系统变性病，其主要特征为在中枢和外周神经系统、内脏中可以发现广泛存在的嗜酸性神经元核内包涵体。该病的临床表现多种多样，包括痴呆、肢体无力、感觉异常、自主神经功能紊乱、意识障碍、共济失调等。由于其临床表现多样，缺乏特异性，因此在临床上极易造成漏诊、误诊。但本病的影像学表现具有高度的特异性，对于疾病的提示有重要意义。本病的最终诊断主要依靠皮肤活检，在脂肪细胞、成纤维细胞及汗腺细胞中均可发现神经元核内包涵体。本病按照发病年龄分为婴幼儿型、青少年型、成年型。我们分析一例成年型神经元核内包涵体病的临床表现及影像学特征，旨在提高对本病的理解和认识，尽早做出正确诊断。

材料与**方法** 本例患者为老年男性，因精神症状入院，入院后行体格检查及头部核磁检查，因患者家属拒绝，未行皮肤活检。

结果 本例患者以共济失调起病，主要临床表现为行走不稳、尿失禁、智力减退，此次入院时出现强哭强笑，嗜睡等精神症状。查体发现双手震颤，定向力、记忆力减退，四肢腱反射减低或消失。头核磁检查示全脑萎缩，可见特征性的皮髓交界处广泛连续 DWI 高信号，另可见弥漫脑白质病变，这些表现与文献报道的 NIID 的经典表现高度一致。未观察到明显的小脑萎缩和小脑异常信号。

结论 本病的特征性影像学表现为沿着皮髓质交界处分布的线样 DWI 高信号，常双侧对称，始于额叶，随病程加重范围扩大，但即使在疾病晚期，仍不会累及白质深部。此外，白质病变多见，部分患者中可观察到小脑或弥漫性脑萎缩、小脑蚓旁 FLAIR 高信号。以脑炎症状起病的，可观察到脑水肿、脑膜强化等脑膜炎性表现。当临床表现提示本病或特异性不足时，掌握其影像学特点尤为重要。

PU-2199

Decreased functional connectivity in frontostriatal circuit in Parkinson disease

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Background:
The pathological hallmark of Parkinson’s disease is the degeneration of dopaminergic nigrostriatal neurons, which in turn leads to depletion of striatal dopamine. The aim of this study was to investigate whether dopaminergic dysfunction in Parkinson’s disease was associated with impairments in functional connectivity across frontostriatal pathway.
Methods: In the present study, 21 patients with PD who met the UK Bank criteria for the diagnosis of PD (Hughes et al., 1992) were recruited in the present study. The HC group comprised 20 volunteers who were matched for age and gender ratio. Regions in the frontostriatal circuit were defined as regions of interest (ROIs) determined by from FSL Harvard-Oxford Atlas. ROI-to-ROI functional connectivity (FC) within this frontostriatal circuit was performed.
Results: No significant differences were found in gender, age and MMSE between HC and PD. ROI-to-ROI analysis found that significant decreases FC of the bilateral putamen were found in the left supplementary motor area and the left superior frontal gyrus, which was further correlated with the motor impairment of this disease.
Conclusion: These findings provides further insight into the understanding the neural mechanisms of motor dysfunction in PD.

PU-2200

基于 MRI 的早期未用药帕金森病患者皮层形态学改变与血脂水平相关性研究

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目的 探讨早期未用药帕金森病患者大脑皮层形态改变与血脂水平之间的相关性。
方法 本研究所有数据均来自 PPMI 数据库，共纳入 43 例早期未用药帕金森病患者（H&Y 分期：1-2 期；MMSE 量表评分＞24；无其他神经或精神疾病），所有患者均行 T_1WI 结构成像扫描。采用 CAT（Computational Anatomy Toolbox）工具包对 MRI 数据处理分析，得到皮层厚度、皮层绝对平均曲率（AMC）、脑沟深度等皮层形态学参数。基于 SPM12 软件，应用 TFCE 方法分别对全脑上述参数与血清高密度脂蛋白、低密度脂蛋白、总胆固醇和甘油三酯浓度进行回归分析，年龄、性别及运动症状评分作为协变量，多重比较误差采用 FWE（family wise error）方法进行校正。
结果 早期未用药帕金森病患者右侧额上回、右侧缘上回、左侧顶下小叶局部皮层厚度与血清高密度脂蛋白浓度成正相关（r=0.601，r=0.589，P＜0.05，FWE 校正）；右侧舌回、楔叶局部脑沟深度与血清低密度脂蛋白浓度成负相关（r=0.712，r=0.643，P＜0.05，FWE 校正）。余大脑皮层形态学参数与血脂水平均无显著相关性。
结论 本研究初步发现血脂水平的异常可能导致早期未用药帕金森病患者大脑皮层厚度、脑沟深度等形态学的改变，为进一步探讨脂质代谢在帕金森病发病机制中的作用提供了影像学证据。
[关键词] 帕金森病；磁共振成像；皮层形态学；血脂

PU-2201

神经元核内包涵体病的磁共振特征分析

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目的 探讨神经元核内包涵体病的磁共振表现特征
材料与方法 回顾性分析临床确诊的 8 例神经元核内包涵体病的磁共振表现及临床资料。其中男性 5 例，女性 3 例，年龄 61-81 岁，平均年龄 71 岁。8 例患者均行磁共振检查。
结果 患者临床表现为认知障碍、椎体外系病变、精神行为异常等。所有患者磁共振表现均为阳性。具体表现为双侧额顶颞枕叶广泛的深部白质及脑室旁白质长 T1 长 T2 信号，FLAIR 呈高信号，边界不清，绵延呈片状，Fazekas 分级呈 II 级及以上脑白质病变。全脑不同程度萎缩。DWI 表现为广泛皮层下 U 型纤维呈高信号，包括额叶、丁叶、颞叶和枕叶，部分患者累及胼胝体及外囊；呈“绸带征”或“飘带征”改变，较具特征性。ADC 图未见明显弥散受限征象。部分病例的随访结果显示 DWI“绸带征”不随时间变化而消失。
结论 神经元核内包涵体病的磁共振表现颇具特征性，病理与影像间有一定相关性，结合临床、影像资料可做出定性诊断。

PU-2202

The clinical value of synthetic magnetic resonance imaging using in Alzheimer’s disease

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Purpose
The aim of this study was to explore the value of synthetic magnetic resonance imaging (MAGnetic resonance image Compilation, MAGiC) in diagnosis of Alzheimer’s disease (AD) and quantitative evaluating the disease severity.

Methods

Twelve AD patients (4 men and 8 women; age range, 54－81 years) and fifteen age-matchednormal controls(5 men and 10 women; age range, 56－82 years) underwent MRI on a 3.0T MRI scanner (Signa Pioneer, GE Healthcare, Milwaukee, USA). The scan protocal included 3D fast spoiled gradient recalled echo and MAGiC (scanning time = 5min 8sec). MRI data processing was performed using FreeSurfer, Matlab R2015b and ITK-SNAP v3.6.0. Finally, these parameters were obtained including the volume, T1 values, T2 values, PD values of bilateral cerebral cortex, cerebral white matter, cerebellum cortex, cerebellum white matter, thalamus,caudate, putamen, pallidum and hippocampus. The values of these parameters in AD and normal controls were compared using independent-samples T test. The mini-mental state examination (MMSE) was performed on all subjects by a neurologist. The correlation between the values of these parameters and MMSE was assessed by the Pearson correlation test.

Results

Compared with normal controls, the volume of bilateral caudate was significantly increased in AD patients (left t = 2.897, p = 0.008; right t = 2.447, p = 0.022), but the volume of bilateral hippocampus was significantly decreased in AD patients (left t = -3.120, p = 0.005; right t = -2.800, p = 0.010). T1 values of left caudatewere significantly decreased in AD patients (t = -2.148, p = 0.042). T2 values of bilateral hippocampus (left t = 2.565, p = 0.017; right t = 2.506, p = 0.019) and PD values of right hippocampus (t = 2.471, p = 0.021) were significantly increased in AD patients. There were significantly negatively correlations between MMSE with T2 values of bilateral hippocampus (left r = -0.855, p = 0.000; right r = -0.602, p = 0.038); PD values of bilateral hippocampus (left r = -0.755, p = 0.005; right r = -0.624, p = 0.024); T1 values of left hippocampus (r = -0.707, p = 0.010), right cerebral cortex (r = -0.719, p = 0.008) and bilateral cerebral white matter (left r = -0.760, p = 0.004; right r = -0.795, p = 0.002).

Conclusion

MAGiC is feasible for diagnosis of AD and could potentially help to monitor the condition of patients with AD in a shorter scanning time.

PU-2203

海马内部结构清晰度评分在颞叶癫痫中的应用

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目的 探讨海马内部结构（HIA）清晰度评分在颞叶癫痫定侧中的应用价值。

资料与方法 HIA 清晰度评分系统主要用于对海马的非对称性进行分级，以评估 HIA 和癫痫发作定侧的一致性。回顾性分析 58 例单侧颞叶癫痫患者的海马内部结构清晰度评分。比较 HS+致痫海马、HS-致痫海马和非致痫海马每侧海马的平均 HIA 分数，统计学方法应用 Kruskal-Wallis 单因素方差分析法。应用双侧 Mann-Whitney U 检验评估组间成对差异性。应用平均 HIA 非对称性分数预测癫痫发作侧，视频脑电图显示真正的癫痫放电侧，统计学方法采用 Logistic 回归模型。用每组病人的各种非对称性阈值来评价其敏感性和特异性。

结果 58 例颞叶癫痫患者符合纳入标准。12 例患者（21%）MR 上显示有海马萎缩和/或海马信号异常的 HS 征象（HS+），46 例患者（79%）MR 上没有显示 HS 征象（HS-）。各组海马的单个海马 HIA

分数和平均 HIA 分数存在明显差异，其中，HS+组 HIA 分数最低，非致痫组海马的 HIA 分数最高。Logistic 回归分析显示 HIA 非对称性分数平均值是癫痫发作定侧很好的预测指标（ß= 3.93508, $p < 0.001$）。HIA 非对称性在进行 HS+/HS-状态调整后仍然具有显著差异性（ß= 3.8854, $p < 0.001$）。HS-患者中，当 HIA 非对称性分数平均值等于或大于阈值 0.5 时，正确预测癫痫发作定侧的特异性为 95%~100%，敏感性为 40%~45%。HS+患者中，0.3 的阈值，敏感性为 85%，特异性为 100%。

结论 HIA 非对称性能够预测颞叶癫痫病人发作侧。建议使用 HIA 评分系统，其对于颞叶癫痫患者定侧具有很高的特异性和较好的敏感性。

PU-2204
成人型神经元核内包涵体病的影像学表现与病理对照

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目的 探讨成人型神经元核内包涵体病的影像学特征并与病理进行对照，提高对该病的诊断水平。
方法 回顾性分析经病理证实的 5 例神经元核内包涵体病的病理学与影像学特征，包括肿瘤的发生部位、形状、大小以及在 CT 和 MR I 上的影像学表现。
结果 5 例病例中，CT 平扫均为脑白质低密度，在 T1WI 上为低信号，在 T2WI、T2FLAIR 上脑白质为高信号,DWI 在皮髓质交界处（ U 型纤维）持续性高信号，有称为皮层下火焰征、尿布征,增强未见明显强化。
结论 神经元核内包涵体病具有一定的特征，掌握其影像学征象可提高对该病的诊断水平。

PU-2205
颞叶癫痫患者与正常人海马体积 MRI 测定及 MRS 对比研究

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目的 运用 MRI 对颞叶癫痫与正常人海马体积测定及 MRS，评价两者的海马体积及 MRS 相应改变的关系。**材料及方法** 取得健康志愿者 50 例和收集我院神经内科住院及门诊颞叶癫痫患者 80 例的双侧海马体积及 MRS 结果，并根据年龄各分为三组，比较分析健康志愿者各年龄组海马体积和 MRS 的变化并计算出均值。根据海马体积的结果对 80 例颞叶癫痫患者年龄组细分为海马硬化组、非硬化组，并与正常对照组进行比对，进行定位、定侧诊断。**结果** 1.男性青年组左、右海马体积青年组大于中年组、老年组有统计学意义（$p<0.05$），中年组、老年组左、右海马体积无统计学意义（$p>0.05$）。男性 40 岁以后双侧海马体积逐渐萎缩，与年龄增长呈反比。2.女性青年组和中年组左、右海马体积大于老年组有统计学意义（$p<0.05$），青年组、中年组左、右海马体积无统计学意义（$p>0.05$）。女性 60 岁以后双侧海马体积逐渐萎缩，与年龄增长呈反比。3. 50 例健康志愿者三组间 NAA/Cr+Cho)、NAA/Cr、NAA/Cho 峰下面积比值进行比对，青年组>中年组>老年组有统计学意义（$p<0.05$），说明随着年龄的增长，海马的神经元就逐渐减少，同时就伴有反应性胶质细胞增生。4. MRI 海马体积测定对 80 例颞叶癫痫患者诊断阳性率为 71.3%，定侧诊断率 90%。5. MRS 对 80 例颞叶癫痫的诊断阳性率是 95%，定侧的诊断率 97.4%。6. MRI 海马体积测定的诊断阳性率、定侧诊断敏感度低于 MRS。
结论 1. MRI 海马体积的测量对颞叶癫痫具有较高诊断及定侧诊断，对早期海马硬化或海马体积未见萎缩患者诊断率不高。2.MRS 是根据脑组织内生物浓度变化功能成像，对早期海马体积萎缩不

明显或未见萎缩患者能做出准确的判断，明显提高诊断阳性率、定侧诊断 3.二者联合应用提高了对颞叶癫痫诊断的敏感性，为临床提供定侧、定位的辅助诊断信息。

PU-2206

帕金森病不同运动障碍亚型的临床特征比较

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目的 比较不同运动障碍亚型帕金森病患者的临床特征，提高对帕金森病运动障碍的认识。**方法** 收集帕金森病患者 76 例，据统一帕金森病评估量表（UPDRS）评分分为震颤为主型 PD（TD-PD）组 19 例、姿势异常步态障碍为主型 PD（PIGD-PD）组 47 例和不确定型 PD 组 10 例，记录所有 PD 患者年龄、性别、受教育程度、病程、起病年龄、起病部位、UPDRS 评分、改良 Hoehn-Yahr 分期评分、简易精神状态监测量表（MMSE）评分、蒙特利尔认知量表（MoCA）评分、老年抑郁量表（GDS-15）评分、汉密尔顿焦虑量表（HAMA）评分、汉密尔顿抑郁量表（HAMD）评分、生活质量量表（PDQ-8）评分、Berg 平衡量表（BBS）评分、冻结步态量表（NFOG-Q）评分、便秘临床评分量表（CCS）评分和便秘生活质量量表（PAC-QOL）评分，统计分析 TD-PD 组和 PIGD-PD 组临床特征的差异。**结果** 性别构成在两组之间存在显著性差异（$P<0.05$），TD-PD 组男性较多，而 PIGD-PD 组女性较多。两组患者 UPDRS-Ⅰ、UPDRS-Ⅱ、改良 Hoehn-Yahr 分期、GDS-15、HAMA、HAMD、BBS、NFOG-Q、PAC-QOL 评分均存在显著性差异（$P<0.05$）。**结论** 帕金森病不同运动障碍亚型之间存在明显的异质性，提高对运动障碍亚型的认识利于分组诊治。

PU-2207

T2WI 在帕金森氏病的诊断价值

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目的 通过比较 T2WI 正常老人中脑黑质致密带的宽度与帕金森氏病人黑质致密带的宽度，比较两者之间的差异，得出 T2WI 在帕金森氏病中的诊断价值。材料与**方法** 测量临床明确诊断的 34 例帕金森氏病人的黑质致密带宽度，按照年龄与性别等一一匹配的方法，随机选取 34 个正常老人的 T2WI 图像，测量其中脑黑质致密带的宽度，首先采用方差齐性检验，然后采用两独立样本 t 检验的方法，进行统计学分析。**结果** 34 个正常老人与 34 个帕金森氏病人的黑质致密带宽度没有明显的统计学差异。**结论** T2WI 对帕金森氏病没有明显的诊断价值，在临床确诊的帕金森病人中，其 T2WI 表现可能有一定的参考价值。

PU-2208

复发缓解型多发性硬化默认网络动态功能连接变异性分析

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目的 探讨复发缓解型多发性硬化（RRMS）患者默认网络（DMN）的动态功能连接（dFC）变异性模式与疾病状态的关系。
方法 使用 siemens 3.0 T MRI 采集 18 例急性期、26 例缓解期 RRMS 患者和 23 例性别、年龄相匹配的正常对照组(HC)静息态功能磁共振（fMRI）数据。选择后扣带回为种子点定义 DMN，基于滑动时间窗及聚类分析方法，比较三组间 DMN 内动态功能连接变异性模式差异，并分析差异脑区与临床参数之间的相关性。
结果 基于种子点方法构建的 DMN 主要包含双侧楔前叶/扣带回、双侧额上中回、双侧颞上中回、左侧角回。DMN 的 dFC 变异性组间比较发现，相比正常对照和急性期 RRMS 患者，缓解期 RRMS 组在左侧颞上回(L.STG)、左内侧额上回(L.MSFG)和右侧颞中回(R.MTG)显示过度增加的 dFC 变异性。与缓解期 RRMS 相比，急性期 RRMS 在 L.STG、L.MSFG、右内侧和旁扣带回(R.MCPG)、R.MTG 均显示过度稳定的变异性（dFC 变异性降低）。使用 k 均值聚类识别瞬时功能连接状态，得到 DMN 最优聚类数为 2，在状态 2 中相比于 HC 组，急性期 RRMS 在 L.STG、L.MSFG、R.MTG 功能连接降低，R.MCPG 功能连接增加；而缓解期仅在 R.MTG 显示较 HC 组功能连接减低。而在状态 1 中仅发现急性期 RRMS 的 L.MSFG 较 HC 组功能连接降低。相关分析发现，缓解期 RRMS 组 L.MSFG 的 dFC 变异性系数(0.14± 0.02)与病程之间呈正相关(r=0.582，P= 0.003)；急性期 RRMS 患者组 R.MTG 的 dFC 变异系数(0.12± 0.02)与病程之间呈正相关(r=0.509，P= 0.044）。
结论 缓解期 RRMS 患者 DMN 内存在过度增加的 dFC 变异性，可能是维持 DMN 功能稳定的有限代偿机制，而急性期 DMN 脆弱性增加且因时间状态而异。

PU-2209
2 型糖尿病患者静息态及嗅觉任务态脑功能磁共振研究

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目的 糖尿病相关认知障碍指代谢紊乱和微血管病变所致的大脑高级功能障碍，可被归类为轻度认知障碍（ MCI）或痴呆。糖尿病患者的痴呆风险是非糖尿病人群的 1.5-2.5 倍，早期诊断有助于延缓认知衰退进程。嗅觉功能受损与遗忘型轻度认知功能障碍（ aMCI）可作为认知损害的早期诊断指标。 2 型糖尿病（ T2DM）增加嗅觉功能损伤的风险，但目前尚未有其嗅觉环路相关的影像学研究。本研究旨在探讨 T2DM 患者静息态及嗅觉任务态脑活动改变与认知功能改变的关联。 方法 研究对象包括认知正常的 41 名 T2DM 患者（包括 24 名男性，年龄： 51±9 岁，教育程度： 14±3 年）及 36 名正常志愿者（包括 18 名男性，年龄 50±7 岁，教育程度： 14±4 年）。收集详细的临床信息以及神经心理学量表，同时运用嗅觉功能测试仪进行嗅觉阈值、识别和记忆评分，对嗅觉任务态功能磁共振成像结果进行分析，得到嗅觉相关脑区的激活情况及组间差异，并以正常志愿者激活脑区为感兴趣区，进行静息态功能连接分析。 结果 T2DM 组嗅觉阈值评分明显低于正常志愿者组（分别为 8.7±3.2 与 11±2.5， P = 0.001）。任务态功能磁共振结果显示两组嗅觉神经环路相关脑区均被激活，组间分析显示 T2DM 组左侧海马及海马旁回激活程度较正常志愿者组减低，而双侧眶额回激活程度增加（ P <0.05， AlphaSim 校正）。功能连接分析提示 2 型糖尿病患者组双侧海马、内嗅皮层及杏仁核，与双侧眶额回间的功能连接均减弱（ P <0.05，AlphaSim 校正）。相关性分析显示，嗅觉神经环路内部功能连接减弱与 2 型糖尿病患者包括记忆力、注意力和执行功能在内的认知损伤相关。且左侧海马和左侧眶额回间功能连接与 2 型糖尿病患者餐后 2 小时胰岛素呈正相关。 结论 嗅觉任务态脑功能及静息态功能连接已经出现改变，可以作为认知衰退的早期影像学预警指标，而保存胰岛 β细胞功能有助于患者认知功能的保护。

PU-2210
遗忘型轻度认知障碍脑灰质扩散张量成像特征研究

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目的 既往研究多是利用扩散张量成像（ＤＴＩ）研究脑白质特性以评估遗忘型轻度认知障碍 （ａＭＣＩ）和阿尔茨海默病（ＡＤ）患者。 文中应用 ＤＴＩ 中的平均扩散率（ＭＤ）评估 ａＭＣＩ 和 ＡＤ 患者灰质微观结构完整性的损伤特征，从而判断其转化规律。 方法 回顾性分析南京大学医学院附属鼓楼医院 ２０１４ 年 １ 月至 ２０１６ 年 １２ 月期间 ３０ 例符合 Ｐｅｔｅｒｓｅｎ 标准的 ａＭＣＩ 患者（ａＭＣＩ 组）、３０ 例 ＡＤ 患者（ＡＤ 组）以及 ３０ 例正常对照组（ＣＮ 组）测量的全脑灰质 ＭＤ 值，构建灰质水分子平均扩散率网络，计算小世界网络特性，并与神经心理学评分进行相关性分析。 结果 与 ＣＮ 组相比，ａＭＣＩ 和 ＡＤ 组的灰质水分子平均扩散率网络显示出异常的小世界特性，即聚集程度较高和路径长度较长，反映了灰质微结构的损伤，且 ａＭＣＩ 患者网络的平均连接度低于ＣＮ 组，但高于 ＡＤ 组，差异均有统计学意义（Ｐ＜０．０５）。 包括双侧海马和边缘系统的 １１ 个枢纽脑区灰质 ＭＤ 值和蒙特利尔认知评估量表得分呈负相关（Ｐ＜０．０５）。 结论 ａＭＣＩ 脑灰质的水分子扩散特征有助于发现 ＡＤ 前期患者，并反映神经退行性疾病脑微观结构的破坏。

PU-2211
DKI 在不同运动障碍亚型帕金森病脑灰质核团微观结构的研究价值

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采用扩散峰度成像(diffusion kurtosis imaging，DKI)量化不同运动障碍亚型帕金森病（Parkinson's disease，PD）患者及正常对照组灰质核团的 DKI 各参数值，探讨 DKI 各参数值的微结构变化及不同运动障碍亚型临床异质性表现。**方法** 对 97 例 PD 及 83 例正常对照组进行常规序列及 DKI 序列检查。根据运动症状分为两型：PIGD 型（57 例）及 TD 型（40 例）。经图像后处理生成 FA、MD、Da、Dr、MK、Ka 和 Kr 图，分别测量灰质核团的各参数值，并对所得数据进行统计分析。**结果** PD 中，TD 型的首发症状以震颤为主；而 PIGD 型 PD 的首发症状以强直、运动迟缓及步态障碍为主；TD 型的 MMSE 评分较 PIGD 型高（$P<0.05$）；且改良 Hoehn-Yahr 病情分级较轻（$P<0.01$）；这两型 PD 在发病年龄、性别构成、起病侧、病程等方面对比无统计学意义（$P>0.05$）。与正常对照组对比，①PIGD 型及 TD 型各核团 MD 值、Da 值及 Dr 值均明显降低，而 Ka 值升高，有统计学差异（$P<0.01$）；②PIGD 型黑质网状带、TD 型黑质网状带、黑质致密带、壳核和苍白球 MK 值升高，有统计学差异（$P<0.05$）；③PIGD 型壳核、尾状核头 Kr、TD 型尾状核头 Kr 值降低，有统计学差异（$P<0.05$）；④TD 型与 PIGD 型对比壳核的 MK 值有统计学差异（$P<0.05$）；⑤余核团的参数值无统计学差异（$P>0.05$）。PIGD 型和 TD 型各灰质核团的各参数值与病程、MMSE 评分及改良 Hoehn-Yahr 病情分级之间均无统计学上的相关性（$P>0.05$）。**结论** TD 型与 PIGD 型 PD 在首发疾病、典型症状方面具有明显的异质性。DKI 参数可以较敏感地量化不同运动障碍亚型 PD 患者灰质核团微观结构的细微变化。

PU-2212
帕金森患者数字 N-Back 工作记忆功能磁共振研究

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目的 近年来，帕金森病人认知功能障碍受到大家重视，认知障碍被认为是一种独立的非运动方面的障碍，并在转化为帕金森痴呆的关键作用，到目前为止，PD 患者记忆障碍方面研究较少，我们期望利用 N-back 方法发现帕金森病人在工作记忆中的网络功能障碍。
方法 轻度认知功能障碍 PD 患者 17 例，剔除 4 名未做反应和反应异常的被试，PD 患者入组 13 例（平均年龄 63.8 岁，M：F=7:6），和 10 例匹配良好的对照组（平均年龄 63.2 岁，M：F=6:4）采用 N-BCK 评估工作记忆，利用 SPM12 对正常组被试和病人组被试的 N-back 数据（2-back+3-back>0-back）进行了 T 检验，设置 p 值为 0.005，未矫正，激活团块阈限为 10 个体素。
结果 相比于病人组，正常组被试显著激活了左脑的旁海马回、颞上回、颞横回、海马、边缘叶、枕上回等脑区；相比与正常组，病人组被试显著激活了右脑的额中回、中央后回、顶上小叶、顶下小叶、楔前叶以及左脑的额中回等脑区。
结论 因记忆难度或注意需求增加，执行相同的功能需枕-颞-额-顶叶中多个区域共同协调一致，多个区域共同参与调节功能，各脑区在功能上相互联系。

PU-2213
认知训练改善 MCI 患者 认知功能的静息态 BOLD-fMRI 研究

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目的 利用静息态 BOLD-fMRI 探索 MCI 患者大脑默认网络（Default Mode Network，DMN）与执行控制网络（Executive Control Network ， ECN）功能连接的改变与认知功能改善之间的关系；**方法** 将 40 例 MCI 患者及 20 例正常认知受试者分为三组，将 40 例 MCI 患者分成实验组和对照组，实验组每周一进行一次认识训练辅导，每次约 1 小时，并要求实验组患者每周二至周日在家完成当周训练任务，持续 12 周。对照组及正常认知组不做干预，实验组干预前后、对照组及认知正常组 2 周前后分别进行多认知域量表采集及静息态 BOLD-fMRI 扫描；**结果** 干预组在经过认知训练后，患者脑默认网络（DMN）与执行控制网络（ ECN）间的连接显著增强，且这种改变与患者整体认知功能改善显著相关。**结论** 认知训练能在一定程度上改善 MCI 患者的认知能力及日常生活活动能力。

PU-2214
基于 CT 的 DESH 量表评分在特发性正常压力脑积水患者中应用

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目的 探讨 CT 对特发性正常压力脑积水患者 DESH 征评分的应用价值。
方法 回顾性分析 29 例可疑 iNPH 患者临床及影像学资料，所有患者治疗前均行头颅 CT 及 MR 检查。分别对样本的头颅 CT 及 MR 图像进行 DESH 量表评分，比较 CT 与 MR 的 DESH 量表各参数的一致性。

结果 iNPH 患者 CT 与 MR 的 DESH 量表各评分参数组内相关系数如下：ICC_{EI} 为 0.928，$ICC_{侧脑室评分}$ 为 0.905，ICC_{CA} 为 0.855，$ICC_{CA\ 评分}$ 为 0.743，$ICC_{侧裂池评分}$ 为 0.983，$ICC_{凸面挤压评分}$ 为 0.984，$ICC_{局部脑沟评分}$ 0.814，$ICC_{DESH\ 总分}$ 0.914。
结论 CT 的 DESH 量表各参数评分与 MR 的 DESH 具有良好的一致性，头颅薄层 CT 的三维重建可应用于 iNPH 患者 DESH 量表评分。

PU-2215

Longitudinal Microstructural Changes in Traumatic Brain Injury Rat: a Diffusion Kurtosis Imaging, Histology, and Behavior Study

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shanghaijiaotongdaxuefushudiliurenminyiyuan

Objective: This study aimed to assess the longitudinal brain microstructural changes in traumatic brain injury (TBI) rat using Diffusion Kurtosis Imaging (DKI).

Methods: DKI was performed in a group of 5 rats at pre-injury, 3 day, 14 day and 28 day after TBI. The DKI parameters were measured in bilateral cortex, hippocampus, and callosum. Another four groups of 5 rats were used as brain Immunohistochemistry (IHC) analysis of neuron (NeuN), astroglia (GFAP), microglia (Iba-1), and myelin (MBP) in the same area to DKI parameter measurement. Furthermore, two groups of 6 rats underwent a Morris water maze (MWM) test at 28 day after TBI. The DKI parameters, IHC results, and MWM test results were compared longitudinally or between TBI and control group.

Results: Compared with baseline, the TBI rat had higher mean kurtosis (MK), higher mean diffusion (MD) value in ipsilateral perilesional cortex and hippocampus, lower fractional anisotropy (FA) value in callosum (P<0.05). The TBI group showed higher staining of GFAP and Iba-1, and lower IHC staining of NeuN and MBP in all ipsilateral ROIs (P<0.05). There was no significant difference in the contralateral ROIs in DKI parameters or IHC results. The MWM test revealed lower platform crossing times in the probe test (P<0.05).

Conclusion: Our study indicated that there were longitudinal changes in DKI parameters, accompanied by multiple pathological changes at different time points following TBI. And MK is more sensitive to detect microstructural changes especially in grey matter than MD and FA.

PU-2216

SWI 与 DWI 在多发性硬化中的应用价值

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目的 探讨 SWI 与 DWI 在多发性硬化中的应用价值。
方法 回顾分析 10 例确诊的复发缓解型多发性硬化患者的 MR 资料。扫描序列为平扫轴位 T1WI、T2WI、SWI、DWI 及增强轴位 T1WI，将直径>5 mm 的病灶纳入研究对象，观察各个病灶的 SWI 及 DWI 图像特点以及测量病灶平均 ADC 值。
结果 1、SWI 图像分析：16 个病灶伴行静脉，4 个病灶内可见静脉穿行。病灶周边为低信号环者 32 个，病灶呈不均匀低信号者 22 个，10 个病灶表现为均匀低信号。2、DWI 图像分析：低信号与等信号病灶的 ADC 值分别为(113．2±9．1)×10-5～(165．1±6.1)x10-5mm2／s，二者差异有统计学意义(F=55．10，P<0．05)；结节性与环形强化病灶 ADC 值分别为(111．7±11．3)x 10-5～(137．7±13．0)×10-5 mm2／s，二者差异有统计学意义(F=62．35，P<0．01)；融合与分散病灶 ADC 值分别为(146．2±6.4)×10-5～(110．4±11.6)×10-5 mm2／s，二者差异有统计学意义(t=9．20，P<0．01)。

结论 1、SWI 对脑内静脉、铁沉积显示敏感，结合常规 MRI，SWI 有助于全面、客观评价病情演变和监测临床治疗效果，提高对 MS 病理发生机制的认识；2、ADC 值的定量分析在解释 MS 各种病灶的病理变化、监测其病程时有一定的价值。

PU-2217
扩散峰度成像在帕金森病早期诊断中的应用价值探讨

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扩散峰度成像在帕金森病早期诊断中的应用价值
选取 2017 年 9 月至 2018 年 9 月经山西医科大学第一医院 PD 专科确诊的原发性早期 PD21 例，H-Y 分级 1-2.5 级，同一时期招募年龄、性别相匹配的 20 例健康志愿者作为对照，所有受试者均行头颅 MRI 平扫及 DKI 扫描，测量各受试者的双侧红核、黑质、尾状核头、苍白球、壳核、丘脑的各向异性分数(fractional anisotropy，FA)、平均弥散峰度(mean kurtosis，MK)、平均弥散率（mean diffusivity，MD），分析组间有差异的脑深部灰质核团，并计算核团 DKI 参数与临床症状的相关性，同时 评价 DKI 参数值对 PD 早期患者的诊断效能。 得出**结论** 磁共振 DKI I 技术对检测 PD 早期患者脑内灰质核团的 早期患者脑内灰质核团的 病理改变具有一定应用价 值，其中双侧壳核的 FA 值对 PD 早期患者诊断的敏感性较高， 双侧黑质的 MK 值则有较高的特异性。

PU-2218
基于 ADC 值鉴别华勒氏变性及腔隙性梗死

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目的：华勒氏变性(WD)患者的脑干锥体束异常信号常被误诊为缺血性病变。本研究的目的是比较华勒氏变性与腔隙性脑梗死的表观扩散系数(ADC)值，以提高诊断准确性。
材料与方法：回顾性收集我院 2016 年 12 月至 2019 年 1 月单侧脑干华勒氏变性患者 27 例，其中男 17 例，女 10 例，平均年龄(65.85±9.12)岁。本研究同时纳入 24 例年龄、性别匹配的单侧脑干腔隙性脑梗死患者，分为急性腔隙性脑梗死组(AL, 13 例)和慢性腔隙性脑梗死组(CL, 11 例)。所有受试者均接受常规 MRI 序列和弥散加权成像(DWI)。由两名放射科医师(5 年、20 年)分别测量病灶侧及对侧的 ADC 值(ADC_{WD}、ADC_{AL}、ADC_{CL})，然后通过将病灶侧 ADC 值除以对侧 ADC 值计算出 ADC 值的比值(rADC)。采用 SPSS 21.0 对数据进行统计分析，对于非正态分布的 rADC 计量资料采用中位数（25 四分位数，75 四分位数）表示，三组间比较采用多组样本资料的秩和检验，组间有统计学意义再采用两独立样本的秩和进行比较，并且用 Bonferroni 进行矫正。检验水准 a=0.05，即 P<0.05 差异有统计学意义。
结果：组间年龄、性别差异无统计学意义。中位数 $rADC_{WD}$[1.24(1.15, 1.35)]高于 $rADC_{AL}$ [0.78(0.71, 0.84)]，但低于 $rADC_{CL}$ [1.50 (1.28, 1.68)] ($\chi 2 = 20.328$, $P < 0.01$)。Bonferroni 检验正确后，秩和检验显示 $rADC_{WD}$ 与 $rADC_{AL}$ 差异有统计学意义(P <0.001)， $rADC_{WD}$ 与 $rADC_{CL}$ 差异也有统计学意义(P =0.002)。
结论：通过计算出 ADC 值的比值有助于区分华勒氏变性与急性或慢性腔隙性脑梗死。

PU-2219
磁敏感加权成像在认知功能障碍脑铁沉积中的价值研究

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目的 应用磁敏感加权成像(SWI)比较阿尔茨海默病(AD)患者、轻度认知障碍(MCI)患者及正常对照组脑铁沉积的差异。**方法** 收集就诊于本院经临床确诊为 AD 的患者 31 例,男 17 例,女 14 例,年龄 61-81 岁,平均年龄 70.2 岁；MCI 患者 20 例,男 10 例,女 10 例,年龄 63-82 岁,平均年龄 72.1；正常志愿者 60 例,男 30 例,女 30 例,年龄 37-82 岁,平均年龄 62 岁。行颅脑常规磁共振检查除外脑梗塞、脑出血、脑肿瘤、颅脑手术及脑外伤等神经系统疾病。行颅脑 SWI 检查,于 SWI 校正相位图上分别测量各组红核、黑质、尾状核头、苍白球、壳核、丘脑、海马及颞叶皮层相位值,用单因素方差分析评价正常组脑组织不同年龄阶段的 SWI 相位值的差异显著性**结果** 1）AD 患者、MCI 患者及正常志愿者红核、黑质、尾状核头、苍白球、壳核、海马及颞叶皮层的相位值差异有统计学意义(P<0.05),丘脑的相位值在三组间差异无统计学意义(P>0.05)。2）AD 组与 MCI 组比较：红核、黑质及壳核相位值差异有统计学意义(P<0.05)；AD 组与正常对照组比较：红核、黑质、尾状核头、苍白球、壳核、海马及颞叶皮层相位值差异有统计学意义(P<0.05)；MCI 组与正常对照组比较：壳核、海马及颞叶皮层相位值差异有统计学意义(P<0.05)。**结论** SWI 技术可以定量分析脑内铁沉积的变化规律,是一种简单、安全、无创的检查方法,具有较好的可重复性,可用于鉴别 AD 患者、MCI 患者及正常人脑铁沉积的差异,为较早诊断 AD 及 MCI 并预防 MCI 发展为 AD 提供一种新的无创的动态监测方法和可靠的生物学指标。

PU-2220
基于 T2 FLAIR 变化（信号及面积）鉴别华勒氏变性及腔隙性梗死

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目的: 缺血性脑卒中患者脑干锥体束高信号强度常被误诊为缺血性病变。本研究的目的是比较华勒氏变性(WD)与腔隙性脑梗死患者脑干面积变化和信号强度的差异。
材料与方法: 回顾性收集我院 2016 年 12 月至 2019 年 1 月单侧脑干华勒氏变性患者 27 例，其中男 17 例，女 10 例，平均年龄(65.85±9.12)岁。将 24 例年龄、性别相匹配的单侧脑干腔隙性脑梗死患者纳入本研究，分为急性腔隙性脑梗死组(AL, 13 例)和慢性腔隙性脑梗死组(CL, 11 例)。所有受试者均接受常规 MRI 检查。每位病人的患侧脑干面积(AR_{WD}, AR_{AL}, AR_{CL})和信号强度(SI_{WD}, SI_{AL}, SI_{CL})分别由两名放射科医生(5 年和 20 年的工作)测量两次。脑干面积比值(rAR)的计算方法是将病变的一侧脑干面积除以对侧脑干面积，同法计算信号强度比值(rSI)。采用 SPSS 21.0 对数据进行统计分析，对于正态分布的 rAR 及 rSI 计量资料采用均数加减标准差表示，三组间比较采用方差分析，组间有统计学意义再采用 Post hoc Tukey 法进行两两比较。
结果:计算出脑干面积比值 rAR_{WD}(0.82±0.13) 是小于 rAR_{AL} (1.01±0.05)和 rAR_{CL}(0.98±0.04) (F=52.87, P＜0.01). rAR_{WD}和 rAR_{CL} 之间有显著差异(P <0.01) ，rAR_{WD} 和 rAR_{AL}之间也有显著差异(P <0.01).
计算出信号强度比值 rSI_{WD} (1.23±0.13) 是大于 rSI_{CL} (0.81±0.07)，但是小于 rSI_{AL} (1.31±0.16). rSI_{WD} 和 rSI_{CL}之间有显著差异(P <0.01), 但是 rSI_{WD} 和 rSI_{AL} 之间无明显差异(P =0.155).

结论：T2 FLAIR 信号强度比值有助于鉴别华勒氏变性与慢性腔隙性梗死。华勒氏变性患者的患侧脑干萎缩可作为鉴别急性或慢性腔隙性脑梗死与华勒氏变性的鉴别依据。

PU-2221
多发性硬化症的 MRI 特点及 MRI 增强病灶数目与炎症因子水平的关系研究

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目的 探讨多发性硬化症（MS）的磁共振成像（MRI）特点，分析 MRI 增强病灶数目与炎症因子[干扰素-γ（INF-γ）、白细胞介素-17（IL-17）]、抑炎因子[白细胞介素-10（IL-10）、白细胞介素-27（IL-27）]水平的关系。
方法 回顾性分析 66 例 MS 患者临床资料，分析其 MRI 特点。根据患者头颅 MRI 增强病灶数目将其分为 A 组（MRI 增强病灶数目≤3 处）和 B 组（MRI 增强病灶数目＞3 处），比较各组血清炎症因子（INF-γ、IL-17）、抑炎因子（IL-10、IL-27）检测结果差异，经 Pearson 线性相关分析法分析 MS 患者 MRI 增强病灶数目与血清 INF-γ、IL-17、IL-10、IL-27 水平的关系。
结果 MS 患者病灶多分布于胼胝体周围（29.1%）、双侧脑室周围（27.2%）及双侧半卵圆中心（23.5%）处。MRI 图像多见大小不一，呈不规则团块状或融合成条带状、片状形态病灶；侧脑室病灶垂直于侧脑室长轴呈 T1 低信号，T2、FLIAIR 呈高信号，可见较典型的“直角脱髓鞘征”；增强扫描可见脑干和侧脑室旁病灶部分强化部分不强化。B 组血清 IL-17、INF-γ检测结果均明显高于 A 组，血清 IL-10、IL-27 检测结果则明显低于 A 组，差异均有统计学意义（P均＜0.05）。Pearson 线性相关分析法分析结果显示，MS 患者 MRI 增强病灶数目与血清 IL-17、INF-γ水平均呈正相关（r=0.713,0.681,P均＜0.05），与 IL-10、IL-27 水平均呈负相关（r=-0.526,-0.627,P均＜0.05）。
结论 MS 有其 MRI 影像特点，可为临床诊断提供依据；MS 患者 MRI 增强病灶数目与血清炎症因子、血清抑炎因子均关系密切，需引起重视。

PU-2222
神经纤维瘤病Ⅰ型脑内影像学表现探讨

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目的 探讨神经纤维瘤病 I 型（NF1）患者脑内影像学表现。**方法** 回顾性分析 16 例临床确诊 NF1 患者头颅影像学资料。16 例行常规 MRI 平扫(T2 WI、T1 WI、FLAIR)，5 例加扫 MRI 增强扫描，3 例加扫 DWI 检查，1 例加扫 MRS；6 例加扫 CT。**结果** 11 例病变表现为基底节受累的 T2/FLAIR 高信号，其中 1 例单侧，10 例双侧；累及丘脑 5 例，脑干受累 4 例；脑内病灶形态呈斑片状，T2WI 序列共检出 27 个，FLAIR 序列共检出 39 个。仅 1 例患者病灶呈肿块样改变；5 例增强未见强化；1 例 MRS 显示 Cho/Cr:1.93，Cho/NAA:2.52；DWI 未见弥散受限。其中 6 例 CT 平扫显示阴性。**结论** NF1 患者在颅脑具有特征性 MRI 表现，基底节好发，FLAIR 序列较 T2 序列检出病灶更具有优势；磁共振在 NF1 患者基底节病变的检出及定性、随诊方面具有明显优势。

PU-2223

糖尿病患者静息态脑功能网络分析

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目的：运用静息态功能磁共振成像（Resting-state Functional Megnetic Resonence Imaging, rfMRI）脑功能网络分析技术，探讨 2 型糖尿病（Type 2 Diabetes mellitus，T2DM）患者的脑功能网络改变。方法：本研究前瞻性收集 24 名 T2DM 患者与 27 名健康志愿者进行 3.0T MRI 扫描，获得受试者的 rfMRI 数据。将自动解剖标签（Automated Anatomical Labeling, AAL）模板定义的 90 个大脑区域作为复杂网络的节点，利用 pearson 相关建立 90 个节点之间的相关关联。选定阈值，构建病变组和对照组受试者的无向网络，得到量化的网络指标——平均效率，聚类系数、节点度分布和模块化组织。结果：在不同的阈值条件下，病变组脑功能网络的全局效率及平均聚类系数较对照组变小（$p<0.05$）；病变组节点度大于 8.5 的节点较对照组少；病变组的脑功能网络模块数较对照组多，且病变组每个模块的组分都发生了改变。结论：T2DM 患者脑功能网络的全局效率及聚类系数下降，T2DM 患者脑功能网络的模块数量及各模块组分发生改变，提示 1）T2DM 患者脑功能连接受损，2）与疾病相关的某些功能皮层发生改变和重组，局部脑区可能出现功能代偿，3）脑功能网络分析技术为 T2DM 患者提供了无创性评估中枢改变的新方法。

PU-2224

视-膈发育不良的 MR 影像学特征及临床认识

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目的：视-膈发育不良（SOD）指一种罕见的前脑中线结构发育异常，以儿童发病多见，包括透明隔缺如及视觉传导通路发育不良，常合并其它脑内发育异常。本文通过探讨、总结视-膈发育不良的影像学特征和临床表现，旨在提高临床工作中对该病的认识，协助临床及早诊疗。
方法：回顾性分析本院 8 例经临床、影像证实的视-膈发育不良患者的资料，总结其临床表现和影像学特征。临床表现主要关注患儿是否有视力障碍、癫痫发作、发育迟缓及垂体功能异常等病史。MRI 检查包括颅脑 MRI 平扫（T1WI、T2WI、FLAIR）、扩散加权成像(DWI)、视神经及垂体 MRI 平扫；在横轴位及冠状面观察有无透明隔缺如、脑实质发育畸形，利用矢状面及冠状面观察视路（包括视神经、视交叉、视束）有无发育异常、垂体形态及位置，DWI 观察脑实质有无弥散受限改变。
结果：本组 8 例患者女性 5 例、男性 3 例，年龄为 1-8 岁，中位年龄 5 岁；临床多表现为视力障碍、癫痫发作、生长迟缓等。影像学上根据透明隔缺如程度、视路发育不良情况、脑实质发育畸形、垂体形态及位置等情况，将视-隔发育不良（SOD）共分为 3 型；本组病例中视-隔发育不良Ⅰ型 4 例（最常见）、Ⅱ型 3 例、Ⅲ型 1 例。其中视-隔发育不良Ⅰ型 MRI 表现为透明隔部分缺如，1 例合并灰质异位；Ⅱ型 MRI 表现为透明隔完全缺如，两侧侧脑室融合扩大，2 例合并胼胝体变薄，1 例视神经和 1 例视束形态变细；Ⅲ型 MRI 表现为透明隔部分缺如，胼胝体扁小，视束变细且伴垂体发育不良（腺垂体小、神经垂体异位）。
结论：视-隔发育不良（SOD）临床上容易误判，当患儿合并视力障碍、生长迟缓等临床表现时，应考虑到该病可能，颅脑、视神经及垂体磁共振（MRI）联合检查对于诊断 SOD 具有重要的价值，其特征影像学表现为透明隔部分或完全缺如、视路发育不良及合并脑内其他畸形。认识和准确诊断该疾病有助于临床选择最合理的治疗方式，稳定病情和改善患儿生存质量。

PU-2225

An analysis of MRI characteristics and risk factors in patients with central pontine and extrapontine myelinolysis after orthotopic liver transplantation

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Objective: To analyze risk factors for different MRI manifestations and characteristics of the initial and follow-up images of patients with central pontine and extrapontine myelinolysis (CPEPM) or central pontine myelinolysis (CPM) after orthotopic liver transplantation (OLT).
Material and Methods: The characteristics of the initial and follow-up MR images of 7 patients with CPEPM or CPM were collected and analyzed. Fluctuations of serum sodium, serum potassium and ammonia, regarded as risk factors, were observed.
Results: Symmetric hyperintensity was seem in brain stems in all the 7 patients on T2WI and DWI, and in extrapontine areas in 3. 2 patients with CPEPM suffered persistent hyperammonemia after surgery. Serum ammonia returned to normal level after operation in the 4 patients with CPM. Extrapontine myelinolysis (EPM) occurred first, followed by CPM in 1 case , whereas CPM and EPM occurred simultaneously in the other 2. The follow-up MR of the patients with higher fluctuation in serum electrolyte showed more lesions.
Conclusion: The persistent hyperammonemia may play an important role in the pathogenic mechanisms of CPEPM. The sequence of CPM and EPM occurrence presents in 2 ways in patients with CPEPM. The magnitude of serum electrolyte changes may be related with the prognosis of lesions.

PU-2226

白质微结构完整性和脑自发活动改变介导胰岛素抵抗对 2 型糖尿病患者认知障碍的影响

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目的： 2 型糖尿病与认知障碍有关，而其背后的神经机制，特别是白质改变，仍有争议。本研究探讨糖尿病患者白质微观结构完整性和血氧合水平依赖性波动的变化，探讨这些变化是否能调节或调节糖尿病相关特征对认知障碍的影响。
方法： 本前瞻性研究于 2016 年至 2018 年期间，包括 55 名 2 型糖尿病患者（30 名男性和 25 名女性；平均年龄 53.2 岁）和 40 名非糖尿病对照受试者（17 名男性和 23 名女性；平均年龄 51.9 岁）。收集详细的神经心理评估、临床和生化信息、弥散张量成像和静息状态功能磁共振成像。比较两组患者白质的分数各向异性（fa）、平均扩散率（md）和低频波动幅度（alff），提取其与临床参数和认知评估的相关性和中介分析。
结果： 尽管糖尿病患者的总体认知状态没有明显下降，但胼胝体、左侧扣带回、双侧额叶和左侧颞叶的 FA 下降，右侧扣带回、双侧额叶和右侧顶叶的 MD 升高，而白质胼胝体膝关节 ALFF 升高（GRF

校正，体素 P 值<0.001，聚类 P 值<0.05）。同时，胼胝体中的 Fa 介导了胰岛素抵抗对糖尿病患者（β=0.0907，95%自举置信区间[0.00081，0.2261]）和非糖尿病对照组（β=0.3124，95%自举置信区间[0.0040，0.6468]）执行功能的影响。而仅在非糖尿病对照组，ALFF 可减缓 FA 对执行功能的影响（β=-0.3025，P=0.0163）。

结论：2 型糖尿病患者存在结构完整性和白质激活的改变，在胰岛素抵抗引起的认知障碍过程中起到调节和调节作用。

PU-2227

一例粘多糖贮积症 II 型（MPS II）早期进行性神经系统表型的影像学特点分析

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目的：探讨粘多糖贮积 II 型（Mucopolysaccharidosis II, MPS II）早期进行性神经系统表型的影像学表现。

方法：回顾性分析在复旦大学附属儿科医院就诊的 1 例 MPS II 型患儿的影像资料并进行分析和总结。

结果：男性患儿，患儿四岁时在我院因打鼾行腺样体削切术。后发现患儿双手指弯曲并逐渐加重，当时未重视。7 岁时我院就诊时考虑结缔组织病，临床表现为爪形手，上肢僵直，身材矮小，面容丑陋，智力低于正常患儿；肌电图示轻度肌源性损伤；肌肉活检示炎性细胞散在；B 超提示双腕关节积液，关节滑膜病变。8 岁时我院风湿科就诊，患儿双手指、腕、肩、膝关节均有功能受累，头颅 MRI 提示异常，腹部 B 超示肝脏肿大，心脏超声示主动脉瓣及二三尖瓣轻度反流，会诊后考虑粘多糖病可能。追问病史，父母非近亲结婚，但患儿母亲的祖父母为姑表近亲结婚。进一步做尿糖胺聚糖（GAG）检查高于正常。基因检测示 IDS 基因突变，可能导致粘多糖型。该患儿 8 岁时，头颅 MRI 示大脑白质多发异常信号，脑内血管周围间隙扩大；头颅 DTI 示半卵圆区白质纤维束减少；胸部平片检查示双侧锁骨增粗，双侧肋骨胸骨端变细呈“飘带征”；双手正位片示掌骨近端、指骨远端变尖，尺桡骨干骺端倾斜稍呈 V 形；四肢长骨正位片示双侧股骨远端干骺端增宽；脊柱全长正侧位片未见明显异常；双侧股骨及左膝关节 MRI 未见明显异常。

结论：粘多糖贮积 II 型，也称作亨特综合征（Hunter syndrome），是一种 X 连锁的累及身体多系统的疾病，其特征在于身体多个器官内 GAG 的聚集，绝大多数受影响的是男性。根据发病年龄和进展速度，分为早期进行性和缓慢进展性两种表型。早期进行性中枢神经系统受累是儿童群体中最重要的特征，该表型可能是缓慢进展性表型的两倍多。MPS 的神经系统典型影像学表现包括扩张的血管周围间隙，白质病变，脑积水，脑萎缩和颈椎管狭窄伴或不伴脊髓压迫或脊髓病变。

PU-2228

肥胖与食物动机的神经机制：ALE 荟萃分析

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目的：肥胖被定义为由于消耗和消耗卡路里之间的不平衡而导致的身体脂肪过度积累。神经系统调节人类的食欲和食物摄入，包括肥胖个体。然而引起肥胖者食欲过大和食物摄入的神经机制仍不清楚。本研究的目的是通过荟萃分析近年来大脑对不同食物刺激的功能成像，确定大脑区域对肥胖受试者、正常体重受试者、野营中食物图片的反应更为活跃的同时，并评估饥饿状态和食物能量含量

的调节作用。**材料与方法**:本实验在 Pubmed 数据库以(fMRI OR PET) AND (food OR nutrition) AND (pictures OR images or vision) AND (Obesity OR Obese OR Overweight)为搜索关键词，入组标准为必须包含正常组及肥胖组，都是对食物图片进行任务态脑功能成像，为了评估饥饿状态和食物能量含量的调节作用，必须提取饥饿状态和饱足状态之间的激活对比坐标，或是对高热量食物和高热量食物的图片的反应坐标。**结果**：最终入组 11 篇文献，通过 ALE 分析显示，12 组间（肥胖>正常体重志愿者）肥胖对食物图片的反应比对非食物图片的反应更强的区域。分别位于左额内侧回、左豆状核等区域。组间（正常体重志愿者>肥胖）对食物和非食物图片的大脑反应差异位于左侧海马体、右侧海马旁回和左侧脑岛。对于高热量和低热量食物图片，组间（肥胖>正常体重志愿者）大脑反应的差异位于海马旁左侧，右腹侧后外侧核和右尾状体。在饥饿和饱足状态下看照片 ALE 分析显示，对食物和非食物图片的大脑反应差异有 8 个区域位于左壳核、右前扣带回、左丘脑、左额上回、右小脑前叶、右额上回、左颞上回、左额下回。**结论**：利用 ALE 荟萃分析，我们确定了肥胖和健康正常体重个体在观看食物图片时激活的的大脑区域。在进行荟萃分析时，我们还确定了与饥饿状态和食物能量含量调节相关的大脑区域，对于肥胖形成的神经机制进行了初步探讨。

PU-2229

STAGE 成像方案对早期原发性帕金森病的研究价值

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目的：应用 STAGE 成像方案对原发性帕金森病早期诊断提供影像学依据，为进一步指导临床对帕金森的评估及预后提供新的参考标准。
方法：应用西门子 Prisma 3.0T 磁共振对经临床诊断为早期帕金森的 24 名患者行脑部 STAGE 扫描，另选年龄及性别等与帕金森组相匹配的健康者纳入健康对照组，通过 STAGE 后处理软件，分别得到两组对应 SWI、tSWI、QSM 等序列，进一步获取高清对比磁敏感图及定量磁化率参数，分析帕金森患者与正常对照者在黑质核团磁敏感及定量磁化率参数差异性。
结果：所有 48 位受试者均成功行 STAGE 扫描。帕金森组与对照组 tSWI 与 SWI 相比，tSWI 更能清晰显示大脑深部核团结构，特别可以较为清晰的显示和分辨黑质致密部、网状部；24 例健康对照组中 4 例（16.67%） “燕尾”征消失，24 例帕金森病患者中 23 例（95.83%）“燕尾征”消失；QSM 具有极高的信号对比度和分辨率，通过后处理软件分析得出定量磁化率，帕金森组黑质明显高于正常对照组，差异有统计学意义（P = 0.000）
结论：STAGE 方案是可以通过一次扫描同时生成 SWI、tSWI、QSM 等多模态新的 MRI 成像方法，通过 tSWI 可以提供比 SWI 更高分辨率的磁敏感图像；QSM 获取磁化率参数可以对早期帕金森患者进行定量分析，为临床对早期帕金森的诊断提供客观的影像学依据，为进一步指导临床对早期帕金森患者病情评估及预后提供新的参考标准。

PU-2230

Pathophysiological evaluation in a case of Wernicke’s encephalopathy by multimodal MRI

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Background To report a patient with Wernicke’s encephalopathy using multimodal MRI including conventional MRI, DWI, ASL and MR Spectroscopy(MRS).

Methods A 50-year-old woman of Wernicke's encephalopathy with a history of cholecystectomy and acute pancreatitis was given MRI scans including DWI, MRS and ASL pre- and post- thiamine treatment.
Results Two weeks after admission, the patient's condition rapidly improved. The typical MRI findings and lesions in frontal cortex at baseline, disappeared or resolved partially. The reduced ADCvalue in part of the thalamus lesion, the elevated cerebral blood flow in the frontal cortex, and the lactate doublet peak in the right thalamus lesion and cerebral spinal fluid, all resolved after treatment.
Conclusions The combination of conventional MR imaging with DWI, MRS, and ASL, offers a powerful diagnostic tool and better understanding of the pathophysiological mechanisms.

PU-2231
发作性运动诱发性运动障碍动脉自旋标记灌注磁共振成像研究

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目的 采用多个标记后延迟时间（post labelling delay，PLD）的动脉自旋标记（arterial spin labelling，ASL）灌注磁共振成像研究发作性运动诱发性运动障碍（paroxysmal kinesigenic dyskinesia，PKD）患者的脑灌注特征。
方法 收集 47 例 PKD 病人和 42 例正常对照，ASL 使用 3.0 T 磁共振伪连续式动脉自旋标记（pseudo-continuous ASL，pCASL）序列进行扫描， 4 个 PLD 分别为，1,400/1,800/2,200/2,600 ms。计算出每个 PLD 对应的脑血流量（cerebral blood flow，CBF）、平均 CBF（CBFmean）以及动脉通过时间（arterial transit time，ATT）。采用 t 检验进行组间比较分析，Pearson 相关分析探讨显著性差异脑区的异常灌注参数值与临床变量的相关性。
结果 PKD 病人组较正常对照组右侧中央前回、右侧颞上回、右侧顶下小叶、左侧海马旁回、左侧额上回以及双侧额中回的 CBFmean 显著降低，未发现 CBFmean 显著增高的脑区。对于 4 个不同 PLD 所探测到的 CBF，CBF1,400 发现的两组间具有显著性差异的脑区最多。PKD 病人组与正常对照组 ATT 的组间比较未发现具有显著性差异的脑区。PKD 组右侧颞上回的 CBFmean 与发病年龄呈负相关(r=-0.428，p=0.003)；右侧顶下小叶的 CBFmean 与疾病病程呈正相关(r=0.453，p=0.001)。
结论 PKD 患者的脑血流动力学存在异常改变，主要表现为包括运动皮层在内的多个皮层区域的 CBF 降低。我们的研究从血流动力学的角度进一步证实了 PKD 的神经机制可能不只是仅仅涉及到基底节、丘脑的异常，包括运动皮层在内的多个皮层区域的异常可能也在 PKD 的神经机制中扮演着重要角色。

PU-2232
老年非酮症高血糖性舞蹈病 75 例临床、影像特点和机制探讨

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【摘要】 目的 探讨非酮症高血糖性舞蹈病的临床、影像特点及可能的致病机制。 **方法** 通过中国知网，万方及维普等全文数据库搜集有关非酮症高血糖性舞蹈病的临床病例报道文献，共获得 22 篇（包含 75 例研究对象）文献，分析每名患者的临床表现、实验室检查、影像学特点及治疗效果，并据此对其发病机制进行探讨。 **结果** 75 例患者均为老年人，均因舞蹈样不自主运动入院，其中 55 例既往糖尿病诊断明确，20 例入院后诊断为糖尿病，发病时血糖水平 11.4-42.8（21.5±4.8）mmol/l，尿酮体阴性；6 例影像学正常，69 例纹状体 CT 早期表现为高密度，可在短时间内消失，MRI T1 呈高信号，数月后信号无明显变化；治疗上采用降低血糖或联合多巴胺受体抑制剂、安定类药物控制舞蹈样症状有效。**结论** 非酮症高血糖性舞蹈病是一特殊的临床综合征，其发病机制尚不清，早期积极治疗多呈良性经过，预后良好。

PU-2233

脑干非肿瘤性病变的 MRI 诊断及及临床决策

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目的：通过对脑干非肿瘤性病变的诊断及鉴别诊断，提示临床及时针对性治疗。
方法：搜集 2017 年 1 月到 2019 年 5 月就诊于山西医科大学第一医院怀疑脑干病变患者 319 例，其中男 180 例，女 139 例，年龄 26-80 岁，平均年龄 63.8 岁；所有患者均为初次发病，症状包括：肢体无力、意识障碍、头晕、呕吐、吞咽困难、癫痫等；所有患者均行头颅磁共振扫描，扫描序列包括 T1WI、T2WI、flair、DWI，扫描图像由两名主治医师进行诊断。
结果：脑梗死 217 例，脑干出血 58 例，脑干脑炎 13 例，桥脑中央髓鞘溶解症 9 例，脱髓鞘病变 31 例，脑干萎缩 18 例；所有病例病灶均为单发。
结论：根据 MRI 表现分析病灶形态、分布、信号特点，对各个疾病进行精确诊断，及时准确指导临床决策，对患者进行对症治疗。

PU-2234

不同剂量急性饮酒对健康人群认知功能影响及扩散峰度成像（DKI）的研究

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目的：研究不同剂量急性饮酒对健康人群认知功能的影响及其与脑白质微观结构扩散峰度成像（DKI）改变的相关性。
方法：选取 25 名健康志愿者随机摄入不同剂量白酒，分别于饮酒开始之前，饮酒后 30 及 60min 完成一系列神经心理学测试量表以及常规 MRI、DKI 扫描。量表包括蒙特利尔认知量表(MoCA)、数字广度测验(DST)及语音流畅试验（PFT）。根据饮酒后 30min 血液酒精浓度(BAC)分组。测量感兴趣区内（额叶、颞叶、半卵圆中心、胼胝体膝、压部及小脑中脚）DKI 参数值，并与不同浓度组饮酒前、后神经心理学量表评分进行相关性研究。
结果：1.不同浓度组饮酒前、后认知功能总体评分 MoCA 及 DST 总分未见明显差异；饮酒后 30 及 *60min DST* 逆序分及 PFT 评分明显降低，且高浓度组降低更明显；饮酒后 60min DST、PFT 评分与酒后 30min 未见明显差异。

2.饮酒后 30min 额、颞叶和胼胝体膝部 FA 值明显升高；BAC 与额、颞叶 FA 值呈正相关。饮酒后 60 与 30min 相比，额叶 FA 值升高，且高浓度组升高显著。饮酒后 30min 额叶和小脑中脚 MD 值较饮酒前明显下降，其中，高浓度组下降最显著；饮酒后 60 与 30min 之间各感兴趣区内 MD 值差异无明显统计学意义。饮酒后 30min 额、颞叶和胼胝体膝部 MK 值较饮酒前明显升高，不同浓度组间 MK 值无明显差异；饮酒后 60 与 30min 相比，中等浓度组额叶 MK 值明显升高，高浓度组额叶和颞叶 MK 值明显升高。

3.饮酒后 30min 额叶 MK 值与 PFT 评分呈负相关，颞叶 MK 值与 DST 总分及 DST 逆序评分呈负相关，FA 及 MD 值与神经心理学量表评分无明显相关性。

结论：1.饮酒后会引起记忆力、注意力及执行功能等认知功能损害，且具有剂量相关性。

2.DKI 能敏感检测出饮酒后脑白质微观结构的变化，其中，MK 值较 FA、MD 值更敏感。

3.饮酒后额、颞叶 MK 值与量表评分具有显著相关性。

PU-2235
基于 TBSS 磁共振扩散张量成像方法对轻微型肝性脑病的研究

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摘要：目的 运用磁共振扩散张量成像（ DTI）基于纤维束示踪的空间统计分析（ TBSS）方法研究轻微型肝性脑病（MHE）患者脑白质微观结构的改变，为 MHE 早期诊断提供帮助。 **方法** 纳入被试 30 例 ，包括 15 例 MHE 患者及 15 例正常人，用 3.0T 磁共振获得全脑 DTI 数据，运用 FSL 软件解算全脑白质各向异性分数（ FA）值，通过 TBSS 方法比较两组间差异。提取患者组有差异脑区的 FA 值与临床指标进行统计分析。 **结果** 与对照组比较 ，MHE 组的胼胝体、左侧丘脑、内囊、额叶及右侧大脑脚等脑区 FA 值减小（FWE 校正，*P<0.05*）。而对照组、MHE 组的 FA 值变化与 NCT-A 时间、DST 评分之间无显著相关性（FWE 校正，*P<0.05*）。 **结论** 基于 TBSS 分析的磁共振扩散张量成像可以敏感地发现 MHE 患者脑白质微观结构的损害，对于解释 MHE 病理生理机制及早期诊断具有一定参考意义。

【关键词】 轻微型肝性脑病 ；扩散张量成像 ； 基于体素的 TBSS 分析
资助基金项目：
1、杭州市卫生科技计划一般（A）类项目 2017A14；
2、浙江省医药卫生一般研究计划项目 2018KY587；
3、杭州市农业与社会发展科研自主申报项目 20191203B101。

PU-2236
经筋疗法促进小儿脑性瘫痪脑白质神经纤维束生长：DTI 表现

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背景与目的：小儿脑性瘫痪简称脑瘫，是指一组持续存在的导致活动受限的运动和姿势发育障碍症候群，这种症候群是由于发育中的胎儿或婴儿脑部非进行性损伤引起的。国际上统计脑瘫的发病率为 1‰ ～5‰，国内脑瘫的发病率为 1.8‰ ～4‰。该病给患者家庭及社会带来极大的负担，已成为严重的公共卫生问题。本研究利用磁共振弥散张量成像技术（DTI）追踪小儿脑瘫患儿经筋疗法治疗后脑白质神经纤维束生长情况，为经筋疗法治疗小儿脑瘫的有效性提供影像学依据。

方法：患儿男 11 岁，出生后被发现“哑巴”，就诊时额头可见隆起筋包，嘴歪 ，智力低下，为 3 岁正常儿童智力水平，行经筋治疗，治疗前及治疗后 2 个月分别进行 3T 磁共振平扫及 DTI 检查。经筋疗法每天 1 次，包括理筋手疗及针刺法，理筋手疗法按 12 经筋循行地图进行“消灶解结”，每日松筋治疗 1 小时，针刺位于百会、四神聪、神庭、风池筋区，留针 1 小时。

结果： 磁共振常规扫描示后颅窝蛛网膜囊肿压迫小脑，小脑发育不良（图 A,B） ，磁共振弥散张量成像（DTI）纤维追综显示额顶叶脑纤维束少(图 C)，经筋手疗及针刺治疗 3 周后，额部筋结包扁平，嘴歪改善，走路平衡及理解能力有明显改善 ，治疗 2 个月后复查 MRI 及 DTI，MRI 脑部表现与治疗前大致相同，但当测定全脑 63 个脑区 FA 值，各脑区 FA 值均较治疗前有显著增高,DTI 纤维追踪显示额顶叶有新的纤维束出现。
结论：DTI 可以直观反映经筋治疗促进小儿脑瘫脑白质神经纤维束生长情况，并可作为疗效定量评估的有效手段。

PU-2237

Altered functional connectivity of brainstem structures: Red Nucleus and Substantia Nigra in migraineurs without aura

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Purpose: Functional connectivity (FC) has been used to investigate the pathophysiology of migraine. Accumulating evidence is pointing to the malfunctioning of brainstem structures: the red nucleus (RN) and substantia nigra (SN) as important factors for migraine without aura. We aimed to identify atypical FC between the RN and SN and other brain areas in migraineurs without aura and to explore the association between the RN and SN connectivity changes and the cognitive test in these patients.
Materials and Methods: Resting-state functional magnetic resonance imaging (fMRI) data were obtained from 30 migraineurs without aura and 22 age-, gender-, and years of education-matched healthy controls. The FC of the brainstem structures were analyzed by using a standard seed-based whole-brain correlation method. The results of the brainstem structures FC were assessed for correlations with other clinical features.
Results: MwoA patients exhibited reduced left RN-based functional connectivity with the left middle frontal gyrus, and reduced right RN-based functional connectivity with the ipsilateral superior parietal lobe and increased functional connectivity with the ipsilateral cerebellum. Additionally, patients with MwoA demonstrated significantly decreased right SN-based function connectivity with right postcentral gyrus, left parietal lobule and left superior frontal gyrus. Hypo-connectivity between the right SN and right postcentral gyrus was negatively correlated with disease duration (r=-0.506, p=0.004). Additionally, increased connectivity of the right RN to ipsilateral cerebellar lobes was positively correlated with headache impact test-6 (HIT-6) scores (r=-o.506, p=0.004).
Conclusion: The present study suggested that migraineurs without aura suffer from disruption in their RN and SN resting-state networks, which are associated with specific clinical characteristics. Taking together, these results may better improve our understanding of the neuropathological mechanism of migraine.

PU-2238

失眠与颈动脉粥样硬化相关性分析

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目的：通过观察失眠人群颈动脉粥样硬化的特点，分析失眠及睡眠相关因素与颈动脉粥样硬化的关系。
方法：本实验纳入 2012 年 10 月至 2013 年 6 月在武汉市第五医院神经内科就诊的患者共 171 例；年龄在 35 至 65 岁之间，按照中国精神疾病分类方案与诊断标准中失眠症的诊断标准，将纳入人群分为失眠与非失眠组。收集纳入患者的一般信息、以及颈动脉内膜中层厚度，及颈动脉斑块等颈动脉超声动脉硬化诊断相关指标情况，采用方差分析及多元性线性回归等统计学方法对数据进行相关性分析。
结果：失眠组患者的颈动脉内膜中层厚度（IMT）和动脉斑块指数明显高于非失眠组患者，结果具有显著的统计学差异（P＜0.05）。与非失眠且睡眠时间＞5 小时的患者相比，失眠且睡眠时间＞5 小时患者的 IMT 及斑块指数增加；而且失眠且睡眠时间≤5 小时患者的 IMT 明显增加，斑块指数更高，结果均有明显统计学差异（P＜0.05）。对失眠和血管危险因素与颈动脉粥样硬化进行相关性分析，结果发现收缩压升高、睡眠总时间减少以及匹兹堡睡眠质量评分（PSQI）升高与 IMT 增加有显著相关性（P＜0.05）,且 PSQI 评分越高，IMT 增厚更加显著（P＜0.05）。
结论：失眠可以增加颈动脉粥样硬化的风险；且睡眠持续时间越短，颈动脉粥样硬化风险更高。收缩压，睡眠持续时间，以及匹茨堡睡眠质量指数（PSQI）评分均与颈动脉粥样硬化的显著相关。

PU-2239

胎儿脑部先天性异常的 MRI 诊断

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目的 探讨胎儿脑部先天性异常的 MRI 诊断方法，提高对脑部先天畸形的早期诊断准确性。
方法：回顾性分析 2017-5 月-2019-3 月临床诊断明确的胎儿脑部先天性发育异常 23 例的影像资料，均于 MRI 检查前完成至少 1 次孕期胎儿超声检查，其中经阴道超声检查 15 例，常规腹部超声检查 7 例；需要 MRI 进一步检查者进行常规 MRI 平扫，包括 T1WI、T2WI 及 DWI 序列，对怀疑存在脂肪信号病灶者加扫 T1WI 压制序列，怀疑胎儿脑部微小出血灶加扫 SWI 序列， T2WI 序列含轴位、冠状位及矢状位，T1WI 序列视病变位置选择轴位或冠状位，DWI（b 值 0,800）常规轴位扫描。
结果：本组胎儿超声初步检查发现脑穿通畸形经 MRI 证实 1 例；脑室扩张伴胼胝体缺如经 MRI 证实 2 例；超声怀疑胼胝体发育异常 5 例 ，MRI 检查发现胼胝体体后部缺如并左侧透明隔部分缺如 1 例，胼胝体压部缺如 2 例，胼胝体体部发育不良并透明隔缺如 2 例；超声怀疑小脑蚓部发育不良 1 例，MRI 检查发现小脑下蚓部发育不全并透明隔局部缺如；超声怀疑脑裂畸形 1 例，MRI 证实系开唇型脑裂畸形并胼胝体压部缺如；超声怀疑后颅窝囊肿 1 例，MRI 发现系 Dandy-Walker 畸形伴脑积水；超声诊断脑积水 1 例，MRI 检查发现系小脑扁桃体枕骨大孔疝并脑积水；超声诊断侧脑室增宽 3 例，MRI 检查发现系透明隔缺如。本组 15 例胎儿脑部先天异常共 23 处病变，超声诊断率约 61%，MRI 诊断率 100%。
结论：超声作为胎儿常规检查，较 MRI 检查经济便捷，无 MRI 的幽闭恐惧症及 SAR 值积累等不良因素；但 MRI 无体位限制，扫描序列丰富，对胎儿脑部先天畸形细微结构显示、解释更全面准确。对

于胎儿神经系统先天异常影像检查，超声结合 MRI，能够对疾病早发现、早诊断，进而为临床及早干预提供有力支撑。

PU-2240

“臼齿”综合征 1 例

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患儿，男，6 岁，以“运动语言发育落后”就诊。
MRI 常规平扫：小脑蚓部体积较小，可见半球间“中线裂”征，小脑齿状核显示尚可，四脑室呈“蝙蝠翼”状，中脑呈“磨牙征”；双侧大脑半球脑实质信号未见确切异常。双侧脑室增宽，双侧侧脑室旁白质较薄。脑沟、裂、池未见增宽加深。中线结构居中。胼胝体形态、大小及信号未见确切异常。
MRI 诊断： 考虑 Joubert 综合征。
讨论： Joubert 综合征是一组病理学特征为小脑蚓部完全或部分发育不全的罕见先天发育畸形，美国统计发病率仅约 1/10 万。其典型神经病理学改变为小脑蚓部发育不良或不发育，齿状核、脑桥基底核及延髓的神经核团发育不良，锥体交叉几乎完全缺如。Joubert 等于 1969 年首次报道。通常认为该病是常染色体隐性遗传性疾病，多见于 AHI1 基因的突变。
Saraiva 和 Baraiser1992 年提出本病的 5 项诊断标准，必须具备小脑蚓部发育不全、张力减退、发育迟缓共三项；异常呼吸、异常眼球运动必须存在至少一项。目前，Joubert 综合征的确诊须依赖影像学与临床，二者缺一不可。“磨牙征”、“蝙蝠翼征”、“裂隙征”均是 Joubert 综合征的典型影像学征象，这些影像学表现均与病理改变相呼应。“磨牙征”是由于小脑上脚纤维缺乏正常交叉，导致小脑上脚增粗并垂直于脑桥中脑结合部，中脑前后径缩短，脚间池加深，在轴位图像形态极似磨牙的侧面观，故称为“磨牙征”。“蝙蝠翼征”是轴位片第四脑室形态如蝙蝠翼状，故而得名。“裂隙征”是由于小脑蚓部严重发育不良或不发育，导致双侧小脑半球紧密相连，中间无正常小脑蚓部结构，只有一细线样脑脊液影，形如裂隙，故称“裂隙征”。对影像表现不典型者，需紧密结合临床进行诊断。

PU-2241

产后抑郁症患者脑镜像同伦功能连接的 fMRI 研究

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目的:探讨产后抑郁症(PPD)患者静息态大脑半球间功能连接性的变化及其与临床严重程度的潜在相关性。
方法：对 28 名 PPD 患者和 25 名分娩后 4 周内的健康产后(HP)妇女进行静息状态功能性磁共振(fMRI)扫描。计算体素水平镜像同伦功能连接(VMHC)，并分析其组间差异及与临床指标之间的相关性。
结果：与 HP 相比，PPD 患者双侧背内侧前额叶皮质(dmPFC)、背侧前扣带回皮质(dACC)和眶额叶皮质(Ofc)的 VMHC 值明显降低(P<0.0 5)。提示 PPD 患者多个镜像脑区之间的功能协调受损。
结论：本研究为 PPD 产妇保健网络相关脑区内异常的半球间连通性提供了证据，并可能有助于进一步了解 PPD 的神经机制。

PU-2242

SBM 在中枢神经系统中的研究进展

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基于表面的形态学（(surface-based morphometry，SBM）是一种对脑结构磁共振图像定量计算的数字图像处理技术。该技术能对高分辨率的磁共振解剖图像进行三维重建并生成展平或胀平图像，进一步计算得到灰质厚度、表面积、体积、曲率等解剖参数。因此，可更精确地显示常规影像检查不能发现的多种神经病变所引起的脑组织形态学改变，对阐明病理机制以及疾病的辅助诊断有重要意义。

PU-2243

弥散张量成像联合 Fugl-Meyer 评分评价针刺治疗脑卒中后运动功能障碍的研究进展

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脑卒中多伴有锥体系、锥体外系及脑灰质的损伤，因此，多数患者伴有不同程度的运动功能障碍，研究表明针刺治疗有助于运动功能的恢复。弥散张量成像（diffusion tensor imaging ,DTI）通过施加多个不同方向的弥散梯度场，能够直观的显示脑白质纤维走向，并运用其各向异性参数能够评估白质纤维结构的完整性及病理变化；Fugl-Meyer 评分法（FMA）是一种基于运动表现的神经系统功能评分方法。因此 DTI 联合 FMA 评分能够在结构及功能水平对于脑卒中后运动功能障碍的严重程度、预后及针刺治疗的机制、疗效做出有效评估，基于此，本文就相关研究进展进行综述。

PU-2244

可逆性胼胝体压部病变综合征的临床和神经影像特征

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目的：分析可逆性胼胝体压部病变综合征（ reversible splenial lesion syndrome，RESLES）孤立性病变的 MRI 表现。方法：对我院 2016 年 8 月至 2019 年 4 月收治的对 11 例可逆性胼胝体压部病变综合征孤立性病变患者的临床病史、影像资料及随访结果进行回顾性分析。结果：3 例为低血糖患者，2 例为癫痫患者，2 例为上呼吸道感染患者，1 例腮腺炎患者，1 例胃部大部分切除患者，2 例为糖尿病患者。头颅 MRI 共同特点为可逆性胼胝体压部孤立性病灶，呈类圆形，部分有“回旋镖征”，边界清楚，胼胝体压部类圆形、边界清楚的孤立结节，T2WI 序列呈稍高信号，液体衰减反转恢复（Fluid attenuated inversion recovery，FLAIR）及扩散加权成像（Diffusion weighted imaging，DWI）序列呈高信号，而相应表观扩散系数（Apparent diffusion coefficient，ADC）序列呈低信号，病灶周围无水肿。结论：可逆性胼胝体压部病变综合征是一种病因复杂、临床症候无特异性、MRI 表现有一定的特征性，结合临床资料，对疾病早期诊断、早期治疗提供依据，对判断预后具有很大价值。

PU-2245

White Matter Structural Differences in OSA Patients Experiencing Residual Daytime Sleepiness with High CPAP Use: A Non-Gaussian Diffusion MRI Study

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Objectives: To investigate white matter (WM) difference in obstructive sleep apnea (OSA) patients with and without residual sleepiness following continuous positive airway pressure (CPAP) treatment by employing diffusion magnetic resonance imaging (MRI) with a continuous-time random-walk (CTRW) model.
Methods: Twenty-seven male patients (30-55 years of age) with OSA received CPAP treatment (≥ 6h/night) for at least 30 days. Based on the Psychomotor Vigilance Task (PVT) results, the patients were divided into a non-sleepy (n=18) and a sleepy group (n=9). High b-value diffusion-weighted images were obtained at 3 Tesla and analyzed using a CTRW model. The differences in CTRW parameters α, β, and D_m, as well as their combinations, between the two groups were investigated using a whole-brain analysis with tract-based spatial statistics and a regional analysis on individual fiber tracts, both with age as a covariate. The CTRW parameters were also correlated with the clinical assessment scores.
Results: In the whole-brain analysis, the sleepy group showed higher α and D_m than the non-sleepy group. In the regional analysis, the two groups showed significant differences in α, β, D_m, or their combinations in a total of twelve fiber tracts. Additionally, moderate to strong correlations between the CTRW parameters and the sleepiness clinical assessment scores were observed.
Conclusion: The observed differences in the CTRW parameters between the two patient groups indicate that WM alterations can be a possible mechanism to explain reversible versus residual sleepiness in OSA patients with identical high level of CPAP nightly use.

PU-2246

轻度脑外伤脑白质纤维束完整性损害磁共振弥散张量成像研究

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目的：本研究基于弥散张量成像(DTI)和基于纤维束追踪空间统计分析(TBSS)，研究轻度创伤性脑损伤(MTBI)患者与正常人全脑白质的扩散张量成像(DTI)的参数变化，分析脑白质束的异常及其与临床表现的关系。

方法:纳入 28 例 MTBI 患者(MTBI 组：GCS, 13-15, 年龄 20-45 岁)与 20 例受教育程度、年龄相匹配的健康者(对照组)行 MRI 和 DTI 扫描。应用 TBSS 方法分析两组受检者脑白质纤维 DTI 的各向异性分数(FA)，并对异常脑白质区进行概率纤维追踪。
结果：MTBI 组与对照组在中央前回、中央后回、扣带回、楔前叶皮层及枕叶皮层外侧上 FA 值具有显著差异（P<0.05）。MTBI 组与对照组在性别，年龄及 GCS 组间无显著差异。
结论:脑白质的完整性降低可能是由于髓鞘缺失，并与轻度创伤性脑损伤患者的神经或认知功能存在一定程度的差异有关。应用 DTI 和 TBSS 可以检测传统磁共振及 CT 检测不到的早期异常损伤，为临床医生更好的解释病人的症状提供的证据。

PU-2247
颅骨单次直接穿刺注血制作兔 SS-CNS 模型的可行性研究

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研究目的 中枢神经系统表面铁质沉积症（superficial siderosis of the central nervous system, SS-CNS）是由软脑（脊）膜、软脑（脊）膜下和室管膜下含铁血黄素沉积所造成的一组综合征。通常认为该病是由于反复多次的蛛网膜下腔出血（SAH ）引起的，近来有文献报道在临床工作中，在对由于或动脉瘤破裂引起 SAH 的 MRI 检查中也可以观察到 SS-CNS 现象，基于此我们提出猜想，单次 SAH 也可能引起脑表面含铁血黄素沉积，但是患者既往可能存在 SAH 的病史。我们采用新西兰兔作为试验动物，利用颅骨单次直接穿刺注射自体动脉血模拟人类的 SAH，并采用 MRI 及病理学检查验证模型，目的在于评价该模型制作方法的可行性，并研究单次注血造成 SS-CNS 的可能性。
研究方法 普通级新西兰兔 38 只，雌雄不拘，全麻后抽取动脉血 2ml 备用，使用颅骨直接穿刺法钻孔将动脉血注入蛛网膜下腔，经 CT 扫描验证 SAH 模型成功与否，在饲养 6-9 月后全麻行使用兔子专业线圈行头颅 3.0T MRI 检查，检查序列为 T1WI、T2WI、SWI，MRI 检查 5 天后，常规麻醉福尔马灌注注取得兔的大脑标本，标本切片后行常规 H-E 染色及普鲁士蓝染色，显微镜下观察脑表面是否有含铁血黄素颗粒沉积。
研究结果 SAH 造模成功兔子 MRI SWI 序列上可以观察到造模部位的线样低信号，普鲁士蓝染色在脑表面观察到蓝色颗粒样物质沉积，在部分兔子可以观察到多部位的含铁血黄素沉积，应用颅骨直接穿刺注血法制作 SS-CNS 模型成功率为 28.9%（11/38）大体标本阳性率为 44%（11/25）,病理检查阳性率为 40%（10/25），MRI 阳性率为 48%（12/25），以三者均为阳性结果为最终阳性病例的阳性率为 40%（10/25）。

研究结论 单次注血可以造成 SS-CNS，应用颅骨直接穿刺注血法建立家兔神经系统表面铁质沉积症模型可行。

PU-2248
乳腺癌患者化疗相关体素度中心性改变与执行功能损害的相关性研究

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目的 应用度中心性（degree centrality, DC）的方法，探讨乳腺癌化疗患者静息态脑网络变化与主观执行能力下降之间的关系。
方法 使用 3.0T MRI 采集未化疗的和主观认知受损的化疗的女性乳腺癌患者的 rs-fMRI 数据，使用连线测验（TMT）评估被试者执行功能。计算两组患者 rf-MRI 数据全脑体素水平的二值化的及加权的 DC 值，比较两组间差异，并探讨差异脑区的 DC 值与 TMT 之间的相关性 （年龄、教育程度为协变量）。
结果 主观认知受损的化疗后乳腺癌患者(n=20)和未化疗乳腺癌患者(n=27)年龄（P=0.207）、教育程度（P=0.455）、TMT-A1(P=0.977)、TMT-A2(P=0.601)和 TMT-B(P=0.356)差异无统计学意义。相较于未化疗乳腺癌患者，主观认知受损的化疗后乳腺癌患者右侧小脑上叶、右侧海马旁回二值化的 DC 值增高，右侧小脑上叶/海马旁回、双侧脑桥加权的 DC 值增高（P=0.01；高斯随机域理论校正，体素水平 P=0.01，簇水平 P=0.05）。控制两组被试者的年龄及教育程度，将差异脑区 DC 值与连线测验量表做偏相关，右侧小脑上叶（P=0.027，R=0.502）、右侧海马旁回（P=0.008，R=0.607）、右侧小脑上叶/海马旁回（P=0.014，R=0.566）、双侧脑桥（P=0.005，R=0.635）的 DC 值与 TMTA2 部分呈显著正相关。
结论 乳腺癌化疗患者存在静息态全脑网络的 DC 值改变，这可能是化疗相关主观执行功能损害的病理生理学基础。

PU-2249

创伤性脊髓损伤的 MRI 评价

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创伤性脊髓损伤是最常见的创伤性中枢神经损伤之一，致残、致死率较高，随着交通及建筑业的发展，脊髓损伤的发生率逐年升高。脊髓损伤的病理生理机制复杂，临床治疗效果不佳，给家庭和社会带来了沉重负担。当常规 T2WI 发现脊髓异常信号时，提示损伤严重不可逆，因此，选择有效、精确、无创的影像学技术早期诊断脊髓损伤，对于临床早期制订正确的治疗方案及对患者的预后至关重要。目前，无创性 MRI 成像技术不仅可以观察脊髓的形态和信号改变，还可以进行脊髓微观结构的研究。本文就扩散张量成像（diffusion tensor imaging, DTI)、扩散峰度成像(diffusion kurtosis imaging, DKI)、磁共振波谱成像（magnetic resonance spectroscopic imaging, MRS)、磁敏感加权成像（susceptibility-weighted imaging, SWI)、定量磁敏感成像(quantitative susceptibility mapping, QSM)、血氧水平依赖性功能磁共振成像（blood oxygenation level dependent fMRI, BOLD-fMRI）等无创性 MRI 技术在创伤性脊髓损伤方面的应用进展进行综述。

PU-2250

乳腺癌患者化疗相关静息态局部一致性改变与记忆功能损害的相关性研究

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目的 探讨乳腺癌患者化疗相关的脑局部一致性改变与记忆功能损害的关系。
方法 采集未化疗的和主观认知受损的化疗后女性乳腺癌患者的 rs-fMRI 数据，使用 Rey 听觉词语学习测试（RAVLT）评估被试者记忆功能。计算两 rs-fMRI 数据在标准频率频带及五个特定频率频

带内肯德尔一致性系数局部一致性（Reho），比较两组间差异，并探讨差异脑区的 ReHo 值与 RAVLT 之间的偏相关性。
结果 化疗后乳腺癌患者(n=20)和未化疗乳腺癌患者(n=27)年龄（P=0.207）、教育程度（P=0.455）及 RAVLT 的即时记忆（P=0.512）、延时记忆（P=0.896）、学习得分（P=0.134）差异无统计学意义，遗忘得分（P=0.032）差异有统计学意义。组间分析显示，乳腺癌化疗患者标准频段内右侧楔前叶/楔叶及 0.027-0.073Hz 频带内右侧楔前叶/楔叶、左侧楔叶/后扣带回局部一致性增高（P=0.01，高斯随机域理论校正，体素水平 P=0.01，簇水平 P=0.05）。将差异脑区 ReHo 值与 RAVLT 做偏相关，标准频带内乳腺癌化疗患者的右侧楔前叶/楔叶 ReHo 值与即时记忆（P=0.011，R=-0.586）、延时记忆（P=0.027，R=-0.521）、遗忘得分（P=0.024，R=0.53）显著相关；0.027-0.073Hz 频带内右侧楔前叶/楔叶脑区与即时记忆（P=0.004，R=-0.648）、延迟记忆（P=0.006，R=-0.62）显著相关，左侧楔叶/后扣带 ReHo 值与即时记忆（P＜0.001，R=-0.747）、延时记忆（P=0.001，R=-0.693）、遗忘得分（P=0.004，R=0.646）显著相关（年龄及教育程度为协变量）。
结论 乳腺癌化疗患者存在静息态 ReHo 改变，这可能是化疗相关记忆功能损害的病理生理学基础。

PU-2251

The relationship between sleep quality and cognitive function in type 2 diabetes mellitus: an fMRI study

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Purpose: To explore the relationship between sleep quality and cognitive function in type 2 diabetes mellitus (T2DM) using the brain resting-state functional MRI (rs-fMRI).
Methods: 40 T2DM patients (20 with good sleep quality (T2DM-GSQ), 20 with poor sleep quality (T2DM-PSQ)) and 18 healthy controls (HCs) underwent rs-fMRI. Normalized regional homogeneity (ReHo) and amplitude of low-frequency fluctuation (ALFF) resting state parameters were measured. The correlations between the Pittsburgh Sleep Quality Index (PSQI), abnormal ReHo/ALFF, and Montreal Cognitive Assessment (MoCA) in T2DM patients was investigated.
Results: Compared with HCs, the T2DM-PSQ group had lower ReHo values in the bilateral middle occipital gyrus (MOG) and left cerebellum, higher ReHo values in the right middle frontal gyrus (MFG), and decreased ALFF values in the bilateral cerebellum. The T2DM-GSQ group had lower ReHo values than HCs in the vermis and left cerebellum, increased ReHo values in the MFG and right superior frontal gyrus, decreased ALFF values in the left cerebellum, and increased ALFF values in the right MFG. T2DM-PSQ group had decreased ReHo values than T2DM-GSQ group in the right precuneus and left MOG, while decreased ALFF values in the right precuneus. In T2DM patients, a negative association was found between PSQI and MoCA, and abnormal ReHo/ALFF values had a significantly negative associated with PSQI.
Conclusions: Our main finding is that poor sleep quality and cognitive dysfunction are interrelated events in T2DM patients highly associated with rs-fMRI outcomes. The long-term effects of T2DM on sleep and cognitive impairment remain to be further elucidated.

PU-2252
经筋疗法“调神醒脑” 相关机制磁共振静息态脑功能成像及 3D-ASL 研究

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目的：利用静息态脑功能成像(rfMRI)及动脉自旋标记(3D-ASL)了解经筋疗法对脑部网络结构及血流改变的影响，为经筋疗法“调神醒脑”的可能效应机制提供影像学依据。
方法：正常青年志愿者 12 人，年龄 23-25 岁，男 6 人，女 6 人，在经筋治疗前后进行脑部 3TMRI 平扫，磁共振静息态功能成像，ASL 扫描，获取相关图像数据，对理疗前后各脑区影像学数据进行自身配对对比，经筋疗法包括理筋手疗及针刺法，理筋疗法于神庭、风池筋区及颞筋区、颈筋区等进行“消灶解结”，针刺采用百会、四神聪筋区留针半小时。
结果：12 名志愿者治疗后均自诉有头脑轻松、眼睛明亮、精神爽快等感觉，磁共振平扫未见异常改变，与治疗前对比，静息态脑功能成像(rfMRI)reho 法观察到治疗后右侧枕叶区激活信号增强，而扣带回，右侧额叶，左侧岛叶信号减弱。ASL 显示经筋手疗治疗后，以下脑区 CBF 增高，治疗前后出现统计学差异，左侧视辐射 P=0.003，左颞中回皮质 P=0.012，右枕叶白质 P=0.045；
结论：经筋治疗后，静息态功能磁共振成像所出现的脑部枕叶区神经元活动一致性增强，及 ASL 所见枕叶区脑血流量增高可能与经筋疗法“调神醒脑”相关作用机制有关。

PU-2253
壁结节在 Rathke 囊肿 MR 诊断中的价值研究

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目的：Rathke 囊肿囊内液体成份多样，MR 表现各异，与鞍内及鞍上囊性病变鉴别困难。旨在探讨壁结节在 Rathke 囊肿 MR 诊断中的价值。方法：回顾性分析 139 例 MR 诊断为鞍内或鞍上 Ratheke 囊肿的病变，分析壁结节出现的概率及 MR 信号特点。结果：79 例经手术及组织病理学证实为 Rathke 囊肿,其中出现壁结节 65 例（82%）；壁结节在 T1 上多表现为低、等或稍高信号，T2 上表现为低信号，其中壁结节为 T1 高信号、T2 低信号共 60 例（76%）。60 例经随访证实病变大小及形态未发生明显变化，临床诊断为 Ratheke 囊肿,病变出现壁结节为 34 例（57%），壁结节在 T1 上多表现为低、等或稍高信号，T2 上表现为低信号。所有病例壁结节在静脉注射造影剂后均未出现强化。结论：壁结节在 Rathke 囊肿 MR 诊断中具有重要意义，尤其对在 MRT1 表现为高信号，T2 上表现为低信号的壁结节，可以作为诊断 Rathke 囊肿的特征性影像表现。

PU-2254
不同注射方案结合不同 KV 在头颈部 CTA 中的可行性研究

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【摘要】目的:探讨不同注射方案结合不同 KV 在头颈部 CTA 中检查的可行性。**资料和方法**：选取 2018 年 9 月至 2019 年 5 月在我院临床怀疑头颈部斑块并行头颈部 CTA 检查的 45 例患者。平均分成分成 A、B、C 三组，三组均在西门子二代双源 CT 下进行扫描，A 组：采用 350 对比剂、100kv、60ml 对比剂，50ml 生理盐水，注射速率 4.5ML/S。B 组 350 对比剂、80kv、对比剂总量 50ml、生理盐水 50ml 注射流率 4.5ml/S,注射方案（A 筒：对比剂 35ml，AB 筒：30ml 混合液，对比剂与生理盐水 1:1 的比例注射，B 筒 35ml 生理盐水）。C 组 350 对比剂、80kv、对比剂总量 45ml、生理盐水 50ml 注射流率 4.5ml/S,注射方案 A 筒：对比剂 36ml，AB 筒：30ml 混合液，对比剂与生理盐水 3：:7 的比例注射，B 筒 29ml 生理盐水）。分别测量 A、B、C 三组的主动脉弓、上腔静脉、头臂干、左侧锁骨下动脉、颈内动脉，基底动脉的 CT 值、SD,同时计算三组的辐射剂量 ED 值、SNR、CNR 值。**结果**:AB 两组的辐射剂量差异有统计学意义 p<0.01,SD,SNR,CNR、HU 差异无统计学意义 P>0.01,AC 两组辐射剂量差异有统计学意义，p<0.01,AC 两组上腔静脉、头臂干、左锁骨下动脉的 SD、SNR、CNR、HU 差异有统计学意义 p<0.01,BC 两组辐射剂量无统计学意义 p>0.01,两组的上腔静脉，头臂干，左锁骨下动脉的 CT 值、SNR、CNR、SD 差异有统计学意义 P<0.01,结果:在头颈部 CTA 成像中，改变其注射方案，降低 KV 值，减少对比剂用量，采用双混合液（对比剂与生理盐水 3:7 比例）可以降低辐射剂量，降低血管线束硬化伪影，提高头颈部血管的显示，提高图像质量，为临床提供更优质的图像质量。**结论**：改变注射方案可优化头颈部 CTA 的图像质量，降低 KV 可降低辐射剂量，减少对比剂用量。

PU-2255
外伤所致蛛网膜下腔出血的临床 CT 分析

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目的：探究外伤所致蛛网膜下腔出血的临床 CT 分析。方法：选取时间段在 2016 年 7 月至 2017 年 1 月，在我院接收治疗的 72 例外伤性蛛网膜下腔出血患者作为观察对象，分析所有患者的检查结果，均采用 CT 检查方式。结果：从积血部位的角度而言，最常见的是显示为 58.3%发生率的脑池积血，相较于其他数据差异具有统计学的意义（P＜0.05）；从疾病分类的角度而言，所有患者中最常见的是显示为 50.00%的发生率的单纯外伤性。结论：在治疗外伤性蛛网膜下腔出血患者的过程中，应当按照患者的真实病情给予相应的治疗，临床医师还需要对患者的 CT 检查特点进行了解。

PU-2256
骨性膝关节炎患者脑功能 MRI 改变与手术前后疼痛的相关性研究

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目的：人工膝关节关节置换术（total knee arthroplasties, TKA）是近年临床常用的治疗人工膝关节置换术（TKA）的手术方法，可以有效缓解患者的关节疼痛并改善膝关节功。但 6-10％的骨性膝关节炎（KOA）患者在 TKA 术后仍存在慢性中重度疼痛。此研究旨在探索 KOA 患者脑功能的改变与手术前后疼痛的相关性。

方法：运用低频振幅（ALFF）及格兰仕因果关系分析（GCA），比较 KOA 患者（n=18）及正常对照组（n=14）静息状态下的脑功能活动差异，以及与 TKA 手术前后疼痛视觉模拟评分（VAS）的相关性。

结果：KOA 患者右侧丘脑 ALFF 值显著减低，右侧中央前回、中央后回、顶上小叶、楔前叶与右侧丘脑的有效连接存在异常（p<0.05, GRF 校正）。相关分析显示 KOA 患者的术后 VAS 评分与右侧丘脑对右侧中央后回的影响呈正相关（r=0.536, p=0.022）；术前 VAS 评分与右侧楔前叶对右侧丘脑的影响呈负相关（r=-0.492，p=0.038）。
结论：KOA 导致的长期慢性疼痛会引起脑功能的改变，进而影响治疗后的疼痛感知，这说明术前对于慢性疼痛的控制是十分必要的，而术前脑功能检查有助于识别术后慢性疼痛高危患者。

PU-2257

胎儿大脑皮质发育畸形的影像-病理对照分析

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目的 分析胎儿大脑皮质发育畸形的产前 MRI 图像特征，并与病理结果对照分析，以总结胎儿 MRI 的诊断价值和图像特征。**方法** 选择 2011 年 1 月至 2018 年 1 月在南京大学医学院附属鼓楼医院行颅脑 MRI 检查者，经引产胎儿病理解剖确诊为大脑皮质发育畸形，将病理解剖结果与产前 MRI 图像对照，回顾性分析胎儿大脑皮质发育畸形的产前 MRI 诊断价值及图像特征。
结果 经引产胎儿病理解剖共诊断胎儿大脑皮质发育畸形 11 例，其中无脑回畸形 4 例，巨脑回畸形 4 例，局部小微脑回畸形 3 例。产前 MRI 诊断准确性为 100%。无脑回畸形产前 MRI 图像特征（n=4）：胎儿孕龄＞24 周，胎儿两侧顶枕沟、矩状沟、中央沟、中央前沟、中央后沟、扣带沟均未见显示，胼胝体发育不良，侧脑室扩张。合并其他畸形：1 例合并小头畸形及脑坏死。巨脑回畸形产前 MRI 图像特征（n=4）：孕龄＞24 周，顶枕沟及矩状沟可见，中央沟、中央前沟、中央后沟、扣带沟均未见显示，见粗大脑回，胼胝体发育不良，侧脑室扩张。合并其他畸形：1 例合并脑穿通畸形。多微脑回畸形产前 MRI 图像特征（n=3）：胎儿孕龄＞25 周，局部大脑皮质见细小脑回，数目增多。合并其他畸形：1 例合并胝体发育不良，脑室扩张，大脑缺血缺氧性脑病；1 例合并胝体发育不良，脑室扩张；1 例合并脑穿通畸形。染色体核型检查结果：11 例胎儿仅 2 例行染色体核型检查，其中 1 例无脑回畸形胎儿染色体微阵列检测发现染色体 6q25.2-q27 存在约 15.5Mb 的 DNA 片段单拷贝缺失，1 例巨脑回畸形胎儿染色体核型正常。
讨论 产前 MRI 可准确诊断胎儿脑组织、脑沟及脑回的发育状况，能明确诊断胎儿大脑皮质发育异常的具体分型及颅脑合并畸形，为产科处理及大脑皮质发育畸形的研究提供可靠依据。

PU-2258

Olfactory function deficiency detected by task-based functional magnetic resonance imaging in a Kallmann syndrome patient: A case report

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The case reported is of a 15-year-old boy admitted to endocrinology department due to secondary sexual characteristics development retardation with olfactory deficiency since 3 years. A diagnostic work-up by endocrinology department identified the presence of Kallmann syndrome (KS) and serious hyposmia. This patient underwent the olfactory threshold test, odor identification test and olfactory task fMRI to evaluate

the olfactory function. Case reports of the activation in central olfactory system in KS patients using fMRI are scarce. While the incidence of KS in the clinical is rare, this case proposes the olfactory fMRI, revealing the activation in the central olfactory system, along with olfactory behavior test and structural MRI, can be useful tools to a multidisciplinary assessment and awareness for KS in clinical practice.

PU-2259

Detectability and Reproducibility of the Olfactory fMRI signal under the influence of magnetic susceptibility artifacts in the Primary Olfactory Cortex

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For human olfactory functional MRI studies, the primary olfactory cortex (POC) suffers severe magnetic susceptibility artifacts, which adversely influences the detectability and reproducibility of the olfactory fMRI data and its clinical applications. The goal of this work is to assess the impacts of the image artifacts on the detectability and reproducibility of the olfactory activation in the POC. The severity of artifacts in the POC were classified into three levels using a Subjective Artifact score (SA_score). The mean temporal signal-to-noise ratio (tSNR) of the fMRI data acquired by a given MRI sequence and olfactory activation (β value) in POC were evaluated and compared to the concurrent activations in the primary visual cortex (Brodmann area 17, BA17) by an odor-visual association paradigm using ninety-nine normal human subjects. Our study revealed that the mean tSNR in POC was above the threshold for reliable detection of the functional activation signal, and, consequently, the mean olfactory activations in the POC were not significantly different from those in BA17. The reproducibility of the activation in the POC was assessed by a random half-split stimulation of a test-retest experiment. The overlap of the activation maps for all the trials (n=1000) in the POC were not statistically different from that observed in BA17. These results show that the detectability and reproducibility of olfactory activation in the presence of susceptibility artifacts in the POC was at similar level of that in the visual cortex.

PU-2260

不同 T2 压脂序列应用于视神经成像的可行性

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在临床中大多数眼眶病变通过磁共振扫描来辅助临床诊疗工作的病例非常的常见，但是如果只采用专科检查技术具有一定的局限性，随着磁共振序列的快速发展和软组织分辨率高的特性，视神经薄层扫描也成为一种新的检查技术并逐渐应用到临床工作中。

随机选择无眼部疾患，无视力障碍，无眼部外伤史的健康志愿者，所有研究对象均告之检查目的并签署知情同意书。
扫描方法：检查采用西门子 MAGNETOM Verio Dot 磁共振设备，12 通道头颈联合线圈。所有志愿者进行磁共振横轴位 fs TSE-T2WI 序列，T2space 序列和 DIXON 序列，以 NOP 平面作为基准线平行于该线进行视神经（眼眶）横轴位扫描，扫描前指导患者闭眼并且不能转动眼球。
测量指标：（1）视神经显示的长度（从球后到达视交叉水平）（包括视神经和视神经鞘）；（2）视神经眶内段的宽径（球后 4mm）；（3）视神经边缘清晰度（清晰锐利光滑/欠清晰/边缘模糊）；
统计学方法：本研究中，计量资料采用均数±标准差表示，计数资料用数值表示，计算百分比。所有统计数据采用 SPSS 统计软件包统计完成。在原始图像上分别测量和计算三种成像方法的 SNR 与 CNR，采用 t 检验，检验 效度 a=0.05，P 值<0.05 为差异有统计学意义。
结果：1.三种 T2 压脂序列均可清晰显示视神经的长度及宽径，与解剖学对比位于 95%可信区间内；
2.spcae 序列信噪比较高，视神经显示边界光滑锐利最清晰，尤其是视神经鞘膜积液对比明显，但是视神经球后段经常出现脂肪信号伪影，和磁共振序列抑制脂肪的原理有关；
3.T2fs 视神经球后段近眼球处压脂不均匀可出现背景信号伪影；
3.dixon 序列容易出现运动伪影，影响图像质量及视神经眶尖段的观察，但是如果患者配合佳，则视神经显示清晰。

PU-2261
儿童及青少年异基因造血干细胞移植后神经系统并发症及影像学表现

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目的 探讨儿童及青少年异基因造血干细胞移植(allo-HSCT)后中枢神经系统并发症(CNS)的类型，与患者免疫状态的关系以及影像学表现。**资料与方法** 回顾性分析我院 11 例 allo-HSCT 后发生 CNS 并发症儿童及青少年患者的临床及影像学资料，分析其并发症类型及相应 CT、MRI 表现。根据免疫状态及并发症的发生时间，将 CNS 并发症分为移植前时期（<allo-HSCT 后 30 天）、移植后早期（allo-HSCT 后 30-100 天）及移植后晚期（allo-HSCT 后>100 天）。**结果**：发生 CNS 并发症移植前时期 2 例，移植后早期 4 例，移植后晚期 5 例。颅内病毒感染 3 例，均表现为皮层下白质多发斑片状 CT 低密度/T2WI 及 FLAIR 高信号灶，1 例可见周边轻度强化。脑血管并发症中脑出血 4 例，均发生于移植前时期及移植后早期，CT 表现为单/多发高密度血肿/出血灶，TIWI 呈混杂高信号影。治疗导致的并发症 5 例，包括可逆性后部脑病综合征（PRES）1 例，MRI 示双侧顶枕叶后部皮层处 T2WI 及 FLAIR 高信号，治疗后临床症状及颅内异常信号消失；放化疗导致脑白质病 4 例，MRI 中 T2WI 和 FLAIR 均表现为双侧室周白质区对称性高信号，增强无强化。移植后晚期中枢神经系统白血病复发 1 例，CT 示脑内皮层、皮层下多发斑片状及肿块样高密度灶。其中 1 例患儿同时患有脑出血、脑白质病及颅内病毒感染特征。2 例患者因 CNS 并发症死亡（1 例出血，1 例 CNS 白血病复发）。**结论** 异基因造血干细胞移植后中枢神经系统并发症类型多样，是患儿发病和死亡的重要原因；早期认识中枢神经系统并发症发生时期及其 CT、MRI 影像学表现对患者成功治疗和良好预后至关重要。

PU-2262

联影 DR770i 自动曝光摄取脊柱全长临床应用的探讨

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目的:分析联影 DR770i 自动曝光控制摄取脊柱全长存在的问题，以达到精确和规范的使用该设备，降低差片率。研究方法：2016 年 8 月-2018 年 8 月在我院放射科行脊柱全长摄影 100 例病例，男 52 例，女 48 例，年龄范围为 11-82 岁；既往无脊柱手术病史；脊柱畸形后凸大于 40° 。结果：联影 DR770i 自动曝光控制摄取脊柱全长，总体来说，该方法自动摄取脊柱全长失败率高于 20%，21 例差片中均是图像清晰度不高，胸椎和腰椎显示不清，不能精确的测 Cobb 角。自动曝光技术在脊柱全长摄影中使用有待进一步改善。讨论：自动曝光控制由于其成像原理，对操作技师要求不高，提高了工作效率，但在脊柱全长摄影中的图像质量欠佳。自动曝光控制成像过程中，主要由电离室反馈中断曝光，被检者身高、体重、肢体厚度都会影响电离室反馈，即图像清晰度不高的重要原因。若取消自动曝光控制，根据被检者的身高、体重、肢体厚度优化一套手动曝光摄影技术方案，在提高图像质量的同时也能将辐射剂量控制在一个更理想的范围。小结：自动曝光控制摄取脊柱全长，在一定程度上，对操作技师的经验要求不高，但总体成像质量有待进一步提高。不使用自动曝光控制情况下，对技师的经验有一定要求，为一次性得到优质的脊柱全长图像，联影 DR770i 自动曝光控制摄取脊柱全长方案有待优化。

PU-2263
稳定期 COPD 患者静息态脑神经血管耦合变化的研究

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目的:慢性阻塞性肺病(COPD)患者轻度认知损害(MCI)越来越受到重视。目前已发现慢性阻塞性肺疾病患者脑结构和功能存在异常，但在静息状态下的神经血管耦合变化研究甚少。本研究旨在通过动脉自旋标记(ASL)和血液氧合水平依赖(BOLD)技术研究慢性阻塞性肺病患者神经血管耦合变化。方法:招募 45 例稳定期 COPD 患者，40 例健康对照组。采集 BOLD 和 ASL 数据，分别计算度中心性(DC)和脑血流量(CBF)。比较两组间的 CBF-DC 耦合和 CBF/DC 比值差异。结果:与对照组相比，COPD 患者认知和情感相关区域的神经血管耦合异常，包括双侧内侧额叶皮质、双侧尾状核、左侧颞回、左侧舌回和左侧额上回。左侧舌回 CBF/DC 与命名评分呈负相关，内侧额叶皮质/颞回 CBF/DC 与 MoCA、视觉空间/执行和延迟回忆评分呈正相关。结论:COPD 患者神经血管异常改变可能是 MCI 发生的神经病理机制之一。

PU-2264
EC-T 化疗方案治疗的乳腺浸润性导管癌长期幸存者海马磁共振波谱及记忆的相关分析

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目的 探讨利用氢质子磁共振波谱技术（^{1}H-MRS）研究经 EC-T（E，表柔比星；C，环磷酰胺；T，紫杉醇）化疗方案治疗的乳腺浸润性导管癌长期幸存者海马代谢与记忆的关系。**方法** 选择 29 例完成 EC-T 化疗方案治疗后的乳腺浸润性导管癌幸存者，平均病程约 28.65±3.79 月，结束化疗至入组时间间隔大于 1 年，平均年龄 45.41±7.11，同时选择年龄、教育程度相匹配的健康志愿者作为对照组，分别进行记忆量表 AVLT-H 检查（词语学习、短期记忆、长期记忆及词语再认），进而进行数字广度（数字顺背、数字倒背）测试评分，完成量表测试后进行磁共振 3D-Brova 薄层扫描，以双侧海马显示的 3D-Brova 像为定位像，选取双侧海马为中心点，构建大小为 2cm×2cm×2cm 的立方体为感兴趣区，进行及 ^{1}H-MRS 检查，获得双侧海马的 NAA 浓度、Cho 浓度、Cr 浓度、NAA/Cr 值、Cho/Cr 值，并使用 SPSS 24.0 软件包对双侧海马波谱数据及量表评分进行统计分析，对正态分布的数据进行独立样本 t 检验，对不符合正态分布的数据进行 Mann-Whitney U 检验。**结果** 患者组右侧海马 Cho 浓度较正常对照组增高，左侧海马 NAA/Cr 值较正常对照组减低，差异均具有统计学意义（$p<0.05$）。患者组左侧 NAA 浓度、Cr 浓度、Cho 浓度、Cho/Cr 值与正常对照组无明显统计学差异（$p>0.05$），患者组右侧海马 NAA 浓度、Cr 浓度、NAA/Cr 值、Cho/Cr 值与正常对照组亦无明显统计学差异。两组受试者 AVLT-H 及数字广度测试评分无明显统计学差异（$p>0.05$）。**结论** 完成 EC-T 化疗方案的乳腺浸润性导管癌长期幸存者海马代谢仍然存在异常，但词语及数字记忆均恢复正常。

PU-2265
脑白质疏松与帕金森病患者认知功能损害的相关性研究

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目的 研究脑白质疏松与帕金森病（Parkinson disease，PD）患者认知功能损害的相关性。方法 选取本院 2018 年 6 月至 2018 年 12 月门诊就诊及住院的 120 例 PD 患者为研究对象，根据临床检查和诊断结果，将符合轻度认知损害（mild cognitive impairment，MCI）诊断标准的患者纳入 MCI 组，将符合帕金森病痴呆（Parkinson disease dementia，PDD）诊断标准的患者纳入 PDD 组，其余无认知损害（non-cognitive impairment，NCI）患者纳入 NCI 组。对 3 组患者均使用 MMSE(简明精神状态量表) 以及剑桥老年认知量表中文版评分进行认知功能评估,以及对 3 组患者进行脑白质高信号评分，脑白质高信号评分是根据 MRI 影像学结果，对脑室旁、深部白质、基底节及幕下 4 个区域的病变情况进行评分，评分标准采用 Scheltens 视觉评定量表，从而分析脑白质疏松与患者认知功能障碍的相关性。结果 NCI 组患者 MMSE 评分和 CAMCOG-C 评分均显著高于 MCI 组和 PDD 组（P ＜0.05），MCI 组患者 MMSE 评分和 CAMCOG-C 评分均显著高于 PDD 组（P ＜0.05）；三组患者脑室旁白质、基底节白质及幕下白质高信号评分比较均无显著差异（P ＞0.05）；NCI 组患者深部白质高信号评分显著低于 MCI 组和 PDD 组（P ＜0.05），MCI 组患者深部白质高信号评分显著低于 PDD 组（P ＜0.05）。多元回归分析结果显示：MMSE 与深部白质高信号评分呈显著负相关，且与深部白质高信号评分相关性最高（P ＜0.05）。结论 PD 患者认知功能损害为多因素共同作用的结果，而脑白质疏松尤其是深部白质病变可能是导致 PD 患者认知功能损害的重要因素，其作用机制为加速认知功能损害甚加速 PDD 的出现。

PU-2266
KIBRA 基因多态性对健康年轻志愿者海马亚区体积影响的研究

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目的：运用海马亚区体积自动分割方法研究 KIBRA rs17070145 位点基因多态性对健康年轻志愿者海马亚区体积的影响。
方法：通过志愿者招募流程，选择符合入组标准的健康年轻志愿者 60 例纳入本研究。根据基因型测定结果将受试者分为两组：一组为 C 等位基因携带者，另一组为 TT 纯合子携带者。所有受试者均行头颅磁共振扫描，其中 23 例受试者行神经心理学量表评估。利用 FreeSurfer 软件将每一被试的 3D-T_1加权成像序列颅脑高清结构像进行海马亚区分割及体积计算，分别得到每个被试左右半球海马各亚区体积。将全脑颅内容积（eTIV）作为协变量，去除每个被试头部大小不一所导致的海马体积差异，采用线性回归检验对两组受试者进行组间比较，观察海马亚区体积改变模式。再将有统计学差异的海马亚区体积与神经心理学量表行 Pearson 相关性检验，对其相关性进行观察。

结果：与 TT 纯合子携带者组相比，C 等位基因携带者组左侧 CA1 区海马亚区体积明显增大（p=0.032）。并且左侧 CA1 区海马亚区体积与数字连线测验-B（NCT-B）完成时间呈明显正相关（r=0.459, p=0.028）。
结论：在健康年轻受试者中，左侧 CA1 区海马亚区体积受到 KIBRA 基因多态性的影响，KIBRA C 等位基因携带者左侧 CA1 区海马亚区体积的增加可能是对记忆功能减低的一种代偿作用，该研究结果有助于 KIBRA 基因多态性与健康年轻人记忆功能关系神经机制的研究。

PU-2267

Detecting social-cognitive deficits after traumatic brain injury: An ALE meta-analysis of fMRI studies

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Purpose: Traumatic brain injury (TBI) can result in significant social dysfunction, which is represented by impairment to social-cognitive abilities (i.e. social cognition, social attention/executive function and communication). This study is aimed to explore brain networks mediating the social dysfunction after TBI and its underlying mechanisms.
Methods: We performed a quantitative meta-analysis using the activation likelihood estimation (ALE) approach on functional magnetic resonance imaging (fMRI) studies of social-cognitive abilities following TBI. Sixteen studies fulfilled the inclusion criteria resulting in a total of 190 patients with TBI and 206 controls enrolled in the ALE meta-analysis.
Results: The temporoparietal junction (TPJ) and the medial prefrontal cortex (mPFC) were the specific regions that social cognition predominantly engaged. The cingulate gyrus, frontal gyrus and inferior parietal lobule were the main regions related to social attention/executive functions. Communication dysfunction, especially related to language deficits, was found to show greater activation of the temporal gyrus and fusiform gyrus in TBI.
Conclusion: The current ALE meta-analytic findings provide evidence that patients have significant social cognitive disabilities following TBI. The relatively limited pool of literature and the varied fMRI results from published studies indicate that social-cognitive abilities following TBI is an area that would greatly benefit from further investigation.

PU-2268

3D LAVA-Flex 序列对腰椎间盘退变的初步研究

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目的：采用 3D LAVA-Flex 序列对腰椎间盘退变进行评估。
材料和方法：对 45 例腰椎间盘退变患者行矢状位 3D LAVA-Flex 序列及矢状位 T2WI 序列扫描。基于 T2WI 并采用 Pfirrmann 分级对每个患者椎间盘进行评估，同时基于 3D LAVA-Flex 成像对髓核与纤维环的界限、椎间盘内低信号及椎间隙进行了评估。对两种序列的评估结果进行比较，并采用基于 3D LAVA-Flex 成像的仿真内窥镜技术对椎间盘退变进行评估。
结果：3D LAVA-Flex 序列显示正常髓核呈均匀中等信号，纤维环为完整高信号，两者之间界限清楚。在伴有椎间隙狭窄的椎间盘中，线样低信号发生率(65/91)显著高于正常的椎间盘(4/134)（P = 0.000）。3D LAVA-Flex 分级与基于 T2WI 的 Pfirrmann 分级具有较好一致性。基于 3D LAVA-Flex 成像的仿真内窥镜技术可以较满意地显示退变椎间盘与椎间孔的关系。
结论：在评估腰椎间盘退变方面，3D LAVA-Flex 序列与常规 T2WI 具有相似的效能，3D LAVA-Flex 的仿真内窥镜技术在腰椎间盘病变的研究中具有潜在的应用前景。

PU-2269

Brain atrophy was a risk factor for neurocognitive impairment in hemodialysis patients: a longitudinal voxel-based morphology study

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Background: To explore longitudinal changes of brain volume in hemodialysis patients, the risk factors for brain volume changes, and the relationship between brain volume changes and results of neuropsychological test.
Methods: Thirty-three hemodialysis patients and thirty healthy controls (HCs) were recruited to this study. All patients underwent magnetic resonance examinations to evaluate baseline and follow-up brain volumes. The mean follow-up time was 21.2±6.8 months. Changes in brain volume, the risk factors for these brain volume changes, and the correlations between brain volume changes and mini-mental state examination (MMSE) scores were analyzed for the time period between baseline and follow-up examinations.
Results: Compared to the HCs, patients at baseline and follow-up showed decreased gray matter (GM) volume and decreased white matter (WM) volume (FWE corrected with age, gender and total intracranial volume [TIV] as covariates, $P<0.05$). Compared to baseline patients, follow-up patients showed diffusely decreased GM volume and decreased WM volume (with age and TIV as covariates, uncorrected, $P=0.001$). Compared to patients at baseline, the patients at follow-up also showed increased GM and increased WM volume in some brain regions (with age and TIV as covariates, uncorrected,

P=0.001). Creatinine, urea, hematocrit, parathyroid hormone and alkaline phosphatase were independent risk factors for decreased brain volume in patients (all *P*<0.05). The decreased GM volume of left caudate volume were positively correlated with reduced MMSE scores in patients (r_s=0.542, *P*=0.002).

Conclusions: Brain atrophy occurred in hemodialysis patients, leading to progressive neurocognitive impairment.

PU-2270

半剂量磁共振造影剂应用于渗透成像 DCE 序列对疾病诊断效能的探讨

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目的：半剂量与全剂量磁共振造影剂应用于渗透成像 DCE 序列对疾病诊断效能的探讨。材料与方法：回顾性分析拟行神外科手术患者 20 例，8 例脑外疾病，其中脑膜瘤 4 例，后颅窝病变 4 例；12 例脑内病变，胶质瘤 8 例，淋巴瘤 4 例。对此 20 例患者行两次磁共振动态增强扫描，按患者的公斤体重 0.2ml/Kg，第一次用于诊断性扫描，应用造影剂为按公斤体重的半剂量。第二次用于术前磁共振定位扫描，应用同样造影剂的全剂量扫描，扫描间隔为 48 小时以上。扫描应用 GE750W 磁共振成像仪，原始图像为 3D 横轴位扫描。因为此研究旨在得到血管渗透性，所以动态增强的注射速度为 2.0ml/s，后处理均应用 GE Adw4.6 版本，对 Ktrans，Kep，Ve，fPV 定量参数测定，及 IAUGC，MaxSlope，BAT 半定量参数测量，两次扫描后处理参数均行组间统计学分析。为了尽量减少测量误差，每例患者均在同一位置做三次测量取平均值。结果:此 20 例患者定量值（Ktrans，Kep，Ve，fPV）无显著性差异，半定量值（IAUGC，MaxSlope，BAT）随着药量分布的区别有显著性差异。结论:半剂量与全剂量磁共振造影剂应用于渗透成像 DCE 序列，基于 T1WI 的灌注成像对疾病的诊断效能无显著性差异，所以半剂量造影剂渗透成像可以替代全剂量造影剂的应用。

PU-2271

基于比率低频振幅的静息态功能磁共振成像在产后抑郁症中的研究

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目的 通过静息态功能磁共振(fMRI)成像探讨产后抑郁症患者在比率低频振幅(fractional amplitude of low frequency fluctuation，fALFF)下异常激活的脑区，旨在探讨产后抑郁症（postpartum depression，PPD）患者脑功能活动的异常改变及其与普通抑郁症之间的差异。 **方法** 选择 23 例产后抑郁症患者（PPD 组）、28 例产后健康志愿者（Healthy Postpartum Women，HPW）以及 20 例年龄、文化程度相匹配的女性脑普通抑郁患者（Major Depressive Disorder，MDD）作为研究对象，对所有入选受试者进行 3.0T 静息态功能磁共振扫描，用 fALFF 技术处理各组图像，分析 PPD 组与 HPW 组、PPD 组与 MDD 组之间的差异脑区，并提取 PPD 组与 HPW 组差异脑区的 fALFF 值，与抑郁程度之间进行相关分析。 **结果** 与 HPW 组比较，PPD 组患者在左侧后扣带回、左侧楔前叶、左侧枕中回及左侧枕下回的 fALFF 值增高，右侧眶部额下回、右侧脑岛、右侧嗅皮质、右侧海马的 fALFF 值减低（AlphaSim 校正，Clusters＞25，*P*＜0.05）。与 MDD 组比较，PPD 组患者在左侧中央前回、右侧舌回、Cerebelum_6_R 的 fALFF 值增高，在右侧背外侧前额叶、

右侧楔前叶、左侧顶上回、左侧角回、右侧旁扣带回、右侧颞下回的 fALFF 值减低（AlphaSim 校正，Clusters＞30，P＜0.05）。相关分析仅发现：PPD 组患者右侧脑岛 fALFF 值与 EPDS 得分间存在正相关关系(r= 0.890，P =0.043)。 **结论** 1.在静息状态下产后抑郁症患者大脑部分区域存在自发性神经活动异常，复制了部分重度抑郁症的神经影像特征，但也存在自己独特的脑功能改变。2.PPD 患者右侧脑岛的功能磁共振 fALFF 值增加与抑郁严重程度密切相关。

PU-2272

椎间盘真空征在 CT 图像上的影像学表现

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目的：椎间盘真空征在临床上并不少见，笔者根据日常生活中收集的 47 例椎间盘真空征表现进行探讨。
方法：本组病例来源于我科 2016 年 10 月~2017 年 5 月，共 47 例椎间盘真空征现象，男 28 例，女 19 例，男女比例约 1：0.7。年龄 25~73 岁，平均 55 岁。25~40 岁 6 例，占 12.77%，40~50 岁 8 例，占 17.02%，50 岁以上 33 例，占 70.21%。采用 CT 机为美国 GE 750HD ,常规平行扫描，体位采用仰卧位，特殊患者可考虑仰卧屈膝位。扫描条件 550mA，120KV,自动曝光技术，层厚层间距 3x3mm，特殊情况加 2x2mm 薄层扫描，可选择双窗摄片，骨窗窗宽 2000，窗位 650-700，软组织窗宽 300，窗位 60。
结果：47 例病例均伴随有不同程度的脊椎骨质增生和椎间盘膨出与突出，少数伴随有椎间隙狭窄和韧带钙化现象，腰椎滑脱症 2 例。真空区域 CT 值大多数在—100~—300HU 左右，个别可高于 0~25HU 以上。气泡中等偏大者多数呈不规则形，有少数表现为多边三角形、梭形或菱形。气泡小者多数呈圆形或椭圆形。病灶边缘清，与周围组织分界明显。
结论：椎间盘真空征发生后 100%合并有不同程度脊椎退行性改变，同时可见不同程度的椎间盘膨出与突出征象。同时，再次证实 CT 检查是诊断椎间盘真空征的重要检查方式。

PU-2273

磁共振扩散张量成像在轻度创伤性脑损伤中的定量研究

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[摘要] 目的：基于磁共振扩散张量成像（Diffusion-tensor imaging, DTI）定量评估轻度创伤性脑损伤(mild traumatic brain injury,mTBI)患者脑损伤的区域及程度。方法：选取急性期 mTBI 患者 14 例(男 6 例，女 8 例，年龄 20-50 岁，平均 33.0±10.2，受教育年限 9-19 年)，其纳入标准为：①急性期（t≤7 天）头部外伤史；②格拉斯哥昏迷评分（Glasgow coma scale，GCS）13～15 分；③无昏迷或昏迷时间不超过 30min；④轻微头痛、头晕等自觉症状；⑤头颅 CT、MRI 检查未发现损伤征象（伴或不伴颅骨骨折）；⑥神经系统检查未发现阳性体征。既往具有颅脑损伤史、脑部疾患、精神疾病史以及 MRI 检查禁忌症均被排除在外。对照组来自同期招募的性别、年龄及教育程度相匹配的 14 名健康者志愿者（男 7 例，女 7 例，年龄 24-49 岁，平均 32.2±9.4，受教育年限 12-19 年）。采用 GE3.0T 磁共振扫描仪对两组受试者进行 DTI 图像采集，应用功能磁共振软件库（FMRIB Software Library,FSL）软件包处理 DTI 数据，基于 TBSS 方法构建纤维束网络骨架并检测病例组与对照组有显著差异的白质体素，计算白质纤维束的部分各向异性（FA）、平均扩散率（MD）。结果：与对照组比较，急性期轻度创伤性脑损伤患者双侧内囊前、后肢的 FA 值均

高于对照组（P<0.05），胼胝体膝部 FA 值低于对照组（P<0.05），胼胝体体部 FA 值略低于对照组，胼胝体压部 FA 值略高于对照组（P>0.05），左侧内囊前肢 MD 值低于对照组（P<0.05）；右侧内囊前肢及胼胝体膝部、体部、压部 MD 值均高于对照组（P>0.05），双侧内囊后肢 MD 值均低于对照组（P>0.05）。结论：基于 TBSS 分析的 DTI 有助于发现 TBI 患者白质纤维束的微结构异常。

PU-2274
基于 1H-MRS 探究标准 ECT 化疗后乳腺浸润性导管癌长期幸存者记忆功能改变的海马代谢异常研究

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目的 探讨利用氢质子磁共振波谱技术（^{1}H-MRS）研究经 EC-T（E，表柔比星；C，环磷酰胺；T，紫杉醇）化疗方案治疗的乳腺浸润性导管癌长期幸存者海马代谢与记忆的关系。**方法** 选择 29 例完成 EC-T 化疗方案治疗后的乳腺浸润性导管癌幸存者，平均病程约 28.65±3.79 月，结束化疗至入组时间间隔大于 1 年，平均年龄 45.41±7.11，同时选择年龄、教育程度相匹配的健康志愿者作为对照组，分别进行记忆量表 AVLT-H 检查（词语学习、短期记忆、长期记忆及词语再认），进而进行数字广度（数字顺背、数字倒背）测试评分，完成量表测试后进行磁共振 3D-Brova 薄层扫描，以双侧海马显示的 3D-Brova 像为定位像，选取双侧海马为中心点，构建大小为 2cm×2cm×2cm 的立方体为感兴趣区，进行及 ^{1}H-MRS 检查，获得双侧海马的 NAA 浓度、Cho 浓度、Cr 浓度、NAA/Cr 值、Cho/Cr 值，并使用 SPSS 24.0 软件包对双侧海马波谱数据及量表评分进行统计分析，对正态分布的数据进行独立样本 t 检验，对不符合正态分布的数据进行 Mann-Whitney U 检验。**结果** 患者组右侧海马 Cho 浓度较正常对照组增高，左侧海马 NAA/Cr 值较正常对照组减低，差异均具有统计学意义（p＜0.05）。患者组左侧 NAA 浓度、Cr 浓度、Cho 浓度、Cho/Cr 值与正常对照组无明显统计学差异（p＞0.05），患者组右侧海马 NAA 浓度、Cr 浓度、NAA/Cr 值、Cho/Cr 值与正常对照组亦无明显统计学差异。两组受试者 AVLT-H 及数字广度测试评分无明显统计学差异（p＞0.05）。**结论** 完成 EC-T 化疗方案的乳腺浸润性导管癌长期幸存者海马代谢仍然存在异常，但词语及数字记忆均恢复正常。

PU-2275
2 型糖尿病患者执行控制网络及额顶网络的功能磁共振研究

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目的采用静息态功能磁共振技术（rs-fMRI），联合运用独立成分分析（independent component analysis，ICA）方法，研究 2 型糖尿病（Type 2 diabetes mellitus，T2DM）患者认知障碍的特点及大脑执行控制网络（executive control network，ECN）、额顶网络（frontoparietal network ,FPN）的完整性。**方法** 对 23 名 T2DM 患者及 25 名健康对照者行临床资料采集、多维度认知功能测试及静息态功能磁共振扫描。使用双样本 T 检验分析两组生化指标、认知功能、静息态脑网络同步性活动的组间差异，并采用 pearson 相关分析脑网络差异与生化指标、认知功能测试的相关性。**结果** T2DM 患者蒙特利尔认知评估北京版（MoCA）、连线测试 B（TMT- B)、复杂图形测试(CFT)、 CFT-延迟、数字广度测验(DST)的得分低于健康对照组（均 P<0.05）。T2DM 患者 ECN 左顶叶深部白质、扣带回、右侧前额叶功能连接减弱（P<0.05，AlphaSim 校正）。右侧 FPN 中的右侧额下回、额中回功能连接增强，右中央后回功能连接减低（P<0.05，AlphaSim 校正）。左侧 FPN

中左顶叶功能连接减低（P<0.05, AlphaSim 校正）。另 ECN 中的右侧前额叶功能连接减低与胰岛素抵抗水平水平显著相关。**结论** T2DM 患者执行功能、注意功能、信息处理速度及空间情景记忆功能障碍，并且存在 ECN、右侧 FPN 和左侧 FPN 选择性受损，T2DM 患者 ECN 功能连接受损与胰岛素抵抗水平相关。

PU-2276
慢性肾功能不全患者脑白质微结构变化扩散张量成像的 TBSS 分析

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目的：利用基于白质骨架的空间统计分析方法（tract-based spatial statistics，TBSS）对慢性肾病（chronic kidney disease，CKD）患者的脑部扩散张量成像（diffusion tensor imaging，DTI）进行分析，以探讨 CKD 患者脑白质微结构异常改变的特点。
方法：研究纳入 CKD3～5 期的患者共 16 例（男性 10 例，女性 6 例），另招募 16 例年龄及性别均匹配的健康志愿者作为健康对照组（男性 10 例，女性 6 例）。所有受试者均行常规头部 MRI 及 DTI 扫描。采用 TBSS 方法分析 DTI 数据，比较 CKD 组与对照组脑白质微结构异常改变的情况，最后统计结果采用 FWE（family-wise error）校正，P<0.05 表示存在统计学差异。
结果：CKD 组与对照组相比，其年龄、性别均无统计学差异（P>0.05）。全脑 TBSS 分析可见，与正常对照组相比，CKD 组可见广泛 MD、AD 升高区域，MD 升高区域主要见于双侧前放射冠、双侧上纵束、双侧胼胝体膝部、双侧外囊、双侧丘脑后辐射、双侧内囊、双侧穹窿、双侧下纵束及下额枕束，左侧扣带回、左侧胼胝体体部、左侧上放射冠、左侧钩束，右侧胼胝体压部等区域，AD 升高区域双侧基本对称，除上述 MD 异常区域外，另可见于右侧扣带回、右侧胼胝体、右侧钩束、双侧扣带回（海马），未见 MD 与 AD 值下降的区域，两组之间 FA 与 RD 值相比无明显统计学差异。
结论：与正常对照组相比，CKD 患者的全脑白质微结构完整性被破坏，可能由血管源性水肿所致，MD 及 AD 可能是 CKD 患者脑白质微结构异常的更敏感的监测指标。

PU-2277
COPD 患者轻度认知功能障碍及临床特征研究

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研究目的： 采用 MoCA 量表研究 COPD 患者轻度认知功能障碍发病率、特定的认知障碍域，评价 COPD 患者 MoCA 评分与肺功能、动脉血气分析的关系。
材料与方法： 纳入 72 例稳定期 COPD 患者和 55 例性别、年龄、受教育程度、体重指数与之相匹配的健康志愿者(healthy controls, HC)。利用 MoCA 量表对两组被试进行认知功能评分，分别对其 MoCA 总分及视空间及执行功能、命名、记忆、注意、语言、抽象、延迟回忆、定向等认知域比较分析，多重回归分析 COPD 组临床参数与轻度认知障碍的相关性。
结果： 共 60 例 COPD 患者及 48 例健康志愿者纳入最终分析。 COPD 组 MoCA 评分明显低于 HC 组（P<0.05）。COPD 组主要认知障碍域为视空间与执行功能、命名、注意、抽象。 COPD 组 MoCA 评分与 SaO2、 PaO2 呈正相关，与 PaCO2 呈负相关（P<0.05）。

结论： 稳定期 COPD 患者存在轻度认知功能障碍，主要表现在视空间与执行功能、命名、注意、抽象等认知域，而且认知功能障碍与动脉血气相关 。

PU-2278

3D-ASL 评价 COPD 患者脑灌注变化

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研究目的： 分析 COPD 患者的脑灌注变化，并评估 CBF 与动脉血气分析、肺功能和神经认知评分之间的关系。
材料与方法： 对 40 例 COPD 患者和 40 例 HC 组行全脑 3D 伪连续动脉自旋标记（3D pc-ASL）MR 扫描。采集两组动脉血气、肺功能和认知功能评分数据。使用 SPM 软件，基于体素水平比较两组全脑 CBF 值差异。进一步分析 COPD 患者 CBF 与肺功能、动脉血气分析和神经认知评分的相关性。
结果： COPD 组视空间与执行功能、注意、抽象、延迟记忆评分明显低于 HC 组（P <0.001）。COPD 组全脑（41.40±9.71mL/100g/min： 46.15±7.91mL/100g/min）、灰质（43.91±10.67mL/100g/min： 49.34±9.13mL/100g/min）和白质（38.34±8.70mL/100g/min：42.51±6.29mL/100g/min）平均 CBF 均低于 HC 组 (P<0.05)； COPD 组较 HC 组右侧额中回、右侧顶下小叶及右侧纹状体（P<0.05）等 3 个脑区 CBF 减低。而且 COPD 组右侧纹状体、右侧顶下小叶 CBF 与 PaCO2 呈正相关（r=0.413，P=0.008；r=0.397， P=0.011）。
结论： COPD 脑灌注异常与其神经认知障碍存在相关性， PaCO2 可能是影响右侧额中回、右侧顶下小叶及右侧纹状体 CBF 的减低的因素。 3D pc-ASL 作为一种无创的技术为 COPD 神经病理学研究提供有价值的脑灌注信息。

PU-2279

颞叶内侧癫痫所致认知功能障碍的工作记忆任务 fMRI 研究

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目的：本研究采用图片记忆任务功能性磁共振成像技术（BOLD-fMRI）检测工作记忆相关脑区激活情况，进一步了解颞叶内侧癫痫患者工作记忆功能受损情况，以助于探讨颞叶内侧癫痫患者认知功能受损的情况与受累脑区之间的关联。**方法：**收集了 80 例 mTLE 患者，并招募 50 例健康正常人作为对照组，采集其基本信息，并对所有受试者均进行神经学量表检查（简易精神状态评定量表（MMSE）贝克抑郁自评表量表（BDI）），排除患有焦虑抑郁等精神类疾病患者。根据 MMSE 量表将 mTLE 全组患者分为颞叶内侧癫痫不伴随认知障碍组（NCI-mTLE）及颞叶内侧癫痫伴认知障碍组（CI-mTLE）,并分析工作记忆任务时编码期（encoding）及延迟期（delay）的脑区激活情况与对照组比较。**结果：**NCI-mTLE 组与正常对照组相比，在工作记忆任务编码期会有与任务相关脑区的代偿性激活升高，包括双侧额下回、额中回及颞叶亚叶等，此外脑默认网络的局部脑区也可出现激活升高，主要为双侧内侧额叶、左侧后扣带回及顶下小叶等。而在延迟期与任务相关脑区表现出激活明显减低，包括双侧顶叶、额下回与左侧扣带回等。而与正常对照组相比，CI-mTLE 组在编码期主要表现出双侧额中回、额叶亚叶及颞前回等与任务相关脑区的失代偿性激活减低，在延迟期亦可表现出与任务相关脑区以及更广泛脑区的激活明显减低。在两组 mTLE 相比较，发现 CI-mTLE 组在

编码期与延迟期表现出颞叶、额叶及顶叶等与工作记忆相关脑区失代偿性激活减低，而脑默认网络局部脑区代偿性激活升高。**结论**：结果表明，在执行 记忆任务时，编码期与延迟期 mTLE 患者和正常人以及两组 mTLE 患者各个脑区域的活动显着不同，可能是颞叶内侧癫痫初期各脑区出现代偿性升高，而长期颞叶内侧癫痫则会造成工作记忆相关脑区失代偿性激活减低，则会导致认知功能受损，揭示了 mTLE 造成工作记忆相关认知功能下降的病理生理机制。

PU-2280

磁共振 DTI 技术在内囊走形纤维束临床应用研究

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目的：采用弥散张量成像（DTI）技术研究观察内囊内纤维束走形及毗邻关系。 **方法**：在一千多病例中，选择健康志愿者一名， 采用 PHILIPS 1.5 磁共振扫描，颅内未发现异常信号，后行 DTI 扫描，应用独立成分分析法分别筛选出 DTI 成分。分别提取脑网络功能连接差异脑区的功能连接强度值，采用 Extended MR WorkSpace 工作站上的 DTI Studio 软件对所有受试者的 DTI 原始数据进行预处理，单独显示内囊纤维束，并对纤维束毗邻关系进行研究。
结果：内囊内纤维束包括、皮质小脑束、丘脑中央辐射、交叉的皮质小脑束、、桥连纤维等
结论：发现内囊纤维束的走形于排列都有一定的顺序，受损后与临床症状息息相关。

PU-2281

推注高流速生理盐水在头颈 CTA 中的应用

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目的：探讨推注高流速生理盐水在头颈 CTA 扫描中的应用。方法：采用 A、B、C 三组实验法。其中 A 组为常规组，采用对比剂 75ml 对比剂+35ml 生理盐水，流速均为 4.5ml/s。B 组为实验 1 组，采用 45ml 对比剂+50ml 生理盐水，流速均为 4.5ml/s。C 组为实验 2 组，采用 45ml 对比剂+50ml 生理盐水，对比剂流速为 4.5ml/s，生理盐水流速为 5.5ml/s。三组均采用碘普罗胺对比剂，由右侧肘正中静脉入路，采用小剂量预实验法进行扫描。每组各 30 例，对三组的头颈动脉 CT 值及锁骨下静脉伪影干扰情况进行综合评价。结果：A 组中 20 例为优，9 例为良，1 例差，30 例均有锁骨下静脉的伪影干扰。B 组中 17 例优，13 例良，21 例有锁骨下静脉伪影干扰。C 组中有 21 例优，9 例良，13 例有锁骨下静脉伪影干扰。结论：推注高流速生理盐水在头颈 CTA 扫描中能够确保图像质量。为临床诊断提供参考。经过高流速盐水的冲刷，能快速的将对比剂输入体内参与循环，并在峰值时间窗进行扫描，同时高流速生理盐水的使用能减少对比剂的总量，可以有效减少右锁骨下静脉的伪影干扰，还能减少患者经济负担，值得推广。

PU-2282

基于静息态 fMRI 的血管性认知功能障碍患者的小世界属性改变

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目的：阿尔茨海默病以及轻度认知功能障碍已经被认为与脑网络拓扑结构的改变有关，但是目前轻度皮质下血管性认知功能障碍（svMCI）的脑网络拓扑结构改变尚不可知，本研究利用静息态血氧水平依赖功能磁共振(BOLD—fMRI)数据，构建大脑功能网络，探讨 svMCI 患者脑功能网络的拓扑属性是否改变。**材料与方法**:本实验一共收集了 28 名 svMCI 患者以及 30 名健康对照组的静息态功能磁共振数据以及临床、神经量表评估信息，使用图论的方法在大尺度水平上对 svMCI 患者脑功能网络拓扑改变进行系统的研究。**结果**：在稀疏度 0.3-0.5 区间，svMCI 患者的全局拓扑属性中小世界指数、聚类系数均显著小于健康对照组（P<0.05），但是最短路径长度没有显著差异。在局部拓扑属性中，svMCI 患者在额叶、颞叶、岛叶、缘上回、后扣带回区域出现节点度、节点介素、局部效率、聚类系数、显著小于健康对照组（P<0.05）。在网络枢纽的研究中发现：两组之间相同的枢纽为双侧眶内额上回、颞中回，左侧眶部额下回，右侧前扣带回，颞下回,正常组独有的枢纽为双侧扣带回中部，左侧梭状回，右侧的颞上回以及颞极，而 svMCI 组独有的枢纽为右侧额上回、内侧额上回，左侧眶部额下回、颞上级、颞中级、颞下回。**结论**：本研究首次在脑功能网络大尺度水平上证明了 svMCI 患者的脑网络信息传递能力、不同脑区的信息整合能力受损以及网络枢纽的改变，为 svMCI 患者的血管性因素对大脑认知功能损害的机制研究提供了新的生物指标。

PU-2283
基于静息态功能磁共振对乳腺癌化疗患者 ALFF 值与认知功能的相关性研究

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目的：通过静息态功能磁共振(resting-state functioning magnetic resonance image, rs-fmri)探索乳腺癌患者化疗前后 ALFF 值变化及 ALFF 值与认知功能的相关性。
方法：化疗组纳入 10 例乳腺癌患者，选择时间为化疗前（t1）、化疗后 3-4 周（t2）进行评估，分别进行神经心理学测评及 rs-fmri 扫描。同时纳入 8 名健康对照组，均在相应时间进行神经心理学测评及 rs-fmri 扫描。蒙特利尔认知评估量表（MoCA）用来评估一般认知功能，ALFF 值反应大脑活动情况。通过配对 t 检验对比化疗组、对照组 MoCA 分数及 ALFF 值变化；对大脑活动变化与 MoCA 分数进行相关性分析。
结果：化疗组 MoCA 评分较对照组差（P＜0.05）；化疗组在右侧颞叶，右侧额叶及左侧小脑可见异常 ALFF 值变化。对照组 MoCA 评分及 ALFF 值无显著差异。ALFF 值变化与 MoCA 评分之间无明显相关性。
结论：研究发现，乳腺癌患者化疗后出现认知功能损害，通过 rs-fmri 反映化疗后大脑部分脑区活动异常变化。

PU-2284
前庭康复治疗对前庭性偏头痛自发性脑活动的影响：静息态功能磁共振成像纵向对比研究

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目的：前庭康复可改善前庭性偏头痛患者的前庭功能障碍，本研究目的是观察前庭性偏头痛经前庭康复治疗后自发性脑活动的改变，探讨物理治疗改善前庭功能障碍的可能机制。方法：纳入 14 例

前庭性偏头痛患者，在基线和前庭康复训练 1 月后接受 MRI 检查，使用眩晕残障量表（DHI）、SF-36 简明健康调查问卷、汉密尔顿焦虑量表（HAMA）和汉密尔顿抑郁量表（HAMD）评估患者临床指标，所有的被试者进行了静息状态功能磁共振成像（functional magnetic resonance imaging, fMRI）扫描和临床评估。采用 DPABI 及 REST 软件包对功能磁共振数据进行预处理，使用低频振幅（ALFF）方法评估患者自发性脑活动，利用配对样本 T 检验比较 14 例前庭性偏头痛患者康复治疗前后的 ALFF 改变，将差异的 ALFF 值和临床特征之间的相关性分析。结果：前庭康复治疗后，前庭性偏头痛患者症状有明显改善。前庭康复治疗后与治疗前相比，前庭性偏头痛患者左侧小脑后叶 ALFF 值增加（GRF 校正，P<0.001）。此外，左小脑后叶的 ALFF 值与 DHI 量表评分的变化呈负相关（r=-0.485，P=0.009）。结论：在这项纵向 fMRI 研究中，我们观察到前庭康复治疗后，小脑的自发神经活动可能在改善前庭功能障碍中起到重要作用。

PU-2285
低频聚焦超声刺激联合盐酸帕罗西汀对老年人抑郁症患者疗效观察

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研究目的 探讨低频聚焦超声刺激（LIFUP）联合盐酸帕罗西汀对老年人抑郁症（MDD）患者的疗效。**研究方法** 随机抽取本院收治的 60 例 MDD 老人，2018 年 1 月至 2019 年 1 月为研究时段，随机数字表法分组，分为实验组与对照组，各 30 例。对照组采用盐酸帕罗西汀，观察组采用盐酸帕罗西汀+低频聚焦超声刺激（LIFUP）治疗，两组均持续治疗 2 个月。入院时及治疗结束后统计对比两组抑郁评分（HAMD,GDS）、睡眠指数评分（PSQI）、治疗效果及不良反应。**研究结果** ①两组治疗后 HAMD 及 GDS 分值低于治疗前，且观察组较对照组低（p<0.05）；②两组治疗后睡眠质量评分 PSQI 分值低于治疗前，且观察组较对照组低（p<0.05）；③两组治疗效果比较，观察组 90%（27/30）较对照组 63.33%（19/30）高（ p<0.05）；④两组不良反应发生率差异无统计学意义（p>0.05）。**研究结论** 低频聚焦超声刺激（LIFUP）联合帕罗西汀可有效改善抑郁症患者病情，减轻抑郁症状，改善失眠，效果显著，且无不良反应发生风险。

PU-2286
慢性期脑桥梗死脑白质微结构改变的 DTI 评价

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目的 探索慢性期脑桥不同侧别梗死患者脑白质微结构损伤、重组模式以及与认知功能改变的潜在关系。 **方法** 收集脑桥梗塞患者 34 例（其中脑桥左侧梗死病变 19 例，脑桥右侧梗死病变 15 例）；另外招募年龄、性别与之相匹配的 25 名健康被试入组为对照组。所有被试行 DTI 序列扫描并使用 TBSS 方法处理图像；同时所有被试进行临床运动功能评价及神经行为学测试。 **结果** 与健康对照组相比，脑桥左侧梗死组患者左侧大脑脚处（体素 16 个，P=0.001）FA 值减低；脑桥右侧梗死组患者右侧前辐射冠（体素 4 个，P=0.010）、右侧内囊后肢（体素 5 个，P=0.005）、右侧大脑脚（体素 2 个，P=0.029）、小脑中脚处（体素 13 个，P=0.006）FA 值减低，左侧内囊前肢处（体素 2 个，P=0.022）FA 值升高。且脑桥右侧梗死组右侧前辐射冠处 FA 值与 RAVLT-short（P = 0.004，r = 0.690）、Numlback-ACC（P = 0.006，r = 0.673）正相关，与 Numlback-RT（P = 0.000，r = -0.807） 负相关。 **结论** 慢性期脑桥不同侧别梗死患者脑白质微结构均存在继发

性损伤，包括顺行性和逆行性损伤；但右侧梗死组的脑白质微结构损伤范围更广，且存在对侧白质纤维重塑现象。同时，脑白质微结构的损伤是造成认知功能损伤的潜在机制及病理基础。

PU-2287
三叉神经痛的灰质体积改变：基于体素的形态学研究的系统评价和 Meta 分析

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目的：目前许多基于体素的形态测量学（voxel-based morphometry, VBM）研究已经证实了三叉神经痛（trigeminal neuralgia, TN）患者存在多个脑区灰质改变。本研究旨在利用基于体素的 Meta 分析方法对 TN 异常脑区灰质体积变化情况进行归纳、分析及讨论，以发现一致的和可重复的灰质改变区。
材料与方法：在 PubMed、Web of Science、EBSO、Cochrane 图书馆、Elsevier Clinicalkey 等数据库中对 1994 年 1 月至 2018 年 11 月运用 VBM 的分析方法探讨 TN 患者脑灰质体积变化的研究进行系统和全面的检索。采用 ES-SDM（effect-size signed differential mapping）软件进行 Meta 分析。另外，Meta 回归分析被用于探讨 TN 患者临床特征与脑灰质体积变化之间的联系。
结果：本研究共纳入了 13 项研究，共含 15 个数据集，其中包括 407 名 TN 患者和 376 名健康对照组。研究发现，与健康对照组相比，TN 患者全脑灰质体积改变区主要位于基底节（壳核、伏隔核、尾状核和杏仁核）、扣带回、丘脑、岛叶和颞上回等区域。Meta 回归分析显示，左侧纹状体的灰质体积变化程度可能是 TN 疾病严重程度的预测指标；病程越长，左侧颞上回和左侧岛叶灰质体积可能萎缩更明显。
结论：以上发现对 TN 患者脑灰质体积变化情况进行了比较全面的概况，并且有力地表明了参与和调控感觉-运动和情感处理过程的脑灰质的异常改变可能在 TN 的病理生理过程中起重要的作用。

PU-2288
多巴胺 D4 受体基因对多动注意缺陷障碍儿童静息态功能网络中心度的影响

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目的探讨多巴胺 D4 受体基因（DRD4）第三外显子 48bp 数目可变重复串联序列（VNTR）多态性对多动注意缺陷障碍（ADHD）儿童静息态脑功能网络中心度的影响及其意义。**方法**采用度中心度（DC）以及基于种子点的功能连接（FC）算法观察 DRD4 基因多态性对 ADHD 儿童脑功能网络的影响。收集 105 例 ADHD 儿童静息态 fMRI 以及神经心理学测验数据，并根据基因检测结果分为携带 DRD4 2 次重复杂合子（2R）基因型组（37 名）以及非携带组（68 名），观察携带 2R 基因型组相对非携带组 DC 值升高或降低的脑区，并根据 DC 结果作为种子点进行全脑功能连接分析，最后对两种算法得出的功能网络参数（DC 及 FC 值）与 Conners 临床量表进行相关分析。**结果**相对非携带组，携带 2R 基因组 DC 值降低的脑区包括右侧额上回、左侧顶下叶，基于右侧额上回的 FC 值降低的包括右侧颞下回、距状沟、左侧颞中回、枕中叶，基于左侧顶下叶的 FC 值降低的包括左侧顶下叶（$p<0.005$）。并且顶下叶 DC 值及 FC 值的改变与冲动多动症状具有显著相关性（$p<0.05$）。**结论**额顶

叶及枕颞叶作为注意控制、情感、视觉网络的重要脑区，与 ADHD 多动冲动、注意缺陷症状密切相关，本次功能网络研究提示 DRD4 2R 基因可能参与这些网络的神经活动，从而影响 ADHD 的冲动多动症状，同时为 ADHD 基因-脑功能-行为通路提供了初步证据。

本研究由浙江省医药卫生科技计划项目（NO. 2019326177）及温州市科技局基础性科研计划项目（NO.Y20180185）资助。

PU-2289
基于静息态功能磁共振对原发性失眠伴认知功能障碍患者的功能连接研究

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目的：通过静息态功能磁共振(resting-state functioning magnetic resonance image, rs-fmri)探索原发性失眠（Primary insomnia, PI）伴认知功能障碍患者 FC 与认知功能的相关性。**方法：**失眠组纳入 30 例伴有认知功能障碍的失眠患者，采用系统的对称体素同伦连接(Voxel—mirrored HomotopicConnectivity，VMHC)分析比较大脑半球间的静息状态 FC 值。同时纳入 30 名健康对照组，均在相应时间进行神经心理学测评及 rs-fmri 扫描。神经心理量表方面使用匹兹堡睡眠质量指数（Pittsburgh sleep quality index，PSQI）、焦虑自评量表（Self-rating Anxiety Scale，SAS）和抑郁自评量表（Self-rating Depression Scale，SDS）。PI 患者还完成失眠严重程度指数（Insomnia Severity Index，ISI）。**结果：**PI 患者前扣带回（ACC）的同伦静息状态 FC 显著增加。左前扣带回和右丘脑之间以及右扣带回和左眶额皮质之间的 FC 也增加。**结论：**本研究发现，与健康对照组相比，PI 患者表现出异常的 FC，不仅在 ACC 的 VMHC 中，而且在 ACC 和其他脑区之间的 FC 中，这些结果均支持 ACC 中增强的 FC 参与原发性失眠的病理机制。

PU-2290
大枕池大囊肿磁共振表现

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【目的】介绍大枕大池囊肿 MRI 表现。
【材料与方法】枕大池位于颅后窝下部，小脑下面，向上与第四脑室相通。大枕大池诊断标准：小脑蚓部距枕骨内板 10 毫米以上。见于任何年龄，临床意义部大。第四脑室正常、无占位效应、无脑扩张、无枕骨变薄、后颅窝大小正常。可长期处于稳定状态。MRI 表现：大枕大池囊肿 MRI 见长 T1 信号、长 T2 信号，成片状。囊肿位于小脑蚓部距枕骨内板 10 毫米以上
【结果】根据以上 MRI 表现，诊断大枕大池囊肿成功率为 99%。
【结论】头颅见长 T1T2 信号、成片状，位于小脑蚓部距枕骨内板 10 毫米以上，面积大于 10 毫米，可诊断大枕大池囊肿。

PU-2291

Headache frequency influences brain microstructure of patients with migraine without aura

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Abstract Neuroimaging studies have implicated the influence of migraine on brain microstructure. However, whether the effects of migraine on brain is altered during migraine chronification is not well known. Fifty-six patients with migraine without aura, including 39 episodic migraine (EM) and 17 chronic migraine (CM) patients, and 35 matched health controls (HC) were enrolled. All subjects underwent a 3 Tesla MRI scan and high resolution T1-weighted images were acquired. VBM analysis was performed to assess gray matter (GM) volume differences among groups and it association with clinical feature. Compared with the HC group, both the CM and EM groups showed increased GM volume in the periaqueductal grey matter (PAG) and decreased GM volume in the anterior cingulate cortex (ACC). The EM group showed smaller GM volume in the dorsolateral prefrontal cortex (dlPFC) relative to both the HC and CM groups. The hippocampus/parahippocampal gyrus (HIP/PHG) volume of the HC group was smaller than that of the EM group, but larger than the CM group. Higher headache frequency is positively associated with greater GM volume in the PAG and dlPFC, but with smaller GM volume in the ACC and HIP/PHG across all patients. Migraine can influence microstructure of the brain, depending on headache frequency. Structural changes of the PAG and ACC may be strengthened with repeated headache, and CM has opposite effect on GM volume in the dlPFC and HIP/PHG in contrast to EM.

PU-2292

Abnormal Insula White Matter Fiber Tracts in Nicotine-dependent Smokers

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Nicotine dependence is characterized as a neural circuit dysfunction, particularly with regard to the alterations in central reward pathways.The insula, a cortical region that is thought to play a central role in this reward circuitry, has been implicated as an important role in the maintenance of nicotine dependence. However, it remains largely unclear about the differences in white-matter diffusion properties of the insular circuits between nicotine-dependent smokers and nonsmokers as well as between relapsers and non-relapsers according to the smoking cessation outcomes. Here, diffusion tensor imaging and probabilistic tractography was used to investigate the white-matter tracts of the insular circuits in two following studies (Study1: 58 smokers (38.5±7.3 years) *vs.* 34 nonsmokers (38.5±8.5 years); Study2: 38 relapsers (38.7±6.7 years) vs. 20 nonrelapsers (38.2±8.6 years)). Relative to nonsmokers, smokers showed lower fractional anisotropy (FA) in the anterior insular cortex-to-nucleus accumbens and posterior insular cortex-to-nucleus accumbens fiber tracts in the left hemisphere, suggesting decreased white matter integrity in these insular

tracts; but smokers showed higer FA, and lower axial (AD), radial (RD), and mean diffusivity (MD) in the right anterior insular cortex-to-medial orbitofrontal cortex, posterior insular cortex-to-medial orbitofrontal cortex, and posterior insular cortex-to-nucleus accumbens fiber tracts in the right hemisphere, suggesting excessive myelination and axonal loss in these insular tracts. However, there were no differences of FA, AD, MD and RD values between relapsers and nonrelapsers. These altered structural insula white matter fiber connectivity could interfere with the normal neural circuitry of reward processing. The present study clarified the precise roles of the insular white-matter microstructure in smoking behaviors, which could improve the understanding of the underlying neurobiology of nicotine dependence.

PU-2293

脊髓型囊虫病 1 例报告

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患者女，49 岁，因“左下肢麻痛不适 2 年。”入院。既往史:（-）。查体：左下肢肌力约 4 级，余肢体肌张力正常，腱反射+++，病理反射-，左脐以下感觉迟钝。胸椎 MRI 平扫+增强扫描见 Th8-9 椎体水平见一团状异常信号影，T1WI 以稍低信号为主，其内见一小类圆形低信号，T2WI 呈不均匀高信号，T2WI 脂肪抑制序列呈明显高信号，边界清楚，大小约 1.6cm×0.8cm，增强扫描呈明显边缘强化，相应脊髓受压移位。颅脑 MRI 未见异常。术前诊断：Th8-9 椎管内占位性病变。术中大体病理见椎管内髓内硬膜下占位病变，病变为实质性，大小约 2cm× 1 cm，病变肉眼观为白红色，质地较韧，血供，边界清楚，有虫体及节结，局部脊髓受压移位。术后病理：符合囊虫病。

讨论:囊虫病以颅内多见，脊髓型囊虫病少见，通常认为与颅内囊虫病并存，单纯脊髓型囊虫病更少见。按照部位可分为蛛网膜下腔型、硬膜下腔型及脊髓型。文献报道以蛛网膜下腔型及硬膜下腔型多见。囊虫 MRI 表现可分为 3 期：生存期：囊虫表现为囊性长 T1 长 T2 信号，囊内可见点状实性头节影，增强扫描可见强化效应。退行性变期：头节消失，虫体肿大肿大变性，周围可见炎性水肿。钙化期：囊虫死后机化、钙化。本病例考虑囊变期，但未见明确显示头节。脊髓型囊虫病的临床诊断比较困难，尤其缺乏颅内病变及椎管内单发病灶的患者，且大部分患者缺乏流行病学相关依据。该疾病还需要与星型细胞瘤、蛛网膜囊肿、神经鞘瘤等相鉴别。MRI 可作为脊髓型囊虫病首先的影像学检查，可清晰的显示病灶的位置、大小、形态、分布及分型，认识其影像学特征，对早期明确诊断、手术及驱虫治疗提供重要依据。

PU-2294

The Three-dimensional Double Echo Steady State Sequence (3D-DESS) Magnetic Resonance Imaging (MRI) technique on diagnosis of a rare Multiple Neurofibromatosis: A case report

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The type-I of neurofibromatosis (NF-I) is with a high morbidity in clinic. Due to the clear image on the location, quantity, size, morphological characteristics and adjacent structures, the Magnetic Resonance Imaging (MRI) technique is usually utilized to help clinicians diagnosing NF. However, the general radiological technologies on localization diagnosis and classification diagnosis of NF-I are unclear and unsatisfied. Here, we report a case of NF-I diagnosed by the Three-dimensional Double Echo Steady State Sequence (3D-DESS) MRI technique. The aim of the present study is to provide a novel strategy for the diagnosis and treatment guidelines of NF and NF-related diseases.

PU-2295

大鼠甲亢模型的颅脑 18-FDG PET/CT 研究

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目的：应用 18-FDG PET/CT 研究大鼠甲亢模型脑内葡萄糖代谢的特点，探讨甲状腺激素水平增高对于脑部结构和代谢的作用机制。**方法：**将 10 只 SD 大鼠随机分为甲亢模型组和对照组各 5 只，甲亢模型组采用优甲乐（左甲状腺素钠片）75ug/100g 灌胃造模，持续给药 4 周，对照组给予生理盐水，后尾静脉采血经放免法测定血清游离 T3、游离 T4 及 TSH 值，确定造模成功。将 10 只大鼠进行脑部 PET/CT 扫描，后处理得到大鼠脑部各脑区的标准摄取值（SUV），对比甲亢模型组和对照组各脑区 SUV 值的差异。**结果：**和对照组相比，甲亢模型组各脑区的 SUV 值均有不同程度减低。其中，双侧扣带回（左侧 P=0.02 右侧 P=0.02）、双侧岛叶皮层（左侧 P=0.012 右侧 P=0.007）、双侧前额叶内侧皮层（左侧 P=0.024 右侧 P=0.022）、双侧眶额皮层（左侧 P=0.024 右侧 P=0.018）、双侧前背侧海马（左侧 P=0.02 右侧 P=0.021）及左侧海马后部（P=0.011）有统计学差异。**结论：**甲状腺激素水平增高导致大鼠脑部葡萄糖代谢的降低，其中扣带回、前额叶内侧皮层、眶额皮层及海马均属于边缘系统，边缘系统的功能多样，与嗅觉、学习和记忆、情绪活动、内脏活动等有关，为研究甲亢状态下中枢神经系统功能紊乱机制提供依据。

PU-2296

DKI 在脑损伤后皮质脊髓束继发性损害的动物实验研究

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目的 应用扩散峰度成像（diffusion kurtosis imaging ，DKI）技术观察急性颅内高压致脑疝（brain herniation，BH）及脑损伤后下行皮质脊髓束（corticospinal tract ，CST）继发性损害的微结构改变，探讨 DKI 检测 CST 继发性损害的可行性。

方法 采用微量注射泵向巴马小型猪左侧额叶内注射自体股动脉血，建立急性颅内高压致 BH 模型猪 10 只，应用 DKI 技术分别测量 BH 模型猪制模前、制模成功后脑桥皮质脊髓束走行区的 DKI 各参数值，统计分析制模前后各参数值变化，并对比分析病理学改变。

结果 制模前巴马小型猪两侧脑桥皮质脊髓束走行区 MK、AK、FA、MD 间差异无统计学意义（P>0.05）。制模后患侧脑桥皮质脊髓束走行区的 MK 较制模前及制模后的镜像侧明显增高，差异

均具有统计学意义（P<0.05）。制模后患侧及镜像侧脑桥皮质脊髓束走行区的 AK 均较制模前明显增高，差异均具有统计学意义（P<0.05），但患侧及镜像侧 AK 间差异无统计学意义（P<0.05）。制模后患侧及镜像侧脑桥皮质脊髓束走行区的 FA、MD 均较制模前减低，但差异无统计学意义（P>0.05）。病理切片行 HE 染色后进行光学生物显微镜观察显示：脑桥神经元核固缩、核消失，神经元周围小胶质细胞围绕，围管样浸润。

结论 急性颅内高压致脑疝及脑损伤后，两侧下行皮质脊髓束发生继发性损害，并可被 DKI 量化评估，较传统弥散成像准确。DKI 有望作为观察皮质脊髓束继发性损害的新的影像学指标。

PU-2297

基于 3D-ASL 脑灌注成像首发未用药强迫症患者静息状态脑血流特征分析

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【摘要】 目的：应用 3D 动脉自旋标记成像（ASL）全脑灌注成像技术探讨首发未用药强迫症患者脑血流灌注特点。**材料和方法**：对 34 名首发未用药强迫症患者的静息状态脑灌注图（ASL）和脑血流（CBF）图像进行分析，并与正常对照组比较。所有患者强迫症状的严重程度使用耶鲁布朗强迫量表（Y-BOCS）评估。**结果**：首发未用药强迫症患者的脑血流较正常对照主要表现为双侧扣带回低灌注，左侧颞中回、颞下回高灌注。**结论**：首发未用药强迫症患者存在静息状态脑血流的异常，提示强迫障碍可能的神经发病机制。

PU-2298

原发性低颅压综合征的 MRI 影像学表现

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目的 探讨原发性低颅压综合征的 MRI 影像学表现。

方法 将 2017 年 3 月-2019 年 3 月经临床证实的 12 例原发性低颅压综合征患者列为病例组，对照组选取同时期与病例组性别与年龄相匹配普通患者 24 例。所有患者均行头部 CT 平扫及头部 MRI 平扫及增强扫描检查，计算两组脑桥和乳头体间距、脑桥腹侧和中脑夹角、直窦(SS)和大脑大静脉(VOG)夹角、VOG 和大脑内静脉(ICV)夹角。

结果 12 例病例组患者头部 CT 平扫中 4 例未见明显异常，6 例可见硬膜下积液（6/12），2 例硬膜下血肿（2/12）；头部 MRI 均可见硬脑膜增厚并强化（12/12）；11 例硬膜下积液及血肿（11/12）；10 例脑室、脑池狭窄及脑沟变浅（10/12）、静脉窦扩张（6/12）、10 例脑组织下移及垂体增大脑下垂征象（10/12）。病例组的脑桥和乳头体间距、脑桥腹侧和中脑夹角、SS 和 VOG 夹角、VOG 和 ICV 夹角均小于对照组，差异具有统计学意义(P＜0.05)。

结论 MRI 诊断原发性低颅压综合征具有特异性，且敏感性比 CT 高；且脑桥和乳头体间距、脑桥腹侧和中脑夹角、SS 和 VOG 夹角、VOG 和 ICV 夹角对原发性低颅压综合征诊断提供客观标准。

PU-2299

不同扫描层厚对脑白质纤维束扩散张量成像定量评估的研究

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目的

探讨扩散张量成像（DTI）中不同扫描层厚的选择对脑白质纤维束各 DTI 定量指标的影响。

资料与方法

采用不同扫描层厚（分别为 3 mm、5 mm、7 mm）对 30 名健康志愿者在 3.0 T MR 扫描仪上行 DTI 以及 3D T1WI 扫描，获得胼胝体压部区域的各向异性分数（FA）、平均弥散率（MD）、轴向弥散（AD）、横向弥散（RD）以及右侧海马区域纤维束数目（FN）、最小纤维束长度（FL_{min}）、最大纤维束长度（FL_{max}）等扩散定量评估指标。比较不同扫描层厚下（3 mm 组、5 mm 组和 7 mm 组）各扩散定量指标，分析扫描层厚与各扩散定量指标的相关性。

结果

FA、MD、RD、FN、FLmin 在各组间、AD 在 3 mm 组与 7 mm 组以及 5 mm 组与 7 mm 组间差异有统计学意义（P 均<0.05），FL_{max} 各组间以及 AD 在 3 mm 组与 5 mm 组间差异无统计学意义（P>0.05）。FA、AD、FN 与扫描层厚呈负相关（r=-0.887，-0.316，-0.560，P<0.05），MD、RD、FL_{min} 与扫描层厚呈正相关（r=0.606，0.767，0.501，P<0.05）。FL_{max} 与扫描层厚无相关性（r=0.008，P>0.05）。

结论

不同扫描层厚对 DTI 部分扩散定量指标有明显的影响，数据获取过程中应引起重视。

PU-2300
磁共振在帕金森病双侧丘脑底核脑深部刺激术前影像学定位的应用价值

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目的 探讨磁共振在帕金森病患者双侧丘脑底核（STN）脑深部刺激术（DBS）治疗前的术前影像学定位价值。

方法 50 例行双侧丘脑底核 DBS 治疗的帕金森病（PD）患者，术前均进行 CT 及 3.0T 磁共振扫描，术后均进行 1.5TMRI 扫描，采用手术计划系统计算靶点坐标，比较术前与术后的靶点坐标的差异，以及侧脑室与针道角度的相关性。

结果 本组 MRI 术前定位坐标数据用均数±标准差表示，结果为术前与术后的靶点坐标无统计学意义；Arc 角的大小可能与侧脑室的大小有关。

结论 磁共振在帕金森病双侧丘脑底核脑深部刺激术治疗前的定位中具有重要意义，为避免误穿侧脑室，制定坐标时注意调整 Arc 角的大小。

PU-2301
岛叶脑沟及脑回形态有望成为可靠的脑部精神疾病的研究指标

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目的:利用 MRI 对不同年龄段中国人优势大脑半球岛叶进行测量，建立正常人岛叶脑沟、脑回的形态正常值标准，评价岛叶脑沟、脑回形态与年龄的相关性，为多种岛叶精神疾病诊断提供影像诊断依据。**方法**:选取 75 例健康志愿者，进行头部核磁扫描，测量并统计中国人优势大脑半球岛叶各亚回形态学数据，包括各亚回皮质、白质、脑沟宽度值，并对各年龄组形态学数据进行对比分析。**结果**：正常人优势大脑半球岛叶形态学测量值：各年龄数值组均符合正态分布的有长前回灰质宽度，平均值为((1.84±0.59))mm；横回白质宽度，平均值为((2.73±0.10))mm；横回灰白质比，平均值为(1.02±0.35)；横沟深度，平均值为((3.18±1.15))mm。其中，横沟长径在各年龄组间差异有统计学意义（P<0.05）。其他优势大脑半球岛叶各亚回皮质、白质、脑沟宽度差异没有因年龄而发生显著变化（PP>0.05）。**结论**：岛叶属于较低级别脑叶，是最先分化和发育的皮质，其形态学参数受年龄影响较小，岛叶灰质宽度与年龄差异无直接相关性，因此有可能成为较可靠的研究脑部精神疾病的指标。

PU-2302

小脑组织疝入颅骨 MRI 诊断

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目的

探讨小脑组织疝入颅骨的 MRI 影像特点及临床意义

方法

搜集经我院经 MRI 检查发现的 3 例小脑组织疝入颅骨的患者，男 2 例，女 1 例，年龄 50-71 岁；和 5 例蛛网膜颗粒患者做对照比较；采用 Siemens Trio3.0 超导 MR 仪，头颈部联合线圈，行常规 T1WI 及 T2WI　T2Flair 横断面、矢状面平扫。

结果

3 例患者中，2 例为右侧小脑半球局限结节状突起的小脑组织疝入右侧枕骨，陷入深度分别约 6mm，6.9mm；1 例为双侧小脑半球 3 个结节突起的小脑组织疝入枕骨内，陷入最大深度约 8mm，陷入最深达板障层，邻近颅骨外板的内缘，陷入颅骨的小脑组织呈结节状、菜花样改变，侧位观部分呈鸟嘴样改变，突起结节与小脑连续且信号与小脑组织相同，T2WI 显示结节后方见脑脊液信号环绕；局部受压枕骨弧形、欠规则凹陷缺损，颅骨内板低信号不连续。5 例蛛网膜颗粒均表现为大小不一的类圆形、圆形，表现为 T1WI 低信号，T2WI 高信号，T2Flair 低信号，与脑组织无连续。

结论

小脑组织疝入颅骨较为罕见，考虑为小脑局部发育异常，分为单发型和多发型，MRI 表现具有特异性，MRI 平扫横轴位、矢状位可以准确诊断，能和蛛网膜颗粒做出准确的鉴别。临床对于该类患者的枕骨手术等，认识小脑组织这种发育异常具有重要意义。

PU-2303

线性钆对比剂 MR 多次增强后小脑齿状核钆沉积的初步研究

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【摘要】 目的 探讨多次使用线性钆对比剂后，MRI 平扫 T1WI 上双侧小脑齿状核、脑桥信号强度的改变。**方法** 回顾性分析 2015 年 1 月至 2018 年 12 月 95 例进行至少 3 次 MR 增强检查的患者的临床及影像学资料，所有 MR 增强检查均在本院进行，且多次增强前后均进行过颅脑 MR 平扫。所有数

据均在西门子后处理工作站进行后处理，在第一次 MRI 检查的及多次使用线性钆对比剂后的 T1WI 上分别测量双侧小脑齿状核、脑桥的信号强度，将左右两侧小脑齿状核的信号强度取平均值作为该病人的小脑齿状核信号强度，计算第一次和最后一次 MRI 检查之间的齿状核/脑桥信号比（SI）。多次增强检查前后齿状核/脑桥信号比采用配对 t 检验，多次增强检查后、齿状核/脑桥信号比采用 Pearson 相关，采用线性回归分析方法，分析多种临床因素与多次增强前后齿状核/脑桥信号强度的相关性。**结果** 95 例患者中 13 例 MRI 平扫小脑齿状核 T1WI 信号增高；11 例多次 MR 增强后小脑齿状核/脑桥的信号强度比大于第一次 MRI 检查的信号强度比，2 例小于第一次 MRI 检查的信号强度比。第一次 MRI 平扫、多次使用线性钆对比剂后小脑齿状核/脑桥的信号强度分别是 1.10±0.07、1.13±0.19（t=-0.40，P=0.698）。接受线性钆对比剂注射次数与信号强度比之间无明显相关性，与临床其他因素无关（P 值均＞0.05）。**结论** 多次使用线性钆对比剂 MR 增强后的患者，T1WI 齿状核信号不一定增高，与增强检查次数无明显相关性。

PU-2304

86 例单纯性软脑膜增厚病因分析及文献复习

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【摘要】目的 总结软脑膜增厚病因，分析其病理生理、好发部位、分布规律。 **方法** 回顾性分析 86 例患者软脑膜增厚的 MRI 表现，联系其发病原因、临床症状、软脑膜增厚部位，了解软脑膜增厚与疾病病理生理的相关性。**结果** 86 例患者均为软脑膜增厚而不累及硬脑膜，可归纳为 3 大类疾病：①炎性疾病：细菌感染，结核感染，真菌感染，寄生虫感染，病毒感染，梅毒感染，非病毒感染无菌性脑膜炎，化学性脑膜炎（表皮样囊肿或皮样囊肿破入蛛网膜下腔），术后炎性反应；②血管性疾病：蛛网膜下腔出血，烟雾病，脑颜面血管瘤病，急性缺血、梗死后反应；③肿瘤性疾病：脑内原发肿瘤直接累及或蛛网膜下腔种植，癌性脑膜炎，硬脑膜（脑外）肿瘤反应性增厚等。不同病因所致软脑膜增厚部位不同。**结论** 软脑膜增厚病因多为炎性刺激增生反应、肿瘤增殖、血管代偿扩张等，其分布、增厚程度有规律可循，非肿瘤性病变常不累及皮层，MRI 常规 T2-FLAIR 及增强 T2-FLAIR 可很好的发现病变并鉴别病因。

PU-2305

慢性创伤性脑损伤后认知障碍大鼠模型弥散峰度成像的研究

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研究背景：慢性创伤性脑损伤（Traumatic brain injury, TBI）后认知障碍发生的病理改变机制尚未完全清楚。弥散峰度成像 （Diffusion kurtosis imaging, DKI）序列对于评估脑组织改变有重要的作用。应用 DKI 探索慢性 TBI 认知障碍脑组织病理改变有一定的前景。
研究目的：探讨慢性 TBI 大鼠脑组织 DKI 参数以及脑组织病理改变情况，并分析慢性 TBI 大鼠 DKI 参数与组织病理学、认知障碍的关系。
材料与方法：纳入 TBI 大鼠模型及对照组大鼠各 6 只，造模后 7 月后进行水迷宫测试、DKI 扫描、免疫组化（包括 NeuN、GFAP、MBP、Iba-1 指标）。分析双侧大脑皮质、海马、胼胝体 DKI 参数及免疫组化指标改变情况，并分析 DKI 参数与免疫组化指标及认知测试的相关性。
研究结果：与对照组比较，TBI 大鼠 7 月后在外伤侧皮质、外伤侧海马、胼胝体 MD 升高、MK 降低(P ＜ 0.05)；免疫组化表现为 NeuN 降低，Iba-1、MBP 升高(P ＜ 0.05)。外伤侧皮质的 MK 与

NeuN，MD 与 MBP 存在正相关(P ＜ 0.05)，外伤侧皮质、外伤侧海马的 MK 与 Iba-1、MBP 存在负相关(P ＜ 0.05)。外伤侧皮质、外伤侧海马 MK 与认知功能存在相关性(P<0.05)。
研究结论：慢性 TBI 大鼠存在认知障碍，DKI 参数改变与免疫组化所反映的神经元丢失、神经炎症、髓鞘破坏存在相关性，DKI 可用来评估慢性 TBI 后认知障碍的脑组织改变情况。

PU-2306
3.0T MR 多参数成像对脑海绵状血管瘤的诊断价值

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【摘要】目的 探讨磁共振多参数扫描显示脑海绵状血管瘤的应用价值。方法 回顾性总结分析经临床诊断为脑海绵状血管瘤的 45 例患者的 MR 影像资料。45 例患者均行 T1WI、T2WI、DWI、SWI 等序列检查，部分患者行增强 MRI 检查。分析脑海绵状血管瘤的影像特征，并对各序列的检出率进行统计分析，采用 SPSS19.0 统计软件，比较各序列病灶检出率的差别。结果 45 患者共发现 56 处病灶，T2WI 显示“爆米花”征 26 例，“黑环”征 30 例。病灶分布于脑内多个区域。其中 41 例 CA 为单发病灶，4 例多发病灶。各序列检出数量：56 处病灶中，T1WI 显示 26 个，T2WI 显示 37 个，DWI 显示 49 个，SWI 显示 56 个。SWI/DWI 序列检出率高于常规序列（*P*＜0.05）；SWI 检出率高于 DWI（*P*＜0.05）。结论 脑海绵状血管瘤影像表现具有一定特征，多参数扫描提供了更多病灶信息，为临床提供大量有用信息。

PU-2307
全脑 CT 灌注成像对缺血性脑卒中侧支循环的定量分析及预后评估

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目的 探讨 CT 灌注成像（CTP）定量评估缺血性脑卒中侧支循环及其对判断预后的价值。
材料与方法 回顾性收集治疗前行 CTP 成像且确诊为急性缺血性脑卒中和大脑中动脉 M1 段闭塞的病人 45 例（中位年龄：73 岁；四分位距：62～80 岁；其中女 20 例，男 25 例)。所有病例均采用德国西门子第二代炫速双源 CT 行多模态一站式一次扫描（NCCT+CTP15cm）或多模态一站式二次扫描（NCCT+CTP10cm+头颈 CTA）。常规平扫、CTP 采用摇篮床低剂量技术，80kV、50mAs，间隔 1.5-2.5 秒，共采集 33 个动态容积数据。所有图像传输到后处理工作站 Siemens MMWP，运行工作站内 VP Neuro 软件，可以得到 4 个灌注参数和灌注图（分别为 CBV、CBF、TTP、MTT），根据研究仅选其中的 1 个即 CBF，测量病变大脑中动脉远端距离闭塞部位最近点血管的血流量（bCBF），采用区域软脑膜侧支循环评分系统将所有患者分为侧支循环良好组、中等组及不良组，比较三组间 bCBF 值。采集患者 90 天改良 Rankin 量表（mRS）评分量表，评定为 0～2 分时被认定为理想的治疗效果，并采用多变量 logistic 回归分析确定 bCBF 和预后之间的关系。
结果 侧支循环不良、中等和良好的患者间 bCBF 存在差异（41mL/100g/min，75mL/100g/min，93mL/100g/min，P<0.05）。区域软脑膜侧支循环评分（rLMC：1-20）分析显示 bCBF 与 rLMC 评分呈正相关（r=0.55，P<0.05）。多变量逻辑回归分析显示 bCBF 是良好预后的独立预测因子。结局良好患者 30 例（90 天 mRS≤2）的 bCBF 高于结局不佳的患者 15 例（90 天 mRS>2）（82mL/100g/min；53mL/100g/min；P <0.05）
结论 全脑 CT 灌注成像是可行的侧支循环定量评估方法，并与缺血性卒中患者的临床结局相关。

PU-2308

Resting-state functional MRI study of functional connectivity density (FCD) in patients with migraine without aura

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To explore the changes of functional connectivity density (FCD) in patients with migraine without aura (MWoA), including chronic migraine (CM) and episodic migraine (EM) patients, resting state functional magnetic resonance imaging (rs-fMRI) and high resolution T_1WI of 56 MWoA patients (EM 39, CM 17) and 35 matched healthy controls (HC) were collected. The patients were admitted to the department of neurology of the first affiliated hospital of soochow university for the first time from December 2016 to September 2017. The FCD differences among the three groups: LFCD changes were mainly found in the right hippocampus, left temporal cortex and temporal pole, and bilateral ventromedial prefrontal cortices. LFCD of these regions in migraine patients were increased than the HC group. For these regions, LFCD in the CM group was higher than that in the EM group. LFCD was decreased in bilateral dorsolateral prefrontal cortices in patients when compared with the HC group. For longFCD, the results of the right temporal cortex and hippocampus showed the same trend as the LFCD results. Moreover, longFCD of bilateral ventromedial prefrontal cortices was increased in migraine patients as compared with the HC group, but there were no significant differences between the CM and EM groups. Compared with the HC group, longFCD in bilateral dorsolateral prefrontal cortices was slight decreased in the EM group, but no significant difference was found in the CM group. So in resting state, the difference among the three groups gathered at the areas closely related to the generation, conduction and regulation of pain itself, as well as the emotional and cognitive changes of patients after frequent and long-term pain attacks. This changes suggest that multiple brain regions are involved in the adjustment to pain and the self-regulation to emotions in migraine patients.

PU-2309

无先兆偏头痛患者发作间期右侧海马区域静息状态下脑功能连接的改变

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目的：采用静息态功能磁共振成像（resting state functional magnetic resonance imaging, rs-fMRI）通过基于种子点的海马功能连接分析，探究无先兆偏头痛（migraine without aura, MWoA）慢性组（chronic migraine, CM）及偶发组（episodic migraine, EM）患者的脑功能连接改变。

方法：分别采集 2016 年 12 月至 2017 年 9 月间就诊于苏州大学附属第一医院神经内科门诊首诊无先兆偏头痛患者 56 例（偶发组 39 例，慢性组 17 例）及 35 名相匹配的健康志愿者（healthy control, HC）的 rs-fMRI 图像及高分辨 T_1WI 解剖图像，对所得图像应用专业软件预处理及建模计算相关系数后比较右侧海马的功能连接(functional connectivity, FC)在两组患者及正常对照组间的差异。

结果：三组间右侧海马的脑功能连接差异：与 EM 组相比，CM 组右侧海马与两侧颞极的功能连接增强。相较于 HC 组，EM 组与两侧颞极、两侧腹内侧前额叶（额下回、直回及前扣带回）功能连接增强；与 HC 组相比，CM 组两侧颞叶（两侧颞极及颞上回、颞中回）、右侧海马及海马旁回、两侧腹内侧前额叶（额下回、直回及前扣带回等）可见显著功能连接增强。

结论：海马功能连接存在组间差异的脑区主要位于边缘系统及脑默认网络内侧组，提示在发作间期疼痛相关脑网络长程应急记忆及情绪反应的功能网络依旧活跃，并可能为偏头痛发作间期的治疗提供理论支持。

PU-2310
通过功能连接密度及脑网络属性探讨早泄患者的 多巴胺通路中长短距离的功能连接失调

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目的 通过功能连接密度（ Functionalconnectivitydensity， FCD）和脑网络属性分析来探讨早泄（ prematureejaculation， PE）患者大脑中多巴胺（ dopamine， DA）通路的改变。 材料与方法 南京大学医学院附属鼓楼医院医学研究伦理委员会批准了这项横断面研究，并且签署书面知情同意书。本研究共包括 20 名右利手早泄患者（年龄： 27.95±4.52，男性）和 15 名年龄和性别匹配的正常对照年龄： 27.87±3.78，男性）。所有被试均接受了静息态功能磁共振和高分辨 T1w 结构磁共振扫描。所有入组患者均排除神经或精神系统病史。应用功能连接密度分析早泄患者组与正常对照组在短距离功能连接密度和远距离功能连接密度之间的组间差异。此外，还采用了基于 ROI 的分析，及基于脑网络和图论来比较网络属性。 最后进行 Pearson 相关分析， 将临床评分（如阴道射精潜伏时间， IELT）与功能连接密度和网络属性进行相关分析。 结果 早泄患者的短距离功能连接密度在多巴胺通路中显著降低，包括双侧中间颞回，梭状回，左眶额叶皮层，伏隔核，尾状核和丘脑（ $p<0.05$）；而左侧岛叶，颞横回和壳核以及双侧楔前叶、辅助运动区中扣带回（ MCC）、前扣带回（ ACC）的长距离功能连接密度显著增高（ $p<0.05$）。脑网络分析发现，早泄患者的脑网络连接在某些节点中得到加强。此外，患者右侧前扣带回，下额叶和中扣带回的枢纽节点的度在早泄患者中显著增加。阴道射精潜伏时间与短距离功能连接呈显著正相关，与长距离功能连接和节点的度呈显著负相关。 结论 我们的研究表明， 早泄患者存在多巴胺通路中短距离及长距离脑区的协同作用障碍及网络特性变化。这种改变可称为反映早泄疾病生物标志物及治疗靶点。

PU-2311
通过来自子宫内正常发育胎儿白质信号强度间接反映胎儿大脑发育

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研究目的 在 1.5T 磁共振上通过 sBTFE 序列检测不同孕周正常胎儿大脑白质信号强度，探索正常胎儿大脑白质信号强度与孕周之间的关系。 材料与方法 收集南京市鼓楼医院 2010 年 9 月至 2013 年 9 月 136 例孕周在 22-39 周的单胎胎脑图像， 测量 18 个选定脑区及双侧脑室后角脑脊液信号强度值（ SI）。考虑到线圈敏感度造成的信号不均一性，通过计算相对信号强度(SIR)，即用相应脑区的 SI 值比上两侧脑室后角脑脊液平均值。 测量并计算出选定区域的 SIR 值： 胼胝体膝部、 体部、压部、双侧额叶、枕叶、颞叶、顶叶及中央前回、丘脑、小脑、脑桥同孕周的相关性。 结果 18 个脑区中，双侧的枕叶、中央前回、中央后回、颞叶、丘脑、小脑及脑桥的信号强度与孕周存在相关
性（ $P<0.05$）。不同脑区的信号强度值与孕周之间的拟合模型不同。 结论 本研究使用相对较大的队列来证明在其改变的不同阶段的胎儿脑中白质的 SIR 差异，使用常规使用的临床 sBTFE 序列。白质信号强度随胎龄的变化，可能在一定程度上反映了生殖矩阵迁移的时间顺序和髓鞘形成进程的时间顺序。

PU-2312

A Combined DTI and Resting State functional MRI Study in Patients with Postherpetic Neuralgia

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Purpose: To explore the brain microstructural and functional changes in patients with PHN.
Materials and Methods: 12 PHN patients and 12 healthy volunteers were enrolled in the study. A 3 T MR scanner was used in this study. DTI, rfMRI and 3D-MPRAGEsequences were used. FA and MD t-maps were obtained after DTI data processing with PANDA, and ALFF and fALFF were obtained after the rfMRI data processing with DPABI. The statistical analysis module of the REST software was used to compare the FA, MD, ALFF and fALFF differences between the PHN patients and normal controls.
Results: There were no statistically significant differences in gender, age and education years between the two groups. FA, MD, ALFF and/or fALFF showed significant alterations in some pain or pain-related brain regions, such as brainstem, cerebellum, parietal lobe, precuneus, frontal lobe, temporal lobe, postcentral and precentral gyrus, corpus callosum, cingulate gyrus, putamen and insula.
Conclusion: Multi-local alterations of spontaneous brain activity form a network related to chronic pain, sensory discrimination, emotion and cognition, suggesting complicated central mechanisms of PHN, combined-action of brain microstructure and function may play a critical role in comprehension of neurological mechanisms of PHN pain.

PU-2313

强制戒断与美沙酮维持治疗半年对海洛因成瘾者脑功能影响的低频振幅 fMRI 研究

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[摘要] **目的** 探讨强制戒断和美沙酮维持治疗两种干预措施半年对海洛因成瘾者大脑功能影响的差异。**方法** 招募 22 名强制戒断约半年的海洛因成瘾者（PA 组）、25 名美沙酮维持治疗约半年的海洛因成瘾者（MMT 组）与 35 名正常对照组（HC 组）参加本研究，对所有受试者进行功能磁共振扫描采集静息态数据，利用低频振幅（ALFF）方法计算三组大脑局部自发性脑活动的强度，分析比较 PA 组与 MMT 组大脑低频振幅差异。**结果** 与正常对照组相比，美沙酮维持治疗组与强制戒断组在右侧额中回、左侧内侧额上回、左侧岛叶、左侧舌回、右侧舌回、右侧辅助运动区 ALFF 存在显著性差异；且强制戒断组在右侧额中回、左侧内侧额上回与右侧辅助运动区脑活动更趋近于正常组。**结论** 经过半年干预后，美沙酮维持治疗者与强制戒断者在部分脑区仍存在异常，但强制戒断可能更有利于海洛因成瘾者脑功能恢复。

PU-2314

3DT1FFE 对三叉神经痛和面肌痉挛的诊断价值

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目的 探讨磁共振 3DT1FFE 序列对诊断三叉神经痛和面肌痉挛血管神经压迫的价值。 方法 临床诊断的三叉神经痛 11 例，面肌痉挛 13 例，行 3DT1FFE 序列采集图像，利用原始图像对两侧三叉神经和面神经进行斜矢状位和冠状位重建，观测血管神经的关系。 结果 11 例三叉神经痛中，图像显示 9 例存在三叉神经血管压迫或接触，阳性率为 81.8%(9/11)，可疑接触 2 例。 13 例面肌痉挛中有 12 例显示了面神经起始段有微血管跨越或对面神经有轻微的推压改变，阳性率为 92.3%(12/13)。 结论 3DT1FFE 序列对发现三叉神经痛和面肌痉挛血管神经压迫具有重要价值，其原始图像及斜矢状位和冠状位重建是显示神经血管接触的敏感方法，对选择手术方式具有重要的指导意义。

PU-2315

大鼠放射性脑损伤动物模型建立与病理观察

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目的：建立大鼠放射性脑损伤模型，观察模型组和空白对照组大鼠海马区脑组织常规磁共振和病理学变化情况，观察动物存活率及用于中长期监测放射性脑损伤组织的磁共振信号变化的可行性。
材料和方法：46 只雄性 Sprague-Dawley（SD）大鼠，分模型组（n=40）和空白组（n=6）。照射组给予单次 35Gy 剂量进行半脑照射，空白组麻醉后假照射。于小动物放疗研究平台进行等中心点照射，精准制造大鼠半脑放射性脑损伤模型。采用 7T 小动物 MRI 进行影像数据采集。于照射前一周、照射后 3 天、2 周、3 周、4 周、6 周、8 周、12 周、24 周、36 周各时间点定期进行大鼠体重、照射区软组织反应、常规 MR 检查（T1WI 和 T2WI）、脑组织病理学检查及两组动物的生存率情况的观察。
结果：模型组与空白对照组大鼠体重及生存率无明显统计学差异。模型组大鼠照射区域 2 周后出现毛发脱落，皮肤出现红肿。空白组无明显改变。模型组大鼠照射后前 24 周常规 MRI 无明显异常信号，36 周时出现照射侧的信号异常，模型组非照射侧也出现轻度的信号改变。病理结果显示模型

组照射侧海马区神经细胞损伤、坏死，神经纤维和胶质细胞出现损伤，非照射侧也出现神经细胞的损伤。空白组常规磁共振检查及病理结果均未见明显异常

结论：35Gy 剂量单次半脑照射能够成功建立放射性脑损伤模型，小照射野有助于动物的长期存活，中晚期出现放射性脑坏死，能够满足放射性脑损伤组织的长期磁共振观察研究的需求。

PU-2316

SCD 及 MCI 患者海马功能连接的研究

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目的：分析主观认知下降（SCD）患者的功能网络异常，探讨健康志愿者(HC)、SCD 及轻度认知功能损害（MCI）的海马功能连接损害的演变。

材料与方法：按照纳入标准纳入 SCD 患者 35 例，MCI 患者 88 例，正常对照 32 例。收集受试者的相关临床数据及神经心理学量表评估数据，采集受试者的多模态 MRI 数据。以海马作为种子点，应用功能连接度（FC）分析方法，分析 SCD、MCI 和 HC 患者的脑功能连接差异。

结果：

以 HIP 为种子点的 FC 分析结果：与对照组相比，SCD 组与 HIP 的功能连接降低主要在双侧 TPJ、双侧 mPFC，与 HIP 功能连接增强的脑区主要在对侧 HIP、PHIP。MCI 组与 HIP 的功能连接降低主要在双侧 TPJ/角回、双侧 mPFC、双侧 ACC、双侧旁中央小叶，未发现功能连接增强的脑区。

结论： SCD 患者存在的脑结构及脑功能异常，此异常可能可以作为 SCD 的影像学生物标记。

PU-2317

前庭系统与睡眠调节

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以前庭系统功能障碍引起的头晕、姿势步态异常和睡眠障碍为主诉的患者，占据神经内科门诊很大的比例，并且影响人们的日常生活。目前已经有研究显示，睡眠障碍与头晕、姿势步态异常存在着相关性。深入了解其相关性，有望获取有效措施进行干预，提高人们的生活质量。

PU-2318

第三脑室底造瘘术后中脑导水管脑脊液流速流量分析

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目的 第三脑室底造瘘术后中脑导水管脑脊液流速流量测定分析。**方法** 回顾性分析第三脑室底造瘘术前及术后中脑导水管脑脊液流速流量改变。8 例患者 MR 扫描全部采用 Philips Archiena 1.5T 成像系统，常规扫描轴面，采用 SE 序列 T1WI（TR600ms, TE15ms, SE 序列, 矩阵 256×192），T2WI（TR4500ms, TE100ms, FSE 序列, 矩阵 324×228），FLAIR（TR6000ms, TE100ms, TI2000ms, 矩阵 256×192）和矢状面 T1WI。中脑导水管层面矢状位 CSF-DRIVE 及相位对比磁共振电影成像。患者第三脑室底造瘘术前及术后均进行中脑导水管水平脑脊液流速流量测定，主要进行中脑导水管

选定层面每博容量，返流分数，绝对容量，平均通过量，每博距离及平均速度的测量。**结果** 8 例患者中，男 7 例，女 1 例，年龄 2～80（平均 38）岁。第三脑室底造瘘术前均有不同程度脑积水，由不同基础病变造成，其中 5 例中脑导水管有膜性狭窄，3 例中脑导水管通畅。8 例患者第三脑室底造瘘术后，其中 5 例患者均出现每博容量下降，返流分数增加，绝对容量下降，平均通过量减少，每博距离减小，平均速度减低。**结论** 第三脑室底造瘘术重建了脑脊液循环，减少了脑积水症状。相位对比磁共振电影成像技术及脑脊液流速流量测定对第三脑室底造瘘术后效果评估具有重要意义。

PU-2319
颈椎间盘源性疼痛患者全脑结构异常与相关临床特征的研究

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目的 采用基于体素的形态学方法（Voxel Based Morphometry, VBM）和基于纤维束的空间统计方法（Tract-Based Spatial Statistics,TBSS）探讨颈椎源性疼痛（Cervical spondylotic pain, CSP）患者大脑灰白质微结构及相关临床特征的异常。
方法 对招募的 31 例 CSP 患者（CDP 组）和 30 例年龄、性别匹配的健康志愿者（对照组）分别采集全脑 3D-T1 结构像和扩散张量成像(Diffusion tensor imaging, DTI)数据，应用 SPM(statistical parametric mapping)和 FSL(FMRIB Software Library)软件分析 CSP 与对照组全脑灰白质微结构的差异，并与 CSP 组的视觉模拟评分（visual analogue scale, VAS）进行相关分析。
结果 与对照组相比，CSP 组右侧楔前叶、右侧颞上回和右侧中扣带回灰质体积减少，且右侧楔前叶、右侧颞上回、右侧中扣带回灰质体积与 VAS 评分呈线性负相关（右侧楔前叶：r=-0.397,p=0.045;右侧颞上回 r=-0.402,p=0.034;右侧中扣带回 r=-0.388,p=0.045）；此外，CSP 组双侧上纵束 FA 值减低，并与 VAS 评分呈负相关关系（左侧上纵束：r=-0.337,p=0.022;右侧上纵束：r=-0.331,p=0.026）
结论 CDP 存在右侧楔前叶、右侧颞上回、右侧中扣带回灰质结构及双侧上纵束白质微结构异常，将为 CSP 疼痛机制的探索提供一定的理论依据。

PU-2320
基于结构协变网络评价尼古丁依赖者脑结构损伤机制研究

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目的：本研究通过基于体素形态学测量(voxel-based morphometry,VBM）的结构协变网络(structural covariance networks,SCNs)分析方法探讨尼古丁依赖引起的大脑灰质结构差异及不同脑区之间灰质改变的协同性。 **材料及方法：**对 118 名长期吸烟者和 57 例不吸烟的健康对照进行 3D-T1 结构像（3D-mprage）序列扫描，将所有志愿者的脑结构像数据在 Matlab 软件平台上的 SPM8 进行分割，并对分割后得到的吸烟组与对照组灰质结构进行两样本 t 检验，找出两组间的差异脑区，然后将吸烟组与对照组的差异脑区作为种子点进行结构协变网络分析。 **结果：**①将所有吸烟组与对照组进行比较可见吸烟组右侧丘脑、左侧顶下叶灰质体积减少($P< 0.001$, cluster size >50voxels),未发现吸烟组存在灰质体积增加的脑区。②结构协变网络分析发现：以右侧丘脑为种

子点，吸烟组相较于对照组表现出右侧丘脑与左侧颞中回、左侧颞下回、左侧顶下叶、右侧顶上叶灰质体积协同性增加，而与右侧额下回（三角部）、左侧丘脑、双侧枕中回、双侧额中回、右侧中央前回皮层厚度的协同性降低；以左侧顶下叶为种子点，吸烟组相较于对照组表现出左侧顶下叶与左侧颞极中部、双侧颞下回、左侧中央后回及右侧额中回灰质体积的协同性增加，而与左内侧额上回、右侧顶上叶、双侧颞下回、左侧扣带回（中部）及左侧小脑灰质体积协同性降低。 **结论：**吸烟可对大脑灰质结构产生影响；长期吸烟者右侧丘脑及左侧顶下叶相关的 SCN 明显不同于对照组，提示在香烟的长期刺激下发生了右侧丘脑及左侧顶下叶 SCN 重塑，可为吸烟成瘾机制的研究及戒烟的临床指导在影像方面提供更多有价值的信息。

PU-2321

Dyke-Davidoff-Masson 综合征一例 MR 特征分析

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Dyke-Davidoff-Masson 综合征(DDMS)是一种以脑损伤后偏侧大脑萎缩，并伴有同侧颅骨代偿性肥大及对侧偏瘫为特点的罕见中枢神经系统疾病，常见于胎儿期或幼儿期。临床症状包括癫痫发作、面部不对称、对侧肢体偏瘫或无力、智力低下及精神异常等。典型的影像表现有：单侧大脑半球萎缩、同侧颅骨增生、同侧鼻窦增大等[1]。本文旨在通过对一例我院确诊的 DDMS 患者的临床表现及其 MR 影像特征进行分析，增进对该病的影像特征了解，以减少漏诊、误诊。

PU-2322

阿帕替尼诱导可逆性后部白质脑病综合征 1 例报道及文献复习

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目的：报道 1 例阿帕替尼诱导可逆性后部白质脑病综合征（PRES），提高临床对本病的认识。
方法：报道 1 例阿帕替尼诱导 PRES，分析文献，对本病的概况、临床及影像特征做一总结。
结果：患者，女，47 岁，2 月余前于诊断为升结肠腺癌伴腹膜、右侧卵巢转移，行右半结肠根治术和卵巢肿瘤切除术，病理提示：1、(右半结肠)腺癌，Ⅱ级，伴坏死，癌组织侵及浆膜外脂肪组织，脉管癌栓（+），神经侵犯（+）。2、右卵巢、大网膜见癌累及。术后诊断为：1.升结肠腺癌 pT4bN0M1ⅣC 期 2.卵巢转移癌 3.大网膜转移癌，并予以两个疗程 XELOX+阿帕替尼化疗。患者否认高血压病史，时头颅 MRI 未见确切异常。
本次因突发头痛、恶心、视物不能，伴恶心，无呕吐，不能视物，仍有光感，急入我院求诊。6 小时后头痛加重，轻微呕吐胃液，意识障碍，双侧瞳孔 3mm，左下斜视，呼之不应，心率 88bpm，血压 223/110mmHg，呼吸 20 次/分，氧饱和度 99%。辅助检查：LDH334.00U/L；颅内 CT 平扫未见明显异常。头颅 MRI 提示：双侧额顶枕颞叶、双侧小脑半球多发斑片状异常信号影，基本对称性分布，T1WI 呈稍低信号，T2WI 呈高信号，FLAIR 呈高信号，DWI 弥散未见受限，以双侧顶枕叶及小脑半球为著。治疗上予以呋塞米利尿、硝普钠控制血压、甘露醇脱水及地塞米松激素等对症支持治疗后缓解。追问患者病史，自诉服用阿帕替尼后出现血压升高、头痛等不适，停药后症状恢复。恢复后 LDH172.00U/L，复查头颅 MRI，较前病灶完全消失；
结论：PRES 是一种罕见的临床-影像综合征，急性或亚急性起病，表现为头痛、癫痫发作、视觉障碍、意识障碍、精神异常等，影像学上以大脑后部白质改变为主。阿帕替尼诱导 PRES 临床鲜有报

道，仅见《OncoTargets and Therapy》一个案报道，PRES 病程可逆、预后较好临床医生应加深认识、及时识别及积极治疗。

PU-2323

性别差异的 DTI 脑网络图论分析研究

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目的

通过 DTI 脑网络图论分析技术探究性别差异。

资料与方法

将 40 名健康志愿者（男 20 名，女 20 名）分成男女两组，在 3.0 T MR 扫描仪上行 DTI 以及 3D T1WI 扫描，获得 g、l、s、C_p、L_p、E_{glob}、E_{loc} 等网络总体属性度量评估指标。比较不同性别下各度量评估指标差异。

结果

g、l、E_{loc} 在两组间差异有统计学意义（P 均<0.05），s、C_p、L_p、E_{glob} 在两组间差异无统计学意义（P>0.05）。

结论

男女两组 DTI 脑网络均具有小世界属性。部分网络总体属性度量评估指标有性别差异。

PU-2324

不同碘浓度对比剂对头部 CT 动脉成像质量的研究

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目的：在头部 CT 动脉成像检查过程中应用不同碘浓度对比剂后会得到不同效果的成像，本次探究的主要目的就是探究对比剂浓度对成像质量的影响。

方法：选取接诊的 120 例患者，经随机数字法随机分成 A、B、C 三组，对三组患者采用不同浓度的对比剂，比较分析扫描检查的结果。

结果：A、B、C 三组的对比剂浓度不断升高，颈内动脉 CT 值、基底动脉 CT 值不断增大，成像的质量越来越高；A、B、C 三组出现不良反应的概率分别为 9.59% 、21.59% 及 35.84% ，C 组最高且明显高于 A 组，差异具有统计学意义(P<0.05) 。

结论：对比剂的浓度是影响检查扫描质量的主要因素，其浓度越高扫描质量越好但是患者出现的不良反应越多，因此应把握对比剂的使用浓度。

PU-2325

磁共振基于凸显网络静息态功能连接对终末期肾病患者的研究

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目的：近年来大量研究均发现终末期肾病(ESRD)患者和健康人（HC）的重要功能连接主要是默认网络存在显著差异,而凸显网络（SN）作为默认网络及执行控制网络的调控开关在 ESRD 认知障碍机制

中的作用一直少有报道。本研究旨在通过 SN 功能连接分析,探讨 ESRD 和 HC 在 SN 功能连接的差异，找到其认知障碍的生物学标记并探究神经学机制。
方法：纳入 ESRD 患者 43 名及性别、年龄及教育程度均匹配 HC 组 43 名采集静息态功能 MRI、神经认知量表及临床实验室数据。使用 DPABI 中基于种子点功能连接方法提取 SN 功能连接矩阵,用 NBS1.2 软件比较两组的功能连接差异；用 matlab2012a 将差异功能连接作为特征向量构建基于线性支持向量分类器；用 SPSS21.0 分析病人组功能连接强度与临床指标及分类分数与神经心理学评分之间的关系，用 sobel 检验来探讨功能连接对临床指标作用于神经心理学评分的中介效应。
结果:与 HC 对比,ESRD 患者蒙特利尔认知评估量表(MoCA)中的视觉空间，命名，语言和抽象思维等认知功能评分下降，同时在焦虑、抑郁、数字连线、数字广度及数字符号转换试验得分上均较有差异(P<0.01)。ESRD 患者的 SN 连接异常，主要位于小脑，岛叶，背侧前扣带回，缘上回和额中回。分类器可将 ESRD 与 HC 区分开，准确率为 72%，ROC 曲线下的面积为 0.78。 超平面距离与数字广度试验，MoCA，焦虑，数字连线试验得分显着相关.背侧前扣带回与左岛叶的功能连接强度与红细胞相关指标呈正相关。SN 中差异性功能连接对临床实验室指标作用于神经心理学评分过程中未见明显中介效应。
结论： 凸显网络中的前岛叶、背侧前扣带回及小脑之间的连接能准确区分 ESRD 和 HC，并且能反映患者的血生化状态、执行功能和情绪调节障碍，有望作为一个潜在 ESRD 认知功能下降的早期生物学标志。需要大样本和纵向数据进一步确认其作用并确定量化标准。

PU-2326

Aberrant brain function in active-stage ulcerative colitis patients: A resting-state functional MRI study

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Background: Patients with ulcerative colitis (UC) usually display cognitive impairments, such as memory loss, attention deficits, and declining executive functions, particularly during the active stage of the disease. However, the potential neurological mechanisms of these symptoms remain unclear.

Method: Forty-one patients with mildly to moderately active UC, as well as forty-two matched healthy controls, were recruited for an examination using psychological scales, cognitive function tests and resting-state functional magnetic resonance imaging (rs-fMRI). Seed points were identified via analysis of amplitude of low-frequency fluctuation (ALFF), and functional connectivity (FC) was calculated between these seed regions and other voxels in the whole brain. Correlation analyses were performed among clinical indexes, neuropsychological assessments and neuroimaging data.

Result: Compared with the healthy controls, patients with UC exhibited lower ALFF values in the bilateral hippocampal/parahippocampal (HIPP/ParaHIPP) region and higher ALFF values in the left posterior cingulate cortex (PCC.L) and left middle frontal gyrus (MFG.L). With HIPP/ParaHIPP as the seed point, the strengths of the FC in the bilateral middle frontal gyri, anterior cingulate cortex (ACC), and left caudate nucleus (CAU.L) increased; Using the PCC.L as the seed point, the strengths of the FC in the middle cingulate cortex (MCC) and the left angular gyrus (AUG.L) increased. These abnormal brain regions were mainly located in limbic system. By analyzing the

correlations between these brain regions and behavioral data, we observed a close correlation between decreased HIPP/ParaHIPP activity and memory loss; increased PCC activity and strength of FC with the AUG.L were related to dysfunction of executive function and attention network in patients with UC.

Conclusion: Based on these results, the limbic lobe might be the core of the brain-gut axis (BGA) and play an important role in cognitive impairments, suggesting potential mechanisms for cognitive impairment in patients with UC in the active stage of the disease.

PU-2327
基于图论的稳定期慢性阻塞性疾病脑结构和功能的研究

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目的：采用图论分析(graph-based analysis)的方法探究稳定期慢性阻塞性肺疾病患者功能及结构脑网络拓扑属性改变，分析稳定期 COPD 患者认知功能损伤的神经机制。
方法：选取 57 例稳定期 COPD 患者及 57 例性别、年龄及受教育程度匹配的健康志愿者（对照组），应用 MOCA、MMSE 临床量表进行认知功能情况评估，进一步对 COPD 患者认知功能障碍发生率及相关影响因素进行统计学分析。采用静息态功能磁共振(rs-fMRI) 、3.0T 磁共振进行全脑 DTI(Diffusion Tensor Imaging)技术进行功能及结构像序列扫描。通过图论方法比较功能及结构脑网络的整体和局部网络拓扑属性,并分析拓扑属性与临床变量之间的关系。
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结果：稳定期 COPD 患者功能及结构脑网络虽具有明显"小世界"属性,但其功能、结构属性存在异常破坏。COPD 患者组全局效率、局部效率、节点度明显降低，具有统计学意义。患者组与对照组相比均显示出广泛的功能、结构连接改变，默认网络和执行控制网络内功能连接减低。而相比于对照组表现出结构-功能去耦合的趋势。

结论：稳定期 COPD 患者脑功能及结构网络表现出明显的拓扑网络属性改变，表现出结构—功能网络去耦合，稳定期 COPD 患者拓扑属性异常可能是认知功能障碍的潜在生物学标志。

PU-2328
经颅聚焦超声开放幼鼠血脑屏障后使用荧光金标记视觉神经通路

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目的：使用经颅聚焦超声（focused ultrasound, FUS）开放幼鼠视上核血脑屏障（blood brain barrier, BBB）后，采用荧光金无创、逆向标记视觉神经通路，探索活体内神经细胞的轴突转运机制。
方法：本研究获得所在医院实验动物伦理委员会批准。使用 4~5 周龄的 Sprague-Dawley（SD）雄性幼鼠 20 只，随机数字法分为实验组和对照组。实验组动物经尾静脉注入超声造影微泡后，使用

FUS 经颅辐照幼鼠视上丘，对照组则不做 FUS 处理。确定实验组幼鼠 FUS 开放视上核 BBB 的微泡剂量、FUS 作用时间以及能量大小等最佳实验参数组合。辐照后的实验组和未辐照的对照组均经尾静脉注入荧光金 0.1 mg，入血循环 1 天、3 天、7 天、14 天分别病理取材。每次取材前 3 小时尾静脉注射伊文思蓝（Evan’s blue, EB），冰冻切片中观察不同时间点荧光金在幼鼠大脑、视神经和视网膜的转运情况。

结果：（1）实验组 FUS 开放视上核局部 BBB；（2）荧光金透过 BBB 开放区域标记大脑神经元细胞；（3）随着荧光金循环时间延长，视神经和视网膜荧光金标记细胞逐渐增多；（4）实验组冰冻切片见靶向区域少量出血；（5）FUS 开放 BBB 增加了荧光金的转运速率。

结论：经颅聚焦超声联合造影微泡可无创开放视上核血脑屏障，荧光金能透过该区域标记局部的神经元细胞，随后通过跨轴突逆向转运至双侧的视神经和视网膜，提供了一种新的神经元和神经通路标记的方法。

PU-2329
急性期轻度创伤性脑损伤患者的灰质体积及认知功能改变

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目的：探讨急性期轻度创伤性脑损伤患者(mild traumatic brain injury，mTBI)的灰质体积及认知功能的变化。

方法：选取符合入组标准的 39 例 mTBI 患者和 32 例年龄、性别及受教育程度与之相匹配的健康对照被试者作为研究对象。采用蒙特利尔认知评估量表（MoCA）对所有受试者进行认知功能评估，之后在 3.0T 磁共振仪进行常相同参数的高分辨率 3D-T1WI 序列扫描，采用 VBM (voxel-based morphometry)方法分析比较 mTBI 组与健康对照组间的脑灰质体积差异，从而发现 mTBI 患者存在显著差异的脑区。

结果：（1）与健康对照组相比，mTBI 患者组双侧额下回、右侧岛叶及左侧小脑等脑区的灰质体积明显减小，全脑灰质未见体积增大的区域。（2）与健康对照组相比， mTBI 患者的认知功能在视空间及执行能力、注意力方面显著降低。

结论：mTBI 患者的大脑灰质体积及认知功能存在异常改变，这种改变可能对于 mTBI 的诊断及预后提供一定的帮助。

PU-2330
MRI 观察复发缓解型多发性硬化患者脑内病灶穿通静脉的研究

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目的 利用 3.0T MRI 3-D 增强型 T_2*加权血管成像(ESWAN)技术观察复发-缓解型多发性硬化(RRMS)患者脑内病灶穿通静脉，并分析病灶与静脉间的关系。**方法** 对 30 例 RRMS 患者组和 30 例自身免疫性结缔组织疾病患者组（其中 12 例系统性红斑狼疮，6 例硬皮病，12 例类风湿关节炎）及 30 例正常对照组行常规 MRI 和 ESWAN 扫描，ESWAN 原始图后处理所得静脉图像应用 MinIP 处理后，由 2 名有经验的医师盲法评定 RRMS 患者大脑内静脉及其主要属支和深部髓静脉的改变，并与结缔组织疾病患者组及对照组比较，分析病灶与静脉间的关系。统计学分析采用 Kruskal Wallis H 检验和 Wilcoxon 秩和检验。**结果** 30 例 RRMS 患者中，110 个侧脑室体旁病灶内“穿通静脉”，在 SWI 图像上呈 3 种表现：①病灶呈稍高信号而无明显低信号区，有异常血管区（22 个）；②病灶呈低信

号，有小血管环绕或穿行（37 个）；③病灶呈低信号，无异常血管区（41 个）；30 例自身免疫性结缔组织疾病患者组侧脑室体旁 40 个病灶呈低信号，有小血管环绕或穿行，50 个病灶呈稍高信号有异常血管区。**结论** RRMS 患者脑内病灶内穿通静脉不具有特异性。

PU-2331
弥散峰度成像预测急性一氧化碳中毒迟发脑病的价值

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目的 探讨弥散峰度成像(DKI)对急性一氧化碳中毒（CO）迟发脑病（DNS）定量预测的应用价值。 **方法** 前瞻性收集 2016 年 11 月至 2019 年 2 月就诊于兰州大学第一医院符合急性 CO 中毒诊断患者 75 人，于中毒后 7 天内行 DKI 扫描并获得相关参数图。随访 3 月后将其分为 DNS 组（22 人）、非 DNS 组（53 人）。测量脑白质 9 个感兴趣区（ROI）各参数值，两组间各参数值比较采用两独立样本 t 检验，采用 ROC 曲线评价 DKI 参数值预测 DNS 发生的效能。**结果** ①与非 DNS 组相比，DNS 组各感兴趣区 MK、AK 及 RK 值均呈升高趋势。②DNS 组半卵圆中心前部 MK 值明显高于非 DNS 组（1.091±0.081 vs 1.029±0.064，*P*=0.001），差异有统计学意义（*P*<0.05）。③在半卵圆中心前后部（1.079±0.040 vs 1.032±0.044，*P*=0.000；1.044±0.051 vs 1.013±0.031，*P*=0.013）、胼胝体膝部（0.728±0.035 vs 0.709±0.021）、额叶（0.960±0.041 vs 0.936±0.027，*P*=0.018）及顶叶（0.751±0.021 vs 0.740±0.019，*P*=0.036），DNS 组 AK 值明显高于非 DNS 组，差异有统计学意义（*P*<0.05）。④半卵圆中心前部 AK 值预测 DNS 的 ROC 曲线下面积值最大（0.784，P=0.000），95%可信区间为 0.676～0.892，以 1.045 为临界值，诊断敏感度为 81.8%（18/22），特异度为 60.4%（32/53），阳性预测值为 46.2%（18/39），阴性预测值为 88.9%（32/36），准确度为 66.7%（50/75）。**结论** 急性 CO 中毒 DKI 的峰度参数值升高与 DNS 的发生关系密切、可以定量预测 DNS 发生。

PU-2332
腰椎 MRI 征象与急性和亚急性下腰痛的相关性研究

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目的 ：探讨急性和亚急性下腰痛的 MRI 征象，评价其临床意义。方法 ：回顾性连续收集因下腰痛至本院就诊并行腰椎 MRI 检查患者 177 例。根据病程时间将患者分为 A 组（亚急性下腰痛组，103 例）和 B 组（急性下腰痛组，74 例），另招募 42 例无下腰痛志愿者作为正常对照组 C 组。腰痛程度依据视觉模拟评分（visual anologue scale,VAS）评定。观察 MRI 征象包括：椎间盘退变、椎间盘突出、椎间盘膨出，纤维环后方高信号、许莫氏结节、椎体终板炎、小关节退变、小关节积液、棘间韧带高信号、皮下或椎后旁肌肉水肿，小关节退变。对不同组间腰椎 MRI 征象分布行统计学比较分析。结果 ：与 C 组相比，A 组和 B 组椎间盘退变、椎间盘突出发生率较高（P<0.05）。三组间椎间盘膨出、许莫氏结节、Modic 改变无统计学差异（P>0.05）。B 组纤维环后方高信号、棘间韧带高信号、皮下或椎后旁软组织肿胀发生率均高于 A 组和 C 组（P<0.05）；A 组中小关节退变和小关节积液发生率均高于 B 组和 C 组（P<0.05）。结论 ：椎间盘退变、突出可能是引起腰痛症状持续存在的主要原因。纤维环后方高信号、棘间韧带高信号和皮下或椎后旁软组织肿胀可能是急性下腰痛患者致痛的原因；小关节退变、小关节积液可能与亚急性下腰痛有关。

PU-2333
320 排 CT 脑灌注对偏头痛患者脑血流动力学评估

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目的：利用 320 排 CT 颅脑灌注成像技术，分析偏头痛患者血流分布及灌注特征，研究偏头痛患者及有无先兆症状与脑血流灌注的相关性，以期为偏头痛患者诊断及治疗提供有效的影像学支持。方法：收集 2015 年 1 月-2019 年 6 月于我院临床诊断偏头痛的例患者作为偏头痛组，去除严重心功能不全者。再根据发病前有无先兆将其分为有先兆组（58 名）及无先兆组（72 名），以同期 23 名健康体检者作为对照组。所有入组者进行颅脑 CT 平扫+动态增强扫描，选择听眶线为基线进行扫描，去除颅内占位、脑动脉明显狭窄者。由两名有经验的放射医师对图像进行血管 VR 重建及灌注成像，分别记录并计算两侧额叶、颞叶及枕叶大脑皮层下白质区、半卵圆中心区、丘脑相同感兴趣区的脑灌注脑血流量（rCBF）、平均通过时间（MTT）数值，分别对组内及组间进行统计学分析。结果：1.健康组及无先兆偏头痛组大脑两侧脑灌注对比均无明显统计学差异，有先兆组一侧丘脑区、额叶皮层下区 rCBF 减少、MTT 延长，两侧对比差异均有统计学意义。2.无先兆性偏头痛组较健康组一侧额叶皮层下白质区及丘脑区 MTT 延长，差异有统计学意义，其余区域灌注无统计学意义。 3.有先兆偏头痛组一侧额叶及颞叶皮层下白质区、半卵圆中心区及丘脑区 rCBF、MTT 与健康组相比均有显著统计学差异。结论：320 排 CT 颅脑 CT 灌注成像能反应偏头痛患者颅内血流动力学变化，可能影响偏头痛的先兆发生和预后，为临床诊断及治疗偏头痛提供重要依据。

PU-2334

Altered gray matter volume and white matter integrity in patients with sensorineural hearing loss: A VBM and TBSS study

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Objective: The purpose of the present study was to detect structural changes in the brains of patients with sensorineural hearing loss (SNHL) by combining voxel-based morphometry (VBM) and tract-based spatial statistics (TBSS).
Methods: Thirty-five patients with SNHL (mean age: 39.72±1.81 years) and 23 age-matched control subjects (mean age: 39.83±1.96 years) were assessed using 3-dimensional, T1-weighted imaging and diffusion tensor imaging. TBSS and VBM analysis were performed to evaluate grey matter (GM) volume changes and white matter (WM) alternations, as measured by mean diffusivity (MD), fractional anisotropy (FA), axial diffusivity (AD), and radial diffusivity (RD).
Results: VBM showed decreased GM volume in patients with SNHL in the fusiform gyrus of the right temporal lobe and right middle occipital gyrus. TBSS revealed WM integrity changes, including decreased FA and RD and increased RD in several WM regions. However, MD showed no significant difference between patients with SNHL and age-matched controls.
Conclusion: Patients with SNHL showed smaller GM volume and WM integrity changes in several regions.

PU-2335

Abnormal Resting-state Functional Connectivity in Adolescent Patients of First-episode Major Depressive Disorder with Suicidal Ideation:Evidence from a Voxel-wise Degree Centrality Analysis

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Objective: The aim of the present study was to investigate the alternations of functional connectivity (FC) in the brain of adolescent patients of first-episode major depressive disorder(MDD) with suicidal ideation at resting-state using the voxel-wise degree centrality(DC) method.
Methods: We analyzed resting-state functional magnetic resonance imaging data obtained from 53 first-episode, treatment-naive adolescent patients of MDD with suicidal ideation using the Beck Scale for Suicide Ideation (BSS) and from 33 healthy control subjects. Analysis of degree centrality(DC) map and the results of DC were select as the seed point to make FC calculation with the whole brain.
Results: Compared with the control group, patients showed significantly decreased FC value in
frontal_mid,supp_motor_area,insula,frontal_inf_tri,postcentral,precentral,temporal_sup and cingulum_ant. Brain regions with increased FC included
calcarine,lingual,occipital_sup,occipital_mid,cuneus and fusiform
（T=4.48,P<0.05,FWE correction）.However,the DC is not correlated with BSS.
Conclusion：DC,as a novel resting-state function MRI parameter in the voxel-wise whole-brain functional networks,might be an appealing alternative index for further studying on pathologic and neuropsychological states of first-episode MDD with suicidal ideation.

PU-2336

SMS Bold 联合 MP2RAGE 对长期冥想者脑的研究

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目的 研究长期慈悲冥想者脑结构和功能的改变。 **方法** 招募年龄、性别、冥想年限(3 年以上）并世居于青海的长期慈悲冥想者 12 例及健康藏族志愿者 12 例，应用 Prisma 3.0T 磁共振扫描仪对所有受检者进行脑结构及脑功能序列的图像采集，应用基于体素形态学(VBM)、局部一致性(ReHo)和低频振幅(ALFF)等方法处理并进行组间对比，提取差异脑区灰质体积、ReHo 值、ALFF 值；**结果** 与正常组相比，长期慈悲冥想者在双侧颞上回，右侧枕中回，左侧中央前回及右侧上部中央后回的灰质体积增加；ReHo 值增加的脑区有左侧丘脑及左侧小脑 4/5 区；ReHo 值减低的脑区有右侧岛盖部额下回，右侧三角部额下回，右侧额中回，左侧背外侧额上回及左侧内侧额上回。ALFF 值增加的脑区有左侧海马旁回，左侧颞下回，左侧小脑 4/5 区，及双侧小脑蚓部 4/5 区；ALFF 值减少的脑区有右侧额中回及右侧三角部额下回。**结论** 长期慈悲冥想者在多个脑区灰质体积

增加、ReHo 值及 ALFF 值的变化，长期冥想者和正常组脑结构和功能的差异可能为冥想辅助治疗临床神经疾病提供了相应的证据。

PU-2337

上颈椎复杂畸形手术前后的 MRI 诊断与评价

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摘要 目的 分析复杂性上颈椎畸形经口手术前后的 MRI 图像，探讨 MRI 成像对其手术方式的选择及手术效果判断的价值。 **方法** 收集 2008 年 12 月至 2010 年 2 月收治的复杂性上颈椎畸形患者 60 例，男 38 例，女 22 例，术前均行 X 线、CT、MRI 检查，根据影像学分为发育不全畸形 29 例，分节不全畸形 21 例，结构畸形 10 例，其中 15 例伴有脊髓前方受压、变性，均采用经口前入路齿状突切除、减压，然后内固定、取自体松质骨植骨融合，术后常规行 MRI 检查。**结果** 所有患者均顺利完成手术，未出现脊髓血管损伤等严重并发症。60 例患者术后 MRI 成像显示内固定在位，寰枢椎复位，脊髓受压情况改善，36 例随访患者中，原上颈椎局部疼痛、活动受限等情况有 30 例明显改善或消失。**结论** MRI 成像可为上颈椎畸形的原因、手术方式的选择、脊髓受压情况及手术效果的判断、术后的恢复提供客观依据。

PU-2338

颅脑外伤行去骨瓣减压术发生出血扩大或新发出血的影响因素：影像学分析

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目的 通过影像学检查预测脑外伤行去骨瓣减压术（DC）后新发出血或出血量扩大的危险因素，并提高预测出血扩大或新发出血准确率。**方法** 收集 197 例我院收治的脑外伤行 DC 的患者，记录患者临床资料（年龄、性别、出血部位、中线是否移位等），通过 CT 检查图像计算术前、术后血肿量。t 检验分析变量（术前体征），Logistic 回归分析患者术前体征、血肿量的多少与术后出血量扩大或新发出血的关系，ROC 曲线分析脑外伤 DC 后出血扩大或新发出血预测效能。**结果** t 检验提示术前血肿量大于 20cm³、伴有硬膜下血肿与脑出血扩大或新发出血有关（$P<0.05$），与年龄、性别、中线移位等无关（$P>0.05$），Logistic 回归分析提示术前伴有硬膜下血肿（$P<0.001$）和术前血肿量大于 20cm³（$P<0.001$）为出血扩大或新发出血的危险因素，根据 ROC 曲线得出术前血肿量大于 20cm³（AUC=0.788）比术前伴有硬膜下血肿（AUC=0.839）模型效果好，患者同时伴有硬膜下血肿和血肿量＞20cm³ AUC 面积最大（AUC=0.914），有较强的预测效能。**结论** DC 前伴有硬膜下血肿和术前血肿量大于 20cm³ 是出血量扩大或新发出血的危险因素，单一血肿量大于 20cm³ 比硬膜下血肿有更高的危险性，二者同时存在风险最高。

PU-2339

Brain GABA Levels by 1H-MRS in Insomnia Disorder

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Objective: Proton magnetic resonance spectroscopy (^{1}H-MRS) can non-invasively determine GABA levels in human brain, which plays an important role in the etiology and maintenance of insomnia disorder. However, current evidences are of contradiction. Our aim was to assess brain GABA levels by ^{1}H-MRS in naïve patients with insomnia disorder.
Methods: We performed a comprehensive literature search for relevant ^{1}H-MRS studies comparing brain GABA levels between patients with insomnia disorder and healthy controls. We pooled separate effect size estimates (Hedge's *g*) across trials for outcome measures of GABA/Cr levels using a meta-analysis according to the Cochrane guideline.
Results: A total of 72 patients with insomnia disorder and 73 healthy controls were enrolled. Insomnia patients exhibited significantly lower GABA level compared with healthy controls only in anterior cingulate cortex (ACC) with Hedges' *g* of -0.50 (95% CI: -0.95, -0.06) (p = 0.027), and heterogeneity was not of significance (I^2 = 28.0%, p = 0.239). The global brain average weighted GABA level (Hedges' *g*, -0.24; 95% CI: -0.50, 0.01)showed a reduced trend in insomnia patients (p = 0.063).
Conclusion: Brain GABA levels probed by ^{1}H-MRS show a reduced trend in patients with insomnia disorder. It is essential to investigate the spatial heterogeneity and dynamic change of brain GABA levels in the future.

PU-2340
3D Cube 技术在帕金森病患者 DBS 术前丘脑底核 MRI 定位扫描的应用研究

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目的 探讨 3D T2 FLAIR Cube 序列对帕金森病(PD)患者深部脑电刺激术（DBS）术前显示丘脑底核(STN) 的价值。**方法** 采用 3.0T MRI 对 12 例正常人及 12 例 PD 患者 DBS 术前进行扫描，其中 3D T2 FLAIR Cube 序列的 TR=6300ms，TE=105ms，矩阵=256X256，层厚=0.9mm，层间距=0 mm，对 12 例正常人与 12 例 PD 患者采集的 3D Cube 序列进行对比，再对 12 例 PD 患者采集的 3D Cube 与以往定位扫描序列进行对比，用两种对比结果进行半定量分析 3D Cube 序列对 STN 显示的情况，术后进行 1.5T MRI 与 CT 扫描复查并确认患者微电极记录(MER） 电极探针位置。**结果** 3D Cube 序列能完成高质量、高效率的薄层采集，一次采集可任意角度观察图像，半定量评分高于常用的 SPACE 和 T2 FLAIR 序列，并与患者术中 MER 确定的电极探针位置有较高的一致性。**结论** 使用 3D Cube 序列明显缩短患者术前检查时间，可以准确预定靶点位置，提高定位精确度和手术效率。

PU-2341
针刺合谷穴激发前额叶 BOLD 信号与 GABA 含量变化的多模态 fMRI 研究

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目的：“面口合谷收”的脑机理尚未明确，本课题通过研究针刺右侧合谷穴时前额叶脑皮质血流的 fMRI BOLD 信号与此皮层内神经递质 GABA 变化的关系，探索针刺右侧合谷穴的脑作用机制。**方法：**本研究共招募到 79 名青年健康志愿者，男 24 名，女 55 名，平均年龄（24.42±1.44）岁。志愿者接受两次 fMRI-MRS 扫描，手针针刺（实验组）和 Von Frey 纤毛针表皮刺激（对照组）右侧合谷穴，两种刺激方式顺序随机分配，两次间隔 1 周。扫描序列含任务前静息态 BOLD、MRS，任务态 BOLD、MRS 扫描；感兴趣区（VOI）定位于双侧前额叶内侧皮层。fMRI 数据采用 SPM12、REST、Brainnet 软件进行处理，MRS 数据采用 LC Model 软件处理；随后行组内分析、组间比较，计算 VOI 内 BOLD 信号定量值，最后行 SPSS 23.0 统计分析 BOLD 信号与 MRS 含量变化的关系。**结果：**实验组与对照组均诱发了大脑皮层广泛 BOLD 负激活信号，主要集中在中线区域脑皮层（包含前额叶内侧皮层）和边缘叶脑区，对照组诱发的信号较少而弱。两组前额叶内侧皮层 ROI 内的 BOLD 信号变化与基线 GABA、任务后 GABA 及 GABA 差值均未发现明显相关性（实验组：r= -0.07，-0.08，0.04；p=0.57，0.88，0.74；对照组：r= -0.10，-0.09，0.01；p=0.43，0.46，0.96）。**结论：**针刺较 Von Frey 纤毛针表皮刺激合谷穴激发了更强更广的包含前额叶内侧皮层的边缘叶-旁边缘叶-新皮层网络负激活效应，但两种刺激下前额叶内侧皮层 VOI 区域内的 BOLD 信号与 GABA 含量变化未发现明确相关，需要进一步在疾病状态下研究证实。

PU-2342

腰椎穿刺活检技术及安全注意事项

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目的：探讨 CT 引导下经皮椎体穿刺活检技术的方法及安全措施。
方法:对患者进行术前相关检验、影像等检查及准备，行 CT 扫描，对病变椎体进行定位测量，再 CT 引导下进行定位并穿刺。整理椎体穿刺活检病例共 23 例，均成功穿刺取材。其中，颈椎 2 例，胸椎 5 例，腰椎 12 例，骶椎 4 例。
结果：23 例患者均成功穿刺取材，穿刺活检阳性率为 87%，假阳性率为 13%。23 例患者均未发生并发症。
结论： CT 引导下椎体穿刺活检术具有创伤小，安全可靠，可多次多处取材等优点，只需局部麻醉即可完成操作，成为柱病变活检的理想方法。CT 引导下活检，实现了从活体组织取材病例检查，是确定病变性质的金标准，对临床手术、治疗提供重要的指导作用。

PU-2343

HIF-1α-Notch 通路在急性癫痫神经发生机制中的研究

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目的:探究 HIF-1α 在急性癫痫神经发生分子机制中的作用以及 Notch 信号通路是否参与该过程。
方法:采用匹罗卡品 SD 大鼠癫痫模型，将动物随机分为四组：对照组，癫痫组，癫痫+2ME2 组，癫痫+DAPT 组。
1.用 Western Blotting，PCR 以及免疫组化法测定 HIF-1α 在急性癫痫中的表达情况。
2.用免疫组化和免疫荧光的方法通过测定急性期癫痫大鼠脑组织神经元凋亡和丢失，内源性神经干细胞的增殖和分化情况来评价 HIF-1α 和 Notch 信号通路在癫痫神经发生过程中的作用。

3. 采用免疫共沉淀和免疫荧光共定位的方法来探究 HIF-1α 与 Notch 信号通路的关系。
结果:1.HIF-1α 在急性癫痫中表达上调,且具有时间依赖性。
2.上调的 HIF-1α 能够调节急性癫痫的神经发生包括神经元丢失，神经干细胞增殖和分化，该过程需要 Notch 信号通路的参与。
3.免疫共沉淀结果表明 HIF-1α 在癫痫中主要通过与 NICD 直接结合来激活 Notch 通路。
结论:我们的结果表明 HIF-1α -Notch 信号通路能够促进急性癫痫的神经发生，该通路如果被阻断，神经发生就会减少。该研究为癫痫治疗提供了新的治疗靶点。

PU-2344

MRS 在脑震荡综合征中的应用

武刚
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目的 用绝对定量对脑震荡患者进行枕叶皮质质子 MR 波谱(^{1}H-MRS)研究，探讨脑震荡后脑代谢物的变化。**材料与方法** 对轻度脑外伤，符合脑震荡临床诊断的 20 例患者进行研究，20 名正常志愿者作为对照组，行常规 MRI 平扫及 ^{1}H-MRS 检查。主要观察的代谢物指标为 N-乙酰天冬氨酸(NAA)、胆碱(Cho)、肌酸(Cr)等，采用后软件进行代谢物绝对浓度定量，获取 NAA、Cr、Cho 浓度，以及 NAA/Cr、Cho/Cr 比值。**结果** 与对照组对比，脑震荡组 NAA 浓度、NAA/Cr 降低，差异有统计学意义($P<0.05$)，Cho 浓度和 Cho/Cr 比值略升高，无统计学意义。**结论** ^{1}H-MRS 能够反映脑震荡患者损伤后脑代谢物的变化，为脑震荡的诊断提供相应的影像学依据。

PU-2345

扩散张量成像技术关于非神经精神性狼疮研究的系统评价

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目的：神经精神性狼疮（Neuropsychiatric systemic lupus, NPSLE）是系统性红斑狼疮常见的并发症之一，其预后较差[1-2]，然而无神经精神症状的 SLE 患者（非 NPSLE）患者亦可能存在脑损伤[2-3]。研究表明扩散张量成像（Diffusion Tensor Imaging, DTI）能够实现对非 NPSLE 脑部微结构损伤的可视化[2-3]。本文旨在对弥散张量成像技术关于非神经精神性狼疮的研究进行系统回顾。
方法：系统回顾 2008 年 1 月至 2019 年 3 月期间发表的应用弥散张量成像技术对非神经精神性狼疮的研究以描述其脑部微结构改变的一些共同特征。
结果：本研究纳入了 15 篇文章[3-17]，大部分的研究都发现相比于健康对照组，非 NPSLE 组的平均扩散系数（Mean Diffusivity, MD）、轴向扩散系数（Axial Diffusivity,AD）及径向扩散系数（Radial Diffusivity, RD）升高而各向异性分数（Fractional Anisotropy, FA）下降，这提示非 NPSLE 组脑白质发生了轴突变性、脱髓鞘改变及细胞内环境的紊乱等改变[3-16]。FA 值的下降及 MD 值的升高被大部分的研究证实集中于胼胝体、双侧后扣带回、钩状束及额叶皮层下白质[3-16]，关于 DTI 的数据后处理技术，较多研究采用的是基于纤维骨架的空间统计分析（Tract-based spatialstatistics, TBSS），但在 Xu 等及 Zhao 等[15,17]采用基于连通性的分析来研究非 NPSLE 白质网络的拓扑组织发现其白质网络结构中断可能会导致认知障碍，可见这种方法在今后 SLE 脑部改变的机制学研究方面十分有前景。

结论：无神经精神症状的 SLE 患者（非 NPSLE）已存在脑微结构的损伤，弥散张量成像技术（DTI）在能敏感地检测出这种异常改变。

PU-2346

毁损梯度在消除颅脑 MRI 中 FID 伪影的应用

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目的：研究毁损梯度在消除 FID 伪影中的作用。
材料和方法：收集本院 2019 年 3-4 月的头颅 MRI 检查 50 例，其中，男 28 例，女 22 例，年龄：8-92 岁。采用飞利浦 Ingenia3.0T 磁共振成像仪，序列为 T1WI-IR，FOV：230mm×200mm，TR/TI/TE=2000/800/20ms，毁损梯度参数：fid reduction = default（不施加） / strong（施加），同一个被检者的序列其余参数相同。每个被检者均行常规 T1WI-IR 及实验 T1WI-IR 序列扫描，对常规序列（不施加毁损梯度）与实验序列（施加毁损梯度）所得图像的伪影情况、SNR、扫描时间等进行分析。分析软件为 spss19.0。
结果：由 2 位诊断医师及 2 位技师对图像质量进行评分，伪影明显为 0 分，伪影轻微为 1 分，无肉眼可辨伪影为 2 分。被检者为 50 例，常规序列：0 分的为 48 例，1 分的为 2 例，2 分的为 0 例；实验序列：0 分的为 0 例，1 分的为 0 例，2 分的为 50 例。
常规序列（不施加毁损梯度）与实验序列（施加毁损梯度）所得 T1WI-IR 图像的伪影情况有统计学意义，SNR 有无统计学意义，扫描时间无统计学意义。
结论：实验序列（施加毁损梯度）所得图像的 FID 伪影较常规序列（不施加毁损梯度）明显减少甚至消除。说明施加毁损梯度，在消除 FID 伪影中的作用是肯定的。施加毁损梯度，虽然在信号采集时会采集更多的噪声，使得图像的 SNR 有所下降，但是这种下降是轻微的，肉眼几乎不能分辨出来，对诊断并不产生影响。同一被检者，实验序列（施加毁损梯度）与常规序列（不施加毁损梯度）的扫描时间相同，证明施加毁损梯度并不会增加序列的扫描时间，不会增加被检者的 SAR，不会对日常工作增加负担。对常规 T1WI-IR 序列施加额外的毁损梯度，可以很好地消除 FID 伪影，对图像的 SNR 影响轻微，而且不增加扫描时间，值得在日常工作中推广使用。

PU-2347

轻度创伤性脑损伤定量磁化率成像研究

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目的：通过 QSM 研究 mTBI 患者脑皮层下白质及深部灰质核团的铁含量变化，预测 QSM 对 mTBI 临床诊断及预后评估的潜在价值。
资料与方法：本研究前瞻性收集 2017 年 10 月 1 日至 2018 年 12 月 31 日期间就诊于北京天坛医院“轻度创伤性脑损伤”门诊、符合收录标准患者 15 人。通过 RPQ 评估 mTBI 患者脑外伤后继发症状

的严重程度。采用 3T 磁共振扫描技术得到 T1WI 和 QSM 图像，根据 T1WI 的解剖定位，于 QSM 上手动勾画感兴趣区 ROI，为双侧尾状核头、壳核、苍白球、丘脑、红核、黑质、额、顶、颞叶皮层下白质，分别测量以上 ROI 的磁敏感值。同时招募 15 名性别、年龄相匹配的健康人群为对照组，采用相同的扫描、勾画方法，并且选定相同的 ROIs 得到其磁敏感值。统计分析采用 SPSS 统计学分析软件。协方差分析（年龄为协变量）和曼惠特尼 U 检验比较 mTBI 组与对照组脑铁含量差异，P<0.05（Bonferroni 校正）有统计学差异。多元线性回归分析通过调整年龄、创伤时间研究患者脑铁与 RPQ 分数关系，分析脑铁对 mTBI 后继发神经退行性症状的独立作用大小。

结果：mTBI 组与对照组相比，左侧丘脑(0.0203±0.0117 vs 0.0128±0.0061)、右侧黑质(0.0923±0.0225 vs 0.0764±0.0180)磁敏感率增加，左侧额叶皮层下白质（-0.0251±0.0086 vs -0.0167±0.0106）磁敏感率减低，差异具有统计学意义（P=0.039，P=0.039，P=0.011）。左侧苍白球磁敏感率与 RPQ 分数呈负相关(P=0.02, β=-586.929)。

结论：mTBI 患者左侧丘脑、右侧黑质磁敏感率增加、左侧额叶皮层下白质磁敏感率减低，左侧苍白球磁敏感率与 mTBI 后临床症状的严重程度呈负相关，提示 QSM 为预测 mTBI 后神经退行性改变风险的潜在生物学指标之一。

PU-2348
基于扩散张量成像技术的双相障碍患者脑白质纤维束异常的研究

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目的 探讨处于抑郁期的双相情感障碍（Bipolar Disorder, BD）患者白质纤维束是否发生变化。**方法** 选取 42 名未用药的 BD 抑郁期患者和 59 名年龄、性别和右利手相匹配的对照者接受 DTI 检查，根据现有的白质纤维束图谱，将大脑白质组织分割为 20 条公认存在的粗大纤维束，然后计算每个被试的每条白质纤维束的四项平均扩散属性，采用非参数置换检验（置换次数 10000 次）来探测两组被试在这 20 条白质纤维束上扩散指标的差异。**结果** (1)双相障碍组左侧钩束 FA 值(0.40 ± 0.01)低于对照组(0.41 ± 0.01, p = 0.001)。(2)双相障碍组胼胝体辐射线额部 FA 值(0.36±0.02)低于对照组(0.38 ± 0.02, p < 0.001)。(3)双相障碍组左侧钩束 RD 值 (6.57e-4 ± 2.41e-5)高于对照组(6.40e-4 ± 2.42e-5, p = 0.0017)。**结论** 本研究结果表明处于抑郁期的双相障碍患者钩束及胼胝体辐射线额部存在白质完整性破坏。

PU-2349
颈源性头痛患者静息态脑功能磁共振局部一致性研究

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目的：应用静息态脑功能磁共振局部一致性方法探究颈源性头痛发生的中枢机制以及病人脑区的改变程度。**方法：**采用 GE 3.0T 磁共振对 13 例颈源性头痛患者（Cervicocogenic headache, CeH 组）和 13 例健康志愿者（health control group，HC 组）进行静息态脑功能磁共振扫描。再利用后处理软件进行数据处理统计。并将 CeH 组有差异脑区的局部一致性值（Regional homogeneity ，ReHo 值）与患者视觉模拟评分（visual analogue scale，VAS）及病程进行相关分析。**结果：**CeH 组与 HC 组相比，ReHo 值增高的脑区有双侧楔前叶、左侧胼胝体压部、左侧背侧

丘脑、左侧海马旁回、右侧岛叶、右侧枕中回以及双侧小脑半球；ReHo 值降低的脑区有：双侧额上回-额中回-前扣带回、右侧中央后回、右侧楔前叶-后扣带回、右侧颞中回、左侧枕下回。且 CeH 组差异脑区 ReHo 值与 VAS 评分及病程之间没有相关性。**结论：**颈源性头痛是累积多个脑区的病理状态，涉及情感、记忆、认知等多个方面。

PU-2350

Mass in the encephalomalacia:Intracranial posthemorrhagic granuloma--an veiled disease?

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AIM:
Mass in the encephalomalacia is uncommon and not well understood.We retrospectively investigated the clinical profiles and neuroimaging data of patients with Mass in the encephalomalacia
METHODS:
From 2011 to 2018,all patients who had brain MRI examinations and diagnosed with encephalomalacia at our hospital were reviewed.Mass inside the site of encephalomalacia were identified after review and their data were retrospectively analyzed.
RESULTS:
3 patients were found to have mass in the encephalomalacia,all with well-known history and complete clinical and radiological follow-ups confirmed their stablity.though with different clinical profiles,Mass in the encephalomalacia of all 3 cases have similar MRI manifestations. Axial DWI image displays the hyperintensity of the lesion with associating low ADC map.FLAIR MR images demonstrates the hyper signal intensity of lesion similar with encephalomalacia gliosis.
CONCLUSION:Mass in the encephalomalacia may be posthemorrhagic granuloma and have characteristic MRI manifestations. It is a disease still needing unveiling and It's a leave-alone lesion and can be monitered.

PU-2351

建立大鼠脑放射性坏死模型的初步探索及磁共振形态学测量、ADC 值测量在放射性损伤检测中的应用价值

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目的：通过电子线照射、陀螺刀照射等方法建立磁共振扫描可以检测出的大鼠放射性脑坏死模型。并通过磁共振常规扫描、弥散加权成像并与病理结果对照，验证大鼠放射性脑损伤的存在。
材料和方法：清洁级 Wistar 大鼠，麻醉后医用直线加速器 5mm 直径电子线半球照射 160Gy（5 只），顶叶局部照射 80Gy（5 只）；CT 扫描定位，数据传输至陀螺刀立体定位系统，左侧顶叶皮层靶点陀螺刀伽玛射线 80Gy 照射（3 只），60Gy 照射（7 只）。伽玛射线照射后 1 周、5 周分别行常规磁共振扫描及磁共振弥散加权成像扫描。

结果：直线加速器 160Gy、80Gy 照射，大鼠存活期约 7-14 天，照射后 1 周 MRI 显示大鼠全脑明显萎缩。伽玛射线 80Gy 照射，大鼠未存活，60Gy 照射均存活。照射后 1 周常规磁共振扫描及 DWI 扫描未见明确异常。第 5 周常规磁共振扫描可见皮层厚度明显变薄，平均（1.50 ± 0.01）mm（n = 7），与正常同月龄大鼠比较 1.71 ± 0.02mm（n = 7），差异具有统计学意义（P <0.05）。5 周后，弥散加权成像照射靶点区 ADC 值（0.643 ± 0.042）×10^{-3} mm^2/s，对称的对侧剂量稍低区 ADC 值（0.701 ± 0.037）×10^{-3} mm^2/s，与照射前相应区域的 ADC 值（0.857 ± 0.012）×10^{-3} mm^2/s 比较，均具有统计学差异（P<0.01）。病理示照射靶点区皮层结构紊乱，细胞肿胀，血管周围间隙扩大，可见慢性炎细胞浸润（以淋巴细胞为主）。
结论：电子线或伽玛射线照射大鼠，单次最大剂量不能超过 80Gy。伽玛射线 60Gy 剂量照射大鼠均可存活，常规磁共振扫描示皮层萎缩，弥散加权成像示 ADC 值降低，可以作为放射性脑损伤的诊断依据。

PU-2352
静息态低频振幅评估轻微型肝性脑病的临床应用价值

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目的 利用静息态脑功能成像，探索肝硬化轻微型肝性脑病（MHE）患者相关脑区低频振幅（ALFF）值的变化。 **方法** 搜集实验组肝硬化 MHE 患者 20 例，对照组健康人 20 例。应用 SPSS 19.0 软件对 MHE 组与健康对照组的性别、年龄、教育年限、数字连接测试-A（NCT-A）和数字符号试验（DST）进行统计检验。采用 GE 3.0T 磁共振扫描仪行 resting-state fMRI 扫描，应用基于 Matlab 环境下运行的 rest-plus 软件对扫描得到的图像进行后处理，使用双样本 t 检验，统计分析两组间 ALFF 值的差异。 **结果** 在双样本 t 检验中，NCT-A 和 DST 的差异有统计学意义（P< 0.05）。静息态脑功能磁共振成像的研究显示，与健康对照组对比，MHE 组的右侧眶部额下回、左侧直回、右侧三角部额下回、左侧颞中回、左侧脑岛、左侧颞下回的 ALFF 值降低（P<0.05），而双侧楔叶、右侧小脑上部、右侧中央后回、右侧颞上回、右侧中央前回、右侧缘上回、右侧顶上回的 ALFF 值升高（P<0.05）。 **结论** MHE 会潜在改变大脑的认知功能，自发性脑活动的改变可能是肝硬化 MHE 患者出现相应临床表现的神经病理生理学基础。

PU-2353
基于体素分析的动脉自旋标记技术在针刺对阿尔茨海默病模型大鼠脑血流量成像研究

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摘要：目的 应用动脉自旋标记(ASL)技术研究中医针刺治疗阿尔茨海默病后脑组织康复的影像学生物标记。**方法** 对 AD 大鼠随机分成正常组、假手术组、模型组、针刺组，每组 10 只。Meynert 核注射微量 Aβ1-42 制备阿尔茨海默病模型。针刺百会、太溪、足三里，每次治疗 30min，每天 1 次，20 次为一个疗程，共治疗 4 个疗程。各组大鼠模型均于干预前、干预即刻、干预后 4 个疗程进行头颅 ASL 检查，应用基于体素分析技术观察各组相同时间点局部脑血流量特征，并用三维连续动脉自旋标记技术分析针刺组不同时间点全脑平均脑血流量变化。**结果** 针刺组与正常组、假手术组、模型组各组间全脑平均脑血流量差异有统计学意义（P<0.05）。基于体素分析发现，静息状态

下针刺组，与干预前相比，干预即刻 CBF 增加主要分布于右顶叶皮层，4 个疗程后 CBF 增加主要分布于后扣带回。**结论** 应用基于体素分析的 ASL 技术发现，提示此技术为中医针刺治疗阿尔茨海默病提供影像生物标记，为针刺治疗机制提供了崭新的研究途径。

PU-2354

甲状腺相关性眼病病理、临床与影像学

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目的：分析甲状腺相关性眼病的病理、临床及影像学表现，以提高对该病的认识。
材料与方法：收集 38 例甲状腺相关性眼病患者的病理、临床及影像学资料，对其进行总结分析，并进行文献综述。
结果：甲状腺相关性眼病目前发病机理尚不完全明确，其病理、临床与影像学表现具有一定的相关性，甲状腺相关性眼病多由 GRAVES 病引起，但是也会发生在甲状腺功能正常甚至甲状腺功能低下的患者。
结论：全面认识甲状腺相关性眼病的病理、临床、影像及可能的发病机理，对该病的诊治具有重要的价值。

PU-2355

MRI 灰度直方图分析在眶区黑色素瘤复发风险评估

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【摘要】目的：探讨 MR 常规序列灰度直方图分析对眶区黑色素瘤复发的风险评估。方法：回顾性分析经病理证实的 40 例眶区黑色素瘤，术后随访时间为 0.5-6.0 年，依据是否复发分为复发组和无复发组，使用 Mazda 软件在常规 MR 序列图像上勾画提取 ROI 并进行灰度直方图分析，对两组病变直方图参数进行统计学分析，比较两组病变差异有统计学意义的特征参数，绘制其 ROC 曲线，评价其对眶区黑色素瘤复发风险的诊断效果。结果：在平扫 T1WI、T2WI、DWI 及 TIWI 矢状增强四个序列灰度直方图分别提取的 9 个特征性参数中，T1WI 直方图的 9 组病变参数差异均有统计学意义，其中第 50 百分位数诊断价值较大，ROC 为 0.985，最佳临界值为 1267，敏感度为 100%，特异度为 88.46%；T2WI 直方图其中 2 组病变参数差异有统计学意义，其中方差诊断价值较大，ROC 为 0.755，最佳临界值为 12152，敏感度为 100%，特异度为 57.69%；DWI 直方图其中 5 组病变参数差异有统计学意义，其中方差诊断价值较大，ROC 为 0.885，最佳临界值为 10489，敏感度为 92.86%，特异度为 84.62%；T1WI 增强直方图其中 2 组病变参数差异有统计学意义，其中方差鉴别价值较大，ROC 为 0.876，最佳临界值为 36282，敏感度为 92.86%，特异度为 76.92%。结论：常规 MR 序列图像灰度直方图可以作为眶区黑色素瘤复发风险评估的重要辅助手段，其中 T1WI、DWI 及 TIWI 增强直方图在鉴别肿瘤复发中的价值较高。

PU-2356

动态增强 MR 对眼眶海绵状血管瘤的诊断价值

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目的 应用动态增强 MR 扫描对眼眶海绵状血管瘤进行血液动力学分析，确定肿瘤内的供血特点。
方法 回顾性的分析 2011 年 4 月至 2012 年 12 月期间病理组织学检查确诊的海绵状血管瘤 26 例，除进行常规影像检查外，均进行动态增强 MRI 扫描。男性 16 例，女性 10 例，右眼 12 例，左眼 14 例；年龄 18-55 岁，平均 40.16 岁。使用 1.5 超导 MR 机，头颅线圈采集。MR 平扫包括：横断面 T1WI、T2WI 及 T1WI 矢状和 T2WI 冠状面扫描，层厚 4mm。增强检查为使用对比剂后立即连续动态扫描，而后 30s、1min、3mins、5min 和 10min 进行扫描，以观察病变的动态变化状况。
结果 26 例海绵状血管瘤动态增强 MR 扫描检查发现：在注射造影剂后 30s 血管瘤边缘或内部出现点状高信号影，1min 后显示点状增强区域扩大；到 3min 时达到 30％～50％被强化，在 5min 时血管瘤内部 60～80％以上强化，在 10min 时有 20 例患者血管瘤内部呈均匀一致强化，以上增强特点即所谓“渐进性强化”。
结论 利用动态增强 MR 扫描对眼眶海绵状血管瘤进行血液动力学分析，可以反映出肿瘤内部的血液供应和分布情况，揭示肿瘤内部 “渐进性强化”的特点，可提高诊断的正确性，对手术治疗具有指导意义。

PU-2357
基于离体头颅标本眼眶扫描探讨 ADMIRE 重建联合低管电压扫描技术的可行性

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目的 基于离体头颅标本，探讨 Force CT ADMIRE 重建技术结合低管电压在眼眶扫描中的可行性。方法 用西门子 Force CT 对 10 例离体头颅标本行眼眶 CT 平扫，每例均行 100Kv+FBP 重建扫描、90Kv+ADMIRE-3 级重建扫描、80Kv+ADMIRE-3 级重建扫描、70Kv+ADMIRE-3 级重建扫描扫描。扫描流程：头先进；摄眼眶侧位定位像，扫描范围：眼眶上缘至下缘。扫描条件：打开 CARE Dose4D，关闭 CARE Kv，分别固定 Kv 在 100Kv、90Kv、80Kv、70Kv，参考管电流均为 88mAs；扫描完成后用分别行滤波反投影（FBP）重建以及 ADMIRE-3 级重建，每例眼眶均获得 4 组数据。扫描后图像传入 sngio.via 后处理系统进行常规三维重建处理分析。 结果 用单因素方差分析，与常规扫描组比较，90Kv、80Kv、70Kv 扫描 ADMIRE-3 级重建三组辐射剂量间有统计学差异（P＜0.05），进一步两两比较（SNK-q 检验），组间均存在统计学差异（P＜0.05），与常规扫描组比较 80kV、70kV 扫描辐射剂量分别降低 51.26% 、70.59%。四组数据间眼球玻璃体及框内脂肪平均 CT 值无统计学差异（P＞0.05），噪声、SNR、CNR 有统计学差异（P＜0.05）；通过进一步计算，与常规扫描组比较，80kV、70kV 扫描 ADMIRE-3 级重建组玻璃体噪声增加 10.21%、29.73%，SNR 降低 6.8%、19.98%，CNR 降低 8.6%、20.6%。对于软组织病变，可以优先选择 80Kv 剂量组扫描观察，有效剂量降低 51.26% ，对病变及细节显示较好。对 于骨质病变，可以优先选择 70Kv 剂量组扫描观察，ED 仅为 0.035mSv，有效剂量降低 70.59%，但对粘膜及软组织病变的显示稍差，应用受到一定限制。

PU-2358

急性眼眶炎性病变 CT、MRI 表现

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目的 分析急性眼眶炎性病变的 CT、MRI 表现并探讨其临床价值。**方法** 回顾总结 40 例眼眶炎性病变患者的 CT、MRI 征象。眼眶 CT、MRI 检查 12 例,仅行眼眶 CT 检查 28 例。**结果** 按病因分类:鼻窦源性 22 例,外伤源性 12 例,肝克雷伯杆菌感染 2 例,糖尿病 4 例。按累及结构分类:骨膜下脓肿形成 5 例,肌锥内间隙脓肿 1 例,肌锥外间隙炎症 4 例,眶隔前炎症 3 例,海绵窦炎 3 例,弥漫性炎症 7 例,内源性眼内炎 3 例,眼球筋膜炎 5 例,泪囊炎 2 例,泪腺炎 7 例。眼眶炎症影像特点取决于受累结构及范围,表现为眶内正常结构界面消失和一个或多个解剖间隙局限或弥漫浸润。**结论** CT、MRI 对客观显示眼眶炎症的致病原因和累及范围具有重要价值。

PU-2359

儿童眼眶横纹肌肉瘤临床及影像

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目的 探讨 6 例儿童眼眶横纹肌肉瘤 CT 及 MRI 影像特征及误诊原因。**方法** 回顾性分析 6 例经病理证实的儿童眼眶横纹肌肉瘤 CT 及 MR 影像资料，对病变的位置、大小、形态、平扫密度及信号、强化方式进行归纳，总结其临床及影像学特征，分析误诊原因。**结果** 6 例儿童眼眶横纹肌肉瘤中，左眼 4 例，右眼 2 例，均位于眼眶内，其中 1 例位于球后肌锥内外间隙、1 例位于眼眶上象限，1 例位于眼眶下象限，1 例位于眼眶内下象限，2 例位于眼眶内上象限。CT 及 MR 平扫 4 例为均匀实性病灶，增强后均匀强化；2 例为囊实性，囊实性成分比例不一，多以实性成分为主，增强扫描病变明显不均匀强化。**结论** 儿童眼眶横纹肌肉瘤的临床及影像表现具有一定特征性，但临床上少见，术前容易误诊，需充分认识其影像学特征，结合临床表现，以提高影像术前诊断准确性。

PU-2360

眼眶视神经鞘蛛网膜囊肿一例

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目的：视神经鞘蛛网膜囊肿临床极为少见，通过对该病例的报道，希望能够对眼眶肌锥内间隙肿瘤的影像诊断提供新的诊断思路。
病例资料：50 岁女性患者因术前行 B 超检查发现左眼球后占位，临床表现无特殊，当时未做特殊处理，今为进一步诊治来我院就诊，专科检查提示左眼视野缺损，患者先后行双眼眶 CT 及 MRI 平扫+增强检查，提示眼球后肌锥内间隙占位，病变与视神经关系密切，考虑良性病变，神经源性病变不除外，后行手术治疗并送病理，最终综合影像、病理及免疫组化考虑视神经鞘蛛网膜囊肿。
讨论：视神经鞘蛛网膜囊肿临床极为少见，可伴有先天发育异常，以及视力减退、视乳头水肿、视睫状静脉怒张等症状，其发病机制可能为视神经鞘膜与视神经之间形成腔隙发育过程中闭塞障碍，第三脑室与视神经鞘膜腔隙仍保持通畅，脑脊液逐渐聚集，形成包绕视神经的囊肿。影像征象与发生于颅内的蛛网膜囊肿表现相似，表现为均匀的液性密度/信号，增强不强化，因周围为脑膜包裹

可见边缘强化。视神经鞘蛛网膜囊肿与视神经关系密切，除了与眼眶内囊性病变（皮样囊肿、表皮样囊肿）鉴别外，应与来源于视神经的视神经鞘脑膜瘤、视神经胶质瘤等鉴别。
结论：视神经鞘蛛网膜囊肿临床极少见，但当影像学发现视神经周围异常病灶，特别是表现为囊性密度/信号的时候，我们应把该病纳入诊断的范畴，其治疗以手术切除为主。

PU-2361

眼眶径线与年龄相关性研究

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摘要：目的 探讨眼眶前后径、横径及眼球横径与年龄的关系。方法 选择 210 例正常人眼眶，男女各 105 例，根据年龄分为 7 组，0-10 岁组、11-20 岁组、21-30 岁组、31-40 岁组、41-50 岁组、51-60 岁组、＞60 岁组，每组均包含 30 例，男女各 15 例。使用螺旋 CT 进行轴位扫描，分别测量左右眼眶的前后径、眼眶横径及眼球横径。分析年龄与眼眶前后径、眼眶横径及眼球横径的关系。结果 左右眼眶前后径分别为 5.16cm、5.16cm，眼眶横径分别为 3.73cm、3.74cm，眼球横径分别为 2.45cm、2.45cm，左右眼眶各径线差异无统计学意义。眼眶前后径（双侧平均值）在 7 组的值分别为：4.64cm、5.06cm、5.24cm、5.30cm、5.28cm、5.29cm、5.24cm，整体平均值为 5.16cm；眼眶横径在 7 组的值分别为：3.40cm、3.78cm、3.82cm、3.80cm、3.79cm、3.76cm、3.82cm，整体平均值为 3.74cm；眼球横径在 7 组的值分别为：2.34cm、2.44cm、2.48cm、2.50cm、2.50cm、2.44cm、2.41cm，整体平均值为 2.45cm；眼眶前后径、眼眶横径和年龄呈正相关，相关性较弱，r 值分别约 0.440、0.363，P 值＜0.001；眼球横径与年龄相关性不大，r 值为 0.146，p 值＜0.05。0-10 岁组三径线与其余各个组之间的差异均有统计学意义，p 值＜0.05；11-20 岁的眼眶前后径与其余各组之间差异有统计学意义（p 值＜0.05）；眼球横径在 51-60 岁组、＞60 岁组和前 5 组（即≤50 岁各组）差异均有统计学意义（p＜0.05），而两者之间差异无统计学意义（p＞0.05）。结论 眼眶前后径、眼眶横径和年龄呈弱正相关关系；双侧眼眶各径线对称。

PU-2362

眼眶肿瘤样病变的 MRI 影像学表现

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目的 总结眼眶肿瘤及类肿瘤病变的 MRI 特点，探讨其诊断思路。提高眼眶的肿瘤样病变的诊断能力。

材料与方法 收集 2011 年 1 月-2018 年 12 月本院疑眼眶内肿瘤样病变收治且经手术病理证实的 35 例眼眶肿瘤的 MRI 表现,归纳总结每种病变的好发部位、形态、边界、信号特点及强化方式,并结合文献找出疾病的具有诊断价值的影像学共同特征。

结果 本组 35 例眼眶肿瘤中,泪腺区肿瘤 6 例,包括多形性腺瘤 4 例及腺样囊性癌 2 例,呈等 T1 稍长 T2 信号,增强后中度-明显强化。视神经鞘膜脑膜瘤 3 例,呈等 T1 等 T2 信号,增强中度-明显强化。血管类病变 10 例,包括海绵状血管瘤 9 例及静脉畸形 1 例,海绵状血管瘤呈长 T1 长 T2 信号,增强明显强化。神经鞘瘤 4 例,3 例合并囊变,呈长 T1 长 T2 信号,增强后实性成分明显强化。淋巴瘤 5 例,呈等 T1 等 T2 信号,增强后轻-中度强化。皮样囊肿 1 例,短或等 T1、长 T2 信号,增强无强化。骨膜

下脓肿 1 例,增强环形强化。神经纤维瘤、纤维肉瘤各 1 例,信号呈等或稍长 T1、等或长 T2 信号,增强明显强化。炎性假瘤 3 例,呈等 T1 等 T2 信号,增强后中度-明显强化。

结论 MRI 可清晰显示肿瘤的大小、形态、内部结构及与周围组织的关系,对眼眶肿瘤及瘤样病变的定位、定量及定性诊断有较大的价值,可提供较好的诊断思路。

PU-2363

螺旋 CT 对单侧先天性小眼球患者的术后评估

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目的
探讨螺旋 CT 测量眼眶容积在临床的运用
材料与方法
选取中山医眼科医院病人，已确诊单侧先天性小眼球（不伴其他眼部畸形）并已放入硅胶填充物进行干预的患者 8 例，使用东芝 16 排螺旋 CT 进行平扫。
结果
在三维重建模式下，可以直观显示眼眶的形态，在横断位中选择视神经层面，测量眼眶深径及左右径，使用几何公式计算眼眶的容积距离，有 7 例病人患侧眼眶容积与健侧差距值较小，有 1 例病人患侧眼眶容积与健侧差距值较大。
结论
CT 技术是目前眼眶容积测量的重要方法之一，它可以使用三维重建的方法，按几何公式计算眼眶的容积，可以较为准确的对先天性小眼球患者术后的效果评估，对临床具有一定的指导意义。

PU-2364

眶内肿瘤的影像学诊断与鉴别诊断

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C T 与 MR I 可清楚显示眼球 、视神经和其他眶内结构或组织的眼球肿瘤，视网膜 、脉络膜和巩膜 , C T 与 MRI 不能分辨 , 表现为一厚度匀称的环影 , 称眼环 。起自视网膜或脉络膜的较小肿瘤均表现为眼环后部向内突入玻璃体的小结节影 。 多单发 , 可多发 , 大者可充填整个眼球 , 并使眼球撑大。 根据影像学表现不能确定是来自哪一层膜的肿瘤 。但 CT 上结节的密度和 MR I 上的信号强度有助于诊断。

PU-2365

眼肌颗粒细胞瘤的 CT 和 MRI 表现

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本文报道 3 例眼肌颗粒细胞瘤（GCT）的影像学及病理表现。其影像特点为肿块以肌腹为中心，CT 上呈均匀等或稍高密度；常规 MRI 上，相对于脑灰质，肿块于 T1WI 上呈等信号，T2WI 上呈低信号，增强扫描呈中等至显著强化；DWI 上呈等或稍低信号，ADC 均值为 0.60±0.13×$10^{-3}$$mm^2$/s。其病理特点为瘤细胞体积大，且细胞排列紧密，胞质充满嗜酸性颗粒，S-100 强阳性表达，从而可诊断眼肌颗粒细胞瘤。

PU-2366

先天性内耳畸形的 128 排螺旋 HRCT 图像后处理表现分析

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目的: 分析先天性内耳畸形的 128 排螺旋 HRCT 表现特征，提高对先天性内耳畸形的认识，减少漏诊、误诊
方法:收集 21 例先天性内耳畸形的 128 排螺旋 HRCT 扫描资料，根据 Levent 分类法进行统计 ，分析各种内耳畸形的 16 层螺旋 HRCT 所见。
结果:21 例先天性内耳畸形中，各种畸形均有，部分合并发生，统计如下：耳蜗畸形 16 例（76.19%）(31 耳 73.80%，此例患者中两耳均畸形 15 例占 93.75 %)，Michel 型 2 例(9.52%)(2 耳 4.76%)；Mondini 型 5 例（23.81%）(9 耳，21.43%);前庭及半规管畸形 18 例（85. 71%）（32 耳，76.19%）；不伴内耳畸形的前庭水管扩大 13 例（61.90%）(23 耳，54.76%)；内耳道发育畸形 3 例（14.29%）(4 耳，9.52%)；耳蜗小管畸形 1 例（4.76%）（2 耳，4. 76%）。伴中、外耳畸形 1 耳（2.38%），伴颈静脉高位 4 耳（9.52%）。
结论: 16 层螺旋 HRCT 能清晰显示先天性内耳畸形的细微解剖及骨质情况、畸形部位和程度，并明确分类，有助于影像医师提高先天性内耳畸形诊断率，并 为临床正确制定治疗方案提供重要的参考依据。

PU-2367

HRCT 及 MRI 对小儿耳蜗畸形的应用

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目的 探讨薄层高分辨率 CT 及 MRI 对小儿耳蜗畸形的应用价值。方法 对 32 例小儿耳蜗畸形的薄层高分辨率 CT 及 MRI 影像进行回顾性分析；结果 32 例(39 耳)耳蜗畸形患儿的 CT 及 MRI 表现：其中：Michel 畸形 2 耳；耳蜗未发育 2 耳；耳蜗发育不良 4 耳；共同腔畸形 6 耳；IP-I 型 3 耳；IP-II 型 12 耳；IP-III 型 4 耳；蜗神经孔狭窄、闭塞 6 耳。合并畸形：前庭畸形 14 耳；半规管畸形 10 耳；大前庭导水管 8 耳；内听道畸形 8 耳；听神经缺如 4 耳；听神经发育不良 2 耳。结论 薄层高分辨率 CT 可对小儿耳蜗畸形的解剖结构清晰显示，对耳蜗畸形的类型及严重程度可有效判断，并发畸形显示清晰，MRI 对听神经显示清晰，两者联合应用可为人工耳蜗植入术前提供重要影像评估。

PU-2368

内耳钆剂造影在梅尼埃病诊断中的应用进展

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梅尼埃病（Ménière’s disease，MD）是一种以波动性听力丧失、间歇性眩晕、耳鸣和耳胀为特征的慢性疾病，其解剖及病理学基础为膜迷路积水（endolymphatic hydrops，EH）。目前诊断 MD 主要依靠患者临床表现及前庭诱发肌源性电位（VEMP）等检查，但这些诊断方式无法对 EH 进行直观准确地评估。随着高分辨 MRI 及内耳钆剂造影的发展应用，使直接评估 EH 成为可能。文本将对内耳钆剂造影在梅尼埃病诊断中的应用进展进行综述。

PU-2369

Ramsay-Hunt 综合征 1 例报道

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病历摘要
带状疱疹病毒侵及膝状神经节所致周围性面瘫较少见，国内文献报告不多，报告如下。
患者女，66 岁，2018 年 10 月无明显诱因出现左耳部疼痛，同时伴有眩晕，外耳道内可见疱疹样肿物，听力略有下降，1 天后出现嘴角歪斜，无耳道流脓、流血，门诊以“亨特综合症”收入科。病来患者精神尚可，体力正常，食欲正常，睡眠正常，体重无明显变化，大便正常，排尿正常。查体：体温：36℃，脉搏 76 次/分，呼吸 18 次/分，血压 164/105mmHg。头颅无畸形，左侧耳廓正常，外耳道内可见疱疹样肿物及少量干痂，鼓膜完整、无内陷；左侧额纹消失，眼裂变小，左侧鼻唇沟变浅，嘴角歪斜，鼓腮漏气。脑积液检查：蛋白定量 63.9mg/dl↑、白细胞计数(csf)35 个/ul↑。入院后呕吐、眩晕症状精神状态差，检测离子：钾 2.9mmol/L↓、氯 95mmol/L↓，对症治疗后症状减轻。影像表现：中耳乳突 CT 平扫：面神经管增宽；左侧乳突炎；头颅 MR 增强扫描：脑缺血灶；脑白质变性；左侧听神经强化，左侧海绵窦增宽，左侧耳蜗及前庭区异常强化灶，考虑炎性病变；
本例患者在治疗上采用联合抗病毒、糖皮质激素、改善微循环及营养神经方案，取得了满意疗效。

PU-2370

双源 CT 对颞骨微小结构显示的初步观察

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目的：应用双源 CT 评价正常人颞骨微小结构的显示情况。
方法：应用双源 CT 对 40 耳（20 例）正常志愿者行颞骨薄层扫描，进行多平面重建，观察 27 处颞骨微小解剖结构，由两名从事影像阅片工作多年医师进行评估。
结果：（1）所有耳听骨链结构清晰可见，三块听小骨及其关节均可清晰显示。（2）所有耳骨迷路及前庭导水管、蜗轴结构清晰可见。（3）所有耳面神经经、岩浅大神经均可清晰显示。35 耳镫骨

肌隐约可见。28 耳锤骨前韧带隐约可见。（4）MPR 重建后，23 耳鼓索神经可见从面神经中发出，隐约可见鼓索神经走行于锤骨颈和砧骨长脚之间。
结论：双源 CT 明显提高了时间分辨率，可以提供低噪声、高质量的颞骨微小结构的图像，在临床手术术前设计方面有重要价值。

PU-2371

MSCT 颞部茎突规范化扫描及后处理

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目的：多层螺旋 CT 在颞部茎突的扫描、后处理方法的规范
方法：设备：TOSHIBA Aquilion 64 排 128 层螺旋 CT。体位设计：仰卧位，头先进，下颌抬高，听眶线（Reid 线）垂直于检查床。扫描范围：茎突、茎突舌骨韧带和舌骨小角统称为茎突复合体（茎突舌骨链）。其分为四段，近段为鼓舌段，发育成茎突根部；中近段为茎舌段，骨化后发育成茎突体部：中远段为角舌段，于出生后发育成舌骨茎突韧带；邻近舌骨处为下舌段，骨化成舌骨小角。故扫描范围应为外耳孔上方 1cm（包括眶下缘）至舌骨。扫描参数：120Kv，200mA，Rot 0.75，0.5x64 采集，螺距 1.484，HP95，层厚 3mm，层间距 3mm 后处理方法：所有测量方法、基线统一规范。使用 VR、MIP、MPR、CPR、斜位等 5 项后处理技术观察茎突形态，测量颞部茎突长度、内倾角、前倾角、茎咽线。
结果：1.VR 是显示茎突形态的最佳后处理方式。3.茎突长度测量由于茎突鞘的遮挡，不宜使用 VR，而选用斜面+MIP。3.内、前倾角推荐使用 MIP+冠状位、MIP+矢状位最优。4.茎咽线推荐使用标准横断位，而非 MIP 或 MPR。
结论：1.熟悉颞骨解剖（鳞部、鼓部、岩部、乳突部、茎突部）2.掌握茎突的解剖（分型、分段、毗邻关系）3.熟悉茎突舌骨链。3.测量方法统一规范。4.规范扫描范围为外耳孔上方 1cm（包括眶下缘）至舌骨。5.观察茎突形态推荐首选使用 VR，其次 MPR。6.测量茎突长度首选斜矢状位（首选）/斜冠状位+MIP，不使用 CPR。7.测量前倾角推荐矢状位+MIP。8.测量内倾角推荐斜冠状位+MIP。9.测量茎咽线推荐标准横断位+冠状位上测量，不能使用 MIP 和斜位。10.窗宽 2800-3000，窗位 1000。11.MIP 为 3-5cm

PU-2372

3.0T 磁共振 3D-T2w-DRIVE-HR 序列在小儿先天内耳畸形及蜗神经发育异常的诊断价值

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目的：探讨利用 3.0T 高场磁共振 3D-T2w-DRIVE-HR 序列对先天内耳畸形及蜗神经发育异常的诊断价值，提高内耳畸形及蜗神经缺如诊断率，为患儿听力早期听力干预提供影像学评估。
方法：选取小儿听力复查仍未通过和未做听力检测发现一侧无听力的 25 名患儿。在 PHILIPS 3.0T 磁共振利用 3D-T2w-DRIVE-HR 序列成像，参数：TR:1500、TE:220、层厚 0.6mm、间隔-0.3mm、NSA：1、Voxel：0.6X0.6X0.6mm，并对所得图像行最大密度投影(MIP)、多平面重组（MPR）、蜗神经斜矢状位重建后处理技术，重点观察内耳、蜗神经。

结果：3.0T 磁共振 3D-T2w-DRIVE-HR 序列示：双侧蜗神经未显示 8 例、单侧蜗神经未显示 6 例、双侧蜗神经纤细 1 例、双侧蜗神经未显示合并内耳畸形 6 例、单侧侧蜗神经未显示合并内耳畸形 4 例。。
结论：3.0T 高场磁共振 3D-T2w-DRIVE-HR 序列成像技术可以清晰显示内耳畸形及蜗神经缺如，对先天性小儿内耳畸形及蜗神经发育异常的患儿早期听力干预提供影像学评估。

PU-2373

HRCT 诊断颈静脉球窝高位合并憩室

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颈静脉球的血管性变异主要有：颈静脉球窝高位（high jugular bulb，HJB）和颈静脉球窝憩室（ jugular bulb diverticulum, JBD)。颈静脉球窝高位是较常见的解剖变异，颈静脉憩室临床少见，而颈静脉球窝高位合并憩室更是罕见，因其引起的症状缺乏特异性而易被漏诊、误诊。

PU-2374

梅尼埃病患者脑灰质体积的研究

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目的 应用基于体素的形态学分析方法检测梅尼埃病患者脑灰质体积的变化，探讨中枢神经系统在梅尼埃患者中的作用。 **方法** 对 28 例单侧型（左侧）梅尼埃患者和 20 名年龄性别相匹配的正常对照者进行磁共振三维 T1 结构像扫描（3D-T1 bravo），应用基于体素形态学分析（voxel-based morphometry，VBM），比较两组的全脑灰质体积的变化，探索各脑区变化在梅尼埃病发生过程中的作用。**结果** 与对照组相比，梅尼埃病患者组双侧海马旁回，双侧枕中回、枕下回、楔叶，左侧额叶直回、扣带回，左侧枕颞内侧回，右侧舌回，右侧颞叶角回，颞中回，左侧小脑蚓部，胼胝体，左侧顶叶缘上回区灰质体积明显下降（P<0.05）**结论** 梅尼埃患者脑灰质异常改变区域可能参与了梅尼埃病患者的脑皮质重塑，可能与梅尼埃眩晕的中枢机制相关。

PU-2375

中耳炎颅内并发症 CT、MRI 表现

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目的 分析中耳炎颅内并发症 CT 和 MRI 表现。**方法** 回顾性分析 28 例（33 侧）中耳炎颅内并发症的 CT 和 MRI 表现。**结果** 33 侧中耳炎中，CT 显示骨质破坏 20 侧，MRI 显示脑膜炎 3 侧，乙状窦感染 2 侧，脑炎 3 侧，脑脓肿 2 侧，迷路炎 3 侧，硬膜外脓肿 3 侧，面神经炎 1 侧。**结论** CT 结合 MRI 检查可以明确颅内并发症的类型、部位和范围。

PU-2376
颞骨孤立性浆细胞瘤 1 例病例报道并文献复习

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目的：探讨颞骨孤立性浆细胞瘤（SPB）的 CT 及 MRI 表现特征，以提高诊断准确率。
方法：对西安市中心医院 2019 年 2 月接诊的 1 例颞骨孤立性浆细胞瘤患者的影像及临床资料结合相关文献进行回顾性分析，并运用多平面重组及曲面重建评估听骨链、半规管、耳蜗及面神经管的情况。
结果：该例患者的临床表现为右侧耳痛，位于右耳周围，呈放射性疼痛，伴有听力下降及耳鸣；影像学上，CT 表现为右侧颞骨溶骨性、膨胀性骨质破坏，无明显硬化边，以颞骨岩部及乳突部为主，累及右侧岩尖、乳突及枕骨斜坡；颞骨多平面重组及曲面重建显示右侧上半规管上壁及面神经管乳突段局部骨质破坏；MRI 上病变呈等 T1 等 T2 信号，信号均匀，增强后呈中等强化，内部强化较均匀；病理上肿瘤由弥漫片状分布分化程度不同的浆细胞构成，大小一致，形态单一，细胞胞浆丰富。
结论：颞骨 SPB 的影像学表现具有一定特征性；颞骨多平面重组及曲面重建可以为临床诊治提供更多信息。

PU-2377
中耳乳突区骨质破坏性病变的影像诊断（专题讲座）

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目的：通过对中耳乳突区骨质破坏性病变的临床及影像特征的分析，提高对该病的影像诊断能力。**方法：**收集我院 2014 年 5 月～2019 年 4 月经病理证实的中耳乳突区骨质破坏病例 12 例，对其临床及影像征象进行分析。男性 7 例、女性 5 例，年龄 10 月～79 岁，11 例行 CT 平扫，其中 5 例行 CT 增强扫描；1 例行 MR 平扫，9 例行 MR 平扫+增强。**结果：**中耳部疼痛伴流脓血 5 例，溢液流脓 3 例，肿痛 2 例，无痛性包块 2 例，所有病例均有骨质破坏。中耳癌 6 例，其中鳞状上皮癌 5 例，腺样囊性癌 1 例；骨纤维异常增殖症、骨巨细胞瘤、颈静脉球瘤、胆脂瘤伴肉芽组织、朗格汉斯组织细胞增多症、化脓性中耳炎各 1 例。6 例中耳癌均可见软组织团块影，溶骨性骨质破坏，其中 5 例破坏边缘毛糙、模糊；4 例行 MR 平扫+增强均可见明显强化软组织突入颅内，邻近脑膜明显强化、增厚；2 例 DWI 弥散受限。1 例骨纤维异常增殖症面颅多骨膨大，骨硬化、磨玻璃、不规则低密度内化钙化骨化影。5 例良性病灶除化脓性中耳乳突炎骨质破坏边缘稍显毛糙外，其余边缘均较清楚，骨巨细胞瘤边缘见残留骨，胆脂瘤病例骨质破坏边缘硬化；颈静脉球瘤、骨巨细胞瘤、胆脂瘤可见鼓室盖不连续；除胆脂瘤病例仅行 CT 和 MRI 平扫，其余病例均行增强扫描，病灶明显强化。朗格汉斯组织细胞增多症强化较均匀，余不均匀强化。静脉球瘤 MRI 可见“盐和胡椒”征。化脓性中耳乳突炎累及耳周、颞下窝及咽旁，多个环形强化影。颈静脉球瘤、骨巨细胞瘤、朗格汉斯组织细胞增多症鼓室盖不连续处见局部脑膜强化，强化脑膜规整，其中，1 例朗格汉斯组织细胞增多症骨质破坏呈大块溶骨性穿凿样缺损，边缘清楚，无骨膜反应，跨越颅缝；颈静脉球瘤 DWI 弥散受限。**结论：**中耳乳突区骨质破坏性病变，根据其临床特征、CT 平扫+后处理与 MRI 平扫+增强+DWI 能对其骨质破坏、软组织肿块及强化表现、颅内侵犯及脑膜改变、以及弥散等差异，可较准确地对其诊断和鉴别。

PU-2378
探讨不典型岩尖综合征漏诊分析、影像诊断及临床治疗预后。

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摘要：探讨不典型岩尖综合征漏诊分析、影像诊断及临床治疗预后。方法：回顾性分析一例不典型岩尖综合征病例，结合 CT 及 MR 多次复查结果分析该病例出现不典型临床症状的原因及以此导致的漏诊。结果：该病例有反复发热，渐进性听力下降症状，但无耳部流脓、三叉神经痛及外展神经麻痹症状，通过分析 CT 及 MR 检查可发现该患者岩尖骨质破坏主要位于岩尖内后侧，非 Meckel 腔及 Dorello 管走形区，故主要累及前庭窝神经而非三叉神经及外展神经，故该患者临床症状不典型，极易漏诊。患者岩尖骨质破坏及前庭窝神经受累在后期经过保守治疗后形态恢复但该患者听力情况无明显好转，可能与神经功能不易恢复相关。虽然大多数岩尖炎的治疗以积极引流为主，但本病例经过保守治疗，岩尖病灶吸收完全，且经过半年随访，患者恢复可。结论：当岩尖炎累及岩尖骨质部位不同时，可不出现典型岩尖综合征表现，此时极易漏诊，综合 CT 及 MR 检查有助于该病的确诊。本病例经保守治疗，随访 6 个月，患者岩尖病灶吸收完全，可见保守治疗也可取得较好的结果。

PU-2379
腮腺影像解剖与常见良恶性肿瘤诊断

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目的 通过对腮腺解剖与常见良恶性肿瘤影像特征分析，旨在通过分析影像解剖征象达到提高常见腮腺肿瘤的诊疗水平，尤其对血管与神经结构判读指导临床手术有重要价值。
材料与方法：
1.解剖要点：面神经、腮腺导管、下颌后静脉与筋膜与脂肪间隙、颈外动脉与静脉血管、淋巴结。
2.病变侵犯范围判断位置，基于间隙脂肪推移判断肿瘤生长方向。
2.影像技术显示特点
2.1 平片显示骨骼变化与钙化征象
2.2 CT 增强对血管判断与及肿瘤定性诊断有重要帮助。
2.3 MRI 对于腮腺导管与肿瘤沿神经转移帮助非常大。
2.4 导管造影对于腮腺导管病定性与定位诊断帮助大。
3.结果
3.1 征象判断：如肿瘤直接征象 、间接征象、周围累及病变范围等。
3.2 综合影像技术：对于肿瘤诊断及治疗随访的作用大。
结论：腮腺影像解剖对良恶性肿瘤定位诊断作用重要，判断病变征象结合血管、神经及淋巴结有否侵犯，对肿瘤定性诊断、肿瘤分期及手术计划的临床诊疗的价值较大。

专题讲座

PU-2380

Diagnostic accuracy of magnetic resonance imaging techniques for parotid tumors, a systematic review and meta-analysis

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Objective To assess the added benefit of combining different MRI techniques for preoperative diagnosis of parotid tumors when compared to conventional MRI and advanced MRI techniques alone with meta-analysis.
Methods A comprehensive PubMed electronic database search was performed for original diagnostic studies up to July 2017. The methodologic quality of each study was evaluated by two independent reviewers who used the Quality Assessment of Diagnostic Accuracy Studies 2 (QUADAS-2) tool. Statistical analysis included pooling of sensitivity and specificity with 95% confidence intervals (CI). All analyses were conducted using STATA (version 12.0), RevMan (version 5.2), and Meta-Disc 1.4 software programs.
Results Pooled sensitivity and specificity of conventional MRI, diffusion weighted imaging (DWI), dynamic contrast enhanced (DCE) and the above combination were 76% (95%CI)/ 91% (95%CI)/ 80% (95%CI)/ 86% (95%CI) and 83% (95%CI)/ 56% (95%CI)/ 90% (95%CI)/ 90% (95%CI).
Conclusion Conventional MRI combined with DWI and DCE showed higher diagnostic accuracy than conventional or advanced MRI alone, supporting their use in parotid tumors diagnosis.

PU-2381

常规 MRI 诊断胆脂瘤型中耳炎的应用价值研究

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目的:探讨 MRI 序列成像在胆脂瘤型中耳炎诊断中的应用价值。**方法:**选取中国人民解放军北部战区空军医院 2018 年 6 月至 2019 年 6 月期间 63 位临床上初步怀疑胆脂瘤型中耳炎的患者行常规序列检查(包括 T1WI、T2WI 及 T1WI 增强序列)。后在患者知情同意条件下行患耳手术探查或鼓室成形术,并将术中标本送病理,最后将影像诊断与手术、病理结果进行对比。**结果：**在 63 位患者中，患耳 46，影像上病灶大小不等。在常规 MRI 序列上，46 耳中有 36 耳符合胆脂瘤诊断标准，即 T1WI 上病灶相对脑组织显示低或等信号，T2WI 上高信号，且 T1WI 增强无明显强化或边缘轻度强化；6 耳影像上不典型，但术中及病理均证实有胆脂瘤还有耳假阴性。常规 MRI 序列诊断胆脂瘤型中耳炎的敏感性、特异性可分别达到 86.4%、50.0%。阅片者间一致性极强。**结论：**常规 MRI 序列对于胆脂瘤型中耳炎的诊断具有较高敏感性，并能够清晰地显示较大胆脂瘤与周围组织间关系，阅片者间诊

断一致性强，并且影像上病灶大小更接近实际,为手术治疗提供很有价值的影像信息，但其诊断特异性偏低，且对于大小早期病灶难以辨别出。

PU-2382

搏动性耳鸣乙状窦骨壁缺损患者手术前后的影像学评估及手术效果分析

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目的：分析乙状窦骨壁缺损所致搏动性耳鸣患者手术前后的颞骨影像学特点，探讨乙状窦骨壁重建手术取得相应治疗效果的原因与机制。
方法：纳入乙状窦骨壁重建术治疗的搏动性耳鸣患者 18 例，回顾性分析患者手术前后高分辨率 CT 的影像学表现，在多平面重建图像上观察术后是否仍伴有乙状窦憩室、乙状窦骨壁缺损以及手术侧颞骨蜂房的气化情况。
结果：17 例研究对象均为女性，平均（42.94±9.93）岁，搏动性耳鸣病程 2 个月-6 年，术后耳鸣完全消失 11 例，耳鸣症状明显缓解 3 例，耳鸣症状未缓解 2 例，搏动性耳鸣消失但发生其它类型耳鸣 1 例，术后耳鸣消失患者中术后颈静脉球高位 8 例，憩室 3 例，耳鸣症状缓解患者中均有颈静脉球高位，合并乙状窦前置 3 例，憩室 1 例，耳鸣症状未缓解患者中颈静脉球高位 3 例，乙状窦前置 1 例。
结论：本研究表明，乙状窦骨壁缺损是搏动性耳鸣的重要病因之一，但是可能并不是导致搏动性耳鸣发生的直接因素。对有确定的乙状窦异常影像表现的搏动性耳鸣进手术行治疗前，可以结合搏动性耳鸣的发病机制进行更全面的考虑，来完善乙状窦骨壁重建术的治疗效果。

PU-2383

头颈部磁共振检查规范化操作

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[摘要]随着磁共振应用于临床，起良好的软组织分辨力，在颈部软组织检查中起到了重要作用。为很多头颈部病变的检出、鉴别诊断提供了非常重要的价值。同时磁共振还具有空间分便利，无辐射，多参数成像，获得信息量大的优势。结合 CT、B 超、核医学及实验室检查，给临床诊断和治疗提高了巨大的参考价值。但由于磁共振成像速度慢，颈部不可避免的存在呼吸运动伪影与血管搏动伪影。头颈部磁共振需要规范化操作以提高检查效果。

PU-2384

鼻腔鼻窦髓外浆细胞瘤的 CT 和 MRI 表现

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目的：探讨鼻腔鼻窦髓外浆细胞瘤（EMP）的 CT、MRI 表现特点，以提高该病的诊断准确率。
方法：回顾性分析经病理证实的 12 例 EMP 的 CT、MR 图像。CT 上主要观察病灶的密度、周围骨质破坏情况；MRI 上主要观察病灶的形状、大小、位置、信号、强化特点，并测量病灶的表观扩散系数(ADC)。
结果：4 例仅行 MR 检查，4 例仅行 CT 检查，4 例同时行 CT 和 MR 检查。男性 9 例，女性 3 例；大部分（7/12）肿瘤形态不规则，最大径 2.5~7.3cm。12 例中，6 例位于鼻腔，6 例位于鼻窦。相对于肌肉，CT 平扫上，6 例呈稍高密度，6 例密度均匀，2 例伴少许液化坏死，7 例伴有周围溶骨性骨质破坏，5 例出现线样残留骨脊。相对于脑灰质，T1WI 上 8 例呈均匀等信号，T2WI 上 6 例呈等信号，2 例呈稍高信号，2 例伴少许液化坏死，4 例出现血管流空影，增强后 8 例均呈显著强化。病变平均 ADC 值为（0.53±0.06)×$10^{-3}mm^2/s$。
结论 CT、MRI 对鼻腔鼻窦 EMP 诊断及鉴别诊断具有一定临床应用价值。

PU-2385
鼻中隔非霍奇金淋巴瘤的影像学表现及误诊分析

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目的：探讨鼻中隔非霍奇金淋巴瘤的影像学特点及不同 MR 抑脂序列对疾病诊断的应用价值。
方法：回顾性分析我院经手术、病理证实的 1 例鼻中隔霍奇金淋巴瘤。患者女，26 岁，以“间断鼻塞头痛 10 年余，加重 10 天”之主诉入院。行前鼻镜检查示：双侧鼻腔脓性分泌物。CT 示鼻中隔类圆形软组织肿块，膨胀性生长，临近骨质吸收变薄，内密度均匀，边界清晰，增强扫描呈弱强化。MRI 示病灶呈短 T1 等 T2 信号，STIR 压脂呈明显低信号，Dixon 压脂呈稍高信号，DWI 呈低信号，影像诊断为黏液囊肿合并感染，病理诊断为非霍奇金淋巴瘤（NHL，T 细胞）。分析并探讨疾病误诊的原因。
结果：鼻中隔淋巴瘤影像学表现为：多起源于鼻腔前部或鼻前庭，呈单或双侧鼻腔分布，沿鼻腔及鼻中隔边缘蔓延；CT 密度相对均匀，呈等或稍高密度，增强后呈轻或中度强化；早期主要循自然窦道生长，表现为膨胀性生长方式，多为筛孔状、虚线状或虫蚀样骨质吸收，无骨质破坏或少数局部轻度骨质破坏；MRI 表现为 T1WI 等或低信号，T2WI 等或高信号，部分病灶信号不均匀。误诊原因分析：①MRI 抑脂序列选择不当。STIR 和 Dixon 序列对脂肪抑制作用机理不同。STIR 序列既可抑制脂肪也可抑制 T1 值与脂肪相近的组织，对脂肪的抑制作用是非特异的。而 Dixon 序列对脂肪抑制作用是特异的，应首选 Dixon 序列。②此病例的影像表现不典型，鼻腔淋巴瘤 T1WI 多为等或稍低信号，而本例表现为明亮高信号；病变比较局限，边界清楚，无骨质破坏，更倾向于良性占位。③鼻中隔淋巴瘤相对少见，对此疾病的认识不足。
结论：鼻中隔淋巴瘤在临床中不多见，应提高对此疾病的认识，选择合适的影像技术，尽可能实现准确诊断，以期达到早期治疗，提高患者生存率、改善生存质量。

PU-2386
PET/CT 与 CT 在喉癌临床诊断与分期中的应用价值

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目的：探讨 ^{18}F-PET/CT 和 CT 检查在喉癌诊断及分期中的应用价值；其次探讨喉癌颈部淋巴结转移的影响因素。**方法：**选取 2015 年 1 月至 2018 年 12 月期间我院怀疑喉部恶性肿瘤患者 45 例，所有患者均在治疗前及手术前进行 CT 平扫、CT 增强及 ^{18}F-PET/CT 检查，判读喉部病灶是否为恶性并对恶性病灶分期，于 PET/CT 测量病灶大小，测量 PET/CT 感兴趣区 SUVmax，分析两种影像学检查方法的诊断正确性、特异性、敏感性、阳性预测值、阴性预测值；分析影响喉癌颈部淋巴结转移的因素。**结果：**1.CT 平扫+增强检查对喉癌原发灶诊断的敏感性为 87.18%，特异性 33.33%，阳性预测值 94.44%，阴性预测值 16.67%，诊断符合率 83.33%；PET/CT 诊断喉癌原发灶的敏感性为 97.44%，特异性为 33.33%，阳性预测值 95%，阴性预测值 50%，诊断符合率 92.86%；CT 平扫+增强与 PET/CT 诊断效能在诊断符合率、敏感性及阴性预测值上差异具有统计学意义（P=0.03，P=0.01，P=0.00），特异性和阳性预测值的差异不具统计学意义（P=1.00，P=0.76）；2.^{18}F-FDG PET/CT 对颈部淋巴结转移的诊断敏感性为 77.78%、特异性为 63.64%、阳性预测值为 58.33%、阴性预测值为 93.33%、诊断符合率为 83.33%；以患者为单位计算时，^{18}F-FDG PET/CT 与 CT 平扫+增强在喉癌颈部淋巴结转移的诊断敏感性上差异无统计学意义（P=0.16）。**结论：**与 CT 比较，^{18}F-FDG PET/CT 对喉癌原发灶及颈部淋巴结转移的诊断具有较高的诊断效能，喉癌患者原发灶的分化程度是影响喉癌患者的颈部淋巴结转移的独立因素。

PU-2387

鼻腔和鼻旁窦平滑肌肉瘤的影像学表现

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目的 分析及评价 MRI 检查在鼻腔和鼻旁窦平滑肌肉瘤的影像学表现及临床应用价值。 **资料与方法** 回顾分析经病理证实的鼻腔鼻旁窦平滑肌肉瘤 3 例，均行 MRI 检查。 **结果** 肿瘤原发于鼻腔 1 例，上颌窦 1 例， 1 例肿瘤范围广已无法确定其原发部位，肿瘤涉及范围包括鼻腔、筛窦、鼻咽部、眼眶、翼腭窝、颞下窝、咽旁间隙、硬腭甚 至口咽侧壁、中颅窝等。该类肿瘤呈浸润性生长及局部较广泛骨质破坏，无 1 例发生钙化及颈淋巴结转移。肿块在 MRIT1WI 呈均匀中等信号，T2WI 表现为略不均匀的中等到稍高号。 **结论** 鼻部平滑肌肉瘤表现为较广泛浸润性生长及骨质破坏，无钙化。MRI 检查在肿瘤范围及与周围炎性相鉴别方面较清楚。

PU-2388

鼻咽部木村病的影像诊断及鉴别

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目的 分析鼻咽部木村病(KD) 的影像学表现，提高对该病的诊断及鉴别诊断水平。**方法** 回顾性分析经病理证实的 2 例鼻咽部 KD 的实验室检查及影像学资料，分析病灶位置、形态、密度/信号及增强表现等特征。结果 2 例患者外周血嗜酸性粒细胞均明显增高。 2 例均表现为鼻咽部肿块并双侧颈部多发肿大淋巴结，其中 1 例鼻咽部肿块及双侧颈部肿大淋巴结在 CT 平扫呈均匀等密度，在 T1WI 呈稍低、T2WI 稍高信号，DWI 鼻咽部肿块及双侧颈部淋巴结均呈明显高信号，ADC 值约 0.541×10-3 mm2/s，增强上述病灶均明显均匀强化; 另 1 例鼻咽部肿块在 CT 上平扫密度不均匀，其内可见小片状低密度区，在 T1WI 呈稍低、T2WI 稍高信号，双侧颈部肿大淋巴结在 CT 平扫呈均匀等密度，在 T1WI 呈稍低、T2WI 稍高信号，DWI 鼻咽部肿块及双侧颈部淋巴结均呈明显高

信号，ADC 值约 0.487×10-3 mm2/s，增强扫描鼻咽部肿块明显不均匀强化，双侧颈部肿大淋巴结呈明显均匀强化。**结论** 鼻咽部占位并淋巴结肿大的患者，尤其是伴外周血嗜酸性粒细胞升高者，应考虑到木村病的可能，需结合临床病史、实验室检查、影像学表现综合诊断，以免误诊。

PU-2389

喉癌在 CT 与磁共振的影像学表现

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喉癌是头颈部常见的恶性肿瘤，在耳鼻喉系统领域发病率仅次于鼻咽癌与鼻腔及鼻窦癌。好发于中老年男性，吸烟及过量饮酒是喉癌发生的危险因素，近些年其发病率呈逐年升高趋势。它来源于喉粘膜的上皮组织，其病理类型多为鳞状细胞癌。临床上常常通过喉镜活检进行诊断，可以直观地显示喉部粘膜、声带、喉室、梨状窝等形态，但是粘膜下的肿瘤侵犯并不能直接观察。治疗喉癌的首选方法主要是手术切除，因此术前对原发肿瘤的精准定位、周围组织是否受侵的评价异常重要，制定合适的手术方案，对患者的预后产生很大的影响。因此使用 CT 及磁共振技术对喉部结合分析，清晰地对肿瘤的原发部位进行定位，诊断粘膜下的病变、淋巴肿大情况以及喉旁间隙和喉软骨受侵情况，结合手术后的病理结果，可以提高对喉癌影像表现的认识，有益于早期发现和诊断喉癌，准确、客观的评价喉癌的病变程度，帮助临床制定治疗方案，从而提高喉癌患者的生存率，对于改善患者预后有着重要的临床意义。

PU-2390

CT and MRI manifestations of rhinoscleroma.

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Objective To explore the features and differential diagnosis of CT and MRI imagings of the rhinoscleroma. **Methods** CT and MRI findings of 8 patients with pathologically confirmed nasal scleroma were retrospectively analyzed. **Results** CT findings of nasal scleroses: non-specific mucosal thickening in early stage. Granulomatous stage presents limited or large soft tissue masses with uniform density and clear contour, but usually not obvious enhancement. Often involve middle, inferior turbinate, expression is out of shape, atrophy or destroy completely, nasal septum is easy to destroy, but remnant bone often has apparent sclerosis. Different degrees of consolidation in adjacent sinuses, including granulation tissue invading the sinuses and distal obstructive inflammation; Bone in the antrum wall may be displaced, atrophied, damaged, or hardened. This disease affects the orbit, causing translocation of the extraocular muscle, surrounding the extraocular muscle or optic nerve; In the scar stage, the turbinate, nasal septum and lateral wall of maxillary sinus were obviously destroyed and disappeared, and the nasal cavity was enlarged with scattered cord shadow. External nasal deformities are common and perinasal soft tissues are markedly thickened.Early nasal scleroses in MRI were only mucosal thickening, which was difficult to distinguish from other inflammatory lesions. In the granulomatous

stage, MR T1WI and T2WI showed mild to significantly high signal, while T2WI usually showed uneven signal, while T1WI showed characteristic high signal, suggesting the diagnosis of this disease. MR T1WI in scar stage presented low or equal signal, while T2WI presented obvious low signal. After enhancement, the lesions were mostly moderately to severely enhanced. MRI findings in the granuloma stage and scar stage often overlap due to unsynchronized lesion development. Sinus scleroses appear on MRI in the same way as nasal scleroses, but tend to spread to adjacent structures such as the orbit, intracranial, pterygopalatine fossa, and the nasal cavity is usually not affected.

Conclusion CT and MRI diagnosis of rhinoscleroma is a more effective method of examination ,moreover ,CT and MRI at the same time the two methods is more conducive to rhinoscleroma diagnosis and treatment.

PU-2391

鼻腔鼻窦少见肿瘤的 CT 及 MRI 表现

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目的 分析几种少见鼻腔鼻窦肿瘤的 CT 和 MRI 表现，提高对其的认识及影像诊断水平。 **方法** 回顾分析 18 例经病理证实的鼻腔鼻窦少见肿瘤的 CT 及 MRI 表现。17 例行 CT 平扫，其中 6 例行 CT 增强扫描；9 例行 MRI 平扫+增强扫描；8 例同时行 CT 及 MRI 检查。 **结果** 脑膜瘤 4 例，神经鞘瘤 3 例，多形性腺瘤 2 例,横纹肌肉瘤 5 例（胚胎型横纹肌肉瘤 3 例，腺泡型横纹肌肉瘤 1 例，1 例未分型），原始神经外胚层肿瘤 3 例，转移瘤 1 例。脑膜瘤多见钙化灶，周围骨质吸收、变薄，肿瘤易累及颅底，部分可见不典型脑膜尾征。神经鞘瘤形态较规则，边缘光滑，T_2WI 中可见斑片状、结节状高信号。多形性腺瘤多呈分叶状，增强扫描轻中度强化。横纹肌肉瘤累及范围广泛，周围骨质破坏明显，可见颈部淋巴结肿大表现。原始神经外胚层肿瘤类似于筛骨纸板的线样强化及肿瘤内迂曲血管具有特征性。转移瘤与原发肿瘤表现类似，难以鉴别，需结合病史。**结论** 部分少见鼻腔鼻窦肿瘤具有一定特征性的 CT 及 MRI 表现，结合病史，可在术前做出正确诊断，为临床提供参考。

PU-2392

鼻咽部淋巴瘤多序列 MRI 诊断分析-附 1 例报道

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【目的】总结鼻咽部淋巴瘤（nasopharyngeal lymphoma,NPL）多序列 MRI 影像表现，从而提高对该疾病的认识，探讨 MRI 多序列成像对该疾病定性诊断的可能性。
【方法】分析 1 例鼻咽部淋巴瘤患者临床、MRI 影像资料，结合文献，梳理 NPL 的多序列 MRI 特征性表现。
【结果】男，76 岁。无明显诱因发现左颈部肿物，偶感疼痛，CT 增强扫描示鼻咽壁明显增厚并颈部多发肿大淋巴结，无明显强化， MRI 平扫+DWI 提示：双侧鼻咽壁明显增厚，呈肿块样隆起填塞鼻咽腔，T1WI 呈稍低信号，T2WI 呈稍高信号，DWI 示弥散受限，ADC 值为 0.552×10^-

3mm^2/sec，鼻咽腔消失，病灶向前突向鼻腔，向下突向口咽腔，向两侧突向咽旁间隙，双侧腭帆张肌、腭帆提肌、咽鼓管圆枕及头长肌显示不清，部分肌肉内见 T2W 稍高信号。颏下、双侧颈动脉鞘区及颌下腺区见多发肿大淋巴结，边界清晰，信号均匀，DWI 示弥散受限。我院病理检查诊断为弥漫大 B 细胞淋巴瘤，

【结论】鼻咽癌（nasopharyngeal carcinoma,NPC）与 NPL 是最常见的两种鼻咽部恶性肿瘤，两者 MRI 平扫均表现为 T1WI 等或稍低信号，T2WI 等或稍高信号，增强扫描轻度强化，仅基于常规 MRI 平扫及增强扫描很难区分。NPL 肿瘤组织的细胞密度大于 NPC,细胞外间隙小，导致其水分子弥散运动受限程度也大于 NPC，使其平均 ADC 值明显低于 NPC。文献报道 DWI 被公认为鉴别 NPC 和 NPL 的重要序列，NPC 的 ADC 值明显高于 NPL，差异存在统计学意义；另有文献表明 ADC 的直方图分析较传统的 ADC 平均值测量有明显优势。本例患者 DWI 明显受限，ADC 值仅为 0.552×10^-3mm^2/sec。因此综合常规 MRI 和 DWI 对于 NPL 的诊断与鉴别诊断有重要意义。

PU-2393

Characteristic radiological features of sinonasal rhinoscleroma: a retrospective study of six minority patients in Southwest China

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Objectives: To study the characteristic radiological features of sinonasal rhinoscleroma (RS).
Materials and methods: Six minority patients with sinonasal RSs were retrospectively studied through computed tomography (CT) (n = 5) and magnetic resonance imaging (MRI) (n = 3).
Results: Five cases originated in the nasal cavity and one originated in the sinus. Of the primary nasal lesions, four were bilateral and one was unilateral. Turbinate destruction (n=5) and nasal septum perforation (n=2) were observed. All nasal RSs showed involvement of the paranasal sinus, consisting of destruction of the sinus walls associated with sclerosis of the remaining sinus bone. On CT, RSs exhibited isodensity and mild heterogeneous enhancement. On MRI, RSs showed heterogeneous iso-, hypo- and slight hypointensity on T2WI, consistent with lesion at the granulomatous stage, fibrosclerotic stage or overlap phase. Two cases contained multiple small nodular areas that exhibited mild hyperintensity on both T1WI and T2WI. Dynamic enhancement (DCE) time-signal intensity curve (TIC) examination showed persistent and plateau types.
Conclusions: A sinonasal lesion exhibiting destruction of the turbinates and nasal septum, together with destruction of sinus walls and sclerosis of the remaining sinus bone, particularly, the unique MR signal intensity should provoke the diagnosis of RS.

PU-2394

侵袭性喉念珠菌病一例及文献复习

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目的：学习一例误诊为喉癌的侵袭性喉念珠菌病，以提高临床医师的诊疗意识。方法：搜集一例经病原学证实的侵袭性喉念珠菌感染患者的临床资料及诊治过程，并检索复习国内外喉念珠菌感染的相关文献。结果：念珠菌是真菌中最常见的条件致病菌，一般认为念珠菌病常发生于免疫功能低下宿主。本文报道了一例相对少见的侵袭性孤立性喉念珠菌病，且发生在免疫功能正常的宿主，因影像及内镜检查均提示恶性肿瘤可能，导致了临床误诊，结合文献对该病例的临床、病理、影像学表现与鉴别诊断进行复习，以期提高影像科医生警惕,加深对该病的认识。结论：侵袭性喉念珠菌病罕见，临床表现不典型，早期易误诊，诊断需依靠病理检查，全身或局部抗真菌治疗是其主要治疗方法，预后良好，必要时可行病损切除术，以提高患者呼吸道通畅情况。

PU-2395
磁共振扩散峰度成像及体素内不相干运动扩散加权成像在鼻咽癌疗效评估中的应用研究

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目的 探讨磁共振峰度成像、体素内不相干运动扩散加权成像在鼻咽癌疗效评估中的价值。**方法** 收集本院病理确诊的鼻咽癌患者 40 例，于治疗前、治疗 3 个月后、治疗 6 个月后行磁共振检查，每次检查均测量 DKI 参数（包括 MD、MK、FA）、IVIM 参数（包括 D、D*、f）。治疗 6 个月后根据鼻咽镜结果将患者分为病灶无残留组、病灶残留组。采用独立样本 t 检验比较治疗不同时间点各参数差异。采用配对 t 检验比较不同分组各参数差异。采用多因素联合诊断的 ROC 曲线比较不同参数对鼻咽癌疗效预测的价值。**结果** 治疗前病灶无残留组和病灶残留组 MD 值分别为 $1.12\times10^{-3}m^2/s$、$1.22\times10^{-3}m^2/s$，MK 值分别为 1.01、1.10，D 值分别为 0.7、0.87，在两组之间差异有统计学意义（$P<0.05$）。治疗不同时间点（治疗前、治疗 3 个月后、治疗 6 个月后）MD 值分别为 $1.15\times10^{-3}m^2/s$、$1.38\times10^{-3}m^2/s$、$1.70\times10^{-3}m^2/$，MK 值分别为 1.04、0.91、0.80，D 值分别为 $0.75\times10^{-3}m^2/s$、$1.37\times10^{-3}m^2/s$、$1.51\times10^{-3}m^2/s$，f 值分别为 8.87%、17.95%、13.17%，不同时间点两两比较差异有统计学意义（$P<0.05$）。联合 MD、MK、D 值预测鼻咽癌疗效 ROC 曲线下面积最大，AUC 值为 0.863，灵敏度和特异度分别为 0.769、0.621。**结论** DKI 和 IVIM 均能有效的评估鼻咽癌的疗效，治疗前联合 DKI 及 IVIM 定量参数较单独使用一种方法预测鼻咽癌疗效价值更大。

PU-2396
CT Findings of Laryngeal Tuberculosis: Report of 8 Cases

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Objective: Our goal was to evaluate retrospectively CT findings of 8 patients with laryngeal tuberculosis (LTB) to determine its main characters as well as to associate with the other findings of laryngoscopy and chest checks. Methods: Eight cases of LTB were analyzed; they were all proved by histological tests. All of them went through laryngoscopy and laryngeal CT tests, and six patients had chest DR check, four had

chest CT check. Result: These cases were categorized into two types: diffuse type (n=4), focal type (n=4). The CT scan mainly showed diffuse thickening of bilateral vocal cords, epiglottis and aryepiglottic folds or focal masses in soft tissue density. The contrast-enhanced CT examination showed diffuse enhancement (n=4) or linear enhancement in mucosa (n=3). Among the 7 patients identified pulmonary tuberculosis by chest checks, 6 were active pulmonary tuberculosis (85.7%) and one was old (14.3%). The one patient was regarded as primary laryngeal tuberculosis. Conclusion: LTB should be considered, if laryngeal CT shows diffuse thickening and linear enhancement in mucosa, and the chest check reveals pulmonary tuberculosis.

PU-2397

鼻腔孤立性纤维瘤/血管外皮细胞瘤影像学表现（附 1 例报告并文献复习）

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目的 ：探讨鼻腔孤立性纤维瘤/血管外皮细胞瘤影像学表现，以提高术前诊断水平。
方法：回顾性分析我院 1 例经手术病理证实的鼻腔孤立性纤维瘤/血管外皮细胞瘤的临床资料及 CT、MR 表现，并复习相关文献。
结果：48 岁中年女性，CT 及 MRI 均提示左侧鼻腔内不规则占位性病变，伴周围骨质破坏，结合影像学表现、镜下病理表现及免疫组织化学染色，最终确诊为鼻腔孤立性纤维瘤/血管外皮细胞瘤。
结论：鼻腔孤立性纤维瘤/血管外皮细胞瘤好发于中年人，无性别差异，常表现为边界清楚的孤立性、圆形或不规则形实性质韧肿块，呈膨胀性生长，可填充整个鼻腔并累及鼻窦，推挤周围组织，并可致邻近骨质压迫吸收。CT 平扫多呈边界清晰、密度均匀的软组织肿块。MR 检查 TIWI 为等低信号，因肿瘤内富含纤维成分，T2WI 常表现为低信号。增强后肿瘤强化常较明显，并可见粗大的引流血管。当鼻腔肿块呈分叶状，膨胀性生长，周围骨质受压吸收、破坏，T2WI 为低信号，增强后明显强化并可见引流血管时高度提示 SFT/HPC 可能。

PU-2398

鼻窦内翻性乳头状瘤诊断要点与分析

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目的：探讨 CT 及 MR 对鼻腔及副鼻窦内翻性乳头状瘤的诊断价值。材料与方法：回顾性分析 30 例经病理证实的鼻窦及副鼻窦内翻性乳头状瘤的 CT 及 MR 征象，术后 16 例行 CT 及 MR 随访。结果：肿瘤呈不规则软组织肿块。以中鼻道为中心，同时侵犯同侧鼻腔及副鼻窦 19 倒，单纯累及上颌窦 3 例；所致骨质改变以骨质破坏多见。术后肿瘤复发率高(75%)，3 例恶性变。结论：CT 及 MR 能较好地显示鼻腔及副鼻窦内翻性乳头状瘤的病变部位、范围及术后有无肿瘤复发，有利于临床治疗方案的选择。

PU-2399
鼻中隔偏曲及窦口鼻道复合体解剖变异的 CT 评价与慢性鼻窦炎相关性研究

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目的 研究鼻窦 CT 冠状位片鼻中隔偏曲及窦口鼻道复合体解剖变异与慢性鼻窦炎的关系
方法 选择 200 例(400 侧)经鼻窦 CT 检查患者，进行 Lund-Mackay 评分并分为慢性鼻窦炎组(,n=146,292 侧)和非鼻窦炎组(n=54,108 侧),选择冠状位片观测鼻中隔偏曲方向、程度及位置，中鼻甲反向偏曲、中鼻甲气化、钩突肥大、钩突气化、钩突角度（内偏、外偏）、Haller 气房和筛漏斗宽度，并进行统计学分析
结果 中鼻甲反向偏曲 3.3%，中鼻甲气化：垂直部 10%，球状部 3.3%，广泛气化 5%；钩突内偏 23.3%，钩突外偏 38.3%，Haller 气房 29.2%，鼻中隔偏曲 281 侧，其中左偏 162 例，右偏 119 例，双侧同时偏曲 31 例；偏曲程度：轻度 62.2%、中度 35.6%、重度 2.2%；偏曲位置：高位 33.3%、低位 51.1%、混合 15.6%；不同钩突变异其慢性鼻窦炎发病率差异有统计学意义(x2=18.528,P＜0.01).其中钩突外偏型和 Haller 气房发病率均明显高于钩突内偏型,差异有统计学意义(P＜0.05).鼻窦炎组钩突角度筛和漏斗宽度分别为(119.5±19.5)°和(5.7±3.5) mm,与非鼻窦炎组(137.1±11.6)°和(3.6±1.4) mm 比较,差异有统计学意义(P＜0.05)
结论 鼻中隔偏曲及窦口鼻道复合体解剖变异与慢性鼻窦炎关系密切,鼻窦 CT 冠状位片扫描可明确其解剖变异及其毗邻关系

PU-2400
磁共振成像(MRI)对鼻咽癌早期诊断的临床价值

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【摘要】 目的 探析核磁共振成像(MRI)对鼻咽癌早期诊断的临床价值。方法收集 2017 年 1 月-2019 年 1 月收治的拟诊断为鼻咽癌的患者 40 例进行回顾性分析。所有患者均进行动态增强成像(DCE-MRI)和弥散加权成像(DWI)扫描,并以穿刺活检病理结果为金标准,比较两种检测方式对鼻咽癌的灵敏度、特异度和准确度;将拟诊断为鼻咽癌患者根据 MRI 的扫描方式不同分为动态增强成像(DCEMRI)组和弥散加权成像(DWI)组。分析两种扫描方式对鼻炎癌患者和非鼻炎癌患者的肿瘤的生物学差异 结论 DCE-MRI 扫描和 DWI 扫描均能对鼻炎癌早期进行一定程度的影像学诊断,但 DCE-MRI 对早期鼻咽癌患者诊断的灵敏度、特异度和准确度更高。

PU-2401
出血坏死性息肉的 CT 和 MRI 特点分析

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目的探讨出血坏死性息肉的 CT 和 MRI 特点,提高术前诊断准确率。**方法** 回顾复习近 3 年收治的 15 出血坏死性息肉患者的影像学资料,分析总结其术前鼻窦 CT 和 MRI 的特点并讨论其与相似疾病的鉴别要点。**结果** 部分病例 CT 表现与一部分真菌性鼻窦炎、内翻乳头状瘤以及上颌窦癌有相似之处。但这些病的 MRI 表现各异,可资鉴别。**结论**相较于单一的鼻窦 CT 检查,CT 结合 MR 影像可提

供更多的诊断信息以提高出血坏死性息肉的术前诊断准确性,有助于术前预估内镜下手术方案,有利于与患者沟通病情。

PU-2402

鼻腔鼻窦畸胎癌肉瘤 1 例

葛欢
山东省立医院耳鼻喉医院山东省立医院西院(原:山东煤矿总医院)

患者男，53 岁，3 月余前无明显诱因出现头痛，程度轻，可耐受，伴有涕中带血丝，未予重视，未行治疗。1 月前出现右侧鼻塞，并逐渐加重，呈持续性，伴有嗅觉减退，无视力下降及头痛加重等。 专科检查：鼻外形正常，右侧鼻腔可见暗红色新生物。
影像学表现：CT：右侧鼻腔、后鼻孔见不规则形软组织密度肿块，密度不均匀，内见钙化灶，最大截面面积约 5.8cm×1.5cm，与邻居鼻甲分界不清，增强检查后可见不均匀强化，内见低密度。考虑肿瘤。MRI：右侧鼻腔、筛窦、后鼻孔区见不规则形等长 T1 长 T2 异常信号，最大截面约 5.7cm×1.4cm，增强扫描呈明显不均质强化，其内可见无强化区，病变与邻近鼻甲分界不清，右眶内侧壁受累，鼻中隔向左侧偏移。考虑恶性肿瘤。术后病理示：（右侧鼻腔）鼻腔鼻窦畸胎瘤肉瘤；免疫组化：CK(+)、Vimentin(+)、Syn （ + ）、CD99 部分（+)、CgA(-)、SMA 部分（+)、Desmin(-)、Ki-67index 50%。
鼻腔鼻窦畸胎癌肉瘤(sinonasal teratocarcinosarcoma, SNTCS)又称“恶性畸胎瘤”、“畸胎样癌肉瘤”等，2005 年 WTO 正式命名为“鼻腔鼻窦畸胎癌肉瘤”，为一种罕见的高度恶性肿瘤。本病好发于成年男性，男女比例为 8:1，发病年龄 18～79 岁，平均 60 岁。其临床症状主要表现为鼻塞、鼻出血、嗅觉减退、头痛、视力降低等症状。该病通常表现为鼻腔内占位、密度均匀或欠均匀、无明显的钙化或囊性变，增强扫描后肿块多不均匀强化。局部进展者可见周围骨质结构破坏，甚至侵及颅底、海绵窦及中枢神经等。确诊需依靠病理学检查，多需多次活检或根治手术方能确诊。
鉴别诊断 ：（1）内翻性乳头状瘤；（2）嗅神经母细胞瘤。

PU-2403

鼻骨区陈旧骨折和新鲜骨折的螺旋 CT 影像特征分析

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目的 应用多层螺旋 CT（multi-slice spiral CT，MSCT）分析鼻骨区陈旧骨折（外伤半年以上）的影像特征，探索和新鲜骨折的鉴别点。**方法** 对 100 例鼻骨区陈旧骨折和 1500 例新鲜骨折（外伤 3 天内）的 MSCT 影像进行回顾性分析，首先确定观察指标：1.骨折断端的形态；2.轮廓改变；3.骨折断端是否伴发游离气体。4. 鼻背部软组织情况。5.鼻腔和鼻前庭的粘膜改变，由三名高年资影像主治医师根据上述指标对陈旧骨折和新鲜骨折做出独立诊断。并统计上述征象在陈旧和新鲜骨折中的出现率和特异性。**结果** 陈旧骨折断端圆钝清晰，骨质增厚硬化，新鲜骨折断端锐利模糊；新鲜骨折断端可伴发游离气体，新鲜骨折的鼻腔和鼻前庭的粘膜明显增厚，陈旧骨折的鼻腔和鼻前庭的粘膜无或轻微增厚。骨折断端形态改变、骨折断端处是否伴发游离气体、鼻腔和鼻前庭的粘膜是否增厚是判断陈旧或新鲜骨折最具有特异性的征象。骨折的轮廓改变和鼻背部软组织是否增厚不具有鉴别陈旧和新鲜骨折的特异性。**结论** 骨折断端形态改变和鼻腔鼻前庭的粘膜改变是判断新鲜

或陈旧鼻骨区骨折的重要征象，正确诊断新鲜或陈旧的鼻骨区骨折对于鼻骨骨折的司法鉴定意义重大。

PU-2404

鼻骨区陈旧骨折的螺旋 CT 影像特征的探索

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目的 应用多层螺旋 CT（multi-slice spiral CT，MSCT）分析鼻骨区不同部位骨折的影像特征和临床特点。 **方法** 对 1500 例新鲜鼻部外伤的患者进行 MSCT 扫描，图像的多平面重建（MPR）和锐化，包括横断位、冠状位、以及容积再现（VR）。把鼻骨区骨折按照发生部位分为：前部骨折：即鼻骨前部，包括鼻骨缝和骨性鼻中隔前部；中部骨折：即鼻颌缝附近和骨性鼻中隔中部；后部骨折：上颌骨额突后部；复合骨折：至少包括前中后任何两处骨折。骨折类型分为：凹陷型，隆起型 ，青枝型，粉碎型（＞或=2 块骨折）。**结果** 骨折发生率：复合-中部-前部-后部。复合骨折最多见，其次是中部骨折，可能和鼻颌缝附近的骨质是最薄弱的有关。下部骨折最少，因为额突下部很坚硬，不易骨折。最常见骨折类型是凹陷骨折，其次是粉碎骨折和隆起型骨折，最少见的是青枝型骨折。**结论** 额突后部是额突最坚硬的部位，骨折发生率最低。青枝骨折最多见于前部骨折，凹陷骨折最多见于中部和后部骨折， 粉碎骨折最多见于复合骨折。鼻中隔骨折最容易引起双侧鼻腔阻塞和出血。复合骨折最容易引起单侧鼻腔和鼻前庭阻塞和出血。前部骨折引起的鼻塞和出血最轻。

PU-2405

鼻骨区新鲜骨折的多层螺旋 CT 影像特征分析

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目的 应用多层螺旋 CT（multi-slice spiral CT，MSCT）观察鼻骨区新鲜骨折（外伤 3 天内）的影像特征。 **方法** 对 1500 例新鲜鼻部外伤的患者进行 MSCT 扫描和图像的多平面重建（MPR）和图像锐化，包括横断位、冠状位、以及容积再现（VR），由三名高年资影像主治医师分析骨折主要征象，并做出独立诊断。 **结果** 总结出新鲜骨折主要影像特征：1.骨折线，明显骨折能够看到骨折线，断端移位成角。2.轮廓改变，轻微骨折，骨折线显示不清，仅表现为鼻骨和上颌骨额突的穹隆弧形塌陷。3. 骨折断端处游离气体。4. 沿骨折外缘轮廓贴边走行的低密度线影消失。5. 鼻背部皮肤中断，软组织增厚，层次模糊伴/不伴积气。6.鼻腔和鼻前庭的粘膜增厚。统计上述征象的出现率，准确率，特异性和敏感性。**结论** 1. 明确骨折线是诊断新鲜骨折最特异性的征象。2.冠状位显示鼻骨的横行骨折有优势。3. 软组织算法的彩色 VR 因能够多角度观察，很好显示鼻骨区轮廓改变，对于诊断轻微急诊骨折有优势。3.骨折断端处游离气体对于诊断新鲜骨折和鉴别陈旧骨折有意义。4.鼻腔和鼻前庭的粘膜增厚对于鉴别新鲜和陈旧骨折有重要意义。5. 骨折断端外缘的低密度线影消失在诊断骨折时并不具有特征性。

PU-2406

鼻软骨间叶性错构瘤 2 例报告并文献复习

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病例 1，女性，7 岁，因右侧鼻腔出血半月就诊，伴鼻塞、视物模糊，无头痛及眼球运动受限等，鼻内镜示鼻腔肿物，行 CT 增强及 MRI 平扫检查，示右侧鼻腔-筛窦-上颌窦肿物，病变内合并结节状、条片状钙化，筛窦间隔及下鼻甲、中鼻甲部分骨质破坏，增强呈不均匀强化，影像诊断鼻腔良性肿瘤，内翻乳头状瘤可能性大，手术切除后病理示鼻软骨间叶性错构瘤。

病例 2，女性，8 岁，左侧鼻塞半年就诊，因感冒后左侧鼻塞伴黏液分泌物，抗炎治疗后效果不佳，就诊于当地医院提示鼻腔肿物，为就进一步治疗就诊我院。行副鼻窦 CT 增强检查，左侧鼻腔见混杂密度肿块影，部分突入上颌窦，肿块内合并条片状钙化，增强实性成份可见中度强化，影像诊断为鼻腔良性肿瘤，纤维血管瘤可能性大，行手术切除后病理提示鼻软骨间叶性错构瘤。

讨论：鼻软骨间叶性错构瘤是一种罕见小儿肿瘤，1998 年，McDermott 等首次报道，认为肿瘤由软骨及软骨样组织的间充质细胞组成，形态上类似于肺部间叶性错构瘤，具体发病机制尚不清楚。鼻腔错构瘤包括间质和上皮成份，常见类型错构瘤包括血管、脂肪、软骨、神经及上皮，各种成份占比决定了其病理、影像表现不同。CT 主要表现为鼻腔内不均质软组织肿块，伴囊性成份，伴或不伴钙化，实性成份呈稍长 T1 稍长 T2 信号影，增强不均匀强化，钙化可以提示诊断。本组 2 例病例图像均显示为软组织肿块伴钙化，MRI 信号混杂，符合文献报道的鼻软骨间叶性错构瘤影像表现。本病影像表现虽具有一定特征，诊断时需与脑膜脑膨出、鼻部神经胶质瘤及鼻腔异位脑膜瘤相鉴别。手术完整切除为主要治疗手段，远期预后良好，暂无复发及恶变相关报道，早期准确诊断，精确描述病变范围，对于手术计划制定及治疗至关重要。

PU-2407

舌扁桃体肥大的影像观察

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摘要
目的：探究 CT 对舌扁桃体肥大的影像诊断效能。
方法：收集 267 例因阻塞性睡眠呼吸暂停低通气综合征行上气道 CT 检查患者的影像资料，观察舌扁桃体形态，对舌扁桃体肥大程度进行影像分级，并与临床纤维喉镜检查结果进行对比，观察影像诊断的准确性。
结果：影像组Ⅰ度、Ⅱ度、Ⅲ度舌扁桃体肥大患者例数分别为 48：135：84 例；纤维喉镜组Ⅰ度、Ⅱ度、Ⅲ度舌扁桃体肥大患者例数分别为 37：138：92 例；Kappa 检查提示两种检查有较高的一致性。
结论：CT 检查能够有效、准确、无创、无痛苦的检出舌扁桃体肥大。既往因阻塞性睡眠呼吸暂停低通气综合征行上气道 CT 检查常忽视对舌扁桃体病变的观察，但该类患者中，咽部异物感症状出现频率高。影像检查对该病变的描述，可有效促进临床对患者的有效治疗，值得在临床上进行推广应用。

PU-2408

断层融合技术在鼻骨骨折中的应用价值探讨

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目的：常规拍摄鼻骨制约因素较多，常不能满足临床工作的需要，文中通过与普通鼻骨侧位片比较，探讨数字
断层融合技术(digital tomosynthesis，DTS)在鼻骨摄片中的应用价值。
方法：选取 43 例因各种原因所致鼻骨骨折患者，
行普通 X 线鼻骨侧位片和 DTS 断层融合成像，将 2 种图像的清晰度、对比度进行比较。分析其相应的表现和诊断。
结果：43 例鼻骨确诊骨折患者所拍普通鼻骨侧位片与 DTS 断层融合图像的鼻骨骨折率各为 60．4％和 100％，可疑骨折
率各为 37．2％和 0％，常规普通 X 线拍片有 4．6％未见明显骨折，而 DTS 断层融合为 0％，所以 DTS 断层融合成像质量
明显高于普通成像。
结论：DTS 断层融合戚像拍摄鼻骨图像清晰度高，避免了临近结构的重叠，不受拍摄时其他条件的限制．辐射剂量低。价格低廉，在实际明确诊断鼻骨骨折中起到很重要的作用。

PU-2409

喉癌肉瘤 1 例

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癌肉瘤是一种由上皮和间质成分组成的恶性肿瘤，因其发生有许多假说，故产生了多种命名，如肉瘤样癌、假肉瘤、化生癌等。组织学上癌成分以鳞状细胞癌及腺癌多见，常位于肿瘤基底部粘膜及粘膜下，肉瘤成分以横纹肌及平滑肌多见，多分布在肿瘤近中心部或蒂部。免疫组织化学中细胞角蛋白 CK 和波形蛋白 VIM 同时阳性较具特征性。**喉部癌肉瘤罕见，仅占喉部恶性肿瘤的 2%-3%**，好发于 50-69 岁中老年男性，恶性程度高，侵袭性强，预后差。发病病因不明，可能与吸烟、饮酒及放射线接触史有关。**喉癌肉瘤多位于声门区，且多为外生性生长，早期即可堵塞喉腔而导致呼吸困难。因生长部位特殊，肿瘤体积常小于 3cm，而其他部位的癌肉瘤生长部位隐匿，初诊时体积常大于 5cm。复习相关文献并结合本例喉癌肉瘤 CT 表现发现：喉癌肉瘤多表现为声门区外生性肿物，呈较均匀等或稍高密度，边缘较清晰，增强扫描呈渐进性强化，晚期可侵犯周围结构，但区域淋巴结转移少见。**

PU-2410

鼻腔骨外尤文肉瘤 1 例

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骨外尤文肉瘤/外周原始神经外胚层肿瘤（Extraskeletal Ewing's Sarcoma/Peripheral Primitive Neuroectodermal tumor，EES/pPNET）是一种罕见的高度侵袭性小圆细胞肿瘤，是起源于软组织的尤文肉瘤，好发于 10-20 岁，男性稍多于女性。EES 好发于脊柱旁、躯干、腹膜后、四肢等，仅 1-4%发生于头颈部，**发生于鼻腔鼻窦者更为罕见**。本文报告了 1

例鼻腔骨外尤文肉瘤，**鼻腔鼻窦骨外尤文肉瘤多位于筛窦及上颌窦，在影像上多为体积较大的软组织肿块，CT 为等或稍低密度，磁共振平扫 T1WI 呈等或稍低信号，T2WI 呈高信号，密度或信号不均匀，囊变坏死多见而钙化少见，常伴邻近骨质膨胀性或筛孔状破坏，可见残留骨壳，通常无骨内尤文肉瘤典型的洋葱皮样骨膜反应或肿瘤骨，增强后伴分隔状强化较具特征性，可能与病灶内局部血管丰富，强化较其他区域明显有关。部分学者认为磁共振图像上病灶内或边缘见流空血管影较具特点**。EES 恶性程度高，易复发或转移，治疗主要采取手术及放化疗等综合治疗，而鼻腔鼻窦结构特殊且紧邻血管神经，往往难以根治性切除，术后需定期随访。

PU-2411

鼻咽纤维血管瘤的 MRI 诊断及其临床价值

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[摘要] **目的：**探讨鼻咽纤维血管瘤的 MRI 影像特点及其临床价值。**材料和方法：**回顾性分析 45 例鼻咽纤维血管瘤 MRI 资料，对肿瘤的侵犯范围、大小、边界、信号、周围骨质改变等进行观察分析。**结果：**影像学表现：鼻咽部软组织肿块；大部分边界清楚；信号均匀；翼腭窝的扩大增宽，上颌窦后壁受压前移、塑形，但后壁骨质无破坏是其特征性表现；周围骨质的压迫塑形或吸收破坏；显著强化。**结论：**MRI 扫描有助于肿瘤诊断、定位及分期，具有重要的临床价值。

PU-2412

CT、MRI 在喉癌术前评估中准确性分析

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目的：研究多层螺旋 CT、MRI 在喉癌术前评估中准确性的对照分析，探讨 CT、MRI 对喉癌诊断及治疗方案选择的临床应用价值。方法：为收集解放军北部战区空军医院 2018 年 5 月~2019 年 5 月经术后病理证实的喉癌病例，对 CT 及 MRI 表现与喉镜及术后病理结果对照研究，并用 CT 后处理技术和喉镜图像进行对照研究及相关数据分析。结果：CT 对喉癌的正确诊断率为 86.36%，敏感性为 86.93%，假阴性率为 13.07%; MRI 对喉癌的正确诊断率为 84.08%，敏感性为 89.19%，假阴性率为 10.81%。CT 图像与 MRI 图像在评价肿瘤侵犯范围的对比中各具优势。结论：CT 图像及 MRI 图像可以很好的显示肿瘤的部位、大小、密度或信号、边界及侵犯范围，为喉癌术前评估和治疗方案的制定提供影像学依据。

PU-2413

鼻腔肿瘤的诊断及鉴别诊断

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分析鼻腔常见肿瘤的 CT 表现， 了解其诊断及鉴别诊断要点。方法 分析经病理证实的鼻腔肿瘤 43 例， 内翻乳头状瘤 12 例(其中恶变 2 例),非霍奇金淋巴瘤 12 例,鼻腔癌 19 例。结果 12 例内翻乳头状瘤均为单侧病变, 12 例 肿物均位于鼻腔外侧壁, 10 例良性内翻乳头状瘤中， 肿

物主要位于鼻腔中后部 9 例(90%) , 10 例(100%) 边界清晰, 无明显 外侵征象,密度均匀 8 例。12 例淋巴瘤中,单侧病变 10 例(83. 3%) ,9 例(75%)位于鼻腔前部,9 例(75%)侵犯鼻翼、颜面 部皮肤,6 例(50%)皮下脂肪层消失,骨质侵蚀变薄 3 例。鼻腔癌 19 例,单侧病变 13 例(68. 4%) ,形态不规则、明显外侵 18 例(94.7%),溶骨性破坏 15 例(78.4 %)。结论 鼻腔内翻乳头状瘤、淋巴瘤、鼻腔癌有不同的影像特点,CT 扫描有助于诊 断及鉴别鼻腔各种常见肿瘤。

PU-2414

嗅神经母细胞瘤一例报道

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嗅神经母细胞瘤(olfactory neuroblastoma，ONB)嗅神经母细胞瘤是一种少见的神经外胚层起源的恶性肿瘤，是低度恶性肿瘤，因其确切组织来源不明确，曾命名为嗅神经上皮瘤，嗅神经细胞瘤，成感觉神经母细胞瘤。它起源于上鼻甲、鼻中隔、筛板表面的嗅上皮。约占鼻腔恶性肿瘤的5%以上。ONB 发病隐匿，症状与肿瘤侵袭的部位有关，大多数无特征性症状表现，且肿瘤生长缓慢，患者常常由于数月后肿瘤侵犯出现如鼻出血、鼻塞、嗅觉减退或丧失、头痛、视物不清等症状后才得以确诊，嗅觉减退或丧失对诊断有提示作用。

PU-2415

鼻腔鼻窦少见良性肿瘤及类肿瘤样病变的 CT 和 MRI 诊断

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目的 探讨 CT 和 MRI 对鼻腔鼻窦少见良性肿瘤及类肿瘤样病变的诊断价值。**方法** 收集我院行 CT 或/和 MRI 检查并经病理证实的鼻腔良性肿瘤及类肿瘤样病变 22 例，对其 CT 和 MRI 影像特征进行分析。**结果** 多形性腺瘤 2 例、神经鞘瘤 3 例、呼吸道上皮腺瘤样错构瘤 2 例、鼻腔鼻窦型血管外皮细胞瘤 2 例、孤立性纤维瘤 1 例、类肿瘤样胆固醇性肉芽肿 4 例、出血坏死性鼻息肉 8 例。病灶边界均较清楚，除 2 例呼吸道上皮腺瘤样错构瘤和 2 例后鼻孔区胆固醇性肉芽肿有沿鼻腔鼻道蔓延填充生长外，其余 18 例均表现为类圆形或欠规则局灶性结节、肿块。8 例见邻近骨质轻度吸收破坏，1 例胆固醇性肉芽肿骨质破坏明显。呼吸道上皮腺瘤样错构瘤嗅裂均增宽。CT 平扫除 1 例血管外皮细胞瘤、1 例胆固醇性肉芽肿、2 例出血性鼻息肉密度不均外，余密度均匀。2 例多形性腺瘤呈等/略低 T1、稍高 T2 信号，轻中度延迟强化伴小斑片无强化区；1 例行 MRI 检查神经鞘瘤小病灶呈等 T1、长 T2 信号，明显均匀强化，另 2 例行 CT 增强检查分别呈中度均匀和明显不均匀强化；2 例鼻腔鼻窦型血管外皮细胞瘤动脉期不均匀强化，其中 1 例延迟期均匀强化；孤立性纤维瘤动脉期不均匀强化，延迟期均匀强化；1 例位于上颌窦胆固醇性肉芽肿病灶内见多发钙化，余均为无强化较低密度占位改变；出血坏死性鼻息肉 CT 增强 1 例无明显强化，其余 7 例不均匀强化，其中 4 例强化峰值达 200HU 以上，4 例可见斑条状强化，2 例行 MRI 检查信号混杂，T1WI 等低信号为主，T2WI 高信号为主，1 例病灶周边可见低信号环及内部分隔表现，增强均明显不均匀强化。**结论** 鼻腔鼻窦少见良性肿瘤及肿瘤样病变 CT 及 MRI 表现各有一定的特征，常规 CT 和 MRI 检查能清楚显示病变部位、血供及周围结构的关系，有助于术前诊断，辅助制订治疗方案并指导手术。

PU-2416

3.0T 磁共振扩散加权成像判别咽后组淋巴结性质的临床价值分析

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目的 探讨 3.0T 扩散加权成像（DWI）在判别咽后组淋巴结性质的临床价值。**方法** 搜集 25 例伴咽后淋巴结肿大的鼻咽部病变患者的 MR 及临床资料，其鼻咽病变经临床或病理活检证实，良性组 13 例 23 枚，恶性组 12 例 15 枚；对比分析良、恶性咽后淋巴结的扩散加权成像（DWI）信号及表观弥散系数（ADC）值，采用受试者工作特征曲线（ROC）得出咽后淋巴结 ADC 值最佳诊断分界点。**结果** 咽后良、恶性淋巴结 ADC 值分别为（0.833±0.095）×$10^{-3}$$mm^2$/s、（0.663±0.070）×$10^{-3}$$mm^2$/s，二者差异有统计学意义（*P*=0.000），ADC 值判断淋巴结性质 ROC 曲线下面积为 0.959，以 0.767×$10^{-3}$$mm^2$/s 为阈值，敏感度为 78.3%，特异度为 100%。**结论** DWI 在鉴别咽后组良、恶性淋巴结具有重要的临床价值，能进一步提高对淋巴结性质判断的准确性。

PU-2417

鼻腔鼻窦恶性黑色素瘤的 CT 及 MRI 表现

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目的：回顾性分析鼻腔鼻窦恶性黑色素瘤(Malignant sinonasal melanoma，MSM))的 CT 和 MRI 影像特点，并与病理对照，以提高 MSM 的诊断与鉴别诊断。
方法：回顾性分析本院 2016 年 1 月至 2019 年 6 月经手术或穿刺病理证实的鼻腔鼻窦部恶性黑色素瘤 13 例，其中行 CT 检查 10 例（其中平扫+增强扫描 5 例；平扫 5 例）；行 MRI 检查 6 例（其中平扫+增强扫描 3 例；平扫 3 例）。分析 MSM 在 CT 和 MRI 上的影像学特点。
结果：肿瘤位于鼻腔 10 例；后鼻孔 1 例；上颌窦 1 例；同时累及鼻腔鼻窦 3 例；CT 平扫呈结节状，边缘规则，密度均匀 5 例，无骨质破坏，增强扫描呈明显强化；膨胀性生长软组织肿块 5 例，密度不均匀，内见高密度出血及低密度坏死，邻近骨质呈溶骨性破坏，增强扫描中度不均匀强化；同时累及鼻腔及鼻窦 3 例，累及鼻窦及眼眶，增强扫描不均匀强化；MRI 典型黑色素型 3 例，呈 T1WI 高信号 T2 低信号，增强扫描呈明显强化；非典型无黑色素型 3 例，T1WI 呈等低信号，T2WI 呈等高信号，其中 2 例内见出血和坏死；增强扫描呈不均匀中度强化。
结论：CT 与 MRI 对鼻腔及鼻窦恶性黑色素瘤的定位、定性及临床分期具有重要作用。CT 表现软组织肿块，部分见溶骨性骨质破坏；MRI 典型黑色素性 MSM 呈 T1WI 高信号 T2WI 呈低信号，非典型无色素性 MSM 表现复杂，须与鼻腔鼻窦其他肿瘤鉴别，结合发病年龄、发生部位、临床表现综合分析后做出诊断。

PU-2418

MRI 对喉癌术前诊断的价值

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目的 探讨 MRI 对喉癌术前诊断准确性评估及诊断价值。**方法** 收集中国人民解放军北部战区空军医院 2018 年 4 月-2019 年 4 月 34 例(平均年龄 62.2±5.1 岁)疑似喉癌的喉内窥镜检查并同时行 MRI 检查的病例，并与病理结果对比。**结果** MRI 影像表现为侵袭前联合、声带、舌骨及会厌前间隙，喉部软骨浸润。在 15 例病例中，声门型有 15 例(44%)、声门上型有 10 例(29%)、跨声门有 9 例(27%)。受累部位包括前联合 (48 例 48%)、会厌前间隙(33%)、软骨浸润(19 例 14%)，与术后病理结果对比差异无统计学意义。根据 MRI 发现，4 例(12%)为 T2，26(76%)为 T3 和 4 例(12%)为 T4；在术后病理结果中，12 例为 T2(35%)，18 例为 T3(53%)，4 例为 T4(12%)。通过 MRI 诊断，76%的患者正确分类，显示有统计学意义(ρ=0.59；p＜0.05)。**结论** MRI 对喉癌术前诊断准确性高,具有重要诊断价值。

PU-2419

复发性喉癌螺旋 CT 诊断价值分析

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目的：探讨喉癌术后复发的螺旋 CT 诊断价值。
材料与方法：回顾分析我院 2015 年 1 月 2019 年 1 月经病理活检证实的 25 例复发性喉癌的 CT 资料。采用东芝 AquilionCX64CT，准直为 0. 625 mm 螺旋 CT 扫描，利用扫描获取的容积资料行薄层 1 mm 冠状、矢状、轴位多平面重组(MPR)，标准算法，矩阵 512×512。
结果：25 例术后复发性喉癌，术前皆为鳞癌，其中声门上型 18 例、声门型 5 例、跨声门型 2 例，分别采用声门上半喉、垂直半喉、全喉切除。术后复发见于 3～5 月 3 例，6～11 月 8 例，12 月～4 年 14 例。主要表现为术后新增强化软组织肿块及周围结构受侵，其中不规则强化肿块 20 例，淋巴结肿大 17 例，喉软骨破坏 5 例，颈动脉鞘受累 5 例，气管造瘘口癌 3 例，颈椎骨质破坏 1 例。
结论：喉癌术后定期 CT 复查，可以及时发现复发性喉癌。

PU-2420

Small cell neuroendocrine carcinoma (SNEC) of paranasal sinuses: Radiologic features in fourteen

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Objective: To explore the characteristic computed tomography (CT) and magnetic resonance imaging (MRI) features of small cell neuroendocrine carcinoma (SNEC) of paranasal sinuses.
Materials and Methods: CT (n = 8) and MRI (n = 14) images, as well as the clinical findings from 14 patients with a pathologically diagnosed SNEC of paranasal sinuses were retrospectively reviewed.
Results: 8 lesions were located in ethmoidal sinus, 4 in maxillary sinus and 2 in sphenoid sinus. SNECs of sphenoid sinus showed bilateral asymmetry pattern. On CT scan, lesions were isodensity, and moderate (n = 5) or mild (n = 3) enhancement. Bony changes were visible in all 8 cases. On MRI scan, 3 cases contained haemorrhage, 9 cases contained cystic or necrotic areas. All cases demonstrated heterogeneous marked enhancement with half showed “cribriform-

like" or "geographic" appearance. Nasal cavity was the most common sites invaded by SNEC of paranasal sinuses. followed by orbits. Time-signal intensity curve (TIC) exam showed wash-out type in all but one cases. The mean apparent diffusion coefficient (ADC) values was 0.77 ± 0.21 * 10^{-3} mm^2/s. Immunohistochemical demonstrated a consistent positive staining for cytokeratin(CK) and synaptophysin(Syn), while negative staining for S-100 and thyroid transcription tactor-1(TTF-1) in all tumors. According to the Dulguerov staging system, tumors were staged as 9 N0 (1 T2, 6 T3, 2 T4) and 5N1 (3 T3, 2 T4).The recurrence rate is 64.3% and 3 patients at T4 stag expired during the 3-30 months follow-up period.

Conclusion: The diagnosis of SNEC is challenging and it can easily be misdiagnosed. Some characteristics of radiological findings can supply important clues for preoperative diagnosis and suitable treatment planning

PU-2421

螺旋 CT 多平面重组技术在喉癌诊断中的应用效果观察

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【摘要】 目的分析螺旋 CT 多平面重组(MPR)技术在喉癌诊断及术前评价中的应用价值。方法选取 50 例喉癌手术患者术前螺旋 CT 横断面及 MPR 图像处理资料,与手术及病理结果相对比,分析 CT 轴位、CT 轴位+MPR 联合 2 种方法对喉旁间隙、甲状软骨等结构受侵评价的准确性、敏感性、特异性。结果 CT、CT+MPR 2 种不同检查方法中,对喉旁间隙受侵的评价准确性分别为 82.0%、94.0%(P<0.05),其中 CT+MPR 检查准确性明显高于单纯 CT 轴位技术;对甲状软骨受侵的评价准确性分别为 83.0%、96.0%(P<0.05);对声带、会厌、室带、梨状窝、会厌前间隙、喉外结构以及杓状软骨受侵的评价准确率差异无统计学意义(P>0.05),但 CT+MPR 对各个结构受侵情况准确性、敏感性以及特异性较高。结论 CT+MPR 可提高喉癌诊断确诊率,在喉癌术前评价中有应用价值。

PU-2422

CT 和 MRI 对鼻内翻性乳头状瘤的诊断价值

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[摘 要] 目的 分析鼻内翻性乳头状瘤的 CT 和 MRI 表现，探讨其诊断价值。**方法** 回顾 21 例经病理证实的鼻内翻性乳头状瘤的 CT 和 MRI 影像，并与术中所见、术后病理及随访结果比较。结果 21 例中，起源于上颌窦 8 例，筛窦 1 例，额窦 1 例，鼻甲 9 例，窦口鼻道复合体 2 例。CT 表现：单侧鼻腔鼻窦软组织病变，骨炎征的出现率为 61.90%，与起源部位一致的 76.92%，2 例出现眶纸板或前颅底骨质破坏，与恶变相关。MRI 表现：20 例出现脑回征，根据脑回征逆向回溯法，18 例准确预测起源部位。**结论** CT 与 MRI 相结合，对于判断鼻内翻性乳头状瘤的起源、范围及是否合并恶变更具有诊断价值。

[关键词] 内翻性乳头状瘤；体层摄影术；磁共振成像；起源；恶变

PU-2423

双源 CT 平扫碘图在甲状腺良恶性结节诊断中的应用研究

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目的 探讨二代光子双源 CT 双能量平扫时碘图碘含量对甲状腺良恶性结节的鉴别诊断价值。**方法** 搜集行二代光子双源 CT 双能平扫的甲状腺结节患者 40 例，且 40 例甲状腺结节患者中发现 65 枚结节全部经病理明确病灶性质，并根据病理结果将其分为良恶性两组。测量甲状腺良性结节与恶性结节行双能 CT 扫描后碘图含碘量，统计分析甲状腺良恶性结节含碘量之间有无差异，并比较良性结节周围正常甲状腺含碘量及恶性结节周围正常甲状腺组织含碘量之间有无差异。 **结果** 40 例行双源 CT 双能扫描的患者共发现 65 枚结节，与手术证实结节数目一致，其中甲状腺良性结节 37 枚，甲状腺恶性结节 28 枚，甲状腺良性结节碘图含碘量为（-0.5±0.36ml/mg）、甲状腺恶性结节碘图含碘量为（ -1.32±0.12 ml/mg），两者之间碘图含碘量有统计学意义（P＜0.05），甲状腺良恶性结节周围在正常甲状腺组织含碘图碘量分别为（1.83±0.28）mg/mL、（1.81±0.26）mg/mL，差异无统计学意义（P＞0.05）。**结论** 双源 CT 双能量平扫时通过碘图定量分析碘含量并结合甲状腺形态学判断甲状腺结节良恶性，可以提高甲状腺结节性病变诊断的准确性和诊断信心。

PU-2424

Madelung’s disease：manifestations of CT and MR imaging (report of 5 cases and literature review)

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Abstract:
Purpose: The aim of this study is to investigate the Madelung ’disease clinical manifestations of CT and MR imaging and improve the detection rate of the disease.
Materials and Methods: Link the literature and review clinic date of 5 cases Madelung`s diseases, review date of 5 cases Madelung`s diseases all were made sure by the clinic department from 2014-1~ 2019-7. 3 cases underwent CT plain scan，1 case underwent CT enhanced scan at the same time; 2 cases underwent MRI plain scan and 1 patients underwent MRI enhancement scan. The MR scanning all apply the squence of fat-restrain.
Result: The patients in this group were male. The clinical manifestations were typical "horse collar" signs. They all had long history of alcohol abuse and smoking history, and the age ranged from 51 to 63 years old, which was consistent with the literature.There were 1 case of type 2 diabetes mellitus, 1 case of esophageal cancer, 2 cases of hyperuricemia, 3 cases of hyperlipidemia, 4 cases of impaired liver function and 3 cases of postoperative recurrence. The central nervous system and peripheral nervous system of this group were not. Clearly involved, there were no characteristic changes in brain MR and cervical vascular MRA.CT showed diffuse thickening of the symmetry of the subcutaneous and/or platysma deep muscles and muscle interstitial fat layer in the neck region,no capsule;most involved bilateral parotid and parapharyngeal spaces. Around the hypopharynx, MRI showed short T1 long T2 signal; low signal on lipostatic sequence and no enhanced enhancement in enhanced scan; combined with patient alcohol abuse history, they were in A preliminary diagnosis was

made before surgery, and postoperative confirmation and pathological results were obtained.
Conclusion: CT and MR examination can display the distribution of neck and shoulder thickening fat and the involvement of adjacent structures, which can provide a clear anatomical relationship for surgical treatment.
Key word: Madelung`s disease,x- ray computer, tomography

PU-2425

颈部粘液样软骨肉瘤 1 例

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目的：熟悉骨外粘液样软骨肉瘤的发病特点及影像学表现。
方法：报道本院经病理证实的颈部软组织粘液样软骨肉瘤 1 例，结合文献分析其 CT 及 MRI 影像学特点及机制。
结果：肿块 CT 表现为中心低密度伴少许钙化和等密度分隔，增强呈边缘强化；MRI 表现为 T1W 低、T2W 高信号影，信号混杂不均，内可见斑片状及索条状 T2W 低信号，增强呈边缘明显强化，中央区域不强化，其内部斑片及索条影强化明显，肿块侵犯邻近骨质。
结论：当软组织内出现长 T1、长 T2 信号肿块，尤其是表现为分叶状外形，其内可见放射状、网格状短 T2 低信号分隔影，增强后呈现边缘及分隔状强化时，应考虑 EMC 的可能，并需与骨骼外间质软骨肉瘤、粘液样脂肪肉瘤鉴别。

PU-2426

甲状腺伴胸腺样分化的梭形细胞肿瘤一例

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目的 分析甲状腺伴胸腺样分化的梭形细胞肿瘤(spindle cell tumor with thymus-like differentiation，SETTLE)的临床及影像表现，提高临床医生对该疾病的认识。
方法 回顾性分析我院 1 例甲状腺伴胸腺样分化的梭形细胞肿瘤患者的临床及 CT 表现。
结果 患者，男性，50 岁，因“发现左颈部肿块 20 年，声音改变 10 余天”入院，其肿块呈无痛性进行性增大，并出现声音嘶哑。甲状腺增强 CT 提示：甲状腺左侧叶肿块，大小为 83.3mmx63.1mmx96.6mm（左右 x 前后 x 上下）。病灶分叶状，边界尚清，内密度不规则，大片环形钙化。实质密度约 53.8Hu-69.8Hu 不等，增强扫描，病灶实质强化至 115Hu，部分区域 48Hu，提示囊变坏死区可能。气管明显向右偏移，压扁，前后刀鞘状，颈鞘血管向左外推压。遂行手术治疗，病理提示伴有胸腺样分化的梭形细胞肿瘤（SETTLE）。
结论 甲状腺伴胸腺样分化的梭形细胞肿瘤是一种罕见的生长缓慢的甲状腺低度恶性肿瘤。本文报道 1 例甲状腺 SETTLE，并复习既往相关文献，以提高对这种甲状腺罕见肿瘤的认识和诊断的敏感性。

PU-2427

低管电压技术对甲状腺 CT 值的影响

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目的：探讨低管电压 CT 扫描对甲状腺实质 CT 值的影响。**方法：**连续收集 2017.12-2018.2 期间行颈部或颈椎 CT 扫描患者 40 例，按时间先后分成 A（20 例）、B（20 例）两组，对应管电压分别为 100/80KVp，其中 A 组 8 例、B 组 12 行增强扫描。两组均与自身对照（管电压为 120KVp，对照组图像为同次或前后一个月内包含甲状腺 CT 图像。）。测量平扫及增强扫描甲状腺左右叶及胸锁乳突肌 CT 值，计算 A、B 两组部分病例甲状腺实质增强幅度与对照组增强幅度之差 DA 和 DB。A、B 组平扫或增强时，甲状腺实质、胸锁乳突肌 CT 值与对照组采用配对 t 检验。 DA 、DB 间采用两独立样本 t 检验。**结果：**A、B 两组平扫甲状腺左、右叶 CT 值均高于自身对照组，且差异有统计学意义（117±12.86HU 和 109±11.76HU/100±16.97 和 88±20.84，136 ± 37.95HU 和 133 ± 31.40HU/100 ± 21.84HU 和 97 ±18.16HU $P<0.05$）；增强扫描，A、B 组甲状腺左、右叶 CT 值均高于自身对照组，但 A 组无统计学差异（$P>0.05$）， B 组有统计学差异（269 ± 65.26HU 和 267 ±74.24HU/177 ± 18.90HU 和 173 ± 17.39HU，$P<0.05$）；A、B 组胸锁乳突肌平扫及增强扫描其 CT 值均与对照组无明显统计学差异（$P>0.05$）；A、B 两组甲状腺实质强化幅度与对照组强化幅度之差比较，差异具有统计学意义（DA =43.0±15.46，DB =60.53±60.83 $P<0.05$）。**结论：**低管电压技术在甲状腺 CT 平扫及增强扫描中均影响甲状腺 CT 值，管电压分别为 120KVp、100KVp、80KVp 时，对应甲状腺 CT 值依次增加。

PU-2428

低剂量 CT 在甲状腺疾病中的应用

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目的：探究 70KVp、最佳虚拟单能与常规 120KVp 在甲状腺结节诊断中的图像质量和诊断效能。
方法：回顾性收集本院西门子第 3 代 FORCE 双源 CT（70/150kv，选取其中 70kv 的图像为 A 组；虚拟单能图像 40Kev 为 B 组）和美国 GE64 排 CT（常规 120Kvp）（C 组）因临床需要行甲状腺 CT 平扫+增强扫描的患者分别 50 例，（1）进行图像质量主、客观评价；客观评价指标为：CT 值、噪声、信噪比（SNR）及对比噪声比（CNR）；主观评分：由 2 位医师双盲、独立完成图像质量评分，a、总体图像质量：评分分级为 1-4 分，分别为差、一般、良好、优（以诊断的可接受性为标准）；b、噪声：1-4 分，分别为很大（不能诊断）；中等（略影像诊断）；轻微（不影响诊断）；无噪声；c、伪影：1-4 分，分别为严重伪影；中等（略影像诊断）；轻微（不影响诊断）；无伪影（2）采用薄层、多窗宽、窗位、MPR 观察，观察结节包膜在平扫及增强时的有无、完整程度及强化方式，与病理结果进行对比分析，观察其诊断效能；（3）辐射剂量比较。
结果：A、B、C 组的主、客观图像质量均无显著差异；诊断效能亦无显著差异，但 A 组其辐射剂量显著降低。
结论：甲状腺成像中采用 70Kvp 管电压可以在亚毫希伏水平不影响诊断效能的同时显著降低辐射剂量，使其能够更广泛的应用于临床。

PU-2429

颈部 CT 扫描中不同体位对甲状腺骨伪影干扰的应用价值探讨

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目的：探讨颈部 CT 扫描中不同体位对甲状腺骨伪影干扰的应用价值。
方法：选取颈部 CT 检查的患者，随机分成 A、B 两组。A 组患者设为常规组；B 组患者为改进组，即让患者双手及肩部尽量用力向足侧，下颌尽量抬高，使定位片上的颌咽角（下颌骨下缘与咽喉壁的夹角）≥80° 。测量 A、B 两组患者图像的噪声值。
结果：B 组的图像质量明显优于 A 组（P＜0.05）。A 组图像噪声变化范围明显增大，噪声平均值明显高于 B 组。与 B 组的差异有统计学意义（P＜0.05）。
结论：患者行甲状腺 CT 扫描，双手及肩部尽量用力向足侧，下颌尽量抬高，能有效减少骨伪影对甲状腺的干扰，提高图像质量。

PU-2430

腮腺单发嗜酸性增生性淋巴肉芽肿 1 例

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个案报道
嗜酸性增生性淋巴肉芽肿（eosinophilic granuloma，EHLG），又名嗜酸性滤泡样增生性肉芽肿、嗜酸性肉芽肿、嗜伊红淋巴肉芽肿、木村病，是一种病因不明的炎症性疾病，常见于亚洲人，中国人和日本人多见[1]。此病较为罕见，国内外报道较少，本文报道本科收入淋巴结嗜酸性肉芽肿 1 例。

PU-2431

Noninvasive amide proton transfer imaging and ZOOM diffusion-weighted imaging in differentiating benign and malignant thyroid nodules

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Synopsis
To identify thyroid papillary carcinoma from thyroid adenoma, we acquired amide proton transfer(APT) value of the both by using the 3T MRI. The differences of APT value of the both were statistically compared by means of nonparametric methods and receiver operating characteristic (ROC) curve analyses were used. The results showed statistical differences among the two nodules, suggesting that APTw imaging can be considered for differentiation of thyroid carcinoma from benign thyroid carcinoma.
Purpose
Thyroid nodules are a common clinical problem. Epidemiologic studies have shown that the prevalence of palpable thyroid nodules was accounted for approximately 5% in women and 1% in men living in iodine-sufficient parts of the world. Thyroid nodules are abnormal growths located on the thyroid gland. In case thyroid nodules are

benign, like the thyroid adenoma, the first thing a doctor will recommend is to watch the way the nodules evolve. In the cases in which the thyroid nodules formed are cancerous, like the thyroid papillary carcinoma, the most common treatment involves surgery. Differention thyroid cancer from benign nodules is becoming increasingly prevalent. Amide proton transfer weighted(APTW) imaging can generate molecular MRI signals that are based on the amide protons of endogenous mobile proteins and peptides. This study aimed to investigate the feasibility of this new imaging method on the thyroid gland tissue by using the 3T MRI, and its role on differentiating thyroid papillary cancer from thyroid adenoma for better clinical management.

Methods
Twenty-six patients who signed informed consent were recruited, including 17 thyroid adenoma patients and 10 thyroid papillary carcinoma patients. Patients had no clinical history of previous surgery, corticosteroid administration, chemotherapy, or radiotherapy. MRI studies were performed using a 3.0 T system (Ingenia, Philips, the Netherlands) with a 25-channel head-neck coil. APT imaging was performed using a three-dimensional (3D) turbo-spin-echo Dixon sequence with imaging parameters as follows: acquisition voxel size of 1.8 × 1.8 mm, slice thickness of 4.4 mm, repetition time (TR)/echo time (TE) of 4108 ms/5.9 ms, turbo spin echo factor of 158; total slice of 10 to cover the entire lesions. seven saturation frequency offsets (±3.5, ±3.42, ±3.58 ppm and 1540ppm) were adapted with four repetitions at ±3.5 ppm to attain a sufficient signal-to-noise ratio (SNR) within an appropriate clinical time frame. Saturation RF pulses for APT imaging were implemented with an amplitude of 2 μT and duration of 2 seconds. B0 maps were obtained with three acquistions at 3.5ppm of different TEs. B0 corrected ATPw images were reconstructed online.
A 2D region of interest (ROI) was visually placed over each solid nodule for each patient and then the mean APTW value were recorded for each ROI. To assess such molecular information differences between thyroid carcinoma and thyroid adenoma, nonparametric methods and receiver operating characteristic (ROC) curve analyses were used.

PU-2432
甲状软骨旁痛风影像学特点及临床分析的病例回顾性研究

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目的：通过对我院诊治的 1 例甲状软骨旁痛风病例进行回顾性分析,提高罕见部位痛风的认识,避免漏诊误诊。
方法：收集我院经病理证实 1 例甲状软骨旁痛风结节伴钙化及囊变病例，回顾性总结 CT 和 MRI 影像学表现并分析误诊原因。
结果：CT 检查示舌骨后方至双侧甲状软骨前见不规则囊状混杂密度影，囊内可见斑结/条状钙化。MRI 扫描呈不规则囊状长 T1、长/短混杂 T2 信号，增强扫描 CT/MRI 均囊壁强化，囊内无强化改变，DWI 弥散无确切受限。实验室检查：尿酸 581.2 umol/L。我院诊断为甲状舌管囊肿伴感染及钙化。
结论：痛风主要发生在关节部位，而发生于甲状软骨旁的痛风极为罕见，临床及影像表现缺乏特异性，易误诊漏诊，提高罕见部位痛风的认识，是很有必要的。CT 能很好显示病灶内钙化，磁共振显示病灶范围及信号特征，而实验室尿酸异常增高对发现不典型部位痛风起到很大提示作用。

PU-2433

甲状腺良恶性病变 的 CT 征象差异性比 较

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目的 探讨甲状腺良、恶性病变的 CT 诊断鉴别。**方法** 收集我院 148 例甲状腺病变患者影像学资料，根据良、恶性病变分为良性组与恶性组，并与术后病理诊断比较，评估 CT 对甲状腺良恶性病变的诊断效能，并分析两组 CT 成像特点。**结果** 手术病理显示良性病变 57 例，恶性病变 91 例：CT 检查显示良性病变 65 例，恶性病变 83 例，示 CT 诊断甲状腺良恶性病变的灵敏度为 92．6%，特异度 96．8%，阳性预测值 96．2%，阴性预测值 93．8%，准确率 94．8%。其中良性甲状腺病变以多发结节为主，其结节边缘形态清晰、密度均匀、甲状腺包膜完整，多无沙砾样钙化，且多无淋巴结肿大，但良恶性病变结节的密度及囊变程度差异不大。**结论** CT 可用于甲状腺良、恶性病变检查，具有较高的诊断应用价值。

PU-2434

20 例鳃裂瘘管的 CT 及 MRI 影像总结

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目的：总结鳃裂瘘管的 CT 和（或）MRI 表现及诊断价值。方法：收集本院 2014 年 1 月至 2019 年 6 月经临床确诊的鳃裂瘘管 20 例，分析各型鳃裂瘘管 CT 和（或）MRI 影像表现，总结其特点。结果：鳃裂瘘管根据组织来源分为 4 型，根据解剖位置特点，各型具有相应的 CT 和 MRI 影像表现特点。本组患者中，5 例（25%）符合第 1 鳃裂瘘管，病灶均起自腮腺、外耳道周围，表现为外耳周围的管道样结构，部分病例内口显示不清。10 例（50%）符合第 2 鳃裂瘘管，表现为胸锁乳突肌前外侧至胸锁关节范围的纵行管道样结构。5 例（25%）符合第 3 或第 4 鳃裂瘘管，二者不易区分，均起自梨状窝基底部，部分穿经甲状腺。结论：CT 及 MRI 能清楚显示病变范围及走行途径，协助诊断及分型鳃裂瘘管。

PU-2435

能谱 CT 在甲状腺疾病中的应用

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本文根据 CT 能谱成像技术特征，从物质分离与定量、单能量成像、能谱曲线及有效原子序数四个方面，综述了近几年能谱 CT 成像在甲状腺疾病中鉴别诊断方面的最新研究进展，以推进能谱 CT 在临床中的应用，提高甲状腺结节鉴别诊断的准确率。

PU-2436

双源 CT 碘含量及能谱曲线 在鉴别甲状旁腺增生、甲状腺和淋巴结中的价值

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目的　利用双源 CT 碘含量及能谱曲线斜率鉴别甲状旁腺增生、甲状腺和淋巴结。方法　回顾分析手术病理证实的 10 例甲状旁腺增生患者共计 38 枚甲状旁腺增生的双源 CT 图像，分别测量动脉期甲状旁腺增生、同层面甲状腺及相邻层面淋巴结的融合图像 CT 值、碘含量及能谱曲线斜率，并比较其差异。结果　甲状旁腺增生、甲状腺、淋巴结的 CT 值、碘含量、能谱曲线斜率分别为(88.66±12.78)HU、(165.07±24.62)HU、(69.03±13.80)HU，（1.51±0.27）g/L、（3.24±0.75）g/L、（0.71±0.34）g/L，2.14±0.57、4.31±0.90、0.95±0.36；甲状腺与甲状旁腺增生、甲状腺与淋巴结的 CT 值、碘含量及能谱曲线斜率均存在统计学差异；甲状旁腺与淋巴结的 CT 值没有统计学差异，但碘含量、能谱曲线斜率存在统计学差异；ROC 曲线表明，1.15 g/L 是区分甲状旁腺及淋巴结碘含量的界值，敏感性为 100%，特异性为 81.6%，1.38 为区分甲状旁腺及淋巴结能谱曲线斜率的界值，敏感性为 100%，特异性为 89.5%。结论　双源 CT 碘含量及能谱曲线斜率能够有效鉴别甲状旁腺增生、甲状腺和淋巴结。

PU-2437

异位甲状腺的诊治进展

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异位甲状腺是一种临床少见疾病，由于其发生部位、临床症状及影像表现缺乏特异性，且可继发甲状腺的任何疾病，加之临床医师对其认识不足和缺少慎密的检查极易被误诊、误治，最终给患者带来严重后果。为此，笔者针对国内外异位甲状腺诊治的文献报道加以回顾分析，进一步对异位甲状腺的临床特点及诊治方法进行综述，以期提高对该疾病的认识，减少误诊、误治。

PU-2438

双源 CT 甲状腺碘含量测定与甲状腺功能的相关性研究

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目的　探讨双源 CT 双能量扫描测量甲状腺平均碘浓度、总碘含量与甲状腺功能的相关性。**方法**　采用双源 CT 对扫描颈部的患者行双能量扫描，并检测甲状腺功能，测量甲状腺组织的平均碘浓度、体积，计算甲状腺总碘量，分析成年人甲状腺平均碘浓度及总碘含量与甲状腺功能的相关性。**结果**　CT 值与 FT3 呈正相关，甲状腺总碘含量与 FT3 呈正相关，甲状腺总碘含量与 TSH 呈负相关，甲状腺平均碘浓度与 FT3 呈正相关，甲状腺平均碘浓度与 TT3 呈正相关。**结论**　双源 CT 甲状腺碘含量测定可以用于评估甲状腺功能以及判断机体碘营养状况，为甲状腺疾病诊断及治疗提供帮助。

PU-2439

C1-3 哑铃型的良恶性肿瘤的影像诊断及临床意义

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目的 探讨 C1-3 哑铃型良恶性肿瘤分型及定性诊断及指导临床手术前方案制定。方法 收集我院 2008-2016 年经过手术病理证实发生 C1-3 哑铃型 9 例良恶性肿瘤。采用平片，CT 及 MRI 等影像技术进行诊断与鉴别。结果 哑铃型形态学分为三型。良性肿瘤多无骨质破坏及明显的软组织肿块，恶性肿瘤多有骨质破坏及软组织肿块，肿块多有不规则强化征象。临床外科采用肿瘤的局部切除加放疗治疗。其中恶性肿瘤术前对病变范围获得准确判断，参与手术方案指导及制定。短期随访，多数病人未见肿瘤复发。结论 综合影像技术对 C1-3 哑铃型肿瘤定性诊断有决定意义，尤其术前恶性肿瘤准确判断对临床预后有重要意义。

PU-2440

基于影像组学的腮腺肿瘤良恶性鉴别研究

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研究目的：探究是否基于 CT 的影像组学特征结合机器学习能够用于腮腺肿瘤的良恶性鉴别。
方法：本研究回顾分析了重庆医科大学附属第一医院耳鼻喉科确诊的 109 例患者，其中腮腺良性肿瘤 54 例，腮腺恶性肿瘤 55 例。从平扫期、动脉和门静脉期 CT 图像中提取了 1352 个定量影像组学特征。采用 LASSO 回归进行特征选择和降维，基于随机森林构建了分类模型，对模型的性能进行交叉验证结合 boosting 算法测试。
结果：基于随机森林的 ROC 曲线显示，腮腺肿瘤良恶性鉴别准确率达 92.33%，AUC 为 0.874。
结论：本研究表明，影像组学特征对腮腺肿瘤的良恶性有很好的鉴别诊断价值。

PU-2441

颈部软组织巨细胞瘤一例

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软组织巨细胞瘤(Gaint cell tumor of soft tissue，GCT-ST)，也称低度恶性潜能的巨细胞瘤，是一种罕见的原发软组织肿瘤，1972 年由 Salm 和 Sissons 首次报道，并发现其与骨 GCT 具有相同的组织学特征[1]。因 GCT-ST 与骨 GCT 组织学和免疫组织化学的相似性，GCT-ST 被认为是骨 GCT 的对应物[2]。组织学多表现为圆形或梭形细胞，与均匀分散的破骨细胞样多核巨细胞密切混合[4]。GCT-ST 可发生在任何年龄，中年人好发，无性别差异。临床表现无特殊性，多表现为无痛性生长的软组织肿块[3]。肿瘤常位于四肢或躯干的浅表部位或深部软组织，其中下肢尤其大腿最为常见，而颈部 GCT-ST 极为罕见，本文就此罕见病例展开讨论

PU-2442

弥漫性甲状腺转移癌一例

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目的：通过一例罕见的肺癌伴甲状腺弥漫性转移癌的病例学习，探讨 18F-FDG PET/CT 在发现转移瘤的价值。
方法：患者男，60 岁。发现甲状腺肿大 20 余天，就诊当地医院超声提示甲状腺双侧叶不均质肿大伴钙化，双侧颈部、锁骨上多发淋巴结肿大，考虑弥漫性甲状腺癌，伴淋巴结转移可能大。转诊我院查血常规：无异常；肿瘤标志物：鳞状细胞癌抗原（SCC）5.8mg/L（正常值<1.5mg/L）、细胞角蛋白 211（CYFRA21-1）12ng/ml（正常值：0.10~4ng/ml），其他肿瘤标志物无异常。进一步 ^{18}F-FDG PET/CT 检查，结果显示：甲状腺弥漫肿大，内散在斑点状钙化灶，代谢增高（SUVmax8.01）；右肺上叶不规则结节，内见支气管截断，边缘多发毛刺，邻近胸膜牵拉、凹陷，代谢增高（SUVmax10.69）；双颈部、双锁骨上区、左腋窝、双肺门及纵隔多发肿大淋巴结，代谢增高（SUVmax9.45）。考虑：右肺癌，伴双肺门及纵隔、双颈部及锁骨上区、左腋窝多处淋巴结转移，甲状腺弥漫转移。
结果：活检病理结果：（右甲状腺）非小细胞癌，鳞癌可能性大；（颈淋巴结）：符合癌转移；（右肺结节）非小细胞癌，鳞癌首先考虑。
结论：在 ^{18}F-FDG PET/CT 上，当甲状腺病灶放射性摄取较高，且其 SUV 值与原发肿瘤病灶（如肺癌、结直肠癌、乳腺癌等）SUV 值在同一基线时，应高度怀疑甲状腺转移癌的可能。与传统解剖影像学相比，^{18}F-FDG PET/CT 在探测不典型部位的转移瘤方面更具有优势。

PU-2443

颈动脉间隙血管移位的方向在颈Ⅱ-Ⅳ区淋巴结源性及神经源性病变中的鉴别价值

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目的：探讨颈动脉间隙血管移位的方向在颈Ⅱ-Ⅳ区淋巴结源性及神经源性病变中的鉴别价值。
方法：收集我院 2017.1.1-2019.4.15 间经病理证实的位于颈Ⅱ-Ⅳ区的淋巴结源性（26 例，其中淋巴结结核 7 例，淋巴结转移 8 例，淋巴瘤 7 例，淋巴结炎 4 例）及神经源性（7 例，其中神经鞘瘤 6 例，神经纤维瘤 1 例）病变共 33 例，除了观察病灶大小、边界、形态、密度，强化方式、强化程度等直接征象外，还重点观察颈动脉间隙血管受压移位的方向。
结果：两组病灶的大小（P=0.866）、边界（P=0.122）、形态（P=0.077）、密度（P=0.228）、强化方式（P=0.697）、强化程度（P=0.123）均无明显统计学差异；而淋巴结源性病变的颈动脉间隙血管向内移位为 26 例（100%），神经源性病变的颈动脉间隙血管向外移位 6 例（85.7%），向内移位 1 例（14.3%），差异具有统计学意义（P=0.000）。
结论：颈动脉间隙血管移位的方向可作为颈Ⅱ-Ⅳ区淋巴结源性及神经源性病变的重要鉴别指标。

PU-2444

蝶窦骨肉瘤 1 例

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骨肉瘤是一种高度恶性肿瘤，好发于长骨，该肿瘤常见于青壮年及儿童，且多见于男性（60%）。头骨以及颅底原发骨肉瘤在头骨肿瘤中的发病率不到 2%，原发于蝶窦的骨肉瘤更为罕见。目前国内仅见少量报道蝶窦软骨肉瘤，国外文献报道蝶窦骨肉瘤者主要为临床诊治分析，影像学报道较少。本病病因复杂，蝶窦患有较大骨肉瘤的患者通常表现为眼球突出或面部肿块、颞下颌关节疼痛、视力下降以及头痛。CT 表现为骨皮质破坏、软组织脓肿、肿瘤骨以及骨膜反应，借助 CT 骨窗扫描可以看到病变骨的硬化以及溶解情况，CT 以及 MRI 增强扫描有助于判断肿瘤侵犯软组织的程度，CT 增强扫描呈明显强化，可伴有周围淋巴结肿大。MRI 增强扫描在 T1 加权像上呈等信号，T2 加权像上呈低信号。本例患者为老年女性，临床及影像学表现可见以上大部分征象，但需与软骨肉瘤进行鉴别。出现骨膜反应、 Codman 三角、放射状骨针、长管状骨软组织肿块环绕度 >1 / 2 、髓腔内斑片状致密钙质密度影、骨小梁显示不清等征象提示骨肉瘤的可能性较大，出现弓状、环状钙质密度影提示软骨肉瘤可能性更大，但最后确诊仍需依赖病理组织学检查。

PU-2445

Dural venous sinuses: What we need to know

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The aim of this review is to provide a general overview of the normal anatomy and notable variants of the cerebral venous system as surveyed from the available literature. The pros and cons of different multimodal imaging methods for investigating dural venous sinuses (DVS) are also outlined. Finally, cases of variously pathological entities are illustrated from current clinical practice.As we are now better aware of the many technical advantages and pitfalls, it seems likely that non-invasive venography protocols may become a feasible alternative to the classical DSA approach and one would predict that they will improve the diagnostic accuracy in most pathological situations.

PU-2446

MR 动态延迟扫描对于鉴别垂体微腺瘤的价值

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探讨垂体动态增强扫描并延迟扫描对鉴别垂体微腺瘤的价值。方法:对 25 例垂体微腺瘤患者行 MRI 动态增强扫描，对 19 例垂体微腺瘤患者行 MRI 动态增强扫描并延迟扫描的影像图进行回顾性分析,主要观察垂体内病变的强化特点。结果:垂体微腺瘤的强化特点为动态增强扫描信号强度弱,延迟扫描信号强度高于正常垂体或与正常垂体相仿。结论:延迟扫描对比剂是否进入是垂体微腺瘤的主要鉴别点。

PU-2447

蝶窦区腺泡型横纹肌肉瘤一例

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患者，男、48 岁,入院前 4 天无明显诱因突发双眼视力下降，左眼为主，无眼痛、溢泪、红肿，偶伴头晕、头痛，无恶心、呕吐；体检：双下鼻甲肿胀，各鼻腔鼻道内未见异常，各鼻道未及引流。双侧眼球活动自如，对光反射灵敏，运动无受限，左眼 10cm 可视物，右眼 30cm 可数指。
影像检查：CT 提示蝶窦区软组织肿块，邻近骨质吸收破坏；MRI 示肿块大小约 4.9cm×4.4cm，呈混杂长 T1 长 T2 信号，增强扫描不均匀强化；包绕海绵窦，向前突向鼻窦、双侧眶尖，向上突向前中颅窝，邻近脑膜增厚、强化，向下累及鼻咽顶，向后累及蝶鞍及斜坡。诊断：蝶窦肿瘤或侵袭性垂体瘤累及蝶窦。
手术及病理：经鼻内镜颅底肿物切除术、蝶窦开放术、双侧视神经减压术等。术后病理（颅底）腺泡状横纹肌肉瘤，伴瘤旁小囊肿，免疫组化：MYod1(+++)、Myogenin（+++）、Vim（弱+）、HMB45（-）、Ki-67（75%），CD45（-）,Syn（灶+），CD56（+++）。
讨论：横纹肌肉瘤（rhabdomyosarcoma，RMS）是最常见的头颈部肉瘤。根据 2016 WHO 中枢神经系统肿瘤分类，RMS 属于间叶细胞、非脑膜上皮肿瘤一类，分为胚胎型 RMS、腺泡状 RMS 和多形性 RMS 3 种亚型。其中腺泡型恶性度高，主要发生于去躯干和四肢，头颈部中好发于眼眶、副鼻窦和颞骨，鼻咽部是颈部的好发部位，常侵犯颅底，原发于蝶窦区的腺泡状 RMS 少见，有明显的侵袭性，发展速度很快，早期即可沿血管、淋巴管等转移。临床表现与肿瘤位置密切相关，本例出现视力下降与颅神经受侵有关。CT 平扫为等、低密度肿块，增强后中度不均匀强化，可有周围骨质破坏。MRI 平扫 T1WI 表现为等或低信号，T2WI 表现为高信号，增强后有显著强化。CT、MRI 检查可为肿瘤性质的判断、累及范围提供依据，最终诊断依靠病理诊断。

PU-2448

CT 灌注成像评价急性自发性高血压脑出血患者的经期预后

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目的：用 CT 灌注成像（CTP），对急性自发性高血压出血性脑卒中（shlcH）血肿周围脑血流动力学变化进行定量测量，评价脑血肿周围组织灌注参数改变与近期预后的相关性。
方法：对华西医院 2017 年 3 月到 2018 年 3 月的 26 例（男 15 例，女 11 例，年龄 30-79，平均年龄 55.7 岁）CT 平扫确诊为急性幕上自发性脑出血的患者行 CTP 检查，自发患者的灌注扫描时间为 3-24h。以血中最大层面为参照，测量血肿周围 1cm 内及对侧镜像区脑血流量（CBF）、脑血容量（CBV）、平均通过时间（MTT），获得相对灌注参数 rCBF、rCBV、rMTT（患侧/健侧）。电话随访患者脑出血后一个月生活表现，并记录日常生活能力表（BI）分值。
结果：shlcH 血肿周围带 CBV 值为（1.61±1.53）ml/100g，CBF 值为（16.48±12.58）ml/(100g*min)，明显低于对侧镜像区（Z=-2.603、-4.178，$p<0.05$）；MTT 值为（9.12±2.57）s，较对侧镜像区明显延长（$t=4.747, p<0.05$）。血肿周围 CBV、CBF 值与 BI 相关（Z=-3.40、-2.98，$p<0.01$），参数 MTT、rCBF、rCBV、rMTT 与近期预后无关（$p>0.05$）;ROC 曲线下面积分别为 0.897/0.848，且 CBV 界限值为 1.24ml/100g 时，敏感度为 66.78%，特异度为 100%；CBF 界限值为 8.44ml/(100g*min)时，敏感度 100%，特异度为 72.70%。

结论：CTP 可预测 shlcH 血肿患者近期预后，在一定范围内，血肿 CBV、CBF 值越大提示预后越差。研究表明，脑出血后血肿周围存在不同程度的低血流灌注，但有关血肿周围灌注改变与预后的关系报道较少。本研究对接受内科保守治疗的急性 shlcH 患者进行动态 CT 灌注成像，并探讨血肿周围组织的血流动力学改变与患者的关系。

PU-2449

Study of a Novel Classification Method on the Circle of Willis on CT Angiography

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Purpose In this study, we aimed to propose a novel classification method on the circle of Willis (CoW) using the computed tomography angiography (CTA).
Methods A total of 114 participants who had undergone the CTA examination were recruited in this study. The CoW was classified into three types: the complete type (an intact CoW with no hypoplastic arteries), the relative-complete type (an intact CoW with hypoplastic ACA or PCA), and the incomplete type (any of CoW arteries were absent). Each type was subdivided into two types: no variation and variation. Besides, the diameters of internal carotid artery (ICA), middle cerebral artery (MCA), anterior cerebral artery (ACA), posterior cerebral artery (PCA), anterior communicating artery (AComA) and posterior communicating artery (PComA) were measured and the ratio of their diameter was calculated.
Results Among the 114 cases, 26 cases were complete type, 9 cases were relative-complete type and 79 cases were incomplete type. The proportion of hypoplastic CoW was 77.2%, of which 64.8% was posterior circulation and 47.7% was two arteries. The proportion of variant CoW was 43.0%, of which 71.4% was posterior circulation and 69.4% was one artery. The ratio of diameter of ICA, MCA, ACA, PCA, AComA and PComA was 1.00: 0.74: 0.54: 0.51: 0.41: 0.40.
Conclusion The novel classification method induced the conception of relative-complete type in order to generate the associations between the development and morphology of CoW. In addition, hypoplasia and variation of CoW were located and quantified. The novel classification may contribute to the treatment of cerebrovascular disease and the ratio of CoW artery diameter may lay the foundation for the study of hemodynamics.

PU-2450

脑静脉血栓形成的影像研究

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脑静脉血栓形成是比较少见但很严重的神经系统病变，影像学检查在诊断中非常重要，及时而正确的治疗是重要的。MRI、TOF MRV、增强 MRV 和 CTV 等是最有用的诊断技术，了解正常静脉变异和影像判断中可能的误差对于正确诊断也是非常重要的。

PU-2451

Eustachian tube teratoma: a case report

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Objective: A combination of computed tomography and MR imaging is necessary pre-operation when patients with recurrent episodes of otitis media and chronic otorrhea. **Methods:** The present case is the first report of a 48-years-old male patient with eustachian tube teratoma that is composed of two parts, who has a history of chronic otitis of the left ear from infancy and been cured via two operations. **Results:** Two mastoidectomies were performed because of the clinical symptoms persisted after the first operation. **Conclusions:** When we found a long history of chronic otitis of ear, and even found polyps in the tympanum and/or external auditory canal, a combination of computed tomography and magnetic resonance imaging is necessary pre-operation.

PU-2452

能谱 CT 头颅平扫图像的最佳单能量选择

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目的 探讨临床适用的头颅 CT 平扫最佳单能量水平。**方法** 在 Revolution CT 上采用能谱扫描模式采集 62 例头颅 CT 平扫数据。将原始扫描数据重建获得 40-140keV 间距为 5keV 的 21 组单能量图像及 120kVp-like 混合能量图像，比较各组图像的噪声、SNR、 CNR、颞骨内板下伪影指数及后颅窝伪影指数；并根据灰白质对比度、颞骨岩部伪影、后颅窝伪影及病变显示 4 个方面对图像质量进行主观评分，然后进行统计学分析。**结果** 最佳单能量水平为 65-75keV。65keV 图像的灰白质 SNR（12.10±2.51, 9.25±2.59），CNR（1.26±0.24）高于其他单能量及混合能量图像，75keV 图像的灰白质噪声（3.51±0.31, 3.22±0.40），颞骨内板下伪影指数（5.76±0.99）及后颅窝伪影指数（3.13±1.04）高于其他单能量及混合能量图像（均 P<0.05）。最佳单能量图像质量评分更高（均 P<0.05），PFAI 除外（P=0.2）。**结论** 65keV 图像幕上脑组织对比度最佳，75keV 图像颞骨岩部及后颅窝伪影最小。

PU-2453

侧颅底少见肿瘤的影像学表现及其分析

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目的：探讨侧颅底少见病变的影像学表现，提高影像学对该区域少见病变的诊断准确性，为临床治疗方案的制定提供有价值的影像信息。
方法：回顾性分析 16 例经病理证实的侧颅底少见病变的影像学表现并和病理作对照分析。重点观察病变部位、影像学特点及侵犯特征。

结果：在 16 例侧颅底病变中，颈静脉孔区肿瘤比较少见，存在多种病理类型，其中颈静脉副节瘤 5 例、神经鞘瘤 3 例、脑膜瘤 2 例；桥小脑角区胆脂瘤 2 例，内淋巴囊瘤 1 例；岩尖区软骨肉瘤 1 例，脑膜瘤 2 例。上述肿瘤分别有其相应的好发部位及 CT、MR 表现。
结论：侧颅底区少见病变种类繁多，MRI 及 CT 能准确显示病变的位置和起源；病变 MRI 表现复杂，但多数仍有其特征性，仔细分析其 MRI 及 CT 征象结合其定位，对临床决定手术或放疗前对肿瘤的局部和进展范围及其周围关系的正确判定是非常必要的。

PU-2454
高压氧治疗一氧化碳中毒后迟发性脑病的定量 T2 Mapping 成像

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目的：急性一氧化碳中毒是生活与工作中常见的窒息性中毒气体事件。部分中毒患者经过数天至数周的假愈期后，可能出现迟发性脑病。临床上仅是一氧化碳中毒所导致患者出现缺血缺氧状况，并不能完全解释临床上迟发型脑病临床变化以及相应病理改变情况。也无相应针对病因的治疗方式。现临床上对于一氧化碳中毒之后出现迟发型脑病使用高压氧治疗机制以及疗效并无统一认识。我们对急性一氧化碳中毒迟发性脑病的患者采用高压氧治疗，联合运用磁共振 T2 驰豫时间图（T2 mapping）技术和运动校正的精密算法，利用定量 T2 mapping 技术检测患者有关氧合血红蛋白和去氧血红蛋白的区域变化，检测其脑内缺血性改变的严重程度，区分不可逆转的损伤和潜在能挽救的组织。定量 T2'值是在弥散加权成像病变和灌注受限组织内确定。**材料与方法**：先对 24 例急性一氧化碳中毒迟发性脑病患者（平均年龄 45 岁）行高压氧治疗，每天治疗 1 次，每次时间为 60 min，连续 10 天。然后进行 MRI 检查。 MR 检查包括弥散成像、灌注成像和定量的运动校正的 T2 驰豫时间图。对比正常对照组的达峰时间，用达峰时间的图谱作为不同程度灌注延迟（例如，≥0s，≥2s）的阈值。将存在表观弥散系数降低和灌注损伤脑区的平均 T2'值与对正常对照组比较。**结果**：与正常对照组比较，表观弥散系数降低的区域 T2 值明显减少（85 毫秒与 94 毫秒; P <0.003）。在灌注受限组织，T2 值也明显低于对正常对照组，但均显著更高于表观弥散系数受损区域。灌注损伤的严重程度对平均 T2 值无影响。**结论**：从健康组织到灌注障碍再到弥散受限组织，运动校正的 T2 驰豫时间图显示其值是显著且逐步下降的。目前 T2 驰豫时间图可以区分缺血核心和灌注受损区域，但不能区分半暗带和血量下降组织。利用磁共振技术评估临床治疗一氧化碳中毒迟发性脑病的疗效， 对预后的改善具有积极的意义，也有助于观察一氧化碳中毒迟发性脑病脑部微结构及代谢的改变。

PU-2455
3D_SPACE 序列和 3D_TOF_MRA 序列联合应用于三叉神经的价值

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目的：三叉神经痛较为常见的疾病，它对人民的健康和生活有着严重的影响，应用西门子磁共振 3D_SPACE 序列及 3D_TOF_MRA 序列对三叉神经及微血管压迫进行检查，以明确诊断和确定治疗方案，在诊疗过程中显得尤为重要
方法：运用西门子磁共振对 13 例三叉神经痛患者进行 3D_SPACE 序列及 3D_TOF_MRA 序列检查，3D_SPACE 序列是从快速自旋回波序列上衍生而来，具有较高的信噪比，组织对比度高，该序列在三叉神经成像上，脑脊液呈高信号，颅神经呈等信号，血管呈底信号，因此在桥小脑池高信号脑脊液的衬托下，脑池段神经自然对比度好，与微血管信号有差异，对比显著。3D_TOF_MRA 序列为三

维时间飞跃法磁共振血管成像序列，三叉神经成像中脑脊液为低信号，三叉神经为中等信号，血流速度快的血管动脉呈高信号，及高信号与中等信号的神经信号形成对比，
结果：13 例三叉神经痛者，9 例发现责任血管压迫，单独使用 3D_SPACE 序列发现责任血管的阳性率 6 例，单独使用 3D_TOF_MRA 序列 5 例，联合应用 8 例，与手术结果完全符合。
结论：3D_SPACE 具有较高的信噪比，表现出重 T2 对比，脑脊液的衬托下，脑池段神经自然对比好，与微血管信号有差异，对比显著，是明确血管压迫性三叉神经痛程度理想的磁共振序列，3D_TOF_MRA 序列具有独特的成像特点，快速流动的小动脉和小静脉等血管一般显示为高信号，而处于静止状态的组织表现为饱和状态为低信号，三叉神经相对于脑脊液为中等信号，脑脊液为低信号，两者联合应用可以相互弥补，对于全面准确的判定血管压迫性三叉神经痛血管接触的部分，受压程度及责任血管的来源的显示具有重要价值。

PU-2456

乙状窦憩室致搏动性耳鸣一例

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目的：探讨乙状窦憩室的临床表现及影像学特征，提高对该病的认识；方法：回顾性分析经临床确诊的一例乙状窦憩室的影像学表现并文献复习；结果：患者右侧搏动性耳鸣 3 年就诊，颞骨 HRCT 平扫+增强显示右侧乙状窦沟外侧壁骨质局部变薄，呈凹陷性改变，前壁骨质局部缺损，与乳突气房直接相邻；增强后乙状窦外侧壁内突起软组织密度影与乙状窦同步强化并延续，符合乙状窦憩室的诊断。结论：乙状窦憩室影像表现有特征性，对于有搏动性耳鸣患者，临床可首选颞骨 HRCT 增强扫描来筛查，大大提高其检出率。

PU-2457

64 层螺旋 CTA 和 3D-DSA 对颅内动脉瘤诊断价值比较的系统评价

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目的：探讨 64 层螺旋 CT 血管造影（CTA）在颅内动脉瘤诊断中的应用价值，方法对成都上锦南府医院 2016 年 1 月至 2018 年 12 月收治的疑似颅内动脉瘤患者 40 例的临床资料进行回顾性分析，经 DSA 和 CTA 双重检查，比较 DSA 和 CTA 检查方法颅内动脉瘤的检出情况，计算 CTA、DSA 对颅内动脉瘤的诊断灵敏度、特异度、准确性，分析 CTA、DSA 诊断颅内动脉瘤所得结果与术后病理诊断结果的一致性，比较 CTA 检查、DSA 检查中的颅内动脉瘤体最大径、瘤颈最大径。三维 CT 血管造影(three dimensional computed tomography angiography,3DCTA)在动脉瘤的诊断中显示出独特的优越性。而且 CT 血管造影是一种无创、快捷、安全的颅内动脉瘤诊断方法，可作为颅内动脉瘤筛查及患者手术或介入治疗前的常规诊断方。

PU-2458

全脑动态 CT 灌注成像联合头颈部 CTA 在急性缺血性脑卒中诊断中的价值

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目的 探讨全脑动态 CT 灌注成像(CTP)联合头颈部 CT 血管成像(CTA)在急性缺血性脑卒中（AIS）的诊断价值。方法 对我院 78 例临床疑似 AIS 患者行全脑 CTP 和头颈 CTA 检查，比较 CTP 联合 CTA 诊断 AIS 的特异度与灵敏度，测量 CTP 参数 CBF、CBV、MMT 和 TTP，评价头颈部动脉血管的狭窄程度及原因，分析不同病变程度脑组织 CBF、CBV、MMT 和 TTP 变化情况及其与头颈部动脉血管狭窄程度的相关性。结果 78 例患者中最终被确诊为 AIS 64 例(83%)，CTP 联合 CTA 诊断 AIS 的灵敏度和特异度分别为 84.5%和 91.7%；CTA 发现颈内动脉闭塞 6 例，大脑中动脉闭塞 27 例，基底动脉闭塞 2 例，大脑中动脉夹层 2 例；CTP 检查发现明显灌注异常者 56 例，其中梗死灶 51 处、半暗带 48 处，两者同时存在 46 处，且梗死区 CBF、CBV 低于对照区和半暗带，MTT、TTP 高于对照区和半暗带，差异有统计学意义(P<0.05)，半暗带 CBF 低于对照区，MTT 和 TTP 高于对照区，差异有统计学意义(P<0.05)；颈内动脉和颅内动脉狭窄与 CBF、CBV 无明显相关性(P>0.05)，与 MTT 呈负相关(P<0.05)，与 TTP 呈正相关(P<0.05)。结论 全脑动态 CTP 可有效评估脑组织血流动力学变化和缺血程度，并能准确区分梗死区与半暗带，头颈 CTA 则可准确检测颈部与脑动脉血管狭窄部位和程度，以及狭窄原因，两种方法联合应用不仅能够对 AIS 进行准确诊断，同时还能准确评估病情及疗效，为临床治疗方案选择提供精准的影像依据。

PU-2459

右侧 Meckel 腔炎性假瘤误诊一例

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患者 67 岁男性，因右侧头痛加重 2 周入院。颅底强化 MRI 检查示右侧 Meckel 腔略增大，内见占位性病变，增强扫描呈均匀明显强化，拟诊为脑膜瘤。术后病理提示炎性假瘤。发生于 Meckel 腔炎性假瘤比较罕见，本例病变临床体征及影像学表现极易误诊为脑膜瘤，手术易损伤周围血管及神经造成患者不可挽回的损失，诊断时要扩展思路，做好病例随访积累经验。

PU-2460

蝶颞骨发育程度的影像学研究

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目的：观察小耳畸形患者中，卵圆孔与棘孔的解剖特点，分析蝶颞骨发育是否存在相关性。
方法：回顾性分析 25 例小耳畸形的 HRCT 图像，其中 3 例为双侧小耳畸形，10 例为左侧小耳畸形，12 例为右侧小耳畸形。
结果：利用 CT 重建技术，有 6 例表现为卵圆孔与棘孔融合（24%），1 例表现为棘孔缺如（4%）。
结论：蝶颞骨发育程度可能存在一定相关性，应进一步分析研究。

PU-2461

乙状窦憩室致搏动性耳鸣的一站式动态容积 CT 评价

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目的 分析导致搏动性耳鸣的乙状窦憩室骨板缺损的一站式动态容积 CT 特征。 **方法** 收集 36 例乙状窦憩室致搏动性耳鸣的病人作为研究组，分析其一站式动态容积 CT 的影像表现，并比较乙状窦沟骨板缺损的位置、范围、数目及伴随征象（包括静脉回流优势、横窦狭窄、高位颈静脉球、颞骨气化、脑灌注参数）。**结果** 36 例乙状窦憩室均发生在静脉窦优势引流侧；21 例垂直方向的乙状窦骨板缺损位于乙状窦沟板骨上部，15 例水平方向上的缺损位于外侧壁。一站式动态容积 CT 直观地显示乙状窦憩室，表现为静脉窦管腔局部呈囊袋样、指状及棘样突起，动态的显示乙状窦局部膨隆的静脉窦经邻近骨壁缺损处疝入邻近的乳突 。患侧脑血流灌注参数脑血流量（CBF）、脑血容量(CBV)、平均通过时间(MTT)均高于对侧(P< 0.0001)。**结论** 一站式动态容积 CT 检查对诊断乙状窦憩室引起的搏动性耳鸣具有特征性的 CT 表现。乙状窦沟骨板缺损可能是由于血管或颅内压异常而产生的，并作为触发搏动性耳鸣感知的常见原因。

PU-2462
颅颈交界区畸形及椎动脉变异与后循环脑梗死的相关性

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目的：分析颅颈交界区畸形病人的椎动脉变异率，并探讨颅颈交界区畸形及椎动脉变异与后循坏脑梗死的相关性。**方法：**回顾性分析颅颈交界区畸形病例组 30 例和 100 例对照组均接受头颈部/颈部 CTA 及头颅 CT 或 MR 检查，由两名有经验的放射科医生评价椎动脉变异类型及后循环脑梗死情况，采用配对 t 检验，X^2检验对比两组资料，多因素 logistic 回归分析评估病例组及对照组中椎动脉变异类型与脑梗死相关性，用 Kappa 检验评估两名放射科医生之间的一致性。**结果：**两名放射科医师之间一致性良好（Kappa=0.78）。病例组的椎动脉变异总发生率 93.3%（28/30）高于对照组发生率（70.0%，70/100），差异有统计学意义（X^2=6.86，P=0.009），其中病例组与对照组之间的双侧髙骑跨椎动脉（HRVA）、持续第一节间动脉(PIA)发生率差异有统计学意义[30.0%（9/30）比 15.0%（15/100）、16.7%（5/30）比 2%（2/100）,P均＜0.05]。病例组的脑梗死阳性率 23.3%（7/30）与对照组 23.0%（23/100）相比较，差异无统计学意义（X^2=0.001，P=0.970）。病例组中的双侧髙骑跨椎动脉（HRVA）（OR=17.262，P=0.036）与后循环脑梗死相关，是后循环脑梗死的危险因素。**结论：**颅颈交界区畸形病人椎动脉变异率更高，但后循坏脑梗死阳性率与非颅颈交界区畸形病人无差异。颅颈交界区畸形合并双侧髙骑跨椎动脉是后循环梗死的危险因素。

PU-2463
颅底巨细胞修复性肉芽肿 9 例影像分析

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目的：回顾性分析 9 例颅底巨细胞修复性肉芽肿(giant cell granuloma，GCRG)的 CT 和 MRI 表现，并与病理对照，以提高 GCRG 的诊断与鉴别诊断。
方法：回顾性分析本院 2016 年 1 月至 2018 年 12 月经手术或病穿刺理证实的巨细胞修复性肉芽肿 9 例，其中颞骨 5 例；上颌骨 2 例；蝶骨 2 例；行 CT 检查 8 例（其中平扫 7 例，平扫+增强扫描 1 例；）；行 MRI 检查 6 例（其中平扫 1 例，平扫+增强扫描 5 例），分析其骨质破坏方式及病变特征的鉴别影像。

结果：膨胀性生长肿块，广泛性骨质破坏伴有分隔 GCRG 9 例（100%）；病灶邻近骨质硬化 GCRG 5 例（55%）；T1WI 高信号 GCRG5 例（55%）；T2WI 高低混杂信号 GCRG 6 例（67%）；增强扫描轻到中度强化 GCRG 8 例（89%）。
结论：头颈部颅面骨肿块呈膨胀性生长，CT 表现广泛性骨质破坏，伴有邻近骨质硬化，MRI 病灶内可见短 T1 长短混杂 T2 信号，增强扫描轻到中度强化，首先考虑巨细胞修复性肉芽肿；骨巨细胞瘤则表现为膨胀性生长伴多房肿块，无强化或轻度强化，术后复发率高。但是两种病变的影像学表现相似,有时难以区分，应当从发病年龄、发生部位、临床表现、病理组织学及对治疗的反应综合分析后做出诊断。

PU-2464
腮腺肿瘤检查中能谱 CT 虚拟平扫代替 常规 CT 平扫可行性研究

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目的 以能谱碘抑制技术（MSI）成像作为虚拟平扫（VNC），探讨腮腺检查中 VNC 代替常规 CT 平扫（TNC）的可行性。**方法** 收集 33 例初步诊断腮腺包块的患者(共 43 个病灶)行颈部常规 CT 平扫和能谱 CT 增强扫描的影像学资料。在 GE AW4.6 工作站 GSI Volume Viewer 软件上，通过碘抑制技术对增强扫描序列数据进行后处理，从而分别得到动脉期虚拟平扫图像和静脉期虚拟平扫图像,比较常规平扫与虚拟平扫图像 CT 值（病灶、腮腺、胸锁乳突肌、椎体、颈动脉窦、颌下腺 CT 值）、诊断效能（病灶、钙化、囊变坏死检出率）、图像噪声、信噪比、图像质量评分及辐射剂量[容积 CT 剂量指数、剂量长度乘积、有效剂量] 。当计量资料符合正态分布时采用配对 t 检验，偏态分布时采用 Wilcoxon 符号秩和检验，计数资料采用 x^2 检验。**结果** （1）CT 值：除 MSIvp 图像上颈动脉窦和颌下腺的 CT 值与 TNC 所测 CT 值差异无统计学意义外（$P>0.05$），其他各组织 CT 值差异均有统计学意义（$P<0.05$），但除椎体差异较大外，其他各组织 CT 值差异均小于 10HU；（2）图像质量：TNC、VNCap 和 VNCvp 的噪声、SNR 中及图像质量评分各组间差异均无统计学意义；（3）诊断效能 TNC、MSIap 和 MSIvp 图像上病灶及瘤内囊变区检出率均为 100%和 4.7%，钙化检出率依次为 36.4%、33.3%和 33.3%，差异无统计学意义（$P>0.05$），（4）辐射剂量 常规三期扫描与单独能谱增强扫描的 CTDIvol、DLP、ED 各组间比较差异有统计学意义，单独双期能谱增强扫描的 CTDIvol、DLP、ED 分别减低了 32.5%、30.7%和 31.1%。**结论** 腮腺检查时 MSI 图像既能达到诊断要求，诊断效能又与 TNC 有较高的一致性，在一定程度上降低了辐射剂量，具有替代 TNC 图像的潜在能力。

PU-2465
Is peak enhancement the best phase for reconstructing arterial and venous phase images: suggestions from the brain CT perfusion study

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Objective: To explore the optimal reconstruction phases for arteries and veins in brain imaging to reduce their interference by analyzing the images in the whole brain CT perfusion (CTP).
Materials and methods: Thirty-two patients (14 males and 18 females) with unilateral intracranial tumors and vascular diseases underwent the whole brain CTP on a 256-rows Revolution CT (GE healthcare). The CTP protocol included 22 phases with 100kV tube voltage and automatic tube current modulation to achieve noise index of 8HU in each phase. Using the time-density curve, the images for arteries (CT angiography, CTA) were reconstructed from CTP data in two different phases: the conventional (peak) arterial phase (AP), and the phase where the arterial enhancement was greater than 350HU and there was maximum difference in arterial-venous (A-V) CT value. Similarly, the images for veins (CT venography, CTV) were reconstructed in two phases: the conventional (peak) venous phase (VP) and the phase where the venous enhancement was greater than 350HU and there was maximum difference in venous-arterial (V-A) CT value. Image noise, SNR, CNR were measured and the subjective scores reflecting vessel display and interference between arteries and veins were obtained. The measurements of CTA and CTV images at different scan phases were compared.
Result: The optimal reconstruction phases were different between the two methods: at 8^{th} and 14^{th} for arteries and veins in the maximum difference method, respectively and 11^{th} and 13^{th} with the conventional peak enhancement method (all $p<0.001$). Both methods displayed intracranial arteries and veins clearly. There were no differences in SNR and CNR for CTA images and in image noise, SNR and CNR for CTV images between the two methods ($p>0.05$). However, CTA images with the maximum difference method had lower image noise with much reduced venous interference ($P<0.001$). The CTV images with the maximum difference method also showed significantly reduced arterial interference ($p<0.001$).
Conclusion: The scan phases with the maximum CT value difference between arteries and veins provide better CTA and CTV images than the conventional peak arterial and venous phases.

PU-2466

3D T2WI TSE 序列在颅神经成像中的应用

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目的
探索 3D T2WI TSE 进行颅神经成像，显示颅内段和颅外段神经成像技术。
方法
采用 西门子 MAGNETOM Skyro-3.0T 磁共振成像仪，颅内段神经使用平扫的 3D T2WI TSE，主要扫描参数：TR1000ms，TE136ms，FOV200×200mm，矩阵 384×384，层厚 0.52mm，不抑脂，横轴位扫描。颅外段神经成像：经静脉注入钆对比剂（种类：钆双胺、量：按体重 0.2ml/kg）后 1~3 分钟

用 3D T2 TSE 序列结合 STIR 技术进行颌面部扫描，主要扫描参数：TR3000ms，TE256ms，FOV260×260mm，矩阵 320×320，层厚 0.81mm，抑脂，矢状或冠状位扫描。

结果

颅内段：扫描完得到一组 3D 的水成像图，可以清晰的显示三叉神经和面、听神经。该序列还能做多种后处理，多平面重组（MPR）可以显示内听道内面、听神经之间的关系。

颅外段：结合 STIR 技术进行背景抑制能清晰显示 12 对颅外段神经。利用曲面重建可以将走行迂曲的颅外段神经拉直显示，更能直观地显示神经的走行、形态（图示）。

结论

颅内段神经在 T2WI 上与脑脊液形成良好对比，不进行背景抑制依然能清晰显示其走行、形态。

颅外段神经周围充满了高信号的脂肪组织，采用 STIR 技术能有效抑制扫描范围内的脂肪组织。

颅外段神经周围含有丰富血管、腺体及淋巴结，影响观察。注入钆对比剂能缩短周围组织 T1 值，使得组织 T1 值和脂肪接近，在进行 STIR 技术时，一并被抑制。钆对比剂还能缩短组织的 T2 值，T2W 成像时，背景信号更低，由于血脑屏障，颅神经内膜内液体信号并无衰减，因此更能突显出神经的走行、连续性和形态。

颅神经走形迂曲，难以在同一层面显示，一般采用 3D 成像，进行各向同性体素采集，可以任意方向 MPR 及曲面重建。

PU-2467

Optimization of scan protocols in low-dose combined CTP-CTA of whole brain on 256-rows MDCT

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Objective: To explore the optimal scan protocol for achieving diagnostic image quality with low radiation dose in the combined brain CT perfusion (CTP) and CT angiography (CTA).

Materials and methods: Forty-five patients (21 males and 24 females, 58.36±11.79 years) with unilateral intracranial occupying and vascular lesions underwent a combined whole brain CTP-CTA with three different scan protocols on a 256-rows MDCT (Revolution CT, GE healthcare). All protocols required 22 scan phases for CTP with 100kV tube voltage and automatic tube current modulation for a noise index (NI) of 8HU except the tenth scan phase where higher tube current was required by using a lower NI value (NI=2.0HU for Group A (n=20) and NI=2.5HU for Group C (n=13)) or a fixed 325mA for Group B (n=12). CTA images were generated using data in the tenth scan phase with higher signal strength. The radiation doses were recorded. The CTA image noise, signal-to-noise ratio (SNR), contrast-to-noise ratio (CNR), and perfusion parameters in different parts of the brain parenchyma and subjective quality scores of the CTA and CTP images were statistically compared among three groups.

Result: There were no significant differences in sex ratio and age among the three groups (P_{sex}=0.442, P_{age}=0.290). Effective doses of the three groups were all low at 3.83±0.53mSv in Group A, 3.46±0.21mSv in Group B and 3.37±0.26mSv in Group C ($p<0.05$). Group C further reduced the effective dose by 12% compared with Group A ($P_{(A-C)}$= 0.001). There was no difference in dose between Group B and C ($P_{(B-C)}$=0.115). No

differences were found in image noise, SNR, CNR and subjective scores for CTA images among the three groups (P_{noise}=0.218, P_{SNR}=0.545, P_{CNR}=0.575, P_{score}=0.900). No differences were found in the perfusion parameters and subjective scores of CTP images among three groups (P>0.05).

Conclusion: The scan protocols of the low dose, combined brain CTP-CTA on a 256-rows MDCT can be further optimized to maintain CTP-CTA image quality while further reducing radiation dose.

PU-2468

Myoepithelial carcinoma of salivary gland: pathological and CT imaging characteristics

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Abstract

OBJECTIVES:To summarize the pathological and CT imaging characteristics of myoepithelial carcinoma in salivary gland.

STUDY DESIGN:10 patients with myoepithelial carcinoma of salivary gland underwent enhanced CT scanning, and the pathological and CT imaging features were evaluated, including the pathological type, size, marginal morphology and enhancement pattern of the lesions.

RESULTS: Myoepithelial carcinoma had a multinodular or lobulated outline. The cut surfaces were gray-brown with no or incomplete capsules, as well as visible bleeding in some cases. The pathological cell type of the tumor may be spindle-shaped, clear, plasmacytoid and epithelioid cells, or a mixed type of several cells. Non-enhanced CT imaging showed an irregularly lobulated or multinodular lesion with ill-defined margin and inhomogeneous attenuation, and punctuate calcification in minority of the lesions. Enhanced CT imaging results revealed moderate and intense inhomogeneous enhancement including cystic and slit-like regions with no enhancement, intense nodular enhancement, and small tortuous vessel in the arterial phase.

CONCLUSION:The pathological features and CT imaging findings of myoepithelial carcinoma were characteristic, and familiarity with its imaging findings may help to diagnosis this entity.

PU-2469

颅骨表皮样囊肿的 CT 及 MRI 影像学表现

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【摘要】 **目的** 探讨颅骨表皮样囊肿（SEC)的 CT 和 MRI 影像学表现，以提高对该病的诊断及认识。 **资料与方法** 回顾性分析 8 例经我院手术病理确诊的 SEC 的 CT 及 MR I 表现。 8 例均行 CT 平扫；其中 6 例行 MRI 检查，包含扩散加权成像（DW I）序列。6 例 MR I 检查中 2 例 MR I 平扫加增强检查，2 例只行 MRI 增强检查。 **结果** 病变均为单发，起自板障， 8 例 CT 平扫示颅

骨呈膨胀性改变,无硬化边缘或可见轻度硬化边缘，其中 3 例病变可见钙化。6 例 MR I 平扫, 4 例以长 T1、长 T2 为主混杂信号, 1 例呈稍长 T1、稍长 T2 信号, 1 例呈等 T1、长 T2 信号。 6 例 DW I 序列中 均呈高信号；2 例 MRI 增强检查呈轻度强化。 **结论** SEC 的 CT 及 MRI 表现具有一定的特征性, 影像学检查有助于其定位及定性诊断。

PU-2470

腮腺腺淋巴瘤 MSCT 多期增强征象再认识

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[摘要] **目的：**再认识腮腺腺淋巴瘤（Warthin 瘤）的多层螺旋 CT（MSCT）多期增强影像学征象及诊断价值。**方法：**回顾性分析经手术病理证实的 25 例 Warthin 瘤的临床及 MSCT 资料，所有病例均行 MSCT 平扫及三期增强扫描。**结果：** 25 例共 29 个病灶，单发 21 例，多发 4 例；大部分病灶（23/29）位于腮腺浅叶后下极，为圆形、类圆形或浅分叶，边界均清楚，大部分（24/29）平扫密度不均匀，24 个病灶动脉期实性部分明显强化，静脉期、延迟期逐渐减退，呈“速升速降”的强化方式，3 个病灶动脉期中度强化，静脉期明显强化，延迟期减退，2 个病灶轻度延迟强化，24 个病灶内有囊变区（17 个囊变呈“裂隙状”），其中 15 个囊变边缘伴小结节样影，8 个除囊变不强化区外，可见界于囊实性密度间的低密度延迟强化区域，29 个病灶均见贴边血管征。1 例左侧颌下可见一枚稍大淋巴结。结论： Warthin 瘤的 MSCT 多期增强征象具有一定的特点，本文归纳的部分征象既往文献未有报道，可能具有一定价值，结合临床病史，有助于提高术前对本疾病的诊断准确率。

PU-2471

The feasibility of optimizing scan protocols to further reduce radiation dose in combined brain CTP-CTA by decreasing scanning phases

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Objective: To explore the feasibility of optimizing scan protocols to further reduce radiation dose by decreasing scan phases in CT perfusion (CTP) without changing perfusion parameters in combined brain CTP-CTA.
Materials and methods: Thirty-two patients (15 males and 17 females, 59.13±12.28years of age) with normal, unilateral intracranial tumors or vascular diseases underwent a combined brain CTP-CTA on a 256-rows Revolution CT (GE healthcare). The original CTP protocol included 22 phases with 100kV tube voltage and automatic tube current modulation to achieve noise index (NI) of 8HU in each phase except the tenth phase where higher signals were required (NI=2HU). CTA images were reconstructed from the tenth-phase CTP data. Five lower dose CTP data sets (Groups B-F) were simulated with the following phases removed from the original set (Group A): Group B, 14th, 16th, 18th, 20th and 22nd phases; Group C, 2nd, 16th, 18th, 20th and 22nd phases; Group D, 2nd, 4th, 6th and 8th phases; Group E, 2nd, 4th, 16th, 18th, 20th and 22nd and Group F,

2nd, 4th ,6th, 14th, 16th, 18th, 20th and 22nd phases. The perfusion parameters CBF, CBV, PS and MTT values in the frontal white matter, caput nuclei caudate, lenticular nucleus, dorsal thalamus, white matter of occipital lobe and cerebellar hemisphere of the left or healthy side were measured and statistically compared among the six groups. Effective doses of six groups were calculated and compared.
Result: Radiation doses (in mSv) of the six groups were 3.72±0.42, 3.21±0.36, 3.20±0.36, 3.31±0.36, 3.00±0.33 and 2.89±0.32. There was no difference in CBV and PS values among the six groups (P>0.05), while CBF and MTT values were significantly different (P <0.05). Only in groups B and C where all 4 parameters were the same as in the original dose group (Group A), and the dose saving was 14%.
Conclusion: It is feasible to appropriately decrease scan phases in brain CTP to further reduce radiation dose without altering perfusion parameters.

PU-2472

唾液腺肌上皮癌：病理和 CT 影像学特征

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目的　总结唾液腺肌上皮癌的病理和 CT 影像学特征。 研究设计　　对 10 例唾液腺肌上皮癌患者进行增强 CT 扫描，并对病理和 CT 影像学特征进行评估，包括病理类型，大小，边缘形态和病变增强模式。 结果 肌上皮癌呈多结节或分叶状，切割表面为灰棕色，没有或不完整的荚膜，有时可见出血。肿瘤的病理细胞类型可以是纺锤形、透明、浆细胞样和上皮样细胞，也可以是多种细胞的混合类型。非增强 CT 表现为不规则分叶状或多结节病变，边缘不清晰，密度不均匀，少数病灶中有点状钙化。增强的 CT 表现为中、重度不均匀性增强，包括囊性、裂隙样无强化区以及动脉期明显的结节性增强和小血管扭曲。 结论　　肌上皮癌的病理特征和 CT 影像学表现是特征性的，熟悉其影像学表现可能有助于诊断该疾病。

PU-2473

鳃裂囊肿少见 CT 表现

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【摘要】
目的　报告鳃裂囊肿的少见 CT 表现，以提高对该病的 CT 诊断水平。
方法　分析 14 例经临床手术及病理证实的鳃裂囊肿 CT 资料。其中男性 9 例，女性 4 例，年龄 11～66 岁，平均 37 岁。8 例行颈部 CT 平扫，其中 4 例平扫后行颈部 CT 增强扫描，6 例直接行颈部 CT 增强扫描，所有病例 CT 扫描后常规行冠状面和矢状面 MPR 重建观察。
结果　13 例为第二鳃裂囊肿，其中 Bailey Ⅰ型 4 例，囊肿位于胸锁乳突肌的前缘或外侧，颈阔肌的深面。BaileyⅡ型 8 例，囊肿位于胸锁乳突肌的前内侧或内侧，颈动脉间隙的外侧，颌下腺后方。BaileyIV 型 1 例，位于右侧颈动脉鞘前内侧、右侧咽旁间隙内侧及右侧咽侧壁外侧，即位于咽粘膜间隙。1 例为第一鳃裂囊肿，位于右侧腮腺内。少见征象有囊肿壁不均匀增厚、壁结节、囊内分隔、多囊状及平扫呈高密度。9 例囊肿壁不均匀增厚，8 例囊肿壁见壁结节向囊腔内突出，平扫壁结节与囊壁等密度，与囊液相比呈稍高密度，增强扫描示增厚囊肿壁及壁结节明显强化，1 例

囊肿内见壁结节和线状分隔，1 例呈多囊状，部分囊之间相通连，2 例平扫囊内呈高密度，其中 1 例呈均匀高密度，增强扫描未见强化，1 例高密度内见 2 处环形低密度影。14 例 CT 诊断均误诊。
结论 囊肿壁不均匀增厚、壁结节、囊内分隔、多囊状及平扫呈高密度为鳃裂囊肿少见的 CT 表现， 当病变出现上述征象时，容易导致误诊，熟悉这些少见征象并结合病变的发生部位，特别是位于胸锁乳突肌的前内侧或内侧，颈动脉间隙的外侧，颌下腺后方，能减少误诊，提高诊断水平。

PU-2474

3.0T 磁共振高分辨率增强 MRI 对 Ramsay Hunt 综合征的诊断价值

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目的
探讨 3.0T 磁共振高分辨率增强 MRI 对 Ramsay Hunt 综合征的诊断价值。
方法
对 14 例患周围性面瘫并耳周带状疱疹、经临床确诊为 Ramsay Hunt 综合征的患者，行 3.0T 磁共振面神经薄层横断面容积平扫及注射 Gd 对比剂增强扫描，观察患侧面神经的信号改变，对增强扫描横断面图像进行 CPR 后处理，将双侧面神经显示于同一平面之上，分别测量患侧异常强化面神经节段的 MR 信号值与健侧相应节段的面神经 MR 信号值，同时测量面神经根部对应的脑桥 MR 信号值，分别计算患侧、健侧相应节段面神经 MR 信号值与面神经根部对应的脑桥 MR 信号值的差值（DSV），对患侧与健侧 DSV 进行两独立样本 t 检验。
结果 Ramsay Hunt 综合征患者注射 Gd 对比剂增强扫描后，患侧与健侧相应面神经节段 MR 信号的 DSV 存在显著统计学差异（P＜0.05），患侧面神经病变节段以迷路段及膝状神经节多见，少数病变累及面神经鼓室段。
结论 3.0T 磁共振高分辨率增强 MRI 能清晰显示 Ramsay Hunt 综合征患者患侧节段性面神经异常强化，可为临床诊断 Ramsay Hunt 综合征提供可靠的影像学参考依据，Ramsay Hunt 综合征患者面神经病变节段以迷路段及膝状神经节多见。

PU-2475

探讨开源大螺距头颈部 CTA 在临床应用价值

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目的：探讨开源 CT 大螺距扫描模式在头颈 CTA 应用价值。
材料和方法：前瞻性搜集拟诊行头颈部 CTA 患者 60 例，随机分为大螺距扫描组（A 组）和普通序列扫描组（B 组）。由 2 名资深医师对图像质量进行独立主观评分并采用 Mann-Whitney U 秩和检验进行比较。记录每例患儿的 CTDIvol、DLP，采用独立样本 t 检验比较两组有效辐射剂量、升主动脉 CT 值及信噪比（SNR）等指标。
结果：两组主动脉 CT 值及 SNR 等指标差异无统计学意义（p ＜ 0.05）。诊断医师对两组图像质量主观评分高度一致（κ= 0.82 和 0.84）且差异无统计学意义（3.53±0.63 vs 3.57±0.82，Z= -0.05，P = 0.96）。A 组患者的有效剂量（4.12±0.11 mSv）明显低于 B 组（7.2±0.2 mSv，t = -4.98，p ＜ 0.05）；扫描时间明显缩短 A 组（0.31 0.02 s），B 组（0.75 0.15 s），t =16.345，p ＜ 0.05)

目的：开源大螺距在头颈部 CTA 中能保证图像质量和显著降低患者照射剂量

PU-2476

Revolution CT 低剂量头颈部 CTA 联合颅脑 CTP 一站式检查及残余功能达峰时间（TMax）的临床应用

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目的：探讨 Revolution CT 低剂量头颈部 CT 血管成像（CTA）联合颅脑 CT 灌注（CTP）一站式检查的可行性及灌注残余功能达峰时间（TMax）伪彩图参数诊断脑缺血的临床价值。方法：前瞻性分析临床诊断脑缺血性病变的 50 例患者，所有患者完成 Revolution CT 低剂量头颈部 CTA 联合颅脑 CTP 一站式检查，计算患者受检 X 线有效辐射剂量；重建头颈部 CTA 及颅脑 CTP 灌注图，统计分析头颈部血管狭窄情况；通过 TMax 伪彩图发现异常与正常灌注区，后通过测量异常与正常灌注区的脑血流量（CBF）、脑血容量（CBV）、达峰时间（TTP）、平均通过时间（MTT）的数据，以确定异常灌注区梗死前期缺血程度（Ⅰ期、Ⅱ期）及急性脑梗死，以及确定残余功能达峰时间（TMax）伪彩图提示异常区域的敏感性；同时测量低灌注兴趣区及正常区域的 TMax 值，通过 ROC 曲线得出诊断Ⅰ期、Ⅱ期与急性梗死期的临界值。结果：颅脑灌注有效辐射剂量为 2.27±0.10mSv，头颈部 CTA 及颅脑 CTP 总辐射剂量为 3.21±0.17mSv。所有 TMax 伪彩图清晰，满足临床诊断，TMax 伪彩图提示异常灌注区敏感性为 95.16%（59/62）。正常区域、Ⅰ期、Ⅱ期及急性脑梗死期的 TMax 值各组间差异均有统计学意义（P=0.000）。诊断Ⅰ期、Ⅱ期、急性脑梗死的临界值分别为 2.12s、3.99s、5.90s； 结论：Revolution CT 头颈部 CTA 联合颅脑 CTP 一站式检查辐射剂量低，能够同时发现血管狭窄及灌注异常，以 TMax 伪彩图发现灌注异常敏感性高，TMax 值的测定对脑缺血低灌注程度有定性的诊断价值。

PU-2477

Imaging Characteristic and Classification of Primary Intraosseous Meningioma

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【Abstract】 **Objective** To analyze the imaging characteristic and classification of primary intraosseous meningioma (PIM) in order to improve the understanding of PIM. **Methods** CT and MRI data in 10 pathologically proved PIM were retrospectively analyzed, imaging classification of PIM was based on the way of bone destruction. **Results** All the 10 cases were single lesion in skull, 5 cases were in the frontal bone, 5 cases were in the parietal bone. As to the imaging classification, 6 cases were inflated type, 3 were sclerotic type, and 1 was osteolytic type. The inflated and osteolytic types showed low density on CT scanning. In MRI, the lesions showed equal or slightly lower signal on T1WI, a slightly higher signal on T2WI 3cases with moderate enhancement and 4 cases with obvious uniformity enhancement on enhanced scanning, 6 cases dura mater adjacent to the lesions were found significant enhancement, 3 cases demonstrated the meningeal tail sign; In osteolytic type, the

diseased skull showed a high density with radioactive bone needle sign on CT scan, and the soft tissue mass was found around the diseased skull, it showed equal or slightly lower signal on T1WI, slightly higher signal on T2WI, and the soft tissue mass and dura mater were found significant uniformity enhancement on enhanced scanning. Conclusion PIM has certain characteristic imaging findings, CT and MRI have important clinical value for the diagnosis and imaging classification of PIM.

PU-2478

心电监控 4D-CTA 评估颅内破裂动脉瘤搏动点的研究

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目的：通过观察已破裂颅内动脉瘤在心电监控 4D-CTA 检查中一个心动周期内的搏动情况，探讨搏动点的临床意义.方法:将 102 个破裂动脉瘤病人进行了双源 CT 的心电监控 4D-CTA 检查，将扫描结束后的原始数据进行重建，得出一个心动周期内的时间间隔均为 5%的 20 组数据包，经工作站三维软件处理后，得到 20 幅图像及动态图。将同一部位连续 3 幅及以上图像发现小泡状或小尖状凸起，判定该凸起为搏动点。根据有无搏动点出现分为有搏动点组和无搏动点组，并将两者的临床病史等进行统计分析，并将出现搏动点的动脉瘤与手术结果进行对照。结果: 102 个破裂动脉瘤中 81 个发现有搏动点，有搏动点组和无搏动点组的性别、年龄、部位家族史、有无并发多发动脉瘤、是否合并高血压及有无吸烟史之间比较无统计学意义（p>0.05），而直径以及瘤颈比在两组之间有统计学意义。在 81 例有搏动点的动脉瘤中，其中 66 例进行了夹闭术，并发现 62 例出血的部位与搏动点的部位一致。且有统计学意义.结论:破裂动脉瘤直径和瘤颈比大，更倾向于容易发现搏动点；破裂动脉瘤的搏动点与术中破裂点有较好的一致性,这对破裂动脉瘤的治疗有很大的临床意义。

PU-2479

探讨 CT 及 MRI 在 Madelung 病应用价值

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目的:探讨 Madelung 病的头颈部 CT 与 MRI 表现，提高对该病的诊断水平。
方法：回顾性分析 2012 年 2018 年 11 例 Madelung 病患者的头颈部 CT 与 MRI 表现。
结果：所有患者均表现为头颈部左右对称性皮下和（或 ）肌肉间隙弥漫性脂肪蓄积增厚，CT 值约-60U~-100HU，MRI 扫描 T 1 WI 及 T 2 WI 均为高信号，信号较均匀，脂肪抑制序列信号减低。其中 9 例患者有长期大量酗酒史，5 例具有“马颈圈”、“牛颈”样特征性外貌。
结论：Madelung 病具有特征性的 CT 及 MRI 表现，结合酗酒史可作出明确诊断。

PU-2480

头颈血管能谱 CT 成像水基物质图提高颈椎间盘显示的可行性研究

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目的 探讨应用能谱头颈 CT 血管造影（CTA）时物质分离所得水基物质图提高颈椎间盘（IVDs）显示及诊断准确性的可行性。**方法** 对 24 例行头颈 CTA 检查的患者行能谱扫描，重建 70keV 单能量图和水（碘）、水（钙）及水（羟基磷灰石（HAP））基物质图像，分别对 C2-7 椎间盘膨出或突出情况进行评估，结果与 MRI 进行对比，并对图像质量进行主观评分比较。同时测量各组图像中 C2-7 椎间盘的 CT 值和相对水浓度值，计算并比较噪声、信噪比（SNR）和对比噪声比（CNR）。采用卡方检验对四组图像检测到的颈间盘情况进行比较；采用 Friedman 秩和检验对四组图像质量行主观评分比较，两两比较采用 SNK 法；采用配对 t 检验对四组图像测量的颈椎间盘客观参数进行比较。**结果** 水（碘）、水（钙）及 70KeV 图评价 IVDs 的形态没有差异（两两比较 P 值分别为 0.935、0.986、0.909），与 MRI 评价结果差异无统计学意义（P 值分别为 0.154，0.116，0.137）。而水（HAP）图评价 IVDs 的形态与其它各组图像及 MRI 结果均有差异（p 值分别为 0.001，0.001，0.003，0.002）。水（碘）、水（钙）及水（HAP）图对颈椎间盘的显示均优于 70KeV 图（p 值分别为 0.000* 、0.000* 、0.018 、0.046、0.000*），以水（HAP）图像质量最好，水（碘）图和水（钙）图无差异（P=1.000）。除了 C2/3 椎间盘水（碘）与 70KeV 图评分差异无统计学意义（P=0.180），其余椎间盘水（碘）基图主观评分均优于 70KeV 图（P 值分别为 0.011、0.007、0.035、0.003）。与 70KeV 图比较，所有水基图均降低了图像噪声，提高了图像 SNR 和 CNR，差异有统计学意义（P 均＜0.001）。**结论** 能谱成像所得的水（碘）和水（钙）基物质图与 70keV 单能量图像比较能更好的显示 IVDs。

PU-2481
Care Dose 4D 技术在西门子 128 排机型上对头颅 CT 检查的应用价值

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目的：探讨 Care Dose 4D 技术在西门子 128 排 CT 机型上对于头颅 CT 检查的辐射剂量和图像质量的影响，并且评价其临床应用价值。方法：在我院由于各种病情需要行 CT 检查的病人 100 例，随机分为 AB 两组，每组 50 例。A 组：采用常规固定管电压（120KV）和固定管电流（280mAs）；B 组：采用常规固定管电压（120kv）和 Care Dose 4D 技术； 。扫描基线均为听框线，采用序列扫描，方向均为从足到头方向。每一例患者结束扫描后记录其辐射计量：容积计量指数（CTDLvol）和计量长度乘积（DLP）并计算图像的噪声（SD）、信噪比（SNR）。A、B 两组头颅 CT 扫描后的图像选择颅底层面、鞍上池及颅顶层面感兴趣区进行 CT 值的计算并计算图像的噪声、信噪比。头颅 CT 的图像质量由两位高年资的影像诊断医师进行盲法评定,根据图像的信噪比，空间分辨率和伪影程度将图像分为优、良、差三个等级。两组扫描方式的辐射剂量及图像信噪比的差异采用 t 检验，图像质量的差异采用卡方检验进行统计学分析。结果：A 组头颅 CT 扫描的平均 CTDLvol39.54mGy，平均 DLP579 mGy；B 组的平均 CTDLvol43.95 mGy，平均 DLP 633mGy。两组的 CTDLvol 和 DLP 的差异均具有统计学意义（p＜0.001）。B 组信噪比略高于 A 组，在颅顶层面和颅底层面两者信噪比差异无统计学意义（p＞0.05），而在鞍上池层面两组信噪比差异有统计学意义（p＜0.05）。两组图像的质量比较，A 组的平均优良率为 96.4%，B 组的为 96.5%，图像质量差异无统计学意义（p＞0.05）。结论：在西门子 128 排 CT 机型上，单独使用 Care Dose 4D 技术并不能明显优化头颅图像质量，同时还会加重患者的辐射剂量。

PU-2482
朗格汉斯细胞组织细胞增生症累及甲状腺、颌下腺和颈部淋巴结 2 例增强 CT 表现

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目的
分析朗格汉斯细胞组织细胞增生症累及甲状腺、颌下腺和颈部淋巴结的 CT 表现，提高对该病认识水平。
方法
回顾性分析 2 例朗格汉斯细胞组织细胞增生症累及甲状腺、颌下腺和颈部淋巴结患者的 CT 资料。患者 1，女，51 岁，发现颈前肿物并缓慢增大 10 余年。患者 2，女 61 岁，颈前区肿大并疼痛 1 年，再发 3 月。2 例均行颈部 CT 直接增强扫描。采用荷兰 Philips Brilliance iCT 扫描仪，管电压 120Kv，管电流 250mAs，螺距 1.0，对比剂采用碘佛醇 300mg I/ml 总量 80～100 ml，注射流率 3ml/s，延迟 45 秒扫描。
结果
甲状腺弥漫性肿大 2 例，密度不均匀减低，其内见多发大小不等低密度结节，部分结节融合，肿大甲状腺边缘强化，强化不连续，内部见迂曲线状、条片状、分隔状强化，甲状腺正常组织大部分消失，病变内均未见钙化灶，病例 1 部分结节内可见囊变，甲状腺内未见钙化。双侧颌下腺肿大 2 例，强化减弱，密度减低，病例 1 颌下腺边缘强化，内部见迂曲线状、分隔状强化影，病例 2 双侧颌下腺内见多个低密度结节，部分融合，肿大颌下腺边缘强化，内部见条片状、分隔状强化，2 例颌下腺内均未见钙化。1 例双侧颈部 2～5 区可见数枚肿大淋巴结，最大者断面大小约 10.9m×7.3mm，部分淋巴结内见线条状强化。1 例双颈 2 区、6 区及左颈 3 区、4 区见肿大淋巴结，最大者约 18.7mm×12.1mm，位于右颈 2 区，中央密度减低，边缘轻度强化。
结论
郎格汉斯细胞组织细胞增生增生症累及甲状腺、颌下腺和淋巴结 CT 表现为甲状腺、颌下腺和颈部淋巴结肿大，甲状腺、颌下腺及淋巴结密度减低，边缘强化，内部呈线状、条带状或分隔状强化，甲状腺、颌下腺及颈部淋巴结内未见钙化。当甲状腺、颌下腺及淋巴结内出现类似病变时，要考虑朗格汉斯组织细胞增生症可能。

PU-2483
颞下颌关节色素沉着绒毛结节性滑膜炎与腱鞘巨细胞瘤的 MRI 特征及其鉴别诊断

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目的 探讨颞下颌关节色素沉着绒毛结节性滑膜炎与腱鞘巨细胞瘤的 MRI 表现特点，以提高对两种病变的鉴别诊断能力。
方法 回顾性分析经手术病理证实的 17 例（8 例色素沉着绒毛结节性滑膜炎和 9 例腱鞘巨细胞瘤）患者的 MRI 资料，所有病例均经 MRI 检查，其中 9 例（4 例色素沉着绒毛结节性滑膜炎和 5 例腱鞘巨细胞瘤）患者行增强扫描。

结果 色素沉着绒毛结节性滑膜炎 MRI 表现为关节腔内滑膜增生形成绒毛结节或肿块,在 T1WI 上主要呈中等或低信号(8 例），T2WI 上主要呈稍低信号(6 例），5 例病灶呈双低信号（结节内含铁血黄素），增强扫描主要以中等不均匀强化为主(4 例）；腱鞘巨细胞瘤在 T1WI 上均以等信号为主，T2WI 上主要以稍高或高信号为主(9 例），增强扫描均呈中等或明显的欠均匀强化(5 例)，两种疾病的 T1WI、T2WI 信号和强化程度有一定差异。色素沉着绒毛结节性滑膜炎与腱鞘巨细胞瘤均可呈弥漫型或局限型，关节滑膜的增生，骨质破坏和关节间隙的增宽，两种疾病上述征象均无明显差异。
结论 色素沉着绒毛结节性滑膜炎与腱鞘巨细胞瘤的 MRI 信号既有一定重叠又有差异，T1WI、T2WI 信号特点和强化程度对两者的诊断及鉴别诊断具有重要价值。

PU-2484
CT 脑灌注联合 CT 血管成像在急性脑卒中患者中应用

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方法：选取 2018 年 7 月至 2019 年 7 月本院收治的 60 例疑似为急性脑缺血的患者作为研究对象,所有患者均行 CT 平扫、CT 全脑灌注及 CTA 检查,并观察检查的图像及相关参数。
结果：CT 全脑灌注联合 CTA 诊断敏感度较 CT 平扫高,差异有统计学意义(P<0.05);ACI（急性脑梗死）患者患侧异常区脑血容量(CBV)、脑血流量(CBF)较健侧对应区域低,平均通过时间(MTT)及达峰时间(TTP)较健侧对应区域高,差异有统计学意义(P<0.05);TIA 患者患侧 MTT 及 TTP 较健侧对应区域高,差异有统计学意义(P<0.05);ACI 患者患侧 CBV、CBF 较 TIA 患者患侧对应区域低,MTT、TTP 较 TIA 患者患侧对应区域高,差异有统计学意义(P<0.05)
结论：CT 脑灌注可准确并及时反应患者脑部缺血程度、缺血位置,并预测其半暗带，可为急性脑缺血患者早期诊断及治疗提供客观依据 ,还可以了解颅脑术后局部脑组织血流灌注情况,并为患者预后评估以及干预措施的制定提供指导,对患者术后病情的预后判断提供帮助,对临床治疗过程中的适时干预具有一定的指导价值。

PU-2485
多层螺旋 CT 后重建技术在颌面部外伤复杂骨折与整形外科治疗中的临床应用价值

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摘要 目的：探讨多层螺旋 CT（MSCT）三维重建后技术，在颌面部骨折中的临床诊断与整形外科治疗中的临床应用价值。**方法：**对 82 例颌面部骨折的患者进行了多层螺旋 CT 容积扫描检查与三维重建后处理。重建后处理方法包括多平面重建（MPR），表面阴影显示（SSD）和容积再现（VR）。结合轴位影像图像，观察骨折线、撕脱游离碎骨片，分析三种后处理重建图像显示骨折效果；骨折线断裂的方向和程度。**结果：**多平面重建颌面部，多个鼻窦骨折、裂隙骨折及骨折内部情况显示较好；通过 SSD 和 VR 显示，特别是在复杂骨折的游离骨片的空间关系显示更好，有很好的空间立体观。**结论：**MSCT 轴位图像是诊断颌面部骨折的基础，三维重建后处理技术，可多方位三维显示粉碎性骨折有着显著的优势，可清楚地显示病变的空间解剖关系，对患者术前具有重要的临床评估价值。

PU-2486

CT 检查在脑出血诊断中的临床价值

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摘要：目的探析对脑出血患者应用 CT 影像学手段检查的临床诊断价值。方法取笔者所在医院影像科 2017 年 9 月至 2019 年 3 月诊疗脑出血患者为分析对象,有 72 例,对所有患者应用 CT 影像学手段检查并对其临床数据以回顾性方式进行分析,归纳 CT 检查对脑出血的临床诊断价值。结果接受 CT 扫描患者病灶发生位于基底节区、丘脑、小脑、脑干,其中病灶位于脑干患者死亡率相对最高(P<0.05);不同病灶的脑出血患者存在不同 CT 扫描影像学特征。患者入院一周与入院两周后颅脑 CT 检查结果存在一定差异。结论颅脑 CT 运用于脑出血诊断过程,不仅可以对出血情况作出准确诊断,还可为临床制定治疗方案提供依据,值得临床推广。

PU-2487

颌骨造釉细胞瘤 CT 征象研究

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目的：研究颌骨造釉细胞瘤的影像特征，探讨 CT 影像对颌骨造釉细胞瘤的诊断与鉴别诊断的价值。方法：回顾性分析本院自 2015 年至今共 51 例病理证实的颌骨造釉细胞瘤的 CT 图像表现，观察病变的部位、形态内部结构，密度改变、邻近结构侵犯，牙齿吸收等。结果：其中 51 例图像中男性患者 31 例，女性患者 20 例，影像分型上单房型共 28 例，多房型 19 例，蜂窝型 4 例，局部恶性征象型 0 例。其中 45 例病灶有向颊侧膨胀性生长改变，3 例向舌侧膨胀性生长改变，3 例较均匀膨胀性生长改变，17 例病灶呈分叶状，34 例病灶无明显分叶状改变。局部骨皮质中断不完整共 27 例，牙根截断吸收共 29 例，9 例病灶内含有牙齿结构，囊变区 CT 值范围约 10～35HU，平均 22.5HU。结论：颌骨造釉细胞瘤在发生部位、形态、内部结构、邻近结构侵犯及牙齿吸收改变等方面均具有一定的特征性.高分辨螺旋 CT 配合三维重建技术可较直观显示病变的形态、周围骨质破坏、牙根吸收及邻近重要结构改变;二者联合应用对于提高造釉细胞瘤的术前诊断正确率有重要价值。

PU-2488

大涎腺腺样囊性癌的磁共振成像特点及误诊分析

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目的 探讨大涎腺腺样囊性癌（Adenoid cystic carcinoma ACC）的 MRI 特点，提高对该病的影像学表现认识，减少误诊。**方法** 回顾性分析经病理证实的 19 例（16 例原发，3 例复发）大涎腺 ACC 患者的 MRI 检查资料并分析误诊原因，其中 13 例行 MRI 平扫检查，4 例行 MRI 平扫和增强检查，2 例行 MRI 增强检查。**结果** 19 例肿瘤中，发生于腮腺 9 例，颌下腺 5 例，舌下腺 5 例。12 例肿瘤形态不规则，呈浸润性生长，边界不清，7 例形态规则，边界清晰。平扫 17 例，12 例呈均匀等 T1WI 信号，5 例信号不均，7 例呈 T2WI 均匀高或稍高信号，10 例呈混杂信号；6 例行 MRI 增强检查，3

例强化均匀，其余 3 例呈不均匀强化。8 例可见筛囊征，3 例病灶周围见 T2WI 低信号假包膜影。4 例发生远处转移，转移至肺、肝脏、椎体及淋巴结等，颌下腺 1 例肿瘤侵及周围骨质。共误诊 13 例，其中误为多形性腺瘤 7 例，炎症 3 例，鳞状细胞癌 1 例，腮腺导管癌、肿大淋巴结各 1 例。**结论** 大涎腺腺样囊性癌 MRI 表现多样，可表现为形态不规则、边界不清，也可表现为边界清晰的类圆形，增强呈均匀或不均匀强化；部分病灶内见筛囊征，本组病例中以舌下腺多见；部分病灶为孤立性囊实性肿块，与周围正常腺体分界清，周围似见低信号完整包膜，称为假包膜型 ACC，增强包膜轻度强化；发生于舌下腺肿瘤可累及颌下腺远段导管，致近段导管增粗或导管末端结构模糊。ACC 影像学表现缺乏特异性，临床上易误诊为涎腺来源的良性肿瘤、炎性病变或其他恶性肿瘤。MRI 增强检查可帮助进一步诊断，弥散加权成像（DWI）中大涎腺 ACC、多形性腺瘤、Warthin’s 腺瘤、粘液表皮样癌、恶性淋巴瘤等肿瘤的 ADC 图像间存在差异，可帮助鉴别诊断[1、2]。密切观察其影像学征象，结合临床特点，并借助 DWI 等功能磁共振成像技术，才能做出正确的诊断，减少误诊，从而为临床诊断及治疗提供更可靠的信息。

PU-2489

椎动脉发育不良与后循环梗死相关性的分析

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【摘要】 目的探讨椎动脉发育不良与后循环缺血的关系。方法 收集在我院神经内科住院的患者,选取行头部/颈部 MRA 检查,同时行颅脑磁共振平扫检查的患者 300 例。根据椎动脉发育不良诊断标准,分为椎动脉发育不良组和无椎动脉发育不良组,比较两组间后循环 TIA 及后循环梗死的总发生率,统计分析椎动脉发育不良与后循环 TIA 和后循环梗死的相关性。 结论 .椎动脉发育不良与后循环 TIA 和后循环梗死有明显的相关性,是缺血性脑卒中的危险因素。

PU-2490

CTA 与 MRI 对胚胎型大脑后动脉与脑循环缺血相关性研究

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【摘要】目的 探讨胚胎型大脑后动脉与脑循环缺血的相关关系。 **方法** 选取我院预计 200 例 CTA 诊断为胚胎型大脑后动脉的患者及预计 200 例 CTA 诊断无胚胎型大脑后动脉的患者，分析此类患者头部 MRI 平扫是否有脑缺血表现及脑缺血灶的位置，进一步分析胚胎型大脑后动脉与脑循环缺血的具体相关关系。**结论** 胚胎型大脑后动脉与脑循环缺血有一定的相关性。

PU-2491

Value of Care Technique in Skull CT Exam using a 128-row multidetector CT scanner

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[abstract]Purpose:to investigate the value of Care technology in decreasing radiation dose of 128 spiral CT in adult skull scanning.[methods]: 150 patients in our hospital because of various conditions required CT scan were randomly divided into three groups ABC, 50 cases in each group.Roution protocol(120KV and 280 mAs) was usea in group A. Care Dose 4D technology was used in group B. Care Dose 4D technology ang Care kv technology was used in group C.Infraorbital line was used to be the baseline. Effective mAs value,volume CTdose index (CTDLvol)and dose lengh product(DLP) were recorded and signal to noise ratio(SNR) of the CT image were calculated after exam.The image quality at the top,suprasella cistern and base level of the skull was judged and calssified as the three levels(excellent,good,poor) by two deputy chief physicians with double blind method. Differences between the three groups scanning radiation dose and image of SNR using analysis of variance, the difference in image quality using the chi-square test was used for statistical analysis.Results:The mean CTDLvol and mean DLP for group A was 39.54mGy and 579 mGy,those for group B was 43.95mGy and 633 mGy,those for group C was 48.67 mGy and 678 mGy.The difference of CTDLvol and DLP between the three groups were with statistical significant (p <0.001). At the top level and base level of the skull,the difference was with no statistical significant（p＞0.05）,but at the suprasella cistern, the difference was with statistical significant（p＜0.05）.The SNR of image in group C was slightly higher than A,B group.And the SNR of image in group B was higher than that in groupA.For the image quality evaluation, the average fine rate was 96.4% in group A, group B was 96.5%, 97.1% in group C. Image quality was no significant difference (p> 0.05).Conclusion: On the Siemens 128 slice CT models, Care Dose 4D technology alone did not significantly optimize image quality of the head image, but also increase the radiation dose to the patient.And in combination with care kv technique, the image quality has improved, but the radiation dose is increased significantly.So in the head CT scan, especially in patients with requires repeated CT follow-up has important clinical value and significance, is not worth popularization and application.

PU-2492

原发性颅骨内脑膜瘤影像分型及表现

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【摘要】目的 分析原发性颅骨内脑膜瘤（primary intracranial meningioma，PIM）的影像学表现，以提高对 PIM 认识。**方法** 回顾性分析经病理证实的 10 例 PIM 的 CT、MRI 资料，并根据颅骨骨质破坏方式对 PIM 作影像学分型。**结果** 10 例病灶均单发，5 例位于额骨，5 例位于顶骨；6 例为膨胀型，3 例为硬化型，1 例为溶骨型；膨胀型及溶骨型者 CT 平扫呈低密度，T1WI 呈等或稍低信号，T2WI 呈稍高信号为主，增强扫描 3 例中度强化，4 例明显强化，其中 6 例病灶相邻硬膜明显强化，3 例见脑膜尾征；硬化型者病变颅骨 CT 平扫呈高密度，见放射性骨针，相邻颅骨内外板见软组织肿块影，T1WI 呈等或稍低信号，T2WI 呈稍高信号，增强扫描病变周围软组织肿物及硬膜明显均匀性强化。**结论**: PIM 具有一定的特征性影像学表现，CT、MRI 对 PIM 诊断及分型具有重要的临床价值。

PU-2493

对比增强 MRA 在脊髓血管病变中的临床运用

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目的 研究利用增强磁共振成像方式在脊髓血管疾病中的显示作用。
方法 选取 2017 年 6 月～2018 年 12 月在本院就诊的 50 例临床拟诊为脊髓血管病变的患者,均行 CTA 或 DSA 检查。年龄 15～72 岁患者，缓慢起病者多见，亦有间隙性病程患者，部分患者无特殊实验室检查阳性指针，伴下肢无力，跛行。采用西门子 3.0T Vrio 磁共振机，颈部线圈，先行常规脊髓失状位、横断位平扫，扫描参数 TSE T2WI TR3000ms,TE100ms;TSE T1WI TR400ms,TE9ms,层厚 3mm,间隔 0.5mm,FOV220x260mm,矩阵 320X256,采集次数 2～4 次。对比增强 MRA,冠状位成像，利用三维扰相 GRE T1WI 序列，TR3~6ms,TE1~2ms,采用 0.2mmol/kg 使用对比剂，流速 1.5~3ml/s,;利用透视触发技术，采用 K 空间中心优先采集技术，然后再行常规脊髓增强扫描，同平扫。扫描结束，利用设备自带减影软件进行减影，然后使用 MIP、SSD、VR 显示脊髓血管。
结果 MR 所示无明显异常征象 3 例，MR 所示：T2WI 像脊髓周围流空信号血管，范例可见脊髓内畸形血管团，呈花边状，脊髓水肿弥散性增粗，呈等/长 T1、长 T2 信号，增强扫描见扩张静脉表现为高信号，及脊髓内出血、蛛网膜下腔出血征象，边缘含铁血黄素沉积呈低信号-黑环征等，追踪问题患者，对比行 DSA、CTA 检查组患者，CE-MRA 显示病灶能力高，阳性率 94%。
结论 脊髓血管畸形是少见病，占脊髓疾病的 2%-4%，但拥有极高的致残率，进行性加重的脊髓和脊神经损害症状，随着 MR 的临床运用，CE-MRA 在脊髓血管疾病中的作用日趋重要，其优质的软组织分辨率，对脊髓有更好的显示能力，通过对比剂的使用，在血管显示上更加明确，是脊髓血管病变检查信价比最高的检查，而且是脊髓血管畸形治疗后随访的有效方法。

PU-2494

The application of low dose CT perfusion in acute cerebral apoplexy

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Objective: To discuss the application of low dose CT perfusion in acute cerebral apoplexy.
Methods: patients with suspected acute cerebral apoplexy who were to receive cerebral CT perfusion (CTP) in our hospital were randomly divided into two groups: group A (t 80 kV, 120 mAs) and group B (100 kV,120 mAs). Image data of 20 patients with no craniocerebral diseases examined by CT were selected from each group, 20 cases in each group. Patients in group A, B two head of frontal lobe paraventricular, caudate nucleus, shell, thalamus, temporal choose interested in occipital area measurement, respectively, measure the interested area value of the cerebral blood flow (CBF), cerebral blood volume (CBV), average value (determined by MTT) over time, two high qualification diagnosis image of doctors on two groups of patients are subjective rating method . CT dose index and CT dose length product were recorded, and the effective dose was calculated to evaluate the radiation d

ose of patients in the two groups. Statistical methods: independent sample t test .
Results: There was no statistically significant difference in perfusion parameters in the region of interest between the two groups (P > 0.05). There was no significant difference in subjective score and objective evaluation of image quality between the two groups (P > 0.05). The CT dose index, CT dose length product and effective dose in group B were all decreased compared with those in group A.
Conclusions: low dose CT perfusion can be used in the examination of acute stroke. On the premise of not affecting craniocerebral perfusion parameters and image quality, the radiation dose can be significantly reduced by selecting the low-kv scanning mode.

PU-2495
基于颅内动脉瘤多模态数模特点探索瘤体破裂的血流动力学机制研究

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目的：以 HCTA 为数据源，构建动脉瘤的血流动力学模型的，探寻血液在动脉瘤里流动的规律。
方法：以 HCTA 为数据源，采用有限元方法、计算流体力学等计算和分析手段，构建同类型脑动脉瘤有限元模型，计算动脉瘤内相关血流动力学参数，主要研究方法包括：
基于 HCT 数据对脑动脉瘤血流动力学模型的建立采集病人高分辨率脑部 CTA 影像数据（包括术前诊断、术后三天以及术后一年），利用逆向工程软件 Geomagic Studio 对脑动脉瘤进行三维几何模型重建，并对三维模型进行几何拓扑优化。利用超声测定动脉瘤患者颈内动脉（4-5 颈椎水平处）三个心动周期的血液流速波形作为有限元计算的入口边界条件。使用网格划分软件 Hypermesh 对血管三维模型进行网格划分得到最终的有限元计算模型，导入至有限元软件 Ansys 中进行计算分析，获得完整心动周期内的血流动力学参数以及其变化规律。
双向流固耦合 FSI 计算利用 CFX 基于有限体积法的思想求解流体区域，Ansys 求解结构部分，具体实现过程如下：
利用参数化建模软件对脑动脉瘤三维模型 Proe 进行处理生成带壁厚血管三维几何模型。
Ansys 导入血管模型后做填充处理，生成流体域，对流体域划分四面体非结构性网格，边界做分层处理，对结构部分划分六面体结构性网格。
定义入口流速、出口压力、流固耦合面等边界条件，定义流体和结构部分材料属性。
采用时步迭代法进行耦合计算，根据血压脉动参数设置时间步长。通过流固耦合面传递流场压力、流速和界面位移，循环迭代直至满足收敛条件。
结果：以 HCTA 数据源，构建的动脉瘤的血流动力学模型很好的表达了血液在动脉瘤里的运动特性。
结论：可以将 HCTA 数据作为研究动脉瘤的血流动力学模型的数据源。

PU-2496
头颅 CTA 检查技术的临床应用价值

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目的：探讨 GE 64 排 CT 在头颅 CTA 检查技术中的临床应用价值。**方法**：仪器：GE 64 排螺旋 CT。资料：我院行头颅 CTA 检查的 50 例患者，其中男性 25 例，女性 25 例，年龄在 30 岁—76 岁之间，所有患者均有不同程度的头痛、头晕、呕吐，部分患者有脑出血、脑梗死等症状。扫描参数：管电压：120KV，管电流 240mAs，螺距 1mm 层厚 0.625mm 对比剂：60-70ml，注射速度 4.5ml/s。被检者仰卧于扫描床，头部正中矢状面垂直于扫描床平面并与床面长轴的中线重合，以听眦线为扫描基线进行螺旋扫描。后处理：多平面重组（MPR）、容积重组（VR）、表面遮盖技术（SSD）、最大密度投影（MIP）。**结果**：颅内动脉狭窄闭塞 33 例，可见斑块形成；大脑前动脉畸形 3 例；动脉瘤 3 例，；烟雾病 1 例;未见明显异常 10 例。**结论**：CTA 在显示血管病变以及疾病诊断方面起到越来越重要的作用，由于其创伤性小，价格低，图像直观清晰、可靠，在较大血管疾病的检查与诊断方面有取代 DSA 血管造影的趋势。

PU-2497

低剂量颅脑 CT 灌注在急性脑卒中的应用

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目的：探讨低剂量颅脑 CT 灌注在急性脑卒中的应用
方法：选取我院拟行颅脑 CT 灌注（CTP）的疑似急性脑卒中患者，随机分为 A、B 两组，使用西门子第二代双源 CT 进行扫描，A 组(管电压 80 kV，管电流为 120 mAs），B 组(管电压 100 kV，管电流为 120 mAs）。分别从每组中筛选出 20 例经 CT 检查无颅脑疾病患者的图像数据进行研究，每组 20 例。在 A、B 两组患者头部的额叶室旁、尾状核、壳、丘脑、颞枕叶选取感兴趣区进行测量，分别测量出感兴趣区内脑血流量值(CBF)、脑血容量值(CBV)、平均通过时间值(MTT) ,请 2 位高年资诊断医生对两组患者的图像进行主观评分（五分法）。记录 CT 剂量指数、CT 剂量长度乘积，计算出有效剂量来评价两组患者的辐射剂量。统计学方法采用独立样本 t 检验。
结果：两组患者感兴趣区内的灌注参数值差异无统计学意义（P＞ 0.05）。两组患者图像质量主观评分和客观评价差异均无统计学意义（P＞ 0.05）。B 组患者的 CT 剂量指数、CT 剂量长度乘积、有效剂量较 A 组患者均有所降低。
结论：低剂量颅脑 CT 灌注可运用于急性脑卒中的检查；在不影响颅脑灌注参数值和图像质量的前提下，选择低 KV 扫描方式可以使辐射剂量明显降低。

PU-2498

头颈部恶性间叶源性肿瘤的 MRI 表现

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目的 探讨头颈部恶性间叶源性肿瘤的 MRI 表现，提高对该类疾病的认识及诊断准确性。**方法** 回顾性分析吉林大学中日联谊医院 2018 年 5 月至 2019 年 5 月 5 例经病理证实为恶性间叶源性肿瘤的临床及影像资料（包括左颧骨低级别中心型骨肉瘤 1 例、颌骨高分化软骨肉瘤 2 例、颊部高分化弥漫大 B 细胞瘤 1 例、舌黏液相关边缘区 B 细胞淋巴瘤 1 例）。所有患者均进行 MRI 平扫、DWI 及增强检查，根据肿瘤的形态、边界及邻近组织关系、实性或囊性、信号特点、ADC 值等方面进行影像分析。**结果** （1）形态、边界：5 例病灶均形态不规整，边界清晰；（2）临近组织关系：5 例病灶中骨肉瘤及软骨肉瘤均出现骨质破坏，临近软组织出现水肿信号，2 例淋巴瘤均与临近组织分界清

晰；（3）成分：5 例病灶中骨肉瘤及软骨肉瘤均成分复杂，淋巴瘤成分均匀单一；（4）信号特点及强化方式：5 例病灶中骨肉瘤及软骨肉瘤信号复杂，可见囊变、坏死及点状双低信号，实性成分呈等信号，增强后呈明显不均匀强化。2 例淋巴瘤均呈稍高信号，增强后呈轻度均匀强化（5）ADC 值：本文中淋巴瘤 ADC 值均呈明显低值（<0.5），且低于以往研究的头颈部恶性肿瘤 ADC 值。**结论** 头颈部恶性间叶源性肿瘤的 MRI 表现具有一定的特点，尤其是肉瘤对骨质的破坏改变、成分特点及淋巴瘤的低 ADC 值颇为有特征性，可有助于提高诊断和鉴别诊断水平。

PU-2499
磁共振纹理分析在头颈部良恶性肿瘤中的鉴别诊断价值

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目的 评估磁共振纹理特征分析在头颈部良恶性肿瘤鉴别诊断中的价值。**方法** 纳入解放军总医院海南医院 30 例头颈部良性肿瘤及 30 例头颈部恶性肿瘤患者，对术前磁共振 T2WI 图像进行灰度共生矩阵纹理分析（纹理参数包括角二阶矩、对比度自相关、逆差距及熵），选取病变实性部位采用感兴趣法进行测量。统计方法采用独立样本 t 检验、Mann-Whitney U 检验、二元 Logistic regression 分析及受试者工作特征曲线（receiver operating characteristic curve，ROC）分析。**结果** 恶性组对比度（18.839±12.291）显著低于良性（40.007±32.238）（T = 3.36，P = 0.002），而恶性组自相关及逆差距[0.017(0.006,0.091)及 0.292±0.101]显著高于良性组[0.008(0.001,0.132)及 0.222±0.096]（Z = 2.706，P = 0.007; T = 2.752, P = 0.008）。两组之间角二阶矩及熵无显著差异（Z = 1.587，P = 0.113 及 T = 1.376, P = 0.176）。对比度、自相关及逆差距的 ROC 曲线下面积分别为 0.722、0.703 及 0.711，其二元 Logistic regression 方程为 Y=-0.05076*Contrast+-31.3318*Correlation+5.4226*IDM+0.5444 (截断值为 0.5)，判断为良性肿瘤的正确率为 50.00%，判断为良性肿瘤的正确率为 73.33%，总正确率为 61.67%，其阳性预测值的 ROC 曲线下面积为 0.758。**结论** 磁共振 T2WI 纹理特征参数对比度、自相关及逆差距可以用来鉴别头颈部良恶性肿瘤。

PU-2500
颈部韧带样纤维瘤的 CT 及 MRI 特征

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【摘要】目的 探讨颈部韧带样纤维的 CT 及 MRI 表现特征。方法 回顾性分析经手术病理证实的 10 例颈部韧带样纤维瘤的 CT 及 MRI 表现。其中行 CT 检查 7 例，MRI 检查 3 例，10 例均增强扫描。结果 7 例 CT 平扫为软组织密度肿块，密度等于或略低于周围肌肉，病灶密度较均匀，未见坏死及钙化，增强后呈明显均匀或不均匀强化，病灶与邻近肌肉分界不清，其中 4 例沿解剖间隙浸润性生长，包绕侵犯周围血管神经，2 例累及腮腺，1 例可见邻近骨质受侵犯；3 例 MRI 平扫为边界不清软组织肿块，与周围肌肉信号相比，T2WI 呈不均匀高信号，T1WI 呈等或略低信号，病灶内可见条带状长 T1 短 T2 信号影，增强后病灶明显强化，条带状长 T1 短 T2 信号区未见强化。结论 颈部韧带样纤维瘤的 CT、MRI 表现有一定的影像学特征，具有较高的诊断价值。

PU-2501
不同流率推注生理盐水对头颈部 CTA 图像质量的影响

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目的：探讨不同流率推注生理盐水对头颈部 CTA 图像质量的影响。
方法：选取我院 于 2018 年 1 月至 2018 年 12 月间收治的 50 例行头颈部 CTA 患者按照随机数字法分为 2 组，两组患者均以流率 4.5ml /s 右肘前静脉注入 30ml 碘帕醇 350mgI/ml 和按对比剂和生理盐水 50%混合的混合液 30ML，对照组 25 例以流率 3.5ml /s 注射 45ml 生理盐水，研究组 25 例以流 率 5ml /s 注射 45 ml 生理盐水。比较两组患者颈动脉分叉区动脉血管及主动脉弓血管平均 CT 值、对比噪声比(CNR) 、信噪比(SNR) 、主观图像质量以及不良反应发生情况。
结果：两组患者颈动脉分叉区动脉血管及主动脉 弓血管平均 CT 值、SNR 比较无显著差异(P ＞ 0. 05) ，研究组颈动脉分叉区动脉血管及主动脉弓血管 CNR 显著高 于对照组(P ＜ 0. 05) 。两组噪声、管腔边缘锐利度比较无显著性差异(P ＞ 0. 05) ，研究组图像清晰度、血管和周围结构对比度评分高于对照组(P ＜ 0. 05) 。两组不良反应发生率比较无显著性差异(P ＞ 0. 05) 。
结论：以流率 5ml /s 追加注射生理盐水相较于流率 3.5ml /s 追加而言，CTA 图像质量更好且安全性好。

PU-2502
能谱 CT 模式扫描降低 HCTA 辐射剂量的研究

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目的比较宝石能谱 CT 及 64 排 VCT 头颈部 CT 血管造影检查的辐射剂量，探讨能谱模式扫描在减低辐射剂量方面的应用价值。
方法 60 名受检者随机分成实验组（30 例）和对照组（30 例），实验组（A 组）用宝石 CT 能谱模式扫描，对照组（B 组）用 64 排 VCT 常规扫描，比较两组患者检查后的辐射剂量及图像质量。
结果 实验组较对照组辐射剂量明显减低，差异有统计学意义（P<0.05）；图像质量上，实验组较对照组评分稍高，但差异无统计学意义（P=0.405）。
结论宝石 CT 能谱模式扫描能够在保证图像质量的同时，大幅减少受检者辐射剂量，对减低医源性辐射危害具有重要临床意义

PU-2503
胚胎发育不良性神经上皮肿瘤 1 例报告

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目的：胚胎发育不良神经上皮肿瘤(dysembryoplastic neuroepithelial tumor, DNT)是一种罕见的良性脑肿瘤，根据 2016 版 WHO 中枢神经系统肿瘤分类将其归为 I 级神经元-混合神经元肿瘤[1]。典型的组织学特征是特征性的神经胶质及神经元成分。胚胎发育不良性神经上皮肿瘤 1 例报道并文献复习,学习并探讨颅内胚胎发育性神经上皮瘤的 MRI 影像表现。

方法：回顾性分析 1 例我院 2018 年 1 月收治的 DNT 患者的临床、MRI 和组织病理学特征。患儿，男性，10 岁，因行为异常 20 余天肢体，肢体抽搐 5 天于 2018 年 1 月 24 日入院。我院颅脑 MRI 平扫及增强示“右侧颞叶异常信号，胚胎发育不良行神经上皮肿瘤可能性大，未除外星形细胞瘤”。后于我院行“右侧颞叶肿瘤切除术”，术后病理示：诊断符合胚胎发育不良神经上皮肿瘤。WHO Ⅰ级。

结果及讨论：DNT 是一种罕见的神经细胞和胶质细胞混合性肿瘤，该肿瘤多见于儿童或青年，男性略多于女性,通常位于幕上,好发于额叶和颞叶，亦可发生于小脑和脑干，临床主要症状为持续性、顽固性癫痫，一般无颅内压增高症状。无明显神经系统阳性体征。在常规磁共振成像中，DNT 表现为界限清楚的囊性或多囊性病变，T1WI 表现为低信号，T2WI 表现为高信号，FLAIR 表现为高信号[2]，增强扫描多为无明显强化。有研究表示“三角征” 和瘤内分隔也是 DNT 较为典型的 MRI 特征。DNT 主要与神经节细胞胶质瘤、少突胶质细胞瘤、毛细胞型星形细胞瘤、血管母细胞瘤等鉴别。

结论：胚胎发育不良性神经上皮瘤（DNT）是一类少见的脑肿瘤，需与神经节细胞胶质瘤、少突胶质细胞瘤、毛细胞型星形细胞瘤等鉴别，结合临床和影像学表现，可以对 DNT 为临床提供合理的治疗方案，提高患者生存质量，避免不必要的放化疗。

PU-2504

锥形束 CT 图像质量的研究

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研究目的：通过主观评价和客观评估的方法研究不同成像参数下 CBCT 的图像质量，分析主观评价和客观评价间的关系。

材料与方法：用 3D Accuitomo 170 的 40 组成像参数（1-10mA，62-90kV）扫描颅骨体模，该体模由一副完整的人颅骨包埋于软组织等效材料中，所得的数据均由 dicom 格式导出并导入 Santa Dicom 软件中，请 5 位医师对图像中 8 个解剖标志的可见性进行独立评分，计算每组图像的平均分。4 周后，随机抽取其中 25 组图像进行再次评分。用同样的成像参数扫描 SEDENTEXCT IQ 图像质量体模，所得的数据由 dicom 格式导出并导入 ImageJ 软件中，计算图像的信噪比。对解剖标志可见性的评分与图像信噪比的关系进行统计分析。

结果：不同管电流、管电压，其他成像参数相同时，各解剖结构的可见性有显著性差异。在相同成像参数下，不同的解剖结构间的主观评分有显著性差异。随着信噪比的不断升高，解剖结构的可见性的变化趋势为首先升高，而后趋于稳定。解剖结构平均分的变点区间为[29.42，36.51]。对不同的解剖结构而言，其可见性趋于稳定的信噪比变点不同。

结论：改变 CBCT 的成像参数在一定程度上可以影响到解剖结构的可见性，不同的解剖结构主观评分对成像参数波动的敏感性不同。解剖结构的可见性随信噪比的升高而升高，直到最后趋于稳定达到最大值。

PU-2505

原发性腮腺恶性淋巴瘤的 CT 诊断

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【摘要】目的 探讨原发性腮腺恶性淋巴瘤（PLP）的 CT 特点，以提高对该少见疾病的影像诊断水平。**方法** 回顾性分析 20 例经病理证实的 PLP 的 CT 资料。20 例 PLP 中女性 12 例，男性 8 例，中位年龄 58 岁(32～76 岁)。对肿瘤的大小、边界、数目、形态、密度、强化方式、周围侵犯、颈部淋巴结肿大等进行分析。**结果** 1）20 例 PLP 中单侧 17 例，双侧 3 例，共 30 个病灶，单发 13 例，双发 5 例，多发 2 例；2）病灶位于浅叶者 18 个，深叶者 9 个，跨深、浅叶 3 个。病灶最大径 *1.3cm～5.8cm*，平均（2.6±0.3）cm；病灶呈类圆形 7 个，椭圆形 17 个，不规则分叶状 6 个；边缘光整 25 个，边缘不光整 5 个，病灶边界清晰 27 个，边界不清 3 个；3）CT 平扫病灶呈低密度 11 个，等密度 19 个；所有病灶均呈实性，未见钙化及出血；肿瘤密度均匀 24 个，密度稍不均匀 6 个；CT 增强病灶呈轻度强化 18 个，中度强化 12 个。4 例伴有颈部淋巴结肿大。**结论** 边缘光整，密度均匀、少见钙化及坏死、乏血供的腮腺实性肿块，可以提示 PLP 的诊断，CT 检查有助于显示肿瘤的范围。

PU-2506
成人外伤性颈内动脉动脉瘤伴颈内动脉海绵窦瘘一例

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目的：探讨成人外伤性颈内动脉动脉瘤伴颈内动脉海绵窦瘘的病因及影像诊断的特征。

方法：回顾性分析成人外伤性颈内动脉动脉瘤伴颈内动脉海绵窦瘘的 CTA 及 DSA 诊断，并进行文献复习。

结果：外伤性颅内动脉瘤(Traumatic intracranial aneurysms)是由于颅脑或颈部外伤后，从血管外突出或膨胀形成，外伤性颅内动脉瘤的发生率极低，占颅内动脉瘤总数的不到 1%。外伤性颈动脉海绵窦瘘(traumatic carotid cavernous sinus fistula)是指颈动脉及其分支与海绵窦之间不正常的动静脉交通，常为颅底骨折而致，在颅脑损伤中的发生率约为 2.5%。所以外伤性颅内动脉瘤合并颈内动脉海绵窦瘘的极为罕见。

案例描述：本病例报道一名 41 岁男性患者因“重型颅脑损伤术后，外院查出右侧颈内动脉海绵窦瘘”入院，患者行头颈 CTA 扫描表现为右侧颈内动脉海绵窦段正常结构消失，右鞍旁、鞍内及海绵窦区见不规则囊状、分叶状扩张，范围约 35.7×40.5mm，边缘不光整；主瘤体可见数条增粗血管与直窦相连，动脉期即可见直窦、两侧横窦及乙状窦显影。行 DSA 检查示，右侧颈内动脉虹吸段结构紊乱，动脉早期海绵窦显影其中见多个囊状血管影显示，鞍区见较多粗大、扭曲静脉，两侧横窦、乙状窦、直窦及右侧颈静脉显影。

结论：外伤性颈内动脉动脉瘤伴颈内动脉海绵窦瘘是颅脑外伤罕见的并发症，无论是闭合性头部损伤还是穿透性头部损伤都有可能发生，诊断以 DSA 为金标准，头颈 CTA 亦有重要的诊断价值。

PU-2507
光子 CT 双低扫描在颅内动脉瘤诊断中的应用

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目的：探讨光子 CT 双低扫描在颅内动脉瘤诊断中的应用价值 方法：根据临床症状疑似颅内动脉瘤的患者或已经确诊为颅内动脉瘤患者 40 例行颅脑 CTA 检查。并且根据扫描方法不同将 80 例患者随机分为 A、B 两组。A 组采用 120kV、50ml 对比剂，注射速率为 5ml/s。B 组采用 80 kV、35ml 对比

剂，注射速率为 3.5ml/s。对两组进行主、客观图像质量评价。A、B 两组大脑中动脉 CT 值分别为 328±58HU、430±72 HU（P＜0.05），SNR 分别为 47±7、43±5（P＜0.05），CNR 分别为 40±8、38±7（P＜0.05）。B 组（双低组）大脑中动脉的平均 CT 值高于对照组，A 组的 SNR 及 CNR 高于 B 组（*P*<0.05），即差异有统计学意义 。甲组图像质量大于等于 3 分的 28 例，乙组 27 例。评分结果的差异无统计学意义（*P*>0.05）。两名医师图像质量评分具有较高的一致性 。两组有效辐射剂量（ED）分别为 0.55±0.4、0.28±0.1（P＜0.05）。B 组（双低组）有效辐射剂量较 A 组降低 49%。所有患者均行 DSA 检查；对照 DSA 结果，分析两组的诊断灵敏度、特异度及准确率。 结果：甲组发现动脉瘤患者 11 例，共 15 个动脉瘤，与 DSA 结果一致；乙组发现动脉瘤患者 9 例，共 12 个动脉瘤，DSA 结果为动脉瘤患者 9 例，共 13 个动脉瘤，CTA 漏检一直径约 1.7mm 动脉瘤。A 组灵敏度、特异度及准确率均为 100%；B 组灵敏度为 92.3%、特异度为 100%、准确率为 98.9%。 结论：综合主、客观图像质量评价，光子 CT 颅脑 CTA 双低扫描对颅内动脉瘤的诊断准确率高，具有较好的临床应用价值。

PU-2508

锥形束 CT 腮腺造影技术在慢性腮腺炎病情评估中的应用

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材料和方法：通过对 30 例临床表现为腮腺反复肿胀的患者进行碘海醇腮腺造影结合大视野（14cm*16.5cm）锥形束 CT（Soredex Scanora 3D，Finland）扫描，对结果进行分析。利用 CBCT 定位及测量的优势，将患者按照造影结果表现分为两组。将导管异常扩张范围大于等于整个主导管的 2/3 或导管扩张大于 3mm 归为病重组，导管扩张小于 2/3 且导管扩张小于 3mm 为病轻组。对两组患者均进行每周一次共六周的腮腺导管灌注治疗（糜蛋白酶 4000u:50ml NS）并比较两组的疗效，以分析 CBCT 腮腺造影在慢性腮腺炎病情评估中的作用。

结果：CBCT 腮腺造影在慢性腮腺炎检查中，对导管病变的定位和测量较平片造影有明显优势。依据 CBCT 腮腺造影所作分组中，腮腺炎病轻组患者在对糜蛋白酶腮腺灌注治疗疗效反应上明显优于病重组。

结论：锥形束 CT 腮腺造影技术在对慢性阻塞性腮腺炎患者病情评估及疗效预测中有一定参考价值。

PU-2509

面神经 MRI 增强扫描技术的临床应用

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摘要 目的：探讨 Bell 面瘫及正常面神经各节段强化方式及面神经炎的诊断方法。**方法：**回顾性分析 2016 年 1 月至 2019 年 2 月我院收治的面神经炎患者及正常对照者各 50 例，所有患者均进行面神经增强扫描，分别统计两组患者面神经强化的区域及分布特点，并对其强化程度进行 0-3 级分级，采用秩和检验比较 Bell 面瘫患者与正常对照组间面神经强化区域及强化程度之间的差异，以及 Bell 面瘫患者健侧与患侧面神经面神经强化区域及强化程度之间的差异。**结果：**47 例 Bell 面瘫患者及 48 例正常对照者均获得清晰的面神经增强扫描图像，面瘫组双侧面神经呈单节段或多节

段受累的不对称性异常强化，而正常对照组双侧面神经粗细无明显差异且呈节段性对称性中等程度强化；正常对照组面神经内听道底段、迷路段、膝状神经节段、鼓室段及乳突段与面瘫组各受累节段患侧间强化程度以及面瘫组患侧与健侧间差异均有统计学意义（p<0.05）。**结论：**Bell 面瘫患者患侧较对侧均有不同程度异常强化，而正常面神经均为双侧对称性强化，根据不对称性异常强化可用于诊断面神经炎。

PU-2510
颅内动脉瘤伴血栓致急性脑梗死后有效溶栓治疗一例并文献复习

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颅内动脉瘤合并瘤体内血栓引起局部脑梗死国内外报道较少，笔者将在吉林大学第一医院神经内科行静脉溶栓治疗，后经头部磁共振黑血成像和颅脑 CTA 证实为颅内动脉瘤合并瘤体内血栓致急性脑梗死的 1 例患者影像资料予以报道，（据我们所知，这是国内第一例），证实存在动脉瘤情况下亦可成功溶栓治疗脑梗死，揭示头部磁共振黑血成像联合颅脑 CTA 可能作为评估动脉瘤内血栓溶栓的安全性，从而显著改善预后。脑梗死发病 4.5 h 内有效静脉应用重组组织型纤溶酶原激活物(recombinant tissue plasminogen activator，rt—PA)溶栓治疗是最主要、最有效的治疗方式。旨在探讨合并颅内动脉瘤的急性脑梗死患者行静脉溶栓治疗的安全性。

PU-2511
颈动脉鞘区神经鞘瘤 25 例临床表现和影像特征

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目的　研究颈动脉鞘区神经鞘瘤（Schwannoma）的临床表现和磁共振成像（Magnetic Resonance Imaging，MRI）特征。 方法 对例颈动脉鞘区神经鞘瘤患者的临床和 MRI 资料进行回顾性分析。结果 多呈慢性起病，临床上以颈部肿块（16 例）和吞咽困难（8 例）为主要表现，反复头晕（1 例）。MRI 示 6 例 T1WI 呈稍低信号，17 例 T1WI 呈等信号，2 例 T1WI 呈稍高信号，5 例 T2WI 呈稍高信号，20 例 T2WI 呈高信号。静脉注射对比剂 MRI 增强检查 19 例，其中 14 例明显不均匀或均匀强化。结论 颈脉鞘区神经鞘的 MRI 表现较具有特征性，结合临床资料可以做出较明确诊断。

PU-2512
头颈 CTA 预测试改良技术联合低剂量扫描方法的应用研究

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目的 探讨改良后低剂量预测试技术联合头颈部 CTA 低剂量扫描方法的应用效果。**方法** 将同时拟行头颈部 CTA 及 DSA 检查的 150 例患者随机均分三组；确定扫描延迟时间（DT）：A 组（传统小剂量预测试技术）： 120kV， 60mA， 5mm，20ml 碘佛醇（320mgI/ml），B、C 组（小剂量预测试改良技术）： 80kV， 20mA，1.25mm，按患者体重 1ml/kg 的 10%计算对比剂用量；正式扫描：A、B 组（常规扫描）： 120kV， 500mA，C 组（低剂量扫描）： 80kV 联合自动管电流调节技术（NI=10，mA=100-300），50% ASIR。记录三组平均 DT、人均碘用量（I）、人均辐射剂量长度乘积（DLP）

及有效剂量（ED），测量、计算三组最终原始图像靶血管平均 CT 值(AA $_{CTValue}$，M1$_{CTValu}$)、噪声（N）、信噪比（SNR）、对比噪声比（CNR），对每组患者头颈部动脉显示情况进行评分，同时各组随机取等数量存在脑血管中度及中度以上狭窄的患者，以 DSA 检查结果为标准，对二级侧枝循环的 CTA 成像情况进行评分。以上三组间各值进行统计学分析，P<0.05 认为差异具有统计学意义。**结果** B、C 组预测的 DT 较 A 组的平均缩短约 0.4s，C 组的靶血管平均 CT 值、N 均高于 A、B 两组，但三组的 DT、图像质量的客观参数（平均 CT 值、N、SNR、CNR）及主观评分（动脉显示情况、狭窄后二级侧枝循环成像情况）均无统计学差异（P ＞0.05），三组的图像质量评分均不低于 3 分；C 组的 DLP、ED 均低于 A、B 组的 DLP、ED（P ＜0.05），平均 ED 分别约为 A、B 组的 24.07%、25.70%；B、C 组的 I 均低于 A 组的 I（P ＜0.05），分别约为 A 组的 82.33%、81.45%（P ＜0.05）。**结论** 预测试改良技术联合头颈部 CTA 低剂量扫描方法是可行的，在保证成像质量的同时，能有效低辐射剂量和对比剂用量。

PU-2513
3.0T 高场磁共振 3D-T1W-VISTA-SPAIR 序列在排出颅内血管病变的应用价值

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目的：探讨利用飞利浦 3.0T 高场磁共振 3D-T1W-VISTA-SPAIR 序列在强化中对颅内动脉血管病变的诊断价值，早期诊断血管狭窄病变，为患者尽早治疗提供影像学依据。
方法：选取本院中老年头晕体检患者 20 例，CT、MR 平扫未见明显异常，飞利浦 3.0T 磁共振 32 通道线圈，颅脑普通强化序列扫描未见明显异常后，加扫 3D-T1W-VISTA-SPAIR 序列;参数 TR:425、TE:20、层厚 0.7mm、间隔-0.35mm、NSA:1、Voxel：0.6X0.6X0.7;并对所得图多平面重组（MPR）等后处理技术，重建有变狭窄的血管横截面观察。
结果：普通强化未见明显异常后，加扫 3D-T1W-VISTA-SPAIR 序列 5 例患者一侧大脑中动脉变狭窄（考虑活动性斑块），3 例患者基底动脉变狭窄。
结论：利用 3.0T 高场磁共振 3D-T1W-VISTA-SPAIR 序列加扫在普通强化序列筛查排除血管性病变，能清晰显示颅内血管病狭窄程度及病变，为有病变的患者提早干预治疗提供影像学依据。

PU-2514
双低联合迭代重建技术在全脑 CT 灌注成像中的可行性应用

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目的：探讨低浓度对比剂、低管电流联合迭代重建技术在急性脑梗死患者全脑灌注成像 CTP 中的可行性应用。方法：选取 2019 年 3 月－2019 年 6 月在我院行全脑 CTP 检查患者 60 例，随机分为 A、B 两组， A 组 30 例管电压 80Kv，对比剂为碘普罗胺（370mgI/mL），滤波反投影重建法（FBP）重建；B 组 30 例管电压 80ｋＶ，对比剂为碘克沙醇（320mgI/mL），迭代重建算法 SAFIRE 3 重建。测量并计算 A、B 两组的大脑中动脉 CT 值、信噪比（SNR）、对比噪声比（CNR）、剂量长度乘积（DLP）、有效辐射剂量（ED）及碘摄入量，并对两组间上述指
标进行统计学分析； 2 名医师对两组图像质量评价的一致性采用 kappa 分析；两组间图像质量主观评价差异采用 x^2检验。结果：A、B 两组间的 CT 值、SNR、CNR、CTP 及 CTA 的图像主观质量评价差异均无统计学意义（P 均＞ 0 .05）；而 B 组（双低剂量组）的 ED、碘摄入量较 A 组低。结论：联

合低管电压和迭代重建技术时，使用低浓度对比剂（320mgI/mL）进行全脑 CTP 检查，在不降低图像质量的同时，还能减少 ED 及碘摄入量，从而降低对比剂肾病（CIN）的风险。

PU-2515
颈动脉易损斑块影像学评估与术后病理及随访及研究

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目的评估颈动脉超声造影对易损斑块识别的准确性。方法本研究为前瞻性临床队列研究。选择 2016 年 11 月至 2019 年 1 月徐州医科大学附属医院 12 例颈动脉狭窄并接受颈动脉内膜剥脱手术的患者。术前常规行颈动脉斑块高分辨核磁成像判断斑块性质是否稳定，颅脑灌注检查观察颅内血管代偿情况，术后 CT 血管造影及颅脑 CT 进展随访观察管腔是否狭窄，是否有新发病灶出现。所有患者行颈动脉内膜剥脱术，完整剥除斑块组织，并行连续病理切片，通过 HE 染色及
分析斑块性质，包括完整性及斑块内是否存在出血/钙化或炎症细胞浸润等。通过病理最终明确斑块性质，并与术前颈动脉斑块的影像学检查结果作对照，
以判定术前颈动脉影像学检查对于易损斑块识别的准确率。结果 12 例患者中，术前磁共振判定均为不稳定斑块，术后病理证实斑块标本中所有病例均可检查出不稳定成分，术后随访病例 CTA 血管无明显狭窄，颅脑 CT 平扫无新发病灶。
结论磁共振对颈动脉斑块稳定性评估的准确性较高，推荐作为颈动脉狭窄术前识别不稳定斑块的可靠检查，对于不稳定斑块及时行颈动脉内膜剥脱能有效预防脑卒中的发生。

PU-2516
DR 在颈椎病诊断中的应用价值

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在医疗技术突飞猛进的年代，医疗设备的更新换代，CT、磁共振的应用，大大提高了医疗诊断技术水平，增加了诊断手段，但其费用是昂贵的。DR 直接数字化 X 线摄影其清晰的影像，廉价的收费，已成为临床医生和患者的需求，通过整理，收集本科近 6 年 206 例颈椎病的 X 线诊断及通过临床治疗情况，综合分析相关资料，论证 DR 直接数字化 X 线摄影在诊断颈椎病的价值。

PU-2517
颈部 3D CE-MRA 信号变化与血管狭窄相关性探讨

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目的：探讨。材料与方法：回顾性分析一周内先后行颈部 3D CE-MRA、颈部 DSA 检查的 72 只颈内动脉的影像资料，总结颈部 3D CE-MRA 血管信号强度变化与血管狭窄程度之间的关系。结果：轻、中、重度颈内动脉狭窄组中血管信号强度降低者分别为 1 只、9 只、3 只，占比分别为 4.8%、31%、23.1%。轻、中、重度颈内动脉狭窄组中血管信号缺失者分别为 0 只、12 只、10 只，占比分别为 0%、41.3%、76.9%。颈内动脉闭塞组 9 只，均表现为血管信号缺失，占 100%。结论：①绝大

部分轻度狭窄的颈内动脉信号强度无变化；②随着颈内动脉狭窄程度的增加，3D CE-MRA 血管信号强度降低、缺失的比例增加。

PU-2518

头颈部髓外浆细胞瘤的影像表现及鉴别诊断的再认识

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目的 分析头颈部髓外浆细胞瘤的 CT 表现，提高对该病的影像诊断及鉴别诊断的认识。
方法 对经病理证实的 10 例头颈部髓外浆细胞瘤的临床（包括病史、年龄、性别、体征、家族史、实验室检查、治疗过程、手术方式、复查时间等）及影像学资料进行回顾性分析。影像学观察包括病变发生部位、病灶最大径、边界（清楚/模糊）、密度（均匀/不均匀）、强化程度（均匀/不均匀，轻度强化/中度强化/明显强化）、肿块及周围迂曲小血管、周围组织、周围骨质情况及有无淋巴结肿大等。
结果 在 10 例病例中 3 例病灶位于左侧鼻腔，1 例位于鼻咽部，2 例位于喉部，2 例位于副鼻窦内，1 例位于右侧眼眶内，1 例位于左侧眼眶、鼻腔及上颌窦内。病灶最大径大于 3cm（8/10 例）、边界清晰（5/10）、密度均匀（8/10），密度不均匀，可见坏死（2/10）。均匀渐进性明显强化（6/9），不均匀渐进性明显强化（1/9），均匀明显强化（2/9）、肿块内及肿块周围可见迂曲小血管（5/10）、周围组织受侵犯（6/10），周围骨质可见侵蚀破坏（8/10）。10 例病例均未见病灶引流区淋巴结肿大。病灶主要表现为体积较大的软组织肿块（最大径多大于 3cm），边界清晰亦可呈浸润性表现；密度均匀，少见坏死。增强扫描多呈均匀强化，强化程度多较明显（渐进性明显强化或早期明显强化），肿块内及肿块周围可见迂曲扩张的小血管影。肿瘤少见远处扩散，但可出现局部侵袭性，对临近组织的侵犯及骨质破坏。
结论 头颈部髓外浆细胞瘤的 CT 表现具有一定特点，但诊断需依靠病理。CT 检查可明确病变范围、周围组织侵犯及骨质破坏情况。

PU-2519

Spinal cord infarction presenting as Brown-Séquard syndrome result from spontaneous vertebral artery dissection

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Objective To study the imaging characteristics of vertebral artery dissection result in spinal cord infarction(SCI) presenting as Brown-Séquard syndrome.
Method Retrospectively analysis of the clinical data and imaging findings of a recent case of vertebral artery dissection in our hospital.
Result An otherwise healthy 40-year-old man presented with acute right-sided body weakness. 6 days before he experienced posterior neck pain witnout obvious inducement, neurologic examination revealed a right Brown-Séquard syndrome. Head Magnetic resonance imaging(MRI) showed normal, Further cervical spine MRI showed right side of SCI at the level of C1-C3, Three-dimensional High-resolusion MRI(3D HR-MRI) T1-VISTA

scan showed evidence of right VAD. The patient was significantly releaved in symtoms and imaging findings after therapy with anticoagulation(AC) and antiplatelet(AP) 6 months.

Conclusions we reported the case of a middle-aged patient without obvious risk factors for atherosclerosis, the possibility of VAD should be considered.Early correct diagnosis and active therapy are crucial to the prognosis.

PU-2520

大脑间变性星形细胞瘤的 CT 及 MRI 表现

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目的：探讨脑间变性星形细胞瘤的 CT 及 MRI 表现，为临床诊治提供依据。**方法**：对颅脑占位性病变的患者实施 CT、MRI 平扫及增强，选择术后病理证实的间变性星形细胞瘤患者 35 例作为研究对象。结果：CT:病灶呈低、等或混杂密度影，邻近脑白质呈指样改变，水肿明显，边界不清晰，多侵入同侧半卵圆中心，邻近侧脑室受压，中线结构向对侧移位，增强呈不均匀强化；MRI:T1WI FLAIR 以低信号为主的混杂信号，其内可见更低及高信号，代表坏死或出血，T_2WI 呈不均匀高信号，周围水肿表现为 T_2WI FLAIR 低信号，肿瘤和水肿之间可见环状低信号，代表胶质增生，增强：病灶呈斑片状、线条状或结节状强化，坏死或出血区无强化，DWI 病灶呈不均匀高信号，CHO 峰升高，NAA 峰降低，部分可见 LIP 峰，CHO/NAA 比值增大，最佳截断值为 3；术后病理表现为间变性星形细胞肿瘤，内含部分神经胶质纤维，病灶呈浸润性生长，可见片状坏死和出血，血管形成不良，血脑屏障不完整。**结论**：间变性星形细胞瘤是颅内最常见的恶性胶质瘤之一，CT 和 MRI 是首要的检查方法，MRI 增强、 DWI、MRS 等成像技术能为定性诊断提供较大的帮助。并能提供手术定位及较为精准的诊断，关于治疗的问题，术后进行放化疗综合治疗已成为其治疗的标准模式，术后调强放疗同期联合替莫唑胺化疗方法治疗，可以显著提高患者的总生存率。一般认为，由间变性胶质瘤进展到胶质母细胞瘤通常为 1～2 年，因此，尽早确诊，尽早手术格外重要。

PU-2521

脑室内中枢神经细胞瘤的 CT 及 MRI 影像表现

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[摘要]目的:分析中枢神经细胞瘤的 CT 及 MRI 影像学特点，探讨其特征性影像学表现，以进一步提高对该病的认识。方法:回顾性分析 14 例经手术病理证实的中枢神经细胞瘤。男性 8 例，女性 6 例，年龄 21-65 岁，平均年龄（30.3±12.0）岁。14 例均行 MRI 检查，5 例同时行 CT 检查。结果:14 例中枢神经细胞瘤中 10 例位于侧脑室近孟氏孔处，4 例位于其它脑脊液播散部位，包括三脑室、四脑室等；肿瘤平均直径（5.79±1.79）cm。CT 图像上肿瘤多表现为混杂密度病灶，2 例肿瘤表现为完全实性，3 例均可见钙化及囊变成分。MRI 图像上肿瘤多表现为不均匀信号病灶，T1WI 多呈等、低信号，T2WI 呈混杂高信号，囊性部分表现为明显高信号；血管流空呈条形低信号影；12 例可见肥皂泡样表现及血管流空影，8 例均可见针状体连接肿瘤实性部分与波浪形侧脑室壁；增强 MRI 肿瘤多呈不均匀强化。结论:中枢神经细胞瘤在 CT 及 MRI 上有一定的特征性，根据其特征性的影像学表现，尤其是针状体及波浪形侧脑室壁的特点，有助于中枢神经细胞瘤的准确诊断。

PU-2522

少见栓子脑栓塞的影像特点分析

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目的 分析研究少见脑栓塞的 CT、MRI 特点，提高临床医师对少见脑栓塞影像表现的认识。**方法** 回顾性分析 2016 年 1 月-2019 年 6 月于我院住院诊断为少见脑栓塞患者的一般资料，重点分析患者的 CT、MRI 特点。**结果** 共收集到少见脑栓塞患者 4 例，男、女各 2 例，年龄 30-74 岁。其中脂肪栓塞 2 例，钙化栓子栓塞 1 例，感染性心内膜炎瓣膜赘生物栓塞 1 例。收集到 CT、CTA 及 MRI 图像各 2 组，MRI 分别包括 TIWI、T2WI、FLAIR、DWI 及增强 T1WI。**结论** 脂肪栓塞 DWI 显示为皮质下白质多发点状、斑片状高信号，呈“星野征”，严重者 CT 可显示脑动脉内低密度脂肪栓子；钙化栓子栓塞 CT 平扫表现为大片低密度梗死区内的多发符合钙化 CT 值的点状高密度，呈“咸脆饼征”；感染性心内膜炎瓣膜赘生物栓塞 DWI 表现无特异性，符合一般心源性栓塞表现。

PU-2523

基于对比剂分段注射的颈髓双期 CTA 成像

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目的：探讨对比剂分段注射颈髓双期 CTA 检查在颈髓血管中的应用价值。**方法**：对 30 例临床怀疑脊髓型颈椎病拟行头颈部 CTA 检查的患者进行对比剂分段注射颈髓双期 CTA 检查（A 组），先期团注流率为 4mL/s，后期以 2mL/s 的低流率持续注射，先期团注和后期低流率持续注射对比剂剂量的比率为 3:1，采用常规峰值（P1）期和延迟平衡（P2）期双期扫描，P2 期扫描时间为峰值期扫描结束后再延迟 5S。选取性别、年龄相匹配的临床怀疑脑缺血拟行头颈部 CTA 检查的 30 例患者作为对照（B 组），B 组对比剂一次性注射，注射流率为 4mL/s，采用常规 CTA 峰值期扫描。对 A、B 组图像的脊髓前动脉（ASA）及前根动脉（ARA）的显示情况进行评分，对比 P1 期、P2 期及 B 组图像 ASA 的 CT 值及其信噪比（SNR）、对比噪声比（CNR）值。**结果**：A 组 P2 期图像的主观评分高于 P1 期和 B 组，差异有统计学意义（P＜0.05），A 组 P1 期及 B 组 ASA 的显示率分别为 50.0%和 53.3%，A 组 P2 期 ASA 的显示率为 86.7%；P1 期及 P2 期共同的显示率可达 90%。P1 期有 22 例可见 ARA 显示，共计 48 段，P2 期和 B 组显示的例数和段数分别为有 27 例、106 段和 23 例、50 段，P2 期图像 ASA 及 ARA 的显示明显优于 P1 期和 A 组。三组脊髓前动脉 CT 值及其 SNR、 CNR 值差异有统计学意义（P＜0.05），P2 期图像优于 P1 期及 B 组图像。**结论**：对比剂分段注射颈髓双期 CTA 能显著提高 ASA 及 ARA 显影质量，可以作为具有复杂血管网器官的补充 CTA 成像方法。

PU-2524

颅内原发恶性黑色素瘤 1 例并文献复习

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目的 提高对颅内原发恶性黑色素瘤的认识。 **方法** 报道一例颅内原发恶性黑色素瘤患者的诊治经过，并对该病影像学表现、诊断及治疗进行文献复习。**结果** 该患者术前行 MR 检查示右侧小脑半球见一类圆形异常信号影，T1WI 呈稍高信号，T2WI 呈等高信号，T2WI-FLAIR 病灶呈高信号，DWI 局部呈稍高信号，行右侧小脑半球肿瘤切除术，术后病理结合免疫组化符合恶性黑色素瘤，建议除外转移，术后全身 PET/CT 检查示右侧小脑半球占位切除术后改变，余未见明显代谢增高肿瘤性病变。**结论** 颅内原发恶性黑色素瘤发病率低，及时行 MR、全身 PET/CT 等影像检查利于早期诊治。

PU-2525

颈部异位性错构瘤性胸腺瘤一例

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目的:报道 1 例罕见颈部异位性错构瘤性胸腺瘤并通过文献复习以提高对本病的认识。
方法：患者男，19 岁，因“发现右侧颈部包块 10+天”入院。专科查体：右侧颈部胸锁乳突肌前缘中部皮下扪及一大小约 5×6.3cm 的包块，边界清，质中，表面欠光滑，活动度可，与皮肤稍粘连，无压痛，包块无搏动感。彩超提示右侧锁骨上窝偏低回声团块，考虑炎性包块可能。应用增强 CT 检查显示右侧锁骨上窝胸锁乳突肌后方软组织密度肿块，边缘不规则，边界清晰，密度均匀，增强后病灶呈均匀持续强化，结合其病理特殊表现，对其 CT 表现进行评估。
结果：对该病例的 CT 表现进行评估，CT 示右侧锁骨上窝胸锁乳突肌后方软组织密度肿块，大小约 2.6x5.5cm，边缘不规则，边界清晰，密度均匀，平扫及增强动静脉期 CT 值分别值约 31HU、35HU、103HU，邻近右锁骨下静脉受压变窄。术后病理诊断：右侧颈部梭形细胞肿瘤，其中穿插少许脂肪组织及鳞状上皮，周围可见包膜样结构，符合异位性错构瘤性胸腺瘤。
结论：异位错构瘤性胸腺瘤（EHT）是一种罕见的良性肿瘤，含有梭形细胞、上皮巢和脂肪组织，但是这种肿瘤的起源尚不清楚。EHT 其临床及影像学的表现与颈部其他的良性肿瘤存在一些共性。当 CT 显示下颈部皮下的肿瘤含有脂肪和软组织的混合成分时，应考虑到 EHT。但本例含有脂肪成分少，肿块在影像学上主要呈现较为均匀的软组织密度，这与其他肿瘤，如神经鞘瘤、淋巴结或异常脂肪瘤，在鉴别诊断上存在一定困难。目前在全世界对此文献报道较少，在临床上正确识别这种罕见肿瘤很重要。今后需要更多的 EHT 病例进行研究，才能正确进行影像诊断及探究其真正的组织学起源。

PU-2526

Mammary analogue secretory carcinoma: a case report

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Background: WHO 2017 defines mammary analogue secretory carcinoma (MASC) as ‘a generally low-grade salivary gland carcinoma characterized by morphological resemblance to mammary secretory carcinoma and ETV6-NTRK3 gene fusion’. The first description of MASC was reported by Skálová et al in 2010. Prior to its recognition, MASC was frequently diagnosed as acinic cell carcinoma and adenocarcinoma, not otherwise specified. The presence of an ETV6-NTRK3 gene fusion is a confirmatory diagnostic criterion for MASC.

Methods: Here we reported a case of a mammary analogue secretory carcinoma of the salivary gland recently identified in our institution, who was a 54 years old male patient presenting with a painless, slow-growing mass in the left parotid-region 3 months prior to examination.

Results: The contrast-enhanced computed tomography (CECT) study showed a partially enhancing and partially cystic mass located in the left superficial parotid gland, with mildly lobulated and well-defined boundary. The lesion size was about 1.2*1.1*1.7cm, with a CT value of 40HU before enhancement and 95HU after enhancement and 73HU in delayed CT scan. The lesion was completely resection by surgery and pathologically diagnosed as MACS which was confirmed by ETV6 translocation fluorescence in situ hybridization study. Immunohistochemical analysis: Vim (+), S100 (+), Mammaglobin (+), STAT5a (+), Dog1 (-), CK7 (+), Calp (-), Ki67 (5% +). Conclusions: MACS exhibit a lobulated growth pattern with fibrous septa and are composed of cystic structures with distinctive luminal secretion. CT can clearly show the solid and cystic components in the lesion, with significantly enhancement of the solid areas.

PU-2527

16 排螺旋 CT 在口腔齿科成像中的应用

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探讨：16 排螺旋 CT 口腔科全景成像在上下颌骨疾病中的诊断价值及相对于普通 16 排 X 线口腔全景片的优劣势。在 CT 后处理工作站上利用相关重组软件对所获得的数据进行重组重建，对病灶的检出率进行分析，并与普通 X 线口腔全景片进行比较。结果：通过比较，我们发现 16 排螺旋 CT 的口腔全景成像对病变的检出率明显高于普通 X 线口腔全景片。结论：16 排螺旋的口腔全景成像不仅能清晰显示上下颌骨的病变，而且可以对病变的形态、大小、内部结构及其与周围组织的结构关系进行深度剖析，从而对病灶进行定性，同时还提供了多种测量工具对病灶进行精确测量与定位，为临床提供最有价值的影像学依据，有助于临床医生对患者治疗方案的选择，手术计划的制定和实施，对患者以后预后的评估作出有力的依据。

PU-2528

能谱 CT 在颅内动脉瘤闭夹及栓塞术后的应用

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目的：利用宝石能谱 CT 能谱成像技术（GSI）和金属伪影消除系统（MAR）减少金属伪影对图像的影响。
方法：收集 2018 年 1 月~2018 年 7 月我院收治的 28 列颅内动脉瘤闭夹及栓塞术后的患者，行宝石 CT 能谱（GSI）扫描。重建 105keV 单能量加 MAR 图像。采用容积再现（VR）、最大密度投影（MIP）及多平面重建技术（MPR）后处理。由两位高级医生对图像质量进行 3 级评价。①优：3

分，颅内血管显示清晰，几乎无金属伪影干扰。②良：2 分，颅内血管显示清晰，少量金属伪影，不影响诊断。③差：1 分，金属伪影严重，闭夹周围血管显示不清。最后进行统计分析。
结果：28 列颅内动脉瘤闭夹及栓塞术后的患者，用宝石能谱（GSI）扫描后重建 105keV 单能量加 MAR 图像，均能得到较好的 CT 图像，能够满足诊断要求。
结论：宝石能谱 CT 特有的能谱成像技术和金属伪影消除系统，能有效的减少金属植入物的线束硬化伪影，为诊断医生及临床提供优质的图像，可为脑血管病的临床随访和疗效评估提供有效的诊断依据。

PU-2529

腮腺良恶性肿瘤影像解剖及诊断

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目的： 通过对腮腺解剖与常见肿瘤的影像特征分析，旨在合理应用影
像解剖与检查技术有助于提高常见腮腺肿瘤的诊疗水平，尤其识别血管与神经结构对指导制定手术方案具有重要的临床价值。
材料与方法：
1.解剖要点：面神经、腮腺导管、下颌后静脉与筋膜与脂肪间隙、颈外动脉与静脉血管、淋巴结。
2.病变侵犯范围判断位置，基于间隙脂肪推移判断肿瘤生长方向。
2.技术显示能力
2.1 平片显示骨骼变化与钙化征象
2.2CT 对血管病变的判断及诊断的主要方法:
2.3MRI 对导管与神经性肿瘤转移帮助非常大
2.4 导管造影对于腮腺导管病变诊断，定性及定位帮助大。
3.结果
3.1 诊断与判断：如肿瘤直接征象 、间接征象、周围累及病变范围等；
3.2 合理使用影像技术方法，实现诊断效益的最大化。
结论：识别正常腮腺解剖结构对良恶性肿瘤定位诊断十分重要，观察血管神经，淋巴结侵犯，有助于良恶性肿瘤定性及肿瘤分期，识别影像解剖血管与神经结构，为制定手术方案提供临床指导。

PU-2530

腮腺上皮-肌上皮癌的 CT 表现

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目的 分析腮腺上皮-肌上皮癌(epithelial-myoepithelial carcinoma, EMC)的 CT 表现。 **方法** 回顾性分析经病理证实的 9 例 EMC 患者的影像图像。**结果** 9 例病灶均为单侧单发肿块，肿瘤最大径线范围约 1.6～6.5 cm；5 例病灶位于腮腺浅叶，3 例位于深叶，1 例跨叶生长。8 例病灶边界清楚。4 例病灶体积较小（最大径线 1.0～2.9cm），均为类圆形实性肿块；5 例病灶体积较大(最大径线 3.0～6.5cm) ，均为分叶状肿块，其中 4 例呈囊实性肿块，1 例可见点状钙化；1 例囊性肿块，囊壁局部残存较厚。增强扫描：8 例实性或囊实性病灶中，5 例呈中度持续强化，3 例呈重度持续强化；1 例囊性肿块，囊壁中度持续强化。**结论** EMC CT 多表现为腮腺单侧单发、边界清晰、

类圆形或分叶状的肿块影，瘤体钙化少见，当最大径＞3cm 时，病灶呈分叶状且易发生囊变；增强扫描病灶实质区/囊壁呈中、重度持续强化，认识这些征象有助于做出提示性诊断。

PU-2531

头颈 CTA 主动脉达峰时间分析

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目的：探究头颈 CTA 主动脉达峰时间调整对比剂用量，达到用最小剂量的造影剂获得最佳的诊断图像。方法：回顾性分析我院 2018 年的头颈 CTA 未见异常的 300 例患者的扫描参数，采用独立样本 t 检验和单因素相关分析患者的性别、年龄、体重、身高、心率、收缩压、舒张压、体质指数、体重用量及扫描位置对达峰时间的影响。结果：患者头部与颈部达峰时间无明显差异，女性患者头颈 CTA 主动脉达峰时间快于男性患者（$p<0.05$）,头颈 CTA 主动脉达峰时间与患者的体重、身高、舒张压及体质指数呈正相关（$p<0.05$），与患者年龄、心率、收缩压及体重不相关（$p>0.05$）结论：CTA 检查结果未见异常时，患者的性别、体重、身高、舒张压及体质指数是影响患者主动脉达峰时间的主要因素，在对患者进行头颈 CTA 扫描时，可以根据以上适当调整对比剂用量及延长扫描时间，达到最小造影剂用量获得最佳的诊断图像效果。

PU-2532

基于腮腺腺淋巴瘤与腮腺混合瘤影像特征鉴别的 Logistic 回归分析

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目的 通过 Logistic 回归分析，评估腮腺腺淋巴瘤及腮腺混合瘤 MSCT 影像征象的鉴别诊断价值。

方法 选自安徽医科大学第二附属医院放射科 2016 年 1 月至 2017 年 12 月经手术病理检查或活检病理确诊腮腺腺淋巴瘤 19 例及腮腺混合瘤 32 例，通过观察病人的临床资料（性别、年龄及有无吸烟等）及 MSCT 影像征象（病灶的大小、平扫 CT 值、动脉期 CT 值，静脉期 CT 值，增强 CT 值增幅，有无“贴边血管征”及病灶内有无囊变），对其进行单因素及多因素分析，根据统计学结果建立 Logistic 回归模型。

结果 单因素分析显示病人的性别、年龄及有无吸烟史、病灶的增强 CT 值增幅、有无贴边血管征及病灶内有无囊变等征象对鉴别腮腺腺淋巴瘤及腮腺混合瘤差异是有统计学意义($P<0.05$)；多因素分析显示病灶增强 CT 值的增幅及有无贴边血管症状、病灶内有无囊变、有无吸烟史对诊断腮腺腺淋巴瘤有重要价值。

PU-2533

磁共振检查戊二酸血症Ⅰ型 1 例并文献分析

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目的：本文通过病例回顾、磁共振表现及结合文献复习，以提高影像工作者对戊二酸血症 I 型（GA-1）的认识。
方法：回顾性分析我院的戊二酸血症 I 型 1 例并文献分析。
结果：患者 1 岁男童，以头围增大就诊。磁共振影像所见：双侧大脑半球（额、颞、顶、枕叶）及双侧基底节区多发对称性斑点状、斑条状长 T1、长 T2 信号影，T2flair 为等信号，DWI 序列为高信号，ADC 图为低信号，提示病灶弥散性受限；双侧额颞部颅脑间隙增宽，部分脑裂、脑池增宽，以双侧外侧裂池为显。磁共振提示：双侧大脑实质及脑沟、裂池改变符合临床“戊二酸血症 I 型”诊断。
结论:结合文献，GA-1 是一种罕见的常染色体隐性遗传病，多在婴幼儿期发病（孕期即可有表现），临床大部分以头围增大就诊，影像表现为早期双侧大脑外侧裂及颞极增宽，随着病情进展表现为双侧基底节区 T2 高信号，DWI 水分子扩散受限。治疗包括限制赖氨酸摄入及口服左旋肉碱和维生素 B2 维持代谢，出现急性脑病危象时对症处理避免神经系统并发症的发生。

PU-2534

磁共振检查 Mikulizc 病 1 例并文献分析

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目的：本文通过病例回顾、磁共振表现及结合文献复习，以提高影像工作者及临床医师对 Mikulicz 病的认识，做到早诊断、早治疗，以免延误病情，避免因盲目手术切除涎腺，降低患者生存质量。
方法：回顾性分析我院经病理证实的 Mikulizc 病 1 例并文献分析。
结果：患者中年女性，以左侧泪窝占位就诊。磁共振影像所见：左侧泪窝区一囊实性占位，边界清楚，实性部分呈等 T1、稍长 T2 信号，周围环绕小圆形囊性灶，增强后实性成分明显强化；双侧腮腺信号不均，多发小囊性灶；磁共振提示：左侧泪窝占位及双侧腮腺改变，考虑自身免疫性相关疾病。术后病理证实为 Mikulizc 病。
结论:结合文献，Mikulizc 病多发于女性，血生化见 IgG4 升高，可有眼干、口干等临床表现，其病理学改变属于良性淋巴细胞增生性疾病，患者泪腺和涎腺组织内淋巴细胞弥漫性浸润，并有泪腺导管肌细胞增生，类似良性淋巴上皮损害的一种特殊肿瘤，腺体内有成团的成熟淋巴细胞，上皮细胞增生。影像表现分为结节型、弥漫浸润型，混合型，各型表现各异，诊断时需结合临床表现及实验室检查。鉴别诊断：舍格林综合征、Mikulizc 综合征等。治疗以糖皮质激素治疗为主。

PU-2535

颊脂垫疝病例报道 2 例

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病例资料
患者 1，女，47 岁，因“涕中带血”来我院检查，鼻窦 CT 平扫 MPR 三维重组冠状位显示双侧眶下裂增宽，左侧约 10.4mm，右侧约 10.5mm，左侧颊脂垫经此疝入眶内（图 1-A 和 B）。

患者 2，女，56 岁，因“耳鸣”来我院耳鼻喉门诊，内耳 MR 平扫显示双侧颊脂垫经眶下裂疝入眼眶，局部呈结节状短 T1 长 T2 信号，与眶内脂肪信号一致，压脂呈低信号（图 1-C 和 D）。
讨论：祥见附件

PU-2536
CT 增强于腮腺潜在恶性肿瘤鉴别中的应用价值

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目的 分析 CT 增强检查在腮腺潜在恶性肿瘤的鉴别诊断中应用价值。 **方法** 回顾性分析本院经病理证实腮腺多行性腺瘤 72 例，腺淋巴瘤 31 例（36 个病灶），基底细胞腺瘤 15 例 CT 增强后的影像学征象，重点观察病灶内有无“囊变”，“囊变”分布方式，强化特征及强化方式等。 **结果** 腮腺多行性腺瘤增强后以持续上升强化为主，且病灶可见“囊变”中心分布为主及散在点片状及结节状明显强化区，腺淋巴瘤增强后以上升-下降式强化为主，病灶内可见“囊变”并以边缘分布为主，肿瘤内实性成分延迟扫描以均匀强化为主，基底细胞腺瘤病灶以明显强化为主，病灶内可见散在裂隙状“囊变”。 **结论** CT 增强检查可以为腮腺良性肿瘤的诊断及鉴别诊断提供诊断依据。

PU-2537
只能推注左肘静脉的患者在头颈部血管成像过程对比剂注射的最佳方案

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目的：前瞻性的研究对于只能推注左肘静脉的患者在头颈部血管成像过程中，对比剂注射的最佳方案，提高图像质量。方法：对于只能推注左肘静脉的患者头颈部血管成像 30 例，分为三组，A 组使用传统注射方案，60ml 对比剂，40ml 生理盐水，注射流速均为 4.5ml/s，B 组首先推注 40ml 对比剂，然后推注 20ml 对比剂与 20ml 生理盐水混合液，最后推注 30ml 生理盐水，注射流速均为 4.5ml/s，C 组首先推注 35ml 对比剂，然后推注 10ml 对比剂与 10ml 生理盐水混合液，最后推注 30ml 生理盐水，注射流速均为 4.5ml/s.ABC 三组均使用相同的碘海醇 370 对比剂，其余扫描方案相同。随后进行 VR,MIP,MRP 等重建方式是进行图像处理，重建出颅内血管影像，由两位副主任医师以上的医师进行双盲阅片，评分。结论：C 组对比剂注射方案静脉血管干扰最小，得出的图像质量最好。

PU-2538
磁共振 3D-SPACE 序列对颅颈动脉夹层的诊断价值

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目的 探讨三维可变翻转角度快速自旋回波（3D-SPACE）序列对颅颈动脉夹层的诊断价值。**方法** 对 12 例（共纳入 60 个血管节段）经本院临床医生确诊为颅颈动脉夹层的患者同时行磁共振 3D-SPACE 与 CTA 成像，由 2 名影像科医生对夹层特征进行双盲分析，评价内容包括双腔征、壁内血肿、内膜瓣。以临床诊断结果作为参考标准，评价两种方法对颅颈动脉夹层的诊断效能，对比分析二者在识别夹层各特征方面的差异。**结果** 3D-SPACE 诊断颅颈动脉夹层与临床诊断一致性较高（Kappa 值=0.856），CTA 诊断结果与临床诊断一致性较差（Kappa 值=0.319），3D-SPACE 诊断正确率、敏感度、特异度均高于 CTA。两种方法对壁内血肿、内膜瓣的阳性检出率比较有统计学差异（P <0.05），对双腔征的阳性检出率比较无统计学差异（P >0.05）**结论** 3D-SPACE 诊断颅颈动脉夹层较 CTA 敏感，且与临床诊断一致性较高，是无创评估颅颈动脉夹层的可靠方法。

PU-2539

颅内结核抗结核治疗前后的磁共振评价

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目的 评价颅内结核治疗前后的 MRI 动态变化。方法 回顾性分析 2012 年 1 月至 2019 年 3 月 20 例颅内结核患者[男 12 例、女 8 例；年龄 12-63 岁]治疗前后 MRI 资料。结果 根据 MRI 成像特征，治疗前 20 例颅内结核患者中，单纯脑膜炎型 3 例（15%）、单纯脑实质型 6 例（30%）和混合型 11 例（55%）。部分出现继发病变，如脑积水等。经 3 个月左右的抗结核治疗后，16 例病情好转，4 例进展，单纯脑膜炎型为 2 例（10%）;单纯脑实质型 5 例（25%）,其中 2 例术后改变；混合型 13 例（65%）。结论 MRI 可清楚显示颅内结核治疗前后情况，脑结核的治疗和预防需要进一步完善。

PU-2540

骶部巨大黏液乳头型室管膜瘤侵及骶骨 1 例

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患者，男，49 岁，左侧骶尾部、臀部及大腿后侧困痛伴左下肢无力 2 年，近 2 个月症状加重并出现小便失禁，便秘等症状，严重影响生活。CT：骶 1-4 椎体骨质破坏，边缘呈“扇贝样”压迹，无硬化边，骶骨、椎管内软组织肿块；MRI：骶 1-4 椎体、椎管内软组织肿块，呈 T2WI 稍高信号，内见条状高、低信号，T1WI 等信号，椎间隙无明显受累，考虑脊索瘤。手术：骶 1-4 椎体饼状瘤体，大小约 10×5cm，呈灰白色、暗红色鱼肉样组织，包裹骶管内异常粗大神经。病理：送检肿物可见乳头状结构，部分为粘液，结合免疫组化结果，考虑黏液乳头型室管膜瘤（myxopapillary ependymomas，MPE）。

讨论 室管膜瘤是一种罕见的神经上皮肿瘤，起源于脑室、脊髓中央管表面及终丝的室管膜细胞，占颅内胶质瘤的 5%-6%，脊髓胶质瘤的 60%。MPE 是室管膜瘤的一种罕见亚型，好发于 30-40 岁青中年的脊髓圆锥、马尾及终丝区域的硬膜下，主要症状为腰骶部疼痛。MPE 虽为 WHO Ⅰ型低级别肿瘤，但可能复发或通过脑脊液在神经轴索内播散。MPE 起源于脊髓圆锥呈中心、膨胀性生长，起源于终丝区呈腊肠样、长条状生长，常推移或包裹马尾神经，可沿终丝进入神经孔向髓外和硬膜外生长，常伴有椎间孔扩大，体积较大时，可侵及脊椎，压迫周围骨质呈“扇贝样”破坏；MPE 呈 T1WI 等信号，T2WI 高信号，合并瘤内出血、囊变或粘液中富含蛋白质时，信号强度不均匀，富血供呈明显强化。骶部 MPE 累及骨质主要需与神经源性肿瘤、脊索瘤等鉴别。神经源性肿瘤沿神经生

长可致椎间孔扩大，累及骨质也呈“扇贝样”压迫性破坏，与 MPE 难于鉴别，当 T1WI 增强中强化的区域在 T2WI 图像上为高信号时，倾向 MPE，为等信号时，倾向神经鞘瘤。脊索瘤：多呈溶骨性骨质破坏，软组织肿块内可见斑点状钙化。MPE 的主要治疗手段为手术切除，肿瘤是否能完整切除是影响 MPE 的重要预后因素。

PU-2541

颌面骨青少年骨化性纤维瘤的 CT 表现

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目的：分析青少年型骨化性纤维瘤的 CT 表现，提高对本病的诊断水平。
方法：收集本院 2008 年至 2019 年 6 月经病理证实为青少年型骨化性纤维瘤的病例 9 例，回顾性分析其 CT 表现，影像观察包括病灶的个数、位置、大小、有无膨胀、病灶的密度、边界、有无硬边、骨皮质是否完整、有无骨膜反应、邻近牙的牙根吸收情况等。
结果：本组病例男女比例为 4:5，年龄范围 7 岁-16 岁，平均年龄 10.8 岁，发生于下颌骨的 4 例，上颌骨 3 例，右侧筛窦 1 例，右眼眶外侧壁 1 例；所有病例均为单发病灶，病灶直径 2cm-11cm，平均直径 6.1cm；9 个病灶中有 8 个病灶局部骨质膨胀，局部骨皮质变薄，另 1 个病灶位于下颌骨，直径 2cm，局部骨质膨胀不明显；2 例病灶呈磨玻璃密度，7 例病灶为混杂密度，其内可见斑片状钙化或骨化影；所有病灶境界清楚，局部骨皮质连续，无明显骨膜反应及软组织肿块，病灶边缘可见完整或不整的硬化边；7 例颌骨病灶中有 6 例累及牙槽骨，邻近的牙根吸收不明显；4 例下颌骨病灶均位于下颌管上方，局部下颌管受压向下移位。9 例中有 2 例分别术后 0.5 年及 1.5 年复发。
结论：颌面骨青少年型骨化性纤维瘤在 CT 上有一定的特征，认识其 CT 表现有助于提高诊断的准确性。

PU-2542

Madelung 病的认识及诊治现状

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前言　Madelung 病也被称为“多发对称性脂肪瘤病（MSL）”、“良性对称性脂肪瘤病（BSL）”、“脂肪颈”、“良性对称性脂肪过多症”、“肥颈综合征（fatlyneck syndrome）”和“Launois-Bensaude（劳诺瓦-本索德）综合征”（13：1～3），是一种罕见的成人发病代谢性疾病，发病年龄多于 30～60 岁发病率为 1:25000，M:F 为 15:1 至 30:1。国内外报道多以个案报道为主。以地中海居民多发，病因尚不清楚，最近的证据表明，MSL 是由棕色脂肪中线粒体的去甲肾上腺素能调节缺陷引起的。但 60%-90%的患者有慢性中重度酒精中毒，其特征是患者颈部、胸部、腹部或四肢有对称的、非包膜的脂肪沉积，严重眼影患者的美观及行为功能，部分颈部 Madelung 病患者甚至因为脂肪压迫导致呼吸困难、睡眠呼吸暂停、吞咽困难、发声困难和头部运动受限等。典型的影像学表现为颈部部、项部、枕部、肩部及背部或附壁、会阴部有弥漫性、对称性增厚的脂肪组织，病变不形成软组织肿块，无明显包膜，分界欠清，邻近肌肉萎缩、肌间隙增宽，可伴或不伴邻近气管受压。某些药物可缓解病情，目前的治疗方法主要有吸脂术和开放性手术，手术不以完全切除为目的，故复发率较高。停止饮酒对疾病的进一步发展没有影响。需要与肥胖症、 Cushing 综合征、淋巴瘤、唾液腺疾病、水囊瘤、甲状腺肿、气管裂囊肿、血管脂肪瘤、神经纤维瘤、多发

性脂肪瘤病等鉴别。正确全面把握该疾病的特征，可极大地减少漏诊及误诊率，最大限度地为患者提供的诊断及科学的治疗方案。本文根据现有最新国内外文献资料，从 Madelung 病的本质、病因、诊断方法、治疗等方面进行了论述。

PU-2543

舌部良性占位性病变的 MRI 影像表现

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【摘要】目的 通过分析舌部良性病变的 MRI 表现，提高 MRI 对舌部良性病变的诊断。**资料与方法** 回顾性分析手术病理证实的 43 例舌部病变术前 MRI 影像及临床资料。 **结果** 43 例患者中，男 22 例、女 21 例，年龄 3~78 岁，平均 42±21 岁。其中血管瘤 7 例（16.3%），T2WI 见流空信号；炎性病变共 11 例（25.6%），呈斑片状长 T2 信号；乳头状瘤及良性增生（9.3%），呈多发斑点状或团块状等 T1 长 T2 信号；囊肿及囊肿样病变（37.2%），呈多位于口底的长 T1 长 T2 信号；异位甲状腺 2 例（4.7%），呈等 T1 稍短 T2 混杂信号；神经鞘瘤 1 例（2.3%），T2WI 呈不均匀等高信号；脂肪瘤 1 例（2.3%），压脂序列呈低信号；淀粉样变性 1 例（2.3%）。**结论** MRI 检查对于舌部良性病变的诊断与鉴别诊断具有重要价值。

PU-2544

Mukulicz 病及其文献复习

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Mukulicz 病是一种以双侧对称性泪腺及涎腺肿大的慢性非特异性炎症，是一种发病率较低的自身免疫性炎症，目前认为可能与免疫抗体 Ig-4 相关的全身免疫性疾病的颈部表现，好发于 30 岁以上的中老年女性，常以腮腺无痛性肿大就诊，以弥漫型及多发结节/肿块型就诊多见，术前很少作出正确诊断，现结合文献分析 Mukulicz 病及 Ig-4 引起的自身免疫性疾病。

PU-2545

“室管膜瘤”的临床表现、MRI 特点及鉴别诊断

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室管膜瘤是一种生长较缓慢的来源于室管膜细胞的胶质瘤，WHO 分类为Ⅱ～Ⅲ级。好发于儿童及青少年，少数可见于中老年人。室管膜瘤无固定的临床特点，症状取决于肿瘤所在位置。常出现癫痫和颅内压增高。脑室内的肿瘤定位体征少。

PU-2546

基于 ASIR 技术的低管电压 MDCT 头颈部动脉造影的可行性研究

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目的：探讨基于 ASIR 技术的低管电压 MDCT 头颈部动脉造影的可行性，实现低辐射剂量 CT 扫描。
方法：将 92 例头颈部动脉 CT 造影患者随机分成 A、B 两组，每组 46 例，A 组患者采用 120kV 管电压，FBP 重建算法，B 组管电压为 80kV，40%ASIR 重建算法，管电流均采用 200mA，注射速率均为 5ml/s，并以相同速率追加生理盐水 30ml。对 120kV 组和 80kV 组 CT 图像的客观指标、主观图像质量评分、CT 剂量指数（CTDIvol）和剂量长度乘积（DLP）进行比较。
结果：与 A 组相比，B 组双侧颈内动脉、椎动脉、基底动脉及双侧大脑中动脉 CT 值分别升高 10.2%、9.8%、9.3%、9.1%，B 组双侧颈内动脉、椎动脉、基底动脉及双侧大脑中动脉噪声分别增加 23.8%、26.2%、24.7%、25.2%。80kV 组 SNR、 CNR 均有所下降。2 组双侧颈内动脉、椎动脉、基底动脉及双侧大脑中动脉 CT 值、噪声差异均有统计学意义。A 组图像质量评分为优、良、差的患者例数分别为 40、6、0，B 组图像质量评分为优、良、差的患者例数分别为 38、8、0，2 组间图像质量评分差异无统计学意义。A、B 两组的 CT 剂量指数（CTDIvol）分别为 10.13、3.20，CT 剂量长度乘积（DLP）分别为 1366.09、431.68。与 A 组比，B 组 CTDIvol、DLP 下降 68.4%。
结论：基于 40%ASIR 技术的 80kV 管电压头颈部动脉 CT 造影是可行的，能够在保证图像质量的前提下降低受检者的辐射剂量。

PU-2547

局灶性机化性肺炎的 CT 表现特点分析

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目的：分析局灶性机化性肺炎的 CT 影像学表现。方法：回顾性分析 10 例经手术或穿刺病理学证实的 FOP 的 CT 影像学表现，所有患者均行 64 排螺旋 CT 平扫及增强扫描检查，其中 7 例行双期增强。结果：5 例位于左肺，5 例位于右肺；4 例位于上肺，6 例位于下肺。5 例呈结节状，2 例呈肿块状，3 例呈楔形团片状。边界清楚者 6 例。毛刺 3 例，弓形凹陷征 1 例，彗星尾征 1 例。8 例病灶均呈不均匀强化，其中空泡 3 例，坏死 5 例。增强扫描后，5 例病变内见血管征，延迟强化者 4 例。合并肺门或纵膈肿大淋巴结者 3 例。结论：局灶性机化性肺炎的影像表现多种多样，缺乏特异性，需在高分辨 CT 薄层加多期增强扫描下，认真分析影像学特点并结合临床才能做出正确的诊断。

PU-2548

肺淋巴管肌瘤病的胸部影像学表现

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目的：探讨肺淋巴管肌瘤病(PLAM)的影像学表现。
方法：报告 3 例 PLAM 病例，结合文献资料对该病病因、临床特点及影像学表现进行讨论。
结果：3 例患者均为育龄期女性，首发症状均为活动后呼吸困难，其中 1 例合并气胸，1 例合并气胸及乳糜胸，1 例合并肺外淋巴管肌瘤。结合文献资料，本病常发于育龄期女性，临床表现依次为

呼吸困难、咯血、气胸、乳糜胸等。本病 X 线片常呈非特异改变，CT 较具特异性，主要表现为多发均匀分布囊状影，伴有间隔线，呈网格状改变，同时出现液气胸和淋巴结肿大，肺外也可有多发相关改变。肺功能测定常伴有阻塞性通气功能障碍。结论：CT 检查对 PLAM 具有诊断价值。对育龄期妇女发生的渐进性呼吸困难、咯血、自发性气胸应及时进行胸部 CT 检查，并应常规进行腹部和盆腔影像学检查以了解患者是否合并肺外淋巴管平滑肌瘤。

PU-2549
兔煤工尘肺模型高分辨率 CT 表现与血清转化生长因子β1 表达水平相关研究

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目的研究兔煤工尘肺模型在高分辨率 CT(HRCT)上的基本形态和血清转化生长因子β1(TGFβ1)表达。方法用≤5μm 煤尘悬液建立煤工尘肺(CWP)兔动物模型,以 0.9%氯化钠注射液作为对照组。于 2 周、1、2、3、5 个月 2 组兔行 CT 扫描,同时抽取各组兔血清用免疫组织化学法观察 TGFβ1 在肺组织中的表达。结果 CWP 兔模型肺 HRCT 早期表现为磨玻璃及实变影,中晚期出现肺间质纤维化并见微结节影及支气管扩张;TGFβ1 在 CWP 兔肺组织各细胞中的表达明显高于对照组(P<0.01),其表达数量与 HRCT 表现的肺纤维化程度一致。结论兔煤工尘肺模型成功,TGFβ1 在尘肺中有所表达,且其 HRCT 表现与 TGFβ1 密切相关。

PU-2550
基于 MSCT 定量评估慢性阻塞性肺疾病严重程度的价值

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【摘要】目的：通过 MSCT 对慢性阻塞性肺疾病（COPD）患者肺气肿 CT 定量分析，进而评估肺气肿定量参数与 COPD 严重程度之间的相关性。**方法**：选取我院呼吸科收治的 COPD 患者 72 例作为试验组，按照 COPD 全球倡议（GOLD）将患者分为 1～4 级，其中 GOLD1 级为 12 例，GOLD2 级为 23 例，GOLD3 级为 23 例，GOLD4 级为 14 例，同时选取同一时期健康志愿者（无相关肺疾病）17 例作为对照组。所有研究对象均进行配对呼吸双相 CT 扫描及肺功能检查，采用 CT 后处理软件对总肺体积（TLV）及总肺气肿体积（TEV）进行定量分析，TLV、TEV 与 COPD 分级之间的相关性分析，与肺功能参数［第 1 s 用力呼气容积（FEV1）、用力肺活量（FVC）及其比值（FEV1/FVC）］之间关系的相关分析。 **结果**：TLV、TEV 在健康对照组与 GOLD 1 级之间差异均无统计学意义（$P>0.05$），与 GOLD2～4 级之间差异有统计学意义；TEV 在 GOLD 4 级 与 GOLD 1 级、GOLD 3 级之间差异均有统计学意义（均 $P<0.05$）；TLV 在 GOLD 1 级、GOLD 2 级 与 GOLD 4 级 患者之间差异有统计学意义（$P<0.05$）；对照组、GOLD1 级、GOLD2 级、GOLD3 级以及 GOLD4 级的 FEV1、FEV1 /FVC 呈逐渐下降趋势，差异均有统计学意义(均 $P<0.05$) 。**结论**：MSCT 可对慢性肺阻塞性肺疾病患者 TEV、TLV 可准确定量分析，可客观评价肺气肿，且与肺功能指标之间有良好的相关性，因此，CT 定量评估对于 COPD 患者具有一定的临床价值。

PU-2551
基于 GOLD 分级慢性阻塞性肺疾病患者 CT 定量参数与肺功能参数相关性分析

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目的 根据慢性阻塞性肺疾病（COPD）的严重程度评估 CT 定量参数与肺功能检测（PFT）参数之间的相关性，并确定 CT 参数是否可以作为 COPD 患者的肺功能预测因子。**方法** 收集临床诊断为 COPD 患者 75 例，按照慢性阻塞性肺病全球倡议（GOLD）I-IV 标准，将患者根据疾病严重程度分为四组（GOLD1、GOLD2、GOLD3、GOLD4），招募健康志愿者 25 例定义为健康对照组（GOLD0）。所有 COPD 患者及志愿者均采用 SOMATOM Definition 64 排螺旋 CT 行完全吸气末、呼气末胸部扫描，且在 CT 检查后一周内行肺功能检测。使用自动分割软件测量所有志愿者肺气肿指数（EI），即深吸气时双肺 CT 值＜-950 HU 的区域百分比。采用单因素方差分析（*One-Way ANOVA*）比较不同 GOLD 分级 COPD 患者及志愿者的临床参数（年龄、体质指数 BMI、吸烟状况、6 分钟步行试验）、PET 结果（FVC、FEV_1、FEV_1/FVC）及 EI 结果，P<0.05 具有统计学意义。采用 *Pearson* 相关对 COPD 患者的 BMI、6 分钟步行试验、EI 与 PFT 结果进行相关性分析。**结果** 各组年龄、吸烟状况组间差异均无统计学意义（P>0.05）；BMI 差异具有统计学意义（P<0.05），且 BMI 随着 GOLD 分期的增加而下降；各组 6 分钟步行试验、PET 结果及 EI 组间差异均具有统计学意义（P<0.05），同样随着 GOLD 分期的增加而恶化、加重。BMI、6 分钟步行试验结果及 EI 与 PET 结果之间存在线性相关关系（P<0.05）。**结论** COPD 患者的 BMI、6 分钟步行试验及 CT 定量参数 EI 随着 COPD 的严重程度而变化，可以用于预测 COPD 患者的肺功能。

PU-2552
基于双气相 CT 的右肺支气管壁厚对慢阻肺通气受限诊断的价值

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目的 基于计算机辅助评估慢性阻塞性肺疾病（chronic obstructive pulmonary disease,COPD）患者吸、呼双气相支气管参数与通气受限的相关性。**方法** 收集行吸、呼双气相胸部 CT 扫描及肺通气功能检查（PFT）的慢阻肺患者，双气相 CT 图像导入“数字肺”分析软件进行处理，支气管定量分析获取两肺 3-9 代支气管壁厚（Wall thickness，WT）、管壁面积百分比值（Wall area ratio，WA%）。采用 Pearson 相关或 spearman 秩相关分析评价此支气管参数在吸气相、呼气相、双气相差值法及比值法下分别与肺功能中 FEV1%、FEV1/FVC 的相关性，并分析 WT 与 WA%的相关性。利用偏相关分析排除 WT 与 WA%潜在影响。**结果** 最终纳入 89 例慢阻肺患者。支气管壁厚（WT）在吸气相下右肺中下叶第 4 代、中叶第 7 代、下叶第 5 代及左肺上叶第 7 代与肺功能相关（右肺 r=0.23~0.34，左肺 r=-0.26，P＜0.05）；在双气相差值法及比值法下右肺第 4 代、中叶 5-7 代、下叶第 6 代及左肺上叶 4-5 代、下叶第 7 代与肺功能有关（右肺 r=0.23~0.62；左肺 r=0.27~0.46，P＜0.05）；在呼气相下与肺功能不相关。其中 WT 在吸气相下右肺下叶第 4 代，差值法及比值法下右肺第 4 代、中下叶第 6 代及左肺上叶第 4 代与管壁面积百分值（WA%）相关（P＜0.05）。控制以上支气管的 WA%行偏相关分析，WT 在吸气相下右肺下叶第 4 代、差值法及比值法下右肺中上叶第 4 代、中下叶第 6 代与肺功能相

关（吸气相 r=0.26，双气相 r=0.24~0.53，P＜0.05）。WA%在单、双气相下基本与肺功能不相关。**结论** 基于定量 CT 的慢阻肺患者在评估通气受限时支气管壁厚优于管壁面积百分比值，右肺优于左肺，且右肺支气管壁厚与肺功能独立相关性较好。双气相优于单气相，差值法与比值法无明显差异。

PU-2553
基于 KARL 迭代算法对 COPD 低剂量 CT 扫描条件下肺气肿定量测量的影响

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目的 探讨 KARL 迭代重建算法在低剂量与常规剂量扫描条件下对慢性阻塞性肺疾病（COPD）患者肺气肿指数定量的影响。**方法** 前瞻性收集我院 2019 年 1 月～2019 年 3 月符合肺功能诊断的 COPD 患者 30 例，其中男性 25 例，女性 5 例。采用联影 uCT-760 128 排螺旋 CT 对 30 例患者进行常规剂量（120kV,150mAs）与低剂量（120kV,80mAs）扫描，常规剂量采用滤波反投影（filtered back projection ,FBP）重建，低剂量采用 FBP 与 KARL 迭代算法重建，计算有效辐射剂量（ED），在肺动脉分叉层面计算升主动脉 CT 值与噪声（SD 值）并计算信噪比（SNR）。将 3 组扫描原始数据导入“数字肺”检测及分析平台，计算出肺气肿指数（EI）、全肺容积（LV）及全肺平均肺密度（MLD）。采用配对样本 t 检验分析图像 CT 值、SD、SNR 与 CT 定量指标差异。Bland-Altman 分析计算肺气肿平均测量偏差。P＜0.05 差异具有统计学意义。**结果** 常规剂量和低剂量有效辐射剂量分别为 6.91±0.53mSv 和 3.71±0.28mSv，下降约 47%。常规剂量 FBP 组与低剂量 FBP 组 LV、MLD 及主动脉 CT 值差异无统计学意义（P＞0.05），EI、SD 与 SNR 差异有统计学意义（P＜0.05），常规剂量 FBP 组与低剂量 KARL 迭代重建组各定量指标差异均无统计学意义（P＞0.05）。与常规剂量 FBP 组相比，低剂量 FBP 组 EI 高估 4.1%，KARL 迭代重建组 EI 高估 1.7%。 **结论** KARL 迭代重建的低剂量 CT 可用于 COPD 患者定量测量，KARL 迭代重建技术在降低噪声、提高 SNR 的同时一定程度上提高了 CT 定量测量 EI 的准确性。

PU-2554
肺癌合并 COPD 及单纯性肺癌的影像学和临床特征差异分析

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目的 采用 MSCT 扫描对 COPD 患者行影像学表型诊断，探讨 COPD 影像学表型与肺癌分型的关系。**材料与方法** 回顾性分析从 2013 年 2 月到 2017 年 12 月期间在扬州大学附属医院诊断为肺癌并且合并有 COPD 的患者 99 例及同期收治的单纯性肺癌患者 62 例，所有患者均进行多层螺旋 CT 检查及 PFT 肺功能检查，分析两组间原发肿瘤的发生部位、性别、年龄、吸烟史、吸烟指数、肺功能指标及肺癌的病理类型等资料的相关性。测量并比较病例组和对照组多层螺旋 CT 定量测量指标及肺功能指标的差异，观察肺癌合并 COPD 患者多层螺旋 CT 定量测量指标与肺功能指标的相关性。采用 SPSS20.0 软件对结果进行统计学分析。计数资料比较采用卡方检验，计量资料的比较采用 t 检验，以 P<0.05 为差异有统计学意义。以 P<0.05 为差异有统计学意义。肺癌合并 COPD 患者多层螺旋 CT 定量测量指标与肺功能指标进行相关性分析。P＜0.05 为差异有统计学意义。

结果 在肺癌合并 COPD 组中的患者一般以男性、吸烟及中央型肺癌为主，病理学分型以鳞状细胞癌为主；而在单纯肺癌组的患者则以女性、不吸烟及周围型肺癌常见，病理学分型以腺癌多见，二者之间存在明显统计学差异，但是在年龄之间无明显统计学差异。COPD 组深吸气末全肺容积(V)明显高于对照组，差异具有统计学意义(P＜0.05)；COPD 组用力肺活量(FVC)、第 1 秒用力呼气量(FEV1)、第 1 秒用力呼气量与用力肺活量百分比(FEV1/FVC)均明显高于对照组，残气量(RV)、肺总量(TLC)、残气量与肺总量百分比(RV/TLC)均明显低于对照组，差异均有统计学意义(P＜0.05)。

结论 COPD 合并肺癌与单纯肺癌为相互独立的疾病，CT 表现及临床特征的差异有助于二者之间的鉴别诊断，为疾病的疗效及预后的判断提供相关依据。

PU-2555
基于多层螺旋 CT 图像对 COPD 患者肺小血管改变的特征性分析

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目的 评价 COPD 患者肺小血管横断面积占肺血管总面积百分比（%CSA）与其疾病严重程度的相关性。

方法 收集我院临床确诊的 COPD 患者 124 例（男 80/女 44）；健康人 106 例（男 48/女 58）。两组均行 CT 及肺功能检查，测量 FEV1、FVC、FEV1/FVC%及 FEV1%，按照 PFT 结果将 COPD 组分为 3 个亚组：GOLD I 为轻度组，GOLD II 为中度组，GOLD III、IV 为重度组。使用 Image J Version 软件测量升主动脉、降主动脉、气管分叉处三个层面亚段（CSA<5mm^2）、亚段以下（CSA5-10mm^2）肺小血管面积，并计算%CSA<5mm^2、%CSA5-10mm^2。

结果 COPD 组与对照组总体$\%CSA_{<5}$、$\%CSA_{5-10}$ 均存在差异（t=-8.46/-5.87，P<0.05）；COPD 患者轻、中、重度组$\%CSA_{<5}$、$\%CSA_{5-10}$ 均显著小于对照组（P<0.05），且随着 COPD 严重程度增加而逐渐减小。COPD 患者轻、中、重三组间%CSA5、%CSA<5-10 有显著差异（F=34.91、25.21；P<0.05），轻度组与重度组、中度组与重度组间有显著差异（P<0.05），而轻度组与中度组无显著差异（P>0.05）；$\%CSA_{<5}$及$\%CSA_{5-10}$ 两个参数的 ROC 曲线下面积分别为 0.765、0.752，敏感度分别为 78.3%、61.3%，特异度分别为 34.7%、23.7%；COPD 组$\%CSA_{<5}$、$\%CSA_{5-10}$ 与 FEV1、FVC、FEV1/FVC%、FEV1%均呈正相关（r=0.249、0.462、0.431、0.456；0.18、0.342、0.384、0.408，P<0.05）。

结论 COPD 患者$\%CSA_{<5}$ 及$\%CSA_{5-10}$ 随疾病严重程度增加而减小，且与肺功能有相关性，肺小血管截面积（%CSA）可作为评估 COPD 患者严重程度的新方法。

PU-2556
慢性阻塞性肺疾病 CT 定量分析气流受限与肺功能相关性研究

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目的：研究 CT 定量分析肺气肿和 3-5 级支气管相关参数，评估其与气流受限和肺功能的相关性以及临床应用价值。**方法** ：收集 2017 年-2019 年就诊慢性阻塞性肺疾病（COPD）患者，35 例为研究组，35 例健康者为对照组。均常规行临床肺功能检查和呼吸双相胸部 CT 平扫。应用后处理软件测

量呼吸双相肺容积（LVi、LVe）,容积比(LVe/Vi)；并设研究组肺气肿体素指数 $LAA_{950}E$（%）、$LAA_{950}I$（%），$LAA_{910}E$（%）、LAA_{910} E-I（%）。利用气道分析软件测量左右肺上叶尖段或前段，左右肺下叶后基底段 3-5 级支气管中点处气道参数，包括壁厚度(WT)、腔面积（LA）、壁面积比值百分比(WA%)、腔面积百分比（AI%）等；比较两组之间参数差异性；再将其分别与临床肺功能指标进行相关性分析。**结果**：1、两组肺功能指标有差异（P<0.05）；研究组全肺肺气肿体素指数、肺容积参数与对照组存在差异（P<0.05）。且研究组肺气肿体素指数、肺容积参数与肺功能指标均有不同程度相关性，LVe、LVe/LVi 与 FEV1%、FEV1/FVC 之间呈不同程度正相关（r=0.492-0.963,P 均<0.05）。$LAA_{950}E$（%）、$LAA_{910}E$（%）、LAA_{910} E-I（%）呈不同程度负相关（r=-0.472--0.755,P 均<0.05）。2、两组气道参数指标部分有差异（P<0.05），具有统计学意义。呼气相 LA 、WA% 、AI%与肺功能的相关性高于吸气相，相关系数随着管腔变小而增加；第 5 级支气管 AI% 、WA%与 FEV1%、FEV1/FVC 呈明显正相关（r=0.346-0.413,P 均<0.05）。**结论**：CT 定量分析肺气肿和气道相关参数，与肺功能指标均有良好的相关性。可以准确、直观反映气流受限程度，气道重构和肺功能受损程度。可作为 COPD 患者进行分级和预测一种有效途径，具有较高的临床应用价值。

PU-2557
基于 CT 双气相扫描对 COPD 患者肺容积定量研究

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目的 基于数字肺测试平台对吸、呼双相 CT 肺容积定量分析，探讨 CT 肺容积定量测量在正常人与慢性阻塞性肺疾病（chronic obstructive pulmonary disease，COPD）中的临床应用价值。**方法** 初步收集我院 2016 年 11 月至 2018 年 2 月，正常人 91 例和慢性阻塞性肺病患者 61 例的双气相胸部 CT 数据。采用 128 层螺旋 CT 进行双气相胸部扫描，所得图像导入数字肺测试平台进行分析，统计分析软件采用 SPSS20.0。**结果** 慢阻肺双气相肺容积差异具有统计学意义，p ＜0.01，且吸气相肺容积（LVin）＞呼气相肺容积（LVex）。慢阻肺与正常人双气相肺容积差异具有统计学意义，p ＜0.01，且正常人肺叶容积明显小于 COPD 患者。定量分析正常人与 COPD 患者各肺叶双气相肺容积结果显示：无论吸气相或呼气相肺容积差异均以左肺上叶变化最显著（吸气相肺容积差约 506.57±119.39ML，呼气相差约 468.74±111.2ML），变化最小的是右肺中叶（肺容积差约 115.45±36.07ML）。**结论** CT 定量测量可判断各肺叶病变的严重程度，一方面对 COPD 患者有一定的临床诊断价值，同时呼气相可辅助吸气相评价 COPD 病变程度；另一方面，对肺减容手术的评估提供有效的临床价值。

PU-2558
慢性阻塞性肺疾病合并重度肺动脉高压患者肺小血管区的 CT 评价

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目的：严重肺动脉高压在慢性阻塞性肺疾病中是很少见的,一种独特的表型已经被假设。我们的目的是评估 CT 能否测量肺小血管。

材料与方法：COPD 患者在稳定期行肺功能检查、胸部 CT 平扫及右心导管(RHC)检查。在 105 例患者中，20 例 COPD 合并重度 PH(平均肺动脉压>35 mmHg)与 20 例 FEV1 匹配、年龄匹配的 COPD 伴轻度或不伴 PH(mPAP<35 mmHg)进行比较。CT 检查测量肺面积(%CsA<5)、5~10mm2(%CSA5~10)、平均横断血管数(CSNS)、支气管壁厚度(WT)小于 5mm2 的总横截面积百分比，并进行组间比较。通过接受者操作特征分析，比较 PAW 评分结合 PaO2 和 CT 参数与 mPAP 的相关性，预测 COPD 重度 PH。
结果：重度 PH 组 CsA 和 CSN 值均高于无重度 PH 组，差异有显著性(P<0.0 5)。多元回归分析显示，%CsA<5 和 WT 分别为重度 PH 和非重度 PH 患者 mPAP 的最佳预测因子。综合%CsA<5、PaO2 和 WT 能更好地预测 COPD 患者的重度 PH。
结论：COPD 合并重度 PH 时，小血管的 CT 测量支持明显的血管相关表型，结合动脉血氧饱和度(PaO2)和野值(WT)，可为 RHC 的选择提供一种非侵入性的工具。

PU-2559

多层螺旋 CT 对于 COPD 肺气肿进展期患者气道壁厚度及肺小血管相关性的诊断价值研究

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目的：
近年随着多层螺旋 ct 的日益广泛应用，copd 患者的影像学资料愈加齐全及完备。多层螺旋 ct 能探测与肺气肿相关的肺组织的丢失情况；并且能获得气道壁的厚度及壁面积的百分比。肺小血管（横截面小于 5mm^2）的百分比值目前被认为是表达肺灌注的一个技术参数。本文旨在分析这些影像学数值的变化对于 copd 肺气肿加重患者的解剖结构的改变。
方法：
我们对 58 名患者均进行了肺功能测试，多层螺旋 ct 检查和 copd 评估。我们分析了 ct 的各项指数，检查了 copd 加重患者的影像学结构的变化。
结果：
copd 评价表和第一秒用力呼气容积在两年的随访中没有明显的改变。肺气肿的参数变化值明显增加。另一方面远端气管壁的百分比明显下降或趋于下降，同时肺小血管的百分比在此段时间轻微或明显上升，特别是前吸烟者。在 copd 急性加重期间患者或终止吸烟患者肺气肿参数改变更加明显，相比较而言，支气管壁厚度与肺小血管百分比并不随着肺气肿的进展而呈比例性改变。
结论：
远端支气管管壁厚度比与肺小血管百分比并不与肺气肿的低密度区在同一时期呈平行改变。我们假设气道病变及肺血管重建在某种程度上是可逆性的，通过终止吸烟或适当的治疗。合理的处置对于肺血管病和气道病变比早期的 copd 的肺实质破坏有更佳的作用。
创新点：关于 COPD 患者的健康状态及肺功能的研究已经报道过很多了。但 COPD 的肺部结构异常改变没有被清楚地解释。肺气肿变化进程的研究也被报道过，但是对于气道变化和肺小血管重组的改变是很稀少的。肺泡的破坏、气道病和肺血管改变还是未知的。而且，COPD 患者加重期和吸烟终止者的结构数据没有被建立过。
所以，本次研究是通过多排螺旋 CT 对 COPD 患者的肺部结构异常进行动态随访；并且去区分肺气肿、气道病及肺血管病的分类、分级；并可以对于 COPD 患者急性加重期患者或吸烟终止者的肺结构的变化。

PU-2560

双源 CT 肺小结节分析对早期肺癌的诊断价值

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【摘要】目的：探讨双源 CT 肺小结节分析对早期肺癌的诊断价值。方法：收集 2018 年 1 月-12 月经病理活检证实的肺小结节患者 49 例，男性 29 例，女性 20 例，行 SOMATOM Definition 双源 CT 增强扫描，扫描后经西门子副控制台计算机及 mmwp4661 工作站处理，显示结节与血管关系，实性结节工作站自动测量最大层面直径、正交直径、体积，部分实性或磨玻璃结节手动勾画边缘测量最大层面直径、正交直径、体积；采用西门子后处理工作站 snygo.via 中双能量模块后处理测量结节碘浓度。结果：49 例病例共 62 个小结节，其中恶性 51 例，良性 13 例，实性结节 18 例，混合实性结节 31 例，纯磨玻璃结节 13 例。1）良恶性肺结节在大小方面无明显差异（t=0.329，P>0.05）。2）良恶性结节在体积方面差异具有统计学意义（t=0.0117，P＜0.05）。3）良恶性结节在碘浓度方面差异具有统计学意义（t=0.023，P＜0.05）。结论：双源 CT 肺小结节分析中体积分析、碘浓度分析能增加 CT 诊断早期肺癌的诊断效率。

PU-2561
多层螺旋 CT 低剂量灌注扫描对中晚期非小细胞肺癌化疗疗效的评价研究

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目的： 探讨多层螺旋 CT 低剂量灌注扫描对中晚期非小细胞肺癌化疗疗效的评价，旨在及时有效地确认化疗方案的有效性，便于最大效能使用化疗方案或修订化疗方案，减少患者无效化疗的时间、减少无效化疗药物对患者的损害、减轻患者及家属对无效化疗药物的经济支出。
材料与方法：35 例经病理确诊的非小细胞肺癌，男性 20 例，女性 15 例，年龄 35-75 岁，中位年龄 56 岁。其中腺癌 25 例，T3 期 10 例，T4 期 15 例；鳞癌 10 例，T3 期 3 例，T4 期 7 例。15 腺癌的治疗方案为标准的化疗,10 例腺癌的治疗方案为靶向治疗；鳞癌的治疗方案为标准的化疗方案。35 例中晚期非小细胞肺癌患者均在化疗方案实施前、化疗方案实施两个疗程、四个疗程后进行多层螺旋 CT 低剂量灌注扫描，将灌注数据通过肿瘤灌注分析软件进行灌注分析，主要分析肿瘤大小、BFD、BVD、TMAXD 及 FED 的前后变化。将数据进行统计分析，并进行 X^2 检验。
结果：35 例非小细胞肺癌在第二个化疗疗程结束后 20 天，10 例肿瘤大小无明显变化，25 例肿瘤大小有轻度缩小；第四个化疗疗程结束后 20 天，在第二个化疗疗程结束后 20 天后肿瘤体积无明显变化的 10 例患者中出现 6 例患者肿瘤体积有缩小，25 例肿瘤体积有轻度缩小的患者肿瘤体积继续缩小。在 BFD、BVD、TMAXD 及 FED 方面，31 例患者的肿瘤 BFD、BVD、TMAXD 及 FED 在第二、四个化疗疗程结束后 20 天后出现不同程度持续下降，4 例患者的肿瘤的 BFD、BVD、TMAXD 及 FED 在第二、四个化疗疗程结束后 20 天出现持续上升，同时肿瘤体积在第四个化疗疗程结束后 20 天后复查时肿瘤体积增大。
结论：多层螺旋 CT 低剂量灌注扫描能够有效判断非小细胞肺癌的化疗疗效，尤其是两个疗程后就可以早期判断非小细胞肺癌对化疗疗效的敏感性，能够及时指导化疗医师制定和调整化疗方案。

PU-2562

探讨 DL-CAD 对肺结节的定性诊断价值及良恶性肺结节的影像表现

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摘要：目的　探讨 DL-CAD 对不同病理类型肺结节的检出率及良恶性预测价值，并总结不同类型肺结节在多排 CT（MDCT）的影像特征。方法：回顾性分析我院 2017 年 1 月-2019 年-6 月有确切术后病理的肺结节（共 155 个病灶）多排螺旋 CT 影像资料，把病灶分为浸润性癌组 87 个病灶，微小浸润性癌组 11 个病灶，浸润前组（不典型腺瘤样增生+原位癌）39 个病灶，良性病灶组 18 个病灶，用 DL-cad 对 4 组病灶进行分析并记录病灶的检测情况及对病灶良恶性的预测值，再由 2 名放射医师对 4 组病灶的大小，实性成分（实性结节、混合密度结节、纯磨玻璃结节），瘤肺界面（清晰光整、模糊）、空泡征、毛刺、血管集束征、胸膜凹陷及病灶形态（圆形或类圆形）等进行对比分析。
结果：CAD 对肺结节的检出率为 99.3%，诊断符合率为 81.2%。分叶、血管集束、胸膜凹陷、不规则形在肺癌组与良性病变组比较，差异有统计学意义。ROC 曲线分析显示曲线下面积为 0.821，二者敏感度和特异度分别为 84.7%和 66.7%，
结论：CAD 系统检出率和诊断正确率较高，可以辅助放射科医生，此外通过 CT 征象的全面分析，可以有效提高肺结节定性正确率。

PU-2563
健康体检人群肺亚实性结节发病率的低剂量螺旋 CT 研究

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目的　应用低剂量螺旋 CT 对健康体检人群进行研究，探讨国人肺亚实性结节的发病率及年龄分布特点，使早期肺腺癌防治更有针对性。

方法

1.1　一般资料

选取 2017 年 1 月～2017 年 12 月来我院体检中心进行胸部低剂量螺旋 CT 检查的健康体检者。纳入标准：①在我院体检中心进行胸部低剂量螺旋 CT 检查者；②直知情并同意进行健康随访。剔除标准：①年龄＜18 岁；②既往已确诊为肺癌或其它部位肿瘤的患者；③图像质量差。按照纳入和剔除标准，共中 52995 例检查者进入研究，男 32212 例，女 20783 例，年龄范围 18～97 岁。将所有体检者按年龄不同分为 7 组：18～29 岁组；30～39 岁组；40～49 岁组；50～59 岁组；60～69 岁组；70～79 岁组；80 岁以上组。

1.2　CT 检查方法、步骤及图像分析

德国西门子 SOMATOM Definition AS+ 128 层螺旋 CT 扫描仪。扫描前对受检者进行呼吸训练，常规行胸部低剂量螺旋 CT 扫描，管电压 120kV，30～50mAs，重建层厚 1.25mm。由我科中级职称以上医师对图像进行观察。

1.3　统计学方法

运用 PSS17.0 统计进行统计学分析。计数资料以例数和百分率表示，率的比较采用卡方检验进行分析，$P<0.05$ 为差异具有统计学意义。

结果

2.1　无因图像质量差而剔除检查者。

2.2 健康体检人群亚实性结节的发病率为 2.11%，女性的发病率为 3.91%，明显高于男性（1.6%），$P<0.05$.
2.3 女性亚实性结节发病率随着年龄增长有升高趋势，男性 70 岁以前发病率有升高趋势，随后发病率降低。

结论 健康体检人群亚实性结节的发病率为 2.11%，女性的发病率明显高于男性，且随着年龄增长有升高趋势，应该注重中老年女性的健康体检。低剂量螺旋 CT 能准确的发现亚实性结节，有利于早期肺腺癌防治。

PU-2564
1.5T 磁共振弥散加权成像在肺部良恶性肿块鉴别诊断中的应用价值

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本研究运用 1.5T 磁共振成像仪得出受检者肺部 DWI 图像，对肺部肿块的 DWI 信号强度及 ADC 值特点作统计分析，得出成像最优 b 值，为良恶性肺部肿块的鉴别诊断提供帮助。方法 选取 18 例恶性病灶和 22 例良性肿块，应用 GE signa HDX t 1.5T 磁共振成像仪和 Torso 相控阵表面线圈进行横断面 DWI 成像，在 ADW4.5 工作站上，利用 Functool 软件生成 DWI 图和 ADC 图。在 DWI 横断面上以胸髓的信号作为参照，选取病灶实性成分最大层面，病灶在 DWI 上的信号强度，分成四个等级：低（低于相应平面肌肉的信号）、稍低（介于相应平面肌肉的信号和胸髓信号之间）、等（等于胸髓的信号）和高（大于胸髓的信号）。在横断面 ADC 图上选择感兴趣区，避开坏死、出血区域，放置三个面积大致相同的感兴趣区，面积 70-100mm2，计算出平均 ADC 值，以均数±标准差(s)作为记录的方式。应用 SPSS17.0 统计学软件进行数据处理，采用单因素方差分析比较不同 b 值组病灶良、恶性病变 ADC 值。采用受试者操作特征曲线（receiver operating characteristic, ROC）分析不同 b 值组 ADC 值对肺良、恶性病变进行鉴别诊断的效能，以 $p<0.05$ 为差异有统计学意义。**结果** 本研究中肿块信号以相应层面胸髓作为参照物，大多数肺部恶性肿块在 DWI 上都呈等、高信号，大多数良性肿块呈低、等低信号。可见，评价病灶信号强度有助于良恶性肿块的鉴别诊断。此外，本研究结果显示，以 500 s/mm2 为最佳弥散系数时，恶性病灶中 2 例鳞癌、1 例腺癌呈等信号，与多数良性肿块信号相似。良性肿块中 1 例结核性肉芽肿、1 例非特异性炎性肉芽肿病变呈高信号。**结论** 磁共振 DWI 及 ADC 值对肺部良恶性肿块的鉴别诊断价值较高，且 ADC 值对肺癌的分类有一定价值，一定程度上可以反映肿块内细胞密度情况。

PU-2565
能谱 CT 定量分析对孤立性肺结节诊断价值

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目的　　探讨能谱 CT 定量分析对孤立性肺结节的诊断价值。方法　收集我院 33 例行双期能谱 CT 扫描的孤立性肺结节患者影像学资料，根据术后病理将 33 例病例分为恶性结节组（24 例）、良性结节组（9 例）。分别测量两组结节的动静脉期 40~70KeV 能谱曲线斜率、动静脉期碘（水）浓度、动静脉期水（碘）浓度、动静脉期标准化碘（水）浓度等定量指标。应用 SPSS17.0 统计学软件，对两组病例动静脉期 40~70KeV 能谱曲线斜率、动静脉期碘（水）浓度、动静脉期水（碘）浓度及动静脉期标准化碘（水）浓度采用独立样本 t 检验。　结果　动脉期 40~70KeV 能谱曲线斜率、静脉期 40~70KeV 能谱曲线斜率、动脉期碘（水）浓度、动脉期水（碘）浓度、静脉期水（碘）浓度、动脉期标准化碘浓度、静脉期标准化碘浓度均无统计学意义（P＞0.05），静脉期碘（水）浓度具有统计学意义（P＜0.05）。结论　静脉期碘（水）浓度在一定程度上可以为鉴别良恶性孤立性肺结节提供依据，动脉期 40~70KeV 能谱曲线斜率、静脉期 40~70KeV 能谱曲线斜率、动脉期碘（水）浓度、动脉期水（碘）浓度、静脉期水（碘）浓度、动脉期标准化碘浓度、静脉期标准化碘浓度等能谱定量指标仍需扩大样本量后，进一步探讨其诊断效能。

PU-2566
超高分辨率 CT（Ultra-HRCT）靶扫描对肺孤立性磨玻璃结节的诊断价值研究

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目的　探讨超高分辨率 CT（Ultra high resonance CT， Ultra-HRCT）靶扫描对肺孤立性磨玻璃结节的诊断价值。 **方法**　回顾性性分析 2017 年 6 月-2018 年 6 月于上海市胸科医院及杭州市萧山区第一人民医院进行 Ultra-HRCT 靶扫描的 70 例孤立性磨玻璃结节患者的影像及病理资料。肺结节平均直径为（11.0±4.2）mm。70 个结节进行手术切除后病理结果显示其中 1 个为良性结节（结核）、1 个为非典型腺瘤样增生(atypical adenomatous hyperplasia，AAH)、11 个为原位癌(adenocarcinoma in situ，AIS)、29 个 为微浸润腺癌(minimally invasive adenocarcinoma，MIA)，28 个为浸润性腺癌(invasive adenocarcinoma，IAC)。70 个病例均行常规 CT 扫描和 Ultra-HRCT 靶扫描， 由 2 名高年资放射科医师阅片，评价图像质量、 判断结节类型、给出诊断结果， 并对阅片结果进行统计学分析。 **结果** Ultra-HRCT 靶扫描在显示肺结节在显示空泡征、支气管征、胸膜凹陷征及实性成分方面优于常规 CT 检查（ P<0.05）， 尤其在显示实性成分上方面两者有非常显著统计学差异(P<0.01)。与常规 CT 比较， Ultra-HRCT 靶扫描的诊断正确率增高（c2=5.909,P<0.05）。 **结论** Ultra-HRCT 靶扫描可以更清晰地显示肺磨玻璃结节边缘结构及内部特征，尤其是对实性成分的显示具有较明显的优势。对通过常规 CT 检查难以确诊或需重点隔期复查的肺磨玻璃结节，建议采用 Ultra-HRCT 靶扫描进一步检查。

PU-2567
DWI 在鉴别肺部肿块与阻塞性肺不张中的应用

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目的 探讨 3.0T 磁共振 DWI 技术在 CT 难以鉴别的肿块与阻塞性肺不张中的应用价值。**方法** 对 33 例 CT 疑似肿块合并阻塞性肺不张患者（由临床或 PET-CT 确诊）行磁共振 T1W-FFE、T2W-TSE 及 DWI-EPI 扫描，观察肿块与肺不张在各序列的信号特征，并于 b=800s/mm^{2}的 DWI 图像上测量肿块与

阻塞性肺不张区域的表观弥散系数（ADC）及二者的信号强度（SI）并进行比较。**结果** T1WI、T2WI、DWI 和 T2WI+DWI 能区分肿块与阻塞性肺不张的比例分别为 12 例(36.36 %) 、24 例(72.73 %)、30 例(90.91%)、30 例(90.91%)。在鉴别能力上，DWI>T2WI>T1WI(P<0.05)；联合应用 DWI+T2WI 鉴别能力与单独运用 DWI 无显著性差异（P>0.05）。肿块的 ADC 值低于阻塞性不张(P <0.05) ，二者[1]分别为(1.15±0.14)′1 0^{-3} s/ mm^2、(1.74±0.15) ′1 0^{-3} s/mm^2 ，在 DWI 相，肿块信号强度高于阻塞性不张(P<0.05) 。 **结论** 3.0T MRI DWI 技术在鉴别肿块与阻塞性肺不张鉴别中具有重要价值，可鉴别常规 CT 及 T1WI 及 T2WI 无法鉴别的部分病例。

PU-2568
MSCT 灌注联合 MVD 测定对孤立性 NSCLC 病理分级的临床价值研究

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摘要　目的：探讨多层螺旋 CT（Microvessel-slice spiral CT，MSCT）灌注成像参数联合微血管密度(Microvessel density MVD)测定对孤立性非小细胞肺癌（NSCLC）患者病灶分化程度的诊断价值。方法：回顾经病理证实的 46 例肺部孤立性 NSCLC 患者治疗前的病灶 MSCT 灌注结果，统计其灌注测定参数，与术后 MVD 测定值比较，分析肿瘤组织不同病理分化程度之间差异。结果：全部患者中，血容量（BV）在 NSCLC 的高、中、低分化程度鉴别中及毛细血管通透性（PS）在高、低分化鉴别中差异具有统计学意义（P<0.05），其中以 BV 值差异最大；不同分化程度的 NSCLC 患者 MVD 差异存在统计学意义，血流量（BF）、BV、PS 与 MVD 呈正相关，平均通过时间（MTT）无明确相关性。结论： MSCT 灌注成像可定量反映活体肺部病变血管生成状况，对术前判断 NSCLC 病灶分化程度具有参考价值。

PU-2569
传统 CT 形态学特征对 NSCLC 患者 EGFR 基因突变状态的预测价值

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目的：探讨传统 CT 形态学特征预测非小细胞肺癌（NSCLC）患者 EGFR 基因突变状态的诊断价值，并联合临床特征构建 EGFR 基因突变预测模型。
方法：回顾性分析病理证实为 NSCLC 并行 EGFR 基因检测的 243 例患者的影像学资料，其中突变型有 112 例，突变率为 46.1%，野生型有 131 例。比较分析两组患者的 5 个临床特征（性别、年龄、临床分期、CEA 水平及吸烟情况）和 17 个传统 CT 形态学特征（最大直径、密度、形状、分叶、胸膜凹陷征等）。将 EGFR 基因突变状态作为因变量、有差异的特征作为自变量进行多因素 Logistic 回归分析，并对回归预测概率和各单独特征进行 ROC 曲线分析。
结果：单因素分析显示，性别、临床分期、最大直径、密度、纵隔或肺门淋巴结肿大、位置、空泡征及 CT 支气管征在两组间的差异具有统计学意义（P＜0.05）。多因素 Logistic 回归分析显示，性别、密度和病灶位置是 EGFR 突变型的独立预测因素，对回归预测概率进行 ROC 曲线分析后，AUC 为 0.693(P＜0.05)。对各单独特征进行 ROC 曲线分析后，性别、密度和病灶位置的 AUC 分别为 0.608、0.631 和 0.579。
结论：在 NSCLC 患者中，性别、病灶密度和病灶位置与 EGFR 基因突变密切相关，女性患者、亚实性密度以及周围型肺癌可提示 EGFR 基因突变阳性。

PU-2570

肺神经内分泌肿瘤的影像诊断与病理对照

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目的

分析肺神经内分泌肿瘤的 CT 表现，并与病理分型对照，提高对该病的认识。

方法

回顾性分析本院 2003 年 8 月至 2018 年 12 月间诊治的 53 例肺神经内分泌肿瘤病例，对照分析 CT 表现与病理分型。

结果

53 例肺神经内分泌肿瘤包括 6 例典型类癌、10 例不典型类癌、18 例大细胞神经内分泌癌、19 例小细胞肺癌。其中男 37 例、女 16 例，均年龄 56 岁; 中央型 23 例、周围型 30 例; 肿瘤平均直径(35. 021 ± 9.23) mm，分叶征 23 例(43.3%) ，密度均匀 33 例(62. 3%) ，增强扫描 CT 值增高(45. 134 ± 9. 621) HU; 合并纵隔及肺门淋巴结转移 31 例。

结论

肺神经内分泌肿瘤的 CT 表现与其病理特性相对应，典型类癌及不典型类癌影像表现有一定特点，大细胞神经内分泌癌及小细胞肺癌缺乏特征性影像表现，确诊最终依赖病理。

PU-2571

肺原位腺癌与不典型腺瘤样增生的影像诊断

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目的

探讨肺腺癌浸润前病变的 MSCT 影像学特征。

方法

回顾性分析２０１１年３月－２０１８年１２月经手术病理证实的 75 例肺腺癌浸润前病变患者的临床和ＣＴ资料，其中不典型腺瘤样增生（ＡＡＨ）25 例、原位癌（ＡＩＳ）50 例，主要分析指标包括病灶分布、大小、密
度、分叶征、毛刺征、空泡征、充气支气管征、肿瘤微血管成像征和胸膜凹陷征。

结果

55 例表现为纯磨玻璃密度结节、20 例为部分实性成分磨玻璃密度结节；ＡＡＨ组和ＡＩＳ组中病灶直径分别为（１０．７５±2. 53）和（１2. 08±3. 14）ｍｍ，平均ＣＴ值分别为（－571±32. 23）和（－451. 9±107. 63）ＨＵ，两组间差异均无统计学意义（Ｐ＞０．０５）。ＣＴ征象中以肿瘤微血管成像征最多见（出现率为 70. 1%），其次是分叶征、空泡征（均为 27. 3%），充气支气管征最少见（3. 2%）；两组间各征象的差异均无统计学意义（Ｐ＞０．０５）。

结论

肺腺癌浸润前病变的ＣＴ 征象中肿瘤微血管成像征具有一定特异性，ＣＴ 形态学征象并不能准确鉴别不典型腺瘤样增生和原位癌。

PU-2572

AIDS 合并肺癌 CT 表现

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目的　探讨获得性免疫缺陷综合征合并肺癌的 CT 表现与 $CD4^{+}T$ 计数的关系。方法：分析经病理证实的 25 例获得性免疫缺陷综合征合并肺癌患者的临床及 CT 表现。结果 25 例获得性免疫缺陷综合征合并肺癌患者中 20 例为非小细胞癌，其中腺癌 15 例、鳞癌 5 例，5 例为小细胞癌；17 例发生在右肺、8 例发生在左肺；20 例合并纵隔及肺门淋巴结肿大、12 例出现胸腔积液、6 例出现胸膜或肺内转移、3 例出现阻塞性肺炎、3 例合并空洞，15 例合并其他感染。结论：获得性免疫缺陷综合征合并肺癌的 CT 表现具有一定特点，CT 检查及相关的临床检查、实验室检查对其诊断及鉴别诊断具有一定的价值。

PU-2573

多层螺旋 CT 对囊腔类肺癌的诊断价值

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目的：回顾性分析囊腔类肺癌的 CT 影像学特征，进一步提高对本病的认识。
方法：收集 2014 年 3 月至 2019 年 3 月经手术或病理结果证实的囊腔类肺癌患者 15 例，并对其影像表现及病理类型进行分析。
结果：本组 15 例患者影像表现为囊腔壁厚薄不均一者 12 例，病灶边缘可见短毛刺征者 7 例，病灶边缘呈分叶征者 9 例，有壁结节者 10 例，邻近胸膜有改变者 7 例，囊腔内壁不光滑者 14 例，囊腔内示血管穿行者 4 例。病灶内示囊腔影者 5 例，囊腔影伴周围磨玻璃密度结节者 2 例，囊腔影与磨玻璃密度结节、实性软组织密度影混合者 3 例，囊腔影伴周围实性软组织密度者 5 例。随访结果显示 2 例磨玻璃结节影内出现囊腔，3 例囊腔逐渐增大并囊壁不规则增厚，1 例囊腔缩小并实性软组织密度影增多。15 例患者术后病理证实为腺癌 14 例，鳞癌 1 例。
结论：囊腔类肺癌病理表现多为腺癌，影像表现为囊壁厚薄不均一、邻近胸膜凹陷不平、短毛刺征、壁内结节形成等征象时较为典型。通过对这些征象的认识，可进一步提高对于此类肺癌的诊断准确率。

PU-2574

肺部结节筛查的优化

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【目的】探讨肺部小结节最佳检查方法。

【材料与方法】选取 100 例被检者，分成甲乙 2 组，每组 50 人。每组男女各 25 例，年龄 41 岁-78 岁。对每一位被检者进行肺部容积扫描，然后进行 CT 图像重建。甲组采用 1 毫米层厚进行 CT 图像重建；乙组采用 5 毫米层厚进行 CT 图像重建。请 1 位副主任医师、2 位主治医师、2 位住院医师对扫描图像进行观察。
【结果】结果如下：1 毫米层厚进行 CT 图像重建的小结节检出率高于 5 毫米层厚进行 CT 图像重建。2 者有显著性差异。但前者的工作量是后者的 5 倍，过小的结节没有任何临床治疗意义，反尔会造成被检者精神负担。
【结论】建议采用 5 毫米层厚进行 CT 图像重建。

PU-2575
CT 重建技术与 AI 肺结节筛选系统的联合应用在肺内小结节定性中的诊断价值

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目的:探索肺癌患者肺内小结节应用 CT 重建与 AI 肺结节筛选系统的联合应用在肺内小结节定性中的诊断价值。方法:选取我院胸瘤科 2018 年 7 月-2019 年 5 月收治的肺孤立小结节患者 87 例为研究对象,肺内小结节直径≤3cm,对全部患者均取得病理，且术前进行 CT 扫描,统计 CT 重建后人工判断与 AI 系统筛查对扫描在结节良恶性鉴别的价值。结果:87 例患者经 CT 检测 AI 对肺内小结节检出率 100%,人工检出率为 92%，5 例人工未能检出，均为<8mm 磨玻璃结节。AI 判断良性病例 31%，恶性病例 69%，人工判断良性病例 28.7%，恶性 65.5%，未检出者占约 5.7%。病理证实良性 29.8%，恶性 70.1%。AI 对肺结节特异性为 85.2%，有 15 例假阳性结节，人工判断肺结节特异性 100%。结论:肺内孤立小结节经 CT 检查后，AI 肺结节筛查系统对肺结节检出率高，特别对于较小磨玻璃结节的检出有优势，但存在假阳性，需要与 CT 后重建人工判读结合，这样可以提高对肺结节判断的敏感度与特异性。

PU-2576
多排螺旋 CT 低剂量检查技术在肺部小结节诊断中的价值研 究

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目的：对比多排螺旋 CT 中常规剂量 CT 检查与低剂量 CT 检查对肺部小结节的诊断价值。**方法**：收集在我院进行肺部常规剂量螺旋 CT 平扫（下称常规平扫）中检出肺部≤3mm 小结节的患者 283 例，组织其同意 3 个月后进行肺部低剂量螺旋 CT 平扫（下称低剂量平扫）复查者 100 例，对两次检查结果进行比较。**结果**：在复查的 100 例低剂量平扫中，检出肺部≤3mm 小结节的患者共 98 例，对两组不同剂量检查下肺部小结节诊断结果进行比较，差异无统计学意义（P>0.05）。**结论**：低剂量平扫在对肺部小结节的诊断中与常规平扫具有相当的检出率，同时可以减
少患者接受的辐射剂量，相比常规平扫具有更高的诊断价值。

PU-2577

Study of relative CT values to evaluate the invasiveness of pulmonary ground-glass nodules in patients with emphysema

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【Objective】To investigate the ability of relative CT (rCT) values to evaluate the invasiveness of pulmonary ground-glass nodules (GGNs) in patients with emphysema.
【Materials and Methods】Targeted high resolution (HRCT) of 187 pulmonary GGNs in 175 patients with emphysema confirmed by surgery and histology were retrospectively reviewed. Among them, 107 nodules appeared as a pure ground-glass nodule (pGGN), which includeds (7 atypical adenomatous hyperplasia (AAH), 12 adenocarcinoma in situ (AIS), 38 minimally invasive adenocarcinomas (MIAs) and 50 invasive adenocarcinomas (IACs); the remaining 80 nodules appeared as a mixed ground-glass nodule (mGGN), which included 10 MIAs and 70 IACs.The mean maximal diameter, mean CT values of GGN and background lung were measured. The rCT values of 1 (nodule CT value - lung CT value), 2 (nodule CT value / lung CT value) and 3 ((lung CT value - nodule CT value) / lung CT value)) of GGN were calculated. The differences of the mean and rCT values among different invasive GGNs were identified. The performance of the CT values between pre-invasive and invasive lesions was evaluated using a receiver operating characteristic (ROC) curve. The intraclass correlation coefficient (ICC) was used to evaluate the agreements in measuring quantitative parameters.
【Results】The mean CT value of the background lung was -907.82 ±27.53HUi. Significant differences were found in rCT values of 1, 2 and 3 between pGGNs with different levels of invasiveness, in rCT values of 1, 2 and 3 of the ground-glass area (GGA) and in mean CT of the solid area of mGGNs between MIA and IAC (all $P < 0.05$). The mean diameter was significantly different between pGGNs with different invasiveness ($P < 0.05$). The cutoff rCT values of 1, 2 , 3 and mean diameter for differentiating between the pre-invasive and invasive pGGNs were 293.82 , 0.68, 0.32 ; and 1.10 cm respectively. The measurement agreements were good for CT values of pGGN, GGA and SA of mGGN, CT value of lung, and mean diameter of GGN.
【Conclusion】In patients with emphysema, the mean diameter can be helpful for distinguishing the invasiveness of pGGN. The rCT values are more useful than the mean CT value for differentiating between GGNs with different invasiveness and can be valuable biomarkers for evaluating the invasiveness of GGNs.

PU-2578

MR 压脂 T2 加权与弥散加权成像在合并肺不张的中心型肺癌中的应用

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摘要： 目的 探讨 MR 压脂 T2 加权与弥散加权成像在合并肺不张的中心型肺癌中的应用及价值.方法选取 2016 年 5 月至 2018 年 5 月于本院就诊的 35 例合并肺不张的中心型肺癌患者为研究对象,行 MR 检查,测量压脂 T2WI、DWI 图像中感兴趣区信号强度及背景噪声,计算肺癌与肺不张组织的信号强度比(Signal Intensity Ratio,SIR)、噪声比(Contrast-to-Noise Ratio,CNR),观察压脂 T2WI、DWI、两者联合图像对肺癌及肺不张组织边界的显示情况.比较单纯压脂 T2WI、DWI 及联合图像的图像质量和诊断效能.结果 DWI 图像的 SIR 和 CNR 均高于单纯的压脂 T2WI 图像,压脂 T2WI 联合 DWI 图像区分肺癌组织与不张肺组织边界的阳性率高于压脂 T2WI,差异均具有统计学意义.结论压脂 T2WI 联合 DWI 能显著提高压脂 T2WI 对肺癌与肺不张的鉴别能力,压脂 T2WI 能为 DWI 图像提供更多的解剖信息,两者互为有力补充

PU-2579
MSCT 在肺孤立性磨玻璃结节鉴别诊断中的价值

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目的探讨多层螺旋 CT(Multi-slice spiral CT,MSCT)在鉴别良恶性肺孤立性磨玻璃结节(sp GGO)中的价值。方法回顾性分析 2015 年 1 月至 2017 年 7 月间经 MSCT 检查有肺孤立性磨玻璃结节的 44 例患者的 MSCT 资料,根据病理结果将所有病例分为良性、恶性两组,其中良性结节有 13 例,包括 9 例不典型腺瘤样增生(AAH),4 例慢性炎症;恶性结节有 31 例,均为腺癌。观察肺孤立性磨玻璃结节的 CT 征象特点,包括病灶形态、大小、边缘、实性成分、空气支气管征、空泡征、胸膜凹陷征、瘤肺界面、毛刺征、分叶征、血管集束征,对照病理结果,统计分析 CT 征象与肺磨玻璃结节良恶性的相关性。结果肺孤立性磨玻璃结节的病灶形态、大小、边缘、实性成分、空泡征、胸膜凹陷征、毛刺征、分叶征、血管集束征与 sp GGO 的良恶性有相关性,结果具有统计学差异(P<0.05),而两组 sp GGO 的空气支气管征、瘤肺界面没有统计学差异(P>0.05)。结论 MSCT 对肺孤立性磨玻璃结节的良恶性鉴别诊断具有重要价值。

PU-2580
胸膜下孤立结节病变的 320 排 HRCT 双入口容积灌注描的诊断价值

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目的 探讨不同病理类型及不同分化程度肺癌的双循环(肺循环及体循环)灌注特点，以期为临床诊断 及预判提供指导。 方法 对 116 例肺癌患者进行前瞻性容积灌注扫描，最后经病理证实腺癌 44 例，鳞癌 32 例，小 细胞癌 18 例，良性者 22 例;其中病理得到分化程度 53 例。采用双入口模式对其进行后处理分析分别得到病灶的肺 动脉血流量(PF)、支气管动脉血流量(BF)及血流灌注指数 [PI = PF/(PF + BF)] 。采用 LSD 两两比较考察不同病 理类型肺癌各灌注值之间的差异有无统计学意义，采用 Spearman 相关分析探究肺癌的分化程度与各灌注值之间的 相关性。 结果 腺癌与鳞癌之间的灌注值 PI 差异有统计学意义(P ＜0. 05)，灌注值 PF、BF 差异均无统计学意义;

腺癌与小细胞癌，鳞癌与小细胞癌之间灌注值 PF、BF 及 PI 差异均无统计学意义。Spearman 相关分析结果显示:灌 注值 PI 与肺癌的分化程度呈负相关(相关系数为 －0. 680， P ＜ 0. 05)，即随肺癌分化程度的降低，灌注值 PI 呈增高 趋势。灌注值 PF 及 BF 与肺癌的分化程度无相关性。 结论 肺腺癌与肺鳞癌的 PI 值差异有统计学意义，腺癌 PI 值高于鳞癌;肺癌的分化程度与其灌注 PI 值呈负相关。双入口灌注技术对肺癌的病理分型及分化程度的临床预

PU-2581
能谱 CT 在肺动脉、肺静脉与肺结节融合成像中的应用探讨

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目的：通过对比分析探讨 CT 能谱技术在肺动脉、肺静脉与肺结节融合成像中的临床价值。方法：本院 56 例直径小于 3 cm 的肺磨玻璃（ground glass nodule，GGN）结节术前行肺血管与结节融合成像的患者，随机分为对照组和观察组，每组 28 例；对照组使用 CT 常规扫描，观察组使用 CT 能谱扫描及能谱后处理技术，对比分析 2 组血管成像图像质量的优劣，另外观察组内用能谱扫描的数据分别生成一组 60 keV 和 74 keV 的单能量数据，进行组内对比。结果：28 例 60 keV 单能量成像观察组肺动脉、肺静脉及肺结节全部清晰显示，利用融合成像技术能明确展示三者的关系。对照组有 7 例不能完整显示远端供血及回流血管与肺结节的联系，另外 21 例虽能显示三者关系，但远端血管结构显示清晰度均不及 60 keV 单能量成像观察组，通过 CT 值、信噪比(signal noise ratio，SNR)的客观评价和主观评分，观察组 60 keV 和对照组比较，及观察组内的 60 keV 和 74 keV 比较，差异均具有统计学意义（P<0.05）。结论：能谱 CT 60 keV 单能量成像在肺动脉、肺静脉与肺结节融合成像中效果优于常规 CT 扫描。

PU-2582
孤立性肺结节的 CT 肺灌注扫描与病理对照分析

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目的：应用 CT 肺灌注成像技术对孤立性肺结节的进行诊断及良恶性鉴别诊断。方法：对近 2 年收治的 76 例孤立性肺结节患者的 CT 灌注参数 BV、BF、MTT、PS 进行分析，所有患者最终均手术或穿刺病理证实。结果：本次病例恶性肿瘤占比例约 89.5%（68/76），其中以腺癌居多。恶性病变中 55 例为真阳性，13 例为假阳性。恶性肿瘤的 BF、MTT、BV、PS 与良性病变相比明显偏高，有统计学意义，其中以 BV、PS 更为显著。结论：CT 灌注扫描可对孤立性肺结节进行血流灌注分析，从而更早期更灵敏的鉴别肺结节的良恶性。

PU-2583
基于深度学习人工智能软件在胸部 CT 肺结节检测中应用价值

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【摘要】 背景与目的 肺结节高精确检测是实现结节发现早诊断、早随访、早干预的基础。人工智能在肺内结节检测领域发展迅速，对其效能进行验证是促进其应用于临床的前提。本研究旨在评估

基于深度学习人工智能软件在胸部计算机断层扫描（computed tomography, CT）结节检出中的价值。

方法 从 PACS 系统中随机抽取 100 例胸部 CT 数据，排出弥漫性肺病、乱肺、间质性病变及严重呼吸伪影患者，采取 1mm 薄层图像导入肺结节人工智能软件识别系统，记录软件自动识别结节，并与原始影像人工报告结果进行对比，部分病例包含病理证实的肺癌及定期随访结节病例，人工智能软件及阅片者检测到的结节由 2 名胸部专家进行评估并记录其大小及特征。计算灵敏度、假阳性率评估人工智能软件及医师的结节检测效能对比。

结果 100 例胸部多层螺旋 CT 人工智能软件共检出非钙化结节 635 例，其中实性结节 353 例，磨玻璃结节 165 例，混合结节 34 例，假性结节 83 例，其中小于 5mm 结节 104 例；放射科医师检出结节 487 例，其中实性结节 327 例，磨玻璃结节 135 例，混合结节 25 例，其中小于 5mm 结节 78 例。人工智能软件结节检测灵敏度明显高于放射科医师。人工智能总体假阳性率为每例 CT 0.83 个。

结论 人工智能软件能实现肺结节的无漏诊检出，具有较医师更高的结节检出灵敏度，在排除微小结节后可降低假阳性率。

PU-2584

能谱 CT 在鉴别中央型肺癌与肺不张中的价值

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目的 探讨能谱 CT 在鉴别中央型肺癌与肺不张中的应用价值。 **方法** 回顾性分析 2014 年 5 月-2019 年 5 月我院收治的经纤维支气管镜活检证实的中央型肺癌合并肺不张 42 例患者的能谱 CT 影像资料，利用能谱 CT 优化对比噪声比（CNR）技术重组出最佳单能量图像（BMI）与最佳单能量-碘基物质融合图像（BMI&ICM）。统计增强各期中肿瘤与不张肺组织优化 CNR 的最佳单能量值，比较：①PI 与 BMI 的图像质量。根据瘤-肺交界面显示情况建立 4 分制主观评分标准，并规定 1-2 分为检出率（-），3-4 分为检出率（+），比较：②动脉期、静脉期和延迟期混合能量图像（PI）、BMI 与 BMI&ICM 对瘤-肺交界面的主观评分与检出率；③肿瘤与不张肺组织的碘浓度值差异。 **结果** ①增强各期中，肿瘤与不张肺组织在 56KeV 时取得最佳对比噪声比，此条件下 BMI 的图像质量明显优于 PI，差异有统计学意义（P＜0.001）。②增强各期中，BMI & ICM 的瘤-肺交界面评分最高，BMI 次之，PI 最低，差异有统计学意义（P 均＜0.05）；增强各期中 BMI 及 BMI & ICM 的瘤-肺交界面检出率均显著高于 PI（P 均＜0.001），但 BMI 与 BMI & ICM 的瘤-肺交界面检出率差异无统计学意义（P＞0.05）；PI 在增强各期瘤-肺交界面评分及检出率均无统计学意义（P 均＞0.05），BMI 与 BMI & ICM 动脉期及静脉期瘤-肺交界面评分及检出率均高于延迟期，差异有统计学意义（P 均＜0.05），但动脉期与静脉期之间差异无统计学意义（P＞0.05）。③增强各期中，肺癌的碘浓度值均低于不张肺组织，差异有统计学意义（P＜0.001）。**结论** 能谱 CT 对中央型肺癌与肺不张具有较好的鉴别能力，值得在临床中应用推广。

PU-2585

2cm 以下肺部磨玻璃影 HRCT 特征及其病理基础的研究

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目的 探讨 2 公分以下肺部磨玻璃影（GGO）HRCT 特征与病理分类的联系。
方法 回顾性分析直径 2cm 以下的肺部磨玻璃影 152 例病灶，所用病灶均是手术切除后经病理证实的。图像评价分析内容包括：病灶位置、大小和密度、边缘（分叶、长短毛刺）、内部（空泡征、细支气管造影征）、病灶实性成分的大小和密度、所占的比例（大小、密度）、胸膜凹陷征、病灶与血管的关系。采用统计方法对资料进行分析。
结果 不同病理组的病灶的大小有统计学差别（P<0.001），病灶大小浸润组（MIA+IAC）＞浸润前组（AAH+AIS）＞炎性病变组（INF）。不同病理组病灶的密度、实性成分的密度有统计学差异，病灶密度 IAC、MIA 组最高，INF、AAH 病灶密度最低。INF、IAC 的实性密度最高。不同病理组病灶的边缘（分叶、短毛刺、长毛刺）有统计学差异（P<0.001），其中 MIA、IAC 组中的分叶征象较 INF 组更常见（P<0.005）；MIA、IAC 组中的短毛刺征象较 AIS 组更常见，AIS 组短毛刺征象较 INF、AAH 组更为常见（P<0.001）；不同病理组病灶内部（空泡征、细支气管造影征）有统计学差异（P<0.001），MIA 组中的空泡征较 AIS 组中更常见；IAC 组出现细支气管造影征的可能性最大（P<0.005）。AIS、MIA、IAC 组较 INF、AAH 组出现胸膜牵拉征的可能性更大（P<0.005）。五组病理类型中，病灶与血管关系类型是有差异的（P<0.001）， INF、AAH 组以Ⅰ、Ⅱ型与血管关系为主，AIS、MIA 组以Ⅲ、Ⅳ型与血管关系为主，IAC 组则以Ⅳ、Ⅴ型与血管关系为主。
结论 病灶位置、大小和密度、边缘（分叶、长短毛刺）、内部（空泡征、细支气管造影征）、病灶实性成分的大小和密度、所占的比例（大小、密度）、胸膜凹陷征、病灶与血管的关系类型对病理分类有预测价值。

PU-2586
CT 引导下带钩钢丝定位术在肺部孤立性磨玻璃密度结节胸腔镜手术中的价值分析

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目的：探讨 CT 引导下带钩钢丝（Hook-wire）定位术在肺部孤立性磨玻璃密度结节（solitary ground glass nodule, sGGN）胸腔镜手术中的应用价值。**方法**：对 48 例患者的 sGGN 于术前行 CT 引导下带钩钢丝定位，然后施行电视胸腔镜手术（video assisted thoracic surgery, VATS）楔形切除术，根据术中冰冻病理结果决定下一步治疗方式。统计定位准确率、并发症发生率、VATS 肺楔形切除手术成功率、中转开胸率以及 sGGN 病理分型等。**结果**：Hook-wire 定位成功率为 100%，咯血 1 例需要处理，术中 Hook-wire 脱落 1 例(2.08%)，VATS 肺楔形切除手术成功率为 97.9%，中转开胸 1 例。**结论**：采用 CT 引导下 Hook-wire 定位术在肺部孤立性磨玻璃密度结节胸腔镜手术中的应用价值理想，诊断准确率高、方法可靠，并发症少，具有很好的临床推广价值。

PU-2587
7 例原发性肺黏液腺癌误诊的影像表现及文献复习

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目的 回顾性分析 7 例误诊为肺炎性病变的原发性肺黏液腺癌(PPMA) 的影像表现，结合相关文献复习，提高对 PPMA 的影像诊断准确率。方法 回顾性分析 2014 年 12 月至 2019 年 7 月误诊为肺炎性病变经病理证实的 7 例 PPMA 的临床及影像学表现。结果 7 例患者，2 例临床表现为典型的咳白色泡沫痰，7 例肿瘤标志物均升高，5 例影像表现为肺炎型，2 例表现为结节肿块型，伴“枯树枝征”5 例，近心端磨玻璃影 3 例，多发囊腔影及“蜂窝”影 4 例，肺叶膨隆征 4 例，“血管造影征”4 例，分叶征 2 例，全部经穿刺活检或手术切除明确病理。结论 PPMA 的影像表现多样，极易与肺炎性病变相混淆，当发现 CT 值低于一般肺炎性实变的病灶出现肺叶膨隆、“枯树枝征”、近心端磨玻璃对诊断 PPMA 具有重要价值。

PU-2588
320 排容积 CT 单、双入口联合模式全瘤灌注参数对肺内孤立性结节诊断价值探析

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摘要 目的 探讨 320 排容积 C T 单、双入口联合模式下，全瘤灌注参数对孤立性肺结节良恶性的鉴别价值，并尝试探索诊断界值。**方法** 对我院 2016 年月至 2017 年 10 月初诊为肺内孤立性结节病变，进行灌注扫描。对所有数据进行回顾性研究。所得数据全部由 Vital 工作站进行后处理，全部获得双入口模式（DI-CTP）下的：支气管动脉血流量（AF）、肺动脉血流量（PF）、肺动脉灌注指数（PI，PI=PF/AF+PF)；单入口模式(SI-CTP)下的：等效血容量（E.BV）、血流萃取率（FE）、动脉血流量（S-AF）。所有数据使用 SPSS19.0 统计软件进行统计学分析。**结果** （1）肺内结节良、恶性组的 AF、PI、E.BV、FE、S-AF 差异有统计学意义。（2）肺内良、恶性结节统计上有显著性差异的全瘤灌注参数 ROC 曲线下面积分别为：AF，0.771；E.BV,0.906；FE，0.772；S-AF，0.775；PI,0.889。①ROC 曲线下面积比较：E.BV＞PI＞S-AF＞FE＞AF。②各参数诊断界值：E.BV=5.00，敏感性 0.909，特异性 0.857；PI=43.24，敏感性 0.905，特异性 0.121； S-AF=69.65，敏感性 1.000，特异性 0.714； FE=39.85，敏感性 0.636，特异性 1.000； AF=54.20，敏感性 0.879，特异性 0.667。（3）多参数联合，结合形态学诊断阳性预测值达到了 93.97%，阴性预测值达到了 95.24%，诊断效能明显高于单纯形态学诊断及单一灌注参数诊断。**结论** 320 排容积 C T 全瘤灌注参数对肺内孤立性良恶性结节鉴别具有实际应用价值，且有较大帮助。多个灌注参数中，以 PI、E.BV、FE 诊断效能突出。多参数联合，结合传统形态学诊断，可达到更高诊断符合率。具体各参数诊断界值尚待探索，亟待统一研究标准。

PU-2589
AI 辅助软件对疲劳状态下放射科规培医生肺结节检测效能的研究

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目的：对疲劳状态的放射科规培医师在 AI 肺结节检测软件辅助下对肺结节诊断效能提升的研究。**方法：**收集西门子双源 CT 扫描的胸部病例 182 例。放射科规培医师分别三种模式下进行阅片，即正常状态下（A 组）、疲劳状态下（即一天日常工作满 8 小时以上）独立阅读（B 组）、疲劳状态

使用 AI 软件进行阅片（C 组），三种阅片模式均间隔洗脱期（大于 15 天），并记录结节位置、大小、数目。最终，将 3 次肺结节检测结果与金标准（由 2 名从事影像诊断工作 8 年及以上的医师结合 AI 辅助软件共同阅片，意见不同时由第 3 名从事影像诊断工作 15 年及以上的医师进行会诊，最后做出一致诊断）进行比对，记录正确、误诊、漏诊结节数，用敏感度及假阳性率评价三种模式的检测效能。

结果：试验共纳入 1281 个结节，三组检出真阳性结节数为；591、517、995，假阳性数为 299、232、167，三组均有统计学差异(p＜0.05），三组敏感性分别为 46.1%、40.3%，77.7%,假阳性率分别为 1.64/CT、1.27/CT、0.92/CT (p＜0.05）；B 组（疲劳状态）比 A 组（正常状态）肺结敏感性降低了 5.78%(p<0.05)，C 组疲劳结合 AI 状态下敏感度最高（77.7%），假阳性率最低（0.92/CT）。

结论：疲劳降低了放射科规培医师对肺结节检测效能，然而，在 AI 软件辅助下，疲劳状态下的放射科规培医师能够达到比正常状态下更高的肺结节检测效能，有助于应对日益增长的工作量，且明显提高了结节的敏感性。

PU-2590

能谱 CT 对局灶性机化性肺炎与周围型肺腺癌的鉴别诊断

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目的：评价能谱 CT 对局灶性机化性肺炎与周围型肺腺癌的鉴别诊断价值。

材料与方法：回顾性分析经手术病理证实的 25 例周围型肺腺癌患者（肺癌组）和 16 例局灶性机化性肺炎患者（肺炎组）的能谱 CT 资料，对所有图像均采能谱软件处理，获得病灶在动脉期、延迟期不同能量水平（40-140keV）的 CT 值、能谱曲线、基物质对浓度（水-碘）定量参数，采用独立样本 t 检验分析能谱特征参数，并用 x^2 检验定性分析其形态学表现。

结果：肺癌组病灶边界清晰、短毛刺征、深分叶征、钙化、纵隔淋巴结肿大占比均显著高于肺炎组（P<0.05），而肺炎组支气管充气征、长毛刺征、液化坏死及邻近胸膜肥厚占比显著高于肺癌组（P<0.05）。肺炎组动脉期及延迟期在 40-70 keV 范围内单能量 CT 值及碘浓度均高于肺癌组（P<0.05），且单能量越低，CT 值之间的差异越大；二者间水浓度无统计学差异（P> 0.05）。二者增强双期能谱曲线均呈下降型，动脉期肺炎组能谱曲线斜率（2.55±0.32）与肺癌组（2.00±0.84）有统计学差异（p <0.05）；延迟期肺炎组能谱曲线斜率（2.17±0.27 ）与肺癌组（1.76±0.56）有统计学差异（p <0.05）。

结论：局灶性机化性肺炎与周围型肺腺癌具有不同形态学特征及单能量 CT 值、能谱曲线和能谱特征物质含量等定量特征。能谱 CT 为鉴别局灶性机化性肺炎与周围型肺腺癌提供了一种多参数的方法。

PU-2591

Pertinence of CT and Clinic Characteristics on Epidermal Growth Factor receptor Mutation in lung adenocarcinoma

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Perpose:To explore the pertinence of CT and Clinic Characteristics on Epidermal Growth Factor receptor Mutation in lung adenocarcinoma.Methods:We identified 1095 patients with isolated lung adenocarcinoma,excluding that whose boundary cannot be determined.A total of 803 cases were included.Results:①EGFR gene mutation status: among 803 patients,426 had EGFR mutation while 377 had EGFR wild-type mutation. Among 422 mutant patients, the EGFR gene exon 19-del deletion mutation accounted for 39.1%, the exon 21 L858R and L861Q deletion mutation accounted for 51.7%, and the others accounted for 9.2%.②Correlation between clinical features and EGFR gene mutation: the female with EGFR mutation were significantly higher than those with wild-type and the non-smoking patients with EGFR mutation were significantly higher than those with wild-type EGFR, and the mutation rates were 69.5% and 69.3% ,respectively(p=0.000).③Correlation between CT image features and EGFR gene mutation: Maximum diameter, Ground Glass Opacity(GGO), air bronchogram , burr,lobulation, pleural retraction, pleural effusion, necrosis,vascular convergence,lymph node metastasis,multiple bilateral lung metastasis in EGFR-mutation group were statistically significant than EGFR-wild group.Logistic regression showed that the clinical characteristics of women , non-smoking and imaging characteristics of GGO,lobulation,pleural retraction and vascular convergence,multiple bilateral lung metastasis could be used as independent predictors of EGFR mutation status in isolated lung adenocarcinoma. The Receiver Operating Characteristic curve analysis found that the area under the curve curve(AUC) was 0.762(p=0.016) and the sensitivity and specificity of the predicted therapeutic efficacy of NSCLC were 62.68% and 78.72% respectively.Conclusion:Female,non-smoking,GGO,pleural,retraction,lobulation,vascular convergence and multiple bilateral lung metastasis could be independent predictors of EGFR mutation lung adenocarcinoma .

PU-2592

成人 B55 型腺病毒肺炎胸部 CT 表现分析

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目的 总结成人 B55 型腺病毒肺炎的胸部 CT 特征性表现，提高对该病的诊断能力。**方法** 选择在本院 2015 年 2-3 月间住院确诊的腺病毒肺炎患者 76 例，均为男性，平均年龄 19.2 岁，回顾性分析其胸部 CT 图像，总结肺部病变的 CT 征象及特点。**结果** 主要表现为不同程度的发热、咳嗽、扁桃体肿大以及其他非特异性全身毒血症状。86%的患者白细胞未见明显升高；其中 39 例以磨玻璃病灶为主，26 例以实变为主，11 例患者仅表现为肺部少许条片影、小片状或结节样密度增高影；大部分病灶边缘清晰，部分膜玻璃病灶或实变灶呈云絮状，较有特征性。临床治愈出院时及近期复查

时绝大部分病灶消失，个别表现为病变区细条索影或胸膜粘连。**结论** 腺病毒肺炎的主要胸部 CT 表现为肺部单发或多发的叶段性或斑片状磨玻璃密度影、实变或间质性改变，病变分布多位于两肺下叶。

PU-2593

初治与复治耐多药肺结核的 CT 表现分析

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【摘要】 目的 探讨初治与复治耐多药肺结核 CT 表现。**方法** 搜集 2016 年 1 月至 2019 年 1 月我中心 186 例耐多药肺结核患者，初治组患者 80 例；复治组患者 106 例。对比两组患者 CT 表现进行统计学分析。**结果** 初治组肺毁损 6.3%、病灶范围≥3 叶 71.3%、病灶中叶及舌段发生率 72.5%、条索影 23.8%、钙化灶 10%、支气管扩张 31.3%发生率少于复治组[分别为 20.8%、90.6%、85.8%、54.7%、27.4%、77.4%]，差异均有统计学意义（X^2值分别为 7.730、11.656、5.098、18.021、8.621、39.670，*P*均＜0.05）；初治组胸廓塌陷 5.0%、纵膈移位 7.5%、胸膜增厚 53.8%发生率少于复治组[分别为 21.7%、35.8%、78.3%]，差异均有统计学意义（X^2值分别为 8.943、20.288、12.576，*P 均*＜0.05）。初治组空洞发生率 56.3%(45/80)、空洞≥3 个 23.8%(19/80)、厚壁空洞 51.3%(41/80)、薄壁空洞 12.5%(10/80)、虫蚀样空洞 16.3%(13/80)、空洞呈簇聚集 16.3%(13/80)、空洞内壁不光滑 7.5%(6/80)均少于复治组[分别为 83%(88/106)、59.4%(63/106)、70.8%(75/106)、40.1%(43/106)、40.6%(43/106)、40.6%(43/106)、20.8%(22/106)]，差异有统计学意义（X^2值分别为：16.034、23.551、7.390、17.626、12.810、12.810、6.264，*P*均＜0.05）。**结论** 初治耐多药肺结核肺毁损、纤维钙化灶、多发空洞、虫蚀样空洞、支气管扩张等典型耐多药肺结核影像表现的发生率均较低，复治者则与典型的耐多药肺结核 CT 表现相似。

PU-2594

白血病患者化疗期间肺部真菌感染的 CT 影像特征及抗真菌感染相关性回顾性研究

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目的：白血病是血液系统恶性肿瘤性病变，患病率逐年上升。由于白血病对自身免疫系统的破坏，以及白血病化疗药物造成的骨髓抑制进一步加重机体免疫功能的下降，让白血病患者感染罹患率明显增加，肺部是感染最主要的靶器官，肺部真菌感染致死性病因之一，临床症状和体征缺乏特异性，因此难以明确诊断、及时治疗。痰培养耗时、且阳性率不高，鉴别诊断困难。笔者分析总结我院一组病例,探讨白血病患者肺部真菌感染的影像学表现和诊断。

方法：回顾性分析 53 例白血病合并肺部感染（真菌感染 27 例、细菌感染 25 例）的胸部 CT 影像资料，对肺部感染分布特点、肺部病灶影像特征以及肺部病灶特征与抗真菌治疗相关性进行统计分析。

结果:27 例 1 确诊真菌感染患者，肺真菌感染的影像学表现多种多样，11 例均有结节、磨玻璃状的渗出、实变性病变，2 例呈结节、斑片影，2 例结节周围有晕征，5 例实变侧胸腔积液， 27 例病人

接受抗真菌治疗后，23 例患者病灶痊愈、好转或有吸收，4 例无效。25 例患者肺部出现类似病灶，抗细菌治疗遂好转，未作抗真菌治疗。

结论:1.白血病患者治疗病程中，肺部真菌感染的罹患率明显上升，加重患者经济负担，增加死亡率。2.真菌感染的胸部影像学征像随临床症状而出现，表现多种多样，多缺乏特征。3.多发结节、实变合并磨玻璃病变，是真菌感染的较为特征性的表现，具有提示诊断价值。4. CT 是在诊断白血病患者合并肺部真菌感染、评价抗真菌感染疗效具体重要价值。

PU-2595

原发性肺肉瘤样癌的 MSCT 表现及病理基础

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目的 探讨原发性肺肉瘤样癌（PSC）的多层螺旋 CT（MDCT）的表现特征及病理学基础，以提高对该病的影像诊断。方法 回顾性分析经临床手术病理证实的 22 例肺癌肉瘤的 CT 表现，并与病理结果进行对照分析；所有患者均行平扫加增强扫描。结果 22 例中周围型 19 例，主要表现为肺外围实性肿块，直径大小 3.0-9.2cm，瘤-界光整 8 例，模糊 2 例，呈分叶状 4 例，毛刺 2 例；中央型 3 例，表现为肺门支气管周围肿块，大小 2.5-6.7cm，支气管受压变窄，均合并阻塞性肺炎。22 例 CT 增强扫描肿瘤均呈不均匀强化，部分呈厚薄不均环形强化；7 例侵及胸膜，5 例肺门和（或）纵膈淋巴结肿大，3 例有远处转移；结论 原发性 PSC 的 CT 平扫表现无明显特异性，具有肺癌和肉瘤的双重特性，典型表现为伴有分叶或毛刺的较大类圆形肿块，增强后呈厚环状强化，对其初步诊断具有一定临床价值。

PU-2596

肺奴卡菌病的影像学表现

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肺部奴卡菌感染是一种少见疾病，男多于女（男女比例约 2:1-3:1）。奴卡菌感染的易感因素为器官移植、恶性肿瘤、糖尿病、酗酒、使用激素、HIV 感染和应用免疫抑制剂等，特别是因艾滋病或移植相关的细胞免疫功能受损的患者，但有大约三分之一的奴卡菌病患者免疫功能正常。奴卡菌可以累及全身多个器官，其中最多见的受累器官是肺部和中枢神经系统。
大多数奴卡菌感染始于肺部，通过直接吸入奴卡菌发生，占感染患者的 2/3。肺部奴卡菌病可以是急性，亚急性或慢性起病，常有复发和缓解交替的表现。患者症状没有特异性，包括胸痛，咳嗽，痰中带血，出汗，发冷，虚弱，纳差，体重减轻以及呼吸困难或劳累，咯血和腹痛相对少见。急性或亚急性起病者症状类似肺炎，而慢性病程的患者症状与肺结核类似。
肺奴卡菌病是一种非特异性感染，其影像学表现无特异性。主要表现包括：
（1）肺实变：肺实变可能是肺奴卡菌最有特征性的表现。实变可以累及单个或多个肺叶，后者多见。若实变内部密度减低，通常提示脓肿形成。约 30%的病灶内有空洞形成；
（2）肺结节或肿块：实性结节多见，实性结节多于磨玻璃结节，部分病灶周围可以出现“晕征”，但是相对少见；
（3）胸膜增厚、胸腔积液和脓胸：约三分之一的患者出现胸腔积液；当病灶累及胸膜腔时可出现脓胸；

（4）根据奴卡菌在肺部播散途径不同，可有不同的影像学表现。经支气管播散的患者常可见空洞形成，其更特征性的表现是小的小叶中心结节，常伴有支气管壁增厚和支气管内小碎片影。而经血行播散的肺奴卡菌病灶表现为多发大小不等结节。
该病目前诊断较为困难，本文结合近年来国内外对肺部放线菌病的报道和研究，为该病的诊疗提供参考和借鉴。

PU-2597

MSCT 结合临床病史对双肺多发实性结节病变鉴别诊断价值的评价

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目的： 探讨 MSCT 结合临床病史对双肺多发实性结节病变的鉴别诊断价值。方法：对我院 2017.4-2019.6 收治的 5 例双肺多发实性结节病变患者的临床资料进行回顾性分析,总结相应的 MSCT 特征和临床病史。结果： 5 例患者均表现为双肺多发大小不等结节影，4 例伴有空洞，单纯依靠影像难以鉴别，结合临床病史：1 例 pANCA 阳性，双肺结节较大病灶位于双肺下叶，部分结节见晕轮征和供养血管征，空洞内见液气平面，激素治疗后病灶及空洞体积均减小，诊断为肺韦格氏肉芽肿；1 例结肠癌化疗后病史，痰真菌核酸检测阳性，空洞表现为新月形，抗真菌治疗好转，诊断为肺真菌感染；1 例肿瘤标志物升高，较大结节边缘见分叶及毛刺，牵拉胸膜，空洞小且偏心分布，穿刺找到腺癌细胞，诊断为肺腺癌；1 例结核感染 T 细胞斑点试验阳性，结节位于上叶后段及下叶背段，多为薄壁空洞，局部洞壁见钙化，诊断为双肺结核；1 例原发性肺癌病史，双肺结节边缘光滑锐利，未见空洞，诊断为双肺多发转移瘤。结论：MSCT 结合临床病史对双肺多发实性结节性病变鉴别诊断有价值.

PU-2598

关于肺部类鼻疽感染的探讨

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目的 分析类鼻疽肺炎临床特点及影像学表现，提高人们对类鼻疽感染的认识。
方法 总结本院 2012 年 2 月至 2018 年 10 月经细菌、血液、脑脊液等培养证实的 22 例类鼻疽肺炎患者，探讨其临床特点及影像学表现。
结果 类鼻疽肺炎症状表现：发热(100%)、咳嗽和咳痰(40%)等；血象：大多贫血，白细胞和中性粒细胞比例及 c 一反应蛋白和血糖大多明显升高（95%）；类鼻疽伯克霍尔德杆菌(血培养阳性占 90%，痰培养阳性占 20%)；Strauss 反应阳性（占 95%）；血清学检测：间接红细胞凝集试验效价在 1:40 以上，补体结合试验效价在 1:8 以上（占 98%）。胸部影像学表现常累及多个肺叶，散在分布，多形态，常累及胸膜，以浸润性病变为主(80%)，多发大小不等结节(40%)、胸腔积液(30%)、空洞(20%)也常见。

结论 在糖尿病、肝硬化等（ 95 % ）为主要基础疾病， 出现发热、胸痛、咳嗽等临床表现；肺部影像学表现以浸润病灶为主的多形态病灶， 经过一次或多次血培养出类鼻疽伯克霍尔德菌。应考虑到类鼻疽感染可能，应及时行微生物培养

PU-2599

肺毛霉菌病的 CT 表现及动态随诊

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目的 探讨肺毛霉菌病(pulmonary mucormycosis，PM)的 CT 特征，包括其随诊动态变化，以提高对该病的认识。方法 回顾性分析 9 例经病理证实的 PM 患者的胸部 CT 及临床资料。所有患者均行 MSCT 平扫，5 例行增强扫描。结果 PM 主要为双侧分布，肺叶、肺段分布无规律。2 例为大片实变，7 例以肿块、结节、实变的组合形式出现。病灶出现液化坏死 7 例，晕征 6 例，毛刺征 5 例（长毛刺为主），空洞及空泡征各 4 例，气液平、反晕征、分叶征（浅分叶为主）及点状钙化各 2 例，空气半月征 1 例。5 例实性成分轻中度强化，支气管受侵 6 例，淋巴结肿大 5 例，胸腔或心包积液 6 例，胸膜凹陷征 4 例。抗真菌治疗约 1～2 周病灶扩大，继而出现液化坏死及空洞，治疗约 3～4 周后逐渐好转，停药后病变进展 3 例。结论：PM 基线 CT 表现形式多样，常伴晕征，强化程度低，易侵犯支气管，可出现类似肺癌的恶性征象，反晕征少见。PM 治疗初期易出现影像学加重的假象，停药可致病变进展。

PU-2600

CT 低剂量检查在儿童肺炎复查的应用

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目的：在满足诊断的前提下依据体重指数（BMI，Body Mass Index）采用部分迭代技术降低儿童胸部 CT 辐射剂量。方法，测量儿童肺 CT 复查患者的体重指数，根据个体差异前瞻性给予不同技术参数设为对照组，与首诊无差别的技术参数常规组相比较，图像质量主观评价评分、客观数据统计分析，分析辐射剂量对照组相对常规组容积剂量指数(CTDIvol)、剂量长度乘积(DLP)，计算有效剂量（effective dose，ED）。结果：通过体重指数采用迭代技术制定儿童差异性 CT 参数能够有效地降低 X 线辐射剂量，BMI<15.0kg/m^2辐射剂量降低约 %，15.0≤BMI<18.5kg/m^2辐射剂量降低约 %，18.5≤BMI≤24.9 kg/m^2辐射剂量降低约 %，24.9<BMI<30 kg/m^2辐射剂量降低约 %，对照组较常规组降低辐射剂量 %，主客观评价图像质量无统计学意义，均能满足影像诊断。讨论：儿童肺炎复查运用部分迭代技术根据患者体重指数制定 CT 不同扫描方案，降低儿童受辐射剂量，减少生物学随机效应不良发生的概率，规范个体扫描参数。

PU-2601

表现为肿块样改变的肺结核与周围型肺癌的鉴别诊断

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目的：对比周围型肺癌的 CT 平扫及增强表现，分析肿块样肺结核的误诊原因，以提高对肿块型肺结核的认识及诊断准确性。方法：收集术前误诊为肺癌经手术病理或经穿刺活检为肺结核的肿块 40 例，分析病变的部位、形态、大小、密度、内部空洞的形态及部位、内部钙化数量及形态、卫星灶有无、增强程度、胸膜凹陷、纵膈淋巴结形态及密度、胸水有无等表现，分析误诊原因。同时收集 40 例经病理或穿刺活检证实的周围型肺癌，对两组病例按照上述特点进行对比。结果：40 例肿块型肺结核中边缘欠光整 35 例，5 例边缘光滑；浅分叶 30 例，深分叶 10 例；短小毛刺 5 例，细长毛刺 13 例；7 例可见点状或结节状钙化；11 例可见小空洞，边缘光滑，并位于近肺门侧；14 例周围可见数量不等卫星灶；28 例周围胸膜增厚；轻度强化 28 例，中度强化 9 例，显著强化 3 例；纵膈淋巴结肿大 18 例，其中 2 例可见钙化；7 例可见胸水。40 例肿块型结核与肺癌相比，深分叶征、短毛刺、空洞征、胸膜凹陷、卫星灶、强化程度在 2 组间差异有统计学意义（$P<0.05$），以上征象（深分叶、短毛刺、空洞、胸膜凹陷）出现越多、越典型提示肺癌可能性大；卫星灶出现越多提示结核可能性大；空洞越靠近肺门、边缘光滑强烈提示肺结核，空洞远离肺门端、边缘欠光滑更倾向于肺癌；轻度强化提示肺结核，显著强化提示肺癌。结论：在对肿块型病变进行分析诊断时，不要一味考虑肿瘤占位性病变，结核表现多种多样，要充分结合以上影像表现及临床特征进行分析，除对肿块型病变的常规毛刺、分叶、胸膜凹陷、血管集束等方面仔细分析时，同时更要注重空洞形态及位置、周围卫星灶、强化程度等方面予以重视，以提高对肿块型结核的诊断准确性，为其治疗提供科学依据。

PU-2602
异基因造血干细胞移植受者真菌性肺炎的 ＣＴ 表现及动态变化

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目的 探讨异基因造血干细胞移植 （ａｌｌｏｇｅｎｅｉｃ ｈｅｍａｔｏｐｏｉｅｔｉｃ ｓｔｅｍ ｃｅｌｌ ｔｒａｎｓｐｌａｎｔａｔｉｏｎ， ａｌｌｏ-ＨＳＣＴ）受者真菌性
肺炎的发病时间 ＣＴ 表现及动态发展变化。 方法 回顾性分析 ２８ 例 ａｌｌｏ-ＨＳＣＴ 受者真菌性肺炎的 ＣＴ 表现及临床资料。
结果 ２８ 例真菌性肺炎，发生在移植后 ３０ 天内 ４ 例，３１ ～１００ 天 ８ 例，１０１ ～３６５ 天 ６ 例，３６５ 天以后 １０ 例。 ２４ 例 ＣＴ 主要
表现为结节和（或）团块状影，其中７ 例伴晕征； １６ 例病程中出现空洞，其中１１ 例空洞出现分隔征； １１ 例出现气腔实变； １０
例出现磨玻璃密度； ６ 例出现局限性支气管扩张； ６ 例出现网织状改变。 经抗真菌治疗后， １７ 例病变吸收，其中 １０ 例患者
病变吸收过程中出现空洞伴分隔征。 结论 ａｌｌｏ-ＨＳＣＴ 受者真菌性肺炎可发生在移植后各个时间段，其 ＣＴ 表现多种多
样，主要表现为结节、团块及空洞；空洞伴分隔症可能是病变吸收的表现

PU-2603
平扫薄层 CT 结合窗技术对肺动脉栓塞的显示

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目的：探讨平扫 CT 薄层肺窗影像在肺动脉栓塞（PE）患者的表现及诊断价值。 方法：回顾性分析 2016.7-2019.7 我院住院患者经肺动脉 CTA 检查 735 例，其中 CTA 检查前行胸部 CT 平扫 253 例，以肺动脉 CTA 为对照，对比常规纵隔窗（层厚：8mm，WW:350HU,WL:35HU）和薄层肺窗（层厚：2mm,WW:80HU,WL:35HU）影像上，PE 的表现及阳性率。统计学分析采用卡方检验。 结果：经肺动脉 CTA 检查确诊 PE 的 62 例，年龄 31-87 岁，下肢深静脉血栓患者 53 例（85.48%），D 二聚体均升高，平扫 CT 检查均未给予疑似 PE 诊断。肺动脉 CTA 上，PE 发生于肺动脉Ⅰ级 1 例，Ⅱ级 24 例，Ⅲ级 40 例，Ⅳ级 51 例，Ⅴ级 33 例。在平扫 CT 上，与非病变血管密度相比，PE 可表现为高密度影（>45HU）或低密度影（<20HU）；常规纵隔窗阳性为 14.51%，薄层肺窗影像阳性率为 40.32%，差异有统计学意义，P<0.05；薄层肺窗影像上，Ⅲ级以上阳性率为 38.46%，高于Ⅲ、Ⅳ级阳性率 6.15%，P<0.05。结论：平扫 CT 薄层肺窗影像对肺动脉栓塞的显示优于常规纵隔窗影像，对于高危人群应细致观察，有助于及早行肺动脉 CTA 检查以进一步确诊。

PU-2604

2D-PC MRI measurement of pulmonary artery blood flow and left atrial function in smokers: a correlational research

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Purpose To investigate the correlation between main pulmonary artery blood flow and left atrium functional parameters in smokers using two-dimensional phase contrast magnetic resonance imaging (2D-PCMRI). **Method** Twenty-two smokers (all men, mean age: 39.6±7.3 y years) were enrolled in this study. All of them underwent main pulmonary artery 2D-PC and cardiac scan at 3.0T MR from December 2017 to February 2018. Blood flow parameters include Peak Positive Velocity (PPV) (cm/s), Peak Negative Velocity (PNV) (cm/s), Average flow (AF) (ml/beat), Average Positive Flow (APF) (ml/beat), and Average Negative Flow (ANF) (ml/beat). The correlation between main pulmonary artery blood flow and left atrial functional parameters was analyzed. **Result** There is a statistically correlation between pulmonary artery PPV and left atrial active ejection fraction (LAEFa) (p=0.016, r=0.509), and left atrium total ejection fraction (LAEFt) (p=0.011, r=0.531) respectively. Similarly, there is a statistically correlation between pulmonary artery AF and LAEFt (p=0.009, r=0.545). There is a statistically correlation between APF and LAEFt (p=0.045, r=0.431).**Conclusion** There is a positive correlation between the main pulmonary artery blood flow and left atrium function in smokers. It is helpful in further to understand and reveal the effect of smoking on the cardiovascular system.

PU-2605

CT 诊断成人右肺动脉起源于升主动脉(AORPA)合并动脉导管未闭 1 例并文献复习

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目的：通过总结 1 例 CT 检查提示右肺动脉异常起源于升主动脉患者诊疗经过。 方法：回顾性分析 2018 年 12 月收治的一例肺动脉起源异常患者的临床资料并复习相关文献，探讨其疾病临床特点、影像学表现；结果 男 1 例 32 岁 体重为 42kg，影像诊断为右肺动脉异常起源于升主动脉并合并动脉导管未闭。结论：一侧肺动脉异常起源于主动脉极为罕见 术前影像诊断易漏诊，合并肺动脉高压患者手术困难。

PU-2606

双能 CT 碘图灌注技术评价肺动脉栓塞的价值

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目的：探讨双能量 CT 扫描技术对肺动脉栓塞的诊断及肺灌注评价价值。
方法：回顾性研究 2019 年 1 月至 2019 年 7 月，可疑肺栓塞患者共 35 例，均行双源 64 层螺旋 CT（Siemens Definition）扫描。采用双能肺栓塞扫描方式，球管 A：管电压 140kV，管电流 55mA；球管 B：管电压 80kV，管电流 210mA。准直宽度为 64×1.2mm，螺距 0.5，旋转时间 0.33s，层厚 1.5mm，层间隔 1mm。所有患者行肘静脉穿刺，采用 MEDRAD 双筒高压注射器，采用三联注射方案：碘帕醇 20mm，3ml/s，碘帕醇 40mm，4ml/s，生理盐水 50mm，4ml/s，即先慢速注射 20ml 对比剂，立即跟注 40ml 碘帕醇，再推注 50ml 生理盐水。检测肺动脉干，100HU 触发扫描程序，延时 8S 后双能量一期扫描。然后，讲薄层数据传输至后处理工作站行 CTA 重建、双能量分析。
结果：双能量扫描方式，一次扫描可以得到 CTA 数据和肺血流灌注数据，可评价血管栓塞位置、数量、及影响范围。双能量特有的碘图能够分析肺血流灌注范围。
讨论：1.采用双源 CT 扫描较单源 CT 有更多优势，双能量扫描数据得到 CTA 的同时，能够得到碘对比剂在肺实质内的灌注的分布图，从灌注情况可以印证栓塞的责任血管和影响程度。无论是诊断新发梗塞，还是评价治疗后肺功能恢复情况，均有较高的影像价值；2.采用三联注射方案，触发探测程序注射较慢的速率，能够节约对比剂用量，也降低人体对比剂反应发生；3.部分使用单源 CT 的同行采用的是两期扫描，该扫描方案采用一期扫描，可得到 CTA 及肺实质灌注碘图，可减少对患者的辐射剂量，缩短扫描时间。延时 8s 时间，能够使碘对比剂通过肺泡，此时扫描，可以得到肺实质的灌注情况，太早期的扫描可能因为肺实质本身的灌注不均，造成栓塞存在的误诊，太晚会错过肺 A 的血管器，至 CTA 显示不佳。

PU-2607

Pulmonary Artery Size Measurements: a Comparison Study between Electrocardiographic-gated and Non-electrocardiographic-gated Computed Tomography

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OBJECTIVE. The aim of this study was to determine the differences in pulmonary artery size when measured from electrocardiographic-gated CT and non-electrocardiographic-gated CT.

MATERIALS AND METHODS. Electrocardiographic-gated CT coronary angiography and non-electrocardiographic-gated CT were performed in 279 patients suspected of having coronary artery disease. Maximum and minimum main pulmonary artery, right pulmonary artery and ascending aorta diameters were measured on the end-diastolic and end-systolic phase of pulmonary artery with electrocardiographic-gated CT. Mean main pulmonary artery and right pulmonary artery measurements were also obtained in this study. Correlation between electrocardiographic-gated CT and non-electrocardiographic-gated CT parameters were explored. Further validation of the correlation between the electrocardiographic-gated and non-electrocardiographic-gated CT was performed by using linear regression, respectively.
RESULTS. There was a significant difference in maximum and minimum pulmonary artery diameters between electrocardiographic-gated CT and non-electrocardiographic-gated CT, while mean pulmonary artery measurements showed no statistically difference. The ratio of maximum main pulmonary artery to ascending aorta diameter was slightly larger in electrocardiographic-gated CT. The correlation of the electrocardiographic-gated CT measurements showed a strong positive correlation with non-electrocardiographic-gated CT, which was confirmed in the validation data set.
CONCLUSIONS. There was a significant difference in pulmonary artery size between electrocardiographic-gated CT and non-electrocardiographic-gated CT. Electrocardiographic-gated CT measurements demonstrate a high level of correlation with non-electrocardiographic-gated CT.

PU-2608

MSCT 后处理技术在肺隔离症中的应用价值研究

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目的 探讨 MSCT 后处理技术在肺隔离症中的应用价值。
方法 选取我院 2012 年 2 月一 2019 年 6 月收治的肺隔离症患者 13 例，收集其临床资料、影像学资料等，分析、总结 13 例肺隔离症患者 CT 平扫及在不同后处理技术中的影像学表现。所有患者均行平扫及增强扫描，对图像采用最大密度投影（MIP）、容积再现(VR) 重建技术，由两名诊断医师独立观察病灶具体部位、外观形态特点、直径、密度、病变范围等情况。
结果 MSCT 平扫显示病变均位于下肺后基底段，发病部位：左肺 9 例，右肺 4 例；疾病类型：叶内型 10 例，叶外型 3 例。CT 平扫 9 例显示为囊实性混合肿块，实质性成分内出现多个囊性区合并有气体，增强后未见明显强化，其中 3 例伴有支气管扩张；病灶呈实性肿块者 4 例，伴有明显强化，边缘清楚。经 MIP、VR 后处理，13 例患者均可发现来自体循环的供血动脉，9 支由胸主动脉供血，引流入肺静脉系统，1 支由腹主动脉上段供血，1 支由腹腔干直接参与供血。
结论 MSCT 扫描结合后处理技术可清晰显示肺隔离症的外观形态、血管分布情况，为临床制定手术方案提高可靠影像学资料

PU-2609

ANCA 相关性血管炎临床及影像分析

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目的：抗中性粒细胞胞浆抗体相关血管炎(AAV)是一组以中小血管炎受累为主、ANCA 阳性为特征的系统性疾病。主要包括显微镜下多血管炎（MPA）、肉芽肿性多血管炎（GPA）和嗜酸性粒细胞性多血管炎（EGPA）。间接免疫荧光法(IIF)和酶联免疫吸附试验(ELISA)是此类疾病常用的实验室检测方法；本研究旨在分析 AAV 患者在实验室检查分类亚型中临床及影像特点，以提高临床医生对此疾病进一步认识。方法：检索并回顾性分析 2012 年 1 月至 2019 年 3 月武汉大学中南医院诊断为 ANCA 相关性血管炎的患者。胸部 CT 由 2 名影像科医生诊断核实，临床资料（包括患者基本病例资料，实验室检查）由 1 名肾病内科医生核实。IIF 和 ELISA 联合检验分类，统计分析两种 ANCA 亚型患者是否存在差异。结果：ANCA 相关性血管炎临床表现多样且无特异性，本研究的 69 名患者中合并肺部表现的患者有 35 例，其中主要表现为咳嗽、咳痰（32 例，46.4%），肾脏损伤（64 例，92.7%）是主要的肺外表现，包括血尿、蛋白尿、肌酐及尿素氮升高等症状；共有 59 人有肺部 CT 影像资料，以斑片状稍高密度影及肺间质改变为主。PR3-ANCA 组的患者更易表现为双肺多发结节[5/10（50%）vs 7/48（14.6%），P=0.037]。尽管不具有统计学意义，但仍可以发现肺部斑片状稍高密度影及间质性肺炎是 MPO-ANCA 更易出现的影像学表现。实验室检查中，PR3-ANCA 组的患者血沉指标升高比 MPO-ANCA 组明显（中位数：44mm/h vs 91mm/h，P=0.026）。结论：ANCA 相关性血管炎是多系统受累的一类疾病，临床表现以肺部和肾脏受损为主，ANCA 血清学检测对该疾病诊断积有极作用，在两组亚型中 PR3-ANCA 患者影像学表现更具特异性。

PU-2610

ANCA 相关性血管炎的胸部 CT 表现

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目的

研究抗中性粒细胞胞浆抗体（ANCA）相关性血管炎（AASV）在肺部疾病的临床表现及胸部 CT 表现。

方法

回顾性分析 2016 年 1 月至 2019 年 2 月于中山市人民医院经血清学确诊的 8 例 AASV 患者的临床资料及胸部 CT 表现。

结果

8 例患者中，男 3 例，女 5 例，年龄 35~79 岁（平均 48）岁。p-ANCA 均为阳性，其中合并有肾功能不全 2 例，合并有结缔组织病 3 例。胸部 CT 主要表现为实质型（肺泡毛细血管炎）及间质型（肺间质性病变），间质性肺炎 5 例，斑片状磨玻璃影 3 例，胸膜增厚 2 例，支气管扩张 5 例，支气管充气征 2 例，空洞 1 例，胸腔积液 2 例，蜂窝肺 1 例。

结论

AASV 的发病率逐渐增高，胸部 CT 表现无特异性，其临床症状与体征常与感染、恶性肿瘤、血栓性疾病及结缔组织病相重叠，易误诊为感染性肺炎、肺水肿、肺结核等。当患者血红蛋白降低，且有血尿、蛋白尿，肾功能减退，出现不可解释的双肺炎性渗出影像学改变时，应警惕 AASV。

PU-2611

320 排 CT 肺血管减影成像（DSCTPA）在肺栓塞（PE）诊断中的应用

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目的 探讨 320 排 CT 肺血管减影成像(DSCTPA) 在肺栓塞(PE) 诊断中的价值。 方法 79 例临床怀疑 PE 患者行 DSCTPA，先进行 CT 平扫，后立即行 CT 肺动脉血管造影(CTPA) ，并将两组图像加载到 Sure-SubtractionLung 软件进行处理，得到两组视图模式图像: Tissue 模式为碘分布图融合肺动脉血管像(CTPA+碘图) ，Vessels 模式为减影后肺动脉血管图像(CTPA+血管像) 。由 2 名医师采用双盲法对 2 组图像和 CTPA 图像进行分析，肺动脉血
管按肺动脉干，叶、段、亚段及以下，分别记录各患者栓子的数目与位置。研究图像显示方法诊断 PE 的敏感度、特
异度、假阴性率及假阳性率。 结果 每个病例减影后处理平均耗时 3. 5 min，按标准测得血栓共 326 个，其中位于
主干 35 个，叶肺动脉 76 个、段肺动脉 133 个、亚段及以下 82 个。CTPA 图像、CTPA+血管像以及 CTPA+碘图 3 组显
示 PE 总栓子数的灵敏度、特异度及假阴性率和假阳性率分别为 87. 7% /91. 7% /96. 6%、82. 9% /85. 2% /83. 7%、12.
3% /8. 3% /3. 4%和 17. 1% /14. 8% /16. 3%。CTPA、CTPA+血管像、CTPA+碘分布图三种方法在各肺段栓子检出率为
肺叶动脉 96. 1% /97. 4% /98. 7%，肺段动脉 85. 7% /92. 5% /97. 0%和肺亚段动脉及以下 76. 8% /81. 7% /92. 7%。 结论
DSCTPA 成像一次减影可同时得到 2 组模式图像，有助于提高对周围肺动脉的显示能力和反映碘剂在肺实质的
分布。CTPA 图像结合碘分布图和血管减影图，不仅提高了亚段及以下段 PE 栓子的诊断检出率，而且可评价肺动
脉栓塞后肺实质血流灌注的变化，为制定临床治疗方案提供参考。

PU-2612
640 层容积 CT wide-volume 模式在肺动脉成像中的应用价值

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目的 探讨 640 层容积 CT 回顾性心电门控 wide-volume 模式在肺动脉成像中的可行性及其应用价值。**资料与方法** 收集本院行 640 层容积 CTPA 的病例，随机分为常规非心电门控螺旋扫描组（非门控组）、回顾性心电门控螺旋扫描组（门控组）、回顾性心电门控 wide-volume 模式扫描组（wide-volume 组），每组 30 例。比较各组患者基本资料及辐射剂量、图像质量评分、呼吸运动伪影及心脏大血管搏动伪影。**结果** ①扫描时间：非门控组、wide-volume 组及门控组依次增加（P<0.05）。心率：wide-volume 组（82.7±14.1）次/分显著高于门控组（68.1±12.1）次/分（P<0.05）。②图像评分：门控组及 wide-volume 组评分明显优于非门控组（P<0.05）；门控组与 wide-volume 组评分无统计学差异（P<0.05）。三组 CTPA 图像在心脏搏动伪影之间有显著统计学差异（P<0.05），采用心电门控 CTPA 能有效消除心脏搏动伪影，提高图像质量。③辐射剂量：非门控组、wide-volume 组及门控组有效辐射剂量依次增加（P<0. 05）。**结论** 640 层容积 CT 回顾性心电门控 wide-volume 扫描模式应用于 CTPA 检查具有可行性，可以在并不大幅度增加患者辐射剂量的前提下，减少心脏大血管搏动伪影，明显改善肺动脉图像质量。

PU-2613
低对比剂碘量支气管动脉 CTA 成像质量分析及其在咯血介入栓塞治疗中的应用价值

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【摘要】目的：探究低对比剂碘量支气管动脉 CTA 成像质量分析及其在咯血介入栓塞治疗中的应用价值。**方法：**选取 2018 年 6 月至 2019 年 6 月我院呼吸内科收治的因咯血介入栓塞治疗的患者 110 例进行分析，随机分分为 A、B 两组各 55 例，对 A 组行 CTA 检查注射对比剂 60ml，采用滤波反投影重建法（FBP）进行后期处理；对 B 组行 CTA 检查并注射对比剂 80ml，采用 FBP 进行后期处理。记录两组的背景噪声（SD）值、对比噪声比（CNR）、背景噪声判断值（SNR），对两组成像结果进行主观比较，按 5 分评价图像总体质量。**结果：**A 组的成像质量在 3 分以上（5 分 24 例、4 分 21 例、3 分 6 例）共有 51 例，B 组的成像质量在 3 分及 3 分以上（5 分 13 例、4 分 11 例、3 分 14 例）共有 38 例，差异具有统计学意义（$p<0.05$）；结果显示 A 组的背景噪声（SD）值（8.42±1.32）明显低于 B 组（19.24±5.64），A 组的对比噪声比（CNR）、背景噪声判断值（SNR）（51.80±5.28、45.62±4.32）明显高于 B 组（25.38±3.68、22.42±5.84）。**结论：**60ml 低对比剂碘量对支气管动脉 CTA 成像质量明显高于 80ml 低对比剂碘量，因此在不影响图像质量的情况下，低对比剂碘量对在咯血介入栓塞治疗中有良好的临床应用价值，值得推广并广泛应用于临床。

PU-2614
应用 80kV 联合 ASIR-V 迭代算法行超低对比剂量和低辐射剂量左心房和肺静脉 CT 血管造影的可行性分析

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目的：评价应用 80kV 联合自适应统计迭代重建(ASIR-V)在 16 cm 宽体探测器 CT 上实现左心房(LA)和肺静脉(PV) CT 血管造影(CTA)超低对比剂量和低辐射剂量检查的可行性。
方法: 前瞻性收集 60 例房颤患者，在计划射频消融术前接受 16cm 宽体探测器 LA 及 PV CTA 检查，使用前瞻性心电门控，患者均自由呼吸。随机分为 A 组(n=30)，80kVp，对比剂剂量为 0.4ml/kg, 75%对比剂和 25%生理盐水混合溶液，80%ASIR-V 图像重建;B 组(n=30) ，120kVp，对比剂剂量为 0.9ml/kg, 50%ASIR-V 图像重建。测定 LA、PV、PA 的 CT 值(HU)。并计肺动脉与肺静脉的差值 ΔHU:ΔHU = HU_{LA}-HU_{PA}。采用 5 分法进行主观评分。比较两组患者的有效辐射剂量(ED)
结果: A 组与 B 组患者性别、年龄、体重及 BMI 无显著差异(p>0.05)。A 组辐射剂量(mSv)下降 69.8%(1.10±0.21 vs. 3.64±1.01,p<0.001)，对比剂量(gI)下降 57.9%(9.47±1.34 vs. 22.48±3.15,p<0.001)，碘流率(gI /s)下降 36.2%(1.18±0.15 vs. 1.8, p<0.001)。两组患者左心房及肺静脉强化良好。LSPV、LIPV、RSPV、RIPV 的 CT 值无明显差异(p>0.05)。A 组左心房 CT 值(HU)高于 B 组(568.98±129.57 vs. 501.07±62.15,p=0.02)。A 组的 ΔHU 高于 B 组(364.27±107.34 和 186.79±131.97,p < 0.05),肺动脉对肺静脉的干扰较小。A 组与 B 组主观评分无明显差异(4.33±0.55 vs. 4.21±0.77)。
结论:在宽体探测器 CT 上采用低管电压和迭代重建技术，可以在较低的辐射和对比度剂量下获得高质量的 LA 和 PV CTA 图像。

PU-2615

GE Revolution CT 肺静脉及冠脉联合成像研究

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目的：作为治疗心房颤动的主要方法之一，射频消融肺静脉电隔离术要求临床医师能准确评估患者冠脉情况，左心房情况及肺静脉开口位置、数量、开口直径等信息。在满足临床影像诊断需求的前提下，肺静脉与冠脉的联合成像不仅降低了扫描次数，也减少了造影剂用量，从而降低患者经济与生理上的负担。本文即以 GE Revolution 256 排 CT 为检查工具，探讨不同 BMI 下肺静脉与冠脉联合成像的可行性。
方法：选取我院需进行肺静脉与冠脉成像的病人 27 例，其中 BMI≤23 者 9 例，BMI≥28 者 9 例，BMI 在 23-28 之间者 9 例，行肺静脉与冠脉联合成像。造影剂选取碘帕醇 370（370gI/ml），经肘正中静脉注射，流速 5.0ml/s，用量为：BMI≤22 者，注射 50ml，BMI≥28 者,注射 60ml，BMI 在 23-28 之间者，注射 55ml。扫描为动态触发双期扫描方式。第一期为冠脉轴扫，第二期为由肺尖到肺底的螺旋扫描。电压均为 100KV，采用 SmartmA 技术（450-600mA）。冠脉扫描期相为自动推荐。检查数据均由 GE ADW4.6 工作站处理。图像评价为三分法：1 分为优（肺静脉及左房显示清晰，各冠脉显影良好）2 分为良（肺静脉、左房显影较差或冠脉显影较差，但满足诊断需求）3 分为差（肺静脉、左房或冠脉有任一显影差，不满足诊断需求）。辐射剂量采用自动计算 DLP，K 取 0.014。数据均以均数±标准差显示，采用方差分析进行统计学处理，以 p≤0.05 为差异有显著性。
结果：27 例肺静脉与冠脉联合 CT 成像均满足诊断需求，其图像质量为 1 分 21 例，2 分 6 例，3 分 0 例,不同 BMI 组别之间强化程度无差异（p≥0.05）。有效辐射剂量为 6.33±0.84mSv。
结论：应用 GE Revolution 256 排 CT 进行肺静脉与冠脉联合扫描可为不同 BMI 患者提供满足临床诊断需求的影像参数，是一种有效的影像技术平台。

PU-2616

Pulmonary Artery Lymphomatoid Granulomatosis :CT Findings

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Introduction:
Lymphomatoid granulomatosis (LG) is an angiocentric lymphoproliferative disease.At present most of the reported cases are in the lungs, followed by skin, central nervous system, spleen, liver, lymph nodes and peripheral nerve, and pulmonary lymphomatoid granulomatosis mainly invaded the small pulmonary artery,there have been no reports of cases that the main trunk of the pulmonary artery been violated.In this report, we describe a case of pulmonary artery lymphomatoid granulomatosis.

Through a case report,To summarize the imaging features of lymphomatoid granuloma when it occured in pulmonary artery,and adds to the medical literature for the particular clinical presentation of this rare disease.

Case presentation:

A 46-year-old man was treated for chest tightness and shortness of breath for more than half a year.CTA examination showed pulmonary hypertension, irregular filling defect in pulmonary trunk,,and left pulmonary artery,and right pulmonary artery occlusion (Fig1a-1c), right atrium and right ventricle enlargement.Biopsy suggested lymphomatoid granulomatosis, and symptoms improved significantly after stent implantation sequentially,CTA examination showed:stenting can be seen in the left and right pulmonary trunk,and they also had more distant branches than before (Fig2a-2c,3a-3c).

Conclusions:

Lymphoma-like granulomatosis, which is mainly characterized by pulmonary artery invasion, is rare.The CTA examination is mainly characterized by progressive thickening of the pulmonary artery wall, narrowing of the lumen,and its diagnosis depends mainly on histological examination.but it is not easy to identify with lymphoma. This case report adds to the medical literature for the particular clinical presentation of this rare disease.

PU-2617

增强 CT 扫描及后处理技术对肺隔离症的 诊断价值

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目的：探讨增强 CT 扫描及其后处理技术在肺隔离症中的诊断价值。方法回顾分析 18 例经手术和病理证实的肺隔离症患者胸部增强 CT 及后处理图像。结果其中叶内型 16 例(89%) ，叶外型 2 例(11%) ; 14 例位于左下肺(78%) ，4 例位于右肺(22%) ; 实性肿块 3 例，囊实性肿块 11 例，囊性病灶 1 例，血管增粗及条索影 3 例; 供血动脉 2 例来自腹主动脉上段，另外 16 例来自胸主动脉下段，其中多支供血动脉 3 例，单支供血动脉 15 例， 16 例引流至同侧肺静脉，1 例引流至半奇静脉，1 例为双重静脉引流(肺静脉、奇静脉) ; 18 例均能完整地显示异常供血动脉及引流静脉的全貌。结论增强 CT 扫描及其后处理技术能清晰显示病灶内异常供血动脉及引流静脉，对肺隔离症的诊断具有重要的临床应用价值，可以取代血管造影作为诊断该病的最佳检查方法。

PU-2618

新诊断为慢性血栓栓塞性肺动脉高压患者的 HRCT 表现

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目的

探讨新诊断为慢性血栓栓塞性肺动脉高压（Chronic thromboembolic pulmonary hypertension，CTEPH）的 HRCT 表现。

方法
收集我院 2016 年 1 月-2019 年 1 月临床新诊断为 CTEPH 的 60 例患者，回顾性分析 HRCT 扫描评估血管的 CT 表现，在 HRCT 轴位上测量右心室、左心室、右心房、左心房（dRV、dLV、dRA、dLA）的直径，升主动脉（dAA），左、右肺动脉（drPA、dlPA）和主肺动脉（dPA）的直径。采用 Philips256 层螺旋 CT，扫描范围从胸廓入口至肋膈角。
结果
大多数慢性血栓栓塞性肺动脉高压患者 HRCT 表现为马赛克灌注，肺段血管大小差异，肺实质密度，支气管扩张和支气管壁增厚。慢性血栓栓塞性肺动脉高压 HRCT 表现无明显差异。平均 PAP 显示与 dRV / dLV，dRA，dRV，dPA 和 dPA / dAA 比率 CT 指标显著相关，与中心血栓评分无相关性。通过后向线性回归，dPA / dAA 比率与 mPAP 独立相关。
结论
大多数新诊断为慢性血栓栓塞性肺动脉高压患者在 HRCT 扫描时表现为马赛克灌注，肺段血管大小差异，肺实质密度，支气管扩张和支气管壁增厚。HRCT 可为慢性血栓栓塞性肺动脉高压的诊断提供重要的信息，可作为常规筛查检查方法。

PU-2619

Dual energy Dual source CT scanning in the diagnosis of pulmonary embolism value

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Objective :Explore the dual-energy dual-source CT pulmonary angiography scan (CTPA) the accuracy of the diagnosis of pulmonary embolism and pulmonary perfusion imaging (DEPI), evaluate the value of dual-source dual-energy CT scanning in the diagnosis of pulmonary embolism .
Methods: For between November 2012 -2014 Feb. 96 cases in our hospital patients with suspected pulmonary embolism dual-source dual-energy CT examination , 55 patients diagnosed with pulmonary embolism as an object of study, to get a complete picture and CTPA and DEPI data , and collect finishing surgical pathology or clinical outcomes for patients . CTPA and were evaluated using DEPI situation around the pulmonary artery, pulmonary lobe , segment and sub- segment pulmonary emboli , using statistical software evaluation both diagnostic sensitivity of pulmonary embolism .
Results:55 cases of pulmonary emboli in patients with a total of 226 , of which 30 involved about pulmonary emboli , 69 involved lobe pulmonary artery, pulmonary segments involving 84 , 43 involving subsegmental pulmonary artery. CTPA emboli were detected in 197 , DEPI detect emboli 208 . Dual-source dual-energy CT imaging of lung filling 55 cases of pulmonary embolism in patients with diagnostic accuracy was 92% , higher than the diagnostic accuracy of CTPA is 87%; (P <0.05), two methods for accurate diagnosis of pulmonary embolism the difference between the rate was statistically significant. In which the left pulmonary artery , CTPA diagnosed 28 , DEPI found 30 , CTPA diagnostic accuracy was 93.3% ; diagnostic accuracy was 100%, (P> 0.05), the difference was not statistically significant. In leaf pulmonary artery , CTPA diagnosed 63 , the diagnostic accuracy was 91%, DEPI diagnosed 67 , the diagnostic accuracy was 97%, (P> 0.05), the difference was not statistically significant. In paragraph pulmonary artery , CTPA diagnosed 72 , the diagnostic

accuracy was 86%, DEPI diagnosed 75 , the diagnostic accuracy was 89%, (P <0.05), both statistically significant. In Asia pulmonary artery , CTPA diagnosed 32 , the diagnostic accuracy was 74%, DEPI diagnosed 36 , diagnostic accuracy was 83%. The statistical units (P <0.05), both statistically significant.

PU-2620
Revolution CT 在胸痛三联征一站式检查中两种扫描方案的探索

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目的 比较 Revolution CT 两种扫描方案在胸痛三联征（Triple-Rule-Out，TRO）CTA 一站式检查中的图像质量、辐射剂量及临床价值。**方法** 选取 2017 年 10 月－2018 年 4 月有胸痛症状的 40 例病人，随机分为两组，其中 20 例病人采取第一种 TRO-CTA 的扫描方法，首先采用 15mL 碘普罗胺注射液(碘浓度 370mg/ml) 以 5ml/s 的速度注射进行小剂量测试得到肺动脉达峰时间与主动脉达峰时间的时间间隔差，采用碘普罗胺注射液(碘浓度 370mg/ml) 40ml 经手背静脉或肘静脉注射，接着以 5ml/s 的速度注射生理盐水 30ml，然后以肺动脉为感兴趣区，首先螺旋扫描肺动脉范围接着轴扫冠状动脉范围。另外 20 例病人采取第二种 TRO-CTA 方法，以降主动脉为感兴趣区，监测 CT 值达到 70HU 即自动触发扫描，采用碘普罗胺注射液(碘浓度 370mg/ml) 40ml 注射，接着继续以 2.5ml/s 的速度注射碘普罗胺注射液 25ml，然后以 2.5ml/s 的速度注射生理盐水 30ml，然后以降主动脉为感兴趣区，连续轴扫肺动脉及冠状动脉范围。**结果** 第一组病人中肺动脉达峰时间与主动脉达峰时间的时间间隔为 6-14s。两组病例中肺动脉根部 CT 值分别为（481±36.5HU，410±33.7HU），两组主动脉根部 CT 值分别为（409±34.2HU，440±28.4HU），均没有统计学差异。第一种 TRO-CTA 方法肺动脉与主动脉的 CT 值比值明显高于第二种方法（P<0.001）。第一种 TRO-CTA 方法造影剂用量低于第二种方法。 第一种 TRO-CTA 方法辐射剂量高于第二种方法（4.6±0.8mSv，2.0±0.6mSv， P<0.001），两组之间图像质量无统计学差异（P>0.05）。**结论** 本研究中，两种扫描方法均可行。

PU-2621
肺静脉造影扫描方法

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目的 利用碘对比剂 CT 造影对肺静脉 左心房 左心室 及升主动脉和主动脉瓣的正常解剖和病变类型进行研究。
方法 运用小螺距回顾性心电门控扫描方法 （使用心电门控抑制心脏搏动产生的运动伪影）肘正中静脉置管 造影剂注射方法 静脉团注 造影剂使用量与体重 1:1 。患者需配合呼吸指令减少呼吸伪影。监测触发阈值为 100 监测位置置于左心房内 触发方式为手动出发，触发扫描前延迟时间 5 秒。
结果 肺静脉 左心房 左心室 升主动脉内造影剂均匀充盈，肺动脉右心房 右心室内无造影剂填充。可以对肺静脉数量 位置 分型及变异进行分析，便于观察左心房左心室的形态腔内结构。扫描图像分为收缩期和舒张期 两期图像便于观察主动脉瓣形态以及打开和关闭后状态。

PU-2622
高分辨率 CT 诊断异常体循环动脉供血正常左肺下叶 1 例

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[摘要]目的：汇报高分辨率 CT 诊断异常体循环供血正常左肺下叶病例 1 例，为同行提供影像资料及参考。方法：结合患者的临床资料及影像学资料，分析该病例的 CT 表现特点，并确定其归类。结果：CT 平扫示左肺下叶基底段见异常粗大的血管影，最大径约 1.2cm，其周围血管分支增粗，近端走行扭曲，并在胸 7/8 椎体盘水平与降主动脉左前壁相连；该肺段密度稍增高，似见磨玻璃影；左下叶各基底段支气管及其分支形态、走行正常，管腔通畅。增强扫描，左肺下叶基底段肺动脉缺如，多层面 CT 三维重建及血管成像示异常增粗、扭曲的动脉起自降主动脉左前壁，呈“乙”字形走行，其分支与相应支气管伴行，分布至左肺下叶各基底段。左肺下叶基底段静脉显影，回流至左心房，并与上述畸形血管不相通 。
结果：异常体循环供血正常左肺下叶属于肺血管畸形，与叶内型肺隔离症不同；高分辨率 CT 对本病的诊断具有重大价值。

PU-2623
Comparative study between anomalous systemic arterial supply to the basal segments of the lung and lung sequestration in adult by computed tomography angiography

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Objective: Anomalous systemic arterial supply to the basal segments of the lung and lung sequestration are often confused due to their nonspecific presentations and similar imaging findings. Our study is to summarize the distinguishing variations between two disease entities in adult with MSCT angiography and further provide reliable evidence for clinical diagnosis and subsequent treatment.

Materials and Methods: This study was conducted from December 2013 to January 2019 in our center. Medically diagnosed cases of two diseases lung sequestration and anomalous systemic arterial supply to the basal segments of the lung (n=65) were enrolled in this study. We reviewed 42 patients with lung sequestration and 23 patients with anomalous systemic arterial supply to the basal segments of the lung on the basis of clinical features (age, gender, symptoms like hemoptysis, exertional dyspnea, persistent dry cough) as well as CT imaging findings (location of the lesion, origin of the blood vessel, vascular diameter, increased lung markings, solid or ground glass shadow, vacuoles or cavitation sign or emphysema). The chi-square test, fisher exact test and t-test were applied to compare different CT features of two different diseases.
Results: In this study, a total of 65 patients diagnosed with lung sequestration (n=42) and anomalous systemic arterial supply to the basal segments of the lung (n=23) were

systemically retrospected. There was no significant statistical difference observed in the setting of the age (p=0.376) and gender (p=0.229) between two groups. However, regarding symptoms significant statistical differences were found between two diseases (p=0.000). Concerning the characteristics found on the basis of CT findings, there were no significant statistical differences found between them according to the location of lesion (p=0.966) and origin of blood vessel (p=0.133). Meanwhile, it was demonstrated that there were significant statistical differences on the vascular diameter (p=0.000), increased lung markings (p=0.000), solid or ground glass shadow (p=0.000) and vacuoles or cavitation sign or emphysema (p=0.000).

Conclusion: As a rare variety of two different diseases of the lung including anomalous systemic arterial supply to the basal segments of the lung and lung sequestration, multi-sliced CT angiography can accurately pinpoint the differences between them and help in providing future treatment planning.

PU-2624

肺硬化性血管瘤 MSCT 表现特征及病理学基础

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目的 探讨肺硬化性血管瘤(pulmonary sclerosing hemangioma,PSH)的 MSCT 表现特征和病理基础,以提高对该病的进一步认识。
方法 回顾性分析 13 例经穿刺或手术病理证实为肺硬化性血管瘤患者的 MSCT 表现及相关病理。
结果 10 例为单发实性边界清晰类圆形结节或肿块,仅 1 例多发,2 例病灶周围可见"晕征"。11 例直径小于 3cm,最大病灶直径约 10cm,最小者直径约 0.8cm。强化情况,明显强化 6 例,其中 3 例不均匀强化,另 4 例为渐进性强化,1 例未见明显强化。
结论 肺硬化性血管瘤 MSCT 表现具有很多种特征性,再加上 MSCT 的 MPR 技术的运用,不仅能更好地显示病灶的形态学特征及其与邻近血管、支气管的关系,而且病灶动脉期的高度强化可以反映 PSH 的特征性病理学特点,有利于该病变的诊断。

PU-2625

肺泡弥漫毛细血管瘤病一例

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目的：报道一例肺毛细管瘤病，对该病的诊断以及影像学特点进行总结，提高各科医生对这一罕见病的认识。
方法：采用高分辨力 CT 薄层+增强扫描，结合病理进一步确诊。
结果：冷冻活检符合肺毛细血管瘤病。
结论：通过对此疾病的 CT 影像特点总结，能够为各科医生诊断此疾病提供影像学支持。

PU-2626

对比度用于增强磁共振肺动脉成像中栓子与截断伪影的鉴别

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目的　探讨运用对比度（CR）定量测值的方法辅助鉴别对比增强磁共振肺动脉成像（CE-MRPA）中肺动脉栓子与截断伪影（肺动脉血管腔中心血液信号降低影）的可行性。 资料与方法　收集 CE-MRPA 疑似肺栓塞并行 CT 肺动脉成像（CTPA）患者 30 例，两位高年资磁共振医师观察 CE-MRPA 图像并记录肺动脉横断面中心疑似栓子的低信号影的信号强度及其周围正常肺动脉血液信号强度，计算二者对比度 CR。以 CTPA 为标准将 CE-MRPA 疑似栓子影分为栓子组和截断伪影组。结果　CTPA 证实为栓子组 CR 6.6±5.5，截断伪影组 CR 1.3±0.2，两组 CR 相比 P<0.0001。ROC 显示 CR 最佳诊断临界值为 1.8，敏感度为 92.3%，特异度为 100.0%。 结论 以 CR 为定量参数，通过这种定量测值的方法可以辅助鉴别 CE-MRPA 中的截断伪影与肺动脉栓子

PU-2627

Application study for differentiation pulmonary embolism from truncation artifacts in contrast-enhanced pulmonary MRA

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Objective On the enhanced pulmonary MR angiography (CE-MRPA), truncation artifacts could cause signal intensity drop in the center of vascular lumen. We aimed to discuss the application study of quantitative measurement of the contrast ratio (CR) to assist in the differentiation of pulmonary embolism (PE) from truncation artifacts.
Methods Thirty patients with CT pulmonary angiography (CTPA) and CE-MRPA were enrolled. Two radiologists read CE-MRPA images together and reached a consensus. The location and signal intensity drops(SI_D)within pulmonary arteries, signal intensity of surrounding pulmonary arteries(SI_{vessel})were measured; contrast ratio (CR= SI_{vessel}/ SI_D) was calculated. Results of CE-MRPA were divided into PE group and truncation artifact group by using CTPA as reference standard. CRs of two groups were compared by Mann-Whitney U test. The optimal cutoff value, sensitivity and specificity were analyzed by ROC.
Results CTPA confirmed PE group:CR was 6.6±5.5, CTPA confirmed truncation artifact group: CR was 1.3±0.2. The comparative values of two groups were statistically significant. ROC showed the optimal diagnostic cutoff values of CR was 1.8 with 92.3% sensitivity,100.0% specificity.
Conclusion CR can be used to calculate the quantitative contrast between the central signal drop and surrounded pulmonary arteries, which can be used as an auxiliary method to differentiate PE from truncation artifacts on CE-MRPA.

PU-2628

CT 与 IMA、D-D 水平在急性肺栓塞患者病情评估中的应用

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目的：探讨 CT 与缺血修饰白蛋白（IMA）、D-二聚体（D-D）水平在急性肺栓塞（APE）患者病情评估中临床应用价值。**方法：**选取 2017 年 6 月-2019 年 6 月间本院收治的疑似 APE 患者 130 例作为研究对象，进行 CT“金标准”检查，确诊 100 例 APE 患者为 APE 组，其中高危组 48 例，低危组 52 例，同时期进行体检的 90 例健康志愿者为对照组，采用双抗体夹心酶联免疫吸附试验（ELISA）检测血清 IMA 水平，免疫比浊法检测血浆 D-D 水平，利用 ROC 曲线获分析 IMA、D-D 对 APE 疾病的诊断价值。**结果：**APE 组的 IMA、D-D 水平显著高于对照组（$P<0.05$）；高危组患者的 IMA、D-D 水平显著高于低危组（$P<0.05$）；以入院后 CT 检查为诊断 APE 疾病金标准，ROC 曲线表明，D-D 和 IMA 水平诊断 APE 的 AUC 分别为 0.88 和 0.73，对应的敏感度为 90.6%和 93.3%，特异度为 52.5%和 95.2%，IMA+D-D 水平联合诊断 APE 的 AUC 为 0.82，敏感度为 95.0%，特异度为 77.6%，D-D 和 IMA 水平诊断高危 APE 的 AUC 分别为 0.95 和 0.91，敏感度为 97.2%和 93.9%，特异度为 31.5%和 76.9%。IMA+D-D 水平联合诊断高危 APE 的 AUC 为 0.95，敏感度为 96.3%，特异度为 76.8%；对比 CT 检查结果，100 例确诊 APE 患者中，IMA 处于阴性水平的患者有 5 例，D-D 处于阴性水平的患者有 7 例，对照组样本检测 IMA 和 D-D 水平均处于阴性水平。**结论：以** CT 检查结果为参考，IMA 联合 D-D 水平诊断 APE 具有良好的敏感度和特异度，可有效提高 APE 疾病的确诊率，为临床快速可靠的检测和治疗 APE 疾病提供重要依据。

PU-2629

探索 64 排肺动脉 CTA 小剂量测试的最低剂量

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目的：通过对比不同造影剂剂量的肺动脉 CTA 检查，在图像质量满足肺动脉栓塞疾病诊断的前提下，探索患者使用的最低剂量

方法：采用美国 GE Light Speed VCT 64 排螺旋，患者取仰卧位，足先进，双上肢上举。扫描范围为肺尖到肺底，扫描方向从足至头。对比剂：碘克沙醇，浓度为 320mg/ml。对照组和实验组均采用小剂量团注法，注射速率为 4ml/s，追加等速率 30ml 生理盐水。监测层面在肺动脉主干，在定位像上位于支气管分叉下 1~2cm,延迟时间设为 4s,扫描时间和间隔时间均设为 1s,单层重复扫描。

1、分组

A 组：造影剂 40ml

B 组：造影剂 30ml

C 组：造影剂 20ml

D 组：造影剂 15ml

2、根据时间密度曲线，计算相应检查的时间进行扫描，将采集的数据均进行薄层重建，层厚、层间距均设置为 0.625mm，将薄层重建图像传至 GE AW4.5 后处理工作站，采用 VR、MIP 进行后处理，多方位显示肺动脉主干及其各级分支血管解剖结构。

3、图像质量评价：主观和客观评价对四组图像质量进行评价

4、进行统计学分析

结果：1、A、B、C 组没有统计学意义

2、A、B、C 组与 D 组均有统计学差异，且 D 组图像质量不满足肺栓塞疾病诊断的要求

结论：64 排肺动脉 CTA 小剂量测试检查的最低剂量选用 20ml，其图像质量满足肺栓塞疾病诊断，大幅度减少了对比剂的用量，减少了患者肾功能损害的风险，降低了患者对比剂肾病的发病率，具有临床意义。

PU-2630

双源 CT 肺动脉血管成像对肺动静脉瘘的诊断价值

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目的：探讨双源 CT 肺动脉血管成像对肺动静脉瘘的诊断价值。方法：回顾性搜集 52 例临床疑诊断肺动静脉瘘并行双源 CT 肺动脉血管成像的病例，且所有病例均有肺动脉 DSA 造影为参考标准，将 CT 诊断结果与 DSA 结果进行对照。 结果：双源 CT 肺动脉血管成像诊断肺动静脉瘘 33 例，其中囊型 30 例,弥漫型 3 例。DSA 诊断肺动静脉瘘 36 例，其中囊型 30 例，弥漫型 6 例，双源 CT 肺动脉成像诊断肺动静脉瘘准确度 94.2%，敏感度 91.7%，特异度为 100%，阳性预测值为 100%，阴性预测值 84.2%，弥漫型肺动静脉瘘受累肺叶磨玻璃病灶内同时包含增粗的小肺动脉及小肺静脉两种血管。结论：双源 CT 肺动脉血管成像诊断肺动静脉瘘与 DSA 对比具有较高的准确性，其中 CT 对囊型肺动静脉瘘诊断与 DSA 一致，并可直观显示囊型肺动静脉瘘的位置、个数、大小、供血肺动脉及引流肺静脉的情况，而弥漫型肺动静脉瘘应排查肺叶内是否有同时包含增粗的小肺动脉及小肺静脉的磨玻璃影，以避免漏诊。

PU-2631

70kV 联合超级“双低”对比剂模式在低体质量患者肺动脉 CT 成像的可行性探索

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目的：探讨 70kV 管电压条件下，采用超级“双低”对比剂模式在体质量小于 60KG 的患者行肺动脉 CTA 检查的可行性。**方法**：收集 2019 年 1 月-6 月临床怀疑动脉栓塞，体质量小于 60KG 的患者 80 例，随机分入 A、B 两组行肺动脉 CT 成像。A 组：40 例，年龄 64-88 岁，体重 35-50KG，平均 42.4±6.58KG，采用管电压 70kV，参考管电流 500mAs，ADMIRE3 级迭代重建，对比剂总量 10ml，流率 2ml/s。B 组：40 例，年龄 49-83 岁，体重 40-59KG，平均 47.6±7.82KG，管电压 100kV，参考管电流 150mAs，采用 FBP 重建，对比剂总量 30ml，流率 5ml/s。对两组图像主、客观图像质量以及两组患者接受的辐射剂量和对比剂用量进行统计学分析。**结果**：A 组（70kV/ADMIRE 组）肺动脉平均 CT 值为 285.2±51.9HU，略低于 B 组（100kV/FBP）组 385.9±79.4HU，差异有统计学意义（P=0.045）。A、B 两组图像的 SD、SNR、CNR 分别为：（13.2±2.38）&（31.1±2.12）、（22.4±8.0）&（10.8±2.0）、（32.3±9.1）&（15.3±2.6），差异均有统计学意义（P<0.05）。两组图像主观评分分别为 4.50&4.33，差异无统计学意义（P>0.05）。与 B 组比较，A 组 CTDI、DIP 分别降低约 49.9%、45.7%差异均有统计学意义（P<0.001）。A 组的对比剂用量与 B 组相比，减少约 66.6%，有显著的统计学差异（P<0.001）。 **结论**：与对照组 100kV/FBP 相比，70kV/ADMIRE 条件下，采用超级“双低”对比剂模式也可获得满足诊断的肺动脉 CTA 图像，并且可以显著减少对比剂用量和辐射剂量。对于年老、低体重以及血管条件不理想的患者，可尝试采用这种模式进行肺动脉 CTA 成像。

PU-2632

咯血患者肺外体循环动脉供血的 CTA 研究

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目的 探讨咯血患者肺外体循环动脉供血的 CT 血管造影 （computed tomography angiography，CTA）表现及其与胸膜增厚的关系。**方法** 回顾性分析 233 例因反复或大量咯血患者的影像学资料，首先通过数字减影血管造影（digital subtraction angiography，DSA）明确咯血责任血管的来源、数量，然后分析咯血患者肺外体循环供血动脉的 CTA 表现及其与胸膜增厚的关系。**结果** 233 例咯血患者中，参与供血的肺外体循环动脉共 318 支，平均 3.8 支/例，包括肋间后动脉 171 支，锁骨下动脉分支 56 支，胸廓内动脉分支 47 支，腋动脉分支 23 支，腹主动脉分支 21 支，CTA 表现为管径增粗、走行迂曲，发出分支至病灶区域参与供血，部分侧枝可与肺动脉或供血支气管动脉相互吻合形成丰富的血管网。84 例有肺外体循环动脉供血，其中 82 例（97.62%）伴有靶胸膜增厚，149 例无肺外体循环动脉供血，其中 90 例（60.40%）伴有靶胸膜增厚。靶胸膜增厚与肺外体循环动脉供血率之间存在统计学差异（c^2=36.60，P<0.01），且肺外体循环供血动脉来源与靶胸膜增厚部位之间存在对应关系。**结论** 肺外体循环动脉是重要的咯血责任血管，其数目、来源与病灶位置及胸膜增厚密切相关，CTA 能够帮助术者全面了解咯血患者肺外体循环动脉供血情况，指导相关介入治疗。

PU-2633

假性肺栓塞患者的 CTPA 研究

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目的 探讨假性肺栓塞患者的 CTPA 影像表现及其与肺部疾病、D-二聚体水平和双下肢深静脉血栓形成的关系。**方法** 回顾性分析 59 例误诊为肺栓塞患者的影像学资料，分析、归纳其影像表现；同时将其设为病例组，选取同期肺栓塞患者 300 例，设为对照组，两组患者均行 CTPA 检查，并至少追加扫描一个延迟期，分别比较两组患者肺部疾病、D-二聚体水平和双下肢静脉彩超等结果之间的差异，并使用 SPSS 21.0 统计学软件对结果进行统计学分析。**结果** 1. 假性肺栓塞的 CTPA 表现：39 例（66.10%）表现为肺动脉管腔内部分或完全充盈缺损，边界模糊，以肺动脉主干及双肺下叶分布为主，15 例（25.42%）表现为肺动脉内完全充盈缺损，边界清楚，以双肺上叶分布为主，且多（12 例/15 例或 80%）发生于双肺上叶肺动脉主干及其分支内；5 例（8.47%）表现为条状、孤立充盈缺损，边界清楚，与肺动脉管壁分界清楚；2. 病例组和对照组的肺部病变数量差异无统计学意义（p>0.05）；3. 病例组 D-二聚体水平明显低于对照组，两组差异有统计学异常（p<0.05）；4. 病例组患者双下肢深静脉血栓发生率明显低于对照组，两组差异有统计学异常（p<0.05）。**结论** 1.对疑诊肺栓塞的患者，行 CTPA 检查时应至少追加一个延迟期的数据采集，从而最大程度排除假性肺栓塞；2. D-二聚体水平及双下肢深静脉血栓形成可作为鉴别真假肺栓塞的重要指标。

PU-2634

Rheumatoid Mitral Valve Stenosis: Quantification of Severity with Magnetic Resonance Imaging: Initial Experience

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PURPOSE: To evaluate whether retrospectively electrocardiographic (ECG)-gated magnetic resonance imaging (MRI) can quantify severity of pure rheumatoid mitral stenosis (PRMS) in comparison to transthoracic echocardiography (TTE).
MATERIALS AND METHODS: Fifty-three patients with PRMS(29 men, 24 women; mean age, 49±9) were underwent both MRI and TEE in the present study. Right ventricular end-systolic volume (RV-ESV), stroke volume (RV-SV), and ejection fraction (RV-EF), cardiac output (RV-CO), wall mass (RV-Mass), and left ventricular end-diastolic volume (LV-EDV), transmitralvalvular peak velocity (TMV-PV), transmitralvalvular peak gradient (TMV-PG), transmitralvalvular net flow (TMV-NF), LV-Peak filling rate (LV-PFR) were measured with dedicated cardiac analysis software on MRI. Severity of mitral stenosis was classified by (TMV-PG) with TEE and MRI. .
RESULTS: RVSV, RVEF, RVCO, RVMass, LVEDV, TMV-NF, and LV-PFR were significantly lower in patients with severe PRMS (n=15) than in patients with moderate (n=21, P<0.001) and mild PRMS (n=17) (P<0.001). RVESV, TMV-PV and TMV-PG were significant higher in severe group than in patients with moderate and mild PRMS (P<0.001).RV-ESV, RV-SV, RV-EF, RV-CO, RV-Mass and LV-EDV correlated well with TMV-PG (r= 0.82, -0.93, -0.94, -0.91, -0.96, and -0.94; P<0.001).
CONCLUSION: Measurement of right ventricular systolic and left ventricular diastolic function with ECG-gated MRI could quantify severity of patients with PRMS.
CLINICAL APPLICATION: The retrospectively ECG-gated magnetic resonance imaging (MRI) allows a reliable assessment of severity in patients with rheumatoid mitral stenosis.

PU-2635
探讨冠状动脉 CT 血管成像（CTA）对左心房憩室的诊断价值及临床应用

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目的 探讨冠状动脉 CT 血管成像（CTA）对左心房憩室的诊断价值，以及对心房颤动合并左心房憩室患者的临床处理方案的指导意义。**方法** 对我院 2019 年 1 月至 2019 年 6 月，经我科室飞利浦 256 iCT 冠状动脉 CTA 检查所得的 669 例患者进行回顾性分析，分析左心房憩室的影像学表现，判定憩室的位置、大小、形态等指标。**结果** 共发现左心房憩室患者 213 例，发病率为 31.8%，其中 176 例单发，37 例多发（2 个及 2 个以上）。共检出憩室 261 个，囊状 218 个，管状 43 个，囊状明显多于管状。位于左心房前上壁 93 个，前下壁 66 个，后上壁 41 个，后下壁 57 个，内侧壁 3 个，另有 1 例（单个）患者憩室位于左心耳内侧缘。**结论** 冠状动脉 CTA 可以准确诊断左心房憩室，分析其位置、大小、形态等指标，为临床医生对心房颤动患者的电生理治疗提供术前指导。

PU-2636
基于 CT 钙化积分图像测量心外膜脂肪特征与左右心室重构的关系

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目的：利用 CT 钙化积分（CACS）图像测量心外膜脂肪（EAT）体积和密度，探究 EAT 体积和密度与左右心室结构和功能的相关性。
方法：连续收集 2019 年 4 月～7 月临床疑诊冠心病行冠状动脉 CTA 的患者 183 例。利用 Volume 软件在 CACS 图像上半自动测量 EAT 体积与密度；重建 CCTA 0%-100%全期相 R-R 间期图像，利用后处理 Cardiac Function 软件获得左右心室解剖结构图像并测量左室舒张末内径（LVEDD）、室间隔舒张末期厚度（IVST-ED）、左室后壁舒张末期厚度（LVPWT-ED）及左右心功能数据[包括左右心室射血分数（LVEF、RVEF）、左心室质量（LVMM）、左右心室收缩和舒张末期容积（LVESV、LVEDV、RVEDV、RVESV）、左右心室每搏输出量（LVSV、RVSV）]。
结果：高 EAT 体积（≥122cm^3）组和高 EAT 密度（≥-81HU）组的 LVMM、LVESV、LVEDV、RVEDV、LVEDD、IVST-ED 分别高于低 EAT 体积（<122cm^3）组与低 EAT 密度（＜-81HU）组（P<0.05）。单因素回归分析后，EAT 体积与 LVMM、LVESV、LVEDV、RVEDV、LVEDD、IVST-ED 均呈正相关（β 值分别为 0.21、0.17、0.20、0.18、0.30，0.146，P<0.05），EAT 密度与 LVMM、LVESV、LVEDV、RVEDV、LVEDD、IVST-ED 均呈正相关（β 值分别为 0.29、0.31、0.24、0.30、0.32、0.30，P<0.05）。在多因素回归分析之后，EAT 体积和密度与 LVMM、LVESV、LVEDV、RVEDV、LVEDD、IVST-ED 仍有相关性（P<0.05）。
结论：EAT 体积和密度均能独立反映左右心室重构的严重程度，可作为左右心室重构危险分层的指标。

PU-2637
基于双层探测器光谱 CT 多参数成像技术诊断房颤病人射频消融术前左心房血栓

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目的：探讨双层探测器光谱 CT 在房颤病人射频消融术前诊断左心房血栓的价值。**方法**：回顾分析 26 例房颤病人射频消融术前的左心房和肺静脉 CT 血管成像的影像表现和临床资料，以经食管超声内镜诊断结果为金标准，分析左心房血栓在双层探测器光谱 CT 50keV 虚拟单能级（MonoE）成像、有效原子序数值、碘密度图和能谱曲线的表现特点和量化结果，统计分析新型光谱 CT 诊断左心房血栓的敏感性、特异性、准确性、阳性预测值和阴性预测值。**结果**：Likert 量表法定性分析显示，光谱 CT 50keV MonoE 图像质量明显优于传统增强 CT，软组织对比度明显提高。血栓的有效原子序数为 7.8±0.07，周围充盈造影剂的心房的有效原子序数为 12.9±0.06，两者差异显著。血栓组织碘含量很低，碘密度为 0.3mg/ml±0.07。血栓的能谱曲线走形低平，斜率较小，不同于血液与造影剂混合不均的大血管或心腔。综合光谱 CT 多参数成像特征，诊断左心房血栓的敏感性、特异性、准确性、阳性预测值和阴性预测值分别为 100%、95%、96.3%、83.3%和 100%。**结论**：采用基

于双层探测器的新型光谱 CT 多参数成像能够准确诊断房颤病人左心房血栓，可代替经食管超声内镜检查。

PU-2638

室间隔罕见血肿样病变的 CT 诊断及文献复习

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室间隔血肿样病变非常罕见，且大多是通过超声心动图诊断的。心脏 CT 在心血管疾病中的应用已经很广泛，但室间隔血肿样病变因为罕见且不被认识常常被漏诊或误诊。笔者报道了两例 CT 表现室间隔血肿样异常的病例，经过手术证实一例是冠状窦的破裂延伸至室间隔形成血肿，另一例是室间隔缺损伴假性膜部瘤。通过对比其 CT 征象的异同点并总结以往的文献报道，笔者认为 CT 因空间和软组织分辨率的限制，对诊断室间隔血肿样病变有一定的难度，多个心动周期图像对比、多角度观察可以帮助诊断。

PU-2639

Anatomical characteristics of double superior vena cava: quantitative assessment with CT and clinical implications for interventional procedures

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Background: Presence of double superior vena cava (DSVC) may exacerbate technical difficulties in some intervention procedures (PICC, catheterization, radiofrequency ablation, pacemakers or filter implantation) or complicate the procedures. It is important to confirm existence of DSVC, drainage pattern and anatomical characteristic for the successful intervention procedures.
Methods: DSVC were documented on CT reports of 129 cases. According to drainage approach of left side superior vena cava and presence or absence of left brachiocephalic vein, all cases were divided into Group A (A1, A2) and B (B1, B2). Lengths of left/right side superior vena cava (L/RSVCL), diameters and areas of origin of L/RSVC(RSVCD/A), diameters of coronary sinus orifice(CSOD), lengths and areas of coronary sinus(CSL/A) were measured and compared retrospectively among the groups and Group control (Group C, n=109).
Results: LSVCL of Group A were longer than those of Group B (p=.00 to .24). RSVCD/A of Group A1and GroupB1 were shorter than those of Group A2 and Group B2 (p=.003 to .048), LSVCD/A of Group A1and GroupB1 were longer than those of Group A2 and Group B2 (p=.003 to .048). CSOD, CSL and CSA of Group A1were larger than those of Group A2 and Group C (p=.000 to .032), no significant differences was in the values of Group B and Group C. RSVCD/A of 129 cases were less than those values of Group C (p=.000). RSVCL were shorter than LSVCL in the same group (p=.000).
Conclusions: CT can accurately confirm the presence of DSVC, drainage patterns and anatomical characteristic values of DSVC.

PU-2640
Pure Rheumatic Mitral Stenosis: Quantitative Assessment with DSCT

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PURPOSE: To evaluate whether DSCT can assess right ventricular (RV) systolic and left ventricular (LV) diastolic function and quantify the severity of pure rheumatoid mitral stenosis (PRMS) in comparison to the transthoracic echocardiography (TTE)
MATERIALS AND METHODS: Fifty-three patients with PRMS (26 men, 27 women, mean age, 46±8 years) were enrolled in this study. All patients underwent ECG-gated DSCT and TTE for assessing LV diastolic and RV systolic function. Left ventricular end-diastolic volume (LV-EDV), maximal mitral valve area(MVA) and maximal mitral valve annular area(MVAA), as well as Right ventricular end-systolic volume (RV-ESV), stroke volume (RV-SV), ejection fraction (RV-EF), cardiac output (RV-CO) and wall mass (RV-Mass) were measured with dedicated cardiac analysis software on DSCT. The severity of mitral stenosis was classified by MVA with TTE and DSCT. All the data were reviewed retrospectively.
RESULTS: LV-EDV, MVA, MVAA, RV-SV, RV-EF, RV-CO, and RV-Mass were significantly lower in patients with severe PRMS (n=15) than those in patients with moderate (n=21) and mild PRMS (n=17, p<0.001). RV-ESV was significant higher in severe PRMS than that in patients with moderate and mild PRMS (p<0.001). LV-EDV, MVAA, RV-ESV, RV-SV, RV-EF, RV-CO, and RV-Mass correlated well with MVA (r=0.95, 0.97, 0.97, 0.94, 0.87, 0.93, and-0.96, respectively; p<0.001).
CONCLUSION: The ECG-gated DSCT may provide an accurate, noninvasive imaging technique for assessing ventricular function and quantifying the severity of PRMS.

PU-2641
右室双出口的 320 排 CT 动态容积扫描技术与诊断

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目的 分析 320 排 CT 动态容积扫描技术在复杂性先天性心脏病右室双出口（DORV)中的诊断价值。方法收集 陆军军医大学新桥医院经手术证实的 DORV 78 例，A 组病例 36 例，行 320 排 CT 动态容积扫描，采用心脏节段分析法分析 CT 图 像，B 组病例 42 例，行传统 64 层 CT 扫描；比较两种方法的诊断准确率。**结果** 320 排 CT 动态容积扫描诊断 36 例右室双出口， 与手术结果一致。43 例对照组 B 组的诊断准确率为 90. 7%,与 A 组比较差异无统计学意义 P>0. 05)。78 例 DORV 均合并有 室间隔缺损，合并肺动脉狭窄 56 例，房间隔缺损 34 例，肺动脉高压 21 例，动脉导管未闭 16 例，主动眯缩窄 9 例。**结论** 320 棑 CT 动态容积扫描对诊断先天性心脏病 DORV 具有重要的价值。

PU-2642
先天性心脏病 CT 扫描中原始数据域迭代重建技术的应用及其临床意义分析

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目的 探索先天性心脏病 CT 扫描中原始数据域迭代重建技术（SAFIRE）的应用及其临床意义分析。**方法** 选取 2016 年 12 月－2018 年 12 月收治的 260 例先天性心脏病患者。随机分为 2 组，各 130 例。2 组均行 CT 检查，其中观察组采用原始数据 SAFIRE，对照组采用滤波反投影重建技术（FBP）。比较 2 组图像的升主动脉和肺动脉的 SNR 与 CNR、图像质量评分 3～5 分的占比、辐射剂量参数 $CTDL_{vol}$、DLP、ED。**结果** 2 组患者升主动脉和肺动脉的噪声比和信噪比组差异无统计学意义（P ＞ 0.05）。2 组图像质量评分 3～5 分患者的占比分别为 79.23%与 72.31%，差异无统计学意义（P ＞ 0.05）。2 组患者辐射剂量参数 $CTDL_{vol}$、DLP、ED 差异有统计学意义（P ＜ 0.05），观察组辐射剂量显著低于对照组。 **结论** CT 扫描中原始数据域迭代重建技术可以有效降低患者辐射剂量的接受，且对图像质量无明显影响，对于先天性患儿临床诊断和治疗具有重要指导意义。

PU-2643
双源 CT 三维成像在主动脉瓣膜置换术前评估中的临床应用

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目的：主动脉瓣环由主动脉瓣膜三个瓣叶最低点所在平面左室流出道围绕而成。选择合适的人工主动脉瓣膜型号要求准确测量主动脉瓣环径线。本研究探讨双源 CT 三维成像在主动脉瓣膜置换术前评估中的临床应用价值。**方法**：应用双源 CT 对 27 例主动脉瓣膜狭窄/关闭不全患者进行术前检查，男性 17 例，女性 10 例，平均年龄(73.44±6.22)岁。测量主动脉瓣环周径、直径及左、右冠状动脉开口距离主动脉瓣环高度。所有患者在双源 CT 检查后 1 周内行主动脉瓣膜置换手术。**结果**：27 例主动脉瓣膜置换患者中 6 例主动脉瓣狭窄，13 例主动脉瓣关闭不全，8 例主动脉瓣狭窄合并关闭不全。主动脉瓣狭窄组瓣环周径 72.76±7.42mm，瓣环直径 23.15±2.36mm，左冠状动脉开口距离主动脉瓣环高度 10.33±3.34mm，右冠状动脉开口距离主动脉瓣环高度 13.87±2.00mm。主动脉瓣关闭不全组瓣环周径 81.31±7.84mm，瓣环直径 26.00±2.54mm，左冠状动脉开口距离主动脉瓣环高度 13.21±2.56mm，右冠状动脉开口距离主动脉瓣环高度 15.22±3.38mm。主动脉瓣狭窄合并关闭不全组瓣环周径 78.35±6.64mm，瓣环直径 24.94±2.12mm，左冠状动脉开口距离主动脉瓣环高度 13.76±2.68mm，右冠状动脉开口距离主动脉瓣环高度 14.39±2.95mm。**结论**：双源 CT 三维成像能够清晰显示主动脉瓣环位置及邻近解剖结构，在主动脉瓣膜置换术前评估中起着重要作用。

PU-2644

Assessment of severity of rheumatoid mitral valve stenosis with MRI

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PURPOSE: To evaluate whether retrospectively electrocardiographic (ECG)-gated magnetic resonance imaging (MRI) can quantify severity of pure rheumatoid mitral stenosis (PRMS) in comparison to transthoracic echocardiography (TTE).
MATERIALS AND METHODS: Fifty-three patients with PRMS(29 men, 24 women; mean age, 49±9) underwent both MRI and TEE in the present study. Right ventricular end-systolic volume (RV-ESV), stroke volume (RV-SV), and ejection fraction (RV-EF), cardiac output (RV-CO), wall mass (RV-Mass), and left ventricular end-diastolic volume (LV-EDV), transmitralvalvular peak velocity (TMV-PV), transmitralvalvular peak gradient (TMV-PG), transmitralvalvular net flow (TMV-NF), LV-Peak filling rate (LV-PFR) were measured with dedicated cardiac analysis software on MRI. Severity of mitral stenosis was classified by (TMV-PG) with TEE and MRI.

RESULTS: RVSV, RVEF, RVCO, RVMass, LVEDV, TMV-NF, and LV-PFR were significantly lower in patients with severe PRMS (n=15) than in patients with moderate (n=21, P<0.001) and mild PRMS (n=17) (P<0.001). RVESV, TMV-PV and TMV-PG were significant higher in severe group than in patients with moderate and mild PRMS (P<0.001).RV-ESV, RV-SV, RV-EF, RV-CO, RV-Mass and LV-EDV correlated well with TMV-PG (r= 0.82, -0.93, -0.94, -0.91, -0.96, and -0.94; P<0.001).
CONCLUSION: Measurement of right ventricular systolic and left ventricular diastolic function with ECG-gated MRI could quantify severity of patients with PRMS.
CLINICAL APPLICATION: The retrospectively ECG-gated magnetic resonance imaging (MRI) allows a reliable assessment of severity in patients with rheumatoid mitral stenosis.

PU-2645

镜面内脏并法洛四联征畸形 1 例

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本文报道 1 例镜面内脏并法洛四联症影像表现，患儿 2 岁，因活动后出现口唇发绀 2 年于 2019 年 7 月 24 日就诊于我院，行心脏超声诊断及胸部 CTA 提示：腹腔内脏呈镜面转位，镜面心，主动脉骑跨，肺动脉缩窄，右心室肥厚，室间隔缺损。本例患者影像影像资料完整，特与同仁分享。

PU-2646

冠状动脉 CTA 诊断卵圆孔未闭的临床价值

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目的:探讨冠状动脉计算机断层扫描血管造影（CTA）诊断卵圆孔未闭（PFO）的临床价值。
方法：回顾性分析 2019 年 2 月至 2019 年 8 月期间在武汉大学中南医院进行冠状动脉 CTA 检查，且怀疑有卵圆孔未闭的患者 186 例，对其冠脉 CTA 中以下参数进行评估：左向右分流束的存在、左心房开口位置、左心房开口直径以及 PFO 隧道长度。
结果：186 例患者中，34.4%(64/186)的患者存在左向右的分流，65.6%(122/186)的患者仅表现为房间隔小袋。开口位置以左心房房间隔侧前上份多见，占 55.4%（103/186）。分流存在与左心房开口直径（P=0.324）之间，或分流存在与 PFO 隧道长度之间没有观察到显著的关系。
结论：冠状动脉 CTA 可以准确评估 PFO 的分流存在、开口位置、开口直径以及隧道长度，能很好地指导临床工作。

PU-2647
能谱 CT 鉴别左房内血栓和血流瘀滞的初步研究

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目的：初步探索能谱 CT 鉴别左房内血栓和血流瘀滞的可行性及其价值。
方法：127 例因房颤行开源心脏 CT 双期增强扫描的患者纳入研究，其中动脉期为能谱扫描（90kv、Sn150kv），静脉期为常规 FLASH 扫描。将动脉期能谱 CT 扫描图像定义为实验组组，将双期 CT 图像（动脉期能谱 CT 扫描图像＋静脉期 FLASH 扫描图像）定义为对照组，规定对照组不能使用能谱 CT 后处理工作站进行数据分析；由两位高年资放射科医师分别对两组图像结果进行判读，以双期心脏 CT 图像结果为参考标准，评价能谱 CT 检测左房内血栓的诊断效能。
结果：127 例患者中，88 例均被实验组、对照组诊断为正常，26 例均被诊断为血流瘀滞，5 例均被诊断为血栓；另有 8 例患者由对照组诊断为血流瘀滞，而实验组诊断为血栓。以双期心脏 CT 图像为参考标准，能谱 CT 诊断左房内血栓的灵敏度为 1，特异度为 76.45%，两种检出方法的一致性较高。
结论：能谱 CT 检出左房内血栓的敏感性高，并可供提供碘浓度等定量指标，减少双期扫描引起的辐射剂量增加，是一种很有前景的新方案。

PU-2648
复杂型先天性心脏病合并下腔静脉肝静脉回流异常 MDCT 分析

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复杂型先天性心脏病合并下腔静脉肝静脉回流异常 MDCT 分析上海远大心胸医院放射科 汪卫中 茹欢孟 吴平平 范雅茹 吴晏 胡军 周晓杰 【摘要】 目的：探讨 MDCT 对复杂型先天性心脏病改良 Fontan 术前下腔静脉肝静脉回流异常评估的价值。方法：回顾分析 41 例复杂型先天性心脏病下腔静脉肝静脉回流异常，心外管道 Fontan 术前常规 MDCT 扫描和心脏彩色多普勒检查，按照年龄分成婴幼儿组（10 例）、少年组（23 例）、成人组（8 例），三位有经验的医师根据后处理图像分析下腔静脉与肝静脉回流情况，并对心脏大血管 MDCT 的扫描范围、扫描期相、对比剂注射部位对下腔静脉肝静脉回流的影响做出评估。结果：（1）肝段至肾上段下腔静脉缺如，下腔静脉延续为奇静脉通过上腔静脉回流至心房 25 例，其中肝静脉汇合成单一开口于心房 17 例（68%），肝静脉汇成 2 支分别开口于两个心房或冠状窦 7 例（28%），肝静脉汇成多支开口于心房 1 例（4%）。（2）

肝段下腔静脉存在，肝静脉部分汇入下腔静脉开口于右侧心房，另一支 9 例（56%）直接开口于左侧心房，2 例（12.5%）经半奇静脉通过永存左侧上腔静脉引流入冠状窦，1 例（6.2%）右下肺静脉汇入左肝静脉再入冠状窦。4 例（25.3%）肝静脉汇成一支与下腔静脉分别回流至单一心房。（3）成人组、婴幼儿组图像质量优良率高于少儿组，扫描两期成功率高于单次扫描，扫描范围包括肾静脉有利于下腔静脉畸形的判断。从上肢或下肢注射对比剂不影响下腔静脉与肝静脉回流的判断。结论：MDCT 扫描能较好地显示下腔静脉与肝静脉回流异常，有助于制定复杂型先天性心脏病改良 Fonton 手术方案。

PU-2649
MRI 测量 TAPSE 及 RVFS 评价成人房间隔缺损右室功能的应用研究

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目的 应用 MRI 三尖瓣环位移幅度（TAPSE）及右心室轴缩短率（RVFS）定量评估成人房间隔缺损患者的右心室功能，探讨其与肺动脉压收缩压及右室射血分数的相关性研究。
方法 38 例经我院 TTE 诊断为房间隔缺损的患者，依据 DSA 右心导管所测肺动脉平均压(mPAP)将病例分为 2 组：房间隔缺损不伴 PAH 组(mPAP<25mmHg，n=21)、房间隔缺损伴 PAH 组(mPAP≥25mmHg，n=17)，另选 17 例健康成年人作为对照组(n=17)。三组均行四腔心电影 MRI 测得三尖瓣环右室游离壁处相对于右室心尖部的收缩期峰值位移（TAPSE）及校正后右心室轴缩短分数（RVFS），比较三组间各位移的差异并分析与肺动脉收缩压（PASP）及右室射血分数的相关性。
结果 1. 对照组、ASD 不伴 PAH 组、ASD 伴 PAH 组的 TAPSE 测值不具有统计学差异(P>0.05)；ASD 伴 PAH 组 RVFS 明显低于对照组及 ASD 不伴 PAH 组，差异具有统计学意义(P<0.05)；ASD 伴 PAH 组与对照组、ASD 不伴 PAH 组相比 RVEF 值显著降低(P<0.05)。
2. TAPSE 及 RVFS 均与 RVEF 呈正相关(r 值为 0.74/0.85)，以 RVFS 的相关性较好；TAPSE 及 RVFS 与 PASP 在病例组呈显著负相关(r 值为-0.70/-0.79，P<0.05)；RVEF 与 PASP 亦呈显著负相关(r 值为-0.84，P<0.05)。
结论 MRI 测量 TAPSE 及 RVFS 评价房间隔缺损患者右室功能省时、准确；随着肺动脉高压的出现，RVFS 显著降低，可作为临床无创评估患者右心室功能、判断预后的可靠指标。

PU-2650
心房颤动患者左心耳形态解剖学特征及功能的双源 CT 成像分析

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目的：探讨基于双源 CT 血管成像技术的房颤患者左心耳形态学特征及功能特点，为指导左心耳封堵术前规划提供详实的影像学资料。方法：分析 2016-1-1 至 2018-12-31 拟行左心耳封堵手术的 126 例 AF 患者 CTA 影像资料，扫描图像行多种三维后处理并进行左心耳解剖形态分型及参数测量。结果：①左心耳形态学分型：鸡翅型（31 例，25.4%，其中反鸡翅型 5 例，4.0%）、菜花型（29 例，23.0%）、风向标型（41 例，32.5%）、仙人掌型（24 例，19.0%）。②左心耳与左上肺静脉位置关系分型：左心耳口位置高于、平行于、低于左上肺静脉平面分别为 3 例（2.3%）、99 例（79.1%）、24 例（18.7%）。③左心耳口形态学分型：左心耳口形态分型：椭圆形（115 例，

91.3%）、类圆形（6 例，4.9%）、水滴形（3 例，2.6%）、足形（1 例，0.8%）、三角形（1 例，0.8%）。④解剖参数分析：左心房容积(108.1±29.8)ml^3、左心耳容积(10.5±4.5) ml^3、左心耳口面积(293.2±113.7)mm^2、左心耳口长、短径(24.3±5.3)mm、(15.6±4.4)mm。其中 118 例成功进行左心耳封堵术，8 例患者因为左心耳形态异常或左心耳口径较大而封堵失败。结论：双源 CT 可作为测量及评价左心房、左心耳相关指标，明确左心耳周围组织结构的有效检查手段；对房颤患者术前准确评价其左心耳形态和左心耳口大小以选择合适封堵器及其型号很有帮助。

PU-2651

双源 CT 在先天性心脏病诊断中的应用价值

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目的 探讨双源 CT 在先天性心脏病诊断中的应用价值。**方法** 采用西门子 Siemens Somatom Definition DSCT 增强扫描检查先天性心脏病 66 例，扫描均采用心电门控扫描模式，所有病例均行心脏超声检查且经手术或 X 线心血管造影证实，其中 52 例经手术证实，14 例经血管造影证实。本组病例以手术或 X 线心血管造影结果为标准，比较双源 CT 和心脏超声的诊断准确率。**结果** 经手术或 X 线心血管造影证实的上述 66 例先心病例，含单纯房间隔缺损 4 例、单纯室间隔缺损 5 例、主动脉弓离断 2 例、单心室 6 例、单心房 4 例、肺静脉异常引流 3 例、法洛三联症 7 例、法洛四联症 12 例、单纯动脉导管未闭 8 例、完全型大动脉错位 3 例、肺动脉起源异常 5 例、冠状窦无顶综合征 2 例、主动脉缩窄 5 例。其中心内畸形 63 处，双源 CT 和心脏超声诊断准确率分别为 95.52%和 96.32%；心外畸形 48 处，双源 CT 和心脏超声诊断准确率分别为 95.89%和 88.56%；双源 CT 诊断准确率高于心脏超声。**结论** 双源 CT 对比增强扫描对先天性心脏病心外畸形的诊断准确率高于心脏超声，且图像直观明了，便于观察，二者联合可进一步提高对先天性心脏病的诊断准确率。

PU-2652

双源 CT 对肺血减少类复杂先心病肺动脉发育的研究

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目的：探讨 CT 对肺血减少类复杂先心病肺动脉发育的术前评估准确性。
方法：选择 2009 年 2 月至 2011 年 2 月在我院术前行 CT 和超声检查的肺血减少类复杂先天性心脏病患者 79 例，CT 检查完成后选择收缩末期图像进行多种方法重建，在后处理工作站上分别从轴位、冠状位和矢状位观察肺动脉发育情况、体肺侧支的检出及发育情况，计算 McGoon 指数、主-肺动脉比值、肺动脉指数，结合超声、手术结果评价 CT 对肺动脉发育的诊断准确性。
结果：1.79 例患者手术结果共发现肺动脉主干 49 个，左肺动脉 76 个，右肺动脉 79 个，其中 CT 全部正确检出，超声共漏误诊 3 例,两种检查方法测得值与手术结果之间差异无统计学意义，所测得值之间亦无统计学差异。2.手术结果共发现主-肺动脉间侧支共 31 例，其中 CT 准确诊断 30 例，漏诊 1 处降主动脉中部发出体肺侧支,超声准确诊断 25 例，共漏误诊 6 例,两种检查方法对主-肺动

脉间侧支的检出差异有统计学意义,CT 的检出率相对较高；对固有肺动脉直径（包括肺动脉主干和左右肺动脉）及升、降主动脉直径的测量结果与手术实测值之间有较高相关性，三者间差异不具统计学意义,CT 所测平均值及手术实测值之间相关性更好。两种检查方法对固有肺动脉直径及升、降主动脉直径的测得值之间差异无统计学意义，但 CT 所测平均值均较超声测得值大；两种检查方法测得的 McGoon 指数、主-肺动脉比值、肺动脉指数之间相关性良好（r=0.740/0.832/0.785），差异不具统计学意义，但 CT 所得 McGoon 指数、肺动脉指数均比超声所得值偏大，而其所得主-肺动脉比值则较超声所得值偏小。

结论：CT 在对肺血减少类复杂先心病患者的诊断方面有其技术优势，其对固有肺动脉及其分支的测量准确度较高，其测得的 McGoon 指数、主-肺动脉比值、肺动脉指数能准确反映肺动脉的发育情况，可作为术前评估肺动脉发育的主要检查手段。

PU-2653

心上型完全性肺静脉异位引流一例

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患者，男，25 岁，5 天前于当地医院体检发现心脏杂音，超声提示房间隔缺损、右心大、三尖瓣中度返流；为求进一步诊治，来我院就诊；体查患者口唇和四肢末梢轻度紫绀，左前胸壁明显隆起；胸骨左缘第 2/3 肋间可闻及 3/6 级收缩期杂音，余正常。胸片示肺血多，右心房心高比稍大，右心房稍大，主动脉结较小，肺动脉段明显突出；左心缘圆隆，右心室大；正位片呈“雪人征”，符合肺静脉异位引流。肺血管 CTA+CTV 示双肺静脉及其分支明显增粗，右肺静脉及左下肺静脉于左心房下方处汇合，汇合从纵隔左侧上方走行，途中左上肺静脉汇合，经无名静脉与左头臂静脉汇合后汇入右心房；异常引流肺静脉全程未与左心房相通，肺内静脉及远端分支未见充盈缺损。左心房、左心室体积增大，房间隔局部造影沟通。肺动脉及分支稍扩张，左心房、左心室体积较小，主动脉全程管腔缩小。诊断为完全性肺静脉异位引流（Ⅰa 型）。术中见右房右室明显增大，左心发育偏小，上下腔静脉增宽，主动脉直径约 2cm，肺动脉直径:主动脉直径=2:1。三尖瓣瓣环三指半，中度返流。后行完全性肺静脉异位引流矫治+三尖瓣成形术+房间隔缺损修补术。结扎无名静脉，将肺静脉与左心房吻合，闭合房间隔缺损，并适当将左房成型扩大，最后三尖瓣 kay’s 成形。术后恢复良好。

讨论：肺静脉异位引流分为完全性和部分性。根据引流部位的不同又可分为心上型、心内型、心下型及混合型。其中心上型根据引流途径不同，又可分为Ⅰa 型及Ⅰb 型，本例为Ⅰa 型，是指全部或部分肺静脉连接于无名静脉后自上腔静脉汇入右房，本例同时合并右心扩大、肺动脉高压及房间隔缺损，能存活至 25 岁者少见。CT 血管成像可全方位显示肺静脉的走行，容积再现能显示心脏大血管的整体及肺静脉的引流途径、各房室的大小及连接关系，通过任意角度旋转及剪切，能将肺静脉走行整体剪辑出来。对肺静脉异位引流的诊断及合并的其他复杂血管畸形诊断上有重要价值。

PU-2654

Partial absence of the pericardium leads to tricuspid regurgitation

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Congenital absence of the pericardium (CAP) is an uncommon finding, It is usually diagnosed incidental, as most patient with CAP are asymptomatic. There are only a few symptomatic cases published where pericardial defects were associated with herniation or ischemia of the heart, compression of coronary vessels , undue torsion or strain on the great vessel, or tricuspid regurgitation which maybe need further management. we present a case of partial Congenital absence of the pericardium leading to enlargement at the base of the right ventricle and tricuspid regurgitation due to band-like rim of remaining pericardium restricting the blood flow by using multi-modality imaging.

PU-2655
高浓度对比剂结合低 KV 技术在心衰患者冠脉 CTA 中的研究

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【摘要】目的:探讨高浓度对比剂结合低 kv 技术在心衰患者冠脉 CTA 检查的可行性。资料和方法：选取 2018 年 9 月至 2019 年 3 月在我院临床怀疑心衰行冠脉 CTA 检查的患者共 100 例，年龄 50—80，其中男性 52 例，女性 48 例，随机分成 A、B 两组,A 组为对照组 50 例，其中男 28 例，女 22 例，B 组为实验组 50 例，其中男 24 例，女 26 例，A、B 两组均使用西门子二代双源 CT 前瞻性扫描模式，均使用迭代重建技术，A 组:320 对比剂，65ml，4ml/s，120kv，B 组 370 对比剂 65ml，5ml/s，100kv。两组注射完对比剂后均注射 50ml 生理盐水。根据美国心脏协会 (American Heart Association, AHA)标准，将冠状动脉分为 15 段,分级评分标准：I 级 4 分，图像质量优，血管 显示良好，边界清晰，管腔连续完整；n 级 3 分，图像质量良好，血管边界稍模糊，或有轻度伪影，但不影响诊断；m 级 2 分，图像质量一般，边界模 糊，有重度伪影，尚可以诊断；W 级 1 分，图像质 量差，血管显示不清，有严重阶梯状伪影，不能作 出诊断。由两位经验丰富的影像医师分别对 15 段冠 脉血管图像分四级进行评分，分别统计两组各段血管得分情况，分别计算两种模式下病人吸收辐射剂量。
结果：两组之间图像质量有统计学意义（$p<0.05$）,两组之间辐射剂量有差异（$p<0.05$）。**结论**：高浓度对比剂结合低 KV 技术可提高心衰患者冠脉 CTA 的图像质量，同时降低患者的辐射剂量。

PU-2656
Revolution 256 排 CT 冠状动脉成像联合胸腹主动脉 CTA 成像在诊断突发性胸背部疼痛的优势。

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目的：探讨基于 Revolution 256 排 CT，冠状动脉成像联合胸腹主动脉 CTA 扫描对快速诊断突发性胸背部疼痛中的优势，以及临床意义。
方法：选取突发性胸背部疼痛患者 20 例，在询问病史、体格检查及相关血生化检查后，排除 CT 扫描禁忌症，立即予以冠状动脉成像联合胸腹主动脉 CTA 检查，选用机器：GE Revolution 256 排 CT，造影剂选取 370mgI/ml 非离子型对比剂（注射造影剂方案：65ml，5ml/s）；扫描方法：Group1:14/16cm 轴扫，自动触发；Group2:8/4cm 螺旋扫描，对冠状动脉轴扫结束后自动移床并立即启动螺旋扫描；成像顺序：冠脉 CTA→胸腹主动脉 CTA。扫描结束后用 GE aw4.7 工作站进行后处理，选取层厚为 0.625mm 的动脉期组图，使用 VR 中 tree VR、Big Vessels 及 Small Vessels 重建出冠状动脉及胸腹主动脉；再重建出 MIP 图像，调整合适窗宽窗位；最后使用 MPR 后处理技术，从多角度观察血管情况，并对冠状动脉做血管分析。分析 Revolution 256 排 CT 冠状动脉成像联合胸腹主动脉 CTA 扫描图像的优越性及其诊断突发性胸背部疼痛相关疾病的优势。
结果：20 例突发性胸背部疼痛患者中，主动脉夹层 6 例，冠状动脉粥样硬化性心脏病 2 例，冠状动脉粥样硬化性心脏病合并主动脉夹层 1 例。图像能同时且清晰显示患者冠状动脉及胸腹主动脉的情况，可在 GE aw4.7 工作站中运用 VR、MIP、MPR 等后处理技术，清晰直观的显示病变情况。
结论：Revolution 256 排 CT 冠状动脉成像联合胸腹主动脉 CTA 扫描在诊断突发性胸背部疼痛患者中较以往运用 64 排螺旋 CT 分别行冠状动脉成像及胸腹主动脉 CTA 成像对快速给出临床诊断及图像质量有很大的优势。运用 GE aw4.7 工作站重建出的 VR 图像更能清晰直观反应病变情况。

PU-2657

Assessment of ventricular wall motion with cardiac MRI in acute myocardial infarction after PCI

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Purpose: To find out changes in segmental ventricular wall motion and value of prognostic predication with cardiac MRI in acute myocardial infarction after PCI.
Material and method: 18 consecutive patients with acute myocardial infarction underwent routine medical and PCI therapy. All 18 patients were performed baseline, 6 months follow-up with cardiac MRI. 12 patients fulfilled 12 months follow-up. Scan sequences used short-axis left ventricular view in FIESTA. The ventricular wall motion was described by maximal expansion velocity (temporal max), maximal contraction velocity (temporal max), expansion velocity at peak filling rate (PFR), contraction velocity at peak ejection rate (PER), maximal wall-thickness (temporal max), mean end diastole wall-thickness, mean end systole wall-thickness, wall-thickening, fractional wall-thickening and myocardial volume. Statistics procedure used SPSS 13.0, including T-test and correlation analysis.
Result: 18 patients were studied including 14 male and 4 female, media age was 59yr. All infarction zones belong to left coronary artery supply and located in 7-15 segments. In SEGMENT the margin of myocardium were depicted automatically and revised manually. The motion data were calculated. Statistics analysis revealed maximal expansion velocity (temporal max) of infarct segments in 6 months follow-up was larger than that in baseline, which indicated the wall compliance decreased. Maximal contraction velocity (temporal max), expansion velocity at PFR and contraction velocity at PER of infarct segments in baseline all showed significant decrease compared with non infarct segments in 6 months follow-up, which may suggest the pump function impaired. Maximal wall thickness (temporal max) between infarct and non

infarct segments existed significant difference in 6 months follow-up. In 12 months follow-up expansion velocity at PFR was lower in infarct than non infarct segments. Myocardial volume decreased continuously in follow-up duration, the trend was more obvious in infarct than non infarct segments.
Conclusion: Quantitive evaluation of ventricular wall motion with cardiac MRI in acute myocardial infarction after PCI is available. Contraction and expansion velocity may be sensitive indicators for pump function impairment evaluation

PU-2658
Revolution CT 一站式冠脉联合上腹部增强扫描应用价值研究

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目的：探讨 256 排宽体探测器联合多模型迭代重建技术（ASiR-V）在一站式冠脉联合上腹部增强扫描中应用的可行性。
方法：前瞻性收集需要行冠脉 CT 血管扫描（CCTA）及上腹部增强扫描的患者 75 例，采用通过一次造影剂注射，一站式前瞻性心电门控扫描联合上腹部增强扫描。测量并记录图像的客观评价指标[升主动脉根部（AA）、左冠主干（LMA）、前降支近段（LAD-p）、左回旋支近段（LCX-p）及右冠近段（RCA-p）的 CT 值，图像噪声 SD、SNR 及 CNR；肝脏、胰腺、主动脉、门静脉的 CT 值、CNR 及图像噪声 SD]及辐射剂量，主观评价冠状动脉可判读节段数百分比（美国心脏学会 15 分段以 4 分法进行评价，≤3 为可判读）、上腹部图像质量（5 分制，≥3 分符合临床诊断需求）。
结果：冠脉 AA、LMA、LAD-p、LCX-p 和 RCA-p 的 CT 值分别是（443.9±84.9）HU、（421.1±92.5）HU、（410.8±88.1）HU、（401.7±86.5）HU 和（418.9±92.2）HU；冠脉图像噪声 SD、SNR、CNR 分别为 32.3±5.9、14.1±2.9 和 17.2±3.4。全组共 925 段冠状动脉纳入被评价范围，其中 67.6%（625/925）图像优秀，21.8%（202/925）图像质量良好，9.2%（85/925）图像质量中等，1.4%（13/925）图像质量差。75 例患者所有上腹部图像均能达到诊断要求。
结论：一站式冠脉联合上腹部增强扫描在 Revolution CT 宽体探测器上可行，明显减少患者对比剂用量，同时多模型迭代重建技术可在较低辐射剂量条件下完成联合扫描，并获得较高质量的冠脉及上腹部图像。

PU-2659
Additional Diagnostic Improvements of Coronary CT Angiography on Calcified Coronary Stenosis Using a Dual-Layer Spectral Detector CT: Validation by Invasive Coronary Angiography

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Objectives: The objective of this study was to explore the optimal spectral based images reconstruction approach and the incremental diagnostic value for calcified and mixed plaques stenosis evaluation on dual-layer spectral detector CT.
Materials and Methods: 72 consecutive patients with known or suspected CAD who underwent both coronary CTA and ICA were enrolled. The conventional 120kVp images, 8 different virtual monoenergetic keV images (VMI) (70 to 140keV, with increment of 10 keV), the effective atomic number images and iodine no water images were reconstructed, respectively. Invasive coronary angiography was used as the reference standard. Subjective and objective evaluation were performed on each lesion for all keV levels. Optimal qualitative keV level was selected. Bland-Altman analyses were used to assess agreement of the data between different monochromatic series and ICA. The sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy were calculated and compared among all the different approaches.
Results: There were 122 vessels in 72 patients （49 men and 23 women; 63.7±10.2years） finally enrolled for analysis. The qualitative optimal keV was selected at 100 keV (52%) and 90 keV (39%) for most cases. Among 8 monochromatic keV levels, Bland-Altman analyses yield best agreement between the stenosis assessment under 100keV and the result of ICA. The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and diagnostic accuracy of 100 keV VMI, the effective atomic number images, iodine no water images and conventional 120kVp to identify stenosis ≥ 50% were 83%, 80%, 74%,73% and 78% respectively; 92%, 58%, 76%,83% and 80%,respectivly; 86%, 66%, 78%,77% and 78% respectively and 88.9%, 44%, 70%, 73% and 70%. The sensitivity reached 97.2% when combining 100keV VMI with the effective atomic number images (the degree of stenosis ≥50% on both images.
Conclusion: Our study shows that virtual monochromatic reconstruction at 100keV has optimal diagnostic performance of coronary stenosis evaluation for calcified plaques on DLCT. The sensitivity to detect coronary artery diseases improve significantly when combining 100keV VMI with the effective atomic number images.

PU-2660
血透患者上肢血管通路 CTA 诊断研究（附 26 例报告）

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目的：分析不同扫描技术下血透患者上肢内瘘血管通路 CT 血管造影（CTA）肯定性、干扰性表现，提高此类患者 CTA 诊断水平。**方法：**回顾性逐例分析 26 例血透患者上肢血管通路 CTA 检查技术参数及影像表现，归纳其中有价值的诊断信息和干扰信息，提出诊断要点。**结果：**26 例 35 人次患者，扫描体位、扫描范围、打药部位、阈值设定位置及触发时间、扫描期限等技术参数均不一，以双手上举（n=28）、完整包含上肢血管通路（n=30）、对侧打药（n=22）、阈值设定胸主动脉（n=20）、平均 150HU 触发延迟 12 秒一期扫描，20 秒二期扫描多见。肯定性阳性表现包括狭窄 26 例（吻合口狭窄 11 例，引流静脉狭窄 8 例，中心静脉狭窄 7 例）、引流静脉增粗 14 例、瘤样扩张 12 例、血栓 11 例、侧枝循环 8 例、钙化 4 例、肱动脉下段假性动脉瘤 1 例、肘正中静脉纤细+多发小瘤样扩张 1 例、腋静脉支架置入后闭塞+多发侧枝循环 1 例。干扰诊断或假阳性表现包括左头臂静脉假阳性狭窄 3 例、锁骨下静脉假阳性狭窄 5 例、头静脉假阳性狭窄 8 例、假阳性血栓 1 例，结合检查技术参数后综合分析可以鉴别；另有 3 例血管不显影或模糊显影和 1 例血管造影剂充盈不

均与血栓鉴别困难。**结论：**血透患者上肢 CTA 技术缺乏规范客观现实；对狭窄、引流静脉增粗、瘤样扩张、侧枝循环、钙化等显示具有优势；分期或多次扫描可鉴别假阳性狭窄；血管不显影或显影不佳与血栓鉴别困难。

PU-2661

Feasibility of Coronary CT Angiography in Patients with Atrial Fibrillation Using a Wide Detector CT Scanner

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Objectives: We aim to evaluate the image quality and radiation dose of wide detector CT coronary angiography (CCTA) in patients with atrial fibrillation (AF). **Methods:** We retrospectively analyzed the CCTA images from 43 patients with AF (group 1) and compared them with CCTA images from 58 patients without arrhythmia (group 2). All of the patients underwent a prospective electrocardiogram (ECG) trigger of CCTA. We evaluated image quality, coronary evaluability, heart rate, irregular heartbeat, and effective dose (ED). **Results:** In the segment-based analysis, the coronary evaluability was 98.7% and 98.8% in two groups, and there was no significant difference between the two groups (p = 0.21). Scanning times, heart rate, heart rate changes, and irregular heartbeats were significantly higher in group 1 than in group 2 (p = 0.001). Mean ED was similar in both groups (p = 0.52). **Conclusion:** CCTA using a wide detector CT scanner can evaluate the coronary artery in patients with AF. Although heart rate is variability, the image quality and radiation dose are similar to those of normal rhythm patients.

PU-2662

个体化注射对比剂软件 Medrad P3T 在双源 CT 冠脉 CTA 成像中对心脏结构显示的初步探讨

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目的 评价双源 CT 采用个体化对比剂注射软件 Medrad P3T 行冠脉 CTA 成像的图像质量，探讨个体化对比剂注射方案的可行性，推广低剂量注射方案的应用。方法 回顾性分析在本院行双源 CT 联合 P3T 个性化注射方案冠状动脉成像的 76 例患者及同时期采用经验性传统双筒注射方案进行冠状动脉成像 76 例患者图像，比较 2 组方案的图像质量及各处测定 CT 值。结果 ①Medrad P3T 个性化注射组左心室与右心室 CT 值较传统注射组有明显差异，具有统计学意义(P <0 .05)，而升主动脉 、降主动脉 、肺动脉的感兴趣区 CT 值差异无明显差异，不具有统计学意义(P >0 .05)。 ②采用 Medrad P3T 个性化注射组室间隔显示情况明显优于传统注射组，具有统计学意义(P <0 .05) 。③采用 MedRadP3T 个性化注射方案注射所用对比剂量比传统方案使用对比剂量减少约 5.7%～28.7%。结论 Medrad P3T 个性化注射方案与传统注射方案均可获得良好的冠脉图像质量以满足临床诊断需求，但 Medrad P3T 个性化注射方案能提高心室结构的显示及冠脉各段均匀性显示，尤其对合并室

间隔缺损等心脏、大血管疾病患者能基本能达到“一站式”扫描，即冠状动脉和心脏大血管结构均可得到良好显示，避免重复扫描以减低辐射剂量及减低对比剂用量，值得临床借鉴及推广应用。

PU-2663

冠状动脉钙化积分在冠心病诊断中的价值

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目的：探讨冠状动脉钙化积分冠心病诊断中的价值。
方法：对 117 例可疑冠心病患者行 CT 检查，一个月内行冠状动脉造影（ICA）检查。以 ICA 显示冠状动脉狭窄≥50％为 CAD 诊断金标准，用受试者工作特征（ROC）曲线评价 CACS 对 CAD 的诊断效能，并获得 CACS 诊断 CAD 的最佳界值；计算 CACS 诊断 CAD 的灵敏度、特异度、准确度、阳性预测值、阴性预测值.
结果：
（1）以 ICA 显示冠状动脉狭窄≥50％为 CAD 诊断标准，117 例可疑冠心病患者诊断为 CAD72 例，非 CAD45 例，CAD 组 CACS 明显高于非 CAD 组[（535.7±103.7）vs. （38.1±16.0）]，差异具有统计学意义（t=4.73，P<0.05）。
（2）CACS 诊断 CAD 的 ROC 曲线下面积为 0.73，依据 ROC 曲线获得 CACS 诊断 CAD 最佳界值为 96.4 分，据此计算灵敏度、特异度、准确度、阳性预测值、阴性预测值分别为 61.1％（44/72）、95.5％（43/45）、74.4％（87/117）、95.6％（44/46）、60.5％（43/71）。
结论：CACS 诊断 CAD 最佳界值为 96.4 分，CACS 诊断 CAD 有较高的特异性及阳性预测值，但其灵敏度较低，CACS＜96.4 分甚至为 0 分，不能排除微钙化及非钙化性斑块所致 CAD

PU-2664

双源 CT Flash 模式正弦迭代重组技术结合“双低”扫描在胸痛三联检查中的应用研究

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目的 通过比较二代光子双源 CT Flash 模式下“双低”扫描联合正弦迭代重组技术(SAFIRE)与双源 CT 传统扫描技术联合常规滤波反投影重组(FBP)技术对胸痛三联病变的显示能力，评估双源 CT Flash 模式下结合“双低”扫描在急性胸痛患者中应用的优势及可行性，以期显著减低患者的辐射剂量及对碘摄入量。**方法** 将临床初步筛查需要行胸痛三联检查的 40 例满足实验条件的患者随机分为实验组和对照组两组，分别使用双源 CT Flash 模式下“双低”技术联合正弦迭代重组(SAFIRE)法和常规的胸痛三联序列（DS Chest Pain ECG)进行扫描，对两组图像质量分别进行主观评价和客观评价，对比两组辐射剂量并进行统计学分析。 **结果** 两组图像质量的主观评价无明显差异（P＜0.01），两组图像质量客观评价血管 CT 值均大于 300HU，完全满足临床诊断需求。两组辐射剂量 CTDI 、DLP 及 ED 均有显著统计学差异，（P＜0.01），其中实验组 ED 为 1.04±0.03 mSv，对照组 ED 为 18.17±8.21mSv，有效辐射剂量较对照组降低 94%～95%。**结论** 双源 CT Flash 模式结合“双低”扫描联合正弦迭代重组技术(SAFIRE)不但可以获得满足诊断条件的图像，更重要的是显著降低了辐射剂量和对比剂摄入量，具有广泛的应用前景。

PU-2665
探讨 128 层螺旋 CT 胸痛“三联”CTA 结合迭代重建技术在胸痛病人临床中的应用价值

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目的：探讨应用 128 层螺旋 CT 胸痛“三联”CTA 结合 iDose 技术在胸痛患者病因诊断中的临床应用价值。材料及方法：收集川北医学院附属医院 2018 年 1 月-2019 年 1 月期间符合纳入及排除标准的胸痛患者，随机分为 A、B 两组，A 组为常规组，B 组为 iDose 组，每组 60 人，采用飞利浦 128 层螺旋 CT 进行扫描，两组心率均控制在 75 次/分之下。然后记录分析上述各组的噪声、SNR、CNR 及辐射剂量、以及图像质量（运用 1-5 分评价各组总体图像质量），同时以冠状动脉及主动脉造影为金标准，来探讨胸痛“三联”CTA 结合 iDose 技术在胸痛患者病因诊断中的临床应用价值。结果：与 A 组相比，B 组辐射剂量明显减低，差异有统计学意义（P＜0.05）。结论：128 层螺旋 CT 胸痛“三联”CTA 结合 iDose 技术可以根据不同病人设置个性化方案并大大减少辐射且保证足够的图像质量，为临床监测胸痛患者及治疗方案的选择提供科学依据。

PU-2666
冠状动脉 CT 斑块稳定性分析与冠心病中医辨证分型的相关性研究

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目的 探讨冠心病患者冠状动脉 CTA 斑块分析结果与中医辨证分型间的关系，为冠心病中医辨证防治及高危患者筛查提供客观指标。
方法 对 307 例冠心病患者分别行冠状动脉 CTA 检查及中医辨证分型，分析不同证型与斑块的性质及稳定性的关系。
结果 冠心病基础证型以血瘀证（38.56%）和痰浊证（24.07%）最常见，复合证型以心血淤阻证（35.5%）与痰浊壅塞证（24.76%）最常见；基本证型及复合证型与斑块性质均存在相关性（x^2=162.712，p<0.05、x^2=55.818，p<0.05），相依系数示两种辨证方法均存在低度关联（0.310、0.241），基本证型及复合证型与斑块稳定性均存在相关性（x^2=125.994，p=<0.05、x^2=57.971，p<0.05），相依系数示两种辨证方法均存在低度关联（0.276、0.243）；对比两种辨证分型方法中不稳定性斑块的分布特点，痰浊壅塞证中不稳定性斑块比例最高。
结论 冠心病不同证型与斑块的性质及稳定性存在一定相关性，复合证型中痰浊壅塞证最易出现不稳定性斑块，需要临床高度关注。

PU-2667
不同类型的心包脂肪与心血管危险因素及冠状动脉粥样硬化的关系

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目的 研究不同类型心包脂肪与各种心血管危险因素及冠状动脉粥样硬化的关系。**方法** 回顾性收集我院 2018 年 1 月至 2018 年 12 月行双源 CT 冠状动脉造影（coronary computed tomography angiography, CCTA）检查的 276 例住院患者的临床资料，根据排除标准最终纳入 203 例，测量从左心耳上缘到心尖 CT 值为-200HU 到-30HU 的心包内脂肪容积（epicardial fat volume, epi-FV）、心包外脂肪容积（paracardial fat volume, para-FV）及心脏周围脂肪容积（pericardial fat volume, peri-FV），分析患者冠状动脉 CTA 资料及各类型心包脂肪量与年龄、性别、BMI、空腹血糖、血脂、血压以及各心包脂肪指数与冠状动脉斑块累及节段及其管腔、Gensini 评分等的关系。**结果** 男性、糖尿病及血脂异常患者均具有较高的 epi-FV、peri-FV 及 para-FV，吸烟患者有较高的 peri-FV、para-FV，而高血压患者的 epi-FV 及 peri-FV 高于血压正常者。相关性分析显示年龄、BMI、血糖及甘油三酯与 epi-FV、peri-FV 及 para-FV 均呈正相关，peri-FV，para-FV 与高密度脂蛋白呈负相关。在冠状动脉粥样硬化分析中，存在冠状动脉斑块者具有较高的心包内及心脏周围脂肪指数，且两指数均与斑块累及节段数目及 Gensini 评分呈正相关，危险斑块者较稳定斑块者具有较高的心包外脂肪指数（所有 P<0.05）。**结论** 心脏周围脂肪体积包括心包内脂肪体积及心包外脂肪体积均与心血管危险因素相关。心包内及心脏周围脂肪指数与冠状动脉粥样硬化斑块形成及累及范围有关，而心包外脂肪指数与斑块稳定性相关。

PU-2668
Revolution CT 低管电压血管成像在胸痛三联征的临床运用

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目的：探讨 GE Revolution CT 低电压血管成像在胸痛三联征的临床应用。方法：选取遂宁市中心医院 2018 年 6 月至 2019 年 6 月疑似胸痛三联征患者 50 例随机分为观察组与对照组，每组各 25 例。其中观察组扫描肺动脉成像 PE 设为 80KV 管电压，冠脉动脉成像 CCTA 设为 100KV 管电压，胸主动脉成像 AAA 设为 80KV 管电压，对照组扫描肺动脉成像 PE 设为 100KV 管电压，冠脉动脉成像 CCTA 设为 120KV 管电压，胸主动脉成像 AAA 设为 100KV 管电压，各组患者按实验要求接受胸痛三联 CTA 成像检查。比较两组患者的图像成像质量，分别测量两组患者的肺动脉干、升主动脉、降主动脉及冠状动脉开口 CT 值，计算两组患者图像的 SNR、CNR 和辐射剂量。结果：观察组与对照组两组患者资料比较，图像质量主观评分无统计学差异（P>0.05），；升主动脉图像 SNR 无统计学差异（P>0.05）；肺动脉干、升主动脉、降主动脉及冠状动脉开口处的 CT 值和 CNR，肺动脉干、降主动脉及冠状动脉开口处的 SNR，患者的剂量长度乘积 DLP 和有效辐射剂量 ED 均具有统计学差异(P<0.05)。胸痛三联 CTA 平均曝光时间（3.12±0.41）s，肺动脉成像 PE 平均曝光时间（1.14±0.19）s，冠状动脉成像 CCTA 平均曝光时间 0.4s，胸主动脉成像 AAA 平均曝光时间（1.35±0.22）s。结论：GE Revolution CT 利用低管电压技术行胸痛三联血管成像检查，在保证图像质量的同时，可降低患者有效辐射剂量，具有较高的临床应用价值。

PU-2669
探讨宽探测器 CT 心脏三维重建在 TAVR 术前评估的应用价值

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目的 探讨宽探测器 CT 心电门控心脏三维重建技术在经心尖经导管主动脉瓣置换术治疗高龄高危主动脉瓣关闭不全的应用价值。**方法** 回顾性分析 2016 年 6 月至 2018 年 8 月于我院因主动脉瓣关闭不全欲行 TAVR 手术来我科做 CT 增强心脏三维重建的 69 例患者的临床资料，其中男 45 例，女 24 例，平均年龄 75.8±4.2 岁，术前均采用 CT 心电门控三维重建技术对主动脉瓣膜区域及心脏大血管进行全面评估，包括主动脉起始部 CT 值，对比度噪声比（CNR），记录所有患者剂量长度乘积（DLP），并计算有效辐射剂量（ED），观察主动脉瓣膜形态，测量主动脉瓣环直径、冠状动脉开口距主动脉瓣环高度、升主动脉直径、左心室主动脉夹角、三维容积图像分析最佳造影投射角度。依据测量数据筛选适合手术的病例，并制定理想的手术策略例如选择最佳瓣膜尺寸，选择造影投射角度以及心尖部入路等。适宜患者采用第二代人工生物瓣膜-J-Vavle 杂交手术。 **结果** 所有患者均成功完成 CT 心脏成像。CT 报告显示，瓣膜全部为三叶式，均无左心室壁瘤。主动脉根部 CT 值 409±27HU，CNR 平均 17.7±5.8，DLP 64.98±7.27，有效辐射剂量 0.91±0.35 mSv,。根据测量结果，9 例患者瓣环直径大于 29mm（6 例为男性），60 例瓣环直径小于 29mm 的患者中，1 例的冠脉开口距瓣环直径小于 10mm，此 10 例患者转为外科开胸瓣膜置换术，其余 59 例患者均成功完成 TAVR 手术。手术成功的 59 例患者中，CT 测量平均瓣环径 27.7±3.5mm，其中 55 例患者瓣膜无钙化，4 例患者瓣膜轻度钙化。依据术前三维全容积三维图像准确预测 94.9% （56/59）患者术中造影最佳角度。**结论** 宽探测器 CT 心电门控心脏三维成像技术对 TAVR 术前评估有关键作用，对于手术可行性，手术器材和手术方式的选择，均有重要指导意义，而且辐射剂量小，适合在临床推广运用。

PU-2670

320 排容积 CT 冠状动脉成像的初步研究

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目的 通过与冠脉 DSA 造影的比较，研究 320 层螺旋 CT 评估冠状动脉 III 级 IV 级狭窄的准确性。**方法** 收集 2012 年 7 月—2013 年 2 月于我院行 320 排螺旋 CT 和冠状动脉造影的 100 例患者影像学资料，评估 320 排螺旋 CT 诊断冠状动脉中度以上狭窄的准确性。 **结果** 320 排螺旋 CT 评估冠状动脉≥51% 、≥76%狭窄性病变特异性分别为 94.3%、86.0%，敏感性分别为 95.5%、95.3%， 阳性预测值分别为 78.0%、73.5%，阴性预测值分别为 99.0%、97.4%。**结论** 320 排螺旋 CT 作为一种无创性检查手段，评估冠状动脉中重度狭窄有较高的准确性，可以作为冠心病患者可靠的筛查方法。

PU-2671

128 层螺旋 CT 冠状动脉造影对冠状动脉少见疾病的诊断价值

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目的：探讨多层螺旋 CT 冠状动脉造影检查多冠状动脉少见疾病的诊断价值，提高对其少见病的认识和掌握。
方法：搜集 2011-5-1 至 2013-5-1 间 8 例少见冠状动脉病人的资料，包括 4 例冠状动脉瘘，2 例冠状动脉瘤，2 例冠状动脉夹层动脉瘤。均经 DSA 造影或临床症状，体征确诊。男性，6 例，女性，2 例，年龄 53-81 岁，平均年龄 68 岁。采用西门子螺旋 CT，层厚 0.625mm，扫描范围心脏上缘至膈顶，经肘静脉注射对比剂，平静吸气后屏气扫描，采用心电门控技术，观察冠状动脉分布，走形，病变情况。

结果：4 例冠状动脉瘘病人，1 例为右冠状动脉-肺动脉瘘，2 例为左回旋支-肺动脉瘘，1 例为左前降支-肺动脉瘘，可见多发扭曲呈蚯蚓状血管位于异常瘘血管之间，128 层螺旋 CT 可以清晰显示瘘口血管情况以及发生血管。2 例为冠状动脉瘤病人，1 例为右侧冠状动脉瘤形成，1 例为右冠状动脉瘤形成，伴右冠状动脉狭窄。2 例为冠状动脉夹层动脉瘤形成，位于右侧冠状动脉近中段，左冠前降支中段，128 层螺旋 CT 可清晰显示破裂口形态。
结论：128 层螺旋 CT 可明确诊断冠状动脉少见疾病，包括冠状动脉瘘，冠状动脉瘤，冠状动脉夹层动脉瘤等，可以清楚了解沟通血管的起源，可以直观显示动脉瘤管腔内情况。能为临床提供切实，有效地帮助，制定最佳治疗方案。同时由于其安全、无创，可作为 DSA 冠状动脉造影检查的有效补充，甚至替代。

PU-2672
64 层螺旋 CT 冠状动脉血管成像诊断冠状动脉变异的价值

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目的 评价 64 层螺旋 CT 冠状动脉血管成像诊断各种类型冠状动脉变异的价值和临床应用。 **资料与方法** 回顾性分析 617 例接受 64 层螺旋 CT 冠状动脉血管成像患者中冠状动脉变异的检出率，并根据 CT 结果对冠状动脉变异进行分类。 **结果** 64 层螺旋 CT 冠状动脉血管成像共检出冠状动脉变异 78 例（12.64%，78/617），其中右冠状动脉起自主动脉左窦者 9 例、左冠状动脉起自主动脉右窦者 2 例、右冠状动脉开口高位者 2 例、多开口变异者 2 例（并行左主干）、心肌桥者 59 例、前降支－肺动脉瘘者 2 例、左右冠状动脉－肺动脉瘘者 1 例、右冠状动脉－左室瘘合并右冠状动脉瘤者 1 例。 **结论** 64 层螺旋 CT 冠状动脉血管成像能准确评估冠状动脉变异，并清晰显示各类病变的细节，可作为无创性诊断冠状动脉变异的首选方法。

PU-2673
Coronary plaque characteristics on baseline CT predict the need for late revascularization in symptomatic patients after percutaneous intervention.

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OBJECTIVES: To assess pre-procedural plaque characteristics as determined by coronary CT angiography (CCTA) and their associations with late revascularization in symptomatic post-procedural patients. METHODS: Symptomatic patients with pre-procedural CCTA were prospectively enrolled and referred for invasive coronary angiography (ICA). Plaque characterization was performed on the basis of baseline CCTA data. Multivariate logistic regression analysis with a stepwise selection method was performed to identify independent predictors of late revascularization. RESULTS: Seventy-eight patients with 134 lesions were included. Late revascularization was performed to treat 15 ISRs and 22 de novo lesions. Lesions with late revascularization showed higher prevalence rates of low-attenuation plaque (LAP) and positive remodelling (PR) (70.3% vs. 23.7% and 86.5% vs. 30.9%; both $p < 0.001$) at baseline

CCTA. However, the incidence of spotty calcification or napkin-ring sign (NRS) was not significantly different between the subgroups. According to ROC curve analysis, PR and LAP showed the largest AUC values for diagnosing lesions with late revascularization (AUC = 0.78 and 0.73, both p < 0.001). In multivariate analysis, LAP and PR (odds ratio = 6.30 and 13.94; both p < 0.05) were revealed to be independent predictors for late revascularization. CONCLUSIONS: LAP and PR observed by baseline CCTA independently predict late revascularization caused by ISR or progression of de novo lesions. KEY POINTS: * LAP and PR observed by baseline CT are predictors of late revascularization. * NRS and spotty calcification are not associated with late revascularization. * CT plaque characterization is useful in identifying lesions at high risk of late revascularization.

PU-2674
双源 CT 100Kv 管电压冠状动脉血管成像诊断冠心病的临床研究

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目的： 探讨在 100Kv 管电压下双源 CT 冠状动脉成像对诊断冠状动脉狭窄的临床诊断价值。方法：收集我院 93 例行冠状动脉 CT 血管成像（CCTA）与冠状动脉数字减影血管造影（DSA）检查的冠心病患者的影像学资料，以 DSA 结果为金标准，共分析评价 1400 支节段冠状动脉。结果：CCTA 显示冠状动脉狭窄 0～Ⅳ级分别为 945 节段、155 节段、 104 节段、183 节段和 13 节段；DSA 诊断冠状动脉狭窄 0～Ⅳ级分别为 988 节段、112 节段、125 节段、153 节段、22 节段。CCTA 诊断冠状动脉狭窄的敏感性为 94. 67%（284/300），特异性为 97.45%（1072/1100），阳性预测值为 91.03%（284/312），阴性预测值为 98.53%（1072/1088），准确率为 96. 86%（1356/1400）。CCTA 与 DSA 诊断冠状动脉狭窄的一致性检验 Kappa 值为 0.72。结论：双源 CT 100Kv 管电压冠状动脉成像对诊断冠状动脉狭窄具有较高的敏感性、特异性，能够显示狭窄病因，可做为疑似冠心病患者的首选检查方法。

PU-2675
不同管电压技术对双下肢血管造影图像质量和辐射剂量的影响研究

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目的 本文拟对需要行双下肢血管造影检查（CTA）的患者，采用不同的管电压进行检查，观察不同管电压对双下肢动脉的图像质量以及患者的辐射剂量的影响，寻找低辐射剂量且高影像图像质量的影像学检查方法。

方法 招募某三甲医院 2015 年 06 月~2016 年 12 月间，行双下肢动脉造影检查的患者。随机分为三组，A 组（120kV）、B 组（100kV）、C 组（80kV），每组 40 例。比较三组患者双下肢各支血管的 CT 值、信号噪声比（SNR）、对比噪声比（CNR）、噪声（SD），以描述图像质量评分；采用 CT 剂量指数（CTDIvol）和剂量长度乘积（DLP），分析辐射剂量；同时对重建图像质量、血管边缘形态等进行对比和统计分析。

结果 A、B、C 三组颈动脉血管造影图像质量的主观评分均在 6 分以上，满足主观诊断的要求。与 A 组相比，B 组和 C 组的各支双下肢动脉平均 CT 值分别降低 3.27%和 19.70%，具有统计学意义（P<0.05）。与 A 组相比，B 组和 C 组的容积 CT 剂量指数（CTDIvol）分别低 33.88%及 53.97%，差异具有统计学意义（P<0.05）。与 A 组相比，B 组和 C 组的剂量长度乘积（DLP）分别降低 33.74%和 63.83%，具有统计学差异（P<0.05）。

结论 双下肢动脉 CT 血管造影（CTA）扫描时，采用 100 kV 低管电压扫描所得图像，其质量与 120kV 相似，但辐射剂量明显减少。采用低管电压 80 kV，虽可明显减少辐射剂量，但图像质量有所下降。本研究提示，双下肢动脉 CTA 检查降低管电压至 100 kV 可行。

PU-2676
腹主动脉瘤腔内修补术后瘤体体积的变化与内漏发生的关系

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目的 探讨腔内修补术(endovascular aneurysm repair,EVAR)后，腹主动脉瘤体积变化与内漏的关系。**方法**：回顾性分析了 2014 年 7 月至 2019 年 2 月在北京协和医院就诊的腹主动脉瘤患者 54 例（男性 47 名，女性 7 名，平均年龄 67.7±9.1 岁），所有患者均行腹盆 CTA（computed tomography angiography）检查，分别测量术前、术后 4 个月及术后 12 个月时腹主动脉瘤体积（V_0、V_1、V_2）及轴位最大径（D_0、D_1、D_2），同时记录患者发生内漏的情况。通过计算动脉瘤 V_1/V_0、V_2/V_0及 V_2/V_1的比值，分析 EVAR 后动脉瘤体积的变化及其与内漏的关系，并且也探究了瘤体轴位最大径变化与体积变化的相关性。**结果** 54 例患者在第一次随访时，11 例存在内漏，43 例无内漏。存在内漏的 11 例患者中有 8 例又进行第二次随访，其中 5 例发生内漏，3 例无内漏；无内漏的 43 例患者中有 15 例进行了第二次随访，其中 1 例发生内漏，14 例无内漏。术后第一次随访，有内漏者与无内漏者的瘤体体积变化有统计学差异（P=0.007）；术后第二次随访，有内漏者与无内漏者的体积变化无统计学差异（P=0.476）。术后第 1 次随访的和术前的瘤体体积变化与最大径变化之间呈中等程度相关（ r=0.5，P<0.001）；术后第 2 次随访的和术前的瘤体体积变化与轴位最大径变化之间呈强相关（ r=0.8，P<0.001）。**结论** 在腹主动脉瘤腔内修补术后，动脉瘤体积的变化不能完全反应是否发生内漏；动脉瘤体轴位最大径的变化与瘤体体积变化呈较强相关性

PU-2677
青年冠心病患者冠状动脉计算机断层摄影术征象及相关危险因素分析

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目的：量化≤45 岁青年患者冠状动脉计算机断层摄影术成像（CCTA）的冠心病检出率，并初步探讨其影像学特征及相关危险因素。

方法：选择我院接受 CCTA 检查的≤45 岁青年患者 2 099 例，分析≤45 岁青年人群中冠心病发病的危险因素，并且对≤20 岁、21~30 岁、31~40 岁及 41~45 岁 4 组不同年龄段患者冠心病发病率及病变特征进行分析比较，观察图像并记录有无冠状动脉斑块及其性质和狭窄程度。

结果：2 099 例患者中，男性、吸烟、血脂异常、高血压、糖尿病及家族史在冠心病阳性患者中所占比率均高于冠心病阴性患者（P 均<0.05~0.001）。CCTA 检出冠心病患者 229 例，总检出率为 10.9%（229/2 099）；其中≤20 岁检出率为 3.1%（1/32），21~30 岁检出率为 6.2%（11/177），

31~40 岁检出率为 9.7%（79/818），41~45 岁检出率为 12.9%（138/1 072），随着年龄的增加，发病率逐渐升高，差异有统计学意义（F=11.4，P<0.001）。单支病变患者发生率 72.5%（166/229）显著高于多支病变患者发生率 27.5%（63/229），差异有统计学意义（P<0.001）；323 支病变血管中，非钙化斑块 183 支（56.7%），其中低密度斑块 39 支（12.1%）；混合斑块 54 支（16.7%）；钙化斑块 86 支（26.6%），其中斑点状钙化斑块 72 支（22.3%）。重度狭窄及其以上 158 支（49.0%）。

结论：青年≤45 岁疑似冠心病患者 CCTA 图像上冠心病的检出率为 10.9%，其影像学特征多表现为单支病变和

非钙化斑块。对于临床怀疑冠心病的≤45 岁青年患者，尤其具有吸烟、高血压、高血脂等危险因素且相关症状典型的 30~45 岁男性患者，可建议行 CCTA 检查。

PU-2678

基于体重指数个性化注射对比剂冠脉 CTA 成像的研究

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【摘要】目的：探讨 256 排螺旋 CT 基于体重指数乘以注射系数对比剂注射方案冠脉 CTA 成像的可行性。方法：300 例有胸痛症状行冠脉 CTA 成像的患者，随机分成 A,B,C 三组。A 组，注射速率为 0.15×BMI(ml/s)；B 组，注射速率为 0.20×BMI(ml/s) ；C 组，注射速率为 0.25×BMI(ml/s)，按注射速率×9 计算对比剂用量。扫描完后主观评估图像质量及测量主动脉根部，左前降支（left anterior descending coronary artery, LAD），左冠状动脉回旋支（proximal portion of the left circumflex artery, LCX），右冠状动脉（the right coronary artery, RCA）三支冠脉开口内造影剂浓度。结果：图像质量评价结果显示 B 组优良率明显高于另外两组。三组不同方案主动脉及冠状动脉三个主要分支（LAD 近端、LCX 近端及 RCA 近端）CT 值对比有明显差异（P＜0.001）。而三组方案噪声无明显差异（P＞0.05），其信噪比及对比噪声比依次递增。结论：基于体重指数乘以注射系数调整对比剂注射速率与用量的冠脉 CTA 成像方法可以满足临床诊断，并且可以大大降低对比剂的用量。

PU-2679

肺动脉及冠状动脉 CTA 扫描中扫描时机选择的讨论

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【摘 要】**目的**：研究注射小剂量对比剂扫描时机的选择，在肺动脉及冠脉联合扫描成像中的应用价值。**方法**：1、对 20 例肺动脉及冠状动脉联合扫描的病人，进行小剂量测试测得时间密度曲线。通过分析上述病例的时间密度曲线，初步判断不同年龄、心率、BMI、体重的患者不同的时间密度曲线中扫描时间的分布的参数。2、通过以上参数对 30 例肺动脉冠脉联合扫描的患者不进行时间密度曲线的监测扫描，直接进行肺动脉进行智能追踪扫描并对冠脉进行延时扫描。**结果**：通过对 30 例联合扫描进行监测并延时扫描，得到符合诊断要求的 CTA 图像，经高年资医师判定，其中 23 例肺动脉及冠脉显示良好，肺静脉不显影；3 例肺动脉显示良好，冠脉显示欠佳；4 例肺动脉、肺静脉同时显影，冠脉显示良好。**结论**：这种直接对肺动脉进行监测的联合扫描方案，能够满足对肺动

脉及冠脉扫描的日常需要。既能保证图像质量不影响诊断，又能实现“双低剂量”，减少了对患者的伤害，是一种经济、环保、快捷的检查方法，具有较好的临床应用价值。

PU-2680
冠状动脉能谱成像最佳剂量对图像质量及冠脉斑块的检测和定性

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目的：评价不同重建算法改善图像噪声，斑块特征及量化斑块成分冠状动脉 CT 血管成像图像质量的效果，筛选最佳重建算法。
方法：对 60 例疑似冠状动脉粥样硬化患者应用第三代双源 CT（SOMATOM Force, Siemens Healthcare）进行扫描,用三种不同的重建算法：a.常规虚拟单能图像；b.线性混合图像；C.噪声优化的虚拟单能；进行图像重建,并测量钙化斑块和非钙化斑块冠脉的图像噪声、碘信号噪声比(SNR)和对比度噪声比 CNR)，并对图像质量进行定性读数。客观图像质量指标包括平均 CT 值、图像噪声、信噪比(SNR)、对比度噪声比(CNR),主观图像质量评价由两名具有 10 年以上诊断经验的影像医师对图像质量及斑块进行双盲评分。将三种重建方法进行了比较。1)将原始低能图像和高能图像线性混合，得到混合图像，加权比为 0.6 近似于传统的单源 120 kV CT 图像。2)光子能量为 40~150 keV 的常规虚单能图像，并以 20keV 为间隔。3）噪声优化的虚拟单能重建，光子能量为 40~150 keV，以 20keV 为间隔。
结论：SNR/CNR：100~150 keV 噪声优化的虚拟单能图像比混合图像具有更低的图像噪声。在 40 keV 噪声优化图像中，碘信噪比最高，比混合图像高 42.9%。从 40~70 keV 噪声优化虚拟单能图像和 70 keV 虚拟单能图像相比，冠状斑块 CNR 明显改善。对于混合图像和 70 keV 噪声优化的虚拟单能图像，冠状动脉斑块的定量相似.低能量(40 KeV)图像显示钙化斑块体积增加 81.6%，而非钙化斑块体积比混合图像低 38.7%。高能(100 keV 和 130 keV)噪声优化图像分别比混合图像低 14.7%和 22.1%。低能量(40~70 keV)虚拟后处理的双能冠状动脉 CTA 图像可使冠状动脉斑块 CNR 提高 20.2%~22.7%。使用现有的斑块量化软件，40 keV 图像产生不同的冠状动脉斑块体积。

PU-2681
冠状动脉——肺动脉瘘的 CT 血管造影诊断

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目的：分析冠状动脉一肺动脉瘘（CPF）的 CT 血管造影的影像表现，以期提高对该种冠脉异常的认识。
方法：回顾性分析十堰市太和医院 2018 年 1 月—2019 年 7 月经 CCTA 检查确诊的 15 例 CPF 患者的临床资料,采用多平面重组、曲面重组及 VR 技术观察冠状动脉异常分支(瘘血管)的起源、数目、冠状动脉有无斑块及狭窄,瘘口位置、大小以及瘘管形态、大小、继发改变等。
结果：15 例 CPF 患者，其中 5 例见右冠脉圆锥支供血，8 例左冠脉供血，其中 7 例相当于左圆锥支位置；双侧性供血 2 例。病灶在肺动脉表面形成迂曲、显著强化的血管网，其中仅 2 例形成较为明显的小动脉瘤，13 例可见明确的“射血征”，全部位于肺动脉瓣上方。1 例异常血管网可疑与支气管动脉交通。
结论：冠状动脉一肺动脉瘘并不少见，但绝大多数较小，没有明显血流动力学影响。该瘘有典型 CTA 表现，多起自冠状动脉的圆锥支，在肺动脉起始段表面形成血管网，有典型“射血征”。CTCA

具有无创性,可提供 VR 图像,能够清楚地表现出血管变异的空间关系,能够提供更多的影像学信息,可作为首选影像学检测方法。

PU-2682
Philips Brilliance iCT Elite 冠脉 CTA 低剂量扫描的研究与探讨

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目的：评价冠脉 CTA 低剂量结合 iDOSE 重建与常规剂量 FBP 重建图像的图像质量，探讨 Philips Brilliance iCT Elite 冠状动脉成像中降低 KVP 对减低辐射剂量的程度。**方法**：筛选 73 例行回顾性门控轴位扫描的患者，分成 A 组、B 组、C 组、D 组。分别 A 组采用常规剂量 120KVP,B 组、C 组、D 组分别采用 100KVP，应用软件 idose^{4}分别降噪，观察降低剂量的效果。**结果**：应用 Philips Brilliance iCT Elite 的 idose^{4}迭代重建可以显著改善图像的质量，在 CTDI 较常规剂量降低 50%的条件下仍可以得到与常规剂量 FBP 重建相当甚至更好的图像，在非选择性人群中，其冠状动脉 CTA 辐射剂量降至 55%是可行的。**结论**：通过降低 KVP 可以显著降低冠状动脉成像扫描的辐射剂量。CT 低剂量技术的应用和研究要遵循最优化（as low as reasonably achievable.ALARA）原则，即在保证获得良好的 CT 图像质量（满足临床诊断的需求）的同时，尽可能合理地降低受检者的检查剂量，飞利浦公司（iDose4）其核心特征是双空间多模式，通过在双空间——投影空间和图像空间进行基于噪声模型系统和解剖模型系统的迭代运算消除低光子伪影，降低图像噪声，提升图像分辨率，且不改变图象质地。据文献报道：一次冠脉 CTA 的辐射剂量为 20-25msv，远远高于其他胸部 CT 检查（3-9mSv），而通过降低 KVP 应用 iDose4 迭代重建可以显著降低辐射剂量，这是因为降低管电压扫描后，会因为光电效应增加，康普顿效应降低，导致血管腔内碘对比剂密度显著升高。另外辐射剂量与管电压的平方成正比,管电压降低,辐射剂量以平方的关系降低。

PU-2683
Feasibility of "One-stop" Myocardial Computed Tomography Perfusion Imaging in Coronary Artery Disease using 16-cm wide detector CT

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Purpose To investigate the feasibility of “one-stop”myocardial computed tomography perfusion imaging (CTP) in coronary artery disease (CAD) using 16-cm wide detector CT, compared with conventional coronary CT angiography (CCTA).
Materials and Methods Totally 104 participants (64 males (61.5%), 60.0±9.7 years) with suspected CAD were randomly divided into group A(n=52; routine CCTA examination) and group B(n=52; “one stop”CTP and manually triggered by a small-dose bolus test). Heart rate was not controlled and a 0.7ml/kg contrast dosage was applied. Contrast noise ratio of coronary artery relative to fat (CNR_{a-fat}) was used for objective image quality evaluation and a 4-point system was used for subjective evaluation. Scan time and effective dose of two groups were recorded. Transmural perfusion ratio (TPR) ,

defined as sub-endocardial/ sub-epicardial myocardial blood flow ,and left ventricular ejection fraction (LVEF) were measured on a commercially post-processing software (Ziostation2, Minato-ku™, Tokyo, Japan, version2.4.0.2).
Results The scan time was 72±29.5(s) longer in group B than A without increasing radiation dose (A vs B: 3.3±0.5 vs 3.4±0.6 mSv, P=0.593). Both the subjective and objective scores showed no difference between the two groups (A vs B: CNR_{a-fat} of LAD (28.7±7.0 vs 27.1±6.3, P=0.392); LCX (28.4±7.6 vs 26.9±5.7, P=0.424) and RCA (30.3±7.0 vs 28.2±7.8, P=0.317). For group B, there was a negative correlation between coronary artery stenosis degree and myocardial perfusion indexes. And patients with coronary arteries stenosis showed decreased LVEF (45.7±5.0%) compared with patients with normal coronary arteries(58.1±7.1%),P＜0.0001.
Conclusion Compared with conventional CCTA, “one-stop” CT myocardial perfusion imaging can simultaneously assess myocardial perfusion, coronary stenosis and left ventricular cardiac function, without increasing radiation dose and contrast medium volume.

PU-2684
不同对比剂注射方案对冠脉 CTA 图像质量的影响的对比研究

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目的探讨二代双源 CT 冠状动脉(CCTA)前瞻性心电门控扫描中不同对比剂注射方案对图像质量的影响。方法：前瞻性收集 CCTA 检查患者 200 例，随机分为对照组（A 组）和实验组（B 组），每组 100 例。两组患者采用不同的注射方案，A 组注射流率=[体重（Kg）×0.8]/10s，先注射对比剂 10s，再注射生理盐水。B 组以相同的流率先注射 7s 对比剂，后将对比剂和生理盐水按 3：7 比例注射，注射混合液 6s，再注射生理盐水。记录两组患者升主动脉根部、冠脉各支血管近、中、远段 CT 值，所有数据的统计采用 SPSS18.0 分析，并进行方差分析和 Levene 检验。结果：两组间患者的一般资料之间没有显著差异；B 组对比剂用量较 A 组减少 12%；A、B 两组间升主动脉根部、右冠近段、左主干、左前降支近段、回旋支近段 CT 值组间比较，无统计学意义 $P>0.05$。两组间右冠中、远段，前降支中、远段，回旋支中、远端，组间比较，均有统计学意义 $P<0.05$。B 组冠脉各支中、远段血管 CT 值均高于 A 组；B 组冠脉强化程度标准差较 A 组低，表明 B 组 冠脉强化程度的组内差异最小。结论：CCTA 前瞻性心电门控扫描中，采用对比剂混合注射方案能使用较少的对比剂获得冠状动脉均一的强化效果，整体提高图像质量，降低对比剂肾病(CIN)的风险，值得推广

PU-2685
冠脉病变采用 64 排螺旋 CT 血管成像的诊断观察

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目的：观察冠脉病变采用 64 排螺旋 CT 血管成像的诊断价值。方法：选取我院诊治的 80 例冠脉病变患者作为研究对象，均行 64 排螺旋 CT 血管成像与冠脉造影检查，以冠脉造影检查结果为标准，分析 64 排螺旋 CT 血管成像诊断的符合率。结果：80 例患者经 64 排螺旋 CT 血管成像共显示 1006 个冠脉节段图像，其中包括血管正常 498 个，轻度狭窄 165 个，中重度狭窄 343 个；以冠脉造影检

查结果为标准，64 排螺旋 CT 血管成像诊断血管正常、轻度狭窄、中重度狭窄的符合率分别为 98.2%、95.8%、99.4%。结论：冠脉病变采用 64 排螺旋 CT 血管成像的诊断价值高，属于无创检查，具有定位精准、操作简便等优势，值得推广。

PU-2686

双源 Flash 扫描模式在高心率屏气不良患者 CT 冠状动脉成像中的可行性研究

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目的 探讨双源 Flash 扫描模式在高心率屏气不良患者 CT 冠状动脉成像（CTA）中的可行性，并评估图像质量和辐射剂量。
方法 选择 40 例高心率屏气不良需行 CT 冠状动脉成像的受检者纳入研究。检查前均不给予降心率药。根据受检者平均心率的不同分为 2 组，A 组（70 次/分≤心率≤80 次/分）20 例、B 组（80 次/分<心率<100 次/分）20 例。所有受检者均采用 Flash 双次扫描模式行 CT 冠状动脉成像。根据双次扫描获得的图像综合评估冠状动脉主观图像质量（4 分法），并分析 2 组的辐射剂量($CTDI_{vol}$、ED)。
结果 两组冠状动脉图像质量主观评分均>2 分，满足临床诊断要求，A、B 组的图像主观评分分别为（3.5±0.4）、（3.3±0.5）分，差异无统计学意义(P>0.05)。A、B 组的平均心率分别为（73.6±2.6）、（85.8±4.5）次/分，差异有统计学意义(P<0.05)。A、B 组的 $CTDI_{vol}$ 分别为（4.56±0.55）、（5.07±0.63）mGy，有效剂量分别为（1.14±0.12）、（1.09±0.10）mSv，差异均无统计学意义(P<0.05)。
结论 应用双源 Flash 扫描模式在高心率屏气不良患者 CT 冠状动脉成像（CTA）中具有可行性，能以较低的辐射剂量获得满足诊断要求的图像质量。

PU-2687

Force CT Turbo Flash 模式主动脉 CTA 扫描联合 ADMIRE 的临床研究

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目的: 探讨 Force CT Turbo Flash 模式行主动脉 CT 血管造影（CTA）扫描联合高级建模迭代重建（ADMIRE）算法的临床应用价值。方法: 疑诊主动脉疾病患者 62 例随机分为观察组与对照组，每组 31 例。观察组采用 Force CT Turbo Flash 模式主动脉 CTA 扫描联合 ADMIRE 图像重建，对照组采用常规 Body Angio 模式扫描和滤波反投影重建算法（FBP）图像重建。比较两组的扫描范围、扫描时间、图像质量、辐射剂量差异。结果: 两组的扫描范围、噪声、信噪比（SNR）、对比噪声比（CNR）比较差异无统计学意义（P>0.05），但观察组的扫描时间显著短于对照组（P<0.05）。观察组无主动脉根部伪影，与对照组的 51.61%比较差异有统计学意义（P<0.05）。观察组的图像主观质量评分显著高于对照组（P<0.05），而有效剂量（ED）显著低于对照组（P<0.05）。结论: Force CT Turbo Flash 模式主动脉 CTA 扫描联合 ADMIRE 技术能够获得满足主动脉病变诊断的优质图像，且可缩短扫描时间并降低辐射剂量。

PU-2688

A patient-specific study of computational fluid dynamics models for type B aortic dissection: causes of false lumen expansion

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Purpose:

This study has performed computational fluid dynamics (CFD) simulations for follow-up data of type B aortic dissection and expect to provide some valuable information for clinical strategy from a different perspective.

Materials and Methods:

The rare data was from a 68-year-old male patient who had been diagnosed with a type B aortic dissection. 3D Models were reconstructed based on the CT images with in-plane resolution of 0.759 mm and slice thickness of 1 mm. The mass flow and pressure waveform were applied to inlet and outlets of the rigid wall model respectively. The fluid was assumed to be incompressible and Newtonian with a dynamic viscosity of 0.0035 Pas and a mass density of 1060 kg/.

Some parameters including velocity, pressure and wall shear stress (WSS) were extracted to evaluate hemodynamic environment. Time-averaged wall shear stress (TAWSS) and oscillatory shear index (OSI) were calculated from the results of the middle cardiac cycle. OSI is a non-dimensional index to assess the oscillatory nature of blood flows with an upper bound of 0.5. The higher value means more oscillatory flow.

Results:

False lumen (FL) with a single tear was rapidly developed from penetrating aortic ulcer at T1. And FL remarkably enlarged at follow-up compared to baseline. It could be found that low-velocity flow entered the false lumen and formed vortex here in both systolic and diastolic periods at T1 and T2. High-velocity flow appeared in the narrowed aortic true lumen (TL). And the pressure imbalance (2.28 mmHg at systolic phase of T1) was found between TL and FL, the increased pressure in the FL might elevate the risk of expansion of FL and more vicious clinic events.

WSS in whole FL was in a lower level, while it is higher in the relative regions of TL owing to the high velocity. The lower WSS might be relevant with the expansion of FL. Significant high OSI (> 0.48) was observed in the distal portion of FL where there was an obvious extension found at T2.

Conclusion:

Significant vortex with low-velocity dominated flow patterns in the FL. Higher pressure and lower WSS were observed in the FL, which might elevate the risk of expansion of FL.

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PU-2689

640 层容积 CT 对左冠状动脉解剖结构与左前降支狭窄关系的研究

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目的 运用 640 层容积 CT 测量结果探讨左冠状动脉解剖结构与左前降支狭窄程度的关系。
方法 对 116 例行冠状动脉 CT 血管造影（CTA）及冠状动脉造影（CAG）的左冠状动脉多发斑块患者情况进行回顾性分析，测量左冠状动脉解剖结构：左主干（LM）长度、左前降支与左回旋支（LAD—LCX）夹角、左主干与左前降支（LM—LAD）夹角。根据左前降支（LAD）是否显著狭窄（冠状动脉造影为准）分为两组，LAD 显著狭窄组（LAD 狭窄≧50%）和 LAD 非显著狭窄组（LAD 狭窄<50%）。并纳入年龄、性别、血压、血糖、血脂各临床指标，分析 LM 长度、各夹角及各项临床指标与 LAD 狭窄的关系。对以上有统计学意义的因素运用 Logistic 回归分析。
结果 单因素分析显示，LAD 显著狭窄组的 LM 长度、LAD—LCX 夹角、LM—LAD 夹角明显大于 LAD 非显著狭窄组（$P<0.05$）。Logistic 回归分析显示 LAD 显著狭窄的独立预测因素为 LM 长度（OR=6.98，95%CI：1.98~24.69，P=0.003）和 LAD—LCX 夹角（OR=12.61，95%CI：3.03~52.52，$P<0.001$）。
结论 较长的 LM 长度、较大的 LAD—LCX 夹角能用来鉴别冠心病(CAD)的风险等级。

PU-2690
RevolutionCT 对冠心病患者左心收缩功能与冠脉狭窄程度关系的应用分析

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目的：探索和研究 RevolutionCT 对冠心病患者左心收缩功能与冠脉狭窄程度关系的应用价值
方法：回顾性分析我院近年来接受 RevolutionCT 冠脉造影（冠脉 CTA）患者 156 例，其中冠脉狭窄 53 例(包括轻中重度狭窄)，正常 123 例。查阅临床病史，对比分析冠脉狭窄程度及左心室收缩末期容积（ESV）、左心室输出量（SV）、左心室射血分数（EF）等指标的关系。
结果：冠脉轻中度狭窄与冠脉正常者左心收缩功能对比无统计学差别，冠脉重度狭窄左心收缩功能明显下降，有统计学意义。
结论：RevolutionCT 冠脉 CTA 能精准反映冠脉狭窄程度与左心收缩功能关系，具有重要的临床意义。冠脉狭窄>50%时，左心收缩功能不同程度下降，冠脉狭窄程度>70%时，左心收缩功能明显下降。

PU-2691
IQonCT 平均原子序数图在评价主动脉粥样硬化斑块中的应用

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目的：光谱 CT 利用不同物质对高低能量的 X 射线的吸收不同成像，比普通单源 CT 有更好的物质分辨能力。本研究拟分析光谱 CT 的平扫原子序数成像在显示主动脉粥样硬化斑块的比例及影响因

素。**方法：**我们收集了 2019-5 至 2019-8 期间，在我院行头颈部、腹部、胸部光谱增强 CT 的患者资料。我们收集了 37 个患者的 116 个主动脉粥样硬化斑块，分析了平扫 CT 的原子序数成像图、增强 CT 的图像，分别测量主动脉腔内血管面积、血管面积、血管壁面积、斑块面积等，统计平扫 CT 可以显示主动脉斑块的比例，并将增强 CT 显示的斑块大小作为基准，分析影响斑块显示程度的因素。**结果：**通过与增强 CT 图像进行对比，大约有 65%的斑块在 CT 平扫中可以显示，但大部分斑块（93%）较增强 CT 显示的面积小。CT 平扫显示斑块的大小与斑块的 CT 值相关，而血管腔内面积、血管面积、血管壁面积、斑块面积等并不影响斑块显示的程度。**结论：**光谱 CT 平扫，利用平均原子序数图可以显示部分非钙化的主动脉斑块，而无需增强。对造影剂过敏、肝肾功能严重受损及胸痛等急症进行平扫检查的患者可以通过平扫即可以发现动脉壁的情况。

PU-2692
腔内治疗腰椎间盘术后医源性髂动静脉瘘：病例报道及文献复习

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目的 回顾本院及国内外文献中腰椎间盘术后医源性髂动静脉瘘（Iliac arteriovenous fistula，IAVF）患者的临床资料，提高对其认识。**方法** 系统检索国内外主要数据库中腰椎间盘术后医源性 IAVF 相关文献并回顾本院病例，收集临床资料。**结果** 共纳入 31 篇中英文文献，包括 44 名患者。椎间盘受累以 L4-L5 和（或）L5-S1 水平最常见（62%），多数患者在术后数月至数年出现临床症状（63.6%），并大多数患者（88.6%）可经覆膜支架置入术治疗。**结论** 腰椎间盘术后医源性 IAVF 虽然罕见，但应给予足够重视，以便正确地诊断及恰当地治疗。

PU-2693
双源 CT 采 脏单扇区算法的前瞻性 ECG 触发序列扫描模式和电 控螺旋扫描对婴幼 先 病 CTA 检查的辐射剂量对研究

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的： 较双源 CT 采 脏单扇区算法的前瞻性 ECG 触发序列扫描模式和 电 控扫描对婴幼 先 病 CTA 检查的辐射剂量 。 法 ：连续收集我院 2016 年 1 —2019 年 8 临床疑先 病需 脏 CTA 检查且 率《65 次/分的婴幼 患者 100 例,根据扫描模式的不同，随机将 50 例(A 组)临床先 病婴幼 患者进 采 单扇区算法的前瞻性 ECG 触发序列扫描模式扫描，再随机将 50 例(B 组)进 电 控扫描，然后由 2 名有经验的影像医师对 2 组图像质量进 评分并记录测量值和辐射剂量。应 参数检验和两独 样本的 f 检验 较 2 组患者的辐射剂量 。**结果** ：A 组采 脏单扇区算法的前瞻性 ECG 触发序列扫描模式的平均辐射剂量为(1.49 ±0.38)mSv,B 组采 电 控扫描模式的平均辐射剂量为(2.79±0.54) mSv,即采 单扇区算法的前瞻性 ECG 触发序列扫描模式约为采 电 控扫描模式的 1/2，且前者低于后者，2 组差异有统计学意义(t=13.677,P＜0.05）。**结论** ：双源 CT 采 单扇区算法的前瞻性 ECG 触发序列扫描模式在不影响

图像质量的情况下 采 电 控螺旋扫描的对先 病婴幼 的辐射剂量低，对先 病婴幼 患者 脏 CTA 有较好的临床优势。

PU-2694

小剂量团注测试法在宝石冠状动脉 CTA 中的应用价值

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【摘要】目的：探讨小剂量对比剂团注测试（test bolus）的扫描方案在宝石 CT 冠脉成像中的应用价值。**方法**：将 100 例行冠脉 CTA 检查者分为实验组和对照组，每组各 50 例。实验组:用 15mL 对比剂及 20mL 生理盐水团注测试，根据造影剂所达到兴趣区峰值计算时间，再进行扫描；对照组:采用传统团注追踪程序自动触发技术，于气管分叉下 1-2cm 处行监控层面扫描，并于降主动脉内设置兴趣区，触发阈值 120HU，达到阈值后延迟 5s 扫描。分别测量主动脉根部、左主干、左前降支、左回旋支、右冠状动脉、右冠状动脉至后降支的强化 CT 值；采用双盲法，由两名有经验的放射科诊断医师进行图像质量评分，比较两组图像质量有无差异。**结果**：实验组目标血管强化 CT 值为 348-396HU，对照组目标血管强化 CT 值为 256-356HU，差异有统计学意义；冠状动脉各分支主观评分没有显著性差异，$P>0.05$。**结论**：在冠脉造影检查中，应用小剂量对比剂团注测试法可以更准确地把握扫描时机，从而获得良好的血管成像质量。

PU-2695

感染性腹主动脉瘤的 CT 诊断价值

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感染性腹主动脉瘤（infectious abdominal aortic aneurysm，IAAA）发病率较低，由 Osler 于 1885 年首次报道，约占所有腹主动脉瘤（abdominal aortic aneurysm，AAA）的 0.7%~3.0%，但病情凶险，临床表现各异、并发症多、预后差，死亡率可高达 70%，死因主要为 AAA 破裂及脓毒血症。IAAA 的临床治疗不同于非感染性腹主动脉，原位主髂动脉重建术后吻合口并发症和移植血管感染率较高。而近年来，腔内隔绝术应用于本病治疗疗效尚有争议，文献报道其用于 iAAAs 的治疗术后因感染死亡率高达 23%-40%。腹膜后解剖外血管旁路术治疗 IAAA，安全且临床疗效满意，因此认识感染性腹主动脉的 CT 特征对 IAAA 患者的临床治疗方案至关重要。

目的 探讨感染性主动脉瘤的 CT 表现.**方法** 回顾性分析 2009 年 6 月至 2019 年 6 月期间 12 例感染性腹主动脉瘤患者(其中 11 例经外科手术确诊,1 例为腹主动脉支架术后并感染)的临床及 CT 检查资料，总结感染性腹主动脉瘤的 CT 特征。**结果** 12 例患者动脉瘤均位于腹主动脉肾下段，动脉瘤处管腔呈瘤样扩张,管壁增厚见钙化，腔内见不规则充盈缺损，2 例瘤腔内伴有散在气体影，增强扫描延迟期瘤体外周见不规则片絮状及环状强化；2 例瘤体破裂者，瘤壁不完整，部分中断。3 例患者伴肠瘘，2 例合并腰大肌脓肿。本组 11 例 iAAA 患者均采用腹膜后解剖外血管旁路术重建主髂动脉. 血管重建完成后再行瘤腔清创；1 例支架后合并感染患者目前内科抗感染治疗中。**结论**：感染性腹主动脉瘤及其周围组织在 CT 增强扫描上表现为斑片状及环状强化, 瘤腔内或瘤体周围有积气、积液是区别于常见动脉瘤的典型表现, CT 显示主动脉周围腹膜后脓肿或炎性包块等，高度提示感染性腹主动脉瘤的诊断，CTA 联合延迟期扫描是感染性腹主动脉首选影像检查方法。

PU-2696

Comprehensive Evaluation of Intramural Hematoma Associated with or without Other Aortic Diseases by DSCT

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Purpose:
To describe CT features of intramural hematoma（IMH） associated with or without other aortic diseases.
Materials and methods:
We consecutively evaluated CT features in 258 patients with documented intramural hematoma for the location, shape, depth, density, aorta shape, intimal calcification, and complication.
Results: 258 patients with IMH, there were type B IMH (186, 76%) and type A IMH (72, 24%). Associated aneurysm(143,55.4%), penetrating atherosclerotic(PAU: 64,24.8%), and aortic dissection(AD:18,7.0%) and pure IMH（33,12.8%）were revealed in 258 cases. Of the 143 cases with aneurysm, type B perianeurysm hematomas（102,71.3%）, type A IMH associated type B aneurysm(39,27.3%), type B IMH associated isolated type B aneurysm （2,0.01%）were seen. Of the 18 cases with AD, type A IMH and isolated type B AD(5,27.8%), type B IMH and isolated type B AD（13,72.2%）were revealed. Without contrast scanning, annular or crescent（253,98.1%）high-attenuation IMH along the compressed or dilated aorta and multiple intimal calcification were showed, with contrast scanning, no rise of CT value was detected in IMH. Larger depth of IMH and more complication were revealed in patients with IMH associated other aortic diseases than pure IMH.
Conclusion:
DSCT could comprehensive assess CT features in patients with IMH.
Clinical application: DSCT could provide information essential to make an accurate diagnosis, choose optimal treatment, and make a timing evaluation of prognosis in patients with IMH for cardiac physicians or surgeons.

PU-2697

冠状动脉 CTA 评估左前降支中段心肌桥与临床缺血症状及动脉粥样硬化的关系

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目的
评估左前降支中段心肌桥冠状动脉 CT 成像（CTA）征象与临床缺血症状及动脉粥样硬化发生的关系。
方法
回顾性分析自 2018 年 3 月至 2019 年 5 月于锦州医科大学附属第一医院行 CTA 检查且诊断为左前降支中段心肌桥者 131 例，分为单纯性心肌桥组（74 例）与心肌桥合并粥样动脉硬化组（57 例），

再将单纯心性肌桥者根据患者有临床缺血症状（胸痛、胸闷、心前区疼痛、ST-T 改变等）分为无症状组（39 例）和有症状组（35 例）。探究左前降支中段心肌桥的 CTA 征象（心肌桥分型、心肌桥长度及厚度、壁冠状动脉（MCA）压缩程度）与临床缺血症状及粥样硬化发生的关系，统计数据结果采用卡方检验及独立样本 t 检验。所有患者采用回顾性心电门控冠脉成像。

结果

有症状组的心肌桥厚度、长度、MCA 舒张期压缩率、MCA 收缩期压缩率均大于无症状组，差异均有统计学意义（t=2.17、t=2.04、t=2.70、t=3.04，P均<0.05）；纵深型心肌桥较表浅型更易出现临床缺血症状（ x2=9.59，P<0.05）。心肌桥合并粥样硬化组心肌桥厚度、MCA 收缩期压缩率均大于单纯性心肌桥组，差异均有统计学意义（t=2.84、t=2.68，P均<0.05）；心肌桥长度、MCA 舒张期压缩率，两组对比差异均无统计学意义（t=2.03、t=1.44，P均>0.05）；纵深型心肌桥较表浅型更易形成斑块（ x2 =12.96，P<0.05）。收缩期 MCA 狭窄程度 0%~50%的 91 例患者中，粥样硬化发生率为 47.92%，收缩期 MCA 狭窄程度 50%~75%的 36 例患者中，粥样硬化发生率为 79.44%，MCA 狭窄程度>75%的 4 例患者中，粥样硬化发生率为 100%，提示随着 MCA 收缩期压缩程度加重，粥样硬化的发生率明显增高。

结论

CTA 对心肌桥厚度、长度、MCA 压缩率方面的测量、评估能在预示心肌桥患者出现临床缺血症状及冠脉粥样硬化发生提供重要的指导信息。

PU-2698

成人左冠状动脉异常起源于肺动脉个案报道及文献复习

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目的 研究成人左冠状动脉异常起源于肺动脉的 CT 表现、临床资料与治疗，加深对左冠状动脉异常起源于肺动脉的认识，提高对该变异的影像诊断能力。

方法 回顾性分析 1 例我院成人左冠状动脉异常起源于肺动脉的 CT 表现，结合文献复习，探讨成人左冠状动脉异常起源于肺动脉的 CT 影像学特点。

结果 患者女，38 岁，因于与家人说话时突发晕厥，伴小便失禁，无抽搐，无喷射性呕吐，家人拨打 120，途中行心肺复苏术。后到达我院急诊室，床边心电监护提示心率、血压、氧饱和度测不出，立即予人工心肺复苏，并气管插管接呼吸机辅助通气，后患者发作室颤、室速。查血气提示严重代酸、高乳酸血症、呼吸衰竭，收住我院 ICU，予以 ECMO 辅助循环呼吸等治疗，患者病情好转。超声心动图提示左右冠状动脉起始部增宽，左心室饱满，结合临床，三尖瓣轻度返流。心脏冠状动脉 CTA 提示冠脉弥漫性增粗伴大量侧枝形成，局部瘤样扩张，心肌增厚，左冠状动脉异常起源于肺动脉。开胸术后复查，心脏冠状动脉 CTA 提示左冠状动脉与升主动脉左前壁吻合，吻合口无明显狭窄。

结论 成人左冠状动脉异常起源于肺动脉是从肺动脉起源的一种罕见的先天性心脏病，心脏冠状动脉 CTA 检查能清晰展示心脏血管的异常改变和血管分支细节，对临床诊治具有指导作用。

PU-2699

Free-breathing coronary CT angiography using 16-cm wide-detector for patients referred for transcatheter aortic

valve replacement: comparison with invasive coronary angiography

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Objectives: To detected the performance of free-breathing coronary computed tomography angiography (CCTA) with 16-cm wide-detector CT for patients referred for transcatheter aortic valve replacement.
Methods:A total of 124 patients with severe aortic stenosis underwent both free-breathing CCTA and ICA were included. Two reviewers evaluated coronary arteries on the per-segment (using 16-segment model), per-vessel and per-patient basis for image quality using a four-point scale and stenosis degree. CCTA results were compared with invasive coronary angiography to calculate the diagnostic accuracy, sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV).
Results: Out of 1984 total segments, 62(3.1%) were less than 1.5mm in diameter and were excluded in CT, 14(0.7%) with calcification and motion artifacts and were considered positive in CT. 1908segments (96.1%) were evaluated both on CCTA and ICA and 44(2.2%) segments had stenosis ≥50% on ICA. The diagnostic accuracy, sensitivity, specificity, PPV, and NPV of CCTA were 97.3%, 70.4 %, 97.2%, 37.3% and 99.3% on a per-segment basis; and 82.3%, 83.3%, 82%, 52.6% and 95.3% on a per-patient basis.

PU-2700
典迈伦 400 联合第 3 代双源 CT Turbo Flash“三低”成像前瞻性应用研究

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目的：初步评价最新一代对比剂典迈伦 400 联合第 3 代双源 CT Turbo Flash 行低 kV、低对比剂用量和低注射流速（三低）冠脉成像的可行性。方法：前瞻性收集云南省第一人民医院 2019 年 3-5 月因临床诊断需求行 CCTA 患者 120 例。随机分为 A 组（Turbo Flash 模式）和 B 组（前瞻性心电门控序列，断层扫描模式）各 60 例,均采用第 3 代双源 CT 扫描及 3 级 ADMIRE 迭代重建成像。采用 5 分制李克特量表评价主观图像指标（图像显影、噪声、运动伪影），应用卡方分析比较两组图像质量评分。应用两独立样本 t 检验分析比较两组年龄、BMI、心率、辐射剂量、客观图像指标（CT 值、SNR、CNR）。结果：A、B 两组患者的年龄、BMI、心率均无统计学差异。A、B 两组平均有效辐射剂量分别为（0.47±0.13）mAs 和（2.86±1.98）mAs，差异有统计学意义（t=-6.577，P＜0.001）。A 组右冠状动脉图像噪声（ 2=4.282，P=0.039）及左回旋支图像运动伪影（ 2=4.862，P=0.027）评分均优于 B 组，余主观图像质量评分无统计学意义。两组各动脉段客观图像指标（CT 值、SNR、CNR）之间无统计学差异。结论：典迈伦 400 联合第 3 代双源 CT Turbo Flash 模式行低 kV、低对比剂用量及低注射流速（三低）冠脉成像扫描能够获得等同于甚至优于前瞻性心电门控断层扫描的图像质量，同时有效辐射剂量及对比剂剂量明显降低，并尽可能减少对比剂外渗、对比剂不良反应、对比剂肾病等对比剂不良事件的发生。

PU-2701
2 型糖尿病心肌细胞外间质改变的心血管磁共振成像研究

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目的本研究的目的是使用心血管磁共振和 ECV 评价 2 型糖尿病患者左室心肌细胞外间质改变情况及其与糖尿病病程的关系。**材料与方法**本研究纳入 2015 年 6 月至 2018 年 3 月我院住院的 60 名 T2DM 患者和 45 名健康志愿者，排除掉图像质量差、乳头肌太小不能勾画 ROI 的受试者，最终有 38 名健康志愿者和 53 名 T2DM 患者。根据病程不同，将 T2DM 组分为短病程组（<5 年，n=18）和长病程组（>5 年，n=35）。所有受试者扫描增强前和后 T1 mapping 以及电影序列，测量受试者的增强前和后 T1 值结合 HCTm 计算 ECV、LV 心肌质量指数、ECV 结合 MMi 计算细胞外间质的总体积指数以及心肌细胞的总体积指数。比较对照组、T2DM 短病程组和长病程组的 ECV、MMi、ECMVi 和 CVi 之间的差异。**结果**对照组、T2DM 短病程组和长病程组之间的心肌 ECV 有显著性差异（对照组：26.7 ± 2.7% vs. T2DM 短病程组：28.4 ± 2.9% vs.T2DM 长病程组：28.8 ± 3.6%，p=0.018）。对照组、T2DM 短病程组和长病程组之间的心肌 ECMVi 有显著性差异（对照组：13.3 ± 2.8 ml/m^2 vs. T2DM 短病程组：15.4 ± 2.9 ml/m^2 vs.T2DM 长病程组：15.6 ± 3.8 ml/m^2，p=0.008）。对照组、T2DM 长病程组和短病程组之间的心肌 MMi 和 CVi 没有显著性差异。对照组、T2DM 长病程组和短病程组之间的心肌和血液 native 和 post-contrast T1 值都没有统计学差异。**结论** T2DM 患者疾病早期即存在心肌细胞外间质扩张，且随病程进展。此外 ECMVi 可能比 ECV 更加敏感地反应 T2DM 心肌细胞外间质改变。

PU-2702
主动脉瓣狭窄钙化的 CT 表现及 TAVI 术后瓣周漏的相关性初探

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【目的】探讨主动脉瓣狭窄钙化的 CT 表现与 TAVI 术后瓣周漏相关性。【方法】对本院 2018 年 25 例主动脉瓣狭窄患者 TAVI 手术前后的 CT 和超声影像资料回顾性分析。男 16 例，女 9 例，62-87 岁，平均 74.5 岁。使用飞利浦 64 层及 256 层螺旋 CT 和西门子双源 CT，重组成像及 VR 三维重建。超声设备是：Philips iE33 超声诊断仪。【结果】25 例主动脉瓣狭窄病例，钙化评分 0 分 2 例，1 分 4 例，2 分 6 例，3 分 13 例。术后并发主动脉瓣瓣周轻度反流 8 例（钙化评分 3 分 8 例，），中度反流 2 例（钙化评分 1 分 1 例，3 分 1 例），重度反流 1 例（钙化评分 3 分 1 例）。【结论】成年人单纯主动脉瓣狭窄的常见原因是退行性主动脉瓣钙化。其次风湿性主动脉瓣的病变。再就是主动脉瓣二瓣畸形(BAV)等先天性心脏病也常常出现瓣膜钙化。主动脉瓣膜钙化程度分级评分，其标准为：0 分（无钙化）为瓣膜无钙化；1 分（轻度钙化）为瓣膜轻度增厚，局灶性点片状钙化；2 分（中度钙化）为瓣膜增厚，主动脉窦部可见弥漫性斑点状及针状钙化，瓣环多呈灶状钙化；3 分（重度钙化）为瓣膜明显增厚，瓣叶间粘连，主动脉窦内结节状钙化，瓣环区域钙化灶融合成“C”形，或钙化累及周围心肌组织。术后瓣周漏是 TAVI 术后并不少见，约 25%的患者发生在早期开展的 TAVI 术后。主要潜在原因为：原有瓣膜的严重钙化；瓣膜过小；置入瓣膜位置不正；人工瓣膜与原瓣环贴附不良。其中，瓣膜钙化是一个重要的原因，这种钙化瓣环为置人瓣膜留下一个不平整的平面。多层螺旋 CT 能清楚显示瓣膜的钙化程度、分布及瓣膜粘连。钙化灶多分布在瓣叶边缘及瓣环周围，位于瓣叶的钙化灶易在瓣膜释放后遮蔽冠状动脉开口，导致急性冠状动

脉综合征。瓣环周围的钙化灶易引起术中瓣环撕裂及术后瓣周漏等并发症。因此，术前常规多层螺旋 CT 检查，全面了解瓣膜的钙化情况，有助于 TAVI 术后并发症的预防。

PU-2703

Histological validation of cardiac magnetic resonance T1 mapping for evaluating the extent of myocardial injury after myocardial infarction.

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Purpose:
Current cardiac magnetic resonance(CMR) T1 mapping is a quantitative imaging technique allowing the characterization of injured myocardium after myocardial infarction, and further assessment the severity of myocardial damage. However, a key limitation of present work is the lack of histopathological confirmation of these findings. Our aims are to 1) detect whether the measurement of pre-contrast T1 and ECV by 3T CMR would be sufficient to detect extent of myocardial injury 2) evaluate the relationship between ECV and pre-contrast T1 against myocardial fibrosis by histopathology.
Materials and Methods:
A total of 14 myocardial infarct pigs were induced successfully with left anterior descending coronary artery ligated. Then CMR with cine, Late gadolinium enhancement (LGE) and modified Look-Lock inversion(MOLLI) T1 mapping were serially performed at 24h, 7 days, 3 months. CMR characteristics were compared with histological findings after hematoxylin-eosin and Masson trichrome staining. In clinical study, STEMI patients were serially scanned at 2 days,7 days and 3 months. To compare CMR in STEMI patients and pigs, the same scanning protocol was used. LGE and MOLLI T1 mapping were used to assess infarct area and pre-contrast T1 and ECV values in infarct and remote zones at different time points, respectively.
Results:
In post-MI pigs, ECV in the infarct myocardium increased with time and pre contrast T1 values were highest at day 7 after MI. The similar trend of the evaluation of these findings was found in clinical study. Furthermore, both of pre contrast T1 and ECV significantly correlated with histological findings in experimental model.
Conclusions:
The study shows that T1 mapping provides a non-invasive and comprehensive methods for quantification of the extent of myocardial injury in MI. Further studies are needed to study the effect of other factors on these variables.

PU-2704

“三低”扫描方案用于慢性肾病患者冠状动脉 CT 成像的可行性分析

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目的 评估低电压、等渗低浓度和低容量（“三低”）碘对比剂检查方案用于慢性肾病患者冠状动脉 CT 成像的可行性。**方法** 共 36 例临床怀疑冠状动脉疾病而准备行冠脉 CTA 检查的慢性肾病患者随机分为 A、B 两组：A 组 13 例为对照组，使用常规管电压高浓度碘对比剂 63-85ml， FBP 重建；B 组 23 例为实验组，使用低电压 SAS 扫描 100 Kv（BMI≥25kg/m^2或 80 kV（BMI＜25kg/m^2）管电压，等渗低浓度碘对比剂 45 ml，迭代算法重建。两组患者扫描时均开启自动管电流调制（4D CareDose）。对照评估两组的冠脉图像质量、辐射剂量、总碘量和肾功能变化。**结果** 32 例患者顺利完成检查，两组的冠脉图像质量主观评分差异无统计学意义（t=0.479；P=0.202）；平均信噪比差异无统计学意义（t=-0.963，-0764 和-0.474；P= 0.343，0.451 和 0.646）；对比噪声比差异均无统计学意义（t=-0.554，-0.937 和-0.941；P=0.584，0.356 和 0.354）。B 组平均辐射剂量降低了 61.75%。平均碘摄入量降低 54.70%。72h 内血清肌酐清除率下降差异有明显统计学意义（c^2=9.004，P=0.003）。**结论** 双源 CT“三低”扫描方案可以用于慢性肾病患者的冠状动脉成像检查，患者接受的辐射剂量、总碘量均大幅度降低，对肾功能影响小，但图像质量仍可满足诊断，推荐临床使用。

PU-2705
等渗低浓度对比剂冠状动脉 CT 低剂量成像在房颤患者中的应用

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【摘要】**目的：**评价 100 kV 管电压、270mgI/ml 等渗低浓度对比剂联合迭代重建算法对房颤（AF）病人冠状动脉图像质量及诊断冠心病（CAD）的准确性。**方法：**连续前瞻性纳入临床 68 例怀疑冠心病的 AF 病人行冠状动脉 CTA 检查，采用随机数字表法分为两组，每组 34 例，对照组使用 370mgI/ml 对比剂，以常规 120 kV 扫描，重建采用传统滤过反投影法（FBP）；试验组使用 270mgI/ml 对比剂，以 100 kV 扫描，重建采用第三代适应性迭代降噪算法（AIDR-3D）。两名医师对两组图像质量进行双盲法评分，比较观察者评分的一致性。比较两组患者的图像质量主观评分、图像质量客观评价[包括平均 CT 值、图像噪声(N)、信噪比（SNR）、对比信噪比（CNR）、图像优良指数（FOM）]、有效剂量（E）和总碘量。**结果：**两组冠状动脉图像质量主观评分差异无统计学意义（P>0.05），两名医师评分的一致性较高（Kappa=0.82，P<0.05）。两组图像平均 CT 值、N、SNR 和 CNR 差异无统计学意义（P>0.05），试验组的 FOM 明显高于对照组（P>0.05）。试验组的有效剂量 E 为（4.72±1.19）mSv，较对照组（10.76±3.76）mSv 明显降低（t=-8.434，P<0.05）。试验组总碘量低于对照组（t=4.534，P<0.05）；以冠状动脉段为单位，对照组诊断冠脉狭窄的灵敏度、特异度、假阳性及假阴性率为 91.2%、98.5%、88.6%、98.8%，试验组诊断冠脉狭窄的灵敏度、特异度、假阳性及假阴性率为 89.2%、97.4%、83.3%、98.7%，两组没有统计学差异（P>0.05）。**结论：**采用 320 排 CT，使用等渗低浓度对比剂结合低管电压冠状动脉检查对于房颤患者具有可行性，可以在不降低图像质量的前提下，大幅度减低辐射剂量和碘摄入量，并且对冠心病的诊断具有较高的准确率。

PU-2706
IQon 光谱 CT“双低”扫描技术在心脏一站式成像中的应用探讨

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目的：心脏一站式 CT 成像在诊断先天性冠状动脉发育异常、冠心病、探测冠状动脉粥样硬化斑块、评估冠状动脉支架、搭桥血管通畅性及心肌活性等方面具有较高的临床实用价值。而检查中辐射剂量过高诱发癌症的风险以及碘对比剂的不良反应等问题受到业内的广泛关注，采用“双低”技术即低辐射剂量及低对比剂用量扫描,在满足诊断图像质量的前提下尽可能减少辐射剂量和碘对比剂不良反应的风险是目前研究的热点,也是将来的发展方向。**材料与方法：**1、设备：飞利浦 IQon Spectral CT。2、造影剂：碘海醇 350，30ml（因体重或个体差异需微调）。3、使用低造影剂量同时结合迭代技术行心脏扫描，如有怀疑心肌坏死患者需增加一期延迟扫描来评估心肌碘对比剂延迟强化。**结果：**IQon 光谱 CT 心脏一次打药扫描，可重建出虚拟平扫、单能级图像、无水碘图、碘密度图、有效原子序数图等图像。1、常规图像分析血管解剖结构。2、光谱 40keV 图像、碘密度图、有效原子序数图分析斑块的物质成分、心肌缺血、坏死等。**结论：**光谱 CT“双低”技术在心脏成像方面有独特优势，常规 CT 只能从密度、解剖及形态学角度判定冠脉狭窄程度，而光谱 CT 在此基础上还可以提供冠脉斑块的定量分析，心肌活性等诸多信息，并且只需一次扫描，即可显示冠脉的解剖结构、冠脉斑块的物质成分和心肌血液灌注信息。

PU-2707

肺血栓栓塞症影像与临床

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肺血栓栓塞症（PTE）是一种发病凶险的致死性心肺疾病，其发病率逐年升高，临床表现缺乏特异性，临床医生在面对此类危急重症病人时，容易出现误诊、漏诊和过度诊断。及时选择合适的影像学检查，对疾病做出正确的影像诊断，能够为临床治疗提供必要的帮助，降低疾病的死亡率。目前，应用于疑诊 PTE 患者的影像检查有：CT 肺动脉造影（CTPA）、肺通气灌注（V/Q）扫描、MR 肺动脉造影(MRPA)等。本文总结了 PTE 的流行病学、病理生理表现、临床表现、各种影像检查的适用范围及影像表现，旨在为诊断提供帮助。

PU-2708

迭代重建结合优化卷积核对冠脉支架内再狭窄的诊断价值

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目的 评估第三代双源 CT 迭代重建结合优化卷积核对冠状动脉支架植入术后支架内再狭窄的应用价值。

方法 收集 2017 年 12 月至 2018 年 9 月期间接受冠脉检查的冠心病金属支架植入患者 32 例（男性 24 例，女性 8 例），所有患者均于 2 周内行 ICA 检查，共计 53 根支架，支架实际内径≥3mm 的有 36 根，支架内径＜3mm 有 17 根。采用第三代双源 CT 机扫描，管电压采用 CARE kV 自动调节（参考管电压 100kV），开启实时动态剂量调节自动曝光 Care Dose 4D（参考管电流 300mAs/rot）。高级迭代重建算法（ADMIRE 3）结合优化的卷积核值（Bv49）对不同内径大小的支架（＜3mm 和

≥3mm）进行重建评估。ICA 为参考金标准，对支架的通畅情况及再狭窄的程度进行评估，ISR 阳性定义为支架内膜增生、血栓形成等造成支架内再狭窄≥50%。
结果 CCTA 诊断 ISR 阳性有 11 根，ISR 阴性有 42 根。ICA 诊断 ISR 患者 8 例；ISR 支架阳性有 8 根，ISR 阴性有 45 根。以 ICA 为金标准，基于患者分析，CCTA 诊断 ISR 阳性的灵敏度、特异度、阳性预测值、阴性预测值、准确性分别为 100%、87.5%、72.73%、100%、90.63%；以 ICA 为金标准，基于支架分析，CCTA 诊断 ISR 阳性的灵敏度、特异度、阳性预测值、阴性预测值、准确性分别为 100%、93.33%、72.73%、100%、94.34%。内径≥3mm 的支架中，CCTA 诊断 ISR 阳性的灵敏度、特异度、阳性预测值、阴性预测值、准确性分别为 100%、96.77%、83.33%、100%、97.22%；内径＜3mm 的支架中，CCTA 诊断 ISR 阳性的灵敏度、特异度、阳性预测值、阴性预测值、准确性分别为 100%、85.71%、60%、100%、88.24%。
结论 第三代双源 CT 迭代重建结合优化卷积核对 ISR 有很好的诊断价值，特别是内径≥3mm 的支架。

PU-2709
MSCT 评估 Stanford B 型急性主动脉夹层动脉弹性的初探

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摘要：目的：初步探讨 MSCT 评估 Stanford B 型急性主动脉夹层（AAD）患者动脉弹性的应用价值。资料与方法：回顾性对比分析 40 例 Stanford B 型 AAD 病例及 40 例对照组的 MSCT 影像资料，分析其动脉弹性及相关病史、实验室指标的差异。结果：Stanford B 型 AAD 病例及对照组经 MSCT 检查后均成功测出了动脉弹性相关指标，且在两组患者之间具有显著差异（AD、AC、ASI 的 P 值均＜0.05）。两组间的高血压 3 级患者数（P=0.000,P＜0.05）、吸烟者人数（P=0.004,P＜0.05）也存在显著差异。结论：利用 MSCT 测定 Stanford B 型 AAD 患者动脉弹性数值是可行的，且是有实际意义的，吸烟及高血压 3 级是 AAD 的危险因素，今后的研究可以利用 MSCT 进一步探究动脉弹性对 AAD 患者治疗、预后的价值。

PU-2710
MSCTA 用于动脉弹性评估的临床应用及研究进展

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摘要：动脉弹性是反映动脉舒张和收缩功能的指标，它取决于动脉腔径大小、管壁硬度和可扩张性，其量化指标主要有：可扩张度(AD)，顺应性 (AC)及僵硬度 (ASI)。动脉弹性降低即动脉硬化，是心血管疾病独立的死亡预测因子。近年来，MSCTA 检查有报道应用于动脉弹性的评估，其相比于其他评估手段有自身的独特优势，本文就 MSCTA 在评估动脉弹性方面的临床意义及应用，论述国内外学者的研究进展。

PU-2711

绝对时相冠脉成像方法探讨

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探讨冠脉成像常规的扫描及重建方法与绝对时相的扫描及重建方法在心率不齐的患者中成像的差异。**方法** 收集进行冠状动脉检查心率不齐的患者 30 例，随机分为 A 组用常规方法进行扫描共 15 例和 B 组用绝对时相法共 15 例，比较组间冠状动脉的图像质量，图像评价参考张楠等[3-4],比较组间出现错层的情况。检查方法 使用 siemens somatom definition flash 双源 CT 机，CT 双筒高压注射器，采用自适应前瞻性门控的扫描方法。A 组重建最百分比的佳舒张期，百分比的最佳收缩期，45%，75%，B 组重建绝对时相的最佳舒张期，绝对时相的最佳收缩期，300ms，360ms。**结果** 常规组和绝对时相组，冠脉评分分别为[（3.6±0.49）和（2.5±0.5），P 值＜0.004]，其差异具有统计学意义。错层出现情况 A 组 10 例，B 组 3 例。**结论** 对心率不齐的患者进行冠脉 CT 检查时，常规法图像质量不如绝对时相法，出现错层的的机率也比较高，绝对时相法改善了这类病人的图像质量满足的诊断要求，值得临床推广应用。

PU-2712

不同重建模式在冠状动脉含钙性斑块 CTA 中的应用价值

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目的：探讨 stent 重建在冠状动脉含钙性斑块 CTA 中的应用价值。**方法：**采用标准重建模式、stent 重建模式以及减影重建模式分别对 38 例冠脉动脉含钙性斑块狭窄程度进行评估，其中 32 例经介入性冠状动脉血管造影。**结果：**我们发现以介入性冠状动脉血管造影诊断狭窄程度为金标准；①相较标准重建模式，stent 重建模式在冠脉孤立斑块钙化评分小于 300 中，诊断信心、诊断准确性均明显提高，而在冠脉孤立斑块钙化评分大于 300 中，诊断信心和诊断准确性相较不同重建模式无统计学意义；②相较标准重建模式，减影重建模式在冠脉孤立斑块钙化评分无论大于 300 还是小于 300，诊断信心和诊断准确性均明显提高，但是减影重建对含钙性斑块形态及性质无法分析。**结论：**stent 重建模式适用于钙化评分小于 300 的冠脉含钙性斑块，减影重建模式可能更适用于钙化评分大于 300 的冠脉含钙性斑块。

PU-2713

The value of MDCT cardiac function assessment in the diagnosis of coronary stenosis in coronary heart disease

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Objective To research the value of MDCT cardiac function assessment in the diagnosis of coronary stenosis in coronary heart disease. **Method** From March 2018 to February

2019, 200 patients with suspected coronary heart disease underwent multi detector row spiral CT (MDCT), echocardiography in our hospital were selected as the subjects of study. The left ventricular function parameters of CHD patients measured by MDCT and echocardiography were compared, and the left ventricular function of CHD patients with different degree of coronary stenosis were compared.
Result The levels of left ventricular ejection fraction (LVEF), stroke output (LVSV), left ventricular myocardial mass (LVMM) measured by MDCT were slightly lower than those measured by echocardiography. Levels of left ventricular end-diastolic volume (LVEDV) and left ventricular end-systolic volume (LVESV) were slightly higher than those measured by echocardiography. There was no significant difference between groups (P>0.05). By MDCT examination, the levels of LVEDV, LVESV and LVMM in patients with different degrees of coronary stenosis were significantly higher than those in the control group, and the levels of LVEF and LVSV were significantly lower than those in the control group. At the same time, the higher the severity of coronary stenosis, the higher the levels of LVEDV, LVESV and LVMM, the lower the levels of LVEF and LVSV, the difference was statistically significant (P<0.05). **Conclusion** MDCT can accurately assess coronary artery stenosis and left ventricular function in patients with coronary heart disease at the same time. It can provide reliable basis for clinical diagnosis and treatment of CHD patients, and is worthy of active promotion in clinical practice.

PU-2714
双源 CT 冠状动脉成像对钙化斑块导致的冠状动脉狭窄的研究

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定性、定量分析钙化斑块对双源 CT 冠状动脉造影诊断准确性的影响。方法回顾性分析双源 CT 冠状动脉造影诊断为冠心病，后一个月内行选择性冠状动脉造影的患者 204 例，共 315 处明显狭窄病变，其中 221 处为钙化病变。分析钙化斑块的程度、钙化斑块形态、钙化斑块长度、钙化斑块处血管直径和钙化斑块血管分布对 CT 冠状动脉成像诊断冠状动脉狭窄度的准确性影响。**结果** 对轻中度钙化斑块和重度钙化斑块，CT 分别高估管腔狭窄度 6.1%(P=0.0026)和 18.2%(P<0.0001)，且高估狭窄度在重度钙化斑块中更为明显(P<0.05)。
对结节型和螺旋形钙化斑块，CT 分别高估管腔狭窄度 3.2%(P=0.0026)和 15.2%(P<0.0001)，且高估狭窄度在螺旋形钙化斑块中更为明显(P<0.05)；对于分布冠脉管径较小和管径较大的钙化斑块，分别高估管腔狭窄度 6.8%(P=0.0023)和 17.1%(P<0.0001)，且高估狭窄度在血管直径较大时更明显(P<0.05)。对不同长度的钙化斑块，双源 CT 的诊断准确性未见差异(P=0.73)。结论 斑块钙化使双源 CT 高估冠状动脉管腔狭窄,且钙化程度重和血管直径较大时更易出现。

PU-2715
Computed tomography angiography and Perfusion to assess coronary artery stenosis causing perfusion defects by single photon emission computed tomography

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Purpose: To investigate the diagnostic power of integrating static CT stress myocardial perfusion (CTP) with computed tomography angiography (CTA) in detecting obstructive coronary artery disease (CAD) defined as a flow limiting stenosis causing a corresponding perfusion defect by single photon emission computed tomography (SPECT).
Methods and results: 48 patients (74 vessels) with suspected coronary artery disease from a single planned. We conducted a single-center study to evaluate the accuracy of integrated CTA-CTP for the identification of patients with flow-limiting CAD defined by ≥50% stenosis by invasive coronary angiography (ICA) with a corresponding perfusion deficit on stress single photon emission computed tomography (SPECT/MPI). Forty-eight (74 vessels) patients were enrolled who underwent research indicated combined CTA-CTP and SPECT/MPI prior to conventional coronary angiography. All four image modalities were analyzed in blinded independent core laboratories. Logistic regression and the net reclassification index (NRI) were used to evaluate incremental differences in CT-derived FFR or CTP compared with CCTA alone. The prevalence of obstructive CAD defined by combined ICA‐SPECT/MPI was 33%. Per-vessel sensitivity and specificity were 88 and 47% for CCTA, 81 and 86% for combined CTA and CTP, respectively. The diagnostic performance of CCTA (AUC = 0.78) was improved by combining it with CTP (AUC = 0.88, P = 0.04, NRI = 0.32).
Conclusion: Static stress CTP combined with CCTA provides an incremental diagnostic improvement over CCTA alone in identifying patients with flow limiting CAD defined as ≥50 stenosis by ICA causing a perfusion defect by SPECT/MPI.

PU-2716
320 排螺旋 CT 心肌灌注技术在冠心病心功能评价中的应用价值

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目的探讨 320 排螺旋 CT 心肌灌注技术在冠心病心功能评价中的应用价值。方法选取 2013 年 1 月至 2014 年 10 月来第三军医大学新桥医院就诊的 30 例出现可逆性心肌缺血的冠心病患者作为研究对象，并选取同期进行体检的 30 例健康人作为对照组。采用 320 排螺旋 CT 心肌灌注扫描评价两组研究对象多巴酚丁胺负荷前后心功能指标的变化情况。结果负荷试验前后，两组研究对象的每搏输出量（SV）、收缩末期容积（ESV）、舒张末期容积（EDV）以及射血分数比较，差异均有统计学意义（P ＜ 0.05）；负荷后，对照组的 SV、ESV、EDV 较负荷前显著降低［（58.0 ± 5.2）mL 比（62.2 ± 5.2）mL；（48.8 ± 3.8）cm3 比（51.8 ± 4.6）cm3；（51.8 ± 4.6）mL 比（112.5 ± 7.3）mL］（P ＜ 0.05），而射血分数无显著变化［（65.0 ± 4.0）%比（64.9 ± 3.8）%］（P ＞ 0.05），而冠心病组患者的 SV、ESV、EDV 与负荷前比较差异无统计学意义（P ＞ 0.05）［（66.9 ± 5.4）mL 比（66.8 ±5.2）mL；（61.7 ± 4.2）cm3 比（61.8 ± 4.5）cm3；（133.0 ± 6.7）mL 比（133.1 ± 6.1）mL］，而射血分数较之前显著降低［（53.5 ± 5.4）% 比（56.6 ± 5.3）%］（P ＜ 0.05）。结论 320 排螺旋 CT 心肌灌注技术能够评价冠心病缺血心肌的心功能受损程度，为冠心病的临床诊治提供参考依据。

PU-2717
冠状动脉 CTA 在 H 型高血压冠状动脉病变的临床应用

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【摘要】 **目的** 目前对 Hcy 与心脑血管疾病的研究，基本上采用血管插管造影的方法（如冠状动脉动脉造影，CAG）。我们采用 64 层螺旋 CT 对 Hcy 高血压与非 Hcy 高血压患者冠状动脉病变的对比研究，探讨 H 型高血压患者冠状动脉病变与冠状动脉 CT 血管成像(CTA) 的临床价值。**方法** 98 例符合标准的原发性高血压患者，按照同型半胱氨酸(Hcy) 水平分为 H 型高血压组(HH 组) 和非 H 型高血压（NHH 组）。所有患者均行 Hcy 及冠状动脉 CTA 检查。**结果** HH 组冠心病发病率 77.4%， NHH 组 47.2%（17/36）；HH 组冠状动脉受累情况 87.1%，NHH 组 63.9%； Gensini 积分 HH 组（45.2±9.6），NHH 组（22.5±6.4），HH 组冠状动脉重度狭窄占 37.1%，NHH 组 22.2%，差异均有统计学意义（P<0.05）。**结论** Hcy 和高血压与冠状动脉硬化的程度及受累情况相关，64 层螺旋 CT 对 Hcy 高血压与非 Hcy 高血压患者冠状动脉病变的对比研究，取得和 CAG 相同的结论，但 CAG 为有创伤检查，受设备及操作者的技术熟练程度等影响，且费用较高，不易为患者所接受，并不推荐作为临床常规应用。而 CTA 具有无创、操作简单、费用相对低、安全可靠及成功率高的优势，不但能够准确判断冠状动脉受累分支数目、狭窄程度进行准确评估，完全可以取代 CAG 进行初步的评估，最重要的是 CTA 还能鉴别冠状动脉硬化斑块性质，对 H 高血压合并冠心病的患者，重视硬化斑块的性质更有预防价值，有助于加强干预力度。因此，对高血压合并 Hcy 水平增高的患者，CTA 应当成为评价冠状动脉病变的的重要手段和首先方法。

PU-2718
双源 CT 对复杂型先天性心脏病的诊断价值分析

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目的探究双源 CT 对复杂型先天性心脏病的诊断价值。方法选取 2016 年 5 月至 2017 年 5 月本院收治的怀疑为复杂型先天性心脏病患者 290 例为研究对象,采用随机数表法将其分为双源 CT 组与超声心动图组,每组各 145 例。比较双源 CT 与超声心动图对心脏内部畸形、心脏与大血管连接处畸形、心脏外部大血管畸形的检出率,以及两种检查方法的诊断符合率。结果 290 例患者经手术证实均为复杂型先天性心脏病。双源 CT 组患者复杂型先天性心脏病的检出率明显高于超声心动图组(97.24%：79.31%,P<0.05)。双源 CT 组患者心脏内部畸形、心脏与大血管连接处畸形的检出率分别为 95.12%和 95.00%,超声心动图组分别为 100.00%和 90.00%,组间比较差异均无显著性(P_均>0.05);双源 CT 组患者心脏外部大血管畸形的检出率明显高于超声心动图组(98.81%：64.94%,P<0.05)。结论双源 CT 是一种无创、安全、经济、便捷的高质量客观影像检查方式,对复杂型先天性心脏病的诊断具有较高价值,能够弥补超声心动图在心脏外部畸形诊断方面的不足。

PU-2719

Assessment of the image quality and the radiation dose of the third generation of dual-source CT used for the diagnosis of coronary heart disease

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Objective: The third generation of dual-source CT (T-DSCT) has an advantage over scanning speed. We aimed to evaluate the image quality, and radiation dose of the third generation of dual-source CT (T-DSCT) used for the diagnosis of coronary heart disease (CHD).
Methods: These patients were randomly divided into control group and observation group, with 55 cases in each group.
Results: The CT Volume Indexes in observation group was 7.58±2.10 mGy, which was significantly decreased when compared with that of the control group (8.98±2.21 mGy) ($p<0.05$); The DLP in observation group was 99.73±20.15 mGy′cm, which was significantly decreased when compared with that of the control group (118.24±21.25 mGy′cm) ($p<0.05$).
Conclusion: The current study demonstrated that T-DSCT technology has high image quality and low radiation dose as compared to the conventional CT.

PU-2720

IgG4 相关性疾病致冠状动脉病变 CT 表现 1 例报告

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IgG4 相关性疾病（IgG4-related disease,IgG4RD）是一种与 IgG4 淋巴细胞密切相关的慢性、进行性自身免疫性疾病。其主要特征为：血清 IgG4 水平升高和病变组织 IgG4+浆细胞浸润。多见于经常患有变态反应性疾病的老年人，常有胰腺、唾液腺和泪腺、肺、腹膜后间隙、肾、蛛网膜、垂体等受累。虽然 IgG4RD 疾病谱广泛，但其致冠状动脉病变的相关报道甚少，本文就 1 例 IgG4RD 致冠状动脉病变患者的 CT 表现进行报告。

1 临床资料

患者男，58 岁，因“胸骨后不适半月”于 2016 年 10 月 08 日入院。患者半月前开始无明显诱因出现活动后胸骨后及心前区不适，呈闷胀感，行走及其他体力活动可诱发，经休息后症状可以缓解，不向它处放射，每次持续约半小时后可自行缓解，无心慌、胸痛、气喘、头痛、头晕、发热、咳嗽、咯血、腹痛、腹胀、恶心、呕吐等症状。

既往史：6 年前行腹部 MRI 检查（胰腺异常改变考虑为自身免疫性胰腺炎，并多发假性囊肿形成，并致胰头段以上胆总管明显扩张、胰管轻度扩张）及免疫球蛋白检查，诊断为“自身免疫性胰腺炎、胆管炎”，而后间断发作，行激素治疗后可缓解；有“冠心病 不稳定心绞痛”病史，间断行冠心病二级预防治疗；有“腰椎病变及右侧腹股沟淋巴结肿大”10 余年，未行特殊处理，否认其他病史。

2 CT 表现：

冠状动脉呈均衡型分布，左前降支（LAD）及回旋支（LCX）直接起自左冠窦；LAD、LCX 及右冠状动脉（RCA）近段管壁明显环形增厚，最宽处约 9mm，管壁少许钙化斑块及非钙化斑块，管腔轻度狭窄，中段可见错层伪影。
CT 诊断：LAD、LCX、RCA 近段改变多考虑为：血管炎性改变，结合临床考虑有 lgG4 相关疾病冠状动脉损害可能。
3 讨论：(略)
3.1 IgG4RD 致冠状动脉病变的机制：
3.2 IgG4RD 致冠状动脉病变临床特点：
3.3 IgG4RD 致冠状动脉病变的 CT 特点：

PU-2721
人工智能冠状动脉 CT 血管成像在冠状动脉狭窄诊断的应用

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目的
探讨人工智能(AI)冠状动脉 CT 血管成像(CCTA)在诊断冠状动脉狭窄程度的准确性。

方法
选取 2019 年 5 月-2019 年 7 月期间来我院就诊并同期行 CCTA 和冠状动脉造影检查(CAG)的冠心病患者 25 例，女性 10 例，男性 15 例，年龄 47～90 岁，平均年龄（64±9.35）岁。
CCTA 采用 GE Revolution CT 进行扫描，采用前瞻性心电门控技术，管电压 100 kVp，自动毫安 600—720 mA，阈值 300 HU，非离子碘对比剂(碘帕醇 370 mgI / mI)。
将获取的图像数据同时上传至 Sigovia 工作站及数坤冠状动脉 AI 辅助诊断工作站。将冠状动脉分成 9 个节段，狭窄程度分为非中重度狭窄（≤50%）和中重度狭窄（>50%）。AI 组由冠状动脉 AI 辅助诊断工作站自动识别血管和病变生成报告；医生组由一名有 5 年以上心血管影像诊断经验的医生借助 Sigovia 冠状动脉分析软件对图像进行后处理，分析各节段有无斑块及狭窄； AI+医生组由 AI 辅助诊断工作站自动识别血管和病变后，由一名有 5 年以上心血管影像诊断经验的医生进行复核并生成报告。所有病例均经医生组、AI 组、AI+医生组分别进行图像后处理及诊断，并记录所需时间，以 CAG 为标准，评价各组诊断冠状动脉狭窄的准确性。

结果
所有 CCTA 后处理图像均能清晰显示冠脉主干及主要分支血管，医生后处理及诊断时间平均约 13min，AI 平均时间约 10s，AI+医生平均时间约 5min。CGA 显示 25 例患者共有 91 个节段狭窄，AI、医生、医生+AI 分别正确诊断出 68、77、80 个，诊断准确率分别为 75%、85%、88%；其中共有 41 个节段狭窄≤50%，诊断准确率分别为 76%、87%、92%；共有 50 个节段狭窄>50%，诊断准确率分别为 74%、82%、86%。

结论
冠状动脉 AI 能显著减少医生后处理及诊断时间，医生与 AI 联合诊断可明显提高对血管狭窄程度的诊断准确率。

PU-2722

Revolution CT 低剂量扫描联合 ASIR-V 重建算法在冠脉 CTA 成像中的应用研究

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目的：评估正常体质量指数的患者在 revolution CT 100kVp、120kVp 不同管电压条件下结合不同权重 ASIR-V 重建算法冠状动脉 CTA 的图像质量和辐射剂量，并获取最佳重建参数。**方法：**搜集 120 例冠状动脉 CTA 检查的正常体质量指数患者，随机分为两组，在 100kVp、120kVp 管电压条件下分别进行 FBP 及 20%，40%，60% 和 80% ASIR-V 算法重建，比较图像质量主观评价指标、客观评价指标(噪声、信噪比、对比噪声比)及辐射剂量。**结果：**（1）100kVp 管电压条件下不同权重 ASIR-V 重建算法下图像质量主观评分在 2 分及 2 分以上，40%及 80%两者间 ASIR-V 重建算法差异无统计学意义，其余有统计学意义，其中 60%重建算法评分最高；图像客观评价指标 SD、SNR、CNR 差异均有统计学意义(P＜0.05)（2）60% ASiR-V 重建两组间冠状动脉近段管腔 CT 值具有统计学差异(P＜0.05)，且 100kVp 组近段管腔 CT 值＞350Hu，两组 LAD、LCX 及 RCA 的图像质量主观评价、客观评价指标比较差异均无统计学意义；（3）100kVp 组的有效辐射剂量 1.46±0.12 mSv 较 120kVp 组 2.16±0.12 mSv 降低约 32.4%，两组间患者所受的 ED 差异具有统计学意义(P＜0.05)。**结论：**revolution CT 100kVp 管电压扫描能够有效降低辐射剂量且联合 60% ASIR-V 重建算法可以获得最佳图像质量。

PU-2723

冠状动脉疾病报告与数据系统在疑似冠心病患者及排除阻塞性冠脉疾病患者中的临床应用

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目的：探讨冠状动脉疾病报告与数据系统在疑似冠心病患者及排除阻塞性冠脉疾病患者中的临床应用。
方法：回顾性分析我院行 CCTA 和 ICA 的患者，应用冠状动脉疾病报告与数据系统结构化报告判断阻塞性冠脉疾病，与 ICA 结果对照，判断两者的一致性。
结果：基于冠状动脉疾病报告与数据系统的 CCTA 判断非阻塞冠脉疾病患者与 ICA 具有较高的一致性；而判断阻塞性冠脉疾病患者与 ICA 具有一定的一致性。
结论：冠状动脉疾病报告与数据系统在排除阻塞性冠脉疾病患者中具有较高的临床价值。

PU-2724

冠脉 CT 成像技术在冠心病诊断中的应用价值研究

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摘要：目的：研究冠脉 CT 成像技术在冠心病诊断中的应用价值。方法：从来我院诊治的疑似冠心病患者中选择 104 例作为研究对象，分别行 256 层螺旋 CT 冠脉成像技术与冠脉造影， 256 层螺旋 CT 冠脉成像技术以 DSA 冠脉造影为金标准，对比两种技术在病支检出率及动脉分级结果一致性，

通过统计学处理，判断 CT 冠脉造影在诊断冠心病的敏感度及特异度。结果：两种方法的病支检出率与动脉分级结果均未有明显差别（P > 0.05）；256 层螺旋 CT 冠脉成像技术具有较高敏感度与特异度。结论：冠脉 CT 成像技术在冠心病诊断中具有高敏感度、高特异度、高准确率的特点。

PU-2725

双源 CT 对先天性肺静脉异位引流的诊断价值

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摘要：目的 探讨双源 CT 血管造影在先天性肺静脉异位引流中的诊断价值，以提高对该病的认识并为临床手术提供更为全面的影像参考。**方法** 回顾性分析 67 例先天性心脏病肺静脉异位引流患者的双源 CT 图像，在工作站上行多平面重建（MPR）,最大密度投影（MIP）,和容积再现（VRT）等后处理资料，观察分析其位置、形态及分型、合并的其他心脏畸形，并对其手术治疗的 CT 诊断与手术结果进行比较。**结果** 双源 CT 对诊断肺静脉异位引流的先心病（包括各种分型）与手术结果完全相符合。**结论** 双源 CT 结合多种重建方法不仅能够明确诊断肺静脉异位引流，还可以准确的分型，具体引流位置。还可以对伴有其他先心病做出明确诊断，是其有效、安全、准确的检查方法。

PU-2726

CCTA 评分准确评价冠心病的可行性分析

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目的：探讨冠状动脉 CT 血管造影狭窄评分（CCTA-SS）用于准确评价冠心病（CAD）的可行性。
材料与方法：对 228 例疑似冠心病患者行冠状动脉造影（CCTA），左前降支病变 1 例，一周内行有创冠状动脉造影（ICA）。将两组患者随机分为 A 组（直径狭窄组）和 B 组（CCTA-SS 组），随访 6 个月。使用专用软件进行定量 CT 测量。分析两组之间的数据。以 ICA 为金标准，比较其与 ICA 的相关性和诊断准确性。对服从正态分布的独立样本数据进行 t 检验或单因素方差分析。非参数数据采用卡方分析或 Fisher's 精确概率法。P 值<0.05 被认为具有统计学意义。
结果：两组患者的基线数据、斑块特征和区域性心肌功能（RMF）无统计学差异（P>0.05）。两组的前壁和侧壁 RMF 差异有统计学意义（P<0.001）。以 ICA 为金标准，CCTA 的 r 值明显低于 CCTA-SS（0.4612 vs 0.9001）。以 50%直径狭窄为阈值，CCTA 的 AUC 低于 CCTA-SS（0.803 vs 0.906，Z=1.578，P=0.1146）。以 70%直径狭窄为阈值，CCTA 的 AUC 明显低于 CCTA-SS（0.673 vs 0.903，Z=4.722，P<0.0001）。CCTA-SS 的诊断准确率明显高于 CCTA（P<0.001）。经过 6 个月的随访， CCTA-SS 组进行血运重建治疗的患者明显多于接受 CCTA 组（X^2 = 13.027，P < 0.015）。
结论：CCTA-SS 来源于 CCTA，并结合与心肌缺血相关的功能指标，可提高 CCTA 诊断冠心病的准确性，优化临床策略。

PU-2727

双源 CT 冠状动脉造影对冠状动脉起源变异的诊断价值

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目的：探讨双源 CT 冠状动脉造影对冠状动脉起源变异的诊断价值。 **方法**：回顾性分析我院 2014 年 12 月-2018 年 12 月期间行双源 CT 冠状动脉造影检查的影像资料，利用曲面重组、多平面重建和容积再现等后处理技术，观察冠状动脉起源变异的形态学特征及其三维空间关系。 **结果**：在 4892 例冠脉 CTA 检查中共检出冠状动脉起源异常者 78 例，其中右侧冠状动脉起源于左冠状窦 25 例，左侧冠状动脉起源于右冠状窦 2 例，左侧冠状动脉起源于无名窦 1 例，回旋支起源于左冠状窦 12 例，回旋支起源于右冠状窦 1 例，冠状动脉起源高位 37 例（右侧冠状动脉起源高位 15 例，右侧冠状动脉起源高位 19 例，双侧冠状动脉起源高位 3 例）。 **结论**：双源 CT 冠状动脉造影可以准确、清晰显示冠状动脉起源变异的解剖细节，与常规血管造影相比，它对冠脉起源变异的检出率更高，可以更准确地显示异常起源及血管走行，且容积重建能更直观、立体的展现起源变异血管的三维空间关系，能为临床决策提供理论依据。

PU-2728
高级迭代重建算法对低剂量冠状动脉 CT 血管成像图像质量及管腔狭窄 诊断准确性的研究

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目的 评价不同强度高级迭代重建(ADMIRE 1-5)算法与传统滤波反投影(FBP)算法在低剂量冠状动脉 CT 血管成像（CTA）中对图像质量的影响及对管腔狭窄程度诊断的准确性。
方法 收集 30 例一周内同时进行低剂量冠状动脉 CTA 及冠状动脉造影（CAG）的病例。所有病例行 CTA 图像重建时均采用六种重建算法(FBP、ADMIRE 1-5)，并对获得的图像进行主、客观评价，采用单因素重复测量方差分析比较六组间图像主观评分、图像噪声、图像信噪比（SNR）、对比噪声比(CNR)，两两比较采用 LSD 法检验。以 CAG 为金标准，通过一致性检验（Kappa 检验）比较六种重建算法对冠状动脉狭窄程度诊断的准确性。
结果 图像噪声高低排序为 FBP>ADMIRE 1>ADMIRE 2>ADMIRE 3>ADMIRE 4>ADMIRE 5（$P<0.05$），图像 SNR 及 CNR 高低排序为 ADMIRE 5>ADMIRE 4>ADMIRE 3>ADMIRE 2>ADMIRE 1>FBP（$P<0.05$），主观评分高低排序为 ADMIRE 4>ADMIRE 5>ADMIRE 3>ADMIRE 2>ADMIRE 1>FBP（$P<0.05$）。以 CAG 为金标准，不同强度 ADMIRE 对狭窄管腔诊断准确性高于 FBP（$P<0.05$），且以 ADMIRE 4 最优（Kappa 值为 0.956），其他各组从高到低依次为 ADMIRE 3，5，2，1，FPB（Kappa 值分别为 0.812，0.844，0.914，0.956，0.904）。
结论 在冠脉 CTA 低剂量扫描中，相比 FBP 算法，ADMIRE 算法能大幅度降低图像的噪声，提高图像质量，其中以 ADMIRE 4 重建算法所得图像质量较优。以 CAG 为金标准，ADMIRE 算法重建图像对冠状动脉狭窄程度的诊断准确性明显高于 FBP 算法，且 ADMIRE 4 诊断准确性最高。

PU-2729
高级迭代重建算法在双低主动脉 CTA 中的应用研究

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目的 探讨双源 CT 迭代重建算法在双低主动脉 CTA 中的应用潜能。**方法** 采用随机分组法将 108 例临床要求行全主动脉 CTA 扫描的患者分为实验组（A）和对照组（B），A 组（n=52）：采用 80kV，造影剂用量为 0.7 ml/kg， B 组（n=56）：采用 100kV，造影剂用量为 1.0 ml/kg，余扫描条件相

同。两组图像均应用迭代重建（SAFIRE）与滤波反投影重建（FBP）两两比较，并对各组图像质量进行主观和客观评价：由两名高年资医师分别测量主动脉四个不同层面感兴趣区（ROI）的 CT 值、噪声（SD），对比噪声比（CNR）并对图像质量进行主观评分。**结果** A 组 SAFIRE 重建图像 CT 值、噪声、CNR 优于 B 组 FBP 重建有统计学意义（P<0.05）；而主观评分高于 B 组 FBP 重建无统计学意义（P>0.05）；B 组 SAFIRE 重建图像 CT 值、噪声、CNR 优于 A 组 SAFIRE 重建有统计学意义（P<0.05），而主观评分高于 A 组 SAFIRE 重建无统计学意义（P>0.05）；B 组 SAFIRE 重建主观评分略高于 B 组 FBP 重建无统计学意义（P>0.05）。A 组 DLP（1.81±0.64）mGy.cm 较 B 组 DLP（5.48±0.23）mGy.cm 辐射剂量减少 67%，A 组造影剂用量（48.54±12.04）ml 较 B 组用量（67.02±13.47）ml 减少 28%。**结论** 低电压联合迭代重建算法能够减少图像噪声，提高图像质量，降低辐射剂量、减少造影剂用量。

PU-2730

心脏磁共振组织追踪技术结合小剂量多巴酚丁胺评估大鼠心肌缺血再灌注损伤存活心肌的实验研究

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目的：探讨心脏磁共振组织追踪技术(Cardiovascular magnetic resonance tissue tracking, CMR－TT)结合小剂量多巴酚丁胺检测大鼠急性心肌缺血再灌注后局部存活心肌的应用价值。**材料与方法：**24 只大鼠分为实验组和假手术组，各 12 只。结扎大鼠左冠状动脉前降支，闭塞 30 分钟后再通造成心肌缺血再灌注模型。再灌注后第 24h 和第 3 天分别进行静息态及低剂量多巴酚丁胺负荷态[10 μg/（kg·min）]Cine 电影序列和 LGE 延迟强化序列 MR 扫描。采用 CVI^{42}后处理软件 CMR-TT 技术进行心肌应变分析和心功能分析。每次扫描结束后两组分别安乐死 6 只大鼠，取心脏病理组织进行伊文思蓝-TTC 染色，测定心肌梗死、水肿以及存活心肌面积。**结果：**实验组静息及负荷态整体径向、环向及纵向应变峰值（GPCS、GPLS）均显著低于对照组（31.49±8.96% VS 33.64±6.68%、-17.68±3.86% VS -18.75±2.52%、-15.68±4.00% VS -16.65±3.24%），且差异均有统计学意义。24h 后实验组负荷态左室径向应变峰值（PRS）及左室环向应变峰值（PCS）高于静息态（70.76±12.59% VS 68.66±11.71%、11.78±13.31% VS 6.86±24.28%），且差异有统计学意义（P<0.05）。MR 扫描低剂量多巴酚丁胺负荷前后，实验组左室射血分数（LVEF）、舒张末期容积（EDV）、收缩末期容积（ESV）以及搏出量（SV）均升高。相关性分析显示 GPRS 与 EDV、ESV 值呈正相关（r=0.596；r=0.597，P <0.05）、GPCS 与 ESV 值呈负相关（r=0.604，P<0.05）。**结论：**心脏磁共振组织追踪技术结合低剂量多巴酚丁胺负荷可用于评价急性短暂缺血再灌注损伤心肌损伤程度，早期准确识别缺血再灌注损伤后心肌活性。

PU-2731

用双能量冠脉 CTA 检查验证低剂量冠脉 CTA 成像是否会漏诊低密度斑块

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对比 15 名受试者的冠脉 CTA 扫描数据在不同 keV 条件下单能量算法重建图像中非钙化性斑块检出率的差异。以每名受试者的冠脉 CTA 扫描数据由线性混合算法重建出的双能量图像为标准，分别对比 40 至 120keV（以 10keV 为间隔）条件下的虚拟单能量算法重建出图像中的非钙化性斑块检出率，结果表明较低剂量条件下冠脉 CTA 成像很可能漏诊非钙化性斑块。

PU-2732
多层螺旋 CT 心电门控扫描在诊断主动脉夹层及评估主动脉弹性中的应用与研究进展

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主动脉夹层是一种危及生命的心血管疾病，是由于主动脉内膜、中膜病变或外伤等原因导致的主动脉内膜破裂，血液经内膜撕裂口进入主动脉中层，造成主动脉中层沿长轴分离，形成真假两腔的一种病理状态[1]，病死率非常高。动脉弹性是指在单位压力作用下动脉壁的功能学反映,如血管直径、横截面积、体积的变化等。动脉弹性可以作为反映大血管功能的指标，有研究证实大动脉顺应性是心血管疾病死亡率的独立预测因素[2]，在无临床症状的心血管疾病早期，血管弹性功能就已发生改变。研究[3]显示，动脉壁硬度增加与主动脉瘤、主动脉夹层形成和破裂有关。因此检测主动脉弹性对于心血管事件高危患者的发现与确定具有重要意义。随着影像学技术的发展，对于动脉弹性功能评价的无创性检查方法受到重视。目前可应用超声、MRI、CT 血管成像(CTA)测量动脉血管弹性。国内外文献对于主动脉弹性的研究多局限于超声[4-5]。 超声检查费相对较低，在临床中被广泛应用，但易受操作者技术水平的影响。MRI 软组织分辨率高，近年来逐渐用于测量主动脉弹性，但受扫描时间及空间分辨率的影响，且费用较高，在临床普及受限。CTA 方法简单易行、空间分辨力高，在进行主动脉弹性测定方面起着重要的作用。多层螺旋 CT(multi—Slice Computed Tomography，MSCT)结合心电门控技术能够通过血管直径及面积变化准确反映大动脉的弹性功能[6]。本文就目前多层螺旋 CT 心电门控技术评估主动脉夹层动脉弹性的临床应用、研究进展以及未来该项技术的展望等方面做一综述。

PU-2733
双源 CT 肾灌注成像在评估 Debakey Ⅰ型主动脉夹层围手术期急性肾损伤中的价值

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目的：探讨双源 CT 肾灌注成像在评估 DebakeyⅠ型主动脉夹层围手术期发生急性肾损伤的价值，寻求可以评估主动脉夹层肾血流动力学变化的无创性检查。**方法：**收集 2013 年 10 月至 2014 年 12 月间在本院心血管外科确诊并且接受手术治疗的 20 例 DebakeyⅠ型主动脉夹层患者的临床资料，术前当日行双源 CT 经肾门层面行肾灌注扫描，经后处理系统获取患者两侧肾皮质的时间-密度曲线（time-density curve, TDC），并计算得到患者两侧的肾灌注值。分别以术前 1 小时、术后 1 小时、术后 24 小时和术后 48 小时为时间点持续监测患者血肌酐水平，根据 KDIGO 急性肾损伤诊断标准，对比患者 48 小时内血肌酐升高情况，判定患者是否发生术后急性肾损伤（acute kidney injury, AKI）。将所有患者术前 CT 肾灌注值和围手术期血肌酐水平进行 Spearman 相关性检验，检验水准 $\alpha=0.05$，$P<0.05$ 为无统计学意义，研究 CT 肾灌注值与肾损伤之间是否存在相关性。**结**

果：两组患者间肾灌注水平和血肌酐水平存在统计学意义（*P*>0.05）**结论：**患者术前肾灌注值与围手术期血肌酐水平存在相关性，且呈现高度负相关性，说明 CT 肾灌注扫描可在一定程度上对急性主动脉夹层患者术后肾损害进行评估。

PU-2734
冠脉 CT 成像技术在冠心病诊断中的应用价值 研究

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摘要：目的：研究冠脉 CT 成像技术在冠心病诊断中的应用价值。方法：从来我院诊治的疑似冠心病患者中选择 104 例作为研究对象，分别行 256 层螺旋 CT 冠脉成像技术与冠脉造影， 256 层螺旋 CT 冠脉成像技术以 DSA 冠脉造影为金标准，对比两种技术在病支检出率及动脉分级结果一致性，通过统计学处理，判断 CT 冠脉造影在诊断冠心病的敏感度及特异度。结果：两种方法的病支检出率与动脉分级结果均未有明显差别（P > 0.05）；256 层螺旋 CT 冠脉成像技术具有较高敏感度与特异度。结论：冠脉 CT 成像技术在冠心病诊断中具有高敏感度、高特异度、高准确率的特点。

PU-2735
Typical Clinical and Imaging Manifestation of Loeys-Dlietz Syndrome: A Case Report

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Background: First described in 2005 by Loeys and Dietz, Loeys-DIietz Syndrome （LDS） is an autosomal dominant connective tissue disorder characterized by cardiovascular and skeletal involvement. In order to further deepen the understanding of this disease, this paper reported a case of a child who visited our hospital。

Method: A 3-year-old child was brought to hospital for the assessment of his gradually expanding aortic sinuses and ascending aorta as usual ,who born with patent foramen ovale. The child also manifested inguinal hernia、hyperextension of both knee joint and growth retardation .We reviewed his imaging findings and clinical procedures

Result: Imaging findings of the echocardiography demonstrated bulbous dilatation of the aortic extending from the Sinuses of Valsalva to the ascending aorta , in addition to moderate regurgitation of the aortic valve; The enlarged aortic sinuses and ascending aorta was also obviously seen in the volume rendering reconstruction of the heart and cardiac vessels. The abdominal aorta also showed dilatation of the superior mesenteric artery, which measured 6.2mm in width . Head and neck CTA with anteroposterior projection and right oblique posterior view demonstrated tortuous dilatation or worm-like appearance of the carotid and vertebral artery. Due to suspicion of LDS, an autosomal-dominant connective tissue disorder first characterized by aortic aneurysms and generalized arterial tortuosity, the patient received a

molecular test, which revealed transforming growth factor-β receptor type 2 (TGFBR2) gene mutation, which confirmed the diagnosis of type 2 LDS.

Conclusion: LDS is a recently discovered autosomal dominant disease involving multiple systems.At the same time, LDS often cause aortic dissection and aneurysms. Therefore, active clinical intervention is very necessary.

PU-2736

成人主动脉弓离断 CTA 表现

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目的 分析成人主动脉弓离断 CTA 影像特征及临床价值。**方法** 回顾分析 1 例成人主动脉弓离断患者的临床资料及影像学表现，并复习相关文献。 **结果** 患者以无诱因胸痛起病，既往有难治性高血压，CTA 显示患者升主动脉于发出左锁骨下动脉后成尾状缩窄、中断，并见多发扩张侧枝循环与降主动脉相通，降主动脉借开放动脉导管与肺动脉相通，伴左向右分流。 **结论** 成人主动脉弓离断有典型 CTA 表现，CTA 在确诊该病及确定临床分型、观察体循环侧枝循环及分流情况、有无合并症等方面有重要价值，结合后处理及 3D 打印技术可以为临床手术方案的选择以及手术路径设计提供帮助，可以辅助介入治疗术中评估手术效果。

PU-2737

优化对比 CE-SSFP 序列在急性心肌梗死患者检查流程中的应用

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目的 本文旨在提供一种对比增强自由稳态平衡进动电影序列在急性心肌梗死患者影像检查流程中的优化应用方案。**方法** 对临床确诊的 38 例急性心肌梗死患者行 SSFP 和 CE-SSFP 序列，对比在造影剂注射前后其心功能 EDV、ESV、EF 以及图像成像质量 SNR 和 CNR 的差异，再定量评估 CE-SSFP 和 LGE 对心肌梗死面积的显示。**结果** 注射造影剂前后， 3 8 例患者 EDV：147.61±36.8 VS 135.84±39.7；ESV：56.74±23.5 VS 52.21±28.8；EF：61.5±9.1 VS 60.2±8.6，P＝0.066、0.248、0.059 大于 0.05，无统计学差异；CE-SSFP 与 LGE 在 ST 段抬高组别一致性较高，R^2=0.92，P<0.0001；；非 ST 段抬高组别，R^2=0.81，P<0.0001；Bland-Altman 分析显示两种方法间具备较低偏差，分别为 0.4±0.9，0.54±0.96。**结论** CE-SSFP 可用于急性心肌梗死患者的 CMR 检查流程中，可为临床提供一种优化的检查方案，此方案可减轻患者的不耐受程度，为临床提供安全的检查环境，对未来更深入研究提供时间成本上的支持。

PU-2738

双源 CT 对于冠状动脉狭窄与左心室功能的相关性研究

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目的：探讨双源 CT 冠状动脉成像技术在评价冠状动脉主要分支（左前降支、右冠状动脉）不同程度狭窄时的左心室功能的变化。**材料及方法：**收集我院行双源 CT 冠脉检查的 454 例患者相关信息，其中冠状动脉狭窄患者 324 例在冠状动脉存在不同程度狭窄的 324 例患者中有 24 例于两周内行 CAG（冠状动脉造影）检查，将两种检查方法的结果进行对比分析。利用双源 CT 工作站心功能分析软件分别计算出单纯冠状动脉左前降支及右冠状动脉在不同程度狭窄时所对应的心功能参数，主要包括：左室舒张末期容积(EDV)、左室收缩末期容积(ESV)、每搏输出量(SV)、射血分数(EF)、心肌质量（MM）。随机抽取 30 例正常患者作为对照组。**结果：**1.双源 CT 对于冠状动脉狭窄程度的诊断与 CAG 诊断结果比较，具有很高的一致性。2. EF、MM 两个指标项轻度狭窄组与重度狭窄组相比较、中度狭窄组与重度狭窄组相比较，均有显著差异性。 3. 冠状动脉左前降支和右冠状动脉同为重度狭窄时两组间比较，并分别与正常组比较，EF、MM 两个指标项左前降支组与右冠状动脉组相比有显著差异性，左前降支组与正常组相比有显著差异性。**结论：**1. 双源 CT 对冠状动脉狭窄程度的诊断结果与 CAG 诊断结果相比较，两者具有很高的一致性，这一结果与国内外已完成的一些研究结果相一致。2. 冠状动脉左前降支和右冠状动脉轻或中度狭窄时对左心功能均无显著影响，这可能与人体自身的代偿机制有关，导致轻、中度狭窄对左心功能影响较小。3. 左冠状动脉前降支和右冠状动脉同为重度狭窄，左前降支重度狭窄对左心功能影响明显大于右冠状动脉，这可能与两者对心肌的供血范围不同有关。

PU-2739
冠状动脉 CT 血管成像对血压等危险因素与冠状动脉狭窄关系的研究

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目的 通过收集疑似冠心病并行冠状动脉 CTA 检查的患者的临床资料，进而探讨血压等危险因素与冠状动脉狭窄的关系的相关性，从而更好的控制冠状动脉病变的发生。**方法** 通过收集自 2012 年 9 月至 2014 年 1 月期间，我院疑似冠心病并行冠状动脉 CTA 检查的患者的临床资料 763 例，其中在短时间内同时行 DSA 检查的患者 32 例，经冠状动脉 CTA 确诊冠状动脉存在不同程度狭窄的患者 494 例，正常的患者 269 例。测量血压，取空腹静脉血，检测 TG、TC、LDL-C、HDL-C、FPG，并记录年龄，吸烟史等临床资料。根据冠状动脉正常组与冠状动脉狭窄组中，各因素的数据进行对比分析，筛选影响冠状动脉病变的相关危险因素，并以血压为主要因素进行单独分析，按血压水平分组，并以合并其他危险因素，来探讨不同血压水平合并危险因素的情况与冠状动脉狭窄的关系的相关性研究。**结果** 1. CTA 与 DSA 两者在评价冠状动脉的病变方面，检查结果相符率高，没有明显差异（P＞0.05），差异无统计学意义。2. 关于危险因素的分析：与冠状动脉正常组比较，冠状动脉狭窄组的相关因素：男性、高血压、糖尿病及吸烟的比例增大（P＜0.05），年龄及血清 TG、TC、LDL-C 水平升高（P＜0.05），而血清 HDL-C 水平降低（P＜0.05）。3. 在不同级别的血压组中，冠状动脉狭窄与合并其他的危险因素有线性正相关。**结论：**DSCT 的冠状动脉 CTA 与 DSA 的检查结果有较良好的一致性。高血压是冠状动脉狭窄发生的重要的独立危险因素，而男性、高龄、血脂异常、糖尿病及吸烟史等其他相关因素，也是不可忽略的危险因素，尤其在多重的相关危险因素的协同作用下，冠状动脉狭窄发生的危险性更高。

PU-2740

Revolution CT 低剂量低造影剂用量联合基于多模型的迭代重建算法在超重和轻中度肥胖患者冠状动脉 CTA 中的应用价值

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目的 与传统的 100kVp 扫描相比，探讨对超重和轻中度肥胖患者采用 80kVp 联合基于多模型的迭代重建算法(ASiR-V)进行前瞻性心电门控冠状动脉 CTA 检查的价值。材料方法 利用 16cm 宽体探测器 Revolution CT，对 60 例超重和轻中度肥胖患者(25≤BMI<35 kg/m2)前瞻性纳入低剂量扫描组采用 80kVp 进行冠状动脉 CTA 扫描和 60%ASiR-V 进行图像重建。匹配 60 例超重和轻中度肥胖患者纳入常规剂量扫描组采用 100kVp 进行 CTA 扫描和 60%ASiR-V 进行重建。造影剂采用浓度为 350 mgI/ml 的碘海醇。冠状动脉 CTA 图像均由一名有 15 年工作经验的放射科医师在 GE ADW4.7 工作站上进行图像后处理和重建。所有图像分别由 2 名具有 5 年以上工作经验的放射科医师单独进行测量和评价。图像评价包括对图像质量和每段冠状动脉血管的主观评价和客观评价。比较常规剂量组和低剂量组的图像质量、辐射剂量和造影剂用量。结果 常规剂量组和低剂量组患者的一般资料之间没有明显的统计学差异(P>0.05)。两组患者的冠状动脉 CTA 图像的信噪比和对图像质量的主观评价结果在两组之间无明显的统计学差异(P>0.05)。但低剂量组患者接受的辐射剂量(1.59±0.20 mSv)比常规剂量组(3.06±1.40 mSv)明显减低(P<0.001)，同时低剂量组患者所采用的造影剂用量(22.18±6.24 ml)比常规剂量组(47.23±3.87 ml)明显减低(P<0.001)。结论 在 16cm 宽体探测器 CT 上对超重和轻中度肥胖患者进行前瞻性心电门控触发的冠状动脉 CTA 成像时，相对于采用常规 100kVp 扫描，采用 80kVp 进行扫描和 60%的 ASiR-V 进行图像重建可以获得满足诊断要求的图像，同时可以明显减低患者接受的辐射剂量和造影剂用量。

PU-2741

Calcification Remodeling Index Characterized by Cardiac CT as a Novel Parameter to Predict the Use of Rotational Atherectomy for Coronary Intervention of Lesions with Moderate to Severe Calcification.

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OBJECTIVE: To assess the feasibility of calcification characterization by coronary computed tomography angiography (CCTA) to predict the use of rotational atherectomy (RA) for coronary intervention of lesions with moderate to severe calcification.

MATERIALS AND METHODS: Patients with calcified lesions treated by percutaneous coronary intervention (PCI) who underwent both CCTA and invasive coronary angiography were retrospectively included in this study. Calcification remodeling index was calculated as the ratio of the smallest vessel cross-sectional area of the lesion to the proximal reference luminal area. Other parameters such as calcium volume, regional Agatston score, calcification length, and involved calcium arc quadrant were also recorded.

RESULTS: A total of 223 patients with 241 calcified lesions were finally included. Lesions with RA tended to have larger calcium volume, higher regional Agatston score, more involved calcium arc quadrants, and significantly smaller calcification remodeling index than lesions without RA. Receiver operating characteristic curve analysis revealed that the best cutoff value of calcification remodeling index was 0.84 (area under curve = 0.847, $p < 0.001$). Calcification remodeling index $\leq$ 0.84 was the strongest independent predictor (odds ratio: 251.47, $p < 0.001$) for using RA.

CONCLUSION: Calcification remodeling index was significantly correlated with the incidence of using RA to aid PCI. Calcification remodeling index $\leq$ 0.84 was the strongest independent predictor for using RA prior to stent implantation.

PU-2742
多模型迭代算法 ASIR-V 联合 100kVp 在头颈冠脉一站式扫描可行性研究

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【摘要】：目的　探讨**多模型迭代算法 ASIR-V 联合 100kVp 在头颈冠脉一站式扫描可行性。材料与方法** 前瞻收集头颈冠脉 CTA 检查的患者 40 例。随机分 A、B 两组，每组 20 例。A 组对照组管电压为 120KV，FBP 重建。B 组实验组管电压为 100KV，Pre-ASIR50%，Pos-Asir-V80%。两组均采用：冠脉 CTA 心脏（Cardiac）轴扫，探测器宽度 140mm，头颈 CTA 螺旋扫描，探测器宽度 80mm，两组对比剂用量及打药方案均采用分段注射：碘流率（25mgI/kg/s），注射时间为 14s（心脏 10s，4s 低流速（3.0ml/s））维持量。测量主动脉根部、RCA 近段、LAD 近段、LCX 近段、左右颈总动脉起始部、颈内动脉起始部、大脑中动脉 M1 段、椎动脉 V4 段管腔的 CT 值、SD 值，并记录 CNR、CTDI、DLP、并计算有效辐射剂量 ED 进行统计学分析。客观评价：采用独立样本的 t 检验比较两组图像动脉的 CT 值及图像背景噪声 SD 统计学分析。主观评价：Kappa 对两名医生一致性评价，采用 Mann-Whitney U 检验对两组图像统计学分析。**结果**　A、 B 两组年龄、BMI 无统计学差异（P>0.05）;客观评价：两组 CT 值、CNR 差异性无统计学意义（P>0.05），两组有效辐射剂量 ED 分别为：A（3.48±1.36）、B（1.59±0.65）,两组具有统计学差异（P＜0.05），且 B 组较 A 有效辐射剂量降低了 54.3%。主观评价：两者图像质量差异性具无统计学差异（P>0.05）。**结论　多模型迭代算法 ASIR-V 联合 100kVp 在头颈冠脉一站式扫描可行，**图像质量满足临床诊断，且可以有效降低辐射剂量。**临床相关于与应用：**临床推荐使用**多模型迭代算法 ASIR-V 联合 100kVp 在头颈冠脉一站式扫描可行性的，值得临床借鉴与推广应用。**

PU-2743
冠脉减影 CT 血管成像对高心率患者的临床应用价值

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目的
应用患者个体特异性血流动力学信息，优化冠脉减影 CT 血管成像（减影 CCTA）扫描方案，探讨在减影 CCTA 未控制心率患者中的临床应用价值。
方法
选取 49 例（男 47 例，年龄 37-84 岁，平均 61.34±11.26 岁）欲行冠脉 CTA 检查的患者，按心率≧70 与<70 分为高、低心率组，高心率组 26 人，低心率组 22 人，两组患者体重指数、心率及年龄无差异。两组患者均行优化后减影 CCTA 扫描方案：于升主动脉根部进行监测，绘制个人特异性的时间-密度曲线，记录升主动脉对比剂到达时间 t1 及峰值时间 t2。正式扫描时平扫及增强触发时间为：平扫为(t1-3)s，增强扫描时间根据心率调整（心率 65 次/分以下为 t2+4.5s，心率 65~80 次/分时为 t2+4s，心率 80 次/分以上时为 t2+3.5s），嘱患者屏气，于一个屏气相内完成两期扫描。对比高、低心率组冠状动脉平扫、增强序列血管对比剂充盈情况。将冠状动脉造影证实的 18 例减影 CCTA 患者（25 支支架节段与 15 支重度钙化节段）分为高、低心率两组，对比减影在两组

间 CCTA 图像质量提高的应用价值，研究减影 CCTA 对高心率患者冠脉中、重度狭窄（狭窄程度>50%）的诊断效能。

结果

优化后减影 CCTA 扫描方案在高、低心率患者平扫序列升主动脉根部、冠状动脉未见对比剂充盈，增强序列血管获得明显强化。冠脉左主干、左前降支近段及左回旋支近段 CT 值在两组间差异无统计学意义（P<0.05）。经减影 CCTA 图像质量及诊断敏感度、特异度、阳性预测值、阴性预测值均提高（P<0.05）。高、低心率组间减影 CCTA 对图像质量提高及冠脉中、重度狭窄的诊断特异度、阳性预测值、正确率差异无统计学意义。

结论

应用个人特异性血流动力学信息，相针患者不同心率调整扫描时机，首次证实减影 CCTA 对高心率患者图像质量、诊断效能提高的应用价值，为冠脉减影 CTA 的临床广泛实施提供基础。

PU-2744

256 排 CT 对胸痛三联征的诊断价值。

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目的 探讨 256 排 CT 对胸痛三联征的诊断价值。

方法 对我院自 2018 年 12 月份至 2019 年 4 月份临床怀疑胸痛三联症的 23 例患者进行回顾性分析，其中男性患者 20 例，女性患者 3 例，平均年龄 35 岁~75 岁，均采用美国 GE 公司的 RevolutionCT 对胸痛患者进行 CTA 检查，肺动脉扫描范围为胸廓入口至膈顶；心脏扫描范围为气管隆突下 1cm 至心脏下缘 2cm，扫描左右范围使心脏图像显示整个视野的中心，以便提高空间分辨率；主动脉上界包括锁骨下动脉，下界包括所有腹主动脉。扫描方式在采用一次注射注射造影剂下，按照肺动脉 CTA 加冠脉 CTA 加主动脉 CTA 的扫描顺序进行扫描，采用阈值触发方式启动扫描，触发层面选择在肺动脉层面，感兴趣区阈值为 50HU，肺动脉扫完后延迟扫描冠脉，冠脉扫描结束后立即扫描主动脉，肺动脉与主动脉扫描采用 80mm 探测器，0.28s 旋转速度螺旋扫描，冠状动脉采用 160mm 的探测器，0.28s 旋转速度轴扫，采用碘佛醇 350 非离子型造影剂 70 毫升，对比剂首先采用 4.5~5ml/s 的速度注射 50ml，然后再以 2.5~3ml/s 的速度注射 20ml 的药，以相同的速度注射 30ml 的生理盐水，整个扫描过程中无需患者屏气，扫描完成后，冠脉根据不同的心率选择最佳时相采用冠脉运动冻结技术（SSF）进行回顾性心电门控重建，采用 AW4.7 工作站立即进行曲面重组（CPR）、最大密度投影（MIP）、多平面重组（MPR）、容积再现（VR）等对冠状动脉、肺动脉、主动脉及肺部等进行观察，快速作出影像学的诊断。

结果 23 例患者均完成检查，肺动脉、冠脉、主动脉图像均满足临床诊断要求，特别冠状动脉各支显示连续可辩。

结论 急性胸痛的病因复杂，起病急，发病快，症状缺乏特异性，病情进展迅速，患者死亡率高，较早和确定诱因，及早对症处理治疗，对患者与临床有着至关重要的意义。

PU-2745

心脏 CT 平扫与 CTA 定量评价心外膜脂肪对比研究

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目的：对比研究基于心电门控的心脏 CT 平扫（NCT）与冠状动脉 CTA 定量评价冠心病患者心外膜脂肪体积（EFV）的一致性。方法：回顾性分析本院临床诊断冠心病同期行心脏 CT 平扫和冠状动脉 CTA 检查患者 40 例。心外膜边界由 2 位具有丰富心血管 CT 临床工作经验的医师（观察者 1、2）采用 GE AW4.7 工作站自动软件自动勾勒心外膜轮廓，EFV 结果由软件自动计算生成。采用线性回归分析、Bland-Altman 分析法及组内相关系数（ICC）评价两观察者间的一致性。结果：NCT 和冠状动脉 CTA 测得 EFV 分别为 99.43±43.78cm^3、93.66±48.49cm^3，两者差异无明显统计学意义（$P > 0.05$）。观察者 1 在 NCT 和 CTA 的重复系数（CR）误差分别为 10.01cm^3、7.83cm^3；观察者 2 在 NCT 和 CTA 的 CR 误差分别为 11.05cm^3、7.58cm^3。NCT 的 CR 为 8.05cm^3；CTA 的 CR 为 7.13cm^3。各组 ICC 均大于 0.96。结论：基于心电门控的心脏 CT 平扫和冠状动脉 CTA 均可用于 EFV 的评估。

PU-2746

轻中度冠心病风险患者冠状动脉 CTA 的诊断效能分析

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背景：近期计算机断层扫描（CT）血管造影（CTA）技术可以减少疑似冠心病（CHD）患者的血管造影需求，但仍需要验证。
目的：比较双源 CT、640 层容积 CT 对冠心病轻中度危险的诊断能力。
方法：对 1 月份到第三军医大学附属新桥医院心内科就诊的疑似冠心病患者进行回顾性研究。2010 年和 2018 年 1 月。所有患者均接受冠状动脉造影（CAG）双源 CTA（n=224）或 640 层容积 CTA（n=218）。敏感性、特异性、阳性预测值、CTA 检测>50%狭窄的 Ct 值（PPV）和阴性预测值（NPV）按每个血管和患者水平计算。
结果：在 HR<65 bpm 和 65~70 bpm 的患者中，三种方法的诊断价值无显着性差异。在 HR>70 bpm 的患者中， 双源 CTA 和 640 层容积 CTA 具有较好的敏感性(89%和 91%比 43%，P<0.001)、特异性(73%和 73%比 20%，P=0.001)、PPV(80%和 84%比 43%，P=0.002)和 NPV(85%和 84%)。 20%，P<0.001)。双源 CTA 与 640 层容积 CTA 无明显差异.
结论：双源 CTA 和 640 层容积 CTA 对轻中度冠心病的诊断价值无明显统计学差异。

PU-2747

Diagnostic performance in the assessment of coronary artery stenosis: comparison between 96-row detector dual source CT and 256-row multidetector CT

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Background: Both 96-row detector dual source CT (DSCT) and 256-row multidetector CT (256-row MDCT) have been used in clinical practice for assessment of coronary artery stenosis, however, no one has compared the diagnostic performance of two scanners.

Methods: Eighty patients who underwent both coronary computed tomography angiography (CCTA) and CAG were enrolled. Among them, forty-three underwent DSCT scan, while thirty-seven underwent 256-row MDCT scan. The image quality of coronary arteries was divided into four grades (score 1-score 4). A cut off point of 70% diameter stenosis was used to define significant stenosis. The diagnostic accuracy and constituent ratio of excellent image quality (score 4) of two scanners were compared using McNemar test.
Results: Both DSCT and 256-row MDCT presented a comparably high diagnostic accuracy at patient/vessel/segment-level, while 256-row MDCT demonstrated higher diagnostic accuracy than DSCT significantly on segment-level (91.85% vs 95.40%, P=0.020). The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of 256-row MDCT in detecting stenosis at segment-level was 87.07%, 98.07%, 93.52% and 95.95%, respectively. The corresponding values of DSCT were 77.52%, 95.98%, 84.75% and 93.68%. The constituent ratio of excellent image quality (score4) of DSCT was higher than that of 256-row MDCT significantly at all levels (all P<0.001).
Conclusion: Both DSCT and 256-row MDCT could obtain high diagnostic accuracy in detecting coronary artery stenosis, with slight superiority of 256-row MDCT at segment-level. An advantage in obtaining excellent image quality of DSCT over 256-MDCT could not enhance the diagnostic performance in determining coronary artery stenosis.

PU-2748
Clinical application of "one-stop" low dosage imaging of chest pain

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Objective: To evaluate the clinical value of "one stop" low dosage imaging of revolution CT in the triple examination of chest pain. **Methods:** We selected 60 patients with chest pain as the main symptom and chest pain triplet CTA examination from November 2016 to December 2017 in our hospital and randomly divided them into two groups, 30 cases in each group. The inclusive criteria were: Patients with sudden chest pain, acute face, ultrasound and electrocardiogram can not accurately determine the cause of the diseases. The two groups of scanning conditions are as follows: the voltage of the fixed tube is 100kVp, the pre ASIR-V is 60%, the rear ASIR-V is fixed to 80%, the noise index is 35, and the automatic tube current technology is used. In the controlled group, the cardiac scan mode of the coronary artery combined with the pulmonary artery and the aorta spiral (Helical) scan mode was used in the controlled group A by bolus monitoring (Time Bolus), peak scan monitoring layer is at 1-2cm, then start scanning injection of small dosage of contrast agent of 15ml and 35ml saline flush, observe the image on a screen, when the descending aortic concentration of contrast fades, scanning may be terminated. In the same level of pulmonary artery stem and descending aorta were placed in ROI1 and ROI2, respectively calculating the interested peak time of T1 and T2 according to the time density curve of the pulmonary artery scan delay time for T1 (2n+2) s (n monitoring points, if

each exposure interval is 2S, coronary artery scan delay time T2 (2n+6) s. Group B was a one-stop scan, which consisted of two axial scan (Axial) splicing scans. ROI was set at the descending aorta at the 1-2cm level below the tracheal carina, and the threshold reached 220HU automatic triggering. The coronary artery, pulmonary artery and aorta were scanned once. The CT values and SD values of RCA, LAD, LCX, left pulmonary artery, right pulmonary artery, aortic arch, left aorta and right aorta were measured, and CNR were also calculated. **Results:** there is no significant difference in age and body mass index between the two groups (P>0.05). There is no significant difference in the objective measurement between the two groups (P>0.05), and there is no statistically significant difference in subjective scores (P>0.05). The average radiation dosage in group A is (4.65 + 1.14) mSv, the average radiation dose in group B is (2.21 + 0.82) mSv, and the radiation dosage between two groups is statistically significant (P=0.000 < 0.05). **Conclusion:** In the Revolution CT chest pain triplet examination, one-stop scan can not only get excellent images of pulmonary artery, coronary artery and aorta, but also can reduce the radiation dose by about 53%.

PU-2749

CTA 诊断右冠状动脉圆锥支-肺动脉瘘 1 例

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患者女，29 岁，阵发性心悸 3 年，加重 1 月。查体：血压 132mmHg/63mmHg，心率 50 次/分。心脏超声：心脏各房室大小正常，二尖瓣前瓣稍增厚、轻度返流，主动脉瓣稍增厚、少量返流，左室舒张功能稍减退。心电图：房室结双径路伴房室结折返性心动过速。胸部 X 线：心、肺、膈未见异常。冠状动脉 CTA：1.冠状动脉右优势型，冠状动脉未见钙化；右冠状动脉圆锥支-肺动脉瘘（图 1、2、3）；左冠状动脉主干、前降支、回旋支及右冠状动脉未见异常。DSA：右冠状动脉显影未见明显狭窄，前向血流 TIMI3 级，可见右冠状动脉近端圆锥支-肺动脉瘘（图 4）。

PU-2750

复查 CT 对 A 型主动脉壁内血肿不良事件的预测价值

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目的 探究复查 CT 对诊断 A 型主动脉壁内血肿患者发生严重的主动脉相关不良事件的意义。**方法** 连续入选 2009 年 9 月到 2018 年 6 月于我院确诊为 A 型主动脉壁内血肿并至少进行过一次 CT 复查的患者，收集患者的临床和影像资料并进行随访，随访终点为主动脉相关不良事件，建立主动脉相关不良事件的预测模型并对随访结果作生存分析。**结果** 共纳入 103 例患者，其中男性 59 例（57.3%），女性 44 例（42.7%），平均年龄 56.8±9.9 岁。中位复查时间为 14（8，37）天，中位随访时间为 482（28，1600）天，随访期间有 52 例（50.5%）患者发生终点事件。基线资料中的高脂血症（OR=3.85，P=0.004）、最大管径≥50mm（OR=3.14，P=0.020）和内膜破裂（OR=3.08，P=0.015）以及复查资料中的最大血肿厚度增加（OR=1.32，P＜0.001）是主动脉相关不良事件的独立危险因素，联合预测模型（AUC=0.85）的诊断效能优于基线预测模型（AUC=0.72）。此外，有高

脂血症、内膜破裂和最大血肿厚度增加的患者无事件生存时间更短。**结论** 对于初始进行药物治疗的 A 型 IMH 患者，高脂血症、最大管径≥50mm、内膜破裂和最大血肿厚度增加与主动脉不良事件相关，定期影像复查能为临床治疗策略的选择提供更多的帮助。

PU-2751

精准胸痛“三联征”CTA 一站式检查的研究

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目的：探讨 GE Revolution CT 在胸痛“三联征”精准 CTA 一站式检查中的应用价值。
方法：对不明原因急性胸痛患者，使用 GE Revolution CT，采用小剂量对比剂峰值测试肺动脉、升主动脉峰值时间，一次性注射对比剂，行胸痛“三联征”精准 CTA 一站式检查，评价肺动脉、冠状动脉、主动脉成像情况及患者的辐射剂量。
结果：使用 GE Revolution CT 在胸痛“三联征”精准 CTA 一站式检查可以得到的肺动脉、冠状动脉及主动脉的精准清晰的影像信息，同时辐射剂量在合理范围。
结论：使用 GE Revolution CT 在胸痛“三联征”精准 CTA 一站式检查能够得到的肺动脉、冠状动脉及主动脉的精准清晰的影像信息，明确了胸痛病因、提高检出效率、提高诊疗水平，具有很高临床应用价值。

PU-2752

“双低”技术在双源 CT 冠状动脉成像中的临床研究进展

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冠状动脉疾病的发病率和死亡率在全球位居高位。冠状动脉计算机断层扫描血管造影是无创性检查冠状动脉病变的重要方式，其病变的检出率和准确率与冠状动脉血管数字减影术相当。然而随着该技术的普及，患者面临高剂量辐射损伤和对比剂不良反应的双重风险。在低剂量双源 CT 研究中，低管电压（kV）联合低剂量对比剂的“双低”技术研究较为成熟。众多学者基于“双低”技术探索不同 kV 与对比剂剂量优化方式，并结合不同浓度对比剂、BMI 值、迭代重建研究的方案在降低辐射剂量和对比剂用量方面发挥了重要作用。本文就“双低”技术在冠状动脉成像中研究进展作一综述，这对于双源 CT 冠脉疾病患者扫描的临床应用有一定指导意义。

PU-2753

Stanford B 型主动脉夹层腔内隔绝术后（TEVAR）再干预危险因素预测

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目的：探讨 Stanford B 型主动脉夹层（TBAD）腔内隔绝术后（TEVAR）再干预危险因素。
方法：回顾性分析 2011 年-2019 年 192 例经 CTA 确诊 Stanford B 型主动脉夹层并接受 TEVAR 术的患者基本人口学资料、临床资料、术前及术后的影像学资料及 TEVAR 术中造影资料。

结果：68 例（35.4%）TBAD 患者 TEVAR 术后需要进行再干预，多因素 logistic 回归模型分析发现年龄＞66.5 岁（OR，8.162 ；95% CI，2.468-26.999；P=0.001）、距左锁骨下动脉层面主动脉直径＞38.5 mm（OR， 4.297；95% CI，1.882-9.810； P =0.001)、假腔最大层面假腔直径＞29.5mm （OR，3.124；95% CI，1.355-7.201；P =0.008)、术中造影即刻内漏 （OR，3.734；95% CI， 1.711-8.149； P=0.001)和裸支架植数量 （OR，5.610； 95% CI， 2.061-15.27；P =0.001)是再干预的危险因素。ROC 曲线下 AUC 为 0.831（P＜0.000；95% CI，0.770-0.892），敏感度、特异度分别为 69.1%，83.9% 。

结论：TBAD 患者 TEVAR 术后再干预的发生率较高，确定再干预的危险因素，有助于提醒高危患者建立定期随访计划以便及时观察主动脉的变化情况，及时调整监测时间和治疗方案。

PU-2754

双源 CT 血管成像对小儿冠状动脉瘘的诊断价值

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目的：评价双源 CT 血管成像在小儿冠状动脉瘘（CAF）中的诊断价值。

方法：选择双源 CT 诊断证实为 CAF 的 15 例患儿为研究对象，所有患儿均行心导管造影检查及手术治疗。所有图像均用多平面重建（MPR）、容积再现（VR）、最大密度投影（MIP）、曲面重组（CPR）等方法进行重建，观察瘘的起源、走行、瘘口的位置及伴发心血管异常。此外，起源动脉、瘘口等最大径被测量。

结果：①15 例 CAF 患儿中，14（93.3%）例为单侧冠状动脉起源,其中 8（53.3%）例起源于右冠状动脉，6（40%）例起源于左冠状动脉。1（6.7%）例为双侧冠状动脉起源。所有患儿起源动脉的最大径平均为 0.63±0.25。②瘘口位于右心房者 6（40%）例，右心室 4（26.6%）例，肺动脉 3（20%）例，左心室 1（6.7%）例，冠状静脉窦 1（6.7%）例。所有患儿瘘口的平均大小为 0.46±0.19cm，2 例患儿瘘管成“喷射状”进入瘘口。③4（26.6%）例患儿瘘管末端并动脉瘤形成，动脉瘤的平均最大直径为 1.90±0.82。④伴发心血管异常最常见为心脏增大、肺动脉增粗、房间隔缺损等。⑤8（53.3%）例患儿行手术矫治治疗，7（46.7%）例患儿行介入封堵术治疗。⑥双源 CT 诊断结果与心导管造影、手术诊断结果完全吻合。

结论：双源 CT 血管成像能对小儿冠状动脉瘘进行准确诊断，并可对其瘘管的起源、走形、瘘口、伴发心血管异常、起源动脉、瘘口等最大径等进行准确评估，为临床术前提供了丰富的影像学资料。

PU-2755

Association Between Coronary Artery Plaques and Chronic Kidney Disease as Assessed by CT Angiography

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Purpose: The purpose of this study is to determine the characteristics of coronary artery injury and the correlations with clinical features in patients with chronic kidney disease(CKD).

Methods and materials: Sixty-seven patients with CKD who underwent coronary CT angiography(CTA) were retrospectively analyzed. The extent, distribution and types of plaques and grading of stenosis were evaluated. The imaging characteristics were compared between dialysis and non-dialysis group. In dialysis group ,the imaging characteristics were compared between diabetes and non-diabetes patients in further.
Results: In total, 152 coronary vessels (2.3±1.3 per patient)and 306 segments (4.6±3.5per patient) were found to have plaques. The most common diseased coronary vessel was the left anterior descending(LAD) artery (34.9%). The most common involved coronary artery segment was the middle segment of LAD artery (14.1%). Calcified plaque (65.9%) and minimal stenosis (55.8%) were the most frequently detected plaque type and grading of stenosis, respectively. The length of plaque in dialysis group was longer than non-dialysis group, furthermore, it increased gradually with the dialysis duration. In dialysis group, the length of plaque in diabetes patients is shorter than in non-diabetes patients.
Conclusion: CKD patients had a high plaque burden in coronary artery with characteristics of non-obstructive calcified plaque involving long segment of vessels. Dialysis may aggravate vascular calcification injury with the length of involved vessels increased along the duration of dialysis.

PU-2756
3 2 0 排螺旋 CT 评估 升主动脉弹性与冠 状动脉狭窄的相关 性

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【摘要】目的 利用 320 排螺旋 CT 评估升主动脉弹性指标与冠状动脉狭窄程度的相关性。方法 搜集我院拟诊冠心病并行 320 排螺旋 CT 冠状动脉造影 138 例患者(正常组 31 例，狭窄组 107 例)，其中狭窄组
分为轻度狭窄组及中重度狭窄组，比较不同组间升主动脉弹性指标及与 Gensini 评分的相关性。结果 升主动脉弹性指标[膨胀性(AoD)及僵硬度(AoS)]在冠状动脉狭窄组与正常组间及不同狭窄程度组间的弹性指标差异均具有统计学意义(P<0.05)。ROC 曲线评估 AoD、AoS 预测冠心病的价值，曲线下面积(AUC)分别为 0.94、0.89。结论 升主动脉弹性与冠状动脉狭窄与否及狭窄程度有密切相关性，有可能可以作为冠心病的独立预测因子。

PU-2757
P3T 自动触发扫描技术在 CT 冠状动脉造影检查中的可行性研究

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目的 探讨 MedRad P3T 心脏模块采用自动触发扫描技术行 CT 冠状动脉血管成像（CCTA）检查的可行性。**方法** 前瞻性收集心功能 NYHAⅡ级以内并行 CCTA 检查患者 80 例，随机分为 T 组（采用小剂量团注测试扫描，通过小剂量测试获取主动脉根部达峰时间，达峰时间加 3 秒为延迟扫描时间）及 B 组（采用自动触发扫描，监测层面位于主动脉根部，触发阈值为 100HU），采用西门子第二代双源 CT 前瞻性心电门控序列扫描模式进行扫描，两组扫描参数完全一致。T 组通过在 P3T 心脏软

件中输入患者体重、对比剂浓度、心脏平扫时间、主动脉根部达峰时间及 CT 值峰值获取对比剂注射方案，B 组通过在 P3T 心脏软件中输入患者体重、对比剂浓度及心脏平扫时间获取对比剂注射方案。分别对比两组冠脉近中远段 CT 值（采用美国心脏协会 15 节段分法）、冠状动脉三大分支近段的 SNR 及 CNR、 冠状动脉节段可诊断率、对比剂用量、对比剂注射流率、扫描时间（T 组扫描时间为从开始小剂量测试到完成扫描的时间，B 组扫描时间为从开始自动检测到完成扫描的时间）。**结果** ①两组冠状动脉近中远段 CT 值、冠脉三大分支近段 SNR 及 CNR 值差异无统计学意义（$P>0.05$）；②T 组冠状动脉可诊断率 97.8%（579/592），B 组冠状动脉可诊断率为 97.1%（572/589），差异无统计学意义，差异无统计学意义（$P>0.05$）。③T 组、B 组对比剂流率差异无统计学意义（$P>0.05$）；T 组、B 组对比剂用量分别为 75.04±7.20ml、56.06±7.01ml，差异具有统计学意义（$P<0.05$）。④扫描时间 B 组较 T 组平均减少 27.40±3.96s（$P<0.05$）。**结论** 对心功能 NYHAⅡ级以内的患者，采用 MedRad P3T 心脏模块以自动触发检查方法行冠状动脉血管成像，快速、简便、减少了对比剂用量，并保证了冠状动脉图像质量，在临床上具有可行性。

PU-2758
高压注射器双流技术在急性胸痛患者中的运用价值

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目的：探讨低流速联合双桶高压注射器“双流”推注技术行胸痛三联征检查的运用价值。方法：选取 2018 年 1 月—6 月江口县人民医院行胸痛三联征检查患者 60 例，按就诊时间先后顺序分为 A、B 两组；A 组 30 例，使用美德瑞达双桶高压注射器“双流”推注技术，推注方法为：第一步 10ml 生理盐水以 4ml/s 试管；第二步 40ml 造影剂以 4ml/s 推注；第三步造影剂与生理盐水混合推注，混合比 50%造影剂与 50%生理盐水以 3ml/s 推注，总量为 30 ml；第四步以 4ml/s 推注 40ml 造影剂冲管。B 组 30 例，常规推注，第一步以 5ml/s 推注 16ml 生理盐水试管；第二步以 5ml/s 推注 80ml 造影剂，第三步以相同速率推注 40ml 生理盐水冲管。A、B 两组均选用西门子 128 层螺旋 CT 回顾性心电门控扫描模式。比较 A、B 两组肺动脉主干、左、右肺动脉干、升主动脉、降主动脉、左、右冠状动脉 CT 值、造影剂用量、流速及主观图像质量平分。结果：A、B 两组感兴趣区 CT 值比较差异无统计学意义（P>0.05）；A 组较 B 组造影剂用量平均减少约 50%，差异有统计学意义（$P<0.05$）；A 组使用较小流速能保证图像质量，满足临床诊断，在一定程度上降低了因高流速造成造影剂渗漏的风险。A 组主观图像评分均高于 B 组，上腔静脉及右心房无高密度条索状伪影。结论：低流速双通高压注射器“双流”推注技术行胸痛三联征检查在保证图像质量的同时显著减少了造影剂用量，降低了造影剂肾病的发生率及血管渗漏的风险，值得临床推广运用。

PU-2759
实影渲染技术在动态心脏 CTA 成像中的价值

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传统的容积重建算法采用单点光源，光线投射仅考虑沿光线的能量发射和吸收来计算 3D 图像，使用局部渐变着色模型对散射效果进行建模。这种传统方法忽略了具有多个散射图案以及消光的复杂光路，这可能导致较少的伪影以及可能不太准确的 VR 图像，图像缺少足够的细节与深度。

实影渲染技术受到电影技术的启发，图像运算过程中采用了多个光源，这样更符合我们肉眼观察的习惯。与传统的 VR 方法相反，实影渲染技术解决了多维和非连续渲染方程，以整合沿光线从所有可能方向散射的光。因此，在 CT 中使用的路径追踪集成了大量的光线，每个光线具有不同的路径以形成渲染图像的每个像素。
本研究尝试将 cVRT 技术用于心脏 4D CTA 成像。
首先将多期重建的冠脉数据导入 syngo.via （软件版本 VB20A，Siemens Healthineers，Forchheim，Germany）工作站，使用 CT 心脏工作流程打开。使用 cVRT 重建数据，将图像保存后进行主观评估。
研究发现，与传统渲染方法（如 VR）中使用的合成光源相比，实影渲染技术采用高动态范围（HDR）渲染光照图用于照明，这导致渲染数据的照明更自然。因此，基于物理的虚拟现实方法 CR 实时计算了照明效果的复杂物理特性，重点是增强深度和形状感知。多光源的另一个好处是，不同部位不同角度对光的反射、折射和散射都有区别，经过这种相互作用，这就产生了与现实解剖人体几乎难以区分的影像。使用 cVRT 重建可以获得更逼真的图像数据，空间位置关系更显著，对于指导临床工作可能有一定价值。

PU-2760
磁共振评价冠状动脉非阻塞型心肌梗死的应用价值

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目的：冠状动脉非阻塞性心肌梗死（MINOCA）是一种潜在多病因综合征，心脏磁共振（CMR）可以寻找 MINOCA 潜在的发病原因，本文旨在探讨 CMR 在 MINOCA 病因诊断和鉴别诊断中的价值。
方法：回顾性研究 2017 年-2019 年 26 例急性胸痛伴血肌钙蛋白升高的患者，冠状动脉造影未见明显阻塞或狭窄＜50%，临床诊断为 MINOCA。所有患者冠状动脉造影后行心脏磁共振扫描，分析磁共振图像特点，观察心脏结构、功能及有无灌注异常和延迟强化。
结果：26 例 MINOCA 中 CMR 诊断心肌梗死 15 例（57.7%）、心肌炎 3 例（11.5%）、Takotsubo 心肌病 3 例（11.5%），有 4 例（15.4%）CMR 检查未见明显异常，1 例（3.8%）无法明确具体病因，根据磁共振特征归为非缺血性心肌病。CMR 最终确诊 26 例 MINOCA 中 21 例，诊断率 80.8%。
结论：心脏磁共振一站式成像对于诊断 MINOCA 有独特作用，能够鉴别心肌炎、Takotsubo 心肌病与急性心肌梗死等不同病因引起的 MINOCA。

PU-2761
Diagnostic contributions of cardiac magnetic resonance in patients with myocardial Infarction with non-obstructive coronary arteries

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Objective: Myocardial infarction with non-obstructive coronary arteries (MINOCA) is a syndrome with underlying many causes. Cardiovascular magnetic resonance (CMR) imaging

has the potential to clarify the underlying pathology in patients with MINOCA. The objective of this study was to investigate the diagnostic value of CMR imaging in this group of patients.
Methods: From 2017 to 2019 we examined 26 patients with clinical suspicion of angiography (the patients were considered to have significant angiographic disease only a 50% stenosis was detected in any of their coronary arteries). Of these, all were underwent CMR imaging. The role of CMR with the late gadolinium enhancement was evaluated.
Results: Final diagnoses included acute myocardial infarction (15 cases), acute myocarditis(3 cases) and Takotsubo cardiomyopathy (3 cases). The remaining patients (5 cases) had either nonspecific findings or could not be classified.
Conclusions: One-stop CMR allowed for the identification of an etiology in most of the patients in this study. CMR imaging may help to differentiate between MINOCA with myocarditis, acute myocardial infarction, Takotsubo cardiomyopathy and myocarditis.

PU-2762

囊状奇静脉瘤：影像与临床

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囊状奇静脉瘤为需要与纵隔内肿瘤相鉴别的少见肿瘤样疾病，多数患者为偶然发现，病因及发病机制待明确，国内仅见数例案例报道，我中心截止目前诊治了 3 例囊状奇静脉瘤的患者，典型病例影像学表现有一定的特征性。我们将结合我中心 3 例病例及已发表的文献对囊状奇静脉血管瘤临床和影像特征做一梳理，对影像上需要鉴别的疾病及本病特征影像形成的原因做初步探讨，以期加深同行对本病认识，更好地帮助更多患者获得更适宜的诊治及管理。

PU-2763

320 排 CT 冠脉成像缩窄采集时间窗的可行性研究

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目的　通过分析 320 排 CT 冠脉成像图像质量与重建时相及心率的关系,探讨前瞻性心电门控缩窄采集时间窗的可行性。**方法**　回顾性分析了 2018 年 5 月至 2018 年 12 月心率 65～95bpm 的 90 例患者 261 支冠脉血管，按血管的图像质量评分结果，确定血管和患者的最佳时相；分析患者最佳时相与心率的关系，找出最佳时相转移的临界心率；根据临界心率和患者最佳时相，分别分析并确定采集时间窗能够缩窄的范围。对比分析缩窄采集时间窗前后的图像质量以及辐射剂量。**结果**　患者最佳时相转移的临界心率为 70bpm。心率 65～70bpm 时采集时间窗可缩窄为 R-R 间期的 72%～80%；心率 65～95bpm 时则可缩窄为 40%～50%。缩窄采集时间窗后的最佳时相与预设时相的图像评分差异有统计学意义（P=0.00），图像质量明显提高。缩窄采集时间窗前后的有效辐射剂量（ED）差异有统计学意义（P=0.00），辐射剂量明显降低。**结论**　根据不同心率进一步缩窄采集时间窗，既可提高图像质量，又能明显降低辐射剂量，值得临床应用和推广。

PU-2764

第三代双源 CT 冠脉造影静脉通路与 400 对比剂用量的前瞻性研究

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目的 研究贵要静脉通路与头静脉通路在 CCTA 中的差异，以及 Force CT 冠脉造影对比剂用量的优化。**方法** 前瞻性纳入患者 100 例，记录 CCTA 检查中对比剂注射位置、起始时间，左冠窦上缘升主动脉出现对比剂时间、经历心动周期数，主动脉达触发阈值 100Hu 时间和心动周期数，对比剂注射后左、右冠状动脉近段、中段、远段显影经历的时间、CT 值、心动周期数。将纳入患者依据静脉通路分贵要静脉组和头静脉组，对比两组各指标的差异。将纳入患者依据对比剂用量分≤25ml 组，28ml 组和≥30ml 组，对比两组指标的差异。**结果** 贵要静脉组对比头静脉组，对比剂注射后左冠窦上缘阈值触发点、右冠状动脉及左冠状动脉近段、中段、远段的显影时间、CT 值、经历心动周期数没有统计学差异（P>0.05）。对比剂用量分组结果除外≤25ml 组与 28ml 组中右冠近段、远段理想显影 CT 值没有统计学差异（P>0.05），右冠远段显影时间有统计学差异（P＜0.05）。≤25ml 组分别与 28ml 组、≥30ml 组对比显示对比剂注射后，升主动脉达阈值经历时间、CT 值没有统计学差异（P>0.05），左、右冠近、中、远段显影时间无统计学差异（P>0.05），CT 值有统计学差异（P＜0.05）。回归分析右冠中段 CT 值影响因素，体重、身高、BMI、均值心率、脏横径、心脏高度、管电流、碘总量、对比剂用量、水注射量、注射总量没有统计学意义。管电压、心脏扫描时间、延迟时间有统计学意义。**结论** 贵要静脉与头静脉在上臂是不同通路，但 CCTA 在左、右冠状动脉近、中、远段强化是一致的，他们可以被认为是相同的通路来选择。与 28ml 及≥30ml 对比剂对比，≤25ml 对比剂（23.39±2.47ml）对于 Force CT 冠脉造影是可行的，足以达到理想冠脉强化，但仍然不是最理想的最小对比剂用量。管电压、心脏扫描时间、延迟时间是影响右冠中段 CT 值的重要因素，给出回归方程。

PU-2765

IVIM-DWI 诊断陈旧性心肌梗死

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目的 研究体素内不相干运动扩散加权磁共振成像(IVIM-DWI)技术在鉴别陈旧性心肌梗死及正常心肌中的应用价值；探讨基于 IVIM-DWI 的成像参数对陈旧性心肌梗死心肌纤维化的诊断价值。
方法 选取 35 例陈旧性心肌梗死患者和 12 例健康志愿者，所有入组实验者均行多扩散敏感因子（b 值）DWI 序列及延迟强化检查，采用双指数模型对采集到的 DWI 数据进行重建。以 LGE 图像为参考，在心脏短轴位上分别对 LGE 阳性陈旧性梗死心肌和健康志愿者正常心肌室间隔前部、后部及侧壁的进行测量，得到陈旧性心肌梗死组、正常志愿者组的扩散系数（D 值）、灌注系数（D^*）和灌注分数（f值）。应用秩和检验检验比较正常心肌、陈旧性心肌梗死心肌各参数值的差异，并采用受试者工作特征（ROC）曲线评价不同参数值的诊断价值。
结果 12 例健康志愿者所有层面正常心肌平均 D 值、D^*值和 f值与 35 例心肌梗死心肌比较，差异有统计学意义（Z=-5.028、-5.582、-5.257，P<0.05），D 值、D^*值和 f值曲线下面积分别为 0.939、0.988 和 0.959，健康志愿者组和心肌梗死组的敏感度和特异度分别为 84.6%、 88.9%，100%、94.4%和 84.6%、93.1%。
结论 IVIM-DWI 技术通过提供心肌的扩散状态及血流灌注状态信息，对于无法打药病人陈旧性心肌梗死的诊断具有较大的应用价值。

PU-2766
冠状动脉管腔密度梯度相关参数预测心肌桥收缩压迫程度的价值

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目的 探讨基于冠状动脉 CT 血管成像（coronary CTA，CCTA）所测得左前降支管腔内密度梯度相关参数预测前降支心肌桥对壁冠状动脉收缩压迫程度的诊断价值。**资料与方法** 回顾性研究 81 名经 CCTA 证实有心肌桥的患者，测量并计算左前降支血管腔内密度梯度（transluminal attenuation gradient，TAG）及其校正值（TAGstandardized,TAGs）、校正后壁冠状动脉强化值（corrected mural coronary opacification，CMCO）之差、心肌桥长度、心肌桥深度，分析其在预测心肌桥收缩压迫壁冠状动脉程度中的诊断效能。**结果** TAG、TAGs、CMCO 之差在显著压迫组、轻度压迫组、无压迫组中的差异均具有统计学意义（P＜0.05），而心肌桥长度、深度不具有显著性差异（P＞0.05）。ROC 分析 TAGs、CMCO 之差及其联合诊断指标曲线下面积在显著收缩压迫组分别为 0.81、0.83、0.89。**结论** TAG、TAGs、CMCO 之差与心肌桥收缩压迫程度有关，且在心肌桥具有显著收缩压迫时有较好的诊断价值，TAGs 和 CMCO 之差联合指标的诊断价值高于单一指标，因此可通过这些参数间接判断心肌桥是否具有显著收缩压迫。

PU-2767
Brilliance256 层 iCT 冠脉斑块分析对急性冠脉事件发生风险的预测价值

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摘要:目的 探讨 Brilliance256 层 iCT 冠脉斑块分析对急性冠脉事件发生风险的预测价值。**方法** 研究 24 例发生急性冠脉事件(ACS)的病例和 25 例稳定型冠心病(SAP)的病例，2 组均进行冠脉 CTA、选择性冠状动脉造影检查(SAG)，以 SAG 结果作为“金标准，利用冠脉斑块色彩编码，对其冠脉斑块的类型、性质及成分进行对照分析，比较两组间斑块类型、斑块性质、斑块成分及斑块引起的狭窄的差异。**结果** 49 例患者共检出斑块 85 个。ACS 组 39 个斑块中Ⅱ、Ⅲ型斑块 29 个，Ⅰ型斑块 10 个， 软斑块 82.05%，硬斑块及混合斑块 17.95%，脂质成分占 69.70%，纤维成分占 26.18%，钙化成分占 4.12%。 SAP 组 46 个斑块中Ⅰ型斑块 27 个，Ⅱ、Ⅲ型斑块 19 个，硬斑块及混合斑块 82.61%，软斑块 17.39%，钙化及纤维成分占 72.68%，脂质成分占 27.32%。两组间斑块类型、斑块性质、斑块的成分差异均有统计学意义(P<0.05)。**结论** Brilliance256 层 iCT 冠脉斑块分析，能够有效分辨斑块的类型、性质及成分，评价斑块的稳定性，具有在 ACS 人群中预测发生急性冠状动脉事件风险的价值。

PU-2768
猪急性心肌梗死模型中血清缺血修饰白蛋白与左室射血分数相关性的初步研究

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目的 血清缺血修饰白蛋白（IMA）水平反映疾病的严重程度，因此可能是评估急性心肌梗死(AMI)预后的一个有价值的指标。本研究旨在确定猪 AMI 模型中血清 IMA 水平变化的时间进程，并探讨血清 IMA 水平与左室射血分数（LVEF）的相关性。**方法** 采用球囊介导的左前降支永久性闭塞术诱导滇南小耳猪 AMI。采用第三代双源 CT(DSCT)对 AMI 诱导前后 30 天内 LVEF 动态变化进行评价，同时测定血清 IMA 水平，并进一步确定血清 IMA 水平与 LVEF 的相关性。**结果** 血清 IMA 水平在 AMI 后 1 小时明显升高，于 6~12 小时达到峰值，此后逐渐下降，30 天后恢复至基线水平。早期血清 IMA 水平与 LVEF 呈显著的负相关（r=-0.41～-0.80，P<0.05）。30 天血清 IMA 水平与各时间点 LVEF 无统计学差异（P>0.05）。**结论** 猪 AMI 模型早期循环中 IMA 水平与 LVEF 呈显著负相关，支持血清 IMA 水平可能作为早期预测 AMI 患者临床不良预后具有价值的生物标志物的假设。

PU-2769
应用 CT 评估腹部脂肪相关参数与冠脉病变严重程度的关系

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目的：应用腹部平扫 CT 评估腹部脂肪相关参数与冠状动脉病变严重程度的关系。
方法：同期行腹部平扫 CT 及有创冠脉造影患者纳入分析，测量并分析纳入者腹部脂肪相关参数，包括腹部内脏脂肪、腹部皮下脂肪、腹部内脏脂肪与皮下脂肪比及传统心血管危险因素，评估腹部脂肪相关参数与冠状动脉病变严重程度的关系，应用多元 logistic 回归分析预测冠状动脉病变严重程度的危险因素。
结果：共 223 名患者纳入分析（冠心病组，n=117；非冠心病组，n=106））。结果显示冠心病组腹部内脏脂肪与皮下脂肪比明显高于非冠心病组（0.95±0.33 vs 0.70±0.25, P<0.001）；冠心病组患者较非冠心病组患者更倾向于合并非酒精性脂肪肝（P=0.002）；冠心病组腹主动脉钙化分数高于非冠心病组（P<0.001）。多元 logistic 回归分析显示腹部内脏脂肪与皮下脂肪比（OR 10.492，P<0.001）、非酒精性脂肪肝（OR 2.807，P=0.025）、腹主动脉钙化分数（OR 1.964，P<0.001）及糖尿病（OR 2.572，P=0.019）是发生冠脉明显狭窄的独立危险因素；利用回归模型联合四种因素预测冠脉明显狭窄的曲线下面积（AUC）为 0.85，相较这四种因素的独立预测能力，差异具有统计学意义（P<0.05）。
结论：包含了腹部内脏脂肪与皮下脂肪比、非酒精性脂肪肝、腹主动脉钙化分数及糖尿病等在内的预测模型可以帮助筛选未来发生冠脉明显狭窄的患者，如果在影像学检查及临床资料获取当中发现了此类患者，有助于患者疾病的早期发现、干预和治疗，当然还需要更多进一步的研究论证。

PU-2770
双源 CT 自适应前瞻性心电门控在自由心率的老年冠心病患者冠脉成像中的运用价值

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【摘要】 目的：探究双源 CT 自适应前瞻性心电门控应用于自由心率老年冠心病患者冠脉成像（CTCA）的价值。**方法：**选取在本院行 CTCA 检查的临床疑诊老年冠心病自由心率患者 102 例，根据双源 CT 扫描时心率分为低心率组 32 例、中等心率组 37 例、高心率组 33 例。比较三组冠脉节段可评价率、图像质量、辐射剂量；以冠脉造影（CAG）检查为金标准，分析 CTCA 对不同心率组冠脉狭窄的诊断价值。**结果：**102 例患者 1594 个冠脉节段中 1528 个满足诊断要求，可评价率 95.86%，可评价率在心率由低到高组（以下顺序同此）分别 96.43%（486/504）、95.72%（537/561）、95.46%（505/529），三组差异无统计学意义（*P*>0.05）。三组冠脉节段图像质量评分（4.12±0.89、4.07±0.85、4.06±0.81）差异亦无统计学意义（*P*>0.05）。随心率增高，CTDIvol、DLP、ED 降低（*P*<0.05）。CTCA 诊断冠脉狭窄的灵敏度、特异度、阳性预测值、阴性预测值为：低心率组 89.61%、95.84%、80.23%、98.00%，中等心率组 88.51%、96.22%、81.91%、97.74%，高心率组 86.75%、95.73%、80.00%、97.35%；三组各项比较差异无统计学意义（*P*>0.05）。Kappa 检验显示，CTCA 与 CAG 在三组中的诊断一致性均较好（Kappa 值=0.816、0.821、0.798，$P_{均}$<0.05）。CTCA 诊断冠脉狭窄 AUC 为：0.927、0.924、0.912，均诊断准确性较高。**结论：**双源 CT 自适应前瞻性心电门控应用于 CTCA 检查对老年冠心病自由心率患者均可获得较高图像质量，尤其对高心率患者可降低辐射剂量，但不影响图像质量；同时对不同心率患者冠脉狭窄度的诊断效能、准确性均较高。

PU-2771

双能量 CT 单能谱技术在显示冠状动脉支架中的应用价值

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目的：评价西门子第三代双源 CT 双能量扫描单能谱技术对冠状动脉支架图像质量的影响。
材料与方法：使用西门子第三代双源 CT 对 15 例（共计 21 枚支架）冠状动脉支架植入术后的患者采用双能量扫描，获得的两种不同能量(90 及 150 kV)数据采用单能谱技术重建处理，分别得到 40～190 keV(间隔 10 keV)图像及线性融合 120 kV 图像，共 17 组图像。图像评价包括（1）主观评价，由 2 位有经验医生进行双盲评估。采用 5 分制，1 分最差，5 分最佳。（2）客观评价，评价内容包括支架内径、支架长度、支架腔内衰减值、支架内噪声、支架内信噪比、支架内对比信噪比及冠状动脉图像噪声、冠状动脉图像信噪比、冠状动脉图像对比信噪比。分析上述指标各组间差异性，P＜0. 05 为差异有统计学意义。
结果：
（1）所有患者均顺利完成检查，其中男 13 例，女 2 例，平均年龄(64.13±11.82)岁，BMI 值为 26.24±1.76kg/m2，平均辐射剂量为 5.58±1.35mSv。
（2）支架腔内主观评价：两名影像医师主观评分一致性良好(kappa=0.80)，80keV 组主观评分最高。
（3）支架图像质量客观评价：支架内径、支架长度组间比较均无统计学差异（P 分别为 0.97 和 1.00）；支架腔内衰减值组间比较有统计学差异（P=0.00），40keV 组最高，190keV 组最低；支架内噪声组间比较有统计学差异（P<0.01），40keV 组最高，100keV 组最低；支架内信噪比组间比较有统计学差异（P<0.05），线性融合 120 kV 组最高，其次是 80keV 组；支架内对比信噪比组间比较有统计学差异（P<0.05），线性融合 120 kV 组最高，其次是 80keV 组，180keV 组最低；
结论：较传统 120kV 融合图像，双源 CT 双能量单能谱技术 80keV 能级图像重组能显著降低支架内噪声，获得更好的支架主客观图像,可用于 PCI 患者术后随访。

PU-2772

Revolution CT 冠脉 CTA 屏气扫描与自由呼吸扫描对检查结果的影响

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目的 探讨屏气与自由呼吸两种不同方式下行冠状动脉 CT 血管造影(Coronary CT Angiography,CCTA)扫描时对检查结果的影响。
方法 选取在我院行 CCTA 检查的患者 100 例，按照是否能配合呼吸分为 A、B 两组，对 A 组 63 例较能配合患者进行呼吸训练，要求检查时吸气后屏气完成扫描，对 B 组 37 例由于各种原因无法配合呼吸的患者不进行要求，自由呼吸完成扫描（仍使用相同参数进行检查，语音提示不关闭）。扫描完成后对原始数据使用 Smart phase 自动选择最佳时相，对仍存在少许伪影的图像利用运动追踪冻结技术（SSF）处理，进一步降低时间分辨率，优化图像。
使用 GE Revolution CT 进行扫描，其具有 16CM 宽探测器及最快 0.28s/r 的机架旋转速度，可在 1s 内完成全心脏扫描，最低时间分辨率为 140ms，而使用 SSF 技术后时间分辨率可降至 29ms。由于扫描速度快，可适当降低对呼吸的要求。
结果 63 例屏气扫描的患者都能经后处理得出符合诊断要求的冠脉图像，37 例自由呼吸扫描的患者中 28 例可处理出符合诊断要求的图像，另有 7 例在使用 SSF 技术之后达到诊断要求，1 例由于患者自身运动误触发提前扫描导致冠脉内药物浓度不够，1 例由于呼吸幅度较大导致无法明确诊断。
结论 以往使用中低端 CT 检查冠脉时，需扫描多次心动周期，进行多扇区重建，需患者屏气 15s 甚至 20s 以上，经常出现扫描后段由于患者屏气不佳导致图像错层，从而检查失败。使用 Revolution CT，在一个心动周期内科完成检查，仅需采集单扇区数据，加快了扫描速度，语音提示开始至扫描结束在 10s 以内，减少了患者屏气时间。虽然自由呼吸扫描成功率也较高，但仍难以避免有失败的情况产生，在工作中仍应尽量训练患者屏气，以达到更高成功率，为患者负责。

PU-2773
Revolution CT 冠脉 CTA 检查时不同心率对最佳时相选择的研究

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目的 探讨冠状动脉 CT 血管造影(CCTA)检查时不同心率患者最佳时相选择的差异。
方法 选取在我院行 CCTA 检查的患者 100 例，按心率分为 A 组（<65 次/分）、B 组（65~75 次/分）、C 组（>75 次/分）、D 组（心律不齐，最高与最低心率相差 20 次以上）四组。检查时设置扫描区间为绝对时相 150-800ms，扫描完成后对原始数据使用 Smart phase 自动选择最佳时相。
使用 GE Revolution CT 进行扫描，其具有 16CM 宽探测器及 0.28s/r 的机架旋转速度，可以在任意心率及心律条件下，在一个心动周期内完成冠脉 CTA 检查。
结果 心率不同，Smart phase 自动选择最佳时相也不同，A 组 14 例在 300-400ms 区间内，22 例在 700ms 左右甚至以上区间内（部分慢心律患者将采集区间延长至 1000ms）；B 组有 11 例在 300-400ms 区间，19 例在 600-700ms 区间；C 组 15 例在 300-400ms 区间，6 例在 500-700ms 区间；D 组视扫描时心率变化，自动选取的最佳时相也有变化，其中 8 例在 200-400ms 区间，3 例在 400-600 区间，2 例在 600-700 区间。
结论 A 组最佳时相应为 R-R 间期的 70%-80%，即是绝对时相为 700ms 左右及以上区间。C 组最佳时相应为 R-R 间期的 40%-50%，即是绝对时相为 300-400ms 区间。B 组一般选取双期扫描绝对时相为 300-400ms 及 700-800ms，或全期扫描 200-800ms。D 组一般推荐选择绝对时相 200-400ms。

以往冠脉检查都需要采集全期数据，作回顾性重建以寻找最佳时相来诊断，费时费力且患者接受辐射剂量大；应用 Smart phase 后，减少了医师从全部图像中筛选最佳时相的时间，但并未减少患者接受的辐射剂量；根据不同心率定制个性化的检查方案，可有效减少患者接受的辐射剂量。

PU-2774
ForceCT 冠状动脉血管成像对冠状动脉瘘的诊断价值

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目的：探讨 ForceCT 冠状动脉血管成像对 CAF 的诊断价值。方法：回顾性分析我院 2018 年 4 月到 2019 年 4 月在 ForceCT 行冠状动脉血管成像的患者图像，并通过曲面重建（CPR）、容积再现（VR）等重建方法对 CAF 进行观察。结果：3462 名患者中共检出 CAF14 例，检出率为 0.4%，其中男性 8 例，女性 6 例；年龄 49-86 岁，平均 65.4 岁。CAF 同时从双侧冠状动脉发出 3 例（21.4%）；单侧 11 例（78.6%）。单侧发出的 CAF 起自右冠状动脉 3 例（21.4%）；CAF 起自左冠状动脉 8 例（57.1%）。CAF 瘘入肺动脉 11 例（78.6%）；右心室 1 例（7.1%）；上腔静脉 1 例（7.1%）；肺静脉 1 例（7.1%）。瘘血管发生迂曲、形成丛状改变 1 例（7.1%），部分瘘血管扩张粗大 2 例（14.3%）。结论：ForceCT 冠状动脉血管成像的图像，在经过多种重建后可清晰直观的展示出 CAF 的起源、走行以及瘘口位置和形态，为 CAF 的诊断提供了便利，有助于患者 CAF 的早期检出，对临床的后续治疗具有指导价值。

PU-2775
GE RevolutionCT 冠脉追踪冻结技术（SSF）对不控制心率受试者冠脉成像质量探讨

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目的:评估冠脉追踪冻结技术（SSF）对不控制心率受试者 CT 冠脉成像质量的影响。
方法:筛选 21 名疑似冠心病患者在不控制心率的前提下在 revolution CT 上行 CT 冠脉成像扫描，所有患者均采用标准算法及 SSF 两种方法进行重建。然后由两名有经验的医师对两种方法重建图像质量进行评价，对整体图像质量及各分支细小血管显示等方面分别进行评分。
结果:经 SSF 重建图像质量普遍优于标准算法重建图像质量，且两者差异存在统计学意义。
结论:与标准算法相比，在不控制心率条件下 SSF 能够明显提升冠脉图像质量。

PU-2776
64 排双源 CT 血管成像技术和后处理技术在主动脉 CTA 中的应用

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目的 探讨 64 排双源螺旋 CT 血管造影技术和后重建技术对主动脉 CTA 的显示以及诊断价值。**方法** 收集急诊 65 例行主动脉 CTA 检查患者的 CT 影像资料，其中男性 50 例，女性 15 例；年龄 30 ～ 85 岁，平均年龄 60.2 岁。分析其 64 排双源 CT 征象，原始数据采集层厚为 0.75mm，层间隔 0.75 mm。分别采用多平面重建(MPR)、 曲面重建(CPR) 、最大密度投影(MIP) ，应用 VR 和 inspace 软件重建出立体三维图像。**结果** 经 CTA 检查: 正常 10 例，主动脉夹层 35 例，其中伴瘤样扩张的 5 例，（DeBakey Ⅰ型 12 例，Ⅱ型 10 例，Ⅲ型 10 例（Stanford 分型法：A 型 25 例，B 型 10 例）），主动脉夹层壁间血肿型（1）3 例，主动脉瘤 12 例，穿透性粥样硬化性主动脉溃疡〔1〕3 例，主动迂曲扩张 5 例。MPR 能直观显示主动脉及其主要分支的走形及形态、钙化，对夹层真假腔、内膜片和内膜初始破口的显示甚好。VR 立体感强，能清晰显示病变的全程及与分支血管的空间关系。**结论** 64 排双源螺旋 CT 的血管成像技术及后重建功能可准确反映主动脉异常状况，并对病变进行分类，在急诊中能快速得到结果并为术前规划提供更加重要、详细的信息。

PU-2777

超高端 CT 在体检中的优势分析

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目的：探讨超高端 CT 在体检冠状动脉健康状况检查中的应用优势。
方法：选取 2019 年 1 月至 6 月来我院接受体检的 350 例体检者作为研究对象，排除未成年体检者和有造影剂过敏史的体检者，应用超高端 CT 对体检者实施冠状动脉 CTA 检查，造影剂为碘普罗胺（370mgI/ml），使用高压注射器经肘静脉注射，速度 5ml/s，注射总量 40~60ml。先进行胸部平扫，确定心脏位置，然后进行增强扫描，扫描过程中详细记录体检者心电信号。扫描结束后将源图像上传至工作站，使用图像后处理软件对源图像进行曲面重建、最大密度投影、容积再现等处理，获得高质量影像学资料。将最后得到的影像学资料交由 2 名工作经验丰富的医师共同进行评价及诊断。
结果：350 例体检者均获得高质量冠状动脉 CTA 影像学资料，共 243 例体检者影像学资料提示冠状动脉存在问题，所占比例为 69.43%，其中男性共 165 例，所占比例为 67.90%，女性共 78 例，所占比例为 32.10%，平均年龄（61.30±4.01）岁。冠状动脉存在问题的 243 例体检者中，14 例体检者影像学资料提示冠状动脉变异，所占比例为 5.76%，其中 9 例体检者显示冠状动脉起始部狭窄，5 例体检者左右冠状动脉起字相应冠状窦的上缘。其余存在冠状动脉问题体检者中，51 例体检者有冠状动脉斑块，所占比例为 20.99%。92 例体检者存在冠状动脉心肌桥，构成比为 37.86%，分型：浅表型 56 例；深在型 33 例；混合型 3 例。存在冠状动脉问题的体检者中，最少有 1 支病变，为左前降至病变，最多有 4 支病变，为前降支、回旋支、右冠状动脉和第一对角支病变，1 例体检者的管腔狭窄程度>50%，其余均低于 30%。
结论：超高端 CT 冠状动脉 CTA 作为一项无创检查技术，具有成像清晰、影像学资料质量高的应用优势,在急性冠状动脉综合征的预防中发挥着重要作用，可作为体检常用冠状动脉病变筛查方法。

PU-2778

MR 心肌灌注成像对冠心病心肌缺血的诊断价值

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目的：探讨 MR 心肌灌注成像（MR myocardial perfusion imaging，MRMPI）对冠心病心肌缺血的诊断价值。**方法：**选取行 MRMPI 及冠脉造影检查（CAG）的冠心病患者 30 例，分析 MRI 特征，测量 MRMPI 中病变心肌与正常心肌首过灌注时间、首过最大上升斜率及延迟强化信号强度。**结果：**30 例中，以 CAG 为参照，MRMPI 发现左前降支（Left anterior descending，LAD）病变 20 例，诊断符合率、灵敏度、特异度分别为 93.8%、95.5%、 90.0 %；左旋支（**Left circumflex，**LCX）病变 12 例，诊断符合率、灵敏度、特异度分别为 90.9 %、92.9 %、89.5 %；右冠脉（Right coronary artery，RCA）病变 15 例，诊断符合率、灵敏度、特异度分别为 85.7%、89.5 %、81.3 %。54 个室壁节段出现心肌首过灌注减低及最大上升斜率减低；49 个心肌节段出现延迟强化，其中 22 个节段呈透壁性强化，27 个节段呈非透壁强化，主要表现为中层心肌、心内膜、心外膜下的异常强化。**结论：**MRMPI 有利于显示心肌病理生理学方面的改变，对冠心病综合诊断有很高的临床应用价值。

PU-2779

Force CT 冠状动脉 CTA 对冠状动脉走形异常的诊断价值

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目的： 探讨 Force CT 对冠状动脉走行异常的诊断价值。 方法： 回顾性分析我院 2018 年 5 月到 2019 年 7 月在 Force CT 行冠状动脉 CTA 检查的共 3496 病例资料，对所有图像进行容积再现(VR) 、曲面重组(CPR)等处理，从各种角度观察冠状动脉的起源、走行及其形态。 结果： 所有受检者中共发现存在冠状动脉走行变异 1639 例。男性 983 例，女性 651 例。年龄 15-93 岁，中位数 62 岁。检出率为 46.9%，其中起源变异合并走行异常 27 例（1.6%），存在心肌桥 1634 例（98.3%），其中 1516 例（92.3%）患者心肌桥都发生在左前降支中段；发生在左回旋支有 13 例（0.8%）；发生在对角支有 19 例（1.2%）；发生在钝缘支有 15 例（0.9%）；发生在中间支 15 例（0.9%）；发生在右冠的病例仅有 2 例（0.1%）。同时存在 2 支心肌桥 15 例（0.9%）；同时存在 3 支及以上心肌桥 7 例（0.4%）。 结论： Force CT 可从多角度、全方位显示冠状动脉的变异，明确其起源、走行及其与周围血管、心脏之间的解剖学关系，可作为常规检查手段用于冠状动脉异常的临床筛查，从而为临床提供高质量的影像诊断，具有临床指导意义。

PU-2780

The comparison between reference point selections when using automated computer-aided detection of stenosis severity in CCTA

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OBJECTIVES: This study sought to compare the accuracy between proximal reference point and double reference point when automated computer-aided detection (CAD) software was used to detect 70% stenosis in coronary computed tomography angiography (CCTA).
METHODS: Retrospective included 57 patients who both underwent CCTA and invasive coronary angiography. All CCTA data sets were analyzed using AW4.6 product, a stand-alone image analysis and review station. The proximal and double reference points were selected and corresponding reference diameter values were obtained. Finally, the

performance of the two references was compared. The invasive coronary angiography was the reference standard. **RESULTS:** Of the 57 patients, 178 vessels were analyzed. For patient-based analysis, the proximal reference yielded 91.67% sensitivity, 85.71% specificity, 91.67% positive predictive value (PPV), and 85.71% negative predictive value (NPV) while those of double reference were 88.89% sensitivity, 90.48% specificity, 94.12% PPV, and 82.61% NPV. On per-vessel analysis, the sensitivity, specificity, PPV and NPV were 83.08%, 94.69%, 90.00% and 90.68% in proximal reference and 84.62%, 94.69%, 90.16% and 91.46% in double reference. There was no significant difference in the two reference selections (All P > 0.05).
CONCLUSION: When using automated computer-aided detection to analysis 70% stenosis in CCTA, there was no difference between the proximal reference and double reference selection both in patient-based and vessel-based evaluation.

PU-2781
冠状动脉 CTA 在急性冠脉综合征中的应用价值

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摘要：目的：探索冠状动脉 CT 血管造影(CTA)评价急性冠脉综合征(ACS)患者行冠状动脉介入治疗术前及术后的应用价值。**方法：**回顾性分析 118 例行冠状动脉介入治疗术的 ACS 患者资料，以数字血管减影造影(DSA)作为评价金标准，分析 CTA 诊断 118 例 ACS 患者介入术前冠状动脉狭窄程度分级准确性；并根据介入治疗术后 6 个月内是否发生支架内再狭窄(ISR)情况分为 ISR 组(n=18)及对照组(n=100)。评价冠状动脉 CTA 诊断术后 ISR 分型的准确性，并对比两组冠状动脉 CTA 定量参数的差异性。**结果：**118 例 ACS 患者介入治疗术前经 DSA 确诊 236 支粥样硬化冠状动脉，CTA 对冠状动脉狭窄程度分级诊断准确率为 88.56%(209/236)，对介入治疗术后 ISR 分型诊断准确率为 86.44% (102/118)。介入治疗术后 ISR 组管腔内密度衰减梯度—校正值(TAG-CCO)水平以及 CT 血流储备分数(FFRCT)均明显低于对照组，差异均具有统计学意义($P<0.05$)。**结论：**冠状动脉 CTA 对 ACS 患者介入治疗术前血管狭窄程度能够进行准确分级，并对于 ISR 患者在术后随访中能够作出早期定量与定性的评价。对于临床科室制定合理介入治疗方案、改善患者预后提供重要的影像资料。

PU-2782
不同浓度对比剂在能谱 CT 冠状动脉成像中的对比研究

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目的 利用能谱 CT 探讨冠状动脉 CT 血管成像（CCTA）不同浓度对比剂对冠状动脉管腔内 CT 值高低，冠状动脉图像质量，以及冠状动脉斑块局部显示的影响。
方法 将临床怀疑或诊断为冠状动脉性心脏病的连续病例 90 例随机分为 A、B、C 三组，每组 30 例；所有病例都用能谱 CT 进行 CCTA 检查，所用对比剂总量按 1.0ml/kg体重计算，对比剂流速依据患者静脉血管情况使用 3.5~5.0ml/s，采用智能触发曝光技术扫描，管电压均为 100kV，采用智能管电流技术，A 组病例使用对比剂浓度为 270mgI/ml，B 组为 300mgI/ml，C 组为 350mgI/ml。利用能谱后处理工作站分别测量每例病例冠状动脉的最佳对比噪声比（CNR），得到最佳单能量点(keV)；分别在最佳单能量图像上的升主动脉根部、左主干以及右侧冠状动脉近段的三个不同水平

及冠脉斑块设置感兴趣区（ROI），测量上述各处冠脉管腔内平均 CT 值、图像噪声（SD）、信噪比（SNR）以及斑块局部图像质量（SNR、CNR），并对≥1.5 mm的冠脉节段图像质量进行评分。
结果 对 90 例病例共 1152 个冠脉节段进行了图像质量评分，其中 1146 段（99.5%）满足诊断要求，共发现不同性质斑块 382 处（A 组 140 处，B 组 98 处，C 组 144 处），其中钙化斑块 313 处（A 组 112 处，B 组 103 处，C 组 98 处），非钙化斑块 69 处（A 组 26 处，B 组 22 处，C 组 21 处）；与 B、C 组相比，A 组的对比剂浓度分别降低了 10.0%、22.9%；三组间最佳单能量点、最佳 CNR、管腔 CT 值、SD、SNR、图像质量评分、斑块局部显示质量差异均无统计学意义（$P>0.05$）。
结论 冠状动脉 CT 能谱成像时，应用 270mgI/ml 对比剂浓度，不仅可以降低患者对比剂肾病的发生率，而且可以保证冠脉管腔增强效果以及冠脉图像质量。

PU-2783

Age difference in association of coronary atherosclerosis progression and cardiac events stratified by age: evaluation by CT angiography in patients with suspected coronary artery disease

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Background and aims: We sought to investigate the age difference in predictive value of coronary atherosclerosis progression for major adverse cardiac events (MACE), assessed by serial coronary CT angiography (CCTA).
Methods: In this IRB-approved retrospective study, we investigated 1062 patients (63.0% male; mean age 54.1 ± 9.7 years) with suspected coronary artery disease (CAD) who had undergone repeat CCTA. Average time between CCTA scans was 2.4 years. Coronary atherosclerosis was semi-quantitatively assessed by 1) calcified plaque score, 2) non-calcified plaque score, 3) mixed plaque score, 4) total plaque score describing plaque distribution and extent. Incidence of MACE was assessed. Statistical analysis was performed using Cox proportional hazard models.
Results: The mean patient follow-up period was 5.0 ± 1.2 years. MACE as a composite endpoint of cardiac death, nonfatal myocardial infarction, hospitalization due to unstable angina, and coronary revascularization occurred in 148 (13.9%) patients. There were plaque progression in calcified plaque, non-calcified plaque, mixed plaque and total plaque in all patients . The progression of non-calcified plaque score (HR = 3.92, $p < 0.001$) and mixed plaque score (HR = 1.23, $p = 0.043$) were independently associated with MACE. There were having statistically significant associations in all age group between the progression of non-calcified plaque score and incidence of MACE (all $p < 0.005$).
Conclusions: Coronary atherosclerosis progression as assessed by repeat CCTA had difference in age, and had predictive value for MACE and might aid in risk stratification and management of patients with CAD.

PU-2784

Relationship of the Duke jeopardy score combined with minimal lumen diameter as assessed by computed tomography angiography to the hemodynamic relevance of coronary artery stenosis.

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Objectives: To study the diagnostic performance of the ratio between the Duke jeopardy score (DJS) and the minimal lumen diameter (MLD) (DJS/MLDCT ratio) as assessed by coronary computed tomographic angiography (CTA) for differentiating functionally significant from non-significant coronary artery stenoses, with reference to invasive fractional flow reserve (FFR).

Methods: Patients who underwent both coronary CTA and FFR measurement during invasive coronary angiography (ICA) within 2 weeks were retrospectively included in the study. Invasive FFR measurement was per- formed in patients with intermediate to severe coronary stenosis. DJS/MLDCT ratio and anatomical parameters were recorded. Lesions with FFR ≤0.80 were considered to be functionally significant.

Results: One hundred and sixty-one patients with 175 lesions were included into the analysis. Diameter stenosis in CT, area stenosis, plaque burden, lesion length (LL), ICA-based stenosis degree, DJS, LL/MLD4 ratio, DJS/MLA ratio as well as DJS/MLD ratio were all significantly different between hemodynamically significant and non-significant lesions ($p < 0.05$ for all). ROC curve analysis determined the optimal cut-off value for DJS/MLDCT ratio to be 1.96 (area under curve = 0.863, 95 % confidence interval = 0.803 - 0.910), yielding a high diagnostic accuracy (86.9%, 152/175).

Conclusions: In coronary artery stenoses detected by coronary CTA, the DJS/MLD ratio is able to predict hemodynamic relevance.

PU-2785

多排螺旋 CT 的冠脉 CTA 及心肌灌注的临床应用

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[摘要]多排螺旋 CT 的技术发展及临床应用的普及，使得冠脉 CTA 与心肌灌注联合“一站式”成像，对于心肌缺血等相关疾病进行诊断，本文章主要阐述冠脉 CTA 及 CTP 的成像方法、处理分析方法及心脏 CT“一站式”成像的临床应用、治疗对比。

PU-2786

IBR 技术纠正冠脉 CTA 血管飘移伪影与冠脉 DSA 对比研究

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目的：分析宝石能谱 64 排螺旋 CT 冠状动脉 CTA 血管成像中冠状动脉飘移伪影纠正后与冠脉 DSA 的影像对比研究。
方法：选取我院 2014 年 4 月到 2019 年 4 月行冠状动脉 CTA 检查均有冠状动脉飘移伪影的 50 例患者，全部患者后续均行 DSA 检查，按冠脉 CTA 图像质量评分标准分组，狭窄程度与 DSA 进行比较分析。
结果：CTA 显示血管 200 支（693 节段），运动伪影血管 66 支（108 节），运动伪影 155 处；CTA 判读重度狭窄 2 处，中度狭窄 5 处，轻度狭窄 11 处，轻微狭窄 17 处，无狭窄 120 处。

结论：IBR 技术对各种原因引起不同程度的运动伪影均有良好且可靠的修复能力，纠正后狭窄程度与 DSA 判读无显著差异。

PU-2787
下腔静脉肝段缺如伴奇静脉回流、主动脉后型左肾静脉复杂畸形一例

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患者女，56 岁，因早期肺癌筛查于我院行低剂量胸部 CT 检查，发现奇静脉异常扩张，继而行胸腹部联合 CT 增强扫描。既往体健，查体无明显胸闷、气急、紫绀等症状，曾因脊柱侧弯行腰椎内固定术，无其他胸腹部手术史。

MSCT 增强示下腔静脉肝段缺如，下腔静脉收受肾静脉血后，连接右侧明显扩张的奇静脉，沿脊柱右缘于上腔静脉入右心房前，开口于上腔静脉；三支肝静脉汇合后直接汇入左心房；左侧肾静脉走行于腹主动脉后方汇入下腔静脉，管腔略受压；肾静脉水平以下腔静脉走行正常、管腔增粗；胃后方、左肾外侧见 6 个软组织结节，并可见自每个结节发出的独立血管与门静脉汇合；胰腺体尾部发育不良。本院心脏超声提示左室舒张功能下降，二、三尖段轻度返流。

影像诊断：下腔静脉肝段缺如伴奇静脉回流、主动脉后型左肾静脉复杂畸形，合并多脾、短胰。

讨论 先天性下腔静脉畸形相当少见，其发病率约为 0.2%-0.5%。目前多数文献将其分为 6 类：（1）下腔静脉肝段缺如；（2）环主动脉左肾静脉；（3）主动脉后左肾静脉；（4）双下腔静脉；（5）左位下腔静脉；（6）腔静脉后输尿管或环下腔静脉输尿管；多种畸形可联合发生。本例就是下腔静脉肝段缺如伴奇静脉回流、主动脉后型左肾静脉联合畸形，并且合并有多脾、短胰多脏器发育畸形。下腔静脉肝段缺如，奇静脉系统因引流腹部和下肢的血流导致增粗，突出的奇静脉弓在 X 线平片上易被误诊为纵隔占位，并且该畸形存在深静脉血栓和肺栓塞的高风险；主动脉后型左肾静脉可造成左肾静脉受压、回流受阻，产生后胡桃夹症状；均需特别警惕。另外，临床上很多患者因无明显症状容易被忽视，但是在外科手术时，尤其是涉及心脏、肝脏、下腔静脉的手术，需要特别注意这些畸形的存在，准确了解解剖关系，以避免灾难性后果的发生。MSCT 清晰显示下腔静脉及分支的畸形并准确诊断尤为重要，对临床诊疗具有积极指导意义。

PU-2788
主动脉夹层累及右侧第 3 肋间后动脉与右支气管动脉共干

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患者男，64 岁，以突发胸背疼痛 8 小时来我院就诊，无明显诱因突然出现胸部撕裂样疼痛。既往史：11 年前曾因“瓣膜病”行主动脉瓣置换术，10 年前因“升主动脉夹层”行升主动脉置换术；全程 CTA 扫描示：升主动脉冠窦宽约 58mm，窦管交界宽约 41mm，升主动脉中段宽约 39mm，主动脉于头臂干分叉以远至双侧髂总动脉管腔呈双腔样改变；假腔较大，

密度较低，较大破口位于主动脉弓左侧壁，宽约 12mm，距离左锁骨下动脉开口月 25mm。头臂干及左锁骨下动脉受累及呈双腔改变，于主动脉弓降部右侧壁见一血管影（右侧第 3 肋间后动脉与右支气管动脉共干）管腔呈双腔改变，以远管腔沿脊柱向上走行，较远管腔未见明显显示，近端管腔局限性略增粗，直径约 8mm。

CTA 诊断示：Ⅲ型主动脉夹层，弓上三大分支受累及，右侧第 3 肋间后动脉及右支气管动脉共干受累及并夹层形成。

我院收住院主动脉夹层病人数千例，均未见肋间动脉及支气管动脉共干受累及呈双腔夹层改变，以往主动脉 CTA 检查，右侧第 3 肋间后动脉及右支气管动脉共干很少显示，或显示未见受累及，很多情况是：支气管动脉起始部以远的肋间隙动脉起始部局限性血池改变，复查部分可吸收。

PU-2789
心脏磁共振评价化疗药物所致心脏毒性的研究进展

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化疗药物很大程度的延长了癌症患者的生存期，但是其导致的心脏毒性改变不容忽视。心脏磁共振（Cardiovascular Magnetic Resonance Imaging，CMR）是评估心脏毒性的金标准，它不仅能早期发现心肌功能的异常，并能识别癌症幸存者治疗相关的心脏毒性的过程，还能全面评估心血管功能的改变。越来越多的新技术应运而生，如：心肌形变成像（Myocardial Strain，MS）可在心室射血分数出现明显异常之前观察到整体和局部的早期心肌功能异常；相位对比-CM 能通过测量脉冲波速度和主动脉扩张性无创的评估主动脉的流速及僵硬程度；早期强化可识别化疗引起的早期的心肌炎及心肌水肿，延迟强化可无创的识别心肌纤维化；T1 mapping 和细胞外容积分数（EVC）直接量化心肌纤维化的范围以及程度；T2 mapping 不仅能反映由如心肌水肿或铁离子沉积引起的横向弛豫时间的改变，还能区别视觉上不敏感的水肿；T2*WI 可能能够非侵入性的监测由化疗等引起的心肌的铁过载。上述磁共振技术联合临床指标（如肌钙蛋白及脑利钠肽）可以准确的评估心脏功能早期的异常改变及程度，指导临床早期干预治疗，降低癌症患者心脏毒性的发病率，延长患者的有效生存期。

PU-2790
CMR-PSIR MOCO 序列在扩心病患者中的诊断价值

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目的：探讨心脏磁共振心肌延迟强化序列（PSIR-MOCO）在扩心病患者中的诊断价值
方法：纳入 2018 年 2 月~2019 年 5 月在我院行心脏磁共振检查的心衰患者 57 例，按标准扫描方案，在完成心肌首过灌注 12~20 分钟后行心肌延迟扫描。所有患者均行 PSIR-MOCO 和常规节段采集心脏延迟增强(segmented-PSIR)完成左心室短轴扫描。比较两种序列图像的质量，采用国际心脏 17 节段分析法，比较两种序列图像心肌显示的一致性。
结果：所有患者均成功完成所有扫描。PSIR-MOCO、segmented-PSIR 的信噪比分别为 55.23±12.35,41.38±17.64，两种序列采集的心肌延迟强化图像对比度噪声比差异有统计学意义（$P<0.05$）；主观评分分别为 4.25±0.48、3.39±1.58；差异有统计学意义（$P<0.05$）；心肌纤维化评价中，16 例 segmented-PSIR 图像由于运动伪影无法诊断，其余 41 例患者的纤维化评价两者的一致性差异无统计学意义。

结论：PSIR-MOCO 序列在评价心肌纤维化程度时与常规的分段采集（segmented—PSIR）有高度一致性，且图像质量高于 segmented-PSIR，可以避免 segmented—PSIR 容易产生的运动伪影，图像稳定性高；在扩心病患者的磁共振扫描中尤其明显。

PU-2791

IQon Spectral CT 心肌灌注虚拟单能图像与 SPECT 心肌灌注显像的对照研究

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目的：能谱 CT 可以得到虚拟单能图像，由于更准确地诊断心肌缺血；由于以往 CT 在低能级图像时信噪比较低，而 IQon Spectral CT 可以在 40kev 虚拟单能图像中有较高的信噪比及对比噪声比，提升了图像质量。在本次研究中，我们通过比较 SPECT 心肌灌注显像作为参考标准来评估光谱 CT 在心肌缺血中的诊断价值。
方法：回顾性分析 23 例心脏静息灌注发现显著狭窄并在 1 个月内接受 SPECT 心肌灌注的患者。评估 40kev 虚拟单能图像对于诊断心肌缺血的诊断价值。
结果：IQon Spectral CT 心肌灌注虚拟单能图像诊断心肌缺血的灵敏度、特异度、阴性预测值、阳性预测值和总体准确度分别为 91%, 67%, 67%, 91% 和 86%（P<0.05）.
结论：以 SPECT 心肌灌注作为参考标准，CT 心肌灌注虚拟单能图像诊断心肌缺血有良好的诊断效能。

PU-2792

A Comprehensive Mapping and Strain Assessment in Idiopathic Inflammatory Myopathies Patients with Preserved Left Ventricular Ejection Fraction

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Purpose: *The aim of the study was to evaluate the role of comprehensive cardiac magnetic resonance (CMR) mapping and strain analysis in the early diagnosis of cardiac involvement in idiopathic inflammatory myopathies (IIM) patients with preserved left ventricular ejection fraction (LVEF).*
Methods: *Thirty-eight consecutive IIM patients who underwent CMR examination at our institution were retrospectively included. Twenty-three age-matched healthy individuals served controls. Parameters including native T1, extracellular volume (ECV), T2 mapping, global radial strain (GRS), global circumferential strain (GCS), global longitudinal strain (GLS) were measured semi-automatically using a dedicated processing software. All the mapping and strain parameters were compared between patients and controls.*
Results: *LGE was only present in IIM patients (n=17, 44.7%). IIM patients showed higher native T1 (1346ms vs 1269ms, p*<0.001), expanded extracellular volume (ECV) (31.1% vs 27.4%, *p*<0.01), T2 (44.4ms vs 39.2ms, *p*<0.001) values and lower global

radial strain (GRS) (36.7% vs 46.9%, p<0.001), global circumferential strain (GCS) (-21.2% vs -24.1%, p<0.01), and global longitudinal strain (GLS) (-13.6% vs -15.6%, p<0.05) values as compared with controls. The alteration of all the mapping and strain values were independent of the LGE status. The most of abnormal values beyond the 95% percentile of controls was observed for T2 value (73.6%).

Conclusions: *IIM patients demonstrated higher T1, ECV, T2 values and lower GRS, GCS, GLS values compared with healthy controls, independent of LGE status. T2 showed to be the most useful in the early detection of myocardial involvement in IIM patients.*

PU-2793

心脏磁共振 T1 mapping 和特征追踪技术定量评价肥厚型心肌病患者心肌纤维化和形变的初步研究

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目的：探讨心脏磁共振（CMR）T1 mapping 和特征追踪（FT-CMR）技术定量肥厚型心肌病（HCM）患者心肌纤维化和心肌形变的诊断价值及其相关性。

方法：本研究共纳入 25 名 HCM 患者和 28 名健康志愿者行 1.5-T 心脏磁共振检查。CMR T1 mapping 扫描采用改良的 Look-整体纵向（GLS）、周向（GCS）和径向（GRS）心肌收缩应力。比较 HCM 组和对照组的 T1 值、ECV 值和心肌收缩应变的差异，并分析其相关性。

结果：HCM 患者的左室整体心肌平均初始 T1 值和 ECV 值均高于对照组，差异有统计学意义[初始 T1 值：（1047.3±43.7）ms vs.（1013.8±26.9）ms，p=0.001；ECV 值：（28.2±4.7）% vs.（24.0±1.9）%，p<0.001]。HCM 患者的左室 GLS 和 GCS 均低于对照组，差异有统计学意义[GLS：（-13.6±3.7）% vs.（-16.9±1.9）%，p<0.001；GCS：（-16.3±4.8）% vs.（-19.2±2.7）%，p=0.011]。多变量回归分析显示 HCM 患者性别和 GRS 与左室心肌 ECV 均存在独立相关性（性别：标准化β=0.429，p=0.012；GRS：标准化β=-0.471，p=0.007）。与初始 T1 时间和心肌应力相比，ROC 曲线分析示心肌 ECV 对 HCM 诊断价值最大（AUC=0.846，p<0.001），ECV 诊断 HCM 的敏感性、特异性、阳性预测值（PPV）和阴性预测值（NPV）分别为 80.0%、85.7%、83.3%和 82.8%。

结论：HCM 患者的心肌初始 T1 值和 ECV 增高，与心肌弥漫性纤维化有关。HCM 患者与对照组比较 EF 正常而 GLS 和 GCS 降低，提示心肌应力比 EF 能更早地反映心功能受损。HCM 患者的心肌纤维化与性别和 GRS 相关。相对于初始 T1 时间和心肌应力，心肌 ECV 诊断 HCM 的价值较大。

PU-2794

食管癌伴心肌及骨骼肌转移：病例报道

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男，41 岁，进食梗噎感 3 周，外院胃镜显示距门齿 25-33cm 食管鳞状细胞癌，右锁骨上淋巴结穿刺活检证实为转移性浸润性低分化癌。SCC：1.7ng/ml。

胸部增强 CT 发现食管旁 8 组淋巴结肿大伴中央坏死，同时发现室间隔及右室心尖部壁增厚呈团块样，奇静脉可疑侵犯，继续随访，20 天后行第 4 次辅助化疗，出现乏力头晕，化疗结束后 20 天，诉右小腿肿块约 6cm*4cm 大小肿块，部位较深，质硬，活动性较差，有压痛。行 MRI 检查发现比目鱼肌内结节，随后行软组织穿刺活检，心脏超声及 MRI 检查显示心肌肿块增大伴大量心包积液，放

弃治疗出院，超声显示右侧小腿后外肌层内低回声团块伴液化及钙化，MRI 增强扫描右小腿中段外侧比目鱼肌内肿块，T2WI 成不均匀高信号，T1WI 显示少许不成熟钙化及坏死，增强后肿块明显不均匀强化并见与肌肉分界清晰，筋膜少许水肿。随后行超声引导下右小腿肿块穿刺，病理提示转移性鳞状细胞癌。PET-CT 示食管癌放化疗后，食管壁糖代谢未见明显增高；纵隔淋巴结转移（累及右胸膜）、右小腿肌肉转移；左心室区低密度灶、糖代谢异常增高，考虑转移可能大，心包少量积液；右肺下叶转移结节。心脏 MRI 增强显示室间隔前下部约 4.1cm×4.7cm 肿块，T1WI 黑血序列成等低信号，T2WI 抑脂序列成不均匀稍高信号，灌注增强显示肿块内少许持续灌注强化，范围逐渐扩大，延迟后成等信号，肿块与心肌分界不清，压迫双室心尖部致充盈不良，患者无相应症状。室间隔内肿块于半年内明显增大，体积增加至 4 倍。文献报道食管癌心肌转移罕见，骨骼肌内转移偶见报道，超声检查可明确肿块部位，心脏磁共振检查对于肿块与心肌及心包的关系显示更清晰。

PU-2795

Remodeling of Left Atrial in Hypertrophic Cardiomyopathy Patients Influenced by Atrial Fibrillation, a polit study

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Purpose

To evaluate remodeling and dysfunctional of left atrial (LA) in hypertrophic cardiomyopathy (HCM) patients influenced by secondary atrial fibrillation (AF), and identify the diagnostic value of LA remodeling and dysfunction to AF.

Materiel and methods

We retrospectively enrolled 46 HCM patients (mean age 59.02±11.99 years) including 13 patients who were diagnosed with atrial fibrillation and 23 healthy people (mean age 53.78±10.40 years). All of them underwent CMR imaging on 3.0T. All data was indexed to body surface area.Diagnostic value of LA parameters to atrial fibrillation was performed by ROC curve analysis.

Results

1. LAVmaxi, LAVpre-Ai, LAVmini were greater in HCM patients than healthy volunteers (57.91±19.90ml/m^2 vs 41.05±12.96ml/m^2; 46.81±19.83ml/m^2 vs 27.44±9.41ml/m^2; 31.86±19.02ml/m^2 vs 17.09±7.07ml/m^2), while LAEF-T, LAEF-P, LAEF-A were lower in HCM patients (45.30±14.78% vs 58.34±9.05%; 20.91±10.56% vs 32.70±10.51%; 30.96±14.81% vs 38.22±9.39%).

2. Patients with atrial fibrillation showed greater LAVmini (58.83±47.94ml/m^2 vs 27.49±16.41ml/m^2,) but lower LAEF-T and LAEF-A (34.36±16.60% vs 49.52±12.68%,; 21.83±15.02% vs 35.30±14.00%,). ROC curve showed excellent diagnostic value of LAVmini, LAEF-T, LAEF-A to atrial fibrillation, area under the curve is 0.78, 0.77, 0.75 respectively.

Conclusion

This study evaluated multi-paremeters of LA in HCM patients, showed the feasibility of CMR to evaluate LA remodeling and dysfunction comprehensively and precisely, and this study also showed the remodeling and dysfunction of LA in HCM patients was influenced by secondary atrial fibrillation. There is a good clinical application prospect of study in LA by CMR.

PU-2796
联合 TPAT 单次屏气心脏电影序列在增强后扫描的应用价值初探

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目的：1.探讨增强后的 SSFP 电影结合 TGRAPPA 技术在测量左心室功能上的准确性及图像质量。2.研究增强 SSFP 电影结合 TGRAPPA 技术出现早期强化的节段与出现延迟强化的节段的相关性。
材料与方法：收集行增强心脏 MR 检查的患者 75 名，所有患者均行增强前 SSFP 结合 TGRAPPA 技术全心短轴位电影检查和延迟增强检查。随机选取其中 29 名患者测量并比较 SSFP 电影结合 TGRAPPA 技术增强前后的左心室射血分数、舒张末期容积指数、收缩末期容积指数及心搏量的变化。选取乳头肌水平图像进行图像质量评价、图像信噪比 SNR 及 CNR 分析。采用配对 t 检验分析增强前后 TGRAPPA 测量的心功能指标、SNR 及 CNR 的变化。采用 Wilcoxon 符号秩和检验分析增强前后的图像质量评分。筛选心脏磁共振相位敏感反转恢复序列中出现延迟强化的病例 65 例，根据发病机制分为非缺血性心肌病、心肌炎、急性心肌梗死 3 组，将 TGRAPPA 序列中出现早期强化节段数和 PSIR 中出现延迟强化的节段数行 kappa 一致性分析。
结果：1.SSFP 电影结合 TGRAPPA 技术在增强前、后测得的左室功能参数如 EF、EDVI、ESVI、SV，经统计学分析，各指标在增强前后无明显统计学差异。图像质量分析中，心肌和血池的 SNR 增加，心肌和血池之间的 CNR 下降。图像质量评分中，增强后图像的伪影变化不明显（P>0.05），增强后的图像仍然具有诊断价值。2.在强化节段 kappa 一致性分析中，病人全体、非缺血性心肌病、心肌炎、急性心肌梗死组的 kappa 值分别是 0.705、0.601、0.807、0.923。
结论：1.增强后 SSFP 电影序列结合 TGRAPPA 可以准确完成左心功能的定量分析。2.增强后 SSFP 电影序列结合 TGRAPPA 中出现的早期强化征象对出现延迟强化的节段有提示作用，可指导针对性扫描。

PU-2797
The performance of First-Pass Myocardial Perfusion MR Image Sequences with motion correction reconstruction

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Objective

Our study is to investigate the clinical value of combining nonrigid motion correction reconstruction method with CMR first-pass myocardial perfusion by assessing quantitative parameters and image quality.

Materials and methods

A dynamic-contrast-enhanced magnetic resonance imaging consists of many frames were acquired with contrast injection. A automatic reconstruction algorithm was applied to

generate motion corrected perfusion images. The noise, contrast-to-noise ratios (CNRs) and signal-to noises (SNRs) of MR perfusion images with (moco) and without (nonmoco) motion correction were measured and compared. The distance of lateral and longitudinal movement of interventricular septum, as well as quantitative perfusion parameters (including slope, Timemax and maxSI) in moco and non-moco images were recorded and compared, respectively. All the frames and time-intensity curves from moco and nomoco images were subjectively evaluated.
of moco and non-moco images from automatical tracking and expert drawn

Results
A dataset comprising 60 slices images from 10 patients were included ($n_{nomoco}=n_{moco}=30$). There was no significant difference in SNRs and CNRs between moco and nomoco images(all $p>0.05$). The distance of lateral movement of IVS in moco images were significantly higher than this in non-moco images (6.24±3.22mm vs. 3.68±1.42mm, $p<0.05$). When using motion correction reconstruction, there was no significant difference in TimeMax ($p=0.069$) and MaxSI ($p=0.055$) between automatical tracking and expert drawn methods. As well as, motion artifacts due to diaphragmatic drift and the patient’s inability or non-compliance to hold breath are eased obviously, and quality of time-intensity curves were significantly improved. But quantitative perfusion parameters were significantly different in nomoco images when expert drawn methods was used.

Conclusions

MR perfusion image combining with motion correction reconstruction could generate accurate parameters by automatical tracking without relying on expert drawn, it is convenient and reliable tool to quantitatively evaluate myocardial perfusion. .

PU-2798

The Application Value of Multi-modal MRI in Assessment of Myocardial Edema in Patients with End-stage Renal Disease

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PURPOSE

ESRD patients are highly prevalent cardiovascular risk. ME occurred in various cardiovascular disease and precipitate myocardial fibrosis and arrhythmia in ESRD patients, and ultimately lead to heart failure or cardiac death. The study is to compare the effectiveness of native T1 mapping、T2 mapping and conventional T2-weighted imaging (T2WI) in the detection of myocardial edema in patients with end stage renal disease, and further explore clinical value of ME in early diagnosis of myocardial injury.

METHOD AND MATERIALS

Seventy hemodialysis ESRD patients and 16 age- gender-matched healthy volunteers were prospectively enrolled and underwent CMR. All the parameters from CMR, including native T1 values,T2 values, T2 SI ratio, were measured (cmr42; Circle Cardiovascular Imaging Inc.; Calgary; Canada) and compared. Receiver operating characteristic analysis was performed to determine whether T2 values could be used in discriminating myocardial edema between ESRD patients and normal subjects.

RESULTS

The global T2 and native T1 values of ERSD patients were higher than normal controls (all P<0.05). But there was nosignificant difference in T2 SI ratios between two groups (p=0.146). The myocardial native T1 and T2 values of ESRD patients with preserved and decreased LVEF were both higher than those of normal controls (p<0.05), but there was no significant difference between the two groups in native T1 and T2 values. There was no significant difference between the three groups in T2 SI values (p=0.366). Moreover, the global T2 values of patients with MF and without MF were higher than normal controls (43.69±3.62, 41.82±3.43 v.s 38.79±3.69ms, respectively, all P<0.05). The global T1 values of ERSD patients with MF was highest among three groups (1286.12±52.60 v.s 1321.02±56.65, 1356.79±40.08ms, respectively, all P<0.05),but no statistical difference were found between normals and patients without MF. There were no significant difference in T2 SI ratios among three groups (p=0.311). In ESRD with MF , the proportion of left ventricular dysfunction (19, 52.8%) was higher than that in the ESRD without MF (8, 23.5%). By ROC analysis, T2 values exhibited a higher diagnostic accuracy for detecting ME than did native T1 or T2 SI values (0.83 vs. 0.67 and 0.63,all p<0.05). A cutoff value for global myocardial T2 of >= 41.94ms provided a sensitivity and specificity of 73.5% (52.0-85.8%) and 87.5% (61.7-98.4%) for ME in ESRD patients, respectively.

CONCLUSION

The myocardial pathological changes in patients with end stage renal disease were complex. The multiple cardiac magnetic resonance sequence demonstrated that myocardial edema exited in patients with ESRD patients. The CMR T2 mapping technique has a higher accuracy in quantifying the myocardial edema in patients with end stage renal disease compared with native T1 mapping and conventional T2WI.

PU-2799

心脏磁共振技术评价老年 2 型糖尿病无合并症患者各冠状动脉区域左心室肌 T2*值定量研究

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目的 采用心脏磁共振（cardiac magnetic resonance, CMR）定量评价老年 2 型糖尿病（type 2 diabetes mellitus, T2DM）无合并症患者各冠状动脉供血区域左心室肌 T2*值的临床研究。方法 前瞻性搜集老年 T2DM 无合并症患者（年龄≥60 岁，男性 7 例，女性 10 例）、非老年 T2DM 无合并症患者（年龄＜60 岁，男性 18 例，女性 19 例）、以及健康老年对照组（年龄≥60 岁，男性 5 例，女性 7 例），并记录老年 T2DM 无合并症患者的糖尿病病程及体重指数，采用 CMR T2*Mapping 序列对上述纳入对象进行左心室短轴位扫描。比较上述 3 组纳入对象之间左前降支、左回旋支、右冠状动脉供血区域左心室肌 T2*值的差异，并分析左心室各冠状动脉供应节段心肌 T2*值与糖尿病病程及体重指数有无相关性。结果 老年 T2DM 组左回旋支供应区域左心室肌 T2*值低于健康老年对照组，差异有统计学意义（P=0.017），其余老年 T2DM 组与非老年 T2DM 组、健康老年对照组左前降支、右冠状动脉动脉供血区域左心室肌 T2*值差异无统计学意义（P＞0.05）；老年 T2DM 无合并症患者左心室肌 T2*值与糖尿病病程及体重指数无相关性（P＞0.05）。结论 老年 T2DM 组左回旋支供应区域心室肌 T2*值降低，提示心肌可能缺血缺氧。

PU-2800
基于冠状动脉 CTA 的影像组学列线图预测心肌缺血的应用价值

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目的：基于冠状动脉 CTA 图像，建立并验证一种预测心肌缺血的影像组学列线图。
方法：回顾性分析 261 例同时行冠状动脉 CTA 及 ATP 负荷-静息门控心肌灌注显像检查的患者资料，将所有患者分为训练组（n=143）和验证组(n=33)。选取每例患者冠脉 CTA 的原始增强横断面图像导入 GE 公司的 CQK 软件进行全心肌自动切割并提取纹理特征，然后对训练组数据使用最小绝对收缩与选择算子算法（LASSO）进行降维后建立影像组学标签，结合临床相关因素，使用多变量逻辑斯回归构建心肌缺血预测模型并生成可视化影像组学列线图，列线图的诊断准确性在训练组中使用 ROC 曲线评估并在验证组中进行验证，最终基于训练组和验证组数据使用列线图计算预测值并与心肌灌注显像结果进行统计学分析以验证临床实用性。
结果：从冠状动脉 CTA 动脉期图像中共提取了 328 个纹理特征，使用 LASSO 算法降维后筛选出 9 个价值较大的特征，其中共生矩阵 4 个、游程矩阵 3 个、形态学特征 2 个。使用多因素逻辑斯回归构建包含了管腔狭窄度和影像组学标签的预测模型并制作列线图，列线图预测心肌缺死的准确率在训练组和验证组中分别为 0.893 和 0.835，评估列线图、影像组学标签和管腔狭窄度在所有患者中的准确性分别为 0.873、0.801 和 0.683。基于列线图区分的高风险组与低风险组中的心肌缺血患者数差异无统计学意义（P>0.05）
结论：基于冠脉 CTA 图像构建的影像组学列线图是一种无创性预测心肌缺血工具，可以对心肌缺血具有良好的预测准确性

PU-2801
The Value of Low-Dose Dynamic Myocardial Perfusion CT for Accurate Evaluation of Microvascular Obstruction in Patients With Acute Myocardial Infarction.

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OBJECTIVE. The purpose of this study was to investigate the diagnostic performance of quantitative parameters generated from dynamic myocardial perfusion CT for assessment of acute myocardial infarction (AMI) and microvascular obstruction (MVO) using cardiac MRI as a reference standard. SUBJECTS AND METHODS. Patients who underwent successful reperfusion treatment within 1 week after AMI between January 1, 2018, and May 31, 2018, were prospectively enrolled. All patients were referred for cardiac MRI and dynamic myocardial perfusion CT on the same day. Various quantitative parameters and late iodine enhancement (LIE) were analyzed for the evaluation of AMI and MVO using cardiac MRI findings as a reference standard. RESULTS. Twenty-seven patients with 442 vascular segments were ultimately included in the analysis. The mean radiation doses +/- SD for dynamic myocardial perfusion CT and LIE were 3.3 +/- 1.1 mSv and 2.0 +/- 0.6 mSv, respectively. Myocardial blood flow (MBF) was significantly lower in segments with MVO than in those without MVO and in reference segments (23.08 +/- 7.95 mL/min/100 mL vs 44.60 +/- 14.97 mL/min/100 mL and 75.07 +/- 7.34 mL/min/100 mL; $p < 0.001$). According to ROC curve analysis, MBF had the largest AUC of all parameters for identifying AMI with and without MVO as determined by late gadolinium enhancement (LGE) (AUC = 0.941 and 0.996; $p < 0.001$). The diagnostic accuracy of MBF-based assessment for identifying MVO was 99.2%, which outperformed other quantitative parameters and LIE. We found good correlation between the AMI area and MVO area estimated by MBF and LGE ($r = 0.95$ and 0.99; $p < 0.001$). CONCLUSION. MBF derived from dynamic myocardial perfusion CT is accurate and outperforms other quantitative parameters and LIE in diagnosis of AMI and MVO. Area of AMI and MVO can also be accurately estimated using MBF.

PU-2802
心肌 T1、T2 mapping 及细胞外容积在急性心肌梗死诊断中价值

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目的 探讨心肌 T1、T2 mapping 技术和细胞外容积在急性心肌梗死中的诊断价值。**方法** 采用西门子 1.5TAera 磁共振扫描仪对 12 例急性心梗的患者行心肌 T1、T2 mapping 序列和延迟灌注检查，将扫描图像输入到 syng MR D13 后处理工作站，在 T1 、T2mapping 图手动画取延迟强化节段(梗死核心区)兴趣区并计算强化前后 T1 、T2 值及血池增强前后 T1 值，以临近层面相应节段未强化区域为对照组，同样方法计算该域强化前后 T1 值及血池 T1 值，计算两组的细胞外分数，采用 t 检验和 ROC 曲线进行分析。
结果:阳性节段区域初始 T1 值(1320.0±28.4)ms 大于阴性节段区域初始 T1 值(1196.8±27.0)ms（P<0.001），阳性节段区域 T1 值下降较阴性节段更明显，两者细胞外容积分别为(38.7±2.1)%、(24.8±2.5)%（P<0.001）；阳性节段 T2 值为(93.3±6.6)ms 大于阴性节段 T2 值(80.7±6.7)ms（P<0.001）；各参数值 ROC 曲线下面积（AUC）分别为 0.812、0.840、0.875、0.819 和 ，均具备较好的灵敏度、特异度和准确度。从 ROC 曲线图中可看出 ECV 值对于心肌梗死的诊断效能较其他参数值高。
结论 心肌 T1 、T2mapping 技术和细胞外容积在识别及定量急性心肌梗死具有较高价值。

PU-2803

三尖瓣下移畸形 MRI 影像学表现

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目的：观察罕见病三尖瓣下移畸形（Ebstein's anomaly，EA）在心脏 MRI 成像中的影像学表现。
材料与方法：回顾性分析 5 例经手术证实的 EA 患者的磁共振成像（MRI）资料，总结其临床及磁共振影像学特征。
结果：5 例 MRI 共同特征是右心房扩大，与房化右心室连为一体，三尖瓣隔叶或后叶下移，功能右心室减小，右心室收缩功能减低。其中 4 例合并房间隔缺损，1 例合并肺静脉异位引流，1 例合并右心室流出道狭窄；延迟强化后 3 例出现房化右心室近室间隔线样、斑片状延迟强化高信号影。
结论：MRI 心脏成像对于三尖瓣下移畸形的诊断有明显的优势，不但可以动态观察右心房、房化心室及功能心室的运动情况，对下移瓣膜的形态及程度、房化心室大小及形态、功能性右心室大小及功能、右心室流出道是否狭窄，而且可以对心肌是否纤维化做出准确评估，对患者临床治疗方法的选择及预后做出提示。

PU-2804

心脏 MRI 组织追踪技术评估军事训练对学员心脏力学运动影响的初步研究

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目的：研究常规军事训练包括力量训练及耐力训练对军队学员心脏功能及心肌组织应变力的变化规律，探讨心脏磁共振早期预警训练强度对学员心脏损伤的可行性。**材料与方法：**于 2018 年 6 月份至 10 月份，随机抽取重庆市某部队大四学员 40 名作为试验组，地方大学正常志愿者大四学生 26 名作为对照组，进行 3TMRI 平扫检查，将心脏短轴电影及左室长轴两腔、四腔心电影数据导入心脏后处理 CVI42 软件上，通过 3D 组织追踪技术进行半自动定量分析，半自动计算左心室整体收缩峰值径向应力（Err）、周向应力（Ecc）和纵向应力（Ell）。应用 SPSS19.0 统计软件进行数据分析，通过独立样本 t 检验比较各测量值差异， $P<0.05$ 认为差异有统计学意义。**结果：**（1）两组在心功能参数上：舒张末期容积 EDV（132.9±19.2vs104.9±15.2，$P<0.05$）；收缩末期容积 ESV（53.4±10.0 vs37.7±8.2，$P<0.05$）；每搏输出量 SV（79.5±13.0 vs67.2±10.7，$P<0.05$）射血分数 EF（59.7±4.7vs64.1±5.5，$P<0.05$）；心率 HR（65.1±7.3vs70.3±10.5，$P<0.05$）及心肌质量 Myo Mass（107.0±21.9vs73.3±16.2，$P<0.05$）差异有统计学意义。（2）两组在左室整体收缩峰值径向应力 Err（38.4±6.7vs43.9±11.3，$P<0.05$），差异有统计学意义；周向应力 Ecc（20.7±2.0vs21.8±2.7，$P>0.05$），差异无统计学意义；纵向应力 Ell（19.0±2.8vs19.3±2.3，$P>0.05$），差异无统计学意义。**结论：**军队生在心脏功能参数射血分数（EF 值）及径向应力较地方生偏低，说明军事训练可以使心脏组织结构首先在径向力学方向上产生适应性变化，并对心脏收缩功能造成不利影响。

PU-2805

Late-gadolinium enhancement and CMR longitudinal strain, in the risk stratification for idiopathic dilated cardiomyopathy and end-stage heart failure subgroup

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Background: Myocardial strain based on cardiac magnetic resonance (CMR) feature tissue trackinghas been proven to provide more details of the cardiac function and prognostic value incremental to late-gadolinium enhancement (LGE). Although several studies have explored the prognostic value of global longitudinal strain and LGE in idiopathic dilated cardiomyopathy (IDCM), but their results were contradictive.

Purpose: Our study aimed to evaluate the predictive value of CMR-derived global longitudinal strain, LGE for main adverse cardiac events (MACEs) in IDCM, as well as in subgroup divided by end-stage heart failure (HF) and non-end-stage HF for further.

Methods: Totally 150 IDCM patients were retrospectively enrolled. The MACEs was defined as a combination of cardiac death, heart transplantation, implantation of ICD, and rehospitalization due to heart failure. Myocardial strain was derived by CMR feature tissue tracking. Prognostic value was evaluated by Kaplan–Meiermethod and Cox regression.

Results:During a median follow-up of 31 months, 47 (31.3% or 34.8%) patients experienced MACEs, including 10 deaths, 1 heart transplantation, 1implantation of ICD, and 35 rehospitalizations due to severer heart failure. There were 72 patients in subgroup of end-stage HF and 83 patients in non-end-stage HF. Multivariate Cox shown that global longitudinal strain(GLS; HR=1.017, p=0.833) was not associated with prognosis of IDCM(HR=1.017, p=0.833). LGE and LnBNP were independent predictors of MACs in IDCM(HR=2.176,p=0.024 and HR=1.498, p=0.012 respectively). LGE and LnBNP provide important information for risk stratification in subgroup of end-stage HF (Log-Rank=3.663, p=0.056 and Log-Rank=4.566, p=0.033)and non-end-stage HF(Log-Rank=3.897, p=0.048 and Log-Rank=7.538, p=0.006).

Conclusion: LGEis an independent and reliable predictor of MACs in IDCM. GLS does not show satisfied prognostic value for risk stratification in IDCM.

PU-2806

3.0T 磁共振评价右心功能对肥厚型心肌病和高血压性心肌病鉴别诊断价值

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[摘要]**目的：**探讨 3.0T 磁共振评价右心室功能对肥厚型心肌病和高血压性心肌病鉴别诊断的应用价值。**方法：**连续收集 2013 年 2 月—2018 年 12 月在大连医科大学附属第二医院行心脏核磁共振扫描，诊断为肥厚型心肌病（HCM）患者 87 例。收集同期诊断为高血压性心肌病（HHD）患者 42 例，无症状正常志愿者 42 例。将所有患者图像导入 Cvi42 心脏功能分析软件，由三名放射科医师分别进行相关数据测量并取平均值，最终获得左、右心室的舒张末期容积（EDV）、收缩末期容积（ESV）、射血分数（EF）、每搏输出量（SV）、心输出量（CO）、舒张末期心肌质量（MM）、室间隔厚度（IVST），右心室半定量指标三尖瓣环收缩期位移（TAPSE）、右室纵轴缩短分数（RVFS）、右室面积变化分数（RVFAC）、右室中段短轴变化分数（FMDC）。两组数据间的差异性比较采用独立样本 t 检验。**结果：**HCM 患者组 LVEF、IVST 均值较 HHD 组、正常志愿者组增高；LV Mass 均值较正常志愿者组均值明显增高，*P*值均<0.05，差异具有统计学意义，与 HHD 组比较差异无统计学意义；LVESV、RVEDV、RVESV 均值较 HHD、正常志愿者组减低；半定量指标 RVFAC、FMDC 均值均较正常志愿者组明显增高，*P*值均<0.05，差异具有统计学意义。HHD 患者组 LVEDV、LVESV 较 HCM 组及正常志愿者组均增高，LV Mass 均值较正常志愿者组增高，较 HCM 组无统计学差异，IVST 均值较正常志愿者组增高，低于 HCM 组，RV Mass 均值较 HCM 组及正常志愿者组均值增高，半定量指标 TAPSE、RVFS 均值低于 HCM 组及正常志愿者组，RVFAC 均值低于 HCM 患者组，*P*值均<0.05，差异具有统计学意义。
结论：对室间隔厚度、右心室容积、右心室心肌质量及右心室收缩功能的评估有助于 HCM 与 HHD 的鉴别诊断。

PU-2807
采用 Mapping 技术识别临床可疑心肌炎儿童 “正常”心肌中潜在损伤

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目的：心脏磁共振的 Mapping 技术已证实可以显著提高表现为局限性心肌损伤心肌炎的诊断准确性。本研究的目的是去验证 T1、T2 Mapping 技术能否识别临床可疑心肌炎儿童 “正常”心肌中潜在的弥漫性心肌损伤，并评估弥漫性心肌损伤同心功能的相关性。
方法：本研究纳入 46 位受试者：20 名急性心肌炎患者、11 名亚急性/慢性心肌炎患者及 15 名健康志愿者。对比三组“正常”心肌的 T2 值、初始 T1 值和细胞外容积（ECV）；评估弥漫性心肌损伤同心功能的相关性。
结果：同健康志愿者相比，亚急性/慢性心肌炎患者“正常”心肌的 ECV 值显著提高(30.1±2.8 VS 27.0±2.4, P=0.004)。急性心肌炎患者“正常”心肌的 T1、T2 值同健康志愿者未见明显差异。亚急性/慢性心肌炎患者“正常”心肌的 ECV 值同左心室射血分数具有显著相关性(P<0.05)。
结论：亚急性/慢性心肌炎患者“正常”心肌中存在弥漫性心肌损伤，并同左心室射血分数相关。Mapping 技术能够提高临床可疑心肌炎儿童心肌内弥漫性心肌损伤的敏感性。

PU-2808

Optimizing Myocardium T2 Star Mapping based on a Novel Multi-Dimensional Integrated (MDI) Reconstruction Algorithm

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Aim: Traditional myocardium T2 star mapping methods, such as curve fitting, suffer from flow artifacts, motion artifacts, low SNR caused by the iron deposition, and poor reproducibility [1][2]. A novel multi-dimensional integrated (MDI) reconstruction algorithm could solve the least square problem for extracting an overall complex signal ratio, by simultaneously integrating both dimensions of echoes and channels [3]. This study aimed to propose a myocardium T2 star mapping method based on the MDI algorithm, and optimize the SNR and sensitivity in the myocardium T2 star mapping.
Method: The MDI algorithm was compared with traditional curve fitting method based on SOS and ACC algorithm [4]. Twenty subjects with myocardiopathy were recruited in this study. A 2D dark blood multi-echo GRE sequence was collected on a 3.0T scanner (uMR 790, UIH, Shanghai) with a 24-channel body coil, using following parameters: 6 echoes with monopolar readout. Myocardium T2 star mapping were reconstructed using MDI, SOS and ACC algorithm, respectively. The image quality and diagnose sensitivity of each method were accessed by three experienced radiologists. One-way ANOVA was used with $p<0.05$.
Results: For radiologist 1, the image quality score were 3.89±1.21, 3.22±0.97, 3.44±1.03, and the diagnose sensitivity score were 2.26±0.84, 1.97±0.74, 1.97±0.71; For radiologist 2, the image quality score were 4.14±0.32, 3.25±0.76, 3.53±0.50, and the diagnose sensitivity were 2.84±0.28, 2.07±0.57, 2.39±0.45; For radiologist 3, the image quality score were 4.00±0.23, 2.65±0.23, 3.06±0.22, and the diagnose sensitivity score were 2.86±0.35, 2.58±0.44, 2.81±0.24.
Conclusion: Compared with traditional curve fitting method, the MDI algorithm could offer better significantly SNR and sensitivity, and minimize mapping bias of the myocardium T2 star mapping. Our T2 star mapping method based on MDI might provide more accurate measurements for myocardial iron content.

PU-2809

心脏 MR 室间隔脂肪瘤

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研究目的：心脏脂肪瘤临床少见，多见于心包和心房。心脏脂肪瘤可引起恶性室性心律失常、心肌梗死和血栓等心血管事件。本文报道了一例罕见的室间隔全层脂肪瘤，并讨论了治疗方案的选择。

研究方法：患者男，48 岁。因被人撞击胸部后感心前区不适检至当地医院就诊，心脏超声检查提示“左室后间隔节段性增厚，占位性病变待排”，遂于来我院诊治。心脏超声和经食道心脏超声检查提示室间隔及下壁中段近后内侧乳头肌处可见一个偏高回声区，主要位于心肌内，浸润心肌全层，部分凸向左室腔，略见活动及变形。左心声学造影显示室间隔中下段偏强回声团块内未见明显血流信号，乏血供表现。 CT 示室间隔内异常密度，测其 CT 值为-31.3Hu，提示为脂肪组织密度，增强后病灶未见强化，诊断为脂肪来源肿瘤，脂肪瘤考虑。心脏磁共振增强扫描示 FIESTA 序列显示后室间隔-左室下壁见一混杂高信号“小核桃”样大小肿物，T2WI 上为高信号，Triple IR 序列上病灶全部为低信号，提示为纯脂肪成分，病变周围可见低信号环，提示为化学位移伪影，病变质地较软，边界尚清楚，电影序列可见病灶柔软摆动，并随心动周期形态改变，局部突入左心室，舒张末期测量大小约 25mm*19mm*36mm，灌注序列见灌注确实，延迟增强未见强化，拟诊为心脏脂肪瘤。

研究结果及结论 心脏肿瘤较为少见，且继发性占绝大多数。原发性心脏肿瘤发病率为 0.0017%- 0.033%，可见于任何性别与年龄，以 40-49 岁发病率最高，良性肿瘤和恶性肿瘤比例约为 3:1。心脏肿瘤中脂肪瘤和脂肪肉瘤均为罕见，好发于心包和心外膜下。肿瘤形态、血供是否丰富和代谢是否活跃是鉴别脂肪瘤和脂肪肉瘤的重要依据。

心脏脂肪瘤可引起的不良后果有：心律失常、心肌缺血、心腔梗阻、心力衰竭、血栓和瘤栓栓塞。患者接受了详细的相关评估，以充分揭示该脂肪瘤可能对患者造成的短期和长期风险。

PU-2810

心脏 MR 多参数联合对主动脉瓣狭窄（AS）患者左心室重构的诊断及评估价值

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目的：本研究通过对重度 AS 患者进行心脏磁共振多参数成像，以评估重度 AS 患者继发左心室重构的心肌组织特征和功能改变，初步探讨心脏 T1-mapping 和 Feature-tracking 技术对 AS 继发左心室重构的诊断及评估价值。

方法：本研究分别纳入 29 例重度 AS 和 20 例正常志愿者为病例组和对照组，分别行心脏电影、改良 MOLLI 序列扫描，并进一步利用 Medis 软件对心脏电影及 T1-mapping 图像进行后处理分析。首先对重度 AS 组及对照组进行常规心功能参数（LVEDMi、LVEF 及 LVEDVI 等）、T1 mapping 来源参数（ECV）及 Feature-Tracking 来源参数（GLS、GCS 和 GRS）的差异性分析；然后进一步对病例组进行左心室重构指标（LVEDMi）与各心脏磁共振新技术指标（ECV、GLS、GCS 及 GRS）的相关性分析；最后对病例组各心脏磁共振新技术指标（ECV、GLS、GCS 及 GRS）两两间进行相关性分析。

结果： 重度 AS 组的 LVEDMi、LVEF、LVEDVI、ECV 和 GLS、GCS 与无症状对照组间差异有统计学意义（$p<0.05$），部分值如下：LVEDMi（192.52±77.13 vs. 36.09±6.97）； ECV（29.51±3.40 vs. 26,51±2.34）；GCS（-15.54±5.41 vs. -24.59±3.53）;GRS 并未表现出显著差异性。通过进一步分析，发现左心室重构指标（LVEDMi）与 ECV、GLS、GCS 及 GRS 均有良好的相关性（$p<0.05$）；而 ECV 值与 GLS、GCS 及 GRS 均无相关性。

结论：重度主动脉瓣狭窄患者继发的左心室重构改变可用心脏磁共振新技术 T1-mapping 和 Feature-tracking 进行评估，ECV 联合 GLS 更能早期对左心室重构发生的心肌组织特征和应力改变进行探测，这有助于我们及时对重度 AS 患者进行临床干预和治疗。

PU-2811

磁共振心肌首过灌注成像评估经皮冠状动脉腔内成形术对心肌微循环障碍疗效的研究

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目的 探讨磁共振心肌首过灌注成像早期评估经皮冠状动脉腔内成形术（PTCA）对心肌微循环障碍疗效的价值。
方法 收集行 PTCA 治疗的患者 30 例，PTCA 术前、术后 1 周内均行心脏磁共振（CMR）心肌首过灌注检查，将右冠状动脉、左前降支、回旋支作为独立血管，测量各供血区域的灌注参数（达峰时间 T、峰值信号强度 SI、心肌信号强度最大上升斜率 Smax），以 PTCA 治疗前、后的溶栓治疗临床试验（TIMI）评分分为微循环正常组（3 分）、轻度障碍组（2 分）、重度障碍组（1 分）及无复流组（0 分）等四组，对比研究各组灌注参数的差异性以评估 CMR 对心肌微循环障碍的诊断能力；再以手术血管为研究对象，将 PTCA 治疗前、后 TIMI 血流分级变化特点分为微循环恢复组、未变组及加重组，对比研究各组灌注参数差值的差异性以评估 CMR 对 PTCA 治疗微循环障碍疗效的价值。
结果 30 例患者，手术血管共计 47 支； PTCA 治疗前后共 180 支冠脉 TIMI 血流分级示 3 分者 93 支,2 分者 63 支，1 分者 24 支，0 分者 11 支，各评分级组的 CMR 心肌首过参数 T、SI、Smax 值均有显著差异（P＜0.05）；对比手术血管 PTCA 治疗前、后 TIMI 评分变化特点，评分增大者 21 支，评分未变化者 15 例，评分减小者 11 例，以评分级变化分组的 CMR 心肌首过参数 T、SI、Smax 术后与术前差值均有显著差异（P＜0.05）。
结论 磁共振心肌首过灌注成像能及早发现 PCI 术所致的心肌微循环障碍，且无创、特异性高，可作为 PCI 术疗效评估的方法。

PU-2812

一例重症病毒性心肌炎心脏磁共振报道

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患者病史简介：患者张 XX, 女 ， 29 岁 MRI:12967495、住院号：80087842，确诊重症病毒性心肌炎后 2 月；行心脏 MRI 检查。
包含以下内容：
检查机型、增强设备；
注射方案；
扫描方案；
影像表现；
结果分析；
总结。
（正文请见附件）

PU-2813

Quantification of right ventricular strain and strain rate using cardiac magnetic resonance feature tracking in hypertrophic cardiomyopathy subjects with preserved ejection fraction

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Objectives: We aimed to evaluate the feasibility and reproducibility of using CMR-FT for analysis of bi-ventricular global and regional strain and strain rate (SR) in HCM patients as well as to explore the correlation between RV and LV deformation.
Methods: A total of 60 HCM patients and 48 controls were recruited in this study. Global and segmental peak values of LV and RV longitudinal, circumferential, radial strain and systolic SR were analyzed. Pearson analysis was performed to investigate the correlation of RV and LV deformation. Intra-observer and inter-observer reproducibility were also assessed.
Results: Left ventricular mass in the HCM group was significantly higher than that in the control group. Left ventricular end-systolic volume, Left ventricular end-diastolic volume ,right ventricular end-systolic volume,
right ventricular end-diastolic volume in the HCM group were significantly lower than the correlated parameters in the control group ($P<0.001$, respectively), whereas there was no statistical difference between the two groups in terms of ejection fraction ($p>0.05$, respectively). Global longitudinal strain (GLS), global longitudinal strain rate (GLSR), global circumferential strain (GCS), global circumferential strain rate (GCSR), global radial strain (GRS) and global radial strain rate (GRSR) of the LV and RV were all significantly lower ,compared with the control group,segmental strain and SR were also true($p<0.001$, respectively). Bi-ventricular strain and SR measurements were highly reproducible at both intra- and inter-observer levels. Additionally, Pearson analysis showed RV GCS, GLS, GRS positively correlated with LV GCS, GLS, GRS ($r=0.713$, $p<0.001$; $r=0.728$, $p<0.001$; $r=0.730$, $p<0.001$, respectively).
Conclusions: CMR-FT, as a promising novel approach for myocardial deformation assessment, may be used to analyze impairment of global and segmental myocardium deformation in HCM patients non-invasively and quantitatively, with good intra- and inter-observer reproducibility. Additionally, the systolic dysfunction of RV is correlated with LV to great extent demonstrating the global nature of pathology in HCM patients.

PU-2814
一例广泛心肌钙化表现的爆发性心肌炎个案分析

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患者，男，15 岁，入院 9 天前受凉后出现咳嗽， 2 天前发热，体温达 38℃，伴胸闷、胸痛、乏力，在当地诊所输液治疗，具体不详，夜间突然出现恶心、呕吐一次，伴胸闷、胸痛，当地县医院

考虑“病毒性感冒”，未予特殊治疗。1 天前患者胸闷、胸痛加重，伴恶心、呕吐，呕吐 2 次，呕吐物为胃内容物。急诊心电图考虑“急性心肌梗死”，给予溶栓治疗，溶栓后胸闷症状较前好转，于当地市级医院行冠脉造影检查，提示冠脉无异常。住院查心肌酶：乳酸脱氢酶 1529μ/L，肌酸激酶 6828μ/L，肌酸激酶同工酶 478.35μ/L，羟丁酸同工酶 1529μ/L，肌红蛋白 1651.5μg/L，患者出现血压下降，心率明显增快，持续胸闷、胸痛，面色苍白、出汗，诊断为爆发性心肌炎。
实验室检查：肌酐 149μmol/L，尿酸 523μmol/L，钙 1.67μmol/L，磷 4.38μmol/L；白细胞 9.68×10^{9}/L;谷丙转氨酶 400U/L，谷草转氨酶 1054 U/L；凝血酶原时间 24.8s，D-二聚体 3.77mg/L。
入院当天查体：体温 36.9℃，心率 91 次/分，呼吸 19 次/分，血压 92/44mmHg（多巴胺、去甲肾上腺素应用），意识间断丧失，急性病容。
入院 CT 示：心脏增大，左右心室壁广泛絮状致密影。
讨论　爆发性心肌炎是心肌炎最为特殊和严重的类型，以起病急骤，进展迅速为特点，很快出现血液动力学问题以及各种恶性心律失常。心肌炎的病理生理学改变主要为心肌细胞水肿、毛细血管渗漏、缺血及纤维化。CT 对心肌炎组织学敏感性低。本例为左右心室广泛心肌钙化，较为罕见。心肌钙化分营养不良性和转移性钙化。营养不良性钙化主要见于陈旧性心肌梗死、感染性心内膜炎等；转移性钙化常见于慢性肾衰竭和甲状旁腺功能亢进。本病例虽然肌酐值升高，钙磷代谢紊乱，但需与转移性钙化鉴别。因此患者除肾脏功能损伤外，呼吸系统、肝功能、凝血功能均受影响。

PU-2815
磁共振特征追踪技术定量评估急性 STEMI 患者早期左室应变的研究

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目的
探索心脏磁共振组织特征追踪技术在定量评估急性 ST 段抬高型心肌梗死患者早期左室应变的诊断价值。
资料与方法
纳入 2017 年 10 月至 2018 年 12 月深圳市人民医院 78 例急性 STEMI 患者，患者于 24h 内行急诊 PCI，并在术后 2-6d 内行 CMR 检查并收集完整临床资料。通过 CVI42 后处理获得左室整体及节段心肌应变指标、左室心功能、左室梗死体积分数和微血管阻塞体积分数。根据心肌梗死及微血管阻塞（MVO）发生与否、透壁程度（≤50%或>50%）进行分组，组间定量资料比较采用 Mann-Whitney U 检验。应变指标对透壁性心肌梗死及 MVO 发生的诊断效能采用 ROC 分析。
结果
GPS、GTTP 无法区别透壁性与非透壁性心肌梗死（P>0.05）；PRS、PCS、PLS、TTPr、TTPc、TTPl 在非梗死组及梗死组间具有统计学差异（TTP1，P=0.002，其余参数 P<0.001）；
PRS（P=0.002）、PCS（P<0.001）在透壁与非透壁心梗组间存在统计学差异，PRS 值为 24.45 时，其识别透壁性心梗的敏感性与特异性分别为 70.3%与 77.8%，PCS 取-16.55%，敏感性与特异性分别为 74.5%、70.3%；
GPS、GTTP 在 MVO 组与无 MVO 组间均无统计学意义（P>0.05）；PRS、PCS、PLS 在 MVO 组与无 MVO 组间存在统计学差异（P<0.05），PRS 取 24.65%时对节段心肌 MVO 检出的敏感性为 89.0%，特异性为 60.6%，PCS 取-14.05%时敏感性和特异性分别为 75.7%、75.9% 。
结论
节段峰值应变 PRS、PCS 有助于区分梗死心肌及非梗死心肌，并可较准确地识别 MVO 和透壁性心肌梗死的发生，为肾功能不全的 STEMI 患者评价左室结构和功能改变提供较为可靠的新途径。

PU-2816
压缩感知单次屏气 CMR 与标准多次屏气技术对心功能评价的比较研究

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目的：本研究旨在评估压缩感知单次屏气 CMR 与标准多次屏气技术对心功能评价的比较。
材料与方法：本研究回顾性收集 2018 年 11 月至 2019 年 4 月于我院进行心脏磁共振检查的 53 名患者和 17 名健康志愿者。扫描序列包括短轴压缩感知单次屏气电影序列和标准多次屏气电影序列。压缩感知电影序列扫描参数： TE/TE=1.4/3.2；FOV=350cm；矩阵=208×166；时间分辨率=40ms；翻转角=31~42°；扫描时间平均 18s。标准多次屏气电影序列扫描参数： TE/TE=1.4/3.2；FOV=350cm；矩阵=208×166；时间分辨率=40ms；翻转角=42~52°；扫描时间平均 2min30s。将短轴电影图像导入西门子 Argus 后处理软件进行心功能分析，左心室心内膜和心外膜轮廓由软件自动追踪，之后经过手动矫正，得到左心室容积及功能参数，包括左心室舒张末期容积（left ventricular end-diastolic volume, LVESV）、收缩末期容积（left ventricular end-systolic volume, LVESV）、每搏输出量（stroke volume, SV）、心肌质量以及射血分数（left ventricular ejection fraction, LVEF）。采用 SPSS 20.0 软件进行统计学分析。选择配对样本 t 检验或 Wilcoxon 符号秩检验，比较两种方法测得心功能参数的差异。应用线性回归评估两种方法测得心功能参数的一致性。
结果：压缩感知电影序列测得 LVEDV、LVESV、LVSV、LVEF 均显著低于标准电影序列（$p<0.001$）。而两种方法测得心肌质量无显著统计学差异（$p=0.788$）。两种方法测得心功能参数一致性良好（$r>0.87$, $p<0.001$）。
结论：压缩感知单次屏气 CMR 对心功能评价准确性高，有望替代标准多次屏气技术。

PU-2817
磁共振在原发性肥厚型心肌病诊断及其分型中的价值

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目的 探讨心脏磁共振（CMR）在原发性肥厚型心肌病诊断分型及心肌功能方面的临床应用价值。
方法 回顾性分析 2017 年-2019 年在我院就诊的 40 例原发性肥厚型心肌病患者，所有患者均行心脏磁共振检查，采用亮血电影序列、首过灌注序列、延迟增强序列，分析图像质量，观察心肌受累节段，从形态学上对肥厚型心肌病的进行分型，测量心肌厚度、心室容积、射血分数；观察室壁运动和首过灌注情况，评价心肌活性，判断是否存在心肌微循环障碍及纤维化。
结果 40 例患者心脏磁共振符合原发性肥厚型心肌病诊断。根据心肌肥厚形态特点，将肥厚型心肌病分为 4 型。心尖肥厚型心肌病 11 例、室间隔型 19 例、向心性 4 例、心室中部型 6 例。CMR 检查确诊 31 例出现心肌延迟强化，表现为肥厚心肌内斑片样强化，占心肌肥厚患者的 77.5%。2 例发现心尖室壁瘤。
结论 心脏磁共振一站式成像对于诊断原发性肥厚型心肌病有独特作用，多平面电影序列能充分显示肥厚心肌节段、范围，有无流出道梗阻，并且可动态观察室壁运动情况，首过灌注及对比剂延迟强化，能提示心肌活性，判断心肌纤维化，对临床治疗和预后有指导意义。

PU-2818

Application Value of Magnetic Resonance Diagnosis in Hypertrophy Cardiomyopathy and its Classification

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Objective: To analyze cardiac magnetic resonance of hypertrophy cardiomyopathy (HCM) and its phenotypic expression in order to achieve better understanding of this disease.
Methods: 40 patients with HCM were retrospectively analyzed from 2017 to 2019 in our hospital. All patients underwent cardiac magnetic resonance imaging (CMR). The myocardial involvement segments were observed. EDV, LVEF, end diastolic ventricular wall thickness of various segments, and the late gadolinium enhancement (LGE) was evaluated.
Results: CMR showed hypertrophic in all the patients. According to the morphological characteristics, HCM was divided into 4 types: apical (11 cases), midventricular(6 cases), septum(19 cases) and concentric type(4 cases). 2 patients had apical aneurysms. All patients underwent myocardial contrast enhancement scanning, 31 patients presented late gadolinium enhancement.
Conclusions: CMR is best diagnostic modality for HCM. LGE plays an important role in the natural history of HCM, which indicates myocardial fibrosis. In particular, the presence of abnormal LGE is associated with clinical symptoms and increased wall thickness.

PU-2819

单能量与多组重建技术在左心室流入道系统中成像效果的研究

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目的：通过能谱 CT 扫描，对左心室流入道系统成像质量的综合评价和对比分析，寻找最佳单能量成像、最佳对比信噪比以及多组重建技术的最优显示，有利于左心室流入道系统的精确诊断。
方法： 采用超高端 GE Revolution 256 排螺旋 CT 扫描，回顾性分析左心室流入道系统共 30 例（体质指数 BIM<30）资料，可获取 40~140keV 间距为 10keV 的 11 组单能图像，分别对 11 组图像进行同层面肺静脉、左心房、左心室 CT 值和 SD 值、背景噪声（BN），计算并比较各组单能量图像的最佳对比信噪比（CNR）的峰值、良好的噪声比（CNR）以及辐射剂量（PDFI），并比较相应的心腔与肺静脉的强化程度，以降主动脉平均 CT 值和增强度为标准，由两名放射副主任医师对图像进行主观评价、评分，对结果进行统计学分析。
结果：(1)肺静脉干最佳单能量平均 CT 值高于降主动脉(P＜0.05)，两心腔显影最佳单能量左心室和右心室平均 CT 值高于降主动脉(P＜0.05)，左心室系统图像质量评分高于降主动脉(P＜0.05)，均具有统计学意义。(2)左心耳增强扫描 CT 值、碘值、增强与平扫 CT 值的差值、纯肺静脉增强前

后 CT 值的差值以及左心室外侧壁增强扫描的噪声、SNR、CNR 在不同单能量间的差异均无统计学意义(P 值均>0.05)。(3)左心室系统显影效果好，最佳对比信噪比单能量为 67kvp。(4)将左心室流入道系统影像图像数据利于工作站合成三维图像，并设定成为不同的透明度，同时利用虚拟照明效应，运用后处理 VR、Mip 以及伪彩融合技术（含多对象组合显示方式、多对象透明度的融合方式以及伪彩色条方入道系统更加美观、立体化，利于临床术中精准定位。

结论：能谱 CT 与多组重建技术有利于最佳对比信噪比单能量的选择，对两心腔、肺静脉血管显影最佳，减少因个体循环功能差异及心脏、血管结构异常对左心室流量的影响,有利于左心室流入道系统的精确诊断和临床术中价值。

PU-2820
不同抑脂技术结合 T2WI 黑血技术在心肌水肿诊断价值的对比研究

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目的　对比分析 STIR 技术和 SPAIR 技术在心脏磁共振成像中评价心肌水肿方面的优缺点。材料和方法　回顾性分析临床确诊病毒性心肌炎、且行心脏磁共振检查的患者 34 例，所有患者在心肌参数扫描时分别使用 STIR 技术和 SPAIR 技术行左心室 T2WI 黑血序列。通过肉眼评分及 CNR 值测量，按心律情况分组，应用重复测量方差分析及简单效应分析进行统计。结果　对于心律齐的患者，两种评价方法 SPAIR 技术所获图像质量均优于 STIR 技术所获图像，简单效应分析差异有统计学意义，p＜0.05，在心律不齐短轴位的检测中，肉眼观察提示 STIR 技术得分高于 SPAIR 技术，长轴位上无差异，CNR 评价长轴位和短轴位检测中 STIR 技术得分均低于 SPAIR 技术，简单效应分析差异有统计学意义，p＜0.05。结论　对于怀疑心肌水肿的患者，为了获得清晰满意的左心室壁的 T2WI 抑脂序列, 应优先采用 SPAIR 技术扫描，STIR 技术可作为补充。

PU-2821
心血管磁共振成像在急性心肌炎中的应用进展

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急性心肌炎临床症状具有不典型、多样性等特点，轻者可无症状，重者可出现心源性休克甚至猝死，早期明确诊断对患者的治疗与预后具有重要的临床价值。心血管磁共振成像（Cardiac magnetic resonance imaging，CMR）独特的显示心肌水肿、瘢痕和其他组织异常的能力，已成为急性心肌炎患者的主要非侵入性诊断工具。目前推荐的急性心肌炎诊断标准为 2009 年制定的路易斯湖标准，其诊断准确性较高而特异性不高，随着磁共振检查技术的发展，特别是 T1 mapping、T2 mapping 的应用，可进一步提高诊断价值。本文论述了心血管磁共振成像在急性心肌炎诊断的最新进展，以指导急性心肌炎的诊断与研究。

PU-2822

从新角度探究肥厚型心肌病 ——CMR 分形分析技术对左室心肌小梁复杂性分析

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目的：
通过 CMR 分形分析（fractal analysis）和特征追踪技术（feature tracking），分别对肥厚型心肌病患者（Hypertrophic cardiomyopathy ，HCM）和健康志愿者的左室心肌小梁的复杂性和左室心肌应变进行定量分析并比较， 从新角度分析 HCM 左心室过度小梁化程度。
方法：
收集 HCM 患者 52 例(HCM 组)及健康志愿者 30 名(对照组)。所有受检者均接受心脏 MR 检查，扫描序列包括心室短轴、二腔心、四腔心层面快速平衡稳态进动序列(FIESTA)。通过后处理软件测量左心室心肌小梁的全心平均分形维数（mean global FD）及心室不同部位最大或平均 FD。测定心肌整体的径向应变峰值(GPSR)、环向应变峰值(GPSC)、纵向应变峰值(GPSL)以及心室不同部位(心尖部、心室中部和基底部)的径向、环向和纵向应变峰值(PSR、PSC 和 PSL)。
结果：
HCM 组与对照组的全心 FD 值存在明显差异性（P<0.001），并呈明显增高趋势。两组的心尖部最大 FD 及室中段平均 FD 差异均有统计学意义(P 均*<0.001)*。HCM 组与正常组的 GPSR、GPSC 和 GPSL 差异均有统计学意义(P 均*<0.001)*。除 EDV 两组间差异无统计学意义外，HCM 组与正常组的 ESV、SV、LVEF 差异均有统计学意义（P 均<0.05），HCM 组的 LVEF 属于正常范围内。全心 FD 与 GPSR、GPSL 均呈负相关（*r =-0.557, P<0.001*；r = -0.622, P<0.001），和 GPSC 存在正相关（r = 0.542, P<0.001）。心尖部最大 FD、室中段平均 FD 均与对应心室部位的 PSL 相关性最好（r = 0.459, r = 0.543, P 均<0.001）。
结论：
CMR 分形分析技术能在早期对 HCM 的心腔内小梁化进行定量分析，且 HCM 的小梁复杂程度与心肌形变存在明显相关性，特别是纵向心肌形变程度。

PU-2823

Quantitative assessment of double ventricular strain in patients with dilated cardiomyopathy using Cardiovascular magnetic resonance feature tracking techniques : a preliminary clinical study

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Purpose: Dilated cardiomyopathy (DCM) can cause structural and functional changes in the left/double ventricle. The purpose of this study was to assess the double ventricular myocardial systolic strain in patients with DCM using cardiac magnetic resonance feature tracking (MR-FT) and their underlying relationships with clinical parameters.

Methods: We recruited 73 patients with DCM and 40 healthy volunteers to undergo CMR examinations. Then we used the routine cine images and MR-FT to analyze the double ventricular myocardial global systolic strain and the strain rates. Before the CMR examination, we collected the baseline clinical and biochemical indices.
Results: The values of LVGLS、LVGCS、LVGRS and RVGLS were significantly lower in the DCM group than those in control group [LVGLS：（-4.7±2.5）%:（-14.4±2.4）%; LVGCS：（-6.1±2.6）%:（-21.8±2.3）%; LVGRS：（7.7±4.0）%:（39.2±9.0）%; RVGLS：（-9.9±6.5）%:（-19.5±3.7）%; P<0.01]. The left and right ventricular EF values were lower in the DCM group than those in control group [LVEF：（16.2±7.2）%:（58.0±5.5）%; RVEF：（19.9±11.8）%:（43.7±8.6）%; P<0.01]. In DCM group, the LVGRSR-D and RVGLSR-S values were correlated with the troponin I (TNI) levels (P<0.05) ; the LVGRS、LVGCS and LVGCSR-S values were associated with the Lactate dehydrogenase (LDH) levels (P<0.05) ; the RVGLSR-S value was correlated with the creatine kinase (CK) level (P<0.05).
Conclusion: Our results suggested that the left and right ventricular systolic function and systolic strain were impaired in DCM patients. We also found that there was a correlation between the myocardial enzyme spectrum and the left and right ventricular strain in patients with DCM.

PU-2824
心脏磁共振评价左室心肌致密化不全弥漫性心肌纤维化及与应变相关性

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目的：利用心脏磁共振（cardiac magnetic resonance, CMR）评估左室心肌致密化不全（Left ventricular non-compaction, LVNC）患者弥漫性心肌纤维化，并探讨其与应变的相关性。方法：回顾性分析 2016 年 8 月至 2019 年 2 月在中南大学湘雅二医院行 CMR 检查并临床确诊的 LVNC 患者 37 例，将 40 名正常人作为正常对照组，应用 T1 mapping 序列获得心肌细胞外容积（myocardial extracellular volume fraction, ECV），利用 Tissue Tracking 技术获得左室心肌整体及各水平（基底部、中间部、心尖部）径向应变（RS）、周向应变（CS）、纵向应变（LS），对数据进行统计学分析。结果：①LVNC 组整体及各水平 RS、CS、LS 均较对照组减低（P<0.001），整体及各水平 ECV 值均较对照组升高（P<0.001）；②LVNC 组基底部-心尖部 CS、LS 梯度较对照组明显下降（P<0.001），LVNC 组基底部-心尖部 ECV 梯度较对照组明显升高（P<0.001）。③LVNC 组整体 RS、CS、LS 与 ECV 值均有一定的相关性（r = 0.412、0.403、0.413，p = 0.011、 0.013、0.007）。结论：ECV 能较敏感的检测出 LVNC 患者弥漫性的心肌纤维化，并且这种弥漫性病变以心尖部最为明显。ECV 与心肌各个方向的应变均有一定的相关性，即对于 LVNC 患者心肌纤维化在一定程度上参与心肌运动功能障碍的发展。心脏磁共振新技术可以提供心肌组织学及功能改变的定量参数，为疾病的临床评估提供更全面的信息。

PU-2825

Application of cardiac magnetic resonance to evaluate strain abnormalities in preclinical and overt apical hypertrophic cardiomyopathy

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Objective The aim of this research was to evaluate and explore correlations between strain and other functional parameters in apical hypertrophic cardiomyopathy (AHCM) patients.
METHODS Cardiac magnetic resonance imaging was performed in 21 overt AHCM, 22 preclinical AHCM, and 54 normal patients. CVI42 software was used to measure global and regional (basal, medial, apical) peak, epicardial, and endocardial circumferential strain. Functional parameters were measured by SIEMENS work station. Functional parameters and strain value were analysed.
RESULTS Compared to the control group, overt and preclinical groups had greater apical left ventricular wall thicknesses, higher ejection fraction, and decreased apical angle. The apical circumferential strain in both overt and preclinical groups was decreased compared to the control group. The differences between epicardial and endocardial circumferential strain (cTSD) were also apparent. Both overt and preclinical groups had decreased epicardial stain and elevated endocardial circumferential strain. The cTSD was also elevated in both groups compared to the controls.
CONCLUSION CMR strain analysis can distinguish normal participants from AHCM patients and accurately determine disease stages. This method may become a promising diagnostic parameter.

PU-2826

Aortic remodelling after thoracic endovascular aortic repair for acute and subacute type B aortic dissection

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Purpose: To investigate aortic remodelling after thoracic endovascular aortic repair (TEVAR) for acute and subacute Stanford type B aortic dissection (AD) patients.
Methods: Clinical data of 38 Stanford type B AD patients who received TEVAR treatment in our hospital between July 2012 and December 2017 were retrospectively analysed. The maximum diameters of the aorta, the mean diameters of the true lumens (TLs) and the false lumens (FLs) of the aorta in the dissection range before and after TEVAR treatment were measured. Comparisons of all diameters between different groups or in the same group before and after therapy were subjected to analysis of nonparametric test. Count data were examined using the χ^2 test.
Results: These 38 patients were 31-82 years old with a mean age of 57.0 ± 11.0 years, and the group included 31 men and 7 women, with 22 cases in the acute phase and 16

cases in the subacute phase. Among the 38 patients included in this study, seven patients had endoleak (18.4%) after treatment. No perioperative deaths occurred. Analyses of computed tomography angiography measurement results showed that the baseline levels of the maximum diameters of the aorta, TLs and FLs before TEVAR between the acute and subacute group were not different significantly ($p=0.193$, $p=0.301$ and $p=0.067$, respectively). After TEVAR treatment, the maximum diameters of the aorta and the diameters of the FLs between the two groups were different evidently ($p=0.005$ and $p=0.012$), but the diameters of the TLs were not ($p=0.069$). Both the diameters of TLs increased, and the FLs decreased significantly in the acute and subacute group after TEVAR ($p<0.001$, $p=0.00438$, $p<0.001$ and $p=0.007$, respectively); the maximum diameters of the aorta decreased significantly in the acute group ($p<0.001$), but they did not change obviously in the subacute group ($p=0.121$). **Conclusion**: TEVAR offers satisfactory results for treating type B AD. Acute AD can achieve better aortic remodelling than subacute AD after TEVAR.

PU-2827

MSCT 精确评估气胸、液气胸肺压缩比的临床应用价值

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【摘要】 **目的** 探讨 MSCT 后处理技术精确评估气胸、液气胸肺压缩比的临床应用价值。 **方法** 885 名气胸/液气胸患者，先后行常规 X 线胸片及胸部 CT 扫描，将患者胸部 CT 图像导入 Philips EBW4.05 工作站，利用 Tissue Segmentation（组织分割）及 Lung Density（肺密度）技术分别精确测定胸腔内气体、液体及同侧胸腔体积，准确计算出肺压缩比，与胸部 X 线评估结果进行比较。 **结果** 利用 Tissue Segmentation 及 Lung Density 技术，我们可以精确测出胸腔内气体体积（G）、液体体积（E）及该侧胸腔体积（L），利用公式 G / L 或 G+E / L，准确计算出肺压缩比。 **结论** 利用 MSCT 后处理技术能够精确计算出肺压缩比，可以有效指导临床进行治疗，帮助临床大夫更好地确定治疗方案。

PU-2828

The performance of cine-MRI sequence for central venous catheter-related thrombosis in ESRD patients

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PURPOSE
To evaluate diagnostic value of non-contrast cine MRI sequence in the assessment of thrombosis associated with tunneled hemodialysis central vein catheters (TCCs) as compared to computed tomography venography (CTV).

METHOD AND MATERIALS
31 patients withtunneled hemodialysis central vein catheters dysfunction were continuously included and underwent CTV and cine-MRI examination. The range of CTV is

from the root of neck to the lateral phrenic angles. The contrast diluted by 30% saline was used to avoid the superior vena cava is too ligh. The 8-mm-thick cine transverse images was obtained with breath holding in end-expiration combined with electrocardiographic gating. The sensitivity, specificity, PPV, NPV and accuracy regarding CTV as reference standard were calculated.

RESULTS

CTV and cine-MRI imaging were successfully completed in all patients. 24 thrombosis were found in both CTV and cine-MRI. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of cine-MRI in the diagnosis of central venous thrombosis were 83.3% (20/24), 73.3% (11/15), 83.3% (20/24), 73.3(11/15), 79.5 (31/39), respectively. There was no significant difference between Cine-MRI and CTV (P>0.5). In addition, cine-MRI can also show whether there is abnormal position of central venous catheter.

CONCLUSION

The cine-MRI could achieve almost same accuracy in the diagnosis of catheter-related thrombosis in ESRD patients with hemodialysis, it could be an effective alternative to CTV examination under certain circumstances.

PU-2829
表观扩散系数值在食管癌放化疗疗效评估中的应用价值研究

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目的：探讨表观扩散系数值在食管癌放化疗疗效评估中的应用价值。方法：回顾性分析 30 例经病理证实的食管癌患者，根据 RECIST 标准将其分为缓解组与未缓解组，比较食管癌患者放化疗前后病灶的长度值、厚度值、ADC 值，比较缓解组与未缓解组的患者放化疗前后病灶的长度差值及变化率、厚度差值及变化率、ADC 值差值及变化率，绘制 ROC 曲线，得出相应的的阈值及诊断的灵敏度与特异度。结果：食管癌治疗后病灶的长度、厚度均缩小，ADC 值升高。治疗前后病灶的长度、厚度及其变化不能作为疗效预测指标。治疗前后病灶的 ADC 值差值及变化率可作为疗效预测指标：ADC 值的差值和变化率为 $0.630\times10^{-3}mm^2/s$ 和 0.559 是诊断病变缓解的阈值，其灵敏度和特异度分别为 81.3%、85.7%，87.5%、85.7%。结论：DWI 可以用于食管癌患者放化疗疗效的评估，且 ADC 值可对疗效评价进行量化分析。

PU-2830
探讨 MSCT 的 MSCT 下肢血管 CTA 的临床应用意义

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目的：探讨 MSCT 的 MSCT 下肢血管 CTA 的临床应用意义，提高下肢动脉疾病诊断率
方法：仅需静脉内注射造影剂，同时掌握好扫描时机即可获得完整的靶血管图像信息，具有操作简便、时间短、费用较低等优点。64 排螺旋 CT 具有多种重建方式和三维显示功能，可以重复使用，并从各个方位、各个角度来观察受检的血管，为临床制定手术方案提供了重要的参数。

应用 64-MSCTA 技术对患者行腹主动脉下端上水平至足背动脉水平的大范围联合扫描，不仅可以快速、高效率的完成多部位、多节段血管成像，而且观察病变全面、连续性好，为手术入路的选择和手术方案的制定提供了有效的影像学信息，并且能够准确判断下肢动脉狭窄的级别。
结果：对于动脉瘤和血管瘤的应用：动脉瘤在 CTA 上表现为动脉管腔的局部异常扩大，对比剂充盈于瘤腔内，部分病例可见瘤壁出现附壁血栓。血管瘤在增强扫描时，在动脉期及静脉期都能见到强化的血管团和供血动脉。应用 VR 及 MIP 等重组方法还可提供动脉瘤的大小、范围，MPR 还可以观察动脉瘤与周围肌肉邻近组织的关系，有利于协助外科医生制定手术计划。

64-MSCTA 可用于血管搭桥术及血管内支架术后血管通畅性的评价。下肢血管病变行支架及血管搭桥术后行 MSCTA 复查，运用 VR 及 MIP 技术进行血管三维重建，均能显示搭桥血管或支架的位置、走行、吻合口及远侧段血管情况，间立体感强，可显示重叠血管间的复杂关系。
结论：64-MSCTA 技术在显示血管病变方面具有独到的优势，而且其操作简便、安全、无创，扫描速度快，覆盖范围大。

PU-2831

PET/CT 对肺内结节诊断及治疗的临床价值

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【摘要】**目的** 探讨 PET/CT 显像对肺内结节诊断和治疗的临床应用价值。**方法** 因肺内结节行 18F-FDG PET/CT 检查且得到临床或病理证实的患者 30 例，其中结节性质不明者 2 例，临床或病理确诊为肺癌者 18 例。结合其 PET/CT 检查结果和临床诊断、治疗资料进行分析。患者禁食 6h 以上，检查当日禁止做剧烈运动。检查前查血糖，测身高、体重。显像剂注射剂量 5.5MBq/kg，注射后 40~60min 进行全身扫描。PET：层厚 4.25mm，矩阵 128×128，采集时间 4~6min/床位。重建条件：迭代重建，子集 28，迭代次数 2。重建层厚 4.25。**结果** (1)28 例诊断结果与临床随访或病理诊断结果符合，总诊断符合率 93.3%。2 例结节性质不明者经 PET/CT 检查诊断为良性病变 2 例，恶性 0 例。21CT 显示单结节病灶，PET/CT 单病灶显影 19 例，8 例除肺内病灶显影外，还可见肺外其他组织显影，4 例确诊为有肺外转移，3 例肺内单结节病灶系转移灶。(2)PET/CT 检查后，30 例患者中，27 例改变了原治疗方案，继续观察 4 例，抗炎 5 例，手术 10 例，局部放疗 3 例，单纯化疗 54 例，综合治疗 1 例。(3)根据 10 例手术治疗患者的 PET/CT 融合图像确定手术路径及切除范围，术后病理结果显示，手术切口边缘及切除淋巴结均未见癌细胞累及和浸润。**结论** （1）对于肺内结节性质，PET/CT 较单纯 CT 更容易做出鉴别诊断。PET/CT 检查能够更加准确地反映肺癌的临床分期，并辅助临床确定正确的治疗方案。PET/CT 融合图像能够指导放疗生物靶区的精确定位和确定外科手术方案及切除范围。

PU-2832

夹层累积头颈血管和主动脉 CTA 扫描方案

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目的：利用多层螺旋 CT 联合头颈血管和夹层一站式扫描，解决夹层患者需多次进行检查的问题。
方法：比较头颈血管和夹层分开扫描与一站式扫描的图像质量。分析两组图像是否存在差异。

结果：两组图像均能满足诊断需求，头颈血管一站式扫描患者图像客观评分低于分次扫描，但能满足诊断需求。夹层主动脉扫描两组图像无明显统计学差异。
结论：对于夹层累积头颈血管及大动脉患者，可以采用头颈血管与主动脉一站式扫描。

PU-2833
肺癌双能量 CT 碘参数与 CT 灌注成像灌注参数的相关性研究

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目的 比较 CT 灌注成像灌注参数与双能量 CT 碘相关参数评价肺癌血流灌注状态的相关性。
方法 前瞻性收集 28 例肺癌患者（鳞癌 15 例，腺癌 12 例，小细胞肺癌 1 例）的 CT 灌注成像及双能量 CT 数据，勾画病灶最大截面感兴趣区（region of interest, ROI）并测量 CT 灌注成像的灌注参数及双能量 CT 的碘相关参数，分析灌注参数与碘参数的一致性，并比较两种检查方案的辐射剂量。应用 Spearman 相关系数分析肺癌的灌注参数与碘相关参数的相关性。
结果 动、静脉期碘浓度（iodine concentration, IC）与各灌注参数均无统计学相关；动脉期标化碘浓度（normalized iodine concentration, NIC）与血流量（blood flow, BF）、血容量（blood volume, BV）、表面通透性（permeability surface, PS）均呈正相关（r=0.26~0.34，P＜0.05），静脉期 NIC 仅与 BV 呈正相关（r=0.34，P＜0.05）；动脉期 K 值与 BF、BV、PS 均呈正相关(r=0.25~0.31，P＜0.05)，静脉期 K 值与 BF、BV 呈正相关(r=0.29~0.30，P＜0.05)。NIC、ICt、K 值的观察者间一致性好（r=0.90~0.93，P＜0.05）；灌注成像所有参数的观察者间一致性中等（r=0.31-0.78，P＜0.05）。双能量 CT 辐射剂量（4.23±0.66 mSv）显著低于 CT 灌注成像的分别为（7.45±0.02 mSv），差异具有统计学差异（P＜0.05）。
结论 肺癌患者的 CT 灌注成像灌注参数与双能量 CT 碘相关参数的参数相关性较好，双能量 CT 的扫描辐射剂量更低，且观察者间一致性优于 CT 灌注成像。

PU-2834
增强 CT 在食管癌术前 TN 分期的价值

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目的：探讨增强 CT 图像分析在食管癌术前分期的临床应用中的应用价值。方法：127 例食管癌患者为研究对象，均予以术前增强 CT 检查和手术病理检查，以病理结果为金标准。所有患者术前均行 MSCT 单期增强检查，参考国际抗癌联盟—美国癌症联合委员会标准，以增强 CT 图像观察食管癌病灶最大厚度、长度、浸润深度、病灶与周围组织（如气管、主支气管、主动脉等）的关系、病灶强化程度及均匀情况，淋巴结强化程度、最大短径、边缘模糊或毛刺等征象对食管癌术前 T、N 分期的准确性。由我院影像科两位均从事 3 年以上的影像医师采用双盲法，利用多平面重组结合横断面、冠状面及矢状面图像综合分析图像并记录结果，结果不一致时经协商达成一致。结果：病理结果：127 例患者均经食管镜病理证实确诊为食管癌，其中 81 例手术病理检查，均为鳞状细胞癌：T_1 期 10 例、T_2 期 12 例、T_3 期 45 例、T_{4a} 期 14 例；N_0 期 39 例、N_1 期 15 例、N_2 期 18 例、N_3 期 9 例。增强 CT 对食管癌术前 T 分期诊断的准确性为 72.8%（59/81）；对 N 分期诊断准确性为 68%（55/81）。结论：增强 CT 在食管癌术前评估及治疗方案及手术方式选取临床工作中具有一定的参考价值，对患者的临床治疗方案的决定具有指导意义。

PU-2835
支气管囊肿的临床分析及 CT 表现（附 17 例报告并文献复习）

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目的：探讨支气管囊肿的临床表现及影像学特点。
方法：回顾性分析我院经手术、病理证实的 17 例支气管囊肿的临床表现、影像学特征及预后。其中 11 例行 CT 平扫及增强检查，6 例仅行 CT 平扫检查。
结果：17 例支气管囊肿，男性 11 例，女性 6 例，发病年龄 18 至 70 岁，平均年龄 44.1 岁。患者多为体检或偶然发现。17 例支气管囊肿中，包括肺内支气管囊肿 2 例，纵隔支气管囊肿 14 例（前纵隔 9 例，中纵隔 1 例，后纵隔 4 例），肺外支气管囊肿 1 例（骶前）。典型者 CT 表现为薄壁、单房、类圆形或椭圆形囊性占位，边缘光滑，密度均匀，CT 值可达 0-80Hu，增强扫描囊壁均匀强化，囊内未见明显强化。部分病灶囊内合并出血、钙化，需要与肿瘤性病变鉴别。随访后，所有病例均未发现恶变。
结论：支气管囊肿多中年发病，男性多于女性；纵隔型占多数，囊肿可发生在纵隔的任何部位，容易误诊为肿瘤；病灶呈圆形或类圆形，可有浅分叶，CT 上无强化的软组织密度囊肿为多数支气管囊肿的特征性表现。

PU-2836
128 层螺旋 CT CARE kV 联合 SAFIRE 技术在肺动脉成像质量与辐射剂量中的应用研究

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目的：探讨 128 层螺旋 CT CARE kV 技术联合 SAFIRE 算法，对 CTPA 的辐射剂量和图像质量的影响。方法：选取本院行 CTPA 检查的患者 60 例，均采用 128 层螺旋 CT 进行扫描。随机分为两组，各 30 例。对照组：管电压 120kV，开启 Care Dose4D，参考管电流 150mAs。试验组：开启 CARE kV，参考管电压 120kV，参考管电流 150mAs。对照组图像采用 FBP 重组，获得 A 方案图像；试验组图像分别采用 FBP 和 SAFIRE 重组，获得 B 方案和 C 方案图像。记录每位患者的 $CTDI_{vol}$ 和 DLP，并计算 ED。测量肺动脉强化 CT 值，椎旁肌 CT 值及背景噪声，计算 SNR 和 CNR。由两名工作 10 年以上的影像学专家采用双盲法，根据肺动脉强化程度、肺及纵隔结构的显示情况用 5 分法对图像质量综合评分。比较两组的辐射剂量和 A、B、C 三种方案图像的 CT 值、背景噪声、信噪比、对比噪声比，并比较 3 种重组后图像的主观评分。结果：试验组和对照组 ED 差异具有统计学意义，前者较后者下降约 31.03%。A 和 B 方案图像的主观评分及背景噪声的差异均无统计学意义，而 A 与 C 比较，B 与 C 比较，差异均有统计学意义。A、B 方案之间及 A、C 方案之间的肺动脉主干及其分支 CT 值差异均有统计学意义，而 B、C 方案图像 CT 值的差异均无统计学意义。A、B、C 方案图像的肺动脉主干及其分支 SNR 和 CNR 差异均有统计学意义，其中 C 方案图像的 SNR 和 CNR 均最高，B 方案次之。结论：与常规 120kV 扫描模式相比，采用 CARE kV 扫描技术联合 SAFIRE 重组算法不仅能有效降低 CTPA 检查的辐射剂量，又能显著提高图像质量。

PU-2837
中国正常人群中 IVIM 参数的一致性研究

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目的 探讨中国正常人群 IVIM 参数的一致性研究。 **材料与方法** 纳入 2015 年 3 月至 2019 年 2 月在大连医科大学附属第一医院行 3.0T 心脏磁共振检查的 80 例正常志愿者，年龄范围 8-76 岁，其中，男 44 例（35.23±13.11 岁），女 36 例（38.61±17.94 岁），所有纳入对象均接受 3.0T 心脏电影成像以及使用多 b 值 (0, 20, 50, 80, 100, 120, 200, 300, 500 s/mm^2)于左心室的心尖、中间和基底层完成短轴 CMR-IVIM 扫描，选择图像质量最好的一层进行 IVIM 参数的数据测量。应用 Reportcard 后处理软件获得左心室结构和功能参数，应用 Functool 9.4.05a 后处理软件测量左心室心肌慢速表观扩散系数（ADC_{slow}）、快速表观扩散系数（ADC_{fast}）、快速扩散成分所占比例（f）。使用 ICCs 和 Bland-Altman 检验分析 IVIM 参数的一致性情况。**结果** IVIM 参数有较好的组内、组间一致性（均 ICCs>0.75），Bland-Altman 分析显示 ADC_{slow}、ADC_{fast}、f 差异百分比±1.96 标准差分别为(1.61%，-1.37%)、(74.55%，-59.08%)、(0.16%，-0.14%)。 **结论** IVIM 参数具有较好的一致性。

PU-2838
异位胸腺瘤：CT 表现及临床特征 8 例回顾性分析

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目的 分析异位胸腺瘤的 CT 影像特征及临床特征，熟悉本病的 CT 诊断。
材料和方法 回顾性分析 2013 年 9 月至 2019 年 6 月经病理证实的 8 例异位胸腺瘤的 CT 影像资料，临床资料及病理资料。
结果 8 例胸腺瘤，中纵隔 3 例（B1 型、C 型、C 型），心包 2 例（B3 型、B3 型），肺 1 例（B1 型），胸腔 1 例（AB 型），右心房 1 例（B2）；8 例中男性 4 例，女性 4 例，年龄 36 岁-70 岁。临床表现为胸闷、气短咳嗽，1 例有重症肌无力表现。8 例中 6 例 CT 误诊。CT 影像表现如下：肿瘤长径 4.2cm-19.5cm，形态为椭圆形或者类圆形，1 例心房内异位胸腺瘤塑形生长，密度均匀 2 例，不均匀 6 例，边界清晰 3 例，不清晰 5 例，8 例中，3 例伴胸腔积液，2 例伴心包积液，3 例存在钙化，CT 增强轻度强化为主。
结论 异位胸腺瘤罕见，常因位置的异常而造成误诊，但是其 CT 影像表现与前上纵隔胸腺瘤同样具有特征性。

PU-2839
多层螺旋 CT 及后处理技术在肺隔离症诊断中的应用

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【摘要】 背景：肺隔离症是一种少见的先天性肺发育异常，近年来随着医学影像学技术的快速发展，CT 三维重建技术日渐成熟，肺隔离症的检出率呈增高趋势。**目的：**探讨多层螺旋 CT 及后处理技术在肺隔离症诊断中的应用价值。**材料与方法：**收集经手术及病理证实的 19 例肺隔离症患者资料进行回顾性分析。所有检查采用多层螺旋 CT 扫描机，先行 CT 平扫，再行双期增强扫描，将图像传至工作站，进行 MPR、MIP 及 VR 重建。**结果：**17 例为肺叶内型，2 例为肺叶外型；其中 1 例位于

右肺上叶，14 例位于左肺下叶，4 例位于右肺下叶。多平面重建可清晰显示病灶内部结构，血管重建可清晰显示异常供血动脉（1 例来自支气管动脉、1 例来自右锁骨上动脉，14 例来自胸主动脉，1 例来自腹主动脉上段，2 例来自腹腔干），并清楚显示其起源、走行、分支和分布；1 例由异常血管回流至左房，1 例引流至奇静脉，1 例引流至半奇静脉，1 例引流静脉未确切显示，其余均引流至肺静脉。**结论：**多层螺旋 CT 增强及三维重建技术对肺隔离症的诊断有重要的临床价值，是诊断肺隔离症理想的非创性方法。

PU-2840

Stanford B 型主动脉夹层 TEVAR 术后 MSCTA 的分析评估

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目的 探讨 Stanford B 型主动脉夹层患者经胸主动脉腔内修复术（TEVAR）治疗后血管重塑形态。方法 回顾性分析 69 例接受 TEVAR 术治疗的 Stanford B 型主动脉夹层患者的手术前后临床及影像学资料，分析术后 30 天内、1-6 个月及 6 个月后主动脉各段真假腔内径变化及假腔血栓化的情况。结果 TEVAR 术后胸主动脉真腔增大、假腔缩小，与术前比较差异有统计学意义（P＜0.05），腹主动脉管径真腔和假腔变化较术前无统计学差异（P＞0.05），腹部重要分支动脉血供情况较术前改善。结论 Stanford B 型主动脉夹层患者 TEVAR 术后 MSCTA 分析评估证实其近中期效果明确。

PU-2841

术中超声在肺小结节临床诊疗中的应用

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背景：肺癌是如今全球发病率及死亡率最高的恶性肿瘤，手术切除是肺癌的主要治疗手段。术中超声具有精确定位、无创、实时监测肿瘤与血管的关系、提高肿瘤的切除率等优势。得益于医学影像设备硬件和软件技术的日益进步，肺小结节诊断、治疗与随诊的影像学检查水平一直在不断地提高。
目的：本文就当前肺小结节的研究热点，综合评价定位肺小结节的各种技术手段，着重于术中超声在肺小结节临床诊疗中的应用作一综述，并对其临床意义进行客观性评价。
结果：研究表明亚甲蓝灌注是肺结节的有效标志物；然而定位深部结节时，在肺表面上无法观察。目前有报道采用 CT 引导下注射医用胶联合亚甲蓝在肺小结节胸腔镜术前定位。Hook-wire 定位法是应用最早也是最为广泛的结节定位方法。然而钩丝脱落仍然是 Hook-wire 定位失败的主要原因。微弹簧圈通常用于选择性血管栓塞。1994 年 Asamura 首次报道应用微弹簧圈进行肺结节的定位。与常用的 Hook-wire 定位法相比，可保留在患者体内不易脱落。随着超声设备硬件和软件技术的革新，众多学者报道了超声定位在肺部手术的应用。过去，超声检查在肺部疾病的诊断方面具有很大的局限性。在一项 86 枚肺结节的研究中，经术中超声检查明确其确切位置者 78 枚（90.7%），平均操作时间 7.3min，与其他方法相比用时较短。还有学者在达芬奇手术中应用术中超声进行了肺小结节的定位与定性研究：术中超声检查作为“触摸”的“替代手指”可以找到肺结节的准确位置，尤其是混合磨玻璃结节。电磁导航支气管镜（ENB）是近年来新出现的一项微创诊断技术，已经证明在评估外周小病变时具有很大的实用性。

结论：随着超声新技术的更新，其价值将不仅限于实时定位、肺组织切缘情况和肿瘤的大小、深度等方面，同时有利于医生在手术中重复多次多角度探查。综上，肺小结节的每一种定位方法都有其优缺点。

PU-2842
螺旋 CT 多平面重组技术（MPR）在食管癌术前评估中的意义

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目的 探讨螺旋 CT 的多平面重组技术（MPR）对于食管癌术前评估的意义。
方法 收集分析 37 例经内镜病理证实的食管癌患者术前 CT 增强扫描图像，由两组同年资医师分别应用多平面重组技术（multi-plane reformation ，MPR）及常规轴位图像对 37 例食管癌患者的癌灶基本情况（癌灶大小、周边侵犯及脏器累及情况）、纵膈内淋巴结（No.105 组、No.106 组(No.106rec、No.106tb、No.106pre)、No.107 组、No.108 组、No.110 组、No.111 组）情况进行评估（其中转移淋巴结评判标准为：淋巴结短径大于 7mm 或淋巴结有不均质强化或淋巴结之间相互融合）。依据术后病理结果对比分析 MPR 重建图像与常规轴位图像对于食管癌癌灶周边基本情况及纵膈内淋巴结情况的敏感性、特异性、阳性预测值、阴性预测值。（淋巴结分组参考日本食管癌协会第十版指南）
结果 37 例患者中术中癌灶切除 35 例，2 例因黏连转肿瘤中心继续治疗；37 例患者中切除共清理肿大淋巴结 366 枚，其中转移淋巴结 72 枚。MPR 重建图像中标记癌灶侵犯周边情况 3 例，标记转移淋巴结 80 枚，正确诊断 60 枚；常规轴位图像中标记癌灶侵犯周边情况 1 例，标记转移淋巴结 76 枚，正确诊断 42 枚。MPR 重建图像评估食管癌癌灶周边侵犯的敏感性及特异性分别为 100%、97%，转移淋巴结的敏感性、特异性、阳性预测值、阴性预测值分别为：83.3%、93.1%、75%、95.8%；常规轴位图像评估食管癌癌灶周边侵犯的敏感性及特异性分别为 50%、100%，转移淋巴结的敏感性、特异性、阳性预测值、阴性预测值分别为：58.3%、88.4%、55.2%、89.6%。
结论 CT 多平面重组技术（MPR）的运用对评估食管癌癌灶侵犯及检出转移淋巴结有更好的敏感性和特异性，对食管癌术前影像评估及术中淋巴结清扫有重要临床意义。

PU-2843
隆突性皮肤纤维肉瘤的 CT 诊断及鉴别诊断

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目的
探讨螺旋 CT 对隆突性皮肤纤维肉瘤的诊断和鉴别诊断价值。
方法
回顾性分析经手术病理证实的 6 例隆突性皮肤纤维肉瘤患者的 CT 平扫及增强图像。
结果
6 例患者，男 4 例，女 2 例。发生在背部 2 例，腹股沟区 2 例，颈肩部及上胸壁各 1 例。5 例术后原位复发，其中 1 例为术后多次原位复发。CT 表现病变多发生于体表，向体外隆起。平扫多呈稍低密度软组织肿块，边界清楚，增强呈明显强化。手术后易复发，多是由于对此病缺乏足够的认识，常误诊为良性肿瘤而行单纯局部的切除，忽略了其具有侵袭性的特点。较少发生远处转移。隆

突性皮肤纤维肉瘤需与以下病变相鉴别：1、皮肤癌、基底细胞癌：均为发生于皮肤的恶性肿瘤，其 CT 表现为皮肤的不规则片状增厚，皮下脂肪层受侵时主要表现为脂肪层密度增高模糊，多无明显的软组织肿块形成。2、黑色素瘤：以躯干、头颈多见，皮损多呈蓝黑色，多发生于富含黑色素细胞的表皮与真皮交界处，出血、囊变、坏死多见。3、神经鞘瘤：多位于深层肌肉间隙，沿神经干走行，且与神经关系密切，易囊变使肿瘤密度不均，强化多不均匀。4、真皮纤维瘤：单发或多发，多发生于四肢各部位，常伴表皮组织的增厚。5、血管瘤：多发生于四肢肌肉的无痛性软组织肿块，多可见静脉石，增强明显强化。

结论

隆突性皮肤纤维肉瘤具有单发，病灶边界清楚，均匀明显强化等影像学特征，结合临床资料及影像学特点可以做出明确的诊断。

PU-2844

非小细胞肺癌 CT 征象与 EGFR、Ki-67 基因突变的差异性研究

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目的：探讨非小细胞肺癌 EGFR 阳性组与阴性组、Ki-67 阳性组与阴性组间影像表现的差异。
方法:选取经病理确诊为非小细胞肺癌，并进行 Ki-67 及 EGFR 基因检测的患者共 69 例，记录影像学特征，包括毛刺征、分叶征、空泡征、血管集束征、支气管充气征，并与 EGFR、Ki-67 检测结果进行差异性分析。结果：EGFR 阳性组与阴性组间，毛刺征、分叶征、空泡征差异具有统计学意义（P<0.05），血管集束征、支气管充气征的差异不具有统计学意义。Ki-67 阳性组与阴性组间毛刺征、分叶征、血管集束征差异具有统计学意义（P<0.05），空泡征、支气管充气征的差异不具有统计学意义。结论：毛刺征、分叶征、空泡征能为临床预测非小细胞肺癌 EGFR 突变提供一定依据，具有上述征象的患者更有可能发生 EGFR 的突变，毛刺征、分叶征、血管集束征能为临床预测非小细胞肺癌 Ki-67 突变提供一定依据，具有上述征象的患者更有可能发生 Ki-67 的突变。

PU-2845

the application value of wide detector CT electrocardiograph gating three dimensional reconstruction of the heart in transapical transcatheter aortic valve replacement in the treatment of elderly and high-risk aortic valve insufficiency.

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Abstract to explore the application value of wide detector CT electrocardiograph gating three dimensional reconstruction of the heart in transapical transcatheter aortic valve replacement in the treatment of elderly and high-risk aortic valve insufficiency.**Methods** a retrospective analysis in June 2016 to August 2018 in our hospital because of aortic valve insufficiency to TAVR surgery for CT enhanced heart 3d reconstruction of the clinical data of 69 patients, 45 cases of male, female 24

cases, mean age 75.8± 4.2 years, adopt preoperative CT heart switch control 3 d reconstruction technology of aortic valve area and heart vessels have to conduct a comprehensive assessment, including the aorta initial CT value, contrast to noise ratio (CNR), records of all patients dose length product (DLP), and calculate the effective radiation dose (ED), observation for the shape of the aortic valve,The diameter of aortic valve ring, the height of coronary artery opening from aortic valve ring, the diameter of ascending aorta, the included Angle of left ventricular aorta, and the optimal imaging projection Angle of 3d volume images were measured.Appropriate surgical cases were selected based on the measured data, and ideal surgical strategies were developed, such as selecting the optimal valve size, imaging projection Angle, and the apical approach.The second generation of artificial biological valve -J-Vavle hybrid surgery is suitable for patients.**Results** CT cardiac imaging was successfully performed in all patients.The CT report showed that the valves were all three-lobed and no left ventricular aneurysm was found.CT values of aortic root were 409±27 HU,CNR 17.7±5.8, DLP 64.98±7.27, and effective radiation dose was 0.91±0.35 mSv.According to the measurement results, the diameter of valve ring was greater than 29mm in 9 patients (6 males), and the diameter of coronary valvulotomy ring was less than 10mm in 1 of the 60 patients with the diameter of valve ring less than 29mm. These 10 patients were converted to surgical thoracic valve replacement, and the remaining 59 patients successfully completed TAVR surgery.Among the 59 patients with successful operation, the mean ring diameter of valve was measured by CT. Among them, 55 patients had no calcification of valve, and 4 patients had mild calcification of valve.The best intraoperative imaging Angle of 94.9% (56/59) patients was accurately predicted according to the preoperative three-dimensional full-volume three-dimensional image.**Conclusion** the wide detector CT electrocardiograph gating 3d imaging technology plays a key role in the preoperative evaluation of TAVR, and has important guiding significance for the feasibility of surgery, the selection of surgical equipment and surgical methods, and the radiation dose is small, which is suitable for clinical application.

PU-2846

Increase detection of pulmonary arterio-venous malformation on CT scans after the 2nd decade of life

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Pulmonary arterio-venous malformation was considered as a heritable disease, it is when the pulmonary arteries and veins in the lung join together (pulmonary and systematic circulation) causing left to right shunt between the circulations. PAVM is a rare inherited malformation seen 80% in patients with Hereditary hemorrhagic telangiectasia knows as Osler- Weber syndrome. Patients who has the disease it mostly diagnosed at a younger age , and these patients usually present with symptoms of nose bleeding, stroke, brain abscess, shortness of breath or chest pain. The non in hereditary disease is usually called the secondary/acquired type of malformation is usually asymptomatic and is not found due to the fistula/malformation is small and

only tend too increase later years in life, due to the growth and expand of the lungs and other environmental factors that could affect the fistula. Most of the secondary type of fistula are detected accidentally can be detected on Chet CT scans when patients are more required for the diagnosis of CT Scans to different approach in the medical health check up. The Male to Female ratio of PAVM is 1:1. PAVM in a pregnant female increases the risk for increase in size of the malformation, pulmonary hemorrhage and stroke, hence due to the hormonal influence of estrogen on pregnancy to the vessels.

PU-2847

Askin 瘤的 CT 表现分析

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目的 探讨胸壁及肺 Askin 瘤的 CT 表现特点及其诊断价值。**方法** 回顾性分析经病理证实的 6 例 Askin 瘤，男 3 例，女 3 例。全部行 CT 平扫，其中 3 例行增强扫描，从 CT 图像上分析肿瘤的位置、数量、形态、大小、密度、强化程度及方式、周围侵犯及远处转移等。**结果** 5 例为胸壁来源，1 例为左肺来源，均为单发肿物。4 例呈类圆形，2 例呈分叶状，大小从 56×52×32mm 到 130×111×92mm 不等。1 例密度均匀，5 例均密度不均，见不同程度坏死区。3 例行增强扫描者均呈不均匀强化，2 例有延迟强化。所有病例均侵及邻近组织，包括 5 例肋骨受侵，5 例胸膜受侵，1 例后纵隔及椎管受侵。均未见淋巴结及远处转移征象。**结论** Askin 瘤为好发于年长儿及青少年的一种恶性度极高的肿瘤，其 CT 表现具一定特征性，肿瘤内坏死多见而钙化少见，增强扫描不均匀强化并有延迟强化，易侵犯邻近结构，淋巴结及远处转移少见，以上征象有助于 Askin 瘤的诊断和鉴别诊断。

PU-2848

基于深度神经网络进行 CMR 自动心室分割的初步研究

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目的：手动勾画心脏轮廓进行心功能分析在临床工作中耗时耗力，本研究应用 2D U-Net 方法进行心脏磁共振双室自动分割，提高心室分割精准度。
方法：回顾性收集 50 例正常人、50 例肥厚型心肌病、50 例扩张型心肌病、50 例心肌梗死患者心脏磁共振电影图像。选取 80%数量作为训练组进行人工手动勾画每一层电影左右室轮廓，20%数量作为测试组。通过 CNN-LSTM 模块对于 2D 图像的前后时间点的影像进行利用，使用空洞卷积，在中间层加入不同大小的空洞卷积从而利用不同层次的图像信息进行训练学习。使用 Dice 系数评估分割的精度。
结果：正常人心室分割整体 DICE 值为 0.928，左室、右室及左室心肌分别分割 DICE 值分别为 0.943、0.892、0.943；肥厚型心肌病患者割整体 DICE 值为 0.891，左室、右室及左室心肌分别分割 DICE 值分别为 0.922、0.903、0.877；扩张型心肌病患者割整体 DICE 值为 0.893，左室、右室及左室心肌分别分割 DICE 值分别为 0.966、0.887、0.903；心肌梗死患者割整体 DICE 值为 0.870，左室、右室及左室心肌分别分割 DICE 值分别为 0.956、0.825、0.866。

结论：基于 2D U-Net 能够进行自动心室分割，该方法具有较高的精准度，未来拟应用 3D U-Net 作为基础框架进行开发，将组件做成 3D，并进行精度实验。

PU-2849
探究根据 BMI 标准选择低剂量条件在 16 排螺旋 CT 肺结节筛查中的应用价值

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目的：探究根据身体质量指数（BMI，Body Mass Index）选择低剂量条件在 16 排螺旋 CT 肺结节筛查中的应用价值。
方法：共收集肺结节患者 150 例，根据 BMI 分为 20mAs 组（偏瘦）、30mAs 组（正常）、40mAs 组（超重）、50mAs 组（偏胖）、60mAs 组（肥胖）。采用 16 排螺旋 CT 对患者进行常规条件及低剂量条件两次扫描。对图像进行图像质量双盲法评价并对肺结节进行测量分析。
结果：常规剂量组和低剂量组图像均能满足临床诊断需求，图像优良率差异无统计学意义（P >0.05）；低剂量组参数毫安秒、CTDI、DLP 均低于常规剂量组，两组差异有统计学意义（ P <0.05）；两组肺结节检出率、病理检查符合率差异无统计学意义（P >0.05）。
结论：在临床肺部疾病 CT 筛查中，根据 BMI 标准选择低剂量条件体现了患者个体差异化，在满足临床图像要求和疾病诊断的基础上明显降低患者受照剂量。

PU-2850
基于第八版非小细胞肺癌 TNM 分期的 CT 与 MRI 对照研究

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目的 以第八版肺癌 TNM 分期为标准，对比分析 CT 和 MRI 在非小细胞肺癌 TN 分期中的应用价值。**方法** 回顾性分析 2018 年 6 月～2019 年 4 月经手术、穿刺活检及病理证实的非小细胞性肺癌患者 40 例，术前均行 CT 增强、MRI 平扫及 MRI 动态增强扫描，由 2 名高年资影像诊断医师采用双盲法阅片，分别评估 CT 和 MRI 对非小细胞肺癌治疗前的 TN 分期及胸部 M 分期。采用配对卡方检验，以临床分期为金标准，对非小细胞肺癌 CT、MRI 检查的 T 分期和 N 分期的准确性进行组间差异性分析，采用 kappa 值对 CT、MRI 的 T 分期和 N 分期结果进行一致性分析。**结果** 40 例非小细胞肺癌中，34 例 CT T 分期与临床分期符合，6 例不符合；32 例 MRI T 分期与临床分期符合，8 例不符合。25 例 CT N 分期与临床分期符合，15 例不符合；36 例 MRI N 分期与临床分期符合，4 例不符合。MRI 在 N 分期上总体符合率高于 CT，CT 与 MRI 在 T 分期上的差异没有统计学意义（P=0.754），CT 与 MRI 在 N 分期上的差异有统计学意义（P=0.007）。CT 与 MRI 在 T 分期结果上的一致性较高（kappa=0.634），在 N 分期上的一致性中等（kappa=0.479）。在胸部 M 分期上，MRI 显示 3 例胸椎及 1 例肋骨转移，而 CT 呈阴性表现。**结论** CT 和 MRI 对非小细胞肺癌在 T 分期上的准确率较为一致，在 N 分期上，MRI 的准确率高于 CT，在胸部 M 分期上，MRI 对早期胸椎、肋骨的转移敏感性优于 CT。

PU-2851
CT 肺动脉成像低剂量扫描研究

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目的 探讨管电压和管电流对 CT 肺动脉成像图像质量和辐射剂量的影响。**方法** 将 100 名怀疑肺动脉栓塞需行 CT 肺动脉成像的患者随机分成五组，分五种方案扫描。方案 1 至 5 管电压、管电流分别为 120 KV、200 mAs，120 KV、150 mAs，120 KV、100 mAs，100 KV、200 mAs，80 KV、200 mAs。对各组图像进行主观评价，包括图像质量、噪声和锐利度评分；进行客观评价，测量肺动脉 CT 值和噪声，计算性噪比（SNR)和对比性噪声比(CNR)，记录 CT 剂量容积指数（CDTIvol）和剂量长度乘积（DLP）。采用非参数 *Kruskal-Wallis* 检验比较不同扫描方案下的图像评分，采用方差分析比较不同扫描方案下肺动脉 CT 值、噪声、SNR 和 CNR，。**结果** 五种方案图像主观评分均≥3 分，差异无统计学意义（*P*>0.05)。五种扫描方案图像 5 肺动脉 CT 值最大，方案 3 最小。噪声最大，性噪比和对比性噪声比差异不明显，辐射剂量最小。**结论** 降低一定管电压或管电流，图像质量均能满足诊断要求，辐射剂量降低。降低管电压可更明显强化肺动脉血管，更大降低辐射剂量。

PU-2852
成人 PICC 导管末端定位在胸片及 CT 中的一致性研究

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目的：经外周静脉置入中心静脉导管 (peripherally inserted central catheter, PICC),是指经外周静脉穿刺置入导管,使其头端位于中心静脉内。PICC 头端位置与导管的安全留置和使用密切相关。本文目的回顾性分析 PICC 末端位置在胸片及 CT 检查中的一致性。方法：回顾性分析 160 例 PICC 置管患者的胸片及一周内的胸部 CT 检查，分别测量并记录 PICC 管到气管隆突、T6 椎体下缘、右侧胸锁关节下缘、右支气管角的垂直距离（直接距离）,数值单位 mm，精确到小数点后 1 位；并测量 T6 椎体单元高度，就算相对距离=直接距离/T6 椎体单元高度。将所得数据进行统计分析。采用 SPSS 18. 0 软件包对数据进行分析，用 Bland－Altman 法和 95%可信区间来评价两组数据的一致性。以 P ＜ 0. 05 为差异有统计学意义。结果 ：胸片组 PICC 管到气管隆突、T6 椎体下缘、右侧胸锁关节下缘、右支气管角的垂直距离（直接距离）分别为 44.5mm，26.1mm，85.8mm，36.9mm，相对距离分别为 1.94，1.14，3.74，1.61；CT 组患者的 PICC 管到气管隆突、T6 椎体下缘、右侧胸锁关节下缘、右支气管角的垂直距离（直接距离）分别为 27.7mm，12.9mm，87.7mm，33.0mm，相对距离分别为 1.28，0.59，4.04，1.52。与 CT 组相比，PICC 管到气管隆突、T6 椎体下缘的直接距离在胸片上位置偏下约 15mm 左右，相对距离约 0.6 个 T6 椎体单元高度；PICC 管到右侧胸锁关节下缘、右支气管角的直接距离在胸片上位置偏下约 5mm 左右，相对距离约 0.3 个 T6 椎体单元高度。结论 ：在 PICC 管定位时应充分考虑患者的体位，检查方法等影响因素。

PU-2853
ASIR-V 在提高低剂量条件下胸部 CT 图像质量中的价值

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目的 探讨基于多模型的自适应统计迭代重建（ASIR -V）技术在降低胸部 CT 辐射剂量中的价值。**方法** 将 60 例拟行胸部 CT 平扫的患者随机分为 A、B 两组，每组 30 例，两组患者均采用自动管电

流调制技术进行扫描。常规剂量组 A 组预设噪声指数(NI=10)，采用滤波反投影算法（Filtering Back-Projection，FBP）重建，低剂量组 B 组预设噪声指数(NI=14)，设定权重为 0%，10%，20%，30%，40%，50%，60%，70%，80%，90%，100%多模型的迭代重建算法（ASIR -V）重建图像，测量胸廓入口平面、支气管分叉平面及肺底平面竖脊肌、胸壁脂肪、胸主动脉的 CT 值及 SD（标准差）值;方差分析及组间配对 t 检验比较噪声。**结果** A 组 CTDIvol 为 13.23±4.51mGy，DLP 为 462.1±158.08mGy.cm,ED 为 6.47±2.21mSv。B 组 CTDIvol 为 8.49±2.39 mGy，DLP 为 301.02±84.4mGy.cm,ED 为 4.21±1.18mSv。B 组较 A 组的辐射剂量降低了约 37.9%。相比于常规剂量 FBP 重建，权重 70%ASIR -V 低剂量组噪声低，但 FBP 及 20%～40%ASIR -V 低剂量组噪声高，差异均有统计学意义（P＜0.05）。两名医师主观评价图像噪声、肺内结构、纵隔结构一致性好（Kappa 值＞0.7），低剂量 60%ASIR -V 和 80%ASIR -V 主观评分大于常规剂量 FBP 重建，但 FBP 及 20%～40%、100%ASIR -V 低剂量组主观评分小于常规剂量 FBP 重建，差异均有统计学意义（P＜0.05）。**结论** ASIR -V 有利于提高低剂量条件下胸部 CT 图像质量，可减少约 38%辐射剂量。

PU-2854

早期肺癌影查方法像筛的选择

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【摘要】 **目的** 比较分析早期肺癌影像筛查 DR、CT、MRI 对其诊断的临床价值。**方法** 对我院 96 例有胸部数字化 X 线胸片和经螺旋 CT 扫描发现肺部有小于 30.0mm 结节的患者影像资料进行回顾性分析。采用柯达公司生产的数字 X 线摄影机常规摄取正侧位片。采用双源 CT 行胸部低剂量扫描和 ADW4.5 工作站队图像进行薄层后处理。**结果** 胸部数字平片：96 例患者中 13 例患者可见 11～30mm 结节，83 例可见小于 10mm 的实性小结节，或磨玻璃结节在平片上均未能清晰显示。螺旋 CT 智能化毫安低剂量扫描：96 例中，除平片所见的 13 例较大结节外，其余 83 例均为 10mm 内的实性（21 例）或磨玻璃密度结节（62）例。于 1.0mm 层厚图像上清晰可见小病灶为单纯磨玻璃密度结节或磨实两种不同密度成分组成的磨实性结节，部分还可清晰显示伸入结节内的供应，血管及结节周围的毛刺和分叶征像。为病灶定性诊断提供了有力依据。20 例患者同时进行了高分辨 CT 检查，所得影像资料与螺旋 CT 薄层重建图像所见无异。**结论** 肺部筛查早癌，可常规先摄 DR 胸部正侧位片，如胸片未发现病灶，可于 3 月内行胸部低剂量 CT 扫描，低剂量 CT 扫描是今后值得推广的胸部筛查项目。

PU-2855

胸腺原发黏膜相关淋巴组织淋巴瘤的 CT 诊断

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目的 探讨胸腺原发性黏膜相关淋巴组织淋巴瘤（MALToma）的 CT 表现和诊断价值 。**方法** 回顾性搜集本院经病理证实的胸腺原发 MALToma 共 7 例。观察胸腺 MALToma 的 CT 特征，并与 6 例胸腺癌及 6 例胸腺弥漫大 B 细胞淋巴瘤的 CT 表现进行对照。**结果** 7 例 MALToma 患者中 2 例为男性，5 例为女性，年龄<40 岁者 5 例（5/7），与胸腺癌（0/6）相比（P<0.05），而与弥漫大 B 细胞淋巴瘤（6/6）比较无统计学差异；胸腺 MALToma 所有病灶均呈单侧生长（7/7），与弥漫大 B 细胞淋巴瘤（1/6）比较（P<0.05），而与胸腺癌（5/6）比较无统计学意义；所有 MALToma 病灶均呈囊实性肿块（7/7），囊变区呈小而多发，囊与囊之间分界清楚，囊壁光滑，胸腺癌囊变多呈单个大片坏死（4/6），边缘欠清，弥漫大 B 细胞淋巴瘤囊变较少见（2/6，P<0.05）；所有 MALToma 病灶均无

纵隔淋巴结肿大（0/7），胸腺癌中 2 例出现淋巴结肿大（2/6），两者比较无统计学差异，而弥漫大 B 细胞淋巴瘤均有纵隔淋巴结肿大（6/6，P<0.05）；所有 MALToma 病灶均未出现周围大血管侵犯（0/7），与弥漫大 B 细胞淋巴瘤（5/6）比较（P<0.05），而与胸腺癌（2/6）比较无统计学差异。**结论** CT 表现在胸腺原发性 MALToma 的诊断中具有一定价值。

PU-2856

Phantom Study on the Influence of Low Dose and Reconstruction Algorithm on Cardiac Calcification Score

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Objectives: *To study the effects of different reconstruction algorithms combined with dose reduction protocol on calcium scoring in a thoracic phantom and confirm suitable calcium scoring correction factors between low dose protocols and reference protocol if possible.*
Methods: *The thorax phantom embedded in cylinders with different proportions of hydroxyapatite was scanned with the reference protocol (120 kv, 80 mAs, FBP) and dose reduction protocol (120 kV, 100 mAs-20 mAs, 5 mAs interval) with 256-slice scanner. Row data was reconstructed with different levels of different reconstruction algorithms. Calcifications were quantified calculating. The Agatston and volume scores, quantitative image quality parameters and CTDIvol were obtained on technical software (Philips Healthcare, Cleveland, OH, USA). Linear regressions analysis was performed, whose slopes were as correction factors.*
Results: *Overall qualitative image quality significantly improved with iDose as compared to FBP, and further improved with IMR ($p < 0.05$ all). The Agatston and volume area scores with IMR were decreased as compared to FBP ($P < 0.05$ all), they were similar when data were reconstructed with iDose and FBP ($P > 0.05$ all). At decreasing tube current, the Agatston and volume scores decreased with IMR(τb= 0.849 and 0.882 respectively, $P < 0.05$ all), however the Agatston scores increased with iDose and FBP(τb= -0.523 and -0.5, $P < 0.05$ all). the Agatston scores were similar with the lowest dose protocol (120kv, 20mAs) with iDose7 and with reference protocol and the Agatston scores with the lowest dose protocol with IMR2 need correction factors to match the Agatston scores with reference protocol, correction factors were 1.10. Dose reduction was 74.7%.*
Conclusions: *the Agatston scores with the lowest dose protocol with IMR2 and iDose7 could match the Agatston scores with reference protocol after corrected by correction factors with dose reduction up to 74.7%, correction factors for IMR2 were 1.10.*

PU-2857

胸膜孤立性纤维性肿瘤良恶性的 CT 影像学特征

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目的：回顾性分析 20 例经病理证实的胸膜纤维瘤（SFTP）的计算机断层扫描（CT）特征。**方法**：回顾性分析 20 例经手术及病理证实的胸膜纤维瘤的术前 CT 图像。记录患者图像病变特征，包括大小、边界、强化程度、胸腔积液和钙化等方面，并与病理组织学诊断相关联。回顾影像学和临床表现以除外复发。影像结果由两位高年资胸部影像诊断经验的放射科医师评估。统计学分析采用 SPSS17.0 统计软件进行统计评价，结果采用单因素方差分析，P ＜ 0.05 代表差异具有统计学意义。**结果**：20 例患者中，女性 11 例，男性 9 例，良性 12 例，恶性 8 例。良性肿瘤和恶性肿瘤的平均年龄分别为 55.1±18.9 和 63.7±10.4 年，差异不具有统计学意义（P＞0.05）。恶性肿瘤的中位（四分位范围）直径为 4.79（3.0-7.2）cm，恶性肿瘤为 9.4（6.1-14.5）cm，恶性肿瘤直径高于良性肿瘤，其差异具有统计学意义（p＜0.05）。肿瘤边缘分叶征，良性肿瘤 41%例（5/12），恶性肿瘤 80%例（8/10），恶性肿瘤分叶征检出率高于良性中， 差异具有统计学意义（p＜0.05）。良性肿瘤与恶性肿瘤强化程度相比，差异不具有统计学意义（P＞0.05）。钙化发生在良性肿瘤 33%例（4/12）和恶性肿瘤 87%例（7/8），恶性肿瘤钙化检出率高于良性肿瘤，差异具有统计学意义（p＜0.05）。恶性病变胸腔积液检出率高于良性病变(良性胸腔积液 8%例（1/12），恶性病变 50%例（4/8）)，差异具有统计学意义（p＜0.05）。术前抽吸活检仅 1 例病理诊断为 SFTP。随访数年（1～10 年，平均 3 年），10 例良性 SFTP 患者中 5/10 例（50%）发生局部复发。**结论**：没有明确的影像学特征以区分良性和恶性 SFTP。肿块的大小，边缘分叶状，钙化及同侧胸腔积液是预测恶性肿瘤的 CT 影像特征。在疑似病例中，应进行穿刺活检，从而取代细针穿刺。

PU-2858

螺旋 CT 支气管重建成像技术的临床应用

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目的：螺旋 CT 气管支气管树成像的方法是指在螺旋 CT 薄层容积数据采集的基础上，利用计算机的后处理技术做气道的立体重建，可重建成各种不同的二位（2D）和三维（3D）气管支气管像，将病变真实地显示出来。气管支气管 CT 重建后，可对支气管异物、新生物及气管狭窄等病变的显示和诊断提供准确的依据。**方法**：1.一般资料：随机抽取临床疑有气管支气管病变，且经支气管重建成像的 40 例患者，另选 30 例健康体检志愿者进行参照对比。2.设备和 CT 扫描条件：应用 GE Light speet VCT64 排螺旋 CT 机扫描系统，扫描范围自胸廓入口至第 12 肋骨最低点下 1cm。3.图像后处理：轴位扫描后进行矢状、冠状位由 GE Advantage Window4.5 计算机工作站进行三维重建。**结果**：1.正常支气管像：30 例中 28 例支气管影像无异常改变。SSD 表现为依所取 CT 域值的范围和高低不同，可分别获得三种 3D 图像。2.异常支气管像：40 例异常支气管像表现，腔内占位表现为 MPR 直接显示病灶；SSD 表现视支气管阻塞程度而异；MinIP 表现为气道低密度投影不延伸；CTVE 表现为腔内高密度灶。腔外肿块压迫或管壁肿瘤侵犯为 MPR 和 MinIP 均能显示狭窄并可见移位但管壁规则；SSD 表现为狭窄变形表面见弧形压迹；MPR 除显示气道不规则狭窄外；CTVE 见管腔变形或闭塞。支气管异物可清晰显示其直接征象，支气管扩张可见囊状、椭圆形、柱状含气或含气液结构，支气管狭窄可在轴位、冠状位与矢状位上清晰显示狭窄段气管或支气管的长度和狭窄程度。**结论**：胸部螺旋 CT 扫描的图像后处理，可获得各种效果的气管支气管像。MPR、SSD、MinIP、CTVE 各处理技术的配合运用，可全面了解气管支气管的外表、内壁和官腔，对于研究正常和异常支气管影像学特性有着重要价值。

PU-2859
多层螺旋 CT 及多平面重建在气管支气管异物诊断中的应用

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目的探讨多层螺旋 CT 及多平面重建在气管支气管异物不同时期的诊断价值。**方法**经纤维支气管镜确诊气管支气管异物的患者 93 例，术前行多层螺旋 CT 扫描及多平面重建，根据病程长短分为：I 组（0-24 小时）；II 组（1-7 天）；III 组（7 天以上）。分别记录年龄、性别、病史、症状、体征和 CT 检查异物大小、位置及肺内继发征象。**结果** 93 例患者 3 岁以下 72 例，突然咳嗽 39 例，呼吸困难 29 例；CT 提示 42 例嵌顿于右支气管内，24 例嵌顿于左支气管内；I 组较 II 组及 III 合并肺气肿患者比例更高（p＜0.05），II 组和 III 组较 I 组及 II 组发热及合并肺炎患者比例更高（p＜0.05）。**结论**多层螺旋 CT 扫描及多平面重建技术能够准确直观地显示不同时期异物的大小、位置及其肺内继发征象，具有重要的临床应用价值。

PU-2860
肺结核误诊肺癌

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[摘要] 目的 探讨引起邻近骨质破坏的肺结核误诊为肺癌的原因。方法 对 2009 年 1 月至 2016 年 12 月我院收治的 6 例引起骨质破坏的肺结核患者 CT 影像表现进行回顾性分析研究，由 3 名主治医师及 2 名副主任医师对其 CT 表现进行分析，探究影像被误诊的原因。结果 在 6 例患者中，病灶均靠近肋骨或脊柱，并引起相邻骨质破坏，肋骨破坏骨质以内侧为重，呈虫蚀状或斑片状，范围较广，边缘轻度硬化，椎体破坏边缘呈小囊状破坏，边缘不同程度硬化，其中 4 例肺结核呈不规则软组织肿块型，2 例呈肺实变型，6 例患者均误诊为肺癌并邻近骨质侵犯，6 例患者行纤支镜或病理穿刺均为结核，治疗后出院。结论 引起骨质破坏的肺结核属于不典型肺结核，表现和肺癌类似，容易误诊，临床医生在对其诊断过程中要认真结合临床资料进行诊断与鉴别诊断，无法确诊时要尽早进行病理活检，以减少误诊误治。

PU-2861
双源 CT 双低剂量结合大螺距扫描在肺动脉 CTA 的应用价值

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目的:探讨双源 CT 双低剂量结合大螺距扫描在肺动脉 CTA 中的临床应用价值。
方法:选取 2017 年 1 月到 2018 年 10 月期间在本院接受肺动脉 CTA 扫描的其中 40 例患者作为本次临床试验研究的观察和分析对象。根据双源 CT 扫描管电压、对比剂剂量和螺距的不同将这 40 例患者分为对照组和观察组各 20 例的两组患者,对照组的 20 例患者以 100kV 管电压和 370mgI/mL 对比剂进行扫描,螺距 1.0；观察组的 20 例患者以 80kV 管电压和 320mgI/mL 的对比剂进行扫描,螺距 3.2。对观察组和对照组两组患者的肺动脉栓塞诊断结果、肺动脉 CTA 图像质量的评分和辐射剂量、CNR 以及 SNR 等图像参数情况进行观察和对比。

结果:观察组和对照组两组患者在肺动脉栓塞的诊断准确度、灵敏度和特异性等方面均无明显的差异,P>0.05,差异不具有统计学意义;观察组患者的肺动脉 CTA 图像质量评分 zong'f 为 134 分,平均分 4.65±0.39,对照组患者的肺动脉 CTA 图像质量评分为 120 分,平均分 3.96±0.42,P<0.05,差异具有统计学意义;观察组患者的辐射剂量、CNR 以及 SNR 三项图像参数均比对照组患者的图像参数低,P<0.05,差异具有统计学意义。
结论:采用双源 CT 双低剂量结合大螺距进行肺动脉 CTA 的扫描在不影响肺动脉栓塞诊断准确率的情况下,能够有效提高肺动脉 CTA 扫描的图像质量,减少患者的辐射剂量、CNR 和 SNR 等图像参数,降低对比剂引发的肾病情况,值得在肺动脉栓塞的临床诊断和治疗中进行推广应用。

PU-2862

双源 CT 在肺结节病影像学诊断中的应用价值分析

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目的:分析双源 CT 在肺结节病影像学诊断中的应用价值。**方法**:回顾性分析我院 2018 年 4 月—2018 年 6 月撷取的 50 例肺结节病患者，所有肺结节病患者均存在发热、咳嗽、咯痰、胸痛等症状，排除精神病症者、不配合检查者，所有患者均通过胸腔镜纵隔淋巴结活检，激素治疗后反复对比复查。选择双源 CT 设备检查，层厚为 5.0mm，实行连续性扫描，扫描范围为肺底至肺尖区域。针对难以鉴别的患者，可通过 CT 增强扫描进行处理，采用动态观察，给予 70ml 碘海醇，进行静脉注射,注射速率为 3.5ml/s。完成造影后，分别对动脉期、静脉期 进行 CT 值检测，所得数据进行分析。**结果**:肺内改变者 29 例,均为肺内结节影像改变,包括 18 例胸膜下多发结节者、肺内散在结节改变者、6 例肺内单发结节改变者、5 例磨玻璃样改变者。50 例肺结节病患者中,胸部淋巴结无明显肿大者 8 例、淋巴结肿大者 42 例。42 例淋巴结肿大者中，主动脉弓旁淋巴结肿大者、气管前腔静脉后间隙淋巴结肿大者各占 71%（30/42）、80%（34/42）。**结论**:肺结节病检查中,使用双源 CT 检查,不会出现数据采集位置和时间差,对肺结节的检出具有重要的临床应用价值。

PU-2863

The Diagnostic Value of Multi-detector CT Angiography for Catheter-related Central Venous Stenosis in Hemodialysis Patients

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Objectives: Central venous stenosis (CVS) is a common complication in hemodialysis patients, especially those who are dialyzed through a central venous catheter (CVC). The objective of our study was to assess the diagnostic value of Multi-detector CT angiography (MDCTA) for catheter related-CVS compared with conventional digital subtraction angiography (DSA) in hemodialysis patients.
Methods: Between October 1, 2012 and September 30, 2018, hemodialysis patients admitted to our center for suspected catheter related-CVS who received both MDCTA and DSA were retrospectively enrolled. We compared the sensitivity, specificity, accuracy, diagnostic odds ratio (DOR), positive predictive value (PPV), negative predictive value (NPV), positive likelihood ratio (PLR) and negative likelihood ratio (NLR) for

MDCTA as an alternative to DSA. Cohen’s kappa coefficient (κ) was calculated to assess inter-test agreement.
Results: A total of 1533 vascular segments in 219 patients were analyzed. Among the 280 lesions identified by DSA, 156 were correctly identified by MDCTA. MDCTA had a high specificity (96.73%) but a low sensitivity (55.71%). The accuracy, DOR, PPV, NPV, PLR and NLR were 89.24%, 37.20, 79.19%, 90.72%, 17.03, 0.4578, respectively, with a moderate inter-test agreement (κ=0.5930). In stratified analyses of vascular segments, the specificities of MDCTA were 89.93% (superior vena cava), 98.95% (left innominate vein), 95.33% (right innominate vein), 99.53% (left subclavian vein), 97.61% (right subclavian vein), 97.13% (left internal jugular vein), and 95.86% (right internal jugular vein), while the sensitivities were 90.00%, 65.52%, 66.67%, 87.50%, 40.00%, 20.00% and 8.11%, respectively.
Conclusions: MDCTA was a reliable imaging technique with high specificity in being able to diagnose catheter related-CVS in hemodialysis. However, the low sensitivity in some vascular segments diminished its value as a screening test. MCDTA seemed to have better diagnostic value for CVS in more “central” segments, such as the superior vena cava and innominate veins.

PU-2864

VEGF 及αvβ3 在恶性胸膜间皮瘤中的表达

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目的 研究血管内皮生长因子(vascular endothelial growth factor ,*VEGF*)及整合素αvβ3 在恶性胸膜间皮瘤（malignant pleural mesothelioma, MPM）患者及大鼠中的表达情况，揭示 MPM 与血管生成之间的关系。**方法** 收集经病理确实 MPM 患者组织标本 32 例，行胸膜腔染尘法诱发 MPM 大鼠 30 只，取材后制备成石蜡切片，采用免疫组化法分别检测人及鼠 VEGF 及αvβ3 表达情况。**结果** 32 例人 MPM 中上皮型 13 例（40.63%），纤维肉瘤型 9 例（28.13%）和混合型 10 例（31.25%）。人 VEGF 免疫组化染色阳性表达率为 53.13%，其在纤维肉瘤型中表达最高，为 66.67%，其次为混合型 60.00%及上皮型 38.46%，三者表达情况差异无统计学意义。人αvβ3 阳性表达率为 28.13%，以纤维肉瘤型中表达最高，为 44.44%，其次为混合型 30.00%及上皮型 15.38%，三者表达情况差异无统计学意义。人 MPM 中 VEGF 与αvβ3 表达呈中度一致性。30 只大鼠 MPM 中纤维肉瘤型所占比例最大（63.33%），其次为上皮型（30.00%）及混合型（6.67%）。鼠 VEGF 免疫组化染色阳性表达率为 50.00%，其中混合型 100%，上皮型 80.00%及纤维肉瘤型 30.00%，三者表达情况差异无统计学意义。鼠整合素αvβ3 免疫组化染色阳性表达率为 30%，鼠混合型 2 例，均为阳性表达，上皮型 44.44%及纤维肉瘤型 21.05%，三者表达情况差异无统计学意义。鼠 VEGF 与αvβ3 表达呈中度一致性。人与鼠 VEGF 及αvβ3 表达无统计学差异 。**结论** VEGF 及αvβ3 在人和鼠 MPM 肿瘤组织中都有一定程度的表达，血管生成在 MPM 肿瘤组织生长中发挥着重要作用。

PU-2865

双向法 CT 深静脉造影技术的应用

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目的 探讨双向法下肢静脉血管造影（CTV）诊断髂静脉受压综合征（IVCS）的临床应用价值。**方法** 共 43 例临床疑似 IVCS 的患者进行了 CTV 检查，其中 22 例实施了双向法 CTV 检查，21 例实施了常规间接法 CTV 检查。双向法 CTV 是经肘静脉快速注入未稀释的对比剂碘佛醇（320mg/ml，江苏恒瑞医药公司，中国）80ml，注射速率 4ml/s，在注射开始后 1 分钟时经足背静脉注入已稀释的对比剂 60ml，速率 1.5ml/s。对比剂稀释配比为 1:5。踝关节上方扎止血带，在第 1 次注射对比剂 2.5 分钟后启动下肢静脉扫描。在 CT 检查完成后通过左下肢手工注射 5ml 小分子肝素进行预防性抗凝。**结果** 两种 CTV 方法均能直接诊断 IVCS，而且能够诊断无症状的轻度髂静脉受压情况。CTV 共诊断 IVCS 患者 32 例。27 例 IVCS 伴有下肢深静脉血栓形成（DVT），左侧髂总静脉平均直径为 3.23±1.45mm，平均受压率为 67%。伴有 DVT 的 IVCS 患者、不伴有 DVT 的 IVCS 患者与非 IVCS 患者的左侧髂静脉平均直径大小两两比较的差异均有显著性意义。双向法 CTV 的图像质量评分高于间接法，差异有显著性意义。**结论** 双向法 CTV 是一种可行的新型静脉造影方法，图像质量优于常规间接法 CTV 检查，有可能成为 IVCS 检查的主要标准。

PU-2866

SSF 技术在冠状动脉 CTA 中的应用

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目的 探讨冠状动脉追踪冻结技术（snapshot freeze,SSF）在冠状动脉 CTA 中的应用价值。 方法 连续收集 69 例疑似冠心病患者行冠状动脉 CTA 检查，选取最佳重建时相应用标准算法和 SSF 算法将图像进行重建。分别测量出应用标准算法和 SSF 算法图像中右冠状动脉中段血管轴截面移动伪影以及附近脂肪组织的 SD 值，计算移动伪影指数（MAI）值；采取双盲法由两位高年资主治以上医师按照冠状动脉 15 段分段法，采用 5 分制评分法评价两组图像质量。对两组算法图像的 MAI 值和质量评价进行比较和量化分析。 结果 标准算法组 MAI 高于 SSF 组 MAI，差异有统计学意义（$p<0.05$）;图像质量评分 SSF 组在右冠状动脉、左前降支及左旋支血管评分高于标准算法组（p 均<0.05）；左主干差异无统计学差异（$p>0.05$）。 结论 与标准算法相比 SSF 算法技术可消除移动伪影，改善图像质量，具有较好的应用价值。

PU-2867

胸膜少见肿瘤的 CT 表现分析

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目的 分析胸膜少见肿瘤的 CT 表现，提高对该类疾病的认识和诊断水平。
方法 回顾性分析本院 2012 年 1 月-2019 年 3 月经病理证实的 24 例胸膜少见肿瘤的临床、影像及病理资料，总结 CT 表现特征。
结果 24 例胸膜少见肿瘤中，孤立性纤维瘤 7 例，肿块平均最大径约 11.9cm，5 例 CT 平扫密度不均匀，5 例增强扫描“地图样”强化，3 例渐进性强化；原始神经外胚层肿瘤 5 例，4 例肿块平均

最大径约 6.7cm，1 例表现为双侧胸壁软组织不均匀增厚，4 例 CT 平扫密度不均匀，3 例增强扫描部分边缘延迟强化，4 例伴肋骨转移；神经鞘瘤 4 例，肿块平均最大径约 4.9cm，CT 平扫密度范围约 10-30HU，增强扫描轻度强化；淋巴瘤 3 例，CT 主要表现为胸膜不均匀增厚，增强扫描轻度强化；畸胎瘤 2 例，肿块平均最大径约 11.2cm，CT 表现为胸腔内含有脂肪、钙化及水样密度的肿块，增强扫描不均匀强化，1 例可见双侧内乳动脉供血；滑膜肉瘤 2 例，肿块平均最大径约 9.8cm，CT 平扫密度不均匀，增强扫描明显不均匀强化；脂肪肉瘤 1 例，右侧胸腔巨大软组织密度肿块，最大径约 15.4cm，密度不均匀，增强扫描轻度不均匀强化。

结论 胸部 CT 检查是发现和诊断胸膜少见肿瘤的重要手段，部分胸膜肿瘤 CT 表现具有一定的特征性，结合肿瘤的形态、密度、强化特点及与周围结构的关系有助于提高术前诊断的准确性。

PU-2868
低剂量与超低剂量 CT 条件下对计算机辅助检测系统肺容积定量的影响

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目的：
探讨低剂量与超低剂量扫描条件下计算机辅助检测系统（computer-aided detection ，CAD）对肺容积定量的影响。

方法：采用联影 128 排 CT 对 58 例患者分别进行低剂量（120KV,40mA），超低剂量（120KV,3mA）扫描，参数设置：准直 40mm，螺距 1.0875，转速 0.5s/r，扫描层厚 5mm。低剂量组采用 FBP 重建，超低剂量组采用 FBP 和 Karl 迭代重建，重建算法为骨算法，层厚 1mm，FOV35mm，矩阵 1024x1024。在肺动脉分叉层面计算肺动脉主干图像噪声（SD 值），将数据导入“Dexin-Fact”3D 数字肺检测及分析平台，并定量测量全肺容积。两名放射科医生 5 分法主观评价图像质量（5：优秀，图像质量清晰，无噪声，对比度好；4：良好，图像质量好，噪声不明显，对比度良好；3：一般情况下，图像质量在 2-4 之间；2：不好，图像质量较差，噪声大，结构对比较差。1：图像质量差，噪声大，结构不能识别）。采用单因素方差分析比较各组肺容积、噪声值及主观评分间的差异，P＜0.05 差异具有统计学意义。

结果：
低剂量和超低剂量有效辐射剂量分别为 1.70±0.13mSv 和 0.13±0.01mSv，下降约 92%。低剂量组、超低剂量组 FBP 重建及超低剂量组 Karl 迭代重建相比较，图像噪声及图像主观评分差异具有统计学意义（P〈0.05）；肺容积差异无统计学意义（P=0.99）。

结论：与低剂量相比，超低剂量胸部 CT 扫描的辐射剂量可减低约 92%。超低剂量 CT 可用于胸部肺容积的定量研究。Karl 迭代重建技术在进一步降低图像噪声提高图像质量前提下不影响肺容积定量。

PU-2869
不同噪声指数联合迭代重组算法对不同体质量指数患者行冠状动脉成像的图像质量和辐射剂量的影响

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目的 探讨采用不同噪声指数（NI）联合迭代重组算法对不同体质量指数（BMI）患者行冠状动脉成像的图像质量和辐射剂量的影响。

方法 收集 80 例疑似冠心病患者，根据 BMI 将患者分为 A 组(16kg/㎡≤BMI≤23kg/㎡)和 B 组（24kg/㎡≤BMI≤31kg/㎡）,每组 40 例，再将 A,B 组患者随机分为 4 个亚组，每个亚组 10 例。80 例患者均应用 256 层 CT 以前瞻性心电门控技术单个心动周期扫描结合冠状动脉追踪冻结技术（SSF）行冠状动脉 CT 成像，管电压 100KV,采用自动管电流调节技术，A、B 两组 4 个亚组 NI 分别设定 17、20、23、26，采用权重为 60%的迭代重组算法进行重组。对图像质量进行客观评价（信噪比和对比噪声比）和主观评价，并记录辐射剂量。采用方差分析或 Kruskal-Wallis 比较各组图像质量和辐射剂量的差异。

结果 A 组各亚组的图像质量评分差异有统计学意义（P＜0.05）。A 组 NI=26 亚组图像的信噪比和对比噪声比与其他各组差异有统计学意义（P＜0.05），其余 3 组间的差异无统计学意义（P＞0.05）。A 组 NI=23 与 NI=26 亚组的有效剂量（ED）差异无统计学意义（P＞0.05），其余各组两两对比差异有统计学意义（P＜0.05）。B 组各亚组的图像质量评分差异有统计学意义（P＜0.05）。B 组 NI=23 组的信噪比和对比噪声比与其他各组差异有统计学意义（P＜0.05），B 组 NI=20，NI=23 与 NI=17 亚组的有效剂量（ED）有统计学意义（P＜0.05）。

结论 在保证图像质量不影响诊断的前提下，根据 BMI 设置不同 NI 并联合迭代重组算法能够有效降低冠状动脉成像的辐射剂量。对于 16kg/㎡≤BMI≤23kg/㎡的患者推荐采用的 NI 值为 23；对于 24kg/㎡≤BMI≤31kg/㎡的患者推荐采用的 NI 值为 20。

PU-2870

MRI 扫描和上消化道造影测量食管癌病变长度的价值及与实体肿瘤长度的符合程度

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目的：探讨 MRI 扫描和上消化道造影测量食管癌病变长度的价值及与实际病变长度的符合程度。

方法：回顾性分析经手术病理确诊的 60 例食管癌患者的临床及影像资料。所有患者术前均采用 MRI 扫描和上消化道造影检查，MRI 扫描序列包括 T2WI 矢状位扫描和 T1WI 增强扫描。以食管癌病理标本收缩比回推至人体内实际长度为标准，采用 Pearson 相关性检验分析各检查方法测量食管癌病变长度与实体肿瘤长度的相关性。采用 x^2 检验比较各检查方法测量食管癌病变长度与实体肿瘤长度符合程度的差异。

结果：食管癌平均收缩为术中长度的 90%±10%，患者的实体肿瘤平均长度为（33.87±14.34）mm。上消化道造影、MR T2WI 矢状位扫描、MR T1WI 增强扫描测得食管癌病变平均长度分别（44.58±14.95）mm、（46.25±14.65）mm、（46.77±14.13）mm，与实体肿瘤长度的相关性均较高（r 值分别为 0.732、0.729、0.708，P 均＜0.05）。对于侵及深肌层或外膜的食管癌病变，MR T2WI 矢状位扫描及 MR T1WI 增强扫描测量食管癌病变长度与实体肿瘤长度的符合程度均高于上消化道造影，差异均有统计学意义（x^2=5.740、4.413，P 均＜0.05）。

结论：MRI 扫描和上消化道造影测量食管癌病变长度均较准确，对于侵及深肌层或外膜的病变，MR 测量食管癌病变长度与实体肿瘤长度的符合程度高于上消化道造影。

PU-2871
采用 256 层螺旋 CT 对房颤患者肺静脉及左心房解剖变异的分析

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目的:通过 256 层螺旋 CT 在射频消融术前获得房颤病人的肺静脉及左心房的解剖变异，指导射频消融的进行。
方法:
对 180 例房颤患者（男性 113 例，女性 67 例，平均年龄为 60.67±10.45 岁）和 180 例非房颤患者（男性 96 例，女性 84 例，平均年龄为 59.14±9.77 岁）行 256 层螺旋 CT 检查，分别测量并评价肺静脉的数目、变异、左心房体积及左心房憩室/副心耳，分析肺静脉及左心房解剖变异与房颤发生的关系。
结果:
房颤组与对照组总的肺静脉解剖变异发生率为 52 例（28.89%）和 44 例（24.44%），两者之间没有统计学差异(P>0.05)。房颤组所有变异中，发生率最高的为左侧肺静脉短共干（14.44%）,其次为右中副肺静脉（10.56%）。
房颤组与对照组相比左心房体积明显扩大（111.43±41.52mm^3 vs 82.15±21.13mm^3，P< 0.001）。
两组左心房憩室及副心耳的发生率（30.56%和 25.00%，P=0.24），（6.11%和 9.44%,P=0.24）相似。左心房憩室/副心耳均在左心房在右前上壁更常见，且常为单发，两组之间均无明显统计学差异（P=0.42、P=0.93）。
结论：
肺静脉变异常见，个体差异大；256 层螺旋 CT 能为房颤射频消融提供详细的肺静脉及左心房的解剖学信息，有助于电生理学家安全有效地进行射频消融手术。

PU-2872
管腔内密度衰减梯度在下肢动脉硬化闭塞症中的技术优化

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【摘要】 目的:探讨下肢动脉管腔内密度衰减梯度（TAG）值测量技术的优化方案，并分析优化后的 TAG 值在下肢动脉硬化闭塞症（ASO）临床分级中的价值。**方法**:回顾性分析上海中医药大学附属上海市中西医结合医院 2016 年 1 月至 2018 年 8 月病例资料完整的 ASO 患者 53 例，总计 88 条股浅动脉入组。ASO 患者 88 条动脉中，Fontaine 分级：Ⅰ级 22 条、Ⅱ级 12 条、Ⅲ级 10 条、Ⅳ级 44 条。所有病例均在入院 0～14 天（平均 3 天）行下肢动脉 CTA 检查。由两名有经验的医师利用 CT 后处理软件将股浅动脉开口处（腹股沟韧带中点深面）至末端（股骨内外髁上缘）划定为分析区域，分别以 10mm、20mm、30mm 为间隔测量计算 TAG 值（ROI3.0mm^2），然后以 ROI 为 1.0mm^2、3.0mm^2、4.0mm^2（10mm 间隔）测量计算 TAG 值，分别对不同间隔及不同 ROI 的 TAG 值行一致性分析。结合临床其他因素选出最优测量方案，并用方差分析比较优化后的 TAG 值在下肢动脉硬化闭塞患者 Fontaine 分级的差别。**结果**:①3 组不同间距测得的 TAG 值一致性较好（r=0.963，p<0.001；r=0.914，p<0.001）。②3 组相同层面不同大小 ROI 测量计算出的 TAG 值一致性良好（r=0.999，p<0.001；r=0.933,p<0.001 ）。③比较不同 Fontaine 分级的 TAG 值，差异有统计学意义。组间比较，Ⅰ级与Ⅳ级之间差异具有统计学意义（P<0.05），其余组间差异无统计学意义（P>0.05）。**结论**: 结合实用性、可重复性及可操作性等综合因素，下肢 TAG 技术推荐 20mm 间距，1.0mm^2ROI 为

最优测量方案，优化后的 TAG 值能较好地反映股浅动脉不同的临床分级，可为临床治疗提供参考价值。

PU-2873

Compared with left atrium, left atrial appendage function and myocardial remodeling play a greater role in recurrence of AF after radiofrequency ablation

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Objective: To quantitatively measure the left atrial and left atrial appendage function with 256-slice spiral CT, including the volume strain, and to evaluate the role of left atrium and left atrium appendage in the recurrence of atrial fibrillation (AF) after radiofrequency ablation.
Methods: 63 patients with AF who underwent radiofrequency ablation for the first time were enrolled in this study. The average age was 59.43 (+10.67), BMI was 25.99 (+3.60 kg/m2), and 38 (60.3%) males. The median follow-up time was 19 (4-24) months, and 20 (31.7%) recurred. According to the recurrence of AF after radiofrequency ablation, the patients were divided into recurrence group (n = 20 cases) and non-recurrence group (n = 43 cases). All patients underwent 256-slice spiral CT examination before operation. The original image was reconstructed from 5% to 95% of the cardiac cycle and the interval was 10%. The maximum volume of left atrial appendage (LAAVmax), minimum volume of left atrial appendage (LAAVmin), left atrial appendage emptying fraction (LAAEF), and left atrial appendage ejection volume (LAAEV), left atrial appendage volume strain (LAA-VS), maximum volume of left atrium (LAVmax), minimum volume of left atrium (LAVmin), left atrial emptying fraction (LAEF), left atrial ejection volume (LAEV), and left atrial volume strain (LAVS) were measured and calculated during the whole cardiac cycle. They were processed by statistical methods.
Results: The CHA2DS2-VASc score of recurrence group was higher than that of non-recurrence group ($P < 0.05$). According to the analysis of clinical data, the proportion of patients with persistent atrial fibrillation and heart failure in recurrence group was higher than that in non-recurrence group ($P<0.05$).

The LAAVmax, LAAVmin, LAVmax and LAVmin in the recurrence group were higher than those in the non-recurrence group ($P < 0.05$), while LAAEF, LAEF and LAA-VS in the recurrence group were lower than those in the non- recurrence group ($P < 0.05$). There was no difference of LA-VS between the recurrence group and the non- recurrence group. Multivariate Cox proportional hazard regression analysis showed that LAAEF was an independent predictor of recurrence after radiofrequency ablation of AF (HR: 0.790 95% CI: 0.657-0.950 $P = 0.012$). ROC curve analysis showed that LAAEF < 44.68% had the highest predictive value for recurrence after radiofrequency ablation (area under curve 0.817), sensitivity was 90%, specificity was 67.4%.
Conclusion: LAAEF is a predictor of recurrence after radiofrequency ablation of atrial fibrillation. Compared with left atrial volume strain, left atrial appendage volume strain which represented fibrosis of left atrial appendage, is more useful in

evaluating myocardial remodeling associated with recurrence of atrial fibrillation after radiofrequency ablation.

PU-2874

右侧肾上腺静脉 CT 平扫和增强的显示率

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背景：右侧肾上腺静脉短而细，在肾上腺静脉取血术中右侧较左侧难以显示，CT 影像可显示右侧肾上腺静脉。
目的：评价右侧肾上腺静脉 CT 平扫和增强的显示率。
材料与方法：收集我院 2018 年 7 月~2019 年 6 月肾上腺区 CT 扫描者 100 例，男 56 例，女 44 例，年龄 11~72 岁，平均 40.5 岁，CT 平扫 32 例（男 18 例），CT 增强 28 例（男 16 例），CT 平扫加增强 40 例（男 22 例），CT 扫描设备为西门子 Force，自动 kV，自动 mAs，对比剂为优维显 370g/dL，对比剂注射剂量为 1.0ml/kg，流率为 4.0ml/sec，CT 增强扫描的 CT 值监测平面为腹主动脉腹腔干水平，触发阈值为 100HU，扫描后延迟约 30sec 重复扫描，CT 平扫和增强扫描后，由 2 位医师分别对 CT 平扫和 CT 增强图像进行分析，评价右侧肾上腺静脉的显示率。
结果：右侧肾上腺静脉 CT 平扫的显示率为 43/72（17（男 10 例）/32，26（男 16 例）/40），CT 增强的显示率为 58/68（24（男 13 例）/28，34（男 19 例）/40），CT 平扫显示右侧肾上腺静脉者，CT 增强均同时显示右侧肾上腺静脉。
结论：右侧肾上腺静脉 CT 增强的显示率较高，高于 CT 平扫。

PU-2875

镜像右位心与正常人心功能指标的比较研究

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目的 研究对比静息状态下镜像右位心与正常人的心功能指标的差异，为相应镜像右位心患者心功能退化和心衰的发生发展提供参考。 方法 回顾性分析厦门大学附属东南医院 2006 年 2 月至 2018 年 7 月经超 声心动图及胸片诊断为镜像右位心且不合并其他异常畸形的患者 30 例（ 其中男 18 例，女 12 例）临床资料，与 30 例正 常心志愿者对比分析左心室射血分数（ EF）、左心室缩短分数（ FS）、心率（ HR）、每搏输出量（ SV）、每分输出量（ CO）等心功能指标，比较两者间是否存在明显差异。
结果 镜像右位心患者的心率、左室射血分数、左心室缩短分数、每搏输出量、每分输出量分别为（ 80±11. 32）次/min、（ 0. 57±0. 42）、（ 0. 37±0.20）、（ 54. 43±10. 90）mL 和（ 5.03±0. 35）L/min，正常人分别
为（ 77. 57±9.83）次/min、（ 0.60±0. 32）、（ 0. 32±0. 3）、（ 59. 63±10.27）mL 和（ 4. 20±1. 13）L/min。2 组人群比较，心率、左室射血分数、左心室缩短分数、每搏输出量、每分输出量差异无统计学意（ P＞0. 05）。
结论 镜像右位心患者与正常心人群心功能指标无明显区别。

PU-2876

采用 256 层螺旋 CT 对不同分型房颤患者肺静脉形态及开口方 向的定量研究

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目的：通过 256 层螺旋 CT 在消融术前获得不同类型房颤患者的肺静脉形态结构及开口方向，分析其与房颤发生发展的关系。

方法：

入选 131 例房颤患者（其中阵发性房颤 84 例，持续性房颤 47 例），阵发性房颤组男性 45 例，女性 39 例，平均年龄为 59.86±11.41 岁；持续性房颤组男性 34 例，女性 13 例，平均年龄为 62.79±9.32 岁；收取 90 例窦性心律者作为对照组，男性 56 例，女性 34 例，平均年龄为 59.42±9.10 岁，行 256 层螺旋 CT 扫描,分别测量并评价肺静脉径线、椭圆度、从开口到第一分叉的距离及开口方向，比较不同类型房颤患者之间的差异。

结果：

与正常组相比，房颤组右上肺静脉开口的短径及截面积、左上肺静脉开口短径、双下肺静脉开口短径均显著增大($P<0.05$)，而副肺静脉及肺静脉共干的开口径线及截面积两组无差异($P>0.05$)。且持续性房颤组四支主肺静脉的长短径及截面积、肺静脉共干的长径及截面积均较阵发性房颤组增大($P<0.05$)。此外，房颤组副肺静脉的长短径均小于四条主肺静脉，肺静脉共干的长短径均大于四条主肺静脉，且有统计学意义（$P<0.001$）。

不同分型房颤患者肺静脉的椭圆度及第一分支到肺静脉口的距离两组之间均无统计学差异($P>0.05$)。汇入左心房右侧的肺静脉口部较左侧更接近于圆形（$P<0.001$）。肺静脉共干患者肺静脉口部更接近于卵圆形（$P<0.05$）。

每个患者肺静脉走向变异范围较大，房颤组中双上肺静脉向上向前走行，双下肺静脉向后向下走行。不同性别房颤患者肺静脉的走向没有统计学差异（$P>0.05$）。

结论：

不同分型房颤患者各肺静脉之间的径线、形态、走向变异较大；256 层螺旋 CT 左心房肺静脉成像可以对左心房及肺静脉提供详细的解剖形态学信息，为临床治疗方案制定提供影像依据。

PU-2877

A Comparative Study of Ventricular Myocardial Strain in Hypertensive Heart Disease by MR Tissue Tracking Technique

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Objective: To explore the differences and elucidate the effect of hypertension Of left and right ventricular strain and remodeling in patients with hypertensive heart disease (HHD) by MR tissue tracking technique .

Methods:36 HHD patients and 20 healthy volunteers were grouped according to left ventricular ejection fraction (LVEF≥50%,LVEF<50%), left ventricular diameter (LVD)[whether LVD was enlarged (female LVD > 54mm, male LVD > 59mm)divided to centripetal or centrifugal remodeling group] and atrium area(atrial area > 24 cm^2:the bilateral atrium was normal, only the left atrium was enlarged,the bilateral atrium was enlarged), respectively.
Results: Overall 36 HHD patients were finally analyzed,the global radial, circumferential and longitudinal peak strain(GRPS,GCPS,GLPS) of left and right ventricle were lower than those in normal group, and with the decrease of ejection fraction,all showed decreasing trends (P<0.05).LV concentric remodeling changed to acentric remodeling,LV GRPS25.23±6.85%vs.11.37±4.03%,GCPS-12.71±3.82% vs.-6.94±3.08%; RV GRPS 21.06±5.06%vs.11.02±4.80%,GCPS-9.89±2.96%vs.-4.55±2.13%, GLPS-16.11±4.71%vs.-9.98±3.80%(P<0.05).According to atrium area, LV GRPS27.20±6.80 vs.22.19±6.60%,10.58±4.56%,GCPS-13.53±4.86%vs.-10.85±2.84%,-7.13±1.53% ;RV GRPS23.38±5.33%vs.17.43±4.71%, 11.04±3.59%,GCPS-11.30±4.07% vs.-7.54±3.17%,-4.78±1.75%(P<0.05).ROC curve showed that GLPS is more sensitive to assess ventricular remodeling.The cut-off values were - 13.43% and - 16.74% respectively,with a sensitivity of 89% and 82%, a specificity of 90% and 89 % (AUC = 0.90 and 0.86, respectively).
Conclusions: Hypertensive heart disease not only affects the left ventricle, but also contributes to right ventricular remodeling. There are differences in left and right ventricular remodeling and synergy in the evolution process. The degree of bilateral ventricular remodeling can be determined from the perspectives of ejection fraction retention, left ventricular configuration and atrial involvement. MR myocardial strain quantification, as a sensitive index of functional remodeling, especially longitudinal strain, can provide earlier and more accurate information for ventricular remodeling in HHD.

PU-2878

17 例囊腔型肺癌影像学误诊分析

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目的
肺癌是发病率最高的恶性肿瘤，近年来囊腔型肺癌的发现逐渐增多，作为肺癌的少见类型，临床误诊率较高，误诊常延误治疗，预后较差。本文对 17 例囊腔型肺癌的进行了误诊分析，旨在提高对于该疾病的影像诊断水平。
方法
收集本院 2016.06.01-2019.04.30 术前/初次检查误诊，后经手术、病理证实为囊腔型肺癌的 17 例病例，用基本统计学方法分析归纳其临床特征、误诊情况及影像学特征，分析其影像学表现、误诊原因，并将误诊疾病与该疾病进行对比分析。检索 PubMed、CNKI 和万方数据库，收集囊腔型肺癌的个案报道及综述文章，进一步分析。
结果
临床资料：17 例中男性 12 例，女性 5 例，平均年龄 54.4 岁。所有病人均经手术病理证实为囊腔型肺癌。11 例患者有重度吸烟史，6 例有肺大疱病史，4 例既往有肺癌病史。

误诊统计：误诊为肺气囊/肺大泡 9 例（52.9%）；肺结核空洞 5 例（29.5%）；真菌感染 2 例（11.9%）；支气管囊肿 1 例（5.7%）
影像学表现：初次检查平均直径 17mm，6 例有连续观察，4 例有增大，5 例有壁增厚。11 例位于上肺；圆形/类圆形 15 例，不规则型 2 例；边缘分叶状 5 例，短毛刺 10 例，长毛刺 3 例；瘤肺界面毛糙/模糊 13 例（76.4%）；单腔 13 例（76.4%），多腔 4 例；内壁不光滑 10 例(58.8%)，壁结节 6 例（35.2%）；胸膜凹陷征 9 例(52.9%)，卫星灶 0 例。增强扫描壁强化 5 例(29.4%)。
结论
囊腔型肺癌虽然具有一定的 CT 特征，但总体仍缺乏特异性表现。易误诊的疾病主要是肺气囊/肺大泡、肺结核空洞。连续定期观察是最可靠的确诊办法，囊腔体积增大、囊壁增厚、出现壁结节都支持囊腔型肺癌的诊断。此外，囊腔内/外界面粗糙、短毛刺、壁强化具有一定的提示作用，卫星灶的出现具有一定的排除意义。因此仔细分析 CT 征象、连续定期观察，对于囊腔型肺癌的诊断有重要意义。

PU-2879
肺泡蛋白沉积症的高分辨 CT 诊断分析

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目的探讨肺泡蛋白沉积症的高分辨 CT(HRCT)的影像表现,提高对该疾病的认识及诊断;因其治疗方法特殊,因此 HRCT 准确诊断对临床十分必要。方法回顾性分析 2009 年 1 月至 2018 年 1 月期间 20 例经病理证实的肺泡蛋白沉积症患者的肺部 HRCT 表现,归纳其特征。结果肺泡蛋白沉积症分布肺内随机,无肺段叶、肺野分布规律。HRCT 主要影像表现有以下五点:磨玻璃影(GGO ground glass opacity) 20 例,"铺路石征"17 例,"地图样改变"13 例,气管走行自然、管腔清晰的空气支气管征 3 例,蜂窝状片状影 2 例。另外,双侧胸膜轻度增厚且无胸腔积液 11 例,纵隔可见淋巴结但淋巴结不肿大 5 例。结论 PAP 的 HRCT 表现有一定特征,肺内分布随机,主要以边界清晰的 GGO 为基本表现,"铺路石征""地图样表现"常见,发展较重或合并其它类型感染时可出现支气管走行自然的"空气支气管征"及"蜂窝状影"; PAP 有可能累及胸膜出现轻度胸膜征像;纵隔淋巴结不肿大支持其诊断。

PU-2880
双源 CT 对猪急性心肌挫裂伤的左心功能评价及实验研究

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目的：探讨双源 CT 评价猪急性心肌挫伤及心功能损伤程度。
1 材料与方法
1.1 实验材料 健康雌性巴马小型猪 16 头，日龄 150-180 日，体重 15-26KG，平均体重 18.64KG；身长（耳根至尾根）60-72cm，平均 64.57cm。监测生命体征变化（心跳、呼吸、平均动脉压）。BIM-Ⅱ型水平撞击器，制作创伤模型，驱动力 7.01KN，截面半径 1.9cm，胸壁内压缩 4cm。创伤即刻、2h、4h、8h 进行 CT 分析。10%KCl 处死动物，沿左室短轴剖面切开，切面厚度 5mm，TTC 组织染色。
1.2 心功能与统计学分析

左室射血分数(LVEF)，左室收缩期/舒张期长轴、短轴长径，左室短轴短缩率（LVFS），左室舒张期/收缩期室壁厚度变化值（测量撞击点），所测数据以均数±标准差表示，SPSS 软件行单因素方差分析。
2.结果
2.1 平均动脉压创伤 创伤后即刻时最低，2h、4h、8h 逐渐升高。局部明显肿胀、CT 密度减低，5 例少量心包积液。撞击后 2H，左心室舒张和收缩功能较撞击前减低。（结果见表格 1）.
2.2 EF：创伤后即刻、2H、4H、8H 的 EF 值下降，分别约 10.47%、17.68%、13.14%、0.82%（P＜0.05）；创伤后 4H、8H 的 EF 值（P>0.05）
2.3 创伤前后各时间点短缩率，分别为 17.14%、12.02%、15.17%、13.03%、16.42%（P>0.05）。
2.3 左室舒张期/收缩期室壁厚度变化值：创伤前室壁厚度差平均 0.47cm，创伤后即时、2H、4H、8H 各时间点室壁厚度差，分别 0.34cm、0.21cm、0.32cm、0.41cm，其中创伤后 2H 室壁厚度差与创伤前之间存在显著性差异（P＜0.01）。
结论：双源 CT 能准确评价猪急性心肌挫伤及左心功能损伤。
*2012 年国家自然基金（编号 61273249）：基于多模医学图像信息融合的心脏创伤自动评价。

PU-2881

Evaluation of cardiac function in patients of acute chest pain with non-gated triple rule-out CTA using 16 cm detector CT

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Purpose: To validate the feasibility of measuring cardiac function with free breathing non-gated triple rule-out CTA in patients of acute chest pain using a 16 cm detector CT.
Materials and methods: Study protocol was approved by the institutional review board. Non-gated Triple rule-out CTA were performed with a 16cm detector CT scanner (GE revolution), on patients of acute chest pain. The CTA protocol includes a sequential one heartbeat cardiac CTA without ECG gating under free breathing and a spiral scan from the heart to the top of thorax. 1.25 mm axial images of the heart were reconstructed at each 5% R-R interval of the simulated ECG for cardiac function evaluation, including the ejection fraction of left ventricle (LVEF), left atrium (LAEF) and right ventricle (RVEF). 0.625 mm images at the best phase were also reconstructed for CTA evaluation, as well as the axial images of the thoracic aorta and pulmonary arteries regions. Cardiac function data was measured automatically by the work station and semi-automatically by two independent observers. The accuracy of target phases determination and cardiac function evaluation of the work station was evaluated. The objective image quality score (4 points) of CTAs of coronary arteries, and the mean CT value and contrast to noise ratio (CNR) of thoracic aorta and pulmonary arteries were also evaluated.
Results: Totally 24 patients received triple rule-out CTA. Cardiac function measurements were successful in all the cases, with a mean LVEF of 56.77±12.27, LAEF of 42.07±11.82, and RVEF of 46.21±12.65. The accuracy of end-diastole and end-systole determination was 100%. The average image quality score of all coronary

segments was 3.04±0.43. The mean CT value and CNR of thoracic aorta, pulmonary arteries were 487.11±77.59Hu, 549.76±92.26Hu and 16.93±3.88，19.40±5.70 respectively. The total DLP of the CTA scan was 358.67±50.96 mGy*cm.
Conclusion: Cardiac function can be measured using the scan data from non-gated triple rule-out CTA, providing additional information for acute chest pain patient management.
Clinical relevance: Coronary artery, cardiac chamber and cardiac function evaluation with non-gated triple rule-out CTA can be useful for emergent management and prognosis prediction of patients with acute chest pain, especially those suspected of patients with abnormal heart functional changes.

PU-2882

64 排螺旋 CT 肺动脉 CTA 扫描技术的探讨

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目的：探讨 64 排螺旋 CT 肺动脉 CTA 的扫描技术。
方法：选择本院 30 例需行肺动脉 CTA 检查的患者为研究对象，均予 64 排螺旋 CT 进行扫描，扫描时均用 35ml 碘海醇，流速为 5ml/s，扫描区域为肺尖至膈水平，将 ROI 感兴趣区放置上腔静脉，监测法与目测法同时进行，当上腔静脉出现造影剂立即启动扫描。将扫描完后的数据进行三维重建，然后对肺动脉图像进行分析。
结果：30 例患者肺动脉图像均显示良好，无肺静脉及其他血管影干扰。
结论：64 排螺旋 CT 肺动脉 CTA 扫描，采用流速为 5ml/s，低浓度（35ml）碘海醇，将 ROI 感兴趣区放置上腔静脉，监测法与目测法同时进行的扫描技术,能够抓住最佳扫描时间，可以提供无其他血管污染的优质的肺动脉图像，为临床提供清晰可靠的影像学资料。

PU-2883

Observer variability for CAD-RADS categorization based on coronary stenosis severity in subjects with stable chest pain : impact on patient management

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Objectives: The aim of the study was to evaluate inter-observe variability among multiple readers for CAD-RADS categorization of coronary stenosis severity in subjects with stable chest pain and their potential effect on patient management.
Methods: A prospective study was carried out upon 102 patients with coronary artery disease, who underwent coronary computed tomography angiography(CTA).The images were categorized using the Coronary Artery Disease-Reporting and Data System(CAD-RADS) proposed by the society of Cardiovascular Computed Tomography based on coronary stenosis severity. For per-patient analysis, agreement of seven radiologists was analysed by using Cohen k statistics. Discrepancies were correlated with risk

evaluation and patient management. For affected per-coronary analysis, multivariate analysis variance was performed to assess the effect of coronary stenosis characteristics and image quality on observer disagreement.
Results: Pair-wise inter-observer agreement was moderate(mean k 0.64,95%CI 0.60-0.72).A discordant CAD-RADS categorization was found in 27%(578 of 2142) by taking all possible reading pairs into consideration(21 possible combinations of observer pairs x 102 patients).Nearly one third of these discrepant readings(186 of 578) would have potentially led to substantial patient management. Additionally, extensive calcification (calcium score 101~400 and > 400),diffuse stenosis(>3cm) and location in the distal third of coronary artery significantly reduced observer agreement on assessment of coronary stenosis severity.
Conclusion: Inter-observer agreement for CAD-RADS categorization based on coronary stenosis severity is moderate in this prospective study. Discrepancies in stenosis severity categorization were associated with extensive calcification, location and length of coronary stenosis, which may resulted in different patient management.

PU-2884
左心耳解剖结构与心房颤动射频消融术后复发的关系

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目的 采用 256 层螺旋 CT 定量评价左心耳解剖结构与房颤射频消融术后复发的关系。
方法 研究纳入 83 例首次进行射频消融术的房颤患者，平均年龄 60.36±10.11 岁，男性 49 例（59%）。所有患者术前均行 256 层螺旋 CT 检查，测量左心房体积、左心耳体积、左心耳开口周长、短径、长径、深径并收集患者临床资料。83 例房颤患者行射频消融术后中位随访时间 19（4-24）月，27 例（32.5%）患者复发。根据有无复发分为复发组（n=27 例）和未复发组（n=56 例）。
结果 对临床资料进行分析，复发组持续性房颤患者及心衰患者较未复发组比例更高，CHA_2DS_2-VASc 评分更高（P＜0.05）；对左心耳解剖结构分析，左心房体积、左心耳体积、左心耳开口周长、短径、长径、深径，以上参数复发组均大于未复发组（*P*＜0.05）；多因素 Cox 比例风险回归分析显示较大的左心耳体积是房颤复发的独立预测因子（HR：1.160 95%CI：1.095-1.229 *P*＜0.001）；左心耳体积＞9.25ml 对射频消融术后复发具有一定预测价值，敏感性 85.2%、特异性 67.9%、曲线下面积 0.82，房颤复发率较高（*P*＜0. 001）。
结论 房颤会造成心脏结构重构，左心耳各解剖径线明显增大可能是影响房颤射频消融手术成功率的原因，并且发现左心耳体积增大是房颤射频消融术后复发的独立预测因子。

PU-2885
256 排 Revolution CT 对快慢不同心率患者行胸痛三联扫描的图像质量分析

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目的 探讨使用 256 排 Revolution CT 宽体探测器对不同心率患者行胸痛三联扫描的临床应用
方法 收集 2016 年 8 月至 2018 年 10 月就诊于我院的 75 名胸痛患者患者。根据心率分为 A（心率≤70 次 / 分）、B（70 次 / 分＜心率＜85 次/分）、C（心率≥85 次/分）三组，每组 25 人。使用

256 排 Revolution CT，分别对三组患者进行三联扫描成像，测量各组图像的 CT 值、噪声，计算图像的信噪比并对比其噪声比，记录机器生成的剂量长度乘积，计算辐射剂量。胸主动脉及肺动脉的 CT 值>200HU 作为满足诊断条件的标准，由两名放射科医生对冠脉图像质量进行主观评价。连续变量采用单因素方差分析或非参数检验，等级资料比较采用 Kruslal-wallis H 检验，p＜0.05 表示差异具有统计学意义。

结果 三组患者的性别、年龄、体重指数无明显差异，三组患者的肺动脉、胸主动脉及右冠脉的信噪比（20.0（6.0）vs 19.2±3.0 vs 19.3±5.2，14.7（4.1）vs 14.3±3.8 vs 13.4（6.1），13.5（5.5）vs 13.5±3.1 vs 13.6±3.5，p=0.194，0.148, 0.941）及对比噪声比（24.5（16.0）vs 23.7±5.6 vs 22.0±9.5，17.3（5.1）vs 16.5±6.7 vs 13.2±9.6，19.9±5.1vs 18.3（4.1）vs 18.9（5.7）p=0.295,0.053,0.622）无明显差异，三组患者的主观评分无明显差异（1.67±0.70 vs 1.78±0.69 vs 1.72±0.66，p=0.105）。

结论 256 排 Revolution CT 对不同心率患者行胸痛三联 CTA 具有可行性，快心率者亦得到好的图像质量。

PU-2886
扩散加权成像与动态增强磁共振成像在乳腺病变定性诊断中的应用

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目的：评价 3.0T 扩散加权成像(DWI)和动态增强 MRI(DCE-MRI)在乳腺病变定性中的应用价值。材料与方法：采用常规成像(乳房 X 线、超声)BI-RADS 分级为 4 级或 5 级的患者纳入本研究。所有患者均接受了 3.0T 乳腺 MRI 检查，包括扩散加权成像(DWI)和与动态增强 MRI(DCE-MRI)。最终诊断由组织病理学确诊。两名有经验的放射科副主任医生(R1，R2)独立判读病变，包括病变大小、表观扩散系数和时间信号曲线等。结果：88 例(平均年龄 52±12)共检出恶性病变 56，良性病变 32 例，扩散加权成像联合动态增强磁共振成像应用在乳腺病变定性诊断中的敏感性（93%）、特异性（90%）及准确性（92%）明显提高。结论：扩散加权成像联合动态增强 MRI(DCE-MRI)应用对乳腺病变具有较高的诊断性能。

PU-2887
肺局灶性磨玻璃结节与肺腺癌病理亚型的相关性分析

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目的 探讨局灶性磨玻璃结节的 CT 征象与肺腺癌病理亚型的相关性，为临床术前评估和判定预后提供必要的影像学依据。

方法 回顾性分析我院 2015 年 12 月 ～2018 年 12 月经手术及病理证实的 189 例肺纯磨玻璃结节患者的影像学资料。其中浸润性腺癌组 88 个、微浸润腺癌组 34 个、浸润前腺癌组 67 个。CT 征象包括病灶部位、大小、分叶征、毛刺征、支气管气相、胸膜凹陷征、血管集束征、病灶形态和密度、瘤肺界面等进行分析。

结果 ①3 组患者病灶部位、病灶形态、支气管气相征比较差异无统计学意义(P＞0. 05) 。但是病灶分叶征、毛刺征、胸膜凹陷征、血管集束征、密度及瘤肺界面在三组间差异具有统计学意义(P＜0. 05) 。结节大小:浸润前组＜微浸润组＜浸润性组(P＜0. 05)。②二元 logistic 回归分

析显示肺局灶性磨玻璃结节的直径和空气支气管征是预测浸润前组与浸润性组（IA+MIA）的重要因素。
结论：肺局灶性磨玻璃结节的 CT 征象有助于术前预判肺腺癌的浸润性， 从而可指导临床合理选择治疗或随诊方案。

PU-2888
探讨肺磨玻璃结节与支气管关系对肺腺癌浸润程度预测与鉴别诊断的临床研究

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目的：旨在研究肺磨玻璃结节(GGN)与相关支气管关系及其类型，旨在提高 GGN 恶性程度诊断准确率。
方法：回顾性分析有明确诊断结果的 192 例直径≤3cmGGN(其中浸润前腺癌组 70 例、微浸润腺癌组 57 例、浸润性腺癌组 65 例)。 将 GGN 与支气管的关系分为以下 5 型： Ⅰ 型， GGN 中支气管走行截断； Ⅱ 型， GGN 实性成分中支气管走行扭曲、 扩张； Ⅲ型， GGN 磨玻璃成分中支气管走行扭曲、 扩张； Ⅳ型， GGN 内支气管走行正常； Ⅴ 型： 支气管在 GGN 旁绕行。 采用 SPSS22.0 软件进行统计学分析。 计数资料采用 Pearson χ^2检验； 计量资料采用独立样本 t 检验； 以 P<0.05 为差异有统计学意义。
结果 ： 本次研究显示肺磨玻璃结节与支气管关系：浸润前腺癌组表现为 Ⅰ~Ⅴ型分别 6、 6、9、35、 14 个； 微浸润腺癌组分别占 0、 5、 25 、19 、8 个；浸润性腺癌组 12、 33、14、3、 3 个。 支气管各分型在三组间差异均具有统计学意义(P＜0.05)。其中浸润前腺癌组多见于Ⅳ型； 微浸润腺癌组多见于Ⅲ型；浸润性腺癌组常见于Ⅱ型。
结论： GGN 与邻近支气管的关系及分型对三组不同病理类型 GGN 的浸润性的诊断及鉴别具有重要的实用价值。

PU-2889
HRCT 对肺纯磨玻璃结节侵袭性的诊断价值

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目的 探讨高分辨率 CT（HRCT）对肺纯磨玻璃结节侵袭性的诊断价值。 方法 回顾性分析我院析 2013 年 12 月 ～2018 年 12 月经手术病理证实的 98 例肺纯磨玻璃结节患者的资料。分析包括：年龄、性别、大小（最大界面积）、密度（CT 值）、毛刺征、分叶征、血管集束征、空气支气管征象、胸膜凹陷征等。探讨 HRCT 肺纯磨玻璃结节影像表现对肺腺癌侵袭性诊断价值。采用 SPSS 22.0 进行统计学数据分析，计量资料采用均数±标准差表示，采用单因素方差分析，计数资料采用率或百分比表示，采用 χ^2检验，P＜0.05 为差异有统计学意义。 结果 患者年龄、性别在非典型腺瘤样增生(AAH) 、原位腺癌(AIS) 、微浸润腺癌(MIA) 、浸润性腺癌(IA) 组四组间差异无统计学意义（P＞0.05）； 但是纯磨玻璃结节的密度、大小、分叶征、毛刺征、血管集束征在

AIS 组与 AAH 组差异无统计学意义（P＜0.05），但在 IA 组与 MIA 组差异有统计学意义（P ＞0.05）；且两者均高于 AIS 组、AAH 组（P＜0.05）。空气支气管征象在 AAH、AIS、MIA 三组间发生率比较差异无统计学意义（P＜0.05），但是 IA 组发生率显著高于 AAH、AIS 和 MIA 组（P＜0.05）。胸膜凹陷征在 IA 与 AAH、AIS、MIA 组差异具有统计学意义（P＜0.05），且 MIA 组与 AAH 组差异也具有统计学意义（P＜0.05），MIA 组与 AIS 组发生率比较差异无统计学意义（P ＞0.05）。结论　肺纯磨玻璃结节密度、大小、分叶征、毛刺征、血管集束征、胸膜凹陷征可以较好地预测其侵袭性，有利于临床诊断鉴别以及治疗。

PU-2890
利用基于深度学习的人工智能改善放射科住院医师对急诊外伤肋骨骨折诊断效能

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目的：探讨基于深度学习的人工智能（AI）诊断系统对放射科住院医师诊断急诊外伤肋骨骨折准确性及时间的影响。
资料与方法：收集急诊胸部外伤的 76 例患者，层厚 1.25mm 及 1mm 进行重建，由一名住院医师在 LUNG 算法下进行肋骨骨折的诊断，第 1 次无人工智能辅助，第 2 次利用人工智能（InferRead CT Bone research，Infervision, Beijing）辅助，两次间隔大于 4 周。由两位有 15 年以上胸部诊断经验的医师结合 AI 谈论最终做出肋骨骨折的金标准。记录住院医师单独和住院医师联合人工智能在检出肋骨骨折总数、真阳性数、假阳性数及诊断所用时间。利用卡方比较放射科住院医师使用人工智能和不使用人工智能诊断急诊外伤肋骨骨折的灵敏度、假阳性率，利用 T 检验比较住院医师使用 AI 和不使用 AI 所用时间的差异。
结果：　76 例患者中共有 1822 根肋骨（其中两根肋骨发育不全）金标准中骨折共有 291 处，住院医师利用人工智能和不用人工智能分别检出骨折 316/291，其中真阳性骨折 274/260 处，假阳性骨折 42/31 处。使用人工智能和不使用人工智能诊断肋骨骨折的灵敏度分别为 94.16%/89.35%，差异有统计学意义(P=0.035<0.05)，使用和不使用人工智能的假阳性率分别为 2.55%/2.01%，差异无统计学意义(P=0.193>0.05)。不使用人工智能放射科住院医师所用的时间为 240.79±63.20s，使用人工智能所用的时间为 105.26±57.20s，差异有统计学意义(P=0.000<0.05)，。放射科住院医师使用人工智能所用时间明显缩短。
结论：放射科住院医师利用人工智能够明显缩短急诊外伤肋骨骨折诊断所用时间，提高工作效率，而且能够提高住院医师对于急诊外伤肋骨骨折诊断的准确性。

PU-2891
肺动脉高压多排螺旋 CTA 血管成像

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目的 探讨肺动脉高压多排螺旋 CTA 血管成像扫描延迟时间的最佳值最佳肺动脉血管成像。

方法 收集 40 例肺动脉高压多排螺旋 CTA 血管成像。造影剂 70ml，注射速率 4ml/S，扫描延迟时间用 Bolus Tracking 第一组 20 例其中 10 例监测层面定在上腔静脉，10 例监测层面定在肺动脉，Test Bolus 为第二组 10 例，常规计算时间为一组 10 例，准直宽度 2.5mm，层厚 3mm，

数据重建用最大密度投影 MIP 和容积显示（VR3D）等常规方法。一、二、三组图像分别由两位高年资医师阅片。

结果 第一组中 10 例监测肺动脉图像和第二组 10 例图像均清晰显示，第三组 10 例中 6 例图像模糊，第三组与第一、二组图像质量有显著差异。

结论 肺动脉高压 CTA 血管造影中监测层面的选择对扫描延迟时间最佳值的确定有很重要的作用，肺动脉高压 CTA 血管造影中扫描时间用 Test Bolus 和 Bolus Tracking 较优，常规计算时间延迟图像质量较差。

PU-2892

CT 纹理分析鉴别前纵隔淋巴瘤和胸腺瘤的价值

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目的 探讨 CT 纹理分析鉴别前纵隔淋巴瘤和胸腺瘤的价值。

方法 回顾性分析经病理证实为前纵隔淋巴瘤及胸腺瘤的病例各 15 例，分别为淋巴瘤组，胸腺瘤组。入组标准：①所有患者术前均行常规 CT 平扫、增强检查；②病变直径大于 3cm；③图像质量满足纹理分析。采用 MaZda 软件通过手动勾画感兴趣区的方式提取病变的纹理特征，特征选择方法包括交互信息（MI）、Fisher 系数、分类错误概率联合平均相关系数（POE+ACC）。特征分类统计方法包括原始数据分析（RDA）、主要成分分析（PCA）、线性分类分析（LDA）和非线性分类分析（NDA）。结果以错判率形式表示，对错判率最小的分析方法的纹理特征数据进行统计学分析并制作 ROC 曲线图，筛选出 ROC 曲线下面积最大的纹理参数，并采用 t 检验对该纹理参数进行统计学分析。同时请 3 名分别具有 8 年、10 年及 10 年以上影像诊断经验的中、高级医师共同评估 30 例患者的影像资料，结果以错判率的形式表示。**结果** 鉴别前纵隔淋巴瘤和胸腺瘤的纹理特征主要来自于 CT 平扫，错判率最小（0.00%）。特征统计方法中，NDA 错判率最低（0.00%），其次为 LDA 错判率（6.67%～13.33%），RCA 与 PCA 错判率较高（20.00%～26.67%）。3 名影像诊断医师对 30 例患者的影像资料进行评估，其中 3 例淋巴瘤误诊为侵袭性胸腺瘤，1 例胸腺瘤误诊为淋巴瘤，错判率为 13.33%，较采用纹理分析方法鉴别两种肿瘤的错判率高。t 检验分析得出 4 种纹理特征(来源于小波能量参数、游程矩阵参数)在鉴别淋巴瘤和胸腺瘤中具有统计学意义(P＜0.05)。

结论 CT 纹理分析可用于鉴别前纵隔淋巴瘤和胸腺瘤，为鉴别两者提供可靠的客观依据。

PU-2893

256 层 iCT 心脏 CTA 剂量优化技术在复杂先天性心脏病中

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目的：256 层 iCT 心脏 CTA 剂量优化技术在小儿复杂先天性心脏病中的应用。**方法：**收集了先天性心脏病患儿 50 例，根据检查时间分别采用回顾性、前瞻性心电门控心脏 CTA 检查，对两组图像进行图像质量评估、差异分析；采用独立样本 t 检验对两组患儿有效射线辐射剂量进行对比分析；并以手术结果为金标准，对比分析术前 CTA、UCG 与手术结果符合率。**结果：**回顾组、前瞻组两组图像差异无统计学意义（Z=-1.311，P=0.19）；前瞻组 CTDI、DLP、ED 值均低于回顾组，两组间差异有统计学意义（P<0.05）；术前总体 CTA 诊断手术符合率（94.2%）优于 UCG（83.7%），两种检查方法差异具有统计学意义（P<0.05）。**结论：**256 层 iCT 前瞻性心电门控心脏 CTA 检查在保证图像

质量的同时降低了患儿接受的有效射线辐射剂量，能很好地显示心内、心室-大血管、心外畸形及纵隔侧枝血管、冠状动脉开口、腹腔脏器、气管发育情况，对复杂先天性心脏病术前诊断提供更丰富的信息，对手术计划的制定、选择具有重要临床意义。

PU-2894
原发性气管支气管树腺样囊性癌的 MSCT 表现与临床病理特点

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【目的】原发性气管支气管树腺样囊性癌（primaryadenoid cystic carcinoma，PACC）是呼吸道罕见肿瘤，结合文献对 PACC 的临床、病理特点及 MSCT 表现进行回顾性分析，提高对 PACC 的诊断水平及预后判断。【方法】收集 10 例 2011 年 3 月至 2019 年 2 月经病理证实为气管、支气管原发 PACC 患者的临床、病理及 MSCT 资料，全部病例均行 MSCT 平扫，7 例另行 MSCT 增强，7 例行一次或多次 MSCT 复查。所有病例均行手术治疗，3 例术后复发。【结果】 10 例 PACC 均为中央型，7 例位于气管，左侧主支气管 2 例，左肺下叶基底干 1 例。10 例中腔内生长 4 例，腔内外生长 3 例，管壁增厚生长 3 例。MSCT 平扫病变呈均匀软组织密度,1 例内见点状钙化。7 例增强后 3 例轻度强化，1 例中度强化，3 例无明显强化。肿瘤外侵 2 例。【结论】PACC 具有一定特征：好发于大气道、多见于气管，生长方式表现为腔内型、腔内外型及管壁增厚型,宽基底沿长轴纵向缓慢生长多见。MSCT 平扫密度均匀，增强后轻度强化或强化不明显。本病常因阻塞气道出现体征，术后易复发。

PU-2895
Tumor surface irregularity at CT imaging predicts prognosis in lung tumors patients with overlying vessel signs

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Abstract
Purpose: The study aimed to evaluate the correlation between multi-slice computed tomography (MSCT) findings and clinical characteristics for the prognosis of lung tumors with overlying vessel signs, and identify the factors predicting prognosis.
Material and Methods: The CT imagings and clinical data of 132 lung tumors patients with overlying vessel signs were analyzed retrospectively. The prognosis of lung tumors patients with overlying vessel signs was compared using the Kaplan-Meier method and compared with the log-rank test. The correlation between tumor indexes and prgnosis was determined by Kaplan-Meier analysis and Cox regression was used to identify the independent factors for prognosis.
Results: The different lung tumors with overlying vessel signs showed similar clinial features (P>0.05), except for the age, shape and enhancement (P<0.05).

The age, tumor shape and enhancement (P<0.05) were significantly associated with prognosis. However, multivariate Cox regression analysis showed that only the tumor shape was an independent predictive factor of prognosis of lung tumors with overlying vessel signs(Exp(B)=9.664, 95%CI: 4.378-21.333, P=0.000).
Conclusion: Lung cancer, pulmonary mucoepidermoid carcinoma, and pulmonary carcinoid patients with overlying vessel signs weren't reported in the past. And age, tumor enhancement and shape are significantly associated with the prognosis of lung tumors patients with overlying vessel signs, however, the latter is an independent risk factor.

PU-2896

双能量 CT 在肺癌中的应用进展

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肺癌是我国最常见的恶性肿瘤，早期发现、诊断、分期与疗效评估对肺癌患者具有重要意义。目前常用传统 CT 对肺癌患者进行初步评估，但双能量 CT 较传统 CT 具有诸多优势，对临床研究与应用已有一定指导意义，随着双能技术的进步及研究的深入，肺癌患者将更好的从双能量 CT 评估中获益。

原发性肺癌（简称肺癌）是我国最常见的恶性肿瘤，其在男性和女性的癌症死因中均居首位。早期发现、诊断、分期及疗效评估对改善肺癌患者的生存质量和降低死亡率具有重要意义。双能量 CT 指通过各种方式进行双能量扫描的技术，临床最常用的是快速管电压切换单源双能量 CT 和双源 CT。除具备传统 CT 的特点外，DECT 还能通过获得虚拟平扫图像、碘基图、单能量图像、能谱曲线等，其常用参数包括：1）碘浓度；2）标化碘浓度，一般为增强后病灶与同平面主动脉碘浓度的比值；3）能谱曲线斜率，通过比较不同物质的 X 线衰减系数差异以对物质进行定量分析，为能谱曲线中病灶两个能级（常为 40 和 100keV）的 CT 值与能级差的比值，计算公式 λHU=（CT_{40KeV}-CT_{100keV}）/60。相对于传统 CT，DECT 图像对噪比更高、不增加甚至降低辐射剂量、提供多参数分析，在肺癌的诊断、指导个体化治疗、预后评估及随访中发挥着重要作用。

本文主要从以下六个方面回顾 DECT 在肺癌中的应用进展，包括肺部良恶性病灶的鉴别、评估恶性 GGO 的血供并预测侵袭性、辅助预测分子标志物表达及水平、评价肺癌的分化程度、肺癌 TNM 分期评估及疗效评估等。

PU-2897

256 层螺旋 CT 在冠状动脉支架后评估的价值

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目的：冠心病现在成为危害人民健康的常见病之一，因此心血管病成为我国公共卫生及健康事业所面临的严峻挑战，冠心病的治疗及术后评估是提高患者生存质量的必要手段。
方法：采用我科室 Philips 256 层 BrillianceiCT 进行检查 电压为 120 kV， 管电流 300 mA，旋转速度 0.27 s， 扫描层厚 1 mm 检查前对患者进行规律呼吸屏气训练，通过双通道高压注射器经手臂静脉，以流速 5.0～5.5ml / s，团注造影剂 40～70 ml 及 0. 9%氯化钠注射液 20 ml。

结果：2 5 6 层螺旋 c T 用于心脏冠状动脉成像以来,由于其扫描速度更快 ,时间分辨率较高及空间分辨率提高了，由于冠状动脉支架内再狭窄多数由于血管内膜以及中膜的过度增生所致 ,而不是冠状动脉内血栓急性形成，所以发生支架再狭窄部位的支架内密度与支架周围的血管组织密度基本一致。256 层螺旋 c T 对左主干和前降支近中段支架血管重建的图像清晰度及狭窄符合率明显高于右冠状动脉和回旋支，这是由于右冠状动脉和回旋支处于心脏边缘且晃动较快，同时回旋支与心大静脉伴行影响，易受其干扰而显影模糊。
结论：MSCT 冠脉造影具有价格低、快速、安全无创等优点，MSCT 可以用于临床冠状动脉支架术后患者复查的首选辅助检查之一，对于不能准确诊断的患者可以再进一步行选择性冠脉造影检查。

PU-2898

胸片在评价 PICC 置管中的应用价值

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【摘要】目的 探讨胸片在评价 PICC 置管中的应用价值。**方法** 收集 PICC 导管尖端位于 A（上腔静脉中 1/3 下份和上腔静脉下 1/3，但不包括 PICC 导管尖端在气管隆突或心影右上缘）处 214 例，PICC 导管尖端位于 B（心影右上缘，用 CAJ 表示）处 81 例，观察并记录每名患者气管隆突位置、PICC 导管尖端位置。测量气管隆突到 PICC 导管尖端的距离、测量胸椎单元上下径。计算胸椎单元数。按性别（女 124 例，男 90 例）、年龄（年龄＜40 岁 23 例，40 岁≤年龄 r≤70 岁 175 例；年龄＞70 岁 16 例）分组。分析年龄、性别的影响。用 SPSS22.0 统计软件对数值进行分析。**结果** ①气管隆突、PICC 导管尖端、CAJ 约对应三个椎体，分别约 T4/5 到 T7、T6 到 T8/9、T6 到 T8/9。胸椎单元较固定，2.30cm 左右，男性＞女性。②年龄、性别对气管隆突到 CAJ 距离或胸椎单元数影响较小（相差距离与年龄、性别分组无关，胸椎单元数与年龄无关，女性＞男性）③年龄、性别对导管尖端位于 A 处相差距离或胸椎单元数有一定的影响（＜40 岁组较大，女性＞男性）。④当导管尖端位于 A 处，相差距离为（2.24±1.32）cm，胸椎单元数为（0.94±0.55）。⑤气管隆突到 CAJ 的距离为（4.47±0.91）cm，胸椎单元数为（1.92±0.38）。**结论** 当 PICC 导管尖端位于气管隆突下约 2.24-4.47 cm，胸椎单元数为 0.94-1.92 时，约位于上腔静脉中下 1/3 和/或 CAJ，位置较好。

【关键词】 PICC；气管隆突；心影右上缘；CAJ；胸片
基金项目：2019 年四川省卫生与健康委员会（19PJ120）

PU-2899

阻塞性睡眠呼吸暂停低通气综合征心血管相关损害的心脏磁共振研究

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目的： 阻塞性睡眠呼吸暂停低通气综合征（OSAS）主要表现为睡眠过程时反复发生上气道阻塞，气流中断或降低从而引起睡眠时呼吸暂停和低通气。 临床研究证实，OSAS 与难治性高血压、中风、心率失常、冠心病及心力衰竭等相关。 对于 OSAS 致心血管损害以超声心动图研究较多，通过

超声心动图研究发现 OSAS 患者的心室功能及结构较正常对照组存在差异，包括右房面积增大，左室质量指数（LVMI）增加，左室射血分数受损，左室的应变能力下降等。但是利用心脏磁共振（CMR）对于这方面的研究较少。所以，我们的研究旨在探索心脏磁共振常规的扫描及新的扫描序列如 T1 mapping，BOLD-MRI 及 Strain 等是否能够早期发现 OSAS 患者中存在心血管损害改变。

方法：对以打鼾为主要症状就诊的患者进行多导睡眠监测（PSG），排除心血管疾病及心血管相关危险因素后分别选择中重度 OSAS 及正常受试者各 20 例。纳入人群进行 CMR 检查，检查的序列包括 CMR 常规黑血、白血电影序列、 T1 mapping、 BOLD 序列及延迟强化扫描。在 CVI[42] 后处理软件中分别测得 OSAS 组与正常组的左右心室 EF、EDD、ESD，LVMI，左室后壁厚度，T1 native、T1 post、ECV 值，BOLD 序列中信号强度（SI）以及纵向应变（GLS）、圆周应变(GCS)及径向应变(GRS)的参数差异。

结果： OSAHS 患者心脏较正常对照组扩大，心肌质量较对照组增加；通过 T1 mapping 技术测得的 ECV 值发现 OSAS 组较正常对照组增大，BOLD-CMR 测得的信号强度较对照组降低且差异具有统计学意义；应变分析中，发现 GLS 在两组中存在差异，但 GRS 及 GCS 未见差异。

结论：心脏磁共振不仅能够早期发现 OSAS 患者心脏结构及功能的改变，还能发现心肌缺血缺氧性及心肌纤维化改变，这提示临床医生对中重度 OSAS 患者应采取更为积极的干预措施。

PU-2900

临床常见肺部弥漫性疾病的 MSCT 诊断

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目的：分析 MSCT 对临床常见几种肺部弥漫性疾病的影像特征显示，对临床工作中放射科医生的诊断提供分析思路，让临床医生对于疾病的治疗更有把握。
方法：选取我院 2017 年 12 月～2019 年 5 月诊治的 53 例胸部弥漫性疾病，行胸部 CT 扫描，对 CT 图像进行仔细分析，并结合临床病史及相关实验室检查进行诊断。
结果：CT 检查结果显示，其中 17 例肺水肿，12 例肺转移瘤，11 例感染性疾病（包括结核、曲霉）,8 例尘肺，1 例 ANCA 相关性血管炎，其余 3 例影像上分别诊断为 UIP（寻常型间质性肺炎）、LIP（淋巴细胞性间质性肺炎）、（HP）过敏性肺炎，但是未得到回访结果或相应治疗预后追踪。分别总结了几种常见疾病的影像特点，并结合临床及实验室检查、病人体征等，做出正确诊断。
结论：在肺部弥漫性疾病诊断中，疾病种类繁多，影像表现特异性低，诊断困难，所以在此总结本科室常见疾病的影像表现。结果显示，多数疾病虽然异病同影，但是结合病史及其他检查后可以给临床医生提供可参考的诊断思路。

PU-2901

肺郎格汉斯细胞组织细胞增生症的 HRCT 表现分析

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目的：总结肺郎格汉斯细胞组织细胞增生症 （PLCH）高分辨率 CT （HRCT）表现，提高对本病的认识。方法：回顾性分析 12 例符合 2009 年国际组织细胞协会颁布的 LCH 指南中符合 PLCH 诊断标准患者的 HRCT 及病理资料，结合文献进行分析总结。结果：12 例患者均以双肺中上肺野分布为主，肋膈角区均未累及。2 例患者以弥漫性薄壁囊腔及少量散在分布星芒状结节改变为主，3 例患

者以多发小结节及间质增厚改变为主，余患者可见结节、星芒状结节、厚壁囊腔 薄壁囊腔、不规则形囊腔及空洞的病变形态。病灶间隔可见正常的肺组织。2 例患者出现气胸。结论：PLCH 的分布和形态在 HRCT 有一定的特征性表现，认识这些特征，有助于对本病的诊断。

PU-2902
人机协作在高海拔地区肺小结节诊断中的效能评价

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目的：探究肺结节人工智能协助不同级别影像诊断医师对提高肺小结节诊断效能的价值。
方法：回顾性收集我院胸部平扫病例共 200 例。先由初级诊断医师及高级诊断医师对 200 例肺结节做出独立诊断，并记录结节数量及用时；再由肺结节人工智能检测系统（简称 AI）(InferRead Lung CT Research,Infervision,Beijing,China，6.0 版本，阈值 0.75)自动检测；最后初、高级影像诊断医师联合人工智能筛选肺结节，并记录检测数量及用时。以高级医师与 AI 协作诊断肺结节为标准，统计比较初高级医师对肺结节诊断的检出率、AI 检测肺结节假阳性率以及人机联合检出提升率、时间缩短百分比。
结果：高级医师+AI 共检出结节 1169 个，用时 31.00（17.00,48.00）s；初级医师检出结节 592 个，用时 72.00（51.25,96.75）s，初级医师+AI 共检出结节 1164 个，用时 30.50（16.00,49.75）s；高级医师共检出结节 818 个，用时 77.00（49.25,104.75）s；AI 共检出结节 1492 个；初级、高级医师对肺结节检出率分别为 50.64%、69.97%，AI 检测肺结节假阳性率为 27.63%；初、高级人机联合检出提升率分别为 49,14%、30.03%，时间缩短百分比分别为 57.64%、59.74%。
结论：1.高级诊断医师独立诊断肺小结节较初级医师检出率高，但均有不同程度的漏诊率，尤以初级诊断医师漏诊率较高；2.AI 独立诊断肺结节假阳性率较高；3.AI 协助初、高级诊断医师不仅可以提高对肺小结节诊断的检出率，还能提高诊断效率，其中对初级诊断医师帮助较高级诊断医师更大。

PU-2903
256 排 CT 冠脉成像评估冠状硬化与冠心病危险因素的相关性

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目的：探讨 256 排 CT 冠脉成像（CTA）在评价冠脉斑块支数与冠心病危险因素的相关性，初步评估其临床应用的价值。 **方法：**对本院 2018 年 7 月至 2018 年 8 月期间临床诊断或疑诊为冠心病并行冠状动脉多层螺旋 CT 检查的 61 例住院患者的临床资料进行总结，分析其中的吸烟、血压、血脂、血糖等危险因素与冠脉斑块支数之间的关系,并进行统计学分析。 **结果：**冠脉 CTA 正常者 16 例（26%）；冠脉 CTA 显示有粥样斑块以及不同程度狭窄者 45 例（74%）。合并糖尿病组患者有 4 支狭窄的冠脉有 7 例（23.3%），而非糖尿病患者组为 2 例（6.5%），两者差异有显著性（P＜0.01），且合并糖尿病组多支病变所占比例最大（共 16 例，占 53.3%），而非糖尿病组正常者最

多（共 11 例，占 35.5%），两者差异有显著性（P＜0.01）。冠心病合并高血压、高脂血症、吸烟、饮酒等危险因素与冠脉狭窄程度的关系：本研究显示高血压、高脂血症、吸烟、饮酒等危险因素与冠脉狭窄程度有相关性。合并高胆固醇血症的患者以三支病变为主 （共 6 例 ，占 21.4 %），胆固醇正常组则同样以三支病变为主（共 9 例 ，占 27.3%）。**结论：**冠状动脉 硬 化的程度及单支病变、多支病变与危险因素的数量有关 （P ＜ 0．0 5）。对高危人群开展螺旋 CT 冠状动脉成像检查对 CHD 的早发现、早治疗有着重要的意义，为临床诊断和评价冠心病危险度分层提供依据。

PU-2904
功能影像学及其联合 VEGF 在肺癌疗效评估中的价值

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肺癌是世界上最常见的癌症，每年大约有两百万人会患上肺癌，而大多人都是在中晚期被诊断出来的，如若治疗失败，快速恶化的肿瘤会剥夺了他们潜在有益的二线治疗，停用无效的治疗可以预防相关的不良事件。目前常用的固体肿瘤评估标准存在一定滞后性，且单纯依靠肿瘤形态学对疾病作出疗效评价可能会出现误差。因此，临床上迫切需要更加有效的早期肺癌疗效预测及评价手段。如今，功能影像学快速发展，对肿瘤评估的量化越来越多地应用于我们的日常临床实践中，其中主要检查手段包括正电子发射计算机断层显像（PET/CT）、动态增强磁共振成像（DCE-MRI）、磁共振扩散加权成像（DWI）、CT 灌注成像及双能 CT。此外，与其他实体瘤一样，肺癌的生长、浸润、转移需要肿瘤血管的生成为基础，血管内皮生成因子（VEGF）是促进血管新生的重要因子之一，也是肺癌疗效的重要预测因素。本研究将对几种常用的功能影像学方法及其联合 VEGF 在肺癌疗效评估价值进行综述。

PU-2905
评估双能 CT 碘图影像组学在鉴别良恶性肺结节中的价值

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目的
探讨基于双能 CT 碘图的影像组学特征对良恶性肺结节鉴别的临床价值
方法
回顾性分析术前行双能 CT 检查的 109 位患者（81 例恶性结节和 36 例良性结节）的临床病理及影像资料，提取 9 个碘相关特征和基于碘图的 89 个影像组学特征。采用 LASSO 回归法分别筛选出 2 个诊断效能最高的碘相关特征和影像组学特征，并构成碘相关特征模型和影像组学模型。通过 Receiver Operating Curve （ROC）评估两个模型在鉴别良恶性肺结节中的诊断效能。
结果
所有碘相关特征都与恶性结节相关（p<0.01），其中诊断效能最高的 2 个特征是平扫 CT 值和重要区强化程度，构成碘相关特征模型。影像组学模型由 original_shape_Sphericity 和 original_glszm_Small Area High Gray Level Emphasis 构成。影像组学模型在鉴别良恶性结节中的准确性高达 89.7%，采用 ROC 分析，其 AUC 值、敏感性、特异性分别为 0.957、83.6%、93.8%。影像组学模型在鉴别良恶性肺结节中的诊断效能优于碘相关特征模型（准确性 89.7% vs 80.6%; AUC 0.957 vs 0.756）。
结论

基于碘图的影像组学是一种定量且无创的方法，可以反映结节血管生成和血流灌注特征，在鉴别良恶性肺结节中具有较高的准确性，有望在肺结节临床决策中发挥作用。

PU-2906
CT 检查非小细胞肺癌患者纵隔淋巴结转移效果研究

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【摘要】 目的探讨研究非小细胞肺癌纵隔淋巴结转移的胸部 CT 影像体征及临床特征,以期提高非小细胞肺癌分期诊断与治疗的准确度。方法收集就诊治疗经病理确诊为非小细胞肺癌且术前 CT 影像资料完整的病例 100 例,术前患者经胸部 CT 扫描检查纵隔淋巴结转移情况,并与手术、病理结果进行比较,检测 CT 影像诊断非小细胞肺癌纵隔淋巴结转移的准确率。结果通过对 100 例患者的 CT 检查结果、手术结果与病理结果进行分析显示,其中 CT 显示为阳性的患者共 62 例,其中真阳性患者为 47 例,占 75. 8%,假阳性为 15 例,占 24. 2%; CT 显示为阴性的患者共 38 例,其中真阴性患者为 14 例,占 36. 8%,假阴性患者为 24 例,占 63. 2%;对 CT 检查结果与手术及病理检查结果的灵敏度与特异度进行分析,结果显示,本实验中 CT 检查检测准确度为 66. 2%,特异性为 73. 7%。对 CT 检查结果与手术及病理检查结果进行一致性检验,二者的符合率为 61%,Kappa 指数为 72. 4%。其中,上叶肺癌上纵隔淋巴结转移 11. 0%(11/100 例),下叶肺癌上纵隔淋巴结转移 9. 0%(9/100),上叶肺癌下纵隔淋巴结转移 6. 0%(6/100),下叶肺癌下纵隔淋巴结转移 7. 0%(7/100)。对患者对 CT 检查结果的信任程度进行分析,其中 72 例患者表示信任,5 例患者表示不信任,信任的患者占 72%。结论 CT 对非小细胞肺癌术前纵隔淋巴结状态进行评估,能够较为准确地判断淋巴结是否转移,为手术提供更好的参考,值得临床借鉴。

PU-2907
肺大细胞神经内分泌癌螺旋 CT 表现及其与小细胞肺癌的鉴别

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【摘要】 目的：探讨肺大细胞神经内分泌癌（LCNEC）的 螺旋 CT（MSCT）表现及其与小细胞肺癌（SCLC）的鉴别要点。**方法**：收集 30 例经病理证实的大细胞神经内分泌癌患者，并随机选择 34 例小细胞肺癌患者作为对照，对两组 MSCT 征象进行分析并比较之间的差异。**结果**：30 例 LCNEC 多表现为双肺上叶 80%，体积较大（＞4cm 者 70%），边界清楚（70%），浅分叶（86%），平扫、增强扫描密度不均匀（73%、100%），增强扫描轻到中度强化（90%），坏死常见（100%），且为多发或弥漫性坏死（80%），常合并肺门及纵隔淋巴结肿大（60%），且多合并坏死（77%）；而空洞（6%）、支气管血管征（3%）少见。与 SCLC 的影像征象比较中，LCNEC 沿支气管血管束形态生长率，肺门大血管、心脏、纵隔受侵率，纵隔或肺门淋巴结的肿大率及融合率均分别低于 SCLC（20%vs58%、40%vs67%、60%vs94%、11vs84%），差异具有统计学意义（χ^2=9.959,15.26，10.85，25.38，P<0.05）。结论：LCNEC 具有一定 MSCT 特征，与 SCLC 相比存在一定鉴别点。

PU-2908

胸腹部孤立性纤维性肿瘤 CT 和 MRI 影像学研究

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分析胸腹部孤立性纤维性肿瘤（SFTs）CT 和 MRI 影像学特征及诊断价值。方法：随机选取我院 2013 年 1 月-2018 年 12 月收治的胸腹部 SFTs 患者 80 例。所有患者先接受 CT 检查，休息 24~48h，接受 MRI 检查。并经腹部腔镜手术治疗获取肿瘤组织 2cm×2cm 送实验室检查。结果：80 例 SFTs 患者共检出 97 枚肿瘤。病灶在肺内、胸膜、腹膜、后腹膜，分别有 32 例、24 例、20 例、4 例。肿瘤直径 7.81~21.47cm，平均肿瘤直径（15.68±2.69）cm。CT 共检出 83 枚肿瘤，病灶为肺内 36 例、胸膜 20 例、腹膜 18 例、后腹膜 6 例。MRI 共检出 96 枚肿瘤，病灶为肺内 31 例、胸膜 24 例、腹膜 20 例、后腹膜 4 例。MRI 诊断胸腹部 SFTs 病位、肿瘤检出、肿瘤良恶性准确性显著高于 CT（P<0.05）。CT 胸腹部 SFTs 特征表现为包膜相对完整。肺内肿块影边缘相对光滑，密度均匀。无分叶征集毛刺征，强化影像显示肿瘤轻度不均匀强化，无明确性肿大淋巴结影。胸膜病灶肿瘤呈椭圆形或卵圆形，边缘清楚。MRI 胸腹部 SFTs 特征显示包膜完整且光滑，T1、T2 低信号，增强后有中度延时性强化。胸膜病灶 T2 信号表现为高、略高及低信号。高信号反映肿瘤同粘液样变区，略高信号反映了肿瘤细胞密集，低信号则为致密胶原纤维。高信号中片状及结节状是其典型表现。增强扫描发现病灶动脉期及实质期病灶呈中度渐进性强化。腹膜病灶 T1、T2 低信号。MRI 诊断价值高于 CT，且联合诊断优于单 CT、MRI。结论：MRI 较 CT 在胸腹部孤立性纤维性肿瘤影像学特征、灵敏性、特异性及准确性方面优佳，能较好的反映孤立性纤维性肿瘤良恶性、形态等。但 CT 和 MRI 各有优缺点，建议联合诊断。

PU-2909

气管支气管树腺样囊性癌 CT 特征分析

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目的 探讨气管支气管树腺样囊性癌（ACC）的 CT 特征，从而提高对该疾病的认识水平。**方法** 回顾性分析 9 例气管支气管树腺样囊性癌患者的 CT 图像及临床资料，从 CT 轴位及 MPR、MinIP 等后处理图像中观察与评价病变，并对该病进行总结、讨论。**结果** 9 例气管 ACC 均位于气管，表现为腔内宽基底或气管腔内外肿物；形态上呈分叶状肿物或弥漫性管壁增厚为主；平扫密度一般较均匀，增强扫描呈轻中度强化为主。 **结论** 气管 ACC 的 CT 表现具有一定特点，CT 增强扫描及后处理重建能提高气管 ACC 的诊断，有助于临床诊断、治疗及预后评估。

PU-2910

纵隔血管瘤的多层螺旋 CT 表现

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目的 探讨纵隔血管瘤的多层螺旋 CT 表现。
方法 回顾性分析 13 例纵隔血管瘤的 CT 资料,观察病变数目、部位、形状、大小、边缘、密度和强化模式、肿块-心脏大血管界面（MCI）和肿块-肺界面（MPI）及其他征象。
结果 13 例患者均为单发肿块，边缘模糊，位于前中纵隔 6 例、前中后纵隔 4 例、右后纵隔 3 例。10 例呈弥漫蔓状生长，形态不规则，MCI 模糊并轻度占位效应 9 例、明显占位效应 1 例；2 例呈轻度蔓状生长，哑铃状，并延伸入椎管压迫脊髓；1 例呈膨胀性生长，椭圆形。MPI 清晰 12 例，模糊 1 例。病灶最大径 2.60~23.30 cm。8 例为混合密度并周边条索状软组织，2 例为均匀密度，3 例以脂肪密度为主并结节或条索状软组织，其中 5 例见静脉石；13 例均呈结节状或条索状强化并轻度延迟强化，其中 12 例见引流静脉、7 例见供血动脉；4 例合并脾脏血管瘤。
结论 纵隔血管瘤 CT 表现具有一定的特征，增强 CT 扫描有助于其准确诊断和术前评估。

PU-2911

孤立性纤维瘤的 CT 诊断

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摘要 目的 孤立性纤维瘤为全身发病肿瘤，本文旨在提高对孤立性纤维瘤 C T 影像表现的认识。方法 回顾性分析 12 例经手术病理证实的孤立性纤维瘤的 C T 影像表现，将影像学表现与病理组织学和免疫组织化学变化相对照，并复习相关文献。结果 发生于胸膜 3 例，腹膜后 2 例,盆腔、睾丸、鼻腔、口咽、眼眶、腋窝和髂窝各 1 例，CT 表现为圆形或卵圆形肿块, 境界清楚的软组织肿块,7 例密度均匀,5 例密度不均匀，增强后肿瘤实质部分均呈明显强化，4 例呈“地图样”强化，动脉期显示肿块内较多肿瘤血管，坏死区呈不强化低密度，5 例病灶内见斑点状钙化。结论 孤立性纤维瘤见于全身多个部位,好发于胸膜，影像上具有相对特征性的 C T 表现，结合病理以及免疫组织化学能做出准确诊断。

PU-2912

纵隔（胸腺）淋巴瘤的 CT 表现及病理对照

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摘要 目的：分析原发性胸腺淋巴瘤的 CT 表现及病理学特点；方法及材料：回顾性分析经过手术病理证实起源于胸腺的 10 例淋巴瘤，其中霍奇金淋巴瘤 4 例（HL 组）、非霍奇金淋巴瘤 6 例（NHL 组），总结胸腺淋巴瘤的 CT 表现并病理学对照分析；结果：A 组男 2 例，女 2 例，年龄（36.75±6.65）岁，B 组男 2 例，女 4 例，年龄（43±8.06）岁，A 组中 4 例（2/4）结节硬化型淋巴瘤，1 例（1/4）淋巴细胞消减型淋巴瘤，1 例（1/4）混合细胞型，B 组中 6 例弥漫大 B 淋巴瘤（6/6），胸腺原发性淋巴瘤表现为胸腺区类圆形肿块、无钙化，周围肿大淋巴结较少，增强后轻中度强化，其中 HL 较 NHL 的囊变坏死更明显；结论：胸腺原发性淋巴瘤具有一定的 CT 表现特点，此外肿瘤囊变坏死所占瘤体的体积对于胸腺原发性 NL 与 NHL 可能存在鉴别价值。

PU-2913

研究肺实性病变内血管形态在肺癌及肺炎鉴别诊断中的价值

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目的： 探讨研究肺实性病变内血管形态在肺癌及肺炎鉴别诊断中的价值
方法： 选取接受胸部多层螺旋 CT 血管成像患者 108 例，其中，肺癌患者 71 例（肺癌组），慢性肺炎患者 37 例（肺炎组），对比 2 组的血管形态
结果： 肺癌组的显管示率为 85.15%，显著高于肺炎组的 66.57%（P<0.05）；肺癌组肺内血管的中断率及迂曲率显著高于肺炎组（P<0.05）；肺癌组的血管内径及总截面积较肺炎组显著增大（P<0.05）
结论： 肺癌患者的肺部实性病灶内血管形态具有特征性改变，应用 MSCTA 观察血管的表现对于肺癌与肺炎的临床鉴别诊断具有重要价值。

PU-2914
肺上皮样血管内皮瘤的影像学表现(附 2 例报道并文献复习)

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摘要：分析肺上皮样血管内皮瘤(Pulmonary epithelioid hemangioendothelioma，PEH)的影像学表现。方法：回顾性分析 2 例手术病理证实的 PEH 患者的病例资料，对其临床表现、影像学表现、病理形态及免疫组化结果等结合文献进行分析报道。结果：1 例为 54 岁男性，体检发现肺部占位 3 月。影像学提示左肺下叶前基底段胸膜下孤立性实性结节，边界清楚，邻近胸膜局部增厚。另 1 例为 49 岁男性，体检发现双肺多发结节半月余。影像学提示两肺实性结节或肿块，较大者位于两肺下叶，边缘见分叶、毛刺、支气管充气征及胸膜凹陷征，合并小叶间隔增厚及磨玻璃影，增强后明显不均匀强化，左侧胸腔少量积液。PET-CT 检查右肺下叶局部胸膜代谢增高，提示胸膜转移。术后行脊柱 MR 检查，提示多发骨转移。肿瘤细胞免疫组化均为 CD31、CD34 高表达。结论：PEH 属于罕见血管源性低度恶性肿瘤，有恶性倾向, CT 对 PEH 的诊断和病程评估具有一定意义,须经病理组织学及免疫组化检查方可确诊。

PU-2915
建立多种模型预测纯磨玻璃结节样肺腺癌的浸润程度

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目的 基于肺纯磨玻璃结节 CT 征象建立预测浸润性肺腺癌的预测模型。**方法** 回顾性收集经手术病理证实肺纯磨玻璃结节 300 例，随机按照（1:1:1）分为训练集（n=100 例），验证集（n=100 例），测试集（n=100 例）。收集分析患者一般临床信息及多种 CT 征象，计量资料利用独立样本 t 检验，计数资料利用卡方、Fisher 确切概率检验分析；将 P<0.05 作为二元 logistic 回归输入变量，确定预测浸润性肺腺癌的独立危险因素（P<0.05），次要危险因素（P>0.05）；利用最后二元 logistic 回归建立回归预测模型，利用独立危险因素+次要危险因素建立多种组合形式模型。并利用验证集及测试集中数据检验预测模型效能并选出最佳预测模型。
结果： 二元 logistic 回归结果显示病灶的大小与平均 CT 值是预测浸润性肺腺癌独立危险因素，其余变量病灶的形状、边缘、异常空气支气管征、空泡/空腔征以及血管类型为次要危险因素。共建

立五种预测模型，包括回归方程预测模型、病灶大小分类+至少 1 个次要危险因素、病灶大小分类+至少 2 个次要危险因素、CT 值分类+至少 1 个次要危险因素、CT 值分类+至少 2 个次要危险因素，其诊断效能 AUC 分别为 0.788、0.766、0.678、0.624、0.599。经过验证集预测，五种模型诊断效能分别为 0.804、0.739、0.734、0.676、0.679，再经过测试集预测，预测效能 AUC 分别为 0.789、0.822、0.720、0.636、0.645。其中回归方程模型与病灶大小+至少 1 个次要危险因素在三个数据集中预测浸润性肺腺癌差异没有统计学意义（P：0.5338、0.0517、0.3862）。
结论：肺纯磨玻璃结节病灶大小+至少 1 个次要危险因素与二元 logistic 回归模型对预测浸润性肺腺癌具有一定的帮助。

PU-2916
应用 CMR 评价糖尿病患者右心室心肌应变的初步研究

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目的：糖尿病已经逐渐成为一个公共健康问题，最近的研究表明糖尿病是心血管疾病的一个高危因素，既往研究已经发现糖尿病患者的左心室整体纵向应变（longitudinal peak strain ，LS）和圆周应变（circumferential peak strain ，CS）会发生损害。本研究的目的是利用 CMR 检测糖尿病患者右心室心肌应变是否也发生了变化。

方法：本研究共纳入 28 名糖尿病患者(平均 BMI30.97±4.71 kg/ m²,平均年龄 43.25±12.23 岁)和 30 名健康志愿者(平均 BMI23.88±3.51 kg/ m²,平均年龄 46.13±13.26 岁)。所有患者均于 3.0T MR 行心脏常规成像。在 GE ADW4.4 工作站通过 Reportcard 4.0 软件完成右心室结构及功能参数测量（RVEDV、RVESV、RVEF 等），采用 QMass 8.1 工作站测量右心室整体和区域 LS 及应变率（longitudinal peak strain rate，LSR)。

结果：两组间右心室常规结构功能参数无明显统计学差异，但糖尿病患者整体右心室 LS 明显低于对照组(-14.05±3.47 vs -16.66±3.74, p=0.008)。此外，糖尿病患者间隔壁 LS 及 LSR 也明显受损(-9.84±3.88 vs -16.65±6.10,p=0.000；-0.46±0.20 vs -0.75±0.35, p=0.000）。

结论：CMR 能够定量评估糖尿病患者的右心室心肌应变状况，糖尿病患者右心室整体 LS、间隔壁 LS 及 LSR 在 RVEF 降低以前已经发生了一定程度损害。

PU-2917
原发性肺肉瘤样癌的 CT 表现及误诊分析

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目的 探索原发性肺肉瘤样癌（PSC）的 CT 表现，以提高对该病的认识，降低误诊率。 **资料与方法** 回顾性分析自 2011 年 1 月~2019 年 3 月在南昌大学第一附属医院经手术病理或穿刺活检确诊的 33 例 PSC 患者的临床资料、CT 表现及病理诊断。**结果** 33 例患者均表现为肺内单发肿块，周围型 20 例，中央型 13 例，位于肺上叶者 20 例，肿块平均直径约 6.0cm，其中 24 例直径大于 5cm；病灶边缘清楚者 8 例，25 例边缘模糊，且部分周围伴磨玻璃影；18 例伴分叶状，5 例边缘有毛刺；5 例肿块密度不均匀，其中 5 伴有空洞。增强后 13 例表现为边缘环形强化，9 例表现为环形强化伴

内部斑片状强化；累及胸膜者 16 例，合并胸水者 9 例，16 例表现为肺门或纵隔淋巴结转移，肺内转移 3 例，远处转移 13 例，3 例侵犯血管，1 例累及膈神经。**结论** PSC 的 CT 表现有一定的特征性，周围型多表现为无明显毛刺、空洞等征象的较大软组织肿块，增强呈环形强化伴或不伴内部斑片状强化。中央型 PSC 出现分叶、毛刺等典型肺癌征象的概率高于周围型。

PU-2918

不同注药方式对 CTPA 图像质量的影响

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[**摘要**]目的:探讨不同注药方式对 CTPA 图像质量的影响。**方法**:将 100 例体重在 50~75kg 内的肺动脉 CTA 患者随机分为 A、B 两组。每组 50 例，两组注射的对比剂相同，扫描机器和参数相同。其中 A 组的对比剂总量为 50ml,流速 4.5ml/s 之后以相同速度注射生理盐水 30ml。B 组的对比剂总量为 35ml,流速为 4.5ml/s 之后以相同速度注射生理盐水 50ml。分别测量两组图像肺动脉的 CT 值、信噪比(CNR)、噪声值、对比信噪比（SNR）和上腔静脉伪影。对图像进行质量评分。**结果**:两组扫描方式肺动脉充盈强化显示良好。经过测量 B 组的信噪比优于 A 组信噪比。B 组上腔静脉伪影要少于 A 组。**结论**：在相同的流速下，碘对比剂总量为 35ml,生理盐水 50ml 的扫描方案可以减少上腔静脉伪影并满足临床诊断要求。

PU-2919

肋骨原发性肿瘤的影像学特征及鉴别

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目的：提高对肋骨原发性骨肿瘤的影像学表现认识及诊断、鉴别诊断能力。
方法：回顾性分析 2014 年至今经手术病理证实的 36 例肋骨原发性骨肿瘤和肿瘤样病变的临床和影像学资料。
结果：36 例经病理证实的肋骨原发性骨肿瘤或肿瘤样病变中恶性者 11 例（30.5%）其中软骨肉瘤 5 例，浆细胞骨髓瘤 3 例，Ewing 肉瘤 1 例，恶性纤维组织细胞瘤 1 例，滑膜肉瘤 1 例；良性者 25 例（69.5%），其中纤维结构不良 11 例，骨软骨瘤 7 例，Langerhans 组织细胞增生症 2 例，骨巨细胞瘤 1 例，内生软骨瘤 1 例，软骨粘液样纤维瘤 1 例，纤维黄色瘤 1 例，血管瘤 1 例。纤维结构不良是本组最常见的肋骨病变（30.5%），好发于后肋，影像表现为与肋骨长轴一致的囊性膨胀性分叶状骨质破坏，其内密度均匀或不均匀，呈磨玻璃样，可见钙化或骨化；骨皮质边缘可部分不连续，部分病例可呈肿块样突向胸腔。骨软骨瘤是第二常见的肿瘤（19.4%），好发于前肋肋软骨交界区，影像表现与其它部位骨软骨瘤类似，表现为肋骨外生性骨性肿块，常呈菜花状，突向胸壁或胸腔内。朗格汉斯组织细胞增生症表现为肋骨内单囊或多囊状溶骨性骨质破坏，破坏区可见骨质膨胀性改变伴软组织肿块，可伴有不同程度的骨质硬化。软骨肉瘤是最常见的原发性肋骨恶性肿瘤（13.8%），好发于前肋肋软骨连接处和肋骨头近胸椎处，病变肋骨呈溶骨性、膨胀性骨质破坏并软组织肿块，内多伴有软骨基质钙化，实质呈稍低的均匀密度；MRI T1WI 等低、T2WI 等高信号，血供较丰富，增强呈明显不均环状强化。
结论：肋骨原发性骨肿瘤或肿瘤样病变有不同的影像学特征，影像学诊断要结合病变在肋骨的发生部位、骨质破坏形式、内部结构及对邻近结构侵犯情况综合分析。

PU-2920

DCE-MRI 定量参数与软组织肉瘤组织病理学分级的对照研究

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目的：
探讨动态增强磁共振成像（DCE-MRI）定量参数在评估软组织肉瘤（STSs）组织病理学分级的应用价值

方法：
根据 2013 版 WHO 软组织肿瘤分类标准，收集大连医科大学 2016 年 9 月-2018 年 9 月经病理证实为软组织肿瘤患者 51 例。使用 Siemens 3.0TMRI 扫描仪，序列 T_1WI、T_2WI、DWI、DCE-MRI；使用 Omni Kinetics (GE healthcare) 进行图像后处理生成伪彩图，选取肿瘤强化最明显及弥散受限最显著区域勾画 ROI，拟合计算定量参数容积转移常数（K^{trans}）、血管外细胞外间隙与血浆间速率常数（K_{ep}）及血管外细胞外间隙容积分数（V_e）。根据法国癌症中心联合会(FNCLCC)诊断 STSs 组织病理学分级标准将 51 例 STSs 分为 I～III 级。

结果：
51 例 STSs 组织病理学分级为 I 级 17 例、II 级 18 例、III 级 16 例。K^{trans}、K_{ep}与其组织病理学分级具有正相关性（$P<0.05$），其中 K^{trans}与其组织病理学分级的相关性最好（$r=0.7168$）；V_e与其组织病理学分级无相关性（$P>0.05$）。K^{trans}、K_{ep}值较高者，其组织病理学分级较高，I-III 级间 STSs 的 K^{trans}、K_{ep}差异有显著性（$P<0.05$），依据 K^{trans}、K_{ep}能够鉴别 I 级与 III 级 II 级与 III 级（$P<0.05$），但不能鉴别 I 级与 II 级（$P>0.05$）。依据 V_e对 STSs 的 I-II、II-III 及 II-III 级均不能鉴别（$P>0.05$）。

结论：
STSs 的 DCE-MRI 定量参数 K^{trans}及 K_{ep}与其组织病理学分级呈正相关性，能够反映其组织病理学分级。K^{trans}及 K_{ep}能够鉴别 I 级与 III 级、II 级与 III 级 STSs，但是不能鉴别 I 级与 II 级的 STSs。

PU-2921

少见软组织肉瘤的 CT 及 MRI 表现

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【摘要】目的了解少见软组织肉瘤的 CT 及 MRI 征象，以提高该疾病的诊断率。**方法**:回顾性分析 2013 年 3 月至 2018 年 11 月吉林大学中日联谊医院收治的 20 例经病理证实的少见软组织肉瘤的影像资料，其中包括精索脂肪肉瘤 3 例、肺平滑肌肉瘤 3 例、前列腺平滑肌肉瘤 4 例、颈部滑膜肉瘤 5 例、骶尾部滑膜肉瘤 2 例、大腿低度恶性纤维粘液样肉瘤 3 例。**结果：**20 例中多数病灶密度不均，仅 6 例边界清楚、密度均匀，14 例发生囊变坏死，9 例伴有条状钙化，7 例病灶内可见线状分隔，多数病灶呈边界不清的软组织肿块，侵犯或推挤邻近组织，增强大多数呈明显不均匀强化，少数呈轻-中度均匀强化。**结论：**软组织肉瘤发病率较低，可发生于任何部位，一些少见部位的软组织肉瘤影像学表现也具有一定的特征性。影像学检查具有较高的诊断价值，对指导临床制定治疗方案有重要意义。

PU-2922

The classification and features of primary sacrococcygeal chordoma based on CT imaging

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【Abstract】**Objective** To develop a CT imaging classification system and analyze CT imaging features for pretreatment primary sacrococcygeal chordoma (PSC), provide evidences for its diagnosis and personalized medicine. **Methods** Pretreatment CT imaging of 101 patients with a histopathological diagnosis of PSC were analyzed retrospectively, including tumor location, extent, size, intensity, involvement of adjacent structure. According the tumor location,from upper to lower, PSC were classified into four types (Ⅰ-Ⅳ). Four subtypes (a-d), from small to large, were defined by tumor extent. The ratio of subtype was analyzed by Kruskal-Wallis H test and pairwise comparison.R×C contingency table exact probobility was compared the occurrence rate of tumor calcification among different types and subtypes. One- way ANOVA and LSD-t test were adopted to analyze tumor size and intensity among different types and subtypes. **Result** In 101 cases, the ratio of type Ⅰ-Ⅳ was 17.8%, 30.7%, 36.6% and 14.9% respectively; the ratio of subtype a-d was 9.9%, 25.7%, 58.4% and 5.9% respectively.The differences of ratio among subtypes had statistical significance (P =0.012). The proportion of subtype c was higher than subtype a (P =0.039), while the proportion of subtype d was lower than subtype a (P =0.036). There were no significantly differences among other subtypes. For the occurrence rates of tumor calcification, there were no significantly differences among different types (P =0.233), but not among subtypes (P =0.003).The occurrence rates of tumor calcificationa were increasing from subtype a to d. The transverse dimensions and vertical dimensions of type Ⅰ were larger than type Ⅱ to Ⅳ (P <0.05). For the anteroposterior dimensions, there were significantly differences from subtype b to d (P <0.05), but not between subtype a and b (P >0.05); the transverse dimensions and vertical dimensions were significantly differences among different subtypes (P <0.05); the dimensions were increasing from subtype a to d. **Conclusions** TypeⅡand Ⅲ were common in pretreatment CT imaging of 101 PSC; the first sacrum was seldom involved; subtype a was uncommon, subtype c was the commonest and subtype d was rare.The intensity of tumor was not associated with CT type and the occurrence rates of tumor calcificationa were related to subtypes. The extent of tumor in type Ⅰ was wider than other types; the tumor dimensions were increasing from subtype a to d; CT imaging classification system was beneficial to judge the extent of tumor. The diagnosis delay of PSC was obvious, but the distant invasion and metastasis were infrequency. CT imaging can develop a classification system for pretreatment PSC and provide evidences for its diagnosis and personalized medicine.

PU-2923

恶性黑色素瘤骨转移:一例病例报告

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目的 一例恶性黑色素瘤骨转移患者，影像表现很有特点，本文详细介绍了相关临床及影像表现。
方法 恶性黑色素瘤通过淋巴管及血液循环发生转移，皮肤、皮下组织及淋巴结多见，而骨骼特别是长骨相对少见。1 例 46 岁男性患者，右侧前臂疼痛伴病理性骨折入院，影像显示断端少许骨膜反应，周围见 T1W、T2W 不均匀高信号软组织肿物。患者 3 年前因黑色素瘤入当地医院治疗，经过手术病理以及临床病史分析后，确诊为黑色素瘤骨转移。本文详细介绍了该患者的临床及病理相关信息。
结果 来源于黑色素瘤的 1 例患者，位于尺骨中段，伴病理性骨折。X 线及 CT 上局部骨皮质增厚，边缘不光滑，可见少许骨膜反应，软组织肿块边界欠清。MR 上可见骨皮质信号改变及明显的软组织肿块，肿块包绕骨干，T1 和 T2 上呈稍高信号。骨转移多呈溶骨性破坏，MR 对病灶显示敏感，根据病灶内黑色素的分布及含量，病灶的信号略有不同。T1W 上多显示低信号的软组织肿块内伴稍高信号的黑色素沉积，T2W 显示混杂高信号。本研究中，1 例病灶 T1W、T2W 呈不均匀稍高信号，与文献报道一致。最终，通过病理结果支持恶性黑色素瘤骨转移的诊断。
结论 联合影像学及病理活检可以确诊恶性黑色素瘤骨转移。

PU-2924

脊柱腱鞘巨细胞瘤的影像表现

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[摘要] 目的探讨脊柱腱鞘巨细胞瘤的影像表现。方法收集脊柱腱鞘巨细胞瘤 6 例，分析临床及影像表现特点，进行随访和预后观察。结果 6 例脊柱腱鞘巨细胞瘤，年龄 20～45 岁，男女各 3 例；颈椎 4 例，胸椎 2 例。影像显示病变主要位于椎小关节或以小关节为中心，呈溶骨性骨质破坏，边缘多见骨质硬化；MRI 上因病变内含铁血黄素沉积 ，T1WI 呈等或低信号，T2WI 呈不均匀明显低信号，在梯度回波序列更显著，少数病例 T2WI 呈混杂稍高信号，增强扫描病变呈明显强化。结论发生于脊柱的腱鞘巨细胞瘤多累及颈椎，与附件小关节关系密切。影像表现具有一定的特异性，预后良好。

PU-2925

非典型骨肉瘤的影像学表现

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目的 探讨非典型骨肉瘤的影像学表现，提高大家对非典型骨肉瘤影像学表现的认识，减少影像学上对非典型骨肉瘤的漏诊、误诊。
方法 回顾性分析了 100 例经手术病理证实为骨肉瘤患者的 X 线、CT、MRI 表现。
结果 85 例患者发生于 20 岁以内的青少年 ， 80 例患者发生在长骨干骺端 ，78 例患者肿瘤骨内可见成骨。本组 100 例经手术病理证实为骨肉瘤患者中有 19 例误诊，误诊率达 19%，其中 10 例为年龄大于 50 岁的中老年人，9 例发生于骨干、2 例发生于扁骨，7 例肿瘤骨内未见明显成骨。

结论 典型骨肉瘤好发于青少年、长骨干骺端、肿瘤骨内可见成骨，诊断并不困难，但不典型骨肉瘤也时常可见，误诊率较高，放射科医生应该熟悉骨肉瘤的特殊影像学表现，以提高诊断正确率，减少误诊、漏诊率。

PU-2926

黏液纤维肉瘤的 MRI 表现及其病理学基础

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目的：探讨黏液纤维肉瘤（MFS）的 MRI 表现及其病理基础，提高对本病的诊断水平。方法：回顾性分析 16 例经手术病理证实的 MFS 患者资料，就其 MRI 及病理进行总结分析。结果：14 例位于浅筋膜下，2 例位于肌间隙内；7 例呈类圆形，6 例呈梭形，3 例呈不规则形，肿瘤最大径约 4.6~13.2cm，平均 7.6cm；MRI 上，2 例呈 T_1WI 呈均匀稍高信号，14 例呈混杂等/低信号，2 例 T_2WI 呈均匀高信号，14 例呈混杂高信号，11 例病变呈 DWI 混杂高信号，ADC 均呈混杂低信号；10 例增强扫描呈不均匀明显强化；15 例可见“筋膜尾征”，12 例见瘤周水肿，12 例病灶内见“双低信号征”，11 例见囊变、坏死，6 例见黏液样变，其中 6 例囊变、坏死区及 5 例黏液样变区 ADC 值差异具有统计学意义（$P<0.05$）；镜下疏松区富含黏液基质，并可见散在曲线形血管，细胞密集区见多发梭形肿瘤细胞，异型性明显，核分裂多见； 8 例为低度恶性，2 例中度恶性，6 例高度恶性；免疫组化 16 例 Vimemtin 及 13 例 CD34 呈阳性。结论 MFS 的 MRI 表现具有一定特征性，有助于术前诊断，最终确诊依赖病理。

PU-2927

The clinical and imaging manifestations of SAPHO

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Abstract: Objective: To investigate the clinical manifestations and imaging features of SAPHO syndrome.Methods:The clinical and imaging findings of 27 patients with SAPHO syndrome were retrospectively reviewed, in combination with a literature review. Results: SAPHO syndrome is a chronic disease with the bone, joint and the skin involvement.20 cases had bone and joint swelling and pain as major clinical manifestations, the other 7 cases appeared skin lesions included the pustulsis, acne, hidradenitis suppurativa, etc..Imaging manifestations were chronic inflammation of bone and joint,including bone destruction, sclerosis, hypertrophy, medullary cavity stenosis even disappear.Major including anerior chest wall,spine and the sacroiliac joints,respectively 23 cases,9cases,8cases. vertebra involvement showed inflammation of vertebral angle and end-plate osteochondritis and osteosclerosis;18F-FDG PET/CT performance was increased FDG uptake of bone,bone scintigraphy showed typical "bull head" sign.Conclusion:Clinical manifestations of SAPHO syndrome have no specificity,but the image findings such as anterior chest wall bone osteosclerosis,hyperostosis, hyperostosis are characteristic,Comprehensive analysis should be combined with clinical and typical images to increase the knowledge for the disease and improve the accuracy of diagnosis.

PU-2928

枢椎齿状突加冠综合征的临床及 MSCT 分析

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目的　　探讨枢椎齿状突加冠综合征的病因、CT 影像诊断及临床治疗。方法 搜集近 6 个月 CT 发现枢椎齿状突周围钙盐沉积并经临床治疗的 6 例患者进行分析，其中男性 2 例，女性 4 例，年龄 54-86 岁，平均年龄 70.16 岁。结果 6 例患者均有不同程度的急性颈部疼痛、颈部僵硬、转头活动受限，其中 5 例患者血沉加快和 C 反应蛋白升高，2 例出现发热，MSCT 检查 6 例均有齿状突周围不同程度“皇冠状”钙盐沉积，应用非甾体类消炎药和皮质类固醇治疗两周后症状明显缓解，其中有 2 例先期曾按照颈椎间盘脱出治疗后症状缓解不明显。结论　颈椎 MSCT 平扫检查，显示齿状突周围“皇冠状”钙盐沉积，是诊断枢椎齿状突加冠综合征的重要依据，结合临床和实验室检查做出诊断，齿状突加冠综合征疼痛可特征性的被非甾体类抗炎镇痛药和皮质类固醇所缓解。

PU-2929

黏液纤维肉瘤的影像学表现与病理对照分析

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目的:探讨黏液纤维肉瘤（MFS）的 CT/MRI 表现，并与组织病理学进行对照分析，以提高对该病的认识及影像诊断水平。**方法：**将 10 例经手术病理证实的 MFS 患者按 FNCLCC 标准分为中级别 5 例、高级别 5 例，回顾性分析各级别患者的临床、影像及病理资料。**结果：**肿瘤位于大腿 4 例（其中 1 例同时位于髋部），小腿 1 例，臀部 1 例，踝关节 1 例，手臂 1 例，髂窝 1 例，髂腰肌及股直肌 1 例。肿瘤长径范围 3.8cm~20cm（平均 10.78±6.88cm），大多与周围组织局部分界欠清，呈类圆形、梭形或不规则形。3 例位置较深（1 例高级，2 例中级），6 例位置表浅（3 例中级，3 例高级），1 例高级别同时位于表浅和深部。2 例 CT 检查患者中，平扫呈低或稍低密度，密度均匀者（可见条状分隔）及不均匀者各 1 例，均未见明显出血或钙化。8 例 MRI 检查患者中，平扫主要表现为等、稍长、稍短 T1，长、稍长、稍短 T2 混杂信号，且除 1 例高级别 MFS 外其余均可见线样低信号分隔，平扫 5 例可见尾征。其中 4 例同时行增强 MRI 检查，均呈明显强化，其中 1 例高级别强化均匀；1 例中级别强化与无强化区交织分布；1 例高级别部分明显强化，部分弱强化；1 例高级别强化不均匀，可见结节样强化区。其中 1 例同时行 DWI 检查，呈高低混杂信号。病理表现：MFS 组织病理学表现为大量的黏液样基质背景中分布梭形或星形肿瘤细胞，细胞核具有一定的异型性，高级别肿瘤往往具有更高的异型性和明显的核分裂象。**结论：**MRI 能清楚显示肿瘤的部位、形态、范围以及与周围组织结构的关系，MFS 的影像表现与组织病理学具有一定的相关性，可以指导手术范围的制定。

PU-2930

骨朗汉斯细胞组织细胞增生症的影像学表现

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目的：探讨骨朗汉斯细胞组织细胞增生症（Langerhans cell histocytosis，LCH）的影像学表现。**方法：**回顾性分析 8 例经手术病理证实的 LCH，均行 CT 检查，其中 6 例行增强检查；5 例同时行 MRI 增强检查。分析 CT、MRI 影像学特征，并与病理结果进行对照分析。**结果：**8 例经 LCH 患者中，年龄 6 ~50 岁，男女比例 5：3，发病部位下颌骨 3 例，颞骨 1 例，硬腭 1 例，股骨 2 例，腓骨 1 例。CT 表现为骨髓腔内与骨长轴平行的低密度溶骨性骨质破坏区，边界清，周围可见硬化，邻近骨皮质破坏、连续性中断，可见层状骨膜反应，周围软组织肿胀，增强扫描呈中度-明显强化。MRI 扫描见边界清楚的骨质破坏区，呈 T1WI 低信号，T2WI 压脂高信号，骨皮质中断，周围软组织肿胀，强化程度同 CT。**结论：**LCH 的 CT、MRI 影像学表现具有一定的特征性。骨髓腔内边界清晰的溶骨性骨质破坏、骨缺损，伴或不伴骨质硬化、骨膜反应，增强后中高度强化提示本病。

PU-2931

四肢骨脉管畸形的影像学诊断

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目的：
探讨四肢骨脉管畸形的影像学特征，并分析四肢骨不同部位脉管畸形的影像学差异，以提高期诊断及鉴别诊断水平。
方法：
回顾性纳入于 2016 年 6 月至 2019 年 06 月间以脉管畸形病变收治入我院患者，所有患者均进行 CT 和或 MRI 检查，统计患者一般临床资料、发病部位、影像学表现特点。
结果：
共纳入 112 例动静脉畸形患者，静脉畸形 91 例，动静脉脉畸形 18 例，淋巴管畸形 5 例，病变位于四肢骨，其中手 19 例，足 27 例，肱骨 6 例，尺桡骨 11 例，股骨 20 例，胫腓骨 13 例，尺桡骨及手 4 例，上肢 1 例，胫腓骨及足 3 例，股骨及胫腓骨 1 例，股骨及足 1 例，膝 4 例，肘 1 例，肱骨及股骨 1 例。其中有骨质破坏表现的 32 例。
结论：
动脉畸形及静脉畸形 CT/MRI 表现相似，表现为增强的血管团，而淋巴管畸形，表现为增强或不增强团块影，无血管增大。CT 及其后处理图像有助于显示四肢骨原发性脉管畸形病变三维立体解剖图像和病灶内的血管分布，且在显示骨质破坏表现优于磁共振图像。

PU-2932

长骨骨端软骨母细胞瘤和骨巨细胞瘤临床与 CT 特征分析

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目的：探讨长骨骨端软骨母细胞瘤和骨巨细胞瘤的临床表现、CT 图像特征，提高对两者 CT 征象的认识和诊断能力。**方法：**回顾性分析西安交通大学附属红会医院 2016 年 6 月至 2019 年 3 月经手术或穿刺病理证实的长骨骨端病变软骨母细胞瘤 14 例，骨巨细胞瘤 18 例。分析患者的临床表现和 CT 图像特征。采用 SPSS 22.0 软件进行统计分析，计量资料行 t 检验，计数资料行 Fisher 精确检验，采用 Logic 回归分析各参数与疾病相关性，并以 ROC 曲线评价参数的诊断效能，以 P＜0.05 为

差异有统计学意义。**结果：**两组患者年龄(p=0.02)、病变大于母骨直径 1/2（p=0.038）、分叶（p=0.012）、瘤内钙化（p=0.000）、完整硬化缘（p=0.001）、皮质完整（p=0.000）、分隔（p=0.010）经 Fisher 精确检验，差异有统计学意义（P＜0.05）；性别、触及肿块、压痛、活动障碍，残留骨嵴、边缘清晰、骨膜反应、软组织肿块等资料经 Fisher 精确检验，差异无统计学差异（P＞0.05）。各参数经 Logic 回归分析显示，病变大于母骨直径 1/2、分叶、瘤内钙化、完整硬化缘、皮质完整、分隔为鉴别诊断骨巨细胞瘤和软骨母细胞瘤的特征性因素，差异均有统计学意义（P＜0.05），其 ROC 曲线下面积、灵敏度与特异度分别为（0.689，60.0 %、77.8%）、（0.706，46.7 %、94.4%）、（0.811，73.3 %、88.9%）、（0.800，93.3%、66.7%）、（0.822，86.7%、77.8%）、（0.739，86.7 %、61.1%）。**结论：**年龄、分叶、瘤内钙化、病变大于母骨直径 1/2、完整硬化缘、边缘清晰是鉴别软骨母细胞瘤和骨巨细胞瘤的特征性指标。

PU-2933

透明细胞肉瘤一例

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病例资料 患者男性 ，51 岁，于 4 月余前无意中时发现左侧大腿肿块，当时肿块如黄豆大小，无疼痛，无局部红肿，无畏寒发热，无盗汗、午后潮热，无胸痛、咳嗽、咯血，未就诊。4 月来，肿块逐渐增大，现如弹珠大小，无消瘦乏力，现来院就诊。影像资料：MR 表现为左侧大腿肌肉皮下见类圆形肿物，T1W 等、稍低信号，T2W 及 T2W 脂肪抑制呈不均匀高信号，周边见少许水肿，增强后较明显不均匀强化。 术中所见：切开皮肤，沿肿块分离正常组织，见左侧大腿肌肉间一约 3.0*2.5cm 大小肿物，将肿块连同周围少量正常组织完整切除，创面止血。病理结果：左大腿肌间肿物上皮样细胞肿瘤伴色素沉着，结合形态及免疫组化结果，考虑软组织透明细胞肉瘤。免疫组化：S100（+），HMB45（+），Melan A（+），Ki67（约 60%+），Syn（-），CgA（-），CD56（弱+），CK(广)（部分弱+），Vim（+），SMA（-）。

讨论 透明细胞肉瘤（clear cell sarcoma，CCS）是临床上一种罕见的软组织来源肿瘤，病程一般较长，约占所有软组织肉瘤的 1%。1965 年由 Enzinger 首先报告。CCS 可发生在任何年龄，但以中青年多见，偶可发生在儿童及老年患者。发生部位多见于四肢远端的深部组织，以足、膝部、手腕部多见。肿瘤常见与肌肉、深筋膜相连，但未见与表皮相连。病理上肿瘤常呈分叶或结节状肿块，边界清楚，生长以浸润性为主。从组织细胞上看，多由梭形细胞或（和）上皮样细胞组成，常呈片状、巢状等形状排列，中间被纤维组织分隔。在免疫组化方面，S-100 蛋白和 HMB45 常表现为阳性。最近研究发现基因检测对于 CCS 诊断准确性较高，表现为 t（2；22）（q32；12）染色体易位，导致 EWS-ATF1 基因融合。现 CCS 的治疗有多种方法，如手术治疗、靶向治疗、免疫治疗、化学治疗、放射治疗，但以手术治疗为最主要方法。

PU-2934

骨促结缔组织增生性纤维瘤的影像学分析

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目的 分析及探讨骨促结缔组织增生性纤维瘤(Desmoplastic fibroma of bone)的影像学表现。
资料与方法 回顾性分析 15 例经手术病理证实的骨促结缔组织增生性纤维瘤的影像学特点。 15 例骨促结缔组织增生性纤维瘤具有 X 线平片的 15 例，具有 CT 检查 13 例，具有 MR 检查的 6 例。

结果 15 例骨促结缔组织增生性纤维瘤的发病年龄 14~52 岁，以 30 岁以下的青少年多见。男性 7 例，女性 8 例（男女无明显差异）。本组 15 例的发病部位是股骨 5 例，胫骨 3 例，髂骨 2 例，椎体 2 例，肱骨 1 例，桡骨 1 例，跟骨 1 例。长骨常见于干骺端。X 线及 CT 表现分为四种类型：（1）囊样型：主要呈囊样膨胀性改变，可见残存骨嵴、呈丝瓜囊状；（2）溶骨型：呈类似恶性肿瘤的溶骨性破坏；（3）小梁型：表现为以肿瘤性骨小梁形成为主的改变，骨失去正常形态，呈“树根”状；（4）骨旁型：主要表现为边缘性压迫性骨侵蚀；病变区内的 CT 值较高（大部分病例 CT 值大于 50Hu）。MR 信号因类型不同而表现为信号差异较大，但大部分病例病变区 T1 呈不均匀的等或低信号，T2 为等或偏高信号，其信号与周围肌肉信号类似；病灶区内可见散在条索状长 T1 短 T2 信号（特征性较强），其形态及信号与韧带相似，低信号周边可见散在长 T1 长 T2 信号，病变强化不明显。

结论 骨促结缔组织增生性纤维瘤病灶区 CT 值高（50Hu 以上居多），其内可见散在条索状长 T1 短 T2 信号为其特点。因骨促结缔组织增生性纤维瘤为中间型、具有侵袭性，所以又具有恶性肿瘤的征象。综合 X 线、CT 及 MR 影像特点，有利于鉴别诊断及提高本病的准确率。

PU-2935
骨母细胞瘤合并动脉瘤样骨囊肿影像表现：附 3 例报告暨文献复习

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目的：分析骨母细胞瘤合并动脉瘤样骨囊肿的影像学表现特点，以提高对该病的认识。 **方法**：对 3 例术前行影像学检查，病理证实为骨母细胞瘤合并动脉瘤样骨囊肿病例进行回顾性分析,并结合文献复习。 **结果**：病灶均为单发。病例 1 初次检查表现为 C5 左侧椎板椭圆形磨玻璃样骨质破坏区，边界清楚。7 个月后病灶范围增大,位于 C5 左侧椎板及棘突，呈不规则膨胀性骨质破坏，边界清楚，边缘骨质硬化，内见小点状、斑片状高密度影及线样分隔。MRI 表现为 T1WI 等信号，T2WI 及 STIR 呈前份等信号、后份高信号，增强扫描显示不均匀明显强化。病例 2 位于右侧耻骨上支、髂骨，表现为膨胀性骨质破坏。病灶体积大，边界清楚，骨质不连续，可见软组织肿块影，边缘未见骨质硬化或骨膜反应。病例 3 位于左股骨远端，首次就诊时 DR 表现为边界清楚的类圆形骨质破坏，其内见结节状钙化或骨化灶，边缘骨质硬化。18 个月后，DR 显示骨质破坏区边界不清，呈斑片状。 **结论**：骨母细胞瘤合并动脉瘤样骨囊肿罕见，影像表现差异大，术前影像诊断难度较大。CT 及 MRI 表现，对本病的术前诊断有一定的价值。

PU-2936
脊索瘤的ＣＴ和ＭＲＩ影像表现与病理分型的对照研究

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目的：探讨脊索瘤的 CT 及 MRI 影像表现与病理分型的对照研究，为临床制定个性化治疗方案提供依据。

方法：回顾性分析了我院 2013 年 9 月—2019 年 5 月，经手术病理证实脊索瘤 72 例。利用 CT 及 MRI 观察病变发生部位、大小、生长方式、密度或信号特点，以及与邻近组织的关系，以判定病变内部组成成分及生长侵袭程度；反映组织病理学表现。

结果：72 例脊索瘤患者中，男性 44 例，女性 28 例（男：女=1.6:1）。发病年龄范围 2.8 岁-77 岁，平均发病年龄为 49.1 岁。病变起源骶尾部者为 43 例，颅底骨质起源为 25 例，颈椎及胸椎 4 例。根据组织病理学分型结果经典型 48 例，软骨样型 11 例，去分化型 3 例。72 例均行 CT 和/或 MRI 检查，其中 CT 增强 20 例，MRI 增强 38 例。CT 检查（49 例），主要表现为膨胀性溶骨性骨质破坏，呈软组织密度影，病变内部密度不均匀，病变内部因斑点状钙化或残存骨呈高密度，因病变内部含粘液基质及病变囊变呈低密度改变。MRI（35 例），主要表现为以 T1WI 低信号及 T2WI、STIR 高信号为主的混杂信号影，MRI 可清晰显示病变侵袭范围，低信号纤维分隔影，由于病变大量存在的粘液成分及伴发亚急性出血时，表现为 T1WI 高信号；因残存骨、软骨基质的钙化、陈旧性出血而呈 T2WI 低信号改变。CT 及 MRI 增强扫描（33 例），病变均呈现不均匀强化，其中轻度强化 24 例，中度强化 9 例；动态增强扫描（9 例）呈持续上升型强化方式。
结论：CT 和 MRI 可清楚显示脊索瘤的发病部位、形态、大小、侵袭程度以及病变组成成分，直接反映出病理组织学的部分特征，对术前明确诊断、手术方式及术后随访评估具有重要指导作用。

PU-2937

滑膜血管瘤的 MRI 诊断

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目的 探讨滑膜血管瘤的 MRI 表现。**方法** 回顾性分析 23 例经病理证实的滑膜血管瘤患者资料，总结其 MRI 特征。**结果** 局限型 6 例，弥漫型 17 例。局限型肿瘤位于关节内滑膜组织，不侵犯关节囊和周围组织，常有包膜，边界清楚，形态较规则，5 例信号不均匀，T_1WI 上呈低或等信号，T_2WI 及脂肪抑制序列 PDWI 上呈不均匀高信号，其内可见斑片状及多发细条形低信号影。弥漫型肿瘤分布于关节内外，常侵犯关节囊或关节囊外组织，17 例肿瘤信号皆不均匀，T_1WI 上呈低或等信号，其内可见斑片状或蜿蜒匍匐状高信号，T_2WI 及脂肪抑制序列 PDWI 上呈不均匀高信号，其内可见斑片状、结节状及多发细条形低信号，6 例瘤体内可见粗大的低信号流空血管，3 例可见静脉石。增强扫描 15 例，肿瘤呈明显斑片状、结节状或迂曲脉管状不均匀强化，其内可见斑片状、结节状及条索状低信号未强化区。**结论** 滑膜血管瘤内常见脂肪纤维成份和流空血管，MRI 表现具有特征性，对该病的诊断具有重要的临床价值。

PU-2938

肌骨系统孤立性纤维瘤的影像学表现与病理对照

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目的
探讨孤立性纤维瘤的 CT、MRI 及 DSA 的影像学表现，分析影像学表现与病理表现的相关性，寻找孤立性纤维瘤与其他肿瘤鉴别征象。
材料与方法
回顾性分析我院近十年的骨与软组织肿瘤共 34 例记录病变的位置、形态、大小、边界、平扫的密度及信号强度、增强扫描的强化程度及强化方式、邻近及周围血管情况、邻近软组织及骨质改变、有无转移。病理采用常规 HE 染色剂免疫组化检查。
结果

34 例患者中，19 例进行了 CT 检查，17 例进行 MRI 检查，12 例进行了 DSA 检查，4 例进行 PET-CT 检查。其中位于骶骨区 16 例，大腿软组织 8 例，肩部软组织 2 例，背部软组织 1 例，脊柱旁 1 例，骨内 6 例。20 例位于骨盆区的患者呈不规则分叶状，有钻孔生长的特点，12 例位于四肢软组织的患者呈类圆形，形态略有浅分叶，1 例患者沿骨干长轴呈长椭圆形。病灶大小 3-14cm。
CT 平扫时呈现等或略低密度，12 例可见小片状略低密度，4 例可见大量的液化坏死，2 例密度均匀，4 例有钙化成分，3 例有脂肪成分，增强扫描后 19 例均呈明显强化，2 例呈均匀强化，17 例呈不均匀强化，内部可见大小不等的无强化区及低强化区，强化最强处 CT 值 100-230HU，全部病例强化后病灶周边均可见增粗迂曲的血管影。
MRIT1 平扫时 T1 呈中等略低信号 15 例，略高信号 2 例，11 例信号略不均匀，4 例信号明显不均匀，2 例信号相对均匀，T2 呈现不均匀高信号 17 例，内部可见条索状低信号 15 例，内部出现留空信号 15 例，周边出现留空信号 17 例。3 例患者可见脂肪成分。
12 例 DSA 患者均呈现快进慢出的强化特点，病灶内部及周边均可见粗大血管。5 例 PET-CT 患者 SUV 值 1.9-4.3。
病理:7 例呈恶性孤立性纤维瘤表现，27 例为孤立性纤维瘤。
结论
肌骨系统的孤立性纤维瘤虽然比较少见，但是有其典型的影像学表现特点，通过影像与病理对照，大部分还是可以想到这个诊断。

PU-2939
原发性骨上皮样血管肉瘤的影像诊断及鉴别诊断

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【摘要】目的 探讨原发性骨上皮样血管肉瘤（epi-thelioidangiosarcoma，EA）的影像诊断及鉴别诊断，提高对本病的认识及影像诊断水平。方法 对 1 例骨上皮样血管肉瘤进行影像分析，结合相关文献资料进行分析与总结。结果 患者为中年女性，左侧尺骨占位，手术切除，结合免疫组化考虑上皮样血管肉瘤，患者影像学表现为：X 线平片与 CT 图像中，病灶表现为溶骨性骨质破坏，瘤内可见多个细网状囊腔，边界模糊。肿瘤呈膨胀性改变，骨皮质呈“皂泡状”。瘤块内无钙化。MR 图像上，肿瘤呈类圆形，平扫在 T1WI 上，病灶呈等低信号，其中夹杂着大量不规则稍高信号影，考虑为瘤内出血所致。T2WI 上肿瘤呈混杂高信号影，可见坏死。增强扫描，肿瘤呈明显不均匀强化。肿瘤血供丰富，在其周缘常见粗大的迂曲状、点或条状长 T1、长 T2 信号影，考虑为肿瘤血管流空信号，增强后，肿瘤供血血管明显强化。以上表现与相关文献报道一致。结论 原发性骨上皮样血管肉瘤是一种以肿瘤性内皮细胞呈上皮样形态为其特征的高度恶性血管源性肿瘤，影像表现缺乏特征性，需与溶骨性病变进行鉴别，确诊依靠病理检查。

PU-2940
腱鞘巨细胞瘤的 MRI 影像学特征与病理对照分析

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目的：探讨分析腱鞘巨细胞瘤（GCTTS）的 MRI 影像学特征并与病理对照，提高对 GCTTS 的诊断水平。方法：回顾性分析经手术病理证实的 38 例 GCTTS 患者的临床资料、MRI 影像学资料及病理临床资料。结果：38 例患者中局限型 23 例，弥漫型 15 例；MRI 表现：23 例局限型 GCTTS，表现为类

圆形软组织肿块，边界清晰，邻近骨质未见明显异常，与骨骼肌信号相比，T1WI 序列 11 例呈等信号，7 例呈等或低信号，5 例呈低信号，T2WI-FS 序列 17 例呈高或低混杂信号，6 例呈低信号。15 例弥漫型 GTCCS，其中 6 例弥漫型为术后复发，表现为关节旁多发形态欠规则软组织肿块，与周围肌腱、血管、韧带分界不清，邻近骨质未见明显异常，与骨骼肌信号相比，T1WI 序列呈等或低信号，T2WI-FS 序列呈高低混杂信号。镜下见较多组织细胞样单核细胞、多核巨细胞，并见散在泡沫细胞及含铁血黄素沉积。
结论：GCTTS 具有一定特征性的 MRI 影像表现，反映病理改变，结合临床症状和体征，可帮助临床医生提高诊断正确率。

PU-2941

儿童肱骨肿瘤或肿瘤样病变并病理性骨折 8 例

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目的:观探讨儿童肱骨骨肿瘤或瘤样病变并病理性骨折的手术疗效。方法:2016 年 3 月至 2018 年 3 月治疗儿童肱骨骨肿瘤或瘤样病损并病理性骨折 8 例:男 3 例,女 5 例；年龄 8~14 岁,平均 11.3 岁。病理结果:孤立性骨囊肿 3 例，骨巨细胞瘤,2 例,动脉瘤样骨囊肿 1 例,骨纤维结构不良 2 例,。手术采取同种异体骨植骨病、灶刮除联合接骨板内固定。结果:8 例均随访至恢复肱骨解剖及功能正常,随访时间 12~46 个月,平均 27 个月。参照骨与软组织肿瘤协会(MSTS)进行功能评估及 Harris 功能评分。术后最后复查肱骨正侧位 X 线片,病灶未见复发或转移,植骨区域骨愈合,内固定物无松动及断裂、变形等,手术部位均无感染、骨髓炎,双上肢等长,无再次骨折及肱骨畸形等发生。结论:儿童肱骨骨肿瘤或肿瘤样病变并病理性骨折虽治疗困难,但手术中能利用多种手段处理瘤体细胞,采用同种异体骨充分植骨结合 PHILOS 接骨板的有效固定,可以减少复发。

PU-2942

骨肉瘤基本病变 X 线平片、CT 和 MRI 对比研究

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目的
探讨骨肉瘤基本病变在 X 线平片、CT 和 MRI 上的征象对应表现及显示价值。
资料与方法
回顾性分析病理证实的 34 例骨肉瘤的影像学资料(X 线平片、CT 和 MRI)，对骨肉瘤同一基本病变在不同检查方法中的表现进行对比观察和分析。
结果
1. 肿瘤骨：X 线平片显示 20 例，CT 显示 28 例。MR 上，CT 所示的 7 例象牙质样瘤骨区、6 例棉絮状瘤骨区和 7 例针状瘤骨区均呈明显长 T1 短 T2 信号，能够与周围肿瘤组织信号相区分。CT 显示针状瘤骨者 7 例，MR 上均出现形态走行与 CT 相似的低信号。2 例 X 线平片和 CT 并未显示瘤骨，MR 上出现垂直于骨皮质的长 T1 短 T2 信号短针。
2. 骨膜反应及骨膜三角：10 例 X 线平片和 17 例显示骨膜反应。18 例 X 线平片和 20 例 CT 显示骨膜三角。MR 上，CT 所示的 17 例骨膜反应部位呈现明显长 T1 短 T2 信号线，其与骨干骨皮质间为等 T_1长 T_2软组织信号。9 例 X 线平片和 CT 并未显示骨膜反应的部位（3 例软组织肿块内，6 例表面）

呈现介于骨皮质和软组织肿块表面走行的长 T1 短 T2 信号线，与 CT 显示骨膜反应病例对应的 MR 表现完全相同。
3.骨干和干骺皮质：皮质破坏见于 22 例 X 线平片和 30 例 CT 图像。1 例 CT 显示骨干轻度膨胀。MR 上，CT 所示的 30 骨干破坏区呈现长 T1 长 T2 信号，其中 14 例异常信号范围超过 CT 所示破坏区。X 线平片和 CT 均未显示破坏的 3 例，MR 上皮质内出现点条状长 T1 长 T2 信号。
4.其他：干骺端或骨端松质骨、骨干髓腔、骺板（痕）及骨骺侵犯、软组织肿块、软组织肿胀显示率亦不同
结论 骨肉瘤基本病变的 X 线平片、CT 和 MR 征象及显示率不同，在提供诊断和治疗信息方面相互补充。

PU-2943
脊柱原发性平滑肌肉瘤的影像学和临床病理学特征分析

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目的 探讨脊柱原发性平滑肌肉瘤的影像学和临床病理学特征，旨在提高影像科医师对本病的认识，减少误诊。
资料与方法 回顾性分析 5 例经病理证实的脊柱原发性平滑肌肉瘤的临床、影像及病理学资料等情况。
结果 5 例肿瘤均为单发病变，肿块侵犯椎体或椎旁组织大多呈分叶状，骨质破坏边界不清。软组织肿块的 CT 值平均为 53HU。与脊髓信号相比，除 1 例病变骨质破坏区 T2WI 信号不均匀外，病变在 T1WI、T2WI 呈均匀等信号，增强扫描呈明显均匀强化。
结论 脊柱原发性平滑肌肉瘤的准确诊断应结合临床、影像和病理资料，临床上表现为疼痛、活动受限，影像学表现具有一定特异性，病变一般呈分叶状，表现为边界不清的溶骨性骨质破坏，T1WI、T2WI 呈均匀等信号，增强扫描呈明显均匀强化，最后还需病理检查确诊。手术完整切除肿瘤是其主要治疗手段，由于平滑肌肉瘤有较高的复发和转移率，术后定期随访非常重要。

PU-2944
原发性骨淋巴瘤的影像分析

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目的： 探讨原发性骨淋巴瘤（Primary bone lymphoma,PBL）的影像学表现及病理特征，以提高其诊断准确性。
方法：通过本院骨原发性淋巴瘤及回顾性分析文献报道的原发性骨淋巴瘤的 X 线、CT 和 MRI 表现。
结果：本院及文献报道 97 例原发性骨淋巴瘤，单发 81 例，多发 17 例；所有病例病理均被证实为非霍奇金淋巴瘤，其中 B 细胞淋巴瘤共 86 例，T 细胞共 11 例；X 线和 CT 显示溶骨型 74 例，其余为混合型和硬化型；MRI 检查共 39 例，T1WI 上表现为等或稍低信号，T2WI 常高或稍高信号，增强扫描均有不同程度的强化。

结论：原发性骨淋巴瘤可以发生于全身各个部位，病理以 B 细胞型非霍奇金淋巴瘤多见，影像学上具有一定的特征，需要综合各种影像学技术增加病变的影像学信息，但最终确诊仍需要病理学检查。

PU-2945

Contrast-enhanced T1WI Histogram Analysis in Differentially Diagnosing of Osteosarcoma and Ewing's Sarcoma.

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Objective：To determine if histograms of contrast-enhanced T1WI can be used to differentiate osteosarcoma and Ewing's Sarcoma.

Materials: 52 patients with confirmed histologically osteosarcoma in 32(61.54%) patients,and Ewing's Sarcoma in 20(38.46%) patients were enrolled in the study,accepting MRI at 3T. The ROIs were drawn on the maximum level of contrast-enhanced T1WI,and the histogram analysis were performed using the software named Mazda. The statistical analysis was performed on the nine histogram parameters to find out the different characteristics and the ROC curve was drawn to evaluate the diagnostic efficacy.

Results:Histogram metrics derived from mean,Perc.01%,Perc.10% and Perc.50%were significantly lower in osteosarcoma than Ewing's sarcoma. Osteosarcoma was significantly higher variance than Ewing's sarcoma. Optimal diagnostic performance to predict Ewing's sarcoma from osteosarcoma (AUC= 0.787, sensitivity = 70.60%, specificity =79.30%) was obtained when setting Perc.10%= 120.00 as the threshold value.

Conclusions:The contrast-enhanced T1WI histogram analysis may help to discriminate Ewing's sarcoma and osteosarcoma.

PU-2946

成人原发性脊柱淋巴瘤一例

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患者，男，30 岁，因反复腰痛 6 个月余，加重伴下肢麻木 4 天入院。6 个月前患者无明显诱因出现腰部疼痛，为间歇性隐痛，能忍，休息后可缓解，无发热、畏寒，无胸闷、气促，无恶心、呕吐，无双下肢麻木、乏力、跛行等不适，4 天前患者再发腰痛不适伴左下肢麻木，经休息后症状不能缓解，无恶心、呕吐，无乏力、低热盗汗，无胸闷、气促等不适。查体：T:36.9℃，P:108 次/分，R:20 次/分钟，BP:136/96mmHg，腰部活动稍受限，臀部肌肉无萎缩，L3 椎体及椎体左侧组织压痛

明显，伴叩击痛，骨盆挤压实验及分离试验（-），左侧腹股沟区、左膝关节内上侧皮肤感觉迟钝，双侧髂腰肌、股四头肌、胫前肌、腓肠肌、小腿三头肌、跖趾屈曲肌及踇背伸肌肌力 V 级，肌张力正常；双下肢直腿抬高试验阴性，加强试验（-），腹壁反射正常引出、对称，会阴部及肛周感觉未见异常，肛门括约肌肌力正常，肛周浅反射存，双侧髌腱反射、跟腱反射正常，双侧踝阵挛阴性。克氏征（-）、布氏征（-）、巴彬斯基征（-）。

PU-2947

指骨上皮样血管内皮瘤一例

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男，22 岁，发现左手环指末端肿物 2 年余，肿物渐进性增大。查体：左手环指末端可见外生性肿物，肿物呈不规则菜花状，末节指骨变形，中节指骨皮肤颜色发暗。X 线（图 A）表现为：左手环指远节指骨肿物，大小约 3.7×2cm，形态不规则，呈溶骨性及膨胀性骨质破坏，内可见分隔，肿块周边可见钙化；MRI 示：病变呈膨胀性及溶骨性骨质破坏，在 T1WI（图 B）呈不均匀低信号，T2WI（图 C）呈高信号，内可见类圆形更低信号区，PdWI 压脂（图 D）像仍呈高信号，内可见分隔。全身骨显像示（图 E）：左侧第 4 指骨异常示踪剂浓聚。后行左侧环指离断术，术后病理：大体标本：环指指端可见 4×2×1cm 的黑色隆起区域，隆起区域切面呈灰黑色；镜下（图 F、图 G）：组织表面被覆鳞状上皮，上皮角化过度伴出血、坏死及中性粒细浸润，真皮及皮下可见片状血管增生，部分内皮细胞轻度不典型增生，部分腔内可见红细胞，间质淋巴细胞浸润，深部可见骨化；免疫组化：ckp（－），p53（－），CD31（1＋），CD34（1＋），fli-1（1＋），ki67（10%）。诊断：左手指骨上皮样血管内皮瘤。发生于指骨的上皮样血管内皮瘤较少见。

PU-2948

动脉瘤样骨囊肿的影像学诊断

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[**摘要**] **目的** 评价影像学检查对动脉瘤样骨囊肿（ABC）的诊断价值。**方法** 对 16 例经手术病理证实的 ABC 的影像学表现进行回顾性分析。16 例均拍 X 线平片,9 例 CT 扫描，6 例 MRI 扫描。**结果** 16 例 ABC 发生于长管状骨 9 例，脊柱 4 例，短骨及扁骨 3 例。13 例病变呈膨胀性骨质破坏，10 例病变边缘可见硬化，5 例合并病理性骨折，8 例病变可见分隔，11 例可见典型的液－液平面， 3 例病变周围可见软组织异常改变，其中 2 例软组织肿胀，1 例软组织肿块，12 例病变内密度和（或）信号显示不均匀。**结论** 动脉瘤样骨囊肿具有一定的影像学特征，CT 和 MRI 对 ABC 诊断较平片有优势，综合影像学检查能提高 ABC 诊断符合率。

PU-2949

背部骨外尤文肉瘤 1 例

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目的：通过 1 例背部骨外尤文肉瘤及相关文献复习，进一步加强对骨外尤文肉瘤的认识。
方法：回顾性分析 1 例背部骨外尤文肉瘤的影像学表现及手术病理征象。
结果：患者男，19 岁，发现背部包块 1 年，周围皮肤无红肿，皮温无明显升高。实验室检查未见特殊。专科检查：背部可扪及大小约 6×7cm 大小包块，无明显压痛，质韧，边界清楚，活动度可，皮温不高，未扪及波动感。胸部 CT:右侧肩胛区皮下见团块状软组织密度影，CT 值约 46HU，密度较均匀，上下累及范围约 15 个层面，邻近骨质未见明显改变。MRI：右侧背部肩胛区皮层见梭形异常信号影，T1WI 呈等高信号，T2WI 呈高信号，脂肪抑制呈高信号，大小约 7.5x5.2x2.4cm，增强扫描呈明显均匀强化，病变边界清晰，与背阔肌、竖脊肌分界不清。影像诊断：右侧背部皮下占位性病变，多系肿瘤性病变。手术及病理：右侧肩背部皮下包块，尚有包膜，质韧，表面血管丰富，和周围组织分界不清，包块周围粘连紧密，包块血供丰富。背部包块结合形态学、免疫组化及基因检测结果，符合尤文肉瘤/原始神经外胚层肿瘤。免疫组化：CD99(+)、Vim(+)、EMA 灶(+)、CK(-)、Des(-)、CD34(-)、CD31(-)、S-100(-)、SMA(-)、HMB45(-)、Myosin(-)、MyoD1(-)、Ki67(+10%)。基因荧光原位杂交：发生 EWSR1 基因异位的比率 42%，大于阈值 15%；发生 SYT 基因异位的比率 42%，大于阈值 15%。
结论：骨外尤文肉瘤起源于软组织恶性小圆细胞，极为少见，恶性程度高，预后差，可发生任何年龄，20 岁左右发病率高，最常见的发生部位是胸壁、椎旁区、下肢，少数见于盆腔、臀部及腹膜后等部位，且早期临床症状不明显，易延误诊治，早期明确诊断主要依靠病理及免疫组化，最佳治疗是早期手术切除并辅以局部放、化疗。

PU-2950

躯干四肢黏液纤维肉瘤的磁共振表现

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目的 探讨黏液纤维肉瘤患者的磁共振表现，准确对该肿瘤进行术前诊断，以控制术后复发率。**方法** 回顾性分析 14 例经手术病理证实的黏液纤维肉瘤患者的临床影像资料，分析磁共振表现特点。**结果** 本研究共 14 例，男 8 例，女 6 例，平均发病年龄（62±12）岁，50 岁以上 12 例。肿瘤位于上肢 3 例、下肢 8 例，肩背部、臀部、髋部各 1 例。病灶均沿身体长轴生长，多边界清晰，呈多发结节型或肿块型，内见双低信号线样纤维分隔；病灶大小不等，最大直径范围约 2.4cm-12.2cm，平均约（7.3±3.0）cm，10 例大于 5cm；MRI 示 T1WI 12 例等信号，2 例等-低信号，T2WI 8 例不均匀高信号，3 例混杂信号，3 例均匀高信号；10 例可见尾征，9 例瘤周可见水肿区；增强扫描 2 例均呈明显不均匀强化。**结论** 黏液纤维肉瘤术后复发率极高，MRI 呈多发结节型或肿块型，T1WI 呈等信号，T2WI 呈高信号或混杂信号，增强扫描呈明显不均匀强化，可见“尾征”，这些特征有助于准确对该病进行术前诊断。

PU-2951

孤立性骨浆细胞瘤影像表现

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目的：探讨孤立性骨浆细胞瘤的影像表现。
方法：从本院收集经病理证实为骨浆细胞瘤，再经过影像确定为单发病例的 16 例患者的临床及影像资料，所有患者至少有 1 种影像学检查。
结果：共纳入 16 名患者，所有病例在检查前均未接受相关治疗，其中男性患者 12 名，女性患者 4 名，年龄范围 43-71 岁，平均年龄 60.34 岁。病程 1 周-半年。16 例患者中 14 例出现相应部位疼痛，无活动障碍，其中 2 例因病理性骨折入院，其余均加重后入院；1 例为肺癌术后常规检查发现；1 例为反复鼻腔出血入院。发生在四肢长骨 6 例、肋骨 2 例、骨盆 3 例、胸骨 1 例、胸椎 1 例、上颌窦 1 例、肩胛骨 1 例、锁骨 1 例。
所有患者至少有 1 种影像学检查，其中 X 线 5 例，CT 检查 12 例，MR 检查 4 例，ECT 检查 5 例，PET 检查 2 例。
1.X 线及 CT 检查：
骨质破坏形式　　X 线及 CT 上大部分为溶骨型（13 例），呈明显溶骨改变，可见残留的骨嵴及分隔（7 例），部分病灶呈膨胀性改变（7 例），病灶周边骨质密度减低（2 例）；其余为混合型（1 例），溶骨性破坏周边出现硬化边，并可见粗大骨嵴。
2.MR 检查：3 例 T1WI 表现为稍高信号， 1 例呈等信号；4 例 T2WI 表现为稍高信号。2 例骨皮质破坏表现为锯齿状。所有病例均未见明显瘤周骨髓水肿及骨膜反应； 3 例可见明显的软组织肿块，其中 1 例肿块内可见明显分隔，增强后，呈明显不均匀强化。
3.ECT 检查：5 例病灶呈核素浓聚。
4.PET 检查：2 例病灶葡萄糖明显摄取，呈高代谢。
结论：孤立性骨浆细胞瘤有较特异的影像学表现，结合多种检查方式，有助于提高骨浆细胞瘤的诊断准确率。

PU-2952

胸壁原始神经外胚层肿瘤（Askin 瘤）一例

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目的：我们报告一例 Askin 瘤的罕见病例，帮助临床诊断和治疗 Askin 瘤。
材料与方法：患者女性，29 岁孕妇，无明显诱因发现左侧胸壁皮下肿物，当时呈类圆形、鸡蛋大小，质硬，活动度一般，周围皮肤无红肿破溃，无疼痛及不适，未予重视。后肿物逐渐增大，因怀孕未进行治疗。生产后行胸部 256 排 CT 平扫及增强扫描，考虑恶性肿瘤并胸膜转移，后行 CT 引导下穿刺活检术并行组织病理及免疫组化检查。
结果：首次胸部 CT 检查结果示，左侧胸壁较大类椭圆形密度不均匀肿块，边界欠清，增强扫描呈轻中度不均匀强化，中央可见片状无强化液化坏死区，周围脂肪间隙密度增高，包绕邻近肋骨，骨质未见明确破坏，左侧胸膜多处结节状增厚，密度不均匀，增强扫描强化方式与主病灶相仿；组织病理示，穿刺物间质纤维增生显著，瘤组织呈梁索状或巢团状排列，浸润间质，瘤细胞类圆形，胞浆少，核小，类圆形，深染，大部分瘤细胞挤压变形，可见片状坏死。免疫组化示，CD99(+),NSE(-),VIM(-),Syn(+),TTF-1(-),CK7(-),LCA(-),DES(-),CD56(-),Myogenin(-),KI67 约 80%(+)。病理学考虑为小细胞肿瘤，符合 Askin 瘤。患者随后多次接受了全身化疗。首次复查胸部 CT 示，病变范围缩小，后再次复查示，胸壁及胸膜病变明显增大。更换化疗方案，返院复查胸部 CT 示，胸壁及胸膜病变范围进一步增大，左侧胸壁肿物内少许稍高密度渗血，前胸膜新发转移瘤，局部包绕前肋并见骨质破坏。
结论：阿斯金瘤是发生在胸壁软组织的罕见肿瘤，主要发生在儿童、青少年和青年白种人成人中[1]，通常需要手术以手术为主的综合治疗，即广泛切除+术后局部放疗及全身化疗[2]。胸部 CT 征象

于诊断 Askin 瘤存在一定特点，胸壁迅速增大密度不均肿块伴转移及邻近组织受侵、破坏应注意 Askin 瘤可能，需与肋骨的尤文氏肉瘤及胸壁横纹肌肉瘤鉴别[3]。

PU-2953
左股骨中段骨纤维肉瘤伴多器官转移:一例病例报告

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目的 一例骨纤维肉瘤患者，影像表现很有特点，术后 1 年又出现多器官包括扁桃体转移，本文详细介绍了相关临床及影像表现。
方法 一例 55 岁女性患者，下肢疼痛伴病理性骨折入院，影像显示软组织肿物明显并可见纤维分隔，邻近骨皮质局限性缺损，骨膜反应轻微，骨髓腔内有少量钙化灶。经过手术病理分析后，确诊为骨纤维肉瘤。治疗期间出现耐药，患者术后 1 年又出现多器官包括扁桃体转移，最终患者死亡。本文详细介绍了该患者的临床及病理相关信息。

结果 骨纤维肉瘤多见于 20-45 岁的成年人，男女比例相当。起源于非成骨性间叶组织，即成纤维组织，较少见，多为原发，少数为继发。分为中央型和周围型两种，前者多见。好发于四肢长骨的干骺端或骨干，尤其是股骨远端和胫骨近端为其好发部位。一般以肿瘤部位的疼痛及肿胀为主要症状，无特征性，常伴病理性骨折。影像学表现与肿瘤类型有关。中央型表现为溶骨性或轻度膨胀性骨破坏区，边缘模糊，呈筛孔样改变，当穿破骨皮质可形成软组织肿块，瘤内少有钙化及骨化现象，一般无骨膜反应。MR 可以显示肿块内的纤维成分，呈 T1W、T2W 低信号，坏死囊变组织为 T2W 高信号。可发生病理性骨折，生长慢者破坏区可呈囊状。周围型，少见，表现为股旁软组织肿块和邻近部位的骨皮质毛糙、压迫性缺损或虫蚀样破坏，也可穿破皮质侵骨髓腔。该患者临床主要症状为下肢疼痛，继发病理性骨折；软组织肿物明显并可见纤维分隔，邻近骨皮质局限性缺损，骨膜反应轻微，骨髓腔呈磨玻璃密度,内有少量钙化灶，与软骨肉瘤影像表现很相似，但 MR 上软组织肿块内未见明确提示软骨的 T2W 高信号，CT 上分隔未见钙化，髓腔内钙化灶相对较少。病理及镜下可见交织胶原纤维束及大量梭形细胞，瘤细胞弥漫阳性表达 Vim，灶性或弱阳性表达 SMA、AACT、CD68，提示瘤细胞主要具纤维母细胞性分化。支持骨纤维肉瘤的诊断。

结论 联合影像学及病理活检可以确诊骨纤维肉瘤。

PU-2954
恶性血管外皮瘤个案报道及文献回顾

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目的 恶性血管外皮瘤是一种少见的恶性肿瘤,现报道 1 例背部恶性血管外皮瘤,并回顾相关文献,以提高对该疾病的认识。**方法** 对 1 例背部恶性血管外皮瘤的临床病理资料、影像学资料进行分析，并检索 2000~2019 年国内外关于恶性血管外皮瘤的相关文献,对其临床表现、病变部位、影像学检查、病理学检查、治疗方式及随访资料进行临床分析，结合文献进行探讨。病历概要：患者女

性,47 岁,以“发现背部包块 1+月”为主诉于 2016.7 入院。专科情况：双侧肩胛骨上缘中间胸段棘突右侧可发现一大小约 6×4×3cm 的包块，局部及右侧椎旁肌肉深压痛，表面光滑，边界不清，活动度欠佳，质韧，局部皮温不高，无波动感。影像学检查提示胸 3-5 椎棘突右侧见一大小约 2.6×4.9cm 的肿块，考虑肿瘤性病变，胸 3 椎体棘突可疑受侵。无手术禁忌，于 2016-07-20 在全麻下行背部骨骼肌软组织肿瘤切除术。**结果** 术后病理结果提示(背部)恶性肿瘤，结合免疫组化结果，符合血管源性，考虑为恶性血管外皮瘤，免疫组化：CD31(+)，CD34 血管内皮(+)，CD99（+)，bcl-2(-)，TdT(-)，HMB45(-)，CD138(-)，Desmin(-)，TTF-1(-)，Napson-A(-)，LCA(-),EMA(-)，CK(-)，S100(±) Syn(-).CgA(-),ER(-) ,PR(-)，切除骨质部分提示肿瘤浸润。**结论** 恶性血管外皮瘤是一种少见的软组织肿瘤；血管外皮瘤主要根据肿瘤细胞是否丰富,有无异形性,有无坏死及核分裂的多少作为良、恶性鉴别诊断的标准。免疫组化虽无特异性标记，但在血管外皮瘤的诊断和鉴别诊断中有重要意义。恶性血管外皮瘤无特征性影像表现，故难以在术前定性，但 CT 及 MRI 可显示发病部位、大小、形态、病变与周边组织的关系，为制定手术治疗方案及预后观察提供重要依据。

PU-2955

髓外浆细胞瘤的 CT 与 MRI 表现及其误诊分析

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目的 探讨髓外浆细胞瘤（EMP）的 CT 与 MRI 表现，分析影像学误诊的原因。 **方法** 回顾性分析本院经手术或活检病理证实的 7 例 EMP 患者的 CT/MRI 表现，观察其 CT/MRI 表现特征，并分析误诊的原因。 **结果** 7 例中，男 5 例、女 2 例；年龄 34～89 岁，平均（58.4±17.0）岁。病灶位于消化道 2 例（十二指肠及结肠各 1 例），鼻咽部、右上颌窦、颈项左侧、左前后腹壁、左睾丸各 1 例。临床症状主要表现为患处肿痛及触及肿块、压痛，发生于消化道患者出现反复上腹部胀痛或解稀烂大便，发生于鼻咽部患者出现反复鼻塞。7 例中，行 CT 检查 3 例（其中 2 例并行增强扫描），行 MRI 平扫及增强检查 4 例，均表现为患处不同形态软组织肿块影，大小 2.0 cm×2.1 cm×2.0 cm～6.2 cm×6.8 cm×15.8 cm。肿块边缘光整、分界清楚；颈项部肿块呈圆柱状纵向生长达胸廓入口处，右上颌窦肿块侵犯上颌骨，鼻咽肿块呈环壁肿块生长，前后腹壁各见椭圆形软组织肿块，十二指肠肿块向腔内隆起，结肠肿块呈肠壁局部增厚改变，睾丸呈不规则肿块；7 例肿瘤均呈软组织密度影或 T_1WI 稍低等、T_2WI 稍高及 STIR 高信号影，且密度或信号均匀，6 例行增强扫描的肿块均呈中度-明显均匀强化，均未见液化、坏死。7 例分别误诊为颈部淋巴瘤、鼻咽部慢性炎症、右上颌窦囊肿、腹壁巨淋巴细胞增生症、十二指肠降部腺瘤、横结肠癌及左睾丸感染性病变并脓肿形成。肿瘤肉眼观察呈灰白鱼肉样，镜下见弥漫成片分布的瘤细胞，其形态、大小相对一致，细胞呈卵圆形、核偏位，胞浆丰富、红染。免疫组化结果：7 例 CD138、CD38 均为（+），CD56（+）3 例，CD79α （+）4 例，Kappa 阳性 6 例，7 例 CD3、CD20 均为（—）。 **结论** EMP 的 CT/MRI 表现有一定特征性，对 EMP 的诊断与鉴别诊断有重要临床价值；对本病缺乏足够认识是活检与术前误诊的主要原因。

PU-2956

纤维肉瘤的影像学研究进展

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纤维肉瘤是软组织肉瘤中较常见的一种，约占其中的 10%，它是属于纤维母细胞/肌纤维母细胞性肿瘤，其中成人型纤维肉瘤和黏液型纤维肉瘤均归为恶性肿瘤。CT 对软组织具有很好的密度分辨力和空间分辨力，是诊断软组织肉瘤的常用方法；MRI 是软组织肿瘤的一种常用的无创性检测办法，其可以清晰显示肿瘤位置、体积、边界、形态、信号特点和周围结构的比邻关系等，还能观察有无淋巴结转移和远处转移扩散。成人型纤维肉瘤在 CT 上主要表现为类圆形或分叶状的软组织密度肿块阴影，密度不均，增强扫描呈不均匀强化；在 MRI 上表现为 T_1WI 均呈低、等信号，T_2WI 上大部分呈现脑回状混杂高信号。黏液型纤维肉瘤在 CT 上呈分叶状或类圆形，表现为等、低密度肿块影，部分病灶内部可见条索状分隔影；在 MRI 上，T_1WI 上主要以低信号、等低信号为主；T_2WI 上信号比较复杂，其信号特点与病理密切相关。

PU-2957

The Comparative Study of Imaging Features and Histopathological Grading of Fibrosarcoma

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Abstract
Objective: To study the relationship between imaging features and histopathological grade of fibrosarcoma, and to screen out the imaging features associated with the histopathological grade of fibrosarcoma.
Materials and Methods: Clinical and imaging data of 30 patients with fibrosarcoma confirmed by surgery and pathology were retrospectively analyzed. 18 patients underwent MRI examination, of which 13 were enhanced scans; 16 patients underwent CT examinations, including 15 enhanced scans. There were 4 patients who underwent both CT and MRI examinations. Among all fibrosarcoma patients, there were 22 adult fibrosarcomas and 8 mucinous fibrosarcomas. MR inspection equipment uses a Siemens Magnetom Avanto 1.5T magnetic resonance scanner or a Siemens Magnetom Verio 3.0T magnetic resonance scanner. The CT inspection equipment uses a Siemens Somatom Definition 64-layer dual-source CT scanner or a GE Lightspeed 64-slice spiral CT scanner. The tumor imaging evaluation indicators include: growth site, size, shape, boundary, degree of enhancement, and necrosis, hemorrhage, peritumoral edema, and surrounding bone invasion. The relationship between each radiological sign and pathological grade of fibrosarcoma was analyzed.
Results: In this group of 30 tumors, the maximum diameter of the tumor was 2.0cm~21.4cm, with an average of 9.25±4.86cm; 19 cases were oval, 11 cases were irregular; 20 cases had clear boundaries, and 10 cases had less clear boundary; In 8 cases, cystic necrosis area with size ranging from within the tumor was seen; in 6 cases, hemorrhage area was seen in the tumor. The group of 26 cases of enhanced scans, 9 cases of uneven mild to moderate enhancement, 17 cases of uneven enhancement. In 19 cases of MRI examination, 10 cases were associated with different degrees of peritumoral edema. In this group of 30 cases of fibrosarcoma, no significant bone destruction was found on CT and MRI. Compared with the pathological results, there was a correlation between tumor boundary, enhancement degree, and peritumoral edema and

pathological grading. The correlation coefficients were 0.476, 0.522, and 0.578, respectively. The results were statistically significant ($p<0.05$). There was no significant correlation between tumor size, morphology, cystic necrosis and hemorrhage in the tumor and pathological grading, and the correlation coefficients were 0.107, 0.107, 0.223, and 0.101, respectively, and the results were not statistically significant ($p>0.05$).
Conclusions: The boundary, degree of enhancement, and peritumoral edema of fibrosarcoma are related to the histopathological grade of the tumor, which can reflect the biological characteristics of high-grade fibrosarcoma to some extent.

PU-2958

A comparative study of the value of MR follow-up in the management of local recurrent osteosarcoma after surgery

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Objective: To explore the value of magnetic resonance follow-up in the diagnosis and treatment of local recurrent osteosarcoma after joint replacement for primary tumor.
Methods: Thirty-nine patients with local recurrent osteosarcoma were enrolled. Patients were divided into control group and MR follow-up group according to whehther they received MR follow-up after joint replacement for primary tumor. Clinical, imaging and pathological data were collected. We use the independent sample T test to compare the progression-free survival from primary surgery to recurrence of the two groups, Wilcoxon Mann-Whitney test to compare the maximum diameter of the recurrent lesions, Fisher's exact test to compare the limb salvage rate, and Wilcoxon Mann-Whitney test to compare the extent of surgical resection.
Results: Of the 39 patients with local recurrent osteosarcoma, 25 were in the MR follow-up group and 14 in the control group. The progression-free survival time was (11.57 ± 1.28) months in the MR follow-up group and (15.92 ± 1.89) months in the control group ($P=0.064$). The maximum diameter of the recurrent lesions was (9.00 [6.00, 15.50]) cm in the MR follow-up group, and (6.75 [4.50, 10.00]) cm in the control group, and there was a statistical difference between two groups($P=0.041$). The limb salvage rate was 57.1% (8 cases) in the MR follow-up group and 20.0% (5 cases) in the control group, indicating significant difference between two groups($P=0.033$). There was also a significant difference in the extent of surgical resection between two groups ($P=0.020$).
Conclusion: Patients with osteosarcoma receiving MR follow-up after surgery helps to early diagnosis and limb salvage. Whether MR follow-up can improve the prognosis of osteosarcoma needs further exploration.

PU-2959

创伤性平足与弹簧韧带损伤

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目的：探讨非骨折性创伤性平足与弹簧韧带损伤的相关性
方法：1.1 一般资料　回顾分析 2015-2018 年 11 例非骨折性创伤后获得性平足病人足踝部 MR 资料。患者年龄 17-56 岁，平均年龄 39 岁，男 5 例，女 6 例，左足 4 例，右足 7 例。判断弹簧韧带是否损伤，以及损伤程度，分析弹簧韧带损伤与创伤性平足之间的相关性。
1.2 检查方法：采用 Philips3.0T 超导磁共振，使用 16 通道踝关节专用线圈，采用踝关节常规扫描方案，矢状位 FSE T1IW 序列，轴位、矢状位及冠状位压脂图像均采用 Philips 专有 mDIXION 压脂，层厚 3mm，间距 0.1mm，FOV20cm。
1.3 观察与判断　弹簧韧带主要分为三束（内侧束、中间束、外侧束），内侧束主要在冠状位和轴位上观察，中间束和外侧束主要在矢状位及轴位观察。判断标准，急性韧带损伤主要表现为韧带水肿、T2WI 信号增高，部分中断、完全中断，陈旧性损伤主要表现为韧带中断或韧带松弛。
结果：创伤性平足是临床常见病，大部分原因是跟骨骨折后破坏正常足弓的骨及韧带结构，从而导致的创伤性平足，而非骨折性创伤性平足也不少见，早期不易引起重视。非创伤性平足其常见原因为外伤或过度运动后治疗不当导致骨挫伤、胫骨后肌功能不全、弹簧韧带损伤，足底韧带损伤，各因素常同时发生，也可单独存在。10 例获得性平足患者中，既往均有明确扭伤或暴力性损伤病史，均未经过及时有效治疗；　首诊 MR 显示弹簧韧带损伤 8 例，同时合并距骨、跟骨、舟骨骨挫伤 6 例，同时合并胫骨后肌损伤的 5 例，足底韧带损伤 1 例。足弓塌陷后复查 MR，均显示显示弹簧韧带松弛或中断。
结论：弹簧韧带损伤与创伤性平足具有明显相关性。高场强 MR 能清晰显示弹簧韧带正常结构及病变，对弹簧韧带损伤提供可靠的诊断依据，对诊断弹簧韧带损伤早期诊断、临床治疗方案的选择提供了有力依据，能有效预防平足症的发生

PU-2960
关于膝关节功能支具对前交叉韧带损伤后胫骨前移影响的影像学分析

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摘要：目的 探究膝关节功能支具对膝关节前交叉韧带(ACL)损伤后胫骨前移的影响。方法 选取 20 例单侧前交叉韧带损伤的患者,分别在佩戴支具前后对患侧、健侧肢体行 X 线膝关节 90° 侧位片,通过测量胫骨内侧平台外缘与股骨内侧髁前缘的相对位置,评估胫骨前移的距离。结果 20 例患者患侧佩戴支具前的胫骨前移距离为(18.98±1.39)mm,明显大于健侧佩戴支具前的(17.62±1.58)mm,差异有统计学意义(t=2.890, P=0.006<0.05)。健侧、患侧佩戴支具后的胫骨前移距离分别为(16.32±1.47)、(17.19±1.74)mm,均明显小于佩戴支具前的(17.62±1.58)、(18.98±1.39)mm,差异均有统计学意义(t=2.694、3.595, P=0.011、0.001<0.05)。患者患侧佩戴支具前后的差值(1.79±0.94)mm 明显大于健侧的(1.30±0.52)mm,差异有统计学意义(t=2.040, P=0.048<0.05),患侧佩戴支具前后缩小百分比(0.09±0.05)略大于健侧佩戴支具前后的(0.07±0.27),但差异无统计学意义(t=0.326, P=0.746>0.05)。结论 在局限性范围内,膝关节功能支具可以限制前交叉韧带损伤后的胫骨前移。

PU-2961
Diagnosis and follow-up MRI and US evaluation of tennis leg

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Purpose: To evaluate the MRI and ultrasonographic (US) findings of patients with a clinical diagnosis of tennis leg and to explore the pathogenesis of tennis leg.
Materials and Methods: A retrospective review of 47 (35 men, 12 women; age range, 7-81 years; mean age, 46 years) patients with a clinical diagnosis of tennis leg at our hospital during a 58-month period (May, 2014, through March, 2019) was conducted. All the patients underwent MRI examinations, and an additional US examination was performed simultaneously on 5 patients. Follow-up MRI examinations were was performed on 4 patients, with one patient also undergoing an additional US examination. Images findings were analyzed with respect to, including integrity of the myotendinous junction and tendon of the gastrocnemius and soleus, the and presence of a fluid collection were analyzed.
Results: MRI findings in the 47 patients included revealed fluid collection between the medial head of the gastrocnemius and the soleus was identified in 34 cases (69.4%). In 19 cases (38.8%), the collected fluid spread to around the medial border of fascia cruris. The dRupture of the gastrocnemius was identified in 44 Forty-four cases (89.8%) had rupture of the gastrocnemius, among which with most cases (n=44) showing rupture of the medial head of the gastrocnemius at the myotendinous junction was noted in 44 cases, the lateral head of the gastrocnemius at the myotendinous junction was seen in 15 cases, the medial head of the gastrocnemius tendon was observed in 30 cases, the medial and the lateral head of the gastrocnemius tendon was identified in 3 cases,the lateral head of the gastrocnemius tendon was noted in 2 cases. A total of 18Eighteen (36.7%) cases suffered from the had rupture of the soleus, among which with most cases (n=15 cases) showing had rupture of the soleus at the myotendinous junction, 2 cases had rupture of soleus muscle belly, and 6 cases had rupture of the soleus tendon. The mRupture of the pPlantaris tendon rupture was observed in 5 cases (10.2%). On the contraryA thick area of reparative tissue at the distal myotendinous junction of the medial head of the gastrocnemius was observed in all 4 MRI follow-up patients and 1 US patient followed up.
Conclusion: This study has demonstrated that Abnormalities of the medial head of the gastrocnemius at the myotendinous junction and tendon appear to be more common than those of the plantaris tendon. Compared to with US examination, MRI is more sensitive in diagnosis of tennis leg.

PU-2962
大鼠脊髓损伤超急性期的磁共振及弥散张量成像的实验研究

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摘要目的 本研究旨在探讨磁共振弥散张量成像在脊髓损伤超急性期的应用价值。方法 选取实验组 12 只健康 wistar 大鼠通过撞击法制造脊髓损伤模型，6 只正常大鼠作为对照组。常规 MRI 选取了矢状位 T1 加权成像（T1WI）、矢状位和轴位 T2 加权成像（T2WI）以及轴位磁敏感成像（SWI）序列。损伤组在造模后 4h、8h、12h、24h 行常规 MRI 及弥散张量成像（DTI） 检查，对于 DTI 图像进行后处理得到纤维示踪图像（DTT）并测量各向异性分数 FA 和表观弥散系数 ADC 值。结果 在对照组中，常规 MRI 脊髓信号均匀，结构完整。损伤组损伤部位在 T1WI 上呈低信号，在 T2WI 上呈高信号。SWI 图像可见明显的低信号团状出血灶。在 DTI 图像中测得 FA 值和 ADC 值较正常组减低，且随时间 FA 值呈持续下降趋势，ADC 值在 8h 后下降放缓。DTT 图像上可以直观地观察到白质纤维变形、分离。结论 常规磁共振和 DTI 可以全面充分地定量评价脊髓损伤。

PU-2963

利用 CT 评价髌骨脱位三联术后疗效

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目的：利用 CT 观察髌骨脱位三联术手术前后的影像学改变,探讨在评价手术疗效中的作用。
方法：选取 2010 年 1 月至 2014 年 3 月上海市第六人民医院复发性髌骨脱位患者 60 例（61 膝），平均年龄为 22.2 岁，均行髌骨脱位三联术，即外侧韧带松解术、内侧髌股韧带重建术和胫骨结节移位术。测量比较手术前后膝关节 CT 中的髌骨倾斜角、胫骨结节-股骨滑车沟距离、股骨滑车沟适合角、股骨滑车沟角度以及发育不良分级、股骨滑车外侧面倾斜度、髌骨外侧移位值、Insall-Salvati 值和 Caton-Deschamps 值。同时计算手术前后各值阳性率的变化情况。
结果:术后髌骨倾斜角平均值从术前 27.3±2.3° 减小至 8±2.1° ，股骨滑车沟适合角平均值从术前 32.9±5.2° 减小至-5.5±8.4° ，外侧髌骨移位平均值从术前 9.8±1.3mm 减小至-1.1±1.6mm，TT-TG 从术前 19.1±1.5mm 减小至 14.9±1.7mm，INSALL-SALVATI 平均值从术前 1.21±0.05 减小至 1.1±0.05，C-D 平均值从术前 1.3±0.06 减小至 1.11±0.05，以上测量值手术前后均有统计学差异。股骨滑车凹角度以及发育不良分级和股骨滑车外侧面倾斜度手术前后无明显统计学差异，但所有患者均有股骨滑车发育不良，其中 A 级 8 膝，B-D 级 53 膝。
结论：髌骨脱位三联术后 CT 显示尽管股骨发育不良情况并未改善，但手术纠正了髌骨脱位及其部分危险因素，恢复了髌骨的正常解剖和功能位置。同时 CT 能发现部分患者仍然存在髌骨脱位及髌骨不稳的因素，为术后随访提供依据。

PU-2964

3.0T MRI 单髋扫描对圆韧带损伤的诊断价值

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目的 探讨 3.0T MRI 单侧髋关节扫描对圆韧带损伤的诊断价值。**方法** 两名医师回顾性分析 41 例慢性髋关节疼痛患者的髋关节镜及术前髋关节 MRI 资料。定义两种 MRI 扫描方式：双侧髋关节扫描及单侧髋关节扫描。应用统计软件首先分别比较两名医师评价圆韧带损伤的一致性，然后分别比较两种扫描方式与髋关节镜检查圆韧带损伤能力的差异，最后比较并分析两种扫描方式的诊断效能。**结果** 41 个髋关节中，34 例圆韧带损伤，7 例正常。两名医师利用两种髋关节扫描方式评价圆韧

带损伤分别有（*K*=0.76、0.61，*P*<0.01），MRI 资料显示甲医师于两种扫描方式对圆韧带损伤的敏感度、特异度、阳性预测值、阴性预测值、准确率分别为 58.82%（20/34）和 88.24%（30/34）、57.14%（4/7）和 85.71%（6/7）、86.96%（20/23）和 96.77%（30/31）、22.22%（4/18）和 60.0%（6/10）、58.54%（24/41）和 87.80%（36/41）；乙医师于两种扫描方式对圆韧带损伤的敏感度、特异度、阳性预测值、阴性预测值、准确率分别为 52.94%（18/34）和 85.29%（29/34）、71.43%（5/7）和 71.43%（5/7）、90.0%（18/20）和 93.55%（29/31）、23.81%（5/21）和 50.0%（5/10）、56.1%（23/41）和 82.93%（34/41）。单髋扫描的受试者工作曲线下面积大于双髋扫描，且差异具有统计学意义（*P*=0.02）。**结论** 两名医师利用两种扫描方式评价圆韧带损伤的一致性一般，且认为 3.0T MRI 单侧髋关节扫描是诊断圆韧带损伤较好的影像学检查方法。

PU-2965

尺腕撞击综合征的影像表现体会

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目的：通过尺腕撞击综合征的影像表现分析，提高基层影像科人员对该病的认识；**方法**：应用 X 线、CT 和 MR 对临床疑及尺腕撞击综合征患者进行必要的影像检查，**结果**：5 例均有不同程度腕部疼痛及软组织肿胀，2 例有腕部外伤病史；其中 1 例为月骨、尺骨远端关节面病变；1 例表现为三角骨、豌豆骨的低密度病变。**结论**：临床医生、影像科医生尺腕撞击综合征重视，结合病史资料和影像学表现，可以做出有效正确的诊断，明显减少误诊、漏诊发生。

PU-2966

成人髋关节发育不良患者股骨前倾角的 CT 影像学研究

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目的 通过 CT 测量股骨前倾角对 DDH 病例组和正常对照组进行对比分析，探讨股骨前倾角在成人 DDH 患者中的临床意义。
资料与方法 收集我院 2018 年 6 月至 2019 年 5 月的成人 DDH 患者共 98 例，其中男性 62 例，女性 36 例，测量其股骨前倾角，并与正常成人对照组比较分析。
结果 DDH 组和对照组存在显著性统计学差异，DDH 组股骨前倾角的平均值明显大于正常对照组（P＜0.01）。股骨前倾角较大的 DDH 患者继发骨关节炎的 CT 表现越明显。
结论 CT 扫描对 DDH 患者术前测量股骨前倾角有一定的临床价值。研究认为股骨前倾角过大的患者有必要进行矫正，有利于缓解骨关节炎的进展。

PU-2967

CT 与 MRI 在评估不同时期骨质疏松性椎体骨折压缩程度的对照研究

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[摘要] 目的：观察与研究比较 CT 和 MRI 在骨质疏松性椎体骨折中的检查效果及对椎体压缩情况的应用效果。方法：选取 2017 年 6 月~2019 年 5 月期间的 90 例骨质疏松性椎体骨折患者为研究对象，将其分别以 MRI 及 CT 进行检查。比较 MRI 及 CT 检查对不同时期骨质疏松性椎体骨折的检查结果，同时比较对不同压缩程度椎体的检查结果。并比较两类检查方法的特异度、灵敏度、阳性预测值、阴性预测值。结果：MRI 检查对不同时期（急性期、亚急性期及陈旧期）骨质疏松性椎体骨折的检查准确率分别为 100.00%、97.78%及 95.56%，对不同压缩程度（轻度、中度及重度）椎体的检查准确率分别为 97.78%、100.00%及 100.00%，上述均高于 CT 检查；且特异度、灵敏度、阳性预测值及阴性预测值分别为 97.67、97.67、100.00、66.67，均高于 CT 检查的，差异有统计学意义（P＜0.05）。结论：MRI 在骨质疏松性椎体骨折中的检查效果较好，且对椎体压缩情况具有较高的检测价值，因此在骨质疏松性椎体骨折中的诊断价值较高。

PU-2968

高频超声与 CT 三维成像在急诊肋软骨骨折的对比研究

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目的:对比多层螺旋 CT 三维成像、高频超声在肋软骨骨折诊断的优势，为临床提供有效的影像检查方法。方法：回顾性分析我院 2016 年 1 月-2018 年 12 月以明确胸部外伤史于急诊就诊的患者，均行超声及胸部肋骨三维成像检查，对比高频超声及多层螺旋 CT 三维成像在肋软骨骨折检出率、不同损伤肋软骨骨折及不同错位幅度肋软骨骨折检出率，分析二者优缺点，总结高频超声及 CT 在急诊肋软骨骨折诊断的优势和诊断价值。结果：二者在肋软骨骨折检出率及不同伤机制下肋软骨骨折及检出率差异无统计学意义（P>0.5）,在断端错位小于 1.0mm 时，高频超声检出率优于 CT 检查，差异有统计学意义（P<0.5）,断端错位大于 2.0mm，二者比价差异无统计学意义（P>0.5）；总体观察 CT 较超声好，可同时观察肺部情况。结论：高频超声适用于各种受力及骨折错位幅度小的肋软骨骨折中，价格便宜，值得临床广泛应用；但整体观察较 CT 差。

PU-2969

马拉松运动对髋关节影响

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目的：马拉松被认为是人类大的耐力运动项目之一。迄今为止，关于与马拉松运动相关的 MRI 研究大多是膝关节、踝关节关节软骨及运动损伤方面，马拉松运动对髋关节影响研究较少，本研究通过 MRI 评价马拉松运动员髋部骨肌改变，旨在为马拉松者科学运动提供依据。
方法：对 22~53 岁马拉松运动员，31 名（62 个髋关节）进行髋关节 MRI 平扫；同时选取不经常参加运动的 29 名健康志愿者（58 个髋关节）作为对照组。

髋关节积液量分级：1 级.单侧股骨头或股骨颈周围无积液或微量液体；2 级.股骨颈周围积液较多，包绕股骨颈，但不扩张隐窝；3 级.关节囊渗出更多，包绕股骨颈，隐窝扩张。
髋关节滑囊炎性渗出分级：0 级.滑膜腔厚度为 0mm-2mm;1 级.滑膜腔厚度为 2mm-4mm;2 级.滑膜腔厚度大于 4mm。

髋关节肌腱损伤标准：1 级.T2 加权成像存在增厚或信号增高。2 级.无完整肌腱纤维的局灶性不显示且高信号提示部分撕裂。3 级.肌腱不连续提示完全的撕裂，且该部分该由液体和/或肉芽组织填充，液流体信号。
运动常造成肌肉损伤，包括挫伤、撕裂伤，挫伤可在肌肉深处引起出血，导致血肿。
对髋关节骨髓转化采用分级和分型二种方式进行评价。
结果：对髋关节积液、滑囊、盂唇、关节骨软骨、肌肉、肌腱、骨髓转化等进行评价，马拉松运动员与正常对照组以上骨及软组织间均存在均有不同程度的差异。马拉松运动员关节积液 2 级较多；滑囊可有少量积液；肌肉、肌腱可见 PD 抑脂高信号影；盂唇损伤可见；髋关节各部位骨髓信号在 T1W 均较常人低，以红骨髓信号为主。
结论：马拉松运动员对髋关节积液、滑囊、肌肉、肌腱均有一定影响，要与相应的病理性改变鉴别；马拉松运动员髋关节骨质存在骨髓逆转化改变。

PU-2970
64 排螺旋 CT 扫描技术在肋骨骨折临床中的应用

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目的：分析在临床上对肋骨骨折进行诊断的过程中，应用 64 排螺旋 CT 扫描技术的意义与价值。
方法 ：本研究在 2018 年 1 月～2018 年 12 月期间收治肋骨骨折患者中选取 122 例作为研究对象，采用 64 排螺旋 CT 扫描技术对其进行诊断，同时使用 SSD、MIP、MPR、VR 以及 CPR 等方法对扫描结果进行处理，将其与 CT 扫描前拍摄的 DR 片结果进行相应的分析与比较。
结果：通过对比发现，DR 片中显示的肋骨骨折数量为 174 处，64 排螺旋 CT 扫描技术中显示的肋骨骨折数量为 209 处，由此可以证明，64 排螺旋 CT 对于患者骨折情况的描述更为清晰。
结论 ：在临床上，64 排螺旋 CT 扫描技术对于患者骨折情况的检出效果更为准确，对于患者的治疗具有积极的意义。

PU-2971
CT 肩关节造影与 MR 肩关节造影对于肩关节外伤的诊断价值对比研究

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目的：探讨 CTA 与 MRA 对肩关节外伤病变的诊断价值。
方法:收集 2017 年 10 月至 2019 年 4 月间因外伤在我院就诊并行 CTA 与 MRA 检查的患者 18 例，分别观察这两种检查对于关节囊及韧带损伤、盂唇损伤、骨与软骨损伤的检出情况，并与关节镜检查结果对照。
结果:18 例患者共 18 个患肩。关节囊及韧带损伤 14 个（CTA 检出 11 个，MRA 检出 12 个）；盂唇损伤 12 个（CTA 检出 8 个，MRA 检出 11 个）；骨与软骨损伤 13 个，其中骨折 5 个（CTA 检出 5 个，MRA 检出 2 个），骨挫伤 4 个（CTA 检出 0 个，MRA 检出 4 个），软骨损伤 3 个（CTA 检出 0 个，MRA 检出 3 个）。
结论:对于关节囊及韧带损伤，CTA 与 MRA 检出率相似；对于盂唇损伤，MRA 的检出率优于 CTA；CTA 更利于发现微小的骨折，而 MRA 对于观察骨挫伤及软骨损伤更有优势。

PU-2972

股前外侧穿支皮瓣 CTA 和 CE-MRA 临床应用评价

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目的：应用 CTA 和 CE-MRA 设计股前外侧穿支皮瓣的准确性和可行性。**方法：**28 例股前外侧穿支皮瓣供体者纳入研究，12 例进行双下肢 CTA、16 例进行 3D CE-MRA 检查。根据旋股外侧动脉分支类型、穿支血管直径并结合血管分布和覆盖范围进行术前皮瓣设计，与术中穿支血管观察和术后皮瓣存活进行对照，采用配对 t 检验统计分析。**结果：**26 例移植皮瓣存活良好，1 例左前臂皮瓣造成术后左手腕掌侧原有皮肤局部坏死，1 例皮瓣区动脉栓塞后再灌注损伤。术中观察旋股外侧动脉分支类型、穿支血管及其分布与覆盖范围与影像学测量无显著性差异（$P>0.05$）。**结论：**CTA 和 CE-MRA 可准确、直观地显示供体股前外侧皮瓣设计的各要素，是术前皮瓣设计的有效技术方法。

PU-2973

Three-Dimensional Fast Spin-Echo Imaging without Fat Suppression of the Knee: Diagnostic Accuracy Comparison to Fat-Suppressed Imaging on 3.0T MRI

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Purpose: To evaluate the diagnostic performance of three-dimensional fast spin-echo (3D FSE-Cube) without fat suppression (NFS) for detecting knee lesions, using comparison to 3D FSE-Cube with fat suppression (FS).
Materials and Methods: Twenty patients who underwent knee magnetic resonance imaging (MRI) scans,using a 3.0T scanner(Signa HDxt, GE Healthcare, Milwaukee, WI) with a receive-only dedicated knee coil,and 16 subsequent arthroscopic surgeries were retrospectively reviewed,informed consent was obtained from all patients. Each stuy consisted of 3D Cube images with fat suppression and without fat suppression. Coronal 3D Cube images with fat suppression parameters:TR=2000ms, TE=35.8,Matrix=288×288, FOV=18×18cm^2, Slice thickness=1.0mm, gap=0.5mm, NEX=0.5, acquisition time=253s. Fat suppression was achieved with chemical shift selective (CHESS) fat saturation. Delineation of anatomic structures of the knee, meniscus, ligaments, cartilage, joint fluid, all structure were qualitatively evaluated using the 5-point scoring system. Diagnostic performances of 3D FSE-Cube-NFS and FS imaging about lesions the anterior cruciate and posterior cruciate ligaments, tears of the medial and lateral menisci, subchondral bone marrow edema (BME), and cartilage were compared. Using arthroscopic results and two-dimensional images as reference standards, statistical analysis was performed to calculate the sensitivity, specificity, and accuracy of the two methods.

Results: The 3D FSE-Cube NFS demonstrated higher scores than FS in anatomic structure of the medial collateral ligament(P=0.014), the lateral collateral ligament(P=0.019), cartilage(P=0.043), medial and lateral menisci (p=0.015).However,there were no statistical significance between 2D and 3D MRI in disc and overall quality. Mean specificity and accuracy for medial meniscal tears were significantly higher with 3D FSE-Cube NFS (specificity, 97.0%; accuracy, 93.6%) than FS (specificity, 76.1%; accuracy, 86.6%), and the difference was statistically significant (specificity, p=0.003; accuracy, p=0.004). Mean specificity for BME and cartilaginous defects was significantly higher with 3D FSE-Cube FS than with NFS p=0.036). There were no other significant differences between the two methods. **Conclusion:** 3D Cube-NFS imaging has higher specificity than FS for evaluation of medial and lateral collateral ligament, medial meniscal tears and cartilaginous defects. 3D Cube-NFS imaging showed lower diagnostic performance for detecting BME and lesions of cartilage compared to FS imaging.

PU-2974

急性距腓前韧带损伤：改良斜轴位 MRI 扫描的优势

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【摘要】 目的 探讨 MRI 改良斜轴位扫描在诊断距腓前韧带损伤中的应用价值。方法 收集 2017 年 3 月—2018 年 12 月门诊踝关节损伤患者 180 例，采用斜轴位 MRI 扫描随机分为 3 组：踝关节中立体位（ A 组）、内旋 10°～15°（ B 组）、内旋 20°～25°（ C 组）。使用以上参数获取斜轴位 T2 加权快速自旋回波图像，扫描线平行距腓前韧带（ 与踝关节轴面成 20°）。对各组病例的图像显示效果等级作出评定。结果 距腓前韧带全长的显示以踝关节内旋 10°～15° 效果最佳，其次是内旋 20°～25° 和中立体位，两者显示效果相当；踝关节内旋 10°～15° 在显示 0～3 级损伤的分级诊断中也与其他两组相比有统计学差异（ P＜0. 05）。结论 MRI 评价距腓前韧带时，选择适当的扫描角度及体位可以达到最佳的显示效果。

PU-2975

The value of MRI in the evaluation of medial patellar patellofemoral ligament reconstruction of recurrent patellar dislocation

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Objective This study aimed to explore the value of MRI in the evaluation of medial patellar patellofemoral ligament (MPFL) reconstruction in patients with recurrent patellar dislocation. **Methods** Follow-up 14 patients which diagnosis with recurrent patella dislocation, all patients underwent MPFL reconstruction and were followed up two years after surgery. MRI and DTI scan of the ipsilateral knee joint were performed in these 14 patients, the same as preoperative examiation. Trochlear

facet asymmetry, lateral trochlear inclination, trochlear depth, patellar tilt angle, lateral patellar displacement, tibial tuberosity-trochlear groove distance (TTTG) and cross-sectional area of the VMO on MRI were measured. FA, ADC, λ1, λ2, and λ3 values on DTI were measured. The paired-samples *t*-test was used to compare these parameters between the preoperative group and postoperative group. **Results** The postoperative patellar tilt angle and lateral patellar displacement were significantly lower after surgery(both $P<0.05$). Compared with the preoperative group, the postoperative group showed significantly lower FA values and significantly higher λ3 values (both $P<0.05$). Trochlear facet asymmetry, lateral trochlear inclination, trochlear depth, TTTG, Cross-sectional VMO area, ADC, λ1 and λ2 values did not differ between the two groups(all $P>0.05$). **Conclusion** The patellar tilt angle and lateral patellar displacement these two MRI bony measurements have clinical significance for evaluation the patellar stability of recurrent patellar dislocation after MPFL reconstruction. DTI imaging carries on the preliminary quantitative assessment for VMO muscle condition after MPFL reconstruction of recurrent patellar dislocation.

PU-2976

长途奔袭训练后髌软骨 T2*弛豫时间变化分析

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目的：探讨长途奔袭训练后髌软骨 T2*弛豫时间变化。**方法：**对 20 名新兵于训练前后分别行右膝关节磁共振检查，数据传输到 SEIMENS3．0T 磁共振工作站，用软件处理后产生伪彩图。髌软骨按照髌骨嵴分为内、外侧髌软骨，然后将内、外侧髌软骨分别按其上下径平均分为上部及下部，分别测量四个区域髌软骨深层、浅层 T2*弛豫时间，比较训练前后对应区域 T2*弛豫时间的变化,训练前后 T2*弛豫时间比较采用配对样本 t 检验，运动前后髌软骨不同区域 T2*弛豫时间变化率采用单因素方差分析。**结果：**与训练前相比，训练后外上、外下、内上髌软骨浅层及外下髌软骨深层 T2*弛豫时间延长有统计学意义（p=0.004，p=0.001，p=0.001，p=0.001），但其相互间 T2*弛豫时间变化率无统计学意义（F=0.823，p=0.485）；内下髌软骨浅层及内上、内下、外上髌软骨深层 T2 弛豫时间均无统计学意义（p=0.015，p,0.021，p=0.026，p=0.356）。**结论：**磁共振 T2-starMapping 成像可以发现新兵长途奔袭后髌软骨生物成分早期变化，或对科学训练、早期临床干预具有一定的参考价值。

PU-2977

MRI 分级在小腿三头肌损伤中的应用价值探讨

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目的 探讨 MRI 肌肉损伤分级系统在小腿三头肌损伤中的应用价值。材料 收集本科室小腿三头肌损伤的 MRI 病例 41 例。方法 分析所收集的病例所累及的肌肉、损伤的部位、肌肉损伤横截面积的百分比、撕裂的程度，然后分别运用慕尼黑共识声明、英国运动医学专家协商会议、意大利运动员下肢肌肉损伤保守治疗指南所提出的三种 MRI 肌肉损伤分级系统做损伤分级，对比其差异性。结果

41 例病例中仅一块肌肉损伤 31 例，同时具有两块肌肉损伤 10 例，三块肌肉损伤 4 例，损伤肌肉一共 55 块。对各损伤肌肉采用慕尼黑分级系统、英国运动分级系统及意大利分级系统判定功能性损伤均为 14 块、；部分撕裂分别为 32 块、33 块、30 块；（次）完全撕裂为 9 块、8 块、11 块。结论 MRI 可以根据肌肉损伤的类型、部位、严重程度、大小和横截面积等，将损伤分成不同的等级，而不同的等级在最佳治疗的条件下所需要的康复时间不同，选择一个合适的分级系统，这对于临床的治疗及患者的预后、康复可以提供一个非常重要的指导方针。

PU-2978

运动型横纹肌溶解症的临床及 MRI 特点分析

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目的 分析运动性横纹肌溶解症（exercise-induce rhabdomyolysis, EIR）的临床表现及 MRI 征象，提高临床对该病的认识，提高早期确诊率。
方法 回顾性分析我院经临床和实验室确诊的 4 例 EIR 的临床表现及 MRI 征象，并结合文献分析总结该病的临床、MRI 特点。
结果 4 例患者均有短时间内过量运动的病史，其中 3 例患者为突然大量剧烈健身运动后起病，1 例为连续数天持续搬重物上下楼后起病，均有肌肉疼痛伴无力、尿色加深等表现，实验室检查肌酸激酶、尿肌红蛋白升高，其中 1 例伴有发热、恶心呕吐，1 例继发肾功能衰竭。其中 3 例病变仅累及双侧大腿，1 例病变累计双侧大、小腿，受累肌肉肿胀，病变呈对称分布，于 T1WI 上信号减低，T2WI 上信号增高，脂肪抑制序列能更好的区分受损肌肉和临近脂肪，病变肌肉可见斑片状或云絮样高信号，边界欠清晰，周围肌间隙均有受累，界限模糊；其中 1 例于 T1WI 上可见到等高信号。
结论 EIR 具有典型的起病原因及临床表现， MRI 能够很好的显示病变肌肉的范围，评估损伤程度及预后，及早行 MRI 检查能够为临床制定治疗方案提供可靠依据。

PU-2979

多层螺旋 CT 平扫及三维重建对桡骨骨折的术前评估及临床治疗应用价值探讨

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【摘要】 目的 旨在探讨多层螺旋 CT 平扫及三维重建对桡骨骨折的术前评估及临床治疗应用价值。**方法**：回顾性分析 2016 年 8 月到 2018 年 6 月于我院就诊治疗的 76 例桡骨骨折患者的临床及随访资料根据资料可知所有患者入院后均行多层螺旋 CT 平扫及三维重建检查，且在完善相关准备后均行桡骨骨折内固定术治疗，分析桡骨骨折在不同影像学检查中的影像学特征表现，并总结不同检查方法对桡骨骨折检出率以及诊断的灵敏度和特异度，研究多层螺旋 CT 平扫和三维重建对桡骨骨折患者术前评估及临床治疗的应用价值。**结果** 多层螺旋 CT 平扫对桡骨骨折检出率、诊断的灵敏度和特异度分别为 84.21%、73.68%和 67.11%，三维重建检查对桡骨骨折检出率、诊断的灵敏度和特异度分别为 97.37%、93.42%和 89.47%，即三维重建检查对桡骨骨折检出率、诊断的灵敏度和特异度均显著高于多层螺旋 CT 平扫，比较差异间均具有统计学意义（P<0.05）；多层螺旋 CT 平扫可示骨折关节面出现压缩性塌陷，且主要表现在舟骨窝和月骨窝中央部分，且关节面骨块带有软骨面，矢状面可见骨折处骨皮质不连续且出现游离骨块影，三维重建检查中可示存在较多骨折块，且在三维重建矢状面表现为桡骨远段骨皮质呈现连续性中断，且远端关节面可被累及，游离骨块影可

被见；骨折断端出现变形，且以成角形式，而腕关节间隙变窄，所有患者根据图像均行切开复位内固定治疗，术后复查 X 线检查显示断端对位对线良好。**结论** 三维重建技术对桡骨骨折的检出率、诊断灵敏度和特异度均显著优于多层螺旋 CT 平扫，且临床可根据图像资料制定相关手术方案，更有利患者恢复。

PU-2980

骶髂关节磁共振扫描用于强直性脊柱炎的诊断效果观察

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目的 探究骶髂关节炎（SIJ）核磁共振（MRI）扫描对强直性脊柱炎（AS）的诊断效果。方法 研究时限为 2017 年 1 月至 2019 年 3 月，随机抽选此期间在我院确诊为 AS 患者 51 例，均有完整的影像学资料。对全体 AS 患者 CT 影像、MRI 影像进行回顾性分析，通过与 CT 影像学结果进行比较，探究 MRI 对 SIJ 诊断效果。结果 与 CT 影像相比，MRI 对患者关节扭曲、信号异常、不规则变粗等解剖学结构及关节病变信息显示更准确；MRI 诊断正确率为 100.0%（51/51），与 CT 诊断正确率 94.12%（48/51）相比，差异无统计学意义（P＞0.05）；MRI 对 SIJ 中Ⅰ、Ⅱ级、总诊断正确率分别为 91.67（11/12）、93.75%（15/16）、96.08%（49/51），均高于 CT 诊断 50.00%（5/12）、62.50%（10/16）、74.51%（38/51）（P＜0.05）；MRI 诊断对于骨髓水肿、骶髂关节退变、关节面下骨质囊变、关节面侵蚀检出率分别为 97.44%（38/39）、94.12%（32/33）、97.56%（40/41）、96.55%（28/29），较 CT 诊断 82.05%（32/39）、76.47%（26/34）、85.37%（35/41）、79.31%（23/29）高（P＜0.05）。结论 在对于 AS 患者的 SIJ 诊断中，MRI 与 CT 诊断正确率相近，但在 SIJ 早期病变分级准确率的诊断中，MRI 较 CT 具有明显优势，以此在临床诊断中，可借用 MRI 对 SIJ 发病早期病情严重程度及病变情况进行判断，以此为临床治疗提供较准确的影像学依据。

PU-2981

SAPHO 综合征的临床表现及影像学特点

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目的 探讨 SAPHO 综合征的临床表现及影像学特点。提高大家对 SAPHO 综合征的认识，减少临床上对 SAPHO 综合征的漏诊、误诊。
方法 回顾性分析了 10 例临床明确诊断为 SAPHO 综合征患者的临床表现及影像学特点。
结果 8 例患者有双手足、颜面部的红皮疹、疱疹及脓疱疮等皮肤改变， 9 例患者有胸骨柄肿痛、6 例患者有腰骶部疼痛、5 例患者有胸腰椎压痛等骨关节症状。其中 5 例患者皮肤改变先于骨关节症状出现，2 例患者骨关节症状表现先于皮肤改变出现。影像学表现： 9 例患者累及前上胸壁,X 线、CT 表现为骨及肋软骨硬化、肥厚,关节破坏、强直， 关节间隙融合、消失,胸骨柄、锁骨近端和第 1 肋软骨受累，其中双侧不对称受累 4 例,双侧对称性受累 4 例,单侧受累 1 例。6 例柄胸联合受累,3 例第 2 肋软骨受累。5 例伴有脊柱病变,X 线、CT 表现为多发椎体终板侵蚀、硬化,椎旁骨化,椎间隙变窄,椎体楔形变;MRI 表现为椎体不均匀长 T1 长 T2 信号。6 例伴骶髂关节受累,X 线和 CT 表现为关节破坏、强直。

结论 SAPHO 综合征在临床上时常可见，临床表现以双手足、颜面部的红皮疹、疱疹及脓疱疮等皮肤改变及胸骨柄肿痛腰骶部疼痛、胸腰椎压痛等骨关节症状为主，影像学表现以前上胸壁受累为特征性表现，其中胸骨柄、锁骨近端和第 1 肋软骨受累最为常见。

PU-2982
数字断层融合检查与 CT 在诊断骶髂关节炎中的图像质量和辐射剂量的比较研究

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目的 评价数字断层融合（DTS）在诊断骶髂关节炎中图像质量与辐射剂量，以此替代螺旋 CT 扫描，作为此类疾病优先筛查的可行性。**方法** 由于骶髂关节炎专科门诊检查常规 DR 和螺旋 CT 扫描，而 DTS 本身优于 DR，故联系门诊专科医师随机开出 18 例患者行螺旋 CT 扫描，另开出 18 例患者行数字断层融合（DTS）作为对照组，最后评价图像质量和记录辐射剂量以比较研究。**结果** 两组患者检查后图像在双盲条件下评价：都能满足诊断要求。两组质量评分：4.17±0.82 和 4.30±0.70，差异无统计学意义（P＞0.05）。而两组患者显示的辐射剂量（mSv）分别为：3.64±0.22 和 15.85±0.73，差异有统计学意义（P＜0.05）。**结论** 骶髂关节炎 DTS 与螺旋 CT 扫描的图像质量基本等同，完全能满足诊断要求，但螺旋 CT 扫描的辐射剂量明显高于 DTS（相差 1/5），因此，在临床疑似骶髂关节炎检查时，应常规首选 DTS 检查较为符合“正当化”。**讨论** 强直性骶髂关节炎的早期诊断和治疗对于防治永久性关节损伤是非常重要的，而影像学上骶髂关节骨侵蚀的程度，决定就有调整和治疗的需要，临床上原先影像学检查多普通数字化摄影（DR），但骶髂关节结构不规则，二维重叠，加上盆腔肠道伪影致使图像灵敏度、特异性及精确度下降，即使行螺旋 CT 扫描，虽然图像质量明显提高，但患者的辐射剂量大幅上升，尤其骶髂关节处于生理敏感部位，更需要加强防护，又由于此疾患为慢性、需要多次影像学复查，所以采用一项既不影响图像质量又不造成过多辐射剂量的检查方法必要的，国际放射防护委员会（ICRP）主张 X 射线诊断应遵循实践正当性、防护最优化原则。有作者认为 DTS 在骨性结构的显示方面与 CT 类似，但患者接受的放射学剂量约为 CT 检查的 1/2 。

PU-2983
炫速双源 CT 双能量成像技术对于痛风性关节炎的诊断价值研究

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【摘要】目的：研究炫速双源 CT 双能量成像技术（DSCT）对于痛风性关节炎的诊断价值。方法：选取 2018 年 1 月到 2019 年 1 月到我院收治关节炎患者 189 例，采用 DSCT 对发病部位扫描并分析获取影像资料，判断患者检测部位有无尿酸盐结晶沉积,把检测结果与临床确诊病例进行对比，分析 DSCT 对于痛风性关节炎诊断准确率。结果：在 189 例关节炎患者中，经炫速双源 CT 扫描检出尿酸盐检测呈阳性 136 例，经过临床确诊为痛风性关节炎有 142 例，诊断准确率为 136/142（95.7 %）。讨论：DECT 对于痛风性关节炎诊断准确率高，可作为筛查诊断痛风性关节炎重要手段。

PU-2984
定量ＣＴ评估老年男性冠脉钙化与骨质疏松症的相关性研究

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目的 ：
定量 CT（QCT）测量老年男性冠脉钙化骨密度，分析骨质疏松症（op）与冠状动脉钙化（coronary artery calcification，CAC）的相关性。
材料方法：
收集 2019 年 3 月至 2019 年 8 月期间在武汉科技大学附属普仁医院老年男性者（年龄≥60 岁），随机选取 62 例，所有受检者均行 QCT 检查，采用西门子 16 排 MSCT 机及 Mind-ways 公 司的 5 样本固体体模，电 压 120KV，电流
125mA， 床高 90cm，FOV400mm 扫描上界为腔静脉切迹上缘，下缘达第 3 腰椎，测量胸 12、腰 1 椎体骨密度值。
根据 CT 扫描胸部过程中，确定冠脉钙化（CAC）患者 42 为组，无冠脉钙化（NCAC）患者 20 例为对照组。.分析 42 例 CAC 组和对照组的各项一般数据及骨密度值进行分析，尝试用骨密度值预测冠脉钙化。
结果：
1、冠脉钙化（CAC）组与无冠脉钙化（NCAC）患者罹患骨质疏松明显增加，比较均有统计学意义(P<0.05)，CAC 组更易罹患骨质疏松症。
2、CAC 患者骨密度值较 NCAC 明显降低，两者比较均有统计学意义(P<0.05)。
结论：
冠脉钙化（CAC）组与无冠脉钙化（NCAC）患者罹患骨质疏松明显增加，两组比较有统计学意义(P<0.05)，CAC 组更易罹患骨质疏松症。

PU-2985
年龄分层在女性腰椎骨密度与肥胖相关研究中的重要意义

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目的　研究不同年龄段女性腰椎骨密度与体重指数（BMI）及腹部脂肪分布测量参数的相关性，探讨年龄分层在女性腰椎骨密度与肥胖相关研究中的重要意义。**方法**　纳入成年女性 314 例，以 10 年为年龄段分为 6 组,测量其身高、体重，并计算 BMI。利用 Midways pro 定量 CT（QCT）分析系统，测量脐水平腹部脂肪面积（FA）、腹内脂肪面积（VFA）、腹壁脂肪面积（SFA）、腰 2-4 椎体的骨密度（BMD），计算腹脂比（VF/SF）及腰椎平均 BMD（vBMD）。采用单因素方差分析不同年龄段各指标是否存在组间差异；采用 Pearson 相关分析不同年龄段女性腰椎骨密度与各指标的相关性。结果　女性腰椎峰值骨密度出现在 26～35 岁组。在 25 岁以下及 26～35 岁组，腰椎 vBMD 与腹部脂肪（r=-0.5，p=0.042；r=-0.35，p=0.014），特别是腹壁脂肪呈显著负相关（r=-0.491，p=0.045；r=-0.299，p=0.033），与年龄和 BMI 不相关；36～45 岁组，腰椎 vBMD 与各项参数均未表现出相关性； 46～55 岁及 56～65 岁组，腰椎 vBMD 与年龄呈显著负相关（r=-0.265，p=0.003；r=-0.253，p=0.003）；56～65 岁及 66 岁～以上组，腰椎 vBMD 与 BMI 呈显著正相关

（r=0.179，p=0.042；r=0.150，p=0.033）。结论 不同年龄段女性腰椎骨密度与体重指数（BMI）及腹部脂肪分布测量参数之间关系复杂，在相关研究中进行合理的年龄分层十分必要。

PU-2986

儿童复发性多灶性骨髓炎影像表现

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目的：熟悉慢性复发性多灶性骨髓炎(CRMO)的临床、影像特点，提高诊断准确率
方法：收集经临床随访诊断为慢性复发性多灶性骨髓炎的患者共 6 例
的临床及影像学资料，分析其 X 线、CT 及 MRI 影像表现，总结
其影像学特点。
结果：4 例均发生于儿童，年龄 6-15 岁，平均为 11.5 岁，男性 2 例，女性 4 例。病史 20 天~6 月，症状为病变部位疼痛、活动障碍，为钝痛、间断疼痛，无明显发热、盗汗、肿块等，2 例为多部位同时发病，2 例为多部位先后发病。病变累及部位包括股骨下段及干骺端、胫骨上端干骺端、骶骨、胸骨。影像表现：X 线平片检查，长骨干骺端病变表现为近干骺端髓腔内骨质密度增高，并多发局灶性破坏，边缘硬化，2 例周围见多层状骨膜增生；骶骨、胸骨密度增高，骨纹理模糊。CT 检查长骨破坏区显示更为清楚，为多发灶状骨缺损，周围骨质硬化，硬化区与正常骨髓没有明确界限；骶骨破坏区呈多发小灶状低密度，邻近骶骨耳状面毛糙，局部软组织略肿；胸骨破坏为高密度内见灶状低密度影，边缘模糊。MRI 扫描病变区主要表现为模糊 T1WI 低信号、T2WI 上为较高信号，压脂为高信号，其中破坏灶为更长 T1、T2 信号影，邻近骺板模糊，周围骨膜水肿，骶骨病变周围软组织水肿较明显。所有病例的影像检查即复查均未发现死骨、钙化。

结论：慢性复发性多灶性骨髓炎主要为慢性多发或先后发病的病灶，影像表现为多灶慢性骨破坏、骨膜炎、骨髓水肿、骨骺炎，常无脓肿、死骨。结合临床病程长，细菌培养阴性、抗生素治疗无效可以诊断。

PU-2987

体素内相位不相干运动在椎体骨质疏松评价中的应用研究

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[摘要] 目的 探讨体素内相位不相干运动成像（IVIM）在椎体骨质疏松评价的应用价值。**材料和方法** 纳入例 42 例骨质疏松患者及 38 例健康志愿者，进行双能 X 线吸收法（DXA）、常规 DWI 成像和 IVIM 成像，测量椎体的骨矿物密度（BMD）、表观扩散系数（ADC）、扩散系数（D）、灌注扩散系数（D*）及灌注分数（f），比较健康志愿者及骨质疏松患者的 ADC 和 IVIM 参数，采用 Spearman 相关性分析 IVIM 参数与骨密度值（T）的相关性。**结果** 健康志愿者的 ADC 值、D 值、D*值和 f 值分别为 $0.50\pm0.08\times10^{-3}$ mm^2/s、$0.45\pm0.09\times10^{-3}$ mm^2/s、$14.42\pm3.01\times10^{-3}$ mm^2/s 和 0.12±0.04%，而骨质疏松患者的 ADC 值、D 值、D*值和 f 值分别为 $0.53\pm0.08\times10^{-3}$ mm^2/s、$0.39\pm0.06\times10^{-3}$ mm^2/s、$11.29\pm3.37\times10^{-3}$ mm^2/s 和 0.13±0.03%。骨质疏松患者的 D、D*值显著低于健康志愿者(P< 0.05)，并和 BMD 值之间存在中度正相关，相关系数分别 0.590 和 0.702，而 ADC 值和 f 值无统计学差异，且和 BMD 无明显相关。**结论** D 和 D*值和 BMD 存在一定相关性，IVIM 成像为临床提供了一种无创评价骨质疏松的方法。

PU-2988
膝关节痛风性关节炎 CT、MRI 及 DECT 对比分析

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目的： 对比分析膝关节痛风性关节炎（GA）CT、MRI 及 DECT 影像表现特点，探讨三种常用检查方法对痛风性关节炎的诊断价值。
方法： 回顾分析 28 例符合美国风湿病学会制定的痛风临床诊断标准的 GA 患者的膝关节 DECT 及 MRI 资料，其中 CT 图像从 DECT 平扫中分割提取。在未知最终诊断结果的情况下，由两位副高级以上职称骨肌影像医师对三种检查方式进行影像判断。
结果： 共 28 位患者，两位医师对 CT、MRI 及 DECT 三种检查方式的诊断符合的病例数是 21 例（75%）、18 例（64%）、27 例（96%）。CT 平扫表现：27 例骨质破坏，表现为圆形或类圆形骨质破坏区，边缘硬化；20 例骨质破坏区见悬垂边，19 例关节积液，20 例可见混杂高密度痛风结节；MRI 表现：27 例骨质破坏及软骨损害，3 例破坏区轻度骨髓水肿，23 例关节腔积液及滑膜增厚；痛风结节在 T1WI 呈不均匀等低信号，T2WI 和 PDWI 压脂呈不均匀中到高信号，和软组织分级清晰. 27 例在 DECT 可发现尿酸盐结晶沉积。
结论：GA 影像诊断 CT、MRI 及 DECT 都具有一定的特征，DECT 对于检测尿酸盐沉积方面较敏感，并且 CT 平扫在骨质破坏形态、痛风结节部位及密度测量等有优势，但 MRI 对于显示 GA 软组织及软骨损害有明显优势，可以做为痛风性关节炎严重程度评估的补充检查。

PU-2989
非增强磁共振对强直性脊柱炎髋关节受累的价值研究

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目的探讨磁共振非增强扫描对强直性脊柱炎髋关节结构受累检出的价值，并总结髋关节受累时的磁共振影像表现。**方法**共纳入研究对象 176 例，共 352 髋，依据临床有无髋部临床症状分为 AS 无髋部症状组和 AS 有髋关节症状组，全部研究对象均行双髋非增强 MRI 检查。由 2 位放射科诊断医师对 MRI 图像进行独立、盲法分析，并对强直性脊柱炎髋关节累及的影像表现进行分析汇总。计算两组间髋关节受累的检出率，P<0.05 差异具有统计学意义。计算评估者之间一致性百分比和 kappa 系数。**结果** 髋关节症状组 95 例（95/176），无髋关节症状组 81 例（81/176），平均年龄分别为(30.9±7.1 岁)，（31.7±8.6）岁，髋关节症状组的平均病程（7.6±6.8 年），无髋关节症状组的平均病程（7.2±6.0 年），两组间无统计学差异（P=0.30）。髋关节症状组 MRI 检出阳性 90 例（90/95，94.7%），无髋关节症状组检出 2 例（2/81，2.5%）；92 例 MRI 阳性病例中：关节积液 66 例（62.9%），附着点炎 21 例（22.8%）；软骨下骨髓水肿 46 例（50%），关节面下骨质侵蚀 26 例（28.3%），关节狭窄 19 例（20.6%），关节面下脂质沉积 7 例（7.6%）。两个评估者间的变异度为 0.81，诊断一致性较好。**结论**非增强磁共振双髋检查能了解强直性脊柱炎髋关节受累情况，用时短、诊断一致性较好，并可减少钆造影剂使用，可作为 AS 患者的常规影像检查及长期随访的手段。

PU-2990

超声多普勒与 MRI 在类风湿性关节炎 早期临床诊断上的对比研究

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[目的] 类风湿性关节炎是一种不可逆转的滑膜关节炎症，早期诊断早期治疗对有效控制病情进展起关键作用。关节超声和 MRI 在评估其进展及临床治疗效果方面发挥了重要作用。本研究旨在比较超声分级评分与 MRI 在早期类风湿性关节炎影像诊断中的作用，帮助临床选择优势影像学检查项目。
[方法] 收集 2011 年 10 月到 2018 年 8 月期间，出现症状一年内在我院确诊为类风湿性关节炎的 53 例患者，所有患者均行 DAS28、RF、CRP、ESR、CCP、双手双腕超声及 MRI 检查。分析 DAS28 评分、实验室参数、磁共振与超声检查结果之间的关系。
[结果] 超声与 MRI 对于滑膜炎、关节囊积液和腱鞘炎的诊断价值无统计学差异（P＞0.05）。超声对骨关节侵蚀性病变的检查率低于 MRI（P＜0.05）。对于滑膜炎的诊断，灰阶超声敏感性优于能量多普勒（P＜0.05）。能量多普勒检出敏感性与 DAS28、ESR、CRP、CCP 数值呈正相关（P＜0.01），与 RF、病程时间无关（P＞0.05）。灰阶超声检出敏感性与 RF、CRP 呈正相关（P＜0.01），与 DAS28、CCP、ECR、病程无关（P＞0.05）。骨质侵蚀程度与病程、CCP、RF 呈正相关（P＜0.01），与 DAS28、ECR、CRP 无关（P＞0.05）。
[结论] 超声与 MRI 对早期类风湿性关节炎患者的滑膜炎、关节积液、腱鞘炎、骨糜烂等改变具有较高的可靠性。不同超声检查与临床及实验室参数相关性不同。超声检查成本低廉，可作为类风湿关节早期筛查首选，而 MRI 评估骨侵蚀更加准确，应作为病情进展评估、治疗效果评估的优选项目。

PU-2991

In vivo quantification of bone mineral density of lumbar vertebrae using fast kVp switching dual-energy CT: correlation with quantitative computed tomography

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Purpose: To evaluate the feasibility and accuracy of phantomless in vivo dual-energy computed tomography (DECT) based bone mineral density (BMD) quantification in comparison with quantitative computed tomography (QCT).
Methods: We retrospectively analyzed 128 consecutive healthy participants (62 males, 66 females, age range 22-90 years) who underwent both DECT and QCT lumbar examinations from July 2018 to February 2019. Demographic characteristics (age, height, weight) were recorded before scanning. All the participants were divided into 6 age subgroups (21-30, 31-40, 41-50, 51-60, 61-70, ≥71 years). The density of calcium(water), hydroxyapatite(water), calcium(fat), hydroxyapatite(fat) ($D_{Ca(Wa)}$, $D_{HAP(Wa)}$, $D_{Ca(Fat)}$, $D_{HAP(Fat)}$)

and BMD were measured respectively on the trabecular bone of L1-L5 by DECT and QCT. Linear regression analysis was performed to assess the relationship between DECT-derived and QCT-derived BMD among different genders, ages, lumbar levels and BMI. Linear regression models were quantitatively evaluated with adjusted *R*-square, normalized mean squared error (NMSE) and relative error (RE). $P < 0.05$ suggested a difference was statistically significant.

Results: There were strong correlations between DECT-derived and QCT-derived BMD among different genders, age subgroups, lumbar levels and BMI (genders: $R = 0.984$-0.994, $R^2 = 0.968$-0.987, NMSE = 1.38%-3.15%, RE = 0.72%-2.18%; age subgroups: $R = 0.954$-0.983, $R^2 = 0.910$-0.966, NMSE = 4.99%-10.57%, RE = 0.11%-3.36%; lumbar levels: $R = 0.978$-0.994, $R^2 = 0.955$-0.987, NMSE = 1.74%-5.48%, RE = 0.76%-3.29%; BMI: $R = 0.992$-0.994, $R^2 = 0.984$-0.987, NMSE = 1.43%-2.01%, RE = 0.16%-1.68%). $D_{Ca(Fat)}$ showed the best predictive capability for QCT-derived BMD ($R = 0.991$, $R^2 = 0.982$, NMSE = 1.83%, RE = 1.38%).

Conclusion: 256-row fast kVp switching DECT allows for accurate phantomless in vivo BMD quantification of lumbar spine, $D_{Ca(fat)}$ has the best predictive capability.

PU-2992

膝关节脂肪垫常见疾病的 MRI 特征及临床诊断

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目的

分析膝关节脂肪垫常见疾病的 MRI 影像表现，以提高对该类疾病的临床诊断。

方法

回顾性分析 2017 年 5 月至 2019 年 5 月山东省医学影像学研究所经病理或临床证实的 100 例（女 45 例、男 55 例；年龄 20~60 岁）膝关节脂肪垫疾病患者，其中脂肪垫损伤 60 例，脂肪垫囊肿 10 例，腱鞘巨细胞瘤 20 例，滑膜骨软骨瘤病 10 例 。100 例患者均行膝关节平扫 MRI 检查，其中 30 例患者另行膝关节增强 MRI 检查。根据病变部位、形状、边缘、大小及与周围组织关系、信号特点、强化特点、水肿程度等方面进行影像学分析。

结果

100 例脂肪垫病变共有 3 种类型。（1）脂肪垫损伤：60 例，其中 30 例髌下脂肪垫损伤，15 例髌上前脂肪垫损伤，15 例交叉韧带旁脂肪垫损伤，MRI 表现为脂肪垫边缘毛糙，内可见条、片状 FS-T2WI 高信号，相应 T2WI 信号减低，其中 13 例髌下脂肪垫损伤表现为脂肪垫边缘不规则、萎缩、形态失常，并可见滑膜囊肿；10 例髌上前脂肪垫损伤表现出占位效应，向后推压髌上囊。（2）脂肪垫囊肿：10 例，其中 8 例为髌下脂肪垫囊肿，2 例为交叉韧带旁脂肪垫囊肿，MRI 表现为脂肪垫形态失常，内可见类圆形囊性病变，FS-T2WI 呈高信号，其中 2 例髌下脂肪垫多发囊变。（3）脂肪垫区肿瘤：30 例，其中 20 例为腱鞘巨细胞瘤，均发生在髌下脂肪垫区，与正常骨骼肌信号相比，所有病灶均在 T1WI 上呈不匀均等、低信号，T2WI 上为等、低混杂信号。20 例行增强扫描的患者中，15 例病变呈明显不均匀强化，5 例病变呈轻度强化。10 例为滑膜骨软骨瘤病，6 例发生在交叉韧带旁脂肪垫区，4 例发生在髌下脂肪垫区，病灶在 T1WI 和 T2WI 均呈高、低混杂信号，增强扫描均呈明显不均匀强化。

结论

膝关节脂肪垫的常见疾病的发病部位和 MRI 表现具有特征性，有助于对该类疾病的诊断和鉴别诊断。

PU-2993

腰椎曲霉菌感染一例报告

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患者，男，60 岁，仓库工人。腰背痛、咯血 2 月余，再发腰痛半月余。否认高血压、糖尿病，吸烟 20 支/天，饮酒 白酒 1 斤/天 30 年。既往无殊。外院曾诊断感染性休克，左侧脓气胸、右肺炎，血培养阴性，行胸腔闭式引流、抗感染对症支持治疗后好转。查体:生命体征平稳，左侧呼吸音低，可闻及湿罗音，脊柱活动受限，双侧肢体肌力Ⅴ级，双下肢无水肿，病理反射未引出。血清 CRP 48.8 mg/L、ESR 72 mm/h、嗜酸细胞绝对数 4.5* 10^9/L，胸部 CT：两肺炎症，左侧少量液气胸。腰椎 MR 增强：T12、L1 锥体及 L5/S1 相邻锥体斑片 T1WI、T2WI 信号减低，临近终板条片信号增高，增强可见明显强化，椎旁软组织增厚伴强化，感染性病变考虑（图 1）。骨髓穿刺活检术：骨髓培养阴性；多次血培养：阴性；椎旁软组织穿刺活检术：涂片阴性、培养阴性；椎旁软组织病理：纤维组织增生，伴浆细胞及嗜酸粒细胞浸润（图 2）；骨髓病理：组织增生活跃。GM 试验：4.98ug/L，烟曲霉 IgG 86。诊断为曲霉菌感染。后给予伏立康唑治疗后，血清 CRP、ESR、嗜酸细胞绝对数、免疫球蛋白 E 及曲霉菌半乳甘露聚糖指标进行性下降，腰背部疼痛好转。

讨论 曲霉菌病属于机会性感染，多见于支气管和肺部，发生在腰椎者少见。椎体及椎管内曲霉菌病多经血行扩散而定植到椎体及椎间盘组织。T2W 序列真菌性脊柱炎骨髓内低信号，提示惰性感染所致的纤维化可以和明显更具攻击性化脓性脊柱炎进行鉴别[1]。确诊还需靠病理及培养。

PU-2994

18F-FDG PET/CT 在 POEMS 综合征中的应用价值

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目的：总结 POEMS 综合征患者的临床特点及影像学表现，探讨 ^{18}F-FDG PET/CT 在该病中的应用价值。

方法：回顾性分析 2014 年 9 月至 2018 年 9 月在我院行 PET/CT 检查的 10 例经临床或病理证实的 POEMS 综合征患者的临床资料、实验室及影像学资料。

结果：10 例患者中男 6 例，女 4 例，年龄 52.9±9.8 岁，主要临床表现为不同程度的四肢麻木，轻中度的肝脾、淋巴结肿大，皮肤色素沉着等。实验室检查：10 例均存在 M 蛋白血症，9 例血清 VEGF 水平异常升高，4 例甲状腺功能异常及 2 例 ACTH 异常升高。18F-FDG PET/CT 影像学表现：10 例患者均存在不同程度的骨病变，9 例多发，1 例单发，病灶共计 198 个，主要分布于脊椎、骨盆，肋骨等。所有骨病变中以硬化性最常见（157/198，79.3%），混合性次之（38/198，19.2%），溶骨性最少（3/198，1.5%）。FDG 阳性病灶约 22.7%（45/198），SUVmax 为 4.6±3.2，其中溶骨性骨病变 SUVmax 为 10.8±10.0，混合性病变 SUVmax 为 4.3±2.0，硬化性 SUVmax 为 3.5±0.3。FDG 阳性病灶以 10mm 以上多见，FDG 阴性病灶以 5-10mm 多见。7 例出现淋巴结病变者均伴 FDG 异常摄取，SUVmax 为 3.7±2.0。肝脏肿大者 2 例、脾脏肿大者 6 例。6 例出现浆膜腔积液，其中 4 例多发，2 例单发，均未见 FDG 异常摄取。

结论：^{18}F-FDG PET/CT 可系统性的评估 POEMS 综合征的骨病变、淋巴结病变、肝脾肿大、多浆膜腔积液等特点，对该病的早期诊断、活检定位及疗效评价方面具有重要临床价值。

PU-2995

骨化性肌炎的 CT 和 MRI 诊断

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目的 分析骨化性肌炎的 CT 和 MRI 表现，以提高对骨化性肌炎的认识。
方法 回顾性分析 11 例经手术病理证实的骨化性肌炎的 CT 和 MRI 的表现，并结合文献总结其影像学表现。
结果 大腿及肘关节各 6 例，踝关节 1 例，早中期病灶 MRI 上信号较混杂，早期临近软组织水肿明显，较明显不均匀强化，CT 上边缘可见钙化；晚期病例以钙化为主，MRI 上呈低信号。
结论 骨化性肌炎多有外伤史，其 CT 和 MRI 表现有一定特征性，根据病程分析更能避免穿刺活检或不必要的手术治疗。

PU-2996

能谱 CT 对早期痛风降尿酸治疗的定量评价

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目的 探讨能谱 CT 物质分离技术在早期痛风患者降尿酸治疗定量评估中的价值。**方法** 回顾性分析临床确诊的 32 例早期足部痛风患者降尿酸治疗前、后的能谱 CT 图像，采用物质分离技术获取尿酸（钙）基物质图，两名医师分别测量治疗前、后第一跖趾关节周围的尿酸盐沉积浓度。对患者治疗前、后的血尿酸浓度与尿酸盐沉积浓度分别进行配对 t 检验，采用 Pearson 相关分析评价治疗后血尿酸浓度下降值与尿酸盐沉积浓度下降值的相关性。**结果** 治疗前能谱 CT 所测尿酸盐沉积浓度为（1178.69±11.79）mg/L，血尿酸浓度为（421.59±115.23）umol/L。治疗后能谱 CT 尿酸盐沉积浓度为（1162.65±9.68）mg/L；血尿酸浓度为（309.41±87.59）umol/L。治疗后血尿酸浓度与能谱 CT 所测第一跖趾关节周围尿酸盐浓度明显低于治疗前（$P<0.05$）；治疗前、后血尿酸浓度差与能谱 CT 尿酸盐浓度差呈弱相关（$P<0.05$）。**结论** 能谱 CT 成像能够通过基物质分离技术定量测定第一跖趾关节周围尿酸盐沉积浓度在治疗后的改变，从而对早期痛风降尿酸治疗的疗效进行定量评价，为临床的治疗与监测提供依据。

PU-2997

DR 在负重立位全下肢 X 线摄影中的优势

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目的：探讨 DR 在负重立位全下肢 X 线摄影中的优势。**方法：**随机选取 CR 和 DR 负重立位全下肢摄影各 43 例，对比分析图像质量、成像方式等。**结果：**86 例患者中，得到 CR 摄影和 DR 摄影拼接图像各 43 幅。CR 摄影中，两评分者均评为 3 分的有 15 幅，约占 34.88%；评为“2 分-3 分”或均评

为 2 分的有 22 幅，约占 51.16%；评为“1 分-2 分”或均评为 1 分的有 6 幅，约占 13.95%。DR 摄影中，两评分者均评为 3 分的有 31 幅，约占 72.09%；评为“2 分-3 分”或均评为 2 分的有 9 幅，约占 20.93%；评为“1 分-2 分”或均评为 1 分的有 2 幅约占 4.65%。CR 和 DR 图像质量评分的对比分析应用 Wilcoxon 秩和检验（所有 P<0.001），DR 摄影所得图像的质量比 CR 摄影高。**结论：**DR 负重立位全下肢摄影操作简单，成像速度快，自动无缝拼接，得到的图像清晰、细腻，对下肢关节疾病的临床诊断、治疗及关节置换方案的制定具有重要意义，与 CR 负重立位全下肢摄影相比具有明显优势。

PU-2998

腰椎间盘退变软骨终板下骨 MRI 纹理分析研究

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目的 探讨腰椎软骨终板下骨（VSB）MRI 纹理分析参数评价腰椎间盘早期退变的可行性。
方法 选择 80 名受检者行 T_1WI、T_2WI 与 T_2* mapping 成像，并对腰椎间盘进行 Pfirrmann 分级。其中 Pfirrmann Ⅰ级、Ⅱ级、Ⅲ级分别归为Ⅰ级、Ⅱ级、Ⅲ级三组。对各组腰椎头、尾侧软骨终板下骨行 T_1WI 纹理分析，并提取纹理特征参数（平均值、方差、偏度、相关性、熵）；测量各组腰椎头、尾侧 CEP 的 T_2*值。采用单因素方差分析或 Kruskal-Wallis 秩和检验对各参数值（平均值、方差、偏度、相关性、熵、T_2*）进行分析；Mann-Whitney 检验检测男女间各参数值性别差异；Dunnett's T3 检验比较不同组别间各测量值差异；ROC 分析比较Ⅰ级与Ⅱ级各测量值诊断效能。
结果 头、尾侧 VSB 各组 T_1WI 纹理特征参数（平均值、方差、熵）值及 CEP 的 T_2*值均有明显统计学意义。头、尾侧 VSB 纹理参数及 CEP 定量参数（T_2*）值在男、女组间无明显统计学差异。腰椎头侧 Pfirrmann Ⅰ级与Ⅱ级、Ⅱ级与Ⅲ级间 VSB 的方差值差异无明显统计学意义（$P > 0.05$）；Ⅰ级与Ⅱ级间 CEP 的 T_2*值差异均无明显统计学意义，余头侧各组间参数比较均有明显统计学意义。腰椎尾侧 Pfirrmann Ⅰ级与Ⅱ级、Ⅱ级与Ⅲ级间 VSB 的方差值差异无明显统计学意义；Ⅰ级与Ⅱ级间 CEP 的 T_2*值差异均无明显统计学意义，余尾侧各组间参数比较均有明显统计学意义。头侧与尾侧间各参数值差异均无明显统计学差异。对于鉴别Ⅰ级与Ⅱ级退变，头、尾侧 VSB 的纹理参数-平均值的 AUC 值、敏感度及特异度均大于其它纹理参数（方差、偏度、相关性、熵）及 CEP 定量参数（T_2*）。
结论 MRI 纹理分析评价椎间盘早期退变软骨终板下骨改变是可行的。

PU-2999

膝关节半月板边缘性移位的 MRI 研究及其临床价值

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目的：采用 MRI 观察膝关节半月板边缘性移位的影像学特点，并探究其临床价值。**方法：**收集本院 2017 年 1 月-2019 年 3 月因膝关节症状进行 MRI 检查符合骨性关节炎诊断 100 例患者（共 230 个膝关节）作为观察组，20 例正常膝关节（共 40 个膝关节）作为对照组，共 270 个膝关节，分析其半月板边缘性移位的发生情况，结合年龄等情况进行分组，以移位指数为指标进行量化分析。**结果：**膝关节半月板发生边缘性移位共 32 例，其中外侧半月板发生边缘性移位 12 例，内侧半月板发生边缘性移位 20 例，总发生率为 11.9%。半月板边缘性移位外内侧发生率之比为 1：1.67。观察组与

对照组半月板边缘性移位发生率及移位指数差异具有统计学意义(P<0.05)。所有病例移位指数平均值为 0.3421±0.2415。观察组各年龄组间半月板边缘性移位发生率及移位指数差异具有统计学意义(P<0.05）。**结论**：膝关节半月板边缘性移位与年龄、骨性关节炎具有明显的相关性，并具有重要的临床意义。

PU-3000
高分辨 3D-NerveView 序列结合压缩感知技术在磁共振腰骶丛神经根成像的临床应用研究

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目的 探讨高分辨三维 Nerve View 序列结合压缩感知技术在 3.0T 磁共振腰骶丛神经成像临床应用的可行性。 **方法** 对 20 例志愿者及 48 例怀疑腰骶丛神经根病变患者行 3.0T 常规扫描及 3d CS-Nerve View 神经成像序列扫描。由 2 名神经放射专家采用 5 分法对所获得的图像进行评估，比较常规 T2 STIR 图像与 3d CS-Nerve View 图像对腰骶丛神经及病变的显示差异。**结果** 20 例健康志愿者均完整显示腰骶丛及各分支全程且双侧对称无病变，48 例患者中 12 例肿瘤占位性病变，20 例椎间盘膨出或脱出压迫神经根，10 例外伤引起的神经根压迫或损伤，6 例遗传性周围神经病。3d CS-Nerve View 图像与常规 2D T2 STIR 图像比较，其对腰骶丛神经各解剖解剖分段显示评分及综合评分均有显著性统计学差异（P＜0.001），且前者明显大于后者。志愿者组 3d CS-Nerve View 图像可接受率（100%）明显高于常规 T2 STIR（16.7%），患者组中前者的图像可接受率（96%）也明显高于后者（10.4%）**结论** 相比常规扫描，3.0T 磁共振高分辨 3d CS-Nerve View 能更好的显示臂丛神经及病变，且可缩短扫描时间，提高成像效率。

PU-3001
多回波 Dixon 序列定量评估慢性腰背痛患者椎旁肌脂肪含量：与最大背伸展力的相关性研究

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目的：运用多回波 Dixon 序列定量评估慢性腰背痛(Low back pain, LBP)患者 4-5 椎间盘椎旁多裂肌，竖脊肌和竖脊肌群(多裂肌加竖脊肌)脂肪含量(Fat%)与最大背伸展力相关性，并与正常志愿者比较对应部位 Fat%的差异性。
方法：20 名 LBP 侧突畸形患者(4 男，16 女，平均年龄 62.40±7.63 岁)，20 名正常志愿者(4 男，16 女，平均年龄 60.85±6.75 岁)行腰椎磁共振检查，4-5 椎间盘行多回波 Dixon 序列扫描。测量 40 名纳入者左右椎旁多裂肌，竖脊肌和竖脊肌群 Fat%，比较 LBP 组和正常志愿者组的差异性，计算 LBP 组椎旁肌 Fat%与最大背伸展力的相关性。校正卡方检验分析两组间男女分布差异性，Wilcoxon 秩和检验分析两组年龄、体重指数和椎旁肌 Fat%的差异性，Spearman 相关分析 Fat%与最大背伸展力的相关性。
结果：两组纳入人群性别分布，年龄和体重指数无显著性差异(P=1, P=0.364, P=0.433)，两组间多裂肌和竖脊肌 Fat%无显著性差异(P=0.108, P=0.100)，两组间竖脊肌群 Fat%有显著性差异(P=0.044)。多裂肌，竖脊肌和竖脊肌群分别与最大背伸展力呈中等负相关，无相关性和弱负相关性。(R=-0.325, R=-0.095, R=-0.226)。

结论：多回波 Dixon 序列可定量鉴别诊断 LBP 侧突畸形患者，竖脊肌群 Fat%为最佳定量鉴别探针，高于正常人 Fat%。多裂肌和竖脊肌群与最大背伸展力呈负相关，能更好反应患者背部最大伸展力变化情况。

PU-3002

动态 DR 在隐匿性肋骨骨折诊断中的优势

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检查目的：

肋骨生理解剖结构复杂，骨体呈弓形弯曲，自后侧脊柱向前下斜行，从影像学角度将胸部肋骨分为膈上部分和膈下部分。膈上肋骨与纵隔、心脏、肋骨、肺部血管等诸多组织器官重叠交叉，膈下肋骨受腹腔脏器成像因素影响，缺乏天然对比，往往显像不清晰，对隐匿性肋骨骨折的诊断有失精准，容易遗漏，需采用转体高清大幅面透视获取骨折显像的最佳体位图像，以便于准确定位、定性诊断。

检查
通过动态 DR 的大幅面图像可以清晰的显示完整胸廓的解剖结构，有利于观察骨性胸廓、心、肺、膈肌在呼吸运动状态下的整体状态，在透视功能下变换患者检查体位，从而获取不同体位的动态图像，选择骨折显示较为清晰的体位进行毫秒级抓拍，有效避免了漏诊和误诊。

结果：
动态 DR 大幅面透视图像，便于观察完整骨性胸廓、心、肺、膈肌在呼吸运动状态下的整体状态，有利于识别肋骨骨折部位和位置，以及骨折类型，有无合并症等，实施快速诊断，尤其适用于急诊患者的快速处治。可在透视下变换患者体位，使与纵隔、心脏、肋骨、肺部血管等诸多组织器官重叠交叉，以及被皮下气肿、胸壁血肿、气胸、胸腔积液等合并症遮盖的肋骨得以清晰的显示，在转体过程中选择骨折显像的最佳体位实时毫秒级抓拍，避免了误诊、漏诊。动态 DR 的视频保存/回放功能，可以完整的记录整个透视动态图像，便于重复观察、分析，指导教学，多科会诊，减少遗漏。

结论：
在肋骨不完全骨折或完全骨折移位不明显时，可仅表现为一侧骨皮质轻度翘起、凹陷、皱褶或呈现不完整的透亮线影、致密影，甚至有时仅表现为肋骨走行弧度的异常而不出现可见的骨折线，故部分极细微的骨折线及不完全性骨折等,须在具备高清摄像和动态转体透视多角度、多体位状态下，结合临床及影像学间接征象综合考虑，降低对隐匿性肋骨骨折病症的误诊、漏诊率，提高检查安全性。

PU-3003

定量 CT 骨密度测量应用于血压与腰椎骨密度相关性的研究

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【摘 要】 目的 应用定量 CT(QCT)测量腰椎骨密度(BMD),分析血压与腰椎骨密度的相关性。**方法** 选取 2018 年 7 月－8 月我院体检中心的体检人群 934 例，男 531 例，女 403 例，年龄 20～88 岁，平均年龄 49.47±11.90 岁，对其行低剂量胸部 CT 扫描，并测量腰椎骨密度，根据定量 CT 腰椎松质骨骨密度分为骨量正常、低骨量、骨质疏松三组。并对体检者血压进行测量，根据中国高血压防治指南 2018 年修订版中的诊断标准，将体检者根据血压情况分为四类人群：血压正常人群、高血压 1 级人群、高血压 2 级人群、高血压 3 级人群，比较这四类人群骨代谢异常的发病率。 **结果** 三组间比较骨质疏松组中，女性所占比例较大（P ＜ 0. 05）;低骨量组及骨质疏松组的年龄明显大于骨量正常组(P ＜ 0. 01)；各组体重指数（BMI）比较差异没有统计学意义(P ＞ 0. 05)。低骨量组及骨质疏松组的收缩压（SBP）、脉压（PP）大于骨量正常组(P ＜ 0. 01)；低骨量组及骨质疏松组的舒张压（DBP）大于骨量正常组(P ＜ 0. 05)。四类人群中，高血压 1 级人群、高血压 2 级人群、高血压 3 级人群的低骨量和骨质疏松的发病率均高于血压正常人群(P ＜ 0. 01)，随着血压分级的增加，骨代谢异常（低骨量+骨质疏松）的发病率也在逐渐增加(P ＜ 0. 01)。进一步行 *Pearson* 相关分析表明年龄、收缩压、舒张压、脉压均与腰椎骨密度呈负相关(P ＜ 0. 01)。 **结论** 年龄、收缩压、舒张压、脉压与腰椎骨密度呈负相关；女性骨质疏松较男性明显；随着血压的增高，骨代谢异常的发病率也逐渐增高。

PU-3004

精准医疗之动态 DR 在髋关节置换术中的临床应用探讨

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背景：

长期以来放射科应用传统拍片并不能有效解决重叠部位的清晰显影，容易造成漏诊误诊，并且受制于成像视野的大小，不能有效显示脊柱四肢全长的整体结构及病变。动态 DR 的出现，较好的弥补了传统拍片的不足，而且初步实现了影像诊断设备向精准诊断方向的转变。动态 DR 具有多功能、全视角、卓越的图像质量，它拥有可视化操作及大幅面成像、全像素高清点片、视频保存及回放功能、全身拼接功能。本研究采用安健动态 DR 全景拼接技术拍摄双下肢负重位全长片，探讨其在髋关节置换术中的临床应用价值。

摄影体位及检查方法：

患者直立于摄影架上，后背贴近摄影架，双手自然下垂，膝关节尽量伸直，足部与双肩同宽，并内旋 15° 左右，使腓骨小头与胫骨重叠接近三分之一，髌骨垂直指向正前方。将标尺贴于患侧髋关节处，嘱患者保持姿势不动，以双髋关节股骨头连线的中点为入射点，曝光一次，得到双髋正位影像；然后向下移动立柱探测器（X 线球管与探测器呈联动状态），中心线对准两腘窝连线中点下缘，水平投照，得到双膝正位影像；再次向下移动立柱探测器，中心线对准两侧外踝连线中点，水平投照，得到双踝正位影像。

结果

30 例患者行双下肢全长拼接摄影，影像拼接成功 30 例，拼接成功率 100%，下肢全长片均由副高以上职称的放射诊断医生及技师和一位临床骨科主治医生共同阅片、分析，均认为图像质量满意，投照技术符合临床要求，图像能满足诊断及治疗要求。

结论：

动态 DR 双下肢全长站立负重位片投照技术操作相对简便，在实际工作中注意操作要点，不断积累经验，通过调节合适的图像对比，进行无缝拼接，便能得到良好的双下肢全景片，可为临床髋关节置换术提供满意的术前诊断及相关力线测量参考，并为术后评估提供了重要依据。

PU-3005
多层螺旋 CT 对极外型腰椎间盘突出症的诊断价值 及微创介入治疗的相关性探讨

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目的：探讨极外型腰椎间盘突出在多层螺旋 CT 扫描及多平面重建的影像学特征，提高极外型腰椎间盘突出的诊断率及临床价值。**方法与材料：**本文收集 2016 年 1 月至 2019 年 6 月经我院疼痛科临床手术确诊极外型腰椎间盘突出症患者 336 例，回顾性分析层螺旋 CT 扫描及多平面重建方法及影像学特征，336 例极外型腰椎间盘突出均使用多层螺旋 CT 扫描。（1）根据极外型腰椎间突出的部位及突出范围并进行三维重建；（2）评估极外型腰椎间盘突出物与受压神经根部位的关联性；（3）极外型腰椎间盘突出物影像学描述；（4）影像诊断医师根据诊断结果，追踪患者手术是否与诊断结果相符合；（5)本组病例均有 MRI 扫描影像对比分析。**结果：**回顾本组病例，336 例极外型腰椎间盘突出症。其中（1）椎间孔型极外型腰间盘突出 59 例；（2）椎间孔外型（远外侧型）腰间盘突出 213 例；（3）混和型外型腰椎间盘突出 64 例。多层螺旋 CT 扫描及后处理重建清楚显示极外型腰椎间盘突出的部位、范围、边缘；目前尚无文献对极外型椎间盘进行描述，本文 CT 及 MRI 影像学表现分为：椎间孔淹埋型、纺锤型、类园型、不规则型、水滴型（上迁移型）、神经节嵌压型（特殊型）。本分型对临床症状的分析及手术方案制定具有重要的指导作用。MRI 扫描能显示极外型腰椎间盘突出的部位，范围不确定、边缘分界不清的病例 46 例，占本组病例 13.8.4%。**结论：**多层螺旋 CT 扫描及后处理重建能准确诊断极外型腰椎间盘突出，在对椎间盘突出显示的部位、范围、边缘优于 MRI 图像，神经根与突出物的比邻 MRI 优于多层螺旋 CT。多层螺旋 CT 扫描及后处理重建对极外型腰椎间盘微创手术治疗方案及手术入路具有重要的临床指导价值。

PU-3006
多回波弥散成像在化疗后骨髓抑制鉴别诊断中的应用价值

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目的：探讨磁共振多回波弥散成像技术在恶性肿瘤化学治疗后骨髓抑制【1】的鉴别诊断中的作用。
方法：将试验对象分为骨髓抑制组和对照组。在西门子 3.0T Prsima 磁共振上，使用多回波扩散加权成像（Multi-TE DWI)技术【2，3】，3D T2 SPACE 成像技术，3D T1 VIBE 成像技术， b 值选择（0，100，200，500，1000s/mm^2)，TE 时间选择 60ms，70ms，80ms，90ms，100ms，120ms。图像配准和运动校正后，使用单指数模型，比较不同 TE 时间下的 b 值拟合信号曲线，以及拟合出的 T2 Map 值的差异，3D T1/T2 加权信号差异。在 MRICRON 行感兴趣分析，感兴趣位置选择 L3~L5 椎体和髂骨，以及脑脊液。同时对不同 TE 时间下的 b 值的拟合信号曲线进行分析，得到信号拟合斜率 K 与回波时间 TE 的比值，作为特征参数。
结果：骨髓抑制组和对照组在椎体和髂骨 T2 map 值、K/TE 比值存在差异，其敏感度要优于 T1/T2 加权成像。
结论：多回波弥散成像技术可以帮助鉴别骨髓抑制，其特征参数敏感性要优于传统 T1 或 T2 加权成像。该研究同时表明选择合适的弥散成像的 TE 时间有助于恶性肿瘤化疗后骨髓抑制的鉴别诊断。该多回波技术同样可以用于其它骨骼肌肉疾病的定量分析。

PU-3007
膝关节软骨损伤：常规 MRI 成像方案加扫 3D-WATS 序列对分级诊断的价值

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目的：探究常规 MRI 成像方案中加扫 3D-WATS 序列对膝关节损伤分级诊断的价值。
材料与方法：搜集因膝关节疼痛及运动受限入院治疗的患者 20 例，其中男性 1 例，女性 19 例；年龄 59-77 岁，平均 68.45 岁。所有患者均先进行膝关节 3.0T MRI 膝关节平扫，包括常规序列（矢状位 T1WI，矢状位、冠状位、横断位 PDW_SPAIR）及三维扰相脂肪抑制梯度回波序列（3D-WATS）。将膝关节软骨的 4 个区域作为感兴趣区，分别为内髁远端、外髁远端、后髁内侧及后髁外侧。磁共振检查后一周内行全膝关节置换术，术前与手术医生共同阅片确定各感兴趣区损伤最严重部位，并于术后获取病理标本。影像科诊断医生分别使用常规序列成像方案及常规序列+3D 序列成像方案根据 Recht 标准对各感兴趣区的软骨损伤进行分级。
结果：20 例患者中 5 例损伤过于严重，未能留取全部病理标本，最后共获得 15 例患者的 60 个病理标本。病理 Collins 分级：1 级 1 例，2 级 10 例，3 级 43 例，4 级 6 例。MRI 常规序列方案分级：1 级 1 例，2 级 13 例，3 级 41 例，4 级 5 例。MRI 常规序列+3D 序列成像方案分级：1 级 1 例，2 级 9 例，3 级 44 例，4 级 5 例。MRI 常规方案分级与病理 Collins 评分的一致性系数 Kappa=0.642（P＜0.001），诊断符合率为 83.3%（50/60）。MRI 常规序列+3D 序列方案与病理 Collins 评分的一致性系数 kappa=0.845（P＜0.001），诊断符合率为 93.3%（56/60）。常规序列+3D-WATS 序列成像方案的分级诊断结果与病理分级之间的一致性高于常规序列成像方案（0.845＞0.642），诊断符合率优于常规序列成像方案（93.3%＞83.3%）。
结论：3.0T MRI 常规序列加扫 3D-WATS 序列成像方案在膝关节软骨损伤的分级诊断的一致性及符合率方面明显优于常规成像方案，具有重要的临床价值。

PU-3008
双能量 CT 骨髓水肿成像在脊柱转移瘤中临床应用

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目的 本研究旨在探讨双能量 CT 骨髓水肿对脊柱转移瘤的诊断准确性及其临床应用价值。
方法 收集我院 32 名脊柱转移瘤患者的双能量 CT、MRI 图像。以 MRI 为“金标准”，由两名放射科医生对图像进行主观评价分析，比较双能量骨髓水肿成像、常规 CT 图像对脊柱转移瘤的诊断准确性。测量转移椎体与相邻正常椎体虚拟去钙化成像及常规 CT 定量值，两者进行比较，通过 ROC 曲线评价其对脊柱转移瘤的诊断效能。
结果 共纳入分析 215 个转移椎体。在双能量 CT 骨髓水肿、常规图像上，两观察者主观评估的一致性均较高（Kappa 值：0.885vs0.866），诊断准确性明显高于常规 CT（89.9%vs82.8%、90.1%vs83.8%）。在溶骨型转移瘤中，虚拟去钙化成像 CT 定量值要高于相邻正常椎体，存在统计学差异（*P*=0.024），常规 CT 定量值与相邻正常椎体定量 CT 值无明显统计学差异（*P*=0.065）。溶骨型转移瘤 AUC 值大于常规 CT（0.65vs0.53）。

结论 双能量 CT 骨髓水肿成像能提高脊柱转移瘤诊断准确性。其中溶骨型转移瘤在双能量 CT 骨髓水肿成像定量值要高于邻近正常椎体。

PU-3009
II-IV 期股骨头坏死软骨 T2 值比较及其与 Harris 评分的关系

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目的 探讨 II-IV 期股骨头坏死关节软骨 T2 值差异及其与 Harris 评分间的关系。
方法 对 20 例 II-IV 期股骨头坏死患行 T2mapping 成像检查，通过 Siemens 后处理工作站计算定量参数 T2 值。比较不同国际骨循环研究会（ARCO）分期患者的 T2 值，并分析 T2 值与 Harris 评分间的关系。
结果 正常对照、Ⅱ期、Ⅲ期、IV 期患者两两比较 T2 值差异均无统计学意义（ P＞0.05）。T2 值与 Harris 评分无相关性。
结论 II、III、IV 期股骨头坏死关节软骨 T2 值改变不明显，与 Harris 评分无相关性，临床意义不大。

PU-3010
Research on the uric acid depositing in tophaceous gout around the knee using gemstone spectral computed tomograph

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PURPOSE
To investigate features of uric acid salt's deposition in joint of knee in gout using gemstone spectral computed tomography (CT) , and measure series spectrum parameters of uric acid salt to assess its clinical value

METHOD AND MATERIALS
Gemstone spectral CT scans of knee were performed on 46 patients with gout.Then we investigate the features of uric acid salt's deposition, analyze series spectrum parameters of uric acid salt and with cortical bone, muscle, cancellous bone around,include effective atomic number(Eff-Z),spectrum curve slope,),comparison between four tissue groups use Kruskal Wallis H test (P < 0.05), pairwise comparisone use the Mann-Whitney U test. And calculated CNR of deposition urate,and statistics

optimal CNR to get the optimal single energy keV, use chi-square test to test the difference significance(P<0.05).

RESULTS

The deposition of uric acid salt was found in all patients ,which distributes in 271 areas.The most common affected sites were collateral ligaments(98/271, 36.09%),cruciate ligament(37/271,13.70%),quadriceps tendon(23/271,8.49%) successively. The possibility of deposite in other site of knee articular is lower. 2. The effective atomic number (Eff-Z)of uric acid salt is 8.12±0.29, The Eff-Z of cortical bone is 13.27±0.48, The Eff-Z of muscle is 7.71±0.15, The Eff-Z of cancellous bone is 9.16±0.62, which were significantly different with cortical bone, muscle, cancellous bone around. The number of optimal CNR appear in single energy of 65keV gets to 138 of all 217 deposited uric acid salt . By chi-square test ,the difference of probability appear in 65keV with others single energy was statistically significant. 6. In one follow-up Patient,we found the deposited uric acid salt in leading edge of tibial plateau was disappeared,UA(ca) of uric acid salt decrese mostly.

CONCLUSION

The uric acid salt deposited more in ligaments and tendons of knee where stresses more, so we guess that the deposition of uric acid salt may be in proportion to stress. 2.The GSI parameter analysis [Eff-Z ,spectrum curve slope, the optimal single energy ,UA(ca) and CA(ua) and UA(ca)/CA(ua)] can help the correct qualitative diagnosis of uric acid salt, UA(ca)/CA(ua) may be more sensitive to detect the change of uric acid

PU-3011

256-row Dual-energy CT－based Hydroxyapatite-Fat separation technique in Bone Mineral Density Measurement

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Purpose： To evaluate the feasibility of 256-row Dual-energy CT-based Hydroxyapatite(HAP)-Fat separation technique in Bone Mineral Density Measurement in comparison with quantitative computed tomography (QCT).

Methods： We retrospectively analyzed 128 healthy adults who underwent dual-energy CT(DECT) and QCT scans of the lumbar spine in our hospital.The region of interest (ROI) was delineated by cancellous bone at the middle level of L1-L5 lumbar spine HAP (Fat) ,density of lumbar spine was measured by dual-energy CT material separation technique, and BMD of vertebral body was measured by QCT. The HAP (FAT) density of lumbar spine and BMD derived from QCT were analyzed by paired t test and linear

regression in direct method and regression method.The linear regression models were quantitatively evaluated by adjusted R-square and relative error (RE),.
Results：In the direct method,there was significant difference between the density of HAP (FAT) derived from DECT and the BMD derived from QCT(P < 0.01),,RE =29.76%.In the regression method, there was no significant difference between the density of HAP (FAT) derived from DECT and the BMD derived from QCT.There was a significant linear positive correlation between HAP (Fat) density derived from DECT and BMD derived from QCT .The regression equation is Y(BMD)=1.226×HAP(FAT)-58.228(r^2=0.980,RE=1.50%,P＜0.05)..
Conclusion：The Bone Mineral Density of lumbar spine can be measured quantitatively by Dual-energy CT HAP (Fat) separation technique.

PU-3012

Comparison Between High-Resolution Isotropic Three-Dimensional Cube FS PD and Conventional Two-Dimensional FS PD MR Images of the TFCC at 3 Tesla

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Purpose: To compare a newly developed high-resolution isotropic three-Dimensiona(3D) Cube FS PD sequence with conventional high-resolution2D FS PD sequence in assessing TFCC of the wrist in term of image quality and diagnostic performance.
Materials and Methods: 12 volunteers were enrolled in the study with an average age 22.4 years (range 22-27 years). All the sequences were carried out on all volunteers at 3.0T MR scanner (Signa HDxt, GE Healthcare, Milwaukee, WI) and a Wrist Array coil. Each imaging was performed with 2D PD FS (coronal,axial and sagittal:TR=2900ms,
,TE=32.0ms,Matrix=320×256, FOV=10×7cm2, Slicethickness =2.0mm,gap=0.3mm,NEX=2,acquisition,time=99s)and 3D isotropic PD FS (coronal:TR=1400ms, TE=36.4,Matrix=256×256, FOV=10×9cm2, Slicethickness=0.4mm, gap=0.2mm, NEX=0.5, acquisition time=279s).Delineation of anatomic structures of the wrist, amount of artifact, effect of fat suppression, image blur, and overall quality were qualitatively evaluated using the 5-point scoring system (5: excellent, 4: good,3: satisfactory, 2: poor, and 1: nonidentified.Signal-to-noise-ratios (SNR) of each structure and contrast-to-noise ratios(CNR)between structures of the TFCC were quantitatively measured using vendor supplied software (AW4.6work station, GE).
Results: The 2D MRI demonstrated higher scores than 3D in anatomic structure of the SL ligament(P=0.043), the LT
ligament(P=0.022),cartilage(P=0.043),artifact(p=0.007)and image blur(p=0.015).However,there were no statistical significance between 2D and 3D MRI in disc and overall quality. Higher SNR values were found for in the 2D sequence (6.32±3.32)than the 3D(4.20±1.66),The corresponding CNR values were(4.87±3.10) for the 2D and(3.45±1.97) for the 3D.To better control for voxel size, we also measured the SNR and CNR values in the reconstructed 2-mm images from original 3D isotropic images and obtained similar values as in the 2D (5.86±3.05 and

3.01±0.86, respectively), indicating that reconstruction with larger slice thickness improved SNR and CNR.
Conclusion: Although,Isotropic 3D Cube FS PD sequence may enhance standard wrist MRI by increased visualization of multiplanar and post processing capabilities, however,the 3D Cube image quality was lower.

PU-3013
应用 MR T2 mapping 序列对肾衰患者膝关节软骨损伤的研究

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目的 测量肾衰组及尿毒症组患者膝关节和正常对照组关节软骨 T_2弛豫时间并比较差异性，评价磁共振 T_2 mapping 成像在肾衰患者膝关节软骨损伤中的应用价值。**材料与方法** 采用西门子 3.0T 磁共振，选取正常组 20 个膝关节，肾衰组 21 个膝关节，尿毒症组 20 个膝关节；应用 T_2 mapping 序列观察和测量正常组（20 例）和肾衰组（21 例）及尿毒症组（20 例）髌软骨、股骨内侧髁、外侧髁、胫骨内侧平台、外侧平台 5 处关节软骨的 T_2值，并进行统计学分析。**结果** 肾衰组及尿毒症组 T_2值均高于正常组；正常组对比肾衰组以及尿毒症组软骨 T_2值差异具有统计学意义（P<0.05）；肾衰组与尿毒症组关节软骨 T_2值差异不具有统计学意义（P>0.05）；**结论** T_2 mapping 成像可以早期发现膝关节软骨内组织成分的变化，进而评价软骨的损伤，对肾衰患者膝关节软骨损伤的诊断和监测具有一定的临床应用价值；肾衰患者存在膝关节软骨的损伤。

PU-3014
The value of improving artifacts by using WARP sequences in assessing image quality after internal fixation implants

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Purpose: the aim of this article is to evaluate the value of improving artifacts by using WARP sequences in assessing image quality after internal fixation implants.
Methods: Analyze total 24 subjects image scores which scanned by using WARP sequences and normal TSE sequences after internal fixation implants operation. Compare the difference between two type sequences about SNR, image scores, scanning time. All data were processed by SPSS 23.0 software edition and checked for statistical significance.
Results: The image scores of WARP sequences were higher than normal TES sequences(P<0.01) as well as the same SNR in these two groups(P>0.01) even if it expended much time(P<0.01).
Conclusion: WARP sequences could help to improved image quality with lower artifacts influence in patients suffered internal fixation implants.

PU-3015

四关节置换术前模拟下肢拼接 DR 投照体会

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摘要

目的：下肢全长拼接术前投照诊断意义

方法：选择悬吊数字化 X 线 DR，站立位投照双下肢。

结果：2017 年 5 月我院迎来一位 67 多岁老年患者，该患者双侧髋关节、膝关节严重骨性关节炎，导致双髋、双膝关节严重畸形改变，常年卧床，已丧失基本生活能力，由于长期卧床关节强直活动度不强，初步考虑患者有骨质疏松，临床医生要求关节置换站立位检查，给我们的检查带来了一定困难。结合老人实际病情，组织我科相关人员在数字化 XH-DR2000 型 DR 机上经行投照前模拟位置摆放、曝光条件的设定、站立时间的计算等，有我们的年资高医生为年轻医生进行实地讲解的患者情况，并科内进行讨论，双下肢全长拼接方法：需要患者站立位投照，分阶段经行曝光，显示合理图像，然后经行软件后处理拼接，对图像经行长轴、立线、角度等测量，观察双侧关节间隙对应情况等。我科的医生都谈到患者不能站立时间过长，而且站立的稳定性不好，患者长期不能正常活动，也会骨质疏松，肌肉力量不均匀，投照时还会出现运动性伪影，给拼接后处理带来一定困难，运动伪影会出现影像学假象，也会给临床诊断带来错觉，拼接检查时间过长，考虑到患者不能站立时间过长，我们的医生都说出了自己的个人看法和日常工作中的经验，结合模拟情况分析。

结论：为了保证图像质量，确定分 4 阶段曝光，并选择高该患者 10 岁年龄的曝光条件，使用 125mA、高 KV、短 mS 经行曝光，最后在患者坚强意志的配合下，我科医生的努力下一次性为患者投照完毕，并拼接出优质的图像，为临床的治疗提供了第一手影像学资料。

PU-3016

胫骨远端骨折继发腓骨近端骨折 30 例全长投照的价值

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摘要

目的：X 线平片全长投照对诊断胫骨远端骨折继发腓骨近端骨折价值。

方法：选择 X 线平片（踝关节正侧位、胫腓骨（全长）正侧位）进行检查。

结果：患者主因，踝关节车祸及其他外伤后，查体踝关节软组织肿胀、畸形改变，行 X 线检查示：踝关节正侧位，片示胫骨远端骨折，住院或门诊保守治疗，石膏外固定或切开手术内固定，治疗后患者自感膝关节外侧不适，行 X 线检查示：膝关节正侧位或胫腓骨全长正侧位，片示胫骨远端骨折及腓骨近端骨折（折端移位和无移位），腓骨头骨折 13 例，腓骨近端 17 例，成人 25 例，儿童 5 例，男 26 例，女 4 例，部分患者神经损伤。

结论：漏查会致使患者满意，部分患者投诉或引发医疗纠纷，部分对位好的患者可以理解，但也对当时没有检查发现对医生不太满意。为了减少诊疗过程中，避免投诉和纠纷，胫骨远端骨折患者检查时，建议患者初诊时胫腓骨全长投照，在诊疗过程中检查是否神经损伤。以免给患者带来没必要的伤害。

PU-3017

腕关节碟式位加食指屈曲位投照对诊断腕舟骨病变的价值

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摘要
目的：X 线平片诊断腕舟疾病的价值。
方法：选择数字化 X 线摄影（DR），腕关节正侧位、碟式位、食指屈曲位进行检查，摄影方法为：患者坐于摄影床前，做好辐射防护工作，自然曲肘，掌心向下，手掌尽量向尺侧偏移、加食指屈曲位放置，摄影距离为 90cm，中心线向肘侧倾斜 20 度角，对准尺骨、桡骨茎突连线中心摄入。
结果：常规腕舟骨损伤，普通 X 线检查方位为正侧位、碟式位为主，选择常规碟式位 20 例，碟式位加食指屈曲位 20 例对比发现，腕舟骨的重叠影更少，显示更清晰，更有利于腕舟骨骨折和疾病的诊断。
结论：腕关节损伤考虑腕舟骨骨折首选 DR 检查，除常规检查追加特殊位，更有利于腕舟骨骨折、骨质疾病的诊断。随着医学设备的先进化、科学化，按照资料查询，坚持能简单不复杂是我们的宗旨，不过度利用大型设备检查，减轻患者负担、节省资源浪费、诊断清楚为目的。

PU-3018

Comparative analysis of three sequence in Three-dimensional meniscus model reconstruction in 3.0 T MRI

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Abstract:
Objective To compare and analysis the clinical value of (SE) T1WI, (TSE) T2WI and (FS-PDWI) sequences in Three-dimensional meniscus model reconstruction.
Methods
Thirty normal knee joints meniscus were scanned using 3.0T MRI at the same scan conditions. MRI was performed by SIEMENS AG, Germany MAGNETOM Verio 3.0T. The knee joint was coiled with special coils. The legs were straightened naturally. The knee joint was fixed with sponge pads on both sides. Scanning range is from the outside to the inside of the knee joint, and all patients are positioned and examined by the same scanner. Three scanning parameters were set: T1WI (group A): TR440ms, TE 13ms; T2WI (group B): TR4000ms, TE 68ms; FS-PDWI (group C): TR3000ms, TE26ms; the other parameters of the three groups were consistent, the thickness of the three groups was 1.1mm, the spacing of the layers was 0mm, the pixels were 384*348, the field of vision was 180*180mm, the number of excitations was 1, and the sagittal MR images were stored in DICOM 3.0 standard format in the electronic computer.Images data of DICOM 3.0 format of three modalities including A. (T1WI) B. (T2WI) C. (FS-PDWI) were obtained. The images data were imported and view images were processed by using Mimics 16.0 software to reconstruct three-dimensional menisci model. The width and height of the anterior and posterior angles of the meniscus were measured at the sagittal plane, and the anterior cruciate ligament attachment of the intercondylar spine was measured at the coronal plane. All measurements were performed independently by two radiologists. Mean diameters were included in the statistical analysis. The interval between the

meniscus of the 3D model and the original two-dimensional image was one week.The height and width of anter,mid-body and posterior horn of medial and lateral menisci between 3D model and original 2D image were compared. The objective image quality of subjective image quality between three groups were compared. The image quality of 3D meniscus model was compared with that of arthroscopic meniscus model by two experienced radiologists and sports injury physicians, and the subjective score was 5 points.SPSS19.0 software was used for further statistical analysis.
Results
The image quality scores were for group A4.52±0.31, for group B3.98±0.24 ,and for group C4.10±0.46 ,the $\chi 2$ value were 8.86 for group A vs group B(P＜0.05) ,4.38 for group A vs group C (P＜0.05)and 0.26 for group B vs group C(P＞0.05). The width and height of the anterior and posterior angles of the inner and outer meniscus and the height of the inner and outer meniscus are slightly smaller than those of the original two-dimensional images, while the width of the inner and outer meniscus is slightly larger than that of the original two-dimensional images.There was no statistic difference in the mean value of the height and width of anter,mid-body and posterior horn of medial and lateral menisci between 3D model and original 2D image(P＞0.05).
Conclusion MRI T1WI sequence is the advantage sequence for reconstructing three-dimensional menisci model.The model can clearly and precisely simulate three-dimensional geometrical morphology of meniscus to lay foundation for accurate analysis of meniscus before operation and provide 3D model for meniscus biological printing technology.

PU-3019
第三代双源 CT 低管电压联合高级迭代重建技术在髋关节 CT 检查中的应用研究

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[摘要]目的：探讨第三代双源 CT 低管电压联合高级迭代重建（ADMIRE）技术在髋关节 CT 成像检查中的辐射剂量和对图像质量的影响。
方法：前瞻性收集临床拟诊髋关节病变行髋关节 CT 检查患者 60 例,体质指数为 18kg/m^2<BMI≤24kg/m^2,随机分为 2 组，各 30 例；使用第三代双源 Force CT 进行扫描；A 组：固定管电压为 120kV，开启 CARE DOSE4D 采用 FBP（滤波反投影法）重建;B 组:固定管电压 90kV，开启 CARE DOSE4D，使用 ADMIRE strength 3 级重建得。比较 2 组图像的在同一解剖层面的图像平均 CT 值、噪声值 SD 值和信噪比（SNR），对比噪声比（CNR），记录容积 CT 剂量指数(CTDIvol)、剂量长度乘积（DLP）,并计算有效剂量（ED）；由 2 位高年资的骨关节系统诊断医师分别对两组图像进行图像质量主观评分。
结果:A、B 两组描方案图像的有效辐射剂量，B 组(0.56±0.17)mSv 较 A 组(1.47±0.41)mSv 减少约 62%，差异有统计学意义（P<0.05）；与 A 组相比 B 组图像的噪声、SNR 相比较差异无统计学意义（P＞0.05）；CNR 比较差异有统计学意义（P<0.05）。两组图像质量的主观评分比较，差异无统计学意义(P>0.05)。
结论：低管电压联合 ADMIRE 重建技术可在髋关节 CT 的检查中保证图像质量同时有效降低辐射剂量，值得被推广。

PU-3020
能谱 CT 单能量成像技术在去金属伪影中的临床应用

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摘要　　目的：探讨能谱 CT 单能量成像技术在去金属伪影中的应用价值。方法：选取我院 2018 年 1 月-2018 年 12 月体内含金属物的 50 名患者行能谱 CT 检查，并采用单能量成像进行图像重建，其中单能量成像重建时能量间隔为 10KeV，范围 40-140KeV，共计获得 11 组图像，并测量每组图像感兴趣区的 CT 值和 SD 值。结果：110KeV 能量时图像最优，噪声最小，与其他 10 组图像有明显统计学差异（P>0.05）。结论：能谱 CT 单能量成像技术能有效减少金属伪影，其中以 110KeV 进行能量成像时伪影最小，提高了图像分辨率，具有十分重要的临床意义。

PU-3021
骨髓脂肪含量与 MR 定量测量技术研究进展

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骨髓脂肪含量与骨质的丢失、癌症的骨转移以及放化疗后骨髓损伤等有着密切关系，因此对骨髓脂肪含量的定量测量有较重要的临床价值。MR 具有无创伤、无辐射、良好的软组织对比已成为共识。本文通过对目前 MR 多种定量测量技术的汇总分析，为临床医生对骨髓脂肪含量检查的选择提供便利。

PU-3022
不同黏度骨水泥治疗骨质疏松性椎体压缩性骨折疗效比较

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【摘要】目的：探讨不同黏度骨水泥治疗骨质疏松性压缩性骨折的临床疗效，为骨质疏松性压缩性骨折治疗提供依据。**方法：**选择 2016 年 1 月~2018 年 6 月我院收治的骨质疏松性压缩性骨折患者 90 例，按照数字随机表法分为高黏度组 42 例和低黏度组 48 例，分别采用高黏度骨水泥经皮椎体后凸成形术和低黏度骨水泥经皮椎体后凸成形术治疗。比较两组单个椎体手术时间、骨水泥注入量、骨水泥渗漏发生情况。所有患者术后随访 3 个月，比较两组术前、术后 3 个月疼痛数字评分量表（NRS）、Oswestry 功能评分、椎体高度和 Cobb 角变化。**结果：**高黏度组单个椎体手术时间少于低黏度组（*P*<0.05），两组骨水泥注入量、骨水泥弥散体积比较无统计学差异（*P*>0.05）。高黏度组骨水泥总渗漏率显著低于低黏度组，两组数据比较有统计学差异（*P*<0.05）。两组患者术前 NRS 评分、ODI 评分、椎体中间高度和 Cobb 角比较差异无统计学意义（*P*>0.05）；术后 3 个月两组 NRS 评分、ODI 评分和 Cobb 角较术前比较显著降低，椎体中间高度显著升高，高黏度组 NRS 评分、ODI 评分和 Cobb 角显著低于低黏度组，椎体中间高度显著高于低黏度组（*P*<0.05）。**结论：**高黏度骨水泥经皮椎体后凸成形术单个椎体手术时间较低黏度骨水泥经皮椎体后凸成形术少，总渗漏率

更低，高黏度骨水泥经皮椎体后凸成形术后椎体高度恢复更好，患者脊柱畸形矫正、脊柱功能恢复更佳，疼痛也显著降低，适于临床推广。

PU-3023

脊椎多房棘球蚴病的影像学诊断

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目的 分析脊椎多房棘球蚴病的 CT 和 MRI 影像特征及诊断价值，以提高对该病的诊断和鉴别诊断能力。**方法** 回顾性分析经临床诊断或手术病理证实的 13 例脊椎多房棘球蚴病的临床和影像资料，其中 13 例行 CT 扫描，8 例 MRI 检查。 **结果** 13 例脊椎多房棘球蚴病中，1 例单椎体和 12 例相邻多椎体破坏，共 34 个椎体受累。CT 扫描 26 个（76.5%）椎体表现为簇状或弥漫的蜂窝状、囊样和斑片样溶骨性骨质破坏。18 个（52.9%）椎体破坏周围伴骨质硬化，19 个（55.9%）可见结节、砂粒样钙化或死骨形成。21 个（61.8%）椎体附件受累，20 个（58.8%）骨性终板局限性骨质破坏，13 个（38.2%）椎间盘破坏，12 个（35.2%）椎间隙变窄、消失。压脂 T_2WI 椎体及附件小囊泡检出率为 62.5%（5/8 例），软组织多房棘球蚴病小囊泡检出率 87.5%。 **结论** 脊椎多房棘球蚴病的 CT 和 MRI 影像表现具有一定特征性，综合分析更有利于准确诊断。

PU-3024

在正位定位像下，颈胸段 CT 扫描体位对图像质量的影响

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目的：
探讨双源 CT 不同体位对颈胸段 CT 扫描图像质量的影响及辐射剂量。
材料与方法：
连续收集在我院行颈胸段 CT 扫描的非术后成年患者 120 名。将患者随机分为 A、B 两组（每组 60 人）。记录每组病人的性别、年龄、体重指数。A 组病人头部垫高，收紧下颌，使椎体尽可能与床面平行，并通过正位定位像进行螺旋扫描；B 组病人头部后仰，使下颌骨尽可能与床面垂直，并通过正位定位像进行螺旋扫描。
设备：Siemens Somatom Definition 双源 CT；开启 CARE Dose 4D 技术，扫描范围：C4—T6。
图像客观评价：记录并比较每次扫描的剂量长度乘积（DLP）。在第一胸椎体（T1）上缘层面选取 ROI 及同层面空气选取 ROI，以其 SD 值（$SD_{空气}$）作为图像噪声（N），测量两侧斜方肌的 CT 值并取其平均值（$CT_{斜方肌}$），计算并记录对比噪声比（CNR），信噪比（SNR）。
图像主观评价：两位经验丰富的放射科医师评估图像质量的主观评价，以评估基于 3 点评分系统的硬化伪影和诊断可接受性。评分标准：1 分为差，线束硬化严重，椎体边缘显示不清，无法用于诊断；2 分为良，线束硬化伪影较轻，椎体边缘大部分显示清晰，可用于诊断，但是准确性可能受影响；3 分为优，线束硬化伪影基本没有，椎体显示清晰，对诊断无影响.
统计学方法：对两组数据采用 SPSS 23.0 软件包进行分析，统计方法包括单因素方差分析及独立样本 T 检验，$P<0.05$ 认为差异有统计学意义。
结果：以上所有图像均满足诊断，A、B 两组性别，年龄，BMI,信噪比（SNR）,对比噪声比（CNR）均 $P>0.05$，差异没有统计学意义；A、B 两组 DLP，$P<0.05$ 差异有统计学意义。

结论：西门子二代双源 CT，开启 CARE Dose 4D 技术，采用正为定位像扫描颈胸段 CT 时，病人头部后仰，使下颌骨尽可能与床面垂直，既可以保证优秀的图像质量，还可以降低病人辐射剂量约 20%，建议临床推广。

PU-3025

QCT 检查在体检中的应用价值的探讨

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摘要：目的 中老年体检人群中行胸部低剂量扫描同时应用 QCT 测其腰椎骨密度,通过分析体检者是否为骨质疏松患者及椎体压缩性骨折的发生率，达到提早预防及治疗的目的.**方法** 对 200 名中老年体检者行胸部低剂量，应用 QCT 对 L1、L2 分析,测量出腰椎骨密度, 通过软件比对同龄同性别健康对照组的年龄骨密度曲线及椎体压缩性骨折概率图，健康管理师给出适合该体检者最佳治疗方案，并定期随访。**结果** 骨质疏松检出 78 例,低骨量检出 99 例,正常骨密度 43 例，健康管理师对低骨量和骨质疏松客户制定详细的治疗方案，半年后复查，123 人骨量减低情况好转。**结论**：QCT 能够测量体积骨密度，对骨量变化有很高的灵敏度，且椎体是骨质疏松最先累及的部位，不受血管、钙化及椎体附件影响，所以应用 QCT 测量椎体可更早期测量体检人员骨量丢失情况，对骨折危险性进行较准确的预测,而且不受患者身高、骨退行性变及体重等的影响,可体检人群中低剂量胸部扫描的同时应用 QCT 测量骨密度，既简单快捷又适合在体检中大量运用，精准判断体检人群骨质疏松及椎体压缩性骨折的发生率，达到真正体检“早期预防”及“早期治疗”的目的。

PU-3026

影像检查对成人股骨头缺血性坏死的诊断体会

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目的：进一步提高影像学检查对成人股骨头缺血性坏死诊断的认识，利于患者早期诊疗和康复。**方法**：选取我院 2015.01-2019.01 的 20 例股骨头缺血性坏死的患者，进行 DR、CT 及 MRI 影像检查对比分析。**结果**：DR 检查阳性率为 60%,CT 检查阳性率为 71.43%,MR 检查阳性率为 100%，三者间差异有统计学意义（P＜0.05）。**结论**：MRI 检查是早期股骨头缺血性坏死最好的检查诊断方法，为临床制定早期股骨头缺血性坏死治疗方案提供充分的影像学依据，值得临床推广应用。

PU-3027

双能 X 线骨密度测量仪在赣南地区人群骨密度异常中的应用价值

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摘要：目的：探讨双能 X 线骨密度测量仪在赣南地区人群骨密度异常中的应用价值。 **方法：**回顾性分析 1372 例赣南地区人群骨密度测量结果，并对其数据进行分析。**结果：**青年组男性股骨颈骨量减少和骨质疏松患病率分别为 31%和 0%，Ward 三角分别为 43%和 3%，腰 1～4 椎体分别为 14%和 2%；青年组女性股骨颈分别为 26%和 1%，Ward 三角分别为 42%和 2%，腰 1～4 椎体分别为 17%和

0%；中年组男性股骨颈分别为 40%和 1%，Ward 三角分别为 65%和 5%，腰 1～4 椎体分别为 19%和 3%；中年组女性股骨颈分别为 41%和 2%，Ward 三角分别为 52%和 10%，腰 1～4 椎体分别为 23%和 13%；老年组男性股骨颈分别为 54%和 23%，Ward 三角分别为 52%和 39%，腰 1～4 椎体分别为 41%和 30%；老年组女性股骨颈分别为 58%和 7%，Ward 三角分别为 57%和 27%，腰 1～4 椎体分别为 18%和 5%。**结论：**双能 X 线骨密度测量仪对诊断骨密度异常有重要价值，且 Ward 三角对骨密度异常变化敏感性高，骨量减少和骨质疏松患病率随年龄增长而递增。

PU-3028

血友病性假肿瘤影像分析并文献复习

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【摘要】 目的：提高对血友病性假肿瘤影像学表现的认识，减少误诊。 **方法：**对我院 5 例确诊血友病性假肿瘤的临床、影像及病理资料进行回顾性分析，并复习国内外血友病性假肿瘤相关文献。**结果：**血友病性关节炎为血友病患者最常见并发症。血友病性假肿瘤为反复关节、肌肉出血所致肿瘤样改变，影像表现特异性较强，但缺乏相关病史时诊断困难，MRI 扫描较高鉴别诊断价值。 **结论：**血友病性假肿瘤影像学表现通常较为典型，但也要认识到不典型的影像表现，早期明确定性诊断有助于患者治疗方法的个性化选择。

PU-3029

磁共振水脂分离序列对椎体外伤的诊断价值探讨

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【摘要】 目的：探讨磁共振（MR）水脂分离序列对椎体损伤的诊断价值。 方法： 在给 74 例脊柱外伤患者做脊柱 MR 检查时，采用水脂分离序列进行脊柱扫描，水脂分离序列计算出类 T1 相、类 T2 相、脂相、水相，然后观察分析水脂分离序列有哪些征象对诊断椎体损伤有诊断意义。 结果：74 例共有 89 个椎体有损伤征象，其中椎体重度压缩 5 个、中度压缩 20 个、轻度压缩 46 个，椎体无压缩 18 个；16 个椎体可见明确的骨折线，7 个椎体可见碎骨片；89 个椎体均有超过单个椎体 1/3 体积的水肿样信号，其中 88 个椎体水肿信号区内有散在脂肪信号，在水脂分离序列 T1 相、T2 相均淡薄显示为稍高信号，在水相上脂肪被抑制呈极低信号，在脂肪相上明显显示为高信号，脂肪分布的特征有“满天星状”、“条带状”；88 个椎体水肿区没有直径超过 5mm 的“完全无脂肪区”；仅有 1 个椎体水肿区内有直径 9mm 的“完全无脂肪区”，但此“完全无脂肪区”在椎体水肿区上 1/2，其与下 1/2 的“有脂肪水肿区”的交界部也没有完整的分界线。结论： MR 水脂分离序列对椎体损伤除了能观察到常见的椎体压缩、椎体骨折线、碎骨片征象之外，还能清晰显示椎体水肿区内含脂肪信号，更有利于推论该区域为骨质不均一损伤后还有脂肪的残存，对椎体的损伤有一定的诊断价值。

PU-3030

一例胸部及肩关节骨溶解症的病例分析

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目的 临床上胸部及肩关节骨溶解症是一种极其罕见的疾病，常容易被误诊。顾报道一例典型病例，并探讨该例病例的临床表现，病理学、影像学特点及诊断治疗方法。方法 报道一例胸部及肩关节骨溶解症病例，结合文献报道总结本病的临床表现，病理学、影像学特点及诊断治疗方法。结果 胸部及肩关节骨溶解症的临床表现、病理结果及 X 线检查常不一致，极易误诊、漏诊；临床表现多无特异性；病理学亦无特异性，早期以血管增生为主，后期以纤维组织增生为主；X 线表现为大量骨质溶解吸收但无骨质增生、硬化，无骨膜反应，无瘤骨形成，早期边界模糊，后期边界清楚、锐利。结论 胸部及肩关节骨溶解症早期诊断困难，必须综合临床表现、病理、X 线及 CT 检查等结果来进一步确诊；应根据本病活动期或静止期，给予相应药物治疗、放射治疗、手术治疗及综合治疗等方法，长期随访。

PU-3031

前交叉韧带术后 CT 评估

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目的

DSCT 对前交叉韧带修复术后，观察股骨隧道入点及髓腔通道情况，探讨 DSCT 对前交叉韧带修复术后的影像表现及预后评价的临床意义。

材料与方法

选取广州军区广州总医院骨病关节科病人，已确诊膝关节前交叉韧带损伤，并已行膝关节前交叉韧带修复术的患者 12 例。所有患者使用双源 CT（siemens Somatom Definition 2008G）双能模式下行双膝扫描,扫描后应用西门子图像后处理工作站，在双能 3D 模式二维观察术后钉道的走形及位置，并行 3D 建模，以髁间窝中心点为界进行图像切割，并观察股骨隧道入点处距离该点的距离。

结果

在 3D 模式下，可以直观显示股骨隧道入点处的位置，并可测量其与解剖止点的距离，有 9 例患者测得距离在 5.4mm~5.9mm，有 3 例患者距离在 6.1~6.3mm，临床预期理想距离为（5.7±0.3），说明 9 例患者行前交叉韧带修复术时股骨隧道入点达到了预期设想。

结论

前交叉韧带是膝关节的重要结构，一旦损伤、断裂会无法维持膝关节稳定，迫使人体无法进行正常活动，对患者日常生活造成较严重的影响。前交叉韧带修复术是目前针对此优选的方法。对患者而言，术后最关心的是“能否预后”，而并非“是否预后”，“能否预后”的首要条件在于手术位置是否准确，对于观察膝关节的内部结构，关节镜检查是目前公认的金标准。关节镜下可以清晰而准确的观察膝关节内部结构，但是因其检查费用高，具有一定的创伤，且无法随意旋转观察髓腔通道等不利因素，常常有患者对此往望而却步。不但是因其高昂的检查费用，更因为在一次术后，不少患者患侧关节内部会产生不同程度的积气，且创伤遗留的肿胀、疼痛，也让患者在短期类不想二度承受。而 DSCT 是无创的，同时可通过仿真 3D 模型多角度、多层面观察股骨隧道入点处的位置及髓腔通道内部情况，从解剖角度对患者能否预后情况做一个首期评估，故对临床具有一定的指导意义。

PU-3032
MRI 3D－FFE 序列、增强扫描及两者联合应用对椎管内神经鞘瘤的诊断效能对比研究

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目的：探讨 MRI 3D－FFE 序列、增强扫描对椎管内神经鞘瘤的诊断价值，为椎管内神经鞘的诊断及鉴别诊断术前提供科学的依据。
方法：收集 2018 年 1 月－2019 年 4 月在我院就诊的研究对象 45 例，这些患者均行 MRI 平扫、3D－FFE 序列及增强扫描，以手术病理结果作为评价标准，计算 MRI 3D－FFE 序列和增强扫描诊断椎管内神经鞘瘤准确性、敏感性、特异性，比较 2 种检查方法的有效性。
结果：45 例患者中，最终病理结果证实神经鞘瘤 38 例（其中 17 例合并囊变，10 例合并囊变出血），髓核组织 5 例，囊肿 2 例。颈椎体 7 例，胸椎 6 例，腰椎 32 例。男性 28 例，女性 17 例。年龄 28～72 岁。MRI 3D－FFE 序列、增强扫描及两者联合诊断神经鞘瘤准确性、敏感性、特异性分别为 88.7%、98.5%、87.5%，92.2%、95.3%、88.7%，98.7%、99.5%、97.5%。MRI 3D－FFE 序列和增强扫描诊断神经鞘瘤准确性、敏感性、特异性差异无统计学意义（P >0.05），但 MRI 3D－FFE 序列联合增强扫描诊断神经鞘瘤的准确性高于单个检查方法(P<0.05).
结论：椎管内神经鞘瘤多见，常发生囊变，极易误诊为脱出髓核或其它囊性病变，MRI 3D－FFE 序列和增强扫描诊断神经鞘瘤各有优劣，两者联合应用可提高诊断效能。

PU-3033
胸骨侧位数字化 X 摄影的后处理研究

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[摘要] **目的** 研究数字化影像（DR）图像后处理在胸骨摄影中的应用价值。 **方法** 选取 32 部外伤怀疑胸骨骨折的病例，对胸骨侧位影像进行后处理，得到默认组和优化组两组图像，进行对比评价。 **结果**优化组图像在细节表现比默认组有明显提高。 **结论** 图像后处理能够提高胸骨侧位主观感受，提高图像质量。

PU-3034
站立位 X 线摄影与常规卧位诊断腰椎退行性滑脱对照性研究

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目的 研究站立位 X 线摄影与常规卧位诊断腰椎退行性滑脱对照性。**方法** 于 2015.6 月-2017.2 月间收治的 58 例腰椎退行性滑脱患者，按照检查方式不同划分为观察组与对照组各 29 例，观察组采用站立位 X 线摄影检查，对照组提供常规卧位检查，评价两组患者诊断结果。**结果** 观察组 29 例受检者中，诊断腰椎位移 22 例(75.86%)，对照组 29 例，诊断腰椎位移 14 例(48.28%)观察组结果优于对照组，（x^2=16.155，P=0.000)。观察组患者位移程度显示<3mm、滑脱程度分布均优于对照组

检查结果，（x^2=8.654，P=0.003）；（x^2=1.668，P=0.196）。**结论** 对腰椎滑脱患者提供 X 线检查期间，采用站立位，可如实、准确反应腰椎失稳、滑脱程度，为诊断提供依据。

PU-3035

关节游离体病变的影像学诊断

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【摘要】 目的：探讨关节游离体病变的影像学表现及诊断价值。方法：回顾性分析经临床手术或病理证实的游离体病变 51 例，观察病变的临床及影像学特点，其中 48 行 X 线检查,20 例行 CT 检查,25 例行 MRI 检查.结果：发生于膝关节 38 例，单侧 32 例，双侧 6 例。髋关节 3 例，踝关节 4 例，肩关节 4 例 ,肘关节 2 例。退行性骨关节病 16 例，滑膜骨软骨瘤病 10 例，,色素沉着绒毛结节性滑膜炎 7 例，剥脱性骨软骨炎 6 例，神经营养性关节病 5 例，骨坏死 3 例，关节面骨折 2 例，关节内血肿钙化 1 例，髌骨下关节囊钙化 1 例.影像学主要表现为关节间隙及周围见数量不等、大小不等的骨性高密度影。结论:关节腔内钙化或骨化的游离体病变病种虽多，但部分病变有一定的影像学特点，影像学检查可以诊断，CT 更能清晰的显示游离体的准确数量、分布范围和方位，MRI 可发现未钙化或骨化的游离体。

PU-3036

膝关节软骨 MRI 信号异常能否预测软骨形态学缺陷的进展情况

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目的 探讨首次检查 MRI 信号异常的关节软骨 18 个月后，关节软骨形态学缺陷的发病率，并与首次检查 MRI 信号无异常的关节软骨形态学缺陷的发病率进行比较。

材料与方法 本项研究符合 HIPAA 且获得伦理委员会批准。选取 90 例[平均年龄（55±8）岁；51%为女性] 3.0 T MR 成像中显示右膝关节存在软骨信号异常但无软骨形态学缺陷且影像上无骨性关节炎表现者（Kellgren-Lawrence 评分，0~1），再选取 90 例年龄、性别、Kellgren-Lawrence 评分、体质量指数相匹配的[平均年龄（54±5）岁；51%为女性]右膝关节 无 软骨信号异常及形态性损伤者。 根据中间加权快速自旋回波 MR 成像，异常信号（n=126）分为 4 个等级：A 级：低信号，B 级：不均匀信号，C 级：高信号，D 级：高信号伴肿胀。48 个月后，在一个关节间室水平，利用广义评估方程 logistic 回归模型比较两组之间的关节软骨形态学缺陷的进展情况（全器官 MR 成像评分≥2）。

结果 髌股关节的软骨信号异常发生率高于股胫关节（59.5%：39.5%）。A 级出现的概率较 C 级和 D 级高（36%:22%）。18 个月后首次检查出现信号异常的关节软骨中软骨形态学缺陷的发生率为 57%，然而，首次检查无信号异常的关节软骨中软骨形态学缺陷的发生率仅 4%（所有关节间室合并及每个关节间室分别评估，所有 P<0.01）。 不是任何级别的软骨信号异常均发展为关节形态学损伤（P=0.98），后者与骨髓信号异常的进展显著相关（P=0.002）。 结论 MR 成像上膝关节软骨信号异常是骨关节炎形态学缺陷的先兆征象，并可能成为评估关节软骨退变风险的影像生物学标志。

PU-3037

跟骨轴位单板 DR 拍摄新思路

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目的：现在很多医院没有双板 DR，大部分都是单板 DR，单板 DR 没有双板 DR 拍摄方便，要来回移动球管和探测器，而且有的体位要旋转球管，花费时间，特别是一些特殊位置，更要增加病人等待时间，所以我想通过想一些简单方便的体位来减少病人拍摄等待时间，提高工作效率。

方法：日常工作中就有这个跟骨拍摄，我和我同事通过平常做检查，可以用下面的体位检查来试验这几个体位设计，每个体位拍摄十次，以验证这些体位的准确性。
第一个设计体位是单腿离地法
第二个体位是起跑姿势位
第三个体位是坐凳子式
第四个体位常规位
结果：前三个位置是设计的，第四个位子是常规位，经过这四十次对比结果，发现这几个位置拍摄出来效果基本一致，都能达到基本诊断要求，其中第一体位图像质量和第四体位图像质量相近，第二体位和第三图像质量少差一点。但是都能达到诊断的基本条件。
结论：第一体位和第四体位图像质量比较好，第二体位和第三体位图像质量也能达到诊断基本要求。对于可以自由活动的患者，第一体位还比较容易实现，操作方便，基本都能用这个体位。对于一些跟骨骨折的患者还是考虑得用第四位或者第三体位。根据不同的患者来决定用哪种体位。

PU-3038

定量 CT 探讨年龄、腹部脂肪与骨密度的关系

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目的 采用定量 CT（QCT）探讨腹部脂肪、骨密度（BMD）随年龄变化的规律及腹部脂肪与 BMD 的相关性。 **方法** 选取低剂量胸部 CT 联合 QCT 检查的健康体检者共 2442 例，年龄为 30－90 岁，分为 5 个年龄段（30－39，40－49，50－59，60－69，70－90 岁）。采用 QCT 测量 L2 中心层面腹部总脂肪（TAT）、腹内脂肪（VAT）、皮下脂肪（SAT）及腰椎 BMD。统计分析各年龄段间 TAT、VAT、SAT、BMD 的差异性及 TAT、VAT、SAT 与 BMD 的相关性。 **结果** 50 岁后各年龄段男性 TAT、VAT 高于 30－39 岁男性，而 SAT 低于 30－39 岁男性（P<0.05）。50 岁后各年龄段女性 TAT、VAT、SAT 高于 30－39 岁女性（P<0.001）。无论男性还是女性：50 岁后各年龄段间 TAT、VAT、SAT 无显著性差异（P>0.05），均在 40－59 岁出现 VAT 明显增多（P<0.01），BMD 随年龄增长逐渐减低（P<0.001）。多元逐步回归方程显示 VAT 是女性 BMD（β=-0.089，P=0.007)而非男性 BMD 的独立影响因素，TAT、SAT 均不是 BMD 的独立影响因素。 **结论** 腹部脂肪和 BMD 随年龄发生变化，对 40－59 岁男性和女性应加强内脏型肥胖预防。VAT 可能是女性 BMD 的独立负性调节因素

PU-3039

寰枢椎骨质破坏性病变的 CT 及 MR 诊断

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目的：探讨寰枢椎椎体及附件骨质破坏性病变的影像学诊断，提高对造成寰枢椎骨质破坏病变的认识。**方法：**收集我院 2013 年 8 月至 2019 月 2 月经手术病理证实的寰枢椎椎体及附件骨质破坏的病例共 50 例，回顾性分析其 CT 及 MRI 检查的影像学表现。**结果：**45 例引起寰枢椎骨质破坏病变患者中，转移 15 例（平均年龄为 65.8±18.9 岁）,结核 12 例（平均年龄为 35.5±12.3 岁），嗜酸性肉芽肿 6 例（平均年龄为 23.8±8.5 岁），浆细胞骨髓瘤 5 例（平均年龄为 35.2±15.5 岁），脊索瘤 4 例，内生性软骨瘤 1 例，骨巨细胞瘤 3 例，动脉瘤样骨囊肿 3 例，骨母细胞瘤 1 例；骨质破坏发生在椎体者 16 例，齿状突 23 例，寰椎侧块者 12 例，寰椎前弓者 3 例，造成病理性骨折 19 例，寰枢椎关节脱位者 13 例，侵犯椎管 13 例，脊髓受压者 6 例，骨质破坏区可软组织肿块者 31 例，其中增强后出现强化者 25 例。**结论：**寰枢椎骨质破坏性病变主要可分为转移、结核及原发性

肿瘤，结核好发于年轻人，转移好发于中老年人，原发肿瘤与脊椎其它部位影像学表现相似，软组织肿块常见于浆细胞骨髓瘤及嗜酸性肉芽肿，膨胀性改变常见于内生性软骨瘤及骨巨细胞瘤，单纯性骨质破坏者鉴别困难。齿状突骨质破坏病变容易并发病理性骨折及寰枢椎半脱位，CT 及三维重建后处理易于显示骨质破坏及关节脱位，MRI 易于察骨质破坏区软组织、椎管受侵及脊髓受压，增强扫描对鉴别病变性质有意义。

PU-3040
461 例中老年男性 QCT 骨密度结果及相关因素分析

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摘　要

目的：了解中成年男性骨密度状况及相关影响因素。**方法：**对 461 例中年男性进行定量 CT 骨密度测量，收集受检者年龄、身高、体重、吸烟、饮酒、糖尿病病史，其中 137 例进行骨代谢生化指标检查，并对结果进行统计学分析。**结果：**与正常组相比，骨量减低骨质疏松组及严重骨质疏松组，年龄与骨量减低呈正相关，相对危险度分别为 1.107、1.163、1.174，其余影响因素无统计学意义；137 例骨代谢生化指标检查结果中，骨量减低组 PINP 值低于正常组（P<0.05）；骨质疏松组β-CXT、N-MID 及甲状旁腺素值大于正常组及骨质减低组（P<0.05）；正常组与骨质减低组间β-CXT、N-MID 及甲状旁腺素无显著性差异（P >0.05）。结论：QCT 可反映骨密度随年龄变化的趋势，其结果与骨代谢生化指标具有良好相关性。

PU-3041
正常胎儿标本颈、胸、腰段脊柱椎体骨化中心发育的磁共振研究

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背景和目的：胎儿脊柱测量在脊柱畸形的产前诊断中越来越重要，在评估脊柱病病变之前，必须了解胎儿脊柱在不同胎龄时的正常表现。本研究的目的是测量正常胎儿颈、胸、腰椎椎体骨化中心体积，研究其发育随胎龄的变化。

方法：采用 3D-T2WI 序列对 55 例 17～42 孕周胎儿标本进行磁共振成像，利用后处理工作站测量颈、胸、腰及 L1=L5 椎体骨化中心体积。

结果:颈、胸、腰椎椎体骨化中心体积随胎龄呈线性增大,颈、胸、腰椎椎体骨化中心体积发育无性别差异;腰椎单椎体骨化中心平均体积增长率和体积增长倍数均大于颈、胸单椎体骨化中心;L1-L5 椎体骨化中心体积随胎龄呈线性增大。

结论：颈、椎、腰椎和 L1-L5 椎体骨化中心体积与孕中晚期胎龄有较好的相关性。L1 椎体骨化中心容积的测量更能体现胎儿颈、胸、腰椎的发育，了解胎儿脊柱的正常发育情况是研究胎儿脊柱异常的必要条件。

PU-3042
肋骨畸形、脊柱畸形对 Poland 综合征的诊断价值

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目的：探讨体格检查时偶然发现的肋骨畸形（短小肋骨、叉状肋骨）、脊柱畸形（脊柱侧弯、椎体融合、半椎畸形、蝴蝶椎、Sprengel 畸形）对 Poland 综合征诊断的应用价值，提高对 Poland 综合征有相关联的其他畸形的认识，有助于提高对 Poland 综合征的诊断水平。

资料与方法：回顾性分析 5 例 Poland 综合征患者的异常体征，收集患者体格检查资料（DR、CT），分别观察胸肌、肋骨、肋软骨、胸椎、腰椎、骶尾椎、肩胛骨及四肢等情况。
结果：Poland 综合征患者胸大肌以缺如为主，胸小肌以营养不良为主。5 例患者除了双侧胸大肌缺如和（或）双侧胸小肌营养不良、翼状肩胛骨和肩关节前突和不同程度外展受限，双侧不同程度的背阔肌、斜方肌、前锯肌的发育不全及缺失、胸廓畸形、胸部和腋窝脱毛、乳房及乳头发育不全、皮下组织发育不全、不对称乳晕及手异常外还有一部分患者表现为其他畸形，本研究中包括肋骨畸形和脊柱畸形较为多见，本研究 5 例患者中，有 4 例存在脊柱侧弯：2 例脊柱侧弯合并叉状肋、1 例脊柱侧弯、短小肋骨畸形合并腰椎椎体融合、1 例脊柱侧弯合并胸椎椎体蝴蝶椎畸形；1 例单纯胸椎椎体蝴蝶椎畸形；3 例椎体半椎畸形：2 例胸椎椎体半椎畸形，1 例腰椎椎体半椎畸形；4 例患者胸肋缺失或发育不良；5 例患者肩关节前突和外展受限，其中 4 例患者肩关节外展受限严重（外展不大于 90 度）；骶尾椎以脊柱侧弯为主。
结论：Poland 综合征是非常罕见的胸壁及胸肌发育不良，并伴有多系统异常或畸形的综合征。体格检查中经常发现的畸形，包括肋骨畸形和脊柱畸形，特别容易被临床医生和影像医生忽视，认为是先天发育所致，临床极其容易漏诊，耽误诊断与治疗。故观察和总结 Poland 综合征相关联的其他畸形，对早期诊断、临床评价及治疗具有重要指导意义。

PU-3043

The application value of CT and MR contrast fistulography in evaluating the sinus/fistula

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Objective: To investigate the application value of CT and MR contrast fistulography in evaluating the sinus/fistula.

Methods: Twenty-five patients with sinus or fistula were enrolled and received CT contrast fistulography, MR contrast fistulography and sinus endoscopic exploration. CT and MR images were reconstructed with multiplanar reconstruction and maximum intensity projection to observe the morphology of sinuses/fistulas. Wilcoxon signed rank test was used to compare the number of sinus branches detected on CT/MR images with endoscope. Paired T-test compared the depth of sinuses/fistulas measured on CT/MR images with endoscope. Kappa test was used to assess the consistency between CT/MR contrast fistulography and endoscopic exploration in diagnosing sinus/fistula involving body cavity. Using the result of endoscopic exploration as golden standard, we also calculated the sensitivity, specificity and consistency rate of MR images in detecting the pathological features at deep part of sinus/fistula.

Results: In 22 cases of sinuses and fistulas, 11 were demonstrated as pipeline-shaped, 8 were Y-shaped, 2 were cavity-shaped, and 1 was crab-shaped. CT and MR contrast fistulography clearly showed the morphology of sinuses and fistulas clearly. Compared

with endoscope, there was no significant difference of CT (P=0.500) and MR images (P=0.125) in detecting sinus branches. The depth of sinuses/fistulas on CT and MR images was 5.00±1.42cm (P=0.714) and 5.45±1.42cm (P=0.433), respectively, indicating no significant difference with endoscopic exploration. The detection rate of sinus/fistula involving body cavity was 92.9% and 62.5% for CT and MR images, with a Kappa value of 0.904 and 0.526,respectively. The sensitivity, specificity and consistency of MR images was 83.3%、89.5% and 88.0% for detecting involving bone at deep part of sinus/fistula , 83.3%、84.2% and 84.0% for detecting formation of fibroplasia pate at deep part of sinus/fistula, 37.5%、94.1% and 76.0% for detecting effusion at deep part of sinus/fistula.

Conclusion: CT and MR contrast fistulography can effectively evaluate the morphology, depth, branching and the deep feature of sinus/fistula, indicating significant application value in diagnosis and treatment of sinus/fistula.

PU-3044

x 线容积成像在膝关节隐匿性骨折检出上的价值

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目的：通过与 X 线摄影平片比较评价 X 线容积成像在膝关节骨折检查上的应用价值。
方法：使用 GE XR656 型号 DR 对 68 名膝关节外伤的患者行 X 线平片检查，在其同意的情况下再对其行 X 线容积成像检查，分别评价两种检查结果的骨折检出率。
结果：X 线容积检查的骨折检出率大于普通 X 线平片。
结论：X 线容积检查在膝关节的检查过程中有着价格低廉，图像成像清晰，骨折检出率高的优势，对于膝关节隐匿骨折的检查有很大的价值

PU-3045

基于 MRI 生理学成像定量在膝骨关节炎早期诊断及软骨损伤分级中的应用

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【摘要】 **目的** 探讨 MRI 生理学成像定量技术在膝骨性关节炎早期诊断的临床价值，并分析生理学定量 T2 值与软骨损伤分级的关系。**方法** 收集 2018 年 1 月至 2019 年 5 月期间我院诊断为膝骨性关节炎（KOA）患者 49 例作为观察组，另选取与观察组年龄段相匹配的 35 名健康志愿者作为正常对照组，所有受检者均在 Siemens Skyra 3.0T 超导型磁共振给予膝关节常规 MRI 扫描+T1/T2 mapping 成像。根据国际软骨修复协会(ICRS)标准对关节软骨退行性变进行分级，将观察组分为轻度 KOA 组和重度 KOA 组，在西门子 syngo MRE11 工作站对扫描所得图像进行后处理，利用 Functool 软件包生成 mapping 伪彩图，分别测量股骨及胫骨平台内外侧髁、髌骨共 5 处软骨的 T1 值和 T2 值。采用 SPSS 22.0 及 EXCEL 统计学软件进行统计学分析作图，比较正常对照组、轻度

KOA 组、重度 KOA 组生理学定量值的差异及生理学定量 T2 值与软骨损伤级别的相关性。**结果** 轻度 KOA 组、重度 KOA 组平均 T1 值、T2 值均高于正常对照组相应软骨区域，差异有统计学意义(P <0.05)；重度 KOA 组关节软骨 T2 值高于轻度 KOA 组相应各亚分区，差异有统计学意义(P <0.05)；重度 KOA 组关节软骨 T1 值高于轻度 OA 组各亚分区，但差异无统计学意义(P >0.05)；T2 值与软骨损伤分级呈正相关(r=0.695，P<0.05)。**结论** 膝关节软骨损伤早期表现为 T1 值和 T2 值延长，MRI 生理学成像定量可以发现无明显形态学改变的早期损伤，为临床早期诊治骨性关节炎提供依据；同时 MRI 生理学定量成像技术作为一种无创、准确评估软骨早期退变的工具可反映 KOA 患者病情程度分级，有助于膝关节软骨损伤的级别判定。

基金项目：湖北省卫生健康委项目（WJ2019M050）、十堰市科技局科研项目（18Y50）

PU-3046

青少年型骨质疏松的背后：一个成骨不全家系的 QCT 表现及基因突变筛查

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【摘要】 **目的** 筛查 1 个成骨不全(osteogenesis imperfecta,OI)家系中基因突变、骨密度、影像表现与临床表型的关系。 **方法** 收集先证者及家系成员 3 代共 13 人临床资料, 采集先证者、随诊家属的外周血标本、QCT 结果和 x 线影像资料。分析筛查基因突变,基因测序确定突变位点，骨密度改变和影像学特征。 结果 PCR—HRM 分析显示,先证者和其后代 COL1A1 基因第 33 外显子结果异常，测序结果提示,先证者 COL1A1 基因第 33 外显子 C.516delC,移码突变,导致此后第 173 位氨基酸提前出现终止密码子(UAA)，即 P.（Gly173fs）杂合突变，先证者之女基因测序均具有相同的突变位点，其余家系成员无此突变。该突变位点在人类胶原突变数据库中未见报道。家系图谱显示为常染色体显性遗传,先证者及家系患者临床诊断均为 I 型 OI。先证者及其女 QCT 均显示为骨质疏松，骨量分别为 75mg/cm^2 、70mg/cm^2 ，先证者 x 线表现为桡骨及尺骨鹰嘴骨折，少许骨痂形成不愈合，骨皮质稍菲薄，骨小梁稀疏，其余家系成员 QCT 结果和影像检查均未见异常。结论 成骨不全 COL1A1 基因 C.516delC 为新的突变位点，临床表型较轻。QCT 诊断青年型骨质疏松较敏感，对于早期提示表型较轻的成骨不全有一定意义，反复骨折并骨折难以愈合为 I 型 OI 影像特点。

PU-3047

The relationship between breast density, age and mammographic lesion type among Chinese breast cancer patients from a large clinical dataset

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Objective: The purpose of this study was to investigate the relationship between breast density, age and mammographic lesion type among Chinese breast cancer patients from a large clinical dataset.

Materials and Methods: A retrospective review of mammographic images from a total of 9716 breast cancer patients imaged between July 2014 and June 2017 were conducted.

Mammographic breast density was defined according to ACR's BI-RADS 4-class density rating. Mammographic lesion types were defined according to ACR's BI-RADS, including mass, mass with calcifications, calcifications, architectural distortion/asymmetries, and architectural distortion/asymmetries with calcifications. All mammograms were interpreted by three experienced breast radiologists. The chi-square (χ^2) test and Pearson correlation analyses were performed to assess the relationship between breast density, age, and mammographic lesion type.

Results: There was a significant inverse relationship between BI-RADS breast density rating given by radiologists and patient age overall ($r=-0.521$, $p<0.01$). The distribution of breast density in breast cancer patients from China reversed at 55 years old, and showed one age peak for 55-59 years group. The percentage of lesions with calcifications decreases with increasing age ($p<0.01$), and increases with increasing breast density ($p<0.01$).

Conclusions: In general, we found there is a relationship between patient breast density, age and mammographic lesion type. It may provide the basis for clinical diagnosis and screening program of breast cancer in China.

PU-3048

乳腺三阴性导管原位癌的 X 线及超声表现

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目的：分析乳腺三阴性导管原位癌的 X 线及超声表现,提高术前诊断的准确性。
方法：经手术、病理证实的乳腺三阴性导管原位癌 11 例, 三阴性原位癌伴微浸润 6 例,回顾性分析其 X 线及超声表现。
结果：(1)X 线表现多样：微钙化 5 例,肿块 3 例，局限不对称密度 3 例,结构扭曲 2 例,阴性 1 例.(2)微钙化特点为区段性分布小圆形钙化为主，部分伴有杆状及线状钙化.(3)超声主要表现为肿块，形态不规则、边缘模糊、血流丰富，部分伴强回声光点。
结论：乳腺三阴性导管原位癌的 X 线及超声表现有一定特征,在一定程度上可为临床治疗方法的选择提供参考。

PU-3049

Association of the differences in average glandular dose with breast cancer risk

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Purpose: To compare the average glandular dose (AGD) difference between both breasts of healthy subjects and breast cancer patients and further to investigate whether the addition of AGD difference improves cancer classification and evaluate its association with breast cancer risk.

Methods: This study was conducted by collecting full-field digital mammography (FFDM) images including CC view and MLO view from 1005 healthy subjects (BI-RADS category I or II for both breasts) and 475 unilateral breast cancer patients (proved by biopsy and the contralateral side of BI-RADS category I or II). The data set was divided into a training set and a test set. AGD differences between both breasts of healthy subjects and cancer patients were calculated, respectively. Odds ratio (OR) was used to assess the association between AGD difference and breast cancer risk. Multivariate logistic regression analysis was used to build the model and the receiver operating characteristic area under the curve was used for model estimation. Another 57 subjects undergoing screening FFDM (BI-RADS category I or II for both breasts) who received a diagnosis of unilateral breast cancer subsequently at least 1 year later were recruited for validation.The controls included 93 healthy subjects who had cancer-free follow-up for at least 3 years.
Results: The AGD differences of CC and MLO views from cancer patients were significantly higher than healthy subjects ($p<0.001$). The OR of CC view was 9.463 ($p<0.001$) and MLO view was 7.566 ($p<0.001$). The logistic regression model had an Az value of 0.83±0.03 for the training set and an Az value of 0.80±0.03 for the test set. The model without AGD difference had Az values of 0.64±0.04 and 0.63±0.03 for the training set and the test set, respectively. The model with AGD difference as an additional factor was significantly improved cancer classification ($p<0.001$). No significant AGD differences were found on twice follow-up CC or MLO views of healthy subjects. While for cancer patients, higher AGD differences were found on CC ($p=0.042$) and MLO ($p=0.021$) views when compared with their previous healthy breasts.
Conclusion: The proposed AGD difference between both breasts demonstrated a strong association with breast cancer risk and has the potential to serve as an independent factor for risk prediction.

PU-3050

FFDM 联合超声对第二乳腺癌相关因素的探索

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目的：探讨不同的乳腺癌筛查方法是否与筛查检测的 DCIS 患者不同的生存结果有关，并评价与第二次乳腺癌相关的临床病理和影像学因素。
材料和方法：选取 2013 年 7 月至 2019 年 7 月间，在本机构中确诊为 DCIS 并接受手术治疗的患者，她们最初在乳腺 X 线筛查或 US 检查中发现病灶。评估总生存率(OS)和无病生存率(DFS)。用多变量 Cox 比例风险回归分析发现与第二乳腺癌(浸润性癌或 DCIS)相关的因素。根据筛选方法对各亚组进行分析。
结果：包括 814 名妇女(中位年龄 47 岁；年龄范围 25-81 岁)，627 名为接受了乳房 X 线检查检测的 DCIS(乳腺 X 线检查组)，187 名为接受了 US 检测 DCIS 的筛查(US 检查组)。随访期间(中位 4 年，间隔 2~6 年)，发现 26 例同侧和 26 例对侧第二乳腺癌(6.4%，占 814 例中的 52 例)，乳腺 X 线检查组 44 例，超声检查组 8 例。总体 5 年 OS 和 DFS 率分别为 100%和 95.3%.DFS 率在筛查方法上无显着性差异(P=.21，乳腺 X 线检查组为 94.9%，US 检查组为 96.5%)。在乳腺 X 线检查组，级别高(中等级别：危险度[HR]，5.7；95%可信区间[CI]：1.3，24.3；P=0.02)(高级别：HR，8.0；95%CI：1.9，34.2；P=.01)和致密乳腺(HR，3.5；95%CI：1.1，11.4；P=0.04)与第二次乳腺癌相关。在 US 检测组，HER-2 阳性与第二乳腺癌相关(HR，9.2；95%CI：2.2，38.5；P=.002)。

结论：接受导管原位癌筛查治疗的患者，其无病生存率在筛查检测方法上无差异。在筛查乳腺 X 线检出 DCIS 的患者中，级别较高、乳腺致密的患者与第二乳腺癌有关；在筛查经超声检测的 DCIS 的患者中，人表皮生长因子 2 阳性与第二乳腺癌有关

PU-3051
基于 FFDM 评价 DBT 联合 CAD 对乳腺病变诊断的应用价值

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目的：评价数字化乳腺断层摄影及计算机辅助侦测对乳腺病变的临床诊断价值。
方法：收集我院经病理证实且术前均行 DBT 和 FFDM 检查的 119 例连续病例，共 131 个乳腺病变，进行回顾性分析。以病理诊断为金标准，其中乳腺良性病变 69 例，恶性病变 62 例。采用 Combo 自动曝光模式，获得二维乳腺图像和断层图像。由两位高年资放射科医师对所有病例的 FFDM 图像和 DBT 图像进行回顾性分析并记录结果。运用 SPSS23.0 统计软件进行统计学分析。
结果：（1）在 131 个乳腺病灶中，DBT、FFDM+DBT、FFDM+CAD 和 FFDM+DBT+CAD 的敏感性均比 FFDM 的高（P＜0.005），FFDM+DBT 和 FFDM+DBT+CAD 的特异性高于 DBT（P＜0.005），其余各组间敏感性和特异性比较，差异均无统计学意义。FFDM、DBT、FFDM+DBT、FFDM+CAD 和 FFDM+DBT+CAD 的 Kappa 系数分别为 0.462、0.623、0.757、0.636 和 0.848(P 值均＜0.001)，ROC 曲线下面积分别为 0.730、0.816、0.882、0.820、0.926。（2）在 ACR(3+4)中，DBT、FFDM+DBT、FFDM+CAD 和 FFDM+DBT+CAD 的敏感性均比 FFDM 的高（P＜0.005），FFDM+DBT+CAD 的特异性高于 DBT（P＜0.005），其余各组间敏感性和特异性比较，差异均无统计学意义。在 ACR(3+4）组中 FFDM+DBT+CAD 的 ROC 曲线下面积分别为 0.933，其诊断结果均和病理结果具有高度一致性(P 值均＜0.001)。在 ACR(1+2）组中 FFDM 联合应用 DBT 和或 CAD 的诊断效能相仿。
结论：DBT 和 CAD 对乳腺病变诊断有临床应用价值，FFDM、DBT 和 CAD 三者联合在致密型腺体组中诊断效能最好。

PU-3052
隐匿型乳腺癌的多种影像诊断价值及探讨

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目的：研究和评价早期隐匿性乳腺癌的乳腺钼靶，多普勒 B 超及 MRI 的诊断应用价值。
材料和方法：一例无疼性无意发现右乳腺内小肿块患者，年龄 45 岁，来我院经门诊乳腺大夫触诊于乳晕后外方触及较小肿块，活动度可，质地中等。摄双侧钼靶片考虑为右侧乳腺良性肿瘤可能，进一步 B 超检查考虑右侧乳腺肿瘤，恶性可能，再行 MRI 检查考虑乳腺癌可能。
结果：该患者钼靶片见双乳为致密型乳腺，见右乳外中象限较左侧乳腺不对称性密度稍增高影，边缘不清，无明显钙化，无明显分叶改变。再行彩超检查，发现患者右侧乳腺散在二处形态欠规则，内部回声不均匀低回声区，与周围组织分界较清楚，无包膜，有较丰富的博动性血流，腋窝末及肿大淋巴结。最后行 MRI 检查，患者右乳腺内外中可见较明显三个小结节状影，肿块边缘清楚，分叶改变明显，与周围腺体组织境界分明，增强扫描肿块强化明显，动态扫描行时间一信号曲线，为快速增高，快速减低，符合恶性肿瘤特征。该患者行右乳全切术病理结果为乳腺癌。病理类型分别为粘液腺癌及浸润性导管癌。

结论：钼靶是发现及诊断乳腺病变的最简便和重要有效的方法，但是对早期隐匿性乳腺癌的诊断仍需辅助其它检查。B 超对早期肿瘤及致密型乳腺更能良好的显示肿块内部及周边的血流信号，年轻女性及腺体丰富缺乏对比的患者，B 超应为首选检查。MRl 对隐匿性乳腺癌的诊断及检出率明显更高于钼靶及 B 超，但因其价格昂贵，仅作辅助检查，不能作为常规普查。

PU-3053

500 例白领女性乳腺疾病 X 线摄影普查诊断分析

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目的对白领女性来我院进行乳腺疾病普查，了解乳腺疾病发病特点。

方法用问诊（既往史、用药史、生育哺乳史、家族史等）、触诊、乳腺 X 线摄影等检查方法对 2015 年 3 月到 2016 年 7 月 500 例白领女性进行普查，分析各乳腺疾病、各年龄阶段患者的发病情况。

结果 500 例白领女性共 438 例合并乳腺增生等乳腺疾病，患病率为 87.6%。其中乳腺增生、乳腺肿块例数分别为 157 例、112 例，患病率分别为 31.4%、22.4%。乳腺增生患病率明显高于乳腺肿块,疾病间存在显著性差异(P<0. 05)。20-29 岁、30-39 岁,40—49 岁、50 岁以上年龄组女性患病率分别为 4%、22.92%、49.68%、22.92%。40～49 岁年龄组女性乳腺增生患病率明显高于 50 岁以上组，组间存在显著性差异(P<0. 05)。乳腺增生患病率随女性年龄的增加而有降低趋势。

结论白领女性乳腺疾病发生率较高，主要为乳腺增生、乳腺肿块。由于白领女性身负家庭和事业的双重角色，面临竞争压力、工作繁忙、心情压抑、生活不规律、应加强乳腺疾病的普查工作，不放过蛛丝马迹，对可疑病例及早防治。

PU-3054

18F－FDGPET－CT 与 SPECT 骨显像在乳腺癌骨转移的诊断价值对比研究

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目的
对比分析了 18 F－FDGPET－CT 骨显像与 99 Tcm －MDP SPECT 骨显像对乳腺癌相同位置骨转移病灶的诊断价值。研究 18 F－FDGPET－CT 诊断恶性乳腺癌骨转移的临床应用价值。
方法对 14 例乳腺癌患者短期内行 18 F－FDGPET－CT 及 99 Tcm－MDP SPECT 显像，结果以 其它影像学检查和临床手术病理及随访结果为诊断依据。
结果 14 例乳腺癌患者中， 最终诊断 6 例患者出现骨转移，18 F－FDGPET－CT 显像发现全部骨转移患者，99 Tcm－MDP 诊断骨转移 4 例。18 F－FDGPET－CT 显像与 SPECT 显像共发现转移病灶 73 个， 其中 18 F－FDGPET－CT 显像发现全部转移病灶， 敏感性 100%， 特异性 93%， 准确性 99%。 SPECT 骨显像发现骨转移病灶敏感性 96%， 特异性 72%， 准确性 90%。

结论
检查乳腺癌骨转移， 18 F－F D G P E T－C T 显像的敏感性、 特异性、 准确性均高于 SPECT 骨显像。

PU-3055
基于深度学习的乳腺数字化 X 线 BI-RADS 密度分类的研究

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目的：为了确保基于 ACR BI-RADS 乳腺 X 线密度评估的一致性和准确性，本研究构建基于深度学习的乳腺数字化 X 线密度的自动分类模型，使之达到对乳腺密度的精准分类。
方法：在研究中，构建并优化基于深度学习的卷积神经网络（CNN）的经典模型 ResNet 50。收集本院于 2015 年 8 月至 2018 年 2 月间行全数字化乳腺摄影图像 18152 幅，由两位有经验的放射科医师根据 ACR BI-RADS 标准对图像的乳腺密度进行评估。各自经微调的分类模型分别在小数据集（4000 幅）和原始数据集（18152 幅）对乳腺密度的分类进行评估，得到相应的分类准确性，以受试者工作特性曲线和曲线下面积评估模型的分类性能。
结果：CNN 模型在小数据集训练时，各类的分类准确性分别为 a 类 91%、b 类 86%、c 类 84%、d 类 90%；当在原始数据集训练时，a 类和 d 类的分类准确性无明显变化，b 类和 c 类的准确性分别为 89%、88%，随着数据量的增加，准确率明显提高，比较 AUC 发现分类性能明显改善。
结论：基于深度学习的卷积神经网络（CNN）分类模型能以较高的准确率对乳腺密度进行分类，在临床工作中，可协助放射科医师对乳腺密度进行准确、一致的分类。

PU-3056
数字乳腺摄影与彩色多普勒超声成像及两者联合应用在乳腺疾病诊断中的价值

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本文旨在比较和评价乳腺 X 线摄影检查和超声成像及两者联合应用在乳腺疾病诊断中的价值。
方法：2009 年 3 月-2009 年 5 月期间的住院患者中随机抽取 100 例，术前分别进行了数字化乳腺摄影和彩色多普勒超声检查且经手术病理证实。乳腺超声资料和乳腺 X 线片先分别由超声科和影像科医生独立进行分析诊断，记录诊断结果。再对两者进行综合分析做出联合诊断，其标准为：对同一病灶如两种方法诊断结果不同时，以分级高者为最后诊断。然后将三种检查结果与病理诊断对照。诊断结果分为以下 2 类：（1）符合（包括正确的良性、恶性、可疑良性和可疑恶性诊断）；（2）误诊或漏诊。应用 SPSS13.0 软件包，采用卡方检验，计算并比较乳腺超声、数字化乳腺摄影和两者联合应用对全部病变诊断的准确性、敏感性、特异性、阳性预测值和阴性预测值。
结果：100 例患者中共发现病灶 112 个。经手术病理证实：良性病变 28 个，位于左乳 13 个，右乳 18 个；恶性病变 84 个，位于左乳 36 个，右乳 48 个。数字化乳腺摄影、彩色超声对乳腺疾病诊断的准确性、敏感性、特异性、阳性预测值、阴性预测值分别为 95.53%、95.18%、96.55%、98.75%、87.5%和 86.61%、93.85%、70.59%、87.95%、82.76%。两者的准确性、敏感性、特异性均有显著性差异（P<0.05），数字化乳腺摄影优于彩色超声检查。两者联合诊断的敏感性、准确性、特异性、阳性预测值和阴性预测值分别为 97.62%、98.21%、100%、100%和 93.33%，均高于两

项检查的各值。但数字化乳腺摄影漏诊 4 例、误诊 1 例；彩色超声漏诊 5 例、误诊 10 例；联合诊断漏诊 2 例，没有误诊。
结论：超声成像和乳腺 X 线摄影是两种不同成像原理的影像检查方法,具有各自的优势。利用两者优势互补联合诊断，能够提高乳腺疾病诊断的准确率，达到比较满意的临床效果，是目前乳腺影像学检查的黄金组合。

PU-3057
同步辐射衍射增强成像技术检测人离体乳腺癌的实验研究

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目的：探讨同步辐射衍射增强成像(DEI)技术在人离体乳腺癌标本中的应用。**方法：**15 例乳腺癌标本经 4%福尔马林溶液固定后，在北京同步辐射装置(Beijing synchrotron radiation facility，BSRF)的 4W1A 束线 X 射线成像站进行同步辐射衍射增强成像，最后行病理学检查，将所得影像学资料与病理学资料进行对比研究。**结果：**15 例标本均获得了良好的衍射增强图像，均可清晰显示病变组织与正常组织，其中 3 例标本中可见钙化灶，同一样品在摇摆曲线不同位置获得不同的图像，所有的衍射增强图像均具有较高的空间分辨率和衬度分辨率。**结论：**同步辐射衍射增强成像技术具有很高的衬度分辨率和空间分辨率，可清晰观察肿瘤内部组织特征和空间分布，而且其采用的折射成像机制，可以有效的减少 X 射线对人体的辐射损伤，具有良好的基础医学应用前景。

PU-3058
The Value of Mammography Radiomics for Preoperative Prediction of Axillary Lymph Node Metastasis in Breast Carcinoma

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Purpose: To investigate whether quantitative radiomics features extracted from cranial caudal (CC) view of mammogram are suit for preoperative accurate prediction of axillary lymph node (ALN) metastasis in invasive breast cancer. **Methods:** A total of 216 women patients with breast carcinoma lesions confirmed by surgical pathology were divided into primary cohort (n=144) and validation cohort (n=72). Radiomics features were extracted from CC view mammogram, and feature selection was performed using the methods of ANOVA F-value and Least absolute shrinkage and selection operator (LASSO); then a radiomics signature was constructed with support vector machine (SVM). The clinicopathological features model and the integrated model of radiomics signature and clinicopathollogical factors were constructed using the multivariate logistic regression. The integrated model was also presented as the radiomics nomogram. The four predictive models, including mammography (MG), radiomics, clinicopathological features model and the nomogram, were compared, and the performance is expressed as

the sensitivity, specificity, accuracy and area under the receiver operating characteristic (ROC) curve (AUC). **Results:** 95 of 216 breast cancer patients had ALN metastasis confirmed by surgical pathology, and 52 cases were diagnosed as metastatic ALNs based on MG-reported criteria on mammograms. The sensitivity, specificity, accuracy and AUC value of MG, radiomics, clinicopathological features model and the nomogram were 42.7%, 90.8%, 24.1% and 0.666(95% confidence interval [CI]: 0.591-0.741), 75.00%, 77.08%, 76.39% and 0.862(95%CI: 0.822-0.896), 45.83%, 85.42%, 72.22% and 0.657(95% CI: 0.590-0.708), 75.00%, 81.25%, 79.17% and 0.863(95%CI: 0.821-0.897), respectively. **Conclusion:** Quantitative radiomics features of breast tumor extracted from CC view of mammogram and the nomogram are helpful for preoperative accurate predicting ALN metastasis.

PU-3059

乳腺 X 线影像组学方法预测乳腺癌腋窝淋巴结转移的初步研究

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目的 探讨基于乳腺 X 线影像组学方法预测乳腺癌腋窝淋巴结转移与否的价值。**方法** 收集 214 例病理证实为浸润性乳腺癌的术前 X 线图像资料，分成训练集(n=153)和验证集(n=61)；所有患者均行腋窝淋巴结清扫或前哨淋巴结活检手术评价腋窝淋巴结状态。对所有患者的乳腺 X 图像进行病灶分割、图像高维特征提取；采用 LASSO 回归算法筛选与乳腺癌腋窝淋巴结转移有关的组学特征，构建淋巴结转移预测模型；使用 10 折交叉验证的方法对模型的预测能力进行验证。分析临床模型及其联合组学模型对腋窝淋巴结转移的预测效能，并应用受试者工作特征(ROC)曲线下的面积(AUC)来量化预测的准确性。**结果** ⑴ 每例患者均获得 360 个高维组学特征，包括 CC 位和 MLO 位图像各 180 个组学特征。应用 LASSO 回归模型分别从 CC 位图像、MLO 位图像和 CC+MLO 位图像的高维特征中依次筛选出 3、9 和 7 个组学特征。本研究中单独乳腺 X 线 CC 位及 MLO 位图像的影像组学特征预测腋窝淋巴结转移的效能均不如 CC+MLO 位图像，其 AUC 值分别为 0.680、0.723 和 0.740。⑵ 214 例乳腺癌患者中，病理证实腋窝淋巴结转移者 99 例，无腋窝淋巴结转移患者 115 例；分析二者在年龄、病灶大小、病理学分级、ER、PR、HER2 及 Ki-67 等方面的差别，仅病灶大小在二者有统计学意义(p=0.010)。⑶ 单独组学特征预测腋窝淋巴结转移的效能明显高于较临床模型，AUC 值分别为 0.740 和 0.558，而二者联合后预测效能较单独组学特征预测效能稍减低(AUC 值: 0.714 vs. 0.740)。**结论** 乳腺 X 线图像组学特征可术前定量预测乳腺癌腋窝淋巴结是否发生转移，但仍需扩大样本量进一步验证。

PU-3060

Breast cancer and angiogenesis with synchrotron radiation

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Purpose: To evaluate the privilege of the synchrotron radiation (SR) in-line phase-contrast imaging on human breast tumors.

Materials and methods: Eighty-four excised human breast specimens were studied. Monochromatic SR in-line phase-contrast images were obtained at the beamline BL13W of the SSRF in China at the energy of 13~16 keV, and 0cm, 60cm, 100cm and 120cm different sample-detector distances. Meanwhile, we progressed 3D image angiogenesis reconstructions. Moreover, for comparison, conventional mammograms were taken. Finally, the pathology results were confirmed.
Results: The images obtained with SR had higher contrast and better resolution than traditional mammograms and demonstrated excellent details in all cases studied. Moreover, 3D image reconstruction of breast tumor angiogenesis was obtained for the first time without using any contrast agents.
Conclusion: Synchrotron radiation mammography was much better and much detailed than traditional mammography, and might be a great potential diagnostic tool in clinical application in the future.

PU-3061

Mammographic imaging in diagnosis of benign and malignant male breast lesions

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Purpose: Our study aimed to evaluate the mammographic characteristics and enhance radiologists' acquaintance between benign and malignant male breast lesions.
Methods: Patients with male breast lesions detected by preoperative mammography were enrolled in this study. All lesions were identified by biopsy and classified into benign group and malignant group. Imaging features were recorded and analyzed by statistical methods.
Results: A total of 93 men(median age: 61, rang 32 to 81) were enrolled, 40 men were in benign group and 53 men were in malignant group. Advanced age was common in malignant lesions(p=0.014). A mass with calcification was more likely to be malignant than mass or asymmetry(p=0.0142). A mass eccentric to a nipple, distinct margin, high density were significantly related to malignancy(p<0.001, p=0.033, p=0.047). In addition, nipple retraction and enlarged lymph nodes were increased the risk of malignancy(p<0.001, p=0.041).
Conclusion: Mammographic characteristics have significant differences and promote diagnostic accuracy between the benign and malignant male breast lesions.

PU-3062

数字乳腺断层摄影在乳腺疾病诊断中的临床研究

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目的 通过比较全数字化乳腺 X 线摄影（FFDM）与 FFDM 结合数字化乳腺断层摄影（DBT）这两种方法在乳腺病变诊断中的差异，探讨 DBT 在乳腺疾病影像诊断中的应用价值。**资料与方法** 搜集本院

2017 年 1 月至 2017 年 5 月期间在我院同时进行过 FFDM 和 DBT 检查，检查后经病灶穿刺活检或手术病理证实的患者 87 例作为研究样本。对基本病变的影像特征显示清晰度、同一病例 FFDM 与 FFDM 结合 DBT 的诊断符合率、BI-RADS 分类准确性、FFDM 结合 DBT 较 FFDM BI-RADS 分类结论发生的改变进行统计学分析，得出两种检查方法之间的差异，P＜0.05 为差异有统计学意义。**结果** FFDM 与 DBT 对各病例乳腺基本病变影像特征显示清晰度、诊断符合率、BI-RADS 分类结论准确性、BI-RADS 分类结论存在的差异均有统计学意义。**结论** FFDM 结合 DBT 对乳腺基本病变的影像特征显示更加清晰，可以提高乳腺病变的检出率、与病理诊断的符合率，对乳腺病变的 BI-RADS 分类级别更准确，对进一步确定乳腺良、恶性病变性质较 FFDM 有明显优势，可以减少 BI-RADS 0 类诊断。

PU-3063

乳腺叶状肿瘤影像表现与病理对

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目的 探讨超声、X 线钼靶摄影、MRI 检查对乳腺叶状肿瘤的诊断价值，并与病理对照提高乳腺叶状肿瘤的诊断水平。**方法** 回顾性分析经手术病理证实的 32 例乳腺叶状肿瘤超声、X 线钼靶摄影和 MRI 影像表现，并将三种检查方法分别进行对照分析，比较各自优势。**结果** 32 例乳腺叶状肿瘤中病理良性 19 例，交界性 10 例，恶性 3 例；X 线钼靶诊断：叶状肿瘤 13 例，准确率 40%（13/32）；X 线表现：以不规则形＞10cm 的高密度肿块为主 47.87%（15/32），肿块边缘光整见分叶，部分见晕环征为主要表现；超声诊断：乳腺叶状肿瘤 15 例，准确率 43%（15/32）；超声表现：肿块周围见丰富的供血血管 96.4%（27/28），血流分级以 III 级为主，动脉阻力指数（RI）及收缩期峰值流速（Vmax）明显升高；MRI 诊断：乳腺叶状肿瘤 27 例，准确率 84%（27/32）；MRI 表现以囊变、坏死及出血为主 84.37%（27/32），以裂隙性囊变及压脂 T2WI 分隔不强化为主要特征。**结论** 超声、X 线钼靶及 MRI 在叶状肿瘤的诊断中，各自有特征性及局限性，三种检查结果互补，可提高乳腺叶状肿瘤的诊断率。

PU-3064

人工智能乳腺 x 线密度评估新方法:探索一种更有效的人工智能模型用于临床

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目的：验证现有乳腺密度评估 AI 模型的效能，进一步探求更适用于临床的深度学习(DL)算法。方法：从 2018 年 11 月-2019 年 2 月，每周随机抽取 50 人份病例，最终收集 637 例 2548 张钼靶片子（除去做过单乳切除的病人）。由四位有 5 年以上乳腺钼靶诊断经验的医生进行独立密度评价，之后统一评价结果获得测试集金标准。同时，由 AI 模型输出腺体评价分析结果，该模型是基于 ResNet-18 神经网络构建的，收集医生对多中心多钼靶机型 22000 名女性的 80156 张钼靶图像的密度评价结果训练得到。与以往文献里报道的测试方法不同的是，4 名医师分别对每个患者的乳腺密

度评价 7 次，包括双乳总体、右乳总体、左乳总体、右乳 CC、右乳 MLO、左乳 CC、左乳 MLO。AI 模型也分别输入相应的图像获得 7 次密度评价结果。
结果：AI 与医师评价准确率都较高，均在 0.77 以上，其中 AI 对单张片子评价准确率最高。以单张片子为入口，AI 与医师人工评价的准确率及一致性相近（κ = 0.675; 95% CI: 0.648,0.702），差异无统计学意义；以单侧乳房或以整个病人为入口，AI 评价的准确率及一致性均略差于医师评价，且差异有统计学意义(κ = 0.559 vs 0.718; κ = 0.667 vs 0.751)；AI 对单张乳腺 X 线片子密度评价的准确率及一致性近似于双乳总体评价，且较优(κ = 0.674; κ=0.667)，而对于单侧乳房评价效能不如对单张片子及双乳总体评价效能(κ=0.599)。对于医师对单张乳腺、单侧乳房及双乳总体密度评价的准确率及一致性逐渐升高(κ= 0.696; 0.718;0.751 respectively)；此外，我们发现 AI 对 CC 位评价准确率及一致性(κ= 0.698)高于 MLO 位(κ= 0.650)，而医师人工评价则差异不明显。
结论：该 DL 模型可用于乳腺密度评估，但若中和了人为逻辑性，评价准确度及一致性会更高。

PU-3065
乳腺癌 DBT 征象与不同分子亚型之间的相关性研究

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目的：本研究通过回顾性分析术后病理确诊的乳腺癌病例，研究乳腺癌分子分型与 DBT 征象之间的相关性，以期在术前通过影像表现来预测乳腺癌的分子分型，从而对临床治疗和预后评估起到一定的指导作用。
方法：收集本院 2017 年 1 月至 2019 年 6 月手术后病理证实为乳腺癌的病例。观察乳腺病灶类型，肿块形态、边缘，钙化形态、分布等。本研究共收集女性病例 260 例，年龄 24~87 岁，其中 5 例患者为双侧发病，因此共 265 例病灶，其中左侧乳腺病变者 135 例，右侧病变者 130 例。运用 SPSS 24.0 统计软件进行统计学分析，采用卡方检验比较各分类变量间的差异性。
结果：
1.乳腺癌各分子亚型的 DBT 征象表现不同（P=0.002），Luminal A（9/18，50%）、三阴型（5/18，27.8%）更多表现为局部不对称影或结构扭曲；单纯性微钙化最多见于 HER-2 型乳腺癌（5/11，45.5%），肿块伴钙化最多见于 Luminal B 型乳腺癌（40/80,50%）。
2. 乳腺癌各分子亚型 DBT 表现是否有肿块无统计学差异（P=0.304），对于肿块形态、边缘特征，不同分子亚型乳腺癌间差异有统计学意义（均 P<0.001）。与其他三种类型相比，三阴型乳腺癌（13/20，65.0%；16/39，41.0%）更多表现为边缘清楚的规则肿块。
结论：
乳腺癌某些 BDT 影像特征可用于预测特定的亚型，将这些发现与临床信息相结合，放射科医生可以提供有关潜在肿瘤生物学的信息，并帮助指导临床决策。

PU-3066
乳腺导管原位癌微钙化 X 线特征与病理的对照研究

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目的 探讨通过乳腺导管原位癌（DCIS）微钙化 X 线特征判断 DCIS 生物学行为及预后的可能性。方法 回顾性分析 2010 年 9 月到 2018 年 08 月在我院经钼靶定位穿刺微钙化病灶并通过手

术、病理证实的 DCIS 患者 101 例，收集 101 例患者的乳腺钼靶及病理资料，将钙化形态分为细小多形性组及非细小多形性组，将钙化分布分为群集分布组与非群集分布组，分析钙化表现与 ER、HER2、ER/HER2 亚型、Ki67 表达及病理分级相关性。结果 ①在细小多形性组与非细小多形性组中 DCIS 的 ER（x^2=0.571 ,P=0.450）、HER2（x^2=0.019，P=0.890）、ER/HER2 亚型（Fisher 精确检验，P=0.214）、Ki67（x^2=2.129，P=0.145）表达及病理分级（x^2=2.021，P=0.155）构成均无显著差异。②在群集分布组与非群集分布组中 DCIS 的 ER（x^2=17.460，P<0.001）、HER2 （x^2= 13.305，P<0.001）、ER/HER2 亚型（Fisher 精确检验，P<0.001）、Ki67 表达（x^2=8.117，P=0.004）及病理分级（x^2=17.241，P<0.001）构成均存在显著差异。结论 DCIS 钙化分布特征与 ER、HER2、ER/HER2 亚型、Ki67 表达情况及病理级别存在相关性，对预后评估能够提供一定的参考价值。对于表现为群集分布钙化的 DCIS，可以推测具有较好的预后。

PU-3067
多模态影像组学模型对 X 线乳腺 BI-RADS 4 类肿块型病变良恶性的鉴别诊断价值

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目的 探讨基于多模态影像组学模型对 X 线乳腺 BI-RADS 4 类肿块型病变良恶性的鉴别诊断价值。
方法 回顾性分析山东省千佛山医院 2017 年 8 月至 2019 年 4 月，经 FFDM 和 DBT 检查诊断为 BI-RADS 4 类肿块型病变，且最终诊断经病理证实的 60 例女性患者。良性病变 28 例，恶性病变 32 例。患者均行乳腺 FFDM 头尾位和内外斜位及 DBT 头尾位和内外斜位扫描。由两名有经验的医师参照 X 线乳腺影像报告与数据系统对病变进行亚型分级，分为 4A、4B、和 4C 类，将有病灶一侧乳腺的 FFDM 头尾位和内外斜位及 DBT 头尾位和内外斜位图像导入影像组学分析工具（Radcloud,Huiying Medicial Technology Co.,Ltd），分别对病灶区进行勾画，其中 DBT 图像选取病灶最清晰的五幅图像，然后进行影像特征提取。分别构建 FFDM、DBT、FFDM+DBT 及 FFDM+DBT+BI-RADS 分级四类分类模型，依次采用 VarianceThreshold、SelectKBest 和 Lasso 进行特征降维。对影像特征进行预处理，分别使用四种模型数据的 80%做训练集，20%做测试集，利用 KNN 模型进行机器学习，比较四个模型的分类诊断效能。
结果 建模后分别验证四种类型的诊断准确度，FFDM、DBT、FFDM+DBT 及 FFDM+DBT+BI-RADS 分级四种类型中 DBT 预测模型的诊断效果高于 FFDM,FFDM+DBT 与 FFDM+DBT+BI-RADS 分级预测模型诊断效果基本相当，其灵敏度和特异度为 1、0.83，AUC 值分别为 0.92、0.98，均高于 FFDM、DBT 预测模型的 AUC、敏感度及特异度，其分别为 0.85、0.86、0.67，0.89、0.88、0.73。
结论 多模态影像组学模型对鉴别 X 线乳腺 BI-RADS 4 类肿块型病变良恶性具有价值，联合应用效果优于单独应用。

PU-3068
乳腺 X 线摄影与 64 排螺旋 CT 筛查乳腺癌的价值对比

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目的：研究乳腺癌患者实施 64 排螺旋 CT 与 X 线摄影的筛查价值情况。

方法：选择 52 例我院所收治的疑似乳腺癌患者，2017 年 11 月至 2018 年 11 月作为本研究的时间范围，全部疑似乳腺癌患者予以 CT 与 X 线摄影检查，对比 2 种检查方式准确率、乳腺癌患者钙化及淋巴转移情况。
结果：疑似乳腺癌患者确诊结果阳性 41（78.85%）例、阴性 11（21.15%）例；X 线摄影检查阳性 38（73.08%）例、阴性 14（26.92%）例；CT 检查阳性 40（76.92%）例、阴性 12（23.08%）例；同 X 线摄影检查（78.05%、45.45%、71.15%）相比，疑似乳腺癌 CT 检查诊断结果灵敏度（95.12%）、特异度（90.91%）、准确性（94.23%）较高，CT 检查泥沙状钙化、杆状钙化、叉状钙化、不规则钙化检出率（75.61%）与 X 线摄影检查（46.34%）相比较高，具备显著组间差异性（P＜0.05），2 种检查方式淋巴结转移比例（70.73%、65.85%）具一致性（P＞0.05）。
结论：通过 CT 与 X 线摄影检查均可诊断乳腺癌疾病，但 CT 检查准确性水平较高，可降低临床乳腺癌误诊及漏诊比例。

PU-3069
乳腺断层成像在致密型乳腺内乳腺癌诊断中的应用价值

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目的：探讨数字乳腺断层成像(DBT)在致密型乳腺内乳腺癌诊断中的应用价值。方法：收集我院病理证实乳腺癌患者 143 人，均为致密型乳腺，分别行双侧乳房全数字化乳腺摄影（FFDM）检查及数字乳腺断层成像（DBT）检查，并进行 BI-RADS 分类。最终以病理结果为金标准，分别评价 DBT、FFDM 与 FFDM 结合 DBT 对致密腺体内乳腺癌的检出率及准确率之间的差异性。
结果：143 例致密型乳腺患者中,共病理证实乳腺癌病灶 153 个。DBT 对致密腺体内病灶的总检出率明显高于 FFDM(93.6% vs. 77.6% ，P＜0.05) ，其中 DBT 检出不伴钙化的肿块型病灶的比率明显高于 FFDM(67.5% vs. 47.5% ，P＜0.05) 。同时，FFDM 结合 DBT 对致密腺体内病灶的诊断准确率也明显高于 FFDM(95.3 % vs. 77.6% ，P＜0.05)，其中 FFDM 结合 DBT 准确诊断不伴钙化的肿块型病灶的比率明显高于 FFDM(76.8% vs. 47.5% ，P＜0.05) 。
结论：对于致密型乳腺，DBT 较 FFDM 能更敏感地检出乳腺癌，尤其是不伴钙化者，FFDM 结合 DBT 能显著提高诊断准确率，更适合于对致密型乳腺内的可疑乳腺癌筛查。

PU-3070
乳腺 X 线密度与乳腺癌的相关性研究进展

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目的：本文综述了数字化乳腺 X线摄影对乳腺密度的评估及乳腺癌诊断率的影响，以及乳腺 X 线密度与年龄、月经情况、雌激素水平、生育情况、BMI 以及分子分型信息的相关性。
方法：对近年来有关乳腺 X 线密度的文章进行了阅读及总结，主要从以下三个方面总结了乳腺 X 线密度的应用、开发及研究进展：乳腺癌患者乳腺实质密度在不同年龄阶段的分布差异；乳腺癌患者的双侧乳腺实质密度差异；不同年龄段乳腺癌患者乳腺实质密度与月经情况、雌激素水平、生育情况、BMI 以及分子分型的相关性探索。
结果：年龄是影响乳腺密度的重要因素，随年龄的增长，乳腺密度逐渐减低，但不是绝对的；对于不同地域、不同种族的人群，乳腺密度有差异；致密型乳腺伴随高的患乳腺癌风险；乳腺密度与多种因素相关。乳腺密度是预测乳腺癌风险的一个指标，致密型乳腺与乳腺癌具有相关性，随着乳腺

密度的增加，乳腺癌诊断敏感度下降，数字化乳腺 X 线摄影技术可提高致密型乳腺乳腺癌的诊断敏感度。

PU-3071
量子计数乳腺 X 线摄影系统与常规几何成像乳腺 X 线摄影系统辐射剂量及图像质量的对比研究

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目的：量子计数乳腺 X 线摄影系统采用量子计数探测器，成像过程中不涉及可见光散射，理论上能在较低辐射剂量条件下保持图像质量。本研究以常规几何成像乳腺 X 线摄影系统为对照，研究量子计数乳腺摄影系统的辐射剂量及图像质量。 材料与方法：204 例年龄介于 40-54 岁疑似乳腺癌患者，随机分为两组。 A 组应用量子计数乳腺 X 线摄影系统，B 组应用常规几何成像系统进行乳腺摄影。每例均获取内外侧斜（MLO）位和头尾（CC）位摄影，记录两组患者的平均腺体剂量（AGD）和乳腺压缩厚度。由两名高年资（从业 5 年以上）乳腺放射学医师采用 4 分制量表，根据美国放射学会 2012 版 AAPM 实践指南，遵循双盲法进行主观图像质量评估。采用两独立样本 t 检验比较两组年龄分布，乳腺厚度以及 AGD，采用 Mann-Whitney U 检验比较两组图像质量，以 P<0.05 为差异有统计学意义。 结果：两组患者平均年龄分别为（46.9±3.9）及（46.8±3.7）岁，P=0.716，差异无统计学意义。MLO 位乳腺压缩厚度 A 组(53.8±11.4)mm，高于 B 组(50.0±10.1)mm，p=0.00，差异有统计学意义；CC 位乳腺压缩厚度 A 组(49.9±10.8)mm，高于 B 组(45.9±10.8)mm，P=0.00, 差异有统计学意义。A 组 MLO 位 AGD(0.55±0.19)mGy,显著低于 B 组 MLO 位(1.41±0.56)mGy，p=0.00；A 组 CC 位 AGD(0.60±0.21)mGy，显著低于 B 组(1.56±0.58)mGy，p=0.00。两组图像质量无显著差异，U=5304,P=0.603。结论：相较常规几何成像乳腺 X 线摄影系统，量子计数乳腺 X 线摄影系统在不损失图像质量的条件下，可降低患者平均乳腺检查剂量 60%以上。

PU-3072
乳腺断层摄影及彩色多普勒超声在乳腺导管原位癌的诊断价值比较

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目的：回顾性分析 DCIS（包括微浸润）DBT 与超声 BI-RADS 分类、有无钙化等影像表现的差异，比较两者对 DCIS 的诊断价值。
方法： 收集我院 2017 年 1 月～2018 年 12 月经病理证实的 184 例 DCIS（包括微浸润）患者，术前均进行乳腺断层摄影（DBT）及彩色多普勒超声检查，回顾性分析了患者的 DBT 及超声检查的病例资料。采用 SPSS16.0 统计分析软件，计数资料行 χ^2 检验，以 P＜0.05 时差异有统计学意义。
结果：184 例患者纳入本次研究，年龄 29～80 岁，平均 48±8 岁；其中 DCIS152 例（82.6%），伴微浸润 32 例（17.4%）。DBT 检查结果：无异常表现 7 例（3.8%）；单纯钙化征象 6 例（3.3%）；肿块 59 例（32%），其中形态规则 12 例（20.3%），不规则 47 例（79.7%%），结构紊乱 99 例（53.8%），结构扭曲 10 例（5.4%），非对称性致密影 3 例（1.6%）；伴钙化 115 例（62.5%），不伴钙化 56 例（30.4%）。彩超检查结果：无异常表现 9 例（4.9%）；单纯钙化征象 5 例

（2.7%），肿块 149 例（81.0%），其中形态规则 22 例（14.8%），不规则 127 例（85.2%），乳管扩张 13 例（7.1%），腺体增厚结构紊乱 8 例（4.3%）；伴钙化 69 例（37.5%），不伴钙化 81 例（44.0%）.统计结果显示：DBT 分类与彩超 BI-RADS 分类两组资料间比较，χ^2=41.095，P＜0.001，具有统计学意义；DBT 钙化检出率达 65.8%，彩超钙化检出率 40.2%，两组资料比较，χ^2=16.993，P＜0.001，具有统计学意义。其余组间比较无统计学意义。
结论：X 线摄影诊断最突出且无可替代的重要作用是发现乳腺内微钙化，而微钙化对于 DCIS 诊断意义重大，DBT 的诊断价值尤为突出，但对于肿块型 DCIS 患者 DBT 与超声相结合可起互补作用。

PU-3073
基于乳腺 X 线灰度直方图在乳腺良恶性肿块诊断中的价值

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目的：探讨 X 线直方图分析鉴别乳腺良恶性肿块的价值。
材料和方法：回顾性分析我院经手术病理证实的 92 例乳腺肿块性病变，其中恶性病变 55 例，良性病变 37 例。收集 92 例未经治疗的乳腺 X 线图像，用软件 Mazda 提取病变的感兴趣区(ROI)，针对病变 ROI 进行直方图分析，利用平均值、方差、偏斜度、峰度、第 1、10、50、90、99 百分位数特征，找出良恶性病变之间的显著性差异。
结果：利用直方图提取出的 9 个纹理参数中，方差、第 90 百分数、第 99 百分数具有统计学意义(P<0. 05)，并绘制 ROC 曲线，ROC 曲线下的最大面积分别为为 0.585、0.802、0.766，鉴别良恶性病变的敏感性分别为 80.0%、92.7%、92.7%，特异性分别为 40.5%、51.4%、48.6%。**结论：**直方图分析可以提供更多量化信息特征，为乳腺肿块的良恶性鉴别诊断提供了新的思路和方法。

PU-3074
Digital mammography improve diagnostic accuracy of breast microcalcification

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ObjectiveWe aimed at investigating diagnostic value of digital mammography (DBT) in breast microcalcifications of Asian women. **Methods**A retrospective analysis of 70 breast disease patients with 76 confirmed microcalcifications were enrolled. Clinical characteristics and diagnosis accuracy by full field digital mammography (FFDM) and DBT images were compared. **Results**52 malignant lesions and 24 benign lesions were found in 76 breast microcalcifications. FFDM presented with high sensitivity and low specificity with 94.2% and 45.8%, while DBT presented with high sensitivity and media specificity with 96.1% and 62.5%. The positive predictive value, negative predictive value and diagnostic coincidence rate of DBT were also higher than FFDM examination (84.7%, 88.2%, 85.5% vs. 79.0%, 78.5%, 78.9%). The area under curve (AUC) of DBT was significantly higher than FFDM examination (Z=2.322, P = 0.020) with 0.700±0.055 [0.584-0.800] and 0.793±0.052 [0.685-0.878]. Diagnosis decision by two image specialists indicated that DBT was more precise for breast microcalcification

diagnosis. **Conclusion**DBT improves the diagnostic accuracy and detection rate of microcalcifications in Asian women.

PU-3075

乳腺癌微钙化与 ER、PR 及 HER-2 表达的相关性

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目的 探讨乳腺癌微钙化与雌激素受体（ER）、孕激素受体（PR）及人类表皮生长因子受体-2（HER-2）表达水平的关系。**方法** 回顾性分析 2017 年 9 月 - 2018 年 12 月于锦州医科大学附属第一医院经穿刺或手术病理证实的 152 例乳腺癌患者，按有无微钙化、微钙化的分布及形态记录乳腺癌患者的 X 线微钙化征象，并分析其与 ER、PR 及 HER-2 表达的相关性。**结果** 乳腺癌微钙化的存在、分布及形态与 ER、PR 的表达无关（P>0.05）；乳腺癌微钙化的存在、分布及形态与 HER-2 的表达有关（P<0.05）。微钙化呈线样或段样分布的 HER-2 阳性表达率 80.0%，细线样或细线分支状组 HER-2 阳性表达率 100%，乳腺癌微钙化呈集群分布、不定型或粗糙不均质钙化与 HER-2 阴性表达相关。**结论** 乳腺癌微钙化与 ER、PR 的表达无关，与 HER-2 的表达有关，因此可以从乳腺癌的钼靶 X 线微钙化特征去预测乳腺癌患者的预后因子的表达，从而为乳腺癌的治疗方案的选择提供一定的帮助。

PU-3076

多体位设计在乳腺 X 线摄影中的应用

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目的：探讨多体位设计在乳腺 x 线摄影中的应用 方法：应用美国 Hologic 乳腺机对 2018 年 1 月到 8 月乳腺 B 超结果显示腺体内靠近胸壁有可疑病灶的 500 个病人进行乳腺 x 线摄影。条件选择自动曝光模式。分两组进行，一组照常规的 CC 位及 MLO 位，另一组对有病灶侧加照 ML 位。 结果：加照侧位组的病灶检出率高达 90%。还有一部分由于包块太小，贴近胸壁太近，病人体型过瘦，乳房偏小等原因造成常规位置与侧位都无法显示。 讨论：乳腺 X 线摄影的常规位置 CC 位与 MLO 位对于一般的病灶显示完全足够，但如果病灶靠近胸壁压迫过程中容易遗漏病灶，这时我们发现加照侧位是达到乳腺靠近胸壁肿瘤显示的最佳方法。可见多体位设计在乳腺 X 线摄影中有着举足轻重的作用。

PU-3077

基于乳腺 X 线摄影及超声等影像学特征构建机器学习模型预测乳腺癌分子亚型 Here-2

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研究目的：乳腺癌是女性最常见的恶性肿瘤之一，其发生率逐年上升。研究表明人表皮生长因子受体 2（ＨＥR-２）在乳腺癌分子分型、预测靶向治疗疗效及预后中有重要价值，早期检测乳腺癌 HER-2 表达状态对个性化治疗乳腺癌至关重要。目前ＨER-２表达水平主要通过活组织标本免疫组织化学检测，为有创检查，且肿瘤的异质性可能导致误诊。乳腺 X 线摄影联合超声检查被认为是乳腺癌筛查及诊断的“黄金组合”。因此本研究通过开发和验证一种可解释和可重复的机器学习模型，依托临床信息联合乳腺 X 线摄影和超声影像学特征预测乳腺癌 HER-2 的表达状态。
研究方法：回顾性收集 2010 年 1 月至 2016 年 12 月在术前同一时间段内行乳腺 X 线摄影及超声检查并经病理学诊断证实为乳腺癌并经免疫组化证实为 HER-2 阳性的患者 320 例，通过查阅病例资料，收集每例患者的临床数据信息；而乳腺 X 线摄影及超声影像学特征均由两位具有 5 年以上诊断经验的乳腺诊断医生根据第五版 BI-RADS 通过共同阅片后所决定，总共提取 58 个影像学特征。将所收集的数据按照 7:3 的比例将数据分为训练组、测试组，基于支持向量机分类器，在建立模型前先对输入的特征值进行标准化处理，然后采用 5 折交叉验证法对分类性能进行验证，计算 SVM 的敏感性、特异性、准确性、阳性预测值、阴性预测值以及曲线下面积。
研究结果：该模型在术前预测乳腺癌 HER-2 表达效能的 AUC 值为 0.85(95% CI：0.729~0.875)，敏感度、特异度和准确度分别为 82.5%、83.4%和 86.7%。
研究结论：基于第五版乳腺 BI-RADS 特征描述，通过结合乳腺 X 线摄影和超声的影像学特征，并加入临床信息，构建的支持向量机模型预测乳腺癌 HER-2 的效能是可行的。

PU-3078
基于诊断效能的男性乳腺病变的数字化乳腺 x 线摄影及乳腺超声诊断价值对比分析

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目的
通过基于诊断效能，包括敏感性、特异性等指标的评价，探讨数字乳腺 X 线摄影及乳腺超声对男性乳腺病变的诊断价值。
方法
回顾性收集行乳腺 X 线摄影检查的男性乳腺肿块的病例，最后共纳入 89 例，部分病例同时行乳腺超声检查，共计 71 例。乳腺病灶的评价根据 2013 版乳腺影像报告和数据系统（breast imaging reporting and data system，BI-RADS）标准，通过 3 位高年资乳腺放射医师对征象进行分析，并作出影像 BI-RADS 分类，并以病理为金标准，最终评价数字乳腺 X 线摄影及乳腺超声对男性乳腺病变的诊断效能。
结果
(1) 89 例男性乳腺病变，年龄分布于 16-83 岁，平均年龄为 53.1 岁，中位年龄为 55.0 岁；临床触诊上，阴性 8 例，单侧包块 67 例（右侧 27 例，左侧 40 例），双侧包块 13 例，溢血 1 例。
(2) 数字乳腺 X 线摄影的 BI-RADS 分类为：1 类 5 例，2 类 62 例，3 类 5 例，4a 类 3 例，4b 类 1 例，4c 类 4 例，5 类 9 例。其中乳腺超声 71 例，BI-RADS 分类为：0 类 6 例，1 类 4 例，2 类 43 例，4a 类 5 例，4b 类 1 例，4c 类 7 例，5 类 5 例。其中超声诊断为 0 类的 6 例病例，在乳腺 X 线摄影中 BI-RADS 分类为 1 类 1 例、2 类 3 例，3 类 2 例。
(3) 数字乳腺 X 线摄影检查对男性乳腺疾病的敏感性为 100%，特异性为 98.7%，阳性预测值为 92.9%，阴性预测值为 100%，ROC 曲线下面积为 0.993；乳腺超声检查对男性乳腺疾病的敏感性为 83.3%，特异性为 84.7%，阳性预测值为 52.6%，阴性预测值为 96.2%，ROC 曲线下面积为 0.840。
结论

数字乳腺 X 线摄影及乳腺超声对男性乳腺疾病均具有较高的诊断效能，尤其数字乳腺 X 线摄影在敏感性、特异性方面表现出更为显著的优势，并且在 BI-RADS 分类方面更为准确。在剂量允许的基础上，对于男性乳腺疾病患者，数字乳腺 X 线摄影可作为一种推荐检查方法。

PU-3079

基于多排螺旋 CT 的深度学习标签对乳腺癌前哨淋巴结转移的术前预测价值

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目的 探讨基于多排螺旋 CT 的深度学习标签在术前预测乳腺癌前哨淋巴结（SLN）转移状态的价值。
方法 回顾性收集 2016 年 1 月至 2018 年 12 月行术前多排螺旋 CT 胸部增强扫描并经病理证实的浸润性乳腺癌患者 374 例，将其进一步分为训练组 198 例（2016 年 1 月-2017 年 4 月）和验证组 171 例(2017 年 5 月-2018 年 12 月)。在 CT 动脉期增强图像上肿瘤最大层面的感兴趣区域提取深度特征，筛选并构建深度标签预测 SLN 转移状态及数目（1～2 枚或 2 枚以上）。利用多参数 logistic 回归构建深度学习 SLN 转移预测标签。使用 Mann-Whitney *U*检验分析深度学习标签与浸润性乳腺癌 SLN 转移状态之间的关系；应用受试者工作特征(receiver operating characteristic，ROC)曲线并计算曲线下面积(area under curve，AUC)、敏感度、特异度及准确度以评价深度学习标签术前预测浸润性乳腺癌 SLN 转移的效能，应用校准曲线评价标签的校准能力;并在验证组中验证其效能。
结果 在训练组中分别提取并筛选出 12 个、5 个深度特征，分别构建术前预测浸润性乳腺癌 SLN 转移深度标签和预测 SLN 的转移数目的深度学习标签。其中，术前预测浸润性乳腺癌 SLN 转移的深度学习标签效能在训练组中 AUC 值为 0.783 (95% CI:0.717-0.849)，在验证组中，AUC 值为 0.801(95% CI:0.738-0.865)；预测 SLN 的转移数目的深度学习标签也表现出良好的预测效能，在验证组中 AUC 值为 0.772(95% CI:0.726-0.818)。
结论 基于多排螺旋 CT 的深度学习标签对术前预测乳腺癌前哨淋巴结转移有一定价值，有望协助临床治疗决策。

PU-3080

肉芽肿性乳腺炎 2D X 线摄影的影像特点

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背景：肉芽肿性乳腺炎是一种临床罕见的炎性乳腺疾病，它的临床特点和影像学征象与乳腺癌类似，是影像工作中容易误诊的一类疾病。但是它的治疗和预后与乳腺癌差异很大，因此，正确诊断此病具有较大临床意义。
目的：本研究的目的是回顾性地分析肉芽肿性乳腺炎的 2D X 线摄影相关征象及临床特点。
患者及方法：本文章回顾性研究了 2014.1.1-2017.12.31 在武汉大学中南医院就诊并确诊为肉芽肿性乳腺炎患者的钼靶图像，共计 33 例。这些患者最后都由组织病理学结果来确诊。
结果：这 33 例患者中，小于 30 岁的有 4 人，30-34 岁的有 15 人，35-39 岁的有 2 人，40-49 岁的有 7 人，50 岁及以上的有 5 人，总体发病年龄较轻；其中，胸痛的有 12 人（36%），皮肤红肿有 9 人（27%），可扪及肿块的有 26 人（79%），皮肤破溃窦道形成的有 2 人（6%），乳头回缩的有 4

人（12c%），腋窝淋巴结肿大的有 17 人（52%）；2D X 线摄影图像表现为非对称致密的有 28 人（85%），结构扭曲的有 9 人（27%），表现为肿块的有 5 人（15%），皮肤增厚 7 人（21%），2D X 线摄影为阴性的有 4 人（12%）。
讨论：肉芽肿性乳腺炎的 2D X 线摄影表现缺乏特异性，乳腺 MRI 及穿刺作为乳腺的辅助诊断手段，可以帮助鉴别肉芽肿性乳腺炎及乳腺癌

PU-3081

可疑无定形钙化：恶性风险分级研究

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目的：结合临床及影像特征评估不同分布乳腺无定形钙化的恶性率，旨在细致管理无定形钙化恶性肿瘤风险。
材料和方法：PACS 系统中搜索 2016 年 1 月至 2018 年 12 月无定形钙化病例，纳入有明确病理结果病例 1098 例，由两名乳腺影像诊断医师（3 年、12 年工作经验）分别回顾性分析录入影像学特征及临床特征（临床症状、年龄、绝经情况、个人及家族史、乳腺腺体构成、钙化分布、定位、是否多发、最大径、伴随征象、新出现或较前增多、BIRADS 分级、病理结果）。以病理结果为金标准将病例分为三类：良性病变、高危病变及恶性病变，采用卡方检验、秩和检验及 Logistic 回归分析对影像及临床特征进行统计学分析。
结果：1098 例无定形钙化病例中 406 例（37.0%，符合 BI-RADS 4B 类）证实为恶性， 76 例（6.9%）为高危病变，616 例（56.1%）为良性病变。临床症状、年龄、绝经情况、钙化分布、是否多发、最大径、伴随征象均有统计学差异且为独立危险因素。集群样分布病例 659 例恶性率为 25.3%(4B)，段样 238 例恶性率为 74.4%（4C）,区域样 127 例恶性率为 37%（4B）。绝经前病例 791 例恶性率为 31.7%(4B)，绝经后病例 307 例恶性率为 50.8%(4C)。临床体检病例 578 例恶性率 9.0%（4A）且其中 61.5%为 DCIS；而体格检查阳性病例 310 例恶性率 83.9%（4C）。单发病例 628 例恶性率 46.8%，单侧多发 149 例恶性率 32.2%，双侧多发 321 例恶性率 19.9%。结合多个危险因素考虑临床体检绝经前患者中，集群样分布无定形钙化恶性率仅为 4.2%，其中多发者仅为 2.9%（4A）且 50%为 DCIS。
结论：无定形钙化的恶性率与分布、临床症状、绝经情况等密切相关，可结合危险因素进行危险度分层管理，对于体检无症状绝经前患者集群样分布恶性率较低，尤其是多发患者，组织学检查的假阳性率较高。

PU-3082

乳腺癌的多层螺旋 CT 征象与 VEGF 和、CD34 表达水平相关性研究

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目的：探讨乳腺癌的多层螺旋 CT 征象与 VEGF-C 和 CD34 蛋白表达水平相关性研究。

方法：选取 120 例乳腺癌患者，同时期检查的 64 例非乳腺癌患者作为对照组，采用酶联免疫吸附法测所有定患者血管内皮生长因子(VEGF)水平，采用多层螺旋 CT 进行影像学检查，对 CT 图像进行分析，观察图像中肿块大小、形态、淋巴结转移、钙化区域、血流显像分级等，分析 CT 征象与 VEGF 蛋白表达和 CD34 蛋白表达之间的相关性。
结果：观察组患者组织 CD34 蛋白表达水平和血浆 VEGF 蛋白表达水平均显著高于对照组患者，差异有统计学意义；血浆 VEGF 蛋白表达和组织 CD34 蛋白表达水平在不同肿块大小、边缘形态及微小钙化点的患者体内无显著差异，但是肿块形态规则的患者体内血浆 VEGF 蛋白表达和组织 CD34 蛋白表达水平显著高于不规则患者，差异有统计学意义；血流显像分级在 2～3 级的患者体内血浆 VEGF 蛋白表达和组织 CD34 蛋白表达水平显著高于 1～2 患者，差异有统计学意义；存在淋巴结转移的患者体内血浆 VEGF 蛋白表达和组织 CD34 蛋白表达水平显著高于不存在淋巴结转移的患者，差异有统计学意义)；血浆 VEGF 蛋白表达和 CD34 蛋白表达之间呈正相关。
结论：乳腺癌 CT 图像征象与血浆 VEGF 蛋白表达和组织 CD34 蛋白表达之间存在相关性，可以作为无创性预测乳腺癌患者血浆 VEGF 蛋白表达和组织 CD34 蛋白表达的方式，为乳腺癌恶变程度和预后的判断提供更多的依据。

PU-3083
基于 X 线纹理分析鉴别诊断乳腺纤维腺瘤与良性叶状肿瘤

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摘要：目的 探讨 X 线纹理分析对乳腺纤维腺瘤与良性叶状肿瘤的鉴别诊断价值。**方法** 回顾性分析 2016 年 8 月至 2019 年 6 月，在我院术前均行数字化乳腺 X 线摄影共 115 例患者 X 线资料，并经手术病理证实为乳腺纤维腺瘤或良性叶状肿瘤，其中纤维腺瘤 55 例，良性叶状肿瘤 60 例；115 例患者共计 131 个病灶，其中纤维腺瘤多发 7 例，良性叶状肿瘤 2 例。利用 ITK-SNAP 软件对上述 115 例患者乳腺 X 线图像种的 131 个病灶进行 ROI 勾画，再使用美国 GE 公司提供的 A.K 软件，通过软件自动分析进行相关纹理提取分析，共提取 377 个纹理特征，经过 laso 降维，共提取 10 个有意义特征。所得结果应用 SPSS 软件，采用单因素方差分析及 LSD， $P<0.05$ 有统计学意义。**结果** 乳腺纤维腺瘤与良性叶状肿瘤位置、形状、肿瘤最大径、有无钙化、有无晕征等无统计学差异($P>0.05$)。2 组间纹理特征比较，提取 10 个有意义特征中，运用 SPSS 软件分析，其中 9 个 X 线纹理特征差异具有统计学意义($P<0.05$)。**结论 单**纯 X 线影像征象很难区分乳腺纤维腺瘤与良性叶状肿瘤，但 X 线纹理特征可以提高两者鉴别诊断能力，为临床治疗方案的选择提供更准确的影像参考信息。

PU-3084
Multidetector Computed Tomography-based Radiomics Nomogram for Preoperative Prediction of Axillary Lymph Node Metastasis in Breast Cancer

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Objectives: To assess the predictive value of preoperative multidetector computed tomography(MDCT)-based radiomics for axillary lymph node (ALN) metastasis in breast cancer patients.
Methods: A total of 231 consecutive female patients were retrospectively analyzed (primary cohort, n =120; validation cohort, n =111). Radiomics features were extracted from arterial-phase MDCT images of the whole primary tumor. LASSO logistic regression was performed to choose the key features and construct a radiomics signature. A radiomics nomogram incorporating this signature was developed on the basis of multivariable analysis in the primary cohort. The performance of nomogram was assessed with respect to its discrimination, calibration and reclassification. Clinical usefulness was estimated by decision curve analysis.
Results: The radiomics signature including 9 features was significantly associated with ALN metastasis. The radiomics nomogram, which incorporated the signature and CT-reported ALN status, distinguished ALN metastasis with an area under curve (AUC) of 0.792 in the primary cohort, and performance was similar in the validation cohort (AUC: 0.788) Discrimination of the radiomics nomogram exceeded that of CT-reported ALN status alone in both the primary cohort (p=0.026) and the validation cohort (p=0.008).Integrated discrimination improvement (IDI) and categorical net reclassification improvement (NRI) showed significant improvement in prediction value when the radiomics signature was added to CT-reported ALN status in the validation cohort (IDI 19.2%; p<0.001; categorical NRI 62.7%; *p*<0.001). Decision curve analysis supported that the radiomics nomogram is superior to CT-reported ALN status alone.
Conclusions: The proposed MDCT radiomics nomogram may help preoperative prediction of ALN metastasis in breast cancer patients.

PU-3085
两种乳腺 X 线导管造影图像分类系统 对溢液性乳腺病诊断价值分析

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【研究目的】评估乳腺 X 线导管造影图像分类系统（Galactogram Image Classification System，GICS）和改良版乳腺 X 线导管造影图像分类系统（mGICS）对病理性乳头溢液（PND）患者的应用价值。**【材料与方法】**回顾分析 2017 年 1 月至 12 月行乳腺 X 线导管造影检查并获得病理结果的 PND 患者资料。共纳入 159 名患者，170 侧乳腺。对纳入研究 GL 图像进行 GICS 及 mGICS 分类。将 GICS 与 mGICS 各分类交叉对比，与病理结果对比，并计算 GICS、mGICS 检测恶性病变的诊断性能。**【结果】1.**本组病例全为女性，归入 GICS 0、1、2、3、4、5 类病例分别有 1、30、24、50、26、39 例。归入 mGICS 0、1、2、3、4a、4b、4c、5 类病例分别有 1、34、19、2、50、23、29、12 例。GICS 2 类有 4 例归为 mGICS 1 类。GICS 3 类全部归为 mGICS 4a 类。GICS 5 类被归入 mGICS 4b、4c、5 类，病例数分别为 9、18、12。**2.**病例结果为恶性病变 37 例，GICS 5 类最多，有 13 例（35.1%）；mGICS 1、4c、5 类较多，分别有 9 例、8 例、7 例。良性病变 130 例，GICS 3 类（mGICS 4a 类）最多，有 44 例，占 33.8%。**3.**GICS 检测恶性病变的敏感度、特异度、PPV、NPV、ROC 下面积分别为 45.9%、63.9%、26.1%、81.0%、0.614，mGICS 分别为 59.4%、30.8%、

18.8%、73.2%、0.624。【**结论**】**1.**GICS 与 mGICS 两种对 GL 图像征象的分类有助于临床分类处理。**2.**mGICS 将 4 类细分后，更利于良性病变准确分类。**3.**mGICS、GICS 的分类细则可能需要大样本数据支撑后进一步完善。

PU-3086
探讨 BI-RADS IV 类钙化的影像征象与病理的相关性研究

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目的 探讨数字乳腺 X 线引导下导丝定位的 BI-RADS IV 类钙化灶的影像征象与术后病理之间的关系。**方法** 收集 70 例患者（73 处 BI-RADS IV 类钙化灶行 X 线引导下导丝定位）的临床及影像资料，分析钙化灶的形态及分布等影像特征，并与术后活检病理结果进行对照分析。**结果** 73 处乳腺钙化病灶中，术前 BI-RADS IVA 类 24 例，BI-RADS IVB 类 35 例，BI-RADS IVC 类 14 例；其中不定型钙化 31 例，粗糙不均质钙化 13 例，细小多型性钙化 22 例，细线样或细线样分支钙化 7 例；呈散在分布 6 例，呈区域状分布 25 例，呈集群分布 33 例，呈线样分布 1 例，呈段样分布 8 例；所有患者行乳腺 X 线引导下定位并手术活检，其中恶性病变 25 例，良性病变 48 例；14 例诊断为 BI-RADS IVC 类 13 例病理为恶性，1 例为良性，35 例诊断为 BI-RADS IVB 类其中 10 例为恶性，25 例为良性病变，24 例诊断为 BI-RADS IVA 类 22 例病理为良性，2 例为恶性。**结论** 乳腺钙化灶的形态、分布特征与乳腺病变性质密切相关，基于乳腺 X 线引导下定位对 BI-RADS IV 类钙化中的乳腺癌早期诊断具有重要临床价值。

PU-3087
腺体复杂性的乳腺 X 线影像组学表型对乳腺癌患病风险的预测

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目的 使用影像组学特征确定乳腺 X 线成像实质复杂性的表型，并评估它们与乳腺密度和其他乳腺癌风险因素的关联。
材料与方法 选取从 2016 年 8 月 1 日-2019 年 3 月 28 日采用数字乳腺 X 线成像进行筛查的女性病人的横断面样本（n=1989；年龄 35~75 岁，平均 55.9 岁），使用计算机图像分析方法量化样本的乳腺密度，提取实质的纹理特征。采用无监督聚类算法识别和重现分开的训练集（1319 例）和测试集（670 例）的实质复杂性表型。使用 Fisher 精确检验、卡方检验（ x 2）和 Kruskal-Wallis 检验方法评估年龄、体质量指数、乳腺密度和估计的乳腺癌风险与表型的差异性。使用条件逻辑回归对年龄相匹配的独立病例对照样本（76 例被诊为乳腺癌，158 例对照）的表型与乳腺癌之间的初步关联进行评估。
结果 无监督聚类算法识别了筛选样本的 4 种与实质复杂性增加相关的表型,这些表型可以在训练组和试验组之间重现（P=0.001）。乳腺密度与表型的类别没有很强的相关性（线性趋势 R2=0.24）。低-中复杂表型[390/2029（19％）]的致密乳腺比例最低 [8/390（2.1％）]，而其他表型的乳腺致密性比例相似 [高复杂表型 140/291（48.1%），低复杂表型 275/511（53.8%）]。在独立病例对照样本中，表型与乳腺癌显著相关（P=0.001）。把表型添加到乳腺密度和体质量指数所在的模型中，模型的鉴别能力提高（曲线下面积为 0.84 和 0.80；P=0.03）。
结论 影像组学表型在获取乳腺 X 线成像腺体复杂性上优于传统的乳腺密度测量方法和已制定的乳腺癌危险因素评估方法。

PU-3088
X 线摄影微钙化与乳腺癌临床病理特征的相关性分析

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【摘要】目的 探讨微钙化与乳腺癌临床病理特征的相关性。方法 回顾性收集我院 2011 例乳腺癌患者的临床病理及影像资料。根据 X 线摄影检查是否存在微钙化，分为微钙化组和无微钙化组。采用 logistic 回归分析微钙化与乳腺癌临床病理特征的相关性。结果 微钙化组乳腺癌占 42.3%（850/2011），无微钙化组乳腺癌占 57.7%（1161/2011）。单因素分析结果显示：年龄、月经状态、就诊原因、病理学类型、组织学分级、脉管瘤栓、PR、HER-2、Ki67、是否伴有导管原位癌、肿瘤大小、分子分型及腺体类型与微钙化型乳腺癌均相关（均 P<0.05），而腋窝淋巴结转移、ER 与微钙化无关（均 P>0.05）。多因素 logisitic 回归分析显示：年龄、月经状态、组织学分级、脉管瘤栓、HER-2、是否伴有导管原位癌、分子分型及腺体类型与微钙化明显相关（均 P<0.05）。结论 微钙化与乳腺癌的临床病理特征存在一定的相关性。

PU-3089
原发性乳腺高分化血管肉瘤的影像学表现

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简要： 目的 探讨原发性乳腺高分化血管肉瘤的影像学表现和临床特点，从而提高对该肿瘤的认识。**方法** 对 3 例在我院诊治经病理证实的乳腺高分化血管肉瘤进行回顾性分析，并结合文献总结。**结果** 3 例乳腺彩超均表现为多发大小不等的囊状及长条状的无回声区，无实性占位回声，无异常血流信号；乳腺 X 线均表现为多发结节状、团絮状的较腺体密度稍高的增浓影，无分叶、毛刺及钙化；磁共振 T2WI 均表现为伴有多发分隔的囊性病灶，无明显实质成分，囊内 DWI 图像呈高信号、但 ADC 值未减低，增强扫描，囊腔壁及分隔均呈无或轻度强化。病灶有向腋窝进展的趋势。**结论** 当临床发现影像表现为多发囊性结构而无明显实质成分及无明显异常强化，并且肿块进展快、体积大而触诊柔软的乳腺肿块时，应考虑到高分化血管肉瘤的可能。

PU-3090
乳腺线摄影及彩超对结构扭曲病变的诊断效能对比

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研究乳腺 X 线摄影（全数字化乳腺摄影 FFDM 与数字乳腺断层摄影 DBT）及彩超对于结构扭曲良恶性病变诊断效能对比研究及结构扭曲在 X 线征象的分析方法。**方法：**收集本院 2013 年 6 月～2018 年 12 月期间就诊的 51 例均接受 FFDM、DBT 及彩超检查且发现单纯结构扭曲征象，同时具有病理结果，根据乳腺影像报告和数据系统进行阅片诊断，比较三种影像学方法的诊断效能及结构扭曲的征象分析。**结果：**通过 Fisher 精确算法分析结构扭曲 X 线征象在良恶性鉴别存在显著性差异

（P<0.05）。通过 ROC 曲线分析三种影像学方法在乳腺疾病诊断效能。研究发现，三者曲线下面积均大于 0.5，是具有诊断价值的。**结论：**DBT 相对于 FFDM、彩超能更好地观察结构扭曲病变，提高诊断效能。

PU-3091
数字乳腺断层摄影在乳腺结构扭曲征象中的应用

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［摘要］ **目的** 探讨数字乳腺断层摄影(DBT)在乳腺结构扭曲征象中的应用。**方法** 共收集 58 例经 DBT 发现结构扭曲征象的患者,分别对 FFDM 及 DBT 图像进行影像诊断，其中 41 例在 1 个月内行乳腺超声检查。以病理诊断为金标准，比较 DBT 与 FFDM 对乳腺结构扭曲病变的诊断优势，并评估 DBT 与超声对良恶性结构扭曲病变的诊断价值。**结果** 在 DBT 上发现的 58 例结构扭曲病变中，FFDM 图像上仅发现 23 例，差异有统计学意义（X^2=33.029,P＜0.001）。FFDM 检出 23 例中，中-少量腺体型 6 例，致密腺体型 17 例；未检出的 35 例中,致密型及中-少量型分别为 33 例、2 例，差异有统计学意义（X^2=4.845,P＜0.05）。其中行超声检查的 41 例中，恶性病灶 23 例，良性病灶 18 例。DBT 正确诊断恶性病变 21 例，良性病变 13 例；超声正确诊断恶性病变 19 例，良性病变 16 例；Kappa 检验结果显示，DBT、超声对结构扭曲病变良恶性的诊断与病理结果的 K 值分别为 0.647（P＜0.001）、0.706（P＜0.001）。DBT 与超声对结构扭曲病变良恶性诊断的敏感度及特异度分别为 91.30%（21/23）vs.82.60%（19/23）和 72.22%（13/18）vs.88.89%（16/18）。两者 ROC 曲线下面积（AUC）分别为 0.797、0.906，差异无统计学意义（Z=1.453，P>0.05）。**结论** 与 FFDM 相比，DBT 能明显提高乳腺结构扭曲病变的检出率。DBT 与超声对结构扭曲病变良恶性的诊断与病理结果均存在一致性，且两种检查的诊断效能相当。DBT 上检测到的 AD 恶性程度较高，有必要进行活检。

PU-3092
钼靶、导管造影与 MRI 对乳腺导管内乳头状瘤的诊断价值分析

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目的 分析钼靶、导管造影及 MRI 检查在乳腺导管内乳头状瘤诊断中的影像表现。
方法 回顾性分析于 36 例经病理证实的乳腺导管内乳头状瘤病例，患者术前均行钼靶、导管造影及 MRI 检查。
结果 钼靶及 DWI 对于导管内乳头状瘤诊断参考价值有限；导管造影对于大导管内病变显示较好，可显示特异性乳头状结构，而对于周围型导管内乳头状瘤敏感性较差；增强 MRI 肿块样强化病变多呈良性征象；非肿块样强化病变形态学易与恶性病变混淆；导管样强化病变与导管原位癌强化方式相仿；隐匿性病变病理上均属于周围型导管内乳头状瘤。
结论 钼靶、导管造影及 MRI 对于诊断导管内乳头状瘤各具有优势，故建议联合使用，有利于进一步降低误诊风险。

PU-3093

男性乳腺结节良恶性分析

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目的 探讨男性乳腺结节良恶性影像学特点
材料和方法 本研究为临床回顾性研究。从辽宁省肿瘤医院收集 1 年内经影像学发现乳腺结节的男性患者 9 名，年龄 35-68 岁，平均为 52.7 岁。所有患者均进行至少两项影像学检查，并均病理穿刺活检。评价男性乳腺结节在影像学诊断的价值。

结果 男性乳腺结节发现较早，肿块不大。9 例患者都为单发病灶，全都位于乳头后方，其中 2 例位于右侧乳腺，7 例位于左侧乳腺。结节大小在 10-20mm 范围内，仅 1 例大小约 88mm（乳腺转移瘤）。3 例患者行钼靶检查， 1 例分叶状，呈高密度，边界清楚，周边见环状低密度影（炎性肉芽肿性病变）；2 例不规则，其中 1 例肿块密度局部增高，内缘边界欠清，见少许毛刺，肿块内见集簇状微钙化，伴周围结构扭曲（浸润性导管癌），另外 1 例密度欠均匀，脂肪密度为主，边界欠清，周围结构正常。

CT 检查共 9 例患者，表现为乳内软组织密度肿块影，密度欠均匀，5 例病灶边界不清，其中 3 例肿块周围有晕，2 例周围有少许腺体分布。仅 1 例患者腋窝可见肿大淋巴结。

超声检查共 4 例患者，1 例表现为中等回声，卵圆形，长轴平行于皮肤，后方无声影，内未见异常血流信号。3 例为低回声，局部见等回声，呈分叶状，边界欠光整，周边见少许血流信号，其中 2 例后方回声增强（炎性肉芽肿性病变），1 例后方回声呈混合回声伴回声减弱（慢性炎症伴局灶脓肿）。

MR 增强共 4 例患者。ADC 值大于 0.001mm2/s，共 3 例，边缘多不光整，其中 1 例增强呈较均匀环形强化，1 例见不规则强化结节，1 例呈不均匀环形强化；ADC 值小于 0.001mm2/s，共 1 例（浸润性导管癌），不规则，呈长 T2 信号肿块影，信号不均匀，边缘毛糙不光整，增强扫描强化不均匀，TIC 曲线初始相呈快速强化，延迟期呈平台型，DWI 呈高信号。
结论 结合结节形状、边缘、密度、钙化、ADC 值及强化方式可以对结节进行良恶性鉴别。

PU-3094

维吾尔、哈萨克、汉族等不同民族女性乳腺导管分型及其与导管疾病的关系

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目的 探讨乳腺导管 X 线解剖形态及分型与导管疾病之间的关系。**方法** 对 185 例 236 支溢液导管孔行乳腺导管造影检查，分析其影像征象，对导管分型并与导管疾病进行比较。**结果** 多支型 170 支（72%）；少支型 50 支（21.2%）；单支型 16 支（6.8%）。乳腺导管扩张症 140 支（59.3%）；导管内乳头状瘤 69 支（29.3%）；导管未见异常 27 支（11.4%）。 **结论** 正确认识不同民族乳腺导管的 X 线解剖形态与分型，对少数民族地区乳管系统疾病的诊断与治疗具有重要临床价值。

PU-3095
乳腺导管内乳头状瘤与导管 X 线分型及不同民族之间的相关性

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目的 探讨导管内乳头状瘤与乳腺导管 X 线解剖形态分型及不同民族之间的关系。**方法** 对 188 例 245 支溢液导管孔行乳腺导管造影检查，分析其影像征象与导管分型之间的关系进行分析。**结果** 多支型导管 174 支占 71.0%良性乳头状瘤发病 28 例占 16.1%，恶性 4 例占 2.3%；少支型导管 53 支占 21.6%，良性乳头状瘤发病 24 例占 45.3%，恶性 4 例占 7.5%；单支型导管 18 支占 7.3%，良性乳头状瘤发病 12 例占 66.7%。 **结论** 本组良性乳头状瘤的发病率以单支型多见，少支型次之，多支型较少，其发病率与导管分型有明显的相关性；恶性导管内乳头状瘤以少支型发病较高，单支型较少；正确认识乳腺导管的 X 线解剖形态与分型及不同民族之间的关系，对导管内肿瘤的诊断与治疗具有重要意义。

PU-3096
乳腺包虫病的影像学特征及诊断

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目的 分析乳腺包虫病的 X 线及 CT 影像表现，探讨其影像特征。**方法** 分析经手术证实的 11 例病例的 X 线影像资料，其中 1 例 CT 影像资料并对照手术病理进行分析。**结果** 11 例乳腺包虫囊肿，9 例为单发，2 例为多发，其中 1 例单发者因外伤而破裂。乳腺 X 线征象表现为大小不等单发或多发类圆阴影，密度高或低，边缘光滑锐利，5 例出现钙化中，2 例表现为囊壁弧线形“蛋壳”样钙化，3 例囊肿内有斑点状钙化，1 例破裂后呈空洞样改变，出现“日环蚀”征。其中 1 例乳腺 CT 表现：呈类似水样密度的类圆低密度阴影，边界光滑锐利，界限清，有完整包膜，内后方可见斑点状高密度钙化影。**结论** 乳腺 X 线及 CT 检查能准确显示乳腺包虫病囊肿的部位和形态特征，结合临床及流行学史能提高对该病的认识。

PU-3097
乳腺癌筛查及危险因素调查初探

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目的 通过回顾性调查乳腺病患者的自然状况与乳腺癌发病关系的内在联系，分析其危险因素，找出差异性，提出控制对策**方法** 采用回顾性调查的方法，将 2017 年 6 月~2018 年 6 月新疆伊犁州友谊医院乳腺病就诊病例 1986 例，设置统表格进行调查，利用数据库进行筛选，并进行统计学分析。**结果** 1986 例乳腺就诊妇女人群中，患各类乳腺疾病 943 例（47.5%），其中增生患者 845 例（42.54%），乳腺纤维腺瘤 32 例（1.61%），乳管系统疾病 22 例（1.11%），乳腺癌 44 例（2.22%）。分析结果分为文化程度高，体重指数高，精神心理压抑，性格内向，有女性生殖系统病史，摄入高脂高糖饮食为主要因素，可增加发病危险性。而常年清淡饮食及避孕年数多，哺乳超

过 6 个月为保护因子。**结论**。 高危人群中文化程度高、体重指数高、长期精神压抑、性格内向、患女性生殖系统疾病者内在联系密切，发病率较高。

PU-3098

乳腺结节性筋膜炎 1 例

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乳腺良性疾病中，乳腺结节性筋膜炎比较少见，作者遇到 1 例，已经手术病理证实，现报告如下。结节性筋膜炎(nodular fasciitis，FN) 又称假肉瘤性筋膜炎(pseudosarcomatous fasciitis) ，是由 Kandahar 于 1955 年首次描述并命名。2012 年世界卫生组织肿瘤组织学分类将结节性筋膜炎定义为一种自限性、形成肿块的纤维母细胞、肌纤维母细胞的克隆性增生，确定其属于良性病变[1]。结节性筋膜炎的病因与发病机制目前尚不明确，有观点认为与外伤或感染等因素有关。此病可发生于任何年龄，多为 20-40 岁青年人，男女均可发病，好发部位为前臂、躯干、头颈部的皮下，发生于乳腺者非常少见。典型的临床表现为皮下筋膜、肌肉组织或实质脏器内迅速生长的肿块，病程短，多不超过 3 个月。乳腺结节性筋膜炎绝大多数发生于女性，偶见男性患者报道[2]，一般为单侧乳腺孤立性肿块。国内外有文献认为[3-5]乳腺结节性筋膜炎影像学表现无特异性，乳腺 X 线摄影常表现为不规则，分叶状肿块，超声检查多表现为囊性浸润灶。Brown 等[6]认为因为该病发病年龄较轻，且乳腺 X 线检查阴性率较高，因此不作为首选检查。但是随着 DBT 的出现，它能更清晰地显示病灶及其背景，使乳腺 X 线诊断的误诊率及漏诊率明显地降低，极大地提高了阳性率，对乳腺结节性筋膜炎与乳腺其他良恶性疾病的鉴别诊断亦具有较高的价值。本研究仅搜集 1 例，不能完全代表乳腺结节性筋膜炎的所有 X 线征象，仍需大量的样本对其 X 线表现进行研究总结概括，其最终诊断需要病理及免疫组化学确定。乳腺结节性筋膜炎是一种自限性良性疾病，预后良好，治疗以手术切除为首选，完整切除后很少复发，即使再复发，仍可再行手术切除。

PU-3099

Digital Breast Tomosynthesis Plus Synthesis Two-dimensional images for Breast Cancer Screening :A Systematic Rewiew and Meta-analysis

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Purpose: We evaluated the benefit of digital breast tomosynthesis (DBT) plus synthesized two-dimensional images (s2D) for breast cancer screening compared to full-field digital mammography (FFDM) alone, with a focus on cancer characteristics. Methods: We searched electronic databases including PubMed, EMBASE, the Cochrane Library, Web of Science, and Chinese Biomedical Literature Database, from 1950 to June 2019 and relevant references for published studies comparing DBT plus s2D versus FFDM alone for breast cancer screening. Pooled risk ratios (RRs) for various pathologic results were determined using random effects models. Results: Five eligible studies were included. Pooled RRs superior cancer detection for DBT plus s2D than FFDM alone for all types of breast cancer (1.35; 95% CI 1.13－1.62), and invasive cancer (1.74;

95% CI 1.23－2.47); however, DBT plus s2D did not increase detection of carcinoma *in situ* (1.14; 95% CI, 0.73－1.78). DBT plus s2D decreased recall compared to FFDM alone. Conclusion: DBT plus s2D detected early invasive breast cancer that may be missed by full-field digital mammography alone. DBT plus s2D described the characteristics of breast cancer, which is great significance in predicting the prognosis and treatment of patients.

PU-3100
乳腺 X 线摄影与乳腺断层摄影对乳腺病灶特征描述的一致性分析

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目的 探讨乳腺 X 线摄影（mammography,DM）与乳腺断层摄影（digital breast tomosynthesis,DBT）对乳腺病灶特征描述的一致性分析
方法 回顾性分析来我院同时进行乳腺 DM 和 DBT 检查发现乳腺病灶的患者资料，对 DM、DBT 发现的乳腺病灶的最大直径、形态、边缘、密度、深度、象限、钟点方向、距乳头距离、乳腺实质 BI-ARDS 分类、可疑性钙化分布、可疑性钙化形态及最终分类进行一致性分析。
结果 乳腺检查发现乳腺病灶的患者共 217 例，两种方法共发现 258 个病灶，DBT 发现病灶 257 个，DM 发现病灶 172 个，二者共同发现病灶 171 个，其中可疑性钙化 23 例，结构扭曲 15 例，肿块 158 例，不对称致密 62 例。两种方法检查乳腺病灶的钟点方向、距乳头距离、象限、深度一致性分别为 0.842、0.988、0.854、0.845。两种方法图像特征描述的一致性参数分别为最大直径 0.967、形态 0.911、边缘 0.943、密度 0.936。两种方法钙化特征描述的一致性参数可疑性钙化分布 0.864、可疑性钙化形态 0.940。形态乳腺实质 BI-ARDS 分类一致性参数为 0.945。病灶 BI-ARDS 分类一致性参数为 0.939。
结论 在乳腺病灶诊断方面，DBT 和 DM 具有较好的一致性，DBT 较 DM 可以发现更多的乳腺病灶，可作为乳腺 X 线摄影的补充方法应用于乳腺癌诊断及新辅助化疗疗效评价等方面。

PU-3101
乳腺浸润性导管癌相关病理免疫组化指标表达特点和数字化钼靶摄影影像学特征比较

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目的：对比分析新疆地区维吾尔族与汉族女性乳腺浸润性导管癌相关病理免疫组化指标表达特点和数字化钼靶摄影相关影像学特征。方法：本研究通过对 122 例汉族女性及 42 例维吾尔族女性乳腺浸润性导管癌患者钼靶表现特点及 ER、PR、HER-2、KI-67 免疫组化指标表达进行回顾性对比分析，探讨二者差异性及不同民族乳腺癌 X 线征象与免疫组化指标相关性分析。结果： 新疆地区维吾尔族女性及汉族女性乳腺浸润性导管癌乳腺钼靶表现为肿块伴钙化二者差异有统计学意义；维吾尔族女性乳腺浸润性导管癌 HER-2、KI-67 阳性表达率差异有统计学意义；汉族女性肿块边缘有毛刺 HER-2 阴性表达较无毛刺组高，肿块边缘有血管聚集者 HER-2 阳性表达率较无血管聚集者高，有淋巴结转移者 KI-67 阳性表达率较无淋巴结转移者高；而维吾尔族女性乳腺浸润性导管癌肿块直径越大，ER、PR 阴性表达率越高，肿块边缘有毛刺者 ER、PR 阳性表达率较无毛刺者均偏高，肿块边缘有血管聚集者及腋窝下有淋巴结转移者 HER-2 阳性表达率较无毛刺者及无淋巴结转移者均片高，

肿块伴钙化者 ER 阴性表达率较无钙化者高。结论：新疆地区维吾尔族女性及汉族女性乳腺癌钼靶表现特点及相关免疫组化指标之间存在一定差异性，同时通过对不同民族乳腺钼靶表现特点与 ER、PR、HER-2、KI-67 免疫组化指标的相关性进行分析，在一定程度上可以通过乳腺钼靶无创检查方法间接预测乳腺癌相关免疫组化指标特点，为不同民族乳腺癌临床诊断、 治疗及远期预后提供更多信息及参考。

PU-3102
早期乳腺癌患者 MRI 及数字乳腺断层摄影技术回顾性分析

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目的： 乳腺癌是世界范围内危害女性健康最常见的恶性肿瘤之一，据统计，全世界每年新发乳腺癌病例 120 万，死亡病例 50 万。近年来由于人们生活方式，居住环境以及其它因素的影响下，不但乳腺癌的发病率逐年上升，而且发病年龄有年轻化的趋势。2012 年世界卫生组织（WHO）统计数据显示乳腺癌位居全部女性肿瘤的第二位，而当年我国乳腺癌发病率为 22.1/10 万，已经跃居我国女性肿瘤第一位。乳腺癌的早发现、早诊断、早治疗对提高患者的五年生存率以及降低死亡率有着重要的临床意义，有文献报道乳腺癌处于不同的临床分期，其五年生存率有很大的差异，原位癌为 100%，I 期为 84~100%，II 期为 76~87%，III 期为 38~77%。由此可见乳腺癌的早发现，早诊断能有效改善患者预后并降低病死率。本文旨在认识 MRI 和数字乳腺断层摄影技术联合检查在诊断早期乳腺癌中的作用。

方法： 共收集我院经临床穿刺活检或者手术病理证实，并拥有完整临床资料的 54 例早期乳腺癌患者，纳入标准：1.进行影像学检查之前未进行乳腺手术治疗、放化疗及活检。 2.患者诊断结果由手术或者穿刺活检病理证实 3.患者均行数字乳腺断层摄影及乳腺磁共振检查 4.患者病灶大小≤2.0 cm 且腋窝无肿大淋巴结及远处转移灶。对其 MRI 及数字乳腺断层摄影检查表现作回顾性分析。

结果：54 例患者中术前 MRI 发现 49 例各有 1 个肿块，3 例各有 2 个肿块，2 例各有多个肿块，术前诊断均为恶性；术前 DBT 检查发现肿块 50 例,术前诊断 BI-RADS 4B 级及以上 46 例，BI-RADS 4A 级及以下共 4 例。

结论：MRI 与数字乳腺断层摄影二者结合能提高早期乳腺癌的诊断符合率。

PU-3103
数字乳腺断层摄影在诊断乳腺肿瘤中的临床应用

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目的：乳腺癌是全世界危害女性健康最常见的恶性肿瘤之一，据估计，每年全球新发乳腺癌病例一百二十万，死亡病例五十万。世界卫生组织（WHO）在 2012 年的数据显示乳腺癌位于女性全部肿瘤的第 2 位，而在我国乳腺癌的发病率为 22/10 万，已经成为我国全部女性肿瘤的第 1 位。由于近年来人们生活方式逐渐西方化，以及生活环境以及其它未知因素的影响下，乳腺癌的发病率不但逐年上升，而且发病年龄有越来越年轻化的趋势。本文旨在讨论数字乳腺断层摄影技术在诊断乳腺肿瘤中的临床价值应用,为乳腺癌的诊断提供一个简便、易行、可靠的检查方法。

方法：选取我院 124 例经穿刺活检或者手术病理确诊为乳腺良恶性肿瘤的患者。纳入标准:1.进行影像学检查之前未行乳腺放化疗、手术治疗及活检 2.患者诊断结果由手术或者穿刺活检

病理证实。 3.患者均行数字乳腺断层摄影检查。对其结果作回顾性分析，观察乳腺肿瘤典型影像表现，以病理学诊断结果为金标准，确定肿瘤良恶性。计算诊断良恶性肿瘤的诊断符合率。

结果：经数字乳腺断层摄影检查，共检出恶性肿瘤 73 例，良性肿瘤 51 例，并将其和穿刺活检以及手术病理结果做对比，DBT 检查诊断恶性肿瘤和良性肿瘤的符合率分别为 91.25%和 86.27%，该差异有统计学意义（P＜0.05）。

结论：数字乳腺断层摄影技术检查中，X 线管围绕乳腺进行一定角度的的旋转，每进行一次旋转就曝光一次，获得不同角度下的投射数据，最后由计算机重建出平行于探测器平面的断层融合图像.传统数字乳腺 X 线摄影由于病变组织与正常组织相重叠，可能会遮挡病灶，导致病灶的漏诊或者误诊。而数字乳腺断层摄影技术则能克服这种缺陷，增加诊断的灵敏度与特异度。相较于传统 X 线摄影更能清晰显示病灶的边缘、形态，从而提高诊断准确率

PU-3104
数字乳腺断层摄影在诊断早期乳腺癌中的临床价值分析

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目的 乳腺癌已经成为全球危害广大女性健康最为常见的恶性肿瘤之一，据测算，全球每年新发乳腺癌病患者至少为一百万，死亡患者大约为五十万。世界卫生组织在 2012 年的统计报告中显示乳腺癌已经位居全部女性肿瘤的第 2 位，而我国乳腺癌的发病率也已达到 20/10 万，已经成为危害我国女性健康的最大杀手。由于人们生活习惯逐渐改变，生存环境及其它已知或未知因素的影响下，乳腺癌的发病率不但有逐年上升的趋势，而且发病年龄也愈发年轻化。本文旨在讨论数字乳腺断层摄影在诊断早期乳腺癌中的临床价值，为乳腺癌的诊断提供一个准确、经济、可靠的方法。

方法 选取在我院就诊，经数字乳腺断层摄影检查诊断为早期乳腺癌的患者 116 例，纳入标准为：1.进行数字乳腺断层摄影检查之前未行手术治疗、放化疗及穿刺活检 2.患者诊断结果由穿刺活检病理或手术切除病理证实 3.患者病灶大小≤3.0cm 且腋窝无淋巴结肿大以及远处转移。然后分析数字乳腺断层摄影在诊断早期乳腺癌的临床应用价值。

结果 早期乳腺癌共 116 例 其中肿块型 66 例，簇状分布钙化 41 例，钙化合并肿块 24 例，结构紊乱 9 例 ，不对称致密 4 例。

结论 数字乳腺断层摄影能晰显示病灶的边缘、形态，从而提高诊断早期乳腺癌的准确率。

PU-3105
乳腺非钙化型导管原位癌：乳腺断层融合技术和 X 线摄影及超声诊断的对比研究

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目的 对比分析数字乳腺断层融合技术（Digital Breast Tomosynthesis, DBT）、数字乳腺 X 线摄影（Digital Mammography, DM)及超声检查（Ultrasonography, US）对乳腺非钙化型导管原位癌（Ductal Carcinoma In Situ ，DCIS)的诊断价值。**材料和方法** 110 例非钙化型乳腺导管原位癌患者纳入我们的研究中。以乳腺影像报告及数据系统（Breast Imaging Report and Data

System，2013，BI-RADS 第五版）为诊断标准，比较三种检查方法对全部非钙化型 DCIS、不同乳腺致密度中非钙化型 DCIS 检出率及诊断符合率的差异。**结果** DBT、DM 及 US 对全部非钙化 DCIS 的检出率分别为 84.5%、70.9%、94.5%，对致密型乳腺中非钙化 DCIS 的检出率分别为 82.0%、65.2%、96.6%；全部非钙化 DCIS 及致密型乳腺中非钙化 DCIS，US 的检出率高于 DBT 及 DM，DBT 的检出率高于 DM，差异均具有统计学意义。DBT、DM 及 US 对非钙化 DCIS 的诊断符合率分别为 70.0%、44.5%、69.1%，对致密型乳腺中非钙化 DCIS 的诊断符合率分别为 96.6%、65.2%、66.3%；全部非钙化 DCIS 及致密性乳腺中非钙化 DCIS，US 及 DBT 的诊断符合率均高于 DM，差异均具有统计学意义；DBT 的诊断符合率稍高于 US，但差异无统计学意义。**结论** 对于非钙化型 DCIS 及致密性乳腺组织中非钙化 DCIS 病变，US 的检出更有优势。DBT 作为一种新兴的数字乳腺 X 线摄影技术，对于非钙化导管原位癌病变的诊断具有重要的价值。

PU-3106
数字乳腺 X 线和断层摄影及超声检查对乳腺导管原位癌诊断价值的对比研究

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目的：对比分析数字乳腺断层摄影（Digital Breast Tomosynthesis ，DBT）、数字乳腺 X 线摄影（Digital Mammography ，DM)及超声检查（Ultrasonography，US）对乳腺导管原位癌（Ductal Carcinoma In Situ ，DCIS)检出率及诊断符合率的差异。**材料和方法：**回顾性分析 412 例经手术病理证实的乳腺导管原位癌的 X 线及超声资料，其中钙化型病变 302 例、非钙化型病变 110 例，以乳腺影像报告及数据系统（Breast Imaging Report and Data System，2013，BI-RADS 第五版）为诊断标准，比较数字乳腺断层摄影、数字乳腺 X 线摄影及超声检查对 DCIS 的检出率、诊断符合率的差异。P＜0.05 差异有统计学意义。**结果：**对于本研究中所有 DCIS，DBT 较 DM 对 DCIS 的检出率（95.5% vs 92.2%）及诊断符合率（87.6% vs 78.2%）均较高，DBT 较 US 的诊断符合率（87.6% vs76.2%）较高，差异有统计学意义。**结论：** DBT、US 检查各具优势，DBT 作为一种新兴的数字乳腺 X 线摄影技术具有广泛的应用前景。

PU-3107
关于乳腺癌的发生部位与筛查敏感性及其影响因素的研究

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目的：探讨乳癌部位与筛查性乳腺 x 照片敏感性间关系，评估其是否受 BMI 及 MD 影响。方法：选取行 FFDM 检查的乳癌患者 273 例，其中筛查发现者 150 例，间隔期者 123 例。筛查乳腺 X 线包括每个乳腺 MLO 和 CC 两视图。有关女性特征的资料由病史询问获得。筛查发现是在指在异常后 6 月内诊断出的癌。间隔性癌是在一次异常的乳房 x 检查后 6 至 24 个月内被诊断的乳癌，或一次正常的乳房 x 检查后 24 个月内被诊断之。由一位经验丰富的放射医生据 MLO 及 CC 盲评估 MD 及癌症的位置。为了评估肿瘤的位置，将乳腺分 MLO(后上、后下、中央、乳晕下)投影区 4 个，CC(后内侧、后外侧、中央、乳晕下)投影区 4 个。本项研究中，使用了 2 年敏感性，这相当于筛查后 24 个月发现的浸润性乳腺癌在所有浸润性癌症(即筛检和间隔癌)中所占的比例。筛查敏感性，即筛查发现乳腺癌的数量除以筛查发现乳腺癌和间隔乳腺癌的总数，评估筛查发现乳癌的能力。采用

logistic 回归分析癌症定位与筛查敏感性间的关系。结果：共检出 109 例筛查和 98 例间隔性癌症。2 年的敏感性达 68%。总言之，敏感性与癌症的位置没无统计学联系。但 BMI≥25 kg/m ^{2}者，MLO 位后下区域的敏感度较低，而 BMI≤25 kg/m ^{2}者中心区域敏感性较低。对于乳腺密度较高的女性乳晕下区域的敏感性也较低，而乳腺密度较低者中心区域敏感性较低。结论：1. MLO 后下区的筛查敏感性在 BMI 高的妇女中较低，在乳腺密度较高的妇女的乳晕下区较低。在分析乳房 x 线照片时，应需要特别注意这些区域。2. 对筛查性乳房 x 的解释包括系统地搜索可疑乳腺癌的特定迹象。人们认识到乳房突出的某些区域（“Tabar 禁区”）值得放射医生特别注意。包括位于 MLO 位投影上的“银河系”(平行于胸肌边缘)和位于 CC 位的“无人区”(腺后空间)，在 CC 投影上的乳房中部，以及 MLO 和 CC 的乳晕后区域。

PU-3108

乳腺癌全数字化乳腺摄影误诊分析

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乳腺癌全数字化乳腺摄影误诊分析
[摘要] 目的:通过了解乳腺癌误诊的原因来提高全数字化乳腺摄影（FFDM）对乳腺的诊断准确性。方法:收集经 FFDM 检查并且病例结果证实的 300 例乳腺癌中初诊错误的 59 例患者的病历资料。对其摄影方法、影像表现等回顾性的分析。全部病例均为乳头头尾轴为和内外侧斜位。结果:59 例病例中有 37 例浸润性导管癌，7 例导管原位癌，5 例混合癌，5 例乳头状癌，4 例浸润性小叶癌，1 例腺样囊性癌。其中由于病灶位置深，摄影漏诊 8 例，致密型线体及 x 线片中显示阴性 12 例，显示钙化和肿块儿 9 例，不对称乳腺局部致密 11 例，局部结构扭曲 11 例。大导管儿征，漏斗征各 3 例。本组数据 FFDM 对不对称线体致密、局部结构扭曲和致密腺体型乳腺误诊率较高。结论:对侧乳腺的腺体局部结构扭曲及不对称性致密容易被忽视，FFDM 对致密型腺体的病灶敏感性较低，需结合其他检查方法降低乳腺癌的误诊率。

PU-3109

乳腺包裹性乳头状癌的影像诊断研究

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目的：分析乳腺包裹性乳头状癌（Encapsulated Papillary Carcinoma,EPC）的数字乳腺断层融合技术（Digital Breast Tomosynthesis,DBT）、数字乳腺 X 线摄影（Digital Mammography,DM)及超声检查（Ultrasonography, US）的影像表现，以提高 EPC 的诊断水平。
材料与方法：33 例经手术病理证实的包裹性乳头状癌患者纳入我们的研究中。回顾性分析单纯性包裹性乳头状癌或伴原位癌、包裹性乳头状癌伴灶性浸润以及包裹性乳头状癌合并浸润性癌三组病理的影像学表现。
结果：三组病例的 EPC 在 DBT 均可见典型 EPC 肿块形态，多表现为椭圆形，边界清楚且边缘可见细线征，部分肿块密度不均匀，内见模糊结节样更高密度影，与超声所示囊实性肿块实性部分相对应。DM 表现多呈不规则形，高密度，部分边界清楚。US 表现多为囊实性及低回声结节，边界清楚，后方回声增强，纵横比小于 1，见较丰富血流信号。
结论：乳腺包裹性乳头状癌在 DBT 表现有一定特征，这些特征可提高对 EPC 的诊断。

PU-3110
评估数字乳腺断层合成摄影技术对 X 线或超声表现不典型乳腺纤维腺瘤的诊断价值

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目的 探讨数字乳腺断层合成摄影（DBT）新技术对 X 线或超声表现不典型乳腺纤维腺瘤的诊断价值。**方法** 回顾性分析 2016 年 1 月至 2017 年 12 月经手术病理证实为乳腺纤维腺瘤，以 DM 及 US 图像为基准，影像表现不典型为：形态不规则、边界不清、边缘成角或毛刺状、高密度、纵横比＞1、后方回声衰减、伴有可疑恶性钙化、局灶性不对称致密、结构扭曲以及单一检查方法假阴性的 545 例患者共 688 个病灶进行分析，其中 91.3%（627/688）为致密乳腺纤维组织；手术前均进行过乳腺 DBT 、DM 和 US 检查。参照第 5 版乳腺影像报告及数据系统（BI -RADS）对肿块型病变进行评估，进行 BI-RADS 分类和乳腺致密度分类。评估数字乳腺合成摄影新技术对 X 线或超声表现不典型乳腺纤维腺瘤的诊断价值。采用 c2 检验比较 DBT 、DM 及 US 对 X 线或超声表现不典型乳腺纤维腺瘤的检出率和诊断准确率的差异。**结果** DBT 、DM 及 US 对 X 线或超声表现不典型纤维腺瘤的检出率分别为 69.5%（478/688）、43.8%（301/688）、99.4%（684/ 688），3 种检查方法两两比较检出率的差异均有统计学意义（P 均< 0.05）。 DBT 、DM 及 US 对 X 线或超声表现不典型纤维腺瘤的诊断准确率分别为 60.8%（418/ 688）、23.3%（160/ 688）、91.1%（627/ 688），DBT 及 US 的诊断准确率均高于 DM，3 种检查方法两两间诊断准确率的差异均有统计学意义（P 均< 0.01）。**结论** DBT 较 DM 对 X 线或超声表现不典型乳腺纤维腺瘤的检出及诊断准确性具有明显优势，更能清楚显示病灶边缘，使 BI-RADS 分类更趋向于良性；但检出及诊断准确性弱势于 US。

PU-3111
对比增强 X 线能谱对乳腺癌诊断价值的系统评价

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摘要：目的：乳腺 X 线摄影是乳腺癌筛查首选的检查方式，微钙化是钼靶检查的优势，但乳腺钼靶检查的假阳性仍然是个关注的焦点问题，对比增强能谱 X 线乳腺摄影是一项新技术，检查方便，诊断效能高，可以应用于乳腺癌的筛查、诊断及随访等方面。本研究目的在于通过系统评价和荟萃分析评价对比增强能谱 X 线摄影对乳腺癌的诊断价值。方法:检索 PubMed、Embase 以及 Cochrane 数据库，所有数据库检索时间截止到 2018 年 7 月，筛选能获得 CESM 独立诊断乳腺癌的真阳性值（TP）、假阳性值（FP）、假阴性值（FN）、真阴性值（TN）等原始数据并在国内外公开发表的 CESM 对乳腺癌的诊断性试验。所有入选文献研究对象必须为 18 岁以上患者，性别、病例来源不限；目标病灶行 CESM 且有明确的病理诊断（不论是穿刺或手术切除活检）。研究的结局指标包括其诊断实验的合并敏感性（Sen）、合并特异性 （Spe）、合并诊断比值比（DOR）以及受试者工作特征（SROC）曲线下面积（AUC）、诊断实验准确性指标（TPR），用 Revman 软件进行 meta 分析。结果:此次研究检索到如何纳入标准的 18 篇文献进行分析，meta 分析结果显示合并后的灵敏度和特异度分别为 84.03%、77.59%，表明对比增强能谱 X 线摄影在乳腺癌的诊断中具有较好的灵敏度和特异度。本研究 SROC 曲线下面积为 0.874，诊断试验准确性指标 TPR 为 81.62%，SDOR 值为 15.05（95%CI：10.32%～21.95%）），说明对比增强能谱 X 线摄影对乳腺癌的诊断价值较高，具有较好的准确性，是乳腺癌筛查和诊断的一种较好的影像学方法。结论:尽管对比增强能谱 X 线摄

影对乳腺癌的诊断价值较高，具有较好的准确性，是乳腺癌筛查和诊断的一种较好的影像学方法。本研究认为，对比增强 X 线能谱对乳腺癌的早期诊断还值得进一步研究。

PU-3112
低剂量腹壁下动脉 CTA 的图像质量和临床价值

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目的 探讨基于双源 CT 大螺距 Flash 扫描模式和高级建模迭代重建技术下的低管电压低辐射剂量腹壁下动脉 CTA 对图像质量的影响和临床应用价值。**方法** 30 例患者随机分为两组，对照组采用常规剂量滤波反投影重建技术，实验组采用低辐射剂量的低管电压 FLASH 扫描模式结合高级建模迭代重建技术。设腹壁下动脉平脐孔层面为感兴趣区，计算两组图像质量的客观评价指标并统计两组患者的辐射剂量以 t 检验比较差异。图像质量的主观评价采用 4 分法，采用 Mann-Whitney U 非参数检验比较两组主观图像质量评分。**结果** 对照组感兴趣区的 CT 值为 251.06±18.16Hu，实验组为 276.02±14.86Hu ，（*P*=0.882＞0.05）。对照组 SNR 为 8.37±1.94，实验组 SNR 为 9.17±1.90，（*P*=0.903＞0.05）；对照组 CNR 为 7.02±1.93，实验组 CNR 为 7.31±1.54，（*P*=0.180＞0.05），差异均无统计学意义；主观评价两组图像的对比度、锐利度、主观噪声和总体图像质量差异无统计学意义（*P*=0.63，0.55，0.32，0.63＞0.05）。两组有效辐射剂量为(1.61±0.04)mSv 和(7.02±0.21)mSv，实验组约为对照组剂量的 23%。利用 MIP 和 VR 重建技术，根据腹壁下动脉 CTA 建立腹壁下动脉穿支皮瓣三维重建模型 30 个，共观察到可靠的腹壁下动脉穿支 126 支，实验组和对照组中分别有 13 例和 12 例主观图像质量被评为：腹壁下动脉血管边缘锐利并清晰显示其可靠穿支(直径＞0. 5 mm)和最粗穿支。**结论** 低剂量腹壁下动脉 CTA 可以显著地提高目标血管的 CT 值，提高图像信噪比与对比噪声比，在辐射剂量降为对照组的约 23%的情况下仍能保持与之相当的图像质量，为手术提供可靠的腹壁下动脉穿支血管路径信息。

PU-3113
Blood supply to male nipple-areola-complex evaluated by CTA

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Purpose: In male breast surgeries, necrosis of Nipple-Areola-Complex (NAC) is a common complication. Earlier studies on blood supply of NAC were all conducted on female breasts. Vasculature to male breast NAC is seldom studied. Understanding male-specific blood supply is important to reduce NAC ischemia in male breast surgeries. CTA has been proven to be the golden standard in preoperative visualization of breast blood supplies. This retrospective study is to fill the blank in literature by describing the main blood supply to male NAC.
Method: We retrospectively included 25 male thoracic CT angiography patients. The dominant supply arteries to NAC were revealed through image data analysis.
Results: 25 male patients were included with totally 50 breasts, age 16-63 years (mean: 45.1). For the right breasts, 6 breasts had double dominant vessels (24%). Among all

the 19 breasts with single dominant arteries, 10 were internal thoracic (Internal mammary) artery (ITA)(40%), 3 were lateral thoracic(external mammary) artery (LTA) (16%), 1 was anterior intercostal artery (AICA) (4%). No dominant supply vessel was detected in 7 breasts(28%).
For the left breasts, 1 breast had double dominant vessels(4%). Among all the breasts with single dominant arteries, 4 were ITA (16%), 10 were LTA(40%), 2 were AICA (8%), 1 was contralateral ITA (4%). No dominant supply vessel was detected in 7 breasts (28%).
Conclusion: Unlike female breast vasculature of NAC, ITA and LTA intended to be the dominant blood supply in male NAC. Most male breasts showed asymmetrical perfusion pattern (18/25, 72%). For most male breast NAC, there is a single dominant supply artery.

PU-3114
基于对比增强能谱 X 线摄影的影像组学诺莫图预测乳腺癌新辅助化疗疗效

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目的：探讨基于对比增强能谱 X 线摄影（CESM）的影像组学诺莫图术前预测乳腺癌新辅助化疗疗效的价值。
材料和方法：回顾性分析我院 135 名术前接受新辅助化疗的乳腺癌患者（训练组 100 ，验证组 35），按照实体瘤疗效评价标准（RECIST）评价患者新辅助化疗的疗效，并将患者分为有效组和无效组。从每个病人的 CESM 图像中提取影像组学特征。然后在训练集中用 LASSO 算法建立影像组学标签。结合独立的临床预测因子，采用多元 Logistic 回归模型建立诺莫图。诺莫图的效能在训练集中进行评估，并在验证集中进行验证。
结果：由 9 个特征组成的影像组学标签，具有良好的预测效果。包括影像组学标签、ki67、HER2 的诺莫图在训练集（AUC 0.87；95%CI，0.82-0.91）和验证集（AUC 0.85；95%CI，0.80-0.90）中也显示出良好的效能。决策曲线表明了我们列线图的临床实用性。
结论：基于术前 CESM 影像组学特征和临床预测因子建立的诺莫图模型在预测乳腺癌患者新辅助化疗疗效方面具有重要的价值。

PU-3115
对比增强能谱乳腺 X 线摄影对乳腺可疑钙化的诊断价值及对外科治疗的影响

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目的：探讨对比增强能谱乳腺 X 线摄影(contrast-enhanced spectral mammography，CESM)对乳腺可疑钙化的诊断价值及其对外科治疗决策的影响。**材料与方法：**回顾性分析 2017 年 4 月至 2019 年 4 月我院行 CESM 检查并在低能图上发现可疑钙化的患者，所有患者均经穿刺或手术获得病理结果。两名经验丰富的乳腺诊断放射科医生分别为低能图及 CESM 提供 BI-RADS 分级，通过病理与影像的对照分析，使用受试者操作特性（receiver operating characteristic，ROC）曲线分析二者

对乳腺可疑钙化的诊断效能，计算诊断敏感性、特异性。使用组内相关系数（intraclass correlation coefficient，ICC）评估恶性病灶的影像最大径与病理最大径的一致性。两名乳腺外科医生根据影像表现决定恶性病灶的首选外科治疗方式（保乳治疗[BCT]或乳房切除），分别与最终的外科治疗方式进行比较，采用 McNemars 检验比较手术决策的差异。**结果：**94 名患者共检出 103 例乳腺可疑钙化病灶，良性 49 例，恶性 54 例。低能图及 CESM 的敏感性为 80.39%、96.23%，特异性为 75.00%、94.00%，ROC 下面积分别为 0.81、0.96，CESM 的 ROC 下面积显著大于低能图（*P* = 0.0003）。低能图及 CESM 的病灶最大径与病理最大径的 ICC 分别为 0.86、0.96。根据低能图，44.44%的患者推荐行 BCT，55.56%的患者推荐行乳房切除术，与最终外科治疗方式之间差异有统计学意义（*P* = 0.0075）；根据 CESM，27.78 %的患者推荐行 BCT，72.22%的患者推荐行乳房切除，与最终外科治疗方式之间差异无统计学差异（*P* = 0.1250）。**结论：**CESM 对乳腺可疑钙化的诊断准确性较高，对病灶大小的评估较准确，为术前手术决策的制定提供了依据。

PU-3116
对比增强能谱乳腺 X 线摄影量化评分对定性乳腺病灶的价值

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【摘要】目的 探讨对比增强能谱乳腺 X 线摄影（contrast-enhanced spectral mammography，CESM）量化评分在定性乳腺病变中的价值。**方法** 回顾性分析 2017 年 8 月至 2019 年 3 月我院临床或超声检查怀疑有乳腺病变，并在术前一周内行 CESM 检查的患者。两名经验丰富的乳腺诊断放射科医师共同对同一患者的低能图进行 BI-RADS 评分，然后对减影图进行病灶强化程度分级，最后计算 CESM 综合评分。通过与病理对照，使用受试者操作特性（receiver operating characteristic，ROC）曲线比较低能图 BI-RADS 评分、减影图病灶强化程度分级和 CESM 综合评分鉴别诊断乳腺良恶性病变的效能。**结果** 181 名患者共检出 190 例乳腺病灶，良性病灶 97 例，恶性病灶 93 例。低能图 BI-RADS 评分、减影图病灶强化程度分级和 CESM 综合评分判别病灶良恶性的 ROC 曲线下面积分别依次为 0.83、0.87、0.95；CESM 综合评分与低能图 BI-RADS 评分、减影图病灶强化程度分级的 ROC 曲线下面积有统计学差异（*P* 均＜ 0.0001），后两者的 ROC 曲线下面积间无统计学差异（*P* = 0.34）；三者判别乳腺病灶为恶性的诊断敏感性分别依次为 84.95%、92.47%、89.25%，特异性依次为 71.13%、67.01%、93.81%。**结论** 综合低能图及减影图的 CESM 综合评分提高了定性乳腺病变的诊断效能。

PU-3117
CESM 对致密型乳腺患者良恶性病灶的诊断效能评价

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目的：探讨对比增强乳腺 X 线摄影(CESM)在致密型乳腺患者应用中，对良、恶性病灶的诊断效能进行评价，确定 CESM 的临床应用价值。**方法：**回顾性收集 2017 年-2018 年于我院行 FFDM 和 CESM 的致密型乳腺患者信息，并且有穿刺或手术病理结果的 114 例，与病理结果的金标准来比较分析。比较 FFDM 与 CESM 的低能图，FFDM 与 CESM 的低能图+减影图，对乳腺疾病的诊断的敏感度、特异度、阳性预测值和阴性预测值；采用卡方检验两种检查方法对致密型乳腺疾病的诊断效能比较。**结**

果：在 114 位有病理结果的患者中，总共发现 144 例病灶，其中良性病灶 110 个，恶性病灶 34 个。以病理诊断结果为金标准，计算出两种检查方法对乳腺疾病的诊断效能。FFDM 的敏感性、特异性、阳性预测值及阴性预测值分别为：63.55%、75.10%、43.22%、82.72%，CESM 的低能图敏感性、特异性、阳性预测值及阴性预测值分别为：67.58%、76.35%、46.57%、83.33% ；CESM 的低能图+减影图的敏感性、特异性、阳性预测值及阴性预测值分别为：82.4%，96.4%，87.5%，94.6%。FFDM 与 CESM 的低能图的诊断效能对比,差异无统计学意义（P>0.05），FFDM 与 CESM 的低能图+减影图的诊断效能对比，其中敏感性、特异性、阳性预测率都存在显著差异，具有统计学意义（P＜0.05）。**结论** 与 FFDM 比较,CESM 的低能图像诊断效能相当，而 CESM 的低能图+减影图，其中减影图像能够去除正常乳腺组织的干扰，突出显示乳腺病灶的形态和血供情况，特别是对致密型乳腺疾病的诊断效能明显提高。中国女性中有较多的致密型乳腺，因此 CESM 具有较广阔的临床应用价值 。

PU-3118
乳腺对比增强 X 线摄影的强化特点对于乳腺浸润癌的诊断价值

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目的 通过分析乳腺良恶性肿瘤在对比增强乳腺 X 线摄影（CESM）上的强化特点，探讨其对于乳腺癌的诊断价值。**方法** 回顾性分析本院 138 例临床怀疑乳腺肿瘤的女性患者资料。以手术或组织活检的病理结果为参考标准，参照第五版乳腺影像报告及数据系统（BI-RADS）对乳腺肿瘤进行评估分类。对浸润癌、原位癌及良性肿瘤的强化程度（轻，中及重度）、密度（均匀，不均匀）及方式（流入型Ⅰ型，平台型Ⅱ型，流出型Ⅲ型）进行统计，再使用 x^2检验乳腺浸润癌的强化特点与原位癌、良性肿瘤的组间差异。 **结果** 经病理确诊乳腺肿瘤共 147 个，40 个良性肿瘤，86 个浸润癌，21 个原位癌。96.5%（83/86）的浸润癌、42.9%（9/21）的原位癌、15.0%（6/40）的良性肿瘤表现为中或重度强化（*P*=0.000，χ2=87.878）。 91.9%（79/86）的浸润癌、85.7%（18/21）的原位癌、73.5%（25/34）的良性肿瘤表现为不均匀强化（包括环形强化）（*P*=0.030，χ2=7.036）。90.7%（78/86）的浸润癌、47.6%（10/21）的原位癌、32.4%（11/34）良性肿瘤表现出Ⅱ型或Ⅲ型强化方式（*P*=0.000，χ2=45.683）。中、重度强化这个独立的诊断指标对诊断乳腺浸润癌、原位癌、良性肿瘤的敏感度分别为 96.5%，42.9%，15.0%；不均匀强化对诊断三者的敏感度分别为 91.9%，85.7%，73.5%；Ⅱ型或Ⅲ型强化方式对诊断三者的敏感度分别为 90.7%，47.6%，32.4%。 **结论** CESM 上肿块显示为中、重度，不均匀强化，流出型或平台型强化方式，对于乳腺浸润癌有较大的诊断价值。

PU-3119
探讨对比增强光谱乳房 X 线与 MRI 在评价新辅助全身治疗后乳腺癌残留的价值

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目的：目的评价对比造影(CESM)与 MRI 在评价乳腺癌新辅助全身治疗(NST)患者肿瘤反应中的表现。方法：从 2014 年 9 月到 2017 年 6 月，我们确定了接受 NST 手术的经病理证实的侵袭性乳腺癌患者。所有患者均行术前和术后的 CESM 和 MRI 检查，并在手术治疗后进行病理评估。并与手术病理结果进行比较。采用 Lin 一致性和 Pearson 相关系数进行一致性评价。用布兰德-阿尔特曼图观察肿瘤大小在影像学和病理学上的差异。结果：65 名患者被确诊。平均年龄为 52.7 岁(范围 30-76 岁)。NST 类型包括化疗 53 例(82%)和内分泌治疗 12 例(18%)。NST 后肿瘤平均大小为 14.6 mm(范围 0-105)，CESM 为 14.2 mm(范围 0-75 mm)， MRI 为 19.6 mm(范围 0-100)。等值试验表明，用 CESM (p = 0.009)或 MRI (p = 0.01)测量的肿瘤平均大小与病理在- 1 和 1 cm 范围内测量的肿瘤平均大小相等。比较 CESM 与 MRI 对完全缓解的评估，敏感性为 95%对 95%，特异性为 66.7%对 68.9%，阳性预测值为 55.9%对 57.6%，阴性预测值为 96.7%对 96.9%。结果：在评估 NST 术后残余恶性肿瘤方面，CESM 与 MRI 具有可比性

PU-3120
对比增强乳腺 X 线摄影（CESM）对乳腺肿瘤的应用价值

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目的：探讨常规数字化乳腺 X 线成像（FFDM）和对比增强能谱乳腺 X 线摄影（CESM）的术前评估乳腺肿瘤分型，对临床应用价值。
方法：收集临床拟诊乳腺肿瘤患者两组共 66 例，年龄 24～67 岁，根据腺体类型分为第一组 30 例少量腺体组，第二组 36 例多量腺体组。两组均先行 FFDM 检查，再进行双侧乳腺 CESM 检查，图像自动重建和图像融合后分别获得低能图像和减影图像，记录病灶检出情况。由两位有经验的乳腺医师根据乳腺病变的评价乳腺影像报告和数据系统 BI-RADS，具体分为 0～6 类，将 BI-RADS 分类标准中的 4B、4C、5、6 类作为影像恶性评价，1、2 类为影像良性评价，3、4A 类在 3 或 6 个月后随访或结合其他检查进行评估，0 类需结合其他影像检查。两组病例均行病理检查，以病理结果为金标准。并对 FFDM、CESM 的图像进行分析，将影像学诊断结果与病理结果进行对照分析。
结果：第一组 30 例受检病例中，病理结果共检出病灶恶性 26 例，CESM 影像学评价恶性 24 例，准确度分别为 92.3%（24/26）；FFDM 影像学评价恶性 19 例，准确度分别为 53.8%（14/26）；X^2 检验显示影像差异有统计学意义（X^2=6.696,P<0.05）。第二组 36 例致密型腺体组受检病例中，病理结果共检出恶性病灶 28 例；CESM 影像学评价恶性 22 例，准确度分别为 78.6%（22/28）；FFDM 影像学评价恶性 16 例，准确度分别为 57.1%（16/28）；X^2 检验显示影像差异有统计学意义（X^2=8.461,P<0.05）。在多量腺体乳腺中，CESM 重建图像能够去除腺体背景干扰，可以提高临床对乳腺肿瘤诊断的敏感度。
结论 ：由于本研究病例有限，CESM 是否能广泛应用于临床，还需要进一步大规模的数据。但本组的初步研究结果表明 CESM 对乳腺肿瘤的诊断准确度较高，优于 FFDM。

PU-3121
增强光谱钼靶和磁共振对乳腺癌诊断效能的 Meta 分析

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摘要：目的：评价 CESM 诊断乳腺癌的诊断效能。**方法：**检索中国知网、万方数据库、CBM、MEDLINEE、Embase、PubMed 和 Ovid 近 10 年发表的 CESM 与 MRI 比较诊断乳腺癌效应的文献，采用 Review Manager5.3 软件对发表偏倚进行评价，采用 Meta Disc 14 对纳入文献的异质性进行检验，根据异质性检验结果选择效应模型，同时对敏感性、特异性、PLR、NLR 和 DOR 进行汇总分析。**结果：**共检索出相关中英文文献 435 篇，经过筛选共有 12 篇文献符合入选要求。汇总结果显示，CESM 和 MRI 的敏感度分别为 0.97 和 0.97，特异度分别为 0.69 和 0.51，DOR 分别为 105.44 和 33.73，PLR 分别为 2.94 和 1.95，NLR 分别为 0.05 和 0.07，AUC 及其 95%CI 分别为 0.9645(0.981552~0.9558)和 0.9198(0.946848~0.892752)。两种诊断方法 AUC 的 95%CI 不重叠，CESM 的 AUC 大于 MRI，说明其真实性有明显的差异。**结论：**CESM 在乳腺癌诊断方面具有较高的准确性，与 MRI 比较有统计学差异。

PU-3122
乳腺错构瘤 X 线、超声及 DCE-MRI 影像表现及其诊断效能评价

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【摘要】目的 分析乳腺错构瘤的 X 线、超声及 DCE-MRI 表现特点，旨在提高对本病的影像诊断水平、同时评估三种检查方法的诊断效能。**资料与方法** 搜集 2012 年 11 月~2019 年 2 月于我院行乳腺肿瘤切除并经病理证实为乳腺错构瘤者 24 例，分析其 X 线、超声及 DCE-MRI 表现特点，并基于 BI-RADs 分级对其良恶性进行分类，以最终病理学为金标准，采用卡方检验和 *Fisher* 精确检验评估 X 线、超声及 DCE-MRI 的诊断效能。**结果** 肿块呈类圆形或椭圆形，内密度/回声/信号多不均匀，边界清楚、局部可与邻近腺体分界不清；可有包膜。X 线检出病灶 22 例，2 例未检出；诊断为良性 19 例，恶性 3 例。超声检出病灶 23 例，未检出 1 例；诊断为良性 22 例，恶性 1 例。DCE-MRI 检出所有病灶，并全部诊断为良性。诊断符合率：X 线为 79.17%%、超声为 91.7%%、100.0%，$P_{X线,MRI}<0.05$，$P_{超声,MRI}>0.05$，$P_{超声,X线}>0.05$。**结论** 乳腺错构瘤因其内部组织结构不同而有差异，但典型病例其影像学表现具有一定特点，X 线、超声是首选检查方法，MRI 在乳腺错构瘤的诊断及鉴别诊断方面是重要的补充手段。

PU-3123
乳腺 MRI 背景实质强化预测新辅助化疗早期疗效的研究

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目的：回顾性分析进展期乳腺癌对侧乳腺腺体背景实质强化（background parenchymal enhancement,BPE）在乳腺癌新辅助化疗（neoadjuvant chemotherapy,NAC）前后的变化是否有助于预测乳腺癌的肿瘤反应。
材料与方法：收集 2017 年 5 月至 2018 年 4 月经穿刺活检或手术证实的单侧乳腺癌，并于本院行新辅助化疗以及手术治疗的患者共 168 例。由两名放射科医师根据乳腺影像报告和数据系统（Breast Imaging Reporting and Data Syetem, BI-RADS）对 MR-DCE 上对侧乳腺腺体的背景实质强化行定性评价（1＝极少，2＝轻度，3＝中度，4＝明显），治疗前以及治疗 2 疗程后均行 MR 检查。评估背景实质强化在新辅助化疗前后的变化，并评估背景实质强化与新辅助化疗早期疗效的关系。

结果：新辅助化疗治疗后，62 例达到病理完全缓解（pCR）；106 例非完全缓解（非 pCR）。绝经前组背景实质强化均明显高于绝经后组，无论是治疗前还是治疗后；背景实质强化的降低在绝经前组及绝经后组均有统计学意义（P＜0.05）。
结论：无论绝经前、后，乳腺腺体背景实质强化（BPE）的变化可以作为早期治疗反应有效性的指标。

PU-3124

深度学习在乳腺癌磁共振诊断的研究

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目的： 探讨在乳腺磁共振诊断中，深度学习自动判读与医生团队对乳腺癌的诊断效能，以及弱监督学习对病灶自动定位的准确性。
方法： 此项研究收集了从 2013 年 3 月到 2017 年 6 月 1715 例乳腺动态增强 MRI 扫描和非脂肪抑制的 T1 平扫图像，包括 1137 例恶性肿瘤和 578 例良性肿瘤，平均年龄 47.5 岁±11.8，均为女性，乳腺 MRI 均在 1.5T 的磁场进行。患者俯卧位检查，两个乳房自然放置在线圈腔中。动态增强扫描前先扫描蒙片，采用脂肪抑制 3D VIBE 序列，静脉注射对比剂钆喷酸葡胺后，连续用相同的序列扫描 6 次，7 个时相全部完成后，使用自动高压注射器以 2 毫升/秒的速度用 20 ml 生理盐水（0.9%）冲洗。扫描完成后，机器自动完成 6 个时相的减影。所有病例均有穿刺或手术的病理结果，影像学结果由具有 10 年以上丰富经验的影像医生团队给出最终的 BI-RADS 分类。基于病理基础事实的监督，输入数据集 10290（1715x6）个对 CNN 进行训练，实现对病灶的自动分类和定位。整个数据集被随机分为训练集（1204）、验证集（165）和测试集（346）。计算模型诊断乳腺癌的准确性、敏感性、特异性和受试者工作特征曲线下面积（AUC）。
结果： CNN 训练模型诊断乳腺癌的准确性为 85.5%（296/346），敏感性为 85.7%（198/231），特异性为 85.2%（98/115），受试者工作特征曲线下的面积 AUC 为 0.902。BI-RADS 评估诊断乳腺癌的准确性为 84.7%，敏感性为 98.3%，特异性为 57.4%。深度学习对癌灶的自动定位采用自动定位的中心点到人工标记的中心点之间的距离来评价，平均值为（18.26+-13.65）mm，较传统方法得到的结果（39.82+-8.82）mm 有提高。
结论： 深度学习自动诊断乳腺癌可有望改变放射科医生阅片的工作流程，提高医生的综合诊断结果；弱监督学习自动定位较传统方法有提高。

PU-3125

多模态 MRI 检查对乳腺囊实性肿块结节的诊断与鉴别诊断价值

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目的 探讨乳腺囊实性肿块结节的 MRI 影像特征和诊断价值。
方法 回顾性分析经手术及病理证实的 21 例乳腺囊实性肿块结节的影像表现，总结病变的形态学特点、其在 T2WI、扩散加权成像上的特点，血液动力学表现，探讨其特征及 MRI 诊断价值。
结果 结节型导管内乳头状瘤 3 例，葫芦状改变或分叶，边界欠清 1 例，边界清楚 2 例，表现为多囊状扩张的导管内实性壁结节，结节可向扩张的导管腔内外生长，弥散受限轻度、中度、不受限

各 1 例，时间-信号曲线流出型 3 例；导管内乳头状癌 2 例，均边界欠清楚，分叶 1 例，不规则形态 1 例，弥散均中度受限，时间-信号曲线均流出型；囊肿伴附壁肉芽结节形成 6 例，壁结节多较规则，边界多清楚，弥散均不受限，壁结节 TIC 平台型 4 例，渐进型曲线 2 例；浸润性导管癌 2 例，边界清楚 1 例，欠清楚 1 例，弥散受限较明显 2 例，流出型曲线 1 例，平台型曲线 1 例；粘液腺癌 8 例，边界均较清楚，T2WI 信号明显整体增高 8 例，弥散多不受限，增强后强化多不明显、少许小结节或间隔状强化，TIC 平台型为主。

结论　乳腺囊实性肿块结节的组织学类型多样，MRI 影像学有一定特征，对术式选择和指导治疗有重要价值。

PU-3126

A comprehensive nomogram to predict distant metastasis in breast cancer: a study based on clinicopathological characteristics and magnetic resonance imaging features

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Purpose: The aim of this study was to develop a comprehensive nomogram for predicting distant metastasis in breast cancer (BC) based on clinicopathological characteristics and magnetic resonance imaging (MRI) features.

Materials and Methods: Ninety-three metastatic BC patients and 186 age-matched cases without distant metastasis were selected from the breast MRI database consisting of 6,703 patients from January 2011 to December 2016. The least absolute shrinkage and selection operator (LASSO) method was used to identify the optimal subset of clinicopathological and MRI features. Multivariate logistic regression was used to construct a model for predicting distant metastasis. A nomogram was constructed based on the identified features. The performance of the nomogram was evaluated by areas under receiver operating characteristic curves (AUCs) and calibration curves. The temporal splitting method was used to evaluate the stability of the nomogram.

Results: A total of nine features, namely, reproductive history, menstrual status, lesion type, multiple masses, oestrogen receptor status, progesterone receptor status, lymph node metastasis, tumour size and T2-weighted imaging (T2WI) signal, were incorporated into the predictive nomogram. The calibration curve showed an optimal consistency between the observed and predicted probability of distant metastasis. The predictive nomogram made satisfactory discrimination [AUC=0.857; 95% confidence interval (CI): 0.809-0.905]. No difference was found in the AUC between the training and validation datasets.

Conclusion: The comprehensive nomogram incorporating clinicopathological and MRI features was a valid tool for predicting distant metastasis in breast cancer and can potentially guide distant metastasis screening and implementation of prophylactic treatment.

PU-3127

3.0T MRI 多 b 值扩散加权成像 ADC 直方图与乳腺癌分子分型及预后因素 的相关性研究

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目的：探讨 3.0T MRI 多 b 值扩散加权成像表观扩散系数（apparent diffusion coefficient，ADC）直方图参数与乳腺癌分子分型及预后因素的相关性，并评估 ADC 直方图在各 b 值下诊断效能。**方法**：回顾性分析 2015 年 3 月至 2016 年 1 月于天津医科大学肿瘤医院行乳腺 MRI 检查并经手术病理证实为浸润性导管癌患者的临床病理资料，共 116 个病灶。利用 Image J 软件对 b 值为 0、500、800、1000、1 500 s/mm^{2}时 ADC 图进行直方图分析，记录 ADC 最小值（ADC_{min}） 、ADC 平均值（ADC_{mean}） 、 ADC 众数（ADC_{mode}）、偏度及峰度等参数。根据肿瘤分子分型、T 分期（T1 *vs.* T2~T3）、组织学级别（高级别 *vs.* 低级别）以及淋巴结转移情况（阳性 *vs.* 阴性）进行分组，采用 Mann-Whitney U 检验比较不同两组间参数差异，并绘制受试者工作特征（receiver operating characteristic curve，ROC）曲线。**结果**：b 值为 500、800、1000 及 1 500 s/mm^{2}时，Luminal 型偏度均低于非 Luminal 型（均 P<0.05），Her-2 过表达型 ADC_{min}均高于非 Her-2 过表达型（均 P<0.05），T1 期肿瘤峰度均低于 T2~T3 期（均 P<0.05），且峰度与肿瘤大小存在相关性（均 P<0.05）。b 值为 500 s/mm^{2}时，组织学低级别组 ADC_{mode}及 ADC_{mean}较高级别组高（均 P<0.05）。在不同 b 值下，通过 ROC 曲线分析差异具有统计学意义的各直方图参数的曲线下面积（area under ROC curve，AUC）无显著性差异（均 P>0.05）。**结论**：多 b 值 ADC 直方图是一种肿瘤异质性的定量分析方法，在一定程度上反映乳腺癌的生物学行为和预后。

PU-3128

磁共振弥散峰度成像在鉴别乳腺癌裸鼠皮下移植瘤模型上皮-间质转化中的实验研究

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目的：探讨磁共振弥散峰度成像（DKI）在鉴别重组 Snail1 基因过表达诱导的乳腺癌裸鼠皮下移植瘤模型上皮-间质转化（EMT）中的价值。**材料与方法**：采用慢病毒介导的重组 Snail 1 基因过表达转染乳腺癌 MCF7 细胞，诱导 MCF7 细胞的 EMT。将 MCF7/Control 和 MCF7/Snail1 分别于裸鼠进行皮下成瘤（MCF7/Control、MCF7/EMT 组，每组 10 只）。待两组皮下瘤体积达 500 mm^{3}左右时，采用常规 MRI 和 DKI 序列进行扫描，DKI 扫描采用 3 个扩散梯度场，选取 5 个 B 值（0,500,1000,1500,2000 sec/mm^2）。比较两组皮下瘤的 DKI 后处理参数（表观弥散系数 D 值和峰度系数 K 值）的差异，分析 D 值和 K 值与 EMT 标记分子 E-cadherin 和细胞增殖标记分子 Ki-67 标记分子表达的相关性。**结果**：MCF7/Control 和 MCF7/EMT 组皮下移植瘤的 D 值分别为（0.76±0.13）×10^{-3} mm^2/sec、（0.53±0.43）×10^{-3}mm^2/sec，两组间的 D 值具有显著差异（P<0.001）； K 值分别为 1.18±0.09、1.36±0.11，两者间差异具有统计学意义（P<0.001）。D 值取阈值为 0.60×10^{-3} mm^2/sec 时，其评估 EMT 的敏感度为 100%，特异度为 90%；K 值取阈值为 1.28 时，其评估 EMT 的敏感度为 80%，特异度为 80%。D 值与 Ki-67 表达呈负相关，与 E-cadherin 表达呈正相关（P<0.001，P=0.005）；K 值与 Ki-67 表达呈正相关，与 E-cadherin 表达呈负相关（P=0.006，P=0.032）。

结论：DKI 对鉴别乳腺癌裸鼠皮下移植瘤的 EMT 具有潜在的价值，有助于筛选具有 EMT 特征的高侵袭性、易于远处转移的乳腺癌。

PU-3129
3.0T MRI 扩散加权成像及动态增强扫描对乳腺病变 的诊断价值

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目的 探讨妊娠期乳腺癌的临床与 MRI 表现，加强认识，提高诊断率。**方法** 回顾性分析 2012 年 9 月至 2015 年 1 月间我院 3 例经手术病理证实为乳腺癌的妊娠期或哺乳期患者的 MRI 表现，分析病灶的 MRI 形态学、信号强度、弥散加权信号及表观扩散系数（ADC）值及其动态增强特点等，并与病理结果对照。**结果** 3 例病灶病理组织学类型均为浸润性导管癌。3 例均发生于右乳，其中占据整个乳腺 1 例，位于外上象限 1 例，位于内下象限 1 例；肿块最大径为 8.2~12.8cm；3 例病灶肿块形态均不规则，其中 2 例由多个病灶融合而成，边界均不清；MRI 平扫 T1WI 与乳腺实质比较呈混杂等信号，T2WI 呈混杂高信号；3 例肿块内均见坏死出血区，表现为 T1WI 和 T2WI 均为高信号；所有病灶 DWI 上均表现为高信号，相应 ADC 值低于正常乳腺组织，平均 ADC 值为 0.73×10-3mm2/s；动态增强后病灶均为边缘强化，时间信号强度曲线呈快速流入-流出型（III型）。**结论** 妊娠期乳腺癌的 MRI 表现与一般乳腺癌相比具有一定特征性，认识其特征性 MRI 表现有助于鉴别诊断，提高诊断准确率。

PU-3130
低信号分隔在 MRI 诊断乳腺纤维腺瘤中的价值

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目的：评价 MRI 低信号分隔征诊断纤维腺瘤中的价值，加深对低信号分隔的认识，更好地鉴别乳腺良恶性病变。

方法：收集本院自 2013 年 3 月至今核磁报告诊断纤维腺瘤患者 62 例，均行手术切除，其中 52 例诊断正确，2 例双侧发病，误诊 10 例。确诊患者中，51 例女性患者，1 例男性患者，年龄最 18 岁，最大 75 岁，中位年 42 岁。采用西门子 Pink Espree 1.5T 磁共振机，乳腺专用线圈进行扫描。分析经病理证实纤维腺瘤中有无低信号分隔，低信号分隔在各个序列中的显示率及分隔的粗细情况。

结果：手术证实 52 例共 54 个纤维腺瘤中，37 个纤维腺瘤在 MRI 可观察到低信号分隔，发生率为 69%（37/54）；其中 29 个病灶分隔厚度小于 2mm，8 个病灶厚度大于 2mm；37 个病灶低信号分隔 33 个在抑脂 T2WI 像可以观察到，在非剪影 TIWI 增强序列均可观察到。

结论：纤维腺瘤“分隔征”在 T1WI 及 T2WI 均表现为低信号，增强扫描无强化，部分胶原带较为细小 MRI 难以显示，MRI 可显示的胶原带都有相似的厚度，一般厚约 0. 25～0. 75 mm[3],偶有大于 2 ｍｍ者，较纤细者难以显示。低信号在抑脂 T2WI 或非减影的增强后图像显示最好，分析除与增强扫描层厚有关外，还与部分纤维腺瘤在抑脂 T2WI 呈明显低信号，影响低信号分隔征观察有关。虽然文献报道低信号分隔征是纤维腺瘤的特异性 MRI 征象，但同时也是叶状肿瘤的一个常见征象,但诊断价值有限。值得注意的是，在部分边界清楚的乳腺癌中也会出现所谓的“分隔”征，表现为 T2WI 低信号。但纤维腺瘤的内部分隔增强后通常不强化，乳腺癌的内部分隔则常有强化，两者病理构成截然不同。

PU-3131

影像组学在乳腺癌的应用

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【摘要】 目的 传统乳腺磁共振在乳腺癌诊断、疗效评估、转移等方面处于主要地位，但仍存在主观、半定量等缺点。 新兴的放射组学它应用大量的自动化数据特征算法将感兴趣区域的影像数据转化为具有高分辨的可发掘的特征空间数据，应用于乳腺癌的诊断预测模型、基因表型模型、分子亚型预测模型和疗效评价模型等一系列临床应用模型，有望成为乳腺癌精准医疗的重要方法。本文总结放射组学在乳腺癌各个方面的研究进展。 方法 应用 PubMed、万方数据库等检索系统， 以“乳腺癌，放射组学”或“乳腺癌，影像组学”为关键词，检索相关文献。 纳入标准：（ 1）放射组学在乳腺癌诊断的研究进展；（ 2）放射组学在预测乳腺癌分子亚型方面的研究进展；（ 3）放射组学在乳腺癌新辅助治疗疗效评价及预测治疗反应性中的研究进展；（ 4）放射组学对乳腺癌基因表型的预测；（5）放射组学在乳腺癌复发及淋巴结转移评估中的研究进展。共纳入分析 20 篇文献。 结果 放射组学作为一种新兴的研究方法，最初主要用于辅助临床诊断及评估乳腺癌治疗后疗效，逐渐地在乳腺癌的分子亚型及基因表型的预测、乳腺癌的复发及淋巴结转移评估、治疗反应性的判断及预测等方面取得了一定的成果。大量研究证实，结合放射组学提取的特征来评估乳腺癌患者可达到精准的预测效果，有望成为基因检测，分子亚型测定等的替代物，从而促进精准医疗及个体化医疗的实现。结论 放射组学在乳腺癌中有高度的临床应用价值及研究前景。

PU-3132

Necrosis nodule mimic breast cancer after breast augmentation with injectable polyacrylamide hydrogel a case report

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Introduction: Necrotic nodule is a common complication after polyacrylamide hydrogel injection of the breast. A necrosis nodule mimicking breast cancer after polyacrylamide hydrogel injection was reported.
Case presentation: A 43- year- old woman underwent bilateral breast augmentation with injectable polyacrylamide hydrogel (PAAG) 12 years ago. 7 years later, she was admitted to hospital for the PAAG removal surgical procedure followed by bilateral silicone implant breast augmentation. 5 years afterward, she noted a palpable nodule in the upper-outer quadrant of her left breast.
Ultrasound: A hypoechoic nodule in the tail of the left breast at 2 o'clock was noted, with an irregular shape, microlobulated, closely adjacent to the pectoral muscle, with rich internal blood flow signal, BI-RADS 4C
MRI: An oval mass with heterogeneous enhancement was noted in the left breast, upper outer quadrant, 10:00, posterior third, near the pectoral muscle. The nodule size was

about 1.2 × 1.9 × 2.2cm, its boundary with the posterior chest muscle was unclear, DWI signal was high, ADC value is about $1.01\times10^{-3}mm^2/S$. In kinetic curve assessment, rapidly enhancing pattern was noted, delayed post-contrast indicate washout enhancement.BI-RADS 5.Surgery: The patient underwent B-ultrasound guided left breast extensive local excision and biopsy.
Pathology: Necrotic nodule, blue-stained amorphous matter and multi-nuclear giant cell reaction, accompanied by scattered calcification, a little fibrous adipose tissue, and striated muscle tissue.
Conclusion: Necrotic nodule after polyacrylamide hydrogel injection of the breast can mimic breast cancer in multiple imaging evaluations. Carefully differentiation should be made in imaging diagnosis.

PU-3133

乳房 MRI 背景实质增强与乳腺癌分子亚型相关性的探索

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目的：探讨不同乳腺癌分子亚型 MRI 乳腺实质增强(BPE)的分布特点**方法：**回顾性研究行 DCE 检查的患者 73 名。由 2 名医师采用 BI-RADS 分类法盲法评阅磁共振扫描图像，在 DCE-MRI 序列的早期阶段对 BPE 进行评估，将 BPE 分为 4 类：最小（<25%）、轻度（25%-50%）、中度（50%-75%）、明显（>75%）。如 BPE 等级评估有差异，则由两位医师共同讨论后决定。免疫组化：ER≥1%为阳性、PR≥1%为阳性。HER-2 染色强度评分为-、+、++或+++，≥3 值为阳性，-和+为阴性，分值为++时需进一步采用 fish 检测.若 fish 检测为阳性，则 HER-2(++)为阳性。据 2013 年 S t. Gallen 会议提出的临床病理分子分型，将患者分为 5 组 ：Luminal A 型组， Luminal B 型 HER2 阴性组 ，Luminal B 型 HER2 阳性组，HER2 阳性非 Luminal 型组 ，三阴型组。采用 x 2 试验，评价 5 组肿瘤亚型中 BPE 型分布的意义。同时采用 x 2 试验，研究了 5 种乳腺癌亚型在不同类型乳腺癌中的分布情况。**结果：**仅在腔 B 型(Her-)组中，轻度 BPE 型明显高于其他类型（P<0.001）。在其他乳腺癌亚型组中没有发现显著的分布差异。根据 BPE 在五组中分布情况，其中 4 组的轻度和中度 BPE 为常见类型。唯一的例外是三阴型组，中度和明显 BPE 在占优势;在所有轻度 BPE 患者中，腔 B 型 (HER 2-)组明显增高（P<0.001）。明显 BPE 患者中，三重阴型组明显高于其他对照组(P<0.001)。5 种肿瘤亚型在最小、中等 BPE 组中均无显著差异(P=0.07 和 P=0.09)。**结论：**1.不同分子亚型的乳腺癌中 BPE 的分布有所不同。2.BPE 可为从影像学角度来预测乳腺癌分子亚型提供一定的帮助。

PU-3134

Unilateral hematoma after breast augmentation with injectable polyacrylamide hydrogel a case report

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Introduction: Bleeding is a rare complication after polyacrylamide hydrogel injection of the breast. Accurate preoperational diagnosis is helpful to the formulation of the surgical plan and follow-up treatment. A case of breast hematoma after breast polyacrylamide hydrogel (PAAG) injection and removal surgery was reported.
Case presentation:
A 46- year- old woman injected PAAG to both breasts for augmentation in 2004. Neither acute nor chronic complication like skin ulceration, redness or breast pain was present. Since 2013, the patient noticed nodules in both breasts, she underwent surgery to remove the PAAG gel in 2016, but progressive bilateral breast enlargement was noted afterward. And she was admitted again to our hospital for treatment. Breast physical examination: asymmetrical bilateral breasts was seen. It was found that the right breast enlarged with high skin tension. Neither side of the skin had erythema or dimpling. Scars were noted under bilateral papillae. Hard nodules were palpable in all four quadrants of the right breast. No discharge was found in both nipples.
Ultrasound: There were multiple hypoechoic nodules in the right breast. The largest one was located 2 cm away from the nipple at 5 o'clock direction, 2.6×2.2×2.1cm in size. CDFI: no obvious blood flow signal. BI-RADS 3.
MRI: multiple irregular implant cysts were seen anterior to the bilateral pectoralis major, an abnormally enlarged rounded mass was noted anterior to the right pectoralis major muscle. Its maximum cross-section plane was approximately 8.1×11.3cm. It was mainly consisted of T2WI and T1WI high signal, with scattered linear low T2 signal and patches of extremely high T2 signal. No obvious enhancement was noted in the mass.
Consideration: Mass in the right breast was considered mixed bleeding evolution signal at different phases.
Surgery record: Cut the skin along the right areola incision line. Then, the gland was cut into the deep semi-curved shape. There was a large amount of brown liquid in the posterior space of the gland, which was sucked out, and a large amount of brown semi-solid was taken out by scraping spoon.
Conclusion: MRI is a valuable choice in differentiating complications after polyacrylamide hydrogel injection, with multi-sequence and large viewing field. More accurate imaging diagnosis can be made by MRI.

PU-3135

Feasibility study of diffusion-weighted imaging histology in predicting Ki-67 expression in breast cancer

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Objective To investigate the feasibility of preoperative prediction of Ki-67 expression in breast cancer using diffusion-weighted magnetic resonance imaging (DWI).

Methods DWI images of breast cancer patients who underwent preoperative MRI examination were selected and Ki-67 expression level was measured by pathological examination. 114 lesions were obtained, of which 38 were negative for Ki-67 expression and 76 were positive for Ki-67 expression. They were randomly divided into training set and verification set. The image histology characteristics of DWI images were analyzed, and the image histology characteristics were screened and dimensionality reduced by LASSO regression model. The image histology label was constructed. According to the weight of the selected image histology characteristics, each patient was scored by image histology. The patients were divided into Ki-67 positive expression and Ki-67 negative expression 2. Group B: Established a prediction model for evaluating the expression level of Ki-67 in breast cancer by screened characteristic parameters combined with pathological diagnosis detection. The classification performance was evaluated by the area under the working characteristic curve (AUC).

Results Statistical analysis showed that 25 of 76 image histology parameters, such as entropy, energy and contrast, had statistical significance in both groups ($P < 0.05$). LASSO method was used to select uniformity, Haralick Correlation, inverse Difference Moment and difference Variance among 76 image histology features. To the training set and verification set, the distribution of each patient's image histology score was significantly different between the two groups. Combined with pathological results, the two-classification model was established. The training set AUC was 0.83, and the verification set AUC was 0.76.

Conclusion Ki-67-negative and Ki-67-positive breast cancer have different imaging histological characteristics in DWI images. The imaging histology of DWI is feasible in identifying the two, which is helpful to predict the expression of Ki-67 in breast cancer before operation.

PU-3136
基于多模态影像学表现的乳腺叶状肿瘤预后预测研究

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目的：基于乳腺叶状肿瘤（Phyllodes Tumors，PTs）的超声（Ultrasound，US）、X 线摄影（Mammography，MG）及磁共振成像（Magnetic Resonance Imaging，MRI）的多模态影像学表现，分析其与 PTs 分级的关系，以期术前能准确诊断 PTs 并判断分级，为临床治疗策略的选择提供影像学依据。**材料与方法**：按照美国放射学院（American College of Radiology，ACR）BI-RADS 诊断标准回顾性分析 2006 年 12 月至 2016 年 4 月经手术病理证实的 132 例 PTs 的多模态影像图像及病理资料。采用卡方检验、fisher 精确检验对数据进行统计分析。**结果**：69 例具有术前 MG 检查的 PTs 术后病理诊断良性 25 例，交界性 17 例，恶性 27 例，肿物周围的“晕征”与分级有关（P=0.011）；121 例术前行 US 检查的 PTs 中有良性 43 例，交界性 36 例，恶性 42 例，形状不规则（P<0.01）、边缘不清晰（P<0.01）、内部回声不均匀（P=0.002）且出现囊性回声（P<0.01）与 PTs 的分级有关；36 例具有术前 MRI 检查的 PTs 中良性 20 例，交界性 8 例，恶性 8 例，病变平扫信号均匀性（P<0.05）、脂肪抑制 T_2WI 病变信号呈等或低信号（P=0.025）、不均匀强化（P<0.01）、时间-信号强度曲线呈Ⅱ、Ⅲ型（P=0.009）及 ADC 值较低（P=0.034）与分级有关。**结论**：MG 肿物周围“晕征”更易出现在良性 PTs 中，而 US 检查中肿物形态不规则、边缘不清晰及内部回声不均匀且有囊性回声，MRI 检查中病变平扫信号不均匀、脂肪抑制 T_2WI 信号呈等或稍

低信号、内部强化不均匀可见无强化区、时间-信号强度曲线呈Ⅱ、Ⅲ型及 ADC 值较低提示恶性 PTs 的可能。多模态影像学表现能有效为 PTs 术前的准确诊断及分级提供影像学信息，为临床制定治疗策略提供依据。

PU-3137

误诊为其它疾病的不典型乳腺导管内乳头状瘤的 MR 征象及临床症状分析

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目的：分析误诊的乳腺导管内不典型乳头状瘤的 MR 征象及临床症状，以提高乳腺导管内乳头状瘤的诊断正确率。
方法：研究纳入了 16 例误诊的导管内乳头状瘤，把 23 例正确诊断的乳头状瘤作为对照组，对照性分析误诊的导管内乳头状瘤的 MR 征象，评价指标包括：病变部位、病变边缘情况、强化形态、内部强化特点、时间-信号强度曲线、导管扩张情况及乳头溢液情况。并对有统计学显著性差异的影像学征象的鉴别诊断价值进行分析。
结果：16 例误诊的不典型乳头状瘤中，乳头状瘤误诊为其它良性病变 7 例，包括腺瘤 4 例，误诊为腺病 3 例；误诊为恶性病变 9 例，包括导管原位癌 3 例，误诊为小叶浸润癌 1 例，误诊为浸润性导管癌 2 例，漏诊 3 例。病变位于周围乳腺导管多见于误诊组（67.3% vs 32.2%; p=0.02），无乳头溢液多见于误诊组（42.3% vs 20.2%; p=0.03），病变形态不规则多见于误诊组（47.3% vs 21.3%; p=0.04），乳腺导管未扩张多见于误诊组（57.4% vs 21.5%，p=0.03）。两组的强化形态无显著性差异（p=0.06），多表现为结节状强化；两组的内部强化特点无显著性差异（p=0.09），多表现为不均匀性强化；两组的时间-信号强度曲线无显著性差异（p=0.10），多表现为廓清型或平台型。
结论：病变位于周围乳腺导管、无乳头溢液、形态不规则及乳腺导管未扩张的乳头状瘤容易误诊，综合分析 MR 征象与临床症状可以提高不典型乳头瘤的正确诊断率。

PU-3138

乳腺脂肪坏死的 MR 诊断

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目的：分析乳腺脂肪坏死的 MR 表现，以提高其正确诊断率。
材料与方法：12 例乳腺脂肪坏死的患者进行回顾性分析，分析病变形态、边界情况、内部结构、动态增强表现及临床病史、临床症状。
研究结果：在压脂序列显示为灶性“黑洞”征象，T1WI 显示病灶呈高信号改变，但有低信号环改变，增强后表现为环形强化（8/12）；动态增强区域（测量区域避开无血供的坏死区）显示为持续增强型（n=7）、平台型（n=3）及廓清型（n=2）。病史包括：外伤（n=3）、感染（n=2）、放疗（n=1）、自体脂肪植入手术（n=2）和病史不详（n=4）。
结论：乳腺脂肪坏死有特征性的 MR 表现，结合病史有助于提高其正确诊断率。

PU-3139
不同激素受体状态下 HER-2 阳性乳腺癌的 MR 影像与病理特征比较分析

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目的：探讨不同激素受体（HR）状态下人表皮生长因子受体 2 （HER-2）阳性乳腺癌的 MR 影像与病理特征。
方法：对在我院行 MRI 检查并住院治疗的共 45 例 HER-2 阳性乳腺癌患者的 MR 影像及病理资料进行分析。
结果：将 HR+/HER-2+组与 HR-/HER-2+组乳腺癌的影像、病理结果做统计学分析，其中两组间在 BPE、病变位置、边界、瘤周水肿、前胸水肿、增强早期高/低强化比值、病理级别及 Ki-67 指数方面的差异有统计学意义；将上述差异有统计学意义的变量纳入多因素 logistic 回归分析，并绘制相应 ROC 曲线。logistic 回归分析结果显示增强早期高/低强化比值及病理级别对鉴别 HR+/HER-2+与 HR-/HER-2+乳腺癌的意义较大（P<0.05）。RCO 曲线下面积以增强早期不均质强化程度、瘤周水肿、组织学级别及 Ki-67 指数最大。根据 logistic 回归分析结果及 ROC 曲线，MR 影像征象方面，瘤周水肿与增强早期不均质强化程度对鉴别 HR+/HER-2+与 HR-/HER-2+乳腺癌的意义较大；病理上，组织学级别与 Ki-67 指数对鉴别 HR+/HER-2+与 HR-/HER-2+乳腺癌的意义较大。
结论：HER-2+乳腺癌根据 HR 状态的不同有着不同的影像、组织病理学及分子生物学特征。与 HR+/HER-2+乳腺癌比较，HR-/HER-2+乳腺癌多位于右乳，背景实质强化程度偏高，边界多欠清，更易出现瘤周水肿、前胸水肿，动态增强早期不均质强化程度、病灶的组织学级别及 Ki-67 表达指数更高，尤其是瘤周水肿、增强早期不均质强化程度、组织学级别及 Ki-67 表达指数的差异更具有鉴别意义，从而可以为不同 HR 状态下的 HER-2+乳腺癌在诊断、治疗及随访预后方面提供有价值的信息。

PU-3140
Histogram analysis of apparent diffusion coefficient maps for histological grades of breast phyllodes tumors

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Background: *In patients with breast phyllodes tumors (PTs), the therapeutic approach and clinical prognosis differ considerably according to tumor histological grade. The aim of this study was to assess the role of apparent diffusion coefficient (ADC) histogram in histologically grading of PTs prior to treatment.*
Methods: *Forty-two women with forty-five histopathologically confirmed PTs were enrolled and divided into three subgroups: fourteen benign, seventeen borderline and fourteen malignant type tumors. Whole-tumor histogram-derived ADC parameters before treatment were compared among the three subgroups. Additionally, intra-reader correlation coefficient (ICC) was calculated to assess interobserver agreement.*

Results: Weak to moderate negative correlations were observed in minimum ADC, ADC5, ADC10 and ADC25 for each histological grade (r = -0.322; r = -0.410; r = -0.436; r = -0.402; all P < 0.05), while skewness showed a weak positive correlation (r = 0.312; P = 0.037). Among a series of parameters, only minimum ADC proved to be statistically significant among histological grades (P = 0.026). However, the results of pairwise comparisons demonstrated that minimum ADC differed significantly between benign and malignant PT (P = 0.009), but did not show any differences between borderline and benign as well as malignant PTs (P = 0.078 and 0.305, respectively). ROC curve revealed that ADC10 and ADC25 produced the largest AUCs (0.760 and 0.744) in distinguishing benign PT from combined borderline and malignant PT (namely non-benign PT), with corresponding threshold values of $1.335\times10^{-3}mm^2/s$ and $1.520\times10^{-3}mm^2/s$. All the parameters except minimum ADC and kurtosis showed excellent inter-observer agreement with ICCs higher than 0.80.

Conclusions: *Several histogram-retrieved parameters can be used to help determine the histologic grade of breast phyllodes tumors. However, the borderline type remains to be identified individually.*

PU-3141

乳腺磁共振成像检查序列规范化与病例展示

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扫描序列及扫描参数
常规平扫序列：推荐采用横轴面扫描 T1WI 非脂肪抑制序列、T2WI 脂肪抑制序列、扩散加权成像(diffusion weighted imaging，DWI)。扫描参数：层厚 4～6 mm，层间隔为层厚的 10%～20%。
动态增强扫描序列：采用横断面三维快速梯度回波 T1WI 抑脂序列，三维快速容积成像 T1WI，先平扫再注射对比剂，采用同样序列连续 5～7 次,不同时相的动态增强扫描，延迟时间≥7 min。扫描参数：层厚应 1～3 mm，层面内的分辨率应＜1.5 mm，单期相扫描时间<2 min。对比剂选用 Gd-DTPA，注射剂量 0.1 mmol/kg，采用压力注射器以 2～3 mL/s 的速率经肘静脉注入，注射完对比剂后以相同速率注入 15 mL 生理盐水冲管。增强延迟扫描时长推荐 7 min，不低于 5 min。
MRI 图像后处理 平扫 T1WI 非脂肪抑制序列、T2WI 脂肪抑制序列图像不需后处理。DWI 图像需要测量 ADC 值。动态增强扫描的图像需测量信号强度并生成时间-信号曲线(time-intensity curve，TIC)。将采集的图像传送至工作站对病灶进行分析，利用后处理软件寻找病灶放置感兴趣区(region of interest，ROI)，ROI 光标不能小于 5 个体素，应避开肉眼可见的出血、液化、坏死及囊变区，并在对侧正常乳腺组织内选取相同大小的 ROI 作为对照，绘制病灶 TIC。多平面重组，用动态增强的不同期相原始轴面图像，根据需要重组矢状面像及冠状面像。
影像显示：乳腺和腋窝区域包括完全；各序列影像组织层次分明，病灶显示清晰；脂肪抑制序列压脂良好；增强检查时相把握准确，血管、病灶显示清晰；背景噪声较低；假体检查时，假体清晰可见，无伪影。

PU-3142

BPE 与乳腺良恶性病变、雌孕激素受体状态及乳腺癌分子亚型的相关研究

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【目　　的】探讨乳腺增强磁共振背景实质强化（BPE）与乳腺良、恶性病变、雌、孕激素受体状态及乳腺癌分子亚型之间的相关性。
【方　　法】　回顾性分析 150 名女性受检者(良性病变 49 例，恶性病变 101 例)的乳腺 DCE-MRI 资料以及临床病例资料。定性及定量分析良恶性病变组间 BPE 的关系，乳腺癌组中 BPE 与雌孕激素受体状态的相关性；乳腺癌四种分子亚型中不同类型间 BPE 的关系，并对 BPER 与背景实质 ADC 值之间的相关性进行分析。**【结　　果】**乳腺良、恶性组间 BPER 无差异（P>0.05）；在乳腺癌中，BPE 与雌、孕激素受体状态无相关性（P>0.05）；增强早期乳腺癌四种分子亚型之间 BPER 有差异（P<0.05），三阴性组最高，Lumina A 组最低；BPER 与背景实质 ADC 值之间无相关性（P>0.05）。
【结　　论】　1、乳腺背景实质强化与乳腺良、恶性病变之间无明显相关性。2、雌激素、孕激素受体阳性及阴性乳腺癌患者乳腺背景实质强化率之间无差异。3、乳腺良性病变组乳腺背景实质强化率与病灶强化率之间呈中等度相关，相关系数大于恶性病变组。4、乳腺背景实质强化程度与乳腺背景实质 ADC 值之间的无相关性。5、在乳腺癌分子分型中，三阴性乳腺癌的 BPER 最高，Luminal A 型最低，BPER 的增高预示乳腺癌预后不良。

PU-3143

Comparative study of diffusion kurtosis imaging model and traditional diffusion weighted imaging model in diagnosis of breast cancer

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Objective: To compare the value of diffusion kurtosis imaging model with traditional single-index diffuse weighted imaging model parameters in the differential diagnosis of benign and malignant breast lesions, and to explore the correlation between the parameters and molecular subtypes and prognostic factors of breast cancer.
Methods:64 cases of breast lesions were examined by DKI (b = 0,500,1000,1500,2000,2500,3000 s / mm^2) and traditional DWI (b = 0,1000 s / mm^2). To compare the diagnostic efficacy of DKI parameters (MK and MD) and traditional DWI parameters (ADC) in benign and malignant breast lesions, and to analyze the correlation between MK, MD and ADC values and molecular subtypes and prognostic factors of breast cancer. **Results:**The difference of MK, MD and ADC between the benign and malignant groups was statistically significant (P <0.05). The area under the ROC curve of MK, MD and ADC was 0.897, 0.827 and 0.776, respectively. According to the Youden index, the sensitivity, specificity and accuracy of the MK were 83.3%, 85.3% and 84.4% respectively. The combination of the three parameters could increase the AUC to 0.935. The MK of ER positive lesions were higher than negative (P = 0.024). The correlation analysis showed that ER was low positively

correlated with MK (r = 0.417, P = 0.022), and there was no significant correlation between the other prognostic factors and the parameters (P> 0.05). There were no significant differences in DKI and DWI parameters between the subtypes (P> 0.05). **Conclusion:**The parameters of DKI model and traditional DWI model can be used to differentiate benign and malignant breast lesions. The diagnostic value of MK value in DKI model is the largest. There is a certain correlation between DKI model parameters and prognostic factors.

PU-3144
月经周期、乳腺肿瘤性质对乳腺磁共振背景实质强化程度影响的研究

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目的 研究月经周期、乳腺肿瘤性质对乳腺磁共振（MRI）背景实质强化（BPE）程度的影响。**方法** 回顾性分析 2017 年 6 月至 2018 年 6 月在中国科学院大学宁波华美医院诊断为乳腺肿瘤的 127 名患者病例资料，根据患者的月经周期（1-7 天为第 1 周，8-14 天为第 2 周，15-21 天为第 3 周，22-28 天为第 4 周）及肿瘤性质（良性肿瘤，恶性肿瘤）分别对患者进行分组研究。在患者乳腺 MRI 的 T_1加权脂肪抑制-最大强度投影减影序列中观测 BPE，根据最新版 BI-RADS 对患者健侧乳腺的 BPE 进行定性评价（极少、轻度、中度和重度），分析患者月经周期、肿瘤性质与 BPE 程度的关系。**结果** 1、50 岁及以下患者 80 名，BPE 为中度或重度占 75.0%（60/80）；50 岁以上患者 47 名，BPE 为中度或重度占 10.6%（5/47），两者具有统计学差异（P<0.05）。2、乳腺良性肿瘤患者 BPE 为中度或重度占 62.7%（32/51），乳腺恶性肿瘤患者 BPE 为中度或重度占 43.4%（33/76），两者无统计学差异（P>0.05）。3、在 44 名乳腺良性肿瘤患者和 40 名乳腺恶性肿瘤患者中，不同月经周期患者的乳腺 BPE 均无统计学差异（P>0.05）。通过组间比较发现，乳腺良性肿瘤患者月经周期第 4 周的 BPE 高于非第 4 周，具有统计学差异（P<0.05），乳腺恶性肿瘤患者月经周期各周期无统计学差异（P>0.05）。**结论** 1、50 岁以下女性的乳腺 BPE 高于 50 岁以上女性。2、乳腺肿瘤良恶性与乳腺 BPE 无明显的相关性。3、乳腺良性肿瘤患者的 BPE 与月经周期有关，月经周期第 4 周不适宜行乳腺磁共振检查。

PU-3145
乳腺颗粒细胞瘤影像学发现

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颗粒细胞瘤(granular cell tumor)是一种少见的软组织良性肿瘤，可以发生于任何部位，大多数位于头颈部，发生于乳腺者少见。本文报道 1 例乳腺颗粒细胞瘤，分析该肿瘤的影像学、临床病理特征、免疫组化特点及诊断和鉴别诊断要点，并结合文献进行讨论。GCT 多位于内上象限。本例发生于乳晕旁，是为特殊。GCT 通常表现为无痛、质硬肿物，易于与乳腺癌混淆。GCT 的 MRI 表现多在个案中有报道，缺乏共性。最终确诊需要依靠组织病理学检测和免疫组化检查。影像学意义在于确定病灶范围及数量，初步判断良恶性，诊断病理类型相对困难。

PU-3146

MRI 动态增强光梭成像在乳腺疾病中的应用

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目的：针对乳腺疾病临床诊断中应用 MRI 动态增强光梭成像应用价值。方法：2018 年 1 月～2019 年 2 月行乳腺 UCS-MRI 扫描，且均有病理和临床随访证实的乳腺结节患者 50 例。采用联影 UMR770 先行乳腺常规 MRI 平扫，15 毫升顺磁性造影剂钆喷酸葡胺 MRI 造影剂，按照 2.5 毫升/秒速度采用高压注射器注射。采用常规矢状位、冠状位及轴位序列进行扫描后，再进行脂肪抑制、动态增强及 TSE T2WI 扫描。对患者采取平扫方法检查后，将 Gd-DTPA 造影剂对患者注射后再采取 T1 高分辨率各向同性容积采集技术进行 UCS-MRI quick 3d 动态扫描，无间断 10 次连续扫描的增强扫描方法。10 个动态增强序列先后导入到乳腺分析软件中，计算出 TIC 曲线。对诊断结果及动态增强磁共振征象进行分析研究。结果：有 17 例患者为乳腺癌，25 例患者为乳腺良性疾病，准确性为 80%、特异性为 76%、敏感性为 85.6%。临床患者在医学影像、周边血管及初期病灶增强性等方面，乳腺良性疾病和乳腺癌患者存在的差异具有统计意义（P ＜0.05）。结论：磁共振光梭成像在临床中应用于诊断乳腺疾病，女性患者与男性患者相比发病率相对较高一些，早期对患者及时进行诊断并制定有针对性地方案进行治疗，可使患者疗效明显提高，患者预后得到显著改善，采用磁共振动态增强光梭检查技术在临床中诊断乳腺肿瘤主要是能够利用对肿瘤血流动力学状态分析并形成影像，对比剂产生肿瘤强化与向组织细胞外间隙进入的剂量及肿瘤内血管的密度等有关指标存在比较密切的关系，而病变强化程度及速度等与组织细胞外渗透的间隙及病灶部位血管密度存在密切关系，乳腺良性疾病和乳腺癌患者存在的差异具有统计意义（P＜ 0.05），这与有关研究结果基本吻合，说明磁共振动态增强检查技术不只是在诊断乳腺疾病中能够使准确性、特异性及敏感性提高，还对乳腺疾病的良恶性分型具有重要的应用价值。

PU-3147

乳腺浸润性微乳头状癌 MRI 表现与淋巴结转移的关系

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目的：探讨具有微乳头结构的乳腺癌磁共振检查的影像学表现及与淋巴结转移的关系。**方法：**将 79 例 IMPC 的 MRI 表现按淋巴结是否转移分为两组进行统计分析。**结果：**IMPC 的淋巴结转移组与淋巴结未转移组 MRI 检查均主要表现为不规则性肿块伴边缘毛刺，强化方式为不均匀强化，时间-信号强度曲线常为流出型，早期快速强化。淋巴结转移组 ADC 平均值为 (0.000853±0.000176)㎜²/s，小于淋巴结未转移组 ADC 平均值(0.000963±0.000183)㎜²/s，两者差异具有统计学意义(P=0.017)。**结论：**淋巴结转移 IMPC 的 ADC 值小于淋巴结未转移 IMPC，说明 ADC 值低的 IMPC 较 ADC 值高的 IMPC 可能更易发生淋巴结转移。

PU-3148

Diffusion parameters in diffusion kurtosis imaging and perfusion parameters in dynamic contrast-enhanced MRI:

Correlation of prognostic factors in breast invasive ductal carcinoma

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Purpose: This study evaluated the capability of characterizing breast lesions by diffusion parameters derived from diffusion kurtosis imaging (DKI) and perfusion parameters derived from dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI) and investigated whether a correlation exists between those parameters and prognostic factors of breast invasive ductal carcinoma.

Materials and methods: The institutional review board approved the study, and written informed consent was obtained. This prospective study included 133 women (mean age±standard deviation: 46.16 years±13.70; range, 19–79 years) with breast lesions (61 malignant, 72 benign) who underwent magnetic resonance imaging (MRI) examination before surgery between July 2017 and Jan 2018. For the DKI model, we used 7 b values: 0, 500, 1000, 1500, 2000, 2500 and 3000 s/mm^2. The quantitative parameters of the DKI model (MK and MD) and DCE model (K^{trans}, V_e, V_p and K_{ep}) were calculated by two radiologists. Student's t tests were performed tocompare malignant and benign breast lesions. Receiver operating characteristic (ROC) analysiswas used forassessing the sensitivity, specificity and accuracy of the quantitative parameters. The relationships between parameters, prognostic factors and molecular subtypes were investigated using the Mann-Whitney U test or the Kruskal-Wallis H test.

Results: The mean values of MK, K^{trans} and K_{ep} in malignant lesions were significantly higher than those of benign lesions ($P<0.05$). Conversely, the mean MD values of benign lesions were higher than those of malignant lesions ($P<0.05$). The K^{trans} value obtained the largest sensitivity (85.2%) using 0.083 as a threshold, with a relatively low specificity (65.3%). The MK value demonstrated the largest area under the curve (AUC) (0.847), specificity (84.7%) and accuracy (82.0%) using a cutoff value of 0.727; however, the sensitivity was not comparably high (78.7%). Combined with MK or MD, the specificities of K^{trans} were improved to 83.3% and 81.9%, respectively. Meanwhile, combined with K^{trans} or K_{ep}, the sensitivities of MK increased to 86.9% and 85.2%, respectively. The mean V_e was higher in tumors with a low histologic grade (1.042±0.882) or progesterone receptor (PR) positivity (1.034±0.893) than in tumors with a high histologic grade (0.780±0.901) or PR negativity (0.700±0.875) ($P=0.038$ and 0.022, respectively). The mean K_{ep} was higher in tumors with high Ki67 expression (0.564±0.496) than those with low Ki67 expression (0.289±0.125, $P=0.016$). The mean MK was higher in tumors with Her-2 negativity (0.977±0.142) than in those with Her-2 positivity (0.847±0.140, $P=0.004$). Luminal B breast tumors showed significantly higher MD values than luminal A and triple-negative breast tumors ($P=0.018$ and 0.021, respectively).

Conclusion: The combination of DKI and DCE-MRI can complementarily improve the performance of differentiating between benign and malignant breast lesions. Preoperative functional MRI parameters could be used to identify several prognostic factors or molecular subtypes.

PU-3149

Radiological and Clinical Findings in Sclerosing Adenosis of the Breast

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Purpose: To study the imaging and clinical features of breast sclerosing adenosis (SA), and to enhance the recognition of this disease, as well as to help the clinic to give a correct diagnosis. ***Methods:*** Imaging findings were retrospectively reviewed in 47 women with SA lesions confirmed by pathology (including 39 cases of mammography, 40 cases of US and 34 cases MRI). ***Results:*** Of 47 patients confirmed with SA, 18 cases were pure SA, and 29 cases coexist with other proliferative lesions and malignancies; the maximum diameter of SA lesions was 0.5cm~3.5cm with an average of 1.6cm. On the mammogram of 39 SA cases, the percentage of architectural distortion, calcifications, mass/nodular, asymmetric density and mass combining with calcifications were 30.8%, 23.1%, 17.9%, 12.8% and 7.7%, respectively; and 3 cases had no abnormal findings. On the sonogram (excluding five normal finding cases), the majority lesions showed regular shaped (57.1%), well defined margined (60.0%), heterogenous low echoed (71.4%) nodulus. 85.3% lesions showed high signal on T2-weighted images, and all lesions were enhanced markedly, including 82.4% lesions appearing mass-like enhancement(17 star-shaped enhanced masses included); and the percentage of the time-signal intensity curve in type 1, type 2 and type 3 were 52.9%, 41.2% and 5.9%, respectively. If the category BI-RADS≥4b was considered to be a suspicious malignant lesion, the misdiagnostic rates of mammography, US and MRI would be 17.9%, 17.5% and 35.3%, respectively. ***Conclusion:*** The SA lesions are small and can occur with other diseases histologically. The majority SA lesions showed distortion or calcifications on mammograms, low echo-level nodules with heterogenous echo on US and mass like lesion with or without star shape on enhanced MRI.

PU-3150

基于超顺磁性氧化铁基多功能纳米探针的乳腺癌诊疗一体化研究

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目的：回顾多功能纳米探针的乳腺癌的成像现状，介绍基于超顺磁性氧化铁基分子探针乳腺癌诊疗一体化研究成果。
材料与方法：综述了近年来在超顺磁性氧化铁作为肿瘤成像的多功能分子探针现状。此外，还介绍了一系列潜在的治疗技术，这些技术包括成像引导手术，光动力疗法，光热治疗，化疗，磁热疗疗法。
结果：超顺磁性氧化铁的制备和表面改性对于进一步的成像和治疗至关重要。制备方法包括共沉淀法，高热分解，水热反应和微波辐射。表面改性包含介孔二氧化硅，PEG，PVA，葡聚糖和白蛋白。

为了准确定位乳腺癌，应选择特异性受体，如叶酸受体，人类表皮受体，转铁蛋白受体和αvβ3整合素。乳腺癌成像除外，SPION 也可用作光动力疗法，光疗法和化疗的载体。
结论：葡聚糖包裹的超微 USPIO 纳米对比剂，核心粒径=4nm，实现 MRI 的 T2 负性增强向 T1 正性增强成像模式转变；白蛋白包裹叶酸靶向超顺磁性氧化铁纳米探针，实现对乳腺肿瘤的高效、低毒和靶向 MRI 显像；创新设计出 Janus 结构的 Fe3O4-TiO2 复合分子探针，可以实现 MRI 成像和光动力/光热治疗双功能。

PU-3151
乳腺癌 MRI 表现与肿瘤浸润淋巴细胞比例的相关性研究

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目的 本研究旨在探讨乳腺癌 MRI 表现特征与肿瘤浸润淋巴细胞比例之间的相关性，以期能否从乳腺癌 MRI 表现特征间接提示和预测肿瘤浸润淋巴细胞比例，为从影像学角度评价预后提供一定的依据。**方法** 回顾性分析 2015 年 6 月至 2016 年 12 月于天津医科大学肿瘤医院行乳腺 MRI 检查表现为肿块型病变并经病理证实的浸润性导管癌患者 138 例（共 140 个病变）的资料。所有患者均行双侧乳腺平扫、DWI 和动态对比增强 MRI 检查。依据美国放射学院（ACR）提出的乳腺影像报告和数据系统（BI-RADS）标准对图像进行分析，观察病变的形状、边缘、脂肪抑制 T_2WI 信号强度及均匀度、强化方式和时间-信号强度曲线（TIC）类型，并测量病变的大小（最大径）、早期强化率和 ADC 值。根据肿瘤浸润淋巴细胞比例将所有病例分为两组，比例＜30%者纳入肿瘤浸润淋巴细胞低比例组，比例≥30%者纳入肿瘤浸润淋巴细胞高比例组。评估肿瘤浸润淋巴细胞比例与病变影像学特征之间的关系。定性资料的比较采用 x^2检验，定量资料的比较采用独立样本 t 检验。**结果** 在 138 例（共 140 个病变）乳腺癌患者中，肿瘤浸润淋巴细胞低比例组 97 个病变，高比例组 43 个病变。TIL 低比例组和 TIL 高比例组病变在肿块的形状、边缘、脂肪抑制 T_2WI 信号是否均匀、内部强化方式的差异上有统计学意义（P均＜0.05）。两组病变在肿瘤大小、TIC 类型、早期强化率及 ADC 值的差异上无统计学意义（P均＞0.05）。**结论** 乳腺癌 MRI 表现部分特征与肿瘤浸润淋巴细胞比例之间具有一定的相关性。病变的形状规则、边缘趋于光滑、脂肪抑制 T_2WI 信号趋向均匀以及动态增强后病变内部强化均匀这些征象提示病变肿瘤浸润淋巴细胞比例较高。通过这些影像学表现特征可以间接预测肿瘤浸润淋巴细胞比例，有助于评价预后并为临床选择合适的治疗方案提供一定的影像学信息。

PU-3152
基于 DCE-MRI 的影像组学和五种不同网络的深度学习对乳腺良恶性病灶的鉴别诊断

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目的：探讨并比较 MRI 增强影像组学和深度学习对乳腺良恶性病变的诊断价值。
方法：本研究选取 2017 年月至 2018 年 6 月经手术病理证实的乳腺病变患者 152 例，其中恶性肿瘤患者 93 位、病灶 103 个，良性病变患者 59 例、病灶 73 个。所有患者均术前行乳腺 MRI 平扫及增强检查。基于动态增强生成了早期流入信号增强比、最大增强信号比和流出斜率相对应的 DCE 参数图。采用基于纹理和强度直方图的影像组学分析和 5 个网络（ResNet50、VGG16、VGG19、

Exception 和 Inception V3）的深度学习进行诊断分析，并采用包含不同肿瘤周围组织的五种不同输入边界框进行 CNN 分析。
结果：影像组学的诊断准确度均值为 80%；五种不同输入边界框的 CNN 模型中，含少量肿瘤周围组织的最小边界框诊断效能最高，ResNet50（93%）、Xception（94%）和 InceptionV3（93%）的平均诊断准确度优于 VGG16（80%）和 VGG19（79%）。
结论：深度学习的诊断效能优于影像组学，含少量肿瘤周围组织的诊断效能高于仅包含肿瘤组织或包含较多肿瘤周围组织。
本研究由温州市科技局基础性科研计划项目（NO.Y20180187）资助。

PU-3153
多参数 MRI 神经网络自编码器影像组学融合模型预测乳腺癌患者前哨淋巴结转移

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目的：本研究基于动态增强（DCE）、T2 加权脂肪抑制（T2-FS）和弥散加权（DWI）的多序列磁共振图像，使用神经网络自编码器影像组学融合模型，无创性地预测乳腺癌患者前哨淋巴结（SLN）转移状态。

方法：回顾性收集广东省人民医院 2012 年 2 月至 2018 年 2 月组织病理学证实为乳腺癌的 284 例患者（均为女性，年龄范围 24-80 岁），按时间分为训练集（n=199）和验证集（n=85）。所有患者均接受了 DCE、T2-FS 和 DWI MRI 扫描，未在 SLN 活检或腋窝淋巴结清扫术前接受新辅助化疗。本研究的病理临床信息包括 Ki-67 增殖指数、病理组织学分级、雌激素受体（ER）状态和孕激素受体（PR）状态等。本研究使用 ITK-SNAP 软件人工勾画肿瘤区域，使用 Matlab 对肿瘤区域提取手工影像组学特征 15000 个（4 类，包括一阶统计特征、形态特征、纹理特征和小波特征），并使用神经网络自编码器提取自编码器特征。研究使用最小冗余最大相关算法（mRMR）选择 top-5 特征组成影像组学标签，最后使用 logistic 回归融合影像组学标签，构建乳腺癌患者前哨淋巴结转移预测模型。

结果：融合模型在训练集和测试集的 C-index 分别为 0.918 和 0.807，通过综合判别改善指数（IDI）和净重分类改善指数（NRI）分析，发现融合了多序列的手工特征和深度特征的融合模型，优于单序列模型，具有统计学差异（p 值均小于 0.05）.通过决策曲线分析（DCA），发现无论在训练集还是测试集，融合模型均优于单序列模型。

结论：本研究基于多序列（DCE、T2-FS 和 DWI）MRI，提取神经网络自编码器和手工影像组学特征，建立了乳腺癌患者前哨淋巴结转移术前预测模型。研究结果表明，无论在训练集还是测试集，多序列融合模型均优于单序列模型。该模型提高了 SLN 转移预测的性能，为临床实践提供了新的思路。

PU-3154
Differences in heterogeneity analysis at pre-contrast and post-contrast of DCE-MRI between tumor and

peritumoral stroma for predicting Ki-67 status of invasive ductal breast carcinoma

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Purpose: This study aimed to evaluate and compare the heterogeneity of intratumor and peritumor in predicting Ki-67 status, and the effect of different contrast periods on prediction accuracy.
Materials and Methods: This study included 88 patients with 57 high-Ki-67 and 31 low-Ki-67 breast lesions. All patients underwent preoperative breast dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI). The signal characteristics, which representing heterogeneity, was derived from the grey-level co-occurrence matrix on slice-matched post-contrast and five post-contrast images. We obtained the signal characteristics of tumor and peritumoral stroma by drawing the region of interest (ROI) of different regions.
Each parameter was correlated with Ki-67 status using the Mann-Whitney test and receiver operating characteristic curve analysis.
Results: Statistical assessment demonstrated that entropy values obtained at the first post-contrast period in each ROI were all highly significantly different between the high- and low-Ki-67 proliferation status (P< 0.05). At the first post-contrast series, the AUC values amongst various regions of tumor and peritumoral stroma are all higher than 0.6 (AUC= 0.713, 0.636, 0.644, 0.756, 0.632 respectively). Entropy values obtained based on the tumor boundary as a band-like area inside and outside at the first post-contrast series revealed the highest AUC (0.765).
Conclusion: Heterogeneity analysis of DCE-MRI lesions obtained before pathological diagnosis could successfully discriminate high- and low-Ki-67 proliferation status. The band-like region inside and outside the tumor boundary can also distinguish the Ki-67 states and showed better predictability.

This work was supported by grants from the Science Foundation of Wenzhou(NO.Y20180187).

PU-3155

具有微乳头状结构乳腺癌影像学研究

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目的：探讨具有微乳头结构的乳腺癌的临床病理特点，乳腺磁共振检查的影像学表现。**方法：**回顾性总结 84 例具有微乳头结构的乳腺癌患者的临床病理学特点及 MRI 检查结果，并选取 60 例同期同级别非特殊型浸润型导管癌（NST）作为混合型 IMPC 的对照组进行统计分析。**结果：**5 例 IMPC 伴导管原位癌 MRI 表现以非肿块样强化为主，平均 ADC 值为(0.00101±0.000118)㎜²/s。19 例纯型 MRI 表现多为形态不规则、边缘毛刺、不均匀强化的肿块，早期快速强化，时间-信号强度曲线为流出型，11 例中 8 例 ADC 值平均为（0.000898±0.000322）㎜²/s。60 例混合型 IMPC 及 60 例同级别单纯 NST 的 MRI 检查均主要表现为形态不规则的肿块，强化方式为不均匀强化，时间-信号强度曲线为流出型，早期强化率为快速强化；混合型 IMPC 肿块边缘毛刺常见，与 NST 比较有统计学差异（P=0.049）；混合型 IMPC 的平均 ADC 值为(0.000873±0.000176)㎜²/s，小于 NST 的平均 ADC

值（0.001058±0.000212）mm²/s,两者有统计学差异(P=0)。**结论：**IMPC 侵袭性强、易发生淋巴结转移。影像学表现为典型的恶性肿瘤征象，多为形态不规则、边缘毛刺的肿块，ADC 值较低。

PU-3156

Predicting breast cancer prognosis using quantitative dynamic contrast-enhanced (DCE)-MRI parameters with a reference region model

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Background: In this study, we investigated the feasibility of using quantitative DCE-MRI with a reference region model for the prognosis of breast cancer.
Methods: We retrospectively analyzed 80 cases with pathologically confirmed invasive ductal carcinoma of the breast using quantitative dynamic contrast-enhanced (DCE-MRI) with a reference region model. The pharmacokinetic quantitative parameters and prognostic factors of breast cancer were measured, and the relationship between the quantitative parameters and prognostic factors was examined.
Results: The volume transfer constant (RRK^{trans}) and rate constant (K_{ep}) were significantly higher in patients with level 3 histological grading compared to patients with level 1 & 2 histological grading ($p<0.05$), and patients with negative estrogen receptor (ER-negative) and/or negative progesterone receptor (PR-negative) compared to patients with ER-positive ($p<0.05$) and/or PR-positive ($p<0.05$), respectively. For immunohistochemistry, RRK^{trans} was significantly higher in Triple-Negative Breast Cancer (TNBC) type ($p<0.05$) compared to luminal type breast cancer. In addition, K_{ep} was higher in TNBC type compared to luminal type ($p<0.05$).
Conclusion: Our results demonstrated that high RRK^{trans} and K_{ep} values are associated with a poor breast cancer prognosis. In addition, RRK^{trans} and K_{ep} parameters can differentiate different types of breast cancer, in particular, differentiating between luminal type and TNBC type. Quantitative DCE-MRI parameters with reference region models (RR) may potentially improve the prediction of breast cancer prognosis.

PU-3157

三阴性与非三阴性乳腺癌转移临床特征的差异性研究

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目的：探讨三阴性乳腺癌（TNBC）转移的临床特征，与非三阴性乳腺癌（NTNBC）比较。**方法：**回顾分析本院 2016 年 1 月至 2018 年 1 月 75 例乳腺癌转移患者临床资料，根据免疫组化分为 TNBC 转移与 NTNBC 转移组。分析两者在发病年龄、肿瘤大小、手术方式、病理类型之间的差异。**结果：**（1）TNBC 转移组与 NTNBC 转移组在发病年龄间差异有统计学意义；组间比较，≤40 岁与＞60 岁年龄组差异有统计学意义。（2）TNBC 转移组与 NTNBC 转移组在肿瘤大小间差异有统计学意义；组

间比较，＞2cm 且≤5cm 与＞5cm 组差异有统计学意义。（3）TNBC 转移组与 NTNBC 转移组在手术方式、病理类型间差异无统计学意义。**结论：**TNBC 转移好发于≤40 岁患者，或原发灶＞5cm；NTNBC 转移好发于＞60 岁患者，或原发灶＞2cm 且≤5cm；两者均多见于浸润性导管癌，且原发灶手术方式对转移发生率无影响。

PU-3158
MRI 在乳腺癌化疗疗效评估中的应用研究

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目的：通过分析乳腺癌化疗前与化疗 4 周期后肿瘤大小、ADC 及早期强化率的变化，研究 MRI 测量指标在乳腺癌化疗疗效评估中的应用价值。材料与方法：收集 2016 年 12 月至 2018 年 11 月就诊于我院的 70 例乳腺癌患者的 MRI 资料。患者在治疗前、4 周期后进行乳腺 MRI 检查，用 1.5T Espree Pink MRI 系统扫描轴位 T1WI、轴位和矢状位 T2WI，DWI 和的动态增强扫描，在西门子工作站上测量肿瘤的大小、ADC 值及早期强化率。用 RECIST 1.1 和 Miller＆Payne 标准对乳腺癌进行评价；经 Kolmogorov-Smirnov[3]、Shapiro-Wilk、方差齐性及 t 检验，分析乳腺癌化疗前后 MRI 测量指标的变化，用 ROC 曲线检测评估效能。结果：术后病理示完全反应组 38 例，未完全反应组 32 例。疗前组间肿瘤大小、ADC 值及早期强化率无差异(P>0.05)，4 周期后组间肿瘤的大小、ADC 值及早期强化率存在明显差异(P<0.05)。化疗后，完全反应组的肿瘤收缩 15.87%~85.37%，ADC 值升高 0.092×10^{-3}~$1.943\times10^{-3}mm^2/s$，早期强化率降低 53.3%~292.1%；未完全反应组的肿瘤收缩 16.26%~58.79%，ADC 值升高 0.004×10^{-3}~$0.798\times10^{-3}mm^2/s$，早期强化率降低 1.4%~246.2%；完全反应组的肿瘤收缩率、ADC 值增加高于未完全反应组(P<0.01)，早期强化率下降较未完全反应组明显(P<0.01)。肿瘤收缩率、ADC 值和早期强化率变化对乳腺癌疗效评估的 ROC 曲线下面积(AUC)分别为 0.768、0.850 与 0.900，多指标联合应用的 AUC 为 0.919。结论：MRI 显示的肿瘤大小、ADC 值及早期强化率的变化可早期反映乳腺癌的最终化疗效果，且早期强化率和 ADC 值较肿瘤大体敏感，早期强化率较 ADC 值敏感。

PU-3159
扩散加权成像在不同分子亚型乳腺癌新辅助化疗疗效的评估价值

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【目的】比较乳腺癌新辅助化疗前、后 DWI 表现的差异是否与乳腺癌的不同分子亚型有关，并进一步探讨 DWI 对不同分子亚型乳腺癌 NAC 疗效的评估价值。**【资料与方法】**穿刺活检证实为乳腺癌的患者 69 例，患者分别于 NAC 前、全程化疗后（手术前）行乳腺 MRI 扫描。将所有病例分为病理完全缓解组与非病理完全缓解组。比较不同分子亚型乳腺癌 CRp 与 NCRp 间，NAC 前后 ADC 值、rADC 的差异。绘制受试者工作特征曲线，并计算曲线下面积值（AUC），分析各参数对病理反应性的预测和评估效能，并获取预测病理反应的最佳临界点。**【结果】** 69 例患者经术后病理证实 LuminallA、LuminalB、HER-2+及三阴性乳腺癌病例分别有 19 例，23 例，14 例和 13 例。化疗前，LminalA、LuminalB 的 rADC 值在 CRp、NCPp 组间有差异（P＜0.05）。化疗后，LuminalA 的 rADC 值，HER-2+的 ADC 在相应亚型乳腺癌病灶中的 CRp、NCRp 组间均有统计学差异（P＜0.05），其余各亚型乳腺癌各参数在相应亚型病灶的 CRp、NCRp 组间均无统计学差异（P＞0.05）。采用 ROC 分析 DWI 对四种不同亚型乳腺癌病理反应性评估的效能： LuminalB 的化疗前 rADC 具有诊断效能；

LuminalA 型化疗后 ADC 具有诊断效能。HER-2+乳腺癌的化疗后 rADC 具有诊断效能【**结论**】乳腺癌新辅助化疗前、后 DWI 的表现在一定程度上可以评估新辅助化疗疗效，且 DWI 表现的差异与乳腺癌的不同分子亚型间具有一定相关性；化疗前 rADC 能更好地评价 LuminalA 是否达到病理完全缓解。

PU-3160

纯型浸润性微乳头状癌影像学表现特征

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目的：探讨浸润性微乳头状癌（invasive micropapillary carcinoma，IMPC)影像特点，及与分子分型、淋巴结转移的关系。**方法：**回顾性总结了 19 例纯型 IMPC 病人 X 线、超声、MRI 检查并与临床病理资料进行分析。**结果：**19 例纯型 IMPC 中的 8 例 X 线表现多为形态不规则(85.7%)、边缘毛刺(71.4%)的高密度(71.4%)肿块，常伴钙化(62.5%)，多为细小多形性钙化（60.0%）。15 例超声表现多为形态不规则(100.0%)、边缘毛刺(60.0%)的低回声(60.0%)肿块，后方回声正常（66.7%），11 例 RI 值平均为 0.81。19 例 MRI 表现多为形态不规则（56.2%）、边缘毛刺（62.5%）、不均匀强化（87.5%）的肿块（84,2%），早期快速强化（63.2%），TIC 曲线为流出型（68.4%），11 例中 8 例（72.2%）ADC 值小于 0.001mm²/s。分子分型 Luminal A 型占 78.9%，Luminal B 型占 5.3%，Her-2 阳性型占 10.5%，三阴性型占 5.3%。Ki-67 平均为 27%。淋巴结转移率为 68.4%。**结论：**IMPC 侵袭性强、易发生淋巴结转移。影像学表现为典型的恶性肿瘤征象，多为形态不规则、边缘毛刺的肿块，X 线表现常伴细小多形性钙化，超声检查血流非常丰富，MRI 检查 ADC 值常小于 0.001mm²/s。分子分型以 Luminal A 型多见。

PU-3161

Influence of menopause status on fibrograndular tissue and background parenchymal enhancement

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Objective To evaluate the influence of menopause status on fibrograndular tissue, background parenchymal enhancement volume ratio(BPE_V) and intensity ratio(BPE_I) by breast MR image automatic quantitative analysis. **Methods** From 14,033 consecutive patients who underwent breast MRI in our center, we randomly selected 101 normal cases (47 cases of premenopausal and 54 cases of postmenopausal). Premenopausal status was subclassified into four groups (8 cases in the 1st week and 13 cases in the 2nd, 3rd and 4th week, respectively) based on the menstrual cycle. We evaluated FGT and BPE_V, BPE_I at early (2 minutes), medium (4 minutes) and late (6 minutes) enhanced time phases of breast MRI for quantitative assessment. The FGT, BPE_V and BPE_I in premenopausal and postmenopausal women was compared using the Mann-Whitney U test. Comparison of each menstrual cycle using the Kruskal-Wallis test. **Results** The FGT, BPE_V and middle-late BPE_I of postmenopausal women were significantly lower than premenopausal women ($P<0.05$). The maximum BPE_I in the 1st week, the minimum in

the 2nd week in premenopausal women (P<0.05). The FGT and BPE_V in the 1st week are the highest than the other weeks, but there was no significant difference. **Conclusions** The FGT, BPE_V and BPE_I were significantly decreased after menopause. The optimal time of breast MR examination is in the 2nd week of menstrual cycle.

PU-3162
MRI 定量参数联合动态增强曲线评价对腋窝淋巴结的定性诊断价值

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目的：探究 MRI 定量参数联合动态增强曲线对腋窝淋巴结定性诊断中的价值
材料与方法：搜集在我院进行乳腺磁共振动态增强扫描患者，对有明确手术病理结果或穿刺活检病理结果的 43 例患者共 68 枚腋窝淋巴结（淋巴结长径>1cm）进行回顾性分析。应用自带软件处理出时间-信号强度曲线（TIC）类型，并使用专用灌注软件行后处理，获得容量转移常数(Ktrans)、速率常数（Kep）、细胞外血管外间隙容积比（Ve）定量参数。应用 ROC 曲线分析其在定性中的最佳诊断界点和敏感性、特异性。
结果：乳腺癌腋窝淋巴结转移者 TIC 曲线多为 Ⅲ型，早期强化率 1.75；Ktrans 值（0.346）min^{-1}。乳腺良性病变伴淋巴结增大，TIC 曲线多为Ⅰ型，早期强化率 0.68；Ktrans 值（0.127）min^{-1}。其中结核 TIC 曲线均为Ⅲ型，早期强化率为 1.68，但达峰时间小于 50s；Ktrans 值（0.232）min^{-1}。乳腺癌腋窝淋巴结转移和除结核外良性病变的定量参数有统计学意义，与腋窝淋巴结结核无统计学意义，但腋窝淋巴结结核达峰时间少于乳腺癌伴腋窝淋巴结患者。
结论：联合定量参数和动态增强曲线有助于对腋窝淋巴结定性诊断，从而提高对乳腺病变的诊断。

PU-3163
联合 DCE-MRI 定量参数和 DWI 对乳腺癌新辅助化疗疗效的预测价值

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目的：探讨乳腺癌新辅助化疗 2 周期后联合动态增强 MRI（DCE-MRI）和扩散加权成像（DWI）对预测病理反应性的价值。方法：收集术前需行新辅助化疗（NAC）的乳腺癌患者于新辅助化疗（NAC）前、NAC 第 2 周期后分别行磁共振检查并获得 DWI 和 DCE-MRI 数据。术后按病理结果分为组织学显著反应（MHR）组和非组织学显著反应（NMHR）组。对化疗前两组参数采用两独立样本 t 检验，然后计算并评估表观扩散系数（ADC）、容量转移常数（K^{trans}）、速率常数（K_{ep}）的变化率，并通过 Mann-Whitney U 检验评估 MHR 组和 NMHR 组间各参数变化率的差异。选择 ADC 变化率和最佳 DCE-MRI 定量参数变化率建立 Logistic 回归模型并构建新参数，以术后病理结果为金标准，通过绘制

受试者工作特征曲线（ROC）探究新构建参数对预测乳腺癌新辅助化疗疗效的价值。结果：MHR 组有 11 例，NMHR 组 37 例。NAC 前 MHR 组 ADC、K^{trans} 和 K_{ep} 值分别为 774±104*10^{-6} mm^2/s、0.345±0.121 min^{-1}、0.925±0.30 min^{-1}；NMHR 组参数值分别为 786±126 mm^2/s、0.347±0.157 min^{-1}、0.936±0.349 min^{-1}，两组间各参数均无统计学差异。NAC 2 周期后 MHR 组 ADC、K^{trans} 和 K_{ep} 变化率分别 51.2%、 -65.1%、 -64.7%，NMHR 组 ADC、K^{trans} 和 K_{ep} 变化率分别为 31.2%、-11.8%、-24.9%，两组间 ADC、K^{trans}、K_{ep} 变化率均有统计学差异。
ADC、K^{trans}、K_{ep} 变化率和新构建联合预测参数曲线下面积（area under curve，AUC）分别为 0.774、0.850、0.823 和 0.894。
结论：联合 ADC 和 K^{trans} 可以更准确的预测乳腺癌 NAC 的疗效。

PU-3164
磁共振成像在乳腺良恶性病变中的诊断价值

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目的：探讨磁共振功能学参数对浸润性导管癌及乳腺良性病变的鉴别诊断价值。
方法：回顾性分析经手术或穿刺病理证实的 20 例乳腺浸润性导管癌患者及 20 例乳腺良性病变患者的表观扩散系数（Apparent Diffusion Coefficient , ADC）值及时间-信号强度曲线(Time-signal intensity curve , TIC)类型，患者均为女性，避开出血、液化、坏死和囊变的前提下，对乳腺病变的感兴趣区（Region of Interest , ROI）的 ADC 值进行 3 次测量，每次测量的 ROI 面积均>2mm^2，取三次测量的均值为该 ROI 的 ADC 值；同时计算出时间-信号强度曲线类型。
结果：20 例乳腺浸润性导管癌，1 例Ⅲ级（4.00%），15 例Ⅱ级（77.00%），4 例Ⅰ级（16.00%），其中时间-信号强度曲线呈廓清型的 11 例（55.00%），平台型的 9 例（45.00%），流入型的 0 例（0%）；20 例乳腺良性病变中，11 例为乳腺腺病，5 例为乳腺纤维腺瘤，3 例导管内乳头状瘤，1 例乳腺囊肿，其中流入型的 4 例（20.00%），平台型的 15 例（75.00%），廓清型的 1 例（5.00%）。乳腺浸润性导管癌的 ADC 为(0.99±0.12)×$10^{-3}$$mm^2$/s，乳腺良性病变的 ADC 值为(1.47±0.29)×$10^{-3}$$mm^2$/s ，差异具有统计学差异（P＜0.05）。将乳腺病变的 ADC 值以 1.20×$10^{-3}$$mm^2$/s 为界值时其灵敏度、特异度相对最高，分别为 95.0%、90.0%，阳性预测值 90.48%，阴性预测值 94.47%。
结论：浸润性导管癌与乳腺良性病变的 TIC 曲线类型、ADC 值有明显差异，该两项指标，对浸润性导管癌和乳腺良性病变有重要的鉴别诊断价值。

PU-3165
基于 DCE-MRI 纹理分析的乳腺癌新辅助化疗的疗效预测与评估研究

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目的：探讨基于动态增强磁共振成像（DCE-MRI）的纹理参数对乳腺癌新辅助化疗（NAC）的疗效预测与评估价值。**方法：**回顾性分析本院 2014 年 9 月至 2018 年 10 月在 NAC 前后均行 DCE-MRI 且经病理证实的乳腺癌患者共 63 例，根据实体瘤反应评价标准（RECIST），将患者分为治疗有效组（40 例）和治疗无效组（23 例），测量 NAC 前及 NAC4~8 个周期后的 DCE-MRI K^{trans} 图的纹理参数，使用独立样本 t 检验或非参数 Mann-Whitney U 检验对两组纹理参数进行统计分析，并绘制受

试者工作特征（ROC）曲线，根据曲线下面积（AUC）得出 DCE-MRI 纹理参数对乳腺癌 NAC 疗效的诊断效能。**结果：**本研究采用 47 个纹理参数。63 例患者 NAC 前与 NAC4~8 个周期后有 36 个纹理参数差异有统计学意义（P＜0.05）；NAC 前有效组与无效组之间有 9 个纹理参数差异有统计学意义（P＜0.05），包括均匀性、直方图能量及直方图熵等；NAC4~8 个周期后有效组与无效组有 10 个参数之间差异有统计学意义（P＜0.05），包括相对偏差、直方图熵、熵、Haralick 熵、灰度不均匀性（GLN）及游程长度不均匀性（RLN）等；有效组与无效组 NAC 前后的参数变化率之间有 13 个参数变化率的差异有统计学意义（P＜0.05），主要包括Δ灰度不均匀性、Δ游程长度不均匀性及Δ高灰度游程强度等。经 ROC 曲线分析，在所比较的参数中，AUC 较大的有 NAC 后 DCE-MRI K^{trans} 图的灰度不均匀性、游程长度不均匀性及Δ灰度不均匀性、Δ游程长度不均匀性，其 AUC 分别为 0.80、0.81 及 0.85、0.84。**结论：**基于 DCE-MRI K^{trans} 图的纹理参数可以预测评估乳腺癌 NAC 疗效，诊断效能较高的参数有 NAC 后灰度不均匀性、游程长度不均匀性及Δ灰度不均匀性、Δ游程长度不均匀性。

PU-3166

三阴性乳腺癌的 MRI 与临床病理特征

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目的：探讨三阴性乳腺癌(TNBC)的磁共振特点与临床病理特征的相关性。**方法：**收集 31 例 TNBC 及 68 例非三阴性乳腺癌(non-TNBC，NTBNC)患者的 MRI 资料及临床病理资料。分析病变的 MRI 形态、时间-信号强度曲线(TIC 曲线)、表观扩散系数(ADC 值)(b=1000S／mm^2)与临床病理特征之间的相关性，采用 SPSS 13.0 统计软件进行统计学分析。**结果：**TNBC 与 NTNBC 患者在病理类型、病理分级、形态、边缘、内部信号特征、TIC 曲线、ADC 值方面、腋窝淋巴结转移率等差异均具有统计学意义(p＜0.05)。病理类型上，TNBC 主要表现为髓样癌、鳞状细胞癌、基底样癌；TNBC 的腋窝淋巴结转移率较高，为 81.3%；TNBC 更易表现为III型 TIC 曲线类型(91.3%)；病灶易出现分叶征，增强后环形强化等征象，发生率分别为 55.6%、43.6%；TNBC 病灶有较高的 ADC 值；而在发病年龄、是否绝经、家族史及肿块最大径、病灶的个数、肿块类型等方面，两组间差异无统计学意义(p＞0.05)。**结论：**TNBC 的 MRI 影像学征象与临床病理特点具有一定的相关性，掌握 TNBC 的 MRI 特点，有利于初步预判乳腺癌的临床病理特点，为临床治疗及预后评估提供影像学依据。

PU-3167

MRI 在乳腺癌新辅助化疗中的作用

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目的：对于局部进展期乳腺癌患者，新辅助化疗（NCT）已成为乳腺癌综合治疗的重要组成部分。准确地评估化疗的疗效是临床治疗过程中的一个重要环节。本研究的目的是探讨 MRI 对乳腺癌患者新辅助化疗后肿瘤评估的效果，以指导临床医师制定合适的治疗方案。
方法：经组织学活检证实为乳腺癌 20 例患者，采用多西紫杉醇联合表柔比星(75mg/m2 静脉推注)进行 NCT 治疗，每 21d 为 1 个周期,至肿瘤缩小到可手术或保乳手术可行时停止化疗。分别在新辅助化疗前、化疗 2 个周期后及化疗结束后行 MRI 检查（3.0T GE），对动态增强数据进行后处理，分别得到基线时（第一次 MRI）、两个周期后（第二次 MRI）和完成化疗后（第三次 MRI）K^{trans}, K^{ep}, V^e, initial area under the time signal curve (IAUC), ADC 和增强曲线；以肿瘤体积减少 50%定义为肿瘤治疗有效，反之为无效，分为两组，使用 SPSS（17.0 版）对数据进行分析。计算基线

和化疗结束时所有参数的平均值，并通过方差分析进行比较。P<0.05 被认为具有统计学意义。在最后一疗程化疗后，所有入选的患者接受了乳腺切除术或保乳治疗。术后进行病理检查，并记录病理检查测量的大小。
结果：以肿瘤体积减少 50%为界值。在第二次 MRI 检查中，有效果（10/20）的 IAUC 明显小于无效果者（10/20）（p=0.023）。当比较第一次和第二次 MRI 检查的结果时，无效果者和有效果者的 k^{ep} 都明显降低（p=0.04）。从基线到第三次 MRI，有效果者的 ADC 值显著增加（p=0.012）；化疗后 MRI 测得肿瘤体积大小与手术后病理测量的肿瘤体积大小较一致。
结论：IAUC 和 ADC 可以在新辅助化疗后有效鉴别化疗是否有效，从而指导临床制定下一步的治疗方案；新辅助化疗结束后 MRI 测得的肿瘤大小与病理大小较一致，在指导临床手术切除范围具有重要的意义。

PU-3168

Evaluate the ability of Diffusion Kurtosis MR Imaging in invasive breast cancer classification and its correlation with prognostic factors

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Purpose: To assess the ability of diffusion kurtosis imaging (DKI) in invasive breast cancer grading and to evaluate the potential association between DKI-derived parameters: MK/MD and breast cancer clinical-pathologic factors: Estrogen receptor (ER), progesterone receptor (PR), human epidermal growth factor receptor 2(HER-2), antigen identified by monoclonal antibody Ki-67(Ki-67).
Materials and methods: 168 patients with suspicious breast cancer who were treated in our hospital from August 2015 to August 2018 were selected, DKI (with b values of 0, 1000, 2000 sec/mm2) data were acquired. Breast lesions were histologically characterized and DKI related parameters - mean diffusivity (MD) and mean kurtosis (MK)—were measured. The MD and MK in grade II and grade III were compared by One-way analysis of variance (ANOVA). Kurtosis and diffusion coefficients from DKI were measured by two radiologists.
Results: According to the exclusion and enrollment criteria of the study, 108 cases of breast cancer were finally enrolled, MK were significantly higher in grade III breast cancer than in grade II breast cancer (0.99 ± 0.31 vs 0.85± 0.23, respectively; $P<0.05$). MD were significantly higher in grade II breast cancer than in grade III breast cancer (1.17 ± 0.24 vs 0.83 ± 0.21 P <0.05). MD values were significantly different in Ki-67 expression (1.01 ± 0.24 vs 1.10 ± 0.16), ER expression (1.05 ± 0.14vs 1.22 ± 0.32), PR expression (0.78 ± 0.29 vs 1.15 ± 0.26). But MK values only showed significant difference in Ki-67 expression (0.90 ± 0.15 vs 1.09 ± 0.24, $P<0.05$).
Conclusion: DKI quantitative parameters have important application value in the evaluation of breast cancer classification, MD value and MK value are different between partial immune factor groups, and there is a certain correlation with the expression of ki-67.DKI can provide valuable information in evaluating the proliferation activity of breast cancer tumor cells. MD value and MK value can be used

as the indicator of prognosis factors of breast cancer, and indirectly predict the prognosis and treatment effect of breast cancer.

PU-3169
IVIM 参数与乳腺癌免疫因子 ER、PR、HER-2、Ki-67 的相关性研究

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目的：探讨体素内不相关运动（IVIM）模型参数与乳腺癌雌激素受体（ER）、孕激素受体（PR）、人表皮生长因子受体-2（HER-2）和增殖标志物 Ki-67 表达相关性。
方法：选取 2015 年 8 月到 2018 年 8 月期间在我院接受治疗的可疑乳腺癌患者 152 例，均进行常规 T2WI 脂肪抑制序列、T1WI、DWI、DCE-MRI 扫描和 IVIM 科研序列的扫描，采用相关软件计算表观扩散系数（ADC）、单纯扩散系数（D）、假性扩散系数（D*）、灌注分数（f）等参数，检测所有患者肿瘤组织中的 ER、PR、HER-2、Ki-67 表达情况。
结果：根据研究的排除和入组标准，最终入组研究乳腺癌病例 90 例，、ER、PR 阳性表达与阴性表达之间的 ADC 值、D 值、D*值、f 值比较无统计学差异（P＞0.05），HER-2 阳性表达与阴性表达之间的 ADC 值、f 值比较无统计学差异（P＞0.05），HER-2 阳性表达的 D 值、D*值高于 HER-2 阴性表达的 D 值、D*值（P＜0.05）；Ki-67 阳性表达与阴性表达之间的 D*值和 f 值比较无统计学差异（P＞0.05），Ki-67 阳性表达的 ADC 值、D 值低于 Ki-67 阴性表达的 ADC 值、D 值（P＜0.05）。Spearman 相关分析结果：ADC 与 ER 因子表达情况呈负相关，D 值与 HER-2 因子呈正相关，D 值与 Ki-67 呈负相关；D*值与 HER-2 因子呈正相关（均为 P＜0.05）。
结论：根据 ADC 值、D 值、D*值在乳腺癌免疫因子 ER、HER-2 及 Ki-67 阴阳表达情况的组间差异，以及 ADC 值与 ER、D 值与 HER-2 和 Ki-67、D*值与 HER-2 表达情况的相关关系，提示 IVIM 参数可以有助于分析乳腺癌部分免疫因子的表达情况，进而分析患者的预后。

PU-3170
DKI 参数在乳腺癌病理分级及与免疫因子的相关性研究

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目的：评价 MR 扩散峰度成像（DKI）在乳腺癌病理分级中的应用及 DKI 参数与乳腺癌雌激素受体（ER）、孕激素受体（PR）、人表皮生长因子受体-2（HER-2）和增殖标志物 Ki-67 表达相关性。
方法：选取 2015 年 8 月到 2018 年 8 月期间在我院接受治疗的可疑乳腺癌患者 168 例。所有患者术前进行乳腺磁共振常规 T2WI 脂肪抑制序列、T1WI、DWI、DCE-MRI 扫描以及基于 b 值为 0，1000，2000 sec/mm2 的 DKI 模型计算平均扩散率（MD）和扩散峰度平均值（MK）值。通过 SPSS 软件，应用 Spearman 分析上述参数值与乳腺癌病理分级及与 ER、PR、HER-2、Ki-67 的组间差异及相关性。
结果：根据研究的排除和入组标准，最终入组研究乳腺癌病例 108 例，在这些患者中，MD，MK 值在不同分级乳腺癌之间差异有统计学意义（P＜0.05），III 型乳腺癌组 MK 值大于 II 型乳腺癌组，III 型乳腺癌组 MD 值小于 II 型乳腺癌组。在对 ER、PR、HER-2、Ki-67 阴阳表达情况组间的统计学分析发现，MD 值在 ER、PR、Ki-67 阴阳表达组间存在统计学差异（P＜0.05），MK 值仅在 Ki-67 阴阳表达组间存在显著统计学差异（P＜0.05）。Spearsman 相关分析显示，MD 值与病理分

级呈负相关（r=-0.43，p<0.05），MK 值与病理分级呈正相关（r=0.48，p<0.05），MD 值与 Ki-67 表达呈负相关（r=-0.39，P<0.05），MK 值与 Ki-67 表达呈正相关（r=0.56，P<0.05）。
结论：DKI 定量参数在评价乳腺癌分级方面有重要的应用价值，DKI 在评估乳腺癌肿瘤细胞增殖活性方面可以提供有价值的信息，MD 值和 MK 值可以作为乳腺癌病理分级和预后因子表达的提示指标，从而可以间接评估乳腺癌的预后和治疗效果。

PU-3171
乳腺浸润性导管癌扩散加权成像与 HER-2 的相关性研究

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目的：探讨乳腺浸润性导管癌的扩散系数 ADC 值与乳腺癌预后因子 HER-2 的相关性。
方法：回顾性分析 2013 年 6 月至 2016 年 2 月在山西省肿瘤医院行 MRI 检查，并经手术或细针穿刺获得病理证实的浸润性导管癌患者，排除病灶小于 1cm 者，最终获得研究对象 52 例。在病变区域设置感兴趣区（ROI），分三次测量病灶的 ADC 值，求平均值。利用获取的肿瘤标本，采用 SP 法对 HER-2 的表达情况进行染色，根据免疫组化结果分：0、1+、2+、3+；其中 0、1+定义为阴性组，3+定义为阳性组，若为 2+则继续采用原位杂交检验分为阳性组及阴性组。研究 ADC 值与生物学预后因子 HER-2 的相关性。采用两独立样本 t 检验，计算阳性组与阴性组之间 ADC 有无统计学差异。
结果：两组之间 ADC 值的差异具有统计学意义。HER-2 阳性组 ADC 值（1.18×10^{-3}）较 HER-2 阴性组 ADC 值（0.94×10^{-3}）高（$p<0.05$）。同时发现 HER-2 过表达者 ADC 值更高。
结论：HER-2 可促进肿瘤细胞的有丝分裂，HER-2 的高表达与肿瘤的侵袭与转移具有相关性。利用 MRI 通过对 ADC 值的测定可间接反映浸润性导管癌的 HER-2 表达情况，有助于对浸润性导管癌的恶性程度及其预后进行评估。

PU-3172
Ktrans 联合 ADC 值对乳腺浸润性导管癌及纤维腺瘤的鉴别诊断价值

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目的：联合 Ktrans 与 ADC 值对乳腺浸润性导管癌及乳腺纤维腺瘤的鉴别诊断价值。
方法：回顾性分析我院 2015 年 1 月到 2016 年 3 月经手术病理证实的乳腺病灶 75 例，其中浸润性导管癌 41 例、乳腺纤维腺瘤 31 例；采用飞利浦 3.0T 磁共振扫描仪，行 DCE-MRI 检查及扩散加权成像(b 值 1000s/mm^2)，测量病灶 ADC 值。采用 GE 公司 Omni-Kinetics 软件测定病灶容量转运常数(Ktrans)，分别评价 ADC 值、Ktrans 值、联合 ADC 与 Ktrans 对乳腺浸润性导管癌及乳腺腺病合并纤维腺瘤的鉴别诊断价值。
结果：乳腺纤维腺病、浸润性导管癌的平均 ADC 值分别为：（1.49 ± 0.23）$\times10^{-3}$mm/s、（1.18 ± 0.13）$\times10^{-3}$mm/s，二者具有统计学差异（$p<0.001$）。二者的定量参数 Ktrans 平均值分别为：（0.78 ± 0.11）min^{-1}、（0.46 ± 0.05）min^{-1}，二者具有统计学差异（$p<0.05$）。以最大约登指数为最佳诊断切入点， Ktrans、ADC 值的敏感性分别为 90.3%、84.5%，特异性分别为 88.1%、80.4%，曲线下面积分别为 0.907、0.813。联合 Ktrans 与 ADC 值对鉴别良恶性病变的敏感性、特异性分别为 94.3%、85.4%，以最大约登指数为最佳诊断切入点，曲线下面积为 0.935。

结论：乳腺浸润性导管癌及纤维腺瘤的 Ktrans 及 ADC 值差异均具有统计学意义，Ktrans 及 ADC 值对乳腺癌均有较高的诊断效能，Ktrans 的诊断效能高于 ADC 值。联合 Ktrans 与 ADC 值对鉴别乳腺良恶性病变的诊断效能较单一参数有所提高。

PU-3173

乳腺非特殊型浸润性癌的影像学诊断与组织分级

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目的 分析乳腺不同组织分级的非特殊型浸润性癌在乳腺 X 线摄影及 MRI 上的影像学特征，以提高对其诊断和鉴别诊断能力。
资料与方法 60 例经穿刺或手术病理证实的乳腺非特殊型浸润性癌，其中 I 级 6 例，II 级 33 例，III 级 21 例，年龄 33-81 岁，平均 57 岁，术前均行 MRI 检查，47 例同时行钼靶 X 线检查，结合病理，回顾性分析病灶的形态、信号特点、ADC 值及增强时间- 信号曲线（TIC）的类型。
结果 Ⅰ级中 4 例行乳腺 X 线摄影，表现为多发小肿块，部分周边毛糙 1 例，局灶性不对称性致密伴高密度小肿块 1 例，高密度肿块 1 例，腺体致密 1 例。MRI 表现为非肿块区域性强化 3 例，多发强化小肿块 1 例，不规则小肿块 1 例，边界清晰肿块伴出血 1 例。Ⅱ级中 28 例行乳腺 X 线摄影，表现为不规则肿块伴毛刺 2 例，肿块伴钙化 5 例,成簇钙化 5 例,不对称致密影伴钙化 4 例,结构扭曲 1 例,不对称致密 2 例,不规则肿块 4 例,腺体致密 5 例;其中 14 例有钙化,占 50%。MRI 表现为肿块样强化 29 例,占 88%,不规则肿块 22 例,伴毛刺 12 例,环形强化 1 例;非肿块样强化 4 例;平均 ADC 值约：0.99 ×10-3mm2/s。Ⅲ级中 16 例行乳腺 X 线摄影，表现为肿块影 11 例，伴毛刺 2 例，伴钙化 4 例；结构扭曲伴钙化 1 例；节段性分布钙化 1 例；表现为钙化占 38%。MRI 表现为不规则肿块样强化 17 例，占 81%；表现为区域性强化 1 例；节段性异常强化 1 例；弥漫性强化 1 例。
结论 乳腺非特殊型浸润性癌多发生于中老年女性，典型表现易于诊断，以不规则肿块伴沙砾样钙化或毛刺征，较低的 ADC 值及 II-Ⅲ型 TIC 曲线诊断价值最大，级别越高伴出血及坏死可能性越大，肿块大小与组织学分级呈正相关。

PU-3174

不同分子亚型乳腺癌 MRI 特征分析

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目的：探讨不同分子亚型乳腺癌的 MRI 特征。**方法：**回顾性分析 85 例经病理证实的乳腺癌患者的 MRI 资料，采用免疫组织化学检查结果判断不同分子亚型（Luminal A 型、Luminal B 型、Her-2 过表达型和基底细胞样型），分析呈肿块样强化不同分子亚型乳腺癌的 MRI 征象（数目、形态、边缘、肿块的强化特点、TIC 曲线类型以及 ADC 值等），进一步利用统计学软件进行分析。**结果：**本组 85 例患者中，77 例病灶呈肿块样强化，Luminal A 型 9 例、Luminal B 型 40 例、Her-2 过表达型 18 例和基底细胞样型 10 例，病灶的形态、边缘、强化方式、ADC 值于不同分子亚型间差异有统计学意义（P＜0.05），病灶的数目、瘤周血管有无增多及 TIC 曲线类型与不同分子亚型间差异无统计学意义（P＞0.05）。**结论：**不同分子亚型乳腺癌表现出不同的 MRI 征象，MRI 检查有助于术前对分子亚型的预测。

PU-3175

乳腺实性乳头状癌的影像表现及病理

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目的:探讨乳腺实性乳头状癌(SPC)影像表现及病理,以提高诊断准确性，指导临床判断疾病预后及选择治疗方案。
方法：回顾分析 2013 年 6 月-2019 年 6 月经手术及病理证实为 SPC 的 31 名患者的乳腺 MRI 及病理检查资料。术后病理区分 SPC 病变为原位或浸润性癌，免疫组化分析病变生物学标志物包括雌激素受体（ER）、孕激素受体（PR）、人表皮样生长因子受体-2（Her-2）以及 Ki67。分析乳腺 MRI 图像手动勾画感兴趣区并测定病灶表观扩散系数(apparent diffusion coefficient, ADC)。统计学分析原位与浸润性癌之间 ADC 值的差别。
结果：31 例 SPC 的病理类型均为 Lumina A 型，Her-2 基因均无扩增。31 例病变均在 MRI 上显示,13 例位于乳晕后区，23 例 T1WI 示病灶前方伴导管扩张 ，19 例 T2WI 呈高信号。动态增强扫描显示 18 例呈非肿块样强化，13 例呈肿块样强化。18 例非肿块样强化中，8 例为集簇小环状强化 ，6 例为集簇样强化，4 例为区域分布不均匀强化。表现为肿块样强化的 13 例均呈不均匀强化。动态增强曲线显示其中 14 例呈快速-流出型。浸润性 SPC 的 ADC 值低于原位 SPC（$P<0.05$）。
结论：SPC 在 MRI 上的表现具有一定特征性，ADC 值与病变浸润性有相关性，对疾病术前诊断有价值，可指导临床判断预后及选择治疗方案。

PU-3176

磁共振脂肪定量技术与扩散加权成像及动态增强扫描比较在乳腺癌患者腋窝淋巴结转移诊断中的价值

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[摘要] 目的 探究磁共振脂肪定量技术(mDIXON-quant)在乳腺癌患者腋窝淋巴结转移诊断中的价值，并与扩散加权成像及动态增强扫描相比较各自诊断效能。 **方法** 本研究共收集 20 例经病理证实的乳腺癌伴腋窝淋巴结肿大病例，淋巴结总数共 45 个，术前患者均行磁共振 mDIXON-quant、弥撒加权成像（DWI）及动态增强扫描，通过 mDIXON-quant 测得脂肪含量比（fat fraction，FF）值，通过 DWI 获得表观扩散系数(apparent diffusion coefficient，ADC)值，通过动态增强扫描获取时间-信号曲线(time-intensity curves，TIC)并判断其类型。 **结果** 病理报告淋巴结阴性组（29/45）FF 值 21.4±4.8%，淋巴结阳性组（16/45）FF 值 6.2±2.7%，两组之间 FF 值具有明显统计学差异（p <0.05），阴性淋巴结组 FF 值明显大于阳性淋巴结组。淋巴结阴性组 ADC 值（1.27±0.29）$\times 10^{-3}mm^2/s$，淋巴结阳性组 ADC 值（0.85±0.18）$\times 10^{-3}mm^2/s$；阴性组 TIC 曲线以“流入型”曲线为主（20/29），而阳性组以“平台型”、“流出型”为主（14/16）；ADC 值及 TIC 类型在两组病变鉴别中亦有统计学意义（p <0.05）。应用 FF 值、ADC 值、TIC 类型对两组病变进行判别，敏感性分别为（94%、81%、78%）、特异性分别为（80%、83%、79%）、准确性分别为（85%、88%、81%） **结论** 脂肪定量技术在判断乳腺癌腋窝淋巴结转移中有着较高的敏感性，其特异性及准确性亦无明显减低，有较高的诊断效能。

PU-3177
乳腺叶状肿瘤与纤维腺瘤 MRI 征象分析及鉴别

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目的：探讨乳腺叶状肿瘤与纤维腺瘤 MRI 表现特点并对两者进行鉴别，提高临床对两种疾病诊断准确率。
材料与方法：回顾性分析经手术或穿刺病理证实的 34 例乳腺叶状肿瘤和 59 例乳腺纤维腺瘤患者临床及 MRI 资料。
结果：叶状肿瘤好发于中年女性（平均年龄 49 岁），纤维腺瘤发好于年轻女性（平均年龄 37 岁）。叶状肿瘤的平均最大径（5.3cm）大于纤维腺瘤(3.7cm)。叶状肿瘤和纤维腺瘤的形态学特征有一定差异：叶状肿瘤表现分叶状有 23 例 (23/34)，表现为不规则形 5 例(5/34)；纤维腺瘤表现为类圆形 31 例(31/59)，表现为分叶状有 23 例(23/59)，本组未见不规则形纤维腺瘤。叶状肿瘤 11 例（11/34）边缘不规则，2 例边缘见毛刺。纤维腺瘤通常边缘光滑，本组 56 例（56/59），边缘不规则比较少见。MRI 平扫 T1WI 叶状肿瘤 13 例内见片状高信号，而纤维腺瘤未见片状高信号。T2WI 压脂序列叶状肿瘤 31 例（31/34）表现为高信号；而纤维腺瘤等、低、高信号均可见，其中 36 例(36/59)表现为高信号。13 例(13/34)叶状肿瘤内见囊变区，而纤维腺瘤内未见。增强扫描两者肿块内均可见未强化的低信号分隔。时间信号强度曲线，叶状肿瘤以Ⅱ型多见 14 例（14/34），Ⅰ型 12 例，Ⅲ型 8 例；纤维腺瘤以Ⅰ型多见 39 例（39/59），Ⅱ型 17 例，Ⅲ型 3 例。
结论：乳腺叶状肿瘤与纤维腺瘤 MRI 表现具有一定特征性，且二者之间存在差异。结合患者的临床资料，病变的形态学特征、MRI 信号、强化特征及时间-信号强度曲线类型，能够对两者作出鉴别。

PU-3178
两例乳腺急慢性化脓性乳腺炎 MRI 误诊分析及鉴别诊断

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摘要 目的 总结分析乳腺急慢性化脓性乳腺炎 MRI 影像学表现特点，提高对该疾病的影像学诊断及鉴别诊断能力。**方法** 回顾性分析 2019 年 3-6 月经手术病理证实并行影像学检查的 2 例乳腺急慢性化脓性乳腺炎，包括一般临床资料、超声表现、乳腺 X 线及乳腺 MRI 影像学资料。**结果** 2 例病例超声均表现为条片状低回声，内部回声不均，形态欠规则，一例边界尚清，一例边界略欠清，超声 BI-RADS 4A 类；乳腺 X 线均表现为条片状致密影，边界不清，其内无明显恶性微钙化灶，周围腺体无明显纠集样改变，BI-RADS 4A 类；乳腺 MRI 均表现为段样走行分布长 T1、长 T2 信号病灶，DWI 像呈不均匀性高信号，ADC 较低值分别为 $0.968\times10^{-3}mm^2/s$、$0.957\times10^{-3}mm^2/s$，增强扫描呈段样强化，强化局部 DWI 像高信号区无明显强化，且 2 例病灶均可见多层厚壁样强化表现，TIC 曲线均呈平台型；灶周无明显水肿及渗出性改变。MRI 术前均考虑为导管源性病变，BI-RADS-MRI 4 类和 5 类。**结论** 急慢性化脓性乳腺炎影像学表现多无明显特异性，MRI 敏感性高，但特异性偏低，易误诊为导管原位癌。综合多种影像学检查，以及 MRI 相对特异性表现，可提高对该疾病的诊断准确性。

PU-3179
乳腺导管原位癌的 FFDM 与 MRI 影像学表现对照分析

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摘要：目的 对比乳腺导管原位癌（ductal carcinoma in situ,DCIS）及其微浸润的钼靶 X 线及 MRI 影像学表现。**方法** 回顾性分析经手术和病理证实的乳腺导管原位癌 26 例。所有病例均于术前进行数字化乳腺摄影（FFDM）及磁共振成像（MRI），均参照乳腺影像报告数据系统（BI-RADS 系统）进行分析。**结果** 乳腺摄影中单纯钙化为 15 例（57.7%），肿块伴钙化、结构扭曲伴或不伴钙化为 11 例（42.3%）。诊断为恶性或可疑恶性病变 24 例，误诊为良性病变 2 例，对乳癌诊断的敏感性是 92.3%；MRI 检出 25 例，敏感性为 96.2%，1 例因未见异常强化灶而误诊为良性。8 例呈肿块样强化（30.8%），18 例呈非肿块样强化（69.2%）。其中内部强化均匀 2 例，强化不均匀 4 例，内部蜂窝状、簇点状、簇环状强化共 19 例，未见明显强化 1 例。所有病例时间-信号强度（TIC）曲线呈平台型 14 例，流出型 9 例，先平台后流出型 3 例。**结论** 乳腺导管原位癌及其微浸润的钼靶 X 线表现以微钙化或肿块伴微钙化为主要特征，乳腺摄片对 DCIS 诊断有较高敏感性。乳腺 MRI 特征表现为非肿块样强化及其内部卵石状及簇状小环状强化，时间-信号强度曲线呈平台型或流出型。MRI 对 DCIS 诊断的敏感性更高，但对于极少部分病例仅在摄片上表现为少许成簇微钙化，且钙化密度较低者，在 MRI 上可以不表现出异常强化灶，故而可能会导致误诊。这两种检查方法结合可以进一步提高 DCIS 的诊断准确性，为临床治疗（尤其是精准治疗）提供可靠的依据。

PU-3180
基于乳腺动态增强分析参数对鉴别乳腺良恶性病变的价值

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【摘要】 目的 探讨基于乳腺动态增强分析参数对鉴别乳腺良恶性病灶的价值。方法 回顾性分析 112 例经手术病理证实的乳腺结节的患者临床及影像资料，依据病理将其分为恶性组 55 例和良性组 57 例。使用联影乳腺分析软件对结节实性成分最大层面进行 ROI 手动勾画，然后经过软件处理后得出流入（WI）、流出（WO）、达峰时间（TTP）、最大上升斜率（MSI）、正性增强积分（PEI）5 个参数作为分析指标。采用独立样本 t 检验及 Mann-Whitney U 检验分析两组之间参数的差异，并采用受试者工作特征曲线下面积评估各参数的诊断效能。**结果** 恶性组的 WI、WO、TTP、MSI、PEI 分别为 877.15±241.35、441.73±69.18、263.64±57.54、1203.71±297.79、1842.69±579.40，良性组上述各参数值分别为 675.87±171.18、477.339±60.87、303.14±62.94、935.54±207.24、1792.82±495.73。WI、WO、TTP、MSI 参数间差异有统计学意义（t 值分别为 5.075、-2.895、-3.463、5.513， $P<0.05$）。PEI 间差异均无统计学差异（$P>0.05$）。ROC 曲线分析显示，WI、MSI 分别以偏度 730.15 和 967.6 为鉴别良恶性结节的阈值，其 ROC 曲线下面积（AUC）、敏感度和特异度分别为 74%、69.1%、38.6%和 76%、76.4%、43.9%。**结论** 基于乳腺动态增强分析参数对鉴别乳腺良恶性结节有一定的价值。

PU-3181
早期乳腺导管内浸润性癌 ADC 值与生物因子 ER、PR、C-erb-B2 表达的相关性研究

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目的：探讨不同早期乳腺导管内浸润性癌 ADC 值与生物因子的表达情况的相关性。**方法**：选取 2014 年 12 月至 2017 年 4 月 100 例经病理及临床证实为早期乳腺导管内浸润性癌，患者年龄 34-67 岁，中位年龄 50.5 岁。所有患者治疗前行 3.0T MR 常规扫描及 DWI 检查，测量肿块区域 ADC 值（避开液性坏死区域），并与乳腺相应正常区域 ADC 值作为对照，统计病人 ER、PR、C-erbB-2 的表达情况，根据生物因子表达情况分为 ER 阴性组与阳性组、PR 阴性组与阳性组、C-erbB-2 阴性组与阳性组，ER、PR、C-erbB-2 均阴性组及非均阴性组，各组之间两两比较采用 LSD-t 行相关性分析。**结果**：100 例早期乳腺导管内浸润性癌患者中 ER 阳性表达率为 28%、PR 为 35%、C-erb-B2 为 36%；C-erb-B2 阴性组 ADC 均值为（1.65±0.209）×$10^{-3}$$mm^2$/s，阳性组（1.16±0.134）×$10^{-3}$$mm^2$/s，ER、PR、C-erbB-2 均阴性组 ADC 均值为（1.76±0.256）×$10^{-3}$$mm^2$/s,ER、PR、C-erbB-2 均阳性组 ADC 均值为（1.12±0.116）×$10^{-3}$$mm^2$/s，C-erbB-2 阴性组与阳性组早期乳腺导管内浸润性癌之间 ADC 均值差异有显著性意义(p<0.05)，ER、PR、C-erb-B2 均阴性与 ER、PR、c-erbB-2 均阳组早期乳腺导管内浸润性癌 ADC 值差异有统计学意义（P<0.05）。ER 阴性与 ER 阳性、PR 阴性与 PR 阳性早期乳腺导管内浸润性癌 ADC 值差异之间两两比较异无统计学意义（*P*>0.05）。**结论**：ADC 值在术前预测早期乳腺导管内浸润性乳腺癌生物因子 C-erbB-2 及三阴性表达有一定意义，但是对 ER 及 PR 的阳性预测价值有限。

PU-3182
DWI 对肉芽肿性小叶性乳腺炎和浸润性乳腺癌的鉴别诊断价值研究

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摘要：目的：研究 DWI 对肉芽肿性小叶性乳腺炎和浸润性乳腺癌的鉴别诊断是否有帮助。方法：回顾性分析 45 个肉芽肿性小叶性乳腺炎和 188 个浸润性导管癌的 DWI 图像和计算其平均 ADC 值，并且分别以对侧正常乳腺实质、胸大肌和胸骨的平均 ADC 值为对照，计算病变 ADC 值率（ADCr），对比平均 ADC 值和多个 ADC 值率是否有统计学差异。结果：肉芽肿性小叶性乳腺炎和浸润性导管癌的平均 ADC 值分别为（1.02±0.17）x10-3mm2/s、（0.98±0.24） x10-3mm2/s，二者无统计学差异（p=0.543）。肉芽肿性小叶性乳腺炎和浸润性导管癌以对侧正常乳腺实质、胸大肌和胸骨的 ADCr 分别为 0.821 ± 0.310、0.789 ± 0.223，4.2 ± 2.62、4.4±1.57，3.94±1.64、5.21±1.26，两组间所有 ADCr 差异均无统计学差异（p>0.05）。结论：肉芽肿性小叶性乳腺炎和浸润性乳腺癌的平均 ADC 值和 ADCr 近似，因此 DWI 对二者的鉴别诊断没有帮助。

PU-3183
术前乳腺癌原发灶 DCE-MRI 特征预测腋窝淋巴结转移的价值

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目的：探讨乳腺癌原发灶动态增强磁共振（DCE-MRI）特征预测腋窝淋巴结转移的价值。

方法：回顾性分析 2014 年 6 月-2017 年 6 月在我院诊断为乳腺癌并行乳腺癌根治术的患者 231 例，根据术后病理淋巴结状态分为淋巴结转移组 91 例、非淋巴结转移组 140 例，将淋巴结转移组依据淋巴结转移数目及 TNM 分期分为 N1、N2、N3 期，分别为 61 例、20 例、10 例。收集两组患者临床病理特征及 DCE-MRI 特征,计数资料采用卡方检验/Fisher 确切概率法，计量资料采用秩和检验，绘制 ROC 曲线评价其预测腋窝淋巴结转移的效能，并应用 logistic 回归计算病灶各特征联合预测腋窝淋巴结转移的效能。
结果：肿块大小、病理分级、HER-2 状态及 Ki-67 状态在腋窝淋巴结转移组和非淋巴结转移组有统计学差异（$P<0.05$）。肿块越大、病理分级越高越易发生淋巴结转移。
原发灶长径及淋巴结短径在腋窝淋巴结转移组与非淋巴结转移组有统计学差异（$P<0.05$）。而病灶强化类型、内部强化方式及 TIC 曲线类型在两组中无统计学差异（$P>0.05$）。
原发灶 AUC 值、Max Conc 值、TTP 值、Max Slope 值、K^{trans} 值及 K_{ep} 值在腋窝淋巴结转移组和非淋巴结转移组有统计学差异（$P<0.05$）。而原发灶 V_p 值在腋窝淋巴结转移组与非淋巴结转移组无统计学差异（$P>0.05$）。
原发灶长径、病灶强化类型、内部强化方式、TIC 曲线类型及动态参数在淋巴结转移分期中无统计学差异（$P>0.05$）。
原发灶长径、淋巴结短径联合动态参数预测腋窝淋巴结转移的曲线下面积为 0.770（95%CI，0.709-0.831），高于单个变量预测及动态参数间联合预测，特异性为 74.29%，敏感性为 65.93%。
结论：
综合分析原发灶 DCE-MRI 特征对术前乳腺癌淋巴结转移的预测、指导选择与设计临床治疗方案有重要意义。

PU-3184
DWI 与 DCE-MR 预测乳腺癌腋窝淋巴结转移中的价值

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目的：探讨磁共振弥散加权成像(DWI) 与动态增强磁共振（DCE-MRI）在乳腺癌原发灶腋窝淋巴结转移预测中的应用价值。方法：回顾性分析我院 2014 年 6 月-2017 年 6 月行乳腺癌根治术或乳腺癌病灶切除术+前哨淋巴结活检术，且术前均行 DWI 及 DCE-MRI 扫描的 259 例早期乳腺癌患者，分析 MRI 的病灶直径、强化方式、强化类型、原发灶表观扩散系数（ADC）值及 DCE-MRI 定量参数在乳腺癌腋窝淋巴结转移组与非转移组、淋巴结转移分期之间的差异。结果：病灶直径、ADC 值及 k^{trans} 值在乳腺癌有无腋窝淋巴结转移中有统计学差异($p<0.05$)，直径＞2cm 较≤2cm 的病灶更易发生淋巴结转移。腋窝淋巴结转移组较非腋窝淋巴结转移的 ADC 值小，k^{trans} 值大。结论：乳腺癌原发灶 DWI 及 DCE-MRI 在腋窝淋巴结转移中有一定的预测价值。

PU-3185
IVIM-DWI 在不同免疫组化表达的 T1 期乳腺癌中的研究价值初探

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目的：探讨在不同免疫组化表达的 T1 期乳腺癌中体素内不相干运动扩散加权成像（Intravoxel incoherent motion diffusion-weighted imaging，IVIM-DWI）技术的诊断价值。**材料与方法**：前瞻性收集超声或 X 线摄影疑诊乳腺癌的女性患者，术前均行 IVIM-DWI 成像，通过后处理工作站获

得各参数值包括 ADCfast、ADCslow 和 f 值。追踪所有手术病人病理结果，最终入组经病理确诊的 T1 期乳腺癌患者共 50 例。采用 SPSS 21.0 统计软件进行数据分析，采用独立样本 t 检验或 U 检验，观察病灶区 ADCslow、ADCfast、f 值与免疫组化指标（ER、PR、HER-2 和 Ki-67）不同表达情况之间是否具有统计学差异。利用 ROC 比较各参数在激素受体（HR）组、HER-2 组的诊断效能。**结果：**50 例 T1 期乳腺癌中 ER 阳性、PR 阳性、HER-2 阳性者分别为 40 例、26 例、25 例。经统计学分析发现 T1 期乳腺癌病灶中，ER 阳性组和阴性组的 ADCslow、f 值差异有统计学意义（P<0.05），ADCfast 两组间差异无统计学意义（P>0.05）；PR 阳性组和阴性组的 ADCslow 值差异有统计学意义（P<0.05），ADCfast、f 值两组间无统计学差异（P>0.05）；HER-2 阳性组和阴性组的 ADCslow、ADCfast 和 f 值差异均无统计学意义（P>0.05）。ER 组 ADCslow 和 f 值曲线下面积（AUC）分别是 0.877 和 0.76，PR 组 ADCslow 值 AUC 是 0.66。**结论：** IVIM-DWI 在激素受体表达的 T1 期乳腺癌中具有较高的诊断效能。

PU-3186
IVIM 参数与乳腺癌分子生物学指标的相关性研究

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目的：通过对不同分子分型乳腺癌的体素内不相干运动（Intravoxel incoherent motion，IVIM）参数的分析，探讨 IVIM 参数与生子生物学指标雌激素受体（Estrogen receptor, ER）、孕激素受体（Progestrone receptor，PR）、人类表皮生长因子受体-2（Human epidermal growth factor receptor 2，HER-2）、Ki-67 的相关性。
方法：收集自 2014 年 4 月至 2016 年 12 月期间在大连医科大学附属一院成功完成乳腺 MR 检查的女性乳腺癌患者，入组 46 例（49 枚病灶）。所有病灶均经手术病理证实，术后行免疫组化分析。磁共振检查前未行穿刺、未接受放化疗。患者年龄范围为 28～74 岁。图像扫描采用 GE 3.0T 磁共振扫描仪，专用 8 通道双侧乳腺相控线圈。所有图像经 GE ADW4.6 工作站处理。分析测量乳腺癌的 IVIM 参数值。记载分子生物学指标 ER、PR、HER-2、Ki-67 的表达状况。统计学分析使用 SPSS 20.0 软件，采用非参数检验 Spearman 方法评价乳腺癌 IVIM 参数与分子生物学指标表达情况的相关性，P<0.05 认为差异有统计学意义。
结果：D 值与 ER、PR 阳性表达呈负相关（r 分别为-0.416，-0.452，$P<0.05$）；
与 HER-2、Ki-67 阳性表达无相关性（r 分别为-0.083，0.236，$P>0.05$）。D*值与 ER、PR、Ki-67 阳性表达呈负相关（r 分别为-0.403，-0.479，-0.415，$P<0.05$），与 HER-2 阳性表达无相关性（r=-0.226，$P>0.05$）。f 值与 ER、PR、HER-2、Ki-67 阳性表达均无相关性（r 分别为 0.05，0.049，0.357，0.079，$P>0.05$）。
结论：D 值愈小，其 ER、PR 阳性表达率愈高。D*值愈小，其 ER、PR、Ki-67 阳性表达率愈高。

PU-3187
T2 联合动态增强增强 MR 对肉芽肿性乳腺炎与乳腺癌的 MR 鉴别诊断价值

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研究目的：探讨以非肿块样方式强化的肉芽肿性乳腺炎与乳腺癌在 T2 加权及 DCE 表现上的差异，提高两者在 MR 上的鉴别诊断效率。
研究方法：回顾性分析已明确病理诊断、且在 MR 增强上以非肿块样方式强化的乳腺 MR 资料 56 例（肉芽肿性乳腺炎 31 例，乳腺癌 24 例）。分析两者在 T2 信号强度、分布方式、内部强化方式及 TIC 曲线上的表现。
研究结果：（1）T2 信号强度：肉芽肿性乳腺炎中，T2WI 呈高信号 25 例，等信号 6 例；乳腺癌中，T2WI 呈高信号 5 例，等信号 18 例，混杂信号 1 例，两者间的差异具备统计学意义（c^2=6.781，P=0.021<0.05）。（2）强化分布：肉芽肿性乳腺炎中，局灶性 2 例，区域性 5 例，多区域性 12 例，节段性 12 例；乳腺癌中，局灶性 3 例，区域性 6 例，多区域性 2 例，节段性 13 例，两者间的差异具备统计学意义（c^2=7.214，P=0.018<0.05），。（3）强化方式：肉芽肿性乳腺炎中，不均匀强化 5 例，簇状环形强化 14 例，环形强化合并不均匀强化 12 例；乳腺癌中，不均匀强化 4 例，簇状环形强化 15 例，卵石样强化 5 例。两者间的差异不具备统计学意义（c^2=1.437，P=0.095>0.05）。（4）TIC 曲线：肉芽肿性乳腺炎中Ⅰ型-Ⅲ型曲线分别为 4 例，23 例，4 例，在乳腺癌中Ⅰ型-Ⅲ型曲线分别 2 例，16 例，6 例，两者间的差异不具备统计学意义（c^2=1.134，P=0.105>0.05）。
结论：非肿块样强化的肉芽肿性乳腺炎与乳腺癌在 T2 信号强度及强化分布方面存在一定差异，有助于两者进行鉴别诊断。

PU-3188

包裹性乳头状癌的影像学表现及病理特征

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研究目的：探讨包裹性乳头状癌的磁共振表现及临床病理特征。
研究方法：回顾性分析经病理证实的 EPC 患者 12 例，其中 12 例行乳腺 MR 检查，8 例行乳腺 X 线检查，观察患者的影像学表现及其相关病理特征。
研究结果：12 例包裹性乳头状癌患者病理表现为实性肿块 7 例、囊实混合性肿块 5 例，免疫组化显示肌上皮缺失，分子分型均为 Luminal A 型，7 例实性肿块中伴发 DCIS 3 例，合并 DIC 者 3 例，其余 6 例为单纯性 EPC，其中囊实混合性肿块 5 例，实性肿块 1 例 。7 例在乳腺 X 线摄影上表现为等密度肿块，12 例均在 MR 上显示，其中 9 例位于乳晕后区。动态增强后，6 例单纯性 EPC 呈结节样（2 例）、囊实混合结节样（4 例）强化，边缘清晰，后者延迟强化见薄壁环形强化影。3 例合并 IDC 者除肿块样强化外见节段样不均匀强化影，2 例合并 DCIS 者表现为边缘不规则的实性肿块样强化，1 例在 MR 上未显示，仅在钼靶上表现为集簇分布的细小多形性钙化。
结论：单纯性包裹性乳头状癌的 MR 表现较有特征性，多为乳晕后区的囊实性肿块，但 EPC 易合并肿瘤，与其病理改变密切相关。

PU-3189

乳腺磁共振智能扫描（SmartExam breast）在乳腺术后患者中的应用价值

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目的 探讨在乳腺 MR 检查中,利用 T2-spair 脂肪抑脂序列，在常规 Breast 以及 SmartBreast 两种不同匀场方式中，对于显示乳腺切除术后术区结构图像质量的影响，评估两种不同匀场方式对于术区病变的诊断价值。

材料与方法 乳腺癌切除术后患者 11 例，采用 PHILIPS Ingenia3.0T 超导 MR 扫描仪，按照常规 Breast 中 T2-spair 脂肪抑脂序列的匀场及 smartBreast 中 T2-spair 脂肪抑制序列的匀场方式分别扫描,每例患者均使用两种不同的匀场方式各扫描一次，共计 11 组图像。由两位高年资医师对图像质量进行主观评分并求其平均值。评分内容包括以下四项：患侧胸壁有无伪影，皮肤是否连续显示，皮下脂肪间隙是否清晰显示，肋骨信号是否清晰显示；每一项根据图像质量分别评分：满意 3 分、一般 2 分、不满意 1 分，然后将合计总分作为每一病例的图像评分结果。利用 SPSS 统计软件对于图像质量的评分结果进行分析。

结果 Smart-Breast 中 T2-spair 脂肪抑制序列的匀场方式，能够智能地勾画出需要匀场的范围，清晰显示乳腺切除术后术区胸壁皮肤、皮下软组织、肋骨等结构，图像质量评分结果较满意；对于常规 Breast、Smart-Breast 中 T2-spair 图像质量的评估分数进行统计分析，显示两者在 99%可信区间 $P<0.01$，提示两者之间的图像质量差异具有统计学意义。

结论 对比常规 Breast 中的 T2-spair 扫描序列，采用 Smart-Breast 进行同一序列扫描，能够避免术后胸壁软组织不对称对局部磁场不均性的影响，有利于对此类患者术后复发、术区新发病灶等的早期诊断，具有较高的临床应用价值。

PU-3190
背景实质强化和纤维腺体组织比例与乳腺癌分子分型相关性研究

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目的：评估乳腺磁共振中背景实质强化（BPE）和纤维腺组织（FGT）比例与浸润性乳腺癌分子亚型的相关性。 材料和方法：回顾性分析 2017 年 7 月至 2019 年 3 月期间于我院行乳腺 MRI 检查并满足纳入标准的 174 例患者的绝经情况、MRI 检查图像及病理免疫组化结果（确定分子分型），根据美国放射学院 2013 版的乳腺影像报告和数据系统（BI-RADS）标准回顾磁共振 T1 加权图像以确定 FGT 比例，并且回顾动态增强的脂肪抑制的 T1 加权图像以确定 BPE，将肿瘤的分子亚型与 BPE 和 FGT 比例进行比较，采用 SPSS22.0 进行统计学分析，采用卡方检验，以 $P<0.05$ 认为具有统计学差异。 结果：在 174 例乳腺癌患者中，绝经前女性 104 例，绝经后 70 例，经病理证实均为非特殊浸润癌，lumina A 型 50 例，luminal B 型 78 例，HER-2 过表达型 22 例，三阴型 24 例，以 luminal B 型最多。 FGT 分类与 BPE 具有相关性（$p=0.000$）；FGT 分类和 BPE 与绝经状态有统计学差异（$P=0.000$），且高 FGT 及高 BPE 在未绝经女性中发生率较高，进行绝经前后亚组分析 FGT 分类和 BPE 均与分子亚型无相关（$P<0.05$）。 结论：对于患乳腺癌的患者，FGT 分类及 BPE 与绝经状态具有相关性，高 FGT 及高 BPE 在未绝经女性发生率高，但无论是绝经前还是绝经后女性，FGT 比例和 BPE 与浸润性乳腺癌分子分型不具有统计学差异。

PU-3191
MRI 动态增强与弥散加权成像联合应用对乳腺良恶性病变的诊断评价

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目的：联合应用磁共振动态增强及弥散加权成像对临床诊断乳腺良恶性肿瘤的意义。**方法：**对伴有乳腺肿块的 80 例患者(良性肿瘤 40 例，恶性肿瘤 40 例)行磁共振平扫 T1W1、T2W1，Flash-3D 动态增强扫描，分别对良恶性病变的形态学特征与动态增强表现进行评估，绘制病变的时间-信号强度曲线，判断其敏感性、特异性；后行弥散加权成像，计算弥散加权成像在不同 b 值时乳腺良性、恶性肿瘤 ADC 值，利用 ROC 曲线判定诊断阈值、敏感性、特异性；最后 MRI 动态增强扫描及弥散加权成像联合对肿瘤良恶性进行判断，与手术病理结果相对照，研究联合应用磁共振动态增强及弥散加权成像对乳腺癌诊断的敏感性和特异性。**结果：**动态增强扫描中，乳腺恶性肿瘤多为Ⅱ、Ⅲ型曲线，乳腺良性肿瘤多为Ⅰ、Ⅱ型曲线，差异有统计学意义(P<0.05)，动态增强扫描诊断的敏感性为 90.0%、特异性为 62.5%；b 值 800 s/mm2 时，磁共振弥散加权成像诊断的敏感性为 92.5%、特异性为 75.0%；二者联合应用敏感性为 95.0%、特异性为 90.0%。**结论：**联合应用磁共振动态增强及弥散加权成像可以提高对乳腺良恶性病变的诊断效能，尤其能够提高特异性。

PU-3192
MR 多参数成像对肉芽肿性乳腺炎和乳腺癌鉴别诊断的价值研究

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目的 分析 MR 多参数成像对肉芽肿性乳腺炎与乳腺癌的鉴别诊断价值。**方法** 回顾性收集经术后组织病理或穿刺活检病理确诊的 23 例肉芽肿性乳腺炎及 53 例乳腺癌患者的临床及影像资料。分析肉芽肿性乳腺炎与乳腺癌 MRI 形态学特征、强化方式、时间-信号强度曲线（Time-signal Intensity Curve,TIC）与表观扩散系数（Apparent diffusion coefficient ,ADC）等差异，进行统计学分析。**结果** 肉芽肿性乳腺炎弥漫性/不规则区域分布 19 例（82.6%），边界模糊 18 例（78.2%），毛刺及分叶征改变 2 例（8.7%）；乳腺癌以结节/肿块形态为主 42 例（79.2%），毛刺/分叶征改变 42 例（79.2%）。 肉芽肿性乳腺炎动态增强扫描后以斑片及环形强化为主（15 例，65.2%），乳腺癌则主要为肿块/结节样强化（37 例，69.8%）；肉芽肿性乳腺炎组中 TIC 曲线呈 I 型 8 例，II 型 15 例，III 型 0 例，乳腺癌组 I 型 6 例，II 型 28 例，III 型 19 例；两组病例的强化方式及 TIC 曲线具有统计学差异。肉芽肿性乳腺炎组 ADC 值（1.146±0.218）×$10^{-3}$$mm^2$/s，乳腺癌组 ADC 值（1.03±0.195）×10^{-3}mm2/s，两组间 ADC 值存在统计学差异（P<0.05）；绘制 ROC 曲线，ROC 曲线下面积为 0.677，当 ADC 值阈值为 1.160×$10^{-3}$$mm^2$/s，灵敏度 59.1%，特异度 77.4%。**结论** 病灶形态、分布特点、强化特征及曲线和 ADC 值对肉芽肿型乳腺炎与乳腺癌鉴别诊断有一定的临床价值。

PU-3193
乳腺原发性弥漫大 B 细胞淋巴瘤的 MRI 影像学表现

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【摘要】**目的** 探讨乳腺原发性弥漫大 B 细胞淋巴瘤的 MRI 影像学表现特点。
方法 回顾性分析 10 例经临床诊断和病理证实的乳腺原发性弥漫大 B 细胞淋巴瘤患者的临床及乳腺 MRI 检查影像学资料，总结其特征征象。
结果 10 例患者均为女性，年龄跨度为 38-69 岁，中位年龄为 55 岁。双乳病变者 1 例，单侧乳腺病变者 9 者（其中左乳 5 例，右乳 6 例）。除一例患者因右侧胸壁刺痛就诊，余 9 例患者均因自

觉乳腺肿块或体检偶然发。非肿块样强化 2 例（1 例为局灶性，1 例为区域性），4 例为单发肿块样强化（1 例为椭圆形且边缘清晰，3 例表现为不规则肿块，其中 1 例伴短毛刺），4 例为多发类圆形肿块样强化、边缘不清晰，呈融合趋势。所有病灶均呈欠均匀强化，其中 5 例表现为 TIC 呈平台型为主，4 例表现为流出型为主，1 例表现为上升型为主。3 例累及乳头，表现为乳头凹陷或增大，乳晕皮肤增厚，1 例出现肿块临近皮肤增厚及患侧乳腺间质水肿改变。4 例患者表现为患侧腋下肿大淋巴结。所有病例均表现为 fsT2W 高或稍高信号，T1W 等信号，DWI 高信号，ADC 图明显低信号。

结论 原发性乳腺淋巴瘤 MRI 表现具有一定特征，乳腺淋巴瘤的确诊依赖于病理学检查，早期诊断有利于患者合理的治疗方案的选择。

PU-3194
MR 表观系数不同测量方法对乳腺良恶性病变的诊断效能

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摘要：目的 评估不同的 ADC 测量方法对乳腺良恶性病变的鉴别诊断效能。方法 回顾性分析经手术病理证实的 65 例乳腺病例，分别采用大 ROI（直径约 4-7mm）及小 ROI（直径约 4mm）测得多个不同 ADC，并相应取得两组数据，即平均 ADC 及最低 ADC，运用 ROC 曲线确定两组数据的诊断效能。结果 平均 ADC 鉴别良恶性病变的临界值为 $1.11\times10^{-3}mm^2/s$,其敏感性为 80%,特异性为 87%，ROC 曲线下面积为 0.894；最低 ADC 鉴别良恶性病变的临界值为 $0.85\times10^{-3}mm^2/s$,其敏感性为 98%，特异性为 78%，ROC 曲线下面积(AUC)为 0.961。结论 小 ROI 测量最低 ADC 值对乳腺良恶性病变的鉴别诊断效能高于大 ROI 平均 ADC 值

PU-3195
MR IVIM-DWI 定量参数与乳腺癌分子分型的相关性分析

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目的：乳腺癌是一种高度异质性肿瘤，分子分型较多，不同分子分型间具备完全不同的治疗及预后反应，因此正确判断乳腺癌的分子分型非常重要。本研究目的在于探究体素内不相干运动（IVIM）模型定量参数(ADC、D、D^*、f)与乳腺癌不同的分子分型的相关性，为临床患者进行精准的个体化治疗、预后评估等提供影像学依据。**方法：**前瞻性搜集临床怀疑为乳腺癌的患者，术前进行 MRI 检查并扫描 IVIM-DWI 序列，将 IVIM 原始数据传送至工作站进行图像后处理和分析，得到 IVIM 各参数图像(ADC、D、D^*、f)。最终符合纳排标准的病例共 55 例，包括 Luminal A 型 13 例、Luminal B 型 15 例、HER-2 过表达型 12 例、基底细胞样型 15 例。采用 SPSS 22.0 统计软件进行方差检验及 t 检验数据分析，比较不同分子分型分组间的参数值。对于组间有统计学差异的参数值，运用 ROC 曲线分析它们鉴别不同分子分型的诊断效能。**结果：**不同分子分型间 ADC 值整体比较及组间比较差异均无统计学意义。HER-2 过表达型组 D 值、D^*值、f 值大于其他各组，差异均有统计学意义（$P<0.05$）；Luminal A 型组 D 值、D^*值参数值小于 Luminal B 型组和基底细胞样型组，差异均有统计学意义（$P<0.05$）；其余各组间参数值均无统计学差异。HER-2 过表达组与 Luminal A 型组组间 D 值、Luminal A 组与基底细胞样型组组间 D^*值、HER-2 过表达组与基底细胞样型组 f 值的诊断效能最好（曲线下面积分别为 0.865、0.810、0.750，P 值分别为 0.002、0.005、0.028）,分别以 0.215×10^{-3} mm^2/s、1.194×10^{-3} mm^2/s、2.283×10^{-3} mm^2/s 为最佳诊断临界值，诊断敏感度及特

异度为 92%、92%及 87%、85%及 75%、100%。 **结论：**IVIM-DWI 模型参数具有预测乳腺癌的分子分型的潜在价值。

PU-3196
双指数模型扩散加权成像对乳腺癌分子分型鉴别诊断的价值研究

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目的：乳腺癌的个体化治疗基于分子分型，本文初步探讨双指数模型 DWI 对乳腺癌不同分子分型的鉴别诊断价值。
方法：回顾分析 2018 年 3 月至 2019 年 4 月我院乳腺外科诊治的 105 例乳腺癌患者资料，年龄 27~75 岁，中位年龄 47 岁。所有患者于治疗前完成 MRI 扫描，仪器为 GE Signa HDxt 3.0T MR，乳腺专用 8 通道相控阵列线圈。所有患者在 MRI 检查前未接受任何治疗及有创检查，扫描后一周内经病理证实。双指数模型 DWI b 值取（20、40、60、80、100、150、200、400、600、700、800、900、1000、1100 及 1200 s/mm^2）共 14 个。应用 Functool 软件对双指数模型 DWI 进行后处理及数据测量，获得各病灶 D_{slow}、D_{fast} 及 f 值。以癌细胞表达 ER、PR 和 HER2 三种蛋白状态分为激素受体阳性乳腺癌（HR+）组、HER2 阳性乳腺癌（HER2+）组及三阴性乳腺癌（TNBC）组。各组参数采用独立样本 t 检验及单因素方差分析比较（$p<0.05$ 为有统计学差异），受试者特征曲线（ROC）判断各参数诊断性能。
结果：（1）105 例患者共检出 111 个病灶，3 例患者为 2 个病灶，1 例为多灶性病灶，9 例患者为非肿块型病灶，其余病例均为单发结节病灶，病灶最大径 8mm~43mm。HR+组 44 例，HER2+组 47 例，TNBC 组 14 例。
D_{slow}、D_{fast} 及 f 值在乳腺癌三种分子分型中均无显著差异（$p>0.05$）。D_{slow} 在 TNBC 与非 TNBC（HR+ +HER2+）间有统计学差异（$p<0.05$），TNBC 具有相对较低 D_{slow} 值，诊断阈值为 $0.402\times10\text{-}3^{mm2}/s$，敏感性、特异性为及准确性分别为 76.7%、83.5%和 80.3%。
结论：IVIM-DWI D_{slow} 值对 TNBC 与非 TNBC 具有一定的鉴别诊断价值，可为乳腺癌治疗前评估提供无创性参考证据。

PU-3197
全肿瘤 ADC 直方图参数与乳腺浸润性导管癌病理分级的相关性研究

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目的：旨在探讨全肿瘤表观弥散系数（ADC）截断值与乳腺浸润性导管癌（IDC）病理分级的相关性，评估乳腺浸润性导管癌的异质性及组织病理学分级。**方法和材料：**回顾性分析本院 2017 年 1 月至 2018 年 5 月间具有完整病理及术前磁共振资料的 92 名浸润性导管癌女性患者，其中单纯型 IDC 69 例，混合性型 IDC 23 例(IDC 合并部分导管原位癌（DCIS）(21 例)及 IDC 合并部分粘液腺癌(2 例))。采用改良的 Bloom 和 Richardson 标准将病理组织学级别分为 3 个等级，证实为 1 级和 2 级者归类为低级别组，3 级独立归为高级别组。患者均行乳腺 3.0 T MRI 检查，在 DWI 图中（b=1000 s/mm^2）手动勾画肿瘤的每一层感兴趣区（ROI），生成 ADC 直方图，并记录全肿瘤体积的直方图参数，包括 ADC 平均值、ADC 最小值、ADC 中位数、ADC 最大值、ADC 各百分位数、不均质度、偏度系数、峰度系数和熵等。对各病理等级组的各 ADC 参数行 Kruskal-Wallis 检验，并通过

Mann-Whitney *U*检验比较浸润性导管癌不同病理等级与 ADC 值之间的关系，使用 ROC 来确定区分低级别组和高级别组浸润性导管癌的最佳直方图参数和截断值。**结果：**高级别组浸润性导管癌的不均质度（p= 0.038）、偏度系数（p= 0.001）、峰度系数（p= 0.043）和 ADC 最大值（p= 0.002）明显高于低级别组。其中 ADC 直方图参数中的偏度系数达到了曲线下最高面积（ROC-AUC：0.79；95%CI：67.5-87.8；p<0.0001），约登指数确定最佳 ADC 阈值为 1.02×10-3mm^2/s，其敏感性和特异性分别达 76.47%、78.85%。**结论：**全肿瘤 ADC 直方图分析可以较好的区分出高、低级别组的乳腺浸润性导管癌， 为辅助临床治疗提供有价值的指导和评估。本研究由温州科技局项目（NO.Y20180187）资助。

PU-3198
浸润性导管乳腺癌 Ki-67 预测与评估的磁共振研究

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目的：本研究旨在明确浸润性导管乳腺癌肿瘤及肿瘤基质不同区域异质性在预测 ki-67 状态上是否存在差异，以及增强前与增强后不同时期对预测准确性的影响。
材料和方法：回顾性研究包括 88 例 57 例高 ki-67 表达(Ki67 增殖指数高于 20%)和 31 例低 ki-67 表达(Ki67 增殖指数低于 20%)肿块型病灶乳腺浸润性导管癌患者，均于术前行连续 6 期动态增强磁共振检查（包括增强前期及增强后 5 期），选取病灶最大层面在增强 6 期分别绘制肿瘤及瘤周基质不同感兴趣区域(ROI)，利用灰度共生矩阵得到各个感兴趣区域的异质性参数值（均值、标准差、峰度、偏度、熵值）。利用 Mann-Whitney 检验和接收机工作特性曲线分析，评估各参数与 ki-67 状态的相关性，并评估其预测效能。
结果：统计结果表明，在注入造影剂后第一时期（90 秒）各 ROI 获得的熵值在 ki-67 高增殖状态和低增殖状态之间均有显著性差异；且肿瘤各区域和瘤周基质的 AUC 值均大于 0.6(AUC 分别为 0.713、0.636、0.644、0.756、0.632)。在增强后第一个时期绘制的 ROI 中，基于肿瘤边界为内外带状区域所获得的熵值显示出最高的 AUC(0.765)。
结论：浸润性导管乳腺癌肿块型病灶所行术前动态增强磁共振检查的图像异质性分析（熵值）可以成功区分 ki-67 的高增殖状态和低增殖状态，肿瘤边界内外的带状区域也可以区分 ki-67 的状态，且具有更好的可预测性。
本研究由温州市科技局基础性科研计划项目（NO.Y20180187）资助。

PU-3199
全病灶 ADC 直方图对乳腺良恶性病变的鉴别诊断价值研究

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目的：探讨全病灶表观扩散系数（ADC）直方图在乳腺良恶性病变中的鉴别诊断价值。**材料与方法：**回顾分析 2017 年 1 月至 2018 年 5 月在本院经病理证实的乳腺病灶 160 个，其中恶性病灶 103 个，良性病灶 57 个，患者术前均行 3.0T MRI 乳腺扫描。对 ADC 图进行分析获得直方图参数，包括 ADC 值平均数（ADC_{mean}）、中位数（ADC_{median}）、第 5、10、15、20、25、75、80、85、90、95 百分位数（ADC_{5th}、ADC_{10th}、ADC_{15th}、ADC_{20th}、ADC_{25th}、ADC_{75th}、ADC_{80th}、ADC_{85th}、ADC_{90th}、ADC_{95th}）、方差、标准差、四分位距、偏度、峰度。进一步对数据进行统计学分析比较分析。**结果：**恶性病灶的平均体积大于良性病灶（P<0.01），恶性组的所有 ADC 值均低于良性组，恶性组的偏度及峰度则均高于

良性组（P<0.05）。第 5-25 百分位 ADC 值和 ADC_{median}的 ROC 曲线下面积（AUC）均大于 ADC_{mean}（P>0.05）。偏度和峰度的 AUC 则低于 ADC_{mean}（P<0.05）。ADC_{mean}的 AUC 为 0.856，最佳阈值为 $1.079\times10^{-3}mm^2/s$，敏感度为 75.73%，特异度为 82.46%，阳性预测值为 88.64%，阴性预测值为 65.28%，准确度为 78.13%。ADC_{15}、ADC_{20}、ADC_{25}的敏感度高于 ADC_{mean}（P<0.05），其中 ADC_{15}的敏感度最高。**结论：**全病灶 ADC 直方图分析可以为鉴别乳腺良恶性病变提供帮助。恶性病灶的所有 ADC 值均低于良性病灶，偏度和峰度高于良性病灶，其中 ADC_{15}、ADC_{20}、ADC_{25}的敏感度高于常规使用的 ADC_{mean}。本研究由温州市科技局基础性科研计划项目（NO.Y20180187）资助。

PU-3200
磁共振动态增强灌注成像参数图在乳腺乳腺良恶性病变鉴别中的价值

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摘要：目的探讨磁共振动态增强灌注成像参数图在乳腺良恶性病变鉴别中的价值。方法收集乳腺病变患者 44 例共 46 个病灶，联合采用乳腺普通平扫、扩散加权成像(DWI)及动态对比增强 MR 成像(DCE-MRI)序列，绘制时间-信号强度曲线(TIC)，通过软件处理获得 Washin、Washout、MPIT、PEI 及 Combine 等 5 种乳腺灌注伪彩参数图像，分别测定病灶的表观扩散系数(ADC)值及各灌注参数值。参照病理结果，绘制 ADC 值及各灌注参数值的受试者工作特征曲线(ROC)，比较 ADC 值及各灌注参数图的 ROC 曲线下面积(AUC)以及诊断乳腺癌的灵敏度和特异度。结果 ADC、Washin、Washout、MPIT、PEI 及 Combine 灌注参数图 ROC 曲线下面积分别 0.977、0.608、0.974、0.759、0.752、0.646。在良恶性病变的诊断差异有显著统计学意义(P<0.01)；ADC、Washout、MPIT、PEI 在良恶性病变的诊断差异有统计学意义(P<0.05)，灵敏度和特异度分别为 97.0%、87.9%、69.7%、72.7%和 92.3%、100%、84.6% 69.2%。结论磁共振动态增强灌注成像参数图特别是 Washout 图在乳腺良恶性病变的诊断中具有较高的应用价值，可为乳腺良恶性病变鉴别诊断提供重要的补充信息。

PU-3201
DCE-MRI 联合 eADC 技术在鉴别诊断乳腺良恶性病变中的价值

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【目的】探讨磁共振动态增强(DCE-MRI)技术联合指数化表观扩散系数(eADC)技术在鉴别诊断乳腺良恶性病变的价值。
【方法】回顾 2014 年 1 月至 2019 年 1 月在我院就诊的乳腺疾病患者 45 例,均行 MR-DWI 和 DCE-MRI 检查，并将 56 个病灶与病理验证结果进行比较分析，其中 38 个病灶为恶性，28 个病灶为良性。结果良性乳腺病灶的 eADC 值为 0.19±0.068;恶性乳腺病灶的 eADC 值为 0.46±0.071,良恶性病灶患者 eADC 值相比差异有统计学意义(P＜0.05)。28 例良性病灶患者Ⅰ型（逐渐上升型）、Ⅱ型（平台型）、Ⅲ型（流出型）曲线病灶分别为 20 个（71.4%），6 个（21.4%），2 个（7.2%）。38 个恶性病灶患者Ⅰ型、Ⅱ型、Ⅲ曲线病例数分别为 1 例(2.6%),20 例(52.6%)和 17 例(44.8%)。DCE-MRI 技术中Ⅰ型和Ⅲ型曲线在乳腺良恶性病灶相比,差异有统计学意义(P＜0.05)。两者联合诊断的曲线下面积与单纯使用 DEC-MRI、eADC 相比,差异有统计学意义(P＜0.05)，eADC 与 DEC-MRI 诊断的曲线下面积相比差异无统计学意义(P＞0.05)。

【结论】DCE-MRI 联合 eADC 技术能够为乳腺良、恶性肿瘤的鉴别诊断奠定坚实的数据基础，能够给临床提供更客观及准确的评价。

PU-3202
基于多 b 值 DWI 在乳腺病变诊断中的优化应用

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目的：探讨 Magnetic Resonance Imaging （MRI）多 b 值弥散加权成像（multiple b-value diffusion-weighted imaging, MB-DWI）在乳腺病变诊断中的优化应用。方法：回顾性分析 2015 年 05 月 01 日-2015 年 05 月 01 日 110 例行乳腺 MRI 扫描的乳腺病变患者（良性 41 例，恶性 69 例），且均进行乳腺 MRI 多 b 值 DWI 序列检查，分别选取 b 值为 0、25、75、100、300、500、800、1000、1200、2000、3000s/mm^{2}进行扫描，取得不同 b 值时的标准化信号强度比（SIR）值及表观扩散系数（ADC）值，以病理结果为标准，观察各参数对病变的诊断价值。结果：当 b 值=2000s/mm^{2}时，SIR 值达最大，提示病变在该 b 值获得最好病变对比显示。当 b 值=500 及 1000s/mm^{2}时，去除了灌注效应的影响，能评估病变内的真实自由水分子扩散，反映病变的细胞密度，ADC 值达到最佳的鉴别诊断效能。结论：优化后的多 b 值 DWI 能提高乳腺病变的对比显示及诊断效能。

PU-3203
磁共振成像特征联合免疫组化指标预测乳腺癌腋窝淋巴结转移的应用研究

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目的
探讨动态增强磁共振成像(DCE-MRI)扫描中,磁共振成像特征联合免疫组化指标在预测乳腺癌腋窝淋巴结转移中的应用价值.
方法 回顾性分析 117 例原发乳腺癌患者的术前 MR 及术后免疫组化特征。所有患者术前未发现淋巴结转移。术前 MR 检查,获得乳腺癌肿块的磁共振成像特征，包括病灶最长径，最短径，内部强化方式，边缘，形态，TIC 曲线，SER，DWI。根据术后病理结果获得免疫组化指标 ER、PR、HerbB-2、Ki-67.利用 Logistic 回归分析得出危险因素，并建立危险模型，进一步应用 ROC 曲线分析其诊断价值.
结果 MR SER≥180.5%、短长径之比≤0.56、Ki-67≥14%均是腋窝淋巴结转移的独立危险因素,危险模型 ROC 曲线的曲线下面积(AUC)为 0.826,其敏感度、特异度分别为 93.8% (60/64)、88.7% (47/53).
结论 MR SER、短长径之比及 Ki-67 的联合应用可预测乳腺癌腋窝淋巴结转移,为临床选择适当治疗方案及评估预后提供参考依据.

PU-3204
乳腺断层 X 线摄影和磁共振成像在浆细胞性乳腺炎诊断中的价值

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目的：探讨乳腺断层 X 线摄影（DBT）及磁共振成像（MRI）在浆细胞性乳腺炎（PCM）中的应用及诊断价值。
方法：回顾性分析我院 25 例经病理证实的浆细胞乳腺炎患者的影像学资料，所有患者均行双侧乳腺 X 线摄影和磁共振检查，DBT 检查包括内外斜位（mediolateral，MLO）和头尾位（craniocaudal，CC），MRI 检查序列有常规横断位，包括 T_1WI-快速自旋回波序列、T_2WI-快速自旋回波序列、T_2WI-快速反转恢复序列、扩散加权成像（DWI）序列和动态增强扫描(DCE-MRI)，分别对图像上病灶的部位、大小、形态、边缘、范围、信号特征、时间-信号强度曲线(TIC)进行研究。所有 MRI 图像均经 2 位放射科乳腺专科医生共同阅片。
结果：15 例患者共检出病灶 16 个，16 个病灶 DBT 图像中，其中 3 个表现为乳晕后区致密影、局部皮肤增厚（3/16），13 个表现为乳头后方肿块、乳晕皮肤增厚（13/16），其中 4 例患者腋窝淋巴结肿大。根据 MRI 图像特征，将 PCM 分为炎症型（6 个）、脓肿型（4 个）及混合型（6 个），所有病变在 T_1WI 均呈等低信号改变，T_2WI 抑脂序列上呈混杂高信号改变。其中炎症型 6 例,病变范围广泛 5 例,病变局限在乳晕后区 1 例 ,增强扫描单纯斑片状强化 2 例,斑片及导管状强化 4 例；脓肿型 4 例,病变范围广泛 3 例,病变局限于 1 个象限 1 例 ,增强扫描呈蜂窝状强化 2 例,环形及片状强化 2 例；混合型 6 例,炎症伴脓肿及窦道形成 ,增强扫描蜂窝状强化 3 例,2 例散在多发环形强化,1 例不均匀斑片状及环形强化。对增强扫描后病灶选取感兴趣区并绘制时间-信号强度曲线，TIC 多数呈Ⅰ型（4 个）和Ⅱ型（12 个）。
结论：浆细胞乳腺炎 DBT 及 MRI 表现具有一定特征性，主要是病灶主要表现为乳头后方肿块样致密影，部分病灶可形成脓肿及管道样改变，尤其是 MRI 可提供 PCM 更多的影像学特征，对临床诊断具有很大的指导意义。

PU-3205
DWI 联合 DCE-MRI 技术鉴别乳腺良性病变和乳腺癌的临床价值探析

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目的探讨弥散加权成像（DWI）联合磁共振动态增强（DCE-MRI）技术鉴别乳腺良性病变和乳腺癌的临床价值。**方法**回顾性分析 2015 年 6 月～2017 年 12 月间收治的 102 例乳腺病变患者临床资料，患者均经 DWI、DCE-MRI 检查，以病理检查结果为金标准，比较不同检查方式及 DWI、DCE-MRI 联合检查评估乳腺良恶性病变的准确性和应用价值（灵敏度、特异度、准确率、阳性预测值和阴性预测值）。**结果**①DWI、DCE-MRI、DWI 联合 DCE-MRI 诊断乳腺良恶性病变的灵敏度、特异度、准确率、阳性预测值和阴性预测值为 90.00%、71.88%、84.31%、87.50%、76.67%，91.67%、80.00%、88.24%、91.67%、80.00%，95.71%、84.38%、92.16%、93.06%、90.00%。**结论** DWI 联合 DCE-MRI 技术鉴别乳腺良性病变和乳腺癌效果良好，有利于提高诊断准确性，临床应用价值可观。

PU-3206

IVIM-MR 评价三阴型乳腺癌新辅助化疗疗效的应用价值研究

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目的 探讨 3.0T IVIM-MR 影像预测三阴型乳腺癌(TNBC)新辅助化疗后的疗效评估。方法 收集接受 3.0T MR 检查并经病理证实的三阴型乳腺癌病例 58 例，新辅助治疗前后分别进行 IVIM-MRI 及常规 DWI-MRI 扫描，并分别获得治疗前及治疗后各个序列的参数，并通过 IVIM-MRI 组及常规 DWI-MRI 组 IVIM-DWI 参数值（f 值、D 值、D*值）、ADC 值的对预后的比较，并采用单样本 t 检验、配对 t 检验分析法进行统计学分析。结果 两组治疗后病灶明显较治疗前缩小(P=0.023)，结合手术后病理结果，IVIM-MRI 对残留癌灶检测率明显于常规 DWI-MRI 组(P＜0.001＝。结论 IVIM-MRI 对癌灶的检测敏感性要明显于常规 DWI-MRI 组.

PU-3207
Diffusional kurtosis imaging for differentiation between benign and malignant breast lesions

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Purpose: To investigate and evaluate the role of magnetic resonance (MR) diffusion kurtosis imaging (DKI) in differentiating malignant from benign breast lesions. Materials and Methods:MRI images data of 93 patients with breast lesions confirmed by surgical biopsy were retrospectively analyzed. There were 107 lesions, including 52 malignant lesions (21 intraductal carcinoma of the breast, 30 non-specific types of invasive carcinoma，1 lymphoma),55 benign lesions (18 mastitis lesions, 8 atypical hyperplasia,7 breast adenosis and 22 breast fibroadenomas). DKI related parameters—mean diffusivity (MD)、mean kurtosis (MK), axial kurtosis (AK), radial kurtosis (RK) , anisotropy fraction (FA), apparent diffusion coefficient (ADC)—were measured.MK, MD, FA, AK, RK, ADC and MK+MD+AK+RK in benign and malignant lesions were compared by independent sample t-test or Mann-Whitney U test.The diagnostic performances of these parameters were evaluated by receiver operating characteristic (ROC) analysis. Results: MK, AK, RK and MK+MD+AK+RK in breast malignant lesions was significantly higher than that in benign lesions. MD and ADC of malignant breast lesions were significantly lower than benign lesions, and the differences were statistically significant (P <0.01). The difference of FA between benign and malignant breast lesions was not statistically significant (P>0.05). The area under the curves (AUCs) of MK, MD, FA, AK, RK, ADC and MK+MD+AK+RK for differentiating malignant from benign lesions were 0.972, 0.921, 0.601, 0.970, 0.973, 0.923, 0.985, respectively.Using 0.662,1.205,0.203,0.715,0.719,1.180 and 0.483 as the cut-off of the these parameters in evaluation of malignant and lesions,the sensitivity was 98.00%, 84.60%,57.9%, 97.6%,98.2%,96.2%,98.9%respectively, and the specificity was 92.3%,89.50%,84.60%,96.2%, 92.3%,89.5%,97.9% respectively.

Conclusion: MK, MD, AK and RK obtained by DKI are valuable in the diagnosis of benign and malignant breast lesions. The combined diagnosis index of MK+MD+AK+RK is more valuable in the differential diagnosis of benign and malignant breast lesions.

PU-3208
乳腺动态增强 MRI 血流动力学参数测量的重复性与一致性研究

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目的 探讨乳腺动态增强 MRI 早期强化率、最大强化率及峰值信号强度（PEI）的重复性和一致性。方法 回顾性分析术前均行 MRI 扫描并经病理证实的乳腺癌患者的 77 个病灶，其中三阴型 11 例，her2 阳型 10 例，luminal 型 56 例。两位操作者分别测得病灶强化最明显区域的 PEI 并计算早期强化率、最大强化率。运用配对 t 检验评估早期强化率、最大强化率以及 PEI 的差异性，运用组内相关系数（ICC）和 Cronbach's Alpha 系数评估其重复性，运用 Bland-Altman 分析以上参数的组间一致性。结果 两位操作者测得的三阴型病灶的以上参数分别为早期强化率（148.40±45.83）%和（132.61±50.78）%、最大强化率（200.87±48.50）%和（206.08±34.68）%以及 PEI（434.47±116.36）和（470.19±106.09）；her2 阳型分别为（130.52±58.21）%和（139.16±64.43）%、（175.20±61.35）%和（205.59±53.28）%以及（386.62±89.56）和（400.92±86.40）；luminal 型分别为（141.86±61.00）%和（134.08±68.06）%、（201.53±61.66）%和（213.89±66.09）%以及（399.97±112.46）和（425.61±114.74）。不同操作者间三种分型的早期强化率、最大强化率以及 PEI 值差异均无统计学意义（P>0.05）；不同操作者间所测得的以上参数的 ICC 均在 0.7 以上，Cronbach's Alpha 系数也均>0.8，显示重复性较好。BlandAltman 分析结果显示两个操作者间一致性较好。结论 乳腺动态增强 MRI 的早期强化率、最大强化率以及 PEI 值的测量在不同操作者间具有较好的重复性和一致性，提示这些指标具有可靠的临床指导价值。

PU-3209
乳腺良性及交界性叶状肿瘤与纤维腺瘤磁共振的差异性表现

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摘要： 目的 分析乳腺低级别叶状肿瘤(phyllodes tumors,PT)与纤维腺瘤(fibroadenoma,FA)的磁共振特征,提高两者的鉴别诊断水平.材料与方法 搜集术后经病理证实且有完整磁共振资料的良性及交界性叶状肿瘤 52 例、纤维腺瘤 68 例,对其 MRI 征象表现进行统计学分析.结果 叶状肿瘤以分叶状或多结节融合状多见,纤维腺瘤以圆形或类圆形多见,无多结节融合状;叶状肿瘤及纤维腺瘤都以边缘光滑多见;T1WI 上 18 个良性及交界性叶状肿瘤病灶内见片状高信号影,病理提示出血,纤维腺瘤只有 5 例出现高信号;T2WI 上叶状肿瘤多呈高信号,纤维腺瘤多呈低或等低信号;动态增强叶状肿瘤多呈明显不均匀强化,可见无强化分隔及囊变;纤维腺瘤多表现为均匀强化,1 例出现囊变,可见无强化分隔;时间信号强度曲线(time-signal intensity curve,TIC)分型,叶状肿瘤以Ⅱ型多见,纤维腺瘤以Ⅰ型多见;DWI 信号表现,叶状肿瘤全部表现为高信号,纤维腺瘤有 8 例表现为等低或低信号.结论 乳腺良性及交界性叶状肿瘤与纤维腺瘤在形状、信号、强化方式及 TIC 表现上具有一定差异,有助于其与纤维腺瘤的鉴别诊断.

PU-3210
基于极端随机树算法的 MRI 乳腺癌淋巴结转移多参数风险预测分析

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目的 采用极端随机树（Extra Tree）方法，研究乳腺癌腋窝淋巴结转移的相关危险因素，以提高 MRI 对淋巴结的诊断效能，并建立术前乳腺癌腋窝淋巴结转移的预测模型。**材料与方法** 收集并分析我院自 2015 年 3 月至 2017 年 3 月经手术或穿刺病理证实的乳腺癌患者 387 例，所有数据分别采用集成学习方法中的 Extra Tree 来进行特征的筛选及多因素 logistic 回归分析，比较二者的诊断效能，选择诊断效能最优的研究方法，并筛选出乳腺癌淋巴结转移的危险因子或预测因素，建立相关的预测模型。**结果** 采用 Extra Tree 方法建立的预测模型的诊断效能要优于 logistic 回归模型。使用 Extra Tree 方法进行数据特征选择时，乳腺肿块位置、淋巴结液化坏死、乳腺皮肤增厚受侵、淋巴结最短径、MRI 乳腺肿块 BI-RADS 分级、肿块边缘、年龄、淋巴结 TIC 曲线的贡献率相对较高，高于均值，其为乳腺肿块腋窝淋巴结转移的危险因子，建立的相关预测模型测试效果的 AUC 值为 0.86，准确率为 0.84、灵敏度为 0.85，特异度为 0.73。采用多因素 logistic 回归建立的预测模型 AUC 值为 0.80，准确率为 0.80、灵敏度为 0.80，特异度为 0.73。**结论** 采用 Extra Tree 方法建立的乳腺癌 MRI 淋巴结转移的预测模型是评估乳腺癌患者淋巴结转移的有用工具，能提供每个危险因素的贡献率，其综合诊断效能提高对临床乳腺癌患者腋窝淋巴结处理及预后提供了有效的参考。

PU-3211
不同乳腺非特殊型浸润性癌分子分型的 MRI 表观扩散系数特点研究

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摘要： 目的 探讨乳腺非特殊型浸润性导管癌各分子亚型(Luminal A、Luminal B、HER-2 过表达、基底细胞样型)及其生物学因子[雌激素受体(estrogen receptor,ER)、孕激素受体(progesterone receptor,PR)、HER-2 及 Ki-67]的表观扩散系数(apparent diffusioncoefficient,ADC)是否具有一定的特征性,为鉴别不同分子亚型及评估乳腺癌预后提供理论依据.材料与方法 回顾性分析术前行 MRI 检查的 158 例乳腺非特殊型浸润性癌患者的资料,术前获得扩散加权成像并测定平均 ADC 值,术后采用免疫组化检查获得 ER、PR、HER-2 及 Ki-67 等生物学因子和 4 种分子亚型.比较不同分子亚型间及乳腺癌生物学因子间的 ADC 值是否具有各自特征.结果 ER、PR、Ki-67 阴性者的 ADC 值(1.013±0.099,1.002±0.094,1.003±0.087)高于阳性者(0.932±0.066,0.940±0.079,0.952±0.089),差异有统计学意义(P 均＜0.01);HER-2 阳性者 ADC 值(1.004±0.088)显著高于阴性者(0.948±0.088),差异有统计学意义(P＜0.05);HER-2 过表达型的 ADC 值(1.048±0.073)较管腔 B 型及基底细胞样型(0.923±0.074,0.960±0.095)高,差异有统计学意义(P 均＜0.01).结论 乳腺非特殊型浸润性癌的各分子分型及生物学因子的 ADC 值具有一定的特征性.

PU-3212
乳腺浸润性导管癌中医证候与 p53、Her-2 蛋白及 Ki-67 表达相关性研究

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摘要： 目的:探讨肝郁气滞证、冲任失调证和正虚毒炽证乳腺浸润性导管癌患者肿瘤组织中 p53、Her-2 蛋白及增殖指数 Ki-67 的表达特点和意义.方法:选择乳腺浸润性导管癌患者 279 例,其中肝郁气滞证 124 例,冲任失调证 99 例,正虚毒炽证 56 例.采用免疫组织化学方法检测各证型患者乳腺肿瘤组织内 p53、Her-2 蛋白及 Ki-67 表达情况并做统计学比较.结果:肝郁气滞证组 p53 蛋白阳性表达比例明显低于冲任失调证组和正虚毒炽证组(P<0.05),正虚毒炽证组 Her-2 蛋白阳性表达比例明显高于肝郁气滞证组和冲任失调证组(P<0.05),正虚毒炽证组 Ki-67 表达水平明显高于肝郁气滞证组和冲任失调证组(P<0.05).结论:乳腺癌中医辨证分型与 p53、Her-2 蛋白表达程度及增殖指数 Ki-67 存在相关性,对于冲任失调证、正虚毒炽证和 p53、Her-2 蛋白及增殖指数 Ki-67 高表达的肝郁气滞证乳腺癌患者均应加强随访并定期复查.

PU-3213
乳腺癌脏腑经络诊断在 MRI、纹理分析中的应用探析以及 ADC 对于新辅助化疗的疗效评价

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摘要： 目的 研究乳腺癌脏腑经络诊断在 MRI 及纹理分析中的应用,探讨表观弥散系数(ADC)对于新辅助化疗疗效的评价,及乳腺癌新辅助化疗疗效评估与乳腺癌脏腑经络的关系.方法 回顾性分析乳腺恶性病变患者 404 例,行 MRI 检查,并采用 O.K.软件进行图像参数处理.选取其中行新辅助化疗的患者,应用磁共振扩散加权成像(DWI),比较 ADC,评价新辅助化疗的疗效.结果 足太阴脾经、足少阴肾经及足阳明胃经经络分组中,乳腺癌病变的肿块大小、强化形态、类型以及灌注参数等影像学表现比较,差异均无统计学意义,但三条经络病变的淋巴结转移情况具有显著差异(P=0.011);足太阴脾经,足少阴肾经,足阳明胃经病变淋巴结转移率分别为 35.3%,21.1%,40.0%.两两分析比较显示,脾经与肾经,肾经与胃经淋巴结转移具有显著差异(P=0.012,0.003),脾经与胃经淋巴结转移比较,差异无统计学意义(P=0.416).乳腺 MRI 纹理参数分析显显示三组经络分组 Cluster Shade 与 Cluster Prominence 具有显著差异,脾经及胃经病变 Cluster Shade 参数值相对较高,胃经病变 Cluster Prominence 参数值较高.化疗有效组患者化疗后肿瘤组织的 ADC 值增高,化疗前与化疗后各疗程相比,差异具有统计学意义,化疗无效组患者化疗后 ADC 值略增高,但差异无统计学意义.化疗有效组患者化疗前及化疗第 2、4 周期的正常乳腺组织 ADC 值比较,差异无统计学意义.结论 脾经、胃经的淋巴结转移率相对较高,腋窝淋巴结状态是乳腺癌患者评估预后效果的重要指标,发生于脾经、胃经的病变可能较肾经预后差,治疗前 ADC 值不能预测疗效.

PU-3214
三阴性乳腺癌的影像学特征分析

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摘要： 目的:探讨三阴性乳腺癌(triple-negative breast cancer,TNBC)的影像学特征,并与非三阴性乳腺癌(non-TNBC,NTNBC)进行比较.方法:回顾性分析辽宁省肿瘤医院经病理学及免疫组织化学证实的 42 例 TNBC 及 504 例 NTNBC 患者的乳腺 X 线及 MRI 表现,两组 X 线及 MRI 检查中病灶钙化、形态、边缘、T2 信号、内部强化、时间-信号强度曲线(time-signal intensity curve,TIC)等比较采用 x2 检验.结果:TNBC 组病变最常见的 X 线表现为边缘清晰(12/25,48%)、圆形或类圆形(10/25,40%)、少钙化单纯肿块(17/28,61%).TNBC 组 MRI 常见表现为类圆形或结节状(22/27,82%)、边缘光滑(11/27,41%),T2WI 序列呈高信号(5/27,18.5%)、环形强化(8/27,29.6%)、TIC 呈速升速降型(20/32,63%).TNBC 组与 NTNBC 组乳腺 X 线肿块边缘及肿块钙化表现差异有统计学意义(P＜0.05).两组 MRI 检查在肿块形态、边缘、强化方式、表观扩散系数(apparent diffusion coefficient,ADC)及 TIC 方面的差异有统计学意义(P＜0.05).结论:TNBC 的 MRI 检查中,如肿块边缘光滑,出现环形强化,TIC 呈III型,ADC 值较高,结合乳腺 X 线检查所见,其对诊断 TNBC 有一定的参考价值.

PU-3215

乳腺癌的影像学诊断进展和研究方向

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摘要： 随着生活方式的改变,我国女性乳腺癌的发病率呈上升趋势,在我国沿海发达地区已居女性恶性肿瘤发病率的第 1 位.早发现、早治疗对降低乳腺癌死亡率有重要的意义.目前,以乳腺 X 线检查为代表的各种医学影像学方法在乳腺癌的诊断中发挥着重要作用.近年来,在乳腺癌的诊断和治疗中,包括数字化乳腺 X 线检查、高频彩超、MRI 等影像学新技术飞速发展,使乳腺癌的影像学诊断由形态学诊断进入了组织水平、细胞水平和分子水平的诊断.

PU-3216

The relationship between kinetic parameters of DCE-MRI and clinicopathological prognostic factors of invasive breast cancer

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Purpose: To determine the association between DCE-MRI derived quantitative kinetic parameters (CD-QKPs) and breast cancer clinicopathological prognostic factors.
Material and Methods: Clinicopathological factors in consecutive women with biopsy-confirmed invasive breast cancer who underwent breast DCE-MRI were retrospectively reviewed. Analysis of variance was used to examine associations between prognostic factors and CD-QKPs. Fisher’s exact test was used to investigate the relationship between kinetic curve type and prognostic factors.
Results: One hundred and ninety-eight women with invasive breast cancer were included. High-grade and HER2+ tumors were more likely to have a washout type curve while luminal A tumors were less likely. High-grade was significantly associated with increased peak enhancement (PE, P = 0.01), enhancement maximum slope (MS, P = 0.03),

and mean enhancement (ME, P = 0.03), while high clinical lymph node stage (cN3) was significantly associated with increased MS and time to peak (tP, P = 0.01). HER2+ tumors were associated with a higher PE (P = 0.03) and ME (P = 0.06) than HER2- counterparts, and ER-/HER2+ tumors showed higher PE and ME values than ER+/HER2- tumors (P = 0.06).
Conclusion: DCE-MRI time-intensity CD-QKPs are associated with high tumor grade, advanced nodal stage, and HER2+ status, indicating their utility as imaging biomarkers.

PU-3217
乳腺 MRI 弥散峰度成像对 ER 阳性、HER-2 阴性乳腺癌 Oncotype DX 的相关性研究

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目的 探讨 ER 阳性、Her-2 阴性乳腺癌病人的临床、MRI 动态增强（DCE-MRI）影像特征、DKI 参数及病理预后因子与复发评分（RS）间的相关性，以寻找能预测 RS 的影像标记。**方法** 收集术前行 DCE-MRI 及 DKI 检查且经手术病理证实为 ER 阳性、Her-2 阴性乳腺癌病人，记录年龄、病灶大小、肿块形状、边缘、内部强化、腺体分型、强化峰值、达峰时间、ADC、MD、MK、Ki67、组织分化程度等。将肿瘤组织石蜡标本送去做 21 基因（Oncotype DX）检测获得 RS 值。**结果：** 1. 低、中、高 RS 组间年龄、ADC、MD、Ki67 具有显著差异，进一步两两比较，低 RS 组与中 RS 组、低 RS 组与高 RS 组间年龄差异具有统计学意义。MD、Ki67 在低 RS 与高 RS 组间有显著差异，ADC 在低 RS 与中 RS 组间有显著差异。2.低 RS 组与中高 RS 组间平均年龄、强化峰值、MD、MK 及 Ki67 分别为 63.96±10.96 岁、52.68±11.96 岁，396.24±94.97 、338.34±102.10 ，(1.35±0.50)×$10^{-3}mm^2/s$ 、1.03±0.13×$10^{-3}mm^2/s$，0.92±0.24、1.03±0.11，（24.80±15.03） %、（42.68±21.43）%，差异具有统计学意义。低 RS 组与中高 RS 组间的腺体构成差异具有统计学意义（p=0.017）。将患者年龄、强化峰值、MK、MD、Ki67 纳入建立逻辑回归方程，其中 MD、年龄对低 RS 与中高 RS 组预测影响有统计学意义。以 Logistic 回归产生的综合变量预测中高 RS 组的 ROC 曲线下面积为 0.92，敏感度为 84%，特异度为 92%，约登指数为 0.76。**结论** 以年龄、强化峰值、MK、MD、Ki67 建立的模型可较好预测中高 RS 组，提示可以预测复发风险，并指导临床治疗及预后评估。

PU-3218
动态增强 MRI 定量分析在乳腺癌新辅助化疗疗效评估的 META 分析

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目的 采用 META 分析来评价动态增强 MRI 定量参数在乳腺癌新辅助化疗疗效评估中的价值。 方法 搜集国内外公开发表的以病理结果为金标准、且运用动态增强 MRI 定量参数来评估乳腺癌新辅助化疗疗效的相关文献，采用 Meta-DiSc1.4 软件进行动态增强 MRI 的定量参数对乳腺癌新辅助化疗疗效评估价值的综合评价。结果 共纳入国内外文献 17 篇，乳腺癌总病灶数 854 例；经统计分析结果显示动态增强 MRI 定量参数评估乳腺癌新辅助化疗疗效的灵敏度为 83.3%，特异度为

82.9%，综合受试者工作特征曲线（SROC）下面积为 89.99%。 结论 动态增强 MRI 定量参数对乳腺癌新辅助化疗疗效的评价具有较高的准确度。

PU-3219

浆细胞性乳腺炎 MRI 表现与临床特点及病理对照

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目的：探讨分析浆细胞性乳腺炎的 MRI 表现与临床特点及病理表现。**方法**：回顾性分析 15 例经病理证实的浆细胞性乳腺炎不同时期的病理表现及临床特点，并进行 MRI 平扫及增强扫描。**结果**：浆细胞性乳腺炎临床热点主要表现为病程多数较长，易反复发作、长期不愈后易形成脓肿及瘘管窦道。MRI 炎症期病灶多表现为节段性、片状不均匀长 T1 稍长 T2 信号影，与周围腺体分界不清。脓肿期病灶内可见多发大小不等脓腔形成，伴有丰富扩张的引流静脉，脓肿壁呈环形强化。瘘管期病灶内脓肿不愈破溃形成的与皮肤表面相通的瘘管，增强后表现为窦道壁强化而官腔不强化的短线样双管征。混合期即脓肿和瘘管同时存在。**结论**：浆细胞性乳腺炎具有一定的临床特点和 MRI 影像特点，随着病理过程的进展，不同时期常有不同的临床表现与 MRI 表现。

PU-3220

乳腺浸润性导管癌磁共振影像表现与相关免疫组化指标的关联性分析

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目的 乳腺浸润性导管癌（IDC）磁共振平扫与增强扫描的基本特征，探讨其与相关免疫组化指标的关联性。
方法 回顾分析 38 例经手术病理证实为乳腺浸润性导管癌患者的乳腺磁共振平扫及动态增强扫描图像，记录病灶大小、形态、边缘、时间-信号曲线（TIC）类型分类；每例病例均行免疫组化检查，测定包括雌激素受体（ER）、孕激素受体(PR)、原癌基因 Her-2、P53 抑癌基因、Ki67 核抗原表达等指标，分析磁共振表现与免疫组化指标之间的相关性。 **结果** 病灶的大小及形态征象与免疫组化指标无明显相关性；病灶的边缘情况及 TIC 曲线类型与免疫组化指标有一定的相关性，其中边缘有毛刺征的 31 例 IDC 病灶 ER、PR 阳性表达明显高于 7 例边缘光整者（P＜0. 05），TIC“流出型”29 例的 IDC 病灶 P53 抑癌基因、Ki67 核抗原阳性表达高于 7 例“平台型”及 2 例“流入型”（P＜0.05）。免疫组化中的 Her-2 基因表达与以上任何一项磁共振表现无明显相关性。 **结论** 乳腺浸润性导管癌影像表现中的边缘毛刺征、TIC 流出型曲线与免疫组化部分指标具有关联性。

PU-3221

乳腺 Paget's 病在磁共振动态增强扫描及弥散加权成像中影像学表现的研究

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摘要：目的 探讨乳腺 Paget's 病在磁共振动态增强扫描（dynamic contrast enhanced， DCE）及弥散加权成像（diffusion weighted imaging，DWI）上的表现特点。**方法** 收集 12 例经过手术病理证实的乳腺 Paget's 病患者的资料，对乳腺 Paget's 病在 DCE 及 DWI 上的影像学表现征象进行研究分析。**结果** 乳腺 Paget's 病在磁共振成像（MRI）表现为乳头增大，乳晕及邻近皮肤增厚，DCE 呈渐渐性明显均匀强化，时间-信号强度曲线以流入型、平台型为主，DWI 显示以高信号为主，高信号范围小于强化范围。91.7%合并的乳腺内导管癌，病灶 DCE、DWI 表现与单发的导管癌病灶表现相近。**结论** 乳腺 Paget's 病在 DCE、DWI 上的表现有一定特征性，DCE、DWI 在乳腺 Paget's 病的诊断上有很好的临床应用价值。

PU-3222

Evaluation of 89Zr-Trastuzumab for HER2 PET in breast cancer xenografts - bearing mice

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Background: Breast cancer with HER2 overexpression is associated with tumor growth, angiogenesis and development of distant metastases. Accurate monitoring of HER2 expression is conducive to individualized application of targeted therapy. Radionuclide tracer imaging has become research focus in recent years.
Methods: Trastuzumab modified by DFO(DF-BZ-NCS) was labeled with 89Zr, the stability and activity were analyzed in vitro by High-performance Liquid Chromatograph (HPLC) and Enzyme linked immune-sorbent assay (Elisa) respectively. Flow cytometry and cell-binding assay were performed to evaluate HER2 expression and radioactivity uptake in BT474 (HER2 overexpress), MDA-MB-453 (HER2 minimally express) and MDA-MB-231 (HER2 negative) cell lines. Micro-Pet was used to evaluate the efficiency of 89Zr-DFO-trastuzumab in HER2/neu-positive and negative xenograft - bearing mice tumor respectively.
Results: Radionuclide 89Zr was effectively combined with trastuzumab modified by DFO at a high radiochemical purity and specific activity in vitro. 89Zr- trastuzumab was significantly enriched in tumorof BT474 xenograft - bearing miceup to 3-5w. Tracer imaging in MDA-MB-453 xenograft - bearing mice with HER2 minimal expression were not quite accurate.
Conclusions: The procedures of conjugation and labeling were stability, targeted and safety. 89Zr- trastuzumab PET as a tool to investigate heterogeneity of HER2/neu-positive breast cancers and provide a good application prospect for clinical transformation from basic research.

PU-3223

Application of Magnetic Resonance Image Texture Analysis in Differential Diagnosis of Benign and Malignant Breast Lesions

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ObjectiveTo study the differential diagnosis of benign and malignant breast lesionsby using texture analysis based on magnetic resonance imaging (MRI) plain scan and dynamic contrast-enhanced scan, and evaluate the diagnostic performance.
Materials and Methods587 breast lesions, including 404 malignant lesions and 183 benign lesions, were retrospectively collected. Three experienced radiologists manually delineatedthe region of interest (ROI), and quantitative radiomics features automatically extracted from ROI images. Dimensionality reduction of features; prediction models for diagnosis of benign and malignant lesions were built based by logistics regression analysis; the diagnosis performance was evaluated by using ROC curves; the radiomics scores of the two models were superposed by generalized linear regression; and the weights of the two models were compared and evaluated by using nomograms.
ResultsThe diagnostic accuracy of the radiomics models built by using T_1WI and enhanced scan images was 71.2% and 83.1%, respectively, the AUC was 0.742 and 0.887, respectively, the sensitivity was 0.636 and 0.820 respectively, and the specificity was 0.740 and 0.855, respectively.
ConclusionMRI texture analysis can be used for distinguishing benign and malignant breast lesions, and the diagnostic efficacy of the radiomics model built by using enhanced scan images was superior to that of the model built by using plain scan images. Therefore, the texture analysis method based on enhanced MR images is expected to become the basic identification tool to aid clinical diagnosis.

PU-3224

DWI 和最小 ADC 值鉴别乳腺良恶性肿瘤

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目的：
DWI 及 ADC 值定量测量在乳腺良恶性病变鉴别中有较高的诊断价值，目前文献中多采用平均 ADC 值的测量方法。本研究探讨扩散加权成像 DWI 和最小 ADC 值、平均 ADC 值在乳腺良恶性病变鉴别诊断中的价值。

方法：
收集我院经手术及病理证实的 97 例乳腺良恶性病变患者，所有患者均在术前行乳腺 MRI 平扫、增强及 DWI 扫描。

病灶 ADC 测量时，ROI 选取方法采用“部分不规则法”，即在病变最大层面上手动绘制 ROI，避免肿瘤囊变坏死区，记录平均 ADC 值和最小 ADC 值。
比较乳腺良恶性病变的最小 ADC 值、平均 ADC 值差异，并以 ROC 曲线分析其诊断效能。

结果：
全部 97 例患者均为女性，年龄 16~74 岁，平均 40.0±12.3 岁。其中良性病变 38 例（纤维腺瘤 19 例、腺病 6 例，炎性病变 12 例，叶状肿瘤 1 例，错构瘤 1 例），最小 ADC 值 1.31±0.31×$10^{-3}mm^2/s$，平均 ADC 值 1.56±0.33×$10^{-3}mm^2/s$；恶性病变 59 例（浸润性导管癌 46 例，导管原位癌 5 例，导管内癌 4 例，浸润性小叶癌 2 例，粘液癌 2 例），最小 ADC 值 0.78±0.29×$10^{-3}mm^2/s$，平均 ADC 值 1.04±0.33×$10^{-3}mm^2/s$。
ROC 曲线结果显示：最小 ADC 值鉴别乳腺良恶性病变 AUC 为 0.908，高于平均 ADC 值（AUC 为 0.868）。以最小 ADC 值 1.07×$10^{-3}mm^2/s$ 为临界值，鉴别良恶性肿瘤的敏感性 88.4%，特异性 89.8%。

结论：
部分不规则法选取 ROI 测量最小 ADC 值鉴别乳腺良恶性病变有较高的临床应用价值，可作为定性诊断的有力补充。

PU-3225
MR 扩散峰度成像对 BI-RADS 3 及 4 类病变的诊断价值

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目的 探讨 MR 扩散峰度成像（DKI）对 BI-RADS 3 及 4 类病变的诊断价值。
方法 收集术前行乳腺 MRI 动态对比增强（DCE）及多 b 值弥散加权成像（DWI）、且 BI-RADS 3 及 4 类病例共 59 例，71 个病灶，据病理结果分恶性组（n=43 个）与良性组（n=28 个）。分析两组间年龄、病灶大小、形态、边缘、T2WI 信号，内部强化特征、早期强化率（EER）、TIC 类型、ADC、MK、MD 差异。采用 Fisher 精确概率法、Mann-Whitney、受试者工作特性曲线（ROC）进行统计分析。比较基于 DCE 和 DCE 结合 DKI 的两组 BI-RADS 评估效能。**结果** ①良、恶性组间病灶形态、内部强化、EER、TIC、ADC、MK、MD 差异有统计学意义（$P < 0.05$），平均年龄、病灶大小、形态、边缘、T2WI 信号差异无统计学意义（$P > 0.05$）。②在基于 DCE 图像的 BI-RADS 评估中，3 类有 17 个，4 类有 54 个。DCE 结合 DKI 的 BI-RADS 评估中，2 类 9 个，3 类 18 个，4 类 10 个，5 类 34 个。与基于 DCE 的 BI-RADS 评估相比，DCE 结合 DKI 数据的评估具有更高的特异度（46.4% vs 89.3%）、准确度(73.2% vs 95.8%)和更低的假阳性(53.6% vs 10.7%)、假阴性(9.3% vs 0%)。**结论** DKI 能提高 MRI 对 BI-RADS 3 和 4 类病灶诊断的特异度和准确度，降低假阳性和假阴性，避免漏诊及不必要的穿刺检查。

PU-3226
To explore the value of edema on MRI T2 around breast cancer masses in prognosis prediction.

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Objectives: Compared with DCE-MRI, MRI Plain Scan provides less information for the diagnosis of breast diseases. This study aims to investigate the role of abnormal manifestations on MRI T2 fat suppression sequence around breast cancer masses in prognosis prediction.
Methods: 80 patients with breast cancer of mass type underwent breast MRI plain scan, DCE-MRI and DWI scan. To analyze the correlation between imaging findings around the mass on MRI T2 fat suppression sequence plain scan and tumor stage, pathological findings, immunohistochemistry and axillary lymph node metastasis of the tumor.
Results: There was grid or patchy blurred high signal shadows around the mass on MRI T2 fat suppression sequences plain scan in 35 patients, Moreover, these area of MRI T2 fat suppression sequences abnormal signals did not show abnormal enhancement on DCE-MRI and that of ADC value did not decrease. In other 45 patients, there was no abnormal signal around the mass on MRI T2 fat suppression sequence plain scan. The 35 patients were later in tumor staging than the other 45 patients, this difference was statistically significant ($P<0.05$) . There was no significant difference in pathological classification between the two groups. There was significant difference in Luminal typing between the two groups ($P<0.05$), these 35 patients are more likely to present with triple-negative breast cancer. There was also a significant difference in axillary lymph node metastasis between the two groups($P<0.05$), these 35 patients had a high rate of axillary lymph node metastasis.
Conclusion: Abnormal gridding or patchy high signal on MRI T2 fat suppression sequence around the mass can predict the prognosis of tumors in patients with mass-type breast cancer. Furthermore, 26 of 35 cases also showed skin thickening and showed subcutaneous fibrous connective tissue enlargement on MRI T2 fat suppression sequence.

PU-3227

Machine Learning Models for Evaluation of Pathological Complete Response to Neoadjuvant chemotherapy in HER2-positive breast cancer

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Objectives: To investigate whether machine learning analysis of radiomics based on dynamic contrast-enhanced magnetic resonance imaging(DCE-MRI) can help predict pathological complete response(pCR) to neoadjuvant chemotherapy(NAC) in patients with locally advanced human epithelial growth factor receptor 2(HER2)-positive breast cancer.
Materials and Methods: One hundred and twenty seven patients with locally advanced HER2 positive breast cancer at our institution were enrolled in this retrospective study. All patients underwent DCE-MRI imaging before NAC, 1316 radiomic features were extracted from DCE-MRI imaging over four time points. To reduce the dimensionality of the feature space, we proposed a two-staged feature selection strategy combining traditional statistics and machine learning-based method. With selected features, the models for pCR classification task were established. The performence of the Machine Learning-Based

classification were assessed by their accuracy, sensitivity,specificity, and the area under the curve (AUC).
Results: Fifty-four of 127 patients(42.52%) achieved pCR. For the pCR classification task, the best accuracy of 79.5% was achieved based on linear support vector machine (SVM) in conjunction with 6 sequential features based on DCE time series and the sensitivity, specificity and AUC values were 0.74, 0.84, 0.84 respectively.
Conclusion: Using pretreatment MRI data over time, we develop a model to predict pCR to NAC in patients with locally advanced HER2 positive breast cancer.

PU-3228
乳腺癌内乳淋巴结影像学评估及临床意义

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目的 探讨乳腺癌内乳淋巴结影像学评估及其临床意义。
方法 回顾性分析武汉大学中南医院 2017-2018 年 200 例乳腺癌患者的临床病理资料及在我院 64 排螺旋 CT、3.0T MR 上的影像学资料进行分析，选取病人的年龄、肿瘤大小、肿瘤位置、乳腺癌类型/分子分型、腋窝淋巴结转移状况、远处转移等 7 个可能相关因素，分析不同情况下内乳淋巴结出现转移的情况；同时通过对转移的内乳淋巴结进行影像学征象分析和总结。
结果 200 例乳腺癌患者中，有 32 例出现内乳淋巴结转移，在选取的 7 个可能相关因素中，肿瘤的大小、乳腺癌类型/分子分型、腋窝淋巴结转移状况与内乳淋巴结转移有相关性；对 32 例内乳淋巴结转移患者的影像资料进行前后对比分析，从内乳淋巴结大小、形态、密度、单发/多发以及伴/不伴腋窝淋巴结肿大五方面进行总结，同时发现内乳淋巴结转移患者较无内乳淋巴结转移患者临床预后差。
结论 腋窝淋巴结状况、乳腺癌类型/分子分型与内乳淋巴结转移有相关性。当内乳淋巴结短径＞5mm，呈不规则形/卵圆形，淋巴结门消失，增强前后 CT 值增加＞20HU，常常伴有腋窝淋巴结肿大，往往提示内乳淋巴结转移；内乳淋巴结阳性检出可以提高临床乳腺癌 TNM 分期的准确性，以及指导精准治疗及判断预后。

PU-3229
乳腺癌原发灶及癌旁组织的影像学特征预测淋巴结转

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目的：探讨乳腺癌癌灶及癌周组织 MRI 特征与腋窝淋巴结转移和淋巴血管侵犯（Lymphovascular invasion, LVI）的相关性。
方法：回顾性分析了 201 例乳腺癌患者的乳腺 MRI 资料，包括 DCE-MRI 和 DWI，以及临床病理资料，分析的影像学特征包括肿块或非肿块强化、单发或多发病灶、病灶最大径、边缘强化、毛刺状、早期增强率、TIC 曲线、Tumor ADC、Peritumor ADC、 Peritumor ADC/ Tumor ADC ratio 等，与手术后病理结果中的腋窝淋巴结转移及有无 LVI 进行相关性分析。
结果：腋窝淋巴结转移和 LVI 与多发肿块病变、大病灶（2cm）、边缘强化、早期快速强化相关，和 Peritumor ADC/ Tumor ADC ratio 强相关。以 Peritumor ADC/ Tumor ADC ratio=2.2 为阈值，

预测腋窝淋巴结转移的敏感性、特异性、阳性预测值、阴性预测值分别为 85.4%、91.7%、88.9%和 84.1%。
结论：乳腺癌病灶及周围组织影像学特征可以预测淋巴结转移及 LVI。

PU-3230

乳腺炎与乳腺癌的 MRI 诊断与鉴别

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目的：探讨乳腺炎与乳腺癌的 MRI 诊断与鉴别研究。
方法：将 2019 年 1 月-4 月在我院治疗的 30 例乳腺癌患者作为观察组，将同期 30 例乳腺炎患者作为对照组，均行 MRI 检查，比较两组的 MRI 图像特征、TIC 类型分布。
结果：观察组淋巴结肿大、强化特征、环形强化、水肿等 MRI 表现与对照组相比有明显差异（P＜0.05），但在边缘、毛刺征、淋巴结肿大、累及乳头、皮肤增厚等 MRI 表现与对照组相比无明显差异（P＞0.05）；观察组Ⅱ型、Ⅲ型明显多于对照组，而Ⅰ型明显少于对照组（P＜0.05）。
结论：乳腺炎与乳腺癌的 MRI 的图像存在一定差异，乳腺炎多呈非肿块样、环形强化、TIC 多为Ⅰ型，乳腺癌多呈肿块样，TIC 多为Ⅱ型、Ⅲ型。

PU-3231

乳腺恶性叶状肿瘤的磁共振表现

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目的：探讨乳腺恶性叶状肿瘤的磁共振表现，为鉴别诊断提供依据，提高对该病的诊治水平。
方法：搜集 2018 年 9 月到 2019 年 3 月我院 5 例乳腺恶性叶状肿瘤患者为研究对象，全部患者都行乳腺磁共振平扫加增强检查，磁共振检查序列包括 T1 加权成像，T2 加权成像，T2 脂肪抑制成像，弥散加权成像，动态增强成像，并有病理结果对照。
结果：5 位患者均为女性，年龄 16-56 岁，5 例叶状肿瘤均发生恶变。T2WI 上多以高信号为主，2 例病变内可见小片状低信号区，病理证实为出血； 3 例伴有出血坏死的病变呈不均匀强化。弥散加权成像高 B 值成像病灶均表现为高信号，时间信号强度曲线有 2 例是平台型，3 例是流出型。
结论：乳腺叶状肿瘤好发于中年妇女，该病一般肿块较大，当发现病变逐渐增大时应考虑是交界性或恶性叶状肿瘤可能。本组中 5 例病变，最大的直径 7 厘米，最小的直径都超过 3 厘米。磁共振多参数成像可提供病变更多的诊断信息，弥散加权成像和乳腺动态增强序列可以很好的鉴别乳腺良恶性病变。

PU-3232

Using histogram analysis on dynamic contrast enhanced MRI to improve assessment of pCR in small residual enhancement of breast cancer after neoadjuvant therapy

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Purpose: To assess the ability of histogram analysis(HA) on pre-operative dynamic contrast enhanced (DCE) MRI in identifying pathologic complete response(pCR) of small residual enhancement after neoadjuvant therapy(NAT) for mass-like breast cancer.
Materials and Methods: Consecutive breast cancer patients who received NAT before operation were enrolled. Regions of interests covering the entire enhanced areas of tumor site were drawn to extract parameters, including volumes and 17 HA features acquired separately on subtractive images of early and late phases to pre-enhanced phase on MR DCE sequences by using a house made radiomics software developed on 3D slicer platform. Lesions were stratified by volume of residual enhancement, and comparison of features were made between pathologic complete response (pCR) and non-pCR groups. Multivariate cox regression and receiver operating characteristic (ROC) curve were used to select useful features and to assess the overall diagnostic abilities and among different molecular subtypes.
Results: Totally 112 patients with mass-like breast cancer on initial MR were enrolled and grouped as pCR(42 cases) and non-pCR (70 cases). Further analysis divided the cohort by residual tumor volume(V) as V=0, $0<V<0.5cm^3$, and $V\geqslant0.5cm^3$. Multivariate regression analysis on group with $0<V<0.5cm^3$ (42 cases) yielded uniformity and entropy on late DCE phase as independent factor related with pCR(P=0.007 and 0.013 respectively). Using the formula with combined factors, areas under the curve on ROC and accuracy for pCR diagnosis in this small enhanced volume group were 0.778 and 83.3%, comparing with 0.500 and 64.3% using the no-enhancement criterion. For the whole setting with 112 case, the accuracy for identifying pCR reached 84.82% by using HA features on DCE late phase and stratified by residual cancer volume. Diagnostic ability was best in triple negative subtype.
Conclusion: HA is a useful tool to depict tumor heterogeneity in post-treatment mass-like breast cancer patients. By stratification of residual volume and combination of uniformity and entropy from DCE late phase, MR's ability to identify complete response in small residual enhanced ($V<0.5cm^3$) tumor group is significantly improved.

PU-3233
结合乳腺 X 线及超声检查降低磁共振 BI-RADS 4 类病灶假阳性率的可能性探讨

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目的 乳腺磁共振敏感性高于乳腺 X 线和超声检查，在乳腺癌患者术前评估中发挥重要作用，但由于乳腺磁共振特异性稍低，其发现的 BI-RADS 4 类病灶的假阳性率较高，引起了过度治疗问题。本研究探讨结合乳腺 X 线及超声降低乳腺磁共振 BI-RADS 4 类病灶假阳性率的可能性。

方法 回顾性收集 2016 年 1 月至 2018 年 12 月于本院进行治疗的原发性乳腺癌患者，收集病人治疗前乳腺磁共振发现并由病理证实的 BI-RADS 4 类病灶，再筛选出同时具有术前乳腺 X 线及超声检查结果的病灶。最终有 173 个病灶入组，其中 78 个为良性，95 个为恶性。以病理

结果为金标准分为良性组和恶性组。BI-RADS 4 类及以上需要活检，3 类及以下不需要活检。观察良性组和恶性组乳腺 X 线及超声检查结果。

结果　78 个良性病灶中乳腺 X 线及超声两种检查均认为需要活检的共 32 个（32/78，41.0%），一种方法认为需要活检的 33 个（42.3%），两种方法均认为不需要活检的 13 个（16.7%）；95 个恶性病灶的结果分别为 70（73.7%）、20（21.0%）和 5（5.3%）。总之，对于乳腺 X 线及超声两种检查均认为不需要活检的磁共振 BI-RADS 4 类病灶，其恶性率仅为 2.9%（5/173）。

结论　乳腺 X 线及超声均认为不需要活检的磁共振 BI-RADS 4 类病灶阳性率较低，在为这类病人制定临床干预方案时应综合考虑，以求在安全范围内降低假阳性率，减轻患者负担。

PU-3234

乳腺实性乳头状癌的影像学表现

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目的：分析乳腺性乳头状癌的钼靶、超声及 MR 表现，以提高其诊断的准确性。
材料和方法：收集我院 2018.06-2018.12 经病理诊断的 21 例实乳腺性乳头状癌患者，年龄范围 39-74 岁，平均年龄 62.10 岁，所有患者术前均行钼靶、超声及磁共振检查。
结果：21 例患者，12 例以乳头溢液就诊，8 例以乳头肿物就诊，1 例无明显症状；10 例术后病理为原位实性乳头状癌，11 例为实性乳头状癌伴浸润。钼靶、超声及磁共振诊断的准确性分别为 29%、95%、100%。乳腺实性乳头状癌的钼靶及超声表现没有特异性，最常见的 MR 表现为位于乳晕后区，通常沿导管分布（16/21,76%），DWI 均表现为高信号（21/21,100%），导管扩张（15/21,71%），表现为线性或段样的非肿块强化（11/21,52%），不均质肿块强化（10/21,48%），TIC 曲线呈平台型及流出型为主（18/22,82%）。原位乳腺实性乳头状癌与伴浸润的乳腺实性乳头状癌相比，大小有显著差异性（t=1.12，p=0.03）。
结论：乳腺实性乳头状癌诊断比较困难，钼靶及超声缺乏特异性，MR 表现具有一定的特征，其表现与临床病理有密切关系。

PU-3235

硬化性腺病的 X 线、MRI 影像学表现及病理对照分析

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目的　探讨硬化性腺病（sclerosing adenosis,SA）的 X 线、MRI 影像学表现特征，结合病理结果，探讨 X 线及 MRI 检查对硬化性腺病术前诊断的价值。
方法　回顾性分析本院经手术病理证实的 68 例硬化性腺病的临床资料及 X 线、MRI 图像特征，其中 58 例术前行乳腺 X 线检查，68 例术前行乳腺 MRI 平扫、动态增强扫描及扩散加权成像，X 线及 MRI 检查结果分别与病理结果对照分析。
结果　68 个硬化性腺病病灶中，单纯硬化性腺病 43 个，伴大汗腺化生 9 个，伴纤维腺瘤 7 个，伴导管内乳头状瘤 6 个，伴钙化灶 3 个。X 线表现为不规则肿块者 11 个、非对称致密者 18 个、结构扭曲者 9 个、钙化 12 个，未见确切异常者 8 个。MRI 表现为不均匀长或者稍长 T2WI 信号者 52 例；肿块 48 例，均可见强化；不均匀非肿块样强化病灶 20 例。病灶时间信号曲线(time intensity curve，TIC)渐进型曲线 33 例，平台型曲线 32 例，流出型曲线 3 例；扩散加权成像

(diffusion weighted imaging，DWI) 呈等信号者 11 例，稍高信号者 44 例，高信号者 13 例。乳腺 X 线及 MRI 相结合诊断硬化性腺病准确率为 83.71%。
结论 乳腺硬化性腺病 X 线检查多表现为不规则肿块、非对称致密，钙化；MRI 多表现为长或者稍长 T2 信号肿块，多不均匀强化。病变形态、增强扫描时间信号曲线及 DWI 图像对硬化性腺病术前诊断具有重要价值。

PU-3236
乳腺 MRI 对单纯型黏液腺癌与纤维腺瘤的鉴别诊断价值

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目的 探讨 MR 平扫、扩散加权成像（DWI）、动态增强及表观扩散系数（ADC）值对单纯型乳腺黏液腺癌和乳腺纤维腺瘤的鉴别诊断价值。方法 回顾性分析经手术病理证实的 20 例单纯型黏液腺癌与 20 纤维腺瘤患者的 MRI 资料，观察比较两组患者的 MR 表现特征。结果 ①TIC 曲线：61.5%的单纯型黏液腺癌延迟期 TIC 曲线呈上升型，71.1%混合型黏液腺癌 TIC 曲线呈平台型；②ADC 值：单纯型黏液腺癌平均 ADC 值(1.62±0.47)×10 -3 mm 2/s 高于纤维腺瘤平均 ADC 值(1.34±0.32)×10 -3 mm 2/s，差异具有统计学意义（P<0.05）。结论 单纯型黏液腺癌和纤维腺瘤的 MRI 表现上有交叉，但是单纯型黏液腺癌的高 ADC 值具有鉴别诊断价值，故 MRI 多种成像序列相结合在单纯型黏液腺癌和乳腺纤维腺瘤的诊断及鉴别诊断中具有重要价值。

PU-3237
MRI 在小体积乳腺叶状肿瘤诊断中的价值

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目的 分析 MRI 平扫、扩散加权成像（DWI）、动态增强及表观扩散系数（ADC）值在小体积（直径＜5cm）乳腺叶状肿瘤（PTB）诊断中的价值。**方法** 回顾性分析经手术病理证实的 18 例乳腺叶状肿瘤患者的 MRI 表现特征,其中良性 10 例，交界性 4 例，恶性 4 例。分析病灶形态、信号强度、ADC 值及其动态增强特点,并与病理结果对照。**结果** 14 例呈分叶状，4 例呈类圆形，最大径 1.1cm～5.0cm，T_1WI 平扫呈低或等信号，T_2WI 呈均匀高信号或混杂高信号，动态增强不均匀强化，5 例见囊变，9 例见不强化分隔，所有病灶 DWI 均呈高信号，平均 ADC 值(1.29±0.18)×10 -3 mm 2/s，TIC 曲线 8 例Ⅰ型，9 例Ⅱ型,1 例Ⅲ例。**结论** 小体积乳腺叶状肿瘤 MRI 表现上具有特征性表现，认识其特征性 MRI 表现有助于鉴别诊断,但最终确诊仍需依靠病理组织学检查。

PU-3238
MR 放射组学：预测三阴性乳腺癌患者新辅助治疗后的病理学完全缓解和无病生存期

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目的： 研究基于增强 MRI 的放射组学能否预测接受新辅助治疗 (NAC) 的局部晚期 TNBC 的病理完全缓解 (pCR) 和无病生存期 (DFS)。

方法： 回顾性分析 2010 年 1 月至 2017 年 5 月共 113 例接受 NAC 的患者，然后随访至 2018 年 8 月。这些患者通过穿刺活检确诊为三阴性乳腺癌。病理完全缓解定义为 ypT0/is 和 ypN0。使用 3Dslicer 后处理软件在动态增强第一期绘制肿瘤全容积 ROI。放射组学标记用于预测 NAC 后的病理学完全缓解以及无病生存期。使用单变量和多变量 Cox 比例风险模型和 Kaplan-Meier 分析确定放射组学特征、MRI 结果和临床病理学变量与 DFS 的相关性。利用开源 pyradiomics 软件总共提取 1177 个组学特征，为了表征 DCE 图像随时间序列的纹理变化，我们测量了 10 个新的连续特征。最后采用 23 个机器学习的模型进行计算，并且所有的机器学习模型使用 5 倍交叉验证。
结果： 47 (41.6%) 例患者最终获得病理学完全缓解 (pCR)，66(58.4%) 例患者没有获得病理学完全缓解(npCR)。中位随访时间为 36 个月。113 例中有 28 例 (24.7%) 发生复发和转移。预测 pCR 的模型显示灵敏度和特异性分别为 77.0 %和 88.0%；准确率为 84.1%（ROC 曲线下面积：0.87）。预测 DFS 的模型显示灵敏度和特异性分别为 71.0% 和 94.0%；准确率为 88.5%（ROC 曲线下面积：0.87）。
结论： 基于 DCE-MR 图像的放射组学标记有望成为三阴性乳腺癌患者新辅助治疗后 pCR 和 DFS 的独立早期预测标记物

PU-3239

肉芽肿性乳腺炎一例

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临床资料：女，30 岁，发现右乳肿物 2 月，伴疼痛、皮温增高，无破溃、流脓、流血等。查体：右乳中央区可触及一大小约 2.5mm*3mm 肿物，质偏硬，不可移动。

乳腺 X 线钼靶摄影：右乳中央区见类圆形肿块影，大小约 32mm×32mm，边缘可见环形透亮带，外上缘见小钙化灶；其外上方可见成串排列的边界不清的结节影，边缘模糊。诊断：右乳中央区肿块，感染性病变？

MRI 表现：右乳中央区下份及外下象限多个结节及团片状异常信号灶，中央区者较大，约 31mm×27mm，呈 T1W 低信号、T2W 明显高信号，增强扫描呈环形强化，壁厚薄欠均，内壁欠光整，见壁结节，DWI 示病灶大部分呈高信号，中间无强化区明显弥散受限，ADC 值减低，壁及壁结节部分弥漫轻度受限；病灶周围大片状 T2W 信号增高区，边界不清。动态增强曲线右乳部分结节呈平台型、部分呈轻度流出型。诊断：右乳多发结节，考虑 BI-RADS 4，感染并脓肿形成，不除外肿瘤合并感染可能。

病理：送检“右乳肿物”穿刺组织，镜下示乳腺组织，见大量的中性粒细胞、浆细胞等炎性细胞浸润、聚集，小脓肿形成，并见组织细胞聚集，肉芽肿形成。

讨论：肉芽肿性乳腺炎好发于已婚、经产妇女，病变常位于单侧，以外上象限多见。肿块不痛或微痛，表面皮肤红肿较轻，质硬，边界不清，常与皮肤或周围组织粘连，并伴通常腋窝淋巴结肿大，少伴发热。乳腺 X 线摄影表现为等、稍高于腺体密度的不规则形肿块，边界不清，部分表现为毛刺浸润或索条状；可有卵圆形或同心圆状小钙化；局部皮肤增厚，可伴腋窝淋巴结肿大。MRI 呈 T1WI 低、T2WI 较高信号，脓肿形成 T2WI 信号明显增高。动态增强以周边环形强化为主，TIC 曲线以上升平台型为主。伴脓肿形成时，病变中心 DWI 呈高信号，脓液可弥散受限，但增强后不强化。

PU-3240
DCE-MRI 定量参数 Ktrans、Kep 及 Ve 与乳腺癌分子分型间的关系

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目的 利用动态增强 MRI，探讨定量参数 K_{trans}（容量转移常数）、K_{ep}（速率常数）和 Ve（细胞外血管外间隙）与乳腺癌分子分型间的关系。
方法 收集 2015 年 1 月～2018 年 1 月我院首诊乳腺癌 136 例作为研究对象，术前利用西门子 3.0T 乳腺 DCE-MRI 进行定量参数 K_{trans}、K_{ep}和 Ve 水平测定。术后病理利用免疫组织化学法作 ER、PR 、HER-2 水平检测并对患者进行分子分型。采用 SPSS18.0 统计学软件处理，计数资料行卡方检验，计量资料行 t 检验，P<0.05 为差异有统计学意义。
结果 136 例乳腺癌患者中，Luminal A 型 46 例 、Luminal B 型 40 例、HER2 阳性型 24 例和 TNBC 型 26 例。统计结果显示 Luminal A 型 K_{ep}水平，高于 Luminal B 型、HER-2 阳性型及 TNBC 型(P<0.05)；Luminal B 型 K_{ep}水平，高于 HER-2 阳性型及 TNBC 型(P<0.05)；ER 阳性者 K_{ep}低于 ER 阴性者(P<0.05)；PR 阳性者 K_{trans}、K_{ep}低于 PR 阴性者 (P<0.05)。ER 阳性者 K_{trans}、Ve 与阴性者比较差异无统计学意义(P>0.05)；PR 阳性者与阴性者 Ve 比较差异无统计学意义(P >0.05)。
结论 利用动态增强 MRI 定量参数对鉴别乳腺癌分子分型有重要价值，不同分子分型乳腺癌 ER、PR 表达水平不同。

PU-3241
乳腺浸润性导管癌 DCE-MR 特征与不同分子分型间的相关性研究

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目的：探讨不同分子分型乳腺浸润性导管癌的 MRI 特征及其相关性。
材料与方法 ：回顾性分析 146 例初诊乳腺浸润性导管癌患者的术前 DCE-MRI 图像，根据美国放射学会乳腺影像报告与数据系统 (ACRBI-RADS)对增强后第二期强化图像进行观察及分类诊断，包括病灶大小、强化方式、肿块样病灶强化后形态、边缘、内部强化特征、时间-信号强度曲线 (TIC) 类型、伴随征象。所有患者均通过手术或核芯穿刺取得组织病理及免疫组织化学(IH C)结果，同时记录免疫组化指标 ER、PR、HER-2 表达情况，按照乳腺癌分子分型分类，分成 Luminal A 型、Luminal B 型、HER-2 阳性型和三阴性乳腺癌(TNBC)。利用卡方检验比较各分子分型间 MRI 表现的差异，采用交叉列联表方法分析二者的相关性，并根据列联系数(C 值)进行判断：C <0.4 为低度相关，0.4≤C <0.7 为中度相关，C ≥0.7 为高度相关，P<0.05 为差异有统计学意义。
结果：146 例患者中 Luminal A 型 33 例 (22.0%) Luminal B 型 78 例(53.4%)，HER-2 阳性型 13 例(8.9%)，TNBC 22 例(15.0%)；肿块样强化病变 121 例（82.8%），非肿块样病变 25 例（17.2%）。肿块样强化病变中，病灶大小、内部强化特征与分子分型呈中度相关 (C =0.481/C=0.472，P= 0.001)；TIC 类型、病变的边缘与分子分型呈低度相关 (C=0. 327/C=0.352，P=0.008)，而病灶的形态及伴随征象与分子分型无相关性(C=0.083，P= 0.528)。
结论：不同分子分型乳腺浸润性导管癌的 MRI 表现各异，乳腺癌分子分型与部分 MRI 征象之间存在一定的相关性，术前 MRI 特征分析对预测乳腺癌生长方式、分子分型有重要价值，为术前初步判定预后及初步确定治疗方案提供了功能学参考指标。

PU-3242

MRI 在乳腺导管原位癌诊断中的应用

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摘要： **目的** 回顾性分析乳腺导管原位癌的 MR 影像表现特点，提高 MRI 对导管原位癌的术前诊断能力。**方法**：收集经手术病理证实的乳腺导管原位癌及导管原位癌伴微浸润患者 40 例，其中导管原位癌 18 例，导管原位癌伴微浸润患者 22 例，对病灶的分布、形态及增强扫描表现进行回顾性总结分析。**结果**：40 例患者中 37 例表现为非肿块样强化，其中包括以段样强化分布的 17 例，分支导管及线样导管分布样强化的 8 例，区域性强化分布的 7 例，簇状强化分布 5 例；40 例中表现为块状强化的 3 例，分别表现为毛刺样 1 例，分叶状 2 例，3 例肿块样强化病变的时间信号强度曲线均呈流出型。**结论** 段样强化分布、分支导管及线样导管分布样强化、区域性强化分布及簇环状强化是导管原位癌较特征性影像表现。

PU-3243

基于 DCE-MRI 组学的机器学习模型预测 HER2 阳性浸润性乳腺癌新辅助治疗疗效的价值

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目的： 探讨基于动态增强磁共振成像(DCE-MRI)组学的机器学习模型是否有助于预测人类上皮生长因子受体 2(HER2)阳性浸润性乳腺癌患者新辅助治疗(NAT)疗效。
材料与方法： 对我院经病理证实的 127 例 HER2 阳性浸润性乳腺癌进行回顾性分析。所有患者 NAT 前均行 DCE-MRI 成像，4-6 疗程 PCH(紫杉醇 + 卡铂 +赫赛汀)方案治疗后行乳腺癌根治手术。以术后病理为金标准将患者分为病理完全缓解(Pathological Complete Response, pCR)组与非病理完全缓解(non-Pathological Complete Response, non-pCR)组。将传统统计和机器学习相结合用于特征降维。根据选定的最优特征，建立预测 pCR 与 non-pCR 的分类模型。通过准确率、敏感性、特异性和曲线下面积(AUC)评价机器学习分类的性能。
结果： 127 例患者中 54 例(42.52%)达到 pCR。据基线 DCE-MRI 增强后第一期图像、DCE-MRI 四期图像分别提取 107、1316 个组学特征。基于增强后第一期图像建立的分类模型中 logisitic regression 具有最大曲线下面积（Area Under Curve, AUC），其预测 pCR 的准确率、敏感性、特异性、AUC 值分别为 68.5%、0.52、0.81、0.69。基于 DCE-MRI 时间序列特征的分类模型中线性支持向量机(SVM)的 AUC 最大，其预测 pCR 的准确率、敏感性、特异性、AUC 值分别为 79.5%、0.74、0.84、0.84。
结论： 基于 DCE-MRI 时间序列组学特征的机器学习模型在预测 HER2 阳性浸润性乳腺癌 NAT 后疗效方面具有潜在的价值。

PU-3244

X 线摄影联合 DCE-MRI 对非肿块乳腺可疑钙化的诊断价值分析

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中文摘要：目的　通过分析非肿块乳腺可疑钙化形态及分布特点，探讨 X 线摄影联合 DCE-MRI 对乳腺癌的诊断灵敏度。方法　回顾性分析 50 例经手术或穿刺病理证实的非肿块乳腺可疑钙化，分别通过对病变在 X 线摄影及 DCE-MRI 的影像特征进行分析，以病理为参照，进一步判断二者对良恶性病变的敏感度。 结果　50 例均行 X 线检查，细小多形性钙化 18 例，无定形钙化 16 例，细线样或细分枝状钙化 13 例，粗糙不均质钙化 3 例，段样分布 21 例，区域性分布 22 例，团簇状分布 7 例，诊断准确率 92%；41 例行 MRI 检查，成簇环状强化 26 例，集簇状强化 7 例，不均匀强化 4 例，弥漫点状强化 2 例，无异常强化 2 例，以段样分布（21 例）和区域分布（7 例）为主，诊断准确率 100%， BI-RADS 分类 5 类的 30 例（81%），X 线 BI-RADS 分类 4C 及 5 类的 20 例（43%），DCE-MRI 对恶性病变的灵敏度高于 X 线摄影，并且具有更高的诊断准确率。结论 对于非肿块乳腺可疑钙化病变，X 线摄影联合 DCE-MRI 可以提高诊断准确率，避免过度治疗，同时提高对恶性病变的灵敏度，为临床提供进一步的参考。

PU-3245

乳腺浸润性筛状癌 MRI 影像学表现

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摘要：目的：通过观察分析乳腺浸润性筛状癌的磁共振图像，总结其特征性影像学表现，提高对该疾病的认知及诊断水平。**方法**：收集于我院做乳腺磁共振检查并手术病理证实的 9 例乳腺浸润性筛状癌病例，回顾性分析其 MRI 特征性影像学表现。**结果**：9 例病例中单纯性 5 例，混合型 4 例；7 例表现为不规则肿块，可见毛刺，2 例表现为卵圆形肿块，边界清楚；9 例均为 T1WI 低信号，T2WI 呈稍高信号，部分中心见类圆形及不规则长或短 T2 信号，DWI 呈结节及环形高信号，病灶实性成分信号均匀一致，强化程度均匀一致，7 例病灶中心见小圆形或不规则形无强化及低强化区，病灶整体呈现为厚环状强化，笔者称其为“甜甜圈征”，考虑此为其特征性表现，2 例病灶过小尚未表现出特征性改变，TIC 曲线多为Ⅱ、Ⅲ型，ADC 值平均值约 0.83 单位。**结论**：乳腺浸润性筛状癌在 MRI 影像表现上有一定的特征性，影像学早期明显诊断对临床优化治疗方案有重要的辅助作用。

PU-3246

乳腺癌患者月经周期不同时期的 DWI 表现特征

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目的：研究乳腺癌患者月经周期不同时期的 DWI 表现的差异，探讨其 ADC 值与月经周期之间的关系，以指导临床有针对的选择乳腺癌患者 MR DWI 的检查时间。方法：回顾性纳入 2016 年 1 月至 2018 年 12 月于我院放射科行 MR DWI 检查的乳腺癌患者 495 例，将所有患者按行 MR DWI 检查时所处的月经周期时期分为月经期、增殖期及分泌期，测量患侧病灶最大层面的最小 ADC 值及健侧相同层面乳腺实质的平均 ADC 值。采用方差分析比较乳腺癌患者 ADC 值与月经周期不同时期之间的差异。结果：乳腺癌患者月经期病灶的最小 ADC 值和乳腺实质的平均 ADC 值分别为：$(0.92\pm0.15)\times10^{-3}mm^2/s$、$(2.01\pm0.20)\times10^{-3}mm^2/s$；增殖期分别为：$(0.85\pm0.13)\times10^{-3}mm^2/s$、$(1.97\pm0.18)\times10^{-3}mm^2/s$；分泌期分别为：$(0.88\pm0.11)\times10^{-3}mm^2/s$、$(1.98\pm0.15)\times10^{-3}mm^2/s$。乳腺癌患者病灶的最小 ADC 值在不同的月经周期当中有统计学差异($P<0.05$)，而健侧乳腺实质的

平均 ADC 值无统计学差异(P＞0.05)。结论：对乳腺癌患者行 MR DWI 检查时应考虑到月经周期因素对乳腺癌患者 ADC 值的影响，避免对疾病准确诊断的干扰。

PU-3247
MRI 影像组学肿瘤最大强化体积预测乳腺癌新辅助治疗早期无复发生存

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背景：本研究的假设是基于 MRI 的影像组学可以在乳腺癌新辅助化疗早期就预测无复发生存率。
材料 一个基于动态对比增强 MR 图像的可行性的子集被用来分析所有进行治疗前基线检查的患者的图像(141 位女性患者：40 位有复发，101 位无复发）和在结束第一轮化疗之后，即，处于早期治疗阶段的患者的图像(143 位女性患者：37 位有复发,105 位无复发)．我们的方法为完全自动化，不存在人为定位肿瘤大致中心的情况。增强最明显的肿瘤容积(METV) 已被自动化计算，用于治疗前和早期治疗实验.METV 在本课题（即预测复发情况）中的表现则通过 ROC 分析来评估.无复发生存率和 METV 之间的关系则通过控制了患者年龄，种族，以及激素受体水平的 Cox 回归模型来评价，并通过 C-statistics 来评估．Kaplan-Meier 分析则被用来预估残存函数.
结果：在 C-statistics 上， METV 和无复发生存率的关联值是 0.69（治疗前）， 95%置信区间[0.58；0.80] 和 0.72 [0.60；0.84]（早期治疗）．由 Kaplan-Meier 曲线计算得来的早期治疗的 METV 的危机比值分别为：下四分位数 2.28 [1.08；4.61],中四分位数 3.43 [1.83；6.75],上四分位数切割点 4.81 [2.16;10.72]
结论：自动化 METV 计算的表现可以媲美为 ACRIN 6657 研究(C-statistic 0.72 [0.60；0.84])准备的半人工模型,它包含了相同的数据集但是获得了对功能性肿瘤容积 (FTV)的半人工勾画以及术前残余癌症负担相关知识。

PU-3248
乳腺磁共振弥散加权成像联合动态增强扫描预测肿瘤恶性度、组织学分级与复发

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目的：探讨弥散加权成像（DWI）中表观扩散系数（ADC）联合动态增强磁共振成像（DCE-MRI）在乳腺癌病理分型及复发中的价值。
材料与方法：本研究为 IRB 批准的回顾性分析，选取 2016 年 10 月至 2019 年 3 月期间，956 名接受乳腺 MRI 检查的患者，其中在 111 名患者中检测到 156 个 BIRADS 分级在 4、5 或 6 级的病变。采用 DCE-MRI 分别进行 B0、B100、B600、B1000 的 DWI 成像。两位接受过相关培训的放射科医生记录 ADC 图像与数值。平均 ADC 值和信号强度（SI）与肿瘤分期、组织学分级、激素受体（ER、PR 和 HER-2）和 Oncotype DX 评分（如有）相关，P ≤0.05 结果具有统计学意义。

结果：156 例病变中，良性病变 59 例(38%)，导管原位癌 24 例(15%)，浸润性导管癌（IDC）47 例(30%)，浸润性小叶癌（ILC）15 例(10%)，粘液性癌（MC）2 例(2%)，混合性导管癌 5 例(5%)，其他 4 例(4%)，包括管状和罕见的恶性肿瘤。恶性肿瘤的平均 ADC 值明显低于良性病变（1085×343×10-6 vs 1481×276×10-6 mm 2/s），具有很高的预测性（曲线下面积=0.82）。此外，具有 PR 阴性和 Oncotype 评分 18（复发率为中到高风险）的肿瘤 ADC 值显著降低。B100 和 B600 的 SI 有助于区分良性病变与 IDC。ADC 值与肿瘤分级或 ER/Her2 状态无显著相关性。
结论：ADC 值是鉴别肿瘤良恶性、Oncotype 评分较高的肿瘤和 PR 阴性的重要因素。因此，它可以作为辅助临床医生制定治疗方案一个重要的工具。

PU-3249
以不规则肿块表现的导管内乳头状瘤的 MR 诊断分析与病理对照研究

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目的：探讨不规则肿块型导管内乳头状瘤（IDP）的 MRI 影像表现和特征，提高 MRI 的诊断率。**方法：**本研究回顾性纳入了 48 例经手术病理证实为 IDP 的患者，分析了包括病灶大小、边界、性质、平扫信号强度、强化方式、ADC 值及 TIC 曲线在内的 MRI 表现。**结果：**病变最大径范围约 0.6cm~5.0cm，平均(1.35±0.81)cm；病灶边界清楚者 22 例、模糊 26 例；病灶性质为囊性者 1 例、实性 27 例、囊实混合 6 例、实性，边缘伴斑点状囊变区 14 例；T2WI 呈等信号者 18 例、稍高或高信号 30 例；ADC 值范围约(0.68~2.1)×$10^{-3}$$mm^2$/s，平均(1.03±0.23)×$10^{-3}$$mm^2$/s；伴导管扩张者 15 例；增强扫描均匀强化 8 例、不均匀强化 13 例、环形强化 26 例、向心性强化 1 例；TIC 曲线达峰时间范围约 1min20s~5min，平均 2min±30s；术前 MR 诊断准确率为 29.2%，误诊为乳腺癌的概率为 56.3%，误诊为纤维腺瘤的概率为 14.6%。**结论：**不规则肿块型 IDP 术前易误诊为乳腺癌，但具备实性病灶边缘伴斑点状囊变区、邻近导管扩张、早期环形强化、曲线达峰时间早的 MR 征象者，提示其为 IDP 的可能性较大。

PU-3250
基于机器学习方法的多参数磁共振对早期预测乳腺癌患者新辅助化疗疗效价值研究

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目的 本研究的目的是评价基于机器学习方法的多参数磁共振成像（mpMRI）早期预测新辅助化疗（NAC）后乳腺癌病理完全缓解（pCR）患者的生存率。
材料与方法 本研究是经伦理审查委员会批准所进行的前瞻性研究。入组患者选取 80 名计划接受 NAC 乳腺癌女性患者（年龄中位数 45.5 岁；年龄范围 25-70 岁）。2 次 NAC 循环前后分别进行 3T mpMRI 包括动态对比增强（DCE）、扩散加权成像（DWI）和 T2 加权成像。针对每个病变提取 23 个图像特征：根据 BI-RADS 分级定性分析 T2 加权及 DCE-MRI 图像，同时定量分析 DCE 药代动力学特征和 DWI 表观扩散系数（ADC）值。将机器学习应用到 mpMRI，采用线性支持向量机、线性判别分析、logistic 回归、决策树、自适应增强和极端梯度增强（xgboost）等 8 个分类器对特征进行排

序。根据 RCB 类、RFS 和 DSS 所定义的 pCR 所提取的定性和定量特征，采用递归特征消除法，对接收操作特性曲线(AUC)下面积的分类精度进行评估。

结果 用 mpMRI 进行机器学习取得了稳定的性能，如基于 xgboost 的 RCB 类（AUC，0.86）和 DSS 类（AUC，0.92）预测的平均分类精度及基于 logistic 回归的 RFS（AUC，0.83）预测的平均分类精度。与其他分类器相比，XGBoost 分类器性能最稳定，精度较高。预测 RFS 最相关特征如下：体积分布、平均血浆流量和平均通过时间；DCE-MRI 病变大小；DWI 的最小、最大和平均 ADC 值。预测 DSS 最相关的特征如下：DCE-MRI 上病变大小，体积分布和平均血浆流量，以及 DWI 下的最大 ADC 值。

结论 基于机器学习方法的 mpMRI，可以早期精准的预测新辅助化疗（NAC）后乳腺癌病理完全缓解（pCR）患者的生存率，以辅助临床医师适时调整治疗方案和评估预后。

PU-3251

乳腺癌复发风险的磁共振图像影像组学特征

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目的：通过研究由计算机提取而来的乳腺核磁图像表型与 MammaPrint, OncotypeDX,PAM50 的多基因试验的关系来评价影像组学在评估乳腺癌复发风险中的作用。

材料与方法：分析基于经机构审查委员会批准的 84 组去识别且多机构的回顾性数据集。这些数据集来自美国国家癌症研究所癌症影像档案库的乳腺核磁试验,和来自肿瘤基因图谱计划的临床, 组织病理学, 基因组数据。这些已经活检证实为侵袭性乳腺癌的数据集包括 74 例 (88%)导管癌, 8 例 (10%) 小叶癌,2 例 (2%) 混合型.这其中, 73 (87%)为雌激素受体阳性, 67 (80%) 为孕激素受体阳性, 19 (23%)为人类表皮因子受体 2 阳性.在每个案例中, 经计算机处理的 MR 图像的影像组学都可以得到经计算机提取的如大小, 形状, 边缘形态,增强纹理, 动态评估的肿瘤表型。回归以及受试者操作特征分析则被用来评价与多基因检测分类相关的核磁影像组学特征的预测水平。

结果：多重线性回归分析表明影像组学特征和多基因检测复发评分（multigene assay recurrence scores）之间存在巨大联系 (R2 =0.25-0.32, r = 0.5-0.56, P < .0001). 重要的影像组学特征包括肿瘤大小和强化纹理（enhancement texture）, 表明了肿瘤的异质性. 通过在区分乳腺癌预后的课题中使用影像组学的方法，我们得到了受试者操作特征曲线下的面积值分别为：MammaPrint：0.88 (标注误差, 0.05)Oncotype DX：0.76 (标注误差, 0.06) , PAM50 基于亚型的复发风险：0.68 (标注误差, 0.08), 以及 PAM50 基于亚型与增殖的复发风险：0.55 (标注误差, 0.09),后者还可以显示除了数据上的区别。

PU-3252

Diagnostic Performance of Whole-lesion Apparent Diffusion Coefficient Histogram Analysis Metrics for Differentiating Benign and Malignant Breast Lesions: A Systematic Review and Diagnostic Meta-analysis

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Purpose: To evaluate the performance of whole-lesion ADC histogram analysis metrics for differentiating benign and malignant breast lesions.
Material and Methods: A systematic PubMed/Embase/Cochrane electronic database search was performed for original diagnostic studies from January 1, 1970 to January 2, 2019. Summary estimates of diagnostic accuracy were generated and meta-regression was performed to explore sources of heterogeneity according to study and magnetic resonance imaging characteristics.
Results: Five original articles involving 493 patients were included in the meta-analysis. The pooled sensitivity and specificity of whole-lesion ADC histogram analysis were 0.85 (95% CI: 0.81－0.89) and 0.79 (95% CI: 0.72－0.84) respectively for distinguishing benign and malignant breast lesions. The area under the curve (AUC) was 0.9178. No publication bias was detected (p=0.51). In subgroup analysis, the summary sensitivity and specificity of 50th percentile ADC value were 0.81 (95% CI, 0.71－0.88) and 0.86 (95% CI, 0.74－0.94) respectively. Meta-regression analysis indicated no covariates were sources of heterogeneity (p＞0.05).
Conclusion: Whole-lesion ADC histogram analysis demonstrated good diagnostic performance for differentiating between benign and malignant breast lesions, with 50th percentile ADC value showing higher diagnostic accuracy than other histogram parameters. Given the limited number of studies included in the analysis, the findings from our meta-analysis will need further confirmation in future research.

PU-3253

基于常规 MRI 图像的纹理分析鉴别乳腺的良恶性肿物

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目的 探讨常规 MRI 序列纹理分析对鉴别乳腺良恶性肿物的可行性。方法 回顾性分析经病理证实为乳腺良性肿物 12 例（纤维腺瘤、乳腺腺病伴良性叶状肿瘤、纤维腺瘤伴粘液变性）和乳腺恶性肿物 6 例（浸润性导管癌、血管肉瘤）患者的术前 MRI 资料。采用 MaZda 软件手动勾画感兴趣区，提取出 T1WI、T2WI-IDEAL 图像中病灶的纹理特征参数，然后通过 Fisher 系数法、分类错误概率联合平均相关系数（POE+ACC）、交互信息（MI）以及三种方法联合（F+PA+MI）分别对其进行筛选，得到最佳纹理参数集合，并使用软件自带的特征分类法包括原始数据分析（RDA）、主要成分分析（PCA）、线性判别分析（LDA）和非线性判别分析（NDA）对两类疾病进行判别；同时由 2 名影像诊断医生通过视觉对 T1WI、T2WI-IDEAL 图像中病灶进行判别，结果以误判率表示。比较两种不同扫描序列的纹理分析参数及医师之间对两类病变的判别能力。结果 纹理分析参数选择方法中，Fisher 系数、POE+ACC、MI 对乳腺良恶性肿物的误判率相近，NDA 的误判率明显低于其他分类方法，其中 T2WI-IDEAL 图像的 NDA（最低误判率 0.00%）的判别能力最强；T2WI-IDEAL 图像的纹理分析参数的误判率（0.00%-5.50%）总体低于 T1WI 图像（8.33%-11.29%），但二者均高于医师的判别（16.67%）。结论 基于常规 MRI 的 T1WI、T2WI-IDEAL 序列的纹理分析有助于鉴别乳腺肿物的良恶性。纹理分析分类方法中，NDA 具有最优的诊断效能，这可能与医学图像本身纹理的复杂性有关。T2WI-IDEAL 序列显示出更高的鉴别能力，可能是由于 T2WI-IDEAL 图像对显示病灶组织有较好的对比度。综上，常规 MRI 图像的纹理分析可用于乳腺良恶性肿物的鉴别诊断。

PU-3254

超声及 MRI 对乳腺癌的诊断与鉴别诊断

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乳腺癌的早期诊断、及时治疗至关重要，可以避免其进一步进展，而临床上诊断、鉴别乳腺肿瘤的影像学检查方法，主要包括超声、钼靶、磁共振成像（MRI）等检查方法。 本研究对本院 60 例乳腺肿瘤患者进行超声检查及 MRI 检查，详细两种检查方法对乳腺癌的诊断结果。
资料与方法
一般资料：选取本院 2017 年 1 月至 2019 年 4 月收治且术后病理确诊的 60 例乳腺癌患者进行回顾性研究， 病史均为发现乳腺肿块、乳房异常溢液而来我院就诊，均为女性患者，乳腺癌为初步诊断，年龄 35~67 岁，平均为（48±15）岁。 检查前详细询问病史、过敏史，告知患者检查方法、步骤及注意事项，完善检查前的各项准备并知情同意。
方法：60 例乳腺肿瘤患者依次进行了双侧乳腺的超声扫描及西门子 3．0 T 高分辨 MRI 扫描。对两组受检者进行检查诊断时采用高频多普勒超声诊断仪，探头频率可调节。MRI 扫描采用西门子 3．0 T 超导磁共振扫描仪，患者体位为俯卧位，双乳自然垂于线圈中心，训练患者自由平静呼吸。
手术病理诊断结果作为诊断的金标准，分析、对比超声和 MRI 检查方法对乳腺癌诊断的灵敏度、特异度、准确性。
结果：超声检查对乳腺肿瘤性质诊断的灵敏度、特异度、准确性依次为 82%（28/34）、77%（20/26）、80%（48/60）， 均低于 MRI 检查诊断结果的 97%（31/34）、96%（25/26）、99%（58/60）。
结论：MRI、超声检查的诊断结果与术后病理诊断结果之间的一致性比较：一致性系数依次为 0．748、0．563，超声低于 MRI；MRI 检查的诊断结果与术后病理诊断结果之间的一致性良好，而超声检查诊断结果与术后病理诊断结果仅有中等水平的一致性。

PU-3255
不同指数模型 DWI 鉴别 BI-RADS 4 类乳腺病变良恶性的价值

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目的 探讨单指数模型参数、双指数模型参数及拉伸指数模型参数在鉴别乳腺影像报告和数据系统（BI-RADS）4 类病变良恶性的价值。**方法** 回顾性分析 MRI 诊断为 BI-RADS 4 类病变，并取得病理结果的 86 例乳腺病变患者（良性组 40 例，44 个病灶，恶性组 46 例，51 个病灶）。所有患者均行 MRI 常规检查及多 b 值 DWI 检查，获得单指数模型、双指数模型及拉伸指数模型各参数。比较各参数在 BI-RADS 4 类病变良恶性中的统计学差异，绘制受试者工作特征（ROC）曲线，评价各参数对 BI-RADS 4 类病变良恶性的诊断效能。**结果** 良性组、恶性组间表观扩散系数(ADC)、慢速表观扩散系数(slow ADC)、灌注分数(f)、扩散分布指数(DDC)及扩散异质性指数(α)值均存在统计学差异（$p<0.05$）。ADC、slow ADC、f、DDC 和 α 的 AUC 分别为 0.911、0.845、0.814、0.938、0.619。 ADC、slow ADC、f、DDC 和 α 的最佳诊断阈值分别为 $1.20\times10^{-3}mm^2/s$、$0.88\times10^{-3}mm^2/s$、0.277、$1.18\times10^{-3}mm^2/s$ 和 0.816，其鉴别良恶性病变的敏感度分别为 81.8%、72.7%、79.5%、84.1%、77.3%，特异度分别为 96.1%、92.2%、78.4%、98.0%、56.9%。**结论** 单指数模型参数 ADC，双指数模型参数 slow ADC、f 值，以及拉伸指数模型参数 DDC、α 对于 BI-RADS 4 类乳腺病变良恶性的鉴别都具有较高的价值，其中拉伸指数模型 DDC 的诊断效能最大。

PU-3256
影像组学预测乳腺癌分子分型及相关生物学标志物的研究进展

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目的：目前，乳腺癌分子分型及相关生物学标志物的检测主要是依靠有创手段取得病理组织并进行免疫组化获得。影像组学能从影像图像中高通量地提取并分析大量高级且定量的影像学特征，本文旨在研究影像组学作为无创手段辅助诊断乳腺癌分子分型及其他相关标志物的研究进展，探讨影像组学代替常规免疫组化诊断的可能性。
方法：检索使用放射组学方法对乳腺癌分子分型及相关生物学标志物进行研究的相关文献，评估放射组学在乳腺癌分子分型及相关生物学标志物预测中的作用。
结果：在 MRI 上，T2WI、DCE-MRI、DWI 的 ADC 图影像组学对不同亚型乳腺癌均有较好的预测作用，T2WI 和 DCE-MRI 影像组学对 HER-2、Ki-67 有较好的预测能力，MRI 提取的背景实质增强（BPE）特征也能在部分亚型乳腺癌中发挥预测作用；在乳腺 X 线摄片上，影像组学对鉴别三阴性乳腺癌与非三阴性乳腺癌有较好的准确性。
结论：影像组学对明确诊断乳腺癌分子分型及 Ki-67、HER-2 有较高的特异性和敏感性，是乳腺癌精准影像医学的重要组成部分，对临床诊断和治疗乳腺癌有较好的辅助作用。

PU-3257
ADC 值对乳腺癌 ki-67 指数表达价值的研究

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摘要：目的 初步探讨乳腺癌 ADC 值与 ki-67 指数表达的关系。
方法 回顾性分析 120 例手术证实的乳腺癌术前 DWI 图像（b=0，800，1000 s/mm^2），并测量其 ADC 值，计算 ADC 值与 ki-67 指数的相关性。根据 ki-67 指数的不同分为 A 组(低 ki-67 组，n=60)和 B 组（高 ki-67 组,n=60），比较两组之间的 ADC 值并采用 ROC 曲线分析 ADC 值鉴别的能力。
结果 乳腺癌测量的 ADC 值与 ki-67 指数呈明显负相关性（$r_{b\,值\,800}$=-0.587，$r_{b\,值\,1000}$=-0.63，P<0.05）。相同 b 值下，B 组的平均 ADC 值明显低于 A 组(P<0.05)。b 值为 1000s/mm^{2}时的平均 ADC 值低于同组 b 值 800s/mm^{2}的平均 ADC 值。当 b 值为 800 和 1000s/mm^{2}时，分别以 ADC 值 1954、1521（×10^{-6}mm^2/s）为临界值，鉴别诊断 A、B 组乳腺癌的 ROC 曲线下面积分别为：0.914、0.944，敏感度分别为：73.3%、83%，特异度分别为：95%、91.7%。
结论 ADC 值对乳腺癌 ki-67 指数的表达有重要的预测价值。

PU-3258
乳腺梭形细胞癌一例

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目的 报道一例乳腺梭形细胞癌的 MRI 表现。方法 使用 GE 1.5T 核磁共振行乳腺 MRI 平扫、扩散加权成像（DWI）及多期动态增强检查，扫描方案：Ax：T2WI-STIR，T1WI，DWI，FSPGR 序列

（VIBRANT）；Sag：fs-T2WI。扫描参数：FOV 32cm；层厚 5mm；T1WI：TE 8ms，TR 480ms；T2WI-STIR：TE 48ms，TR 8200ms； fs-T2WI：TE 83ms，TR 3820ms；DWI（b=1000）：TE 75ms，TR 8800ms；动态对比增强扫描：TR 4.6ms，TE 2.2ms，层厚：2.0mm，无间隔扫描，共扫描 8 个时相（第 1 个时相为蒙片，对比剂注射后 10s 开始扫描第 2-8 时相，每个时相扫描时间 68s）。结果 MRI 表现：右乳外上象限类圆形长 T1 中等 T2 信号影，病变边缘呈环形长 T2 信号影，DWI 上内可见不规则片絮状弥散受限高信号，ADC 值范围约为（1.4-1.5）$\times 10^{-3}mm^2/s$。动态增强扫描后，病变呈环形明显强化，大部分壁尚光整，局部呈开环形未强化；于第 3 期达强化最高峰，动态增强时间信号强度曲线呈平台型。病理：（右乳）梭形细胞化生性腺癌 结论 乳腺梭形细胞癌(Spindle cell carcinoma，SpCC)属于较为罕见的病理类型。2012 年 WHO 乳腺肿瘤分类将梭形细胞癌归为乳腺化生性癌的一个亚型。SpCC 发病率极低，占所有乳腺癌的 0.024%～0.5%。其主要临床表现为无痛性单发乳腺肿块，具有快速增生的特性，内部组织坏死可引起囊性变。影像学多表现为实质性占位病变，无特异性。多数病例表现为良性肿瘤的特征。本例系患者无意发现乳腺肿块，在乳腺 MRI 上呈环形长 T2 信号影，动态增强扫描呈环形强化，动态增强时间信号强度曲线呈平台型，具有一定特征性。因此，了解本病的 MRI 表现，有助于乳腺少见病变的良恶性鉴别，对临床的诊治具有重要意义。

PU-3259
磁共振多参数联合对局部进展期乳腺癌新辅助化疗后病理反应的预测价值

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目的 分析磁共振参多参数联合对局部进展期乳腺癌新辅助化疗（NAC）后病理反应的诊断效能。**方法** 回顾性分析经穿刺病理确诊的局部进展期乳腺癌患者 50 例，于 NAC 前、4-6 周期后行 DCE-MRI 及 DWI 检查，按 Miller&Payne 改良病理分级分为组织学显著反应（MHR）组（19 例）、组织学非显著反应（NMHR）组（32 例）。采用 t 检验分析 NAC 前肿瘤最大径、ADC 值、早期强化率、最大强化率及 NAC 后上述参数变化率在两组间的差异。对 NAC 后 MHR 与 NMHR 组有差异的变量，绘制 ROC 曲线，探讨各参数对病理反应的诊断效能。利用二元 Logistic 回归选择与病理反应相关的变量，并拟合出新的联合参数，探讨联合参数对病理反应的诊断效能。**结果** NAC 前，肿瘤最大径、ADC 值、早期强化率、最大强化率在 MHR 组与 NMHR 组间差异均无统计学意义（P>0.05）；NAC 后，肿瘤最大径变化率、ADC 值变化率、早期强化率变化率、最大强化率变化率在两组间差异有统计学意义（P<0.05）。肿瘤最大径变化率、ADC 值变化率、早期强化率变化率、最大强化率变化率对病理反应的 ROC 曲线下面积（AUC）分别为 0.776、0.873、0.733、0.820，联合参数的 AUC 为 0.944，优于单个参数的诊断效能。**结论**：MRI 形态学与功能学参数联合对局部进展期乳腺癌 NAC 后病理反应的诊断效能优于单个参数。

PU-3260
利用 MRI 动态增强纹理特征预测不同分子亚型乳腺癌

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目的：利用磁共振纹理分析来区分不同分子亚型乳腺癌。 材料及方法：回顾性分析 353 例经病理证实为乳腺浸润性导管癌患者的临床资料及 MRI 图像，根据免疫组化或荧光原位杂交结果分为 Luminal A 型、Luminal B 型、人类表皮生长因子受体 2(human epidermal growth factor

receptor-2，HER-2)过表达型与三阴型(triple-negative breast cancer,TNBC)四型，利用第三方软件在动态增强强化最明显一期手动勾画病灶，所有层面融合为三维感兴趣区并提取纹理特征，采用秩和检验和单因素 logistic 回归分析患者的临床、纹理特征，初步筛选特征，再使用多因素 logistic 回归挑选独立预测因素并建立预模型，最后用 ROC 曲线下面积 AUC 评估模型的预测效能。 结果：Luminal A 型 90 例，Luminal B 型 115 例，HER-2 过表达型 66 例，TNBC 型 82 例。通过单因素分析初步筛选出 25 个特征，再进行多因素 logistic 回归分析，分别找出各分子亚型的预测因素并建立预测模型。获得了鉴别 Luminal A 型与非 Luminal A 型、Luminal B 与非 Luminal B 型、HER-2 过表达型与非 HER-2 过表达型、三阴型与非三阴型的最佳模型，AUC 值分别为 0.811、0.604、0.770 和 0.741，且模型拟合效果均较好。 结论：基于动态增强 MRI 纹理特征能够区别不同分子亚型乳腺癌，其中对 Luminal A 型的鉴别能力最佳。

PU-3261

延迟期环形强化乳腺癌的组织病理学特征分析

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目的：探讨在乳腺 DCE-MRI 中表现为肿块、且内部强化特征为延迟期环形强化的乳腺癌的组织病理学特征。
方法：收集我院 2015 年 1 月至 2018 年 12 月行乳腺 3.0T MRI 检查，MRI 表现为肿块，经手术或活检穿刺病理证实为乳腺癌，并有与分子分型相关的免疫组织化学检查结果的患者纳入本研究。根据 DCE-MRI 上是否具有环形强化特征以及环形强化出现的时相将其分为 3 组：延迟期环形强化组，早期环形强化组和非环形强化组。采用卡方检验和非参数秩和检验，比较延迟期环形强化组与早期环形强化组、非环形强化组的组织病理学上的差异。
结果：共纳入 181 例肿块型病变，其中延迟期环形强化组 40 例，早期环形强化组 31 例，非环形强化组 110 例。三组中最常见的病理类型均为浸润性导管癌，但是所纳 7 例髓样癌均表现为延迟期环形强化，4 例导管原位癌均表现为非环形强化，延迟期环形强化组与早期环形强化组、非环形强化组病理类型比较均具有显著性差异（P＜0.000，P=0.044）。免疫组织化学结果显示，延迟期环形强化组多表现为 ER 阴性表达（30/40，75%）、PR 阴性表达（36/40，90%），以及 Ki67 高表达（33/40，82.5%），与早期环形强化组（32.3%，41.9%和 58.1%）和非环形强化组（16.3%，29.1%和 52.7%）比较具有显著性差异（所有 P＜0.05）。在分子分型方面，延迟期环形强化组多为 HER-2 阳性（11/40，27.5%）和三阴性（20/40，50%），早期环形强化组和非环形强化组多为 Luminal B 型（61.3%，56.4%），而三阴性仅为 16.1%和 10.9%，具有显著性差异（P＜0.01）。
结论：在 DCE-MRI 上表现为延迟期环形强化的肿块型乳腺癌具有显著的组织病理学倾向，延迟期环形强化可以在一定程度上预测乳腺癌的激素受体表达、细胞增殖状态和分子亚型，并提示不良预后。

PU-3262

动态增强 MRI 和 DWI 对乳腺肿块样病变的诊断价值

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目的：探讨 DCE-MRl 对乳腺良恶性病变的鉴别诊断价值。方法：回顾性分析经临床手术或穿刺病理证实的 77 例乳腺肿块样病变的 MRI 影像资料，包括病灶的边缘、病灶强化特点、D1（前后径）、D2（左右径）和 D3（上下径）、TIC 类型、ADC 值，其中 45 例为乳腺癌，32 例为乳腺良性病灶，

对乳腺病变的 MRI 形态学及强化特点采用 χ^2 检验进行分析，对乳腺病变的 ADC 值比较采用两样本的 t 检验。结果：乳腺良恶性病变的 D2/D3 差异具有统计学意义（P<0.05），乳腺癌与乳腺良性病变相比，乳腺癌左右径通常大于等于上下径（D2≧D3），乳腺良性病变左右径多小于上下径（D2＜D3），D1/D2 与 D1/D3 差异不具有统计学意义；乳腺癌边缘多毛刺、不规则，乳腺良性病变边缘多光滑；乳腺恶性病灶的 TIC 类型多为 III 型，乳腺良性病灶的 TIC 多为 I 型，,其 II 型曲线在良恶性病变中均可出现差异具有统计学意义，乳腺恶性病变的 ADC 值小于乳腺良性病变，乳腺癌周围腺体的 ADC 值小于乳腺良性病灶周围腺体的 ADC 值，差异有统计学意义(P 小于 0.05)。结论：DCE-MRI、DWI 联合应用对诊断乳腺良恶性病灶具有较好的诊断价值。

PU-3263

DCE-MRI 定量参数在乳腺癌新辅助化疗疗效评价的应用价值

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目的：探讨 DCE-MRI 定量参数及相关生物学因子的表达评估乳腺浸润性导管癌术前新辅助化疗疗效的应用价值。方法：回顾性收集临床资料完整且术前行新辅助化疗的女性乳腺浸润性导管癌患者 56 例，根据 RECIST 标准分为治疗有效和无效两组，比较两组化疗前、 2 个疗程后、化疗结束时的 K^{trans}、K_{ep}、V_e 值。采用免疫组化染色法检测乳腺癌组织 ER、PR、Her-2 及 Ki-67 表达情况，并分析不同表达状态时 DCE-MRI 定量参数的大小及 DCE-MRI 定量参数与 Ki-67 表达之间的相关性。结果：治疗有效组 K^{trans}max、K^{trans}mean、K_{ep}max、K_{ep}mean 值在 2 个疗程后及化疗结束时均明显低于治疗前（P＜0.05），K^{trans}min 值在化疗结束时较治疗前明显降低（P＜0.05）。ER、PR 阴性组的 K_{ep}max、K_{ep}mean 值高于 ER、PR 阳性组（P＜0.05）；PR 阴性组的 $V_e$max 值高于 PR 阳性组（P＜0.05）。Ki-67 表达与 K^{trans}min、K^{trans}max 值及 K^{trans}mean 值呈正相关（r=0.384，P=0.003；r=0.294，P=0.028；r=0.551,P＜0.01），Ki-67 表达与 K_{ep}、V_e 值无相关性（P＞0.05）。结论：DCE-MRI 定量参数及相关生物学因子的表达可对乳腺浸润性导管癌患者新辅助化疗疗效进行评估，值得临床推广应用。

PU-3264

基于 MRI 的影像组学预测乳腺癌复发风险

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目的：评估雌激素受体阳性、淋巴结阴性乳腺癌患者的磁共振影像组学与复发风险之间的关系。
材料与方法：本回顾性研究经过机构审查委员会批准。该数据包括 298 例具有完整磁共振检查，以及临床、组织病理和基因组数据的乳腺癌病人。从每个病人的磁共振图像中提取影像组学特征。该组患者分为训练集和验证集。通过回归分析和受试者操作特征（Receiver operating characteristic, ROC）曲线分析，评价磁共振影像组学特征对 Oncotype DX 多基因检测结果的预测能力，用独立验证集数据评估模型的效能。
结果：多重线性回归分析显示影像组学与多基因检测复发评分之间存在显著相关性（R2=0.26-0.36，r=0.5-0.55，p<0.0001）。在训练集（AUC 0.89；95%CI，0.80-0.98）和验证集（AUC 0.87；95%CI，0.80-0.95）中，影像组学模型显示出良好的判别能力。

结论：基于磁共振成像的影像组学在评估乳腺癌复发风险中显示出良好的前景。

PU-3265
乳腺癌 DCE-MRI 特征及 ADC 值与相关分子生物学标记物的关系分析

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目的　探讨乳腺癌（BC）动态对比增强 MRI（DCE-MRI）特征及表观弥散系数（ADC 值）与相关分子生物学标记物的关系。方法　选取 2016 年 5 月-2018 年 1 月我院收治的 46 例乳腺癌患者为研究对象，均行 DCE-MRI 扫描检查，测定 ADC 值，免疫组化染色法检测患者分子生物学标记物[雌激素受体（ER）、孕激素受体（PR）、人表皮生长因子受体 2（HER-2）、Ki-67]阳性表达情况，并对 BC 患者 DCE-MRI 特征及 ADC 值与相关分子生物学标记物进行相关性分析。结果　以术后病理结果为金标准，DCE-MRI 诊断 BC 形态学的灵敏度 94.29%、特异度 72.73%、准确度 89.13%，BC 患者 DCE-MRI 形态学中的毛刺状边缘与 ER 阳性表达呈正相关（r=0.409，P<0.05），而与 PR、HER-2、Ki-67 阳性表达无明显相关性（P>0.05）；BC 患者 DCE-MRI 形态学中的不均匀强化与 HER-2、Ki-67 阳性表达呈正相关（r=0.461、0.268，P<0.05），但与 ER、PR 阳性表达无明显相关性（P>0.05），BC 患者 ADC 值与 Ki-67 阳性表达呈明显正相关（r=0.345，P<0.05），但与 ER、PR、HER-2 无明显相关性（P>0.05）。结论 DCE-MRI 在 BC 患者形态学中有较高诊断效能，其 DCE-MRI 形态学特征、ADC 值与 ER、HER-2、Ki-67 阳性表达密切相关。

PU-3266
乳腺叶状肿瘤的影像学表现及病理对照分析

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摘要：目的 评价乳腺叶状肿瘤（PTs）影像学表现与病理组织学的相关性，旨在提高对 PTs 的术前正确诊断率。**方法** 回顾性分析 42 例经手术病理证实为 PTs 患者的临床及影像学资料， 42 例均行钼靶 X 线检查，其中 25 例行 MRI 检查，并与其病理学结果相对照分析。**方法** （1）42 例 PTs 患者共 43 个病灶，病理学分级为良性、交界性及恶性分别为 32.6%（14/43）、46.5%（20/43）、20.9%（9/43）；其病灶的最大直径、形态、边缘及密度在良性、交界性及恶性差异上无统计学意义（P>0.05）。（2）病灶内是否存在点状、粗大钙化在不同病理类型中差异有统计学意义（P<0.05）。（3）在 25 例 PTs 患者（包括良性 14 例，交界性 20 例，恶性 9 例）的 MRI 图像中，三者在 T_2WI 无强化低信号分隔、T_1WI 病灶内高信号（提示出血）、ADC 值减低、坏死囊壁不规则及 TIC 流出型方面差异均有统计学意义（P <0.05）。**结论** 乳腺叶状肿瘤的 X 线及 MRI 表现均具有一定特征性，综合其临床特点分析，可提高术前诊断正确率；并且 MRI 的一些特殊征象对判断叶状肿瘤的病理亚型有一定的价值。

PU-3267

乳腺 MRI 背景实质分型及强化对乳腺癌的辅助诊断价值

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目的:乳腺 MRI 诊断结合病灶本身影像学特征，探讨乳腺背景实质的分型及强化（ BPE）对病灶的辅助诊断价值。
方法 回顾性分析在我院行乳腺 MRI 检查并经手术病理证实的 28 例乳腺癌和 23 例乳腺良性病变患者的临床及影像资料，分别对其平扫及动态对比增强表现进行评估，绘制时间-信号强度曲线，判断其敏感性、特异性。不考虑患者的月经周期，参照美国乳腺影像报告数据系统（ BI-RADS）对乳腺腺体实质密度（ FGT）及 BPE 进行分级。统计病例组及对照组的病变增强强化方式、BPE 强化程度、FGT 之间有无差异。
结果（ 1）平扫：良性病变为边界较清、形态规则肿块，部分其内可见分隔，信号尚均匀，为稍长 T1、T2 信号影；而乳腺癌为界限不清、分叶状肿块，伴毛刺，为不均匀稍长 T1、T2 信号影。（ 2）动态对比增强：良性病变多为缓慢渐进较均匀强化或离心性强化，Ⅰ、 Ⅱ、 Ⅲ型曲线分别为 9 例、10 例、4 例；恶性病变为不均匀、环形强化或向心性强化，Ⅰ、 Ⅱ、 Ⅲ型曲线分别为 2 例、3 例、23 例，诊断敏感性 91% 、特异性 82%，差异有统计学意义（ P ＜ 0．05）。（ 3)BPE 强化程度 4 个级别中良性病变分别为 5 例、7 例、8 例、3 例，乳腺癌分别为 2 例、5 例、7 例、14 例，二者间差异有统计学意义（ P ＜ 0．05）；FGT 无明显差异（ P ＞ 0．05)。
结论 乳腺 MRI 病灶的形态学改变及动态增强强化特点对乳腺癌的诊断价值较高，背景实质强化则具有一定的辅助诊断价值。

PU-3268

微小乳腺癌的 X 线及动态磁共振影像学表现

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目的 探讨微小乳腺癌的 X 线及动态 MRI 影像特点，提高术前影像诊断水平。 **材料与方法** 对 60 例经手术病理证实直径≤1cm 的微小乳腺癌的 X 线及 MRI 影像进行回顾性研究。 **结果** 60 例微小乳腺癌病灶位于左乳和右乳例数分别为 38 例和 22 例。病理结果显示 54 例为单灶，6 例为多灶（≥2 处癌灶，直径均小于 1cm）。其中浸润性导管癌 21 例，导管内癌伴微浸润 26 例，浸润性癌非特殊性 5 例，小叶原位癌 2 例，浸润性乳头状癌、浸润性小叶癌、神经内分泌癌、粘液腺癌、导管内乳头状瘤伴导管原位癌，硬化性小管癌伴导管原位癌各 1 例。在乳腺 X 线中，表现为肿块征象 16 例，微小钙化 9 例，局灶非对称性致密 7 例，结构扭曲 6 例，致密型乳腺中无明显异常征象 22 例。X 线 BI-RADS 分类 3 类、4A 类、4B 类、4C 类分别占 30%，53.33%，11.67%，5%。在 MRI 中测得病灶大小介于 0.4×0.4cm-1.6×1.1cm 之间；术后病理结果显示病灶大小直径 0.2cm-1.0cm。增强显示强化均匀占 30%（18/60），强化不均匀占 70%（42/60）。病灶边缘光整占 30%（18/60），边缘不光整伴小毛刺改变占 70%（42/60）。TIC 为持续上升型、平台型及廓清型分别为 20 例，24 例和 16 例。5 例伴有腋窝淋巴结增大,其中 4 例为病灶同侧，1 例为对侧腋窝淋巴结增大。DWI 上表现为肿块高信号，可测得 ADC 值的为 30 例，ADC 值介于 0.758-1.58 mm^2/s 之间，平均值为 1.128±0.24 mm^2/s。MRI BI-RADS 分类 3 类、4A 类、4B 类、4C 类、5 类分别占 6.67%，23.33%，40%，25%，5%，MRI 诊断 BI-RADS 分类 4B 以上达 70%。 **结论** 动态 MRI 增强作为乳腺病变检查的一种重要影像学检查方法，结合病灶形态特征、ADC 值、重建及动态增强曲线，综合判断，必将大大提高微小乳腺癌术前诊断正确性。

PU-3269
探讨具有髓样特征浸润性乳腺癌的影像学分析

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摘要目的：探讨具有髓样特征的浸润性乳腺癌影像学特点及分子分型，以探讨其影像学特点与分子生物学特点及预后关系。方法：回顾性分析 2014 年 6 月至 2019 年 3 月，我院经手术病理证实具有髓样特征的侵润性乳腺癌 20 例，包括典型 10 例，非典型性乳腺髓样癌 10 例，分析超声、X 线特点，动态增强 MRI 评估，包括早期强化率、TIC 曲线，观察病变内部信号特点，免疫组织化学染色雌激素受体（ER）、孕激素受体（PR）和人类表皮生长因子受体 2（HER2）；同时对照组织病理学、免疫组化化学结果，t 检验，独立样本，比较病变的特点。结果：1、20 例乳腺钼靶表现为单纯肿块/局灶性不对称（75%），同侧乳腺伴有钙化 33%，钙化形态无特异性。肿块形态不规则可见分叶或边缘伴有毛刺约 25%，肿块密度较高约 50%。超声提示肿块周围血流异常约 33%。50%患者乳腺常规筛查方法钼靶及超声提示病灶与良性肿瘤形态学表现相似易误诊。其中术前 X 线评估 BI-RADS 1-3 的 12 例，BI-RADS4A 8 例。2、MRI 表现为单发肿块样强化 15 例，非肿块 5 例。肿块强化特点：其中肿块强化的病变，术前 BI-RADS 43 例，评估 ：非肿块强化病变术前 BI-RADS 3 有 6 例，4A 1 例。3、乳腺 X 线检查阳性率约 66%，准确率约 50%，乳腺超声检查阳性率约 75%，准确率 33%，MRI 检查阳性率 100%，准确率 80%，钼靶超声 MRI 联合检查可有效提高疾病检出率。4、本组资料三阴性乳腺癌例 18，非三阴性 2 例。5、其中选择保乳手术 2 例，改良根治 18 例，大于 75%的患者未行保乳手术治疗。结论：乳腺 MR 成像对伴髓样特征性的癌患者的早期诊断具有细分和参考价值，可提高早期检出率降低漏诊和误诊，多数具有髓样特征乳腺癌为三阴性，不适合选择保乳手术及新辅助化疗，尽管为孤立单发病变但可能提示预后不良。MR 增强检查对治疗方案评估及预后的判断可提供影像学支持。

PU-3270
青年女性浸润性导管癌 T2WI 特征联合 ADC 值与 Ki-67 表达相关性

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目的：探讨青年女性浸润性导管癌 T2WI 特征联合 ADC 值与 ki-67 表达相关性。
方法：选取 2018-2019 年我院就诊 13 例（≤35 岁）经手术证实的青年组浸润性导管癌患者作为研究对象。回顾性分析 MRI 平扫序列中癌组织的 T2 加权的信号特征、表观弥散系数（ADC）的值，并选取免疫组织化学方法计算出 ki-67（增殖细胞的活性）的百分比值。
结果：青年女性乳腺浸润性导管癌组织的 ADC 值范围为（0.78±0.08）10-3/㎜²，所检测的 Ki-67 的阳性表达率约为 92%。在癌组织中,T2 WI 呈现稍高信号与 Ki-67 的阳性表达率呈正相关，ADC 值与 Ki--67 在一定范围内呈负相关。
结论：青年女性浸润性导管癌 MRI 检查中 T2WI 序列信号特征多表现为稍高信号（84%）或等信号(16%)；伴随有 ADC 值下降至一定范围（＜1×10-3/㎜²），Ki-67 呈现阳性表达率显著增高。T2WI 信号特征联合 ADC 值对青年女性浸润性导管癌患者的诊断、临床治疗方法的选择及预后的预估有重要的参考价值，进而可以预测对于一些不能配合做增强扫描的患者或者对高危人群做常规筛查，T2WI 序列联合测量 ADC 值会提供重要的参考信息。

PU-3271

妊娠哺乳期乳腺癌的 MRI 价值研究

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目的：探讨妊娠哺乳期乳腺癌的临床特征及影像学检查在其诊断中的价值。
材料与方法：回顾性分析 2014 年 1 月至 2018 年 8 月期间来我院就诊的妊娠哺乳期乳腺癌（即妊娠期或产后 1 年内发现的乳腺癌）患者 95 例，其中 50 例患者行 MRI 检查，共 52 侧（2 例为双侧乳腺癌）。收集并记录患者的临床病史、病理结果、MRI 图像特点及行 X 线和超声检查的情况。
结果：50 例患者中妊娠期 8 例（16%），均于妊娠中晚期发现，哺乳期 42 例（84%），一级亲属患乳腺癌者仅 1 例（2%），二级亲属患乳腺癌者 3 例（6%）。52 侧妊娠哺乳期乳腺癌的临床分期集中在Ⅱ、Ⅲ期，共 38 侧（73%），35 例（70%）患者行新辅助化疗。病理上均为浸润性导管癌Ⅱ或Ⅲ级，ki-67 百分比较高，大于 14%者 44 侧（85%）,Luminal A、Luminal B、Her2 阳性型和三阴性乳腺癌分别为 8 例（15%）、22 例（42%）、12 例（23%）、10 例（19%）。行超声检查者 37 例（74%）；行 X 线检查者仅 12 例（24%），其中 10 例伴有钙化（83%）。MRI 的敏感性为 98%（1 例双侧乳腺癌患者漏诊），特异性 100%；肿块型 40 侧（77%），其中单发者 35 侧（88%），多发者 5 侧（13%），非肿块型 12 侧（23%），以段样分布或弥漫性分布为主，分别为 6 侧（50%）和 4 侧（33%）;T2WI 以等信号或混杂信号为主，分别占 54%和 27%；DWI 以中等度扩散受限为主，占 62%；增强扫描肿块型病变以混杂强化为主，占 65%，非肿块型病变亦以混杂强化为主，占 75%。时间-信号强度曲线均为“平台型”或“流出型”，分别占 50%和 48%（1 例患者曲线缺失）。同侧腋窝淋巴结转移比例较高，达 77%。
结论：妊娠哺乳期乳腺癌有一定的临床和影像学特征。了解这些特征，可早期诊断、避免误诊，且有助于临床治疗。

PU-3272

年轻乳腺癌分子分型与 ADC 值、KI-67 指数的相关性研究

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目的：探讨年轻乳腺癌 ADC 值与分子分型、KI-67 指数之间的相关性。方法：回顾性分析 2010 年 1 月至 2016 年 5 月间 148 例经手术病理确诊的年轻乳腺癌患者（<40 岁）术前最小 ADC 值，采用免疫组织化学检查将患者分为管腔 A 型、管腔 B 型、HER-2 过表达型、三阴性型 4 组。应用单因素方差分析、pearson 相关分析进行统计分析。结果：148 例患者平均年龄 35.22 岁，其中管腔 A 型 15 例，管腔 B 型 106 例，HER-2 过表达型 22 例，三阴性型 5 例，其最小 ADC 值分别为 $0.8327\times10^{-3}mm^2/s$、$0.8361\times10^{-3}mm^2/s$、$0.8056\times10^{-3}mm^2/s$、$0.7479\times10^{-3}mm^2/s$，KI-67 指数分别为 7.07、30.93、31.14、40.00。不同分子分型年轻乳腺癌患者间的最小 ADC 值无统计学意义。不同分子分型年轻乳腺癌中管腔 B 型、HER-2 过表达型、三阴性型的 KI-67 指数均显著高于管腔 A 型，差异有统计学意义（$P<0.05$），而管腔 B 型、HER-2 过表达型、三阴性型三者间的 KI-67 指数差异无统计学意义（$P>0.05$）。HER-2 过表达型患者的最小 ADC 值与 KI-67 指数有相关性，相关系数为 0.388（$P<0.05$）。
结论：年轻乳腺癌的最小 ADC 值对预测其分子分型表达情况尚需进一步深入研究。

PU-3273
MR 成像定量监测局部进展期乳腺癌新辅助化疗疗效的应用价值

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目的:通过对局部进展期乳腺癌新辅助化疗前后癌灶的 MRI 改变进行定量检测，从而对新辅助化疗进行疗效评价。方法：回顾性分析自 2016 年 1 月至 2018 年 10 月之间 116 例局部进展期乳腺癌患者的临床、MRI 及病理资料，所有患者均接受新辅助化疗，且满足化疗前、后均行磁共振检查，所有病例化疗后均进行乳腺癌根治手术。结果：经病理证实浸润性导管癌 94 例，浸润性微乳头状癌 10 例，浸润性小叶癌 6 例，乳腺化生性癌 4 例，黏液腺癌 2 例。治疗前有效组最大径标准差为（49.18±27.46）mm，治疗后最大径标准差为（28.46±20.28）mm，比较治疗前后有效组最大径改变有统计学意义，P =0.018，P＜0.05；治疗无效组治疗前最大径标准差为（44.45±21.27）mm，治疗后最大径标准差为（25.26±0.37）mm，比较治疗前后无效组最大径差异无统计学意义，P =0.054。治疗前有效组和无效组癌灶最大径比较差异无统计学意义，P=0.760，治疗后无效组和有效组癌灶最大径差异统计学有意义，P=0.043。结论 MRI 可以精确测量病灶大小，通过 fMRI 还可以对 NAC 的疗效进行定量评价，为临床治疗提供客观循证医学依据。

PU-3274
乳腺癌 MRI 表现及诊断价值的分析

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目的: 分析乳腺癌 MRI 表现及 X 线、MRI 两种影像学检查方法对于乳腺癌的诊断价值。
方法: 回顾分析经手术病理证实的乳腺癌患者 42 例，所有患者均行 MRI 及 X 线检查。
结果:
1.42 例患者中，18 例 X 线表现为单发的高密度肿块影，其中 15 个肿块边缘呈分叶状及毛刺征，3 个边缘光整， 部分边界清晰； 6 个肿块内可见成簇状细小钙化影； 2 个仅见斑片状成簇状钙化，未见明确肿块影； 2 例病灶大小小于 1cm， 边缘与周围腺体分界不清， X 线误诊为小叶增生，1 例病灶呈片状高密度影，边界不清，未见明确肿块， 邻近皮肤显示增厚， X 线误诊为乳腺炎； 5 例局部皮肤显示增厚，3 例乳晕显示增厚， 4 例乳头显示凹陷； 2 例腋窝淋巴结肿大。
2.在 MR 检查中， 其中 34 个病灶形态学表现为典型的恶性征象， 边缘显示不规整， 分叶有毛刺， T1WI 为低信号， T2WI 及 STIR 为稍高信号， 部分病灶内信号显示不均；6 个病灶边缘显示清晰， 肿块内信号明显不均， 3 个边界显示模糊， 内部腺体结构紊乱， 增强后病灶显示强化，动态曲线时间- 信号强度曲线为大部分为典型的流出型(33 例)， 平台型(10 例)，未见持续强化型； 本组病例 MRI 显示局部皮肤显示增厚者 7 例， 乳头凹陷者 4 例， 胸壁侵犯者 2 例； 腋下淋巴结肿大者 2 例。
3.42 例乳腺癌共 43 个灶， 在乳腺 X 线检查中， 2 个乳腺癌病灶未见明显显示， 检出率为 93.02%； 乳腺 MRI 检出 43 个病灶。上述病例中，X 线检查漏诊 2 例；与术后的病理结果比较，MRI 检查结果病理符合率较高；对于乳腺皮肤、腋窝淋巴结、及胸壁侵犯情况乳腺 MRI 优于 X 线检查。MRI 与 X 线检查对于病灶检出的价值比较， 显示前者优于后者。
结论：X 线检查对于钙化病变显示较好，可以用于早期肿块不明显而钙化明显病变的显示；MRI 对于乳腺癌病灶的检出高于 X 线摄影， 对于判断病变范围及淋巴结转移等方面也具有较大价值。总之，X 线与 MRI 联合应用有助于提高乳腺癌的诊断准确率。

PU-3275
单纯乳腺导管原位癌 MRI 特征与 HER2 表达及病理核分级的相关性研究

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目的
探讨单纯乳腺导管原位癌动态增强 MRI 影像特征与 HER2 表达及病理核分级的相关性。
方法
回顾我院 2011 年 1 月-2014 年 6 月经手术病理证实的单纯 DCIS 28 例，术前全部接受乳腺增强 MRI 检查。系统描述病变的 MRI 形态特征、早期强化率、时间信号强度曲线、ADC 值及坏死成分，分析它们与 HER2 表达及病理核分级的关系。
结果
单纯 DCIS 动态增强 MRI 形态特征主要为非肿块样强化（22/28,78.6%），以区段分布（13/28,46.4%）为主。早期快速强化为主（25/28,89.3%），时间信号强度曲线以平台型（18/28,64.3%）和流出型(9/28,32.1%)为主。平均 ADC 值约 1.29±0.12×$10^{-3}$$mm^2$/s,95%可信区间（1.24×$10^{-3}$$mm^2$/s—1.35×$10^{-3}$$mm^2$/s）。HER2 表达在高级别组和非高级别组分布差异有统计学意义（P=0.04），高级别组 HER2 阳性比例（11/18）较非高级别组（2/10）高；坏死成分在高级别组、非高级别组以及 HER2 阳性组和 HER2 阴性组分布差异有统计学意义（P=0.00、P=0.03），高级别组和 HER2 阳性组易伴有坏死成分。单纯 DCIS MRI 形态特征、ADC 值及时间信号强度曲线在各组差异无统计学意义。
结论
单纯 DCIS 动态增强 MRI 形态学表现具有相对特异性，主要表现为区段分布的非肿块样强化，早期快速强化为主，时间信号强度曲线以平台型和流出型为主。高级别 DCIS 更易表达 HER2，且更易出现坏死。

PU-3276
Correlation between MRI Characteristics of pure DCIS and HER2 expression and pathology nuclear grade

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Objectives
To investigate the correlation between MRI characteristics of pure DCIS and HER2 expression and pathology nuclear grade.
Methods
Reviewing 28 patients with pure DCIS confirmed by pathology in our hospital from Jan.2011 to Jun.2014,pre-operation all patients underwent Dynamic Contrast-Enhanced MRI.The MRI morphological characteristics,the early enhancement rate,the time-intensity curve,the ADC values and necrosis of the lesion were described

systematically,then analyze the relationships between them and HER2 expression and pathology nuclear grade.

Results

The most common morphological characteristics of pure DCIS is non-masslike reinforcement(22/28,78.6%),mainly on segment distribution(13/28,46.4%).During the initial period,the time-intensity curve mainly on rapid reinforcement(25/28,89.3%),at delayed period,mainly on plateau type(18/28,64.3%) and washout type (9/28,32.1%).The mean ADC value is 1.29±0.12×$10^{-3}mm^2$/s,95% confidence interval is 1.24×$10^{-3}mm^2$/s to 1.35×$10^{-3}mm^2$/s.The distributional difference of HER2 expression in HNG group and non-HNG group have statistical significance(P=0.04),HER2 positive proportion in HNG group(11/18)is larger than non-HNG group(2/10).Necrosis distributional difference in HNG group,non-HNG group and HER2 positive group ,HER2 negative group have statistical significance(P=0.00,P=0.03),necrosis is more easily occured in HNG group and HER2 positive group.The MRI morphological characteristics,ADC value and the time-intensity curve of pure DCIS have no statistical significance.

Conclusions

The morphological manifest of pure DCIS have relative specificity,non-masslike reinforcement,mainly on segment distribution,the time-intensity curve mainly on rapid reinforcement at the initial period,the time-intensity curve mainly on plateau type and washout type at the delayed period.HNG pure DCIS is more easily express HER2 and necrosis.

PU-3277

乳腺黏液癌的 MRI 表现及临床病理特征相关分析

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目的： 探讨分析乳腺黏液癌（breast mucinous carcinoma ，MC）的 MRI 影像学特征及临床病理特征。**方法 ：**收集 2006 年 1 月-2016 年 12 月间临床资料完整的乳腺黏液癌患者 75 例，其中单纯性乳腺黏液癌（Pure MBC）患者 54 例，混合型乳腺黏液癌（Mixed MBC）患者 21 例。分析比较 2 组患者的 MRI 影像学表现和临床病理特征。**结果** 在两组乳腺癌患者中，单纯性乳腺黏液癌与混合型乳腺粘液癌比较，混合纯性乳腺黏液癌更多表现为淋巴结阳性(P =0.002)；在年龄、 月经状况、 家族史、 ER、PR 、HER2 水平方面差异无统计学意义（P<0.05）；在 MRI 检查，肿块平均大小及肿块边缘、形态、强化方式($p=0.002$)、强化程度及表观弥散系数(ADC)差异具有统计学意义($p<0.001$)。**结论：**了解乳腺黏液癌的 MRI 影像学及临床病理特征，可帮助临床医师预测乳腺黏液癌及其亚型和患者的预后，有利于制定最优的治疗方案。

PU-3278

乳腺 X 线摄影及动态增强 MRI 对表现为微钙化病变的诊断价值

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目的：探讨乳腺 X 线摄影及乳腺动态增强磁共振（DCE-MRI）对乳腺微钙化病变的诊断价值。

方法：回顾性分析我院 2014 年 7 月至 2018 年 11 月 67 例患者（78 个病灶）乳腺 X 线摄影发现微钙化，完成 MRI 动态增强检查后行穿刺活检，以术后病理诊断为标准，采用卡方检验对比乳腺 X 线摄影、DCE-MRI 及两种方法相结合对微钙化病变的诊断效能，并分析微钙化病变在乳腺 X 线摄影中的形态、分布特点及在 DCE-MRI 的强化特点。
结果：78 个微钙化病变中，良性 59 个，恶性 19 个。对于微钙化病变，乳腺 X 线摄影与 DCE-MRI 诊断效能比较，其中特异度存在统计学差异（*P*=0.038），乳腺 X 线摄影（81.4%）明显高于 DCE-MRI（64.4%）；且乳腺 X 线摄影、DCE-MRI 及乳腺 X 线摄影结合 DCE-MRI 检查诊断效能比较，特异度也存在统计学差异（*P*=0.038）；而乳腺 X 线摄影结合 DCE-MRI 检查比单独应用乳腺 X 线摄影或者 DCE-MRI 灵敏度、阴性预测值高，分别为 94.7%、97.3%。乳腺 X 线摄影微钙化的形态在乳腺良、恶性病变中差异有统计学意义（*P*=0.004），而微钙化的分布差异不具有统计学意义（*P*=0.688），微钙化形态与分布组合差异具有统计学差异（*P*=0.003）。DCE-MRI 误诊 2 例恶性病变中，1 例为无强化，1 例为明显背景实质强化。
结论：对于微钙化病变乳腺 X 线摄影较 DCE-MRI 诊断效能高，其中微钙化的形态比分布对乳腺良、恶性病变鉴别更具有价值，而形态与分布联合应用增加诊断准确率。乳腺 X 线摄影联合 DCE-MRI 检查可以提高恶性病灶的检出并排除恶性病变，当 DCE-MRI 表现为无强化时多提示良性病变可能性大，但无强化不能完全排除中低级别导管原位癌，同时应排除明显背景实质强化掩盖作用，并结合乳腺 X 线摄影进行综合判断，所以乳腺 X 线摄影与 MRI 联合应用，可以提高良、恶性病变诊断效能。

PU-3279

乳腺叶状肿瘤的 MRI 表现

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【摘要】目的 分析乳腺叶状肿瘤（PTB）的 MRI 特征，并与病理结果对照，提高对该病的诊断水平。方法 回顾性分析 12 例经手术病理证实的乳腺叶状肿瘤的 MRI 表现，包括形态学、平扫信号、动态增强 TIC 形态、弥散信号及表观扩散系数(ADC 值)特点。结果 12 例 PTB 患者经术后病理诊断为良性 6 例，交界性 3 例，恶性 3 例。T1WI 病灶呈等信号或低信号，其中 3 例夹杂斑片状高信号影，T2WI 均为不均匀高信号，12 例 DWI 均呈高信号,相应 ADC 值低于正常乳腺组织。动态增强病灶实质呈不均匀强化,12 例时间一信号强度曲线(Time—signal intensity curve，TIC)类型呈Ⅰ型 3 例,8 例Ⅱ型，Ⅲ 型 1 例。结论 乳腺叶状肿瘤的 MRI 表现多样，MRI 检查有助于乳腺叶状肿瘤的诊断，确诊仍需对整个病灶行组织病理学检查。
[关键词]乳腺肿瘤；叶状肿瘤；磁共振成像

PU-3280

多模态磁共振成像评价术前乳腺癌腋窝淋巴结转移的诊断价值

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目的：探讨多模态磁共振成像对术前乳腺癌腋窝淋巴结转移的诊断价值。
方法：回顾性分析本院经手术病理证实的 219 例乳腺癌患者乳腺原发灶的 MR 特征及，包括：年龄、肿瘤长径、表观弥散系数（Apparent Diffusion Coefficient ，ADC）值、腺体类型、背景强化、肿瘤位置、T2WI 信号特征、强化方式、时间-信号强度曲线（Time-Intensity Curve，TIC）

类型、病灶个数、MR 有无肿大淋巴结，探讨有腋窝淋巴结转移（ALNM(+)）与无转移淋巴结组(ALNM(-))的差异。
结果：与 ALNM（-）组比较，ALNM（+）组的肿瘤长径较大、ADC 值较低、多发病灶比例更多，两者间有显著统计学差异（P<0.05）。MR 有无肿大淋巴结方面，两组间有明显统计学差异（P<0.05）。而在腺体类型、背景强化、肿瘤位置、T2WI 信号特征、强化方式、时间-信号强度曲线（Time-Intensity Curve，TIC）类型等方面，两组间没有显著统计学差异（P>0.05）。
结论：乳腺癌的肿瘤长径、ADC 值及病灶个数与腋窝转移淋巴结有很好的相关性，术前 MR 检查能够对临床判断腋窝淋巴结性质制定有效治疗方案提供参考。

PU-3281

乳腺恶性孤立性纤维瘤一例

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目的：探讨乳腺恶性孤立性纤维瘤的临床、影像表现与相关病理特征，提高对乳腺恶性孤立性纤维瘤的认识。方法：回顾性分析 1 例经手术病理证实的乳腺恶性孤立性纤维瘤的临床、影像及病理学资料并复习相关文献讨论。结果：患者为女性，55 岁，发现左乳肿物 4 月余，增长加快伴肿痛 1 月余。B 超表现肿块呈实质性、混合性回声，边界不清，形态不规则，边缘不整齐，内回声不均匀，可见液性暗区，CDFI：肿块周边及内部可见条棒状血流信号。PW：肿块内部可测及低速高阻力动脉频谱，Vmax19.7cm/s，Vmin5.9cm/s，RI=0.698。钼靶表现左乳腺正常腺体结构消失，肿块边界清楚，分叶状，密度均匀，其内及周围未见钙化。CT 表现肿块呈类圆形，大小约 13.1cm×8.1cm×15.0cm，边界清楚、分叶状，肿块呈稍低密度，密度欠均匀，CT 值约 19Hu，未见钙化，增强扫描病灶不均匀中度强化，内见囊变、坏死区。MRI 表现肿块呈稍短 T1 稍长 T2 信号，信号不均匀，内见多发分隔，DWI 肿块弥散受限，动态增强扫描呈渐进性不均匀明显强化，时间-信号曲线呈流入型，早期强化率为 193.9%-217.5%，ADC 值约 1.212-1.239×10-3mm2/s，周围分支血管增多、增粗，病灶与乳头皮肤分界不清，与左侧胸大肌分界欠清，左侧胸大肌明显强化。免疫组化结果显示:Vimentin(+),CD34(+，部分),CD99(+),Bcl-2(+),CD68(－),CK(－),SMA(+，部分),Desmin(－),Actin(－),EMA(－),S-100(+，少量),Ki-67(40%)。结论：乳腺恶性孤立性纤维瘤的临床特征及影像表现有助于乳腺上皮恶性肿瘤的鉴别诊断。乳腺恶性孤立性纤维瘤具有较高侵袭性，充分认识其影像征像，有助于术前诊断，指导治疗及判断预后。

PU-3282

扩散加权成像在监测乳腺癌患者新辅助化疗的病理反应中的 meta 分析

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【摘要】目的：在乳腺癌患者接受新辅助化疗(NACT)后的完全反应(pCR)，弥散加权成像(DWI)被认为是一种非侵入性和无放射性的成像方式。越来越多的试验正在进行这方面研究，一些研究发现与传统的成像技术相比，DWI 有更好的性能。然而，DWI 的效能仍然存在争议。meat 分析旨在评估 DWI 检测乳腺癌患者 NACT pCR 的准确性。**方法：**采用联合敏感性、特异性和诊断优势比(DOR)评估 DWI 对 NACT 的诊断效果。 计算 SROC、SROC 曲线下面积(AUC)和 Youden 指数(*Q)。通过单因素回归分析探讨了纳入研究中可能存在的异质性来源。采用 Deek 漏斗图和 QUADAS-2 形式对发表偏倚和

质量评估进行分析。**结果：**在我们的分析中，有 20 项研究包括 1490 名参与者。汇总结果显示敏感性为 0.89 (95% CI, 0.86-0.91)，特异性为 0.72 (95% CI, 0.68-0.75)， DOR 为 27.00 (95% CI, 15.60-46.73)。SROC 曲线和*Q 指数的 AUC 分别为 0.9088 和 0.8408。meta 回归分析结果显示，pCR 率、研究人群的持续时间和研究设计并不是异质性的来源。**结论：**在我们的 meta 分析中，我们发现 DWI 对接受 NACT 治疗的乳腺癌患者的 pCP 诊断具有较高的敏感性和特异性。这一发现表明，使用 DWI 可能会对 NACT 的 pCR 进行准确和精确的评估。

PU-3283

乳腺颗粒细胞瘤一例并相关文献复习

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颗粒细胞瘤(granular cell tumor, GCT)是一种临床少见的软组织肿瘤,第一次由 Weber 在 1854 年提出，然后 Abrikossoff 首次描述发生于舌及乳腺的 GCT，认为它是一种肌源性肿瘤[1]。GCT 的起源现在还存在一定的争议，但 S100 强阳性和肿瘤的镜下结构与施万细胞相似支持其是一种神经或神经外胚层源性肿瘤[2]。乳腺 GCT(GCTB)因发病率低、认识较少，在临床、影像、冰冻切片上容易误诊为乳腺癌，导致不必要的乳房根治术及过度治疗[3]。笔者报道江西省肿瘤医院收治的 1 例 GCTB，并结合既往文献总结其影像表现特点，旨在提高对其影像特征的认识并减少误诊。

PU-3284

Granular Cell Tumor of the Breast: A Case Report and Literature Review

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Granular cell tumour (GCT) is a relatively uncommon lesion of the soft tissues, especially in the breast. Often, it mimics carcinoma on clinical and radiological examinations. Besides, the striking feature of GCT is the presence of abundant granular eosinophilic cytoplasm, which can easily lead to a misdiagnosis of needle aspiration biopsy and may result in unnecessary surgery. Immunohistochemistry with S100 positive is necessary to obtain a correct diagnosis. Here, we report a case of GCT of the breast in a postmenopause woman who presented with a subcutaneous mass in the upper outer quadrant of the right breast, and review the importance of differentiating between this tumor and malignant breast carcinoma in imaging. To radiology and clinically, this case appears to be a malignant tumor of the breast, but with a correct and precise diagnosis including histopathologic examination and immunohistochemical studies, it was correctly identified as a GCT.

PU-3285
动态增强磁共振成像及扩散加权成像对乳腺导管原位癌（DCIS）和非特异性乳腺炎的诊断价值

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目的：探讨动态增强磁共振成像（DCE-MRI）及扩散加权成像（DWI）对乳腺导管原位癌（DCIS）和非特异性乳腺炎的诊断价值。
方法：搜集 62 例经病理证实的非特异性乳腺炎 29 例的 MRI 表现,同时随机抽取相同时段经病理证实的乳腺癌患者 33 例作为对照组,术前均行 DCE-MRI 及 DWI。统计病灶的形态学特征、时间-信号强度曲线（TIC）及表观扩散系数（ADC）值,并运用 x 2 检验和 t 检验分析 DCIS 和乳腺炎组差异;采用受试者工作特征曲线（ROC）确定 DCIS 和非特异性乳腺炎的 ADC 界值。
结果：DCIS 和非特异性乳腺炎均以非肿块样强化多见,前者以导管样、节段样强化为主,后者以区域性、弥漫性强化为主;DCIS 以均匀强化多见,其中以点簇样强化更具特征性。乳腺炎多表现为均匀或不均匀强化，其中 19 例可见环形强化小脓腔;Ⅰ型 TIC 多见于非特异性乳腺炎，而Ⅲ型曲线多见于 DCIS,Ⅱ型曲线在两者之间无显著差异。DCIS 的 ADC 值（1.102±0.247）×10-3mm2/s 显著低于乳腺炎病 ADC 值（1.481±0.158）×10-3mm2/s（b=800 s/mm2）,差异具有统计学意义（P<0.001）。根据 ROC 曲线确定 ADC 界值为 $1.30\times10^{-3}mm^2/s$,诊断敏感性和特异性分别为 75.6%、80.3%（$b=800\ s/mm^2$）。
结论：DCE-MRI 联合 DWI 有助于鉴别 DCIS 和非特异性乳腺炎。

PU-3286
乳头状瘤背景下导管原位癌的多模态影像学特征分析

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目的 探讨乳头状瘤背景下导管原位癌（ductal carcinoma in situ within papillomas, DCIS-WP）和普通导管原位癌（ductal carcinoma in situ in general, DCIS-IG）的 X 线、超声和磁共振（magnetic resonance imaging, MRI）影像学表现特征及其影像学正确诊断对临床的意义。**方法** 回顾性分析本院 2015 年 1 月至 2018 年 10 月经病理证实为 DCIS-WP 和 DCIS-IG 的 134 例患者，其中 DCIS-WP 患者 40 例，DCIS-IG 患者 94 例。依据乳腺影像报告和数据系统（breast imaging reporting and data system，BI-RADS）标准对 X 线、超声和 MRI 上的病变进行系统性分析，并评价病变术前穿刺、术中冰冻病理与术后最终石蜡病理诊断一致性。定性资料的比较采用 x^2 检验或 Fisher 确切检验。**结果** 与 DCIS-IG 相比，DCIS-WP 在 X 线上较少出现钙化、X 线上漏诊率高、诊断准确率较低；而超声常表现为多发低回声结节，漏诊率低；MRI 上出现导管扩张征象和多发乳头状瘤背景的比例更高，病变内部环形表现较散在、大小不均；DCIS-WP 在术前穿刺、术中冰冻病理与术后最终石蜡病理诊断一致性较低，P 均＜0.05。**结论** 两种类型 DCIS 的 X 线和超声表现特点不同，DCIS-WP 在 X 线上通常不表现为钙化性病变而易漏诊，超声对其检出具有优势；DCIS-IG 在 X 线通常具有典型恶性钙化征象且检出及诊断准确率高，而在超声上较易漏诊；MRI 对两种类型 DCIS 均具有较好的诊断效能且有助于不同类型 DCIS 的鉴别。在乳腺癌筛查工作中 X 线和超声结合更有利于不同类型乳腺导管原位癌的检出。对影像学提示为 DCIS-WP 的患者，临床应减少穿刺及冰冻检查，以术后最终石蜡病理为准决定进一步治疗方案。

PU-3287
DCE-MRI 及影像组学在乳腺癌新辅助治疗疗效预测中的应用

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目的：探讨新辅助治疗前的 DCE-MRI 图像及影像组学特征对乳腺癌新辅助治疗（Neoadjuvant therapy, NAT）病理完全缓解（pCR）的预测价值。
方法 ：收集 2015 年 6 月至 2018 年 10 月，在我院完成新辅助治疗及后续手术的乳腺浸润性导管癌患者共 73 例，所有患者在治疗前均采用 SIEMENS 3.0T 磁共振行双侧乳腺扫描。根据术后的病理结果,将患者分为 pCR 组和 non-pCR 组。由两名放射科医生在 DCE-MRI 图像上手动分割病灶并提取影像组学特征，采用 LASSO 回归对特征进行降维、筛选。采用 3 种监督学习算法（LR，KNN，SVM）对所筛选出的影像组学特征进行分类建模，并用 ROC 曲线对所构建的模型在训练集中的预测性能进行评价。
结果 ：一般资料及 MR 征象分析显示，pCR 组中三阴型所占比例最大（36.4%），而 non-pCR 组中 Luminal B 型所占比例最大（58.8%），两组患者在分子分型分布上的差异具有统计学意义（P=0.016）。pCR 组中 90.9%（20/22）的病灶表现为肿块， non-pCR 组中肿块所占比例为 49.0%（25/51），两组间的差异具有统计学意义（P<0.001）。影像组学分析显示，使用 LASSO 回归最终筛选出 4 个与 pCR 相关性最佳的影像组学特征用于构建预测模型。其中 LR 分类器相较其他两种方法具有较高的预测效能，训练集的 AUC 为 0.871（灵敏度：0.76，特异度：0.68），测试集的 AUC 为 0.745（灵敏度：0.80，特异度：0.73）。
结论：基于治疗前 DCE-MRI 提取出的影像组学特征可以作为 NAT 疗效的预测因子，利用影像组学特征所构建的预测模型能够有效预测肿瘤组织 pCR。

PU-3288
不同分子亚型乳腺癌的磁共振影像诊断研究

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目的：探讨不同免疫组化分子亚型乳腺浸润性导管癌磁共振影像表现特点。方法：回顾性分析 30 例经手术病理证实为乳腺浸润性导管癌患者 3.0T 磁共振影像特点。包括形态学、动态增强时间信号强度曲线（TIC）特征、ADC 值。根据手术标本免疫组织化学检测雌激素受体（ER）、孕激素受体（PR）、人类表皮生长因子受体 2（HER-2）表达水平分为 4 种亚型：Luminal A 型、Luminal B 型、HER-2 过表达型、基底样型。结果：Luminal A 型 2 例、Luminal B 型 12 例、HER-2 过表达型 14 例、基底样型 2 例。单发 21 例，多发 9 例，不同分子亚型乳腺癌形态学不具特征性。四种不同分子亚型病灶平均 ADC 值分别为（0.807±0.02）×10-3mm2/s,（0.953±0.118）×10-3mm2/s,（1.183±0.191）×10-3mm2/s,（0.961±0.103）×10-3mm2/s（F=1.915,p=0.216）。最小 ADC 值分别为（0.630±0.013）×10-3mm2/s,（0.825±0.089）×10-3mm2/s,（0.987±0.139）×10-3mm2/s,（0.704±0.015）×10-3mm2/s，具有统计学差异（F=4.745,p=0.014）。HER-2 过度表达型与其余三组 Luminal A 型、Luminal B 型、基底样型最小 ADC 值差异均有显著性（p=0.024、0.044、0.010）。Luminal A 型与 Luminal B 型的 TIC 曲线可呈速升平台或速升速降型。 HER-2 过表达型的 TIC 曲线呈缓升持续型 3/12、速升平台型 5/12、速升速降型 4/12。基底样型的 TIC 曲线呈速升速降型。结论：不同分子亚型乳腺癌因病理基础不同，表现出不同 MRI 影像特征，HER-2 过表达型 TIC 曲线表现多样，但其扩散受限特点及最小 ADC 值有一定鉴别价值。

PU-3289
乳腺组织标记物对乳腺病灶磁共振评价的影响及临床意义

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目的 本研究通过对比两种乳腺组织标记物的磁共振表现，探讨不同乳腺组织标记物对 MRI 评价的影响和临床意义。**方法** 回顾性分析 2015 年 11 月至 2018 年 8 月本院 69 位患者（共 78 个肿物）放置两种乳腺组织标记物的乳腺 MRI。在横断位脂肪抑制 T2WI、T1WI 平扫及 T1WI 增强图像上评估乳腺组织标记物影的大小和形状。**结果** 圈状无镍不锈钢合金标记物影的长径大于带状钛金属标记物的长径，在脂肪抑制 T2WI 序列中有统计学意义（P=0.039）。圈状无镍不锈钢合金标记物在 T1WI 平扫及 T1WI 增强图像均比在 T2WI 图像大（P=0.001，P=0.019）。在 T1WI 增强图像中，所有圈状无镍不锈钢合金标记物影均＞6mm，带状钛金属标记物影有 20 例＞6mm，有 8 例≤6mm；前者均为圆形，后者为圆形、点状和条状分别有 20 例、7 例、1 例，两种乳腺组织标记物的大小及形状分类均具有统计学意义（P<0.001、P<0.001）。**结论** MRI 不适于评价放置乳腺组织标记物体积较小的病变，带状钛金属标记物比圈状无镍不锈钢合金标记物产生的伪影范围小，对周围病变的干扰少，应根据临床需要选择合适的乳腺组织标记物和影像评估手段。

PU-3290
A Comparative of Contrast-enhanced Cone Beam Breast CT and Breast MRI for Breast Cancer Diagnosis in women with Dense Breasts

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Background：
Breast density is considered a risk factorfor breast cancer. The peak breast cancer incidence rate occurs in women aged 45 to 55; in this age range most Asian women have dense breast parenchyma. Whereas MRI has good sensitivity and specificity for the diagnosis of breast cancer, Cone Beam Breast CT (CBBCT) is less costly, and time consuming.

Purpose:
To evaluate and compare the diagnostic value of CE-CBBCT and breast MRI in patients with heterogeneous to extremely dense breasts and to provide evidence for the clinical application of CE-CBBCT.

Method：
Eleven patients (22 breasts: 18 heterogeneously dense, 4 extremely dense) were evaluated. Lesion enhancement was evaluated on both CBBCT and MRI according to the Breast Imaging Reporting and Data System (BI-RADS) system with BI-RADS 2, 3and 4a lesions categorized as benign, and BI-RADS 4b、4C and 5 lesions categorized as

malignant. Histopathology findings were used as gold standard. The detection rate, lesion characteristics and diagnostic accuracy of the two modalities were compared.

Results：
Nineteen histopathologically confirmed lesions, including 11 benign (8 intraductal papilloma, 2 inflammatory lesions and 1 fibroadenoma) and 8 malignant (5 non-specified invasive carcinoma and 3 ductal carcinoma in situ) were evaluated. All lesions were detected by both techniques. No significant differences were found between the two modalities in terms of lesion size (mean size: 3.7 cm: range 1 - 8.7 cm; p>0.05). There were 13 mass lesions (10 benign, 3 malignant). MRI determined 6 of 10 benign masses as BI-RADS 4a and 4 as BI-RADS 3 while CBBCT assessed 1 as BI-RADS 4c, 3 as BI-RADS 4a and 3 as BI-RADS 3. The 3 malignant masses were characterized as BI-RADS 4b, 4c and 5 on MRI and as 4b (n=2) and 4c on CBBCT. Six histopathologically confirmed non-mass lesions were detected (5 malignant, 1 benign).MRI characterized 4 of 5 malignant lesions as BI-RADS 5 and the other as BI-RADS 4c. Conversely, CBBCT characterized 2 as BI-RADS 5, 1 as BI-RADS 4b and 2 as BI-RADS 4c. The benign lesion was characterized as BI-RADS 4a by MRI and as BI-RADS 3 by CBBCT. CBBCT better displayed the shape and distribution of calcifications.

Conclusion：
Contrast-enhanced CBBCT has diagnostic sensitivity and specificity similar to breast MRI in patients with dense breasts, especially for mass lesions. CBBCT can reveal calcifications inside lesions which cannot be detected by MRI. CBBCT has good clinical values in breast cancer diagnosis.

PU-3291
磁共振动态增强检查-Vibrant 技术在乳腺疾病 诊断中的应用

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目的：通过优化乳腺扫描序列,结合平扫检查,探讨 Vibrant 软件技术在 1.5T 磁共振双侧乳腺动态增强检查中的优势。**方法**：随机选取我院经手术或穿刺病理证实的乳腺疾病患者 35 例，均为女性，中位年龄 45 岁。术前均采用 GE1.5T MR 机行动态增强检查，应用 Vibrant 乳腺动态增强扫描技术。**结果**：在满足高信噪比、高时间分辨率和高空间分辨率的情况下，Vibrant 技术克服了传统动态增强检查的不足，在乳腺疾病的诊断上发挥了重要作用。本组病例诊断的敏感性为 100%，特异性为 77.78%，准确性为 88.57%。**结论**：相对于传统的乳腺动态增强技术，Vibrant 乳腺动态增强扫描技术无疑是一种更好、更先进的技术。

PU-3292
3.0 动态增强 MR 血管成像对乳腺良恶性病变的诊断价值

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摘要：目的:回顾性评估 3.0T 动态增强 MR 血管成像(MRA)对乳腺良恶性病变的诊断价值。方法:经病理证实的 108 例乳腺疾病患者(52 例恶性,56 例良性)作为研究对象,借助 3D MRA 图像计算患侧血管增加(双侧差异血管数≥2)及病变邻近血管数。结果:52 例乳腺恶性病变中 41 例、56 例良性病变中 9 例出现患侧血管增加,以患侧血管增加作为诊断标准,其对乳腺恶性病变诊断的敏感性、特异性及准确度分别 79%、84%及 84%;52 例乳腺恶性病变中 46 例、56 例良性病变中 18 例出现病灶邻近血管,以病灶邻近血管作为诊断标准,其对乳腺恶性病变诊断的敏感性、特异性及准确度分别为 89%、68%及 76%;患侧血管增加的阳性预测值及阴性预测值分别为 82%、81%,病灶邻近血管的阳性预测值及阴性预测值分别为 82%、79%。结论:3D MRA 能有效评估双侧乳腺血管形成。乳腺恶性病变比良性病变更容易出现患侧血管增加及病灶邻近血管。

PU-3293

3.0T 磁共振不同 b 值表观扩散系数值与乳腺癌预后因子及分子分型相关性对比研究

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摘要：目的对比分析 3.0 T 磁共振扩散加权成像(DWI)不同 b 值下表观扩散系数(ADC)值与乳腺癌预后因子及分子分型的相关性。材料与方法 81 例经手术病理证实为乳腺癌患者,于术前行不同 b 值(b=0、400、800、1000 s/mm^2)DWI 扫描,所有病灶行 ADC 值测量并计算平均值。利用免疫组织化学检测获得雌激素受体(ER)、孕激素受体(PR)、人类表皮生长因子受体 2(,HER2)及 Ki-67 的表达状态,并将其分为 Luminal A 型、Luminal B 型、HER2 过表达型及三阴性型 4 种分子亚型,其中 Luminal B 型又分为 B1 型和 B2 型。根据不同的数据资料分别采用独立样本 t 检验、单因素方差分析及 Kruskal-Wallis 检验进行统计分析。结果 (1)除 b=400 s/mm^{2}时,ER 分别表达阴阳性时的 ADC 值差异无统计学意义外,其余因子在不同 b 值下,不同表达状态的 ADC 值差异均具有统计学意义。(2)除 b=400 s/mm^{2}时,ADC 值与 ER 阳性表达无相关性外,余不同 b 值下 ADC 值与 ER、PR 的阳性表达均呈负相关,与 HER2 阳性表达呈正相关,且当 b=800、1000 s/mm^{2}时,各预后因子阳性表达与 ADC 值间相关系数较高;Ki-67 表达程度与各 b 值下 ADC 值均无相关性。(3)在不同 b 值下,各分子分型间 ADC 值差异均有统计学意义(P<0.05);不同 b 值下 Luminal A 型及 Luminal B 型的 ADC 值间差异具有统计学意义(P<0.05),而 HER2 过表达型及三阴性型则差异无统计学意义(P 均>0.05)。结论扩散加权成像 ADC 值与乳腺癌部分预后因子表达状态及不同分子亚型具有相关性,且行乳腺 DWI 检查时 b 值选择 800 s/mm^{2}为佳。

PU-3294

对于全数字化乳腺 X 线三维钢丝定位术中立位与卧位在乳腺钙化定位应用中的对比探讨

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[摘　要]　**目的** 探讨全数字化乳腺 X 线三维钢丝定位术中立位与卧位在乳腺钙化定位中的应用，对比两种检查方法的应用价值。**方法** 回顾性分析 2016 年 10 月至 2018 年 5 月在我院进行全数字化乳腺 X 线三维钢丝定位术的患者，选取钙化患者，其中分为立位检查者 A 组 157 例，卧位检查者 B 组 86 例。**结果** 本组病例中所有目标钙化灶均全部切除。针尖距离病灶≤2cm ，A 组中

151/157 例(96%)，B 组中 81/86 例(94%)。A 组平均用时 9 分钟，B 组平均用时 16 分钟。**结论** 全数字化三维乳腺 X 线钢丝定位术立位与卧位均能准确定位乳腺中的钙化病灶，指导外科医生准确切除病灶，提高乳腺癌的早期诊断率。

PU-3295

乳腺原发性腺样囊性癌的影像学表现

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目的：探讨乳腺原发性腺样囊性癌（Adenoid cystic carcinoma，ACC)的影像学表现特征，提高对其认识和术前诊断准确性。方法：按照 BI-RADS 标准，回顾性分析经手术病理证实的 31 例乳腺原发腺样囊性癌的 X 线和超声表现，并与病理进行对照分析。结果：31 例乳腺 ACC 的 X 线基本表现：高密度或稍高密度肿物 16 例（51.6%，16/31），其中 14 例符合一般乳腺癌的典型 X 线表现，诊断 BI-RADS 4C 或 5 类，BI-RADS 4A 和 4B 类各 1 例；等密度肿物 7 例（22.6%，7/31），其中诊断 BI-RADS 4B 类 5 例，BI-RADS 4A 和 3 类各 1 例；2 例表现为混杂密度肿物，BI-RADS 2 类和 4A 类各 1 例；局限不对称致密共 6 例（19.4%，6/31）；所有病例均无钙化。超声表现可分为三种：（1）低回声肿物，共 22 例（70.9%，22/31），其中 14 例符合一般乳腺癌的典型超声表现，诊断 BI-RADS 4C 或 5 类；（2）混合回声肿物，3 例，其中 2 例表现为以高回声为主的混合回声肿物，1 例表现为囊实性混合回声肿物，BI-RADS 分类均为 4B；（3）非肿块样低回声区或混合回声区，共 6 例（19.4%，6/31），均无沿导管走行方向分布趋势。依据 BI-RADS 分类，X 线和超声检查的误诊率分别为 22.6%（7/31）和 12.9%（4/31）。结论：大部分乳腺原发腺样囊性癌的影像学表现无特异性，但某些特定征象（如 X 线上表现为形态不规则、边缘模糊的高密度肿物内含稍低密度或脂肪样密度和/或超声表现为偏高回声为主、不沿导管走行方向分布的非肿块样病变）具有一定提示意义，最终确诊依靠病理并需结合免疫组化结果。

PU-3296

The application value of mammography combined with local point pressure magnifying photography in the screening of benign and malignant breast lesions

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Objective
To evaluate the value of mammography local point pressure magnifying photography in the screening of benign and malignant breast lesions.
Methods

Retrospective analysis of 1658 patients with The conventional position of mammography (CC position and MLO position) combined with local point pressure magnification mammography .The clinical diagnosis combined with pathological examination results were compared by comparing different photographic positions. To explore the accuracy of breast X-ray local point pressure magnifying photography in screening for benign and malignant breast tumors.

Results
All patients underwent routine imaging examination of CC and MLO. Only 332 cases (20.02%) were able to confirm the diagnosis. There were 219 cases of benign diagnosis and 113 cases of malignant diagnosis. All patients underwent X-ray local pressure amplification. After photography, 1450 cases (87.5%) were diagnosed, 1232 cases were benign diagnosed, and 218 cases were malignant. The disease diagnosis rate of routine examination was 20.02%, and the disease diagnosis rate of point-pressure magnifying photography was 87.5%. The difference was statistically significant (P<0.05).

Conclusion
The conventional position of mammography (CC position and MLO position) combined with local point pressure magnification mammography can significantly improve the diagnostic coincidence rate of benign and malignant breast diseases, and play a positive role in the diagnosis of early breast cancer tumors.

PU-3297
乳腺 X 线摄影结合局部点压放大摄影在乳腺良恶性病变甄别中的应用价值

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目的 评价乳腺 X 线局部点压放大摄影在乳腺良恶性病变甄别中的应用价值。
方法
回顾性分析我院放射科行乳腺 X 线常规 CC 位及 MLO 位摄影并结合乳腺局部点压放大 X 线摄影检查的患者 1658 例，通过对比不同摄影体位给出的临床诊断结合病理检查结果，探究乳腺 X 线局部点压放大摄影在甄别乳腺肿瘤良恶性的准确性。
结果
所有患者均先行 CC 位 及 MLO 位常规影像检查，其中只有 332 例（20.02%）可以明确诊断结果，良性诊断结果 219 例，恶性诊断结果 113 例； 所有患者加摄乳腺 X 线局部点压放大摄影后可以明确诊断结果 1450 例（87.5%），良性诊断结果 1232 例，恶性诊断结果 218 例。常规检查的疾病诊断率为 20.02%，点压放大摄影检查的疾病诊断率为 87.5% .差异有统计学意义 （P＜0.05）。
结论 乳腺 X 线摄影常规摄影体位（CC 位及 MLO 位）结合乳腺 x 线局部点压放大摄影可以提高钼靶摄影对乳腺疾病诊断的检出率与特异性，尤其适用于隐匿部位的小病灶和致密型乳腺的 X 线检查，显著提高乳腺良恶性疾病的诊断符合率，对乳腺疾病的良恶性诊断有积极的作用，有利于提高早期乳腺癌的检出率，具有较高的临床实用价值。

PU-3298

乳腺 X 线摄影的附加特殊体位在检查中的应用

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目的：通过探讨附加体位在全数字化乳腺 X 线摄影中的应用，从而为临床提供优质的乳腺 X 线图像。
方法：对 69 例乳腺特殊位置的肿块经乳腺常规 X 线摄影无法显示或显示不清，在常规摄影的内外斜位（MLO）和头尾位（CC）的基础上进行附加体位的拍摄，讨论乳腺 X 线常规体位摄影和附加特殊体位对特殊位置病灶的显示。
结果：69 例特殊位置的肿块中，有 27 例肿块位于乳腺 12 点方向腺体边缘处，并紧贴胸壁，加摄 90°侧位摄影（ML 或者 LM），27 例病灶完全显示。有 19 例肿块位于乳腺外上象限靠近腋窝处，加摄夸大头尾位（XCCL），19 例病灶完全显示。有 8 例肿块位于乳房内下象限靠近乳沟的位置，加摄乳沟位，5 例病灶完全显示，3 例病灶部分显示。有 11 例肿块位于乳腺 6 点钟方向，并紧贴胸壁下缘，加摄 90°侧位（ML 或 LM）主要以乳腺下方与胸壁连接处为主，11 例病灶完全显示。有 4 例肿块位于乳腺侧壁，近腋中线位置，加摄腋尾位（AT）,3 例病灶完全显示，1 例部分显示。
结论：乳腺特殊位置的肿块显示，需要配合乳腺 X 线附加体位的摄影方法，以此提高病灶的检出率，为临床提供优质的图像质量。

PU-3299

乳腺三维立体定位技术在乳腺疾病中的应用

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目的：对临床不能扪及的乳腺微小病灶，乳腺 x 线摄影结合三维立体定位穿刺其较高的准确率及精准的定位，是早期乳腺癌定位定性诊断的首选检查方法。
方法：收集 50 名乳腺可疑疾病患者，全部为女性，年龄 28-66，临床触诊阴性，但钼靶片表现异常，经病人同意后穿刺定位并活检。
术前对机器进行校准，根据钼靶片确定可疑病变部位，调整乳腺机到合适位置，拍摄图像，确定病变部位位于压迫板中心，并进行进针。拍摄正负 15°定位像，确定两次拍摄钯点没有移位，如有移位重新拍摄，直至位置居中。确定 x、y、z 三个方向的数值。开始进针并释放导丝，待导丝固定后拔出针套。拍乳腺头尾位、内外斜位片，观察导丝是否位于靶点，纱布包扎并固定体外导丝。
结果：50 名患者定位 52 处病灶，定位满意为 51 处。
病理结果：术后病理结果恶性病变为 19 例，其中癌前病变为 3 例，导管原位癌为 5 例，浸润性导管癌 9 例，粘液癌为 2 例。良性病变 31 例，其中导管癌 8 例，纤维瘤 12 例，非典型增生 11 例。
结论：数字乳腺钼靶摄影对检测乳腺微小病变具有较高的敏感性，原发灶越小，治疗的预后越好。早期诊断在乳腺癌的综合治疗中占有及其重要的地位。而临床不能触及的小病灶立体定位可避免临床医师盲目切除的问题。

PU-3300

锥光束乳腺 CT 平扫下正常乳腺 CT 值初步研究

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目的 测量锥光束乳腺 CT 扫描得出的正常乳腺腺体、脂肪、肌肉 CT 值的范围并总结不同侧别、象限、腺体分型的乳腺腺体及乳房前后部腺体、脂肪的 CT 值的变化规律。方法 选取 2019 年 6 月至 2019 年 8 月在本院进行锥光束乳腺 CT 检查且为结果阴性的 99 侧乳房，共 58 例患者，年龄 24～74 岁，通过测量乳腺、脂肪、肌肉的 CT 值，比较不同侧别、象限、腺体分型的乳腺腺体及乳房前后部腺体、脂肪的 CT 值有无统计学差异。结果 （1）乳腺腺体 CT 值为（92.0±4.1）HU，脂肪 CT 值为（-126.7±3.0）HU，肌肉 CT 值为（-39.7±4.1）HU；（2）乳腺腺体前部 CT 值为（120.2±4.8）HU，乳腺腺体后部 CT 值为（63.6±3.7）HU，乳腺腺体前后部 CT 值组间差异具有统计学意义（P＜0.05）；（3）乳房前部脂肪 T 值为（-118.8±2.9）HU，乳房后部脂肪 CT 值为（-142.4±4.8）HU，乳房前后部脂肪 CT 值组间差异具有统计学意义（P＜0.05）；（4）非致密型乳腺腺体 CT 值为（76.7±4.9）HU，致密型乳腺腺体 CT 值为（113.6±5.5）HU，两种分型乳腺腺体 CT 值组间差异具有统计学意义（P＜0.05）；（5）乳腺外上象限腺体 CT 值为（88.5±4.1）HU，乳腺外下象限腺体 CT 值为（97.7±4.4）HU，乳腺内上象限腺体 CT 值为（87.0±3.9）HU，乳腺内下象限腺体 CT 值为（94.8±4.4）HU，不同象限腺体 CT 值组间差异具有统计学意义（P＜0.05）；（6）左侧乳腺 CT 值为（90.1±6.4）HU，右侧乳腺 CT 值为（94.1±6.8）HU，两侧乳腺 CT 值组间差异无统计学意义（P＞0.05）。结论 锥光束乳腺 CT 平扫下乳腺腺体 CT 值与乳腺的象限、腺体分型有关，乳房后部腺体及脂肪 CT 值较前部腺体及脂肪 CT 值低。

PU-3301

乳腺癌腋窝淋巴结转移的磁共振成像研究进展

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摘要： 乳腺癌腋窝淋巴结转移是患者预后的独立危险因素,因此腋窝淋巴结转移的早期诊断及个体化预测是至关重要的.随着影像诊断技术的进步,磁共振功能成像包括扩散加权成像、动态增强磁共振成像、磁共振波谱成像等越来越广泛的用于乳腺疾病的鉴别及诊断.现就磁共振功能成像评估乳腺癌腋窝淋巴结转移方面的研究进展进行综述.

PU-3302

MRI 技术在乳腺癌诊断中的应用进展

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摘要： 乳腺癌作为女性恶性肿瘤的常见病,其发病率和发病人数表现出逐年递增趋势.伴随诊治技术及方案的改进,乳腺癌的诊治方式、疗效监督及预后评估等各方面都有了显著提升,从而也对乳腺癌临床早期诊断的检出率及分期的准确率有了较高的要求.医学影像技术尤其是 MRI 检查在乳腺疾病诊治方面不断取得新突破和新应用,乳腺 MRI 检查技术的角色和作用显得越发重要.MRI 基础及功能序列扫描等多种辅助检查,多角度、全方位提供病灶相关解剖、血流动力学、功能及代谢等信息.因而需要全方面熟悉 MRI 检查技术在乳腺癌诊治中的应用现状,才能使之合理高效的运用于临床诊断、术前分期、治疗方案选取及疗效评估等各方面.

PU-3303
动态增强 MRI 在乳腺癌保乳手术中的应用价值

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摘要： 目的:探讨动态增强磁共振成像(magnetic resonance imaging,MRI)在乳腺癌保乳手术中的应用价值.方法:选择保乳手术治疗并经病理证实的乳腺癌患者 54 例.术前均行动态增强 MRI 检查,观察病灶的位置、大小和强化类型等,并与术后病理学诊断结果相对照.结果:手术后病理学检查发现 54 个病灶.动态增强 MRI 对病灶的检出率为 100%,对病灶的定位与病理学诊断结果完全符合;对病灶大小的测量与病理学诊断结果具有较高的一致性(P<0.05);不均匀强化的病灶多为低分化癌(13/19).结论:动态增强 MRI 可评估乳腺癌保乳手术的可能性和预后,具有重要的临床应用价值.

PU-3304
纹理分析在鉴别乳腺 MRI 病灶良恶性的研究

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:现代社会，乳腺癌的发生概率大大增加，是女性死亡的第二大原因 。在我国虽然发病率不是最高的，但是增长速率已经达到了恐怖的速度，早期发现可以很大的提高治疗率，所以在乳腺诊断上面的研究也越来越多，虽然乳房 X 线摄影是乳房的主要成像方式，但它有其局限性，尤其是密集的乳腺实质。乳腺磁共振成像(MRI)已发展成为重要的辅助工具，因为它是目前最敏感的乳腺痛检测技术。而纹理分析作为 一种新型的研究方法能够很好的根据图像的信息得到组织的情况，也被应用于 MRI 的分析与诊断，尤其是在病灶良性恶性方面有一定的优势，本文选取了大量外的文献材料对这方面的研究进行综述。

PU-3305
乳腺组成致密类型的乳腺 X 线摄影平均腺体剂量研究

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[摘要]目的：探讨 ACR 新分型 c、d 乳腺类型的数字化 X 线摄影中平均腺体剂量与压迫力、乳腺厚度相关性。方法：回顾分析荷兰飞利浦公司 mammo 乳腺 X 线摄影系统检查的 c、d 乳腺类型患者各 50 例。管电压、管电流为机器根据组织压迫厚度自动选择。管电压范围 26-28KVp。根据腺体厚度分为 5 组，≤30mm，30-40 mm，40-50 mm，50-60 mm，≥60 mm 以上。记录曝光时腺体厚度（mm）、压力（N）、平均腺体剂量（mGy）。结果：c、d 型两种类型乳腺在实际检查中接受压迫板压力差别没有显著性（p=0.18），两者之间腺体厚度差异具有显著性（c 型：45.31±8.11,d 型：28.03±8.52，p=0.008），c 型平均腺体剂量稍小于 d 型，没有统计学差异（c 型：1.67±0.48, d 型：1.79±0.64，p=0.34）。对于不同摄片体位，MLO 位腺体厚度大于 CC 位，且接受压迫板的压力更大(MLO: 145.80±28.05,CC: 113.50±26.80; p=0.000)，有统计学差异。但两者间平均腺体剂量无显著差异（CC:1.75±0.5，MLO:1.70±0.50,p=0.71）。对于不同腺体厚度，CC 位压力与腺体厚度呈明显负相关，平均腺体剂量与厚度呈正相关。对于不同腺体厚度，1~5 各组间压力差别不具有显著性（p=0.554），平均腺体剂量具有明显统计学差异（分别为

1.33±0.54,1.84±0.45,1.51±0.36,1.71±0.57,1.72±0.55，p=0.003）。**结论：平均腺体剂量在 c、d 两种类型乳腺构成、不同摄片体位中均没有明显区别，纤维腺体构成致密的乳腺腺体厚度相对较小，通过增加压力，降低腺体厚度，自动调节管电流，减少辐射剂量。不同腺体厚度的乳腺接受的平均腺体剂量具有明显差异性，提示实际检查中应注意技术操作与辐射防护。**

PU-3306
CBCT 联合乳腺钼靶对于乳腺癌表现的临床初步探讨

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目的：用锥体束乳腺 CT，乳腺钼靶及乳腺切除标本 x 线分别分析乳腺癌的边缘，毛刺、侵润等特征进行比较探讨锥体束乳腺 CT 的临床价值。**材料和方法：**共 46 例乳腺癌患者的标本经实验室设计的锥体束乳腺 CT 扫描。每例患者均在六个月内进行乳腺钼靶检查，术后再进行乳腺切除标本的 x 线摄影。综合乳腺边缘观察如下指标：形态，毛刺，密度，侵袭，结构紊乱和钙化。**结果：**三种检查方式在钙化、毛刺机形态的检出方面无显著统计学差异。这三种方法在观察乳腺癌侵袭性的指标时有显著统计学差异。结论：初步研究表明，在现有的参数条件下，锥体束乳腺 CT 对于乳腺癌边界和钙化的显示并没有呈现出明显优势，但是其空间定位的优势是明显的，这是我们需要进一步研究的突破点，锥体束乳腺 CT 应于于临床还需要更多的实践。

PU-3307
乳腺导管造影技术在乳头溢液性疾病检查中的质量控制

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目的 常规乳腺导管造影检查方法，尚存在操作难度相对大、分支导管显影不足，对比剂易进入腺泡导致诊断困难等问题进行技术改进，以提高造影的成功率和造影质量。**方法** 采用数字表法将 100 例 120 侧，随机分成 2 组，B 组使用常规方法，A 组在此基础上进行如下改进：⑴术前与病人作充分交流，告知检查的必要性和注意事项；⑵使用非离子型对比剂，注射量参考导管溢液的排出量，总量控制在 0.5～4ml，注射时间 5～10s；注射结束到摄第一张片的时间控制在 30 s 之内，摄片时压迫器压力控制在 6～8 牛顿。**结果** A 组 80 侧中，78 侧一次性造影成功（97.5%），2 侧第 2 次插管造影成功；导管树均显示良好，图像清晰，对比剂保留时间长，摄片时间充足，对溢液有一定的缓解作用。B 组 40 侧中一次性造影成功 32 侧（80.0%），8 侧第 2 次插管造影成功；导管树的充盈程度、图像清晰度，均较 A 组显影淡薄，充盈不充分，导管树显影不完全或对比剂进入腺泡。2 组乳腺导管造影质量及显示效果比较，差异有统计学意义。**结论**术前加强和病人沟通，在术中控制进针深度、对比剂总量及注射压力、注射速度，对比剂类型，以及注射结束到摄片的时限，是提高乳腺导管造影质量的关键因素。因此，正确掌握导管造影技术和严格按操作要求进行质量控制，可提高造影质量，获得更优化的影像信息。

PU-3308
CT 联合超声对直径小于 2 cm 乳腺癌临床确诊的价值（摘要）

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目的：观察 CT 联合超声对直径小于 2 cm 乳腺癌的临床诊断价值。
方法：收集直径小于 2cm 乳腺癌患者 20 例，所有患者行 CT 及超声检查，观察这两种诊断方式的影像特点，并与病理结果对比分析。
结果　CT 诊断与病理诊断结果符合率为 85%、敏感性 95%，超声诊断与病理诊断结果符合率为 80%、敏感性 80%。CT 联合超声检查诊断与病理诊断结果符合率为 90%，显著高于 CT、超声单独使用的检查符合率（P<0.05）。20 例早期乳腺癌患者中，浸润性导管癌占比 80%、乳头状癌占比 5%、导管内癌占比 15%。
结论　对直径小于 2cm 乳腺癌应用 CT 联合超声检查具有较高的诊断效果，对乳腺癌早期诊断治疗具有重要意义。

PU-3309
高频彩色多普勒超声及超声造影对乳腺癌腋窝淋巴结转移 的诊断价值

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目的　探讨高频彩色多普勒超声及超声造影对乳腺癌腋窝淋巴结转移的诊断价值。**方法**　回顾性分析 295 例乳腺癌患者腋窝淋巴结的常规超声及超声造影图像，其中淋巴结转移组 198 例，淋巴结无转移组 97 例。记录两组淋巴结的纵横比、皮髓比及血流分布类型，观察其超声造影增强模式，并将两组结果进行对比分析。**结果**　淋巴结转移组的纵横比小于淋巴结无转移组，皮髓比大于无淋巴结转移组，两者相比差异均有统计学差异（P<0.01）。取淋巴结纵横比≤1.8，对诊断淋巴结转移的敏感度及特异度分别高达 63.8%与 65.9%；取淋巴结皮髓比≥1.0，对诊断淋巴结转移的敏感度及特异度分别高达 76.5%与 87.8%。淋巴结转移组血流分布以周围型和混合型居多，而淋巴结无转移组血流分布以中央型居多。对两组淋巴结超声造影的结果分析显示：淋巴结转移组灌注模式表现为不均匀型增强或无增强，而淋巴结无转移组表现为均匀型增强，两组灌注模式之间的差异有统计学意义（P<0.01）。**结论**　高频彩色多普勒超声及超声造影可提高乳腺癌腋窝淋巴结转移的诊断率，具有重要的临床价值。

PU-3310
乳腺 X 线导丝导向立体定位术辐射剂量优化研究

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[摘要]
目的　通过体模及临床研究优化乳腺钼靶立体定位活检术 SNLB 的辐射剂量。

方法 采用不同厚度的 PMMA 板（20-60mm）配合 ACR 乳腺 18-220 体模的核心模块模拟不同压迫厚度的乳腺组织及不同直径的微钙化灶，以手动 Manual 模式 5mA 为变化单位改变管电流为实验组；以自动 AOP 模式为对照组，观察第 7、8 组 A1203 模拟微钙化灶的显示情况，记录每组成像条件下的 mA 值、AGD 及微钙化灶主观评分，分析 mA 值与 AGD、主观钙化评分间的相关性。根据体模研究筛选出的成像参数结合不同患者乳腺压迫厚度和腺体密度，将 61 例患者分 A 组（乳腺压迫厚度≤5cm 且腺体含量≤50%）17 例、B 组（压迫厚度>5cm 或腺体含量>50%）44 例，分别采用超低剂量或¼Dose 模式、¼Dose 或½Dose 模式手动曝光。

结果 管电流 mA 与 AGD 呈线性正相关（R=0.783-0.945）；mA 与微钙化灶主观评分负相关，变化趋势非线性。不同组别的主观评分做 Numear 检验，辐射剂量以 Auto 模式剂量作为基准百分比，不同厚度组别在辐射剂量下降 60%-91%出现具有统计学差异的主观评分衰减。模拟乳腺压迫厚度＜5cm 时，1/2DOSE、 1/4DOSE 以及超低剂量（4mAs）均可满足主观评价的要求；厚度＞5cm 时，超低剂量模式曝光存在风险， 1/2DOSE、 1/4DOSE 可满足主观评价与同厚度对照组相比，主观钙化评分无明显衰减，61 例患者微钙化的显示质量均可满足定位要求，A、B 两组平均腺体剂量分别下降 87.13%、53.94%。

结论 随 mA 递减，AGD 和微钙化主观评分均呈下降趋势。乳腺压迫厚度≤5cm 且腺体含量≤50%组采用超低剂量或¼Dose 模式，压迫厚度>5cm 或腺体含量>50%组采用¼Dose 或½Dose 模式曝光，均可满足 SNLB 术微钙化灶定位需求同时辐射剂量显著下降。

PU-3311
乳腺 X 线引导下穿刺定位在乳腺簇状钙化病变的应用

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目的 乳腺 X 线引导下穿刺定位在乳腺簇状钙化病变的临床应用研究。方法 乳腺影像报告及数据系统分类（BI-RADS）分类为 IV 类和 V 类的簇状钙化病变的患者 68 例，采用乳腺 X 线定位穿刺的方法，定位导丝留置于簇状钙化病变区，在导丝引导下进行手术切检，切除标本再次 X 线摄片，确认钙化灶完全切除，送至病理组织学检查。结果 乳腺 X 线摄片发现簇状钙化病变的患者 68 人均一次性穿刺定位成功，手术均完整切除。病理检查：恶性病灶 52 例，良性病灶 16 例，术前 X 线摄影对乳腺簇状钙化病变诊断的灵敏度，特异度、阳性预测值和阴性预测值分别为 84.62%，75.00%，91.67%和 60.00%，与病理结果一致性 Kappa 值为 0.549（p<0.05）。结论 乳腺 X 线引导下导丝穿刺定位技术可以明确簇状钙化性质，提高早期乳腺癌的检出率，是诊断和治疗为一体的方法。

PU-3312
99Tcm-SC SPECT 与 CT-LG 同机融合显像 VX2 兔乳腺癌腋窝前哨淋巴结的价值

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目的 初步探讨锝 99 标记硫胶体($^{99}Tc^{m}$-SC) SPECT 与 CT 淋巴管造影(CT lymphography, CT-LG)同机融合显示 VX2 兔乳腺癌腋窝前哨淋巴结(sentinel lymph node, SLN)的价值。**方法** 选取 20 只雌性新西兰大白兔建立 VX2 兔乳腺癌动物模型，并先后分别行 CT-LG 和 $^{99}Tc^{m}$-SC SPECT 与 CT-LG

同机融合检查显示腋窝 SLN，且与常规腋窝 SLN 活检和淋巴结清扫手术结果相对照。**结果** (1) 20 只实验兔建模成功率为 95%(19/20)，均依次顺利完成 CT-LG 和 $^{99}Tc^{m}$-SC SPECT 与 CT-LG 同机融合检查。(2) 19 只荷瘤实验兔 CT-LG 检查和 $^{99}Tc^{m}$-SC SPECT 与 CT-LG 同机融合图像上均清楚显示 SLN 及其引流淋巴管的百分比分别为 78.9% (15/19)和 73.7% (14/19)，二者并无明显统计学差异(P＞0.05)。(3) CT-LG 检出腋窝 SLN16 枚，n-SLN7 枚，$^{99}Tc^{m}$-SC SPECT 与 CT-LG 同机融合检查检出 SLN20 枚，n-SLN12 枚；SLNB 手术共 21 枚 SLN，17 枚 n-SLN。比较这三种方法检出腋窝淋巴结的差异，未见明显统计学差异(x^2=1.497, P=0.454)。**结论** $^{99}Tc^{m}$-SC SPECT 与 CT-LG 同机融合检查可有效检出和准确定位腋窝 SLN，可为临床准确识别及定位 SLN 提供一种新的检查方法。

PU-3313
含可疑钙化的乳腺良性增生性病变 MRI 诊断价值

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目的：探讨乳腺 MRI 对乳腺 X 线摄影中含可疑钙化良性增生性疾病的诊断价值。
方法：搜集 2014 年 1 月至 2019 年 4 月于我院行乳腺钙化灶定位下活检术或术前钩丝定位局部切除活检术后，经病理证实为良性增生性病变共 48 例患者，51 个病灶，所有患者术前均行乳腺 X 线摄影及 MRI 检查且病灶包含可疑钙化。分析病灶内可疑钙化的形态、分布及其在乳腺 MRI 上的表现，结合患者乳腺 X 线摄影腺体构成、乳腺 MRI 背景实质强化情况，与组织病理学结果进行对照。
结果：48 例患者均为女性，平均年龄 47.2 岁。共 51 个病灶，其中不伴非典型增生良性增生性疾病共 33 个（64.7%），伴非典型增生良性增生性疾病共 18 个（35.3%）。乳腺 X 线摄影中，可疑钙化的形态及分布方式以无定形（30，58.8%）、团簇状（32，62.7%）多见，在伴或不伴非典型增生的良性增生性疾病中无统计学差异；乳腺 MRI 中，病变以非肿块样强化多见（40，78.4%），伴非典型增生者常表现为多区域或区域性（16，61.5%）、不均匀强化（22，84.6%），不伴非典型增生者常表现为线样（6，42.9%）、均匀或不均匀（6，42.9%）强化，均具有统计学差异。乳腺腺体构成以 C 型、D 型多见，乳腺背景实质强化以中度型、显著型多见，在伴或不伴非典型增生良性增生性疾病中无统计学差异。
结论：乳腺 X 线摄影中伴含可疑钙化良性增生性疾病在乳腺 MRI 上以非肿块强化多见，强化分布方式及内部强化模式在伴与不伴非典型增生中存在差异。

PU-3314
全数字化乳腺 X 线引导下俯卧式三维立体真空辅助活检的护理配合

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目的：总结全数字化乳腺 X 线引导下俯卧式三维立体真空辅助活检的护理配合。方法：通过使用全数字化乳腺 X 线三维立体定位系统及 ATEC 乳房活检与旋切系统，对 53 例临床触诊阴性、乳腺 X 线平片显示钙化灶的患者进行真空辅助穿刺活检，根据病理结果进行下一步治疗。结果：50 例乳腺钙化灶患者真空辅助活检术均一次性完成，护理效果良好，患者无血肿无并发症发生。剩余 3 例患者手术未成功。病理结果：良性 39 例，恶性 11 例。结论：有效的护理配合可以提高全数字化乳腺

X 线引导下俯卧式三维立体真空辅助活检的成功率，极大地减少并发症的发生，而且此项检查创伤小、操作简单，定位准确，可以有效的为临床减轻手术负担。

PU-3315
浅析 X 线引导下真空辅助乳腺活检的技术要点

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目的：探讨 X 线三维立体定位真空辅助乳腺活检系统对乳腺内簇状钙化灶穿刺活检的技术要点。**方法**：回顾性分析我院 2017 年 11 月至 2018 年 10 月 49 例乳腺内有簇状钙化灶的患者行 X 线三维立体定位真空辅助乳腺活检的手术资料。**结果**：49 例患者中有 2 例因乳房压迫厚度较薄无法实施旋切而放弃手术,1 例因乳房压迫后病变距离乳头位置较近而放弃手术，最终完成手术 46 例，有 39 例应用针槽 20MM 旋切探针，7 例应用针槽 12mm 旋切探针，一次压迫找到钙化灶 26 例，经改变体位压迫乳房找到钙化灶 5 例，未改变体位但重复压迫乳房找到钙化灶 15 例。定位准确 43 例，定位不准 3 例。旋切后标本组织 X 线摄影后均显示有钙化。术中未出现严重并发症，未出现感染病例。**结论**：熟练掌握 X 线三维立体定位真空辅助乳腺活检操作技术要点是此项手术成功与否的关键，对术中及术后并发症的发生和患者接受 X 线剂量的多少起决定性的作用。

PU-3316
乳腺三维断层合成摄影引导下导丝定位新技术的临床应用价值

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目的 探讨乳腺三维断层合成摄影(DBT)引导下导丝定位新技术的应用价值。**方法** 收集 2017 年 5 月至 2019 年 2 月我院临床不可触及和乳腺常规二维摄影片(DM)显示阴性，DBT 发现可疑病变 12 例，均行 DBT 引导下导丝定位术，外科切除定位区域病变组织，行乳腺断层标本摄影，确认病变完整切除后送病理科进行组织病理检查。**结果** 本组均定位准确，病变组织切除完全，病理诊断恶性病变 4 例（浸润性导管癌 1 例、导管内原位癌 3 例、），占 33.33% ；良性病变 8 例（导管内乳头状瘤 2 例、放射状瘢痕 3 例、腺病伴慢性炎 1 例、腺病 2 例），占 66.67%。**结论** 临床不可触及和 DM 显示阴性的病变，DBT 引导下导丝定位新技术对 DBT 发现可疑病变并准确切除具有较大的优势，值得临床推广应用。

PU-3317
钼靶 X 线定位穿刺活检对乳腺微小病灶的诊断价值

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目的探讨乳腺 X 线定位穿刺活检术对乳腺微小病灶的诊断价值。方法回顾分析临床触诊阴性而乳腺钼靶 X 线片显示的微小病灶 45 例,采用乳腺钼靶 X 线定位下穿刺,并留置导丝在微小病灶 区,引导手术将病灶切除活检。结果 45 例微小病灶均一次性定位成功,定位满意率 94%,手术切除完整。病理检查:恶性病变 21 例,其中浸润性导管癌 12 例,导 管内癌伴早期浸润 5 例,导管内癌 1 例,髓样癌

3 例;良性病变 24 例。结论乳腺钼靶 X 线定位穿刺活检术,定位准确,诊断明确,能确定乳腺微小病灶的性质,是目前诊断早期乳腺癌的有效方法。

PU-3318

乳腺 X 线钙化灶投影位置与二维体表定位的关系

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目的 ：探讨乳腺 x 线钙化灶的诊断方法。
方法： 回顾临床未触及到乳腺病变患者,根据患者乳腺条件将不可进行钼靶引导下穿刺及导丝定位术筛选出 79 例，对其 79 例患者行乳腺 x 线摄影,用金属铅做标记，使其金属铅的体表位置与病灶投影位置一致。
结果： 79 例患者，其中 23 例硬化性腺病，17 例早期乳腺癌，13 例乳腺小叶增生，26 例重度非典型增生，成功率为 100%。
结论：乳腺钼靶二维定位能够帮助乳腺钙化病灶准确定位，乳腺钼靶摄片立体定位是诊断乳腺钙化病灶的重要方法定位的准确性与乳腺是否下垂无关,与病灶所占象限或方向及乳腺大小有关，过大的乳腺在行 ML 位时，因乳腺过大向上托举时腺体组织活动会导致病灶位置移动。

PU-3319

钼靶二维钩针定位在不能扪及乳腺钙化性病变中的定性诊断及治疗中的应用

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目的：探讨钼靶二维钩针穿刺定位对不可触及乳腺钙化性病变的诊断价值及其对乳腺外科手术的指导作用。
方法：采用 GE Senograghe DS 乳腺钼靶机及数字化二维定位穿刺系统，对 33 例临床不能触及肿块行常规乳腺钼靶头尾位(CC)和侧斜位(MLO)，发现乳腺细小钙化病变进行术前乳腺钩针定位，然后，切取组织标本(连定位钩丝)再行钼靶检查。
结果：经钼靶钩针引导下行乳腺手术活检 38 例中，全部病例均一次性成功定位与切除，其中 2 例为病变贴近胸壁，仅小部分置于穿刺野内，导致定位钩丝偏离；定位正确率达 94.7%。并且根据微小钙化形态、大小、数量和密集度等表现可反映病变性质和范围，本组病理检查结果：恶性 29 例，导管原位癌 16 例，浸润性导管癌 9 例，导管内乳头状癌及小叶原位癌各 2 例，良性病变 9 例。可见对这一类钙化是钩针定位手术活检定性的重要对象；钙化灶的出现对乳腺癌的诊断有十分重要的意义。
结论：乳腺钼靶二维钩针穿刺定位简单易行，在乳腺微小钙化病变的诊断中起着重要的作用，并可指导乳腺外科医生准确切取病变，减少不必要的乳腺损害，使切除范围更准确。

PU-3320

乳腺高危病变的乳腺 X 线诊断及技术进展

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乳腺高危病变包括良性病变及原位癌，具有发生乳腺癌的风险。高危病变首诊主要依赖于穿刺活检，但首诊后存在一定的病变升级率。对于不同的高危病变，如不典型导管增生（ADH）、乳头状瘤伴不典型增生、放射状瘢痕、小叶原位癌（LCIS）、不典型小叶增生（ALH）、黏液囊肿样病变、平坦上皮非典型增生等，乳腺 X 线检查的诊断及处理原则并不完全相同。就乳腺 X 线检查对高危病变的诊断、处理、预后评估的研究进展予以综述。

PU-3321
全数字化乳腺 X 线三维立体定位系统引导下的核芯针活检技术对乳腺病变诊断的临床价值

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目的 探讨全数字化乳腺 X 线三维立体定位系统引导下的核芯针活检技术对乳腺病变诊断的临床应用价值
方法 回顾性分析 21 例在全数字化乳腺 X 线三维立体定位系统引导下行核芯针活检的患者，21 例患者共 21 个病变，活检前 X 线摄影检查表现为包块（4 例）、可疑钙化（15 例）及腺体纠集（2 例），BI-RADS 分类为 4 类，根据乳房 X 线片（0°及 90°）人工计算进针深度，利用全数字化乳腺 X 线三维立体定位系统自动计算进针深度，将此值与人工计算的进针深度值相结合，再结合患者皮肤弹性以及腺体结构情况，调整进针深度，局部麻醉，行小切口置入穿刺针，再行 X 线摄片，观察穿刺针位置，随即激发穿刺枪取出组织，在病变不同位置多次取出组织。将取出组织行 X 线摄影，观察
结果 21 例患者平均乳房厚度 43mm，最厚 63mm，最薄 28mm，行垂直活检 19 例，水平活检 2 例，患者采取侧卧位（19 例）及坐位（2 例），平均整个操作时间 45 分钟，穿刺时间 25 分钟，穿刺针深度调整范围是 3-5mm，采用 14G 穿刺针，根据病变情况穿刺组织条 4-8 条，对取出的组织条行 X 摄影，针对可疑钙化的病例，取出的组织条中均查见钙化灶。21 例患者均未出现严重不良反应，2 个病人出现头晕、恶心、心慌，出现不良反应的患者均为坐位行穿刺活检，经休息、心理安抚后能很快恢复，穿刺结果 6 例乳腺癌（导管内乳头状癌 1 例、导管原位癌 2 例、浸润性乳腺癌 3 例、），15 例良性病变，随诊 1 年后未见明显变化
结论 对乳腺病变行全数字化乳腺 X 线三维立体定位系统引导下的核芯针活检时优先选择患者呈侧卧位，可有效减少不良反应发生；14G 穿刺针，取组织条≥4，阳性率较高。该技术穿刺准确性高，简单易行，具有推广价值

PU-3322
疲劳状态下放射科规培医生借助 AI 辅助软件对肺内不同大小结节检测效能的比较研究

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目的：放射科规培医师在疲劳状态下借助 AI 软件进行肺结节检测，比较其对大于等于 4mm 结节与小于 4mm 结节检测的优效性。
方法：收集 2019 年 1 月 1 日到 2019 年 1 月 10 日大连大学附属中山医院双源 CT 胸部病例 200 例。由 4 名低年资影像规培医师（从事影像诊断工作满 4 月以上）对上述病例肺结节标注，测试前进行统一培训。放射科规培医师，在疲劳状态下（即一天日常工作满 8 小时以上）使用 AI 软件辅助进行阅片，自行调节窗宽窗位观察 1mm 薄层图像，并记录结节位置、大小、数目。最终，肺结节检测结果与金标准（由 2 名从事影像诊断工作 8 年及以上的医师结合 AI 辅助软件共同阅片，意见不同时由第 3 名从事影像诊断工作 15 年及以上的医师进行会诊，最后做出一致诊断）进行比对，分别统计长径≥4mm 与＜4mm 结节的正确、误诊、漏诊数，并计算两组敏感度、准确率、假阳性率、假阴性率，应用 χ^2 检验分析两组敏感度是否存在差异，P＜0.05 为差异有统计学差异。
结果：≥4mm 结节组与＜4mm 结节组敏感度分别为 0.80、0.77，p＜0.05 有统计学意义，两组准确率分别为 0.73、0.90，假阳性率分别为 0.44±0.73、0.44±0.86，假阴性率分别为 0.3±0.63、1.2±1.69。疲劳状态下结合 AI 对≥4mm 结节的检测敏感度（0.80）较＜4mm 结节的检测敏感度（0.77）高，且假阳性率、假阴性率均降低。
结论：放射科规培医师在疲劳状态下应用 AI 软件后对肺内不同大小结节检出效能有差异，且对≥4mm 结节的检出效能优于＜4mm 的结节。

PU-3323
驾驭或被取代？医学影像 AI 时代放射诊断医师的职业思考

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【摘要】目的　浅谈医学影像 AI 背景下，放射诊断医师面临的机遇与挑战，应该如何做出正确的职业思考。 方法　通过我科放射诊断医师 1 年多来使用医学影像 AI 技术筛查肺小结节的情况，以及目前医学影像 AI 技术的应用领域分析研究。 结果　医学影像 AI 技术在辅助筛查肺小结节方面能够明显降低漏诊率，减轻放射诊断医师日常繁重的工作，在其他领域的应用也价值突显。 结论　医学影像 AI 技术不但不会取代放射诊断医师的地位，反而会在正确的引导下发挥它的更大优势，为人类的健康保驾护航。

PU-3324
Title：Ensemble learning-based analysis of T1-weighted and T2-weighted magnetic resonance (MR) radiomics for the prediction of prostate cancer grades with small-scale cohort

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Purpose: The present study aimed to construct predictive models for prostate cancer grading by
combining T1-weighted and T2-weighted magnetic resonance (MR) radiomics features.
Methods:A cohort of 33 samples of prostate cancer (PCa) with T1-weighted images (T1WI) and T2-weighted images (T2WI) was gained from the Baoji Central Hospital. T1WI and

T2WI were co-registered by Statistical Parametric mapping 12 (SPM 12) and then fused via 3DSlicer. After Adaptive Synthetic (ADASYN) was used to balance the data, 1132 radiomics features were extracted through PyRadiomics and selected by XGBoost and Random Forest which were continued to construct the prognostic model afterwards. The performance of two models was evaluated by accuracy and receiver operating characteristics curve (ROC). The best
model—XGBoost was chosen as the higher accuracy and AUC.
Results: To prevent over-sampling, patients' number went up to 53 after ADASTN (12, 13, 16, and 12samples in 1 to 4 Gleason group respectively.). Top 17 features in T1-T2, top 14 features in T2 and top 6 features in T1 were selected and inputted into XGBoost and Random Forest. Their accuracy was 0.69, 0.75 and 0.67 in XGBoost and 0.44, 0.62 and 0.47 in Random Forest separately. Besides, their mean AUC was 0.79, 0.91 and 0.80 in XGBoost and 0.87, 0.78 and 0.73 in Random Forest.
Conclusions:(1) The integrated learning algorithm using XGBoost can effectively predict prostate cancer grade based on T2WI radiomics features. (2) T2WI has a better prognostic performance compared with T1-T2 fusion images.

PU-3325

Study on the detection capability of AI assisted software in detecting long-axis diameter <4 mm pulmonary nodules by resident in radiology department

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MOTIVATION: To evaluate the detection capability of artificial intelligence (AI) assisted software in the detection of long-axis diameter <4 mm pulmonary nodules by resident.
METHOD AND MATERIALS: A total of 169 patients were collected. One senior radiologist with more than 10 years' experience read CT images based on the initial diagnosis of another senior radiologist with similar experience and a final decision was subsequently conducted by deputy chief radiologist with more than 15 years' experience to determine the ground truth lung nodules. All readings were performed on 1 mm slice thickness CT images with the assistance of AI software (InferRead CT Lung Research, Infervision, Beijing, China). One resident read the images without AI software (group A). After two weeks washout period, the same resident read CT images again with AI software (group B). The number of nodules, long-axis diameter, location and labeling time were recorded. The number of true positive nodules, false positive nodules in group A and B were obtained by comparing with the gold standard nodules.
RESULTS: Group A detected 511 nodules, including 442 true positive nodules and 69 false positive nodules with a sensitivity of 0.49±0.26 and a false positive rate of 0.41 per CT scan (69/169). Group B detected 858 nodules including 813 true positive nodules and 45 false positive nodules with a sensitivity of 0.82±0.24 and a false positive rate of 0.27 per CT scan (45/169). The sensitivity in group B was 33% higher than that in group A (p<0.05) and the false positive rate in group B was 14% lower than that in Group A(p<0.05).

CONCLUSION: Compared with resident without AI, the AI-assisted resident achieve much higher detection sensitivity and lower false positive rate of long-axis diameter <4 mm pulmonary nodules .

PU-3326

2D and 3D texture analysis to predict lymphovascular invasion in lung adenocarcinoma

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Purpose: Lymphovascular invasion (LVI) impairs surgical outcomes in lung adenocarcinoma (LAC) patients. Preoperative prediction of LVI is challenging by using traditional clinical and imaging factors. The purpose of this study was to evaluate the value of two-dimensional (2D) and three-dimensional (3D) CT texture analysis (CTTA) in predicting LVI in LAC.
Methods: A total of 87 LAC patients (36 LVI-present LACs and 51 LVI-absent LACs) were retrospectively enrolled. Clinical data (age, gender, smoking history) and CT findings (maximum diametre, lobulation, speculation, bubble lucency, air bronchogram, vessel convergence, pleural indentation, and component of the nodule) were analyzed to select independent clinical predictors. Texture features were extracted from 2D and 3D regions of interest (ROI) in 1.25 mm slice CT images. The 2D and 3D CTTA signatures were constructed with the least absolute shrinkage and selection operator algorithm and texture scores (Tex-scores) were calculated. The optimized CTTA signature was selected by comparing the predicting efficacy and clinical usefulness of 2D and 3D CTTA signatures. A CTTA nomogram was developed by integrating the optimized CTTA signature and clinical predictors, and its calibration, discrimination and clinical usefulness were evaluated.
Results: Maximum diametre and air bronchogram were independent clinical predictors. 837 texture features were extracted from 2D and 3D ROIs and reduced to 9 features to build 2D and 3D CTTA signatures. There was no significant difference (P=0.127) in AUC between the 2D signature (AUC [area under the curve], 0.907; 95% confidence interval [CI], 0.840-0.974) and the 3D signature (AUC, 0.851; 95% CI, 0.767-0.935). Decision curve analysis showed the 2D signature outperformed the 3D signature in terms of clinical usefulness. The 2D CTTA nomogram (AUC, 0.909; 95% CI, 0.846-0.872), which incorporated the 2D signature and clinical predictors, showed similar discrimination capability (P=0.798) as the 2D signature.
Conclusions: Both 2D and 3D CTTA signatures have favorable performance in predicting LVI in LAC, but 2D signature had a higher net benefit. The 2D CTTA nomogram with the 2D signature and clinical predictors incorporated do not show incremental value to the 2D signature for individual LVI prediction in LAC.

PU-3327
放射组学标签：一种优于 CT 形态学特征的 NSCLC 患者 EGFR 基因突变状态的生物标记物

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目的：对比放射组学标签和 CT 形态学特征对于 NSCLC 患者 EGFR 基因突变状态的预测价值，进而建立并比较不同的 EGFR 基因突变预测模型。
方法：回顾性收集 2012 年 4 月至 2016 年 2 月的 243 例非小细胞肺癌（NSCLC）作为训练集，另外收集 2015 年 5 月至 2016 年 10 月的 161 例 NSCLC 作为独立验证集。放射组学特征提取于术前胸部 CT 平扫图像的肿瘤感兴趣体积（VOI）。使用 Mann-Whitney U 检验、卡方检验对所有特征及放射组学标签进行单因素分析。无监督一致性聚类分析用于分析放射组学特征的代表性和减少冗余特征。多因素 Logistic 回归分析用于构建放射组学标签和 EGFR 基因突变预测模型。ROC 曲线用于评价不同特征及模型的预测效能，并采用 Delong 检验比较特征之间、模型之间的效能差异是否有统计学意义。
结果：在 234 个放射组学特征中，筛选出 93 个重复性高及区分度好的特征。放射组学标签（由一个直方图特征、两个纹理特征组成），相比于所有临床特征和形态学特征，显示出最佳的 EGFR 基因突变预测性能（在训练集和验证集中的 AUC 分别为 0.762、0.775，$P<0.05$）。EGFR 基因突变整合模型由最大直径、位置、性别以及放射组学标签构成。在训练集和验证集中，相比于其它两个临床模型，整合模型均显示出最好的预测价值（在训练集和验证集中的 AUC 分别为 0.798、0.818）。
结论：放射组学标签是一种优于 CT 形态学特征的、可用于预测 NSCLC 患者 EGFR 基因突变状态的生物标记物。此外，基于放射组学标签的 EGFR 基因突变整合模型具有较高的预测效能，可辅助临床靶向治疗。

PU-3328
A reliable prediction model for renal cell carcinoma subtypes based on the radiomic features extracted from the 3D multi-phase enhanced CT image

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Purpose: Considering the different treatment methods for different renal cell carcinoma (RCC) subtypes and the risks and limitations of pathological biopsy, we aimed to construct an effective and reliable prediction model to distinguish RCC subtypes by using 3D multi-phase enhanced CT radiomics features (RFs), which can help us to make individualized treatment in a non-invasive way.
Methods: A total of 210 RCC subtypes confirmed patients were included in this study (143 clear cell RCC, 25 papillary RCC, 29 chromophobe RCC, and 13 other RCC). The 3D multi-phase enhanced CT based radiomic features (RFs) were used to construct the

prediction model including: non-contrast phase (NCP), cortico-medullary phase (CMP), parenchyma phase (PP), excretory phase (EP), and an all-phase (ALL-P) which contains all the single-phase information. The ensemble learning stratified bagging method was applied to predict the different RCC subtypes by using LASSO regression and one vs. rest logistic regression algorithm. Five-folds and external stratified cross-validation was used to assess the performance among the different prediction models. **Results:** 105 RFs were extracted from each single phase of CT scan. The study found 4 CMP, 3 PP, 1 EP and 1 NCP RFs were significantly in the All-P model and there was no overlap with the other 4 single-phase model. The prediction efficiency of All-P was the best, showed diagnostic accuracy of 0.81 (AUC, 0.853; precision, 0.717; recall, 0.799, kappa, 0.579).
Conclusion: The All-P prediction model based on the 3D RFs is an effective and reliable prediction model for distinguishing RCC subtypes in a non-invasive way before the treatment.

PU-3329
医院 PACS 平台人工智能骨龄检测系统集成技术与实现

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目的：探讨基于医院 RIS-PACS 网络和工作流的人工智能骨龄检测系统集成方法与技术实现。**材料与方法：**基于 Python flask web 框架的 http 协议，通过调用、对接医院 PACS、RIS 接口，设计一种架构以实现对自主研发的 2 套人工智能骨龄检测系统（CHBoneAI）与 PACS、RIS 系统集成。**结果：**2 套 CHBoneAI 均成功嵌入式集成于本院网络及 RIS-PACS 平台上，稳步临床“并行运行”已近 3 年；在目前医院千兆网络条件下，临床每个病例骨龄 AI 检测整个流程不超过 3 秒。**结论：**人工智能骨龄检测系统的医院 RIS-PACS 平台上集成与“并行运行”完成了 I 期构建，为系统自我进化及“替代运行”的Ⅱ期建设夯实了基础。

PU-3330
Automatic prostate cancer segmentation and location on ADC map using U-Net convolutional neural network

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Objective: To develop an automatic approach using U-Net convolutional neural network (CNN) for prostate cancer (PCa) detection, segmentation and location on apparent diffusion coefficient (ADC) map. **Methods:** This retrospective study included 184 PCa patients confirmed by TRUS-guided systematic plus targeted biopsy after MRI examination from June 2017 to March 2019. 129/18/37 patients were randomly selected for training/validation/testing, respectively. Ground truth of PCa lesion segmentation was obtained using manual delineation by an experienced urogenital radiologist on ADC

map (DWI b=1400 s/mm2) in reference to the pathological findings. After image preprocessing of fully automatic segmentation of the whole prostate gland, a U-Net CNN was trained for the PCa lesion segmentation. The computer-generated segmentation results were compared with the manual segmentation results. Dice similarity coefficient (DSC) was used as an accuracy measure of PCa lesion segmentation and sensitivity of lesion detection was evaluated. Additionally, the accuracy of PCa automatic location in sextant-sector was also assessed. **Results:** The mean DSC of the model for testing set was 71.5±8.2%。For the 51 PCa lesions in testing set labeled by the expert, the sensitivity of lesion detection is 96.1% (49/51). The model accuracy of automatic PCa localization in sextant-sector was 90.1% (200/222), the sensitivity for PCa region detection was 95.5% (64/67), and the specificity was 87.7% (136/155). **Conclusion:** This fully automatic strategy using U-Net convolutional neural network provide relatively satisfactory performance in PCa detection and segmentation on ADC map. The model has high accuracy for automatic localization of PCa.

PU-3331
基于骨盆正位 X 线和深度学习构建髋关节智能测量模型的可行性研究

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研究目的：基于骨盆正位 X 线和深度学习神经网络，研究构建成人髋关节发育不良（DDH）指标智能测量模型的可行性。
研究方法：通过 PACS 系统回顾性采集骨盆正位 X 片 5180 例，从中随机选择 1060 例作为训练集和验证集，另随机选择 200 例作为测试集。选取临床常用的四项成人 DDH 测量的指标：外侧 CE 角、臼顶倾斜角、Sharp 角、头臼指数，左右两侧分别测量。确定测量指标所涉及的关键点，对每个关键点进行命名，由一名放射科医师利用 JPHV 标注软件在骨盆正位片上进行所有关键点标注，以坐标（x,y）的形式保存。将数据随机分为 70％训练集和 30％验证集，基于深度学习神经网络建模，通过训练集和验证集调整优化模型参数，建立成人 DDH 智能测量模型。根据上述测量指标的定义，比较模型预测与人工标注的一致性。采用 medcalc15.2.2 统计软件进行相关性及一致性分析。
研究结果 ：模型预测与人工标注所计算的 8 个指标相关性系数 r 均大于 0.7，P<0.0001：Pearson 相关分析：头臼指数 r=0.8514（左）、r=0.7212（右），Sharp 角 r=0.9029（左）、r=0.8596（右），外侧 CE 角 r=0.8760（左）、r=0.7802（右）；Spearman 等级相关分析：臼顶倾斜角 rs=0.800（左）、rs=0.841（右），（P<0.0001）。进一步 ICC 一致性分析，头臼指数 ICC=0.8341（左）、ICC=0.6650（右），Sharp 角 ICC=0.8923（左）、ICC=0.8321（右），外侧 CE 角 ICC=0.8562（左）、ICC=0.7405（右），臼顶倾斜角 ICC=0.8600（左）、ICC=0.8465（右），除了右侧头臼指数及外侧 CE 角外，其余 ICC 均大于 0.75。
研究结论：成人髋关节发育不良（DDH）指标智能测量模型与人工标注具有较高的一致性，可以成为 X 片智能测量有效工具。

PU-3332

Image reconstruction kernels in determination of pulmonary lesion benign/malignant classification using deep learning (DL)-based computer aided diagnostic system

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OBJECTIVE: Different reconstruction kernels were often used to achieve the improved image qualities for diagnostic decision. The aim of this study is to evaluate the effect of different reconstruction kernels in the detection of malignancy/benign of pulmonary lesions using a available diagnostic image processing software.
METHOD AND MATERIALS:
A total of 68 patients (mean age: 56.31±14.86 years, range 26-83 years) underwent routine chest plain CT scans were collected retrospectively from May 1, 2018 to February 27, 2019. All of the 38 malignant lesions were pathologically proven, while the benign lesions were diagnosed based on pathology or clinical follow-up by attending radiologists. These results were reviewed by board-certified expert panel and served as gold standard. Different reconstruction kernels: sharp (B70) and soft (B30) kernels, were applied to produce images which then used as inputs into a commercial DL-based diagnostic image processing system to classify the pulmonary lesions into malignant or benign lesions. After processing, the performance was evaluated by the area under the ROC curve (AUC) from the score the software assigned to each lesion against the gold standard. The detection and precision rate under different reconstruction kernels were assessed and compared using Chi-square tests and kappa score between groups.
RESULTS:
Reconstruction kernel of B30 achieved AUC of 0.785, while reconstruction kernel of B70 accomplished a higher AUC of 0.821, suggesting an improved prediction of lesion characteristic. For benign lesions, the detection rate for B30 and B70 were 73.7% (28/38) and 97.4% (37/38), and the precision rate were 86.8% and 81.6%. Diagnostic accuracy rate and consistency were found no statistical difference between the two reconstruction kernels (p=0.688, kappa score=0.409)
For malignant lesions, B30 and B70 achieved detection rate of 81.6% (31/38) and 92.11% (35/38); while achieved precision rates were 71.05% and 81.6%, respectively. However, there was no statistical difference in diagnostic accuracy and agreement rate between B30 and B70 (p=0.125, kappa score=0.713).
The two-way ANOVA shows when analyzing reconstruction kernel as the main effect, diagnostic performance was at the boarder-line difference (p=0.054).
CONCLUSION:
B70 demonstrated a trend of better performance in lesion-wise detection and malignancy classification, however, B30 had advantage in classification of benign lesions at non-contrast CT. It was tendency that different reconstruction kernel may have an influence on pulmonary lesions detection and benign/malignant classification.
CLINICAL RELEVANCE/APPLICATION

B70 reconstruction kernel may hold the potential to improve detection of pulmonary lesions, however radiologists should consider the combination of B30 reconstruction kernel when judging the risk degree of pulmonary lesions for better operation decision.

PU-3333

Volumetric apparent diffusion coefficient histogram analysis on gallbladder carcinoma

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Objective: To evaluate the diagnostic performance of histogram analysis of apparent diffusion coefficient(ADC) derived from diffusion-weighted imaging (DWI) for differentiating malignant from benign gallbladder diseases.
Materials and methods: Our study collected 789 patients with gallbladder disease who had undergone DWI scan for preoperative evaluation in Tongji Hospital from Septemper2017 to December2018,and finally 86 patients were enrolled after excluding unqualified cases.Preoperative DWI images of 86 patients with gallbladder disease confirmed by surgery or puncture pathology were measured by two radiologists. Volumetric ADC maps were generated using all slices of the DWI images to obtain histogram parameters, including mean, median, 10th percentile, 25th percentile, 75th percentile, 90th percentile ADC, and SD ADC values, as well as skewness, kurtosis, and entropy.The weighted-K test was used to examine the consistency of the results measured by the two radiologists. Comparisons of these parameters were made by Mann-Whitney U test .The sensitivity and specificity were calculated according to the area under the ROC curve (AUC) to evaluate the differential diagnosis on malignant and benign gallbladder diseases.
Results:1.The consistency analysis of the measurement data has good credibility that ICC range from 0.715 to 0.872.
Mean ADC, median ADC, 10th,25th,75th and 90th percentile ADC of gallbladder cancer were significantly lower than those of benign diseases ($p<0.001$).
SD and entropy of gallbladder cancer were higher than those of benign disease,but there were no differences in kurtosis and skewness among these gallbladder diseases.
The areas under the ROC curves (AUC) of the parameters ,including ADC mean, 10th percentile, 25th percentile, 50th percentile, 75th percentile, 90th percentile, standard deviation, kurtosis, skewness，entropy were 0.856、0.963、0.959、0.942、0.908、0.721、0.861、0.526、0.513、0.612，respectively.The 10th percentile yielded the highest AUC that range from 0.959 to 0.968. It had the largest Yoden index when the critical value is 95,and its specificity and accuracy are 89.5% and 95.4% respectively.
Conclusions: Volumetric apparent diffusion coefficient histogram analysis could be helpful for diagnosing gallbladder cancer.

PU-3334

Glioma: MRI radiomics in prediction of preoperative glioma-associated epilepsy

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Purpose: To investigate whether radiomics feature extracted from MRI could improve glioma epilepsy prediction in patients with glioma.

Methods:

MR images of patients from Picture Archiving and Communication Systems (PACS) scanned on 3.0 T MR scanner (Prisima Siemens Healthcare, Erlangen, Germany) of our hospital date from 2016 Aug. to 2018 Aug. MRI sequence including: axial T2-weighted fast spin echo, T2 tirm dark-fluid images, Diffusion weighted images (DWI) , ADCs, post-contrast 3D MPRAGE-T1 and axial post-contrast MPRAGE-T1. Patients who underwent surgery and pathologically proved to be glioma after MR scanning less than one week were recruited. GAE was diagnosis as glioma patients who had preoperative complained simple or complex seizures. By SPSS statistics software (version 21.0, IBM), independent t-test or Chi-Squared was used to observe the difference of gender, age and glioma grade between glioma GAE group and non-GAE group

Quantitative features included first-order statistics (18) and texture-based features(Gray Level Cooccurence Matrix (24), Gray Level Run Length Matrix (16), Gray Level Size Zone Matrix (16), Neigbouring Gray Tone Difference Matrix (5),Gray Level Dependence Matrix (14)) from ROIs of every sequence as well as 14 shape features were extracted. For selecting the valuable feature in predicting epilepsy, we calculated and ranked all candidate feature importance using Extreme Gradient Boosting algorithm (XGBoost) [5]. A combination of leave-one-out cross-validation (LOOCV) and a grid search strategy were utilized to optimize the necessary parameters in XGBoost. In a grid search, systematically alternating pairs of parameters were used for LOOCV. And the parameter combination which resulted in the best LOOCV result were subsequently applied to select the radiomics features. The selected features were normalized with z-score transformation (a mean of zero and a standard deviation of one) to construct the rad-score. Since the feature importance calculate by XGBoost was absolute value, binary Logistic regression was conducted between the selected features and epilepsy status to further confirm the positive or negative relationship. For each patient, the rad-score was finally constructed by a linear combination of the normalized features and their importance. In this study, all experiments including feature extraction, feature selection and classification were implemented using python (version 3.7.1). Candidate prognostic factors including Radscore, patient’s age and glioma grade were performed in the logistic regression analysis for developing a prediction model of glioma epilepsy. Besides, we developed other logistic regression models, which one was rad-score as prognostic factors and the other one was patient’s age and glioma grade as indicators to compare the predictive value of rad-score. Accuracy, sensitivity, specificity, receiver operating characteristic (ROC) and area under the curve (AUC) were used to assess the prediction efficiency.

Results:

80 adult patients (temporal lobe, n=34; frontal lobe, n=46) underwent surgery and pathologically diagnosed with glioma and 34 patients of them were diagnosed GAE (temporal lobe, n=16; frontal lobe, n=18). 41 of them (temporal lobe,n=17; frontal lobe, n=24) have IDH type: 15 patients (temporal lobe, n=8; frontal lobe, n=7) have IDH wild type, 7(46.7%; temporal lobe, n=4; frontal lobe, n=3) of them diagnosed GAE; The other 26 patients (temporal lobe, n=9; frontal lobe, n=17) have IDH mutation type, 13(50%; temporal lobe,n=7; frontal lobe, n=6) of them diagnosed GAE.
We found that rad-score was significantly correlated with temporal lobe epilepsy occurrence (Figure ROC). Rad-score along with patient's age and glioma grade significantly predicted epilepsy in patients with 96.2% accuracy, while the values were 93.8% without rad-score .
When this specific radiomics features were used to predict frontal glioma epilepsy, AUC 85.1%, accuracy 80.4%, sensitivity 85.7 and specificity 72.2%. When 80 patients were considered to distinguish non-GAE group and GAE group, the accuracy was lower than 65%.
Conclusions：
Radiomics features could offer a noninvasive way to estimate the occurrence of epilepsy in glioma patients. Thus, maybe offer an advance notice for glioma patients to prevent epilepsy and damages from epilepsy.

PU-3335
钆塞酸二钠增强磁共振诊断肝细胞癌微血管侵犯的临床价值

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目的：探讨 T1 Mapping 成像及钆塞酸二钠多期动态增强灌注参数诊断肝细胞癌微血管侵犯（Microvascular invasion, MVI）的临床应用价值。**方法**：纳入行上腹部 T1 Mapping 成像和多期动态增强扫描 36 例患者（36 个病灶）。MDCE-MRI 影像图像通过 MRIcron 将 DICOM 格式转换为分析所需 NIFTI 格式，并应用 MATALAB R2018b（导入统计参数映射包 SPM 12）进行呼吸运动校正，最后导入 PMI 0.4 计算 HCC 的灌注参数。使用独立样本 *t* 检验（正态分布）或 *Mann-Whitney U* 检验（偏态分布）检验评估 T1 减低值比率及各个灌注参数在有无 MVI 组间的差异。ROC 曲线下面积分析定量指标诊断 MVI 的最佳临界点，并计算出敏感度、特异度、阳性预测值、阴性预测值。**结果**：灌注参数 VPF、AFF、Ve 诊断 MVI 具有统计学意义（P<0.05），诊断 MVI 的 ROC 曲线下面积分别为 0.735(95%CI: 0.545-0.924)，0.726(95%CI: 0.530-0.923)，0.749 (95%CI: 0.554-0.944)。Ve 诊断效能最高，以 13.25mL/100mL 为截断值时，诊断 MVI 的敏感度、特异度分别为 77.8%和 74.1%，阳性预测值、阴性预测值分别为 0.50、0.91。**结论**：MDCE-MR 灌注参数 VPF、AFF 与诊断 MVI 具有一定的诊断价值，其中 Ve 的诊断价值最高。

PU-3336

MRI-based Radiomics Features for Prediction of Biochemical Recurrence Following Endocrine Therapy for Prostate Cancer with Bone Metastases

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PURPOSE
To identify radiomics features of multiparametric MRI (mp-MRI) for prediction of biochemical recurrence following endocrine therapy for prostate cancer (PCa) with bone metastases (BM).
METHOD AND MATERIALS
In all, 124 patients with BM from PCa were enrolled,the data was gathered from January 2010 to January 2018. Median follow-up of 42 months revealed 59 patients with biochemical recurrence. A total of 976 texture features were extracted from T2-weighted (T2-w) and dynamic contrast-enhanced T1-weighted (DCE T1-w) MRI. Step regression, ridge regression and LASSO regression method model was applied to select features and develop the predicting model for biochemical recurrence following endocrine therapy for PCa with BM. The performance of the radiomics features, PSA level and Gleason Score were explored with the respect to the receiver operating characteristics (ROC) curve. We built clinical and MRI-based texture features nomogram to predict biochemical recurrence following endocrine therapy for PCa with BM.
RESULTS
The radiomics features, which consisted of 13 selected features, were significantly associated with biochemical recurrence (P＜0.05). The combined MRI features derived from T2-w and DCET1-w showed better prognostic performance(AUC=0.885) than features derived from single sequence (T2-wAUC=0.842、DCE T1-w0.862). MRI -based imaging biomarker(including 7 radiomoics features) combined with clinical risk factors (t-PSA, age and Gleason score) yielded the highest AUC(AUC=0.903). Multivariate regression analysis showed that the imaging biomarker was an independent risk factor for the detection of biochemical recurrence. The clinical and MRI-based radiomics features nomogram was built to predict biochemical recurrence following endocrine therapy for PCa with BM.
CONCLUSION
MRI-based radiomics feature was significant predictor for biochemical recurrence following endocrine therapy for PCa with BM. Clinical risk factors combined with MRI-based texture feature could further improve the prediction performance, which provide an illustrative example of precision medicine and may affect treatment strategies.

PU-3337

人工智能肺结节筛查系统的临床使用效能评估

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目的 在临床环境中检验、验证基于深度学习的人工智能（Artificial Intelligence，AI）肺结节筛查系统的使用效能。
方法 回顾性收集 117 例胸部 CT 平扫病例数据，薄层扫描层厚为 1 至 1.25mm。首先由两位拥有超过 15 年胸部 CT 阅片经验的放射科专家共同制定本研究使用的金标准肺结节数。接着，利用基于深度学习的 AI 肺结节筛查系统（北京推想科技有限公司）进行结节检测，记录其检测到的肺结节数。通过与金标准对比，分析 AI 系统检测到的真阳性结节，假阳性结节和假阴性结节的数量。通过计算 AI 系统检测灵敏度和假阳性率（假阳性结节数/CT），验证其临床应用效能。
结果 在 117 例胸部 CT 数据中，共计标注 563 个肺结节作为本研究的金标准。AI 肺结节筛查系统检测到共计 1285 个结节，与金标准对比发现，其中包含 500 个真阳性结节，其检测敏感性达到 88.81%。与此同时，AI 肺结节筛查系统检测结节的假阳性率为 6.71/CT。
结论 AI 肺结节筛查系统在临床使用中表现出较高敏感性，可以有效的辅助临床肺结节筛查工作。

PU-3338
人工智能在骨盆肿瘤手术规划中的应用

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目的 探究应用全卷积神经网络的人工智能算法在骨盆肿瘤磁共振影像学边界全自动分割中应用的可行性及效果。
方法 回顾性收集 2012 年 3 月至 2018 年 6 月于以骨盆肿瘤收治我院的患者，术前均行 CT、MRI 检查，具有手术切除或穿刺手术病理结果，其中磁共振 T1WI 压脂增强序列同时具有横断位和冠状位图像。肿瘤边界金标准由两名资深骨肌系统放射科医生共同讨论确定，由一名医师采用 ITK-SNAP (version 3.6.0)手动勾画分。磁共振图像经过均一化处理后，同分割结果一起用于人工智能肿瘤边界图像的识别和分割。采用 Dice similarity coefficient（DSC 系数）和 Hausdorff distance（Hausdorff 距离）对于人工智能分割肿瘤边界的结果进行分析。
结果 研究共纳入骨盆肿瘤患者 77 例，平均年龄 49.86±15.92 (12~88)岁。骨盆肿瘤边界人工智能分割结果和金标准间的 Dice 系数为 0.85±0.08 (0.621~0.963)，Hausdorff 距离 5.34±1.71 (2.189~8.762)mm。同医师间标注结果比较，放射医师手动标记肿瘤边界平均需要 40 分钟（10~60 分钟），深度学习网络分割肿瘤边界则仅需要大约 25 秒；放射科住院医师标注同金标准间的 Dice 系数为 0.92±0.03，Hausdorff 距离 5.80±3.07mm，准确性高于人工智能分割结果。
结论 应用全卷积神经网络模型的人工智能算法在骨盆肿瘤全自动分割中效果显著，极大地缩短了骨盆肿瘤分割建模的时间，初步减少了人为操作的误差，肿瘤边界分割的准确性得到保障。

PU-3339
3D 打印技术及其在结构性心脏病中的应用进展

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结构性心脏病有先天性心脏病和瓣膜病及其他类型等。当今世界，结构性心脏病的死亡率仍然很高。随着科学技术的发展，3D 打印技术应时而生。它于 1990 年以颅骨自然造模的方式首次在医学领域应用[2]。3D 打印技术是一种利用计算机辅助制造的一项快速成型技术，以其具有快速、可定制化、可重复性的优势，而在医学领域变得炙手可热！[3],尤其在心血管病、心脏瓣膜病等方面体

现出巨大价值。医学 3D 打印技术是一种与临床相关的成像技术，可应用于许多外科手术的术前评估与术中评价与术后分析。3D 打印技术在医疗业应用广泛，它的出现可成为世界人民的福音，尽管现在技术还不够成熟，还有很多限制，但是其具有的潜在巨大优势值得我们继续研究，我们还需在医疗行业做出极大的努力。

PU-3340

Reduces Reading Time and Occupational Fatigue of Radiologists with Different Experiences by Deep Learning-Based Computer Aided Diagnostic System

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Objective: To explore the potential of deep learning-based computer aided diagnostic system (DL-CAD) in reducing occupational fatigue of radiologists with different experiences.

METHODS: 4 attending radiologists with more than 5 years ‘ experience and 4 intern radiologists with less than 1 year experience were assigned to two groups (group A and group B) to interpret chest CT images for thoracic fractures with and without DL-CAD system (InferRead CT bone Research, Infervision, Beijing). The two groups were both divided into two sub-groups: subgroup I and II each consisted of two attendings and two interns. All 103 cases with thoracic fractures were diagnosed by each radiologist within seven hours. Occupational fatigue index of each radiologist was assessed immediately after they completed all interpreting tasks with the improved Swedish Occupational Fatigue Scale which consisted of 5 evaluation indictors (lack of energy, physical consumption, physical discomfort, lack of motivation and sleepiness). And the mean reading time for each patient in each group and sub-group were calculated. Two-samples t-test and Sidak's multiple comparisons test of Two-way ANOVA were used to examine the differences.
Results: The mean reading time for group A was and group B was 425min and 220min with a significant difference ($P<0.05$). For the occupational fatigue assessment, there was a significant difference between group A and group B for all the 5 evaluation indictors. However, there were no significant differences between subgroup I and II for both group A and group B.

Conclusion: DL-CAD reduces reading time and occupational fatigue of radiologists with different working experiences.

PU-3341

Invasive Ductal Breast Cancer: Preoperative Predict Ki-67 Index Based on Radiomics of ADC Maps

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Purpose: The purpose of this study is to develop a radiomics model for predicting the Ki-67 proliferation index in patients with invasive ductal breast cancer through magnetic resonance imaging (MRI) preoperatively.
Materials and Methods:128 patients who were clinicopathologically diagnosed with invasive ductal breast cancer were recruited. This cohort included 32 negative Ki67 expression (Ki67 proliferation index <14%) and 96 cases with positive Ki67 expression (Ki67 proliferation index >/=14%). All patients had undergone diffusion-weighted imaging (DWI) MRI before surgery on a 3.0T MRI scanner. Radiomics features were extracted from apparent diffusion coefficient (ADC) maps which were obtained by DWI-MRI from patients with invasive ductal breast cancer. 80% of the patients were divided into training set to build radiomics model, and the rest into test set to evaluate its performance. Theleast absolute shrinkage and selection operator (LASSO) was used to select radiomics features, then the Logistic regression (LR) model was established using 5-fold cross-validation to predict of the Ki-67 index. The performance were evaluated by receiver operating characteristic (ROC) analysis, accuracy, sensitivity and specificity.
Results: Quantitative imaging features (n=1029) were extracted from ADC maps, and 11 features were selected to construct the LR model. Good identification ability was exhibited by the ADC-based radiomics model, with areas under the ROC (AUC) values of 0.75±0.08, accuracy of 0.71 in training set and 0.72, 0.70 in test set.
Conclusions: The ADC-based radiomics model is a feasible predictor for the Ki-67 index in patients with invasive ductal breast cancer. Therefore, we proposed that three-dimensional imaging features from ADC maps could be used as candidate biomarker for preoperative prediction the Ki-67 index noninvasively.

PU-3342

Radiomics Signature: A Potential Biomarker for the Prediction of Survival in Advanced Hepatocellular Carcinoma Patients Treated with apatinib plus TACE

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Purpose: To develop and validate a radiomics nomogram for the pretreatment prediction of overall survival (OS) and time to progression (TTP) in patients with advanced hepatocellular carcinoma (HCC) treated with apatinib plus transarterial chemoembolization (TACE).
Materials and Methods: A total of 60 advanced HCC patients were divided into a training set (n=48) and a validation set (n=12). Median survival time and median TTP were calculated in the cohort by using Kaplan-Meier analysis. Radiomics features were

extracted from late arterial and portal venous phase CT images of each patient. A radiomics signature was then constructed with the least absolute shrinkage and selection operator (LASSO) Cox regression algorithm in the training set. Combined with independent risk factors, a radiomics nomogram was built with a multivariate Cox proportional hazards regression model. Nomogram performance was assessed in the training set and validated in the validation set. Finally, decision curve analysis was performed with the combined training and validation set to estimate the clinical usefulness of the nomogram.

Results: Apatinib plus TACE could improve OS in patients with advanced HCC, with median survival times of 540 days. Apatinib plus TACE could prolong TTP in patients with advanced HCC, with median TTP of 270 days. Predictors contained in the individualized prediction nomogram included the radiomics signature and serum α-fetoprotein level(AFP). The radiomics signature achieved favorable prediction efficacy. The calibration curve of the radiomics nomogram for OS and TTP demonstrated good agreement between prediction and observation in the training set.The C-index for the prediction clinical-radiomics nomogram of OS was 0.833 (95% CI, 0.793 to 0.873) for the training set, which was confirmed to be 0.792 (95% CI, 0.715 to 0.870) via bootstrapping validation. The C-index for the prediction radiomics nomogram of OS was 0.828 (95% CI, 0.787 to 0.869) for the training set, which was confirmed to be 0.745 (95% CI, 0.695 to 0.795) via bootstrapping validation. The C-index for the prediction clinical-radiomics nomogram of TTP was 0.739 (95% CI, 0.692 to 0.786) for the training set, which was confirmed to be 0.701 (95% CI, 0.635 to 0.767) via bootstrapping validation. The C-index for the prediction radiomics nomogram of TTP was 0.732 (95% CI, 0.685 to 0.779) for the training set, which was confirmed to be 0.586 (95% CI, 0.543 to 0.628) via bootstrapping validation. Decision curve analysis demonstrated that in terms of clinical usefulness, the clinical-radiomics nomogram outperformed the radiomics nomogram.

Conclusion: Apatinib plus TACE could improve OS and prolong TTP in patients with advanced HCC. The presented radiomics nomogram, a noninvasive preoperative prediction tool that incorporates the radiomics signature and AFP, shows favorable predictive accuracy for OS and TTP in patients with advanced HCC treated with apatinib plus TACE. Multicenter validation is needed to acquire high-level evidence for its clinical application.

PU-3343

放射科医师与人工智能乳腺密度评估探讨

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目的:评价放射科医师和人工智能(AI)对乳腺密度评估的不同观点。
方法:本研究选取 2018 年 11 月至 2019 年 3 月 637 例患者，每周随机抽取 50 例，共收集 2548 张乳腺 x 线照片。4 名经验丰富的放射科医生记录了独立的密度评估。对四名乳腺成像者的多数评价成为共识。与以往的研究相比，这四位放射科医生分别从 7 个不同的角度对每位患者的乳腺密度进行

了评估:双乳、右乳、左乳、头尾侧(CC)位和外侧斜(MLO)位。评估彼此是盲目的。人工智能模型利用深度卷积神经网络 ResNet-18 对这些图像的密度进行了评估。
结果:人工智能在评估一个人,单侧乳腺、单侧乳腺 CC 位和 MLO 位的准确性和一致性分别为 0.821,0.667,0.776,0.600,0.818,0.675,0.840,0.698,0.795,0.650，放射科医生的准确性和一致性分别为 0.856,0.751,0.834,0.718,0.825,0.696,0.831,0.696,0.822,0.700。从临床实践来看，人工智能的最佳表现是单张片子。而放射科医师从单人视角的表现最好。从位置的角度来看，人工智能的最佳性能是 CC 位，而对于放射科医生来说，CC 位和 MLO 位几乎没有区别。
结论:随着乳腺 x 线照相术的增多，人工评价的效果越来越好。因此，BI-RADS 2013 推荐的乳腺密度的类别评估更加科学。单侧乳腺和单个人的人工智能评价不如单张片子评价好。这可能是由于输入和输出模式的不同。CC 位优于 MLO 位，或许因为 MLO 视图可能受到胸大肌、脂肪和腋窝淋巴结结构重叠的干扰。此外，不同的拍摄体位对密度的评估也有所不同。
因此，结果提示放射科医师应综合评价乳腺密度，而人工智能从 CC 的角度显示出更好的结果。此外，今后的研究应强调为每个观点建立不同的投入和产出模型。

PU-3344

Development of a predictive model for intracranial hypertension in neonates based on volumetric quantitative magnetic resonance imaging and clinical features

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Purpose: Intracranial hypertension (ICH) may result in serious sequelae in newborn babies. The aim of this study is to identify factors derived from quantitative magnetic resonance imaging (MRI) as well as clinical characteristics which associated with neonates ICH, and to develop a nomogram for the prediction of ICH in suspected neonates.
Methods: Neonates with suspected ICH and underwent MRI examination were retrospectively collected. The volume of cerebral white matter (WM), gray matter (GM), cerebrospinal fluid (CSF), as well as cerebral blood flow (CBF) was extracted from the MRI data. LASSO regression analysis was used to selected the most relevant variables from the combination of the above four variables and clinical variables. Logistic regression was used to develop a model for the prediction of ICH probability in neonates. Performance of the model was assessed by discrimination, calibration, and clinical applicability.
Results: A total of 181 neonates with suspected ICH were included, and the prevalence of ICH was 67%. GM, birthweight, birth way and corrected age were the selected predictive factors for ICH, with an AUC of 0.777. The model also has satisfactory calibration ability and clinical applicability.
Conclusion: A nomogram for the prediction of ICH in neonates was developed, with an acceptable predictive power, as well as a promising clinical applicability. This model needs external validation before it can be clinically used for guiding decision-making process for individuals.

PU-3345

Automatic Segmentation of Gallbladder in CT Images Using Cascaded 3D U-Net

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PURPOSE
This paper describes the gallbladder segmentation algorithm developed using 3D U-Net.
METHOD AND MATERIALS
1. We selected 100 cases of abdominal CT scan images from previous CT images as gallbladder segmentation training data set. These cases include normal gallbladder and other gallbladder diseases. 2. Label the gallbladder area with the workstation (IntelliSpace Discovery, Philips, Best, The Netherlands). All used images were thin CT slices. Pre-processing like intensity scaling was first performed. The proposed segmentation method is based on a cascaded application of two 3D U-Net that learn the tasks of localization and segmentation of gallbladder, using global and local information respectively. A 3D U-Net was first trained on resampled images to locate gallbladder. The next 3D U-Net aiming to segment gallbladder accurately was trained on the images containing the only gallbladder, which was cropped according to the label map predicted by the first model. 3. Test data set. We randomly selected two random days from 2018 using Excel software. There were 23 cases of CT scan in the emergency department for these two days, one of which was excluded because of cholecystectomy, and the remaining 22 cases (including 5 calculous cholecystitis) were used as test data sets. Segmentation performance was estimated with the Dice coefficient on the test data set. Finally, we calculated the volume of the segmented gallbladder.
RESULTS
Segmentation performance is evaluated on gallbladder in the held-out test data set, with a mean dice coefficient of 0.89. Among them, the average dice coefficient of cases of cholecystitis reached 0.90.
CONCLUSION AND CLINICAL RELEVANCE/APPLICATION
Gallbladder segmentation is a crucially important step for computer-assisted diagnosis and computer-aided functional analysis. Gallbladder's volume is associated with gallbladder functional changes and disease risks. However, manual delineation and volumetric calculation of gallbladder is a time-consuming procedure. Automatic segmentation would be much more appropriate. In particular, in cases of cholecystitis, the gallbladder is automatically segmented from the right upper abdomen, including the edema of the gallbladder wall and gallstones. In the future, cholecystitis and gallstones can be further identified on the basis of segmentation of the gallbladder, and the volume can be analyzed.

PU-3346
基于深度学习的计算机辅助诊断系统在脑出血量测量中的临床应用

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目的：探讨基于深度学习的计算机辅助诊断系统（DL-CAD）在测量脑出血量方面的表现。
方法：前瞻性收集 54 名急性脑出血患者，随机分为两组，第 1 组 27 例(18 名男性, 9 名女性, 年龄范围 44-84），第 2 组 27 例(n=27，15 名男性，12 名女性, 年龄范围 43-77)，所有患者在 64 排螺旋 CT 上用 120 kVp/120 mA 的扫描参数进行常规头部扫描，用 5mm 层厚重建每个患者的图像。第 1 组（DL 组）在有基于深度学习的计算机辅助诊断（DL-CAD）系统（InferRead CT Stroke Research，Infervision，Beijing）的帮助下进行诊断，通过 DL-CAD 系统自动测量脑出血量，第 2 组（非 DL 组）由放射科医师用多田公式法手动测量脑出血量。以经验丰富的放射科医师手动勾画出患者的每一层的脑出血面积并相加得出总出血面积，总出血面积和图像厚度的乘积代表脑出血量的金标准。用 APE = 100 * | Vm-Vr | / Vr 计算表示测量精度的绝对误差率，其中 Vm 和 Vr 分别代表测量的和实际的体积值。并且记录两组患者脑出血量测量的时间消耗。使用 SPSS 2.0 软件，用于双样本 t 检验统计分析。
结果：就测量的脑出血量而言，DL 组或非 DL 组与金标准没有统计学差异。然而，DL 组的测量精度高于非 DL 组的测量精度，APE 值较小（8.17±6.53 vs.23.62±12.07）。另外，DL 组的脑出血测量时间少于金标准的手动测量时间（91.21±8.32s vs. 321.48±114.51s，P <0.05）。
结论：与传统的手动测量方法相比，DL-CAD 实现了脑出血量的自动测量，并且准确，高效。

PU-3347
Semiautomatic segmentation for HCC delineation in CT volumetric images by ITK SNAP

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Objective:

Radiomics based data mining of medical images makes it possible to quantify the Hepatic Cell Carcinoma (HCC) phenotype non-invasively. Accurately segmentation of hepatic tumor is critical for adequately radiomics feature quantification. In this study, we evaluated the clinical feasibility and reliability of a semiautomatic segmentation method using the Radom Forest Classifier based algorithm, implemented in the free and public available ITK SNAP imaging processing platform.

Methods:
Twenty five diagnostic CT scans of Hepatic Cell Carcinoma patients were used for segmentation in this study. Two experienced radiologist performed the manual segmentation of lesion independently. Another radiologist performed the semiautomatic segmentation on ITK SNAP. The Dice similarity index (DSI) was used as a statistical

validation metric to evaluate the performance of both the manual and semiautomatic segmentation methods.

Results:
Results showed that the time and user effort required for classification-based semiautomatic segmentations were on average about fifty percent less than the pure manual segmentations. Furthermore, we calculated the Dice Similarity index (DSI) between the manual(DSI = 79±3.12 %) and the semiautomatic segmentations(DSI = 92±3.34%) to prove that semiautomatic segmentation method was more robust. However, for non-solid tumors with poorly defined boundaries and subtle appearances, automatic segmentations were observed to perform poorly (DSI = 51±3.14%)

Discussion:
Our results show that, for most solid HCC lesion cases, classification based semiautomatic segmentations can be used for accurate contouring and are more time-efficient than manual delineations. Therefore, semiautomatic segmentation of ITK SNAP can be employed as a starting point for radiomics analysis, where manual segmentation often represent a time-consuming bottleneck.

PU-3348
基于深度学习的计算机辅助诊断系统测量不同时期脑出血量的准确性

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目的：探讨和比较基于深度学习的计算机辅助诊断系统（DL-CAD）测量不同时期脑出血量的准确性。
方法：前瞻性收集 33 例超急性期脑出血患者（出血时间<24 小时）（A 组），34 例急性期脑出血患者（出血时间 2-7 天）（B 组）和 27 例亚急性期期脑出血患者（出血时间 8 天—4 周）（C 组）。所有患者在 64 排螺旋 CT 上用 120 kVp/120 mA 的条件进行常规头部扫描，用 5mm 层厚重建的图像。然后利用 DL-CAD 系统（InferRead CT Stroke Research，Infervision，Beijing）自动测量每位患者的脑出血量。脑出血量的金标准由经验丰富的放射科医师确定，该放射科医师手动描绘并计算患者每一层的脑出血面积，总出血面积和图像厚度的乘积代表金标准的脑出血量。用 APE = 100 * | Vm-Vr | / Vr 计算表示测量精度的绝对误差率，其中 Vm 和 Vr 代表测量的和实际的脑出血体积值。使用 SPSS 2.0 软件，用配对 t 检验用于统计分析。
结果：与金标准相比，DL-CAD 测量不同时期的脑出血量均有较高的准确度（A 组，B 组，C 组的 APE 分别为 7.47±5.08,11.54±6.67,19.92±16.66）。在所有这 3 组患者中，测量体积与金标准体积之间无统计学差异。
结论：对于不同时期的脑出血，基于深度学习的计算机辅助诊断系统（DL-CAD）均能够准确的测量，改善了诊断工作流程。

PU-3349

基于深度学习的计算机辅助诊断系统测量不同形状脑出血的准确性

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目的：探讨基于深度学习的计算机辅助诊断系统（DL-CAD）测量不同形状脑出血的准确性。
方法：前瞻性收集 58 名急性脑出血患者。所有患者在 64 排螺旋 CT 上用 120 kVp/120 mA 的条件进行常规头部扫描，用 5.0mm 层厚重建图像。所有患者根据脑出血灶形状分为两组，包括规则脑出血 26 例（类球形）和不规则脑出血 32 例。通过 DL-CAD 系统（InferRead CT Stroke Research，Infervision，Beijing）自动测量脑出血量。脑出血量的金标准由经验丰富的放射科医师确定，放射科医师手动描绘并计算患者每一层的脑出血面积，总出血面积和图像厚度的乘积表示金标准的脑出血量。用 APE = 100 * | Vm-Vr | / Vr 计算暗示测量精度的绝对误差率，其中 Vm 和 Vr 代表测量的和实际的脑出血体积值。使用 SPSS 2.0 软件，用配对 t 检验用于统计分析。
结果：在规则组和不规则组中，DL-CAD 测量的脑出血量均与金标准无明显统计学差异（P> 0.05）；此外，规则组 APE 和不规则组 APE 也无明显统计学差异，表明 DL-CAD 在准确测量脑出血量方面的准确性和鲁棒性。与金标准测量相比，DL-CAD 测量显著缩短了测量时间，规则组脑出血（242.69±61.03s VS 90s），不规则组的脑出血（378.75±107.37s VS 90s）。
结论：DL-CAD 系统测量不同形状脑出血具有强大的的准确性和鲁棒性，并且更加快捷。

PU-3350
基于深度学习的计算机辅助诊断系统测量不同层厚 CT 图像脑出血的准确性

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目的：探讨深度学习计算机辅助诊断系统（DL-CAD）测量不同层厚 CT 图像脑出血的准确性。
方法：前瞻性收集 58 名急性脑出血患者。所有患者在 64 排螺旋 CT 上用 120 kVp/120 mA 的条件进行常规头部扫描，分别用 2.5mm 和 5.0mm 厚度重建图像。通过 DL-CAD 系统（InferRead CT Stroke Research，Infervision，Beijing）在 2.5mm 和 5.0mm 组的图像上自动测量脑出血量。脑出血量的金标准由经验丰富的放射科医师确定，放射科医师手动描绘并计算患者每一层的脑出血面积，总出血面积和图像厚度的乘积表示金标准的脑出血量。用 APE = 100 * | Vm-Vr | / Vr 计算表示测量精度的绝对误差率，其中 Vm 和 Vr 代表测量的和实际的体积值。使用 SPSS 2.0 软件，用配对 t 检验用于统计分析。
结果：在 DL-CAD 测量的脑出血量方面，2.5mm 组或 5.0mm 组与金标准无统计学差异。虽然较小的 APE 值（8.17±6.53vs8.40±6.92）证明 2.5mm 组的测量精度高于 5.0mm 组，但 DL-CAD 测得的脑出血量在 2.5mm 组和 5.0mm 组之间无统计学差异，表明其对脑出血量测量的准确性和鲁棒性。
结论：DL-CAD 在不同厚度 CT 图像上测量脑出血量具有很强的准确性和鲁棒性。

PU-3351
Automatic structured reports of classification and localization of rib fractures from thorax CT using

Convolutional neural networks combined with medical history

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Objectives: This study aims to analyze the accuracy and feasibility of structured reports using convolutional neural network (CNN) combined with medical history which can automatically classify and locate rib fractures based on thoracic CT.
Methods: A total of 1049 patients (25054 annotations) from three hospitals were divided into a monocentric training set (n = 876) and multicentre validation sets (n = 148). Firstly, the feature pyramid network (FPN) part of Faster Region-based CNN (Faster R-CNN) were used to locate and identify the rib fractures categories. Then the classification part of Faster R-CNN combined with patients' medical history were used to classify rib fractures categories. The feature vectors of patients' medical history were processed with nature language processing (NLP) methods including word cutting, embedding and normalization. Finally, intersection over union (IOU) and z-distance was employed to merge results and get structured reports. Three classifications (fresh fracture, healing fracture and old fracture) combined with fracture location (corresponding CT slices) were revealed by structured reports. Precision, recall and F1-score were selected as metrics to measure the performance of CNN model with and without medical history input. Detection/diagnose time, precision, sensitivity were employed to compare the diagnostic efficiency of structured report and experienced radiologists.
Results: The detection efficiency of three categories of rib fractures combined with medical history of CNN model is higher than that without medical history (all $P < 0.05$). There were no significant differences in detection efficiency across three multiparameter validation sets (all $P > 0.05$). The precision and sensitivity of structured reports was greater than that of experienced radiologist (92.4% vs.72.4%, 91.35% vs. 67.65% respectively; $P < 0.05$). The detection time was reduced to an average of 23.9 seconds compared with an average of 3 minters by radiologists.
Conclusions: Our CNN model can output structured reports which can automatically classify and locate rib fractures accuracy and with a certain degree of robustness. The results would help emergency patients to obtain accurate CT findings quickly and reduce the eye strain and workload of radiologists.

PU-3352
运动伪影对基于深度学习的计算机辅助诊断系统测量脑出血准确性的影响

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目的：探讨运动伪影对基于深度学习的计算机辅助诊断系统（DL-CAD）在 CT 图像上测量脑出血的准确性的影响。
方法：前瞻性收集 58 名急性脑出血患者。所有患者在 64 排螺旋 CT 上用 120 kVp/120 mA 的条件进行常规头部扫描，用 5.0mm 层厚重建图像。所有 CT 图像均符合诊断要求，并根据放射科医师的主观评价分为无伪影组 39 例和有伪影组 19 例。通过 DL-CAD 系统（InferRead CT Stroke Research，Infervision，Beijing）自动测量脑出血量。脑出血量的金标准由经验丰富的放射科医师确定，放射科医师手动描绘并计算患者每一层的脑出血面积，总出血面积和图像厚度的乘积表示金标准的脑出血量。用 APE = 100 * | Vm-Vr | / Vr 计算表示测量精度的绝对误差率，其中 Vm 和 Vr 代表测量的和实际的体积值。使用 SPSS 2.0 软件，用配对 t 检验用于统计分析。
结果：DL-CAD 测量脑出血量与金标准量没有统计学差异（P> 0.05）。而且，无伪影组 APE 和有伪影组 APE 也没有统计学差异，表明 DL-CAD 在准确测量脑出血量方面的准确性和鲁棒性。
结论：DL-CAD 系统在有或没有伪影的图像的脑出血量测量方面表现出强大的准确性和鲁棒性。

PU-3353
分类阈值对人工智能肺结节筛查系统检测磨玻璃结节效能的影响

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目的 研究分类阈值对基于深度学习的人工智能（Artificial Intelligence，AI）肺结节筛查系统检出磨玻璃结节效能的影响，进而筛选出适合磨玻璃结节检出的模型分类阈值。
方法 回顾性收集 117 例胸部 CT 平扫病例数据，薄层扫描层厚为 1 至 1.25mm。研究入组病例中的金标准磨玻璃结节数由两位拥有超过 15 年胸部 CT 阅片经验的放射科专家共同制定，共计 147 个。在此基础上，利用基于深度学习的 AI 肺结节筛查系统（北京推想科技有限公司）进行磨玻璃结节检测，记录其在不同模型分类阈值（0.65，0.75，0.85）下检测到的磨玻璃结节数。通过与金标准对比，分析比较不同分类阈值下，AI 系统检测到的真阳性磨玻璃结节（TP），假阳性磨玻璃结节（FP）和假阴性磨玻璃结节（FN）的数量。探索最适合检测磨玻璃结节的模型分类阈值。卡方检验用于比率指标的统计分析，P＜0.05 具有统计学意义。
结果 AI 肺结节筛查系统（后简称 AI 系统）在阈值为 0.65 时，检测到 411 个磨玻璃结节，包含 133 个 TP 和 278 个 FP， FN 个数为 14 个，检测敏感性为 90.48%，假阳性率为 2.38/CT。当阈值调整至 0.75 时，检测到的磨玻璃结节有所减少，主要体现在假阳性结节数目上，TP 仍为 133 个，而 FP 降为 223 个，敏感性不变，假阳性率降为 1.91/CT。相比之下，当阈值调整为 0.85 时，检测到 303 个磨玻璃结节，包括 127 个 TP 和 176 个 FP，虽然 FN 数目增加至 20，检测敏感性降至 86.39%，但与模型一敏感性无统计学差异（p=0.058），假阳性率为 1.53/CT。
结论 分类阈值影响 AI 肺结节筛查系统的磨玻璃结节检测效能，尤其体现假阳性结节数方面。综合分析不同的检测指标，分类阈值为 0.85 保证敏感性的同时有效减少了假阳性磨玻璃结节数，因此是 AI 肺结节筛查系统用于磨玻璃结节检测时的最佳选择。

PU-3354
扫描基线对 Diffusion Toolkit 脑白质纤维束示踪的影响研究

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【摘要】**目的** 探讨不同扫描基线对 Diffusion Toolkit 脑白质纤维束示踪的影响。
方法 招募健康志愿者 6 例，均在 SIEMENS Verio 3.0T 扫描仪行不同扫描基线（一组扫描基线为 AC-PC 线，二组扫描基线不打角度）DTI 扫描。将扫描所得 Dicom 数据导入个人电脑，运行 mricorn 软件进行格式转换，将 BVEC 文件进行分列、转制得到 Gradient table。运行 Diffusion Toolkit 软件，选择每一数据所得 Gradient table，Angle threshold 45，Invert Z，运行结果在 TrackVis 显示，得到全脑白质纤维束容积 Volumn，最大纤维束长度 Maximum Length，最小纤维束长度 Minimum Length 等脑白质纤维束定量指标。根据不同扫描基线将定量指标分为两组。采用 SPSS17.0 统计学软件对各定量指标进行配对样本 t 检验分析，检验水准 α 为 0.05。
结果 一组 Volumn 1145.22±131.15 ml, MaxLength 189.42±37.28 mm, MiniLength 1.32±0.07 mm。二组 Volumn 1122.02±120.09 ml, MaxLength 220.21±24.42 mm, MiniLength 1.27±0.12 mm。 组间差异不具有统计学意义(P=0.21, 0.13, 0.52) 。
结论 在受检者配合较好，头部摆位好的情况下，采用 AC-PC 扫描基线或不打角度的 DTI 扫描对 Diffusion Toolkit 脑白质纤维束示踪不具有统计学差异的影响。

PU-3355

高分辨率 MRI 对直肠癌术前 T 分期的诊断价值

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目的：研究高分辨率 MRI 直肠癌术前 T 分期与病理 T 分期的关系，探讨高分辨率 MRI 在直肠癌术前分期中的诊断价值。方法：选取哈尔滨医科大学附属第二医院 2017 年 3 月至 2019 年 3 月经病例证实为直肠癌的患者 104 例，所有患者术前均接受高分辨率 MRI 扫描。将术前高分辨率 MRI T 分期与术后病理 T 分期结果进行对比，计算高分辨率 MRI 对直肠癌 T 分期的准确性、敏感性、特异性、阳性预测值、阴性预测值。采用 Kappa 检验术前影像分期与术后病理分期的一致性，P<0.05 为差异具有统计学意义。结果：高分辨率 MRI 对直肠癌的分期准确性、敏感性、特异性、阳性预测值、阴性预测值分别为（T1~2 期）83.2%、79.4%、70.6%、80.3%、78.5%，（T3~4 期）89.0%、85.2%、90.4%、80.3%、89.1%。经 Kappa 检验分析与病理结果具有高度的一致性(Kappa=0.75)。结论：高分辨率 MRI 对直肠癌 T 分期具有较高的诊断价值。

PU-3356

Radiomics model based on ADC maps for predicting lymph node metastasis in mid-low risk rectal cancer

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Objectives: Diffusion-weighted imaging (DWI) and its associated quantitative parameters—apparent diffusion coefficient (ADC) can help identify the biological behavior of tumors. Rectal cancer patients with T3b stage and below are recognized in the mid-low risk group, and the clinical decision is controversial. The purpose of

this study was to explore whether the radiomics model based on ADC maps could identify the lymph node metastasis of rectal cancer.
Materials and methods: From January 2017 to December 2018, 109 patients and 156 patients were enrolled from two different MRI equipment with different DWI sequences (A and B, b values=0, 1000s/mm^2), respectively. Patients did not receive any preoperative neoadjuvant therapy. The average age of the patients was 61 years (29-88 years). There were 157 males and 108 females. The region of interest (ROI) was delineated manually along the border of the low signal part of the rectal lesion on ADC images by ITK-SNAP software. Based on the open-source radiomics feature extraction program, five types of radiomics features were extracted from each patient. Patients were divided into lymph node metastasis group and lymph node non-metastasis group according to the postoperative pathological results. Principal component analysis and support vector machine was implemented to achieve reliable results. 80% of the cases were used as training data, and the rest cases were used as validation data to test the classification accuracy of the model. The accuracy, sensitivity, specificity and cut-off value were determined and calculated by the receiver operating characteristic (ROC) curve. Ten-fold cross-validation and ROC were used to validate the performance of the model.
Results: The AUC of radiomics model-A of training data and validation data are 0.989 and 0.984, respectively, and the accuracy is 0.951 and 0.943, respectively. The AUC of radiomics model-B of training data and validation data are 0.960 and 0.930, respectively, and the accuracy is 0.866 and 0.834, respectively. After cross-validation, the AUC of model-A is 0.78±0.05, and the AUC of model-B is 0.80±0.18.
Conclusions: The radiomics model based on ADC map can effectively predict lymph node metastasis of mid-low risk rectal cancer. The prediction model established by ADC images with higher resolution is more stable.

PU-3357
人工智能（AI）辅助诊断冠心病准确性初步研究

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目的 通过 AI 对冠脉识别、冠状动脉狭窄检出率、狭窄程度，与 2 名影像科中高年资医师独立判读结果的比较，评价该方法的准确性。[H1] **方法** 70 例 CCTA 210 支冠脉，开口正常、成像评分 3 分以上的 983 段（其中病变 178 处）行 AI 与医师组对比分析。评价 AI 与医师两者的准确性和一致性。**结果** 以仲裁医师为标准。医师组与 AI 辨认冠脉分支的准确度在 96.2%-100%之间，Kappa 值 0.975。评价斑块（钙斑、非钙斑、混合斑块）准确度 89.32%，kappa 值 0.835；敏感度为 92.54%、98.61%、86.67%；特异度 96.40%、90.57%、97.97%。狭窄程度（轻微、轻度、中度、重度）准确度 82.58%，Kappa 值 0.752；敏感度分别为 84.38%、86.67%、95.83%、75.00%；特异度 93.84%、93.20%、92.31%、98.19%。 **结论** AI 在冠心病诊断上与医师具有较高的一致性，能很好的辅助医师进行冠脉评价，提高诊断准确性，减少漏诊及提供狭窄程度参考，减少诊断时间，提高效率。

PU-3358

Computed tomography (CT)-based radiomics signature: a potential indicator of EGFR mutation in pulmonary adenocarcinoma appearing as a subsolid nodule

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Objective: To investigate the ability of CT radiomics signature based on preoperative CT images for prediction of EGFR mutation status in LADC appearing as a subsolid nodule.
Materials and Methods: We obtained the records of 2932 consecutive patients who underwent surgical resection for primary lung cancer at our hospital from January 2016 to May 2018. A total of 467 eligible patients were divided into a training cohort (n = 306) and a validation cohort (n = 161). All patients underwent unenhanced CT using normalized protocols. We employed a 3D U-net model for nodule segmentation. Radiomics features were extracted from unenhanced CT images by using Pyradiomics. 1063 radiomics features were extracted from unenhanced CT images. A CT-based radiomics signature for distinguishing EGFR mutation status was constructed using RF method in the training cohort and then tested in the validation cohort. To check the additive effect on classification, we concatenated the radiomics features and clinical features. A combination of radiomics signature with clinical factors model was also constructed using RF. The performance of the model was evaluated using the area under the curve (AUC) of a receiver operating characteristic (ROC) curve.
Results:
(1)In this study, 64.2% (300/467) of the patients showed EGFR mutations. Exon 21 missense and exon 19 missense were the most frequent types of mutations. Within the training and validation cohorts, there were significant differences in age, tumor size, CT pattern, and subtype between EGFR(+) and EGFR(-). The EGFR(+) of these lesions also appeared more frequently in patients with an part-solid nodue.
(2)Forty-three features were selected from 1063 radiomics features using RF method in the training cohort. Based on selected radiomics feature, we identified a CT-based radiomics signature that successfully discriminated between EGFR(+) and EGFR(-) in the training cohort (AUC = 0.831) and the validation cohort (AUC = 0.789).
(3) The radiomics features and clinical features were combined to develop a combined model, AUC = 0.826, 0.789, in the training the validation cohorts, respectively. The combined model was not superior to the simple radiomics signature in the training and validation cohorts ($p \geq 0.05$).
Conclusion: CT-based radiomics signature predict the EGFR mutation status of LADC appearing as a subsolid nodule with good predictive performance. CT-based radiomics signature is expected to be an effective supplement to determine the EGFR mutation status of subsolid nodule lung adenocarcinoma.

PU-3359

基于 CESM 的影像组学诺莫图预测乳腺癌新辅助化疗疗效

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目的：探讨基于对比增强能谱 X 线摄影（CESM）的影像组学诺莫图术前预测乳腺癌新辅助化疗疗效的价值。
材料和方法：回顾性分析我院 135 名术前接受新辅助化疗的乳腺癌患者（训练组 100 ，验证组 35），按照实体瘤疗效评价标准（RECIST）评价患者新辅助化疗的疗效，并将患者分为有效组和无效组。从每个病人的 CESM 图像中提取影像组学特征。然后在训练集中用 LASSO 算法建立影像组学标签。结合独立的临床预测因子，采用多元 Logistic 回归模型建立诺莫图。诺莫图的效能在训练集中进行评估，并在验证集中进行验证。
结果：由 9 个特征组成的影像组学标签，具有良好的预测效果。包括影像组学标签、ki67、HER2 的诺莫图在训练集（AUC 0.87；95%CI，0.82-0.91）和验证集（AUC 0.85；95%CI，0.80-0.90）中也显示出良好的效能。决策曲线表明了我们列线图的临床实用性。
结论：基于术前 CESM 影像组学特征和临床预测因子建立的诺莫图模型在预测乳腺癌患者新辅助化疗疗效方面具有重要的价值。

PU-3360
基于人工智能的图像处理在分子成像中的应用

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经过近三十多年的发展，单分子光谱学已经逐渐从低温光谱方法演化为一个通用的工具，在物理学、化学、生物学及相关新兴交叉学科中都有着十分广泛的应用。单分子消除了系综平均，可以作为一个纳米光学探针探测它们所处局部环境的结构和动力学信息；单分子光谱可以提供纳米尺度环境的精细图像，展示了局部环境的异构和异于系综平均的信息。基于单分子荧光技术实现突破衍射极限的超分辨成像获得了 2014 年的诺贝尔化学奖，为生命科学研究提供了前所未有的工具，也迎来了单分子科学发展的新契机。

以荧光染料单分子为探针的动力学跟踪技术，具有速度快、分子选择性强、高分辨率等特点。荧光标记的生物大分子和有机体的扩散方式及与环境的相互作用的动力学特征为深入讨论细胞内和细胞间反应机理具有重要的意义。单分子跟踪技术已经广泛地应用到各种复杂系统中，与系综平均的测量相比，单分子方法能够提供各向异性系统中的分子特性的分布信息。单分子运动轨迹的分析可以用来理解分子运动的特征方式和与环境的相互作用的信息。利用电子倍增电荷耦合器件（EMCDD）对染料分子样品进行荧光成像采集，通过高性能计算机对采集的每帧成像图片上的荧光光斑进行数据提取和分析，拟合获得各个单分子的运动轨迹，实现单分子动力学的跟踪测量，用于生物大分子扩散及与环境的相互作用和细胞内和细胞间反应机理的研究。

PU-3361
An accurate detection method for biopsy needle in ultrasound images based on fuzzy enhancement and Hough transform

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Biopsy needle detection in ultrasound images plays an important role in prostate biopsy. The precise positioning of biopsy needle is vital for reducing the number of insertion failures and it still remains a challenging problem. Existing needle detection methods cannot provide accurate detection results or cannot meet the demand of real-time biopsy. To address this problem, we have proposed a fast and accurate biopsy needle detection method based on fuzzy enhancement and Hough Transform (HT). This method uses the fuzzy enhancement to improve the visibility of biopsy needle in the ultrasound images. Based on the enhanced ultrasound images, Hough transform combined with edge thinning have been used to detect the biopsy needle. To ensure the detection accuracy in the case where the appearance of needle in ultrasound images is discontinuous, the intensity correlation based tracking algorithm is adopted to locate the tip of the needle. The proposed algorithm was tested on the prostate video sequences including 32 frames in total. Experimental results demonstrate that the needles in the sequences can be detected with 6.7% mis-detection rate. The mean length and angle errors are 8.8 pixels and 0.98 degree, respectively. The needle detection time is 25ms for one frame of size 800×600. Indeed, the proposed method will facilitate the reduction of insertion failures during ultrasound-guided needle procedures due to its high needle detection accuracy.

PU-3362
磁共振多模态成像在胶质瘤智能诊断与分级中的应用

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目的：胶质瘤是中枢神经系统最常见的原发性肿瘤，术后复发率和病死率较高。通常低级别胶质瘤预后良好，高级别胶质瘤术后复发率较高，胶质瘤的诊断分级对于指导个体化治疗和精确评估预后具有重要意义。
方法：磁共振多模态成像技术相较于单一模态成像能为不同级别胶质瘤提供更为全面的信息，人工智能的快速发展也给胶质瘤的诊断分级提供了一种新的途径，文中选取动态磁敏感对比增强成像(DSC_MRI)、动态对比增强成像(DCE_MRI)、动脉自旋标记成像(ASL)三种不同模态图像，利用有监督学习的模式来训练优化神经网络，来提高诊断分级的准确性。
结果：结合多模态核磁图像的诊断准确率可以达到 90%以上，明显优于单一模态下的准确率。
结论：研究表明人工智能结合多模态核磁方法在胶质瘤的诊断、分级、术后评估等方面具有重要的临床意义。

PU-3363
基于影像组学的乳腺 ABUS 图像良恶性鉴别诊断

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目的：探讨影像组学用于 ABUS 图像良恶性鉴别诊断的价值。

方法：收集就诊于天津医科大学肿瘤医院的女性乳腺病变患者，进行乳腺 ABUS（Automated Breast Ultrasound System，ABUS）检查并获取 ABUS 图像。纳入研究共计 220 个病变，其中包括 123 个恶性病变，97 个良性病变。手动勾画病变的感兴趣区，对所有病变采用影像组学方法进行特征提取，并用 LASSO 方法进行特征降维，采用支持向量机分类方法进行良恶性的分类，评估其该模型的诊断效能。分析所提取特征对乳腺良性病变及恶性病变的诊断效能，采用正确率、敏感性及特异性评估其诊断效能。
结果：本研究共提取了 21 个影像组学特征，包括：（1）形态学特征：面积，周长，最大径，圆度，凹性率，分叶征；（2）灰度直方图特征：灰度均值，均方差，跨度，偏度，峰度，第五中心态，第六中心态；（3）纹理特征：对比度，相关性，能量，熵，均质性，角二阶矩，惯性逆差距。采用 LASSO 方法进行特征提取，得到偏度，峰度，第五中心态，角二阶矩四个特征。采用支持向量机分类方法，并采用十折交叉验证得到正确率 82.3%，敏感性 76.4%，特异性 90.3%。
结论：ABUS 通过乳腺超声的全自动扫描，可以获得较二维超声更加客观的图像信息，更适合进行影像组学分析。基于 ABUS 影像组学能够为乳腺良恶性病变的诊断提供客观、准确的诊断依据。

PU-3364

Correlation analysis between asymmetry of the inferior fronto-occipital fasciculus and attention

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Objective: Human brain hemispheres differ in their anatomy and function. However, the asymmetry of inferior fronto-occipital fasciculus was still under debate.
Materials and Methods: 60 volunteers were recruited in this study. Attention network test was performed and 3.0T DTI imaging was collected. Trackvis was used to visualize the fasciculus and calculate its microstructural integrity.
Results: The results suggested that the FA of occipital part was leftward asymmetry and the other four segments were rightward asymmetry. For the MD, the frontal and insular parts were rightward asymmetry and the other three segments were leftward asymmetry. In the structure-function correlation analysis, the rightward asymmetry of IFOF was related to EC function and the occipital part was an important segment in the correlation. Moreover, genetic factors were implicated in the aforementioned two relationships.
Conclusion: Our study suggested that structural asymmetry was important in brain function and the common physiological mechanisms were implicated in the brain asymmetry-function correlations.

PU-3365

一体化阅片室构架与实施方案

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我院一体化阅片室具有专业化、智能化、快捷化、舒适化等功能。解决方案由软硬件组成，系统采用模块化设计，通过专业的空间环境设计与智能控制终端进行实施，充分考虑集约化、智能化、标

准化和人性化。整体方案符合国家相关要求及标准，智能化、标准化符合质控和诊断要求。模块包括环境光线可控、照度调节、显示屏颜色统一亮暗调节、桌椅工作台可升降调节匹配、室外光线遮蔽、室内温湿度、窗帘控制，背景音乐调节、情景模式环境噪音控制，胶片投屏等等。符合国际国内环境照度标准。配套会诊智能投屏显示系统，各个系统功能可根据需要自由组合搭配，通过系统交互界面集中控制，适时实现 HIS/EMR/PACS/RIS 以及其它检查检验等数据一键式调阅。控制终端具有遥控智能设备图像无线投屏功能，操作界面为触摸屏图形按钮，操作直观，简单方便，统一管理。

专业化：阅片室采用专业 DICOM 标准 3M、6M 医用诊断显示器，94 寸彩色专业显示器构成影像诊断与会诊显示系统。

智能化：提供声光电的智能控制，提高阅片医生工作效率。显示器屏幕闪烁频率、反射光线、显示器间的相互影响，环境光亮度的差异，导致医生眼疲劳程度增加、诊断准确率降低。

快捷化：合理的布局设计，融合了远程阅片、阅片报告审核、网络会诊的快捷设计，阅片医生可一键将影像分享投屏至会诊显示器进行教学或会诊。

舒适化：提供符合人体工学设计理念的座椅和电动升降工作台，在医生较大工作量的情况下，最大限度保护其颈椎，腰椎。

影像诊断医生以专业化、智能化、舒适化、快捷化阅片为中心，享受着数字化带来的高效率和便捷，真正从传统的胶片阅片模式或单一屏幕阅片显示方式提高到软阅片/无胶片模式。极大提高阅片精确度及阅片效率，杜绝因外部环境造成的漏诊误诊。诊断效率、诊断准确率明显提高，病人等待报告的时间大大缩短，这就是一体化阅片环境设计的重要性体现。

PU-3366
分类阈值对人工智能肺结节筛查系统检测实性结节效能的影响

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目的 研究基于深度学习的人工智能肺结节筛查系统中，分类阈值对实性结节检出效能的影响。**方法** 回顾性收集 117 例胸部 CT 图像，扫描层厚约 1.25mm。由两位超过 15 年经验的放射科专家制定研究参考的实性结节金标准，最终标注 310 个实性结节。再利用 AI 肺结节筛查系统进行检测，记录其在不同模型分类阈值(0.65,0.75,0.85)下检测到的结节数。与金标准对比，分析不同阈值下，AI 系统检测到的真阳性实性结节(TP)，假阳性实性结节(FP)和假阴性实性结节(FN)的数量。通过计算比较不同阈值下 AI 系统检测敏感性，准确性和假阳性率，筛选检测实性结节的最佳阈值。卡方检验用于统计分析,P＜0.05 具有统计学意义。**结果** 阈值为 0.6 时，AI 肺结节筛查系统检测到 727 个实性结节，其中 276 个 TP 和 451 个 FP，假阳性率为 3.85/CT；FN 为 34 个，检测敏感性和准确性分别为 89.03%和 38%。阈值为 0.75 时，AI 肺结节筛查系统检测到 626 个实性结节，FP 降为 356 个，假阳性率降为 3.04/CT；TP 个数为 270 个，FN 数目为 40，检测敏感性 87.1%(p>0.05)，与 0.65 阈值结果比较无统计学差异，准确性提升至 43.13%(p=0.059)。分类阈值为 0.85 时,AI 系统共计检测到 525 个实性结节,257 个 TP 和 268 个 FP,假阳性率为 2.29/CT；FN 数目则增加至 53 个,检测敏感性降至 82.9%,显著低于 0.65 阈值结果的敏感性(p<0.05)，但与 0.75 阈值敏感性无统计学差异(p>0.05)，检测准确性提高至 48.95%, 显著高于前两者准确性(p<0.05)。**结论** 分类阈值影响 AI 肺结节筛查系统对实性结节的检测效能，在假阳性结节数和检测准确性方面尤为突出。本研究中阈值为 0.85 时的 AI 系统在保持相当敏感性的同时有效减少了假阳性结节数，是临床中 AI 系统辅助检测实性结节的最佳阈值。

PU-3367
探究 ctDNA 液体活检对肺结节 CT 鉴别诊断模型的增效作用

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目的：验证循环肿瘤 DNA（ctDNA）在提高 CT 图像的影像组学或语义特征对肺结节诊断模型的价值。材料和方法：这是一项前瞻性研究，共纳入了 123 例经 CT 发现的肺结节患者。患者于 2017 年 4 月至 2018 年 5 月在金陵医院接受手术，并且术前进行了 ctDNA 高通量测序。每位患者都收集其临床信息、术前 CT 图像和术前血液的遗传信息。最终通过 103 个患者的 CT 图像建立了包含 37 个放射组学特征的肺结节影像组学模型。并联试验及方差分析用于评估遗传特征与恶性风险之间的关联。模型由支持向量机（SVM）的方法构建，采用嵌套的 5 倍交叉验证。结果：良性和恶性组之间差异的基因的并联试验得到最终的 ctDNA 遗传特征。通过与遗传特征相结合，影像组学模型的 AUC 从 0.819 增加到 0.887。当语义特征进一步加入模型时，融合模型的 AUC 可以增加到 0.935。结论：ctDNA 液体活检可提高 CT 特征的诊断能力，从而提高诊断正确率。它可以作为术前诊断的微创补充，以提高图像诊断的准确性，避免不必要的侵入性医疗操作。

PU-3368
不同肺结节周围组织的标注对肺结节良恶性预测的影响

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目的
大多数研究通常依赖于肺结节的特征，如大小和形态特征来预测恶性肿瘤。在本文中，我们试图研究肺结节周围组织对结节良恶性分类的影响。
方法和材料
该方法基于 3D CNN 模型，其结合 ResNet 和 UNet 的结构来预测肺结节良恶性。胸部 CT 图像包含直径 5 mm 和 30 mm 的 942 个结节（325 个良性，617 个恶性，841 个患者）用于训练，另外 200 个结节（78 个良性，122 个恶性，200 个患者）分别收集作为我们的测试组。所有结节的恶性肿瘤均经病理证实。我们将图像重新采样为所有维度的 0.6 mm 像素空间，并以三种方式对图像进行预处理。 （1）小组织状况，我们分割立方体（64 * 64 * 64 像素），中心有目标结节和少量周围组织。 （2）大组织状况，我们分割了包含更大范围的周围组织的立方体（96 * 96 * 96 像素）。（3）没有组织条件，我们仅在没有周围组织的情况下分割结节。我们分别用上述数据训练和测试了三种不同的模型，并使用卡方检验来比较结果。
结果
周围组织的存在显着影响预测准确度， $x2= 8.61$，$p = .013$（参见表 1）。具体而言，大组织条件产生的最高准确度为 86%，显着高于无组织条件， $x2= 8.34$，$p = .004$。小组织条件产生的准确度略高于无组织条件。此外，包括周围组织显着改善恶性结节的敏感性（ $x^2= 19.37$，$p <.001$）。然而，是否包括周围组织不影响特异性（ $x2= 1.29$，$p = .52$）。
结论
我们的研究表明，包括周围组织可以改善肺结节分类，尤其是恶性结节的敏感性。这可以为放射医学研究提供新的方向，其中传统方法仅对结节进行分割，这可能遗漏包含在周围组织中的重要信息。
临床相关/应用
我们用于肺结节分类的 3D CNN 模型实现了 86%的高精度。我们还经实验证明了在结节恶性肿瘤预测中包括肺结节周围组织的重要性。

PU-3369
利用深度学习算法预测增强 MR 图像上胰腺神经内分泌肿瘤 WHO 分级

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背景与目的：胰腺神经内分泌肿瘤是较少见的胰腺肿瘤，其 WHO 分级直接影响患者的临床诊疗，临床上对其进行 WHO 分级需要有创操作，此外，其较低的发病率对深度学习算法在影像医学上的运用构成障碍。本研究尝试利用深度学习算法在增强 MR 图像上直接预测胰腺神经内分泌肿瘤的 WHO 分级。
材料与方法：本研究包括了从 2010 年 1 月至 2016 年 12 月期间 50 例在复旦大学附属中山医院进行术前增强 MR 检查及手术治疗的胰腺神经内分泌肿瘤患者，其中 WHO1 级 14 例，WHO2 级 30 例，WHO3 级 6 例。由于 WHO3 级患者较少，将所有患者分为 WHO1 组及非 WHO1 级组。首先，以 5 折交叉验证的方法将所有患者以 4：1 的比例随机分入 4 对训练集与测试集。之后，利用每个训练集中患者的增强 MR 图像，训练 2 个分别针对 WHO1 级组及非 WHO1 级组的生成式对抗网络，并利用这些网络来合成人工图像以扩增相应的训练集。最后，分别利用每个扩增的训练集中的图像（真正的 MR 图像及人工合成的图像），对一个卷积神经网络模型进行训练，并在相应的测试集上评估卷积神经网络对增强 MR 上病灶 WHO 分级的预测能力。此外，卷积神经网络的预测能力也在外部测试集（复旦大学附属肿瘤医院 2015 年 1 月至 2018 年 3 月期间的 8 例患者）上进行了测试。
结果：在 5 折交叉验证中， 当评估于对应的测试集，卷积神经网络准确率在 89.71% to 90.99%之间，ROC 曲线下面积在 0.8895 to 0.9369 之间，模型的平均准确率为 90.29%，平均 ROC 曲线下面积为 0.9245。当评估于外部测试集，在 5 折交叉验证中训练于不同训练集的卷积神经网络准确率在 85.39%与 87.64%之间，ROC 曲线下面积在 0.8909 到 0.9114 之间，模型的平均准确率为 86.97%，平均 ROC 曲线下面积 0.9053。
结论：深度学习算法具备在增强 MR 图像上直接预测胰腺神经内分泌肿瘤 WHO 分级的可行性。

PU-3370
不同重建算法下 AI 对肺结节三维容积定量影响的体模研究

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目的：探讨不同重建算法下人工智能技术对仿真胸部体模肺结节三维容积及 CT 值测量的影响。
材料和方法：一共 15 枚人造肺结节随机放置于体模内双肺上、中、下叶，结节分为 5 种直径（3mm,5mm,8mm,10mm,12mm），每个直径结节各有 3 种 CT 密度值（100HU,-630HU,-800HU），由 GE Revolution256 排螺旋 CT 在 120KV，NI=12 进行扫描，重建层厚为 1.25mm，依次采用肺算法、骨算法、标准算法、软组织算法进行重建，使用人工智能软件读取这些肺结节，记录结节数目、大小、体积及性质等数据信息，利用公式计算结节直径、体积、CT 值测量的绝对错误率（Absolute Percentage Error, APE）:APE=100×（$V_{测量}$-$V_{实际}$）/$V_{实际}$，使用单项方差分析（one-way ANOVA）结合 T 检验比较重建算法、结节直径对 APE 的影响。
结果：将 APE 按照重建算法的不同进行分组比较，发现 $APE_{直径}$、$APE_{体积}$均无显著统计学差异（P=0.932、0.557）,并且可以发现结节直径的大小，对 $APE_{体积}$影响不明显（p=0.162）。

结论：不同重建算法下 AI 对检测出的结节体积和 CT 值的测量结果是可信的，且结节的直径对体积的测量无显著影响。
临床意义：评估重建算法对人工智能在肺结节检测中的影响，更好的利用 AI 为临床提供更详实准确的肺结节信息，对患者尽早开始有效治疗有重大价值。

PU-3371

Accuracy of deep learning-based computer aided diagnostic system in measuring diameter and volume for nodules of different diameter and density: a phantom study

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Objective: To investigate the effects of nodule diameter and density on the accuracy of deep learning-based computer aided diagnostic system (DL-CAD) in measuring nodule sizes and volume.
Materials and Method: In this phantom study, a total of 12 artificial pulmonary nodules (Simulated Tumors, Kyoto Kagaku, Tokyo, Japan) were randomly placed in the chest phantom (Multipurpose Chest Phantom N1 "LUNGMAN", Kyoto Kagaku, Tokyo, Japan). All 12 nodules were divided into 4 groups based on their sizes (5mm, 8mm, 10mm, and 12mm in diameter) while each size group was composed of 3 nodules with different densities to simulate solid, mixed ground-glass and pure ground-glass morphology. The chest phantom was scanned on a spiral CT system (Revolution, GE Healthcare) at 120 kVp with a constant noise index of 12HU. Image sequence was reconstructed with 1.25 mm slice thickness. The diameter and volume of the nodules in the chest phantom were measured by a DL-CAD system. In order to evaluate the measurement accuracy, the absolute percentage measurement error (APE) for measured diameter and volume were calculated with APEd=100*(Dm-Dr)/Dr, APEv=100*(Vm-Vr)/Vr, respectively, where Dm, Vm,and Dr, Vr represented the measured and actual values of diameter, volume. Paired-samples t-test was used for statistical analysis.

Result: As the decrease of nodule sizes, it's becoming more difficult to measure nodules diameters accurately (p=0.041), the measurement accuracy for volume was not affected (p_{volume}=0.71). Meanwhile, the measurement accuracy of diameter and volume was all significantly different among nodules of density ($p_{diameter}$=0.001, p_{volume}=0.007). DL-CAD exhibited higher accuracy for nodules of lower densities.
Conclusion: In contrast to nodule diameter, nodule density had a greater impact on measurement accuracy. Measurement accuracy for ground glass nodules was much better than it for solid and calcified nodules.
Clinical Application: DL-CAD can provide more detailed and accurate pulmonary nodules information for clinical diagnosis, which is of great value in providing effective treatments for patients in time.

PU-3372

不同重建算法对 AI 肺结节检出率的影响：体模研究

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目的：探讨不同重建算法下人工智能技术对仿真胸部体模肺结节检出率的影响。
材料和方法：一共 15 枚人造肺结节随机放置于体模内双肺上、中、下叶，结节分为 5 种直径（3mm,5mm,8mm,10mm,12mm），每个直径结节各有 3 种 CT 密度值（100HU,-630HU,-800HU），由 GE Revolution256 排螺旋 CT 在 120KV，NI=12 进行扫描，重建层厚为 1.25mm，依次采用肺算法、骨算法、标准算法、软组织算法进行重建，使用人工智能软件读取这些肺结节，记录结节数目、长径、体积及性质等数据信息。
结果：不同重建算法下 AI 提取到的结节差异性较大，部分 3mm 和 5mm 结节出现漏诊情况，LUNG 算法漏诊率最低（13.3%），但假阳性结节较多，而 BONE 算法漏诊率最高（40%）。
结论：重建算法会影响 AI 对肺内真实结节的提取，LUNG 算法下漏诊率最低，BONE 算法最高，AI 对≤5mm 结节的识别能力有待进一步提高。
临床意义：重建算法对肺结节的 DL-CAD 诊断有一定的影响.因此，需要对不同内核的图像进行测试，然后再将其应用于临床。

PU-3373

Chest X-Ray Binary Classification by Deep Learning

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Purpose To develop an automated artificial intelligence system that can differentiate normal from abnormal X-ray at a high level. **Materials and Methods** All frontal-view chest radiographs were retrieved from PACS between 2017-8-1 to 2018-5-31, and each image was read by three radiologists together and was annotated with normal (10652) and abnormal (7110) according to the consensus of them . Exclusion criteria were as follows: internal and external implants, chest x-ray beside the bed, under 18 and over 100 years of age.The abnormalities included any lesion or variation in chest. No abnormalities were found in the normal group. The data was divided into 70% training set, 20% verification set and 10% test set.Alexnet-based model, Googlenet-based model, Densenet-based model was respectively trained on our well-labelled data. An automated artificial intelligence model was synthesized through soft-voting method. **Result** The accuracy, sensitivity and specificity of Alexnet-based model is 79.4%, 80.9%, 78.6%. The accuracy, sensitivity and specificity of Googlenet-based mode is 81.4%, 56.3%, 96.7%.The accuracy, sensitivity and specificity of Densenet-based model is 85.1%, 73.6%, 92.9%. **Conclusion**：Our algorithm can distinguish normal and abnormal chest x-Ray with high accuracy,sensitivity and specificity.

PU-3374

全院级 PACS/RIS 的应用研究

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目的：探讨全院级 PACS/RIS 的应用研究。

方法：将 PACS/RIS 和 MRI、cT、DR、乳腺钼靶、多功能胃肠、ECT、超声、内窥镜及激光相机等联结在一起，组成一个局域信息网。并实现 PACS/RIS 与 HIS 跨系统通讯，与 EMR、城市癌症筛查、自助打印等系统集成。

结果：
应用全院级 PACS/RIS 后，工作流程得到优化，缩短了报告的发出时间，提高了诊断的准确率，加强了科室管理。构建了各个影像学科图像及文本信息整合，实现在统一 ID、统一界面及统一索引下涵盖医疗、教学和科研信息的 EMIR 管理。实现区域内医院之间的信息同步和信息共享。应用全院级 PACS/RIS 后，工作流程得到优化，缩短了报告的发出时间，提高了诊断的准确率，加强了科室管理。构建了各个影像学科图像及文本信息整合，实现在统一 ID、统一界面及统一索引下涵盖医疗、教学和科研信息的 EMIR 管理。实现区域内医院之间的信息同步和信息共享。提高了影像诊断的水平与效率，为综合发挥各类影像检查手段提供了广阔的空问。在显著提高科室工作效率的同时，也将医学影像诊断带入了数字化、无胶片化管理的时代．为远程医学奠定了坚实基础。PACS 在更好地为临床医疗服务的同时．也为医学影像学教学提供了更加先进的手段，使医学影像学教学在原有的基础上提高了一个层次。
结论：PACS/RIS 的实施，提高了医院的工作效率和医疗水平，对现代医疗技术的发展和医院信息系统的建设起到了推动作用。

PU-3375
非小细胞肺癌术前 IA 期淋巴结转移预测模型的建立

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目的:利用非小细胞肺癌(NSCLC)术前 IA 期淋巴结转移(LNM)的临床/CT 表现、放射学特征及两者的结合，建立并验证预测模型。
方法与材料:回顾性研究我院 2017 年 9 月至 2019 年 1 月 649 例非小细胞肺癌术前 IA 期患者。所有患者术前均行薄层 CT 扫描。649 例患者手术后病理提示 LNM 的有 138 例(21%)。临床/CT 特征，包括(如年龄，性别，吸烟状况，大小，空泡征，毛刺征，分叶征和胸膜牵扯征)被研究放射科医生所确定，并用于建立一个临床模型。从薄层 CT 扫描中共提取 396 个放射组学特征。训练组 455 例(97 例合并 LNM, 358 例未合并 LNM)，试验组 194 例(41 例和 153 例)。采用 Mann-Whitney U 检验和卡方检验选择临床/CT 特征。采用 Mann-Whitney U 检验和单变量方差分析进行放射组学特征降维。采用最小绝对收缩选择算子(LASSO)逻辑回归算法进行放射组学特征选择。建立了三种预测早期非小细胞肺癌 LNM 的模型(临床模型、放射组学模型和联合模型)。利用三种预测模型，利用接收机工作特性曲线(ROC)下面积(AUC 值)来评价 LNM 分类的性能。
结果:训练组基于 7 个最佳特征的放射组学模型 AUC 值为 0.898 (95% CI, 0.890-0.906)，试验组 AUC 值为 0.851。训练组和试验组临床模型 AUC 值(大小和毛刺征)分别为 0.739 (95% CI, 0.725-0.753)和 0.614。放射组学-临床联合模型 AUC 值分别为 0.911 (95% CI, 0.904-0.918)和 0.860。
结论:基于 CT 放射组学-临床模型在预测非小细胞肺癌术前 IA 期患者 LNM 方面优于单纯应用放射组学和临床特征建立的模型。

PU-3376
基于去噪卷积神经网络（DnCNN）的磁共振压缩感知图像复原可行性研究

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目的

磁共振压缩感知技术可大幅度缩短图像采集时间。但在压缩系数过大时，由于信号丢失会导致采集的图像存在伪影。本研究探讨基于去噪卷积神经网络（DnCNN），对高压缩感知系数磁共振图像复原的可行性。

方法

使用飞利浦 3T 磁共振 Ingenia CX 采集 30 例使用不同压缩感知系数（cs=6,8,10,12,14,16,18）的 3D-MSDE 序列脑部图像，每人 100 层，共计 3000 层。同时采集不使用任何加速算法的 3D-MSDE 序列脑部磁共振数据作为参考图像。计算不同压缩感知系数下采集到的图像与参考图像之间的均方误差，信噪比，图像结构相似度系数，评价不同压缩感知系数下图像噪声严重程度。构建去噪卷积神经网络[1]，将 3000 层图像分为 2000 层训练集，1000 层测试集，训练去噪卷积神经网络参数。同样使用均方误差、信噪比、图像结构相似度系数评价去噪之后的图像相对参考图像的噪声水平。统计分析不同组之间三个评价指标之间的差异性。

结果

随着压缩系数的升高，图像均方误差显著性升高，信噪比、图像结构相似度显著性下降（$p<0.05$）。压缩感知系数在达到 10 以后，图像质量下降严重，影响图像细节观察。使用去噪卷积神经网络处理之后的图像，与对应图像配对比较，信噪比、图像结构相似度显著性升高，图像均方误差显著性降低（$p<0.05$）。横向比较，使用去噪卷积神经网络处理之后的图像，甚至在压缩感知系数达到 18 时，仍可保持图像较高的信噪比和结构相似度。

结论

使用去噪卷积神经网络可有效去除因压缩感知系数过大引入的磁共振图像噪声，去噪卷积神经网络结合压缩感知技术可在保证磁共振图像质量的同时，减少扫描时间。

PU-3377
MRI 影像组学评估肝细胞肝癌 Ki-67 的表达

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目的：探讨 ADC 图、T2WI、DWI 的影像组学特征诊断肝细胞肝癌 Ki-67 标记指数高低的价值。方法：回顾性收集本院行病理检查的肝细胞肝癌患者 57 例。将纳入病例分为 Ki-67＞20%、Ki-67≤20%组。通过 MaZda 软件手工勾画 ROI 并分别提取 ADC 图、T2WI、DWI 纹理特征，随后采用 Fisher 系数、分类错误概率联合平均相关系数（POE+ACC）和交互信息（MI）的方法分别选择 10 种最佳纹理特征。组间比较通过应用 SPSS22.0 进行 *t* 检验或 *Mann-Whitney U* 检验，并做 ROC 曲线计算 AUC 值，并将每个序列组间比较有意义的纹理特征纳入二元 logistic 回归模型进行自变

量筛选，并建立预测模型。应用灵敏度、特异度、受试者工作特征曲线（ROC）的曲线下面积（AUC）大小评估预测模型的分类性能。结果：1.对于区别肝细胞肝癌 Ki-67 标记指数高低，*t* 检验和 *U* 检验示 ADC 图组间差异有统计学意义的纹理特征 20 个。T2WI 序列 Fisher 法共选择出组间差异有统计学意义的纹理特征 8 个。利用 Fisher 法、POE+ACC 法、MI 法共提取 30 种纹理特征，组间比较结果示 DWI 纹理特征对 Ki-67 标记指数高低组间差异无统计学意义。2.二元 logistic 回归示 ADC 图中的 S(5,0)和方差(P<0.01)以及 T2WI 中的高频对角分量小波系数能量 s-5（P =0.03）是 Ki-67>20%的独立预测因素。3.结合 ADC 图中的 S(5,0)和方差以及 T2WI 中的高频对角分量小波系数能量 s-5 建立肝细胞肝癌 Ki-67 表达程度的预测模型，AUC 值为 0.781，灵敏度为 73.3%，特异度为 70.4%。结论：利用 MRI 影像组学评估肝细胞肝癌 Ki-67 的表达，其影像组学预测模型的 ROC 曲线下面积 0.781，灵敏度为 73.3%，特异度为 70.4%。

PU-3378

基于人工智能诊断的 320CT 冠脉斑块的扫描优化研究

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[摘要] 目的 探讨低剂量和常规剂量 CT 条件对人工智能系统冠脉斑块的检出效能的影响。方法 收集重庆医科大学附属第二医院 2018 年 6 月-2019 年 6 月冠脉斑块患者 54 例，其中男 32 例，女 22 例，年龄 40-70 岁，平均 57.3 岁，BMI 值 18.5-23.9。每位患者分别在东芝 320 排容积 CT Aquilion ONE 中应用 4 组不同的 CT 辐射剂量行冠脉 CT 血管成像，其中 A 组为常规剂量组，B、C、D 组为低剂量组，扫描毫安呈等梯度递减。扫描条件为 A 组（120KV，180mA），B 组（120KV，140mA），C 组（120KV，100mA），D 组（120KV，60mA），矩阵 1024*1024，视野 16cm，准直螺距 0.35，其余扫描参数均保持一致，并导入数坤科技辅助诊断软件 Coronary Doc 1.0 进行检测。结果 常规剂量组与低剂量组冠脉斑块在 AI 中检出效能分别为 A、B 组(93.8% vs 94.6%，P>0.05）;A、C 组(93.8% vs91.2%，P>0.05）;A、D 组(93.8% vs 73.2%，P<0.001），在一定剂量范围内，降低管电流，诊断效能无明显差异。结论 在一定剂量范围内，降低管电流，在保证诊断效能的同时，也能大大降低降低辐射剂量。但是要注意避免追求低剂量而导致噪声指数升高,造成图像细节显示受限甚至丢失，低于一定剂量范围，会降低人工智能对冠脉斑块的检出敏感度。

PU-3379

常规 MRI 纹理在脑胶质瘤分级中的价值

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目的 探讨常规 MRI 纹理分析在脑胶质瘤分级中的价值。
方法 回顾性分析 20151 月至 2019 年 5 月于我院经病理证实的脑胶质瘤患者 125 例，其中低级别胶质瘤 46 例，高级别胶质瘤 79 例。所有患者均于术前行常规 MRI 检查，包括轴位 T1WI、T2WI、T2FLAIR 序列及 T1WI 增强。使用 MaZda 软件手动勾画感兴趣区并提取分析病灶的纹理特征，通过 Fisher 系数、交互信息、分类错误概率及以上三种方法联合选择特征，通过主成分分析、线性/非线性判别分析进行特征分类，并筛选出最佳分析方法、分类序列及纹理特征组。将最佳特征组纳入 Logistic 回归模型进一步分析，采用错判率及受试者工作特性曲线评价不同纹理特征的诊断效能。

结果 利用 Fisher 系数、交互信息、分类错误概率三种方法联合选择特征、主成分分析在 T1WI 增强序列上对胶质瘤分级诊断效能最佳，最低错判率为 13.76%，受试者工作特征曲线下面积为 0.935，模型敏感度为 0.818，特异度为 0.726。
结论 基于常规磁共振图像，利用影像组学方法，可以对高低级脑胶质瘤有较好判别能力。

PU-3380
基于人工智能诊断的 320CT 肺磨玻璃样结节的扫描优化研究

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[摘要] 目的 探讨低剂量和常规剂量 CT 条件对人工智能系统肺磨玻璃样结节的检出效能的影响。方法 收集重庆医科大学附属第二医院 2018 年 6 月-2019 年 6 月 3-10mm 大小的肺磨玻璃样结节患者 40 例，其中男 28 例，女 12 例，年龄 45-69 岁，平均 54.3 岁，BMI 值 18.5-23.9。每位患者先后在东芝 320 排容积 CT Aquilion ONE 中应用 5 组不同的 CT 辐射剂量对胸部同一范围行肺结节局部高分辨靶扫描，其中 A 组为常规剂量组，B、C、D、E 组为低剂量组，扫描毫安呈等梯度递减。扫描条件为 A 组（120KV，180mA），B 组（120KV，140mA），C 组（120KV，100mA），D 组（120KV，60mA），E 组（120KV，20mA），矩阵 1024*1024，视野 18cm，准直螺距 1.25，其余扫描参数均保持一致，并导入深睿医疗基于深度学习模型的人工智能软件（Deepwise healthcare,V190120）进行检测。结果 常规剂量组与低剂量组磨玻璃结节在 AI 中检出效能分别为 A、B 组(94.1% vs 94.7%，$P>0.05$）;A、C 组(94.1% vs 91.4%，$P>0.05$）;A、D 组(94.1% vs 63.2%，$P<0.001$）；A、E 组(94.1% vs 21.1%，$P<0.001$）。结论 在保证 AI 诊断效能的同时，降低管电流，能大大降低降低辐射剂量,但要注意避免追求低剂量而导致噪声指数升高,造成图像细节显示受限甚至丢失，过低 mAs 会降低人工智能对结节的检出敏感度。

PU-3381
CT 影像组学在鉴别肺腺癌和鳞癌中的价值

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【摘要】目的探讨基于机器学习的 CT 影像组学方法在鉴别肺腺癌与鳞癌中的应用价值。 **材料与方法** 回顾性收集我院病理证实的 90 例腺癌患者和 84 例鳞状细胞癌患者。从每位患者的平扫及增强 CT 三期扫描图像中各提取出 1160 个定量影像组学特征用于建立影像组学鉴别诊断模型。在建模过程中，我们依次应用了 4 种机器学习算法，每个肿瘤基于 CT 平扫、动脉期和静脉期分别建立 3 个影像组学模型。根据受试者工作特征曲线下面积（AUC）评估每一期扫描的影像组学模型的鉴别诊断效能。 **结果** CT 平扫期影像组学模型鉴别肺腺癌和鳞癌的 AUC（95%CI）为 0.801（0.725,0.859）。动脉期和静脉期影像组学模鉴别效能的 AUC 分别为 0.834（0.763, 0.887）和 0.864（0.797, 0.912）。基于静脉期的影像组学模型的鉴别诊断效能最好，其灵敏度为 89.3%，特异性为 76.7%。**结论**基于机器学习的 CT 影像组学方法有助于提高鉴别肺腺癌与鳞状细胞癌的准确性，特别是在增强扫描静脉期建立的影像组学模型鉴别诊断效能最高。

PU-3382
MRI 影像组学评估肝细胞肝癌的病理分级

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目的：探讨 T2WI、DWI、ADC 图的影像组学特征诊断肝细胞肝癌的病理分级价值。**方法：**回顾性分析经病理证实的肝细胞肝癌患者 55 例，并分为高分化、中-低分化组。采用 MaZda 软件手工勾画 ROI，提取 DWI、T2WI 及 ADC 图纹理特征。利用 Fisher 系数、分类错误概率联合平均相关系数（POE+ACC）和交互信息（MI）的方法分别选择 10 种最佳纹理特征。应用 SPSS22.0 进行分别对提取出最佳纹理特征利用 t 检验或 Mann-Whitney U 检验进行组间比较，将各个序列组间比较有意义的纹理特征纳入二元 logistic 回归模型，并建立预测模型。为了评估预测模型的分类性能，本研究应用灵敏度、特异度、受试者工作特征曲线（ROC）的曲线下面积（AUC）大小评价诊断性试验的价值。**结果：**1.对于肝细胞肝癌病理分级，t 检验和 U 检验结果示 DWI 序列组间差异有统计学意义的纹理特征共 11 个。T2WI 序列组间差异有统计学意义的纹理特征共 2 个。ADC 图各纹理特征组间比较差异无统计学意义。2.二元 logistic 回归示 DWI 的 Teta3（P =0.02）、偏斜度（P =0.02）以及 T2WI 的高频垂直分量小波系数能量 s-5 （P =0.03)是中-低分化程度肝细胞肝癌的独立预测因素，这三者数值越大，患者为中-低分化的风险越高。3.结合 DWI 的 Teta3、偏斜度以及 T2WI 的高频垂直分量小波系数能量 s-5 建立肝细胞肝癌病理分化程度的预测模型，AUC 值 0.855，灵敏度为 70.0%，特异度为 86.7%。**结论：**MRI 影像组学可以一定程度区别高、中-低分化肝细胞肝癌，其影像组学预测模型的 ROC 曲线下面积为 0.855，灵敏度为 70.0%，特异度为 86.7%。

PU-3383
CT 纹理分析对结直肠癌肝转移灶侵袭性与 KRAS、BRAF 基因突变的相关性研究

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目的：研究 CT 图像纹理分析对结直肠癌肝转移灶的侵袭性与 KRAS、BRAF 基因突变的相关性关系。
方法：回顾性收集 2013 年 1 月至 2018 年 4 月在我院行手术或肠镜确诊结直肠癌并且放化疗前进行增强 CT 检查的患者 90 例，并收集其 KRAS、BRAF 基因突变信息，按基因是否突变分为基因突变组 51 例，基因野生组 39 例。使用 ITK-SNAP 软件进行感兴趣区域勾画，分别使用 3 种方法在 CT 门脉期病灶最大横截面积层面进行二维勾画（方法 1 为病灶外延 2cm 和病灶区域，方法 2 为病灶外延 2cm 和内延 1cm 环形区域，方法 3 为病灶外延 2cm 环形区域）。使用 A.K 软件进行纹理特征提取、特征选择和模型建立。将患者随机分为训练组 62 例和验证组 28 例。使用 A.K 软件的方差分析与秩和检验（ANOVA+MW）、相关性分析和主成分分析（PCA）进行特征降维。使用 A.K 软件的 Bayes 和支持向量分类机模型建模。使用 AUC 曲线对模型诊断效能进行评价。
结果：三种方法提取纹理特征均得到 396 个特征，降维后方法 1 得到最相关的特征 6 个，方法 2 得到 8 个，方法 3 得到 3 个。方法 1 使用 Bayes 模型，得到训练集准确率、敏感性、特异性、AUC 值分别为 0.758、0.778、0.743、0.895；方法 2 使用 Bayes 模型，得到训练集准确率、敏感性、特异性、AUC 值分别为 0.732、0.760、0.710、0.817；方法 3 使用 C-支持向量分类机（C-SVC）模型，得到训练集准确率、敏感性、特异性、AUC 值分别为 0.871、0.852、0.886、0.853。三种方法得到的训练集 AUC 值均大于 0.8，准确率、敏感性、特异性均大于 0.7，其中方法 3 表现更优异。
结论：利用三种方法进行的 CT 图像纹理分析对诊断结直肠癌肝转移灶的侵袭性与 KRAS、BRAF 基因是否突变有较好价值。

PU-3384

CT 成像影像组学特征对胸腺上皮肿瘤危险预测

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目的：利用增强 CT 图像中提取的影像组学特征，用于术前预测胸腺上皮肿瘤的危险分类。
材料和方法：收集 2016 年 2 月至 2019 年 2 月经手术切除或穿刺活检，并病理证实的 149 例胸腺上皮肿瘤患者 CT 二期增强图像进行回顾性分析，通过病理类型分为低危组和高危组，对图像进行重采样预处理，再从感兴趣区中提取 254 个放射学特征，对数据进行预处理，之后进行数据划分：训练组所占比例 0.7，验证组 0.3，然后，采用 ANOVA+MW、ANOVA+MW、Lasso: cross validation，进一步建立特征选择和放射学特征。用 ROC 曲线分析评价放射组学特征的预测性能，采用 SVW 建立模型。
结果：在鉴别高低危胸腺上皮肿瘤时，以 SVM 为选择方法的放射组学特征的敏感性 0.786、特异性 0.857、AUC 0.913、精确度 0.821。
结论：CT 增强图像放射组学特征可作为鉴别高低危胸腺上皮肿瘤的无创的、有效的手段。放射组学特征作为一种定量方法，可以为胸腺上皮患者提供更多的诊断信息。

PU-3385

Radiomics in diagnosis of small size lung nodules on unenhanced CT images with different reconstruction algorithms

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Objectives: To investigate whether the reconstruction algorithm can influence the diagnosis accuracy.
Methods: 80 small lung nodules consisting of 26 benign nodules and 54 adenocarcinomas are analyzed. The raw data of each lesion was reconstructed with filter back projection (FBP) and model-based iterative reconstruction (MBIR) algorithm. The texture analysis model,model was trained and validated by retrospective study without CT raw data. Diagnostic accuracy for FBP and MBIR was assessed.
Results: Four features (the average: F3=-0.03804, F10=0.018913, F7= 0.017125, F1=0.014683) have obvious difference between FBP and MBIR algorithm both on benign nodules and adenocarcinoma. All these four texture features are important for differential diagnosis. The AUC calculated with MBIR algorithm (AUC=0.800) is higher than the one from FBP algorithm (AUC=0.775).
Conclusions: The CT images with MBIR algorithm provide more information of structure details, which can bring benefits for radiomics analysis in small lung nodules and improve diagnosis accuracy.

PU-3386
机器学习在青少年肌阵挛癫痫多模态功能成像研究中的应用

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目的：探讨机器学习在青少年肌阵挛癫痫（juvenile myoclonic epilepsy ，JME）静息态功能指标（alff、reho、dc、功能连接等）与年龄、性别、病程、以及正常对照特征分类中的临床应用。
方法：对 45 名 JME 患者以及 30 名性别、年龄相匹配的正常对照组分别计算其低频振幅（alff）局部一致性（reho）度中心度（dc）功能指标并将双样本 T 检验后（通过 FDR 矫正）JME 与正常对照组异常区域选为功能连接种子点进行 ROI-Wise 水平功能连接，基于 PRONTO 机器学习软件包对四种功能指标进行特征提取、模型构建、模型评估使用留一交叉验证方法，最后使用 ROC 曲线计算 AUC（曲线下面积），AUC 越大，其相应功能指标分类性能越好。
结果：基于机器学结果表明 reho 以及 dc 在 JME 与正常对照识别种具有较高一致性，其特异性分别为 80%、75%；敏感性分别为 79%、%82；准确度分别为 80%、81%；而基于功能连接的机器学习特征分类表明：功能连接在 JME 与正常对照组中的特征分类效能最好，特异性为 84%；敏感性为 79%；准确度为 84%。

PU-3387
A New Approach to Predict Grades of Non-functional Pancreatic Neuroendocrine Tumors ≤2 cm: the Portal Rad-score

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Context Non-invasive preoperative grading of non-functional pancreatic neuroendocrine tumors (NF-pNETs) ≤2 cm is challenging, critical for successful surgical outcomes, and currently relies on endoscopic ultrasound-guided fine needle aspiration, which has limitations.
Objective We aimed to construct the rad-score using radiomics features of multi-slice spiral CT (MSCT) images to predict preoperative grades of NF-pNETs ≤2 cm.
Methods In this retrospective study, 158 patients with surgically resected, pathologically confirmed NF-pNETs underwent MSCT from January 2014 to January 2016. Radiomic features were extracted from portal venous CT scans. The least absolute shrinkage and selection operator method was used to select the features. Multivariate logistic regression models were utilized to analyze the association between the rad-score and grades of NF-pNETs. The rad-score performance was determined by its discrimination and clinical usefulness. The rad-score was internally validated in 43 consecutive patients with NF-pNETs 2cm between February 2016 and December 2018.
Results The rad-score, which consisted of 6 selected features, was significantly associated with grades of NF-pNETs (p <0.0001). It showed good discrimination in the training cohort [area under the curve (AUC), 0.86; 95% confidence interval (CI), 0.79-0.92] and in the NF-pNETs ≤2 cm cohort (AUC, 0.81; 95% CI, 0.68-0.91). The best cut

point was -0.66. For a threshold probability of >4.8% for a doctor or patient, DCA indicated greater net benefit from use of the rad-score than from the alternative "treat all" or "treat none" strategies.
Conclusions The portal rad-score, is a potentially valuable noninvasive tool for accurate preoperative prediction of grades for NF-pNETs ≤2 cm.

PU-3388

Machine Learning-Based Radiomics to Predict the Expression of S100 in Gliomas in Different Grades

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Background T1-weight contrast material-enhanced MRI is the current standard for initial imaging of patients with head tumor. We aimed to develop and validate a set of deep learning algorithms for automated detection of the S100 status of glioma from the MRI scan in vivo.

Methods We retrospectively collected a dataset containing 465 subjects with gliomas together with their pathological reports and head MRI scans from a single-institution between Oct 1, 2013, and Mar 1, 2019. Overall, 249 subjects, including 122 cases of high-grade gliomas and 127 cases of lower-grade gliomas with preoperative MRI, histology, S100 status were included. We proposed a multidimensional analysis of machine-learning model, including SVM, decision tree, bagged trees and random forest, based on original contrast material-enhanced axial T1-weighted spin-echo sequences to predict S100 status of glioma. An independent dataset with 50 glioma subjects was further collected to verify the model performance.

Results The S100 status of gliomas can be predicted by radiomics and machine-learning approaches, with areas under ROC curves above 0.728 and mean accuracies above 90% estimated on the training dataset. All P values were less than 0.05. As the malignant degree of glioma increased, the expression level of S100 decreased.

Conclusions The MR radiomics-based method provides a reliable alternative to predict the expression of S100 in different grades of gliomas. It may help in classifying patients for surgery.

PU-3389

Low-dose scan imaging of 256-slice spiral CT of lower extremity superficial varices

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Objective To Patients with lower extremity varices need to undergo extensive CT or X-ray angiography before and after treatment, and the radiation dose is higher. This study is to evaluate the value of low-dose CT enhanced scan for lower extremity varicose vein imaging. Data and methods prospective selection Forty patients with clinically diagnosed superficial varicose veins were randomly divided into 4 groups according to different scanning parameters: group I (standard group): 120 kV, 250 mAs; group II: 120 kV, 100 mAs Group III: 100 kV, 200 mAs; Group IV.: 80 kV, 300 mAs. Evaluation of effective dose (ED), signal-to-noise ratio (SNR), contrast-to-noise ratio (CNR), and image quality. Results 1I to IV There was no significant difference in age, body mass index and height between the two groups (P>0.05). The difference of ED between the two groups was statistically significant (P<0.05). The SNR and CNR of the 3I～IV groups were statistically significant. Significance (F=3.7, 3.6, P<0.05). All images can meet the diagnostic requirements. Conclusion Apply lower tube voltage and higher tube current (80 kV, 300 mAs) to reduce the radiation dose while image quality Less affected, able to meet clinical diagnostic requirements, can be used as a routine scan for patients with lower extremity superficial varices Parameters.

PU-3390

Applying Deep Learning and Radiomics to Determine Biological Lung and Heart Age from Chest Radiographs

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Purpose

Age is an important risk factor for disease. The study goal is to establish a mean value of the size of lung parenchyma (SLP) and the cardiothoracic ratio (CTR) of healthy population in Southern China using a large-scale chest radiograph (CXR) dataset as baseline for different ages and genders. The result is used to generate prediction models for biological lung or heart age to monitor aging processes and early detect lung or heart diseases.

Material and methods

A large PA/AP CXR dataset was acquired from six sources in Southern China, from 2012 to 2018, including 249,858 and 222,011 CXRs for SLP and CTR, respectively. All cases were confirmed by at least one radiology report, EKG, or other clinical report to exclude abnormal SLP and pre-existing heart conditions.

CXR image was first resized and converted into PNG format. An adaptive histogram equalization was applied to improve the contrast. A deep learning artificial intelligence (AI) technique was trained and applied to automatically segment the left and right lung, and the heart area with a very high accuracy (DICE value<0.017). The left and right SLP was calculated for different ages and genders. The CTR was calculated for each age and gender by dividing the transverse cardiac diameter by the maximum internal thoracic diameter.

Results

The mean right and left SLP increased with age until it peaked at gender specific maturity age. Figures 1 and 2 show the SLP and CTR profiles for each age, referred as lung and heart age, with a 95% confidence level. The mean SLPs of the study population were 399, 368, and 435 cm^2, and the mean CTRs of the study population were 0.417, 0.420, and 0.413, for general, female, and male population, respectively.

Conclusion

This is the first large-scale study on radiological lung and heart age measured using PA/AP CXR images. The study generated prediction models and obtained the averaged biological lung and heart age using deep learning AI and radiomics. The trend of lung and heart age profiles are similar to various reported disease risks and growth trends.

PU-3391

Preoperative prediction of extracapsular extension based on radiomics signature: comparison of five different predictive models and the visual assessment to stage prostate cancer

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Objective: To compare five different radiomics-based machine-learning models and the visual assessment for preoperative prediction of extracapsular extension (ECE) in patients with prostate cancer (PCa).

Methods: Preoperative magnetic resonance imaging data from 238 patients with PCa was studied. Patients enrolled were randomized in a two-to-one ratio into the training (n = 165) and validation (n = 73) cohorts. A total of 1619 radiomics features were extracted from T2-weighted images (T2WI). Radiomics signature was built via dimension reduction, feature selection based on the least absolute shrinkage and selection operator (LASSO) method. A radiomics nomogram comprised of radiomics signature, MR-reported ECE status, and independent clinicopathologic risk factors was constructed using multivariable logistic regression. In addition, four other machine-learning

models (tradition support vector machine (SVM) method, radial-basis-function based SVM (RBF-SVM), decision tree and random forest were conducted. The ECE status of the same images were also evaluated by three radiologists by using the Likert 5-point scale method. The predictive performance of these models and the radiologists' interpretations were compared by using receiver operating characteristic curves based on the validation cohort.

Results: A radiomics signature consisting 22 selected features was significantly associated with pathologic ECE status ($P < .001$ for both training and validation cohorts). The radiomics nomogram comprising radiomics signature, lesion location, prostate specific antigen (PSA) level, and MR-reported ECE status demonstrated best performance, with an area under the curve (AUC) of 0.874 and 0.846 in training and validation cohort, respectively. The AUC of SVM, RBF-based SVM, decision tree and random forest were 0.808, 0.840, 0.801 and 0.829, respectively, which were all outperformed radiologists' visual assessment alone (AUC = 0.644)

Conclusion: The proposed predictive models outperformed visual assessment for the prediction of ECE status.

PU-3392

Automatic Lung Nodule Follow-up Assessment with Semantic-Aware Registration

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Purpose:

A longitudinal image registration approach is developed for robust image alignment, accurate lesion correspondence matching and efficient lung nodule follow-up assessment using CT images under large anatomical variation, surgical-absence organ and pathological lesion progression conditions.

Method/Materials:

Lung nodules are automatically detected and quantified by applying a convolutional neural network model on CT images of each subject. For patients who need follow-up, a longitudinal semantic-aware registration is performed by 2 steps: 1) detecting landmarks with salient anatomy and 2) performing longitudinal registration via landmark and image information. Then, a bi-directional matching strategy is performed to accurately establish the nodule correspondences longitudinally by considering their locations and shapes. A hybrid distance metric is designed by not only considering the nodule center distances but also calculating shape similarities across the temporal domain. Finally, after the robust lesion matching, follow-up quantitative assessment is automatically performed according to the RECISTS 1.1 guidelines.

We have 5500 chest CT images from a cohort of health screening patients, trained (80%) and tested (20%) our CNN models for lung nodule detection and quantification. Then, we performed a pilot study on 20 subjects with multiple follow-ups (time interval: 2.2 ± 1.7 months). The baseline for comparison follow-up assessments were performed by one radiologist and verified by another.

Result:
The CNN-based lung nodule detection was proved to be sensitive for the testing dataset (95.1%). Average registration errors for the pilot study are 4.8±3.6 mm evaluated on landmarks. While manual assessment took >14 minutes for each patient, including nodule quantification, it took <1.5 minutes for the proposed method, which is at least 9 times faster. Statistical analysis showed that correct nodule correspondence rates and quantification results were not significantly different from manual assessments based on RECISTS 1.1.
Conclusion：
Experimental results showed the semantic-aware registration is more effective while generating comparable results as compared to manual assessment from radiologists. This algorithm is also robust to anatomical and pathological variations, which facilitates automatic follow-up image assessment in clinics.

PU-3393

MRI 对脑干海绵状血管瘤的诊断价值及临床分析

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摘要： 目的 探讨脑干海绵状血管瘤的 MRI 诊断价值及临床、病理特征。**方法** 对 12 例经手术病理证实且临床及 MRI 资料完整的脑干海绵状血管瘤进行分析；其中 7 例还做过 MRA 检查，8 例做过全脊髓血管造影，9 例曾做过 CT 检查。本组 12 例均经后背正中直切口显微手术治疗。 结果 临床发作方式分为：突然发作和静止发作两种类型。MRI 表现：T_1WI 为等或低信号占 79.8%，T_2WI 为等或高信号占 87.2%；T_1WI、T_2WI 呈混杂信号占 36.5%；T_2WI 上瘤周有低信号环占 17.3%；Gd-DTPA 扫描显示轻度强化或不强化。形态大多为类圆形占 89.5%，部分可见典型的桑椹样或网络样结构占 10.5%。病灶发生于中脑 5 例，桥脑 5 例，延髓 2 例。组织病理学表现：大多具有复合性的病理改变，3 例可见瘤血管腔内存在弹性纤维；2 例可见引流静脉和供血动脉。MRA 及全脊髓血管造影未见异常血管。 结论 脑干海绵状血管瘤的临床表现与病灶的部位及大小密切相关；MRI 表现与病程及病变构成有关；部分组织病理学具有与其它血管畸形重叠的特点。MRI 是脑干海绵状血管瘤
术前诊断及制定手术方案的最佳检查方法。

PU-3394

Construction of Prognostic Prediction Model for Chemoradiotherapy of Small Cell Lung Cancer Based on CT Texture Analysis

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Purpose: Synchronous chemoradiotherapy is a common treatment for small cell lung cancer (SCLC), but recurrence and metastasis are prone to occur in a short time after treatment, and this performance is unpredictable. The purpose of this study was to establish a prognostic prediction model for SCLC after chemoradiotherapy by texture analysis of preoperative computed tomography (CT) images.
Method and Materials: This study retrospectively collected 69 patients with SCLC who were diagnosed and treated at Lishui Hospital of Zhejiang University from July 2013 to August 2018. All patients were confirmed to be SCLC by needle biopsy, and CT scan and laboratory examination were performed before treatment. All the enrolled patients underwent chemoradiotherapy and divided into two groups according to the presence or absence of recurrence 6 months after treatment, which were recurrence group (n=39) and control group (n=30). The AK (Analysis Kit, GE Healthcare) software was used to delineate the volume of interest of the lesions based on the preoperative CT images and extract a total of 396 quantitative texture parameters. All pre-normalized (Z-score) feature values were dimension reduction by Kruskal-Wallis (K- W) one-way ANOVA test, univariate logistic regression, and LASSO algorithm and selected the most useful features. The selected imaging features were further combined with clinical laboratory indicators (NSE, CYFRA21-1 and Pro-GRP) to construct the predictive model.
Results: Eight characteristic parameters with highly correlation with prognosis were selected, which were used to form the Rad-score. The Rad-score and clinical laboratory indicators were applied for modeling, and found that the area under the ROC curve was 0.846, the sensitivity and specificity were 0.846 and 0.700, respectively. A prognostic nomogram was further developed based on Rad-score and clinical indicators, providing a more intuitive reference for prognostic prediction.
Conclusion: A nomogram has been developed that can be used to predict the probability of recurrence within 6 months after chemoradiotherapy for SCLC, which may be useful for patient counseling and patient follow-up planning.

PU-3395
基于动态增强扫描 DCE-MRI 的前列腺良恶性疾病鉴别模型研究

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目的：前列腺癌（PCa）是男性生殖系统最常见的恶性肿瘤，MRI 动态增强扫描（Dynamic Contrast Enhencement, DCE）对前列腺癌的诊断、分期和判断预后价值较大。本研究通过一系列灌注参数，容积转移常数（Ktrans）、运动速度常数（Kep）、血管外细胞外容积分数（Ve）等，提取特征值，与患者的病理结果对应分析，建立一个前列腺良恶性疾病分类模型，为诊断提供更多依据。
方法：通过 DCE 图像，拟合多种已知的药物动力学模型，得到 Ktrans、Kep、Ve 的计算方法，勾画病灶区，计算得到该区域的灌注参数图，并提取参数图的 SIFT（Scale-invariant feature transform）特征和 HOG（Histogram of Oriented Gradient）特征，与病理结果（包括分级、评分、抗原等）进行相关性分析，建立一个用于前列腺良恶性疾病分类鉴别的人工神经网络模型。
结果：本研究基于 DCE 获得的一系列血管渗透性参数建立的前列腺良恶性分类鉴别模型能够有效地对前列腺增生和肿瘤做出分类，分类结果与病理结果一致性高达 85%。

结论：DCE-MRI 对前列腺疾病的诊断鉴别有很大意义，前列腺良恶性疾病的血管渗透性参数是有显著差异的，因此可以通过提取参数图特征运用人工智能方法去探寻它们的内在联系。

PU-3396

Automated nodule segmentation in CT images based on improved U-Net architecture

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Purpose: This study aims to develop CAD systems for automated nodule segmentation that can avoid tedious manual processing and reduce inter-observer variability between different radiologists.
Method: The public Lung Image Database Consortium and Image Database Resource Initiative (LIDC-IDRI) dataset which contains 1018 cases were used in our study. we propose a network architecture based on U-Net for lung nodule segmentation. The dense connection branches into the U-Net architecture to improve segmentation performance was introduced. Meanwhile, a hybrid loss function was designed to address the class imbalance problem between foreground and background. Finally, we apply the fully connected Conditional Random Field (CRF) model as the final post-processing to eliminate some spurious areas.
Result: The proposed method was compared with several state-of-the-art methods and the segmentation results, and it can be observed that our method achieves the mean DSC, PPV and sensitivity of 82.59 3.81%, 89.47 2.04% and 84.71 2.68%, respectively.
Conclusion: Our model achieves the overall best performance in the lung nodule segmentation and could be used for computer-aided diagnosis in clinical.

PU-3397

基于 MR 影像组学分析预测直肠癌病理分化程度的可行性研究

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目的：探讨基于 MR 影像组学分析预测直肠癌病理分化程度的可行性研究。
方法：回顾性分析 127 例直肠癌患者的 MR 图像及病理资料，使用 3D-Slicer 软件，在 T1WI 横轴位增强图像上选择直肠癌灶最大层面区域勾画感兴趣区并提取影像组学特征，利用 SMOTE 算法对预处理后的数据进行平衡处理；利用 LASSO、随机森林、弹性网三种特征选择算法进行最优特征子集的选择；利用支持向量机，基于选择的特征对样本进行分类，建立预测模型，使用 ROC 曲线评估模型预测直肠癌病理分化程度的性能。
结果：本研究 127 例直肠癌患者，男性 82 例，女性 45 例，根据病理分化程度分为三组：低分化组 22 例，中分化组组 77 例，高分化 28 例。共提取 7 大类 110 个有效特征。通过建立两次二分类模型，三种不同的特征选择方法均能预测直肠癌的病理分化程度，所有二分类模型中最小的 AUC 值为 0.76。第一个二分类模型“高-不高”模型中，在三个最优特征子集中均出现的特征有 7 个，基于弹性网特征选择后的预测模型的 AUC 值最高，为 0.79；第二个二分类预测模型“中-低”模型中，

在三个最优特征子集中均出现的特征有 11 个，基于随机森林算法特征选择后的预测模型的 AUC 值最高，为 0.9。
结论：基于 MR 影像组学分析方法，通过两次二分类模型的建立，能够区分直肠癌高、中、低分化程度。基于 MR 影像组学分析方法可以作为一种预测直肠癌病理分化程度的方法，是一种比较稳定的、无创的方法，也使得直肠癌 MRI 检查在临床上具有更大的价值。

PU-3398

Image quality of 30-pass and 15-pass CTP with a new reconstruction algorithm:CNN based on SegNet

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PURPOSE: we use Convolutional Neural Networks (CNN) based on SegNet reconstruction algorithm to obtain 15-pass CTP data. The aim of this study was to evaluate the image quality and clinical decision-making when using 30-pass and 15-pass CTP.
MATERIALS AND METHODS: A total of 40 patients with acute stroke onset≦9-hour were enrolled.30-pass CTP data were obtained from Brilliance iCT 256 (Philips).15-pass CTP data were created by using the new reconstruction algorithm. Perfusion parameters (CBF, CBV) and color maps were calculated by using PMA-Asist(JAPAN) for 30-pass and 15-pass CTP. CTP image quality were estimated by peak signal to noise ratio(PSNR) and structural similarity measure(SSIM).To exam Penumbra(Penu.) and Ischemic core(IC) lesion,adapted absolute CBF/CBV were applied. CBF(Penu.) and CBV (IC) CTP lesion scores were derived from the CBF and CBV color maps respectively and the data were statistically compared.
RESULTS: CTP image quality was similar for 30-pass versus 15-pass ($PSNR_{avg}$=51.73,$SSIM_{avg}$=0.9946，$PSNR_{std}$=1.4666,$SSIM_{std}$=0.0018) . Corresponding penumbra lesions were slightly smaller at 15-pass versus 30-pass (P <.05), whereas corresponding Ischemic core showed excellent agreement. Therapeutic decisions would have remained the same in all patients.
CONCLUSIONS: 15-pass CTP are typically still diagnostic, and therapy would be the same. However, with regard to perfusion quantitation and image quality, our study indicates that 30-pass is preferable to 15-pass.

PU-3399

Towards a clinic-radiologic-biopsy based predictive model for the detection of pelvic lymph node invasion in patients with prostate cancer before surgery

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Abstract
Purpose:

To develop a predictive model, based on preoperative clinical characteristics, MRI image features and biopsy findings, to detect whether pelvic lymph nodes invasion (LNI) exist or not in patients with prostate cancer (PCa) undergoing standard pelvic lymph node dissection (PLND).

Materials and methods:

248 consecutive patients underwent standard prostate 3T MRI before radical prostatectomy (RP) and standard pelvic lymph node dissection (PLND) were enrolled. Image analysis was performed by two independent readers blinded to any clinical information. Histopathologic examination served as the standard of reference. Predictive models were developed from 16 clinicoradiologic features and 3 biopsy findings to assess the prevalence of LNI, using a logistic regression (LR) and support vector machine (SVM) analysis, respectively.

Results:

Total 59/248 (23.8%) LNI patients were identified at surgery. Conventional radiologic-lymph node (LN) report had high specificity (97.9%) and low sensitivity (39.0%) for diagnosis of LNI. SVM model, consisting of 6 most important clinic-radiologic-biopsy predictors, yielded significantly higher area under ROC curve (0.94, 95 confidence intervals [CI], 0.92-0.95 vs 0.90, 95% CIs, 0.88-0.91), higher sensitivity (93.2% vs 84.7%) and higher specificity (86.1% vs 78.8%) than LR model. In radiologic LN-negative subgroup, SVM and LR model identified 33/36 (91.7%) and 27/36 (75%) additional positive cases, respectively.

Conclusion:

The designed predictive model is better than conventional radiologic reporting way for predicting LNI in patients with PCa. The utility of this approach can be viewed in terms of enhancing both the diagnosis and treatment processes.

PU-3400

The value of Radiomics in Predicting the Recurrence and Metastasis of T3 Rectal Cancer

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Objective:

To assess the value to predict recurrence and metastasis of T3 rectal cancer by radiomics.

Method:

A retrospective study of 87 patients with T3 rectal cancer at the First Hospital of Jilin University from January 2011 to December 2013. All the patients underwent contrast-enhanced abdominal CT within 2weeks before surgery, including arterial phase and vein phase. Clinical factors, such as gender, age, bloody stool, tumor differentiation, lymph node metastasis, carcinoembryonic antigen (CEA), carbohydrate antigen 72-4 (CA72-4), carbohydrate antigen 199 (CA199) and CT datasets were obtained. The radiology group cloud platform (http://www.radcloud.cn) was used to map ROI of the lesion and 1029 radiographic features were extracted. All patients were assigned to

two groups: analysis group (n=44) and verification group (n=43). Using analysis group data for univariate analysis, select radiomic features associated with recurrence and metastasis, significantly. Then establishment a predictive model for recurrence and metastasis by Cox analysis. Apply verification group data to verify the predictive model by Kaplan-Meier curves and evaluate the difference between clinical predictive model and final predictive model by Log-rank test.

Results:

There was no significant difference in clinical factors between the analysis group and the verification group. Seven arterial phase radiomic features and nine venous phase radiomic features predict the recurrence and metastasis of T3 rectal cancer after surgery strongly (CI > 0.60 and FDR < 5%). The radiomic features that were finally selected into the predictive model were wavelet HHH-GLRLM-short run high gray level emphasis, and the arterial phase and venous phase had the same results. Among the clinical factors, histological grade and lymph node metastasis were included in the predictive model (Log-Rank test, $p < 0.1$). Compared with the CI index of the predictive model using clinical factors alone, the CI index of the final predictive model of radiomic features of arterial phase increased from 0.69 to 0.76, and the CI index of the final predictive model of radiomic features of venous phase increased from 0.69 to 0.74.

Conclusion:

For predicting recurrence and metastasis of T3 rectal cancer, the addition of radiomic features can improve the prognostic ability of a model compared to one using clinical factors alone.

PU-3401

Development of a multiparametric radiomics combined T2WI and DWI to staging rectal cancer

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Purpose: To explore whether radiomics analysis in T2-weighted imaging (T2WI) and Readout-segmented echo-planar diffusion-weighted imaging (DWI) can help to predict the pathologic staging in rectal cancer.

Material and methods: This study prospectively enrolled 430 patients (age:25~94,male) with rectal cancer staging N0 or N1-2. According to 10-fold cross validation, 70% of this cohort (300 patients) was set as the training cohort, and the others (130 patients) was set as the validation cohort. 2231 radiomics features were extracted from T2WI and DWI. On the one hand, the features of the three modal images are extracted respectively and then model is respectively calculated. The final model was determined by voting on the results of the three models. On the other hand, the data of three kinds of images are combined to build the model. Compare the effectiveness of the two methods.

Results. Three weak models were identified. By setting the voting weight, integration learning of three models reaches a higher distinction between staging N0 and N1-2

(Train:AUC:0.900,Sensitivity:0.907,Specificity:0.797;Test:AUC:0.862,Sensitivity:0.861, Specificity:0.725).
Conclusion: Multiparametric radiomics of rectal cancer, which combined T2WI with DWI, showed a fairly high accuracy in staging of N rectal cancer.

PU-3402

Abnormal nodes characteristics in whole-brain functional networks of long-term abstinence of methamphetamine: A Resting-State fMRI Study

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Background: Neuroimaging studies have shown that methamphetamine (MA) abusers have abnormalities in widespread local regions of the brain. However, little is known about whether the long-term abstinent MA abusers (AMD) have abnormal nodes characteristics in whole-brain functional networks. **Materials and Methods:** 35 AMD (abstinent at least 14 months) and 32 healthy controls (HC) were recruited in the study. The age of the first use of MA, grams of monthly MA consumption, total time of MA use and abstinence of the AMD were recorded. Data Processing Assistant for Resting-State fMRI (DPARSF) was used to measure the mean nodal efficiency and degree centrality of 90 brain regions in the automated anatomic labeling atlas. Comparisons of the two nodes characteristics of the 90 nodes between the two groups were performed with the independent-sample t-tests. Spearman's correlation analysis was performed between the abnormal nodal characteristics and MA use characteristics. **Results:** Compared with the HC, the AMD had significantly decreased nodal efficiency in the left supramarginal gyrus, right precuneus, and had significantly increased nodal efficiency in the right superior temporal gyrus, middle temporal gyrus, and inferior temporal gyrus. Compared with HC, the AMD also had significantly decreased nodal degree centrality in the left middle frontal gyrus, orbital part, supramarginal gyrus, right precuneus, and had significantly increased nodal degree centrality in the right superior temporal gyrus, middle temporal gyrus, inferior temporal gyrus. Moreover, the nodal efficiency and degree centrality of the right precuneus were all positively correlated with the age of the first use of MA. And the nodal degree centrality of the left supramarginal gyrus was negatively correlated with the grams of monthly MA consumption. **Conclusions:** The study showed that the nodal efficiency and degree centrality of some brain regions were abnormal in the AMD. The study provided imaging evidences for abnormal nodes characteristics in whole-brain functional networks of AMD.

PU-3403

Influence of CT effective dose and convolution kernel on the detection of pulmonary nodules in different artificial intelligence software systems: A phantom study

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Abstract
Objective: To investigate the effective dose (E) and convolution kernel's effects on the detection of pulmonary nodules in different artificial intelligence (AI) software systems.
Materials and methods: Simulated nodules of various sizes and densities in the Lungman phantom were computed tomography (CT) scanned at different levels of E (3-5, 1-3, 0.5-1, and <0.5 mSv) and were reconstructed with different kernels (B30f, B60f, and B80f). The number of nodules and corresponding volumes in different images were detected by four AI software systems (A, B, C, and D). Sensitivity, error rate (ER), and relative volume error (RVE) were calculated and compared to the aspects of the E and convolution kernel.
Results: System B had the highest median sensitivity (100%). The median ER of systems B (6.25%) and D (7.14%) was lower than A (56.07%) and C (31.25%). System D had the smallest RVE (13.12%). When the E was <0.5 mSv, system D's sensitivity decreased, while the ER of systems A and B increased significantly ($P < 0.05$ each). When the kernel was changed from B80f to B30f, the ER of system A decreased (33.57%), while that of system C increased (58.84%), and the RVE of systems A, B, and C increased ($P < 0.05$).
Conclusions: AI software systems B and D have high detection efficiency under normal or low dose conditions and show better stability. However, the detection efficiency of systems A and C would be affected by the E or convolution kernel, but the E would not affect the volume measurement of four systems.

PU-3404

基于静息态因果-机器学习模型对 BECTS 分类的脑网络机制的研究

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目的：首次利用静息态动态因果模型(rs-DCM)分析方法探讨支持向量机(SVM)机器学习分类方法对伴中央颞区棘波的良性儿童癫痫（BECTS）和正常健康儿童的鉴别能力，以及潜在的特征性网络模型。
方法：本研究共纳入 246 例儿童被试，包括我院神经内科门诊就诊并确诊为 BECTS 的 67 例首诊未用药患儿（女性 30 例，男性 37 例；平均年龄，8.74 ± 2.25 岁）和 67 例健康正常对照儿童（女

性 31 例，男性 36 例；平均年龄，9.29 ± 2.41 岁），以及外院 56 例 BECTS 患儿（女性 24 例，男性 32 例；平均年龄，9.49 ± 2.48 岁）和 56 例健康正常对照儿童（女性 23 例，男性 33 例；平均年龄，10.12 ± 3.3 岁）。SVM 用于 BECTS 两个亚组的分类。
结果：rs-DCM-SVM 机器学习方法用于区分 BECTS 患儿和正常健康儿童获得较高的分类正确率（85.82%），相应 AUC 值为 0.88。外部单位数据同样得到近似分类正确率（82.14%）和 AUC 值（0.81）。其中，84 条正性效应连接边和 86 条负性效应连接边作为有效特征用于 BECTS 的诊断。这些连接边所在脑区对区分 BECTS 组和正常健康儿童组的贡献权重最高的脑区分别为左侧语言相关脑区、双侧 Rolandic 区、双侧中央前回、右侧 IPS、右侧 EFE、左侧 IPC、左侧丘脑，这些脑区对应的网络分别为感觉运动网络、语言网络、右侧 DAN 及皮层下网络。
结论：rs-DCM-SVM 可能能作为一个较好的生物学指标用于 BECTS 诊断。这些脑网络之间的高兴奋性环路和高抑制性环路可能介导癫痫的发生。本研究结果为我们对 BECTS 发生、发展的病理生理学机制的理解提供新的视角。

PU-3405
双能量 CT 多种重建技术在消除后颅窝伪影中的应用

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目的 评价双能量技术多种重建方式在减轻后颅窝伪影方面的应用价值。
方法 选取 2013-2014 行头颅 CT 平扫并且后颅窝有伪影的成人患者 40 例，扫描参数：双能扫描模式， Sn140/80 kV，有效电流 111 和 222 mAs，开启 Care Dose 4D。准直 128×0.6 mm，矩阵 512×512，自动重组层厚 10.0mm，螺距 0.4 脑窗（窗宽 100HU，窗位 30HU）。机器自动生成三组图像为 140 kV，80kV 及相当于 120kV 混合能量图。分别采用不同后处理方式减轻后颅窝伪影。A 组卷积核 D30，B 组卷积核 D24，C 组卷积核 D34，D 组为 A 组行 SAFIRE3 级重建后图像 Q3，E 组为 A 组行单能谱软件处理后的 16 组图像，F 组为 D 组行单能谱软件处理后的 16 组图像。分别评价 A-D 组及 E、F 组中 16 个亚组图像的后颅窝伪影，并对各感兴趣区域伪影指数和对比噪声比进行分析。**结果** 六组三个部位(内听道、桥脑中心及小脑白质)的平均 CT 值均无统计学意义（$P>0.05$），SD 值有统计学意义（$P<0.05$），且 F 组 80keV 时最小，SNR 有统计学差异（$P<0.05$），且 F 组 80keV 时最大。采用多个独立样本比较的秩和检验，六组伪影评分差异有统计学意义（$P<0.05$），除 A、C 两组、B、D 两组及 D、E、F 三组之间无统计学意义外，其他各两组之间有统计学意义（$P<0.05$）。伪影评分：F 组>D 组>E 组>B 组>A、C 组，即 D30 经 SAFIRE 3 级重建和单能谱 80keV 处理后图像的伪影评分最大。**结论** 单纯卷积核 D24 图像最佳；D30 经 SAFIRE 3 级重建后的图像，减轻伪影效果较好；D30 图像经 SAFIRE 3 级和单能谱软件再处理后的图像，减轻伪影效果更佳。推荐临床使用 D30 经 SAFIRE 3 级重建后的图像，因其简单、方便操作效果亦较好。

PU-3406
基于 CT 影像组学预测局部进展期直肠癌新辅助治疗疗效的研究

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【目的】探讨 CT 影像组学在治疗前预测局部进展期直肠癌新辅助治疗疗效的价值。**【资料与方法】**回顾性入组 168 例经肠镜取材、临床诊断为局部进展期直肠癌并行新辅助治疗和根治手术的患者，根据术后病理肿瘤退缩分级分为疗效反应良好组和反应不良组，并收集患者治疗前临床及 CT

资料。利用 A.K.软件提取 CT 影像组学特征并构建影像组学标签。再通过多变量 Logistic 回归筛选疗效预测因子并构建诺莫图模型。采用 ROC 曲线评价预测模型的诊断效能，并对联合预测模型进行外部验证及校准。最后，采用决策曲线评价预测模型的临床价值。**【结果】**每位患者各提取了 396 个 CT 影像组学特征，降维后筛选出三类（6 个）与局部进展期直肠癌新辅助治疗疗效高度相关的特征。联合独立预测因子影像组学标签、升高的 CEA（≥3.4ng/mL）和临床 T 分期（cT4）构建的诺莫图模型 ROC 曲线下面积（0.881）高于影像组学标签（0.791）（P<0.05），且具有较高的校准度（P>0.05），外部验证一致性也较高（P<0.05）。决策曲线证明两个预测模型均具有临床应用价值。**【结论】**基于治疗前 CT 资料构建的无创、个体化预测局部进展期直肠癌新辅助治疗疗效的影像组学标签、诺莫图模型均具有较高的预测效能，且联合预测模型预测效能优于影像组学标签。

PU-3407
管电压对增强 CT 影像组学特征影响的体模研究

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【摘要】 目的：探讨管电压对不同浓度对比剂增强 CT 影像组学特征的影响。方法：用蒸馏水与碘帕醇注射液溶液配比成不同浓度溶液模拟不同强化程度增强图像，蒸馏水与碘帕醇注射液比例分别为(0:1)、(3:1)、(5:1)、(7:1)、(9:1)、(10:1)、(30:1)、(50:1)、(70:1)、(90:1)、(100:1)、(300:1)、(500:1)、(700:1)、(900:1)、(1000:1)和(1:0)共 17 种浓度溶液，浓度越低代表强化越弱。将溶液装入自制体模中，应用西门子 64 排 Siemens definition AS^{+} CT 对体模进行头部序列扫描，使用 Caredose4D，层厚 5mm，软组织重建算法，千伏分别为 70kV、80kV、100kV、120kV、140kV，FOV 为 300*300 mm。在基于 ITK4.3.2/VTK5.10.1/Qt2013.12.00 的 GE AK 影像组学平台上进行目标勾画，然后提取灰度直方图特征(Histogram)42 个、灰度区域矩阵特征(Gray Level Size Zone Matrix, GLSZM)11 个、Haralick 特征(Haralick)10 个、灰度运程矩阵特征(Gray Level Run Length Matrix, RLM)共 180 个，采用变异系数（Coefficient of Variation，CV）评价特征的稳定性。**结果：**浓度(7:1)- (1:0)稳定的特征个数分别为 151、147、135、95、97、49、45、42、33、34、33、33、33、32 个，在一定强化范围内，稳定的特征个数随着强化程度的升高而增加，但部分浓度溶液某些特征的稳定性基本不受管电压影响。**结论：**本研究表明管电压对增强 CT 图像的影像组学特征影响很大，强化程度的变化会导致部分特征对管电压的敏感性改变，高强化程度的增强 CT 图像能提供更多的稳定特征。

PU-3408
基于人工智能的冠脉 CTA 智能辅助诊断系统在冠心病诊断中的应用

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目的：探讨基于人工智能的冠脉 CTA 智能辅助诊断系统在冠心病诊断中的应用价值。
材料与方法：前瞻性纳入本院 2019 年 1 月至 3 月期间临床疑诊的冠心病患者 60 例，对所有患者常规进行 320 排冠脉 CTA 检查。将扫描获得的原始图像传输至 Vitrea 6.6 后处理工作站，由两名高年资影像科医师手动进行冠状动脉图像三维重建后处理，并判断右冠状动脉、左前降支和回旋支有无斑块及位置、斑块性质、冠脉有无狭窄及狭窄严重程度分级，完成报告书写。同时由冠脉 CTA 智能辅助诊断系统自动重建出三维图像、自动完成图像的分析并生成诊断报告。评价高年资影像科医

师和人工智能系统诊断冠心病的阳性预测价值、阴性预测价值、敏感度和特异度，并记录图像重建和患者等待报告的时间。
结果：人工智能冠脉ＣＴＡ诊断系统能清晰显示所有患者的冠脉主干及主要分支血管，高年资医师平均图像重建时间约 6.2 分钟，人工智能所需时间平均约 0.8 分钟。与高年资医师相比，人工智能诊断冠心病的阳性预测值为 90%，阴性预测值为 75%，敏感度为 90%，特异度为 75%。人工智能对冠脉病变定位识别的敏感度和特异度分别为 89.4%、92.5%。人工智能对斑块性质判断的敏感度和特异度分别为 86.5%、89.6%。在冠脉管腔狭窄程度的诊断中，人工智能和高年资医生对冠脉狭窄的总检出率分别为 40.6%、42.3%，两者间无统计学差异（P>0.05），人工智能对冠脉病变管腔狭窄程度识别的敏感度和特异度分别为 84.7%、88.3%。另外，人工智能冠脉ＣＴＡ诊断系统使得患者等待报告的时间大大缩短（4.8 分钟 VS 27.4 分钟）。
结论：人工智能冠脉ＣＴＡ诊断系统在诊断有无斑块及位置、斑块性质、冠脉有无狭窄及狭窄严重程度分级方面与高年资影像科医师间相比并无统计学差异，但却极大的缩短了图像重建时间和患者等待报告的时间，明显提高了影像科医师的工作效率，具有良好的临床应用价值。

PU-3409
胃癌在影像组学与组织病理学特征中的对照性研究

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目的：本文探讨胃腺癌患者动脉期及门脉期六种机器学习模型在术后病理免疫组化与术前胃癌纹理特征中对照研究诊断方面的价值。
材料与方法：回顾性收集我院胃腺癌患者 254 例。导出患者动脉、门脉期图像。两名放射科医生根据组织病理学结果确定肿瘤边界，在 ITK-snap 软件上结合术后病变位置，手动逐层绘制形成三维 ROI，基于 AK 软件，提取 396 个纹理参数。将 254 例患者按 7：3 随机分成训练集和验证集。去除冗余特征，分别提取血管受侵与否动脉、门脉期 18、17 个特征值；淋巴管受侵与否动脉、门脉期 18、15 个特征值；神经受侵与否未提取出可鉴别的特征值；HER2 阳性、阴性动脉及门脉期 1、9 个特征值。提取的特征分别基于支持向量机（1.C_SVC&LINEAR 2.C_SVC&RBF 3.C_SVC&sigmoid），逻辑回归(Logistic Regression)、K 邻近（K Nearest Neighbor, K-NN）、朴素贝叶斯（Naive Bayesian, NB）六种机器学习模型进行训练，得到最优机器学习模型。同时得到准确度、敏感性、特异性、ROC 曲线、ROC 曲线下面积（AUC）。
结果：六种机器学习中血管组最优模型是 Logistic Regression，AUC 值动脉期为 0.707，门脉期为 0.724，门脉期高于动脉期，分类效果好 ；淋巴组最优模型是 C_SVC&LINEAR，动脉期 AUC 值为 0.737，门脉期为 0.700，分类效果好 ；神经组未能提取有意义的鉴别特征；HER2 组动脉期只有一个特征可做鉴别，故没有较好的机器模型，门脉期最优模型是 Logistic Regression，AUC 值为 0.720，分类较好。
结论：基于对比增强 CT 图像纹理特征建立机器学习模型，在鉴别胃腺癌各个组织病理类型及 HER2 表达中有较好的分类效果，这有望为术前优化胃癌患者治疗方案及评价预后提供重大参考价值。

PU-3410

Application reseach of computer-aided detection and diagnosis based on CT in pneumonia

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Purpose: Pneumonia is a common disease. In the diagnosis of pneumonia, imaging examination should not only find the lesion, but also distinguish it from other diseases. By developing an assisted diagnosis system for pneumonia based on artificial intelligence technology, we established a work mechanism. Using information technology such as artificial intelligence auxiliary ascension pneumonia disease diagnosis level, lay a foundation for grading diagnosis and treatment system, improve grassroots medical institutions in patients with respiratory medical experience, for the majority of patients with convenient, quality health care services.

Methods and Materials: 242 patients with pulmonary infection treated and 124 healthy in the Beijing Hospital from Oct.2018 to Feb.2019 were enrolled in the study. There were 149 males and 93 females, with an average age of 65.539.80 years(28 to 95 years). CT images (pneumonia: 242, healthy: 124) of volunteers with manually marked lesion locations as gold standard (508 pneumonia lesions, ground-glass opacity: 294, consolidation: 74, Patch: 226). Size distribution of lesions: 0-49(mm):130, 50-99:146, 100-149:96, 150-199:75, 200-249:29, 250-299:19, 300-349:10, 350-400:3. The slice thickness of CT images was interpolated to 1 mm to reduce variance. The algorithm adopted multi-scale feature pyramid structure with 3D convolution neural network to overcome the scale variance in pneumonia lesion. Meanwhile, a multi-scale image pyramid strategy was adopted to save computation resources. A multi-stage cascade detection method was introduced to further elevate the performance and generate region of interest (ROI).

Result: the proposed algorithm performed well in pneumonia detection with great efficient (1 second per patient). One third of the CT images were chosen for test the algorithm, which consists of 170 pneumonia lesions. The algorithm detected 139 pneumonia out of 170, with detection rate 81.7 and 9.2 false positive per patient.

Conclusion: This system adopts intelligent technologies such as computer neural network, machine learning and pattern recognition to design and develop an intelligent auxiliary diagnosis system for pneumonia.The proposed method detected most of the pneumonia cases with high efficient. It provides scientific reference for doctors' clinical medical decisions and assists doctors to make the best diagnosis. However, the great variety in texture and the blur boundary of lesion caused the algorithm to generate some false positive samples.

CLINICAL RELEVANCE/APPLICATION:Pneumonia is by far one of the most common lung diseases around the world with certain fatality rate . It is necessary to use artificial intelligence auxiliary technology ascension pneumonia disease diagnosis level, provides scientific reference for doctors' clinical medical decisions and assists doctors to make the best diagnosis. It improve grassroots medical

institutions in patients with respiratory medical experience, for the majority of patients with convenient, quality health care services.

PU-3411

On the intrinsic amplitudes basis of individual differences in sleep-deprived human brain

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Objective: Individual vulnerability to sleep deprivation (SD) appear to be stable within individual but vary across individuals. Such reliability and variability may be deeply rooted in each individual brain's intrinsic activity. Here, we used repeated measures resting-state fMRI to explore the intra-subject reliability and inter-subject variability in both static and dynamic amplitudes of low-frequency fluctuations (ALFF) in the SD.
Methods: Sixteen healthy participants were assessed three times to measure the reproducibility of their performance on a semantic working memory task and of their resting fMRI activity: once after a normal night of sleep in the rested wakefulness (RW) condition and the other two after approximately 24 hours of total SD at an interval of two weeks (named SD 1 and SD 2 conditions).
Results: Behavioral performances were reliable between the two SD time points. The changes in the intrinsic brain activity from RW to SD also remained generally stable and have a specific topographic distribution, with the heteromodal association cortex and the limbic/paralimbic cortices showing relatively higher variability and the unimodal and primary regions showing the least variability.
Conclusions: Our results suggested that the within-subject' s reliability in response to sleep loss is rooted the primary cortices especially the sensory and unimodal association cortices, the inter-subject variability in the heteromodal and transmodal regions, and the variability may be partially interpreted by temporal variations and propagations of intrinsic fMRI signals.

PU-3412

Differentiation between Pilocytic astrocytoma and Oligodendrogliomas: a contrast-enhanced MRI-derived quantitative radiomic features

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Purpose: To assess whether a machine-learning model based on texture analysis could yield a more accurate diagnosis in differentiating Pilocytic astrocytoma from Oligodendrogliomas.
Materials and Methods: The study population consisted of 200 patients enrolled between October 2014 and January 2019 from our institution. All patients diagnoses were confirmed by pathological examination. Preoperative enhanced MRI images were collected. 395 features in total were known to be effective. Four Grandient Boosted Trees classifiers were built, one based on clinical features and three based on texture features from MRI sequences after feature selection. Predictive accuracy, sensitivity and specificity were used to assess model performance.
Results: There were significant differences in age and gender distribution between the two diseases. Compared with OG, PA has a predilection for younger male patients. The AUC of the enhanced T1WI-based classifier was 0.92, significantly higher than that of T1-based, T2-based or T2-FLAIR-based classifiers (0.9,0.78 and 0.86).The AUC of the Grandient Boosted Trees classifier based on clinical and radiomic features was 0.99.
Conclusion: Our study showed the potential use of radiomics features in differentiating PA from OG. This model provides an additional tool for improving diagnostic accuracy to differentiate PA from GBM, and it may be especially helpful for those cases that are difficult to distinguish by conventional interpretation approaches.

PU-3413

Respiratory motion correction for liver contrast-enhanced ultrasound by automatic selection of a reference image

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Purpose: Respiratory motion correction is necessary for the quantitative analysis of liver contrast-enhanced ultrasound (CEUS) image sequences. Most respiratory motion correction methods are based on the dual mode of CEUS image sequences, including contrast and grayscale image sequences. Due to free-breathing motion, the acquired 2-dimensional (2D) ultrasound cine might show the in-plane and out-of-plane motion of tumors. The registration of an entire 2D ultrasound contrast image sequence based on out-of-plane images is ineffective. For the respiratory motion correction of CEUS sequences, the reference image is usually considered the standard for the deletion of any out-of-plane images. Most methods used for the selection of the reference image are subjective in nature. Here, a quantitative method for the selection of an optimal reference image from CEUS image sequences in the B and contrast modes was explored.

Methods: The original high-dimensional ultrasound grayscale image data were mapped into a two-dimensional space using Laplacian Eigenmaps (LE), and K-means clustering was adopted. The center image of the larger cluster with a near-peak contrast intensity was considered the optimal ultrasound reference image. In the ultrasound grayscale image sequence, the images with the maximum correlations to the reference image in the same time interval were selected as the corrected image sequence. The effectiveness of this proposed method was then validated on 18 CEUS cases of VX2 tumors in rabbit livers.
Results: Correction smoothed the time-intensity curves (TICs) extracted from the region of interest of the CEUS image sequences. Before correction, the average of the total mean structural similarity (TMSSIM) and the average of the mean correlation coefficient (MCC) from the image sequences were 0.45±0.11 and 0.67±0.16, respectively, and after correction, the average TMSSIM and MCC increased (P<0.001) by 31% to 0.59±0.11 and by 21% to 0.81±0.11, respectively. The average deviation value (DV) index of the TICs from the image sequences prior to correction was 92.16±18.12, and correction reduced the average to 31.71±7.31. The average TMSSIM and MCC values after correction using the mean frame of the reference image (MBMFRI) were clearly lower than those after correction using the proposed method (P<0.001). Moreover, the average DV after correction using the MBMFRI was obviously higher than that after correction using the proposed method (P<0.001).
Conclusions: The breathing frequency of rabbits is notably faster than that of human beings, but the proposed correction method could reduce the effect of the respiratory motion in the CEUS image sequences. The reference image was selected quantitatively, which could improve the accuracy of the quantitative analysis of rabbit liver CEUS sequences using the reference image method based on the current standard of manual selection and the MBMFRI. This easy-to-operate method can potentially be used in both animal studies and clinical applications.

PU-3414

The value of CT Imaging radiomics features in the diagnosis of pure ground glass nodules

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Objective: To study the qualitative diagnosis value of radiomics features in pure ground-glass nodules of the lung in chest non-enhanced CT. Methods: A retrospective analysis of 171 pure ground-glass nodules with 5-20mm in diameter showed in non-enhanced CT image and confirmed by surgical pathology from July 2014 to March 2019, including 22 benign nodules, 28 pre-invasive lesions (including 15 atypical adenomatous hyperplasia and 13 adenocarcinoma in situ), and 121 invasive lesions (including 66 minimally invasive adenocarcinoma and 55 invasive adenocarcinoma). All patients were examined with dual-source CT or Philips Brilliance ICT for chest non-enhanced CT scan. It’s a redundant work to review all the 1752 features, selecting the statistically different features can be a great help to define which class the nodule is. We applied data mining methods to clean our data first, including replaced

missing values with the average values of the corresponded features and normalizing the data by removing the mean value of each feature, then scale it by dividing non-constant features by their standard deviation. Then we applied L1-based SVM and Extra-Tree Classifier models, which are the powerful algorithm for feature selection, to perform important features. At last, T-test was applied to select statistically significant features with significant level 0.05. Results: For benign and 'AAH&AIS&MIA&IAC', there are six significant radiomics features also displayed significant difference for group benign and "AAH&AIS", for benign and "MIA&IAC", the six significant radiomics features also display significant difference(all $P<$ 0.05), including original_Shape_Maximum3D Diameter and wavelet_HHH_FirstOrder_Kurtosis. There are two significant different radiomics features between "AAH&AIS" and "MIA&IAC"($P<0.05$). Conclusions: Radiomics features showed potential value in the differentiation between benign and malignant pure ground-glass nodules. The presence of the two significant radiomics features in pure ground-glass nodules indicates the high risk of invasive adenocarcinoma.

PU-3415

Development and Validation of a Radiomics Nomogram Based on 18-Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography and Clinicopathological Predictors to Predict the Survival of Patients with Non-small Cell Lung Cancer

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Abstract

Purpose

The purpose of this study was to develop and validate a radiomics nomogram by combining the optimized radiomic signatures extracted from computed tomography (CT), positron emission tomography (PET) and positron emission tomography/computed tomography (PET/CT) images and clinicopathological predictors to assess the overall survival of patients with non-small cell lung cancer (NSCLC).

Patients and methods

The training cohort of 252 and validation cohort of 63 consecutive NSCLC patients were enrolled in this study. 1680 radiomic features were extracted from CT, PET and PET/CT images using a Radiomics prototype. Least absolute shrinkage and selection operator (LASSO) cox regression was used to select radiomic features and construct radiomic score (R-score). R-score and clinicopathological predictors were combined to construct the Cox proportional hazard (CPH) for CT, PET, PET/CT respectively. The independent risk factors analysis and Kaplan-Meier were performed for PET/CT modality. R-score and clinicopathological predictors were combined to construct a

multimodality nomogram for PET/CT modality and was cross-validated. Finally, validation and calibration curves were generated and evaluated.

Results
144 /315(45.71%) females and 171/315 (54.29%) males of patients with NSCLC were enrolled in this study. The C-index of CPH of R-score in the prediction of overall survival (OS) for CT, PET and PET/CT were 0.658,0.611,0.661and combined with clinicopathological predictors were 0.749,,0.718,0.756 respectively.[Lymph node metastasis(Hazard ratio[HR],2.08),Distant Metastasis (HR,2.51)] were independent risk factors for NSCLC patients.It can well distinguish between high and low risk groups. The validation curve showed agreement between predicted and actual values for the 5-year survival prediction. The calibration curve showed predicted survival time was very close to the actual one.

Conclusion
Development and validation of a radiomics nomogram based on 18-Fluorodeoxyglucose positron emission tomography/computed tomography and clinicopathological predictors had a good predictive performance to the survival for NSCLC patients. Our study may provide a little guidance for the improvement of prognosis evaluation and treatment strategies for NSCLC patients and advances in precision medicine.

PU-3416

Machine Learning-Based Radiomics Analysis for Differentiation Degree and Lymphatic Node Metastasis of Extrahepatic Cholangiocarcinoma

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Objective To develop a radiomics model based on magnetic resonance imaging (MRI) features analysis and machine learning classifiers to preoperatively predict Differentiation Degree (DD) and Lymphatic Node Metastasis (LNM) of Extrahepatic Cholangiocarcinoma (ECC).
Methods A group of 100 ECC patients treated from January 2011 to December 2018 were included in this study, diagnosed with perihilar cholangiocarcinoma or distal cholangiocarcinoma. The ECC status of all patients were confirmed by pathology (high DD (n = 36), medium-low DD (n = 64); LNM positive (n = 27), LNM negative (n = 73)).

All patients took MRI scanning. A total of 1,200 radiomics features were extracted from four sequences including T1-precontrast, T2-weighted imaging (T1WI, T2WI), diffusion weighted imaging (DWI), and apparent diffusion coefficient (ADC) images. A systematical framework considering combinations of eight feature selection methods and ten machine learning classification algorithms (classifiers) was developed and investigated. The predictive capabilities for DD and LNM were evaluated in terms of area under curves (AUC), accuracy (ACC), sensitivity, and specificity.
Results In the DD prediction, the combination of the feature selection method Pearson's Correlation Coefficient (PCC) and Decision Tree Classifier (DTC) achieved the best performance (AUC = 0.76, ACC = 0.78, sensitivity = 0.78, and specificity = 0.78), and the radiomics signature was composed of 15 selected features. For LNM prediction, the combination of the feature selection method Joint Mutual Information (JMI) and AdaBoosting Classifier (ADAC) achieved the best performance (AUC = 0.85, ACC = 0.87, sensitivity = 0.70, and specificity = 0.93), and the radiomics signature was composed of 5 selected features.
Conclusions
MRI radiomics analysis based on certain combinations of feature selection methods and machine learning classifiers could demonstrate good predictive accuracies for DD and LNM of ECC. This also shed new light on noninvasive diagnosis of ECC.

PU-3417

Cholangiocarcinoma's evaluation of imaging and artificial intelligence

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Cholangiocarcinoma(CCA) is a relatively rare biliary system malignant tumour, and yet, it represents the second most common primary hepatic neoplasm, following hepatocellular carcinoma. Regardless of the type, location or aetiology, the survival prognosis of these tumour remains poor. The only curable method for CCA is complete surgical resection, but part of patients with complete resection are still subject to local recurrence or distant metastasis. Over the last several decades, our understanding of the molecular biology of CCA has increased tremendously, diagnostic and evaluative techniques have evolved, and novel therapeutic approaches have been established. This review provides an overview of preoperative imaging evaluations of CCA. Furthermore, relevant information about artificial intelligence(AI) in medical imaging is discussed, as well as the development of AI on CCA treatment.

PU-3418

Prediction of Prostate Cancer Invasiveness with a Combination of Radiomics and Machine Learning-Based Analysis of Dynamic Contrast-Enhanced MRI

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Objective: *To investigate whether the combination of radiomics and automatic machine learning-based classification of original images from multiphase DCE-MRI can predict prostate cancer (PCa) aggressiveness.*
Methods: *From January 2016 to May 2019, sixty biopsy-confirmed PCa patients were included. Biopsy was performed within 4 weeks after the DCE-MRI examinations. According to the time signal intensity curve, lesion segmentation was performed on the first and on the strongest phase of tumor enhancement on the original DCE-MR images, and 1000 quantitative radiomics features were automatically calculated from each lesion. These features can be grouped into four categories, first order statistics features, shape- and size-based features, textural features and higher order statistics features, wherein there were three datasets available (Dataset-F, Dataset-S and Dataset-FS). The variance threshold method, select k-best method and Least absolute shrinkage and selection operator (LASSO) algorithm were used to reduce the feature dimensions and the optimal feature subsets for each dataset were filtered out. Five machine learning approaches leveraging cross-validation were employed, and the clinical value of each model was evaluated by area under the curve (AUC). Correlation analysis was performed between the features of the machine learning model that achieved the best classification performance and the Gleason score (GS) of the PCa lesion.*
Results: *8, 4 and 16 features were selected as optimal subsets in Dataset-F, -S and -FS, respectively. Among all three datasets, LR-based analysis with Dataset-FS had the highest predication efficacy (AUC = 0.93). Ten features in Dataset-FS showed significantly positively correlation with GS. The model performance of Dataset-F was generally better than that in Dataset-S.*
Conclusion: *Combination of radiomics and machine learning-analysis based analysis of the union of the first and strongest phases of tumor of original DCE-MR images can predict PCa aggressiveness noninvasively, accurately and automatically.*

PU-3419

Investigating the effects of subjective factors on quantitative CT perfusion parameters towards more robust, reliable and reproducible imaging biomarkers in patients with acute ischemic stroke

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Purpose: To investigate the reproducibility of quantitative CT perfusion (CTP) parameters generated from different postprocessing methods. To assess the relative contributions of subjective factors to overall robustness of the biomarkers in acute ischemic stroke (AIS).

Materials and Methods: Eighty CTP datasets from patients with unilateral MCA occlusion or transient ischemic attack were retrospectively postprocessed, which was implemented on ISP and CK software by different observers using different Arterial Input Function (AIF) fitting methods with different segmentation margins. CTP parameters derived from 10 Parenchymal regions of interests were compared. Student t test and ROC curve was used to identify valuable biomarkers in differentiating AIS. Intraclass correlation coefficients (ICCs) were used to assess the reproducibility between different methods and Spearman correlation test was used to detect the potential relationships.
Results: MTT derived from single-input model located in the putamen (ROI 5) showed good diagnostic performance with AUC 0.811, significantly higher than using dual-input model. Inter-observer and inter-segmentation margins agreements were both good with 80% ICCs >0.80. Inter-software and inter-AIF fitting methods agreements were bad with 80% ICCs <0.62 and <0.56, respectively.
Conclusions:
CTP parameters were stable when measured by different readers with different segmentation margins but varied between different AIF fitting models and different softwares. To evaluate ischemic stroke based on different clinical goals, different input models need to be selected while ensuring consistent of software.

PU-3420
Machine learning-based radiomics strategy for prediction of cell proliferation in non-small cell lung cancer

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Purpose: To explore the feasibility and performance of machine learning-based radiomics classifier to predict the cell proliferation(Ki-67)in non-small cell lung cancer (NSCLC).
Methods: 245 histopathological confirmed NSCLC patients who underwent CT scans were retrospectively in-cluded. The Ki-67 proliferation index (Ki-67 PI) were measured within 2 weeks after CT scans. A lesion volume of interest (VOI) was manually delineated and radiomics features were extracted by MaZda software from CT images. A random forest feature selection algorithm (RFFS) was used to reduce features. Six kinds of machine learning methods were used to establish radiomics classifiers, subjective imaging feature classifiers and com-

bined classifiers, respectively. The performance of these classifiers was evaluated by the receiver operating
characteristic curve (ROC) and compared with Delong test.
Results: 103 radiomics features were extracted and 20 optimal features were selected using RFFS. Among the
radiomics classifiers established by six machine learning methods, random forest-based radiomics classifier
achieved the best performance (AUC= 0.776) in predicting the Ki-67 expression level with sensitivity and
specificity of 0.726 and 0.661, which was better than that of subjective imaging classifiers (AUC= 0.625,
P < 0.05). However, the combined classifiers did not improve the predictive performance (AUC= 0.780,
P > 0.05), with sensitivity and specificity of 0.752 and 0.633.
Conclusions: The machine learning-based CT radiomics classifier in NSCLC can facilitate the prediction of the
expression level of Ki-67 and provide a novel non-invasive strategy for assessing the cell proliferation.

PU-3421

Malignant Signs Identification for Pulmonary Nodules on Chest CT by Using Graph Convolutional Network

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Purpose:
To present a graph convolutional network model for automatic and accurate malignant signs identification for pulmonary nodules.
Materials and methods:
The train dataset contains 1154 nodules from 1054 patients, 72.10% of which are malignant tumors. And each of them was annotated by three senior doctors in terms of lung cancer signs. The signs with at least two doctors annotated are selected for training. In this paper, a graph convolutional neural network is designed with a 3D DenseNet backbone and a multi-task multi-class classification loss, aiming to identify the existence of each sign. Moreover, we take the correlation and dependence among these signs into account, by constructing an adjacency matrix and feeding it into the network, leading to a comparable performance of the proposed method compared with professional doctors. Five common malignant signs of lung nodules are selected, including speculation, vascular embedding, pleural traction, vascular notch and air bronchogram.
Results:

The present method was evaluated on a test dataset, with a total of 144 nodules from 139 patients, 75% of which are malignant tumors. Considering each nodule as an individual sample and all signs of each nodule as a feature, therefore a matrix with 144 rows and 5 columns can be naturally computed. In order to assess the consistency among doctors and our method, Pearson correlation coefficient (PCC) is calculated for each two matrices. Experimental results show that the PCCs between each two doctors are 0.3516, 0.3858 and 0.3730 respectively, while the PCCs between the proposed method and three doctors are 0.4168, 0.3594 and 0.4185. To further verify the results, ground truth is generated by each one of the doctors' annotation and accuracy can be calculated for another two doctors and our method, the result presents that our method has high similarity with doctors (Table1).

Conclusion:

We present a graph convolutional neural network and demonstrate the effectiveness of the proposed method with respect to identify lung malignant signs, and the performance of the proposed method is comparable with senior doctors.

PU-3422

Nuclear grading of renal cell carcinoma using a radiomics approac

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purpose: *Nuclear grade of clear cell renal cell carcinoma* (ccRCC) usually is confirmed by invasive methods. Radiomics is a noninvasive examination and can make full use of the texture feature of the image to speculate whether the heterogeneity of ccRCC could make an independent prediction of tumor nuclear grade. A radiomics approach was used to analyze the association between nuclear grades of ccRCC and CT images.

Methods: *This was a retrospective analysis of 247 patients with clear cell renal cell carcinoma who were diagnosed between 2008 and 2016. A feature set containing clinical and radiomics features was extracted from the pre-therapy non-enhanced, corticomedullary and nephrographic phase CT imaging. Maximizing independent classification information criteria function (MICI) and recursive feature elimination with cross-validated (RFECV) were used to select effective features. Random forests were used to classify clear cell renal cell carcinoma grades.*

Results: *This experiment was based on a training set of 124 patients and a validation set of 123 patients. We found that radiomics features can effectively distinguish four nuclear grades with AUC = 0.71, 0.73, 0.81, and 0.80, respectively. Radiomics features complemented the predictive values of clinical features obtaining a more stable result (AUC = 0.77, 0.75, 0.79, and 0.85, respectively).*

Conclusion: Using radiomics methods, CT images can reflect the differences in the grades of clear cell renal cell carcinoma. Radiomics methods can effectively assist physicians in preoperative classification of renal cancer.

PU-3423

Differential diagnosis of chromophobe renal cell carcinoma and renal oncocytoma based on clinical and radiomic features

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Purpose To evaluate the differential diagnostic efficiency of radiomics models based on the clinical and radiomic features of ChRCC and RO.
Materials and Methods The preoperative images and clinical data of 35 and 17 patients with ChRCC and ROrespectively from March 2015 to November 2018,were retrospectively collected, and features that were significant differently different between the patients with the two conditions were identified. The differential diagnostic efficiencies of the imaging features were compared. We randomly selected 70% of the ChRCC and RO patients to train the radiomics model and and 30% to the test it; significant radiomic features were extracted, selected, and classified. The differential diagnostic efficiencies of the radiomic features were assessed. Finally, the radiomic features were combined with imaging features to establish a combined model, and the differential diagnosis efficiency of the combined model was assessed. The area under the receiver operating curve (AUC) was used to evaluate the differential diagnosis efficiency of the image features, the radiomics model, and the combined model.
Results The authors analyzed52patients (median age, 51.8 ± 13.9 years; 30 men). Among the imaging signs, the location of the lesion's center and the degree of enhancement in the corticomedullary phase (CMP) performed well in differentiating the lesions types (AUC = 0.638 and 0.753, respectively). While the radiomics model showed efficiency in differentiating ChRCC from RO (AUC = 0.77), the combined model was superior (AUC = 0.92).
Conclusion
Radiomics can help to improve the differential diagnosis of ChRCC and RO. When combined with imaging feature, the radiomics model becomes more efficient.

PU-3424

Study on the optimized scanning project of 320CT pulmonary ground glass nodules which based on artificial intelligence diagnosis

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[Abstract] **Objective** To investigate the effect of low dose and conventional dose CT on the detection efficiency of pulmonary ground glass nodules in artificial intelligence system. **Methods** A total of 40 patients who have tested pulmonary glass-like nodules with the size of 3-10mm from June 2018 to June 2019 in the second affiliated hospital of chongqing medical university were collected, including 28 males and 12 females, aged 45-69 years, with an average age of 54.3 years and the BMI from 18.5 to 23.9. All subjects underwent high-resolution target scanning of pulmonary nodules in the same area of the lung with different CT radiation doses in Toshiba 320-slice CT Aquilion ONE and they were divided into 5 groups. Group A was the conventional dose group, while group B, C, D and E were the low-dose groups, and the milliamps of examination reduce in order. Scan conditions for groups are that group A (120 kv, 180 ma), group B (120 kv, 140 ma), group C (120 kv, 100 ma), group D (120 kv, 60 ma), group E (120 kv, 20 ma), matrix 1024 * 1024, 18 cm, vision collimating pitch is 1.25, the remaining parameters are the same. All of the scanning imagines are imported into the deep farce medical artificial intelligence software based on deep learning model (Deepwise healthcare, V190120) for testing. **Results** The detection efficiency of ground glass nodules in AI in the conventional dose group and the low dose group was 94.1% vs 94.7%, $P > 0.05$); Groups A and C (94.1% vs 91.4%, $P > 0.05$); Groups A and D (94.1% vs 63.2%, $P < 0.001$); Groups A and E (94.1% vs 21.1%, $P < 0.001$). **Conclusion** While ensuring the diagnostic efficiency of AI, reducing the tube current can greatly reduce the radiation dose. However, we should avoid that increasing the noise index due to the pursuit of low dose, resulting in limited or even lost image details. Too low mAs will reduce the sensitivity of artificial intelligence to the detection of nodules.

PU-3425

Texture Analysis on T1WI to Differentiate Low- and High-Stage Clear Cell Renal Cell Carcinoma: Can the two-dimensional be an alternative to three-dimensional tumor analysis

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Background: Texture analysis is becoming more popular in tumor diagnosis, but the selection of regions of interest is controversial. Purpose: To determine if there is a difference between two-dimensional (2D) and three-dimensional (3D) texture analysis in distinguishing low- from high-grade clear cell renal cell carcinomas (CCRCCs) Material and Methods: 96 patients with CCRCCs proved by pathology were included. All tumors were staged into low- and high-grade CCRCCs according to the Fuhrman criteria. Axial T1WI images were contoured manually by 2 independent readers. Texture parameters included the volume, area, kurtosis, skewness, entropy, sum entropy, grey-level

nonuniformity, and run-length nonuniformity, and so on. Parameters were compared using Mann-Whitney U tests. Differences in the area under the receiver operating characteristic curve (AUC) between the two methods were evaluated. Results: The high-grade CCRCCs had statistically significant higher entropy, sum entropy, grey-level nonuniformity and run-length nonuniformity than the low-grade CCRCCs ($P < 0.0001$). The low-grade CCRCCs had statistically significant higher difference entropy and angular second moment ($P < 0.0001$). However, there was no difference between the 3D and 2D texture parameters including the entropy, sum entropy, difference entropy, angular second moment grey-level nonuniformity and run-length nonuniformity ($P > 0.05$). Inter-reader concordance correlation coefficients ranged from 0.89 to 0.99. Conclusion: No difference was found between 2D and 3D texture analysis in differentiating low grade from high grade CCRCCs.

PU-3426

Automated detection and classification of the neck of femur fractures by using deep learning algorithm

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Objective To identify the feasibility of using a deep convolutional neural network (DCNN) for the detection and localization of the neck of femur fractures on plain frontal pelvic radiographs (PXRs).
Methods DCNNs (ResNet) was trained using 640 PXRs between January 2016 and May 2019. The accuracy, sensitivity, false-negative rate, and area under the receiver operating characteristic curve (AUC) were evaluated on 160 independent PXRs acquired in the same institution, then those were evaluated on 200 independent PXRs acquired in another institution. The authors also used the visualization algorithm gradient-weighted class activation mapping (Grad-CAM) to confirm the validity of the model.
Results The algorithm achieved an accuracy of 89%, a sensitivity of 94%, a false-negative rate of 2%, and an AUC of 0.89 for identifying the neck of femur fractures. In the external validation, The algorithm achieved an accuracy of 79%, a sensitivity of 90%, a false-negative rate of 4%, and an AUC of 0.80 for identifying hip fractures. The visualization algorithm showed an accuracy of 95.3% for lesion identification.
Conclusions A DCNN not only detected the neck of femur fractures on PXRs with a low false-negative rate but also had high accuracy for localizing fracture lesions. The DCNN also have a good performance in external validation .The DCNN might be an steady , efficient and economical model to help clinicians make a diagnosis without interrupting the current clinical pathway.

PU-3427

Influence of CT effective dose and convolution kernel on detection of pulmonary nodule in different artificial intelligence software: a phantom study

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Background: Lung cancer, the morbidity and mortality of which keep the primary among all cancers. Since 2016, many artificial intelligence (AI) software for diagnosing pulmonary nodule based on deep learning has been available, but the effectiveness and accuracy remain controversial, so this study aims to investigate effects of effective doses and convolution kernel on detection of pulmonary nodule in different AI software, in order to validate the applicability of AI software for clinical imaging diagnosis, and provide the direction for optimization of AI algorithms.
Materials and methods: A commercial chest phantom containing various nodules (3, 5, 8, 10 and 12mm; +100, -630 and -800HU) was scanned with CT at 120kVp, 100kVp and 80kVp with different tube current-time. Each CT was reconstructed with the convolution kernel of B30f, B60f and B80f. Automated detection was performed by two radiologists with four commercial AI pulmonary nodule detection software named A, B, C and D at all CT datasets. Number of the nodules and corresponding volume detected by AI software respectively were acquired. We calculated the sensitivity and false positive rate (FPR) of these softwares. The relative error was calculated for volume. Sensitivity, FPR and relative volume error (RVE) of four AI groups were analyzed by Kruskal-Wallis test. The effects of radiation dose and convolution kernel on sensitivity, FPR and the RVE in different AI software were analyzed with repeated measured ANOVA.
Results: The sensitivity, FPR and RVE of different AI pulmonary nodule detection software were uneven in comparison with the performance in general, and the effects of radiation dose and convolution kernels on various softwares were inconsistent. The sensitivity of System C and the FPR and RVE of System D were not statistically associated with CT effective dose and convolution kernels.
Conclusions: AI softwares has a high detection rate at doses >0.5 mSv in our study. Detection of some AI pulmonary nodule systems may be influenced by radiation does or convolution kernel. Algorithms and computational power need to optimized and there is still a long way to go before AI software is used in clinical practice.

PU-3428

A generative adversarial networks methods normalize the computer tomography images from different imaging protocols

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Purpose: To correct the difference produced by imaging protocols by a generative adversarial networks (GAN) methods.
Material and Methods: In this study, we employed a GAN method to normalize the computer tomography (CT) images from different imaging protocols. The model was trained on the dataset #1, the evaluation of model in aligning the distribution of features was performed on the dataset #2 (tuning) and #3 (validating), and the performance of model in improving the radiomics study was assessed in the dataset #4. We defined the images in a certain imaging protocol as one domain. Four different CT imaging protocols were included in our study. The dataset #1 consisted of four subsets corresponding to four domains, and each subset included ten thousand 2D CT images sampled from sixty CT volumes of patient. The dataset #2 and #3 both included 40 CT images for each domain, and every CT image contained the largest cross section of spleen of patient. The dataset #4 included 98 CT images from three different scanners, and each CT image contained the largest cross section of colorectal tumor of each patient.
Results: After the normalization, the aligned number of features between the domains that needed to be normalized and target domain increase from 10 % (8/77), 18 % (14/77), 36% (28/77) to 90% (69/77), 92% (71/77) and 80% (62/77). The average increment of AUC in the results of cross-validation achieved 11%, the maximum increment was 20%, and the minimum one was 3%.
Conclusion: In this study, we implemented a GAN method to successfully normalize the CT images for different imaging protocols.

PU-3429

Radiomics analysis of multi-subregions for detection of biomarkers in Parkinson’s disease motor subtypes

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OBJECTIVE: The purpose of this study was to to detect sensitive morphometric biomarkers from
T1 high-resolution structural magnetic resonance (MR) images in Parkinson’s disease (PD) motor subtypes using machine learning method.
MATERIALS AND METHODS: 135 PD patients and 99 normal controls (NCs). from the Parkinson’s Progressive Marker Initiative (PPMI) database were enrolled in the study, including 92 tremor dominant (TD)subtype, 43 postural instability gait dominant (PIGD) subtype. Datasets were randomly divived intointo two sets including a training set (~70%) and a validation set(~30%). A total of 5358 imaging features were extracted from different 18 subregions, Select K Best and the least absolute shrinkage and selection operator (Lasso) was used to select the optimal features.The support vector machine (SVM) classifiers were constructed. Receiver operating curve (ROC), sensitivity and specificity were used to illustrate the prediction performance of the model. Both feature selction and models construction were firtstly performed in the training set, then were further tested in the validation set by the same thresholds.

RESULTS: Eight optimal features were obtained from 92 TD patients and 43 PIGD patients. The support vector machine (SVM) model demonstrated that radiomic features allowed us to distinguish PIGD from TD with an accuracy of 86.75% (specificity = 88.89% ,sensitivity = 84.21%).The most sensitive biomarkers between PIGD patients and TD patients are mainly ROI-based features in hippocampal, striatum, thalamus and caudate region.

PU-3430

Measure Cerebral Microstructure Alterations in SVD and BVD Using Diffusion Kurtosis Imaging and Investigate the Correlation with Cognitive Impairment

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Purpose

To observe alterations of cerebral microstructure in brain small vessel disease (SVD) and big vessel disease (BVD) using magnetic resonance imaging (MRI) diffusion kurtosis imaging (DKI), to provide pathogenesis information of these diseases from the perspective of radiography, and to investigate the correlation between these diseases and cognitive impairment.

Material and Methods

Forty-four patients (33 males and 11 females) diagnosed with brain SVD were recruited as the SVD patient group, twenty-four patients (19 males and 5 females) diagnosed with brain BVD were recruited as the BVD patient group, and 16 age- and education-level matched healthy volunteers (12 males and, 4 females) were recruited as the normalcontrol group(NC). Routine MR scan were performed on a whole body 3T scanner (Ingenia, Philips Healthcare) with a 16-channel dS head coil. Kurtosis images were acquired with the following parameters: TE = 91 ms, TR = 1000 ms, number of slices = 18, maximum b value = 2000 andnumber of directions =32. DKE (Version 2.5.1) was employed to generate kurtosis related parameters (Figure 1). The mean kurtosis (MK), the fractional anisotropy (FA), and the mean diffusion coeficient (MD) of cerebral white matter were compared with T test between each patient group and the control group in basal ganglia, thalamus, corona radiata, centrum ovale, and the locations beside lateral ventrical, pons and callosum.

Results and Discussions

There was significant difference of FA value in the right caudate nucleus between the SVD and BVD groups with the same degree of cognitive impairment (Figure 2). The MD values increased in both SVD and BVD groups, indicating that the infarction reason is angiogenic edema, not cytotoxic edema as before. This is consistent with the pathological change of cerebral ischemia and infarction in the chronic latent progress of SVD and the absence state of large acute arterial occlusion in the ROI. In SVD group, MD values of left thalamus is different from those in BVD (P=0.026), suggesting special diffusion movements of free water molecules in the left thalamus . And the

three groups of parameters show consistency. Moreover, MK value decreased in SVD and BVD groups, indicating the structural complexity of the corresponding brain tissue which was damaged in the pathological state. Specially, MK value of left pons in SVD group decreased more obviously than in BVD group (P =0.036) (Figure3). The RK and AK values of the left side of the bridge brain in SVD and BVD groups were dramatically decreased compared to control group, while these values remain closed between the two patient groups. DKI derived parameters and cognitive evaluation scores are linearly correlated (Figure 4.5). The results suggested that DKI could indicate sensitive developmental changes of local microstructures in brain SVD and BVD. The conventional diffusion parameters were estimated using the mono-exponential model, where the derived values depended on the selection of b values. As an extension of DTI model, DKI required at least two non-zero b values in more than 15 independent directions. With a second-order polynomial model, DKI could provide a b-value-independent estimation of the diffusion and kurtosis parameters. Therefore, DKI may be an ideal technique for estimating the restricted diffusion process in *in vivo* study, especially in detecting the pathological alterations in neural tissues.

Conclusion

In conclusion, DKI could provide sensitive developmental changes of local microstructures in brain SVD and BVD. In addition, DKI-derived diffusion parameters were sensitive to alterations in white matter regions with complex fiber arrangements. The atrophy may exist in white matter fiber. Moreover, DKI can reflect the degree of cognitive impairment caused by cerebral vessel diseases, which is useful in early diagnosis and chose of monitoring strategy, as well as dynamic observation and prognostic assessment.

PU-3431

CT-Based Radiomics Signature for the Preoperative Discrimination Between Head and Neck Squamous Cell Carcinoma Grades

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Objective: Radiomics has been widely used to non-invasively mine quantitative information from medical images and could
potentially predict tumour phenotypes. Pathologic grade is considered a predictive prognostic factor for head and neck squamous
cell carcinoma (HNSCC) patients. A preoperative histological assessment can be important in the clinical management of patients.
We applied radiomics analysis to devise non-invasive biomarkers and accurately differentiate between well-differentiated (WD)
and moderately differentiated (MD) and poorly differentiated (PD) HNSCC.

Methods: This study involved 206 consecutive HNSCC patients (training cohort: n=137; testing cohort: n=69). In total, we extracted
670 radiomics features from contrast-enhanced computed tomography (CT) images. Radiomics signatures were constructed with a
kernel principal component analysis (KPCA), random forest classifier and a variance-threshold (VT) selection. The associations
between the radiomics signatures and HNSCC histological grades were investigated. A clinical model and combined model were also
constructed. Areas under the receiver operating characteristic curves (AUCs) were applied to evaluate the performances of the
three models.
Results: In total, 670 features were selected by the KPCA and random forest methods from the CT images. The radiomics signatures
had a good performance in discriminating between the two cohorts of HNSCC grades, with an AUC of 0.96 and an accuracy of 0.92.
The specificity, accuracy, sensitivity, positive predictive value (PPV), and negative predictive value (NPV) of the abovementioned
method with a VT selection for determining HNSCC grades were 0.83, 0.92, 0.96, 0.94, and 0.91, respectively; without VT, the
corresponding results were 0.70, 0.83, 0.88, 0.80, and 0.84. The differences in accuracy, sensitivity and NPV were significant
between these approaches ($p<0.05$). The AUCs with VT and without VT were 0.96 and 0.89, respectively ($p<0.05$). Compared to the
combined model and the radiomics signatures, The clinical model had a worse performance, and the differences were significant
($p<0.05$). The combined model had the best performance, but the difference between the combined model and the radiomics
signature weren’ t significant ($p>0.05$).
Conclusions: The CT-based radiomics signature could discriminate between WD and MD and PD HNSCC and might serve as a
biomarker for preoperative grading.

PU-3432

3D Deep Learning-Based Prior Medical Knowledge Integration Predicts lymph node metastasis in Clinical Stage T1 Lung Adenocarcinoma

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Abstract
Background:
To develop and evaluate a deep learning system named DensePriNet based on 3D convolutional neural networks (CNNs) predicting lymph node metastasis in Clinical Stage T1 Lung Adenocarcinoma on CT images.
Method:

The model we proposed named DensePriNet based on 3D convolutional neural networks and prior medical knowledge, which can perfectly fuse the information of image and semantics and automatically predict lymph node metastasis. We used 401 cases as the development set to train and validate our model, and test it on the 100 cases. The performance was also compared with the traditional radiomics and two radiologists with different experience judgement. Outperformance was measured in terms of AUC, sensitivity, specificity and MCC. The Grad-Cam was used to visualize the areas of the image most indicative of the LN metastasis.
Findings:
The proposed deep learning system achieved the best classification performance than the traditional radiomics and radiologists' prediction results. The AUC, sensitivity, specificity, MCC of the proposed model achieved 0.957, 0.963, 0.89 and 0.80 respectively. The senior radiologist performance was better than the junior radiologist, whose sensitivity, specificity, MCC were 0.296, 0.973 and 0.398 respectively. The radiomics using random forest classifier had the best performance with AUC of 0.930, sensitivity of 0.852, specificity of 0.822 and MCC of 0.623.
Interpretations:
The model we proposed can achieve best performance which could help doctors work efficiently and facilitate the application of precision medicine.

PU-3433

The Application of 1H-MRS in the diagnose of common intracranial tumors

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The types of intracranial tumors are of great variety, and the classification of whose is very complex. And there have a world of differents in the aspect of cure method and prognosis by the different type and different level neoplasm. The routine examination of CT and MRI can merely show the preliminary diagnosis to aim directly at location, morphous and size of tumors, but can hardly determine their nature. MRS as the only noninvasive examination can observe the change of the cellular metabolism continuous, and carry out the qualitative analysis with the metabolism, biochemistry and chemical compound ingredients of the tumors. Accordingly, MRS could provide more quantity and more precise information of neoplasm, could provide liable theory in making out treatment perscription and evaluating therapeutic efficacy.

The change of routine MRI and MRS which has showed by the 99 cases of intracranial tumors of different types were analyzed retrospectively. The purpose of this investigation is to evaluate the diagnostic and differential diagnosis value of MRS in the intracranial tumors. The results can provide evidence to diagnose more accuratly, confirm level and boundary of tumors, understand the characteristics of neoplasm, it also play a key role in the prognose of clinical process.

Methods: All case were performed by SIEMENS 1.5T Avanto MR system, use the phased-array coil to complete MR scanning. At first, routine MR: transverse section scan included T1WI、T2WI、FLAIR, sagittal T1WI and coronal T1WI scan. Scan series

and parameters: transverse, sagittal and coronal T1WI scan use SE series: TR/TE=400/7.8ms; transverse T2WI scan use TSE series: TR/TE=3250/99ms; transverse FLAIR series: TR/TE=9000/109ms, TI=2500ms. the slice thickness was 6mm, the slice interval was 1.2mm, the matrix was 256×256, FOV: 230mm×230mm. MR enhancement scanning: GD-DTPA was injected through vein, dosage: 0.1mmol/kg, and then take the transverse, sagittal and coronal T1WI scaning. ^{1}H proton Magnetic reconance spectroscopy used chemical shift imaging (CSI) methord: TR/TE=1500/135ms, FOV:160mm×160mm，VOI: 80mm×80mm, stimulated time: 4, acquisition time: 7min12s. Compared the ratio of NAA/Cho, NAA/Cr, Cho/Cr with region of tumors, perienhancement and normal regions.

Results: Routine MR plain scan in T1WI intracranial tumors usually manifest equal or lower signal, and uniform or nonuniform higher signal in T2WI, nonhydropsia or different level hydropsia surrounding tumors. Enhancement scanning: neoplasm can manifest non-enhancement, uniform or nonuniform enhancement, so there has some difficulty in the classfication of intracranial tumors, can hardly make qualitative diagnose preoperation. The tumors' $^{1}H-MRS$ is obviously different with normal brain tissue. The ratio of NAA/Cr，NAA/Cho cut down, the ratio of Cho/Cr step up. The NAA/Cr ratio in the region of glioma enhancement is obviously different with meningioma and metastasis($P<0.05$). Analyzing perienhancement feature of MRS in further step, the metabolism ratio in perienhancement of glioma is obviously different with normal tissue($P<0.05$). But meningioma and metastasis do not have the feature($P>0.05$). The diversity of NAA/Cho ratio in the perienhancement of 3 different tumors has statistics sense($P<0.05$). At last, compared the metabolism ratio with tumors and perienhancement of different types of tumors, the ratio of NAA/Cho in meningioma have obviously cut down to the perienhancement, and Cho/Cr ratio step up($P<0.05$).

Conclusion:

1、Routine MR plain scan in T1WI, tumors in brain usually manifest equal or lower signal, and nonuniform higher signal in T2WI, accompainied with different level hydropsia surrounding tumors and enhancement, so there has some difficulty in the classfication of intracranial tumors.

2、The tumors' $^{1}H-MRS$ is obviously different with normal brain tissue. The ratio of NAA/Cr, NAA/Cho cut down, the ratio of Cho/Cr step up.

3、$^{1}H-MRS$ could classified different type of intracranial tumors in molecular level, so it can retrieve the defect of routine MR in clinic.

4、$^{1}H-MRS$ could provide quantitative and semiquantitative method to assay the grade of malignacy, supply consult information for pathology classify, for overall and accurate evaluation with tumors pre-operated, for formulating reasonable treatment perscription.

5、The evaulation of perienhancement by multi-voxel $^{1}H-MRS$ is very valuable for the classification of glioma meningioma and metastasis and the designation of tumors' infiltrating extent.

PU-3434

A novel multimodal(MR/CT) radiomics model for predicting the lymphovascular invasion of rectal cancer

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Abstract

Objectives This study was performed to develop and validate a multimodal model based on MR and CT images for predicting preoperative lymphovascular invasion (LVI) of rectal cancer.

Methods This retrospective study consisted of 94 consecutive patients with rectal cancer who underwent both MRI and CT before surgery within 2 weeks. They were randomly divided into the training cohort (69 patients) and the validation cohort (25 patients). The regions of interest (ROIs) were outlined on T2WI,DWI and contrast enhanced CT images on each slice of the tumor. A total 1188 radiomics features were extracted from every patients. Radiomics features were selected to build a radiomics score. We were constructed two fusion models A and B respectively. A fusion radiomics signature was finally developed using logistic regression modelling. Area under the curve (AUC) was plotted to compare and select the fusion models with good performance and stability, and then establish a nomogram. In the validation cohort, the prediction efficiencies of the best models were evaluated qualitatively by calibration curves and decision curves .

Results By comparing AUC values, the prediction accuracy in the validation cohort was good for the fusion A model ,which achieved (AUC 0.876).It also had a higher sensitivity (0.929) and specificity (0.800). In the validation cohort, the AUC, calibration curves and decision curves indicated that the A model provided greater benefits.

Conclusion The MR and CT-based fusion model can effectively predict the lymphovascular invasion of rectal cancer and the radiomics nomogram demonstrated great potential in the preoperative prediction.

PU-3435

CT Radiomic Nomogram for Preoperative Prediction of Extrathyroidal Extension in Papillary Thyroid Carcinoma

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Abstract

Objectives

Determining the presence of extrathyroidal extension (ETE) is important for patients with papillary thyroid carcinoma (PTC) in selecting the proper surgical approaches. This study aimed to explore a radiomic model for preoperative prediction of ETE in patients with PTC.

Methods

The study included 624 PTC patients (without ETE, n = 448; with minimal ETE, n = 52; with gross ETE, n = 124) whom were divided randomly into training (n = 437) and validation (n = 187) cohorts; all data were gathered between January 2016 and November 2017. Radiomic features were extracted from computed tomography (CT) images of PTCs. Key radiomic features were identified and incorporated into a radiomic signature. Combining the radiomic signature with clinical risk factors, a radiomic nomogram was constructed using multivariable logistic regression. Delong test was used to compare different receiver operating characteristic curves.

Results

Five key radiomic features were incorporated into the radiomic signature, which were significantly associated with ETE ($p < 0.001$ for both cohorts) and slightly better than clinical model integrating significant clinical risk factors in the training cohort (area under the receiver operating characteristic curve (AUC), 0.791 vs. 0.778; F_1score, 0.729 vs. 0.714) and validation cohort (AUC, 0.772 vs. 0.756; F_1score, 0.710 vs. 0.692). The radiomic nomogram significantly improved predictive value in the training cohort (AUC, 0.837, $p < 0.001$; F_1score, 0.766) and validation cohort (AUC, 0.812, $p = 0.024$; F_1score, 0.732).

Conclusions

The radiomic nomogram significantly improved the preoperative prediction of ETE in PTC patients. It indicated that radiomics could be a valuable method in PTC research.

PU-3436

Diagnostic classification of primary insomnia using statistically significant features in resting-state functional MR brain image based on logistic regression method

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Purpose: To investigate whether or not amplitude of low frequency fluctuations(ALFF), regional homogeneity(ReHo) and functional connectivity(FC) features could be used as potential biomarker for classification of primary insomnia (PI) by using the machine learning method -- logistic regression (LR).

Materials and Methods: In this study, 49 PI patients and 47 Healthy controls(HC) were included. Voxel-wise features, such as amplitude of low frequency fluctuations(ALFF), regional homogeneity(ReHo) and functional connectivity(FC), were extracted from the resting-state functional MR brain image. Respectively analyze these features between primary insomnia(PI) patients and healthy control(HC) using two-sample t-test (multiple comparison correction—GRF, p-voxel<0.001,p-cluster<0.05)and obtain

statistically significant features for classification of PI in patients and HC based on logistic regression(LR) method.
Results: Primary insomnia patients had higher ALFF values mainly in superior temporal gyrus. For seed voxels selected in Frontal_Sup_Orb_R(superior frontal gyrus, orbital part), PI patients had significantly descended FC values in right Rolandic operculum, frontal lobe and right postcentral gyrus. For seed voxels selected in Rolandic_Oper_L(Rolandic operculum), PI patients had significantly descended FC values in left postcentral gyrus, left supramarginal gyrus, frontal lobe and parietal lobe. For seed voxels selected in Frontal_Mid_Orb_L(superior frontal gyrus, medial orbital), PI patients had significantly descended FC values in occipital lobe, lingual gyrus, calcarine fissure and surrounding cortex. It also found that PI patients had descended functional connectivity between Frontal_Sup_Medial_L(medial superior frontal gyrus) and parietal lobe, precuneus, median cingulate, paracingulate gyrus. Significantly descended FC values between Cingulum_Ant_L(anterior cingulate and paracingulate gyrus) and middle frontal gyrus, Cingulum_Mid_R(median cingulate and paracingulate gyrus) and middle temporal gyrus, Precuneus_R (precuneus) and parietal lobe, angular gyrus, supramarginal gyrus were found in PI patients. Difficulty in falling asleep was also associated with descended functional connectivity between Cingulum_Mid_L (median cingulate and paracingulate gyrus) and other sensory regions such as supramarginal gyrus, parietal lobe and angular gyrus. Both Cingulum_Post_L(posterior cingulate gyrus), Angular_L(angular gyrus) and Temporal_Mid_L(middle temporal gyrus) had significantly descended functional connectivity with medial superior frontal gyrus in PI patients. For seed voxels selected in Cerebellum_Superior Cerebelum_6_R, PI patients had significantly increased FC values in occipital lobe, left cerebrum and lingual gyrus. However, ReHo features showed no statistically significant brain region in PI patients and NC. With the statistically significant features above, logistic regression(LR) is used for the classification of the group PI-NC. These features showed good discrimination with accuracy of 94.44%, sensitivity of 100%, specificity of 88.89% and AUC of 94.44%.
Conclusion: The present study added information to limited studies on functional specialization and provided an effective and precision means for diagnosis of insomnia.

PU-3437

Validation and Diagnostic Performance of a Computational Fluid Dynamics Method Based on Multi-detector MRI for Diagnosis of Aortic Coarctation

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Background: The clinical diagnosis of coarctation of the aorta (CoA) constitutes a clinical challenge, with the use of the peak systolic pressure gradient (PSPG) being

the reference method. Multi-detector MRI-based computational fluid dynamics (CFD) has been hypothesized to afford accurate and noninvasive PSPG measurement.
Objective: The aim of this study was the validation of a CFD method that utilizes MRI imaging data for CoA diagnosis.
Methods: The study included 75 pediatric patients divided into a training set (n = 50;25 with CoA and 25 without CoA) and a testing set (n = 25). Effectiveness of the CFD method for distinguishing between patients with and without CoA was illustrated by using the training set, while the testing set was used to analyze the diagnostic performance of CFD. All the patients underwent cardiac catheterization for confirmation of CoA or any other congenital heart disease. The utilized CFD models were developed from MRI imaging data. The PSPG determined by CFD(PSPGCFD) was compared with that determined by cardiac catheterization (PSPGCC) to validate the CFD method. The employed diagnostic performance indices included the PSPG, average peak systolic wall shear stress (APSWSS), and peak systolic velocity (PSV), which were analyzed by receiver operating characteristic (ROC) curves.
Results: PSPGCFD agreed excellently with PSPGCC in both the training and testing sets ($R2$ = 0.969 and 0.900, and bias = 1.152 and 0.182 mmHg, respectively; $p <$ 0.001). In addition, PSPGCFD, the CFD-based APSWSS (APSWSSCFD), and the CFD-based PSV (PSVCFD) all exhibited good predictive performance in both the training set (AUC = 0.987, 0.978, and 0.931, respectively) and testing set (AUC =0.953, 0.947, and 0.823, respectively).
Conclusions: The noninvasive MRI-based CFD method can accurately diagnose CoA

PU-3438

Radiomics for Diagnosis of Dual-phenotype Hepatocellular Carcinoma using Gd-EOB-DTPA-enhanced MRI and Patient Prognosis

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Purpose: To describe the clinical characteristics and outcomes of patients with dual-phenotype hepatocellular carcinoma (DPHCC) and investigate the use of radiomics to establish an image-based signature for preoperative differential diagnosis.
Methods: This study included 50 patients with a postoperative pathological diagnosis of DPHCC (observation group) and 50 patients with CK7- and CK19-negative HCC (control group) who attended our hospital between January 2015 and December 2018. All patients underwent Gd-EOB-DTPA-enhanced MRI within one month before surgery. Arterial phase (AP), venous phase (VP), delayed phase (DP) and hepatobiliary phase (HP) images were transferred into a radiomics platform. Volumes of interest covered the whole tumor. The dimensionality of the radiomics features were reduced using LASSO. Four classifiers, including Multi-Layer Perceptron (MLP), Support Vector Machines (SVM), Logistic Regression (LR) and K-Nearest neighbor (KNN) were used to distinguish DPHCC from CK7- and CK19-negative HCC. Kaplan-Meier survival analysis was used to assess

one-year disease-free survival (DFS) and overall survival (OS) in the observation and control groups.
Results: The sensitivity, specificity and accuracy of LR and MLP varied with imaging phase such that the best preoperative diagnostic power for DPHCC will likely be derived from a combination of different phases and classifiers (VP, DP and HP with LR and VP with MLP). The 1-year DFS and OS of the patients in the observation group were 69% and 78%, respectively. The 1-year DFS and OS of the patients in the control group were 83% and 85%, respectively. Kaplan-Meier survival analysis showed no statistical difference in DFS and OS between groups (P=0.231 and 0.326), but DFS and OS were numerically lower in patients with DPHCC.
Conclusion: A radiomics signature with features extracted from Gd-EOB-DTPA-enhanced MR images was used to distinguish DPHCC from CK7- and CK19-negative HCC. DPHCC is more likely to recur and cause death than HCC, suggesting that active postoperative management of patients with DPHCC is required.

PU-3439

Effect of the PixelShine Deep Learning System on Image Quality of Kidney: An Anthropomorphic Phantom Study

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PURPOSE
To evaluate the effect of the PixelShine deep learning system on the renal image quality enhancement in Anthropomorphic phantom.

METHOD AND MATERIALS
CT scans were performed with Revolution CT(GE, America) on an anthropomorphic phantom(IRCU48,FangTuo,China) under 120KV,with 4 different tube currents(250, 300, 350, 400mA).The original data ,with slice thickness of 5mm ,with the FBP method reconstruction condition was set to the A0 group, and the data of 50% ASIR-V reconstruction was set to the V0 group. The PixelShine system(V1.2, AlgoMedica,America) reconstruction intensity A1, A3, A5, A7, and A9 were respectively selected to deal with the A0 data.A1 (FBP+A1), A3(FBP+A3), A5(FBP+A5), A7(FBP+A7), A9(FBP+A9) group were acquired. In the same rule, V1 (50%Asir-V+A1), V3(50%Asir-V+A3), V5(50%Asir-V+A5), V7(50%Asir-V+A7), V9(50%Asir-V+A9) groups were sequentially obtained. Three round ROIs(d=10mm)were placed on the same slice of kidney. The CT values, SD values, SNR values and CNR values were recorded. A nonparametre test Kruskal-Wallis was used($p<0.05$).
RESULTS
1.No significant differences were found on the CT values obtained using different reconstruction intensity($p>0.05$).
2.
There were significant differences among the groups on SD value.
There were differences among V0, A0 and A1 group ($p<0.05$).
There were no significant differences among V0,A3, A5, A7, A9 ,V1 and V3.

There were differences between V0, V5, V7 and V9.
The differences among V5, V7, V9 were not obvious.
V0<A0 ,V0< A1; V5<V0;V5<A5.
3.
There were differences among the groups on SNR value (p=<0.05).
There were differences among V0, A0, A1 group (p<0.05).
There were no significant differences among V0, A3 A5, A7 A9, V1 and V3.
There were differences among V0, V5,V7,V9.
There were no significant differences among V5, V7 V9.
V0 >A0, V0 >A1; V5>V0; V5 > A5.
The V5 group improved the SNR values by 48.6% , 40.1% and 138.8% compared with the A5 group, the V0 group and the A0.

CONCLUSION

The PixelShine deep learning system could enhance the renal image, but not unlimited. combining with the ASIR-V reconstruction algorithm the PixelShine system could achieve better image enhancement.

PU-3440

CT 影像组学术前预测胃肠道间质瘤 ki67 表达的研究

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目的

胃肠道间质瘤(GIST)在胃肠道系统中是发病率最高的间叶源性肿瘤。传统采用美国国立卫生署(NIH)危险度分级系统进行 GIST 患者预后的预测，但 NIH 危险度分级不适用于野生型 GIST 患者(1)。Ki67 作为细胞增殖相关抗体判断肿瘤的增殖活性(2)，有研究表明 Ki67 阳性指数截断值 5%%可以作为 GIST 患者无复发生存的独立预后因子(3)。因此本研究通过对 GIST 的 CT 影像组学特征的提取，建立术前预测 Ki67 表达的模型。

方法

回顾性分析 2017 年 1 月至 2018 年 12 月经手术病理证实的 132 例 GIST 患者的 CT 增强影像资料，以 Ki67 阳性指数(截断值 5%)分为高低表达两组（高表达 41 例，低表达 91 例）。首先将数据按 7:3 的比例分割为训练组与验证组，再采用基于 Matlab 的 IBEX 影像组学软件包提取 CT 增强图像的影像组学特征，包括直方图参数、灰度共生矩阵、游程检验、形态等参数，随后使用最大相关最小冗余算法进行特征降维，最后使用 Logistics 回归结合赤池信息量准则筛选最佳预测模型。在验证数据集使用 ROC 曲线、校正曲线及决策曲线对预测模型进行全面评估。

结果

经过特征降维与模型筛选，其中基于长行程灰度优势、最大概率、高斯方差及相关互信息 4 个纹理特征构建的 Ki67 阳性表达 Logistics 预测模型表现优异，训练组中 ROC 曲线下面积为 0.89，验证组中为 0.83。校正曲线显示预测概率与观察频率之间一致性良好。决策曲线显示该模型在概率阈值为 5－80%之间获得不错的净获益。

结论

CT 影像组学有助于术前预测 GIST 的 Ki67 表达水平，而且具有较高的效能，可为评估肿瘤侵袭性和预后情况提供一种无创性技术手段。

PU-3441

Clinical validation and assessment of aortic hemodynamics using computational fluid dynamics simulations from computed tomography angiography

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Abstract
Background: Hemodynamic information including peak systolic pressure (PSP) and peak systolic velocity (PSV) carry an important role in evaluation and diagnosis of con-
genital heart disease (CHD). Since MDCTA cannot evaluate hemodynamic information directly, the aim of this study is to provide a noninvasive method based on a computational fluid dynamics (CFD) model, derived from multi- detector computed tomography angiography (MDCTA) raw data, to analyze the aortic hemodynamics in infants with CHD, and validate these results against echocardiography and cardiac catheter measurements.
Methods: This study included 25 patients (17 males, and 8 females; a median age of 2 years, range: 4 months－4 years) with CHD. All patients underwent both transthoracic echocardiography (TTE) and MDCTA within 2 weeks prior to cardiac catheterization. CFD models were created from MDCTA raw data. Boundary conditions were confirmed by lumped parameter model and transthoracic echocardiography (TTE). Peak systolic velocity derived from CFD models (PSV CFD) was compared to TTE measurements (PSV TTE), while the peak systolic pressure derived from CFD (PSP CFD) was compared to catheterization (PSP CC). Regions with low and high peak systolic wall shear stress
(PSWSS) were also evaluated.
Results: PSV CFD and PSP CFD showed good agreements between PSV TTE ($r = 0.968$, $p < 0.001$; mean bias = − 7.68 cm/s) and PSP CC ($r = 0.918$, $p < 0.001$; mean bias = 1.405 mmHg). Regions with low and high PSWSS) can also be visualized. Skewing of velocity or helical blood flow was also observed at aortic arch in patients.
Conclusions: Our result demonstrated that CFD scheme based on MDCTA raw data is an accurate and convenient method in obtaining the velocity and pressure from aorta and displaying the distribution of PSWSS and flow pattern of aorta. The preliminary results from our study demonstrate the capability in combining clinical imaging data and novel CFD tools in infants with CHD and provide a noninvasive approach for diagnose of CHD such as coarctation of aorta in future.

PU-3442

人工智能对不同类型骨折检出效能的对比研究

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目的：探讨基于深度学习的人工智能（AI）诊断系统对完全骨折、不完全骨折及陈旧性肋骨骨折检出效能的差异。
资料与方法：收集具有胸部外伤病史的患者 76 例，所有患者均进行胸部 CT 检查，所有患者均利用 Lung 重建算法进行图像重建。利用基于深度学习的人工智能（AI）诊断系统（InferRead CT Bone research，Infervision，Beijing）进行肋骨骨折的检出。由两位有 15 年以上胸部诊断经验的医师结合 AI 最终讨论做出肋骨骨折的金标准。骨折分为完全骨折，不完全骨折及陈旧性骨折。记录人工智能对不同类型骨折的检出数，利用卡方检验比较人工智能对不同类型骨折检出的灵敏度。
结果： 76 例患者中共有 1822 根肋骨（其中两根发育不全），金标准检出骨折 329 根，其中完全骨折 118 处，不完全骨折 103 处，陈旧性骨折 108 处，AI 共检测出骨折 331 处，真阳性骨折 289 处，其中完全骨折 113 处，不完全骨折 84 例，陈旧性骨折 92 处，AI 对肋骨骨折检查的敏感性为 87.84%，假阳性率为 2.81%。AI 对完全骨折/不完全骨折/陈旧性骨折的检出率分别为 95.76%/81.55%/85.19%，对三种骨折检查的敏感性差异具有统计学意义（P=0.003<0.05），AI 对完全性骨折检出的诊断效能优于不完全性骨折及陈旧性骨折。
结论：人工智能对完全骨折、不完全骨折及陈旧性骨折检出的效能有所差异，对完全骨折检出的诊断效能优于不完全骨折及陈旧性骨折。

PU-3443

Convolution Kernel and Iterative Reconstruction Affect the Diagnostic Performance of Radiomics and Deep Learning in Lung Adenocarcinoma Pathological Subtypes

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Background: The aim of this study was to investigate the influence of convolution kernel and iterative reconstruction on the diagnostic performance of radiomics and deep learning (DL) in lung adenocarcinomas.
Methods: We included 183 patients with 215 lung adenocarcinomas in this study. All the CT imaging data was reconstructed with three reconstruction algorithms (ASiR at 0%, 30%, 60% strength), each with two convolution kernels (bone and standard). 171 nodules were selected as training-validation set, whereas 44 nodules were selected as testing set. Logistic regression and a DL framework-DenseNets were selected to tackle the task. Three logical experiments were implemented to fully explore the influence of the studied parameters on the diagnostic performance. The receiver operating characteristic curve (ROC) was used to evaluate the performance of constructed models.
Results: In Experiment_A and _B, no statistically significant results were found in radiomic method, whereas 2 and 6 pairs were statistically significant (P<0.05) in DL method. In Experiment_C, 1 and 4 models were found significant differences in radiomics and DL method respectively. Moreover, models constructed with standard convolution kernel data outperformed that constructed with bone convolution kernel data in all studied ASiR levels in DL method. In DL method, B0 and S60 performed best in bone and standard convolution kernel respectively.

Conclusion: The results demonstrated that DL was more susceptible to CT parameter variability than radiomics. Standard convolution kernel images seem to be more appropriate for imaging analysis. Further investigation with a larger sample size is needed.

PU-3444
Application of Radiomics in Predicting the Expression of Ki-67 in Non-Small-Cell Lung Cancers

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Objective: To develop CT image feature-based radiomics signature to estimate the expression level of Ki-67 in non-small cell lung cancers.
Methods: 107 non-small cell lung cancer patients who underwent contrast-enhanced CT had confirmed histopathologically and tested for Ki-67 expression into 2 levels: low expression (n=58) and high expression (n=49). Patients were divided into training (n=75) and validation cohorts (n=32). The arterial phase images were imported into the ITK-SNAP to manually delineate volume of interest (VOI) of the entire-tumor. Each VOI produced 396 radiomics features including Histogram, GLCM, GLSZM, RLM, Form Factor and Haralick. LASSO regression was used for feature screening to generate a radiomics score. Then multivariate logistic regression analysis (MLRA) was used combining clinical information to screen out independent risk factors for predicting Ki-67 expression level. The predictive accuracy of radiomics was quantified by the area under curve (AUC) of a ROC curve in both cohorts. The calibration degree (CD) of the radiomics was evaluated by Hosmer-Lemeshow test. The clinical usefulness of the radiomics was assessed by decision curve analysis (DCA).
Results: Eleven radiomics features with non-zero coefficients were chosen to build a radiomics model that significantly correlated with Ki-67 expression level with an AUC, sensitivity, specificity and CD of 0.856, 94%, 70% and 0.588 in training cohort; and 0.842, 91%, 79% and 0.175 in validation cohort, respectively. The gender difference between the high and low Ki-67 expressions was significant ($P<0.05$), and there were no significant differences in age and pathological type ($P>0.05$). Radiomics were considered to be independent predictor of Ki-67 expression level in non-small cell lung cancer, and if the threshold probability was between 8% and 99%, using radiomics to predict Ki-67 expression level added more benefit than treating either all or no patients.
Conclusions: The radiomics is helpful to predict the expression of Ki-67 in non-small cell lung cancers, providing a non-invasive technique for assessing the invasiveness and prognosis for non-small cell lung cancers.

PU-3445

Value of CT-based radiomics signature for the prediction of Metachronous liver metastasis after Radical Resection in Locally advanced gastric cancer

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Objective: To investigate value of radiomics for CT in prediction of metachronous liver metastasis after radical resection for gastric cancer.
Methods: The imaging and clinical data of 80 patients without liver metastasis and 40 patients with liver metastasis admitted to Guangxi Medical University Cancer Hospital from 2015 to 2019. Patients underwent CT before radical resection. 492 radiomics features were extracted from portal venous phase to build a radiomics signature. We used ICC and the LASSO regression method to select features, the model evaluated with receiver operating characteristics curve (ROC).
Results: The radiomics signature model showed a diagnostic accuracy of 82.23% (AUC, 0.826; sensitivity, 65.33%; specificity, 96.28%).
Conclusion: Radiomics analysis has the potential to predict metachronous liver metastasis in gastric cancer.

PU-3446

基于甲状腺乳头状癌癌结节 CT 小波纹理分析预测中央组淋巴结转移的可行性研究

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【摘要】 目的 探讨基于甲状腺乳头状癌（PTC）原发癌灶的 CT 小波纹理分析预测甲状腺乳头状癌中央组淋巴结转移的可行性。**方法** 回顾性收集经手术病理证实为 PTC 并行中央组或全颈淋巴结清扫的患者 548 例（612 枚结节），经严格入组标准筛选，共 160 例(189 枚结节)纳入研究,据病理分为中央组淋巴结转移组 110 枚及未转移组 79 枚。使用深睿 DeepWise 软件手动逐层勾画 CT 增强静脉期 PTC 癌结节，每枚结节提取 576 个小波纹理特征。采用独立样本 t 检验（正态分布）和 Mann—Whitney U 检验（非正态分布）比较两组间纹理特征参数的差异，ROC 曲线分析有统计学意义的特征参数，手动筛选 AUC 值排列前 10 的小波纹理特征作为最佳特征参数，对其进行多重共线性检验后纳入多元 Logistic 回归建立模型并检验诊断效能。**结果** 两组间纹理特征比较有 124 个特征差异有统计学意义，手动筛选最佳特征参数诊断中央组淋巴结转移 AUC 值分别为：0.630、0.616、0.610、0.607、0.605、0.604、0.602、0.599、0.595、0.595（P<0.05），多重共线性检验显示特征间不存在共线性后构建模型，诊断中央组淋巴结转移的 AUC 值、敏感性、特异性、准确率分别为 0.693、62.84%、60.47%、63%，小面积低灰度强调是独立预测风险因素。**结论** 基于甲状腺乳头状癌原发癌灶 CT 静脉期小波纹理分析对预测中央组淋巴结转移有一定价值。

PU-3447

Feasibility of a Magnetic Resonance Imaging Based Radiomics Signature for the Prediction of Occult Lymph Node Metastasis in Early Stage Oral Tongue Squamous Cell Carcinoma

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Objectives: To investigate whether preoperative magnetic resonance imaging (MRI)-cased radiomics could accurately predict occult cervical lymph node (LN) metastasis in the early stage oral tongue squamous cell cancer (OTSCC).
Methods: We retrospectively enrolled 76 patients with early stage OTSCC (cT1-2N0) who had been surgically treated by tumor excision and elective neck dissection. For each patient, we extracted 198 features from preoperative T2 weighted imaging (T2WI) and contrast enhanced T1 weighted imaging (CE-T1WI). The Mann-Whitney U test and recursive feature elimination were then used to select optimal features. We applied logistic regression method to create a radiomics signature with optimal features. The predictive accuracy of our radiomics signature was quantified by creating a receiver operator characteristic curve (ROC) and determining the area under the ROC curve (AUC).
Results: Occult LN metastasis was detected pathologically in 42.1% (32/76) of the patients. No significant association was identified with regards to patient gender, age, histological grade, tumor size or clinical T stage when comparing between pathologically node-positive and node-negative patients. The radiomics signature, featuring 12 optimal features, yielded favorable predictive efficacy, with an AUC of 0.87 and 0.93 in the training and validation cohorts respectively. In the validation cohort, the predictive sensitivity, specificity, and accuracy were 100%, 80%, and 87%, respectively.
Conclusions: The current study offers a feasible tool for quantifying the risk of LN metastasis in early stage OTSCC. These preliminary results are worth to be validated in a multicenter external validation study to obtain high-level evidence for clinical applications in subsequent studies.

PU-3448

Can texture analysis preoperatively predict perineural invasion of head and neck adenoid cystic carcinoma?

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Objective To determine whether texture features derived from pretreatment T2-weighted imaging (T2WI) and contrast-enhanced MRI (CE-MRI) could predict the perineural invasion (PNI) of head and neck adenoid cystic carcinoma.

Materials and Methods Preoperative MR images were retrieved and texture features were calculated. Boruta algorithm was used to select the most important features that independently associated with PNI, by taking histopathologically confirmed PNI as the reference. Texture models were built using support vector machine (SVM) and logistic regression (LR) methods, assessed by ten-fold cross-validation.
Results Totally, 38 patients with ACC were evaluated in the current study and PNI was confirmed in 23 cases. For T2WI and CE-MRI, respectively four and three texture features were selected showing significant difference between ACC tumors with and without PNI, and the models were built upon the selected features. The AUCs of the T2WI based models derived using SVM and LR were 0.716 and 0.655, respectively. For CE-MRI, the AUCs were 0.812 and 0.716, respectively. The texture model derived from CE-MRI using SVM method showed the best performance (AUC, 0.812; accuracy, 78.7%).
Conclusion This study suggests a noninvasive technique for predicting PNI in head and neck ACC, which help planning individualized treatment strategy for patients with ACC in the future.

PU-3449

MRI-based radiomics nomogram for predicting overall survival in patients with head and neck squamous cell carcinoma

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Purpose To develop a magnetic resonance imaging (MRI)-based radiomics signature and radiomics nomogram for predicting prognosis in head and neck squamous cell carcinoma (HNSCC) patients.
Methods In a retrospective analysis of patients treated for HNSCC at our institution, a radiomics signature was generated using features derived from T2-weighted MR images. The potential association of the radiomics signature with overall survival (OS) of patients was assessed. A multivariate Cox proportional hazards model was used to identify independent predictors from the radiomics signature and clinical characteristics. A radiomics nomogram incorporating the radiomics signature and any independent clinical predictors was then constructed. The incremental value of the radiomics signature in the areas of discrimination, calibration, and clinical usefulness was assessed.
Results A total of 170 patients with HNSCC were included. The radiomics signature, which comprised 7 selected features, was associated with OS (training cohort, $P < 0.0001$; testing cohort, $P = 0.0013$). The radiomics signature and TNM stage were independently associated with OS and therefore were incorporated to generate the radiomics nomogram. The radiomics nomogram showed a better discrimination capability, than stage in the training cohort (C-indexes 0.76 and 0.63, respectively; $P = 0.005$) and the testing cohort (C-indexes 0.72 and 0.61, respectively; $P = 0.01$). The calibration curves of the nomograms demonstrated good agreement between the estimation based on the radiomics nomogram and actual observation. The decision curve analysis

indicated that the radiomics nomogram had a higher overall net benefit than the traditional staging system.

Conclusion The radiomics nomogram could potentially improve clinical prognostic ability in HNSCC patients, providing a noninvasive means of quantifying imaging features and monitoring patient prognosis in clinical practice.

PU-3450

平扫与增强 CT 影像组学特征诊断肺腺癌浸润性的应用研究

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目的 采用平扫与增强 CT 图像的影像组学特征对比分析探讨其鉴别肺腺癌浸润性的应用价值。方法 收集 42 例（46 个病灶，其中 17 个纯磨玻璃结节，15 个混合磨玻璃结节，14 个实性结节）在本院手术病理证实肺腺癌病例（浸润性肺腺癌 25 个，原位腺癌 13 个，微浸润性腺癌 8 个），并在术前接受层厚≤1mm CT 薄层平扫及增强扫描。使用 Analysis Kit（AK）分析软件定量提取影像组学特征；在 R 软件中用 lasso 和逐步回归的方法降维并建模。采用 ROC 曲线比较运用平扫和增强图像的相关模型性能。结果 运用 AK 软件获取 385 个影像组学特征，平扫和增强图像影像组学特征经降维后参与建模的特征分别为 3 个和 2 个，建模后验证 logistic 回归模型得到 ROC 曲线下面积分别为 0.839 和 0.893，P 值为 0.700。结论 在影像组学纹理特征区分肺腺癌的浸润性，薄层平扫与增强 CT 图像的价值均较高且较为接近。

PU-3451

A comparative study on the detection efficiency of solid lung nodules between intern using Artificial Intelligence (AI) pulmonary nodule screening software and resident without AI in radiology department

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MOTIVATION: To compare the detection efficiency of interns who assume great amount of diagnostic workload while inexperienced with AI software and residents who are experienced without using AI in radiology department for the detection of solid nodules.

METHOD AND MATERIALS: A total of 158 patients were collected. One senior radiologist with more than 10 years' experience read CT images based on the initial diagnosis of another senior radiologist with similar experience and a final decision was subsequently conducted by deputy chief radiologist with more than 15 years' experience to determine the ground truth solid lung nodules. All readings were performed on 1 mm slice thickness CT images with the assistance of AI software (InferRead CT Lung Research, Infervision, Beijing, China). The 158 CT images were interpreted by two groups of doctors to label lung nodules with different experience: group A (intern with 4 months of chest CT experience use AI) and group

B (residents with more than 3 years' experience without using AI). The number of solid nodules, long-axis diameter, location and labeling time were recorded. The number of true positive solid nodules and false positive solid nodules in group A and B were obtained by comparing with the gold standard solid nodules. Finally, statistical analysis was conducted to compare the difference of sensitivity and false positive rate between the two groups.

RESULTS: Group A detected 682 solid nodules including 596 true positive solid nodules and 86 false positive solid nodules with a sensitivity of 0.78±0.26 and a false positive rate of 0.54 per CT scan (86/158). Group B detected 477 solid nodules including 400 true positive solid nodules and 77 false positive solid nodules with a sensitivity of 0.54±0.29 and a false positive rate of 0.49 per CT scan (77/158). The sensitivity in group A was 24% higher than that in group B ($p<0.05$) and the false positive rate in group A and B have no statistical significant difference ($p>0.05$).

CONCLUSION: Compared with resident without AI, intern equipped with AI could achieve much higher diagnostic sensitivity and similar misdiagnosis (false positive rate) for solid nodule detection.

CLINICAL RELEVANCE/APPLICATION:

It is recommended to use AI to assist intern who are inexperienced to achieve desirable detection rate for solid nodules which could potentially enhance early lung cancer detection due to missed nodule findings.

PU-3452

低年资规培医师结合 AI 与高年资规培医师对长径＜4mm 肺结节检测效能的比较研究

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目的：研究低年资规培医师使用人工智能（AI）软件能否达到或超过高年资规培医师独立诊断长径＜4mm 肺结节的检测效能。

方法：收集 2019 年 1 月 1 日到 2019 年 1 月 31 日期间在我院行胸部 CT 检查的患者 200 例，所有病例均由 2 名从事影像诊断工作 8 年以上的医师结合 AI 辅助软件（SCHOLAR,infervision）共同阅片，意见不同时由第 3 名从事影像诊断工作 15 年以上的医师进行会诊，最后做出一致诊断定为金标准。高低年资规培医师在标注结节前均进行统一培训,由 4 名具有 4 个月胸部 CT 工作经验的低年资影像规培医师借助 AI 对上述病例图像进行结节标注(A 组,每人各检测 50 例)，另由 2 名高年资影像规培医师（从事影像诊断工作 3 年及以上）独立标注上述病例图像结节(B 组，每人各 100 例)，记录结节数目、大小、位置及标注时间。将 A、B 两组检测的结节分别与金标准进行比对，记录真阳结节数、假阳结节数、假阴结节数，采用配对样本 t 检验比较两组间阅片时间、敏感度、假阳性率的差异，p ＜0.05 为差异有统计学意义。

结果：A 组的平均阅片时间为 324.30±150.33，B 组的平均阅片时间为 369.34±97.16，两组间差异无统计学意义(P=0.069,P ＜0.05)；A 组检出＜4mm 结节 309 个，其中真阳性结节 267 个，假阳性结节 42 个，敏感度为 0.59±0.26，假阳性率为 0.69；B 组检出结节 167 个，其中真阳性结节 147 个，假阳性结节 20 个，敏感度为 0.35±0.25，假阳性率为 0.33，A 组较 B 组敏感度提高 68%，差异具有统计学意义（$p=0.00, p$ ＜0.05）。

结论：低年资规培医结合 AI 对长径＜4mm 肺结节的检测效率及敏感度高于高年资规培医师，而假阳性率低于高年资规培医师。低年资规培医结合 AI 更优于高年资规培医师独立诊断长径＜4mm 肺结节的检测效能。

PU-3453

Investigation on the detection capability of AI assisted software in detecting pulmonary nodules by resident in radiology department

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MOTIVATION: To evaluate the detection capability of artificial intelligence (AI) assisted software in the detection of pulmonary nodules by resident.
METHOD AND MATERIALS: A total of 169 patients were collected. One senior radiologist with more than 10 years' experience read CT images based on the initial diagnosis of another senior radiologist with similar experience and a final decision was subsequently conducted by deputy chief radiologist with more than 15 years' experience to determine the ground truth lung nodules. All readings were performed on 1 mm slice thickness CT images with the assistance of AI software (InferRead CT Lung Research, Infervision, Beijing, China). One resident read the images without AI software (group A). After two weeks washout period, the same resident read CT images again with AI software (group B). The number of nodules, long-axis diameter, location and labeling time were recorded. The number of true positive nodules, false positive nodules in group A and B were obtained by comparing with the gold standard nodules.
RESULTS: The labeling time of group B (170.40±58.27s) was shorter than that in group A (352.81±100.31 s) (p<0.05). Group A detected 711 nodules, including 605 true positive nodules and 106 false positive nodules with a sensitivity of 0.53±0.22 and a false positive rate of 0.62 per CT scan 106/171); Group B detected 1101 nodules including 1044 true positive nodules and 57 false positive nodules, with a sensitivity of 0.84±0.18 and a false positive rate of 0.33 per CT scan 57/171). The sensitivity in group B was 31% higher than that in group A (p<0.05) and the false positive rate in group B was 29% lower than that in Group A(p<0.05).
CONCLUSION: Compared with resident without AI, the AI-assisted resident could achieve much higher diagnostic efficiency of pulmonary nodules while much faster.
CLINICAL RELEVANCE/APPLICATION:
It is recommended to use AI in clinical practice to potentially expedite workflow, reduce missed diagnosis rate and misdiagnosis rate of pulmonary nodules to enhance earlier detection of lung cancer.

PU-3454

Exploring detection efficiency difference of subsolid nodules between intern using Artificial Intelligence (AI) pulmonary nodule screening software and resident without AI in radiology department

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BACKGROUND: Subsolid nodules including pure ground-glass nodules and semi-solid nodules have higher risk of malignancy than solid nodules.
MOTIVATION: To compare the detection efficiency of interns who assume great amount of diagnostic workload and inexperienced with AI software and residents who are experienced without using AI in radiology department for the detection of subsolid nodules.
METHOD AND MATERIALS: A total of 109 patients who underwent routine chest CT examinations at Zhongshan Hospital affiliated to Dalian University from January 1, 2019 to January 31, 2019 were collected. One senior radiologist with more than 10 years' experience read CT images based on the initial diagnosis of another senior radiologist with similar experience and a final decision was subsequently conducted by deputy chief radiologist with more than 15 years' experience to determine the ground truth lung nodules. All readings were performed on 1 mm slice thickness CT images with the assistance of AI software (InferRead CT Lung Research, Infervision, Beijing, China). The 109 CT images were interpreted by two groups of doctors to label lung nodules: group A (intern with 4 months of chest CT experience use AI) and group B (residents with more than 3 years' experience without using AI). The number of nodules, long-axis diameter, location and labeling time were recorded. The number of true positive nodules, false positive nodules in group A and B were obtained by comparing with the gold standard nodules. Finally, nodule detection sensitivity and false positive rate were calculated and compared for statistical analysis between group A and B.
RESULTS: Group A detected 298 subsolid nodules including 231 true positive subsolid nodules and 67 false positive subsolid nodules with a sensitivity of 0.80±0.35 and a false positive rate of 0.62 per CT scan (67/109). Group B detected 134 subsolid nodules including 112 true positive subsolid nodules and 22 false positive subsolid nodules with a sensitivity of 0.40±0.39 and a false positive rate of 0.18 per CT scan (20/109). The sensitivity in group A was 40% higher than that in group B (p<0.05) and the false positive rate in group A was 44% higher than that in Group B (p<0.05).
CONCLUSION: Compared with resident without AI, intern equipped with AI achieve considerably higher diagnostic sensitivity for subsolid nodule detection although false positive rate compromised.
CLINICAL RELEVANCE/APPLICATION:
It is recommended to use artificial intelligence (AI) to assist intern who are inexperienced to achieve desirable detection rate for subsolid nodules which are commonly associated with early pulmonary adenocarcinoma.

PU-3455

Establishment and prediction Efficacy analysis of IDH1 gene expression type diagnostic Random Forest model based on volumetric ADC texture parameters of glioma and peritumoral edema

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AIM: To establish a model for predicting glioma Isocitrate Dehydrogenase 1 (IDH1) gene mutation by analyzing texture features of tumor parenchyma ADC value and peritumoral edema in preoperative brain glioma and to evaluate the prognostic value of texture analysis.

MATERIALS AND METHODS: A total of 146 patients (77 males and 69 females) with histologically confirmed anaplastic glioma were reviewed retrospectively. Among them, 60 were IDH1 mutants while 86 patients were IDH1 wild type. The data were divided into training group and validation group according to the ratio of 7:3. The training group consisted of 102 patients (42 IDH1 mutants and 60 wild type) and validation group included 44 patients (18 IDH1 mutants and 26 wild type). Conventional MRI features of two independent samples (IDH1-mutant and wild type) were evaluated by the Visually Accessible Rembrandt Images (VASARI) scoring system, *Pearson's Chi-Square* test was used for ranking data, and *t* test for classification variables. Texture analysis (TA) of ADC map based on the entire tumour volume and peritumoral edema was compared between two samples using Principal component analysis (PCA) to screen texture feature parameters. Random forest diagnosis models (VASARI+$Tumor_{ADC}$、VASARI+$Tumor_{ADC}$+$Edema_{ADC}$) were constructed on the bases of morphological single-factor variables, texture labels of tumor ADC images and texture labels of peritumoral edema ADC map.. The accuracy and diagnostic efficiency of the models were evaluated by validation datasets, sensitivity and specificity of the two prediction models were evaluated by drawing dynamic ROC curves. The AUC statistical indicators were used to quantify the predictive efficiency of the two models.The stability of the random forest model was evaluated by using the classification error rate of the model under different outcomes and the classification error rate of the out of bag (OOB) data.

RESULTS: Significant statistical differences in VASARI features were signi peritumoral edema, cystic degeneration and enhancement parameters ($P < 0.01$). Eight kinds of eigenvectors: Gradient OrientHistogram: (InterQuatile Range, Kurtosis), Graylevelcooccurence Matrix (Auto-correlation, Cluster Prominence, Contrast) Sum Entropy Information Measurement Norm (Inverse Differential Norm) were characteristic texture parameter variables were observed by using mean clustering classification. The accuracy of ROC curve of VASARI+Tumor ADC random forest diagnosis model was 71.5%, the specificity was 75.40%, and with areas under the ROC curve (AUC) of 0.769. The diagnostic accuracy of the random forest diagnosis models (VASARI+$Tumor_{ADC}$+preitumoral $edema_{ADC}$) was 80.9%, the specificity was 79.5%, and the AUC was 0.819 which was slightly higher than that of the conventional random forest

diagnosis model (VASARI+TumorADC), and the diagnostic accuracy was improved. About 1/3 of the out-of-pocket data generated in the modeling data are verified repeatedly. The error rate of model classification and random forest out-of-pocket data classification is stable at 10% in the end under different outcomes which indicated that the accuracy of the model was stable.

CONCLUSIONS:

In conclusion, The texture parameters of the ADC image of peritumoral edema were non-invasive markers to predict IDH1 mutational status and they have played a certain role in improving the efficiency of dignostic model.

PU-3456

The value of MRI image texture analysis in determining non-alcoholic fatty liver and its severity.

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Objective:

To determine non-alcoholic fatty liver and its severity by comprehensive MRI image texture analysis and a series of related index

Materials and methods:

We have conducted a retrospective analysis of MRI images from 344 patients (non-alcoholic fatty liver disease patients, including 64 mild cases, 20 moderate cases, 46 severe cases, and 214 normal cases) who had been performed both abdominal CT and MRI from June 2015 to March 2019.In order to determine non-alcoholic fatty liver or not and its severity, we extracted 302 texture features through analyzing each T2 weighted images by MaZda, screened these texture features by Fisher algorithm, classification error rate + average correlation coefficient (POE + ACC, PA) and mutual information algorithm, and established Artificial Neural Network (ANN) by texture feature dimension reduction.

Results:

During this identification of fatty liver, there are a series of valuable characteristics, including S(0,1) Correlat, 45dgr_GLevNonU, S(4,0) Correlat, S(3,-3) Correlat, Tetal, S(4,-4) SumAverg, GrSkewness, S(2,2) Correlat, GrVariance and Skewness.Sensitivity, specificity, positive predictive value and negative predictive value were 90.3%, 90.1%, 85.5% and 93.5%,respectively.In the judgment of severity of nonalcoholic fatty liver, valuable structural characteristics include S(0,1)Correlat, 45dgr_GLevNonU, S(4,0)Correlat, wavenlh_s-2, S(2,-2)Correlat, GrKurtosis, Teta4, Tetal,S(0,4)Correlat,Skewness.Mild sensitivity, specificity, positive predictive value, and negative predictive value are 82.1%, 89.3%, 72.7%, and 93.5%, respectively.Moderateand sensitivity, specificity, positive predictive value, and negative predictive value are 58.8%,93.5%,58.8%and93.5%, respectively.Severe of sensitivity, specificity, positive predictive value, and negative predictive value are 68.2%,100%,100%and93.5%, respectively.

Conclusion:

It is very useful and valuable to evaluate the severity of non-alcoholic fatty liver through the MRI image texture features obtained by MaZda and established ANN model. It can provide a great deal of related reference to formulate treatment strategies for clinical doctors, enjoying a high promotion value.

PU-3457

Pretreatment prediction of response to neoadjuvant chemotherapy in patients with nasopharyngeal carcinoma by radiomic base on MRI

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Purpose
Neoadjuvant chemotherapy (NAC) has been shown to improve the survival rates in patients with nasopharyngeal carcinoma (NPC). However, for patients not responding to NAC, such treatment would cause complications and prolong treatment time. This study aimed to develop a non-invasive radiomic model to predict the response to cisplatin-based NAC in NPC patients using pretreatment contrast-enhanced T1w MRI (CET1).
Materials and Methods
This prospective study was approved by local IRB and written consent was obtained. Currently we have response data from 76 NPC patients who received the cisplatin-based NAC. Forty-five patients showed response to NAC (by RECIST). Their pretreatment CET1 images were used for radiomic analysis. Regions-of-interest covering the whole tumor were manually delineated by a radiologist, and a total of 105 radiomic features were extracted for each patient, including shape, texture and Laws features. The dataset was randomly separated into a training set (~67%) and a validation set (~33%). The training set was used to select predictive features (Mann Whitney U-test $p<0.05$), redundant features with high correlation were removed and the prediction model was generate using LASSO with 3-fold cross-validation. The prediction performance was then evaluated in the independent validation set. The receiver operating characteristic (ROC) analysis was performed in both sets with the optimal threshold determined by maximizing the Youden index in the training set.
Results
In the training set, two radiomic features were selected for the prediction model, with area under the ROC curve (AUC)=0.78, sensitivity=0.93, specificity=0.62. The corresponding results on the independent validation set were 0.66, 0.73, 0.70, respectively.
Conclusion
This study demonstrates the potential of using routine pretreatment CET1 MRI to predict NPC patients' response to cisplatin-based NAC. The current radiomic model shows promising performance and will be further improved by expanding the dataset and adding features extracted from multiple MRI contrasts.
Clinical relevance/application

Pretreatment prediction of the response to NAC could benefit NPC patients, especially for nonresponders, helping them avoid the serious side effects and receive radiation therapy at an earlier time.

PU-3458

Comparison of radiomics by different classifiers and feature selection for assessing the deep myometrial invasion of endometrial cancer

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Abstract

Objective: The deep myometrial invasion of endometrial cancer had worse prognosis and need to expand the extent of surgery or adjuvant therapy. We aimed to identify radiomics methods for assessing preoperatively of deep myometrial invasion (DMI) in endometrial cancer (EC) based on 3D multi-parameters MRI features.

Methods: A total of 259 patients were divided into a primary set (179 patients) and a validation set (80 patients) from Januray 2014 to July 2019. multi-parameters MRI (T2-weighted, diffusion weighted, apparent diffusion coefficient maps and contrast enhanced images) was used to select the radiomics features in assessing DMI in EC. Three feature selection methods (least absolute shrinkage and selection operator (LASSO), recursive feature elimination (RFE) and Boruta of Random Forest (RF)) combined with three classification methods (logistics regression (LR), support vector machines (SVM) and convolution neural network (CNN)), were compared for their diagnostic performance in assessing the DMI of EC. And the diagnostic performance of the radiomics models were presented via area under the receiver-operating characteristic curve (AUC).

Results: From a total of 3152 features, 6, 16 and 10 features were selected by LASSO, RFE and RF method respectively to assess the DMI. And all the selected features were from the T2WI sequence. The selection method RFE with classifier LR had the highest AUC (AUC = 0.85 in the primary set and 0.74 in the validating set), followed by Boruta of RF with LR (AUC = 0.82 in the primary set and 0.76 in the validation set) and Boruta of RF with SVM (AUC = 0.82 in the primary set and 0.75 in the validation set). In feature selection methods aspect, the Boruta of RF had better performance in each classifier. In classification methods aspect, the LR had better performance.

Conclusions: Our study demonstrated multi-parameters MRI features performed well in diagnosing the DMI of EC. The selection method RFE with classifier LR had the best performance in assessing DMI of EC, which could enhance the application of radiomics methods in EC and guide the treatment in preoperative.

PU-3459

基于深度学习的阴道镜图目标区域检测

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宫颈癌是目前最常见的女性恶性肿瘤之一，根据临床数据估计，从感染 HPV 病毒到发展为子宫颈浸润癌需要一定的癌前转变过程，因此及时诊断发现宫颈癌的早期征兆具有非常重大的意义。在目前众多的宫颈癌诊断方式中，宫颈阴道镜检测是最为重要的检测手段之一。主流的做法是通过肉眼对于宫颈阴道镜图像进行识别，找到可能存在病变的区域，进而将可能病变的区域送至活检，确定最终的病变类型。该检测手段具有较强的可操作性和实时性。然而这种手段具有一种非常重要的不足，那就是为了获取准确的诊断结果，需要经验丰富的医生花费大量的时间和精力完成肉眼筛选的过程。我们受到计算机辅助治疗的启发，借助于计算机视觉技术，将肉眼诊断这一过程用计算机代替人类医生执行。在这篇文章当中，我们开发了一套检测并识别阴道镜图中异常区域的模型——富特征医疗目标区域检测器。除此之外，我们还开发了一套阴道镜图数据标注软件，方便后续研究使用。通过这一软件，我们与上海交通大学医学院附属国际和平妇幼保健院的医生进行合作，标注了 400 余例病人的阴道镜图数据。在我们提出的这一数据集上，富特征医疗目标区域检测器在特定场景上的表现（转化区的识别）已经达到人类医生的水平。

PU-3460

利用 Mimics 软件对泌尿系结石模型的研究

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【摘要】 **目的** 探讨 Mimics 软件对泌尿系结石模型的研究。**方法** 用固定容积量筒量取圆柱状同体积陶泥 21 份，按卵圆型、鹿角型、多发型将陶泥手工捏成 A、B、C 三组，每组 7 份，通过 256iCT 扫描获得各组样本的 CT 三维图像，将 CT 图像导入 Mimics 软件，测量每份陶泥的理论体积及平均 CT 值；评估通过 Mimics 软件测量的体积、CT 值与实际测量体积、CT 值的差异。**结果** A 组平均理论体积为 35.130±0.415ml，CT 值为 1065.71±5.33Hu；B 组平均理论体积为 34.521±0.211ml，CT 值为 1008.86±7.73Hu；C 组平均理论体积为 34.356±0.474ml，CT 值为 980.86±6.08；实测体积为 34.735ml，CT 工作站测量的 CT 值为 A 组平均 1121.29±35.76Hu，B 组平均 1071.29±22.19Hu，C 组平均 1083.86±6.33。统计分析结果， A、B、C 三组体积理论值和实测值无统计学差异，Mimics 软件测量的 CT 值与 CT 工作站测量的 CT 值有统计学差异。**结论** Mimics 软件用于测量泌尿系结石体积是可靠的；Mimics 软件测量的 CT 值与 CT 工作站测量的 CT 值存在差异，Mimics 软件测量的 CT 值略低，但从数据上来看，两者相差不大。

PU-3461

18-Fluordeoxyglucose Positron Emission Tomography/Computed Tomography Based Radiomic Features for Prediction of Epidermal Growth Factor Receptor Mutation Status and Prognosis in Lung Adenocarcinoma

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Abstract

Purpose

To investigate whether the radiomic features of 18-fluordeoxyglucose positron emission tomography/computed tomography (^{18}F-FDG PET/CT) could predict the epidermal growth factor receptor (EGFR) mutation status and prognosis in lung adenocarcinoma.

Methods

174 consecutive patients with lung adenocarcinoma who received ^{18}F-FDG PET/CT scan and EGFR gene test were retrospectively analyzed between July 2009 and August 2016. 1672 radiomic features were extracted from PET/CT images, which combined with the clinicopathological factors to construct a Random Forest (RF) model to identify EGFR mutant from wild type. The mutant/wild model was trained on a set of 139 patients and validated on an independent validation group (n=35) using the area under the receiver operating characteristic (ROC) curve. A subset of 105 patients with EGFR mutation were further analyzed. The second RF classifier to predict 19/21 mutation site [training group (n=80) and test group (n=25)] was also built and evaluated in EGFR mutation subset. Radiomic scores (R-scores) was calculated and 5 clinicopathological factors were integrated into a multivariate Cox proportional hazard (CPH) model for the prediction of overall survival (OS). C-index was calculated to evaluate the performance of the model. The prognosis of targeted therapy and chemotherapy in different EGFR mutation status was compared.

Results

109/174 (62.6%) of patients showed EGFR mutation. EGFR mutation of 21L858R was the most common mutation type (55.9%, 61/109). We identified mutant/wild model in the training group (AUC=0.77) and the validation group (AUC=0.71). The second model for the identification of 19/21 mutation site had AUC of 0.82 and 0.73 in the training group and validation group, respectively. The C-index of CPH model for the prediction of OS was 0.757. It was significant difference in survival time between targeted therapy and chemotherapy for EGFR mutation patients(p= 0.03).It was no significant difference in survival time between 19DEL and 21L858R after for targeted therapy (p= 0.40).It was no significant difference in survival time between EGFR mutation and EGFR wild after for chemotherapy (p= 0.30).

Conclusion

Our result show that radiomic features based on the ^{18}F-FDG PET/CT combining with clinicopathological factors could reflect the genetic difference and predict EGFR mutation type and prognosis.

PU-3462
定量 CT 纹理分析评估肾透明细胞癌 Fuhrman 分级的价值

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目的 定量 CT 纹理分析评估肾透明细胞癌（clear cell renal cell carcinoma，ccRCC）核分级的可行性。 **方法** 回顾性分析 78 例病理已经证实为 ccRCC 并且 Fuhrman 分级明确的患者资料，其中Ⅰ级 15 例，Ⅱ级 37 例，Ⅲ级 17 例，Ⅳ级 9 例，依照 Fuhrman 分级，将Ⅰ、Ⅱ级作为低级别组（共 52 例），Ⅲ、Ⅳ级作为高级别组（共 26 例），运用 Matlab 2014a 软件对所有患者的增强 CT 皮质期与髓质期图像进行纹理分析，提取 4 个灰度直方图特征参数（平均值、标准差、峰度、偏度）及 4 个灰度共生矩阵特征参数（对比度、相关度、能量、一致性），并对所有参数值进行分析、比较。 **结果** 不同 Fuhrman 分级患者间平均值、标准差和相关度的差异有统计学意义（$P<0.05$），余 5 个特征（峰度、偏度、对比度、能量、一致性）差异无统计学意义（$P>0.05$）；8 个纹理特征参数（平均值、标准差、峰度、偏度、对比度、相关度、能量、一致性）与 Fuhrman 分级相关性分析显示，仅相关度有较大的临床应用价值，$|r|$值为 0.382（$P<0.05$）；ccRCC 高级别组的相关度高于低级别组，差异有统计学意义（$P=0.001$），余特征值之间差异无统计学意义（$P>0.05$）。相关度鉴别高、低级别肾透明细胞癌 ROC 曲线下面积为 0.753，诊断敏感度与特异度分别为 76.92%、71.15%；各 CT 纹理特征间相关系数$|r|$值为 0.241～0.975，48.89%（22/45）纹理特征间有明显相关性（$|r|\geq0.5$），其中标准差与平均值的相关性最高（$|r|=0.975$），平均值与能量、偏度与峰值的相关性也较高（$|r|$值分别 0.948、0.954）。 **结论** 定量 CT 纹理分析在术前对肾透明细胞癌 Fuhrman 分级评估具有较高的临床应用价值，为患者的治疗方案制定及预后评估提供了依据。

PU-3463

探究人工智能辅助诊断系统对厚层胸部 CT 图像中肺亚实性结节的检出效能

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目的 由于医院 PACS 系统存储容量有限，基层医院常使用厚层胸部 CT 图像（如 5mm/7mm）进行日常影像诊断。因此，本研究探讨人工智能辅助诊断系统对厚层胸部 CT 图像中肺亚实性结节的检出效能。 **方法** 使用第 2 代双源 CT 前瞻性收集行常规胸部 CT 检查的门诊患者共计 120 例，将扫描图像进行厚层（5mm/7mm）图像重建，利用人工智能辅助诊断软件建立的厚层（5mm/7mm）模型，检测 2 组层厚 CT 图像中肺亚实性结节的数目。由 1 名影像诊断专家及 2 名高年资放射科医师通过 1mm 薄层 CT 图像及人工智能辅助诊断软件最终确定肺亚实性结节金标准数目。使用灵敏度及假阳性率评估人工智能辅助诊断系统对厚层胸部 CT 图像中肺亚实性结节的检出效能。**结果** 人工智能辅助诊断软件分别在 5mm，7mm 层厚的胸部 CT 图像中检测到 98、65 个肺亚实性结节，其中分别有 58、33 个与金标准一致，假阳性结节数分别为 40、32 个。肺亚实性结节检出的敏感度分别为 0.188±0.323，0.120±0.274，差异有统计学意义（$p<0.001$）。 5mm 及 7mm 两组间假阳性率分别为 0.333 / CT、0.275 / CT。**结论** 人工智能辅助诊断系统对厚层（5mm/7mm）胸部 CT 图像中肺亚实性结节检出的假阳性率均较低，且 5mm 层厚组检出效能明显优于 7mm 组。

PU-3464

MR-Based Radiomics of Rectal Cancer: Predict Metachronous Liver Metastasis

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Purpose
The purpose of this study was to investigate the value of high resolution T2-weighted-based radiomics in prediction of metachronous liver metastasis (MLM) in patients with rectal cancer.
Materials and Methods
This study retrospectively analyzed 113 patients with rectal cancer (31 in MLM group and 82 in non-metastases group) who underwent rectal MR imaging in our hospital on a 3T scanner (MAGNETOM Skyra, Siemens Healthcare, Erlangen, Germany). We used Radcloud (Huiying Medical Technology Co., Ltd, Beijing, China) to manage imaging data, clinical data, and subsequent radiomics statistics analysis. Lesions were delineated on the high resolution T2-weighted MR images manually by radiologist who was blinded to the clinical information of the patients. Features were extracted on the Radcloud platform, then the optimal features were selected by least absolute shrinkage and selection operator (LASSO) method to best predict the MLM. Computer-generated random numbers were used to assign 80% of the VOIs to the training data set and 20% of VOIs to the validation data set. Four machine learning algorithms of Logistic Regression (LR), Random Forest (RF), Decision Tree (DT) and K-nearest neighbor (KNN) were utilized for predictive model constructing. The prediction performance of the models was evaluated by receiver operating characteristic (ROC) curves with area under the curve (AUC), sensitivity and specificity, and compared by DeLong test.
Results
1409 quantitative imaging features were extracted from MR images firstly, and 10 optimal features related to the MLM prediction were selected with LASSO algorithm finally. The AUC, specificity and specificity for validation set of RF model was 0.943 (95% CI: 0.883 - 0.978), 90.32% and 92.68%, respectively. Compared to these four models, the RF model showed significantly better prediction performance (P_{LR-RF} < 0.0001, P_{KNN-RF} = 0.0036, and P_{DT-RF} = 0.0104). There were no significant differences among LR, KNN and DT Model (P > 0.05).
Conclusion
Our study demonstrated that the high resolution T2-weighted MR-based radiomics with RF model can serve as a quantitative tool to predict MLM of rectal cancer. The radiomics as imaging biomarker has important values in identifying tumor heterogeneity.

PU-3465
基于高分辨 T2WI 的影像组学对直肠癌新辅助治疗疗效的评估研究

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目的 探讨基于磁共振高分辨 T2WI 图像的影像组学方法对评估直肠癌新辅助治疗疗效的价值。
方法 回顾性分析 2018 年 1 月至 2018 年 12 月期间在我院经手术病理证实，新辅助治疗前后均接受高分辨磁共振成像的 46 例直肠癌患者。在两次扫描图像上分别勾画病灶的 VOI 并提取影像组学特征。根据肿瘤退缩分级(tumor regression grade，TRG)将 TRG 0、1 级分为疗效良好组，将 TRG 2、3 级分为疗效不良组。根据 TRG 分组利用 LASSO 算法选择特征。建立逻辑式回归、随机森

林、决策树、K 近邻机器学习分类器模型，进行 ROC 分析，计算曲线下面积（AUC），并比较模型间差异。**结果** 纳入的 46 例患者中 TRG 0 级 4 例，TRG 1 级 15 例，TRG 2 级 17 例，TRG 3 级 10 例，其中疗效良好组 19 例，疗效不良组 27 例。共提取 1029 个影像组学特征，降维得到与 TRG 分组相关的组学特征 3 个。建立的逻辑式回归、随机森林、决策树、K 近邻 4 种分类器模型测试集的 AUC 分别为 0.828，0.922，0.883，0.964。其中随机森林、决策树、K 近邻这三种模型的诊断效能优于逻辑式回归模型（P<0.05）。**结论** 基于磁共振 T2WI 高分辨率图像的影像组学模型能够判断直肠癌新辅助治疗后的肿瘤退缩程度并对直肠癌新辅助治疗的疗效具有一定的评估价值。

PU-3466

Nomogram Based on 18-Fluordeoxyglucose Positron Emission Tomography/ Computed Tomography for Prediction of Survival in Lung Adenocarcinoma Patients with EGFR Mutation Status and Guidance for Individualized Treatment

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Abstract

Purpose

To investigate whether the nomogram based on 18-fluordeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT) radiomic features combined with clinical pathological can predict the survival in lung adenocarcinoma patients with EGFR mutation status. And prognostic analysis was performed in order to guide individualized precision medicine.

Patients and methods

This study consisted of 174 (training cohort (n= 114), validation cohort (n = 60)) consecutive lung adenocarcinoma patients with different epidermal growth factor receptor (EGFR) mutation status (109 mutate-type and 65 wild-type). 1672 radiomic features were extracted from PET/CT images using a Radiomics prototype. Least absolute shrinkage and selection operator (LASSO) cox regression was used to select radiomic features and construct radiomic score (R-score). R-score and clinicopathological features were combined to construct the survival nomogram using another LASSO cox regression. The nomogram was validated in 174 patients with lung adenocarcinoma and 109 patient subset with EGFR mutations. Kaplan-Meier were performed in both training and validation cohorts and its calibration and discrimination were evaluated. The independent risk factors and treatment methods for patients with EGFR mutations were also analyzed.

Results

81 /174(46.65%) females and 109/174 (62.64%) of patients with EGFR mutation. The C-index of nomogram for the prediction of overall survival (OS) for 174 lung adenocarcinoma patients and 109 EGFR mutation patients were 0.83 and 0.80 respectively. It can better distinguish between high and low risk groups. The calibration curve showed good agreement between predicted and observed 5-year survival

probabilities. [Age(Hazard ratio [HR],1.04), Stage(HR,2.02), carcinoembryonic antigen (CEA) (HR,1.00), maximal standard uptake value(SUVmax)(HR,0.89)]and[Treatment(HR,4.08),Stage(HR,2.24),CEA(HR,1.00)]were independent risk factors for 174 lung adenocarcinoma patients and 109 EGFR mutation patients respectively. Targeted therapy is the main treatment method for patients with high-risk EGFR mutations, while two therapies prognoses were similar in low-risk group. The 19del is more likely to benefit from targeted therapy than the 21L858R.

Conclusion

The development of nomogram based on ^{18}F-FDG PET/CT radiomic features combined with clinical pathological has a good predictive performance to the survival in lung adenocarcinoma patients with EGFR mutation status, it can also guide the treatment of patients with EGFR mutations, which is conducive to individualized precision medicine.

PU-3467

Multivariate Pattern Classification of Primary Insomnia Using Three Types of Functional Connectivity Features

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Objective: To explore whether or not functional connectivity (FC) could be used as a potential biomarker for classification of primary insomnia (PI) at the individual level by using multivariate pattern analysis (MVPA).

Methods: Thirty-eight drug-naive patients with PI and 44 healthy controls (HC) underwent resting-state functional MR imaging. Voxel-wise functional connectivity strength (FCS), large-scale functional connectivity (large-scale FC) and regional homogeneity (ReHo) were calculated for each participant. We used support vector machine (SVM) with the three types of metrics as features separately to classify patients from healthy controls. Then we evaluate its classification performances. Finally, FC metrics with significant high classification performance were compared between the two groups and were correlated with clinical characteristics, i.e., Insomnia Severity Index (ISI), Pittsburgh Sleep Quality Index (PSQI), Self-rating Anxiety Scale (SAS), Self-rating Depression Scale (SDS) in the patients' group.

Results: The best classifier could reach up to an accuracy of 81.5%, with sensitivity of 84.9%, specificity of 79.1% and area under the receiver operating characteristic curve (AUC) of 83.0% (all $P < 0.001$). Right fronto-insular cortex, left precuneus and left middle frontal gyrus showed high classification weights. In addition, right fronto-insular cortex and left middle frontal gyrus were the overlapping regions between MVPA and group comparison. Correlation analysis showed that FCS in left middle frontal gyrus and head of right caudate nucleus were correlated with PSQI and SDS respectively.

Conclusion: The current study suggests abnormal FCS in right fronto-insular cortex and left middle frontal gyrus might serve as a potential neuromarkers for PI.

PU-3468

磁共振影像组学对直肠癌术前 T 分期的诊断价值

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目的：探讨基于磁共振高分辨 T2 加权成像的影像组学在直肠癌术前 T 分期中的应用价值。
方法：回顾性分析 2018 年 6 月至 2019 年 6 月期间，在上海长海医院经手术病理证实，术前接受 3T 磁共振成像的直肠癌患者，记录术后病理 T 分期结果。在高分辨 T2WI 图像上手动勾画病灶 VOI 后提取影像组学特征，之后采用 LASSO（least absolute shrinkage and selection operator）算法进行特征值降维，选择出对病理 T 分期最有价值的特征。使用降维后的特征样本随机分为训练集（80%）与测试集（20%）进行机器学习，建立极限梯度增强树（extreme gradient boosting, XGBoost）分类器模型，获得 ROC（receiver operating characteristic）曲线，计算曲线下面积（area under the curve，AUC）、敏感度、特异度及 95%置信区间。
结果：纳入 190 例直肠癌患者，其中男性 114 例，女性 76 例，年龄 15～78 岁，平均年龄 57±11 岁。T1 19 例(10%)，T2 61 例(32.1%)，T3 103 例(54.2%)，T4 7 例(3.7%)。提取得到 1029 个影像组学特征，降维得到与 T 分期相关的特征 7 个。XGBoost 分类器模型对 T1-4 分期的 AUC 分别为：0.927、0.904、0.895、0.970。
结论：基于磁共振高分辨 T2WI 的影像组学对直肠癌的术前 T 分期具有价值，有助于辅助临床制定治疗方案。

PU-3469

平扫和增强 CT 图像影像组学特征对鉴别肺部病灶良恶性价值的研究

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目的 对比平扫和增强 CT 中获取的影像组学特征在区分肺部病灶良恶性的价值。**方法** 收集 62 例肺部病灶病例，均使用层厚≤1mmCT 薄层平扫及增强扫描分别逐层勾画病灶，将勾画的感兴趣区用 AK 软件进行影像组学特征的提取并建模，观察分别来自平扫和增强扫描图像对相关模型性能的影响。**结果** 在 62 例鉴别肺部病灶良恶性方面，由平扫 CT 图像特征和增强 CT 图像特征用逻辑回归，SVM，KNN 方法构建的模型得出的 AUC 分别都为 0.95 及 0.917，用 Rtree 方法构建的模型得出的 AUC 分别是 0.967 及 0.833。**结论** 在鉴别肺部病灶良恶性方面，来自平扫 CT 图像的影像组学特征经过 4 种方法形成的模型性能均优于增强 CT 图像。

PU-3470

基于 CT 图像纹理分析鉴别肾透明细胞癌分化程度 WHO/ISUP 简化分级

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目的：基于 CT 图像纹理分析鉴别肾透明细胞癌(ccRCC)分化程度 WHO/ISUP 简化分级
方法：收集本机构经病理证实的 ccRCC 患者 113 例。其中将 I、II 级分为低级别(81 例)，III、IV 级分为高级别(32 例)。将肾癌的皮质期图像被导入 ITK-SNAP 软件中勾画肾癌 3D-ROI 用于提取纹理特征，共提取纹理特征 42 个。采用 LASSO 回归进行数据降维，构建纹理风险评分。以 WHO/ISUP 简化分级为金标准，将纹理评分和临床资料纳入二元 *Logistics* 回归。绘制 ROC 评价各参数的诊断效能，并计算 C 统计量。采用决策曲线分析纹理分析、临床资料和两者联合的患者净获益情况。
结果：低级别 ccRCC 纹理分析风险评分为-1.30±0.70，高级别-0.40±0.77，两组差异有统计学意义(t=-5.98,p<0.001)。多因素二元 *Logistics* 回归结果表明纹理分析风险评分和区域淋巴结肿大是鉴别低、高级别 ccRCC 的独立危险因素，OR 值分别为 4.445(95%CI:1.928-10.248)及 5.012(95%CI:1.807-13.899)。AUC 分别为 0.811(95%CI:0.730-0.891)和 0.745(95%CI:0.638-0.852)。两者联合 AUC 为 0.854(95%CI:0.783-0.926)。纹量分析风险评分、区域淋巴结肿大及两者联合的诊断效能经两两比较(Delong 法)，联合诊断的 AUC 与区域淋巴结肿大差异有统计学意义(Z=3.60,p<0.001），与纹理分析差异无统计学意义(Z=1.71,p=0.088)。决策曲线分析结果表明联合诊断的决策曲线在 0.21～0.77 概率阈值范围内高于纹理分析结果，可使患者净获益提高。
结论：纹理分析风险评分联合区域淋巴结肿大对于 ccRCC 的 WHO/ISUP 简化分级效能较高，可使患者净获益提高。

PU-3471
基于能谱 CT 影像组学构建肾透明细胞癌分化程度的预测模型：对比常规增强 CT

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目的：比较基于能谱 CT 影像组学及常规增强 CT 对肾透明细胞癌(ccRCC)分化程度的预测模型
材料与方法：119 例 ccRCC 患者采用分层抽样分为开发队列和验证队列。根据 2016 版肾癌 WHO/ISUP 分级将 I 级及 II 级定义为低级别组，III 级及 IV 级定义为高级别组。常规增强 CT 的影像征象被两名放射科医师重新评估用于构建常规增强 CT 预测模型。CT 增强扫描皮质期图像用于构建影像组学的预测模型。两模型分别在验证组队列进行验证。进一步比较两个预测模型的区分度、校准度、净重新分类指数和综合判别指数。采用决策曲线分析两个预测模型不同概率阈值下的患者净获益情况。
结果：在开发队列中，影像组学预测模型的 AUC 大于常规增强 CT 的预测模型，且有统计学显著性（Z=2.47,p<0.05）。净重新分类指数 NRI=9.52%，具有统计学显著性(Z=3.14，p<0.01)。综合判别指数 IDI=21.6%，具有统计学显著性(Z=3.30，p<0.01)。在验证队列中，影像组学预测模型的 C-statistics 大于常规增强 CT 的预测模型，但差异无统计学意义（Z=1.81,p=0.07）。NRI=14.29%，且有统计学显著性（Z=4.64，p<0.01）。IDI=33.7%，且具有统计学显著性

（Z=2.70，p<0.01）。验证队列决策曲线分析显示，在 3%～81%范围影像组学预测模型对患者的净获益始终大于常规增强 CT 的预测模型。
结论：基于 ccRCC 能谱 CT 增强扫描皮质期图像的影像组学构建的预测模型，对预测高、低级别具有一定的临床价值，可为患者术前治疗及预后提供参考依据。

PU-3472
GE Revolution GSI 模式虚拟单能量成像联合 MARS 技术在下肢 CTA 检查中去除金属植入物伪影和改善金属植入物周围血管可视化效果的应用评估。

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摘要 目的：评估 GE Revolution GSI 模式虚拟单能量成像技术联合 MARS 在下肢血管去除金属伪影和改善金属植入物周围下肢血管的效果，并获得图像质量最佳单能量图像。
方法：回顾性分析 20 例下肢有金属植入物患者下肢 CTA 影像资料，均采用 GSI 扫描技术。重建后的影像数据均用 AW4.7 工作站进行后处理，重建得到 1 组 100kvp-like 混合能量图像，40kev~140kev 以 10kev 为间隔的共 11 组 Monochromatic 图像和 11 组 Monochromatic+Mars 图像。每组图像随机选择 1 个伪影最严重和 1 个无伪影的感兴趣区域（ROI），测出各自的 SD 值，计算出各自伪影指数（artifacts index，AI），并对各自图像进行主观评分（0~3 分）结果：2 种成像方式的 AI 在 40~70kev 无统计学意义（p>0.05）,在 80~140kev 存在明显统计学差异（P<0.05）,且 Monochromatic+Mars 图像的 AI 值在 100kev 最低。结论：GE Revolution GSI 模式虚拟单能量成像联合 Mars 技术可以有效改善下肢 CTA 检查患者金属植入物造成的伪影并能同时有效的显示金属植入物附近的下肢血管，对金属植入物术后患者，进行下肢 CTA 检查的影像诊断有重要意义。

PU-3473
基于常规 MR 图像纹理分析术前区分脑胶质瘤高低级别的临床应用研究

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目的：探讨一二阶（直方图及 GLCM 灰度共生矩阵）纹理分析在脑胶质瘤术前分级中的临床应用；
方法：选取手术病理结果为高级别（WHO,Ⅲ--Ⅳ）24 例；低级别（WHO, Ⅰ--Ⅱ）14 例，手术前均做 MRI 脑增强检查，导出常规 T2WI 序列，Dicom 保存图像，将图像导入 ITK-SNAP 软件上进行手动勾画 ROI，ROI 选取病灶最大层面（不包含囊变水肿等区域），不明确病灶时参考增强图像，将保持好的 ROI 导入图像纹理分析软件 AI-Kit（Artificial Intelligence Kit，AI kit），进行纹理分析计算，其中直方图 42 个纹理参数，灰度共生矩阵 144 个纹理参数（步长为 1、4、7）；对所算结果进行独立样本 t 检验，找出有统计学差异的纹理参数，运用 ROC 曲线判断有差异的纹理参数的诊断效能；结果：直方图纹理参数统计学分析差异的有 9 个，GLCM31 个，直方图纹理参数 ROC

曲线下面积最大参数为偏度（skewness），面积为 0.78，敏感度为 0.714、特异性 0.75，诊断界值为 0.128，GLCM 纹理参数最大面积为能量（energy）135 角、步长为 1，面积为 0.708，敏感度为 0.739、特异性 0.786，诊断界值为 0.0099；结论：基于 T2WI 图像纹理分析术前区分脑胶质瘤高低级别一二阶纹理参数分别为偏度和能量，二者诊断效果中等，给术前确定肿瘤分级提供了新的指标。

PU-3474

Frontier ASPECTS 自动评分软件提高了初级放射科医生在评估早期急性缺血性脑卒中的表现

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目的:本研究旨在比较 Frontier ASPECTS 自动评分软件与不同专业水平放射科医生在评估早期急性缺血性脑卒中患者 CT 扫描中的表现，并评价该软件能否有助于提高经验较少的放射科医生评分的准确性。
方法：回顾性分析 55 例急性大脑中动脉缺血患者的头颅 NCCT。Frontier ASPECTS 自动评分软件、两位高级放射科医师（二十年以上）、两位初级放射科医师（三年以下）分别在不知患者临床信息的情况下对患者出现症状 6h 内的头颅 NCCT 图像进行 ASPECT 评分。随后初级放射科医师结合 Frontier ASPECTS 自动评分软件再次进行评分。以另两位高级放射科医师对发病 24h 后的随访 CT 图像所做的协商评分作为参考标准，各组间进行比较，通过组内相关系数分析（ICC）和 Bland-Altman 图进行统计分析。
结果： Frontier ASPECTS 自动评分评分软件、高级放射科医师协商评分与参考评分间一致性均较高（分别为 r=0.842 和 0.803），而初级放射科医师协商评分与随访评分间一致性较差（r =0.680）。同时 Bland-Altman 图分析显示，初级放射科医师组平均 ASPECT 差异和标准差差异（平均差异=1.35；SD = 1.42）与 Frontier ASPECTS 自动评分软件和高级放射医师组相比差异更大（平均差异=0.16，0.22；SD = 1.24，1.13 ）。但在 Frontier ASPECTS 自动评分软件帮助下，初级放射科医师组评分协商值与随访评分间一致性得到提高（r =0.852），平均 ASPECT 差异和标准差差异减小（平均差异= 0.20；SD = 1.11）。
结论：Frontier ASPECTS 自动评分软件评分与高级放射科医师组的 ASPECTS 评分结果有很高的一致性。而且，Frontier ASPECTS 自动评分软件可以为经验不足的放射科医师评估急性缺血性卒中患者评分提供重要参考价值。

PU-3475

Predicting the invasiveness of pulmonary ground-glass nodules by machine learnings

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Background: As a promising method, machine learning has been widely used in medical field. In this study, The machine learnings waere used to predict the pathological infiltration of ground-glass nodules in chest CT images. Materials and Methods: In this study, there were 270 ground-glass nodules were collected from 269 patients.

There were 101 atypical adenomatous hyperplasia, in situ adenocarcinoma and mininvasive adenocarcinoma, and 169 invasive adenocarcinoma. The clinical features, CT morphological features and quantitative features based on CT texture analysis were collected. All cases were divided into training group and validation group.In training group, there were 220 GGNs, and in the validation group,there were 50 GGN (20 cases of lung invasive adenocarcinoma and 30 cases of invasive lesions). In the training group, the imaging method, the random forest method and the convolution neural network method were used to study the characteristics of the case. In the validation group, the above methods were used to diagnose and predict the GGN. The prediction efficiency is evaluated by ROC curve analysis.
Results：In the validation group, The area under the ROC curve is 0.836, the specificity and sensitivity are about 80.8 and 68.5, the accuracy of random forest method is about 78.2 and the area under the ROC curve is about 0.807, the specificity and sensitivity are about 84.3 and 71.5, and the convolution nerve is respectively. The area under the ROC curve is about 0.874, and the specificity and sensitivity are about 83.85.0 and 75.0, respectively. Among the three methods, convolution neural network has the best predictive accuracy.
Conclusion：The method based on machine learning has high accuracy in the diagnosis of pathological invasion of GGN lung adenocarcinoma, and the convolution neural network method based on deep learning is the most accurate.

PU-3476
基于基于深度学习的计算机辅助诊断系统对颅内血肿的体积测量研究

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目的：探索基于深度学习的计算机辅助诊断系统对脑出血规则和不规则形态血肿体积测量的准确性与实用性。
方法：收集符合纳入标准的脑出血患者 120 例，根据 CT 图像上血肿最大层面的形态分为两组：规则组 60 例和不规则组 60 例，分别采用 itk-snap 软件手工勾画、2/3Sh 法、多田公式法及计算机辅助诊断系统进行血肿体积测量，以 itk-snap 软件手工勾画作为血肿体积的金标准，采用两两配对 t 检验比较各种方法测量血肿体积。
结果：种方法对规则血肿及不规则血肿的测量结果比较，差异均有明显统计学意义，且对不规则血肿差异较大。对于规则血肿，相对于 itk-snap 软件手工勾画测得血肿的平均体积 2/3Sh 法平均误差为 7.58%，多田公式法平均误差为 13.15%，计算机辅助诊断系统平均误差为 4.11%；对于不规则血肿，相对于 itk-snap 软件手工勾画测得血肿的平均体积，2/3Sh 法平均误差为 8.37%，多田公式法平均误差为 30.99%，计算机辅助诊断系统平均误差为 6.05%。
结论：基于深度学习的计算机辅助诊断系统对颅内规则和不规则血肿体积测量的结果较 2/3Sh 法、多田公式法更为准确，能减少血肿测量误差。

PU-3477

A Radiomics Nomogrom for prediction of bone metastasis in newly diagnosed prostate cancer patients

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Purpose: To develop and validate a radiomics nomogram for prediction of bone metastasis (BM) in patients with newly diagnosed prostate cancer (PCa).
Materials and Methods: One-hundred and sixteen patients (training cohort: n =81; validation cohort: n =35) who underwent Prostate MR imaging and confirmed by pathology with newly diagnosed PCa from January 2014 to January 2019 were enrolled. Radiomic features were extracted from diffusion-weighted (DWI), axial T2-weighted fat suppression (FST2-w) and dynamic contrast-enhanced T1-weighted (DCE T1-w) MRI of each patient. Least absolute shrinkage and selection operator (LASSO) regression was used for data dimension reduction, feature selection, and radiomics feature construction. Combined with independent clinical risk factors, a radiomics nomogram was established by a multivariate logistic regression model. Nomogram calibration and discrimination was evaluated in training set and verified in the validation set. Finally, decision curve analysis was performed to estimate the clinical usefulness of the nomogram.
Results: The radiomics signature consisting of 12 selected features was significantly associated with bone status (P<0.001 for both training and validation sets). The radiomics nomogram combined a radiomics signature from Multiparametric MR images with independent clinic risk factors. The model showed good discrimination and good calibration in the training cohort (AUC 0.93, 95%IC, 0.86 to 0.99) and the validation cohort (AUC 0.92, 95%IC, 0.84 to 0.99). Decision curve analysis also demonstrated the clinical utility of the radiomics nomogram.
Conclusion: The radiomics nomogram which incorporates the Multiparametric MRI-based radiomics signature and clinical risk factors, can be conveniently used to facilitate the individualized prediction of bone metastasis in patients with newly diagnosed prostate cancer.

PU-3478
疲劳状态的放射科规培医师在 AI 软件辅助下对＜4mm 肺结节检测效能的研究

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目的：疲劳状态的放射科规培医师在 AI 肺结节检测软件辅助下对＜4mm 肺结节检测效能提升的研究。
方法：收集西门子双源 CT 扫描的胸部病例 179 例。放射科规培医师分别在三种不同阅片模式进行阅片：正常状态下（A 组）、疲劳状态下（即一天日常工作满 8 小时以上）独立阅读（B 组）、疲劳状态下结合 AI 辅助软件进行阅片（C 组），三种阅片模式均间隔洗脱期（大于 15 天），并记录＜4mm 结节位置、大小、数目。最终，将 3 次肺结节检测结果与金标准（由 2 名从事影像诊断工作

8 年及以上的医师结合 AI 辅助软件共同阅片，意见不同时由第 3 名从事影像诊断工作 15 年及以上的医师进行会诊，最后做出一致诊断）进行比对，记录正确、误诊、漏诊结节数，用敏感度及假阳性率评价三种模式的检测效能。

结果：试验共纳入 995 个结节，三组检出真阳性结节数为；658、531、847，误诊结节数为 233、168、84，三组均有统计学差异($p<0.05$），三组敏感性分别为 42.71%，36.48%，76.68%,假阳性率分别为 1.48/CT、0.56/CT、0.44/CT ($p<0.05$)；B 组（疲劳状态下阅片）比 A 组（正常状态下阅片）肺结敏感性降低了 6.23%($p<0.05$)，C 组（疲劳状态结合 AI 辅助软件）敏感度最高（76.68%），假阳性率最低（0.44/CT）。

结论：疲劳状态降低了放射科规培医师对＜4mm 肺结节的检测效能，然而，在 AI 辅助下，疲劳状态下的放射科规培医师能够达到比非疲劳状态下更高的肺结节检测效能。对于容易漏诊的＜4mm 肺结节，疲劳状态的放射科规培医师在 AI 肺结节检测软件辅助下能够到达较高的检测效能。

PU-3479

Study on the detection capability of AI assisted software in detecting Perivascular Pulmonary nodules by resident

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PURPOSE: To evaluate the detection capability of artificial intelligence (AI) assisted software in the detection of perivascular pulmonary nodules by residents.**METHOD AND MATERIALS:** A total of 120 patients with perivascular pulmonary nodules who underwent chest CT examination were collected. One senior radiologist with more than 10 years' experience read CT images based on the initial diagnosis of another senior radiologist with similar experience and a final decision was subsequently conducted by deputy chief radiologist with more than 15 years' experience to determine the perivascular pulmonary nodules with the assistance of AI software. All readings were performed on 1 mm slice thickness CT images with the assistance of AI software (InferRead CT_Lung 6.0, Infervision, Beijing, China). One resident read the images without AI software and recorded the perivascular pulmonary nodules (group A). After two weeks washout period, the same resident read CT images again with AI software (Group B). The number of perivascular pulmonary nodules, length-diameter, location and labeling time were recorded. The number of true positive nodules, false positive nodules and false negative nodules in group A and B were compared with the gold standard to calculate sensitivity, false positive rate.**RESULTS:** A total of 235 perivascular pulmonary nodules with the distance between the edge of pulmonary nodules and the adjacent vascular edge ≤ 2mm were found as gold standard. Group A detected 170 perivascular pulmonary nodules, including 159 true positive nodules, 11 false positive nodules and 75 false negative nodules with a sensitivity of 71.74 ±3.25% and a false positive rate of 0.09/CT. Group B detected nodules 261,including true positive nodules 233, false positive nodules 28, false negative nodules 2,sensitivity of 99.31 ±0.50, false positive rate of 0.23/CT. The sensitivity of group B was higher than that of group A ($p<0.05$). The false positive rate of group A was lower than that of group B . The

labeling time of group B (264.07 ±6.31s) was shorter than that in group A (491.92 ±4.30s) with statistically significant difference ($p<0.01$).
CONCLUSION：Compared with resident without AI software, the AI-assisted residents achieved higher detection sensitivity and diagnostic accuracy of perivascular pulmonary nodules with reduced reading time while false positive rate compromised.

PU-3480

Assessment of AI-assisted lung nodule detection software using different reconstruction kernels

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Objective: To evaluate the performance of AI-assisted detection of lung nodules using different reconstruction kernels.
Method And Materials: A total of 183 patients who underwent routine chest CT examinations at Zhongshan Hospital affiliated to Dalian University from January 1, 2019 to January 31, 2019 were collected. The raw data were reconstructed with high resolution kernel (B70f) and standard kernel (B30f) to obtain DICOM images and they were transferred to the AI server (InferRead CT Lung Research, Infervision, Beijing, China) for automated nodule detection. The number of nodules, long-axis diameter and locations were recorded. One senior radiologist with more than 10 years' experience read CT images based on the initial diagnosis of another senior radiologist with similar experience and a final decision was subsequently conducted by deputy chief radiologist with more than 15 years' experience to determine the ground truth lung nodules. All readings for ground truth were performed on 1 mm slice thickness CT images with the assistance of AI software. The number of true positive nodules, false positive nodules under different reconstruction kernels were compared with the gold standard to calculate sensitivity and false positive rate. Finally, statistical analysis was conducted to compare the difference of sensitivity and false positive rate between the two reconstruction kernels.
Results: A total of 1264 nodules were confirmed to be gold standard nodules. The number of true positive nodules in B70f group and B30f group were 1047 and 898, respectively. The numbers of false positive nodules were 283 and 440, respectively. The sensitivity for lung nodule detection were 0.889±0.25 and 0.75±0.429 for B70f and B30f groups, respectively with statistically significant difference. The false positive rates were 1.55 per CT scan and 2.40 per CT scan, respectively for B70f and B30f groups, respectively with statistically significant difference.
Conclusion: The sensitivity for AI-assisted lung nodules detection was higher for B70f reconstruction than B30f. The false positive rates for AI-assisted lung nodules detection was lower for B70f reconstruction than B30f.

PU-3481

AI 辅助软件对住院医师在血管旁肺结节检测价值的研究

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目的：探讨住院医师应用人工智能(Artificial Intelligence，AI)辅助软件对血管旁肺结节检测的临床应用价值。**材料与方法**：随机收集本院使用 2 代炫速双源 CT 行胸部 HRCT 检查的 120 例患者胸部薄层（层厚为 1mm）图像，共收集 235 例血管旁肺结节（肺结节边缘与临近血管边缘距离≤2mm）。所有胸部图像由 2 名高年资胸部放射医师分别进行肺结节标注，再由 1 名主任医师审核，意见不一致时讨论并最终确定金标准，并记录血管旁肺结节的位置、大小及属性。由 1 名住院医生在不借助 AI 辅助软件条件下，独立阅片并记录血管旁肺结节及阅片时间；经过 2 周洗脱期后，此名住院医师使用 AI 辅助软件（推想 6.0 版）再次阅片并记录。将独立阅片（A 组）及 AI 辅助下阅片（B 组）两组结果与金标准比对，分别记录两组血管旁肺结节数并计算血管旁肺结节检出灵敏度与平均阅片时间，并对两组数据进行统计学分析，P＜0.05 为有统计学意义。
结果：A、B 两组检出真阳性结节分别为共 159 个、233 个，假阳性结节分别为 11 个、28 个，假阴性结节分别为 75 个、2 个，平均假阳性结节分别为 0.09/CT、0.23/CT，B 组较 A 组平均假阳性结节多 0.14/CT，两组差异有统计学意义（*P*＜0.05）。A、B 两组血管旁肺结节检出灵敏度分别为 71.74±3.25%、99.31±0.50%，B 组灵敏度较 A 组提高 27.57%，两组差异有统计学意义（*P*＜0.001）。A、B 两组阅片时间分别为 491.92±4.30s、264.07±6.31s,B 组阅片时间较 A 组减少 227.85s,阅片效率较 A 组提高 46.32%。两组差异有统计学意义（*P*＜0.001）。
结论：AI 辅助下住院医师阅片较独立阅片假阳性血管旁肺结节数增加，但 AI 辅助下住院医师阅片对血管旁肺结节的检测灵敏率明显提高并显著减少阅片时间，有较高的临床应用价值。

PU-3482
Automatic kidney segmentation using deep learning: 2D or 3D?

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Purpose: to compare two methods' effects of segmenting kidney in CT images. **Materials and Methods:** The two compared models for kidney segmentation are 2D U-Net and a cascaded application of two 3D U-Net. The 2D U-Net's input is every single slice of CT scan, whereas the first 3D U-Net's input is the down-sampled CT scans and the following 3D U-Net's input is the cropped located kidney images acquired from the first 3D U-Net model, making use of spatial and local information at the same time. 100 abdomen CT scans were collected from hospital for the period from January 2018 through July 2018. The two models were trained and estimated with dice coefficient on the small training dataset(30) and held-out test data set(30), on the larger training dataset(70) and held-out test data set(30), respectively. In addition, we also compare the contour and boundary of the two segmented kidneys with the original labelled kidney. Results: The 2D U-Net and 3D U-Net trained on the larger training dataset achieved a mean dice coefficient of 0.95 and 0.96 in the held-out test dataset, whereas the 2D and 3D models trained on the smaller training dataset achieved a mean dice coefficient of 0.95 and 0.78, respectively. Segmentation out of the kidney's boundary occurred much less in 3D U-Net model compared with the 2D U-Net model. **Conclusion:** 2D U-Net model can perform well with a small training dataset, while the cascaded 3D U-Net model performed better with an adequate training dataset.

PU-3483

Hybrid Deep CNN Model based on Pluralistic Medical Features for Lung Nodule Diagnosis and False Positives Elimination

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Purpose: Artificial Intelligence (AI) is making a strong comeback with its applications in CAD. Recently reported AI models for early detection and diagnosis of lung nodules show that False Positives (FPs) is a severer obstruction for precise diagnosis. The paper proposes a medical cognition assisted AI model based on hybrid deep CNN and pluralistic features to address that problem.
Materials and Methods: The overall scheme is granting medical cognition to a well performed computing model, by introducing thinking ability of radiologist to AI model (FPs can be easily eliminated by radiologists with his/her cognition). Firstly, pluralistic features (image feature, clinical feature, CT characteristics feature) are extracted from CT scan, patient information, clinical test. Then, by imitating thinking pattern of radiologist, we introduce a CNN for clinical and CT characteristics features, three 3D-CNN for image feature to establish a hybrid system, and a RF classifier is used to finalize the diagnosis. Finally, a ternary classification (benign, malignant, FPs) instead of binary classification is carry out, to eliminate FPs.
Results: The proposed system is tested on public dataset of LIDC-IDRI to confirm stability and validity. After sample selection and expansion, 9024 benign samples, 14000 malignant samples, 13444 non-nodule samples are used. FPs are nearly totally eliminated. Sensitivity, specificity, accuracy, AUC of benign/malignant classification are 96.5%, 93.1%, 95.2%, 96.2%. ROC and FROC of our work outperform those of other related works. For clinical application, 340 cases of CT data with pGGN (pure ground-glass nodule) are collected from cooperating hospitals. After FPs elimination, accuracy of ternary classification (AIS, MIA, IA) of malignant pGGN is 90.97%. Sensitivity, specificity, accuracy, AUC of IA identification (binary classification) are 93.7%, 91.4%, 94.1%, 93.6%.
Conclusion: The proposed AI model obtains promising diagnosis precision, due to its high computational power and professional medical cognition. By solving FPs problem, the outcome is improved further.
Clinical Applications: Our work shows great advantages, especially in identifying stages of malignant GGN. Clinically, the model can be used to provide diagnostic information, guide surgery, and manage follow-ups.

PU-3484

基于影像组学模型鉴别结节/肿块型肺隐球菌与肺腺癌、肺结核

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目的 探讨影像组学预测模型鉴别结节/肿块型肺隐球菌病与肺腺癌、肺结核的可行性。**方法** 回顾性分析 28 例结节/肿块型肺隐球菌病和 30 例肺腺癌、26 例结核病人的 CT 扫描资料，应用 GE Artificial Intelligence Kitl 软件计算纹理特征，通过 ANOVA+MW、spearman 相关系数、Lasso 回归三种方法联合筛选主要纹理参数，通过随机森林构建模型，并采用 ROC 曲线评估模型鉴别效能。**结果** 肺隐球菌病和肺腺癌组筛选出 7 个纹理特征进行建模，验证集 AUC 为 0.96［95%CI（0.87-1）］，灵敏度 100%，特异度 77.78%，准确率 88.89%；肺隐球菌病和肺结核组筛选出 4 个纹理特征进行建模，验证集 AUC 为 0.99［95%CI（0.93-1）］，灵敏度 87.50%，特异度 88.89%，准确率 88.24%。**结论** CT 平扫图像影像组学可以用于结节/肿块型肺隐球菌病与肺腺癌、结核的鉴别。

PU-3485

Influence of tube voltage and reconstruction slice thickness on quantitative CT texture analysis: a reproducibility study on kidney stones

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Purpose: Recent evidence suggests that texture features vary with different acquisition parameter. This study aims to determine the possible influence of tube voltage and slice thickness on CT texture analysis (CTTA) for kidney stone evaluation.
Methods: This retrospective study included 93 patients with 120 kidney stones. All the patients underwent unenhanced renal CT with both regular (120kV) and low-dose (Sn150kV) protocols with 1mm and 5mm reconstruction slice thickness on a third-generation dual-source CT. On the basis of stone size, stones were divided into four groups (size≥10mm, 5-10mm, 3-5 mm, <3mm) with 30 stones in each group. For each stone, 3D segmentation was performed manually by using Stonechecker software (www.stonechecker.com part of IQAI Ltd., UK). Regions of interest (ROI) covering the entire stone were delineated on each slice. The agreement of the texture parameters from CTTA analysis of two protocols was assessed by intra-class correlation coefficients (ICC) and further visualized using Bland-Altman plots.
Results: For stones<5mm, texture parameters of Mean, SD, Entropy and MPP are generally reproducible between different kVs on 1mm images with high ICC (0.8-1.0) at fine texture scales. For stones range between 5-10mm, Mean, SD, Entropy and MPP are also reproducible between different kVs on both 1mm and 5mm images with high ICC (0.8-1.0) at fine and medium texture scales. For stones larger than 10mm, Mean, SD, Entropy, MPP, Skewness and Kurtosis are generally reproducible between different kVs on both 1mm and 5mm images with ICC range between 0.7-1.0 at all texture scales. Mean, SD, Entropy, and MPP also showed good to excellent degree of reliability between different slice thickness on 120kV and Sn150kV images.

Conclusion: Texture parameters of Mean, SD, Entropy and MPP showed good reproducibility between protocols with different tube voltages and slice thickness no matter the size of kidney stone.

PU-3486

3D Context-aware Deep learning System in detection of pleural effusion: A Preliminary Study

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Purpose To explore the feasibility and reliability of 3D context-aware deep learning (DL) system in detection and lobe-level localization of pleural effusion by comparisons with radiologists. **Method and Materials** Based on 2722 plain chest CT scanning dataset, We built Context-aware DL network for detection of pleural effusion based on deep learning, with 2601 slice-level annotations confirmed by experienced radiologists. This network took seven consecutive slices from axil CT as input and employed 3D convolution to properly model 3D context. Lesion position is further determained by a 3D convolution based lobe segmentation network. Then, all the chest CT examinations were analyzed by Context-aware automatic pleural effusion (CAPE) from January to March of 2019 as group A, and the results in reporting system were classified as group B. Two experienced radiologists reviewed all the CAPE results and made evaluations as th gold standard. **Results** A total of 504 CT scans were tested, with 347 pleural effusion detected in group A, including 175 true positive cases and 172 false positive cases. While 198 pleural effusion were detected for group B, including 177 true positive cases and 22 false positive cases. With the CAPE results as reference, all 218 pleural effusion were detected by radiologists. **Conclusions** 3D Context-aware Deep learning System demonstrated feasibility in detecting pleural effusion and localizing lung lobes, and the detection rate increased for radiologists with the help of CAPE, but the false positive rate needs improvement.

PU-3487

Correlations Between P53 Mutation Status and Texture Features of CT Images For Hepatocellular Carcinoma

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Objectives: To investigate the performance of texture analysis in characterizing P53 mutations of hepatocellular carcinomas (HCCs) based on computed tomography (CT). Methods: 63 HCCs patients underwent CT scans and were tested for P53 mutations. Patients were divided into two groups of P53(-) and P53(+) according to the P53 scores. First- and second-order texture features were computed from the CT images and compared

between groups using independent Student’s t-test. A Spearman’s correlation coefficient was used for correlations to assess the relationship between the different P53 sores and CT data. The performance of texture features in differentiating the P53 mutations of HCC was assessed using receiver operating characteristic (ROC) analysis. Results: The mean values of angular second moment(ASM) (mean=0.001) and Contrast (mean=194.727) for P53(-) were higher than those of P53(+). Meanwhile the mean values of Correlation (mean=0.735), Sum variance (mean=1111.052), inverse difference moment (IDM) (mean=0.090), and Entropy (mean=3.016) for P53(-) were lower than those of P53(+).Significant correlations were found between P53 scores and ASM(r=-0.439),Contrast(r=-0.263), Correlation(r=0.551), Sum of squares (r=0.282), sum variance(r=0.417),IDM (r=0.308) and Entropy(r=0.569). Five texture parameters (ASM, Contrast, Correlation, IDM and Entropy) were predictive of P53 mutation status, with AUCs ranging from 0.621 to 0.792.
Conclusions: There was a direct relationship between P53 mutations and gray-level co-occurrence matrix (GLCM), but not with histograms for HCC patients. Correlation and Entropy seemed to be the most promising in differentiating P53 (-) from P53(+).

PU-3488
肺部影像人工智能系统在肺结节复查患者中的应用价值分析

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目的：分析人工智能系统在胸部 CT 肺结节患者中的应用价值，提高肺结节复查患者诊断准确性及复查对比价值。
方法：选取肺结节患者行 2 次胸部 CT 检查 40 例，分为 2 组，每组 20 例，一组为肺部影像人眼观察组，另一组为肺部影像人工智能分析组，两组分别对患者 2 次胸部 CT 检查肺部影像进行分析观察肺结节数目、大小、形态及复查对比变化等情况。
结果：肺部影像人眼观察组容易遗漏病变、两次检查结果未对比分析或存在一定差异；肺部影像人工智能组能准确反映出细小病变，不易遗漏病变且两次结果具有较高的一致性，能很好的进行对比分析。
结论：肺部影像人眼观察组观察肺结节受人的主观限制容易遗漏细小病变，两次人眼观察不一定是同一个人，有一定主观判断误差，对肺结节复查患者对比分析价值不高；人工智能对同一患者不同时期检查肺部影像能准确分析定位到每一个细微病变，对结节的数目、大小、形态都有准确的检出且两次结果具有较高的一致性，能很好的进行对比分析，对肺结节复查患者能够清楚的反映病灶是否增多、减少、增大、缩小等敏感问题，具有较高的对比分析价值。

PU-3489
冠脉 AI 在冠状动脉 CT 血管成像图像后处理以及诊断价值的初步评估

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目的：探讨冠脉 AI 在冠状动脉 CT 血管成像图像后处理的优劣势及以及诊断价值初步评估。

方法：从重庆医科大学附属第三医院自 2019 年 4 月 15 日至 2019 年 6 月 19 日就诊的可疑冠心病患者中，随机选取使用数坤科技冠脉 AI 诊断工具进行图像重建及报告，同期与人工重建以及报告进行对比，共 50 名患者。分别从从冠脉图像质量、后处理 VR、VR-tree、拉直对比进行统计分析以及 AI 报告诊断报告 进行分析。

结果：后处理方面：研究发现冠脉 AI 后处理图像较人工处理相比，冠脉分支显示更长、冠脉管壁更加光滑、细节更加出色，同时拉直对比血管对比更加清晰，并且能够准确定位狭窄部位及分析狭窄程度，自动判定支架。共 50 名患者，其中后处理合格 45 名，有 5 名不合格，后处理合格率 90%，其重建错误的原因主要包括冠脉伪影、冠脉截断、血管截断导致的分割遗漏，并且无法自动识别肌桥。报告诊断方面：冠脉 AI 能够部分补充弥补人工报告缺陷（发现轻微钙化及轻度狭窄）。45 名后处理合格患者中，4 名患者报告不合格，报告诊断合格率 91%，其报告错误主要包括伪影、错层造成的软斑误报，管腔密度不均匀导致的钙斑误报，以及血管壁毛糙造成的误报。

结论：冠脉 AI 在图像后处理及报告书写上较人工有部分优势，并且能够完善后处理结果以及补充人工报告的遗漏，但是目前仍存在部分缺陷，冠脉 AI 的报告质量仍需要人工进行把控，冠脉 AI 是放射科工作人员的一项有效辅助工具。

PU-3490

重建层厚对计算机辅助工具肺结节检出准确性的影响

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目的 通过对 149 个不同重建层厚的 SPN 容积数据进行分析，探求计算机辅助工具对 1mm、5mm 重建层厚数据 SPN 的检出效能，进一步研究其重建层厚对肺结节检出的影响作用

资料与方法

收集“数字肺”项目数据库内自 2014 年 6 月至 2015 年 7 月所有 SPN 孤立性肺结节病例，均有完整的病史资料及 CT 影像资料。根据纳入及排除标准，将符合条件的 149 个 SPN 容积数据行 1mm 及 5mm 重建，验证计算机辅助工具对不同层厚的数据检出 SPN 效能以及不同直径的 SPN 对其检测结果的影响。

结果

（1）根据参考标准共检出了 149 个真结节，1mm 层厚 CAD 检出的结节检出 130 个，5mm 层厚检出结节为 121 个；误检结节 1mm 层厚时 10 个，5mm 层厚时 4 个。（3）149 个真性结节分布如下：54%(81/149)的结节位于右肺，46%的结节(68/149)位于左肺；上、中、下肺叶分别分布有 52%(78/149)、3%(5/149)、45% (66/149) 的结节。本组数据 149 个 SPN，其中 0-9mm 结节 78 个，10mm-19mm 39 个，20-29mm 结节 32 个，采用 5mm 层厚时 0-9mm 结节检出率为 74%，采用 1mm 层厚时 SPN 检出率为 84.6%。

结论

1、计算机辅助检测系统检出 SPN 还存在着一定的假阴性、假阳性，计算机辅助工具对 SPN 检测的敏感性尚可,但特异性不足,假阳性标记数太多,因此在使用计算机辅助工具时还需人工甄别。
2、在使用计算机辅助工具对 SPN 检出中，层厚 1mm 时敏感性高于层厚 5mm，但是特异性较之略低，因此使用 1mm 数据时可以更好的检出 SPN，加以人工甄别，检出效能最佳。3.计算机辅助检查工具在分割技术上存在不确定性，部分磨玻璃影存在分割不准确，在输出数据中部分实性结节的直径与人工测量行相关性分析发现依从性较好，进一步的结节分析中应用部分实性结节的直径更为可靠。

PU-3491

基于 CAD 量化技术对良恶肺结节相关性参数研究

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目的 收集数字肺病例库中 114 例已知病理结果的 SPN，探讨各项测量指标与良恶性的相关性，以便于指导临床诊断。

资料与方法

收集“数字肺”项目数据库内自 2014 年 6 月至 2015 年 7 月所有 SPN 孤立性肺结节病例，均有完整的病史资料及 CT 影像资料。根据纳入及排除标准，将符合条件 114 个已知病理结果的 SPN 孤立性肺结节的基本信息及结节测量各指标项的量化值依次录入 Excel 数据库，研究 SPN 测量数据与病变性质（良恶性）之间的相关性，以上数据经整理后采用 SPSS19.0 统计分析软件进行统计学分析。

结果

（1）通过排除及纳入标准， 入选人数 109 人 114 个结节，年龄 21-81，均值 55.58±12.59 岁。其中男 57 人，女 56 人，良性 33 例，恶性 81 例，左肺 54 个，右肺 60 个，右肺上叶 35 个，右肺中叶 3 个，右肺下叶 22 个，左肺上叶 35 个，左肺下叶 19 个。（2）良性结节平均体积小于恶性结节（良性=7.05，恶性=14.15）。良性结节的得分均值低于恶性（良性=1.23，恶性=1.36），年龄良性小于恶性（良性=53，恶性=56.63）。性别与良恶性之间无显著差异（P=0.327 p＞0.05 ），但恶性病变男性患病率高于女性。（3）SPN 的良恶性与体积、表面积、平均密度、最大直径、平均直径、实性部分平均直径采用 Pearson 相关分析，上述指标项均与 SPN 良恶性显著相关；体积 r 值 0.247，平均密度 r 值-0.194，面积 r 值 0.259，最大直径 r 值 0.271，平均直径 r 值 0.281，平均直径（实）r 值 0.249。

结论

（1）SPN 的良恶性与体积、表面积、平均密度、最大直径、平均直径、实性部分平均直径都存在相关性；良性结节平均体积明显小于恶性结节，结节体积越大，密度越实，恶性的可能性越大。（2）SPN 的分布中，男性多于女性，而且男性恶性比率要高于女性，这与男性患者生活习惯密切相关，尤其是吸烟史。

PU-3492

Radiomic signature as a diagnostic factor for classification of histologic subtype in lung cancer

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Abstract

Objectives: To discuss the application of radiomics in Computerized Tomography (CT) scan analysis, for the purposes of improving their the diagnostic efficacy in lung cancer-specifically in distinguishing Squamous Cell Carcinoma (SCC), Lung Adenocarcinoma (ADC), and Small Cell Lung cancer (SCLC).

Materials and Methods: Research findings that identified 189 cases of lung cancer by pathology were analyzed retrospectively (60 patients with SCC, 69 patients with lung ADC and 60 patients with SCLC). A neural network was used to determine whether the pulmonary window or the mediastinal window was selected to extract effective radiomic features. The key features of radiomic signature were retrieved by a Least Absolute

Shrinkage and Selection Operator (LASSO) multiple logistic regression model. Afterwards, a receiver operating characteristic curve and Area Under the Curve (AUC) analysis were used to evaluate the performance of the radiomic signature in both training and validation cohorts (129 in the training cohort and 60 in the independent validation cohort).

Results: About 295 features were extracted from a manually outlined tumor region. Features extracted from mediastinal window CT scans had a better prognostic ability than pulmonary window scans. The average accuracy for mediastinal window scans was 0.933. Multivariate analysis revealed that the radiomic features extracted from mediastinal window scans had the potential to build a prediction model for distinguishing between SCC, lung ADC, and SCLC. The performance of the radiomic signature to diagnose SCC and SCLC in validation cohorts proved effective, with an AUC values of 0.869 and 0.859, respectively.

Conclusions: A unique radiomic signature was constructed for use as a diagnostic factor in different lung cancer histologic subtypes. Patients with lung cancer will benefit from the proposed radiomic signature.

PU-3493

CT Radiomics Features Analysis for Evaluation of Perihematomal Edema in Basal Ganglia Hemorrhage

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Abstract

Objectives: To evaluate the edema area around basal ganglia hemorrhage by the application of CT-based radiomics as a prognostic factor and improve the diagnosis efficacy, for the purposes of improving their the diagnostic efficacy in edema area around basal ganglia hemorrhage.

Materials and Methods: A total of 120 cases with basal ganglia hemorrhage were analyzed retrospectively. The texture analysis software Mazda3.3 was used to preprocess the CT images and manually sketch the region of interest(ROI) to extract the texture features. The extracted texture features were selected by Fisher coefficient, POE+ACC(probability of error and average correlation coefficients) and MI(mutual infoamation). The texture discriminant analysis uses the B11module in the Mazda3.3 software. The data were randomly divided into a training dataset (67%) and test dataset (33%). To further study the texture features, the training dataset can be divided into groups according to the median of GCS score, NIHSS score and maximum diameter of hematoma. Random forest model, support vector machine model and neural network model were built. Area under the curve (AUC) of the receiver operating characteristics curve was used to assess the performance of models with test dataset.

Results: Among all texture post-processing methods, the lowest error rate was 2.22% for the POE+ACC/NDA(Nonlinear discriminant). For the maximum diameter of hematoma, GCS score and NIHSS score group, the lowest error rate were 26.66%, 23.33% and 30.00%

respectively. The values of AUCs were 0.87, 0.81 and 0.76, for random forest model, support vector machine model and neural network model in the test dataset, respectively.
Conclusions: Radiomic method with proper model may have a potential role in predicting the edema area around basal ganglia hemorrhage. It can be used as a secondary group in the diagnosis of edema area around basal ganglia hemorrhage.

PU-3494
基于治疗前 CT 影像组学评估肺腺癌化疗疗效的研究

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目的 探讨基于 CT 软窗的影像组学对肺腺癌化疗疗效的评估价值。**方法** 回顾性搜集 105 例经病理证实的肺腺癌患者的影像及病例资料，根据半年化疗后的疗效，按 RECIST 标准将患者分为缓解组（35 例）和未缓解组（70 例），其中未缓解组分为稳定组（35 组）及进展组（35 组）。提取所有患者的化疗前 CT 软窗图像，通过影像组学方法，在 CT 软窗图像上提取病灶的特征，采用 Lasso 降维和 RTree 建模。采用受试者工作特征曲线（ROC）计算缓解组与未缓解组间比较的模型评估化疗疗效的诊断效能。**结果** 基于缓解组与未缓解组的图像，其训练组相应的 AUC、诊断敏感度和特异度分别为 0.80、0.68 和 0.80，验证组的 AUC、诊断敏感度和特异度分别为 0.74、0.70 和 0.81。影像组预测模型决策曲线在 0.18-0.76 较大的阈值范围内，具有良好的临床实用性。**结论** 基于治疗前 CT 软窗的影像组学可在化疗前对肺腺癌的疗效作出较准确评估。

PU-3495
多层螺旋 CT 肋软　平扫与肋软骨后处理重建技术对全肋隆鼻术的应　研究

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目的 探讨 GE64 排 128 层 CT 扫描肋软骨成像及三维后处理重建技术对整形外科全肋隆鼻术的 应用价值的研究。
方法 回顾性选取 2019 年 5　-7　　全肋隆　术受检者 100 例，年龄 20-35 岁女性，进　多层螺旋 CT 肋软骨扫描。
使　用机型:GE64 排 128 层 Qptima660，扫描参数:120-140Kv，Aotu time，Scan (Helical)，Rotation Time(0.6)，Rotation Length(Full)，Shuttle Mode(off)。重建 参数:Recon(stand)，Recon Option(350/40)(ss40)。扫描完成后原始图像自动导　ADW4.6 后处理工作站，利用软件 Fast VR 进行 VRT、MIP 图像后处理。并由两位影像 科主诊医师、两位整形外科医师对图像进　分析、评价，以横断位原始图像与后处理 VRT、 MIP 三维图像进　对　评价。
结果 原始图像经 Fast VR 三维重建后均能良好并直观显示肋软骨钙化情况。
结论 GE64 排 128 层肋软骨CT 扫描，经后处理重建技术 VRT、MIP，能较好的显示肋软骨实际钙化情况，为中国整形外科　全肋隆　术提供术前有效影像评估，具有重要临床意义。

PU-3496
基于 PACS 系统的多元化教学模式在放射科教学中的应用

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目的：探讨利用 PACS 系统结合多元化教学模式在放射科教学工作中的应用效果。**方法：**选取我校临床医学专业的本科学生 100 名作为研究对象，将其随机分为多元组和对照组。其中多元组采用基于 PACS 系统的多元教学法（LBL+PBL+CBL），对照组则采用传统教学方法（LBL），单元授课结束后，对比两组的教学考试成绩和学生对教学的满意度，从而判断基于 PACS 系统的多元化教学法所具备的教学优势。**结果：**多元组学生的理论成绩、阅片成绩和总成绩、以及学生和教师对教学方法的满意度均高于对照组学生，数据差异对比具有统计学意义（P ＜ 0.05）。**结论：** 与传统教学方法相比，基于 PACS 的多元化教学法教学效果更为显著，且更受学生和老师们的接受，增强学生对医学影像学的学习能力，能够明显提高教学质量。

PU-3497
Preoperative cervical cancer MR Imaging-based on Texture model for Prediction of lymph node status——A Preliminary Analysis

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Purpose To analyze the texture features of the whole tumor in preoperative cervical cancer MR images and to determine the mathematical model that may predict the pelvic lymph node status.
Methods A retrospective analysis of preoperative 1.5T pelvic MR images of 86 patients with cervical cancer confirmed by surgery and pathology between January 2016 to March 2019. The median age of the patients was 49 years. International Federation of Gynecology and Obstetrics (FIGO) stage of the patients is included IB_1 (n=33), IB_2(n=8), IIA_1 (n=34), IIA_2 (n=9), and II B(n=2). There were 25 patients with lymph node metastasis. The region of interest (ROI) was manually delineated along the margin of tumor on each slice of the sagittal T_2 image and the apparent diffusion coefficient (ADC) image with ITK-SNAP software. Stratified sampling determined 60 samples for training and 26 samples for testing. IFoundry (Intelligence Foundry 1.1, GE Healthcare) software performs image omics texture analysis, extracting a total of 5988 features, calculating the Sprearman correlation coefficient to remove high correlation features with a threshold of 0.85, and then Least absolute shrinkage and selection operator (LASSO) regression was utilized to select 5 features for random forest modeling, which five fold cross-validation was used to adjust the parameters. The area under the receiver's operating characteristic curve (AUC), accuracy, sensitivity, and specificity were calculated. A P value of ≦0.05 was statistically significant.
Results Using the random forest prediction model, the AUC, accuracy, sensitivity and specificity of training set were 0.97, 95%, 88.2%, 97.7%, and the test set of them were 0.83, 84.6%, 75%, 88.9%.

Conclusion A random forest classification model based on MR imaging texture analysis of preoperative cervical cancer has certain value for predicting the presence of pelvic lymph node metastasis.

PU-3498

Study on the detection capability alteration of AI assisted software in detecting subsolid pulmonary nodules by resident in radiology department

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BACKGROUND: Subsolid nodules (SSN) including pure ground-glass nodules and part-solid nodule have a high probability of lung cancer.
MOTIVATION: To evaluate the detection capability of artificial intelligence (AI) assisted lung nodule diagnostic software in the detection of subsolid pulmonary nodules by resident.
METHOD AND MATERIALS: A total of 105 patients were collected in our hospital. One senior radiologist with more than 10 years' experience read CT images based on the initial diagnosis of another senior radiologist with similar experience and a final decision was subsequently conducted by deputy chief radiologist with more than 15 years' experience to determine the ground truth lung nodules. All readings were performed on 1 mm slice thickness CT images with the assistance of AI software (InferRead CT Lung Research, Infervision, Beijing, China).One resident read the images without AI software (group A) and the same resident read CT images with AI software (group B) after two weeks' washout period.The number of subsolid pulmonary nodules and location were recorded. The number of true positive nodules and false positive nodules in group A and B were compared with the gold standard nodules to calculate sensitivity and false positive rate.
RESULTS: Group A detected 132 nodules including 112 true positive nodules and 20 false positive nodules with a sensitivity of 0.341±0.36. Group B detected 246 nodules including 231 true positive nodules and 15 false positive nodules with a sensitivity of 0.774±0.47. The sensitivity of group B was 43.3% higher than that of group A (p<0.001).The false positive rate of group A(=0.190,20/105) and B (0.142,15/105) have no statistical difference(p>0.001).
CONCLUSION: Compared with resident without AI software, the AI-assisted resident achieved higher detection sensitivity and equal false positive rate of the subsolid pulmonary nodules.
CLINICAL RELEVANCE/APPLICATION:
It is recommended to use AI to assist resident to achieve desirable detection rate for subsolid nodules which are the most common imaging manifestations of early lung cancer.

PU-3499

基于深度学习的肺结节检测和相关量化参数分析

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目的：探讨基于深度学习的人工智能（AI）在肺结节检测和相关量化测量的临床应用价值。方法：收集胸部 CT 平扫 250 例，以 2 位高年资主治医师的判读为标准，共检出 2230 个结节，比较 A 组（住院医师医）、B 组（AI）、C 组（主治医结合 AI）对肺结节检出的误诊率、漏诊率、敏感度、阳性预测值和平均诊断时间。将经手术病理证实的 170 例 184 个结节分成实性结节组（100 个）和磨玻璃结节（GGN）组（84 个），分别比较两组良、恶性结节的 AI 量化参数差异，对有统计学差异的参数行 ROC 曲线分析，再以病理结果为因变量，各参数为自变量行 Logistic 回归分析。结果：B 组误诊率明显高于 A、C 两组，阳性预测值明显低于 A、C 两组，A 组漏诊率明显高于 B、C 组，敏感度明显低于 B、C 组，B 组平均诊断时间短于 A、C 组，实性良、恶性结节的长径、最大面积、体积、最小 CT 值及恶性概率均差异有统计学意义(P<0.05)，Logistic 回归分析显示恶性概率是实性结节恶变的独立危险因素。GGN 良、恶性结节长径、最大面积、体积、平均 CT 值、最大 CT 值和恶性概率均有统计学差异(P<0.05)，Logistic 回归分析显示长径是 GGN 恶变的独立危险因素。结论： AI 辅助影像医师阅片可明显提高肺结节检出的敏感性并减少误诊和漏诊率，对良恶性的预判也具有一定参考价值。

PU-3500

床旁 x 线摄影体会

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目的：移动 DR 设备在临床使用越来越多，DR 床旁摄影实现了 x 线影像的数字化采集、处理、传输、显示和存储的一体化。院内部分患者因病情严重、术后病情差，身处重症监护室等，不能直接前往放射科，需床旁摄片。床旁摄片具有自身优点和局限性。
方法：一般资料　　收集 2017 年我科室床旁胸片摄影 220 例。设备威高 YDR-YD-4。
　　摄影方法　　体位主要采用仰卧位，少数患者采取坐位或半坐位。将探测器放置患者背部，高出肩部 2cm，包括两侧胸壁，无滤线器，中心线对准胸骨角与剑突连线的中点垂直射入，摄影距离 110cm。
摄影条件　　70--90kv　25--40mAs
结果：89％满足影像诊断要求，少数胸片质量不理想：体位不正，摄影条件不当，图像层次不够丰富，对比度，清晰度差，体外异物（如
电极片，引流管等）。
结论：1.1DR 床旁摄影为年老体弱、行动不便危重患者，术后患者，骨折牵引患者等提供了方便，同时为危重病人的诊治与急救赢得时间。
1.2 DR 床旁摄影后处理功能强大，大大提高了图像质量，易满足临床诊断需求。

2.1 床旁摄影受检者大多病情危重，很难配合检查，易造成体位不正，部位丢失等，易造成误诊，漏诊等。
2.2 实行有效的防护困难。
2.3 检查环境受限，病房通道狭窄，重症监护室及手术室常有心电监护、呼吸机等装置，设备难以到位，床旁摄影技术非常困难。

2.4 设备能力有限，输出容量不大，不适用滤线栅，图像质量及诊断效果有限。
由于床旁胸片检查对象的特殊性，需要工作人员有高度责任心，认真负责，又要有娴熟的投照技能， 合理掌握床旁胸片摄影技术，才能照出优质的图像，是病人得到及时诊治。

PU-3501

基于小型化指静脉识别系统的设计

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到目前为止，身份识别逐渐由外物识别过度到生物特征识别，最常见的生物特征识别包含面部识别和指纹识别。对于指纹识别，人们已经掌握了非常熟悉的技术，但其弊端也是显而易见的。我们最常遇到的问题是，如果指头受伤或者指纹不清晰，则无法进行指纹识别。而且指纹膜极易复制，指纹识别的安全性得不到保障。因此，人们发展出指静脉识别技术来代替指纹识别。指静脉识别是指利用近红外激光照射指部，静脉里的血红蛋白成像从而实现识别的作用。目前市面上的指静脉识别仪都比较庞大，本文旨在对小型化指静脉识别系统进行分析、研究，设计小型化的指静脉光学采集系统，给出光学系统参数分析结果以及具体的设计方案。具体内容包括近红外激光的光学参数测试，CMOS 成像参数测试，光路的模拟和仿真。在这样的基础上，通过微调光路系统的尺寸等参数，对设计进行优化调整，对不同指静脉光学采集设备的差异进行辨别和分析，评估其对指静脉成像质量的影响；研究反射镜、折射棱镜、光路结构尺寸、焦距、物距、成像面积等参数，评估其对指静脉成像的影响；建立多光谱光源、多种光学器件、多种光路设计、多种打光方式、多种光线环境、多种温度环境的综合测试平台。最终设计一套高灵敏，小型化的指静脉识别系统。

PU-3502

刀锋伪影校正技术与传统技术在精神疾病患者海马 MRI 检查中的对比研究

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目的 探讨磁共振刀锋伪影校正（BLADE）技术在改善精神疾病患者海马 MRI 检查中图像质量的作用。**方法** 对 43 例精神疾病患者行 3.0T-MRI 常规海马斜冠状位扫描，常规扫描序列包括 T2WI TSE、T2WI FlAIR，以及结合了 BLADE 技术的 BLADE T2WI TSE、BLADE T2WI FlAIR 序列。患者的图像由 2 名放射科医师采用 5 分法对运动伪影、搏动伪影、颗粒度、海马图像质量进行评价。在本研究中，运动伪影为因患者配合欠佳时运动所造成相位编码偏移，搏动伪影为动静脉搏动、脑脊液流动所致伪影，颗粒度反应主观噪声，海马图像质量为显示海马形态、边缘、灰白质的能力。采用 Wilcoxon’s 符号秩检验分析 BLADE 序列与传统序列在显示运动伪影、搏动伪影、颗粒度及海马图像质量主观评价指标中的差异。P＜0.05 为差异有统计学意义。**结果** 在图像的运动伪影、搏动伪影、海马图像质量方面，结合 BLADE 技术序列与传统序列相比表现更优(P＜0.05)；在图像颗粒度方面，传统序列表现更优(P＜0.05)。**结论** BLADE 技术的应用能够改善海马 MRI 检查图像的运动伪影、搏动伪影，提高图像质量，推荐应用于不合作的精神疾病患者海马检查中。

PU-3503

Fatty acid binding protein 5 (FABP5) regulates proliferation via the PI3K/AKT signaling pathway in clear cell renal cell carcinoma cell lines

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Kidney is the one of most important organs which participates in whole body’s homeostasis. The urine-producing function unit in kidney is nephron, which includes a renal corpuscle and renal tubules. Kidney cancer, also named renal cancer, originates from the cells in kidney. The two common types of renal cancer are renal cell carcinoma (RCC) and urothelial cell carcinoma (UCC). Clear cell renal cell carcinoma (ccRCC) has been associated with the highest mortality rates. Fatty acid binding proteins (FABPs) are a kind of 14~15 kD proteins which are present in high abundance in the cytosol of most tissues. In this report, we found that FABP5 is upregulated and correlates with poor survival in ccRCC patients. Moreover, our research results indicated that FABP5 executed a pro-proliferative role in ccRCC cells, including Caki-1 and 7860. Silencing of FABP5 significantly inhibited ccRCC cells proliferation in vitro; while overexpression of FABP5 promotes cells proliferation; and FABP5 expression was significantly correlated with neoplasm stage and regulated the tumor growth in nude mice. Furthermore, the LY294002 attenuated the pro-proliferative effect of FABP5 in both Caki-1 and 7860 cells, implying that the PI3K/AKT signaling pathway, at least partly, involves in the FABP5-induced ccRCC cells proliferation. Taken together, we found FABP5 was higher expressed in patients with ccRCC, and patients with higher FABP5 showed a decreased survival level. Furthermore, we found the FABP5 regulated proliferation ccRCC cell lines by regulating PI3K/AKT signaling pathway. These results suggested that FABP5 may be a potential prognostic biomarker and provide a new perspective of FABPs in tumor biology.our results indicating that FABP5 was associated with malignant progression and might play an important role in tumorigenesis in ccRCC cells.

PU-3504

Dow-regulation of CTBP2 inhibits proliferation, migration and invasion of Caki-1 cells in vitro

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Clear cell renal cell carcinoma (ccRCC) has been associated with the highest mortality rates. CtBP2 is a member of CtBP family, which works as a transcription regulator protein and is identified because of its interaction of C-terminus of the adenovirus E1A oncoprotein. CtBP2 modulates several tumorigenic processes, including growth, proliferation, and invasion in a variety of cancer cells. Over-expression of CtBP2 is associated with tumorigenesis and poor clinical outcome of prostate cancer, and low-

expression of CtBP2 inhibited the proliferation of prostate cancer cells. In this report, the expression of CtBP2 in human ccRCC cell line Caki-1 was down-regulated by using RNAi lentivirus in vitro. The growth of Caki-1 cells was assessed by using CCK-8 and clone formation assays; the cell cycle was determined by FACS analysis, and the number of cells in S-phase was also accessed using an EdU assay. After 72 h, 96 h, and 120 h of culturing in 96-well plates, OD450nm values of the CtBP2-RNAi cells were significantly lower than those of the control group. The clone forming efficiency of the CtBP2-RNAi group was significantly decreased compared to that in control group. The proportion of cells in S-phase in the CtBP2-RNAi group was lesser than that in the control group, while the proportion of cells in G2/M-phase in the CtBP2-RNAi group was greater than that in the control group. Down-regulation of CtBP2 also impeded cell migration and invasion, as determined using wound healing and cell invasion assays. These results indicated that down-regulation of CtBP2 inhibited the cell proliferation ability and arrested the cell cycle at G2/M-phase, also lead to decreased migration, and invasion of Caki-1 cells in vitro, and CtBP2 might be a potential target to suppress tumorigenesis of ccRCC.

PU-3505

Comprehensive analysis of circular RNA profiles in patients with clear cell renal cell carcinoma

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Circular RNAs (circRNAs), a novel class of endogenous noncoding RNAs, are involved in a variety of diseases, including several types of cancers. We hypothesized that circRNAs are involved in the tumorigenesis and development of clear cell renal cell carcinoma (ccRCC). To verify our hypothesis, we explored the circRNA expression profiles in ccRCC tissues via microarray analysis in 4 ccRCC tissues and their adjacent non-carcinoma tissues. The microarray data showed 1988 circRNAs were significantly dysregulated circRNAs, including 1033 upregulated and 955 downregulated ones in the ccRCC tissues. Hsa_circ_0005875 was confirmed to be significantly upregulated in the ccRCC tumor tissues. Further analysis revealed that hsa_circ_0005875 might play a role in the pathogenesis of ccRCC by functioning as a miRNA sponge; we then performed bioinformatics analysis of the predicted circRNA-miRNA-mRNA (hsa_circ_0005875 - miR-145-5p - ZEB2) networks. Moreover, we found that hsa_circ_0005875 expression was associated with tumor size, pathological TNM stage, histological differentiation, and lymphatic metastasis. These data indicate that hsa_circ_0005875 might play a role in promoting tumor growth and metastasis and be a potential biomarker of ccRCC.

PU-3506

急诊 CT 在腹部外伤致肠及肠系膜损伤的临床治疗决策中指导价值的研究

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背景：肠及肠系膜损伤作为腹部损伤的重要类型之一，有着容易漏诊、病情可迅速进展等特征。急诊 CT 可为临床医师提供及时、准确、清晰的图像，为肠及肠系膜损伤的临床诊断及临床治疗提供重要依据，为患者的临床诊断及临床治疗提供重要依据。
目的：探讨急诊 CT 在外伤致肠及肠系膜损伤的临床治疗决策中的指导价值。
材料与方法：2016 年 4 月-2018 年 11 月我院收治的经急诊 CT 提示为肠及肠系膜损伤患者共 79 例，纳入该研究。综合其 CT 征像及临床症状和体征选择治疗方案。
结果： 10 例为单纯性肠系膜血管损伤（12.86%），34 例为单纯肠壁损伤（43.04%），22 例为肠壁损伤合并肠系膜血管损伤（27.85%），13 例肠及肠系膜损伤合并脾、肝损伤或骨折（16.46%）。接受手术治疗共 58 例，保守治疗 21 例。疗效：79 例腹部外伤致肠及肠系膜损伤患者总有效率 96.20%。
结论：急诊 CT 用于腹部外伤致肠及肠系膜损伤的诊断，征象典型、清晰，对下一步临床治疗决策的指导作用价值较高，值得临床推广应用。

PU-3507

CircAGAP1 acts as sponge of miR-15 to promote renal cell carcinoma progeression through regulating EIF4E expression

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Background: In recent years, circular RNAs (circRNAs), a new star of non-coding RNA, have been emerged as vital regulators and gained much attention for involvement of initiation and progression of diverse kinds of human diseases, especially cancer. However, the regulation and function of renal cell carcinoma (RCC) circRNAs remain largely unknown.

Methods: Here we generated circRNA microarray data from four RCC tissues and paired non-cancerous matched tissues, and detected circular RNA-AGAP1 up-regulated and correlated with tumor grade and poor survival rate of BC patients. We subsequently performed functional analyses in cell lines and an animal model to support clinical findings. Mechanistically, we demonstrated that AGAP1 could directly bind to miR-15a and relieve suppression for target EIF4E expression.

Results: We found that circAGAP1 was evidently up-regulated in RCC, and its level was correlated with clinical stage, pathological grade and poor prognosis of patients with RCC. The results indicated that circAGAP1 could promote RCC cell proliferation, apoptosis and invasion. Finally, we found that circAGFG1 acts as a competing endogenous RNA (ceRNA) for miR-15a to regulate RCC expression on its target EIF4E. Conclusions: circAGAP1 may exert regulatory functions in RCC and serve as a new diagnostic marker or target for treatment of RCC patients

PU-3508
2 型糖尿病及合并微血管病变的骨骼肌超声造影研究

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目的 探讨超声造影在评价 2 型糖尿病及合并微血管病变的骨骼肌微循环障碍中的应用价值。**方法** 收集正常对照组 30 例、2 型糖尿病（type 2 diabetes mellitus, DM)组 30 例、2 型糖尿病合并微血管病变（type 2 diabetes mellitus with microvascular complications ，DM+MC）组 28 例，超声造影观察小腿骨骼肌血流灌注情况，选择性观察其中的小动脉、肌肉组织和小静脉，运用数学模型分析时间-强度曲线，获取各自灌注参数：造影剂到达时间、造影剂渡越时间，造影剂渡越时间定义为造影剂到达时间的差值。同时所有研究对象均空腹测血糖及全血粘度、C-反应蛋白值等血液流变参数。**结果** 动脉到静脉、肌肉到静脉的造影剂渡越时间 DM+MC 组显著比 DM 组及对照组延长，组间比较有统计学意义（P<0.05）。全血粘度 DM+MC 组比 DM 组及对照组延长，组间比较有统计学意义（P<0.05）。全血粘度与血糖、C-反应蛋白有高度相关性（P<0.01）。**结论** 超声造影一定程度上可以评价骨骼肌微循环障碍，微循环障碍可能与血液流变参数异常有关。

PU-3509
超声检查跖腱膜厚度和回声的信度研究

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目的 超声评价者内和评价者间在测量跖腱膜厚度和回声的信度研究。 **方法** 2012 年 1 月至 2013 年 1 月收集 22 例(42 足)临床诊断为跖腱膜炎患者和 28 例（56 足）正常对照组，应用超声分别在纵切面和横切面观察和测量跖腱膜厚度及回声，同时用灰阶 Histgram 软件定量评价足底跖腱膜感兴趣区的平均亮度，由 2 位医师双盲检查。正常对照组 1 周后被同一医师再次检查。 **结果** 在对照组中评价者内和评价者间纵切面和横切面测量跖腱膜厚度的组内相关系数（ICC）为 0.82～0.95；在病例组中评价者间纵切面和横切面测量跖腱膜厚度 ICC 分别为 0.80、0.56；灰阶 Histgram 软件定量评价病例组中评价者间纵切面和横切面测量跖腱膜平均亮度 ICC 分别为 0.74、0.53；在病例组中评价者间横切面与纵切面评价低回声有或无的 Kappa 值分别为 0.34、0.35。 **结论** 在纵切面超声测量跖腱膜厚度与灰阶软件定量评价平均亮度有较高的信度，超声可作为评价跖腱膜的有效的诊断工具。

PU-3510
超声介导微泡爆破促进 ASCs 归巢改善糖尿病小鼠下肢缺血的研究

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目的 探讨超声介导微泡爆破是否能促进静脉移植脂肪干细胞归巢，并改善糖尿病小鼠下肢缺血。

方法和结果 制作 db/db 小鼠右下肢缺血模型，分为 5 组：PBS 组、Sham 组、超声+微泡组、超声+微泡+ASCs 组、ASCs 组。超声造影灌注成像显示术后所有组缺血下肢血流量与对侧非缺血下肢血流量的比值均随着时间的推移而增加，以 US+MB+ASCs 组增加最为显著，与 PBS 组比较差异有统计学意义（P＜0.01），与其他对照组比较，差异有统计学意义。（*P*＜0.01）。下肢肌肉免疫荧光染色 BS-1 凝集素标记微血管密度、α-平滑肌动蛋白标记小动脉密度，均提示 US+MB+ASCs 组高于 US+MB 组，与 PBS 组比较差异有统计学意义（P＜0.01），与其他对照组比较，差异有统计学意义（P＜0.01）。Masson 染色显示 US+MB+ASCs 组肌纤维化程度低于 US+MB 组。治疗后 3 天和 7 天酶联吸附实验、RT-PCR 显示 VEGF、P 选择素、ICAM-1、SDF-1 值 US+MB+ASCs 组高于 US+MB 组，与 PBS 组比较差异有统计学意义（P＜0.01），与其他对照组比较，差异有统计学意义（P＜0.01）。治疗后 3 天和 7 天 Western- blot 分析显示 PP13K、P-AKT、VEGF、P 选择素、ICAM-1、SDF-1 蛋白含量 US+MB+ASCs 组高于 US+MB 组，与 PBS 组比较差异有统计学意义，与其他对照组比较差异有统计学意义（P＜0.01）（P＜0.01）。

结论 通过超声微泡介导爆破产生的生物学效应上调炎性因子表达，提高了干细胞的靶向归巢及黏附能力，脂肪干细胞通过旁分泌效应促进并改善糖尿病小鼠下肢缺血。

PU-3511
超声空化微泡效应促进糖尿病小鼠下肢缺血骨骼肌血管新生的机制

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目的：探讨超声空化微泡效应促进糖尿病小鼠缺血骨骼肌血管新生的作用和可能机制。 **方法：**制作 db/db 小鼠右下肢缺血模型术后 3 天随机分为 4 组：糖尿病对照组（Control）、超声组（US）、微泡组（MB）、超声加微泡组（US+MB）四组，治疗后即取右下肢肌肉 HE 染色，其余小鼠治疗后 7 天同时行 RT-PCR、Western-Blot 检测 P 选择素、ICAM-1、VEGF 表达及免疫组化骨骼肌 VEGF 表达。**结果** 骨骼肌 HE 染色：超声+微泡组：骨骼肌间隙有较多红细胞漏出，肌纤维轻度水肿，无肌溶解。骨骼肌免疫组化 VEGF 表达，超声+微泡组明显高于其他三组，有较多新生血管，同时 VEGF、P-选择素、ICAM-1 的 mRNA、蛋白量也高于其他组，对照组、超声组和微泡组，骨骼肌 VEGF 表达较少，VEGF、P-选择素、ICAM-1 的 mRNA、蛋白量也较少。

结论 超声介导微泡破坏引起局部组织间质毛细血管内皮细胞的轻微损伤，进而在内皮细胞上产生短暂性炎症反应，引起内皮细胞的活化，从而导致 P-选择素、ICAM-1 表达的上调，促进内源性 VEGF 分泌，以促进下肢血管新生。

PU-3512
下肢动脉硬化闭塞症骨骼肌灌注异常与侧枝循环相关性的超声造影研究

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目的 探讨超声造影评价下肢动脉硬化闭塞症（Lower extremity arterial disease，LEAD）致骨骼肌灌注障碍与侧枝循环的相关性。 **方法** 收集 LEAD 组和对照组各 80 例，超声造影观察小腿骨骼肌血流灌注情况，运用数学模型分析时间强度曲线，获取反映组织血流灌注参数达峰时间（time

to peak intensity，TTP）。同时 CT 血管造影评估 LEAD 组侧枝循环。**结果** 时间强度曲线显示对照组平均 TTP38.6s，LEAD 组平均 TTP59.1s，两组比较差异有统计学意义（$P<0.01$），不同超声检查者读取 TTP 平均差异是 0.29S,受试者操作曲线下面积为 0.92。TTP 为 47.5S 诊断点时,阳性预测值为 91%。LEAD 组中侧枝循环丰富组平均 TTP50.4s，侧枝循环差组平均 TTP 为 67.9s，两组比较差异有统计学意义（$P<0.01$）。 **结论** 超声造影可评价小腿骨骼肌灌注障碍，它与侧枝循环程度有很好的相关性。

PU-3513
下肢动脉硬化疾病的骨骼肌微循环障碍的超声造影研究

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目的 探讨超声造影在评价下肢动脉硬化疾病（Lower extremity arterial disease,LEAD ）的骨骼肌微循环障碍的应用价值。方法 收集 45 例正常对照组和 45 例 LEAD 病人，用超声造影观察小腿骨骼肌血流灌注情况，运用数学模型分析时间-强度曲线，得出灌注参数达峰时间（time to peak intensity，TTP）。结果 时间-强度曲线显示在静息时对照组 TTP38s（19-65s），LEAD 组 TTP84s（39-142s），两组比较差异有统计学意义（$P<0.01$），小腿运动试验后，正常对照组 TTP11s（9- 22 s），LEAD 组 TTP52s（27-105s），两组比较差异有统计学意义（$P<0.01$），年龄校正后 $P<0.01$。TTP 和踝肱指数、年龄均无明显相关性。结论 超声造影是一种评价骨骼肌微循环的新型的诊断方法。

PU-3514
Effects of different concentration and duration time of isoflurane on acute and long-term neurocognitve function of young adult C57BL/6 mouse

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Postoperative cognitive dysfunction (POCD) is a decline in cognitive performance after a surgery with anaesthesia. The exact reasons of surgery and/or anaesthesia resulting in POCD are unclear. The aim of this study is to investigate the effects of different concentration and duration time of isoflurane anaesthesia on cognitive performance and cellular mechanisms involved in learning and memory function. In present work, young adult male C57BL/6 mice (age: 8 weeks) were anaesthetized by different concentration isoflurane in 100% oxygen for different duration time (Mice in group I 1received 0.7% isoflurane 0.5 h, mice in I2 received 0.7% isoflurane 2 h, mice in I3 received 1.4% isoflurane 2 h, and mice in I4 received 1.4% isoflurane 4 h). Non-anaesthetized mice served as control group (I0). Spatial learning was assessed at 10 days post-anesthesia in Morris water maze (MWM). Hippocampal protein expressions of activated caspase 3, NMDA receptor subunit NR2B, and extracellular-signal regulated kinase (ERK) 1/2 were evaluated 24 hours and 2 weeks post anesthesia. Protein expression of activated caspase3 was detected acute elevated in I3(24 h post-anesthesia) and acute and long-

term elevated in I4(24 hours and 2 weeks post-anesthesia). There was no significant difference between I1, I2 and control group. Protein expressions of NR2B showed an acute and long-term increasement in I1and I2, decreasement in I4, and an acute decline, then returned to normal in I3 compared to control group. The ratio of phosopho-ERK1/2 to total-ERK showed an acute increasement in I1and I2, then came to normal 2 weeks post anesthesia compared to control group, meanwhile, we detected an acute and long-term decline in I3and I4. In MWM test, mice in I1and I2showed cognitive improvement, mice in I3 showed similar to control group, while mice in I4 demonstrated cognitive impairment, which were approximately corresponding to the changes of protein expression of NR2B and activation of ERK1/2. The present data suggested the following: (1) Isoflurane may cause neurotoxicity by inducing caspase activation and apoptosis with the anesthetic concentration increased and duration prolonged. (2) Low concentration of isoflurane in 2 hours can induce a hippocampus-specific elevation of NR2B subunit composition and ratio of p-ERK1/2 to total ERK1/2, produce hippocampal-dependent cognitive improvement. While high concentration of isoflurane exceeding 4 hours may induce a decline of NR2B and ratio of pERK1/2 to ERK1/2, then result in cognitive impairment.

PU-3515

Effects of Sevoflurane on Young Male Adult C57BL/6 Mice Spatial Cognition

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Inhalation anesthetics are reported to affect cognition in both animals and humans. The influence of inhalation anesthetics in learning and memory are contradictory. We therefore investigated the effects of sevoflurane anesthesia with different durations on cognitive performance and the levels of NMDA receptor subunit NR2B, phosphorylated ERK1/2 (pERK1/2) and activated caspase3 in mouse hippocampus. We anaesthetized eight-week old male C57BL/6 mice with 2.5% sevoflurane for durations ranging from one to four hours. Non-anaesthetized mice served as controls. Mice exposed to sevoflurane for one to three hours showed improved performance, whereas mice with exposure up to four hours displayed similar behavioral performance as control group. NR2B was increased both at 24h and at two weeks post sevoflurane exposure in all groups. The p-ERK1/2: total ERK1/2 ratio increased at 24h in all anesthesia groups. The ratio remained elevated at two weeks in groups with two- to four-hour exposure. Activated caspase3 was detected elevated at 24h in groups with two- to four-hour exposure. The elevated trend of activated caspase3 was still detectable at two weeks in groups with three- to four-hour exposure. At two weeks post anesthesia, the typical morphology associated with apoptotic cells was observed in the hippocampus of mice exposed to four hours of sevoflurane. Our results indicate that 2.5% sevoflurane exposure for one to three hours improved spatial cognitive performance in young adult mice. The cognitive improvement might be related to the increase of NR2B, the p-ERK1/2: total ERK1/2 ratio in hippocampus. However, exposure to sevoflurane for four hours caused neurotoxicity due to caspase3 activation and apoptosis.

PU-3516
不同浓度不同时间七氟醚麻醉对小鼠认知 功能的影响

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目的 评价不同浓度不同时间七氟醚麻醉对小鼠认知功能的影响。方法 成年雄性 C57BL／6 小鼠 50 只，体重 20～24 g，10 周龄，采用随机数字表法，分为 5 组(n=10)：正常对照组(C 组)、吸人 1．3%七氟醚 0.5 h 组(S1 组)、吸人 1．3%七氟醚 2．0 h 组(S2 组)、吸入 2，5%七氟醚 2．0 h 组(S3 组)和吸入 2．5%七氟醚 4．0 h 组(S4 组)。麻醉后 2 周进行 Morris 水迷宫实验，记录逃避潜伏期和穿越平台次数，水迷宫实验结束后处死，取海马组织，检测含 2B 亚基的 NMDA 受体和活化的 caspase3 表达水平。**结果** 与 c 组比较，S1 组、S2 组和 S3，组逃避潜伏期缩短，穿越平台次数增加，S4 组逃避潜伏期延长，S1 组、S2 组、S3 组和 S4 组海马组织含 2B 亚基的 NMDA 受体表达上调，S3 组和 S4 组海马组织活化的 caspase3 表达上调(P<0．05 或 0．01)。**结论** 七氟醚麻醉对小鼠认知功能影响不同的原因与浓度和时间有关。

PU-3517
An Experimental Study on Cisplatin-loaded Magnetic Nanoparticles against HepG2 Cells

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Objective: To prepare a drug carrier (Fe_3O_4/PAA-PEI) and drug-loaded magnetic nanoparticles (Fe_3O_4/PAA-PEI-DDP) for effective killing of hepatocellular carcinoma (HCC) cells, thus providing experimental clues for developing drug-loaded particles for the treatment of HCC. **Methods:** Highly water-soluble Fe_3O_4/PAA nanoparticles were prepared by one-step high-temperature hydrolysis, and Fe_3O_4/PAA-PEI nanoparticles were prepared under catalization of coupling agents. Cisplatin and Fe_3O_4/PAA-PEI nanoparticles were mixed to prepare drug-loaded compound nanoparticles for characterization measurement and drug-loading estimation. Different intervention groups and HCC HepG2 cells were co-cultured for in vitro cell experiments in three groups: pure cisplatin group (group D), drug-loaded nanoparticle group (MPD group), and drug carrier group (MP). Post-intervention survival of HepG2 cells was detected by MTS method. **Results:** The size of the drug carrier (Fe_3O_4/PAA-PEI) and the drug-loaded magnetic naoparticles (Fe_3O_4/PAA-PEI-DDP) was uniform and Zeta potential was stable. The cisplatin-loading rate of the nanoparticles was about 79%. There was no significant cytotoxicity when the drug-carrier concentration was ≤280μg/ml. Survival of HCC HepG2 cells decreased with the increase of the drug-loaded compound nanoparticles. **Conclusion:** Cytotoxocity of the drug carrier (Fe_3O_4/PAA-PEI) was low. The drug-loaded magnetic nanoparticles (Fe_3O_4/PAA-PEI-DDP) can be released retardedly, providing an effective and persistent killing effect on HCC cells.

PU-3518
不同浓度维甲酸预处理对 NSCs 增殖及向胆碱能神经元分化的影响

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目的 探讨不同浓度维甲酸（RA）预处理对小鼠神经干细胞（NSCs）的增殖及向胆碱能神经元分化的影响。
方法 取孕 14 天 C57BL/6J 小鼠胎鼠脑组织体外分离培养 N SCs，通过细胞免疫组化染色鉴定 NSCs，第 2 代 N SCs 诱导培养基中分别加入 0，0.1，0.5，1.0，5.0，10 mM/ml RA 进行预处理 5 天，通过绘制细胞生长曲线及 WST-1 细胞增殖及细胞毒性检测试剂盒检测不同浓度 RA 预处理对 NSCs 活性及增殖能力的影响，RA 预处理的 NSCs 在多聚赖氨酸包被的盖玻片上自由分化，通过胆碱乙酰转移酶（ChAT）免疫荧光染色检测胆碱能神经元并比较各组 NSCs 向胆碱能神经元分化比例。
结果 NSCs 具有自我更新及表达巢蛋白及分化为神经元及胶质细胞的能力；10 mM/ml RA 组 NSCs 第 1、3、5、7 天的细胞计数及增值能力均较其他组显著增加；随着 RA 浓度升高，ChAT 阳性细胞比例也逐渐增高，10 mM/ml RA 组 ChAT 阳性细胞百分比为 93.5±4.2%，较其他组明显升高，差异具有统计学意义（均有 $p<0.01$）。
结论 不同浓度 RA 均具有促进 NSCs 增殖及诱导 NSCs 分化为胆碱能神经元的能力，且随着 RA 浓度的增加而增强。

PU-3519
神经干细胞移植对 APP/PS1 小鼠突触形成的影响

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目的 探讨神经干细胞(Neural stem cells, NSCs)移植对阿尔茨海默病(Alzheimer’s disease, AD)小鼠突触形成的影响。
方法 9 月龄 20 只 APP/PS1 双转基因 AD 小鼠随机分为 2 组，每组 10 只，一组进行 NSCs 移植，即 NSC 组，另一组给予等量磷酸盐缓冲液(phosphate buffer saline, PBS)作为阴性对照组(PBS 组)，移植部位为双侧海马区，10 只野生型(Wild type) 小鼠作为阳性对照组(WT 组)。移植 8 周后采用荧光免疫组化法和 Western 印迹检测 AD 小鼠海马区突触素(synaptophysin,SYN)和生长相关蛋白-43 (growth associated protein-43, GAP-43)表达的变化；透射电镜观察移植区突触的形态和数量。
结果 (1)荧光免疫组化显示 NSCs 移植分化的神经元高表达 SYN 和 GAP-43 蛋白；(2)Western 印迹显示 NSC 组小鼠海马区 SYN、GAP-43 表达明显增加，高于 PBS 组($F=58.367$, $P<0.001$；$F=75.296$, $P<0.001$)，SYN 表达与 WT 组小鼠相比较无明显差异($P>0.05$)，但是 NSC 组小鼠 GAP-43 表达高于 WT 组($P<0.01$)； (3)超微结构显示 NSC 组海马区突触数量增加(12.13±2.11)，多于 PBS 组(6.63±1.78) ($F=15.981$, $P<0.001$)，与 WT 组(11.05±1.45)相比较无明显差异($P>0.05$)。
结论 NSCs 移植分化的神经元通过增加突触素、GAP-43 表达来增加突触的数量，进而建立新的突触连接来改善 AD 小鼠的症状。

PU-3520

ASL MRI 在 MCI、AD 患者早期诊断中的应用

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目的 利用 ASL MRI 技术探讨 MCI 及 AD 患者脑血流灌注随时间变化情况，为 AD 的早期诊断及病情监测提供影像学依据。
方法 研究对象均来自 ADNI 数据库，根据厂家、磁场强度及成像参数相同的标准，选择西门子公司 3.0T MRI 扫描仪脉冲式 ASL 序列和 3D- MPRAGE。据患者认知程度的不同，分为正常老年组（NC 组，55 例）、轻度认知障碍组（MCI 组，106 例）、阿尔兹海默症组（AD 组，26 例）；其中 MCI 组分为早期轻度认知障碍组（EMCI 组，54 例）和晚期轻度认知障碍组（LMCI 组，52 例）。以 NC 组影像资料为基线，利用动脉自旋标记灌注磁共振成像信号处理工具包和统计参数图 12 对各组图像进行预处理及统计分析，双样本 T 检验分别比较各组间全脑平均血流灌注的差异。
结果 AD 组、EMCI 组、LMCI 组及 NC 组间脑灌注结果：（1）EMCI 组与 NC 组间 CBF 值比较，EMCI 组在右侧颞中回、颞下回、颞上回、颞枕叶交界处、顶下小叶较 NC 组脑灌注减低，以颞叶为著(P<0.05)。（2）LMCI 组与 NC 组间 CBF 值比较，LMCI 组在右侧颞下回、颞中回、内侧颞叶、海马旁回、颞上回、海马较 NC 组脑灌注减低，以颞叶为著(P<0.05)。（3）AD 组与 NC 组间 CBF 值比较，LMCI 组在右侧颞下回、颞中回、内侧颞叶、海马、海马旁回，以颞叶为著(P<0.05)。（4）EMCI 组与 LMCI 组间 CBF 值比较，两组间脑灌注差异无统计学意义(P>0.05)。（5）AD 组与 EMCI 组间 CBF 值比较，AD 组在右侧额顶叶、缘上回、颞下回、颞中回较 EMCI 组脑灌注减低，以右侧额叶为著(P<0.05)。（6）AD 组与 LMCI 组间 CBF 值比较，两组间脑灌注差异无统计学意义(P>0.05)。
结论 ASL MRI 有助于鉴别 MCI 及 AD 患者，以颞中/下回、缘上回具有代表性；基于性别的不同对 AD 发病机制及影像改变的研究应当是一个不容忽视的关键点。

PU-3521

320 排 CT 灌注检查对早期急性轻症胰腺炎肝脏损伤情况的评估价值

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目的 探讨 320 排 CT 灌注成像技术对急性轻症胰腺炎（MAP）早期患者肝脏损伤情况的评估价值。
方法 收集我院 2012 年 6 月～2014 年 3 月期间临床诊断为急性胰腺炎并经 Balthazar 评分为 A～B 级的患者 28 例（男 17 例，女 11 例），平均年龄 53 岁（31～75 岁），于发病 48 小时内行 320 排 CT 上腹部平扫及灌注成像检查。临床上无胰腺疾病的患者 25 例（男 10 例，女 15 例）作为对照组，平均年龄 58 岁（29～80 岁）。对 CT 平扫图像观察指标包括胰腺形态、大小、密度的改变、胰周脂肪改变及肾前（后）筋膜等情况。上腹部动态容积扫描原始数据传入东芝 Aqulion one 320 排 CT 机配备的腹部灌注软件，利用最大斜率模型生成上腹部脏器灌注参数伪彩图。在肝脏左叶、右叶分别选取感兴趣区 ROI 获取相关的灌注参数值，每个部位共选取 3 次 ROI 并取其平均值为测量值，单位为 mL min-1 100mL-1；ROI 直径为 2 mm 以上，同时避开脏器边缘、大血管等。记录患者检查时由 CT 机自动生成剂量长度乘积（DLP），根据国际放射防护委员会提出的公式计算出有效剂量。应用 SPSS16.0 统计软件包对数据进行分析，所有数据表示为均数±标准差。以方差分析比较组间及组内胰腺及肝脏各部位参数，两两组间比较采用 LSD 法，P<0.05 为差异有统计学意义。
结果 MAP 患者的肝左叶及右叶 HAP 分别为 60.85±17.72 mL min-1 100mL-1、54.93±14.33 mL min-1 100mL-1，均较对照组升高，差别有统计学意义；肝左叶及右叶 HPP 分别为 164.36±30.25

mL min-1 100mL-1、212.18±38.51 mL min-1 100mL-1，与对照组比较差别无统计学意义。CT 灌注的有效剂量为 16.8 mSv。

结论 320 排 CT 灌注成像有助于了解和评估胰腺炎症对肝脏损伤的情况，可作为常规增强检查的辅助手段。

PU-3522
CT 血管造影对肺癌合并上腔静脉综合征的诊断价值

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目的 探讨肺癌合并上腔静脉综合征(SVCS) 的 CT 血管造影表现及其诊断价值。**材料和方法** 收集 2007 年 7 月至 2011 年 6 月间 23 例经纤维支气管镜、肺穿刺、转移肿大的淋巴结穿刺、胸水及痰液脱落细胞学等病理检查确诊为肺癌并伴有上腔静脉梗阻及 SVCS 继发病变的 23 例影像及临床资料，回顾性分析其螺旋 CT 血管造影的特征。

结果 (1)原发疾病特征：肺癌位于右肺上叶 7 例、右肺中叶 3 例、右肺下叶 5 例、右全肺 2 例、左肺上叶 2 例、左肺下叶 4 例。小细胞肺癌 9 例，非小细胞肺癌 14 例。(2)上腔静脉梗阻征：主要症状包括上肢、头颈部及颜面部肿胀，颈静脉怒张，胸壁、上腹壁皮下静脉曲张，紫绀，呼吸困难等。参照 William Standford 法将上腔静脉阻塞程度分为 3 度。轻～中度：上腔静脉部分阻塞(<90%)；重度：上腔静脉几乎完全闭塞(>90%)；上腔静脉完全闭塞。三者例数分别为 10，9，4。根据上腔静脉与周围病变的关系，其梗阻形态可表现为：单侧压迫 5 例、半环状包埋 5 例、环状包埋 6 例、夹心状包埋 3 例、完全闭塞 4 例；(3)继发病变征：按其位于胸壁的前、后分为 2 组，前组侧枝血管包括胸廓内静脉、胸外侧静脉、膈下静脉、心包膈静脉、肋间前静脉、胸腹壁静脉和左上肋间静脉；后组侧枝血管包括奇静脉、椎静脉丛、后肋间静脉、肩背部静脉、半奇静脉和副半奇静脉。本组 23 例病例中出现侧枝循环的有 13 例，胸壁肿胀 15 例、二者均有的 9 例、二者均无 4 例。**结论** CT 血管造影检查能全面、准确诊断肺癌合并 SVCS，为临床诊断和治疗提供更丰富的影像学信息。

PU-3523
非痴呆型血管性认知功能障碍患者静息态功能磁共振研究

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目的 采用静息态功能磁共振（fMRI）技术，探讨低频振幅（ALFF）分析方法在非痴呆型血管性认知功能障碍（VCIND）中的价值。

方法 以 2013 年 11 月～2014 年 8 月同济大学附属同济医院神经内科收治的 VCIND 患者 16 例，男 10 例，女 6 例；年龄 54～74 岁，平均（62.31）岁；受教育年限 6～17 年，平均（10.94）年。同期征集医院所在地附近社区的正常成人志愿者 17 例作为对照组，男 9 例，女 8 例；年龄 52～70 岁，平均（61.76）岁；受教育年限 6～16 年，平均（11.18）年。由同一位执业超过 10 年的神经内科医师对两组受试者进行简易智能状态检查量表（MMSE）、蒙特利尔认知评估量表（MoCA）、临床痴呆评定量表（CDR）、Hachinski 缺血量表（HIS）等神经心理学量表检查和静息态脑功能磁共振成像。利用 ALFF 算法对两组全脑静息态数据进行对比分析，观察 VCIND 患者与正常对照 ALFF 有显著差异的脑区。

结果 VCIND 组和对照组性别、年龄、受教育程度等方面的差异无统计学意义（P>0.05）。VCIND 组 MMSE 总分为 24～29 分，平均 26.43±1.31 分，MoCA 总分 15～24 分，平均 20.06±2.32 分，HIS 总分 8～11 分，平均 9.93±1.48 分；对照组 MMSE 总分为 27～30 分，平均 29.29±0.85 分，MoCA 总分为 26～30 分，平均 27.29±1.16 分。2 组 MMSE 及 MoCA 总分差异均有统计学意义（P＜0.01＝静息态 fMRI 结果显示：与对照组比较，VCIND 组 ALFF 减弱的区域主要包括边缘叶、两侧梭状回、左侧海马旁回、左侧颞叶等。

结论 静息状态下，VCIND 患者存在某些脑区的活动减低，反映其脑功能失调的病理变化，为临床从大脑神经活动层面进一步了解 VCIND 认知功能损伤及其代偿过程提供了客观依据。

PU-3524

80kVp 联合像素闪烁算法在直接法下肢静脉 CT 血管成像中的应用

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目的：评价 80kVp 联合像素闪烁（pixel shine，PS）算法在直接法下肢静脉 CT 血管成像的辐射剂量和图像质量。方法：采用直接法下肢静脉 CT 血管成像，将 41 例临床诊断为下肢静脉曲张患者随机分为实验组（80kV）和对照组（100kV），对照组采用滤波反投影（filtered back projection，FBP）算法重建，实验组采用 PS 算法重建。比较两种成像技术的容积 CT 剂量指数（$CTDI_{vol}$）和剂量面积乘积(DLP)。分别选取腰 5 锥体层面图像、股骨头层面图像和腘窝层面图像，由两位放射科医师对以上图像的图像质量和噪声做主观评分，并测量、计算静脉血管 CT 值、图像噪声、信噪比（signal-to-noise ratio，SNR）和对比噪声比（contrast-to-noise ratio，CNR）。结果：实验组的 $CTDI_{vol}$ 和 DLP 明显低于对照组（t=-89.95，P＜0.01；t=-35.83，P＜0.01）；两名医师的主观图像质量评价的一致性较好（Kappa 值=0.78，**P＜0.01**），两组图像主观质量评分在下腔静脉、股静脉和腘静脉的差异均无统计学意义（P=0.17，P=0.92，P=0.75）；两组患者在图像噪声方面无差异，但在血管 CT 值、SNR 和 CNR 上，实验组明显高于对照组（**P值均＜0.01**）。结论：80kVp 联合像素闪烁算法可以常规在直接法下肢静脉 CT 血管成像中使用，降低辐射剂量，提高血管增强 CT 值、SNR 和 CNR。

PU-3525

脾脏占位性病变 CT 诊断及鉴别诊断价值

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目的 探讨螺旋 CT 在脾脏占位性病变诊断及鉴别诊断中的价值。

方法 回顾性分析 25 例经病理和临床证实的脾脏占位性病变的螺旋 CT 增强检查资料及临床资料，分析脾脏占位性病变的 CT 特征。

结果：25 例脾脏占位性病变中，脾囊肿 6 例，血管瘤 5 例，脾脓肿 2 例，脾梗死 5 例，淋巴管瘤 1 例，淋巴瘤 2 例，转移瘤 4 例。脾脏囊肿、血管瘤及淋巴管瘤多为偶然发现，常无临床症状；脾脏脓肿临床表现有高热、腹痛、血象增高等，触诊可有左上腹压痛；脾梗死可无临床症状，亦可引起左上腹痛；脾淋巴瘤多有脾脏增大，有时可伴有左上腹疼，可有全身多处淋巴结肿大，白细胞和血小板可减少；转移瘤多有原发恶性肿瘤病史并伴有相应症状。脾脏占位性病变 CT 平扫表现为低密

度，少数可呈囊实性或因出血、坏死、钙化而表现为混杂密度。良性病灶多边界清楚，恶性病灶边缘多模糊，边界不清。CT 增强扫描囊肿、淋巴管瘤及脾梗死无强化；血管瘤呈渐进性强化，体积较小的血管瘤可表现为强化不明显；脓肿为边缘及分隔强化，脓腔无强化；淋巴瘤及转移瘤可有不同程度的强化。良性病变一般具有以下特征：1.脾脏可肿大或不大。CT 平扫表现为境界清楚低密度灶，病灶常较小，增强后明显强化或不强化。2.腹腔淋巴结无肿大。3.临床表现较轻或体检偶然发现。以囊肿和血管瘤为常见。恶性肿瘤：1.脾脏肿大明显，转移瘤脾脏可以不大。2.病灶常较大，边界清楚或不清楚，增强扫描多无或不均匀轻微强化。3.脾门、腹膜后淋巴结肿大。4.临床表现较重，常有左上腹疼痛不适或触及肿块，或伴有发热、消瘦、贫血、脾功能亢进等，可有相关恶性肿瘤病史。4.以恶性淋巴瘤和转移瘤最常见。

结论 螺旋 CT 扫描对脾脏占位性病变的诊断和鉴别诊断有一定的帮助，结合临床病史多可正确诊断。

PU-3526

AD 患者脑功能偏侧性改变的静息态 fMRI 研究

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目的 采用功能磁共振技术，探讨阿尔茨海默病（Alzheimer diseaseAD）患者静息状态下的脑功能偏侧性的改变。**方法** 实验数据均来自 ADNI（Alzheimer disease Neuroimaging Initiative）数据库，以 17 例右利手阿尔茨海默病（AD）患者为研究对象，19 例右利手正常老年人作为对照。将全脑灰质随机划分为左右半球对称的 256 对种子区，基于功能连接分析法计算偏侧性指数（Laterality laterality Index，LI），量化分析静息态下脑功能偏侧性程度；计算 0＜|LI|＜0.2、0.2≤|LI|＜0.4、0.4≤|LI|＜0.8、0.8≤|LI|四段阈值下的左偏 LI 之和及右偏 LI 之和，探索 AD 患者较正常老年人静息状态下的脑功能偏侧性是否存在改变。**结果** 对照组在 0＜|LI|＜0.2、0.2≤|LI|＜0.4、0.4≤|LI|＜0.8 阈值内左右半球偏侧性未见明显不同，在 0.8≤|LI|的阈值内表现出明显的差异，体现出显著的左侧优势（*P*=0.005）；与对照组比较，AD 患者在 0.8≤|LI|阈值内左侧优势消失（*P*=0.06），在 0.4≤|LI|＜0.8 阈值内出现显著的右侧优势（*P*=0.03）。**结论** 对照组静息态脑功能存在一定的偏侧性，该偏侧性主要体现在偏侧性较强范围内（0.8≤|LI|），表现为左侧优势；AD 组在偏侧性较强的范围内（0.8≤|LI|）左侧优势消失，可能是其特征性改变；AD 组在偏侧性较弱的范围内（0.4≤|LI|＜0.8）表现出右侧优势，可能是与认知有关的脑功能代偿所致。

PU-3527

肾脏光谱 CT 增强不同单能级图像评估

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目的：光谱 CT 增强随着光谱单能级能级的减低可使单能级图像更加凸显图像增强程度，但同时会带来对病变强化程度的过度评估。因此，确定合适的单能级光谱 CT 增强图像具有一定的临床应用价值。本研究的目的是采用基于无水碘图碘浓度相关性分析的方法来评估肾脏不同单能级光谱 CT 增强图像。

方法：回顾性分析 50 例肾脏正常并行腹部增强光谱 CT 的受试者，基于无水碘图及不同单能级增强光谱图像测量肾皮质碘浓度及 CT 值，并进行相关性分析及 CT 值变异系数分析。

结果：相关性分析提示肾皮质 40Kev、50KeV、60KeV、70KeV、80KeV、90KeV 及 100KeV 能级 CT 值与碘浓度相关性系数分别为 0.994、0.994、0.993、0.987、0.976、0.960 及 0.938（P = 0.000）。相关系数比较 40KeV、50KeV 能级及 60KeV 能级相关系数均显著大于 70KeV 能级相关系数（$P_{40/50KeV-70KeV}$=0.007，$P_{60KeV-70KeV}$=0.03），40KeV 及 50KeV 能级与 60KeV 能级相关系数之间无显著统计学差异（P=0.59）。皮质期肾皮质在 40Kev、50KeV、60KeV 能级的变异系数分别为 0.21、0.20 及 0.19。

结论：本研究结果证实肾脏光谱 CT 增强图像皮质期最佳单能级为 60KeV。

PU-3528
基于 VBM 的轻度认识障碍患者脑灰质体积改变纵向研究*

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目的 探讨轻度认知障碍患者随访 1 年后脑灰质体积改变。**方法** 利用体素的形态测量学（voxel-based morphometry,VBM）方法，对来自 ADNI（Alzheimer’s disease Neuroimaging Initiative）数据库的 70 例 MCI 患者及 44 例正常对照者基线及随访 1 年的脑灰质体积改变进行对比研究。首先，对两组人两次 3D 磁共振 T1 结构像进行预处理，得到平滑后的全脑灰质数据，运用双样本 t 检验，分别比较正常对照组前后 1 年脑灰质体积差异及 MCI 组前后 1 年脑灰质体积差异。**结果** 正常对照者在 1 年前后脑灰质体积无明显改变；MCI 组患者皮质脑灰质体积在随访 1 年后相关脑区有明显的萎缩（P<0.05，经校正），这些区域主要集中在：1、记忆相关的颞叶区域，包括左颞下回、左颞中回、右颞上回、左侧海马、右侧海马；2、语言功能及躯体感觉相关区域等，包括左侧岛叶、右楔叶、右中央后回。 **结论** MCI 患者在 1 年时间内脑灰质在与记忆相关的颞叶区域及与语言功能和躯体感觉相关区域有发生萎缩，可为阿尔茨海默病的早期诊断提供影像学依据。

PU-3529
多模态磁共振成像对宫颈癌化疗后早期效果评估的价值

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目的 探索多模态磁共振成像对宫颈癌化疗后早期效果评估的价值

方法 收集同济大学附属同济医院 2015 年 4 月至 2016 年 4 月期间，经细胞学涂片或活检证实为宫颈癌且接受化疗的患者 15 例。所有患者在化疗前及化疗后 1 个月分别行多模态磁共振成像检查，成像序列包括常规 T1WI、T2WI、DWI、BOLD-MRI 及 DCE-MRI，并测得相关检查指标，包括肿瘤最大径 d_{max}、DWI 检查指标 ADC_{mean}；BOLD-MRI 检查指标 $R2^*$值；DCE-MRI 检查指标 K^{trans} 及 V_e 值。比较化疗前后肿瘤最大径 dmax 与多模态磁共振检查指标的变化；并比较分析化疗后肿瘤大小变化（肿瘤最大径变化率 Δdmax%）与化疗前多模态磁共振成像检查指标的相关性。

结果 （1）化疗后肿瘤最大径 d_{max} 较化疗前明显减小（P<0.05）；化疗后肿瘤 ADC_{mean} 较化疗前明显升高（P<0.05）；化疗后肿瘤 $R2^*$值较化疗前明显升高（P<0.05）；化疗后肿瘤 K^{trans} 较化疗前明显升高（P<0.05），而化疗后肿瘤 V_e 值较化疗前虽有所升高，但不具有明显统计学意义（P>0.05）；（2）化疗前后肿瘤最大径变化 Δd_{max}%与化疗前肿瘤基线 $R2^*$值呈明显负相关（r=- 0.742，P<0.05）；而与化疗前肿瘤 ADC_{mean}、K^{trans}、V_e 值无明显相关性（P<0.05）。

结论 多模态磁共振成像对宫颈癌化疗后早期效果评估具有一定价值。

PU-3530

多模态磁共振成像对宫颈癌诊断的价值

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目的 探索多模态磁共振成像对宫颈癌诊断的价值

方法 收集同济大学附属同济医院 2015 年 4 月至 2016 年 4 月期间，经细胞学涂片或活检证实为宫颈癌且接受手术治疗的患者 17 例。所有患者在术前均行磁共振检查，成像序列包括常规 T1WI、T2WI、DWI、BOLD-MRI 及 DCE-MRI，并测得相关检查指标，包括 DWI 检查指标 ADC_{mean}；BOLD-MRI 检查指标基线 $R2^*$值；DCE-MRI 检查指标 K^{trans} 及 V_e 值。术后对宫颈癌标本进行评估，包括病理类型、分化程度、宫旁组织浸润情况、盆腔淋巴结转移情况、MVD 及 HIF-1α 表达情况，并比较分析多模态磁共振成像检查指标与病理特征的相关性。

结果 （1）K^{trans} 值在鳞状细胞癌和腺癌间的差异具有统计学意义（P<0.05）；（2）高/中分化组的 ADC_{mean} 明显高于低分化组，且高/中分化组的基线 $R2^*$值明显低于低分化组，差异具有统计学意义（P<0.05）；（3）多模态磁共振成像检查指标与宫旁组织浸润情况及盆腔淋巴结转移情况无明显相关性（P>0.05）；（4）宫颈癌组织内 MVD 水平与 K^{trans} 值存在弱强度正相关(r=0.313, P<0.05)，与其他检查指标无明显相关性（P>0.05）；（5）宫颈癌组织内 HIF-1α 表达水平与基线 $R2^*$值存在中等强度正相关（r=0.559，P<0.05），与其他检查指标无明显相关性（P>0.05）。

结论 多模态磁共振成像对宫颈癌的诊断具有一定价值。

PU-3531

3.0TMR 评估青年人群膝关节前交叉韧带损伤的危险因素

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目的 探讨 3.0TMR 评估青年人前交叉韧带损伤的危险因素及其意义。
方法 回顾性分析已确诊前交叉韧带损伤的患者 69 例（其中男 35 例，女 34 例）及正常对照组 62 例(其中男 33 例，女 29 例）膝关节 3.0T MR 扫描资料，比较 MR 诊断前交叉韧带损伤的敏感性，特异性及准确性。测量损伤组与正常组的膝关节形态，测量参数包括：股骨髁间凹的宽度（NW）、股骨内外侧髁总长（BW）以及两者的比例即宽度指数（NWI），内侧髁至髁间凹的宽度 M、外侧髁至髁间凹的宽度 L 及两者的比值 L:M，所获得的数据采用 SPSS13.0 软件行统计分析。
结果 MRI 诊断前交叉韧带损伤的敏感性是 94.2%，特异性是 92.3%，准确性是 93.5%。68 例男性与 63 例女性比较， BW、L 及 NWI 差异有统计学意义（P<0.05），NW、M 及 L:M 差异无统计学意义（P>0.05）,青年男性与女性膝关节形态不同，男性膝关节的 NWI 较女性更小，在前交叉韧带损伤与未损伤男性人群中， BW、L:M 及 NWI 的差异有统计学意义（P<0.05）,损伤者的 NWI 更小，；而女性前交叉韧带损伤与未损伤组中，各参数差异均无统计学意义。所有参数在活动的强度及损伤部位（左右）之间差异无统计学意义（P>0.05）。

结论 较小的 NWI 很可能是男性前交叉韧带损伤的危险因素，BW 及 L：M 是影响青年男性膝关节动力学的重要因素。

PU-3532
CT 增强扫描及 DWI 在鉴别诊断肿块型胰腺炎与胰腺癌的价值

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目的 探讨胰腺癌与肿块型胰腺炎特征性的 CT 表现，研究 CT 增强扫描及磁共振水分子扩散加权成像(diffusion-weighted imaging，DWI)在 2 种疾病鉴别诊断中的价值。
方法 回顾分析我院经多排 CT 诊断的 101 例肿块型胰腺病变的 CT 表现，并进行病理对照，计算多排 CT 诊断肿块型胰腺病变的敏感性、特异性、准确率、阳性预测值、阴性预测值。比较肿块型胰腺炎与胰腺癌的 CT 表现差异，分析病灶的大小、形态（强化情况、钙化、假囊肿形成、胰胆管扩张）、部位、肾周筋膜增厚、对胰周大血管的侵犯、是否合并转移及糖类抗原 CA199 水平。并于一周内对上述 2 组病例行胰腺 DWI(b 值 800mm2 / s)检查，并测量每组 ADC 值。应用 SPSS 11.5 统计软件进行数据分析。
结果 101 例中，病理诊断胰腺癌 59 例，肿块型胰腺炎 42 例，CT 诊断的敏感性 94.9%，特异性 88.1%，准确率 92.1%，阳性预测值 91.8%，阴性预测值 92.5%。增强前后的 CT 值、胰腺及胰管钙化、假囊肿、胰胆管的扩张、胰周血管的侵犯及是否合并转移及 CA199 水平对肿块型胰腺炎和胰腺癌的鉴别差异有统计学意义（$P<0.05$）。胰腺癌与肿块型胰腺炎的 ADC 值差异无统计学意义（$P>0.05$），两者与正常胰腺相比差异有统计学意义($P<0.01$)。
结论 多排螺旋 CT 是一种评价肿块型胰腺炎及胰腺癌的有效手段，对鉴别这 2 种疾病有重要的应用价值。3T 磁共振胰腺 DWI 有助于正常与病变胰腺的诊断，胰腺癌与肿块型胰腺炎的 ADC 值尚存在重叠，利用 ADC 值鉴别两者尚存在争议。

PU-3533
多参数成像在肾脏恶性肿瘤诊断及鉴别诊断中的价值

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目的 探讨 3.0TMR 磁敏感成像结合弥散加权成像序列与肾癌病理分级分期的关系及 320 CT 动态增强扫描在不同类型肾癌鉴别诊断中的作用。
方法 回顾性分析 65 例不同类型肾脏恶性肿瘤，采用 3.0TMR 行 b 值=800s/mm^2 DWI 及 SWI 检查，所有肿瘤均经手术病理或穿刺活检证实，其中肾透明细胞癌 38 例，乳头状肾细胞癌 15 例，肾嫌色细胞癌 12 例。对病灶的 DWI 及 SWI 信号特点进行记录和分析，将其中的 T 分期与术后病理 T 分期进行对比，计算并比较临床各期 ADC 值间的关系。比较肿瘤动态增强各期增强特点和强化程度，并测量动态增强扫描各期肾癌的 CT 值，对各组数据进行统计学处理，计算均值与标准差，并计算强化幅度。
结果 肾癌中，各期两两比较发现，在未用 SWI 检测出血时，I 期与其余各期相比，差异有统计学意义，III 与 IV 期相比差异有统计学意义，而 II 期与 III、IV 期相比，差异无统计学意义，参照 SWI 除外出血区域后测量 ADC 值发现，I 期与其余各期、II 期与 III、IV 期两两比较相比，差异均有统计学意义，而 I、II 期之间及 III 期与 IV 期之间相比，差异无统计学意义（$P<0.01$）。不同亚型肾癌 CT 动态增强扫描发现，肾透明细胞癌与非透明细胞癌强化幅度差异有统计学意义

（P<0.01），而乳头状肾癌与嫌色细胞癌两者差异无统计学意义（P>0.05）,肾透明细胞癌强化幅度最高。

结论 利用磁共振多参数序列成像能准确、良好的判断肾癌的临床分期，而 CT 动态增强扫描在鉴别不同亚型肾癌有方面较高的临床应用价值。

PU-3534

磁敏感加权成像与灌注加权成像在肾透明细胞癌分级诊断中的应用

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摘　要：目的明确磁敏感加权成像（SWI）肿瘤内磁敏感信号（ITSS）与灌注加权成像（PWI）转运常数（Ktrans）之间是否存在相关性,以及两者在肾透明细胞癌（ccRCC）分级诊断中的应用价值。方法选取 36 例经手术病理证实为 ccRCC 并进行病理 Fuhrman 核分级（Ⅰ~Ⅳ）评估的患者,行 2D 多次屏气 SWI 和肾脏 PWI 扫描。评估测量 ITSS 等级与 Ktrans 的平均值,对 FuhrmanⅠ、Ⅱ、Ⅲ3 组间分别进行 Kruskal-Wallis 检验和方差分析,并分析 ITSS 等级和 Ktrans 平均值之间的相关性;同时应用受试者工作特征（ROC）曲线分析其分级诊断效能。结果 Fuhrman 分级Ⅰ级 8 例、Ⅱ级 16 例、Ⅲ级 12 例,对应的 ITSS 等级分别为 1.25±0.43、1.75±0.83 和 2.20±0.75,Ktrans 值分别为（0.24±0.07）、（0.31±0.08）和（0.34±0.07）min-1,不同 Fuhrman 分级间 ITSS 等级和 Ktrans 值差异均有统计学意义（χ2=6.089,P〈0.05;F=4.116,P〈0.05）。ITSS 与 Ktrans 总体呈中度正相关（r=0.536,P〈0.01）。以 ITSS 和 Ktrans 的 ROC 曲线鉴别高、低级别（FuhrmanⅢvsⅠ~Ⅱ）ccRCC 的曲线下面积（AUC）、敏感性和特异性相对较高,分别为 0.737、80.0%、37.5%和 0.737、90.0%、68.8%。结论 ITSS 和 Ktrans 可以为 ccRCC 术前分级诊断提供更加丰富的信息,从而有助于手术方案的制定及预后的判断。

PU-3535

先天性肾动静脉瘘的影像学诊断

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目的　探讨肾动静脉瘘的影像诊断价值。

方法　回顾性分析 2 例肾动静脉瘘患者的资料。2 例患者 CT 检查，其中 1 例同时行静脉肾盂造影、MRI 检查，发现病变后， 均经 DSA 检查证实。

结果　肾脏发现团块状占位，CT 上呈等密度，周围见钙化影；MRI 上 T1 为等高、T2 为高低混杂信号；增强后明显强化，强化程度与腹主动脉一致，下腔静脉早显；DSA 检查示血管畸形、动静脉短路、多分支供血等，下腔静脉早显。

结论　CT、MRI 等能够发现肾动静脉瘘，CT 检查尤其三维重建能够明确诊断，但 DSA 仍然是诊断肾动静脉瘘最佳的检查方法。

PU-3536
SPIOs 在体标记大鼠室管膜下区神经前体细胞及 MR 示踪成像研究

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目的 研究超顺磁氧化铁纳米颗粒(SPIOs)对成体大鼠室管膜下区(SVZ)神经前体细胞(NPCs) 的在体标记及 MR 示踪成像的可行性。
方法 采用线栓法建立 SD 大鼠脑梗塞模型。在建模成功后第 2d 通过小动物脑立体定位仪分别向梗塞模型组(n=5)和正常成体组(n=5)大鼠脑内注射 1μl SPIOs (浓度 3.5mg Fe/ml)，梗塞对照组(n=4)和空白对照组(n=4)注射同等量 PBS 液，注射位点选择为右侧侧脑室前角前缘区域，于注射当天开始腹腔注射 5-溴脱氧尿嘧啶核苷(BrdU)，连续注射 1 周。所有实验动物均于术后第 1、3、7、14d 进行常规 T2*WI (7.0 T)扫描，于第 14d MR 扫描后行灌注固定取脑，标本分别行 HE、普鲁士兰染色以及普鲁士兰与 BrdU 免疫组织化学双重染色。通过比较 MR 图像与病理结果，观察 SPIOs 在脑内的分布与迁移过程。
结果 在正常成体组大鼠中，注射后 SPIOs 均大部分位于右侧侧脑室前角前缘区，仅部分进入脑室系统。矢状位 T2*WI 能较好地显示 SPIOs 经颅顶部注入脑内的路径以及沿吻侧迁移流(RMS)向嗅球(OB)区分布的过程，磁共振伪影适中，示踪成功率达 100%。染色结果显示 SPIOs 能较好地标记 NPCs，SVZ、RMS 以及 OB 区平均标记率分别约为 75.5%、42.3%、23.6%。在梗塞模型组大鼠中，除了 RMS 内可见少量 SPIOs 分布、迁移以外，梗塞区也可见部分 SPIOs 分布。梗塞对照组及空白对照组各时间点、各部位未见明显低信号改变。
结论 SPIOs 能有效地在体标记成体大鼠 SVZ 的 NPCs，且标记率优于文献报道的 MPIOs；MRI 能动态地监测标记后的 NPCs 迁移、分布的过程。在正常成体大鼠脑内，SPIOs 在体标记的 NPCs 主要沿 RMS 向 OB 方向迁移、分布，而在脑梗塞模型大鼠中，部分标记的 NPCs 可迁移至梗塞区。

PU-3537
SPIOs 在体标记大鼠室管膜下区神经前体细胞及磁敏感加权成像研究

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目的 探讨磁敏感加权成像(SWI)在 SPIOs 在体标记及 MR 示踪成像中的应用价值。
方法 通过小动物脑立体定位仪分别向成体实验组(n=5)、空白对照组(n=5)大鼠脑内注射 1μl SPIOs (浓度 0.7mg Fe/ml)和同等量 PBS 液，注射位点选择为右侧侧脑室前角前缘区域，于注射当天开始腹腔注射 5-溴脱氧尿嘧啶核苷(BrdU)，连续注射 1 周。所有实验动物均于术后第 1、3、7、14d 进行 MR(3.0 T)扫描扫描，MR 扫描序列包括 T2WI、T2*WI、SWI。于第 14d MR 扫描后行灌注固定取脑，标本分别行 HE、普鲁士兰染色以及普鲁士兰与 BrdU 免疫组织化学双重染色。分析比较 T2*WI、SWI 对 SPIOs 在体标记脑内 NPCs 的示踪效果。
结果 3.0 T 磁共振 T2*WI、SWI 及其相位图、MIP 图能显示 SPIOs 注射的路径、分布以及沿 RMS 迁移的状态，其中 T2*WI、SWI 显示的最长迁移距离分别为 2.51±0.22mm 和 5.32±0.31mm，迁移区与皮层信号比分别为 0.75±0.12 和 0.53±0.11，两者比较均具有统计学差异(P＜0.01)，SWI 显示 SPIOs 迁移状态的敏感性和对比度明显优于 T2*WI。除了矢状位 MIP 图磁敏感伪影较重以外，其它矢状位、冠状位 SWI 及其相位图、MIP 图伪影较小，5 例实验大鼠 SWI 示踪成功达 100%。染色结果

显示 SPIOs 能较好地标记 NPCs。空白对照组各时间点、各部位及各成像序列均未见明显低信号改变。
结论 3.0 T 磁共振 SWI 及其相位图、MIP 图能显示由 SPIOs 在体标记的 NPCs 沿 RMS 迁移的状态，且敏感性、对比度明显优于 T2*WI，SWI 序列可作为在体监测 SPIOs 标记细胞迁移的优先序列。

PU-3538

实型胰腺浆液性囊腺瘤：影像与病理

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【摘要】**目的：**探讨实型胰腺浆液性囊腺瘤（Solid Serous Cystadenoma of the Pancreas, SCP）影像学表现及其病理基础。**方法：**对 11 例经病理证实的实型胰腺浆液性囊腺瘤患者的影像学资料和病理资料进行回顾性分析。所有患者均经过 CT 和 MRI 平扫加增强检查。将 CT 扫描中肿瘤强化超过胰腺组织的病例列为 A 组；肿瘤强化未超过胰腺组织的肿瘤列为 B 组。分别测试 CT 动脉期、门脉期和延迟期两组病例肿瘤与周围胰腺组织的 CT 值。将两组肿瘤与周围胰腺在不同时强化时期的平均 CT 值图表比较。**结果：**患者全部为女性，41 岁-77 岁，中位年龄 60 岁。肿瘤 CT 和 MR 图像上边界清晰。A 组 7 例，肿瘤相对胰腺等高密度，增强后在退化胰腺背景下显著强化，肿瘤强化程度在动态增强的各期均超过周围胰腺组织。B 组 4 例，胰腺组织未发生退化，肿瘤相对周围胰腺低密度，增强后肿块各期强化均未超过周围胰腺。MRI T_2WI 图像上所有肿瘤显示 “高亮”信号，与水相近，并可以观察到相对低信号的分隔结构。增强后强化方式与 CT 相同。病理大体标本显示肿瘤为实性肿块，内部可见较为粗大的白色纤维分隔。镜下显示为大量微型囊腔和囊腔之间丰富的肿瘤间质。囊腔友单层立方上皮细胞覆盖内壁。肿瘤间质内富含血管及纤维胶原。**结论：**实型胰腺浆液性囊腺瘤的影像特征与其病理特征密切相关，其相对胰腺的强化方式与周围胰腺是否退化有关，MRI T_2WI 有助于揭示其囊性肿瘤本质。

PU-3539

胃壁增厚的 CT 研究及应用价值

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目的 提高 CT 对于引起胃壁增厚的胃部病变的诊断及应用价值重要性的认识。
方法 回顾性分析经手术病理及胃镜病理证实的 82 例胃壁增厚的 CT 表现，并与正常胃壁厚度相比较，从胃壁增厚的程度、形态等来诊断及鉴别胃壁增厚的病变。
结果 82 例胃部疾病，其中胃癌 45 例，胃淋巴瘤 17 例，间质瘤 12 例，胃炎 8 例，累及范围共 122 处；其中胃窦部 56 处，平均厚度 19.3+11.8mm；胃体部 45 处，平均厚度 32.6+12.3mm；胃底贲门部 21 处，平均厚度 39.1+7.5mm；与正常各区胃壁厚度有显著性差异。本组 82 例病例胃壁增厚的 CT 类型：条形或梭形增厚（30）、肿块形增厚（14）、结节形增厚（5）、溃疡型增厚（10）、不规则形增厚（8）、混合型增厚（15）等。

结论 CT 对于胃壁增厚的厚度、形态等的观察有很大的价值，能够较好地准确诊断胃壁增厚的相关疾病及鉴别诊断。

PU-3540
多模态磁共振成像对前列腺外周带弥漫病变的鉴别诊断

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【目的】探讨多模态磁共振成像对外周带弥漫前列腺癌和前列腺炎的鉴别诊断价值。
【方法】回顾性分析经直肠超声（TRUS）引导下饱和穿刺活检或前列腺根治术后病理证实前列腺病例 33 例，其中前列腺炎 18 例，前列腺癌 15 例。所有患者均采用 Siemens Verio 3.0 T 磁共振扫描，成像序列包括横断位、矢状位高分辨 T2WI，横断位弥散加权成像（DWI）及动态对比增强（DCE）扫描。
【结果】
前列腺炎 T2WI 呈均匀或不均匀低、稍低信号，14 例与中央带分界清，包膜完整；DWI 呈稍高或高信号，平均 ADC 值为（1.12±0.15）×10-3 mm2/s；DCE 9 例呈速升平台型，6 例呈流入型，3 例表现为不均匀强化，可伴有小脓肿或囊肿形成。前列腺癌呈均匀低信号，9 例病灶与中央带分界不清，累及包膜；DWI 呈高或稍高信号，平均 ADC 值（0.85±0.19）×10-3 mm2/s，与前列腺炎之间存在统计学差异（t=4.563，P＜0.01）；DCE 10 例呈流出型，5 例呈速升平台型。
【结论】
多模态磁共振成像有利于外周带弥漫前列腺癌和前列腺炎的鉴别诊断。
关键词：前列腺炎； 前列腺肿瘤； 磁共振成像； 磁共振成像，弥散； 动态对比增强磁共振

PU-3541
利用图论方法研究轻度认知功能障碍患者大脑功能网络的点介性

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目的：利用图论方法探索轻度认知功能障碍（MCI）患者大脑各脑区点介性的异常改变。
方法：首先采集 16 名 MCI 患者和 20 名正常老年人（NC）的大脑静息态 BOLD-fMRI 数据。采用 SPM5 和 DPARSF 软件包进行数据预处理；采用 Matlab 编程语言构建大脑功能网络，并计算 Sparsity=0.18（网络收益最大）时 90 个脑区的点介性。采用双样本 t 检验分别比较 MCI 患者与 NC 组 90 个脑区点介性的差异，并用 REST 软件呈现结果。
结果：两组人额上回、岛叶、楔前叶、前扣带和旁扣带回等区域的点介数较大；而中央扣带回、右海马区、杏仁核、枕下回、左梭状回、豆状核和右颞中回等区域的点介数较小。MCI 患者右额上回、右岛叶、右梭状回、左缘上回、右角回和左中央旁小叶 6 个区域点介性显著高于正常老年（P<0.05）；而右额下回鳃盖部、右辅助运动区和右舌回 3 个区域点介性显著低于正常老年（P<0.05）。
结论：MCI 患者大脑多个区域信息传递能力发生了异常改变，提示在 MCI 的诊断与鉴别诊断中应重点关注这些区域。

PU-3542

轻度认知功能障碍对大脑功能网络效率的影响

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目的 从网络效率的角度来检验轻度认知功能障碍（MCI）患者大脑功能网络的小世界特性，并探讨 MCI 对大脑功能网络效率的影响。
方法 共采集 16 名 MCI 患者和 20 名正常老年人（NC）的大脑静息态 BOLD-fMRI 数据。采用 SPM5 软件包对数据进行预处理，采用 Matlab 编程构建大脑功能网络。针对每个网络生成 100 个与之具有相同节点和边数的规则网络和随机网络。计算各网络的全局效率 E_{global}、局部效率 E_{local} 和网络收益 Earn。通过双样本 t 检验比较 MCI 患者与正常老年人大脑功能网络效率的差异。
结果 两组受试者大脑网络均符合 $E_{global}(G_{reg}) < E_{global}(G) < E_{global}(G_{rand})$ 和 $E_{local}(G_{rand}) < E_{local}(G) < E_{local}(G_{reg})$，且 MCI 组全局效率和网络收益均高于 NC 组（0.16≤Sparsity≤0.28 范围内 $P<0.05$），局部效率低于 NC 组。两组网络收益均为正值。
结论 MCI 患者和正常老年人的大脑功能网络都具有经济有效的小世界特性，但 MCI 患者大脑网络效率发生了异常，提示 MCI 患者大脑信息传递能力受损。

PU-3543

轻度认知功能障碍患者大脑 fMRI 网络的小世界特性

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目的 利用静息态 fMRI 数据检验轻度认知功能障碍（MCI）患者大脑功能网络是否具有小世界特性。
方法 采集 16 例 MCI 患者和 20 例正常老年人（NC）的大脑静息态 BOLD-fMRI 数据。采用 SPM5 软件对图像进行预处理，将大脑分割为 90 个区域并计算 90 个区域间的相关系数。以矩阵稀疏度 Sparsity 为阈值，将相关矩阵转换为网络。计算网络的聚类系数 C 和平均路径长度 L，若满足 $\gamma = C/Crand > 1$ 且 $\lambda = L/Lrand \approx 1$（rand 代表相应随机网络），则说明该大脑功能网络具有小世界特性。采用双样本 t 检验比较 MCI 患者与正常老年人大脑功能网络小世界参数的差异。
结果 在 0.1~0.4 阈值范围内，MCI 组和 NC 组均符合 $\gamma > 1$ 且 $\lambda \approx 1$。MCI 组 γ 和 δ 均大于 NC 组，且在 0.10≤Sparsity≤0.18 时差异达到显著水平（P<0.05）；MCI 组 λ 在各阈值处均小于 NC 组，在 Sparsity=0.18、0.28 和 0.32 处差异达到显著水平（P<0.05）。
结论 MCI 患者大脑 fMRI 网络具有小世界特性，但与正常老年人相比其小世界特性增强。

PU-3544

MDCT 对甲状腺肿瘤的鉴别诊断价值

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目的 分析各种甲状腺肿瘤的 MDCT 征象，探讨 MDCT 对甲状腺肿瘤鉴别诊断的价值。
方法 回顾性分析 2011 年 1 月至 2013 年 12 月间本院收治的 50 例甲状腺肿瘤患者影像学资料及手术病理结果。所有患者术前行 MDCT 检查，MDCT 图像由 2 位中级职称以上影像科医师共同阅片，

分析甲状腺肿瘤边界、密度、强化方式、肿瘤与邻近器官关系；肿瘤以外甲状腺组织的密度、强化情况、边界；颈部淋巴结情况。

结果 50 例患者中男性 12 例，女性 38 例；年龄 17－80 岁，平均年龄 52 岁。50 例甲状腺肿瘤中，良性肿瘤 35 例；恶性肿瘤 15 例。35 例甲状腺良性肿瘤均为甲状腺腺瘤，MDCT 平扫表现为甲状腺内低密度肿块，边界清晰，增强后可更清楚显示病灶边界。肿瘤以外甲状腺组织包膜完整，强化后密度均匀。其中 19 例腺瘤发生囊变，17 例囊变区形态规则， 另 2 例囊变区形态不规则；增强后囊变区内无强化，囊变区周围见完整强化环。其余 16 例腺瘤呈实质性肿块，8 例增强早期强化均匀，2 例早期出现岛状强化，另 6 例早期呈不规则强化；延迟后 16 例实质性肿块均呈均匀强化。4 例腺瘤出现钙化，1 例钙化为块状，3 例钙化为弧形。35 例腺瘤患者均未发现颈部淋巴结肿大。15 例甲状腺恶性肿瘤中 14 例为甲状腺癌，1 例为淋巴瘤。MDCT 平扫多表现为甲状腺内低密度肿块，病灶内密度不均匀。恶性肿瘤边缘不规则，7 例边缘呈蟹足状改变，3 例出现包膜节段征。增强后 11 例恶性肿瘤呈不规则强化，延迟后密度不均匀。14 例甲状腺癌中 8 例肿块内出现钙化，其中细颗粒状钙化 3 例，点状钙化 4 例，不规则钙化 1 例。3 例甲状腺癌病灶突破甲状腺包膜。1 例甲状腺恶性肿瘤出现颈动脉受侵，2 例出现食管受侵，另有 2 例肿块突入气管内、导致气管壁连续性中断。本组甲状腺恶性肿瘤中 8 例发现颈部淋巴结肿大，1 例有纵隔淋巴结肿大。

结论 MDCT 对甲状腺肿瘤的鉴别诊断具有重大价值，可为临床确诊甲状腺肿瘤提供有价值的依据。

PU-3545

直肠癌 MR 灌注成像参数与病理特征的相关性研究

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目的：分析 MR 灌注成像参数包括对比剂容积转换常数（Ktrans）、速率常数（Kep）、血管外细胞外间隙容积分数（Ve）及初始强化曲线下面积(iAUC)与肿瘤病理分化程度、T N 分期、脉管侵犯、神经周围侵犯情况的相关性。方法：经肠镜病理证实的 35 例患者术前行 MR 灌注图像，经后处理获得直肠癌 TIC 曲线及各 MR 灌注参数值，分析直肠癌 MR 灌注参数与病理特征的相关性。结果：直肠癌 Ktrans 及 iAUC 值均高于癌周正常直肠壁；直肠癌 Ve 值低于癌周正常直肠壁；T3-4 期组直肠癌 Ktrans 及 Kep 较 T1-2 期组升高，N+组的 Kep 值高于 N0 组。其余病理特征与 MR 灌注参数均无统计学关系。结论：直肠癌的 MR 灌注成像参数值能反映肿瘤的不同病理特点，可以反映肿瘤微血管状态及血液动力学变化。

PU-3546

匹茨堡复合物 B 修饰的磁性纳米颗粒对阿尔茨海默病淀粉斑块的体外早期检测

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目的 构建特异性结合阿尔茨海默病（AD）病理标记物β淀粉（Aβ）斑块的靶向磁性纳米颗粒，并探究其与 Aβ斑块体外结合的能力。

方法 采用纳米级锰锌铁氧体 $Mn_{0.6}Zn_{0.4}Fe_2O_4$，以两亲性星型嵌段共聚物进行包覆，负载 Aβ特异性探针匹茨堡复合物 B（PiB），构建新型靶向 Aβ斑块的磁性纳米颗粒 MZF-PiB，透射电镜检测其形态，3.0T MRI 扫描测量 MZF-PiB 悬液的 T_2值，通过计算 r_2弛豫率评估其超顺磁性，应用人神经母

细胞瘤细胞株 SH-SY5Y、狗肾上皮细胞株 MDCK 行细胞毒性实验以评估该纳米颗粒的生物安全性，6 月龄 AD 小鼠脑片免疫组化染色检测其体外结合 Aβ 的能力。采用单因素方差分析进行组间比较。

结果 MZF-PiB 纳米颗粒成功构建，透射电镜显示其粒径约 100 nm，r_2弛豫率为 163.11 mMS^{-1}；孵育 MZF-PiB 悬液 24 h、48 h 后的 SH-SY5Y 和 MDCK 细胞与对照组细胞活性相比差异均无统计学意义（F=2.336、2.539、0.293、1.493，均 P>0.05）。体外结合实验显示纳米颗粒可与 Aβ 斑块特异性结合，被检出斑块最小尺寸为 27 μm。

结论 PiB 修饰的靶向磁性纳米颗粒具有良好的生物安全性和优良的顺磁性，具有体外检测 Aβ 斑块的能力和早期诊断 AD 的潜力。

PU-3547
320 排 CT 灌注成像联合踝臂指数在急性脑缺血中的应用

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目的 研究脑灌注成像与踝臂指数(ankle-brachial index，ABI)在急性缺血性脑血管病中的临床应用价值。

方法 选择我院疑似急性缺血性脑血管病患者 105 例，其中 ABI 异常组 33 例，ABI 正常组 72 例。均行 320 排动态容积 CT 全脑灌注扫描，一站式完成颅脑 CT 血管造影(CT angiography，CTA）和 CT 灌注成像（CT perfusion，CTP），获得脑血流量（CBF）、脑血容量（CBV）、平均通过时间（MTT）、达峰时间（TTP）及延迟时间（Delay）等灌注参数图，由 2 位有经验的医师共同评价脑灌注图像，计算 ABI 预测颅脑 CT 灌注异常的阳性预测值、阴性预测值、灵敏度、特异度。

结果 所有受试者中有 68 例出现脑灌注异常，表现为 MTT、TTP 延长，CBV 升高、正常或减低，CBF 正常或减低。其中 ABI 异常组有 25 例，ABI 正常组有 43 例，ABI 异常组脑灌注阳性率（25/33，75.8%）高于 ABI 正常组（43/72，59.7%），差异有统计学意义(P <0.05)，且 ABI 异常组的相对平均通过时间（relative MTT ,rMTT）、相对达峰时间（relative TTP , rTTP）大于 ABI 正常组，差异有统计学意义（P <0.05）。ABI 预测颅脑 CT 灌注异常的阳性预测值、阴性预测值、灵敏度、特异度分别为 75.8%、40.3%、36.8%、78.4%。

结论 应用 320 排动态容积 CT 全脑灌注扫描可以早期、全面、准确评价脑血管及血流动力学改变，简便的 ABI 检查对脑灌注异常有一定的预测价值,二者联合应用，利于早期预防及治疗脑血管病。

PU-3548
CT 全脑灌注成像对交叉性小脑神经机能联系不能的诊断价值

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目的 探讨 320 排 CT 全脑灌注扫描成像对交叉性小脑神经机能联系不能(crossed cerebellar diaschisis,CCD)的诊断价值及临床意义。

方法 收集 115 例急性及亚急性期单侧幕上新发脑梗死病例为实验组，同时期内正常志愿者 10 例为对照组。所有病例均在症状稳定期行 320 排 CT 全脑灌注扫描，运用 MTT、TTP、rCBF、rCBV 四个参数评估脑灌注改变。随访 CCD 阳性病例 2 月后日常生活活动能力量表（Barthel Index,BI），分析神经联系不能程度（the degre e of diaschisis，DoD）与 BI 的关系。

结果 急性脑梗塞组 CTP 参数发现 CCD 的比率为 MTT（36.4%）>TTP（21.8%）>CBF（18.2%）>CBV(9.1%)。亚急性期脑梗塞组 CTP 参数发现 CCD 的比率为 MTT（40%）>TTP（21.7%）>CBF（20%）>CBV（8.3%）。急性期 CCD 阳性组 DoD 与 2 个月 BI 无明显线性相关(P>0.05)。亚急性期 CCD 阳性组小脑ΔMTT、ΔTTP、CBF 减低率与 2 个月 BI 呈线性负相关(P<0.05)。
结论 320 排 CT 全脑灌注扫描成像可以有效诊断脑梗死后 CCD，且 MTT 对于发现 CCD 最敏感。对于亚急性期脑梗塞患者，CCD 现象提示临床预后较差。

PU-3549

CT 全脑灌注成像评估 CCD 严重程度的影响因素

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目的 运用 320 排 CT 全脑灌注成像分析交叉性小脑神经机能联系不能(crossed cerebellar diaschisis,CCD)严重程度的影响因素。
方法 收集 115 例急性及亚急性期单侧幕上新发脑梗死病例。所有病例均在症状稳定期行 320 排 CT 全脑灌注扫描，运用 MTT、TTP、rCBF、rCBV 评估脑梗塞患者大脑灌注异常程度，并计算灌注异常体积。计算 CCD 阳性病例的小脑不对称指数(asymmetry index，AI)，分析幕上大脑灌注异常程度和体积与小脑 AI 值的关系。并比较急性期 CCD 阳性组与亚急性期 CCD 阳性组间小脑 AI 值。
结果 急性期 CCD 阳性组大脑ΔMTT 与小脑ΔMTT、ΔTTP 呈线性正相关(P<0.05)，大脑ΔTTP 与小脑ΔTTP 呈线性正相关(P<0.05)。大脑 CBF 减低体积与小脑ΔTTP 呈线性正相关(P<0.05)，大脑 CBV 减低体积与小脑ΔMTT 呈线性正相关(P<0.05)。 亚急性期 CCD 阳性组大脑ΔMTT、ΔTTP 和小脑ΔMTT 呈线性正相关(P<0.05)。大脑 MTT 延长体积与小脑ΔTTP 呈线性正相关(P<0.05)。急性期 CCD 阳性组与亚急性期 CCD 阳性组间小脑 AI 值比较，差异无统计学意义(P >0.05) 。
结论 脑梗塞患者幕上低灌注体积与低灌注程度均与 CCD 的严重程度正相关。CCD 发生后，梗死持续时间与 CCD 严重程度的演变无关。

PU-3550

临床放射诊断中的精准医学模式

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目的 探讨临床放射诊断中的精准医学模式，摸索出提高放射科学生及未来放射科医师证据推理和数据整合能力的有效可行的教学方法，以适应信息共享及知识网路化的大数据时代生物医学研究和现代医学实践发展的需求。
方法 循证分析大数据时代新的疾病分类方法向着将个人分子检测与健康记录动态相连的、在结合患者内在生物学机理和传统的“ 身体信号和症状”基础上描述和定义疾病、直接对疾病机制和治疗进行更深入理解的趋势发展现状，特别分析现代医学影像学的特征和传统医学影像诊断模式存在的问题。
结果 医院信息系统(Hospital Information System, HIS)，医学影像存档与传递系统(Picture Archiving and Communication Systems，PACS)的与时俱进为放射科精准医学成功实施提供了调控、搜集及解释大量生物信息的框架，通过修订医学影像学专业教材和加强医学影像学学科师资队伍建设，更新教学手段,加强分析技能与影像信息处理能力的培训，提高未来放射科医师证据推理和复杂数据整合能力，从而逐步实现现有临床放射诊断模式向精准医学模式的转变。

结论 基于 PACS 的以放射诊断为核心、辅以影像资讯工具的应用训练及大数据整合基本能力训练的医学影像学课程体系，将有利于培养大数据时代放射科医学影像学专业学生及医师的从业能力和解决问题能力，使临床放射诊断中的精准医学模式成为可能。

PU-3551
联影 128 层 CT 低剂量冠状动脉 CTA 成像的应用价值

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目的：评估应用上海联影医疗科技有限公司生产的 128 层 CT（uCT 760）进行低管电压（80KV，70KV）冠状动脉 CTA 检查的临床应用价值。**方法**：选取 2016 年 3 月至 2016 年 6 月体重指数（BMI）在 22-25Kg/m^2，临床怀疑或已知冠心病拟行冠状动脉 CTA 检查的 120 例患者。采取随机数字表法选取 40 例为常规剂量组(A 组)，其余 80 例为低剂量组（B 组）。两组均行回顾性心电门控扫描技术，A 组采用管电压 120Kv，管电流 150mAs。B 组根据管电压分成两个亚组，B1 组管电压 80KV（40 例），B2 组管电压 70KV（40 例），均采用管电流 150mAs。各组 CT 图像的辐射剂量[CT 剂量长度乘积(DLP)和有效剂量(ED)]以及图像噪声（SD）、图像信噪比(SNR)、冠状动脉近段的对比噪声比(CNR)进行系统测量。由 2 名放射科医师采用双盲法对每例患者冠状动脉的图像质量进行 4 分法评估。应用 ANOVA 单因素方差分析比较三组辐射剂量(DLP 和 ED)、SD、SNR 和冠状动脉近段 CNR。用 Kappa 分析评价不同观察者冠状动脉图像质量评分的一致性。**结果**：A 组、B1 组、B2 组的 DLP 分别为（490.08±78.83）、（182.29±69.79）和（67.10±27.04）mGy*cm,ED 分别为（11.33±1.27）、（2.56±0.97）及（0.94±0.40）mSV，三组间两两比较均有显著性差异（P＜0.05）。主观图像质量评估：A 组(3.61±0.77)分，B1 组(3.53±0.80)分，B2 组(3.74±0.69)分，差异无统计学意义(P=0.20)。客观图像质量评估：三组之间 SD、SNR、冠状动脉近段 CNR **差异无统计学意义（P 值分别为 0.81、0.08、0.15、0.37、0.33）。结论**：联影 128 层排 CT 采用低管电压行冠状动脉 CTA，在保证图像质量的同时，可以有效降低辐射剂量。

PU-3552
RNAi 抑制宫颈癌细胞人端粒酶逆转录酶（hTERT）基因的体外实验研究

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目的 通过 RNAi 技术对宫颈癌细胞人端粒酶逆转录酶 hTERT 基因的特异性抑制,旨在探讨 RNAi 技术在宫颈癌中应用的可行性，并筛选出对宫颈癌治疗可能有效的 siRNA 片段，为宫颈癌的基因治疗提供实验依据。方法 1. 宫颈癌细胞株 Hela 的培养传代。2. 化学合成靶向于 hTERT 基因的 siRNA，用阳离子脂质体转染法将其导入宫颈癌细胞内。3. 实验分组如下：转染组 siRNA-1、siRNA-2、siRNA-3、siRNA-4、阳性对照组(siRNA-G)、阴性对照组(siRNA-NC)、阳离子脂质体组（LIP），空白对照组(Blank)。4. 通过 TRAP，RT-PCR、实时定量 PCR 和 Western Blot 方法分别检测宫颈癌细胞转染后细胞的端粒酶活性，hTERT mRNA 和蛋白水平，MTS 法检测细胞生长增殖，流式细胞仪检测细胞凋亡情况。结果 1. 流式细胞仪显示宫颈癌细胞的转染效率为 80%。2. siRNA-1、siRNA-2、siRNA-3、siRNA-4、siRNA-NC、Blank 的端粒酶活性分别为 0.540 士 0.21、0.624 士 0.19、0.292 士 0.12、0.778 士 0.14、0.81 士 0.14、0.91 士 0.05，siRNA-3 组的端粒酶活性明显下降，与其他 5 组相比有显著统计学意义（p＜0.01）。3. siRNA-3 组 hTERT mRNA 表达水平显著下降，与其他 5

组相比有显著统计学意义（p＜0.01）。4. siRNA-3 组，hTERT 蛋白表达明显下降，与其他各组相比有显著统计学意义（p＜0.01）。5. siRNA-3 组细胞凋亡率明显升高，与其他 5 组相比有明显统计学意义（p＜0.01）。结论 RNAi 技术能特异性抑制宫颈癌 Hela 细胞 hTERT 基因，下调 hTERT mRNA 及蛋白表达水平，降低端粒酶活性，抑制癌细胞生长、增殖，促进宫颈癌细胞凋亡，为宫颈癌的基因治疗研究提供实验依据。

PU-3553

简述医疗设备的管理

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目的：做好医疗设备的管理工作，使之满足现代管理的需要，提高高资产使用率和经济效益。
方法：回顾性分析医疗设备管理的现状及存在的缺陷，阐述管理医疗设备的意义。
结果：随着新技术、精密化的现代医疗设备被医院广泛的使用，传统的管理模式已经无法高效、及时的管理和维护医疗设备。此外国家医疗卫生管理部门出台过一系列医疗设备管理相关的法律法规，从政策层面看，医疗设备的生产、经营和使用等都进行了规范的管理，但当前设备的质量检测工作相关的技术、操作、标准等层面的规范还不够完善。同时，由于医疗设备管理软件技术的落后，使得软件的移植性和易用性降低，从而导致整个医疗体系无法规范化、标准化的管理医疗设备。
结论：现代新型医疗设备的广泛引进，迫切需要相关部门进一步制定详细、标准、统一的准则来规范医疗设备的管理，从源头上解决医疗设备管理的混乱，真正做到管理过程中有法可依、违法必究。另一个方面，随着科学技术和信息技术的快速发展，设备管理系统的信息化、系统化是行业发展的趋势，这需要相关的医学工程专家、医院管理专家及信息工程专家共同研制和开发适合现代医疗设备管理的统一的信息管理系统，以有效的提高医疗设备管理效率、医院的工作效率和经济效益。

PU-3554

放射科医学影像设备防护的重要性

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【摘要】
目的：总结分析放射科影像设备防护的重要性。
方法：对于妊娠妇女和即将要妊娠的妇女尽量避免采用 X 射线检查腹部和盆腔，还有对受检者的非投照部位必须进行相关的屏蔽保护，患者的陪同人员应在检查室外等候，随着离放射源的距离越大，人体接受到的射线剂量会减少。摄影时，采用铅屏风，避开射线进行隔离射片。医务工作者在对危重症患者进行床旁射片时，应当穿上铅衣防护你，坚持个人剂量监测。
结果：1、X 射线对人体的损害机体受到 X 线照射后引起生物分子结构和性质的变化，从而引起细胞组织和器官的损伤产生一系列的生物学效应。2、放射医学 X 线查辐射剂量可增加患癌症的风险，除此之外，损害表现还有其他几个方面：神经系统的脑脊髓细胞损伤，较大剂量的 X 线会引起

脑型放射病；性腺功能降低，精子和卵子数量质量降低，大剂量效应会出现再生障碍性贫血和白血病等；其中消化系统的症状出现最早，会出现恶心呕吐，腹泻及电解质紊乱等临床症状。
结论：在放射医学检查中，X 线检查应用越来越多，但是 X 线技术的应用在给人类带来方便的同时，大剂量的 X 射线给人体健康带来一定的危害。因此，为了保证医护人员与患者的切身利益，我们要重视这个问题，加强对放射科医学设备的防护以及安全保障。

PU-3555
CDT-VIBE 技术在乳腺病变动态增强 MRI 成像中图像质量及病灶形态学特点描述能力

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目的：探究超快速并行采集（CAIPIRINHA）、水脂分离压脂（Dixon）及时间分辨交叉随机轨迹成像（TWIST）三种技术的容积插入法扫描（VIBE）序列在高空间分辨率动态增强磁共振成像中的可行性，评价 CDT-VIBE 序列在应用于乳腺病变动态增强 MRI 图像质量及病灶形态学特点描述能力。
方法：1.体模成像：使用 1.5TMR 扫描仪(MAGNETOM Aera,Siemens），4 通道乳腺专用线圈，对两个球形体模进行 16 期 CDT-VIBE 序列和 16 期 GRE 序列（无脂肪抑制）扫描，CDT-VIBE 序列并行采集加速因子为 CAIPIRINHA 4 ,TWIST A、B 值均为 20%，时间分辨率为 12s；GRE 序列基本扫描参数与 CDT-VIBE 序列一致。
2.对 50 名乳腺疾病患者采用 CDT－VIBE 序列行动态增强 MRI,采用 4 通道乳腺专用线圈，行 30 期动态增强扫描（选择与体模成像参数相同的 CDT-VIBE 序列），扫描范围均完整覆盖双侧乳腺。
3.数据处理：在体模近中心 10 层图像上分别测量 20 期 CDT-VIBE 脂像（从第 2 期开始）与常规 GRE 图像双侧体模信号强度及标准差，计算图像信噪比。在患者图像上测量病灶信号强度与正常组织的信号强度，计算病灶/正常组织信号强度比值，对同期像的 CDT-VIBE 水像和常规 GRE 图像并行采集技术的伪影、边缘锐利度、病灶显著程度、内部结构清晰度、总体图像质量进行评估。测得病灶血流动力学参数，对良恶性病变的定量参数进行 T 检验分析，用 ROC 曲线进行诊断效能分析。
结果：CDT－VIBE 序列能在显著缩短采集时间的同时保留足够的形态学信息，使观察者在 CDT-VIBE 图像和常规 GRE 图像上进行的病灶形态学描述取得了较高一致性，CDR-VIBE 序列可成功应用于病人的灌注扫描，其对于病灶边缘锐利度和内部结构特征显示较清晰。

PU-3556
冠状动脉 CTA 对冠状动脉异常起源的诊断价值

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目的 总结大样本病例冠状动脉 CT 血管造影成像中发现冠状动脉异常起源的类型及数量，提高对冠状动脉变异的认识，为临床诊治提供依据。
方法 回顾性分析 2010 年 6 月至 2013 年 12 月间在本院行冠状动脉 CTA 检查的 2679 例患者的影像学检查及病史资料。冠状动脉 CTA 采用回顾性心电门控，将 CT 原始图像在 R—R 间期 45%、50%、75%、80% 四个时相重建，选择图像最佳者在工作站进行图像后处理。采用容积成像（VR）、曲面重建（CPR）、最大密度投影（MIP）等后处理软件。CT 图像由 2 位中级职称以上的影像科医师各自独立完成图像后处理及诊断，重点分析冠状动脉的分布优势类型、是否为冠状动脉异常起源并判断开口位置、观察冠状动脉走行及管壁、管腔情况。造影术毕由包括术者在内的 2 名中级职称以上

的介入医师讨论，判定冠状动脉分布优势类型、是否为冠状动脉异常起源及其开口位置、观察冠状动脉的走行及管腔狭窄程度。
结果 4679 例患者年龄 69.5±10.6 岁；男性/女性 2798/1881。右优势型 3346 例，左优势型 356 例，均衡型 977 例。男性均衡型及左优势型所占比例均高于女性(P<0.05)，右优势型所占比例在男女性别之间无显著性差异(P>0.05)。4679 例患者中共发现冠状动脉异常起源者 33 例，其中男性 23 例，女性 10 例。右冠状动脉起源异常 19 例,其中最多见的类型是右冠状动脉开口于左冠状动脉窦（n=13,），其次为右冠状动脉高位开口（n=6）。左冠状动脉起源异常共 12 例，其中左主干短小或缺如较多（n=6）；另有左旋支缺如 4 例、左冠状动脉高位开口 2 例、左冠状动脉与右冠状动脉共同开口于右冠状动脉窦 1 例。单一冠状动脉 1 例。
结论 冠状动脉 CTA 能准确直观地显示冠状动脉异常起源，可作为冠状动脉变异的筛查手段。

PU-3557
RNA 干扰沉默 P2X7 受体治疗 APP/PS1 转基因小鼠的实验研究

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目的 检测 RNA 干扰沉默 $P2X_7R$ 对 APP/PS1 转基因小鼠治疗效果，探讨 $P2X_7R$ 作为 RNA 干扰治疗 AD 治疗靶点可行性。
方法 以 9 月龄 APP/PS1 转基因小鼠和同月龄的阴性纯合子小鼠为研究对象，通过颅内注射 Lenti-si$P2X_7R$ 将 siRNA 引入小鼠脑内。用 Real-Time PCR 和 Western blotting 检测小鼠脑内 $P2X_7R$ 的 mRNA 和蛋白表达水平。通过氢质子磁共振波谱检测小鼠海马区 NAA、mI 及 Cr 水平并计算 NAA/Cr、mI/Cr 比值。通过 HE 染色、Aβ 免疫组化染色、Iba1 免疫荧光染色、电镜检查观察各组小鼠脑组织病理改变。
结果 Real-Time PCR 检测结果显示注射 si$P2X_7R$ 的小鼠 $P2X_7R$ 基因 mRNA 表达下降，与注射 siNC 的小鼠比较差异有统计学意义(P＜0.05)，Western blotting 检测 $P2X_7R$ 蛋白表达下降与 Real-Time PCR 结果一致。氢质子磁共振波谱显示注射 si$P2X_7R$ 的转基因小鼠 RNA 干扰治疗后，海马区 NAA/Cr 较治疗前增高，与注射 siNC 的转基因小鼠相比差异有统计学意义(P＜0.05)。结合 HE 染色及电镜检查发现注射 si$P2X_7R$ 转基因小鼠海马区大部分神经元细胞形态良好；而注射 siNC 转基因小鼠海马区见大量神经元凋亡，核溶解，线粒体肿胀。注射 si$P2X_7R$ 转基因小鼠治疗后海马区的 mI 水平下降，与注射 siNC 转基因小鼠相比差异有统计学意义(P＜0.05)，结合 Iba1 染色发现该组小鼠海马及皮层的 Iba1 阳性细胞数少于注射 siNC 的转基因小鼠。
结论 颅内注射 Lenti-si$P2X_7R$ 可有效沉默 APP/PS1 转基因小鼠脑内的 $P2X_7R$，改善小鼠的学习记忆能力及脑内病理改变。氢质子磁共振波谱能有效评价 RNA 干扰沉默 $P2X_7R$ 治疗 APP/PS1 转基因小鼠的疗效。$P2X_7R$ 可成为 RNA 干扰治疗 AD 的一个新的、有效的治疗靶点。

PU-3558
情景模拟加快速读片培训模式在放射科颈椎 DR 检查技术规范化建立中的应用研究

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目的　探讨情景模拟加快速读片培训模式在放射科颈椎 DR 检查技术规范化建立中的应用。方法　通过每日晨间随意抽取颈椎 DR 片进行快速阅片，让低年资技师对抽取 DR 片的对比度、曝光条

件、体位摆放等进行评价，并由高年资主管技师进行指导；随后采用检查室情景模拟拍摄颈椎 DR 片的方法，由 3 位以上高年资技师从患者核对、曝光条件、体位摆放、胶片打印、检查安全及辐射防护等方面，对低年资技师的不足进行评价指导，最后通过每位技师的不足及发现的问题整理成颈椎 DR 检查技术规范手册。随机筛选规范化建立前后年龄 18-45 岁、行动无异常、无内固定颈椎常规投照患者各 200 例，规范前为 A 组、规范后为 B 组，分别比较 A、B 两组图像质量、重复投照率；结果 B 组图像质量评分（9.14 分）＞A 组（8.26 分），B 组重复投照率（2%）＜A 组（9%）；结论 通过快速读片与情景模拟培训模式，建立适合科室情况的颈椎 DR 检查技术的规范；各年资技师通过参与规范化建立及培训过程较快掌握科室工作流程及相应检查技术，更有利于保障检查安全、规范、高效

PU-3559

Feasibility of using Optimal Monochromatic Image Technique in Dual-Energy Gastrointestinal Cancer Feeding Artery CT Angiography with Low- concentration Contrast Medium for Over-weighted Patients

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Purpose To investigate the use of the optimal monochromatic image technique in single-source dual-energy spectral CT angiography (CTA) with low concentration contrast media (LCCM) for imaging feeding arteries in over-weightedgastrointestinal cancer patients. **Material and methods** 86 over-weighted gastrointestinal cancer patients who underwent spectral CT examination were randomly divided into two groups: Group A(n=41) used 120 kVp with high-concentration contrast medium (HCCM) of 350mgI/ml;Group B(n=41) used spectral CT with LCCM of 270mgI/ml. CT values and standard deviations of arteries and muscle were measured using the monochromatic image sets by two observers to calculate contrast-to-noise ratio (CNR) for arteries with data consistencies tested by ICC. The optimal monochromatic images for the highest CNR were determined. Image quality of the ideal image was evaluated by two radiologists using 5-point scale. The CT dose index (CTDI) at the arterial phase of two groups were recorded. Measurements of the two groups were statistically compared. **Results**Group B reduced 23% contrast dose compared to group A (27gI in Group B vs. 35gI in Group A). With the optimal monochromatic images (at energy levels 54±6keV), Group B had improved contrast enhancement (395.81±56.42HU vs. 234.46±43.66HU) and CNR (16.20±3.25 vs. 8.76±2.52) in arterials, and higher overall image quality score (3.47±0.69 vs. 2.71±0.84) (all P<0.05). There was no difference in image noise (20.79±2.01 HU vs. 20.57±2.77HU) and CTDI (16.87 ±0.00mGy vs.18.05±4.58mGy) between Groups B and A (P>0.05). **Conclusion** Using the optimal monochromatic imaging technique dual-energy spectral CTA improves the image quality of gastrointestinal cancer feeding arteries with reduced contrast does. **Advanced in knowledge** The optimal monochromatic imaging technique in dual-energy spectral CT compensates for the use of low-concentration contrast medium and provides more clear visualization for the gastrointestinal cancer feeding arteries than the conventional CT with high-

concentration contrast medium, effectively reduces the contrast media concentration while improving CTA image quality without increasing the dose of radiation, which has a good clinical application prospect.

PU-3560
不同重建算法下 AI 辅助肺结节检测效能的评价

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目的：探讨不同重建算法条件下（高分辨算法、标准算法），AI 辅助肺结节检测效能是否有差异。
方法：前瞻性收集 177 例患者的胸部 CT 资料，用高分辨率算法（B70f）、标准算法（B30f）重建原始数据以获得 DICOM 图像，并将数据传送到 AI 服务器进行结节检测。记录患者年龄、结节数、长轴直径及位置并进行统计，首先由两名具有 10 年以上工作经验的放射科医师结合 AI 辅助软件进行肺结节标记，最终由一名具有 15 年以上工作经验的放射科副主任医师进行最终判定，最终确定金标准肺结节，并比较不同重建算法条件下 AI 辅助肺结节检测效能是否有差异。
结果：高分辨率算法（B70f）、标准算法（B30f）对所有结节检出的敏感度分别为 **0.889±0.25、0.75±0.429**；假阳性率分别为 **1.58/CT、 2.46/CT**，差异具有统计学意义（$p<0.01$）。 高分辨率算法（B70f）、标准算法（B30f）对＜4mm 结节检出的敏感度分别为 **0.875±0.286、0.714±0.5**；假阳性率分别为 **0.58/ CT、1.06/CT**，差异具有统计学意义（$p<0.01$）。高分辨率算法（B70f）、标准算法（B30f）对 *≥4mm* 结节检出的敏感度分别为 **0.83～1、0.83～1**；假阳性率分别为 **0.99/CT、 1.38/CT**，差异具有统计学意义（$p<0.05$）。**结论：**在使用 AI 辅助软件检测肺结节时，高分辨重建算法的检测效能优于标准算法。
临床相关性/应用：建议使用高分辨重建算法用于 AI 辅助肺结节的检测，以提高检测效能。

PU-3561
数字乳腺断层摄影与全数字乳腺 X 线摄影技术对 ACR-156 体模内模拟病灶显示能力的对比研究

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目的：评价全数字乳腺 X 线摄影（FFDM）、数字乳腺断层摄影（DBT）对模拟病灶的显示能力。
方法：采用有机玻璃板及 ACR-156 体模组合模拟四种压迫体模厚度，同一压迫下，先自动曝光控制（AEC）获得 FFDM、DBT 的摄影管电压（kVp）及管电流（mAs），然后保持与自动曝光相同 kVp，手动曝光 mAs 值分别设置为 AEC 曝光的 90%、80%、70%、60%。计算模拟病灶检出率。
结果：同一体模厚度随管电流减小，FFDM 及 DBT 辐射剂量分别呈递减趋势；同一体模厚度、同一管电流条件下，DBT 较 FFDM 辐射剂量略高。随体模厚度增加 FFDM、DBT 及 V-Preview（合成 2D 图像）对纤维样、微钙化簇样及肿块样模拟病灶的检出率呈逐渐降低趋势。
结论：体模厚度及曝光条件是影响 DBT 及 FFDM 辐射剂量的直接因素，同一压迫体模厚度、同一曝光条件下，DBT 较 FFDM 辐射剂量略高，DBT 与 FFDM 图像对三种模拟病灶的显示能力相仿，且都高于 V-Preview 图像。

PU-3562
肺部 CT 成像中正位定位像与侧位定位像的对比研究

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目的：比较在肺部 CT 成像中正位定位像与侧位定位像的准确性
方法：随机选取 80 位行肺部 CT 平扫的患者，分为两组，一组在 CT 扫描中采用正位定位像，一组在 CT 扫描中采用侧位定位像，所有患者均采用西门子双源 CT 进行扫描，所有操作均有同一名技师完成操作。扫描完成后，测量肺组织下界与扫描末端距离。比较两组测量值是否有差别,行 T 检验。
结果：采用正位定位像组肺组织下界与扫描末端距离平均为 8.5cm，采用侧位定位像组肺组织下界与扫描末端距离平均为 3.4cm，行 T 检验，P＜0.05。
结论：在肺部 CT 扫描中采用侧位定位像定位准确

PU-3563
心脏 MR 的常见伪影及解决方案

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目的：探讨心脏 MR 的常见伪影的成因及其应对策略。方法：回顾性分析了心脏 MR 成像的伪影类型及产生原因。结果：心脏磁共振常见见的几种伪影中射频伪影、梯度伪影,磁场不均匀引起的伪影在去除外界因素干扰仍无法改善时,则要请专业的技术人员进行判断和维护;运动伪影、化学位移伪影及卷摺伪影则要根据诊断的需要采用不同的方法加以克服.结纶:了解心脏磁共振图像伪影的产生原因和预防方法,对改善图像质量,提高诊断率具有重要意义。

PU-3564
影响 CT 图像质量的因素及控制措施

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目的：探讨影响 CT 图像质量的各类因素及控制措施，从而改善 CT 图像质量。
方法：随机抽取 100 例在同一个月内的被检者 CT 扫描图像进行评估，根据质控百分制统计，满分有 42 例，90-95 分 45 例，85-89 分 8 例，85 分以下即不合格未达到阅片要求为 5 例，其影响因素与控制措施可分为五类，分析如下：一、窗口技术。各部位都有其特定的窗宽和窗位，操作者应根据被检部位选择合适的窗宽窗位，达到良好的对比度，提高图像质量。二、分辨率。操作者可通过薄层、大矩阵及合适的重建算法来提高空间分辨率，采用高 KV、mAs，大像素、厚层提高密度分辨率，并应根据患者具体情况调整好空间分辨率与密度分辨率的关系，从而获得高质量图像。三、噪声。操作者可通过减小层厚，增大像素，增加 KV、mAs，采用恰当的重建算法降低噪声。四、伪影。常见的是金属异物伪影及运动伪影，检查前应做好患者的准备工作，消除患者人为伪影，去除金属异物，训练呼吸，扫描时采用屏气和缩短时间减少生理性运动伪影。对于躁动、不合作的患者争取临床医生意见给予适量镇静。五、扫描时的摆位及定位的不准确导致被检部位显示欠佳，CT 增强及血管成像患者碘对比剂的剂量、流速以及扫描时间的把控不准，操作者应熟知各解剖部位及增强时严格制定不同部位不同目的相应的注射剂量、流速以及扫描时间。

结果：将以上 5 例未达到阅片要求的检查者再次进行同部位扫描，在改变以上所述参数后，图像质量明显提高，按照以上标准扫描，再随机抽取 100 例 CT 扫描图像进行质控评估百分制统计，得到满分图像 70 例，90-99 分图像 25 例，85-89 分图像 4 例，85 分以下仅 1 例，整体图像质量明显提高。
结论：窗口技术、分辨率、噪声、伪影、定位及碘对比剂剂量、流速、扫描时间为影响 CT 图像质量的重要因素，操作者应选择合适的参数，提高 CT 图像质量，为临床提供优质的影像学资料。

PU-3565
探讨全胰腺脂肪定量测量：ROI 画取法和阈值拟合法比较研究

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目的：应用 3D mDIXON Quant 序列，探讨 ROI 画取法和阈值拟合法定量测量胰腺脂肪含量的可行性。
材料与方法：纳入 11 名健康志愿者在 3.0T 磁共振(Ingenia CX，Philips)上应用 3D mDIXON Quant 序列进行扫描。扫描参数为：FOV=375mm×300mm×168mm，TR=6ms，层厚= 5.0mm，层间距=2.5mm，CS=2，Echo=6。图像导入飞利浦 ISP(IntelliSpace Portal, Philips)工作站，在脂肪分数图像上进行胰腺脂肪测量。分别于胰腺钩突、头颈部、体部和尾部各放置三个 ROI。所有 ROI 尽可能避开血管、胰管和腹部脂肪组织。将 ROI 的平均值定为该区域的脂肪分数值，然后将每个区域的平均脂肪分数值计算为整个胰腺脂肪分数值。每个 ROI 大约为 25-64 mm^2。采用阈值拟合法在脂肪分数图像上得到胰腺脂肪分数。两名观察者（临床经验分别为 3 年和 5 年）采用双盲法进行胰腺脂肪分数测定。采用 SPSS19.0 进行统计学分析。采用组内相关系数(ICC)检验数据的一致性。
结果：胰腺脂肪分数值的 ICC 值分别为 0.957 和 0.947。ROI 画取法和阈值拟合法所测得胰腺脂肪分数值分别为：2.37(2.16,2.57)和 3.03(2.46,3.37)；两种方法间胰腺脂肪分数值的 ICC 值为 0.983。ICC 值大于 0.80，结果一致性良好。
结论：无论是 ROI 画取法还是阈值拟合法都可以评价胰腺脂肪含量。但由于阈值拟合法能全面地评价胰腺，因此可能是一种更为合适的方法。

PU-3566
第三代双源 CT 低管电压联合低浓度等渗对比剂在头颈心 CTA 一站式成像中的应用

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目的 探讨 80 kV 低管电压联合等渗对比剂（碘克沙醇 320 mgI/100ml）扫描方案行 Force CT 头颈血管及冠状动脉一站式检查的可行性。**方法** 对拟行头颈血管及冠状动脉成像的患者，采用 Force CT 进行前瞻性心电门控大螺距模式一次性扫描，按照随机数字法分为两组。对照组（30 例）：管电压 100 kV，对比剂浓度 370 mgI/100ml；试验组（30 例），管电压 80 kV，对比剂

浓度 320 mgI/100ml。记录并比较两组患者一般资料、图像质量、辐射剂量以及用碘量。**结果** 两组患者性别、BMI、胸围、平均心率等一般资料差异无统计学意义(P>0.05)。试验组主动脉根部、颈总动脉、大脑中动脉的平均 CT 值、SD 值均大于对照组，除颈总动脉 SD 值外，差异均有统计学意义（P<0.05）；相应层面图像的 SNR、CNR 与对照组比较，差异无统计学意义（P>0.05）。两组头颈部和冠状动脉图像的主观评分分别为（2.47±0.12）&（2.49±0.99）、（3.50±0.12）&（3.47±0.11），差异均无统计学差异差异均无统计学意义(P>0.05)；对照组与试验组患者 CTDIvol、DLP、ED 及用碘量分别为（3.07±0.28 mGy、158.1±19.93 mmGy·cm、1.32±0.18 mSv、15.6±0.66 g）&（1.17±0.16 mGy、63.5±6.52 mGy·cm、0.55±0.05 mSv、13.1±0.85 g），差异均有统计学差异(P<0.05)。与对照组比较，试验组的有效辐射剂量（ED）降低约 58.3 %，碘总量降低约 16.0 %。**结论** 低管电压（80 kV）结合等渗对比剂（320 mgI/100ml）行 Force CT 头颈心血管大螺距一站式扫描可获得满意的图像质量，并有效降低辐射剂量和减少对比剂用量，值得临床推广。

PU-3567

飞利浦 DR 平板探测器故障分析与解决

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目的 通过对平板探测器故障的分析和解决，保证平板正常的工作，从而保证整个 DR 系统的工作正常
方法：故障现象：飞利浦 DR Digital Diagnost 开机后发现右下角平板状态指示灯一直显示黄色，正常应该是蓝色，同时显示 detector is busy！无法曝光。
故障分析：这个时候我们使用的是胸片架平板模式，由于我院采用的是诊断床和胸片架双平板，我们切换到诊断床模式，这时屏幕右下角的指示灯变成正常的蓝色，可以正常曝光出图像，再切换回胸片架模式，屏幕上的平板状态指示灯依然显示异常的黄色，观察胸片架里面的平板状态指示灯是正常，说明平板功能是正常，怀疑是工作站和胸片架端平板的连接有问题。
故障解决：对换插在 blade2500 工作站的光纤通讯板上胸片架和诊断床端的光纤线，使用胸片架模式，这个时候屏幕右下角的平板状态指示灯显示正常的蓝色，切换回诊断床模式，平板状态指示灯显示异常状态的黄色，这个时候我们就确定了是胸片架到 blade2500 工作站通讯的光纤线断了。
结果 更换损坏的光纤线，曝光正常，图像正常，问题解决！
结论 日常工作中，要理解系统工作原理，冷静分析故障状态，再结合设备资料和维修经验，可以解决很多问题，保证设备正常运行。

PU-3568

前列腺磁共振扫描技术的质量评价

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目的：探讨前列腺磁共振扫描定位的应用标准，获取前列腺磁共振精准图像，帮助临床对于前列腺相关疾病的诊断。方法：选取就诊于本院的前列腺疾病患者（包括前列腺体检筛查患者）作为本次研究对象，所有患者均采用西门子 3.0 T vero 磁共振进行扫描，同一病人同时采用两种磁共振前列腺定位方法，一组采用小视野前列腺扫描，横断面图像在矢状位定位像上使横断面层面平行于膀胱底部，垂直于尿道前列腺部得到 T2WI，T1WI 横断面图像；在矢状面定位像上扫描层面与横断面

垂直，平行于尿道前列腺部，垂直于膀胱底部得到 T2WI 冠状面图像，使其前列腺左右侧叶在冠状面上左右对称。另一组采用大范围全盆腔轴位 T2WI 和 T1WI 扫描，T2WI 冠状位扫描。将所得到的两组图像，让同一位影像诊断医生进行观察对比判断。结果： 40 组前列腺疾病患者，其中前列腺癌患者 24 例，前列腺增生患者 13 例，正常前列腺患者 3 例。将所得到的前列腺图像进行对比分析，小视野扫描方法所得图像，前列腺左右叶、内腺及外腺显示对称，病变组织均能观察清晰，可明确诊断前列腺相关疾病，而大范围全盆腔扫描方法 6 例患者前列腺与邻近组织显示不佳，不能明确判断前列腺癌患者肿瘤是否受累精囊或膀胱。结论：前列腺磁共振扫描定位根据前列腺组织解剖结构进行精准定位，能够更为准确的得到前列腺病变图像，帮助临床更为直观的观察与诊断前列腺相关疾病。

PU-3569
双源 CT 双能量扫描对结石成分分析准确性初步探究

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目的：初步探讨并验证双源 CT（DSCT）双能量扫描对泌尿系结石成分分析的准确性。
方法：将不同成分、大小相同的类结石物质（含碳酸钙、尿酸盐、非尿酸盐）各 20 例分别随机置入体积相同形态相当的鲜猪肉内以模拟正常人体环境，全部经西门子双源 CT 双能量扫描并于 syngo 工作站上对每例行 DSCT 双能量扫描对其结石成分进行分析，将结果与对应分组物质红外线光谱分析成分作对比，计算 DSCT 在体内分析结石成分的准确性和特异性。
结果：以上 60 例标本均顺利完成体内结石成分分析，以红外线光谱分析为参照标准，双源 CT 双能量分析显示尿酸、草酸钙和磷灰石成分分别得到准确性 95.2%、91.3%、32.1%，灵敏度 86.3%、100%、9.1%，特异度 99. 0%、65.1%、91.0%，阳性预测值 94.8%、93.7%、66.2%，以及阴性预测值 95.2%、100%、30.6%。
结论：双源 CT（DSCT）双能量扫描分析体内泌尿系结石成分是可行的，对尿酸和草酸钙的定性有很高的准确性，具有较高的临床实用价值。

PU-3570
3T 磁共振动态增强在肝脏疾病诊断中的技术应用

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目的 探讨 3T 磁共振动态增强扫描技术对肝脏不同疾病诊断的应用价值，及对肝脏病变的鉴别诊断价值及不同病变的强化特征。
方法 对 40 例临床怀疑肝脏占位病变的病人进行肝脏动态增强三期扫描。女性 20 例，男性 20 例，年龄 32-78 岁，平均 47.6 岁。检查使用 SIEMENS MAGNETOM Verio 3T 磁共振扫描仪，专用 3T Body MATRIX 线圈。所有患者均行 MRI 平扫和动态增强扫描，患者取仰卧位，腹部以专用腹部相控表面线圈固定，常规行冠状位，横断位定位扫描后，采用（1）冠状位 haste T2WI（TR1200ms TE94ms 层厚 5mm 间隔 1mm 矩阵 202x320 FOV370mm；（2）横断位 haste T2WI，横断位 T1WI，T2WI 加脂肪抑制；（3）动态增强扫描三期（动脉期，门脉期，平衡期）横断位。检查前用 20G 静脉留置针建立静脉通道，对比剂采用 GD-DTPA30ml，生理盐水 20ml 高压注射器静脉快速团注 3ml/s。

结果 12 例原发性肝癌病人发现病灶 16 个，动脉期呈均匀或不均匀明显强化，门脉期病灶强化明显消退，平衡期病灶信号强度低于周围均匀强化的肝组织。5 例肝转移瘤病人发现病灶 13 个动脉期，门脉期，平衡期均呈呈环型强化。17 例海绵状血管瘤病人发现病灶 22 个，动脉期病灶周边呈结节状强化，门脉期明显或轻度强化，延迟期(2～8 分钟后)病灶呈均匀明显强化。6 例局灶性结节增生病人发现病灶 6 个，动脉期明显强化，门脉期明显或轻度强化，延迟期病灶强化明显消退而瘢痕轻度或中度强化。

结论 3.0T 磁共振动态增强扫描具有极高的时间分辨率，结合常规序列，动态增强技术能在极短的时间内获得肝脏增强多个时相,在 MR 腹部增强扫描中具有显著价值。选择正确合理的扫描序列，把握正确的扫描时间，诊断结果具有很高的参考价值，对原发性肝癌、肝血管瘤、肝转移癌等病变的鉴别诊断可起到非常大的帮助，更为临床的下一步治疗提供了好的依据。

PU-3571

膝关节前交叉韧带部分断裂的 MRI 诊断与关节镜对照研究

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[目的] 目前 MRI 诊断前交叉韧带（Anterior Cruciate Ligament，ACL）部分断裂的准确率较低，为了进一步提高 ACL 部分断裂诊断的准确率，探讨 ACL 部分断裂的 MRI 表现特点及诊断价值，并对误诊原因分析。

[方法] 回顾性分析 48 例膝关节外伤患者的 MRI 资料,患者均来自同济大学附属同济医院。其中女性 19 名，平均年龄 39 岁，男性 29 名，平均年龄 42 岁。在不告知关节镜结果的条件下，由两位放射科专家分别分析 48 名患者的 MRI 图像，对韧带的连续性、信号、轮廓及走行进行观察并诊断，诊断结果包括 ACL 正常、部分断裂及完全断裂，并与关节镜诊断结果进行对比，分析 ACL 部分断裂 MRI 的表现特点，分别计算 ACL 部分断裂 MRI 诊断的灵敏度、准确度及特异度，并对误诊原因进行分析总结。

[结果] 关节镜检查证实 ACL 正常 16 例，部分断裂 14 例，完全断裂 18 例。MRI 诊断 ACL 正常 15 例，部分断裂 14 例，完全断裂 19 例。MRI 诊断 ACL 部分断裂的灵敏度、特异度及准确度分别为 71%、88%、83%。ACL 部分断裂 MRI 主要表现为韧带局部不连续、增粗或变细并伴有局限高信号。

[结论] MRI 对 ACL 部分断裂具有重要的诊断价值，MRI 横断位对 ACL 部分断裂的诊断价值应该得到充分重视。

PU-3572

Targeted Biodegradable Nanoparticles MRI Contrast Agent for Enhanced Tumor Imaging and Non-viral Gene Delivery

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PURPOSE

To prepare targeted biodegradable nanoparticles to connect folic acid MRI contrast agent with appropriate size. To explore the feasibility of the macromolecular contrast agent for tumor targeting and the characteristics of imaging in vivo and in vitro with folic receptor-positive tumor cells in nude mice models.

METHOD AND MATERIALS

1. Synthesis of SSPUA-DTPA-FA-PEG-Gd. 1) Synthesis of SSPUA. a) synthesis of a new disulfide-containing monomer, 2, 2’-dithiodiethanol bis(p-nitrophenyl carbonate) (DTDE-PNC) for the generation of bioreducible cationic polyurethanes (SSPUAs); b) Polycondensation reaction of DTDE-PNC and tertiary-amine containing primary amines. (Notes: these SSPUAs are coded with the name of primary diamines and shown as disulfide bond in blue, urethane linkage in magenta and protonable amino group in red; 2) Synthesis of PEG AND FA modified SSPUA .3) preparation of SSPUA-DTPA-FA-PEG-Gd. 2. Characterization and measure cell toxicity of the poly nanoparticles. 3. Detection of transfection efficiency. 4. Tumor model. About 1×107 SKOV3 cells were suspended in 200μL of PBS and subcutaneously injected into the right lower back of the nude mice. The MRI study was performed when the tumor size reached 5 mm in diameter at day 10. 5. MR phantom images were obtained using a 3.0 Tesla Siemens MR in nude mice model.

RESULTS

The SSPUA-DTPA-FA-PEG-Gd had a high longitudinal relaxivity up to 18.1 $mM^{-1}s^{-1}$, 4 times higher than the clinically used contrast agents such as Magnevist. The MRI contrasted by SSPUA-DTPA-FA-PEG-Gd outlined the inoculated tumor more clearly, and had much higher contrast enhancement for a much longer time than Magnevist. Furthermore the SSPUA-DTPA-FA-PEG-Gd/siVEGF complexes can inhibitor the tumor growth. More importantly, the biodegradable SSPUA-DTPA-FA-PEG-Gd gave much less Gd retentions in all the organs or tissues than non-degradable contrast agents.

CONCLUSION

In summary, SSPUA-DTPA-FA-PEG-Gd was successfully developed as a target specific, biodegradable and non-toxic delivery system of siRNA therapeutics. Treatment with SSPUA-DTPA-FA-PEG-Gd/siVEGF complex reduced VEGF mRNA and protein expression in vitro and in vivo, and it also retarded tumor growth in vivo. The SSPUA-DTPA-FA-PEG-Gd helps to intensify the effect in MR enhancement in nude mice models. Therefore, SSPUA-DTPA-FA-PEG-Gd might be effective non-viral gene vector for gene therapy.

PU-3573

简述磁共振成像中的伪影

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目的 探究磁共振成像图像伪影产生的原因，寻求磁共振图像伪影的克服方法。

方法 收集 2017 年 1 月至 2019 年 6 月间本院磁共振设备上采集出的具有代表性的伪影图像，分析伪影产生的原因，提出克服方法。

结果 磁共振图像常见的伪影主要有运动伪影、卷褶伪影、磁敏感伪影、拉链伪影、金属伪影、化学位移伪影等，这些伪影有的可以消除，有些则仅能尽量减少而不可能完全消除。

运动伪影通常分为自主性运动伪影和生理性周期运动伪影，前者主要包括检查中患者配合不佳的随意运动、吞咽动作、眼球运动等；后者主要包括心跳、大血管波动、呼吸等。运动伪影的主要出现在相位编码方向上，是因为相位编码方向的采集时间比频率编码方向的采集时间要长很多，因此，运动对相位编码方向的影响要比较重。预防和补偿措施通常为：在行使检查前充分的告知被检者检查过程中的注意事项；检查过程中可以根据检查部位改变相位编码方向；采用门控和触发技术；预饱和技术；梯度补偿；BLAD 技术等。

卷褶伪影是当检查部位大小超出所设置的视场（FOV）范围时会产生假频，从而出现图像混叠的现象。卷褶伪影可出现在频率编码或相位编码方向上，由于目前几乎所有的设备均设置了频率编码方向上的过采样，所以一般只出现在相位编码方向上。可采取如下对策来减弱或消除卷褶伪影：增大FOV；采用预饱和技术；切换频率和相位编码方向，采用举行像素技术；相位编码方向上采用过采样技术。
拉链伪影是由于额外的某一频率射频脉冲进入扫描室，并与病人体内的弱信号相互干扰从而产生的在图像频率编码方向上的致密线状伪影。出现此伪影通常需要重新扫描，若反复出现应立即通知维修工程师。
结论 了解磁共振图像伪影的产生原因及机理，并掌握伪影的克服方法，对于提高磁共振图像质量具有重要的意义。

PU-3574

FMRI study of mild Alzheimer's disease using amplitude of low frequency fluctuation analysis

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Background Previous studies have shown that the functional brain activity in the resting state is impaired in Alzheimer's disease (AD) patients. However, most studies focused on the relationship between different brain areas, rather than the amplitude or strength of the regional brain activity. The purpose of this study was to explore the functional brain changes in AD patients by measuring the amplitude of the blood oxygenation level dependent (BOLD) functional MRI (fMRI) signals.
Methods Twenty mild AD patients and twenty healthy elderly subjects participated in the fMRI scan. The amplitude of low frequency fluctuation (ALFF) was calculated using REST software.
Results Compared with the healthy elderly subjects, the mild AD patients showed decreased ALFF in the right posterior cingulate cortex, right ventral medial prefrontal cortex, and in the bilateral dorsal medial prefrontal cortex. No brain region with increased ALFF was found in the AD group compared with the control group.
Conclusion The reduced activity in the posterior cingulate cortex and medial prefrontal cortex observed in the present study suggest that the functional abnormalities of those areas are at an early stage of AD. The ALFF analysis

PU-3575

Spontaneous brain activity in mild cognitive impairment revealed by amplitude of low-frequency fluctuation analysis: A resting-state fMRI study

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Background Spontaneous low-frequency fluctuations (LFF) in the blood oxygenation level dependent (BOLD) functional magnetic resonance imaging (fMRI) signal have been shown to reflect cerebral spontaneous neural activity. The objective of this study was to explore the brain functional changes in MCI patients with measuring the amplitude of the BOLD signals.
Methods Eighteen amnestic MCI patients and twenty healthy elderly participated in the fMRI scan. The amplitude of LFF (ALFF) was calculated using REST software.
Results MCI patients showed decreased ALFF in the right hippocampus and parahippocampal cortex, and left lateral temporal cortex, right ventral medial prefrontal cortex and increased ALFF in the left temporal-parietal joint and inferior parietal lobule. The ALFF value in the right hippocampus and parahippocampal cortex was positively correlated with the scores of Mini-Mental State Exam.
Conclusion Reduced medial temporal lobe activity may implicate the underlying memory impairment mechanisms in MCI. Increased temporal-parietal joint and inferior parietal lobule activity may indicate the compensatory mechanism in MCI patients. These findings suggest that the ALFF analysis could provide a useful tool in fMRI study of MCI.

PU-3576

3.0T MR DWI 序列在肾脏肿块型病变的诊断价值

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目的 评价 3.0T MR 弥散加权成像（Diffusion weighted imaging,DWI)序列在肾脏肿块型病变的诊断及鉴别诊断价值。

方法 回顾性分析 139 例肾脏肿块型病变，采用 3.0TMR 行 b 值=800s/mm^2 DWI 检查，除良性囊肿性病变外，所有肿瘤均经手术病理或穿刺活检证实，对病灶的 DWI 信号特点进行记录和分析：1、计算 ADC 值鉴别肾脏良恶性肿瘤的敏感性、特异性，阳性预测值、阴性预测值。2、测量比较所有病灶、病灶周围及健侧肾组织的 ADC 值。

结果 肾癌与癌周组织及正常肾实质 ADC 值相比，差异有统计学意义(P<0.05)，癌周组织与正常肾组织 ADC 值相比，差异无统计学意义(P>0.05)。肾癌、肾盂癌、肾脓肿、肾血管平滑肌脂肪瘤、肾良性囊肿性病变及肾癌囊变区各组 ADC 值差异有统计学意义(F= 129.71，P=0.000),其中肾癌、肾血管平滑肌脂肪瘤及肾盂癌组的 ADC 值两两之间差异有统计学意义（P<0.01)，肾癌及肾盂癌的 ADC 值统计学上均低于良性病变（肾脓肿及肾血管平滑肌脂肪瘤），肾盂癌的 ADC 值最低，肾血管平滑肌脂肪瘤的 ADC 值最高。良性囊肿性病变及肾癌囊变区的 ADC 值差异有统计学意义

（t=3.756，P=0.000 ）。其中透明细胞癌病理各分期两两比较发现，I 期与 III、IV 期及 II 期与 III、IV 期相比，差异有统计学意义（P<0.01），III 期及 IV 期的 ADC 值较低。

结论 高 b 值 DWI 鉴别肾脏良恶性肿瘤有较高的准确率，结合量化分析 ADC 值能够更好的显示肾脏肿块的病变特征，有助于肾脏肿块的鉴别、恶性程度评估以及预后预测等方面有着重要的意义。

PU-3577

PET 显像膀胱不常见低浓聚的原因分析

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[**摘要**] **目的**：分析非泌尿系疾病患者氟代脱氧葡萄糖（18F-fluorodeoxyglucose,18F-FDG）PET/CT 显像膀胱低放射性浓聚的影像表现及产生原因，指导今后的临床采集工作。**方法**：对日常采集中偶发的 1 例非泌尿系病变患者膀胱代谢浓聚过低的影像进行量化分析，测量该患者肝脏组织、脑组织、膀胱的平均标准率摄取值（the average of standardized uptake value,SUVavg），与 50 例正常患者上述组织的 SUVavg 相比较，制作折线走势图。进行诊断、技术、放药综合读片分析会，从病史询问、放射性药物制备与检测、患者检查前准备、图像采集参数、图像重建参数等角度回顾性分析，找出浓聚异常的原因。**结果**：1，影像特点 不常见浓聚分布：肝脏 SUVavg＜膀胱 SUVavg＜脑 SUVavg；正常浓聚分布：肝脏 SUVavg＜脑 SUVavg＜膀胱 SUVavg。2，原因分析 患者单侧肾失代偿后肾小球率过滤（Glomerular Filtration Rate，GFR）过低，FDG 在泌尿系排泄速率降低，膀胱大量尿液对放射性的稀释，导致图像呈现膀胱放射性略高于肝脏远低于脑的不常见分布。**结论**：有针对性的病史询问、与患者充分的交流沟通、检查前核实患者检查前准备完成情况、及时在 PET Cine Display 窗口对成像进行预览、技师对 PET 诊断知识的普及都是 PET 检查图像质量的有效保证。

PU-3578

直接法联合间接法 CT 静脉成像在髂静脉受压综合征诊断中的应用

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目的：探讨直接法联合间接法 CT 静脉成像(CTV)在髂静脉受压综合征(IVCS) 诊断中的应用价值。**方法**：选择临床怀疑髂静脉受压综合征并经数字减影血管造影(DSA) 证实的患者 40 例，分为 A、B 两组，A 组采用间接法扫描，肘静脉注射造影剂后 180s 启动扫描，造影剂为优维显（370mgI/mL），注射速率 5.0mL/s，注射剂量 100~120mL，追加盐水 40 mL，从头至足侧扫描，扫描范围为 L3 下缘平面至耻骨联合平面；B 组采用肘静脉注射造影剂 80 mL，注射速率 4.0mL/s，延迟 40s 后分别自双足背静脉注射造影剂（优维显 370mgI/mL）与盐水混合液（1:7 浓度）各 100 mL，踝关节处扎止血带，监测肾门水平下腔静脉，当阈值达到 150HU 后启动扫描，从足至头侧扫描。两组扫描结束后测量右侧髂总动脉及左侧髂总静脉的 CT 值，记录左侧髂总静脉的前后径及左右径，数据进行 VR 及 MPR 重建，并进行主观评分，采用 4 分法进行评价（1 分差；4 分优）两组数据比较采用 t 检验。**结果**：所有患者均完成检查，所有患者左侧髂总静脉左右径及前后径对比均大于 2，15 例受压呈细线状，13 例左侧髂总静脉受腰骶椎及右侧髂总动脉联合压迫， 6 例左侧髂总静脉可见血栓；B 组右侧髂总动脉及左侧髂总静脉的 CT 值明显大于 A 组，差异有统计学意义（p＜

0. 05），主观评分 B 组评分高于 A 组，差异有统计学意义（p＜0. 05）。**结论**：直接法联合间接法 CT 静脉成像能对髂静脉受压综合征作出准确诊断，相比传统间接法能获得更高的图像质量指导临床治疗。

PU-3579
呼吸门控技术对于 SPN 患者 PET 采集后 MTV 测量值的无效影响及增加技师所受辐射剂量分析

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【摘要】 目的：比较常规 PET 采集与呼吸门控采集后孤立性肺结节（solitary pulmonary nodule,SPN）患者病灶代谢肿瘤体积（metabolic tumor volume，MTV）的测量差异，分析呼吸门控技术对测量值的影响。同时检测技师使用该技术时所受辐射剂量大小，从上述两方面论证该技术的临床应用可行性。**方法**：从 2017.10.1-2017.12.30 来我中心做 PET/CT 检查的病人中选择 50 例符合条件的患者，入组条件为肺部孤立性病灶患者。在常规 PET 采集之后加做呼吸门控采集，使用 TrueD 后处理软件分别测量两次采集后同一病灶层面下 MTV 值（50%SUV_{max}）以及病灶 SUV_{max}，使用折线图辅助统计软件法分别分析两组数据之间的组间差异；利用个人辐射检测仪监测技师在常规采集与使用呼吸门控技术床边操作时技师所受辐射剂量率的差异，从辐射安全的角度去分析这一方法的临床可操作性。
结果：使用呼吸门控技术后，患者病灶 MTV、SUV_{max} 无明显变化；技师安装和拆卸呼吸压敏原件所受的瞬时辐射剂量率较常规采集时所处的操作间本底明显增加。**结论**：呼吸门控技术在 PET 采集过程中并不能良好的控制患者的呼吸运动伪影，患者 SPN 在有无呼吸门控技术干预下，测量值无统计学变化，对临床诊断意义不大，且技师使用该技术时需床边操作，所受辐射剂量率成几十倍增加，从临床意义及可操作性均不提倡临床推行。

PU-3580
技师参与 PET/CT 检查前病史询问的必要性分析

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【摘要】 **目的** 通过对比技师参与病史询问前后 PET/CT 检查影响图像质量的不良事件发生率的变化，说明技师参与病史询问的必要性。**方法** 对照组：作者所在 PET/CT 中心 2018.8.1-2018.9.31 期间共完成检查患者 647 例，技师未参与病史询问。观察组：2018.11.1-2018.12.31PET/CT 中心共完成检查患者 644 例，由技师参与病史询问并进行相应的检查前预处理。分别统计影响图像质量的不良事件占总患者比例数以及涉及到成像操作的不良事件所占总不良事件比例数。将所得数据做图表分析及统计学分析。**结果** 观察组患者不良事件发生率为 6.21%低于对照组 10.97%，差异具有统计学意义（P＜0.05）；由于成像技术原因所导致的不良事件占总不良事件比例，观察组 25.00%亦低于对照组 69.01%；差异具有统计学意义（P＜0.05）。**结论** 技师参与病史询问，可以从成像技术出发更加有针对性的得到患者的第一手资料，做出更加周全的采集预案，保证每一位患者的 PET 图像质量。具体临床推广价值。

PU-3581

碘对比剂特性及注射路径对肾脏的影响

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碘对比剂诱导急性肾损伤（Contrast-induced acute kidney injury，CIAKI）发生在多达 30%接受碘对比剂的患者，被认为是医院获得性急性肾损伤的第三个最常见的原因，仅次于肾灌注不足和肾毒性药物[1]。CIAKI 定义为在注射对比剂后 24 小时到 5 天内血清肌酐（Serum creatinine，SCr）水平升高（＞25%或绝对值升高＞0.5mg /mL）。大多数 CIAKI 患者肾脏呈暂时的功能障碍，但 CIAKI 也有严重的后果，如住院并发症发生率增加、死亡率升高以及转化为慢性肾脏疾病或长期肾功能丧失[2]。本文旨在总结目前临床上常用碘对比剂种类和特性，为临床选择更恰当的使用方法提供依据。

PU-3582

DR 及移动 DR 检查患者不同部位受照剂量水平监测与分析

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目的　对比分析 DR 及移动 DR 检查患者不同部位 X 射线受照剂量水平,为医疗辐射防护提供科学依据。方法分别选择 100 例进行 DR 及移动 DR 检查患者。采用氟化锂热释光探测仪测量患者甲状腺、左胸、会阴、左手臂肘内的 X 射线受照剂量。结果 移动 DR 组患者甲状腺、左胸部、会阴表面受照剂量比较,差异均有统计学意义(P<0.05),移动 DR 组会阴受照剂量均高于 DR 组,DR 组甲状腺、左胸部受照剂量均高于移动 DR 组(P<0.05)，医院使用的 X 射线管电流比较,差异无统计学意义(P>0.05)。结论 不同的检查方式患者的不同部位的表面受照射剂量不同,应加强对床边患者的放射防护工作,以降低患者受照剂量水平。

PU-3583

青少年全脊柱全长摄影中两种 X 线曝光模式图像质量和辐射剂量的比较

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目的:探讨比较青少年全脊柱全长摄影中 2 种不同曝光模式下的图像质量评价以及辐射剂量,以指导针对青少年采用合理使用全脊柱全长摄影曝光模式。方法:选择 80 名全脊柱全长摄影患者并随机平分成 2 组,其中有 20 名脊柱侧弯患者随机均分入 2 组，每组男性 20 例（平均年龄 24 岁），女性 20 例(平均年龄 23 岁）。全脊柱全长摄影时 1 组运用自动曝光控制(AEC)模式曝光,另 1 组运用手动曝光控制(FIXED)模式曝光,曝光后任由软件采用自动拼接，并记录每位患者辐射剂量,由 3 名高年资医师对 2 组曝光的图像质量进行分析评分，。结果:2 组患者中非脊柱侧弯患者均能明确诊断,

但在手动曝光控制模式下普通患者图像质量评价得分与自动曝光控制图像质量评价得分差距微小。而脊柱侧弯患者在手动曝光控制模式摄片下脊柱侧弯图像质量评分高于自动曝光模式，但在辐射剂量上 FIXED 模式明显高于 AEC 模式。结论:不同曝光模式对图像质量有一定的影响,为了提高图像质量,脊柱侧弯患者可用手动曝光模式（FIXED）检查；但对于一般未有明显临床症状患者,考虑青少年低辐射剂量保护，仍然考虑推荐使用 AEC 模式摄片。

PU-3584
多扩散敏感系数的弥散加权成像对基于生成对抗网络的前列腺癌病灶检测影响的研究

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目的 探讨多扩散敏感系数（b 值）的弥散加权成像（DWI）对基于生成对抗网络（GAN）的前列腺癌病灶检测影响的价值。
方法 回顾性收集 2012 年 1 月至 2018 年 6 月在本院就诊的前列腺疾病病例 446 例，其中前列腺癌 174 例，前列腺增生 272 例，所有病例均经直肠超声引导下前列腺穿刺活检或前列腺根治术后病理证实。所有患者均采用 Siemens Verio 3.0T MRI 扫描，成像序列包括横断位、矢状位高分辨 T_2WI，b 值=0、500、1000 s/mm^{2}横断位 DWI 及 DCE 扫描，通过 Matlab 后处理化合成 b=1500、2000 s/mm^{2}的 DWI 图像。我们提出一个新的神经网络模型 SegDenseAN，并结合多 b 值 DWI 图像进行检测。该网络基于 GAN，由生成网络和判别网络两部分组成，生成网络是一个基于 Dense 模块的分割模型，而判别网络是一个多尺寸的特征提取网络。将多 b 值 DWI 与 ADC 影像的不同组合作为 SegDenseAN 网络的输入：组合 1：ADC 图；组合 2：ADC+DWI0+DWI500；组合 3：ADC+DWI0+DWI1000；组合 4：ADC+DWI0+DWI1500；组合 5：ADC+DWI1000+DWI1500;组合 6：ADC+DWI1000+DWI2000，分析比较不同组合对检测精度的影响。
结果 组合 1-6 的准确性分别为：0.871、0.887、0.903、0.903、0.903、0.903；敏感性分别为：0.935、0.935、0.968、0.968、0.968、0.968；特异性分别为 0.806、0.839、0.839、0.839、0.839、0.839；组合 6 的前列腺癌病灶区域识别最接近于原始金标准。
结论 SegDenseAN 可以实现病灶区域的自动分割，有助于前列癌的自动检测；多 b 值尤其多个高 b 值 DWI 与 ADC 影像的不同结合对算法的检测效果有影响，有助于提高前列腺癌的自动检测结果。

PU-3585
外周带前列腺癌 PI-RADS V2 评分与 Gleason 评分的比较研究

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目的 比较外周带前列腺癌 PI-RADS V2 与 Gleason 评分的关系；探讨外周带前列腺癌第二版前列腺影像和数据报告系统（PI-RADS V2）中总分 3+1 分与总分 4 分是否有差异并评估其对 PI-RADS V2 的影响。
方法 前瞻性连续收集 2012 年 1 月至 2016 年 1 月 354 例临床疑诊前列腺疾病病例，其中前列腺移行带病变 150 例，前列腺外周带病变 204 例（142 例前列腺癌，62 例非前列腺癌），病例均经过病理证实。所有患者均采用 Siemens Verio 3.0T 多参数 MRI 序列扫描。所获图像根据 PI-RADS V2 标准进行评分。204 例前列腺外周带病变用于统计分析。评分者之间一致性通过 Kappa 系数统计。PI-RADS 总分 3 分、3+1 分、4 分病例通过非参数 2 检验分析。

结果 204 例前列腺外周带病变中前列腺癌有 169 例，非前列腺癌 35 例。PI-RADS 总分 4 分的 kappa 系数高于 PI-RADS 总分 3 分或 3+1 分的 kappa 系数（k = 0.802 vs 0.737 vs 0.591; p < 0.01），PI-RADS 总分 2、5 分的 kappa 系数高于 PI-RADS 总分 3 分、3+1 和 4 分的 kappa 系数。PI-RADS 总分 3 分、3+1 分、4 分之间的构成比有统计学差异（ x 2 = 29.839, p < 0.05）。PI-RADS 总分 4 分中前列腺临床显著癌高于 PI-RADS 总分 3+1 和 3 分（78.2% vs 43.2% vs 16.7%）。PI-RADS 总分 3+1 分和 4 分之间的构成比有统计学差异（ x 2 = 15.286, p < 0.01）。71%病例 (44/62) 由于 DCE 阳性从 PI-RADS 总分 3 分升高到 3+1 分。

结论 PI-RADS V2 外周带评分系统中有必要将 PI-RADS 总分 3+1 分与 PI-RADS 总分 4 分加以区分，我们认为可将 PI-RADS 总分 3+1 分定义为 PI-RADS 3b 而非直接升级到 PI-RADS 总分 4 分。

PU-3586

不同计算化高 b 值对外周带前列腺癌第二版前列腺影像和数据报告系统中弥散加权成像评分的影响

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目的 探讨不同计算化高 b 值对外周带前列腺癌第二版前列腺影像和数据报告系统(PI-RADS v2)中弥散加权成像(DWI)评分的影响。

方法 回顾性分析 2012 年 1 月至 2013 年 12 月在本院经直肠超声引导下前列腺饱和穿刺活检或前列腺根治术后病理证实外周带前列腺癌 104 例患者的临床资料。所有患者均采用 Siemens Verio 3.0T MRI 扫描，成像序列包括横断位、矢状位高分辨 T_2WI，b 值=0、50、1000 s/mm^{2}横断位 DWI 及 DCE 扫描，通过 Matlab 后处理化合成 b=1000、1400、2000 s/mm^{2}的 DWI 图像（cDWI）。依据 PI-RADS v2 评分标准对 b=1000、1400、2000 s/mm^{2}的三组 cDWI 资料进行评分，并对各组病例的病灶信号强度比（SIR）进行独立样本 t 检验及单因素方差分析。

结果 三组 cDWI 中 DWI 评分 2、5 分的病例数无差别，27 例 b=1000 s/mm^2 DWI 评分 3 分的病例中有 9 例在 b=1400 s/mm^{2}及 2000 s/mm^{2}时 DWI 评分均升高到 4 分。升高至 DWI 评分 4 分的病例与仍为 DWI 评分 3 分的病例间的病灶 SIR 在 b=1400 s/mm^{2}及 2000 s/mm^{2}时的比值分别为 1.86±0.21 比 1.61±0.27、2.18±0.26 比 1.75±0.30，两组间 SIR 差异均有统计学意义（t=2.486、3.671，P<0.05）。升高至 DWI 评分 4 分的 9 例病例的病灶 SIR 在 b=1000、1400、2000 s/mm^{2}时两两之间差异均有统计学意义（F=10.907、33.768、8.043，P<0.05），且病灶 SIR 随 b 值的升高而增大。

结论 b≥1400 s/mm^{2}的高 b 值主要影响 DWI 评分 3 分的病例，但 b=2000 s/mm^{2}不改变 b=1400 s/mm^{2}时的 DWI 评分，b=1400 s/mm^{2}可能更适用于外周带前列腺癌的 PI-RADS v2 中 DWI 评分。

PU-3587

普放 DR 放大失真临床意义

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在 X 线摄影过程中，照片影像较被照体的大小和形态的改变称之为影像失真，其变化的程度称之为失真度，根据失真的情况可分为放大失真、变形失真和重叠失真等。

我们这次主要探讨的是照片的放大失真，那照片放大有几个相关的因素:

（1）肢-片距

由半影公式 H=F·(b/a)知道，半影与肢-片距成正比。

（2）焦-片距 一定大小的照射野，焦-片距↑，照射到平板探测器上 X 线越接近平行，肢体放大率越小，半影也随之越小。由半影公式可知，半影的大小与焦-肢距成反比，即当 b 肢一定时，焦-片距增大，则半影缩小。
(3)模糊阈值及允许放大率
模糊阈值是指人眼观察照片影像认为有模糊时的半影值。国际放射学界公认的模糊阈值为 0.2mm。
照片影像变形失真的控制 X 线摄影控制、减小影像变形失真应注意和采取的方法有：
①被照体应尽量靠近和平行于平板探测器。
②将 X 线球管焦点置于被照体正上方。
③在 X 线及负荷允许的范围内尽量增加焦-片距离。

随着医学影像设备和信息化技术的迅猛发展，医学影像数字化在许多医院得以实现，但是不同的设备、不同的拍摄方式、不同的打印模式其影像放大率不同，给日常工作造成了一定的影响，如一个肺癌患者治疗前后复查胸片，如果两次的放大率不同，则难以判断病灶大小，也难以判断治疗效果。
有文献做过相关测试，用同一被照体在不同的设备上胶片距相同的情况下进行投照，分别测量所拍摄物体在照片中的大小和实际大小进行对比，分别计算出每台设备的影像放大率，立位摄影结果岛津 X 光机为 2.5%、飞利浦 DR 为 5%、西门子 DR 为 5%，卧位投照放大率分别为 7.5%、5%、15%。

DR 检查是影像都存在放大问题，所以我们一定要熟悉所使用的设备的放大率以及在摄影方法上严格按照操作规程操作，最大限度减小影像放大，为患者和临床做出指导。

PU-3588
基于磁共振成像调制的相关实验和理论研究

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磁共振成像广泛用于医疗方面的研究，利用磁共振成像的高分辨率，无限的穿透深度和极佳的软组织对比度优势可以有效探测器官的生化变化信息。磁共振成像的发展得益于磁共振仪的不断更新。多年来人们对磁共振仪的研究取得了显著的进步。在进行磁共振检测时，需要将检测对象置于几 T 到十几 T 的强磁场下，此时原子的能级发生塞曼分裂，但是由于高能级的核自旋与低能级的核自旋数量之差较小，引起微弱的探测信号常常被噪声所湮没，本文旨在发展一套集成化电路系统，包括数字控制，电路反馈系统，大磁场快速开断模块，从而实现对微弱信号的调制，消除噪声对探测结果的影响，进而提高磁共振成像的分辨率。同时，通过在理论上对探测结果的分析和拟合，来验证这一套集成化电路系统的合理性和有效性。本文提出的磁共振成像调制系统可以推广到常规的医疗检测中，用于提高成像的分辨率。

PU-3589
迭代重建算法对腰椎间盘 CT 图像质量和辐射剂量的影响

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[**摘要**] **目的** 比较低剂量扫描、IRIS 重建与常规剂量扫描、FBP 重建所得腰椎间盘 CT 的图像质量、辐射剂量及诊断可靠性。**方法** 回顾性分析 2018 年 7 月到 2019 年 2 月期间 232 例采用常规剂量（190mAs，130kVp）扫描、FBP 重建（n=115）或低剂量（130mAs，130kVp）扫描、IRIS 重建（n=117）的、临床怀疑腰椎间盘突出或膨出的患者，评价两组图像客观图像噪声、主观图像噪

声、图像锐利度、诊断可接受性、诊断准确性以及观察者间的一致性。**结果** 与常规剂量组相比，低剂量组辐射剂量显著减低（*P*<0.001），客观图像噪声及主观图像噪声显著减小（*P*<0.05），图像锐利度及诊断可接受性无显著差别（*P*>0.05），诊断可靠性（灵敏度、特异度、阳性预测值、阴性预测值及准确度）无显著差别（*P*>0.05），观察者间的一致性较好或很好（kappa 值 0.778-0.903）。**结论** 在辐射剂量减少约 30%的情况下，IRIS 重建低剂量 CT 对腰椎间盘突出的诊断效果与 FBP 重建常规剂量 CT 无显著差别，可以用于检查疑为腰椎间盘突出的患者。

PU-3590
CT 下肢血管造影不同触发阈值对图像质量的影响探讨

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【摘要】 目的 探讨不同的触发阈值对图像质量的影响 **方法** 采用团注法示踪触发技术，当监测层面第三腰椎水平腹主动脉 CT 阈值分别达 100 HU 和 120HU 后延迟 10s 即启动扫描，一次性连续螺旋扫描。 扫描结束后将 2 组数据于工作站行 MPR、MIP、VR 等后处理。**结果** 30 例中，同层面实验组横断面动脉 CT 值除了髂总动脉分叉水平略低外，其他层面都比对比组的高，图像质量明显好些。**结论** 用阈值 100HU 的扫描条件时图像质量优于 120HU

PU-3591
自适应性统计迭代重建技术结合低管电压在肝脏三期增强低剂量扫描中的应用价值

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目的 探讨自适应性统计迭代重建（ASIR）技术结合低管电压在肝脏三期增强低剂量扫描中的应用价值，以达到在保证图像质量、满足临床诊断的同时，有效降低 CT 辐射剂量，并进一步实现临床推广。**方法** 收集哈尔滨医科大学附属第二医院 CT 诊断科肝脏占位拟行三期增强扫描的患者 100 例，随机分成 A、B 两组，每组各 50 例患者行 GE Discovery CT 750 HD 肝脏 CT 三期增强扫描，男 56 例、女 44 例，年龄 27～73 岁，42 例患者有肝细胞癌，44 例患者有肝血管瘤、肝囊肿，14 例患者为其他疾病。采用 GE Discovery CT 750HD 宝石能谱 CT，A 组患者动脉期和延迟期采用低剂量扫描即 100 kV+ASIR，门静脉期采用常规剂量扫描即 120 kV+滤波反投影（FBP）；B 组患者动脉期和延迟期采用常规剂量扫描即 120 kV+FBP，门静脉期采用低剂量扫描即 100 kV+ASIR；同时对所有低剂量扫描期相采用 FBP 重建，得到常规重建模式下低剂量图像。统计方法：图像质量主客观评价方法、辐射剂量评价方法。**结果** ASIR 技术结合低管电压在肝脏三期增强低剂量扫描，低剂量组较常规剂量组辐射剂量降低 37%；图像质量主观评价低剂量组（100 kV+ASIR）与常规剂量组（120 kV+FBP）差异无统计学意义（P>0.05）；图像质量客观评价除低剂量组门静脉期噪声略差于常规剂量组外（低剂量 10.86±1.98，常规剂量 9.40±2.12，P<0.05），其余各期各评价指标均优于或无差别于常规剂量组。**结论** 1. 肝脏三期增强 CT 检查，使用管电压为 100kV，可使患者辐射剂量降低大约 37%；2. 自适应性统计迭代重建结合低管电压技术可用于肝脏三期增强低剂量扫描，但在门静脉期时，低剂量图像的噪声会略高于常规剂量图像的噪声；3. 肝脏三期增强检查，当使用管电压 100kV 且重建算法为 FBP 算法时，图像质量会降低，不利于诊断。

PU-3592

256 排螺旋 CT 在自由呼吸下冠状动脉成像的研究

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目的：探讨应用 GE 256 排螺旋 CT 在患者自由呼吸下冠状动脉成像效果。**方法：**选取 30 例行冠状动脉 CTA 检查的患者，心率小于 90 次/分，使用美国 GE Revolution 256 排螺旋 CT 机，设置扫描参数为管电压 80KV，自动管电流 400～650 mAs，噪声指数 NI 为 12，扫描层厚 0.45mm，层间距 0.45mm，螺距为 0.16，旋转时间为 0.28s/转，探测器为 256×0.625mm，重建矩阵 512×512。患者保持双手举过头顶，仰卧位足部先进，先进行正侧位定位像及冠状动脉钙化积分扫描，再记录最近心电图变化情况，最后采用阈值触发法行冠状动脉 CTA 扫描，动态监测感兴趣区为患者主肺动脉窗层面降主动脉区域内，设置触发阈值为 150HU，达到阈值之后，患者无需吸气后屏气（自主均匀呼吸），延时 5 秒自动启动一个轴位扫描，曝光时间在 0.3～0.7s。使用双筒高压注射器，通过右侧肘前静脉留置针将碘对比剂碘海醇（350 mgL/ml）注入 70ml（1.0ml/kg）左右，注射速度 5.0～6.0ml/s，后以相同流率注射 40ml 的生理盐水。将图像数据传送到 AW4.7 工作站，利用 SSF 自动冻结后处理软件，重建一期最优图像，用于冠状动脉血管图像重组。如对其核心分支血管利用容积再现（VR）、最大密度投影（MIP）、多平面重建（MPR）、曲面重建（CPR)等技术分析处理图像。**结果：**升主动脉 CT 值均在 350HU 以上，冠状动脉主干及各分支清晰显示，无明显呼吸运动伪影。**结论：**患者在自由呼吸情况下，应用 GE 256 排螺旋 CT 行冠状动脉 CTA 成像可以得到满足诊断要求的优质图像。

PU-3593

医学影像诊断与医疗责任险小议

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目的:寻求一种解决临床医生包括影像医生与患者发生医疗纠纷产生经济损害赔偿方面的合理有效途径，尽可能减少双方的伤害及经济损失。
方法:本文在保险项目中检索到一种医疗责任险，可以单位集体参保，也有个人参保，横向的不同保险公司的具体保险额度及保费不太确切，同一保险公司不同职业间保费也有待详细咨询。
结果:由于时间较仓促，中国知网目前没有检索与题目相关内容，也没有通过保险公司方面看到一些个例及处理过程流程的详细资料；国外文献没有进一步检索。中文文献比较多，涉及医疗责任险制度建立、发展现状及对策、发展模式、运行机制及有效缓和医患矛盾，包括医疗责任险在医院开展 10 年的效果评析与思考一篇。
结论:
1、临床现状：临床医疗工作复杂繁琐，老龄化患者数量增多，就诊期望值较高；医生护士工作人员数量有限，各项工作交替，身心大脑思维连轴转，难免有一些疏漏闪失，甚至较大的纰漏。
2、临床高精尖、高强度的诊断治疗操作工作，就像再精确的仪器也会有系统误差一样，医疗差错、事故在所难免，给患者带来身体伤害会产生纠纷及经济损害索赔，这期间医护人员与患方交涉会费很多时间精力，情感可能受到一些干扰冲击……
3 基于这样的前提，医疗责任险在一定程度上可缓解这方面的问题。平时小投入，用时大回报，减轻患者及医护人员个人经济负担，解决燃眉之急和后顾之忧。特别是一些单位个人承担最高限额不低，就很有必要参保个人医疗责任险，避免时间经济更大损失。

4、同时在保证患者与医务人员双方权益的前提下，减少或免于相关责任人处理纠纷牵涉的时间与精力，保证临床工作的正常进行就尤显得重要。
5、如能像医疗保险一样全社会全员参与医疗责任险，每人每月有一部分投入，用时方便，整个社会形成良性循环，积极妥善解决实际问题。

PU-3594
CT 增强检查中等渗性造影剂对正常人及有高血压基础疾病患者的肾功能损害的临床分析

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摘要：目的 探讨 CT 增强检查中非离子型等渗性造影剂对肾功能的损害，在不影响造影对比图像质量的前提下减少造影剂肾病的发生率。 **方法** 收集本院 400 例行 CT 增强检查患者的临床资料，随机分为两组，分别为注射等渗性造影剂组及注射低渗性造影剂组，又分别分为有高血压组及无高血压组。回顾性分析患者的血肌酐升高水平及造影剂肾病的发生率。 **结果** 在所有受试者中，接受注射等渗性造影剂组 3 天后肌酐升高率较注射低渗性造影剂组肌酐升高率有差别（P<0.05），且等渗性造影剂组的 3 天后肌酐升高均数较低渗性造影剂组的肌酐升高均数低，但两组发生造影剂肾病的概率无显著差别；在有高血压组中注射等渗性造影剂组的患者肌酐升高率与低渗性造影剂组的患者肌酐升高率有明显差别（P<0.05），且注射等渗性造影剂组肌酐升高率均数更低；注射等渗性造影剂组的患者造影剂肾病（CIN）的发生率与注射高渗性造影剂组的患者 CIN 的发生率不构成统计学意义。 **结论** 等渗性造影剂对正常人及有高血压患者的肾功能影响较小，临床使用等渗性造影剂来降低 CT 增强检查造成的肾功能损伤,但未显示等渗性造影剂可降低造影剂肾病的发生率。

PU-3595
放射科影像质量控制方案及持续改进措施

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随着科技不断进步，影像诊断智能化，优质的影像是精确的诊断的基石，“影像精准，技术先行”，一直是我们影像技术工作的方向。严把技术质量关，切实做好质量控制。精准医疗依从于精准诊断，而精准诊断依从于精准技术，从细节入手，从差错入手，全面实现信息采集及图形后处理规范化，标准化。做好影像技术的持续改进的常态化，真正实现图像精准，技术先行。
一、实现影像技术的规范化、标准化，统一考核
1、制定并不断完善包括分院在内的 DR、CT、MR 检查标准，
2、实现总院、分院技术质量同质化。统一标准考核、抽查，归档、总结及分析。
3、定期学习，提高技师工作责任心，态度决定影像质量。
二、定期抽查与动态管理相结合
1、质控常态管理：继续开展图像质量缺陷登记和每月质量考核抽查，每月每人抽查不低于 40 份，对差错率较高的前三位，进行重点整改。
2、动态观察质控效果。每月差错率最高的 前 1 名，必须提出改进意见，并在下月的抽查中增加抽查 40 份，直到差错率进入后三名为止。
3、缺陷登记是在审签过程中，发现明显有质量缺陷的图像进行登记，月末收集，与抽查缺陷一起纳入考核，根据考核标准，扣分计入量化考核。由当事技师现场说明差错原因，并提出改进意见。

4、积极收集临床科室反馈意见，每月进行整理，持续改进。
5、学术交流，外出学术会期间，学习新知识，新理念，把新的知识融入到质量管理工作中。提高本科质控管理工作。
6、质控扣分与绩效挂钩，每月底对质控总结，部分绩效纳入质控管理，每一分对应相应比例的绩效扣除，提高技师的责任心。
三、做好质量持续改进
从细节入手，从差错入手，做到差错率真实降低；一是加强业务学习，积极参加我市及全国影像技术学术活动；二是加大与临床沟通，满足临床的需求，对临床的技术要求尽量满足，并且成为一个标准。改善图像质量，达到图像控制目的。影像质量控制工作任重而道远，一直在路上，需要全科同志共同参与，共同提高。

PU-3596
增大螺距在降低下肢 CTV 辐射剂量的应用研究

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摘要 目的 通过增大螺距联合使用低管电压、迭代重建算法及较低剂量的对比剂，研究下肢 CTV(computed tomography venography,CTV)图像质量及辐射剂量的相关研究。方法 选择临床怀疑下肢静脉血栓患者 40 例，随机分为 A、B 两组，每组各 20 例。 A 组扫描方案是标准螺距 1.0，B 组扫描方案是大螺距 1.55，两组扫描方案均采用低管电压 80kv 联合迭代重建算法，并注入较少的非离子型对比剂，记录并分析各组 CT 剂量指数(computed tomography dose index,C T D I)、CT 剂量长度乘积(dose length produce,D L P)、图像噪声(background noise,BN)、图像对比噪声比(contrast to noise ratio,C N R)，测量并分析增强后下腔静脉、髂静脉、股静脉、腘静脉管腔内 CT 值，由两位影像诊断医生采用双盲法分别评价各组 CT 图像主观质量。综合评价增大螺距联合低管电压及迭代重建算法在降低下肢 CTV 辐射剂量的可行性。结果 结论 对首次就诊患者，标准 1.0 螺距可以更全面评估病情，在病情随访复查时推荐使用较大螺距扫描，可以兼顾扫描剂量和图像质量。

PU-3597
Philip 256 排 CT 肺动脉低剂量扫描及低造影剂使用的新型成像方案的研究

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摘要
目的：评价 CT 低剂量扫描及低造影剂使用的新型肺动脉成像方案，以明确能否获得可以满足影像诊断需求的图像。
方法：随机选择 80 例拟行胸部增强 CT 的患者，在获得患者及其家属同意、签署知情同意书后对其加做肺动脉成像。将患者随机分为 4 组，分别为低剂量 A 组、低造影剂 B 组、低剂量低造影剂 C 组及正常扫描对照 D 组。使用的 Philip 256 排 CT 扫描条件为 A 组（120kv，30mAs，80ml 造影剂）、B 组（120kv，100mAs，30ml 造影剂）、C 组（120kv，30mAs，30ml 造影剂）及 D 组（120kv，100mAs，80ml 造影剂），均使用 CAREDose 6，由两名具有丰富诊断经验的影像学诊断医

生进行肺动脉图像质量盲测。两名诊断医生对肺动脉影像学图像质量合格意见一致的即为合格图像。两组之间比较采用卡方检验，P<0.05 时差异具有统计学意义。
结果：A 组合格图像 19 例，B 组合格图像 19 例，C 组合格图像 18 例， D 组合格图像 20 例。A 组与 D 组合格图像比例比较 P>0.05，差异无统计学意义，说明 CT 低剂量扫描不影响肺动脉成像图像质量。B 组与 D 组合格图像比例比较 P>0.05，差异无统计学意义，说明 CT 低造影剂扫描不影响肺动脉成像图像质量。C 组与 D 组合格图像比例比较 P>0.05，差异无统计学意义，CT 低剂量联合低造影剂使用的新型成像方案不影响肺动脉成像图像质量。
结论：临床中可采用 CT 低剂量扫描及低造影剂使用的新型肺动脉成像方案，可满足影像诊断需求的图像。

PU-3598
探讨 CT 血管造影剂复方泛影葡胺对血液透析患者肾功能的损害

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目的 探讨 CT 血管造影剂复方泛影葡胺对血液透析患者肾功能的损害（To investigate the damage of CT angiographic agent compound meglumine diatrizoate on renal function in patients with hemodialysi）。**方法** 选取 20 例行电子计算机断层扫描血管造影（造影剂为复方泛影葡胺）的血液透析（血透）患者，在检查后一小时内行血常规肾功能检查。**结果** 20 例患者的肌酐值与未行电子计算机断层扫描血管造影前的肌酐值相比明显增高。**结论** 血管造影剂复方泛影葡胺对血液透析患者肾功能的损害明显。

PU-3599
高龄、肾功较差患者采用低浓度、低流率、低总量造影剂扫描

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个案分析出，对于一些高龄患者，常伴有肾功能差、血管质量差、血压高等症状，这对于一些疾病的增强扫描带来了很大的局限性。为提高临床诊断要求，我们做了 3 例全泌尿系 CTU，采用低浓度、低流率、低造影剂总量同时低辐射剂量扫描，得到清晰完整达到临床进一步检查要求得图像，患者无不良反应，检查后一周肾功、血压等较检查前无改变。

PU-3600
下肢动脉支架置入后支架变形断裂的原因分析及应对策略

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目的：探讨下肢动脉支架置入术后支架变形断裂的原因及处理方法。**方法：**回顾性分析我科自 2013 年 1 月～2017 年 12 月 209 例通过血 管支架置入术治疗下肢动脉硬化性闭塞症患者的临床资料。依据患者影像学资料及手术记录 ， 归纳整理患者的病变特点，分析支架变形断裂的原因及处理方法等。**结果：**80 例患者置入髂动脉支架共计 118 枚，其中有 1 例患者出现支架塌陷变型，支

架急性血栓形成。下肢股腘动脉 129 例患者共置入血管支架 200 例，6 例患者出现支架变形断**结论：**下肢动脉支架变形断裂的原因主要和动脉病变性质、支架置入位置、数量、支架和周围组织关系、病变血管的血流速度等因素有关，亦和支架本身缺陷相关，处理办法主要包括置管溶栓、球囊扩张、再次支架置入等治疗。

PU-3601
双低剂量结合迭代重建技术在急性脑梗死患者全脑灌注成像中的应用

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目的：应用低浓度造影剂和低管电压结合迭代重建在急性脑梗死患者全脑灌注（CTP）成像中的对比研究。
方法：选取了 2018 年 2 月至 2019 年 7 月接受全脑 CTP 检查的 100 名患者。患者随机分为 A 组和 B 组.A 组 50 例[管电压，100 kV;造影剂，碘海醇（350 mg I / ml），通过滤波反投影重建]和 B 组 50 例[管电压，80 kV;造影剂，碘克沙醇（270 mg I / ml），通过迭代重建技术重建测量并统计分析两组的动脉 CT 值，信噪比（SNR），对比噪声比（CNR），剂量长度乘积，辐射有效剂量（ED）和脑碘摄入量。两位医生对图像质量评估的一致性进行了 kappa（κ）分析。通过 x 2 测试两组间主观图像质量评价的差异。
结果：两组 CT 值，SNR，CNR，CTP 和 CT 血管造影主观图像质量评价差异无统计学意义（P> 0.05）;两组急性梗死的诊断率无显着差异;而 B 组（双低剂量组）的 ED 和碘摄入量均低于 A 组。
结论：低管电压和迭代重建技术的结合，以及低浓度造影剂的应用（270 mg I / ml）在全脑 CTP 检查中，在不影响图像质量的情况下减少了 ED 和碘的摄入，从而降低了造影剂引起的肾病的风险。

PU-3602
X 线立位胸片架同步开合式屏蔽防护装置的价值研究

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目的： 胸片中使用 X 线立位胸片架同步开合式屏蔽防护的价值研究，解决放射检查工作中辐射防护规范要求落实难的问题。
方法：研究制作胸片架同步开合式防护装置，基本结构含同步防护屏框架、头颈部防护屏（包括甲状腺屏蔽凸）、腹部及盆腔防护屏，铅板厚为 1.0mmpb。检测点位分别选择在胸部探测器板投照区中心和探测器周围及防护屏蔽区上、下、左、右，并各设置 1 个兴趣区，其中 1 点区及 1a 区为头颈部屏蔽防护区，2 点区为腹部防护区；先用模具进行未做任何防护前各点位常规标准曝光时的基础辐射剂量的检测，进而再检测使用防护后各点位常规标准曝光时的辐射剂量的检测 600 例，其中穿戴式防护组（对照组）300 例，同步开合式屏蔽防护组（观察组）300 例。在相同投照技术条件下，比较两组患者平均检查时间和兴趣区受到辐射剂量。
结果：1.平均检查时间：观察组明显短于对照组，有显著差异（p＜0.05）。2、兴趣区受到辐射剂量：观察组明显低于对照组，有显著差异（*P*＜0.05）。
结论：自动同步开合式辅助防护装置，操作简便，在有效防辐射同时，缩短患者检查时间，没有对患者、技师检查造成干扰或不便；结构简单，成本低廉，便于制造，利于推广应用；无需穿戴、搬运，不接触患者，消毒处理方便且不易老化，更符合院感控制要求；通过更换不同大小屏蔽板，可

以应用于立位胸片架其它部位投照检查。综上所述，使用立位胸片架同步开合式屏蔽防护装置能有效降低所受到辐射剂量，操作简便，只需一个简单动作就能完成防护，能节省检查时间，解决了日常放射检查工作中辐射防护规范要求落实难的问题，减少辐射对人体危害和减少医疗纠纷，值得在临床推广应用。

PU-3603

高分辨 3D-CE-MRV 在大脑浅静脉成像中的应用价值

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目的探讨高分辨三维对比增强磁共振静脉造影(3D-CE-MRV)在大脑浅静脉成像中的应用价值。**方法** 34 例行大脑浅静脉检查的患者采用高分辨 3D-CE-MRV 成像，分别对大脑中浅静脉、Trolard 静脉、Labbe 静脉的显示效能进行统计学分析。**结果** 34 例患者检查均获得成功，高分辨 3D-CE-MRV 对大脑中浅静脉、Trolard 静脉、Labbe 静脉显示率分别为 95.59%，95.59%，94.12%。**结论**高分辨 3D-CE-MRV 能提供高质量的大脑浅静脉图像，可为神经外科手术路径的选择提供重要的影像学信息。

PU-3604

3.0T 磁共振 TRICKS 技术在颈动脉成像中的应用研究

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目的 探讨时间分辨对比剂动态显像技术（TRICKS）在颈动脉成像中的应用价值，对比分析 TRICKS 和三维时间飞跃法磁共振血管造影（3D-TOF-MRA）在磁共振颈动脉成像图像质量的差异。**方法** 32 例行颈部 MRA 检查患者，采用 TRICKS 和 3D-TOF-MRA 成像。对 TRICKS 及 3D-TOF-MRA 图像颈动脉显示情况进行评分并测算图像的对比噪声比（CNR）。比较 TRICKS 及 3D-TOF-MRA 在扫描时间的差异。2 名医师对 TRICKS 和 3D-TOF-MRA 图像评分情况进行 Kappa 一致性检验，对 TRICKS 及 3D-TOF-MRA 图像评分进行 Mann-Whitney 秩和检验；对 TRICKS 和 3D-TOF-MRA 的 CNR、扫描时间采用 t 检验进行统计学分析。**结果** 2 名医师对颈动脉的评分在 TRICKS 分别为（3.03±0.180）、（3.06±0.181）分，Kappa 值 0.871；在 3D-TOF-MRA 上分别为（2.97±0.180）、（3.00±0.359）分，Kappa 值 0.747。2 名医师的评分结果一致性良好，TRICKS 图像质量评分高于 3D-TOF-MRA，两种方法的结果差异有统计学意义（Z=3.854，P 值均＜0.05）。TRICKS 及 3D-TOF-MRA 的 CNR、扫描时间分别为 13.45±7.75、62.00s 和 10.12±0.87、325.00s，TRICKS 与 3D-TOF-MRA 的 CNR、扫描时间差异有统计学意义（P 均＜0.05）。**结论** TRICKS 较 3D-TOF-MRA 具有更高的时间分辨率，图像质量更好，能更清楚显示颈动脉的解剖结构及病变，可作为颈动脉病变筛查的首选检查方法，但 TRICKS 需要使用钆对比剂，患者危险性及检查费用同时增加。

PU-3605

影像诊断警示录

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目的：通过分析影像影像诊断医师在临床工作中的常见错误，提高住培医师的防范意识。
材料与方法：分析人体各系统影像学诊断报告投诉情况主要包括胸、腹、骨骼及神经系统诊断中的漏诊即严重错误，从而给患者带来不同程度的精神及机体组织、脏器的伤害，总结如何避免类似错误发生。
结果：
胸部：主要是胸片肺癌漏诊、肋骨骨折，还有纵膈病变的漏诊；
骨肌系统：主要是骨折、脱位漏诊；
腹部：空腔脏器穿孔、血管病变（尤其是肠系膜血管）、肠道肿瘤漏诊；
神经系统：脑膜瘤等疾病漏诊；
报告书写：用词不当，同名不同片（张冠李戴）等。
结论：重视培养住培医师对影像诊断报告中常见错误的发生，有助于住培医师将来在临床工作中的防范能力并提升自信心。

PU-3606

鞍区 CT 扫描及增强规范要点

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目的：研究鞍区 CT 扫描，使检查更清晰更有针对性，方便临床检查
方法：从本院收治的鞍区 CT 检查患者中，抽取 50 例患者作为研究对象，观察其所拍 CT 图像并询问患者检查过程中相关信息，相互进行对比研究。
结果：少数患者图像对比度不清晰，范围太大或不全面，有些病变不足够突出，而图像特别鲜明的，分析后发现螺距≦1.0，层厚≦2mm ，重建间隔为 50%，基线向上包括鞍区及相应病变位置，增强扫描均是经上肢静脉高压注射含碘对比剂，注射流率 2.5ml /s ~3ml /s ，同时患者能很好的配合医生的指挥。
结论：鞍区 CT 扫描及增强检查必须规范要求，也需按照患者自身情况进行参考值调整，对比剂用量，成人 60～100ml 离子型或非离子型含碘对比剂，儿童按体重计算 2ml/kg

PU-3607

探究儿科 DR 摄影技术及对辐射的防护措施

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目的： 探讨儿科 DR 摄影技术及对辐射的防护措施。 **方法：** 抽取本院 2018 年 1 月至 2018 年 12 月间收治的 128 例需要进行 DR 摄影的患儿为研究对象，按照患儿年龄分为两组。对照组 64 例就诊时年龄 1 个月到 1 岁之间，观察组 64 例患儿 1 岁到 10 岁之间，比较 DR 摄影技术对两组患儿的影响，并探讨相关防护措施。 **结果：** 对照组照射中心以及性腺的 ESD 值均大于观察组，差异具有统计学意义（P>0.05），观察组患儿甲状腺部位的 ESD 值大于对照组，差异具有统计学意义

（P>0.05）。**结论：** DR 摄影对各个年龄阶段的儿童具有一定的辐射危害，因此需要针对特定年龄患儿在进行摄影过程中，选择合适的方式进行防护，避免辐射对患者造成伤害。

PU-3608

基于 CIP 管理方法提高住院患者 MR 预约到检准时率

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目的：运用 CIP 管理方法来提高住院患者 MR 预约到检准时率。**方法：**CIP 是精益生产思想的精髓和推进精益生产的最有效管理手段，意为不断（Continuous）改进（Improvement）流程（Process）。准时的界定：因 MR 检查需要提前准备，所以在预约排检单上会有提示需提前 10 分钟至放射科登记台报到，以利检查顺利进行。提前预约排程时间前 10min 的为准时。 合理运用 CIP 管理方法可以达到以下效果：1 对患者而言：及时完成各项检查，尽快明确病因；2 对同仁而言：优化工作流程，提高工作效率 3 对院方而言：提升患者满意度，提高设备使用率。所以此次改善重点是患者 MR 检查的准时率。回顾性选取 2018 年 10 月 8 日-2018 年 10 月 22 日 MR 预约情况，将医院病房按楼层进行统计，当前 MR 到检准时率为 68%。按照柏拉图 80/20 原则，选取前 9 名科室作为分析重点。经统计，2018 年 10 月 8 日-2018 年 10 月 22 日做 MR 检查患者男性准时 58 人，迟到 150 人，女性准时 75 人，迟到 145 人，P=0.166>0.05,男女性别上没有显著的相关性。根据科室迟到分布，迟到大于 40 分钟科室主要分布在神经内科，占 61%。按时间段的人次准时率统计准时性在 51%-65%的在 9:45-10：30；13：45-14:30；18:45-20：30，按时间段迟到人数中平均迟到时间统计迟到时间的平均值>30 分钟的主要均集中在上午 8:45-12:30。本次的目标值是运用 CIP 方法将准时率从 68%提升至 84%，增幅为 24%。通过分析迟到真因有主护负责多床病患，事情太多忘记了 ；同一病区的排程时间按常规 15min 间隔；等电梯时间长。**结果：**针对迟到出的 3 种真因制定对策，实施良好，护理人员及 TC 配合度较高，对提高 MR 预约到检准时率效果明显。**结论：**运用 CIP 管理方法将住院患者 MR 预约到检准时率从 68%提升至 82%.

PU-3609

上腹部 CT 增强的个性化研究

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目的 根据患者的体质量指数（body mass index，BMI）来制定上腹部 CT 增强时个性化碘对比剂使用剂量的可行性研究。**材料与方法** 实验组（n=40）根据患者 BMI 指数使用个性化的对比剂剂量、流速，并增加 30ml 生理盐水的助推。对照组（n=40）以速率 2.5ml/s 注射 80ml 碘对比剂。测量标准体重、轻度肥胖体重患者在动脉期、门脉期中第一肝门水平腹主动脉、下腔静脉、门静脉的 CT 值，并对对数据进行统计学检验。**结果** 实验组动脉期标准体重、轻度肥胖体重的 CT 值分别为：腹主动脉（236.41±46.62）HU、（227.08±28.94）HU；下腔静脉（101.98±26.47）HU、（121.09±18.10）HU；门静脉（120.13±23.46）HU、（140.82±18.95）HU。实验组门脉期标准体重、轻度肥胖体重的 CT 值分别为：腹主动脉（142.44±21.92）HU、（120.65±18.06）HU；下腔静脉（121.09±18.10）HU、（106.42±16.61）HU；门静脉（140.82±18.95）HU、（124.83±20.49）HU。与对照组对比，标准体重实验组对比剂用量（62.75±6.38 ml），（t=12.090，p=0.000），注射速率（2.08±0.21 ml/s），（t=9.050，p=0.000）；轻度肥胖体重对比剂用量（79.99±7.95 ml），（t=0.007，p=0.994），注射速率（2.65±0.25 ml/s），

（t=2.690，p=0.011）。实验组标准体重者对比剂的剂量明显降低但 CT 值无差异；实验组轻度肥胖者对比剂的剂量基本相同但 CT 值无差异。**结论** 根据个性化的对比剂注射方案，在图像质量一致的情况下，标准体重者对比剂剂量、速率均明显减少，而轻度肥胖者对比剂剂量相同，注射速率提高。

PU-3610
双能量 CT 非线性融合技术对头颈部 CTA 图像质量的影响

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目的：头颈部血管病变是脑缺血性或出血性疾病的主要发病原因。头颈部多层螺旋 CTA 无创、快速、便捷，可以较全面地评价脑血管的解剖与变异，且与 DSA 诊断符合率较高，已被广泛用于动脉瘤、动脉畸形、动脉粥样硬化等头颈部血管病变的诊断中。双源双能量 CT 优化对比显示技术近年受到关注，其中非线性融合（NLB）技术作为其独有的图像处理方法，有别于传统的图像线性融合（LB）方式。因此对于接受双能头颈部 CTA 检查的患者，可采用 NLB 技术以改善和提高头颈部 CTA 图像质量。旨在评估 NLB 改善和提高头颈部 CTA 图像质量的临床应用价值。
方法：
1、资料收集：选取院内近一年来对单能量图像不佳或不能满足诊断要求（主观评分≤3 分）的 15 例双能头颈部 CTA 图像。
2、检查方法：采用西门子双源电脑断层扫描仪，患者采用仰卧位，将扫描定位基准线定于听眦线，在摄取正侧位定位图像后，先进行一次正常头颈部 CT 平扫，增强前采用 SmartPrep 法，将监测的感兴趣区置于升主动脉处，同时按下打药与扫描键。层厚 1.0mm，层间距 0.7mm。采用高浓度对比剂碘佛醇注射液（350mg I/ml），流率 4.5ml/s，流量 55ml（数值依人而意），盐水流量 50ml。最终得到 100kV、140kV 两组图像。
3、对比方法：将收集到的影像行 LB 与 NLB 处理，每位患者则有 100kV、140kV、LB 以及 NLB 四组图像，测量并计算 4 组图像颈内动脉床突段、大脑中动脉、基底动脉及脑干的 CT 值、SNR 和 CNR，并由两名有经验的影像科医技师分别对四组图像进行独立盲法评分，采用 5 分标准评价图像质量。
4、统计学方法：对收集的数据进行统计学分析，计量资料以均值±标准差表示，计数资料以百分比表示。对四组图像的 CT 值、SNR 及 CNR 的比较采用重复测量方差分析，P＜0.05 认为差异具有统计学意义。
预期结果：NLB 技术明显改善头颈部 CTA 的图像质量。

PU-3611
基于常规 DWI 和 ZOOMit DWI 技术对甲状腺图像质量的对比评估

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目的:采用常规和 ZOOMit DWI 技术对甲状腺图像质量进行定量评估及主观评价。**方法:**前瞻性分析 61 例甲状腺患者的常规 DWI 和 ZOOMit DWI 图像。定量分析两者在形变(def)、信噪比(SNR)的差异及主观评分。**结果:**甲状腺 ZOOMit DWI 图像较传统 DWI 图像更清晰。ZOOMit DWI 图像的信噪比（signal-to-noise ratio，SNR）显著高于传统 DWI 图像（9.05 vs. 4.81, P<0.001），图像形变（deformation，def）值显著低于传统 DWI 的 def 值（2.53mm vs. 3.14mm, P< 0.001）。两名医

师间主观评分一致性好（Kappa 值分别为 0.702，0.613）。ZOOMit DWI 图像的总评分（平均 231）高于 DWI 图像（平均 127）且每个患者的 ZOOMit DWI 图像评分（平均 3.79 分）均高于 DWI 图像（平均 2.08 分）差异具有统计学意义（$P<0.001$）。**结论:**与传统 DWI 相比，ZOOMit DWI 技术的甲状腺图像 SNR 更高，形变更小，图像与解剖一致，且医师主观评分较高。

PU-3612
心电编辑技术在屏气不佳患者 320 排 CT 冠脉成像中的应用分析

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目的：探讨心电编辑技术在 320 排 CT 冠状动脉成像中弥补患者屏气不佳的应用价值。
方法：选取我院行 320 排 CT 冠状动脉血管成像中屏气不佳的患者 30 例，对屏气不佳患者的冠脉图像使用心电编辑技术进行后处理，并进行前后图像质量对比。
结果：统计 30 例患者心电编辑前后可显示右冠状动脉、左主干、左前降支以及左回旋支总数分别为 20/30、27/30、21/30、22/30 支。图像质量采用 4 级评价法。心电编辑前图像质量Ⅰ~Ⅳ级主支分别为 2、44、44、30 支，图像质量符合诊断要求的共 90 支。心电编辑后图像质量Ⅰ~Ⅳ级各主支分别为 59、54、7、0 支，图像质量符合诊断要求的共 120 支。心电编辑前后的影像质量差异均有统计学意义（$p<0.05$）。
结论：心电编辑技术能明显提高屏气不佳患者 320 排 CT 冠状动脉血管成像的后处理图像质量，提高一次性检查成功率。

PU-3613
不同成像参数与肺部结节 CT 图像质量及辐射剂量的相关性研究

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目的 探讨不同管电压及不同管电流对模拟植入肺部结节的胸部 CT 图像质量及相应辐射剂量的影响。方法 利用仿真人体模型植入模拟四种不同直径大小及每种直径设置三种不同密度共 12 枚结节，在不同管电压及管电流条件下进行分次成像，对结节检出率、结节变形度及图像质量（主观评价及客观评价）进行评价，并记录分次成像辐射剂量，分析成像参数与结节检出率、结节变形度、辐射剂量及图像质量的相关性。结果 在图像质量评价方面，管电压或管电流不变时，图像质量随管电压或管电流的增加而提升（P<0.05）；胸部器官 CT 值评价：管电流不变时，随着管电压增加，椎体 CT 值逐渐降低（P<0.05）；肺野 CT 值差异无统计学意义（P>0.05）。相同管电流 100mAs，不同管电压条件下，高密度（+100HU）肺结节 CT 值差异有统计学意义（P<0.05）；磨玻璃结节（-630HU）肺结节 CT 值差异有统计学意义（P<0.05）；更低密度结节（-800HU）肺结节 CT 值差异无统计学意义（P=0.57）。对于肺结节检出率，在 100kV 及 120kV 条件下，所有管电流结节检出率为 100%；80kV/15mAs 条件下，3mm 结节检出率为 33%，80kV/20mAs 条件下，3mm 结节检出率为 66%。对于肺结节变形度的影响，-630HU 密度结节及直径小于 5mm 结节变异度最大，其差异有统计学意义（P<0.05）。分析不同管电压下图像质量(Y)与辐射剂量(X)的关系，并确立相关性方程：80kV：Y=2.625x+0.038；100kV：Y=14.66x+0.158；120kV：Y=18.59x+0.093。结论 图像质量随管电流及管电压的增加逐渐上升，辐射剂量随管电压及管电流的上升相应增加。适当降低管电压，增加管电流可降低辐射剂量。肺部磨玻璃结节随访 CT 检查，应遵循相同管电压成像参数，从而有效减低结节密度测量的误差，更真实的评估结节的变化。

PU-3614

DTS 单侧和双侧摄影模式下茎突侧位影像的对比

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目的：应用头颈部仿真体模评价 DTS（Digital Tomosynthesis，数字断层融合）技术单侧和双侧摄影模式对茎突侧位影像质量的影响。材料与方法：使用 DTS 技术对同一仿真体模茎突的左右两侧标准侧位分别进行扫描，在后处理工作站上根据各单侧原始图像分别重建出左右两侧茎突影像并测出茎突的长度，以 CT 扫描及三维重建测得的茎突长度作为标准值，分析 DTS 各测得值相对标准值的的准确度。结果：经各侧 DTS 摄影原始数据重建出的近侧茎突的长度测量值与 CT 标准值相比分别为左侧偏差 1.8mm，偏差度 8.6%，右侧偏差 1.2mm，偏差度 5.6%，偏差范围均在 2mm 以内，而经各侧 DTS 原始数据重建出的对侧（远侧）茎突的长度测量值与 CT 标准值相比分别为左侧偏差 2.5mm，偏差度 11.9%，右侧偏差 3.4mm，偏差度 15.9%，偏差度均已大于 10%，偏差相对较大。结论：DTS 茎突侧位摄影时应采用双侧摄影模式对两侧分别进行检查，不宜使用单侧侧位原始数据重建出双侧影像。

PU-3615

DR 比赛-有效提高 DR 照片质量的新方法

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目的：探讨在日常医疗工作中怎样更好提高普放 DR 照片质量。
方法：从 2018.11 起，我院放射科进行每月一次的 DR 照片比赛，首先制定出优质胸部 DR 片的标准，然后规定当月在普放上班的职工必须参加，当月没在普放上班的职工（当月在 CT 及 MRI 上班的）可以自愿参加。每月月底前报出当月自己照的 5 个胸部 DR 号，评比的时候从 5 个号中随机抽取 1 个参加评比。每月评出前三名。对获奖者给予不错的奖励。对报名情况及获奖情况定期进行公示。
结果： 经过几个月的胸部 DR 比赛，我院放射科胸部 DR 照片质量得到了明显提高，取得了满意的效果。
结论：我院每月进行的 DR 比赛规定在普放上班的职工每人都必须参加，获奖者有不错的奖励，提高了大家注重工作质量的积极性；对报名情况定期公布，从另一方面又促使大家积极参加这项比赛，并尽可能地按照赛前制定的优质 DR 标准来认真进行每一个病人的检查。所以照片质量自然就提高了。

PU-3616

基于有源体模的 BOLD 信号仿真和 fMRI 质量控制的研究

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血氧饱和依赖（BOLD）是功能磁共振（fMRI）的常用方法之一，广泛用于各种神经生理成像，然而对 BOLD 信号的仿真仍存在一定的困难。本研究旨在设计并仿真 BOLD 信号体模，利用铜丝内的电流对周围凝胶弛豫时间的影响，仿真 BOLD 信号的产生机制。利用本体模评价不同型号扫描仪对刺激信号的敏感程度以及体模刺激信号可重复性及稳定性的评价。结果表明本体模成功仿真 BOLD 信号，并且具备良好的稳定性和可重复性，可应用到日常的 fMRI 的质量控制

PU-3617

在 RIS-PACS 系统中建立并运用符合质控督查要求的在线评片和手术随访功能模块

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目的：探讨如何在 RIS-PACS 系统中建立并运用符合质控督查要求的在线评片和手术随访功能模块。方法：回顾分析上海市儿童医院 RIS-PACS 系统建立在线评片和手术随访模块的经过，收集使用过程及结果的反馈。以实际运用结果评价以上功能模块的适用性、合理性，重点评价以上模块是否符合上海市放射诊断质控督查标准。结果：上海市儿童医院 RIS-PACS 系统在线评片和手术随访功能模块在建立过程中充分考虑了实际使用需求，经认真细致的前期调查工作，放射科、信息科及软件公司通力合作，所得软件功能完善，界面友好，与 HIS 无缝连接；其统计报表项目完善，结果准确；功能模块操作过程、生成的各类报告及统计报表均完全符合上海市放射诊断质控督查标准的要求。结论：在 RIS-PACS 系统中建立并运用符合质控督查要求的在线评片和手术随访功能模块是完全可行并且是必需的。前期调查准备工作是重要的基础，放射科、信息科、软件公司及医院其它有关部门通力合作是成败的关键。

PU-3618

LIPO 技术在肾脏 DWI 的应用价值

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目的：研究 LIPO 技术在肾脏 DWI 成像中的应用价值。
方法：前瞻性收集 10 名健康受试者（平均年龄 28.7±2.15 岁），所有受试者采用 3.0T MR 扫描（Ingenia CX，Philips）对肾脏进行扫描。首先关闭 LIPO 技术，仅仅行 DWI 常规扫描（b 值= 0,1000,2000），随后在 DWI 扫描（b 值= 0,1000,2000）的同时采用 LIPO 技术。所有图像分析均在 IntelliSpace Portal（Philips）上进行。两名放射科医师将 ROI 分别置于右肾的上，中，下极的肾皮质和髓质以及相同水平的腰大肌，计算 ADC 值，信噪比(SNR)和对比噪声比(CNR)。使用 Friedman 检验分析来自不同序列的图像之间的 ADC 值，SNR 和 CNR 值。

结果：在肾髓质及肾皮质的中极，DWI（b 值= 0,1000,2000）联合 LIPO 技术能够显著提升图像质量（SNR 和 CNR 均显著升高）。其肾上，中，下极的平均 SNR 和 CNR 也显着升高（P <0.05）（表 1 和 2）。 LIPO 技术对 DWI 成像的 ADC 值无统计学意义（表 3）。
结论：LIPO 技术能够显著提升肾脏 DWI 成像的图像质量，而对于测量的 ADC 值无显著影响。

PU-3619
轻度阿尔茨海默病患者静息态脑默认活动网络的 fMRI 研究

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目的 采用静息态功能磁共振（fMRI）技术，探讨轻度阿尔茨海默病（AD）患者的脑默认活动网络（DMN）是否存在异常及其可能的神经机制。
方法 对 24 名轻度 AD 患者和 25 名正常老年人（NC）进行简易智能状态检查（MMSE）、Mattis 痴呆评定量表（DRS）和静息态脑功能成像。利用低频振幅算法（ALFF），采用双样本 t 检验，以 P<0.01 水平对全脑静息态数据进行对比分析，观察 AD 患者相对于正常老年人 ALFF 有显著差异的区域。
结果 行为学结果：本组轻度 AD 患者与 NC 组比较，记忆功能存在明显损害。静息态 fMRI 结果：与 NC 组比较，AD 患者与记忆密切相关的后扣带回、前额叶中内侧腹侧、前额叶中内侧背侧等脑区 ALFF 明显减弱。
结论 AD 患者静息态 DMN 与记忆密切相关的脑区结点活动强度减弱，DMN 异常在其早期记忆损害的病理机制中起着非常重要的作用。

PU-3620
能谱 CT 对提高肝门静脉与肝静脉关系成像质量的研究

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【摘要】目的：应用 8-cm 宽体探测器能谱 CT，探讨能谱增强扫描技术对提高肝门静脉与肝静脉成像质量的应用价值。材料和方法：随机选取行腹部能谱增强扫描患者 30 例，采用 8cm 宽体探测器 CT(Revolution,GE Healthcare,美国)扫描仪，能谱肝脏扫描模式，动脉期扫描时间采用对比剂追踪技术监测,动脉期结束 40S 后进行门脉期扫描。利用 GSI Viwer(GE AW4.7)软件处理肝门静脉期图像，分别得到 120 kvp-like 的图像和最佳单能量图像，多平面重组（MPR）,最大密度影（MIP）和容积再现（VR）后处理。选取感兴趣区（ROI）,分别测量两组数据中肝门静脉和肝实质 ct 值，竖脊肌的 ct 值和 std，用于计算门脉主干和肝实质的对比噪声比（CNR=肝门静脉 CT 值-肝实质 CT 值/竖脊肌的 std），同样的方法测量肝静脉和肝实质的 CNR,并由两名 10 年以上腹部影像诊断经验的医师在盲法条件下对重建图像进行主观图像评分。比较采用独立样本 t 检验，两名医师对重建图像质量一致性评估采用 Kappa 检验。结果：肝门静脉期门静脉与肝静脉最佳 CNR 单能图像能量水平集中在 55kev。最佳 CNR 图像上门静脉 CT 值.肝静脉 CT 值.肝实质 CT 值.竖脊肌的 std 值.门静脉-肝实质最佳 CNR，肝静脉-肝实质最佳 CNR，图像噪声均高于 120kvp-like 图像，两者间的差异有统计学意义（P<0.01）两名医师对最佳 CNR 单能重建图像评价一致性（Kappa 值为 0.683）高于 120 kVp -like 图像(Kappa 值为 0.452)；两组图像质量评分分别是（4.36±0.79）分和（3.24±0.57），差异有统计学意义（P<0.01）结论：应用 8-cm 宽体探测器能谱 CT 肝门静脉增强扫描，最佳单能量图像能比 120kVp-like 图像，明显提高了肝门静脉和肝静脉关系成像质量。

PU-3621

3.0T MR 多期动态增强扫描在肾脏肿瘤诊断中的价值

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目的 评价 3.0T MR 多期动态增强扫描（DCE-MRI）在肾脏肿瘤良恶性及不同病理组织学类型之间鉴别诊断的价值。
方法 15 例正常志愿者及 46 例经病理证实的肾脏肿瘤患者（其中肾透明细胞癌 18 例，乳头状肾细胞癌 8 例，肾嫌色细胞癌 7 例，肾血管平滑肌脂肪瘤 13 例）均行 3.0T DCE-MRI。采用单因素方差分析方法比较 DCE-MRI 所得 K^{trans}、K_{ep}、V_e在不同病理类型肾脏肿瘤之间的差异，应用 ROC 曲线评价 DCE-MRI 对于鉴别肾脏肿瘤良恶性的诊断价值。
结果 应用 DCE-MRI 得到正常肾实质的时间-信号强度曲线（SI-T 曲线）呈速升平台型，肾脏良性肿瘤的 SI-T 曲线呈上升平台型，而恶性肿瘤的 SI-T 曲线呈速升流出型。正常肾实质与各病理类型肾脏肿瘤之间 K^{trans}、K_{ep}及 V_e值差异均有统计学意义。肾脏各组恶性肿瘤的 K^{trans}值及 V_e值均高于良性肿瘤（P＜0.05），恶性肿瘤中，仅肾透明细胞癌的 K_{ep}值高于良性肿瘤（P＜0.05）。肾恶性肿瘤中，肾透明细胞癌、肾乳头状细胞癌及肾嫌色细胞癌的 K_{trans}值差异均具有统计学意义（P＜0.05）。肾透明细胞癌的 V_e值（0.42±0.08）高于肾乳头状细胞癌 Ve 值（0.29±0.14）（P＜0.05）。运用 ROC 曲线评估 DCE-MRI 鉴别肾脏肿瘤良恶性的诊断价值， K^{trans} AUC=0.937，灵敏度和特异度分别为 87.9%和 85.7%，临界值为 0.38/min； V_e AUC=0.803，灵敏度和特异度分别为 78.8%和 71.4%，临界值为 0.29/min；K_{ep}则表现出较低的鉴别诊断价值(0.564)。
结论 3.0T MR 多期动态增强扫描（DCE-MRI）能有效鉴别肾脏肿瘤良恶性及不同病理组织学类型，其中 K^{trans}值的诊断价值最高。

PU-3622

基于脑 CT 灌注评估头颈部动脉狭窄

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目的:应用 320 排 CT 一站式 CTA-CTP 动态容积灌注成像技术，探讨头颈部动脉狭窄的脑血流动力学改变，分析头颈部动脉狭窄程度与脑灌注成像表现的关系。
方法:163 例经颈动脉 CTA 或 CE-MRA 及头颅 CTA 诊断为单侧颈动脉系统狭窄的患者纳入本研究中。所有患者均行脑 CTP 检查。经灌注后处理软件，分别得到相对脑血流量（rCBV）图、达峰时间（TTP）图、相对脑血流量（rCBF）图、平均通过时间（MTT）图及灌注参数值。根据头颈部动脉狭窄程度将头颈部动脉分为轻、中及重度狭窄组，对各组灌注表现进行定性和定量研究，分析各灌注参数中的敏感性指标；分析单侧头颈部动脉狭窄程度与灌注参数的相关性。
结果:80 例颈内动脉狭窄患者纳入本研究，年龄 44-90 岁。其中轻度组 25 例，男 15 例，女 10 例。中度组 41 例，男 28 例，女 13 例。重度组 14 例，男 8 例，女 6 例。83 例大脑中动脉狭窄患者纳入本研究，年龄 44-90 岁。轻度组 46 例，男 30 例，女 16 例。中度组 12 例，男 5 例，女 7 例。重度组 25 例，男 10 例，女 15 例。组间年龄、性别及患有高血压、糖尿病患者比例差异均无统计学意义（P>0.05）。各组间灌注参数图的定性、定量诊断显示，共 21 例颈内动脉狭窄和 33 例大脑中动脉出现灌注异常，颈内动脉狭窄患者患、健侧 TTP 差异有统计学意义（P<0.05），大

脑中动脉狭窄患者患、健侧 rCBV、MTT、TTP 差异有统计学意义（$P<0.05$），颈内动脉狭窄程度与患、健侧 rCBV 增加率、rCBF 增加率、MTT 增加率无相关性($P>0.05$)，与患、健侧 TTP 增加率有相关性（$P<0.05$）。而大脑中动脉狭窄程度还与患、健侧 rCBV 增加率、MTT 增加率有相关性（$P<0.05$）。

结论:CTP 是评价颈动脉系统狭窄后脑组织血流动力学改变的敏感方法，其中 TTP 是评价脑灌注异常的最敏感指标，与动脉狭窄程度呈正相关。

PU-3623

Myocardial Blood Flow Analysis of Stress Dynamic Myocardial CT Perfusion for Hemodynamically Significant Coronary Artery Disease Diagnosis: The Clinical Value of Relative Parameter Optimization

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Objectives To investigate the optimal relative parameter of quantitative myocardial blood flow (MBF) on dynamic myocardial CT perfusion (CTP) for the detection of hemodynamically significant coronary artery disease (CAD).

Methods: A total of 86 patients who were prospectively recruited underwent adenosine triphosphate-stress dynamic myocardial CTP. The MBF value was measured by a manually drawn volume of interest (VOIs) on the MBF color-coded polar maps with perfusion defects of vessel-based territory. The relative MBF perfusion parameters were then calculated as Ratio1, Ratio2 and Ratio3 according to the three types of reference MBF values, respectively: 1) average segmental MBF value, 2) 75th percentile of the average segmental MBF value, and 3) highest segmental MBF value. All the data were derived from both the endocardial and transmural layers of the myocardium. Invasive coronary angiography and fractional flow reserve (ICA/FFR) were used as the reference standards for myocardial ischemia evaluation.

Results: 151 vessels of 60 patients (43 men and 17 women; 61.38±8.01 years) were enrolled in the analysis. The performance of endocardial layer was superior to that of the transmural layer (all P <0.05). The Ratio3 of endocardial myocardium (AUC=0.906, 95% CI: 0.857-0.954), for which the highest segmental value was selected as the reference MBF, was superior to both Ratio1 and Ratio2 for ischemia detection (AUC, 0.906 vs. 0.879, P <0.05; 0.906 vs. 0.891, P =0.18), and the sensitivity, specificity, PPV, NPV and diagnostic accuracy were 74.1%, 93.6%, 87.8%, 85.3% and 86.1%, respectively. The cutoff value of Ratio3 was 0.675.

Conclusions: The relative MBF parameter of the endocardial myocardium using the highest segmental MBF value as a reference provided optimal diagnostic accuracy for the detection of hemodynamically significant CAD.

PU-3624

基于脑 CT 灌注评估头颈部动脉狭窄后侧支循环情况

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目的:应用 320 排 CT 一站式 CTA-CTP 动态容积灌注成像技术，探讨头颈部动脉狭窄后脑血流动力学改变与侧支循环关系。
方法:92 例经颈动脉 CTA 或 CE-MRA 及头颅 CTA 诊断为单侧颈动脉系统中重度狭窄的患者纳入本研究中，收集患者的临床基本信息资料及影像学检查资料。所有患者均行脑 CTP 检查。经灌注后处理软件，分别得到相对脑血流量（relative cerebral blood volume，rCBV）图、达峰时间（time to peak，TTP）图、相对脑血流量（relative cerebral blood flow，rCBF）图、平均通过时间（mean transit time，MTT）图及灌注参数值。将颈内动脉组和大脑中动脉狭窄组按侧支循环分级分为良好组和不良组，分析两组间 CTP 增加率的变化。
结果:将颈内动脉（55 例）和大脑中动脉（37 例）中重度组患者根据侧支循环分级分为良好组和不良组。颈内动脉侧支循环良好组 41 例，不良组 14 例；大脑中动脉良好组 15 例，不良组 22 例。组间年龄、性别及患有高血压、糖尿病患者比例差异均无统计学意义（$P>0.05$）。
当 ICA、MCA 中重度以上狭窄时，侧支循环不良者发生 CTP 阳性概率增加。比较各组组间 CTP 参数增加率，rCBV 增加率、rCBF 增加率及 MTT 增加率差异无统计学意义（$P>0.05$），TTP 增加率差异有统计学意义（$P<0.05$），说明侧支循环不良者，TTP 增加率较高
结论:CTA 或 CE-MRA 联合 CTP，可直观显示血管狭窄部位、程度及责任血管供血区的血流动力学情况，评价侧支循环情况，可综合评价颈动脉系统狭窄对个体的影响，对临床个体化治疗具有重要意义。

PU-3625
头颈部动脉粥样硬化斑块周围血流动力学改变的研究

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目的：血流动力学因素在动脉粥样硬化斑块的形成和发展中起到重要作用。计算流体力学(CFD)可以显示和分析动脉狭窄处血液动力学状态，近年来常被应用于血管疾病中。本研究拟应用计算机数值模拟技术，对特定的头颈部动脉粥样硬化斑块进行血流动力学研究，观察头颈部动脉粥样硬化斑块周围血流动力学分布，探讨颅内动脉粥样硬化患者斑块周围血流动力学改变与脑组织灌注的关系。
方法：17 例经头颈动脉 CTA 诊断为颈内动脉中重狭窄及 10 例经颈动脉 MRA 及头 CTA+CTP 诊断为大脑中动脉中度狭窄的患者纳入本研究中，所有血管均行 CFD 后处理，得出壁面切应力（WSS）、血流速度、管壁压力（pressure）、血流储备分数（FFR_{CFD}）等参数值，其中大脑中动脉狭窄患者均行 CTP 检查。经灌注后处理软件，分别得到 CTP 的 rCBV 图、TTP 图、rCBF 图、MTT 图及灌注参数值。
（1）分析 CFD 结果，比较颈内动脉中重度狭窄组与 WSS、血流速度、pressure、FFR_{CFD} 等值之间的关系；
（2）分析大脑中动脉狭窄处与正常血管的血流动力学变化情况，分析大脑中动脉中度狭窄患者脑灌注异常与 CFD 各参数的相关性。
结果：（1）对于 17 例颈内动脉狭窄患者进行 CFD 模拟血流动力学，发现颈内动脉狭窄程度与 WSS、、血流速度、FFR_{CFD} 差异有统计学意义（$P<0.05$）。

（2）10 例大脑中动脉狭窄患者较对侧正常血管，WSS、血流速度、pressure 差异均有统计学意义（$P<0.05$）。10 例患者中 CTP 阳性组（6 例）较阴性组（4 例），WSS、血流速度、pressure、FFR_{CFD}均较大，其中 WSS 差异具有统计学意义（$P<0.05$）。

结论：头颈部动脉粥样硬化狭窄伴有明显的血流动力学改变，血流壁面切应力的增加可能是引起颅内动脉粥样硬化斑块破裂的危险因素。

PU-3626

The application of 3D-STIR-SPACE sequence in the display of the anatomical structure of the seminal tracts in adults.

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【Abstract】**Objective** To explore the value of 3D-STIR-SPACE sequence in displaying the anatomical structure of the seminal tracts. **Methods** Retrospectively collected data of adult male patients who underwent pelvic magnetic resonance imaging in the MRI Room of Huadong Hospital affiliated to Fudan University from November 2016 to March 2019. The complete 3D-STIR-SPACE sequence image data was scanned and the scope of the scan covered the vas deferens and seminal vesicles. There were 58 cases of gland, ranging from 29-87 years old, divided into two groups according to age: younger group (≤60 years old) and older group (>60 years old), including 22 cases in the younger age group and 36 cases in the old age group. The image quality was evaluated by the thin-layer MPR and curved surface reconstruction technique after MIP reconstruction, and the display of the pelvic pelvic segment, the posterior peritoneal segment and the seminal vesicle. The maximal slice diameter of the prostate capsule can be measured by thin section MIP reconstruction of the coronal, transverse and sagittal. **Results** For the posterior peritoneal and ampullary segments of both sides of the vas deferens, curved surface reconstruction was superior to cross-sectional reconstruction, and the difference was statistically significant ($P < 0.05$). The image quality scores of the ampulla and seminal vesicle of the lower age group were slightly lower than those of the older age group ($P < 0.05$). The range of diameter in three orientations of prostate follicle size were 6.31±3.53mm、8.30±3.25mm、8.94±3.61mm, respectively . **Conclusion** 3D-STIR-SPACE sequence can clearly display the fine structure anatomy of the seminal vesicle, the ampullary segment of the vas deferens, the posterior peritoneum, and the prostate vesicle. This technique is good for fine anatomical display of seminal duct and can provide information for surgery in clinical practice.

PU-3627

Donabedian 三维质量结构理论在肺动脉 CT 血管造影检查中的应用效果探讨

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目的 探讨 Donabedian 的结构-过程-结果三维评价模式在肺动脉血管 CT 造影中的应用。**方法** 以 2017 年 6 月~2017 年 12 月临床疑似肺栓塞且需要进行 CTPA 的患者 218 例为观察对象，随机分为两组，对照组通过常规的检查模式进行检查。观察组根据 Donabedian 的三维质量评价理论为指导，为肺动脉 CT 血管造影患者提供安全和系统的检查模式。比较两组病人图像质量，对比剂肾病和造影剂外渗发生率。**结果** 应用结构-过程-结果质量评价模式进行质量控制的患者图像质量高于对照组，对比剂肾病发生率和造影剂渗漏发生率均低于对照组。**结论** Donabedian 的三维质量评价模式的应用通过完善环节质量标准，可有效的提高患者图像质量和护理满意度并降低不良事件发生率。

PU-3628

T1-vibe-cor 序列大动脉搏动伪影去除探究

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目的：探究 T1-vibe-cor 序列大动脉搏动伪影去除技巧
方法：以厂家推荐参数为基础（TR5.66，TE2.12），在保证其他参数不变的情况下，设置 3 套扫描参数方案。方案一，TR 保持不变，TE 以 0.2 位梯度上下各设置 5 个值；方案二，TE 保持不变，TR 以 0.5 为梯度上下各设置 5 个值；每种方案分别收集 10 例 100 组数据；得到的图像进行 A、B、C、D 四级评分；方案三，取方案一和二中，A 级图像扫描参数，收集 40 例病例。同时计算 A、B 组图像大动脉处对比噪声比，数据结果进行配对 t 检验。
结果：方案一中 A 级 55 例，B 级 20 例， C 级 20 例，D 级 5 例，方案二中 A 级 45 例，B 级 25 例，C 级 24 例，D 级 6 例。方案三中 A 级 39 例，B 级 1 例。图像大动脉处对比噪声比检验结果，t=0.053，差异无统计学意义。
结论：T1-vibe-cor 在 TR 为 4.16ms,TE1.12ms 时图像 A 级比例最大。推荐使用该参数进行图像采集，以确保图像质量。

PU-3629

595nm 脉冲染料激光治疗 120 例婴幼儿鲜红斑痣疗效及安全性评价

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目的：评估 595nm 脉冲染料激光治疗婴幼儿鲜红斑痣的疗效及安全性。**方法**：应用美国 Candela 公司生产的 595nm 脉冲染料激光治疗婴幼儿鲜红斑痣 120 例，根据患者的年龄、皮损类型等采用不同治疗参数进行激光治疗。**结果**：应用 595nm 脉冲染料激光治疗婴幼儿鲜红斑痣的总体有效率为 84.17%，其疗效与患者年龄、皮损部位、病变类型等因素关系密切，不良反应的总体发生率较低，安全性好。

PU-3630

不同 C-FLIPL 表达水平下 TIL 密度对结肠癌患者预后影响的研究

郭轶群
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目的：分析在不同 c-FLIP$_L$表达水平下 TILs 和患者总生存时间之间的关系。
材料与方法：收集在中山大学肿瘤医院就诊的 180 例经病理学证实为 IIIB 期(T3N1M0, AJCC, 第 7 版)的结肠癌患者标本。用免疫组化方法检测肿瘤组织中 c-FLIP$_L$ 的表达以及 TILs 的密度。分析 TILs 以及患者预后的关系。然后进一步分析在不同 c-FLIP$_L$ 表达水平下 TILs 和 患者预后之间的关系。**结果：**1.不考虑 C-FLIP$_L$的影响，CD8+和 CD45RO+ T 细胞的高表达与较好的 OS 相关，而 Foxp3+与较差的 OS 相关。2. 在 c-FLIP$_L$ 高表达组，CD8+ 和 CD45RO+T 细胞高表达或 Foxp3+T 细胞低表达与较短的 OS 相关；而在 c-FLIP$_L$ 低表达组，CD8+和 CD45RO+T 细胞 高表达或 Foxp3+T 低表达与较长的 OS 相关。**结论：**在某些特定的肿瘤遗传背景下，“免疫抑制”可能也发挥抗肿瘤效应。本课题的结果将为结肠癌的精准免疫治疗提供参考。

PU-3631

TILs 对 IIIB 期结肠癌患者预后的影响

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目的：分析在不同 c-FLIP$_L$表达水平下 TILs 和患者总生存时间之间的关系。
材料与方法：收集在中山大学肿瘤医院就诊的 180 例经病理学证实为 IIIB 期(T3N1M0, AJCC, 第 7 版)的结肠癌患者标本。用免疫组化方法检测肿瘤组织中 c-FLIP$_L$ 的表达以及 TILs 的密度。分析 TILs 以及患者预后的关系。然后进一步分析在不同 c-FLIP$_L$ 表达水平下 TILs 和 患者预后之间的关系。**结果：**1.不考虑 C-FLIP$_L$的影响，CD8+和 CD45RO+ T 细胞的高表达与较好的 OS 相关，而 Foxp3+与较差的 OS 相关。2. 在 c-FLIP$_L$ 高表达组，CD8+ 和 CD45RO+T 细胞高表达或 Foxp3+T 细胞低表达与较短的 OS 相关；而在 c-FLIP$_L$ 低表达组，CD8+和 CD45RO+T 细胞 高表达或 Foxp3+T 低表达与较长的 OS 相关。**结论：**在某些特定的肿瘤遗传背景下，“免疫抑制”可能也发挥抗肿瘤效应。本课题的结果将为结肠癌的精准免疫治疗提供参考。

PU-3632

比较 CAIPIRINHA-based CISS 和 CISS-3d 序列在三叉神经脑池段的图像质量

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目的：
在相同扫描参数下，比较基于可控混叠的快速并行成像（Controlled Aliasing in Parallel Imaging Results in Higher Acceleration CAIPIRINHA）加速的稳态进动快速成像序列与传统三维稳态进动快速成像序列（CISS-3D）对三叉神经脑池段成像的图像质量。
材料与方法：

对 14 例正常志愿者、40 位患有三叉神经痛患者分别采用应用基于可控混叠的快速并行成像加速的稳态进动快速成像序列（CAIPIRINHA-accelerated CISS）与传统三维稳态进动快速成像序列（CISS-3D）对三叉神经脑池段进行扫描并对两种序列的成像质量进行统计比较。比较的方法包括定性分析和定量分析，定性分析由两位大夫采用三分法对所有实验对象的核磁图像包括三叉神经节显示、周围解剖结构、伪影等方面进行独立主观评分；定量分析包括测量图像的信噪比（SNR）、对比信噪比（CNR）及三叉神经脑池段长度、宽度、角度（三叉神经脑桥角）、桥小脑角池截面积等形态学变化指标。
结果：
利用 SPSS 软件对两种序列图像的定性及定量数据进行分析，两种序列的成像质量无明显统计学差异（P<0.05）。
结论：
与传统三维稳态进动快速成像序列（CISS-3D）相比，基于可控混叠的快速并行成像加速的稳态进动快速成像序列（CAIPIRINHA-accelerated CISS）在不降低图像质量的前提下，可以显著缩短扫描时间。

PU-3633
“云胶片”时代自助打印机解决方案应用前景分析

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【摘 要】 目的 讨论自助打印机解决方案在放射科的临床应用价值及前景分析。**资料与方法** 收集我院本部和西院区自助打印机终端 21 台设备信息，其中锐科 9 台（*型号：KIOSK II 6 台*、*MyVue Center III 3 台*）、爱克发 7 台（*型号：*DRYSTAR Kiosk5503+)、科多尼克 4 台(*型号：*Codonics Kiosk-F）。分析自助打印机终端故障成本、人力成本及应用时效性与传统的人工模式、未来互联网+数字影像—云胶片解决方案对比，分析数字胶片各阶段从局部实现到全面解决的一整套的构造方案，实现与 PACS 系统并集成 HIS/RIS 系统的无缝相连以及完整的工作信息流。 **结果** 自助打印机在放射科发挥着重要的作用。自助打印解决方案实现和解决了医院放射科胶片的电子化存档及按需打印：电子胶片的统一存储和管理；规范的、数字化的工作流程提高工作效率；按需打印降低了由于弃片导致的浪费及节省大量的人力成本。**结论** 医疗机构应用互联网等信息技术拓展医疗服务空间和内容，构建覆盖诊前、诊中、诊后的线上线下一体化医疗服务模式，数字影像—云胶片是诊疗介质未来的发展方向。但现阶段从事云胶片服务的企业和单位来说，资质审核、存储时限保证的要求、数据安全和患者隐私保护等等都是待解的问题。自助打印解决方案秉承着检查技师现有工作流程和临床医生观片的习惯等一系列的优势，在一段时间内自助打印机仍发挥着不可替代的重要作用。

PU-3634
应用 3D mDIXON Quant 测量胰腺体积:单层 ROI 画取叠加容积测量技术与 3D 提取技术的比较研究

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目的：应用单层 ROI 画取叠加容积测量技术和 3D 提取技术，评价胰腺体积测量的一致性和操作时间。
材料与方法：前瞻性纳入 11 名志愿者（男 4 例，女 7 例，平均年龄 24.91±1.64 岁，年龄范围 22—27 岁，BMI 为 17.71—28.73kg/m^2，平均 BMI 为 21.75±3.35 kg/m^2）。所有患者行 3.0T 磁共振扫描仪（Ingenia CX, Best，the Netherlands）3D mDIXON Quant 序列扫描。扫描参数如下:FOV=375mm×300mm×168mm, TR=6ms，层厚及层间距=5.0mm/2.5mm,CS=2，Echo=6。应用单层 ROI 画取叠加容积测量技术和 3D 提取技术在 ISP 工作站进行胰腺体积测量。记录测量时间。数据经 SPSS 19.0 处理。用组内相关系数(ICC)检验两种技术测得数据的一致性。采用 Mann-Whitney U 检验分析两种技术测量时间的差异。
结果：两名观察者数据一致性良好，ICC 值分别为 0.880、0.908。两种技术所测得胰腺体积（cm^3）分别为 58.50±6.42、55.98 ±9.19 ，一致性良好（ICC=0.701）。两种技术测得胰腺体积所需时间分别为 8.14±0.84、5.14±0.60，差异具有统计学意义(P<0.001).
结论：两种技术所测得胰腺体积一致性良好，但 3D 提取技术的操作时间明显小于单层 ROI 画取叠加容积测量技术。因此，3D 提取技术可能更适用于胰腺体积的测量。

PU-3635

Assessment of AI-assisted lung nodule detection for long-axis diameter <4mm nodules using different reconstruction kernels

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OBJECTIVE: To evaluate the performance of AI-assisted detection of long-axis diameter <4mm lung nodules using different reconstruction kernels.
METHOD AND MATERIALS: A total of 183 patients who underwent routine chest CT examinations at Zhongshan Hospital affiliated to Dalian University from January 1, 2019 to January 31, 2019 were collected. The raw data were reconstructed with high resolution kernel (B70f) and standard kernel (B30f) to obtain DICOM images and they were transferred to the AI server (InferRead CT Lung Research, Infervision, Beijing, China) for automated nodule detection. The number of nodules, long-axis diameter and locations were recorded. One senior radiologist with more than 10 years' experience read CT images based on the initial diagnosis of another senior radiologist with similar experience and a final decision was subsequently conducted by deputy chief radiologist with more than 15 years' experience to determine the ground truth lung nodules. All readings for ground truth were performed on 1 mm slice thickness CT images with the assistance of AI software. The number of true positive nodules, false positive nodules under different reconstruction kernels were compared with the gold standard to calculate sensitivity and false positive rate. Finally, statistical analysis was conducted to compare the difference of sensitivity and false positive rate between the two reconstruction kernels.
RESULTS: A total of 984 long-axis diameter <4mm nodules were confirmed to be gold standard nodules. The number of true positive nodules in B70f group and B30f group were 792 and 662, respectively. The numbers of false positive nodules were 103, and

189, respectively. The sensitivity for lung nodule detection were 0.875±0.286 and 0.714±0.5 for B70f and B30f groups, respectively with statistically significant difference. The false positive rates were 0.56/CT and 1.03/CT, respectively for B70f and B30f groups, respectively with statistically significant difference.
Conclusion: The sensitivity for AI-assisted long-axis diameter <4mm nodules detection was higher for B70f reconstruction than B30f. And the false positive rates for AI-assisted long-axis diameter <4mm nodules detection was lower for B70f reconstruction than B30f.

PU-3636

肾脏 3D 酰胺质子转移成像：可重复性研究

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目的：评价 3D 酰胺质子转移（APT）成像技术应用于健康肾脏的可重复性
材料与方法：前瞻性招募 10 名健康志愿者（年龄 22-35 岁，平均年龄 28.7±2.15 岁；男性 5 名，女性 5 名），采用 3.0T MR 仪（Ingenia CX, Philips），使用 3D TSE 序列（TR/TE = 7300/8 ms, FOV = 180×220×42 mm^3，分辨率= 2×2.3×6 mm^3，扫描时间= 4:30）对所有志愿者的双侧肾脏进行扫描。两名放射科医师分别将圆形 ROI 置于双肾的上、中、下极的肾皮质和髓质（图 1），计算平均 APTw 值。使用组内相关系数（ICC）对两名放射科医师测量结果的一致性进行检验。
结果：两名放射科医师对受试者双肾（右肾皮质、右肾髓质、左肾皮质、左肾髓质）的非对称磁化转移率（MTRasym）（中位数(P25, P 75)）进行测量，分别为放射科医师 1：1.12 (0.18,1.54)；1.56 (0.67,2.33)；1.23 (0.63,2.39)；2.09 (1.74,3.36)；放射科医师 2：1.34 (0.17,1.97)；1.59 (0.66,2.27)； 1.39 (0.75,2.28)；1.82 (1.58,3.54)。两名放射科医师测量 MTRasym 的组内相关系数分别为 0.982、0.989、0.933、0.977（表 1）。
结论：APT 成像技术可应用于健康肾脏的不同部位的定量测量，实验具有可重复性，不同观察者之间的组内一致性良好。

PU-3637

追踪定位技术：一种保证多次波谱扫描可重复性的方法

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目的 基于图像的配准信息，提出一种自动重定位感兴趣体素（VOI）的方法，提高重定位的准确性和效率，并降低对操作者的依赖性。
方法 将医学图像的配准方法应用于磁共振波谱的研究过程中。每次采集磁共振波谱数据前，均采集一高分辨结构像。将后续扫描时的结构像与第一次扫描的结构像进行配准，获取被试的位置变动信息，计算得到波谱扫描 VOI 的定位信息，以此完成定位，得到理想位置的波谱数据。为了对定位方法进行评估，选取 20 名被试在 3T 磁共振仪上进行多次扫描，其中后续扫描分别通过手动定位和追踪定位两种方法进行重定位。我们通常用体素的重合率和波谱含量的差异系数(CV)来评价重定位方法提高波谱测量结果可重复性的效果。按照组织类型的不同对 VOI 内的脑区进行分割并记录灰白质的含量，以此计算体素重合率。分别计算 NAA、Cr、Cho、NAA/Cr 和 Cho/Cr 的 CV 值，CV 通过公

式 CV=100*SD/mean 计算出来，其中 SD 代表每组数据的标准差，mean 代表每组数据的平均值，平均 CV 作为衡量化合物含量以及含量比值的可重复性的指标。将两种定位方法所得结果进行比较。**结果** 利用追踪定位技术得到的 VOI 与初始定位的 VOI，体素内白质和灰质的重合率分别为 98%和 94%，体素内化合物含量及含量比值的差异性系数分别为 NAA 1.84±2.11, Cho 2.73±2.45, NAA/Cr 1.99±1.54, Cho/Cr 1.55±1.38，与连续两次扫描所得差异性系数接近，符合文献报道连续扫描的合理范围。

结论 本文提出的方法能够有效地提高重定位的准确率和定位效率，对于身体不灵活，不能严格配合摆位要求的病人同样适用，保证了纵向研究的可行性，同时降低了对操作者的依赖性，减少了主观性的误差。

PU-3638
侧脑室内注入脑源性神经营养因子（BDNF）对 AD 小鼠 酪氨酸激酶（TrkB）及内源性 BDNF 表达的影响

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目的 探讨侧脑室内注入脑源性神经营养因子(BDNF)对 APP/PS1 双转基因阿尔茨海默病小鼠酪氨酸激酶 B(TrkB) 及内源性 BDNF 表达的影响。

方法 10 月龄 10 只 APP/PS1 小鼠随机分为两组，一组双侧侧脑室内注入 BDNF，另一组注入 PBS，为阴性对照组，时间均为 6 周，5 只 10 月龄野生型小鼠，不予任何处理，为阳性对照组；采用荧光免疫组化法观察小鼠皮层区 Aβ 斑块形态学改变，硫磺素 S 法(Thioflavin staining)检测致密斑的数量，同时检测小鼠皮层区 TrkB、BDNF 蛋白表达的强弱。

结果 (1) 治疗前、后 BDNF 组 Aβ 斑块总数与 PBS 组相比较未见明显变化，差异均无统计学意义(t = 0.695、-0.171，P= 0.509、0.869)；治疗 6 周后 BDNF 组 Aβ 斑块体积缩小、TS+斑块数量减少，与 PBS 组相比较，差异均具有统计学意义(t = -2.401、-2.536，P= 0.047、0.039)；(2) 治疗后 BDNF 组 TrkB、BDNF 蛋白表达增强。

结论 侧脑室内注入 BDNF 减少了 Aβ 致密斑的形成，使 Aβ 蛋白沉积导致的神经毒性作用减弱，从而促进皮层区 TrkB 表达增强，导致内源性 BDNF 表达增强，在一定程度上延缓 AD 小鼠的病程。

PU-3639
CT 值与管电流、管电压的关系以及图像噪声与辐射剂量的相关性研究

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目的 探讨管电流、 管电压对图像 CT 值的影响，不同扫描条件下图像信噪比的变化、图像 CT 值的关系以及图像噪声与辐射剂量的相关性。**方法** 配制碘浓度为 0.5mg/ml~50.0mg/ml（以 0.5 mg/ml 递增）的 100 份样本。将样本按顺序装入量均为 4ml 的 100 个注射器，每 25 个为一组，将其用胶带等间隔固定在 CT 校准专用水模上。采用不同管电流（50、100、200、280 mA）及管电压（70、80、 100、 120、 140 kV），两两结合共 20 种扫描方式行轴面扫描。测量不同浓度样本在不同扫描条件下的 CT 值以及各种扫描条件下的图像噪声、信噪比和辐射剂量。采用方差分析比较不同管电流、 管电压条件下 CT 值和信噪比的差异，采用 *Pearson* 线性相关分析评价不同扫描条件下 CT

值以及图像噪声和辐射剂量的相关性，并用线性回归得到回归方程及相关系数，根据图像噪声与辐射剂量的关系曲线计算不同管电压时曲线的交汇点。 **结果** 管电流固定时，不同管电压间样本 CT 值的差异均有统计学意义（*P* 均<0.05）；管电压固定时，不同管电流间样本 CT 值的差异均无统计学意义（*P* 均>0.05）。不同扫描条件下图像 CT 值呈线性相关（R^2=0.973~0.999），并以 120KV 扫描的 CT 值为基准，得到其他管电压扫描下图像 CT 值的转化公式。不同管电压扫描下图像噪声与辐射剂量呈反比，并根据相关方程得到不同管电压下图像噪声和辐射剂量的关键点。 **结论** 管电压对图像 CT 值、信噪比有影响，可以根据图像噪声和辐射剂量的相关关键点调整管电压，以获得保证图像质量并降低辐射剂量的优化扫描方案。

PU-3640

探讨两次磁共振波谱扫描所得结果的稳定性

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目的 探讨磁共振波谱研究中两次扫描所得结果的稳定性。
方法 选取 30 名健康志愿者（9 男，21 女，年龄 21±3）分为 A、B 两组，每组 15 人，以大脑右侧前额叶作为目标脑区。利用 3.0T 磁共振成像扫描仪（Siemens MAGNETOM Trio Tim），采用点分辨波谱（PRESS）序列对每位志愿者进行两次扫描，其中 A 组在定位后进行两次连续扫描，B 组在定位后先进行一次扫描，然后将扫描床移出磁场中心，隔三分钟再进床至原来的位置，间隔期间确保被试不动，严格按照第一次的定位并扫描得到第二次的数据，利用 LCmodel 软件对采集到的脑代谢物波谱数据（NAA、Cho、NAA/Cr、Cho/Cr）进行后处理及定量分析，将两次扫描所得结果的差异性系数（CV=100*SD/mean）作为衡量两组波谱定量分析结果一致性的指标。利用各个代谢物的含量及含量比值，分别对 A、B 组内数据进行统计分析，检验干扰因素是否造成各组内两次扫描数据间的显著性差异。
结果 A 组所得大脑右侧前额叶中各个代谢物含量及含量比值的平均差异性系数（Mean CV）分别为 NAA 1.84%, Cho 2.73%, NAA/Cr 1.99%, Cho/Cr 1.55%，B 组所得各个代谢物含量及含量比值的平均差异性系数分别为 NAA 4.44%, Cho 3.06%, NAA/Cr 4.57%, Cho/Cr 2.49%。利用各个代谢物的含量及含量比值，分别对 A、B 组内数据进行配对样本 t 检验，发现对于不同代谢物及代谢物比值，除了 B 组 Cho/Cr（0.001<P<0.05）外，利用两种方法所得结果的差异性不具有统计学意义（P>0.05）。
结论 干扰因素不会影响两次扫描结果定性分析的可靠性，但会影响结果的定量计算的精确度，且间隔扫描受到更多的干扰因素的影响，精确度低于连续扫描。

PU-3641

探讨纵向研究中多次扫描所得 MRS 结果的差异性

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目的 通过两种方式分别对相同患者同一脑区进行两次扫描，探讨多次扫描所得波谱结果的差异性。
方法 选取 30 名健康志愿者（9 男，21 女，年龄 21±3）分为 A、B 两组，每组 15 人，以大脑右侧前额叶作为目标脑区。利用 3.0T 磁共振成像扫描仪（Siemens MAGNETOM Trio Tim），采用点分辨波谱（PRESS）序列对每位志愿者进行两次扫描，其中 A 组在定位后进行两次连续扫描，B 组在定

位后先进行一次扫描，然后将扫描床移出磁场中心，隔三分钟再进床至原来的位置，间隔期间确保被试不动，严格按照第一次的定位并扫描得到第二次的数据，利用 LCmodel 软件对采集到的脑代谢物波谱数据（tNAA、tCho、tNAA/tCr、tCho/tCr）进行后处理及定量分析。将两次扫描所得结果的差异性系数（CV）作为衡量两组波谱结果一致性的指标，并将 A、B 两组数据进行比较。
结果 A 组所得大脑右侧前额叶中各个代谢物含量及含量比值的平均差异性系数（Mean CV）分别为 NAA 1.84±2.11, Cho 2.73±2.45, NAA/Cr 1.99±1.54, Cho/Cr 1.55±1.38，B 组所得各个代谢物含量及含量比值的平均差异性系数分别为 NAA 4.44±2.98, Cho 3.06±2.45, NAA/Cr 4.57±2.63, Cho/Cr 2.49±1.58。配对样本 t 检验发现，对于不同代谢物及代谢物比值，除了 B 组 Cho/Cr（$P<0.05$）外，两种方法所得结果的差异性不具有统计学意义（$P>0.05$）。
结论 当扫描有一定的时间间隔时，所得同一患者的波谱数据之间一致性不如连续性扫描，代谢物的含量值浮动范围更大，说明间隔一段时间的扫描引入了更多的干扰因素，如磁场稳定性的改变、定位不精确等。在进行纵向临床研究时应考虑这些干扰因素造成的结果的差异。

PU-3642
慢性血吸虫肠病的 CT 影像表现与病理对照分析研究

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目的 回顾性分析慢性血吸虫肠病患者的 CT 表现与病理特征。
方法 共 56 例患者，男 37 例，女 19 例，平均 69.2 岁，均行腹部 CT 平扫+增强扫描,对病灶部位、形态、大小，钙化特点及强化方式进行评估；所有病例均经病理学检查证实为慢性血吸虫肠病，对其 CT 表现与病理学特点进行对照分析。
结果 CT 扫描中 56 例慢性血吸虫肠病均发生在大肠，呈广泛管壁增厚，0.3～1.2cm；43 例为较均匀增厚，占 76.8%。肠壁钙化可分为：线状钙化 42 例，轨道状钙化 19 例，斑点状钙化 8 例。钙化边界清晰。其中全结肠钙化 5 例，升结肠钙化 9 例，横结肠钙化 12 例，降结肠钙化 24 例，乙状结肠直肠钙化 34 例，直肠钙化 30 例。17 例患者管壁明显钙化。病理学证实线状、轨道状钙化为虫卵广泛沉积于黏膜下层、浆膜下层所致，8 例斑点状钙化及 17 例管壁明显钙化者，肠壁各层均可见钙化虫卵沉积，同时有结肠壁有不同程度炎性细胞浸润、肉芽肿、纤维组织增生及息肉伴钙化虫卵沉积，并发腺癌 5 例。
结论 CT 是显示慢性血吸虫肠病的重要影像学诊断方法，特征性表现为管壁较均匀增厚为主伴肠壁钙化，在此基础上出现管壁不规则增厚或伴软组织团块影，高度提示并发结直肠癌。

PU-3643
MCI 患者选择性记忆损害机制的 fMRI 研究

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目 的 人脑默认网络（DMN）与记忆密切相关，该网络可能存在负责记忆和注意功能的两个子系统。本研究利用静息态 fMRI 技术，旨在探讨 MCI 患者是否选择性损害 DMN 的记忆子系统。
方 法 33 例 AD 病人和 20 名健康老年志愿者参加实验。简易智能状态检查和 Mattis 痴呆评定量表（DRS）测试，评估受试者认知水平。采集静息态 BOLD-fMRI 数据。首先利用 rest 软件，分析两组受试者的 BOLD 信号低频振幅差异脑区，检验 MCI 患者低频振幅异常是否选择性出现在 DMN 的记忆

子系统。随后提取每个低频振幅异常区域内所有体素的 BOLD 信号平均值，计算每两个区域之间的相关系数，构建功能网络，检验 MCI 患者脑功能连接异常是否选择性出现在 DMN 的记忆子系统。
结 果 行为学结果：MMSE 平均分值，AD 组和正常对照组分别为 20.60±2.30、28.20±1.80。DRS 平均分值 AD 组和正常对照组分别为 96.00±10.82、123.22±13.74。MMSE 和 DRS 平均分值两组差别均具有统计意义。与正常对照组比较，MCI 患者低频振幅异常区域主要出现在前额叶中内侧、海马及颞叶等与记忆密切相关的 DMN 子网络：进一步的功能连接分析发现，MCI 患者功能连接降低也主要出现在 DMN 记忆子网络，而不是整个 DMN 网络。
结 论 本研究表明 MCI 患者选择性损害了人脑默认网络（DMN）的记忆子系统，而不是整个网络。这对深刻认识 DMN 的功能，阐明 MCI 记忆障碍脑机制，探讨早期诊断和治疗 MCI 的可能效方法具有重要意义。

PU-3644

阿尔茨海默病人大脑功能网络效率变化

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目 的 人脑网络具有小世界属性，网络效率反应网络内部的信息传递效应。本研究采用图论方法，探讨阿尔茨海默病对大脑功能网络的效率的影响。
方 法 33 例 AD 病人和 20 名健康老年志愿者参加实验。简易智能状态检查和 Mattis 痴呆评定量表（DRS）测试、评估受试者认知水平。采集静息态 BOLD-fMRI 数据，利用解剖学自动标记模板将大脑分成 90 个区域，提取每个区域内所有体素的 BOLD 信号平均值，计算每两个区域之间的相关系数，构建功能网络。利用图论方法，检验两组人群脑功能网络的小世界属性，并计算网络的效率。通过双样本 t 检验，对比研究 AD 病人脑网络效率的特征性变化。
结 果 行为学结果：AD 组 MMSE 和 DRS 平均分值均显著低于正常对照组($p<0.01$)。两组受试者的小世界性检验：以连接矩阵的稀疏度（Sparsity）为阈值，在 0.1~0.4 范围内，发现两组受试者的全局效率低于相应的随机网络，高于规则网络；局部效率高于随机网络，低于规则网络，都具有小世界属性。与对照组比较，AD 病人全局效率显著降低，局部效率显著增高，两者差别均具有统计意义($p<0.05$)。
结 论 AD 病人的大脑功能网络仍具有小世界属性，但网络的全局效率显著降低，局部效率显著增高，提示 AD 病人脑功能网络的信息传递能力和效率受损。该发现对从网络角度研究 AD 病理机制具有重要意义。

PU-3645

正常老年人大脑功能网络的小世界性

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目的 利用静息态 BOLD-fMRI 探讨正常老年人脑功能网络是否具有小世界性。
方法 20 名健康老年志愿者纳入研究。采集静息态 BOLD-fMRI 数据。应用 SPM 5 软件进行数据预处理，利用解剖学自动标记模板将大脑分成 90 个区域，提取每个区域内所有体素的时间序列平均值，计算每 2 个区域之间的 Pearson 相关系数，构建 N×N(N=90)的相关性矩阵 R，并对矩阵进行 Fisher r to z 变换。采用直接定义阈值 T 和设定矩阵稀疏度两种方法确定阈值，根据小世界性的

定义：当γ＝Cp/Crand＞1，且λ＝Lp/Lrand≈1 时（γ和λ分别表示是由 c 和 p 确定的两个小世界参数，不需要特别说明，C 为平均聚类系数，L 为平均路径长度，下标 p 表示规则网络，下标 rand 表示随机网络），认为该网络具有小世界性。

结果 在直接定义阈值 T 条件下，γ值为 1.3157±0.3572（1.0005～2.1882），λ值为 1.0149±0.0226（1.0000～1.0796）；在设定矩阵稀疏度条件下，γ值为 1.3299±0.2330（1.0759～1.9574），λ值为 1.0152±0.0190（1.0001～1.0679）。两种方法均表明该网络具有小世界性。

结论 正常老年人脑功能网络具有小世界性。

PU-3646

X 线球管投照角度在 HSG 检查中的应用价值

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近年来临床上不孕症的发病率不断增加，不孕症的诸多病因中子宫输卵管性不孕约占 45%。近几年子宫输卵管造影检查技术被广泛应用于不孕症的检查中。

目的：本研究通过改变 X 线球管投照角度，纠正因子宫前倾前屈或后屈引起的宫颈和宫体相互重叠引起的短缩问题，更好的观察子宫及输卵管真实全貌，以便给临床提供更准确的子宫及输卵管信息，为临床诊断和治疗提供可靠依据。

方法：收集山西医科大学第一医院放射科 2018.7.10~2019.2.10 因不孕症行 HSG 检查患者的影像学图像 1678 例，剔除其中各种畸形子宫 42 例，选择子宫呈倒三角形的 1636 例入组。

选择月经干净 3~7 d 内的不孕症患者，在 X 线检查床上取截石位常规消毒外阴、阴道、宫颈，插入子宫输卵管造影管至宫腔内，囊内注入 3~5 mL 空气，轻拉导管确定气囊在子宫腔内并堵住宫颈口，向导管内缓慢注入 76%复方泛影葡胺，观察子宫及输卵管通畅情况，仰卧位，球管垂直于检查床拍摄第一张 X 线片;根据子宫及输卵管的显影情况，向头或足侧倾斜球管,拍摄第二张 X 线片。

以观察到对称的倒三角形为摄片满意，采用配对 χ2 检验，分别计数两次摄片满意的数量。

结果：收集的 1636 例患者中，第一张 X 线片即摄片满意者有 778 例，子宫形态显示率为 47.56%，第二张 X 线片摄片满意者增加至 1588 例，子宫形态显示率为 97.07%，余 48 例因子宫过度屈曲以及球管变换角度有限，并且球管只能沿着一条轴线摆动，未能显示真正子宫形态。对两组子宫形态显示率进行 χ2 检验，差异具有统计学意义，P＜0.05。

结论：子宫输卵管造影检查中子宫形态显示率在适当改变球管角度后得到显著提高，适当调整球管角度可避免因子宫正常解剖结构引起的重叠短缩问题，在进行 HCG 检查中具有重要的应用价值。

PU-3647

浅谈儿童辐射的防护管理

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重申儿童 X 线检查中防护的重要性，并倡导对儿童进行高效及规范性放射防护措施，达到放射检查目的，同时实现低剂量高水平的摄片要求，降低放射检查过程中的辐射危害。常规的 X 线检查，对儿科疾病诊治起着越来越重要的作用，对于儿童辐射的防护管理就显得尤为重要。对患儿进行有

效地防护，对提高其后的生活质量有着非常重要的作用。分析放射损伤对儿童的危害，做到有效防护，医院放射科应提高重视程度，努力完善防护管理。

PU-3648

LCmodel 软件与 Spectroscopy 软件在 MRS 数据分析中的结果对比

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目的 利用 LCmodel 软件与 Spectroscopy 软件对同一组数据进行分析处理，比较两个软件的处理结果。

方法 选用健康志愿者 15 名（4 男，11 女，年龄 22±2 岁），以大脑右侧前额叶作为目标脑区。利用 3.0T 磁共振成像扫描仪（Siemens MAGNETOM Trio Tim），在每次定位后，采用点分辨波谱（PRESS）序列对志愿者连续扫描两次。利用 Spectroscopy 软件计算 NAA、Cho、NAA/Cr、Cho/Cr 的值，并利用 LCmodel 软件处理后获得 tNAA、tCho 相对含量值及以 tCr 为参照物的相对含量的比值 tNAA/tCr、tCho/tCr，并将两种软件的分析结果进行比较。研究假设在完全相同的条件下，连续的两次扫描所得代谢物含量及代谢物含量比值应该是恒定不变的，因此本研究将两次扫描所得结果的差异性系数（CV）作为衡量两种软件数据分析的准确性的指标。

结果 对于连续两次扫描的大脑右侧前额叶中，Spectroscopy 软件计算所得各代谢物含量的平均差异性系数（Mean CV）分别为 NAA 1.68±1.21, Cho 2.21±2.11, NAA/Cr 2.36±1.60, Cho/Cr 3.36±2.52，LCmodel 软件所得各代谢物含量的平均差异性系数分别为 NAA 1.84±2.11, Cho 2.73±2.45, NAA/Cr 1.99±1.54, Cho/Cr 1.55±1.38。将两种软件的分析结果进行配对样本 t 检验，发现对于不同代谢物及代谢物比值，利用两种方法所得结果的差异性不具有统计学意义（P>0.05）。

结论 两种分析软件都能对波谱数据进行准确的分析，分析结果没有显著差异，表明在没有 LCmodel 的情况下，系统自带 Spectroscopy 软件仍能满足需求。系统自带软件对单个化合物含量的分析较 LCmodel 软件精确度略高，而对化合物含量比值的分析则 LCmodel 软件更具优势。

PU-3649

软件 LCModel 与 Spectroscopy 对 MRS 数据的后处理技术比较

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目的 比较软件 LCModel 与 Spectroscopy 对 MRS 代谢物含量估计的稳定性和准确性。

方法 选用健康志愿者 15 名（4 男，11 女，年龄 22±2 岁），以大脑右侧前额叶作为目标脑区。利用 3.0T 磁共振成像扫描仪（Siemens MAGNETOM Trio Tim），在每次定位后，采用点分辨波谱（PRESS）序列对志愿者连续扫描两次。利用 Spectroscopy 软件计算 NAA、Cho 波峰下面积的积分值，求出 NAA/Cr、Cho/Cr 的值，并利用 LCModel 软件处理后获得 NAA、Cho 相对含量值及以 Cr 为参照物的相对含量的比值 NAA/Cr、Cho/Cr。分别将两种软件计算的代谢物含量比值与文献参考值进行比较，然后分别对每种软件计算的两次扫描数据进行比较，以差异性系数（CV=100*SD/mean）作为衡量两种软件数据分析稳定性的指标。

结果 对于连续两次扫描的大脑右侧前额叶中，LCModel 软件所得波谱数据基线较 Spectroscopy 软件所得波谱数据的基线更平稳，各代谢物峰清晰。LCModel 与 Spectroscopy 测得的代谢物含量比值 NAA/Cr 分别为 1.8±0.2, 1.9±0.7，文献参考值为 1.6±0.2，LCModel 结果更为接近；比值 Cho/Cr 分别为 0.3±0.03, 1.1±0.41，文献参考值为 0.9±0.2，Spectroscopy 结果更为接近。配

对样本 t 检验发现，对于不同代谢物及其比值，两种软件两次扫描所得结果的差异均不具有统计学意义（P>0.05）。
结论 两种软件对 MRS 代谢物含量的估计均有较高的稳定性。但 LCModel 有相对较好的处理基线不稳的能力，在实际临床应用中更具前景。

PU-3650

探讨多次重复扫描中 MRS 的可重复性

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目的 通过两种方式对被试同一脑区进行两次重复扫描，探讨重复扫描所得波谱结果的可重复性。
方法 选取 30 名健康志愿者（9 男，21 女，年龄 21±3）分为 A、B 两组，每组 15 人，以大脑右侧前额叶作为目标脑区。利用 3.0T 磁共振成像扫描仪（Siemens MAGNETOM Trio Tim），采用点分辨波谱（PRESS）序列对每位志愿者进行两次扫描，其中 A 组在定位后进行两次连续扫描，B 组在定位后先进行一次扫描，然后将扫描床移出磁场中心，隔三分钟再进床至原来的位置，间隔期间确保被试不动，严格按照第一次的定位并扫描得到第二次的数据，利用 LCmodel 软件对采集到的脑代谢物波谱数据（tNAA、tCho、tNAA/tCr、tCho/tCr）进行后处理及定量分析。将两次扫描所得结果的差异性系数（CV）作为衡量两组波谱结果可重复性的指标，并将 A、B 两组数据进行比较。
结果 A 组所得大脑右侧前额叶中各个代谢物含量及含量比值的平均差异性系数（Mean CV）分别为 NAA 1.84±2.11, Cho 2.73±2.45, NAA/Cr 1.99±1.54, Cho/Cr 1.55±1.38，B 组所得各个代谢物含量及含量比值的平均差异性系数分别为 NAA 4.44±2.98, Cho 3.06±2.45, NAA/Cr 4.57±2.63, Cho/Cr 2.49±1.58。配对样本 t 检验发现，对于不同代谢物及代谢物比值，除了 B 组 Cho/Cr（P<0.05）外，两种方法所得结果的差异性不具有统计学意义（P>0.05）。
结论 结果提示多次重复扫描所得代谢物分析结果的变化不完全代表被试真实生理状态的改变，并且具有时间间隔的重复扫描会受到更多因素的干扰，在进行长期的跟踪研究时应将这种结果的差异性考虑进去。

PU-3651

CT 增强扫描知情同意告知主体的研究

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[**摘要**] **目的** 探讨在临床医生与 CT 室护士中，谁更适合给患者进行 CT 增强扫描知情同意告知。**方法** 选择临床医生与 CT 室护士进行知情告知的两个月份作为研究对象，对比两个时间段知情告知内涵与患者检查时感受等指标，探讨不同知情告知主体在告知过程中的差异。**结果** 由临床医生进行知情告知后，临床医生对知情同意书的知晓度更高、知情同意退费率下降、患者检查折返率下降、患者恐惧心理减少，CT 室工作效率提高。**结论** 临床医生比 CT 室护士可能更适合进行 CT 增强扫描知情同意。

PU-3652

CT 检查在儿童急性颅脑外伤中的应用

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目的 探讨 CT 检查对儿童急性颅脑外伤的诊断价值及应用中的相关问题。 方法 回顾性分析 80 例患童急性颅脑外伤的 CT 检查结果。结果 按 CT 检查结果损伤部位分三大类。单纯头皮血肿：共 19 例，占 23.75%。颅骨损伤：共 32 例，占 40.00%。颅内损伤：共 29 例，占 36.25%。 结论 儿童急性颅脑损伤首选 CI 检查；颅脑损伤的抢救和诊治，应选择 CT 检查配合；由于 CT 有一定的辐射副作用，对于仅有皮外伤、无任何临床症状、体征无任何变化的可暂不作 CT 检查；CT 检查是儿童急性颅脑损伤的首选检查方法，但不应作为常规检查方法；可以在儿童颅脑检查中采用低剂量扫描模式，减轻对儿童造成的损伤。

PU-3653

放射科含碘非离子对比剂静脉外渗管理的证据应用

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目的 探讨基于最佳证据的放射科碘对比剂静脉外渗管理的干预方法并评价其效果。**方法** 应用循证护理的方法得出证据并将证据本土化后应用于临床，制定放射科碘对比剂静脉外渗管理的审查标准，规范护理人员的临床行为；采用线上线下的培训方式，对护理人员进行最佳证据的培训，比较应用最佳证据前后放射科碘对比剂静脉外渗的发生率，培训前后护理人员对最佳证据的知晓情况及执行情况。**结果** 最佳证据应用后，放射科碘对比剂静脉外渗的发生率由 1.01%下降至 0.41%；应用前后高危患者取消检查率从 0.0.8%提高至 1.75%；临床护士对碘对比剂静脉外渗的识别与评估、碘对比剂静脉外渗的相关因素分析、碘对比剂静脉外渗的处理等方面有所提高，差异有统计学意义（$P<0.05$）；临床护士对碘对比剂静脉外渗最佳证据的执行率大于 85%。**结论** 护理人员通过应用最佳证据，以科学的护理方法解决碘对比剂静脉外渗的问题，可提升护理质量。

PU-3654

含碘对比剂静脉外渗风险因素 logistics 回归分析

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目的 分析含碘对比剂静脉外渗的风险因素，为临床预防和管理提供可靠的参考依据。**方法** 回顾性收集 2017 年 5—7 月在我院放射科接受 CT 增强检查的门诊和住院患者 5837 例，发生了明显的对比剂静脉外渗的患者为外渗组，未发生对比剂静脉外渗的为非外渗组，通过医院信息中心数据库提取相关信息，比较两组患者一般情况、患者疾病情况、注射信息和注射护士情况，并对收集的因素进行非条件 logistic 回归分析。**结果** 两组患者年龄、性别、体质指数、手术史、化疗治疗史、放疗治疗史等因素差异均无统计学意义（P 均>0.05）。两组患者的年龄划分的比较，差异有统计学意义（P<0.05）。两组患者对比剂注射情况的比较，对比剂的品牌、患者穿刺部位、注射速率、造影剂剂量、盐水量等差异均无统计学意义（P 均>0.05）。留置针规格、患者血管评估之间差异有统计学意义（P<0.05）。logistic 回归分析显示，年龄划分（中年，OR=0.152，

95%*CI*：0.040～0.576）为发生外渗的保护因素；有手术史（OR=3.514，95%*CI*：1.026～12.034），血管评估（差，OR=13.039，95%*CI*：1.399～121.483），留置针规格（24G，OR=9.170，95%*CI*：1.474～57.047），为发生外渗的危险因素。**结论** 患者年龄、自身静脉条件、留置针的粗细、手术史均可成为对比剂静脉外渗发生的风险因素。

PU-3655

MRI 增强扫描后致钆沉积病个案报道及文献复习

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摘要：目的 报道 1 例 MRI 增强扫描静注钆对比剂（GBCA）后所致疾病的临床资料。方法 对 1 例 MRI 增强扫描静注钆对比剂后出现全身不适症状的患者的接触史、临床表现、辅助检查、诊断、鉴别诊断及治疗进行总结。结果 患者接触 GBCA 后约 6 小时后开始出现手、面部发麻，后逐渐表现为全身不适，临床症状主要表现为头痛，后出现内脏器官灼痛；手、面部发麻，颈部皮肤紧缩感等；接触 GBCA 5 个月后查 24h 尿钆为 0.097ug/g 肌酐，高于美国标准（≤0.019ug/g 肌酐）5 倍。参考相关文献，临床诊断为钆沉积病。治疗上予依地酸钠钙 1g qd 静滴驱钆治疗，驱 3d 停 4d 为一疗程，共驱三个疗程。结论 应加强对钆沉积病的认识，争取做到早期诊断及早期治疗。

PU-3656

儿童核磁共振检查的护理对策

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目的: 探讨儿童核磁共振检查中的护理配合，以提高儿童检查核磁共振的检查质量，提高正确诊断率。方法:收集我院 2017 年 7 月至 2019 年 3 月 156 例做 MRI 各部位检查的患者，所有患儿均进行心理护理、药物护理、特殊护理。结果: 经过心理护理、药物护理、特殊护理，145 例患儿均成功做完检查，图像清晰、无伪影、病灶显示清晰、图像优良。11 例患儿因特殊原因未完成检查。结论:加强心理护理、药物护理、特殊护理可以有效减少患儿的不良心理反应，能够使患儿积极配合完成检查,提高了图像的质量，为临床医生快速做出诊断提供依据。

PU-3657

多层螺旋 CT 图像常见伪影的影响因素与解决方案

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目的:探讨多层螺旋 CT 成像过程中常见伪影的影响因素与解决方案,提高图像质量,获取优质的 CT 影像。
方法:选取 139 例患者 64 层螺旋 CT 扫描后的影像资料,其中头部伪影 38 例、胸部伪影 53 例、腹部伪影 29 例以及盆腔伪影 19 例,对 CT 图像伪影的形态和成因逐一进行分析。
结果:头部伪影包括:射线束硬化伪影 24 例、探测器故障伪影 1 例、斑马样伪影 2 例、运动伪影 1 例、金属伪影 10 例;胸部伪影包括:射线束硬化伪影 8 例、部分容积效应伪影 9 例、光子不足伪影

9 例、欠采样伪影 1 例、散射伪影 3 例、运动伪影 21 例、金属伪影 1 例、投影数据不完全伪影 1 例;腹部伪影包括:部分容积效应伪影 10 例、散射伪影 5 例、运动伪影 4 例、金属伪影 10 例;盆腔伪影包括:光子不足伪影 5 例、金属伪影 14 例。分析产生伪影的原因,主要为设备固有因素与检查技术因素两类;提出相应解决方案。
结论:多层螺旋 CT 图像的伪影与设备固有及成像检查技术的诸多因素有关,优化扫描技术参数,可有效消除、抑制或避免图像伪影,获得优质图像。

PU-3658
新一代基于模型不同迭代重建技术对腹部 CT 图像质量的影响

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目的：探讨基于模型的迭代重建（MBIR）的 STND 和 NR40 重建方法对常规薄层腹部 CT 图像质量的影响。
方法：采用 GE Discovery CT 750HD 对 20 例患者进行腹部常规剂量 CT 扫描。分别采用常规迭代 40%ASiR 重建和 MBIR 的 STND 和 NR40 重建技术对原始数据进行 0.625mm 薄层重建，并应用后处理台对图像进行质量评价分析。测量比较肝脏、脾脏、髂腰肌、皮下脂肪等实质脏器的噪声值（SD）、信噪比(SNR)、和对比噪声比(CNR)。重建薄层图像的主观评价由 2 名有经验的影像医师采用盲法评价，从图像的清晰度、锐利度、病灶细节显示和病灶或脏器内部的异质性四个方面按 5 分法（1－5 分）进行主观独立评分。
结果：以肝脏为主要研究对象，常规迭代 40%ASiR 和 MBIR 的 STND 和 NR40 重建三组图像的肝脏噪声分别为 17.08±2.58、9.77±1.06 和 5.78±1.13（P＜0.001）。STND 和 NR40 重建组图像噪声分别较 40%ASiR 组降低 41.9%和 65.3%，40%ASiR、STND 和 NR40 三组图像的肝脏组织的 CNR 分别为 12.60±2.66、18.32±3.42 和 32.90±4.74，STND 和 NR40 重建组图像 CNR 分别较 40%ASiR 组提 49.9%和 170%（P＜0.001）。40%ASiR、STND 和 NR40 三组重建图像肝脏组织的 SNR 分别为 5.19±1.03，7.59±1.53 和 13.58±2.43。STND 和 NR40 组图像 SNR 分别较 40%ASiR 组提高 49.9%和 169%（P＜0.001）。三组重建图像的主观评分分别为：3.73±0.45、4.63±0.49 和 4.80±0.41。
结论：与常规 40%ASiR 重建算法比较，在相同剂量条件下，MBIR 的 STND 和 NR40 重建能显著降低图像噪声,提高图像质量；其中 NR40 重建算法降噪及提高图像质量效果更为显著。

PU-3659
钆对比剂不良反应的预防及处置体会

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目的：回顾性分析我院磁共振检查中钆对比剂不良反应的发生情况，探讨有效的预防及处置方法。
方法：回顾分析我院 2017-2019 年钆对比剂的使用情况，共 115937 例，其中过敏反应共 156 例，汇总分析其病例资料和处置措施。
结果：钆对比剂不良反应发生率极低，不足 0.13%，其中轻度反应 128（82%）例，中度 27（17%）例，重度 1（1%）例。经过吸氧、静卧、注射地塞米松、肾上腺素等处置措施，患者情况均痊愈。
结论：钆对比剂检查前患者宣教、签署知情同意、告知不良反应可能性，检查中密切关注患者情况，检查后保留静脉通道、继续观察 30 分钟，及时发现患者出现的可疑过敏反应，高效的抢救处置流程，能够减轻对比剂过敏反应造成的后果。

PU-3660
64 排 CT 下肢血管成像在糖尿病引起的下肢血管病变中的应用

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摘要 目的 探讨 64 排 CT 下肢血管成像在糖尿病引起的下肢血管病变中的应用价值。
方法 29 例糖尿病临床疑诊下肢血管病变的患者，采用 Philips64 排 CT 机行螺旋 CT 下肢动静脉增强扫描，患者仰卧，右肘静脉穿刺埋置放置 18G 的套针管，连接高压注射器，扫描范围 L3 至足，对比剂用量 120ml，注射速率 4ml，固定双下肢，监测腹主动脉自动触发扫描，完成动脉增强扫描后延迟约 70s 开始静脉扫描，从 L3 至足扫一期，随后从足至膝扫一期，既保证大腿静脉显影同时也提高了小腿静脉的显影，根据原始图像利用工作站进行多模式成像分析。
结果 29 例双下肢动静显影良好，下肢血管正常 4 例，下肢血管硬化狭窄 20 例，血管微血栓形成后闭塞 5 例。
结论 64 排 CT 下肢血管成像结合工作站多模式成像分析可以全貌显示下肢血管，狭窄的位置、程度，血栓的位置、范围，为临床选择正确的治疗方法提供可靠的客观依据，具有一定的临床应用价值。

PU-3661
讨论 multivane 技术对肩关节 MR 扫描中的应用

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目的：探讨 multivane 技术（简称 MV 技术）在减少及消除肩关节运动伪影及提升图像质量的作用 。
方法：对 53 例在肩关节 MR 扫描中无法配合的患者行 3.0T MRI 常规 TSE T2WI 扫描后加扫 MV TSE T2WI 序列 。 扫描后的图像由两位诊断医师对运动伪影、肌肉组织边缘、血管搏动伪影和图像的总体质量进行 5 个等级的评分。常规扫描图像与相同方位的 multivane 序列图像之间的对比使用 Wilcoxon 秩和检验 。
结果：常规 TSE T2WI 扫描序列中 5 例因严重运动伪影无法用于诊断 ，而 MV TSE T2WI 序列图像运动伪影明显降低 ，评分范围 3 ~4，平均值 3.74 ；肩关节 MR multivane 扫描能显著降低运动伪影及血管搏动伪影（均 P< 0.05） ，等级评分均在 3 级及以上 ；图像质量有显著提高 ，总体评分在 3 级及以上（P<0.05） ；肩关节肌肉边缘更加清晰 、锐利 。
结论：与肩关节常规 TSE T2WI 相比 ，multivane 技术能显著降低肩关节的运动及血管搏动伪影 ，提高图像总体质量，为临床提供更优质的诊断图像 。

PU-3662
自适应滤波联合迭代重建技术改善双上肢不能上举的急重症患者胸腹部 CT 伪影的可行性研究

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目的：分析自适应滤波(Adaptive Filter, AF)联合迭代重建减轻双上肢不能上举的急重症患者胸腹部 CT 成像伪影的可行性。**方法：**采用联影 128 层 UIH uCT760 螺旋 CT，对双上肢不能上举急重症成人患者行胸腹部 CT 扫描，其中胸腹连扫 11 例，胸部 49 例，腹部 49 例，BMI18-24。扫描参数胸部：100kV，80mAs，腹部：100kV，200mAs，管电流自动调制，球管转速 0.5s/r，螺距 0.938。将同一患者原始数据行四种方法重建：（1）A 组 AF 联合迭代（KARL 3D）重建；（2）B 组 AF 重建；（3）C 组迭代重建；（4）D 组无 AF 及迭代重建。四组图像质量行主观评分、客观指标、病灶形态特征（边缘、密度）显示效果对比：主观评分 5 分法（1 分伪影最大，5 分最小）；测量肺组织、降主动脉、肝脏、脾脏、胰腺、腹主动脉 CT 值、噪声（SD），计算 SNR、CNR。**结果：**（1）图像质量主观评分，胸腹部差异均有统计学意义（P<0.05），A>B>C>D，A 组伪影最小，B、C 次之，D 组最差。（2）图像质量客观指标，胸部四组图像 CT 值差异无统计学意义（P>0.05）；SD 值肺实质差异有统计学意义（P<0.05），A<B=C=D，降主动脉差异有统计学意义（P<0.05），A<B<C<D，A 组噪声最小；腹部 SNR 值差异有统计学意义（P<0.05），肝脏、胰腺、腹主动脉均为 A 组>B 组=C 组>D 组，脾脏 A 组>B 组>C 组>D 组，A 组 SNR 最高。肝脏、脾脏、胰腺、腹主动脉 CNR 值，差异均无统计学意义（P>0.05）。（3）胸部发现病灶 55 个，27 个位于 D 组伪影区，在 ABC 三组中分别有 26、24、6 个得到改善；腹部部发现病灶 53 个，38 个位于 D 组伪影区，在 ABC 三组中有 34、24、1 个得到改善。**结论：**急诊无法配合体位双上肢上举的患者行胸腹部 CT 检查时，采用 AF 联合迭代重建能有效减少伪影，提高图像质量。

PU-3663
基于体重优化 CT 扫描条件对 PET/CT 成像的 CT 辐射剂量与图像质量的影响研究

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目的 探讨 PET/CT 成像中优化 CT 扫描条件对检查辐射剂量和图像质量的影响。
方法 收集 60 例接受 18 F-FDGPET/CT 检查的肿瘤患者,其中体重≤60 kg 和>60 kg 患者各 30 例,并分为两组:CT 常规条件组 30 例及 CT 优化条件组 30 例。两组检查前准备方法相同。测量两组患者 PET 有效剂量(ED18 F-FDG)与 CT 辐射剂量。CT 辐射剂量为剂量长度乘积（Dose LengthProduct,DLP）和 CT 容积剂量指数（CT Volume Dose Index,CTDIvol）,计算图像对比度噪声比（Contrast Noise Ratio,CNR）,采用视觉特征分级评分法对两组图像质量进行 5 级评分。
结果 与常规组比较,优化组有效剂量指标 DLP 和 CTDIvol 显著降低（P<0.05）,ED18 F-FDG 和 CNR 差异未见统计学意义（P>0.05）。两组图像质量均满足诊断要求,图像质量平均得分差异未见统计学意义（P>0.05）,图像质量评分等级分布差异未见统计学意义（P>0.05）。
结论 基于体重优化 CT 扫描条件能够降低 PET/CT 中 CT 辐射剂量,且并不降低图像质量。

PU-3664
基于新模型迭代算法 Asir-V 在 70kVp 超低剂量成人副鼻窦 CT 扫描中的探究

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目的：探讨超低剂量 70Kvp 在成人副鼻窦 CT 检查联合新模型迭代算法 Asir-V 获取最佳图像质量 Asir-V 权重。**材料与方法：**前瞻性收集 Revolution CT 副鼻窦检查成人患者 20 例，采用超低计量 70Kvp 进行螺旋扫描。每例均对原始数据进行后置 Pos-Asir-V 算法不同权重重建（0%，20%，40%，60%，80%，100%）、共 120 组图像、对每例 6 组图像进行客观评价；同时由 2 名高年资医师采用双盲法以 Likert 5 分法进行主观评分。**结果：**客观评价：Revolution CT 超低剂量 70Kvp 扫描有效辐射剂量 ED、较常规扫描有效辐射剂量明显减少；不同权重 Pos-Asir-V 图像 SD 值评分随着 Asir-V 权重的提升而降低，CNR 值随着 Asir-V 权重的提升而升高；主观评价： Asir-V80％图像质量最佳。**结论：**超低剂量 70Kvp 在成人副鼻窦 CT 检查联合多模型迭代算法既可满足临床诊断，也可明显降低有效降低辐射剂量。

PU-3665

PET/CT 显像常见伪影及质量控制

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目的 分析 PET/CT 检查常见伪影,探讨相应的质控措施,以减少误诊,提高诊断率。
方法 选取 2015 年 1 月至 2018 年 1 月期间有伪影影响的 97 例全身 PET/CT 图像,统计分析 PET/CT 显像的常见伪影,并探讨相应的质控措施。
结果 97 例有伪影的图像中设备伪影 1 例,运动伪影 24 例,金属异物伪影 16 例,截断伪影 12 例,示踪剂因素伪影 11 例,生理性摄取及 18F-FDG 的非特异性伪影 33 例。
结论 掌握 PET/CT 显像的常见伪影,及时采取有效的质控措施,减少或避免干扰因素,是获得高质量 PET/CT 图像的重要保证。

PU-3666

基于压缩感知技术的盆腔三维 T2W 图像曲线重建测量子宫内膜厚度的初步研究

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目的：探讨三维 T2W 图像曲线重建测量子宫内膜厚度的可行性。**材料与方法：**招募了 17 名年轻健康女性志愿者（年龄 23-29 岁，平均年龄 25.24±1.68 岁），所有志愿者在 3.0 T 磁共振扫描仪（Ingenia CX，Philips Healthcare，Best，The Netherlands）进行上腹部 MRI 检查。采用压缩感知（compressed SENSE, CS）技术进行三维 TSE 盆腔图像序列以获取子宫的 T2 加权图像。扫描参数：CS 加速因子 5，采集时间 155 秒，FOV 350mm×404mm×120mm，分辨率 1.1mm×1.1mm×2 mm。在 Intellispace Portal 7.0（ISP, Philips Healthcare, The Netherlands）工作站，在矢状面 T2W 图像上使用曲线重建功能沿着子宫内膜绘制曲线。子宫内膜厚度由两名放射科医生单独测量。记录身高、体重、从检查时间到末次月经开始的时间（$time_b$）和从检查时间到末次月经结束

的时间（$time_e$），并计算体质量指数（BMI）。使用类内相关系数（ICC）检验两位放射科医生测量值之间的一致性。使用 Spearman 相关分析检验子宫内膜厚度与身高、体重、体质量指数、$time_b$ 和 $time_e$ 之间的相关性。采用多元线性回归建立回归模型。**结果：**两名观察者测量子宫内膜厚度的一致性良好（ICC ＞ 0.995）。子宫内膜厚度与 $time_b$ 和 $time_e$ 呈强相关（p=0.001），相关系数分别为 0.750 和 0.748。与身高、体重、体重指数无关（P>0.05）。多元线性回归发现子宫内膜厚度与 $time_b$ 和 $time_e$ 呈良好的线性相关，厚度=2.655+0.596×$time_b$-0.379×$time_e$，r=0.797。**结论：**三维 T2W 图像曲线重建测量子宫内膜厚度是可行的。

PU-3667
前瞻性、多中心、个体内比较加乐显和马根维显在腹部增强 MRA 扫描的应用价值

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目的：前瞻性、多中心、个体内比较加乐显和马根维显在腹部增强 MRA 的应用价值。
方法：本研究为前瞻性、多中心、个体内比较的试验。本研究获得伦理委员会同意。纳入 2014 年 12 月至 2015 年 12 月间同时行加乐显和马根维显增强 MRA 的健康志愿者。每位志愿者两次 MRA 检查间隔 3-5 天。三个中心 MRA 成像均在 Siemens Avanto 1.5T 完成。两名影像诊断医师盲法分析图像。采用三分类方法对 MRA 大血管、小血管和微小血管图像进行定性分析。采用信噪比和对比信噪比对大血管图像进行定量分析。采用秩和检验进行定性和定量数据的比较。两位观察者主观评分一致性分析采用 Kappa 检验。
结果：本研究最终纳入 40 例健康志愿者。40 例志愿者加乐显增强 MRA 大、中、小血管图像的定性分析结果分别是 20.98+2.11, 6.03+1.03, 3.41+1.18。40 例志愿者加乐显增强 MRA 大、中、小血管图像的定性分析结果分别是 20.01+2.18, 5.28+1.67, 2.61+1.40。秩和检验显示在小血管和细小血管定性分析方面，加乐显优于马根维显且差异具有统计学意义。对于大血管定性分析和定量分析，两组数据差异无统计学意义。两位阅片者之间定性分析一致性检验 Kappa 值 0.832，提示一致性高。
结论：本研究发现在腹部增强 MRA 成像中加乐显和马根维显均可良好显示腹部血管情况，其中加乐显在小血管和细小血管定性显示优于马根维显。

PU-3668
通过能谱 CT 提高低剂量胸部 CT 成像质量的胸部体模研究

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目的：探讨能谱成像在低剂量胸部 CT 中的可行性及临床应用。**方法：**使用 GE Discovery CT750HU 对胸部体模进行能谱 CT 扫描。常规剂量组扫描参数为管电压 100kVp，自动管电流调制，噪声指数

为 10HU，采用反滤波投影法（FBP）进行图像重建。低剂量组扫描参数为管电压 120 kVp，自动管电流调制，噪声指数为 12HU，GSI-49 扫描协议。能谱扫描后可以得到重建从 40keV 到 140keV（具有 10keV 间隔）11 组图像。测量肺实质、主动脉、背部肌肉和骨骼的 CT 值和标准差（SD）。计算脏器的信噪比（SNR = $CT_{主动脉}$ / $SD_{肌肉}$）和对比噪声比（CNR =（$CT_{主动脉}$-$SD_{肌肉}$）/ $SD_{肌肉}$）。记录两组的 CT 剂量容积指数（CTDIvol）、剂量长度乘积（DLP），并计算有效剂量（ED = k×DLP，k = 0.017）。单因素方差分析用于分析两组之间 SD、SNR 和 CNR 的差异，P <0.05 具有统计学意义。两组间图像主观评分由两名经验丰富的医生使用 5 盲法进行评分，并通过 Kappa 检验比较评分的一致性。**结果：**与常规剂量组相比，使用 GSI 后，平均 ED 降低约 50%。在 40keV 单能量图像上，两位医生观察肺窗的主观评分分别为 5.00±0.00 和 5.00±0.00，均高于常规剂量组的 4.66±0.57，差异有统计学意义（P <0.05）。在 100keV 单能量图像上，两位医生观察纵隔窗的主观评分分别为（4.66±0.57）和（4.66±0.57），均与常规剂量组的评分（4.66±0.57）相似。100keV 单能量图像的主动脉、背部肌肉和骨骼的 SD 值均较低，SNR 和 CNR 值均高于 FBP（P <0.05）。**结论：**当辐射剂量减少 50%时，使用 GSI40keV 单能量图像肺窗和 GSI100keV 单能量图像纵隔窗，可以获得与常规剂量组相似并且满足诊断要求的图像质量。

PU-3669

3.0 T 磁共振成像系统的质量控制检测

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目的：本研究通过对 Siemens Skyra 3.0 T 磁共振成像系统的质量控制检测，探讨日常工作中 3.0 T 磁共振成像系统的质量控制方法。
方法：使用 Magphan SMR170 磁共振性能模体对 Siemens Skyra 3.0 T 磁共振成像系统的信噪比、图像均匀性、空间分辨率、低对比度分辨率、线性度和层厚进行检测。
结果：Siemens Skyra 3.0 T 磁共振成像系统的信噪比为 104，图像均匀性为 98.7%，空间分辨率为 5LP/cm，线性度变化为 0.92%，低对比度分辨率为 4mm/0.5mm，层厚偏差 0.7mm，所有指标均满足标准要求。
结论：通过对信噪比、图像均匀性、空间分辨率、线性度、低对比度分辨率和层厚的检测，可及时掌握设备的性能参数，有效保证磁共振设备始终处于良好的运行状态。

PU-3670

基于 ACR 标准的 MRI 图像均匀度及层厚的检测

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目的：采用 ACR 模体对 Siemens Skyra 3.0 T 与 GE Excite HD 1.5T 磁共振成像系统的图像均匀度及层厚进行测量，阐述 MRI 图像均匀度及层厚的测量方法。
方法：使用 ACR 磁共振性能模体对 2 台磁共振成像系统的图像均匀及层厚进行检测，并根据相应的测量计算方法得出检测结果。
结果：3.0T MR 和 1.5T MR 图像的均匀度分别为 96.0%和 92.7%，所侧层厚分别为 4.64mm 和 5.58mm，层厚偏差分别为 0.36mm 和 0.58mm，所测指标均满足检测标准的要求。
结论：通过对 MRI 图像均匀度和层厚的检测，可保证图像质量与层厚的准确性。

PU-3671

手运动相关脑功能皮层 BOLD-fMRI 质量控制和管理前后结果评价及相关影响因素探讨

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目的 对手运动相关脑功能皮层 BOLD-fMRI 质量控制和管理前后成功率进行评价，同时探讨影响手运动相关脑功能皮层 BOLD-fMRI 结果的相关因素。
方法 回顾性分析接受手运动相关脑功能皮层 BOLD-fMRI 的 77 例受检者资料，其中质量控制与质量管理前后手运动相关脑功能皮层 BOLD-fMRI 影像资料分别为 31 例和 46 例，以试验结果是否出现合理的激活图为标准得出质控前后两组试验的成功率，并进行统计学分析。同时分析不成功的试验原因，包括：设备因素、受试者因素及其他因素。
结果 实施质量控制与质量管理后，手运动相关脑功能皮层 BOLD-fMRI 试验的成功率由质控前 67.74%上升到 86.96%，差异具有统计学意义。实施质量控制与质量管理后，受试者因素、设备因素两个方面较质控前对试验的影响明显降低，差异具有统计学意义。
结论 质量控制与质量管理对于提高手运动相关脑功能皮层 BOLD-fMRI 的成功率、降低受试者因素、设备因素对试验结果的影响具有重要的作用和意义。

PU-3672

磁共振成像的伪影及应对策略

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目的 研究磁共振成像图像伪影产生的原因，探讨日常工作中磁共振伪影的克服方法。
方法 收集 2009 年 10 月至 2015 年 8 月间 GE HD Excite 1.5T、Siemens Trio 3.0 T 和 Siemens Skyra 3.0 T 磁共振设备的具有代表性的伪影图像，分析伪影产生的原因，提出克服方法。
结果 磁共振图像常见的伪影主要有运动伪影、金属伪影、化学位移伪影、勾边伪影、卷褶伪影、截断伪影、交叉伪影、iPAT 伪影、拉链伪影、部分容积效应和近线圈效应。
结论 了解磁共振图像伪影的产生原因及机理，并掌握伪影的克服方法，对于提高磁共振图像质量具有重要的意义。

PU-3673

256 排 CT 在自由呼吸下对胸腹部联合扫描 图像质量和辐射剂量的影响

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目的：探讨 Revolution CT 宽体探测器在自由呼吸下对胸腹部联合扫描图像质量和辐射剂量的影响。**方法：**收集 60 例胸腹部联合 CT 扫描的患者，并分为两组，对照组（A 组 30 例）采用憋气扫描；实验组（B 组 30 例）采用自由呼吸。两组相同参数 管电压均设置为 120Kv、噪声指数固定为

（NI）为 8、前置的 Asir-V 为 0%、后置 Asir-V 固定为 70%、自动管电流范围（80-350mA）。所有患者均记录体重指数（BMI）、CT 容积剂量指数（CTDIvol）、剂量长度乘积（DLP）、曝光时间（S）。客观评价：AW4.6 工作站测量软组织窗（1.25mm）、肺窗（0.625m），测量主肺动脉窗层面和肝门层面的各组织 CT 值和 SD 值，并记录相关数值，感兴趣区（ROI）的大小约 10mm²。主观评价：两名高年资主治医生协商一致取最终结果，采用 spss24.0 软件进行统计学分析。**结果：**两组患者基本信息均无统计学差异（p＞0.05）（表 1），两组 CTDI、DLP、ED、曝光时间比较均具有明显的统计学差异（P 均<0.05）(表 2)，客观评价均有统计学差异（P＜0.05）(表 3)，两组图像主观评价均无统计学差异（P＞0.05）(表 3)。**结论：**Revolution CT 宽体探测器、大螺距、高转速在自由呼吸下胸腹部联合扫描既保证图像质量达到诊断要求，又降低辐射剂量，缩短曝光时间，宜使用于胸腹外伤、COPD、急诊患者。

PU-3674
256 排 CT HD 扫描模式在冠状动脉支架术后 CCTA 成像应用价值

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目的 探讨 GE Revolution CT 高清（HD）扫描模式在冠状动脉支架术后 CCTA 成像应用价值。**方法：**收集我院行冠状动脉 CTA 检查的患者共 40 例，随机分为两组各 20 例：常规对照组（A 组）和高清（HD）实验组（B）。所有患者心功能均正常，签订造影剂知情同意书。管电压（A 组 100kV,B 组 120KV），自动 mA，NI 为 28，PreASiR-V：70%。对比剂采用团注跟踪，ROI 10mm²监测层面放置于支气管隆凸下 1-2cm 的将主动脉，CT 阈值 220HU，触发扫描方式，延迟扫描时间 1.4s。对比剂碘帕醇 370mg/ml，两组碘含量按照公式 25mgI/kg/s 为标准，流速按照公式：流速=总量/注射时间 ml/s，总量=流速×注药时间（A 组为 10s，B 组为 12s）。客观评价　分别测量主动脉根部、RCA 近段、LAD 近段、LCX 近段、临近肌肉和脂肪的 CT 值和 SD 值，以肌肉为噪声背景，算出 SNR 值和 CNR 值。主观评价　冠状动脉节段的分段，AHA 修订的方法。由两名有经验的主治医师用盲法分别评价不同成像模式下冠状动脉支架、钙化斑块的图像质量，对冠状动脉支架、钙化斑块的曲面重组图像的图像质量采用 5 分制等级评分方法，评价支架、钙化斑块边缘及邻近管腔的清晰程度。采用 SPSS 24.0 软件进行统计学分析。**结果**　两组患者基本信息均无统计学差异（p＞0.05），两组患者的 CTDL、DLP、ED 均无统计学差异（p＞0.05），两组患者的主动脉根部、RCA、LAD、LCX、临近脂肪的 SNR 值和 CNR 值客观评分均无统计学意义（p＞0.05），主观评分均有统计学差异（p＜0.05）。 **结论**　Revolution CT 高清（HD）扫描对冠状动脉钙化、支架术后的图像质量优于常规扫描，且提高冠状动脉钙化斑块、支架及支架管腔情况的显示，可作为冠状动脉钙化和支架术后患者筛查和随访有效手段。

PU-3675
GE Revolution 256 排 CT 对血管内支架或骨关节金属植入物的能谱成像分析

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利用能谱 CT 成像的基本原理：能谱 CT 成像的物理基础为：（1）X 线通过物质的衰减能客观反映 X 线的能量；（2）X 线经过物质后产生的光电效应与康普顿效应共同决定了物质的衰减曲线；（3）物质的衰减曲线呈线性关系（不包括 K 峰区域），可以选择 2 种物质作为基物质进行物质分离。能

谱成像的实现方式技术层面的临床类型（即双 KVp 成像）包括瞬时双 KVp 技术、双 X 线管技术和双扫描技术。采用双扫描或双 X 线管模式的能量成像中一个主要问题是由于能量时间分辨率不足引起的运动伪影。这种伪影出现于心脏等快速运动的器官、胃肠的蠕动及呼吸运动中。减影使这种运动伪影更加明显。双扫描或双 X 线管模式实现图像空间双能减影的另一个问题是硬化效应。由于减影图像是低电压和高电压的图像组合而成，而低电压的图像往往带有较严重的硬化效应，这样使得组合的减影图像也存在硬化效应。由于运动伪影和硬化效应的干扰，图像空间的双能减影图像中存在诸多不准确性和不确定性，使得临床应用受到很多限制。而以瞬时双 KVp 为核心技术的能谱 CT 双能量解析过程是在投影数据空间完成的，因为不受自主和不自主的运动干扰，在准确的硬化效果校正的基础上得到准确的能谱成像。
进而消除金属支架或骨关节金属植入物对周围组织的产生的伪影，使植入物周围组织显示清晰，提供准确的 CT 值，为影像诊断提供清晰准确的图像。能谱 CT 成像还可清晰还原支架或金属植入物本身形态，对临床了解血管内支架或骨关节金属植入物的结构及与周围软组织关系提供帮助。

PU-3676

幽闭恐惧症患者行 MR 检查的可行性研究

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目的：分析研究磁共振检查中幽闭恐惧症患者心理辅导的具体方式及其应用效果。
方法：选取 2018 年 5 月～2019 年 6 月在本院接受磁共振检查的幽闭恐惧症患者共计 40 例,患者随机平均分为观察组(20 例)和对照组(20 例),对照组患者采用常规心理辅导,观察组患者在此基础上增加放松训练及心理安抚措施。对比两组患者在检查时的恐惧心理状况,检查完成情况,检查图像质量。
结果：在经过心理辅导和干预后,观察组患者与对照组患者在检查期间的负面情绪均有所下降,观察组患者检查前与检查期间的负面情绪变化明显,检查期间的负面情绪得分明显低于检查前,负面情绪得到了显著改善(P <0.05);观察组的心理辅导总有效率明显高于对照组,组间差异显著(P <0.05);检查图像质量方面,观察组得分明显高于对照组,组间差异显著(P <0.05)。
结论：磁共振检查中采用心理辅导能够有效改善幽闭恐惧症患者的心理状态,有助于磁共振检查顺利完成和保证图像质量。

PU-3677

重视高负荷急诊 CT 工作中防漏潜在的 AAS

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目的：探讨急性主动脉综合征（AAS）的形成机理、征象特点、影像诊断要点及实例教训，以减少漏误诊率，提高急诊影像工作质量。**方法：**分析 AAS 的概念、征象识别进展以及征象交集、转归的临床意义，归纳 AAS 的诊断要点及实例实战分析；对急诊工作技师及医师均进行上述 AAS 基础理论与实践的反复训练、以往 AAS 漏误诊经验的实战病例分享等急诊专项病种管理。**结果：**主动脉瘤、主动脉夹层及穿透性溃疡是主要 AAS 的病因，三者之间征象不仅有较多重叠、交集，也可有相互转化、转归，正确识别关键征象不仅利于准确诊断与鉴别诊断，同时也利于认识 AAS 演变的动态过程。多层 CT 增强血管成像（CTA）由于快速、便捷性，成为首选的急诊检查工具，尤其是心电门控的大视野、大螺距 CTA 技术能够提供精确的一站式诊断信息；强调急诊 CT 平扫可“意外发现”AAS

的诊断线索，经过专业反复训练后，能够极在地减少 AAS 在急诊平扫 CT 中的漏诊率。**结论：**正确认识 AAS 的关键征象有助于高负荷急诊工作状态下及时准确诊断 AAS；CTA 能够提供快速的一站式诊断信息，是首选的筛查工具。急诊 CT 平扫时更要重视中-大血管的 AAS 的潜在征象。

PU-3678
探讨 NSCLC 疗效的影像学定量评估要点及阅片人 QC 时评估结果差异的来源

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目的：探讨非小细胞型肺癌（NSCLC）影像学评估标准的应用要点及影像评阅结果差异的常见缘由。
方法：浅析、比较肿瘤影像评估标准的发展演变过程，从 WHO 标准发展到 RECIST 和 RECIST 1.1 标准及其之间的区别。解读 RECIST 1.1 标准中的主要诊断术语解析及应用要点；NSCLC 多中心临床试验影像评估实际案例分析：28 家全球分布的多中心 890 例病例 4900 个访视点，独立影像中心采用 A、B 两组双盲独立阅片所有病例，每组由 2 名 5 年以上 RECIST 阅片经验的放射医师采用双盲一致性独立评估所有病例，评估结果不一致时由另一名同样资质的阅片人进行裁判阅片。最后，比较 2 组阅片人的结果差异，并归纳导致此差异的来源。
结果： A 组、B 组 2 组的组内阅片一致率分别为 95.7%、97.2%（P<0.05）;经裁判阅片后，两组间的评估结果一致性为 92.3%，符合 FDA 的评估要求。组内与组间的不一性的主要原因有（占 80%）：靶病灶的选择，肺内靶病灶的测量时的窗宽位，新病灶的确认；其次原因有（20%）：非靶病灶明确进展的确认；新增淋巴结病灶的判断；腹膜转移的忽略。
结论：掌握 RECIST1.1 的要点，并能科学合理的运用是 NSCLC 评估时的基础，也是评估结果差异的主要来源。

PU-3679
低剂量及低浓度对比剂注射方案在 CCTA 中的可行性研究

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目的 探讨 320 排 CT 冠状动脉成像使用低剂量及低浓度对比剂注射方案的可行性。**方法** 连续收集行 320 排 CT 冠状动脉成像检查的患者 150 例（男性 83 例，女 67 例），将患者随机分为三组，每组 50 例患者。A 组使用两时相 50ml 碘帕醇对比剂（370 mgI/mL）的注射方案、B 组使用三时相 39ml 碘帕醇对比剂（370 mgI/mL）的注射方案、C 组使用三时相 39ml 碘克沙醇对比剂（320 mgI/mL）的注射方案。由两位诊断经验丰富的医生对冠状动脉进行评价和分析，测量并比较主要血管 CT 值及信噪比、对比噪声比。**结果** 三组患者年龄、体重、BMI、曝光时心率、主动脉根部噪声、SNR、上腔静脉、CNR^{RCA1} 和 CNR^{LM} 比较，差异均无统计学意义（P>0.05），三组患者主动脉根部、右心房、肺动脉、右心室、RCA1、LM、心室壁 CT 值比较，差异有统计学意义（P<0.05）。三

组患者总共评价了 1822 个冠状动脉节段，冠状动脉节段图像质量评分分别为 1.22±0.53、1.21±0.51、1.27±0.64，组间比较差异无统计学意义（c2 = 0.782，*P* = 0.676）。**结论** 320 排 CT 在采用低管电压、低剂量、低浓度碘对比剂(320 mgI/ml)的情况下行 CCTA 检查，具有可行性，能以较低的碘负荷获得诊断所需图像质量。

PU-3680
胸部 CT 扫描联合专用手臂托架降低辐射剂量的对比研究

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摘要 目的 探讨胸部 CT 检查时，正确、规范双手摆放位置降低辐射剂量的对比研究。**方法** 连续收集本院行胸部 CT 检查患者 50 例，使用西门子第三代双源 CT 扫描仪进行扫描，参考管电压 100kVp，管电流 110mSv，开启自动管电压（CARE kV）及自动管电流（CARE DOSE-4D）调节技术。患者取仰卧位，头先进，头足方向扫描，进床至胸廓入口处，调整检查床高度对准腋中线；A 组常规双手置于头顶，扫描定位像，确定扫描范围，设备自动预测出扫描范围所需辐射剂量并记录其 DLP 值；B 组使用专用手臂托架（专利号 ZL 2018 2 0614969.1），将患者双手平放于托架平板上并完全伸直，扫描定位像，扫描范围同 A 组完全一致并记录 DLP 值；比较两组预测辐射剂量 DLP 值差异。**结果** A、B 两组预测辐射剂量比较差异有统计学意义（P<0.05），B 组较 A 组 DLP 下降约 20.61% 。**结论** 胸部 CT 扫描联合专用手臂托架正确摆放双手位置能有效降低辐射剂量，值得临床推广运用。

PU-3681
冠状动脉 CTA 检查中使用硝酸甘油的不良反应分析

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【摘要】**目的** 在冠状动脉 CTA 成像中，通过舌下含服硝酸甘油扩张冠状动脉从而获得充盈良好的血管图像已经成为共识，但硝酸甘油的使用经常会产生一系列不良反应，通过回顾分析检查中使用硝酸甘油出现的不良反应，找出不良反应的发生的原因并提出相应的对策，为影像科医师使用该药物提供参考。

方法 回顾分析一年内成功完成冠状动脉 CTA 检查患者 2060 例，所有患者检前采取卧位舌下含服硝酸甘油 0.25mg,检查结束后 5 例患者不能维持自主体位，出现晕厥和意识丧失等严重不良反应，确认排除碘过敏反应和低血糖。所有患者在检查前均详细核查，确认无药物使用禁忌症。

结果 发生不良反应患者中男性 4 例，女性 1 例，年龄 51-72 岁。即往无硝酸甘油药物使用史 2 例。硝酸甘油所致低血压、低血压休克、晕厥等不良反应，是由于其是一种血管扩张剂，使回心血量减少，有效循环血量减少，产生低血压、脑供血不足，进而产生昏厥，其预防措施是采用正确的体位，宜采用平卧位，有利于增加回心血量；检查结束后离开检查床由平卧到站立位速度不易过快。发生休克的患者，要采取抗休克治疗。

结论 虽然硝酸甘油的不良反应大多见于静脉用药，但舌下含服仍有发生严重不良反应的风险。检查前要排除药物使用禁忌症，既往未使用过硝酸甘油的患者应减量使用。禁止在直立体位状态时用药，使用药物过程中监测患者脉搏血压改变情况。发生不良反应时应将患者迅速置于平卧状态，给予吸氧等治疗措施，发生休克的患者，应采取抗休克治疗。

影像科医生掌握硝酸甘油不良反应的表现、预防措施和抢救方法，可将该药物使用的风险将至最低。

【关键词】硝酸甘油；冠状动脉 CTA

PU-3682
超声造影及三维重建技术对腹壁下动脉穿支（DIEP）皮瓣血管评估的探索性研究

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目的：探讨超声造影及三维重建对腹壁下动脉穿支皮瓣血管检查有效性，为运用 DIEP 皮瓣进行乳房再造术的术前穿支血管评估提供依据；探索腹壁下动脉深穿支（DIEP）血管的影响因素以及超声对于优势穿支的选择标准。研究内容：纳入本院乳腺再造科室从 2013 年 2 月至 2017 年 10 月乳腺癌患者应用 DIEP 皮瓣对胸壁组织缺损进行修复再造患者。详细记录患者的基本信息，乳腺癌病史及治疗史，术前高频彩色多普勒超声检查结果（超声测量下腹壁下动脉深穿支数、穿支部位、腹直肌前鞘处穿支点口径、血流参数），之后选用医用超声造影剂（SonoVue）肘静脉推注，采用 CDFI 模式观察穿支血管血流信号，同时标注穿支血管穿出肌肉进入腹壁脂肪层（出肌点）的体表投影位置；应用超声三维容积探头的重建技术将感兴趣区域内的穿支与主干的关系以及穿支在皮瓣的走行发布情况进行图像重建，使临床医生直观了解穿支血管情况。结果：超声造影检查是术前 DIEP 穿支血管探查可靠手段；DIEP 穿支管径与患者年龄、腹壁脂肪厚度呈正相关；血管收缩期峰值血流速度与患者穿支内径呈负相关，与患者年龄无显著相关。结论：超声造影因其无辐射、操作简捷、可重复等众多有点，在 DIEP 术前对穿支血管评估有重要的应用价值。

PU-3683
危急值记录报告流程在放射科安全管理中的价值探讨

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【摘要】 目的 探讨危急值记录报告流程在放射科安全管理中的应用价值。
资料和方法：收集我院放射科 2014 年 6 月-2016 年 7 月实施危急值记录报告流程前 180 例危急值患者为对照组，再收集我院放射科 2016 年 8 月-2019 年 2 月实施危急值记录报告流程 200 例危急值患者为观察组，对两组医疗事件发生情况及预防措施、急救流程、诊断报告及时性、临床满意度进行比较分析。
结果：观察组医疗不良事件发生率为 2.5%，对照组医疗不良事件发生率为 12.5%，两组差异具有统计学意义（P＜0.05）。对照组的诊断报告及时性明细低于观察组。对照组临床满意度为 76.25%，观察组 97.5%临床满意度为 97.5%，两组差异具有统计学意义（P＜0.05）。因我科急救流程完善，两组急救流程差异无统计学意义（P＞0.05）。
结论：在放射科安全管理中建立起完善的放射科危急值记录报告流程，能够减少医疗不良事件的发生率，提高临床满意度，该方法简单易行，值得推广。

PU-3684

单次屏气快速采集与呼吸门控触发采集 3D SPACE MRCP 图像质量的比较

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目的：比较单次屏气快速采集方式与呼吸门控触发采集方式在不同屏气状况下、不同呼吸状况下成像质量的比较。**方法：**126 名患者在西门子 Skyra3.0T 磁共振上进行单次屏气快速采集与呼吸门控触发采集的 3D SPACE MRCP 检查。由检查技师通过对呼吸伪影与导航显示框的评价进而对屏气状况与呼吸状况进行定性分类，再由 2 名医师分别盲法记录、评价主观图像质量分数。**结果：**对于屏气好的患者，单次屏气快速采集 3D SPACE MRCP 的图像质量优于呼吸门控触发采集（P＜0.05）；对于呼吸规律的患者，呼吸门控触发采集 3D SPACE MRCP 的图像质量优于单次屏气快速采集（P＜0.05）；对于屏气好且呼吸规律的患者，两种采集方式比较无统计学意义（P=0.45）。**结论：**对于屏气好的患者，采用单次屏气快速采集能得到较好的图像质量；对于呼吸规律的患者，采用呼吸门控触发采集能得到较好的图像质量；对于屏气好且呼吸规律的患者，虽然两种采集方式得到的图像质量无差异，但是采用单次屏气快速采集能极大的缩短扫描时间。

PU-3685

320 排 CT 冠状动脉成像扫描技术及相关因素浅析

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目的：分析 320 排 CT 冠状动脉成像能力及影响因素。 方法：对新疆生产建设兵团医院医学影像科 54 例(其中包括 1 例冠状动脉搭桥术后，4 例支架置入术后)受检者按心率≤55 次/min，55 次/min＜心率≤75 次/min，心率＞75/min 分为 3 组，运用 320 排 CT 在前置心电门控条件下对冠状动脉进行成像，并选择心动周期的相位窗 10%～90%，每间隔 15%进行相位窗和重建算法重建。 结果：54 例检查中显示冠状动脉血管总数为 634 节段，第一组（心率≤55 次/分）的 20 例中 240 节段血管全部显示，显示率达 100%，所有显示血管节段均可用于评价；第二组（55 次/min＜心率≤75 次/min）的 27 例中共显示 324 段血管，显示率达 96.1%，其中 6 段血管节段不满足评价标准，占所有血管节段的 1.9%；第三组(心率＞75 次/min) 的 7 例中共显示了 84 段血管，显示率达 95.2%，其中有 7 段血管节段不满足评价标准，占所有血管节段的 8.8%。 结论：在控制心率(75 次/min)下，16 层螺旋 CT 能有效显示冠脉及大部分支，是无创、简便、优良、准确的冠状动脉成像方法。

PU-3686

动态容积 CT 后处理技术在颈部 CTA 中的应用

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目的：探讨动态容积 CT 在颈部 CTA 后处理的应用。 方法：使用动态容积 CT 对 92 例颈部血管扫描患者的图像分析，通过使用多平面重组（MPR）、曲面重建（CPR）、最大密度投影（MIP）、容积显示（VR）、心电门控等技术，对颈部血管进行后处理。 结果：92 例患者颈部血管重建后，所得图像均显示良好，充分达到临床诊断要求。 结论：对多层螺旋 CT 的后处理技术在颈部 CTA 扫描及后处理中相互结合能够更好的达到诊断要求。

PU-3687

CEST 心脏磁共振技术用于评估系统性轻链型淀粉样变病人心肌受累的可行性研究

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目的：化学交换饱和转移（CEST）影像技术用于心脏磁共振中可通过检测肌酸的信号反应心肌代谢，本项研究目的在于探究 CEST 心脏磁共振技术用于诊断系统性轻链型淀粉样变病人心脏受累的可行性。
方法：研究共纳入了 40 位病理诊断的系统性轻链型淀粉样变性病人以及 21 位正常对照。对其进行 CEST 心脏磁共振扫描，测定心肌平均 CEST 信号强度；同时病人组接受了增强心脏磁共振扫描。
结果：和正常对照相比，伴有心肌延迟强化的病人中心肌 CEST 值明显减低(0.116 ± 0.022 vs 0.090 ± 0.002, P <0.001)，并且 CEST 显著减低的部位与延迟强化区域具有较好的一致性。而不伴延迟强化的病人其 CEST 值与对照组无明显差异(0.116 ± 0.022 vs 0.115 ± 0.030, P =0.969)。
结论：对于系统性轻链型淀粉样变性，有延迟强化的病人其心肌 CEST 值较正常对照明显减低。CEST 心脏磁共振有望成为评估轻链型淀粉样变性病人心脏受累的平扫参数。

PU-3688

放射检查分层管理的实践经验分享

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目的：探索放射科众多检查的分层管理，将特殊检查归类于放射科医生与临床医生合作的检查项目，促进特殊检查成为放射科技术水平提升的桥梁。

材料与方法：将放射科各项检查氛围普通检查和特殊检查两大类，各亚专业的放射医师提出特殊检查的种类，制定特殊检查的目的、技术方法、适应症、负责人联系方式等一系列关键信息，与相关科室临床医生沟通，将特殊检查推广使用，参与临床各种疑难疾病解决的过程，是临床医生参与到检查结果分析中来，融入到临床各科室的诊疗过程中，提高特殊检查在解决临床特殊、疑难疾病中的作用。

结果：通过与临床广泛沟通，放射科推出了 70 多项特殊检查项目，受到临床的广泛欢迎，放射科技术水平和临床解决特殊、疑难疾病的能力空前提高，放射科医生走向临床第一线诊疗过程成为自

然的现象，放射科检查质量不断提升，在全院的学术影响力不断提升，也为放射科亚专业科研开展提供了坚强的基础。

结论：放射科检查分层管理是切实可行的，对放射科、临床各科的技术水平提高都十分有利。

PU-3689
急性肠系膜血管血栓致小肠透壁性梗死的相关危险因素分析

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目的：探讨急性肠系膜血管血栓患者的临床资料及 CT 平扫影像特征在预测小肠透壁梗死中的价值。
方法：回顾性分析 2011 年 4 月至 2018 年 12 月期间我院诊断为急性肠系膜动脉血栓或肠系膜静脉血栓的病例 75 例，对可能预测患者发生透壁性梗死的临床资料及 CT 平扫影像特征进行单因素及多因素分析。
结果： 单因素分析结果显示，与无透壁性梗死组比较，有透壁性梗死组出现呕吐（P=0.009）、肠壁变薄（P=0.011）、肠腔扩张（P=0.001）、小肠粪便征（P=0.040）、肠壁内积气（P=0.026）及肠系膜血管管腔密度增高（P=0.003）的比例较高。性别、年龄、腹痛、腹胀、腹泻、恶心、是否伴结肠缺血、发病到检查时间、发病到手术时间、糖尿病、房颤、低蛋白血症、腹膜炎、多器官功能衰竭、红细胞计数、红细胞分布宽度、血小板计数、白细胞计数、中性分叶核粒细胞绝对值、国际标准化比值、甘油三酯、胆固醇、高密度脂蛋白、低密度脂蛋白、碱性磷酸酶、肌酸激酶、乳酸脱氢酶、羟丁酸脱氢酶、肠壁密度增高、肠壁增厚、靶征、肠系膜模糊、腹水、气液平、其它器官受累这些临床资料及 CT 平扫影像特征在有透壁性梗死组和无透壁性梗死组的差异均无统计学意义（P>0.05）。多因素 logistic 逐步回归分析结果显示，呕吐（P=0.015）、肠腔扩张（P=0.002）及肠系膜血管管腔密度增高（P=0.003）是预测透壁性梗死的独立危险因素。
结论：呕吐、肠腔扩张及肠系膜血管管腔密度增高是预测急性肠系膜血管血栓所致小肠透壁性梗死的独立危险因素，对小肠不可逆的透壁性梗死的预测有助于治疗方案的选择和预后的有效评估。

PU-3690
设立不良事件登记本，降低不良事件发生率

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目的：通过登记不良事件，总结事件类型、分析事件原因、提出改进方法来降低不良事件的发生率。
方法：建立一个不良事件登记本，登记发生不良事件的基本信息、事件类别、发生原因、不良后果、导致事件的可能原因、事件的处理情况（提供补救措施或改善建议），并记录当事人职称、姓名、工作年限（方便了解哪类人员容易发生不良事件，并帮助改进）。每半年统计一次不良事件登记本，将不良事件按类别，发生次数排列。分析不良事件发生次数最多的原因（是人为因素，还是客观因素），讨论改进方法，制定方案实施。
总结：3 个月或半年后检验方案是否有效，发生次数最多的不良事件是否有所减少。如果方案有效，则继续统计、分析这半年新登记的不良事件次数最多类别发生原因，讨论改进方法，制定方案

实施，以此循环。最后统计发生不良事件最多的人员名单，了解当事人是因为什么原因导致的发生不良事件，并帮助他（她）减少和避免类似的不良事件发生。
结论：通过设立不良事件登记本，能有效的统计不良事件发生原因及易发人员，并通过分析讨论，制定方案来减少不良事件的发生率。

PU-3691

动态 500 排在肺动脉强化中的应用

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目的：普通肺动脉强化中通常使用监测肺动脉螺旋扫描的方法。由于病人血液循环快慢不同，一期肺动脉扫描经常会出现肺动脉与静脉同时显影，甚至肺静脉 ct 值会超过肺动脉 ct 值，给诊断带来影响。有没有另一种方法可以更好的扫描肺动脉呢？本文就利用宝石能谱 ct 上的动态 500 排技术对肺动脉增强扫描方法做下简介。
方法：胸部普通螺旋扫描过后找到上腔静脉，将其所在位置作为监测面，准备追踪扫描，其中准备时间设为 0，间隔时间设为 1，感兴趣区放在上腔静脉，阈值设为 50，打开动态 500 排功能，扫描次数设为三期。关掉自带语音，采用技师语音控制病人呼吸。进行增强扫描。
结果：三期扫描通常可得到肺动脉显影不充分的，肺动脉显影良好的，肺动脉与肺静脉皆显影的图像，此时可根据临床需要选择性的后处理。且由于动态 500 排的特性，患者接受这种扫描所受剂量并不大。
结论：监测上腔静脉使用动态 500 排增强扫描肺动脉具有很好的效果。

PU-3692

应用 ARMS 技术改良肩关节的图像质量

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目的　　评估和使用联影磁共振 ARMS（Acquision and Reconstruction with Motion Suppresion）技术在提高和改良肩关节 MRI 总体图像质量 、减少及限制运动伪影方面的作用和临床价值。方法 使用联影 uMR770 磁共振机器采集肩关节图像，收集我院 2016 年 1 月至 2017 年 1 月共 300 例肩关节数据，分析常规 FSE PDW 图像与 ARMS PDW 图像 。图像由 2 位医学影像科诊断医师和 2 位临床骨关节医生分别对图像伪影（血管搏动 、运动、呼吸 ） 、图像总体质量和肱二头肌边缘颗粒度和软化度进行 Rensis A Likert 5 分量表法评分 。常规 PDW 扫描和相同方位的 ARMS 图像对比后采用 Wilcoxon 符号秩检验 。 结果:运用 ARMS PDW 序列图像，评分范围 3.01 ～ 4.00 ，平均值 3.68 ，其中呼吸、运动、血管搏动伪影等平均分均在 3 分以上（P＜ 0.05），图像质量得到明显提高，伪影得到改善或消失。而常规 FSE PDW 扫描序列评分范围 2.54～3.00，平均值 2.76 分 。结论 通过与对比组的参照 ，ARMS 实验组评分优于对比组。运用 ARMS 技术在核磁共振肩关节扫描中，可以减少图像伪影，提高图像整体质量。

PU-3693

同源双功率成像技术降低对比剂剂量及流速的实验研究

玉权

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[摘要]
目的 对比贵州小型猪腹部的不同增强扫描模式，探讨同源双功率成像技术降低对比剂总量及流速的可行性。
材料与方法 对 8 只贵州小型猪腹部重复行 A、B、C 三组 CT 增强扫描，每次间隔时间一周，A 组：常规扫描组，开启 Care Dose 4D、Care kV ，参考电压 100 kV、参考电流 160 mAs，对比剂总量按 1.0 ml/kg，流速 1.5 ml/s；B 组：Dual source dual power 技术扫描，A/B 球管电压均固定为 70kV、开启 Care Dose 4D、参考管电流 160mAs，对比剂注射方案同 A 组。C 组：对比剂总量及流速均按 A 组减半为 0.5ml/kg、0.7ml/s，其余条件同 B 组。比较 A、B、C 三组对比剂总量、流速、辐射剂量及图像质量等。
结果 对比剂总量、流速的比较，A、B、C 三组间存在统计学差异（P<0.05），C 组较 A 组对比剂总量、流速降低 47.6 % 、66.7 %；辐射剂量（ED)的比较，A、B、C 三组间存在统计学差异（P<0.05），与常规扫描 A 组比较，C 组辐射剂量（ED)降低 31 %，而 B、C 两组无统计学差异（P>0.05）；图像质量的比较，A、B、C 三组无统计学差异（P>0.05）。
结论 腹部增强扫描中应用同源双功率成像技术能减少对比剂总量及降低注射流速，同时还能降低辐射剂量并保证图像质量，值得临床推广。

PU-3694
不完整包膜预测肝细胞癌微血管侵犯的 META 分析

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目的：探究肿瘤不完整包膜、完整包膜和无包膜与微血管侵犯的关系，为微血管侵犯的预测提供重要价值。
方法：在 Medline (by PubMed) 和 Embase (by OvidSP)数据库进行文献检索，运用 Stata V.13、Meta-Disc 1.4 和 Revman5.3 这三个软件进行统计分析。
结果：总共检索到 451 篇文献，最终纳入 15 篇文献，8 篇来自数据库检索的文章，7 篇来自文献的参考文献。META 分析结果显示，不完整包膜是微血管侵犯的危险因素[DOR=1.85 (1.13, 3.04)]，完整包膜是微血管侵犯的保护性因素[DOR=1.97 (1.01, 3.86)]，无包膜与微血管侵犯的关系没有统计学意义[DOR=0.90 (0.64, 1.26)]。CT 和 MRI 的亚组分析结果显示，在 MRI 组中，不完整包膜是微血管侵犯的危险因素[DOR=1.98 (1.00, 3.93)]，完整包膜是微血管侵犯的保护性因素[DOR=2.05 (1.19, 3.55)]，无包膜和微血管侵犯的关系没有统计学意义；在 CT 组中，不完整包膜、完整包膜和无包膜与微血管侵犯的关系都没有统计学意义。
结论：对于肝细胞癌微血管侵犯的预测，不完整包膜可能是个危险因素，完整包膜可能是个保护性因素，无包膜与微血管侵犯没有关系。这个结果的原因可能是不完整包膜的保护性因素与完整包膜的危险性因素相抵消，导致无包膜与微血管侵犯没有关系。

PU-3695
下腔静脉及从属性静脉对比剂淤积征

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目的：危重患者接受 CT 增强检查可以得到更明确的诊断，在这个过程中患者可能伴有心源性休克或突发心脏骤停、急性心功能不全。该类患者的增强ＣＴ影像有其显著特点，即“下腔静脉及从属性静脉对比剂淤积征”。及时识别该征象可以争取抢救时机。
方法：密切观察患者动脉期血管强化情况。如患者右房或右室无造影机充盈应立刻停止检查。排除连接管脱落或造影机渗漏等情况。若患者呼之不应，意识突然丧失或伴有短阵抽搐；大动脉（颈动脉、股动脉）搏动消失，应马上就地抢救。
结果
病例 1：患者做胸腹部增强时采用追踪法。追踪层面里上腔静脉逐渐出现高亮的造影剂液平面，胸部少数静脉也出现高亮情况。

病例 2：患者做全腹部增强时采用延迟法。CT 增强显示患者心脏除右房内均无造影剂；肝静脉、门静脉、右肝均有对比剂淤积；右肾静脉、下腔静脉造影剂淤积。

病例 3：患者做胸腹部增强时采用延时法。动脉期出现与病例 2 相同影像，立即停止检查观察病人情况。发现患者意识良好。随后采用追踪法再次扫描，发现右房强化后，右室缓慢充盈并逐渐强化。最终该患者诊断为心包内血肿导致心功能不佳，并在增强时出现从属性静脉对比剂淤积征。

结论：CT 增强扫描过程中密切观察患者图像。如仅发现右心房有造影剂，右心室没有造影剂：并伴随下腔静脉及从属性静脉有高密度造影剂淤积时，应立即观察患者身命体征，如有需要立即抢救。

PU-3696

320 排螺旋 CT 在儿童和危重症病人扫描的优势

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1.极快的扫描速度可在 1 秒内完成单器官检查，10 秒内高速完成全身检查，无创完成心脏检查，为急、危重病人的抢救赢取时间。
2.图像清晰度高，对小病灶显示清晰精准。图像分辨率高。
3.多脏器功能的分析，脑缺血性疾病，急性脑梗塞的灌注，腹部实质脏器灌注等方面的应用检查，时间快，显示效果好。使得 ct 检查从单纯形态学诊断发展进入到功能诊断。
4.低辐射。部分器官如颞骨可在 0.35 秒内完成，时间短，辐射剂量低。
5.安全性高，对患者损伤小。如冠状动脉的筛查及搭桥，支架术后的复查。
6.常规体检。如低剂量胸部扫描，可以及时发现肺部小结节。
7.二三维后重建更可以多方位多角度对病灶进行全面分析。

PU-3697

探讨脊柱全长摄影技术的应用

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目的 探讨脊柱全长摄影技术的应用

方法 对 100 例脊柱侧弯患者进行 dr 脊柱全长摄影，大多数患者胸椎侧凸，部分患者腰椎侧凸。首先在图像上确定侧弯脊柱的端椎，上端椎上缘划横线，下端椎下缘划横线，对比两线做垂直，上述横线或垂线的交角即为 COBB 角。
结果 测量 COBB 角进行分析。COBB 角小于 10 度为阴性，10 度到 20 度为阳性，大于 20 度为显阳性，一般临床会根据 COBB 角进行临床上的矫正治疗。
结论 脊柱全长摄影对脊柱侧弯检查有很大帮助。

PU-3698
低 KV 低流率联合 ASIR-V 重建算法应用不同浓度对比剂对肺动脉 CTA 图像质量影响的初步研究

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目的 低 KV（80KV）低流率（3.5ml/s）联合 50%ASIR-V 重建算法的技术前提下，比较低浓度对比剂威视派克 270、一般浓度对比剂碘帕醇 300 和高浓度对比剂碘帕醇 370 在肺动脉 CTA 图像质量的影响。**方法** 共纳入我院 2019 年 1 月 1 日至 7 月 1 日共 60 例患者行低 KV 低流率联合 ASIR-V 重建算法的肺动脉 CTA 检查；随机分为 3 组：A 组 20 例采用威视派克 270，B 组 20 例采用碘帕醇 300，C 组 20 例采用碘帕醇 370，三组扫描范围包括全肺动脉，扫描方向采用足头方向。肺动脉期扫描采用对比剂跟踪阈值触发技术。经右前臂静脉采用 18G 静脉留置针预注射生理盐水 16ml。感兴趣区设置于上腔静脉，阈值 130HU，团注速率 3.5ml/s，延迟时间 4s，共使用对比剂 30ml。扫描完成后采用 RevolutionCT 基于多模型的迭代重建算法（ASIR-V）50%进行图像重建。扫描比较三组的质量评分，肺动脉各段 CT 比值、图像信噪比（SNR）、图像载噪比（CNR）、碘用量及注射后的不良反应。**结果** C 组的主观质量评分高于 B 组和 A 组（P<0.05）；C 组的 CNR 和肺动脉的 CT 值高于 B 组和 A 组，B 组高于 A 组（P<0.05）；三组的 SNR 的比较差异无统计学意义（P>0.05）；A 组有效碘用量高于 B 组和 C 组，B 组有效碘用量高于 C 组（P<0.05）。**结论** 低 KV（80KV）低流率（3.5ml/s）联合 50%ASIR-V 重建算法的技术前提下，肺动脉 CTA 采用追踪扫描法联合低浓度对比剂可以提高有效碘用量降低对比剂的不良反应，并且保证图像质量，具有可行性。

PU-3699
MRI 定量评价直肠扩张对前列腺 T2WI 及 DWI 成像质量的影响

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目的 MRI 定量评价直肠扩张对前列腺 T2WI 及 DWI 成像质量的影响。**资料与方法** 2017 年 8 月至 2018 年 5 月期间，回顾性分析 236 例来我院就诊行前列腺 MRI 检查患者图像资料。由两名阅片者采用双盲法对 MRI 图像进行客观及主观评价，评价参数包括直肠体积、直肠负荷、T2WI 成像锐利度、T2WI 成像伪影、DWI 成像伪影和 DWI 成像变形。T2WI、DWI 及 ADC 图总体成像质量评价采用 Likert 5 分法。直肠扩张程度与前列腺 MRI 图像质量参数的相关性比较采用 Spearman 相关性分析。两位阅片者评分间的一致性评价采用 κ 检验。**结果** 两位阅片者在评价前列腺 MRI 直肠负荷、T2WI 质量、DWI 质量、DWI 伪影、DWI 变形及 ADC 质量评分的 κ 值分别是 0.87、0.84、0.77、0.71、0.73、0.73。直肠负荷与直肠前后径、体积呈正相关，r 值分别为 0.883、0.819（P 值均<0.05），与直肠左右径、上下径并无相关性（P 值均>0.05）。DWI 成像质量与直肠负荷显著相关（r= -0.628，P< 0.01），与直肠体积亦相关（r= -0.552，P<0.01）。DWI 成像变形与直肠负荷

相关（r= 0.814，P<0.01），与直肠体积亦相关（r= 0.887，P<0.01）。DWI 成像伪影与直肠负荷相关（r= 0.425，P<0.05），与直肠体积显著相关（r= 0.614，P<0.01）。直肠扩张导致 T2 运动伪影增加（P<0.05），但并没有显著影响 T2WI 成像的锐利度（P>0.05）。**结论** 直肠扩张影响前列腺 T2WI 及 DWI 的成像质量，在临床上行前列腺 MRI 检查前，必要的的肠道准备，可能将有助于提高图像质量。

PU-3700

不同呼吸指令对肺动脉 CTA 强化效果的影响

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目的 探讨肺动脉 CTA（CTPA）扫描时不同呼吸指令对肺动脉强化效果的影响。方法 本研究经医院伦理委员会批准。根据纳入标准和排除标准，连续纳入我院疑诊肺栓塞行 CTPA 检查的患者，记录性别、年龄、身高、体重，计算体重指数（BMI）。根据肺动脉期 CTA 扫描采用的呼吸指令不同随机分为三组：A 组，深吸气后屏气；B 组，平静呼吸下轻屏气；C 组，自由呼吸下扫描。所有患者均采用西门子双源 CT 完成检查，扫描参数一致，自动触发阈值 100Hu，感兴趣区为主肺动脉。采用双通高压注射器经右肘静脉注射碘克沙醇注射液（320mg I/ml）70ml，追加生理盐水 30ml，注射速率 4.5 ml/s。工作站测量主肺动脉 CT 值，测量面积 200 ㎜²，3 次测量取均值。评估有无肺动脉栓塞、有无严重肺气肿。结果 共 192 例患者纳入本研究，其中 A 组 84 例、B 组 52 例、C 组 56 例，各组间一般资料、肺栓塞检出率、严重肺气肿检出率比较均无统计学差异。三组肺动脉干 CT 值分别为 311.42±77.49 Hu、341.94±82.10 Hu、345.77±66.16 Hu，差异具有统计学意义（F=4.392，P=0.014）。两两比较，A 组肺动脉 CT 值小于 B 组和 C 组，差异均有统计学（P 值分别为 0.023、0.009），B 组与 C 组差异无统计学意义（P=0.793）。A 组主肺动 CT 值（Y）与性别（X_1）、年龄（X_2）、BMI（X_3）、肺气肿（X_4）的多元线性回归分析显示：深吸气后屏气扫描时，BMI、肺气肿对肺动脉 CT 值有影响（P＜0.05）。回归方程为 $Y=408.41-4.96\ X_3+47.47\ X_4$，标准化方程为 $Y'=-0.238X_3+0.305X_4$。结论 传统的深吸气后憋气扫描可导致肺动脉强化程度减低，肥胖患者易受影响，肺气肿则为保护因素之一，平静呼吸下轻屏气或自由呼吸下扫描能够改善肺动脉强化效果。

PU-3701

血压对 CT 检查头颈血管成像的影响

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摘要：目的:探讨在 CT 检查中血压对头颈血管成像的图像质量影响情况 **方法**：以我院近一月内门诊 113 例急诊 CT 头颈血管成像检查为例，检查前先询问受检者的基本病情，签署 CT 增强知情同意书，均在 GE64 排 CT 上扫描，使用头颈 CTA 扫描协议，采用造影剂实时监控触发技术进行检查，监测升主动脉起始段，阈值设定为 120HU，在受检者右侧肘静脉打 18G 留置针，造影剂为碘海醇，药量总量为 50ml，流速为 4.5ml/s,后续生理盐水总量为 25ml，流速为 4.5ml/s,注射药的同时按下扫描键监测阈值，到达阈值自动触发扫描头颈血管，然后以其第一期扫描图像质量作对比 **结果**：113 例 CT 头颈血管成像检查中，其中有 55 例患者平时血压情况良好，在正常血压范围值内，触发扫描时造影剂已经注射完毕，生理盐水已注射一半，其图像的头颈动脉显影清晰，伴有头颈静脉未显影或轻微显影，可以对头颈动脉血管清晰诊断；有 49 例患者有不同程度的高血压，触发扫

描时造影剂已经注射完毕，生理盐水也即将注射完毕，其头颈动脉成像近心端显影清晰，远心端小分支血管显影欠清晰或者不显影，可以对头颈大血管进行诊断；有 9 例患者血压偏低或有心功能偏差，触发扫描时造影剂已经注射完毕，生理盐水注射完毕，其头颈动脉成像只有近心端显影模糊或并未显影，头颈静脉并未显影，无法对头颈大血管诊断 **结论**：CT 检查中，血压对头颈血管成像的图像质量有着一定的影响。血压影响着体内血流的速度。同等情况下，对于多数血压增高患者，其血流速度相对减慢，提高阈值延迟触发扫描或者减慢造影剂注射速度，同样可以获得清晰地头颈动脉影像

PU-3702
急诊与复查多层螺旋 CT 对肋骨骨折诊断价值的对比分析

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目的：探讨急诊多层螺旋 CT(MSCT)对肋骨骨折的诊断价值及限度.
方法：回顾性分析我院 2018、2019 年肋骨骨折影像资料,采用 Wilcoxon 配对符号秩和检验比较两次检查诊断结果的差异.
结果：急诊 MSCT 诊断肋骨骨折数 291 处,其中完全性骨折 187 处,不完全性骨折 104 处;复查 MSCT 诊断肋骨骨折数 334 处,其中完全性骨折 203 处,不完全性肋骨骨折 131 处.以复查 MSCT 为标准,急诊 MSCT 对肋骨骨折的检出率为 87. 12% (291/334).两次诊断在肋骨骨折总数、完全性骨折及不完全性骨折数方面均差异有统计学意义(Z= -4. 35、-2. 94、-3. 63,P=0. 000、0. 003、0. 000).
结论：MSCT 是肋骨骨折诊断的重要手段,但急诊 MSCT 对肋骨骨折诊断存在着一定的限度,肋骨骨折病人复查 MSCT 是有必要的.

PU-3703
研究者及感兴趣区对 IDEAL-IQ 评价肝脏脂肪定量的影响研究

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目的：探讨不同工作年限研究者及感兴趣区对 IDEAL-IQ 评价肝脏脂肪定量的影响。**方法**：应用 GE Discovery MR750W 3.0T 超导 MR 扫描仪的 3D IDEAL-IQ 序列获得脂肪分量图，由 3 名不同工作年限（1 年、4 年和 11 年）的研究者，以 3 种不同面积（10 mm^2、25 mm^2和 50 mm^2）的感兴趣区（ROI），分别测定符合研究标准的脂肪分量图的 PDFF，使用单因素方差分析和信度分析进行统计学分析。**结果**：3 名研究者测定的 PDFF 和按 3 种面积 ROI 测定的 PDFF，经单因素方差分析，差别均无统计学意义。同一名研究者分别以 ROI 面积 10 mm^2、25 mm^2、50 mm^2测定同一组资料，经信度分析，alpha 系数均＞0.8 和 ICC 均＞0.75，说明在不同面积 ROI 条件下测定的 PDFF 有很高的可信度和可重复性；同一面积 ROI，由 3 名研究者分别测定同一组资料，alpha 系数均＞0.8(分别为 0.998，0.994，0.997，0.982，0.985，0.984)和 ICC 均＞0.75(分别为 0.994，0.981，0.992，0.951，0.957，0.953)，说明不同研究者在同一面积 ROI 下测定的 PDFF 亦有很高的可信度和可重复性。**结论**：**研究者**工作年限和 ROI，对 IDEAL-IQ 序列评价肝脏 PDFF 无影响，具有极高的可信度和可重复性。

PU-3704
定量磁敏感成像 TE 与图像质量、磁化率的相关性研究

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目的 探讨定量磁敏感成像中 TE 与图像质量、磁化率的相关性。**方法** GE ADW4.6 工作站 QSM 模块中，阈值为“0.06”，对 21 例研究对象按回波数量（1～4 个）分为 A～D 组，分别重建出对应的磁敏感图，评价的左侧苍白球（GP）的图像质量、磁化率，分析回波组合数量、TE 与图像质量及磁化率变化关系。**结果** 4 组图像质量评分、磁化率与 TE 的变化曲线基本重叠。当 TE 为 16.4 ms～39.7 ms 时，A、B、C、D 组图像质量评分平均值均≥2.5 分。磁化率随 TE 的变化呈类似抛物线样曲线变化。当 TE 为 29.7 ms～48.0 ms 时，磁化率曲线趋于水平走行，磁化率值趋于稳定。当 TE≥21.4 ms 时，4 组磁化率与模块默认回波序号组合（“14/15/16”）的磁化率差异无统计学意义。**结论** 图像质量、磁化率与回波组合数量无关；当 TE 为 29.7～39.7 ms 时，图像质量优秀，磁化率一致性好，且不随 TE 变化而改变。

PU-3705
影响 DR 摄影图像质量的因素及控制措施的探讨

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目的：探讨影响 DR 摄影图像质量的因素及控制措施。
方法：随机抽取本院 2019 年 6 月 DR 摄影图像 200 例，根据 X 线质量控制评分统计，甲级片 130 例（65.0%），乙级片 48 例（24.0%），丙级片 20 例（10%），废片 2 例（1%）,其影响因素大致可分为四类，分析如下：一、摄影前患者准备未做好。检查前应嘱咐患者去掉身上异物，在胸腹部摄影时训练呼吸，应用吸气、呼气、屏气曝光获得良好图像。二、摄影时摆位不标准、中心线、照射野及摄影距离不对导致被检部位显示欠佳。操作者应加强理论学习及操作训练，熟知各部位摄影体位及方法，选择合适照射野、摄影距离及中心线。三、曝光条件过高或过低。操作者应根据不同患者组织密度及厚度的不同适当调整 KV、mAs 等曝光条件，学会灵活运用。四、图像后处理不佳。操作者应确认左右标识正确，合理使用平滑锐化，选择合适的对比度及亮度，并运用裁剪功能。
结果：将以上 2 例废片的检查者再次进行同部位拍摄，在改变以上所述参数后，图像质量明显提高，按照以上标准拍摄，再随机抽取 200 例 DR 摄影图像进行质量控制分析，得到甲级片 160 例（80.0%），乙级片 32 例（16.0%），丙级片 8 例（4%）废片为 0。整体图像质量明显提高。
结论：摄影前准备、摄影体位、中心线、照射野、摄影距离、曝光条件及图像后处理为影响 DR 摄影图像质量的重要因素，操作者应选择正确的体位及参数，获取优质的 X 线图像。

PU-3706
基于情景模拟的静脉肾盂造影的影像质控

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目的：探讨技师情景模拟对提高静脉肾盂造影影像质量的影响
方法：连续 3 个月对普放组技师进行静脉肾盂造影情景模拟，由一名技师扮演被检者，另一名技师对其做静脉肾盂造影模拟检查。包括：①检查前准备：肠道准备情况询问、患者基本信息询问、异物去除；②体位设计：仰卧位，双下肢伸直，正中矢状面与暗盒长轴中线重合，双臂置于身体两

侧，中心线对准脐下 1cm；③曝光条件、呼吸模式设计、压迫点选择；④造影剂剂量的设计、注射造影剂后摄片时间的选择；⑤图像质量判断、过敏反应的判断和处理。其余技师对整个模拟过程进行评价并提出意见讨论，所有技师轮转进行情景模拟。同时高年资诊断医师根据统一标准对当月所有静脉肾盂造影图像进行评分，根据影像范围、图像对比度、解剖结构显示、图像中心显示、造影剂注入后摄片时间、标识放置、伪影等进行评分。
结果：①连续三个月技师出错率、患者过敏发生率逐月下降；②技师图像质量平均评分逐月提高；③同一技师图像质量评分逐月提高。
结论：全科技师情景模拟及每月质控能够提高静脉肾盂造影的影像质量，值得广泛推广。

PU-3707
HIFU 治疗单发性子宫肌瘤的影响因素与安全性及有效性分析

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【目的】探讨子宫肌瘤 HIFU 消融的影响因素。
【方法】回顾分析 234 例症状性单发子宫肌瘤 HIFU 治疗资料。治疗前 MRI 观察子宫位置，肌瘤部位、体积、T2WI 信号、强化类型、靶皮距、后场距。HIFU 消融并记录消融参数和不良反应（AEs）、能效因子（EEF）、肌瘤非灌注区体积（NPV）及非灌注区体积比率（NPVR）。可能影响消融的因素为自变量，EEF 和 NPVR 为因变量，建立多重线性回归模型。随访消融前后症状严重程度（SSS）、相关生活质量（UFS-QOL）、肌瘤体积变化，方差分析评价疗效。
【结果】患者年龄 37.73±6.29 岁。肌瘤体积 93.66±76.46cm3。治疗成功率 100％，EEF 7.13±5.13j/mm3。治疗后 NPV 69.67±61.99cm3、NPVR 74.74±15.15%。结果：EEF 与 T2WI 低 SI、肌瘤最大径、前位子宫呈负相关，与贯穿型肌瘤、强化程度、靶皮距呈正相关； NPVR 与贯穿型肌瘤、T2WI 高 SI、强化程度、靶皮距呈负相关，与前壁肌瘤、T2WI 低 SI 呈正相关。
AEs44.44%，SIR A 85.90%、B 11.11%、C 1.71%、D 1.28%、无 E 及 F，其中皮肤灼伤 24 例（10.26%），2 例需治疗，其余自行康复。随访完整的 49 例治疗前及后 1、3、6 个月，SSS、QOL、平均肌瘤体积，均随时间明显下降（$P<0.05$）。
【结论】HIFU 消融症状性单发子宫肌瘤可显著减轻症状，提高生活质量，缩小或消除肌瘤。EEF 和 NPVR 受声通道、肌瘤及子宫位置、肌瘤成分等多因素的影响。前位子宫，T2WI 低 SI、大直径、小靶皮距的消融效率高。前壁、T2WI 低 SI、CET1WI 轻度强化、靶皮距小的易达高 NPVR。AEs 一般轻微，严重 AEs 罕见。

PU-3708
基于不同水平自适应迭代重建技术的肋间后动脉成像图像质量比较

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目的 探讨宝石 CT 能谱成像（GSI）不同水平自适应迭代重建技术对提高肋间后动脉图像质量的可行性，为 CT 引导经皮穿刺活检术提供指导。**方法** 回顾性收集我院 30 例患者使用 GE 公司的宝石能谱 CT(Discovery CT750HD)行 CT 增强扫描图像，其中男 15 例，女 10 例，年龄 28-60 周岁，平均 55.91±12.95 岁。分别采用自适应统计迭代算法（ASIR）将数据重建为 0-80%（间隔 20%）不同 ASIR 权重的 5 组图像，重建层厚为 0.625mm，并传至 ADW 4.6 后处理工作站用于分析。分别在不同

ASIR 权重的 5 组图像测量中肋间后动脉 CT 值、噪声、对比噪声比（CNR）、信噪比（SNR）。由两名副高级及以上职称放射科医生使用双盲法进行主观评价，在相同的窗宽、窗位下对 0% ASIR、20% ASIR、40% ASIR、60% ASIR、80% ASIR 重建图像进行主观评价。所获图像采用 SPSS 22.0 软件进行统计学分析。**结果** 随着 ASIR 权重的增高，SNR 与 CNR 值也在逐步增高。与 0%ASIR 组相比，20% ASIR、40% ASIR、60% ASIR、80% ASIR4 组图像的肋间后动脉 SNR 分别提高了 31.24%、38.19%、44.49%、50.47%。20% ASIR、40% ASIR、60% ASIR、80% ASIR 4 组图像肋间后动脉 CNR 分别提高了 33.86%、40.58%、46.63%、52.25%。其中 80% ASIR 的图像噪声最低，SNR 值、CNR 值最高。两位放射科医师对 5 组图像中 60% ASIR 的评分最高。**结论** 能谱扫描模式在不同权重肋间后动脉血管成像中，肋间后动脉血管成像的最佳 ASIR 权重水平为 60%。60%权重水平图像明显优于其他权重图像的图像质量，可以提高肋间后动脉的显示，便于 CT 引导下经皮穿刺活检术及胸腔穿刺在安全范围内进行，有助于介入操作的顺利进行。

PU-3709

肺动脉 CTA 短暂性对比剂中断的解决方案

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背景及目的 短暂性对比剂中断（transient interruption of contrast, TIC）指常规肺动脉 CTA（CTPA）扫描时，肺动脉主干及其分支强化不良并影响肺栓塞诊断的一种少见现象，通常在深吸气后屏气扫描时发生，主要由无对比剂的下腔静脉血一过性大量回流所致。本研究旨在探讨深吸气后屏气下 CTPA 扫描出现 TIC 现象时，平静呼吸下轻屏气扫描能否改善肺动脉强化效果。方法 回顾性分析 2016 年-2018 年间行 CTPA 扫描的患者 1260 例，共 16 例出现 TIC 现象而影响诊断。TIC 的判断标准：常规扫描方案下，主肺动脉 CT 值≤200Hu 且低于升主动脉 CT 值。16 患者均在深吸气后屏气下完成首次 CTPA 检查，其中 13 例患者接受了二次扫描被纳入本研究，两次扫描参数及对比剂注射方案相同，仅呼吸指令改为平静呼吸下轻屏气。比较两次扫描所获上腔静脉、主肺动脉和升主动脉 CT 值。结果 13 例患者平均年龄 46.45±10.32 岁，更改呼吸指令后肺动脉强化效果均有不同程度改善，首次、二次扫描所获主肺动脉 CT 值分别为 140.38±39.93 Hu、263.23±38.18 Hu，差异具有统计学意义（Z=3.181，P＜0.001）。上腔静脉、升主动脉 CT 值两次扫描比较差异无统计学意义（P＞0.05）。结论 传统的深吸气后憋气 CTPA 扫描出现 TIC 现象时，平静呼吸下轻屏气能够明显改善肺动脉强化效果。

PU-3710

256 排 CT 呼气相低剂量胸部增强扫描方案

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目的：改善低管电流呼气相胸部增强扫描方案，大幅减少患者受辐射剂量，同时减少患者碘对比剂摄入，降低造影剂风险及辐射危害。

方法：选取 2017 年 11 月-2019 年 4 月我院 50 例行胸部增强扫描患者，所有患者均接受 256 层 CT 容积扫描。将患者分为实验组、对比组两组（实验组 29 例，采用呼气相扫描，对比组 21 例，吸气相扫描）。扫描后分别评价实验组对比组胸部增强图像质量、总碘浓度及辐射剂量。
结果：实验组及对比组胸部增强图像质量均可达到诊断要求。两组涵盖范围对比组差异有统计学意义（$p<0.05$），对比组高于实验组。两组造影剂用量及摄入总碘含量，实验组明显少于对比组，约为对比组三分之二。
结论：本方法可适用于胸部小气道疾病患者的常规增强检查，大幅降低辐射剂量，明显减少造影剂用量从而降低造影剂肾病风险。

PU-3711
东软医疗 NeuViz 64 CT 与 Philips Brilliance iCT 在儿童胸部低剂量扫描中图像质量对比与辐射剂量的评估

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目的：对比东软 NeuViz 64 CT（实验组）与 Philips Brilliance iCT（对照组）在儿童胸部低剂量扫描模式下图像质量与辐射剂量的差异。方法：回顾性分析 2016 年 6 月-2017 年 12 月在湖南省人民医院行胸部低剂量扫描的 80 例儿童患者资料，年龄 3-6 岁。按照随机数字法将其分为两组。两台 CT 设备均采用低剂量扫描模式，扫描条件相近。实验组及对照组分别采用 30% ClearView 迭代算法及 iDose Level3 自适应统计迭代重组算法进行图像重建。分别测量管分叉处层面肺组织及邻近前胸壁表面空气的感兴趣区（ROI）CT 值及噪声值（SD），信噪比（SNR）及对比噪声比（CNR）为图像质量客观评价指标。图像主观评分由 4 名放射科主任医师对肺部主要血管、气管及肺内病变边缘的锐利程度进行 5 分制评价。记录两组病例的容积 CT 剂量指数(CTDI vol)、剂量-长度乘积(DLP)、有效辐射剂量(ED)并进行辐射剂量。结果：实验组与对照组图像的客观评价指标 SD 及 SNR 上存在显著差异($t=2.13$，$t=4.09$；$P<0.05$)，CNR 无统计学差异($t=-1.71$，$P>0.05$)，两组图像的主观评分无显著性差异。实验组与对照组剂量评价指标 CTDI vol、DLP 和 ED 比较均有统计学意义($z=8.88$，$t=2.82$，$t=3.50$；$p<0.01$)，实验组低于对照组。结论：在相似扫描条件下，东软医疗 NeuViz 64 CT 与 Philips Brilliance iCT 两款设备对于儿童胸部较低剂量扫描可以获得相当水平的图像质量且辐射剂量相对较小。

PU-3712
子宫内膜癌 MRI 术前评价的成本-效果分析

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目的：不同的 MRI 检查方案在各地区的价格执行标准不同，对比子宫内膜癌术前评价的三种临床常用 MRI 检查方案的成本-效果，为更加合理应用 MRI 对子宫内膜进行术前评估提供参考。**材料与方法**：利用 TreeAge Pro 2011 软件，以我国东、中、西部地区共 10 省（市）医疗卫生服务价格标准为依据，构建决策树模型进行成本-效果分析。（1）评价对象：①评价要素：肿瘤是否侵犯深肌层、侵犯宫颈及盆腔淋巴结状态。②评价方案：本研究分别从以上这三要素对以下三种 MRI 检查方案进行经济学评价：a. 常规 MRI 检查方案：简称 MRI 方案，包括抑脂和/或非抑脂 T1WI + 抑脂和/或非抑脂 T2WI；扫描方位不限定。b.增强（contrast enhanced, CE）+常规 MRI 检查方案：简称 CE-MRI 方案。序列包括抑脂和/或非抑脂 T1WI + 抑脂和/或非抑脂 T2WI + T1WI 增强扫描（包括动

态增强和非动态增强扫描）；扫描方位不限定。c.弥散加权成像（diffusion weighted imaging, DWI）+常规 MRI 检查方案：简称 DW-MRI 方案。序列包括抑脂和/或非抑脂 T1WI + 抑脂和/或非抑脂 T2WI + DWI；扫描方位不限定。**结果：**（1）对深肌层浸润的诊断，东部地区首选 DW-MRI 方案，其次为 MRI 方案；而中、西部地区首选 MRI 方案，其次为 DW-MRI 方案。（2）对宫颈侵犯的诊断，东、中、西部地区均首选 MRI 方案，其次为 DW-MRI 方案。（3）对盆腔淋巴结转移的诊断，东、中、西部地区均首选 MRI 方案，其次为 CE-MRI 方案。**结论：**DW-MRI 方案应做为子宫内膜癌术前评价的首选一体化 MRI 检查方案，以最大限度的满足临床需求；为降低 MRI 检查成本，建议现行 MRI“分项”收费标准应该调整为“基于单病种的 MRI 检查打包收费”。这一结论为更加合理的应用 MRI 进行子宫内膜癌术前评价及制定单病种收费价格标准提供了参考依据。

PU-3713

数字化 X 线摄影双能量成像技术的临床应用价值探究

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目的：解读数字化 X 线（DR）摄影双能量成像技术用于临床疾病诊断中的价值。**方法：**抽取 2016.4~2017.8 收治的 70 例患者，遵照随机原则分为常规组、试验组，每组各 35 例，分别给予传统 X 线片与 DR 摄影双能量成像技术检查，观察两组的拍片质量，比较与分析临床诊断率。**结果：**试验组甲级片占有率为 94.29%，高于常规组的 71.43%；试验组、常规组的临床诊断率依次为 86.21%、97.06%，经比较分析，差异有统计学意义（$P<0.05$）。**结论：**DR 摄影双能量成像技术具有操作过程简单，拍片质量优良，能为疾病临床诊断与治疗提供质量较高的影像资料，具有推广价值。

PU-3714

下腔静脉平滑肌肉瘤 1 例

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下腔静脉平滑肌肉瘤少见，发病者以女性多见，平均发病年龄 60 岁。肿瘤起源于血管平滑肌，下腔静脉起源最常见（50%）。血管来源平滑肌肉瘤占腹膜后平滑肌肉瘤 38%，其中完全位于血管内者约 5%，同时累计血管内外者 33%。CT 检查能够对病变的诊断与鉴别诊断提供较大帮助。

PU-3715

基于体模的腹部器官辐射剂量算法研究

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目的 探讨腹部 CT 扫描时 Radimetrics 软件与热释光剂量法测得器官剂量之间的关系。**材料与方法** 分别采用 GE64、Philips64、Siemens64 排螺旋 CT 按如下扫描方案（10 mAs，120kv；25 mAs，120k；50 mAs，120kv；150 mAs，120kv；150 mAs，100kv；150 mAs，80kv）对仿真体模进行三次

腹部扫描。扫描参数如下：螺距 0.984 ； 旋转时间 0.6 s；层厚 5 mm ； 层间距 5 mm；矩阵 512×512，分别通过基于 Monte-Carlo 算法的软件平台与热释光剂量法两种方法分别得到不同器官的有效剂量。**结果** Radimetrics 软件与热释光剂量法测得的器官剂量有很强的相关性，Pearson 相关系数为肺脏 0.995、肝脏 0.990、结肠 0.978、脾脏 0.967、肾脏 0.992、胰腺 0.967，且二者之间存在线性相关，可用对应线性方程表示，对于线性方程的拟合系数分别为肺脏 0.989、肝脏 0.979、结肠 0.954、脾脏 0.931、肾脏 0.982、胰腺 0.930。但二者间器官剂量之间的相对差异不可忽略。**结论** 不同器官的辐射剂量值通过 Radimetrics 软件与热释光剂量计之间可进行线性转化。

PU-3716
基于 HIMMS7 信息系统平台优化含体内植入物患者磁共振就诊流程的探讨

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探讨以三甲医院 HIMMS7 搭建的信息化建设平台对体内含有金属植入物患者行磁共振检查时就诊体验改善的作用。应用品管圈等管理方法，收集我院 2016 年 1 月至 2018 年 12 月门诊患者集中反馈的问题进行筛选，整理和分析，阐述我院信息化管理辅助临床科室的现状及问题，完善信息化管理的措施，并分析信息化建设促进临床工作，提升患者就医体验的发展趋势，为提升信息管理服务水平提供借鉴和参考。

PU-3717
《军队医院影像基地规范化培训模式的探索——以实践转化能力和效果评估为导向》

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2013 年国家初步建立住院医师规范化培训制度。在政策推行的五年间，由于军队医院管理上的特殊性，仍存在与地方不相统一的若干部分。本文试就军地住院医师规范化培训的差异分析入手，建立健全军队影像学科住培体系，并实现闭环评估，着重体现实体转化成果。

PU-3718
应用 Revolution CT 进行肺动脉血管造影检查个性化扫描方案研究

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目的 比较 256 排常规单源 CT、Revolution 单能 CT 及 Revolution 双能量 CT 进行肺动脉 CT 血管造影（CTPA）检查时的辐射剂量，对比剂用量、对比剂流速、主观及客观图像质量。

材料和方法 前瞻性的纳入 180 例临床怀疑肺动脉栓塞拟行肺动脉 CTA 检查的患者，将他们平均分为 3 组，每组 60 例。组 1：常规单源 CT（SSCT）120kV；组 2：Revolution 单能 CT 100kV（DSCT）；组 3：Revolution 双能量 CT（80/140kV）（DECT）。记录 CTDIvol、DLP，计算出有效辐射剂量（ED）；扫描前根据患者 BMI 指数及对比剂用量表选择个性的对比剂用量及流速，扫描后在肺动脉主干、右肺下叶肺动脉分支、左肺上叶肺动脉分支层面上选择三个感兴趣区，记录感兴趣区的 CT 值，计算出信号噪声比（SNR）、对比噪声比（CNR）。根据图像质量 5 级评分表，由 3 位不同层级的放射科医生（住院医师、主治医师、教授）在单盲条件下分别对图像质量进行评分。
结果 组 3 的平均 CTDIvol、DLP 比组 1 及组 2 明显减低（$p<0.001$ [CTDIvol]，$p<0.001$ [DLP]，组 1:($p=0.002$ [CTDIvol]; $p=0.002$ [DLP]，组 2）；组 3 的 ED 亦较组 1、组 2 明显减低。组 3 的 SNR 及 CNR 较组 1、组 2 高。组 1 的对比剂用量及流速明显大于组 2、组 3；组 2 的对比剂用量稍大于组 3，两者对比剂流速没有统计学差异。观察者间及组间的主观图像评分没有统计学差异。
结论 应用 Revolution 双能量 CT 进行肺动脉 CTA 检查不仅能够在保证图像质量的前提下有效的降低辐射剂量，而且可以减少对比剂的用量及对比剂流速，同时获得物质能谱曲线、碘基图等多模态 CT 成像特征。

PU-3719

影像医学检查中患者隐私的保护

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近年来，医学技术的飞速发展，极大地提高了医学临床诊治水平，也大大提高了人类的健康水平，然而同时也带来了许多复杂而棘手的医学伦理难题，其中患者隐私问题已经成为国内外关注的重点。随着公民自我保护意识的提高，患者隐私权的问题被不断提出，因此引发的诉讼和案件也层出不穷。目前，我国在影像医学检查中对患者隐私权没有设置相关的法律保护，患者本身无法确定哪些属于隐私权保护的内容，往往容易受到侵犯，也无法找到保护自己隐私权的依据。我国立法机关应当对患者的隐私权从法律的高度予以规定，确定医患关系中隐私权的内容以及侵权行为。由于隐私权概念具有高度模糊、抽象和不确定等特点，使得影像医技人员无法准确了解患者隐私范围，患者在影像医学检查中也难以区别医技人员的哪些行为属于合法诊疗行为。加之我国的相关立法中也没有规定患者隐私权的内容，往往使得患者隐私权的法律保护无法达到预期效果。在影像医学检查过程中，由于患者的法律意识弱，患者对自己权利的认识只是处于了解阶段，对于自己的隐私权问题，没有全面的法律认识，无法保持理性的态度来解决问题。部分医技人员缺乏医学伦理学知识，导致缺乏保护患者隐私权的意识，涉及患者隐私也未获得患者许可，时常忽略了对患者人格尊严的保护。笔者根据实际工作经验，阅读文章文献，分析相关问题，提出在影像医学检查中患者隐私权保护的观点

PU-3720

CT 重复扫描的记录及分析运用于质量控制的优化探讨

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目的：对于 CT 重复扫描的记录及分析结果对于提高质量控制、优化扫描方案的探讨。

资料和方法：选取并记录 2014 年 1 到 6 月之间的所有出现重复扫描的 CT 图像，期间的扫描未做过任何质控优化分析，作为对照组；选取 2019 年 1 到 6 月所有重复扫描的 CT 图像，期间扫描进行系统质控优化分析，作为观察组。本科室对于每月的重复扫描数据进行不断完善，逐月进行优化分析、数据统计，找到一套比较合适的记录方案，分别从定位失误（定位反向；定位错误；体外金属伪影）、扫描范围不足、闭气不佳、心脏扫描中的心率异常、图像充盈不佳、图像运动伪影、设备故障、其他突发状况等，这几个方面记录平时工作中出现的重复扫描例数及出现重复扫描的原因。然后对不同年份的两组数据进行统计学比较以及对图像质量改善满意度进行统计学分析。
结果：对照组的各项数据指标明显高于观察组，于当年受检者总数占比率明显高于观察组，存在统计学差异；观察组 CT 图像质量明显改善，满意度高于对照组，存在统计学差异。
结论：CT 扫描过程中，由于各种因素造成的重复扫描是无法避免的。在放射科质量控制中建立完善的重复扫描记录规范是十分有必要的，不仅能够知晓每月重复扫描的情况，有效的减少重复扫描发生率，还可以提高 CT 扫描图像的质量。重复扫描的记录分析，有效的减少患者因人为因素造就的多余受照剂量，减少我们工作中出现的不必要的失误。该方法简单可行，值得推广。

PU-3721
质量控制对乳腺 X 线摄影图像质量影响的研究

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[摘要] **目的** 探讨质量控制对乳腺 X 线摄影图像质量的影响。**方法** 随机抽取我院 2019 年 3 月进行乳腺 X 线摄影的 1000 例受检者作为对照组，2019 年 5 月进行乳腺 X 线摄影的 1000 例受检者作为实验组。实验组在实施质量控制后进行摄片，对照组未实施质量控制，仅行常规乳腺 X 线摄影检查。对比两组受检者的 X 线图像质量、CC 位标准片主观评估与客观评估、分析影响图像质量的主要原因并提出相应整改措施。**结果** (1)实验组图像质量 I 级率为 93.5%，高于对照组，II 级率和 III 级率分别为 6.9%、0.2%，均低于对照组；(2)影响图像质量的主要因素有：①乳房皮肤皱褶、乳腺组织遗漏、乳头轮廓未显示切线位及伪影，在实施质量控制后上述因素所占比例均明显降低，且差异有统计学意义；(3) 统计两组 CC 位标准片的评估结果发现，主观评估和客观评估种实验组图像组织遗漏率均低于对照组组（1.3% vs 6%；4% vs 9.3%）。**结论** 经过对乳腺 X 线质量控制，可以明显提高图像质量，减少 II 级片或 III 级片概率，为诊断医生提供准确、科学的图像根据，从而使患者得到更好的医疗保障。

PU-3722
能谱 CT 不同单能量模式与非能谱模式下扫描成像的硬化伪影的对比研究

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目的：探讨能谱 CT 不同单能量模式下扫描成像与 120kvp 混合能量模式下扫描成像的硬化伪影的差异。方法：将 9 支含不同浓度碘溶液（浓度分别为 0、0、10.0、20.0、5.0、3.0、10.0、20.0、1.0 mg/ml）的硬塑料试管，置于圆柱形塑料体模（QC phantom）内，浓度为 0 的置于体模中心（记为 0 号试管），其余 8 支按 20.0、10.0、3.0、5.0、20.0、10.0、0、1.0 mg/ml 的顺序依次等距环形排列于体模的周边（分别记为 1-8 号试管）。应用能谱 CT（Revolution CT），分别用 GSI（40-140keV, 间隔 10keV)模式和 120kVp 混合能量模式采用相同剂量扫描，共获得 12 组图

像。在 AW 4.6 工作站选取 4 个层面分别测量 GSI（40-140keV, 间隔 10keV)和 120kVp 时的试管 0-1,1-2,5-6 之间的椭圆形感兴趣的 SD，以及背景处圆形感兴趣区的 SD，采用单因素方差分析比较 GSI（40-140keV, 间隔 10keV)模式和 120kVp 模式下所获扫描图像测得 的 BAI(Beamharding Artifact Index)之间的差异。结果：40-80Kev 的 5 组单能量图像的 BAI 之间的差异均有统计学意义，120kvp 混合能量图像与除 70kev 单能量图像外与其他 10 组单能量图像的 BAI 之间的差异均有统计学意义。各感兴趣区的 BAI 值均与 kev 值呈负相关关系，且与 120kVp 混合能量图像相比，70-140kev 的 8 组单能量图像所测得 BAI 值均有显著降低（但 120kvp 混合能量图像与 70kev 单能量图像的 BAI 之间的差异无统计学意义）。结论：能谱 CT 在 40-140kev 每隔 10kev 重建的 11 组扫描成像的硬化伪影随光子能量的升高而降低，且与 120kvp 混合能量模式扫描成像的硬化伪影相较，80-140kev 的单能量模式的硬化伪影均有显著降低。

PU-3723
双能量 CT 增强三种扫描方案对显示肠系膜上动脉血栓的对比研究

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目的 双能量 CT 增强三种扫描方案对显示肠系膜上动脉血栓的对比研究。**方法** 回顾性分析 36 例经临床证实的肠系膜上动脉血栓的双能量 CT 表现，采取随机分组，分别行基于 DS 模式双源双能量 CT 增强检查、双源双能量常规 CT 增强、双源双能量 CTA（分别为 A 组、B 组、C 组），包括动脉期、门脉期、平衡期及虚拟平扫、后处理血管重建，分别计算辐射剂量、肠系膜上动脉分支血管显示、血栓显示率。**结果** 辐射剂量：C 组>B 组>A 组；肠系膜上动脉分支血管显示：C 组=A 组>B 组；血栓显示率：C 组=A 组>B 组。**结论** 基于 DS 模式的双能量 CT 增强对显示肠系膜上动脉血栓效果优于双能量 CT 常规增强模式，辐射剂量最低，对显示肠系膜上动脉分支血管及腔内情况接近 CTA 图像质量，并有助于判断肠壁缺血的程度，减少临床误诊误治。

PU-3724
miRNAs 在 X 线辐射损伤后修复机制中的作用

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目的：探究细胞接受 X 射线辐照后通过 miRNAs 转录后调控对损伤及损伤后修复的分子生物学机制，以建立并完善辐射后损伤-修复模型，在分子层面及细胞层面上对放射防护提供理论支持。
方法：选用放射高敏感性的淋巴母细胞 T2、TK6 两个细胞系经不同剂量 X 线辐照后，利用 MTT 及 FCM 技术于不同时间点对两个细胞系进行细胞生物学检测，构建在梯度辐射剂量下细胞周期、增殖凋亡随时间变化的模型，并通过 miRNAs 表达芯片及 qPCR 技术筛选辐照相关 miRNAs，利用靶基因研究及 Western Blot 技术构建 miRNAs 与其靶基因对放射损伤的反馈调节模式图，建立完善的细胞放射损伤后修复模型。
结果：let-7 家族 miRNAs，miR-103b，miR-142，miR-143，miR-146ap，miR-155，miR-15a，miR-16，miR-181a，miR-191，miR-21，miR-22，miR-26a，miR-378，miR-423，miR-92a，miR-93 等多种 miRNAs 随辐照处理后存在显著性低表达趋势（P 值≤0.05），后在不同时间点（8h，24h，48h，72h）存在显著性过表达趋势（P 值≤0.05）。其中 let-7 家族，miR-92a，miR-143，miR-19b 等 miRNAs 的表达量随时间变化的趋势与细胞周期、凋亡变化趋势无统计学差异（P 值

≥0.05）。其中，靶基因研究表明 let-7 家族 miRNAs 通过调控 HIFs 通路；mir-92a 通过调控 VEGF/CD31/Tie2 通路；mir-143 通过调控 CD44v3/HGF 通路；miR-19b 通过调控 PGC-1α 通路等参与损伤后修复过程。
结论：多种 miRNAs 通过对不同蛋白通路调控，参与体内 X 线辐射损伤后修复的分子生物学机制。

PU-3725

DBT 与 FFDM 平均腺体辐射剂量差异

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目的：分析乳腺三维断层成像（DBT）与全数字化乳腺钼靶 X 线摄影（FFDM）Average Glandular Dose(AGD)平均腺体辐射剂量差异
方法：回顾性分析湖北省武汉市中南医院 2019 年 1 月至 7 月 100 例乳腺检查患者的钼靶图像与检查数据。不同乳腺类型其致密度 ，厚度，曝光条件不同对 AGD 都有相应影响。发现双侧 cc 位的 DBT 是 FFDM 的 Average Glandular Dose(AGD)平均腺体辐射剂量高一倍不到，最大 AGD 值不超过 3mGy。而 DBT 比 FFMD 图像数多 25 倍及以上。
结果：由本院 2 位从事放射诊断工作 5 年以上及 1 位 1 年工作经验以内诊断医师一起依据美国放射学会推荐的乳腺影像报告和数据系统（BI-RADS）得出结果。其中 100 例患者中有 41 例 BI-RADS 2 类。25 例在 DBT 和 FFDM 都能发现肿块，但是 DBT 上其边界大小显示更清楚。22 例只在 DBT 上发现肿块，多为致密性腺体结构。3 例结构扭曲，DBT 上显示的与周围结构关系更加清晰。9 例发现恶性钙化，在 FFDM 上显示清晰，DBT 上易出现放射状伪影。DBT 对病灶检出率提高，显示明显率提高，在致密型乳腺结构扭曲病变的总体检出率有显著提高。
结论：DBT 增加了 AGD 值的同时大幅度的提高诊断准确率。在日常工作中要进行有效的预评估，有效率的使用 DBT 增加诊断率控制对患者的辐射剂量。注意提醒患者佩戴辐射防护设备。

PU-3726

超低剂量条件下应用全迭代 IMR 重组技术对肝脏增强 CT 的应用价值

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目的:讨论超低剂量条件下（80kv，50mA）应用全迭代 IMR 重组
技术对于肝脏增强 CT 的应用价值.
方法：将 42 例患者的肝脏增强 CT 延迟期分别采用常规剂量下（120kv，150mA~200mA）滤过反投射法 FBP 进行图像重组并标记为 A 组；超低剂量下（80kv，50mA）全迭代 imr 重组技术并标记为 B 组。将两组图像的容积 CT 剂量指数、有效剂量作为单独指标。对两组图像进行客观评价（包括噪声、信噪比、对比噪声比）以及主观评价（低对比分辨率、图像失真度、诊断信心）测量记录用于图像评价。记录两组方案的 CT 剂量指数。对两组图像间客观指标的比较采用配对样本 t 检验；两组主观评价指标的比较采用 wilcoxon 符号秩和检验。
结果：B 组对于 A 组容积 CT 剂量指数、有效剂量均降低 90%以上;A 组噪声、信噪比、对比噪声比分别为（26.16±4.28HU）、（8.22 ±1.41）、（3.70±1.20）：B 组噪声、信噪比、对比噪声比分别为（14.96±5.42HU）、（15.61±3.56）、（6.97±2.63），差异均有统计学意义（t 值分别为-15.87、-10.01、11.50，P 值均<0.001），B 组对于 A 组主观评分中低对比分辨率无统计学差异

（Z=-1.000 P=0.317）、图像失真度有统计学差异（Z=-6.481 p〈0.001）、诊断信心有统计学差异（Z=-2.449 p=0.014）。
结论：超低剂量条件下应用全迭代 IMR 重组技术对比常规扫描应用滤过反投射法可以在明显降低剂量的基础上，使图像客观质量提升，并且主观诊断中可以帮助提高诊断信心。

PU-3727

科学规范小儿肠套叠空气灌肠诊断流程

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目的：探讨如何科学规范小儿肠套叠空气灌肠诊断流程，降低假性肠套叠发生率。**方法**：采用回顾性分析的方法，分析在我科室进行过空气灌肠复位诊断的所有患儿影像表现。**结果**：在 X 线透视下确诊为肠套叠的仅占 10.5%，其余均为假性肠套叠，其影像表现主要为：肠管内气粪混合影，乙状结肠冗长，肠管扩张，回盲部水肿。**结论**：科学规范小儿肠套叠空气灌肠诊断流程，能够很大程度上降低假性肠套叠发生率，同时避免患儿接受不必要的 X 线辐射。

PU-3728

胸部低剂量 CT 成像的应用与挑战

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摘要：通过对比其他检查方法，进一步探讨出低剂量 CT 的疾病诊断价值及其对健康人体检对于疾病筛查的益处。在了解胸部各种疾病（例如，胸壁肿瘤、纵膈肿瘤、肺肿瘤、食管肿瘤、乳腺肿瘤等）的基础上研究出哪一项疾病最为适合采用低剂量 CT 进行检查，并讨论它的优势之处和不合理使用导致的后果。Abstract:By comparing with other examination methods, we further explored the diagnostic value of low-dose CT and its benefits for healthy people of disease screening. In order to understand various diseases of the chest (for example, chest wall tumors, mediastinal tumors, lung tumors, esophageal tumors, breast tumors, etc.), it has been studied which disease is most suitable for examination with low-dose CT. It also discusses its advantages and the consequences of improper use.

PU-3729

SPIO 新型高分子材料在吞噬细胞标记和示踪领域的研究进展

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Superparamagnetic iron oxide (SPIO) plays an important role in magnetic resonance and molecule imaging. SPIO can
track the vivo distribution and transformation of macrophage or other cells cell as they are marked by SPIO, which has becoming an im
portant part of biomedical research. In addition,S PIO cell mark and tracking can be used in the diagnosis, assessment and differentiation

of tumor and inflammation.Therefore, this article summarize the research progress of SPIO in phagocyte cell marker and tracking field in
recent years and now report as follows.

PU-3730

水合氯醛用于婴幼儿磁共核振检查的效果观察

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目的：探讨水合氯醛灌肠用于婴幼儿核磁共振检查的效果。方法：将 3 月 ～3 岁需要做核磁共振的 500 例患儿，按检查的先后顺序随机分平均为两组，对照组患儿于检查前半小时用 10%水合氯醛 30mg/kg/次口服，观察组患儿在检查前半小时给予水合氯醛 50mg/kg/次灌肠，比较两组检查用药入睡后药物制动效果。结论：观察组患儿灌肠入睡后制动效果好。婴幼儿核磁共振检查时，水合氯醛液灌肠效果好。

PU-3731

GE Revolution CT 能谱（GSI）扫描去伪影技术在脊柱内固定术后的临床应用

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摘要：**目的** 评价 Revolution CT 能谱扫描去伪影技术在减少脊柱内固定伪影方面的临床应用效果，同时研究应用能谱曲线寻找最佳 keV 值的可能性。
方法 对 4 例江苏省人民医院脊柱骨折内固定术后患者进行 GSI 扫描，获得 110kVp-like 图像，并用能谱分析软件获得 100KeV 单能量图像及 Mono+MAR 图像，以 10keV 为间隔重建 11 组 Mono 图像。每例病人选取 2 个带有金属伪影最大的层面对椎弓根螺钉伪影及椎管内结构伪影进行主观评分，同时选择椎管内感兴趣区进行测量并计算 AI 和 CNR，比较三组间椎弓根螺钉伪影、椎管内结构伪影主观评分及椎管内 AI 值的差异，寻找 GSI 去金属伪影最佳成像条件。以最佳图像为对照，比较利用能谱曲线寻得最佳 Mono 图像的质量和诊断效能。
结果 AI 在 90-140keV 时减低，在 100-130keV 达最低；CNR 在 100～120keV 时减低且最低。能谱成像技术在 90-140keV 对软组织、骨质及金属植入物诊断效能提高，在 110-130keV 对软组织观察最优，在 110-140keV 对骨质及植入金属观察最优。利用能谱曲线寻得最佳单能量成像条件为 100-120keV，范围落在普通方法确定的电压值区间内，其图像均能满足诊断。
结论 Revolution CT 能谱扫描在高电压区（100-120keV）可有效减除脊柱金属植入物伪影。对于椎管内结构的评价，单能量去伪影技术较常规混合能量图像及单能量+MAR 图像更有优势和临床指导意义。

PU-3732

缩短放射科急诊报告时限 PDCA

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随着自助打印机管理系统的广泛应用，放射科信息化程度正在变得越来越高。信息化管理将现代信息技术与先进管理理念相结合，转变或改造了放射科操作方式和业务流程，使得管理目标更加数字化。ISO15189《医学实验室质量和能力认可准则》中明确指出，实验室质量管理不仅包括对检验结果数据真实可靠性的管理，对影响检验结果的各种因素的管理也必不可少。而检验结果回报时间(turn-around time，TAT) 它的及时性是影响检验质量的重要因素。TAT 又称为结果回报时间，是指从临床医生开出申请单到接收报告的时间。目前，国内外许多医院的临床实验室都将 TAT 作为其质量持续改进的观察指标。放射科于 2019 年 12 月由德国 AGFA 公司投放 4 台自助打印机，借用检验科 TAT 管理，对影响 TAT 的因素进行分析和定位，完善分析流程和技师操作等环节的信息化监控。通过 PDCA 循环应用确定延误放射科报告的原因，优化放射报告时限的各环节流程，有效的缩短 TAT，缩短放射科门急诊报告时限，放射科在提高临床和患者满意度方面取得了一定成效。具体措施：

放射科开展 X 线数字化透视、CR、DR、CT 检查 24 小时急诊服务。

临床科室根据患者病情需要申请医学影像急诊检查，放射科接到申请通知后，了解患者病情，申请检查项目部位，随时登记患者信息，按照设备操作规程完成检查。

发生紧急意外抢救事件时，按照放射科紧急意外抢救预案，放射科与临床科室紧急呼救与支援的机制与流程执行。

在放射科候诊大厅增添 4 台自助胶片打印机，检查完成后通知患者或陪人自助打印胶片和纸质报告，或后台处理，由值班人员发给患者，及时出具医学影像报告，并按照放射科影像报告审核制度与流程进行。

发现危急值时按危急值登记制度与报告流程执行。

循环运用到缩短放射科急诊报告时间，通过每一次的循环，增强了放射科全体人员对急诊报告及时性的重视程度，促进了临床医师合理使用急诊资源。

PU-3733

儿童 X 线检查成像的影响因素与质量控制

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摘要

目的：讨论儿童 X 线检查成像的影响因素与质量控制的方法

方法:随机抽出我院 2019 年 4 月至 6 月儿童 X 线摄影图像 100 例，根据 X 线质量控制评分统计可得：100 分 60 例（60%），90-99 分 15 例（15%），80-89 分 11 例（11%），不及格 4 例（4%）。分析得出其影响因素可分为以下几类：一、儿童自身因素。检查前应安抚儿童情绪，取得儿童配合，也可让家属适当控制儿童或等儿童睡眠时拍摄，必要时遵循医嘱使用适量镇静剂。二:体位设计、中心点，摄影距离及照射野问题。摄影技师应熟知各部位摄影体位，根据被检部位选择合适照射野、摄影距离及中心点。三：摄影条件的选择。摄影技师应根据儿童年龄大小、摄影部位的不同来调整摄影条件，实现摄影条件的最优化。四：图像后处理问题。在摄片完成后应正确标识左右、站立或仰卧、适当调整图像对比度。

结果：应用以上方法进行摄影，在随机抽取 100 例图像进行质量评分统计，100 分片为 87 例（87%），90-99 分片为 6 例（%），80-89 分片为 6 例（6%），80 分以下片为 1 例（1%），图像质量整体明显上升。

结论：摄影前准备及儿童配合度、摄影体位、照射野、摄影距离、中心点、摄影条件及图像后处理是影响儿童 X 线成像的重要因素，操作者应从以上方面获得优质的 X 线图像。

PU-3734
高职医学影像技术专业开展“医院课堂”教学改革探索

姚建新
江苏联合职业技术学院南京卫生分院

目的 《医学影像检查技术》是医学影像技术专业核心课程之一，随着影像新技术不断发展，必须寻找适合《医学影像检查技术》课程教学模式。方法 学校与医院紧密合作，校院共建影像实训中心，将《医学影像检查技术》课程的课堂设在医院，由校内专任教师和影像科技师共同完成教学任务。结果 用医院真实的临床案例和人文环境，为师生提供一个教、学、做合一的平台，从而提高专业教学的质量和水平。结论 校院合作共建医学影像技术专业“医院课堂”，有助于医学影像技术专业学生实践技能的提高和专业知识的掌握。

PU-3735
培养具有辐射防护意识的医学影像技术后备人才

姚建新
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目的 培养具有一定专业知识和良好职业情感的医学影像技术人才。方法 学校、医院、企业、行业学（协）会紧密合作，共同参与专业调研，共同制定人才培养方案，合作进行医学影像技术人才培养。结果 X 射线得到合理运用，医患和谐，服务质量得到提升。结论 学校、医院、企业、行业学（协）会共同承担培养高素质医学影像技术后备人才重任。

PU-3736
HIMSS 信息平台助力高层次影像技师培养的理论模式与实践探索

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医学影像学技师培训工作是影像专业学生迈向临床工作的关键环节，本文从理论模式到实践探索双重背景下探讨 HIMSS 信息平台助力高层次影像技师人才培养的情境性、合作性、参与性和自我评价性，从而讨论如何将教育教学工作的计划、行动、考察和反思呈螺旋式发展，使得信息化建设成果转化成为促进人才培养和发展的强大动力。

PU-3737
肩关节 MR 常规检查三步定位法应用价值分析

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摘要 目的 探讨肩关节 MR 常规检查“三步定位法”在临床工作中的临床应用价值。**方法** 常规准备患者仰卧位，头先进，线圈包饶被检测肩部，上臂伸直，置于身旁，上臂与身体间保留一定间隙，掌心向上，固定肢体（沙袋压制），线圈中心对准检查者肱骨头内测，定位线横向线对准线圈中心，锁定位置后进床至磁体中心；“三步定位法”应用于肩关节常规检查：第一步、通过常规定位扫描出肩关节常规正向冠、矢、轴三个方向图像；第二步、在第一步的基础上扫描出肩关节斜冠、矢状位图像；第三步、在前两步基础上，精准定位肩关节斜冠、矢状位图像。**结果** 在临床工作中行肩关节 MR 常规检查时，应用“三步定位法”获得肩关节的斜冠、矢状位图像和轴位图像的准确性明显提高，出现运动伪影次数明显减少。**结论** 肩关节 MR 常规检查“三步定位法”在临床工作中的临床应用价值高，能准确获得肩关节的斜冠、矢状位图像和轴位图像，更加符合临床工作需求，值得临床推广印证。

PU-3738

碘造影剂的不良反应与临床应用分析

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目的:调查 CT 扫描中碘造影剂的用药安全性与碘造影剂过敏试验的预测价值.**方法:**收集自 2018 年以来本院及全军药物不良反应监测中心碘造影剂不良反应病例报告,分析不良反应病例临床表现类型、诱发药物、高危因素个体与不良反应发生的相关性以及碘过敏试验预测价值.**结果:**两组不良反应病例报告分别为 38 例与 145 例,其中重度反应分别占 15.8%与 12.4%;诱发药物早期主要为泛影葡胺,近年则多为碘普罗胺与碘海醇;高危人群与重度不良反应密切相关.**结论:**近 5 年来碘造影剂中非离子型品种不良反应报告增多(87.1%);碘过敏试验对提高临床用药安全性有一定的预测价值.

PU-3739

Noise reduction and image quality in ultra-high resolution computed tomography of the nasal bone and paranasal sinus using advanced modeled iterative reconstruction

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Abstract
Background:The novel advanced modeled iterative reconstruction (ADMIRE) algorithm in ultra-high-resolution computed tomography (CT) of the nasal bone and paranasal sinus has not yet been systematically evaluated.

Purpose:To assess the potential of ADMIRE in nasal bone and paranasal sinus.
Material and Methods: Twentycases of nasal bone fracture patients who underwent UHR CT of the nasal bone and paranasal sinus were retrospectively selected for analysis. Images were reconstructed using filtered back projection (FBP) and ADMIRE with multiple strength levels. Regions of interest were drawn in the nasal bone and

paranasal sinus. The average density (in Hounsfield units [HU]) and the image noise (standard deviation of density values) were extracted.The signal- to-noise ratio (SNR) and contrast-to-noise ratio (CNR) were then calculated. Additionally, a subjective qualitative analysis was performed using a five-point Likert scale.
Results:The image noise was significantly lower, and the SNR and CNR were significantly higher in ADMIRE reconstructions levels A2-A5 than in FBP (P < 0.001, respectively). Subjective image quality was significantly higher in ADMIRE levels A2-A5 than in FBP (P < 0.001) and it was rated best in ADMIRE level A3, which showed the fracture line clearly.
Conclusions: The ADMIRE reconstruction algorithm significantly improves image quality and reduces noise on nasal bone UHR CT scans. Thus, it is beneficial to observe the fracture of nasal bone.

PU-3740
艾力彼星级认证下的放射技术工作质量持续改进

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目的 总结艾力彼星级医院认证下的放射技术工作质量持续改进。方法 自启动星级认证之日起，至评审结束，在此期间按照评审标准的要求，放射技术组在质量与安全管理、设备管理、感控管理等方面所做的质量持续改进。结果 通过一年多的准备，技术组全体按照认证标准，逐条梳理，不断地对发现的问题进行及时整改，使放射技术工作质量持续改进，提高了工作效率，也使患者的就医感受大大提升。结论 作为中国版的 JCI 标准，在推进医院内涵建设的同时，极大地促进放射技术组在医疗质量、应急能力和患者安全管理方面水平的提升，使放射技术组的服务质量与水平达到新的高度。

PU-3741
基于 Magphan SMR170 体模的 3.0T 磁共振成像设备的质量控制检测

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目的：通过对我院 3 台 3.0T 磁共振成像成像设备（MRI）的质量控制检测，探讨日常工作中 3.0T MRI 的质量控制检测方法及评价指标。**方法：**使用 Magphan SMR170 体模对我院 3 台（两台不同型号的 GE 和一台 Siemens）3.0T MRI 进行周期性检测，计算信噪比、图像均匀性、空间分辨率、低对比度分辨力、层厚、纵横比等指标，并进行分析。**结果：**3 台 MRI 的信噪比分别为 852.364±73.591、674.468±106.607、962.369±205.847，图像均匀性为 0.942±0.009、0.949±0.056、0.900±0.023，空间分辨率均为 5Lp/cm 及以上，低对比度分辨率均为可见孔径为 4mm，孔深为 0.5mm 的孔，层厚分别为 5.250±0.178mm、5.098±0.130、5.219±0.150，纵横比分别为 0.996±0.003、0.997±0.002、0.996±0.002，所有指标均满足现行检测标准的要求；其中信噪比均远远高于国家标准(≥100)，且不同厂家、不同型号的差别较大；图像均匀性均高于国家标准（≥85%），相同厂家的比较接近，不同厂家的有所差别。**结论：**通过对 3.0T MRI 进行信噪

比、图像均匀性等主要成像参数的评价指标进行检测分析，可及时掌握设备的性能参数，以有效保证磁共振设备的稳定运行。此外，3.0T MRI 的信噪比远远高于国家标准，因此，现行的质量检测方法及标准需要进一步完善，以更好地规范与指导 3.0T 及更高场强的 MRI 的质量控制与质量保证。

PU-3742
双源 CT 在 CTP 结合 CTA 在短暂性脑缺血发作(TIA)患者早期诊断中的应用价值

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摘要： **目的** 研究 CT 灌注成像(CTP)结合 CT 血管成像(CTA)在短暂性脑缺血发作(TIA)患者早期诊断中的应用价值。**方法** 选取 2018 年 2 月～2019 年 5 月我院收治的 TIA 患者 50 例。均进行 CTP、CTA 检查.对比病变侧与健侧(镜像区)局部脑血流(CBF)、局部脑血容量(CBV)及平均通过时间(MTT),分析 CTP、CTA 单独诊断与联合诊断结果，比较 CTP、CTA 单独与联合诊断 TIA 阳性检出率和漏诊率。**结果** 根据 CTP 检查所测的 CBF 值、CBV 值、半影以及梗死核心体积，CTP、CTA 联合诊断 TIA 阳性检出率 93.00%，高于 CTP、CTA 单独诊断,漏诊率 7.00%，能有效提高 TIA 阳性检出率,降低漏诊率。 **结论** CTP 能反应 TIA 患者脑组织血流动力学异常灌注情况, CTP 结合 CTA 诊断 TIA,能有效提高阳性检出率,降低漏诊率.为临床提供更准确的依据。

PU-3743
基于重复扫描原因分析的上腹部 MR 质量控制

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目的：探讨重复扫描记录及原因分析在提高上腹部 MR 图像质量中的应用。
方法：全科 MR 技师对 2019 年 4 月至 2019 年 7 月上腹部 MR 成像时的重复扫描进行记录，指定人员对前一周的记录进行汇总并作原因分类，当周一全科 MR 技师对汇总记录进行原因分析，情景模拟后讨论解决方法；高年资 MR 技师对当月全组技师的上腹部 MR 图像根据统一标准进行评分，评分标准包括：体位设计、抑脂效果、呼吸伪影、其他伪影、增强时机、延迟时间等，根据不同基础病种、年龄、性别做评分分类，质控评分将进行公示，同时对一次性检查成功率和检查耗时进行统计。
结果：①重复扫描记录总数逐月降低；②一次性检查成功率逐月提高；③检查耗时下降明显、单一病种检查成功率有提高；④当月质控平均评分较上月均有提高；⑤同一技师当月质控评分均高于上月。
结论：重复扫描记录能够发现原因，基于重复扫描原因分析的情景模拟及解决方法探讨提高了个人及全科整体的上腹部 MR 图像质量；检查时间的节约，提高了上腹部 MR 成像的一次性检查成功率。

PU-3744

64 排螺旋 CT 在儿童口腔齿科成像中的应用

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探讨 64 排螺旋 CT 全景齿科成像在口腔颌面部疾病中的诊断价值及相对于 X 线口腔全景片的优势，阐述 64 排螺旋 CT 的应用方法。在工作站上利用相关软件对所获数据进行重建，对病灶进行分析，并与 X 线口腔全景片相比较。结果：通过对比，我们发现 64 排螺旋 CT 全景齿科成像展示病变的阳性率、分辨率明显优于 X 线口腔全景片。

PU-3745

CT 四肢关节质量控制规范与优化

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本院每月四肢关节检查占比较少，大概在 4%-6%，但是因为之前未形成统一的质量控制标准，以及大部分四肢关节病因为骨折所致，导致体位设计的出入，造成扫描及后处理差异性较大。目前按照四肢关节操作规范以及专家共识，通过对每月随机抽取的 50 例受检者图像进行质控评分，结合临床医生的要求以及诊断医生的反馈，逐月进行完善优化，找到一套较为合适的质控方案。

将 2018 年 7-12 月以及 2019 年 1-6 月随机抽取的 600 例四肢图像按月分配，每组 50 人。图像采取 100 制，扫描占 40 分，后处理占 60 分。扫描由体位设计、扫描定位像范围、运动伪影、金属异物、噪声以及扫描范围组成，后处理包括重建图像范围、VR、MIP、层厚、重建角度、重建图像的完整性、特殊重建等。图像由本科室高年资技师对图像进行评分。

由于之前四肢关节缺乏统一的扫描及重建要求，2018 年的图像质量评分较低，所以 2019 年的图像进行规范化培训并且纳入个人考评后，2019 年图像较之前得到明显的改观，临床及诊断医生反馈较好。

PU-3746

急诊 CT 中体外异物对诊断影响预估和应用

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摘要：目的： 探讨急诊 CT 中体外异物形成的伪影对 CT 图像的影响，预估其是否影响诊断结果，在图像质量控制和诊断上达到平衡，避免重复 CT 扫描，减少患者痛苦，为病人救治争取时间。方法：1 在我院 2019 年 1 月-2019 年 6 月期间急诊 CT 中，选取 100 例有体外异物的 CT 图像，进行回顾性分析。分别测量 CT 图像中，体外异物的长度或直径、线性伪影的半径、有效干扰半径，CT 值。根据测量异物长度或直径，把异物分为小于 3mm，3-5mm，5mm-10mm, 大于 10mm。根据 CT 值测量，分为金属材料 、混合材料。2 调取相应 CT 扫描序列和诊断报告，评估体外异物产生的伪影，对诊断的影响。结果：在胸腹 CT 图像中金属材料异物小于 3mm，线性伪影半径 0-15mm，有效干扰半径 0-9mm。金属材料异物 3-5mm，线性伪影半径 15-25mm，有效干扰半径 9-15mm。金属材料异物大于 10mm，线性伪影半径大于 50mm，有效干扰半径大于 30mm。结论：1 大于 10mm 的金属异物，如粗项链、吊坠和腰带扣等，其有效干扰半径大于 30mm，其有效干扰范围已可达脏器中部，影响诊

断，应当去除。3-5mm 的金属异物，如电极、钮扣等，其有效干扰 9-15mm，其有效干扰范围可达脏器边缘，对诊断影响较小，尤其对于肥胖患者，影响只到皮下脂肪层，可是适当保留。小于 3mm 的金属异物，如导线、胸钩等，其有效干扰范围只达皮下，基本不影响诊断，适当调整顺直即可。2 头颅由于本身有颅骨干扰，加上金属异物，易行成贯穿性条形伪影，影响诊断，已予以去除。3 混合材料（如导线护套、体外引流管等）虽然 X 线下可见，但其有效干扰半径很小，可以保留，适当顺直即可。

PU-3747

噪音心理建设在 MRI 头颅检查中图像质量控制

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随着医学检查技术的广泛普及，磁共振检查也逐渐成为临床及患者愿意接受的首选影像检查项目，虽说磁共振检查没有辐射，对软组织、神经方面有独有的优势，但是，磁共振检查过程的中的噪音也是不得不引起重视，尤其在进行头颅 MRI 检查中图像质量的主动控制尤为明显，噪音是头颅 MRI 检查图像质量控制中不能忽视的问题。通过对头颅 MRI 检查前患者进行噪音心理建设，消除患者初次行头颅 MRI 检查的恐惧心理，促进检查顺利进行，达到较好的图像效果。结论 MRI 头颅检查前对患者进行噪音心理建设减少头颅 MRI 图像运动伪影，提高头颅 MRI 检查图像质量具有良好的临床意义。

PU-3748

基于微信公众号的科室信息发布平台

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目的：科室内发布实时信息一直采用微信群内信息发送，包括工作安排、工作通知、设备故障反馈与记录，在微信群内查看不便，图片保存时效短，未查看的图片 7 天后将无法再次打开，而且微信聊天信息保存于本地，更换手机后数据迁移繁琐，给日常工作带来了不便。由于在工作中微信的使用场景较多，并且难以要求所有人安装或更换特定软件，所以唯有基于微信这个软件平台的二次开发才能适当解决上述问题。实现方法：注册微信公众号，按照腾讯公司公开的开发者手册实现公众号二次开发。最终结果：在微信公众号里可以通过链接打开程序网页，各种工作通知可以随时发布并查看，在公众号后台程序内可以修改各类信息。结论：通过此次二次开发后，可以方便的解决之前在工作中的各种不便，提高工作效率。

PU-3749

低体质量指数在小肠 CT 增强中的强化值及优化

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探讨低体质量指数在小肠 CT 增强中的强化值以及应用价值。**方法:**回顾性选取 2007 年 9 月-2017 年 11 月期间 186 例在我院行小肠 CT 增强的低体质量指数患者作为本次的研究对象，随机将他们平

均分为对照组和研究组，每组各 93 例。给予所有患者 370 mg/kg 的碘普罗胺，研究组实施 CT 增强扫描，对比剂量为 300 mg/kg，选取 40-65KeV 单能量图像联合 50% ASIR 重建，对照组采用 80Kvp 扫描，对比剂量为 420 mg/kg，联合 50% ASIR 重建，对全部的图像进行主观评价和客观评价、对比两组的辐射剂量，采用独立样本 t 检验比较客观评价，采用 Mann-Whitney U 检验对比两组间总体图像质量的主观评分。**结果:**辐射剂量对比方面，研究组的 DLP、CTD（Ivol）、ED 以及 SSDE 均高于对照组（P＜0.05）；在 40、50 keV 下,研究组噪声值均高于对照组（P＜0.05）；图像质量比较方面，两组主观图像质量对比无明显区别（P＞0.05）。**结论:**对于低体质量患者联合 CT 增强扫描和 ASIR 重建技术进行小肠 CT 增强扫描安全有效，获得图像质量较高，值得在临床上进一步推广。

PU-3750
640 层 CT 低剂量对比剂在肺动脉 CTA 检查中应用价值的研究

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目的:研究 640 层螺旋 CT 低剂量对比剂（碘帕醇）在肺动脉 CTA 检查中的应用价值。方法:选取 2017 年 3 月到 2019 年 2 月在我院行肺动脉 CTA 检查的 112 名患者作为研究对象,年龄及性别不限。应用随机数字表法分为实验组和对照组,各 56 例。其中实验组患者使用 30mL 对比剂,对照组患者使用 65mL 对比剂。比较分析两组患者 CT 图像噪声、对比噪声比、信噪比和主观图像质量及不良（过敏）反应发生情况。结果:两组患者 CT 图像噪声、信噪比、对比噪声比和主观图像质量比较差异无统计学意义(P>0.05)。实验组患者 CT 检查后的不良反应发生率为 6.84%,对照组患者 CT 检查后的不良反应发生率为 41.54%。实验组的不良反应发生率远远低于对照组,差异具有统计学意义(P<0.05)。结论:在肺动脉 CTA 检查中应用低剂量对比剂不影响 CT 图像噪声、信噪比、对比噪声比和主观图像质量,且能降低不良反应发生率,其临床应用价值极佳。

PU-3751
探讨规范化呼吸训练在多层螺旋 CT（MSCT）胸部高分辨（HRCT）检查中的临床应用价值

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探讨规范化呼吸训练在多层螺旋 CT（MSCT）胸部高分辨（HRCT）检查中的临床应用价值。方法 2 名技师分别在 128 层 CT 和 640 层 CT 采集规范化呼吸训练前后的胸部高分辨图像,共 100 例。2 名医师对图像的伪影进行等级评分。使用 t 检验比较规范化呼吸训练前后所采集图像的伪影程度和扫描前的准备时间有无差异。结果在 128 层 CT 上,比较规范化呼吸训练前后伪影等级评分,对于中、下肺区,P 值分别为 0.017 和 0.003,具有统计学意义；而上肺区没有统计学差异。在 640 层 CT 上,规范化呼吸训练前后在上、中、下肺区图像伪影等级评分均没有统计学差异。在 128 层 CT 和 640 层 CT 上,比较规范化呼吸训练前后扫描前准备时间,P 值均〈0.05,无统计学意义。结论在 640 层 CT 的胸部 HRCT 检查中,对于中、下肺区,规范化呼吸训练能明显减少呼吸运动伪影,改善图像质量；同时规范化呼吸训练并未增加扫描之前的准备时间。

PU-3752

Research status of methods to improve the quality of CTA image reconstructed from CTP raw data

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Many patients with cerebrovascular diseases must undergo CTP and CTA to evaluate their intracranial perfusion and vascular status. Repeated examinations are a burden to patients and consume medical resources. CTA images can be reconstructed from CTP raw data. However, due to the CTP scanning layer thickness and reconstruction technology, the quality of CTA images which reconstructed from CTP raw data is not good enough to provide appropriate images for clinical diagnosis and treatment. This paper reviews the methods used to obtain higher quality intracranial CTA images from CTP post-processing, which is of great significance for reducing the number of examinations and optimizing clinical diagnosis.

PU-3753

前列腺癌 MR 定性诊断规范化流程探索

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目的：探索对临床疑诊前列腺癌患者进行 MR 定性诊断的规范化流程。
材料和方法：回顾性收集 2013 年 10 月～2016 年 10 月因临床疑诊前列腺癌，申请前列腺 MR 检查的病例共 320 例。整理、统计其临床资料、扫描序列及参数、图像质量、报告结果、超声引导下穿刺活检病理、手术、出院诊断及随访结果。通过全面分析、比较，总结前列腺 MR 定性诊断规范化流程。
结果：前列腺癌 MR 定性诊断规范化流程包括检查适应征、检查前准备、检查方案、规范化报告、影像病理对照及随访五个步骤。检查适应症为：因临床症状、PSA 升高、超声发现异常回声、直肠指诊异常等疑诊前列腺癌；检查前准备：肠道准备及 MR 通用准备；检查方案：前列腺癌专用方案核心为轴位 T2WI、高 B 值 DWI、动态增强（DCE）均行小 FOV 高分辨扫描；规范化报告要求对前列腺进行 PI-RADS 评分；MR 检查与检查后超声引导下穿刺活检、手术、随访进行影像病理对照。
结论：前列腺 MR 定性诊断规范化流程相较普通盆腔 MR 可显著提高前列腺 MR 定性诊断效能，应作为前列腺癌 MR 基本规范推广于临床。

PU-3754

宽体探测器在颅脑 CTA 的临床应用及辐射剂量的探讨

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目的：比较宽体探测器采用容积(Volume)扫描模式和螺旋(Helical)扫描模式在颅脑 CTA 检查中的图像质量和辐射剂量，探讨两种扫描模式的临床应用价值。**方法：**对比性分析本院 2019 年 1 月至

2019 年 6 月 40 例行头颅 CT 血管成像的病例，采用东芝 Aquilion ONE 640 层 CT 机进行扫描，扫描条件：120kV，Auto mA，rot.0.5s，FOV160mm，层厚、层间距 1mm，保持其他扫描条件不变，改变扫描模式，其中 A 组采用容积扫描模式 20 例，B 组螺旋扫描模式 20 例。采用造影剂追踪技术，感兴趣区置于颈内动脉，阈值 100-120HU。测量两组图像颅内动脉主要分支的 CT 值，记录两组图像的 CT 剂量指数（CTDI）和 CT 剂量长度乘积（DLP），并计算有效剂量（ED），采用两独立样本的 t 检验对 A、B 两组图像进行比较分析。通过 Vitra 后处理软件对图像进行重建，方法包括：多平面重组（MPR）、最大密度投影（MIP）、容积再现（VR）和表面遮盖技术（SSD）等。**结果：**A、B 两组扫描模式的图像均能清晰显示颅内动脉主要分支，各分支平均 CT 值均达 450HU 或以上，符合临床诊断要求，诊断信息评分无差异（P>0.05）。A 组有效剂量（ED）为（0.93±0.24）mSv，B 组为（1.67±0.82）mSv，A 组较 B 组辐射剂量降低约 45%，差异有统计学意义（P<0.05）。其他条件不变，相同扫描范围（FOV=160mm），A 组曝光时间为 0.5s，B 组曝光时间为 5s，A 组患者检查受照时间更短，辐射有效剂量（ED）更少。**结论：**应用容积扫描模式可在剂量减少约 45%的扫描条件下获得满足临床诊断要求的颅内动脉图像，且扫描时间短，减少了扫描时间，降低了患者的受照辐射，能够符合防护的最优化原则。

PU-3755

DR 影像的特点及临床应用

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摘要:目的:对直接数字化 x 线摄影(DR)应用与临床的相关优势进行分析。方法:选取我院于 2013 年 7 月至 2015 年 7 月 期间经 X 射线检查的 1200 例患者为研究对象，根据相关标准，对三片率进行统计。结果:统计三片率为甲级占 95.00%、乙 级占 3.25%、废片占 1.25%。结论:DR 数字化影像技术具有曝光时间短、操作简单、诊断准确度高的优势特征，在临床上的 应用前景非常广阔。

PU-3756

门脉 CT 成像的图像质量控制

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目的：探讨使用小剂量测试法及经验法对门脉 CT 成像图像质量的影响
材料与方法：将于 64 排 GE CT 行门脉 CT 成像检查的且体质量指数 19≤BMI≤25.0kg/m2 的患者 80 例，随机分为 A,B 组，每组各 35 例。A 组采用经验法，B 组采用小剂量团注测试法，测量门静脉 CT 值达峰时间，并设置达峰时间触发扫描；两组其余扫描参数一致:管电压 120kV，管电流 250mAs，对比剂浓度 370mol/ml，对比剂剂量 1.5ml/kg。由两名高年资诊断医师使用双盲法以统一标准对图像质量进行主观评分，图像质量客观评价指标包括门静脉 CT 值、信噪比(SNR)。使用 SPSS 20.0 软件对计量资料进行统计分析，对 CT 值、信噪比及主观评分使用独立样本 t 检验，对两名诊断医师进行一致性检验，确认各参数有无统计学差异，P＞0.05，差异无统计学意义，P＜0.05，差异有统计学意义。
结果：A 组图像质量评分（3.87±0.56），B 组图像质量评分（3.96±0.47），两者（P＞0.05）差异无统计学意义；A 组 CT 值为 189±22.3，B 组 CT 值为 232±17.6，两者（P＜0.05）差异有统计

学意义；A 组信噪比 35.7±11.7 ,B 组信噪比 36.2±11.5，两者（P＞0.05）差异无统计学意义；两名诊断医师一致性高。
结论：小剂量测试法在门脉的 CT 检查中对门脉的显示能力优于经验法，在对门脉显示要求较高的检查中，应作为首选的方案。

PU-3757
医院必须重视 CT 检查的辐射安全和防护工作

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在科学技术日新月异的今天，CT 已经成为现代化医院的标配；在医院里接受 CT 检查的患者越来越多，作为有辐射伤害的一种检查手段，CT 检查期间的辐射安全和防护问题迫切需要关注和规范；医院至少应该从正确的选型与安装、科学的使用和合理防护三个方面做好辐射安全和防护工作。

PU-3758
XCY2002—1/200 型野战 X 线诊断车展开及伪装训练实践与思考

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目的：比较不同训练方法展开及伪装野战 X 线车的时间，探讨改良法在野战 X 线诊断车快速展开及伪装的应用价值。
方法：记录双人协作传统操作流程展开及伪装时间，另记录双人协作改良法野战 X 线车展开计伪装时间，比较分析两者间差异。
结果：改良法较传统法明显减少 X 线车展开及伪装花费时间，极大提高了效率。
结论：改良法能够快速展开并伪装野战 X 线车，大幅减少 X 线车展开时间，对于提升野战 X 线车生存能力具有重要意义。

PU-3759
腰椎数字 X 线摄影中曝光指数的回顾性分析

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目的：在数字 X 线摄影中，曝光指数（Exposure index，EXI）作为一种反映平板探测器对相关图像区域所受辐射剂量的响应测量方法，理论上与 DR 图像的信噪比成正比关系，与图像质量密切相关。本研究调查了一组连续的站立位腰椎数字 X 线摄影 EXI 值，对数据进行分析，以探讨 EXI 的实际意义。**方法：**回顾性收集 2019 年 5 月-7 月在我院西门子 DR 系统（型号 YSIO FLUOROSPOT Compact）上拍摄的腰椎正、侧、斜位及过伸过屈位片连续病例图像，记录图像信息中的物理 EXI 和临床 EXI 等数值，对性别、有无内固定、不同体厚和曝光野等情况下的差异进行比较，并作 mAs 与 EXI 的相关性分析。**结果：**本研究共纳入腰椎 X 线摄片 405 例，计算腰椎六个方位的临床 EXI 均值，男女性 EXI 分别为 391±121 ，381±110，差异存在统计学意义（t=2.05，P＜0.05）；有内固定与无内固定者 EXI 分别为 427±147，385±115，差异存在统计学意义（t=2.67，P=0.01）；

体厚较大与较小者 EXI 分别为 332±74，302±67，差异存在统计学意义（t=3.01，P=0.00）；大曝光野与小曝光野 EXI 分别为 441±124，359±99，差异存在统计学意义（t=11.66，P=0.00）；mAs 与临床 EXI 无相关（ρ=0.065，P=0.355），mAs 与物理 EXI 亦无相关（ρ=0.148，P=0.034）。**结论：**尽管曝光指数与管电流量成正比的理论与实际并不相符，但不同临床情况下 EXI 的差异变化符合数字 X 线摄影原理，有助于 DR 图像质量的客观评价。

PU-3760
颈椎数字 X 线摄影中自动曝光控制的适用性评价

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目的：颈椎 X 线摄影检查是颈椎病常用的影像手段，尤其是功能位摄片在评价椎体失稳方面有着重要作用。在曝光参数选择时为减少对操作者个人经验的依赖，通常会应用自动曝光控制（Automatic exposure control，AEC）技术来消除受检者个体差异对图像质量的影响，可实际上颈椎各方位的数字 X 线摄影图像质量却参差不齐。本研究回顾了颈椎各方位数字 X 线摄影应用 AEC 后获得的相关曝光参数，旨在对 AEC 的适用性进行评价。**方法：**回顾性收集 2019 年 5 月-7 月在我院西门子 DR 系统（型号 YSIO FLUOROSPOT Compact）上拍摄的颈椎正、侧、斜位及过伸过屈位片，由 2 名 3 年工作经验的放射诊断医师对图像质量进行评分，并记录图像信息中的管电流量。**结果：**本研究共纳入站立位颈椎 X 线摄片 69 例。颈椎正位、左侧位、过屈位、过伸位、左斜位及右斜位的 mAs 变异系数分别为 28%、32%、33%、38%、38%；颈椎左侧位与过屈位、左侧位与过伸位、过伸位与过屈位、左斜位与右斜位质量评分的 ICCs 分别为 0.047、0.014、-0.147 及 0.293。**结论：**在颈椎数字 X 线摄影中应用 AEC 时，侧位与功能位 mAs 值的变异系数均大于前后位，导致图像质量差异较大。提示临床上必须规范使用 AEC，必要时对传统 AEC 技术进行改进或寻求更可靠的 AEC 替代技术。

PU-3761
陈旧性 CR 在新生儿 PICC 床旁摄片辐射剂量及图像质量权衡

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摘要: 目的：探讨陈旧性 CR 在新生儿 PICC 床旁摄片应用中，辐射剂量与图像质量的权重。

方法：随机抽取 2018 年新生儿 PICC 床旁摄片 50 例为 A 组，条件为 1.8~2.0mA s，40~42 kV；2019 年改变剂量拍摄新生儿 PICC 床旁胸片 50 例为 B 组，条件为 2.4~3.0mA s，42~44 kV 进行比对。新生儿均为出生 5±4 天，体重 1.38±0.5，设备为东芝 CR 已使用 15 年+，IP 板 8 年+。

结果：B 组图像质量优于 A 组，PICC 位置清晰可见层次清晰度比较高，具有统计学意义。辐射剂量增加 5%，无统计学意义。

结论：随着科学的不断发展，床旁设备也在日益更迭，但由于客观条件的限制，很多陈旧性设备依旧在使用且占有重要的地位。对图像质量及诊断带来了严峻的考验。本次研究在满足临床诊断的前提下，较好的权衡了图像质量与辐射剂量，为临床在新生儿 PICC 插管提供信息量多、图像质量高的影像。

PU-3762

冈上肌出口位的摄影方法改良

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目的:探讨冈上肌出口位的摄影方法及技巧,及其在临床的应用价值。方法:对常规冈上肌出口位摄影方法进行改良、简化,采取后前位水平投照的方法,对 100 例因肩关节疼痛或外伤的患者拍摄冈上肌出口位片,并加以分析。结果:肩胛骨侧位投影成一明显"Y"字,肩峰形态、骨质结构显示清晰;肩峰分为三型:扁平型(Ⅰ型),弯曲型(Ⅱ型)和钩型(Ⅲ型)。90 例非外伤患者中,Ⅰ型 23 例(26%),Ⅱ型 32 例(35%),Ⅲ型 35 例(39%);20 例外伤患者中 10 例可见骨折或脱位征象。结论:对冈上肌出口位摄影方法的改良、简化是适用的,能达到临床诊断的目的;冈上肌出口位摄片对肩峰下撞击综合征的诊断具有重要参考价值,对外伤所致的肩关节骨折或脱位的诊断也有临床应用价值。

PU-3763

碘对比剂对 CT 检查辐射生物学效应影响的初步研究

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目的 评估碘对比剂对 CT 检查辐射效应的影响。**方法** 60 例怀疑泌尿道系统疾病而准备行 CT 泌尿道造影（computed tomography urography，CTU）的患者随机分为对照组和实验组。对照组使用常规法 CTU 检查（平扫、皮质期、髓质期和排泄期），第 1 次仅腹部 CT 平扫，3 天后补充其他三期增强扫描；实验组使用分次注射法 CTU 检查（平扫、实质-排泄期），第 1 次行分次注射增强扫描（实质-排泄期），3 天后补充平扫。两组患者第 1 次 CT 扫描前后 10 分钟内各抽取一次外周静脉血 2ml，分离淋巴细胞，使用免疫荧光法计数外周静脉血内淋巴细胞核的γH2AX 焦点数目。对照分析两组患者第一次扫描的辐射剂量和扫描前后外周静脉血内淋巴细胞核内γH2AX 焦点数目的差异。**结果** 共 50 例患者顺利完成 CT 扫描和免疫荧光法γH2AX 焦点数测定（对照组 24 例，实验组 26 例），对照组和实验组患者第一次 CT 扫描所接受的辐射剂量分别为(4.83±1.88)和(4.55±1.66) mSv，差异无统计学意义（t=0.56 P=0.58）。扫描前后外周静脉血内淋巴细胞内平均γH2AX 焦点数分别为（0.06±0.02，1.06±0.27）和（0.06±0.03，1.42±0.50）个，差值为（0.97±0.23）和（1.34±0.41）个，差异有统计学意义（t=-3.25，P=0.00），实验组焦点增多量较对照组高 38.14%。两组患者扫描前后的γH2AX 焦点变化受性别影响差异无统计学意义，但受年龄影响差异有统计学意义。**结论** 碘对比剂的存在可在一定程度上增加 CT 辐射引起的外周血淋巴细胞 DNA 损伤，建议临床工作中应尽可能降低碘对比剂使用的浓度和总碘量，以降低机体的损伤。

PU-3764

低浓度碘对比剂用于降低 CT 泌尿道造影的辐射生物学效应的可行性研究

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目的 评估低浓度碘对比剂用于降低 CT 泌尿道系造影（Computed Tomography Urography，CTU）辐射生物学效应的可行性。**方法** 58 例临床怀疑泌尿道系统疾病而准备行 CTU 检查的患者随机分为对照组和实验组。两组均使用分次注射法 CTU 检查，对照组使用常规对比剂 CTU 检查（350 mg I／ml，100ml）；实验组使用低浓度碘对比剂 CTU 检查（270 mgI/ ml，100ml)。CT 检查前后 10 分钟内各抽取一次外周静脉血 2ml，分离淋巴细胞，记录两组的平均辐射剂量，用免疫荧光法测定外周静脉血内淋巴细胞核内γH2AX 焦点数目。对照分析两组患者扫描前后外周静脉血内淋巴细胞 DNA 损伤的差异。**结果** 共 51 例患者顺利完成检查（对照组 25 例，实验组 26 例），对照组和实验组 CT 扫描前后外周静脉血内每个淋巴细胞γH2AX 焦点数分别为（0.058±0.028，2.549±0.904）和（0.064±0.020，1.878±0.469）个，差值为（2.490±0.887）和（1.814±0.452）个，差异有统计学意义（t=-3.617，P=0.001），实验组焦点较对照组降低了 37.26%。**结论** 低浓度碘对比剂可降低 CTU 检查时辐射导致的 DNA 损伤，临床工作中推荐尽可能使用低浓度碘对比剂 CTU 检查。

PU-3765

联影 uCT 低剂量 CT 技术的临床应用研究

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目的：探讨低剂量 CT 在胸部体检中如何降低患者所受辐射剂量的临床应用研究。**方法：**从本单位职工体检中随机选取年龄在 24-35 岁体检患者 50 例。随机分为 AB 两组，研究 A 组使用联影 uCT 的 uDose®智能 mA 技术，自动 mA 设置范围 14-110mA,研究 B 组使用固定毫安 50mA,其余扫描参数与 A 组相同。记录每一位患者的 CT 容积剂量指数（CTDIvol）和剂量长度乘积（DLP）值，计算 ED。由两名诊断组副主任医师对两组患者的 CT 结果进行随机取样分析，图像质量分为优良差三级。同时，对两组图像的肺尖层面、主动脉弓层面、肺动脉开口层面、肺底层面进行噪声测量，所有数据记录 Excel，分析采用 SPSS3.0。**结果：**2 组图像质量评级分别为 A 组：优 0 例、良 25 例、差 0 例；B 组：优 0 例、良 21 例、差 4 例。测量 A 组图像噪声为：肺尖层面（16.77±1.37）、主动脉弓层面（15.56±1.22）、肺动脉开口层面（15.05±1.03）、肺底层面（21.32±1.53）；测量 B 组图像噪声为：肺尖层面（18.78±1.41）、主动脉弓层面（16.96±1.12）、肺动脉开口层面（17.88±1.24）、肺底层面（25.57±1.81）。研究 A 组 CTDIvol 为（2.51）mGy，ED 为（1.30±0.14）mSv；研究 B 组 CTDIvol 为（1.81）mGy，ED 为（0.85±0.57）mSv。两组 t 值比较 age t=1.345，P=0.171，CTDI t=5.713（P＜0.001），DLP t=6.371（P＜0.001），ED t=6.371（P＜0.001）。**结论：**使用联影 uCT 的 uDose®智能 mA 技术进行检查的患者，ED 低于使用固定毫安组的患者，图像质量也优于固定毫安组。联影 uCT 的 uDose®智能 mA 技术更适合用于低剂量胸部 CT 体检。

PU-3766

飞利浦 256 层螺旋 CT 头颈胸腹联合血管成像方案的探讨

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目的：临床上经常有部分患者需要同时进行头颈部 CTA、胸部 CTPA、腹部 CTA、主动脉 CTA 以及各部位的常规增强。为了保证图像质量，一般这种患者都是进行逐项检查，检查费用较高，检查时间长，辐射剂量大，对比剂使用多且副反应发生率高。基于此，笔者设置了头颈胸腹联合血管成像方案，目的是一次性完成检查，降低检查费用，减少辐射剂量。**方法：**方案分置为定位、平扫、监测、头颈胸腹联合 CTA、静脉期扫描五个序列，扫描范围自颅定到耻骨下缘，扫描参数：120KV、150-450mAs 自动毫安秒技术、0.984:1 螺距、0.625mm 薄层重建；右肘静脉注射 370mgI/ml 非离子造影剂 75~95ml，速率 5ml/s，40~60ml0.9%生理盐水冲管。监测层面设为主动脉弓层面，监测前延迟 5s 后开始监测，阈值 150HU 自动触发，触发后扫描前延时 6~8s，静脉期延迟 25~35s。扫描头颈胸腹联合 CTA 时期相当于注射造影剂后 15~25s，静脉期相当于造影剂注射后 65~80s。**结果：**共记录 8 例患者扫描结果，所有患者均一次性完成检查。检查图像横断面层次分明，基底动脉、肺动脉、肺静脉、主动脉弓、髂总动脉的动脉期 CT 值分别为 350±50HU、300±90HU、330±60HU、400±50HU、350±50HU；血管与周围组织界限清晰可辨，与常规 CTA 检查结果无明显差异；不足之处是双上肢及腔静脉毗邻处存在部分伪影干扰，且有少数患者肺动脉显影较淡。**结论：**大部分行行头颈部 CTA 加主动脉 CTA 的患者主要是观察夹层或者动脉瘤的情况，对于这部分患者行此扫描方案能完全达到诊断目的，但对于主要想观察肺部血管的患者部分患者图像质量上存在一定的不足；但此方案所需的检查时间及检查费用相对于逐项检查有明显的优势，且辐射剂量总 DLP 也从逐项检查的总 6000mGy_cm 降至 3000±500mGy_cm，仍可以认为是一种理想的检查方法。

PU-3767

颈椎和腰椎数字 X 线摄影的目标曝光指数

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目的：数字 X 线摄影中的曝光指数（Exposure index，EXI），如同屏-片成像系统中胶片密度信息，反馈给放射技师用来判断到达平板探测器的曝光量是否合适。AAPM TG116 建议将偏差指数用于 DR 图像的质量管理，而根据偏差指数公式要求，应先行获得厂家或用户制定的目标 EXI 表。目前各厂家给出的目标 EXI 并未得到临床认可，用户应根据不同诊断任务自行制定目标 EXI 表。本文通过规范化操作得到一组较为标准的站立位颈椎和腰椎数字 X 线摄影图像，求出各方位摄影的目标 EXI，旨在为其他用户制定目标 EXI 表提供一些经验和借鉴。**方法：**回顾性收集 2019 年 7 月 1 日至 30 月在我院西门子 DR 系统（型号 YSIO FLUOROSPOT Compact）上拍摄的颈椎和腰椎正、侧、斜位及过伸过屈位片，由 2 名 3 年工作经验的放射诊断医师对图像质量进行评分，并记录图像信息中的临床 EXI 值，将求得的均值作为目标 EXI。**结果：**图像质量符合诊断要求的腰椎 X 线摄影 200 例，颈椎 77 例纳入统计。腰椎前后位、左侧位、前屈位、后伸位、左斜位和右斜位的 EXI 分别为 525±97、316±72、350±72、340±76、475±111、461±104。颈椎前后位、左侧位、前屈位、后伸位、左斜位和右斜位的 EXI 分别为 169±26、97±19、80±19、102±27、105±27、103±29。**结论：**由于受数字 X 线摄影过程中多种因素的影响，求均值得到的目标 EXI 不能直接用于偏差指数的计算，建议根据经典理论和用户经验适当修正数据后，制定各型号 DR 设备曝光条件协议的目标 EXI 表。

PU-3768

自动曝光控制在腰椎内固定术后数字 X 线摄影中的应用评价

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目的：自动曝光控制（Automatic exposure control，AEC）技术，可以个性化地精确控制透过被照体达到成像介质的 X 线曝光量而获得稳定的图像质量，在各部位的数字化 X 线摄影（Digital radiography，DR）中得到广泛应用。但由于 AEC 技术原理上的局限，在一些特殊临床情况中使用 AEC 仍需要进一步规范。本文回顾调查了站立位腰椎 DR 中有无内固定植入物两种情况的管电流量、剂量面积乘积（Dose area product，DAP），旨在对 AEC 的合理使用进行探讨。
材料与方法：收集 2019 年 5 月-6 月在我院西门子 DR 系统（型号 YSIO FLUOROSPOT Compact）上拍摄的站立位腰椎正位和侧位片，查看是否存在金属内固定植入物，并记录图像信息中的 mAs 和 DAP，比较其差异。
结果：本研究共纳入站立位腰椎 DR 中金属内固定植入者 108 例，无内固定者 401 例。有内固定与无内固定植入者的 mAs 分别为 71±34，64±29，差异有统计学意义（t=2.18，P＜0.005）。有内固定与无内固定植入者的 DAP 分别为 225±103，198±102，差异有统计学意义（t=2.49，P＜0.005）。
结论：腰椎内固定植入术后进行 DR 随访时，采用 AEC 技术可能导致不必要的高 mAs，并存在增加患者辐射剂量的风险，违背了 ARALA 原则。在 AEC 技术局限未突破前，推荐优先使用经过临床验证和认可的手动摄影曝光参数。

PU-3769
改进护理工作流程对提高护理工作效率的临床意义

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目的 分析目前放射诊断科护理工作流程中存在的问题，根据问题改进护理工作流程，提高护理工作效率。**方法**：对护理制度加以完善，相关流程进行优化，护理人员职责进一步明确，比较流程改进前后一名增强检查患者的穿刺时间、每日增强检查患者的穿刺数目及患者的满意度。**结果** 实施 1 年后，一名增强检查患者的静脉穿刺时间短于实施前，差异有统计学意义（P〈0.05）；每日增强检查患者的穿刺数目大于实施前，差异有统计学意义（P〈0.05）；患者对护理工作的满意度较实施前提高了 12.7%。**结论** 工作流程的改进对提高放射诊断科护理工作效率具有临床价值，可在临床推广应用。

PU-3770
前瞻性护理与改良扫描法在 COPD 患者胸部 CT 检查中的应用

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慢性阻塞性肺疾病（chronic obstructive pulmonarysease，COPD） 是一种严重威胁身体健康和生命安全的肺部最常见疾病，其发生率较高，仅次于心脑血管病与恶性肿瘤[1]，临床症状较严重，肺、心脏及肾脏等多个脏器的影响较大，发病率伴随环境污染的加重，社会人口结构的变化，肺部慢性病变发病率逐渐增加，是临床常见的危重症，常并发Ⅱ型呼吸衰竭，主要是肺通气和换气功能发生障碍，促使重症Ⅱ型呼吸衰竭的死亡率明显升高[2]，COPD 患者多系老年人，由于肺功能较差，在进行 CT 扫描时无法较长时间的屏气，往往在扫描后 1/3 或 1/2 时段就出现屏气不良、腹部

出现抖动，致使所扫描区域图像出现运动性伪影，影响病变的分析判断。我们采取有效的护理干预和改良这类患者的胸部扫描技术，较好的避免了扫描过程中屏气不良的影响，增加了图像的清晰度，确保了诊断质量。

PU-3771
人工智能技术在影像护理管理中的应用与展望

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目的 人工智能技术在影像医学领域的研究越来越深入，应用前景广阔，这必将给影像医学及护理的发展带来新的推动力。本文将结合国内外人工智能研究和应用现况，将人工智能技术与影像医疗护理专业相结合，论述人工智能在影像医疗护理中应用的优势，在碘对比剂外渗护理管理中的应用现状，并对其研发和应用前景进行展望。**方法** 从人工智能技术的发展及现状出发，综述人工智能技术与影像医疗护理相结合的概况，探讨影像医疗碘对比剂外渗护理管理中的相关因素，具体分析国内外人工智能技术在影像医疗碘对比剂外渗患者护理管理中的应用研究进展，并综合分析目前人工智能技术在影像医疗护理领域应用过程中所面临的挑战和不足。**结果** 基于人工智能技术在影像医疗护理领域各方面的研究进展和运用现状，从人工智能技术的特点及优势、增强 CT 检查前初步评估、缓解护理人力资源紧张、护理模式重构等方面分别阐述了目前人工智能技术的研究及应用情况。**结论** 通过人工智能的辅助，可以提高判断碘对比剂外渗的及时性，提高 CT 检查的效果，降低医护人员劳动强度，减少影像医护人员的辐射。尽管目前人工智能技术尚未在临床上广泛应用，但随着技术的不断完善和发展，相信人工智能将给影像科护理带来新一轮的技术革新，促进影像护理飞速发展，助力影像医疗碘对比剂外渗护理管理的建设和发展。

PU-3772
开展职业生涯规划教育对护理专业学员挫折教育情境现状及影响因素的调查分析

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摘要：临床护理技术性实践工作，是贯穿整个临床护理专业教学中重要的组成部分，也是临床护理专业学生在巩固与加强理论知识的同时，培养其具有独立工作能力的一个重要性阶段。这是继学校理论知识教育的深化和延续，但在现实培养教育工作中，医学临床护理专业教学质量受到来自多方面因素的影响。通过本调查研究分析发现，临床护理专业学生自身的理论知识储备量，以及临床带教老师专业性技能的熟练程度和患者所具有的个人素质等多方面因素，这些都有可能会影响到临床护理专业教学中的整体质量，所以要针对这些特定性因素，如何在日常的临床实践工作中去加强人文关怀？如何正确引导临床护理专业学生的学习态度？又如何去给临床护理专业实习学生们创造更多的临床实践机会？这些都是当前在临床教学工作中所要面对的新问题，在深化理论知识学习的同时应加强临床一线师资队伍的建设，完善优化临床教学方法，将有效提高临床护理带教工作的质量。

PU-3773
肿瘤患者颈外静脉高压注射碘对比剂的精细化管理

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目的：肿瘤患者由于长期放疗、化疗使外周静脉破坏严重，血管壁硬化，对外周静脉穿刺特困难的患者行颈外静脉穿刺，为肿瘤患者高压注射碘对比剂提供安全有效的增强检查途径。**方法：**选择常规上肢静脉穿刺注射碘对比剂者为对照组(n=100)；颈外静脉穿刺注射碘对比剂为实验组（n=98），实验组为上肢和下肢血管特差、穿刺特别困难者。颈外静脉穿刺的精细化管理方法有：严密评估患者心肺功能、仔细静脉评估、掌握正确穿刺方法、缩短等待检查时间、严格试注水、精确把握碘对比剂剂量、注射速率等。**结果：**对照组 3 例穿刺失败，一次穿刺成功率为 97%；实验组全部一次性穿刺成功无渗漏发生；实验组穿刺时间比对照组穿刺时间缩短、对比剂使用总量比对照组少、患者使用对比剂后不适感比对照组少。 **结论：**对血管条件特别差的肿瘤患者选择颈外静脉穿刺并实施精细化管理提高了穿刺成功率，缩短穿刺时间，减轻患者的痛苦，颈外静脉穿刺高压注射增强检查具有重要的临床意义。

PU-3774
肺栓塞患者行肺动脉 CT 血管成像的护理干预效果

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目的 分析肺栓塞患者行肺动脉 CT 血管成像检查过程中的护理特点干预措施。方法 回顾性分析 2017 年 2 月--2019 年 2 月在我院临床确诊或疑似肺动脉栓塞患者 93 例（分别为 43 例和 50 例）的临床资料。结果 造影术前和术中的护理使本组患者肺动脉 CT 血管成像获得满意造影效果，而术后护理有效地预防和控制了源自上述检查的并发症。结论 肺栓塞患者行肺动脉 CT 血管成像的护理要求高于普通 CT 增强检查，需强化对患者的观察，采取预见性、针对性的护理干预措施，确保患者高质量地完成检查。

PU-3775
碘克沙醇 CT 增强扫描致迟发型不良反应分析

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目的：探讨 CT 增强扫描检查中使用碘克沙醇对比剂迟发型不良反应的危险因素。**方法：**统计分析 2019 年 4 月使用碘克沙醇对比剂发生迟发型不良反应患者的资料、碘克沙醇使用方法、不良反应表现、不良反应发生时间。**结果：**使用碘克沙醇对比剂行 CT 增强扫描 5 例患者发生中度迟发型不良反应，发生不良反应时间均在注射碘克沙醇后 6-8h。**结论：**碘克沙醇迟发型不良反应发生率低，但是对于首次使用碘对比剂的患者应高度重视迟发型不良反应的发生，适当延长不良反应观察时间。

PU-3776

1 例高龄肝癌合并房颤患者行全麻 CT 引导下射频消融术的围手术期护理

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【摘要】总结 1 例高龄肝癌合并房颤患者行全麻 CT 引导下射频消融术的围手术期护理经验。护理要点包括：重视术前检查及合并症处理，进行有效的心理干预；密切术中护理配合和患者观察；做好术后一般护理、临时起搏器护理，加强并发症预防和处理。经过精心的治疗与护理，患者恢复良好，术后第 5 天出院。

PU-3777

18F-PSMA PET/CT 检查前列腺癌的护理配合

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目的：探讨 ^{18}F-PSMA PET/CT 检查前列腺癌的具体护理措施，规范检查护理程序 ,保证检查图像质量。方法：回顾性分析 68 例 ^{18}F-PSMA PET/CT 检查前列腺癌患者的护理经验和体会，提出了具体的护理措施，规范 ^{18}F-PSMA PET/CT 检查护理程序。结果：通过预约时的接诊护理、患者及家属的心理护理，检查前护理配合、注射药物前后的护理及健康教育，67 例顺利完成检查，其中 66 例图像显示清楚，符合诊断要求，1 例因饮水不足图像质量不合格；1 例因酒精过敏无法完成检查。结论：本检查需要工作人员严格掌握检查的适应症及禁忌症，对患者做好有关检查前、中、后注意事项的解释工作和心理护理，共同积极配合，是顺利完成检查和获得高质量图像的重要保证。

PU-3778

碘对比剂致过敏性休克 3 例病例分析

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目的:探讨碘对比剂致过敏性休克的特点、防范措施以及抢救流程。**方法**：对 3 例 CT 增强检查患者静脉注射碘对比剂注射液后发生过敏性休克的抢救过程进行回顾性分析。**结果**：我们按常规严密观察患者使用对比剂后的不良反应，及时发现，医、技、护立即启用应急议案，按急救流程争分夺秒抢救，患者转危为安。**结论**：在使用碘对比剂的过程中应严密观察使用者的药物不良反应，备齐急救药品和急救器材，处于备用状态，掌握急救技能，出现过敏性休克，当班的医、技、护应各负其责、齐心协力抢救病人，才能取得成功。

PU-3779

护理风险预警管理在介入手术中的应用效果

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【摘要】目的：探讨护理风险预警管理在介入手术中的应用效果。方法：通过分析 2016 年 8 月至 2017 年 8 月介入手术中护理管理存在的风险因素，没有进行护理风险预警管理，实施护理风险预警管理前患者 246 例；2017 年 9 月至 2018 年 9 月采取护理风险预警管理，实施护理风险预警管理后的患者 246 例。观察实施护理风险预警管理前后介入手术室护理管理改善情况。结果：护理风险预警管理使用后，介入手术风险因素、介入术中意外事故发生率及手术医生对房间护士测评结果比较均优于实施前（P＜ 0.05）。结论：护理风险预警管理在介入手术配合中的应用效果显著，可以很好地改善发生护理管理风险的比例，减少介入手术护理风险的存在，具有重要临床意义。

PU-3780

对比剂不良反应的预防护理及应急抢救措施

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【摘要】目的：分析放射科对比剂不良反应的预防护理及应急抢救措施。**方法：**选取大连医科大学附属第一医院 2018 年 2 月-12 月期间采用增强扫描检查且使用对比剂的急诊患者 88 例，平分为对照组与试验组。对照组为常规告知注意事项组别，试验组为常规告知基础上给予预防护理的组别，比较分析两组患者不良反应的发生率以及在不良反应发生后采取相应应急抢救措施的恢复效果。**结果：**试验组不良反应发生率明显低于对照组，两组中发生不良反应的患者，在采取及时准确的应急抢救措施后，均显示快速、良好、稳定的恢复效果。**结论：**对采用增强扫描的患者进行合理的预防护理和及时的应急抢救措施，不仅能大大降低患者对比剂不良反应的发生率，也能有效改善对比剂不良反应患者的恢复效果。

PU-3781

1 例耐高压留置针夹闭拇指夹回血的护理汇报

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随着医学技术的不断发展，在增强 CT 检查中已广泛使用耐高压静脉留置针外周静脉穿刺。对护理的要求也越来越高，只有注重细节管理才能给病友好的就医体验。现将我科 2019 年 2 月 20 日出现的 1 例耐高压留置针夹闭拇指夹后仍回血的事件进行鱼骨图分析查找原因，采取的对策汇报如下。

PU-3782

泌尿系 MSCT 一站式检查前的护理干预

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目的：泌尿系 MSCT 一站式检查技术也逐渐成熟，通过泌尿系 MSCT 检查的多期扫描，可显示整个尿路系统的全貌、血管、各种病变及肾脏的排泄功能，为临床提供重要的影像学依据。通过检查前的护理干预可使患者更好的配合检查，从而达到提高图像质量，避免重复扫描。
方法：1.泌尿系 MSCT 检查前护理干预要点
（1）心理护理：在进入检查室前，向受检者说明此项检查的意义以及需要配合的事项，告知患者扫描时噪声以及增强后会有发热可能，消除患者紧张焦虑的情绪，取得患者的配合。告知延时扫描会在第一次扫描完成，下床活动 20-30 分钟后进行，消除患者疑虑，避免产生纠纷。
（2）询问受检者一周内是否服用过含重金属的药物及胃肠道钡剂检查，去除检查部位的金属异物。
（3）检查前半小时将膀胱排空，并饮 200-300ML 水,保证检查时膀胱处于中度充盈状态。
训练患者在屏气，讲解屏气的重要性以及对图像质量和诊断的影响；告知扫描时会多次屏气，每次屏气 10S 左右，且每次屏气幅度保持一致。
1.2 收集我院 2019 年 1 月到 6 月，进行泌尿系 MSCT 检查患者 300 名。其中 150 名给予 CT 检查常规准备；另 150 给予常规准备外，还进行泌尿系 MSCT 检查前的护理干预。分析比较两组检查的图像质量和重复扫描情况。
结果：150 名常规准备患者图像质量优 89 例、良 41 例、差 20 例，优片率 59.3%；护理干预后图像质量优 127 例、良 23 例、差 0 例，优片率 84.6%。相比具有显著统计学差异（P＜0.01）。常规准备患重复扫描为 19 例，原因为：患者屏气配合不佳 9 例；膀胱充盈欠佳 7 例，肠道内有钡剂 3 例；护理干预后患者重复扫描为 0 例，相比具有显著统计学意义（P＜0.01）。
结论：在进行泌尿系 MSCT 一站式检查前护理干预，可保证患者有效配合，并顺利完成扫描，得到了更高的图像质量和更准确诊断，提高了患者及家属的满意度，有效的避免重复扫描，使患者接受更低的辐射剂量。

PU-3783

子宫肌瘤介入治疗与护理

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【摘要】：目的：针对临床上子宫肌瘤病症介入治疗的观察以及护理进行了分析总结。方法：依据导管子宫动脉栓塞术进行子宫肌瘤病患治疗的相关临床资料进行分析总结。结果：在术后一个月患者的子宫肌瘤缩小非常明显，术后一年病患者子宫肌瘤基本消失。 结论：通过对子宫肌瘤介入治疗临床观察以及护理能够进一步提升手术的成功率。

PU-3784

标准预防在放射科感染控制的重要性

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目的 ：了解放射科医院感染相关因素，为加强放射科医院感染工作的管理提供可靠依据。
方法

1.资料：放射科是面向全院的重要窗口，是医院感染监控的薄弱环节，人员流量大。所以实施“标准预防”，切断可能引发传染的各个环节，采取切实可行的措施，即可保证就诊者检查服务的安全性，杜绝医源性交叉感染，又能保障医务人员免遭感染。
2.方法：
2.1.1 手卫生 涵义：依据标准预防的规定和诊疗活动的需要，合理配置手卫生设施、持续推动和优化手卫生实践。
2.1.2 流动水洗手设施、洗手池、洗手液、干手设施、速干手消毒液，以及手卫生流程图等。
2.1.3 手卫生宣传、教育和培训
2.1.4 临床科室是手卫生执行的主体部门，日常实施自查与监督管理。
2.1.5 手卫生监测、评估、干预和反馈机制，不断提升医务人员手卫生知识知晓率、手卫生依从性和正确率。
2.2.1 隔离 涵义：针对诊疗过程中出现或者可能出现的感染传播风险，依法、规范地设立有效屏障。
2.2.2 隔离对象分为两类：一类是具有明确或可能的感染传播能力的人员，对其按照感染源进行隔离；另一类是具有获得感染可能的高风险目标人员，对其进行保护性隔离。
2.2.3 在严格标准预防的基础上，按照疾病传播途径和防控级别实施针对性隔离措施。
2.2.4 对隔离措施执行情况进行督查、反馈，并加以持续质量改进。
2.3.1 环境清洁消毒 涵义：对诊疗区域的空气、环境和物体（包括诊疗器械、医疗设备、床单元等）表面，以及地面等实施清洁消毒或新风管理，以防控与环境相关感染的发生和传播。
2.3.2 确定实施环境物表清洁消毒的主体部门及监管部门，明确各部门及相关岗位人员的职责。
2.3.3 规范开展针对诊疗环境物表清洁消毒过程及效果的监测。
结果 放射科医院感染与相关制度缺乏，标准预防不到位相关。
结论 了解放射科医院感染相干因素，重视医务人员院感知识管理培训，提高医务人员感控意识，使院感工作落到实处。

PU-3785

CT 引导下经皮肺穿刺活检术的护理配合及体会

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【摘要】**目的**:总结 CT 引导下经皮肺穿刺活检术的护理体会。**方法**:运用 GE 宝石螺旋 CT 机对 258 例患者进行 CT 引导下经皮肺穿朝活检术的护理配合，进行回顾性分析。**结果**:258 例患者肺穿刺活检均获得成功。做好患者的心理护理，熟练掌握术前、术中、术后的护理是保证成功的关键。**结论**:良好的护理在肺穿刺活检中发辉着重要的作用。

PU-3786

CT 增强检查中对比剂不良反应的预防和护理

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【摘要】
目的：探讨 CT 增强检查中患者对比剂反应的预防和护理。
方法：对我院 10502 例 CT 增强检查患者给予检查全过程、全方位的护理干预。
结果： 10502 例 CT 增强检查患者，均顺利完成检查，其中出现荨麻疹 30 例，轻度呕吐

10 例，均为轻度反应，无中度、重度反应的发生。
结论：对比剂不良反应的预防与护理是影像科室护理工作的重点，通过有序的、全面的、专业的护理，做到检查前充分预防、检查中密切观察，及时发现，及时处理，及时抢救，把专业的护理干预贯穿于 CT 增强检查的全过程，从而使对比剂不良反应的发生率、严重程度降到最低，以保障患者的检查安全。

PU-3787
1 例股青肿型下肢深静脉血栓患者行机械性血栓清除联合导管溶栓的护理

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目的：总结 1 例股青肿型下肢深静脉血栓患者行机械性血栓清除联合导管接触性溶栓的护理经验。方法：对 1 例股青肿患者行 AngioJet 机械性血栓清除联合导管接触性溶栓术，护理要点包括预防肺栓塞的发生、患肢护理、术后并发症的观察与护理、抗凝治疗的护理、溶栓治疗的护理和出院指导等。结果：此例患者手术效果良好，术后 12 天患肢青紫完全消退。患者术后发生了急性肾功能损伤和血红蛋白减少等并发症，经积极治疗和护理，于入院后第 20 天康复出院，随访 1 个月未发生血栓复发和血栓后综合征。结论：机械性血栓清除联合导管接触性溶栓术是治疗股青肿的重要方法，护士应做好围术期护理和病情观察，及时发现并发症。

PU-3788
下肢动脉硬化闭塞症行血管腔内治疗的护理要点

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目的 探讨接受下肢动脉硬化闭塞症血管腔内治疗患者的护理要点。 **方法** 对 89 例下肢动脉硬化闭塞症患者术前、术后的护理进行回顾性分析。**结果** 89 例患者血管腔内治疗后患肢皮肤温度明显改善，麻木症状消失，疼痛症状缓解， 间歇性跛行消失，运动障碍明显改善，坏疽肢体血液再灌注明显，8 例出现术后并发症，其中 6 例再灌注损伤，2 例穿刺部位血肿，占手术的 9.0%。**结论** 血管腔内治疗下肢动脉硬化闭塞症具有微创、操作简单、疗效确切，合理有效的护理可提高手术成功率、有效改善下肢缺血、降低致残率，提高患者的生活质量。

PU-3789
影像科检查流程信息化管理

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目的：建立影像科检查流程信息化管理系统，增强影像检查工作的标准化和规范化，完成并运行自助到检系统，实施无纸化办公流程，提高患者检查速度，减少等候时间。方法：利用先进的信息技术，通过 4G 网、ＷＩＦＩ、无线互联网，集成构建影像检查流程管理框架，绘制各个检查模块

的流程图，在每一个流程的关联活动添加标准化文档，集成流程管理的标准化系统。结果：通过建立智能化检查流程管理系统优化预约系统，实行分时段预约，缩短了病人等候时间，实现标准化成果的可应用、可共享、可优化、可持续。结论：通过信息化的流程管理， 可提高医疗质量和患者的满意度，并大力推动影像学科的快速发展。

PU-3790

探讨放射科护理安全隐患及其防范措施

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［摘要］目的：分析放射科护理安全隐患并探索其防范措施。**方法**：将 2017 年 1 月来我院放射科进行影像检查的 41523 例患者设定为对照组，将 2018 年 1 月 44702 例患者设定为研究组。总结对照组出现的各种护理安全事件并进行回顾性分析，探讨其发生的原因及安全隐患，针对性地制定出有效的防范措施，实施于研究组患者，统计研究组发生的护理安全事件，并加以对比研究。**结果**：研究组差错发生率、意外事件发生率均低于对照组。**结论**：依据放射科发生护理安全隐患的因素进行分析，制定出针对性的防范措施，可以有效地规避安全风险，减少或杜绝医疗差错，提升影像护理安全，提升患者安全。

PU-3791

1 例经导管主动脉瓣置入术患者的护理

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摘　要：目的 探讨 1 例经导管主动脉瓣置入术（TAVI）患者的护理方法。**方法** 分析 1 例患者在围手术期的护理措施，包括：术前评估、麻醉护理、心理护理；术中护理；术后生命体征的监测、穿刺部位的护理及并发症的护理等。**结果** 患者成功置入主动脉瓣，术后恢复良好，症状明显改善，无并发症，顺利出院。**结论** 经股动脉途径的经导管主动脉瓣置入术的患者，创伤小，恢复快，症状改善效果明显，但 TAVI 操作难度大，需要护理团队对患者整个围手术期制定详细护理计划来保障患者安全。

PU-3792

碘造影剂外渗的风险评估及护理对策

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［摘要］ 目的：对患者行碘造影剂外渗的风险评估，探讨恰当的护理措施在 CT 增强检查过程中的应用效果。方法：2019 年 5 月~7 月，对 100 例在我科行 C T 增强检查的住院患者行高压注射外渗的风险评估，并给予恰当的护理措施。结果：为 100 例住院患者行 CT 检查，对其行外渗的风险评估，并给予恰当的护理措施，均无碘造影剂外渗的发生。结论：对 CT 增强检查的患者行外渗的风险评估，并给予恰当的护理措施，能有效的防止外渗的发生，减轻患者的痛苦，提高检查的成功率。

PU-3793

颅内动脉瘤介入治疗的护理

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目的：探讨颅内动脉瘤患者介入治疗的护理措施及效果
方法：回顾性分析 20 例颅内动脉瘤患者介入治疗的临床病例资料
结论：颅内动脉瘤是临床上常见的脑血管疾病之一，颅内动脉瘤是因为局部脑血管由于先天发育不良或后天损伤导致血管动脉壁产生损害逐步形成囊性的膨出，是几何形态、血流动力学和病理生理学三者相互动态作用的结果。绝大多少动脉瘤破裂出血后才得以诊断，而动脉瘤性的蛛网膜下腔出血致死致残率高达 33%—40%。在动脉瘤破裂出血前，约 99%的患者无特殊症状，而随着检查手段如磁共振、CT 等仪器设备及检测手段越来越先进，越来越多的未破裂的动脉瘤被检测出，若患者早期采取积极的治疗及预防措施可预防动脉瘤的破裂，显著的提高生存率和治愈率。而介入治疗具有创伤小、疗效显著、手术并发症少等特点，随着介入治疗技术的成熟，现如今介入治疗已成为颅内动脉瘤治疗的首选方法。
而对于患者来说，病情变化会让他们感到极度的恐慌及焦虑，在期待介入治疗的同时又对治疗效果及手术方式产生疑虑，护士在术前对患者进行心理护理，加强健康宣教，避免一切诱导动脉瘤破裂的危险因素；利用沟通技巧准确的发现患者的心理问题，进行心理疏导，帮助患者克服心理压力，维持情绪稳定，并向患者讲清介入治疗的意义、作用及效果，清除他们紧张、恐惧的心理，增强治疗的勇气和信心，积极配合手术，以良好的心态接受治疗。在术后严密的观察患者的生命体征、意识、瞳孔及四肢活动情况等，进行综合的护理干预，可以进一步降低术后并发症的发生；通过一系列准确、有效的护理措施及护理指导，提高了患者的舒适度，加强了护患之间的交流和理解，很大程度上提高了患者的治疗依从性，提高治疗效果、促进术后康复。实施整体综合护理能够减轻患者紧张、焦虑情绪，为介入手术的顺利进行、术后并发症的积极预防奠定了良好基础，有效的减短了患者的住院日期，有效的避免了并发症的出现，所以综合的护理干预实施具有重要的临床价值。

PU-3794

全程护理干预在提高螺旋 CT 增强扫描护理质量中的应用效果

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目的：分析全程护理干预在提高螺旋 CT 增强扫描护理质量中的应用效果。**方法：**随机挑选螺旋 CT 增强扫描的 100 例患者，时间为 2017 年 8 月至 2018 年 8 月。研究中依照双盲原理将患者分为对照组与观察组，两组患者均 50 例。对照组接受常规护理，观察组患者实行全程护理干预。对照两组患者护理满意度与检查情况。**结果：**统计分析两组患者护理满意度，对照组为 74.0%，低于观察组的 96.0%，检验数据 P<0.05，具有统计学意义；观察两组患者检查时焦虑、不良反应、检查中断发生率，观察组患者各项指标均优于对照组，检验两组患者的各项指标 P<0.05，符合统计学意义。**结论：**患者实行螺旋 CT 检查时，接受全程护理干预可明显提高扫描时护理质量，有助于患者顺利完成检查，应用效果较好。

PU-3795
微信随访对造影剂外渗患者满意度的影响研究

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摘要：［目的］ 探讨微信随访对造影剂外渗患者满意度的影响。 **［方法］** 选取解放军总医院放射诊断科门诊 CT 室增强检查使用造影剂外渗的患者 100 例，按照造影剂外渗先后顺序分为研究组和对照组。对照组病人接受常规健康教育和电话随访， 研究组病人在常规健康教育的基础上接受微信随访。造影剂外渗后 24 小时、48 小时、72 小时对两组病人焦虑程度及患者满意度进行比较。 **［结果］**研究组病人的焦虑程度远低于对照组且患者满意度均高于对照组，差异有统计学意义（Ｐ＝0.002 ）。 **［结论］**微信随访可以提高患者满意度。

PU-3796
症状性慢性颈内动脉闭塞患者行复合手术治疗的护理

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中国人民解放军火箭军特色医学中心

总结 98 例症状性慢性颈内动脉闭塞患者行复合手术治疗的术后护理经验。护理要点：①所有术后患者均入住具有双向监护功能的 PCU，以提供持续监护、及时病情评估和专业的救护；②术后患者血压按照指南进行三级管理模式，分层管理，逐级控制；③应用应用美国国立卫生研究院卒中量表（National Institute of Health stroke scale,NIHSS）及行洼田饮水试验进行动态连续评估及护理干预；④在制动和切口上实施专科联合复合护理；⑤并发症的预见性护理。患者均痊愈出院。

PU-3797
一例原发性肝癌切除联合 TACE 介入治疗患者的护理

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摘要：本文总结了一例原发性肝癌切除联合 TACE 介入治疗患者的护理。肝细胞癌（ hepatocellularCarcmoma，hcc)是世界上最常见恶性肿瘤之一，位列我国癌症死亡原因的第三位[1]。因起病隐匿，患者就诊时大多处于中、晚期，再加上有肝硬化病史及术后复发率高等多种因素，70%-80%的患者需非手术治疗[2]。经过术前充分准备、术中仔细监护、术后精心护理，再配合积极有效的治疗，取得了良好的疗效和满意的临床效果，现将有关情况报告如下。

PU-3798
1 例下腹部 CT 增强检查并发对比剂脑病的相关因素分析及预防

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目的：对比剂脑病是一种较少见的对比剂不良反应，据报道其导致神经系统结构或功能短暂、可逆性异常，出现一系列神经系统表现，多为短暂性，部分患者症状加重甚至死亡。探讨分析对比剂脑病的相关危险因素，为采取积极有效的护理预防措施，降低其发生率。**方法：**回顾性分析 2018 年 10 月 15 日 1 例患者，女，51 岁，因“间断腹疼”行下腹部 CT 碘海醇增强检查，常规准备，检查顺利完成，5 分钟后患者自诉心慌、胸闷，遵医嘱静推地塞米松 10mg 好转，2 小时后患者心悸加重，头痛、呕吐，反应迟钝，急查电解质，提示低钾低氯血症，继之患者全身抽搐，口吐血沫，立即给咪达唑仑针 10mg 缓慢静推，急查头颅 CT、MRI 未见异常，临床诊断造影剂脑病，给予吸氧、补充电解质、利尿降颅压、抗癫痫镇静及支持治疗，患者 3 天后神志转清，31 日好转出院。**结果：**本例患者对比剂脑病的相关因素 1.个体基础疾病如高血压所致大脑调节能力受损，对比剂外渗于大脑致脑损伤；2.患者年龄大肾脏代谢能力相对较差，对比剂排泄缓慢；3.检查前禁食水和导泄药应用使血容量相对不足，短时间内应用大量对比剂造成血液内渗透压偏高，造成一过性脑脱水；4.检查前评估不到位和没有充分水化；5.对比剂的神经毒性作用，对比剂渗透压高于脑组织的渗透压，可透过血脑屏障降低神经细胞的防御功能，引起脑组织变态炎性反应，表现出精神症状。护理预防：检查前 1.充分评估患者的基本情况，关注基础疾病，严格掌握适应症；2.高龄及肾功能异常患者调整好一般情况，多倾听患者的感受；3.详细交代检查前注意事项如导泄药应用，禁食水时间等，避免脱水血容量相对不足；4.检查前充分水化有助于造影剂排泄；5.尽量减少对比剂剂量，且使用非离子型、等渗或次高渗造影剂；**结论：**对比剂脑病是一种较为罕见的并发症，及时并及早发现是进行治疗的前提，积极采取预防措施，临床密切观察，及时有效地治疗，对降低其发生率，改善预后具有重要意义。

PU-3799

根因分析在减少放射科不良事件中的应用

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摘要：目的：探讨根因分析法在减少放射科不良事件中的应用效果；方法：针对 2017-10～2018-8 月共 19 例不同的不良事件中，运用根因分析方法进行近端原因、根本原因分析，从而改善制度和方式；**结果：**在同类事件中得到很大改善，杜绝了相关不良事件的再次发生。**结论：**应用根因分析法确定根本原因，完善影像科的相关措施和指引、制度，大大提高了影像科室的服务质量。

根因分析（Root Cause Analysis ,RCA） 作为一种质量管理模式，其核心是一种基于团体的、系统的、回顾性的不良事件分析方法，找出系统和流程中的风险和缺点并加以改善，通过与同行从错误中反思、学习及分享经验，可以做到改善流程、事前防范、从多角度、多层次提出针对性预防措施［1］。不良事件凡是在医院内发生的或在患者转运过程中发生的非疾病本身造成的异常医疗事件均属不良事件；此处不良事件属于因医疗器械或医疗设备的原因给患者或医务人员带来的损害，因工务人员或陪护人员的原因给患者带来的损害。

PU-3800

1 例碘帕醇重度外渗患者的护理

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总结 1 例门诊碘帕醇重度外渗患者的护理经验。护理方法包括：早期正确、及时的处理、患者的心理护理、以及患者回家后实施基于微信小程序的延续护理，患者肿胀肢体快速消退，无并发症发生，患者的满意度提高，微信小程序的延续护理模式，值得在影像科推广使用。

PU-3801
主动脉夹层合并阻塞性睡眠暂停综合征患者的护理体会

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主动脉夹层是因主动脉内膜破损，高压血流冲入血管壁，造成内膜与中膜分离，并延主动脉长轴方向扩展，形成真假两个通道。急性期病死率约 50%的在 48 小时内死亡，70%死于一周内[1],传统的经胸腹手术创伤大，费用高，严重并发症发生率和死亡率分别高达 17%和 26%[2]。随着介入治疗的发展，对主动脉夹层患者实施腔内隔绝术，具有创伤小，并发症少，恢复快，病死率低等优点。我科收住一例主动脉夹层合并阻塞性睡眠暂停综合征患者，并成功施行主动脉夹层腔内隔绝术，取得满意疗效，现报告如下。

PU-3802
化疗药物介入治疗对医护人员的损伤及防治

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我国近几年的癌症发病率一直呈上升趋势，化疗药物的出现使得癌症患者的治愈率得到了明显的提高。但与此同时，化疗药物的致癌、致畸、致突变也被证实，临床医护人员的自身防护问题也是国内外同行关注的焦点，特别是各种新药的临床应用，抗肿瘤药物应用越来越广泛。化疗药物对长期直接接触的医务人员的身体健康状况存在着巨大的危害，因此只有提高医护人员的自身防护意识，保护医护人员自身的健康才能更好地为患者服务。本研究旨在调查使用化疗药物相关科室的医护人员接触化疗药物所致的不良反应现状，并分析其影响因素，以期通过建立健全职业防护制度，提高管理部门对职业防护的重视，从而降低职业暴露及其所致的伤害。

PU-3803
颜色标识管理在放射科 CT/MRI 增强检查中的应用

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目的：颜色标识在放射科 CT/MRI 增强检查中的应用价值。统一规范醒目的颜色标识能引起患者和护士的注意，使患者明确自己的检查项目，有效防止护理安全隐患的发生；

利用色彩实现多元化的护理服务，一定程度上减少患者的检查等待时间，提高了医护人员对患者进行识别的正确性，提高科室患者满意；
让患者知晓并且参与到检查流程中，能够更好的配合技师及护士完成检查。
方法：通过利用不同颜色区分不同区域以实现目标管理进行评价。
结果：两组相对比，使用颜色标识管理后目标实现。
结论：颜色标识管理在放射科 CT/MRI 增强检查中可以使患者在明确自己检查项目的同时消除紧张情绪。同时减少患者的等待时间。也提高了医护人员对患者进行识别的正确性，预防护理不良事件的发生提高科室患者满意度。

PU-3804
润肤软膏对晚期肝癌患者使用索拉非尼致手足综合症的疗效观察与护理

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目的：手足综合症（HFSR）是晚期肝癌患者服用索拉非尼过程中最常见的不良反应，探讨我院自制的润肤软膏对手足综合症的疗效。**方法**：选取我科 2018 年 1 月-2019 年 1 月服用索拉非尼的肝癌患者为研究对象 200 例，使用后出现皮肤反应，并对其分级后使用润肤软膏涂抹 3 次/d，连续两周，为一个疗效，观察使用前后的皮肤变化，评估患者的治疗对比前后的手足综合症的反应转归率情况。**结果**：患者出现不同程度的皮肤反应，使用润肤软膏后，症状减轻，患者无明显不良反应，治疗后手足综合症反应情况明显低于治疗前（$p<0.5$）,均未因手足综合症反应而停用索拉非尼。**结论**：润肤软膏对手足综合症有明显的疗效，减轻患者因手足综合症导致的痛苦，提高患者的生活质量。

PU-3805
延续服务在 PTBD 术后带管出院患者中的应用效果评价

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目的 研究对 PTBD 术后带管出院患者应用延伸服务的效果。 **方法** 随机选取 2018 年 1 月到 2019 年 2 月期间在本院接受 PTBD 手术治疗的 86 例术后带管出院患者，将其作为研究对象并随机平分为对照组和观察组，每组各 43 例。对照组患者接受常规出院护理，观察组患者接受延续服务护理。 **结果** 观察组并发症发生率低于对照组且护理总满意率高于对照组，$P<0.05$。 **结论** 对 PTBD 术后带管出院患者采取延续服务的效果显著，可有效提高护理满意度，降低并发症的发生率，值得推广。

PU-3806
探讨介入专科护士信息素养培养

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摘要：探讨介入专科护士信息素养培养的重要性。对介入专科护士从个人信息素养的：信息意识、信息知识、信息能力、信息道德及捕捉信息的敏锐性、筛选信息的针对性、评估信息的准确性、交流信息的自如性、应用信息的独创性等方面的培养。介入专科护士的信息素养培养有益于提高个人专业素质、综合能力、服务能力。逐步实现护理资源共享、服务领域拓展，地区间护理工作水平共同提高。
介入专科护士的信息素养培养利于提高临床护理质量和介入护理专业的发展，优化介入护理服务流程，提高介入护理服务效率，改善介入护理服务体验，实现科学的、创新的、人性化的护理管理；同时促进患者健康恢复，减少患者住院天数及费用。

PU-3807
256 排 Revolution CT 冠脉 CTA 检查患者的心理护理及总结

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[**摘要]：目的** 探讨 256 排 Revolution CT 行冠脉 CTA 检查的更佳心理护理方法。**方法** 对我院冠脉 CTA 检查患者实施全程心理护理干预并进行分析总结。**结果** 患者均配合良好，顺利一次性完成检查且图像质量清晰。**结论** 全程有效连续的心理护理有利于缩短冠脉 CTA 检查用时，提高图像质量。
[Abstract]: **Objective** To explore a better psychological nursing methods for coronary CTA examination of 256-row Revolution CT. **Methods** Patients with coronary CTA examination in our hospital were given whole-course nursing intervention,and then the process was analyzed. **Results** Patients were cooperated well, completed the examination item at one time smoothly, and the CT image quality was clear. **Conclusion** The whole process of effective and continuous psychological nursing is beneficial to shorten the time of coronary CTA examination and improve the image quality.

PU-3808
下腔静脉滤器置入合并药物溶栓治疗下肢深静脉血栓形成的围手术期护理

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目的：总结和探讨下腔静脉滤器置入术合并药物溶栓治疗下肢深静脉血栓形成的围手术期护理方法及效果。
方法 ：回顾性总结和分析 8 例不同原因导致下肢深静脉血栓形成患者，采用下腔静脉滤器置入术治疗下肢深静脉血栓形成的护理经验。
结果：本组患者均顺利手术，取得满意疗效。
结论 ：下腔静脉滤器置入术下肢治疗深静脉血栓形成具有疗效好、 损伤小、恢复快优点，通过术前评估、患肢观察、心理护理以及术后穿刺处、溶栓导管及鞘管的观察及溶栓用药的护理，有效减少并发症的发生，促进患者的康复。

PU-3809
经造瘘插入型肠梗阻导管治疗肠梗阻患者的护理体会

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目的:探讨经造瘘插入型肠梗阻导管治疗肠梗阻患者的有效护理措施。方法:对 3 例肠梗阻患者应用经造瘘插入型肠梗阻导管治疗后的效果进行观察和分析。结果:2 例治愈,1 例拔管后肠梗阻复发再次应用后痊愈。结论:应用经造瘘插入型肠梗阻导管治疗肠梗阻患者胃肠引流量明显增多,腹胀腹痛明显减轻,肠道功能恢复更快。

PU-3810
抗反流装置在经皮经肝胆道引流术患者中的临床价值

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【摘要】目的 探讨抗反流装置在经皮经肝胆道引流术患者中减少胆道感染的临床运用及效果。方法 选取例 PTCD 术的患者，随机分成两组，各 113 例。试验组应用抗反流装置连接 PTCD 引流管；对照组应用普通一次性使用引流袋与 PTCD 引流管连接。观察比较两组患者的意外拔管率（引流管与 PTCD 橡皮管连接处发生脱管）、两组发生感染的概率。结果 试验组的感染率低于对照组，差异有统计学意义（P＜0.05）。结论 抗反流装置运用于 PTCD 术后带引流管的患者具有较高的临床价值，值得推广运用。

PU-3811
骨关节肿瘤患者复合手术的护理配合路径建立

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摘要：目的 分析探讨骨关节肿瘤患者进行复合手术的护理配合路径的建立。**材料方法** 选取本院收治的 36 例较大骨关节肿瘤患者，患者入院后均完善相关检查及术前准备，签署手术知情同意书，接受手术方案并进行复合手术，先介入造影了解肿瘤血管供血情况，将肿瘤供血丰富的血管栓塞或者用球囊临时阻断，再进行外科肿瘤切除。**结果** 对较大骨关节肿瘤患者进行复合手术并组建复合手术团队，制定外科手术流程及抢救流程，完善护理干预建立配合路径；介入栓塞后能充分暴露手术视野、利于外科医生手术操作、提高了肿瘤的清除率；缩短手术耗时；较大骨关节肿瘤患者肿瘤血供丰富手术难度相对较大、手术创面大、出血量多，进行复合手术介入栓塞后减少出血量；并发症发生情况改善明显。**结论** 在骨关节肿瘤患者复合手术的过程中组建专业的手术团队，制定临床护理路径和完善手术流程有较好的应用效果，改善了患者生活质量，降低了并发症发生率，保证手术的顺利进行具有重要的临床意义值得应用推广。

PU-3812

介入护士分层次培训内容与考核体系的构建

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【摘要】目的 针对介入放射科护士培训内容及要求，根据护理人员的年资、职称、能力水平及发展需求等特点对护理组考核体系进行分层次构建。**方法** 将我院介入放射科护理组 15 人根据见习护士、初级责任护士、中级责任护士、临床护理专家分 N0-N4 五个层次，针对各层次制定相应岗位工作职责、准入规定及晋级标准、各层次培训目标，培训内容等从知识、技能及态度三方面出发；针对培训制定专业能力考核内容及方法构建一套完整的考核体系，包括专业理论知识、专业实践能力、核心能力完成情况等的评估考核，合格按百分制计算达标率 85%；考核形式以笔试、现场提问、教学查房、随机手机答题等多种形式进行。**结果** 根据分层次的针对性对不同层次护士进行培训和考核，能个性化的有选择性的对各护士层次及岗位需要进行分层次、有目的、有计划的培训，能迅速掌握所需的专业知识。**结论** 介入护士分层次培训内容与考核体系的构建，使介入队伍能迅速掌握系统的介入手术护理专业知识和技能为患者提供系统、连续、安全、有效的专业技术服务。

PU-3813

主动脉夹层急诊 CT 检查的相关护理

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[摘要]目的 使行主动脉夹层急诊 CT 增强检查的患者安全地完成检查，防范潜在的医疗纠纷。 方法 选择 2018 年 1 月至 2018 年 6 月主动脉夹层急诊 CT 增强 180 例患者为研究对象，在检查前与急诊科紧密合作，部分准备工作前移至急诊科完成，减少病人在 CT 室的滞留时间，降低风险保障安全。急诊科需控制及稳定收缩压至 100-120 /mmhg、与家属、病人积极沟通做好解释工作及签署知情同意书等准备工作；CT 室准备好急救物品及人力、机房环境等准备工作。检查过程中护士认真做好患者心理护理及交代配合事项，减轻患者紧张、恐惧心理，嘱咐患者勿用力并给与持续吸氧，密切观察病情等有效护理干预措施。结果 180 例急诊患者在我院行主动脉 CT 检查,179 例患者顺利完成 CT 检查，1 例患者因过床后病情变化未能完成检查。结论 对于疑似主动脉夹层的病人，急诊 CT 增强检查具有重要的意义，获取优质的图像，及早的做出诊断为患者的救治进一步赢得宝贵的治疗时间，提高预后效果。但由于患者病情危更易出现不同程度的不良反应或医疗纠纷。CT 室护士应正确识别风险因素，认真审视护理工作中存在的不安全因素，给与相应有效的护理干预措施，保证患者顺利、安全完成检查。

PU-3814

快速反应团队工作模式在肿瘤并发肺栓塞患者行 CT 检诊过程中的建立与应用

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目的：对肿瘤并发肺栓塞患者行 CT 检诊过程进行优化管理，充分发挥快速反应团队工作模式的作用。**方法：**根据入院的先后顺序将符合条件的患者进行分组，实验组在进行增强 CT 的检诊过程中采用快速反应团队工作模式，对照组实施常规的检查流程。在检查结束后调查患者不良事件的发生情况、患者家属的满意程度及 CT 室检诊周期时间，比较两组的差异情况。**结果：**肿瘤并发肺栓塞患者 CT 检诊时间从(25±2.53) min 缩短到(19±1.31) min。快速反应团队工作模式在肿瘤并发肺栓塞患者 CT 检诊中的应用，能有效缩短患者检诊时间，提高了患者家属满意度，降低了不良事件发生率。**结论：**通过采用快速反应团队工作模式对肿瘤并发肺栓塞患者 CT 检诊中的优化管理，能有效缩短了检诊时间，改善影像质量，提高紧急救护的有效性和患者家属满意度，降低检诊过程中不良事件的发生率，保障了患者安全。

PU-3815
脑血管介入术后改善患者舒适度的护理人文关怀实践研究

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摘要：介入治疗具有损伤小、恢复快、效果好的优势，可用于肝癌、动脉瘤等多种临床疾病[1]。社会的进步，人民生活水平的提高，病人不仅需要高超的医疗护理技术，而且更需要人文关怀。脑血管介入术后患者的舒适度在人文护理实施中得到改善，提高患者舒适度体验，把高超的介入护理技术与人文关怀完美结合，推进脑血管介入护理的深入发展，达到真正满足病人整体需求，让脑血管介入术后患者受益的最终目的。

PU-3816
颅内动脉瘤介入治疗术后进行持续有创血压监测的护理体会

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目的:探讨颅内动脉瘤患者介入治疗术后经桡动脉行有创血压监测的临床应用监测期间的护理方法。方法：2018 年 11 月至 2019 年 03 月行颅内动脉瘤栓塞术后并进行桡动脉有创血压监测的患者共 30 例，给予导管相关护理干预，并观察其效果。结果：30 例行颅内动脉瘤介入术患者置管监测的平均时间为（30.8±7.2）min，监测期间并发症发生率为 1%，穿刺点少量渗血 2 例、皮下淤血 1 例，经相关对症处理后均好转。结论：颅内动脉瘤介入术后持续有创血压监测，值得临床上大力推广结论，护理过程中应给予个性化护理，并密切观察患者病情变化，以保证患者的安全。

PU-3817
介入手术室流动人员培训效果评价

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多年来从事这项工作的医生、技师、护士风雨同舟，使得介入医学在全国各地得到延伸和发展。胸痛、卒中中心的成立，为更多的病人带来福祉，这也使得医生、技师、护士的培训工作迫在

眉睫。然而，由于各家培训基地的流动人员的培训只关注介入技能的操作，在对流动人员进行针对性、全方位教学与培训方面产生空缺。介入手术室是医院的重要科室之一，流动人员管理的质量直接影响着医疗工作的顺利开展，笔者从事介入手术室管理工作十余年，在工作中不断总结创新，大胆摸索，最终将人性化管理的理念和方法[1]，应用于介入手术室流动人员管理中，对培训效果进行比较，干预后效果具有显著性差别。

PU-3818
分析护理干预对介入导管室中肝癌患者治疗的临床效果

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目的：讨论护理干预对介入导管室中肝癌患者临床治疗效果的影响。**方法：**研究时间为：2018 年 1 月-2019 年 5 月。研究观察对象为：本院收治的 44 例肝癌患者，将其以随机法分为对照组（常规护理）与研究组（对照组基础上实施舒适护理）各 22 例。评判标准：总有效率及护理满意度。**结果：**研究组患者的治疗总有效率及护理满意度指标均明显高于对照组，P＜0.05。**结论：**舒适护理的实施可明显提高介入治疗效果，提高患者对护理工作的满意度，值得推广。

PU-3819
影像导检宣教系统的开发与应用

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目的：开发与应用影像导检宣教系统，实现患者检查的全流程管理，提高医患关系和医疗安全质量及服务水平。**方法：**放射诊断科患者宣教引导系统采用 C/S 结构，以医院信息系统 HIS 为基础，通过患者移动终端应用程序 APP，短信、候诊区视频广播播报，实现与患者提供有效的信息及数据反馈交换。**结果：**通过系统流程，完成引导宣教，以结合视频引导宣教提示，可以满足绝大多数受检者的管理，由试用前的 92%受检者坚持候诊区等待降低至试用后的 15%临近和老年受检者候诊等待，有效随访率由之前的 78%提升到 97%。**结论：**放射诊断科患者影像导检宣教系统可以将受检者给以合理的流程化管理，时间管理、宣教完成情况管理，风险知情告知，随访完成情况等，从检查的每个环节及后期进行跟踪并有效管理，实现了导检宣教随访的信息化流程管理。

PU-3820
多模式教学法在静脉穿刺基地教学中的应用

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目的：探究放射诊断科静脉穿刺基地新护士教学中采用多模式教学法的效果及意义。方法：选择 2018 年 1 月-12 月在我科静脉穿刺基地轮转的 96 名新护士为研究对象，随机分为对照组和观察组，每组 48 名新护士，对照组采用传统手把手授课教学法，观察组实施了量化培训标准，采用多模式教学法（即手把手教学法结合情景剧教学法及静脉穿刺手臂模型教学法），对两组新护士对教学方式满意度及一次性静脉穿刺成功率（一针见血，无后退）进行比较。结果：观察组新护士对教

学方式满意度及一次性静脉穿刺成功率均显著高于对照组，差异有统计学意义（P<0.05）。结论：静脉穿刺基地新护士带教中采用多模式教学法可有效提高新护士静脉穿刺水平，减轻了患者的疼痛，同时增加了放射诊断科增强检查患者高压团注的成功率，赢得了患者对护理工作的信任，提高了医院在群众中的威信。因此，该种教学模式在静脉穿刺基地新护士教学中值得推广。

PU-3821
马铃薯与 50%硫酸镁湿敷治疗对碘对比剂静脉外渗疗效与安全性的比较

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目的 比较土豆片外敷与 50%硫酸镁湿敷治疗碘对比剂静脉外渗的疗效与安全性。
一般资料：选择我院 2011. 03-2019. 06 月期间在我院放射科行静脉注射碘造影剂增强扫描发生造影剂外渗的的患者共 358 例，随机分为两组，观察组为土豆片外敷治疗共 178 例，对照组为 50%硫酸镁湿敷治疗组，共 180 例。观察组男 105 例，女 73 例，平均年龄 57.4±15.2 岁；对照组男 109 例，女 71 例，平均年龄 56.8±17.3 岁，两组差别没有统计学意义（P>0.05）。两组患者碘对比剂注射前均无局部感染。
两组患者静脉留置穿刺前，均进行健康宣教及心理护理，选择桡静脉或肘正中静脉，留置针型号为我科室通用，造影剂选择和流速根据科室常规。患者增强扫描造影剂注射时，选择有经验的护士观察造影剂外渗情况，一旦发生，立马停止注射。扫描完毕，选择有经验的护士评估评估造影剂外渗情况。处理：观察组：将土豆片切成厚 0.2-0.5cm 的土豆片，外敷于静脉外渗处并覆盖周围 1cm；2h 更换一次，4-6 次/天。对照组：硫酸镁敷料敷于患处外渗处，2h 更换一次，4-6 次/天。评估临床疗效，用 VAS 对评估疼痛及变化。
两组患者造影剂外渗程度，观察组轻度 137 例，中度 39 例，重度 2 例，而对照组轻度 133 例，重度 44 例，重度 3 例，两组差别没有统计学意义。
所有两组患者疗效比较，两组患者均得到临床痊愈，治愈率达 100%。观察组的治愈时间为 4.2±1.3 天，对照组治愈时间为 6.3 加减 0.9 天。两组 WAS 评分比较，统计外渗即刻、2 小时、24 小时、3 天及一周，两组数据对比提示外渗即刻及一周两组差别没有统计学意义，外渗 2 小时、24 小时及三天观察组疼痛较对照组轻，差别有统计学意义。
结论：使用土豆片外敷与硫酸镁治疗相比，疗效相当，但更加安全，稳定，价格更低廉，更容易为患者接受。

PU-3822
利多卡因封闭治疗增强 CT 检查造影剂渗漏的疗效分析

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目的:探索碘对比剂渗漏利多卡因局部封闭治疗的疗效
方法:回顾性调查我院影像科 2010 年至 2019 年 6 月份例增强 CT 静脉注射碘对比剂渗漏患者 30 例，随机分为观察组和对照组，观察组采用利多卡因局部封闭治疗，对照组采取冰敷或 50%硫酸镁外敷。
结果: 采用碘对比剂渗漏利多卡因局部封闭治疗显效率 98%，有效率 100%。冰敷或 50%硫酸镁外敷组治疗显效率 70%，有效率 92%，利多卡因局部封闭治疗时效提高 24 小时。

结论：利多卡因封闭治疗碘比剂渗漏是一种有效的治疗方法。

刺激征的肠套叠患者。肠套叠一般多发生于小孩和老年人，对疑有肠套叠而腹部透视、平片不能明确诊断时,应尽早进行空气灌肠检查并酌情加压整复。动态 DR 可视化条件下空气灌肠法对本病的诊断和治疗具有重要意义。

二、检查方法：

患者描述：

陶某某、男、62 岁，高血压 10 年，突发腹痛 5 小时，伴恶心、呕吐。CT 提示右下腹结结型肠套叠，行肠套叠空气灌肠整复术。

检查过程：

1、先肌肉注射 5-10mg 654-2。

2、使用动态 DR 透视功能，行胸腹透视；采用高清点片，摄取腹部平片,仔细观察有无心肺病变、气腹、肠梗阻、肠管积气的程度和部位等。

3、接自动控制压力的结肠注气机和带有压力计的注气囊，由肛门插入带有气囊的双腔导管,向气囊内注入 20～30ml 气体,堵塞肛门。

4、在动态 DR 大幅面透视下向肠腔内注气,注气观察气柱的前端,辅以手法按摩腹壁。

5、复位时注气的压力一般保持在 7-10Kp,，即可达到整复目的。套管较紧者, 可增加至 15Kp,个别早期病人还可酌情增加,但不超过 20Kp。可用间断注气法,间断时间 15～20min。整复时间一般为数分钟到 1 小时左右。

6、复位标准：气体大量进入小肠；回盲部块影消失；患者症状消失，腹部柔软， 血便消失。

检查结果与结论：

肠套叠空气灌肠整复术是目前比较简单、实用的肠套叠复位方法，复位深度肠套叠时需要注入大量气体，操作不当极有可能造成肠穿孔。动态 DR 矩形采集，成像视野大，一次曝光即可显示腹部全部肠道，操作医生非常便捷——缓慢注气、揉按腹部、变换体位，整复术一气呵成。动态透视下图像清晰，利于观察气柱的前端及套鞘内肠管回复的情况，可以清晰看到套叠盲端渐进回复，并随时监控肠穿孔的发生。

电子壁报

EPO-0001

The Diagnostic Value of MRS and DTI in Epilepsy

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Objective: To investigate the performance of epilepsy of hydrogen proton magnetic resonance imaging and diffusion tensor imaging and its combined application in the diagnosis of epilepsy, in order to improve the understanding of the disease and to provide more accurately valuable information for initial diagnosis of the disease.
Methods: The subjects were 20 cases of epilepsy clinically diagnosed and the control group is the healthy volunteers without obvious symptoms and brain diseases.The two groups performed MRS and DTI simultaneously . We selected bilateral frontal lobe, parietal lobe, temporal lobe , hippocampus and anterior branch of internal capsule as interest area.We measured NAA / Cho + Cr, NAA / Cr , Cho / Cr, Cho / NAA , ADC and FA of the area of interest. Statistical analyzes were performed between groups and within groups, and the correlation between MRS metabolites and DTI parameters was also studied. Simultaneously,We observed the changes of NAA, Cho and Cr in the area of interest of the subjects .
Results:
1.MRS NAA decreased, Cho and Cr increased in ipsilateral epilepsy group.Compared with the opposite side of the epilepsy and normal control group, the NAA / Cho + Cr and NAA / Cr of hippocampus declined and the Cho / NAA of hippocampus of the ipsilateral epilepsy group rised,the difference is significant in statistics (P <0.05).Compared with the opposite side of the epilepsy and normal control group, the Cho/Cr of hippocampus of the ipsilateral epilepsy group rised,the difference is not significant in statistics (P <0.05).
2.DTI Compared with the normal control group, the ADC of hippocampus of the ipsilateral epilepsy group rised,the difference is significant in statistics (P <0.05); Compared with the normal control group, the ADC of the occipital lobe of the ipsilateral epilepsy group decreased, the difference is significant in statistics (P <0.05);There was no statistically significant difference in ADC among various brain regions (P>0.05). Compared with the normal control group, the FA of hippocampus of the ipsilateral epilepsy group rised,the difference is significant in statistics (P <0.05). Compared with the normal control group, the FA of the occipital lobe of the ipsilateral epilepsy group decreased, the difference is significant in statistics (P <0.05). There was no statistically significant difference in FA among various brain regions(P>0.05).
3.Correlation between MRS and DTI parameters there is a negative correlation between Cho / Cr and FA hippocampus of the opposite side of the epilepsy (P <0.05). There is no correlation between the relevant parameters of each group.

Conclusions:
1.^{1}H-MRS can noninvasively reflect the brain metabolism of epilepsy patients;
2.^{1}H-MRS contribute to epilepsy epileptogenic focus and positioning in clinical;

3.Combined application of MRS and DTI technology can show the microstructure of white matter and micro-metabolism changes, providing a possibility for the prospective study of epilepsy.

EPO-0002

Altered brain functional network in patients with Amyotrophic Lateral Sclerosis

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Purpose: *To investigate the brain functional network changes in patients with amyotrophic lateral sclerosis (ALS).*
Materials and Methods: *This study was approved by the relevant research ethics committee, and all participants provided informed consent. Resting-state fMRI data at 3.0T MR scanner from 18 right-handed ALS patients and 13 age and gender-matched healthy controls were enrolled. Time series of Power 264 regions were extracted for each subject and correlation matrices were analyzed based on graph theory using GRETNA software. The functional brain properties such as clustering coefficient (Cp), characteristic path length (Lp), and degree centrality (DC) were compared between two groups using two-sample t-test. The Pearson Correlation Coefficient was calculated between Cp/Lp and disease progression rate (PR).*
Results: *In the defined sparsity (S) range (0.35≤S≤0.6), both ALS patients and healthy control exhibited small-world topology. Compared with healthy control, ALS patients showed significantly decreased clustering coefficient (t=-2.465, P =0.020) and increase characteristic path length (t=2.246, P =0.033) when S=0.6. Decreased average degree centrality were observed in ALS patients relative to controls, especially significant in the left middle temporal gyrus, the left inferior temporal gyrus, the left middle frontal gyrus, the right middle frontal gyrus, the right inferior frontal gyrus, and the right middle temporal gyrus, which all located in the default-mode network and frontal-parietal network (p <0 .05, not corrected). Moreover, the clustering coefficient of ALS patients was negatively correlated with PR (r=-0.648, P=0.004) while the characteristic path length was positively correlated with PR (r=0.656, P=0.003).*
Conclusions: *This study demonstrated that the brain network integration and segregation were disrupted in ALS patients. The brain network abnormal could help to monitor the disease progression and understand the brain dysfunction of ALS.*

EPO-0003

Quantitative Evaluation of the Compressed L5 and S1 Nerve Roots in Unilateral Lumbar Disc Herniation by Using Diffusion Tensor Imaging

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Background and Purpose Nerve root compression by lumbar disc herniation (LDH) induces a series of clinical symptoms, seriously affecting the patient's life and work. The purpose of this study is to investigate microstructural changes and fiber bundle abnormalities of the compressed L5 and S1 nerve roots in young patients with unilateral LDH by using diffusion tensor imaging (DTI). Methods Forty young patients with unilateral LDH and 17 healthy volunteers participated in the study, and 33 patients received follow-up DTI examination after one month of conservative treatment. Fractional anisotropy (FA), apparent diffusion coefficient (ADC) and trace weight (TraceW) values of the L5 and S1 nerve roots were measured on FA maps.Results The mean FA, ADC and TraceW values of the affected nerve roots were 0.259± 0.047, 1.79±0.252 and 0.076 ±0.025, respectively. Compared to the contralateral side and volunteers, the affected nerve roots showed a decreased FA ($P < 0.01$), an increased ADC ($P < 0.01$) and TraceW ($P < 0.05$). The compression severity had a moderately negative correlation with FA ($r = -0.646$, $P < 0.01$) and positive correlation with ADC ($r = 0.408$, $P < 0.01$) but not with TraceW ($r = 0.298$, $P = 0.06$). For 33 patients with follow-up study after conservative treatment, FA (0.286±0.06) and ADC (1.630±0.046) in the affected nerve roots showed an increasing and a decreasing trend, respectively.Moreover, FA values (14 cases; 0.246±0.015, $P = 0.213$) in the severe compression group had no significant changes between initial and follow-up data.Conclusions DTI is able to assess microstructural abnormalities of the compressed nerve roots and has potentially practical value for prognostic evaluation after treatment in patients with LDH.

EPO-0004

基于 fMRI-DTI 多模态评估阿尔茨海默病进展

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目的：探索阿尔茨海默病疾病进程中大脑内在功能活动及结构改变的同步变化。
方法：本研究纳入从 2009 年 9 月至 2016 年 6 月于宣武医院记忆门诊就诊受试，所有受试者完成系统性客观认知评估，包括健康受试 68 名、主观认知下降 35 例、遗忘型轻度认知障碍 47 例和阿尔茨海默病痴呆受试 31 例。首先计算得到静息态功能磁共振数据的低频振荡波幅（ALFF）图以及扩散张量成像数据的部分各向异性（FA）图，然后采用联合独立成分分析（Joint ICA）进行融合分析，最后利用单因素方差分析方法统计分析联合成分权值的组间差异，偏相关分析计算独立成分权值与认知测试结果的相关性。
结果：本研究结果显示 HC 组较 SCD 组权值无组间差异，相较于 HC、SCD 及 AD 组，aMCI 组 ALFF 成分在小脑、双侧楔前叶、双侧角回以及双侧额叶、颞叶、丘脑及左侧岛叶增高，AD 组比 HC 组降

低。FA 成分在胼胝体及边缘系统亦表现出相同的趋势。经偏相关分析显示，独立成分的权值与简易智力状态量表(MMSE)得分呈正相关（r=0.29, P＜0.01）。
结论：本研究通过联合独立成分分析实现对阿尔茨海默病的功能-结构改变同步评估，提示阿尔茨海默病作为神经退行性变疾病，病程进展过程中包含灰质功能及白质结构的广泛受累，尤以默认网络脑区及胼胝体为著，揭示了其潜在的代偿与退行性改变机制，从功能与结构的角度阐释了早期干预获益增多的可能性，为早期干预提供了潜在的理论基础，为未来疾病适配治疗提供靶点。

EPO-0005

Differential patterns of dynamic functional connectivity variability of default model network in relapsing-remitting multiple sclerosis

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Objective To investigate the dynamic functional connectivity (dFC) variability of the default mode network(DMN) of relapsing-remitting multiple sclerosis (RRMS) patients seed-based correlation analysis using resting-state functional magnetic resonance imaging (rs-fMRI).**Methods** 3.0 T magnetic resonance imaging was used to collect rs-fMRI data from the acute phase RRMS (18), the remission phase RRMS (26), and 23 age- and sex- matched healthy controls(HC group). The fMRI data was preprocessed use Data Processing Assistant for Resting-State fMRI Advanced Edition(DPARSFA) based on Matlab 2012a,and the posterior cingulate cortex(PCC) (0, -53, 26) was selected as the seed, the dFC analysis based on the sliding time window technique was used to compare the dFC variability difference between the three groups,and analyzed correlations between dFC variability coefficient of the differences regions and MRI—derived metrics(brain parenchymal fraction,T2 lesion load), as well as the expanded disability status scale,the paced auditory serial addition test,the modified fatigue effect scale (MFIS-5) score and disease duration of the disease.**Results** The seed-based correlation analysis via functional connectivity of PCC showed that the temporal correlation between the blood oxygen level dependent signals of the DMN was reliable spatial patterns of activation.Compared with HC and acute phase RRMS patients,the remission phase RRMS group showed excessive variability (increased dFC variability) in the left superior temporal gyrus,the left medial superior frontal gyrus and the right middle temporal gyrus.By contrast,excessive stability (decreased dFC variability) was found in the right middle cingulum gyrus,the left superior temporal gyrus(SFG),the left medial superior frontal gyrus and the right middle temporal gyrus(MTG) in the acute phase RRMS patients when compared with the remission phase RRMS .In addition, correlation analysis revealed that the excessive variability in the left SFG(0.14±0.02) of remission phase RRMS was related to the course of disease (r=0.582, P=0.003),while excessive stability in the right MTG(0.12±0.02) of the acute phase RRMS patients was positively correlation with the course of the disease (r = 0.509,P = 0.044).**Conclusion** Abnormal changes dFC variability of the DMN in patients with acute and remission RRMS. The excessive increase of dFC variability in DMN in RRMS patients during remission is likely to be a limited compensatory mechanism to maintain stable DMN function.

EPO-0006

Global Functional Network Connectivity Disturbances and Resting-State Functional Connectivity Alterations in early Parkinson’s disease by Resting-State functional MRI

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PURPOSE: Examining the spontaneous BOLD activity to understand the neural mechanism of Parkinson’s disease (PD) is a focus in recent resting-state functional MRI (fMRI). The aim was to investigate the alteration of brain functional connectivity in PD in a systematical way at two levels: functional connectivity analysis within resting state networks (RSNs) and functional network connectivity (FNC) analysis.
MATERIALS AND METHODS: Using group independent component analysis (ICA) on resting-state fMRI data acquired from 30 participants (14 healthy controls and 16 patients with PD), 16 RSNs were identified; and functional connectivity analysis within the RSNs and FNC analysis were carried out between groups.
RESULTS: (1) Compared to controls, patients with PD showed decreased functional connectivity within putamen network, thalamus network, cerebellar network, attention network, and self-referential network and increased functional connectivity within execution network. (2) Globally disturbed, mostly increased functional connectivity of FNC were observed in patients group. Insular network and execution network was the dominant network with extensively increased functional connectivity with other RSNs. Cerebellar network showed decreased functional connectivity with caudate network, insular network, and self-referential network.
CONCLUSION: In general, decreased functional connectivity within RSNs except execution network and globally disturbed functional connectivity of FNC may be characteristics of PD. Increased functional connectivity within execution network may be an early marker of PD. Insular, execution and cerebellar network were the dominant RSNs with functional connectivity changes of FNC in PD group. The multi-perspective study based on RSNs may be a valuable means to assess functional changes corresponding to specific RSN, contributing to the understanding of the neural mechanism of Parkinson’s disease.

EPO-0007

帕金森病合并认知障碍患者静息态功能磁共振成像初步研究

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目的：通过应用脑血氧水平依赖（BOLD)信号的低频振幅（ALFF）及局部一致性（ReHo）分析帕金森认知障碍患者静息态脑功能改变，探讨帕金森认知障碍患者神经活动特点及其相关机制。**方法：**收集贵州医科大学附属医院神经内科确诊的 PD 患者 32 例，以及 16 例健康对照者（HC）。所有 PD 患者均行蒙特利尔认知评估量表（MoCA）评估，进而将分为帕金森病合并认识障碍组（PD-CI）以

及帕金森病认知功能正常组（PD-CN）。采集研究对象静息态功能磁共振数据，运用 ALFF、ReHo 算法分析，得到具有统计学差异的脑区。**结果：**1、与 HC 组相比，PD-CI 组在双侧枕叶中回、右侧距状裂周围皮层、左侧小脑、左侧梭状回、双侧楔叶 ALFF 值减低；双侧额叶（包括右侧额中回、左侧额上回、左侧额中回）、左侧小脑前叶、左侧小脑后叶及左侧小脑扁桃体 ALFF 值增高；双侧额叶、双侧颞叶、双侧顶叶、扣带回、右距状裂周围皮层、右侧小脑 ReHo 值减低；双侧小脑、双侧楔前叶、胼胝体、右侧额叶 ReHo 值增高。2、与 PD-CN 组相比，PD-CI 组在右侧颞上回、右侧顶叶（包括顶下小叶、顶上小叶）ALFF 值减低，双侧额叶（包括双侧额叶回直肌、右侧额上回眶部）、双侧辅助运动区 ALFF 值增强；双侧额叶、扣带回、右侧丘脑、右侧尾状核、右侧距状裂周围皮层、左侧小脑、左侧梭状回 ReHo 值减低，左侧额叶、双侧小脑 ReHo 值升高。3、与 HC 组相比，PD-CN 组在左侧额叶（包括左侧额叶回直肌、左侧额上回眶部）、左侧外囊区、双侧辅助运动区 ALFF 值减低；左侧额叶（包括左内侧额上回、左额上回眶部）、双侧楔前叶 ALFF 值增高；左侧额叶、左侧壳核 ReHo 值减低；双侧小脑、双侧丘脑、左尾状核、左额叶、扣带回 ReHo 值增高。**结论：**PD-CI 患者存在多个脑区的静息态功能磁共振成像的改变，部分脑区活动减低可能与 PD 患者的认知损害相关。

EPO-0008

Changed emotional memory related brain network in Alzheimer’s disease: a resting-state functional MRI research

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Objective

Alzheimer’s disease (AD) is the most common type of dementia in senile individuals, characterized by progressive and irreversible cognitive decline. Amnestic mild cognitive impairment (aMCI) is thought to be an earlier stage of AD. Emotional stimuli are more easily remembered than neutral stimuli, a phenomenon known as the emotional enhancement of memory (EEM). Previous studies of emotional memory of AD mainly focused on behaviors; however, the influence factors and the underlying neural mechanisms are inadequately understood. Since the high morbidity and limited treatment of AD, it will be very helpful if the neural pathway of emotional memory could be found, so that we may use the EEM effect of emotion on memory to improve the memory performance of AD patients. The purposes of current study were: (1) to investigate the probable influence factors of emotional memory, (2) to investigate the relationships between emotional memory and the related brain functional network changes during disease progression of AD.

Methods

Thirty-one AD patients, 24 aMCI patients and 23 normal controls were included in this study. Positive-high-arousal (PH), positive-low-arousal (PL), neutral (N), negative-high-arousal (NH) and negative-low-arousal (NL) pictures were used during the incidental encoding phase and the Recognition-Remember/Know paradigm according to the “Dual-process theory of memory recognition” was used during the retrieval phase of behavior test. Resting state functional magnetic resonance imaging (rs-fMRI) data were acquired on the 750w 3-T MRI scanner of GE. The resting state emotional memory

network was then built using graph-theoretical method. Both global and regional network measures were calculated to reflect brain network changes of AD and aMCI patients. The correlation analyses were conducted between the global and regional network properties and the behavioral scores of emotional memory.

Results
The EEM effect was only detected during the “recollection” process. Compared with neutral pictures, the NC group benefited from PH, NH and NL pictures. For aMCI patients, the EEM effects were preserved for high arousal emotional pictures. For AD patients, the EEM effects were completely lost. Notably, compared with NC, there was significantly decrease of the recognition sensitivity of recollection process rather than familiarity in aMCI patients. For AD patients, both the recognition sensitivity of recollection and familiarity were impaired. At a global level, AD patients showed significantly higher normalized clustering coefficient, small-worldness, and normalized local efficiency. At a regional level, there were disrupted neural circuits, consisting of abnormal nodes (increased or decreased nodal properties) and edges (decreased functional connectivity strength). The node degree and node efficiency of left dorsal caudate and left lateroventral fusiform were increased in aMCI patients. The amygdala, hippocampus and entorhinal cortex showed significant correlations with the recollection and familiarity processes of emotional memory in AD and aMCI patients.

Conclusions
Emotional memory is influenced by the arousal, valence and means of retrieval methods. The EEM effects of high-arousal-positive and high-arousal-negative pictures are remained in aMCI patients. And there exist some degrees of compensatory mechanisms of the emotional memory functional network in aMCI patients. The EEM effect is lost in AD patients, and may be associated with the regularization shift of emotional memory related network, function changes of vital nodes and decreased connections of neural circuits of both intra- and inter-hemispheres.

EPO-0009

Aberrant Brain Spontaneous Activity and Synchronization in Type 2 Diabetes Mellitus Patients with APOE-ε3 Homozygotes: A Resting-State Functional MRI Study

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Objective: To investigate the pattern of brain spontaneous activity and synchronization in type 2 diabetes mellitus (T2DM) patients carrying APOE-ε3 homozygotes.
Methods: In the population carrying APOE-ε3 homozygotes, 37 T2DM patients and 37 healthy controls (HC) were included with group-matched in terms of age, sex, education years and BMI. All participants were involved in blood sample measurement, neuropsychological test, and brain functional data acquisition. Amplitude of low-frequency fluctuations (ALFF) analysis was conducted to determine the peak coordinates

of brain regions with abnormal spontaneous activity. Then, the identified brain regions were considered as seeds to compute their functional connectivity (FC) with the rest brain regions. The two-sample *t* test and *Mann-Whitney U* test were applied to reveal significant differences of imaging indices, neuropsychological data and blood sample measurements between the T2DM group and HC group. Finally, the potential correlations among the three types of measurements were explored using partial correlation analysis in T2DM group.

Results: Comparing to HC group, T2DM group have elevated levels of HbA1c and fasting plasma glucose and scored lower in the MoCA but higher in HAMA and HAMD tests ($p < 0.05$). T2DM group exhibited higher ALFF in left middle occipital gyrus ($p < 0.05$) and the left middle occipital gyrus had lower FC with left caudate and left inferior parietal gyrus. No significant correlations were observed among three types of measurements in T2DM group.

Conclusion: T2DM patients carrying APOE-ε3 homozygotes exhibited aberrant brain spontaneous activity and synchronization associating with vision-related information processing, cognition and negative affect. The findings may advance our understanding of the mechanisms of T2DM-related brain dysfunction avoiding the potential influence of APOE-ε2 and -ε4 allele.

EPO-0010

Neurite orientation dispersion and density imaging in the substantia nigra and striatum in early-stage idiopathic Parkinson disease

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Purpose:

Neurite orientation dispersion and density imaging (NODDI) was used to quantify microstructural changes in substantia nigra (SN), red nucleus (RN) and striatum in the early stage of idiopathic Parkinson disease (PD).

METHOD AND MATERIALS:

19 PD (12 men and 7 women, mean age 58.48±6.36 years) cases and 20 healthy control (HC, 13 men and 7 women, mean age 60.20±7.02 years) cases were investigated. All PD patients were at stage≤2.5 (5 patients were stage 1, 2 were stage 1.5, 5 were stage 2 and 7 were stage 2.5) on the Hoehn and Yahr (H-Y) Scale without Parkinson's medication before. Movement Disorder Society-Sponsored Revision of the Unified Parkinson's Disease Rating Scale part III (MDS-UPDRS III) was obtained for all patients.

For all cases, the NODDI sequence was conducted on a GE 750 3T scanner. The protocol consists of one shell with 30 gradient directions and b= 711 s/mm^2 and the other with 60 directions and b= 2855 s/mm^2. The protocol also includes 3 b=0 images. The sequence parameters were as follows: repetition time=10000 ms; echo time=minimum; field of view=256×256mm; matrix size=128×128; slice thickness=2mm, and acquisition time=15 min 40 seconds. High-resolution 3D T1 SPGR and T2 FLAIR images were acquired as well. The T2 FLAIR parameters were: TR=8400ms, TE=140ms, slice thickness=3mm, slice spacing=0.3mm, slice number=41. The 3D T1WI parameters were: TR=8.2ms, TE=3.2ms, flip angle=9°, slice thickness=1mm, slices per slab=192, resolution=1mm×1mm×1mm.

All DWI data were fitted to the NODDI model using the Accelerated Microstructure Imaging via Convex Optimization (AMICO) algorithm (https://github.com/daducci/AMICO), where intracellular volume fraction (Vic), orientation dispersion index (OD), and isotropic volume fraction (Viso) maps were generated. An experienced neuroradiologist drew both sides of the head of caudate nucleus (CN), putamen (Pu), globus pallidus (GP), substantia nigra pars compacta (SNpc), substantia nigra pars reticulate (SNpr), red nucleus (RN) and thalamus on T2 FLAIR images including all areas of each nucleus in continuous slices. T2 FLAIR images were registered to the b_0 images using FSL (https://fsl.fmrib.ox.ac.uk/fsl/fslwiki/). Then we extracted values of each parameters of NODDI in every drawing slice and calculated the average values of nuclei mentioned above. We performed a two sample t-test using SPSS 21 to compare parameters of NODDI of the two groups.

RESULTS

1. Compared with HC, the OD of PD group was different significantly in bilateral GP and right thalamus ($p_{right\ GP}$=0.02, t=-2.39; $p_{left\ GP}$=0.01, t=-2.65; $p_{right\ Thalamus}$=0.005, t=-3.30); there is no significant difference in Vic and Viso between the two groups among the nuclei.

2. Compare with PD patients whose H-Y Scale was equal or greater than 2, those less than 2 have a significant difference of OD in the right CN (p=0.048, t=-2.13).

3. There is no correlation between the parameters of NODDI and MDS-UPDRS III scores in all involved nuclei.

CONCLUSION

Our results revealed microstructural change patterns of the substantia nigra and striatum in early stage patients, suggesting underlying neurite orientation abnormality. As a potential biomarker, OD of NODDI is effective to measure regional neurite changes in early PD patients.

CLINICAL RELEVANCE/APPLICATION

NODDI is a useful noninvasive MRI sequence to identify the cerebral microstructural changes in early-stage PD patients.

EPO-0011

扩散峰度成像对轻度认知障碍和阿尔茨海默病脑微观结构改变的研究

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目的 应用磁共振扩散峰度成像-DKI 技术及基于体素水平的全脑分析（voxel-based analysis，VBA）方法评估轻度认知障碍（MCI）和阿尔茨海默（AD）患者脑微观结构的改变。**方法** 对年龄和性别相比配的 19 例 MCI 患者（MCI 组）、19 例 AD 患者（AD 组）及 18 例正常老年人（NC 组）进行 3D-T1WI 及 DKI 扫描，对被试全脑 DKI 参数 MK、AK、RK 及 DTI 参数 FA、MD、AxD、RD 进行 VBA 分析研究。**结果** DKI 对 MCI 组全脑白质区域的分析结果：MCI 组与 NC 组比较：FA 未见明显差异。MK 降低的白质区域包括双侧额叶、右侧颞叶、左侧海马旁回。MD 升高的白质区域包括左侧海马旁回。AD 组与 NC 组比较：FA 降低的主要白质区域包括双侧颞叶、额叶、右侧枕叶和胼胝体压部。MK、KR、KA 降低的主要白质区域包括双侧额叶、颞叶、枕叶、中脑、脑桥、海马旁回和胼胝体体部及压部、左侧内囊前肢，其中 MK 显示异常区域最大。对应区域 MD、DA、DR 升高，其中 DA 显示异常区域范围最大。AD 组与 MCI 组比较：FA 未见明显差异。MK、MD 未见明显差异。DKI 对 MCI 组全脑灰质区域的分析结果：MCI 组与 NC 组比较：FA 未见明显差异。MK、KR、KA 降低的灰质区域包括双侧额叶、颞叶和右侧丘脑，其中 MK 显示异常区域最大。MD、DA、DR 未见明显差异。AD 组与 NC 组比较：FA 降低的主要灰质区域包括双侧额叶、颞叶和双侧丘脑。MK、KR、KA 降低的主要灰质区域包括双侧额叶、颞叶、海马旁回、双侧尾状核、丘脑，其中 MK 显示异常区域最大。MD、DA、DR 升高的灰质区域包括双侧额颞叶及左侧枕叶、左侧扣带回、双侧海马、海马旁回、丘脑。其中 DA 显示异常区域范围最大。AD 组与 MCI 组比较：FA、MK、MD 均未见明显差异。**结论** DKI 各参数的变化提示 MCI 和 AD 脑内微观结构的改变，MK 比 FA 具有更高的敏感性。

EPO-0012
基于磁敏感加权成像的新纹状体影像组学模型对帕金森病的诊断价值

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目的 探讨基于磁敏感加权成像（SWI）的新纹状体影像组学模型对帕金森病（PD）的诊断价值。
方法 收集 135 例原发性 PD 患者及年龄、性别相匹配的 135 例健康志愿者；按 7:3 比例分别将两组受试者随机分为训练集（n=94）和验证集（n=41）。采用同一台磁共振设备对所有受试者进行颅脑 SWI 扫描。在 SWI 图上手动分割新纹状体（壳核和尾状核区域）并提取影像组学特征，分别采用 LASSO 算法对训练集的特征进行降维并构建诊断模型，运用受试者工作曲线（ROC）对两模型在训练集和验证集中的诊断效能进行评价；采用 Hosmer-Lemeshow 检验对模型在训练集的拟合优度进行检验。
结果 在壳核和尾状核区域分别提取了 542 个影像组学特征，经 LASSO 算法降维后，分别筛选出 13 和 9 个最佳特征用于构建壳核和尾状核诊断模型。壳核模型的曲线下面积（AUC）、特异度、敏感度在训练集中分别为 0.91（95%CI：0.88-0.98）、81.25%、95.83%，Hosmer-Lemeshow 检验模型无过拟合（P=0.812），在验证集中分别为 0.74（95%CI：0.65-0.91）、95.38%、67.40%；尾状核模型的曲线下面积（AUC）、特异度、敏感度在训练集分别为 0.88（95%CI：0.81-0.94）、65.23%、87.56%，Hosmer-Lemeshow 检验模型无过拟合（P=0.370），在验证集分别为 0.71（95%CI：0.54-0.87）、77.45%、65.62%。“S(1,0)Contrast_R”同时出现在壳核和尾状核模型的最佳特征中，在两个脑区处的特征值 PD 组均高于对照组（t=-4.63,P<0.001;t=-2.75,P=0.016）。
结论 本研究建立了基于磁敏感加权成像的新纹状体影像组学模型，该模型具有良好的诊断效能及泛化能力，为 PD 的诊断提供可靠的客观依据。

EPO-0013

轻度认知功能障碍脑细微结构评估的 DKI 研究

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研究目的：通过运用磁共振弥散峰度成像技术（DKI）研究轻度认知障碍（MCI）、阿尔茨海默病（AD）以及认知功能正常老年人（NC）多部位感兴趣脑区的各向异性（FA）值、平均弥散率（MD）值以及平均峰度（MK）值的差异，探讨 AD 患者脑组织细微结构的演变过程，评估 DKI 相关参数对 MCI 及 AD 的诊断及鉴别诊断价值。

材料与方法：采用美国 GE 3.0 T 磁共振仪，对选取的临床诊断为轻度认知障碍患者（aMCI 组）20 例、阿尔茨海默病患者（AD 组）14 例、认知功能正常的老年对照组（NC 组）20 例行常规 MR、DKI 扫描，分别测量比较三组内四个所选感兴趣区（海马区、前额叶白质、顶叶白质、颞叶白质）左右对称部位及三组间感兴趣区的相关参数值（FA 值、MD 值及 MK 值），了解其变化情况。

结果：（1）三组所选四个感兴趣区左右对称部位的 MD 值、MK 值及 FA 值均无明显统计学差异(P>0.05)。

（3）三组间 MD 值两两比较结果：NC 组-AD 组间，在四个所选感兴趣区中均具有统计学差异，P 值分别为 0.021，<0.010，0.042；MCI 组-AD 组间，仅海马区存在统计学差异，P 值为 0.027；而 NC 组-MCI 组间未检测到有统计学差异的脑区。

（4）三组间 MK 值两两比较结果：NC 组-AD 组间，在四个所选感兴趣区中均具有统计学差异，P 值分别为<0.010，0.043，0.039，<0.010。MCI 组-AD 组间，仅海马区存在统计学差异，P 值为 0.025；NC 组-MCI 组间，海马区同样存在统计学差异，P 值分别为 0.013。

结论：运用 DKI 技术可以检测到 AD 患者脑组织细微结构的受累改变，表现为 MK 值及 FA 值减低，MD 值升高，较具有特征性，提示 DKI 检查可以作为早期诊断 AD 的一种影像学辅助检查手段，且海马区的 MK 值有助于轻度认知障碍患者在老年人群中的筛查。

EPO-0014

Investigation of SWI of Brain Iron Deposition in Patients with Alzheimer’s Disease and Mild Cognitive Impairment

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Objective: To compare the difference of brain iron deposition between Alzheimer’s disease(AD) patients and mild cognitive impairment(MCI) patients and control subjects through measuring the brain iron content by applying SWI and evaluate the application value of SWI. To provide a noninvasive and valuable biological indicator for the early diagnosis of AD and MCI.

Methods: 24 AD patients and 22 MCI patients were collected from hospital. There are 14 men and 10 women in the AD patients and 12 men and 10 women in the MCI patients. The age range of AD patients is 64 to 83 years and average is 72.2. The age range of MCI patients is 61 to 86 years and average is 71.1. 70 healthy volunteers were collected whose age is from 30 to 79.The average age is 58.There are 35 men and 35

women in the volunteers. 24 volunteers whose age are from 61 to 79 were selected from them to match the group of patients. Conventional brain MR examination was performed in all people to exclude the possibility of cerebral infarction, hemorrhage, tumor, operation or trauma.SWI examination was performed and measure the phase values of red nucleus, substantia nigra, caudate nucleus head, globus pallidus, putamen, thalamus, hippocampus, temporal cortex on corrected phase SWI pictures. The control group was divided into 5 groups, each group gender was balance. To evaluate the cerebral significance of phase values difference between different ages with one-factor ANOVA. To analyse the correlation of SWI phase value of each part and age with Pearson method. To evaluate the significance of phase values difference among AD patients, MCI patients and control group with one-factor ANOVA and compare the difference between every two groups with LSD method.

Results: ①Measured between different age groups of healthy volunteers, there were statistically differences in red nucleus, substantia nigra, caudate nucleus head, globus pallidus, putamen, hippocampus, temporal cortex SWI phase values($P<0.01$).There were no differences between different ages SWI phase values of the thalamus ($P=0.612>0.05$).Negative correlations were measured between SWI phase values and age in red nucleus($r=-0.384$, $P<0.01$), substantia nigra($r=-0.859$, $P<0.01$), caudate nucleus head($r=-0.829$, $P<0.01$), globus pallidus($r=-0.680$, $P<0.01$), putamen($r=-0.582$, $P<0.01$), hippocampus ($r=-0.441$, $P<0.01$), temporal cortex ($r=-0.548$, $P<0.01$).There was no correlation between the SWI phase value of thalamus and age ($r=0.006$, $P=0.960>0.05$).②There were statistically differences in red nucleus, substantia nigra, caudate nucleus head, globus pallidus, putamen, hippocampus, temporal cortex SWI phase values among AD patients, MCI patients and control group ($P<0.05$), but no differences in thalamus ($P=0.084>0.05$). ③There were statistically differences in red nucleus, substantia nigra, putamen SWI phase values between AD patients and MCI patients ($P<0.05$). There were statistically differences in red nucleus, substantia nigra, caudate nucleus head, globus pallidus, putamen, hippocampus, temporal cortex SWI phase values between AD patients and control group($P<0.05$). There were statistically differences in putamen, hippocampus, temporal cortex SWI phase values between MCI patients and control group($P<0.05$).

Conclusion: SWI was a simple, safe and non-invasive method and had good repeatability and can quantitatively analyse the changes of brain iron deposition. The brain iron deposition of AD patients, MCI patients and healthy volunteers could be distinguished by SWI. SWI may provide a new noninvasive dynamic monitoring method and valuable biological indicator for the early diagnosis of AD and MCI and the prevention of developing from MCI to AD.

EPO-0015

Self-reported traumatic brain injury and in vivo measure of AD-vulnerable cortical thickness and AD-related biomarkers in the ADNI cohort

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Purpose: To investigate whether self-reported TBI was associated with decreased AD-vulnerable cortical thickness, and to assess the relationship between AD-vulnerable cortical thickness and AD-related biomarker in the Alzheimer’s disease Neuroimaging Initiative subjects.
Materials and methods: We identified 46 self-reported TBI subjects, who had structural MRI, 18F-AV45 PET, and cerebrospinal fluid (CSF) data. Of them, eight subjects were normal; ten were preclinical AD; eighteen were MCI due to AD; ten were AD. Additional demographics-controlled 46 subjects were included. Cortical thickness of eight AD-vulnerable regions, mean AD-vulnerable cortical thickness, 18F-AV45 PET mean amyloid SUVR, CSF Aβ42, CSF total tau (T-tau), and CSF phosphorylated tau (P-tau) were compared between TBI and non-TBI groups. Correlational analysis was done to investigate the relationship between mean AD-vulnerable cortical thickness and mean amyloid SUVR, CSF Aβ42, CSF T-Tau, CSF P-Tau.
Results: Preclinical AD subjects with self-reported TBI had smaller cortical thickness in mean and three AD-vulnerable cortical regions than control subjects ($P<0.05$). The mean AD-vulnerable cortical thickness was correlated with CSF T-tau ($r= -0.72$, $P=0.001$) and CSF P-tau ($r= -0.53$, $P=0.019$). There was no statistical difference in the comparison of normal, MCI due to AD, and AD groups.
Conclusions: Among individuals with preclinical AD subjects, but not normal, MCI due to AD and AD subjects, self-reported TBI was associated with more decreased AD-vulnerable cortical thickness which was related to CSF tau pathology.

EPO-0016

The mechanism of olfactory visual associative learning evidenced by comparing activation in the primary olfactory networks under semantic and non-sematic visual cue task-fMRI

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Sensory perception is shaped by past experience, multi-sensory context as well as internal states and appears to be highly relevant in olfaction. Specifically, in humans, odor detection and perceived intensity can be modulated by congruent visual cues[1]. Human odor perception strongly depends on visual cue, because human are visual dominant species[2]. However, the odor and visual association learning mechanism are largely unknown. Previous study showed that rapid visual odor association using lexical sematic visual cue[3]. Our goal is to investigate if the non-sematic visual cue could activate the olfactory regions like the sematic visual cue and the differences.
Twenty-one healthy, nonsmoking, right-handed young adults (mean age = 28.5 ± 6.8 years old, 7 male) participated in the study. All participants were screened for any otorhinolaryngeal, neurological, psychiatric, central nervous system, and olfactory system disorders. Each subject’s smell function was scored within the normal range (mean = 35.7, SD = 2.8).The fMRI study was performed at Philips 3T MR Scanner (Achieva

TX, Best, the Netherlands). The olfactory paradigm was executed using a programmable olfactometer (Emerging Tech Trans, LLC, Hershey, PA, USA) to deliver odorants to subject's nostrils accurately and synchronized with the MRI scanner. The fMRI imaging paradigms were designed as the. The stimulus was lavender oil. Statistical Parametric Mapping (SPM8, Welcome Trust Centre for Neuroimaging, University College London, UK) was used to analyze all imaging data. Activation maps for the odor + visual and visual-only conditions, and for each subject, were computed using event-related generalized linear models (GLMs) and used in a one-sample t-tests to generate group activation maps. The odor + visual and visual-only conditions were compared using a paired t-test.

The two activation patterns of odor presentation with visual "(smell)" and visual "(smell)" only are very similar (P>0.05), both include bilateral olfactory cortex, piriform cortex, amygdala, entorhinal cortex, orbital frontal cortex, dorsolateral prefrontal cortex and hippocampus. In the odor presentation with visual "○" and visual "○" only, the two activation patterns both included bilateral olfactory cortex, piriform cortex, amygdala, entorhinal cortex, orbital frontal cortex, dorsolateral prefrontal cortex and hippocampus, but are significantly different in intensity and range.

In the paired t-test, there was no significant difference between odor presentation with visual "(smell)" and visual only, but there was a trend in bilateral olfactory cortex, piriform cortex, amygdala, entorhinal cortex that the BOLD signal intensity was higher in condition odor presentation with visual "(smell)" than in condition visual only. There were significant differences at bilateral amygdala, entorhinal cortex between odor presentation with visual "○" and visual only, and there was a trend in bilateral olfactory cortex, piriform cortex that the BOLD signal intensity was higher in condition odor presentation with visual "○" than in condition visual only.

Symbol can also be codes by odor, its role is similar with Chinese characters, but the coding effect is slightly lower. In the bilateral olfactory cortex, piriform cortex, amygdala, entorhinal cortex, the semantics encoding effect was the strongest. In non-olfactory-related semantic cue, the degree of activation was significantly lower than that of odor activation in bilateral amygdala, entorhinal cortex.This shows that the Olfaction and other sensory systems both have a perfect associative learning[4], Whether physical, Chinese characters or symbols. Olfactory sensory memory reflects activity, in part, within the primary olfactory cortex (POC), which like most sensory cortices (Ghazanfar and Schroeder 2006) receives direct and/or indirect convergent multisensory inputs [5]. There was also a shortcoming of this study that we didn't consider the difference between the non-semantic Chinese characters and the semantic, our next experiment will be verified.

EPO-0017

Structural magnetic resonance imaging study of cortical thickness in early-stage Parkinson's Disease

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PURPOSE
Parkinson’s disease (PD) is a progressive age-related neurodegenerative disease. The purpose of the study was to use surface-based analysis techniques to assess cortical thickness and identify characteristic morphological patterns of cortical changes in early-stage PD.

METHOD AND MATERIALS
24 patients diagnosed with early PD (Hoehn-Yahr stage ≤2.5) and 25 healthy control participants who were matched in age and gender were recruited. For all cases, High resolution 3D T1 SPGR was acquired for the whole brain on a GE Discovery750 3.0T scanner. The 3D T1WI parameters were as follow: TR=8.2ms, TE=3.2ms, flip angle=9°, slice thickness=1mm, slices per slab=192, resolution=1mm×1mm×1mm. Cortical thickness was automatically calculated using FreeSurfer (version 6.0.0) and the Desikan-Killiany Atlas for segmentation. We performed a two sample t-test using SPSS 21 to compare the cortical thickness of the two groups. The statistical threshold was set at p＜0.05.

RESULTS
Compared with the HC group, cortical thickness in the early PD group was widely reduced in the bilateral caudalmiddlefrontal, fusiform, inferiorparietal, inferiortemporal, lateraloccipital, lateralorbitofrontal, middletemporal, parsorbitalis, rostralmiddlefrontal, superiorparietal, supramarginal, frontalpole, temporalpole, and insula cortices, left bankssts and parahippocampal cortices, and right parsopercularis, parstriangularis, and precentral cortices; and increased in the bilateral paracentral and posteriorcingulate cortices, and right caudalanteriorcingulate and rostralanteriorcingulate cortices.

CONCLUSION
Our results demonstrate that the early PD patients designated by Hoehn-Yahr stage had a wide range of cortical thinning. The widespread cortical thinning was conformed to the complex neural pathological mechanism of PD patients with multiple system involvement. This provides important information about the pattern of cerebral atrophy in the early PD.

EPO-0018
早、晚发性帕金森病脑皮层厚度及皮层折叠的研究

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摘要：
研究目的：

通过比较早发性帕金森病组与晚发性帕金森病组大脑皮层厚度及折叠度的改变，探讨早、晚发性帕金森病的不同发病机制。

材料与方法：

本研究募集了原发性帕金森病患者 60 例。根据年龄 50 岁为界将帕金森病患者分为早发性帕金森病（EOPD）27 例和晚发性帕金森病（LOPD）33 例。另外从社区募集 48 例年龄、性别等分别与 EOPD 和 LOPD 相匹配的正常人作为健康对照组，分为年轻正常对照组 23 例和老年正常对照组 25 例。利用同一台西门子 3.0T MRI 成像系统采集所有被试高分辨头部三维 T1 加权图像，然后利用 FreeSurfer 软件对被试脑结构图像进行数据后处理分析，比较早、晚发性帕金森病患者与相应正常对照组间的脑皮层厚度及皮层折叠变化。

研究结果：

早发性帕金森病组与相应正常对照组比较，结果发现早发性帕金森病组右侧顶上小叶、顶下小叶、楔前叶、中央旁小叶及双侧额上回、扣带回后部的皮层厚度增加（$p<0.05$），右侧梭状回、舌回皮层厚度变薄（$p<0.05$）；右侧额中回、额下回、中央前回、中央后回、岛叶、缘上回、颞叶、枕叶、顶下小叶的脑皮层折叠减低；右侧距状旁回、舌回、楔叶的脑皮层折叠增加（$p<0.05$）。晚发性帕金森病组与相应对照组比较，结果发现晚发性帕金森病组的双侧中央前回、中央后回、额下回、颞上回、岛叶、眶额叶皮层厚度变薄（$p<0.05$）；两组间脑皮层折叠无显著差异（$p<0.05$）。

结论：

本研究发现早发性帕金森病与晚发性帕金森病存在不同的脑皮层厚度及折叠度改变，磁共振成像研究将为进一步研究早、晚发性帕金森病的发病机制提供影像学依据。

EPO-0019
基于机器学习方法的 BOLD 诊断 HIV 相关神经认知障碍的研究初探

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目的：运用基于机器学习方法的静息态功能磁共振成像技术，探究局部一致性和低频振幅两种指标在评估 HIV 相关神经认知功能障碍中的应用价值。

方法：按照纳入排除标准，收集 2017 年 09 月至 2018 年 12 月期间首诊于南宁市第四人民医院感染科的艾滋病患者，共纳入未进行抗病毒治疗的艾滋病患者 29 例（HIV 阳性组），16 位男性，13 位女性。以 NP 测验为参考标准，将 HIV 阳性组分为 HAND 组和非 HAND 组。要求受试者签署磁共振检查知情同意书并进行静息态功能磁共振扫描。采用 GE Discovery MR 750w 3.0T 磁共振行常规轴位 T1WI、轴位 T2WI、矢状位 T1WI 薄层扫描和梯度回波-回波平面成像序列(EPI)。图像的预处理使用 SPM12 和 DPARSF3.1，正式处理采用低频振幅（ALFF）指标，使用 PRoNTo2.1.1 机器学习工具包进行图像数据的分析。使用 SPSS25.0 统计软件分析 ALFF 指标在 HAND 组和非 HAND 组的差异。

结果：（1）ALFF 指标在 HIV 阳性组和 HIV 阴性组间差异贡献最大的十个大脑区域依次为：左侧中央旁小叶、右侧中央旁小叶、右侧楔叶、左侧颞极颞中回、左侧楔前叶、小脑蚓部 1、2 区、右侧补充运动区、左侧角回、左侧顶上回、小脑蚓部 10 区；（2）ALFF 的 AUC 为 0.65，准确率为 63.27%，灵敏度为 75.86%，特异度为 45%，阳性预测值为 66,67%，阴性预测值为 56.25%。HAND 组和非 HAND 组的 ALFF 值在右侧中央旁小叶、小脑蚓部 1、2、10 脑区有统计学差异，$p<0.05$。

结论：基于机器学习法的 ALFF 指标在 HIV 阳性组和阴性组的认知功能评估方面均有意义，其中 ALFF 指标可用于诊断 HAND。HIV 阳性组和 HIV 阴性组对比功能差异较大的脑区包括双侧旁中央小叶，运动辅助区，小脑半球、小脑蚓部和部分额、颞、顶、枕叶。

EPO-0020

Dynamic Alterations of Spontaneous Neural Activity in Parkinson's Disease: A Potential Diagnostic Feature

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Objective: To investigate dynamic amplitude of low-frequency fluctuations (dALFF) in patients with Parkinson's disease (PD) and healthy controls (HCs), and to further explore whether dALFF can be used to test the feasibility of identifying PD from HCs.
Methods: Twenty-eight patients with PD and 28 demographically matched HCs received resting-state functional MRI (rs-fMRI) scans and neuropsychological tests. A dynamic method was used to calculate the dALFF of rs-fMRI data obtained from all subjects. The alterations in dALFF were compared between group of PD and HCs, and the correlations between dALFF variability and disease duration/ neuropsychological tests were further calculated. Then, the statistical differences of dALFF between groups were selected as classification features to discriminate patients with PD from HCs through a linear support vector machine (SVM) classifier. Classifier performance was assessed using permutation test (repeated 5000 times).
Results: Significantly increased dALFF in the left precuneus was detected in patients with PD when compared to HCs, and dALFF variability in this region was positively correlated with duration of disease. The present results show that 80.36% (p<0.001) of subjects were correctly classified through SVM classifier by leave-one-out cross-validation.
Conclusion: Patients with PD exhibited abnormal dynamic brain activity in left precuneus, and the dALFF variability can distinguish PD from HCs with high accuracy. Our results not only showed novel insights into the pathophysiological mechanisms about this disorder but also might provide a potential effective feature for its clinical diagnosis.

EPO-0021

Disrupted network topology contributed to spatial navigation impairments in mild cognitive impairments

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Bacground
Impairment in spatial navigation is not limited to patients with AD dementia, but can be detected earlier in patients with mild cognitive impairment (MCI). At the same time, the network topology is disrupted in early MCI. However, little is known about disrupted network topology on spatial navigation skill.
Methods

A total of 60 individuals were recruited, including 32 MCI (65.91±11.33 years old) and 28 NC (69.68±10.79 years old). All participants underwent spatial navigation tests and a 3.0-tesla DTI and T1 weighted imaging. We focused on global efficiency, local efficiency, clustering coefficient, shortest path length computed from weighted connectivity matrices based on DTI. The spatial navigation skill, evaluated as egocentric and allocentric, was assessed by a computerized human analogue of the Morris Water Maze tests Amunet. We further analyzed that the correlation between spatial navigation skill and network parameters.

Results

Compared with normal controls, MCI subjects showed significant decreased clustering coefficient parameters in left middle frontal gyrus, right rectus, right superior parietal gyrus and right inferior parietal, decreased shortest path length in left paracentral lobule and increased global efficiency in right middle frontal gyrus. MCI subjects performed worse egocentric navigation compared to normal controls, which indicated by larger average total error . Decreased clustering coefficient of the right inferior parietal gyrus was associated with poor performance in allocentric+egocentric, egocentric and allocentric navigation. white matter hyperintensity volume?

Conclusion

In conclusion, this study demonstrated the abnormalities of network, including global efficiency, clustering coefficient and shortest path length mainly in frontal and parietal gyrus are correlated to worse spatial navigation skill.

EPO-0022

Spatial Navigation Impairment Is Associated with Alterations in Subcortical Intrinsic Activity in Mild Cognitive Impairment: A Resting-State fMRI Study

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Impairment of spatial navigation (SN) skills is one of the features of the Alzheimer’s disease (AD) already at the stage of mild cognitive impairment (MCI). We used a computer-based battery of spatial navigation tests to measure the SN performance in 22 MCI patients as well as 21 normal controls (NC). In order to evaluate intrinsic activity in the subcortical regions that may play a role in SN, we measured ALFF, fALFF, and ReHo derived within 14 subcortical regions. We observed reductions of intrinsic activity in MCI patients. We also demonstrated that the MCI versus NC group difference can modulate activity-behavior relationship, that is, the correlation slopes between ReHo and allocentric SN task total errors were significantly different between NC and MCI groups in the right hippocampus (interaction F = 4 44, p = 0 05), pallidum (F = 8 97, p = 0 005), and thalamus (F = 5 95, p = 0 02), which were negative in NC (right hippocampus, r = -0 49; right pallidum, r = -0 50; right thalamus, r = -0 45; all p < 0 05) but absent in MCI (right hippocampus, r = 0 21; right pallidum, r = 0 32; right thalamus r = 0 28; all p > 0 2). These findings may provide a novel insight of the brain mechanism associated with SN

impairment in MCI and indicated a stage specificity of brain-behavior correlation in dementia. This trial is registered with ChiCTR-BRC-17011316.

EPO-0023
联合 FCD 和 VBM 研究 AD 和 MCI 患者的脑结构和功能改变

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目的：本研究将利用基于体素形态测量学（VBM）和基于静息态血氧水平依赖功能磁共振（fMRI）的功能连接密度(FCD)，比较阿尔兹海默病（AD）、轻度认知障碍（mild cognitive MCI）和健康老年人对照组（NC）间脑灰质体积和全脑功能连接密度的改变。
方法：对 19 名 AD 患者，22 名 MCI 患者，以及 32 名性别、年龄匹配的 NC 进行三维脑结构磁共振和 fMRI 检查。采用 VBM 的方法分析 AD、MCI、NC 全脑的形态学改变。采用全脑功能连接密度（gFCD）、短程功能连接密度（sFCD）和长程功能连接密度（lFCD）的方法分析 AD、MCI、NC 脑功能活动状态，gFCD 用于分析每个体素与全脑体素的连接数量，sFCD 用于分析每个体素与周围体素的连接数量，lFCD 用于分析每个体素与远端体素的连接数量。利用 SPM8、DPARSF、REST 软件进行统计分析，采用方差分析、两样本 t 检验，$p<0.01$ 差异有统计学意义。
结果： AD 与 MCI 和 NC 比较，双侧海马及海马旁回和左侧中央前回灰质显著萎缩($p<0.01$)，楔前叶的 sFCD 显著减小($p<0.01$)。MCI 与 NC 比较，左侧中央前回灰质显著萎缩($p<0.01$)，楔前叶 sFCD 有减小趋势($p=0.06$)，部分区域 sFCD 增加。AD、MCI、NC 的 gFCD 和 lFCD 各组之间无显著变化。
结论：本研究证实了 AD 和 MCI 患者双侧海马及海马旁回和左侧中央前回脑萎缩之外，还发现楔前叶的短程功能连接密度在患者中减低，为 AD 和 MCI 患者脑结构和功能退化的机制研究奠定了理论和方法学基础，有助于临床的早期诊断和治疗。

EPO-0024
APOE ε 4 基因型子非痴呆老年人中对深部灰质体积与认知表现的相关性的调控作用研究

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目的： apoe ε 4 等位基因是阿尔茨海默病（AD）风险的最强预测因子，但其在深灰质体积与认知障碍之间的关系中的作用尚不清楚。
方法： 本研究调查了 apoe ε 4 等位基因对非痴呆老年人这种关联的影响。我们招募了 24 名轻度认知障碍（MCI）患者和 28 名年龄、性别和教育程度与正常对照组（NC）相匹配的患者，他们接受了全脑 3DTIW MRI、APOE 基因型测试和神经心理学测试。
结果： MCI 组右侧丘脑、左侧苍白质和双侧杏仁核体积均小于 NC 组。MCI 组右侧丘脑体积（$P=0.006$）、壳核体积（$P=0.006$）、左侧苍白质体积（$P=0.012$）、双侧杏仁核体积（右 $P=0.005$，左 $P=0.006$）与 MOCA 评分呈正相关。MCI 组右侧丘脑体积（$P=0.043$）与位数跨度（依次）评分呈正相关。此外，双侧丘脑体积（右 $p=0.001$，左 $p=0.003$）和尾状体积（右 $p=0.015$，左 $p=0.023$）与 MCI 组的位数跨度（向后）评分呈正相关。此外，一般线性回归模型表明，在非 apoe ε 4 等位基因携带者中，右丘脑和右壳核体积与 MOCA 评分呈正相关，而这些相关在 apoe ε 4 等位基因携带者中不显著。但 APOE ε 4 等位基因携带者右侧丘脑与 MOCA 评分相关的非标准系数大于非携带者，说明右侧丘脑体积萎缩与 APOE ε 4 等位基因携带者的认知水平有关。

结论： 总之，apoe ε 4 等位基因改变了右侧丘脑和 MOCA 评分以及右侧壳核之间的相关性。apoe ε 4 等位基因在一定程度上对认知与大脑结构的关系有着特殊的影响。

EPO-0025

嗅觉神经环路在 AD 超早期 SCD 中改变特征的研究

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目的： 采用嗅觉刺激任务态功能磁共振（task-fMRI）探讨主观认知能力下降（SCD）患者与正常老年人的嗅觉脑区激活差异，探寻早期识别和评估 SCD 向阿尔茨海默病（AD）转化的客观影像标志物。
方法： 2017 年 3 月至 2018 年 12 月从社区招募 20 例 SCD 患者（SCD 组）及 20 名匹配的正常老年人（NC 组）。所有受试者均进行全套认知心理学量表测试、嗅觉行为学测试及嗅觉 task-fMRI。分析两组被试之间的嗅觉行为学、认知心理学量表及 task-fMRI 脑激活之间的差异，进一步采用两组在任务态有差异的脑区为种子点做静息态功能连接分析，计算脑区激活与行为学的相关性。
结果： 与正常被试比较，SCD 患者的嗅觉行为学（嗅觉识别能力）显著下降（t=-3.042, P<0.01），嗅觉阈值差异没有统计学意义。在 SCD 自评量表（t=6.973, P < 0.01）、费城词语学习的即刻（t=-4.623, P < 0.01）和延迟（t=-2.746, P<0.01）测试中也出现显著下降，其余常规认知心理学量表均表现为正常。嗅觉任务态 fMRI 中，SCD 患者双侧初级嗅觉皮层（POC）的激活显著下降，包括双侧内嗅皮层、梨状皮层、杏仁核、嗅前核以及海马头部。以 POC 为种子点，静息态功能连接显示 SCD 患者嗅觉系统与默认网络的功能连接显著减弱（AlphaSim 校正，体素水平，P<0.01，簇水平，P<0.05）。
结论： 嗅觉功能在 SCD 患者中已出现损伤，内嗅皮层等初级嗅觉皮层的活动改变可能是早期客观评价 SCD 神经环路损伤的生物标志物。

EPO-0026

Age-related iron deposition in the basal ganglia of controls and Alzheimer disease patients quantified using susceptibility weighted imaging

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This study aimed to investigate age-related iron deposition changes in healthy subjects and Alzheimer disease patients using susceptibility weighted imaging. The study recruited 182 people, including 143 healthy volunteers and 39 Alzheimer disease patients. All underwent conventional magnetic resonance imaging and susceptibility weighted imaging sequences. The groups were divided according to age. Phase images were used to investigate iron deposition in the bilateral head of the caudate nucleus, globus pallidus and putamen, and the angle radian value was calculated. We hypothesized that age-related iron deposition changes may be different between Alzheimer disease patients and controls of the same age, and that susceptibility

weighted imaging would be a more sensitive method of iron deposition quantification. The results revealed that iron deposition in the globus pallidus increased with age, up to 40 years. In the head of the caudate nucleus, iron deposition peaked at 60 years. There was a general increasing trend with age in the putamen, up to 50-70 years old. There was significant difference between the control and Alzheimer disease groups in the bilateral globus pallidus in both the 60-70 and 70-80 year old group comparisons. In conclusion, iron deposition increased with age in the globus pallidus, the head of the caudate nucleus and putamen, reaching a plateau at different ages. Furthermore, comparisons between the control and Alzheimer disease group revealed that iron deposition changes were more easily detected in the globus pallidus.

EPO-0027

MR 定量磁敏感图评估阿尔茨海默病患者静脉血氧水平及其与认知功能水平的关系

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目的

采用 MR 定量磁敏感图（QSM），定量测量 AD 患者大脑静脉血氧水平，并分析磁敏感值与临床实验室指标、认知评分之间的相关性。

材料与方法

研究对象分为 AD 组及对照（CON）组。AD 组共 59 例，均为自 2015 年 9 月-2019 年 12 月期间在本院住院，并符合 NINCDS/ADRDA 诊断标准的患者；CON 组 22 例，为自愿或因其他原因来我院检查的患者。记录所有 AD 组患者的临床资料及实验室检查指标，包括年龄、性别、病程、受教育程度、血压情况、总胆固醇、甘油三酯、高密度脂蛋白（HDL）、低密度脂蛋白（LDL）及同型半胱氨酸含量，并由神经内科医生进行简易智力状态检查量表(MMSE)、蒙特利尔认知评估量表(MoCA)、画钟试验(CDT)以及日常生活能力量表(ADL)评估。采用 GE 3.0TMR 机，行常规 MRI 及 ESWAN 检查。采用美国韦恩州立大学 SPIN 软件进行图像后处理，获得 QSM 图，在 QSM 图像上分别测量大脑内静脉（ICV）、丘纹上静脉（TV）、透明隔静脉(SV)、基底静脉(BV)及齿状核静脉(DNV)的磁敏感值（MSV）。应用 SPSS 17.0 进行数据分析。

结果

1.AD 组所有大脑静脉 MSV 值均高于 CON 组，并在双侧 TV、双侧 DNV、左侧 BV、左侧 ICV 具有显著差异（P＜0.05）。

2.双侧 TV、双侧 ICV、双侧 DNV 与 MMSE 评分间具有显著负相关性；双侧 TV、双侧 DNV 与 MoCA 评分间具有显著负相关性；双侧 TV、双侧 DNV、右侧 SV 与 CDT 评分间具有显著负相关性；双侧 TV、双侧 SV、左侧 BV 与 ADL 评分间具有显著负相关性。

3.左侧 DNV 的 MSV 值与病程正相关；右侧 SV 的 MSV 值与总胆固醇含量正相关；右侧 DNV 的 MSV 值与甘油三酯含量呈正相关；左侧 ICV 的 MSV 值与 HDL 含量呈负相关。

结论

AD 患者脑静脉 MSV 值增高，血氧饱和度降低，也影响认知评分；大脑静脉 MSV 值可以用于 AD 的鉴别诊断。

EPO-0028

多模态磁共振成像在帕金森病中的应用价值

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摘要：目的 探讨多模态磁共振成像技术在帕金森病(Parkinson’s disease，PD)患者脑结构变化中的应用价值。**方法** 对符合入选标准的 20 例 PD 患者及性别、年龄、利手相匹配的 20 例老年健康对照者，进行临床评估及磁共振图像采集，获取各项异性分数(FA)降低、灰质体积(grey matter volume，GMV)减小的脑区，比较两组间 T2 加权成像(T2WI)横断面黑质致密部(SNc)宽度及其与中脑直径的比值差异，并与 Hoehn-Yahr 分级量表、PD 统一评分量表第 3 部分(parkinson disease unified rating scale-Ⅲ，UPDRS-Ⅲ)评分进行相关性分析。**结果** 1.与对照组比较，PD 组神经纤维束呈现弥漫性异常，存在多个 FA 值降低区域：胼胝体、双侧前放射冠、内囊、外囊、皮质脊髓束、上纵束、钩状束、扣带束、穹隆、矢状层（下纵束及额枕下束）及小脑下脚。2.与对照组比较，PD 组距状沟、左侧角回、右侧额下回 GMV 减小；未发现 PD 组 GMV 增加的脑区。3.与对照组比较，PD 组 SNc、SNc/中脑直径减小，差异有统计学意义(P<0.05)；PD 组 SNc、SNc/中脑直径与 H-Y 分级、UPDRS-III 评分无相关性(P>0.05)。**结论** 多模态磁共振成像技术能精准定位 PD 患者脑内微结构损伤区域，对探究 PD 患者脑结构变化具有重要价值。

EPO-0029
静息态 BOLD-fMRI 在轻度认知障碍和阿尔茨海默病中的应用

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目的：应用静息态 BOLD-fMRI 成像技术，比较认知功能正常的老年人、aMCI 患者和 AD 患者与后扣带回（PCC）相关的默认网络结构的差异，探讨静息态 BOLD-fMRI 在 MCI 患者和 AD 患者中的应用，为 aMCI 及 AD 的早期诊断提供影像依据。**方法**：收集就诊于山西医科大学第一医院神经内科临床疑诊为 aMCI 患者 10 例，男 3 例，女 7 例，年龄 63～78 岁，平均年龄 69.3 岁；疑诊为 AD 患者 15 例，男 6 例，女 9 例，年龄 65～80 岁，平均年龄 71.9 岁；选取与 AD 组及 aMCI 组性别、年龄及受教育程度相匹配的健康志愿者 10 例，男 7 例，女 3 例，年龄 60～75 岁，平均年龄 67.8 岁。行头颅常规 MRI 检查除外脑外伤、脑出血、脑梗塞、脑肿瘤及颅脑手术等神经系统疾病。所有受试者行静息态 BOLD-fMRI 检查，以 PCC 为种子区，进行与全脑其他区域基于体素的时间序列相关分析。经获得激活脑区阈值设为经校正的 P<0.05，激活脑区体素范围>10。**结果**：①正常对照组与 PCC 有功能连接的脑区包括：前额叶内侧区、双侧海马、丘脑背侧、楔叶及楔前叶、顶下小叶、部分颞叶，网络结构的对称性良好，连通性完整。②aMCI 组所显示的与 PCC 有功能连接的脑区和正常对照组相似，但是激活脑区的体素减少，网络结构连通性减弱。③AD 组与 PCC 有功能连接性的脑区包括：双侧前额叶内侧区、楔叶及楔前叶、顶下小叶、部分颞叶等，激活脑区的部位及范围较正常对照组明显减少，双侧海马未见激活，网络结构存在减弱和断裂。**结论**：BOLD-fMRI 技术作为一种新的 MRI 成像方法，使磁共振检查不再局限于人脑形态学的研究，已经延伸到脑功能成像的领域，为我们更好的研究脑功能提供了方法。静息态默认网络的提出为我们诊断 AD 开拓了新思路，AD 认为

是一种“失连接状态”，MCI 患者和 AD 患者脑内默认网络功能的连通性出现减弱和断裂，为 aMCI 及 AD 的早期诊断提供了依据

EPO-0030

Altered resting-state voxel-level whole-brain functional connectivity in multiple system atrophy patients with cognitive impairment

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Objective: *Increasing evidence suggests that cognitive impairment (CI) is frequent in patients with multiple system atrophy (MSA), however, the neurobiological mechanisms underlying CI in patients with MSA are still debated.*
Methods: *Degree centrality(DC), voxel-wise image and clinical symptoms correlation and secondary seed-based FC analyses were performed in 61 patients with probable MSA and 33 healthy controls to reveal voxel-level whole-brain FC changes in MSA-CI.*
Results: *Patients with MSA-CI and patients with MSA with normal cognition (MSA-NCI) both exhibited similar low DC values in the left calcarine and right postcentral regions, while high DC values were noted in the bilateral caudate and left precuneus compared to controls. Direct comparison of MSA-CI and MSA-NCI showed differences only in the right middle frontal gyrus. The average DC values of right middle prefrontal cortex correlated with clinical cognitive severity, and using it as a seed, a secondary seed-based FC analysis further revealed FC changes in the right precuneus, inferior parietal lobe, and right insula.*
Conclusions: *Decreased right middle frontal cortex activity and its functional connectivity network alterations with the precuneus, inferior parietal lobe, and insula may serve as biomarkers of brain dysfunction in patients with MSA-CI.*

EPO-0031

Local connectivity of the resting brain connectome in patients with low back-related leg pain: A multiscale frequency-related Kendall's coefficient of concordance and coherence-regional homogeneity study

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Increasing evidence has suggested that central plasticity plays a crucial role in the development and maintenance of (chronic) nonspecific low back pain. However, it is unclear how local or short-distance functional interactions contribute to persisting low back-related leg pain (LBLP) due to a specific condition (i.e., lumbar disc

herniation). In particular, the multiscale nature of local connectivity properties in various brain regions is still unclear. Here, we used voxelwise Kendall's coefficient of concordance (KCC) and coherence (Cohe) regional homogeneity (ReHo) in the typical (0.01–0.1 Hz) and five specific frequency (slow-6 to slow-2) bands to analyze individual whole-brain resting-state functional magnetic resonance imaging scans in 25 persistent LBLP patients (*duration: 36.7±9.6 months*) and 26 healthy control subjects. Between-group differences demonstrated significant alterations in the KCC- and Cohe-ReHo of the right cerebellum posterior lobe, brainstem, left medial prefrontal cortex and bilateral precuneus in LBLP patients in the typical and five specific frequency bands, respectively, along with interactions between disease status and the five specific frequency bands in several regions of the pain matrix and the default-mode network (*P<0.01, Gaussian random field theory correction*). The altered ReHo in the five specific frequency bands was correlated with the duration of pain and two-point discrimination, which were assessed using partial correlational analysis. These results linked the course of disease to the local connectivity properties in specific frequency bands in persisting LBLP. In future studies exploring local connectome association in pain conditions, integrated frequency bands and analytical methods should be considered.

EPO-0032

Extensive Microstructural Alterations of White Matter have been exited in End-stage Renal Disease Patients before Dialysis Initiation

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Purpose This study aimed to perform the microstructure of white matter in end-stage renal disease (ESRD) patients before dialysis initiation.
Methods We recruited 49 ESRD patients before dialysis initiation (mean age 35.41±10.04 years) and 42 healthy volunteers (mean age 38.25±8.93 years). Three-dimensional T1-weighted imaging and diffusion tensor imaging (DTI) were acquired using a GE 3.0T scanner. The tract-based spatial statistics (TBSS) of FSL tools was used to detect the micro characteristics of white matter, and correlation analysis among neuropsychological tests and laboratory tests was made for exploring the brain structural and functional impairment from microscopic level of white matter.
Results ESRD patients before dialysis initiation showed extensive white matter microstructural changes, almost involved all of the fiber tracts, characterized by decreased diffuse anisotropy (FA), and increased mean diffusion (MD), axial diffusivity (AD) and the radial diffusivity (RD) coefficient (P<0.05, FWE correction). The changes of white matter microstructure had a relationship with the accumulation of blood urea nitrogen. It may be associated with osmotic gradient change of blood-brain barrier, and then induced the diffuse interstitial brain edema. The changed

microstructural characteristics of bilateral superior longitudinal fasciculus (SLF) had a close relationship with memory function decline.
Conclusion Our findings revealed that ESRD patients before dialysis initiation have exited widespread white matter microstructural abnormality. And the microstructural damage of white matter, especially the injury of SLF which is the main internuncial fibers between the prefrontal cortex and posterior parietal cortex, is related to the decline of memory function in ESRD patients before dialysis initiation. The accumulation of urea nitrogen was one of most important risk factors for the impairment of whiter matter in ESRD before dialysis initiation.

EPO-0033
应用 SMS-Bold fMRI 评估高海拔地区慢性失眠障碍患者脑结构和功能变化

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目的 慢性失眠影响人的记忆、免疫及认知等功能，而高海拔地区由于低氧、低压、低温特殊的地理环境，慢性失眠障碍的发生率较高。故本研究目的在于应用 SMS-Bold fMRI 探讨高海拔地区慢性失眠障碍患者脑结构及功能的改变，为研究高海拔地区慢性失眠障碍发生的病理生理机制提供影像学支持。**方法** 招募高海拔地区（海拔高度约 2300m）、年龄、教育年限相匹配的 13 例慢性失眠障碍患者及 13 例健康志愿者，采集所有受检者脑结构像（MP2RAGE）及静息态功能磁共振(SMS-BOLD)序列，应用基于体素的形态测量学（VBM）、低频振幅（ALFF）方法处理并组间对比，提取差异脑区灰质体积（GMV）及 ALFF 值。**结果** 与正常对照组相比，慢性失眠障碍组在双侧梭状回、双侧小脑 6、1、9 区、左侧舌回、左侧距状裂周围皮层、左侧枕叶、双侧海马、左侧楔叶、左侧海马旁回、左侧杏仁核、右侧小脑 4/5 区灰质体积萎缩；与正常人对照组相比，慢性失眠障碍患者组在双侧小脑 2、8、1、7b 区、双侧舌回、左侧梭状回 ALFF 值减低。**结论** 高海拔地区慢性失眠障患者有多个脑区灰质体积的萎缩及功能异常，部分脑区功能的变化与结构相关。

EPO-0034
Analysis of Resting-state Cerebral Blood Flow Characteristics in Treatment-naive Patients with First-episode Obsessive-compulsive Disorder Based on 3D-ASL Cerebral Perfusion Imaging

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【Abstract】**Purpose**:The cerebral blood perfusion characteristics of treatment-naive patients with first-episode obsessive-compulsive disorder patients were studied by 3D arterial spin labeling imaging (ASL) whole brain perfusion imaging technique.
Materials and Methods:Analysis of resting-state cerebral perfusion map (ASL) and

cerebral blood flow (CBF) images in 34 treatment-naive patients with first-episode obsessive-compulsive disorder, The results were compared with that of 34 healthy controls.The psychiatric symptoms of all patients were assessed with Y-BOCS. **Results**:The resting-state cerebral blood flow of treatment-naive patients with first-episode obsessive-compulsive disorder is mainly characterized by low perfusion of bilateral cingulate gyrus and high perfusion of left middle temporal gyrus and infratemporal gyrus. **Concolusion**:Resting-state cerebral blood flow of treatment-naive patients with first-episode obsessive-compulsive disorder is abnormal , suggesting a possible neurological pathogenesis of obsessive-compulsive disorder.

EPO-0035
失去独生子女所致创伤后应激障碍的脑灰质体积改变

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目的 采用基于体素的形态测量学（Voxel-based Morphometry，VBM）的方法探讨失独所致创伤后应激障碍（Post-traumatic Stress Disorder，PTSD）患者的脑灰质体积（Gray Matter Volume，GMV）的变化。

方法 共收集 19 例伴 PTSD 的失独患者（PTSD 组）、28 例不伴 PTSD 的失独患者（TC 组）及 27 例健康对照组（HC 组），应用当前和终生的临床用创伤后应激障碍诊断量表（Clinician Administered PTSD Scale, CAPS）评估每位失独者的症状严重程度。所有受试者接受 3.0T MRI 扫描，并采用基于 Matlab_R2013b 平台的 SPM8、VBM8 分析软件，将年龄、性别及颅内容积（Intracranial Volume, ICV）作为协变量，得到两组间 GMV 有显著差异的脑区。

结果 结果显示，PTSD 组、TC 组及 HC 三组之间，默认网络相关脑区的 GMV 存在差异，差异有统计学意义（$P<0.01$）。与 HC 组相比，PTSD 组的右侧额上回、海马旁回及颞下回的 GMV 减小；与 HC 相比，TC 组的右侧海马、中央前回及楔前叶的 GMV 减小；与 TC 组相比，PTSD 组的左侧额上回、右侧楔前叶 GMV 减小，而左侧梭状回的 GMV 增加（P 均<0.001）。相关分析结果显示，左侧梭状回的 GMV 与 CAPS 评分呈中度负相关（$r=0.490$，$p=0.033$），且与 PTSD 的回避症状呈显著负相关（$r=0.555$，$p=0.014$）。

结论 失独者的默认网络相关脑区的脑结构存在异常改变，其中左侧额上回及右侧楔前叶的灰质体积减低可能导致了失独患者 PTSD 的发生，而左侧梭状回的体积增加可能是 PTSD 症状严重程度的潜在预测因子。

EPO-0036
Cerebral Neurovascular Coupling Altered in Patients with Narcolepsy

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Background

Nowadays, narcolepsy is aggravating the adverse effect on human life. Recent studies have shown that there is a certain relationship between narcolepsy and neurovascular coupling (NVC) dysfunction. However, there is still a lack of clinical evidence for the association between narcolepsy and NVC dysfunction. Multifunctional MRI can explore the relationship between cerebral vascular perfusion and neural activity, thus reflecting NVC condition in people with narcolepsy [1]. Therefore, exploring the relationship between narcolepsy and NVC dysfunction may play an important role in the treatment of narcolepsy.

Methods

This study included 27 patients (including 2 type: rapid eye movement sleep behavior disorder, RBD; nonRBD) with narcolepsy and 27 healthy controls with no difference in age, gender, BMI and education level. All participants completed Pittsburgh Sleep Quality Index (PSQI) to assess sleep quality, which shown that narcolepsy patients have lower sleep quality. We used blood oxygen level dependent signal (BOLD) sequence to reflect the activity intensity of brain neurons and cerebral blood flow map (CBF) based on arterial spin labeling (ASL) signal to reflect cerebral blood perfusion. All these indicators were estimated between narcolepsy and the controls groups.

Results

The PSQI score increased significantly in narcolepsy patients compared with the control group indicating the sleep quality of narcolepsy patients decreased significantly. Decreased NVC were found in left occipital gyrus, right and left precentral gyrus, left postcentral gyrus, right amygdala and left fusiform gyrus. Besides, the total PSQI score was negatively correlated with NVC coefficients in the regions with deceased NVC.

Conclusion

Imaging results showed that there is neurovascular disfunction in narcolepsy patients. Significant correlations were found between the imaging changes of neurovascular uncoupling and the brain function indicators.

EPO-0037

Prognostic correlation between stent and thrombolytic therapy in patients with acute cerebral infarction with aspects score

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Background:

Early ischemic changes(EICs) on CT before the administration of acute stroke therapies may predict functional outcome and the risk of cerebral hemorrhage. The Alberta Stroke Program Early CT score (ASPECTS) system is developed to assess the EICs on noncontrast-enhanced computed tomography (NCCT) in patients with acute ischemic stroke involving the middle cerebral artery (MCA) territory. However, its merit in predicting prognosis remains controversial. We aimed to use ASPECTS to predict patient prognosis in the our patient cohort of our hospital.

Methods:
A total of 358 patients from 2009 to 2019 with Acute cerebral infarction(ACI) who received intravenous thrombolysis or stent therapy were retrospectively included, the complete pre-treatment NECT images were obtained from the PACS(Picture Archiving and Communication Systems). According to the treatment, ACI patients were divided into two thrombolytic therapy group (n = 22) and stent therapy group (n = 336). The APPECTS of NECT as well as the patient prognosis were retrieved from NECT and the medical follow-up, respectively. The predicting merit of ASNPECTS for prognosis was analyzed.
Results:
This study included 336 patients. 123 cases were treated with intracranial stent implantation and 213 cases were treated with percutaneous intracranial stent implantation. 90% patients were successful recanalization (40% cerebral infarction thrombolysis [TICI] 2B (Almost completely re-pass) and 51% TICI 3 (Complete recanalization)), and aspects score decreased during hospitalization in all patients, with an average Aspects score decrease of 2-3 points. Compared with TICI 2B recanalization, the Aspects score of TICI 3 patients showed a significant decrease. There was Almost no symptomatic intracranial hemorrhage in our cohort.
Conclusions:
careful selection of patients using ASPECTS may allow for safe interventions, with low risk of clinical deterioration, and no-periprocedural mortality. All our patients demonstrated a reduction in their Aspects score after the thrombectomy and clinical improvement.

EPO-0038

The predictive value of anatomic abnormalities of habenula in the diagnosis of schizophrenia

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Purpose
The diagnostic value of the anatomic abnormalities (AA) of habenula (Hb) became noticeable with the development of high resolution (HR) MRI in neuropsychiatric disorders. In this study, we primarily investigated the correlation of the AA effect of Hb with the pathophysiological mechanism of schizophrenia.

Methods
Institutional approval and consent form were obtained for this study. Fifteen patients with chronic schizophrenia (SC) and sixteen matched healthy controls (HC) were recruited. Psychopathological symptoms were assessed with the Positive and Negative Syndrome Scale (PANSS). All subjects were scanned at a 3.0T MR scanner. Left and right Hbs of each subject were manually delineated on the obtained 3D HR T1 MR images by two radiologists. Except for the Hb volume of each subject, the volume of grey matter (GM) and white matter (WM) contained in Hb were automatically generated using the “New Segment” toolbox in SPM8. The statistical comparisons were performed using paired t

tests for hemisphere, independent samples t tests between groups, and Spearman's rank correlation for correlation between volume and clinical variables.

Results and Discussion

Lateralization was found in both groups, with left Hb larger ($p<0.01$). It was observed the relative Hb volumes were far less a sensitive index as the absolute Hb volumes. Comparing with HC, SC patients exhibited significantly volumetric decreasing in left Hb GM and whole left Hb ($p<0.05$). The volumes of left Hb WM were significantly related with PANSS negative scores ($p<0.05$), so as the right Hb GM with the general scores and the total scores of PANSS ($p<0.05$).

Conclusion

Although the lateralization of Hb remained in SC, it was observed the volume of Hb for SC patients were smaller than HC. Especially, at certain regions, the absolute volumetric index of Hb had significant relationship with clinical syndrome, which indicated the AA of Hb might be involved in the neuropathological course of schizophrenia.

EPO-0039

The study of resting-state functional MRI based on amplitude of low-frequency fluctuation (ALFF) in chronic alcoholics

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Objective This study was to assess the value of amplitudes of low-frequency fluctuation (ALFF) in detecting the changes of brain spontaneous activity based on resting state functional MRI (fMRI) in chronic alcoholics, and to discuss the underling neurophysiological mechanism.
Methods Eighteen chronic alcohol dependent individuals and 22 relevant basic information (including gender, age, education and handedness) matched healthy controls were recruited as the alcohol dependent group and the control group respectively. All subjects were asked to perform MAST, ADS and record clinical symptom, then conventional sequences and resting-state functional MRI were applied. SPM8 and DPARSF software was used to process and analyze the resting-state functional MRI data, and then the whole brain regional homogeneity (ReHo) data were acquired. Two-sample t-test was used to examine the differences of ALFF values between two groups.
Results In comparison with control group, the alcohol-dependent group had decreased ALFF values in extensive brain regions including bilateral precuneus, left middle frontal gyrus, right cuneate lobe (voxels range 15～90. $t=-5.394$～-3.949, $P<0.01$), as well as increased ALFF values in bilateral frontal gyrus (voxels range 6～15. $t=3.585$～3.600, $P<0.01$).
Conclusion In resting state, the chronic alcohol-dependence individuals showed abnormal spontaneous activity of the brain compared to that of the normal's. The

significant abnormal brain regions in ALFF is also located in bilateral frontal lobes, and there existed overlap between the abnormal regions of ALFF and Reho values. The abnormal brain regions are the part of brain's default mode network, it may imply that these abnormal activities might be related to the brain's default network changes.

EPO-0040
DCE-MRI 定量半定量分析对鼻咽癌放射性脑病影像诊断相关性研究

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目的 研究对鼻咽癌放射性脑病（RE）的影像诊断中 DCE 定量及半定量参数相关性。**方法** 46 例经病理证实鼻咽癌并放疗后 2 年以上影像诊断及临床诊断符合放射性脑病的病人行普通 MRI 增强检查三次以上的患者扫描加 DCE 扫描，采用 FFE 序列行多层采集，采用渗透分析软件，按放射性脑病病理生理学变化特点在对比剂强化区域、水肿区域及同侧正常脑组织回顾性画出感兴趣区，获得 T1 加权信号强度-时间曲线，基于双室血流动力学模型，产生三个脑血流动力学参数 Ktrans、Ve 和 Kep。测量时参考增强图像，手动勾画感兴趣区，为了减少误差反复测量 8～10 次，取其平均值定量及半定量分析结构对比。比较强化区、水肿区及正常脑组织的各参数的变化，分别探讨 DCE-MR 参数与强化特点之间的各参数的相关性比较后期治疗效果评价的相关性研究。**结果** 放射性脑病病理学改变特点与放射性脑病影像表现特点、DCE-MRI 的各参数的变化特点参数意义基本一致。**结论** 鼻咽癌放射性脑病患者普通 MRI 强化以外 DCE-MRI 各定量血流动力学参数变化有一定相关性。RE 的强化区的 DCE-MRI 参数中（Ktrans、ve、kep 等）表现出明显意义，在 RE 水肿区的 DCE-MRI 参数（Ktrans、ve、kep）表现有一定的鉴别特点，可以用（Ktrans、ve 值）参考判断病变区域并疗效评估及治疗计划改变上有一定的价值指标，为鼻咽癌个体化治疗和治疗方案修正提供依据。DCE-MRI 定量参数对结合普通 MRI 增强结合评估病灶的各期变化特点及治疗效果评价中有一定量意义。

EPO-0041
The velocity of cerebral blood flow declines during prolonged altitude exposure in elderly men.

Jie Feng,Shiyu Zhang,Xiao Yu,Wenjia Liu,Lin Ma
radiology of PLAGH

Objective
The alteration of the cerebral arterial flow velocity (CBFv) is the integrated consequence of the hemodynamic and it can reflect the cerebral perfusion in certain extent. The aim of the present study was to explore the effects of acute and prolonged altitude exposure on extracranial cerebral arterial flow velocity (CBFv) in old male subjects, using phase contrast MR sequence.
• Materials and Methods

Eleven healthy old male subjects (56.7± 2.6 years, body mass index 22.7± 2.7) were recruited for this study with written informed consent obtained. All of the participants were apparently healthy and living at <100 m above sea level without previous exposure to high altitude (>1500 m). No alcohol, caffeine, or medication that could affect CBF was consumed during this study. None of the subjects received medication to prevent AMS. The study was approved by the Ethics Committee of Chinese PLA General Hospital and conformed to standards set by the Declaration of Helsinki. All subjects received MR scan at sea level (Beijing, 50 m) (SL1), the day ascent to the altitude (D0), the and the following 4 consecutive days (D1-D4) and the day descent to the sea level (SL2). PC sequence was acquired to measure the CBFv of 4 extracranial cerebral arteries (bilateral vertebral arteries (VA_R, VA_L) and internal carotid arteries (ICA_R, ICA_L)). Due to the technical problems, there were 68 data acquired that were: SL1=10, D0=10, D1=9, D2=9, D3=10, D4=9, SL2=11, only 4 subjects had accomplished all the 7 scan. So ANOVA and paired t test was used to maximize the usage of the data. A $p<0.05$ was considered as statistically significant.

Results

The CBFv of SL1,D0,D1,D3 was analyzed using one-way ANOVA, trend analysis of VA_R, VA_L, ICA_R and ICA_L shows the CBFv of these arteries during acute and prolonged altitude exposure show a quadratic trend (p=0.015, 0.000, 0.020, 0.013 respectively). After acute altitude exposure, the CBFv declines progressively, and after 2days accommodation, the CBFv restores to the basal level. Paired t test shows the CBFv of VA_L and ICA_L on D0 decreased compared with that on SL1(31.43 ± 8.72 VS 25.11 ± 5.25, p=0.019; 40.66±9.66 VS 30.24 ± 6.86, P=0.022), and the CBFv of VA_L and VA_R on SL2 decreased than that on SL1(32.09±8.47 VS 26.46±6.92, p=0.015; 30.53 ± 4.85 VS 27.46±5.46,p=0.030). During the prolonged exposure to the altitude, no increased CBFv was captured in present study.

Conclusions

Contrary to previous studies reported increased CBFv during altitude or simulated altitude exposure, the present study shows that CBFv of the extracranial cerebral arteries declines during acute altitude exposure, and restores after accommodation. In addition, there might be differences between the altitude accommodation of right and left, and ICA and VA, it needs to be investigated in the future.

EPO-0042

Altered spontaneous brain neural activity in dysthyroid optic neuropathy: A resting-state fMRI study

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Purpose: Some researchers suggest that visual function impairment related disease maybe not only a disease limited to the visual system, but also a neurodegenerative disease involving multiple brain regions. We aim to investigate the altered global spontaneous brain neural activity in patients with dysthyroid optic neuropathy (DON)

by combined employing regional homogeneity (ReHo) and the amplitude of low-frequency fluctuation(ALFF).
Material and Methods:18 DON patients, 24 TAO patients without neuropathy and 30 age-,sex-matched healthy controls(HC) were included. ReHo and ALFF values were calculated to represent spontaneous brain activity. ANOVA were performed among them for comparison, then, two-sample t test were performed to observe the difference between any two groups.
Results:
(1) Compared to HC, TAO patients showed increased ReHo and ALFF in anterior cingulate, right hippocampus and left parietal lobe; ReHo and ALFF values significantly decreased in superior temporal gyrus, occipital lobe, anterior central gyrus, left middle frontal gyrus and right parietal lobe.
(2) Compared to HC, DON patients showed increased ReHo and ALFF in left middle temporal gyrus, left fusiform gyrus, right hippocampus, superior posterior cingulate gyrus and right superior marginal gyrus; ReHo and ALFF values significantly decreased in Brodmann area 18/19 and right superior temporal gyrus.
(3) DON patients showed increased ReHo and ALFF values in right middle temporal gyrus, posterior cingulate gyrus and central anterior gyrus in comparison with TAO, whereas, the ReHo and ALFF values of DON were decreased in Brodmann area 19 and the anterior cingulate. ($p<0.01$, AlphaSim corrected).
Conclusions: Combined ALFF and ReHo analyses demonstrated a significant decrease in spontaneous brain neural activity in various brain regions, which mainly located in the visual cortex areas. This study may enhance our understanding of the visual function impairment in DON, and the altered brain neural activity. Which may have potential guidelines for future therapeutic implications.

EPO-0043
抑郁症性别差异的磁共振脑结构成像研究

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目的：采用基于体素的形态学测量法（VBM）探讨男女性抑郁症患者脑灰质体积改变的性别差异，以及这些差异脑区灰质体积值与抑郁症临床指标的相关性。
方法：纳入 25 例男性未用药抑郁症患者、36 例女性未用药抑郁症患者及年龄匹配的 25 例男性和 36 例女性健康对照者为研究对象。对 4 组受试者均采用美国 GE 3.0T MR 扫描仪行磁共振常规及 3DT1 结构像数据采集。应用 VBM-DARTEL 对数据进行后处理，使用 SPM8 软件进行统计分析，对 4 组受试者行双因素方差分析，性别和诊断作为组间因素，在差异脑区的基础上进行 post-hoc 两两间双样本 t 检验。提取主结果中性别差异脑区的灰质体积值与抑郁症患者临床指标（病程、发病年龄及 HAMD 评分）进行相关分析。
结果：4 组受试组之间年龄、受教育年限差异均无统计学意义； 男女性抑郁症组 HAMD 评分差异无统计学意义；男女性抑郁症组病程差异有统计学意义（$P<0.05$）。 4 组间主分析结果发现男性右侧舌回、双侧颞中回、左侧中央后回、右侧额叶内侧回、双侧丘脑、双侧额上回、左侧中央后回、左侧额中回及双侧中央前回灰质体积均小于女性；进一步组间两两比较发现男性抑郁症组与女性抑郁症组相比，左侧额中回、双侧额上回、左侧中央前回、右侧额叶内侧回、双侧中央前回及双侧丘脑灰质体积减小（ $P<0.05$，Alphasim 校正），提取主分析结果中性别差异脑区的灰质体积值与抑郁症患者临床指标进行相关分析发现，男性抑郁症患者左侧颞中回的灰质体积与 HAMD 评分呈负相关

（r=-0.418, p=0.042），左侧额中回的灰质体积与 HAMD 评分呈负相关（r=-0.498, p=0.013），而女性患者无相关性。
结论：男女性 MDD 患者灰质体积出现性别差异的脑区可能与男女性患者临床表现和发病率的差异有关。男性 MDD 患者左侧颞中回及左侧额中回的灰质体积值与 HAMD 评分呈负相关提示灰质体积可以预测男性抑郁状态的严重程度。

EPO-0044

Resting-state functional MRI study: component analysis of brain networks in patients with diabetic retinopathy

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PURPOSE: To explore the brain networks changes in diabetic retinopathy (DR) patients and uncover the underlying mechanism.
Methods and Materials: 21 patients with DR and 21 age and sex matched healthy controls were enrolled from August 2012 to September 2014. Subjects were scanned using 3T MR with blood-oxygen-level dependent (BOLD) and 3 dimension fast spoiled gradient echo (3D-FSPGR) sequences. MR data was analyzed via preprocessing and functional network construction. After a group comparison, components of brain networks with significant group differences were extracted and brain network-connection strengths among components were evaluated. The brain areas were compared between patients and controls group. P-values less than 0.05 were considered statistically significant. Connection strength was evaluated with alphasim $p<0.01$.
RESULTS: The components map of altered brain networks with quantified connection strengths were obtained in DR patients, demonstrating disconnections mainly in bilateral heschl’s gyrus, left cuneus, left occipital lobe, bilateral amygdala, left parahippocampal, bilateral fusiform and left superior parietal, in patients group than those in healthy controls ($p<0.01$, 12 network notes with mean count in random data 0.1190), while the compensations may occur in frontal-cingulumregion, as well as among the right caudate, left thalamus, left inferior temporal lobe and middle orbital frontal lobe.
CONCLUSION: Brain network connections, decreased in the brain areas of which in charging with cognition and visual function, suggests that DR patients might have cognitive decline and visual function loss. However, there might be a frontal compensatory circle in patients with DR.

EPO-0045

硫化氢中毒脑损伤影像学征象

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【摘要】 目的：探讨硫化氢气体引起中毒脑损伤在 CT 及 MRI 检查的影像学特征及机制。

方法：回顾分析 2016 年 1.1 -2018.11.1 三年间我院 9 例硫化氢气体中毒患者的影像学资料：在 9 例硫化氢中毒患者中，其中男性 8 例，女性 1 例；年龄 25-54 岁，中位年龄 33 岁。
结果：9 例患者均成功行头颅 CT 或 MRI 检查:其中 2 例重度中毒患者仅行 CT 检查，一例表现为脑水肿,并出现蛛网膜下腔出血，患者预后差，未行影像学检查复查;另一列脑白质对称性密度减低、双侧放射冠对称性密度减低；4 例中度中毒患者头颅 CT 检查表现为脑水肿、双侧基底节核团对称性密度减低，MRI 检查表现为双侧额叶、半卵圆中心、侧脑室周围、基底节核团对称性长 T1 长 T2 信号，DWI 及 T2-Flair 像呈对称性高信号，其中 2 例经治疗后行 MRI 复查脑内病变变化较前不著,2 例患者治疗过程中出现脑水肿加重、迟发脑改变等情况；3 例轻度中毒患者头颅 MRI 检查为阴性，经对症治疗后一般情况良好，各项生化指标正常。
结论： CT 及 MRI 检查对硫化氢中毒脑损伤患者的诊断和预后有重要价值。在 CT 检查中，硫化氢中毒脑内病变表现为脑水肿、脑白质对称性密度减低，部分病例可有出血。在 MRI 检查表现为双侧额顶叶、放射冠、半卵圆中心、基底核团、侧脑室周围对称性长 T1 长 T2 信号，DWI 呈等至高信号，T2-flair 像为高信号。MRI 检查能够早期发现脑部的异常表现，敏感性较高，观察 MRI 动态变化，对确定治疗方案、用药、高压氧疗程及判断预后有重要价值。但是不足之处在于其特异性较差，我们阅读其他文献提示脑血流灌注成像（rCBF 灌注减低）及波谱可能对硫化氢中毒脑损伤有特异性，在今后的工作中我们会进一步研究探索。此外，我们发现硫化氢中毒脑损害还有反复、迟发加重的表现，部分重度中毒病人可以发生不可逆性脑损害，应引起足够重视。

EPO-0046

Functional connectivity strength in patients with Type 2 Diabetes Mellitus: A resting-state functional MRI study

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Objective To provide a new approach to further elucidate the underlying pathogenesis of diabetes-related cognitive impairment in T2DM patients by using resting-state functional connectivity strength(FCS). **Methods** T2DM patients (n = 56) and age-, sex-, and education-matched healthy control subjects (n = 48) underwent the rs-fMRI .The whole brain FCS values were constructed and two-sample t-test was used to compare the FCS values of both groups to locate the regions with significant change. Functional Connectivity (FC) analysis was carried out between the seed points(the brain regions with significantly different FCS) and the voxels of whole brain. Additionly, correlation analysis was performed between the time series signal of significantly different FCS, FC and neuropsychological test , clinical variables . **Results** Patients performed worse on several neuropsychological test ,including Beck Depression Inventory,MOCA,HRSD,HAMA,YMRS,CDT. Compared with the control group, T2DM patients exhibited significantly increased FCS values in right middle temporal gyrus (t=4.718, P(voxel-level)<0.001,P (cluster-level<0.05) , additionly,decreased functional connectivity between right middle temporal gyrus and cingulate gyrus was found inT2DM.Pearson correlation analysis shows FC was significantly negatively correlated with the C- reactive protein (CRP) (t=-0.292, P=0.037). **Conclusion** The abnormal functional connectivity strength of the right middle temporal gyrus may be involved in the pathophysiological mechanisms of cognitive dysfunction of T2DM.

EPO-0047

Altered gray matter volume in patients with type 1 diabetes mellitus

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Background and Purpose: Previous studies of voxel-based morphometry (VBM) have found that patients with type 1 diabetes mellitus (T1DM) exhibit gray matter alterations, but these findings are inconsistent and have not been quantitatively reviewed. Therefore,
the aim of this study was to conduct a quantitative meta-analysis of VBM studies of patients with T1DM.
Materials and methods: The seed-based d mapping method was applied to quantitatively estimate the regional gray matter abnormalities in T1DM patients. We also used meta-regression to explore the effects of some demographics and clinical characteristics.
Results: Seven studies, with 6 datasets comprising 414 participants with T1DM and 216 non-T1DM controls, were included. The pooled meta-analyses found that T1DM patients showed robustly increased gray matter volume in the left dorsolateral superior frontal gyrus and middle frontal gyrus. And decreased gray matter volume in the right lingual gyrus, cerebellum, precuneus, the left inferior temporal gyrus and middle temporal gyrus. The meta-regression found that the patients' mean age, the percentage of female patients with T1DM, illness duration and HbA1c% were not linearly associated with gray matter volume changes.
Conclusion: This meta-analysis indicates that T1DM patients have significantly androbustly reduced gray matter mainly in the cortical regions and cerebellum.

EPO-0048

Deep radiomics biomarkers for differential diagnosis between neuromyelitis optica spectrum disorders and multiple sclerosis

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Purpose: Deuromyelitis optica spectrum disorders (NMOSD) could present similar symptoms to relapsing remitting multiple sclerosis (MS). This study aims to quantify the differences of brain MRI measurements between NMOSD and MS, so as to provide the basis for computer-aided diagnosis.

Method: Clinical brain MRI sequences for 31 patients with NMOSD, 20 patients with MS and 20 healthy controls were examined. Different from the typical radiomics approach which extract features from lesions, the convolutional neural network VGG-18 was used to extracte deep radiomics features. The random forest algorithm was used to select features with importance values over 0.001 and support vector machine was used to built a linear discriminant analysis classifier.
Result: The classification performance (area under the curve (AUC): 0.872; 95% confidence interval (CI): 0.801-0.913) consistently outperforms those of independent radiomics (AUC: 0.817; 95% CI: 0.707-0.886) and SVM (AUC: 0.856; 95% CI: 0.835-0.886) approaches.
Conclusion: This study demonstrates that MRI radiomics analysis is valuable in supporting differential diagnosis between MS and NMOSD.

EPO-0049

Dynamic properties of functional connectivity in the first-episode, treatment-naive patients with obsessive-compulsive disorder

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Background and purpose: Traditional investigations of intrinsic brain organization of obsessive-compulsive disorder (OCD) patients based on resting-state functional magnetic resonance imaging have largely not taken into account the presence and potential of temporal variability. In this work, we describe an approach to assess whole-brain functional connectivity dynamics of first-episode, treatment-naive OCD patients based on spatial independent component analysis, sliding time window correlation, and k-means clustering of windowed correlation matrices.
Material and Methods: Using resting state eyes-closed functional imaging and independent component analysis on the data that included 29 first-episode, treatment-naive OCD patients and 29 age- and gender matched healthy controls, we decomposed the functional brain data into 28 components. We subsequently evaluated group differences in functional network connectivity in a dynamic sense, computed using sliding windows (20s in length) and k-means clustering to characterize four discrete functional connectivity states. To assess the severity of OCD symptoms, the Yale-brown obsessive－compulsive scale (Y-BOCS) was used to assess the severity of both obsessions and compulsions separately and provide an overall score.
RESULTS: A total of 14 components were selected from 28 independent components, which were highly similar to the standard functional network template and located on the gray matter, overlapping less with the ventricles and blood vessels. Relevant functional networks were default mode network, salience network, auditory network, executive control network, visual network, language network, sensorimotor network, basal ganglia and precuneus. In the comparison of dynamic functional connectivity indicators, we found that there were significant differences in number of transitions among the four functional connectivity states, but no significant differences in

fraction time and mean dwell time. The number of transitions among the four states was positively correlated with the total score of Y-BOCS.
Conclusion: The dynamic evolution of functional connection in patients with first-onset OCD has the characteristics of switching state frequently, and the more the number of transitions, the more severe the obsessive-compulsive symptoms.

EPO-0050

Local connectivity of the resting brain connectome in breast cancer patients with chemotherapy: A multiscale frequency related regional homogeneity study

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Objective To explore the alteration of regional homogeneity (ReHo) and the relationship between the altered ReHo and the memory function impairment in breast cancer patients with chemotherapy.
Methods Recruited a cohort of female breast cancer (BC) patients. Using Rey auditory verbal learning test (RAVLT) to evaluate the memory function of the subjects, and voxel wise Kendall's coefficient of concordance ReHo in the typical (0.01－0.1 Hz) and five specific frequency (slow-6 to slow-2) bands to examine the difference of local functional properties between the BC patients after chemotherapy with subjective cognitive impairment (BC-CSCI group, in this study) and the prechemotherapy BC patients (BC group). The relationship was assessed between the ReHo values of altered regions and the measured value of RAVLT in the BC-CSCI group using a partial correlational analysis.
Result There is no significant difference between the BC-CSCI group and the BC group in age (P=0.207), education (P=0.455), the immediate recall (IR) of RAVLT (p=0.512), the delayed recall (DR, P=0.896), the study score (SS, P=0.134), and significant difference in the forgotten score (FS, P=0.035). Compared with the BC group, the BC-CSCI group exhibited significantly difference of the ReHo values in right precuneus/cuneus at the typical frequency band, and right precuneus/posterior cingulate gyrus (PCG), left precuneus/PCG at slow-4 (P=0.01, GRF, voxelwise P=0.01, clusterwise P=0.05). In the BC-CSCI group, the KCC-ReHo values of right precuneus/cuneus at the typical frequency band significantly correlated with IR (P=0.011, R=-0.586), DR (P=0.027, R=-0.521) and FS (P=0.024, R=0.53), while right precuneus/PCG at slow-4 significantly correlated with IR (P=0.004, R=-0.648), DR (P=0.006, R=-0.62), and left precuneus/PCG significantly correlation with IR (P＜0.001, R=-0.747), DR (P=0.001, R=-0.693) and FS (P=0.004, R=0.646), which assessed using partial correlational analysis (age and education as covariate).
Conclusion These findings linked altered ReHo to the memory function impairment in BC-CSCI group, which may provide new evidence into the understanding of the pathophysiology mechanism of chemotherapy related cognitive impairment.

EPO-0051
CACNA1C rs58619945 在双相障碍患者注意网络皮层厚度的作用

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背景及目的：持续性的注意力损害被认为是双相障碍（BD）特异性的，且独立于药物因素之外，可作为 BD 的客观标志物。影像遗传研究表明 CACNA1C 通过调节注意网络，在精神疾病注意力缺陷发育过程中起重要作用。至今，CACNA1C rs58619945 在注意网络的效应尚未明了，本研究应用结构核磁共振成像技术，以期探索 CACNA1C rs58619945 在 BD 患者注意网络皮层厚度的作用及相关机制。

材料和方法：159 例 BD 患者及 82 例正常对照接受 3.0 T 高分辨结构核磁共振扫描，利用 Freesurfer 软件后处理获取注意网络皮层厚度指标进行统计分析。

结果：BD 组右侧前额叶皮层、右侧顶叶后部、右侧颞上回、左侧外侧眶额叶皮层厚度较正常对照组减低($p<0.001$)， CACNA1C 基因型及诊断在右侧前额叶、右侧顶叶后部、右侧颞上回、左侧外侧前额叶皮层厚度存在交互效应($F=7.798$, $P=0.001$;$F=5.151$, $P=0.006$;$F=5.194$, $P=0.006$;$F=6.029$, $F=0.003$,respectively)。BD 患者 GA 及 GG 基因携带者右侧前额叶、右侧颞上回、左侧外侧眶额叶皮层厚度以及 GG 基因携带者右侧顶叶后部皮层厚度较健康对照减低。在 BD 病例组中，上述脑区皮层厚度在三种不同基因型存在较一致的变化趋势（AA>GA>GG），部分脑区不同基因型之间的皮层厚度具有统计学差异($P<0.05$, Bonferroni 校正)
。
结论：本研究首次应用结构核磁共振成像技术，探讨 CACNA1C rs58619945 在 BD 患者注意网络皮层厚度的作用及相关机制，结果显示通过神经可塑性变化等途径，CACNA1C rs58619945 在警觉、定位子网络形态学变化起一定的作用，有助于阐明 CACNA1C rs58619945 与 BD 之间的神经病理机制。

EPO-0052
Frequency-Specific Abnormalities of Functional Homotopy in alcohol dependence: A Resting-State fMRI Study

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Purpose: Alcohol dependence (AD) is a relapsing mental disorder and always concurrent misuse of tobacco. Increasing studies indicated disruption of structural connectivity between hemispheres in ADs brain. However, the alterations in interhemispheric interactions and its specificity of frequency bands in ADs is still unknown. Voxel-mirrored homotopic connectivity (VMHC) offer a means to examine the functional interactions between mirrored interhemispheric voxels. Here, we use VMHC to investigate the homotopic connectivity of ADs and alcohol and nicotine co-dependence (AND) subjects.
Patients and methods: VMHC and seed-based functional connectivity (FC) between 24 ADs, 30 ANDs, and 35 sex-, age-, education-matched healthy controls (HCs) were calculated in different frequency bands (slow-5, slow-4, and typical band).

Results: ADs demonstrated significantly reduced VMHC in bilateral cerebellum posterior lobe (CPL) and increased VMHC in bilateral middle frontal gyrus (MFG) compared to HCs in typical band and slow-4 band, and this higher VMHC value in MFG was positively correlated to dependence-severity score. In all bands of VMHC analysis, no significant differences were found in ANDs versus other groups. Subsequent seed-based FC analysis demonstrated all the abnormal VMHC regions exhibited altered FC with its counterpart on the opposite hemisphere in typical and slow-4 band, still consisting of CPL and MFG. Furthermore, FC value between bilateral CPL within ADs was negatively correlated with alcohol intake.
Conclusions: Our findings of abnormalities in CPL and MFG provide further evidence of the role of disruptions within brain circuitry supporting cognitive control in development of AD. Alterations neural activities in those regions might be a biomarker of dependence severity in AD patients. Meanwhile, because of the frequency-specific in VMHC, we have to consider frequency effects in future fMRI study of AD. Finally, No finding observed in AND group need further study.

EPO-0053

Default Mode Network Changes in Individuals with Subjective Cognitive Decline and Mild Cognitive Impairment

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Abstract
Objectives: To investigate the change of the DMN in subjects with SCD and MCI,and provide evidence that SCD may occur before MCI in the course of AD disease.
Methods: Thirty-five subjects with SCD,88 with MCI and 32 healthy controls were recruited in present study. Resting-state functional MR imaging were used to detect the changes of the DMN with posterior cingulate cortex (PCC) ,anterior medial prefrontal cortex (a mPFC)and ventral medial prefrontal cortex(mPFC) as seed.
Results: with the bilateral PCC as seed,reduced activity can be detected in bilateral anterior cingulate cortex (ACC) and in individuals with SCD compared to HC,and in the bilateral HIP and PHIP,right medial frontal guri/left ACC,angular gyrus/partial right medial temporal gyrus in individuals with MCI compared to HC; and increased activity can be detected in the right inferior frontal gyri in individuals with SCD compared to HC,and in the right precentral gyrus, left insular/left inferior temporal gyrus, right middle cingulate gyrus/right ventral ACC, right insular/right inferior temporal gyrus, right supplementary motor area(SMA),partial right cerebellum in individuals with MCI compared to HC;no significant DMN changes in individuals with SCD compared to MCI.With the bilateral a-mPFC as seed, reduced activity can be detected in the right PCC in individuals with SCD compared to HC, no significant DMN changes in individuals with MCI compared to HC and SCD. With the bilateral v-mPFC as seed, reduced activity

can be detected in bilateral HIP/PHIP, bilateral PCC/ partial middle cingulate gyrus, left middle frontal gyrus/left ACC ,and increased activity in the right middle temporal gyrus in individuals with MCI compared to HC;and reduced activity can be detected in the right ACC in individuals with MCI compared to SCD; no significant DMN changes in individuals with SCD compared to HC.

Conclusion: Subjective cognitive decline may occur before mild cognitive impairment in the course of AD disease.

EPO-0054

An independent component analysis of dorsal attention network in alcohol dependence patients

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Objective To study the changes of dorsal attention network(DAN) in alcohol dependent patients by using functional magnetic resonance imaging(fMRI) based on independent component analysis(ICA), and to explore its role in the mechanism of attentional dysfunction.

Methods Thirty three alcohol dependent individuals and twenty one healthy control volunteers, matched in gender, age, handedness and education, were enrolled as the alcohol dependent group and control group from September 2016 to June 2017. Michigan alcoholism screening test(MAST) was performed for all subjects. All the subjects underwent fMRI data acquisition by MR scanning. The dorsal attention network was extracted by independent component analysis. Independent sample *t*-test was performed to evaluate the significant difference of two groups, meanwhile, the correlation analysis was conducted in the different brain regions and MAST scores.

Results In the resting state, compared with healthy control group, the alcohol dependence group showed no functional connectivity increased in brain, the functional connectivity of the right inferior parietal lobule (42 voxels, $t=-5.1477$), right supramarginal gyrus (35 voxels, $t=-4.4603$), right middle frontal gyrus (17 voxels, $t=-4.0956$), left superior parietal gyrus (11 voxels, $t=-3.8545$) and left precentral gyrus (18 voxels, $t=-4.2176$) were significantly decreased in alcohol dependent patients. The significantly decreased regions showing no correlation with the MAST scores($P>0.05$).

Conclusions In the resting state, The functional connectivity of the dorsal attention network was decreased in alcohol dependent patients. Resting-state brain functional magnetic resonance imaging(fMRI) can reflect the changes of brain function, and also provides a imaging basis for the mechanism of addiction and behavioral cognitive abnormality in alcohol dependent patients.

EPO-0055

动脉自旋标记评估复发缓解型多发性硬化灰质灌注改变及临床评分相关性

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目的：利用三维伪连续动脉自旋标记技术(3D PCASL)评估复发-缓解型多发性硬化患者（RRMS）灰质灌注改变，进一步研究灌注参数与临床扩展残疾状态量表（EDSS）及神经心理学量表评分间的相关性。**方法：**收集 25 例 RRMS 患者和 27 例与之年龄、性别相匹配的健康对照组（HC），扫描前根据 EDSS 及神经心理学量表评估所有受试者残疾程度及记忆功能。所有受试者均行 3D T_1WI 及 3D PCASL 扫描，并应用 Matlab 平台的 SPM 8 软件对图像进行预处理，采用 SPM 统计软件，以性别、年龄及受教育年限作为协变量分析 RRMS 患者灰质灌注改变，进一步提取差异脑区灌注值并与 EDSS 和神经心理学量表评分做相关性分析。**结果：** 与 HC 组比较，RRMS 组灰质灌注下降脑区包括左侧距状回、双侧尾状核、左侧丘脑、双侧额中回、左侧补充运动区（P<0.001）。,相关分析结果显示，RRMS 组左侧丘脑灌注值与符号数字转换测验（SDMT）、Rey 听觉词语学习测试（RAVLT）评分呈正相关（r=0.477、r=0.544, P均＜0.05）。**结论：**动脉自旋标记技术对评估 RRMS 灰质损害具有重要应用价值，其中丘脑灌注值与记忆量表呈正相关，提示丘脑灌注异常可作为 MS 患者记忆功能受损一种新的生物学敏感指标。

EPO-0056

Abnormal intrinsic functional hubs in chemotherapy breast cancer patients: evidence from a voxelwise degree centrality analysis

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Objective To explore the altered intrinsic functional hubs using voxelwise degree centrality analysis approach, and the relationship with subjective executive function impairment in breast cancer patients with chemotherapy.
Methods A cohort of female breast cancer (BC) patients were recruited, and the Trail Making Test (TMT) were evaluated the executive function. Using a binary and weighted voxelwise degree centrality (DC) to examine the difference of intrinsic functional hubs between the BC patients after chemotherapy with subjective cognitive impairment (BC-CSCI group, in this study) and the prechemotherapy BC patients (BC group). The relationship was assessed between the DC values of altered regions and the measured value of TMT in the BC-SCI group using a partial correlational analysis.
Result There is no significant difference between the BC-CSCI group and the BC group in age (P=0.207), education (P=0.455), part A1 of TMT (P=0.977), part A2 (P=0.601) and part B (P=0.356). Compared with the BC group, the BC-CSCI group exhibited significantly difference of the binary voxelwise DC values in right parahippocampa gyrus and right cerebellum anterior lobe, and the weighted voxelwise DC values in bilateral pons and right cerebellum anterior lobe/parahippocampa gyrus (P=0.01, GRF, voxelwise P=0.01, clusterwise P=0.05). In the BC-CSCI group, the TMT values in part A2

was significantly correlated with the altered DC values of right prahippocampa gyrus (P=0.008, R=0.607), right cerebellum anterior lobe (P=0.027, R=0.502), right cerebellum anterior lobe/parahippocampa gyrus (P=0.014, R=0.566), and bilateral pons (P=0.005, R=0.635), using partial correlational analysis (age and education as covariate).
Conclusion These findings linked the altered intrinsic functional hubs to the subjective executive function impairment in the chemotherapy BC-CSCI group, which may provide new evidence into the understanding of the pathophysiology mechanism of chemotherapy related cognitive impairment.

EPO-0057

Large-scale network abnormality in bipolar disorder: A meta-analysis of resting-state functional connectivity and voxel-based morphometry

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Background: Bipolar disorder (BD) has been linked to abnormalities in the communication and gray matter volume (GMV) of large-scale brain networks, as reflected by impaired resting-state functional connectivity (rs-FC) and aberrant voxel-based morphometry (VBM). However, given variable methods and results across studies, identifying patterns of network abnormality in BD has been elusive. The aim of this study was to investigate characteristic large-scale brain changes in BD through a multimodal meta-analysis of resting-state functional and structural magnetic resonance imaging (rs-fMRI, sMRI) studies.
Methods: Whole-brain seed-based rs-FC and VBM studies comparing individuals with BD and healthy controls (HCs) (published before May 3, 2019) were retrieved from multiple electronic databases (PubMed, Embase, Web of Science, SinoMed, Chinese National Knowledge Infrastructure (CNKI), and WanFang). Then, coordinates of seed regions of interest (ROI) and between-group effects were extracted and coded. Seed ROIs were categorized into seed networks by their location within an a priori template. Multilevel kernel density analysis (MKDA) was used to identify brain networks in which BD was linked to hyper-connectivity or hypo-connectivity with each a priori network and the overlap between dysconnectivity and GMV changes.
Results: Twenty-two seed-based rs-FC publications (929 individuals with BD and 976 HCs) and 57 VBM publications (2277 individuals with BD and 2590 HCs) were included in the meta-analysis. Our results showed that BD was characterized by hypo-connectivity within the default network (DN, self-related thought), hyper-connectivity within the affective network (AN, emotion processing), ventral attention network (VAN, processing of salience), and thalamus network (TN, gating information), and hypo- and hyper-connectivity within the frontoparietal network (FN, external goal-directed regulation). Additionally, hyper-connectivity between the AN and DN, AN and FN, AN and VAN, AN and

TN, FN and VAN, VAN and TN, VAN and DN, and TN and sensorimotor network (SS, involved in sensory and auditory perception). The only instance of hypo-connectivity between-network in BD was observed between the FN and DN. Decreased GMV in BD was found for DN, AN, VAN, FN, TN, and SS. Finally, dysconnectivity and GMV reductions converged in the insula, ACC, mPFC, caudate, thalamus, and SFG.
Conclusions: These results suggest that BD is characterized by both structural and functional abnormalities of large-scale neurocognitive networks. Data suggests that the ACC, mPFC, insula, caudate, SFG, and thalamus for DN, VAN, AN, and TN are characteristic targets of BD.

EPO-0058

Abnormalities of intrinsic regional brain activity in first episode and chronic schizophrenia: a meta-analysis of resting-state functional MRI

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Background: While resting-state functional magnetic resonance imaging (rs-fMRI) studies have provided numerous evidences of abnormal intrinsic brain activity in schizophrenia (SZ), results have not been consistent. **Methods:** A meta-analysis of whole-brain rs-fMRI studies that explored differences in the amplitude of low-frequency fluctuation (ALFF) between SZ patients (including first episode [FE] and chronic patients) and healthy controls (HCs) were conducted. **Results:** Systematic literature search identified 24 studies comparing 1249 SZ patients and 1179 HCs. Total SZ patients displayed decreased ALFF in the bilateral postcentral gyrus, bilateral precuneus, left inferior parietal gyri (IPG), and right occipital lobe and increased ALFF in the right putamen, right inferior frontal gyrus (IFG), left inferior temporal gyrus (ITG), and right anterior cingulate cortex (ACC). In the subgroup analysis, FE patients with SZ demonstrated decreased ALFF in the bilateral IPG, right precuneus, and left medial prefrontal cortex (mPFC) and increased ALFF in the bilateral putamen and bilateral occipital gyrus. Chronic patients with SZ showed decreased ALFF in the bilateral postcentral gyrus, left precuneus, and right occipital gyrus and increased ALFF in the bilateral IFG, bilateral superior frontal gyrus, left amygdala, left ITG, right ACC and left insula. **Limitations:** Small sample size of our subgroup analysis and Asian samples dominated, processing steps and publication bias can limit the accuracy of the results. **Conclusion:** Our comprehensive meta-analysis suggests that aberrant regional intrinsic brain activity during the initial stage and much more widespread damage with the progression of disease may contribute to understand the progressive pathophysiology feature of SZ.

EPO-0059

Analysis on Mean Apparent Propagator (MAP)-MRI and memory impairment in temporal lobe epilepsy patients with hippocampal sclerosis

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Purpose To explore the value of MAP-MRI in the diagnosis of hippocampal sclerosis (HS) and in the evaluation of cognitive function, and to extract comprehensive parameter indicators for preoperative evaluation to facilitate clinical diagnosis and treatment.

Methods and Materials

Eighteen patients with unilateral HS and seventeen controls underwent MRI acquisition on a 3T scanner with T2 FLAIR sequence and diffusion-weight sequence (DWI). The Auditory Verbal Learning Tests (AVLT) were performed to assess immediate memory, delayed recall and delayed recognition for patients. The DWI parameters: FOV = 220×220 mm^2, voxel size = 2.0 × 2.0 × 2.2 mm^3, TR/TE =3800/72 ms, b-value=0 and 3000 sec/mm^2 with 64 gradient directions. The MAP-MRI parameters were estimated from diffusion data using an open-resource tool DIPY (Diffusion Imaging in Python). The MAP-MRI parameters included the mean square displacement (MSD), non-Gaussian parallel (NG∥), non-Gaussian perpendicular (NG⊥), q-space inverse variance (QIV), the return to the origin probability (RTOP), the return to the axis probability (RTAP), and the return to the plane probability (RTPP). Hippocampus outline was delineated on the T2 FLAIR image of the axis oblique coronal position using MRICro. The ROI was then automatically transferred into the space of parameter maps Then the receiver operating characteristic (ROC) and correlation analysis were performed.

Results:

For the group of hippocampal sclerosis side, the mean values of MSD, and QIV in ROI were higher and NG, NG∥, NG⊥, RTAP, RTOP, and RTPP were lower than those of the group of contralateral non-hippocampal sclerosis side ($P < 0.05$). ROC analysis indicated that RTPP had the highest diagnostic accuracy for differentiating the two groups (AUC: 0.903, sensitivity: 93.33%, specificity: 81.82%). Correlation analysis showed that the mean values of MSD, QIV were negatively correlated while NG, NG∥, NG⊥, RTAP, RTOP, RTPP were positively correlated with delayed memory. However, these MAP-MRI parameters were not significantly correlated with delayed recognition and immediate memory.

Conclusion The MAP-MRI parameters can reflect the microstructure change of the early HS. Especially, RTPP had the highest diagnostic accuracy. The correlations between MAP-MRI parameters and delayed memory can also reflect the memory impairment caused by HS. MAP-MRI can help diagnose early hippocampal sclerosis and assess memory impairment.

Clinical relevance/application

MAP-MRI can help diagnose early hippocampal sclerosis and be used as a relatively objective and repetitive method for clinical assessment of patients with memory impairment.Correlation analysis showed that the mean values of MSD, QIV were negatively correlated while NG, NG∥, NG⊥, RTAP, RTOP, RTPP were positively correlated with delayed memory. However, these MAP-MRI parameters were not significantly correlated with delayed recognition and immediate memory.

EPO-0060
集合 MRI 作为日常神经成像检查方案的初始临床经验

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目的:在日常实践中将使用 32 通道头线圈进行 5 分 4 秒的单次扫描作为常规神经成像方案，通过评估集合 MRI 的诊断图像质量来分析其临床可行性。
方法:回顾性分析 2018 年 8 月至 2018 年 10 月间使用合成 MRI 进行常规颅脑 MRI 检查的 80 例患者的影像学资料。两个独立的评阅者对利用多动态多回波获得的 MAGiC T1 (FLAIR)、MAGiC T2、T2 FLAIR 和相敏感反转恢复序列（PSIR）进行了图像质量评估成像。使用 kappa 统计数据对两个评阅者之间的观察者可靠性进行了评估。
结果:颅脑合成 MRI 成像呈现的整体图像质量和解剖定位均较好，除 T2 FLAIR 序列外，所有序列的得分均在 3 分以上。合成的 T2 FLAIR 序列提供了足够的图像质量，但显示出更明显的伪影，尤其是脑脊液搏动伪影和沿脑表面的线性高信号。评估所有合成序列图像质量的组间一致性较好 (k 值为 0.67-0.90；P <0.001)。
结论:扫描时间较短的合成 MRI 可以成为常规临床神经影像成像方案，并且可根据需要设定灵活的神经成像方案。

EPO-0061
γ-aminobutyric Acid Level Changes in Prefrontal Lobe and Bilateral Hippocampus of Temporal Lobe Epilepsy

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Purpose: To explore the changes of inhibitory metabolite GABA(γ-aminobutyric acid) in the brain of TLE (temporal lobe epilepsy) patients and normal controls by magnetic resonance spectroscopy.
Materials and Method: This research included 27 controls(male/female:11/15, age: 31.22±8.52) and 40 TLE patients (male/female:24/16, age: 33.2±10.28). The clinical information of TLE patients has been collected, it including their seizure frequency, clinical history duration, type of seizure, and EEG(electroencephalogram). All participants did the MMSE(mini-mental state examination) and BDI(Beck Depression Inventory) scale test. The BDI was to excluded depressive patients, and MMSE was used to assess cognitive function of patients. Then TLE patients were divided into CI(cognitive impairment) group (MMSE score＜26) and NOCI(no cognitive impairment) group (MMSE score≥26). The hippocampal sclerosis was assessed by two radiologists based on the patient's cerebral MRI. NAA, Cr, CHO, GLX and GABA level in the prefrontal lobe cortex, right hippocampus and left hippocampus were measured by using a MEGA-PRESS sequence. NAA/(Cho+Cr) and GABA/Cr ratios were compared between controls

and TLE. These two ratios also analyze according to the patient's medical history information, cognitive score and hippocampus sclerosis.
Result：The NAA/(Cho+Cr) ratio in bilateral hippocampus of TLE was lower than that of controls group, and significantly decreased in right hippocampus (p=0.009). The GABA/Cr ratio of TLE was significantly decreased in left hippocampus(p=0.027) and right hippocampus(p=0.032) in comparison to controls group. Neither NAA/(Cho+Cr) or GABA/Cr ratio has significant decrease in the prefrontal lobe cortex. Further analysis according to hippocampal sclerosis, seizure frequency, history time and cognitive impairment of TLE patients, the following results were obtained: (1) The two ratios of left hippocampus sclerosis group were the lowest in left hippocampus, while those of right hippocampus sclerosis group were the lowest in right hippocampus. (2) Compared with CHD(clinical history duration)≥10 years group, NAA/(Cho+Cr) ratio significantly decreased and GABA/Cr increased remarkably in CHD＜10 years group. (3) From NOSeizure≥1 year(No seizures occurred for more than one year) group to SeizureF＜1/M(attacks occur within a year and the seizure frequency is less than once a month) group and then to SeizureF≥1/M(attacks occur within a year and the seizure frequency is more than once a month) group, NAA/(Cho+Cr) ratio decreased, and GABA/Cr ratio increased in turn. (4) In both NOCI and CI groups, NAA/(Cho+Cr) ratio decreased in the right hippocampus, but there was no significant change in the left hippocampus and prefrontal lobe cortex. In bilateral hippocampus, GABA/Cr ratio of NOCI was significantly lower in bilateral hippocampus than in NC group and CI group, and in prefrontal lobe cortex, GABA/Cr ratio of CI group was significantly lower than that of NC group and NOCI group.
Conclusion：(1) The results of GABA/Cr ratio are more stable and regular than those of NAA/(Cho+Cr), GABA/Cr ratio is more sensitive than NAA/(Cho+Cr) in the brain of TLE. (2) Changes of TLE neuronal metabolites in bilateral hippocampus and prefrontal lobe are different, And only GABA/Cr ratio has a downward trend in the prefrontal cortex. With the progression of seizure frequency, duration of disease history and cognitive impairment, the ratio of NAA/(Cho+Cr) is decreased in bilateral hippocampus. The change of GABA/Cr ratio in the bilateral hippocampus showed that it first decreased in the early stage and then increased to the normal level in the late stage. The changes of NAA/(Cho+Cr) and GABA/Cr ratios had no obvious regularity in the prefrontal lobe, they will show a decreasing trend when TLE patients with cognitive impairment, and GABA/Cr ratio in CI group is significantly decreased.

EPO-0062

基于 VBM 的首发强迫症患者脑结构研究

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基于 VBM 的首发强迫症患者脑结构研究
目的：强迫症是世界范围内功能性残疾的主要原因之一，但其神经生物学和病因学起源尚不清楚。本研究的目的是使用基于体素的形态测定法（voxel-based morphometry ，VBM）探索强迫症患者脑灰质结构的改变。
方法：采用 3.0T 磁共振成像对 36 例首发、未经治疗且未合并任何并发症的强迫症患者和 37 例健康对照组进行检查。利用指数李代数（exponentiated Lie algebra，DARTEL）对不同形态解剖配

准后的基于体素的形态测量法进行了区域灰质体积组间差异的体素分析。耶鲁-布朗强迫症量表（yale brown obsessive compulsive scale，Y-BOCS）用于评估强迫症状严重程度。
结果：与健康对照相比，强迫症患者组双侧扣带回前皮质的灰质体积减小（T=-4.181，P=0.0005），左侧梭状回（T=4.841，P=0.0005）和左中央后回（T=4.299，P=0.0005）的灰质体积增加。灰质体积的改变与 Y-BOCS 评分无相关性。
结论：首发强迫症患者存在大脑灰质体积的异常，且这些异常不仅仅存在于经典的强迫症皮质-纹状体-丘脑-皮质环路中。

EPO-0063

IVIM 成像对慢性高原病脑灌注的定量分析

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目的　利用 IVIM 成像探究高原低氧环境下慢性高原病（CMS）灌注的脑灌注情况。方法　选择 14 例临床诊断为 CMS 的患者及高原正常健康志愿者为研究对象,所有病例均在 3.0T Prisma 磁共振扫描仪上行扩散加权成像(DWI)和 IVIM (b=0，50，100，150，200，400，600，800，1000 s/mm2)扫描。DWI 序列扫描后，表观扩散系数自动生成，通过独立的扩散工具箱软件(西门子健康工程公司)对 IVIM 原始数据进行后处理,以获得灌注分数(F)、伪扩散系数(D*)、扩散系数(D)；分别对比 CMS 患者与高原正常人双侧额、顶、颞、枕叶灰质及白质、尾状核头、豆状核、背侧丘脑、小脑半球的 IVIM 各参数值。采用两独立样本 t 检验进行统计学分析。**结果**　所有参与者的脑实质的衰减曲线符合双指数模型。CMS 组双侧额叶灰质 D*值高于高原正常组，f、D、ADC 值均低于高原正常组（D*: P＜0.05）;双侧额叶白质 D 和 ADC 值高于高原正常组，f 和 D*值低于高原正常组（P>0.05）；CMS 组双侧顶叶灰质 f、D*、D 值高于高原正常组而 ADC 值低于高原正常组（P>0.05）；双侧顶叶白质 f、D、ADC 值均高于高原正常组，D*值低于高原正常组（P＜0.05）；双侧颞、枕叶灰质、尾状核头、双侧背侧丘脑及右侧小脑半球的 IVIM 各指标均高于高原正常组（P＜0.05）；双侧颞叶白质 f 高于高原正常组，D*、D、ADC 值均为低于高原正常组（f: P＜0.05）；双侧枕叶白质 f、D、ADC 值均为低于高原正常组，D*低于高原正常组（D*:P>0.05）；双侧豆状核 D*、D、ADC 值均为高于高原正常组，f 低于高原正常组（P>0.05）；左侧小脑半球则髂与双侧豆状核的各值想法（P>0.05）。结论 与高原正常人比，CMS 患者的部分脑区灌注发生改变，IVIM 能够通过反映弥散信息及脑组织微循环灌注为 CMS 的 研究提供新方法。

EPO-0064

Distinguishing bipolar disorder and major depressive disorder by dynamic amplitude of low-frequency fluctuations: a resting state fMRI study

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Objective

When bipolar disorder (BD) presents as the depressive state, it is often misdiagnosed as major depressive disorder (MDD), which are lead to inappropriate treatment, even poor clinical outcomes. However, few studies have focused on dynamic alterations of local brain activity directly compared between MDD and BD II depression. The present study in order to explore the whether there were neuroimaging marker between BD II and MDD by using dynamic amplitude of low-frequency fluctuations (dALFF) of resting-state functional magnetic resonance imaging (rs-fMRI).

Method

All patients met Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (known as DSM-V) criteria for BD II or MDD according to the diagnostic assessment by the Structured Clinical Interview for DSM-V Patient Edition (SCID-P). And they were diagnosed with YMRS score<7, HDRS-24 score>21 for patients with BD II depression and HDRS-24 score>21 for MDD patients. Patients with BD II depression (n = 107) and MDD patients (n =116) as well as 120 healthy controls underwent resting‐state functional magnetic resonance imaging. We first used sliding window analysis to evaluate the dynamic amplitude of low-frequency fluctuations (dALFF), which is a synonym for intrinsic brain activity. The one-way ANOVA analysis was performed to assess the significant differences among three groups. The brain regions showing significantly statistical differences were defined as mask respectively for further post-hoc analysis. Age, gender, education years and the mean framewise displacement were included as nuisance covariates. Multiple comparisons were corrected using Gaussian random field (GRF) theory (minimum z>2.3, cluster significant p<0.05, corrected).

Results

Compared with HCs, the BD II and MDD groups both showed significantly increased dALFF in left superior frontal gyrus (SFG) while the bilateral posterior cingulate cortex (PCC)/Precuneus were showed decreased dALFF variability in both BD II and MDD. BD II patients showed increased dALFF variability in the bilateral PCC/Precuneus compared with MDD patients.

Conclusions

Our findings showed that the alterations of temporal variability in the left SFG and the bilateral PCC/Precuneus may suggest this regions were associated with pathophysiology of BD II and MDD.

EPO-0065

The study of VBM in minimal hepatic encephalopathy

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Objective: To study the characteristics of gray and white matter volume changes in the precuneus subregions of patients with minimal hepatic encephalopathy (MHE) and to explore the related neurological mechanisms via voxel-based morphometry (VBM).
Methods: The neuropsychological test was performed on 15 normal subjects and 15 MHE first , and then the 3D T_1WI images were obtained and analyzed by using 3.0 T MRI

scanner and dparsf softwar, respectively. Finally, the changes of gray and white matter volumes in the precuneus subregions were statistically analyzed between MHE and normal group.

Results: Compared with the normal group, generally the volumes of gray matter in the left precuneus decreased in MHE (slightly in the anterior and central but significantly in the posterior and the ventral), at the same time, a little increase was also noted in some parts. For the white matter volumes, 4 subregions increased in the left (slightly in the anterior and central subregions, but significantly in the posterior and ventral), along with some increase.The changes of gray matter and white matter in the right precuneus subregions were also more obvious than that in the left [$P<0.05$].

Conlusion: The changes of gray and white matter volumes in the precuneus subregions of MHE can be revealed by using voxel-based morphometry, which had a certain value in the early diagnosis of MHE and understanding of the mechanisms of nerve injury.

EPO-0066

Functional connectivity strength in patients with Type 2 Diabetes Mellitus

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Objective To provide a new approach to further elucidate the underlying pathogenesis of diabetes-related cognitive impairment in T2DM patients by using resting-state functional connectivity strength(FCS). **Methods** T2DM patients (n = 56) and age-, sex-, and education-matched healthy control subjects (n = 48) underwent the rs-fMRI .The whole brain FCS values were constructed and two-sample t-test was used to compare the FCS values of both groups to locate the regions with significant change. Functional Connectivity (FC) analysis was carried out between the seed points(the brain regions with significantly different FCS) and the voxels of whole brain. Additionly, correlation analysis was performed between the time series signal of significantly different FCS, FC and neuropsychological test , clinical variables .

Results Patients performed worse on several neuropsychological test ,including Beck Depression Inventory,MOCA,HRSD,HAMA,YMRS,CDT. Compared with the control group, T2DM patients exhibited significantly increased FCS values in right middle temporal gyrus （t=4.718, P(voxel-level)<0.001,P（cluster-level<0.05）,pearson correlation analysis shows FC was significantly negatively correlated with the C- reactive protein (CRP) (t=-0.292, P=0.037). **Conclusion** The abnormal functional connectivity strength of the right middle temporal gyrus may be involved in the pathophysiological mechanisms of cognitive dysfunction of T2DM.

EPO-0067

基于动态功能连接分析的酒精使用障碍者脑默认网络和执行控制网络的 fMRI 研究

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目的：长期饮酒或酗酒将会导致酒精依赖或中毒，会不同程度损害大脑的结构及功能，本文旨在探讨酒精依赖者静息态脑默认网络和执行控制网络功能网络连接的动态改变。
材料和方法：收集酒精使用障碍者 23 例及与酒精使用障碍组年龄、受教育程度、利手等相匹配的健康对照组 24 例，采用基于组水平的空间独立成分分析方法提取网络成分，利用软件进行最优估计分为 35 个独立成分，提取默认网络和执行控制网络，然后基于 GIFT 软件采用滑动窗口方法研究默认网络和执行控制网络功能连接的时变变化，对网络连接所有时间窗口的脑功能连接活动状态进行 K-means 聚类分析，利用最优估计将大脑活动归类为 4 类不同的状态。
结果：相对于健康对照组，酒精依赖者的脑活动状态发生改变，其中 state1 停留时间增加约 6.81%，相应 state2 停留时间缩短约 6.84%，而 state3 和 state4 相对稳定；在 state1 状态下默认网络内部连接增强，state2 状态下执行控制网络内部连接增强。
结论：酒精使用障碍者脑功能动态活动是发生变化的，默认网络内部功能连接增强的脑活动状态增加，执行控制网络内部功能连接减弱的脑活动状态减少，这种脑默认网络和执行控制网络功能分离和异常整合的动态改变可能与酒精成瘾机制及其造成的脑损害相关。

EPO-0068

Aplication of Monochromatic Imaging and Metal Artifact Reduction Software in Computed Tomography Angiography after Treatment of Cerebral Aneurysms

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Purpose: To evaluate the image quality and degree of metal artifact reduction using the new-generation gemstone spectral imaging (GSI) and artifact reduction software (MARs) and to demonstrate the optimal monochromatic energy level for dual-energy cerebral CT angiography (CTA) in patients with intracranial aneurysm after endovascular treatment.
Material and Methods: A total of 20 patients with cerebral aneurysms treated with coils or clips underwent CTA using gemstone spectral CT. Artifact index (AI) was calculated at each energy level with and without MARs. Signal-to-noise (SNR) and contrast-to-noise (CNR) ratios were calculated on all axial images with MARs; subjective evaluation was done by using a 4-point scale and a 3-point scale for assessing noise and vessel contrast respectively and compared between the monochromatic energy levels.
Results: The AI value of group GSI-MARs was significantly lower than that of group GSI at each monochromatic energy level (all $P < 0.01$). CNR and SNR of the parent arteries decreased as the energy increased from 40 to 140 keV in group GSI- MARs (all $P < 0.01$). SNR and CNR between each two adjacent monochromatic energy level showed significantly difference (P). Subjective evaluation showed that a monochromatic energy level between 40-70 keV provided the optimal image quality.
Conclusion: GSI with MARs could reduce metal artefacts and improve the image quality of cerebral CTA after coils or clips treatment. The new generation of GSI could

provide better CNR and SNR at lower energy level, and the best image quality was obtained at energy 40-70 keV for GSI-MARs.

EPO-0069

Preliminary research on depression treatment: Combination of Transcranial Magnetic Stimulation and MRI-guided Low-intensity Focused Ultrasound Pulsation

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Depression (major depressive disorder) is a common but serious mood disorder. When traditional medication treatment does not reduce symptoms, transcranial magnetic stimulation (TMS) has been approved by the Food and Drug Administration (FDA), neuromodulation has become increasingly relevant to clinical research. However, TMS has significant drawback in the lack of depth and special specificity. In the last few years low-intensity focused ultrasound pulsation (LIFUP) has been used to be focused noninvasively through the skull anywhere within the brain, together with functional magnetic resonance imaging (fMRI) guided techniques, LIFUP can be applied to deep structures with greater spatial precision. In this manuscript, combination of TMS and fMRI-guided LIFUP on the treatment of depression was proposed to achieve the benefits of both. The data of the combined methods demonstrate significantly better clinical results in comparison to the control group, as measured by the Hamilton Rating Scale for Depression (HAM-D) scale, Geriatric Depression scale (GDS) and the Pittsburgh Sleep Quality Index (PSQI) with low adverse reaction.

EPO-0070

Altered dynamic parahippocampus functional connectivity in patients with posttraumatic stress disorder

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Posttraumatic stress disorder (PTSD) might result from deficits in static and dynamic functional connectivity (FC).

Aims

This study investigated dynamic brain functional alterations in PTSD patients with resting state functional magnetic resonance imaging (rs-fMRI)

and evaluated the relationship between brain function and clinical indices in PTSD.

Methods

Degree centrality (DC) and seed-based functional connectivity (FC) analyses were conducted among typhoon survivors with (n = 27) and without PTSD (n = 33) and healthy controls (HC) (n = 30) to assess the intrinsic dysconnectivity pattern and network-level brain function. Pearson correlation analyses were performed to examine the association of brain function with clinical symptoms.

Results

Both the PTSD group and the trauma-exposed control (TEC) group had increased DC in the left parahippocampus relative to the HC group. More increased DC in the left parahippocampus gyrus was found in the PTSD group. Both traumatized groups exhibited decreased left parahippocampus dynamic FC with the bilateral middle frontal gyrus and superior frontal gyrus relative to the HC group. The Checklist-Civilian Version score was positively correlated with dynamic FC between the parahippocampus and left superior frontal gyrus but was negatively correlated with dynamic FC between the parahippocampus and right middle frontal gyrus.

Conclusions

Trauma exposure may lead to an altered dynamic FC in individuals with or without PTSD. An altered DC in the parahippocampus may be an important risk factor for PTSD development following trauma exposure. A more prominently increased DC in the parahippocampus might be a common trait in the PTSD group.

EPO-0071

2 型糖尿病患者的静息态脑功能分数低频振幅研究

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目的 采用静息态功能磁共振技术计算分数低频振幅（fALFF）值探讨 2 型糖尿病患者全脑自发性神经活动改变特点。方法 收集性别、年龄、受教育程度匹配的 2 型糖尿病患者（T2DM 组）56 例，正常志愿者（对照组）48 例，进行静息态功能磁共振扫描、神经心理认知量表测定、临床相关变量采集。计算静息态 fALFF 值，进行两独立样本 t 检验，以 fALFF 差异显著脑区为种子点与全脑各体素间进行功能连接（functional connectivity, FC）分析，并提取组间 fALFF 及 FC 差异显著脑区的时间序列信号值与临床变量、量表评分进行 pearson 相关分析。结果 两组 BECK 抑郁自评、MoCA、HRSD24 项、HAMA、CDT 差异有统计学意义；与对照组比较， T2DM 组右侧楔前叶 fALFF 值显著减低（t=-3.9508，P(voxel-level)<0.005，P(cluster-level)<0.05）；以右侧楔前叶为种子点与全脑的 FC 分析结果显示 T2DM 组右侧楔前叶与右侧颞中回间 FC 显著增加（t=4.011 ，P(voxel-level)<0.001，P（cluster-level）<0.05）；pearson 相关分析显示差异显著脑区 fALFF 值与血

浆皮质醇水平呈边缘显著性负相关（r=-0.322, p=0.089）。结论 T2DM 患者存在认知功能的损害和抑郁风险的增加。其右侧楔前叶局部自发性脑活动减低，且该脑区与右侧颞中回间功能连接异常，提示该脑区的静息态脑功能改变可能是 T2DM 患者认知功能损害和 T2DM 共病抑郁的潜在神经生物学标记。

EPO-0072

The abnormal brain regional homogeneity in end-stage renal disease patients at 24 hours after hemodialysis: a resting-state functional MRI study

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Objective Resting-state functional magnetic resonance imaging (rs-fMRI) and Regional homogeneity (ReHo) analysis were used to investigate spontaneous neural activity abnormalities associated at 24 hours after hemodialysis in patients with end-stage renal disease (ESRD) with cognitive improvement. **Methods** 24 ESRD patients (the ESRD group) and 26 healthy volunteers (the control group) who were matched by gender and age were performed on rs-fMRIscans and ReHoanalysis. All the patients in the ESRD group were evaluated by the Montreal cognitive scale (MoCA) at 24 hours after hemodialysis. The laboratory indicators of the ESRD group were collected at the same time point: serum creatinine and urea. The control group was evaluated at the same time point. The ReHochanges in both groups were calculated and statistically analyzed. **Results** There was no significant difference in MoCA scores between the ESRD group and the control group (P=0.033). Compared with the control group, the ReHovalues in the left middle frontal gyrus, bilateral anterior cingulate and bilateral middle cingulatein the ESRD group were decreased (P<0.005), the ReHovalues in the right hippocampusand right inferior temporal gyruswere increased (P<0.005), the correlation between the ReHovalues of difference brain regions and serum creatinine and urea in the ESRD group was not statistically significant (all P>0.05). **Conclusion** The overall cognition level of ESRD patients recovered to be normal at 24 hours after hemodialysis, but there was consistency abnormality of spontaneous neural activity in multiple brain regions, which provided objective imaging basis for revealing the dialysis treatment to assess the cognitive recovery of ESRD patients.

EPO-0073

Impaired interictal functional connectivity between the thalamus and visual cortex is related to anxiety in migraine without aura

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Purpose: The visual network has been confirmed to be involved in patients with migraine without aura (MwoA). Migraine suffers may be associated with abnormal functional connectivity within the thalamo-visual pathways and psychiatric symptoms. The goal of this study was to determine whether migraine disrupted the functional connectivity patterns within the thalamo-visual pathway as measured by using resting-state functional magnetic resonance imaging (fMRI) approach.

Methods: Resting-state fMRI scans were acquired from 33 patients with MwoA and 22 well-matched healthy controls. The thalamus, a major site of information transmission, was chosen as seed region to detect the functional connectivity patterns with the visual network and then determine whether these changes were linked to clinical characteristics of migraine such as disease duration, headache severity, anxiety and depression.

Results: The visual network, described by independent component analysis, exhibited statistically significant regions (bilateral cunei, right lingual and left calcarine sulcus) by inter-group comparison. Patients with MwoA showed significantly increased functional connectivity between the bilateral thalami and bilateral cunei. Moreover, the right thalamus also showed similar connectivity with the contralateral calcarine sulcus. Furthermore, enhanced functional connectivity between the left thalamus and right cuneus in migraine patients was negatively correlated with Generalized Anxiety Disorder (r = -0.381, p = 0.038), and the neural activation of the left calcarine sulcus was positively correlated with Visual Analogue Score (r = 0.412, p = 0.024).

Conclusion: Patients with MwoA showed abnormal synchronization in visual network, and these abnormalities were correlated with headache severity and psychiatric symptoms. The results suggest that migraine distress is exacerbated by aberrant feedback projections to visual network, playing a crucial role in migraine physiological mechanism. The current study provides further insights into the complex scenario of migraine mechanism.

EPO-0074
失独所致 PTSD 患者基于静息态功能磁共振的 ALFF 研究

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摘要

目的：采用基于静息态功能磁共振的低频振幅探讨失独所致 PTSD 患者自发脑活动特点，并分析失独者脑 ALFF 改变与临床症状间的关系。

方法：收集 28 例失独伴 PTSD 患者（$PTSD^{+}$组）、19 例不伴 PTSD 的失独者（$PTSD^{-}$组）及 28 例健康对照组。采集所有被试的 rs-fMRI 图像并对临床症状进行评估，比较三组间的 ALFF 值差异并分析ＡＬＦＦ值与临床量表评分的相关性。

结果：$PTSD^{+}$组、$PTSD^{-}$组及健康对照组间，左侧颞中回、左侧颞下回、右侧颞中回、左侧后扣带回、右侧角回、右侧枕上回、右侧楔前叶、左侧楔前叶的 ALFF 存在异常（P＜0.05）。

与健康对照组比较，$PTSD^{+}$左侧颞中回、左侧颞下回的 ALFF 增高（P＜0.05），左侧后扣带回、右侧角回、右侧楔前叶、左侧楔前叶 ALFF 减低；

与对照组比较，$PTSD^-$组左侧颞中回、左侧颞下回增高；右侧颞中回、左侧后扣带回、右侧角回、右侧枕上回、右侧楔前叶、左侧楔前叶减低。（P＜0.05）
$PTSD^+$组与 $PTSD^-$组之间比较，右侧颞中回增高；未见 ALFF 减低脑区。（P＜0.05）
相关分析结果显示 $PTSD^+$组右侧角回与 CAPS 评分呈正相关；右侧楔前叶与回避症状呈负相关。
结论：失独者存在双侧颞叶（颞中回和颞下回）、左侧后扣带回、右侧角回、右侧枕上回和双侧楔前叶局部脑区自发活动异常，失独这个巨大创伤可以在不引起 PTSD 的情况下引起一系列脑区的自发活动变化，且可能对人脑产生持续性的影响。

EPO-0075
基于 ALFF 及 ReHo 法的非酒精性肝硬化的 MHE 患者静息态功能磁共振研究

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目的 通过 ALFF 及 ReHo 法显示基于非酒精性肝硬化的 MHE 患者神经元功能活动的改变情况。
方法 收集 22 例 MHE 患者（MHE 组）、23 例无 MHE 的非酒精性肝硬化患者（NHE 组）和 31 例正常人（HC 组）行静息态下 BOLD-fMRI 扫描，然后利用后处理软件获得组间 ALFF 和 ReHo 值有统计学差异的脑区，并进行相应差异脑区临床意义的分析。
结果 与 HC 组相比，MHE 组表现为右侧岛叶、右侧豆状核、右侧楔前叶、双侧楔叶、双侧枕叶及顶叶等多个脑区 ALFF 值有差异，NHE 组表现为双侧海马及海马旁回、左侧楔前叶及左侧颞叶多个脑区 ALFF 值有差异（P 均<0.05）；与 NHE 组相比，MHE 组 ALFF 值无明显差异性脑区（P>0.05）；与 HC 组相比，MHE 组表现为右侧额中回、右侧楔前叶、双侧侧楔叶等多个脑区 ReHo 值有差异（P 均<0.05），NHE 组表现为双侧尾状核、右侧前扣带回、右侧楔前叶及双侧楔叶多个脑区 ReHo 值有差异；与 NHE 组相比，MHE 组 ReHo 值无明显差异性脑区（P>0.05）。
结论 利用功能磁共振可以对基于非酒精性肝硬化的 MHE 患者脑功能的改变情况进行早期评估，为研究 MHE 的功能恢复机制提供依据，并有潜力应用于 MHE 的早期诊断。

EPO-0076
White matter abnormalities based on TBSS and its correlation with impulsivity behavior of abstinent methamphetamine addicts

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ABSTRACT
Purpose: Methamphetamine (MA) abuse is one of the most rapidly growing illicit drug problems worldwide. Impulsivity has been considered as a core impairment underpinning addictive behaviors. Studies have demonstrated that MA addicts have white matter abnormalities based on ROIs almost reflected by FA, no study has correlated diffusion parameters and impulsivity behavior of MA addicts. we used tract-based spatial statistics to detect FA, AD, RD and MD, and correlate these with the Barratt Impulsivity Scale (BIS), in order to verify and expand the previous results.

Methods: *A total of 28 MA addicts and 22 healthy controls were recruited. MRI was performed to evaluate the brain structural changes, the BIS was used to evaluate impulsivity behavior, white matter differences were compared between MA addicts and healthy controls, and the partial correlation between diffusion parameters and BIS scores was determined by using the FTND and AUDIT scores as covariates.*
Results: *MA addicts had significantly lower FA, and higher AD, RD and MD in a wide range of white matter, which mainly included: superior longitudinal fasciculus, sagittal stratum, corona radiata, internal capsule, external capsule, superior fronto-occipital fascicule, corpus callosum, and corticospinal tract compared with controls. The MA group had significantly higher total score, attention and motor scores compared to healthy controls. The major tracts that were significantly associated with the BIS scores were the corticospinal tracts.*
Conclusion: *MA addicts had significantly lower FA and higher AD, RD and MD in a wide range of white matter. The MA group has significantly higher impulsivity scores compared to healthy controls, and the correlation among AD, RD, MD and the BIS scores were almost reflected by the corticospinal tracts. Future studies on larger sample sizes, gender effects and longitudinal studies are needed.*

EPO-0077

Decreased relative cerebral blood flow in unmedicated heroin-dependent individuals

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Background: Understanding the brain mechanisms of heroin dependence is invaluable for developing effective treatment. Measurement of regional cerebral blood flow (CBF) provides a method to visualize brain circuits with functional impairments due to heroin dependence. This study examined regional CBF alterations and their clinical associations in unmedicated heroin-dependent individuals (HDIs) using a relatively large sample. We trained a classifier on CBF data from significantly different brain areas.
Methods: Sixty-eight (42 males, 26 females; age: 40.9 ± 7.3 years) HDIs and forty-seven (34 males, 13 females; age: 39.3 ± 9.2 years) matched healthy controls (HCs) underwent a high-resolution T1 and whole-brain arterial spin-labelling (ASL) perfusion magnetic resonance imaging (MRI) scan. We measured rCBF in significant differences brain regions, and trained a support vector machine (SVM) to differentiate HDIs from HCs with 10-fold cross-validation. Additionally, clinical characteristics were collected for neurocognitive assessment.
Results: HDIs showed worse neuropsychological performance than HCs and had decreased relative CBF (rCBF) in the bilateral middle frontal gyrus (MFG), inferior temporal gyrus, precuneus, posterior cerebellar lobe, cerebellar vermis, and the midbrain adjacent to the ventral tegmental area; right posterior cingulate gyrus, thalamus,

calcarine. rCBF in the bilateral MFG were negatively correlated with the Trail Making Test times in HDIs. SVM showed that the left MFG contributed most, with 76% classification accuracy.
Conclusion: HDIs had limbic, frontal, and parietal hypoperfusion areas. Low CBF in the MFG predicted cognitive impairment in HDIs. Together, these findings suggest the MFG as a critical region in HDIs and suggest ASL CBF as a potential marker for use in heroin addiction studies.

EPO-0078
注射对比剂后不同延迟时间对于臂丛神经磁共振成像的影响

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目的：探讨注射对比剂后不同延迟时间对于臂丛神经磁共振成像的影响。
材料与方法：收集本院需行臂丛神经（BP）MR 成像的患者 34 例，设备为 GE Discovery MR 750 3.0T 扫描仪，8 通道头颈部联合线圈。34 例患者随机分为两组，第一组对比剂用量按照 0.2ml/kg，注射速率为 1.5ml/s，后以相同速率注射 20ml 盐水，注射对比剂的同时开始计时并扫描 3D CUBE STIR 序列，延迟时间分别为 10，20，30 分钟时重复扫描 3D CUBE STIR 序列；第二组对比剂的剂量和注射速率同上，注射对比剂的同时开始计时，延迟时间分别为 5，15，25，35 分钟时重复扫描 3D CUBE STIR 序列。所得图像传输至 GE Adw 4.6 工作站，用 MIP 对臂丛神经进行三维图像重组，测量左右两侧臂丛神经及其周围软组织的平均信号值 SI 和均方差 SD，根据公式计算臂丛神经的 SNR 和 CNR。利用 SPSS20.0 软件进行单因素方差分析（$p<0.05$）。
结果：第一组注射对比剂前 SNR 为 20.08±4.70CNR 为 6.66±2.69；延迟时间为 0 时 SNR 为 6.66±2.69CNR 为 11.81±3.57；10min 时 SNR 为 27.66±6.04CNR 为 10.39±3.76；20min 时 SNR 为 22.61±4.64，CNR 为 9.05±3.33；30min 时 SNR 为 20.24±5.87，CNR 为 9.09±3.79。第二组注射对比剂前 SNR 为 19.9±7.61CNR 为 6.25±3.43；延迟时间为 5min 时 SNR 为 30.16±7.58CNR 为 11.42±3.92；15min 时 SNR 为 25.46±6.34CNR 为 9.83±3.81；25min 时 SNR 为 22.58±6.44CNR 为 7.78±3.11；35min 时 SNR 为 17.92±6.89CNR 为 6.43±3.92。
结论：注射对比剂后建议 10min 以内扫描，臂丛神经图像质量最佳。

EPO-0079
The effect of early life stress on memory is mediated by anterior hippocampal network

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Purpose: The experience of early life stress (ELS) is a risk factor for memory dysfunction, but the impact at the neural level is less clear. One possibility is that ELS alters hippocampus, which, in turn, affects memory. The aim of this study is to investigate whether healthy people with a higher ELS display more structural and functional changes of hippocampus than people with a lower ELS. We aimed to investigate the association between ELS and memory and to test whether hippocampus change mediates this relationship statistically.

Method: The Childhood Trauma Questionnaire (CTQ) was used to assess early life stress in 100 young health participants. Resting state fMRI data were acquired and voxel-wise correlation analysis was performed to functionally divide the hippocampus. Group differences in gray matter volumes and memory circuits of the anterior and posterior hippocampus were analyzed. We also tested whether group difference in hippocampus mediated the relationship between ELS and memory.
Results: There was no overall group difference in hippocampal volume. Compared with participants with a lower ELS, participants with a higher ELS had reduced functional connectivity in anterior hippocampal network (p=0.001, Bonferroni corrected), which positively correlated with visual memory (p=0.046, r=0.309). In contrast, within participants with a lower ELS group, no significantly correlation was found (p=0.250, r=0.166). Among all participants, functional connectivity in anterior hippocampal network mediated the relationship of ELS on visual memory.
Conclusions: These findings suggest that ELS decreased anterior hippocampal-cortical functional connectivity, which, in turn, drives memory decline and highlight a potential pathway in which ELS affects memory by degrading anterior hippocampal functional network changes directly.

EPO-0080

Volume of subcortical nucleus in amyotrophic lateral sclerosis: magnetic resonance imaging study

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Objective To assess the extent of basal ganglia injury and provide neuroimaging evidence for cognitive and behavioral damage in patients with amyotrophic lateral sclerosis(ALS), in this study, Freesufer MR volumetric analysis is applied to evaluate volumetric alterations of subcortical structures，while the relationship between the motor symptoms and the alterations of subcortical structures’ volume in ALS. **Methods** Clinical and imaging data of all patients with definite or probable diagnosis of sporadic ALS according to the El Escorial criteria was recruited through the neurology department at First Affiliated Hospital of Xi’an Jiaotong University included in-patient and out-patient, as well as healthy subjects matched for age, handedness and gender recruited in the same period . Based on 3D T1WI structural image, the volume of bilateral subcortical gray matter nucleis including cauda nucleus, pupilli nucleus, thalamus, globus pallidus, hippocampus, nucleus accuminatus, amygdala were calculated by Freesufer software.The relationship between ALS-FRSR score and the volume changes of gray matter nucleus between groups was analyzed by pearson’s correlation analysis. **Results** According to the revised E1 Escorial diagnosis, 66 patients with ALS (36 males) was included in this study, with an average age of (53 + 9) years. The healthy control group consisted of 47 (27 males) with an average age of (52±8) years. Compared with the healthy control group, the volume of bilateral hippocampus, thalamus, left cauda nucleus and left amygdala were significantly reduced in the ALS group, with statistically significant differences (P<0.05).Person’s correlation analysis results showed that there was a positive correlation between bilateral thalamic volume change

and ALS-FRSR score (right: R =0.29, p=0.032;Left r=0.319, p=0.018).
Conclusion Volume of subcortical gray matter nuclei in ALS patients were evaluated by using MRI analysis in vivo, which finds that gray matter nuclei are extensively involved, especially thalamus, hippocampus, caudate nucleus and nucleus accumbens. This study can explain the characteristics of motor and cognitive behavior in ALS patients, and has implications for the pathophysiological mechanism of the disease.

EPO-0081

Quantification of radiation doses at different scan power in children and adolescents head CT by a Monte-Carlo paltform

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Objective: In clinic practice, a unified head CT scan protocol was employed for both children and adolescents and this could be overdose for the children/adolescents since they usually have smaller head circumferences. Since the size of the head varies among children and adolescents, a more specific guideline for younger patients may reduce the radiation doses but keep imaging quality for diagnosis. In this study, we investigate if lowering the radiation doses based on the head circumference (HC) could keep the image quality. We then calculate the benefits of low-dose head CT scans to the patient's organ-specific-dose levels.
Methods: 83 patients including children and adolescents with suspected nervous system disease symptoms were prospectively selected. The conventional group received standard CT scan protocol (tube current: 250mAs). Low-dose groups were divided into 3 subgroup based on the HC: 54.1-57.0cm for group A, 51.1-54.0 cm for group B, and 48.1-51.0cm for group C. The tube current was set to 200mAs, 150mAs and 100mAs, respectively. The Image quality was assessed by subjective and objective image score. A Monte-Carlo-Simulation analysis platform (Radimetrics, Bayer) was used to calculate radiation doses of organ-specific including brain, eye lens and salivary glands. ANOVA test was employed to analyse the differences between groups in organ-specific-radiation doses and image quality score.
Results: In the conventional group, patients with smaller HC will receive higher radiation doses. The radiation dose levels of specific-organ of low-dose groups were significantly lower than that of conventional group. The brain in three low-dose groups (A:25.91±0.99mSv; B:23.18 ±6.11mSv; C:17.38±3.27mSv) were significantly lower than conventional group (34.37±3.62 mSv; P_{A-con}＜0.01, P_{B-con}＜0.01, P_{C-con}＜0.01). The radiation doses in group C were significantly lower than the other 3 groups (P＜0.01 for all three compares). The radiation doses in group A and B were not significantly different (P = 0.110).The salivary glands is 25.92±0.99 mSv, 22.93±6.54 mSv, 14.96±2.67 mSv, respectively in group A, B and C, there were significantly lower than conventional group(35.04±4.94 mSv; P_{A-con}＜0.001, P_{B-con}＜0.001, P_{C-con}＜0.001). The radiation doses in group C were significantly lower than the other 3 groups (P＜0.001 for all three compares). The radiation doses in group A and B were not significantly different (P=0.099). The

eye lens in three low-dose groups (A:33.03±0.35 mSv; B:26.12±2.72 mSv; C:20.88±4.45 mSv) were significantly lower than that of conventional group (41.54±1.04 mSv; P_{A-con}<0.01, P_{B-con}<0.001, P_{C-con}<0.01). Eye lens radiation dose of four group were different to each other (P<0.001 in all compares). In three low-dose groups, the images quality met the clinical requirement. The image quality scores in group A and B(A：4.51±0.22, B：4.54±0.32) was no statistical different than conventional group (4.39±0.58) (P_{A-Con}=0.64, P_{B-Con}=0.47).

Conclusion: Our research indicates that low-dose CT scan can significantly reduce the organ-specific-radiation dose levels but keep the same image quality. Head circumference can serve as an effective index to guide personalized head CT scan.

EPO-0082

Investigation on Altered Amplitude of Low-Frequency Fluctuation Induced by Acupuncture at Baihui: a Functional MRI Study

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Abstract

Background: Baihui (GV20), an important acupoint of the Governor Vessel according to the traditional Chinese medicine (TCM) theory of acupuncture, is usually used for treatments of psychiatric disorders. However, studies about relationships between the brain activities and GV20 are limited.

Methods: In the present study, we thereby tried to investigate specific pattern of brain activities induced by electroacupuncture stimulation (EAS) at GV20. Twenty nine healthy subjects were enrolled in this study for MRI scanning. Each subject underwent EAS at GV20 and at sham acupoint, separately. Based on sustained effects of acupuncture, amplitude of low-frequency fluctuation and fractional amplitude of low-frequency fluctuation (ALFF/fALFF) methods were used to examine different ALFF and fALFF patterns of the whole brain induced by GV20 with comparison to the ones induced by sham acupoint.

Results: Results showed that GV20 induced altered ALFF/fALFF in the brain regions, including the medial prefrontal cortex (mPFC), orbital frontal cortex (OFC), dorsolateral prefrontal cortex (dlPFC) and middle cingulate cortex (MCC), temporal cortex (TC), supplementarymotorarea (SMA), precuneus, thalamus, hippocampus (HIPP), insula, putamen and cerebellum compared to sham acupoint.

Conclusions: Our findings might present the specific neural responses to EAS at GV20 using ALFF and fALFF approaches, and may further provide preliminary evidence for understanding the mechanisms of GV20.

EPO-0083

Altered Amygdala Resting-State Functional Connectivity Following Acupuncture Stimulation at BaiHui (GV20) in First-Episode Drug-Naïve Major Depressive Disorder

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Abstract
Background: Amygdala is an important locus of dysfunction implicated in major depressive disorder(MDD). Aberrant amygdala networks(AN) had been reported in resting-state functional magnetic resonance imaging (rs-fMRI) study. The safety and efficacy of acupuncture treatment on patients with MDD has been verified in previous clinical studies. We aimed to investigate whether acupuncture at GV20 could modulate the abnormal AN of patients with the first-episode, drug-naïve MDD by using rs-fMRI combined with functional connectivity (FC) method.
Materials and Methods: Thirty MDD patient underwent 6-minute rs-fMRI scans respectively before and after 20-minute electro-acupuncture stimulate(EAS) at GV20. Twenty-nine healthy subjects underwent only a 6-minute rs-fMRI scan. Based on the amygdala as the seed region, FC method was adopted to examine abnormal AN in patients by comparing with healthy subjects and to evaluate the influence of EAS on intrinsic connectivity within the AN in patients with MDD.
Results: Compared to healthy subjects, MDD patients had aberrant intrinsic AN which mainly showed increased FC between amygdala and hippocampus, precuneus, precentral gyrus and angular gyrus, meanwhile decreased FC between amygdala and orbital frontal cortex(OFC). Moreover, our results indicated that EAS at GV20 induced increased FC between amygdala and OFC, and decreased FC between amygdala and precuneus and precentral gyrus in MDD patients, which were the main brain areas showing significant differences between MDD patients and healthy subjects. In addition, the intrinsic amygdala FC within other certain brain regions in MDD patients were regulated by EAS at GV20 showing increased FC between amygdala and dorsolateral prefrontal cortex, and decreased FC between amygdala and anterior cingulate cortex, periaqueductal gray and insula.
Conclusion: The abnormal AN of MDD patients could be modulated by EAS at GV20. Our findings may further provide the potential imaging evidence to support the therapeutic mechanisms of acupuncture in MDD.

EPO-0084

Alterations of default mode functional connectivity in individuals with end-stage renal disease and mild cognitive impairment

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Background: Mild cognitive impairment (MCI) occurs frequently in many end stage renal disease (ESRD) patients, may significantly worsen survival odds and prognosis. However, the exact neuropathological mechanisms of MCI combined with ESRD are not fully clear. This study examined functional connectivity (FC) alterations of the default-mode network (DMN) in individuals with ESRD and MCI.
Methods: Twenty-four individuals with ESRD identified as MCI patients were included in this study; of these, 19 and 5 underwent hemodialysis (HD) and peritoneal dialysis (PD), respectively. Another group of 25 age-, sex- and education level-matched subjects were recruited as the control group. All participants underwent resting-state functional MRI and neuropsychological tests; the ESRD group underwent additional laboratory testing. Independent component analysis (ICA) was used for DMN characterization. With functional connectivity maps of the DMN derived individually, group comparison was performed with voxel-wise independent samples t-test, and connectivity changes were correlated with neuropsychological and clinical variables.
Results: Compared with the control group, significantly decreased functional connectivity of the DMN was observed in the posterior cingulate cortex (PCC) and precuneus (Pcu), as well as in the medial prefrontal cortex (MPFC) in the ESRD group. Functional connectivity reductions in the MPFC and PCC/Pcu were positively correlated with hemoglobin levels. In addition, functional connectivity reduction in the MPFC showed positive correlation with Montreal Cognitive Assessment (MoCA) score.
Conclusion: Decreased functional connectivity in the DMN may be associated with neuropathological mechanisms involved in ESRD and MCI.

EPO-0085

Feasibility of free breathing, non-gated heart to brain CTA using wide detector CT in acute ischemic stroke

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Purpose: To evaluate the feasibility of non-gated heart to brain CTA using a 16 cm detector CT in patients of acute ischemic stroke.
Materials and methods: Study protocol was approved by the institutional review board. Patients of acute ischemic stroke who were referred to multi-model CT were recruited consecutively. CT scans were performed with a 16cm detector CT scanner (GE revolution). Carotid and cerebral CTA conventionally included in the multi-model CT protocol was replaced by non-gated heart-brain CTA under free breathing. The CTA protocol includes a single heartbeat cardiac CTA and a spiral scan from the heart to the brain. Cardiac CTA was performed under simulated ECG triggering without wire connection. Axial images at 0.625 mm slice were reconstructed for further processing. As for the heart, the best phase was selected by the computer automatically. Another group of patients who received ECG-gated coronary CTA served as control for image quality evaluation of coronary arteries. Objective image quality of coronary artery segments was evaluated and compared. The CT values and contrast to noise ratio (CNR) were evaluated at thoracic aorta, carotid and vertebral arteries.

Results: The study group included 24 cases and the control group included 20 cases. There was no difference in age and body mass index between the two groups. The image quality scores of coronary artery segments of the study group and control group were 3.10±0.82 and 3.28±0.71, respectively (P>0.05). The radiation dose of coronary CTA was 13.41±4.91（CTDIvol）and 187.71±68.71（DLP）. The mean CT value and CNR of thoracic aorta, carotid arteries and vertebral arteries were 429.01±107.30（thoracic aorta）, 556.35±137.52(LICA), 559.80±136.80(RICA), 545.29±124.06(LVA), 542.42±135.40(RVA), 21.68±6.14(CNR), respectively.
Conclusion: It is feasible to perform free breathing, non-gated heart-brain CTA for patients of acute ischemic stroke, with good illustration of coronary arteries in addition to carotid and cerebral arteries.

EPO-0086
三叉神经痛患者脑灰质体积的变化：一项基于 VBM 的研究

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研究目的：三叉神经痛(Trigeminal neuralgia，TN）属于慢性神经性疼痛，临床上以反复发作的面部三叉神经区域的剧烈电触样疼痛为特点，严重影响人们正常的生活。近年来，关于慢性疼痛的研究让人们认识到，长期疼痛刺激可促使中枢神经系统疼痛相关脑区皮层发生病理性重构。但是关于 TN 患者脑形态学改变的研究较少。因此，本研究采用基于体素的形态测量学（VBM）的分析方法，对 TN 患者进行全脑分析，从而定量 TN 患者脑部灰质结构的改变，为三叉神经痛发病机制提供新的影像学证据。
材料和方法：对 28 名三叉神经痛患者和 28 名健康控制组进行常规 MRI 扫描，获得高分辨率的 3D 结构像，使用 VBM 对每个被试的图像进行分割、空间标准化、调制以及平滑，然后对两组被试预处理后的图像进行统计学分析，得到灰质体积存在显著差异的脑区；随后提取差异脑区的平均灰质体积，并与疼痛年限进行相关性的分析。
结果：与健康控制组相比，TN 患者在双侧颞上/颞中皮层，双侧旁海马，左侧前扣带回，右侧梭状回及右侧小脑表现出显著的灰质体积的减少；相关分析发现双侧颞上/颞中皮层的平均皮层厚度与疼痛年限存在显著的负相关。
结论：TN 患者灰质体积的异常影响到其疼痛的处理与感知。而且疼痛年限是影响大脑结构的关键因素，疼痛时间越长，对灰质体积的影响越大。这些结果的发现为三叉神经痛神经机制的研究提供了重要的信息，而且在临床中为 TN 患者的治疗提供了重要的依据。

EPO-0087
Abnormal intrinsic functional activity in patients with cervical spondylotic myelopathy: A resting-state fMRI study

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Purpose: We employed resting state-fMRI analyses to reveal central functional reorganization in the brains of patients with cervical spondylotic myelopathy (CSM)[1] and to provide complementary evidence of cortex reorganization[2] in these patients.
Patients and methods: We obtained zALFF[3] and zReHo[4] measurements from 33 patients with CSM and 33 healthy controls (HC) and used the brain regions with significant alterations in the zALFF or zReHo values as seed regions. Then, we calculated Pearson's correlation coefficients between the resting-state time courses of each seed and the time series of the rest of the brain. Lastly, we computed correlations between the altered zALFF, zReHo, and functional connectivity with Japanese Orthopaedic Association (JOA) scores[5], Neck Disability Index (NDI) score, and the duration of symptoms in patients with CSM (See Fig1, Table 1).
Results: zALFF and zReHo values were increased in the left medial superior frontal gyrus (lSFGmed) and left supramarginal gyrus (lSMG) in patients with CSM compared with those in the HC group (See Fig2, Table2). Selecting lSFGmed as the seed, we observed increased functional connectivity between it and the left postcentral gyrus (lPoCG) and left rolandic operculum (lROL), and decreased functional connectivity with the right medial superior frontal gyrus (rSFGmed) in patients with CSM (See Fig3, Table3) . In addition, there was a significant increase in the functional connectivity between the lSMG (seed) and the left calcarine (lCAL) and lPoCG in patients with CSM (See Fig4, Table3). However, we did not find any significant correlation between the resting-state findings and the clinical performance of patients with CSM (See Table4).
Conclusion: These observed intrinsic functional changes in the patients with CSM may be related to functional reorganization and reflect the innate cortical plasticity in patients with CSM. Notably, the increased connectivity between the lPoCG and the two seed ROIs indicate the adaptive changes in patients with CSM. These findings provide complementary evidence of cortex reorganization in CSM.

EPO-0088

Visible "Butterfly" in the Cervical Spinal Cord: A Pilot study using Phase-Sensitive Inversion Recovery and multiple Fast Field Echo

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Purpose: The aim of this prospective study was to determine the feasibility of phase-sensitive inversion recovery (PSIR) and multiple Fast Field Echo (mFFE) imaging for the imaging of gray matter (GM) and white matter (WM) in cervical spinal cord (C-SC).
Methods: Ten healthy subjects (mean age 28.9±2.36 years; 5 males, 5 females] were recruited for MRI can. PSIR and mFFE sequences were performed at the superior cervical spinal cord (C1 to C4). The signal intensities of GM, WM and cerebral-spinal-fluid (SI_{GM}, SI_{WM}, SI_{CSF}) were measured on C1, C2 and C3 segments by two radiologist. The GM-to-WM contrast ratio, GM-to-CSF and WM-to-CSF contrast to noise ratio ($CR_{G/W,}$ $CNR_{G/C}$, $CNR_{W/C}$) and SNR ($SNR_{G/C}$, $SNR_{W/C}$) were calculated for each sequence. The differences of all

parameters were assessed using Mann-Whitney U test between the two sequences, and inter-reader agreement were evaluated using intraclass correlation coefficients (ICC). **Results**: ICC showed good to excellent consistency between the two radiologists (0.682 to 0.869). No significant difference was found for $CNR_{G/C}$ (P=0.600) and $CNR_{W/C}$ (P=0.401) between the two sequences. On PSIR imaging, GM showed a hyper-intensity signal relative to those of WM (P=0.005), the mean $CR_{G/W}$ was significantly greater than those on mFFE Imaging. mFFE imaging showed significantly greater SNR for GM (P=0.003) and WM (P=0.016). There was no significant difference of $CR_{G/W}$ on the mFFE images (P=0.115). **Conclusion**: PSIR imaging is superior to mFFE imaging in depicting GM and WM of cervical spinal cord with an acceptable SNR loss compared to mFFE.
Clinical application: PSIR for the superior cervical spinal cord can provide a visible differentiation of white matter and gray matter, a macroscopic distinguishable butterfly structure. We can further apply it to monitor diseases that usually involve the cervical spinal cord.

EPO-0089

伴冻结步态原发性帕金森病患者脑网络连接属性

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目的：探究伴冻结步态（FOG）原发性帕金森病（PD）患者静息态功能磁共振（Rs-fMRI）脑网络连接属性的改变及其内在机制。
方法：本研究对 25 名伴冻结步态（FOG+）的 PD 患者、30 名无冻结步态（FOG-）的 PD 患者和 26 名健康对照者（ HC）进行 Rs-fMRI 检查。根据自动解剖标记（ AAL）图谱，将大脑分成 90 个解剖脑区。利用 GRETNA 软件构建 90 个脑区的功能连接皮尔逊相关矩阵并进行阈值化处理，采用图论方法分析全脑网络拓扑属性，包括全局属性和局部属性，评估有统计学差异的脑网络拓扑属性与临床神经量表的关系。使用基于网络的统计（ NBS）方法筛选出超阈值的脑网络连边，采用非参数置换检验评估其统计学意义。
结果：PD FOG+组、PD FOG-组和 HC 组脑功能网络均显示出小世界属性（sigma >1）。与 FOG-和 HC 比较，FOG+患者右侧颞上回局部节点效率减低（P < 0.001、P = 0.014）。NBS 分析结果发现 FOG+和 FOG-存在异常的功能连接网络：与 HC 比较，FOG-患者感觉运动皮层、默认模式网络和视觉网络显示功能连接减低（P < 0.05）；与 HC 比较，FOG+患者的感觉运动皮层、默认模式网络、视觉网络、听觉网络和背侧注意网络功能连接减低（P < 0.05）。FOG+组右侧颞上回局部节点效率与统一帕金森病评分量表（UPDRS） Ⅰ评分成负相关（r = - 0.410，P = 0.042）。
结论：PD FOG+ 组、PD FOG- 组和 HC 组的脑功能网络均表现出小世界属性。FOG+组右侧颞上回局部节点效率减低, 并与注意情绪功能下降相关；FOG 患者感觉运动皮层、默认模式网络、视觉网络连接减弱；另 FOG+组听觉网络和背侧注意网络连接减弱；本研究为寻找伴冻结步态帕金森病患者的影像学标志提供新思路。

EPO-0090

Topological Properties of Gray Matter Structural Networks in Children with Bipolar Disorder

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Objective: Bipolar disorder (BD) is a chronic, severe, and fluctuating mental disorder, the diagnosis of BD is always substantially delayed until the episode and bivalent nature of the illness has clearly expressed itself. Thus, it is necessary to investigate the neuropathological mechanism of BD.In the present study, we investigated structural brain network alterations in unmedicated depressed bipolar II disorder patients.So far, alterations of grey matter structure networks in BD remains to be characterized.
Methods: Sixty-eight currently depressed children diagnosed with BD II were recruited from our Hospital.Cortical reconstruction and parcellation were performed with the FreeSurfer software.The Graph Analysis Toolbox for the quantification of network measures, was used in graph theoretical analysis.The Graph Analysis Toolbox was used to conduct a comparison of network measurements between two groups.
Results: HC group demonstrated small-world network properties. BD patients showed lower Cp, Lp, γ, λand σ. Statistically, FDA analysis indicated that BD patients had significantly lower γ(P = 0.026), λ(P = 0.015) and σ(P = 0.042).The number of hubs in the BD group was less than that in the HC group, mainly from the bilateral frontal lobe, parietal lobe and temporal lobe.
Conclusions: This study serves as the first investigation of the complex topological organization of brain structural networks in patients with BD.The loss of small-world topological features indicated a less efficient network organization. The randomization alteration is an important characteristic occurring in the whole-brain network of bd patients, which may contribute to cognitive and affective processing problems.

EPO-0091
失去独生子女所致创伤后应激障碍的脑灰质体积的变化

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[摘要] 目的 采用基于体素的形态测量学（Voxel-based Morphometry，VBM）的方法探讨失独所致创伤后应激障碍（Post-traumatic Stress Disorder，PTSD）患者的脑灰质体积（Gray Matter Volume，GMV）的变化。
方法 共收集 19 例伴 PTSD 的失独患者（PTSD 组）、28 例不伴 PTSD 的失独患者（TC 组）及 27 例健康对照组（HC 组），应用当前和终生的临床用创伤后应激障碍诊断量表（Clinician Administered PTSD Scale, CAPS）评估每位失独者的症状严重程度。所有受试者接受 3.0T MRI 扫描，并采用基于 Matlab_R2013b 平台的 SPM8 及 VBM8 分析软件，将年龄、性别及颅内容积（Intracranial Volume, ICV）作为协变量，得到两组间 GMV 有显著差异的脑区。
结果 结果显示，PTSD 组、TC 组及 HC 三组之间，多个脑区的 GMV 存在差异，差异有统计学意义（P<0.01）。与 HC 组相比，PTSD 组的右侧额上回、海马旁回及颞下回的 GMV 减小；与 HC 相比，TC 组的右侧海马、中央前回及楔前叶的 GMV 减小；与 TC 组相比，PTSD 组的左侧额上回、右侧楔前叶 GMV 减小，而左侧梭状回的 GMV 增加（P 均<0.001）。相关分析结果显示，左侧梭状回的 GMV 与

CAPS 评分呈中度负相关（r=0.490，p=0.033），且与 PTSD 的回避症状呈显著负相关（r=0.555，p=0.014）。

结论 失独者存在异常变化的脑区大部分属于默认网络，这些脑区的改变与创伤应激（失独）有关；而 PTSD 组的左侧额上回及右侧楔前叶 GMV 减低可能与疾病相关。左侧梭状回 GMV 与 CAPS 评分之间的负相关关系表明左侧梭状回的结构受损导致了 PTSD 症状的加重，其灰质体积增加可能是 PTSD 的一个潜在保护因素。

EPO-0092

DCE-MRI 和 IVIM-DWI 对下腰痛患者退变椎间盘新生血管的研究

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目的 探讨动态增强磁共振成像（dynamic contrast enhanced magnetic resonance imaging,DCE-MRI）和体素内不相干运动扩散加权成像（intravoxel incoherent motion diffusion-weighted imaging ,IVIM-DWI）对下腰痛患者退变椎间盘新生血管的评估价值。材料与方法 选取 51 例经腰椎后路手术治疗的腰椎间盘突出患者设为实验组，选取 8 例腰椎骨折经手术治疗的患者为对照组。所有患者术前行 DCE-MRI 和 IVIM-DWI 扫描，并分别测量 DCE 参数 Ktrans、Kep、Ve 和 IVIM 参数 D*，D 和 f。椎间盘通过免疫组织化学方法，并计算微血管密度（microvessel density,MVD）。应用 Pearson 相关分析 IVIM-DWI、DCE-MRI 参数和 MVD 的相关性，采用单因素方差分析 IVIM-DWI、DCE-MRI 各项参数值在不同退变程度患者中的差异。结果 Ktrans 值随着退变分级增加而增大（P<0.05），D 值随退变分级增加而减低（P<0.05）。Ktrans 值、f 值分别与 MVD 具有良好相关性(r 分别为 0.794，0.589；P 值均小于 0.05)。结论 DCE-MRI 和 IVIM-DWI 磁共振技术可无创重复地观察椎间盘退变的血管形成情况，并对病人椎间盘退变程度进行评估。

EPO-0093

Changes of brain function in male with hyperuricemia: A resting-state functional Magnetic Resonance Imagine study

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Background: *Physiological concentration of uric acid is an endogenous antioxidant that protects nervous system and cognitive function. However, abnormal high concentration of uric acid may cause damages to brain structure, cognitive function and emotions, such as widening of cerebral vascular space, atrophy of white matter, decrease of working memory and executive function, sleep disorder, depressive state and so on. Thus, the potential neurobiological mechanisms of these symptoms need to be explored.* ***Method:*** *Fasting serum uric acid, cognitive function and neuropsychology scale and resting-state magnetic resonance image(rs-fMRI) scanning were performed in 41 male patients with hyperuricemia and 41 healthy controls matched with age and education. Analysis of amplitude of low-frequency fluctuation (ALFF) was used to calculate the abnormal brain region. Then, the functional connectivity (FC) between these abnormal seed points and other voxels in the whole brain was calculated by using the peak value of the abnormal brain regions as the seed points. Finally, the correlation between clinical indexes, neuropsychological evaluation and neuroimaging data was analyzed.* ***Result:*** *Compared with the healthy controls, male patients with hyperuricemia showed lower ALFF values in the left inferior temporal gyrus (ITG.L) and higher ALFF values*

in the bilateral inferior frontal gyrus (IFG.B). With the ITG.L as the seed point, the strength of FC in left thalamus and right caudate increased; with the IFG.L as the seed point, the strength of FC in bilateral cuneus increased; By analyzing the correlation between these brain regions, uric acid value, neuropsychological evaluation and cognitive test results, we observed that the negative activation of ITG.L in ALFF was closely related to the damaged working memory. The activated IFG.L, strength of FC with THA.L and CAU.R are associated with weakened executive function, poor sleep quality, and depressive state.

Conclusion: *These results elucidate the brain abnormalities of regional and network levels in male patients with hyperuricemia, which may provide useful information for the potential mechanisms of cognitive impairment and emotional changes in this group.*

EPO-0094

Altered brain structural and cognitive impairment in End-stage renal disease patients with secondary hyperparathyroidism

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Objective: To assess the pattern of brain volume changes in end-stage renal disease (ESRD) with secondary hyperparathyroidism (SHPT) by using voxel-based morphometry (VBM) and correlation with clinical and Montreal Cognitive Assessment (MoCA).
Methods: Fifty ESRD patients with no anatomical abnormalities in conventional magnetic resonance imaging (25 patients with SHPT, 14 males, mean age 42.20±7.53 year; 25 patients without SHPT, 15 males, mean age 41.96±6.17 year) were selected in this study. All patients underwent laboratory tests, neuropsychological tests and resting-state function magnetic resonance imaging (rs-fMRI). VBM analysis were performed to detect regional grey matter volume (GMV) changes among two groups. The relationship between abnormal GMV and clinical markers and MoCA scores were investigated.
Results: VBM revealed increased GM volume in ESRD patients with SHPT in bilateral caudate and bilateral thalamus compared with non-SHPT patients (p<0.05, FWE corrected). For laboratory tests and neuropsychological tests, we found a significant correlation between these brain regions and iPTH levels, and negative correlations with MoCA scores in SHPT groups. There was no significant association between brain volume changes and other clinical data (disease duration, urea, creatinine and uric acid).
Conclusion: Our results showed significantly increased GMV in ESRD patients with SHPT, which was associated with iPTH and cognitive impairment. Serum iPTH level may be a risk factor for cognitive impairment in ESRD patients with SHPT.

EPO-0095

基于 ALFF 及 ReHo 法的非酒精性肝硬化的 MHE 患者静息态功能磁共振研究

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目的 采用低频振幅（ALFF）及局部一致性(ReHo)方法观察基于非酒精性肝硬化的轻微型肝性脑病（MHE）患者神经元功能活动的改变情况。**方法** 收集 22 例 MHE 患者（MHE 组）、23 例无 MHE 的非酒精性肝硬化患者（NHE 组）和 31 例健康对照者（HC 组）行静息态下 BOLD-fMRI 扫描，利用 DPARSF 软件预处理图像数据并获取 ALFF 和 ReHo 值进行统计分析。**结果** 与 HC 组相比，MHE 组表现为右侧岛叶、右侧豆状核、右侧楔前叶、双侧楔叶、双侧枕叶及顶叶等多个脑区 ALFF 值有差异，NHE 组表现为双侧海马及海马旁回、左侧楔前叶及左侧颞叶多个脑区 ALFF 值有差异（P 均<0.05）；与 NHE 组相比，MHE 组 ALFF 值无明显差异性脑区（P>0.05）；与 HC 组相比，MHE 组表现为右侧额中回、右侧楔前叶、双侧侧楔叶等多个脑区 ReHo 值有差异（P 均<0.05），NHE 组表现为双侧尾状核、右侧前扣带回、右侧楔前叶及双侧楔叶多个脑区 ReHo 值有差异；与 NHE 组相比，MHE 组 ReHo 值无明显差异性脑区（P>0.05）。**结论** 利用功能磁共振可以对基于非酒精性肝硬化的 MHE 患者脑功能的改变情况进行早期评估，为研究 MHE 的功能恢复机制提供依据，并更好的指导 MHE 的治疗。

EPO-0096

Degree Centrality of the Functional Network in Adolescent Patients of First-episode Major Depressive Disorder with Suicidal Ideation

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Objective: The aim of the present study was to investigate the alternations of degree centrality (DC) in the brain of adolescent patients of first-episode major depressive disorder(MDD) with suicidal ideation at resting-state.
Methods: We analyzed resting-state functional magnetic resonance imaging data obtained from 53 first-episode, treatment-naive adolescent patients of MDD with suicidal ideation using the Beck Scale for Suicide Ideation (BSS) and from 33 healthy control subjects. Analysis of DC map between the patient group and the control group were performed by two sample t test.
Results: Compared with the control group, patients showed significantly decreased DC value in caudate,thalamus and hippocampus. Brain regions with increased DC included lingual,calcarine,temporal_inf,temporal_sup,occipital_mid,occipital_inf,precuneus,cingulum_mid and postcentral (T=5.08,P<0.05,FWE correction).However,the DC is not correlated with BSS.
Conclusion: DC,as a novel resting-state function MRI parameter in the voxel-wise whole-brain functional networks,might be an appealing alternative index for further studying on pathologic and neuropsychological states of first-episode MDD with suicidal ideation.

EPO-0097

The Precuneu Sub-regions Features changes in Cirrhotic patients : A Radiomics Analysis

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Purpose: Patients with the low grade of hepatic encephalopathy (HE) — covert HE (CHE), have poor health related quality of life (HRQoL). But CHE screening and diagnosis are often difficult to perform in clinical practice. CHE patients exhibit functional abnormalities, which are closely related to the function of the precuneu (PC). And studies found that there are significant changes in the PC of HE patients. We aimed to identify significantly different radiomic features in PC sub-regions among CHE and No-HE patients, by using radiomics analysis.
Materials and Methods: Radiomics analysis was applied to the high resolution image of T1-weighted three dimensional magnetization of 106 cirrhotic patients, included 54 had current CHE (CHE group) and 52 had no HE (No-HE group). The PC and its sub-regions (bilateral PEp, PEm, PEr and Lc1), in each subject, was segmented and extracted the radiomic features, a total of 423 features for each region. Then three major selection processes were carried out, included the variance and Mann-Whitney U-test, correlation analysis (Spearman' s correlation), and the least absolute shrinkage selection operator (Lasso), to obtained the significant features. Then the logistic regression models were constructed and evaluated according to identified features and clinical data. Finally the nomogram is used individualized prediction of CHE.
Results: Finally, 4 features (right PEp _ Var HLH, right Lc1 _ Median HLL, right Lc1 _ GrayLevelNonuniformity LLL, right Lc1 _ IMC1 LLL) were selected using the three major selection processes, following which, the logistic regression model was constructed. For the model of the selected 4 radiomic features, the area under the receiver operating characteristic curve values (AUC), sensitivity, specificity, and accuracy values of the test set were 0.846, 0.812, 0.706, and 0.758, respectively. The model integrating radiomic featuresd and clinical data has higher AUC values (0.949).
Conclusion: The results demonstrated the potential of PC sub-regions texture features, special the right PC, as a biomarker for the diagnosis of CHE, the radiomics models of PC based on machine learning was a valuable method for the diagnosis of CHE. And the results of this study also provide preliminary evidence that it is meaningful to further explore the sub-regions of the PC.

EPO-0098

Functional magnetic resonance imaging (fmri) based correlation study of cerebral cortex activity and clinical correlation scale score in patients with postoperative depression of breast cancer

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Objective to investigate the changes of cerebral cortex activity in depressed patients with breast cancer after operation and its relationship with clinical correlation scale score by using resting state functional magnetic resonance imaging (rs-fmri) based on low-frequency amplitude (ALFF) and local consistency (ReHo). **Methods** functional magnetic resonance imaging (fmri) was used to analyze the changes of cerebral cortex activity in 23 patients with postoperative depression. Based on SPSS 25.0, Pearson and spearman correlation analysis was used to evaluate the correlation between ALFF value and ReHo value and clinical correlation scale score. **Results** the low-frequency amplitude of right precuneus was negatively correlated with HAMA score in patients with postoperative depression of breast cancer. The low-frequency amplitude of the left angular gyrus and the upper right marginal gyrus is positively correlated with the comprehensive attention quotient. The low frequency amplitude of the right posterior cingulate gyrus is positively correlated with the general control quotient. The ReHo values in the right angular gyrus were positively correlated with SAS and HAMA scores. **Conclusion** the changes of cortical activity in multiple functional brain areas of depressed patients with breast cancer in resting state are correlated with the scores of the clinical correlation scale, which may be related to the pathophysiological changes of depression, suggesting that the changes of brain activity in depressed patients can be used to evaluate clinical symptoms.

EPO-0099
扩散峰度成像对儿童特发性全面性癫痫脑白质改变的研究

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目的：应用扩散峰度成像技术（及基于纤维束示踪的空间统计分析方法）研究儿童特发性全面性癫痫患者脑白质微观结构改变，分析其与临床变量（病程、语言智商、操作智商、总智商）的相关性。
方法：收集就诊于我院的 24 例特发性全面性癫痫患者作为病例组，另招募一般资料与病例组相匹配的 28 例健康志愿者作为对照组。两组性别使用卡方检验，年龄以及受教育程度使用双样本 t 检验。病例组接受中国-韦氏儿童智力量表进行智力测试。所有受试者采用 GE 3.0T 磁共振行颅脑 MRI 检查（T_1WI、T_2-FLAIR 和 DKI 序列）。首先用 DKE 软件进行批处理，获得各向异性分数 FA、平均扩散率 MD、平均峰度 MK。然后构建平均 FA 骨架图，将 FA 图、MD 和 MK 图投射至平均 FA 骨架图，最后采用置换检验，p <0.05 作为有统计学差异，使用 JHUICBM- DTI-81 模板显示有差异的脑区。在有差异的区域提取相关参数值，采用相关分析观察其与临床变量是否存在相关性（p <0.05）。
结果：病例组与对照组性别、年龄、受教育程度无统计学差异（p >0.05）。相对于对照组，病例组胼胝体（膝、体、压部）、双侧外囊、双侧内囊前、后肢、双侧前辐射冠、双侧丘脑后辐射 MK 值减低；胼胝体（膝、体、压部）、左侧外囊、内囊前肢、前辐射冠、丘脑后辐射及右侧外囊、内囊后肢、前辐射冠 FA 值减低；胼胝体（膝、体、压部）、右侧内囊后肢、左侧外囊 MD 值增高。相

关分析发现病例组平均 MK 值与 PIQ 呈正相关（r_s=0.392，p<0.05），病例组病程与 VIQ、PIQ、FIQ 无明显相关性，平均 FA、MD 值与病程、VIQ、PIQ、FIQ 无明显相关性，平均 MK 值与病程、VIQ、FIQ 无明显相关性。

结论：儿童特发性全面性癫痫患者存在广泛的脑白质结构异常，DKI 特征参数 MK 能发现更广泛的异常脑区；并且平均 MK 与操作智商具有相关性，为揭示儿童特发性全面性癫痫的病理生理机制提供新的依据。

EPO-0100

Whether brain structural and functional changes occur in Patients with medullary cone injury: A pilot fMRI study

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Neuropathic pain after medullary cone injury (MCI) affects the quality of patients' life seriously. Previous studies have shown that brain reorganization occurs in patients with neuropathic pain. The purpose was to explore possible brain changes after MCI, and to further study their associations with clinical variables.

10 MCI patients (all patients were labeled as grade A) and 10 age- and sex-matched healthy controls (HCs) were recruited. The 3D high-resolution structural images and resting-state functional magnetic resonance imaging of all subjects were obtained using a 3.0 Tesla MRI system. Voxel-based morphometry (VBM) and tract-based spatial statistics (TBSS) analysis were conducted to investigate the differences in gray matter volume (GMV), white matter volume (WMV) and white matter integrity between MCI patients and HCs, separately. The amplitude of low-frequency fluctuations (ALFF) and fractional ALFF (fALFF) was used to characterize changes in regional neural activity. Seed-based functional connectivity (FC) analysis was performed to study the whole brain changes using the results of VBM and ALFF/fALFF as seed regions. American Spinal Injury Association (ASIA) Scale scores and visual analog scale (VAS) were also obtained from each patient. Associations between brain changes and clinical variables were also analyzed.

MCI patients showed decreased ALFF in the right frontal lobe (FL). Additionally, when choosing the right FL as seed, MCI patients showed increased FC between the seed region and left orbital frontal cortex (OFC) and between the seed region and right cerebellum posterior lobe (CPL), separately . No significant difference was found in GMV, WMV, white matter integrity or fALFF between MCI patients and HCs. Subsequent correlation analyses revealed that increased FC between the right FL and right CPL was negatively correlated with the VAS score .

MCI may result in alterations in brain function rather than brain structure, and all these changes were within the cognitive-related areas or between these areas and sensorimotor related region. The association between the FC and VAS score may indicate that the neuropathic pain after MCI is closely related to cognitive-related brain functional changes.

Cognitive-related functional training may play an important role in rehabilitation for SCI patients with neuropathic pain.

EPO-0101

电针刺激百会穴即刻脑效应 fMRI 研究

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目的：利用血氧水平依赖功能磁共振成像(BOLD-fMRI)技术，观察针刺状态下脑区 ReHo 值的异常，研究其即刻脑效应情况。**材料与方法：**招募 20 例正常健康志愿者，通过针刺专用头颅柔性线圈在电针刺激百会穴下进行进针前、进针后及电针刺激三个时间段 fMRI 扫描，所得数据用 SPM12 软件预处理，然后用 RESTplus 软件测量 ReHo 值，最后用 SPM12 及 SPSS 软件进行统计学分析比较差异。**结果：**三个时间段之间比较，右侧舌回、左侧舌回、右侧楔叶、左侧楔叶、左侧中央后回、左侧中央前回、左侧中央旁小叶及右侧角回脑区 ReHo(regional homogeneity)值存在差异。电针刺激段相比较进针前段，ReHo 值增高的脑区为右侧舌回、左侧舌回、右侧楔叶、左侧楔叶、左侧中央后回、左侧中央前回、左侧中央旁小叶，ReHo 值减低的脑区为右侧角回。电针刺激段相比较进针后段，ReHo 值增高的脑区为右侧舌回、左侧舌回、右侧楔叶、左侧楔叶、左侧中央后回、左侧中央前回及左侧中央旁小叶，未见明显 ReHo 值减低的脑区。进针后段相比较进针前段，ReHo 值增高的脑区为右侧舌回、左侧舌回、右侧楔叶、左侧楔叶，未见明显 ReHo 值减低的脑区。**结论：**利用针刺专用头颅柔性线圈，可以观察电针刺激百会穴即刻脑效应情况，提高对其穴位特异性效应的认识。

EPO-0102

COMT-rs4680 和 KIBRA-rs17070145 多态性对健康青年海马体积和情景记忆的影响

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目的:
comt 和 kibra 的基因变异与记忆功能有关，记忆功能都在海马体中表达。本研究旨在探讨 comt rs4680 和 kibra rs17070145 对健康青年人海马亚区容量和记忆能力的影响。

方法:
共有 187 名健康青年志愿者参与了这项研究。采用 Freesurfer 6.0.0 软件计算海马区亚区体积。应用双向 ANCOVA 分析了 COMT 和 KIBRA 基因型间海马体积的变化。

结果: 我们发现，KIBRA 和 COMT 两个基因在右 CA1 和 CA3 亚区有显著的相互作用。在 Kibra C 等位基因携带者中，Comt-Val/Val 纯合子在这些区域的体积大于 Comt-Met 等位基因携带者。此外，这种相互作用效应可以调节海马体记忆关系。在 Kibra C 等位基因亚群中，在 Comt-Val/Val 纯合子和 Met 等位基因携带者之间，右 Ca1 体积和 CVLT 立即回忆（交互作用 f=4.36，p=0.041）以及延迟回忆（f=6.44，p=0.014）之间的相关性有显著差异，尽管 Correla 和 Met 等位基因携带者之间的相关性有显著差异。组内海马体记忆水平无明显升高。
结论: 这些发现提供了对 comt 和 kibra 对海马体积和记忆性能的相互作用影响的见解，这可能突出了遗传因素在海马记忆关系中的作用。

EPO-0103

A Preliminary Study of Diffusion Weighted Imaging and Resting-state Functional MRI in the Link between Brain Structural and Functional Network Disruptions in Cirrhosis with Minimal Hepatic Encephalopathy

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PURPOSES
While minimal hepatic encephalopathy (MHE) is increasingly recognized as a system-level disorder affecting brain structure and function, little is known about alterations of topological organization of brain functional and structural connectivity networks.
METHOD AND MATERIALS
We constructed functional connectivity networks from functional MRI signal correlations and structural connectivity networks from diffusion tensor imaging tractography in 30 MHE patients, 31 cirrhotic patients without MHE (NMHE) and 59 well-matched healthy controls. Graph theoretical analysis was employed to compute network properties. We investigated the relationships between functional and structural connectivity networks.
RESULTS
We found that MHE/NMHE patients exhibited altered small-worldness property in both functional and structural networks. Many regional characteristics were altered in both networks, involving attention, subcortical and visual networks, and some topological parameters in those regions were correlated with neurocognitive performances and/or disease duration, which reflect disease-specific pathophysiology in MHE. Compared with NMHE patients, MHE patients had decreased nodal local efficiency in functional network. The coupling strength of functional-structural connectivity was decreased and exhibited high sensitivity and specificity to differentiate MHE patients from controls.
CONCLUSION
This study indicates that MHE patients exhibit dysregulation of the 'small-world' topological organization in both brain structural and functional networks, and there is decoupling between the two networks. Our results suggest this so far neglected relationship (i.e, decoupling) serves a key point, which is related to neurocognitive dysfunction.
CLINICAL RELEVANCE/APPLICATION
Graph theoretical analysis of diffusion weighted imaging and resting-state functional MRI images can evaluate the structural and functional networks of MHE, and be a useful diagnostic tool to distinguish MHE from NMHE.

EPO-0104

维持性血液透析患者局部脑血流变化的纵向研究

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目的 为探究血液透析(Hemodialysis, HD)患者局部脑血流量(Cerebral blood flow, CBF)的改变，观察组间有差异的脑区 CBF 与 MMSE(Mini-mental state examination，简明精神状态量表)评分的相关性，筛选影响 HD 患者 CBF 变化的危险因素。
材料与方法 本研究纳入 24 例 HD 患者为病例组和 23 例正常志愿者为正常对照组(Health controls，HCs)。病例组首次检查记为基线组，随访检查记为随访组。采用脉冲式动脉自旋标记技术测量 CBF，病例组于血液透析前一天行 MR 检查，并于 MR 检查一周内行临床实验室检查。分别比较基线组和 HCs、随访组和 HCs、基线组和随访组组间不同脑区 CBF 值的差异。各组间差异脑区 CBF 值与临床实验室指标采用逐步多元线性回归分析观察其相关性。
结果 病例组较 HCs 多发脑区 CBF 增加 (年龄、性别作为协变量，P=0.001)。随访组与基线组相比右侧中央后回 CBF 增加(年龄作为协变量，P=0.001)。病例组的 MMSE 评分低于 HCs(P<0.05)，随访组的 MMSE 评分低于基线组(P=0.017)。血红蛋白是影响基线组右侧颞上回颞极、左侧海马、左侧壳核 CBF 的独立危险因素；尿素是影响基线组右侧颞上回 CBF 的独立危险因素；肌酐是影响基线组右侧壳核、右侧苍白球、右侧岛叶、左侧岛叶 CBF 的独立危险因素。甲状旁腺激素是影响随访组右侧颞上回颞极 CBF 的独立危险因素；血红蛋白是影响随访组右侧颞中回、右侧中央后回、右侧背外侧额上回、右侧颞上回、右侧壳核、左侧中央前回 CBF 的独立危险因素。
结论 HD 患者局部脑区 CBF 增加，同时伴有认知功能下降。基线组与随访组相比，随访组右侧中央后回 CBF 增加。肌酐、尿素、血红蛋白可能是影响基线组 CBF 的独立危险因素。甲状旁腺激素、血红蛋白可能是影响随访组 CBF 的独立危险因素。

EPO-0105

Chronic tinnitus exhibits bidirectional functional dysconnectivity in frontostriatal circuit

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Purpose: The phantom sound of tinnitus is deemed to result from abnormal functional coupling between nucleus accumbens (NAc) and prefrontal cortex, which may form a frontostriatal top-down gating system to valuate and modulate the sensory signals. Resting-state functional magnetic resonance imaging (fMRI) was used to recognize aberrant directional connectivity of the NAc in chronic tinnitus patients and ascertain the relationship with tinnitus characteristics.
Methods: Participants included chronic tinnitus patients (n=50) and healthy controls (n=55), matched for age, sex, education, and hearing thresholds. The hearing status of both groups was comparable. On basis of the NAc as seed regions, a Granger causality analysis study was conducted to investigate the directional connectivity and the relationship with tinnitus duration or distress.
Results: Compared to healthy controls, abnormal directional connectivity between the NAc and prefrontal cortex has been discovered within tinnitus patients, principally the middle frontal gyrus (MFG), orbitofrontal cortex (OFC), and inferior frontal gyrus (IFG). Additionally, positive correlations between the Tinnitus Handicap Questionnaire (THQ) scores and increased directional connectivity from the right NAc to the left MFG (r=0.357, p=0.015), and from the right MFG to the left NAc (r=0.626, p<0.001) have

been observed. Furthermore, the enhanced directional connectivity from the right NAc to the right OFC was positively associated with the duration of tinnitus ($r=0.599$, $p<0.001$).

Conclusions: Concurring with expectations, tinnitus distress was strongly correlated with enhanced directional connectivity between the NAc and prefrontal cortex. To sum up, the current study not only helps illuminate the neural basis of frontostriatal gating control of tinnitus sensation, but also makes a great difference in deciphering the neuropathological features of tinnitus.

EPO-0106

Does Freezing of Gait in Parkinson Disease have relationship with Cortical Thickness reduction in Middle Temporal Gyrus?

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Abstract: Freezing of gait (FOG) is a crucial characteristic in late-stage Parkinson disease. However, the mechanism behind it still remains as a mystery. Cortical thickness (CTh) showed as a promising, reliable biomarker reflecting neuron degeneration. The aim of this study is to find out whether CTh reduction exists between PD patients with FOG onset and those without. 24 PD patients with FOG, 37 PD patients without FOG assessed by neurologist and 24 HC went through MRI scan. With Freesurfer toolkits, the Cortical Thickness, along with Brain Segmentation Volume Without Ventricles(BSVWV) and estimated Total Intracranial Volume(eTIV) of each participant were extracted. Between-group t test of each parameter were performed and CTh is correlated with clinical assessments of FOG and nFOG groups. As result, CTh difference were found between HC vs FOG, HC vs nFOG PD groups in middle temporal gyrus (MTG), but there is no significant difference between FOG and nFOG groups while no correlation established between CTh and FOG Questionnaire score. We unexpectedly found that weak correlation exists in CTh and BI score between two groups of PD patients. Regarded as a part of semantic system referring to visual perception, sound recognition and language information processing, MTG stays out of motor system to which mainstream opinions attribute the onset of FOG. While on the contrary, our finding may explain cognitive impairment, learning performance happen generally in PD patients as well as their worsening of abilities to perform daily tasks.

EPO-0107

轻度脑外伤认知障碍静息态脑功能研究

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研究目的：利用静息态功能磁共振成像(rs-fMRI)技术)和 MoCA 量表对 mTBI 后认知障碍患者静息态脑网络和认知功能受损情况进行研究，探讨 mTBI 后认知障碍患者静息态脑网络连接改变与认知功能异常之间的关系。
材料和方法：mTBI 后认知障碍患者组 18 人，健康对照组 16 人，所有受试者在进行 fMRI 检查前签知情同意书，采用西门子 3.0T 磁共振成像仪，采用 T1 Flair 序列采集受试者结构像，采用 GRE-EPI 序列采集受试者的 rs-fMRI 数据。使用 SPM8 软件对数据进行分析预处理，fMRI 后处理工具盒对预处理后的数据进行独立成分分析(ICA)，组间差异进行双样本 t 检验。
结果： mTBI 后认知障碍患者组较健康对照组静息脑网络连接增强差异有统计学意义的脑区位于：右侧颞上回(58，-30，8)、右侧楔叶(14，-98，12)、右侧回直肌(2，18，-28)及左侧中央后回(-46,-14,56)，即默认网络和左侧执行网络所在的区域；mTBI 患者组较健康对照组静息脑网络连接减弱差异有统计学意义的脑区位于：左侧前扣带回(-6，22，28)、右侧枕上回(26，-90，28)，即视觉网络和右侧执行网络所在的区域
结论： TBI 导致了静息态网络尤其是默认网络和执行网络的改变，这些改变可能是 mTBI 患者伤后视空间与执行、语言能力、延迟记忆方面认知功能异常的神经功能基础。

EPO-0108

Changes in Brain Activation Patterns during Motor Imagery in Patients with Complete Spinal Cord Injury

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Objective: The aim of our study was to investigate changes in the brain activation patterns in complete spinal cord injury (CSCI) patients during motor execution (ME) and motor imagery (MI) tasks, and to thereby explore the mechanism of MI for motor function rehabilitation in CSCI.
Methods: Fourteen CSCI patients and twenty age- and gender- matched healthy control subjects (HCs) were recruited for this study. Brain activity was assessed with task-related functional MRI during the mental movement of the right foot (the MI task) and the actual movement (ME: autonomic movement for HCs and passive movement for CSCI patients) that were performed with block design (MI & rest and ME & rest). The brain activation patterns between MI and ME within group and the activation patterns between groups during MI and ME tasks were compared.
Results: For the HCs, there were many overlapping activated brain regions during MI and ME, but the activation of these brain areas during MI was lower than that during ME. However, the activated regions during both tasks in CSCI patients were partially different from those in HCs. Compared with autonomic motor execution data of HCs, passive motor execution in CSCI patients revealed reduced primary motor cortex activation at the group level. Further comparisons with HCs revealed that during motor imagery, CSCI patients showed enhanced activation regions in superior parietal lobule, paracentral lobule and precuneus.

Conclusion：Our findings suggested that patients with CSCI may need more cognitive and emotional involvement during MI, which may reflect central plasticity changes due to altered input and output after CSCI. A better comprehension of the functional reorganization of the MI network in CSCI patients may help to improve the brain-computer interfaces (BCI) tools devices based on MI.

EPO-0109

Sensorimotor and pain-related alterations of the gray matter and white matter in type 2 diabetic patients with peripheral neuropathy

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Diabetic peripheral neuropathy (DPN) has long been deemed a disease of the peripheral nervous system, although recent neuroimaging studies have shown that alterations in the central nervous system may play a crucial role in the pathogenesis of this disease. In this study, surface-based morphometry (SBM) and tract-based spatial statistics (TBSS) were used to investigate gray matter (GM) and white matter (WM) alterations in patients with DPN (44 painless and 23 painful) compared with 88 healthy controls (HCs). Compared with HCs, we observed GM alterations in pre- and post-central gyrus, deep gray matter nuclei (such as the caudate, putamen, medial pallidum, thalamus, and ventral nuclear), and altered WM tracts (including corticospinal tract, spinothalamic tract, and thalamocortical projecting fibers) in DPN patients, suggesting impaired motor and somatosensory pathways in DPN. Compared with HCs, we also observed morphological alterations in the cingulate cortex, insular cortex, prefrontal lobe and thalamus, as well as the impaired WM integrity in periaqueductal WM, internal and external capsule mainly in the patients with painful DPN, suggesting altered pain-perception/modulation pathways in painful DPN. Additional intermodal correlation analyses found that the morphological indices of the significant brain regions of the SBM analysis were significantly correlated with the FA of the significant brain regions of the TBSS analysis, suggesting that the GM and WM alterations were tightly coupled. Overall, our study showed sensorimotor and pain-related GM and WM alterations in patients with DPN, which might be involved in the development of DPN.

EPO-0110

Immediate abnormal intrinsic brain activity patterns in patients with end-stage renal disease during a single

dialysis session: A resting-state functional MR imaging study

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Purpose: *To prospectively investigate and detect cerebral amplitude of low-frequency fluctuations (ALFF) algorithm changes in patients with end stage renal disease (ESRD) undergoing maintain hemodialysis(HD) during a single HD in vivo resting-state functional MR imaging (rs-fMRI).*

Materials and Methods: *Twenty-four patients with ESRD undergoing maintain HD(HD group; fourteen men and ten women; mean age ± standard deviation, 56.21 years ± 11.85) and twenty-seven healthy contrast subjects (HC group: ten men and seventeen women; mean age, 50.7±11.2*) were recruit. HD group underwent neuropsychologic tests and MR imaging at least one hour before HD session (HDb), and within 30min after the session (HDa). zALFF values were compared among the three groups. The partial correlation between zALFF values and duration of dialysis, duration of disease, ultrafiltration volume, neuropsychological test scores were performed.

Results: Compared to the HC group, patients in HDb group performed poorer in digit symbol test and serial dotting test, the difference was significantly, and HDa group performed better in digit symbol test than HDb group, the difference was significantly, but there was no significant difference between HDa group and HC group. Patients in HDa showed higher zALFF values in left putamen region than that of HDb ($p<0.05$, false discovery rate corrected at cluster level, initial voxel-wise threshold $p=0.001$). Compared HDb and HDa to HC group respectively, multiple regions showed lower zALFF value ($p<0.05$, false discovery rate corrected at cluster level, initial voxel-wise threshold $p=0.001$). In patients in the HDa group, using left putamen region as mask consisting of regions of interest, the mean zALFF of each patient were correlated with the ultrafiltration volume($R=-0.679$, $p=0.005$). The demographic, clinical data, neuropsychological test scores correlated or positively correlated with zALFF value of multiple regions based on Automated Anatomical Labeling atlas(AAL) 90 templates, and the correlations changed after a single HD duration.

Conclusion: *Spontaneous brain activity abnormalities mainly occurred in left putamen during a single HD, which may related with improved performance of neuropsychological test indirectly. Ultrafiltration volume might be associated with activity of the left putamen in patients with ESRD underwent HD.*

EPO-0111

Increased amplitude of low-frequency fluctuation in right angular gyrus and left superior occipital gyrus negatively correlated with heroin use

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Purposes: Abnormal amplitude of low-frequency fluctuation has been implicated in heroin addiction. However, previous studies lacked consistency and didn't consider the impact of confounding factors such as methadone and alcohol. The purpose of this study is to explore abnormal regional neural activity in heroin-dependent individual and the relationship between the heroin-use-induced disrupted local neural activity and the clinical characters of heroin-dependent individual.
Materials and Methods: Fifty-one heroin-dependent (HD) individuals and 40 healthy controls underwent resting-state functional magnetic resonance imaging. The 'amplitude of low-frequency fluctuation' (ALFF) value was calculated and support vector machine (SVM) classification analysis was applied to analyze the data.
Results: Compared with healthy controls, heroin addicts exhibited increased ALFF in the right angular gyrus (AG) and left superior occipital gyrus (SOG). A negative correlation was observed between increased ALFF in the right angular gyrus and left superior occipital gyrus and the duration of heroin use (p_1=0.004, r_1=-0.426; p_2=0.009, r_2=-0.361). Moreover, the ALFF in the right AG and left SOG could discriminate the HD subjects from the controls with acceptable accuracy (Acc_1=64.85%, p_1=0.004; Acc_2=63.80%, p_2=0.005).
Conclusion: HD patients showed abnormal ALFF in the brain areas of semantic memory and visual network. The longer HD individuals abused heroin, the less the ALFF of associated brain regions increased. These observed pattern suggested that accumulative effect heroin' neurotoxicity overpowered self-recovery of the brain and may be applied as a potential biomarker to identify HD individuals from the controls.

EPO-0112

Study of resting-state fMRI in limb persistent numbness induced by electrical stimulation

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[Abstract] **Objective** To investigate brain function changes in limb persistent numbness induced by electrical stimulation by fractional amplitude of low frequency fluctuation of resting-state fMRI , and to discuss the brain mechanism of persistent numbness. **Methods** totally 21 healthy adult volunteers with and without numbness stimulation underwent resting-state fMRI scans, and the volunteers were asked to rate the nubmness intensity of the same electrical stimulation. Using fLAFF algorithm to analyze the fALFF date of the brain with and without stimulation , and acquire the significantly different brain regions , and correlation analysis was performed between the stimulation brain fALFF date with the individual numbness intensity score. **Results** Compared with none nubmbness stimulation, the brain regions with fALFF increased in nubmbness stimulation are medial frontal cortex, anterior cingulate cortex, bilateral medial temporal gyrus, bilateral inferior temporal gyrus and right temporal pole; brain regions with fALFF decreased are precuneus / posterior cingulate cortex and right cerebellum. The brain regions positively correlated with individual numbness scores have anterior precuneus / posterior cingulate cortex and left medial

temporal gyrus, and the negatively associated brain regions have right frontal pole and left inferior temporal gyrus. **Conclusion** The limb persistent numbness involves brain regions of sensorimotor, emotional and cognitive functions.,and is related to default mode network . The precuneus / posterior cingulate cortex, temporal lobe and frontal lobe are closely related to individual numbness. This study provides a new paradigm to explore the brain mechanisms of numbness.

EPO-0113

论利手的脑结构和功能偏侧化及对称性关联

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目的：应用静息态磁共振基于体素水平的体素-镜像同伦连接（VMHC）和灰质不对称性（AI）分析，探索不同利手程度的半球间结构和功能整合的神经关联。
方法：通过招募被试，得到左利手（LH）13 名，混合利手（MH）13 名，及 24 名右利手（RH）对照组。使用磁共振（3.0T）收集所有被试的结构像（T1）和静息态（BOLD）数据。在 Matlab 平台上利用 DPARSF 对 T1 和 BOLD 数据进行预处理并得到 VMHC 和 AI 值图，使用 SPM 软件对其进行单因素协方差分析，将年龄和性别作为协变量回归,对 AI 数据的分析额外加入协变量颅内体积 TIV 结果。对 zVMHC 值事后检验中有显著差异脑区作为感兴趣区（ROIs）,提取每个 ROI 的 VMHC 值与利手得分的绝对值使用 SPSS25.0 做偏相关分析。其中回归年龄和性别，$p<0.05$ 认为有显著统计学差异。
结果：对三组被试的 zVMHC 值图进行单因素协方差分析，结果在枕下回/颞下回（IOG/ITG）、额中回（MFG）和额叶眶部皮质（OFG）上有显著差异。对这三个差异脑区进行事后检验（$p<0.05$），非右利手在 IOG/ITG 上均与右利手有显著差异，左利手与非左利手在 MFG 上均有显著差异，右利手与非右利手在 OFG 上均有显著差异。三组被试的 AI 结果在内侧前额叶（MPFC）、额上回（SFG）和颞上回（STG）上显示有显著差异。事后检验得到左利手和右利手在 MPFC 上均与混合利手有显著差异，左利手与非左利手在 SFG 和 STG 上均有显著差异。偏相关结果发现在 MFG 上有显著正相关，在脑区 OFG 上有显著负相关（$p<0.01$）。
结论：非右利手的大脑半球连接较右利手表现出更多的互动性，左利手相对非左利手表现更多的脑区偏侧化，整体脑结构差异与功能连接差异结果一致。利手偏侧化程度与差异脑区左右半球间的信息交流有一定相关。

EPO-0114

The Influence of Childhood Trauma in Patients with Untreated MDD: Severity, Duration and the Functional Connectivity of FPC-DMN

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Background: DSM-5 declares that childhood trauma (CT) is a risk factor for MDD, but how does CT change brain function and induce MDD is still unclear. This study is to investigate therelationship between childhood trauma, MDD and large-scale network connectivity through observing the resting-

state functional connectivity (FC) between fronto-parietal control (FPC)and default mode networks (DMN) in MDD and healthy controls (HC).
Methods: Independent component analysis was used to exam the functional connectivity between FPC-DMN. Fifteen untreated MDD and twenty HC were included. Symptom severity was rated using
Hamilton Depression and Anxiety Scale (HAMD and HAMA), while fivesubsets of early traumatic experiences was measured by Childhood Trauma Questionnaire.
Results: The OR of exposure - nonexposure to develop
MDD was 12.071, and OR of single-multiple exposure was 2.5. Physical abuse (PA) showed difference on first onset andrecurrence (t = -1.830, p = 0.043). Significant differences FC were seen (t = -2.309, p = 0.027) between FPC-DMN in two groups, and the FC was positively correlated with HAMD scores (r= 0.338, p = 0.047), PA(r = 0.336, p = 0.049), and emotional neglect (EN, r = 0.411, p =0.014).
Conclusion: Our findings suggests that CT increases the risk of MDD and amplifies its severity. PA and EN increase the FC, and Positive FC in FPC-DMN separates MDD from HC group.

EPO-0115
无共患病儿童注意缺陷多动障碍的全脑体积研究

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目的：本研究的目的是探究排除 ADHD 共患病的干扰后，ADHD 患儿是否仍存在脑结构的改变以及这种改变是否主要由 ADHD 的某种亚型造成的。
方法：在我们的研究中，我们采用了来自 ADHD-200 公共数据库中 3T MRI 的 T1 结构像。 采取严格的排除标准后（例如：排除了 181 名共患精神类疾病的 ADHD 样本），我们共纳入了 121 名年龄匹配的排除共患病的 ADHD 样本（11.3 ± 2.4 岁，包括 54 名注意力缺陷型和 67 名混合型）和 265 名正常对照（11.1 ± 2.3 岁）。我们使用基于体素的形态学分析软件（VBM8）来评估全脑体积和局部灰质体积，并显示组间有显著差异的脑区域。ADHD 组与正常组，以及 ADHD 注意力缺陷型、混合型分别与正常组显示显著差异的脑局部区域根据 AAL 图谱用 REST 软件进行提取。其次，提取出来的每个脑区体积与临床量表中的 ADHD 症状评分在 SPSS 22.0 软件中进行 Pearson 双变量相关的统计分析。
结果：ADHD 组相比正常组双侧丘脑体积显著增加（p< .0001, 未校正）。事后基于 ADHD 注意力缺陷型、混合型和对照组之间的分析显示只有 ADHD 注意力缺陷型与对照组相比显示右侧丘脑和右侧中央前回体积增大。ADHD 混合型与注意力缺陷型以及对照组均无组间差异。相关分析显示注意力缺陷型的右侧丘脑体积与 ADHD 注意力缺陷评分呈正相关(p= .033, r= .44)。另外，各组间全脑体积无显著差异。
结论：排除共患病的 ADHD 体积改变主要存在于丘脑且这种改变主要由 ADHD 注意力缺陷型造成。其次，注意力缺陷型的右侧丘脑体积增大可能是导致其注意力缺陷症状的病理基础。本研究为 ADHD 患者临床上分亚型进行治疗以及 ADHD 注意力缺陷型的右侧丘脑靶向治疗提供了初步的参考。
本研究由浙江省医药卫生科技计划项目（NO. 2019326177）及温州市科技局基础性科研计划项目（NO.Y20180185）资助。

EPO-0116

Evaluation of cerebral hemodynamics in migraine patients with 320-slice CT perfusion

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Objective To analyze cerebral hemodynamics distribution and perfusion characteristics of migraine patients with 320-slice CT perfusion imaging, and to study the correlation between migraine patients and aura symptoms and cerebral blood perfusion. **Methods** Patients diagnosed with migraine in our hospital during January 2015 to June 2019 were enrolled as the migraine group. Divided them into the group with aura (58 patients) and without aura (72 patients) according to the presence or absence of aura before onset, and 50 healthy patients were taken as the control group during the same period. All enrolled patients proceed craniocerebral CT nonenhanced scan and dynamic enhanced scan, removal the pattients of intracranial intracranial mass lesion and artery stenosis. Performed perfusion imagingCalculated and recorded cerebral blood flow (rCBF) and Mean transit time (MTT) on both sides of the frontal lobe, temporal lobe and occipital lobe subcortical white matter of brain regions, the center of a semicircle and the thalamus in the interested in same area cerebral perfusion , adopt chi-square test and LSD - t test to figure out the interclass correlation coefficient respectively, The correlation between aura and migraine was analyzed. **Results** 1. There was no significant difference in cerebral perfusion between the healthy group and the migraine group without aura, and there was an decrease in rCBF and a increase in MTT in basal ganglia area and subfrontal cortex area on one side of the group with aura. 2. Compared with the healthy group, the group with migraine without aura had increaseed MTT in the subcortical white matter area and thalamic area of one side of the frontal cortex, and the difference was statistically significant, while the perfusion in the other areas was not statistically significant. 3. There were statistically significant differences in rCBF and MTT between one side of the frontal lobe and the subcortical white matter area of the temporal lobe, the central area of the semicircle and the thalamic area of the migraine group and the healthy group. **Conclusion** 320-slice CT perfusion imaging can reflect the changes of intracranial hemodynamics in migraine patients, and may affect the occurrence and prognosis of migraine aura, providing an important support for clinical diagnosis and treatment of migraine.

EPO-0117

基于 VBM 评价 COPD 患者脑灰质体积

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研究目的： 基于体素水平形态学的分析方法评价 COPD 患者灰质体积的变化。

材料与方法： 纳入 COPD 患者 60 例，HC 组 48 例。采集两组动脉血气、肺功能和认知功能评分。采集两组被试高分辨率 3D-T1WI 结构像 MR 数据，采用 VBM 软件分析两组脑灰质体积的差异。
结果：共 40 例 COPD 患者及 40 例健康志愿者纳入最终分析。与 HC 组相比，COPD 组灰质体积降低的脑区为：双侧颞中回、右侧枕中回、右侧额下回、双侧缘上回、左侧额中回、左侧中央前回、左侧楔前叶；灰质体积增加的脑区为：双侧纹状体。 COPD 组 MoCA 评分明显低于 HC 组，视空间与执行功能、注意、抽象、延迟记忆评分差异有统计学意义（P＜0.05）。COPD 组患者左侧额中回体积与 FVC 呈正相关、与 FEV_1/FVC 呈负相关；右侧颞中回体积与视空间与执行功能评分呈负相关；右侧额下回体积与 SaO_2、PaO_2 呈负相关，右侧额下回体积与语言评分呈负相关；右侧纹状体体积与 FEV_1%预计值、 FVC%预计值呈正相关；右侧缘上回体积与 FEV_1呈正相关；左侧额中回体积与 FVC、FEV_1/FVC 呈正相关；左侧缘上回体积与 SaO_2、PaO_2 、延迟记忆评分呈负相关；中央前回体积与 SaO_2、PaO_2 呈负相关、与 $PaCO_2$、FVC 呈正相关、与语言评分呈负相关。
结论： 稳定期 COPD 患者多个脑区灰质体积的异常，而且这些异常的灰质体积与肺功能、动脉血气分析及神经认知评分相关。这些发现可能为 COPD 的发病机制提供新的见解。

EPO-0118
脑梗死患者局部脑活动指标动态特征初步研究

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目的：

研究皮层下脑梗死患者在恢复过程中局部脑活动指标的纵向差异脑区及其动态演变模式，并探讨差异脑区局部脑活动指标的变化是否与临床行为学有关。

方法：

22 名皮层下脑梗死患者分别于发病后半年内进行 4 次数据采集，采用 3.0T MR 进行 fMRI 和 3D-T1 像采集。23 名健康志愿者作为对照组。将 fMRI 处理获得全脑 ReHo 图及 ALFF 图，统计分析皮层下脑梗死患者发病后 ReHo 及 ALFF 纵向变化差异脑区，提取其 ReHo 和 ALFF 值，分析平均值随时间的变化趋势。最后，将差异脑区 mReHo 值和 mALFF 值与临床行为学量表进行偏相关分析。

结果：

1.皮层下脑梗死患者 ReHo 纵向变化差异脑区为双侧楔前叶和健侧 MOG，双侧楔前叶 mReHo 值于急性期轻度增高，差异无统计学意义，随之逐渐减低并维持数周后又缓慢增高，最终低于对照组，差异无统计学意义；健侧 MOG mReHo 于急性期低于对照组，差异有统计学意义，之后升高并大致维持在某个稳定水平，最终低于对照组，与对照组无统计学差异。

2.皮层下脑梗死患者 ALFF 纵向变化差异脑区为双侧楔前叶和患侧 IFG，其中双侧楔前叶 mALFF 值于急性期低于正常对照组，差异无统计学意义，之后继续减低而后缓慢增高并于最终低于对照组，且与对照组有统计学差异；患侧 IFG 其变化趋势为急性期高于对照组，之后先减低而后略增高，最终低于对照组，但与对照组无统计学差异。

3.患侧 IFG 多个时间点的 mALFF 值与患者短时记忆评分存在相关性，且急性期 mALFF 值与慢性期短时记忆量表呈正相关。

结论：

本实验对皮层下脑梗死患者发病后不同时间点局部脑活动指标纵向分析得到 ReHo、ALFF 差异脑区为双侧楔前叶、健侧 MOG 和患侧 IFG，且这些差异脑区随时间的变化趋势各不相同。其中患侧 IFG mALFF 值与脑梗死患者记忆及认知功能恢复有一定相关性，可能作为急性期预测记忆功能预后的指标。

EPO-0119

Hypodensity sign predicts hematoma expansion in spontaneous intracerebral hemorrhage

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Objective To explore the application of "hypodensity sign" on plain CT scan in predicting the hematoma expansion in patients with acute spontaneous intracerebral hemorrhage (ICH).
Methods Clinical data of 82 patients with acute spontaneous ICH within 24 h were retrospectively analyzed. All patients were required to receive the baseline plain CT scan of the head, CT angiography (CTA) and repeated CT scan within 24 h after the onset of ICH. Clinical and imaging data of all patients were observed and analyzed by two independent radiologists. The hematoma volume was measured to determine whether the hematoma volume was enlarged. Univariate logistic regression analysis and ROC curve were performed to evaluate the values of "spot sign" in CTA and "hypodensity sign" on plain CT scan in predicting the hematoma expansion were statistically compared.
Results Among 82 patients with acute ICH, 39 cases had hematoma expansion. Univariate analysis demonstrated that the time of the first head CT scan, spot and hypodensity signs significantly differed between ICH patients with and without hematoma expansion (X^2=0.465, 9.854 and 23.146, all P<0.05). Binary logistic regression analysis showed that both the spot and hypodensity signs significantly differed between ICH patients with and without hematoma expansion (both P<0.05). The area under ROC curve (AUC) of the "spot sign" was 0.631, and 0.752 for the "hypodensity sign". The sensitivity and specificity of "spot sign" were 30.77% and 95.35%, and 92.31% and 58.14% for the "hypodensity sign".
Conclusion Both "spot sign" and "hypodensity sign" are independent factors for predicting the hematoma expansion in acute ICH patients. The specificity of "spot sign" is higher, whereas the sensitivity of "hypodensity sign" is higher. It can not only reduce the irradiation dose and medical cost, but also avoid the incidence of adverse reactions caused by contrast agents.

EPO-0120

Prediction of early hematoma expansion in cerebral hemorrhage based on non-contrast CT

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Objective: Patients with intracerebral hemorrhage (ICH) were divided into hematoma expansion group and non-hematoma expansion group. The clinical features of the two

groups of patients and the imaging features of non-contrast CT were analyzed to explore the relationship between the two groups and the early hematoma expansion.

Methods: Consecutive adult patients (>18 years) with spontaneous ICH who had undergone baseline CT within 6 hours after ICH symptom onset in Xiangyang Central Hospital between June 2017 and June 2019 were screened for inclusion into this study. A follow-up CT scan was performed within 24 hours after the initial CT scan. The time to baseline and follow-up CT scan and baseline clinical and radiological variables were recorded for each participant. Baseline clinical data, including age, sex, diabetes mellitus, coronary heart disease, past stroke history, onset to CT scan time, and CT features (hematoma volume, hematoma morphology, hematoma site, delayed intraventricular hemorrhage and island sign), were prospectively collected and recorded in our ICH research database. We also prospectively recorded admission blood pressure, admission Glasgow Coma Scale (GCS) score. We defined hematoma growth as a 33% increase in hematoma volume or >6 mL at the time of the follow-up CT scan, and the hematoma expansion group and non-hematoma expansion group were respectively evaluated. Detailed records of clinical and radiographic baseline characteristics and comparing the differences of data in two groups, univariate logistic regression was used to analyze the relationship between baseline variables and early hematoma expansion. Multivariate logistic regression was used to analyze the independent predictive effect of early hematoma expansion, and to calculate the sensitivity and specificity of predicting hematoma expansion.

Results: A total of 370 patients with cerebral hemorrhage were enrolled, including 140 patients with hematoma expansion group (37.8%) and 230 patients with non-hematoma expansion group (62.2%). There was no significant difference between the two groups in sex, age, blood pressure at admission, diabetes mellitus and coronary heart disease ($P > 0.05$). Compared with the non-hematoma expansion group, the initial GCS score was relatively low in the hematoma expansion group ($P = 0.033$), and the time from onset to the first CT scan was shorter ($P = 0.043$). In terms of CT features, there was no significant difference between the two groups in the hematoma site and the delayed intraventricular hemorrhage ($P>0.05$). The initial hematoma volume, irregular hematoma shape, island sign and delayed intraventricular hemorrhage in both groups ($P<0.05$). Multivariate logistic regression analysis showed irregular hematoma shape (OR=2.289, 95% CI=1.131-4.631, P=0.021), island sign (OR=2.327, 95% CI=1.139-4.751, P=0.020) and delayed intraventricular hemorrhage (OR=4.979, 95% CI=1.423-17.429, P=0.012) are the independent predictor of early hematoma expansion. The predicted sensitivity and specificity were 71.45% and 54.78%, 51.4% and 81.7%, 23.07% and 71.3%, respectively.

Conclusion: Irregular hematoma shape, island sign and delayed intraventricular hemorrhage expansion based on non-contrast CT are the independent predictors of early hematoma expansion. Irregular hematoma shape has the higher sensitivity and island sign has the highest specificity.

EPO-0121
颅内有明显强化斑块病人的特征分析：一项高分辨 MR 研究

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目的：斑块内的炎症反应是脑卒中发生中重要的危险因素。利用 3.0T 高分辨率磁共振成像（High resolution magnetic resonance imaging, HRMRI）技术探讨颅内动脉明显强化的斑块及临床相关危险因素及斑块负荷之间的相关性。
方法：2015 年 10 月至 2017 年 10 月一共 141 例（102 例男性，平均年龄为 61.1±11.4 岁）病人进行了颅内动脉高分辨 MR 检查证实颅内有动脉粥样硬化斑块，根据颅内斑块的强化程度将所有患者分为两组，存在明显强化斑块的患者为明显强化组，存在轻度强化及无强化斑块的患者为非明显强化组，并统计所有患者的临床相关资料及实验室检查结果，用二元 logistic 回归评估斑块强化程度与临床特征及斑块负荷之间的关系。
结果：在 141 例病人中，共 98 例（69.5%）病人存在颅内明显强化斑块，和颅内没有明显强化斑块的病人比较，颅内有明显强化斑块的病人中更多的人患有糖尿病、有脑卒中家族史，有更低的高密度脂蛋白，更大的斑块最大长径及更严重的管腔狭窄程度（以上所有 $p<0.05$）；颅内动脉管腔狭窄与颅内明显强化斑块独立相关(OR 值：1.037; 95% 可信区间: 1.022, 1.052)。颅内动脉斑块明显强化组与非明显强化组之间的年龄、性别、高血压、吸烟史及家族史均无显著性差异（以上所有 $p>0.05$）。
结论：颅内动脉管腔狭窄与颅内明显强化斑块独立相关，提示明显强化的斑块有更大的负荷。

EPO-0122

The research of difference between CT and MRI in the evaluation of cerebral hemorrhage volume

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Abstract: Objective To investigate the difference between CT and MRI T1WI in cerebral hemorrhage volume assessment and its relationship. **Methods** Fifty-five patients with intracerebral hemorrhage were collected, and conventional CT and MRI examinations were performed within 7 days of hemorrhage. Manual and automatic hematoma volume measurements were performed on CT and MRI T1WI images, and paired sample t tests were performed on manual and automatic measurements, and CT and MRI images were performed on cerebral hematoma volume measurements. **Results** The mean hematoma volume measured by CT and MRI images was 16.20 10.68ml and 29.28 21.34ml, respectively.There was no significant difference between manual and automatic measurement of cerebral hematoma volume ($P>0.05$), and the difference between CT and MRI images was statistically significant ($P<0.05$).Pearson correlation test showed that there was a significant positive correlation between the volume of cerebral hematoma measured by CT and MRI images ($r=0.783$, $P=0.000$), and the relationship between the two was: $V_{CT}=0.613*V_{MRI}$. **Conclusion** MRI is beneficial to the analysis of the internal components of cerebral hematoma, but MRI images may overestimate the hematoma volume. The results of this study can accurately evaluate the hematoma volume on MRI images, providing reliable imaging basis for clinical treatment.

EPO-0123

The performance of time-of-flight MR angiography with sparse under-sampling and computed tomographic angiography in detection of unruptured cerebral artery aneurysms: digital subtraction angiography as a reference standard

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Purpose
To investigate the performance of time-of-flight with sparse undersampling MRA (TOFu-MRA) and CTA in the visualizationand evaluation of morphological parameters of intracranial aneurysms, DSA as the gold standard.

Method and materials
Twenty-five consecutive adult patients who suspected intracranial aneurysms were perspectively enrolled and underwent CTA and TOFu-MRA within one week before DSA. Visualization of aneurysms was quantitatively assessed using: graded 2, visible (definitely present); grade 1, scarcely visible (inconclusive) and grade 0, invisible which indicating aneurysms were not detected by two neuroradiologists. The neck, height and width of aneurysms on volume rendered (VR) images of TOFu-MRA and CTA were measured and compared . With DSA as the reference, the absolute differences between CTA and DSA (d1neck, d1height, d1width), as well as TOFu-MRA and DSA (d2neck, d2height, d2width) were calculated and compared. Radiation dose in CTA was calculated.

Results
There were a total of 27 aneurysms in DSA. All aneurysms on these three imaging protocols were considered as graded 2. For aneurysms' morphologic parameters, the measurement data were as followed: the neck (DSA, 3.34±2.05, CTA, 3.79±2.35and TOFu-MRA, 3.62±2.21), height (DSA, 5.51±4.68, CTA, 4.49±3.84and TOFu-MRA,4.84±3.72) and width (DSA,4.63±3.54mm, CTA, 5.84±3.65mm and TOFu-MRA, 5.96±3.80mm. There were no significant differences between d1 and d2 (all $p > 0.05$). The radiation dose in CTA were as followed: $CTDI_{vol}$=6.10±0.15mGy, DLP=122.5±6.75mGycm.

Conclusion
Compared with conventional CTA, time‐of‐flight MR angiography with sparse TOF could visualizeintracranial aneurysms more clearly, as well as measure morphological parameters of intracranial aneurysms more accurately without ionizing radiation.

EPO-0124
针刺治疗脑卒中患者运动通路的脑功能连接变化特点的 fMRI 研究

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目的：利用静息态 fMRI 观察针刺治疗脑卒中患者运动相关脑区功能连接的纵向变化特点，为优化卒中后偏瘫的治疗方案提供研究基础。**方法**：纳入脑卒中伴右侧肢体运动功能障碍患者 23 例，招募年龄、性别、文化程度相匹配的健康人 20 例。收集脑卒中患者治疗前后 Fugl-Meyer 量表评分及所有受试者的静息态 fMRI 数据，选取双侧初级运动皮层（Primary motor cortex，M1）为种子点，比较患者与健康受试者双侧 M1 区与全脑的功能连接差异。**结果**：脑卒中组治疗前与健康对照组比较，左侧 M1 区与右侧中央前回、右侧额上回、右侧额中回、左侧中央后回、左侧顶下缘角回、右侧岛叶、右侧岛盖部额下回、Cerebelum_7b_R 功能连接减弱，但与 Cerebelum_6_L 功能连接增强。右侧 M1 区与左侧中央前回、右侧眶部额中回、右侧中央后回、右侧中央前回、左侧中央后回、右侧顶下缘角回、右侧颞下回功能连接减弱，但与 Cerebelum_Crus2_R 功能连接增强。脑卒中组针刺治疗后与健康对照组比较，左侧 M1 区与右侧中央前回、右侧额中回功能连接增强，但与左侧颞中回、左侧前扣带和旁扣带脑回功能连接减弱。右侧 M1 区与右侧中央前回、右侧中央后回、右侧眶部额上回、右侧颞中回功能连接增强，但与右侧杏仁核、右侧海马功能连接减弱。脑卒中患者在针刺治疗后 Fugl-Meyer 量表评分有明显的提高。卒中组治疗前右侧额上回的功能连接与治疗前 Fugl-Meyer 量表评分呈明显负相关；卒中组治疗后右侧中央前回的功能连接与治疗前 Fugl-Meyer 量表评分呈明显正相关。**结论**：脑卒中伴右侧肢体运动障碍的患者针刺治疗前后双侧大脑皮质功能减弱与增强并存，这些改变可能与针刺治疗脑卒中运动功能网络改善和重建相关。脑卒中患者治疗后右侧中央前回的功能连接可以预测卒中患者针刺治疗的疗效。

EPO-0125
高分辨率 MR 血管壁成像对缺血性卒中病因诊断的临床应用价值

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目的：研究高分辨率 MR 头颈动脉管壁成像对缺血性卒中病因诊断的临床应用价值。
方法：选择 2017 年 5 月-2019 年 6 月于我院就诊的缺血性卒中的患者经过临床评估及血管腔评估不能确定病因，而行高分辨率头颈动脉管壁 MR 成像明确病因的患者共 22 名进行分析，观察对高分辨率 MR 血管壁成像对血管壁病变的诊断能力。
结果：HR-MRI 头颈动脉管壁成像发现 2 例颈动脉蹼，表现为颈动脉起始部后壁突出并延伸至动脉腔内的薄膜样片状物；4 例头颈动脉夹层(cerebral artery dissection, CAD)，表现为双腔改变及短 T1 壁间血肿形成伴或不伴有管腔扩张，4 例 CAD 均为正性重构，其中 3 例 CAD 合并卵圆孔未闭及房间隔膨胀瘤；5 例烟雾病(Moyamoya disease, MMD)，4 例动脉粥样硬化性烟雾综合征(atherosclerotic Moyamoya syndrome, AS-MMS)，MMD 和 AS-MMS 均出现颅底动脉管腔缩小、闭塞及烟雾状侧枝形成，均为负性重构，但 AS-MMS 年龄更大、血管危险因素更多、颅外动脉粥样硬化证据更多、后循环受累更多、MR 血管成像分期系统评分更高、HR-MRI 动脉管壁成像出现易损斑块的表现更多、强化更明显；3 例原发性中枢神经系统血管炎，表现为颅内动脉多发节段性管壁增厚、强化，均为环形强化，累及颅内大中型动脉；4 例继发性中枢神经系统血管炎，其中 2 例为巨细胞动脉炎，表现为双侧颞浅动脉环形增厚、强化，管腔狭窄，1 例为神经精神性狼疮，责任动脉管壁环形增厚、强化，管腔中-重度狭窄，1 例为桥本脑病，责任动脉管壁轻度环形增厚，管腔轻度狭窄。

结论：高分辨率 MR 血管壁成像在缺血性卒中病因诊断中具有重要价值，尤其是血管腔评估（CTA、MRA、DSA）为阴性的不明原因卒中及血管腔狭窄病变的鉴别诊断，是血管腔诊断技术的重要补充。

EPO-0126

Imaging Features of High-resolution MRI Vascular Wall Imaging of Carotid Artery Dissection Caused by Massaging

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Objective: To discuss the imaging features of high-resolution MRI vascular wall imaging (HR-VWI) of carotid artery dissection caused by massaging.
Methods: A retrospective analysis was carried out by collecting information of patients with carotid artery trauma caused by massaging in Guizhou Provincial People's Hospital from January 2017 to January 2019. All included patients were interpreted by the staff in this study to inquiry the interval between the end of massaging and the onset of central nervous system symptoms. All patients underwent HR-VWI, and imaging features of the lesions were observed subsequently.
Results: Of the 9 patients, 4 were female, 5 were male, age ranged 31-57 years old, with an average age of 42.4±9.6 years. The median time from the end of the massage to the onset of symptoms was 11.5 hours. There were 10 lesions, with 7 located in internal carotid arteries and 3 in vertebral arteries. In addition, the average length of internal carotid artery lesions and vertebral artery lesions was 46±13 mm and 9±6 mm, respectively. The lesions were located laterally and posteriorly, with 1 occlusive lesion, and 10 moderate-severe stenosis in the lesion segment.
Conclusion: High-resolution MR vascular wall imaging can accurately analyze the extent of lesions and intraluminal hemorrhage in patients with massage-induced dissecting, providing clinicians with detailed and accurate imaging data as early as possible, thereby guiding clinicians in the decision-making of therapeutic programs.

EPO-0127

DWI 在不同类型的脑梗中的对比研究

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目的：探究腔隙性脑梗死与其他类型脑梗的不同 DWI 表现与临床症状的关系，从而对病人的临床治疗方案的选择起一定的指导作用。 材料与方法：搜集从 2013 年 1 月到 2013 年 7 月经临床确诊脑梗死的 30 例病人影像资料，将 30 名脑梗病人根据 DWI 及 CT 表现分为腔梗组及非腔梗组，腔梗组的判断标准为病灶小于 1.5cm，非腔梗组的判断标准为病灶大于 1.5cm。根据 OCSP 标准将脑梗死患者临床症状分为 LACS（腔梗综合征）、PACS（部分前循环梗死综合征）、TACS（完全性前循环梗死综合征）、POCS（部分后循环梗死综合征）。 结果：30 名脑梗患者中经 DWI 诊断为腔梗的患者为 9 例，非腔梗患者 21 例，腔梗组表现为 LACS 的患者高于非腔梗组（$p<0.001$），而非腔梗组患者表现为 PACS、TACS、POCS 的患者明显高于腔梗组($p<0.001$)。

EPO-0128

Random vessel-encoded arterial spin labeling in the assessment of altered flow territories after carotid stenting: a comparative study with digital subtraction angiography

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Purpose: Random vessel-encoded pseudocontinuous arterial spin labeling (rVE-pCASL) is a noninvasive and planning-free method for mapping cerebral blood flow territories. In this study, we aimed to compare the rVE-pCASL with gold-standard digital subtraction angiography (DSA) for 1) the assessment of flow territories in patients with internal carotid artery (ICA) stenosis; and 2) the alterations in flow territories after carotid angioplasty with stent placement (CAS).
Materials and methods: Thirty-two patients presenting with internal carotid arterial stenosis were recruited. CAS were performed in 15 (46.9%) all these patients. Flow territory mapping was performed with rVE-pCASL before intervention and 3 months after. Cohen's k-statistics were computed to quantify agreement in perfusion patterns between rVE-pCASL and DSA.
Results: The cross-territorial filling patterns were consistent with circle of Willis anatomy. Good agreement was found between rVE-pCASL and DSA in the assessment of flow territories. The Cohen's k-statistics was 0.721 (95% CI, 0.582-857) and 0.763 (95% CI, 0.632-896) for reader one and two, respectively. The alterations of cerebral blood flow territories after CAS assessed on rVE-pCASL was comparable to that on DSA.
Conclusion: rVE-pCASL provided radiological information comparable to DSA on mapping flow territories and their alternations after CAS in patients with internal carotid artery stenosis.

EPO-0129

症状性大脑中动脉粥样硬化斑块分布及形态学特征的高分辨磁共振成像研究

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目的　采用 HR-MRI 血管壁成像技术观察症状性大脑中动脉(MCA)粥样硬化斑块的分布和形态学特征，探讨急性脑梗死相关的高危斑块的 HR-MRI 特征。方法　对 57 例症状性 MCA 粥样硬化患者进行 DWI、3D TOF-MRA 及 HR-MRI 检查。统计 TIA 组和急性脑梗死组 MCA 管腔最狭窄层面斑块的分布情况，定量测量血管最狭窄处(MLN)的管腔面积(LA_{MLN})、血管面积(VA_{MLN})和参考血管的管腔面积($LA_{reference}$)、血管面积($VA_{reference}$)，再以此计算出血管最狭窄处管壁面积(WA_{MLN})、斑块面积、斑块负荷百分比、狭窄率、重构指数。结果 TIA 组和急性脑梗死组位于腹侧壁、上侧壁、背侧壁、下侧壁

分别为 6 例、5 例、7 例、9 例和 13 例、10 例、3 例、4 例，其差异无统计学意义（均 $P>0.05$）。TIA 组和急性脑梗死组的 $VA_{reference}$、$LA_{reference}$、VA_{MLN}、重构指数之间的差异无统计学意义($P>0.05$)。两组均以正性重构为主。TIA 组和急性脑梗死组的 WA_{MLN}、斑块面积、狭窄率、斑块负荷百分比分别为(8.85±1.92) mm^2、(4.00±3.00) mm^2、20.92%±9.18%、19.05%±14.93%和(11.10±1.88) mm^2、(6.00±2.25) mm^2、28.56%±8.67%、27.3%±7.69%，其差异有统计学意义($P<0.01$)。TIA 组和急性脑梗死组斑块表面不光整有统计学差异($P<0.05$)。TIA 组和急性脑梗死组的 LA_{MLN} 分别为(11.93±1.59) mm^2和(10.43±2.08) mm^2，其差异有统计学意义($P<0.01$)。 结论　急性脑梗死组的 MCA 粥样硬化斑块负荷更大，最大狭窄处管壁更厚，表面不光整更多，提示其具有高危斑块的特征性。

EPO-0130
颈动脉分叉处斑块表面形态特征与前循环脑血流灌注的关系

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目的：应用 CTA 评估颈动脉粥样分叉处斑块表面形态，分析其与狭窄程度、脑缺血性事件的关系；应用 ASL 测量前循环脑血流量，进一步探讨颈动脉斑块特征与前循环脑血流灌注的关系。
材料及方法：回顾性收集我院 2017 年 07 月至 2018 年 12 月以颈动脉狭窄收入院患者共 64 例，男 50 例，女 14 例，平均年龄为 71.00±9.37 岁，所有患者均行头颈动脉 CTA、颅脑 MRI 检查（含 ASL 序列，PLD=1.5s）。收集所有患者得临床资料及实验室检查。应用 CTA 评估颈动脉分叉处斑块表面形态，测量并记录斑块狭窄程度。将所有患者分为光滑、不规则及溃疡斑块组。通过 ASL 获得 CBF 图，测量责任血管侧前循环供血区（额叶、颞叶、顶叶皮层下白质和半卵圆中心、基底节区）CBF 值。采用行×列表卡方检验分析不同斑块形态与脑血管事件和狭窄程度的关系；应用 Kruskal-Wallis H 非参数检验比较不同斑块形态组间、狭窄程度组间前循环 CBF 值的差异。
结果：
1. 128 支颈动脉共 115 支血管颈动脉存在异常颈动脉斑块：光滑斑块 73 个（62.6%），不规则斑块 29 个（26.1%），溃疡斑块 13 个（11.3%）。
2.不同斑块形态组间脑缺血症状发生存在显著差异（P<0.001），不规则与溃疡斑块发生缺血症状的比例更高。不同狭窄程度组间脑缺血症状的发生存在明显差异（P<0.05），随着狭窄程度的增大脑缺血症状的发生率升高。斑块形态在不同狭窄程度组间有显著差异（P<0.001），随着狭窄程度增加，不规则和溃疡斑块的发生比例升高。
3.不同斑块形态组间的前循环 CBF 值无明显差异（P 值均>0.05）。额叶皮层下白质、半卵圆中心、顶叶皮层下白质的 CBF 值在狭窄程度组间有明显差异（P 值均<0.05），随着狭窄程度增加，CBF 值降低。
结论：不规则或溃疡斑块的缺血性脑血管事件的发生几率增大；前循环脑血流灌注与狭窄程度相关，而与斑块表面形态无关。

EPO-0131
CT 灌注成像对症状性烟雾病血流动力学的评价研究

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目的：探讨 CT 灌注成像(CTP)在评价症状性烟雾病血流动力学中的应用价值。**材料与方法：**回顾性分析行颅脑 CTP 检查的烟雾病患者 40 例，选择症状性烟雾病人为研究对象。勾画基底节层面的额叶、颞叶、基底节区脑组织及脑干为测量感兴趣区(ROI），以中线为镜面，同时获得额叶、颞叶、基底节区对侧镜面 ROI，分别测量并记录各 ROI 的灌注值。 (1)采用配对 t 检验或配对秩符号检验比较症状侧与非症状侧各感兴趣区各 CTP 参数相对值的差异。(2)根据 DSA 或/和 CTA 检查结果，将病人分为单侧烟雾病组和双侧烟雾病组，分别进行亚组分析，比较症状侧与非症状侧各感兴趣区各 CTP 参数相对值的差异。以上比较均以 P<0.05 认为差异有统计学意义。**结果：**40 例患者中，33 例患者纳入统计学分析。其中单侧烟雾病 7 例，双侧烟雾病 26 例。烟雾病患者症状侧与非症状侧灌注比较显示：症状侧额叶、颞叶及基底节区 rCBF 值较非症状侧明显降低，rTTP 及 rMTT 值较非症状侧明显延迟。亚组分析显示：对于单侧烟雾病患者，双侧额叶的各 CTP 参数比较无明显统计学意义。症状侧颞叶与基底节区 rCBF 值较非症状侧无明显统计学差异，rTTP 值较非症状侧明显延迟。TTP 能够敏感的反映症状侧与非症状侧的灌注差异。症状侧颞叶 rMTT 值较非症状侧明显延迟，基底节区 rMTT 值较非症状侧比较未见明显统计学差异。对于双侧烟雾病患者，症状侧额叶、颞叶及基底节区 rCBF 值较非症状侧明显降低，rMTT 较非症状侧明显延迟。症状侧 rTTP 值较非症状侧比较未见明显统计学差异。TTP 不能反映症状侧与非症状侧的灌注差异。以上各组症状侧与非症状侧各感兴趣区 rCBV 值比较，差异无明显统计学意义。**结论：**CTP 能够直观、定量地评价症状性烟雾病患者脑血流动力学的变化情况，了解其各参数的意义可以为临床提供重要的脑组织灌注信息，为临床治疗提供客观依据。

EPO-0132

Brain Grey Matter Potential Abnormalities in Type 2 Diabetes Mellitus: A study use VBM and SBCT Analysis Abstract

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Objective: Previous research has shown abnormalities in gray matter structure in type 2 diabetes (T2DM) and which are increased risk factors for cognitive impairment, dementia, and depression. It’s unclear whethergrey matter abnormalitiesalready occur in the patients with normal cognition. Thus, this study aims to investigate both potential grey matter density and cerebral cortical thicknessalterationsin T2DM patients without cognitive impairments and microvascular complications and to examine the relationship of these changes with cognitive functions.
Methods and materials: T2DM patients with normal cognition (n=28) and age-, sex- and education-matched health controls (HC, n=31) underwent clinical,neuropsychological assessments and 3D structural T1 on a 3.0T scanner. We used both voxel-based morphometry (VBM) and surface-based cortical thickness (SBCT) analysis to investigate whole brain grey matter density (GMD) and cerebral cortical thickness (CCT) alterations, respectively.
Results:T2DM patients showed no significant differences in total grey matter volumes, but presented significantly lower regional GMD and CCT mainly in temporal, frontal, insular lobe and inferior parietal lobule. Both significant decreased brain GMD and

CCT were found in left fusiform gyrus and right orbital frontal gyrus. Even T2DM patients in normal cognition, it exhibited significant poor attention and delayed recall. Furthermore, GMD (the right orbital frontal gyrus) was analyzed by VBM demonstrated greater relationship with cognitive functions (the visual space and executive ability) and performed worse as disease duration progress; while strong correlation was observed between clinical parameters (the fasting plasma glucose and HbA1c%) and CCT (the right inferior parietal lobule, pars triangularis and fusiform gyrus) was analyzed by SBCT.

Conclusion: VBM combine with SBCT can better detect the potential alterations and their relationship with cognitive functions then one method. Our findings indicated that grey matter abnormalities already occur even the patients without cognitive impairments and microvascular complications and suggested that early blood glucose control contributes to the prevention of early T2DM-related cognitive decline.

EPO-0133

Quantifying Hemodynamic Changes in Moyamoya Disease Based on Two-Dimensional Cine Phase-Contrast Magnetic Resonance Imaging and Computational Fluid Dynamics

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OBJECTIVE: To investigate hemodynamic changes in moyamoya disease (MMD) via two-dimensional cine phase-contrast magnetic resonance imaging and computational fluid dynamics.

- METHODS: In 18 patients with MMD and 10 healthy control subjects, phase-contrast magnetic resonance imaging was performed to quantify flow rate of main supplying arteries, including internal carotid arteries (ICAs) and vertebral arteries. Mean flow rate in these vessels was adopted as the patient-specific boundary condition for computational fluid dynamics simulation of the circle of Willis in MMD and control groups. Pressure drop in both ICAs and their difference, wall shear stress and secondary flow in the carotid siphon of ICAs, and flow rate and size of posterior communicating arteries (PComAs) were
compared between MMD and control groups. Four patients with MMD underwent follow-up scans for longitudinal comparison.

- RESULTS: Phase-contrast magnetic resonance imaging data revealed significantly different flow rate in the left ICA and right vertebral arteries between MMD and control groups. Computational fluid dynamics simulation demonstrated similar wall shear stress and similar secondary flow of both ICAs but significantly higher pressure drop in left ICA, higher pressure drop difference between left ICA and right ICA, and higher flow rate in PComAs in patients with MMD compared with control subjects. Significantly increased size of left PComA in patients with MMD was also found. Follow-up results confirmed that the combination of pressure drop difference, flow rate, and size of PComAs can potentially assist long-term prognosis after surgery.

- CONCLUSIONS: Pressure drop difference, flow rate, and size of PComAs can be used to evaluate impairments in cerebrovascular reserve and indicate long-term prognosis in MMD.

EPO-0134
轻中度血管狭窄易损斑块进展与临床生化指标相关因素分析的 HR-MRI 研究

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目的 应用高分辨磁共振成像（high-resolution magnetic resonance imaging，HR-MRI）评估轻中度狭窄的颈动脉易损斑块进展，并探讨生化指标与易损斑块（vulnerable plague，VP）进展的关联性。**方法** 回顾性纳入轻中度狭窄的颈动脉 VP33 个，分为责任斑块（culprit plague，CP）组和非责任斑块(non-culprit plague，non-CP)组。HR-MRI 图像上测量定量参数包括斑块最厚层面、远端及近端参考点的总管腔、管壁面积；管壁标准化指数、重构指数、斑块负荷及斑块大小，临床生化指标比较采用独立样本 t 检验。用 SPSS19.0 软件绘制受试者反应曲线（receiver-operating characteristic，ROC）分析 C-反应蛋白(C-reactive protein，*CRP)*对于 VP 进展成为 CP 的预测价值，确定其阈值、敏感性及特异性。**结果** *CP* 组与 non-CP 组在总管腔、管壁面积、管壁标准化指数、斑块负荷及斑块大小差异无统计学意义(P>0.05)，生化实验室检查糖化血红蛋白、同型半胱氨酸、载脂蛋白、脂蛋白、总胆固醇、甘油三酯及高、低密度脂蛋白等均无统计学差异（*P>0.05*），CRP 在责任斑块组及非责任斑块组统计学分析有差异 *(P=0.032<0.05)*，且 CRP 的 ROC 下的面积（area under the curve，AUC）为 0.789（P=0.009，95%的置信区间为：*0.618~0.961*），表明通过 CRP 预测 VP 进展为责任斑块的可靠性很高，其 cut-off 值为 18.61，敏感性和特异性分别为 81.8%，78.9%。**结论** 通过回顾性研究发现轻中度血管狭窄颈动脉粥样硬化 VP 进展为 CP 可能与 CRP 有关联，斑块的进展与 CRP 测量值大小成正相关，通过 CRP 预测 VP 进展为 CP 的可靠性很高。

EPO-0135
Cerebrovascular Events of DAWS in Extracranial Internal Carotid Arteries in Moyamoya Disease

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Objective:
The aim of this study was to investigate association between severity of cerebrovascular events and disruption of arterial wall structure (DAWS) in extracranial internal carotid arteries (EICA) in patients with moyamoya disease (MMD) confirmed by ultrasound imaging and angiography.
Methods:
48 patients with MMD were consecutively recruited in this study. The diagnosis of DAWS in EICA was observed by ultrasound imaging. To clarify the severity of cerebrovascular

events in patients with and without DAWS in EICA, we defined unstable hemorrhage as either hemorrhage with infarctions or repeated hemorrhage. we compared the infarctions, hemorrhage and unstable hemorrhage . Univariate and multivariate logistic regression analysis was performed to identify independent risk factors for the presence of cerebrovascular events in patients with DAWS in EICA.
Results:
No significant differences in clinical characteristics were found between patients with and without DAWS in EICA. 15 (31.3%) patients (mean age: 41.5 ±12.5 years; 6 males) and 24 arteries were found to have DAWS in EICA, those with DAWS had higher prevalence of unstable hemorrhage (53.3%vs. 18.2%, P=0.019), prevalence of hemorrhage (6.7%vs. 36.4% p=0.04), prevalence of infracts (40%vs. 36.4% p=1.0). Compared these results of cerebral disease in normal sides, univariate and multivariate logistic regression analysis identified unstable hemorrhage (OR, 4.47; 95% CI:1.22-16.32; p=0.02) as independent risk factors for the presence of cerebrovascular events in patients with DAWS in EICA.
Conclusion:
We found MMD patients with DAWS in EICA had more serious cerebrovascular

EPO-0136

椎动脉发育不全与后循环中风的关系

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背景
椎动脉（VA）发育不全的临床意义正在讨论中。这项回顾性研究的目的是评估 VA 发育不全（VAH）与后循环中风（PCS）或 TIA 发生率之间可能的因果关系的假设，这取决于 VAH 和血管危险因素的程度。
方法
共有 367 名症状性（PCS 或 TIA）和 742 名无症状受试者被选中参与该研究。通过超声检查颅外动脉。尽管检查了不同程度的 VAH，但 VAH 被定义为整个过程中的 VA 直径<3mm。所有有症状的患者均接受 MRI 或 CT 和 MRA 或 CTA 检查。该研究评估了所有受试者的年龄，性别，共同危险因素（高血压，高脂血症，糖尿病，外周动脉疾病，心房颤动，心肌梗死），以及 180 名健康志愿者的身高。
结果
无论严重程度如何，VAH 在非心源性栓塞性 PCS 或 TIA 患者中更常见，而非无症状患者。65 岁以下患者发育不全的程度增加是 PCS / TIA 的预测指标，OR = 1.8,95%CI：1.3-2.5； p <0.001。在年龄超过 65 岁的受试者中，这种关联失败了。仅在 50 岁以下的患者中，TIA 组 VAH 发生率明显高于 PCS 组（分别为 68.2%和 50%； p= 0.047）。分离 PCS / TIA 和无症状组的最佳 VA 直径截止点为 2.7 mm。该值可能在不同的群体中有所不同，因为 VA 直径显示出对性别以及人体测量参数（身高）的显着依赖性。随着 VAH 程度的增加，远端 VA 部分狭窄/闭塞发生的可能性增加（OR = 1.6,95%CI：1.2-2.1； p = 0.002）。VA 直径<2.2 mm 时，可能发生远端 VA 狭窄/闭塞。
结论
VAH 对 PCS / TIA 的影响及其发病机制受年龄的显着影响。影响不同人群中 PCS 发生的 VA 直径的截止点可能会有所不同，因为 VA 直径取决于性别和人体测量参数（尤其是身高）。

EPO-0137

Combination of Plaque Characteristics and Hemodynamics Predicts Neurological Impairment in Patients with Infarction or Transient Ischemic Attack: A Multi-modal MRI Study

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Background and propose: Intracranial atherosclerotic disease (ICAD) is the major reason for stroke events including infarction and transient ischemic attack (TIA) all over the world, especially in Chinese populations (1). Some patients merely suffer from transient symptoms of cerebral alchemist, but irreversible cerebral infarction happens to someone else. So how to discriminate infarction from acute stroke needs further study. The aims of current study were to explore relationship between the atherosclerotic plaque, hemodynamic parameters and irreversible infarction area, and to establish a multi-paramenter model for predicting the extent of neurological impairment of acute ischemic patients.

Methods and Materials: Sixty-seven patients (41 males; age, 58.01 ± 12.40 years) with acute ischemic events in MCA territory were reviewed retrospectively. MRI scans of patients were obtained on 3.0 T MRI Siemens Prisma System (Siemens Medical Systems, Allegra, Germany) with 64-channel head-neck coil, including DWI, TOF-MRA, pre-enhanced and post-enhanced Inversion-Recovery prepared Sampling Perfection with Application-optimized Contrast using different flip angle Evolutions (IR-SPACE) and DSC-PWI examination. All patients were subdivided to infarction group and TIA group according to DWI and neurological examination. The plaque characteristics, including outer wall area, lumen area, wall area, stenosis percentage, normalized wall index, plaque length, arterial remodeling ratio, plaque morphology, and enhanced behavior were evaluated in IR-SPACE. Pial collaterals (PCs) was graded as 4 grades, which were assessed on the raw axial images of TOF-MRA according to the method proposed by Yuan et al (2). DWI-ASPECTS was assessed in DWI images(3). RAPID software (4) was used to compute Tmax maps. Chi-square test, Mann-Whitney U test, univariate and multivariate logistic analysis, ROC curve, and multiple linear regression analysis was used.

Results: Forty-five patients were subdivided into infarction group, and 22 into TIA group. Longer laque length (8.63 mm vs. 6.40 mm, $P = 0.022$), more intraplaque hemorrhage (IPH) (25/45 vs. 1/22, $P < 0.01$), higher grade enhancement ($P = 0.021$), PCs ($P = 0.003$), and larger Tmax > 6.0 s volume (12.81 ± 21.72 ml versus 4.41 ± 18.27 ml, $P = 0.020$) were common seen in infarction group. IPH (OR 13.577, 95% CI 1.542-119.535, $P = 0.019$) and PCs (OR 0.453, 95%CI 0.210-0.975, $P = 0.043$) were independent predictors for patients with acute infarction. The AUC of combination of two variables was 0.860, and specificity was 95.45%. Plaque length, enhanced grade, IPH, Tmax > 6.0 s volume, and PCs were correlated with DWI - ASPECTS score ($P < 0.05$), respectively. Best setting

was achieved with Tmax > 6.0 s volume (β = 0.342, 95%CI 0.021-0.078, *P* = 0.001), IPH (β = 0.283, 95%CI 0.537-2.918, *P* = 0.005), hypertension (β = 0.260, 95%CI 0.431-2.845, *P* = 0.009), and PCs (β = -0.227, 95%CI -1.211- -0.060, *P* = 0.031) for NIHSS (F [4, 58] = 16.108, *P* < 0.001) in linear regression model.

Discussion and Conclusion: Our results indicated that plaque characteristics and hemodynamics had incremental values on predicting infarction occurrence and size. We established a multi-parameter model to prediction of patients' neurological deficit, and it may be useful in predicting clinical severity of acute ischemic patients.

EPO-0138

Clinical and MRI features of posterior reversible encephalopathy syndrome with atypical regions involvement: a large sample of descriptive study

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Background: With the deepening of research on posterior reversible encephalopathy syndrome (PRES) in recent years, the lesions can also occur in atypical regions. However, until now little is known about the clinical manifestations and damage mechanisms of the PRES with atypical regions involvement. And its accurate diagnosis and timely treatment are very important in clinical practice. So the aim of this study is to investigate the clinical and MRI features to promote the clinical diagnosis and deepen our understanding of this disease.

Materials and methods: Six cases of PRES with atypical regions involvement were collected from our hospital. Another 437 cases were obtained by searching from the PubMed database with the keywords "posterior reversible encephalopathy syndrome", "reversible posterior leukoencephalopathy" or "hypertensive encephalopathy" contained in Title/Abstract. The clinical and MRI features of these 443 cases were analyzed together.

Results: 247 patients were females, and 193 were males, with a median age of 36 years. The gender or age information of 3 patients were not available. The most common symptom was headache (231/443, 52.1%), followed by altered mental status (193/443, 43.6%), seizure (172/443, 38.8%), visual disturbance (161/443, 36.3%), nausea/vomiting (112/443, 25.3%), and focal neurological deficit (82/443, 18.5%). Hypertention (337/443, 76.1%), renal diseases (130/443, 29.3%), immunosuppressant drugs (51/443, 11.5%), autoimmune disorders (46/443, 10.4%), chemotherapy (37/443, 8.4%), infection/sepsis/shock (33/443, 7.4%) and pre-eclampsia/eclamptic (32/443, 7.2%) were the major predisposing factors. The most common location of lesion was cerebellum (256/443, 57.8%), followed by occipital (204/443, 46.0%), parietal (171/443, 38.6%), basal ganglia (115/443, 26.0%), pons (112/443, 25.3%), frontal (105/443, 23.7%), periventricular/deep white matter (103/443, 23.3%), temporal (98/443, 22.1%), brain stem (86/443, 19.4%), thalamus (84/443, 19.0%), midbrain (45/443, 10.2%), medulla (33/443, 7.4%), and spinal cord (29/443, 6.5%). The major treatments were

antihypertensive (200/268, 74.6%), antiepileptics (59/268, 22.0%), discontinuation/switching agents (38/268, 14.2%), steroids treatment (29/268, 10.8%), and dehydrating/diuretics (17/268, 6.3%). The neurological symptoms of most patients completely resolved after appropriate treatment.

Conclusion: The PRES with atypical regions involvement is characterized with relatively specific clinical symptoms and MRI features. They can be reversible in a relatively short time, when promptly recognized and properly treated.

EPO-0139

Single-phase CTA could predict hemorrhage transformation in acute ischemic stroke patients after mechanical thrombectomy

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Background: Hemorrhage transformation is a severity complication after mechanical recanalization. Radiological evaluation plays an important role in selection patients for further endovascular treatment and monitoring iodine extravasation and hemorrhage after recanalization. The aim of this study is to identify useful predictive information from single-phase CTA.
Method: We retrospect the imaging factors of sixty-seven patients with acute middle cerebral artery obstruction or internal carotid obstruction from our hospital from June 1, 2018, to June 1, 2019. We divided these patients into three groups according to the follow up CT and MRI scan. The computed tomography angiography (CTA) was obtained in 24 hours after stroke onset before mechanical thrombectomy. Alberta Stroke Program Early CT Score (ASPECTS) and regional leptomeningeal score (rLMC) were evaluated by two experienced radiologists. Good clinical outcome was defined as mRS ≤2 at 90 days. Multiple linear correlation was conducted.
Results: Fourteen patients had no iodine extravasation and hemorrhage. 24 patients had iodine extravasation and hemorrhage. 29 patients only had iodine extravasation. There was significant difference in ASPECT ($p=0.001$), rLMC ($p=0.007$), mRS (0.023) within the three groups. Post hoc analysis showed that patients having hemorrhage had lower score of ASPECT, rLMC and mRS than other two groups ($p<0.05$).
Conclusions: Single-phase CTA showed that patients having poor collateral circulation were prone to hemorrhage after mechanical thrombectomy. Single-phase CTA can provide important diagnostic information in selecting patients for endovascular treatment.

EPO-0140

Interaction between cerebral small vessel diseases and iron deposition in grey nucleus: Quantitative susceptibility mapping study

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Objective To analyze the relationship between cerebral small vessel diseases (CSVDs) and iron deposition in gray matter nucleus in the elderly and further explore the interactive effect of the two entities.
Methods Patients was collected who accepted the MRI examination with no obvious structural lesion. SWI images were post-processed and was used to measure susceptibility of 14 gray matter nucleus. The location, number and volume of cerebral microbleeds(CMBs) were evaluated on SWI and recorded, the white matter hyperintensity(WMH), brain atrophy and lacunar infarction(LI) was scored on T2WI images. The Spearman test, multivariate linear stepwise regression analysis and one-way ANOVA was used for statistical analysis.
Results (1) The Spearman test showed that the iron deposition of several deep brain nucleus (caudal nucleus, putamen, thalamus, substantia nigra and dentate nucleus) is positively correlated with several CSVDs (P all<0.05).(2) Multivariate linear stepwise regression analysis was used to investigate the effect of CSVDs on nuclear iron content and the result showed that the number and volume of CMBs, WMH, LI, brain atrophy are the risk factors of caudate nucleus, putamen, dorsal thalamus and substantia nigra (P <0.05). (3) The iron deposition of nucleus was used as an independent variable to analyze the effect of nuclear iron content on CSVDs, the result showed that the right thalamus, right substantia nigra, right putamen, left globus pallidus are risk factors of some cerebral small vessel diseases. (P<0.05). (4) Patients were divided into 4 groups according to the number of CMBs, there is statistical significance between four groups in the left caudate nucleus (p = 0.016), right thalamus (p = 0.002), left substantia nigra (p = 0.026), right substantia nigra (p = 0.043). In the left caudate nucleus and bilateral substantia nigra, there is significantly increase of susceptibility once the CMB appeared. In the right thalamus, when the number of CMBs is greater than 10, the iron deposit of the nuclei is significantly increased.
Conclusion: Compared with other CSVDs, CMBs is more closely related with some gray matter nuclei. The iron overload of some gray nucleus may contribute to the occurrence or development of CSVDs.

EPO-0141
源于全模型迭代 CTP 的多期相 CTA 在烟雾病中的诊断价值

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目的 探讨基于全模型迭代重建技术(knowledge-based iterative model reconstruction, IMR)低辐射剂量 CT 灌注容积数据重组的多期相 CTA 对烟雾病患者侧支循环的评估价值。**方法** 收集经 DSA 证实的 18 例烟雾病患者，利用基于 IMR 技术的 CT 灌注薄层原始数据重组出多期相 CTA，由两名放射科医生对图像进行主观质量评价，以 DSA 为“金标准”，多期相 CTA 和 DSA 对侧支血管评估结果进行一致性及相关性分析。**结果** 多期相 CTA 与 DSA 在侧支血管评估方面一致性及相关性较好（k=0.778，P<0.01），（r=0.864，P<0.01），图像质量与常规 CTA 相比差异无统计学意义。**结**

论　源于低辐射剂量 CT 灌注的多期相 CTA，图像质量能满足临床诊断需求，能获得多时相血管信息，准确评估烟雾病患者侧支循环状态。

EPO-0142

MRI findings of cerebral small vessel disease in patients with systemic lupus erythematosus

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Objective: To evaluate MRI findings of enlarged perivascular space (EPVS), white matter hyperintense (WMH) and lacunes of CSVD in patients with systemic lupus erythematosus (SLE). **Materials and Methods:** Twenty-nine SLE patients (2 males and 27 females, mean age 43.82±12.99 yrs) and twenty-nine age- and sex-matched healthy subjects (2 males and 27 females, mean age 45.14±9.73 yrs) were participated in this retrospective study. All subjects underwent routine MRI scans. EPVS, WMH, and lacunes were rated by two radiologists. Kappa test was to verify the consistency of the evaluation results of two radiologists. With SPSS 24, Kolmogorov-Smirnov Z test was used to analyze group difference. Relations between CSVD and clinical & laboratory finding were analyzed using spearman correlation. **Results:** In the centrum semiovale (CS), the EPVS score in the SLE patients was higher than that in the healthy ones (2.52±0.91, 1.34±0.55, P<0.01). The periventricular hyperintense (PVH) and deep white matter hyperintense (DWMH) in the SLE group were more serious than that in the healthy subjects (P<0.01). Lacunes occurred more in the SLE's than in the controls (P<0.05).In SLE group, EPVS in the CS and PVH was associated with complement C3 (r=0.505, 0. 400, P<0.05) ; DWMH was negatively correlated with triglyceride levels (r=-0.482, P<0.05); and EPVS and WMH were positively correlated with disease duration(r=0. 460、0. 428、0. 416、0.404, P<0.05). **Conclusion:** Cerebral small vessel disease is a common manifestation of central nervous system lesions in SLE patients and is associated with complement C3 and disease duration.

EPO-0143

A simple scoring model for prediction of rupture risk of anterior communicating artery aneurysms

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Background: The rupture risk of anterior communicating artery aneurysms (ACoAAs) has been known to be higher than those of the other locations. Thus, the aim of this

study was to investigate the clinical and morphological characteristics associated with risk factors for the rupture of ACoAAs.
Methods: A total of 361 consecutive patients with 361 ACoAAs between August 2011 and December 2017 were retrospectively reviewed. Patients and ACoAAs were divided into rupture and unrupture groups. In addition to clinical characteristics, ACoAAs characteristics were evaluated by CT angiography (CTA). Multiple logistic regression analysis was used to identify the independent risk factors associated with ACoAAs rupture. The assigning score of these variables depends on the β coefficient. Receiver operating characteristic (ROC) curve analysis was used to calculate the optimal thresholds.
Results: Multiple logistic regression model revealed that A1 dominant (odds ratio (OR) 3.034), irregular shape (OR 3.358) and aspect ratio (AR, OR 3.163) positively increased the risk of rupture, while cerebral atherosclerosis (OR 0.080) and mean diameters (OR 0.474) were negatively correlated with rupture. Incorporating these 5 factors, ROC analysis revealed that the threshold value of the multi-factors was 1, the sensitivity was 88.3%, and the specificity was 66.0%.
Conclusions: The scoring model is a sample method which based on A1 dominant, irregular shape, aspect ratio, cerebral atherosclerosis and mean diameters on CTA is of great value in the prediction of rupture risk of ACoAAs.

EPO-0144

SWI 与常规 MRI、DWI 序列及 CT 在急性期脑梗死伴微出血病变诊断的对比研究

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目的 探讨磁敏感加权成像(susceptibility weighted imaging， SWI)在急性期脑梗死伴微出血病变中的诊断价值，以及在急性脑梗死溶栓治疗患者复查中的监测意义。**方法**收集整理 2014 年 12 月-2018 年 12 月在我院就诊的 131 例急性脑梗死患者，应用常规 MR 序列、DWI 序列、SWI 序列及 CT 对所有急性脑梗死病例脑微出血的检出率及脑微出血灶在 SWI 上的分布特点。根据 SWI 序列上脑微出血灶的检出数量，对其进行分级。对搜集病例中行溶栓治疗的病人进行 48h 后复查，行 SWI、MR 常规序列、DWI、CT 扫描。**结果** 与常规 MR 序列、DWI 序列及 CT 相比，SWI 可以更敏感地发现急性脑梗死患者的微出血灶(P<0.05)。在出现的 51 例 238 处脑微出血灶分布中，有 125（52.5%）个微出血灶位于基底节/丘脑区；有 98（41.2%）个微出血灶位于皮层及皮层下白质区；有 15（6.3%）个微出血灶位于幕下区。根据急性脑梗死患者 CMBs 数量进行分级，轻中重度比例分别为 19.6%、62.7%、17.7%。因此，CMBs 中度患者最常见。行溶栓治疗的急性脑梗死患者 48h 后复查，SWI 检测出新出血灶，并且部分微出血灶体积增大、数量增多。SWI 比常规 MRI 更敏感地检测出了脑出血病灶，提示其可以作为急性脑梗死患者溶栓治疗后的监测手段。**结论** SWI 序列在诊断急性脑梗死患者的微出血灶以及溶栓后继发出血均具有良好的检测效果。在急性脑梗死患者的诊断治疗过程中，采用 SWI 序列可以准确的观察和判断患者脑部微血管出血的详细情况以及溶栓后的治疗效果。因此，SWI 序列在急性脑梗死治疗过程中的运用效果更好，具有重要的预后监测作用。

EPO-0145

Whole-brain computed tomography perfusion on admission and delayed cerebral ischemia time-window to detect the delayed cerebral ischemia in patient with aneurysmal subarachnoid hemorrhage

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objective To evaluate the value of whole-brain computed tomography perfusion (CTP) parameters on both admission and delayed cerebral ischemia time-window(DCITW) for detcting delayed cerebral ischemia(DIC) in patients with aneurysmal subarachnoid hemorrhage(aSAH).
Methods 80 aSAH patients underwent the one-stop whole-brain CTP scan on admission and DCITW.A total of 12 parameters ,including the mean cerebral blood flow(CBF),cerebral blood volume(CBV),mean transit time(MTT),time to delay(TTD),time to start(TTS),transit time to the center of the impulse response function(Tmax) were measured. Quantitative CTP parameters on admission and DCITW were compared between DCI and non-DCI groups by using Student's t-tests.Quantitative CTP parameters in patients with DCI on admission and DCITW were assessed by using paired Student's t-tests.The relation between CTP parameters and DCI was assessed using logistic regression models.The receiver operating characteristic(ROC) curve of all parameters were generated and the optimal threshold values were derived to calculate the sensitivities and specificities of quantitative CTP parameters.
Results 66.2% patients developed to DCI.There were statistical differences in CBF, MTT, TTS, TTD and Tmax between DCI and non-DCI groups on admission and DCITW. The CTP parameters of DCI were further deterioration compared with non-DCI on admission and DCITW.The mean TMax had the largest AUC of 0.698 (95%CI: 0.581-0.813),and a cutoff value of 2.220 seconds provided sensitivity of 62.26% and specificity of 77.77% for prediction DCI on admission.The mean TTS had the largest AUC of 0.789(95%CI:0.688-0.889),and a cutoff value of 0.605 seconds provided sensitivity of 60.37% and specificity of 92.59% for diagnosing DCI in DCITW. The combined model had a higher predicting value which provided a sensitivity of 60.56% and a specificity of 70.73% (AUC of the combined model 0.817:(95%CI,0.720-0.914).
Conclusion The quantitative CTP on admission can predict DCI early and quantitative CTP in DCITW can dignose DCI after aSAH. However the quantitative CTP paremeters in DCITW have obvious higher sensitivity and specificity than on admission. Furthermore, the combined model is more accurate and effective to detect DCI in patient with aSAH.

EPO-0146

缺血性脑卒中预后评估系统

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目的 建立一个简便有效的临床/影像评分系统，用以指导急性缺血性脑卒中患者的临床治疗和评估 90 天临床功能恢复情况。**方法** 49 例急性缺血性脑卒中（＜9 小时）的患者行“多模式 CT” 扫描，评价基线多模式 CT、随访影像 ASPECTS 及基线 NIHSS，并应用 ROC 曲线分析，判断 90 天临床功能恢复良好（MRS<2）的各参数的阈值；按照获得的阈值分级并获得各参数的阈值评分，多模式 CT 各参数的阈值评分整合在一起获得多模式 CT 评分系统，将基线 NIHSS 阈值评分加入多模式 CT 评分系统中获得临床/多模式 CT 评分。然后应用 ROC 曲线分析比较各评分模式预测临床功能恢复的效能。**结果** 临床/多模式 CT 评分、多模式 CT 评分、基线 NCCT ASPECTS、动脉期 CTP-SI ASPECTS、静脉期 CTP-SI ASPECTS、CTA TICI 及基线 NIHSS 判断 90 天临床功能恢复良好（MRS<2）的各参数的阈值分别是：>1，>1，>9，>6.5，>8.5，>1 和≧7。临床/多模式 CT 评分 ROC 曲线下面积最大，其预测急性缺血性脑卒中患者 90 天临床功能恢复的效能最高，除临床/多模式 CT 评分与 ACTP-SI 及 NIHSS 阈值评分的差异无显著性意义外，其余各参数阈值评分与临床/多模式 CT 评分的差异均存在显著的统计学意义。**结论** 应用临床/多模式 CT 评分系统比多模式 CT 系统及 NIHSS 各参数单独预测 90 天急性缺血性脑卒中患者的临床功能恢复良好的效能高。

EPO-0147
CT 灌注在判断脑卒中患者缺血半暗带中的价值

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目的：探讨 CT 灌注在判断急性脑卒中患者缺血半暗带中的价值。
方法：回顾性研究 2018 年 10 月至 2019 年 1 月，怀疑脑卒中行 CT 灌注扫描的患者 28 例，男性 25 例，女性 3 例，所有病例均行 CT 灌注扫描。使用飞利浦 256 层 iCT，患者仰卧于检查床头部托架内，头部用绑带固定，先行 CT 平扫，然后，经患者肘静脉注射对比剂（碘帕醇 370mgI），流速=4-5ml/s，剂量=50ml，利用灌注扫描程序，覆盖扫描范围 16cm，间隔 4S，持续扫描 60s，灌注后，立即行延时扫描。所得原始数据传输至飞利浦后处理工作站，对各期图像、及 CTA、CTP 进行分析，设置延迟时间>3s 和 rCBF<30%分别为预测半暗带和核心梗死区体积参数阈值。
结果：28 例 CT 灌注患者中，脑梗塞 17 例，动脉瘤并出血 1 例，蛛网膜下腔出血 2 例，脑膜瘤 1 例，灌注正常 3 例，其它 4 例。CT 平扫、CT 灌注、延时扫描相结合能够对急性脑卒中进行确诊，能够区分梗死区及半暗带。
讨论：缺血半暗带仅是脑血流低灌注后神经功能受损，恢复灌注后神经功能仍可恢复的区域，长时间、严重的低灌注可致半暗带进展为不可逆梗死区。CT 平扫对于急性脑梗塞难以发现，即使增强扫描也不一定可发现急性期脑梗塞，而 CT 灌注可确诊急性脑卒中。本研究有 2 个病例 CT 平扫、延时扫描均不能观察到脑梗赛，而 CT 灌注显示存在低灌注区域，经重建血管，发现对应责任血管堵塞。CT 灌注可预测急性脑卒中，可区分梗死区和半暗带，灌注延迟时间>3s，可较好的显示半暗带的范围，与临床手术证实范围较一致。rCBF<30%确定的梗死区体积与临床实际一致性较好。特别是灌注扫描的同时还可得到 CTA 图像，能够准确的诊断急性脑卒中，确定责任血管，为临床溶栓提供全面的指导信息。

EPO-0148
磁敏感征和不对称静脉征对急性大脑中动脉闭塞患者诊断价值

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目的探讨磁共振磁敏感加权成像(SWI)动脉磁敏感征(SVS）和不对称脉静脉血管征（,AVS)对急性大脑中动脉闭塞(AMCAO)引起急性缺血性卒中（AIS）体积程度的预测研究和临床价值。**材料与方法** 45 例 AMCAO 患者，根据 ASPECTS 评分的为基础的改良为 SWI-ASPECTS 评分。SWI-ASPECTS 显著组和稀疏组以及无 SVS 组、SVS≤20mmm 组、＞21mm 组进行 SWI-ASPECTS 评分量化，比较患者脑梗死体积程度是否差异。**结果** 45 例 AMCAO 的患者中，无 SVS 为 11 例、占 24.4%，有 34 例 SVS 征（SVS≤20mm 为 19 例、SVS>20mm 为 15 例）、占 75.6%。无 SVS 组、SVS≤20mm 组、SVS>20mm 组，其脑梗死体积分别（5.11±5.913）、（22.71± 33.568）和（111.51± 87.352）mm3，三组梗死体积差异有显著统计学意义（P＜0.001），三组梗死 SWI-ASPECTS 评分差异有显著统计学意义（P＜0.01）。随着 SVS 长度增加，SWI-ASPECTS 评分呈减小趋势(经 Spearman 检验，r=-0.538，P<0.001)； AVS 稀疏组 19 例、占 42.2%，AVS 显著组 26 例、占 57.8%，其体积分别（103.555±80.684）和（7.413±8.224）mm3，经 Mann-Whitney U 检验，稀疏组的梗死体积大于显著组，差异有显著统计学意义。(Z=-5.102，P<0.001)。**结论** SVS 颅内动脉严重狭窄或闭塞的标志，代表了血栓形成、预测栓子成分。AVS 代表 AMCAO 的缺血区域软脑膜侧支循环的形成，AVS 越广泛，SVS 长度越小，梗死面积越小，SWI-ASPECTS 评分越高患者的侧支循环分级越高。这对于患者最终梗死体积及临床预后的评估都具有重要意义。

EPO-0149

Vessel Encoded Arterial Spin Labeling Evaluation of Collateral Circulation in Symptomatic and Asymptomatic Patients with Internal Carotid Artery or Middle Cerebral Artery Occlusion

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Introduction

Symptomatic and asymptomatic patients with internal carotid artery (ICA) or middle cerebral artery (MCA) occlusion have the different prognosis. The symptomatic patients had a higher recurrent stroke than that of asymptomatic patients. The important factors determining the disease evolution include collateral circulation, cerebral vasoreactivity, and etiology of occlusion. Asymptomatic occlusion was considered as the benign condition, differences between symptomatic and asymptomatic occlusion regarding the disease evolution determinants remain unclear, but which is helpful to understanding the mechanism of stroke resulting from artery occlusion and improve patients management. The aim of the study was to evaluate collateral circulation and cerebral vasoreactivity in symptomatic and asymptomatic patients with unilateral ICA and/or middle MCA occlusion.

Methods

In the retrospective study, we enrolled consecutive patients with unilateral ICA or MCA occlusion confirmed by MRA, computed tomography angiography or Digital subtraction angiography (DSA) from June 2015 to June 2017. Patients with MCA and/or ICA stenosis were excluded. Patients with ipsilateral ICA ≥ 50% stenosis were excluded. Patients with evident cardioembolism and other pathologies such as vasculitis, dissection, and Moyamoya disease were excluded. Symptomatic patients were defined as having an

ischemic stroke/TIA within 90 days and asymptomatic patients were defined as having no history of ischemic event. All patients had underwent routine head MRI, Vessel Encoded Arterial Spin Labeling (VE-ASL) (technique: pseudo-continuous labeling scheme, labeling duration=1500ms, post labeling delay=2000ms) and Dynamic susceptibility contrast (DSC) perfusion imaging. VE-ASL was used to evaluate collateral circulation and DSC was used to assess cerebral vasoreactivity by mean transit time (MTT) map according to a previous study.[1] The VE-ASL perfusion information was combined with 3-colored cerebral blood flow maps of the left carotid, right carotid, and posterior circulation territories. The presence of collateral flow was identified by the color compared with the standard anterior cerebral artery/MCA flow territory obtained from volunteers. Variants of Circle of Willis including missing A1 segment and fetal type posterior cerebral artery were carefully and thoroughly considered. The intensity of collateral flow was categorized as: Grade 1, collateral flow distributed less than 1/3 target downstream territory; Grade 2, collateral flow distributed within 1/3-2/3 target downstream territory; Grade 3, collateral flow distributed more than 2/3 target downstream territory. The pattern of collateral flow was categorized as: A. Anterior dominant pattern: collateral flow mainly originated from anterior cerebral artery(ACA) by anterior communicating artery or leptomeningeal collateral; B. Posterior dominant pattern: collateral flow mainly originated from posterior cerebral artery(PCA) by posterior communicating artery or leptomeningeal collateral; C. Anterior and posterior pattern: collateral flow equally originated from ACA and PCA. Relative MTT value, as well as other parameters, were calculated by volumetric measurements of affected territory divided normal territory. If patients also had underwent DSA, the DSA data were collected. Collateral pattern and intensity were graded by a scaling system named Collateral index score which represented the origination and robustness of collateral.[2] Comparison between asymptomatic group and symptomatic group was conducted using student’s t-test/Mann-Whitney test and Chi-squared test.

Results

Totally, 35 patients (51.80±12.99 years, 28 men) including 25 symptomatic and 10 asymptomatic patients were recruited. Twelve patients had also underwent DSA. Kappa was 0.815 for the intensity of collateral and was 0.855 for the pattern of collateral between collateral evaluation by VE-ASL and DSA. In VE-ASL, The intensity of collateral in asymptomatic patients was significantly better than symptomatic patients (median 3, interquartile range(2.75-3) versus median 2, interquartile range(1-2), P=0.0001), whereas the pattern of collateral showed no significant differences. Collateral intensity and pattern showed no significantly different between different lesion location, In DSC, relative cerebral blood flow value was significantly greater in the asymptomatic group than the symptomatic group. Relative MTT value showed no significant differences. Risk factors were not significantly different between the symptomatic and asymptomatic group.

Conclusion

The present study indicates that hemodynamic impairments in symptomatic patients with ICA/MCA occlusion may be mainly induced by the insufficiency of collateral circulation. As a feasible and useful approach to evaluate the intensity and pattern of collateral flow, VE-ASL may be helpful in stratifying high-risk patients with ICA/MCA steno-occlusion.

EPO-0150

Analysis of cerebral small vessel disease and clinical factors in young patients with symptomatic cerebral infarction

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Purpose To evaluate and compare MRI manifestations of cerebral small vessel diseases (CSVD) in young patients with symptomatic cerebral infarction and then to exploit the correlation between CSVD and clinical factors.
Materials and Methods Retrospectively collect clinical and imaging data of 54 young acute ischemic stroke patients (43 males, 11 females, mean age=38.4±4.7 yrs). 57 elderly patients with acute ischemic stroke (37 males, 20 females, mean age=68.9±10.3 yrs)and 21 patients (17 males, 4 females, mean age=39.7±4.2 yrs) whose age and gender matched with the young group were recruited as control. Demographic features and clinical risk factors were recorded. All patients underwent conventional sequences (including T1WI, T2WI and T2 Flair) and DWI on 1.5T MRI scanner. Basal ganglia (BG) and centrum semiovale (CS) EPVSs, white matter hyperintensity (WMH), lacunar infraction (LI), cerebral microbleeds (CMBs) were rated. Calculate and classify total burden scores of CSVD (TBS). The Kruskal-Wallis H test was used to compare the ranked data between groups. Correlation between CSVD and clinical factors were assessed by spearman correlation analysis. The possible influencing factors (univariate analysis P ＜0.05) were further analyzed by multivariate logistic ordered regression analysis.
Results Compared with the young control and the elderly group, young patients with cerebral infarction showed a significant difference in TBS between the three groups (P ＜0.001 after adjustment). The EPVS, LI, CMBs and TBS in the young patient group were significantly higher than those in the young control group, but EPVS, WMH and TBS were significantly lower than those in the elderly group (P＜0.001 after adjustment).In multivariate logistic ordered regression, hypertension was independently associated with TBS and EPVS in the BG and CS in young patients (P＜0.05).Besides, age and smoking are closely related to LI and CMBs respectively in young patients with cerebral infarction (P＜0.05).
Conclusion Young patients with acute symptomatic cerebral infarction often combined with CSVD. Hypertension, smoking and age are the influencing factors.

EPO-0151

SWI 诊断脑微出血对急性缺血性脑卒中预后及随访的价值研究

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目的 分析 SWI 诊断脑微出血与急性缺血性脑卒中治疗前后脑灌注的改变、NIHSS 评分的变化和 mRS 评分的相关性，来评估通过 SWI 诊断颅内微出血灶对急性缺血性卒中做早期预后判断的临床价值。
方法 收集 2016 年 1 月至 2018 年 12 月我院收治的发病在 24 小时内急性缺血性脑卒中患者共 100 例，所有患者到院 1 小时内完成首次磁共振检查，按照中国缺血性卒中治疗规范标准化治疗一周后复查磁共振，成像序列包括 DWI、PWI、SWI，并取得患者完整临床资料。根据首次磁敏感加权成像诊断有无脑微出血，将患者分为微出脑血阳性组和阴性组，比较两组患者治疗后脑灌注 Tmax 延迟的脑容积及治疗前后变化的程度、治疗后 NIHSS 评分以及出院后随访 mRS 评分有无显著性差异；数据以“中位数 （四分位差）”表示，P<0.05 为有显著性差异。
结果 两组患者在年龄、性别、急性缺血性卒中的主要危险因素（包括高血压、糖尿病、房颤、吸烟、饮酒）以及收缩压、舒张压、主要实验室检查项目（包括血糖、胆固醇、甘油三酯、高密度脂蛋白、低密度脂蛋白和纤维蛋白原）的均无显著性差异。两组患者入院 NIHSS 评分、Tmax>4s 脑容积和 Tmax>6s 脑容积、发病至入院时间、梗塞的部位分布和治疗方式也没有显著性差异。治疗后脑微出血阳性患者 Tmax>4s 脑容积为 61（165.75）ml、Tmax>6s 脑容积 6（48）ml、NIHSS 评分 2（5）、mRS 评分 3（3），脑微出血阴性组四项值为 12（36）ml、0（3）ml、1（3）、1（2），两组间均有显著性差异，治疗后 Tmax>4s 脑容积及 Tmax>6s 脑容积恢复的容积、NIHSS 评分降低的值也有显著性差异。
结论 脑微出血阴性的急性缺血性卒中患者治疗后脑灌注的恢复、NIHSS 评分和 mRS 评分均好于脑微出血阳性患者，通过 SWI 诊断脑微出血可以对急性缺血性脑卒中做早期预后判断。

EPO-0152

Cortical microstructural changes in chronic lacunar infarcts

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Background and Purpose
Lacunar infarcts may cause disturbances of cortical microstructural remote from the primary lesion. Here, we used Neurite orientation dispersion and density imaging (NODDI) to spatially characterize cortical microstructural abnormalities identified by probabilistic diffusion tensor tractography starting from the chronic lacunar infarcts.
Methods
In 25 patients with single lacunar infarct, we reconstructed the affected white matter tract using probabilistic fiber tractography. And then identified the corresponding affected cortex. The corresponding nonaffected lesion in the contralateral hemisphere served as a control cortex. orientation dispersion, neurite density, isotropic volume fraction indices (ODI/NDI/ISO) were projected to the corresponding cortex.
Results
Affected cortex neurite density indices(NDI) remote from chronic lacunar stroke significantly decreased compared with the control cortex (P=0.001). There were no significant differences in isotropic volume fraction (ISO) and cortex. orientation dispersion (ODI) between affected cortex and control cortex.
Conclusions
Chronic lacunar infarcts are associated with abnormalities in the affected cortex that extend beyond the lesion visible on conventional MRI. Our initial results suggest cortex changes after lacunar infarcts deriving from the loss of neurite density rather than the changes of orientation dispersion which is more sensitive to be affected in white matter.

EPO-0153

Brain Volume changes in children with moyamoya disease after indirect surgery

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Purpose: Neurocognitive impairment is often reported in postoperative moyamoya disease (pMMD). We aimed to evaluate brain volume changes and correlated with neurocognitive impairments in children with MMD after indirect surgery.
Materials and Methods: In this study, 13 MMD children who underwent indirect surgery and 14 healthy controls were recruited. Total Brain Volume (TBV), Grey Matter Volume (GMV), White Matter Volume (WMV), ration of GMV/TBV, ratio of WMV/TBV and ratio of WMV/GMV were calculated based on high-resolution T1-weighted image by using SPM12 software. Wechsler Intelligence Scale was applied to evaluating cognitive function. We compared brain volume between two groups and also explore the correlations between brain volume alterations and clinical variables and Wechsler Intelligence Scale scores in pMMD.
Results: There were no difference in TBV and GMV between two groups. However, compared with controls, pMMD showed decreased WMV, WMV/TBV and WMV/GMV, and pMMD also showed significantly decreased performance intelligence quotient (PIQ) scores. In addition, there was positive correlation between PIQ and GMV/TBV (p=0.042, r=0.569), negative correlations between age and GMV/TBV (p=0.002, r=0.766), postoperative time and GMV (p=0.011, r=-0.679) in pMMD.
Conclusion: Our study found aberrant brain volume and worse PIQ in pMMD and demonstrated cognitive decline, providing insight into the neuropathological nature of this disease.

EPO-0154

通过 CT 灌注定量侧枝预测急性脑卒中大血管闭塞的亚型

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目的
目前尚无快速、准确的方法来识别不同脑卒中亚型，且侧枝在不同脑卒中亚型中是否起着不同的作用尚不清楚。本研究目的是检验一种评价侧支血管功能的新方法能否成为急性脑卒中亚型的独立预测指标，并评价其与不同脑卒中亚型临床预后之间的关系。
方法
回顾性收集诊断为 AIS 且大脑中动脉 M1 段完全闭塞的病人。通过 CT 灌注得到脑侧枝最大血流灌注量($cCBF_{max}$)；脑卒中亚型按 TOAST 标准确定；症状出现后 3 个月采用改良 Rankin 量表评定临床预后；最终梗死体积用随访 NCCT 或 DWI-ASPECTS 评分确定，采用多变量 Logistic 回归检验 $cCBF_{max}$ 与脑卒中亚型的关系。
结果

86 名脑卒中患者符合纳入标准，其中 LAA 卒中患者 26 名，CE 卒中患者 42 名，UE 卒中患者 18 名。$cCBF_{max}$是 (A)LAA 卒中(OR, 0.941;95%CI,0.901-0.983; P=0.006)的独立预测因素，经过调整性别，基线 NIHSS 评分、基线 NCCT-ASPECTS、高血压、TG 和(B)CE 卒中(OR, 1.043;95%CI,1.009-1.078; P=0.012)的独立预测因素，经过调整年龄、男性、吸烟和低密度脂蛋白(LDL)。临床预测模型经加 $cCBF_{max}$后在 LAA 脑卒中(AUROC 0.807vs0.717，p=0.03)和 CE 脑卒中(AUROC 0.801vs0.726，p=0.049)中预测能力明显升高。较高的 $cCBF_{max}$与 CE 患者较好预后(r=-0.567，p<0.001)、较低 NCCT 或 DWI-ASPECTS(r=0.473，p=0.002)和较低死亡率(r=-0.434，p=0.004)有关，而与 LAA 患者无关。

结论

$cCBF_{max}$作为一个简便的方法是可行的，可作为 LAA 卒中和 CE 卒中的独立预测指标，侧枝血管功能与 CE 病人临床功能转归密切相关，而对 LAA 卒中则可能无明显影响。

EPO-0155

Improving the accuracy of quantifying carotid atherosclerotic plaques with high definition acquisition and reconstruction

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PURPOSE

To investigate the accuracy of quantifying carotid atherosclerotic plaques with high-definition (HD) acquisition and reconstruction model on a high-definition computed tomography (HDCT) system.

METHOD AND MATERIALS

20 Patients with carotid stenosis and plaques (9 males, 11 females, mean age 66±0.46y) underwent HDCT carotid arteries angiography with a high-definition acquisition mode. Images were reconstructed with the high-definition algorithm with the new adaptive statistical iterative reconstruction (ASIR-V) at 50% strength (50% ASIR-V) and standard algorithm with 40% ASIR-V. The axial images of the two reconstructions were further processed to generate the maximum intensity projection (MIP) and multi-planar reconstruction (MPR) three-dimensional images. CT values, standard deviation (SD) in arteries and muscle and the areas of plaques, calcifications and the degree of stenosis in vessels were measured. Contrast-to-noise ratio (CNR) for the carotid arteries was calculated (CNR= (CT carotid arteries -CT muscle) / SD muscle. All measured data were compared using paired sample t test for statistical analysis using SPSS software, α=0.05 indicating significant difference.

RESULTS

73 plaques, including 28 calcified plaques, 23 mixed plaques and 22 soft plaques were identified in both standard and HD reconstructions. CNR values of two reconstruction methods were statistically the same (P>0.05). However, the area measurement for the calcified plaques with the HD reconstruction (3.60±3.00mm2) was statistically smaller than that with the standard reconstruction (4.27±3.45mm2) (p=0.02). There was no difference between the two reconstructions in the vascular stenosis degree (P = 0.129) and plaque area measurement (P = 0.598) .

CONCLUSION

High-definition acquisition and reconstruction on a HDCT system improves the accuracy of quantifying calcified carotid atherosclerotic plaques.

EPO-0156
高分辨率磁共振粥样硬化性大脑中动脉管壁特征与脑梗死类型相关性研究

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目的：利用 3.0 T 高分辨率磁共振成像（HRMRI）研究粥样硬化性大脑中动脉（MCA）管壁特征，探究其与脑梗死类型的相关性，从而对梗死机制进行预测。
方法：回顾性分析 32 例行颅内动脉 HRMRI 检查的急性脑梗死患者，HRMRI 采用 3D 可变翻转角度快速自旋回波 T1 加权（3D T1 SPACE）序列。分析其 MCA 的斑块形态、分布、强化程度，管腔狭窄程度以及重构指数（正性重构）。根据扩散加权成像（DWI）图像上 MCA 供血区急性梗死灶的数量(分为单发与多发梗死)及位置分布（分为穿支动脉梗死、分水岭梗死与皮质梗死)对梗死进行分型，探讨 MCA 管壁特征与梗死类型之间的关系。
结果：32 例急性梗死患者中，多发梗死 21 例，单发梗死 11 例。多发梗死组中分水岭梗死居多(16 例，76.2%)；单发梗死组均为皮质下深穿支动脉梗死（11 例，100%）。30 例(93.8%)偏心性斑块；斑块在穿支动脉梗死中多位于上壁（7 例，63.6%），分水岭梗死中多位于腹侧壁(12 例，75.0%)。单发与多发梗死组病人的临床资料及实验室检查指标比较，差异无统计学意义（P 均＞0.05）。多发梗死组中斑块位于腹侧壁、斑块明显强化、PR 重构方式的发生率以及管腔狭窄程度均大于单发梗死组，差异具有统计学意义（P 均＜0.05）。
结论：颅内粥样硬化性 MCA 斑块的位置分布与脑梗死类型密切相关，斑块位于上壁，多发生穿支动脉梗死，且多为单发梗死。斑块强化程度能够反映其稳定性。利用 HRMRI 能够直观显示粥样硬化性 MCA 的管壁特征，在一定程度上预测其梗死类型

EPO-0157
体素内不一致运动磁共振成像在缺血性脑卒中的应用价值研究

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目的：研究体素内不一致运动磁共振成像(IVIM-MRI)的相关参数灌注分数 f、扩散系数 D 和伪扩散系数 D*评估梗死灶及周边区域的应用价值。材料与方法：材料：本次研究采用前瞻性的研究方法。按照中国急性缺血性脑卒中诊断指南（2014 版）中急性缺血性脑卒中的诊断及分期标准，收集 20 例急性及亚急性缺血性脑卒中患者，并排除脑肿瘤、出血及外伤等影响脑血流的疾病。仪器及后处理软件：设备：Siemens verio 3.0 T MRI；采用 MITK-Diffusion。数据测量：选择只存在单侧病灶且病灶的最大范围层面，手动画取病灶区域范围，作为感兴趣区，获得 D、D^*、f 值，以脑中线作为对称轴，于健侧镜像对照区选取相同大小及形状的感兴趣区，计算 D、D^*、f 值。手动在病灶周边宽约 5mm 区域范围内画取合适范围，作为感兴趣区，获得 D、D*、f 值，以脑中线作为对称轴，于健侧镜像对照区选取相同大小及形状的感兴趣区，计算 D、D*、f 值，每个区域测量间隔一周测量三次，计算平均值。 4、统计学分析：采用 SPSS 21.0 统计学软件进行统计学分析，病变区域与健侧镜像对照区、病灶周边宽约 5mm 区域与健侧镜面对照区 IVIM-MRI 相关参数进行统计

学分析。结果： IVIM-MRI 对缺血性脑梗死灶大小、形态及部位的评估与常规 MRI 序列相一致；梗死区 D 值、f 值较镜面健侧减低，且差异存在统计学意义，梗死区 D* 值较镜面侧比较差异不存在统计学意义；梗死周边 5mm 宽范围内感兴趣区的 D 值较镜面健减低，且差异存在统计学意义，梗死周边 5mm 宽范围内感兴趣区 D*及 f 值较镜面健侧减低，但差异不存在统计学意义。结论:IVIM-MRI 参数中的 D 值、f 值可用于评价缺血性脑梗死灶；参数 D 值提示梗死灶扩散受限，f 值提示毛细血管灌注血容量减少；参数 D 值提示梗死灶周边 5mm 范围内存在水分子扩散受限改变。

EPO-0158

动态对比增强磁共振成像（DCE-MRI）在急性大面积脑梗死患者病情及预后评估中的价值

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目的 探讨动态对比增强磁共振成像（DCE-MRI）在急性大面积脑梗死患者病情及预后评估中的价值。

方法 收集我院急性期大面积脑梗死患者 16 例，在急性期内对患者进行 3T 磁共振平扫、DWI、DCE 检查，获取相关数据及图像，并进行对比分析，分别测得脑梗死患者病灶处及镜像对侧脑组织的血流动力学参数：容积转移参数（Ktrans）、速率常数（Kep）及血管外细胞外间隙体积比（Ve）；半定量参数：曲线最大上升斜率（MaxSlope）和强化率（CER）；初始轧曲线下面积（IAUGC）]；对 16 例患者进行急性期及发病 3 个月后 NIHSS 评分，依据 NIHSS 评分进行分组（高分组：大于 15 分， 低分组：小于 15 分），统计学分析比较各 DCE-MRI 参数组间差异是否存在统计学意义。

结果

1、急性大面积脑梗死患者病灶处与对侧正常脑组织的血流动力学参数除 IAUGC 外，余参数差异均有统计学意义（P＜0.05）。

2、急性期 NIHSS 评分分组（高分组 n=7，低分组 n=9），两组间比较参数 IAUGC 与 Ktrans 差异具有统计学意义（P＜0.05）；3 个月后 NIHSS 评分分组：随访 13 例，其中高分组 3 例，死亡 2 例，低分组 8 例，将死亡者合并入高分组并进行统计学分析，两组间比较参数 IAUGC 与 Ktrans 差异具有统计学意义（P＜0.05）。

结论 DCE-MRI 参数（IAUGC 与 Ktrans）在急性大面积脑梗死患者的病情及预后评估中有一定的价值。

EPO-0159

Comparation on the Vessel Wall Characteristics of Branch Atheromatous Disease Acute Infarction in Different Artery Territory

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Background: Acute infarction has various mechanisms, branch atheromatous disease (BAD) is one of the common mechanisms. To compare the different vascular pathophysiologies of BAD occurred in the basal ganglia regions and pons, we compared the high-resolution magnetic resonance imaging characteristics between the BAD in the two regions.

Material/Methods: We retrospectively studied 64 patients with acute infarction located in the basal ganglia regions and pons bleeding by proximal middle cerebral artery or basilar artery without carotid/cardiac embolic sources (34 located in the basal ganglia region and 30 located in pons). We divided each group into 2 groups according to whether the vessel has plaques or not. We compared the MR characteristics between the cases in the different regions as well as the vessel wall characteristics.
Results: BAD in the basal ganglia regions and pons had similar clinical features and radiological features such as infarct size and vessel wall characteristics ($P>0.05$). But in the basal ganglia regions, the infarct size of the cases with atherosclerotic plaques is larger than that without plaques($P<0.05$). Vessel wall characteristics including plaque size, remodeling mode, wall area index as well as the location feature between the two regions' lesions had no obvious difference($P>0.05$).
Conclusions: The acute ischemic stroke of BAD in different regions have similar vascular pathophysiology, but in the basal ganglia regions, the atherosclerotic plaques may lead to larger infarct size.

EPO-0160
应用功能连接预测脑卒中患者的视野缺损的恢复情况

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目的：运用功能磁共振成像（fMRI）测量的静息状态功能连接（RSFC）变化预测急性卒中患者视野缺损（VFD）的恢复情况。
方法：搜集来我院就诊并治疗的脑卒中患者 29 例。选择与实验组年龄、性别相匹配的正常志愿者 15 例作为对照组。实验组及对照组均进行 RS-fMRI 扫描和高分辨率 T1 加权图像序列扫描，并在初始时、1 周、1 月及 3 月时进行视野检测，以枕叶为功能连接的感兴趣区，通过图像后处理得到相关数据图，并进行相关测算，得到 RSFC 与不同时期 VFS 情况的相关分析。
结果：受影响的半球的平均总偏差发生了显著变化，但未受影响的半球没有显著变化。与对照组相比，卒中发病后 1 周内 VFD 患者枕叶的半球间 RSFCs 水平较低。在卒中后 1 周内，RSFC 与 VFS 之间没有显著相关性。 然而，枕叶半球间 RSFC 与卒中后 1 个月和 3 个月时的 VFS 呈正相关。
结论：卒中发病后 1 周内视皮层中的半球间的 RSFC，可能是预测长期 VFD 恢复的有用生物标志物。

EPO-0161
高分辨 MR 颅内动脉斑块与 ASL 脑灌注评估缺血性脑卒中风险影像学研究

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目的 建立一种基于临床和多模态磁共振成像(MRI)的大脑中动脉（MCA）粥样硬化性狭窄缺血性卒中风险评估系统，以提高预测急性缺血性脑卒中风险准确性。**方法** 197 例 MCA 狭窄患者完成多模态 MRI，包括颅脑 MRI+MRA、DWI、HR MRI 及 3D-pCASL。根据 DWI 分为脑梗死组和无脑梗死组。评价两组 Essen 卒中风险评分（ESRS）、超敏 C-反应蛋白（hs-CRP）、同型半胱氨酸（Hcy）、血管狭窄程度、斑块易损性及脑血流量（CBF）等临床/影像信息对脑卒中的影响。采用

多因素分析筛查出单因素分析中具有统计学意义的参数作为卒中风险评估系统组成部分，应用 ROC 获得各参数的阈值评分，整合后获得临床/多模态 MRI 评分，ROC 曲线下面积（AUC）用于脑卒中风险效能评估。**结果** 脑梗死与无脑梗死组在 ESRS、hs-CRP、Hcy、狭窄程度、易损斑块及 CBF 值差异均有统计学意义。多因素分析示 ESRS、hs-CRP 或（和）Hcy、狭窄程度、易损斑块及 CBF 值为脑卒中风险因素，构成临床/多模态 MRI 评分系统五个因素。ROC 分析获得五个参数评估脑卒中风险阈值分别为 ESRS≥4 分、狭窄率>60%、易损斑块阳性、CBF 值≤30ml/（min·100g）及 hs-CRP>9mg/l 或（和）Hcy>15umol/l。临床/多模态 MRI 评分系统 AUC 最大（AUC=0.937，$p<0.001$），敏感性 89.1%，特异性 83.8%，其预测急性缺血性卒中风险效能最高。其次 Hcy（AUC=0.880）、hs-CRP（AUC=0.850）、ESRS（AUC=0.793）、CBF（AUC=0.720）和狭窄程度（AUC=0.627）。**结论** 临床/多模态 MRI 评分系统比单纯 ESRS 和各影像学参数判断急性缺血性卒中风险效能高；结合血管影像学改变、临床特征及血清学检查极大地提高了评估急性缺血性卒中风险效能。

EPO-0162

Quantitative association between carotid stenosis and cerebral perfusion on whole brain CT perfusion imaging

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Quantitative association between carotid stenosis and cerebral perfusion on whole brain CT perfusion imaging

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Purpose: Carotid stenosis may lead to abnormal cerebral perfusion. The aim is to quantify the association between carotid stenosis and cerebral perfusion using whole brain CT perfusion (CTP) imaging.

Materials and methods: 43 patients were randomly selected. All patients underwent whole brain CTP and carotid CT angiography by a multi-slice CT scanner (GE HD750) in the same day. Two radiologists read all the images and did post-processing using AW4.6 software package. We evaluated both frontal, parietal, occipital, temporal and insular lobes, and basal ganglia regions.Blood flow (BV), blood volume (BF), mean transit time (MTT) and maximal time (Tmax) were derived from CTP. Vessel stenosis percentage were derived from carotid CT angiography. Pearson's correlation coefficient was used to assess the association between CTP and vessel stenosis. ROC analysis was used to determine the optimal stenosis level leading to cerebral perfusion abnormality.

Results: Stenosis level of both carotid arteriessignificantly associated with BV in parietal, occipital and temporal lobe, and basal ganglia region ($P<0.05$), but not BF, MTT and TMax ($P>0.05$). Stenosis level of both vertebral arteries showed no association with cerebral perfusion ($P>0.05$). Abnormal perfusion was observed in

21 patients. ROC analysis indicated that carotid stenosis of 39% was optimal to determine abnormal perfusion, with a sensitivity of 82% and specificity of 79%。

Conclusions: Carotid stenosis associated with cerebral blood volume. A carotid stenosis of 39% has the potential to predict abnormal cerebral perfusion.

Clinical application: Abnormal cerebral perfusion is a risk factor leading to stroke. An investigation on the association between carotid stenosis and brain perfusion would benefit early diagnosis and treatment for abnormal cerebral perfusion.

EPO-0163

Default Mode Network Connectivity in the Asymptomatic Carotid Stenosis is Preferentially Influenced by the Dorsal Pairs

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Objective: Severe asymptomatic carotid stenosis (SACS) is an independent risk of cognitive impairment and future strokes. One suggested brain biomarker for cognitive impairment is the decreases in connectivity of default mode network (DMN).
Methods: Twenty-four patients with SACS (19 males/ 5 females; 64.25 ± 7.18 years), 24 comorbidities-matched controls (19 males/ 5 females; 67.16 ±6.10 years), and an independent sample of elderly healthy controls (39 females/45 males; 57.92 ± 4.94 years) were included. Eight-minute resting-state fMRI was acquired for each subject. Pair-wise functional connectivity within the DMN were analyzed using nineteen 6-mm spherical seeds from metanalytical activation of previous publications. Voxel-wise functional connectivity density (FCD) of the DMN was also computed with two types of long-range (> 75mm) and short-range (< 75mm) FCD.
Results: Behaviorally, the SACS patients were severely impaired on recall tasks (Bonferroni correction, $p < 0.05$. Pathologically, patients with SACS had significantly higher WMH loads (ratio between WMH size and total brain size, WMH volumes, and WMH number, $p < 0.005$). For the pair-wise FC within the DMN, patients with SACS exhibited remarkably decreased FC in several pairs of seeds within the default network, especially the dorsal DMN ($p < 0.05$, FDR corrected). Among these significant connectivity pairs, we sorted them according to their statistical weights, and found that FC of LLP_dorsal-RLP_dorsal, LPHP_ventral-RLP_ventral, LPCNG_ventral-RPCNG_ventral, LPHP_dorsal-RSFG_ventral, LMFG_ventral-LPHP_dorsal, LPHP_dorsal-RLP_ventral, LPCC_ventral-RLP_ventral, LPCNG_ventral-RLP_ventral, and LPCNG_ventral-RLP_ventral pairs are among the top 5 %. For the full-range and long-range FCD, significant reductions of FCD in bilateral posterior cingulate/ precunes cortices (voxel-wise $p < 0.05$, FDR corrected) were found in patients with SACS. For the short-range FCD, we only found significant increase in FCD in the left temporal-parietal conjunction in the patients with SACS (voxel-wise $p < 0.05$, FDR corrected).

Conclusions: The SACS patients present significantly distinguishable differences in connectivity within the DMN, especially the dorsal pairs of the DMN, and the connectivity can potentially reflect the extent of cognitive impairment.

EPO-0164

Optimization of scanning parameters to reduce diffusion kurtosis imaging scanning time in hypoxic-ischemic brain injury in newborn piglets model

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Purpose: Rapid qualitative and quantitative diagnosis of neonatal hypoxic-ischemic brain damage is essential for neonatal neuroprotective therapy and neurodevelopmental prediction.To reduce the time of diffusion kurtosis imaging (DKI) in newborn hypoxic-ischemic encephalopathy piglets model.

Materials and methods: Twenty-three newborn healthy piglets (20 and 3 in the experimental and control groups, respectively) with a full-day age of 3 days were selected and MR scan performed 6 h after ischemia and hypoxia. DKI scanning parameters, conventional DKI, 30 diffusion directions, TR=4500ms, NEX=2.Fast DKI A, 20 diffusion directions, TR = 3250ms, NEX = 1.Fast DKI B, 15 diffusion directions, TR = 3250ms, NEX=1. The contrast to noise ratio (CNR) of the MK map , percentage change of the lesion MK value, area of the lesion, and total number of lesions. Two piglets from each group were examined for pathology.

Results: There was no significant difference in hypoxic-ischemic lesion areas between the fast DKI A and conventional DKI MK maps (Wilcoxon test; P>0.05). Compared with fast DKI A, fast DKI B MK maps showed a significant difference in hypoxic-ischemic lesion areas. The CNR 0.848 (0.688, 1.01) and the MK percentage change [71.3 (62.5, 93)]of the conventional DKI MK map was significantly higher than that 0.521 (0.444, 0.639)and [39.3 (26.1, 50.7)] of the fast DKI B. In 16 scans, the number of lesions in the conventional DKI, fast DKI A, and fast DKI B MK maps were 155, 155, and 130, respectively. Pathological results showed that the fast DKI A and fast DKI B lesion mismatch only the neuron edema was observed under light microscopy.

Conclusion: Fast DKI A MK maps can quickly test hypoxic-ischemic encephalopathy in newborn piglets model for qualitative and quantitative diagnosis.

EPO-0165

缺血性卒中病人颅内动脉硬化斑块的 HRMRI 特征 及相关临床危险因素研究

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目的：利用 3.0T 高分辨率磁共振成像（HRMRI）技术分析缺血性卒中病人颅内责任动脉斑块特征，并探讨颅内动脉不稳定斑块的临床相关危险因素。
方法：共纳入 49 例缺血性脑卒中病人行颅内动脉 HRMRI 检查，男 35 例，女 14 例，年龄 31~81 岁，平均年龄（60.73±12.4）岁。根据病人斑块与缺血区责任动脉的关系分为责任动脉斑块组和非责任动脉斑块组，分析 2 组病人的 HRMRI 特征。根据斑块的强化程度分为明显强化组和非明显强化组，分析斑块强化程度与临床相关危险因素的关系。计数资料采用 x 2 检验，计量资料采用 t 检验进行统计学分析。
结果：49 例病人共 196 处斑块，其中责任动脉斑块 70 处（35.7%），非责任动脉斑块 126 处（64.3%）；2 组间的管腔狭窄程度、斑块明显强化的比例等差异有统计学意义（P<0.001），责任动脉斑块所致的管腔狭窄程度更为严重、明显强化的比例更高（P<0.001）。明显强化组与非明显强化组之间的年龄、性别、高血压、糖尿病、吸烟史、既往卒中史及家族史差异均无统计学意义。非明显强化组的低密度脂蛋白/高密度脂蛋白（LDL/HDL）比值低于明显强化组（分别为 1.95±0.62 和 2.53±0.94，P=0.048）。
结论：颅内动脉粥样硬化斑块的强化与缺血性卒中事件的发生密切相关。斑块的强化程度能够反映斑块的稳定性。颅内动脉粥样硬化常见的危险因素并不能完全反映斑块的稳定性，LDL/HDL 比值升高有可能作为不稳定斑块的预测因子。

EPO-0166
形态学成像结合临床指标评估急性缺血性卒中预后：与功能成像对照研究的进展

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讲座摘要：急性缺血性卒中（AIS）早期预后评估对于积极采取血管内治疗和手术治疗具有重要作用，目前多采用复杂、甚至有创的功能成像进行预后评估研究，虽然效果良好，且能较好地反映脑梗死局部病理生理学状态，但这些功能成像需要一定的技术支持、操作较复杂，解读标准不统一；而简便易行的形态学成像的评估价值尚未完全认识。作者就 CT 和 MR 病变与颅腔相对容积、相对密度及信号特征、高密度血管征、脑沟裂形态改变、病变范围基本评分（如 ASPECT）、非对比增强侧支循环评分，结合临床指标，如年龄、AIS 高危因素、入院时神经功能评分等对 AIS 预后早期评估的进展进行解读，比较形态学指标联合预测模型对于 AIS 预后评估的作用。

EPO-0167
Predicting the outcome of STA-MCA Bypass Surgery depends on hemodynamics differences between Intracranial and Extracranial Circulation in MOYAMOYA Disease

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Abstract: This study aimed to investigate hemodynamic changes in Moyamoya disease (MMD) via two-dimensional cine phase-contrast magnetic resonance imaging and computational fluid dynamics, and determine whether the STA-MCA bypass surgery is feasible.
Method: 18 patients with MMD prepared for surgery were recruited. Phase-contrast magnetic resonance imaging was performed to quantify flow rate of main supplying arteries, including internal carotid arteries (ICAs) and vertebral arteries. Mean flow rate in these vessels was adopted as the patient-specific boundary condition for computational fluid dynamics simulation of the circle of Willis in MMD【1】. The pressure drop in both STAs and both ICAs in each subject was calculated. A pressure drop ratio (PDR) between the STA pressure drop and the ICA pressure drop was proposed to access the hemodynamic differences between the intracranial and extracranial circulation in MMD, and CTP was also performed for each subject before and after surgery. A correlation analysis was performed between PDR and cerebral blood flow (CBF). Clinic scales were also acquired to evaluate the prognosis.
Result: PDR result has a correlation ship with (CBF). Those patients with bigger PDR >7 and <2 in the the operation side showed a poor prognosis after surgery. Those patients with PDR between 2<PDR<7 showed a good outcome.
Conclusion: Hemodynamics differences between the intracranial and extracranial circulation in MMD, such as PDR, could be used to evaluate impairments in cerebrovascular reserve, and as an indicator to determine whether the STA-MCA bypass surgery is feasible.

EPO-0168

Beyond the carotid arteries: asymptomatic stenosis is associated with consistent changes to cortical morphology

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Objective: This study aimed to explore cortical morphologies (thickness, sulcal depth, gyrification, and cortical complexity) and brain lesions measured by multiparameter structural magnetic resonance imaging (MRI) parameters in patients with unilateral severe (stenosis > 70%) asymptomatic carotid stenosis (SACS).
Methods: Twenty-four patients with SACS (19 males/ 5 females; 64.25 ± 7.18 years), 24 comorbidities-matched controls (19 males/ 5 females; 67.16 ±6.10 years), and an independent sample of elderly healthy controls (39 females/45 males; 57.92 ± 4.94 years) were included. Surface-based cortical measures of the cortical thickness, sulcal depth, gyrification, and cortical complexity were computed based T1-3D high-

resolution anatomical images. Susceptibility weighted imaging based microhemorrhagic lesions, and T2-weighted white matter hyperintensities were also quantified.
Results: Significantly and robust cortical reductions across the multiparameter-based measures of the thickness, sulcal depth, gyrification, and complexity (validated by the independent dataset) were identified around the Perisylvian fissure and somatomotor areas in patients with SACS (false discovery rate corrected, $p < 0.05$). These involved areas span across the large-scale brain systems of somatomotor, salience, dorsal attention, and orbitofrontal-limbic. Further association analyses suggest that the decreased thickness and gyrification in left insula and superior temporal gyrus best reflect the delayed recall memory and other simple cognitive as well as sensorimotor functions measured by the metanalytical Z scores.
Conclusions: These results suggest that the SACS preferentially affects the lower hierarchy of the cortical anatomy, while the higher hierarchy, especially the topographies of default mode network are least impacted, which may be a hallmark of a precursor to vascular dementia. The multiparameter morphological measures may help to noninvasively track the progression of downstream cerebral damages under asymptomatic carotid stenosis.

EPO-0169

BRAIN STRUCTURAL AND FUNCTIONAL PLASTIC STUDY OF BASAL GANGLIA STROKE DURING MOTOR RECOVERY

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Objective: Studies shows that structural and functional cerebral reorganization exist during motor recovery of stroke patients. Corticospinal tract (CST) has shown structural change and the change is correlated with motor dysfunction. Damage on basal ganglia (BG) affects CST integrity and impacts on cerebellum (CB) and thalamus, both of which involve motor control and learning. We combined DTI and fMRI methodologies to investigate dynamic changes of CST pathway, BG-thalamus-cortical loop, CB-thalamus-cortical loop and the correlation of these loops along with motor recovery.
Methods: We recruited 14 basal ganglia stroke patients and performed DTI and fMRI scan for 3 sessions (S1:2w, S2:1-3m, S3:>3m). Fugl-Meyer (FM) motor assessment was acquired and finger-tapping task was performed during fMRI scanning. We calculated diffusion parameters of CST pathway and activation level of motor-related regions, analysed the correlation with FM score.
Results: The lateralization of bilateral CST fractional anisotropy (FA) value was positively correlated with FM score during S2, implying the importance of CST integrity in maintaining good motor function. The FAs in contralesional CP and PLIC during S1 were associated with changes of FM score, motor recovery was dependent on the damage degree of ipsilesional CST. The fMRI results showed CB functional lateralization correlated with motor recovery. The more contralesional dominance of CB activation at S1, the better motor recovery is at S2; but S2 showed the opposite trend to predict S3 stage motor function. Significant activation of cingulate gyrus during

S2 predicted functional motor recovery of S3, implying the role of attentional modulation.
Conclusions: The longitudinal study on motor recovery after stroke consolidates the hypothesis that basal ganglia stroke patients dysfunction in the three mentioned loops. The neuroimaging biomarkers showing significant correlation with motor recovery provide informative target for treatment.

EPO-0170

Application of the tecnique of contrast agents based on compound body weight factor in head and neck CTA

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Objective: To explore the feasibility of the contrast agent dose estimation method based on Tongji index in CTA examination of head and neck. **Methods:** Forty patients served as the experimental group underwent head and neck CTA with the use of contrast agent based on the weight and height named as compound body weight factor and tube voltage of 100kV. Twenty-six patients served as controls underwent head and neck CTA at the same spiral CT scanner with the use of contrast agent based on weight and conventional tube voltage of 120kV. An independent sample *t*-test was used to compare the contrast agent dose, radiation dose, and the CT value and relative enhancement CT values of aortic arch, right common carotid artery, right internal carotid artery, right vertebral artery, basilar artery, posterior cerebral artery, middle cerebral artery, and anterior cerebral artery between the experimental group and the control group, and the signal-to-noise ratios (SNR) and contrast noise ratios (CNR) of the CTA images in the two groups were also compared by the *t*-test. Subjective evaluation of the CTA image quality in the two groups was performed using a double-blind method and compared using Mann-Whitney *U* test. **Results:** The contrast agent dose in the experimental group was (55.4±5.9) mL, and (62.8±7.9)mL in the control group. There was a statistical difference in the contrast agent dose between the two groups (t=4.348, P<0.05). The dose length product (DLP) in the experimental group and control group was (489.1±55.0) and (555.6±78.7) mGy•cm, respectively. There was a statistical difference in radiation dose between the two groups (t=4.045, P<0.05). The CT values and enhancement CT values of the eight arteries observed in the experimental group were higher than those in the control group, and the differences were statistically significant (P<0.05). There were no statistical differences in the SNR and CNR between the two groups (P>0.05). The score of image quality in the experimental group was better than that in the control group with statistical significance (P<0.05). **Conclusion:** The method of contrast agent estimation based on compound body weight factor combined with low tube voltage may reduce contrast agent dose and radiation dose on the premise of ensuring image quality and satisfying clinical diagnosis needs.

EPO-0171

无症状颈内动脉狭窄的脑灰质不对称性研究

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目的：重度（＞70%）无症状颈内动脉狭窄是缺血性卒中的独立高危因素，也是血管性认知损害的主要原因。狭窄侧半球的血流动力学改变和沉默性病灶可能导致半球间脑实质不对称性的丢失、及相应神经认知功能的损害。本研究旨在使用 T1-3D 高分辨解剖图像建立这类无症状人群的脑损害偏侧化指标，进而辅助识别高风险人群。
方法： 24 例单侧无症状颈动脉重度狭窄患者（无先前 TIA 和卒中的发生，12L/12R，单侧狭窄 70~99%，64.25 ±7.18 岁）24 例人口统计学及合并症相匹配的健康老年人（67.16 ±6.10 岁）作为对照，同时纳入 84 例健康老龄数据作为独立对照样本。采集 T1-3D、T2-FLAIR-3D 及 SWI-3D 全脑高分辨形态解剖成像。T1 高分辨图像经非线性配准到镜像对称解剖模板、左右翻转、DARTEL 空间标准化及调制后，计算右侧半球体素水平的灰质不对称性指数（Asymmetry Index, AI）并使用 8mm 空间平滑用于随后的组间统计。FLAIR 及 SWI 图像经过信号校正、空间标准化、病灶识别后用于计算脑白质高信号的体积、空间位置和微出血灶的体积及空间位置。
结果：我们的初始（24 vs 24）及重复分析（24 vs 84）均发现单侧无症状颈内动脉狭窄患者呈现显著的灰质右侧偏侧化，特别是围绕外侧裂的中央前后回、颞上回、颞中回、岛叶、角回，以及海马、丘脑和壳核（体素水平 FDR 校正，$p < 0.05$）。同时患者呈现显著较高的脑白质高信号体积比及 SWI 低信号，特别是岛叶及角回的灰质不对称性能部分由脑白质高信号体积比解释。
结论：无症状重度颈动脉狭窄患者呈现显著的右侧灰质偏侧化，且与狭窄侧别无关，提示稳定的半球间灰质不对称性丢失及解剖重塑，反映了潜在的慢性适应不良性脑改变。个体水平灰质不对称性指标，特别是岛叶及角回区域的灰质右侧偏侧化可能是一种反应患者脑损害程度的潜在生物学标志物，但需要进一步的大样本验证。

EPO-0172

Comparative study of SWI and 3D-TOF-MRA in detection thrombus in acute cardioembolic stroke

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Objective: To explore the clinical application of SWI and 3D-TOF-MRA in detection of intravascular thrombus in the primary of acute cardioembolic stroke. **Methods:** In 50 patients with acute cardiogenic stroke, SWI and 3D-TOF-MRA were analyzed to determine the matching degree of position in displaying thrombus, vascular occlusion or stenosis. **Results : (1)**In 50 patients, the detection rate of SVS was 78%, 3D- TOF-MRA was 60%. There was significant difference in the total detection rate of thrombus between SWI and 3D-TOF-MRA(P<0.05); The SVS was observed in 9 patients without occlusion on 3D-MRA. (2) The results of SWI and 3D-TOF-MRA were consistent in 30 patients, the detection rates of thrombus in M1segment were 36% in both examinations, they were no significant difference; while detection rates of thrombus within the distal of M1 segment have significantly difference (32% for SWI versus 14% for 3D-TOF-MRA,P<0.05). **Conclusion:** In this study, we concluded that SWI is superior to 3d-tof -MRA in the accurate positioning of embolus in ACS patients, which was expected to be the first choice to

determine the location of ACS emboli, a new diagnostic model for ACS patients to select treatment plan and evaluate the prognosis will be established.

EPO-0173

Cerebral Amyloid-β -Related Angiitis: Case Report and Literature Review

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Purpose

To report a case of amyloid beta-related angiitis (ABRA), discuss diagnosis and differential diagnosis, review the literature, and emphasize early diagnosis of the disease by neuroimaging.

Method

One patient was described with histopathologically confirmed ABRA. We also summarized the imaging finding of ABRA from the published literature.

Results

A 61-year-old female patient with sub-acute onset of headache, vomiting for 2 months and mental disorder for 1 month. The patient had previously psoriasis. MRI was performed when admission which showed that multiple lesion with hyperintensity on T2 weighted imaging, hypointensity on T1 weighted imaging (T1WI), the lesions demonstrated hyperintensity on diffusion-weighted imaging (DWI), which indicated multiple infarctions. Heterogeneous contrast enhancement of part of the lesions as well as leptomeningeal enhancement was observed on post-contrast T1WI. Susceptibility weighted imaging showed linear hypointensity located in the superficial cortex which suggested hemorrhage. Arterial spin labeling perfusion showed cerebral blood flow of bilateral hemisphere decreased. MRA showed normal. The patient had also performed examinations of cerebral spinal fluid (CSF) and found no cancer cell. CSF studies including autoimmune encephalopathy panel were unremarkable. PET-CT also suggested lowered metabolism of the brain. The patient had follow-up MRI scans after corticosteroid pulse therapy and showed dynamic changes of the lesions with some turning invisible and newly found lesions within one month. The diagnosis included meningeal metastases, primary central nervous system vasculitis/ secondary vasculitis, infectious disease and cerebral amyloid angiopathy. The patient received MRI-guided biopsy which revealed granulomatous perivascular inflammation and extensive Aβ staining in the vessel walls consistent with amyloid-β -related angiitis. ABRA. She was then received long-term immunosuppression and clinical symptom had improved. The available literature revealed that partial overlap exists between the clinical features and investigation results of inflammatory cerebral amyloid angiopathy, ABRA, and primary angiitis of the central nervous system (PACNS). Most inflammatory cerebral amyloid angiopathy and ABRA patients are beyond 50 years, whereas one-half of PACNS patients present before this age. Brain MRI commonly shows white matter T2-hyperintensities and leptomeningeal gadolinium enhancement.[1]

Conclusion

ABRA is a rare cause of central nervous system vasculitis, with clinical and radiologic features that overlap with those of cerebral amyloid angiopathy and PCNSV. Definite diagnosis requires brain and leptomeningeal biopsy. Early diagnosis is critical for early treatment to improve clinical outcome. Age ≥50 years, the presence of multiple confluent lesions which can be hyperintensity on DWI with focal or diffuse cortical hemorrhages and leptomeningeal enhancement should alert radiologists to consider the possibility of ABRA.

EPO-0174
SWI 成像对多发性硬化和视神经脊髓炎的鉴别诊断价值

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背景与目的：多发性硬化（MS）和视神经脊髓炎（NMO）虽同为中枢神经系统炎性脱髓鞘疾病，但两者的治疗方法不同，早期的鉴别诊断一直是临床工作中的难题。近年来影像及病理均证实铁质异常沉积极有可能是 MS 发生发展的机制之一，而 NMO 病灶内是否也存在铁质沉积尚不清楚。本研究拟采用 SWI 研究 MS 及 NMO 病灶内铁质沉积及中心静脉征的差异，用以鉴别诊断。
材料与方法：回顾性收集我院 2017 年 9 月至 2019 年 7 月临床证实的连续的 30 例 MS 患者及 18 例 NMO 患者。所有患者均行常规及 SWI 序列成像。T2w 高信号灶被定义为 MS 或 NMO 病灶，由两名有经验的放射科医师对图像进行单独随机盲法阅片，记录所有病灶在 SWI 的 Phase 图上的信号改变，病灶周围低信号环征及 CVS 征，结果有差异时共同协商达成一致意见。两组病灶在信号特征，CVS 征的差异及两观测者之间的差异均采用卡方检验进行比较。
结果：两组病人共检出 362 个 MS 病灶及 135 个 NMO 病灶。SWI-Phase 图上 82.6%的 MS 病灶（299/362）呈低信号，17.4%的 MS 病灶（63/362）呈等信号，1.5%的 NMO 病灶（2/135）呈低信号，98.5%的 NMO 病灶（133/135）呈等信号。MS 病灶在 Phase 图上呈低信号的比例显著高于 NMO（p<0.001）。SWI-Phase 图上 43.9%MS 病灶（159/362）具有周围低信号环征，显著多于 NMO 病灶（0.7%，1/135，p<0.001）。CVS 征只出现在 MS 病灶中（32.3%，117/362）。两个观察者的结果具有很好的一致性（Kappa=0.92）。
结论：SWI-phase 图像上低信号病灶，病灶周围低信号环征及 CVS 征是 MS 特有的影像学征象，有助于 MS 和 NMOSD 的早期鉴别诊断。提示虽同为脱髓鞘疾病，铁质沉积参与 MS 发病机制，却并不参与 NMO 发病机制，但需要病理研究进一步证实。

EPO-0175
基于纤维束自动细分量化技术评估抗 N-甲基-D-天冬氨酸受体脑炎白质纤维束完整性

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目的：应用纤维束自动细分量化（AFQ）技术探讨抗（NMDA）受体脑炎患者脑白质纤维束各节段的扩散特性，以评估其完整性。

材料与方法：（1）收集在本院住院诊断并随访的 48 例抗 NMDA 受体脑炎患者，同时招募性别、年龄、教育程度与病例组匹配的 40 例健康志愿者。（2）两组被试均行头颅常规 MRI 和 DTI 扫描，并接受 mRS 评分及 MMSE 评分。（3）两组 20 条纤维束的逐点部分各向异性（FA）、平均扩散率（MD）值比较，采用 5000 次置换检验；病例组白质纤维束各扩散参数与 mRS、MMSE 之间的相关性采用 *Pearson* 相关分析。$P < 0.05$ 差异有统计学意义。
结果：（1）常规 MRI 示 1 例患者双侧皮质脊髓束走行区和双侧海马、1 例患者左侧额叶皮层存在异常信号。（2）病例组左、右侧皮质脊髓束、扣带束、扣带束海马及弓形束弥漫性 FA 值降低和 MD 值升高，与对照组存在显著统计学差异（$P < 0.01$）；其余白质纤维束扩散指标呈节段性改变，与对照组比较无统计学差异（$P > 0.05$）。（3）患者双侧皮质脊髓束、扣带束和扣带束海马、弓形束 FA 值与 mRS 评分均呈负相关（r 分别为-0.81、-0.77、-0.86、-0.85，$P < 0.01$），与 MMSE 评分均呈正相关（r 分别为 0.90、0.83、0.92、0.89，$P < 0.01$）；双侧皮质脊髓束、扣带束、扣带束海马、弓形束 MD 值与 mRS 均呈正相关（r 分别为 0.84、0.77、0.88、0.77，$P < 0.01$），与 MMSE 评分均呈负相关（r 分别为-0.92、-0.86、-0.92、-0.89，$P < 0.01$）。
结论：抗 NMDA 受体脑炎患者以皮质脊髓束、扣带束和扣带束海马、弓形束为主的白质纤维束存在广泛微结构损害，与患者 mRS 评分和 MMSE 评分密切相关，有助于患者白质纤维束隐匿性损伤的判断，更好地解释临床症状。

EPO-0176
复发缓解型多发性硬化患者扣带束白质完整性和扣带皮质灌注研究

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目的 采用扩散张量成像(DTI)及三维伪连续动脉自旋标记(3D-pCASL)技术探讨复发缓解型多发性硬化患者扣带束微结构改变和扣带皮层亚区灌注及其与临床评分的相关性。
方法 对 24 名 RRMS 患者（RRMS 组）和 26 名健康对照组（对照组）行临床扩展残疾状态量表(EDSS)和神经心理学量表评分。行 DTI 及 3D-pCASL 扫描，测量左右扣带束的 FA、MD 值和扣带皮层 8 个亚区 CBF 值及均值，分析评估 MR 参数值与 EDSS 及神经心理学评分之间的相关性。
结果 (1) 与对照组相比，RRMS 组左侧前扣带皮层尾部、右侧后扣带皮层及扣带皮层峡部 CBF 值明显减低，右侧扣带皮层的平均 CBF 值显著低于对照组(p 均＜0.05)。MS 组双侧扣带束 CGC 部分 FA 值明显降低，MD 值明显升高；左侧 CGH 部分 FA 值明显降低，双侧 CGH 部分 MD 值明显升高(p 均＜0.01)。(2) RRMS 患者 SDMT 评分与左侧前扣带皮层尾部、右侧后扣带皮层及扣带皮层峡部 CBF 值呈正相关(r=0.391、0.346、0.307， p 均＜0.05)；与双侧扣带束 CGC 部分 FA 值呈正相关(左侧：r=0.389, p=0.005；右侧：r=0.374, p=0.007)，且与右侧扣带束 CGH 部分 MD 值呈负相关(r=-0.371, p=0.008)。HAMD 评分与双侧扣带束 CGC 部分 FA 值呈负相关(左侧：r=-0.296, p=0.037；右侧：r=-0.338, p=0.016)，与 MD 值呈正相关(左侧：r=0.324, p=0.022；右侧：r=0.343, p=0.015)。
结论 RRMS 患者扣带束及扣带皮层均出现改变，与患者认知功能障碍和抑郁相关，可能体现出扣带回的功能异质性。

EPO-0177
Significance of 3D Cube Flair with Compressive Sensing in the Diagnosis of Subcortial Microlessions

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PURPOSE

Optimize 3D Cube Flair with compress sensing sequence to improve detection rate of subcortical microlesions,optimize scanning sequence package and speed up scanning process.

METHOD AND MATERIALS

Twenty patients with cerebrovascular diseases,who came to hour hospital for treatment were collected as subjects.Scanning sequence include T2WI\T1WI\DWI\T2 Flair and 3D Cube Flair with compress sensing on 3.0T MR(Discovery 750W,GE Healthcare,Milwaukee,USA).After scanning,coronal 2D T2 Flair and 3D Cube Flair with compress sensing were compared subjectively and objectively.Subjective scoring is based on the five-point method,two deputy chief physicians with more than ten years of diagnostic experience scored subjectively with double blindness from images with or without artifact,image homogeneity and contrast between lesions and normal brain tissue.Subjective indicators were analyzed by non-normal distribution test,and the consistency between the two raters was analyzed by Kappa analysis.The objective evaluation mainly starts from three aspects:image signal-to-noise ratio,contrast between lesions and brain parenchyma,and the number of lesions detected.The results were analyzed by t-test with two independent samples.

RESULTS

Coronal 3D Cube Flair with compressed sensing image sequences and 2D T2 Flair subjective scores were as follows:Statistical result of subjective score about artifact X^2=40.83,P<0.05,subjective scores of image homogeneity were X^2=46.97,P<0.05,subjective scores of contrast between lesion and normal brain tissues were X^2=49.12,P<0.05.Coronal 3D Cube Flair with compressed sensing image sequence and 2D T2 Flair objective evaluation results were as follows:The SNR of images was t=6.97,P<0.05,the contrast between lesions and white matter was t=11.07,P<0.05,the number of lesions detected was t=13.01,P<0.05.

CONCLUSION

3D Cube Flair with compressed sensing technology can improve the detection rate of subcortical micro lesions,and can improve scanning speed on the premise of ensuring images,and can effectively avoid various artifacts caused by cerebrospinal fluid fiuctuations and phase error in 2D scanning,thus replacing the conventional coronal 2D T2 Flair and optimizing the scanning process.

EPO-0178

Can electrotherapy and rehabilitation training be conducive to the functional recovery for spinal cord injury rats? Study of rat's cortex via magnetic resonance diffusion tensor imaging and motor behavior scoring

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PURPOSE
Previous studies focused on spine to investigate the functional recovery after spinal cord injury (SCI), but precious few studies discussed the subsequent alterations of cortex induced by SCI. This study aim to evaluate the functional recovery after SCI via magnetic resonance (MR) diffusion tensor imaging (DTI) and motor behavior Basso-Beattie-Bresnahan(BBB) scoring, we conducted a comparison between electrotherapy and rehabilitation training that may improve the functional recovery for SCI rats.
METHOD AND MATERIALS
Eighteen rats were randomly divided into 3 groups receiving a midline contusion(n=6, each): control(C), rehabilitation training(R) and electrotherapy combined with rehabilitation training(ER). Contusions were induced at T-10 using a MASCIS impactor. The therapies were implemented one week after contusions with frequency of six days a week for six weeks. Besides, the electrodes were placed between the lesion of contusion with electrical stimulation for electrotherapy and treadmill exercises were used for rehabilitation training. Motor behavior scoring was applied six weeks later after contusions, three trained observer recorded scores for hind-limbs. Besides, DTI and T2 imaging of rat's cortex for all groups were underwent two weeks later after BBB score. The DTI images were post-proceeded and calculated fractional anisotropy (FA), apparent diffusion coefficient (ADC), including regions of interesting (ROIs) of the motor, sensory cortex and corpus striatum were measured.
RESULTS
The groups of C, R and ER were different in FA of motor cortex (0.17±0.02 vs. 0.20±0.04 vs. 0.22±0.04, all $p<0.05$), however no difference in FA of sensory cortex and corpus striatum (0.15±0.01 vs. 0.15±0.02 vs. 0.14±0.01, all $p>0.05$; 0.25±0.01 vs. 0.27±0.03 vs. 0.25±0.02, all $p>0.05$). Farthermore, there were no difference in ADC for motor, sensory cortex sections and corpus striatum. For motor behavior scoring, C, R and ER were different in BBB scores (5.67±0.69 vs. 6.42±0.77 vs. 6.6±0.39, all $p<0.05$).
CONCLUSION
MR DTI method and motor behavior scoring can be applied to assess the functional recovery for SCI rats after therapies. Although, the mechanism of influence occurred within cortex after SCI are not clear yet, it still revealed some information about the relationship between SCI and cortex. On the other hand, this study may propose a simple method to evaluate the treatment effect that used proverbially for the those SCI patients.

EPO-0179
3D PCASL 在 2 型糖尿病患者特定功能大脑皮层 BF 值的初步研究

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目的：
通过三维准连续动脉自旋标记（three-dimensional pseudo continuous arterial spin labeling，3D PCASL）技术，探讨 2 型糖尿病伴有视网膜病变的患者与正常人在记忆、情感及视觉相关的脑皮层的脑血流量（BF）值的差异性。
方法：
将 36 例 2 型糖尿病患者依据视网膜病变程度分为 A 组和 B 组，其中 A 组 18 例为增殖性视网膜病变，B 组 18 例为单纯性视网膜病变，另外收集 18 例年龄相近的健康志愿者作为 C 组，所有患者均进行常规磁共振成像及三维准连续动脉自旋标记成像，测量各组双侧额中回、颞上回和楔回脑皮层的 BF 值。组间差异采用 Pearson 进行相关性分析。
结果：
糖尿病患者及正常志愿者在 MRI 常规平扫及增强扫描图像上无明显差异。A 组、B 组及 C 组双侧额中回、颞上回脑皮层在灌注图像上信号依次增高，BF 值依次增加，组间差异具有统计学意义（P<0.05）；A、B 两组双侧额中回脑皮层的 BF 值与病期长短呈负相关。
结论：
2 型糖尿病伴有视网膜病变的患者双侧额中回、颞上回脑皮层的 BF 值明显低于正常人，提示 2 型糖尿病伴有视网膜病变的患者相应脑皮层的微血管结构和功能出现异常，说明 2 型糖尿病与脑损伤之间有一定的相关性，且随着疾病进展，脑损伤有进一步加重的趋势。

EPO-0180

Assessment of Peripheral Neuropathy in Type 2 Diabetes by Diffusion Tensor Imaging: a case control study

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Objectives: To evaluate the diagnostic accuracy of DTI in DPN for patients with type 2 diabetes and detect correlations with electrophysiology.
Materials and Methods: Twenty-seven DPN patients, 24 NDPN patients and 32 HC were enrolled in this study. Clinical examinations and neurophysiologic tests determined the presence of DPN. The knee joint covered the lower sciatic nerve to CPN at the peroneal head for all the patients and volunteers were scanned. The diameters, cross-sectional areas, FA and ADC of TN and CPN were calculated. ROC analysis was performed for FA and ADC values. Pearson rank test was used to assess the correlation between DTI and electrophysiology parameters in the patient group.
Results: DTI-MRN can accurately differentiate between DPN, NDPN, and HC. FA values of TN and CPN were lowest and ADC values were highest in DPN group ($P < 0.05$). Excellent diagnostic accuracy of FA and ADC was seen in the diagnosis of DPN. In addition, DTI-MRN could distinguish between axonal injury and demyelination. FA values in the DPN group with axonal injury were lower than those in the DPN group with demyelination, while ADC values were higher than those in the DPN group with demyelination, with statistically significant difference ($P<0.05$).
Conclusion: DTI-MRN accurately discriminate DPN by lower nerve FA value and higher ADC value. DTI multi-parameter quantitative analysis of peripheral nerves is conducive to differentiating DPN axonal injury from demyelinating lesion, and can be applied in the diagnosis of diabetic peripheral neuropathy.

EPO-0181

糖尿病患者脑部磁共振弥散张量和波普研究

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目的利用磁共振弥散张量成像(DT)及磁共振频谱(MRS)研究糖尿病患者脑部组织 FA 值、ADC 值及脑代谢物的变化情况初步探讨糖尿病患者脑组织的 FA 值、ADC 值与脑内各代谢物之间及患者认知损害的相关性。
方法：收集年龄 45-70 岁有代谢综合征的患者 41 例纳入病例组分为糖尿病组(=23)和非糖尿病患组(无糖尿病但有高血压、高血魔 n=18)10 例健康志愿者(年龄 4565)为正常对照组。进行常规颅脑 MR 扫描及半卵园中心层面同期多体素 MR 扫描和全脑 DT 扫描。测量半卵圆中心 FA、ADC 值与 Cho、NAA 和 C 等代谢物。
结果 1 病例认知 MMsE 评分情况:1.糖尿病组认知损害发生率高于非糖尿病组组间 2.糖尿病组脑萎缩、脑白质疏松症的发生率明显高于非糖尿病组。3.FA 值、ADC 值与 NAAC、 NAA/Cho、Cho/cr 较正常对照组上升。与非糖尿病组比较糖尿病组 FA 值
下降差异具有显著统计学意义(P<001)ADC 值、 Cho/cr 上升,NAAC、 NAA/Cho 下降但差异均无统计学意义(均为 P>005)。13 例 MR 平扫未见异常病例中有 5 例出
现认知轻度损害与正常对照组比较 FA 值均下降。
结论 1 代谢综合症患者认知评分 MMsE 较正常人低糖尿病患者认知损
害发生率比非糖尿病组高但糖尿病与非糖尿病患者认知评分 MsE)组间没有差异性。2 糖尿病患者较一般人更容易引起脑内小血管病变导致腔隙性脑梗塞、脑白质疏松症及脑萎缩等改变。3 糖尿病患者与正常对照组 DT 与 MRS 值之间的差异性提示糖尿病患者脑白质纤维与脑代谢物均有损害改变。4 DTI/MRS 联合技术显示糖尿病与非糖尿病患者脑内神经代谢标志物与反映神经纤维完整性的 FA 值及弥散系数的 ADC 值存在相关性。5 认知评分(MMsE 与 FA 值之间存在相关性提示 FA 值是认知评估的有效手段可检测出脑部 MR 平扫正常而在认知等功能上的异常微观变化。

EPO-0182

Cerebral signal changes in rest fMRI in different times of LHON.

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Leber's hereditary optic neuropathy (LHON) is a maternal inherited disease characterized by retinal ganglion cell degeneration, leading to acute or sub-acute painless vision loss and end-stage optic nerve atrophy. The aim of this study was to demonstrate the function signal changes in visual functional area or the extra-visual functional area in patients with acute stage and patients with chronic stage of LHON compared with healthy controls. The correlation of such changes with neuro-ophthalmologic findings and measurements of peripapillary retinal nerve fiber layer (RNFL) thickness by optical coherence tomography (OCT) was also assessed. Rest-fMRI scans were acquired from 9 LHON patients in acute stage, 24 LHON patients in chronic

stage and 27 matched controls. Rest fMRI analysis was performed using SPM8 and REST software. A complete neuro-ophthalmologic examination, including average and temporal peripapillary retinal nerve fiber layer thickness (PRNFL) measurements as well as standardized automated Humphrey perimetry, was obtained in all patients. Compared with controls, average peripapillary RNFL thickness increased significantly in LHON patients in acute stage; adversely decreased significantly in LHON patients in chronic stage. Compared to controls, LHON patients in acute stage had a significant increase of RS fluctuations in the primary visual an Compared to controls, LHON patients in acute stage d auditory cortices, bilaterally. They also showed decreased RS fluctuations in the right lateral occipital cortex and right temporal occipital fusiform cortex. Compared to controls, LHON patients in chronic stage. Compared to LHON patients in chronic stage, LHON patients in acute stage. The different changes in rest-FMRI and RNFL between LHON patients in acute stage and LHON patients in chronic stage suggesting there was some relationship between brain functional change and retinal ganglion cell degeneration.

EPO-0183

Modulation of Catechol-O-methyltransferase Val158Met Polymorphism on Topological Reorganization of White-matter Networks in Attention-deficit/hyperactivity disorder Children

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Attention-deficit/hyperactivity disorder (ADHD) children showed the redistribution of structural connectivity involving large-scale brain systems beyond the prefrontal-striatal model. The dopamine system has been associated with symptoms of ADHD, and is important for pharmacologic treatments. However, there is a lack of integrated concept that dopamine impact neural circuitry underlying behavior pathways occurs in ADHD. In this study we provided graph theory approach to study structural brain networks reorganization modulated by Catechol-O-methyltransferase (COMT) Val158Met polymorphism in ADHD children. We found significant reorganization of white matter structural networks in ADHD Met allele carriers, manifested as increased nodal degree, nodal efficiency, fronto-striatal circuitry, parietal-cingulum-motor circuitry, feeder and local connections. Those diffuse white matter alterations were not only implicated in fronto-striatal networks mediating executive functions but were also involving in sensorimotor network, frontal, cingulum, and parietal areas during perception-motor, higher order cognitive, attention control and processing. Together, these genetic-based findings highlight large-scale brain systems reorganization in ADHD, might also have important implications on the clinical pharmacologic treatments and development of pharmacogenomics.

EPO-0184
基于纤维束空间统计分析多参数 DKI 在脊髓小脑共济失调 3 型中的应用

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目的：采用基于纤维束空间统计分析（TBSS）的方法分析脊髓小脑共济失调 3 型（SCA3）患者 DKI 多参数图，以研究其全脑白质纤维束损害的特点，评估各参数诊断价值；进一步探索相应纤维束与患者 CAG 基因重复次数、疾病严重程度（SARA）评分的相关性。
材料与方法：收集 28 例经基因检测证实为 SCA3 的患者，按 SARA 评分将 SCA3 分为症状组（20 例，平均年龄 42.1 岁）及症状前组（8 例，平均年龄 27.3 岁）。收集 20 例性别、年龄与症状组匹配的健康志愿者作为对照组。对被试行全脑 DKI 扫描并得到 FA、MD、MK、Kr、Ka 参数图，对其进行 TBSS 分析。提取差异纤维束的上述参数值，以 ROC 曲线评估其用于 SCA3 的诊断效能，并进一步研究其与 CAG 基因重复次数、SARA 评分的相关性。
结果：与对照组相比，SCA3 症状组 FA、MK、Kr、Ka 的白质纤维骨架见显著减低区域，主要集中在双侧小脑下脚、内侧丘系、皮质脊髓束、小脑中脚及桥脑交叉束，其中 Kr 显示全脑纤维束损害最广泛（P＜0.01，TFCE）。ROC 曲线分析发现右侧小脑下脚的 Kr 值对 SCA 的诊断价值最高（AUC=0.96），其敏感度，特异度和拐点值分别为 85.7%，100% 和 1.06。另 SCA3 症状患者在上述纤维束的各 DKI 参数值与 CAG 基因重复次数存在显著相关，其中 MD 与其呈正相关（r=0.501~0.571，P＜0.05），其余参数呈负相关（r=-0.695 ~ -0.452，P＜0.05）；但与 SARA 评分均不存在显著相关。
结论：SCA3 症状患者存在脑内多发纤维束损害，主要位于中脑和小脑；DKI 各参数均可用于 SCA3 的诊断，而右侧小脑下脚的 Kr 值诊断价值最高。上述受损纤维束的 DKI 各参数值与 CAG 基因重复次数明显相关，但无法反映患者共济失调的严重程度。

EPO-0185
Blood-Brain Barrier leakage with Is Associated With type 2 diabetes mellitus

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Purpose: To investigate whether the blood-brain barrier (BBB) leaks blood-circulating substances in patients with T2D, and to examine the extent and mode of leakage.
Materials and Methods: For this study,20 patients with T2D and 40 age and gender matched participants for physical examination were recruited in this cross-sectional study. We used dynamic contrast-enhanced-MRI and Patlak pharmacokinetic model to quantify BBB permeability in the normal-appearing white matter (NAWM), white matter hyperintensity (WMH), cortical gray matter (CGM), and deep gray matter (DGM).
Results: The BBB leakage rate was significantly higher in patients compared with that in control subjects in NAWM (P=0.003), WMH (P=0.018), CGM (P=0.023), and DGM (P=0.025). Patients had a significantly higher leakage volume of the brain tissue in NAWM(P=0.032), WMH(P=0.016), CGM(P=0.046), and DGM(P=0.013). Spearman correlation analysis revealed that in all ROIs, BBB leakage rate, and area under the leakage curve

were both positively correlated with T2D(all P＜0.05), while only blood plasma volume in NAWM showed negative correlation with T2D(P＜0.05). Univariable linear regression analysis revealed that leakage rate and area under the leakage curve in all ROIs were positively associated with T2D(all P＜0.05), while only fractional blood plasma volume in the DGM was negatively associated with T2D(P＜0.05)after adjustment for age, sex, and vascular risk factors.

Conclusion: This study indicated that participants with T2D had global BBB leakage, which provides additional evidence that compromised BBB integrity may play a role in the pathogenesis of CNS disease of T2D. Longitudinal studies are required to confirm a causal relationship between the BBB permeability and CNS disease of T2D progression.

EPO-0186
应用基于体素的形态学测量方法结合 ASL 建立脊髓小脑共济失调 3 型影像学诊断标记

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目的：基于 VBM 的方法分析 SCA3 患者的脑灰质体积变化，结合 ASL 求脑灰质变化显著区域的脑血流量（CBF）改变，建立基于 CBF 的 SCA3 影像学诊断标记。

材料与方法：收集 25 例经基因检测证实为 SCA3 患者按照 SARA 评分将患者分为症状组（20 例，平均年龄 39.7 岁）及症状前组（5 例，平均年龄 27.3 岁）。对照组选择 20 例（女 11 例，平均年龄 37.6 岁）与症状组匹配的健康志愿者。对所有入组者行 T1 mprage 和全脑 PASL 扫描。经后处理获得全脑 CBF 图，其中 19 例 SCA3 症状患者和 12 例健康志愿者 PASL 图像质量符合要求纳入分析。利用 CAT12 软件包对被试 T1 mprage 原始数据后处理得到全脑灰质图像，并利用 SPM12 对全脑灰质数据进行基于体素的非参数统计学比较，寻找差异显著的脑区。提取上述灰质体积差异显著脑区的 CBF 均值，进行非参数检验比较分析。再采用 ROC 曲线分析该区域 CBF 对于 SCA3 的诊断效能。

结果：相比对照组，SCA3 症状组在右侧小脑存在灰质体积显著减低区域，主要集中在右侧小脑前叶(P ＜ 0.001, FWE 校正)。症状前组与症状组以及对照组与症状前组在全脑灰质体积变化上未见显著差异。比较 SCA3 症状及正常对照右侧小脑前叶的 CBF 值，发现症状组右侧小脑前叶 CBF 值明显高于对照组（$CBF_{症状}$：56.0±31.7 (mL/(100 g*min) vs. $CBF_{对照}$：29.6±22.0 (mL/(100 g*min))，差异具有统计学意义（P＜0.05）。ROC 曲线分析发现，CBF 对 SCA3 有较高的诊断效能（AUC = 0.75），其中特异度、灵敏度和拐点值分别为 75%、84.2%和 29.8 (mL/(100 g*min))。

结论：相比正常对照组，SCA3 患者的右侧小脑前叶灰质体积显著减低，但相应区域 CBF 代偿性增高。 基于右侧小脑前叶的 CBF 值可以用于无创诊断 SCA3，具有较高的灵敏度。

EPO-0187
DKI 对脑胶质瘤分级诊断价值及与 Ki-67 标记指数相关性研究

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目的：研究磁共振扩散峰度成像（DKI）对脑胶质瘤分级诊断价值及与 Ki-67 标记指数的相关性。

方法：收集本院 2015 年 12 月至 2018 年 10 月经手术病理证实胶质瘤共 50 例，均于术前采用 GE Signa HDxt 3.0T 磁共振扫描仪行 DKI 检查。经 Functool 软件分别得到平均峰度（MK）、轴向峰

度（AK）、径向峰度（RK）、平均扩散系数（MD）、各向异性分数（FA）及其标准化值（nMK、nAK、nRK、nMD、nFA）。所有病例均行免疫组织化学对 Ki-67 的表达情况进行测定。$p<0.05$ 为差异有统计学意义。结果：MK、AK、RK 值在 II 级与 III 级、III 级与 IV 级胶质瘤间均存在统计学差异（$p<0.05$）；FA 值仅在 III、IV 级胶质瘤间有统计学差异（$p<0.001$）；MD 值仅在 II、III 级胶质瘤间有统计学差异（$p=0.033$）。nMK、nAK、nRK 仅在 II、III 级胶质瘤间有统计学差异（$p<0.05$）；nFA、nMD 在 II 级与 III 级、III 级与 IV 级胶质瘤间均无统计学差异（$p>0.05$）。MK 鉴别 II 级与 III 级、III 级与 IV 级胶质瘤的 AUC 均最大，分别为 0.927、0.906（p 值均为 0.001）；nRK 鉴别 II、III 级胶质瘤的 AUC 最大，为 0.889（$p=0.003$）。MK、AK、RK 及其标准化值、FA 与 Ki-67 LI 呈正相关（$p<0.05$），以 MK 相关性最好（rs 为 0.712，$p<0.001$）。MD 及其标准化值与 Ki-67 LI 呈负相关（rs 分别为 0.399、0.372，$p<0.01$）。nFA 与 Ki-67 LI 无相关性（$rs=0.268$，$p=0.05$）。结论：DKI 可无创地评估胶质瘤的病理分级并预测 Ki-67 的表达情况，MK 是胶质瘤分级诊断、细胞增殖情况预测价值较好的影像学指标。应用 DKI 对胶质瘤进行分级诊断时，可不用 NAWMc 对肿瘤实质参数进行标准化。

EPO-0188

Association between NOODI parameters and ki67 index in pituitary macroadenoma

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Purpose: Ki-67, represented tumor proliferation, is one of the important risk for aggressive pituitary adenomas. However, there’s no specific imaging finding for aggressiveness in macroadenomas. NODDI (neurite orientation dispersion and density imaging) model is a multi-compartment model for diffusion MRI data, allowing more specific neurobiological interpretation of microstructural changes in the tissues. The purpose of this study is to evaluate the accuracy of NODDI parameters in predicting Ki-67.

Materials and methods: Seventeen patients with surgically proved pituitary macroadenomas were retrospectively analyzed in this study. Q-space imaging at 3-T was performed with b values from 0 and 3000 s/mm^2. NODDI model was used to fit the diffusion data. Parameters maps for neurite density index (NDI), Volume fraction of the isotropic compartment (FISO), orientation dispersion index (ODI) were calculated and generated by using Spherical Mean Technique (Fig 1). For comparison, parameters for DTI (Diffusion Tensor Imaging) model, including Fractional Anisotropy (FA), Mean diffusivity (MD) and Radial Diffusivity (RD) were also computed. 3-D volume of interest was placed on tumor parenchyma avoiding necrosis, hemorrhage cystic degeneration. Metrics above were binned to construct histogram, the mean, 25% percentiles, 75% percentiles, skewness, and kurtosis of these metrics were computed. These histogram parameters were then compared with the Ki67 index and Knosp classification of pituitary adenomas by using Wilcoxon rank-sum test. A p-value less than 0.05 was considered to be statistically significant. We also performed a receiver operating characteristic (ROC) curve analysis to assess

the diagnostic performance of histogram parameters between high ki67 index (>3%) and low ki67(<3%) index of pituitary adenomas.

Results: The skewness and variance of ODI showed significant differences between ki67 indices (skewness: p=0.04 and variance: p=0.04). Variance of NDI and FISO are also significant between ki67 indices (NDI: p<0.01, FISO: p<0.01). However, all parameters derived from DTI model, including FA, MD, RD are not significant between two group. All parameters showed no significant differences between negative and positive invasion (Knosp classification). Receiver-operating characteristics analysis between positive and negative recurrence showed that both the skewness and variance of ODI histogram achieved area under the curve at 0.87 , and the variance of both NDI and FISO histogram achieved area under the curve at 0.80.

Conclusion: Skewness and variance of ODI histogram and variance of both NDI and FISO histogram were the predictive parameters for assessing tumor proliferative potential and aggressive of pituitary adenomas. This indicates that the tumor proliferative potential and aggressive of pituitary adenomas are related to microstructural changes in the tumor tissues, including neurite orientation dispersion and intral-celluar volume fraction. Unlike previous study, our study show that there are no significant relationship between parameters derived from DTI model and kI67 index

EPO-0189
乙酰唑胺负荷 CT 灌注成像对脑胶质瘤肿瘤血管生成的评价

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目的：探究乙酰唑胺（Acetazolamide，ACZ）负荷 CT 灌注成像在大鼠 C6 胶质瘤中的应用，探讨 CT 灌注参数与变化率对于评价 C6 胶质瘤血管生成的价值及其病理基础。
材料与方法：雄性 SD 大鼠 32 只，随机平均分为正常对照组和 C6 胶质瘤种植 10 天、14 天、18 天组，通过立体定向仪于鼠脑右侧尾状核区分别注射生理盐水及 C6 胶质瘤细胞。行 CT 灌注成像，间隔 1 小时后行 ACZ 负荷下的 CT 灌注成像。采用 Philips CT 后处理软件获得灌注参数 rCBF（relative CBF=患侧 CBF/对侧 CBF）、rCBV（relative CBV=患侧 CBV/对侧 CBV），并计算 ACZ 负荷下的变化百分率。取肿瘤中心层面固定切片，进行 HE 染色及免疫组化染色测定 HIF-1、FVIII-MVD 和α-平滑肌肌动蛋白（α-SMA）-MVD，计算 VMI=（α-SMA-MVD/FVIII-MVD）×100%。应用 SPSS 21.0 软件比较不同实验组之间 rCBF、rCBV 及其变化百分率之间的差异，以及灌注参数与病理指标之间的相关性。
结果：对照组与肿瘤组之间的 rCBV、rCBF 及其变化百分率存在显著差异（Student t 检验，$p<0.01$）。不同种植天数的 3 个肿瘤组之间静息和 ACZ 负荷 rCBV、rCBF 及其变化率之间均存在显著差异（ANOVA 分析，$p<0.01$）。病理染色分析肿瘤组的 HIF-1、FVIII-MVD、VMI 与静息和 ACZ 负

荷 rCBV、rCBF 及其变化百分比均具有显著相关性（Pearson 检验，p<0.05），α-SMA-MVD 与 CT 灌注参数不相关（p>0.05）。
结论：ACZ 负荷实验 CT 灌注成像的灌注参数及变化率在对照组及不同种植天数肿瘤组之间存在显著差异。CT 灌注成像结合 ACZ 负荷实验得到的 rCBF、rCBV 以及其变化率可以一定程度上反映胶质瘤肿瘤血管生成情况。

EPO-0190

Radiomics profiling identifies the incremental value of MRI features to key molecular biomarkers for risk stratification of high-grade gliomas

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Purpose: To identify the incremental value of MRI features to the key molecular biomarkers for risk stratification of high-grade gliomas (HGGs).
Methods: A total of 137 patients were retrospectively collected including the preoperative magnetic resonance images, clinical and genetic data from The Cancer Genome Atlas/The Cancer Imaging Archive (TCGA/TCIA) dataset and our institution. Radiomic features (n=1976) were extracted on both post-contrast T1-weighted (CE-T1) and T2-weighted fluid attenuation inversion recovery (T2FLAIR) MR images. The least absolute shrinkage and selection operator (LASSO) method was used to select effective features. The univariate and multivariate Cox model was built to explore the advantage of clinical characteristics, molecular biomarkers, and radiomic features. The Kaplan-Meier survival analysis was used to evaluate the prognostic models, and a stratified analysis was conducted to demonstrate the incremental value of the radiomics signature. A nomogram was developed to predict the 1-year, 2-year and 3-year overall survival (OS) of HGGs.
Results: The radiomics signature provided significant prognostic value for risk stratification of HGGs. The combined model integrated radiomics signature with clinical (age) and isocitrate dehydrogenase (IDH) genotype holds the best prognostic value which yielded C-index values of 0.764, 0.731 and 0.761 on the training set, ValidationSet1 and ValidationSet2 respectively. The stratified Kaplan-Meier survival analysis showed that the radiomics signature could identify risk subgroups in various clinical and molecular subgroups.
Conclusion: The radiomics signature allows risk stratification of patients with HGGs, and has incremental value to the key molecular biomarkers, providing a preoperative basis for individualized diagnosis and treatment decision-making of HGGs.

EPO-0191

Giant cell glioblastoma: Survival management of a rare tumor

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Abstract：Giant cell glioblastoma (GCG) belongs to glioblastoma (GBM), a subtype of IDH-wild type, which is considered to have a better prognosis than GBM. However, due to its rarity, little is known about its treatment and prognosis. This study retrospectively collected 26 cases of GCG confirmed by surgery and pathology in our hospital from January 2013 to June 2019. The clinical data, treatment plan and follow-up data were obtained from the existing electronic medical records. The overall survival (OS) rate of 26 patients was 8.5 months. Most patients (73.1%) have primary nontotal tumor resection as the main treatment, and have received different forms of postoperative adjuvant therapy (88.5%), of which 46.5% received radiation therapy (RT) and chemotherapy. Multivariate analysis showed that age (p = 0.338), gender (p = 0.356), Karnofsky performance status (KPS) (p = 0.070), and number of tumors (p = 0.963) were not found to be important predictors of OS. However, adjuvant therapy (p = 0.019) and clinical history (p = 0.005) were independent and significant predictors of OS. RT combined with temozolomide (TMZ) was associated with longer OS, and the median survival of patients receiving this adjuvant therapy was 12.6 months, not 6.2 months. Moreover, we found that a shorter clinical history was associated with a longer OS. When the patient's clinical history was Less than 1 month, the median survival time was 11.5 months, not 4.3 months.

EPO-0192
半用量对比剂对磁共振动态对比增强 DCE 序列在颅脑疾病诊断效能中的价值

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目的：探讨半用量与全量磁共振造影剂注射，对 DCE 序列的颅脑疾病诊断效能的影响。材料与方法：回顾性分析拟行神外手术的患者 20 例，其中包括 8 例脑外疾病，脑膜瘤 4 例，后颅窝病变 4 例；12 例脑内病变，胶质瘤 8 例，淋巴瘤 4 例。所有患者均行两次磁共振动态对比增强 DCE 序列扫描，第一次注射对比剂标准剂量的 50%，第二次按照标准剂量进行注射 100%，两次扫描的间隔时间为 48-72 小时，对比剂的标准剂量为 0.2ml/kg。第一次为诊断性扫描，主要用于辅助临床诊断，第二次为术前磁共振定位扫描，主要用于临床手术方案的质量和手术路径规划。所有扫描均在 GE750W 磁共振成像仪上完成，扫描序列为 LAVA 梯度回波，多期动态增强扫描，具体扫描参数为 TR/TE3.89/1.31 ms，层厚 3mm，FOV230*230mm；矩阵 224*224，随后进行动态增强检查，共采集 60 期，每期时间为 5s，在第 3 期采集结束后，经肘静脉以 2.0 ml/s 速率注射对比剂。后处理均应用 GE 工作站 Aw4.6 版本完成，分别获得 Ktrans，Kep，Ve，fPV 定量参数，及 IAUGC，MaxSlope，BAT 等半定量参数，两次扫描后处理参数均行组间相关性和差异性分析。为了减少测量误差，每例患者均在选取了三个层面进行测量。结果:此 20 例患者定量值（Ktrans，Kep，Ve，fPV）无显著性差异，半定量值（IAUGC，MaxSlope，BAT）随着药量分布的区别有显著性差异。这种定量的 MRI 技术可以提供脑肿瘤病变发生发展过程。生理病理学信息，可以评价病变的微血管通透性，微血管通透性成像同时使用较高的时间分辨和较长的采集时间，以描绘对比剂流入流出过程中病变及正常组织血管的通透性及血管外细胞外间质的通透性。结论:半剂量造影剂渗透成像可以替代全剂量造影剂的应用，此技术的重复性及药量的把握可以提供诊断用量，对颅脑疾病的诊断具有可靠的诊断效能。

EPO-0193

Predictive value of Machine Learning on Isocitrate Dehydrogenase (IDH) Mutation in Patients with Glioma: A Systemic Review and Meta-analysis

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Purpose: Noninvasively predicting isocitrate dehydrogenase (IDH) mutation in glioma is of great significance. Machine learning (ML) has been wildly used in medical imaging, but the predictive value of ML on IDH mutation in patients with glioma was unclear. A meta-analysis is needed to provide a systematic review of the published findings.
Materials and methods: PubMed, Web of Science and the Cochrane library were searched to collect all the relative articles in investigating the diagnostic performance of ML for prediction of IDH mutation in glioma. Pooled sensitivity, specificity and their 95% CI were calculated. And AUC was obtained.
Results: Seven reports with glioma were included. AUC of ML in predicting IDH mutation was 91% (95% CI: 88%-93%), the pooled sensitivity and specificity were 86% (95% CI: 81%-91%) and 86% (95% CI: 79%-91%), respectively. In subgroup analysis, clinical information, MRI sequences and glioma's grade were associated with study heterogeneity. Clinical and imaging features integrated in ML had a higher sensitivity (92% vs. 83%) and specificity (89% vs. 81%) than the imaging features alone. In addition, ML performed better in high grade glioma than in low grade glioma, and ML which used conventional MRI sequence demonstrated a higher specificity than included the conventional and advanced MRI sequences in predicting IDH mutation.
Conclusions: ML demonstrated excellent diagnostic performance in predicting IDH mutation of glioma. Clinical information, MRI sequences and glioma's grade were the main factors of influencing the diagnostic specificity.

EPO-0194

Assessement of Glioma grading and molecular features using Isopulse imaging: A preliminary single-center study

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Abstract: Diffusional variance decomposition (DIVIDE) imaging parameters was proved capable to distinguish the meningioma from glioma by mapping tumor heterogeneity. This

study is aimed to find out whether DIVIDE could predict the Glioma grade and molecular features based on a sequence named Isopulse.

Method: 30 patients diagnosed with gliomas by clinicopathologic analysis after surgery were recruited in this study. Before the surgery, all patients were scanned with T1w, T2w, T2 Flair, T1 contrast-enhanced imaging, DTI and Isopulse imaging. The total mean kurtosis (MKT), microscopic anisotropy (MKA), isotropic heterogeneity (MKI), and the microscopic Fractional Anisotropy(uFA) derived from Isopluse scan, and the Fractional Anisotropy (FA) and Mean Diffusivity (MD) derived from DTI scan, were used to grade glioma. The DIVIDE and DTI were compared in grading Glioma. The results were compared in regard to the WHO-based histological findings and molecular characteristics leading to integrated diagnosis: isocitrate-dehydrogenase (IDH1/2) mutation status chromosome 1p/19q loss of heterozygosity (LOH), and O6-methylguanine DNA methyltransferase (MGMT) promoter methylation status.

Result: significantly differences diffusion patterns MKa, MKi, MKt, especially MKi/MKt values were found among the three glioma grading groups. MKa and uFA have better specificity in grading than MKt. 75 and 90 percentile MKi and MKa were significantly lower in tumors with IDH1/2 mutation than in those with IDH1/2 wild type. We found no significantly difference among the parameters according to MGMT methylation status

Disscussion: MKa and MKi resulted from Isopulse imaging correlates well to cell eccentricity and density extracted from microscope images of the tumor tissue, which might be superior to conventional DTI and DKI parameters in grading Glioma , and can be useful in predicting IDH1/2mutation status.

EPO-0195
基于不同感兴趣区域动态对比增强 MR 定量参数纹理分析评估胶质瘤等级

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目的 本研究旨在探讨纹理分析与基于不同感兴趣区域（ROI）动态对比增强 MR 定量参数在确定胶质瘤等级中的作用。以探索不同 ROI 中的参数，以评估肿瘤异质性，并进一步比较不同 ROI 的诊断性能。
方法 搜集病理证实的高级别胶质瘤（WHO III 级、IV 级）及低级别胶质瘤（WHO I 级、II 级）各 40 例。所有患者均在德国 SIEMENS 公司 3.0T MAGNETOM Skyra 磁共振扫描仪上进行检查。DCE-T1WI 采用三维容积内插（VIBE）梯度回波序列，动态增强扫描前先行 2 个不同反转角序列（2°,15°）扫描，用以在后处理过程中生成 T1 map 图。多反转角序列扫描完成后行动态增强扫描。将 MR 数据传输到个人计算机，胶质瘤病变在 DCE-MRI 上分为三部分：1.实性部分；2.其它部分（如坏死和出血）；3.瘤周水肿部分。然后由同一位研究人员在经验丰富的神经影像学家的指导下绘制肿瘤实体部分和整个肿瘤 ROI。为了量化 ROI 内的图像纹理特征，使用 GE AnalysisKit Version V3.0.1A 软件来量化异构信号。利用直方图分析来计算一阶参数。通过灰度共生矩阵（GLCM）进行纹理分析以从图像中提取二阶特征。在这项研究中，纹理分析在 3D ROI 内进行，参

数不均匀性用于定量分析。使用非参数 Wilcoxon 秩和检验比较高级别胶质瘤（HGG）和低级别胶质瘤（LGG）之间的纹理特征。
结果 对于整个肿瘤 ROI，HGG 和 LGG 之间的不均匀性值是显著不同的（Z=50.37,P=0.01<0.05）。对于实性部分 ROI，不均匀性显示 HGG 和 LGG 之间的显著差异（Z=34.65,P=0.06>0.05）。整个肿瘤的不均匀性参数比实性部分 ROI 具有更高的诊断准确性。
结论 基于不同 ROI 的 DCE-MRI 定量参数纹理分析可以为评估胶质瘤等级提供可靠的价值。

EPO-0196

MRI features and prognosis of glioma associated with IDH-1 mutation and MGMT promoter methylation

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Abstract
Purpose To investigate the associations of isocitrate dehydrogenase 1 (IDH-1) and O6-methylguanine-DNA-methyltransferase (MGMT) promoter methylation with MRI characteristics and its prognosis factors in glioma.
Methods A total of 116 patients with gliomas were recruited from January 2013 to December 2015. All patients underwent conventional MRI before operation which included T1-weighted imaging (T1WI), T2-weighted imaging (T2WI), T2-weighted fluid attenuated inversion recovery (T2-FLAIR), contrast-enhanced T1-weighted imaging. X^2 and Fisher's exact probability test were used to determine the significance of associations between MRI features and IDH-1 mutation and the status of MGMT promoter methylation in glioma. The survival distributions were estimated using the Kaplan-Meier method, and compared by Log-rank test. Univariate and multivariate analyses were performed using Cox regression
Results IDH-1 mutant glioma was significantly more likely to exhibit homogeneous signal intensity (p=0.009) and less contrast enhancement (p=0.000) on MRI. IDH-1 mutant glioma was inclined to cross the middle (p=0.001). MGMT promoter methylated of glioma had more obvious enhancement (p=0.049). The overall survival between IDH-1 mutated and wild-type glioma (p=0.000), MGMT promoter methylated of glioma and MGMT promoter unmethylated glioma (p=0.04), the age over 40 and under 40 (p=0.003), KPS scores before operation more than 80 and KPS scores no more than 80 (p=0.000), low grade glioma and high grade glioma were compared (p=0.000), the difference were statistically significant.
Conclusions Our results suggested that IDH-1 mutant in glioma is more likely to exhibit homogeneous signal intensity, less contrast enhancement and inclined to cross the middle. Glioma with MGMT promoter methylated tend to have more obvious enhancement. The patients with IDH-1 mutated and MGMT promoter methylated may have longer life and better prognosis.

EPO-0197

The value of DWI and minimum ADC value in grading diagnosis of Oligodendrocyte tumors

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[Abstract] **Purpose** To investigate the value of DWI and minimum ADC value in the differential diagnosis of different grades of oligodendrocyte tumors. **Materials and Methods** A retrospective analysis of 18 cases of oligodendroglioma (OD, WHO class II) and 27 cases of anaplastic oligodendroglioma (AOD, WHO class III) confirmed by surgery and pathology from January 2012 to May 2019 in our hospital. clinical, pathological data and DWI characteristics, the minimum ADC value of the tumor parenchyma was measured, the difference between the two was compared, and the receiver operating characteristic curve (ROC curve) was drawn to evaluate the minimum ADC value in grading. **Results** Of the 18 cases of oligodendroglioma , 14 of the solid parts of the tumor showed slightly higher/high signal on DWI, 2 showed equal/low signal, 2 showed heterogeneous mixed signal, and the minimum ADC value was (0.798±0.159).$\times 10^{-3}$ mm^2/s; in 27 cases of anaplastic oligodendroglioma, 19 of the solid part of the tumor showed slightly higher/high signal on DWI, 2 showed equal/low signal, and 6 showed no For the homogeneous mixed signal, the minimum ADC value was (0.670±0.108)$\times 10^{-3}$ mm^2/s, and the difference in the minimum ADC value between the two groups was statistically significant (t=3.223, P<0.005). The ROC curve results showed that the AUC value was 0.761, and the minimum ADC value 0.734$\times 10^{-3}$ mm^2/s was used as the threshold for the two-stage grading diagnosis. The sensitivity and specificity of the differential diagnosis were 72% and 74%, respectively. **Conclusion** DWI and minimal ADC value can be used as a quantitative tool for grading diagnosis of oligodendrocyte tumors, which provides a new reference for clinical identification.

EPO-0198

Radiological characteristics study on epithelioid glioblastoma, a rare subtype of GBM

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Background: Epithelioid glioblastoma(eGBM) is rare and a newly recognized subtype of GBM. Given the short of studies focusing on radiological characteristics of these tumors, we aimed to report the radiological features of eGBM deriving from six patients.

Methods: Six patients with pathologically diagnosed as eGBM were enrolled in this retrospective study. CT and pre-operative MR examinations with conventional and advanced sequences, such as diffusion weighted imaging and so on were analyzed. Immunohistological staining and mutation analysis of BRAF V600E was also explored.

Results: Only case 6 showed a co-locating tumor which was verified to be a diffuse astrocytoma (WHO II), other cases demonstrated single intracerebral tumor. Majority of the tumors originated in cerebral cortex, two cases involved corpus callosum. Tumors demonstrated iso-, hypo- or mixed intensity on T1WI, hyper- or mixed intensity on T2WI and FLAIR, heterogeneous enhancement on post-contrasted imaging. Involvement of leptomeninge, which appeared as leptomenigeal thickening and abnormal enhancing was discovered in 4 cases. Peritumoral edema (4/6) and hemorrhage (3/6) was common, calcium was only seen in case 5. Notable restrictive diffusion and consequently decreased rADC was found in solid component in 5 cases. Most cases demonstrated increased Cho and Lac/Lip value on ^{1}H-MRS, and promoted rCBV value on PWI. The cases with CT examination showed an ill-defined mass with mixed density.
Conclusions: Although there are some overlaps between typical GBM and eGBM, some radiological characteristics, such as location (often in cerebral cortex), involvement of leptomeninge and intratumoral calcium, may support the diagnosis of eGBM.

EPO-0199

Histogram Analysis of Intravoxel Incoherent Motion and Dynamic Contrast-Enhanced MRI with 2CXM modle in Glioma

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Introduction: The following paper evaluates the differential diagnostic performance of Intravoxel Incoherent Motion (IVIM) and Dynamic Contrast-Enhanced (DCE) with the two-compartment exchange model (2CXM) based on histogram analysis between different grades of glioma.
Methods: Thirty-nine patients with glioma underwent IVIM and DCE imaging at 3.0T. Quantitative parameters (mean, median, 10^{th}, 25^{th}, 75^{th} and 90^{th} percentiles) from IVIM (ADC, D, D*, f, and their product fD*) and DCE (V_p, V_e, PS, and F) were analyzed. The independent Student's t-test and Mann-Whitney U-tests were used to assess whether these parameters could distinguish low- from high-grade glioma. Receiver-operating characteristic (ROC) curve analysis and Delong test were performed to determine and compare diagnostic efficiency of IVIM and DCE parameters in differentiating low- and high-grade gliomas, respectively.
Results: Various histogram statistics of IVIM and DCE parameters can be used to differentiate between low-grade and high-grade glioma. V_e and V_p generally yielded higher AUC values than IVIM parameters, and the differences in AUC values of V_e_mean and IVIM parameters had a statistical significance. Although DCE had higher AUC values than IVIM, they didn't reach statistical significance.
Conclusions: V_e was the best parameter in differential diagnosis of gliomas. IVIM had the similar diagnosis performance with DCE,and both IVIM and DCE-MRI parameters can be used for preoperative grading of gliomas.

EPO-0200

Comparative intraoperative MRI、US、5-ALA 、Neuronavigation and Conventional surgery guided resection in patients with gliomas: a network meta-analysis

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Purpose:In the recent decades, some intraoperative technologies, such as Magnetic Resonance Imaging(iMRI), ultrasound(iUS), fluorescence-guided surgery with 5-ALA and neuronavigation were used more often in the surgery of gliomas. However, in the clinical work, it was difficult for neurosurgeons to make decisions to choose which technologies could give them the most support. In our study, we used the gross total resection(GTR), patients' postoperative complications and improvement as outcomes to compare these technologies, while conventional surgery was also included.
Methods and materials:The pubmed, Cochrane library, Web of Science, Embase, China Knowledge Resource Integrated Database, Wan-fang database were searched up to April 2018. Randomized controlled trials(RCTs), two-arm or three-arm prospective studies, retrospective studies in patients with glioma who had surgery treatment were included. We used multiple treatment meta-analysis, also known as mixed-treatment comparisons meta-analysis or network analysis, which allows the integration of data from direct and indirect comparisons. We did a random-effect model with in a Bayesian framework using Markov chain Monte Carlo methods in R version 3.5.0. This model combined direct and indirect evidence for any compared intervention. We got the ranking of the technologies in different outcome measured by calculating the OR for each technology compared with a control group.
Results: In terms of GTR, iMRI, iUS, 5-ALA, neuronavigation were more effective than conventional surgery(ORs 5.70,2.70,2.40,1.90). For the rate of postoperative complications, iUS, iMRI, nueronavigation were more improved than conventional surgery(ORs 0.15,0.24,0.34). As for the rate of patients improvement, iMRI, iUS, neuronavigation were better than conventional surgery(ORs 8.10, 4.90, 2.60).
Conclusion: From our ranking probability table, the data indicated that iMRI was the best in GTR and rate of patients improvement. iUS was the best in reducing postoperative complications. iMRI and iUS might be the best choice to for tumor resection in patients with gliomas.

EPO-0201

Predictive Value for Tumor Recurrence of Suspicious Enhancing Lesions of BT-RADS Categories 3 in High-Grade Gliomas Using PWI and DWI

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ABSTRACT
Background and Purpose: Treatment-related changes can often micmic tumor recurrence in high-grade gliomas (HGGs) on conventional MRI. The aim of this study is to evaluate the ability of PWI and DWI to predict whether tumor recurrence of suspicious enhancing lesions of BT-RADS categories 3 in postoperative patients with high-grade gliomas;and to further analyze which of the two schemes show the better diagnostic performance.
Materials and Methods: 60 patients with high-grade gliomas treated by surgery followed by chemoradiotherapy and adjuvant chemotherapy, who next appeared increasing enhancing lesions classified as BT-RADS categories 3 were retrospectively enrolled. All patients received conventional MRI, PWI and DWI regularly. Radiologists retrospectively evaluated the maximal relative cerebral blood volume (rCBVmax) of the enhancing lesion using PWI and the mean apparent diffusion coeffcient (ADCmean) values using DWI to differentiate tumor recurrent from nonrecurrent.The diagnostic performance of these two techniques was estimated with receiver operating characteristic (ROC) curve analysis.
Results: 31 of the 60 patients (51.7%) turned out to be tumor recurrence, while 29 patients (48.3%) had tumor nonrecurrence.Whether tumor recurrence could be identified by using rCBVmax and ADCmean values,PWI analysis presented significantly higher rCBVmax in tumor recurrence group (mean±SD, 2.35±0.87) compared with nonrecurrence group(1.29±0.45,p<0.001).DWI analysis revealed ADCmean of the tumor recurrence group (mean±SD,0.91±0.19×10-3mm/s2) were significantly lower than the nonrecurrence group (1.21±0.24×10-3mm/s2,p<0.001).The diagnostic performance of PWI is higher(AUC, 0.877) than that of DWI(0.829).
Conclusion: Assessment of rCBVmax and ADCmean of BT-RADS Category 3 lesions followed treated HGGs is available in differentiating recurrent tumors from tumor nonrecurrence. PWI seems to provide better diagnostic performance compared with DWI.

EPO-0202
联合扩散加权成像与动态磁敏感对比增强 MR 灌注加权成像对脑星形细胞瘤分级的应用价值

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目的　探讨扩散加权成像（DWI）联合动态磁敏感对比增强（DSC）MR 灌注加权成像在脑星形细胞瘤分级中的诊断价值。资料与方法 搜集经手术病理证实的不同级别脑星形细胞瘤 63 例，所有患者术前除常规扫描外均行头颅 DWI 及 MR 灌注加权成像扫描，其中低级别星形细胞瘤（WHOⅡ级）13 例，间变型星形细胞瘤（WHOⅢ级）24 例，胶质母细胞瘤（WHOⅣ级）26 例。分别测定肿瘤实质区最小 ADC 值、相对脑血容量（rCBV）最大值。应用方差分析 *ANOVA* 比较不同级别星形细胞瘤间肿瘤实质区的最小 ADC 值及最大 rCBV 值的差异；采用 ROC 曲线比较 ADC 值、rCBV 单独使用及两者联合应用对脑星形细胞瘤分级的诊断效能，并确定不同级别星形细胞瘤 ADC 及 rCBV 临界值。结果 DWI、DSC 及两种联合应用在鉴别 WHOⅡ级与 WHOⅢ级脑星形细胞瘤 ROC 曲线下面积（AUC）分别为 0.885、0.913、0.958，最小 ADC 值和最大 rCBV 值鉴别两者临界值分别为 $1.021\times10^{-3}mm^2/s$、3.760，灵敏度分别为 70.8%、79.2%、87.5%，特异度分别为 92.9%、100%、100%。DWI、DSC 及两种联合应用在鉴别 WHOⅢ级与 WHOⅣ级脑星形细胞瘤 AUC 分别为 0.712, 0.889 和 0.904。最小 ADC

值和最大 rCBV 值鉴别两者临界值分别为 0.783×$10^{-3}$$mm^2$/s、5.870，灵敏度分别为 57.7%、100%、84.6%，特异度分别为 83.3%、70.8%、91.7%。结论 联合应用 DWI 与 DSC 可以提高对脑星形细胞瘤分级诊断的准确性。

EPO-0203
扩散峰度成像与脑星形细胞瘤 GFAP、TopoⅡα、MGMT 表达的相关性研究

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目的：应用磁共振扩散峰度成像（DKI）初步探讨脑星形细胞瘤磁共振影像学表现与术后病理 GFAP、TopoⅡα、MGMT 表达的相关性。
方法：收集自 2012 年 3 月至 2014 年 9 月就诊于山西医科大学第一医院经手术病理证实的脑星形细胞瘤 66 例，其中高级别 34 例（III-Ⅳ），低级别 32 例（Ⅰ-Ⅱ），所有患者术前均行头颅常规 MRI 扫描、增强扫描及 DKI 扫描。通过工作站对图像进行后处理，得到平均峰度（MK）图、各向异性分数（FA）图，由两名有经验的 MR 医师结合常规 MRI 扫描图像进行分析，测定肿瘤实质区的部分各向异性分数（FA）值、平均扩散峰度（MK）值及 GFAP、TopoⅡα、MGMT 表达。采用 t 检验比较组间 DKI 各参数值及 GFAP、TopoⅡα、MGMT 表达水平差异，Spearman 相关分析 DKI 各参数值与 GFAP、TopoⅡα、MGMT 表达的相关性。
结果：（1）高级别组脑星形细胞瘤实质区 MK 值明显高于低级别组（P<0.05），高级别组脑星形细胞瘤实质区 FA 值与低级别组差异无统计学意义（P=0.331）；（2）高级别组脑星形细胞瘤实质区 GFAP 表达显著低于低级别组（P<0.05），高级别组脑星形细胞瘤实质区 Topo-Ⅱα表达显著高于低级别组（P<0.05），高级别组脑星形细胞瘤实质区 MGMT 表达与低级别组差异无统计学意义（P=0.679）；（3）MK 值与 GFAP 表达呈显著负相关（r =-0.836；P=0.03），与 Topo-Ⅱα表达呈正相关（r =0.896；P=0.01），与 MGMT 表达均无线性相关性（r =0.362；P=0.05）；FA 值与 GFAP（r =-0.562；P=0.05）、Topo-Ⅱα（r =-0.153；P=0.10）、MGMT（r =0.362；P=0.05）表达均无相关性。
结论： DKI 参数 MK 值与脑星形细胞瘤 GFAP、TopoⅡα表达显著相关。

EPO-0204
弥散张量成像在颅内环形强化病变中的诊断价值

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目的 探讨弥散张量成像（diffusion tensor imaging，DTI）对颅内环形强化病变的诊断价值。
方法 收集颅内单发环形强化病例 53 例，男 30 例，女 23 例，年龄 13～71，平均 45.6 岁。除 4 例脑转移患者为临床证实外，其余病例均经病理证实。其中高级别胶质瘤 35 例（包括间变性星形细胞瘤 19 例和胶质母细胞瘤 16 例），单发脑转移瘤 8 例，脑脓肿 10 例。全部病例均行弥散张量成像（DTI）扫描，分别测量病变坏死区、灶周水肿区及对侧正常脑实质的平均弥散系数(MD)值及各向异性分数（FA）值。并重建白质纤维示踪图，观察病灶与白质纤维束的关系。DTI 的图像分析及数据处理均采用 Siemens 公司提供的 Leonardo 工作站及配套 DTI 软件。
结果 脑脓肿坏死区的 MD 值（0.604±0.13 ×10-3mm2/s）和 FA 值（0.185±0.03）与高级别星形细胞瘤（MD 2.76±0.26×10-3mm2/s，FA 值 0.069±0.02）及脑转移瘤（MD 2.82±0.29×10-

3mm2/s，FA 值 0.064±0.02）间存在显著性差异(P＜0.01)。高级别星形细胞瘤水肿区的 FA 值（0.23±0.06）与脑转移瘤水肿区（0.17±0.06）、脑脓肿（0.15±0.03）间存在显著性差异(P＜0.01)。DTI 白质纤维示踪图可以较为准确的反映病灶与白质纤维束的关系，为手术治疗及评估预后提供依据。
结论 坏死区 MD 值及 FA 值有助于脑脓肿与环形强化脑肿瘤的鉴别；水肿区 FA 值有助于脑胶质瘤与转移瘤、脑脓肿的鉴别；白质纤维示踪图能够为优化手术方案及评估预后提供一定帮助。

EPO-0205

Combined Values of SWI and DSC-PWI in Noninvasively Assessing Isocitrate Dehydrogenase Mutational Status for Diffuse Gliomas

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Purpose To explore the contribution of 3.0T susceptibility weighted imaging (SWI) for non-invasively assessing isochelate dehydrogenase (IDH) genetic subtypes and examine the combined usefulness of SWI and dynamic susceptibility contrast-perfusion weighted imaging (DSC-PWI) for the evaluation of IDH genotypes in diffuse gliomas.
Materials and Methods Fifty-one patients with pathologically confirmed diffuse gliomas who underwent conventional magnetic resonance imaging(cMRI), SWI and DSC-PWI scans were enrolled in our study. IDH genetic subtypes were determined by sanger sequencing. Intratumoral susceptibility signal intensity (ITSS) grading and maximum relative cerebral blood volume (rCBVmax) differences between IDH-mutated gliomas and IDH wild-type cases were compared using the non-parametric rank sum test. Receiver operating characteristic (ROC) curve analysis was performed to determine the optimal threshold for IDH mutation status. The area under the curve (AUC) was calculated to examine diagnostic performances.
Results Significantly higher ITSS grading and rCBVmax values were found in 27 IDH wildtype gliomas compared to 24 IDH-mutated samples (P=0.02 and ＜0.01, respectively). In subgroup analysis, IDH mutantions and wildtype groups of HGGs showed differences in the ITSS grading and rCBVmax (P=0.01 and 0.03, respectively). No differences in ITSS grading and rCBVmax were observed between the LGGs(P=0.31 and 0.07, respectively). ROC analysis showed that rCBVmax (AUC=0.80) better differentiated between genetic subtypes of gliomas compared to ITSS grading(AUC=0.68). A combination of SWI and DSC-PWI for the identification of IDH mutations lead to AUC of 0.83, which was higher than any single indicator diagnostic performance.
Conclusions 3.0T SWI may provide a new noninvasive method for evaluating the IDH mutation status of diffuse gliomas and a combination of SWI and DSC-PWI produces higher predictive value.

EPO-0206

能谱 CT 评价贝伐单抗抗大鼠 C6 胶质瘤血管生成的研究

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目的 探索能谱 CT 定量参数评估贝伐单抗抗大鼠 C6 胶质瘤血管生成的可行性。**方法** 取健康雄性 SD 大鼠 30 只进行 C6 胶质瘤模型的建立，造模后 2 周对所有大鼠进行能谱 CT 扫描，观察成瘤情况。扫描完成后，将其随机分为实验组（n=15 只）和对照组（n=15 只），实验组开始每天腹腔注射贝伐单抗注射液 5 mg/kg，对照组每天腹腔注射同等剂量的生理盐水（0.9%NaCl），连续注射一周，分别在用药后第 4 天和第 8 天进行能谱 CT 扫描，能谱 CT 后处理软件分析得到定量参数以及伪彩图。每次扫描结束后，各组随机抽取 3 只利用心脏灌流取脑方法取材鼠脑组织，进行 HE 染色及 VEGF、HIF-1α的免疫组化染色，统计学分析能谱 CT 定量参数与 VEGF、HIF-1α的相关性。**结果** 对照组及实验组治疗前 70keV 单能量 CT 值、斜率、碘浓度组间无统计学意义（p>0.05）。实验组经抗血管生成药物贝伐单抗治疗后，70keV 单能量 CT 值、碘浓度均下降，斜率呈升高趋势，治疗后不同时间点对照组及实验组 70keV 单能量 CT 值、斜率、碘浓度值组间均有统计学意义（p<0.05）；免疫组化与能谱 CT 各定量参数相关性分析显示实验组及对照组不同时间点 70keV 单能量 CT 值、斜率、碘浓度值与 VEGF、HIF-1α均呈正相关。**结论** 能谱 CT 多参数成像可作为评估贝伐单抗抗大鼠 C6 胶质瘤血管生成的新方法。

EPO-0207
比较分析弥散峰度成像和弥散张量成像在脑胶质瘤分级、预测肿瘤细胞增殖和 IDH-1 基因突变状态中的作用

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目的：弥散张量成像（DTI）和弥散峰度成像（DKI）已经广泛应用于胶质瘤的术前评估。但很少有研究综合应用 DKI 和 DTI 来评估胶质瘤。本研究描述了综合运用 DKI 和 DTI 对胶质瘤评估的疗效，包括肿瘤分级，异柠檬酸脱氢酶-1（IDH-1）突变状态和肿瘤增殖率（Ki-67）等，并对其结果进行了比较。

方法：前瞻性纳入 30 例经病理证实的胶质瘤患者，其中 12 例为女性，中位年龄为 45 岁。所有病例均接受 DKI 检查，推导出 DKI 和 DTI 的参数图。DKI 参数包括平均峰度 MK、轴向峰度 Ka、径向峰度 Kr，DTI 参数包括平均弥散率 MD、分数各向异性 FA。

结果： HGGs 中 MK，Ka，Kr 和 FA 显著高于 LGGs，而 MD 明显低于 LGGs（P <0.01）。 ROC 分析证明 MK（特异性：98%敏感性：63%）和 Ka（特异性：88%敏感性：79%）具有相同且最高（AUC：0.93）的诊断值。在 III 级神经胶质瘤中 MK，Ka 和 Kr 显著高于 II 级神经胶质瘤（P≤0.01）。DKI 和 DTI 可以显著鉴定 IDH-1 的突变状态（P≤0.03）， Ka（敏感性：84%，特异性：67%，AUC：0.69）显示出最高的诊断价值。DKI 指标和 MD 显示出与 Ki-67 的显著相关（P≤0.01），Ka 具有最高的相关系数（rs = 0.72）。

结论：DKI 指标在区分 HGG 和 LGG 方面的诊断效力、特异性和敏感性高于 DTI 参数。Ka 可作为预测胶质瘤分级，肿瘤细胞增殖率和 IDH-1 基因突变状态的的理想成像指标。

EPO-0208

Predictive Value of Texture Analysis of High b-Value Diffusion-Weighted Imaging for Consistency of Pituitary Macroadenomas

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Abatract

Purpose: The aim of this study was to evaluate the diagnostic performance of texture analysis(TA) of diffusion-weighted imaging(DWI) at a standard b-value (b=1000 s/mm^2) and a high b-value (b=2000 s/mm^2) for their ability to predict the tumor consistency of pituitary macroadenomas.

Materials and Methods: 50 patients with histologically confirmed pituitary macroadenomas were retrospectively reviewed. All patients underwent readout segmentation of long variable echo-trains(resolve) DWI at b=1000 s/mm^2 and b=2000 s/mm^2, and corresponding apparent diffusion coefficient (ADC) maps (ADC_{1000} and ADC_{2000}) were generated. On the basis of surgical and histological findings, the macroadenomas were classified as either soft or hard types. The parameters derived from TA of T2-weighted images (T2WI), ADC_{1000} and ADC_{2000} for predicting tumor consistency were compared between the two types by using unpaired student's t-test. Receiver operating characteristic curve (ROC) and logistic regression were used to assess their diagnostic performance.

Results: Significant statistical differences in TA parameters of ADC_{1000} and ADC_{2000} were observed between soft and hard types, whereas the TA of T2WI resulted in no significant difference. TA of ADC_{2000} provided superior diagnostic performance compared with that of ADC_{1000} and the entropy of the ADC_{2000} was the best single-feature under the ROC curve (AUC) of 0.861. Using multivariable logistic regression, a combination of meanvalue and entropy of ADC_{2000} yielded an AUC, a sensitivity and a specificity of 0.911, 78.4% and 92.3%.

Conclusions: TA of ADC values were useful for predicting the tumor consistency of pituitary macroadenomas and the high b-value ADC_{2000} may facilitate better type discrimination.

EPO-0209

Differentiation of High-Grade Astrocytomas from Solitary Brain Metastases: Comparing Diffusion Kurtosis Imaging and Diffusion Tensor Imaging

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Objective: The purpose of this study was to compare MRI diffusion kurtosis imaging (DKI) and diffusion tensor imaging (DTI) in the differentiation of high-grade astrocytomas from solitary brain metastases

Methods: This study was approved by the institutional review board and patient consent was obtained. Twenty-one high-grade astrocytomas and nineteen solitary brain metastases were retrospectively identified. The DKI parameter values (MK, Kr and Ka) and DTI parameter values (MD and FA) were measured from the tumoral enhanced part and peritumoral edema. All data were normalized to the values in the contralateral normal-appearing white matter (NAWM) at the same level, which was used for correction. Differences between the two groups were analyzed using one-way ANOVA test, and ROC curves were used to test for the best parameters.
Results: There was no age difference between high-grade astrocytomas and solitary brain metastases (P=0.580), while the Kr and Ka values in the contralateral NAWM decreased significantly in high-grade gliomas (P=0.022). The DKI values (MK, Kr and Ka) and DTI values (MD and FA) in tumoral enhanced parts did not show significant differences between two groups (P＞0.05). MK, Kr and Ka values in peritumoral edema with or without correction by NAWM were higher in high-grade astrocytomas than solitary brain metastases (P＜0.05), and MD values without correction was lower in high-grade astrocytomas than solitary brain metastases (P＜0.05). Ka (1.000) with correction by NAWM had the highest AUC, followed by MK (0.889), Kr (0.861), MD (0.793), the AUC of MK, Kr and Ka values were higher than that of MD value (P＜0.05). The optimal threshold for MK, Kr, Ka and MD with correction by NAWM for differentiating high-grade astrocytomas from solitary brain metastases were 0.369, 0.405, 0.483 and 2.067, respectively.
Conclusion: DKI resulted in better differentiation of high-grade astrocytomas from solitary brain metastases than DTI.

EPO-0210
探究 IVIM 在高级别胶质瘤与脑转移瘤瘤周水肿区的鉴别价值

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目的探讨体素内不相干运动扩散加权成像(IVIM)在高级别胶质瘤与脑转移瘤瘤周水肿区的差异与鉴别价值。方法收集 2017 年 06 月-2018 年 12 月,就诊于山西医科大学第一医院经病理证实的 34 例高级别胶质瘤(WHO III 级 14 例,WHO IV 级 20 例)和 32 例脑转移瘤(原发肿瘤为肺癌的有 22 例,食管癌 3 例,直肠癌 7 例)患者术前或放化疗前的 MRI 平扫、增强及 IVIM 检查资料,将 IVIM 图像导入后处理工作站,获得灌注系数 fast ADC(D*)、扩散系数 slow ADC(D)和灌注分数 fraction of fast ADC(f)及参数伪彩图,参考 MRI 平扫和增强图像测取瘤周水肿区(1cm 内)及对侧半卵圆中心的 D*、D 和 f 值,高级别胶质瘤和转移瘤肿瘤瘤周水肿区(1cm 内)的各参数值分别与对侧半卵圆中心的相应参数值相比获得相对参数值,即 r D*、r D、rf 值。应用 SPSS 22.0 统计学分析软件,所有数据经正态性检验后,应用独立样本 t 检验分析两组肿瘤间所选三个区域各参数的统计学意义。对两组肿瘤间存在差异的参数做 ROC 曲线分析,以确定诊断其最佳阈值,并计算敏感性、特异性和曲线下面积(AUC),评价各参数诊断高级别胶质瘤或转移瘤的效能。结果高级别胶质瘤肿瘤瘤周水肿区(1cm 内)的 D*值、r D*值均高于转移瘤相对应区域的 D*、r D*值,差异有统计学意义(P 均<0.05);高级别胶质瘤肿瘤瘤周水肿区(1cm 内)的 f 值、rf 值均低于转移瘤相对应区域的 f 值、rf 值,差异有统计学意义(P 均<0.05)。瘤周水肿区 D*值的 AUC(AUC=0.910,P<0.001,敏感性 100%,特异性 76.2%)。两组肿瘤的肿瘤瘤周水肿区(1cm 内)的 D 值、r D 值及二者对侧半卵圆中心的 D*值、D 值、f 值差异均无统计学意义(P 均>0.05)。

EPO-0211

Malignant transformation of a suspected low-grade glioma into hemorrhagic glioblastoma: a case report

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Background

By Common Consent, patients with low-grade gliomas (LGGs) have a more favorable clinical outcome than those with high-grade gliomas (HGGs) although patients with LGGs eventually die of either tumor progression or malignant transformation. Treatment regimen for LGGs remains controversial especially for those within important functional areas. Since tumor size and gross-total resection are independently correlated with malignant transformation of LGGs, treatment of small LGGs usually follows "watch and wait" strategy especially when tumor located at important functional zone and gross total resection might be at significant risk for complications. Here we present a case of malignant transformation of a followed-up suspected LGG into hemorrhagic glioblastoma on which emergent craniotomy was operated.

Case history

We report a case of a 34-year-old male, who was referred for complaints of tic of limbs 5 hours before. His physical examination was unremarkable. CT scan revealed a hypointensity lesion located on surface of left posterior parietal lobe which was indentified as a swollen gyrus on T2WI of MRI, LGG was suspected. The patient was treated with Sodium valproate and carbamazepine for the seizure and regular follow-up was prescribed. Nothing was remarkable in the following seven months until the next epileptic seizure accompanied by headache and loss of consciousness the next day. Rechecked CT scan showed irregular hyperintensity mass beneath cortex of left posterior parietal lobe associated with subarachnoid hemorrhage, surrounding edema and midline shift. MRI confirmed a heterogeneous mass hidden by hematoma. During emergent surgery, old hemorrhage was sucked away and light yellow tumor tissue was gross-totally resected just beneath the rotten-fish-like cortex. Glioblastoma multiforme (WHO IV) was diagnosed at pathologic exam, the patient received radiation and chemotherapy and was followed up annually.

Conclusion

Malignant transformation of LGGs might take much more less time than reported and hemorrhage can be a rare but disastrous complication. Given this way, the first choice of LGGs treatment modality is surgery whenever possible. The total resection may delay the onset of malignant transformation and avoid accidental complications while provides histological types and biologic behavior for further treatment plan. Follow up without surgery must be more carefully executed and explained more detailed to patients.

EPO-0212

Evaluation of heterogeneity in diffuse intrinsic pontine glioma using quantitative dual-layer CT and MR spectroscopy: a pilot study

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PORPOSE

To investigate the alterations of the attenuation values, effective atomic number (Z_{eff}), and iodine density (IoD) in diffuse intrinsic pontine glioma (DIPG), comparing to metabolic changes from MR spectroscopy. And to explore the relationships between imaging parameters and histopathological and genetic results.

METHOD AND MATERIALS

Data were collected from 9 patients with diffuse intrinsic pontine glioma by a dual-layer detector spectral CT scanner and a 3.0 T MR system. The attenuation values (HU), Z_{eff}, and IoD during artery phase (AP) were measured on all 9 patients. The region-of-interest (ROI) were placed on the whole tumor and different regions inside the tumor. Then eight of the patients underwent multi-voxel 1H-MRS and the NAA, Cho and Cr were measured accordingly. The correlations between imaging parameters from CT and metabolite contents were made by Spearman correlation analysis.

RESULTS

The patients are 5 males and 4 females with age range of 7-48 years (23.1 ± 14.5 years). Eight of the patients underwent surgery and had pathological and genetic testing results, including H3K27M, GFAP, and olig-2.

The only one patient with lower grade tumor showed a smaller deference in attenuation values, IoD and Z_{eff}. Two patients with negative H3K27M showed lower density difference (8.23 HU and 8.27 HU difference in 50-keV virtual monoenergetic) and lower Z_{eff} difference (0.10 and 0.06) than other six patients with positive H3K27M (HU difference 11.06-67.02, Z_{eff} difference 0.11-0.67).

There was no significant correlation between metabolite contents and attenuation values, IoD and Z_{eff} ($p>0.10$). While we found the trends of their relationships. The correlation coefficient of Cho/Cr with HU, IoD or Z_{eff} difference are 0.619, 0.587 and 0.537, respectively.

CONCLUSION

Attenuation values, IoD and Z_{eff} difference from dual-layer detector spectral CT may apply the information of tumor heterogeneity, which is important to indicate the malignancy of the tumor. Larger sample size is needed to support the relationships with metabolite contents and genes.

EPO-0213

Diffusion Kurtosis Imaging Reflects GFAP, TopoⅡα, and MGMT Expression in Astrocytomas

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Objective: Preliminary study of magnetic resonance (MR) diffusion kurtosis imaging (DKI) assessing the pathological glial fibrillary acidic protein (GFAP), TopoⅡα, and O 6-methylguanine-DNA methyltransferase (MGMT) expression in astrocytomas. **Materials and Methods:** This study was approved by the local ethics committee, and informed consent was obtained from all participants. Sixty-six cases with pathologically proven astrocytomas were enrolled in this study; of which, 34 were high grade and remaining 32 were low grade. They patients underwent conventional MRI head scan, DKI scan, and enhanced scan under the same conditions. Fractional anisotropy (FA) and mean kurtosis (MK) calculated from DKI, as well as GFAP, TopoⅡα, and MGMT expression level were compared prospectively between high and low-grade astrocytomas. Spearman rank correlation analysis was used for comparing values of DKI and GFAP, TopoⅡα, and MGMT expression level in the two groups. **Results:** The MK values were significantly higher in high-grade astrocytomas than those in low-grade astrocytomas ($P < 0.05$); FA values demonstrated no significant difference between the two groups ($P = 0.331$). GFAP expression level was significantly lower in high-grade astrocytomas than in low-grade astrocytomas ($P < 0.05$). Topo-Ⅱα expression level were significantly higher in high-grade astrocytomas than in low-grade astrocytomas ($P < 0.05$). There was no significant difference in MGMT expression level between the two groups ($P = 0.679$). MK values were negatively correlated with the expression of GFAP ($r = -0.836$; $P = 0.03$), however, they were positively correlated with the expression of Topo-Ⅱα ($r = 0.896$; $P = 0.01$). FA values were not correlated with the expression of GFAP ($r = 0.366$; $P = 0.05$), Topo-Ⅱα ($r = -0.562$; $P = 0.05$), and MGMT ($r = -0.153$; $P = 0.10$). **Conclusion:** MK, the DKI parameter values of astrocytomas, was significantly correlated to the expression of GFAP and TopoⅡα. To a certain extent, applying DKI may provide the biological behavior of tumor cell differentiation, proliferation activity, invasion and metastasis, and can guide individual treatment.

EPO-0214
磁共振动态对比增强联合弥散加权成像鉴别脑胶质瘤复发和治疗后反应的初步研究

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目的：
探讨磁共振动态对比增强联合弥散加权成像在鉴别胶质瘤复发和治疗后反应中的应用价值。
方法：
收集 32 例脑胶质瘤全切术+同步放化疗术后出现强化灶的病人（肿瘤复发 22 人，治疗后反应 10 人），在放化疗结束 2 个月内行常规 MRI 平扫+增强、DWI、DCE 灌注成像，原始数据经工作站后处

理获得 DCE 灌注伪彩图及 ADC 图，分别测量异常强化区所对应的 Ktrans、Kep、Ve、iAUC 及 ADC 值，采用秩和检验分析两组间各参数差异性，并绘制受试者工作特征(receiver operating characteristic，ROC)曲线，分别计算敏感度、特异度及曲线下面积，评估各参数的诊断能效。

结果：

复发组实性强化区 Ktrans 值和 iAUC 值明显高于治疗后反应组，且差异有统计学意义（P＜0.05），两组间 Ve 值和 Kep 值显著均无差异（P＞0.05）。Roc 曲线分析，当 Ktrans 值、iAUC 值阈值为 0.128、0.152 时，其曲线下面积分别为 0.973、0.941，灵敏度均为 95.5%，特异度分别为 90%、80%。治疗后反应组 ADC 平均值高于复发组，差异有统计学意义（P＜0.05）。Roc 曲线分析，当平均 ADC 阈值为 0.864 时，其曲线下面积为 0.864，灵敏度及特异度分别为 86.4%、80%。且 Ktrans 诊断效能高于 iAUC 及平均 ADC 值，在并联试验中，当 Ktrans 值＞0.128 或平均 ADC 值≤1.15 时，诊断胶质瘤复发的敏感度可以提高至 100%，特异度 81.8%；串联试验中，当 Ktrans 值＞0.128 且平均 ADC 值≤1.15 时，诊断胶质瘤复发的敏感度及特异度为 81.8%、90%。

结论：

应用 DCE-MRI 联合 DWI 成像技术可以有效鉴别诊断胶质瘤复发和治疗后反应，对指导临床治疗方案的选择以及预后评估提具有重要的价值。

EPO-0215

多 b 值 DWI 在 WHO II 级脑星形细胞瘤 IDH 基因型的诊断价值

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目的：探讨多 b 值弥散加权成像在 WHOII 级脑星形细胞瘤异柠檬酸脱氢酶（isocitrate dehydrogenase，IDH）基因型的诊断价值。材料与方法：回顾性分析 2015 年 1 月至 2018 年 12 月经手术病理确诊为星形细胞瘤 WHO Ⅱ级且有基因结果的患者资料，术前均行颅脑常规 MRI 扫描及多 b 值弥散加权扫描，通过后处理工作站获得水通道蛋白相关扩散系数（AQP-ADC）、纯扩散系数（D）、灌注相关扩散系数（D*）、灌注分数（f）等伪彩图，测量肿瘤实质区及同一层面对侧正常脑实质区的各个参数值，计算获得校正后的参数值（瘤体参数值除以对侧正常脑实质值）：相对水通道蛋白扩散系数（rAQP-ADC）、相对纯扩散系数（rD）、相对灌注相关扩散系数（rD*）、相对灌注分数（rf）等，应用两样本 t 检验分析同一病理级别不同基因分型之间的参数值差异，对有统计学意义的参数值绘制受试者工作特征(receiver operating characteristic，ROC)曲线，计算敏感度及特异度。结果：WHO Ⅱ级星形细胞瘤患者中，IDH1 突变组与野生组间的 AQP-ADC、D、D*、f、rAQP-ADC、rD、rD*、rf 等均无统计学意义（P＞0.05）；结论：研究发现 WHO Ⅱ级星形细胞瘤的各参数 AQP-ADC、D、D*、f 等在野生组和突变组之间均无统计学意义。

EPO-0216

儿童颅骨筋膜炎影像学表现及结局

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目的：颅骨筋膜炎属于筋膜炎的一种，比较罕见的良性颅骨肿瘤，对颅骨具有一定潜在侵袭性，在膨胀性头皮肿物中，鉴别诊断具有一定的难度，因此，本文通过认识其影像学多种表现及预后结局，旨在提高对该疾病的认识，及帮助临床医生对头皮及颅骨肿物的诊疗工作。
方法： 本研究收集 2011 年 1 月至 2018 年 12 月的 12 例手术后病理证实为颅骨筋膜炎的患者，并进行了 2-7 年随访。其中 3 例进行 MRI 检查，其中 1 例平扫及增强，9 例进行 CT 及超声检查。由 2 位儿科神经医师对颅骨筋膜炎的临床表现及影像学以及随访中的临床结局进行了归类总结。**结果：** 12 例患者，男，7 例，女，5 例，平均年龄 23.66 月，最小年龄 4 月，最大年龄 9.08 岁； 3 例出生发现病灶，6 例外伤后迅速增大，3 例无明显诱因；均进行手术切除；手术后 1 例在半年后复发，但生长缓慢，该例影像特征无骨质破坏，仅有软组织包块。病变位置：额顶交界处 3 例，颞顶交界处 2 例，人字缝旁 1 例，顶骨 3 例，颞骨 1 例，枕部 2 例。依据超声、CT 和 MR 影像学分 4 类：① 无骨质破坏，仅软组织包块，共 5 例；②骨质膨胀性破坏，破坏自颅骨外板至内板，无组织包块，共 3 例；③骨质梭形膨胀破坏，破坏自颅骨外板至内板，伴软组织包块，均可见其内残留条状骨片影，共 2 例；④骨质侵蚀性破坏，伴软组织包块，共 2 例，其中 1 例累颞骨岩部及中耳乳突。
结论：颅骨筋膜炎虽然为罕见病，但在婴儿、较小儿童皮下软组织包块鉴别诊断中应该常常考虑，临床上常有在外伤后短期迅速增长特征，其影像学表现多样，其骨质梭形膨胀性破坏，自外板向内板具有一定的特征性，且其内均可见其内残留条状骨片影，大多数结局良好，少数仅有皮下软组织包块有复发倾向。

EPO-0217

DSC and DCE histogram analysis for differentiation and survival analysis of diffuse glioma biomarkers including IDH, MGMT and TERT

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Abstract
Purpose: To evaluate the performance of parameters of dynamic susceptibility contrast magnetic resonance imaging (DSC)-MRI and histogram parameters derived from dynamic contrast-enhanced (DCE)-MRI in discriminating the states of molecular biomarkers and do survival analysis
Materials and Methods: Forty-three glioma patients who had undergone DCE-MRI and DSC-MRI for preoperative evaluation were respectively enrolled. The relevant immunohistochemical results and molecular test results of all patients were collected, including isocitrate dehydrogenase (IDH), O6-methylguanine-DNA methyltransferase (MGMT) and telomere reverse transcriptase (TERT). Parameters of DSC-MRI (cerebral blood volume(CBV), cerebral blood flow(CBF), mean transit time (MTT) and time to peak (TTP)) and histogram parameters derived from DCE-MRI(volume transfer coefficient (K_{trans}), fractional volume of the extravascular extracellular space (EES)(V_e),fractional blood plasma volume(V_p), rate constant between EES and blood plasma (K_{ep}) and area under the curve (AUC)) were calculated. The differences of each parameter between diffuse gliomas with different expression states (IDH mutation status, MGMT methylation status and TERT mutation status) were evaluated respectively using a Mann-Whitney U-test. The receiver operating characteristic (ROC) curve analysis was

performed to assess the diagnostic efficiency of these parameters. Kaplan－Meier method was used to calculate patient’s overall survival.
Results: Histogram parameters of DCE-MRI demonstrated better diagnostic performance in identifying different expression states of molecular biomarkers. The 10^{th} percentiles of K_{trans}($p<0.001$) and 10^{th} percentiles of AUC($p<0.001$) were significantly high in the mutation state of IDH. The 90^{th} percentiles of V_e ($p<0.001$), 50^{th} and median K_{trans} ($p<0.001$) were significantly high in the methylation status of MGMT. But for the mutation status of TERT, only K_{ep}-related values (75^{th} K_{ep}($p=0.001$) and mean K_{ep}($p<0.001$)) had remarkable differences. The results of ROC analysis indicated that the 10^{th} percentiles of AUC provided the highest differential efficiency (sensitivity =0.78, specificity=0.80) for IDH, 90th V_e returned the highest (sensitivity =0.84, specificity=0.79) for MGMT and mean K_{ep} provided the highest (sensitivity =0.76, specificity=0.78) for TERT. Kaplan－Meier curves showed a significant difference between subjects with 10th AUC higher or lower than 0.028 (log-rank=7.535; P=0.006)for IDH and between subjects with 90th Ve higher or lower than 0.178 (log-rank=6.532; P=0.011) for MGMT.
Conclusion: Histogram analysis of perfusion-weighted imaging can better assess diffuse glioma molecular typing and prognosis assessment.

EPO-0218
表观扩散系数直方图鉴别 WHOII、III 级胶质瘤分子亚型的价值

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目的 研究基于肿瘤实性成分和瘤周水肿区域的 ADC 信号灰度直方图鉴别 WHOII、III 级胶质瘤分子亚型的价值。**方法** 回顾经手术及病理证实为 WHOII、III 级胶质瘤，术前接受过头颅 MRI 平扫、增强及 DWI 检查的 55 例患者的病理及影像学资料。其中，IDH 野生（IDH^{wt}）组 14 例，IDH 突变不伴 1p19q 联合缺失（$IDH^{mut}1p19q^{int}$）组 19 例，IDH 突变伴 1p19q 联合缺失（$IDH^{mut}1p19q^{del}$）组 22 例。利用后处理软件生成并记录不同分子亚型组的 ADC 直方图参数，包括平均值、最小值、 ADC 各百分位（5、10、25、50、75、90、95）、最大值、众数、峰度、偏度、标准差、不均一性、极差、熵值，并采用独立样本 t 检验（正态分布）或 Mann-Whitney U检验（偏态分布）进行比较。采用 ROC 评价上述参数鉴别 WHO II、III 级胶质瘤不同分子亚型的效能。**结果** IDH^{wt}组的最小值、ADC5%小于 IDH^{mut}组（$P<0.05$）,而 IDH^{wt}的标准差、不均一性和极差则大于 IDH^{mut}组（$P<0.05$）。$IDH^{mut}1p19q^{int}$组的平均值、ADC5%、10%、25%、50%、75%、90%、95%及众数均高于 $IDH^{mut}1p19q^{del}$组（$P<0.05$），而 $IDH^{mut}1p19q^{int}$组偏度和峰度则低于 $IDH^{mut}1p19q^{del}$组（$P<0.05$）。不均一性鉴别 IDH^{wt}组和 IDH^{mut}组的效能最高，ROC 曲线下面积为 0.937，以 0.186 为截断值，敏感度和特异度分别为 92.9%和 82.5%；偏度鉴别 $IDH^{mut}1p19q^{del}$组和 $IDH^{mut}1p19q^{int}$组的效能高于其他参数，ROC 曲线下面积均为 0.821，以偏度为 0.185 鉴别二者的敏感度和特异度分别为 81.8%和 78.8%。**结论** ADC 信号强度直方图可以为 II、III 级胶质瘤的分子亚型的鉴别提供更多信息。

EPO-0219
GSH and GABA decreases in IDH1 mutated low-grade gliomas detected by HERMES spectral editing at 3.0T in vivo

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Purpose: To examine in vivo γ-aminobutyric acid (GABA) and glutathione (GSH) alterations in isocitrate dehydrogenase 1 (IDH1) mutated low-grade gliomas using Hadamard Encoding and Reconstruction of Mega-Edited Spectroscopy (HERMES).
Methods and materials: Twelve patients with suspected diagnosis of low-grade glioma were enrolled prospectively in this study; all subjects underwent a 3T MRI scan, including 3D T1 weighted imaging and HERMES acquisition with a volume of interest 3×3×3 cm^3. The GABA signal detected by HERMES also contains signal from macromolecules and homocarnosine, so it is referred to as GABA+. The detected GABA+ and GSH signals in tumor foci and contralateral cerebral regions were quantified using Gannet. The fitting errors of HERMES for GABA + and GSH were also analyzed. Paired t-test was performed to compare the GABA+ and GSH levels and FitError values between the tumor foci group and contralateral regions group in IDH1-mutant low-grade gliomas.
Results: Paired t-test revealed no differences in FitError values between glioma foci and contralateral regions (p=0.71 and p=0.74 for GABA+ and GSH respectively) Both GABA+ and GSH decreased significantly in glioma foci compared with contralateral regions (p=0.015, t=3.322; p=0.000, t=7.313 respectively) in IDH1-mutant low-grade gliomas.
Conclusion: Our results suggest HERMES is a reliable tool to simultaneously measure GABA and GSH alterations in low-grade gliomas with IDH1 mutation; noninvasive detection of GABA and GSH may prove to be a valuable diagnostic and prognostic biomarker of gliomas.

EPO-0220

Preoperative Detection of Parasagittal Meningiomas Classification with 3D Gadolinium-enhanced CUBE T1 Sequence

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Objective:According to the invasion degree of the superior sagittal sinus(SSS), Dr Sindou classified parasagittal meningiomas into six types. The surgical procedure for patients with parasagittal meningiomas may vary according to the sinus involvement. This paper evaluated the role of 3D gadolinium-enhanced CUBE T1 in preoperative classification of parasagittal meningiomas.
Methods:56 patients with parasagittal meningiomas were imaged with 3D gadolinium-enhanced CUBE T1 sequence before they received surgery of a total removal of meningiomas with/without SSS reconstruction. Two neuroradiologists independently assessed the images to decide the invasion degree including attachment to the outer surface of the SSS wall(CUBE I), one-wall invasion of SSS(CUBE II), two-wall invasion of the SSS(CUBE III) and total occlusion of SSS(CUBE IV) ; Disagreements were resolved

by discussion. All patients were operated on, and intraoperative findings were taken as the criterion standard.
Results:The use of 3D gadolinium-enhanced CUBE T1 imaging was found to provide an easy way to detect the SSS invasion degree by parasagittal meningiomas. The inter-observer agreement was very good(κ =0.831, 95% confidence interval 0.706－0.955) and the result after discussion was highly consistent with the surgical findings(κ =0.755, 95% confidence interval 0.602－0.908).
Conclusion:In preoperative planning for patients with parasagittal meningiomas, 3D gadolinium-enhanced CUBE T1 sequence could provide reliable information for parasagittal meningioma classification.

EPO-0221

Histogram Analysis of Magnetic Resonance Imaging in Differentiating Sellar Germinomas from Craniopharyngiomas

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Background and Purpose: Accurate differential diagnosis is essential for treatment planning of sellar germinoma and craniopharyngioma. We hypothesized that the histogram analysis of MRI would differentiating sellar germinomas from craniopharyngiomas.
Materials and Methods: We retrospectively appraised a pathology database for five years and obtained 20 histopathologically proven sellar germinomas and 48 craniopharyngiomas with MR images. The T_1WI and T_2WI, ADC maps, and contrast-enhanced T_1WI (CE-T_1WI) of each patient were analyzed with the Mazda software. Nine parameters were selected as indicators of comparison, including variance, skewness, kurtosis, mean, 1^{st}percentile, 10^{th}percentile, 50^{th}percentile, 90^{th}percentile, and 99^{th}percentile. The ROC curves were drawn for the parameters with significant group differences, and the area under the curve (AUC) was calculated.
Results: Among the nine parameters extracted using histogram analysis, the mean, skewness, 50^{th}percentile, and 90^{th}percentile of ADC map showed statistical significance with AUCs of 0.915, 0.890, 0.916, and 0.808, respectively. The optimum mean, skewness, 50^{th}percentile, and 90^{th}percentile of ADC map to distinguish sellar germinomas from craniopharyngiomas were 165.73 (with 87.5% specificity and 80.0% sensitivity), -0.13 (with 80.0% specificity and 87.5% sensitivity), 170.50 (with 83.3% specificity and 85.0% sensitivity), and 237.00 (with 81.3% specificity and 75% sensitivity), respectively. Here, we only analyzed the parameters with statistical differences between groups. Among these parameters, we chose specificity and sensitivity greater than or equal to 75% to accurately meet the clinical needs.
Conclusion: The T_1WI, T_2WI, ADC map, and CE-T_1WI histogram contributed to the identification of sellar germinomas and craniopharyngiomas. Besides, the ADC map histogram was more effective than other MRI sequence histograms.

EPO-0222

DSC-MRI and DCE-MRI in differentiating recurrent tumour from radiation-induced brain injuries in patients with glioma

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Objective To explore the clinical significance of dynamic susceptibility contrast (DSC) perfusion MRI and dynamic contrast-enhanced (DCE) permeability MRI in distinguishing radiation-induced brain injuries from recurrence in glioma patients. **Methods** Nineteen pathologically diagnosed glioma patients were performed MR scanning with DSC and DCE after surgery, before and after synchronous chemoradiotherapy. Hemodynamic parameter value were got, and the perfusion imaging results and the final clinical diagnoses were contrasted. The differential diagnostic values of the perfusion parameters were analyzed statistically. **Results** Eleven cases were recurrent glioma , while 8 cases were radiation-related injuries. The values of recurrent pateints including relative cerebral blood volume (rCBV), relative cerebral blood flow (rCBF), volume transfer constant (Ktrans), unit volume of extravascular extracellular space (Ve) and initial areas under the concentration curve (riAUC) were significantly higher than the radiation-induced brain injuries patients (all $P<0.05$). While there were no significantly statistical differences of Kep and Vp between glioma recurrence and radiation-induced injuries. Combining the optimal parameters rCBV with Ktrans in the differentiation diagnoses of the series and parallel tests, the sensitivity were 90.9%, 72.7% ;while the specificity were 75%, 100% respectively. **Conclusion** Both DSC and DCE can distinguish glioma recurrence from radiation-induced brain injuries. The parameters Ktrans, riAUC and rCBV values seems to be slightly efficient in diagnosis than rCBF and Ve, while combined with Ktrans and rCBV, the diagnostic accuracy may be improved.

EPO-0223

DOXCuS@iRGD-Albumin Nanotheranostic platform Guided Tumor-Targeted and Photoacoustic Imaging for Chemotherapy Photothermal Therapy in Orthotopic primary U87 gliomas mice model

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Objective

Herein, in this article, we present the fabrication of DCiB for glioma diagnosis and treatment nanotheranostic. Using biological sources albumin as the carrier, through covalent coupling with iRGD peptide, for having the initiative to the integrin αVβ3 receptors on the tumor vascular endothelial cell and the U87. For the subcutaneous U87 gliomas mice model and the orthotopic primary glioma mice model, the accumulation of DOX in tumor site play a role of chemotherapy through endocytosis combination of nucleic acid within the tumor cells. Besides, the CuS coupled carried by the system exhibited the function of photothermal effect and photoacoustic imaging in the theranostics treatment. The DCiB nanotheranostic platform combination the chemotherapy and photothermal therapy, and the noninvasive photoacoustic diagnostics for the efficacy and safety therapeutic regimes.

Method

We functionalize the albumin with tumor target function, and to integrate the copper sulfide mineralization on albumin carrier with photothermal function to build a copper based CuS@iBSA functional carrier. Chemotherapy drug doxorubicin loaded to construction of DOX/CuS@iBSA nanoparticles (DCiB) diagnosis and treatment integration system. Examining its physicochemical properties, pharmaceutical properties, photothermal behavior, targeting function, evaluation of efficacy in vitro and in vivo, and other experimental studies, aiming to evaluate the function of this targeted diagnosis and treatment system, and explore its photothermal function both in vitro and in vivo. Targeting function, and then investigate its therapeutic effect in animals, found that the scope of application and problems of the combination therapy, provide a certain basis for the future development and application of functional formulations. In this article, the functional parts of the DCiB nanotheranostic platform were synthesized, prepared and constructed. In detail, CuS@BSA was synthesized by biomineralization, iRGD-BSA was reacted with coupling reaction, DCiB was prepared by solution mixing with doxorubicin, and the near-infrared response of CuS@BSA was determined by UV-Vis absorption spectra.To further investigate the photothermal properties and photothermal conversion efficiency under different conditions by 980 nm laser irradiation; the safety was evaluated by MTT assays, hemolysis experiments, blood biochemistry, complete blood count (CBC) and pathological sections (H&E) from the cell, tissue and the animal level; its pharmaceutical properties were examined by TEM, particle size analysis, drug loading (DL), encapsulation efficiency (EE), and controlled release experiments in vitro; The targeted properties were performed by cell uptake experiments and in vivo subcutaneous tumor imaging experiments in mice. In imaging experiments, photoacoustic imaging experiments of orthotopic tumors in mice were performed to investigate their targeting in vitro and in vivo. By establishing two mice models of glioma subcutaneous and orthotopic tumors to evaluate the targeting combination therapy in vivo of the DCiB nanotheranostic platform.

Results

A copper based DCiB nanotheranostic platform was successfully constructed, the investigations on physicochemical properties, pharmaceutical properties, photothermal behavior, targeted functions, and the efficacy *in vitro* and *in vivo* evaluations were performed. The results are as follows: synthesis and characterization of CuS@BSA

nanoparticles, iRGD-BSA (BSA is 67 kD, and the modified iBSA is about 100 kD) was modified by iRGD, the active targeting functional vector. As a result, the monodispersity size measured by dynamic light scattering indicating the size of CuS NPs is 85 nm, and 5% drug loadings DCiB is 125 nm which revealed that successful integration of doxorubicin.
To investigate the photothermal conversion performance of CuS@BSA nanoparticles *in vitro* and *in vivo*. Different proportions (Cu/S 2:1, 1:1, 1:8, 1:16) perform a similar thermal responsiveness trend, along with the increase of irradiation time, temperature rise up around to 60-70 ° C. We measured the photothermal performance of CuS@BSA (10 mg/mL) under the different output power density (0.04, 0.5, 1.5, 2, and 2.3 W/cm^2). The solution temperature was significant increased when power density above 1.5 W/cm^2, which guide the selection of power of photothermal therapy *in vitro* and *in vivo*. The photothermal conversion efficiency (η) of CuS@BSA NPs was 49.8%.
Hemolysis experiments, MTT assays, blood biochemistry *in vivo*, and blood cell count tests validated their blood safety shows that it has good biocompatibility.
The system has performed the proper pharmaceutical properties, a certain drug carrying capacity and sustained release ability. The system showed good chemo-photothermic therapy combined treatment effect in cell experiments of tumor cells U87 *in vitro*. The system showed obvious targeting of different imaging modalities in cells and different animal models (subcutaneous and Orthotopic primary U87 gliomas mice model) *in vitro* and *in vivo*. Anticancer activity of the combination in mouse subcutaneous and orthotopic primary glioma models, the combination therapy targeted group (DCiB + NIR) showed statistically significant compared to PBS and chemotherapy/ photothermal therapy groups. ($p^{**} < 0.01$), thermal therapy with chemotherapy could eventually cover the whole tumor lesions.

Conclusion
Over all, photoinduced tumor thermal ablation were intensely investigated. We ascertain that copper sulfide as the PTT agents performed good treatment effect on superficial solid tumor. The combination therapy method reduces the frequency of chemotherapy. It must be mentioned that and CuS@BSA exhibited more accurate photoacoustic imaging with the mediating of iRGD. Nevertheless, the PTT on the orthotopic primary tumor including glioma, lung cancer is still needing to be further explored.

EPO-0224
弥散峰度成像对脑胶质瘤术前分级的诊断价值及相关性研究

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目的探讨弥散峰度成像(DKI)对脑胶质瘤术前分级的诊断价值及相关性。**方法**对经病理证实的 31 例脑胶质瘤病人依据病理分为低级别组 13 例，高级别组 18 例。行 DKI 扫描，经后处理分别得到 DKI 相关参量图。DKI 选择肿瘤实性部分和对侧正常脑白质，分别测量平均弥散峰度(MK)、径向弥散峰度(Kr)、轴向弥散峰度(Ka)和部分各向异性(FA)、平均扩散系数(MD)参数值，并计算同对侧正常脑白质校正后的相对参数值。采用两样本 t 检验，分别分析 MK、Kr、Ka、FA、MD 以及 rMK、rKr、rKa、rFA、rMD 在不同级别脑胶质瘤中有无差异，以及差异有无统计学意义。采用

Spearman 等级相关分析 rMK 值及病理级别之间的相关性。**结果** MK、Kr、Ka、FA 的数值随着胶质瘤级别增加有所升高，MD 随着随着胶质瘤级别增加下降。校正之前，MK、Kr、Ka 值在不同病理级别的胶质瘤差异有统计学意义(*P* 分别为 0.004、0.011、0.008)，FA、MD 值在不同病理级别胶质瘤的差异不具有统计学意义(*P* 分别为 0.17、0.15)。校正之后，rMK、rKr、rKa、rFA、rMD 值在不同病理级别的胶质瘤的差异均有统计学意义(*P* 分别为 0.002、0.003、0.007、0.012、0.012、0.007)。*Spearman* 相关分析显示 rMK 值与病理级别呈正相关(*r*=0.593，*P*=0.002)。**结论**(1) DKI 各参数 MK、Kr、Ka 可用于胶质瘤术前分级，各相对参数 rMK、rKr、rKa、rFA、rMD 均可用于胶质瘤术前分级。(2) rMK 值、胶质瘤病理级别之间呈正相关。

EPO-0225

3.0T 磁共振氢质子波谱对脑胶质瘤放射性损伤与复发鉴别诊断分析

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目的 探讨 3.0T 磁共振氢质子磁共振波谱在脑胶质瘤放射性损伤与复发鉴别诊断中的价值。 方法 回顾性分析 24 例脑胶质瘤患者术后、放疗后复查的氢质子磁共振波谱资料，其中 15 例为放射性损伤， 9 例为脑胶质瘤复发。利用 Philips 后处理工作站(EWS)进行波谱分析，分别得到强化区、周围水肿区、对侧正常白质区的 Cho/Cr、 NAA/Cr、 Cho/NAA 比值。 结果 胶质瘤复发者强化区与水肿区 Cho/Cr、 Cho/NAA 比值高于放射性损伤者(P<0.05)。胶质瘤复发者强化区与水肿区 Cho/Cr 比值分别为 3.50±1.10 和 1.95±0.66；其 Cho/NAA 比值分别为 4.42±1.98 和 2.14±1.11。放射性损伤者强化区与水肿区 Cho/Cr 比值分别为 1.80±0.21 和 1.20±0.26；其 Cho/NAA 比值分别为 1.69±0.37 和 0.84±0.24。强化区 Cho/Cr 比值的诊断敏感性及特异性分别为 93.3%和 100%，而水肿区为 66.7%和 88.9%； Cho/NAA 比值的敏感性及特异性分别为 86.7%和 100%，而水肿区为 73.3% 和 77.8%。NAA/Cr 比值无统计学意义(P>0.05)。 结论 3.0T 磁共振氢质子磁共振波谱分析在脑胶质瘤放射性损伤与复发鉴别诊断中有重要价值，可以明显提高鉴别诊断的正确率。

EPO-0226

Conventional MRI abnormalities associated with recurrent pattern and poor outcomes in GBM patients: a retrospective study

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Purpose To investigate the significance of preoperativeconventional MRI abnormalitieson patterns of recurrence and outcomes in patients with GBM.
Methods Sixty-five patients with recurrent GBM were retrospectively evaluated. Conventional MRI including T1W, T2W, FLAIR, DWI and T1W contrast images were acquired for all patients preoperatively. Quantitative MRI features were extracted using

VASARI featurescriteria. Recurrence patterns were defined in T1W contrast images. Progression free and overall survival was determined for patients with different patterns.Potential risk factors for outcomes were assessed using univariate models followed by multivariate analysis.
Results Thirty VASARI features were identified in all cases. The recurrence pattern in these cases was local in 49/65 (75.4%) and distant in 16/65 (24.6%). VASARI features including Definition of the non-enhancing margin (F13), Cortical involvement (F20) and Deep WM invasion (F21) overlapped with recurrence patterns. Kaplan–Meier analysis revealed inferior progression free survival (PFS) in patients with an Age over 48 or with an irregular non-enhancing margin compared to those without, despite similarities between the groups in terms of IDH status, performance status, and F20, F21 status. Followed cox multivariate analysis revealed F13 was an independent prognostic factor on PFS in recurrent GBM patients.
Conclusions The presence of conventional MRI based features were associated with the location of tumor recurrence as demonstrated by frequent overlap in this series, and was associated with a trend toward inferior outcomes. This may indicate warrants consideration with respect to treatment planning.

EPO-0227
灌注相关的磁共振成像技术在脑胶质瘤 分级诊断中的应用

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目的通过对比 3D-pCASL、DCE 及 eDWI 在胶质瘤分级诊断中的准确性，探究联合这三种技术能否进一步提高其准确性，并探讨各灌注指标间及与 Ki-67 间的相关性。
方法 33 例病理证实胶质瘤患者术前均行常规序列、3D-pCASL、DCE 和 eDWI 扫描，获得 CBF、K^{trans}、K_{ep}、V_e、V_p、D*、D、f 及 ADC 等参数。结合 3D T1WI 增强，在肿瘤灌注最高的区域和对侧正常半卵圆中心放置 ROI，分别测量相应的参数，以及相对参数 rCBF、rD*、rD、rf 及 rADC，比较高、低级别组间的各参数，并进行 ROC 分析。联合分级时，使用二分类 Logistic 回归和支持向量机（SVM）分类方法。采用双变量相关分析，探究各灌注参数间以及与 Ki-67 之间的相关性，采用一般线性回归获取与 Ki-67 相关的参数。
结果在高级别胶质瘤肿瘤实质区，rCBF、K^{trans}、V_e、V_p和 rD*值均明显高于低级别，而 rD、rf 和 rADC 值明显低于低级别（均 P <0.05）。ROC 显示 rCBF、K^{trans}、V_e、V_p和 rD*具有较好的诊断意义，K^{trans}的准确性最高。联合时，二分类 Logistic 回归显示仅 K^{trans}具有最佳的诊断效能；SVM 显示，联合 rCBF、K^{trans}、K_{ep}和 rD*可以进一步提高其准确。rCBF 与 rD*、K^{trans}与 rD*、V_e与 rD*间存在明显正相关关系（均 P<0.05）。各灌注参数与 Ki-67 间的相关分析显示，仅 V_e与 Ki-67 的相关性更为显著（P=0.001）。
结论 3D-pCASL、DCE 和 eDWI 在鉴别高、低级别胶质瘤方面具有很好的诊断价值，DCE 最佳，eDWI 次之，优于 3D-pCASL。联合三种磁共振成像技术可以进一步提高鉴别的准确性。rCBF 与 rD*、Ktrans 与 rD*、Ve 与 rD*具有相关性。Ve 与 Ki-67 之间具有很好的相关性，能反映肿瘤的增殖能力。

EPO-0228

定量磁敏感成像及纹理分析结果在星形细胞瘤分级诊断中的应用价值

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目的：新生血管的增殖在恶性肿瘤中起着重要的作用，肿瘤中的出血和微出血与其密切相关。定量磁敏感成像 QSM 对血液降解产物中的顺磁性的铁具有很高的敏感性。该研究的目的在于评估 QSM 图像的测量结果及其纹理分析的结果在星形细胞瘤分级诊断中的应用价值。
材料和方法： 42 例星形细胞瘤病人行常规磁共振成像和 QSM 成像，其中 QSM 图像由 GRE 图像采用形态辅助偶极子反转方法重建得到。在 T1 增强或 T2 图像上画 ROI 取整个肿瘤的相对磁化率的平均值。分别对高低级别及 II、III、IV 级星形细胞瘤的磁化率平均值进行两两间比较。将 42 例病人随机分为培训组和检验组。将图及 ROI 载入 MaZda 软件采用线性判别分析进行纹理分析，并得到最大判别因子 MDF。建立 ROC 曲线判断培训组数据诊断的准确性并根据分界值判断检验组数据诊断的准确性。
结果：肿瘤内 QSM 高信号随着肿瘤级别的增高而增多。基于整个肿瘤的平均磁化率值，可以鉴别高、低级别（p=0.0018），II 级和 IV 级（p=0.004），III 级和 IV 级星形细胞瘤（p=0.048），但不能有效鉴别 II 级和 III 级的星形细胞瘤。对 QSM 图进行纹理分析，培训组数据的 MDF 值在高低级别，II、III 级别，II、IV 级别，III、IV 级别的星形细胞瘤之间均有统计学差异。对于 QSM 图的检验组数据进行纹理分析，鉴别高低级别星形细胞瘤的正确率可以达到 95%，对 II、III、IV 级别的星形细胞瘤鉴别正确率为 80%。对 FLAIR 图进行纹理分析，培训组数据的 MDF 值在高低级别，II、IV 级别，III、IV 级别的星形细胞瘤之间有统计学差异，但不能有效鉴别 II、III 级的星形细胞瘤。对于 FLAIR 图的检验组数据进行纹理分析，鉴别高低级别星形细胞瘤正确率为 85%。
结论：QSM 图可以为星形细胞瘤的分级诊断提供更多的信息，纹理分析可能成为对星形细胞瘤分级极为有帮助的工具。

EPO-0229

Tumor microvascular normalization enhancing CAR-T immunotherapy to glioblastoma

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Abnormal tumor vasculature not only hinders the infiltration of chimeric antigen receptors T (CAR-T) cells into the tumor parenchyma, but also suppresses the CAR-T function in tumors. Thus, tumor microvascular normalization based on anti-angiogenesis may enhance CAR-T immunotherapy to solid tumors. However, lacking the effective non-invasive tracking methods for monitoring tumor microvascular remodeling window to determine the right time to transplant CAR-T cells, which laid difficulties to apply and develop this new CAR-T therapeutic strategy. Based on our previous studies that IL13R2α-CAR-T therapy in glioblastoma, we evaluated the effects of treatment with lower-dose bevacizumab on NOD-SCID mice orthotopic glioblastoma model by 7.0 T MRI, and obtained the imaging biomarkers of tumor microvascular normalization to determine the right time to transplant CAR-T cells. And we used the ultrasmall superparamagnetic iron oxide labeled cell tracking technique with MRI to evaluate the penetration and persistence of CAR-T cells in tumor, and functional MRI to assess the therapeutic

effect. We establish a combinational regimen that synchronizes CAR-T therapy with tumor vascular normalization, which increased intratumoral infiltration, proliferation and cytotoxicity of CAR-T cells, reduced tumor volume and increased survival. In addition, we establish an imaging platform and evaluation system for in vivo tracking of tumor vascular normalization enhancing CAR-T immunotherapy to glioblastoma. These findings offer hope of developing new approaches that could enhance CAR-T therapy in solid tumors.

EPO-0230

弥漫性星形细胞瘤的少见 MRI 表现

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目的　研究弥漫性星形细胞瘤的少见 MRI 表现，提高对本病的认识。方法　收集 2013-2 至 2019-7 经手术病理证实的 175 例弥漫性星形细胞瘤的术前 MRI，回顾性分析其少见表现。结果　弥漫性星形细胞瘤的少见表现主要有：①肿瘤位于侧脑室、穹隆、顶盖、皮层下等少见部位；②肿瘤沿锥体束浸润蔓延生长；③肿瘤呈囊性，可见出血及液平；④肿瘤呈纯囊样表现；⑤肿瘤实质在 T2W 呈稍低/等信号，且有清晰边界；⑥表现为脑内多发肿瘤。结论　弥漫性星形细胞瘤 MRI 表现在弥漫浸润的典型表现的基础上，具有多样性及复杂性，熟悉肿瘤的少见表现，有助于诊断、鉴别诊断及对预后的判断。

EPO-0231

三维准连续动脉自旋标记在鼻咽部良恶性病变鉴别诊断中的价值

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目的：
探讨三维准连续动脉自旋标记（three-dimensional pseudo continuous arterial spin labeling，3D PCASL）技术对鼻咽部良恶性病变的诊断及鉴别诊断价值。
方法：
选择 2017 年 3 月至 11 月临床怀疑鼻咽癌的患者 40 例，男 28 例、女 12 例，中位年龄 45 岁。所有患者均进行常规磁共振成像及三维准连续动脉自旋标记成像。患者 MR 检查后短期内均行鼻咽部活检；根据不同病理结果分为 2 组，A 组为鼻咽癌（NPC）组，B 组为鼻咽慢性增生性炎症(NPH)组。测量 2 组 3D PCASL 血流量(BF_{ASL})图像上肿瘤区域的 BF 值，比较鼻咽癌与鼻咽慢性增生性炎症的 BF_{ASL} 值差异。
结果：
40 例中完成 3D PCASL 的患者中共 37 例完成数据统计，其中 3 例(A 组 2 例，B 组 1 例)因病灶较小无法准确测得 BF 值不参与数据统计。在 BF_{ASL} 图像上，A 组肿瘤表现为明显高灌注，B 组肿瘤表现为中、低灌注。A 组的平均 BF_{ASL} 值为 126.86±17.90 ml/(100g.min)，B 组的平均 BF_{ASL} 值为 94.94±13.40 ml/(100g.min)05）。，NPC 组的平均 BF_{ASL} 值明显大于 NPH 组，两者之间有明显的统计学意义（P<0.
结论：

3D PCASL 技术有助于鼻咽癌的诊断，不同 BF_{ASL} 值对鼻咽癌及鼻咽部慢性炎症具有一定的鉴别诊断价值，BF_{ASL} 值在鼻咽部良恶性疾病鉴别诊断方面具有潜在的重要临床参考价值。

EPO-0232
3D PCASL 联合 DWI 技术在鼻咽癌放化疗疗效评估中的应用

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目的：
探讨 3D PCASL 联合 DWI 技术在鼻咽癌近期放化疗疗效评估中的应用价值。
方法：
搜集 2018 年 5 月至 2019 年 4 月经鼻咽镜活检病理证实的鼻咽癌患者共 38 例。所有患者均于治疗前行 MRI 平扫、DWI 检查、3D PCASL 检查及增强检查。DWI 图像及 3D PCASL 图像经后处理并测量得到相应的 ADC 值及 BF 值。检查结束后进行诱导化疗和同步放化疗。于同步放化疗结束 6 个月后再次进行上述检查。根据肿瘤缓解情况，将患者分为治愈组和残留组。分析两组治疗前后 DWI 及 3D PCASL 参数的相关性。
结果：
治愈组治疗前 ADC 值较残留组低(P＜0.05)，BF 值较残留组高，差异有统计学意义(P＜0.05)。ADC 值和 BF 值预测诱导化疗和同步放化疗结束后 6 个月疗效的受试者工作特征(ROC)曲线下面积(AUC)分别为 0.68、0.82(P 值均＜0.05)。
结论：
治疗前 DWI 及 3D PCASL 定量参数值可对鼻咽癌患者诱导化疗 + 同步放化疗的近期疗效进行预估，为患者的个体化、精准化治疗方案提供参考依据。

EPO-0233
阻塞性睡眠暂停患者全脑功能网络属性改变

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目的： 利用静息态功能磁共振（rs-fMRI）探究阻塞性睡眠呼吸暂停（OSA）患者全脑功能网络属性改变。
方法： 对 2016 年 1 月至 2018 年 1 月经东南大学附属中大医院耳鼻咽喉头颈外科就诊的 OSA 患者 33 名，以同期招募的 29 名社区健康志愿者为对照组。两组受试者均行功能磁共振成像，对所有被试采集到的静息态磁共振血氧水平依赖（BOLD）数据进行后处理。应用 GRETNA 软件配准到自动解剖名称标记（AAL）模板，构建 N×N（N=90）的 Z 值矩阵，构建全脑功能网络，以连接矩阵的稀疏度为阈值，在 0.1~0.2 范围内（步长 0.01），比较两组全脑功能网络属性改变。相关参数：聚类系数 C_p，γ，λ，σ，全局效率 E_{glo}，局部效率 E_{loc}，节点参数等。所有被试者均于耳鼻喉头颈外科进行多导睡眠监测（PSG）、一般资料及量表测定，获得睡眠呼吸暂停低通气指数（AHI）、氧减饱和度指数(ODI)、简易精神量表（MMSE）、埃普沃思嗜睡量表（ESS）等。
结果： OSA 组 BMI、AHI、ODI、ESS 均显著高于对照组，MMSE 低于对照组（均 P＜0.001）。OSA 组与对照组均具有“小世界”属性，且“小世界”属性与全局属性未见显著统计学差异（P>

0.05），左侧后扣带回、颞中回，右侧额叶、楔叶局部节点属性较正常对照组有显著统计学差异（$P<0.05$）。

结论： OSA 患者全脑功能网络“小世界”属性及全局属性未见明显受损，OSA 疾病未对脑功能网络全局信息整合造成明显影响，但是部分脑区节点属性仍然存在异常，局部信息传递功能受损。

EPO-0234

MRI value of pterygopalatine fossa invasion of nasopharyngeal carcinoma(Micro-Course competion)

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Objective The pterygopalatine fossa (PPF) is a major neurovascular crossroad between the oral cavity, nasal cavity, nasopharynx, orbit, masticator space, and the middle cranial fossa. This study is to explore the MRI features of PPF and its communication structures invasion of nasopharyngeal carcinoma (NPC).

Methods MRI images of 45 cases pathologically proved NPC with PPF involvement were analyzed retrospectively。

Results Fifty-three PPF invasion were found in the 45 NPC cases. The common MRI features of NPC with PPF invasion were as follows: the disappearance of normal fat signal in the PPF in 45 cases, the enlargement of PPF in 30 cases, and bone structure destruction of PPF in 27 cases. Invasion of PPF directly took place in 7 cases, from nasopharynx via palatovaginal canal in 4 cases, from nasal cavity via sphenopalatine foramen in 3 cases and from oral cavity via greater palatine canal in 1 case. From the PPF, the tumor extended into foramen rotundum in 4 cases, in which further into cavernous sinus in 1 case, via the inferior orbital fissure into the orbit in 3 cases, via the canales pterygoideus into the middle cranial fossa in 3 cases and via the pterygomaxillary fissure into the infratemporal fossa in 4 cases.

Conclusion MRI can show characterized apperance for PPF and its tiny communication structures involvement of NPC, which is important for prognosis and radiation treatment planning

EPO-0235

黄金角轮辐状稀疏平行（GRASP）动态容积增强 MRI 对鼻咽癌裸鼠模型早期抗血管治疗疗效的评估价值

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目的：探讨黄金角轮辐状稀疏平行（Golden-Angle Radial Sparse Parallel，GRASP）动态容积增强 MRI 在鼻咽癌裸鼠皮下移植瘤早期抗血管生成治疗效果的评价价值。**方法：**建立鼻咽癌裸鼠皮下移植瘤模型，种瘤 2 周后，实验组（10 只）腹腔给药贝伐单抗（10mg/kg），对照组（10 只）给予等量的生理盐水。治疗 3 周后行 GRASP 动态容积增强 MRI 检查。检查后取肿瘤标本分析肿瘤组织微血管密度（MVD），肿瘤细胞增殖和 BcL-2 凋亡蛋白表达情况等。**结果：**实验组荷瘤鼠的肿瘤生长

速度、瘤体大小、重量均较对照组减小，实验组治疗后肿瘤组织信号-时间曲线显示其强化峰值时间明显低于对照组，差异有统计学意义（P < 0.05）。实验组 MVD，肿瘤细胞增殖指数和 BcL-2 凋亡蛋白表达情况均低于对照组，差异有统计学意义（P < 0.05）。**结论：**GRASP MRI 动态增强成像能够在自由呼吸下更快速更简便实现图像信息采集，同时其高的时间分辨率能够较精准反映肿瘤微循环灌注情况，是评价肿瘤抗血管生成治疗疗效的可靠方法，具有重要临床应用价值。

EPO-0236

The Value of MRI Texture Analysis to Evaluate the Effect of Radiotherapy for Nasopharyngeal Carcinoma

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Objective: To evaluate the value of MRI texture analysis in evaluating radiotherapy effect of nasopharyngeal carcinoma (NPC).
Materials and methods: the MRI images of 71 patients with nasopharyngeal carcinoma confirmed by pathology were retrospectively analyzed. The therapeutic effects were evaluated by two experienced radiologists according to the follow-up results. According to the curative effect, it was divided into residual group (25 cases) and non-residual group (46 cases).All patients' T1WI (71 cases), fat suppression T2WI (71 cases), TIWI enhanced (54 cases), DCE (33 cases) and IVIM (33 cases) images were collected. After processing IVIM and DCE images in AW4.6 workstation, the parameters ADCstand of IVIM based on single exponential model, ADCfast, ADCslow, Fraction of ADCfast based on double exponential model and Ktrans, Kep, Ve, MaxSlope, CER, IAUGC, Bolus Arrival Time of DCE are calculated. At the same time, Omni-Kinetics Version V2.06 software was used to analyze the texture of T1WI, fat suppression T2WI and TIWI enhancement images. The correlation parameters of gray level co-occurrence matrix and run length matrix were calculated and analyzed statistically.
Results: The subjective effect evaluation and objective data measurement of the two observers are in good agreement (P < 0.001). In T2WI image texture analysis, the mean value and entropy were significantly different between the residual group and the non-residual group (P < 0.05).The area under the ROC curve , ensitivity and specificity of the meanvalue and entropy are 0.349, 52.0%, 15.2% and 0.628, 48%, 73.9%, respectively. However, the parameters of other sequences have no statistical significance (P > 0.05). **Conclusion:** T2WI image texture analysis plays an important role in evaluating the radiotherapy effect of nasopharyngeal carcinoma (NPC). Entropy is most effective in evaluating the radiotherapy effect and it can be used as a imaging marker to evaluate the radiotherapy effect of nasopharyngeal carcinoma.

EPO-0237

Diffusion Kurtosis Imaging and Intravoxel Incoherent Motion MR Imaging in the Differentiation of Four Histological Types of Sinonasal Malignant Tumors

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Purpose: To evaluate the usefulness of diffusion kurtosis imaging (DKI) and intravoxel incoherent motion (IVIM) in the differentiation of sinonasal malignant tumors with different histological types.
Methods: 65 patients with sinonasal malignancies who underwent DKI and IVIM were enrolled in this retrospective study, including 27 squamous cell carcinomas (SCCs), 13 olfactory neuroblastomas (ONBs), 14 malignant melanomas (MMs) and 11 lymphomas. The kurtosis (K) and diffusion coefficient (Dk) from DKI and the pure diffusion coefficient (*D*), pseudo-diffusion coefficient (*D**), perfusion fraction (*f*) and the product of *D** and *f* (*f*·*D**) from IVIM were measured. Kruskal-Wallis and Dunn multiple comparison tests with Bonferroni correction, receiver operating characteristic curve and logistic regression analyses were used for statistical analysis.
Results: Lymphomas demonstrated highest K values but lowest Dk, *D*, *D**, *f* and *f*·*D** values among these four malignant tumors. ONBs exhibited high K values and MMs had highest *D**, *f* and *f*·*D** values. The cutoff value $\leqslant 0.887 \times 10^{-3}\ mm^2/s$ for *f*·*D** provided a sensitivity, specificity and an accuracy of 100%, 98.1% and 98.5%, respectively, for differentiating lymphomas from other three entities. The combination of *f*·*D** and *D* values showed a sensitivity of 92.9% and a specificity of 92.5% for the discrimination of MMs from ONBs and SCCs. The K value was useful for differentiating ONBs from SCCs, with a threshold value of 0.942 (sensitivity, 84.6%; specificity, 63.0%).
Conclusion: The combined use of DKI and IVIM is helpful for differentiating among four histological types of sinonasal malignant tumors.

EPO-0238

Differentiation of Amelanotic Sinonasal Mucosal Malignant Melanomas from Sinonasal Carcinomas Using Whole-tumor Histogram Analysis of Diffusion Kurtosis Imaging and Intravoxel Incoherent Motion

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Objective: To evaluate the value of whole-tumor histogram analysis of diffusion kurtosis imaging (DKI) and intravoxel incoherent motion (IVIM) in the differentiation of amelanotic sinonasal mucosal malignant melanomas (SNMMMs) from squamous cell carcinomas (SCCs).
Methods: DKI and IVIM were performed in 12 patients with amelanotic SNMMMs and 26 patients with SCCs. The whole-tumor histogram metrics were calculated on DKI (diffusion kurtosis [K], diffusion coefficient [Dk]) and IVIM (pure diffusion coefficient [*D*], pseudo-diffusion coefficient [*D**], perfusion fraction [*f*]) parametric maps. The Student's *t*-tests, ROC curve and multivariate stepwise logistic regression analyses were used for statistical analysis.
Results: Significantly higher mean, median, 75th and 90th percentiles of K, skewness of *D*, mean, median, 90th percentile and kurtosis of *D**, 75th and 90th percentiles of *f*

were found in amelanotic SNMMMs than in SCCs (all $P < 0.05$). Higher 75th percentile of K (β coefficient = 0.007; OR = 1.007, 95% CI = 1.001-1.012; $P = 0.026$) and skewness of D (β coefficient = 0.209; OR = 1.232, 95% CI = 1.001-1.518; $P = 0.049$) were independently indicators for the differentiation of amelanotic SNMMMs for SCCs. The combination of 75th percentile of K and skewness of D can improve the diagnostic performance with a sensitivity and specificity of 75.0% and 80.8%, respectively, for differentiating these two malignant tumors.
Conclusions: Whole-tumor histogram analysis of DKI and IVIM are valuable for differentiating amelanotic SNMMMs from SCCs. The 75th percentile of K and skewness of D were independent predictors for distinguishing between them.

EPO-0239

Predictive Value of DCE-MRI to Tumor Regression and Sensitivity after Concurrent Chemoradiotherapy for Nasopharyngeal Carcinoma

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Objective: To study the predictive value of DCE-MRI to tumor regression and sensitivity after concurrent chemoradiotherapy for nasopharyngeal carcinoma. **Method:** 45 patients who were diagnosed with nasopharyngeal carcinoma from June 2017 to December 2017 were enrolled in the study. All the patients received MRI examination before chemotherapy and were given intensity-modulated radiotherapy after 2 cycles of induction chemotherapy. The quantitative parameters before chemotherapy, at 50 Gy of radiotherapy and at the end of radiotherapy were compared; the correlation of the quantitative parameters and RSO during chemo-radiotherapy was studied and all the patients were divided into the sensitive group, the efficacy intermediate group and treatment resistant group according to RSO and symptoms, and the parameters at 50Gy in patients with different sensitivities were compared. **Results:** The parameters of Ktrans, Kep and Ve in the nasopharyngeal carcinoma area were significantly higher than those in the lateral pterygoid muscle (P<0.05); Ktrans had the highest sensitivity and Kep had the highest specificity; the Ktrans and Kep values after treatment were significantly lower than those before treatment, and Ve after treatment was significantly increased (P<0.05); at 50Gy, the Ktrans was negatively correlated with RSO (r=-0.613 P<0.05), the Kep was negatively correlated with RSO (r=-0.626 P<0.05), and the Ve was not correlated with RSO (r=0.022 P=0.887). The Ktrans and Kep in the sensitive group were significantly higher than those in the efficacy intermediate group and the treatment resistance group (P <0.05). Although the Ve of the sensitive group was slightly lower than those in the efficacy intermediate group and the treatment resistance group (P>0.05). **Conclusion:** The quantitative DEC-MRI is applicable to effectively evaluate the efficacy of chemo-radiotherapy in patients with nasopharyngeal carcinoma, predict the tumor regression and treatment sensitivity of nasopharyngeal carcinoma after treatment, and may provide more reliable data for efficacy assessments and predictions of nasopharyngeal carcinoma.

EPO-0240
多参数 MRI 在鼻咽部良性淋巴组织增生性病变中的诊断价值

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目的:
探讨鼻咽部良性淋巴组织增生性病变的 MR 表现，以提高诊断准确性。
方法:
回顾性分析 83 例经活检病理证实为鼻咽部良性淋巴组织增生患者的 MR 平扫、增强扫描，分析其生长方式、MRI 信号特点、强化方式及 DWI 表现，并统计对比增强率ΔT1【（增强后 T1 值-增强前 T1 值）/增强前 T1 值】。
结果:
83 例鼻咽部良性淋巴组织增生性病变中，100%（83/83）可见鼻咽部完整粘膜显示，鼻咽两侧壁均受累者占 65 %(54 / 83)， 仅累及一侧壁者 35 %(29/83)，均无邻近结构浸润。病变 T1WI 呈等信号，T2WI 呈稍高或高信号，47%(39/83) 信号较均匀，53%(44/83)信号不均、伴囊变，未见坏死。增强后，44%(37/83)呈中度较均匀强化，55%(46/83)呈中度不均匀强化，对比增强率ΔT1 为 1.23 土 0.54。DWI 呈等或稍高信号，ADC 为低信号。
结论:
鼻咽部良性淋巴组织增生性病变 MR 具有一定表现，结合 MRI 平扫及增强有助于提高诊断准确性。

EPO-0241
弥漫性喉部疾病的鉴别诊断（中文论文比赛）

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目的 探讨 CT 图像影像学特征在鉴别弥漫性喉部疾病中的应用价值。 **方法** 筛选 CT 平扫及增强扫描且经手术病理证实的累及喉部两个及三个区域的病例，共 60 例。其中喉癌 20 例，喉淋巴瘤 14 例，喉乳头状瘤 15 例，喉结核 11 例。分析其发病年龄、累及范围、强化程度、喉部侵犯、颈部淋巴结五个方面，进一步鉴别以上四种疾病。 **结果** （1）发病年龄：喉癌好发于 50 岁以上（18/20）；喉淋巴瘤好发于 20-40 岁（10/11）；喉乳头状瘤好发于十岁以下儿童（10/15）；喉结核无特殊好发年龄，但多数伴有胸部结核（10/11）。（2）累积范围：喉癌易累积声门上区及声门区（15/20）；喉淋巴瘤易累积三个区域（12/14）；喉乳头状瘤易累及喉前联合（9/15）；喉结核易累积后联合（9/11）；（3）强化程度：喉癌明显不均匀强化（15/20）；喉淋巴瘤轻度均匀强化（13/14）；喉乳头状瘤轻中度渐进性强化（13/15）；喉结核线样粘膜强化（8/11）。（4）喉部侵犯：喉癌易发生喉旁间隙、喉旁软骨的侵犯（13/20），其他三种疾病均不易发生侵犯。（5）颈部淋巴结：喉癌易发生淋巴结转移，呈明显不均匀强化；喉淋巴瘤淋巴结肿大，呈轻度均匀强化；喉乳头状瘤无淋巴结肿大；喉结核为环形强化淋巴结。**结论** CT 增强对于弥漫性喉癌、喉淋巴瘤、喉乳头状瘤及喉结核的鉴别有一定的意义。

EPO-0242
钩突解剖形态与慢性鼻窦炎的相关性分析

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目的：探讨副鼻窦冠状位 CT 图像上钩突的形态变异与慢性鼻窦炎的发生及严重程度的相关性。方法：回顾性分析 140 例（280 侧）行副鼻窦 CT 检查的病人影像资料，其中鼻窦炎组 192 侧、非鼻窦炎组 88 侧，在 CT 冠状位观察所有钩突头端的附着部位，并测量钩突内倾角度，分析钩突头端不同附着部位、钩突内倾角解剖变异分布情况及其与慢性鼻窦炎的关系，对鼻窦炎组采用 Lund-Mackay CT 评分系统来反映单侧鼻窦炎的严重程度，对钩突角度测量结果与鼻窦炎 Lund-Mackay 积分进行相关性分析。结果：钩突头端的附着部位有 4 种类型：中鼻甲型(17.86%)、纸样板型(45.00%)、前颅底型(12.14%)、分叉型(25.00 %)；这 4 种类型的发病率在鼻窦炎组与非鼻窦炎组有显著差异；钩突平均角度在鼻窦炎组与非鼻窦炎组有明显差异；钩突内倾角与鼻窦炎积分呈负相关（ r＝－0.578，P＜0.05），钩突内倾角度越小， 越易发生病变，鼻窦炎越重。结论：钩突形态变异与慢性鼻窦炎关系密切。

EPO-0243

Dual-energy CT in the differentiation of stage T1 nasopharyngeal carcinoma and lymphoid hyperplasia

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Purpose: To explore the value of dual-energy CT for the differentiation between stage T1 nasopharyngeal carcinoma (NPC_{T1}) and lymphoid hyperplasia (LH).
Methods: Patients with histopathological proven nasopharyngeal lesions (stage T1 NPCs, n=30; LHs, n=47) who underwent dual-energy CT were enrolled in this retrospective study. Quantitative parameters derived from dual-energy CT were measured. Statistical analyses were performed using the independent sample *t*-test, Wilcoxon rank sum test, and receiver operating characteristic curve (ROC) analysis.
Results: There was significantly higher iodine concentration (IC), normalized iodine concentration (NIC, to internal jugular vein) in NPC_{T1} compared with LH ($p < 0.001$). The effective atomic number (Z_{eff}) was significantly higher in NPC_{T1} than that in LH ($p < 0.001$). The virtual monochromatic images (VMIs) at 50 keV-190 keV (20 keV-interval) of NPC_{T1} were all significantly higher than those of LH (all $p < 0.001$). The slope (k) value of spectral attenuation curve was also significantly higher in NPC_{T1} than LH ($p < 0.001$). There was no significant difference in virtual noncontrast (VNC) between the NPC_{T1} and LH ($p = 0.443$). The best single parameter for differentiation between NPC_{T1} and LH was the 70 keV on VMI, with AUC, sensitivity, and specificity value of 0.98, 93.33%, 93.62%, respectively.
Conclusions: Dual-energy CT can be helpful for the differentiation between NPC_{T1} and LH lesions.

EPO-0244

合成磁共振成像(MAGiC) 在鼻咽癌诊断中的应用价值：初步研究

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目的：探讨合成磁共振成像（MAGiC）在鼻咽癌诊断中的应用价值

方法：连续收集自 2018 年 11 月至 2019 年 3 月新诊断的鼻咽癌患者(30 例)和健康志愿者(16 例)，并用 MAGiC 序列进行合成磁共振成像。测量并比较鼻咽癌与正常鼻咽粘膜、鼻咽癌与翼外肌、鼻咽癌转移性斜坡(n=14)与非转移性斜坡(鼻咽癌 16 例，健康志愿者 16 例)之间 T1、T2 和 PD 定量参数的平均值。用 ROC 的曲线下面积评价 T1、T2、PD 值诊断鼻咽癌的应用价值。

结果：鼻咽癌的 T1 平均值和 T2 平均值均明显低于健康志愿者的鼻咽粘膜(T1: 1462.47ms VS. 1915.88ms，P<0.001，AUC=0.923; T2: 82.77ms VS. 90.375ms，P=0.004，AUC=0.729，而 PD 平均值的差异无统计学意义(89.35ms VS. 91.58ms，P=0.102)。以 T1 值<=1616ms 的作为阈值，鉴别鼻咽癌与正常鼻咽粘膜的灵敏度、特异性和准确性分别为 83.33%、93.75%和 86.96%。鼻咽癌的三个参数均高于翼外肌(T1: 1121.53ms，T2: 49.33ms，PD:69.79ms)，所有 P 值均小于 0.001。与非转移性斜坡相比，鼻咽癌转移性斜坡的 T1 平均值更高(1526.21ms VS. 635.00ms，P<0.001)、T2 平均值更低(90.79ms VS. 108.47ms，P=0.006)和 PD 平均值更低(84.09ms VS. 104.18ms，P<0.001)。

结论：合成磁共振成像(MAGiC)在鼻咽癌的检出、诊断和无创性评估肿瘤范围方面具有潜在的应用价值，有助于进一步划定靶区。

EPO-0245
CT 对绿脓杆菌所致鼻窦炎和黄曲霉菌所致鼻窦真菌球的鉴别诊断价值

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目的：通过比较绿脓杆菌所致鼻窦炎和黄曲霉菌所致鼻窦真菌球的 CT 表现特征，探讨 CT 对二者的鉴别诊断价值。 **方法**：收集自 2013 年至 2017 年经组织病理学检查确诊为绿脓杆菌所致鼻窦炎和黄曲霉菌所致鼻窦真菌球各 78 例患者的临床及 CT 影像资料，回顾性比较分析二者发病年龄、性别及 CT 表现特征。统计学方法除二者的发病年龄比较采用独立样本 t 检验外，性别和 CT 表现特征的比较均采用 x^2检验，P 值＜0.05 认为差异有统计学意义。 **结果**：绿脓杆菌所致鼻窦炎 78 例中男 31 例、女 47 例，发病年龄 15 岁～83 岁，平均年龄 50±14 岁；黄曲霉菌所致鼻窦真菌球 78 例中男 33 例、女 45 例，发病年龄 24 岁～75 岁，平均年龄 51±13 岁，二者在性别（x^2=0.106，P=0.745）和发病年龄（t=-0.077，P=0.939）上差异无统计学意义。CT 上二者均表现为鼻窦内软组织密度影，比较二者在病变范围只累及单窦（x^2=22.205，P=0.000）、病变部位累及额窦（x^2=25.012，P=0.000）、筛窦（x^2=32.322，P=0.000）、上颌窦（x^2=16.949，P=0.000）、伴钙化（x^2=7.572，P=0.006）、上颌窦口扩大（x^2=9.054，P=0.003）的显示率及钙化部位（x^2=5.975，P=0.015）的差异有统计学意义，而二者在累及蝶窦（x^2=0.030，P=0.863）、伴窦壁增生硬化（x^2=0.500，P=0.480）或破坏吸收（x^2=0.126，P=0.722）的显示率上差异无统计学意义。 **结论**：绿脓杆菌所致鼻窦炎和黄曲霉菌所致鼻窦真菌球的 CT 表现相似，但前者常多窦受累且更易累及上颌窦、筛窦、额窦，而后者多累及单窦、钙化更常见且易发生于上颌窦口、常伴窦口扩大，有助于鉴别诊断。

EPO-0246

The first case of kimura’s disease with thrombocytopenia, anasarca, fever, renal dysfunction and organomegaly (TAFRO syndrome)

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Abstract
Objective: TAFRO syndrome is considered as a sub-type of Multicentric Castleman Disease (MCD). We descibe a case that is disgnosed by kimura’s disease (KD) with TAFRO syndrome. To our knowledge, TAFRO syndrome with kimura’s disease (KD) has not been reported in previous literature.
Materials and methods: We describe a case of a 68-year-old female patient presenting with pharyngeal mass accompanied by generalized lymph node enlargement. In the course of the hospital, she suffered from fever, thrombocytopenia, anemia, proteinuria and massive edema of lower legs. Computed tomography(CT) revealed a thickening of the pharynx wall with multiple lymphadenopathy(<1.5cm in diameter) and hepatosplenomegaly with large ascites. MRI revealed diffuse thickening of the lateral and posterior of the pharynx of high signal on T2-weighted images and iso-signal on T1-weighted images with multiple lymph enlargement in the neck. Enhancement revealed homogeneous enhancement . The bone marrow specimen of the patient had been performed and reported a normocellular marrow with increased megakaryocytes. Furthermore, biopsy specimen of lymph nodes showed Lymphoid tissue hyperplasia, large amount of eosinophilic granulocytes infiltration and vascular proliferation (Fig2d); the immunohistochemical examination of the specimens showed CD10(-), CD30(-), CD20(+), CD45(+), CD3(+), CD38(+), CD68(-), CK(-), EGFR(-), ki-67(+)80%.
Finally, based on the histopathological findings of the lymph node biopsies, the laboratory data and other clinical manifestations, we diagnosed the patient as KD with TAFRO.
Results: The patient received glucocorticoid and cyclophosphamide for immunomodulation therapy, and the temperature returned to normal, edema, pericardial and pleural effusion absorbed. But the patient succumbed to multiple organ failure after 50 days of hospitalization.
Conclusion:It is believed that it is not precise that TAFRO syndrome is considered as a sub-type of Multicentric Castleman Disease (MCD). Platelet reduction diagnosed in hematology and oncologists were likely to hide TA FRO syndrome. It is extremely important to identify it by pathological examination and careful clinical observation.

EPO-0247

CT and MRI Features of Extraskeletal Ewing's Sarcoma/Peripheral Primitive Neuroectodermal tumor

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【abstract】 **Objective** To investigate the imaging manifestations and clinical features of Ewing's sarcoma / peripheral primitive neuroectoderm tumors and improve the recognition of it. **Methods** The CT and MRI finding of 12 cases of EES proved by pathology were retrospectively reviewed and related literatures were reviewed. The imaging features were summarized.**Results** The lesions were located in oropharynx(n=3),mouth(n=1), mandible(n=1), sinus(n=3), cervical root(n=1),mediastinum(n=2), and jejunum(n=1).4 cases underwent plain and enhanced CTand MRI scanning,5 cases underwent plain and enhanced CT scanning,3 cases underwent plain and enhanced MRI scanning .Most of the lesions were characterized by large invasive soft tissue masses, with heterogeneous density or signal,mild to moderate or obvious enhancement, 3 cases showed diffusion restriction with slightly and remarkable hyperintense signal on DWI and hypointense signal on corresponding ADC maps.Among the 12 cases,100% were accompanied with necrosis, 16.7% with calcification,100% with mass effect, 75% with surrounding tissue invasion, 41.7%cases with bone destruction and 25%cases with lymph node metastasis. **Conclusion** There are some characteristics of CT and MRI findings in EES: lesions are usually large, which are often accompanied with necrosis,obvious mass effect, frequently invade or destruct the surrounding structures,high flow vascular around or in the lesion , lack of calcification and bone destruction.

EPO-0248

Analysis of Histograms of ADC and Enhanced-T1WI in Differentially Diagnosing of Small Round Cell Malignant Tumors of Nasal and Paranasal Sinus.

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Objective: To determine if histograms of ADC and enhanced-T1WI can be used to differentiate small round cell malignant tumors(SRCMT) and Non-SRCMT of nasal and paranasal sinus.

Materials: 142 patients with confirmed histologically SRCMT in 69(48.59%) patients and Non-SRCMT in 73(51.41%) patients were enrolled in the study,accepting MRI at 3T. There were 69 SRCMT,of which 13 lesions were rhabdomyosarcoma(RMS),22 lesions were non-Hodgkin' S lymphoma(NHL),15 lesions were malignant melanoma(MM),10 lesions were neuroendocrine carcinoma(NEC),and 9 lesions were olfactory neuroblastoma(ON). There were 73 Non-SRCMT,of which 51 lesions were squamous cell carcinoma(SCC) and 22 lesions were adenoid cystic carcinoma(ACC). The ROIs were drawn on the maximum level of ADC and enhanced-T1WI,and the histogram analysis were performed using the software named Mazda. The statistical analysis was performed on the nine histogram parameters to find out the different characteristics. LSD and Bonferroni test were used between any two of the three groups and the ROC curve was drawn to evaluate the diagnostic efficacy.

Results:Using ADC histogram,the mean,skewness,Perc.01%,Perc.10%,Perc.50%,Perc.90% and Perc.99% of SRCMT was significantly different from Non-SRCMT. There were statistically significant difference between NHL and SCC,between NHL and ACC,between SCC and NEC,between SCC and MM,between SCC and ACC,between RMS and ACC,between NEC and ACC,between MM and ACC,between ON and ACC.
Using enhanced-T1WI histogram,The skewness of SRCMT was significantly different from Non-SRCMT. There were statistically significant difference between NHL and ACC,between SCC and ACC.

Conclusions:The histograms of ADC and enhanced-T1WI may help to discriminate SRCMT and Non-SRCMT and ADC histogram showed better efficacy compared to histogram of enhanced-T1WI.

EPO-0249

Study on CT Value of Lingual Thyroid

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Abstract **Objective:** The objective of the study was to identify the typical imaging features (CT values) of lingual thyroid to facilitate the diagnosis. **Methods:** This was a retrospective single-institutional study, with 11 lingual thyroid cases, 28 patients with other lesions at the base of the tongue (control group) and 28 normal orthotopic thyroid controls (normal controls).Nonenhanced and contrast-enhanced CT values were measured. **Results:** The mean nonenhanced and contrast-enhanced CT values (±SEM) in lingual thyroid were significantly (P=0.000) higher than those in control group. All except for two ectopic thyroids (proved to be 1 nodular goiter and 1 Hashimoto's thyroiditis) had attenuation greater than 60HU on nonenhanced CT and 100HU on contrast-enhanced CT. There was no statistical significance between lingual thyroid and normal controls in nonenhanced CT values (P=0.051). The mean contrast-enhanced CT values in lingual thyroid were significantly (P=0.029) lower than those in normal controls. **Conclusions:** In most cases, lingual thyroid can be distinguished from other lesions at the base of the tongue for its characteristic high CT values, although its CT appearance can be affected when pathological cases occur. Lingual thyroid had a lower CT value than normal orthotopic thyroid on contrast-enhanced CT. It may be related to the high proportion of subclinical hypothyroidism in lingual thyroid.

EPO-0250

骨外尤文肉瘤/外周原始神经外胚层肿瘤的 CT 及 MRI 表现

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目的 探讨骨外尤文肉瘤/外周原始神经外胚层肿瘤的 CT 及 MRI 表现及临床特点，旨在提高对该病的认识。**方法** 回顾性分析 12 例经病理证实的骨外尤文肉瘤/外周原始神经外胚层肿瘤的 CT 及 MRI 资料并复习相关文献，总结其影像学特征。**结果** 病灶位于鼻口咽 3 例，口底 1 例，颌下 1 例，鼻腔鼻窦 3 例，颈根部 1 例，纵隔 2 例，空肠 1 例。4 例同时行 CT 及 MRI 平扫+增强检查，5 例行 CT 平扫+增强检查，3 例行 MRI 平扫+增强检查。病变多表现为浸润性生长的软组织肿块，体积较大，密度或信号不均，增强后强化程度不一，3 例 DWI 高 b 值弥散受限呈混杂高/稍高信号，对应 ADC 图为低信号。12 例均伴坏死，2 例伴钙化，12 例均伴邻近结构受压移位，9 例伴周围组织受侵，5 例伴骨质破坏，5 例病灶内部或边缘见血管影，2 例 MRI 检查见流空血管影，3 例伴淋巴结转移。 **结论** EES 多表现为浸润性生长的软组织肿块，体积较大且形态不规则，部分病例表现为软组织不规则增厚。CT 平扫呈类似于肌肉组织的等或稍低密度（等密度为主），MRI 平扫 T1WI 表现为等或稍低信号（等信号为主），T2WI 多呈高信号，密度或信号不均匀，囊变坏死多见，钙化少见，可出现假包膜；增强扫描强化不均匀且强化程度不一。有研究显示，EES 强化是否均匀与肿瘤的分化程度有关，分化程度越高则强化越均匀。肿瘤占位效应明显,表现为推压周围组织，易侵犯周围结构，可伴溶骨性骨质破坏，病灶周围或内部常可见流空血管影。

EPO-0251

The application of intravoxel incoherent motion magnetic resonance imaging in the staging of nasopharyngeal carcinoma

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Objective: To explore the value of IVIM-MRI in the staging of nasopharyngeal carcinoma (NPC).
Methods: This study prospectively included 63 patients with pathologically confirmed NPC. IVIM-MRI scans (9 b values: 0, 25, 50, 75, 100, 150, 200, 500, and 800 s/mm^2) were performed on the enrolled patients. The ADC values were calculated by the mono-exponential model. The bi-exponential model were used to obtain the pseudodiffusion coefficient (D^*), the pure diffusion coefficient (D), and the perfusion fraction (f), then comparing the differences of IVIM parameters between different stage groups and analyzing correlation between different parameters and different stages.
Results: The D values and D^* values of the high-stage group in the clinical stage were significantly lower than the low-stage group. The D values for the high- and low-stage groups were ($0.617\pm0.080\times10^{-3}$ mm^2/s, $0.692\pm0.124\times10^{-3}$ mm^2/s, P=0.021) respectively. The D^* values for the high- and low-stage groups were ($102.499\pm14.972\times10^{-3}$ mm^2/s, $118.335\pm22.812\times10^{-3}$ mm^2/s, P=0.002) respectively. The optimal thresholds of D and D^* values for clinical stage were 0.642×10^{-3} mm^2/s, 106.618×10^{-3} mm^2/s, and the AUC were 0.702, 0.721. The D^* values of the high-stage group in the N-staging were lower than the low-stage group. The D^* values for the high- and low-stage groups were ($100.647\pm13.798\times10^{-3}$ mm^2/s, $114.037\pm21.193\times10^{-3}$ mm^2/s, P=0.004) respectively. The optimal threshold of the D^* values for N-staging was 105.743×10^{-3} mm^2/s and the AUC was 0.694.

Conclusion: Some parameters of IVIM had good effects on clinical stage and N-staging of NPC. The D and D^* values would be good parameters for the clinical stage of NPC. The D^* value would also be a good parameter for N-staging of NPC. IVIM parameters could have a certain value for the staging of NPC.

EPO-0252

The application of intravoxel incoherent motion magnetic resonance imaging in evaluating the efficacy of chemoradiotherapy of nasopharyngeal carcinoma

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Objective: To research the dynamic changes of the IVIM-MRI parameters during chemoradiotherapy of nasopharyngeal carcinoma (NPC), and to explore the value of IVIM-MRI in evaluating and predicting the efficacy of chemoradiotherapy in NPC.
Methods: With the approval of the hospital's ethics committee and informed consent of patients, this study prospectively included 33 patients with NPC. The enrolled patients were confirmed as NPC by pathology (clinical stage: II-IV_A). Three IVIM-MRI scans (9 b values: 0, 25, 50, 75, 100, 150, 200, 500, and 800 s/mm^2) were performed on the enrolled patients. Those patients underwent MRI at the time points of pretreatment (MRI_{pre}), four weeks after the start of radiotherapy (MRI_{4th}) and one month after the end of radiotherapy (MRI_{post}). The ADC value was calculated by the mono-exponential model. The bi-exponential model was used to obtain the pseudodiffusion coefficient (D^*), the pure diffusion coefficient (D), and the perfusion fraction (f). The maximum area and IVIM parameters during chemoradiotherapy were recorded, and the differences of the parameters at different time points were analyzed and the parameters before treatment between the different therapeutic effect groups were compared.
Results: During the course of treatment, the ADC values, D values, and D^* values of NPC lesions showed a gradual upward trend, and f value increased first and then decreased after treatment. The mean values of ADC in the MRIpre group and the MRIpost group were 0.79×10^{-3} mm^2/s and 1.56×10^{-3} mm^2/s, respectively ($P_{MRIpre\ vs\ MRIpost} < 0.001$), and the D values were 0.67×10^{-3} mm^2/s and 1.30×10^{-3} mm^2/s, respectively ($P_{MRIpre\ vs\ MRIpost} < 0.001$). The f values in the MRI_{pre} group and the MRI_{4th} group were 10% and 18%, respectively ($P_{MRIpre\ vs\ MRI4th} < 0.001$). 16 patients were included in the complete response group one month after the end of radiotherapy, and 17 patients were included in the partial response group. The D values of pretreatment in partial response group were significantly higher than that in complete response group($0.72\pm0.10\times10^{-3}$ mm^2/s vs $0.51\pm0.16\times10^{-3}$ mm^2/s, $P=0.04$).
Conclusion: ADC and D values could monitor the efficacy of chemoradiotherapy for NPC. D values could be more reliable. IVIM-MRI could have application value for dynamically monitoring the efficacy of chemoradiotherapy in NPC.

EPO-0253
最佳单能量联合 SAFIRE 技术对鼻腔鼻窦肿物 图像质量的影响

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【摘要】目的：探讨双能量 CT 最佳单能量成像联合迭代重建 SAFIRE 技术对鼻腔鼻窦肿物的图像质量的影响。方法：回顾性分析 60 例经病理证实的鼻腔鼻窦肿物，所有患者术前均行常规 CT 平扫及双能量 CT 动脉期与静脉期增强扫描。动脉期、静脉期图像均采用传统滤波反投影法（filte-red back prejection, FBP）及联合原始数据迭代重建法（sinogram affirmed iterative reconstruction,SAFIRE）重建，并将 SAFIRE 重建组调入 Monoenergetic 软件后处理获得最佳单能量联合 SAFIRE 组。总共获得 A、B、C 三组图像(A 组：最佳单能量/SAFIRE，B 组：线性融合图像/FBP，C 组：线性融合图像/SAFIRE)。比较三组图像的主观评价（图像质量评分、病灶显著性评分）及客观评价[病灶的信噪比（SNR）、对比噪声比（CNR），背景噪声（SD）]。比较动脉期与静脉期的最佳单能量值。结果：动静脉两期 A 组及 C 组图像的病灶 SNR 和 CNR、图像质量评分、病灶显著性评分均高于 B 组，背景 SD 值均低于 B 组，差异有统计学意义（P＜0.05）；动静脉两期 A 组与 C 组图像的病灶 SNR 和 CNR、背景 SD 值、图像质量评分差异均无统计学意义（P＞0.05），两期 A 组图像病灶显著性评分均高于 C 组（P＜0.05），A 组的静脉期病灶显著性评分高于动脉期（P＜0.05）。动、静脉期最佳单能量值差异无统计学意义（P＞0.05），最佳 CNR 单能量值为（65.38±0.87）KeV。结论：最佳单能量联合 SAFIRE 技术可明显减小图像噪声，提高病灶对比度，更利于鼻腔鼻窦肿物的分析诊断。

EPO-0254
3D pCASL 与 DCE-MRI 对鼻咽癌灌注相关性研究

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目的 探讨三维准连续式动脉自旋标记（3D pCASL）成像与动态增强磁共振成像（DCE-MRI）在鼻咽癌不同临床分期中应用价值及相关性。
材料与方法 回顾性分析 45 例经病理确诊的鼻咽癌首诊患者并分成高、低分期组。所有患者治疗前均行鼻咽部 MRI 平扫、3D pCASL 及 DCE 扫描，用后处理软件得到肿瘤血流量（tumor blood flow，TBF)与药代动力学参数 K^{trans}、K_{ep}、V_e值。鼻咽癌高、低分期组间各参数差异采用独立样本 t 检验；TBF 值、DCE 参数与鼻咽癌不同分期间相关性行 spearman 相关分析；TBF 值、DCE 参数对鼻咽癌不同分期的诊断效能行 ROC 曲线分析；TBF 值与 DCE 参数间相关性行 pearson 相关分析。
结果 在鼻咽癌不同分期中高、低分期组 TBF、K^{trans}、K_{ep}差异具有统计学意义（P＜0.05），Ve 值无统计学意义；TBF、K^{trans}、K_{ep}与不同分期间具有很好的相关性，Ve 无相关性；TBF、K^{trans}对不同分期具有很好的诊断效能，K^{trans}略优于 TBF；TBF 与 K^{trans}、K_{ep}显著正相关，与 Ve 无相关性。
结论 3D pCASL 与 DCE-MRI 均能很好的评估鼻咽癌灌注，并用于临床分期的预测，两者间具有显著的一致性，3D pCASL 是一种可供选择的无创评价鼻咽癌灌注水平的有效替代手段。

EPO-0255
双能量 CT 定量参数对喉癌转移淋巴结的定性评估价值

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摘要 目的 探讨双能量 CT 动脉期碘浓度及能谱曲线斜率在诊断喉癌转移淋巴结中的价值。**方法** 收集具有完整术前双能量 CT 扫描资料并经病理证实的喉癌 46 例，淋巴结共计 90 枚，按病理结果将淋巴结分为转移组（47 枚）和非转移组（43 枚），采用独立样本 t 检验分别比较转移组与非转移组淋巴结、原发灶与转移淋巴结动脉期碘浓度及能谱曲线斜率的差异，并绘制 ROC 曲线，计算曲线下面积（AUC）及最佳诊断阈值。以 P<0.05 为差异具有统计学意义。**结果** 转移组淋巴结动脉期碘浓度及能谱曲线斜率分别为 2.29±0.50mg/ml 及 2.38±0.71，均高于非转移组（1.77±0.48mg/ml 及 1.99±0.63），差异有统计学意义（P均<0.05）；动脉期碘浓度及能谱曲线斜率诊断淋巴结转移的阈值分别为 1.85mg/ml、2.15，对应 AUC 分别为 0.77、0.67（P均<0.05）。喉癌原发灶与转移淋巴结动脉期碘浓度及能谱曲线斜率均无统计学差异（P均>0.05）。**结论** 喉癌转移淋巴结与原发灶之间具有同源性，双能 CT 动脉期碘浓度及能谱曲线斜率对喉癌转移淋巴结的诊断有一定的价值。

EPO-0256
双能量 CT 在诊断喉癌甲状软骨侵犯中的应用价值

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【摘要】目的 探讨双能量 CT 在诊断喉癌甲状软骨侵犯中的价值。**方法** 收集 2013 年 6 月至 2019 年 2 月术前行喉部双能量 CT 增强扫描的喉癌 106 例，以手术病理为金标准，对比双能 CT 混合能量图像及碘图联合混合能量图像对喉癌甲状软骨侵犯的定性评估价值，并通过比较受侵甲状软骨与对侧正常非骨化甲状软骨动脉期标准化碘浓度及能谱曲线斜率，分析双能 CT 客观定量参数鉴别二者的效能。计数资料的比较采用 McNemar 检验及 Kappa 检验，计量资料的比较采用独立样本 t 检验。**结果** 106 例中，40 例伴甲状软骨侵犯，双能 CT 混合能量图像的诊断灵敏度、特异度及准确度分别为 75%、83.33%及 80.19%，碘图联合混合能量图像的诊断灵敏度、特异度及准确度分别为 87.50%、94.45%及 92.45%，差异无统计学意义（P>0.05）。受侵甲状软骨动脉期标准化碘浓度及能谱曲线斜率分别为 0.16±0.05 及 1.92±0.39，均高于对侧正常非骨化甲状软骨（P均<0.05），利用动脉期标准化碘浓度及能谱曲线斜率鉴别受侵甲状软骨及正常非骨化甲状软骨的临界值分别为 0.05 及 0.71，AUC 分别为 0.98 和 0.98，灵敏度、特异度分别为 97.50%、92.50%及 92.50%、97.50%。**结论** 以双能 CT 动脉期标准化碘浓度=0.05 及能谱曲线斜率=0.71 为诊断阈值鉴别受侵甲状软骨和正常非骨化甲状软骨具有一定的价值。

EPO-0257
喉部炎症性病变的 MSCT 诊断价值

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目的：探讨多层 CT（MSCT）对喉部炎症性病变的诊断价值，提高喉部病变影像诊断水平。
方法：回顾性分析经病理证实 5 例喉部炎症性病变患者临床及 MSCT 资料。
结果：5 例喉部炎症性病变中喉结核 2 例，喉真菌感染 1 例，慢性喉炎 2 例。患者年龄 20-82 岁（中位年龄 40 岁），其中 4 例以声嘶、2 例以咽喉痛就诊。喉镜喉黏膜充血、增厚，4 例患者伴溃

疡形成。喉真菌感染患者系统性红斑狼疮病史 5 年，间断激素治疗 3 年；2 例喉结核患者胸部 CT 提示继发型肺结核。CT 检查示 2 例喉结核患者双侧杓会厌皱襞、会厌增厚；1 例喉真菌感染患者双侧室带、声带黏膜增厚，边缘结节状，双侧室带黏膜下小斑条状软组织密度；1 例慢性喉炎患者左侧声带后份局部结节样稍突起，1 例慢性喉炎患者双侧室带增厚，黏膜下小斑状影。增强扫描慢性喉炎病例左侧声带后份结节样突起病灶轻度强化，其余 4 例喉部炎症增厚黏膜或黏膜下小斑条状影中度或明显强化。2 例患者喉旁间隙模糊（结核、真菌各 1 例），喉部软骨、周围结构均未见破坏。1 例喉结核患者双侧颈 II、III、V 区淋巴结肿大、钙化，环形强化；其余病例淋巴结未见肿大。

结论：喉部炎症性病变 MSCT 表现具有一定特异性，病变范围、黏膜及周围脂肪间隙、喉部软骨情况对肿瘤及炎症性病变的诊断及鉴别诊断具有重要意义。喉部病变缺乏特异征象时，MSCT 首要目的为显示病变范围、喉部结构情况及颈部淋巴结。

EPO-0258
磁共振高清弥散在头颈五官病变中的应用经验分享

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磁共振弥散加权成像（Diffusion weighted imaging，DWI）在全身各部位病变中有重要应用价值。

单激发平面回波序列（Single shot echo-planar imaging，SS-EPI）易产生磁敏感伪影，在鼻腔鼻窦部病变中的应用价值有限。

RESOLVE（readout-segmented echo-planar imaging using parallel imaging and a two-dimensional navigator）序列能有效减少磁敏感伪影，较好地应用于头颈部病变。

—我们定性和定量比较 RESOLVE 序列与 SS-EPI 序列在鼻腔鼻窦、视神经、耳部部的图像质量。—探讨 RESOLVE 序列在评价前述部位病变中的应用价值。

研究发现除鼻腔鼻窦区，RESOLVE 序列还能够**更好的显示眼眶视神经、颞骨和颅底等部位，变形和磁敏感伪影少**。本研究中，两种序列的脑干 ADC 值没有明显差异，但是 RESOLVE 序列的病灶 ADC 值却明显低于 SS-EPI 序列。导致这种差异产生的原因主要是由于 SS-EPI 序列在鼻腔鼻窦区易产生磁敏感伪影和鬼影，并造成 ADC 图中 ADC 值的不均匀性。**RESOLVE 序列能够更准确地反映病灶的 ADC 值。有助于鼻腔鼻窦肿瘤的定性、不同类型视神经炎的鉴别，能更准确的判断术后胆脂瘤有无残留或复发。**

EPO-0259
磁共振动态增强定量参数及纹理分析对鼻咽癌疗效的预测价值

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目的：评估磁共振动态增强定量参数及纹理分析对鼻咽癌放化疗疗效的预测价值。 **方法：**前瞻性收集 2018 年 7 月至 2019 年 5 月经穿刺活检证实的鼻咽癌患者 30 例。所有患者治疗前及放疗计量达 50Gy 均行磁共振常规平扫及动态增强检查。将动态增强序列原始格式导入西门子后处理工作站 Tissue 4D 进行定量分析，提取定量参数 Ktrans、kep、Ve，并根据时间-信号强度曲线选择强化程度最高的时期，将强化程度最高的图像导入开源软件 3D Slicer 进行纹理特征提取。依据 WHO

发布的实体肿瘤疗效评价标准 RECIST 修订版对放疗计量达 50Gy 时进行疗效评价，有效组包括 CR 和 PR，无效组包括 SD 和 PD。采用两独立样本 t 检验或 Mann－Whitney U 检验对组间参数进行比较，采用多因素回归分析筛选预测因子，采用 ROC 曲线分析对参数的诊断效能进行评估。 **结果：** 30 例患者年龄 33-74 岁，平均年龄 55 岁，男性 19 例，女性 11 例。有效组和无效组治疗前 Ktrans、Ve 差异具有统计学意义，有效组治疗前 Ktrans 值高于无效组，而有效组 Ve 值低于无效组，Ktrans 值对疗效具有预测价值。增强图像的纹理特征中多个参数对疗效具有预测价值，Ktrans 联合纹理特征的预测效能更高。 **结论：**磁共振动态增强定量参数及纹理分析对鼻咽癌放化疗疗效具有预测价值，两者联合使用将提高对疗效的预测价值。

EPO-0260
鼻腔鼻窦结外 NK/T 细胞淋巴瘤 CT 及 MRI 诊断价值

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目的 分析总结鼻腔鼻窦结外 NK/T 细胞淋巴瘤的 CT 及 MRI 影像表现，探讨其对原发鼻腔鼻窦结外 NK/T 淋巴瘤的临床诊断价值，以提高该病影像诊断的准确性。**方法** 回顾性分析我院 31 例经手术或活检病理证实的鼻腔鼻窦结外 NK/T 细胞淋巴瘤的 CT 及 MRI 表现。31 例患者 28 例行 CT 检查，其中 CT 平扫 16 例，CT 平扫+增强检查 12 例；MRI 检查 13 例，均为平扫+增强扫描。CT 采用东芝 Aquilion CX 螺旋 CT 机行 64×0.5mm 轴位容积扫描，层厚、层距 5mm 轴位及冠状位重建，造影剂使用碘海醇注射液(欧乃派克)；MRI 使用西门子 Verio 3.0T 磁共振机，扫描轴位 T1WI、轴位和冠状位 T2WI 抑脂，以及轴位、冠状位抑脂 T1WI 增强扫描；对比剂采用钆喷酸葡胺(Gd-DTPA)。**结果** 31 例 NK /T 细胞淋巴瘤患者，单侧鼻腔肿瘤 25 例，双侧鼻腔肿瘤 6 例；病灶局限性于鼻腔前中部 21 例，中后部 2 例，弥漫分布于整个鼻腔 8 例；肿瘤浸润鼻前庭、鼻翼、鼻背或邻近面部软组织 26 例。23 例患者伴阻塞性鼻窦炎。31 例中 19 例出现骨质破坏吸收，但骨质破坏程度相对较轻，病变软组织范围明显大于骨质破坏范围。CT 平扫肿瘤呈等或稍低软组织密度,密度较均匀，该组病例均未见钙化。MRI 表现为 T1WI 呈等/稍低信号，T2WI 呈稍高信号，信号强度与肌肉比较 T1WI 呈等信号(5 例)/稍低信号(8 例)，其中 7 例信号均匀，6 例信号不均；T2 压脂肿瘤呈稍高信号，高于肌肉组织信号，低于鼻黏膜信号(其中 7 例信号均匀，6 例信号不均)。20 例行 CT 和（或）MRI 增强,大多表现为轻至中度强化(16/20),少数明显强化(4/20)。**结论** 鼻腔鼻窦结外 NK/T 细胞淋巴瘤 CT 及 MRI 表现具有一定特征，常规 CT 和 MRI 检查有助于该病的诊断，并能较准确的观察病变的部位及侵犯范围，对临床治疗及评估病情预后有重要的临床意义。

EPO-0261
原发性鼻腔及鼻窦黑色素瘤的影像特征与鉴别诊断

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目的 总结并探讨鼻腔鼻窦原发性恶性黑色素瘤的 CT 和 MRI 影像学特征。**方法** 回顾性分析经病理证实鼻腔鼻窦原发性恶性黑色素瘤 15 例并探讨其 CT 和 MRI 影像学特征。 **结果** 单侧 12 例，双侧 3 例。14 例肿瘤主体位于鼻腔，1 例位于双侧筛窦。鼻腔病灶 10 例较大，另 4 例相对局限；较大病灶形态不规则，其中 9 例呈填充式膨胀性生长，累及筛窦 7 例、上颌窦 6 例；周围结构受侵：鼻咽部（3 例）、鼻背（3 例），同侧上腭（2 例）、眼眶（1 例）、翼腭窝（1 例）、鼻翼（1 例）；骨质吸收 7 例，溶骨性骨质破坏并局部缺损改变 5 例。CT 病灶呈软组织密度，其内未见

钙化及囊变；CT 增强扫描明显强化 3 例，中度强化 3 例，轻度强化 1 例。MRI 扫描，T1WI 高信号（2 例），其中 T2WI 等/低信号（1 例），T2WI 混杂稍高信号（1 例）；T1WI、T2WI 稍高信号（2 例）；T1WI 等信号、T2WI 稍高信号（3 例）；增强扫描轻-中度强化 3 例，明显强化 4 例；4 例行 DWI 扫描，均提示弥散受限。**结论** CT 和 MRI 能充分显示肿瘤的部位、范围、OOO 与周围组织关系及邻近骨质破坏情况。典型色素型鼻腔鼻窦原发性恶性黑色素瘤有较特异的 MRI 信号，较大的鼻腔鼻窦恶性黑色素瘤有相对特异的生长方式，其骨质破坏也有所不同，具有一定的诊断和鉴别意义。

EPO-0262

A Correlation Study between DKI Metrics and Immunohistochemical Labeling Indices in Nasopharyngeal Carcinoma

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Objective: To evaluate the expression and intercorrelation of immunohistochemical (IHC) labeling indices in nasopharyngeal carcinoma (NPC), and to explore the correlation between the diffusion kurtosis imaging (DKI) metrics and pathological indicators in NPC.
Materials and Methods: Sixty-six patients with NPC received DKI and nasopharyngeal biopsy before treatment were prospectively studied. Quantitative DKI metrics (mean diffusion, MD and mean kurtosis, MK) were acquired. hematoxylin-eosin (HE) staining. Pathological biomarkers reflecting angiogenesis (microvessel density, MVD), proliferation (nuclear proliferation index, Ki67) and vasopermeability (aquaporin-1, APQ-1) were detected by IHC methods. Finally, the correlations were analyzed by Spearman’s rank coefficient analysis. A P value＜0.05 was considered statistically significant.
Results: The positive expression rates of Ki67, AQP-1 and MVD in recruited NPC subjects were 93.3%, 95.4% and 98.4% respectively. There have a significantly positive correlation between CD and Ki67 expression (γ = 0.377, P = 0.003) and between MVD and AQP-1 (γ = 0.403, P = 0.001). MD was negatively associated with CD and Ki67 respectively (γ = -0.357, P = 0.004; γ = -0.412, P = 0.001). There were not statistical significant between MK and any IHC labeling indices in this primary study.
Conclusion: DKI quantitative parameter (MD) has negative correlation with the CD and Ki67, which provide pathological potential mechanism of the utility of DKI in NPC management.

EPO-0263

真菌性鼻窦炎的 CT 诊断分析

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[摘要] **目的**：探讨真菌性鼻窦炎的 CT 特征性表现。 **方法**：选取我院经临床病理证实为真菌性鼻窦炎患者 25 例，对其影像学表现进行回顾性分析。**结果**：25 例经临床病理证实为真菌性鼻窦炎患者中，发病部位位于上颌窦者左侧 18 例（72.0%，33.3%），右侧 9 例（36.0%，16.7%），双侧 3 例（12.0%，5.5%）；位于蝶窦者左侧 1 例（4.0%，1.8%），右侧 2 例（8.0%，3.7%），双侧 1 例（4.0%，1.8%）；位于筛窦者左侧 2 例（8.0%，3.7%），右侧 1 例（4.0%，1.8%），双侧 0 例；位于额窦者左侧 1 例（4.0%，1.8%），右侧 0 例，双侧 0 例；同时累及四组鼻窦者 0 例。 25 例真菌性鼻窦炎患者中，病灶内伴有钙化者 20 例（80.0%），钙化部位位于上颌窦窦口及鼻腔 9 例（45.0%），上颌窦窦口 4 例（20.0%）。**结论**：真菌性鼻窦炎好发于一侧鼻窦，以上颌窦最为常见，可累及多窦腔；钙化是真菌性鼻窦炎的特征性表现，钙化好发部位位于上颌窦窦口及鼻腔；钙化形态多样，以砂砾状最为常见；真菌性鼻窦炎患者受累窦壁存在不同程度骨质增生，部分伴有骨质破坏。

EPO-0264
冠状面 CT 及 MRI 对出血坏死性鼻息肉及内翻性乳头状瘤的鉴别诊断价值

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目的 探讨冠状面 CT 及 MRI 对出血坏死性鼻息肉及鼻腔-鼻窦内翻性乳头状瘤鉴别诊断价值。**方法** 对经手术病理证实的 12 例出血坏死性鼻息肉及 23 例鼻腔-鼻窦内翻性乳头状瘤患者的一般临床资料、冠状面 CT 及 MRI 影像资料进行回顾性研究。**结果** 出血坏死性鼻息肉发病年龄低于鼻腔-鼻窦内翻性乳头状瘤($P<0.05$)，前者青壮年，后者中年多见。生长方式上，出血坏死性鼻息肉表现为膨胀性生长，周围骨质压迫吸收，增生硬化，而内翻性乳头状瘤则无此特点，易复发，可以恶变，表现为病灶周围局部骨质破坏。CT 平扫上，出血坏死性鼻息肉密度高于内翻性乳头状瘤($P<0.05$) ，MRI 上出血坏死性鼻息肉的出血成分表现为 T1WI 高信号，T2WI 低信号，因反复出血病灶边缘及内部见线样低信号分隔，信号不均匀，而内翻性乳头状瘤密度、信号较均匀。增强扫描，出血坏死性鼻息肉表现为明显结节样或片状强化，而内翻性乳头状瘤轻中度较均匀强化，MRI 上瘤体呈卷曲“脑回状”强化较为特征。**结论** 出血坏死性鼻息肉及内翻性乳头状瘤的 CT、MRI 表现有一定区别，冠状面 CT 增强扫描及 MRI 在两者的鉴别诊断上有重要意义。

EPO-0265
平静呼吸和 Valsalva 屏气下螺旋 CT 扫描在下咽癌诊断中的对比研究

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目的：分析平静呼吸下和 Valsalva 屏气下螺旋 CT 扫描对下咽癌及周围解剖结构的显示情况，探讨 Valsalva 屏气法对下咽癌的诊断价值。
方法：对 60 例临床拟诊下咽癌的病人分别进行平静呼吸下和 Valsalva 屏气下的螺旋 CT 增强扫描，分析两种检查方法对下咽癌及其周围解剖结构的显示情况及对肿瘤的分期结果，并与临床手术病理结果进行对比。

结果：Valsalva 屏气下和平静呼吸下 CT 扫描相比，对梨状窝显示优者有 47 例，对咽后壁显示优者 35 例，对喉前庭显示优者 11 例，对肿瘤边界显示优者 15 例，对喉室的显示差者 20 例，P 值均<0．05，差异有统计学意义，对环后区显示优者 16 例，P<0．05 差异有统计学意义。Valsalva 屏气下对肿瘤分期的准确性为 87%，平静呼吸下的 CT 扫描对肿瘤分期的准确性为 70%，P<0．05，差异有统计学意义。

结论： Valsalva 屏气下 CT 扫描对梨状窝、咽后壁、喉前庭、环后区肿瘤边界的显示效果好于平静呼吸下的 CT 扫描，对喉室的显示效果比平静呼吸下的 CT 图像欠佳； Valsalva 屏气下 CT 扫描对肿瘤分期的准确性高于平静呼吸下的 CT 扫描。

EPO-0266
出血坏死性鼻息肉 CT、MRI 征象特点及影像解剖分析

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目的 分析出血坏死性鼻息肉的影像征象及解剖特点，增强对出血坏死性鼻息肉的认识。方法 回顾性分析 21 例经病理证实为出血坏死性鼻息肉的 CT 及 MRI 病例图像，探究其影像特征、临床表现，并与病理结果对照。结果 18 例出血坏死鼻息肉源自上颌窦，其在 MR 中具有特征性表现：15 例息肉 T2WI 序列边缘可见低信号环。全部息肉 T2WI 内部呈高低混杂信号，并在 MR 增强中息肉内高信号部分呈显著强化。在解剖位置上，16 例鼻息肉表现为靠近上颌窦口生长，并突出上颌窦口进入中鼻道内。3 例来源于左侧鼻腔内，其在 MR 征象中无特殊。在 CT 中，鼻息肉表现为高低混杂的软组织密度影，所有较大的病灶不同程度压迫周围骨质，临近骨质吸收变薄，2 例息肉可见结节状钙化。结论 出血坏死性鼻息肉典型影像表现为生长于上颌窦内的肿块，T2WI 中见低信号环并有邻近骨质变薄。此外，CT、MRI 中病灶结构、位置及继发改变为临床治疗方法的选择提供了信息。

EPO-0267
USPIO-PEG-sLeX 在裸鼠鼻咽癌转移模型的 MR 成像研究

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目的 探讨本课题组制备的靶向分子探针 USPIO-PEG-sLe^{X}在鼻咽癌移植瘤转移模型中应用价值。**方法** 依据裸鼠鼻咽癌移植瘤解剖及病理结果将荷瘤鼠分为转移组和非转移组，测量造影剂注射前后四次扫描（t0=平扫，t1=增强后即刻扫描，t2=增强后 1 小时，t3=增强后 2 小时）移植瘤 T2*值，分析各时刻 T2*值及 T2*值变化情况。 **结果** 转移组和非转移组的平扫 T2*值分别为 22.25±8.08、27.01±9.45，两组间差异无统计学意义（P＞0.05）。转移组和非转移组裸鼠经尾静脉注入造影剂后 t1、t2、t3 时刻 T2*值分别为 11.57±4.02 和 24.82±7.84、10.09±4.88 和 24.15±8.74、12.46±5.63 和 23.42±7.12，差异均有统计学意义（P 值分别为 0.005、0.008 和 0.019）；转移组和非转移组裸鼠 t1、t2、t3 时刻ΔT2*值分别为 10.69±6.23 和 3.86±2.20、12.17±8.67 和 2.87±1.37、9.80±3.03 和 4.32±2.28，差异均有统计学意义（P 值分别为 0.027、0.048、0.043）。转移组和非转移组裸鼠 t1、t2、t3 时刻强化率分别为 45.98±14.03 和 7.10±5.18、 51.15±22.70 和 11.04±6.01、44.05±13.92 和 12.09±7.54，差异均有统计学意义（P 值分别为 0.001、0.005、0.007）。经两因素重复测量的方差分析检验，转移组和非转移组 T2*值差异有统计学意义（P=0.02＜0.05），不同时刻 T2*值差异有统计学意义（P=0.001＜0.05），转移组和非转移组与扫描时刻之间存在交互作用（P=0.043＜0.05）。 **结论** USPIO-PEG-sLe^{X}可以无创监测 E-selectin 表达，在监测鼻咽癌移植瘤模型转移方面具有较好的应用前景。

EPO-0268

Comparison between simultaneous multi-slice and integrated slice-by-slice shimming readout-segmented echo planar imaging in head and neck tumors

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Purpose

To compare the simultaneous multi-slice (SMS) and integrated slice-by-slice shimming (iShim) readout-segmented echo-planar imaging (rs-EPI, RESOLVE) for diffusion-weighted imaging (DWI) in head and neck tumors.

Materials and Methods

Data were collected on a MAGNETOM Skyra 3T MR scanner (Siemens Healthcare, Erlangen, Germany) with a 20-channel head-neck coil and a pair of 4-channel special purpose coils. Twenty patients (15 males; mean age, 56 years; range, 29 - 81 years) with head and neck malignant tumors who underwent neck MR scan including both prototype sequences SMS-RESOLVE and iShim-RESOLVE were enrolled in this perspective study. Detailed acquisition parameters of the two sequences were listed as follows:

SMS-RESOLVE: repetition time (TR) = 4000ms, echo time (TE) =66/104ms, field of view (FOV) = 260×260 mm^2, slice thickness=3mm, voxel size=2.4×2.4×3.0mm^3, b-values=0 and 800 s/mm^2, readout segments=5, slice acceleration factor=2, GRAPPA accelerated factor = 2, acquisition time=2 minutes and 47 seconds.

iShim-RESOLVE: TR=6790ms, TE =49/74ms, FOV=260×260 mm^2, slice thickness=3mm, voxel size=2.4×2.4×3.0mm^3, b-values=0 and 800 s/mm^2, readout segments=5, GRAPPA accelerated factor = 2, acquisition time=3 minutes and 9 seconds.

The subjective image quality based on lesion distortion was evaluated according to the five-point scales: 0 for no distortion, 1 for small distortion, 2 for moderate distortion, 3 for high distortion, 4 for impossible to evaluate. And the ADC values and the signal intensity of lesions were measured at the largest section of the tumors. The signal-to-noise ratio (SNR) was calculated by the ratios between the mean signal intensities of the lesion and the standard deviation of the background noise. The subjective image quality scores, SNR, ADC values and signal intensity of lesions between SMS- and iShim-RESOLVE were compared.

Results

Ultimately, twenty primary tumors and seven metastatic lymph nodes were analyzed. The locations of twenty primary tumors were seven in tongue, six in larynx, three in hypopharynx, two in thyroid and two in esophagus.

The image distortion scores of iShim-RESOLVE were significantly lower than that of SMS-RESOLVE (iShim-RESOLVE 1.90±0.64, SMS-RESOLVE 2.85±0.36, p value＜0.001). The SNR of iShim-RESOLVE images were significantly higher than that of SMS-RESOLVE (iShim-RESOLVE 348.37±344.58, SMS-RESOLVE 127.96±119.71, p value=0.007).

What’s more, primary lesions in iShim-RESOLVE images acquired at b values=800 s/mm^2obtained much higher signal intensities than in SMS-RESOLVE images (iShim-RESOLVE 280.04±135.11, SMS-RESOLVE 58.17±38.15, p value＜0.001).

In addition, there was no significant difference of the ADC values of primary lesions between iShim-RESOLVE and SMS-RESOLVE sequences (iShim-RESOLVE 1052.05±163.16, SMS-RESOLVE 950.26±244.86, p value=0.198). And the ADC values of metastatic lymph nodes between these two sequences showed no significant difference neither (iShim-RESOLVE 941.93±241.12, SMS-RESOLVE 942.54±358.46, p value=0.993).

Conclusions

IShim-RESOLVE can improve image quality in head and neck DW imaging practice with substantially decreased lesion distortion and increased SNR, and it showed comparable ADC values of tumors and total acquisition time compared to SMS-RESOLVE sequence.

EPO-0269

Simultaneous multi-slice readout-segmented echo planar imaging for accelerated diffusion-weighted imaging of the head and neck tumors

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Purpose

To investigate the feasible application of simultaneous multi-slice (SMS) to readout-segmented echo-planar imaging (rs-EPI, RESOLVE) with the use of special purpose coils for accelerated diffusion-weighted imaging in head and neck tumors, allowing for a markedly reduced total acquisition time and improved image quality compared to the images acquired by conventional RESOLVE and rs-EPI with a readout partial Fourier acquisition (RESOLVE-RPF) protocol.

Materials and methods

Data were collected on a MAGNETOM Skyra 3T MR scanner (Siemens Healthcare, Erlangen, Germany) with a 20-channel head-neck coil and a pair of 4-channel special purpose coils. Twenty patients (15 males; mean age, 56 years; range, 29 - 81 years) with head and neck malignant tumors who underwent neck MR scan including four prototype sequences RESOLVE, RESOLVE-RPF, SMS-RESOLVE and SMS-RESOLVE+Coils were enrolled in this perspective study. DWI images were acquired with RESOLVE, RESOLVE-RPF and SMS-RESOLVE. The imaging parameters were as follows: TR/TE = 6540/58 ms, slice thickness = 3 mm; voxel size = 1.5 × 1.5 × 3.0 mm^3; FOV = 160 × 160 mm^2; readout segments = 5; b value = 0 and 800 s/mm^2. Three segments with readout partial Fourier factor 6/8 were used in RESOLVE-RPF. The TR/TE in SMS-RESOLVE was 4560/59 ms with slice acceleration factor 2. The acquisition time for RESOLVE, RESOLVE-RPF, and SMS-RESOLVE was 3:37 min, 2:58 min, and 2:47 min, respectively. The ADC values and the signal intensity of lesions were measured at the largest section of the tumors. The signal-to-noise ratio (SNR) was calculated by the ratios between the mean signal intensities of the lesion and the standard deviation of the background noise. The SNR, ADC values and signal intensity of lesions among the four protocols were compared.

Results

Ultimately, twenty primary tumors and seven metastatic lymph nodes were analyzed. The locations of twenty primary tumors were seven in tongue, six in larynx, three in hypopharynx, two in thyroid and two in esophagus.

There was no significant difference among the SNR of RESOLVE, RESOLVE-RPF and RESOLVE-SMS. Using special purpose coils, the SNR of RESOLVE-SMS+Coils was significantly increased more than twice compared to that of RESOLVE (211.61±108.69 versus 94.24±49.80, p value=0.004). The SD values of image background of four protocols were compared, and RESOLVE-SMS+Coils showed the smallest SD values (p value＜0.001). There was no significant difference of ADC values of primary lesions and metastatic lymph nodes among four DWI protocols (primary lesions p=0.382, lymph nodes p=0.796, respectively). With similar lesion area of primary lesions, images of RESOLVE-SMS+Coils showed significantly smaller SD of ADC values. Although there was no statistically significant difference of SD of lymph node ADC values among four protocols, images of RESOLVE-SMS+Coils showed relatively smallest SD values.

Conclusions

Combining SMS-RESOLVE with additional special purpose coils can improve image quality in head and neck DW imaging practice with increased SNR, and it showed comparable ADC values of tumors and substantially reduced total acquisition time compared to conventional RESOLVE sequence.

EPO-0270

Machine-learning-assisted radiomic biomarkers for early detection of radiation- induced temporal lobe injury: Development and retrospective validation

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Purpose: Early radiation-induced temporal lobe injury (RTLI) diagnosis is very challenging, and predictive biomarkers of RTLI are lacking. Therefore, we developed noninvasive radiomic biomarkers for early detection of RTLI.

Methods: We retrospectively evaluated 242 nasopharyngeal carcinoma (NPC) patients who had undergone baseline and regular follow-up magnetic resonance imaging (MRI) scans. The clinical endpoint was RTLI, which was diagnosed using MRI. The radiomic pipeline involved MRI data pre-processing, medial temporal lobe segmentation, feature extraction, feature selection, and predictive modeling. Total 24 non-texture and 61,920 texture features were extracted from the medial temporal lobe. A 0.632 + bootstrap and the area under the receiver operating characteristic curve (AUC) were applied for feature selection. Random forest was used to construct the prediction model. Three models, 1, 2 and 3, were developed for prediction 1, 2, and 3 years before RTLI onset, respectively. Different numbers of selected features were tested for optimization. AUC was used to assess the predictive performance.

Results: Of the 242 included patients, 171 (70.7%) were men, and the mean (standard deviation) age was 48.5 (10.4) years. The median follow-up time and latency from radiotherapy until the first RTLI were 46 and 41 months, respectively. Models 1, 2, and 3, with 20 radiomic features derived from the whole medial temporal lobe, yielded maximum AUCs of 0.830 (95% CI: 0.823–0.837), 0.773 (0.763–0.782), and 0.716 (0.699–0.733), respectively.

Conclusion: The three machine-learning-assisted radiomic models can dynamically predict RTLI 1–3 years in advance, enabling early detection and preventive neurological intervention.

EPO-0271

Radiomic machine-learning classifiers for prognostic biomarkers of advanced nasopharyngeal carcinoma

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We aimed to identify optimal machine-learning methods for radiomics-based prediction of local failure and distant failure in advanced nasopharyngeal carcinoma (NPC). We enrolled 110 patients with advanced NPC. A total of 970 radiomic features were extracted from MRI images for each patient. Six feature selection methods and nine classification methods were evaluated in terms of their performance. We applied the 10- fold cross-validation as the criterion for feature selection and classification. We repeated each combination for 50 times to obtain the mean area under the curve (AUC) and test error.We observed that the combination methods Random Forest (RF) þ RF (AUC, 0.8464 ± 0.0069; test error, 0.3135 ± 0.0088) had the highest prognostic performance, followed by RF þ Adaptive Boosting (AdaBoost) (AUC, 0.8204 ± 0.0095; test error, 0.3384 ± 0.0097), and Sure Independence Screening (SIS) þ Linear Support Vector Machines (LSVM) (AUC, 0.7883 ± 0.0096; test error, 0.3985 ± 0.0100). Our radiomics study identified optimal machine-learning methods for the radiomics-based prediction of local failure and distant failure in advanced NPC, which could enhance the applications of radiomics in precision oncology and clinical practice.

EPO-0272

Differentiation of sinonasal mucosal melanomas from sinonasal lymphomas based on MRI radiomics nomogram

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objective: *To develop a MRI radiomics-based nomogram for differentiating SNMMs from sinonasal lymphomas, using T2 weighted imaging and contrast enhanced T1 weighted imaging.*

Methods: *Forty-eight SNMMs and forty-five sinonasal lymphomas were included. An individualized 3D nomogram(I-3D-N), an individualized 2D nomogram(I-2D-N) and a generalized 3D nomogram(G-3D-N) were built. Visual assessments of two radiologists were also obtained. The area under the curve (AUC) between the I-3D-N and I-2D-N or between the I-3D-N and the G-3D-N, and the accuracy between the I-3D-N and the radiologists were compared.*

Results: *The I-3D-N was satisfactory with an accuracy of 0.88, AUC of 0.94 in the training cohort and accuracy of 0.89, AUC of 0.93 in the validation cohort. It harbored higher AUC than the I-2D-N (p<0.001) and the G-3D-N (p<0.001), and higher accuracy than the young (p<0.001) and experienced radiologist (p<0.05).*
Conclusions: *The I-3D-N based on MRI radiomics could help differentiate SNMMs from sinonasal lymphomas.*

EPO-0273
喉癌临床关注点和影像分析思路（讲座）

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背景和目的：喉癌是头颈部恶性肿瘤中第二常见肿瘤，约 60%诊断时为晚期(III 或 IV 期)。喉癌的治疗方案主要根据分期来确定，因此，临床重点关注喉癌的 TNM 分期。本文重点讲述如何根据喉癌患者的颈部 CT 表现进行分期及存在的问题与解决思路。方法：对照手术病理结果对照讲解喉癌的 TNM 分期。结果和结论：颈部 CT 表现可较准确地确定喉癌的 TNM 分期，但甲状软骨等喉软骨侵犯和隐匿性淋巴结转移目前是显示和诊断难点，需要进一步研究探讨，提高喉软骨侵犯和隐匿性淋巴结转移的灵敏度和特异度，为治疗方案及手术方式提供更准确依据，提高治疗效果。

EPO-0274
头颈部腺样囊性癌临床关注点及影像分析思路（讲座）

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背景和目的：头颈部腺样囊性癌并不多见，恶性程度不高，但容易沿神经蔓延，后者常被误诊为炎性病变或神经源性肿瘤。因此，本文重点讲解头颈部腺样囊性癌常见发生部位及沿神经蔓延的路径和表现，着重讲解分析思路。方法：讲解怎样分析肿瘤来源和分析思路。结果和结论：头颈部腺样囊性癌常来源于硬腭、腮腺、泪腺和鼻腔等，容易沿三叉神经与分支以及面神经与分支蔓延，翼腭窝是最常见的沿神经蔓延的部位，因此，对于翼腭窝不规则病变需仔细检查头颈部有无原发肿瘤，避免将沿神经蔓延误诊耽误治疗。磁共振是最佳检查方法。

EPO-0275
鼻窦常见病变的影像诊断与鉴别诊断

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目的:采用正确的诊断思路及分析方法，重视临床影像技术合理应用，以期提高鼻窦常见病变的影像诊断及鉴别水平。材料与方法:1、病变分类：先天性、外伤性、炎性、肿瘤与肿瘤样。2、征象分析，评价包括：分泌物信号改变，骨膜及骨膜下，骨质及腺相关颅内侵犯改变。3、定位、定

性、定量分析及 MPR 显示。4、回答临床问题与病变的精准评价，手术后及治疗后随访对比评价。5、扫描技术参数的标准化与合理匹配应用。结果:通过正确诊断思路方法，合理应用扫描技术与参数，实现临床、病理、影像及技术协同应用，提高鼻窦常见病变的诊断能力。结论:采用正确诊断思路方法、合理应用影像技术，可提高鼻窦常见病变的评价能力。

EPO-0276

RNA-Seq analysis of peripheral blood mononuclear cells reveals unique transcriptional signatures associated with radiotherapy response of nasopharyngeal carcinoma and prognosis of head and neck cancer

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Radiotherapy is the main treatment for nasopharyngeal carcinoma (NPC); however, radioresistance limits the therapeutic efficacy and prognosis of patients with NPC. Here, we plan to identify the genes involved in radiotherapy response. Peripheral blood mononuclear cells (PBMC) from three paired NPC patients with pre-radiotherapy and post-radiotherapy were extracted. Next-generation deep sequencing was then performed to identify the PBMCs transcripts profiles in response to radiotherapy. Data of gene chip GSE48501 was obtained from Gene Expression Omnibus (GEO) database. The gene integration of differentially expressed genes identified from RNA-Seq data and gene chip was performed using “RobustRankAggreg” package. RNA-Seq data from 44 normal and 519 Head and neck squamous cell carcinoma (HNSCC) tissues (downloaded from TCGA) was integrated into the analysis to further support our study. Cox regression was used to identify risk factors impacting survival. Total of 45 genes were identified to be associated with radiotherapy response. Significantly enriched Gene Ontology (GO) terms and pathways were enriched. Univariate and multivariate analysis suggested the dysregulated genes, *CHAC2, CLEC9A, GNG10, JCHAIN, KLRB1, NOG, OLR1, PRELID2, SYT1, VWCE, ZNF443* were associated with survival in HNSCC patients. Our data provide an overview of the profiles of radiotherapy-associated genes, which will facilitate future investigations into the function of radiotherapy resistance.

EPO-0277

多层螺旋 CT 与 MRI 鼻泪管成像对泪道阻塞的诊治分析

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目的 分析多层螺旋 CT 与 MRI 鼻泪管成像对泪道阻塞的诊治。方法 选取 2015 年 9 月—2016 年 9 月重庆市中医院眼科收治的泪道阻塞 23 例（46 侧）。采用 64 排螺旋 CT 和 MRI 鼻泪管成像对所有患者进行检查。结果 23 例患者中泪小管或泪囊阻塞共 18 侧，64 排螺旋 CT 检测出 1 侧（5.6%），MRI 鼻泪管成像检测出 15 侧（83.3%）；鼻泪管阻塞共 23 侧，64 排螺旋 CT 检

测出 19 侧（82.6%），MRI 鼻泪管成像检测出 18 侧（78.3%）。与 64 排螺旋 CT 和 MRI 鼻泪管成像相比，内镜检查诊断正确率为 67.5%(27/40)。结论 多层螺旋 CT 与 MRI 鼻泪管成像检测泪道阻塞的准确率均较高。

EPO-0278

体素内不相干运动扩散加权成像定量评价鼻咽癌 同步放化疗疗效的初步研究

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目的 探讨体素内不相干运动扩散加权成像(IVIM-DWI)定量评价鼻咽癌（NPC）放化疗疗效的价值。**材料与方法** 30 例经病理活检确诊的鼻咽癌患者，于放疗前、放疗中、放疗后行多 b 值扩散加权成像（DWI）检查。单指数模型获得表观扩散系数 ADC，双指数模型获得纯扩散系数 D 值、灌注分数 f 值、伪扩散系数 D*值。测量各扫描时间点肿瘤 IVIM-DWI 参数，分析其动态变化及相关性。**结果** 鼻咽癌病灶 ADC 及 D 值在整个治疗过程中逐步升高，且差异显著（$P<0.05$）。f 值先上升后下降，放疗前与放疗开始后 1 个月 f 值分别为 11%、19%（$P<0.05$）。不同扫描时间点间 D*值均无显著统计学差异（$P>0.05$）。**结论** 鼻咽癌放化疗前、治疗中、治疗后 IVIM 的各参数值可以较好评价放化疗的效果，D 值更能有效监测放化疗疗效，f 值可作为潜在观察指标，而 D*值需要技术上的改进。

EPO-0279

Non-Hodgkin’s lymphoma of paranasal sinus: Multiparametric MR Imaging Analysis

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Purpose: To investigate the characteristics of MRI appearances of paranasal sinus non-Hodgkin’s lymphoma (NHL).

Materials and Methods: 18 patients histologically proven NHL underwent preoperative MRI. Images were evaluated for the histologic phenotypes,primary sites, growth pattern, local tumor invasiveness(LTI), signal and homogeneity features , dynamic enhancement multiparameters(T_{peak},T_{max},CI_{peak},CI_{max},WR),ADC value,and extent or stage of the tumors. DCE parameters and ADC value were computed.

Results: Pathology covered four histopathologic phenotype of sinonasal NHL including NK/T cell lymphoma(NKTCL,n=2, 11.11%),diffuse large B cell lymphoma(DLBCL,n=14, 77.78%), Lymphoplasmacytic lymphoma(n=1, 5.56%),Mantle-cell lymphoma(n=1, 5.56%).MRI morphological patterns of NHL were identified:
(i)The majority of DLBCL found in paranasal sinus(77.78%).(ii)Three Growth pattern was diffuse filtration, localized mass and thickened mucosa.Diffuse pattern may be associated with advaced stage.(iii)When LTI occurred, subcutaneous and soft tissue involvement was the most common sign regardless of histopathological type. NKTCL showed anterior-posterior growing orientation accompanying less bilateral involvement. DLBCL easily extended orbit or pterygopalatine fossa and other more adjacent sites.

Most tumors were homogeneous isointensity on both T1WI and T2WI sequences and mild to moderate homogeneous enhacement. DCE and DWI sequences showed the unique features of T_{peak}, T_{max}, CI_{peak}, CI_{max}, WR and ADC value on MRI. T_{peak} and WR also showed the potential for sinonasal NHL stage.

Conclusion: On MRI, paranasal sinus NHL showed multiple parametric identifiable features. These findings help to more comprehensive understand MRI appearance of this disease from morphology, intensity, hemodynamic and diffusion. Our exploration showed the potential and clue for clinical differential diagnosis between lymphoma and other malignant tumors of paranasal sinus.

EPO-0280

鼻旁窦的非霍奇金淋巴瘤的 MRI 影像表现

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目的：研究总结副鼻窦非霍奇淋巴瘤的 MRI 影像特点，为临床诊断与治疗提供依据。

材料与方法：搜集近 4 年中 18 例于我院就诊经病理证实副鼻窦非霍奇金淋巴瘤患者治疗前的完整 MRI 影像资料。 通过对病理亚型、原发部位、生长形式，局部浸润、信号、均匀度、动态增强序列多个参数 (T_{peak}, T_{max}, CI_{peak}, CI_{max}, WR), ADC 值, 病变范围及肿瘤分期的评价和计算，总结该病特点。

结果：18 个病人的病理结果包括 4 个病理亚型：发生在鼻筛区或筛窦的 NKT 淋巴瘤 2 例（NKTCL, n=2, 11.11%），鼻腔筛窦区、上颌窦、筛窦、蝶窦、额窦的弥漫大 B 细胞淋巴瘤 14 例 (DLBCL, n=14, 77.78 %），上颌窦浆细胞母细胞瘤 1 例（n=, 5.56%），鼻筛区套细胞淋巴瘤 1 例 (n=1, 5.56%)。副鼻窦的非霍奇金淋巴瘤有下列特点：(i)绝大多数副鼻窦的非霍奇金淋巴瘤的病理类型为弥漫大 B 淋巴瘤（占 77.78%)。(ii)生长方式分为浸润性、局部肿块及粘膜增厚等形式，弥漫性形式往往与进展期病变相关。(iii)当发生局部浸润时，常出现面部软组织肿胀及皮下肿瘤浸润。弥漫大 B 型淋巴瘤容易累及眼眶、翼腭窝和其他邻近结构.大多数肿瘤在 T1WI 和 T2WI 序列上呈均匀等信号，增强后呈轻度到中等度均匀强化，少数不均匀，可见分隔强化。DCE 和 DWI 序列的 T_{peak}，T_{max}，CI_{peak}，CI_{max}，WR 参数及 ADC 值较其他类型副鼻窦恶性肿瘤有独特特点。T_{peak} 和 WR 对于副鼻窦 NHL 分期有一定帮助。

结论： MRI 上副鼻窦非霍奇金淋巴瘤的影像具备独特特点，这些特点表现在形态、信号、均匀度、动态增强参数及扩散 ADC 值等方面。我们的研究总结了发生于副鼻窦的 NHL 的 MRI 特点，对于鉴别淋巴瘤与副鼻窦其他恶性肿瘤提供参考依据，也为治疗分期提供有用信息。

EPO-0281

Onodi 气房与视神经管关系的鼻窦 CT 研究

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目的：鼻窦 CT 探索 Onodi 气房与视神经管之间的关系。

方法：回顾性分析 275 例鼻窦 CT（男 161 例，女 114 例）。评估 Onodi 气房是否出现，并根据文献分型方法将 Onodi 气房与视神经管之间的关系分成 I-IV 型。

结果：Onodi 气房的出现率为 45.8%，其中左侧 26.2%，右侧 29.4%，双侧 44.4%；男女性出现率分别为 46.9%、57.1%。Onodi 气房与视神经管之间的关系分型例数 III>IV>I>II。

结论：由于 Onodi 气房靠近视神经管，其临床意义十分重要，必须在相关手术术前评估 Onodi 气房是否出现及气化类型以避免视神经管损伤。鼻窦 CT 可准确评估 Onodi 气房及其与视神经管之间的关系，在此次研究中 III 型 Onodi-视神经管关系最为常见。

EPO-0282

增强 MR 诊断面神经运动去神经支配

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目的 探讨增强 MR 在诊断面神经运动去神经支配中的价值。
方法 对 9 例不同类型的周围性面瘫（PFP）患者进行 MR 增强扫描。采用 Philips EBW 工作站，行面神经 CPR 观察面神经受累及走行情况，观察分析 PFP 患者患侧面神经、表情肌受累情况，并与健侧进行比较。
结果 9 例 PFP 患者中，感染性 1 例，外伤性 2 例，肿瘤性 3 例，面神经肿瘤术后 3 例。1 例感染性 PFP 患者诊断为 Ramsay-Hunt 综合征， 其 MR 表现为患侧面神经病变节段出现明显强化伴轻度增粗；患侧面部表情肌（如颧大肌、颊肌、眼轮匝肌等）较对侧萎缩。2 例外伤性 PFP 中，其 MR 表现为患侧面神经增粗伴明显强化，患侧表情肌较对侧萎缩，且信号增高；3 例肿瘤性 PFP 中，其 MR 表现为面神经走行区及其周围区域的软组织样信号，面神经增粗伴明显强化，患侧表情肌较对侧萎缩。3 例面神经肿瘤术后 PFP 中，其 MR 表现为颞骨岩部、中耳乳突区斑片状不均匀 T1、T2 高信号，面神经走行区结构模糊，患侧表情肌较对侧萎缩。
结论 不同病因可致面神经运动去神经支配，在临床工作中应予以重视，增强 MR 可评价面神经运动去神经支配，CPR 可直观显示颞骨内面神经受累情况。

EPO-0283

内耳内常见疾病的高分辨 MRI 研究

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目的：利用高分辨磁共振成像研究内耳常见疾病的磁共振表现。
材料和方法:回顾性分析来我院就诊的 98 例累及内耳结构的患者（54 例突发性耳聋、26 例临床确诊为 Ramsay Hunt 综合征、6 例外伤，9 例颞骨术后），其中男性患者 54 名，女性患者 44 名，年龄范围为 21 岁~72 岁。所有患者行 3.0T MR 行内耳强化扫描，扫描序列包括强化前轴位 3D-T1WI 序列、3D-T2WI 序列、3D-FLAIR 序列及强化后轴位 3D-T1WI 序列、3D-FLAIR 序列。观察内耳的信号特点。
结果：（1）在磁共振上，内耳中内淋巴液和外淋巴液信号不同，主要体现在前庭部位，具体表现为内淋巴液在 T1WI 和 T2WI 上呈低信号，外淋巴液在 T1WI 和 T2WI 上呈高信号，正常情况下两者在 T2-FLAIR 上不显影；（2），98 例内耳病变患者信号存在异常，在 T1 上呈等或高信号，T2WI 呈高信号，T2-FLAIR 呈不同程度的高信号；其中 54 例突发性耳聋患者中，病变位于前庭外淋巴液 46 例，位于前庭内、外淋巴液 8 例；26 例 Ramsay Hunt 综合征患者病变位于前庭外淋巴液约 24 例，位于位于前庭内、外淋巴液 2 例；6 例外伤患者病变位于前庭外淋巴液 4 例，位于前庭内外淋巴液 2 例；9 例颞骨术后患者病变位于前庭外淋巴液 7 例，位于前庭内外淋巴液 2 例。
结论：利用磁共振 3D-T1WI、T2WI 及 FLAIR 序列能够分辨出前庭中的内、外淋巴液成分；内耳内常见疾病导致的内耳信号异常主要位于外淋巴液中，外伤导致的内耳出血常累及前庭内、外淋巴液。

EPO-0284
磁共振 3D-Cube T2 序列成像对脑脊液鼻漏的诊断价值

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目的探讨磁共振 3D-Cube T2 序列成像在脑脊液鼻漏中的临床应用。方法回顾性分析 2017 年 2 月—2018 年 8 月陆军军医大学第二附属医院收治的脑脊液鼻漏患者 17 例,其中 10 例为颅脑创伤,7 例为垂体瘤术后。行 MRI 常规检查及 3D-Cube T2 序列成像,研究 3D-Cube T2 序列脑脊液鼻漏的表现,总结 3D-Cube T2 序列成像对脑脊液鼻漏诊断的优势。结果 17 例患者发现脑脊液鼻漏 14 例,表现为鼻腔或鼻窦内与颅内脑脊液信号一致的高信号影,并可见沟通二者相连的线状高信号影。14 例鼻漏患者一共发现漏口 16 个,分别位于右侧前组筛窦及上鼻道 7 个、额窦 6 个、蝶窦及鞍旁 2 个、筛板 1 个。结论磁共振 3D-Cube T2 序列为重 T2 加权水成像,脑脊液在此序列图像上表现为高信号,通过图像后处理能多角度展示脑脊液鼻漏漏口的确切位置。

EPO-0285
听骨双向调整 MPR 结合听骨链 CPR 重组技术在先天性听骨链畸形患者中的临床应用

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目的 探讨听骨 MPR 及听骨链 CPR 重组技术在先天性单纯性听骨链畸形患者中的临床应用。
方法 对 94 例（125 患耳，年龄 6～39 岁）先天性单纯性听骨链畸形患者行颞骨 HRCT 轴位扫描并作听骨双向调整 MRP 重组及听骨链 CPR，二种方法结合观察听骨链畸形类型及程度；另选取 98 例（191 耳，5～47 岁）同期在我院因耳鸣、眩晕等症状就诊需行颞骨高分辨 CT 检查明确诊断者作为正常对照组（电测听检查均无听力异常）。机型及主要扫描参数：采用 Philips Brilliance-iCT256 扫描，准直 0.6mm，重建间隔 0.2mm，采用骨算法重建，重建矩阵 1024×1024。听骨 MPR 重组方法：在受检者同一序列轴位图像进入 MPR 功能窗口，根据听骨空间分布特点，利用双向调整 MPR 技术显示锤骨、砧骨、镫骨的全程结构；听骨链 CPR：在 MPR 的基础上绘制并调整听骨链参考线，在 1 幅图像上显示听骨及其连接关系。
结果 （1）正常对照组：两种方法相结合对听骨及其连接关系的显示率可达到 100%，对锤骨、砧骨及镫骨的全程显示的最佳方位分别是斜冠状位、斜矢状位及斜轴位。（2）临床应用：本组中镫骨畸形 107 耳，占 85.6%，砧骨长突畸形 84 耳，占 67.2%，其中单纯性镫骨畸形 41 耳（32.8%），单纯性砧骨畸形 18 耳（14.4%），镫骨畸形合并砧骨畸形 66 耳（52.8%）。听小骨畸形包括单纯砧骨长突缺如或发育不良，镫骨完全缺如，镫骨部分缺如（头颈部缺如——环状镫骨、前后脚缺如），镫骨发育不良（发育小、不规则块状、前脚或后脚细、“棒状”——单足弓等），单纯镫骨底板固定，镫骨异位，镫骨及砧骨长突均缺如或发育不良等多种类型。
结论 先天性单纯性听骨链畸形临床上表现类型多样，以镫骨、砧骨长脚畸形为主； MSCT 听骨 MPR 结合听骨链 CPR 重组技术能清晰显示畸形的不同类型，为患者临床治疗提供准确信息。

EPO-0286
Ramsay-Hunt 综合征和 Bell 麻痹患者影像学特点的对比分析

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目的：对比分析 Ramsay-Hunt 综合征和 Bell 麻痹患者面神经影像学的差异,以提高诊断及鉴别能力。
方法：回顾性分析来我院就诊的 89 例周围性面瘫患者（58 例临床确诊为 Bell 麻痹、31 例临床确诊为 Ramsay-Hunt 综合征），所有患者均行面神经 MRI 强化扫描，扫描序列包括平扫 T1WI、T2-FLAIR、T2WI 及强化后 T1WI、T2-FALIR，观察患侧面神经各序列的影像学表现有无差异。
结果：（1）Ramsay-Hunt 综合征:T1WI 平扫示 15 例患者可见患侧面神经增粗；5 例患侧内耳信号有轻度升高；T2WI 上患侧面神经、内耳信号均未见明显异常；T2-FLAIR 平扫示 20 例患者患侧面神经及前庭神经增粗；28 例患者患侧内耳内信号不同程度升高；增强后 T1WI 示 31 例患者患侧面神经增粗并强化，26 例患者患侧前庭神经增粗并异常强化，面神经主要病变部位在膝状神经节，由此向两端发展；同时 13 例患者患侧内听道壁脑膜异常强化；8 例患侧内耳有轻度强化。增强后 T2-FLAIR 示 31 例患者患侧面神经、前庭神经增粗并强化；11 例患者患侧内耳有不同程度强化。（2）Bell 麻痹：T1WI 平扫示 21 例患者患侧面神经增粗；T2WI 上患侧面神经、内耳信号均未见明显异常；T2-FLAIR 平扫示 15 例患者患侧面神经增粗；患侧内耳内信号均未见异常；增强后 T1WI 示 50 例患者患侧面神经增粗并强化，主要累及面神经内听道底段、迷路段及膝状神经节强化；增强后 T2-FLAIR 示 46 例患者患侧面神经增粗并强化；患侧内耳内信号均未见异常及强化。
结论：通过对比两者的影像学特点,发现两种病变有一定的相似之处,也存在差异，差异主要体现在强化后 T1WI（Ramsay-Hunt 综合征患者内听道壁有异常强化）及强化前后 T2-FLAIR 序列（Ramsay-Hunt 综合征患者内耳及前庭神经有异常），因此可针对疾病的影像学表现做出诊断。

EPO-0287
高分辨 CT 联合高分辨 MRI 在儿童人工耳蜗植入术前评估中的诊断价值

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目的：探讨颞骨高分辨率 CT(HRCT)和磁共振成像在儿童人工耳蜗植人术前评估的各自的诊断价值及两者联合应用对提高儿童内耳发育异常检出率的价值。
方法：回顾性分析 50 例(100 耳)临床确诊感音神经性聋患儿行人工耳蜗植人术前的颞骨 HRCT 及 MR 影像学检查资料,由 2 名具有 10 年以上耳鼻喉专业方向影像诊断医师分别进行影像学诊断，评估其内耳发育情况，得出内耳发育畸形诊断平均符合率。
结果：50 例（100 耳）患儿颞骨 HRCT 及 MRI 结果显示，两者联合应用共检出内耳畸形患儿 43 例、共计 76 耳，平均符合率 76%。其中耳蜗发育畸形共 26 耳(含 Mchel 畸形 3 耳、共同腔畸形 3 耳、耳蜗未发育 1 耳、耳蜗发育不全 5 耳、不完全分隔 I 型 3 耳、不完全分隔Ⅱ型 9 耳、蜗神经孔狭窄 2 耳)，前庭畸形 10 耳，半规管畸形 9 耳，前庭导水管畸形 14 耳，内听道畸形 6 耳，耳蜗神经畸形 8 耳，面神经位置异常 3 耳。其中 HRCT 诊断平均符合率 62% ，MRI 诊断平均符合率 71%。
结论: HRCT 在显示内耳骨迷路及骨质方面具有优势,MRI 在显示内耳膜迷路及听神经方面具 有优势,两者联合应用，优势互补，有利于小儿人工耳蜗植人术前内耳发育的全面评估及手术指导。

EPO-0288

Decreased functional connectivity of the primary auditory with cognitive networks in inattentive children and adolescents with hearing loss: a resting-state fMRI study

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Early profound deaf children and adolescents have been reported to suffer from distractibility and inattentiveness, which lead to academic difficulties. Neural correlates of this attention deficits have been little documented. The brain mechanism of this attention impairment in deaf children and adolescents is not clear yet. We hypothesized the functional connectivity of the primary auditory cortex to the attention control networks, default mode network and other cognitive networks may be reduced in inattentive children and adolescents with bilateral early profound deafness. Early intervention may mitigate the effects of deafness on attention development in deaf children and adolesecnts. In this study, we applied resting-state functional magnetic resonance imaging to investigate the functional connectivity of the superior temporal gyrus and transverse temporal gyrus in primary auditory cortex on 25 inattentive children and adolescents with bilateral prelingual profound deafness (BPPD), comparing with 30 age-matched normal controls. Pearson correlation analyses were then used to explore the correlations of functional connectivity changes with the years of deafness, sign language usage and hearing aid usage. Our results revealed alterations mainly decrease in resting-state functional connectivity (RSFC) between the primary auditory cortex and the attention control, language comprehension, default-mode and sensorimotor networks in these deaf subjects. The usage of hearing aid was also found to normalize the connectivity between primary auditory cortex and attention network in these deaf subjects. Our findings indicated a negative impact of early auditory deprivation on the attentional and other high cognitive networks, which is crucial for early intervention and clinical care of deaf children and adolescents.

EPO-0289

Evaluated Type 2 Diabetes Mellitus is Associated with Sudden Sensorineural Hearing Loss: Novel Findings from Labyrinthine MRI Study

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Background and Purpose---The association between type 2 diabetes mellitus (T2DM) and sudden sensorineural hearing loss (SSNHL) has been extensively reported. However, the pathophysiology of T2DM related SSNHL is still speculative. Recent studies have proposed that modern MRI can identify the presence of abnormalities on labyrinthine. In this study, we aimed to explore this association between T2DM and SSNHL by using labyrinthine MRI.

Materials and Methods---From August 2018 to December 2018, 162 patients with SSNHL were consecutively recruited and underwent 3.0T MRI, including pre/post- contrast 3D fluid-attenuated inversion recovery (FLAIR) and T1-weighted imaging (T1WI). Signal intensities of the medulla and perilymph of the cochlear basal turns of the affected ear in each patient were measured in a blinded fashion, and cochlea/medulla ratios were calculated. Clinical and demographic characteristics and incidence of abnormal MRI findings were compared between patients with T2DM and without T2DM.

Results---A total of 150 participants (mean age 45.96 ± 15.38 years, 88 male) were available for analysis. Forty-six (30.7%) patients showed abnormal findings on labyrinthine MR imaging in the affected ear, and thirty (20.0%) had history of T2DM. The incidence of abnormalities on pre-contrast FLAIR or T1WI images was not significantly different between T2DM and None-T2DM group (10 [33.3%] vs. 36 [30.0%], p=0.436). T2DM group showed higher cochlea/medulla ratios on pre-contrast FLAIR images in affected ear than None-T2DM group (0.41 ± 0.31 vs. 0.26 ± 0.53, p=0.038). Moreover, in the T2DM group, eight (26.7%) patients showed abnormalities on post-contrast FLAIR or T1WI images, which was higher than that in None-T2DM group (8 [6.7%], p=0.002).

Conclusions--- Increased cochlea/medulla ratio indicates the presence of intracellular and extracellular methemoglobin or increased protein content in the membranous fluid. Abnormalities on post-contrast FLAIR or T1WI images indicate increased blood-labyrinth barrier permeability. In this study, SSNHL patients with T2DM showed higher cochlea/medulla ratios and higher incidence of abnormalities on post-contrast FLAIR or T1WI images, which may provide a pathophysiologic biomarker for the association between T2DM and SSNHL.

EPO-0290

MR Imaging Study on the Correlation Between Lipid Metabolism and Disturbed Microcirculation in Patients with Sudden Sensorineural Hearing Loss

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Background and Purpose---Previous studies have reported that microcirculation is one of the key causes leading to sudden deafness, which could be detected by labyrinthine 3D fluid-attenuated inversion recovery (FLAIR). Furthermore, dyslipidemia may contribute to the disturbance of microcirculation. The purpose of this study was to investigate the correlation between disturbed microcirculation and dyslipidemia by using labyrinthine MR imaging.

Materials and Methods---From August 2018 to December 2018, this study consecutively recruited 162 patients who were diagnosed with unilateral sudden sensorineural hearing loss (SSNHL) and underwent labyrinthine FLAIR on 3.0T MR scanner. One hundred and fifty participants (mean age 45.96 ± 15.38 years, 88 male) were available for analysis. Signal intensities of the medulla and perilymph of the cochlear basal turns of the affected ear in each patient were measured in a blinded fashion, and cochlea/medulla ratios were calculated. We analyzed abnormalities on labyrinthine FLAIR and correlated them with serum lipid parameters.

Results--- Forty-six (30.7%) patients showed abnormal findings on labyrinthine FLAIR in the affected ear, and twenty-five (16.7%) had history of hyperlipioemia. In hyperlipioemia group, eight participants (32.0%) showed increased signal intensity on labyrinthine FLAIR, which was not significantly different to None-hyperlipioemia group (38 [30.4%], p=0.275). Hyperlipioemia group showed increased cochlea/medulla ratios on labyrinthine FLAIR images in affected ear than None-hyperlipioemia group (0.28 ± 0.36 vs. 0.15 ± 0.24, p=0.021). In patients with abnormal labyrinthine FLAIR, significant positive correlation between cochlea/medulla ratios and total cholesterol (TC) was found (r=0.254, P=0.041).

Conclusions--- According to our findings, it is suggested that lipid metabolism significantly correlated with disturbed microcirculation in patients with SSNHL. Increased cochlea/medulla ratio in hyperlipioemia group may indicate that increased serum lipid parameters could contribute to the presence of intracellular and extracellular methemoglobin or increased protein content in the membranous fluid.

EPO-0291
经静脉内耳钆造影 MRI 对可疑梅尼埃病诊断价值的研究

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目的　探讨经静脉内耳钆造影 MRI 在可疑梅尼埃病（Ménière’s disease）中的诊断价值。资料与方法　回顾分析 130 名梅尼埃病可疑患者资料，以 2017 年梅尼埃病诊断和治疗指南作为诊断标准，评价经静脉内耳钆造影 MRI 检查在梅尼埃病中的诊断价值。结果　其中诊断为梅尼埃病 80 名患者，21 名患者诊断为突聋，21 名患者为前庭性偏头痛，9 名患者诊断为迟发型迷路积水等其他疾。内耳钆造影诊断梅尼埃病的灵敏度、特异度、阳性预测值和阴性预测值分别为 88.3%、77.4%、85.0%、82.0%；经静脉内耳钆造影 ROC 曲线下面积及 95%可信区间为 83.5%（76.4%-89.7%）；经静脉内耳钆造影诊断结果进行一致性分析诊断结果与临床诊断结果的一致性较好（κ=0.66）。结论　经静脉内耳钆造影可以作为一种无创性诊断梅尼埃病的可靠检查方法。

EPO-0292
颞骨巨细胞修复性肉芽肿特征性影像学表现

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目的 回顾性分析 10 例颞骨巨细胞修复性肉芽肿（giant cell reparative granuloma, GCRG）CT 和 MRI 表现，总结其具有特征性的影像学特点。
方法 收集于本单位行影像学检查并经病理证实的颞骨 GCRG 患者 10 例，8 例患者均行 CT 平扫、MRI 平扫及动态增强检查，2 例患者仅行 CT 平扫，由两名经验丰富的影像医师分别分析病变的密度、骨质改变、信号特点及时间信号强度曲线。
结果：颞骨 GCRG 发生在左侧 6 例，右侧 4 例。女性 3 例，男性 7 例。年龄 29-50 岁，平均年龄 39 岁。10 例均累及鳞部，其中 6 例局限在鳞部，3 例发生在鳞部、乳突部，1 例发生在鳞部、乳突部及鼓部。CT 表现为膨胀性骨质破坏 10 例，病变周围宽带状增生硬化 9 例，增生硬化以近蝶鳞缝骨质、颧突为著，其中 2 例累及同侧蝶骨大翼。病变密度不均匀，内见低密度囊变区 7 例；病变密度均匀 3 例。MRI 表现为 T2WI、T1WI、DWI 序列以低信号为主的混杂信号 7 例；表现为 T2WI 以高信号为主、边缘条状低信号，DWI 等信号，T1WI 低信号 1 例。动态增强 MRI 时间信号强度曲线表现为速生速降型 5 例，速生缓降型 3 例。合并中耳乳突炎 10 例，周围软组织炎性反应 8 例，脑膜强化 8 例。
结论：颞骨 GCRG 好发于鳞部，病变向后、向下生长侵犯乳突部、鼓部。CT 表现为膨胀性骨质破坏，邻近骨质宽带状增生硬化，以近蝶鳞缝骨质、颧突为著，MRI 表现为 T2WI、T1WI、DWI 序列以低信号为主的混杂信号，时间信号强度曲线呈速升速降型、速升缓降型为该病的特征性影像学表现。

EPO-0293
颞骨低剂量扫描自动调节管电压技术在成人患者中应用

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目的：评估第 3 代双源 CT 自动调节管电压技术(CARE kV)与常规扫描方案在成人患者中行颞骨薄层扫描辐射剂量与图像质量的影响。
步骤与方法：收集 2018 年 7 月 1 日至 2018 年 7 月 31 日在北京协和医院就诊，临床需要行颞骨 CT 检查的成人患者，采用随机表格法分为 2 组：A 组（n=25）采用第 3 代双源 CT 自动管电压选择技术（CARE KV）及 ADMIRE 迭代重建；B 组（n=25）采用第 3 代双源 CT 常规颞骨扫描方案(120kv/200mAs)及 FBP 重建。扫描范围为眉弓至乳突下缘。测量目标结构（颞骨皮质、耳前皮下脂肪、脑干）CT 值及图像噪声，计算信噪比（SNR），记录机器自动测量的辐射剂量,由两位放射科医师采用 5 分制评分对 10 个解剖结构的图像质量进行评估。
结果：两组患者性别、年龄、身高、体重及 BMI 均没有统计学差异（P 均>0.05）。两组患者各解剖结构间的 CT 值、图像噪声及 SNR 均无统计学差异（*P*均>0.05）。两组患者 10 个解剖结构间的主观评分(*P*=0.138)差异均无统计学意义（*P*均>0.05）。A 组的 CT 容积剂量指数为（15.16±1.54）mGy，较 B 组的（32.46±1.79）mGy 下降了 53%（t=-40.140p<0.05）。A 组的平均剂量长度乘积和平均有效剂量分别为（114.48±12.43）mGy·cm 和（0.24±0.03）mSv，明显低于 B 组的（243.72±19.02）mGy·cm 和（0.51±0.04）mSv （t=-31.153，p<0.05），下降达 53%。

结论：与常规扫描方案相比，第 3 代双源 CT CARE kV 技术行颞骨扫描可在保证图像质量的前提下，明显降低辐射剂量。

EPO-0294
面神经管多层螺旋 CT 及后处理技术与手术结果对照研究

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目的:探讨面神经管多层螺旋 CT 成像并结合各种后处理技术对面神经管在中耳手术中的评估应用。**材料与方法:**收集本院 2015 年 1 月至 2018 年 12 月期间,经手术、病理证实的慢性化脓性中耳炎 60 例,合并中耳胆脂瘤 66 例。所有病例术前均行颞骨 CT 平扫。将患者的原始图像数据传入 CT 三维重建工作站,使用重建软件的多平面重组(MPR)技术及曲面重建（CPR）技术分别沿面神经管进行图像后处理，将 CT 平扫及重建后的图像与术中情况对比。**结果:**1、在面神经管常规轴位及双斜位图像上能清楚显示并区分出膝状神经节、鼓室段、后膝部和乳突段,在双斜位上面神经管表现“(?)”形,但是不能完整显示出颞骨全段，而 CPR 能很好显示面神经管颞骨段全部结构。2、60 例慢性化脓性中耳炎患者中颞骨 CT 轴位组与术中对照的符合率约 92.0%。MPR 重建组与术中对照的符合率约 95.6%。两组之间的差异无统计学意义(P>0.05)。CPR 重建与术中对照符合率约为 96.2%，两组之间差异无统计学意义（P>0.05）。3、66 例中耳胆脂瘤患者中颞骨 CT 轴位组与术中对照的符合率约 79.7%。MPR 重建组与术中对照的符合率约 96.97%。两组之间存在显著性差异(P<0.05)。CPR 重建与术中对照符合率约 88.3%，两组间有统计学差异（P<0.05） **结论:**面神经管 CT 检查通过 MPR 和 CPR 重建能更好提供面神经的形态及走行,对病变程度的判定、病情的评估、术前交待及术中操作具有指导意义。

EPO-0295
静脉性搏动性耳鸣患者影像学评估及发病机制分析

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目的：分析静脉源性搏动性耳鸣患者影像学检查异常表现，探讨静脉性搏动性耳鸣的发病机制。
方法：回顾性分析 2015 年 12 月-2018 年 12 月 71 例静脉源性搏动性耳鸣患者的高分辨率 CT 影像学表现，从 CT 图像上观察是否伴有颈静脉球、乙状窦、乳突导静脉等颈内静脉解剖异常。
结果：71 例患者中，69 例为女性，2 例为男性，其中颈静脉球异常 49 例，包括高位 39 例，颈静脉球乙状板缺损 2 例；乙状窦异常 61 例，包括乙状窦前置 16 例，乙状窦沟骨壁缺损 53 例，乙状窦憩室 28 例；乳突导静脉显影增大 18 例。只出现一种颈内静脉解剖异常 4 例，两种异常 58 例，三种 9 例。
结论：本研究总结性地展示了静脉源性搏动性耳鸣的常见颈内静脉结构异常，颈内静脉结构的异常产生了搏动性耳鸣的声源并提供了耳鸣传导的路径，通过分析静脉源性搏动性耳鸣的异常及病因可以为进一步探讨搏动性耳鸣的发病机制提供了新的思路。

EPO-0296

4D-flow MRI evaluates the blood flow velocity in transverse sinus of venous pulsatile tinnitus after therapy

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Purpose: To use 4D-flow MRI to characterize the differences of blood flow velocity of transverse sinus between the good efficacy group and poor efficacy group in venous pulsatile tinnitus (VPT) patients after therapy and to investigate their differences vs healthy controls.
Materials and Methods: A total of 20 patients with VPT and 10 healthy controls were included in the retrospective study. 20 patients were divided into good efficacy group (10/20) and poor efficacy group (10/20) according to whether the VPT recurred after half a year. All participants underwent 4D-flow scan in a 3.0T MR scanner. All quantification and analysis of 4D-flow data were performed using dedicated GT-flow software. Variance analysis was used to compare the blood flow velocity of transverse sinus between good and poor efficacy group after therapy and to investigate the differences vs normal control group.
Results: There were differences about blood flow velocity between patient group and healthy controls, and the blood flow velocity of good efficacy group verged on control group. The blood flow velocity of good efficacy group was slightly higher than control group ($P<0.05$). Apparently, the blood flow velocity of poor efficacy group was higher than control group ($P<0.05$). Compared with the poor efficacy group, the good efficacy group showed lower blood flow velocity ($P>0.05$).
Conclusions: Significant differences about blood flow velocity were found between patient group after therapy and healthy controls with 4D-flow MRI, but the differences between good and poor efficacy group were not preonunced. Blood flow velocity in transverse sinus could serve as biomarkers for diagnosis of VPT and evaluation of curative effect.

EPO-0297
多层螺旋 CT 成像对鼓室壁及听小骨骨质破坏评估价值

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目的 探究 128 层螺旋 CT 颞骨薄层扫描并结合后处理技术对于鼓室成形术前鼓室壁及听小骨骨质破坏评估的临床价值。**方法** 选取 2016 年 6 月至 2019 年 6 月间收治行乳突病变切除联合鼓室成形术治疗的 80 例中耳乳突炎患者，其中 50 例术前诊断合并胆脂瘤形成,患者术前均进行颞骨轴位高分辨率 CT(HRCT)扫描,利用多平面重建、曲面重建技术及 VR 技术进行图像后处理,将术前检查结果与术后病理诊断进行对比,评价诊断准确率。**结果** 颞骨薄层扫描对患者中耳骨质破坏的判断情况中,乙状窦骨壁破坏诊断符合率 100.0%,鼓室盾板 98.3%,外耳道后壁 95.8%,半规管 97.0%,鼓室鼓窦天盖 96.9%,面神经管 82.3%。而对于患者的听骨链显示中,砧骨短脚破坏诊断符合率 88.5%,砧骨长脚 98.6%,锤砧关节 100.0%,锤骨头 96.1%,砧骨体 95.0%,锤骨柄 100.0%,镫骨支 100.0%，镫骨底板 52%,砧镫关节 95.6%。**结论** 应用多层螺旋 CT 的颞骨 HRCT 结合多种图像后处理技术,除了对镫骨

底板显示欠佳外能对中耳骨质的破坏情况以及听骨链的结构与连接状况、病变程度与范围等进行准确显示。

EPO-0298

The assessment of imaging characteristics and invasion pathways of malignant external otitis by HRCT and MRI

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Objective To analyze the imaging characteristics and invasion pathways of MEO by high resolution computed tomography (HRCT) and magnetic resonance imaging (MRI).
Methods HRCT (13/13) and MRI (9/13) data in 13 patients were retrospectively analyzed. We evaluated the sign of bone erosion, soft tissue abnormity, temporal bone pneumatization and invasion pathways.
Results: 13 patients (100%) present diffuse soft tissue in EAC and middle ear cavity; 9 patients (69.2%) had bone erosion of EAC;13 patients (100%) had bone erosion of middle ear cavity, and 7 patients (53.8%) presented with bone destruction of PF in middle ear. Poorly temporal bone pneumatization was found in 61.5% at the affected side and the degree of temporal bone pneumatization was significantly lower than that of the unaffected side (P=0.01). MEO invaded forward temporomandibular joint (TMJ) (100%)through petrotympanic fissure(PF)(55.6%), bony EAC(11.1%) and cartilage of EAC(33.3%); It invaded inward middle ear cavity(100%), parapharyngeal space(77.7%) mainly through PF(71.4%), nasopharynx (44.4%) and contralateral tissues (11.1%); It directly invaded downward styloid process (30.7%) and skull base bone (55.6%); It invaded upward endocranium (77.8%) and cavernous sinus (11.1%) through foramen ovale(57.1%) and tegmen tympani(71.4%). Besides, MEO directly invaded backward posterior wall of EAC (53.8%), posterior mastoid bone (30.8%), mastoid segment of the facial nerve canal (15.4%) and mastoid air chamber (100%).
Conclusions: MEO shows some characteristics on HRCT and MRI. PF is an important pathway for MEO to invade TMJ and parapharyngeal space.

EPO-0299

Application value of TSE-DWI sequence and EPI-DWI sequence in the diagnosis of cholesteatoma

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OBJECTIVE:To study the application value of TSE-DWI and EPI-DWI in the evaluation of cholesteatoma.METHODS:41 patients with primary cholesteatoma were prospectively enrolled in the study. All patients underwent Philips Ingenia 3.0T superconducting magnetic resonance scanner and 32-channel head coil.The TSE-DWI and EPI-DWI were completed before surgery. The b value was 1000s/mm^2.In the middle ear region, TSE-DWI

and EPI-DWI images were found to be diagnosed as cholesteatoma with high signal lesions compared with gray matter, and surgical treatment was performed within the next two weeks to pathology. The pathological results were gold standard. The accuracy, sensitivity, specificity, positive predictive value and negative predictive value of TSE-DWI and EPI-DWI in the diagnosis of primary cholesteatoma were calculated.RESULTS:Of the 41 patients with suspected cholesteatoma, 10 were diagnosed as non-cholesteatoma and 31 were cholesteatoma.The average long diameter of cholesteatoma was 9.9±7.0 mm (range 3.0-40.0 mm). TSE-DWI scan was performed,29 cases were diagnosed as cholesteatoma,12 cases were non-cholesteatoma, and the accuracy,sensitivity,specificity,positive predictive value and negative predictive value of TSW-DWI sequence for diagnosis of cholesteatoma were 90.24%, 90.30%, 90.00%,96.60%,75.00%.EPI-DWI scan,30 cases of cholesteatoma,11 cases of non-cholesteatoma,EPI-DWI sequence diagnosis of cholesteatoma accuracy,sensitivity,specificity,positive predictive value and negative predictive value were 73.17%,80.65%,50.00%,83.33%,45.45%.Conclusion:The TSE-DWI image has higher signal-to-noise ratio than the EPI image. The TSE-DWI sequence improves the diagnostic accuracy and reduces the rate of misdiagnosis. It has superiority in the study of cholesteatoma and has high application in clinical diagnosis and treatment value.

EPO-0300

The auditory network and default mode network in rats post broad-band intense noise exposure

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PURPOSE

Noise-induced hearing loss (NIHL) is associated with cognitive impairments and considered to be an independent risk factor that triggers incident dementia [1][2][3][4]. However, where and how NIHL affects the central nervous system and cognitive behaviors are not well understood. We aimed to investigate the alterations in cognition and functional connectivity post noise, finding the progress and neural substrates of NIHL-induced cognitive impairments.

METHODS

We exposed rats to 122 dB broad-band noise for 2 hours to induce hearing loss and the auditory function was assessed by measuring auditory brainstem response thresholds. Morris water maze test was computed at 0 day, 1, 3, 6 months post noise to reveal cognitive ability. The interregional connections in the auditory network and default mode network, as well as the connections using the auditory cortex and cingulate cortex as seeds were also examined at four time points. Behavioral data was compared by two sample t test with a significant p value at < 0.05. Interregional connectivity and seed-based functional connectivity were used two sample t test with $p < 0.01$ and $p < 0.005$, respectively.

RESULTS

The deficit in spatial learning/memory was only observed at 6 months after noise exposure. NIHL rats didn't exhibit any statistically significant deficits in spatial memory performance of training days, but in the spatial probe period, NIHL rats swam less distance in the target quadrant, while the number of crossing platform was reduced in NIHL group comparing to the control group. The internal connections in the auditory network and default mode network were enhanced at 0 day and decreased at 6 months post noise. The connectivity using the auditory cortex and cingulate cortex as seeds generally followed the rule of "enhancement-normal-decrease-widely decrease", involving auditory regions and non-auditory areas (such as limbic area, arousal area and cerebellum).

CONCLUSION

Functional alterations in brain areas are prior to behavioral changes and NIHL led to deficits in the auditory-limbic-arousal-cerebellum network.

EPO-0301

Diagnostic value of Intravenous Gadolinium Inner Ear MRI in Suspected Meniere's disease

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Purpose to evaluate the diagnostic value of intravenous gadolinium inner ear MRI in suspected Ménières disease. **Materials and methods** We retrospectively analyzed the data of 97 suspected patients with Meniere's disease. The diagnostic criteria were based on the 2017 guidelines for the diagnosis and treatment of Meniere's disease. We evaluated the diagnostic value of inner ear MRI in Meniere's disease. **Results** Of the 130 suspected patients, 21 patients were diagnosed with sudden deafness, 21 patients with vestibular migraine, 9 patients with delayed hydrolabyrinth and other diseases. The sensitivity, specificity, positive predictive value and negative predictive value of intravenous gadolinium inner ear mri in the diagnosis of Meniere's disease were 88.3%, 77.4%, 85.0% and 82.0%, respectively. The area under the ROC curve and 95% confidence interval of intravenous internal ear gadolinium angiography were 83.5% (76.4%-89.7%), and the area and 95% confidence interval of intravenous internal ear gadolinium angiography were 83.5% (76.4%-89.7%). The diagnostic results of angiography were consistent with those of clinical diagnosis(κ=0.66). **Conclusion** Intravenous gadolinium inner ear MRI can be used as a reliable method for noninvasive diagnosis of Meniere's disease.

EPO-0302

中耳乳突区广泛骨质破坏性病变的 CT 和 MRI 诊断

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目的：探讨中耳乳突区广泛骨质破坏性病变的 CT 和 MRI 特征。

方法：对 12 例经临床病理证实的中耳乳突区广泛骨质破坏病例 CT 和 MRI 特征进行分析总结。
结果：中耳癌 6 例，鳞状上皮癌 5 例，腺样囊性癌 1 例；骨纤维异常增殖症、骨巨细胞瘤、颈静脉球瘤、中耳胆脂瘤伴炎性肉芽组织、朗格汉斯组织细胞增多症、化脓性中耳炎及其并发症各 1 例。6 例中耳癌均可见软组织团块影，骨质溶骨性破坏并致鼓室盖或/和乙状窦前壁部分骨质缺失，5 例骨质破坏边缘毛糙、模糊，仅 1 例边缘较清楚；4 例破坏骨质类“碎米粒”或/和磨玻璃样变；4 例行 MRI 增强扫描见明显强化软组织肿块突入颅内并沿颅内板下侵延生长，相应部位脑膜明显不规则增厚、强化，1 例还可见乙状窦癌栓；2 例行 DWI 扫描，病灶弥散受限。1 例骨纤维异常增殖症为颅面多骨膨大变形，骨硬化、磨玻璃及不规则低密度区内钙化骨化影多种表现并存，乳突区病灶呈等 T1、长 T2 信号，明显强化；该病例恶变为骨肉瘤，在上颌窦区形成巨大软组织肿块。5 例良性病灶除化脓性中耳炎及其并发症骨质破坏边缘稍显毛糙、模糊外，余骨质膨胀性、溶骨性或穿凿样破坏表现不一，但边缘均较清楚、规整，骨巨细胞瘤边缘可见残留骨，中耳胆脂瘤边缘有硬化边。中耳胆脂瘤病例仅行 CT 和 MRI 平扫，其余病例增强扫描病灶多为明显不均匀强化。颈静脉球瘤 MRI 可见“盐和胡椒”征。化脓性中耳炎广泛累及耳周、颞下窝及咽旁，相应受累部位见多个环形强化脓肿影形成。本组各良性病灶，虽多有鼓室盖或/和乙状窦前壁骨质不连续并颅内受累，但仅见相应部位强化脑膜轻中度增厚、相对规整、自然，无结节状突起及沿颅内板下侵延生长肿块表现；颈静脉球瘤 DWI 弥散受限。
结论：中耳乳突区广泛骨质破坏性病变，CT+MRI 可根据其骨质破坏、软组织肿块及强化特点、颅内侵犯及脑膜改变、以及弥散等差异，能较准确地对其进行诊断鉴别和评估病变的侵犯范围，为临床治疗提供依据和帮助。

EPO-0303
经鼓室注射钆动态增强 3D-FLAIR 技术对梅尼埃病的临床诊断价值

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目的采用经鼓膜穿刺鼓室内导入造影剂 Gd-DTPA 动态增强三维快速液体衰减反转恢复磁共振扫描(3D－FLAIR)技术，评价其对梅尼埃病的有效性及临床诊断价值。**方法** 5 例正常志愿者，11 例经临床确诊的梅尼埃病患者，采用经鼓膜穿刺中耳腔给药的方法，在耳内窥镜监视下注入稀释的钆喷酸，给药 4 小时，12 小时，24 小时后在 3.0T 磁共振机器进行动态增强三维快速液体衰减反转恢复磁共振扫描(3D 一 FLAIR)。由 2 名熟悉内耳的放射科医生对 16 例样本耳蜗、前庭、半规管进行测量 SIR 值，并对内耳及同层脑干的信号强度比分别进行测量和计算，进行统计学分析。分别测量 5 例正常志愿者及 11 梅尼埃患者内淋巴间隙面积/前庭内外淋巴总面积比值，统计结果并进行统计学分析。**结果** 16 例受试者动态增强扫描检查均可显示内耳的耳蜗、前庭、半规管。动态增强 4 小时扫描大部分耳蜗、小部分前庭可显影，12 小时耳蜗、前庭、半规管均可显影，24 小时扫描耳蜗信号强度较淡，前庭部分显影可，半规管显影较好。梅尼埃病患者内淋巴间隙面积/前庭内外淋巴总面积大于 1/3,而正常对照组小于 1/3，两者比较有统计学意义。**结论**经鼓膜穿刺鼓室内导入造影剂礼，内耳 3D－ FLAIR MRI 动态增强扫描检查，可以多期相动态观察耳蜗、前庭、半规管外淋巴对造影剂的摄取情况，从而明确内淋巴积水的情况，为梅尼埃病提供重要的临床诊断价值。

EPO-0304
颞下颌关节紊乱病患者髁突位置和形态的 MRI 观察

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目的 通过 MRI 评估颞下颌关节紊乱病患者髁突位置及形态的变化，为临床提供参考。**方法** 对 137 例临床诊断为颞下颌关节紊乱病的患者[年龄（37.5±16.1）岁，男性 39 例，女性 98 例]进行颞下颌关节 MRI 扫描，根据关节盘移位情况分为关节盘正常组（disc without displacement，DWoD）（185 侧关节），可复性关节盘前移位组（anterior disc displacement with reduction，DDWR）（17 侧关节）及不可复性关节盘前移位组（disc displacement without reduction，DDWoR）（72 侧关节），在矢状位 PDWI 上观察颞下颌关节髁突位置（前位、中立位及后位）和形态（卵圆形、扁平形及鸟嘴形），并在横轴位 T2WI 图像上测量髁突长轴、短轴及髁间角。**结果** DWoD 组、DDWR 组和 DDWoR 组髁突位置差异无统计学意义（χ^2=7.435，*P*=0.115）。DWoD 组扁平形髁突发生率[83.9%（115/137）]显著高于 DDWoR 组[50.7%（22/137）]（*P*＜0.05），DWoD 组鸟嘴形髁突发生率[16.1%（22/137）]显著低于 DDWoR 组[49.3%（34/67）]（*P*＜0.05）。DWoD 组髁突长轴[（17.2±2.4） mm]显著大于 DDWR 组[（15.4±2.0） mm]和 DDWoR 组[（14.7±2.7） mm]（*P*＜0.05）。DWoD 组髁突短轴[（7.3±1.2） mm]显著大于 DDWR 组[（6.5±1.3） mm]和 DDWoR 组[（6.1±1.4） mm]（*P*＜0.05）。正常组、单侧移位组髁间角（分别为 136°±13°和 132°±14°）均显著大于双侧移位组（124°±17°）（*P*＜0.05）。**结论** 颞下颌关节紊乱病人群中颞下颌关节盘移位患者可见髁突形态显著改变。

EPO-0305

Otoscopy and radiography features of spontaneous temporomandibular joint herniation into the external auditory canal

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Objectives: *To explore the otoscopy, CT and MRI features of spontaneous temporomandibular joint* (TMJ) herniation(STMJH) into the external auditory canal (EAC) through the persistent foramen of Huschke (PFH).
Materials and Methods: *there were 15 cases with STMJH confirmed by surgery or dynamic otoscopy. The otoscopic, CT and MRI data of these cases were reviewed.*
Results: *① Otoscopy revealed a mass located in the anterior wall of the bony EAC that moved forwards and backwards during mouth opening and closing, respectively. ② CT of the temporal bone showed a bony defect and with a soft mass in the anterior wall of the EAC; the bony defect margin was well defined in all cases. The bone adjacent to the PFH was pressed and partially wrapped around the soft mass, as if "holding a ball", in 7 cases. A partial, peripheral, pseudo bone shell around the soft mass was observed in 8 cases. The soft mass appeared to be attenuated with the soft tissue of the TMJ, with no enhancement.* ③ Six cases included MRI scans, which showed TMJ soft tissue herniated into the EAC.
Conclusion: *The otoscopy, CT and MRI features of STMJH are unique. The diagnosis can be confirmed by dynamic otoscopy or contrast-enhanced MRI. Conventional CT was necessary to detect the bone of the EAC. MRI can be chosen when the herniation is complicated by infection or otitis externa or when the patient has TMJ dysfunction.*

EPO-0306

CT, conventional, and functional MRI features of endolymphatic sac tumor: a series of nineteen cases in a single institution

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Objective: With the hypothesis that the combination of CT, conventional, and functional MRI can indicate a possible diagnosis of endolymphatic sac tumor(ELST), this study aimed to systematically explore CT, conventional, and functional MRI features of this rare entity.
Materials and methods: This retrospective study included nineteen patients with pathologically confirmed ELST. CT and conventional MRI findings, including the location, size, CT value, attenuation/signal intensity, calcification, enhancement, signal voids of vessel, adjacent structures invasion, and brain parenchyma edema, were reviewed. We also reviewed multi-parametric functional MR imaging features obtained from diffusion-weighted imaging (DWI, n = 12) and dynamic contrast-enhanced MRI (DCE, n = 2).
Results: The nineteen patients in this series consisted of six males and thirteen females. 11 to 65 years was the age range of the patients, with a mean age of 38.1 years. All ELSTs showed multiloculated, highly-vascularized soft-tissue masses located in mesal or trailing edge of petrosal bone with alveolate osteolytic destruction of adjacent sclerotin. The average CT value of the Mass parenchyma is between 60IU and 110IU. Some high density shade like ‘slender needles’ could be found in the interior of masses , with anomaly thin calcified shade in back of smaller masses. In MRI images, the masses showed a mixed signal in both T1WI and T2WI, with flaky short T1 and long T2 high signal in the margins, and long T1 and short T2 low signal voids of vessels and bleeding or sclerotin or calcification in the solid parts of tumor. The tumors demonstrated low signal on DWI with high ADC values (about 1100 to 1600) comparing to Brain parenchyma, . The dynamic enhanced curve is of fast rising and slow falling type.
Conclusions: Multi-parametric functional MRI combined with high resolution CT may be a promising tool for the diagnosis ELSTs.

EPO-0307

Differential diagnosis of malignant nodules from benign nodules in thyroid gland

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A brief summarization of key points in distinguishing benign and malignant nodules in thyroid gland will be given. I will mainly focus on typical imaging findings of malignant and benign nodules on MRI. Morphological features and intensity

characteristics of malignant nodules and benign nodules using conventional structural MRI, including T1WI, T2WI, T2WI FLAIR, contrast enhanced MRI will be discussed.Then, the added value of some parameters such as ADC from DWI, TIC curve type from dynamic contrast enhanced MRI will be talked about also. Since the talk will be about only 8 minutes, maybe it is impossible to talk about every detail in such a short time. So in the end, the content will be adjusted accordingly.

EPO-0308

Multiphase Contrast-Enhanced CT Imaging Features of Salivary Duct Carcinoma

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Objective: To investigate the CT imaging features of salivary duct carcinoma (SDC) with multiphase contrast-enhanced CT (CECT) scanning and to compare them to mucoepidermoid carcinoma (MEC), adenoid cystic carcinoma (ACC), and acinic cell carcinoma (AcCC).
Study design: A total of 63 patients with histologically diagnosed salivary gland malignancies underwent preoperative multiphase CECT. Clinical information, location, size, mass pattern, enhancement pattern, borders, invasion of adjacent tissues, and lymph node metastasis were evaluated. CT number attenuation patterns were calculated.
Results: SDCs were significantly more common in males and in the parotid gland ($p \leq 0.018$). They were more likely to invade into adjacent tissues and metastasize to lymph nodes ($p \leq 0.032$). Six SDCs (66.7%) had comedonecrosis as detected on histopathological examination, and 3 lesions presented cribriform necrosis on CECT. CT numbers during delayed-phase scanning were significantly higher in SDC than ACC ($p=0.031$). Significant differences were discovered between MEC and ACC for CT numbers during arterial-phase scanning ($p=0.047$) and in the ratio of CT numbers ($p=0.018$).
Conclusion: SDC exhibits some specific CT features, and multiphase CECT imaging is useful in the differential diagnosis of salivary gland malignancies.

EPO-0309

Machine Learning-Based Multiparametric MRI Radiomics for Predicting the Aggressiveness of Papillary Thyroid Carcinoma

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Purpose: *To investigate the predictive capability of machine learning-based multiparametric magnetic resonance (MR) imaging radiomics for evaluating the aggressiveness of papillary thyroid carcinoma (PTC) preoperatively.*
Methods: *This prospective study enrolled 191 consecutive patients who underwent neck MR scans and subsequent thyroidectomy during the study interval. The diagnosis and aggressiveness of PTC were determined by pathological evaluation of thyroidectomy specimens. Thyroid nodules were segmented manually on the MR images, and radiomics features were then extracted. Predictive machine learning modelling was used to evaluate the prediction of PTC aggressiveness. Area under the receiver operating characteristic curve (AUC) values for the model performance were obtained for radiomics features, clinical characteristics, and combinations of radiomics features and clinical characteristics.*
Results: *The study cohort included 120 patients with pathology-confirmed PTC (training cohort: n = 96; testing cohort: n = 24). A total of 1393 radiomics features were extracted from T2-weighted, apparent diffusion coefficient (ADC)* and contrast-enhanced T1-weighted MR images for each patient. The combination of Least Absolute Shrinkage and Selection Operator for radiomics feature selection and Gradient Boosting Classifier for classifying PTC aggressiveness yielded the highest AUC values of 1.0 in the training cohort and 0.92 in the testing cohort. In contrast, clinical characteristics alone poorly predicted PTC aggressiveness, with an AUC of 0.56.
Conclusions: *Our study showed that machine learning-based multiparametric MR imaging radiomics could accurately distinguish aggressive from non-aggressive PTC preoperatively. This approach may be helpful for informing treatment strategies for PTC and the prognosis of PTC patients.*

EPO-0310
CT 影像组学在直径小于或等于 2cm 甲状腺结节中的诊断价值

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目的：探讨 CT 影像组学对最大直径小于或等于 2cm 的甲状腺结节的良恶性鉴别能力。
方法：搜集了 97 例经手术病理证实的直径小于或等于 2cm 的甲状腺结节患者，按 7:3 的比例随机分为训练组及验证组。所有患者术前 2 周内行常规甲状腺 CT 扫描。在 3D-slicer 软件中手动勾画出甲状腺结节 CT 的 2D 感兴趣区（ROI），提取感兴趣区内的影像组学特征。在训练组对影像组学特征进行降维并最终建立起区分甲状腺结节良恶性的影像组学鉴别模型，在验证组对模型进行验证，采用受试者操作特性曲线（ROC）对模型的诊断效能进行评估。
结果：共提取影像组学特征 848 个，经特征筛选，基于 8 个影像组学特征建立的影像组学模型在训练组区分直径小于或等于 2cm 甲状腺结节的良恶性的诊断效能 ROC 曲线下面积为 0.86，敏感度及特异度分别为 76.0%，85.7% 在验证组其 ROC 曲线下面积为 0.77，敏感度及特异度分别为 70.6%，74.7%。
结论：CT 影像组学对最大直径小于或等于 2cm 的甲状腺结节的良恶性具有较好的鉴别能力，为甲状腺结节的鉴别诊断提供了一种无创性诊断方法。

EPO-0311

CT-based of primary lesions radiomics analysis for prediction of lymph node metastasis with Papillary thyroid carcinoma

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Background: Preoperative accurate determination of lymph node metastasis is an important factor affecting the efficacy and prognosis of Papillary thyroid carcinoma. However, by existing methods, patients are at high risk of inaccurate clinical lymph node staging. We attempted to construct a radiomics model to evaluate the efficiency on CT images of intratumoral papillary thyroid carcinoma for preoperative prediction of lymph node (LN) metastasis in papillary thyroid carcinoma.
Methods: Sixty-one CT (32 positive in lymph node metastasis and 29 negative) scan manually segmented images of patients with Papillary thyroid carcinoma with lymph node status obtained from pathology report were enrolled in our retrospective study. Randomly divide it into 42 in the training set (22 positive in lymph node metastasis and 20 negative) and 19 in the validation set (10 positive in lymph node metastasis and 9 negative). A total of 396 radiomics features were extracted from enhanced-CT scan images of the whole primary tumor. A radiomics signature was constructed using the statistical models such as data dimensionality reduction and feature screening construction in the training set. Based on the multivariable logistic regression analysis, a radiomics nomogram was developed incorporating the radiomics signature and selected clinical predictors. The prediction performance was evaluated on the validation set.
Results: Consisting of 3 selected features, the radiomics signature showed a favorable discriminatory ability in the training set with an AUC of 0.830, which was confirmed in the validation set with an AUC of 0.667. The nomogram, consisting of the radiomics signature and selected clinical predictors. The decision curve analysis indicated that the nomogram was clinically useful.
Conclusion: In the present study, we developed and validated an CT-based radiomics nomogram incorporating the radiomics signature and the selected clinical predictors for individualized preoperative prediction of LN metastasis in Papillary thyroid carcinoma., which showed favorable discrimination and calibration. The proposed nomogram can be conveniently used to facilitate the preoperative prediction of LN metastasis in Papillary thyroid carcinoma.

EPO-0312

双能量 CT 图像优化评价甲状腺结节的临床意义

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目的 探讨双能量 CT 图像优化评价甲状腺结节的图像质量的临床意义。方法 125 例回顾性研究双能量 CT 增强扫描的甲状腺病变，比较 80kV（A）、140kV（B）、线性融合 0.3LB（C）及非线性

融合 NLB（D）四组图像的颈动脉、正常甲状腺及甲状腺病灶 CT 值、SNR、CNR，比较四组图像的背景噪声 SD。主观评分 C、D 两组的甲状腺病灶包膜及内部结构。结果 C 组与 D 组背景噪声差异无意义（*P*=0.590）；颈动脉、正常甲状腺及甲状腺病灶 CT 值 A 组与 D 组差异无意义（*P*=0.486、0.077、0.079）。正常甲状腺 SNR，C、D 两组差异无意义（*P*=0.192）；颈动脉 SNR 及 CNR、甲状腺病灶 SNR 及 CNR、正常甲状腺 CNR，D 组大于其他三组（*P*<0.05）。C、D 两组图主观评分为 3.36±0.51、4.01±0.56，D 组优于 C 组（*P*=0.019）。结论 双能量 CT 图像优化评价甲状腺结节有一定临床意义。

EPO-0313
对比分析能谱 CT 与常规 CT 发现甲状腺癌微小钙化的价值

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目的：对比分析能谱 CT 与常规 CT 的甲状腺癌影像，探讨能谱 CT 发现甲状腺癌微小钙化的价值。
方法：回顾性分析 2018 年 7 月至 2019 年 1 月中山大学附属第一医院 60 例行能谱 CT 检查甲状腺癌患者资料，经手术或活检获得病理诊断，以病理学结果为标准，比较能谱 CT 与常规 CT 发现甲状腺癌微小钙化的价值。
结果：本组 60 例甲状腺癌患者中，能谱 CT 平扫发现 54 例患者有微小钙化灶，6 例患者未能发现有微小钙化灶；常规 CT 平扫发现 43 例患者有微小钙化灶，17 例患者未能发现微小钙化灶，两者之间差异有统计学意义(P=0.011；X2 检验)。
结论：能谱 CT 发现甲状腺癌微小钙化比常规 CT 更有优势，可为甲状腺结节的定性诊断提供更多信息，有助于甲状腺癌的诊断，提高诊断信心。

EPO-0314
A Correlation Study of the Total Thyroid Iodine Measured by Dual-source CT and Thyroid Function

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[Abstract] **Objective** To investigate the correlation between the thyroid mean iodine concentration, the total thyroid iodine measured by Dual-source CT dual-energy scanning and the thyroid function. **Methods** Double-source CT was used for dual-energy scanning of the neck in adults with normal thyroid function. The mean iodine concentration and the size of thyroid glands were measured, while the total thyroid iodine was calculated. The thyroid function and other related test data were collected to analyze the correlation between the mean iodine concentration, the total thyroid iodine and thyroid function in general population. **Results** Age was negatively correlated with FT3. The total thyroid iodine was positively correlated with FT3 and negatively correlated with TSH. The mean thyroid iodine concentration was positively correlated with FT3 and TT3. **Conclusion** Dual-source CT dual-energy scanning technology has certain clinical value in evaluating thyroid function and

assessing iodine nutrition status.To provide assistance for the diagnosis and treatment of thyroid diseases.

EPO-0315
双能量 CT 碘浓度测定诊断良恶性甲状腺结节的价值（中文论文比赛）

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目的 探讨双能量 CT 碘浓度测定对甲状腺良恶性结节鉴别的价值。
方法 分别收集双源 CT 双能量平扫 47 个甲状腺结节（恶性 20 个，良性 27 个）及双能量 CT 增强扫描 90 个甲状腺结节（恶性 60 个，良性 30 个），均经手术病理证实。分别测量平扫、动、静脉期正常甲状腺组织、良、恶性结节的碘浓度及 CT 值，增强后结节计算出 NICnod 值（标准化碘浓度）及标准化 CT 值，采用受试者工作特性曲线（ROC 曲线），选取最佳灵敏度及特异度的临界值。比较良、恶性及正常组间的差异，并辅以形态学分析。
结果 平扫恶性、良性结节 CT 值与周围正常组织的碘值具有相关性（r=0.755、0.678、0.813、0.774，$P<0.05$）。良性结节实性部分的 CT 值及碘值高于恶性结节，差异有统计学意义($P<0.05$)。而良性与恶性结节周围正常组织的 CT 值及碘值差异无统计学意义($P>0.05$)。碘值临界值为 0.15mg/ml 时，灵敏度为 81.50%，特异度为 80.00%，且与传统形态学诊断结果具有较高一致性（Kappa 值=0.742）。
增强良恶性结节碘图形态学表现差异有统计学意义（$P<0.05$）。正常组、恶性组及良性组 NICnod 值及标准化 CT 值静脉期差异均有统计学意义（$P<0.05$），动脉期差异统计学无意义。动、静脉期各组间 NICnod 与标准化 CT 值具有相关性（r 均>0.73, $P=0.000$）。静脉期最佳 NICnod 及最佳标准化 CT 值分别为 0.76、0.79，ROC 曲线下面积 AUC 值分别为 0.91、0.92。结合碘图形态学，定性诊断敏感度、特异度高达 90.01%、93.60%。
结论 双能量碘浓度测量对甲状腺结节的定性诊断有一定价值。增强 NICnod 值及标准化 CT 值结合碘图形态学的诊断价值高于平扫碘浓度测量。

EPO-0316
高 b 值 MRI 与超声弹性成像在甲状腺微小乳头状癌诊断中的对比研究

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目的 探讨高 b 值 DWI 检查与超声弹性成像对甲状腺微小乳头状癌的诊断价值，并做对比分析。**方法** 选取拟行手术的甲状腺微小结节患者 78 例，术前均常规进行甲状腺 DWI 检查及超声弹性成像检查，将上述检查与手术结果做对比，计算两组诊断甲状腺微小结节良恶性的灵敏度、特异度、阳性预测值、阴性预测值，Youden 指数，并比较两种诊断方法的准确性。
结果 经手术病理证实的 36 例恶性微小乳头状癌及 42 例良性微结节进行了高 b 值 MRI 诊断及超声弹性成像。高 b 值 MRI 诊断甲状腺微小乳头状癌的灵敏度 91.7%，特异度 83.3%，阳性预测值

82.5%、阴性预测值 92.1%，Youden 指数 0.75；超声弹性成像诊断甲状腺微小乳头状癌的灵敏度 88.9%，特异度 78.5%，阳性预测值 78.0%、阴性预测值 89.1%，Youden 指数 0.674；高 b 值 MRI 及超声弹性成像两组灵敏度及特异度的差别无统计学意义(灵敏度： x 2=1.636，P=0.305>0.05；特异度： x 2=2.291，P=0.155>0.05)。两种诊断方法具有较高一致性（Kappa=0.974，P＜0. 001）。**结论** 高 b 值 MRI 检查、超声弹性成像作为新的诊断技术，对于甲状腺微小癌的诊断均具有较高的诊断价值，值得临床推广应用。

EPO-0317
能谱 CT 对腮腺常见良性肿瘤的鉴别诊断价值

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目的：探讨能谱 CT 在腮腺常见良性肿瘤诊断及鉴别的应用价值。 方法：收集腮腺常见良性肿瘤 46 例，包括多形性腺瘤(18 例)、腺淋巴瘤(20 例)及基底细胞腺瘤（8 例），患者均经术后病理证实。采用能谱 CT 对所有患者行 GSI 增强扫描，测量并计算各腮腺肿瘤在动脉期及静脉期标化有效原子序数（Z_{eff-s}）、标化碘含量（NIC）、标化水含量（NWC)、能谱曲线斜率及标化能谱曲线斜率，进行对比分析。 结果：多形性腺瘤、腺淋巴瘤、基底细胞腺瘤 NIC 动脉期 0.16±0.09、0.27±0.08、0.28±0.18，多形性腺瘤与腺淋巴瘤、基底细胞腺瘤之间差异有统计学意义，腺淋巴瘤与基底细胞腺瘤差异无统计学意义，静脉期 0.53±0.26、0.45±0.11、0.67±0.17，腺淋巴瘤与基底细胞腺瘤差异有统计学意义，多形性腺瘤与腺淋巴瘤、基底细胞腺瘤差异无统计学意义；Z_{eff-s}动脉期 0.74±0.06、0.79±0.03、0.78±0.08，多形性腺瘤与腺淋巴瘤差异有统计学意义，基底细胞腺瘤与多形性腺瘤、腺淋巴瘤差异无统计学意义，静脉期组间差异无统计学意义；能谱曲线斜率动脉期 1.10±0.61、1.82±0.59、2.44±1.84，多形性腺瘤与腺淋巴瘤、基底细胞腺瘤差异有统计学意义，腺淋巴瘤与基底细胞腺瘤差异无统计学意义，静脉期 1.76±0.85、1.31±0.35、2.21±0.69，腺淋巴瘤与基底细胞腺瘤差异有统计学意义，多形性腺瘤与腺淋巴瘤、基底细胞腺瘤差异无统计学意义；标化能谱曲线斜率动脉期 0.15±0.10、0.27±0.10、0.29±0.19，多形性腺瘤与腺淋巴瘤、基底细胞腺瘤差异有统计学意义，腺淋巴瘤与基底细胞腺瘤差异无统计学意义，静脉期组间差异无统计学意义。NWC 动脉期及静脉期组间比较差异无统计学意义。 结论：腮腺常见良性肿瘤能谱参数之间差异明显，能谱 CT 有助于其诊断及鉴别。

EPO-0318
意外摄入异物及其并发症的各种 CT 影像表现

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目的：对多层螺旋 CT(muhisliceCT，MscT)下意外摄入异物的诊断及其相关并发症描述，并说明意外摄入异物后的并发症的各种在 CT 影像学的表现。探讨多层螺旋 CT(muhisliceCT，MscT)三维重建在意外摄入异物的临床应用价值。方法：对 35 例食管及气管异物患者，采用薄层 MSCT5mm 以下扫描，1-2mm 以下的重建；将扫描所得原始数据通过网络传送至后处理工作站，采用数字 3D 后处理软件进行重建，主要重建方法包括最大密度投影(maximumintensityprojection)MIP、多面重建(multiplanreformation，MPR)、容积再现(volumerendenng，VR)、曲面重建及仿真内窥镜。结果：食管异物位于颈部的 15 例，位于胸部的 10 例及气道 10。异物为弧状、小片、条状状或不规

则状；异物在食道及气道内走向为纵向、斜向、横向及竖向；CT 能明确显示异物与气道、食管及周围组织的关系，结论：多层螺旋 CT 三维重建能明确显示食管及气道异物的位置、大小、形态、有无穿孔及明显气道堵塞等并发症，MIP、 MPR、vR、曲面重建及仿真内窥镜等重建模式的相互结合对诊断意外摄入异物及指导临床及时准确地制订治疗方案有明显优势。

EPO-0319

Prognostic value of the radiomics-based model in progression free survival of hypopharyngeal cancer treated with chemoradiation (oral speech or 10 min letures)

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Purpose: *To develop a radiomics-based model to stratify the risk of early progression (local/ regional recurrence or metastasis) among patients with hypopharyngeal cancer undergoing chemoradiotherapy and modify their pre-treatment plans.*
Materials and Methods: *We randomly assigned 113 patients into two cohorts: training (n=80) and validation (n=33). The radiomic significant features were selected in the training cohort using least absolute shrinkage and selection operator and Akaike information criterion methods*, and they were used to build the radiomic model. Concordance index (C-index) was applied to evaluate the model' s prognostic performance. Kaplan-Meier analysis and log-rank test were used to assess risk stratification ability of models in predicting progression. A nomogram was plotted to predict individual risk of progression.
Results: *Composed of four significant features, the radiomic model showed good performance in stratifying patients into high- and low- risk groups of progression in both the training and validation cohorts (log-rank test, p=0.00016*, p=0.0063, respectively). Peripheral invasion and metastasis were selected as significant clinical variables. The combined radiomic-clinical model showed good discriminative performance, with C-indices 0.804 [95% confidence interval (CI): 0.688-0.920], 0.756 (95% CI: 0.605-0.907) in the training and validation cohorts, respectively. The median PFS in the high-risk group was significantly shorter than that in the low-risk group in the training (median PFS: 9.5 m and 19.0 m, respectively; p[log-rank]＜0.0001) and validation cohorts (median PFS: 11.3 m and 22.5 m, respectively; p [log-rank]=0.0063).
Conclusions: *A radiomics-based model was established to predict the risk of progression in hypopharyngeal cancer with chemoradiotherapy.*

EPO-0320

Preoperative Diagnosis of Cervical Metastatic Lymph Nodes in Papillary Thyroid Carcinoma:Dual-Energy

Spectral CT Quantitative Parameters Combined with Conventional CT Features

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Purpose:To assess the value of dual-energy spectral CT quantitative parameters combined with conventional CT features for preoperative diagnosis of metastasis to the cervical lymph nodes in patients with papillary thyroid carcinoma.
Materials and Methods: 31 thyroid carcinoma patients were enrolled and received dual-energyspectral CT scanning before thyroidectomy and cervical lymph node dissection surgery.Analyses of dual-energy spectral CT quantitative parameters and qualitative conventional CT features of metastatic and benign lymph nodes were independently performed by two radiologists. Logistic regression models,sensitivity and specificity analyses were performed by using receiver operating characteristic curves and were compared with data combined with the qualitative analysis.
Results: 103 and 79 cervical lymph nodes were confirmed surgically to be metastatic and benign lymph nodes, respectively.The slope of the spectral HU curve (λHU), iodine concentration (IC) and normalized iodine concentration (NIC, to that of carotid artery) of the metastatic lymph nodes measured in venous phase were significantly higher than those of benign lymph nodes (all P<0.05). The best single parameter for detection of metastatic lymph nodes was λHU in venous phase, with sensitivity, specificity, accuracy, positive predictive value, and negative predictive value of 64.0%, 90.1%,79.6%, 75.6%, and 81.0%, respectively. The best combination of parameters was λHU and necrotic change in lymph nodes, with values of 71.0%, 88.4%, 82.9%, 78.0%,and 85.3%, respectively, with significant improvement in sensitivity.
Conclusion:Dual-energy spectral CT quantitative parameters combined with CT features showed higher sensitivity than the use of single spectral CT parameters or CT features for preoperative diagnosis of metastatic cervical lymph nodes in patients with papillary thyroid cancer.

EPO-0321
甲状腺乳头状癌原发灶双能量 CT 多参数预测中央组淋巴结转移的价值（参加中文论文比赛）

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【摘要】目的 探讨甲状腺乳头状癌（PTC）原发灶双能量 CT 多参数预测 PTC 中央组淋巴结转移（CLNM）的价值。**方法** 回顾性收集经手术病理证实为单发甲状腺乳头状癌且行中央组淋巴结清扫术患者 340 例，分为中央组淋巴结转移组（178 例）及未转移组（162 例）。术前均行颈部 CT 常规平扫及双期双能量增强扫描，测量原发灶动脉期和静脉期碘浓度（IC）、标准化碘浓度（NIC）、Overlay 值，计算能谱曲线斜率（K），采用独立样本 *t* 检验比较两组间 IC、NIC、Overlay 值及 K 的差异，绘制受试者工作特征（ROC）曲线，计算其曲线下面积（AUC），选取最佳敏感度及特异度

的临界值，利用二元 Logistic 回归分析有统计学意义的双能量 CT 多参数联合预测 CLNM 的效能。**结果** 原发灶静脉期双能量 CT 各参数在两组间差异均有统计学意义（t=8.348，P<0.05；t=6.815，P<0.05；t=5.951，P<0.05；t=6.231，P<0.05），转移组与未转移组值分别为 IC（2.83±0.26、2.15±0.36）；NIC（0.64±0.31、0.55±0.17）；Overlay 值（60.15±0. 28HU、52.48±0. 73HU）；K（3.54±0.56、2.96±0.45），其预测 CLNM 临界值分别为 2.4mg/ml、0.58、55.7HU、3.11；敏感度、特异度分别为 70.5%、81.6%；75.2%、75.1%；72.1%、69.7%；67.4%、80.8%。动脉期原发灶双能量 CT 各参数在两组间差异无统计学意义（P>0.05）。利用二元 Logistic 回归分析原发灶静脉期双能量 CT 多参数联合预测 CLNM 的敏感度为 75.3%，特异度为 76.4%，准确度为 77.9%。**结论** 甲状腺乳头状癌原发灶的双能量 CT 各参数在预测中央组淋巴结转移方面有一定价值，多参数联合可提高预测效能。

EPO-0322
双能量 CT 和核素显像诊断及定位甲状旁腺腺瘤的对比研究

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目的：对比分析双能量 CT 和核素显像在甲状旁腺腺瘤诊断及定位中的价值。
方法：对临床怀疑原发性甲状旁腺功能亢进但未触及增大甲状旁腺或甲状腺的患者采双能量 CT 平扫及增强后 25、55 秒 3 期扫描，测量颈部结节的碘浓度、CT 值，计算标准化碘浓度、CT 值，并生成碘图、虚拟单能量成像图及能谱曲线。之后患者行 99mTc-甲氧基异丁基异腈（MIBI）甲状旁腺显像检查。以术后病理为金标准，比较双能量 CT 与核素显像的诊断效能。
结果：46 例患者的中 39 例接受手术治疗，术中摘除 51 个结节，其中 41 个结节经病理学确诊为甲状旁腺腺瘤。核素显像检出 39 个瘤体，敏感度和特异性分别为 95%和 90%。双能量 CT 检出 35 个瘤体，敏感度和特异性分别为 85%和 80%。双能量 CT 对于阳性病灶和阴性病灶均提供了精确的解剖定位。能谱曲线能区分甲状旁腺瘤及正常淋巴结。
结论：双能量 CT 能有效检出并定位甲状旁腺瘤，有助于临床医生提高手术治疗的成功率。

EPO-0323
CT 双期增强扫描鉴别甲状腺良、恶性结节价值

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目的：探讨 CT 双期增强扫描在甲状腺良、恶性结节鉴别诊断中的价值。
方法：回顾性分析经组织病理学证实的 175 例 182 枚甲状腺结节 CT 资料，包括良性结节 60 例，恶性结节 122 例。观察结节形态、密度、位置、ΔCT 值（甲状腺与结节的 CT 差值）及强化方式在两组良、恶性结节中的分布差异，并采用单因素和多因素 logistic 回归分析进行检验，比较两组阳性 CT 征象对良、恶性结节预测价值的 OR 值、预测概率曲线下面积。
结果：单因素及多因素 logistic 回归分析显示形态、密度、位置、ΔCT 值在甲状腺良、恶结节中的分布有统计学差异（P＜0.05），强化方式在两组中的差异无统计学意义（P＞0.05）。四种阳性征象联合预测概率曲线下面积值为 0.899，当预测概率为 0.711 时，约登指数最大，此时诊断恶性结节的敏感性和特异度分别是 0.869 和 0.783。
结论：CT 双期增强扫描对甲状腺良、恶性结节鉴别诊断有重要价值，多种 CT 征象联合可提高良、恶性甲状腺结节的预测价值。

EPO-0324

甲状腺髓样癌多层螺旋 CT 影像特征与病理对照

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【摘要】目的:分析和总结甲状腺髓样癌（medullary thyroid carcinoma，MTC）的 CT 影像学特征。**方法:** 回顾性分析经手术病理证实的 20 例 MTC 患者的 CT 平扫及增强影像，并与术后病理进行对照。甲状腺 CT 检查参考《甲状腺结节影像检查流程专家共识》进行标准摆位，全部行平扫及增强检查。为避免锁骨伪影，受检者下颌尽量抬高至 85 度左右，下拉双肩，以充分暴露甲状腺为宜。扫描范围包括颅底至主动脉弓水平；增强扫描碘对比剂（碘浓度 300mgI/ml）总量约 80～100ml，高压注射器流率 2～3ml/s，动、静脉期扫描开始时间分别为 25～30s、50～55S。**结果：**20 例 23 枚 MTC 中，单发 17 例（85%），双发 3 例（15%）。CT 平扫中，形态规则 19 枚（82.6%），边界清晰 17 枚（73.9%），均匀低密度 20 枚（87.0%），假包膜 9 枚（39.1%），钙化 16 枚（69.6%）。CT 增强中，动脉期有肿瘤血管显示 17 枚（73.9%）；动脉期均匀强化且静脉期持续强化 5 枚（21.7%），动脉期不均匀强化而静脉期强化范围增加 18 枚（78.3%）；坏死囊变 6 枚（26.1%）。4 例（20%）有颈部淋巴结转移，1 例（5%）有气管侵犯。**结论：**MTC 常表现为单发、密度均匀、形态规则、边界清晰的低密度灶，不均匀持续低强化伴动脉期肿瘤血管显示为其特征性的 CT 征象。

EPO-0325

腮腺 Mikulicz 病 CT 特征研究

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目的探讨腮腺 Mikulicz 病 CT 特征。方法回顾性分析我院经手术病理证实的 16 例腮腺 Mikulicz 病的临床及影像学资料，所有患者均进行常规 CT 平扫及增强扫描，观察病灶的数目、形态、密度、边界及强化表现。结果患者均表现为腮腺或耳下区无痛性渐大肿块，体检耳下区可触及圆形或卵圆形单个或数个肿块，质软或稍硬，活动度佳。单侧腮腺病变 10 例，双侧腮腺病变 6 例。3 例为单发结节；13 例为多发大小不一的结节或肿块，病灶边界大部分清楚，部分边缘稍模糊，呈等、稍高密度，中度强化；其中 4 例多发结节病灶伴囊变，囊性病灶壁较薄，见分隔，囊壁及分隔见强化；1 例多发结节病灶伴散在钙化。 2 例为弥漫浸润型，表现为双侧腮腺弥漫性肿大，密度不均匀性增高，内多发片团状稍高密度，病灶边界不清，增强扫描呈弥漫不均匀强化。结论腮腺 Mikulicz 病在 CT 表现有一定特征性，多发结节或肿块型需与腮腺常见肿瘤相鉴别，弥漫浸润型需与腮腺炎症、淋巴瘤鉴别。

EPO-0326

Parotid Gland Tumors: Diagnosis by Using Arterial Spin Labeling-Initial Experience

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Purpose： To evaluate whether parotid gland tumors can be accurately detected and differentiated by using Arterial Spin Labeling (ASL).
Materials and Methods: This prospective study was approved by the institutional review board, and written informed consent was obtained from all enrolled patients. In total, 27 patients with parotid gland tumor were preoperatively evaluated with TBF/TBC which represented the ratio of tumor blood flow (TBF) to blood flow of contralateral corresponding area (TBC) by using ASL. Histopathologic results of parotid gland dissection samples served as the reference standard for all cases. The optimal cutoff value for differentiating between pleomorphic adenoma, Warthin tumor and malignant parotid gland tumor was determined by means of receiver operating characteristic (ROC) curve analysis.
Results: Of the 27 enrolled patients, meanTBF/TBC in pleomorphic adenoma, Warthin tumor and malignant parotid gland tumor groups were 0.92±0.10,3.42±0.67, 1.57±0.26, respectively. There were statistically significant differences between Warthin tumor from the other two (P<0.05), but no statistical significance between pleomorphic adenoma, malignant parotid gland tumor (P>0.05). ROC curve analyses showed TBF/TBC cut point of 1.61 provided the highest discriminatory power in differentiating Warthin tumor from other parotid gland tumors while area under the ROC curve, Youden index, sensitivity, specificity was 0.903, 70.8%, 87.5%, 83.3%, respectively.
Conclusion: ASL might be useful for distinguishing Warthin tumor from other parotid gland tumors.

EPO-0327
MRI 与 CT 在甲状腺结节诊断中的联合应用价值

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目的：甲状腺结节的影像学检查中 CT 对发现甲状腺肿瘤内低密度区的敏感度高，MRI 检查的价值与 CT 扫描相仿，主要是评价病变范围与周围重要结构的关系。本研究旨在通过对甲状腺结节表现特点的分析，评价 MRI 与 CT 的联合应用价值。材料与方法：回顾性分析 60 例甲状腺结节患者（86 个结节）术前 MRI 及 CT 检查与术后病理结果对照。结果：86 个甲状腺结节包括 61 个良性结节和 25 个恶性结节，良性结节包括单纯性甲状腺肿 26 例、结节性甲状腺肿 15 例、甲状腺腺瘤 10 例、亚急性甲状腺炎症 8 例、急性甲状腺化脓性炎症 1 例、产后甲状腺炎 1 例。各类甲状腺炎症中 MRI 与 CT 表现为甲状腺侧叶及峡部弥漫增大，边缘规则锐利呈矩形，密度较均匀，低于正常甲状腺。主要影像表现：（1）甲状腺内单或多发囊变结节；（2）病变大小常为 1-6cm，边缘光滑、锐利，肿块有完整包膜；（4）纵长比（结节前后径/上下径），恶性结节纵长比常>1；（3）增强扫描病灶有强化，实性者为均匀结节状强化，囊变者呈环状强化，囊变区不强化。26 例恶性结节是甲状腺癌（23 例）及起源于间质的恶性肿瘤（肉瘤）女性（3 例），除 MRI 无法发现钙化外，MRI 与 CT 均清楚显示肿块形态、大小和内部组织成份以及肿瘤周围被侵犯的范围。平扫表现为不规则或分叶状软组织密度肿块，密度不均匀，病灶无包膜或包膜不完整，呈浸润性生长，与周围分界不清；增强扫描时腺癌呈不规则强化，强化部分也较正常甲状腺密度低。良恶性结节的 MRI 与 CT 表现在形态、边界、囊变、实性部分强化方面的差异具有显著统计学意义（P<0.05），完整的包膜是良性病变的特异性征象，而恶性肿瘤的假包膜不完整或无。良恶性结节在出血、钙化、纵横比及淋

巴结增大方面的差异无显著统计学意义（P>0.05）。结论：MRI 与 CT 联合应用在于判断其大小和位置以及甲状腺周围的组织情况，有助于手术方式的选择，术前同时行 MRI 与 CT 是必要的。

EPO-0328
甲状腺嗜酸细胞腺瘤的 CT 平扫及多期增强扫描表现

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目的：分析甲状腺嗜酸细胞腺瘤的 CT 成像影像特点，分析螺旋 CT 对甲状腺嗜酸细胞腺瘤的诊断价值。方法：搜集我院 2013.3-2019.5 病理证实为甲状腺嗜酸细胞腺瘤的 23 例患者，回顾性分析其 CT 平扫及增强表现，结合病理组织学表现，描述甲状腺嗜酸细胞腺瘤的影像学特征。结果：23 例患者中，男 7 例，女 16 例。所有患者接受 CT 平扫及增强扫描。临床以颈前区无痛性包块为主，病程 1 月-6 年，查体见颈部质软包块，边界清，无压痛。实验室检查：2 例表现为嗜酸性粒细胞数稍升高。甲功：甲状腺球蛋白升高者 13 例，甲状腺过氧化物酶抗体升高者 3 例，甲状腺球蛋白及甲状腺过氧化物酶同时升高者 4 例，T4 升高 1 例，2 例甲功正常。其中，17 例为单发嗜酸性甲状腺腺瘤，2 例合并结节性甲状腺肿，2 例合并桥本氏甲状腺炎，2 例合并对侧甲状腺微小乳头状癌。影像学表现：病变表现为单发结节或肿块，位于甲状腺右叶 15 例，甲状腺左叶 7 例，甲状腺峡部 1 例。均呈类圆形，直径 1.3-5.2cm。CT 平扫为稍低密度影，密度较均匀 20 例，不均匀 3 例，CT 均值为 17.6Hu，边界欠清，2 例合并边缘条状粗大钙化，其余病变均无钙化。增强扫描病变边界更清楚，边缘光滑，病变周围有较完整包膜，病变边缘可见受压的正常甲状腺组织。病变强化不均匀，动脉期中等度强化 20 例（低于周围正常甲状腺），明显强化 3 例（高于周围正常甲状腺），肿瘤内见粗大迂曲的血管影，4 例病变中央见类似星芒状瘢痕。静脉期强化程度轻度下降，强化较动脉期均匀，瘢痕呈延迟轻度强化。所有病例均未见颈部肿大淋巴结。结论：甲状腺嗜酸细胞腺瘤 CT 表现有一定的特征性，多表现为单发类圆形肿块，边界清楚，边缘光滑，增强扫描强化不均匀，动脉期强化程度稍高于静脉期，部分病变内见星芒状瘢痕，病变周围见类似包膜结构，呈良性肿瘤特征。

EPO-0329
弥散加权成像和动态增强磁共振成像对甲状腺良恶性结节的诊断价值

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目的:探讨弥散加权成像(DWI)和动态增强磁共振成像(DCE-MRI)多种 MRI 参数对甲状腺良恶性结节诊断及鉴别诊断的应用价值。
方法:对 165 例经病理证实的良性结节 55 例，恶性结节 110 例进行回顾性研究。所有患者均行常规 MRI、DWI 及动态增强 MRI 检查，获取形态信息及多种定量参数。应用西门子 Tissue 4D（T4D）后处理软件进行 Tofts 单输入双室模型进行数据处理，得出 TIC 曲线半定量参数，以及灌注定量参数转运常数（Ktrans）、血管外细胞外间隙体积百分比（Ve）、速率常数（Kep）等，利用独立样本 t 检验对恶性组和良性组的各参数进行比较分析。采用受试者操作特征(ROC)分析，评估诊断能力。
结果:甲状腺良恶性结节 ADC 值、Ktrans、Ve、 TIC 斜率、信号衰减百分比（Id%）差异均有统计学意义(P< 0.05)，而 Kep 均值差异无统计学意义（p>0.05）。ADC、Ktrans、Ve、TIC 斜率和信号

衰减百分比（Id%）对甲状腺良恶性病变的 AUC 分别为 0.921、0.701、0.654、0.692 和 0.648。ADC 值灵敏度为 89.2%，特异性 90.3%； Ktrans 敏感性 0.742，特异性 0.653； Ve 值灵敏度 0.525，特异性 0.825；TIC 斜率灵敏度 0. 556，特异性 0.735；信号衰减百分比（Id%）灵敏度 0.375，特异性 0.930。结合 ADC 值和各定量参数，诊断性能得到改善，AUC 为 0.935，敏感性为 0.943，特异性为 0.956。
结论:DWI 联合 DCE-MRI 能较好地鉴别甲状腺结节的良恶性，具有良好的临床应用价值。

EPO-0330
结节性甲状腺肿与甲状腺腺瘤 CT 上具有鉴别意义征象分析

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目的：探讨结节性甲状腺肿与甲状腺腺瘤在 CT 诊断上具有鉴别意义的征象。**方法:**回顾性分析经手术及病理证实共 74 例结节性甲状腺肿与甲状腺腺瘤 CT 影像表现，包括瘤体外甲状腺情况(体积、轮廓、密度)、结节数目、结节密度、结节边界、结节强化情况及结节内钙化。**结果:**本组 74 例中，结节性甲状腺肿 62 例，甲状腺腺瘤 12 例。结节性甲状腺肿、甲状腺腺瘤在瘤体外甲状腺情况（体积、轮廓、密度）、结节数目、结节密度、结节边界、结节强化情况及结节内钙化具有特征性鉴别意义。**结论：**掌握结节性甲状腺肿与甲状腺腺瘤 CT 的特征性征象，对诊断甲状腺良性结节具有一定的价值。

EPO-0331
Texture analysis of dual-phase contrast-enhanced CT in the diagnosis of cervical lymph node metastasis in papillary thyroid cancer patients

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Abstract
Objectives: To evaluate the value of texture analysis of dual-phase contrast-enhanced computed tomography (CT) images in diagnosing cervical lymph node metastasis in papillary thyroid cancer (PTC) patients.
Methods: Twenty-seven metastatic and thirty-two non-metastatic cervical lymph nodes were retrospectively analyzed. Texture analyses were performed on both arterial (A) and venous (V) phase CT images. Texture parameters including mean grey-level intensity, skewness, kurtosis, entropy and uniformity were obtained and compared. Receiver operating characteristic (ROC) curves analyses were used to evaluate the diagnostic value of significant texture parameters. Multivariate logistic regression analysis was used to identify the independent predictors for metastatic cervical lymph node.
Results: Metastatic lymph nodes showed significant higher A-mean grey-level intensity ($p<0.001$), A-entropy ($p<0.001$), A-skewness ($p=0.013$) and V-skewness ($p=0.009$), and lower A-kurtosis ($p<0.001$) and V-kurtosis ($p<0.001$) than non-metastatic mimics. ROC curves analyses indicated A-kurtosis demonstrated optimal diagnostic area under the

curve (AUC, 0.884) and specificity (92.59%), while A-mean grey-level intensity showed optimal diagnostic sensitivity (90.62%). Multivariate logistic regression analysis indicated that A-mean grey-level intensity was the independent predictors for metastatic cervical lymph node (p=0.010), with an AUC of 0.807, a sensitivity of 90.62%, and a specificity of 77.78%.
Conclusions: CT textural analysis, specially the mean grey-level intensity on arterial phase CT images, might be helpful in diagnosing metastatic cervical lymph node in PTC patients.

EPO-0332

原发性甲状腺淋巴瘤影像表现及误诊分析

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目的 探讨原发性甲状腺淋巴瘤（PTL）的影像表现,以期进一步提高 PTL 的诊断准确率。
方法 回顾性分析经手术病理证实的 6 例 PTL 患者的影像表现,其中 5 例行 CT 平扫及增强扫描,1 例同时行 MRI 平扫及全身 18F-FDG PET/CT 检查。
结果 6 例患者均以发现颈部肿物就诊,病理证实均为非霍奇金淋巴瘤,其中 3 例合并有桥本叶及峡部 1 例。CT 表现为单发结节型 2 例,多发结节型 1 例,弥漫肿大型 3 例。CT 平扫 6 例病灶均呈稍低密度,5 例密度大致均匀,1 例病灶内可见钙甲状腺炎。病灶侵及甲状腺一侧叶 4 例,侵及甲状腺双侧叶及峡部 1 例,侵及甲状腺单侧化。增强扫描 5 例病灶呈均匀、轻中度强化。2 例出现颈部淋巴结转移。MRI 病灶 T1WI 呈等信号,T2WI 呈稍高信号,DWI 呈高信号。PET/CT 病灶表现为高代谢。6 例患者术前全部误诊。
结论 PTL 容易误诊,其影像表现具有一定特征性,结合临床资料,有助于提高诊断准确性,其最终确诊仍需依靠病理学检查。

EPO-0333

甲状腺超声造影检查的护理经验总结

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目的 探究超声造影在甲状腺检查中的护理经验。 **方法** 将 2019 年 2 月-2019 年 7 月的 100 例甲状腺超声造影检查的患者纳入研究范围，应用随机数字表的方式将患者平均分为实验组与对照组，并分别应用综合护理干预及常规护理干预方式进行护理，总结护理经验。 **结果** 经研究，实验组造影后出现造影剂外渗、轻微头晕、皮疹、瘙痒及疼痛等情况的概率显著低于对照组，差异显著，P＜0.05。 **结论** 采用综合护理方式对甲状腺超声造影检查患者进行干预，能够提升造影成功率，减少患者不良反应的出现。所以,应采用综合性护理干预方式对患者进行护理干预。

EPO-0334

多 b 值磁共振弥散加权成像对甲状腺乳头状癌甲状腺外侵犯的诊断价值

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目的:探讨术前多 b 值磁共振弥散加权成像（diffusion-weighted imaging ，DWI-MRI)及表观弥散系数(apparent diffusion coefficient, ADC) 在甲状腺乳头状癌(papillary thyroid carcinoma，PTC)甲状腺外侵犯（extrathyroidal extension，ETE）诊断中的价值。**材料和方法:** 回顾性分析 81 例经手术病理证实为甲状腺乳头状癌患者的 MRI 平扫、增强和弥散加权成像的影像学图像。在工作站上构建 ADC 图，分别测量伴 ETE（微小 ETE、广泛 ETE）、无 ETE 的甲状腺乳头状癌肿瘤实性区域的 ADC 值，并比较其肿瘤实性区域 ADC 值的差异。**结果:**b 值为 500s/mm^2 时，伴 ETE 的甲状腺乳头状癌肿瘤实性区域 ADC 值[(1.27±0.17)×10-^{3}mm^2/s]明显低于无 ETE 的甲状腺乳头状癌肿瘤实性区域 ADC 值[(2.12±0.72)×$10^{-3}$$mm^2$/s，$p$ <0.05]；伴广泛 ETE 的甲状腺乳头状癌肿瘤实性区域 ADC 值[(1.23±0.17)×$10^{-3}$$mm^2$/s]低于伴微小 ETE 的甲状腺乳头状癌肿瘤实性区域 ADC 值[(1.29±0.16)×$10^{-3}$$mm^2$/s ，$p$>0.05]；b 值为 500s/$mm^2$时，弥散加权成像诊断甲状腺乳头状癌伴 ETE 的 ADC 值诊断效果最佳，ROC 曲线下面积为 0.887，诊断阈值为 1.530×10^{-3} mm^2/s，诊断敏感度为 69.0 %、特异度为 93.7 %、阳性预测值 77.6 %、阴性预测值 77.5 %。**结论:**.磁共振弥散加权成像中，伴 ETE 的甲状腺乳头状癌的肿瘤实性区域 ADC 值明显低于无 ETE 的甲状腺乳头状癌肿瘤实性区域 ADC 值，磁共振弥散加权成像有助于甲状腺乳头状癌的 ETE 的鉴别诊断。

EPO-0335
多参数 MRI 成像对甲状腺腺瘤和甲状腺乳头状癌的鉴别诊断价值

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目的:研究磁共振多参数成像表观扩散系数（apparent diffusion coefficients，ADC）和时间-信号强度曲线(time-signal intensity curves，TICs) 在甲状腺腺瘤(Thyroid adenoma, TA)和甲状腺乳头状癌(Papillary thyroid carcinoma, PTC)的诊断及鉴别诊断中的价值。**材料和方法:** 回顾性分析 2016 年 1 月至 2017 年 6 月江苏大学附属人民医院 88 例患者共计 132 个病灶的影像学资料，经病理证实 TA（53 枚）和 PTC（79 枚），依次行磁共振平扫、弥散加权成像(MR diffusion-weighted imaging,MR-DWI) 、动态增强扫描(dynamic contrast-enhanced MR imaging， DCE-MRI)，计算多 b 值时 TA、PTC 的 ADC 值，绘制 ROC 曲线，判定诊断阈值并评价诊断效能，绘制病变的 TICs，最后 MR-DWI 联合 DCE-MRI 对 TA、PTC 进行鉴别诊断，与病理对照，研究 MR-DWI 和 DCE-MRI 联合应用鉴别诊断 TA、PTC 的敏感度、特异度、准确度、阳性预测值、阴性预测值。**结果：**b 值=500s/mm^2时，MR-DWI 诊断 PTC 的 ADC 值诊断效果最佳，ROC 曲线下面积为 0.871，诊断阈值取 1.538×10^{-3} mm^2/s 时，诊断 PTC 的敏感度 83.0%、特异度 78.5%、准确度 81.8%、阳性预测值 78.2 %、阴性预测值 84.3 %，约登指数 61.5；MR-DWI、DCE-MRI、MR-DWI 和 DCE-MRI 联合诊断，三者相比较其敏感度、特异度、准确度、阴性预测值、阳性预测值差异均有统计学意义(P=0.044，P=0.010，P=0.024，P=0.009，P=0.006)。**结论：**多参数 MRI 成像鉴别诊断 TA、PTC 较单一动态增强扫描或扩散成像诊断效能强。

EPO-0336
超声和 MRI 联合对甲状腺乳头状癌的甲状腺外侵犯的诊断价值分析

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目的：探讨术前超声(ultrasound，US)、磁共振(magnetic resonance imaging, MRI)与两者联合检查在甲状腺乳头状癌(papillary thyroid carcinoma，PTC)甲状腺外侵犯（extrathyroidal extension，ETE）中的诊断价值。**材料和方法**：回顾分析 2013 年 1 月至 2016 年 12 月在我院术前行 US 和 MRI 检查并经手术病理证实的 PTCs 伴 ETE 的 83 例患者，对两种方式及二者联合诊断的结果进行分析比较。**结果**：T3 (微小 ETE)诊断正确率 US 为 92.2% (47/51) ，MRI 为 74.5% (38/51) ，两者联合为 98.0% (50/51)，三者对 T3 的诊断正确率差异有统计学意义(P=0.000)；T4 (广泛 ETE)诊断正确率 US 为 62.5% (20 /32) ，MRI 为 87.5% (28/32) ，两者联合为 93.8% (30/32)，三者对 T4 的诊断正确率差异有统计学意义 (P=0.000)；ETE 诊断的总正确率 US 为 80.7% (67/83)，MRI 为 79.5% (66/83)，两者联合为 96.4% (80/83)，三者对 ETE 的诊断正确率差异有统计学意义(P=0.001)。**结论**：US 与 MRI 联合诊断，可提高 ETE 术前诊断正确率。

EPO-0337
背景抑制弥散加权成像（DWIBS）与 PET-CT 对甲状腺癌术后颈部淋巴结转移的诊断价值比较

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目的：对比 DWIBS 与 PET-CT 在甲状腺癌术后颈部淋巴结转移的诊断价值。
方法：选取 2018 年 11 月至 2019 年 6 月我院收治的甲状腺癌术后患者进行颈部 DWIBS 检查，选定目标淋巴结单独送检，共 55 例患者（92 枚淋巴结），其中 40 例患者（71 枚淋巴结）同时行 PET-CT 检查，以再次术后病理为金标准，分别测量目标淋巴结的 ADC 值与 SUVmax 值，分别对比转移性淋巴结与非转移性淋巴结的 ADC 值、SUVmax 值的差异，分析 DWIBS、PET-CT 对甲状腺癌术后转移淋巴结的诊断价值。
结果：术后病理显示，转移性淋巴结 41 枚，非转移性淋巴结 30 枚，转移性淋巴结及非转移淋巴结 ADC 值分别为（0.813±0.032）×$10^{-3}$$mm^2$/s、（1.195±0.079）×$10^{-3}$$mm^2$/s，差异有统计学意义（P<0.001），并可获得最佳的诊断效能（诊断阈值：0.956×$10^{-3}$$mm^2$/s，AUC 面积：0.967，95%的可信区间：0.932-1，敏感性：86.7%，特异性：92.7%）。转移性淋巴结及非转移性淋巴结 SUVmax 值分别为（4.56±1.057）×$10^{-3}$$mm^2$/s、（1.706±0.320）×$10^{-3}$$mm^2$/s，差异有统计学意义（P<0.001），并可获得最佳的诊断效能（诊断阈值：2.657，AUC 面积：0.907，95%的可信区间：0.835-0.978，敏感性：82.9%，特异性：90%）。
结论：DWIBS 与 PET-CT 检查均可作为诊断甲状腺癌术后转移淋巴结的重要方法，其中 DWIBS 拥有更高的敏感性及特异性，其诊断效能优于 PET-CT。

EPO-0338

增强 CT 直方图分析对甲状腺结节良恶性鉴别的价值研究

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目的 评价基于 CT 平扫和增强图像的直方图特征是否有助于甲状腺良恶性结节的鉴别诊断。
方法 回顾性分析我院经手术后病理证实甲状腺结节患者 132 例，共 140 个结节，其中良性组 66 个结节，恶性组 74 个结节。选取轴位图像病灶边界最清晰的时相、病灶最大层面，采用 Mazda 软件沿病灶边缘勾画 ROI，随后将 ROI 复制粘贴于其它时相并进行直方图分析，获得以下参数：均值（Mean）、方差（Variance）、偏度(Skewness)、峰度(Kurtosis)及第 1、10、50、90、99 百分位数。比较两组数据的差异，并通过 ROC 曲线分析有统计学差异的灰度直方图参数对甲状腺良恶性结节间鉴别诊断效能。
结果 CT 平扫直方图分析，恶性组均值、第 10、50、90 百分位数高于良性组，差异有统计学意义（P 均＜0.05）；CT 增强直方图分析，良性组和恶性组间均值、方差及第 1、10、50、90 百分位数总体差异均有统计学意义（P 均＜0.05），恶性组均值、第 1、10、50、90 百分位数高于良性组，良性组方差高于恶性组。两组的偏度、峰度、第 99 百分位数在 CT 平扫和增强中差异均无统计学意义（P 均＞0.05）。在 CT 平扫和增强直方图的参数中，第 10 百分位数 AUC 最高,为 0.677,其鉴别甲状腺良恶性结节的敏感度、特异度分别为 74.32%、62.12%。
结论 CT 直方图分析可作为鉴别甲状腺良恶性结节的重要辅助手段，可提供客观、可靠的信息，增加诊断的准确性，对两者鉴别提供客观依据。

EPO-0339
结合迭代重建算法的低剂量螺旋 CT 在颈部的应用研究

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目的：探讨结合迭代重建算法的低剂量螺旋 CT 在颈部应用价值。**方法**：172 例疑头颈部病变患者行 CT 检查，随机分为常规剂量组(86 例，管电流 125mAs)和低剂量组(86 例，40-110mAs），分别采用滤波反投影重建（FBP）及自适应迭代重建（AIDR3D）。在下颌角及上纵隔水平分别测量图像 CT 均值及标准差，由两位 8 年以上工作经验的 CT 影像医师采用 4 分法标准对图像盲法评分；比较不同扫描方式下患者的辐射剂量。**结果**：下颌角水平，两组间胸锁乳突肌噪声、信噪比、对比信噪比及背景噪声无明显差异（p>0.05）,低剂量组颈内静脉噪声高于常规剂量组（p<0.05）；上纵隔水平，低剂量组上腔静脉、胸大肌及胸壁皮下脂肪噪声低于常规剂量组（p<0.05），信噪比更高（p<0.05）。下颌角水平低剂量迭代图像评分与常规 FBP 组图像无明显差异（p>0.05）；上纵隔水平低剂量迭代图像评分优于常规剂量 FBP 组（p<0.05）；与常规剂量组相比，低剂量组有效辐射剂量显著降低（p<0.05），剂量指数减低 63.34%，有效辐射剂量减低 63.16%。**结论**：结合 AIDR3D 重建技术的低剂量 CT 技术可以用于颈部 CT 扫描，可以减少辐射剂量并提供优质的图像

EPO-0340
The value of different voxel volume of magnetic resonance spectroscopy in parotid tumors

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Purpose: To explore the characteristics and value of magnetic resonance spectroscopy in parotid tumors between simple-voxel and multi-voxel volume.
Methods: 28 subjects of parotid tumors proved by pathologically were examined by both simple-voxel and multi-voxel volume of magnetic resonance spectroscopy(MRS) in 1.5-Tesla MR scanner. Using a default threshold full-automation MRSI processing protocol, images for signal intensity including Choline(Cho), Creatine (Cr),Cho/Cr ratio,Lactate and Lipid(LL) were created together with the relative reference T1 or T2 weighted image(T1WI,T2WI). voxel. Analyses were performed by using auto-calculated peak area of the metabolite and metabolite ratio maps in different voxel volume sequences.
Results: Results of 28 subjects were examined confidently and successfully without any artifact of breathing or pulsation. the signal intensity peak of LL was higher in multi-voxel significantly(P<0.01) as opposed to Cho, Cr and Cho/Cr ratio had no difference(P>0.01) in two grpups.
Conclusion: MRS was a sensitive and accurate method in detecting parotid tumors. The baseline of simple-voxel volume was steady. The unit of multi-voxel volume was small and multiselect.

EPO-0341
“三低”技术在甲状腺 CT 增强扫描中的应用

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目的探讨低管电压 80kV、低对比剂剂量、低对比剂注射速率并联合 SAFIRE 迭代重建算法的“三低”甲状腺 CT 增强扫描技术的临床应用可行性。**方法**前瞻性收集甲状腺双期增强 CT 扫描的患者 60 例。随机分成 2 组。A 组：常规组，管电压 120kV，对比剂碘普罗胺（370mgI/ml），注射速度 3ml/s，滤波反投影。B 组：“三低”组，管电压 80kV，对比剂碘克沙醇（270mgI/ml），注射速度 2.5ml/s，SAFIRE-3。比较 2 组图像质量客观指标 CT 值、SNR、CNR；图像质量的主观评分；诊断效能的比较对照金标准病理结果，分析两种方案诊断甲状腺良恶性病变的灵敏度、特异度及准确度的差异。同时对比两组的辐射剂量、对比剂摄入总量及碘总量。**结果**①两组平扫、动静脉期△CT 值差异均有统计学意义（P<0.05），“三低”组＞常规组，其中以动脉期△CT 最大。两组动、静脉期正常及病变甲状腺组织的 SNR、CNR 差异无统计学意义（P>0.05）。②两组甲状腺主观评分比较，差异有统计学意义（z=-2.697，P=0.007＜0.05），“三低”组评分高于常规组。③两组诊断效能的比较，病理随访显示“三低”组诊断符合率为 80%，常规组为 76%，灵敏度、特异度及准确性比较差异均无统计学意义（P>0.05）。④两组辐射剂量各指标的比较，差异均有统计学意义（P<0.05），“三低”组较常规组辐射剂量（ED）降低约 60%。两组对比剂用量及碘量差异均有统计学意义（P<0.05），“三低”组碘总量较常规组降低约 37%。**结论**“三低”甲状腺 CT 增强技术在保证图像质量达到诊断要求的前提下，提高了正常甲状腺与病变的 CT 差值，可更有利于甲状腺病变的显示和微小病灶检出，以动脉期更优。同时使 CT 检查的有效辐射剂量大幅度降低，及对比剂总量和碘总量，并获得相同的诊断效能。

EPO-0342
腮腺多形性腺瘤和低度恶性多形性腺瘤的 CT 表现及初步分析

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目的：探讨腮腺多形性腺瘤（PA）及低度恶性 PA 患者的多层螺旋 CT（MSCT）表现及其影像学鉴别诊断价值。方法：回顾性分析经手术病理证实的 45 例（共 48 个病灶）PA 患者的影像学资料（在术前 CT 均诊断为良性）。结果：良性病灶 33 个，低度恶性 15 个。PA 病灶的起源部位、大小（平均最大径：良性组 2.10±0.79cm，低度恶性组 2.64±1.45cm）、包膜的完整性及强化程度与良恶性之间无明显统计学差异。病灶边界模糊（良性组 3/33 个，低度恶性组 10/15 个）、形态不规则（良性组 8/33 个，低度恶性组 9/15 个）、密度不均（良性组 11/33 个，低度恶性组 13/15 个）及边缘血管样强化（良性组 6/33 个，低度恶性组 10/15 个）与病变的良恶性存有显著统计学差异（P<0.05）。结论：MSCT 检查有助于腮腺多形性腺瘤的诊断及良恶性的判断，为指导临床治疗及预后提供重要参考价值。

EPO-0343
CT 检查对钙化在甲状腺良恶性结节鉴别的诊断价值

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目的 探讨 CT 对钙化在甲状腺良恶性结节鉴别的诊断价值。**方法** 回顾性分析经手术切除病理证实的 116 例甲状腺钙化结节的 CT 及临床资料，根据钙化形态将其分为细颗粒钙化及粗颗粒钙化；根据钙化在结节中的位置，分为中央和边缘；统计细颗粒钙化、中央及两者联合在良恶性结节中的分布，并采用 X^2 检验进行统计学分析。根据以上模型继续收集 88 例病例对以上结果进行验证。**结果** 116 例钙化结节中，良性 75 例，恶性 41 例，细颗粒钙化、中央及二者联合在良恶性结节中分别占 26.7%(20/75)和 68.3%(28/41)(X^2=18.936, P= 0.000)、32%(24/75)和 58.5%(24/41)(X^2=7.6956, P= 0.005)、8%(6/75)和 56.1%(23/41)(X^2=32.7063, *P*=0.000)；粗颗粒钙化和边缘联合在良恶性结节中分别占 60%(45/75)和 9.76%(4/41)(X^2=27.4283, *P*= 0.000)。继续收集的 88 例钙化结节中，良性 56 例，恶性 32 例，以细颗粒钙化和中央为标准诊断甲状腺恶性结节的灵敏度为 81.3%(26/32) ，特异度为 89.3%(50/56)；以粗颗粒钙化和边缘为标准诊断甲状腺良性结节的灵敏度为 80.4%(45/56)，特异度为 90.6%(29/32)。**结论** 甲状腺结节中出现钙化且为细颗粒状、位于中央为 CT 诊断甲状腺恶性结节的重要征象，甲状腺结节中出现钙化且为粗颗粒状、位于边缘为 CT 诊断甲状腺良性结节的重要征象。

EPO-0344
Effect of Region of Interest on ADC and Interobserver Variability in Thyroid Nodules

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Background: To determine the effect of region of interest (ROI) on tumor’s apparent diffusion coefficient (ADC) and interobserver variability in thyroid nodules.

Methods: Thirty-three individuals with 45 pathologically-confirmed thyroid nodules were assessed by preoperative diffusion-weighted imaging (DWI) with b values of 0 and 400 s/mm2, respectively. Two readers evaluated the ADC values of lesions based on three ROI techniques: whole-volume, single-slice and small solid-sample groups. Interobserver variability was analyzed for all ROI techniques, and the mean ADCs of benign and cancerous thyroid nodules were compared.
Results: For the mean ADCs of non-cancerous thyroid nodules, average differences and limits of agreement (LOAs) between readers were 0.00 [-0.17 - 0.17]×10-3 mm2/s for whole-volume ROI (ICC=0.967), 0.00 [-0.26 - 0.26] ×10-3 mm2/s for single-slice ROI (ICC=0.932) and -0.02 [-0.38 - 0.41] ×10-3 mm2/s for small solid-sample ROI (ICC=0.823). For the mean ADCs of cancerous thyroid nodules, average differences and LOAs between readers were -0.05 [-0.23 - 0.13]×10-3 mm2/s (ICC=0.885), 0.01 [-0.23 - 0.25]×10-3 mm2/s (ICC=0.839) and -0.07 [-0.52 - 0.39]×10-3 mm2/s (ICC=0.579) for the three ROI methods, respectively. The mean ADC values were more scattered in the small solid-sample ROI group in comparison with the whole-volume and single-slice groups, in noncancerous and cancerous specimens. Of all three ROI techniques, whole-volume ROI-determined ADC had the highest combined sensitivity (80.0%), specificity (88.3%) and Youden index (0.683), with a cut-off of 1.84×10-3 mm2/s.
Conclusions: The ROI method overtly affects ADC measurements in benign and cancerous thyroid nodules. Small solid-sample ROI yielded the worst interobserver variability of average ADC measurements.

EPO-0345
高弛豫率安全型对比剂在周围神经成像的应用探讨

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摘要 对比增强高分辨率磁共振周围神经成像已经在临床上广泛使用，但磁共振对比剂中的钆离子可能导致部分患者肾源性系统性纤维化（NSF）的风险一直受到持续关注。采用低计量磁共振对比剂、安全的型对比剂是降低此类风险的主要考量。本文探讨在周围神经成像时采用高弛豫率大环形结构安全型磁共振对比剂替代线性多用途对比剂的可行性。
目的：探讨高弛豫率大环状安全型磁共振对比剂在磁共振臂丛神经成像应用的可行性。**方法**:对比常规线性离子型磁共振对比剂臂丛神经成像与大环型安全型对比剂臂丛神经成像的诊断效能，A 组， 120 例用新型大环状低剂量对比剂臂丛神经成像患者（大环结构的加乐显，0.15ml/kg），年龄范围 18-70，平均 48.3，女性 56 人，男性 64 人。 B 组，既往 120 例常规线性离子型磁共振对比剂臂丛神经成像患者（0.2ml/kg,马根维显）成像效果比。按常规磁共振臂丛神经成像的要求和操作程序进行检查；由 2 位高年资影像医生对成像结果进行统一规范的薄层 MIP 重建、测量 C6 神经与周围组织的对比度，并做出神经影像的主观评分；并从 PACCS 数据库中随机选择 B 组 120 例既往使用线性结构多用途磁共振对比剂的臂丛神经源图像进行同样的后处理、测量和主观评分作为对照组对比研究。**结果**
A 组 B 组神经与组织的对比度 C，$C_{神经-肌肉}$ P_{AB}=0.169，$C_{神经-脂肪}$ P_{AB}=164，$C_{神经-骨骼}$ P_{AB}=0.159，$C_{神经-静脉}$ P_{AB}=0.16；主观评分 A 组 B 组 P_{AB}=0.168
从以上结果可以看出减量使用大环状对比剂后，主观评分和客观数据评价 A、B 组与常规神经成像没有显著性差异。
结论：使用更低剂量安全性型大环状结构磁共振对比剂作为磁共振臂丛神经成像的背景抑制剂，其成像效果与常规剂量无显著性差异，是线性对比剂理想的替代品。

EPO-0346
甲状腺乳头状癌多种 CT 征象的多因素分析

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目的 探讨多种 CT 征象在甲状腺乳头状癌诊断及鉴别诊断中的价值。方法 回顾性分析经组织病理学证实的 86 位患者，111 枚甲状腺结节（57 枚甲状腺乳头状癌、54 枚结节性甲状腺肿）的 CT 征象，其中 89 枚（80.2%）结节在平扫和/或增强下可显示低密度环，（46 枚甲状腺乳头状癌、43 枚结节性甲状腺肿）。通过多因素 logistic 回归对 89 枚有低密度环的病灶进行三种征象的回归分析，包括不光整低密度环征、咬饼征及增强后病变模糊征，并计算不同阳性 CT 征象及多种征象联合在 PTC 诊断中的灵敏度和特异性。结果 多因素 Logistic 回归分析显示在有环征的 89 枚病例中，不光整低密度环、咬饼征及增强后病变模糊更常见于 PTC 中 （P＜0.05），通过模型预测值对病例进行良恶性判断，判断结果使用 ROC 曲线进行评价，ROC 曲线下面积（AUC）：0.927（诊断价值高）。OR 值分别为 8.474（95%CI:7.983～33.062）、14.824（95%CI:1.969～26.744）和 6.574（95%CI:13.998～43.286）。结论 低密度环在甲状腺结节中的出现率较高，不光整低密度环征及咬饼征、增强后病变模糊在 PTC 的诊断中具有重要价值，多种征象联合可以进一步提高 PTC 诊断的准确性。

EPO-0347
40 例甲状旁腺囊肿 CT 诊断

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目的：探讨 CT CT 在甲状旁腺囊肿诊断中价值。方法：搜集经过手术和病理证实的甲状旁腺囊肿共 40 例，其中进行 CT 平扫及双期增强病例共 33 例。分析甲状旁腺囊肿部位、形态及最大径的位置、CT 值及与甲状腺的关系。结果：40 例甲状旁腺囊肿中 30 例为女性， 10 例男性，年龄 21～70 岁，平均年龄 51.89 岁。14 例伴发甲状腺疾病。而 CT 检查 32 例甲状旁腺囊肿均位于甲状腺下部后方或者下方，9 例位于右侧，23 例位于左侧。均显示气管食管沟及气管旁与颈总动脉之间，2 例至上纵隔，3 例跨越中线生长。5 例呈类圆形，7 例椭圆形，20 例形状稍不规则；直径大小 1.0cm～6.1cm。平均 CT 值 13.1HU，增强扫描内部未见强化，边缘轻度线状强化。与甲状腺之间界限清晰，平扫或增强可见低密度线分隔。结论：成年女性甲状腺下极附近囊性病灶，包膜清晰，内部均匀水样密度，与甲状腺分界清晰，应考虑甲状旁腺囊肿可能。

EPO-0348
基于模型的迭代重建在减少硬化伪影对甲状腺 CT 成像中的价值

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目的 探讨 MBIR 在减少胸廓入口处硬化伪影对甲状腺 CT 图像的影响。**方法** 回顾性选取超声发现甲状腺结节并行胸部 CT 平扫患者 20 例，使用 FBP、ASIR40、$MBIR_{STND}$、$MBIR_{NR40}$ 四种算法重建层厚 0.625 ㎜ 图，选取冠状位图像线束硬化伪影最明显平面放置感兴趣区分别测量甲状腺左右叶伪影

干扰处及周围正常甲状腺组织 CT 值和标准差并计算甲状腺伪影指数（AI），AI=（SDa^2-SDb^2）$^{1/2}$。由两名放射科医师在三维图像上采用 4 分法（1 分，重度伪影，甲状腺边缘及结节显示不清，不能诊断；2 分，中度伪影，甲状腺边缘及内部细节显示欠佳，影响诊断；3 分，轻度伪影，甲状腺边缘及内部细节显示较好，不影响诊断；4 分，无带状伪影，甲状腺边缘及内部细节显示）主观评价图像伪影，意见不同时协商统一。采用方差分析、配对 t 检验比较不同重建图像甲状腺左右叶锁骨因硬化伪影干扰正常甲状腺组织 CT 减低值和 AI，采用 wilcoxon 符号等级检验主观评分差异性。**结果** FBP 和 ASIR40 重建甲状腺左右叶 CT 减低值及 AI 大于 $MBIR_{STND}$ 和 $MBIR_{NR40}$ 图像，差异有统计学意义（P＜0.05），FBP 和 ASIR40 重建甲状腺左右叶 CT 减低值及 AI 无统计学差异，$MBIR_{STND}$ 和 $MBIR_{NR40}$ 重建甲状腺右叶 CT 减低值及 AI 无统计学差异、左叶 CT 减低值及 AI 无统计学差异。主观评价锁骨伪影及噪声方面，$MBIR_{STND}$ 和 $MBIR_{NR40}$ 图像甲状腺及结节评分增高，高于 FBP 和 ASIR40,且 $MBIR_{NR40}$ 最优，差异具有统计学意义（P＜0.05）。**结论** MBIR 能够显著降低 CT 扫描时锁骨线束硬化伪影和噪声对甲状腺及其内结节的影响,特别是优化低密度对比设置的 $MBIR_{NR40}$。

EPO-0349

甲状腺未分化癌的临床和 CT 特征分析

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【摘要】目的 探讨甲状腺未分化癌的临床和 CT 特征。方法 回顾分析 23 例经病理证实为甲状腺未分化癌的临床和 CT 资料，主要统计患者性别、年龄、主诉病史，以及瘤体大小、分布状态、形态、钙化、坏死、向周围侵犯、淋巴结转移和肺部转移等 CT 征象的分布。结果 23 例 ATC 中，女男比例为 16:7，年龄 53~91 岁（72±8 岁），发现声音嘶哑或颈部肿块 21 例（91.3%），瘤体短期内迅速增大 8 例（34.8%），单叶 6 例，单叶+峡部 8 例，双叶+峡部 9 例，直径 3.0~10.2cm（6.1±1.7cm），瘤体形态不规则 20 例（87.0%），粗大钙化 16 例（69.6%），较大范围坏死 17 例（73.9%），向气管食管沟延伸 15 例（65.2%），颈部淋巴结转移 18 例（78.3%），肺部转移 8 例（34.8%），侵犯气管 16 例（69.6%），侵犯颈动脉 7 例（30.4%），侵犯颈静脉 10 例（43.5%）。结论 老年女性患者、瘤体较大、短期内迅速增大等临床特点，以及形态不规则、粗钙化、较大范围坏死、向气管食管沟延伸、颈部淋巴结转移、肺部转移和侵犯气管、颈动脉、颈静脉等 CT 征象，对 ATC 的定性诊断和对周围结构侵犯、颈部淋巴结转移、远处转移评估等方面具有重要价值。

EPO-0350

CT 在超声 4-5 类甲状腺粗钙化结节定性诊断中的价值

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摘要：超声诊断 4-5 类结节时，对于医生或患者而言，都是恶性的不能除外，如果能够通过 CT 检查，将原来超声诊断的 4 类结节降到 3 类结节，将在很大程度上降低没必要的手术创伤，并且为社会节省大量医疗资源。
目的 探讨 CT 在超声 4-5 类甲状腺粗钙化结节定性诊断中的价值。方法回顾分析 2009 年 1 月-2019 年 6 月超声诊断为 4-5 类甲状腺粗钙化结节的 CT 资料，观察增强后边界清晰、伪影、最大 CT 值＞1200HU 在良、恶性结节中的分布，并建立诊断甲状腺良、恶性结节的方程式。结果（具体信息正在整理中） 258 枚超声 4-5 类甲状腺粗钙化结节中，良性结节 218 例，恶性结节 40 例，增强后边

界清晰、伪影、最大 CT 值＞1200HU 均常见于良性结节中（p＜0.05），其 CT 最大值＞1200HU 对良性结节的诊断具有高度的特异度。结论 CT 在超声 4-5 类甲状腺粗钙化结节定性诊断中具有重要价值，可在很大程度上减少不要要的手术创伤

EPO-0351

腮腺基底细胞腺瘤的 MRI 诊断与鉴别诊断

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【摘要】目的 探讨腮腺基底细胞腺瘤的 MRI 影像诊断及鉴别诊断。**资料与方法** 回顾性分析经手术病理证实的 43 例患者 45 个腮腺基底细胞腺瘤的 MRI 影像表现，术前均行 MRI 平扫＋增强检查，对患者性别、发病年龄、临床表现，以及病灶的数目、部位、形态、大小、境界、MRI 信号特点及强化方式进行分析。**结果** 43 例患者中女性 31 例，男性 12 例，平均年龄 47.5 岁（17～78 岁），主要表现为耳垂下方无痛性缓慢生长的肿块。43 例患者中有 2 例为双侧双发病灶，41 例为单侧单发病灶。45 个病灶中 25 个位于腮腺浅叶，12 个跨叶生长，8 个位于腮腺深叶。45 个病灶中 23 个为椭圆形，20 个为类圆形，2 个为分叶状。45 个病灶境界均清楚光滑，体积较小，最大者直径为 38mm。45 个病灶实性成分 T1WI 均呈稍低信号，42 个病灶实性成分压脂 T2WI 呈稍高信号，低于周围正常腮腺实质信号，病灶信号欠均匀，35（78%）个病灶发生囊变，36（80%）个病灶周边见 T2WI 低信号包膜。18 个病灶行 DWI 序列检查，16（89%）个病灶弥散明显受限。增强检查示 43（96%）个病灶实性部分呈明显强化，7 个病例动态增强呈速升平台型方式强化。**结论** 腮腺基底细胞腺瘤好发于老年女性，体积一般较小，易囊变，增强扫描实性成分呈明显强化等影像学特征，结合临床特点有助于肿瘤诊断与鉴别。

EPO-0352

CT 强化程度对甲状腺乳头状癌颈部淋巴结转移的诊断价值

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目的 探讨 CT 强化程度对甲状腺乳头状癌(Papillary thyroid carcinoma，PTC)颈部淋巴结转移的诊断价值。**方法** 回顾分析经手术病理证实的 251 例 PTC 中 535 枚颈部淋巴结的 CT 资料，计算 CT 增强与平扫密度值的比值和差值，采用 Mann-Whitney 检验分析比值和差值在淋巴结转移组和非转移组中的分布，通过受试者工作特异度曲线(ROC)获得比值和差值在两组中的最佳阈值。**结果** 535 枚颈部淋巴结中，包括转移组 271 枚和非转移组 264 枚，两组的比值分别为 2.30（2.04，2.76）和 1.66（1.51，1.81）（Z=-16.94，P<0.05），差值分别为 58（49，76）Hu 和 31（22，36）Hu (Z=-18.045，p<0.05）。两组比值和差值的 ROC 曲线下面积分别为 0.923 和 0.951，最佳阈值分别为 1.93 和 39.5Hu，诊断淋巴结转移的敏感度和特异度分别为 84.9％和 87.1％、91.5％和 86.0％。两者联合诊断淋巴结转移的敏感度和特异度为 82.3%和 91.7%。**结论** 增强与平扫密度值的比值≥1.93 和差值≥39.5Hu 对 PTC 颈部淋巴结转移具有较高的诊断效能，两者的特异度相仿，后者具有更高的敏感度，两者联
合可以明显提高特异度，从而减少不必要的手术创伤。

EPO-0353
影像组学在甲状腺滤泡性肿瘤良恶性鉴别价值的初步研究

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目的：探讨 CT 纹理分析方法在鉴别甲状腺滤泡性肿瘤良恶性的价值。
方法：回顾性分析经手术病理证实的 122 例甲状腺滤泡肿瘤的影像学资料，随机分为训练组和验证组，根据病理结果分为良性组和恶性组。采用 LIFEx 软件提取纹理特征。采用 R 软件 Lasso 模型进行特征筛选及模型建立。采用 ROC 曲线评价模型的预测效能。
结果：经筛选的纹理特征建立的影像组学标签对甲状腺滤泡性肿瘤的良恶性具有较好的预测效能。训练组和验证组中的 AUC 分别未 0.91、0.86，敏感度分别为 86.11%、70.00%，特异度分别为 86.67%、95.24%。
结论：CT 纹理分析对于甲状腺滤泡状肿瘤的良恶性鉴别具有较好的预测效能，为临床制定治疗方案提供依据。

EPO-0354
增强 CT 对甲状腺乳头状癌中央区转移淋巴结的诊断价值

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目的：探究增强 CT 对甲状腺乳头状癌（Papillary Thyoid Carcinoma，PTC）中央区淋巴结（Central Lymph Node，CLN）转移的诊断价值。方法：回顾 2018 年 11 至 2019 年 7 月病理证实为 PTC 的患者，分析术前增强 CT 图像，包括中央区淋巴结短径是否大于 5mm，有无明显强化、不均匀强化、囊变/坏死、钙化，术后病理结果比较并分析。结果：81 例患者，共计切除 111 侧 CLN，44 侧转移，CT 假阳性 5 侧，包括 1 侧出现异位甲状腺，4 侧出现淋巴结炎性反应性增生，假阴性 25 侧，均为轻度强化/小于 5mm 的淋巴结。增强诊断 PTCCLN 转移的 CT 敏感性为 43.2%，特异性为 92.5%，阳性预测值为 79.2%，阴性预测值为 28.7%。结果：增强 CT 诊断 PTC 患者伴 CLN 转移的特异性较高，但敏感性不足，在临床工作中预防性切除 PTC 患者 CLN 具有重要意义。

EPO-0355
第三代双源 CT 双能量碘图在甲状腺结节鉴别诊断中的应用

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目的 利用西门子第三代双源 CT 双能量碘图测定甲状腺结节的碘浓度并探讨其鉴别良恶性价值。
方法 回顾性分析经病理证实的 68 例甲状腺结节患者术前的 Force 双源 CT 双能量平扫及增强资料，经后处理工作站分别得出碘图，比较甲状腺结节平扫、动脉期及静脉期碘浓度、标准化碘浓度(NIC)，绘制 ROC 曲线，分析应用碘浓度及 NIC 对甲状腺结节鉴别的诊断效能。**结果** 平扫甲状腺良性结节碘浓度 $IC_{病灶}$为 1.1175±0.3961mg/ml，恶性结节 $IC_{病灶}$为 0.7042±0.3394mg/ml，良性大于恶性，差异有统计学意义（$P<0.05$）；两者均低于正常甲状腺组织，正常甲状腺组织碘浓度 $IC_{甲状腺}$与 $IC_{病灶}$良恶性结节比较有统计学差异（$P<0.05$）。动脉期良恶性结节标准化碘浓度比（NIC）分别为 0.4025±0.0984、0.3825±0.0659，差异无统计学意义($P>0.05$)；静脉期良、恶性结节 NIC 分别为 0.7607±0.2245、0.5946±0.1674，良性大于恶性，差异有统计学意义($P<0.05$)。平扫碘

浓度界值为 0.85mg/ml 时，灵敏度为 72.5%，特异度为 60.8%；增强扫描静脉期 NIC 界值为 0.59 时，灵敏度为 75%，特异度为 54.2%。**结论** Force 双源 CT 双能量碘图成为鉴别甲状腺结节良恶性的有效影像检查手段之一。

EPO-0356
高分辨弥散 RESOLVE-DWI 序列与常规 DWI 在舌癌的对照应用研究

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目的 *探讨* 1.5 T MRI 分段读出扩散加权成像(RESOLVE DWI) 与常规扩散加权成像(DWI) 对舌癌图像质量的影像。
方法 回顾性分析 28 *例经手术病理证实为舌癌的患者，所有患者术前均行磁共振平扫、增强及* RESOLVE DWI 与常规 DWI *成像。分别计算常规* DWI 及 RESOLVE DWI 图像的信噪比(SNR) 、对比度(CR) 、对比噪声比(CNR) 及表观扩散系数(ADC) 值，分别评价不同序列对于舌部解剖的显示、图像畸变的程度，病灶的清晰度以及图像的整体质量评分。应用 SPSS 24.0 统计学软件对于数据进行分析，使用配对 Wilcoxon 秩和检验比较主观评分及图像质量之间的差异，采用 ICC 曲线分析评价 2 名医师评分之间的一致性。
结果 2 名医师对 28 例舌癌常规 DWI 和 RESOLVEDWI 图像解剖结构、病灶的清晰度与图像畸变的程度以及图像的整体质量评分的一致性均较好，RESOLVE DWI 对于舌部的解剖结构显示、病灶的清晰度与图像的畸变程度明显高于常规 DWI，差异有统计学意义，(P＜0.05)； RESOLVE DWI 中的图像的 SNR、CR、CNR 显著高于常规 DWI，差异有统计学意义，(P＜0.05)；舌癌病灶 RESOLVE DWI 的 ADC 值和常规 DWI 的 ADC 值无显著差异性(P＞0.05) 。
结论 RESOLVE DWI 图像质量优于常规 DWI，可以降低图像变形，提高图像
质量，对于舌癌病灶的显示具有更好的诊断价值，可以作为舌癌的常规影像诊断方法。

EPO-0357
Development and validation of an ultrasound-based nomogram to improve the diagnostic accuracy of identification of malignant thyroid nodules

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Objectives: The aim of this study was to develop an ultrasound-based nomogram to improve the diagnostic accuracy of the identification of malignant thyroid nodules.
Methods: A total of 1,675 histologically proven thyroid nodules (1169 benign, 506 malignant) were included in this study. The nodules were grouped into the training dataset (n = 700), internal validation dataset (n = 479), or external validation dataset (n = 496). The grayscale ultrasound features included the nodule size, shape, aspect ratio, echogenicity, margins, and calcification pattern. We applied least absolute shrinkage and selection operator (lasso) regression to select the strongest features for the nomogram. Nomogram discrimination (area under the receiver operating characteristic curve, AUC) and calibration were assessed. The nomogram was subjected

to bootstrapping validation (1,000 bootstrap resamples) to calculate a mean AUC and 95% confidence interval (CI).
Results: The nomogram showed good discrimination in the training dataset, with an AUC of 0.936 (95% CI: 0.918-0.953) and good calibration. Application of the nomogram to the internal validation dataset also resulted in good discrimination (AUC: 0.935; 95% CI, 0.915-0.954) and good calibration. The model tested in an external validation dataset demonstrated a lower AUC of 0.782 (95% CI: 0.776-0.789).
Conclusions: This ultrasound-based nomogram could be used to quantify the probability of malignant thyroid nodules.

EPO-0358

Visualization of trigeminal Nerve Using 3D STIR sequence after contrast

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Purpose: The objective of this study was to explore the feasibility of using 3D STIR SPACE after contrast to visualize the trigeminal Nerves at 3T.
Material and methods: Ten healthy volunteers and Five patients were examined with 3D STIR sequence after contrast. The data obtained were reconstructed in relation to the course of the trigeminal nerve by using the MPR and thin-section MIP programs. Images acquired were analyzed by 2 neuroradiologists . They made the initial evaluations independently, The certainty of identifying each division of the trigeminal nerve was scored and recorded on an arbitrary scale of 0－2. Statistical evaluation of the results was achieved by the 2-tailed Wilcoxon test.
RESULTS: In all subjects, 3D STIR SPACE images provided a reliable definition of the normal trigeminal bilaterally. There were no significant differences between scores of bilateral trigeminal nerves (P＞.05). The trigeminal nerve showed high signal intensity while the surrounding soft tissue showed relatively low signal intensity.
CONCLUSIONS: The 3D STIR SPACE sequence after contrast can display the course of normal trigeminal nerves.

EPO-0359

正常人颌面部骨性孔道的形态学分析

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摘要：目的：测量正常人颌面部主要骨性孔道（眶下管、鼻泪管及颧眼管）孔径、鼻泪管的含气量及位置等形态学参数，探讨颌面部主要骨性管道有无偏侧化、性别差异、年龄相关的改变以及鼻泪管位置及含气量与孔径的关系。方法：对 64 位年龄范围 6-80 岁的正常人（平均年龄 42.7 ±18.1 岁；其中男性 43 人，女性 21 人）的颌面部 Force 双源 CT 精细薄层轴位图像行双侧眶下管、颧眼管及鼻泪管的孔道直径、鼻泪管含气量和位置以及颧眼孔的眶距及眶水平中线距等形态学参数进行测量评价，之后对各骨性孔道的形态学参数行性别、左右侧、鼻泪管的含气量和位置孔道直径的关

系等进行统计学分析。结果：①除眶下管内孔直径有性别差异外（$p<0.05$），余各骨性孔道形态学测量值无显著的性别差异②鼻泪管含气量、位置及颧眼孔外孔左右无显著差异外，余颌面部主要骨性孔道的形态学参数均有显著的偏侧性（$p<0.01$）③右侧鼻泪管的含气量及位置与右侧鼻泪管上孔及中段直径显著相关（$p<0.05$），但左侧无显著相关④左侧鼻泪管中段直径、颧眼孔左侧内孔及颧眼孔眶水平中线距与年龄相关（$p<0.05$），余颌面部骨性孔道的形态学参数与年龄无显著的相关性。结论：全面了解颌面部骨性孔道的性别差异、偏侧性及鼻泪管的位置和含气量等形态学特征，对颌面部手术方案的选择极其重要。

EPO-0360
3.0T 头颈 MRI 扫描对椎基底动脉扩张延长症与缺血性脑卒中的相关性研究

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目的：探究 3.0T MRI 扫描对椎基底动脉扩张延长症与缺血性脑卒中的相关性。 方法：回顾性分析与新疆生产建设兵团医院医学影像科经神经内科确诊为缺血性脑卒中的患者 118 例的临床与影像学资料，其中椎基底动脉扩张延长症患者 60 例，60 例患者均已完成头颈 MRI 扫描，对比分析头颈 MRI 影像图像，统计学分析缺血性脑卒中患者与椎基底动脉扩张延长症的相关性。 结果：MRA 诊断椎动脉直径≧4mm 者 50 例，基底动脉直径≧4.5mm 者 47 例，椎动脉颅内段长度>23.5mm 者 58 例，基底动脉的长度>29.5mm 者 57 例；缺血性脑卒中发生率与椎基底动脉扩张延长症具有统计学意义（$P<0.05$），同时缺血性脑卒中发生率与椎基底动脉扩张延长症具有明显相关性（$r=0.626$）。 结论：椎动脉扩张延长症与缺血性脑卒中具有显著相关性，早期对椎基底动脉扩张延长症的诊断有助于使患者对于缺血性脑卒中的预防提供依据，同时对临床早期干预及患者预后具有重要意义。

EPO-0361
高分辨力 MR 血管壁成像技术在头颈动脉夹层诊断中的应用价值

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目的：探讨高分辨力血管壁 MRI(HR-MRI)在头颈动脉夹层诊断中的价值。方法：前瞻性连续纳入 2017 年 6 月-2019 年 3 月就诊的头颈动脉夹层患者 25 例，采用 12 通道头颈联合线圈行头颈一体化 HR-MRI 成像，其中 3 例随访共 3 次，3 例随访 2 次。根据纳入病人的临床病史、实验室检查、影像检查对夹层做出综合诊断并作为参考标准。由 2 名放射科医生对 HR-MRI 影像进行分析，评价内容包括夹层累及的血管、夹层数目、内膜片、壁内血肿及双腔征等。结果：25 例中 HR-MRI 显示 33 个血管节段存在夹层（包括颈内动脉 13 个节段、椎动脉 13 个节段、基底动脉 5 个节段、大脑中动脉 2 个节段），其中 30 个血管节段见壁内血肿，25 个血管节段见双腔征。6 例随访的病例经治疗后夹层病灶均有不同程度缩小，临床症状减轻。结论：头颈联合 HR-MRI 可全景显示夹层动脉管壁特征，可作为动脉夹层诊断和随访的一线检查技术，其中 3D-T1WI-SPACE 可作为随访评估的重要序列，可重复性强。

EPO-0362
颈椎曲度变直患者横韧带损伤研究

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目的：探讨颈椎曲度变直患者横韧带异常改变，为早期诊断横韧带损伤提供客观依据。
材料与方法：选取 2018 年 1 月至 2019 年 6 月因颈部不适于天津市人民医院脊柱科就诊的 18-30 岁颈椎曲度变直患者 50 例为病例组。同期选取年龄、性别相匹配，无颈部症状、颈椎曲度存在志愿者 50 例为对照组。所有受试者均于西门子 3.0 T 磁共振检查仪行横韧带 PDWI 检查。以垂直于齿突的横轴位为扫描方向，扫描范围为枕骨大孔水平至枢椎椎体下缘水平。以横韧带全部或局部信号高于同层肌肉信号视为信号异常。
结果：全部受试者均完成横韧带 MRI 检查，病例组有 2 例、对照组有 1 例受试者因运动伪影图像质量不满足分析要求。病例组有 31（31/48）例患者表现为横韧带局部信号增高，未见横韧带信号弥漫性增高。对照组有 4 例（4/49）出现横韧带局部信号增高，未见横韧带信号弥漫性增高。两组间横韧带信号增高发生率差异有统计学意义（*P<0.05)*。
结论：对于有颈部症状的颈椎曲度变直患者需进行横韧带 MRI 检查除外横韧带损伤。

EPO-0363

腭部腺样囊性癌的 CT 表现特点

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目的：评价腭部黏膜完整的腺样囊性癌（acc）的 CT 表现，建立其临床诊断的预测模型。
方法：从 2016 年 3 月至 2018 年 5 月，共收集 102 例腭部粘膜完整的肿瘤入组，其中 28 例术后病理诊断为 ACC。记录并分析患者的临床症状、CT 表现特征及病理诊断。采用单变量分析和多变量 logistic 回归确定了 ACC 的独立预测因子，并对预测模型进行了判别和校正，并进行了内部验证。
结果：对患者的单变量分析显示，与非 ACC 患者相比，ACC 患者多为老年人（P=0.019）；多表现为腭骨破坏（P<0.001）和腭大孔（GPF）增大（P<0.001）；累及翼腭窝（P<0.001）、圆孔（P<0.001）、鼻腔（P<0.001）和上颌骨（P<0.001）。同时伴有麻木（P=0.007）和疼痛（P<0.001）。多变量 logistic 分析显示年龄和 GPF 增大是腭部肿瘤中 ACC 的独立预测因子。根据受试者工作特性曲线下面积（0.98）和霍斯默-莱梅肖拟合优度检验（P=0.927），诊断预测模型显示出良好的识别和校正能力。
结论：基于年龄和 GPF 增大的腭部 ACC 预测模型显示出良好的辨别力，没有校准不良的迹象。腭部粘膜完整的老年肿瘤患者，有 GPF 增大时应首先考虑 ACC。

EPO-0364

A diagnostic prediction model of adenoid cystic carcinoma for masses in the palate

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Objective: To create and evaluate a diagnostic prediction model of adenoid cystic carcinoma (ACC) for the patients with palatine tumors.

Materials and Methods: From March 2016 to May 2018, 102 patients with palatine tumors, including 28 patients with pathological diagnosis of ACC were enrolled in this study. The patients' clinical symptoms, computed tomography features and pathological diagnoses were recorded and analyzed. Independent predictors of ACC were detected by using univariate analysis and multivariate logistic regression, then the discrimination and calibration of the prediction model was evaluated and internal validation was performed.
Results: Univariate analysis of patients showed: ACC patients were more likely to be older, with palatine bone destruction, greater palatine foramen (GPF) enlargement, pterygopalatine fossa involvement, foramen rotundum involvement, nasal cavity involvement, maxillary bone involvement, numb and pain. Multivariate logistic analysis showed: age and GPF enlargement were independent predictors of ACC in palatal masses. The diagnostic prediction model had excellent discrimination and calibration. The area under the receiver operating characteristic curve for the prediction model was 0.98. The calibration of the model was assessed by Hosmer Lemeshow goodness-of-fit test (p=0.927). The evaluation was further confirmed by internal validation.
Conclusion: The age and GPF enlargement prediction model for ACC in the palate shows excellent discrimination with no evidence of poor calibration. The older patients with palatine masses should be considered with ACC when they GPF enlargement.

EPO-0365
磁共振弥散张量成像在巨大听神经瘤患者术前评估面神经中的临床应用

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目的：巨大听神经瘤患者的面神经由于受到肿瘤推挤，可向多个方向移位，因此在切除巨大听神经瘤时如何保护面神经对外科医生是一项艰巨的挑战。本研究旨在探讨利用磁共振弥散张量成像（DTI）通过追踪神经束的走行，从而实现术前评估面神经形态及与听神经瘤体的空间关系。

方法：本研究前瞻性收集 5 例巨大听神经瘤（肿瘤直径>2cm）患者，术前通过 House-Brackman 分级确定面神经功能正常。利用 GE 3.0T 磁共振先行桥小脑角区常规 T1WI 及 T2WI 扫描后，再行 DTI 功能成像，成像参数：b=1000s/mm^{2}序列扫描 64 个方向；b=0 序列：TR 6900ms, TE 80ms，层厚 1.5mm，无间隔扫描，FOV 22.4×22.4mm，NEX=2，扫描层数 55~65 层。然后行 T2 加权的 3D FIESTA 扫描，用于后处理时与 DTI 序列叠加定位的解剖学成像序列。 利用 Functional tool 后处理工作站软件，把 SeedROI 放到桥小脑角面神经发出的部位，点击 Tracking 得到数条白质纤维束。然后导入 3D FIESTA 解剖学序列来修正 ROI 的放置位置，检验所追踪出的神经纤维束中哪一根为面神经，确定其与听神经瘤体的空间关系，并与术中所见进行对比验证。

结果：5 例听神经瘤患者中 4 例 DTI 追踪出了面神经， 1 例 DTI 未能追踪出面神经，可能是因为肿瘤太大（直径 4.6cm），术中发现面神经被挤压菲薄如纸，故未能成功追踪出神经束。4 例中 2 例面神经桥池段位于肿瘤前方中部，1 例位于前方上部，1 例位于前方下部，DTI 成像结果与术中所见结果相吻合。

结论：磁共振弥散张量成像（DTI）在巨大听神经瘤患者术前追踪面神经领域具有很高的临床应用价值，但当听神经瘤体过大时可能追踪失败，仍需对磁共振成像方法学和后处理技术做进一步探索和改进。

EPO-0366

Clinical Application of Diffusion Tensor Imaging in Preoperative Evaluation of Facial Nerve in Patients with Giant Acoustic Neuroma

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Objective: In patients with giant acoustic neuroma, the adjacent facial nerve can be displaced in many directions due to the pushing of tumors. Therefore, it is a challenge for surgeons to protect the adjacent facial nerve when resecting giant acoustic neuroma. The purpose of this study was to investigate the spatial relationship between acoustic neuroma and the adjacent facial nerve by tracking the course of facial nerve tract by using diffusion tensor imaging (DTI).

Materials: Five cases of patients with giant acoustic neuroma (tumor diameters > 2 cm) were prospectively collected and facial nerve function was determined by using House-Brackman grading before operation. The cerebellopontine angle was scanned by conventional T1WI and T2 WI on a GE 3.0T MR and followed by DTI functional imaging. Imaging parameters: b=1000s/mm^2 sequence, 64 directions were scanned, and b=0 sequence: TR 6900ms, TE 80ms, slice thickness 1.5mm, no interval scanning, FOV 22.4 × 22.4mm, NEX = 2. T2-weighted 3D FIESTA scan was performed to superimpose and anatomically locate the DTI images on Functional Tool Post- Processing Workstation. Seed ROI was placed at the site of the facial nerve in the cerebellopontine angle. Then we click Tracking and put target ROI at the distal end of the internal auditory canal near the cochlea, and several white matter bundles were obtained. After that, the 3D FIESTA anatomical images were used to determine the facial nerve fiber tract and its spatial relationship with the acoustic neuroma, which was compared with the intraoperative findings.

Results: Facial nerve was accurately traced by DTI in 4 of 5 cases, but failed in 1 case, probably due to the extremely large tumor size (4.6cm in diameter), which squeezed the adjacent facial nerve as thin as paper. Within the 4 succeed cases, the pontine cistern segment of the facial nerve was located in the middle anterior part of the tumors in 2 cases, and in the upper anterior part in 1 case and in the lower anterior part in 1 case. The DTI results were in accordance with intraoperative findings.

Conclusion: Magnetic resonance DTI imaging has high clinical value in the evaluation of adjacent facial nerve for patients with giant acoustic neuroma before surgery.

However, when the tumor is too large, it can be difficult to track. Further exploration and improvement of MRI techniques and post-processing treatments are still needed in future.

EPO-0367
磁共振波谱参数变量在颌面部肿瘤中应用价值的探索

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目的 探讨磁共振波谱成像参数变量中ＴＥ时间变化对颌面部肿瘤检测的区别和价值。
材料与方法 选取我院确诊为颌面部舌鳞癌患者 40 例和正常对照组 20 例。将其分为短ＴＥ肿瘤组（A 组 n=20）、短ＴＥ对照组（B 组 n=10）、长ＴＥ肿瘤组（C 组 n=20）、长ＴＥ对照组（D 组 n=10）。所有病例均行术前ＭＲＳ检查并进行后处理分析，测量比较 Cho、Cr、Cho/Cr 比值、LL。将取值采用两独立样本 t 检验方法进行统计学分析。
结果 (1)A 组与 B 组比较 Cho、Cr、Cho/Cr、LL 峰差异有统计学意义（P<0.01）；（2）C 组与 D 组比较 Cho、Cr、Cho/Cr、LL 差异有统计学意义（P<0.01）；(3)A 组与 C 组 Cho、Cr、Cho/Cr、LL 差异有统计学意义（P<0.01）.
结论 磁共振波谱成像能在舌鳞癌诊疗中提供一定的诊断信息，参数变量 TE 时间的取值决定了不同的谱峰含量和形态，具有一定的临床应用价值。

EPO-0368
鼻腭部腺样囊性癌嗜神经扩散的征象研究

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目的：通过对鼻腭部腺样囊性癌（ACC）和鼻腭部鳞状细胞癌（SCC）磁共振成像（MR）对比分析，探讨鼻腭部腺样囊性癌嗜神经扩散的 MR 表现，以提高临床认识。**方法**：回顾性分析本院 2012-2018 年以来经手术病理证实的鼻腭部原发性腺样囊性癌以及鼻腭部原发性鳞状细胞癌的临床和影像学资料。采用两独立样本 t 检验分析两组间嗜神经扩散征象发生率的差异。**结果**： 鼻腭部原发性腺样囊性癌 24 例，鼻腭部原发性鳞状细胞癌 26 例。鼻腭部 ACC 常侵犯翼腭窝，发生率达 75%。两组间神经增粗、强化；翼腭窝脂肪间隙消失；海绵窦被软组织包绕；Meckel 腔长 T2 信号消失；肌肉水肿强化发生率的差异均具有统计学意义（P＜0.05）。两组间肿瘤对翼腭窝、卵圆孔、翼管、腭大孔侵蚀的差别具有统计学意义（P＜0.05），肿瘤对眶下裂的侵蚀无统计学意义（P＞0.05）。**结论**：MR 对鼻腭部腺样囊性癌神经周围扩散的诊断有一定价值。鼻腭部腺样囊性癌嗜神经扩散征象的发生率明显高于鳞状细胞癌。

EPO-0369
探讨常规磁共振联合 DWI 和 DCE-MRI 对颈静脉孔区肿瘤及肿瘤样病变的鉴别诊断价值

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目的：探讨常规磁共振联合弥散加权成像（Diffusion weighted imaging，DWI）和动态增强磁共振（Dynamic contrast enhancement MRI，DCE-MRI）对于颈静脉孔区肿瘤的病理类型的判断及鉴别诊断价值。材料与方法：前瞻性分析 2015 年 1 月-2018 年 12 月颈静脉孔区肿瘤或肿瘤样病变的磁共振特征。所有病例均行术前磁共振检查，且经过手术确认手术病理。两名研究者对于磁共振图像作出独立评估，并记录肿瘤的信号、形态特点、时间-信号曲线（time-intensity cure，TIC）类型、表观弥散系数（Apparent diffusion coefficient, ADC）。采用卡方分析检验两研究者间诊断差异及不同病理类型间影像学差异。结果：最终纳入病例 49 例，病理结果显示良性肿瘤 31 例，恶性肿瘤 18 例。两名研究者对于肿瘤良恶性定性诊断准确率分别为 93.8%及 91.8%，一致性良好（P＞0.05）。软骨肉瘤表现为明显 T2WI 高信号，与副神经节瘤、脑膜瘤的信号特点有明显差异（P＜0.05），与神经鞘瘤 T2WI 信号强度差异不明显（P＞0.05）。TIC 曲线表现上，所有副神经节瘤均表现为廓清型曲线，神经鞘瘤和脑膜瘤表现为持续上升型或平台型曲线，所有软骨肉瘤均表现为持续上升型曲线，副神经节瘤与其他肿瘤类型在 TIC 曲线表现上有明显统计学差异（P＜0.001）。DWI 序列提示软骨肉瘤的 ADC 均值明显高于良性肿瘤（P＜0.001）。良性肿瘤中神经鞘瘤的 ADC 均值高于副神经节瘤及脑膜瘤（P＜0.05）。结论：常规磁共振联合 DWI 和 DCE-MRI 在颈静脉孔区肿瘤及肿瘤样病变的鉴别诊断中具有较高的准确性，能为临床治疗选择提供可靠依据。

EPO-0370
腮腺基底细胞腺瘤与 Wathin’s 瘤的 CT 和临床特征

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目的：探究腮腺基底细胞腺瘤与 Wathin’s 瘤的 CT 和临床特征，为腮腺基底细胞瘤与 Wathin’s 瘤的诊断和鉴别提供依据。
方法：回顾性分析我院经手术及病理证实的腮腺基底细胞腺瘤 12 例、Wathin’s 瘤 23 例，对其性别构成、年龄、有无吸烟史、病灶数目、病灶位置、病灶大小、有无囊变、有无壁结节、CT 强化程度进行分析对比。
结果：两种肿瘤患者的性别构成、年龄、有无吸烟史、有无壁结节、CT 强化程度差异存在统计学意义（P<0.05），其中腮腺基底细胞瘤患者女性多见，发病年龄相对较小，CT 强化明显且有壁结节，而 Wathin’s 瘤患者男性多见，发病年龄较大，有吸烟史，CT 强化明显，延迟强化迅速减退，呈“速升速降”。
结论：根据 CT 和临床特征可对腮腺基底细胞腺瘤与 Wathin’s 瘤做出较为准确的定性诊断，有利于外科手术的方案的确定。

EPO-0371
MR imaging findings of nodular fasciitis in the head and neck

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Introduction and objectives: The purpose of this study was to describe the MR imaging findings of nodular fasciitis occurring in the head and neck region.
Material and Methods: We retrospectively reviewed MR images of nodular fasciitis with pathologic correlation in 8 cases collected between August 2003 and October 2015 from our pathologic database. All of the MR images were retrospectively evaluated with respect to the location, size, relationship to fascia, signal characteristics , enhancement, and enhancement pattern by 2 experienced radiologists.
Results and discussion: All patients presented with a palpable mass in the head and neck that was noticed 13 months earlier. There were 2 male and 6 female patients. Mean age was 40 years (range, 2159 years). Lesions ranged in size from 1.2 to 2.7 cm. All lesions were located in the head and neck region. Six lesions were subcutaneous in location, and 2 were intra-muscular. Lesions were consistently ovoid in shape with broad fascial contact. They exhibited internal homogenous low T1 and heterogeneous intermediate T2 signal with surrounding edema and slightly inhomogeneous enhancement. One lesions exhibited central non-enhancing areas.
Conclusions: MR imaging features of nodular fasciitis are generally non-specific and can be mistaken for a soft tissue sarcoma. This series, the largest MRI series of head and neck cases in the literature, confirms the predilection of nodular fasciitis for the head and neck. When a rapidly growing oval mass in contiguity with a fascial plane is recognized, the diagnosis of nodular fasciitis should be entertained.

EPO-0372

颈源性眩晕患者静息态脑功能连接研究

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目的 通过静息态功能磁共振分析方法，研究颈源性眩晕（Cervical Vertigo-CV）[1]患者脑区间长程功能连接和局部相邻神经元之间短程连接的特异性改变。
方法 通过 CONN[2]软件计算 31 例 CV 患者和 25 例正常对照（Normal Controls-NC）基于 AAL[3]模板 116 个脑区任意两个脑区间的功能连接，对每条连接进行两组间独立双样本 T 检验（$p<0.05$，错误发现率校正）；与此同时，通过 DPABI[4]软件计算两组各被试的 zReHo[5]指标值并做组间独立双样本 T 检验（$p<0.01$, cluster $p<0.05$,高斯随机场理论校正），随后，对有组间显著差异的功能连接和 zReHo 指标值分别依次进行与眩晕障碍量表评分（DHI）及其亚量表，躯体得分（PS），情绪得分（ES），功能得分（FS）间线性回归相关分析。
结果 相比 NC 组，CV 组分别有 6 条显著增强和减弱的功能连接（表 1，图 1）。CV 组左侧辅助运动区的 zReHo 值相比 NC 组显著增加，而双侧内侧额上回的 zReHo 值相比 NC 组显著减弱（表 2，图 2）。CV 组左侧额中回与 Vermis_4_5 间功能连接和 ES 显著正相关($r=0.4624$, $p<0.0115$)，左侧辅助运动区与 Vermis_3 间功能连接和 PS 显著正相关 ($r=0.4338$, $p<0.0187$)（图 3）。CV 组相比 NC 组具有显著改变的 zReHo 值与其各临床量表评分均不存在相关性。
结论 CV 组左侧辅助运动区和左侧前辅助运动区局部神经元间短程连接的改变及其与其他脑区间长程功能连接的改变一定程度上解释了 CV 患者躯体控制能力减弱的原因，以及其显著改变的功能连接与临床量表评分间的相关性可以尝试作为影像学指标以辅助对 CV 展开更进一步的认识。

EPO-0373

Delayed time-density curve in acute ischemic stroke patients with severe cardiogenic diseases may result in abnormal perfusion results

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Objective: CTP is widely used in acute ischemic stroke before reperfusion therapy. At present, the standard CTP protocol adopts the discontinuous volumetric scanning with fixed time interval and phases, which is well used in patients with normal systemic circulation time. We found that some patients with severe cardiogenic diseases had a delayed TDC which resulted in some perfusion data losing. The aim of this study is to explore whether a delayed time-density curve (TDC) in patients with severe cardiogenic diseases can result in partial perfusion data losing and wrong perfusion results.
Method: Twenty-nine acute ischemic stroke patients with unilateral anterior circulation large vessels occlusion were divided into two groups A and B. Nineteen patients in group A had normal TDC, and ten patients in group B with severe cardiogenic diseases had delayed TDC. Circulation time here was defined as the time from injection to peak of the venous curve. Perfusion parameters including CBF, CBV, TTP and MTT in all patients were all recorded and compared between bilateral hemispheres. The parameters in the lesion side and mirror side of brain in two groups were compared.
Result: CBF at the affected hemispheres in group B was increased in the infarction area rather than decreased (36.7±11.7 vs 26.7±11.0, $P<0.05$), and MTT was obviously shorten rather than prolonged (2.5±0.6 vs 4.4±1.1, $P<0.05$). Circulation time (22.4 vs 37.4, $P<0.05$) was significant difference between two groups.
Conclusion: Patients with severe cardiogenic diseases may have a delayed TDC due to delayed or slow circulation. In these patients, the standard CTP protocol may have resulted in some perfusion data losing and wrong perfusion results.

EPO-0374

15 例腮腺脂肪瘤的 CT 与 MRI 表现分析

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目的 探讨腮腺脂肪瘤的 CT 与 MRI 表现特点，以提高其认识水平。
方法 收集 15 例经手术病理证实的腮腺脂肪瘤的 CT 与 MRI 资料，回顾性分析其影像学表现（包括肿块大小、形态、边界、内部密度/信号、增强特点及周围淋巴结等），并与病理学对照分析。
结果 （1）临床发病情况： 15 例患者中男性 9 例，女性 6 例；发病年龄 20-74 岁，平均（44.0±6.8）岁；所有患者均为单侧发病，左侧 7 例，右侧 8 例。（2） CT 检查：11 例患者行

CT 检查，表现为，①形态：3 例呈分叶状，5 例为较规则的圆形或椭圆形，3 例呈不规则形，包膜不完整，其中 2 例向咽旁间隙生长，1 例向颌下区浸润性生长。②边界：9 例边界尚清晰，2 例复发性脂肪瘤边界欠清。③密度：8 例均呈脂肪样低密度影；3 例呈混杂密度影，其中 2 例可见钙化密度影，1 例夹杂软组织密度影。④增强模式：7 例患者行增强 CT 扫描，其中 4 例双期扫描未见明显增强，3 例呈轻度不均匀强化。（3）MRI 检查：10 例患者行 MR 检查，特点为，①形态：4 例呈分叶状，6 例为较规则的圆形或椭圆形。②边界：6 例边界清晰，4 例边界欠清晰。③内部信号：6 例表现为较均匀短 T1 长 T2 信号，4 例不均质短 T1 中等 T2 信号，其内伴有团状或条索样低信号，脂肪抑制序列呈均匀或不均匀低信号。④增强模式：6 例患者行增强扫描，其中 3 例未见显著增强，3 例呈轻度不均匀强化。⑤周边淋巴结：病灶周边均未见明显肿大淋巴结。

结论 腮腺脂肪瘤为少见的良性肿瘤，具有较为特征的影像学表现，临床上应将 CT 与 MR 等影像学检查方法相结合，以期早期发现病变。

EPO-0375
头颈部 CT 动脉成像对颈动脉体瘤术中出血量的预测价值

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目的：探讨头颈部 CT 动脉成像（CTA）对颈动脉体瘤术中出血量的预测价值。**方法：**回顾性分析 36 名经诊断颈动脉体瘤并行手术治疗的患者的头颈部 CTA 影像资料，结合多种后处理技术仔细观察颈动脉体瘤供血动脉来源及数量，Shamblin 分型，测量平扫及增强 CT 图像上肿瘤最大截面 CT 值等，测量肿瘤轴位最大径及冠状位上下最长径等，对比分析术中出血量＜500ml 组与术中出血量≥500ml 组的病例患者年龄，性别，病程，Shamblin 分型，病灶轴位最大径，上下最长径，平扫及增强 CT 值的差别，建立受试者工作特征曲线(ROC)，计算各指标预测术中出血量≥500ml 的灵敏度、特异度。**结果：**颈动脉体瘤术中出血量＜500ml 组与术中出血量≥500ml 组在患者年龄（*P*=0.025）、肿瘤的上下最大径（*P*=0.004）、轴位最长径（*P*=0.007）、Shamblin 分型（*P*=0.012）、供血动脉数量（P＜0.01）方面差异均有统计学意义。供血动脉数量对于 CBT 患者的术中出血量 AUC 值（0.865）大于上下最大径（AUC=0.806）、轴位最长径（AUC=0.781）以及 Shamblin 分型（ AUC= 0.766）。当供血动脉数量最佳临界值取 3.5 时，准确性，灵敏度及特异度分别是 81.1%，81.8%及 80.8%。**结论：**颈动脉体瘤术前在头颈部 CTA 图像上显示的肿瘤径线、Shamblin 分型以及供血动脉数量，可以预测术中出血情况，其中供血动脉数量具有最好的诊断效能。

EPO-0376
磁共振动态增强联合弥散峰度成像多参数分析鉴别腮腺肿瘤的初步研究

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目的：探讨磁共振动态增强联合弥散峰度成像多参数分析对腮腺混合瘤、warthin 瘤和基底细胞腺瘤的鉴别诊断价值。
材料和方法：回顾性分析 30 例经手术病理证实的腮腺肿瘤的临床及影像学资料，其中混合瘤 16 例，warthin 瘤 8 例，基底细胞腺瘤 6 例。所有患者均行常规 MRI 平扫、动态增强及 DKI 检查。后处理获得肿瘤感兴趣区 K^{trans}、K_{ep}、V_e值及 D 值及 K 值。绘制 ROC 曲线获得诸参数单独鉴别诊断效能，根据最大约登指数确定最佳诊断界值，计算诸参数鉴别诊断的敏感度、特异度。使用线性判别分析评价所有联合参数和参数组合的鉴别诊断能力。使用留一验证法对线性判别分析结果进行校正。
结果：基底细胞腺瘤和 warthin 瘤的 K^{trans} 和 K_{ep}高于混合瘤，warthin 瘤的 V_e值低于混合瘤和基底细胞腺瘤；混合瘤的 D 和 K 值高于 warthin 瘤。ROC 结果示 K 值和 V_e值鉴别混合瘤、warthin 瘤和基底细胞腺瘤的敏感性/特异性分别为 100%/100%但存在明显重叠。线性判别分析显示联合参数组能较好地鉴别混合瘤与 warthin 瘤（AUC=1）、warthin 瘤与基底细胞腺瘤（AUC=0.946），使用留一验证法验证后敏感性及特异性下降。
结论：初步研究显示磁共振动态增强联合弥散峰度成像多参数分析可能为腮腺肿瘤的鉴别诊断提供新的可能有效的方法。

EPO-0377

Noninvasive evaluation of collateral circulation and prognosis in acute stroke patients using 4D CTA

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Objective: To explore the significance of 4D CTA in evaluating collateral vessels in patients with acute stroke.
Method: 23 acute stroke patients with unilateral anterior circulation large vessels occlusion underwent one-stop CT scan, including non-contrast CT (NCCT), 4D CTA and CT perfusion (CTP). The collateral vessels were scored 0 to 4 according to modified collateral circulation scoring based on 4D CTA. The score 0 to 2 points was defined as poor collateral circulation, and the score 3 to 4 points was defined as good collateral circulation. Good prognosis was defined as modified Rankin scale (mRS) score of 0-2. Logistic regression model was used to analyze the relationship between collateral circulation and prognosis. Furthermore, receiver operating characteristic (ROC) curve was used to evaluate the efficacy of collateral circulation scoring in predicting the clinical prognosis.
Results: 23 acute stroke patients with anterior circulation large vessel occlusion were recruited. All the patients received intravascular interventional treatment according to the guideline. The proportion of patients with good collateral circulation in good prognosis group was significantly higher than that in poor prognosis group (P<0.01). Logistic regression analysis showed 4D CTA collateral circulation scoring was the independent factor for predicting the prognosis (OR: 0.009; 95% CI: [0.000 to 0.770]; P<0.05). The ROC curve showed 4D CTA collateral circulation scoring had a moderately predicting efficacy on clinical prognosis.
Conclusion: Collateral circulation on 4D CTA could estimate collateral status. It has certain significance for clinical diagnosis and prognosis.

EPO-0378

MRI Study of Normal Skull Bone Marrow Transformation in Plain and Plateau Areas

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Objective: Long-term hypoxic environment at high altitude can lead to compensatory increase in bone marrow hematopoietic erythropoiesis, so we investigated the relationship between skull marrow transformation and age, also the influence of altitude on skull marrow transformation of normal Han residents at plain and plateau areas using conventional MRI and DWI techniques.
Methods: Select 860 people from the altitude of Below 200 meters above sea level ,2000-3000m, 3000-4000m , the people on the same altitude will be divided into 5 age groups: 0-5, 6-14, 15-29, 30-49, 50 and above. First, according to the average thickness of normal skull barrier and signal strength, type the skull marrow of study subjects at each altitude interval on the sagittal T1WI; Then, measure the ADC values of marrow in frontal bone, parietal bone, occipital bone and temporal bone in DWI post-processing workstation; Moreover, investigate the relationship between normal skull bone marrow transformation and age as well as the influence of altitude on skull marrow transformation using statistical methods.
Result: (1) For normal Han residents at each altitude interval, skull marrow type and barrier thickness of the skull were positively correlated with age($P<0.05$). (2) In the age of 0~5, 6~14, 15~29, there was no significant statistical difference between the ADC value of skull marrow and altitude($P>0.05$); In the age of 30~49, 50 and above, the ADC values of the occipital and temporal marrow of normal Han residents were positively correlated with altitude($P<0.05$), which had statistical significance; However, there was no significant statistical difference between the ADC value of parietal and frontal bone marrow and altitude($P>0.05$).
Conclusion: The skull marrow of the normal Han residents at the high altitude area changes from type I to type IV with the increase of age; The occipital and temporal marrow of residents aged above 30 has undergone bone marrow red pulp with the increase of altitude.
Key words: Altitude Magnetic resonance imaging Skull marrow Bone marrow red pulp

EPO-0379

Measurement of Internal carotid artery stenosis on CT or MRI is useful to identity invasive sellar tumors

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Background ： identification of sellar tumors in patients is largely based on shape、location、enhancement、relationship with pituitary、dural tail and so on;finding internal carotid artery stenosis Wrapped with sellar tumors on CT or MRI was recently shown to be differentiating of invasive meningiomas and others

Methods

A retrospective analysis from January 2012 to December 2016 imaging datas with invasive pituitary adenomas and with invasive meningiomas were diagnosed by the Department of Neurosurgery . Summarized the MRI imaging features， measured the narrowest diameter($D_{stenosis}$) and area($A_{stenosis}$) of internal carotid artery around the tumor by computed tomography angiography(CTA), then calculated the stenosis score ($\%_{stenosis}$) ; On working the diagnositic validities of measured indicators were calculated by Receiver Operating Characteristic Curve（ROC）.

Result

The median Ki-67 of invasive pituitary adenoma was 3% (2% ～ 5%), which was significantly higher than that of invasive meningioma (1%, 1% to 2%)There were significant differences in Texture(P=0.001).NO difference in the average diameter between the invasive adenoma with invasive meningiomasThere were significant differences in aspects of shape（P=0.010）、T1WI （P=0.000）、signal（P=0.000）、Post-gadolinium enhancement（P=0.000）、Separation from normal pituitary（P=0.001）、Dural tail sign （P=0.000）、Skull（P=0.000）。ROC showed that the diameter of the stenosis area under curve was 0.725, P=0.006, the cut-off level was 3.45mm, the sensitivity was 62.5%, the specificity was 76.5%; the area of stenosis area under the curve was 0.737，P=0.003, the cut-off level was 11mm^2, the sensitivity was 75.0%, the specificity was 64.7%; the area of the stenosis score curve was 0.711， P=0.013, the cut-off level was 0.306, the sensitivity was 43.75%, the specificity was 97.06%.

Conclusions

the stenosis measured of the internal carotid artery is a valuable tool for differentiating tumors in addition to the imaging features of MRI , three indicators including the narrowest diameter, the narrowest area and stenosis score have moderate diagnositic validities.

EPO-0380
多层螺旋 CT 增强在头颈部多间隙感染中的应用价值研究

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【目的】 观察分析多层螺旋 CT 增强应用于头颈部多间隙感染中的价值。

【方法】 回顾性分析 2017 年 1 月-2019 年 7 月在我院耳鼻喉科及口腔科就诊的 67 例口腔颌面颈部多间隙感染的患者，并给予患者 X 线、超声等检查进行初步扫描，且全部患者均确诊。为了能更精准地确定患者的致病因素，本文给予全部患者进行多层螺旋 CT 增强扫描；并通过 CT 的扫描结果来进一步确定病因及受累间隙。

【结果】 扫描结果显示，3 例为发育性的囊肿继发性感染、4 例为颌骨外伤感染、2 例为颞下颌关节感染、8 例为腺源性感染、44 例为牙源性感染，4 例为其他类型继发性感染，其中未查明病因的有 3 例，病因的检出率为 97.01%；累及间隙包括颞下间隙、颈深间隙、咽后间隙及颊间隙的例

数各为 2 例，咽旁、舌下间隙、翼颌间隙的例数各为 3 例、8 例为咬肌间隙、42 例为下颌下间隙，感染的检出率为 100%。
【结论】 在头颈部多间隙感染中合理运用增强 CT，可为临床诊断、治疗以及预后的判断等提供有价值的信息。

EPO-0381
探讨 CT 图像对于鉴别颈部肿大淋巴结来源的应用价值

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目的：鉴别诊断颈部肿大淋巴结。
方法：回顾分析经病理证实 195 例颈部肿大淋巴结 CT 图像，并结合其临床体征和症状，放射学特征，手术发现等。
结果：转移性淋巴结 134 例，它们来自不同的原发疾病：例如鳞状上皮细胞癌，甲状腺乳头状癌等；原发恶性肿瘤 23 例：如淋巴瘤和肉瘤；良性淋巴结 38 例，如结核、脓肿和其他一些炎症性疾病。
结论：CT 图像有助于鉴别颈部肿大淋巴结来源。

EPO-0382
低管电压、低碘对比剂用量在头颈 CTA 的应用研究

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目的 探讨低电压、低碘对比剂剂量在头颈 CT 血管造影(CTA)中的应用。方法 2019 年 3 月-2019 年 6 月到我院行头颈 CTA 的 200 例患者随机分为常规组（A 组）及双低组（B 组），每组 100 例，常规组患者 CTA 对比剂剂量为 60mL，流率为 4.5mL/s，接着相同的流速推注生理盐水 30mL；管电压为 120kVp，双低组患者 CTA 对比剂流速为 4.5mL/s，先注射 6s，再推注混合液（碘对比剂:生理盐水=3:7）5s，接着以相同的流速注射生理盐水 30mL，管电压为 80kVp。记录两组患者剂量长度乘积(DLP)，有效辐射剂量（ED），对两组图像进行客观及主观评价。结果 两组受试者 CTA 图像质量主观评价及合格率差异均无统计学意义(P>0.05);两组间 SNR、CNR 比较,无统计学意义(*P*>0.05)；B 组上腔静脉、锁骨下静脉 CT 值明显低于 A 组。B 组患者 DLP、ED 均显著低于 A(*P*<0.05)。结论 低电压、低碘对比剂剂量可显著降低头颈部 CTA 扫描辐射剂量及对比剂碘的用量，且图像质量优于常规组。

EPO-0383
颞下颌关节盘电影序列成像质量的评价

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目的：评价不同电影序列对颞下颌关节的显示情况，以期确定颞下颌关节扫描较为理想的 MRI 序列。方法：应用 GE W750 3TMR 机对 25 例颞下颌关节功能紊乱的患者分别进行 SSFSE、FIESTA、

SPGR 等电影序列的斜矢状位检查，并对所获得图像的信号强度及信噪比，应用 Fredman 秩和检验进行统计学分析。结果：SSFSE、FIESTA、SPGR 序列的信噪比分别是 138.93±40.51、72.15±37.76、57.46±13.29，SSFSE 序列与 FIESTA 、SPGR 序列均有显著的统计学差异，P 值<0.001，而 FIESTA 、SPGR 序列间没有统计学差异，P 值>0.05；髁突的信号强度分别为 2784.23±547.35、906.95±338.89、221.45±43.01，3 个序列两两间均有显著的统计学差异，P 值<0.001。结论：SSFSE 电影序列具有较好的图像质量，能较好的显示颞下颌关节，可作为电影序列扫描的首选。

EPO-0384

PROGNOSTIC VALUE OF ADC HISTOGRAM ANALYSIS AND TRADITIONAL MEASUREMENT IN PATIENTS WITH HEAD AND NECK SQUAMOUS CELL CARCINOMA

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Objective: The aim was to evaluate and compare the prognostic value of whole-tumor based apparent diffusion coefficients (ADC) histogram analysis and region of interest (ROI) based traditional ADC measurement in patients with head and neck squamous cell carcinoma (HNSCC).

Methods: A total of 96 patients with histopathologically proved HNSCC between Jun. 2012 and Dec. 2015 were included in the current study. All patients underwent a pretreatment MRI examination including diffusion weighted imaging (DWI). The ADC value was measured both by delineating the tumor on each slice of ADC map to acquired whole-tumor histographic parameters (ADC_{25}、ADC_{50}、ADC_{75}、ADC_{mean1}), and manually selecting ROI on slices to calculate the mean ADC value (ADC_{mean2}). The clinical variables included age, sex, smoking status, tumor volume，tumor location，treatment method and AJCC stage. Univariate and multivariate Cox analyses were conducted to assess the association of clinical characteristics and ADC values variables with overall survival (OS) of the patients.

Results: The higher values of ADC parameters, including ADC_{25}, ADC_{50}, ADC_{75}, ADC_{mean1} and conventional parameter ADC_{mean2} were significantly associated with worse OS. However, in multivariate Cox analyses, after adjusting for clinical-pathologic risk factors, only ADC_{50}, ADC_{75} and ADC_{mean1} were further confirmed as the independent predictors ($P<0.05$), while no significant difference was observed in ADC_{mean2} ($P=0.11$).

Conclusions: Whole tumor based ADC histogram analysis had independent and incremental prognostic value for the patients with HNSCC.

EPO-0385

最佳单能量图像结合形态学分析在腮腺良恶性占位诊断中的应用价值

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【目的】探讨双源 CT 双能量技术中最佳单能量图像结合常规形态学表现对腮腺良恶性占位的诊断价值。
【资料方法】 回顾性分析昆明医科大学第一附属医院行双源 CT 双能量扫描并获得病理证实的腮腺占位患者共 89 例病例。①将双能扫描重建后的图像导入单能谱（Monnenergetie）软件，量取 55KeV～80KeV 间隔 5KeV 共 6 组图像的病灶、咬肌 CT 值及 SD，计算并分析各组 ROI 区 SNR、CNR 及空气背景噪声，得到最佳单能量值。②用最佳单能量图像分析记录腮腺占位的常规形态学表现（包括部位、形态、边界、囊变坏死、强化方式、淋巴结肿大），分组为腮腺良性组及恶性肿瘤组，进行 x^2 检验及 Logistic 回归区分析主要征象及次要征象。③对比分析最佳单能量图像下腮腺占位的形态学表现（方案Ⅰ）与常规线性融合图像下腮腺占位的形态学表现（方案Ⅱ）对腮腺占位定性诊断的准确率。
【结果】①70keV 为观察腮腺占位的最佳单能量值；②腮腺内占位的形态及周围淋巴结肿大是腮腺良恶性肿瘤鉴别诊断的主要形态学指标；③用 70keV 最佳单能量图像分析腮腺占位的形态学表现，可提高腮腺良恶性占位的定性诊断正确率。
【结论】用 70keV 最佳单能量图像分析腮腺占位的形态学表现可提高腮腺良恶性占位诊断的准确性，其中肿瘤形态和淋巴结肿大是鉴别腮腺良恶性肿瘤的主要诊断指标。

EPO-0386
能谱技术在腮腺多形性腺瘤、腺淋巴瘤及腮腺恶性肿瘤诊断及鉴别诊断中的价值

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【目的】探讨双源 CT 能谱成像技术在腮腺多形性腺瘤、腺淋巴瘤及腮腺恶性肿瘤诊断及鉴别诊断中的价值。
【资料方法】回顾性分析昆明医科大学第一附属医院行双源 CT 双能量扫描并获得病理证实的腮腺占位患者共 73 例，所有患者均进行常规平扫及双能量双期增强扫描,其中腮腺多形性腺瘤 32 例，腺淋巴瘤 23 例，恶性肿瘤 18 例，共 73 例腮腺肿瘤。其中多形性腺瘤根据病理表现再分为 A、B 二组，A 组为病理有包膜侵犯或包膜不完整、富含黏液成份，共 7 例；B 组为病理包膜完整，共 25 例。
将重建层厚 1mm 的 80kVp 及 Sn140kVp 两组薄层数据一并调入双能量（Dual Energy, DE）软件，选择 Monoenergetic 模式进行能谱分析，利用工具软件定义圆形 ROI（region of interest）于病灶实性部分最大层面,避开囊变、坏死及钙化区域，面积为实性病灶的 2/3～3/4。分别得到 4 组腮腺肿瘤 40keV～160keV 范围内的衰减曲线，观察分析每个病灶的能谱衰减曲线特征。
【结果】①动静脉期四组肿瘤实质的能谱曲线均为衰减型，动脉期 4 组肿瘤实质 CT 值差异具有统计学意义（P＜0.05），但 A 组与 B 组多形性腺瘤实质病灶 CT 值以及与恶性肿瘤组实质病灶 CT 值差异无统计学意义（P＞0.05）；静脉期 4 组肿瘤实质 CT 值差异不具统计学意义（P＞0.05）。②动脉期 4 组肿瘤实质能谱曲线斜率差异具有统计学意义（P＜0.05），腺淋巴瘤组与 A、B 两组多形性腺瘤动脉期斜率差异具有统计学差异（P＜0.01），腺淋巴瘤组与恶性肿瘤组、恶性肿瘤组与多形性腺瘤组见均无明显统计学差异（P 均＞0.05）。静脉期 4 组肿瘤实质能谱曲线斜率差异无统计学意义（P＞0.05）。
【结论】 腮腺腺淋巴瘤、多形性腺瘤及恶性肿瘤动脉期能谱曲线斜率不同，测量三种病变动脉期能谱曲线斜率，可为其鉴别诊断提供有价值的信息。

EPO-0387

头颈部 CTA 中静脉血管返流的优化扫描方案

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目的：探讨头颈部 CTA 中静脉血管返流的优化扫描方案以及成像质量的相关性。
方法：选取 600 例头颈部 CTA 受检者进行分组研究，随机均分成 A、B 两组。碘总量设定为单位体重 300 毫克碘，注射流速设定为 5ml/s，对比剂注射完毕之后“无缝隙”推注 50ml 生理盐水。A 组为对照组；B 组为观察组，在推注对比剂之前先推注 30ml 生理盐水，然后“无缝隙”推注对比剂及生理盐水。分别用 ROI 测量颈总动脉，颈内动脉，大脑中动脉及颈内静脉 CT 值，采用 5 级标准对周围静脉内对比剂返流总长度进行分级。
结果：两组动脉 CT 值无统计学差异，并且均满足诊断要求；A 组未出现静脉返流 23 例，得 5 分的 142 例；B 组未出现返流 88 例，得 5 分的 61 例。5 级评分存在统计学差异。
结论：头颈部 CTA 作为一种简单、快速和非创伤性技术，在临床的应用越来越广泛。然后由于血管解剖发育方面以及个体差异等不可避免的因素形成的静脉返流对头颈部 CTA 成像质量造成不同程度的干扰。甚至有可能造成重复扫描或者大计量给药的情况。以 B 组对比结果可以看出，在保证图像质量的前提下，同流速注入造影剂之前，注入一定量的生理盐水先填充入静脉血管。在持续灌注的情况下，填充在静脉中的生理盐水形成的压力，有效的阻止了后续对比剂的注入，达到降低静脉返流的风险。虽然无法完全避免产生一定量的返流，但是可以针对性采取措施将其控制在可接受范围内。

EPO-0388

腮腺嗜酸细胞腺瘤 CT 表现与病理对照分析

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目的 分析腮腺嗜酸细胞腺瘤的 CT 表现，以提高对该少见疾病的认识。**资料与方法** 回顾性分析经手术病理证实的 12 例腮腺嗜酸细胞腺瘤的 CT 资料，并与病理进行对照。12 例中男 7 例，女 5 例，中位年龄 56 岁(31～73 岁)。对肿瘤的大小、边界、数目、形态、密度、强化方式、周围侵犯、淋巴结转移等进行分析。**结果** 12 例患者均为单发肿瘤，右侧 7 个，左侧 5 个；9 例位于腮腺浅叶，2 例位于腮腺深叶，1 例跨深、浅叶；肿瘤最大径 1.1cm～2.9cm,平均（2.1±0.3）cm；病灶呈类圆形 8 例，椭圆形 2 例，不规则分叶状 2 例；边缘光整 10 例,不光整 2 例，边界均清晰，未见侵犯周围组织；CT 平扫病灶呈等密度 8 例，低密度 4 例,未见明显钙化；病灶均呈实性，密度均匀 9 例，不均匀 3 例；增强后病灶呈明显强化 10 例，中度强化 2 例。**结论** 单发、边缘光整、少见钙化囊变、血供丰富的腮腺浅叶实性占位灶，有助于提示 PGO 的诊断，其 CT 表现与病理具有相关性。

EPO-0389

基于血流动力学颅内不同位置未破裂动脉瘤破裂风险预测模型的建立与验证

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目的： 对于无症状未破裂颅内动脉瘤的最佳治疗方案需基于动脉瘤破裂风险与选择手术干预治疗风险之间的全面比较。诸多研究表明血流动力学在颅内动脉瘤破裂中起着重要作用。此外，不同位置动脉瘤的破裂风险因素可能存在差异。因此本研究目的是比较不同位置动脉瘤的破裂风险因素，并基于患者人口学信息、动脉瘤形态学参数及血流动力学特征建立颅内不同位置动脉瘤破裂风险预测模型。

材料与方法： 2010 年 1 月至 2016 年 12 月在本院经 CTA 与 DSA 诊断为颅内动脉瘤的患者纳入组内。根据位置分为前交通动脉组、颈内动脉组、大脑中动脉组、后交通动脉组。各组按比例 4:1 随机分成训练组和验证组。利用单变量和多变量回归分析，基于人口学信息、动脉瘤形态学及血流动力学特征建立各位置动脉瘤破裂风险预测模型。模型预测性能以 ROC（Receiver Operation Characteristic）曲线下面积展现。

结果： 后交通动脉瘤组共 278 例患者，尺寸、血流冲击区域及血流稳定程度是后交通动脉瘤破裂的独立预测因素（P 值均 <0.05）；前交通动脉瘤组共 304 例患者，血流冲击区域及血流稳定程度是前交通动脉瘤破裂的独立预测因素（P 值均 <0.05）；颈内动脉瘤组共 127 例患者，高血压、血流冲击区域及血流稳定程度是颈内动脉瘤破裂的独立预测因素（P 值均 <0.05）；大脑中动脉瘤组共 220 例患者，血流冲击区域、血流稳定程度及 OSI_{CV} 是大脑中动脉瘤破裂的独立预测因素（P 值均 <0.05）。基于人口学、动脉瘤形态学及血流动力学特征所建立的后交通、前交通、颈内动脉及大脑中动脉破裂风险预测模型的 AUC 分别为 0.82、0.817、0.837 和 0.882。

结论： 颅内不同位置动脉瘤的破裂危险因素存在差异，且基于人口学信息、动脉瘤形态学及血流动力学特征建立的颅内不同位置动脉瘤破裂风险预测模型可能更为准确。

EPO-0390
腮腺占位病变双能 CT 扫描中 80kV 图像与常规线性融合图像 的等效性研究

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目的 探讨腮腺占位病变双能量扫描中 80kV 图像与常规线性融合图像的等效性。资料方法 回顾性分析我院行双源 CT 双能量扫描并获得病理证实的腮腺占位患者共 94 例，所有患者均进行常规平扫及双能量双期增强扫描,联合 SAFIRE 重建法、FBP 重建算法及 LB 技术,将每位患者的图像分为 A、B、C、D 四组 （A 组为 80Kv/FBP、B 组为 80Kv/SAFIRE(3）、C 组为 0.3LB/FBP 、 D 组为 0.3LB/SAFIRE(3)），对比分析四组图像中颈动脉、正常腮腺、腮腺病灶的 CT 值、SNR、CNR、SD、咬肌的 CT 值及 SNR、图像质量评分。结果 ① A、B、C、D 四组图像正常腮腺 CT 值及 SNR、病灶 CNR 比较差异无统计学意义，腮腺 CNR、病灶 CT 值及 SNR、咬肌 CT 值及 SNR、颈动脉 CT 值与 SNR 及 CNR、背景噪声的差异具有统计学意义（P＜0.05）。② A 组背景噪声、腮腺 CNR、病灶 SNR、咬肌 SNR 均较 B、C、D 组低具有统计学意义（P＜0.05），但 B 组与 C 组差异无统计学意义，D 组与

A、B、C 组有明显差异（P＜0.01）。③ A、B、C、D 四组病灶 CT 值、咬肌 CT 值、颈动脉 CT 值、SNR 及 CNR 比较差异具有统计学意义（P＜0.05），病灶、咬肌及颈动脉 CT 值均为 A 组与 B 组间、C 组与 D 组间无明显统计学差异，但 A 组与 B 组病灶、咬肌及颈动脉 CT 值均高于 C 组与 D 组，差异具有统计学意义（P＜0.05）；A 组与 C 组、B 组与 D 组颈动脉 SNR 及 CNR 差异无统计学意义，但 A 组与 C 组颈动脉 SNR 及 CNR 均低于 B 组与 D 组，差异具有统计学意义（P＜0.05）。④各组间主观评分差异无统计学意义。结论 腮腺占位双源 CT 双能量扫描中，80kV 扫描得到的图像质量与常规线性融合图像质量相近并能满足诊断要求，可作为低剂量扫描方案推广应用；结合 SAFIRE 技术可进一步提高图像质量，具有潜在降低辐射剂量的优势。

EPO-0391

The diagnoses and differential diagnoses Olfactory Neuroblastoma of ethmoidal sinus (Micro-lesson competition)

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Olfactory Neuroblastoma also known as Esthesioneuroblastoma, is a rare but distinct malignant neuroectodermal tumor arising from the olfactory epithelium of roof of nasal cavity and cribriformplate.It account for 2 to3% of intranasal tumors.

Although rare,it can spread to brain in the early stage.Cases primarily arising from other parts of nasal cavity,paranasal sinuses and frontal lobe of brain have also been reported.These tumors are associated with a number of symptoms including nasal obstruction,epistaxis,headaches,visualdisturbances,proptosis,andanosmia.

Metastasis to distant as well as cervical lymph nodes occurs in10 to 30%of the cases.Grossly, they usually appear as a soft,glistening,polypoidal or nodular mass covered by intact mucosa or as friable masses with ulceration and granulation tissue. The course will intruduce the anatomy of Olfactory nerve and epidemiology, image fetures of olfactory neuroblastoma.Then we will present points of differential diagnoses inclding inverted papilloma, squamous cell carcinoma of ethmoidal sinus, fungal infection, malignant melanoma, metastases,rhabdomyosarcoma and so on to enable timely and accurate diagnoses.

EPO-0392

能谱 CT 在头颈部肿瘤临床及科研应用进展（专题讲座）

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能谱 CT 进入临床已经有很长时间了，其原理是将空间吸收投影数据转换为物质密度投影数据，在准确的硬化校正的基础上得到精准的 CT 值，将 CT 从单参数成像转变为多参数成像，从而进行物质定量分析和能谱曲线分析，本文将介绍能谱 CT 的临床应用工具，单能量图像，物质分离，能谱曲

线，虚拟平扫等，以及能谱 CT 在头颈部肿瘤的检出，鉴别诊断，转移灶与原发灶同源性分析及疗效评估和随访。

EPO-0393

Prognostic value of preoperative computed tomography and clinical findings in patients with recurrent hypopharyngeal cancer

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PURPOSE
To obverse subjective preoperative CT findings, clinical and pathological features of recurrences of hypopharyngeal carcinomas at least 2 years of follow-up.

MATERALS AND METHODS:
We reviewed the preoperative CT imaging and clinical findings of 69 patients who underwent curative resection of pathological proven hypopharngeal carcinoma. 7 case were recurrence. TMN staging and evaluate the surgery margin have been done after operation. Statistical analysis was performed using the SPSS 20.0. Percentage were calculated.

RESULT
All of the 7 case were male and had a history of smoking, rang for 20-40years. 5 of 7 had a history of alcoholics, rang from 10 to 50 years. 3 of them has pharyngalgia for 2 months. Pretreatment CT imaging up-staged 1 of 5 pT3 cases and 1 of 2 pT2 cases. The accuracy for clinical staging by CT imaging was 71.4%. Partial and total laryngectomies were performed in 3(42.8%) and 4(57.2%) patients, respectively. All of the surgical margins were negative. A pT2 and a pT3 patient only received postoperative radiotherapy. The recurrence of this patient was 19 months and 6.5 months, respectively. The rest of patients received postoperative radiochemotherapy. The median follow-up for recurrence patients was 13 months(range 11-49). As the same T staging tumor, the patient of pN1 recurrence was shorter than pN0.

CONCLUSION:
Imaging is a key role in staging tumor for the decision of therapy. N staging of hypopharyngeal carcinoma may have some value in prognosis. Postoperative radiochemotherapy is crucial to postoperative patients even the tumor is T2, though it differs from man to man. However, the surprising good prognosis in most of our cases makes necessary to more studies and longer follow-up to confirm our data.

EPO-0394

准连续性动脉自旋标记技术(pCASL)序列相比于传统 MRI 对不同类型腮腺肿瘤鉴别诊断优势。

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目的：探索准连续性动脉自旋标记技术(pCASL)序列对不同类型腮腺肿瘤的显示情况，对不同类型腮腺肿瘤进行鉴别诊断，以及相比于传统 MRI，准连续性动脉自旋标记技术(pCASL)序列在鉴别不同类型腮腺肿瘤的优势。
方法：选择临床怀疑涎腺肿瘤的患者 30 例,男 18 例,女 12 例。患者均行 3.0T MR 扫描常规序列及准连续性动脉自旋标记技术(pCASL)序列，测定肿瘤局部血流量（rTBF）及 ADC 值，Whitney 检验法比较不同病理类型涎腺肿瘤间 TBFs 和 ADC 的差异,绘制 ROC 曲线,比较诊断的准确性。
结果：经过病理证实，共 14 例多形性腺瘤，12 例腺淋巴瘤，恶性肿瘤 4 例，包括粘液表皮样癌 3 个，腺样囊性癌 1 个；恶性肿瘤的 TBFs 明显高于多形性腺瘤腺淋巴瘤低于腺淋巴瘤；恶性肿瘤的 ADC 低于多形性腺瘤高于腺淋巴瘤，TBFs 及 ADC 值对于鉴别诊断不同类型腮腺肿瘤的诊断准确率分别约 94.8%、86.5%。
结论：准连续性动脉自旋标记技术(pCASL)序列在涎腺良性肿瘤的亚型间具有差异; pCASL 对区分涎腺肿瘤的良恶性和病理亚型具有较大的潜力，而且，相比于传统 MRI，准连续性动脉自旋标记技术(pCASL)序列在鉴别不同类型腮腺肿瘤方面更为准确。

EPO-0395
腮腺原发性淋巴瘤的 CT 征象与 Ki-67 水平及预后关系

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目的：观察腮腺原发性淋巴瘤（PPT）的 CT 表现、分析其 CT 征象与 Ki-67 水平及预后关系。**方法**：回顾性分析经病理证实的 37 例腮腺原发性淋巴瘤，观察其 CT 表现，利用 R×C 列表卡方检验观察 CT 征象（大小、部位、形态、边界及强化程度）与 Ki-67 水平关系，用 Kaplan-Meier 法计算 15 例生存率，用 Logrank 法计算性别、年龄、Ki-67 水平及 CT 征象与生存情况的关系。**结果**：腮腺原发性淋巴瘤以 MALTL 及 FL 最多见，CT 多表现为多发或弥漫结节型，中度均匀强化，边界清楚，坏死少见，钙化及出血罕见。Ki-67 表达水平高低组间 PPL 的大小及边界有显著性差异(c2=7.538，P<0.05)，余 CT 征象无显著差异。PPL 患者 5 年生存率为 60%，仅与肿瘤的 Ki-67 水平表达的高低(c^2=18.88，P<0.05)显著相关，与各 CT 征象无显著相关性（P＞0.05）。**结论**：腮腺原发性淋巴瘤 CT 表现具有一定的特征性，Ki-67 表达水平高低组间在大小、边界上存在一定差异。腮腺原发性淋巴瘤预后良好，仅与肿瘤的 Ki-67 密切相关。

EPO-0396
MSCT 血管成像评价糖尿病颈动脉斑块及其与血清糖化血红蛋白水平的相关性研究

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目的：用双源 CT 血管成像评价 II 型糖尿病颈动脉斑块及其与血清糖化血红蛋白水平的相关性研究。**方法：**回顾性分析了 68 例行颈部双源 CT 血管成像检查的 II 型糖尿病患者。所有患者按血清糖化血红蛋白（HbA1c）＞ 6.5%或≤ 6.5%分组，记录组间斑块的发生率、类型、分布、引起狭窄的情况，并定量分析上述颈动脉斑块特征与糖化血红蛋白的相关性。**结果：**68 例患者中，31 例患者（31/68, 45.6%）HbA1c ＞ 7.0%，37 例患者（37/68, 54.4%） HbA1c≤ 7.0%。两组病人间斑块的发生率无统计学差异（P ＞ 0.05）。将所有患者的颈部动脉纳入分析发现，两组病人在斑块类型和分布上无统计学差异（P ＞ 0.05），而与 HbA1c ≤ 7.0%的患者相比，HbA1c ＞ 7.0%的患者颈部动脉的狭窄程度更严重（中度狭窄: 52/248, 20.9% vs. 33/296, 11.1%, P ＜ 0.05; 重度狭窄: 27/248, 10.8% vs. 6/296, 2.0%, P ＜ 0.05）。此外，患者糖化血红蛋白水平与颈动脉狭窄程度呈正相关（r = 0.31; P ＜ 0.05）。**结论：**血清糖化血红蛋白较高的 II 型糖尿病患者行双源 CT 颈部血管成像时，表现出更严重的血管狭窄，这部分病人在诊疗决策中应被高度重视。

EPO-0397

头颈部 Kimura 病的功能磁共振分析

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目的：以多模态功能磁共振分析头颈部 Kimura 病的磁共振特点，为该病的诊断与鉴别诊断提供依据。
方法：我院 11 例经病理证实的 Kimura 病患者，以 DWI、DCE-MRI 及 MRS 功能磁共振方法，结合 MRI 常规序列，总结 Kimura 病的磁共振特点。
结果：11 例患者皆为男性，平均年龄 42.3 岁。病灶位于左侧 2 例，右侧 7 例，双侧 2 例。其中单发 5 例，多发 6 例。位于腮腺区 7 例，颌下区 2 例，面颊部 2 例。形态多样，弥漫性或类圆形实性软组织肿块。T1WI 为等信号，T2WI 及压脂像呈稍高信号，增强后轻到中度强化，信号不均匀，易累及邻近皮下组织和皮肤。多发病灶可包括同侧或双侧颈部多个淋巴结。b＝1000 时，DWI 示其 ADC 均值约 1 左右，TIC 曲线为 I 或 II 型曲线。部分病变的 MRS 上可见升高的 cho 峰。
结论：头颈部 Kimura 病以颌面部腮腺和淋巴结为好发部位，弥漫或类圆形肿块增强后轻到中度强化，易累及邻近皮肤及皮下组织， DWI 示其 ADC 均值约 1 左右，TIC 曲线为 I 或 II 型曲线。这些特点有助于该病的诊断与鉴别诊断。

EPO-0398

累及斜坡少见病变的 MRI 表现 53 例

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目的 分析和探讨累及斜坡少见病变的 MRI 表现，以期提高诊断水平。
资料与方法 回顾性分析 2003 年 1 月 1 日一 2016 年 12 月 31 日均经手术病理证实 53 例累及斜坡少见病变的患者 MRI 影像资料，MRI 平扫+增强 46 例，MRI 平扫 7 例。分析病灶类型，主体部位、大小、信号、形态、边界、强化特点及斜坡形态
结果 脊索瘤 15 例，垂体腺瘤 9 例，脑膜瘤 5 例，淋巴瘤 4 例，鳞癌 3 例，胆脂瘤 4 例，嗅神经母细胞瘤 2 例，软骨肉瘤 2 例，横纹肌肉瘤 2 例，低分化癌 1 例，颅咽管瘤 1 例，Rathke 囊肿 1 例，真菌感染 1 例，未分化肉瘤 1 例，骨巨细胞瘤 1 例，神经鞘瘤 1 例。

病灶中心部位位于斜坡 10 例，斜坡-C2 2 例，桥前池 8 例，蝶窦 10 例，鞍区 7 例，鞍区-鞍上 3 例，右上颌窦 2 例，筛窦 1，鼻咽左侧-左咽旁间隙 1 例，左中颅窝 1 例，右颈静脉孔区-咽旁间隙 1 例，右颞骨-翼腭窝-右桥小脑角区 1 例，鼻咽 1 例，左侧颞骨鳞部 1 例，筛窦-鼻腔 2 例，左侧鞍旁 1 例
病灶位于中颅窝 23 例，后颅窝 10 例及前-中颅窝 10 例，中-后颅窝 10 例；
病变最大径 1.8cm～12.8cm。
信号均匀 19 例，不均 34 例；不规则形 40 例，类圆形 9 例，椭圆形 1 例，葫芦状 3 例；边界清楚 40 例，模糊 13 例；轻度强化 8 例，中度强化 27 例，重度强化 8 例，无强化 2 例
斜坡骨质形态不变 6 例，溶骨性骨质破坏 25 例，骨质受压 12 例，膨胀性骨质破坏 8 例.成骨性骨质破坏 2 例
结论：根据 MRI 表现，能够对累及斜坡少见病变不同的类型作出基本的分析与诊断

EPO-0399

腮腺良性肿瘤容积穿梭 CT 灌注曲线的特征分析

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目的 分析容积穿梭 CT 灌注曲线对腮腺肿瘤定性诊断及鉴别诊断的价值。**方法** 收集 2013 年 4 月至 2018 年 12 月间我院拟诊腮腺肿瘤患者 102 例，男 56 例，女 46 例，年龄 16～82 岁，平均年龄 52.3±14.9 岁，病程 5 天～30 年。所有患者术前均采用 GE Light speed VCT-XT 机行容积穿梭 CT 灌注成像检查，术后经手术病理证实。将扫描数据传送至 GE ADW4.4 工作站，观察分析不同病理类型腮腺肿瘤的位置、大小、密度、边界、颈部是否可见肿大淋巴结（>8mm）及时间-密度曲线（time density curve，TDC）类型，对计数资料采用自然数及百分数表示，计量资料参数采用表示，计数资料比较采用 χ^2 检验，计量资料符合正态分布采用两独立样本 t 检验，不符合正态分布的采用秩和检验，检验水准 α=0.05。**结果** 90 例（92 灶）腮腺良性肿瘤的形态学参数：左侧 46 灶，右侧 46 灶（其中 2 例腺淋巴瘤双侧发病），最大径（2.47±0.95）cm，52 灶密度均匀，40 灶密度不均匀，74 灶边界清晰，18 灶边界不清晰，11 灶颈部有肿大淋巴结，81 灶颈部无肿大淋巴结。各类腮腺肿瘤 TDC 曲线类型：多形性腺瘤以Ⅰ型（缓升型）为主（占 100%），腺淋巴瘤以Ⅱ型（速升-速降型）多见（占 76.9%），基底细胞瘤以Ⅲ型（速升-缓降型）多见（占 66.7 %），肌上皮瘤以Ⅳ型（缓升-缓降型）多见（占 83.3%）。容积穿梭灌注 CT 成像检查辐射剂量为 4.19±0.41mSv。**结论** 1.容积穿梭 CT 灌注成像技术结合低剂量措施在 1 次扫描、1 次对比剂注射的同时，可以获得常规 CT 动态增强和 CT 灌注功能成像两方面信息。2.灌注曲线结合形态学参数对腮腺良性肿瘤的鉴别诊断有重要价值，为患者术式的选择及辅助措施的应用有重要指导意义。

EPO-0400

双能量 CT 头颈部血管成像临床应用价值

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摘要 目的 探讨双源 CT（DSCT）双能量成像技术在头颈部血管疾病诊断中的临床应用价值。**方法** 回顾分析 2009 年 2 月～2019 年 1 月临床怀疑有脑血管病变患者 1060 例双能量成像的影像资料及诊断结果，并与患者全脑血管 DSA 资料作对照。所有患者均在我院双源 CT（Siemens Somatom

Definition）行头颈部血管双能量成像。**结果** 1060 例患者经检查发现有头颈部血管疾病 551 例，正常头颈部血管 CTA 表现 509 例，诊断阳性率 52.0%。其中头颈部血管疾病中 116 例临床上进行了全脑血管 DSA 检查，只有 7 例头颈部血管 CTA 结果与 DSA 结果不符，符合率 93.97%。发现动脉瘤 127 例 146 个动脉瘤，颈动脉粥样硬化并狭窄 96 例，颅内动脉、椎动脉局限性狭窄 94 例，颅内动静脉畸形 65 例，颈内动脉或椎动脉闭塞 46 例，双颈面部血管畸形 29 例，烟雾病和颅内肿瘤各 19 例，脑梗塞和颅内静脉血栓各 18 例，双侧颈动脉、颅内动脉不显影 12 例，颈内动脉血管炎 4 例，sturg-webber 综合症和发现永存三叉动脉各 2 例。108 例患者（动脉瘤 58 例，颅内动脉、椎动脉局限性狭窄 26 例，颈动脉粥样硬化并狭窄、颅内血管畸形和颜面部血管畸形各 8 例，）结果与全脑 DSA 造影结果相符。**结论** 双源 CT 双能量成像更能清晰地显示头颈部血管病变及肿瘤供血动脉，与全脑 DSA 有很好的符合率，对于诊断颈部和颅内血管病变具有较高的敏感性。具有创伤小、费用低、检查时间短、造影剂用量少、毒副反应低、随到随查等多方面优势。在脑血管重建中可根据碘含量的特殊算法,更加清晰地显示脑血管,但对颅底部分骨组织可能还需人为去除。

EPO-0401

Abnormal Cerebral Blood Flow in Patients with Unilateral Pulsatile Tinnitus: A Arterial Spin Labeling Study

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Objective
To explore whether altered cerebral blood flow presented in patients with unilateral pulsatile tinnitus (PT) using Three-Dimensional Arterial Spin Labeling (3D ASL) technique.
Methods
Structural and functional MRI data were obtained from unilateral PT patients with single etiology (= 24) and age-, sex-, and education-matched normal control subjects (= 24). Voxel-based analysis (VBA) was used to observe the regional cerebral blood flow (CBF) characteristics with parameters post-labeling duration (PLD)=2025ms.
Results
Compared with the normal control group, PT patients did not show any structural changes. PT patients showed significant increased CBF in the bilateral middle temporal gyrus, right inferior temporal gyrus and decreased CBF in left triangle inferior frontal gyrus, middle frontal gyrus.
Conclusions
Our results suggest that PT patients may exhibit regional CBF abnormalities, which may provide new insight into the effects of PT on the brain performance.

EPO-0402

T2 mapping 鉴别腮腺肿瘤的价值

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目的 探讨 T2 mapping 对腮腺肿瘤的鉴别诊断价值。**方法** 前瞻性分析经病理证实的 51 例单发腮腺上皮性肿瘤患者资料，术前均行常规 MRI 及 T2 mapping 检查。测量病变的 T2 均值，采用 *t* 检验分析腮腺肿瘤 T2 值的差异，运用 ROC 曲线评价 T2 值的诊断价值。 **结果** 51 例腮腺肿瘤中良性 34 例，恶性 17 例。良性肿瘤 T2 值为 128.64±49.58ms（多形性腺瘤与基底细胞腺瘤 T2 值为 148.05±46.69ms，warthin 瘤 T2 均值为 82.05±5.07ms），恶性肿瘤 T2 值为 105.72±13.31ms，差异有统计学意义（t=2.520，P=0.016）。T2 值诊断多形性腺瘤和基底细胞腺瘤与恶性肿瘤 ROC 曲线下面积为 0.907±0.047，T2 值诊断 warthin 瘤与恶性肿瘤 ROC 曲线下面积为 0.975±0.024，以 90.2≤T2 值≤124.45ms 为临界点判断腮腺良恶性肿瘤，以病理结果为对照，其灵敏度为 82.4%(14/17)，特异度为 88.2%(30/34)，与病理结果行一致性检验，Kappa 值为 0.696。
结论 T2mapping 鉴别诊断腮腺肿瘤具有一定参考价值。

EPO-0403
良恶性多形性腺瘤 CT 征象与病理对照研究

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目的：探讨良恶性多形性腺瘤的 CT 影像学特征与组织病理学的特点的相关性，并探讨其相关的临床意义及具有的诊断价值。
方法：本研究通过回顾性分析经手术病理证实的 65 例腮腺多形性腺瘤的病例，其中 5 例复发病例，10 例恶变病例。每个病例的病理切片均进行 HE 染色及免疫组化检查，分别由两位高年资病理科医师进行检查，根据镜下所具有的上皮、间质成分所占比例进行分组研究：黏液成分为主组、黏液成分和上皮细胞相等组、富含上皮成分组、极富细胞组，同时将各组临床表现、病理表现与 CT 的特征进行对照研究。
结果：5 例复发病例中，3 例属于富含上皮成分组，2 例属于极富细胞组；形态学方面，富含上皮成分组 15 例病例边界较光滑，边界清晰；CT 征象上，多形性腺瘤的强化程度与组织病理学中上皮成分的所占比例有一定的正相关，极富细胞组 10 例均强化明显且较为均质，富含上皮成分组 10 例均匀强化；在恶变的 10 例多形性腺瘤病例中，CT 对比增强有显著强化，边界欠规则，镜下上皮含量丰富。
结论：良恶性多形性腺瘤的组织病理学和 CT 影像学表现各异，但上皮成分与 CT 增强的征象具有一定的相关性，为临床的诊断治疗提供更多的研究价值，而关于确定多形性腺瘤的 CT 影像学特征和病理组织学表现之间的关系，仍需进一步的大量研究。

EPO-0404
降低头颈部 CTA 锁骨下静脉对比剂滞留的可行性研究

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目的：探讨降低 128 排螺旋 CT 头颈部联合 CTA 锁骨下静脉对比剂滞留的扫描方案。
方法：收集头颈部 CTA 检查的患者共 250 例，采用随机数字表法将患者按照每组各 50 例，均分为 A、B、C、D、E 五组。注射使用非离子型对比剂（碘海醇 350mg/ml），碘总量均设定为单位体重 300 毫克碘，对比剂灌注时间设定为 10s，碘流率=碘总量/10s：A 组注射对比剂后以流速 4ml/s 注射生理盐水 20ml；B 组注射对比剂后以流速 4ml/s 注射生理盐水 40ml；C 组注射对比剂后以流速

4ml/s 注射生理盐水 60ml；D 组注射对比剂后以流速 5ml/s 注射生理盐水 60ml；E 组注射对比剂后以流速 3ml/s 注射生理盐水 60ml。通过主客观评价比较五组扫描方案的图像质量。
结果：A、B、C 组两两对比，客观评价：A、B、C 三组所监测主动脉 CT 值无统计学差异；C 组锁骨下静脉 CT 值低于 A、B 组，存在统计学差异，而 A、B 组之间无统计学差异。主观评价：B、C 组结果优于 A 组，存在统计学差异，而 B、C 组之间无统计学差异。C、D、E 三组两两对比，主观及客观评价均发现 C、D 组结果优于 E 组，存在统计学差异，C、D 组之间无统计学差异。
结论：本研究通过以设定不同剂量以及不同流速的生理盐水注射方案，在一定程度上达到降低对比剂滞留的目的的同时，图像质量均满足临床诊断的需求。不同剂量生理盐水对比组中，出现少数患者生理盐水多余推注的问题。所以，适量的增加生理盐水的推注，可以有效的减少锁骨下静脉对比剂的残留，但是持续加大的生理盐水剂量的推注，并不能无限降低对比剂的滞留，因此，建议追加生理盐水的剂量不超过 60ml 最为恰当。不同流速的生理盐水对比组中，因为 C、D 组优于 E 组，而 C、D 之间无差异，考虑高流速会加大血管负荷，造成血管破裂的可能性，因此选择 4ml/s 注射速率为最佳。

EPO-0405

干燥综合征颌下腺及腮腺的 MRI 表现

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目的：干燥综合征患者腮腺 MRI 表现已经有很多文献报道，腮腺 MRI 表现具有特征性，颌下腺的 MRI 表现很少有研究提及，因此本文探讨干燥综合征患者颌下腺 MRI 的表现，颌下腺 MRI 以及联合腮腺 MRI 对于 SS 的诊断效能。
方法：回顾性收集确诊为 SS 的 60 例患者，另收集因口干于本院就诊的 21 例患者，21 例患者行常规腮腺及颌下腺 MRI 检查。观察 T1WI 和 T2WI 图像，进行脂肪信号分级。以临床诊断为金标准，评价颌下腺的 MRI 表现以及腮腺和颌下腺二者联合应用对 SS 的诊断效能。采用配对四格表 x 2 检验比较腮腺和颌下腺诊断 SS 的差异，采用一致性检验比较腮腺及颌下腺脂肪分级结果的一致性。
结果：所有患者均为双侧腮腺及颌下腺病变，表现为信号不均匀，T1WI 和 T2WI 均为多发弥漫分布脂肪信号，抑脂 T2WI 上呈低信号；162 个腮腺的脂肪信号分级，0 级 4 个、1 级 86 个、2 级 40 个、3 级 16 个、4 及 16 个。162 个颌下腺的脂肪信号分级，0 级 48 个、1 级 46 个、2 级 22 个、3 级 20 个、4 级 26 个。81 例 SS 患者的 162 个腮腺中，常规腮腺和颌下腺 MRI 分别检出病变和 158 个和 114 个，均无假阳性结果，差异有统计学意义（ x 2 =37.23，P＜0.005），而二者联合应用检出了全部 162 个病变腺体。腮腺诊断 SS 的灵敏度为 97.5%，颌下腺的灵敏度为 70.3%，二者联合应用的灵敏度为 100％。腮腺及颌下腺脂肪分级结果的一致性较差（Kappa ＝0.067，P ＝ 0.059 ）。
结论：SS 患者颌下腺的 MRI 表现与腮腺相似，但诊断效能低于腮腺，且腮腺和颌下腺腺体脂肪浸润程度并无确切关系。常规 MRI 可以作为诊断 SS 的首要影像学检查，联合腮腺和颌下腺 MRI 表现可提高诊断的准确性，并能客观反应涎腺的病损程度，评估预后。

EPO-0406

探讨 MRI 动态增强联合扩散加权成像鉴别腮腺良恶性肿瘤的价值

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目的：探讨 MRI 动态增强成像联合扩散加权成像鉴别腮腺良恶性肿瘤的价值。方法：选择我院 2013 年 6 月~2018 年 12 月经病理检查证实的 30 例腮腺恶性肿瘤患者与同期随机抽取 31 例腮腺良性肿瘤患者作为研究对象，均采取 MRI 动态增强成像、扩散加权成像检查，对比单独及联合采用 MRI 动态增强成像、扩散加权成像诊断腮腺肿瘤良恶性的敏感度、特异度及准确度。结果：联合采用 MRI 动态增强成像、扩散加权成像诊断腮腺良恶性肿瘤的敏感度为 96.67%(29/30),高于单独采用 MRI 动态增强成像、扩散加权成像诊断，差异有统计学意义(P<0.05)；联合采用 MRI 动态增强成像、扩散加权成像诊断腮腺良恶性肿瘤的特异度、准确度分别为 67.74%（21/31）、81.97%（50/61）与单独采用 MRI 动态增强成像、扩散加权成像诊断对比，无显著差异（P>0.05）。结论：MRI 动态增强联合扩散加权成像能提高对腮腺良恶性肿瘤定性诊断的敏感度。

EPO-0407
MR 动态增强联合扩散加权成像对腮腺肿瘤良恶性的鉴别价值

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目的：探讨磁共振动态增强扫描（DCE）联合扩散加权成像（DWI）对鉴别腮腺肿瘤良恶性的临床应用价值。
方法：回顾性分析 38 例经手术病理证实的腮腺肿瘤患者，术前均行 MR 平扫、动态增强和 DWI 扫描，绘制肿瘤的动态增强时间-信号强度曲线（TIC）并测量 ADC 值，比较 TIC 曲线特征以及各参数在不同病理类型腮腺肿瘤中的差异，并采用受试者工作特征曲线分析其各自及两者联合对腮腺肿瘤良恶性的鉴别诊断效能。
结果：38 例腮腺肿瘤中，良性 28 例，恶性 10 例，良、恶性腮腺肿瘤在形态表现存在显著差异性（P<0.01）；多形性腺瘤以 A 型（缓慢上升型）、B 型（速升平台型）曲线为主，且 A 型曲线只存在于多形性腺瘤中，可将多形性腺瘤与其他良性肿瘤及恶性肿瘤进行鉴别；腺淋巴瘤以 C 型（速升速降型）曲线为主，较具有特征性，恶性肿瘤以 B 型曲线为主，但是 B 型曲线也存在于部分良性肿瘤中，两者之间存在部分重叠，难以进行良恶性鉴别诊断。但是，腮腺恶性肿瘤的 ADC 值显著低于良性肿瘤的 ADC 值，其中多形性腺瘤和恶性肿瘤、腺淋巴瘤 ADC 值差异有统计学意义（P<0.01），腺淋巴瘤和恶性肿瘤的 ADC 值差异无统计学意义（P>0.05）。
结论：MR 常规扫描结合动态增强能够帮助鉴别腮腺良、恶性肿瘤，并且对于不同病理类型腮腺的诊断提供有价值的信息，联合 ADC 值定量分析可明显提高对腮腺良恶性肿瘤的鉴别诊断效能。

EPO-0408
颌面部成釉细胞瘤 DCE-MR 表现

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目的：探讨动态增强磁共振 (DCE-MRI)对不同类型颌面部成釉细胞瘤的诊断价值。 **方法：**回顾性分析术前已行常规磁共振及 DWI 检查并经手术病理证实的 20 例颌面部成釉细胞瘤，包括原发性成釉细胞瘤 12 例、复发性成釉细胞瘤 8 例。病理类型包括单囊型 2 例、实体/多囊型 15 例、促结缔组织增生型 1 例、骨外/外周型 2 例。根据传统 MR 表现将所有肿瘤分为囊性 2 例、囊实性 18 例。测定 18 例囊实性肿瘤的实性感兴趣区（ROI）的信号强度-时间曲线（time-signal intensity curve, TIC）及曲线达峰时间（time to peak，TTP）。采用 SPSS19.0 软件包进行统计学分析，比较不同类型颌面部成釉细胞瘤之间的 TIC 类型及 TTP 均值差异。 **结果：**2 例囊性肿瘤无强化，18 例有强化的成釉细胞瘤的 TIC 类型呈 I 型（10 例）或 II 型（8 例），I 型曲线 TTP 均在 150s 之

后，II 型曲线 TTP 均值为 50.62±10.31s。原发性与复发性肿瘤的动态增强 TIC 曲线类型无统计学差异(P＞0.05)。当肿瘤 DCE-MRI 的 TIC 曲线为 II 型时，原发性与复发性成釉细胞瘤的平均 TTP 有差异，前者为 56.86±5.27s，后者为 44.38±10.68s。 **结论：**DCE-MRI 可作为鉴别不同类型颌面部成釉细胞瘤的辅助工具。

EPO-0409

Functional connectivity density in sensormotor area is associated with sleep latency in patients with primary Insomnia

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It is currently unclear whether the pattern of functional connectivity density (FCD) in patients with primary insomnia (PI) differs in normal control (NC) subjects [1]. The current study sought to investigate the features of FCD in PI using resting-state functional magnetic resonance imaging (rsfMRI) [2]. We obtained rsfMRI data from 32 PI and 34 NC using a 3T scanner. Statistical analysis was performed to compare the strength of functional connectivity between the two groups. Our results showed that PI subjects exhibited significantly decreased FCD in the left Medial frontal gyrus/orbital gyrus, left anterior cingulum gyrus and increased FCD in the left supplementary motor area. In addition, the increased FCD values in the left Supplementary motor area negatively correlated with digit span test 1 and positively correlated with sleep latency. These results suggest that the dysfunctional default mode network and sensorimotor area may play an important role in the pathophysiology of PI [3,4].

EPO-0410

(micro-course) deadly goblet

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The abstract is for the micro course competetion of the head and neck section in 2019 CCR.
Carotid body tumor is one commong tumor orginate in the head and neck.
The typical imaging sign of "carotid body tumor" is the goblet sign.
Accurate diagnosis and differential diagnosis of this tumor is very crucial for the clincial decision.
Therefore, during this section, we want to introduce one case of "carotid body tumor"
My micro course including the following aspects:
First. the overview of carotid body tumor
Second. the diagnosis and differential diagnosis of carotid body tumor

Third. summary of my micro course.

EPO-0411

Reliability of 4D-flow MRI in hemodynamic assessment of Sigmoid Sinus when VENC value changes: comparison with 2D PC MRI

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Objective
To compare the blood flow parameters of sigmoid sinus derived from 4D-flow magnetic resonance imaging (4D-flow MRI) using different velocity encoding (VENC) values and 2D Phase contrast (2D PC) MRI in healthy volunteers.
Methods
A total of 15 healthy volunteers were enrolled in this prospective study. All participants underwent 2D PC and 4D-flow MRI. A 4D-flow MRI protocol involving two different VENC values of 45 cm/s, 90cm/s and a 2D PC MRI protocol involving a VENC value of 60cm/s were performed in middle sigmoid sinus segments. All quantitative and visual data were obtained by dedicated software.
The maximum through-plane velocity (V_{tp_max}), minimum through-plane velocity (V_{tp_min}), average through-plane velocity (V_{tp_avg}), average blood flow ($Flow_{avg}$) calculated from 2D PC, 4D-flow MRI (VENC=45cm/s) and 4D-flow MRI (VENC=90cm/s) were compared by one-way repeated measurement analysis of variance.
Result
There were no significant differences in V_{tp_max}, V_{tp_avg}, $Flow_{avg}$ measurements between groups with varied VENC values in 4D-flow MRI, nor in groups between 2D PC MRI and 4D-flow MRI. The difference in V_{tp_min} between three groups was statistically significant(P=0.003), and V_{tp_min} of 2D PC MRI was significantly less than 4D-flow MRI (VENC=45cm/sec) (P=0.005).
Conclusion
4D-flow MRI appears as a valid alternative for characterizing hemodynamics of sigmoid sinus, which is consistent with 2D PC MRI. We also show that varied VENC values may be used with little effect on the measurement of blood flow parameters.

EPO-0412

CT and MRI Manifestation of Branchial Cleft Fistula

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Objective To discuss the diagnostic value of branchial cleft fistula with CT and(or) MRI. **Methods** CT and(or) MRI findings of 33 cases of branchial cleft fistula were

analyzed retrospectively. **Results** Among the 33 cases, 7 cases (21%) are first branchial cleft fistula, which originate in the external auditory meatus, parotid gland. They usually show as tubular structure around the ear, sometimes invading the facial nerve and causing facial nerve symptoms. 18 cases (55%) are second branchial cleft fistula, which often show as tubular structure in the anterior triangle area of the neck, or along the anterior border of the sternocleidomastoid muscle. 8 cases (24%) are third or fourth branchial cleft fistula, which are difficult to differentiate from each other because they both originate in pyriform sinus. **Conclusion** CT and(or) MRI can show the location and range of branchial cleft fistula well, which made it valuable for diagnosis accuracy.

EPO-0413

鳃裂瘘管感染及癌变的 CT 表现

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目的 探讨鳃裂瘘管继发感染或癌变的 CT 表现及诊断价值。
方法 搜集我院临床确诊的有并发症的鳃裂瘘管患者 36 例，分析鳃裂瘘管继发感染或癌变的 CT 影像特点。
结果 36 例患者中，17 例（47%）符合鳃裂瘘管急性感染，CT 显示耳周、腮腺内或腮腺表面的软组织增厚水肿，可有炎性包块形成，病变密度不均匀，急性感染时病变周围渗出明显，导致与周围组织分辨不清，其中 5 例腮腺密度增高。18 例（50%）符合鳃裂瘘管慢性感染反复发作，CT 显示管样或囊样结构，管壁的厚度、密度、强化程度与感染次数相关，通常感染次数越多，管壁越厚且不规则，周围软组织可见边界不清的炎性改变。1 例（3%）符合鳃裂瘘管癌变，CT 显示耳周的软组织肿块，在部分层面可见肿块生长入外耳道内，病变周围渗出少见，肿块包绕周围血管浸润生长，与邻近组织分界不清。
结论 大部分鳃裂瘘管由于继发急性或慢性感染而就诊，继发癌变者非常罕见。继发癌变者病程长，恶性程度相对较低，因而容易被漏诊。术前 CT 检查可能提示急性感染、慢性感染或癌变，并显示病变的范围及走形途径，这对治疗原则和手术方案的选择是非常有价值的。

EPO-0414

脑动脉瘤的形态与破裂出血的相关性研究

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前言：
本文对 109 例动脉瘤患者探究脑动脉瘤（CA）脑血管形态学与破裂出血的关系，为临床 CA 的诊断和治疗提供参考。
目的：探究脑动脉瘤（CA）脑血管形态学与破裂出血的关系，为临床 CA 的诊断和治疗提供参考。
方法：对 2016 年 6 月-- 2019 年 3 月我院住院治疗的 CA 患者资料进行收集，总数量为 109 名，并记录患者的年龄、性别，采用 CTA 及 DSA 获得脑动脉瘤的三维图像，对动脉瘤与瘤颈平行的最大横径、瘤颈宽进行测量。计算瘤颈宽和脑动脉瘤与瘤颈平行最大横径（简称瘤径）长度比值（简称瘤颈比）。随后分析 CA 破裂与瘤颈比的关系。

结果：破裂组拥有最大横径（8.9±2.4）mm 脑动脉瘤，而未破裂组最大内经的脑动脉瘤为（7.2±2.0）mm，破裂组患者瘤径比未破裂组患者瘤径明显增大，两组患者最大横径差异具备统计学含义（P≤0.05）。使用最大瘤径脑动脉瘤 10 mm 为分界点进行分组，倘若瘤径和 10mm 相比小，那么则应当纳入<10 mm 分组中，倘若和 10 mm 相比大，那么应当将其纳入<10 mm 分组中，通过对数据的整理了解到，在 109 个瘤体中，有 87 个动脉瘤瘤径小于 10 mm， 占总数的 79.8 %，破裂率为 51.3 %。瘤径大于 10 mm 的有 22 个，占总数的 20 %，破裂率为 21/22，约 95.4 %。倘若瘤径的最大直径大于 10 mm 那么其和小于 10 mm 的动脉瘤组相对比，其破裂率高。且两组数据具备统计学含义（P≤0.05）。
破裂组脑动脉瘤的瘤颈宽和瘤径分别为（2.2 士 0.9)和（6.8±2.2）mm。未破裂组脑动脉瘤的瘤颈宽和瘤径分别为（1.4 士 0.4）mm 和（4.7 士 2.2）mm。且两组数据具备统计学含义（P≤0.05）。

结论：
患者瘤径的大小、瘤颈宽与瘤颈比对于脑动脉瘤的破裂都具有较高的相关性，瘤径大于 10mm 及瘤颈比小于 1（窄颈）是动脉瘤破裂的重要危险因素，瘤径越大及瘤颈比值越小破裂风险越高。

EPO-0415
基于 ADC 图的影像组学分析预测舌和口底鳞状细胞癌组织学分级的价值

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目的：探讨基于 ADC 图的影像组学分析能否用于舌和口底鳞癌的组织学分级的预测。
方法：本研究纳入本院 2015 年 5 月至 2018 年 7 月本院行术前 3.0TMRI 检查的 95 例舌和口底鳞癌患者（训练集 63 例，测试集 32 例），被分为低级别组（I 级及 I-II 级）和高级别组（II 级及 III 级）。使用 LASSO 运算，基于训练集数据建立影像组学标签。使用 ROC 分析评价影像组学标签于训练集及测试集预测舌和口底鳞癌组织学分级的效能。
结果：LASSO 运算选择 6 个最佳特征用于组建影像组学标签。影像组学标签于训练集及测试集区分高、低级别舌和口底鳞癌的表现均较好，AUC 值分别为 0.82、0.78。基于训练组获取的最佳界值，影像组学标签于训练集及测试集分类的精确度分别为 0.75、0.78，灵敏度分别为 0.71、0.86，特异度分别为 0.83、0.64。
结论：基于 ADC 图的影像组学分析可以为舌和口底鳞癌的组织分级术前预测提供一种无创手段。

EPO-0416
RESOLVE-DWI 在腮腺肿瘤鉴别诊断中的价值

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目的 探讨分段读出扩散加权成像（readout segmentation of long variable echo-trains diffusion weighted imaging, RESOLVE-DWI）及表观扩散系数（apparent diffusion coefficient, ADC）在腮腺肿瘤鉴别诊断中的价值。
方法 回顾性分析 2017 年 1 月至 2018 年 5 月 87 例经手术病理证实的腮腺肿瘤患者的临床及影像学资料。避开肿瘤囊变、坏死及出血区，在肿瘤最大层面的 ADC 图上，手动勾画 3 个圆形感兴趣区，

测量平均 ADC 值（ADC_m）。采用独立样本 t 检验比较腮腺良恶性肿瘤组间 ADC_m的差异。采用单因素方差分析比较腮腺多形性腺瘤、腺淋巴瘤和恶性肿瘤组三组间 ADC_m的差异。采用受试者工作特征曲线（receiver operating characteristic, ROC）法分析 ADC_m 对腮腺肿瘤的鉴别诊断价值。
结果 腮腺良性及恶性肿瘤组间 ADC_m差异无统计学意义（P=0.071）。腮腺多形性腺瘤、腺淋巴瘤及恶性肿瘤三组组间 ADC_m 差异具有统计学意义（P<0.001）。两两比较均具统计学差异（多形性腺瘤 vs 腺淋巴瘤，P<0.001；多形性腺瘤 vs 恶性肿瘤，P<0.001；腺淋巴瘤 vs 恶性肿瘤，P=0.030）。ADC_m在三组肿瘤两两鉴别中的 ROC 曲线下面积分别为（多形性腺瘤 vs 腺淋巴瘤，AUC>0.999；多形性腺瘤 vs 恶性肿瘤，AUC=0.822；腺淋巴瘤 vs 恶性肿瘤，AUC=0.807）。
结论 腮腺常见肿瘤中腺淋巴瘤 ADC 值最低，随后依次是恶性肿瘤和多形性腺瘤。RESOLVE-DWI 可以准确评估腮腺肿瘤 ADC 值，辅助肿瘤鉴别诊断。

EPO-0417

Preliminary study of using diffusion kurtosis imaging for characterizing parotid gland tumors

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Background: Diffusion kurtosis imaging (DKI) is a technique based on the theory that the diffusion of water follows
non-Gaussian distribution; until now, few studies have explored the usefulness of DKI in differentiating parotid
gland tumors.
Purpose: To evaluate the potential of DKI in the characterization of parotid gland tumors.
Material and Methods: DKI was performed in 40 patients with parotid gland tumors (33 benign, 7 malignant).
DKI parameters including apparent diffusion coefficient (Dapp) and apparent kurtosis coefficient (Kapp) were obtained
using the DK model and compared. Intraclass correlation coefficient (ICC) was used to evaluate inter-observer agreement
of DKI derived parameters.
Results: Excellent inter-observer agreements (Dapp, ICC¼0.988; Kapp, ICC¼0.985) were achieved during quantitative
measurements. There were no significant differences in Dapp (P¼0.055) and Kapp (P¼0.915) between the benign and
malignant groups. In the subgroup analyses, pleomorphic adenomas showed higher Dapp (P<0.001) and lower Kapp
(P¼0.037) than malignant tumors. Combination of Dapp and Kapp showed optimal discriminative value (area under curve
[AUC]¼0.913; sensitivity¼88.89%; specificity¼85.71%). Pleomorphic adenomas also showed higher Dapp (P<0.001)
and lower Kapp (P<0.001) than Warthin’s tumors. A combination of Dapp and Kapp showed optimal discriminative value

(AUC¼1.000; sensitivity¼100%; specificity¼100%). Warthin’s tumors demonstrated higher Kapp than malignant
tumors (P<0.001), while no significant difference was found on Dapp (P¼0.448). The AUC, sensitivity, and specificity
of Kapp for discriminatingWarthin’s tumors from malignant tumors at an optimal threshold of 0.735 were 0.905, 88.89%,
and 85.71%, respectively.
Conclusion: DKI may be a promising imaging technique for characterizing parotid gland tumors.

EPO-0418
青年人正常与慢性关节弹响实施颞下颌关节的 MRI 分析

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【摘要】目的：分析研究青年人正常与慢性关节弹响实施颞下颌关节的 MRI 检查。**方法：**对选取正常青年志愿者 40 例（正常组）以及我院治疗的慢性张口弹响颞下颌关节紊乱的患者 15 例（病例组），分别用同一类型的 MRI 仪扫描，比较两组在同一检查面的关节盘、关节液以及关节盘髁位置关系。**结果：**病例组 14 个关节，每个关节分析通过髁突内的 1/3、中心、外 1/3 的 3 层闭口斜矢状面。结果显示有双凹形和非双凹形，其中病例组双凹形关节盘内 1/3、中心、外 1/3 双凹形比例分别为 28.5.0%（4/14）、28.5.0%(4/14)、14.20%(2/14)；弹响组 71.4%(10/14)的关节盘内可见散在片状稍高信号，7 个位于中后带交界区，2 个位于后带，1 个位于前中及中后带交界区，其中有 9 个关节盘内高信号表现为大片状，均位于 8 个肥大的关节盘内。正常组和病例组非双凹型关节盘中 3 层闭口斜矢状面内 1/3、中心、外 1/3 的比例的差异具有统计学意义（P<0.05）；正常组和病例组关节液的比较显示，差异经过秩和检验后差异具有统计学意义（Z=-7.469，P=0.000）；病例组关节盘在内 1/3、中心、外 1/3 闭口斜矢状面均明显前移位，与正常组相比差异具有统计学意义（P<0.05）；正常组和病例组内 1/3、中心、外 1/3 闭口斜矢状面 Drace 角比较，在两组之间的差异具有统计学意义（P<0.05）。**结论：**慢性关节弹响实施颞下颌关节的 MRI 可以清楚显示出关节盘的位置、关节液的多少以及从斜矢状面明显前移位。

EPO-0419
腮腺基底细胞腺瘤的影像学表现

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目的 探讨腮腺基底细胞腺瘤的影像学表现。
方法 回顾性分析 15 例经手术及病理证实的腮腺基底细胞腺瘤的临床特征、CT 及 MRI 图像特点。
结果 15 例病灶均为单发肿块,左侧 7 例,右侧 8 例;病灶最大径为 3.0cm,10 例位于腮腺浅叶,5 例位于腮腺深叶;12 例呈类圆形,3 例呈椭圆形;8 例病灶呈实性,增强扫描病灶明显强化,7 例病灶伴有囊变,其中 2 例有壁内结节,增强扫描壁内结节明显强化。
结论 腮腺基底细胞腺瘤好发于中老年人,其影像学特征有利于术前诊断。

EPO-0420

T2mapping 在腮腺肿瘤鉴别诊断中的价值

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目的：评估定量 T2mapping 在腮腺肿瘤鉴别诊断中的价值。
方法：回顾性分析 2018 年 1 月至 12 月 73 例经手术病理证实的腮腺肿瘤患者的临床及影像学资料。根据 T2 轴位像，避开坏死囊变及出血，在 T2mapping 图像上肿瘤直径最大的平面选取三个感兴趣区，测量肿瘤的平均 T2 弛豫时间。采用独立样本 t 检验比较腮腺良恶性肿瘤组间 T2 值的差异。采用单因素方差分析比较腮腺多形性腺瘤、腺淋巴瘤和恶性肿瘤组三组间 T2 值的差异。采用受试者工作特征曲线法分析 T2 值对腮腺肿瘤的鉴别诊断价值。
结果：腮腺良性肿瘤 T2 值高于恶性肿瘤，差异有统计学意义(P=0.001，曲线下面积= 0.679，敏感度=46.4%，特异性=94.4%)。多形性腺瘤的 T2 值高于恶性肿瘤(P=0.003，曲线下面积=0.783，敏感度=58.1%，特异性=94.4%)与腺淋巴瘤(P=0.001，曲线下面积=0.892，敏感度=87.1%，特异性=83.3%)，差异有统计学意义；恶性肿瘤与腺淋巴瘤间的 T2 值差异无统计学意义(P=0.435)。
结论：T2 mapping 在鉴别腮腺肿瘤良恶性及区分多形性腺瘤与腺淋巴瘤及恶性肿瘤中具有重要价值。

EPO-0421

MSCT 后处理技术在颌面部骨折中的临床应用

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目的：探讨 MSCT 后处理技术在颌面部骨折中的临床应用价值
方法：收集颌面部外伤患者 56 例，男 32 例，女 24 例，中位年龄 31 岁。均行轴位 CT 高分辨扫描，扫描范围由眶上缘至下颌骨颏部下缘；并在工作站进行后处理重建、分析。56 例患者原始数据均行容积再现（VR）及多平面重组（MPR），32 例行曲面重建（CPR）。详细分析骨折程度及相关结构受累情况。
结果：56 例颌面部外伤患者中，单发骨折 44 例，多发骨折 12 例。其中眶部骨折 9 例，单纯眼眶内壁骨折 4 例，眼眶下壁骨折 2 例，视神经管骨折 3 例；鼻部骨折 11 例，鼻骨骨折 8 例，鼻骨合并鼻中隔骨折 3 例；上颌骨骨折 14 例，上颌窦前壁骨折 3 例，上颌窦前壁及外壁骨折 5 例，上颌齿槽骨骨折 6 例；下颌骨骨折 22 例，下颌骨体部骨折 9 例，其中 4 例致下颌神经管骨折，下颌升支骨折 5 例，髁状突骨折 8 例。
结论：VR 可直观显示骨折线走行及颌面部骨折后骨质形态改变；MPR 可显示周围无法显示的骨折线及周围相关结构受累情况；CPR 可在一幅图像上清晰显示视神经管、鼻泪管、下颌神经管等弯曲管道，推测管内结构受损情况。结合轴位图像充分利用 MSCT 后处理技术，可准确诊断颌面部骨折的程度，对临床治疗选择及预后评价有重要的指导意义。

EPO-0422

髓外浆细胞瘤的 CT 及 MRI 表现

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目的：探讨髓外浆细胞瘤(extramedullary plasmacytoma,EMP)的影像特征，以提高对本病的认识。**方法：**回顾性分析我院 22 例经病理证实的 EMP 患者的临床及影像学资料并复习相关文献，总结其 CT 及 MRI 特征。**结果：**22 例中，16 例发生于头颈部：鼻腔鼻窦 6 例，鼻咽 3 例，眼眶 2 例，颅内 2 例，颌下腺 1 例，甲状腺 1 例，喉 1 例；6 例发生于其他部位：胸壁 2 例，肺内 1 例，盆腔 1 例，睾丸 1 例，椎管内 1 例。22 例均表现为孤立的软组织肿块，15 例密度/信号均匀，2 例伴囊变坏死，2 例伴钙化，5 例 DWI 高 b 值弥散受限呈高/稍高信号，12 例伴邻近骨质吸收破坏，14 例伴周围组织侵犯，增强扫描多呈明显强化，3 例肿块内部或周边见迂曲增粗血管影。**结论：**EMP 的 CT 及 MRI 具有一定特点：病灶多为孤立的软组织肿块，密度/信号均匀，囊变坏死、钙化少见，易侵犯邻近骨质及周围组织，增强扫描呈明显强化，肿块内部或周边可见流空血管影。

EPO-0423

Histogram Analysis Parameters ADC for Distinguishing Ventricular Neoplasms of Ependymoma,Choroid Plexus Papilloma and Central Neurocytoma

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Objective: To determine if histogram of ADC can be used to differentiate ventricular ependymomas,choroid plexus papillomas(CPPs) and central neurocytomas(CNCs).

Materials: 185 patients from January 1,2014 to November 1, 2018 were retrospectively reviewed. In the end, 60 patients with confirmed histologically ependymomas in 36(60.00%) patients,CPPs in 10(16.67%) patients, and CNCs in 14(23.33%) patients were enrolled in the study,accepting MRI at 3T. The ROIs were drawn on the maximum level of ADC,and the histogram analysis were performed using the software named Mazda. One-way ANOVA and Kruskal-Wallis test were performed on the nine histogram parameters to find out the different characteristics. LSD and Bonferroni test were used between any two of the three groups and the ROC curve was drawn to evaluate the diagnostic efficacy.

Results:Ependymomas were significantly higher mean,Perc.01%,Perc.10%,Perc.50%,Perc.90% and Perc.99% than CNCs.Ependymomas were significantly lower skewness than CNCs.Histogram metrics derived from mean,Perc.01%,Perc.10%,Perc.50% and Perc.90% were significantly lower in CNCs than CPPs group.CPPs showed significantly lower skewness than CNCs.A threshold value of 86.50 for Perc.50% had the best diagnostic efficacy to predict ependymomas from CNCs(AUC= 0.97, sensitivity = 97.20%,specificity = 85.70%). Optimal diagnostic performance to predict CPPs from CNCs (AUC= 0.96, sensitivity = 100.00%, specificity =85.70%) was obtained when setting Perc.50%= 84.00 as the threshold value.

Conclusions:The ADC histogram analysis may help to discriminate ependymomas,CPPs and CNCs.

EPO-0424

Histogram Analysis Parameters Enhanced-T1WI for Distinguishing Ventricular Ependymomas,Choroid Plexus Papillomas and Central Neurocytomas

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Purpose: To determine if histogram of enhanced-T1WI can be used to differentiate ventricular ependymomas,choroid plexus papillomas(CPPs) and central neurocytomas(CNCs).

Material and Methods: 185 patients from January 1,2014 to November 1, 2018 were retrospectively reviewed. In the end, 75 patients with confirmed histologically ependymomas in 40(53.3%) patients,CPPs in 18(24%) patients, and CNCs in 17(22.7%) patients were enrolled in the study,accepting MRI at 3T. The ROIs were drawn on the maximum level of enhanced-T1WI,and the histogram analysis were performed using the software named Mazda. One-way ANOVA and Kruskal-Wallis test were performed on the nine histogram parameters to find out the different characteristics. LSD and Bonferroni test were used between any two of the three groups and the ROC curve was drawn to evaluate the diagnostic efficacy.
Results: Ependymomas showed significantly lower mean,Perc.01%,Perc.10%,Perc.50%,Perc.90% and Perc.99% than CPPs.Histogram metrics derived from mean,Perc.01%,Perc.10%,Perc.50%,Perc.90% and Perc.99% were significantly lower in CNCs than CPPs group. Ependymomas showed significantly lower kurtosis than CNCs.A threshold value of 180.50 for Perc.50% had the best diagnostic efficacy to predict ependymomas from CPPs (AUC= 0.81, sensitivity = 83.30%,specificity = 82.50%). Optimal diagnostic performance to predict CPPs from CNCs (AUC= 0.92, sensitivity = 83.30%, specificity =100.00%) was obtained when setting Perc.90%= 185.50 as the threshold value.

Conclusions:The enhanced-T1WI histogram analysis may help to discriminate ependymomas,CPPs and CNCs.

EPO-0425

Segment-specific Progression of Carotid Artery Atherosclerosis: A Magnetic Resonance Vessel Wall Imaging Study

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Background The progression of carotid atherosclerosis has been demonstrated to be associated with subsequent cerebrovascular ischemic events including stroke and transient ischemic attack[1-3] and it is important to accurately measure the progression of carotid plaques which can be used to stratify the risk of ischemic events. However, there is no consensus on plaques from which segment of carotid arteries had a more rapid progression rate among previous studies[4,5]. Thus, this study aimed to investigate the segment-specific progression of atherosclerotic carotid plaques using serial multi-contrast magnetic resonance (MR) imaging. Method Symptomatic patients with carotid 30%-70% stenosis were recruited and underwent carotid MR vessel wall imaging at baseline and follow-up time point (≥6 months after baseline). The location of plaques was determined according to the maximum wall thickness located above or below carotid bifurcation. The baseline and changing characteristics of carotid plaques were compared between plaques above and below carotid bifurcation and the risk factors for segment-specific plaque progression were analyzed with logistic regression. Results Ninety-six carotid plaques from 73 patients (mean age 66.5 ± 11.4 years old) were eligible for statistical analysis. Compared with plaques located below carotid bifurcation, those above bifurcation had significantly greater stenosis at baseline (57.2± 13.0%vs. 50.4 ± 13.5%, p = 0.016, adjusted p = 0.005) and greater progression rate of carotid wall volume (35.2± 68.8 mm^3/year vs. 4.2± 65.0mm^3/year, p = 0.026, adjusted p = 0.005) before and after adjusting for all clinical risk factors and baseline stenosis and wall volume of carotid arteries. Logistic regression showed that the related risk factors were age, hypertension and smoke for the progression of plaques located above the bifurcation and age for plaques below the bifurcation, respectively. Conclusion Plaques located above the bifurcation of carotid arteries had greater annual progression and correlated with more cardiovascular risk factors compared with those located below the bifurcation.

EPO-0426
颈部 2 点法 T2-DIXON 图像水-脂分离错换的纠错方法

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目的 探讨颈部 2 点法 T2-DIXON 图像局部水-脂分离错换的解决方法。**方法** 选择鼻咽、颈部 T2-DIXON 轴位检查图像出现局部水-脂分离错换的 140 例患者随机分为 7 组，采用德国 Siemens MAGNETOM skyra 3.0T 超导磁共振扫描仪进行第二次 T2-DIXON 轴位检查，每组 T2-DIXON 轴位序列采用七种不同方式重复扫描，第一组采用局部水-脂分离错换层面增加匀场块；第二组将 T2-DIXON 序列重复采集次数增加为 2 次；第三组于扫描部位放置匀场辅助装置；第四组采用局部水-脂分离错换层面增加匀场块+T2-DIXON 序列重复采集次数增加为 2 次；第五组采用局部水-脂分离错换层面增加匀场块+扫描放置匀场辅助装置；第六组采用 T2-DIXON 序列重复采集次数增加为 2 次+扫描放置匀场辅助装置；第七组采用局部水-脂分离错换层面增加匀场块+T2-DIXON 序列重复采集次数增加为 2 次+扫描放置匀场辅助装置。并对第二次扫描所得图像与首次扫描的水-脂分离错换图像进行比较并分级，1 级：水-脂分离错换未纠正，且错换范围增加；2 级：水-脂分离错换未纠正，错换范围无明显变化；3 级：水-脂分离错换部分纠正；4 级：水-脂分离错换全部纠正。**结果** 七组病例第二次扫描图像均不同程度的纠正水-脂分离错换现象，第一、二、三组病例采用一种方式扫描，第四、五、六、七组病例采用两种及以上的组合方式进行扫描，后四组病例在水-脂分离错换纠正能力上明显由于前三组病例。第一、三、五组两次扫描图像 SNR 值进行统计学分析，

p>0.05，第二、四、六、七组两次扫描图像 SNR 值进行统计学分析，p<0.05，**结论** 在进行磁共振扫描时出现水-脂分离错换时局部层面增加匀场块、增加重复采集次数、局部放置匀场辅助装置的使用对于纠正水-脂分离错换具有积极的作用，多种方法联合应用其纠正水-脂分离错换的效果更明显。

EPO-0427
椎-基底动脉血流动力学与后循环梗死的相关性研究

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目的：探讨椎-基底动脉血流动力学与后循环梗死(Posterior circulation infarction，PCI)的相关性，提高对 PCI 的认识。
方法：选取 2016 年 1 月至 2016 年 12 月于天津市人民医院神经内科住院治疗的 18-80 岁患者为研究对象，经 MRI 证实为急性 PCI 患者纳入梗死组，无 PCI 患者纳入无梗死组。收集入组患者的基本临床资料、病史资料、头部 MR 影像资料及椎动脉(Vertebral artery,VA)颈段超声资料。基于 VA 颈段彩色多普勒超声数据分析两组间 VA 颈段管径、VAD、VAH、阻力指数(Resistance index,RI)、收缩期峰值流速(Peak systolic velocity,PSV)及峰值血流量差异。以一侧 VA 单位时间内峰值血流量超过对侧 30%作为 VA 峰值血流量优势标准，分析梗死组与无梗死组间 VA 峰值血流量优势差异。采用 SPSS20.0 统计软件进行数据分析，检验水准 α=0.05。
结果：本研究共纳入 177 例研究对象，其中梗死组 85 例，无梗死组 92 例。梗死组 RI 增高 9 例(10.6%)，存在 VA 峰值血流量优势 57 例(67.1%)。无梗死组 RI 增高 1 例(0.11%)，存在 VA 峰值血流量优势 46 例(50%)。梗死组 RI 增高及 VA 峰值血流量优势发生率高于无梗死组(P<0.05)。两组间 VA 颈段管径、PSV 及两侧 VA 血流量之和差别均无统计学意义(P0.05)。
结论：VA 峰值血流量优势为 PCI 的危险因素。

EPO-0428
腮腺区结核 CT 诊断

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目的：分析腮腺区结核 CT 特征及误诊原因。
材料与方法：搜集 2006 年至 2016 年经手术或穿刺病理证实腮腺区结核共 16 例，其中一位患者进行两次 CT 检查及手术，回顾性分析其发病部位、范围、密度、强化方式等 CT 特征。
结果：16 例患者中男 6 例，女 10 例，年龄 11 岁～80 岁。12 例术前 CT 诊断为多形性腺瘤，2 例诊断恶性肿瘤，1 例诊断为脓肿，1 例诊断为淋巴结增生。病理证实 2 例为腮腺结核，2 例为腮腺及腮腺区淋巴结结核，剩余均为腮腺区淋巴结结核。腮腺结核呈弥漫片状明显强化。腮腺淋巴结结核表现为 4 例环状强化，2 例花环状强化，3 例大部分均匀强化，中心小囊状或片状弱强化，2 例较均匀强化，1 例呈带状低密度影，边缘线状强化。腮腺实质伴淋巴结结核呈片状强化及其内环状强化结节。所有病例 4 例腮腺病灶伴有钙化（弥漫点状或砂砾状、结节状），6 例周围筋膜模糊，累及皮下脂肪。12 例同侧淋巴结增大，4 例双侧淋巴结增大。
结论：腮腺结核表现多样，了解其病理改变的本质才能认识到腮腺区结核的表现，环状强化及颈部淋巴结增大以及累及皮下脂肪可能有助于腮腺区结核的诊断。

EPO-0429
抗血小板药物使用与颈动脉粥样硬化斑块内出血的多对比度磁共振研究

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背景 颈动脉粥样硬化易损斑块已被证实与缺血性脑卒中、短暂性脑缺血发作等脑血管缺血性事件的发生显著相关[1,2]。斑块内出血（Intraplaque hemorrhage，IPH）是易损斑块的主要特征之一，可引发斑块破裂而导致脑缺血事件的发生[3]。而近年来，有国外研究发现服用过抗血小板药物患者颈动脉 IPH 的发生率可能更高[4,5]，但目前抗血小板药物使用与颈动脉 IPH 是否存在相关性仍存争议，因为之前多项评估影响颈动脉 IPH 临床因素的研究中，并未发现二者之间的相关性[6,7]。随着影像学技术的发展，多对比度磁共振成像技术能够准确地评估颈动脉粥样硬化斑块 IPH 的发生[8]。本研究旨在利用多对比度 MRI 技术探讨抗血小板药物使用与颈动脉 IPH 之间的相关性。方法 回顾性分析经超声检测至少有一侧颈动脉存在粥样硬化斑块的症状性患者。对所有患者进行双侧颈动脉多对比度 MR 血管壁成像，分析颈动脉 IPH 与患者临床特征。结果 共 108 例颈动脉粥样硬化斑块患者纳入分析，其中存在 IPH 患者 41 例，无 IPH 患者 67 例。与无 IPH 患者相比，IPH 患者抗血小板药物使用（P=0.013）及吸烟（P=0.037）的比例更高，他汀类药物使用（P=0.019）比例更低，颈动脉斑块负荷更大（P<0.001）。Logistic 回归分析显示，在调整混杂因素之前（OR，2.80；95%CI，1.23-6.41；P=0.014）和之后（OR，3.33；95%CI，1.06-10.45；P=0.039），抗血小板药物使用与 IPH 之间均显著相关。结论 颈动脉粥样硬化患者抗血小板药物的使用可能与 IPH 的发生有关，该结果可能为颈动脉粥样硬化患者合理、规范使用抗血小板药物提供一定理论参考。

EPO-0430
Improving the diagnostic performance of benign parotid tumors using image biomarkers in combination with clinical parameters

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Purpose: To develop and validate diagnosis models of the most common benign tumors in parotid gland based on CT image biomarkers (IBMs) in combination with clinical parameters.

Material and methods: The study cohort was composed of two most common benign parotid tumors, including 45 pleomorphic adenoma patients and 40 adenolymphoma patients. Kolmogorov-Smirnov test or Levene test was used for evaluating the significance of the difference on clinical parameters and IBMs from the datasets. Receiver operating characteristic (ROC) curve and area under the curve (AUC) were drawn and calculated using frequency variables. The accuracy, specificity and sensitivity were respectively discussed by the maximum Youden’s index.

Results: In textural IBMs model, the diagnostic efficiency of energy between parotid adenolymphoma and pleomorphic adenoma was the best, and the AUC was 0.90. The accuracy, sensitivity and specificity was 82%,72.81% and 93.2% respectively. In conventional IBMs model, the diagnostic efficiency of time-density curve(TDC) was the best, and the AUC was 0.921.The accuracy, sensitivity and specificity was 88%,74.6% and 93.7% respectively. In clinical model, the diagnosis efficiency of gender was the best, and the AUC was 86.4%. The accuracy, sensitivity and specificity was 81.7%, 90.1% and82.9% respectively. When IBMs were added in clinical model, the AUC was improved to 93.7.The accuracy, sensitivity and specificity was 87.7%, 80.1% and 94.9% respectively.

Conclusion: The addition of IBMs from benign parotid tumors improved the diagnostic performance of the model containing clinical factors. These combined models may improve the diagnostic accuracy of parotid tumors, so as to select individualized surgery program.

EPO-0431

常规 MRI 扫描征象对于原发扁桃体癌和扁桃体淋巴瘤的鉴别诊断价值

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目的 探讨常规 MRI 扫描征象对于原发扁桃体癌和扁桃体淋巴瘤的鉴别诊断价值

材料与方法 回顾性分析 39 例扁桃体癌与 20 例扁桃体淋巴瘤患者的临床资料及常规 MRI 征象。对比的影像征象包括病灶分布、大小、形状、信号强度和均匀程度、强化均匀程度、咽旁间隙浸润及颈部淋巴结受累情况。对两者影像征象的鉴别，首先进行单因素分析，后通过 Logistic 回归分析筛选出具有独立诊断意义的影像征象，并通过 ROC 曲线判断模型的诊断效能。

结果 39 例扁桃体癌发现病灶 42 个（3 例双侧病灶），平均直径 30.8±13.6mm；38 个病灶形态不规则，呈浅分叶状；31 个病灶边缘不清晰并侵犯咽旁间隙。20 例淋巴瘤共发现病灶 25 个（5 例双侧病灶），平均直径 30.4±13.9mm；10 个扁桃体淋巴瘤病灶形态不规则，呈浅分叶状；3 个病灶边缘不清晰，侵犯临近咽旁间隙。两组肿块的 MRI 影像均为 T1WI 呈等信号、T2W 呈稍高信号。33 个扁桃体癌病灶 T2W 信号不均匀，38 个病灶增强不均匀强化。7 个扁桃体淋巴瘤病灶 T2WI 信号不均匀，3 个病灶增强不均匀强化。34 例扁桃体癌合并颈部淋巴结受累，26 例为单侧且均为同侧受累，8 例双侧受累；11 例扁桃体淋巴瘤出现颈部淋巴结受累，10 例单侧受累且均为同侧，1 例双侧受累。单因素分析结果显示扁桃体癌较扁桃体淋巴瘤病灶形态更不规则（P<0.001）、T2WI 信号（P<0.001）及增强扫描信号（P<0.001）更不均匀、更易浸润临近咽旁间隙（P<0.001）及颈部淋巴结受累（P=0.006）。多因素分析病灶强化均匀程度（OR 值=46.197，P<0.001）、临近咽旁间隙浸润（OR 值=9.259，P=0.023）为鉴别扁桃体癌和扁桃体淋巴瘤的独立预测因子，ROC 曲线下面积为 0.964，*P*<0.001）。

结论 常规 MRI 对于扁桃体癌与淋巴瘤的鉴别具有重要价值。

EPO-0432

腮腺 Kimura 病 MR 影像特征

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目的　探讨 MRI 对腮腺 Kimura 病的诊断价值,提高对 Kimura 病的认识。资料与方法　回顾性分析 6 例经病理证实的腮腺区 Kimura 病的临床及 MRI 表现。结果　6 例 Kimura 病表现为腮腺区无痛性肿块(其中 1 例双侧肿大)，部分伴皮肤瘙痒。所有患者血常规嗜酸性粒细胞均明显增多(平均超出正常值约 5~6 倍)。MRI 表现为:(1)单侧或双侧腮腺浅叶弥漫性增大,常有多个结节;(2)累及邻近皮下组织、皮肤增厚;(3)腮腺周围及颈部多发增大淋巴结，信号均匀，边界清楚光滑，无坏死、囊变，几乎不融合。结论　Kimura 病有一定的临床和影像特点，结合实验室检查,，术前可以正确诊断。

EPO-0433
基于机器学习法在 AIDS 患者磁共振技术测量脑灰质体积的应用价值研究

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目的：运用基于机器学习方法的磁共振成像结构像技术，探究灰质体积指标(GMV)在评估 HIV 相关神经认知功能障碍中的应用价值。
方法：按照纳入排除标准，收集 2017 年 09 月至 2019 年 1 月期间首诊于南宁市第四人民医院的艾滋病患者，共纳入未进行抗病毒治疗的患者 27 例（HIV 阳性组），14 位男性，13 位女性。以 NP 测验为参考标准，将 HIV 阳性组分为 HAND 组（认知障碍组）和非 HAND 组。正常志愿者 14 例纳入对照组，8 位男性，6 位女性，经测试正常对照组认知功能正常。要求受试者签署磁共振检查知情同意书。采用 GE Discovery MR 750w 3.0T 磁共振行轴位 T1WI、轴位 T2WI 扫描及矢状位 T1 加权（Sag3D T1WI-BRAVO）薄层扫描。图像的预处理使用 DPARSF3.1，正式处理使用 PRoNTo2.1.1 进行图像数据的分析。使用 SPSS19.0 统计软件分析 GMV 指标在 HAND 组和非 HAND 组的差异。
结果：（1）GMV 指标在 HIV 阳性组和 HIV 阴性组间差异贡献最大的十个大脑区域依次为：右侧中央后回、左侧顶上回、右侧中央旁小叶、右侧补充运动区、左侧顶下缘角回、左侧颞横回、右侧顶下缘角回、右侧顶上回、右侧中央盖沟、左侧缘上回；（2）GMV 的 AUC 为 0.73，准确率为 70.73%，灵敏度为 85.19%，特异度为 42.86%，阳性预测值为 74.19%，阴性预测值为 60.00%。（3）HAND 组和非 HAND 组的 GMV 值与临床血液学、临床量表及认知评分、分组有不同程度的相关性。
结论：机器学习法在基于磁共振的 AIDS 患者的脑灰质体积测量的分类有意义。AIDS 患者组和对照组有差异的位于前十位的大脑区域主要集中在双侧额叶、双侧顶叶、左侧颞叶。GMV 指标可以用于诊断 HAND，磁共振结构成像的检查可以为临床诊断 HAND 提供客观的检查方法，对治疗效果提供客观的评价指标，达到降低 HAND 发生和发展的目的。

EPO-0434
Radiomics features analysis in computed tomography images of parotid tumors

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PURPOSE To develop and validate a useful radiomics model for preoperative classification of malignant and benign parotid tumors on CT imaging data. **METHOD AND MATERIALS** A total of 45 patients with pathology-proven parotid tumors and clinical data were obtained from January 2013 to March 2019. All patients underwent enhanced CT scan before treatment. According to the histological results, they were divided into the benign group (23 cases) and the malignant group (12 cases). ROI drawn manually by a radiologist was used in radiomic analysis for extracting features of the maximum slice of the tumors in CT images. The high throughput features from ROI were extracted for classification analysis by Radcloud platform. A total of 1409 quantitative imaging features were extracted. LASSO algorithm methods was used to gradually select the optimal features. Computer-generated random numbers were used to assign 70% of the ROIs to the training data set and 30% of ROIs to the validation data set. Classifications were made using one supervised learning classifiers (SVM) in our study. Blind diagnoses that classify the 31 cases in validation cohort on CT images, was carried out by a radiologists with 10 years of experience. Diagnostic performance in group classification by the radiomics model and radiologists were evaluated by using ROC analysis.Benign and malignant parotid tumors were significant different in radiomics features. **RESULTS** In radiomic analysis of conventional, arterial phase, venous phase CT image, classification results of training set showed the AUC, sensitivity and specificity were 0.98, 56%, 100% (P>0.05); 0.91, 75%, 97% (P<0.05); 1, 67%, 100% (P>0.05), while that of validation set was 0.38, 25%, 80%(P>0.05); 0.88, 78%,75%(P<0.05); 0.75, 50%, 100% (P<0.05) respectively. The best radiomics model differentiating benign and the malignant parotid tumors was that oriented from arterial phase CT image. The radiologists had AUC of 0.86 (similar to the radiomics model of arterial phase CT image), sensitivity of 76% and specificity of 74% (slightly lower than that model). **CONCLUSION** Combination of radiomics and machine learning was promising in the differentiating these two diseases.

EPO-0435

椎-基底动脉形态与后循环梗死的相关性研究

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目的：探讨椎-基底动脉形态与后循环梗死(Posterior circulation infarction，PCI)的相关性，提高对 PCI 的认识。
方法：选取 2016 年 1 月至 2016 年 12 月于天津市人民医院神经内科住院治疗的 18-80 岁患者为研究对象，经 MRI 证实为急性 PCI 患者纳入梗死组，无 PCI 患者纳入无梗死组。依据头部 MRA 原始及重建图像，分析两组间椎-基底动脉系统(Vertebrobasilar system,VBS)分型、willis 环、后交通动脉(Posterior communicating artery,PCoA)开放情况及其他血管变异情况。基于头部 MRA 数据，对梗死组与无梗死组 VA 颅内段管径、椎动脉优势(Vertebral artery dominance,VAD)、椎动脉发育不良(Vertebral artery hypoplasia,VAH)、VA 中重度狭窄发生率、基底动脉(Basilar artery,BA)管径、偏曲程度及 BA 中重度狭窄发生率的差异进行统计学分析。采用 SPSS20.0 统计软件进行数据分析，检验水准 α=0.05。

结果：研究共纳入 177 例研究对象，其中梗死组 85 例，无梗死组 92 例。梗死组 VA 颅内段管径(2.8±0.6)大于无梗死组(2.6±0.5)，差异有统计学意义(P=0.011)。梗死组颅内段 VAH 发生率(18.8%)低于无梗死组(35.9%)，差异有统计学意义(P=0.011)。在颅内段及颈段，梗死组和无梗死组 VAD 和 VAH 的发生侧别无差异(P0.05)。两组间 VA 颈段管径、颅内段及颈段 VAD 发生率、颈段 VAH 发生率、BA 管径及 BA 明显偏曲发生率差别均无统计学意义(P0.05)。两组间 PCoA 开放比例无差异(P=0.500)。

结论：椎-基底动脉形态与 PCI 的发生无明显相关性。需结合椎-基底动脉血流动力学参数进一步探讨椎基底动脉与 PCI 的相关性。

EPO-0436
甲状腺体积与气管压迫的三维 CT 体积测量研究

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目的：甲状腺体积增大可能导致气管压迫，这是呼吸窘迫的原因之一。本研究的目的是通过计算机断层扫描重建的半自动三维体积测量来研究甲状腺体积与气管压迫严重程度之间的关系，而不依赖于患者的症状。并对导致不同水平气管狭窄的甲状腺体积截止点进行了初步的估测。

材料与方法：回顾性分析自 2016 年至今于天津市人民医院行头颈部增强 CT 检查的 95 例患者图像。应用半自动三维 CT 体积测量患者的甲状腺体积。在甲状腺附近气管横截面积减少最大的位置测量气管压缩程度。我们定义了气管压缩比，即气管压缩比=气管最窄横截面积/气管最大横截面积，来确定气管压缩的严重程度。

结果：研究结果显示患者的平均气管狭窄程度为 15%（气管压缩比=0.85±0.15）。气管狭窄 15%以上患者的甲状腺体积明显大于气管狭窄 15%以下患者（P＜0.001）。甲状腺体积和气管压迫之间存在着显著相关性（P＜0.001）。此外，受试者操作特征曲线分析显示，预测气管狭窄程度 10%、20%、30%和 40%的甲状腺体积截止值分别约为 19.75 ml、21.56 ml、24.54 ml 和 30.29 ml（P＜0.05）。

结论：本研究客观地证明，较大的甲状腺体积引起气管更严重程度的压迫。这一结果可能有助于由于气管压迫症状而行甲状腺切除术的决策过程。

EPO-0437
机器学习法在 AIDS 患者静息态功能磁共振成像中脑网络连接指标度中心度、对称体素同伦连接的应用价值研究

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目的：运用基于机器学习方法的磁共振静息态功能成像技术，探究 DC 值和 VMHC 值在评估 HIV 相关神经认知障碍中的诊断价值。

方法：按照纳入排除标准，收集 2017 年 09 月至 2019 年 1 月期间首诊的艾滋病患者，共纳入未进行抗病毒治疗的患者 27 例（HIV 阳性组），14 位男性，13 位女性。以 NP 测验为参考标准，将 HIV 阳性组分为 HAND 组（认知障碍组）和非 HAND 组。正常志愿者 14 例纳入对照组，8 位男性，6 位女性，经测试正常对照组认知功能正常。采用 GE Discovery MR 750w 3.0T 磁共振扫描。图像的预处

理使用 DPARSF3.1，正式处理使用 PRoNTo2.1.1。使用 SPSS19.0 统计软件分析 DC 和 VMHC 指标在 HAND 组和非 HAND 组的差异。
结果： （1）DC 指标及 VMHC 指标在 AIDS 患者与对照组结果差异贡献最大的十个大脑区域分别是：右中央旁小叶、左中央旁小叶、右枕上回、右运动补充区、右楔叶、左楔叶、左顶上回、左楔前叶、左运动补充区、右中央后回；左中央旁小叶、右中央旁小叶、右运动补充区、右楔前叶、左楔前叶、右顶下缘角回、左运动补充区、左尾状核、右中央后回、左颞横回。（2）DC、VMHC 指标分类效果的评价如下：DC 及 VMHC 指标的 AUC 值为 0.60、0.59，准确率为 65.85、68.85%，敏感度为 100、92.59%，特异度为 0、14.29%，正预测值为 65.85、67.57%，负预测值为 0、67.57%。（3）DC 指标对区别 HAND 组及非 HAND 组有意义，VMHC 指标则无意义。（4）前十位大脑区域的 DC 值、VMHC 值分别部分与临床血液学、临床量表及认知评分、分组有不同程度的相关性。
结论：DC 值 VMHC 值能直观的反映认知功能障碍受损的区域和相应功能受损伤的程度，为患者改善临床抗病毒的治疗方案和增加神经认知障碍的干预措施，对降低 HAND 的发生和发展起到了一定的作用。

EPO-0438

MRI 多模态对涎腺区肿物的鉴别价值

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目的：总结涎腺区肿物的 MRI 表现并探讨其鉴别特征。
方法：回顾性分析我院 2017-2018 年涎腺区肿物。共 26 例，男 14 例，女 12 例，良性病变（21 例），分别是多形性腺瘤（11 例），Warthin 瘤（7 例），Mikulicz（良性淋巴上皮病变）瘤（1 例），单纯囊肿（1 例），嗜酸细胞腺瘤（1 例）；恶性肿瘤 5 例，分别是腮腺癌（1 例），腺样囊性癌（1 例），淋巴上皮癌（1 例），霍奇金淋巴结（1 例），横纹肌肉瘤（1 例）。收集包括 T1WI、T2WI 及 T2WI 脂肪抑制序列、DWI 及 ADC、T1WI 动态增强，观察各肿物边缘、形态、信号、强化方式及颈部有无肿大淋巴结。
结果：良性病变边界清（21/21），恶性肿瘤边界清楚者（3/5），良性病变于 T2WI 序列上边缘可见低信号包膜影，恶性肿瘤无此包膜。多形性腺瘤于 T1WI 序列一般没有高信号区，Warthin 瘤大多数有高信号区，有统计学意义，P=0.018；良性病变与恶性肿瘤 T1WI 有无高信号区，无统计学意义，p=0.078。多形性腺瘤实性成分 ADC 值约（1491±317）×10-6mm2/s，Warthin 瘤约为（970±342）×10-6mm2/s，恶性肿瘤约为（855±246）×10-6mm2/s，多形性腺瘤与 Warthin 瘤具有统计学意义，p=0.005。多形性腺瘤动态增强曲线：4 例流入型，6 例平台型，1 例无强化。Warthin 瘤强化曲线：1 例上升型，1 例无做曲线，5 例流出型。恶性肿瘤强化曲线：2 例平台型，2 例流出型，1 例无做曲线。多形性腺瘤动态强化曲线以流入型或平台型为主，Warthin 瘤以流出型为主，P 值为 0.000。
结论：MRI 多模态成像在诊断腮腺肿瘤具有很高的价值。

EPO-0439

头颈部结外淋巴瘤的影像诊断与鉴别诊断（专题讲座）

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头颈部结外淋巴瘤绝大部分为非何杰金氏淋巴瘤，可累及头颈部的多种器官和并可沿颅底间隙蔓延。头颈部结外淋巴瘤在不同部位有不同的临床症状和影像表现，并容易与发生在这些部位的其他肿瘤和肿瘤样病变相混淆。熟悉头颈部结外淋巴瘤的好发部位、在该部位的典型与不典型影像表现、与其他相似病变的鉴别要点，对于提高诊断准确性具有重要意义。尤其是在影像高度怀疑淋巴瘤的情况下，可提示临床避免不必要的手术操作，从而使患者获益。

EPO-0440

Optimized energy of spectral carotid CT angiography for non-calcified plaque detection

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Objective:
The aim of this study was to optimize spectral carotid computed tomography (CTA) for delineation of non-calcified carotid artery plaque.
Method:
60 subjects with significant carotid stenosis (50%< stenosis < 80%) who performed dual energy carotid CTA at 90/Sn150 kVp were retrospectively enrolled. Total 60 non-calcified carotid artery plaques were reconstructed with linear mixed blending data and noise-optimized virtual monoenergetic algorithm from 40 keV to 160 keV with an interval of 10 keV, respectively. Image noise, signal-to-noise-ratio (SNR) and contrast-to-noise ratio (CNR) for plaque were measured and compared. The subjective image quality evaluation was scored on a 5-point scale.
Results:
The image noise of the 110 keV-160 keV noise-optimized virtual monoenergetic image showed no statistical difference with linear mixed image. Using 90/Sn150 kVp linear mixed images as a reference, the CNR of the 40 KeV -50 keV noise-optimized virtual monoenergetic image was higher (84.01±32.19vs 59.79±6.21 and72.00±27.36 vs 59.79±6.21, respectively, P<0.05) The SNR of linear mixed image was higher. There was only statistical difference between linear mixed image and 40 keV-100 keV noise-optimized virtual monoenergetic image (P<0.05). The subjective score of 40 keV noise-optimized virtual monoenergetic image was the highest. And there was statistically significant difference between the 40 keV and 80 keV-160 keV (P<0.05).
Conclusion:
Spectral carotid CTA with low energies (40-50 keV) post-processing can optimize spectral carotid CTA for delineation of non-calcified carotid artery plaque compared to “conventional” mixed 90/Sn150 kVp images.

EPO-0441
X 线吞咽检查在亚急性期脑卒 中患者吞咽功能评估中的应用

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目的：探讨 X 线吞咽检查在亚急性期脑卒中患者吞咽功能评估中的应用价值。方法：收集 2018 年 1 月-2019 年 2 月在我院康复科住院的亚急性期脑卒中患者 106 例，分别行洼田饮水试验和 X 线吞咽检查。洼田饮水试验：即嘱患者一次性口服 30ml 温水，观察有无呛咳，有则误吸阳性，无则误吸阴性。X 线吞咽检查：嘱患者侧位坐于脚踏板上，口服 20ml 含碘对比剂,对比剂进入气道内,为误吸阳性,未进入气道则为误吸阴性，然后在工作站上慢速逐帧回放，观察吞咽各器官的功能状态。1.比较两种方法之间误吸检出率的差异，采用 SPSS17.0 统计软件对上述计数资料进行配对卡方检验,P<0.05 为差异有统计学意义。2.分析误吸患者吞咽的异常表现形式。结果:1. 洼田饮水试验呛咳者 43（40.6%）例，未呛咳者 63（59.4%）例， X 线吞咽检查,误吸阳性 70 例（66.0%），误吸阴性 36 例（34.0%），P<0.05,两种方法的误吸检出率有统计学差异。2.X 线吞咽检查显示：70 例误吸患者中，环咽肌开放障碍 11 例（15.7%）、喉上抬幅度不足 27 例（38.6%）喉上抬速度减慢 22（31.4%）、喉上抬启动延迟 26（37.1%），梨状窝残留 36 例（51.4%）。结论:1.X 线吞咽检查可以客观显示对比剂走行方向，发现临床评估方法无法发现的隐匿性误吸,提高误吸的检出率。2. X 线吞咽检查可以显示导致误吸的吞咽异常表现模式，可以是一种或多种形式并存。X 线吞咽检查可以为临床进行个体化康复训练提供依据。

EPO-0442
Diagnostic value of CT texture analysis in differential diagnosis between Adenolymphoma and Lymphoma of parotid

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Objective: To evaluate the value of CT texture analysis in the differential diagnosis of parotid adenolymphoma and lymphoma.
Materials and methods: CT images of 33 cases of parotid gland lymphoma and 21 cases of parotid lymphoma confirmed by pathology were retrospectively analyzed. Omni-Kinetics Version V2.06 software was used to analyze the texture of CT enhanced images. The meanvalue, standard deviation, variance, kurtosis, deviation, energy, entropy, contrast, correlation, deficit moment and the correlation parameters of run length matrix are measured. And then we make a statistical analysis of these parameters.
Results: There were significant differences in mean, standard deviation, variance, energy and entropy between parotid gland lymphoma and lymphoma group ($P < 0.05$). The area under ROC curve, sensitivity and specificity of standard deviation, mean value, variance and entropy are 0.808, 90.9%, 66.7%; 0.704, 81.8%, 52.4%; 0.808, 90.9%, 66.7%; 0.674, 87.9%, 47.6% respectively.
Conclusion: CT texture analysis can be used to distinguish parotid adenolymphoma and lymphoma. The standard deviation and variance can be used to distinguish the two tumors with the best efficacy and the highest sensitivity.

EPO-0443

儿童期脑外动静脉畸形的 CT 评估价值

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目的：分析儿童期脑外动静脉畸形的临床特点及 CT 影像表现，探讨 CT 增强检查对儿童期脑外动静脉畸形介入治疗前的评估价值。**方法：**回顾性分析 47 例经 DSA 确诊的儿童期脑外动静脉畸形患者的临床及影像资料，对部位，形态，边界，血管构筑，骨的侵犯等表现进行分析。**结果：**患儿年龄 3-12 岁，平均 9.6 岁，男性 29 例，女性 18 例。病变位于胸壁 1 例，腹盆壁 3 例，四肢 7 例，口腔颌面部 29，耳部 3 例，眼眶 1 例，鼻部 1 例，头皮 2 例。临床呈高流量的血管畸形表现，症状反复或进行性加重。特征性 CT 表现为强化的畸形血管团，粗大扭曲的引流静脉，增粗的供血动脉。**结论：**CT 增强检查能准确显示动静脉畸形的畸形血管团，大部分供血动脉及引流静脉，是介入治疗前的有效评估方法。

EPO-0444

鳃裂囊肿少见 CT 表现

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目的
报告鳃裂囊肿的少见 CT 表现，以提高对该病的 CT 诊断水平。
方法
分析 14 例经临床手术及病理证实的鳃裂囊肿 CT 资料。其中男性 9 例，女性 4 例，年龄 11～66 岁，平均 37 岁。8 例行颈部 CT 平扫，其中 4 例平扫后行颈部 CT 增强扫描，6 例直接行颈部 CT 增强扫描，所有病例 CT 扫描后常规行冠状面和矢状面 MPR 重建观察。
结果
13 例为第二鳃裂囊肿，其中 Bailey Ⅰ型 4 例，囊肿位于胸锁乳突肌的前缘或外侧，颈阔肌的深面。BaileyⅡ型 8 例，囊肿位于胸锁乳突肌的前内侧或内侧，颈动脉间隙的外侧，颌下腺后方。BaileyⅣ型 1 例，位于右侧颈动脉鞘前内侧、右侧咽旁间隙内侧及右侧咽侧壁外侧，即位于咽粘膜间隙。1 例为第一鳃裂囊肿，位于右侧腮腺内。少见征象有囊肿壁不均匀增厚、壁结节、囊内分隔、多囊状及平扫呈高密度。9 例囊肿壁不均匀增厚，8 例囊肿壁见壁结节向囊腔内突出，平扫壁结节与囊壁等密度，与囊液相比呈稍高密度，增强扫描示增厚囊肿壁及壁结节明显强化，1 例囊肿内见壁结节和线状分隔，1 例呈多囊状，部分囊之间相通连，2 例平扫囊内呈高密度，其中 1 例呈均匀高密度，增强扫描未见强化，1 例高密度内见 2 处环形低密度影。14 例 CT 诊断均误诊。
结论
囊肿壁不均匀增厚、壁结节、囊内分隔、多囊状及平扫呈高密度为鳃裂囊肿少见的 CT 表现， 当病变出现上述征象时，容易导致误诊，熟悉这些少见征象并结合病变的发生部位，特别是位于胸锁乳突肌的前内侧或内侧，颈动脉间隙的外侧，颌下腺后方，能减少误诊，提高诊断水平。

EPO-0445

SWI 在新生儿缺血缺氧性脑病中的诊断价值（参加中文论文比赛）

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[摘要]目的：比较 SWI（susceptibility weighted imaging）序列与常规 T1WI、T2WI、FLAIR、DWI 序列在新生儿缺血缺氧性脑病检出中的差异。方法：研究对象为 2018 年 3 月至 2019 年 6 月围产期有窒息史或有新生儿缺血缺氧性脑病高危因素的新生儿 101 例。在西门子 3.0T 磁共振设备行颅脑 MRI 检查，扫描序列包括 T1WI、T2WI、FLAIR、DWI 及 SWI 序列。分别观察 SWI 序列与常规 T1WI、T2WI、FLAIR、DWI 序列图，比较 SWI 序列与常规 MRI 序列对新生儿缺血缺氧性脑病检出率的差异。结果： SWI 序列共检出 52 例缺血缺氧性脑病患者，常规序列共检出 24 例缺血缺氧性脑病患者， SWI 序列检出的 52 例新生儿缺血缺氧性脑病患者中共检出 290 处出血灶，表现为低信号聚集；常规序列检出的 24 例患者中共检出 150 处出血灶，表现为 T1WI 或 FLAIR 高信号。结论：SWI 序列对新生儿缺血缺氧性脑病的检出率高于常规 T1WI、T2WI、FLAIR、DWI 序列，可作为新生儿颅脑 MRI 检查的常规序列。

EPO-0446

基于 MR 多参数评价颈内动脉血流动力学参数在缺血性脑卒中患者症状演变中的作用

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目的：本研究利用磁共振相位对比及 ASL 等序列测量颈内动脉血流学参数及相应脑组织灌注情况，对比分析不同症状患者血流动力学差异性。**方法：**收集 2016 年 1 月-2018 年 7 月我院神经内科住院患者 203 例，排除 6 例，分为无症状组 89 例，TIA 组 62 例，缺血性脑卒中组 127 例，应用 3.0T 磁共振行双侧颈内动脉检查并获得颈动脉的流速、流量等参数，同时采用 ASL 获得大脑半球相对血流量（rCBF），对比分析颈内动脉血流动力学参数同脑组织 rCBF 的相关性，并分析不同症状患者的血流动力学差异。**结果：** TIA 组、梗塞组和无症状组三组在平均流速、峰值流速、血流量上均存在显著的差异（P<0.05）,无症状组血流平均流速、峰值流速、血流量均高于 TIA 组和梗塞组。对颈内动脉血流动力学参数同脑部灌注参数的相关分析发现梗塞组组 rCBF(比值）与平均截面积（r=0.095,P=0.682）,rCBF(比值）与平均流速（r=0.283,P=0.213）,rCBF(比值）与平均流量（r=0.210,P=0.361），rCBF(比值）与压力梯度（r=0.186,P=0.420）均不存在显著的相关关系，P 均>0.05。无梗塞组组 rCBF(比值）与平均截面积（r=-0.035,P=0.795）,rCBF(比值）与平均流速（r=-0.197,P=0.145）,rCBF(比值）与平均流量（r=-0.237,P=0.078），rCBF(比值）与压力梯度（r=-0.193,P=0.153）均不存在显著的相关关系，P 均>0.05。**结论：**颈内动脉的血流动力学变化在缺血性脑卒中患者症状演变中具有重要作用，同患者临床症状直接相关。

EPO-0447

小剂量测试减影法在头颈 CTA 扫描中的优化方案

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目的 探讨 64 排螺旋 CT 小剂量测试减影法在头颈 CTA 扫描中的更优化的扫描方案 **方法**：将需要进行 CTA 检查的 200 例患者随机分组，A 组和 B 组分别 100 例，采用 1mm 直径 ROI 在颈 3 椎间盘处监测左侧颈动脉中心阈值，峰值=取点位×2+12；A 组取阈值最高点点位，B 组取阈值≥100HU 的第一个点位。2 位医师对颈动脉、基底动脉、大脑前、中、后动脉的成像质量进行评分并进行颈静脉干扰对比。分析 2 位医师的观察一致性和 2 种检查方法动脉成像质量以及静脉干扰的差异性。**结果**：2 位医师通过 2 种方法所得动脉成像质量评分一致性好，A 组平均分(2.41±0.38),静脉干扰 75%,；B 组平均分(3.24±0.25)，静脉干扰 18%。2 评论种方法应用 SPSS19.0 统计软件分析数据，计数资料(%)表示，χ2 检验，P ＜0.05 为差异有统计学意义。 **结论**：动脉阈值达到 100HU 点位计算峰值法能得到更优质的动脉血管成像，并且静脉干扰小，缩短后处理时间，提高工作效率，有进一步研究和推广的价值。

EPO-0448

唾液腺粘液表皮样癌 MRI 表现与病理级别相关性

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目的：提取唾液腺黏液表皮样癌磁共振成像(MRI)特征,并与病理对照分析，探讨 MRI 表现与病理级别相关性。
方法：回顾性分析经我院手术病理证实的 20 例唾液腺黏液表皮样癌患者的 MRI 表现,重点观察 T2 压脂上信号强度及囊变情况,并与组织病理特征对照研究，分析粘液表皮样癌是否囊变及囊变占肿瘤比例与肿瘤等级之间关系。
结果：高级别 MEC 2 例,T2WI 及 T2 压脂上均呈不均匀低-中信号,无囊变；中等级 MEC 12 例,T2WI 及 T2 压脂上均呈不均匀中-高信号,11 例(91. 7%)有囊变,1 例(8. 3%)无囊变；低级别 MEC 6 例,T2WI 及 T2 压脂上均呈不均匀中-高信号,6 例(100%)均有囊变,其中 1 例(16. 7%)合并淋巴结转移；T1WI 上 20 例 MEC 均表现低信号,增强扫描显示 18 例肿瘤内部实性成分呈较明显强化;16 例边界不清楚,4 例边界清楚。低级别 MEC、中等级别 MEC 与高级别 MEC 内部有无囊变有统计学差异（P=0.036，P=0.033），低级别 MEC 与中等级别 MEC 内部无有囊变无统计学差异（P=0.667）；低级别 MEC 与中等级别 MEC 内部囊性结构所占肿瘤比例（是否超过 50%）有统计学意义（P=0.001）。
结论：唾液腺粘液表皮样癌的 MRI 表现有一定特征性，多表现为不规则或规则结节、肿块，边界清楚或不清楚，T1WI 上主要呈低信号，T2WI 或压脂上主要呈等-高信号，病理级别越低，T2WI 或 T2 压脂信号越高，内部囊性信号越多。肿瘤内部囊性信号的多少在一定程度上可推测粘液表皮样癌的病理级别。结合患者临床表现及其他辅助检查可为临床术前诊断、治疗、预后观察提供帮助。

EPO-0449

颅面骨孔径精细扫描

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【摘要】**目的** 利用 FORCE CT 研究骨性鼻泪管、眶下管、颧面管的长度、开口大小、位置等解剖信息，为补充人体解剖资料及临床各项面部手术提供形态学依据。**方法** 对 64 例年龄 42.7±18.1 岁成人行颅面骨扫描，利用 MPR 技术进行图像重建，测量眶下管内及外孔直径、长度，鼻泪管上孔及中段直径、含气量及位置，颧面管内孔（颧眶孔）及外孔（颧面孔）直径、眶距（颧面孔到眼眶外下缘最短距离）、颧面孔到眶水平中线垂直距离。**结果** 左侧眶下管内孔直径（1.8±0.8）mm、

外孔直径（2.8±0.8）mm、长度（26.6±2.9）mm；右侧眶下管内孔直径（1.8±0.7）mm、外孔直径（2.8±0.8）mm，长度（27.7±3.1）mm；左侧鼻泪管上孔直径（5.9±1.4）mm、中段直径（5.9±1.3）mm，右侧鼻泪管上孔直径（6.3±1.4）mm、中段直径（6.0±1.3）mm；左侧颧面管内孔直径（1.5±0.5）mm、外孔直径（1.8±0.5）mm、眶距（7.9±7.0）mm、颧面孔到眶水平中线垂直距离（20.3±7.0）mm，右侧颧面管内孔直径（1.5±0.5）mm、外孔直径（1.7±0.5）mm、眶距（7.7±1.7）mm、颧面孔到眶水平中线垂直距离（20.4±7.0）mm。右侧眶下管内孔直径男女之间差异有统计学意义，女性大于男性；右侧鼻泪管内含气量与上孔、中段直径差异有统计学意义，右侧鼻泪管含气量位置与上孔直径差异有统计学意义，与中段直径差异无统计学意义；左、右侧眶下管长度差异有统计学意义，右侧大于左侧；左、右侧鼻泪管上孔直径差异有统计学意义，右侧大于左侧；左侧壁泪管中段直径、左侧颧面管内孔直径、左侧颧面孔到眶水平中线垂直距离年龄差异有统计学意义（想知道怎么随年龄变化的，没看懂。。。）。**结论** FORCE CT 是显示颅面骨解剖孔径的可靠影像学方法。

EPO-0450

比较 RESOLVE DWI 与常规 DWI 在 3T 磁共振颈部扫描的应用

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目的：对比分析 RESOLVE DWI 与常规 DWI 在颈部磁共振扫描的图像质量比较二者的优劣。
方法：对比分析在我院进行了颈部 MR 检查（包括咽喉部、甲状腺）、鼻咽部 MR 检查患者 63 例，其中有金属植入物 8 例、肿瘤患者 21 例。MR 扫描采用 SIEMENS 3T MAGNETOM Verio。颈部、鼻咽部常规扫描冠状位 T2W-FSI，轴位 T1WI、T2WI-FS，矢状位 T2WI-FS，再行 RESOLVE DWI 与常规 DWI 轴位扫描，肿瘤患者均进行钆喷酸葡胺增强扫描，增强扫描采用 3D-vibe 序列。RESOLVE DWI 扫描参数：视野 220mmx220mm，矩阵 160x160，TR6000ms，TE1=62ms、TE2=97ms，层厚 3mm，相位编码方向 A>P，B 值取 0、800；常规 DWI 扫描参数：视野 260mmx260mm，矩阵 128x128，TR8100ms，TE85ms，层厚 3mm，相位编码方向 A>P，4 次信号采集，B 值取 0、800。均采用 FS 进行脂肪抑制。以轴位 T2WI-FS 图像、增强 vibe 图像为基准，以图像信噪比、分别率、磁化率伪影、图像变形等作为指标，比较 RESOLVE DWI 与常规 DWI 的图像质量并给出评分。
结果：与常规 DWI 序列相比 RESOLVE DWI 序列所扫描图像信噪比、分别率更高，磁化率伪影及图形变形更低。同时 RESOLVE DWI 能与 T2WI-FS 及增强后 T1WI（vibe）有更好的匹配度。金属植入物患者行 RESOLVE DWI 扫描能明显降低图像变形、改善图像质量。肿瘤患者行 RESOLVE DWI 扫描能更加准确评价肿瘤的形态。缺点是 RESOLVE DWI 序列扫描时间稍长。
结论：由于颈部组织结构复杂、磁化率差异大，颈部磁共振弥散扫描常规 DWI 图像质量欠佳，RESOLVE DWI 采用了分段读出方式，明显改善了图像质量，颈部磁共振弥散推荐 RESOLVE DWI。

EPO-0451

Diagnosis and differential diagnosis of carotid body tumor by MRA and MSCT

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Objective To investigate the diagnostic value of MRA and MSCT applied in carotid body tumor ,analyze how to make differential diagnosis with other cervical tumors. **Methods** 15 patients with 16 carotid body tumors were investigated with MRA and MSCT ,all the tumors were confirmed by pathology or DSA .**Result** all carotid body tumors presented in plain scan were solid and well defined .because of highly vascular, tumor was significantly enhanced after contrast enhancement . In MRA and CTA ,the existence of tumor make the carotid bifurcation opened widely presenting the appearance of griping ball. **Conclusion** MRA and MSCT was useful in diagnosis and differential diagnosis of carotid body tumor .In some way , it may cooperate with multiple reconstructing technique to supply more detail information for surgery.

EPO-0452

腮腺混合瘤 CT 灌注成像及 MRI 动态增强的特征表现

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目的 总结混合瘤影像常规、CT 灌注成像或 MRI 动态增强扫描的特征表现，目的是提高其诊断率。**方法** 收集 2013 年~2016 年经病理证实的混合瘤病例 48 例，病例已经剔除假牙或运动伪影较明显病例，其中 32 例行 CT 灌注检查，16 例行 MRI 动态增强扫描。**结果** 本组病例,中年女性多见，除一例低度恶性混合瘤有短期内增大情况外，其余混合瘤病史较长，且长时间内变化不大；35 例位于腮腺浅叶，8 例位于腮腺深叶， 5 例跨越浅叶及深叶；所有病例均为单发，除一例为低度恶性混合瘤边界欠清外，其余病例边界均较清楚,尤其是增强扫描延迟期病灶边界显示更清楚；其中 5 例 CT 上出现斑点状钙化，多数病例 CT 增强扫描为轻中强化；磁共振 T2WI 多数病例呈高信号为主的混杂信号，T1WI 低信号为主，绝大多数病例 MRI 增强后均呈中度强化；除一例低度恶性的混合瘤病例 CT 灌注时间-密度曲线为 III 型曲线外，其余病例 CT 灌注时间-密度曲线均为 I 型；MR 动态增强的时间-信号曲线均为 A 型曲线。**结论** 腮腺混合瘤 CT 及 MRI 常规有一定特征性，CT 灌注 TDC 及 MRI 动态增强扫描 TIC 特征性明显， 因此，我们基本上能对混合瘤做出明确诊断。

EPO-0453

MRI 在颈部良恶性淋巴结病变诊断 及疗效评估中的应用

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目的 探讨背景信号抑制扩散成像(DWIBS)结合 MRI 常规序列在颈部淋巴结良恶性鉴别诊断及淋巴源性肿瘤疗效评估中的应用价值。**方法** 48 例经病理或随访证实的颈部淋巴结肿大患者行 DWIBS 及常规 MRI 检查,其中,83 枚恶性淋巴结,79 枚良性淋巴结。对 16 例恶性淋巴结病变患者进行放化疗后复查,比较淋巴结实质部分的 ADC 值。**结果** DWIBS 序列较常规序列可发现更多的淋巴结。恶性淋巴结实质部分的 ADC 值为(0.898±0.111)×10-3 mm2/s,低于良性淋巴结的 ADC 值(1.043±0.106)×10-3 mm2/s,差异有统计学意义(P <0.05)。所有恶性淋巴结病变治疗后的 ADC 值为(1.205±0.121)×10-3 mm2/s,较治疗前的 ADC 值(0.883±0.090)×10-3 mm2/s 明显升高,差异有统计学意义(P <0.05)。**结论** DWIBS 序列在检出淋巴结方面较常规 MRI 序列更为敏感。ADC 值在鉴别淋巴结良恶性及疗效评估方面有一定的参考价值。

EPO-0454

MRI 在颈部良恶性淋巴结病变诊断及疗效评估中的应用

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的　讨论背景信号抑制扩散成像（DWIBS）结合 MRI 常规序列在颈部淋巴结良恶性鉴别及淋巴源性肿瘤疗效评估中的应用价值。**方法**　回顾性分析 67 例经病理结果或随访证实的颈部淋巴结肿大患者行 DWIBS 及常规 MRI 检查，其中恶性淋巴结占 42 例，良性淋巴结占 25 例。对 30 例恶性淋巴结患者进行放化疗后 MRI 复查，对比其实质部分的 ADC 值。**结果**　DWIBS 序列较常规序列可发现更多的淋巴结。恶性淋巴结实质性部分 ADC 值为（0.816±0.108）×10－³㎜²/s，低于良性淋巴结的 ADC 值（1.021±0.093）×10－³㎜²/s，差异有统计学意义（P＜0.05）。所有恶性淋巴结病变治疗后的 ADC 值为（1.208±0.111）×10－³㎜²/s，较治疗前的 ADC 值（0.816±0.108）×10－³㎜²/s 明显升高，差异有统计学意义（P＜0.05）。**结论**　DWIBS 序列在检出淋巴结方面较常规序列更具优势。ADC 值在鉴别淋巴结良恶性及疗效评估方面具有一定参考价值。

EPO-0455

Diagnostic value of multi-parameter MRI-based 3D radiomic features in differentiating malignant from benign lacrimal epithelial tumors: A pilot study (English paper competition)

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Purpose: To explore the diagnostic value of multi-parameter MRI-based 3D radiomic analysis to identify features that can be used to distinguish benign and malignant lacrimal epithelial tumors by MRI characterizing tumor heterogeneity.
material and method: A total of 43 patients with lacrimal epithelial tumor confirmed by postoperative pathology after surgical resection were retrospectively enrolled,28 cases with benign pleomorphic adenoma group and 15 patients with malignant lacrimal epithelial tumor. A total of 66 radiomic features were generated automatically from Artificial Intelligence Kit software, including first order-histogram features, high order-texture features and morphological features. The diagnostic performance of each parameter between benign and malignant groups was compared, and the ROC curve was plotted to assess the diagnostic efficacy. Besides, the differentiating value from the presence (N=?) from absence(N=?) of tumor capsule invasion was assessed.Results: One of the features based on tumor morphology-Spherical Disproportion,with AUC values (area under the curve) of 0.867, 0.900, 0.910, 0.926, and 0.721, respectively. The AUC value was 0.955 in combination with T2 STIR and axial T1WI enhancement sequence, and SD value was significantly higher in malignant group than benign group. Surface Volume Ratio signs (SVR) derived from T1WI, axial enhanced T1WI, T2WI, STIR and coronal enhanced T1WI sequences was found having potential to identify the presence of tumor capsule invasion with AUC values of 0.848, 0.883, 0.825, 0.854 and 0.854, respectively. More surprisingly, the SVR was higher in the non-infiltrated group than in the

infiltrated group.Conclusion: Radiomic features based on multi-parameter MRI which characterized tumor heterogeneity has important significance for the benign and malignant differentiation of lacrimal gland epithelial tumors. Among them, spherical disproportion is the best biomarker which has high diagnostic efficiency in the benign and malignant differentiation, and the value of malignant group is higher than the benign group. Meanwhile, the Surface Volume Ratio (SVR) of the non-infiltrating group was higher than the infiltrating group in the cases of tumor capsule invasion.

EPO-0456

DTI 对糖尿病视神经病变临床诊断价值

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目的：探讨磁共振弥散张量成像技术在糖尿病视网膜病变不同分期中视神经病变的诊断价值。**方法：**选取我院眼科病区糖尿病患者与非糖尿病患者各 30 例，分别作为观察组、对照组，均于我院医学影像科行眼部视神经眶内段 GE 3.0TMRI 弥散张量成像扫描，GE ADW4.6 Functool 后处理软件行图像后处理，获得糖尿病患者双侧视神经多衍生参数各向异性（FA）、平均扩散系数（MD）、平行扩散系数（$\lambda_{//}$）及垂直扩散系数（$\lambda_{\perp}$），对多衍生参数进行对比、记录并行统计分析，对不同衍生参数结合糖尿病视神经病变分期行统计学相关性分析。**结果：**DTI 多衍生参数在糖尿病视神经病变的患者的诊断中具有统计学意义（$P<0.05$），即 DTI 多参数成像在糖尿病视神经病变患者中具有显著差异性；DTI 多衍生参数与糖尿病视神经病变的分期具有相关性，其中 FA、MD 与病变分期呈正相关，而 $\lambda_{//}$、$\lambda_{\perp}$与病变分期呈负相关。**结论：**磁共振弥散张量成像技术对糖尿病视网膜病变患者视神经病变具有一定的诊断价值，同时 DTI 衍生参数为视神经病变分级提供了重要的参考依据。

EPO-0457

Abnormal resting-state functional connectivity of amygdala in primary angle-closure glaucoma

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Background: Glaucoma is the second leading cause of blindness and affected patients are at a high risk of anxiety and depression. However, the neural mechanisms underlying glaucoma-induced anxiety and depression remain unknown.
Purpose: The purpose of this study was to investigate alterations in amygdala-based emotional processing circuits in primary angle-closure glaucoma (PACG) patients by using resting-state functional connectivity (FC) analysis.
Materials and methods: Thirty-seven patients with PACG (20 men and 17 women) and 36 healthy controls (20 men and 16 women) closely matched for age, sex, and education, underwent resting-state magnetic resonance imaging scans. A seed-based correlation analysis was performed to investigate altered FC of the amygdala. A voxel-wise FC method was used to explore differences in amygdala FC patterns between the two groups.

Results: Compared with healthy controls, PACG patients showed reduced FC from the left amygdala to the bilateral brainstem, right thalamus, and left superior frontal gyrus; they also showed enhanced FC from the left amygdala to the left middle temporal gyrus, right inferior temporal gyrus, and left cuneus. In addition, PACG patients showed reduced FC from the right amygdala to the right cerebellum_4_5 and enhanced FC from the right amygdala to the right inferior temporal gyrus and right calcarine (two tailed, voxel-level: P<0.01, GRF correction, cluster-level: P<0.05).
Conclusion: Our results highlighted that PACG patients had abnormal FC between the amygdala and each of the following: superior frontal gyrus, thalamus, temporal gyrus, and visual cortices. This offers novel insights into the understanding of neural mechanisms underlying depression in PACG patients.

EPO-0458

Altered effective connectivity of primary visual cortex in primary angle-closure glaucoma using granger causality analysis

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Background: Previous neuroimaging studies demonstrated that PACG patients were associated with abnormal intrinsic brain activity in primary visual cortex(V1).
*Purpose:*The purpose of this study was to investigate the effective connectivity (EC) patterns of V1 in PACG patients.
*Materials and methods:*37 patients with PACG (26 males and 20 females) and 36 healthy controls (HCs) (26 males and 20 females) closely matched for age, sex, and education, underwent resting-state magnetic resonance imaging scans. A voxel-wise Granger causality analysis (GCA) on the resting-state fMRI data between the primary visual cortex and the whole brain was performed to explore differences between the two groups.
*Results:*Compared with HCs, PACG patients showed a decreased EC from the left V1 to left cuneus and increased EC from the left V1 to left precentral gyrus and right supplementary motor area. Meanwhile, PACG patients showed decreased EC from left precentral gyrus to left V1 and right frontal middle gyrus to left V1. Also, PACG patients showed a decreased EC from the right V1 to left cuneus/calcarine and increased EC from the right V1 to left inferior frontal gyrus and right caudate. Meanwhile, PACG patients showed decreased EC from right middle frontal gyrus/precentral gyrus to right V1 and left precentral gyrus to right V1.
*Conclusion:*Our results highlighted that PACG patients had abnormal EC between V1 and higher visual area, motor cortices, somatosensory cortices and frontal lobe, which indicated that the PACG patients might present with abnormal top-down modulations, visual imagery, vision-motor function and vision-related higher cognition.

EPO-0459

眼眶 MR 脂肪定量分析对 Graves 眼病的临床价值

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【目的】 应用 MR 水-脂分离成像（Dixon）技术测量 Graves 眼病（GO）病人与健康志愿者眼外肌和泪腺的脂肪分数（FF），探讨眼眶 MR 脂肪定量分析在 GO 病人诊断与治疗的价值。【方法】前瞻性收集 2017 年 2 月-2019 年 2 月期间由中山大学附属第一医院确诊的 38 例 GO 患者以及 20 例正常志愿者行眼眶 MR 检查，所有受试者均采用斜冠状 T2WI_FSE 并加 Dixon 技术分别对两侧眼眶进行扫描，然后通过测量同侧各条眼外肌及泪腺在水相和脂相图的信号强度值并计算 FF，计算公式为 FF=［$M_{fat}/(M_{fat}+M_{water})$］×100%，式中 M_{fat}、M_{water} 分别指脂像及水像感兴趣区信号强度值。采用 Mann-Whitney U 检验分析两组患者的眼外肌、泪腺的平均 FF 的差异，采用 Spearman 秩相关分析评价 GO 患者眼外肌 FF 与 TRAb、CAS 评分、GO 病程之间的相关性。【结果】 GO 组的眼外肌 FF 均大于正常对照组，具有统计学差异（P<0.05），而两组的泪腺 FF 无差异。GO 组的眼外肌 FF 与 TRAb、CAS 评分及 GO 病程存在相关关系（P<0.05），其中以与 GO 病程的相关程度为著。【结论】 GO 患者的眼外肌脂肪含量高于正常人平均值，并与 TRAb、CAS 评分及 GO 病程存在不同程度的正相关关系，提示了 MR 脂肪定量分析在评估 GO 病人临床分期及疗效评估可提供新的参考指标。

EPO-0460

眼眶淋巴瘤的 CT 和 MR 影像特点

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【摘要】 目的 探讨眼眶淋巴瘤的 CT 和 MR 影像特点，为临床提供更多有价值的影像学信息。**方法** 回顾性分析 9 例（共 10 眶）经病理诊断明确的眼眶淋巴瘤的 CT 及 MR 影像学表现，包括病变的位置、形态、密度及信号，强化方式及其与邻近结构关系。 **结果** 纳入 10 眶病例的临床表现主要以眼球突出、眼睑肿物为主；纳入 10 眶病变中跨越 2 个区域或以上的有 7 例；8 例为弥漫型，2 例为局限型；CT 密度以同层面眼外肌密度为参照均为均质稍高密度，增强扫描呈均质（1 例）或不均质（3 例）中等强化；MR 同样以同层面眼外肌为参照，病变为均质 T1WI 呈等、稍低信号，T2WI 呈稍高信号；眼外肌有两个或以上受累者有 6 例。**结论** 眼眶淋巴瘤影像学表现有一定的特征性，好发于眶隔前区及泪腺区，病变密度及信号均匀，增强扫描呈轻至中度强化，可以为临床诊断及治疗提供重要的参考价值。

EPO-0461

Imaging findings of solitary fibrous tumors in the orbit

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Objective:To analyze the computed tomography(CT)and magnetic resonance imaging(MRI)findings of solitary fibrous tumors(SFTs)in the orbit and to evaluate its clinical,histologic features and prognosis.

Materials and Methods:We retrospectively reviewed clinical,CT,MRI,and pathological findings in nine patients (5men and 4 women),aged 22 to 59 years,with SFTs proven on histologic examination in and around the orbit.Of the nine patients,six had undergone CT scanning and five had undergone MR imaging.We evaluated the imaging findings with

emphasis on the location,shape,size,margin,internal architecture,and pattern of enhancement of the lesions.Clinical data were retrieved from the medical records.Immunohistochemistry for CD34,vimentin,CD31, CD99,B-cell lymphoma protein 2(bcl-2),S-100 protein,smooth muscle antibody(SMA)and cytokeratin(CK)was performed.Prognosis was assessed by clinic service and telephone interview.
Results: Five were located in the postseptal orbit, 2 in the suborbital region,and 2 in the lacrimal sac.All nine lesions were found as a solitary mass,ranging in size from 1.6 to 3.6 cm(mean,2.6cm).They presented irregular shape in 2/9 patients and ovoid in 7/9.The margin was ill-defined in 1/9 patients and well-defined in 8/9. All the cases showed isointensity masses on unenhanced CT images. Contrast-enhanced CT images showed marked,heterogeneous enhancement in 3 cases,homogeneous mass in 1 case.None of the tumors showed calcification.All the cases showed isointensity on T1-weighted MR images and heterogeneous hyperintense on T2-weighted images,compared with muscle and marked heterogeneous enhancement with hypointense foci on contrast-enhanced T1-weighted images.And hypointense linear septa were observed within two cases.Erosion of the orbital floor was present in one case.Components with decreased apparent diffusion coefficient(ADC)were seen on DWI.The time-intensity curves(TIC)exhibited a rapidly enhancing and slow washout pattern on dual-phase CT and DCE-MRI.Imaging findings of the SFTs depended on the histopathological components.The presence of rounded or linear low-intensity foci is attributable to the collagen content,low cellularity,and associated reduced proton mobility.And SFTs also are vascular tumors that are vigorously enhancing.
Conclusion:SFTs most commonly present in adult man with asymptomatic mass.A solitary,ovoid and well-defined mass with strongly enhancment after contrast agents injection are suggestive of this diagnosis.Restricted diffusion and rapidly enhancing and slow washout pattern TIC may be additional valuable features.The prognosis of SFTs might be highly related to the situation of its initial treatment and total resection is associated with longer progression-free survival.

EPO-0462

磁共振在 IgG4 相关性眼病中的诊断价值

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目的： 分析 IgG4 相关性疾病眼眶受累（IgG4-ROD）的磁共振表现，提高对其认识。
方法： 回顾性分析 18 例经手术病理检查证实 IgG4-ROD 患者 MR 表现。分析 MR 图像病变部位、双侧还是单侧、形状、边缘、眶内结构、T1WI 及 T2WI 信号特点及强化方式。
结果： 6 例患者表现为泪腺增大，其中 4 例双侧对称增大，2 例单侧增大；7 例表现为肌锥内外软组织肿块，其中 2 例多发，5 例多发；1 例眼外肌增粗；4 例表现为沿三叉神经分支走行区多发病变。8 例可见看到眶下神经增粗。平扫 T1WI 呈等、稍低信号，T2WI 压脂呈稍高信号，增强后明显强化。14 例行动态增强检查，时间-信号曲线均表现为快速上升缓慢流出的 II 型曲线。
结论： IgG4-ROD 会累及泪腺、眼外肌、内眦、肌锥外间隙等，眶下神经增粗和沿三叉神经分支浸润性生长是该病特征性表现，认识了解 IgG4-ROD 典型影像学表现，对诊断提高诊断率有帮助。
【关键词】

EPO-0463

Value of magnetic resonance imaging in patients with IgG4-related ophthalmic disease

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OBJECTIVE: To evaluate MRI findings of IgG4-related ophthalmic disease.
METHODS: Study subjects included 18 patients with histopathologically proven IgG4-ROD. MR images were retrospectively evaluated for location, laterality, shape, margin, T1 and T2 signal intensity on precontrast MRI, internal architecture, ocular adnexal lesion enhancement patterns.
RESULTS: The lesions involved the lacrimal gland (n=6), focal mass (n=7), extraocular muscles (n=1). All lacrimal gland lesions presented as diffuse enlargements. 4 patients had lesions involving multiple areas which extended along the trigeminal nerve, accompanied by expansion of neural foramina along their courses, with no signs of bone destruction. Infraorbital nerve enlargement was present in 8 cases. All ocular adnexal lesions showed isointensity on T1- and hypointensity on T2-weighted images, homogenous enhancement patterns and bone remodelling without destruction. TIC exhibited a rapidly enhancing and slow washout pattern in 14 patients.
CONCLUSIONS: IgG4-ROD can involve the lacrimal gland, extraocular muscles, medial canthus, extraconal space, and infraorbital nerves, and pterygopalatine fossa. Recognition of the typical radiological features of IgG4- ROD may be of help in the diagnosis of this benign clinical entity.

EPO-0464

Histogram Analysis Parameters ADC for Distinguishing Orbital Tumors of Lymphoma,Pleomorphic Adenoma and Adenoid Cystic Carcinoma

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Objective: To determine if histograms of ADC can be used to differentiate orbital lymphoma,pleomorphic adenoma(PA) and adenoid cystic carcinoma(ACC).

Materials: 45 patients with confirmed histologically orbital lymphoma in 20(44.45%) patients,PA in 15(33.33%) patients,and ACC in 10(22.22%) patients were enrolled in the study,accepting MRI at 3T. The ROIs were drawn on the maximum level of ADC,and the histogram analysis were performed using the software named Mazda.One-way ANOVA and Kruskal-Wallis test were performed on the nine histogram parameters to find out the different characteristics.LSD and Bonferroni test were used between any two of the three groups and the ROC curve was drawn to evaluate the diagnostic efficacy.

Results:Histogram metrics derived from mean,Perc.01%,Perc.10%,Perc.50%,Perc.90% and Perc.99% were significantly lower in lymphoma than ACC. Lymphoma was significantly lower mean,Perc.01%,Perc.10%,Perc.50% and Perc.90% than PA. Optimal diagnostic performance to predict lymphoma from ACC (AUC= 0.96,sensitivity = 100.00%,specificity =86.70%) was obtained when setting Perc.99%= 132.00 as the threshold value. A threshold value of 95.50 for Perc.50% had the best diagnostic efficacy to predict lymphoma from PA(AUC= 0.80,sensitivity = 70.00%,specificity =100.00%).

Conclusions:The ADC histogram analysis may help to discriminate orbital tumors of lymphoma,PA and ACC.

EPO-0465

Histogram Analysis Parameters T2WI for Distinguishing Orbital Tumors of Lymphoma,Pleomorphic Adenoma and Adenoid Cystic Carcinoma

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Objective: To determine if histograms of T2WI can be used to differentiate orbital lymphoma,pleomorphic adenoma(PA) and adenoid cystic carcinoma(ACC).

Materials: 63 patients with confirmed histologically orbital lymphoma in 27(42.86%) patients,PA in 26(41.27%) patients, and ACC in 10(15.87%) patients were enrolled in the study,accepting MRI at 3T. The ROIs were drawn on the maximum level of T2WI,and the histogram analysis were performed using the software named Mazda. One-way ANOVA and Kruskal-Wallis test were performed on the nine histogram parameters to find out the different characteristics. LSD and Bonferroni test were used between any two of the three groups and the ROC curve was drawn to evaluate the diagnostic efficacy.

Results:Histogram metrics derived from variance,skewness and Perc.99% were significantly lower in lymphoma than PA. Lymphoma were significantly higher Kurtosis than PA. Lymphoma was significantly lower variance,Perc.90% and Perc.99% than ACC. A threshold value of 150.39 for variance had the best diagnostic efficacy to predict lymphoma from PA(AUC= 0.86, sensitivity = 76.00%,specificity =88.50%). Optimal diagnostic performance to predict lymphoma from ACC (AUC= 0.86, sensitivity = 77.80%, specificity =100.00%) was obtained when setting variance= 274.56 as the threshold value.

Conclusions:The T2WI histogram analysis may help to discriminate orbital tumors of lymphoma,PA and ACC.

EPO-0466

Utility of T2 mapping in the staging of thyroid-associated ophthalmopathy: efficiency of region of interest selection methods (English Paper Contest)

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Purpose: To investigate the performance of T2 mapping based on different region of interest (ROI) selection methods in the staging of thyroid-associated ophthalmopathy (TAO).
Material and Methods: Thirty-two TAO patients were retrospectively enrolled. Two radiologists independently measured the T2 relaxation time (T2RT) of extraocular muscles using two different ROIs (hotspot [ROI_{HS}]: T2RT-hot; single-slice [ROI_{SS}]: T2RT-mean, T2RT-max, T2RT-min). Independent-samples t test, pearson correlation analysis, receiver operating characteristic (ROC) curves analyses, multiple ROC comparisons, Bland-Altman method, and intra-class correlation coefficient (ICC) were used for statistical analyses.
Results: No significant difference was found in the measuring time between ROI_{HS} and ROI_{SS} methods ($P = 0.089$). T2RT-mean demonstrated the highest ICC for measurement, followed by T2RT-max and T2RT-min, and T2RT-hot showed the poorest reproducibility. Active TAOs showed significantly higher values for all the T2RTs than inactive mimics (all $P < 0.001$). Significant positive correlations were found between T2RTs and CAS (all $P < 0.001$). T2RT-hot and T2RT-max showed significantly higher area under curves than that of T2RT-mean ($P = 0.013$ and 0.024, respectively), whilst the difference between T2RT-hot and T2RT-max was not significant ($P = 0.970$).
Conclusion: The T2RTs derived from both ROI selection methods could be useful for the staging of TAO. The results of measuring time, reproducibility, and diagnostic performance suggest that T2RT-max would be the optimal indicator for staging.

EPO-0467

T2 mapping in orbital masses: preliminary study on differential diagnostic ability of T2 relaxation time

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Abstract
Background: T2 mapping has been proven to be useful in tumor characterization. As to orbital masses, its diagnostic value needs to be investigated.
Purpose: To evaluate the usefulness of T2 mapping in orbital masses, and the ability of T2 relaxation time in differentiating malignant from benign orbital masses.
Materials and Methods: Forty-seven patients with solid orbital masses (33 benign and 14 malignant) who underwent T2 mapping examination for pre-operation assessment were enrolled in the current study. T2 mapping was acquired using 16 TE values (range, 12-192 ms; delta TE, 12 ms). Mean T2 relaxation time was calculated based on the whole

mass region of interest, and compared between malignant and benign group using unpaired *t* test. Receiver operating characteristic curve analysis was adopted to calculate its diagnostic value.
Results: Malignant orbital masses showed significantly lower T2 relaxation time than benign masses (76.4 ± 13.0 ms vs 119.1 ± 20.4 ms; p<0.001). If setting a T2 relaxation time of 89.5 ms as the threshold value, optimal differentiating performance could be achieved (area under the curve, 0.936; sensitivity, 100.0%; specificity, 87.9%; accuracy, 91.5%; PPV, 77.8%; NPV, 100.0%).
Conclusion: T2 mapping and its derived T2 relaxation time could provide quantitative information, and serve as a supplementary imaging marker for differentiating malignant from benign orbital masses.

EPO-0468

Cerebral Blood Flow Alterations In High Myopia: An Arterial Spin Labeling (ASL) Study

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Objective The aim of this study is to explore the cerebral blood flow (CBF) alterations in high myopic (HM) subjects using three-dimensional pseudo-continuous arterial spin labeling (3D-pcASL).
Methods A total of 16 patients with binocular HM (7 males and 9 females) and 16 normal controls (HCs) (7 males and 9 females) closely matched by age, sex were recruited, 3D-pcASL sequence was performed in all subjects. The CBF generalized from pcASL sequence were normalized to reduce the inter-subject variations. Independent t-test and pearson correlation analysis were applied in this study. The receiver operating characteristic (ROC) curve method was performed to classify the mean CBF values of the HM subjects from HCs.
Results Compared with HCs, HM patients exhibited increased CBF in two clusters located in right and left side, respectively (all P<0.05). The abnormal clusters involved bilateral cerebellum, occipital lobe and fusiform gyrus. However, no significant differences were observed in the rest of brain regions. The area under the curve (AUC) of CBF values of the two clusters were as follows: left cluster (0.922), right cluster (0.949) (HM > HC).
Conclusions HM patients may exhibit increased CBF in bilateral cerebellum, occipital lobe and fusiform gyrus, which may help to understand the HM-related brain deficits. However, the causal relationships between high myopia and abnormal brain alterations need further investigation.

EPO-0469

T2 mapping of the extraocular muscles in healthy volunteers: preliminary research on scan-rescan and observer-observer reproducibility

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Background: T2 mapping technique and derived T2 relaxation time allows quantitative assessment of extraocular muscles (EOMs); however, the reproducibility of T2 mapping derived parameters was seldom studied till now.
Purpose: To evaluate the scan-rescan and observer-observer reproducibility of T2 relaxation time measurements of EOMs in young healthy volunteers.
Materials and Methods: Fourteen volunteers underwent T2-mapping examinations of the EOMs three times within one month on a 3.0T MR system. Scan-rescan and observer-observer reproducibility of T2 relaxation time measurements of the EOMs were assessed using intraclass correlation coefficient (ICC) and coefficient of variation (CV).
Results: Both scan-rescan (short-term and long-term) and observer-observer could achieve good to excellent reproducibility, while better short-term scan-rescan reproducibility was obtained than long-term. The CVs of the T2 relaxation time of each EOMs during both scan-rescan and observer-observer reproducibility assessment were less than 6%.
Conclusions: T2 relaxation time measurement of the EOMs is proven to be highly reproducible at 3.0T. T2 mapping may be a potential imaging technique in the diagnosis and follow-up of orbital diseases involved EOMs in further studies.

EPO-0470

Thyroid-associated orbitopathy: evaluating microstructural change of extraocular muscles and optic nerve using readout-segmented echo-planar imaging-based diffusion tensor imaging

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Objective: We aimed to investigate the ability of readout-segmented echo-planar imaging (rs-EPI)-based diffusion tensor imaging (DTI) in assessing the microstructural change of extraocular muscles (EOM) and optic nerve in thyroid-associated orbitopathy (TAO) patients, and furthermore assisting in disease stage.
Materials and Methods: We enrolled thirty-five TAO patients and 22 healthy controls (HCs) who underwent pretreatment rs-EPI-based DTI. Mean, axial and radial diffusivity (MD, AD, RD) and fraction anisotropy (FA) of medial and lateral EOM as well as optic nerve for each orbit were calculated and compared between TAO and HC groups, or between active and inactive TAO groups. The differences of age, gender, disease

duration, mediation and smoking history between groups were also compared. Logistic regression analysis was used to evaluate the stage value of significant variables.
Results: Disease duration was significantly decreased in active TAOs than inactive ones (P<0.001). TAO patients showed significantly lower FA and higher MD, AD and RD than HCs for both medial and lateral EOMs (P<0.001), except the AD value of lateral EOM (P=0.619). Active patients had significantly higher FA, MD and AD than inactive patients for medial EOM (P<0.005), whereas only FA differed significantly in the lateral EOM (P=0.018). For optic nerve, MD, AD and RD were significantly lower in TAOs than HCs (P<0.05), except FA (P=0.129). Multivariate analysis showed that MD of medial EOM and disease duration were significant predictors of disease activity. Combination of the two parameters showed optimal stage value (area under the curve, 0.855; sensitivity, 68.4%; specificity, 96.9%).
Conclusion: rs-EPI-based DTI is promising in assessing the microstructural change of EOM and optic nerve, and can help to indicate disease activity of TAO, especially the MD of medial EOM.

EPO-0471
第三代双源 CT 双能量单能谱成像技术优化眼动脉显示的应用价值探索

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【摘要】目的 探讨第三代双源 CT 单能谱成像技术优化眼动脉显示的应用价值。**方法：**回顾性收集 35 例行双能量头颈部 CTA 检查的患者,将扫描后高低 kV 两组数据导入西门子 Syngo.via 后处理工作站，采用单能谱+后处理模块（Monoenergrtic plus）对图像进行处理，在 40-190keV 范围内选择 40~70 keV，间隔 5 keV，分别保存 40keV、45 keV、50keV 、55keV、 60keV、65 keV 、70keV 等 7 组图像。分别测量眼动脉起始段颈内动脉、外直肌及肌锥内脂肪的 CT 值、SD 值，计算眼动脉的对比噪声比(CNR)，记录最佳 CNR 所对应的 keV 值，并比较最佳 keV 组和 120KV 平均加权组的图像质量，采用容积重建(VR)、最大密度投影(M1P)等多种后处理方法，将最佳单能量图像与平均加权图像进行比较,由两位 5 年以上工作经验的诊断医生采用 5 分法对眼动脉图像质量进行主观评分；客观评价指标包括眼动脉的 CT 值,图像噪声和 CNR。
结果：最佳单能量图像显示眼动脉的主观评分高于平均加权图像,差异有统计学意义(c^2=210.573，P＜0.05)。眼动脉 CTA 最佳单能量图像的对比噪声比、信噪比、眼动脉 CT 值均高于平均加权图像,两者差异有统计学意义(P＜0.05)。
结论：在不提高扫描条件的情况下，40keV 单能量图像与 120KV 平均加权图像比较能够更好地显示眼动脉

EPO-0472
MR Imaging of Adenomas of the Retinal Pigment Epithelium: a report of 8 cases

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Background and purpose: Adenoma of the retinal pigment epithelium (RPE), a rare intraocular tumor, is always misdiagnosed as uveal melanoma. However, the treatment of RPE tumor is quite different from that of the uveal melanoma. Generally, resection was performed in RPE adenoma while plaque brachytherapy in uveal melanoma. Therefore, it is essential to evaluate the MR imaging features of RPE adenoma.
Materials and methods: MR imaging findings of 8 patients with pathologically confirmed adenoma of the RPE were retrospectively reviewed. Post contrast-enhanced MR images were performed in all patients, among which 5 patients performed dynamic contrast-enhanced MR imaging (DCE-MRI) while time–intensity curves (TICs) and maximum contrast index (CImax) were analyzed. Location, size, shape, margin, signal intensity, and degree of enhancement of the tumors were evaluated. A dark-linear sign, which has never been reported before, was depicted and evaluated in RPE patients.
Results: A well-defined, homogenous mass with hyperintense on T1WI and hypointense on T2WI compared to vitreous body were manifested in 8 cases. An oval masse was seen in 5 cases, a lentiform masse in two cases, and a placoid-shaped mass in one case. Compared to the gray matter, the tumor presented hyperintense on T1WI in 7 cases, and isointensity on T1WI in one case. However, the tumor manifested hypointense on T2WI in 7 cases, and isointensity on T2WI in one case. 5 cases of RPE tumor revealed mild enhancement, and 3 cases showed moderate enhancement on fast-suppressed post contrast-T1-weighted image compared to the lacrimal gland. Dark-linear sign was demonstrated in 8 patients on the post contrast T1-weighted images. A plateau-shaped TICs were demonstrated in 5 patients and CImax ranged from 0.35 to 0.46(median, 0.37).
Conclusions: Adenoma of the RPE should be considered in the diagnosis of an oval mass with hyperintense on T1WI and hypointense on T2WI compared to the gray matter, a dark-linear sign, and mild to moderate enhancement. The dark-linear sign may be a hallmark sign, which should be further verified.

EPO-0473
Graves Ophthalmopathy (English Microclass Competition)

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[Clinical and Pathology]
Graves eye disease is also known as thyroid-related eye disease, It is an autoimmune disease that affects thyroid gland, orbital soft tissue and subcutaneous tissues of limbs, more common in middle-aged women. It may manifest as hyperthyroidism, hypothyroidism, or normal thyroid function, and may occur before, after, or at the same time as thyroid dysfunction. The diagnosis of Graves ophthalmopathy with normal thyroid function mainly depends on medical imaging.
The pathological changes are extraocular muscle edema, mainly with chronic inflammatory cell infiltration at early stage, and fibrosis at late stage, which generally occurred in the extraocular muscle belly, while the tendon part is generally not affected. Pathology confirmed Graves ophthalmopathy is mainly differentiated from other ophthalmopathy by two major features: thickening of extraocular muscle belly and increase of connective tissue behind the bulbus oculi. However, pathological biopsy is

somewhat traumatic and difficult to accept by patient, so medical imaging examination is increasingly applied in clinical practice.

[Imaging Manifestations]

CT findings: 1External ocular muscle thickening: most often involving the lower rectus, followed by internal rectus, upper rectus and upper eyelid levator muscles, the external rectus is occasionally involved, which is characterized by hypertrophy in muscle belly while the tendon is normal. Extraocular muscle thickening can reach 3-4 times of the normal volume, the thickened muscle density is uniform, and CT value can increase after enhanced CT scan. 2The orbital diaphragm move forward, due to the intraorbital fat increase, and the space behind the bulbus oculi is extremely clear. 3Protrusion of the bulbus oculi. 4Thickening of the optic nerve: thickening of the extraocular muscle can compress the optic nerve into edema and thickening. The thickened optic nerve has a clear border and uniform density.

MR findings: compared with normal extraocular muscles, the affected extraocular muscles showed low signal on T1WI, high signal on T2WI, and low signal on fibrotic muscle. In GD-DTPA enhanced scan, mild enhancement is observed in the early and middle stages of lesions. Except for intraorbital malignancies and hematomas, this signal changes are not significantly different from that of extraocular muscle thickening caused by other diseases. No enhancement is observed in late fibrosis.

The imaging diagnosis is based on the thickening of the extraocular muscle while the non-thickening of the tendon. The difference between this disease and inflammatory pseudotumor is that muscle belly and tendon are both affected in inflammatory pseudotumor. Carotid cavernous sinus fistula can cause uniform thickening of the extraocular muscle, accompanied by signs of dilatation of the superior ophthalmic vein and cavernous sinus, and the clinical manifestation is pulsating proptosis.

[Significance of imaging examination of Graves ophthalmopathy]

The positive rate of extraocular muscle thickening in imaging examination is higher than that in clinical findings, and extraocular myopathy appear earlier than clinical symptoms. Therefore, imaging examination can detect characteristic orbital lesions before the occurrence of hyperthyroidism, so as to make early diagnosis of Graves ophthalmopathy. After treatment, most patients' imaging changes are consistent with clinical symptoms, and the thickening degree of extraocular muscle is negatively correlated with the course of treatment and the efficacy, so imaging findings can be used as one of the evaluation indexes of efficacy. Imaging examination can be an important basis for early diagnosis and efficacy evaluation of Graves ophthalmopathy.

EPO-0474

眼眶海绵状血管瘤的影像诊断（参加中文微课比赛）

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摘要：
目的：研究眼眶海绵状血管瘤的影像学征象。
方法及结果：海绵状血管瘤是成人最常见的眶内原发肿瘤，女性较男性多见。类圆形占位病变，边界清楚，肿瘤表现为软组织密度，CT 值大于 50Hu，密度均匀，也可不均匀，少数可见钙化点或静脉石，增强后呈中度或高度强化，强化后可达 70Hu 以上。由于肿瘤压迫可致眶内正常结构的移

位，病史较长者可有一致性眶腔扩大。眶尖可见球后脂肪残留，即“眶尖空虚征”， CT 诊断具有“渐进性强化”征象，CT 平扫检查可见病灶形态不规则，且存在弥漫状生长，有点状高密度影存在病变区域。MRI 肿瘤的空间位置、形态及强化特点同 CT 表现，肿瘤信号在 T1WI 为中等偏低信号。T2WI 为中等偏高信号；眶尖可见球后脂肪残留。MRI 诊断后同样也具有“渐进行强化”征象，T2WI 表现为高信号，T1WI 以中低信号为主。
结论：在眼眶海绵状血管瘤的诊断过程中，CT、 MRI 对于患者疾病定性诊断和定位诊断的准确率均较高 ，因此值得优先推广使用。

EPO-0475
DWI 和 T2 Mapping 定量诊断甲状腺相关视神经病变的价值

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目的：初步探讨扩散加权成像（Diffusion weighted imaging, DWI）与 T_2弛豫时间参数图（T_2 mapping）诊断甲状腺相关视神经病变（Dysthyroid Optic Neuropathy,DON）的价值。
材料与方法: 收集 2017 年 2 月-2019 年 2 月期间由中山大学附属第一医院确诊的 TAO 患者 30 例，其中 DON（DON 组）、非 DON 的 TAO 患者（非 DON 组）各 15 例（30 只眼），同期收集 15 例正常志愿者（30 只眼），所有受试者均行眼眶多回波自旋回波 T_2 mapping 及 DWI 成像，由 2 位医师在不知分组情况下分别在后处理工作站测量各组双侧视神经的 T_2值及 ADC 值。采用单因素方差分析比较不同组别受试者间视神经平均 T_2值及 ADC 值的差异。应用 Spearman 秩相关分析评价 TAO 患者组平均 T_2值、ADC 值与 CAS 评分的相关性。
结果：DON 组双侧视神经 ADC 值与志愿者组、非 DON 组均存在显著差异（P 均＜0.05），双侧视神经的 ADC 值按照志愿者组、非 DON 组、DON 组依次升高，依次为（0.969±0.018）×$10^{-3}$$mm^2$/s,（1.033±0.027）×$10^{-3}$$mm^2$/s,（1.108±0.022）×$10^{-3}$$mm^2$/s。DON 组双侧视神经平均 T_2值与非 DON 组不存在显著差异（P＞0.05），而 DON 与非 DON 组与志愿者间存在显著差异（P＜0.05）。TAO 患者中双侧视神经平均 T_2值、ADC 值均与 CAS 评分呈正相关（r_s=0.328, r_s=0.317,P 均＜0.05）。
结论:DWI 有助于诊断甲状腺相关视神经病变，而甲亢相关眼病患者视神经 T_2值与正常志愿者存在一定的差异，为 T_2 mapping 预测甲状腺相关视神经病变提供了可能性。

EPO-0476
Relationship between MR imaging features and pathological types of uveal melanoma in adults

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Objective To study the relevance of MR imaging findings and pathological types of uveal melanoma in adults.**Methods** A retrospective study was carried out on MR imaging findings of 101 patients with uveal melanoma confirmed by histopathologic results from 2005 to 2015 in Beijing Tongren hospital, 44.5±12.3 (18～78) years,male patients50, female patients51, left eyes 55, right eyes 46, including spindle cell type76 cases, epithelialcell type 12 cases, mixed cell type 13

cases. MR imaging findings of the uveal melanoma were compared with different pathological types by chi-square test and independent t test. **Results**The location, shape, degree of enhancement of the masswere significantly different among three different pathological types of the uveal melanoma（P= 0.006, 0.012, 0.048). The patient gender, age, the margin, secondary retinal detachment,signal intensity on T_1- and T_2WIcompared to the gray matter, homogeneity and degree of enhancement of the mass, height, basal diameter, and ratio of basal diameter to height of the masswere not significantly different. The signal intensity on T_2WIcompared to the gray matter（P= 0.022）, and the homogeneity of enhancement（P= 0.042）of the mass were significantly different between spindle cell type and non-spindle cell type UM.The height of non-spindle cell type（9.4mm±4.5mm）was larger thanspindle cell type（8.2mm±3.2mm）（F= 4.122, P= 0.045）.
ConclusionThere is a correlation between MR features and the pathological types of UM. The shape, location and degree of enhancement of the tumor can help distinguish UM of different pathological types, the homogeneity of enhancement, signal intensity on T_2WIcompared to the gray matter, and the height of the tumor is helpful to identify spindle cell type and non-spindle cell type UM. The homogeneity of enhancement can be used as an MR sign to evaluate the prognosis of UM.

EPO-0477

Comparative research on MR imaging features of dome-shaped and plat-shaped uveal metastases

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Objective To comparetheMR signs of dome-shaped and plat-shaped uveal metastases, and to evaluate the diagnostic value of MR for different forms of uveal metastases. **Methods** A retrospective study was carried out on MR imaging findings of 49 patients with uvealmetastasesconfirmed by histopathologic results or clinical comprehensive diagnosis from 2005 to 2015 in Beijing Tongren hospital, age 52.5±12.3 years old, including 19 males, 30 females, 26 left eyes, 21 right eyes, 2 bilateral eyes. According to lesion morphology, the cases were divided into a flat-shapedgroup (36 cases)and a dome-shaped group (13cases). The clinical manifestations and MR signs of the uveal metastases were compared between the two groups, including patient age, gender, location, morphology, margin, retinal detachment, T_1WIand T_2WIsignals (compared to gray matter), T_1WIand T_2WIsignal uniformity, degree of enhancement, homogeneity, contrast index, height of the mass, the diameter of the base, the ratio of the base and the height were assessed. The Pearson chi-square test was used for the counting data, and the independent sample rank test was used for the measurement data. **Results**The signal homogeneity in T_1WI , degree of enhancement and contrast indexwere significantly different between the flat-shapedgroup and the dome-shaped group of the uveal metastases（χ^2= 4.491, 5.026, 5.914, P = 0.034, 0.025, 0.015）. There were no significant differences in patientgender, side, mass location, morphology, margin, retinal detachment, signal intensity on T_1- and T_2WI(compared to gray matter), signal homogeneityon T2WI（P > 0.05）.The ratio of base diameter to

height was significantly different between the flat group (from 0.8 mm to 11.3 mm, median 2.9 mm) and the dome group (from 1.0 mm to 6.0 mm, median 2.0 mm) (Z=- 1.998, P = 0.046). There were no significant differences in patient age, height of the tumor, and basal diameter (P > 0.05). **Conclusion**The MR signs of dome-shaped and flat- shaped uveal metastases are significantlydifferent. The dome-shaped uveal metastases still have the main characteristics of uveal metastases, such as isointensity on T_1WI and T_2WI. MRIplays an important role in the diagnosis of uveal metastases.

EPO-0478

Diagnostic performance of intravoxel incoherent motion diffusion-weighted MRI in differentiating orbital lymphoma from IgG4-related orbital disease

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PURPOSE: To evaluate the diagnostic performance of intravoxel incoherent motion (IVIM) diffusion-weighted MRI (DWI) in differentiating orbital lymphoma from IgG4-related orbital disease (IgG4-ROD).
MATERIALS AND METHODS: Thirty patients including 16 cases of lymphoma and 14 cases of IgG4-ROD underwent orbital MRI with a 3.0 T MRI scanner using an eight-channel head coil. IVIM-DWI was performed in the axial plane, and routine pre-contrast T1WI, T2WI and post-contrast T1WI were performed. The ADC, true ADC (ADC_{slow}), pseudo-ADC (ADC_{fast}), and perfusion fraction (f) were independently calculated by two radiologists. The independent t-test was used to compare the difference of each parameter between patients with lymphoma and IgG4-ROD. Receiver operating characteristics (ROC) curves analyses were performed to evaluate the diagnostic performance of parameters in distinguishing the orbital lymphomas from IgG4-RODs, and the sensitivity, specificity, and the accuracy were also calculated. The intraclass correlation coefficient (ICC) was calculated to evaluate the reliability of measurements between two radiologists. $P < 0.05$ indicated a statistical significant difference.
RESULTS: The inter-observer agreement was excellent for all evaluated parameters (ICC values from 0.82 to 0.90). Lymphomas showed significantly lower ADC and ADC_{slow} values than the IgG4-RODs for both reviewers ($P < 0.05$). There were no significant differences in ADC_{fast} and f between lymphomas and IgG4-RODs for either reviewer ($P > 0.05$). The cut-off value for ADC was 0.884×10^{-3} mm^2/s (reviewer 1) with sensitivity of 100% (16/16), specificity of 71.43% (10/14), accuracy of 86.67% (26/30), and 0.711×10^{-3} mm^2/s (reviewer 2) with sensitivity of 87.50% (14/16), specificity of 85.71% (12/14), accuracy of 86.67% (26/30). The cut-off value for ADC_{slow} was 0.679×10^{-3} mm^2/s (reviewer 1) with sensitivity of 93.75% (15/16), specificity of 64.29% (9/14), accuracy of 80.00% (24/30), and 0.587×10^{-3} mm^2/s (reviewer 2) with sensitivity of 75.00% (12/16), specificity of 78.57% (11/14), accuracy of 76.67% (23/30). There were no significant differences in AUCs between ADC and ADC_{slow} for either reviewer (reviewer 1: Z=0.137, P=0.8914; reviewer 2: Z=0.368, P=0.7128).

CONCLUSION: IVIM-DWI are useful in differentiating lymphoma from IgG4-ROD, and the parameters of ADC_{slow} and ADC have a significantly higher performance than ADC_{fast} and *f*.

EPO-0479
Multiparametric MR imaging of orbital masses (lecture)

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Background and purpose: Orbital masses in adults comprise a broad spectrum of benign and malignant
diseases including orbital neoplasms and tumor-like disorders. MR imaging plays a valuable role in characterization of these lesions and in evaluation of disease extent. However, it is difficult to differentiate these orbital masses. The paper aims to talk about the role of multiparametric MR imaging in the evaluation of orbital masses. Methods: The role of multiparametric MR imaging will be described. Results and conclusion: Cavernous malformations (also known as cavernous hemangiomas),although not true neoplasms, are the most common benign adult orbital tumor. Lymphoma, which may be primary
or secondary to systemic disease, is the most prevalent orbital neoplasm in older adults (≥60 years of age). Multiparametric MR imaging is the best imaging method in the diagnosis and differential diagnosis of orbital masses.

EPO-0480
Role of diffusion tensor imaging for the detection of dysthyroid optic neuropathy in Thyroid-Associated Ophthalmopathy

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Purpose: this cross-sectional study aims to explore the changes of whole visual pathway in patients with dysthyroid optic neuropathy(DON) with diffusion tensor imaging(DTI) and to investigate the potential of DTI in the diagnosis of DON.
Methods: 23 bilateral DON, 56 TAO without DON and 39 healthy controls were enrolled. Clinical features of 79 patients and DTI parameters of the 118 subjects were analyzed. The MD,FA, and eigenvalue maps were obtained for quantitative analysis. The area under receiver(AUC) operating characteristic curve was employed to evaluate the diagnostic performance of DTI parameters.
Results: For optic nerve, the DON group displayed significantly higher $\lambda_{/\!/}$, $\lambda_{\perp}$, MD and lower FA values than that of TAO and HC(p<0.05, respectively), the TAO group also showed higher $\lambda_{\perp}$, MD and lower FA values than HC group. The FA values of HC in optic chiasm were markedly lower than that of DON and TAO (p=0.003 and 0.031,

respectively). In optic tract, the DON group exhibited higher MD than HC(p=0.013) and lower FA values than TAO and HC, (p=0.009 and <0.001, respectively). The $\lambda_{/\!/}$ and MD of optic radiation in DON elevated when compared with TAO. Both the $\lambda_{\perp}$ in optic radiation increased in DON and TAO patients.
The clinical activity score, visual acuity associated with all DTI parameters. The amplitude of visual evoked potential also correlated with the FA of optic nerve. Combination of the four DTI parameters of optic nerve generated the highest AUC (0.801) and corresponding sensitivity and specificity were 80.43% and 66.96%, respectively.
Conclusions: DTI of visual pathway sensitively may detect that the neurological damage in DON was not limited to optic nerve. DTI parameters were associated with some visual function decline. Combination of multi-parametric DTI of optic nerve may serve as an imaging marker to facilitate clinicians to diagnose DON.

EPO-0481
原发性闭角型青光眼默认模式网络各亚区的异常静息状态功能连接研究

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采用静息态功能磁共振功能连接分析探讨原发性闭角型青光眼(PACG) 默认网络(DMN) 内亚区间的功能连接改变。
方法：
选取 47 名 PACG 患者（20 名男性和 27 名女性）和 47 名正常视力对照者（20 名男性和 27 名女性）接受静息状态磁共振成像扫描。选取 DMN 种子点做功能连接，采用 SPM8 软件数据预处理，分析 PACG DMN 内亚区成对功能连接的改变。
结果：
与正常视力组相比，PACG 组右侧内侧颞叶（MTL.R）与左侧海马（HF.F）功能连接减低(t = -3.12，P = 0.002) 、左侧内侧颞叶（MTL.L）与右侧海马（HF.R）功能连接减低(t = -2.297，P = 0.024) 。
结论：
PACG 患者 DMN 内部功能连接存在异常，提示 DMN 可能参与 PACG 的发病机制，MTL.R-HF.L、MTL.L-HF.R 的功能连接明显减低可能是 PACG 患者认知、情感处理功能障碍的潜在发病机制。

EPO-0482
Morphometric Analyses of Visual Cortex in Patients with Retinitis Pigmentosa

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PURPOSE Previous reports using DTI have shown the damage in optic nerve and optic radiation of patients with retinitis pigmentosa(RP), but possible effects on the

structures of visual cortex using high-resolution anatomical MRI have not been established. In this study, our aim was to investigate volumetric alterations in visual cortex of RP patients using voxel based morphometry (VBM). **METHODS** Twenty-nine patients (17men,12women;mean age,37years;range,16－63years) and twenty-seven healthy controls (17men,10women;mean age,38years;range,18－61years) were enrolled in this study. Measures of visual field (VF) and visual acuity (VA) were performed on all subjects. In addition, a 1 mm isotropic resolution anatomic 3D T1-weighted acquisition based on magnetization-prepared fast spoiled gradient echo sequence was acquired for each participant VBM was used to analyze the difference in cortical grey matter volume between patients and controls. Morphometric values in terms of volume were extracted from ROIs situated in broadmann area 17, 18, and 19. Further analyses were performed to determine the correlation of the altered grey matter volume of RP patients with the mean deviation of visual field (MDVF) and mean VA, respectively. **RESULTS** Compared with healthy controls, in patients with RP volumetric reduction in the middle part of medial occipital cortex was found ($P<0.01$,*FDR* corrected). RP patients showed significantly lower volume in broadmann area 17 and 18 as compared to control subjects ($P<0.001$); however, no significant difference in the volume of broadmann area 19 between patients and controls was seen ($P>0.05$). In addition, for RP patients, the grey matter volume in broadmann area 18 was significantly correlated to mean VA ($r=-0.408$,$P=0.028$) and mean MDVF ($r=0.386$, $P=0.038$), while that in broadmann area 17 was only significantly correlated to mean VA values ($r=-0.408$,$P=0.028$). **CONCLUSIONS** RP is associated with degeneration of structures in the visual cortex. Prevention of visual cortical degeneration may need to become a new therapeutic goal for RP patients.

EPO-0483
体素内不相干运动（IVIM－DWI）对眼眶良恶性病变的鉴别诊断价值

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目的 研究体素内不相干运动（IVIM－DWI）对眼眶良恶性病变的鉴别诊断价值。
方法 收集 2018 年 11 月至 2019 年 6 月因眼眶病变至昆明医科大学第四附属医院行磁共振 IVIM－DWI 检查患者 38 例，经术后病理证实共 38 个病灶，其中良性病变 27 个（良性组），恶性病变 11 个（恶性组）。所有患者均进行 GE 1.5T 磁共振进行常规平扫及 IVIM－DWI 扫描，其中 b 值 DWI 选用 13 个 b 值（b＝0、20、50、75、100、150、200、400、800、1000、1200、1500、2000s/mm2）,通过 GE ADW4.6 工作站测量得到 IVIM－DWI 参数，包括灌注分数（f），伪扩散系数（Dfast），真实扩散系数（Dslow）和标准扩散系数（Standard ADC）值，并比较其参数在眼眶良恶性病变中的鉴别诊断价值。采用独立样本 T 检验分析 IVIM－DWI 参数的诊断价值；以病理诊断结果为金标准，绘制 ROC 曲线，并计算曲线下面积（AUC）。
结果 良性病变与恶性病变的 Dslow 和 Standard ADC 值差异均有统计学意义（P 值均<0.05），Dfast、灌注分数（f）值差异没有统计学意义（P 值 0.05）。Standard ADC、Dslow 值二者 ROC 曲线下面积分别为 0.793、0.800，二者鉴别良恶性病变的敏感度、特异度分别为 90%、66.7%、100%、77.8%。
结论 IVIM-DWI 参数 Standard ADC 和 Dslow 值能够有效提高眼眶良恶性病变的鉴别诊断效果，为定性诊断提供可靠依据，其中，Dslow 值有助于更好的区分肿瘤性质

EPO-0484

Application of 16cm Wide-Detector Dual-Energy CT on Motion Artifacts Reduction for Patients with COPDin chest examination

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[Abstract] Objective To explore the value of using 16cm wide-detector CT on reducing motion artifacts in chest examination of COPD.
Materials and Methods A total of 60 COPD patients underwent chest CT examination Patients were randomly divided into two groups with exclusion criteria : (1) pregnant and lactating women; (2) having severe respiratory symptoms Lay a CT examination. The l control group (group A, 30 cases) was scanned on a 64 rows of VCT with a collimator width of 40 mm, a rotation speed of 0.6 s/rot and a pitch of 0.984:1. The experimental group (group B, 30 cases) was scanned by by a 16cm wide-detector dual-energy CT (Revolution CT, GE Healthcare, USA) with All other scan parameters were same: collimator width 80mm; rotation speed 0.28s/rot; pitch 0.992:1; tube voltage 120Kvp; automatic tube current; preset noise index (NI) of 11. The ROI was selected at the same level of the thoracic inlet plane, the trachea sacral floor, and the level plane image of the hilar plane. The CT and SD were measured to calculate SNR for objective evaluation.. The two radiologists used a 5-point method to subjectively evaluate the image quality in a double-blind manner Subjective scores were aseesed using the Kappa test. Results The subjective and objective scores of images in group B were generally higher than those in group A with more detailed visualization of lung and mediastinum (P<0.001). Exposure time in group B (1.3±0.6)s was 73% lower than that of group A (4.8±0.5)s, and the difference was statistically significant. (t=-22.745, P<0.001). Moreover, there was no significant difference observed in effective radiation dose (ED) between two groups (t=0.591, P>0.05). Conclusion The application of the 256-row wide-detector dual-energy CT can significantly reduce the examination time while optimizing the image quality. As a result, it can substantially reduce image motion artifacts for patients with severe COPD. Clinical application: The 16cm wide-detector dual-energy CT can reduce motion artifacts with the use of its large pitch scan for COPD chest CT examination..

EPO-0485

COPD 急性加重小气道重塑和肺气肿改变的 CT 定量研究

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目的 CT 定量分析慢性阻塞性肺疾病急性加重（AECOPD）患者小气道重塑和气肿指数的改变，并探讨小气道定量参数、气肿指数与 COPD 急性加重频率间的相关性。
材料与方法：回顾性分析 80 例 COPD 急性加重患者的吸气相 CT 扫描图像。将原始数据传输到 COPD prototype 分析软件内进行支气管定量参数及气肿指数的分析。设定 CT 值低于-950HU 的区域为肺气肿区，软件自动计算气肿指数。共选取 5 支支气管为研究支气管，分别为右肺上叶尖段支气管（RB1）、右肺中叶外侧段支气管（RB4）、右肺下叶后基底段支气管（RB10）、左肺上叶尖后段支气管（LB1)、左肺下叶后基底段支气管（LB10）,并测量其远端的第 6 级支气管定量参数。支气管定量参数包括：支气管腔直径（LD)、支气管壁厚度（WT）、管壁面积占支气管断面总面积的百分比（WA%）。对每个支气管定量参数，分别测量 3 次后取其平均值，再取 5 支支气管各定量参数平均值。同时记录一年内 COPD 急性加重发作频率。采用 SPSS18.0 统计学软件。各级支气管定量参数、气肿指数与急性发作频率的相关性采用 Spearman 相关系数检验。以 P<0.05 为差异有统计学意义。
结果：COPD 急性加重频率与气肿指数间无明显相关性(r=0.46,P=0.06)。第 6 级支气管定量参数管壁面积占支气管断面总面积的百分比(WA%)和支气管壁厚度(WT)分别与 COPD 急性加重发作频率间具有明显相关性(r=0.74, P=0.02; r=0.65, p=0.03)。而支气管腔直径(LD)与 COPD 急性加重发作频率间无明显相关性(r=0.53,P=0.08)。
结论：CT 定量成像能有效评价 COPD 小气道重塑及肺气肿，且小气道重塑与 COPD 急性加重发作频率有一定相关性。

EPO-0486

Emphysema and airways remodeling in patients with chronic obstructive pulmonary disease: lobar level CT quantitative analysis and correlation

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Purpose: To analyze the relationship between emphysema, airway dimensions and pulmonary function test(PFT) parameters quantitatively in patients with COPD and to investigate the correlation of emphysema and airways at the lobar level. **Methods:** Thin-section CT was acquired with 256-slice MDCT scanner during the inspiratory phase in 55 patients diagnosed as COPD. All images were retrospectively analyzed using a software program with fully-automated 3D airway extraction, lung lobe segmentation and emphysema analysis based on each lobe. Airway parameters including wall thickness (WT), luminal diameter(LD) and wall area percentage(WA%) were measured in the fourth, fifth, and sixth bronchial generations as follows, RB1, RB4, RB10, LB1 and LB10. Emphysema index based on each lobe were calculated automatically at the threshold of -950HU. Spearmans rho and Pearson correlation analysis were used for statistical analysis. **Results:** There were significant positive correlations between LD-mean and FEV1(R=0.32~0.502, all P<0.05),FEV1%(R=0.314~0.529, all P<0.05) and FVC (R=0.314~0.478, P<0.05) in the fourth, fifth and sixth generation bronchus respectively. WT was negatively mildly correlated with FEV1 (R=-0.307, P=0.036) and FVC(R=-0.301,P=0.040) in the sixth generation bronchus, while WT has no significant correlation with PFT parameters in the fourth, fifth generation bronchus. There was negatively correlation between WA% and PFT parameters in the sixth generation bronchus (r=-0.317~0.424, all p<0.05). FEV1% had a greater correlation with whole lung

emphysema compared with other PFT parameters. Lobar emphysema was negatively correlated with WT in two bronchial paths of sixth generation bronchus as follows: RB10, r=-0.317,p=0.018; LB10, r=-0.379, p=0.004. While there was only negative correlations between WA% and lobar emphysema in LB10(r=-0.336, p=0.012). **Conclusion:** Emphysema and airway remodeling can be assessed by using CT quantitative methods in patient with COPD. WA% and LD had significant quantitative value in the diagnosis of COPD, and wall thickness of sixth generation bronchus has a significant correlation with lobar emphysema, which indicates that the extent of distal bronchial wall thickening is more relevant with emphysema.

EPO-0487

慢性阻塞性肺疾病患者大脑半球间镜像功能连接的静息态功能 MRI 研究

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目的：采用静息态 fMRI(resting-state functional MRI，rs—fMRI)的基于体素镜像同伦连接(voxel-mirrored homotopic connectivity，VMHC)方法研究探讨慢性阻塞性肺疾病（chronic obstructive pulmonary disease，COPD）患者大脑半球间同伦功能变化及其与临床指数的关系。
方法：利用 3.0T MR 采集 19 例 COPD 病人(男性 14 例，女性 5 例；平均年龄 62.7±5.9）和 20 例相匹配的健康志愿者（男性 15 例，女性 5 例；平均年龄 60.8±6.3）的 rs-fMRI 数据。采用基于 Matalab 平台的 DPABI 软件计算两组被试大脑半球间 VMHC 值，然后采用双样本 t 检验分析得出两组间 VMHC 值具有统计学差异的脑区，接着以差异脑区为感兴趣区计算全脑功能连接，并进一步分析两组间基于差异脑区的连接模式差异（异伦连接）。
结果：与健康对照组（healthy controls， HCs）比较，COPD 组颞上回存在 VMHC 值显著下降。异伦连接分析发现，与 HCs 组比较，左侧颞上回与右侧颞上回的功能连接减低，而与舌回的功能连接增强；右侧颞上回与右侧颞下回、右侧额下回、左侧颞上回的功能连接减低，而与右侧额中回、左侧额内侧回、楔前叶/中央后回的功能连接增强。受试者 ROC 曲线分析显示右侧颞上回 ROC 曲线下面积是 0.955，这提示了 VMHC 可以用来区分 COPD 和健康对照组。
结论：本研究发现 COPD 患者存在双侧颞上回间 VMHC 值下降，即颞上回的内源性功能连接破坏，这暗示了 VMHC 是一种重要的和有效的办法去理解 COPD 患者脑内源性功能构架断裂的机制。

EPO-0488

Low-dose CT combined with different levels of KARL iterative reconstruction for Quantification of chronic obstructive pulmonary disease

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ABSRACT
OBJECTIVE: To investigate the effect of low-dose CT combined with different levels of KARL iterative reconstruction (IR) on the quantitative analysis of chest CT in patients with chronic obstructive pulmonary disease (COPD).

METHODS: 30 patients with COPD were performed with standard-dose (120kV, 150mAs) and low-dose (120kV, 40mAs) chest CT scan used 128-slice spiral CT (UNITED IMAGING). The standard-dose CT was reconstructed by FBP, and the low-dose CT was reconstructed by FBP and KARL IR(level 1～9). Calculate the effective dose (ED), calculate the ascending aortic CT value and noise (SD) at the pulmonary bifurcation level and calculate the signal to noise (SNR). All the raw data was imported into the "Dexin-FACT" CT quantitative analysis software and calculated the emphysema index (EI). One-way ANOVA was used to compare the differences of EI, SD, SNR between the data of standard and low dose CT.
RESULTS: The ED of the standard-dose CT and the low-dose CT were 6.91±0.53 mSv and 1.82±0.28 mSv respectively, a decrease of 74%. SD in the low-dose CT wirh FBP was larger than the standard-dose CT with FBP. As the level of KARL IR increased, SD decreased gradually , and KARL9 decreased by 23.70%. The low-dose with FBP had lower SNR than the standard-dose with FBP. With the level of KARL IR increased, the SNR increased gradually, and the KARL9 level increased by 123.81%. Compared with the standard-dose CT with FBP, the EI of the low-dose CT with FBP was overestimated. The level of KARL IR could affect the quantitative analysis of low-dose chest CT. There was no statistical significance difference in the quantitative values of the two adjacent iteration levels, compared with the standard-dose CT with FBP, the EI of the low-dose CT with FBP was overestimated by 13.88%. With the increase of the IR level, EI decreased gradually, and the EI in low-dose CT with KARL9 was overestimated by 5.67%, KARL IR protocol could reduce the EI, tends to the value of the standard-dose CT with FBP, and corrects the quantitative analysis error.
CONCLUSION: The radiation dose of low-dose chest CT scan can be reduced by about 74%. The low-dose image can be used to estimate the EI in patients with COPD. Combined with KARL IR protocol, the error can be corrected to a certain extent, and the quantitative parameters are more accurate.

EPO-0489

能谱 CT 对 COPD 胸椎钙（水）密度变化趋势的初步研究

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目的 探讨能谱 CT 对慢性阻塞性肺疾病患者胸椎钙（水）密度变化规律的应用价值。**方法** 选取 COPD 患者 61 例，按照肺气肿指数分为肺气肿组和非肺气肿组，并设置对照组 35 例，进行对比研究。**结果** 胸椎钙（水）密度随肺通气功能受损加重而减少；肺气肿组胸椎钙（水）密度均低于非肺气肿组和对照组（P＜0.05），胸椎钙（水）密度随 LAV%升高而减少。**结论** 利用能谱 CT 图像可初步评估 COPD 患者胸椎钙（水）密度与肺通气功能及 LAV%变化关系；肺气肿是加重 COPD 胸椎钙（水）密度减低的重要因素。

EPO-0490

HRCT 定量评估慢性阻塞性肺疾病中央气道与肺功能相关性初步研究

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目的 探讨高分辨率 CT 吸气-呼气末慢性阻塞性肺疾病中央气道参数与肺功能分级之间相关性。**方法** 2018 年 01 月至 2019 年 01 月昆明医科大学第四附属医院呼吸内科临床诊断为慢性阻塞性肺疾病且资料完整病人 56 例，于 2 天内完成胸部 CT 及肺功能检查。肺功能检查主要指标包括用力肺活量、第 1 秒用力呼气量、第 1 秒用力呼气量与用力肺活量之比、第 1 秒用力呼气量与预测值的百分比。胸部 CT 检查采用 320 排东芝 Aquilion-One 行吸气-呼气末双相扫描。扫描数据传至 Vitrea 后处理工作站，测量吸气相中央气道管壁厚度（Tin）、管径（Din）、容积（Vin）及呼气相中央气道管壁厚度（Tex）、管径（Dex）、容积（Vex），计算得到呼气相与吸气相中央气道容积变化（Vin-Vex），吸气末图像采用多平面重组（MPR）技术测量并进行计算得到中央气道长度（S），计算得到吸气相与呼气相中央气道容积变化与中央气道长度比（Vin-VexSR）。根据肺功能检查结果对病人严重程度进行分级，分析中央气道吸气-呼气双相容积及容积变化与肺功能分级之间的相关性。数据统计应用 SPSS 17.0 统计软件包进行分析，计量资料采用均数±标准差表示，正态分布计量资料采用完全随机设计资料的方差分析，P<0.05 表示差异有统计学意义。**结果** 56 例 COPD 病人分级，I 级 15 例，II 级 16 例，III 级 16 例，IV 级 9 例。COPD 中央气道吸气相管壁厚度（Tin）、管径（Din）、容积（Vin）及呼气相管壁厚度（Tex）、管径（Dex）、容积（Vex）、吸气相容积与呼气相容积差（Vin-Vex）、吸气相与呼气相中央气道容积变化与中央气道长度比（Vin-VexSR）与肺功能分级间具有相关性，P＜0.01，差异有统计学意义。**结论** COPD 病人中央气道参数与肺功能分级之间具有相关性，呼气相中央气道容积与肺功能分级相关性最高。

EPO-0491

Additional value of expiratory CT in quantitative analysis of pulmonary vessels in COPD

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Objective To evaluate intrapulmonary vascular volume on paired inspiratory and expiratory CT in patients with chronic obstructive pulmonary disease (COPD), and explore the value of expiratory CT quantitative pulmonary vascular in COPD.**Methods** Eighty-nine COPD patients were collected retrospectively from the "Digital Lung" database. All subjects underwent both inspiratory and expiratory CT scans and the intrapulmonary vascular volume (IPVV)、airway wall thickness (WT) 、the percentage of the airway wall area (WA%) and the percentage of emphysema ($LAA\%_{-950}$) were quantitatively analyzed. The correlations between IPVV and PFT parameters、$LAA\%_{-950}$ and airway parameters for the third to sixth generation bronchus were analyzed using Pearson or Spearman's rank correlation coefficients and multiple stepwise regression.**Results** In inspiratory scan, IPVV was negatively correlated with PFT parameters (r=-0.215～-0.292,p<0.05) ,positively correlated with the WT_{3-6} (r=0.233～0.557,p<0.05) and $LAA\%_{-950}$(r=0.238～0.409,p<0.05). In expiratory scan, IPVV was negatively correlated with PFT parameters (r=-0.238～0.360,p<0.05) ,positively correlated with the WT_{3-6} (r=0.260～0.566,p<0.05)and $LAA\%_{-950}$(r=0.241～0.362,p<0.05).The

further multiple stepwise regression demonstrated that IPVV and other parameters could introduce a regression equation with the biggest R^2=0.426、0.505 in inspiratory and expiratory CT, respectively(P<0.05), and WT were independently associated with IPVV (P<0.05).**Conclusion** Paired inspiratory and expiratory CT can quantitatively evaluate IPVV and pulmonary vascular changes in respiratory state of COPD. The correlations between IPVV and other COPD quantitative parameters in expiratory CT were greater than that in inspiratory, the expiratory CT can provide more effective information for assessing the degree of expiratory airflow obstruction in COPD patients, and provide a new approach for studying pulmonary hypertension in COPD. The further multiple stepwise regression demonstrated that bronchial wall thickness may be an independent predictor of pulmonary vascular volume in COPD.

EPO-0492

Can inspiration CT and expiration CT quantitatively assess emphysema and small airways in smokers and non-smokers?

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Can inspiration CT and expiration CT quantitatively assess emphysema and small airways in smokers and non-smokers?
PURPOSE
To quantitatively investigate the emphysema and small airways and its change induced by cigarette using inspiration CT and expiration CT.
METHOD AND MATERIALS
50 smokers and 50 non-smokers male subjects who received inspiration CT and expiration CT . CT parameters assessed were tracheal collapsibility (TCo), the content of emphysema (CE), air trapping (AT) , and square root of the wall area of a hypothetical airway of 10-mm internal perimeter of segmental and subsegmental airways (Pi10). The differences in smokers and non-smokers with a Students' t-test. Using SPSS16.0 statistical software for analysis, with P<0.05 for significant differences.
Result
The CE of the smoking group and non-smoking group were 2.70±1.89%, 3.28±2.55%, there were no significant differences (P > 0.05) between them. The Pi10, AT and TCo in no-smoking group were 2.18 ± 0.56, 79.57 ± 5.23, and 0.61 ± 0.20. The Pi10, AT and TCo in smoking group were 2.45 ± 0.43, 83.15 ± 6.77, and 0.66 ± 0.09. These values were slightly different between both groups (p < 0.05).
CONCLUSION Pi10, AT and TCo are slightly different between smokers and non-smokers.
CLINICAL RELEVANCE/APPLICATION
Tracheal collapse and airway morpholgy obtained from inspiration CT and expiration CT may be used to access smokers and non-smokers.

EPO-0493

慢性阻塞性肺疾病大鼠动物模型的建立与评价

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目的 通过烟熏法、蛋白酶滴注及两者相结合的方法构建大鼠 COPD 模型，并从炎症水平，影像及病理等方面评价造模效果，对三种建模方法进行比较。**方法** 使用烟熏、蛋白酶滴注及两者相结合的方法进行 COPD 大鼠造模，每组大鼠分别为 60 只、30 只、30 只，同时设置对照组 20 只。每周对大鼠进行体重测量。烟熏组及对照组大鼠于造模 24h，1、2、4、8、12、16、20、24 周，蛋白酶组及蛋白酶+烟熏组大鼠于造模 24h，1、2、4、8、12 周接受细胞因子检测、Micro-CT 检查及病理检查。采用方差分析或 Kruskal-Wallis H 检验进行统计分析。 **结果** 第 7 周起烟熏组大鼠及蛋白酶＋烟熏组大鼠体重增长较对照组明显减缓（P<0.05）。蛋白酶组及蛋白酶＋烟熏组大鼠第 24h、1、2、4 周 IL-10 水平显著低于对照组（P＜0.05）。蛋白酶组及蛋白酶＋烟熏组大鼠第 24h 的 MMP-9 浓度显著大于对照组（P＜0.05）。蛋白酶组、蛋白酶+烟熏组第 4 周及烟熏组第 8 周大鼠在 Micro-CT 图像及病理图像上均可观察到肺气肿改变。 **结论** 使用烟熏、蛋白酶及蛋白酶+烟熏的方法均可成功构建大鼠 COPD 模型。Micro-CT 可灵敏真实的反应肺部病理改变。

EPO-0494

肺部白色念珠菌感染的 CT 征象分析

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目的：分析肺部白色念珠菌感染患者的 CT 影像特征。**方法：**回顾性分析 72 例肺部白色念珠菌感染患者的 CT 表现特征。**结果：**以单侧肺发生为主 30 例（41.6%），表现为斑片或实变影 8 例（11.1%）、磨玻璃样影 4 例（5.6%），肿块影 4 例（5.6%），空洞影 6 例（8.3%）合并肿大淋巴结 4 例（5.5%），胸腔积液 2 例（2.8%）。**结论：**肺部白色念珠菌感染发生部位及影像学表现复杂多样，CT 表现具有一定特征。

EPO-0495

成人群发性支原体肺炎的高分辨率 CT 影像及临床特点分析

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目的：探讨并研究某单位群发性成人支原体肺炎患者的临床影像特点与预后情况。 方法：选取 2017 年 9 月份我院收治的某单位 44 例集体感染支原体肺炎病例，对他们进行 CT 检查，就其临床影像特点及治疗预后结果进行统计学比较和分析。 **结果：**统计学比较显示，44 例患者主要临床表现为发热（84.1%）、咳嗽咳痰（86.4%）等；胸部影像学检查：单侧病变（90.9%），明显高于双侧病变（9.1% ），左侧病变（41.0%），右侧病变（50.0%），左肺下叶受累（29.6% ），右肺下叶受累（34.1%）；影像学特征：磨玻璃影（86.4%）实变影（56.8%），沿支气管壁分布（47.7%），结节影（43.2%），树芽征（9.1%）。44 例患者采用氟喹诺酮类抗菌药物及溴己新、头孢类药物联合治疗后痊愈出院。**结论：**对成人的支原体肺炎患者进行 C T 影像学检查，能准确、直观的反映出患者肺部病变的情况，因此，它是一种有效、理想、科学的临床检查的方法。

EPO-0496

Differentiation of inflammatory nodules and malignant tumors using the iodine uptake parameters by dual-energy computed tomography

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Objective: To evaluate the diagnostic performance of iodine uptake parameters by dual-energy computed tomography (DECT) in discriminating inflammatory nodules from malignant tumors.
Materials and methods: This retrospective study was approved by the institutional review board with a waiver of written informed consent. From January 2018 to September 2018, 112 patients with 116 noncalcified nodules (64 inflammatory and 52 malignant nodules) underwent contrast material-enhanced DECT . After entire-tumor volume of interest (VOI) segmentation, iodine uptake parameters, including total iodine uptake volume, total iodine concentration, vital iodine uptake volume and vital iodine concentration were calculated and established a predictive model. Meanwhile, degree of enhancement on contrast enhanced DECT were evaluated. The diagnostic accuracy and prognostic performance of DECT parameters were evaluated and compared via receiver operating curve (ROC) analysis and logistic regression analysis.
Results: The degree of enhancement of malignant nodules was significantly lower than inflammatory nodules (P = 0.011). All the iodine uptake parameters in malignant nodules were significantly higher than in inflammatory nodules (all Ps＜0.001). The Az value, accuracy, sensitivity and specificity of the established model based on iodine uptake parameters were 0.803, 76.72%, 82.69% and 84.37% respectively, which exhibited better diagnostic performance than the degree of enhancement on weighted average image image with Az value, accuracy, sensitivity and specificity of 0.638, 58.62%, 67.31% and 57.81% respectively.
Conclusion: Iodine uptake parameters of DECT exhibited better diagnostic accuracy in discriminating inflammatory nodules from malignant nodules than degree of enhancement on weighted average image image.

EPO-0497

肝移植术后肺部细菌、病毒及真菌感染 CT 表现的对照研究

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目的：对比研究肝移植术后肺部细菌、病毒及真菌感染的 CT 表现。
方法：回顾性分析 453 例肝移植术后肺部感染患者的 CT 表现。453 例患者均在发烧及/或咳嗽 24h 内行 CT 检查并且一周内确诊为细菌、病毒或真菌感染。两位放射科医师分析 CT 图片，共同商量取得一致结果。
结果：肝移植术后肺部细菌、病毒及真菌感染分别为 63.4%、29.4%和 24.5%。70 个大结节（≥1cm）中的 38（54%）个见于肺部真菌感染患者。在肺内出现大结节的患者中，肺部真菌感染

患者（54%，38/70）多于细菌感染患者（10%，22/220）（54% vs 10%，p=0.0059）及病毒感染患者（8%，6/78）（54% vs 8%，p=0.0011）。在出现晕轮征的患者中，肺部真菌感染（38/70，54%）多于细菌感染（17/220，8%）（54% vs 8%，p=0.0026）和病毒感染（7/78，9%）（54% vs 9%，p=0.0015）。肺实变、磨玻璃病灶、小结节、胸腔积液和肿大淋巴结在肝移植术后肺部细菌、病毒及真菌感染中的出现率差异无统计学意义（均 p>0.05）。
结论：大结节伴有晕轮征提示肝移植术后肺部真菌感染，其余征象无助于三者的鉴别诊断。

EPO-0498

Kartagener 综合征胸部 HRCT 特点分析

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目的 分析 Kartagener 综合症（kartagener syndrome，KS）患者的胸部 HRCT 图像特点，提高诊断准确性。**方法** 搜集 13 例符合 KS 诊断标准的患者的 CT 图像，其中 11 例进行过胸部 HRCT 横断位重建，对该 11 例患者的胸部图像进行回顾性分析，将 HRCT 图像上的异常情况或病变进行归类，评估 KS 患者的胸部病变 HRCT 表现特点。**结果** 11 例 KS 均为全内脏反位，HRCT 图像上均出现不同程度支气管扩张，8 例出现特征性的“水滴样”、“棒状”征象（两下肺为主），2 例表现为普通支气管扩张，1 例表现为轻微的支气管扩张。其他随病变包括：支气管炎（9/11）、肺部感染（7/11）、肺气肿（5/11）、胸膜增厚（5/11）、胸腔积液（2/11）、气胸（1/11）等，年长者的支气管扩张程度较年轻着严重，支气管外的病变较年轻患者多。**结论** HRCT 对 KS 患者的支气管扩张和肺内继发性病变均可很好显示，可更准确评估肺内病变状况。“水滴样”、“棒状”支气管扩张是 KS 较为特征性的征象，不同程度的支气管炎、肺气肿和肺部感染是 KS 较为常见的继发性病变。
关键词 kartagener 综合征，支气管扩张，CT

EPO-0499

群发急性肺组织胞浆菌病 CT 表现及临床分析

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目的 探讨群发肺组织胞浆病 CT 表现及临床特征，以提高对该疾病的诊治率。**方法** 回顾性分析临床诊断为肺组织胞浆病 5 例患者的 CT 表现及临床特征、治疗过程。5 例患者均分别于治疗前、抗真菌治疗后、抗真菌合并激素治疗后共行 3 次胸部 CT 平扫，观察临床症状及肺内病灶变化。**结果** 临床拟诊肺组织胞浆菌病的 5 例患者，5 例患者有共同探洞史，胸部 CT 表现为双肺多发结节，部分结节周围见磨玻璃影。临床症状主要表现为咳嗽、发热。抗真菌治疗 1 周后临床症状有所减轻，肺内情况无明显变化，采用抗真菌合并激素治疗 10 天，咳嗽较前减轻，体温正常，胸部 CT 肺内结节较前减少、缩小。**结论** 肺组织胞浆菌病的临床及 CT 表现均有特征性，若抗真菌治疗无效，应考虑到合并过敏性肺炎的可能。

EPO-0500

The Pulmonary CT Images of Patients Infected with Vaccinia Virus through Respiratory Tract

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Objective Vaccinia virus (VACV) is an infrequent virus that belongs to the genus orthopoxvirus. Most of the patients are infected by direct touch and showed symptoms like the development of skin lesions, mainly like the hand herpes, accompanied by clinical symptoms such as headache, muscle pain and fever. However, 5 males were infected with VACV accidentally through respiratory tract transmission and direct hand contact transmission. They had severe systemic symptoms like fever, chills, headache, herpes and respiratory symptoms like cough, chest tightness, and breathlessness. This study aimed to explore the imaging findings of VACV infection in human beings through respiratory tract transmission.
Materials and methods There were 5 Chinese men with VACV infection in our hospital. They underwent CT imaging examination several times during their treatment and follow-up period. We retrospectively collected patient's imaging data and after verifying the CT imaging data and all the other imaging findings were evaluated.
Results Five patients showed similar CT imaging findings. Images showed widely distributed nodules with or without mass/speckle shadow of different degrees. During their follow-up, CT images showed disappearance of a part of nodules , while few others became smaller.
Conclusion Multiple pulmonary nodules are common imaging findings in patients with VACV infection through respiratory tract. Diagnosis can be made by detecting the virus' DNA in the lesions. Follow-up and clinical history are critical for the diagnosis of VACV infection.

EPO-0501

肺放线菌病临床及影像进展研究

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肺部放线菌病是一种少见疾病，约占所有放线菌感染病例的 15-30%，仅次于头颈部和腹盆腔放线菌感染。多因误吸口腔或胃肠道带菌分泌物而致病，引起肺部放线菌感染的放线菌多为以色列放线菌。临床表现缺乏特异性，以中老年男性居多。可出现咳嗽、咳痰、咯血、呼吸困难、胸痛等常见呼吸道症状。病理检查是诊断肺放线菌病的金标准。放线菌病病理表现为慢性肉芽肿性炎，可见化脓，硫黄样颗粒，脓肿和窦道形成，痰中出现硫磺样颗粒可提示肺放线菌病的诊断，但不可作为确诊肺放线菌病的依据。X 线对此病诊断价值有限。肺放线菌病 CT 可分为肺实质型、支气管扩张型、与支气管石病相关的支气管内型、与异物相关的支气管内型。最特征性的 CT 表现包括局灶性或斑片状实变区，常伴中心低密度灶或空洞，增强后病灶周边强化，典型病例有邻近胸膜增厚。该病目前仍有很多问题亟待解决，本文结合近年来国内外对肺部放线菌病的报道和研究，为该病的诊疗提供参考和借鉴。

EPO-0502
肺毛霉菌病的 CT 及正电子发射计算机体层 成像-CT 表现

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目的探讨肺毛霉菌病的 CT 及 PET．CT 表现，提高其诊断的准确率。方法回顾性分析 14 例经手术或穿刺病理证实的肺毛霉菌病的胸部 CT 及 PET．CT 表现。所有患者均行 MSCT 平扫，10 例行多期增强扫描检查，其中 3 例同时行氟代脱氧葡萄糖(”F—FDG)PET．CT 检查。结果 13 例患者肺内见多发斑片影，伴厚壁空洞 9 例(26 个)、肺动脉栓塞 4 例；仅 1 例表现为肺内孤立性不规则肿块。病变侵犯临近支气管 3 例、胸腔少量积液 4 例，肺门及纵隔均未见明显肿大淋巴结影。增强扫描病灶实性部分增强较明显，平均增加(25+8)HU。PET．CT 表现：1 例病灶呈斑片状异常放射性浓聚，2 例呈不规则环形的异常放射性浓聚，最大标准化摄取值(suvmax)分别为 6．2、4．6 和 3．6。结论肺毛霉菌病的影像表现呈多样性，缺乏特征性表现。影像表现为多发厚壁空洞，合并肺动脉栓塞或侵犯支气管时应考虑到本病可能。

EPO-0503
不同分型支气管内膜结核临床及 CT 特征分析

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目的：探讨不同分型支气管内膜结核多排螺旋 MSCT 影像学特征性及鉴别诊断，为临床工作的准确、精确诊断提供基础。
方法：收集我院 129 例支气管结核患者影像学资料，分析 MSCT 影像学特征，并对其进行进一步分型。
结果：（依据中华医学会结核病学分会拟定的《气管支气管结核诊断和治疗指南(试行)》，采用六分型：I 型为炎症浸润型、II 型为溃疡坏死型、III 型为肉芽增殖型、IV 型瘢痕狭窄型、V 型为管壁软化型、 VI 型为淋巴结瘘型； ）
不同分型支气管内膜结核的表现：I 型 MSCT 表现为支气管管壁增厚、管腔狭窄，II 型表现为累及各层气管，可不伴闭塞征但出现肺炎、肺不张；III 型表现为管壁增厚并出现增生；IV 型表现为支气管管腔明显狭窄，可伴有闭塞征；V 型表现为累及气管环，管腔狭窄，可不伴闭塞征；VI 型表现为累及主支气管管腔，伴有结节并出现不同程度狭窄。
不同病理类型的年龄分布：129 个病例中，≤30 岁者 76 例，30-60 岁者 51 例，＞60 岁者 2 例；≤30 岁患者中以 I-IV 型居多，共 70 例，随着年龄的增长，V-VI 型所占比例增加。
临床特征：平均年龄：38.3 岁，男：女 1:3.1
共有 107 例合并肺部结核病灶（82.9%），单纯支气管内膜结核只有 22 例（17.1%）。
结论：不同分型的支气管内膜结核患者，其 MSCT 表现不一，临床可考虑使用 MSCT 检查其疾病严重程度、病变范围及疾病分期。

EPO-0504
CT image analysis of pulmonary cryptococcosis

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Objective: Investigate the clinical features and CT features of patients with pulmonary cryptococcosis (PC) in non-acquired immunodeficiency syndrome.
Methods: Twenty-five patients with pathologically confirmed PC diagnosed by surgery, biopsy, cerebrospinal fluid and bronchoscopy between 2008 and 2018 in the First Affiliated Hospital of Dalian Medical University were retrospectively analyzed. All patients underwent CT plain scan and 16 patients completed CT enhanced scan. All cases Clinical data were relatively complete.
Result: The history of avian influenza or fecal exposure was not clear in 25 patients with PC. The average age was 48.04±9.29 years old, including 14 males (56.00%) and 11 females (44.00%). The ratio of male to female was about 1.3:1 (6 patients with underlying lesions). The onset of the disease was usually asymptomatic (48.00%), cough (32.00%), chest pain (16.00%), etc, and of which 5 cases (20.00%) were associated with cryptococcal meningitis. According to the image classification, there were 5 types: 9 cases with single nodules or masses, accounting for about 36.00%; 12 cases with multiple nodules or masses, 48.00%; 3 cases with lung consolidation and pneumonia, 12.00%; and Atypical 1 case (including frosted glass, miliary and other atypical image performance), 4.00%. Among the 25 cases of PC: 48.00% of cases presented with subpleural distribution, 20.00% with hole sign (thick wall 5/5, dry 5/5), 44.00% with the air-containing bronchial sign, comparably the angiographic sign and delay enhancement accounted for 31.25%、56.25%, respectively.
Conclusion: This study shows that PC onset usually asymptomatic physical examination or accidental discovery. Meanwhile nodules or/and masses are more common. Several signs such as subpleural distribution, borderline sign and uniform enhancement have higher value, and 56.25% mainly delayed enhancement.

EPO-0505
免疫缺陷患者肺孢子菌肺炎影像学特征分析

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目的 分析免疫缺陷患者肺孢子菌肺炎的影像学特征及早期诊断思路。方法 回顾性分析 2017 年 5 月至 2019 年 5 月我院住院确诊的 17 例 PJP 患者的临床资料及影像学检查。结果 异基因造血干细胞移植患者 AHSCT 12 例，肾移植术后 4 例，SLE 激素治疗 1 例。平均年龄(39.61±12.32)岁，均通过 BALF 中找到耶式肺孢子菌的包囊或滋养体。发病时间位于移植后(5.72±2.13)月。外周血 CD4+计数（102.17±44.93）/ul，BALF G-test（1116.97±924.16）pg/ml, 12 例行 BALF NGS 检测耶式肺孢子菌序列数均阳性。16 例胸片检查，17 例 HRCT 检查。4 例平片阴性，4 例表现为双肺门周围为主的磨玻璃影，8 例表现为双肺中内带为主的网格状改变。1 例 AHSCT 病人起病时病变位于双肺上叶，其他 16 例为双肺弥漫性分布（94.12%）。10 例尽管双肺实变范围广泛且严重，但双肺胸膜下未受累及，包括双膈面下区域（58.82%）。所有 17 例起病或随病变进展均表现为典型的磨玻璃影（100%），1 例实变较为淡薄；部分伴支气管气相，9 例伴马赛克征象（52.94%）。大部分病人出现不同程度的间质增厚，病变后期部分呈间质纤维化，少许病人继发轻度支气管扩张。7 例出现肺气囊（41.18%），1 例治疗病变吸收后肺气囊完全消失。无 1 例病人出现树芽征，1 例双上肺结节及肿块样影者为上述上叶分布病人且合并真菌感染。除该例及另一例合并巨细胞病毒感染者，15 例病人均未出现肺实变征象（88.24%）。仅该例合并真菌感染者出现少量胸腔积液（5.88%），无 1 例淋巴结增大（0%）。结论 干咳，气促伴发热的免疫缺陷患者如外周血 CD4+计

数明显下降，HRCT 出现弥漫分布的磨玻璃征象为主，部分伴间质征象，但胸膜下未受累及的病人应考虑 PJP，行 BALF 镜检或 BALF 病原体核酸检测以早期确诊。平片对 PJP 诊断无提示价值。

EPO-0506

叁期尘肺 CT 表现与肺内二氧化硅含量的相关性分析

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摘要：目的：应用双源 CT 双能量扫描技术测量叁期尘肺患者肺组织内二氧化硅（SiO_2）含量及混合能量 CT 值，探讨 SiO_2 含量与其沉积部位及叁期尘肺主要 CT 表现的关系。材料和方法：对 44 例叁期尘肺患者及 50 例非接尘健康体检人员行胸部双源 CT 双能量扫描，分别在其主动脉弓上缘、气管分叉下缘、气管分叉下 3cm 附近平面，于双肺背侧、双肺门旁选择感兴趣区（Region of Interst，ROI），测量其 SiO_2 含量和混合能量 CT 值。结果： 尘肺组肺组织内 SiO_2 含量为（0.57±0.49）mg/mL，健康对照组为（0.26±0.20）mg/mL，尘肺组混合能量 CT 值为（-777.72±111.33）HU，健康对照组为（-829.95±112.31）HU，尘肺组 SiO_2 含量和混合能量 CT 值均高于健康对照组，组间差异均有统计学意义（p=0.00）。,比较尘肺组患者肺组织不同沉积部位间 SiO_2 含量和混合能量 CT 值，发现气管分叉下 3cm 层面 SiO_2 含量和混合能量 CT 值均最高，气管分叉下缘层面次之，主动脉弓上缘层面最低，提示叁期尘肺患者肺组织内 SiO_2 主要分布在两下肺野，由下而上其 SiO_2 含量逐渐减低。f比较尘肺组 CT 影像表现的复杂程度与 SiO_2 含量和混合能量 CT 值关系，含有 5 种 CT 征象者 SiO_2 含量及混合能量 CT 值最高，均值分别为（0.72±0.58）mg/mL 及（-719.30±154.68）HU；仅含 1 种 CT 征象者 SiO_2 含量及混合能量 CT 值最低，均值分别为（0.49±0.40）mg/mL 及（-809.74±105.60）HU。提示叁期尘肺患者 CT 表现越复杂，其肺组织 SiO_2 含量及混合能量 CT 值越高。结论：双源 CT 双能量扫描技术可以量化叁期尘肺患者肺组织内 SiO_2 含量及混合能量 CT 值，其 SiO_2 含量与混合能量 CT 值呈正相关，SiO_2 含量与其沉积部位的 CT 影像表现有关。

EPO-0507

The advantages of wide-body detector combined with large-pitch scan in chest CT imaging in free breathing state

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Objective: To study the advantages of wide-body detector combined with large-pitch scan in chest CT imaging under free breathing conditions. Methods 60 cases of chest CT plain scan in our hospital were prospectively collected and divided into two groups at random. During the routine group A scans, the patient was breath-hold, the collimator width was 40 mm, the pitch was 0.516:1, and the rotational speed was 0.50 s/r; the control group B During the scan, the patient was allowed to breathe freely with a

collimator width of 80 mm, a pitch of 0.992:1, and a rotation speed of 0.28 s/r. Other scanning parameters remain the same, namely Helical Plus mode, tube voltage 120kVp, noise index fixed at 10, pre-Asir-V is 30%, post-Asir-V is 70%, automatic tube current technology, reconstruction layer thickness 0.625mm , Lung window width 1450HU, window position -550HU; vertical window width 400HU, window position 40HU. The CT values and SD values of aortic root, erector spinae, and subcutaneous fat in the same plane were measured at the aortic root level of the mediastinum. The double-blind method was used to evaluate the image quality by 5 points: 1 is divided into poor image quality; 5 is classified into excellent image quality; ≥3 images are used for clinical diagnosis. An independent sample t-test was used to compare the general data, the objective quality of the images, the exposure time, and the radiation dose between the two groups. The Kappa test was used to compare the consistency of the subjective scores of the two physicians. Results: There was no statistical difference in general data between the two groups (P>0.05). CT values, SD values, SNR, CNR, CT values of erector spinae and CT values of subcutaneous fat in aortic root were not statistically different between the two groups (P>0.05); subjective scores of image quality were different between the lung window and the mediastinum window. No statistical significance was found (P>0.005). The average exposure time of group A was (7.99±0.76) s. The average exposure time of group B was (1.13±0.10) s (P<0.001), a decrease of about 86%. The average radiation dose in group A was (3.56±1.16) mSv, and the average radiation dose in group B was (2.79±0.38) mSv (P<0.001), a decrease of approximately 22%. Conclusion The wide-body detector combined with the large-pitch chest scan under free-breathing conditions can both shorten the exposure time and reduce the radiation dose under the premise of ensuring the image quality, especially for the severe patients who cannot cooperate with breathing.

EPO-0508

应用 HRCT 探讨肺气肿亚型在寻常型间质性肺炎与非特异性间质性肺炎鉴别诊断中的价值

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目的 应用高分辨率 CT（HRCT）分析寻常型间质性肺炎（UIP）和非特异性间质性肺炎（NSIP）的影像学特征，探讨肺气肿亚型在 UIP 和 NSIP 鉴别诊断中的价值。**方法** 回顾性分析我院 2010 年 01 月至 2018 年 10 月经临床-影像综合诊治的 49 例 UIP 和 45 例 NSIP 患者的临床特点、HRCT 表现及与肺气肿亚型的相关性。**结果** 统计结果表明：UIP 发病年龄高于 NSIP，UIP 平均发病年龄（69.71±1.54）岁，而 NSIP 的平均发病年龄为（59.93±1.88）岁，两者发病年龄差异具有统计学意义（P＜0.01）。UIP 以男性患者为主（男/女=46/3），NSIP 以女性为主（男/女=15/30），两者发病的性别差异具有统计学意义（P＜0.01）。在 49 例 UIP 患者中，合并间隔旁型肺气肿（PSE）、合并小叶中心型肺气肿（CLE）、合并混合型肺气肿（PSE + CLE）及不伴肺气肿分别占 73.47%（36/49）、0.00%（0/49）、16.33%（8/49）和 10.20%（5/49）；而在 45 例 NSIP 患者中，合并 PSE、CLE、PSE+CLE 及不伴肺气肿分别占 0.00%（0/45）、13.33%（6/45）、4.44%（2/45）和 82.22%（37/45）。两者在合并肺气肿亚型（PSE、CLE）及不伴肺气肿的差异具有统计

学意义（P＜0.01），而在合并 PSE+CLE 中的差异无统计学意义（P=0.094）。在 UIP 与 NSIP 的其它合并症（肺动脉高压、肺癌、纵隔淋巴结肿大、胸腔积液、心包积液等）的差异均无统计学意义（P＞0.05）。**结论** 结果表明，肺气肿亚型在 UIP 与 NSIP 的鉴别诊断中具有重要意义，且两者与发病平均年龄及性别密切相关。UIP 与 PSE 密切相关，发病平均年龄较大，好发于男性；而 NSIP 与 CLE 有一定相关性，发病平均年龄较小，好发于女性。

EPO-0509
CTD-ILD 各病理分型肺功能损害程度及临床治疗效果评估

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目的：评估 CTD-ILD 各病理分型其临床治疗效果及肺功能损害程度之间是否存在差异性，探讨其中治疗效果较好、肺功能损害程度较轻的分型。方法：收集 44 例 2017 年 1 月至 2019 年 1 月在广西医科大学第一附属医院放射科行 HRCT 检查确诊为 CTD-ILD 患者（UIP17 例、NISP13 例、COP5 例、AIP2 例、DAD7 例），其中行肺功能检查的 30 例，将其图像导入西门子肺部 3D 分析软件，分别计算间质纤维化肺容积百分比（ILDV%）及平均肺密度（MLA），以此次检查时间为基线，3 个月后再次获取 HRCT 复查图像，用相同软件及分析方法进行评估，计算两次检查间 ILDV%、MLA 差值及其变化率，进行两两组间对比。比较 UIP 组（17 例）及 NSIP（13 例）组之间各肺功能参数（EFV1/FVC、DLco、DLco/预测值）之间是否存在差异。结果：UIP 组与 DAD 组之间的 MLA 变化率有差异性（P＜0.05），其余各病理分型组间 MLA、ILDV%差值、变化率均无明显差异（P＞0.05）。UIP 组与 NSIP 组间肺功能指标 DLco/预测值具有差异性（P＜0.05）。结论：通过 ILDV%、MLA 差值及其变化率无法推断 CTD-ILD 各病理类型治疗效果的差异，UIP 组弥散功能障碍（DLco/预测值）较 NSIP 组严重。讨论：此次研究无法推断 CTD-ILD 各病理类型治疗效果的差异性，考虑和每个个体治疗方案及治疗的差异性有关，评估 CTD-ILD 治疗效果应结合临床及实验室指标综合分析，才能推断出治疗效果及预后较好的 CTD-ILD 病理分型。

EPO-0510
心电门控双源 CTPA 评价急性肺栓塞及其右心室功能

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目的： 探讨心电门控双源 CTPA 在评价急性肺栓塞及其右心室功能的临床价值。
方法： 例患者行回顾性心电门控下检查后，经图像后处理并进行重建，观察肺动脉栓塞的分布、程度并计算肺栓塞指数，分析心功能。根据栓塞位置分为两组，中央型与周围型。比较有无肺栓塞患者右心功能参数组间差异；对比不同栓塞程度及栓塞部位组间心功能参数差异；比较心功能参数与肺栓塞指数之间的相关性；对不同栓塞部位室间隔形态及对比剂返流的评价。
结果：按照 Qanadli 栓塞指数评分(%)：28 例肺栓塞总的评分为 45.00±27.28,17 例中央型评分为 63.53±18.39,11 例周围型评分为 16.36±4.92。根据栓塞程度的分级，将患者分为轻度组(11 例)、中度组(3 例)和重度组(14 例)， 三组的 CT 肺栓塞指数的中位数分别为 17.50%、30.00%、70.00%。28 例肺栓塞 RVEDV 及 RVESV 均较无栓塞组高；RVEF 值较无栓塞组减低；RVSV 较无栓塞组减低，两组间差异无统计学意义。随着栓塞程度加重，RVEF 逐渐减低，且三组间 RVEF 整体差异有统计学意义。中央型较周围型、无栓塞组 RVEF 明显减低，RVEF 在三组间差异均有统计学意义。Spearman 相关系数分析所有心功能参数与栓塞指数相关性均具有统计意义，其中除了 RVEF 与栓塞

指数呈中等程度负相关（相关系数为-0.512），其余右室心功能参数与肺栓塞指数均存在中等程度正相关关系。室间隔形态及对比剂返流在栓塞组发生率明显高于无栓塞组，且不同栓塞部位组间均具有统计学意义，差异显著。
结论： CTPA 可以准确评价肺栓塞分布、程度及栓塞指数。随着肺动脉栓塞程度加重，右心室功能逐渐减低。中央型与周围型肺动脉栓塞相比，前者右心功能减低更明显。心功能参数与肺栓塞指数中度相关。室间隔形态及对比剂返流是一个简单判断右心功能状况的指标，可以间接反映肺动脉栓塞的严重程度和右心功能受损情况。

EPO-0511

Computer Tomography Angiography for Presence of System-to-Pulmonary Artery Shunt in Systemic Arterial Supply to the Lung

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Purpose: To evaluate the value of computer tomography angiography (CTA) for diagnosis of systemic supply to the lung and investigate possible causes for the presence of retrograde system-to-pulmonary artery shunt.
Materials and Methods: Forty-six patients, with systemic arterial supply to the lung confirmed by surgery, underwent contrast-enhanced CTA. CT images and clinical features were analyzed in consensus by two experienced radiologists. Of all cases, patients with the feature of retrograde system-to-pulmonary artery shunt (RSPAS) in CT scans were compared with those that have no retrograde system-to-pulmonary shunt (NRSPAS). Differences in clinical features, distribution and diameter of systemic supply arteries between RSPAS and NRSPAS were assessed.
Results: Twenty-one patients with RSPAS and 25 patients with NRSPAS were visible at CTA. Hemoptysis were more frequent in RSPAS (82%) than in NRSPAS (47%) ($P<0.05$). Single systemic artery was more common in NRSPAS (67%) and multiple systemic arteries were more frequent in RSPAS (64%) ($P<0.05$). The mean diameter of systemic arteries (6.62 ± 0.47mm) in RSPAS was significantly larger than that (5.12 ± 0.42mm) in NRSPAS ($P<0.05$). The frequency of chest distress, dyspnea and the distribution of systemic arteries were not significant between RSPAS and NRSPAS ($P>0.05$).
Conclusion: RSPAS includes enlarged and multiple systemic supplying arteries. And that may suggest greater risk for life-threaten hemoptysis.

EPO-0512

128 层 CT 对肺栓塞影像表现与心室功能评估联合心脏生物标志物在肺栓塞预后中的意义研究

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背景及目的：快速且准确地评估肺动脉栓塞患者的危险分层对其在治疗方案的选择上有着至关重要的意义。目前，在血流动力学稳定的肺动脉栓塞患者中，用多排螺旋 CT 肺动脉成像（MD-CTPA）评估其右心室功能障碍（RVD）对患者的预后是否有重要价值尚存在争议性。本研究的目的在于探讨用 MD-CTPA 评估血流动力学稳定的肺动脉栓塞患者右心室功能障碍对患者 30 天内的预后价值，并以超声心动图为诊断标准，分析 MD-CTPA 评估右心室功能障碍的诊断效率。同时分析 B 型尿钠肽（BNP）、肌钙蛋白 I（cTnI）及其他因素在血流动力学稳定的肺动脉栓塞患者 30 天内预后中的价值，以及联合检测的意义。
材料与方法：连续性收集 2018 年 1 月-2019 年 1 月在资阳市第一人民医院进行 MDCT 肺动脉血管成像检查的患者，共 127 名受检者的影像资料及临床相关资料。经纳入标准和排除标准筛选后，共收集病例 36 例。追踪收集这 36 例肺动脉栓塞患者 30 天内临床预后情况。回顾性分析 128 层螺旋 CT 检查资料中右心室/左心室直径比值，以及心脏超声检出 RVD、BNP、cTnI 等与临床预后之间的联系，评价各项指标在临床预后中的价值。
结果：超声心动图检出 RVD、cTnI 升高、BNP 升高、心率≥110/min、收缩压<100mmHg、心衰均与 30 天临床预后不良有关，运用多变量 logistic 回归分析，发现 cTnI>0.05ng/ml（*P*=0.08），BNP>100pg/ml（*P*=0.07）这两项指标可以独立预测肺动脉栓塞患者的临床不良预后。
结论：右心室功能障碍（RVD）影像改变的患者较未检出者多，但两者相比较，发生临床预后不良整体风险的意义不显著。多排螺旋 CT 肺动脉成像检出 RVD 影像改变的患者，临床预后还有待进一步细化。因此我们需要结合临床相关检查综合实施。B 型尿钠肽和肌钙蛋白 I 有良好预测意义，并且联合评价能提高临床预后的预测价值。

EPO-0513
7.0T 心脏 MR 成像在肺高压大鼠模型右心功能评估中的作用

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目的：基于 7.0T 心脏磁共振成像（cardiac magnetic resonance，CMR）观察肺高压（pulmonary artery hypertension, PAH）大鼠肺动脉径线和心脏功能的变化。**方法**：选用 36 只雄性 SD 大鼠（随机分为 6 组，每组 6 只）采用低氧建立 PAH 大鼠模型。于未缺氧时（基线）及缺氧后第 1、2、3、4、5 周利用 MR（Bruker BioSpec 7.0T）进行心脏成像，分别测量主肺动脉（main pulmonary artery，MPA）、右肺动脉（RPA）、左肺动脉（LPA）直径，并计算其与同层面升主动脉（AA）直径之比（MPA/AA；RPA/AA；LPA/AA）；四腔心位右室舒张末期最大径线（dRVmax）与左室舒张末期最大径线（dLVmax）之比（dRVmax/dLVmax），右室舒张末容积（RVEDV），右室收缩末容积(RVESV)，进而计算右室射血分数（RVEF)；每只大鼠均行右心导管术获取右室收缩压（RVSP）。采用 SPSS 24.0 统计软件，应用独立样本 t 检验及 ANOVA 分析比较不同时间点上述各参数的差异，采用 Pearson 相关性分析评价各参数与 RVSP 的相关性。**结果**：造模后第 1 周大鼠 RVSP 即较基线升高（29.92±1.94mmHg vs. 41.55±3.14 mmHg，*P*<0.01），后每周逐步升高，MPA、dRVmax/dLVmax 及 RVESV、RVEDV 逐渐增大（*P*<0.01），RVEF 在缺氧第 2 周显著降低（*P*<0.01）。MPA/AA、dRVmax/dLVmax、RVEF 与 RVSP 具有较好的相关性（分别为 *r*=0.573，*r*=0.700，*r*=-0.760，*P*<0.01）。**结论**：7.0T CMR 可敏感地观察到 PAH 大鼠病程进展中肺动脉及右心形态功能的改变，为研究 PAH 的演变机制打下基础。

EPO-0514

Application of the dual-layer spectral detector CT on CT pulmonary angiography (CTPA) with low dose of iodine contrast agent and low injection rate

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Objective The aim of this study was to evaluate the feasibility of the dual-layer spectral detector CT on CT pulmonary angiography (CTPA) with low dose of iodine contrast agent and low injection rate.
Methods 53 patients with suspected pulmonary embolism were performed CTPA with 20ml 370 mg I/ml at 2ml/s. All chest CT examinations were performed using a dual-layer detector spectral CT unit (IQon, Philips Healthcare). The scanning parameters were as follows: 120 kVp, pitch of 1.109, rotation time of 0.4 second, 64 × 0.625 mm collimation, 1-mm slice thickness, 1-mm slice increment. Two series of images were obtained, including conventional images at 120keV and virtual monoenergetic spectral images at 40keV. The regions of interest (ROIs) were placed at the pulmonary artery trunk, the main right and left pulmonary arteries. The CNR, SNR and image quality score were compared between conventional images and monoenergetic images at 40keV. The sensitivity, specificity, PPV and NPV for the detection of pulmonary embolism were compared between conventional images and virtual monoenergetic spectral images at 40keV.
Results CNR of the pulmonary artery trunk, the main right and left pulmonary arteries on monoenergetic reconstruction at 40keV were 24.3±43.3, 22.2±29.8, 22.6±30.3, respectively. SNR on monoenergetic reconstruction at 40keV were 26.4±44.5, 24.4±31.3, 24.7±31.8, respectively. CNR on conventional images were 5.9±6.1, 5.6±4.7, 5.7±4.9, respectively. SNR on conventional images were 7.6±7.0, 4.7±1.9, 7.2±5.7, respectively. CNR and SNR on virtual monoenergetic images at 40keV were significant higher than conventional images($P<0.05$). Subjective image quality score of virtual monoenergetic images at 40keV was higher than conventional images but there was no significant difference（$Z=-1.2$，$P=0.25$）。26 patients of all showed PE. Compared with conventional images, the sensitivity, specificity, PPV and NPV of virtual monoenergetic images at 40keV were higher in the detection of pulmonary embolism.
Conclusion Virtual monoenergetic images at 40keV on dual-layer spectral CT with low dose of iodine and low flow rate increased the detection of PE, while preserving image quality. At the same time, it reduced the risks of contrast media induced nephropathy and contrast agent extravasation.

EPO-0515

完全性肺静脉异位引流外科术后预测模型

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目的：完全性肺静脉异位引流是一类少见的先天性心脏疾病，其全部肺静脉未能与左心房正常连接，而经侧支静脉回流至腔静脉系统或直接回流至右心房，再经房间隔缺损回流至左心系统。心脏

增强 CT 是临床上评价肺静脉引流的重要的手段，但目前的技术尚不能定量准确评价肺静脉、共汇静脉和左心房的形态及空域分布关系。精准评价 TAPVC 的解剖形态是亟待解决的科学问题。
方法：纳入广东省人民医院 2000-2018 年确诊为完全性肺静脉异位引流且在我院行手术治疗的患儿，对患者一般资料、手术信息、手术前后 CT 数据进行分析，并对手术前后患者的肺静脉及双侧心房进行三维重建，比较术前 CT 所示肺静脉解剖数据与术后死亡率、恢复情况、并发症发生、术后 CT 数据等差异，建立完全性肺静脉异位引流的预测模型，指导临床决策。
结果：共纳入 789 例 TAPVC 患者，包括心上型(59%)、心下型(21%)、混合型(12%)和心脏型(9%)。异质性综合征存在于 584 例(74%)婴儿中。该队列的总生存率在 1 年为 65%，3 年为 50%。梗阻组的生存率明显低于非梗阻组(1 年 47% vs 81%;27% vs 73%，P =0 .01)。阻塞性 TAPVC 和产前预测阻塞性 TAPVC 与术后死亡率显著相关(P = 0.01 和 0.03)。
结论：增强 CT 可用于 TAPVC 患者外科引流术后死亡率的预测。

EPO-0516

MSCT 对不同年龄组肺动脉弹性的观察

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目的 应用多层螺旋 CT，观察不同年龄组的肺动脉弹性的差异。**资料与方法** 回顾性收集 2019 年 2 月至 2019 年 7 月间，在我院行冠脉 CTA 的受检查者，满足无高血压、糖尿病、已知冠心病及冠脉 CTA 检查为阴性结果的入组条件，共 26 人，按年龄分为 A 组<50 岁，6 人，B 组 50-60 岁，10 人，C 组>60 岁，10 人。将应用回顾性门控采集的全心动周期图像，每隔 10%RR 间期进行重建，分别测量 10 组图像的主肺动脉（MPA）横截面积，得出最大横截面积（Ds）及最小横截面积（Dd），采用动脉扩张度（AD）=[（Ds-Dd）/Dd]/脉压、血管顺应性（AC）=（Ds-Dd）/脉压 来评价血管的弹性。**结果** A、B、C 组的 MPA 的扩张度（AD）分别是（8.8±2.3）×10^{-3} /mmHg，（ 7.2±2.5）×10^{-3} /mmHg，（ 6.4±2.9 ）×10^{-3} /mmHg，顺应性（AC）分别是 4.2±1.1mm^2/mmHg，4.1±1.1mm^2/mmHg，3.8±1.8mm^2/mmHg。A 组与 B 组，A 组与 C 组，B 组与 C 组分别进行组间比较，均无明显统计学差异（P>0.05）。**结论** 随着年龄增长，主肺动脉的扩张度、顺应性均有下降，但无明显的统计学差异。

EPO-0517

128 层螺旋 CT 血管造影对肺动脉栓塞的风险预测及疗效评估

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目的：通过 CTPA 对疑似肺动脉栓塞患者进行检查，评价栓子的形态及性质、栓塞的程度及范围；对不同性质的栓子及栓塞程度、范围等情况进行分析，并对治疗前后情况进行对比分析，为临床选择治疗方案及评价预后效果提供依据。
材料及方法： 对 96 例临床怀疑 PE 患者行 MSCT 平扫及 CTPA 检查，将其中 43 例 PE 的检查结果及治疗后结果分别进行对比分析。
结果：

1.后处理技术中 MPR 及薄层 MIP 对栓子的显示明显优于 VR 及 CTVE，差异有统计学意义（P＜0.05）。
2. aPE 组与 cPE 组治疗前后的差异存在统计学意义（P<0.05），即 aPE 组治疗效果明显优于 cPE 组。aPE 组与(a+c)PE 组治疗前后的差异无统计学意义（P>0.05），cPE 组与(a+c)PE 组治疗前后差异无统计学意义（P>0.05）。
3.不同类型栓子在治疗前后 CT 直接征象进行比对， 差异有统计学意义(P<0.05)。
4.PE 治疗前后的 CT 间接征象的变化有统计学意义(P<0.05)。
结论：
1.128 层 MSCTPA 可以良好的显示栓子的自身情况,有利于观察栓塞全貌对栓塞部位、形态、程度、面积作出评价。
2.128 层 MSCT 可见明确诊断有无 PE，通过栓子特点推断栓塞的性质。
3.PE 发生部位与受累面积在治疗效果上没有差异；不同性质的栓塞治疗前后短期比较，aPE 组溶栓治疗效果好。
4.马赛克征、肺少血、支气管动脉扩张可能提示栓子处于慢性期，肺栓塞 MSCT 间接征象与严重程度之间有待进一步研究证实。

EPO-0518

80kVp 管电压结合 10ml 低浓度对比剂 个性化扫描延迟时间 CT 肺动脉成像

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目的 证实 80 kVp 管电压结合 10 ml 对比剂肺动脉成像的可行性。
方法 连续选取肺栓塞可疑患者 70 例，随机分为两组。所有患者均满足 BMI＜28 kg/m^2且体重＜80 kg。常规组管电压 100 kVp，试验组 80 kVp，均为自动管电流。采用小剂量对比剂测试法，速率 5 ml/s。常规组 10ml 对比剂+20 ml 生理盐水测试，监测肺动脉干，获得时间密度单曲线，固定公式得出延迟时间。20 ml 碘海醇（350 mg I/ml）+30 ml 生理盐水扫描。试验组 5 ml 碘克沙醇（270 mg I/ml）+45 ml 生理盐水测试，同时监测肺动脉与肺静脉，获得时间密度双曲线，通过分析双曲线得出个性化延迟时间。试验组根据患者 BMI 与体重将注射方案细化为两种。BMI＜24 kg/m^2且体重＜60 kg 时，增强采用 10 ml 碘克沙醇+40 ml 生理盐水； 24≤BMI＜28 kg/m^2或 60≤体重＜80 kg 时，增强采用 10 ml 碘海醇+40 ml 生理盐水。测量各分支肺动脉，部分伴行肺静脉，左上及右下肺叶 CT 值。用 5 分法评价肺动脉成像质量，3 分法评价肺窗的图像质量。应用独立样本 t 检验比较 2 组间图像质量评分、各分支肺血管 CT 值、注射碘总量、SNR、CNR 比和 CTDIvol、DLP、ED 的差异，应用 X^2检验比较 2 组间锁骨下及上腔静脉硬化伪影显示率和肺动脉栓塞诊断阳性率差异。
结果 基于交叉点时间（Tcross）和扫描时间（Tsd）得到延迟扫描时间（Tdelay）：Tdelay=Tcross-Tsd。常规组肺动脉平均 CT 值高于试验组（P＜0.001）。试验组肺动脉图像质量由于常规组（P＜0.01），锁骨下静脉伪影减少，利于试验组监测出节段性的栓塞。试验组放射剂量和碘负荷均低于常规组（P＜0.01）。
结论 我们建立了一种计算 CTPA 延迟扫描时间的方法，该方法可在 80 kVp、10 ml 对比剂的条件下获得高质量的肺动脉成像，且辐射剂量和碘负荷较低。

EPO-0519

能谱探测器 CT 低流速低剂量 CTPA 图像质量的客观评估

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目的：评估能谱探测器低流速低剂量对比剂在 CTPA 不同单能谱下图像质量。
方法：纳入 2018 年 11 月至 2019 年 2 月我院行 CTPA 患者 47 例（男 23、女 24），平均年龄为（50.5±17.1），采用能谱探测器 CT 行 CTPA 扫描，范围自胸廓入口至膈肌水平，重建单能谱 40~110keV 图像，以 10keV 间隔。在肺动脉主干（PA）、右肺动脉主干（RP）、左肺动脉主干（LP）、右肺上叶动脉（URP）、右肺下叶动脉（LRP）、左肺上叶动脉（ULP）、左肺下叶动脉（LLP）勾画感兴趣区（ROI），测量感兴趣区 CT 值，计算信噪比 (SNR)、对比噪声比 (CNR) 。采用单因素方差分析。
结果：肺动脉主干 CT 值 40~110keV 分别为 634.29±279.73、419.29±178.59、292.86±119.20、216.95±83.55、169.48±61.32、138.45±46.83、117.34±37.03、102.48±30.2, SNR40~110keV 分别为 21.40±17.92、14.28±11.99 10.05±8.41、7.5±6.23、5.90±4.86、4.80±3.93、4.14±3.36、3.30±2.63，CNR40~110keV 分别为 19.31±16.49、12.30±10.64、8.14±7.11、5.63±4.96、4.05±3.6、3.02±2.71、2.32±2.11、1.82±1.68；40keV 下 CT 值、SNR、CNR 均显著高于 50~110KeV 能谱。F（PA、LA、RA）=89.005），P＜0.05。单能谱 40keV 各个 ROI 区 CT 值均显著高于 50-110KeV 组，F（URP、LRP、ULP、LLP）=89.269），P＜0.05。
结论：单能谱 40keV CT 值、SNR、CNR 高于其他组，40KeV 图像有利于肺动脉显示，可弥补肺动脉强化不佳导致无法诊断。

EPO-0520

Assessment of coronary artery disease using 1.5-T non-contrast whole-heart magnetic resonance coronary angiography

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Purpose:
To prospectively evaluate the use of whole-heart three-dimensional (3D) coronary magnetic resonance angiography (MRA) at 1.5 T in patients suspected of having coronary artery disease (CAD).
Methods:
Free-breathing steady-state free precession whole-heart coronary MRA images were acquired for 39 patients with suspected CAD using a 1.5-T magnetic resonance imaging unit. The accuracy of MRA for detecting a ≥50% reduction in diameter was determined using X-ray coronary angiography as reference method.
Results:
Whole-heart coronary MR angiography was performed in 38 patients (31 men and 7 women; mean age, 58.4 years ± 8.4 [standard deviation]) with an average imaging time of 10.4±2.6 min. The average heart rate during MRA acquisition was 67±9 beats per minutes. The MRA images were acquired during diastole in 81% patients (31 of 38) and systole in 29% patients (7 of 38). A total of 108 coronary vessels were evaluated while the other 6 vessels in 3 patients were excluded for poor image quality. The sensitivity, specificity, positive and negative predictive values, and accuracy of MRA

were 96%, 29%, 85%, 67% and 84% according to patient based analysis, 98%, 59%, 73%, 97% and 80% according to vessel based analysis.

Conclusion:

Non-contrast whole-heart coronary MRA at 1.5T can noninvasively detected significant CAD with high sensitivity and negative predictive value, which indicates the whole-heart coronary MRA can rule out CAD.

EPO-0521

“一站式”CT 心肌灌注成像在评估冠状动脉重度狭窄患者中的应用价值：与心脏磁共振对比研究

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目的 采用“一站式”CT 心肌灌注成像（CT-MPI）， 与心脏磁共振（CMR）对比，探讨其在评估冠状动脉重度狭窄患者中的应用价值。

方法 前瞻性选取 50 例我院心内科经冠状动脉造影证实冠脉一支或多支狭窄程度≥90%，欲行冠脉支架植入术的患者，于术前一周内行“一站式”CT-MPI 检查，其中 22 例同时行 CMR 检查。采用后处理软件获取灌注缺损心肌、正常心肌的灌注参数并比较，包括血流量（BF）、血容量（BV）、达峰时间（TTP）及平均通过时间（MTT）。同时获取左心功能参数，包括左室射血分数（LVEF）、收缩末期容积（ESV）、舒张末期容积（EDV）及心搏量（SV）。采用 Pearson 相关分析比较 CT 和 CMR 缺损/正常心肌相对灌注参数的相关性。Bland-Altman 法分析 CT 及 CMR 左心功能参数测量的一致性。 记录“一站式”CT-MPI 扫描的辐射剂量。

结果 与正常心肌相比，灌注缺损心肌的 BV、BF 下降，而 MTT、TTP 延长（所有 $P<0.05$）。CT 和 CMR 测得的 rBV、rBF、rMTT 及 rTTP 呈中到高度正相关（r 分别为 0.685、0.641、0.871、0.733，所有 $P<0.05$）。2 种检查方式左心功能参数一致性较好。“一站式”CT-MPI 扫描有效剂量为 3.5（IQR，3.3-3.8）mSv。

结论 “一站式”CT-MPI 能一次扫描同时获得冠脉解剖、心肌灌注和左心功能信息，且辐射剂量较低，在冠状动脉重度狭窄患者病情评估中具有重要意义。

EPO-0522

Preliminary study on non-contrast-enhanced free respiratory navigation whole-heart coronary magnetic resonance angiography based on Dixon at 3.0T

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Objective Previous studies have found that coronary magnetic resonance angiography (CMRA) imaging based on Dixon sequence with water/fat separation technology can improve image quality and increase blood signal-to-noise ratio compared with traditional SPIR fat suppression. The purpose of this study was to explore the feasibility of coronary artery visualization on non-contrast-enhanced free respiratory

navigation whole-heart coronary magnetic resonance angiography (WH CMRA) on Dixon, and analyze the correlation between heart rate and image quality.

Methods Twenty-one patients with suspected coronary heart disease were enrolled in this study, performed WH CMRA based on Dixon in our hospital. CPR reconstruction was performed on all images using the Philips workstation ISP (Intelli Space Portal). The coronary artery were divided into RCA, LM, LAD, LCX and 9 segments according to the recommendations of the American Heart Association (AHA). Two radiologists scored the image quality with 4 points. Spearman correlation analysis was used to observe the correlation between coronary artery image quality score and heart rate.

Results All twenty-one subjects successfully completed the scan with a mean age of 58.62±11.89 years, a mean heart rate of 68.81±21.71 bpm, a mean scanning time of 5.21±0.96 min and included 63 coronary arteries and 189 segments. 165 coronary segments (87.30%) met the diagnostic requirements (≥2 points). The image quality had good inter-observer agreement (Kappa=0.779). Therefore, even with improved diagnostic criteria (≥ 3 points), the display rates of the right coronary artery and the proximal left coronary artery were still very high. Heart rate showed a significant negative correlation with LAD3, LM and LAD2 rather than other segments (P＜0.05).

Conclusion It is a feasible method to visualise coronary artery using non-contrast-enhanced free respiratory navigation WH CMRA based on Dixon, which has stable display in the proximal coronary artery and can meet the needs of clinical diagnosis.

EPO-0523

Feasibility of applying post-processing techniques in triple-rule-out CTA

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Triple-rule-out CTA technique can evaluate the thoracic aorta, pulmonary artery and coronary artery at the same time. Some diseases of above arteries are life threatening causes of acute chest pain (ACP), which belong to most frequently symptoms of patient in the emergency departments. Triple-rule-out CTA can not only reduce radiation dose, but also contrast volume. Furthermore, it reduces the cost and time of examinations. Post-processing techniques include multi-planar reconstruction, curved-planar reconstruction and volume rendering technique. Post-processing techniques are effective methods to evaluate thoracic aorta, pulmonary artery and coronary artery in triple-rule-out CTA.Based on above results and discussions, the conclusions of this study are achieved as below:(1) Technique of triple-rule-out CTA can assess the thoracic aorta, pulmonary artery and coronary artery at the same time.(2) Diagnosis of triple-rule-out CTA can differentiate among diseases with symptom of acute chest pain, such as coronary artery stenosis, pulmonary embolism, aortic dissection, penetrating atherosclerotic ulcer and intramural haematoma.(3) Post-processing techniques are

effective methods to evaluate thoracic aorta, pulmonary artery and coronary artery in triple-rule-out CTA.

EPO-0524

Preoperative coronary computed tomography angiography in non-cardiovascular surgery patients with unknown or suspected coronary artery disease

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Objective: To investigate the usefulness of preoperative coronary computed tomography angiography (CCTA) to rule out or detect significant coronary artery disease (CAD) in patients referred for non-cardiovascular surgery and the impact of CCTA results to clinical decision-making.
Materials and Methods: The institutional review board approved this retrospective study. 918 patients (age 68.5±6.9 years, 74.6% males) including 843 patients with unknown CAD and 75 patients with suspected CAD who underwent CCTA and referred for non-cardiovascular surgery were enrolled from September 2012 to June 2018 at our institution. Multivariate logistic regression analysis was performed to determine predictors of significant CAD and the event of abandoned surgery in patients with significant CAD.
Results: In total, 738 (80.39%) patients had non-significant CAD, and 180 (19.61%) patients had significant CAD. Single-, 2-, and 3- vessel disease was found in 117 (12.75%), 47 (5.12%) and 16 (1.74%) patients. Multivariate analysis demonstrated that positive ECG analysis and Agatston score were independently related with a diagnosis of significant CAD. And the optimal cutoff of Agatston score was 192.4. The event of giving up scheduled surgery increased consistently according to the severity of stenosis and the number of obstructive major coronary artery. Multivariate analysis showed degree of stenosis to be the only independent predictors for giving up of scheduled surgery. In addition, medication using at perioperative period increased consistently according to the severity of stenosis.
Conclusion: In patients referred for non-cardiovascular surgery, preoperative CCTA was useful to rule out or detect significant CAD, and subsequently influenced patient disposal. However, it might not be necessary for many patients if they have negative ECG results and low Agatston score.

EPO-0525

64 层螺旋 CT 冠状动脉血管成像诊断复杂性冠状动脉狭窄的价值

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目的 评价 64 层螺旋 CT 冠状动脉血管成像诊断复杂性冠状动脉狭窄的价值以及对制定治疗策略的影响。 **资料与方法** 选取 69 例在我科接受冠状动脉 CTA 检查，提示有至少一支冠状动脉显著狭窄（≥50%）的患者。将冠状动脉狭窄分为复杂性病变和简单病变。前者包括分叉病变、完全闭塞病变、开口病变、弥漫长病变。后者为除复杂性病变所含类型以外的病变。分叉病变根据 Lefevre 分型进一步分为 5 型。所有患者均于 2 周内行 CAG。将 CTA 的结果与 CAG 对照。 **结果** CTA 共检出大于 50%狭窄 286 处，其中简单病变为 157 处，复杂性病变为 129 处。其中分叉病变 57 处、闭塞病变 22 处、开口病变 9 处、弥漫长病变 41 处。57 处分叉病变，按照 Lefevre 分型，有 1 型 18 处、2 型 21 处、3 型 5 处、4 型 6 处、4a 型 5 处和 4b 型 2 处。与 CAG 相比，CTA 诊断简单病变的敏感度为 92.16%，特异度为 98.51%，阳性预测值为 89.81%，阴性预测值为 98.50%。CTA 诊断分叉病变的敏感度为 100%，特异度为 99.12%，阳性预测值为 85.96%，阴性预测值为 100%。CTA 诊断闭塞病变、开口病变和弥漫长病变的敏感度、特异度、阳性预测值及阴性预测值均为 100%。**结论** 64 层螺旋 CT 冠状动脉 CTA 可准确诊断各类复杂性冠状动脉狭窄，指导进一步治疗方案的选择，在复杂性冠状动脉狭窄的诊断和治疗中均具有重要的临床价值。

EPO-0526

The best predictor of ischemic coronary stenosis: subtended myocardial volume, machine learning-based FFRCT, or high-risk plaque features?mic relevance of coronary artery stenosis.

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OBJECTIVES: The present study aimed to compare the diagnostic performance of a machine learning (ML)-based FFRCT algorithm, quantified subtended myocardial volume, and high-risk plaque features for predicting if a coronary stenosis is hemodynamically significant, with reference to FFRICA. METHODS: Patients who underwent both CCTA and FFRICA measurement within 2 weeks were retrospectively included. ML-based FFRCT, volume of subtended myocardium (Vsub), percentage of subtended myocardium volume versus total myocardium volume (Vratio), high-risk plaque features, minimal lumen diameter (MLD), and minimal lumen area (MLA) along with other parameters were recorded. Lesions with FFRICA </= 0.8 were considered to be functionally significant. RESULTS: One hundred eighty patients with 208 lesions were included. The lesion length (LL), diameter stenosis, area stenosis, plaque burden, Vsub, Vratio, Vratio/MLD, Vratio/MLA, and LL/MLD(4) were all significantly longer or larger in the group of FFRICA </= 0.8 while smaller minimal lumen area, MLD, and FFRCT value were noted. The AUC of FFRCT + Vratio/MLD was significantly better than that of FFRCT alone (0.935 versus 0.873, p < 0.001). High-risk plaque features failed to show difference between functionally significant and insignificant groups. Vratio/MLD-complemented ML-based FFRCT for ″gray zone″ lesions with FFRCT value ranged from 0.7 to 0.8 and the combined use of these two parameters yielded the best diagnostic performance (86.5%, 180/208). CONCLUSIONS: ML-based FFRCT simulation and Vratio/MLD both provide incremental value over CCTA-derived diameter stenosis and high-risk plaque features for predicting hemodynamically

significant lesions. Vratio/MLD is more accurate than ML-based FFRCT for lesions with simulated FFRCT value from 0.7 to 0.8. KEY POINTS: * Machine learning-based FFR CT and subtended myocardium volume both performed well for predicting hemodynamically significant coronary stenosis. * Subtended myocardium volume was more accurate than machine learning-based FFR CT for "gray zone" lesions with simulated FFR value from 0.7 to 0.8. * CT-derived high-risk plaque features failed to correctly identify hemodynamically significant stenosis.

EPO-0527

基层医院开展螺旋 CT 冠状动脉血管成像的应用体会

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探讨多层螺旋 CT 在冠状动脉血管造影中的技术应用，以及造影对临床治疗的意义。方法：使用多层螺旋 CT 对 32 例心脏病患者行冠状动脉造影检查，利用多层螺旋 CT 的后处理功能对冠状动脉影像进行重组，以便更清楚、直观的了解冠状动脉的主枝及分支，促进冠状动脉病变的诊断。结果：31 例均能成功的显示各主枝及分支。其中 27 例患者支冠脉有不同程度的硬斑块和软斑块，冠脉伴有不同程度的狭窄。结论：扫描前，心率大于 75 次/min 的患者，冠状动脉的主要分支都出现了不同程度的不规整，通过技术控制在心率平稳且小于 75 次/min 的情况下扫描，重建冠状动脉三维成像。结论：多层螺旋 CT 对冠状动脉成像可逼真、清晰、准确显示冠状动脉细节状况，对冠状动脉病的诊断有积极意义，具有很高的临床应用价值。在基层医院要严格掌握 CTA 适应症，做好造影剂过敏反应的预防抢救准备工作。

EPO-0528

Impact of blending weight in hybrid iterative reconstruction on coronary artery calcium score based on cardiac CT

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Objectives: To investigate the impact of blending weight in hybrid iterative reconstruction (adaptive statistical iterative reconstruction veo, ASIR-V) on coronary artery calcium scores and risk classification based on cardiac CT. Methods: The non-contrast ECG-gated cardiac CT images of 100 patients were reconstructed using different blending weights of ASIR-V, including FBP (0% ASIR-V), 20% ASIR-V, 40% ASIR-V, 60% ASIR-V, 80% ASIR-V, and 100% ASIR-V. The average CT value and standard deviation (SD) in the ascending aorta, and maximum value of calcified plaque were compared among the different reconstructions. Agatston score, mass score, volume score and risk classification based on Agatston score were also compared. Results: *An increased percentage of ASIR-V was associated with reduction in SD of ascending aorta and the 3-types of calcium scores(P*<0.05). Agatston scores were 170.2±387.3, 168.6±385.3, 166.4±381.9, 164.6±379.4, 162.9±376.7, and 161.1±374.1

for reconstructions with 0%, 20%, 40%, 60%, 80%, and 100% ASIR-V, respectively. Mass scores were 23.62±52.56, 23.49±52.23, 23.32±52.30, 23.20±53.10, 23.15±52.83, and 22.99±52.41 mg, respectively. Volume scores were 68.7±140.7, 67.8±139.8, 67.0±139.6, 65.7±137.2, 64.8±135.9, and 64.0±135.0 mm^3, respectively (all P≤0.001). There was no statistically significant difference in the average value in ascending aorta and plaque maximum value(P＞0.05) ASIR-V led to the risk reclassification to lower category *in 10 patients, including 8 from low to very low, and 2 from moderate to low based on Agatston scores.*
Conclusion：ASIR-V results in image noise and calcium score reduction, and may result in risk reclassification to lower category.

EPO-0529
基于冠状动脉 CTA 的 CTO 评分在冠状动脉慢性完全闭塞病变介入治疗中的预测价值

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目的：评估基于冠状动脉血管成像（coronary computed tomography angiography, CCTA）的 CTO 评分对冠状动脉慢性完全闭塞病变(chronic total occlusion lesions，CTO)经皮介入治疗（percutaneous coronary intervention, PCI）最终结果的预测价值。方法：回顾性分析 66 例冠脉 CTO 患者，分为 PCI 成功组（48 例）和 PCI 失败组（18 例），分析闭塞段入口形态、钙化、弯曲度、长度对介入治疗结果的影响。计算基于冠脉 CTA 的 J-CTO 评分（$J\text{-}CTO_{CT}$），同时将 J-CTO 评分系统中钙化进一步分为钙化程度（轻度、重度）、钙化范围（全段，部分）重新计算改良-CTO 评分（改良-CTO_{CT}），利用 ROC 曲线评价二者对 CTO 介入结果的预测效能。 结果：与 PCI 成功组相比，PCI 失败组在闭塞段近端入钝型纤维帽（22.9% vs 50%，P=0.041）、弯曲度>45°（15.1% vs 50%，P=0.043）、闭塞段长度>20mm（25.7% vs 67%，P=0.046）、闭塞段全段钙化（14.6% vs 38.9%，P=0.043）、闭塞段重度钙化（10.4% vs72.2%, P=0.000）的发生率明显增高，是导致 CTO 病变介入治疗失败的主要因素。改良-CTO_{CT}在预测 CTO 介入成功率的 ROC 曲线下面积高于 $J\text{-}CTO_{CT}$（0.921vs0.847，P＜0.001）。结论：CTO 病变 PCI 术前 CTA 形态学评估有助于预测 PCI 手术成功率，基于冠脉 CTA 的改良-CTO_{CT}评分较 $J\text{-}CTO_{CT}$评分有更高的预测价值。

EPO-0530
迭代重建算法结合不同卷积核值对冠脉支架可视化 的研究

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目的评估第三代双源 CT 高级迭代重建算法结合不同卷积核值对冠脉金属支架的可视化，并比较不同卷积核值对不同内径支架的图像质量影响，为 PCI 术后支架的显示提供最优选择。
方法连续收集 2017 年 12 月至 2018 年 9 月间接受冠脉 CTA 检查的金属支架植入患者 61 例（男 46 例，女 15 例），共 84 根支架，其中实际内径≥3mm 的支架 52 根，内径＜3mm 的有 32 根。采用第三代双源 CT 机扫描，管电压采用 CARE kV 自动调节（参考管电压 100kV），开启实时动态剂量调

节自动曝光 Care Dose 4D（参考管电流 300mAs/rot）。采用 ADMIRE 3 结合不同卷积核值（Bv40、Bv44、Bv49、Bv59）对不同内径的支架（＜3mm 和≥3mm）行内径、可视化率及图像质量的评估，比较各组间差异。正态分布连续变量资料组间比较用单因素方差分析，如组间差异有统计学意义，再进行均数的两两比较。两种不同内径支架组的可视化率比较采用独立样本 t 检验。
结果内径≥3mm 的支架，Bv49 和 Bv59 的支架可视化率（69.49±3.37%，70.04±2.90%）明显高于 Bv40 组和 Bv44（57.94±3.74%，62.78±3.19%），差异有统计学意义（F=175.21，P<0.001）。内径＜3mm 的支架，Bv49 和 Bv59 支架可视化率（52.27±7.92%，53.98±7.16%）也高于 Bv40 和 Bv44（41.96±6.70%，45.52±5.86%），差异有统计学意义（F=21.579，P<0.001）。相同卷积核组，内径≥3mm 的支架可视化率明显高于内径＜3mm 的支架(P<0.001)。Bv49 组的图像主观评分高于其他各组（F=35.780，P<0.001）。
结论第三代双源 CT 高级迭代重建算法结合不同卷积核可改善 PCI 术后支架可视化率及图像质量，以 Bv49 最有利于支架内可视化的显示，尤其内径≥3mm 的支架。

EPO-0531
256 层螺旋 CT 冠状动脉成像在心肌桥-壁冠状动脉合并血栓患者中的诊断效果研究

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【摘要】目的:探讨 256 层螺旋 CT 冠状动脉成像在心肌桥-壁冠状动脉合并血栓患者中的诊断效果。方法：取 2010 年 10 月-2018 年 5 月医院收治的疑似心肌桥-壁冠状动脉合并血栓患者 1632 例，患者均行 256 层螺旋 CT 冠状动脉成像诊断，将获得的数据传输到工作站完成多平面重建（MPR）、容积重建（MIP）、曲面重建（CPR）等处理，分析 256 层螺旋 CT 冠状动脉成像在心肌桥-壁冠状动脉合并血栓患者中的诊断效果及价值。结果：1632 例患者均经过 256 层螺旋 CT 冠状动脉成像诊断后 263 例发生心肌桥，检出率为 16.12%。其中，排在前两位的分别为 LMA 和 LAD，分别占：50.19%和 20.15%；263 例心肌桥-壁冠状动脉合并血栓患者均伴有不同临床表现，并且以心前区不适为主，占 65.78%。心肌桥-壁冠状动脉合并血栓患者 MB 厚度为 0.8-5.6mm，43 例出血壁冠状动脉管腔出现不同程度狭窄。结论：将 256 层螺旋 CT 冠状动脉成像用于心肌桥-壁冠状动脉合并血栓患者中效果理想，能帮助患者早期确诊，指导临床治疗，值得推广应用。

EPO-0532
基于机器深度学习的 FFRCT 与有创性 FFR 的相关性研究

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目的 以压力导丝测量的冠状动脉血流储备分数（FFR）为金标准，探讨不同区间内基于机器深度学习的 FFRCT 数值对冠状动脉功能性狭窄的诊断准确性 方法 回顾性收集先后行冠状动脉 CT 血管成像（CCTA）及 FFR 检查的病人 125 例（162 处病变），年龄 42.0~88.0 岁，平均年龄（61.0±8.2 岁），男 81 例（63.0±10.6 岁），女 48 例（60.2±7.5 岁）。且两项检查时间间隔≤2 周。在 CCTA 影像上获得病变直径狭窄程度，采用德国西门子原型软件 cFFR（cFFR, version 3.0.0）计算 FFRCT 数值。以 FFR≤0.8 为具有血流动力学意义的狭窄。 结果 FFRCT 及 CCTA 对于诊断功能性狭窄的 AUC 分别为 0.85、0.76（P<0.05）。基于病人（n=125）水平分析，CCTA 的诊断敏感度、特异度、准确度分别为 77.6%、69.7%和 76.8%；FFRCT 的诊断敏感度、特异度、准确度分别为 85.7%、78.9%和 86.1%。当 FFRCT 数值≤0.69、0.7~0.8、0.81~0.89、≥0.9 时， FFRCT 诊断功能性狭窄的准确度分别为 86.4%、61.2%、88.6%、98.2%。结论 ①以 FFR 为金标准，FFRCT 数值在“灰色区间”之外的病变结果具有良好的诊断准确性；②而区间内的病变诊断准确性欠佳。

EPO-0533
256 层 iCT 对 2 型糖尿病合并冠心病冠脉病变评价研究

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目的 应用 256 层 iCT 评价 2 型糖尿病合并冠心病冠状动脉病变，为临床诊治提供科学依据。**方法** 收集 2018 年 1 月至 2019 年 6 月本院住院患者 300 例，确诊为 T2DM 合并冠心病 127 例为实验组，单纯冠心病 173 例为对照组。根据糖尿病确诊年限实验组又分为病程＞5 年组（实验 a 组）和病程≤5 年组（实验 b 组）；根据糖化血红蛋白（HbA1c）水平实验组又分为 HbA1c≥7%组（实验 c 组）和 HbA1c＜7%组（实验 d 组）。300 例均行冠脉成像（CTA），其中 134 例同时行 DSA 冠脉造影。分析实验组及对照组相关实验室检查及各组冠脉病变情况，并与冠脉造影对比。**结果** 冠脉 CT 与冠脉造影比较诊断结果相近；实验组甘油三酯（TG）、胆固醇（TC）、低密度脂蛋白（LDL-L）， 尿酸（UA）、肌酐（Cr）、高密度脂蛋白（HDL-L）及尿微量蛋白（mALB）较对照组明显增高，差异均具有统计学意义，P＜0.05；实验组冠脉以 2~3 支病变为主，对照组单支病变为主，差异具有统计学意义，P＜0.05；实验 a 组多为 2 支到多支血管病变，实验 b 组多为单只血管病变，实验 a 组各支血管病变的发生率高于实验 b 组，差异具有统计学意义，P＜0.05；实验 c 组多为 2 支到多支血管病变，实验 d 组多为单只血管病变，实验 c 组各支血管病变的发生率高于实验 d 组，差异具有统计学意义，P＜0.05。**结论** 256 层 iCTA 与 DSA 冠脉造影对冠脉病变具有基本一致的诊断价值；由于高血脂及高血糖等多种因素的存在，2 型糖尿病合并冠心病患者更多发生冠脉病变；2 型糖尿病病程是影响冠脉病变的重要独立因素；糖化血红蛋白水平可单独影响着冠心病发生。对比于单纯冠心病，2 型糖尿病合并冠心病患者冠脉病变呈更广泛、严重的特点。

EPO-0534
基于 Revolution 探讨 One beat 冠状动脉轴扫结合 Snap shot Freeze 重组技术在自由呼吸冠脉扫描（CCTA）中的价值。

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目的 探讨 One beat 冠状动脉轴扫结合 Snap shot Freeze 重组技术在自由呼吸冠脉扫描（CCTA）中的价值。
方法 收集我院行 16 cm 宽体探测器 One beat 轴扫的冠脉 CTA 检查者 128 例，按屏气和自由呼吸分为两组，其中屏气组 76 例，自 由呼吸 52 例。 再根据受检者心率分为低中高三个心率组（A、B、C），其中屏气组：A1 组（小于 70 bpm）40 例，B1 组（71~85 bpm） 25 例，C1 组（大于 85 bpm）11 例；自由呼吸组：A2（小于 70 bpm）25 例，B2 组（71~85 bpm）18 例，C2 组（大于 85 bpm）9 例。 所有受检者均采用手动选取最佳时相并结合冠状动脉冻结技术（SSF）技术进行重组，得到运动伪影补偿前、后的图像。
客 观评分：分别测量屏气组和自由呼吸组冠状动脉 CTA 图像的主动脉弓根部 CT 值、噪声值、信噪比、对比度噪声比；
主观评 分：由 2 名有经验的放射科医师采用 5 分法对 SSF 前后的 5 组图像的右冠状动脉（RCA）、左前降支（LAD）、左旋支（LCX） 进行评分。 比较各分支在 SSF 前后图像质量的变化并比较在自由呼吸和屏气扫描下 SSF 后不同心率组图像质量的差异。
结果 屏气组和自由呼吸组的主动脉弓根部 CT 值、噪声、信噪比、对比度噪声比均无明显差别（P>0.05）。 在使用 SSF 后无 论在自由呼吸组还是屏气组均能够提高图像质量（P<0.05）；自

由呼吸组和屏气组在使用 SSF 后对于不同心率冠状动脉图 像的质量的提升均无明显差别（P>0.05）。

结论 通过自由呼吸组和屏气组的主客观的比较，依赖于 One beat 冠状动脉轴 扫结合 SSF 重组，自由呼吸冠状动脉扫描可以提供高质量的图像。

EPO-0535
基于传统冠状动脉造影对照分析 CT 在冠状动脉成像中诊断心肌桥的价值

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目的 对照分析行 CT 冠状动脉成像（ CTCA）后再次进行传统冠状动脉造影（ CAG）检查患者的影像学资料，探讨 CTCA 对心肌桥的诊断价值。 方法 回顾性分析 267 例行 CTCA 检查后一个月内行 CAG 检查患者的影像学资料，其所有图像分析均采用双盲法，既由两名放射科资深心血管诊断医师及两位介入科医师分别在不知道各自诊断结果的前提下作出诊断，内容包括心肌桥发生部位、深度、长度、管腔狭窄程度以及是否合并粥样斑块，并行统计学方法分析，同时比较 CAG 与 CTA 对心肌桥检出率。结果 267 例患者中，CTCA 中共检出 98 处心肌桥，检出率为 36.7%，平均长度为(20.2±7.6) mm，深度为(1.8±0.3) mm，其中 39 处为完全性心肌桥，59 处为不完全心肌桥；分布在前降支中段 58 处、远段 26 处、近段 5 处，第一对角支 3 处，第一钝缘支 4 处，右冠后降支 2 处；CT 检出心肌桥血管合并粥样硬化 29 例，分别为钙化斑块 7 例、混合斑块 16 例、非钙化斑块 6 例。CAG 显示 24 处心肌桥，检出率为 24.5%（24/98），位于前降支中段 20 处，前降支远段 3 处，右冠后降支 1 处；与 CTCA 检出的心肌桥位置一致，其中 20 处为完全性心肌桥，4 处为不完全心肌桥，合并粥样硬化 12 例。CTCA 对心肌桥的检出率高于 CAG（χ^2 =12.633， P ＜0.001）。 结论 CTCA 能直观显示冠状动脉与心肌的关系，对心肌桥及合并合并粥样硬化斑块的诊断显示优于 CAG，可作为临床诊断心肌桥的首选。

EPO-0536
应用双层探测器能谱 CT 提高门静脉的成像质量

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目的：探索双层探测器能谱 CT 单能级影像对于门静脉成像质量的影响。**方法**：使用单源双层探测器能谱 CT 对 39 个怀疑腹部疾病的患者行对比增强检查。以 3ml/s 的速度注射对比剂 iopamidol (320mg/ml) 60ml 后 90 秒以能谱 CT 采集方式行门静脉期扫描。原始数据被重建成常规的 120kVp 的混合能量图像以及以能谱为基础的数据，获得 40，50，60，70keV 的单能级图像。测量常规 120kVp 混合能量组以及 40，50，60，70keV 的单能级组的图像噪声，门静脉的信噪比（SNR），门静脉与同层竖脊肌相比较的对比噪声比（CNR）。方差分析用来比较各组之间影像噪声、SNR 和 CNR。寻找获得门静脉成像的最佳单能级图像。**结果**：各组之间影像噪声、门静脉的 SNR、与腰大肌相比较的 CNR 有显著的统计学差异（p<0.05）。40keV 组的噪声低于常规 120kVp 混合能量组，SNR 和 CNR 远远高于常规 120kVp 混合能量组及其他单能量组。**结论**：40keV 是双层探测器能谱 CT 成像门静脉的最佳单能级。

EPO-0537

冠状动脉 CTA 心肌血流指数预测阻塞性冠心病

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目的 分析冠状动脉 CT 血管成像心肌血流指数(CCTA-MFI)在预测阻塞性冠心病中的可行性。**方法** 连续性收集 920 例门诊首诊疑似冠心病患者，GRACE 院内死亡风险评分为低危，测量心率、血压、身高、体重，间隔 10 分钟，测量三次，取平均值，行 CCTA 检查，筛选出优质图像 357 例，运用后处理软件计算左心室心肌体积，计算心肌血流指数（CCTA-MFI）；住院后行 ICA 检查 68 例；以 ICA 为金标准，以小于等于 CCTA-MFI 平均值 2 倍标准差为界值预测冠心病（狭窄程度 >70%），分析 CCTA、CCTA-MFI 与 ICA 相关性、评价冠心病准确性及分析两者 ROC 曲线。非参数资料行卡方检验，$P < 0.05$ 认为有显著性统计学差异。**结果** CCTA 扫描平均剂量为（3.17±1.02 ）mSv。CCTA-MFI = 0.131 ± 0.0573，CCTA-MFI 平均值 2 倍标准差为 0.114。68 例患者中， ICA 诊断狭窄程度大于 70%患者 26 例。CCTA-MFI 阳性（≤ 0.114）29 例。以 ICA 管腔狭窄 >70%为金标准，CCTA（≥ 70%）和 CCTA-MFI（≤ 0.114）预测冠心病的敏感性、特异性分别为 75.76%、65.71%和 60.32%、100%，CCTA-MFI 准确性为 92.65%，明显高于 CCTA 的 70.59%（$P< 0.01$）。CCTA、CCTA-MFI 与 ICA 相关系数分别为-0.5876、0.8624（$P< 0.0001$）；ROC 曲线下面积分别为 0.625、0.852（$P = 0.0238$），截断值分别为 40%、0.087，敏感性、特异性分别为 58.33%、100%和 82.54%、80.00%。26 例狭窄 > 70%患者中，24 例 CCTA-MFI < 0.114，20 例行支架植入术。**结论** CCTA-MFI 与心外膜下冠状动脉狭窄程度呈负相关，反映心外膜下冠状动脉狭窄程度，可用于对阻塞性冠心病的准确诊断。

EPO-0538

CT 心肌血流指数评价冠脉支架内再狭窄临床意义

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目的 分析冠状动脉 CT 心肌血流指数(CCTA-MFI)预警冠脉支架内再狭窄临床意义。**方法**连续性收集 572 例 2018 年 2 月至 2019 年 5 月门诊冠心病药膜支架植入术后复诊患者，测量心率、血压、身高、体重，间隔 10 分钟，测量三次，取平均值，537 例行 CCTA 检查，筛选出优质图像 242 例，运用后处理软件计算左心室心肌体积，运用 CT 对比剂示踪技术，计算心肌血流指数（CCTA-MFI），并依据性别、年龄以及是否合并糖尿病、多支血管病变、慢性肾病、过敏体质进行矫正；住院后进一步行冠状动脉造影（ICA）90 例，以 ICA 为金标准，定义支架内狭窄程度<50%为内膜增生，支架内狭窄程度≥50%为支架内再狭窄，寻求诊断支架狭窄最佳 CCTA-MFI 值，分析性别差异及 CCTA-MFI 准确性。非参数资料行卡方检验，$P < 0.05$ 认为有显著性统计学差异。 **结果** 90 例患者，男性 59 例中 23 例发生支架狭窄，女性 31 例中 11 例发生支架狭窄，统计学差异不明显（X^2=0.00933，P=0.9231）。CCTA-MFI 平均值 2 倍标准差为 0.10，最佳截断值为 0.082，90 例患者中，39 例（43.33%，39/90）CCTA-MFI≤ 0.082，其中 34 例（87.18%，34/39）出现支架异常，且其中支架内膜增生 18 例（20%，18/90），支架内再狭窄 16 例（17.78%，16/90）；8 例（8.89%，8/90）出现新的病变，管腔重度狭窄，其中 7 例（87.5%，7/8） CCTA-MFI≤ 0.082。CCTA-MFI 0.082 预警支架异常的敏感性、特异性、阳性预测值、阴性预测值分别为 100%、

91.07%、87.18%、 100%，准确性为 94.44%。**结论** CCTA-MFI 可以用来预测冠状动脉支架异常情况；CCTA-MFI 减低患者容易合并新发病变，且近 50%患者会出现支架内再狭窄，需引起临床重视。

EPO-0539
冠状动脉管腔内对比度衰减梯度校正值在弥漫性钙化冠脉狭窄中的应用价值

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摘要：目的 探究冠状动脉管腔内对比度衰减梯度校正值在冠状动脉弥漫性钙化管腔狭窄中的应用价值。**方法** 回顾性分析 84 位先后行冠状动脉 CT 血管造影及 ICA 的冠状动脉弥漫性钙化患者，应用 320 排 CT 所得的 CCTA 数据，测定弥漫性钙化冠脉两端的 CCO 差异，与金标准 ICA 所得狭窄程度进行比较，用非参数检验 Kruskal-Wallis 进行统计分析，并应用受试者工作特征曲线判断 CCO 差值诊断冠状动脉狭窄的最佳截断点，灵敏度及特异度。**结果** 共纳入 122 例弥漫性钙化冠脉，无明显狭窄组 16 例，狭窄程度＜70%组 42 例，狭窄程度 70-99%组 64 例，三组的中位数分别为 0.064、0.117、0.176。无明显狭窄组和狭窄程度 70-99%组、狭窄程度＜70%组和狭窄程度 70-99%组之间存在显著性差异（P 均＜0.05），无明显狭窄组和狭窄程度＜70%组之间无显著性差异（P=0.233）。ROC 曲线分析结果显示，ROC 曲线下面积为 0.681，最佳截断点为 0.2920。以 ICA 检查结果为金标准，以 0.2920 为 CCO 差值截断点诊断冠状动脉狭窄率≥70%的灵敏度为 84.4%、特异度为 44.8%。**结论** CCO 差异对诊断狭窄程度≥70%的弥漫性钙化冠脉具有提示作用。

EPO-0540
Predicting adverse events and coronary artery disease symptoms in patients with abnormal origin of left coronary artery: a retrospective study

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Purpose: To compare coronary artery features among abnormal origin of left coronary arteries (ALCA) patients with different anatomic patterns and determine the features correlated with coronary artery disease (CAD) symptoms and adverse events.
Methods: Among 30, 406 consecutive patients referred to our institution undergoing coronary computed tomography angiography (CCTA) from 2012-2018, we retrospectively enrolled 43 patients (M/F: 20/23, 54.79 ± 16.92 years) with ALCA. Baseline clinical features were recorded and the follow-up was done by telephone. CTAs were reviewed on a professional software (Horos, V3.3.1) for abnormal artery, origin and course of the abnormal artery, take-off angle, stenosis severity, the length of stenosis, the

diameter of right coronary artery (corrected with the diameter of ascending aorta) and any atherosclerotic plaques. R project was used for statistical analysis and $P< 0.05$ was considered as significant.

Results: Among the ALCA patients, left main artery was the most commonly involved artery (23/43, 53.49%), followed by the left circumflex (LCx) (18/43, 41.86%). Right sinus of Valsalvawas the most common origin (27/43, 62.79%). 20 patients were with a retroaortic course, for which LCx was the most frequently involved (18/20). Three patients with main adverse cardiac eventswere recorded during follow-up (mean 3.21±1.70 years). Two with severe arrhythmia had interarterial course and a take-off angle less the 20°. The last one died without specific reason had a prepulmonic course, a small take-off angle and was anomalous left coronary artery arising from pulmonary artery (ALCAPA). Twenty-five patients had complaint of CAD symptoms. Patients with symptoms shows no significant differences in course, take-off angle, stenosis severity and other anatomic features with patients without CAD symptoms. However, atherosclerosis of normal vessel was more common in patients with CAD symptoms (P=0.004), with more severe atherosclerotic plaques (P=0.040).

Conclusion: Because of the significantly higher risk of sudden cardiac death in ALCA, screening among athletes is necessary. For ALCA patients with small take-off angle, interarterial course or ALCAPA, risk of death exists and intervention might be considered. CAD symptoms should be more from the atherosclerosis instead of the high-risk anatomy for these patients.

EPO-0541

Quantitative Assessment of Right Ventricular Function and Severity of Pure Mitral Stenosis with 64-Section Multi-detector Row CT: Comparison with Magnetic Resonance Imaging

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OBJECTIVE: To evaluate whether 64-MDCT can quantitatively assess the severity of pure mitral stenosis (PMS) by measuring right ventricular (RV) volumetric and other parameters in comparison to golden standard MRI.

METHODS 43 with PMS (26 men, 17 women, mean age, 46±8 years) underwent 64-MDCT and MRI for assessing RV volumetric and other parameters, as well as calculating tricuspid regurgitation volume (TRV). All patients was classified as mild (7), moderate (21) and severe (15) group, according the severity of mitral stenosis.

RESULTS 64-MDCT and TTE had good agreement and correlation in measuring MVA(r=0.99, bias, -0.4mm^2). Right ventricular stroke volume (RV-SV), ejection fraction (RV-EF), cardiac output (RV-CO) and wall mass (RV-Mass) were significantly lower in patients with severe PMS than those in patients with moderate and mild PMS by 64-MDCT and MRI (respectively, all p<0.01). Right ventricular end-systolic volume (RV-ESV) was significant higher in severe PMS than that in patients with moderate and mild PMS (respectively, all p<0.01). RV-ESV, RV-SV, RV-EF, RV-CO, LVCO, TRV, and RV-

Mass by 64-MDCT correlated well with those by MRI in each group (r= mild, 0.86-0.98; moderate, 0.8-0.98; severe, 0.91-0.98, respectively; all p<0.01). No significant differences were revealed in calculated the above parameters in each group between the two modalities (p=0.10 to 0.95). TRV were significant higher in patients with severe PMS than that in patients with moderate and mild PMS with both modalities (all p<0.001).
CONCLUSION 64-MDCT could provide quantitative information for determining the severity of PMS, and be considered as an accurate, noninvasive imaging technique.

EPO-0542
肥心病患者左心室心肌纹理特征与左心室整体功能评估轻心衰程度的对比研究

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目的:运用心脏磁共振电影序列计算肥厚型心肌病(Hypertrophic Cardiomyopathy, HCM)患者左心室舒张末期心肌区域纹理特征鉴别心衰程度，与左心室整体功能参数进行对比。**方法:**纳入我院完成 MR 检查并确诊为 HCM 的患者 82 例，按纽约心脏协会(New York Heart Association，NYHA)心功能分级法分组，NYHAⅠ-Ⅱ为（男 33 例，女 24 例，平均年龄 44.89±12.68 岁)轻度心衰组，NYHAⅢ-Ⅳ为(男 12 例，女 13 例，平均年龄 47.72±16.08 岁)，重度心衰组。用 MATLAB 软件手动提取所有患者左室舒张末期短轴位电影序列心肌区域，并用深度神经网络进行纹理特征提取分析。用 CVI 软件计算所有患者射血分数(Ejection Fraction, EF),延时强化(Late Enhancement，LGE)体积比率每分钟心输出量(cardiac output, CO)，心脏指数(Cardiac Index，CI)。用 SPSS 18.0 行 Mann-Whitney 检验两组患者之间年龄和体重指数(Body Mass Index, BMI)分布的差异性，卡方检验计算两组患者之间男女比例的分布差异性，ROC 对深度纹理特征和 EF，LGE，CO 及 CI 的诊断效能进行分析,并进行 ROC 曲线下面积的计算。**结果:**轻重度心衰两组患者平均年龄和 BMI 没有显著性差异(*P*=0.338,0.120)，男女分布比例没有显著性差异(*P*=0.407)。ROC 计算得出深度纹理特征曲线下面积(90.0%)明显大于 EF(51.2%)，LGE(62.5%),CO(49.5%)和 CI(46.9%),且两组 EF，LGE，CO 和 CI 无显著性差异。**结论:**基于深度神经网络提取纹理特征作为一种新型的定量诊断方案，能够有效定量鉴别纽约心功能分级的Ⅰ-Ⅱ、Ⅲ-Ⅳ级差别，敏感性明显高于传统的延时强化技术以及整体心功能参数。

EPO-0543
磁共振评价室壁瘤对左心室功能影响研究

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目的：探讨磁共振评价心肌梗死后室壁瘤对左心室功能的影响。**方法**：选取自 2018 年 01 月至 2019 年 4 月南京鼓楼医院心肌梗死合并室壁瘤形成的行心脏磁共振的 58 例患者为研究对象，根据美国纽约心脏病学会分级(NYHA) 将 30 例 NYHA Ⅰ-Ⅱ级患者分为 A 组，28 例 NYHA Ⅲ-Ⅳ级患者为 B 组。对两组患者进行心超和心脏磁共振等检查，运用磁共振测量并比较心功能参数及室壁瘤参数。**结果**：两组左心室收缩和舒张功能均不同程度减低，差异有统计学意义。心脏磁共振较心超比

较，敏感性和可靠性更高，磁共振较心脏彩超检测的左室射血分数在两组间差异更加显著。在磁共振检测数据中，与 A 组比较，B 组患者的左心室舒张末容积、左心室收缩末容积、乳头肌重量及室壁瘤瘤体基底部横径、容积均显著升高，左心室射血分数、心指数明显降低，差异均有统计学意义（ P＜0. 05），室壁瘤瘤体高度有增高趋势，但无明显统计学差异。左心室射血分数与室壁瘤瘤体基底部横径及室壁瘤瘤体容积均呈负相关。左心室舒张末容积、左心室收缩末容积和室壁瘤容积呈正相关。**结论：** 心肌梗死室壁瘤形成后左心功能与室壁瘤范围相关，磁共振可精准测量心功能参数及室壁瘤范围，对后续临床治疗具有重要价值。

EPO-0544
ECG 触发容积 CT 在儿童复杂先天性心脏病检查中的应用

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目的：清楚显示复杂先天性心脏病患儿心脏及胸部大血管，左右心系统及分流方向，为临床手术方式提供指导参考。**方法**：A 组：选取 1-10 岁复杂性先天性心脏病患儿 30 例，使用东芝 640 排容积 CT 配合心电门控进行心脏及胸部大血管扫描。扫描参数：100KV 300MAS ECG 触发 容积扫描模式采集左、右心系统舒张期、收缩期心脏及胸部大血管信息。B 组：选取 1-10 岁复杂性先天性心脏病患儿 30 例，使用 GE64 排，东芝 640 排 CT 使用螺旋扫描模式扫描。扫描参数：100KV 300MAS。使用原始轴位图像及 MIP、VR 对图像进行后处理后对比分析。**结果**：A 组容积扫描模式所得图像清晰，运动伪影影响小，可清楚显示异位血管引流血管及细小变异分支，及左右心系统分流情况，房室口、缺损口、瓣口显示清晰。B 组螺旋扫描模式所得图像由于呼吸伪影影响在飞动静脉主干部分交叉重叠显示，不能精准评判异位血管引流血管及细小变异分支，左右心系统各心房室搏动伪影重影响观察，房室口、缺损口、瓣口不可见。**结论**：积扫描模式所得图像清晰，运动伪影影响小，能准确评判心胸血管含细小分支血管形态走形及心脏房室分流情况。

EPO-0545
应用 IMR 重建技术的非门控胸部 LDCT 平扫评估冠脉钙化积分危险度分层新界值的研究

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目的 探讨应用全模型重建技术（IMR）的非门控低剂量胸部 CT（LDCT）平扫一站式筛查评估冠脉钙化积分（CACS）危险分层的新界值。**方法** 前瞻性研究因病情需要行冠脉 CTA 检查的患者 102 例。所有患者均行包含心电门控 CT 平扫的冠脉 CTA 检查及非门控胸部 LDCT 平扫，并将后者进行 IMR 重建。在 Philips 星云工作站的 Heart-Beat CS Agatston 积分分析软件上分别测量非门控胸部 LDCT 平扫和心电门控 CT 平扫图像的 Agatston 积分。非门控胸部 LDCT 平扫评估的 CACS 值按原界值危险分层与传统门控法评估的 CACS 值危险分层进行 kappa 检验；采用 ROC 曲线检验非门控胸部 LDCT 平扫的诊断效能，取约登指数最大的截断点作为最佳界值（新界值），并对新界值所得非门控胸部 LDCT 平扫评估的 CACS 值危险分层与传统门控法评估的 CACS 值危险分层进行 kappa 检验。 **结果** 对非门控胸部 LDCT 平扫的 CACS 值按原界值进行危险分层，与心电门控 CT 平扫的 CACS 值危险分层进行一致性检验，kappa 值为 0.602，P<0.05。非门控胸部 LDCT 平扫测得的 CACS 值与心电门控 CT 平扫测得的 CACS 值低危-中危组的 ROC 曲线下面积为 0.962，P<0.05，最佳诊断界值为 87.44；中危-高危组 ROC 曲线下面积为 0.966，P<0.05，最佳诊断界值为 255.26。对非门

控胸部 LDCT 平扫测得的 CACS 值按最佳诊断界值进行危险分层，与心电门控 CT 平扫测得 CACS 值按原有界值危险分层进行一致性检验，kappa 值为 0.781，P<0.05。**结论** 该研究表明胸部非门控 LDCT 平扫与心电门控 CT 评估 CACS 值的一致性较高，但危险分层存在低估情况；故该研究制定了非门控条件下 CACS 值危险分层新标准，即低危为 1~87，中危为 88~255，高危为>255，使非门控法评估的 CACS 值危险分层更加准确。

EPO-0546

Myocardial Strain in Detecting Coronary Allograft Vasculopathy (CAV) after Heart Transplant (HT)

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Purpose: Despite heart transplant (HT) with normal LVEF, myocardial strain based on deformation registration algorithm (DRA) are significantly decreased[1-3]. The purpose is to determine whether myocardial strain can differentiate between HT patients CAV0 and CAV1.
Method: About 40 HT patients (33 female; 44±16 years) at a median of 3.8 years after surgery, 20 healthy controls (6 female; 40±12.8 years) were enrolled from January in 2018 to March in 2019. Inclusion criteria were the HT patients with normal LVEF, no chronic atrial fibrillation, current confirmed or clinically confirmed acute rejection, no significant renal decline, no CMR and CT contraindications. Each participant was referred for a 1.5T MR scanner (MAGNETOM Aera, Siemens Healthcare) and CT scanner (SOMATOM Force, Siemens Healthcare, Germany) within two days. According to The International Society for Heart and Lung Transplantation (ISHLT) guidelines [4] (CAV0: no obvious stenosis and plaque; CAV1: stenosis< 50% in coronary CTA), 27 HT patients were ISHLT CAV0, 13 patients were ISHLT CAV1. Global longitudinal strain (GLS), global circumferential strain (GCS) and global radial strain (GRS) were from four-chamber long-axis view and short-axis views, RVLS was from right ventricular free wall, which were based on DRA (TrufiStrain, version 2.0, Siemens Healthcare). All subjects were tested ICC and COV.
Results: Biventricular GLS had significant decrease between the HT patients in ISHLT CAV0 and the healthy controls (LVGLS: -11.30±2.07% vs -14.95%±1.98%; P<0.001; RVLS: -12.97±3.39% vs -16.35%±2.35%; P=0.01), also, their peak systolic longitudinal strain rate had statistical difference (all P<0.005), while we did not find a significant difference in HT patients between ISHLT CA0 and ISHLT CAV1 (all P>0.05). Furthermore, Gradual decrease from endocardium to epicardium had been found in LVGLS and peak systolic longitudinal strain rate for all subjects. COV of LVGLS, RVLS, LVGRS and LVGCS were 0%, 1.8%, 3.5% and 1.8%. ICC for these strains were 97%, 96%, 95% and 99% respectively.
Conclusion:DRA is a reliable and robust analysis tool for quantifying global myocardial strain. Biventricular LS allowed discrimination between HT patients and control when with normal LVEF, while these parameters were limited in the detecting CAV and its severity.

EPO-0547

血液病并发气漏综合征预后危险因素分析

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摘要】目的：探寻血液病并发气漏综合征（ALS）患者需要导管引流，以及保守治疗长持续时间的危险因素。**方法：**回顾性分析 2014-01--2018-11 中国医学科学院血液病医院共 55 例血液病并发 ALS 患者的临床和 CT 资料。分别以需要导管引流、保守治疗 ALS 持续时间>10 天为结局变量，对性别、年龄、身体质量指数（BMI）、液气胸、肺部疾病、异基因造血干细胞移植（allo-HSCT）病史、ALS 厚度进行单因素及多因素 *Logistic* 回归危险因素分析，按检验水准 P<0.05 表示差异具有统计学意义。**结果：**液气胸（*OR*，8.846；P<0.05）和 ALS 厚度>11.0cm（*OR*，4.102；P<0.05）为需要导管引流的独立危险因素。肺部疾病（*OR*，3.196；P<0.05）和 ALS 厚度>10.3cm（*OR*，6.078；P<0.05）为保守治疗 ALS 持续时间>10 天的独立危险因素。**结论：**血液病并发 ALS 的患者可以依据有无液气胸、ALS 厚度进行需要导管引流可能的评估；依据有无肺部疾病、ALS 厚度进行保守治疗 ALS 持续时间是否>10 天的评估。

EPO-0548

Thin-Wall Cystic Lung Cancer

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Thin-wall cystic lung cancer is uncommon. Consequently, there is a lack of knowledge concerning the features of this kind of lung cancer, which may lead to misdiagnosis and delayed treatment. The objective of this study is to understand the invasiveness and metastasis of thin-wall cystic lung cancer in its progression. The prognosis of this cancer will also be discussed. We attempted to determine the pathological interpretation of the imaging findings. Forty-five patients with this special lung cancer were analyzed retrospectively based on the review of medical records, radiological findings, pathological changes and treatment strategies. We also telephoned some of the patients in order to learn about their recent physical conditions. Thin-wall cystic lung cancer displayed suspected malignant signs. Most of them are adenocarcinoma, but some squamous cell carcinoma may also display cysts on their images. Although thin-wall cystic lung cancer is often thought to progress slowly, some may progress rapidly. Distant metastasis occurred in three cases, which is relatively rare. Cancer cells grow along the terminal bronchioles and destroy the lung tissues leaving the bronchial arteries and adjacent bronchi. Therefore, we can see separation in cysts on the images. In most cases the thin-wall cystic lung cancer grows slowly, but in a few cases it can be very aggressive.

EPO-0549

2-shot compressed sensing techniques accelerate cardiac cine sequence acquisition and quantitative evaluation of diagnostic efficacy

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Purpose
In this perspective study, we try to introduce a 2-shot compressed sensing (CS) cine technique in cardiac magnetic resonance (CMR), to obtain fast high-quality cine images, and accurately access cardiac function close to standard cine sequence than the single-shot (ss) CS cine technique.
Materials &method
Enrolled patients underwent CMR on a 3T scanner (MAGNETOM Skyra, Siemens Healthcare, Erlangen, Germany) from Jul. to Dec. 2018. Cine image was performed with 3 different methods: a standard segment cine sequence, a real-time single-shot CS (ss CS) cine sequence, and a prototype 2-shot CS cine sequence. Quantitative analysis of image quality was using a 0-4 score system, and cardiac function analysis were performed on all 3 types of cine images.
Result
35 patients were completed all 3 types of cine sequences. The average scan time was (100.3±20.6)s for standard cine, (20.1±4.1)s for ss CS cine, (30.1±6.2)s for 2-shot CS cine. The median for total image quality score was 4 for standard and 2-shot CS cine, 3 for ss CS cine. There was a significant difference in total quality between standard cine and ss CS cine (Z=-2.828, P=0.005), but not with 2-shot CS cine (Z=-1.000, P=0.317). In quantitative study of cardiac function, the differences between the standard cine and the ss CS cine were no statistically significant except for LV mass and LVESV, and there were no statistical differences between the standard cine and the 2-shot cine. There was a good correlation between standard cine and ss CS cine, and standard cine and 2-shot CS cine (P<0.01).
Conclusion
The 2-shot CS cine sequence and the ss CS cine sequence can acquire images significantly faster than the standard cine sequence, but the 2-shot cine sequence can acquire images that are closer to the quality of the standard cine sequence and can be used to accurately evaluate the cardiac function.

EPO-0550
基于影像组学特征在非小细胞肺癌病理类型的预测价值的研究

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目前肺癌仍是全球医学技术攻克的难点,有效降低每年高发的致死率和发病率同样是棘手的问题。由于肺癌中约 85%的患者为非小细胞肺癌(non-small cell lung cancer,NSCLC)类型。随着医疗水平的不断提高,非小细胞肺癌的预后治疗水平已经得到较大的提高,而非小细胞肺癌病理类型的检测

对非小细胞肺癌患者个体化治疗和改善预后都有重要的临床意义。然而,现有检测手段如穿刺、手术切除等虽然准确率很高,但风险亦高且检查结果需要较长时间。所以，本文的目的旨在探讨 CT 影像组学在鉴别不同病理类型非小细胞肺癌中的价值.
回顾性收集分析 2016 年 6 月～2018 年 9 月间行胸部 CT 扫描并经病理确诊的肺鳞癌 80 例,肺腺癌 60 例。将不同病理类型的非小细胞肺癌随机分为训练组及验证组,然后对每个病人的计算机断层扫描(Computed Tomography,CT)影像中进行高标准手动分割,将得到的感兴趣区域进行统一化处理。接着对每个病人提取 1620 个三维影像组学特征进行量化， 通过可重复性评估(组间、组内一致性系数>0.75)、去除高度相关的特征(相关系数>0 .6)，共筛选出 28 个稳定的特征，再通过降维得到 10 个诊断效能及鉴别效能较高的组学特征，采用多因素回归算法建立模型来预测非小细胞肺癌的病理类型，显示组学特征在训练集中具有较好的鉴别诊断效能，AUC 为 0.793。
影像组学特征在非小细胞肺癌病例类型的预测中具有较好的鉴别诊断效能.
影像组学特征在非小细胞肺癌病例类型的预测中具有较好的鉴别诊断效能。

EPO-0551
GE64 排螺旋 CT 低剂量扫描对肺磨玻璃结节检出的价值探讨

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目的 分析探讨 GE64 排螺旋 CT 低剂量扫描对肺磨玻璃结节检出的价值。**方法** 46 例患者（体检者）第一次全部进行常规剂量 GE64 排螺旋 CT 检查，常规剂量扫描参数：覆盖患者胸部；一个月复查时采用低剂量 GE64 排螺旋 CT 扫描，扫描参数：120kv，50mA，0.8s/圈，10mm 层厚，1.0mm 重建间隔，螺距 0.938:1，视野（FOV）完全覆盖患者胸部。扫描全部由固定于 GE64 排螺旋 CT 的高年资技师操作，所得影像资料使用 ADW4.5 工作站进行测量处理。每个患者的 GE64 排螺旋 CT 影像由固定高年资胸部放射诊断医师进行阅片，重点观察 GGN 的大小、形态、密度、内部特点及结节边缘等情况，将一个月内前（常规剂量）、后（低剂量）两次肺部相同部位磨玻璃结节灶进行对比分析。**结果** 46 例患者中，首次经常规剂量 CT 扫描发现 48 个 GGN（其中一例为 2 个 GGN），一个月内低剂量 CT 扫描复查，共发现 45 个 GGN；直径约 4~17mm，其中>11mm 者 16 例（其中 5 例观察 3 个月后结节增大而手术，术后病理证实为浸润性腺癌）;5~10mm 者 21 例（其中 4 例手术，术后病理示：微浸润<5mm 者 9 例，3~6 个月随访 。小于 10mmGGN（经抗炎治疗后）随访患者中，有 8 例病灶吸收，5 例明显缩小（考虑为炎性病变），剩余病例无明显变化，继续观察复查。**结论** GE64 排螺旋 CT 等多排螺旋 CT 低剂量扫描在 GGN 的检查中具有较高的检出率，具有早诊断、早治疗和提高患者术后生存率的优点，同时还因其辐射低，适用于肺部健康普查。

EPO-0552
基于纹理分析在肺癌病理分型及临床分期中的价值

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肺癌是目前发病率最高的恶性肿瘤，且发病率逐年上升并呈年轻化趋势，临床公认肺癌的预后与肺癌的病理类型及分期有密切关联。CT 是肺癌最常用的影像学检查方法，CT 图像是由不同灰度的像素按矩阵排列构成，人体肉眼只能识别一定范围内的灰阶，而恶性肿瘤具有异质性，内部杂乱无章，CT 图像上大量的异质性信息无法从视觉上主观判断，随着医学图像处理技术的飞速发展，纹

理分析日趋成熟，可以量化分析图像像素灰度值的分布特征及变化规律，反映病灶内的不均质性，不受诊断水平及经验的影响。本研究正是基于纹理分析的方法，探讨纹理分析在肺癌病理分型及临床分期中的价值，为临床诊断及治疗提供一定帮助。

EPO-0553

MSCT 对含囊腔型肺癌的诊断价值

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目的 分析含囊腔型肺癌的多层螺 CT（MSCT）表现，加深对此类肺癌的影像学认识，减少临床工作中对此类疾病的误诊、漏诊。 方法 回顾性分析 29 例经病理证实的含囊腔型肺癌患者的 CT 影像资料。所有患者均行 MSCT 扫描并进行多平面重建（MPR）后处理，根据主体病变密度不同，将其分成 3 型，分析主体病变与囊腔的位置关系及其周围伴随征象的影像学特征；随访患者评价 MSCT 的动态变化。结果 29 例中，表现为 I 型（磨玻璃密度灶伴囊腔）有 8 例（27.6%），其中磨玻璃密度灶中有 5 例表现为磨玻璃结节；II 型(实性结节伴囊腔）15 例（51.7%）；Ⅲ型（磨玻璃、实性结节混合病灶伴囊腔）6 例（21.7%）；所有病例中表现为主体病变（磨玻璃密度灶/实性结节）伴偏侧性囊腔者 26 例（89.7%），其余 3 例表现为磨玻璃灶伴中央型囊腔；11 例随访病例中，6 例发现实性成分体积增大、密度增高，8 例囊腔增大、壁增厚；6 例初期检查无囊腔，随访过程中出现囊腔。结论 含囊腔型肺癌的 MSCT 表现具有一定的特征性；结节伴偏侧性囊腔是含囊腔型肺癌较为典型的影像表现，综合分析主体病变、囊腔及其伴随征象的影像特征并结合该类病变影像上动态随访的变化特点可以对此类肺癌做出较为准确的诊断。

EPO-0554

磁共振静脉成像诊断髂静脉受压综合征的价值

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目的：评价磁共振非增强髂静脉成像诊断 Cockett 综合征的价值。**方法：**采用超导型 3.0T MRI 扫描仪，应用腹部表面线圈。扫描序列包括 M2DIPEAR（TR/TE=45/5.8ms，翻转角 60^0）、E-THRIVE (TR/TE= 6.8/3.5ms，翻转角 10^0)、BTFESPAIR(TR/TE= 3.4/1.7ms，翻转角 80^0)和 FLAIR （TR/TE=9000/12ms，翻转角 90^0)，层厚均为 3mm，平均采集次数 2 次。**结果：** Cockett 综合征的 MRV 表现包括受压髂静脉前后径变窄，横径增宽，血管前缘可见弧形压迹，侧支血管形成等；轻、中、重患者的左侧髂静脉平均直径分别为 7.52mm、4.83mm、2.76mm，平均受压率分别为 37%、69%、83%。**结论 ：**非增强 MRV 是可行的髂静脉狭窄诊断方法，尤其适用于特定人群的检查需要。

EPO-0555

Study on the mechanisms of the formation of primary pulmonary mucinous adenocarcinoma with different imaging manifestations

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Abstract: Objective To analyze the relevant mechanisms of the formation of pulmonary mucinous adenocarcinoma by observing its different imaging manifestations. **Data and methods** Retrospective analysis was conducted on imaging manifestations and pathological data of 103 patients with pulmonary mucinous adenocarcinoma confirmed intraoperatively or pathologically. **Results** 43 patients had pulmonary mucinous adenocarcinoma with a solitary nodule/mass.41 patients had pulmonary mucinous adenocarcinoma with localized pneumonia. They had specific CT manifestations, i.e., ground-glass shadows close to the heart, vacuous signs/cavity shadows/honeycombing and withered tree branches. 19 patients had pulmonary mucinous adenocarcinoma with diffuse pneumonia. Their CT manifestations included "falling snowflake sign," ground-glass shadows close to the heart, vacuous signs/cavity shadows/honeycombing and withered tree branches. Under the microscope, all the 3 types of pulmonary mucinous adenocarcinoma had visibly formed mucus lakes but were made of tumor cells with totally different shapes, which included the goblet-like shape (tall column-like shape) and quasi-circular shape. Tall column-shaped tumor cells were negative or weakly positive for thyroid transcription factor-1 (TTF-1) and strongly positive for ALK mutation; whereas quasi-circular tumor cells were positive for TTF-1 and less positive for ALK mutation. **Conclusion** The different imaging manifestations of mucinous adenocarcinoma are possibly due to the different amounts or viscosity of mucus produced, and the mechanisms of its formation may include (1) tumor cells in different shapes have different abilities to produce mucus; (2) tumors in different stages produce different amounts or viscosity of mucus; and (3) the TTF-1 and ALK genes affect the production of mucus.

EPO-0556

The Safety and Accuracy of Automated CT-Guided Mediastinal Biopsy Using an Extrapleural-Locating Method

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Aim: to describe and assess the accuracy and complications of CT-guided core biopsy using our extrapleural locating (EPL) method for minimally invasive diagnosis of mediastinal lesions.

Materials and methods: 164 patients with mediastinal lesions were enrolled between January 2017-January 2019. Post biopsy CT scan was performed and patients observed for

any complications. Tissue samples were taken to pathological analysis. The final diagnosis was based on surgical outcomes and imaging findings, clinical follow-up at least 6 months. A statistical analysis of correlation between various factors and diagnostic accuracy was performed to determine their possible influences on diagnostic accuracy.

Results: From the 164 biopsies, adequate tissue for histological diagnosis was abtained in 155 cases. Overall diagnostic accuracy was 90.3%. Factors affecting diagnostic accuracy were lesion size, method of histopathology and final diagnosis.

Conclusion: This EPL method has been demonstrated to be a safe, fast and accurate diagnostic method with reduced dwell time in the lungs compared with conventional techniques.

EPO-0557

哮喘患者在肺功能检查中的分级与 HRCT 上的支气管壁厚度、肺气肿的关系探究

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目的：肺功能检查可反应气道受阻情况，哮喘表现为可逆性的气流受阻，其支气管壁在炎症等因素作用下可出现管壁增厚。我们的目的是探究肺功能分级不同的哮喘患者在 HRCT 上有无支气管壁的特异表现。
方法和材料：连续纳入了 110 例确诊为哮喘的患者及 50 例肺功能正常的体检患者，他们均行了肺功能和 HRCT 检查，按照肺功能将其分为对照组（50 例），实验 A 组（肺功能检查中一秒率>0.7 的哮喘组，57 例），实验 B 组（（肺功能检查中一秒率<0.7，但 FEV1 大于预计值的 70%， 34 例），实验 C 组（肺功能检查中一秒率<0.7，且 FEV1 小于预计值的 70%，18 例）。用 VIDA 软件测量各肺段支气管壁的平均厚度及管壁占总支气管的面积百分比。使用的统计方法有卡方检验，F 检验等。P<0.05 被认作有统计学意义。
结果：对照组与实验 A、B、C 组在支气管管壁厚度及壁厚面积百分比上均有差异（P<0.05）。实验 A 组和 C 组的支气管管壁厚度在右肺后段 、右肺外侧段、右肺上叶背段 、右肺后侧基底段、左肺上舌段有统计学差异；A 组和 C 组的支气管壁面积百分比在右肺后段、右肺外侧段、右侧内侧段、右侧后侧基底段、左侧前段、左侧上舌段、左侧背段（P<0.05）有统计学差异。B、C 组支气管管壁厚度在右侧后段、右侧外侧段、左侧上舌段、左侧下舌段、左侧前内侧基底段有统计学差异。实验 B、C 组在支气管壁面积百分比上没有统计学差异（P>0.05）。
结论：肺功能检查中分级较严重的哮喘患者，支气管壁厚面积百分比可能也增加，尤其是在右肺后段、右肺外侧段、右肺内侧段、右肺后基底段、左肺前段、左肺上舌段、左肺背段，他们的壁厚面积百分比可能与疾病进展有关系。

EPO-0558

The Clinical research of deep bone suppression imaging and Multiple Imaging Methods in Solitary Pulmonary Nodules(SPNs)

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Objective: *to evaluate a newly developed bone suppression methods (deep Bone Suppression Imaging, deepBSI) for detecting Solitary Pulmonary Nodules (SPNs), comparing to Digital radiograph(DR), Dual energy substraction(DES), and Digital tomosymthesis(DTS)..*

Methods: *A total of 256 patients were collected from Nanfang Hospital from 2017 to 2018, 123 patients with SPNs (average diameter, 12.99 mm) and 133 patients without nodules. Overlap of bone structures was visually quantified by the researcher into minimal (<50% of lesion area), and partial to complete(50*～100%).72 nodules diameter less than 10mm,50 nodules diameter greater than 10mm.Three radiologists and three radiology residents marked suspicious-appearing nodules on the standard chest radiographs, deepBSI images, DES images, and DTS images in this study. Z-test and Receiver operating characteristic (ROC) analysis was used to evaluate observer performance.

RESULTS: *For all observers, the average area under the ROC curves (AUCs) was significantly improved from 0.717 with use of standard chest radiographs alone to 0.807 with standard plus deepBSI and to 0.800 with standard plus DES and to 0.888 with DTS (both P <0.001).The average AUCs for three radiology residents was significantly improved from 0.700 to 0.774 with deepBSI and to 0.762 with DES and to 0.844 with DTS (both P<0.001). The average AUCs for three experienced radiologists was significantly improved from 0.735 to 0.841 with deepBSI and to 0.838 with DES and to 0.930 with DTS (both P<0.001). When the nodule diameter was large than 10mm, the average AUCs were 0.952 with standard plus DES,0.976 with DTS by 6 observers, P=0.0755. The average AUCs were 0.825 with standard,0.848 with standard plus DES by 3 radiology residents , P=0.3838. The average AUCs were 0.867 with standard and 0.916 with standard plus DES by three radiology residents, for nodules with partial to overlapped by bones (P=0.0796).*

Conclusion: *Use of deepBSI imaging together with a standard radiograph can improve radiologists' accuracy for detection of SPNs on chest radiographs, especially for smaller nodules and nodules with partial to complete overlapping with bones. The diagnostic performance of deepBSI and DES is similar, further improvements can be achieved by use of DTS radiography but with the requirement for special equipment and a certainly increase in radiation dose.*

EPO-0559

基于深度学习卷积网络骨抑制技术与多种影像学技术对孤立性肺结节诊断效能的对比分析

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目的：评估新型骨抑制技术——深度卷积网络骨抑制成像（deep bone suppression imaging，deepBSI）对孤立性肺结节（Solitary pulmonary nodule，SPN）的诊断效能，并与数字化 X 线片（Digital radiograph，DR）、双能量减影技术（Dual energy substraction，DES）进行对比分析。方法：收集我院 2016～2017 年拍摄标准胸部正位片共 247 例病例（114 例诊断 SPN，133 例为空白对照组）。3 位低年资及 3 位高年资医师共 6 位医师按 DR 图像→DR+deepBSI 图像→DR+DES 图像的阅片顺序，分别在三组图像上标出结节可能位置并评分，进行 Z 检验，应用 ROC 曲线分析三种检查方法对 SPN 的诊断效能。 结果：6 位医师，DR、deepBSI、DES 三种检查方法诊断 SPN 的 ROC 曲线下面积分别约 0.715、0.804、0.800，deepBSI、DES 诊断效能均优于 DR（P＜0.05）。当结节与肋骨重叠面积＞50%时，deepBSI、DES 二种方法相比于 DR 诊断 SPN 的诊断效能越好。结论：deepBSI、DES 诊断效能均优于 DR，有助于肺结节的检出，与肋骨重叠面积大的结节优势越显著，deepBSI、DES 诊断敏感性及特异性始终相似。

EPO-0560

CT-based radiomics and machine learning to predict spread through air space in lung adenocarcinoma

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Purpose: Spread through air space (STAS) is a novel invasive pattern of lung adenocarcinoma, is also a risk factor for recurrence and worse prognosis of lung adenocarcinoma. The aims of this study are to develop and validate a computed tomography (CT)-based radiomics model for preoperative prediction of STAS in lung adenocarcinoma.

Methods and materials: This retrospective study was approved by institutional review board and included 462 (mean age: 58.06 years) patients with pathologically confirmed lung adenocarcinoma. STAS was identified in 90 patients (19.5%). Two experienced radiologists segmented and extracted radiomics features on preoperative thin-slice CT images with radiomics extension independently. Intraclass correlation coefficients (ICC) and Pearson's correlation were used to rule out those low reliability (ICC<0.75) and redundant (r>0.9) features. Univariate logistic regression was used to select radiomics features which were associated with STAS. Random forest (RF) was used to develop a predictive model and calibrated with five-fold cross-validation. The diagnostic performance of the model was measured by the area under curve (AUC) of receiver operating characteristic (ROC).

Results: With univariate analysis, 12 radiomics features and age were found to be associated with STAS significantly. The RF model achieved an AUC of 0.918 (a

sensitivity of 0.861, a specificity of 0.850 and an accuracy of 0.857) for predicting STAS.
Conclusion: CT-based radiomics model can preoperatively predict STAS in lung adenocarcinoma with high diagnosis performance.

EPO-0561
能谱 CT 成像评价晚期非小细胞肺癌化疗近期疗效的价值

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目的 探讨能谱 CT 定量参数评价晚期非小细胞肺癌化疗近期疗效的应用价值。**资料与方法** 前瞻性收集 34 例拟行化疗的晚期非小细胞肺癌患者，所有患者均在化疗前后行能谱 CT 检查，测量治疗前后病变的 CT 值、能谱定量参数及能谱曲线斜率（slope of spectral curve, λ）。根据 RECIST 1.1 标准将患者分为两组：有效组（完全缓解及部分缓解）和无效组（疾病稳定及疾病进展），比较两组患者治疗前后病变强化程度及能谱参数的差异。将治疗前有统计学差异的参数纳入 Logistic 回归方程筛选出有预测价值的参数，并生成预测化疗有效的新变量（new variable，NV），对进入方程的参数及 NV 进行 ROC 曲线分析，并比较其预测化疗疗效的能力。**结果** 有效组、无效组患者分别为 15 例、19 例，两组临床资料无统计学差异（$P>0.05$）。治疗前有效组动脉期标准化碘浓度（NIC_{AP}）、动脉期能谱曲线斜率（λ_{AP}）、静脉期标准化碘浓度（NIC_{VP}）、静脉期能谱曲线斜率（λ_{VP}）高于无效组（$P<0.05$）。有效组治疗后动脉期强化程度（ΔHU_{AP}）、静脉期强化程度（ΔHU_{VP}）、NIC_{AP}、NIC_{vp}均较治疗前降低（$P<0.05$）。NIC_{VP}及λ_{VP}进入 Logistic 回归方程，NIC_{VP}、λ_{VP}、NV 预测进展期 NSCLC 化疗疗效的曲线下面积（Area under the curve，AUC）分别为 0.832、0.823、0.898。NV 预测进展期 NSCLC 化疗疗效的 AUC 最大，两两比较 AUC 差异无统计学意义（$P>0.05$）。**结论** NIC_{AP}及NIC_{VP}值能够预测晚期 NSCLC 化疗疗效，两者联合可以提高预测的灵敏度及特异度。

EPO-0562
Dual-energy CT-based electron density to differentiate early stage pneumoconiosis from pulmonary metastasis nodules

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Purpose: To investigate the value of dual-source dual-energy computed tomography (DECT)-derived electron density/effective atomic number Rho/Z in differentiating early stage pneumoconiosis from pulmonary metastasis.
Materials and methods: In this retrospective study, 54patients (44men; 10 women,mean age, 48.9 years)with either pneumoconiosis or pulmonary metastasis , who had undergone thorax DECT, were included. 39 pneumoconiosis and 15 pulmonary metastasis with 901 Silicon nodule and 199 Metastatic nodule,were recorded. For each lesion, unenhanced attenuation, as well as DECT-derived Rho and Z measurements were recorded. Mean attenuation, Rho and Z values were compared between

pneumoconiosis and pulmonary metastases. The receiver operating characteristic (ROC) curve analysis was adopted to estimate the optimal threshold for discriminating between both entities.
Results: Assessment of DECT-derived Rho and unenhanced attenuation revealed significant differences between pneumoconiosis (-51.76± 103.3 and -43.08 ± 111.37HU) and pulmonary metastasis (1.7 ± 89.85 and 8.7 ± 173.34HU) .No significant differences were found for Z values (P= 0.392).An Rho value of 4.25 represented the optimal threshold to discriminate between pneumoconiosis and pulmonary metastases. (sensitivity,72.4%; specificity, 66.6%).
Conclusion: Third-generation DECT with assessment of unenhanced attenuation and Rho improves the differentiation of pneumoconiosis and pulmonary metastasis, with Rho showing the stronger diagnostic performance.

EPO-0563

Evaluating mycardium microcirculation in breast cancer patients using CMR intravoxel incoherent motion imaging: a pilot study

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Background and objective

Anthracyclines are the most common anticancer drugs in breast cancer chemotherapy. However, anthracyclines were reported to cause cardiac myocyte death and myocardial fibrosis, and then left ventricular dysfunction. Intravoxel incoherent motion (IVIM) technique is a non-invasive technology and it has been proved to detect mycardium microcirculation in humans.The purpose of the study was to evaluate the changes of left ventricular mycardium microcirculation in patients with breast cancer treated with anthracycline chemotherapy after 1 month by IVIM imaging.

Materials and methods

We randomly selected 4 female patients (aged 28-59 years, mean BMI 25.65±3.45 kg/m²) who received anthracycline antineoplastic drugs adjuvant chemotherapy after total mastectomy in our hospital between February and December 2017. All of them underwent CMR imaging before chemotherapy and 1 month follow-up. All patients were conducted on a 3.0T MR instrument (GE Signa HDxt magnetic resonance imaging scanner). The patients were scanned in the supine position using a dedicated 32-channel cardiac coil, TE 51.2 ms, TR 857 ms, b values 0、20、50、80、100、120、200、300、500 s/mm^2, TD 360~640 ms. The common left ventricular parameters(LVEDV、LVESV and LVEF) and IVIM parameters were quantitatively evaluated by GE ADW4.6 workstation. Comparisons of the measured values were performed by independent sample t test, $p< 0.05$ was statistically significant.

Result

There was no difference in the structure and function of left ventricle before and after anthracycline treatment, but the ADC_{fast} value of left ventricle showed an

decreasing trend in 1 months after chemotherapy compared with pretherapy (0.14±0.04 vs 0.12±0.03).

Conclusion

Anthracycline antineoplastic adjuvant chemotherapy has obvious toxicity on heart in breast cancer patients, CMR intravoxel incoherent motion imaging can quantitatively assess the changes of mycardium microcirculation in the early stage.

EPO-0564

对 2018 年 SCCT 关于女性冠状动脉 CT 血管成像专家共识的解读

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这份专家共识来自于国际心血管 CT 协会(Society of Cardiovascular Computed Tomography,SCCT),它提供了关于女性冠状动脉疾病的 CT 诊断和风险分层的依据。在无心血管疾病症状的女性群体中，一旦发现冠状动脉有钙化，将预示着 10 年内发生动脉粥样硬化性心血管疾病的风险大于 7.5%，通过冠状动脉钙化程度可以判断哪些女性采用药物治疗更加有效。CT 血管成像(CT angiography,CTA)不但可以准确检测阻塞性冠状动脉疾病(coronary artery disease,CAD),还可以识别非阻塞性动脉粥样硬化斑块的范围及其成分。

EPO-0565

Assess the esophageal microcirculation of TIPSS postoperatively in esophageal variceal bleeding with spectral CT imaging

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Assess the esophageal microcirculation of TIPSS postoperatively in esophageal variceal bleeding with spectral CT imaging

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PURPOSE

To quantitatively evaluate the efficacy of the transjugular intrahepatic portosystemic stent shunt (TIPSS) in treatment of esophageal variceal bleeding (EVB) by measuring effective iodine content (eIC) with spectral CT imaging.

METHOD AND MATERIALS

18 patients with esophagus venous bleeding with TIPSS treatment who had no detectable intrinsic lung and heart disease, underwent GSI scanning to collect iodine-water concentrations with a standard injection protocol before EVB and after treatment 2 weeks and 6 months. We measured eIC values of the esophageal wall in the lower

esophagus. We quantitatively evaluated the difference of eIC values between before EVB and after treatment by T-test.

RESULTS
Mean eIC values of the esophageal wall in the lower esophagus in before EVB, after treatment 2 weeks and 6 months were 38.00±11.7mg/ml, 20.64±9.60 and 22.18±4.62 mg/ml, respectively. Mean eIC values in before EVB was significantly higher than that after treatment 2 weeks (t=2.13, p=0.04) and that after treatment 6 months (t=3.14, p=0.03). But, there is no statistical difference between after treatment 2 weeks and 6 months.

CONCLUSION
The findings of this study suggest that effective iodine content of the esophageal wall may reflect esophageal blood perfusion, which is useful to quantitatively evaluate esophagus blood flow change in Postoperative evaluation of TIPSS and followed up in patients with esophageal variceal bleeding.

EPO-0566
IVIM 技术在人体心脏成像中减少 b 值数目的研究

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目的：探讨 IVIM 技术在减少 b 值数目情况下，IVIM 相关参数的差异性情况。 **材料和方法：**回顾性收集我院从 2015 年 5 月到 2019 年 2 月期间在 3.0T MR 上行心脏 IVIM 成像的 20 名正常人群志愿者（男 9 人，女 11 人，年龄 33.15±13.24 岁），在左心室中间部行 IVIM 扫描，将 IVIM 原始图像传送到 GE ADW 4.6 工作站，使用 GE Functool 9.4.05a 软件完成 IVIM 测量，选取 LV 中间部短轴层面心肌整体部分、心肌边缘无伪影干扰的层面，然后手动勾画出心内膜及心外膜，勾画时尽可能避免心腔血池和周边伪影的干扰，采用双指数模型获取左心室心肌各参数值（ADC(apparent diffusion coefficient)$_{fast}$、ADC_{slow}和 f（fraction of ADC_{fast}）），比较使用 8 个 b 值（0, 20, 50, 80, 100, 120, 200, 300, 500 s/mm^2）和 6 个 b 值(0, 20, 80, 100, 200, 300, 500 s/mm^2)情况下，IVIM 相关参数差异性情况，采用配对样本 t 检验检验不同 b 值情况时各参数值的差异性情况。 **结果：** 选取 b 值数目是 8 个时，IVIM 参数值分别是 ADC_{slow}（3.13±1.21mm^2/s）、ADC_{fast}（0.14±0.04mm^2/s）、f（0.31±0.07），b 值数目是 6 个时，各参数值分别是 ADC_{slow}（2.99±1.21mm^2/s）、ADC_{fast}（0.14±0.04mm^2/s）、f（0.32±0.08），比较不同 b 值情况下各参数值差异性情况，P 值分别是 0.48，0.92，0.34。另外，b 值数目减少到 6 个时，缩短了扫描时间。 **结论：**在不同 b 值数目情况下，IVIM 各参数值无差异性，且在 6 个 b 值情况下，缩短了扫描时间，这对 IVIM 成像有一定的价值。

EPO-0567
非小细胞肺癌 CT 灌注参数与 EGFR 基因突变的关系

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目的：通过非小细胞肺癌的 CT 灌注参数来初步推断患者 EGFR 基因的突变情况，以便早期、合理地为患者找到个体化、最优化的治疗策略。**材料与方法：**从 2016.10 到 2018.3，收集山西医科大学第一医院可疑“胸部占位”并行 CT 灌注检查，患者经病理证实为非小细胞肺癌，且均进行了 EGFR 基因突变的检测，有效病例共 30 例。然后根据患者的 EGFR 基因是否存在突变，将 30 例肺癌患者分为 EGFR 突变组和野生组，其中突变组患者有 13 例（13/30, 43%），男 8 例，女 5 例；野生组患者 17 例（17/30，57％），男 11 例，女 3 例。然后分别计算肺癌患者病灶的 CT 灌注值：血流量（BF）、血容量（BV）、平均通过时间(MTT)、表面通透性(PS)。对突变组及野生组病例的肺癌病灶的 BF、BV、MTT、PS 进行比较。对有统计学意义的灌注参数再继续做 ROC 曲线分析，以评价其预测 EGFR 突变的判别能力，最后得出诊断的最佳阈值及相对应的灵敏度与特异度。**结果：**1. 在 30 例非小细胞肺癌患者中，EGFR 突变组有 13 例，占本次研究的 43%，其中腺癌 9 例，鳞癌 4 例；EGFR 野生组有 17 例，占本次研究的 57%，其中腺癌 7 例，鳞癌 10 例。2.EGFR 突变组的灌注参数 BF、BV、PS 均高于野生组，而 MTT 则野生组较高；突变组与野生组的 BV、PS 及 MTT 的组间差异均无统计学意义，BF 值有统计学意义。3. 对 EGFR 突变组与野生组的 BF 值进行 ROC 曲线分析，可得出当 BF 值达到 46.747ml·100ml-1·min-1 时可以判断非小细胞肺癌的 EGFR 基因发生了突变，其灵敏度和特异度分别为 80％、72.7％。**结论：**CT 灌注检查在初步推断 NSCLC 患者的 EGFR 基因突变情况方面具有一定的临床价值。

EPO-0568
能谱 CT 参数对低危型、高危型胸腺瘤及胸腺癌的鉴别诊断价值

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目的 探讨能谱 CT 参数对低危型、高危型胸腺瘤及胸腺癌分型及鉴别诊断价值。**资料与方法** 收集 TETS 患者 35 例，其中低危型胸腺瘤(A、AB、B1)17 例，高危型胸腺瘤(B2、B3)11 例，胸腺癌(C)7 例。行平扫及双期增强能谱 CT 扫描，分别测量 40-140KeV 单能量 CT 值和碘(水)基物质浓度，计算能谱曲线斜率和标准化碘浓度，分析 40-100KeV 单能量、能谱曲线斜率及标准化碘浓度与低危型、高危型胸腺瘤及胸腺癌的相关性。**结果** ①40-100KeV 单能量 CT 值：强化程度上，低危型胸腺瘤>高危型胸腺瘤>胸腺癌，强化方式上，低危型胸腺瘤动脉期明显强化，静脉期强化减退，在 40-100KeV 单能量下，高危型胸腺瘤静脉期 CT 值高于动脉期，呈渐进强化方式；单能量 CT 值在低危型胸腺瘤与胸腺癌、高危型胸腺瘤与胸腺癌差异具有统计学意义。②能谱曲线斜率：动静脉二期低危型、高危型胸腺瘤及胸腺癌能谱曲线斜率差异具有统计学意义 (X^2=8.825,p=0.012;F=6.773,P=0.004)，③NIC 动静脉二期低危型、高危型胸腺瘤及胸腺癌 NIC 差异具有统计学意义(X^2=16.027,p=0.000;F=8.137,P=0.001)，**结论** 能谱 CT 参数 40-100KeV 单能量、能谱曲线斜率、碘基值对 TETS 术前评估有价值，可以帮助在术前做出分型及鉴别诊断。

EPO-0569
The Predictive Value of Energy Spectrum CT Parameters for Ki67 Expression of Lung Cancer

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Purpose To investigate the predictive value of energy spectrum CT parameters for lung cancer Ki67 expression.
Material and Methods Between December 2018 and February 2019, 27 primary lung cancer patients confirmed by pathological examination enrolled this prospective cohort study. All patients underwent baseline arterial phase (AP) and venous phase (VP) energy spectrum CT (ESCT) scan followed surgery in our institution. ESCT parameters {iodine value (IV) , iodine ratio (IR) and the slope of the 40-80 keV energy spectrum curve (SP)} were derived from dual-energy virtual imaging in Siemens postprocessed workstation . Pathological and immunohistochemical test were performed by an experienced pathologist . All enrollment patients clinicopathological data derived from electronic record system. SPSS 19.0 were used for statistical analysis. Quantitive and qualitative data used c2, t and Rank test respectively. ROC curves were used for analysis predicting performance of the Ki67 expression. $P<0.05$ was considered statistically significant.
Results Tumor was larger in Ki67 high expression group than low group (P=0.046). The other demographic and clinicopathological characteristics of all enrollment patients showed no significant difference (**Table 2**). Venous phase iodine value (IV), iodine ratio (IR) and the slope of the 40-80 keV energy spectrum curve (SP) improved than arterial phase IV, IR and SP, respectively (**Fig. 1**). The arterial phase IV, IR, SP and venous phase IV are no significant difference in low and high Ki67 expression group (P value ranged from 0.105 to 0.182) (**Table 3**). There are significantly different in two groups for venous phase IR and SP (0.249±0.083, 0.360±0.162, P=0.033 in IR and 1.744±0.607, 2.562±1.236, P=0.037 in SP, respectively) (**Table 3, Fig. 2**). Venous phase IR ROC analysis showed borderline P value (P=0.056) with AUC, sensitivity (SE), specificity (SP) and cutoff value were 0.717, 92.86, 61.54 and ≤0.347 respectively. The AUC, SE, SP and cutoff value of SP were 0.698, 92.86, 53.85 and ≤2.407 respectively (**Table 4, Fig. 6**).
Conclusion Venous phase IR and SP based on single energy spectrum curve and iodine image may effectively stratify primary lung cancer Ki67 expression into low and high group. The efficacy of other energy spectrum parameters need further investigation.

EPO-0570

Clinical and Imaging features of Primary and Secondary Pulmonary Lymphoma: Discriminant Analysis Based on Logistic Regression Method

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Objective To establish a predictive model for quantitative assessment of primary and secondary pulmonary lymphoma and to compare the characteristics between groups.
Methods A total of 111 patients with pulmonary lymphoma diagnosed from 2004 to 2018 were retrospectively reviewed. There were 24 males and 26 females with median age 56

years in 50 cases primary pulmonary lymphoma (PPL) patients, and 40 males and 21 females with median age 59 years in 61 cases secondary pulmonary lymphoma (SPL) patients. The clinical features included symptoms (asymptomatic, B symptoms and respiratory symptoms), serum lactate dehydrogenase (LDH) level and stage. Two radiologists evaluated the patterns and characteristics of CT findings. $\chi 2$ tests or Fisher's exact tests were performed for the comparison of the differences in clinical features and imaging findings between groups. The significant variables of were further applied to discrimination between PPL and SPL based on *Logistic* regression analysis. *P* value on the left side of the inflection point of the ROC curve according to discrimination probability was used as a criterion to discriminate PPL and SPL.

Results *Logistic* discriminant function for prediction of PPL and SPL was Logit *P*=-0.746-0.125 B symptoms (without=0, with=1)-0.502 LDH level(normal=0,elevated=1)-2.744 stage(I+II=0,III+IV=1)+0.296 number(single=0,multiple=1)+1.294 air bronchogram(without=0, with=1)-1.618 halo sign(without=0,with=1)+1.669 bulging fissure sign(without=0, with=1)+2.062 bronchiectasis(without=0, with=1)-0.868 pleural involvement(without=0,with=1)-0.347 hilar/mediastinal lymphadenopathy (without=0, with=1). *P*=0.575 was used as a criterion. The false positive rate was 12.6%, the sensitivity was 88.5%, and the specificity was 86.0%. In this sample, the rations of the number of SPL patients who were staged I+II and III+IV, and without and with air bronchogram, halo sign and bronchiectasis were 0.064, and 3.646, 0.198 and 7.860, respectively.

Conclusions Patients staged III+IV and who show halo sign suggest the diagnosis of SPL. Air bronchogram with bronchiectasis is a characteristic CT finding of PPL patients. Discriminant analysis based on *Logistic* Regression method can be used as a prediction method of PPL and SPL, which has a high clinical value.

EPO-0571

CT-based Radiomics Features of Carcinoids and Large Cell Neuroendocrine Carcinomas of the Lung: Differential Diagnosis

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Objective: We aimed to differentiate carcinoids, including typical carcinoids (TCs)and atypical carcinoids (ACs), and large cell neuroendocrine carcinomas(LCNECs) of the lung by studying conventional CT image characteristics and radiomics features.

Materials and Methods: We retrospectively enrolled 33 patients (25 men and 8 women; mean age, 57 years ±11.37; range,33-81 years) between January 2013 and May 2018, including 17 patients and 16 patients with histologically confirmed carcinoids and LCNECs, respectively. Lesions were analyzed and delineated manually by two senior radiologists who were blinded to the clinical information of the patients. 107 quantitative imaging features (including first order statistics, shape- and size-based features and texture features) were extracted from CT images of all patients. We used

the least absolute shrinkage and selection operator (LASSO) algorithm methods to select the optimal features and then constructed k-Nearest Neighbor (KNN) model. ROC curve analysis was used to evaluate the prediction ability of the radiomic signatures. Independent sample t-tests and chi-square tests were used to compare the specific CT features of two groups, and Kappa value was used to evaluate consistency between observers.

Results: We select 5 features from 107 features using LASSO method and the model using radiomic feature set showed diagnostic accuracy of 0.85 (AUC, 0.946; 95% CI,0.81 - 1.00; sensitivity, 0.92; specificity, 0.75). Lobulated and lymphadenopathy are significant differences observed between carcinoids and LCNECs ($p<0.05$), and the diagnostic accuracies are both 0.37 (sensitivity, 0.38; specificity, 0.33). Kappa value is 0.68 between observers.

Conclusions: By the contrast of conventional CT features, radiomic features are better to distinguish carcinoids and LCNECs as a biomarker, which is crucial for the preoperative evaluation.

EPO-0572
基于 HRCT 特征探究叶间胸膜下周围型肺腺癌脏层胸膜侵犯的研究

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目的 基于 HRCT 征象建立叶间胸膜下周围型肺腺癌脏层胸膜侵犯的预测模型，提高术前预测脏层胸膜侵犯水平。**方法** 收集 2016-2018 年于大连大学附属中山医院经手术病理证实位于叶间胸膜下（距离胸膜＜1.0cm）且与叶间胸膜存在毗邻关系的周围型肺腺癌 72 例，其中有侵犯脏层胸膜组 15 例（20.8%），非侵犯脏层胸膜组 57 例（79.2%），单因素分析两组 HRCT 征象，对有统计学差异的变量纳入二元 logistic 回归分析，行受试者工作特征（ROC）曲线，评估其预测效能；在 HRCT 平扫或增强图像中将肿瘤与叶间胸膜的毗邻关系分为 3 型，I 型：肿瘤与叶间胸膜呈 1 条或多条索条影牵拉；II 型：肿瘤紧邻叶间胸膜但未见明显胸膜移位；III 型：叶间胸膜向肿瘤内部凹陷。**结果** 脏层胸膜侵犯组中叶间胸膜毗邻关系 I 型 6 例（40.0%）、II 型 1 例（6.7%）、III 型 8 例（53.3%），与非脏层胸膜侵犯组间差异有统计学意义（X^2=11.758 p=0.003）。单因素分析显示平均长径、平均 CT 值、分叶征、肿瘤-胸膜距离、肿瘤-胸膜毗邻关系在两组间差异有统计学意义（$p<0.05$）。将叶间胸膜毗邻关系 II、III 型定义为紧邻叶间胸膜，关系 I 型为非紧邻叶间胸膜。二元 logistic 回归分析显示平均长径、平均 CT 值、紧邻叶间胸膜是预测叶间胸膜下浸润性肺腺癌的独立危险因素（OR=6.849，95%CI：1.629-28.793；OR=4.674，95%CI：1.066-20.491；OR=2.163，95%CI：0.577-8.112），进一步得出二元 logistic 回归模型预判浸润性肺腺癌的 AUC 为 0.828。**结论** 在本研究结果提示，平均 CT 值、平均长径值、叶间胸膜毗邻关系 II、III 型有助于术前预测叶间胸膜下周围型肺腺癌脏层胸膜侵犯的情况，从而一定程度上指导临床合理选择手术方式及后续治疗。

EPO-0573
一箭双雕:CT 冠脉成像后扩展 DFOV 再重建在检出肺部病变中的意义

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目的：探讨 CT 冠脉成像后扩展 DFOV 再重建在检出肺部病变中的意义。**方法：**随机连续选择 170 例行 CT 冠脉成像检查的患者，男 91 例 女 79 例，年龄 33-85 岁，平均 60.1 岁。按照常规检查流程及方法行冠脉成像及诊断。然后以肺野中心为中心扩展 DFOV，使 Z 轴范围内的 X、Y 轴肺野能够全部显示，用 lung、stnd 两种算法、50%ASIR、1.25mm 层厚，分别重建肺窗和纵膈窗。重建后的图像传输至工作站，由有两年以上工作经验的诊断医师分别在肺窗和纵膈窗上观察、检测并记录肺部病变。
结果：83 例患者未检出肺部病变，87 例患者检出肺部病变 140 处，其中结节性影 24 处，软组织影 5 处，条索灶 22 处，渗出性病灶 27 处。肺气肿 8 处，肺大泡 29 处，胸腔积液 2 处，支气管扩张 9 处，胸膜病变 12 处，肺纤维化 1 例，肺栓塞 1 例。
结论：常规 CT 冠脉成像后扩展 DFOV，用不同算法、多窗位重建，约 51%患者可以检测出扫描范围内肺部病变，起到一箭双雕的作用，对肺部疾病的早发现、早治疗具有重要意义。

EPO-0574

Imaging and pathological analysis of esophageal sarcomatoid carcinoma

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【Abstract】
Objective To analyze and compare imaging and pathological characteristics of esophageal sarcomatoid carcinoma and improve the understanding of it. **Method** To retrospectively analyze 18 patients pathologically confirmed esophageal sarcomatoid carcinoma on imaging and pathological characteristic, and to summarize the connection between the imaging and pathological characteristic. **Results** 9 patients underwent esophageal angiography, 6(6/9) patients showed endoluminal lesion type, esophageal barium swallow 3 cases showed medullary type. Based on the CT findings, the patients were divided into two types which include endoluminal mass type (6) and luminal wall thicken type (12). 6 endoluminal mass type patients showed intraluminal mass with clear margin and mild lobulation, peritumoral fat space were clear, no swollen lymph node. 12 cases manifested as luminal wall thicken type, 10 cases infiltrated the whole circle of the esophagus. Extraluminal fat space were obscure in 9 cases (9/12), 8 cases suffered from lymphadenopathy. Pathology examination showed that most of the intraluminal mass type tumor invaded the submucosa layer (4/6), only 1 case with lymph node metastasis (1/6). Infiltrated luminal wall thicken type showed 7 cases infiltrated the whole layer and extra membrane of the esophagus, 5(5/8) cases confirmed with lymph node metastasis.
Conclusions Esophagus sarcomatoid carcinoma manifests as endoluminal mass type shows intraluminal polypoid mass, larger masses with unmatched lower tumor infiltration depth degree and low lymph node metastasis rate, esophageal wall infiltrated thicken type suffered from higher infiltration depth and lymph node metastasis rate.

EPO-0575

CT diagnosis and differential diagnosis of thymic neuroendocrine tumor

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Abstract

Objective: To investigate the CT features of primary thymic neuroendocrine tumors. Material and Methods The clinical and imaging data of 13 patients confirmed thymic primary neuroendocrine tumor by histopathology and immunohistochemistry were retrospectively analyzed. Result Of the 13 patients, three were 3 female and 10 male. There were 5 cases of atypical carcinoids, 1 case had typical carcinoid, 2 cases had small cell neuroendocrine carcinoma, and 5 cases of neuroendocrine carcinoma without detailed definite classification furthermore. One case was associated with bilateral adrenal cortical hyperplasia. Thymic neuroendocrine tumors generally characterized by large mass (4.6 cm to 12.8 cm), more irregular margin (n = 7), most cases had no capsule and the boundary is obscure (n = 8), with uneven density, obvious tumor necrosis or cystic degeneration (n = 10), rare calcification (n = 1), no significant hemorrhage or separation, the tumors showed uneven mild-to-moderate enhancement after contrast, 3 cases with pleural and pericardial effusion, majority invaded mediastinal fat or heart, large blood vessels (n = 12) and 4 cases had mediastinal lymph node enlargement, 3 cases of distant metastasis. Conclusion Most primary thymic neuroendocrine tumors are large masses with irregular shape, uneven density, heterogeneous enhancement and local invasion, and necrotic cystic changes are common, if accompanied by Cushing syndrome diagnosis can be made. CT examination is helpful for disease staging and guiding treatment decision

EPO-0576

Relationship between computed tomography imaging features and clinical characteristics, Masaoka-Koga stage, and World Health Organization histological classification of thymoma

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[OBJECTIVES] Computed tomography (CT) is an important technique to evaluate the condition and prognosis of patients with thymomas, and it provides guidance regarding the treatment strategy. However, the correlation between CT imaging features, described using standard report terms, and clinical characteristics, Masaoka-Koga stage, and WHO classification in patients with thymomas has not been described in detail nor has risk factor analysis been conducted. [METHODS] Overall, 159 patients

with thymomas and preoperative contrast-enhanced CT conducted from September 2011 to December 2018 were retrospectively reviewed. We assessed the clinical information, CT imaging features using standard report terms, and pathological findings for each patient. The relationship between CT imaging features and clinical characteristics, Masaoka-Koga stage, and WHO histological classification were analyzed, and related risk factors based on CT imaging features were identified. [RESULTS] CT imaging features did not significantly differ based on sex and age. Some imaging features demonstrated significant differences between the groups with and without related clinical characteristics. Among all imaging features, there were significant differences between stage I/II and III/IV lesions in tumor size, calcification, infiltration of surrounding fat, vascular invasion, pleural nodules, elevated hemidiaphragm, and pulmonary nodules. Tumor size (odds ratio [OR] = 1.261, P = 0.014), vascular invasion (OR = 2.526, P = 0.023), pleural nodules (OR = 2.22, P = 0.048), and pulmonary nodules (OR = 3.106, P = 0.006) were identified as independent risk factors. Tumor size, contours, internal density, infiltration of surrounding fat, and pleural effusion significantly differed between low- and high-risk thymomas. Tumor size (OR = 1.183, P = 0.048), contour (OR = 2.288, P = 0.003), internal density (OR = 2.192, P = 0.024), and infiltration of surrounding fat (OR = 2.811 P = 0.005) were independent risk factors. [CONCLUSIONS] Some CT imaging features demonstrated significant correlations with clinical characteristics, Masaoka-Koga clinical stage, and WHO histological classification in patients with thymomas. Some imaging features were identified as referential independent risk factors in the clinical evaluation of thymoma.

EPO-0577

肺混合性鳞状细胞和腺性乳头状瘤 2 例报道

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[摘要] **目的** 了解肺混合性鳞状细胞和腺性乳头状瘤的临床病理特征。**方法** 总结分析中国科学院大学宁波华美医院 2 例病理诊断为肺混合性鳞状细胞和腺性乳头状瘤的患者临床、影像及病理学资料。患者男女各 1 例；年龄分别为 70 岁及 54 岁；CT 分别显示为右肺中叶及左肺下叶后基底段斑片、团片影，大小分别约 12*25*13mm、55*47*56mm，形态均不规整且考虑为肿瘤性病变。2 例均行肺叶切除术。**结果** 显微镜下均见肿瘤与周边肺组织分界不清，病理符合混合性鳞状细胞和腺性乳头状瘤。2 例患者术后随访时间分别为 8 个月及 31 个月，均未出现复发和转移。**结论** 肺混合性鳞状细胞和腺性乳头状瘤是罕见的肺良性肿瘤，临床及影像表现无特异性，正确诊断依赖于病理组织学及免疫组化。

EPO-0578

多层螺旋 CT 评价不同类型心房颤动患者 左心房和左心耳功能

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目的 采用多层螺旋 CT 定量测量心房颤动（简称房颤）患者左心房、左心耳功能，探讨不同房颤分型患者间左心房、左心耳功能差异。**方法** 收集 71 例房颤患者，其中阵发性房颤（PAF）患者 40 例，持续性房颤（PeAF）患者 31 例。应用心功能后处理软件测量房颤患者左心耳最大容积（$LAAV_{max}$）、左心耳最小容积（$LAAV_{min}$）、左心房最大容积（LAV_{max}）和左心房最小容积（LAV_{min}），并计算左心耳射血分数（LAAEF）、左心耳射血量（LAAEV）、左心房射血分数（LAEF）、左心房射血量（LAEV）。**结果** PeAF 患者 LAAEF、LAEF、LAEV 小于 PAF 患者(P均<0.01)，$LAAV_{max}$、$LAAV_{min}$、LAV_{max}、LAV_{min}均大于 PAF 患者(P均<0.05)。2 组患者间 LAAEV 差异无统计学意义（P=0.23）。房颤患者 LAAEF 与 LAEF 呈正相关（r=0.57，P=＜0.01），与房颤持续时间呈负相关（r=－0.26，P=0.03）。**结论** 应用多层螺旋 CT 可以客观评价左心房和左心耳功能，对认识不同房颤分型左心耳和左心房功能改变有重要临床意义。

EPO-0579

Correlation Between Radiomics Features and Ki-67 Expression in Peripheral Lung Cancers

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Objective: To develop CT image feature-based radiomics signatures to estimate the expression level of Ki-67 in peripheral lung cancers.
Methods: 117 peripheral lung cancer patients who underwent contrast-enhanced CT had confirmed histopathologically and tested for Ki-67 expression into 2 levels: low expression (n=63) and high expression (n=54). Patients were divided into training (n=82) and validation cohorts (n=35). The arterial phase images were imported into the ITK-SNAP to manually delineate volume of interest (VOI) of the entire-tumor. Each VOI produced 396 radiomics features including Histogram, GLCM, GLSZM, RLM, Form Factor and Haralick. LASSO regression was used for feature screening to generate a radiomics score. Then multivariate logistic regression analysis (MLRA) was used combining clinical information to screen out independent risk factors for predicting Ki-67 expression level. The predictive accuracy of radiomics signatures was quantified by the area under curve (AUC) of a ROC curve in both cohorts. The calibration degree (CD) of the radiomics was evaluated by Hosmer-Lemeshow test. The clinical usefulness of the radiomics signatures was assessed by decision curve analysis (DCA).
Results: Seven radiomics features with non-zero coefficients were chosen to build a radiomics model that significantly correlated with Ki-67 expression level with an AUC, sensitivity, specificity and CD of 0.844, 93%, 71% and 0.709 in training cohort; and 0.881, 91%, 75% and 0.950 in validation cohort, respectively. There were no significant differences in gender, age and smoke between the high and low Ki-67 expressions (P>0.05). Radiomics signatures were considered to be independent predictor of Ki-67 expression level in peripheral lung cancer, and if the threshold probability was between 0.03 and 0.63, using radiomics signatures to predict Ki-67 expression level added more benefit than treating either all or no patients.
Conclusions: The CT image feature-based radiomics is helpful to predict the expression of Ki-67 in peripheral lung cancers, providing a non-invasive technique for assessing the invasiveness and prognosis for peripheral lung cancers.

EPO-0580

Differentiation of focal organising pneumonia and peripheral adenocarcinoma in solid lung lesions using thin-section CT-based radiomics

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AIM: To evaluate the predictive role of radiomics based on computed tomography (CT) scans in discriminating focal organizing pneumonia (FOP) from peripheral lung adenocarcinoma (LA).
MATERIALS AND METHODS: This retrospective study obtained institutional research board approval. We established the comprehensive information of 226 pathologically confirmed patients (117 patients with FOP and 109 patients with LA). Clinical and radiological features were established as model A and a multi-feature based radiomics as model B. Diagnostic performance of model A, model B and model A+B were evaluated and compared via receiver operating curve (ROC) analysis and logistic regression analysis.
RESULTS: Sex, symptomatic, necrosis and halo sign were identified as independent predictors of LA. The area under the ROC (Az value), accuracy, sensitivity and specificity of the model A were 0.839, 75.7%, 82.6% and 69.2% respectively. Model B showed significantly higher accuracy than model A (83.6% vs 75.7%, P = 0.032). The top four best-performing features: WavEnLH_s-3, WavEnHH_s-3, Teta3 and Volume performed as independent factors for discriminating LA. Regression analysis exhibited that model B had superior model fit than model A with Akaike information criterion (AIC) values of 73.6% vs. 59.1%, respectively. Combining model A with model B is useful in achieving a better diagnostic performance in discriminating FOP from LA, the Az value, accuracy, sensitivity and specificity were 0.956, 87.6%, 85.3% and 89.7% respectively.
CONCLUSIONS: Radiomic based on CT scans exhibited better diagnostic accuracy and model fit than clinical and radiological features in discriminating FOP from LA. Combination both of them achieved better diagnostic performance.

EPO-0581

Histogram analysis combined with morphological characteristics to discriminate adenocarcinoma in situ or minimally invasive adenocarcinoma from invasive adenocarcinoma appearing as pure ground-glass nodule

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Objective: To construct a predictive model to discriminate adenocarcinoma in situ (AIS) or minimally invasive adenocarcinoma (MIA) from invasive adenocarcinoma (IAC) appearing as pure ground-glass nodules (pGGNs) using computed tomography (CT) histogram analysis combined with morphological characteristics and to evaluate its diagnostic performance.
Materials and Methods: Two hundred eighty-nine patients with surgically resected solitary pGGN and pathologically diagnosed with AIS, MIA, or IAC in our institution from January 2014 to May 2018 were enrolled in our study. Two hundred twenty-six pGGNs (79 AIS, 84 MIA, and 63 IAC) were randomly selected and assigned to a model-development cohort, and the remaining 63 pGGNs (11 AIS, 29 MIA and 23 IAC) were assigned to a validation cohort. The morphological characteristics were established as model A and histogram parameters as model B. The diagnostic performances of model A, model B, and model A+B were evaluated and compared via receiver operating curve (ROC) analysis and logistic regression analysis.
Results: Entropy (odd ratio [OR]=23.25, 95%CI: 6.83-79.15, p<0.001), microvascular sign (OR=8.62, 95%CI: 3.72-19.98, p<0.001) and the maximum diameter (OR=4.37, 95%CI: 2.44-7.84, p<0.001) were identified as independent predictors in the IAC group. The area under the ROC (Az value), accuracy, sensitivity and specificity of model A+B were 0.896, 88.1%, 79.4% and 91.4%, respectively, exhibiting a significantly higher Az value than either model A or model B alone (0.785 vs 0.896, p<0.001; 0.849 vs 0.896, p=0.029). Model A+B also conveyed a good diagnostic performance in the validation cohort, with an Az value of 0.851.
Conclusion: Histogram analysis combined with morphological characteristics exhibit a superior diagnostic performance in discriminating AIS-MIA from IAC appearing as pGGNs.

EPO-0582
CT 动态能谱成像评估在肺癌碘分布值与灌注参数的相关性

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目的 应用东芝 640 层探测器 CT 机对所有患者进行 CT 动态能谱成像扫描，通过 CT 动态能谱一站式扫描探讨原发性肺癌病灶中血供特征和碘分布值的特点，以期为临床诊断及预判提供指导。
方法 53 例经病理诊断为肺癌的患者，均行 CT 动态能谱成像。在副台 Dual Energy 能谱处理程序中处理每一组能谱得到碘图，通过碘图测得肿瘤的碘分布值；用 Dual input perfusion 程序进行肺双入口灌注分析，得到主动脉血流 AF、肺动脉血流 PF、和血流灌注指数 PI 值 [PI = PF/(PF + AF)] 。所有数据均测量三次取平均数。采用 Spearman 相关分析探究肺癌的碘分布值与各灌注值之间的相关性，以 P ＜0.05 为差异具有统计学意义。
结果 Spearman 相关分析结果显示:病灶碘值与灌注值 AF 值呈正相关(相关系数为 0.349，P ＜ 0.05，P=0.010)，病灶碘值与灌注值 PF 值呈正相关(相关系数为 0.294，P ＜ 0.05，P=0.032)，病灶碘值与灌注值 PI 无相关性。患者的有效辐射剂量为 6.81mSv。
结论 能谱 CT 成像中病灶碘值与灌注 CT 成像中主动脉血流量和肺动脉血流量具有显著相关性。

EPO-0583
一站式能谱及灌注成像在孤立性肺结节鉴别诊断中的应用价值

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目的 通过 CT 动态能谱一站式扫描对孤立性肺结节中血供特征的评价，探讨孤立性肺结节中血供特征的差异，以期为临床诊断及预判提供指导。
方法 对 62 例孤立性肺结节患者进行前瞻性能谱 CT 与灌注 CT 一站式扫描，最后经病理证实恶性结节 53 例，良性结节 9 例，其中恶性结节中腺癌 27 例，鳞癌 13 例，小细胞癌 13 例，类癌 2 例。将扫描图像在副台 Dual Energy 能谱处理程序中处理每一组能谱数据得到动态碘图，通过动态碘图测得肿瘤的碘分布值峰值；用 Dual input perfusion 程序进行肺双入口灌注分析，得到病灶的主动脉血流 AF、肺动脉血流 PF、和血流灌注指数 PI 值 [PI = PF/(PF + AF)] 。
结果 良性结节的 AF 值和 PI 值高于恶性结节，恶性结节的参数平均 PF 和碘值均高于良性结节。在 AF，PI 和良性结节的碘值峰值上有统计学差异。恶性结节[P <0.05（P = 0.004,0.018,0.023）]，而 PF 的差异无统计学意义。此外，良性结节的 AF，PI 和碘平均值有统计学差异。和腺癌[P <0.01（P = 0.000,0.004,0.014），而 PF 的差异不显着。患者的有效辐射剂量为 6.81 mSv。
结论 一站式能谱及灌注成像技术具有实现能谱及灌注成像同时完成的优势,得到的灌注参数和能谱参数对于孤立性肺结节的鉴别诊断具有临床价值。

EPO-0584
基于 CT 征象的 Logistic 回归模型预测非小细胞肺癌脏层胸膜侵犯的临床研究

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目的 基于 CT 征象，利用二元 logistic 回归建立预测模型来评估非小细胞肺癌脏层胸膜侵犯。**方法** 回顾性分析 173 例周围型非小细胞肺癌患者的一般临床资料及 CT 特征，将单因素分析有统计学意义（p＜0.05）的因素纳入二元 logistic 回归分析中，确定脏层胸膜侵犯的独立危险因素，建立二元 logistic 回归方程，行受试者操作（ROC）曲线，评估其预测效能。**结果** 173 例非小细胞肺癌中脏层胸膜侵犯 50 例（28.9%），无脏层胸膜侵犯 123 例（71.1%）。单因素分析显示肿瘤病理分化、分叶征、毛刺征、肿瘤-胸膜关系、肿瘤大小、肿瘤实性成分长径及 C/T 比值在两组间差异均有统计学意义（p＜0.05）。多因素逻辑回归分析结果显示肿瘤-胸膜关系Ⅳ型（胸膜凹陷征）、肿瘤大小、肿瘤实性成分长径是脏层胸膜侵犯的独立危险因素，建立二元 logistic 回归方程：$P=e^x/(1+e^x)$，X=-2.714+1.436（肿瘤实性成分长径）+1.434（肿瘤大小）+1.223（胸膜凹陷征），得到预测脏层胸膜侵犯的 ROC 曲线下面积（AUC）为 0.842，该风险模型预测脏层胸膜侵犯的敏感度为 68.0%，特异度为 87.0%。 **结论** 本研究结果提示肿瘤-胸膜关系Ⅳ型（胸膜凹陷征）、肿瘤大小、肿瘤实性成分长径是非小细胞肺癌脏层胸膜侵犯的独立危险因素，logistic 回归模型能有效预测脏层胸膜侵犯。

EPO-0585
磁共振多参数成像在乳腺癌分子分型中的诊断价值

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目的：探讨磁共振多参数成像在乳腺癌分子分型的诊断价值。**方法：**收集 2017 年 1 月－2018 年 12 月成都市第五人民医院收治并经手术病理证实的 112 例乳腺癌患者的 MRI 影像学资料及免疫组织化学检查结果，并采用卡方检验进行统计学分析。**结果：**Luminal A 及 B 型乳腺癌形态多为分叶状、T_2WI 信号以高及亮高信号为主、强化多均匀；HER2 过度表达型乳腺癌多呈类圆形、T_2WI 等低信号、增强扫描均匀或不均匀强化；三阴性乳腺癌以类圆形、T_2WI 等高信号、环形强化为主，而在病灶大小、病灶边缘、曲线类型差异无统计学意义（P>0.05）。**结论：**不同分子分型乳腺癌在 MRI 影像学表现上有一定特征性，有可能早期预测肿瘤不同分子状态，提高术前诊断率。

EPO-0586
探讨肺结节圆度在预测纯磨玻璃结节浸润性中的应用研究

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目的：本研究旨在评估肺结节圆度在预测纯磨玻璃结节恶性浸润程度的价值。方法:回顾性分析大连大学附属中山医院 2017 年 3 月-2018 年 6 月接受肺切除手术并有病理证实的 pGGN116 例，其中非典型腺瘤样增生（AAH ）8 例、原位腺癌（AIS）55 例、微浸润腺癌（MIA）13 例、浸润性腺癌(invasive adenocarcinoma,IAC）40 例。其中 AAH 和 AIS 为非浸润组（noninvasive cancer, NC，共 63 例），MIA 和 IA 为浸润组（invasive cancer, IC，共 53 例）。通过绘制受试者工作曲线（ROC）评估肺结节圆度、最大截面面积、最大截面周长、最长径及平均 CT 值预测肺腺癌恶性浸润程度的诊断效能，采用二元 logistic 回归分析，确定预测纯磨玻璃结节样肺腺癌侵袭性的独立危险因素。结果：pGGN 圆度、最大截面面积、最大截面周长、最长径及平均 CT 值对鉴别是否为浸润组病变差异具有统计学差异（P<0.05），pGGN 圆度、最大截面面积、最大截面周长、最长径及平均 CT 值的 ROC 曲线下面积分别为 0.900、0.761、0.801、0.804、0.690。二元 logistic 回归分析显示 pGGN 圆度、最长径、平均 CT 值是鉴别非浸润组及浸润组病变的独立影响因素。结论：pGGN 圆度在鉴别其是否为浸润性腺癌具有较高的临床诊断价值。

EPO-0587
Using 4D dynamic imaging for assessing bronchial invasion in central lung cancer patients

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PURPOSE

To analyze the feasibility of lung cancer bronchial invasion using 4D dynamic CT imaging on 320-row volume CT.

METHOD AND MATERIALS

4D dynamic imaging was performed on patients with central lung cancer and bronchial invasion. Before scanning, the patients were subjected to breath training. The patients need to perform a deep breathing during the whole scanning period. 4D dynamic CT scanning was performed for 10 seconds continuously with rotation rate at 0.5

seconds and a total of 21 dynamic image phases were reconstructed. The maximal diameter of the bronchus at the infiltrating site of the tumor of each phase was measured and compared with the maximum diameter of the contralateral bronchi.

RESULTS

The direction of the maximum diameter of the normal bronchus was changed with the respiratory movement, and the bronchus of cancer invasion with the respiratory movement was very small.

CONCLUSION

Application of 4D dynamic imaging is feasible for the analysis of lung cancer infiltrating bronchi.

EPO-0588

Synchronous evaluation of cardiac function as a potential prognosis indicator with non-gated heart-brain CTA for patients of acute ischemic stroke: feasibility

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Purpose: To validate the feasibility of measuring cardiac function with free breathing non-gated heart-brain CTA in patients of acute ischemic stroke using a 16 cm detector CT.

Materials and methods: Study protocol was approved by the institutional review board. Brain perfusion scan and heart-brain CTA were performed with a 16cm detector CT scanner (GE revolution), on patients of acute ischemic stroke. The CTA protocol includes a single heartbeat cardiac CTA and a spiral scan from the heart to the brain. Cardiac CTA was performed under simulated ECG triggering without wire connection. 1.25 mm axial images of the heart were reconstructed at each 5% R-R interval of the simulated ECG for cardiac function evaluation, including the ejection fraction of left ventricle (LVEF) and left atrium (LAEF). 0.625 mm images at the best phase were also reconstructed for CTA evaluation, as well as the axial images of the carotid and cerebral arterial regions. Cardiac function data was measured automatically by the work station and semi-automatically by two independent observers. The accuracy of target phases determination and cardiac function evaluation of the work station was evaluated. The objective image quality score (4 points) of CTAs of coronary arteries, and the mean CT value and contrast to noise ratio (CNR) of thoracic aorta, carotid arteries and vertebral arteries were also evaluated.

Results: Totally 24 patients received heart-brain CTA. Cardiac function measurements were successful in all the cases, with a mean LVEF of 68.00%±7.16, LAEF of 52.05%±13.32. The accuracy of automatic end-diastole and end-systole determination was 100%. The average image quality score of all coronary segments was 3.10±0.82. The mean CT value and CNR of thoracic aorta, carotid arteries and vertebral arteries were 429.01±107.30(thoracic aorta),
556.35±137.52(LICA),559.80±136.80(RICA),545.29±124.06(LVA),542.42±135.40(RVA),21.68±6.14（CNR）, respectively. The total DLP of the CTA scan was 139.03±72.31.

Conclusion: Cardiac function can be measured using the scan data from non-gated heart-brain CTA, providing additional information for stroke patient management.

EPO-0589

Study of the correlation between different CT scanning parameters and image quality along with radiation doses of simulated lung nodules

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To investigate the influence of different scanning parameters (tube voltages and tube currents) on image quality and corresponding radiation doses with simulated lung nodules in chest CT. **Methods** The anthropomorphic chest phantoms with 12 simulated, randomly placed nodules of 4 different diameters (3mm,5mm,8mm, and 10mm) and 3 different densities (-630HU, -800HU, and +100HU) in the chest were scanned by different scanning parameters. The detection rate, the degree of nodular deformation, image quality (with subjective evaluation and objective evaluation) and the corresponding radiation doses were recorded and evaluated, and the correlation between the parameters mentioned above and different scanning parameters was analyzed. **Results** The image quality improved with the increase of tube voltage and tube current (P<0.05). When the tube current was constant, the CT values of the vertebral decreased gradually with the increase of tube voltage(P<0.05). However, no significant difference was detected in the CT values of the lung field (P>0.05). When the tube current was 100mAs, the CT values of lung nodules showed statistical difference when using different tube voltage in both high density nodules (+100HU) and ground glass nodules (-630 HU) (P<0.05); but no significant difference in lower density nodules (-800 HU) (P=0.57). When tube voltage was 100kV or 120kV, all lung nodules were detected (detection rate of 100%) with any current. The detection rate was 33% and 66% for nodules with diameters of 3mm when the parameters were 80kV/15mAs and 80kV/20mAs, respectively. The nodules deformation in nodules with CT value of -630HU and diameter less than 5mm was the most prominent (P<0.05). After analyzing the relationship between image quality (Y) and radiation doses (X) using different tube voltages, we established the correlation equations: 80kV: Y=2.625x+0.038; 100kV: Y=14.66x+0.158; 120kV: Y=18.59x+0.093. **Conclusion** The image quality improved with the increase of tube current and tube voltage, but the corresponding radiation doses were also increased. By reducing the tube voltage and increasing the tube current appropriately, we can reduce the radiation doses. Follow-up CT examination of pulmonary ground glass nodules should apply the same tube voltage imaging parameters, in order to effectively reduce the measurement error of nodule density and evaluate the change of nodules more accurately.

EPO-0590

双源 CT 大螺距（＞2.4）在常规胸部中的图像质量及剂量研究

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目的：探讨大螺距技术在常规胸部中图像质量、剂量如何变化，是否可以在胸部检查中代替常规螺距；方法：将 45 例胸部检查患者随机分成三组，螺距分别为 1.2、2.4、3.2，每组 15 例，测量纵隔窗（350、20）上三个层面 CT 值，分别是胸锁关节（胸大肌），主肺动脉层面（主动脉），膈顶层面（竖脊肌），计算 SNR 及 CNR;记录 DLP,计算有效剂量 ED,三组比较采用独立样本 T 检验，p＜0.05 有意义；结果：三组胸大肌 CT 值分别为 46.9±5.4、57.4±11.4、48.4±13.8，SNR 分别为 6.4±1.8、6.2±2.0、5.6±2.1，CNR 分别为 21.6±7.0、18.5±3.0、17.9±5.4，其中 CT 值、SNR、CNR 三组两两比较差异无统计学差异（p＞0.05）；三组降主动脉 CT 值分别为，37.7±7.9、46.6±7.4、41.8±6.4，SNR 分别为 3.5±1.2、4.1±1.0、2.9±0.7，CNR 分别为 13.4±4.6、13.1±2.9、8.9±2.7，其中 CT 值比较 1.2 组和 2.4 组差异有统计学意义，另外两两比较差异无统计学差异，3.2 组 SNR、CNR 与其它两组较差异有统计学意义；三组竖脊肌 CT 值分别为 46.1±11.2、50.2±16.9、45.5±16.1，SNR 分比为 3.4±0.9、3.4±1.9、3.2±1.3，CNR 分别为 11.6±3.3、9.6±2.7、9.6±2.3，其中 CT 值、SNR、CNR 三组两两比较差异无统计学差异;三组 ED 分别为 4.8±1.1、3.5±0.8、2.7±0.4，三组 ED 两两比较差异有统计学意义（p＜0.05）;结论：随着螺距加大，有效剂量相应的降低，各层面图像质量基本无变化，可用于诊断，在常规胸部检查过程中可以适当加大扫描螺距，降低辐射剂量。

EPO-0591

Association between cardiac CT parameters and risk of stroke in atrial fibrillation patients with low CHA2DS2-VASc score prior stroke

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Background: Cardiac CT angiography (CCTA) has recently emerged as a useful tool to assess left atrium appendage (LAA) structure and detect intracardiac thrombus accurately. Published data has demonstrated that LAA morphology is an independent risk factor for stroke in atrial fibrillation (AF) patients. We investigated the association between size, hemodynamic statement and morphology of LAA from CCTA and history of stroke in AF patients withlow CHA_2DS_2-VASc score.
Method: We retrospective reviewed 210 consecutive AF patients with a low CHA_2DS_2-VASc score (≤1) who obtained CCTA prior to ablation, and 28 (13%) had a prior stroke. Baseline demographic data was obtained from abstraction of an electronic medical records system. Left atrium (LA) diameter, LA volume and LAA volume were measured utilizing a semi-automated 3D workstation application. The hemodynamic statement of LAA was determined by detecting filling defect in two-phase CCTA images. LAA morphology (Cactus, Chicken-Wing (CW), Windsock, Cauliflower) was assessed by volume rendered images.
Results: Patients with prior stoke had a larger LA diameter (47.2±9.7 mm vs 41.0±7.5 mm, p<0.001), LAVi (94.1±39.2 ml/m^2vs 73.1±25.1 ml/m^2, p<0.001) and LAAVi (8.8±4.5 ml/m^2vs 7.0±4.0 ml/m^2, p = 0.031).When comparing CW morphology with non-CW morphology, stroke occurred more frequently in the non-CW patients (19% vs 9%, p = 0.039).Patients

with a thrombus or circulatory stasis of LAA was associated with higher observed rates of prior stroke (53% vs 18%, p<0.001). After controlling for CHA_2DS_2-VAScscore, smoke, hyperlipidemia and AF types in a multivariable logistic model, patients with non-CW of LAA (OR: 0.3, 95% CI: 0.1-0.7, P = 0.003), thrombi or slow blood flow in the LAA(OR: 5.2, 95% CI: 2.3-12.0, P < 0.001) and enlarged LA diameter (OR: 1.1, 95% CI: 1.0-1.1, P = 0.011) were found to be more likely to have a prior stroke history.
Conclusion: Non-CW morphology, thrombi or stasis in the LAA and enlarged LA diameter were more likely associated with a prior stroke for AF patients with low CHA_2DS_2-VASc score. These findings may have relevant impact on anticoagulation management in AF patients at low risk of stroke.

EPO-0592
基于影像组学的肺结核与肺癌的 CT 影像鉴别研究

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摘要：目的：由于肺癌和肺结核在图像上有时难以鉴别，想借用影像组学的方法精确分类肺癌和肺结核。 方法：收集本院肺癌 206 例，胸科医院的肺结核 547 例，通过影像组学方法提取特征，用双样本 t 检验选出具有显著统计学差异的特征，再用 extraTree 提取出 20 个特征。通过构建四种模型训练，鉴别肺癌和肺结核。 结果：使用 AUC 值描述实验结果。通过比较朴素贝叶斯、随机森林、逻辑斯蒂回归，支持向量机四种分类器，逻辑斯蒂分类在测试集的准确率为 95%，ROC 曲线下面积 AUC 为 0.97，表现最好。结论：通过影像组学的方法可以对不同机器的肺癌和肺结核图像进行分类鉴别，可适用于筛查。

EPO-0593
CT 能谱成像在矽肺结节诊断中的应用价值

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目的 探讨 CT 能谱成像的观察指标对矽肺结节的初步应用价值。方法确诊的矽肺 27 例和对照组 20 例。所有研究对象行能谱 CT 能谱模式（GSI）扫描，应用能谱分析软件分析 70～140keV 单能量 CT 值、有效原子序数、基物质对浓度并纳入统计学分析，两组间集中趋势差异性检验采用非参数 Mann-Whitney U 检验。矽肺结节测得指标与对照组结节鉴别采用 ROC 曲线描绘，以 P <0.05 为差异有统计学意义。结果 1.矽肺组与对照组 70～140keV 单能量 CT 值、有效原子序数、基物质对浓度差异有统计学意义（P < 0.001）。2. 70～90keV 单能量 CT 值 ROC 曲线下面积在 0.816~0.843（＜0.85），100~140keV 单能量 CT 值 ROC 曲线下面积在 0.859~0.877（＞0.85）；基物质对浓度 ROC 曲线下面积在 0.894~0.905（＞0.85）；有效原子序数 ROC 曲线下面积（0.923）最大，敏感性和特异性指标值分别为 93.58%和 81.67%。结论 能谱 CT 有效原子序数是矽肺结节诊断最有价值的指标。

EPO-0594

Patients with pulmonary B-cell non-Hodgkin’s lymphoma: characteristic CT findings and role in predicting the survival

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Purpose: To evaluate the value of characteristic CT findings to predict the survival of patients with pulmonary B-cell non-Hodgkin’s lymphoma (NHL).
Materials and methods: We retrospectively enrolled 84 patients with pulmonary B-cell NHL confirmed by pathology between 2004 and 2018. All patients underwent chest CT scan at initial diagnosis in our hospital. Characteristic CT findings and clinicopathological features of them were analyzed. Cox regression models were performed to analyze the relation between characteristic CT findings and OS (overall survival) and PFS (progression-free survival).
Results: Air bronchogram occurred more frequently in patients with early stage,primary pulmonary lymphoma (PPL) and indolent histological type than those with advanced stage, secondary pulmonary lymphoma (SPL) and aggressive histological type (all p<0.05). Halo sign was observed more in the SPL group(p=0.004). While the presence rate of cross lobe sign was higher in patients with PPL (p=0.010). Pleural involvement and hilar/mediastinal lymphadenopathy were observed more in patients with SPL and aggressive histological type (all p<0.05). In survival analyses, the number of lung lesion, cross lobe sign and pleural involvement were independent prognostic factors for PFS; while halo sign and pleural involvement were significantly correlated with OS (all p<0.05). Besides, more aggressive, advanced stage and male patients showed worse outcomes.
Conclusions: Halo sign and pleural involvement are independent prognostic factors for OS; while the number of lung lesion, cross lobe sign and pleural involvement are correlated with PFS.

EPO-0595
动态增强 MRI 半定量分析及 DWI 在肺内空洞性病变良恶性鉴别诊断中的价值

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目的 探讨动态增强 MRI（DCE-MRI）半定量分析及 DWI 在肺内空洞性病变良恶性鉴别诊断中的价值。方法：回顾性分析 42 例经病理及临床证实的肺内单发空洞性病变，其中良性空洞 15 例，恶性空洞 27 例，行 DCE-MRI 及 DWI 检查，观察空洞边界、形态、信号及时间-信号曲线（TIC），测量空洞平均直径、平均壁厚、洞壁表观弥散系数值（ADC）及不同增强期相空洞壁的信号强度，计算达峰时间（TTP）、半峰时间（THR）、最大增强幅度（MRE）、最大斜率（MS）、首过 60 秒曲线下面积（IAUC60）、廓清率（WOR）及早期强化率（EWIR）等半定量参数。分析采用成组 t 检验、两独立样本 *Mann-Whitney U* 检验、χ^2 检验及行×列表资料的 Fisher 确切概率法精确检验。在单变量

分析的基础上筛选出 MRI 形态学征象中与空洞良恶性相关的统计学变量，再采用线性回归进一步分析。采用 ROC 曲线分析半定量参数对良恶性空洞的诊断效能。结果：空洞平均直径、平均壁厚、空洞内、外壁形态、空洞壁 T1WI 信号、洞壁 TIC 及空洞内容物、内部 T1WI、T2WI、DWI、ADC 信号在两组间差异有统计学意义（*P* 值均＜0.05）。线性回归显示空洞内部 T2WI 信号、洞内壁形态、洞内 ADC 信号及洞壁 TIC 曲线与空洞性病变良恶性有显著相关性。半定量参数分析显示 TTP、MS 和 IAUC60 两组间差异均有统计学意义（*P* 值均＜0.05），各指标 ROC 曲线下面积（AUC）分别为 0.746、0.721、0.714，其中 TTP 的诊断效能最高（95%CI0.557～0.935），鉴别良恶性空洞的最佳阈值为 150s，其诊断良恶性的敏感度为 60.0%，特异度为 92.6%。结论：DCE-MRI 形态学征象、DWI、动态增强特征及半定量分析对肺内良恶性空洞性病变的鉴别诊断具有一定的临床应用价值。

EPO-0596

肩背部弹力纤维瘤的影像学表现

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目的：探讨肩背部弹力纤维瘤(elastofibroma dorsi，EFD)的 X 线、CT 和 MRI 表现及其诊断价值,提高对 EFD 的认识。
方法：收集 2013 年 1 月至 2017 年 5 月经手术病理及临床证实，并接受影像学检查的 24 例肩背部弹力纤维瘤患者，观察患者的 X 线、CT 和 MRI 表现及病理改变。统计学处理采用 SPSS 软件，以 P <0.05 为差异有统计学意义。
结果：共 24 例患者，女性患者 17 例，男性患者 7 例,年龄 19 ～88 岁，平均 58.4 岁，左侧 2 例(8.3%)，右侧 8 例(33.3%)，双侧同时发病 14 例(58.3%)，总共 38 个病灶，肩背部弹力纤维瘤发病部位均位于肩胛骨内侧前锯肌与胸壁间的脂肪间隙内，表现为扁平椭圆状或半圆形的软组织肿块，X 线显示发病侧脂肪间隙局部较健侧受压、外移；病灶边缘不规整,病灶外侧与前锯肌和肩胛骨交界部分界不清，脂肪间隙消失。肩胛下区扁丘形软组织密度肿块，此种影像表现为“余肌征”(即形似额外生长出来的肌肉组织)。肿瘤边界清或不清，内见条形脂肪密度沿着病灶长轴呈条纹状分布，这是其特征表现，周围骨质无破坏，临近肌肉弧形受压；MR 信号多不均匀：纤维成分 T1WI 及 T2WI 呈低信号，病变内见散在脂肪组织，T1WI 及 T2WI 呈高信号，压脂后条片状 T1WI 高信号被抑制；1 例患者 MRI 增强扫描中度不均匀强化。男女性发病率差异均有统计学意义(P <0.05)，双侧发病时，右侧病灶大于左侧，左右侧病灶大小差异有统计学意义(P <0.05)。
结论：背部弹力纤维瘤好发于老年人群，女性多见，常累及双侧肩胛下区，表现为稍低于肌肉密度，血供不丰富，病理学上弹力纤维染色阳性为确诊方法。EFD 发病部位固定，影像学表现特殊，CT 及 MRI 检查可明确诊断，X 线检查有提示作用。肩胛骨与胸壁之间的机械性摩擦可能是肿瘤生长的协同因素。

EPO-0597

慢性阻塞性肺疾病认知功能障碍的初步分析

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目的探讨稳定期慢性阻塞性肺疾病（COPD）患者认知功能障碍的发生率及其相关影响因素。方法采集 35 例 COPD 稳定期患者（COPD 组）及 35 例健康志愿者（对照组）的临床资料,通过 Mo CA 量表对两组研究对象进行认知功能评估,研究 COPD 稳定期患者认知功能障碍的发生率;采用 Pearson 偏

相关分析、 χ^2检验,按肺功能、呼吸困难分级标准对患者进行亚组分析,明确患者肺功能、血气分析相关临床指标与 COPD 患者认知障碍的相关性。采用 Logistic 多因素回归分析对 COPD 患者认知障碍相关影响因素进行分析。结果 COPD 患者组评分较对照组评分显著降低,P<0.05,其认知障碍发病率为 60.0%,高于对照组 28.6%（P<0.05）;按肺功能分级,轻中度组（FEV1≥50%）和重度组（FEV1<50%）COPD 患者的认知障碍发生率无明显差异（P>0.05）;按呼吸困难程度（m MRC）评分分级的 COPD 患者认知障碍发生率有统计学意义（P<0.05）。COPD 患者 Mo CA 量表评分与 PaO_2值之间呈正相关（r=0.386,P=0.047）,Mo CA 量表评分与 $PaCO_2$值之间呈负相关（r=-0.398,P=0.040）。单因素分析显示,稳定期 COPD 患者的文化程度、CAT 评分、PaO_2、$PaCO_2$与 COPD 患者认知功能障碍的发生具有相关性（P<0.05）。Logistic 回归多因素分析显示,受教育程度、吸烟指数是 COPD 稳定期患者发生认知障碍的独立危险因素（P<0.05）。结论 COPD 患者发生认知障碍的风险明显增高,其病情严重程度与认知功能下降程度有明显相关性,受教育程度、吸烟指数是 COPD 患者发生认知功能障碍的独立危险因素。

EPO-0598

Compared to left atrium, left atrial appendage function and myocardial remodeling play a greater role in recurrence of AF after radiofrequency ablation

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Objective: To quantitatively measure the left atrial and left atrial appendage function with 256-slice spiral CT, including the volume strain, and to evaluate the role of left atrium and left atrium appendage in the recurrence of atrial fibrillation (AF) after radiofrequency ablation.
Methods: 63 patients with AF who underwent radiofrequency ablation for the first time were enrolled in this study. The average age was 59.43 (+10.67), BMI was 25.99 (+3.60 kg/m2), and 38 (60.3%) males. The median follow-up time was 19 (4-24) months, and 20 (31.7%) recurred. According to the recurrence of AF after radiofrequency ablation, the patients were divided into recurrence group (n = 20 cases) and non-recurrence group (n = 43 cases). All patients underwent 256-slice spiral CT examination before operation. The original image was reconstructed from 5% to 95% of the cardiac cycle and the interval was 10%. The maximum volume of left atrial appendage (LAAVmax), minimum volume of left atrial appendage (LAAVmin), left atrial appendage emptying fraction (LAAEF), and left atrial appendage ejection volume (LAAEV), left atrial appendage volume strain (LAA-VS), maximum volume of left atrium (LAVmax), minimum volume of left atrium (LAVmin), left atrial emptying fraction (LAEF), left atrial ejection volume (LAEV), and left atrial volume strain (LAVS) were measured and calculated during the whole cardiac cycle. They were processed by statistical methods.
Results: The CHA2DS2-VASc score of recurrence group was higher than that of non-recurrence group ($P < 0.05$). According to the analysis of clinical data, the proportion of patients with persistent atrial fibrillation and heart failure in recurrence group was higher than that in non-recurrence group (P<0.05).

The LAAVmax, LAAVmin, LAVmax and LAVmin in the recurrence group were higher than those in the non-recurrence group ($P < 0.05$), while LAAEF, LAEF and LAA-VS in the recurrence group were lower than those in the non- recurrence group ($P < 0.05$). There

was no difference of LA-VS between the recurrence group and the non- recurrence group. Multivariate Cox proportional hazard regression analysis showed that LAAEF was an independent predictor of recurrence after radiofrequency ablation of AF (HR: 0.790 95% CI: 0.657-0.950 P = 0.012). ROC curve analysis showed that LAAEF < 44.68% had the highest predictive value for recurrence after radiofrequency ablation (area under curve 0.817), sensitivity was 90%, specificity was 67.4%.
Conclusion: LAAEF is a predictor of recurrence after radiofrequency ablation of atrial fibrillation. Compared with left atrial volume strain, left atrial appendage volume strain which represented fibrosis of left atrial appendage myocardia, is more useful in evaluating myocardial remodeling associated with recurrence of atrial fibrillation after radiofrequency ablation.

EPO-0599
食管癌 CT、MR 长度的测量与手术病理大体标本对照

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目的 探讨食管癌的病变长度和病变部位在 CT、MRI 和术后大体标本上的差异以及磁共振扩散成像 b 值的选择。**方法**食管肿瘤 29 例，进行 CT 增强扫描、MR 常规平扫及增强、DWI（ｂ=0ｓ/ｍｍ^{2}和ｂ=50、200、400、600、800、1000ｓ/ｍｍ^2）扫描；分别测量长度，将食管肿瘤病变长度与ＣＴ、Ｔ2ＷＩ、DWI 及手术切除病理大体标本病变长度比较。**结果** 在测量病变长度方面，CT 测量肿瘤平均长度确实存在较明显误差，b 值为 400、600、800 s/mm2 时 DWI 图像显示病变长度与病理结果间均无显著性差异(P=0.168)；T2WI 与病理无显著性差异(P>0.05)。b 值为 400、600、800 s/mm2 时 DWI 图像显示病变长度与 T2WI 显示病变长度间无显著性差异(P>0.05),与 CT 显示病变长度有显著性差异(P<0.05)。**结论** 采用 b 值为 400、600、800ｓ/ｍｍ2,ＤＷＩ图像显示病变长度与病理结果间有良好的一致性,与ＭＲＴ2ＷＩ在显示病变长度方面有较好的对应关系，优于 CT。

EPO-0600
碘基图联合 CT 灌注一站式扫描在食管癌中的初步应用价值

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目的：初步探讨使用 Revolution CT 双能量联合灌注一站式扫描在食管癌中的应用价值。
材料方法：使用 Ge Revolution CT 对 30 例食管癌患者进行能谱及灌注一站式扫描，患者均未发现转移并手术治疗。扫描流程：①平扫：选择灌注及能谱扫描范围。管电压电 120KV，使用 SmartAm 技术，管电流 100-450mm，旋转时间 0.5s，螺距 0.992：1，层厚 5mm。②第一次灌注扫描：FOV 包括食管癌病变，探测器范围 16cm。使用高压射器注射 I300 70-90ml，5s 后开始扫描（10 个 passes），每 pass 扫描时间为 0.5s，间隔 2s，总曝光时间 5s，总时间 23s。管电压 100KV，管电流 70mA，重建层厚 1.25mm，使用图像优化技术 AsiR（80%）。③第一次能谱扫描：动脉期，范围包括胸部(或胸+上腹部)。管电压 80-140KV，管电流 200mA，重建层厚 1.25mm，球管旋转时间 0.5s，螺距 0.9921。④第二次灌注扫描：感兴趣区及扫描条件同第一次完全一致。⑤第二次能谱扫描：静脉期，扫描参数同动脉期。⑥第三次灌注扫描：延时期，同前两次灌注。使用 CT perfusion 4D 体部灌注软件获得各灌注参数，使用能谱软件获得碘图各参数。

结果：①碘基图结果：病变食管碘图值高于正常食管壁。高分化、中分化、低分化食管癌患者间 IC 值（标准化碘浓度）、Ia 值（动脉期碘浓度）、Iv 值（静脉期碘浓度）差异均有统计学意义。②灌注结果：BV、BF、TTP、MMT、PS、PEI 食管癌病变高于正常食管壁，差异具有统计学意义。低分化食管癌组 BV、BF、TTP、MMT、PS、PEI 大于高分化癌，差异具有统计学意义。
结论：食管癌双能量联合灌注一站式扫描可以获得更多的功能学信息，能谱扫描获得的碘基图可以预测食管癌的分化程度，并与灌注的某些参数具有较高的一致性。

EPO-0601
能谱 CT 双低技术评价终末期肾病患者中心静脉狭窄闭塞的临床应用

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目的：能谱 CT 低造影剂用量及低辐射剂量评价终末期肾病患者中心静脉狭窄闭塞的临床应用。方法：采用 GE revolution 256 排 CT 能谱扫描技术获得 40、50、60、70、80KeV 不同能谱等级图像。选取上肢肿胀或者累及至颜面部肿胀的终末期肾病患者 28 例，注射造影剂剂量为 1.0ml/kg，流速 3.0ml/s 或 3.5ml/s，注射等渗非离子型造影剂碘克沙醇(320mgI/ml)后 45s 启动扫描。利用 adw4.7 工作站进行的容积再现（VR）、最大密度投影（MIP）、多平面重建（MPR）及曲面重建（CPR）。由 2 名医师对图像质量进行主观评分及给予诊断意见同时亦记录 CT 机自动生成的剂量报告。结果：上腔静脉闭塞 4 例，上腔静脉闭塞及单侧颈内静脉狭窄闭塞 5 例；上腔静脉狭窄、单侧头臂及颈内静脉狭窄闭塞 6 例；单侧头臂静脉闭塞 7 例；双侧头臂静脉狭窄 3 例；单侧锁骨下静脉狭窄 3 例。两位医师对图像质量的主观评价具有非常好的一致性。结论：利用能谱 CT 扫描技术，最少的造影剂、低的辐射剂量及强大的后处理技术能全景显示中心静脉狭窄闭塞情况，给临床进一步诊治提供依据。同时显影最佳的单能谱能级是 50KeV。

EPO-0602
Differential diagnosis efficacy of thymic solid tumors with intravoxel incoherent motion diffusion-weighted MRI

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PURPOSE
A retrospective study was conducted to evaluate the differential diagnosis performance of intravoxel incoherent motion diffusion-weighted imaging (IVIM-DWI) for thymoma, thymic carcinoma and thymic lymphoma.

METHOD AND MATERIALS
Seventy-one subjects (49 men, 22 women; age range, 5–72 years) including thymoma (n=27), thymic carcinoma (n=16) and thymic lymphoma group (n=28) confirmed by pathological analysis underwent thoracic MRI on a 3.0-T MRI system, including conventional sequence and 9 b-value (b-value: 0 - 1,000 s/mm^2) DWI. Multi-b-value

apparent diffusion coefficient (ADC_{mb}) were calculated by mono-exponential model. Pure diffusion coefficient (D), pseudo-diffusion coefficient (D*) and perfusion fraction (f) were calculated with bi-exponential model. Mean ADC_{mb}, D, D*, and f values were compared for the differences among thymoma, thymic carcinoma and thymic lymphoma groups by one-way ANOVA, and further post hoc multiple comparisons were performed with Bonferroni test or Dunett's T3 test. Receiver operating characteristic curve (ROC) analyses were performed to determine the efficacy and optimum thresholds for differentiating the defined groups by various parameters.

RESULTS

The mean D and D* value in thymoma were significant higher than the value from thymic carcinoma and lymphoma (D, 0.90, 0.62 and 0.49 $\times 10^{-3}$ mm^2 /s; D*, 9.50, 5.56 and 3.62$\times 10^{-3}$ mm^2 /s, and 10.47, 4.76 and 4.01 $\times$ 10^{-3} mm^2 /s, respectively, all $P < 0.001$),while there were no significant difference between the thymic carcinoma and lymphoma ($P > 0.05/3$). The mean ADC_{mb} value in thymic lymphoma were significantly lower than thymoma and thymic carcinoma (ADC_{mb}, 0.71, 1.32 and 0.99 $\times 10^{-3}$ mm^2 /s, respectively, $P<0.001$), but no significant difference between the thymoma and thymic carcinoma ($P > 0.05/3$). As for the f value, no significant difference was found among groups ($P > 0.05$). The AUC and cutoff value, respectively, for differentiating thymoma from thymic lymphoma: ADC_{mb}, 0.946 and 0.872 $\times 10^{-3}$ mm^2/s; D, 0.861 and 0.721$\times 10^{-3}$ mm^2/s; D*, 0.878 and 4.80 $\times$ 10^{-3} mm^2/s; for differentiating thymic carcinoma from lymphoma for ADC_{mb}, D and D* were as follows: ADC_{mb}, 0.786 and 0.932$\times 10^{-3}$ mm^2/s; D, 0.670 and 0.679 $\times 10^{-3}$ mm^2/s; D*, 0.721 and 4.2 $\times 10^{-3}$ mm^2/s.

CONCLUSION

Results of this study have shown that IVIM-DWI measurements should be valuable to differentiate thymic solid tumors preoperatively.

EPO-0603

纵隔少见囊性病变的 CT 诊断价值

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目的 探讨基于新的 ITMIG 纵隔分区标准纵隔少见囊性病变的 CT 影像特征，提高对纵隔少见囊性病变的影像诊断及鉴别诊断能力。

方法 回顾性分析 37 例经手术病理证实的纵隔少见囊性病变患者的 CT 表现，观察病变的发生部位、形态、大小、密度、内部特征、强化程度及生长方式，与术后病理进行对照。

结果：经病理证实支气管囊肿 7 例，食管重复囊肿 4 例，心包囊肿 3 例，淋巴管瘤 2 例， 胸腺囊肿 4 例，囊性畸胎瘤 7 例，囊性胸腺瘤 3 例，神经鞘瘤囊性变 5 例，表皮样囊肿 4 例，包虫囊肿 1 例。支气管囊肿位于中纵隔 5 例，后纵隔 2 例，单房、圆形或类圆形，直径约为 2.5～9.0cm，密度均匀，6 例呈水样低密度，1 例囊壁见弧形钙化，与气管及支气管关系密切；食管重复囊肿均位于后纵隔，直径为 2.7～4.9cm，类圆形囊性均匀水样密度影，边缘规整，与食管壁紧密相连，增强扫描未见强化；心包囊肿于前纵隔心缘旁，椭圆形或三角形均匀水样密度，边缘锐利，囊壁薄而光滑，增强扫描不强化；淋巴管瘤 2 例，类圆形或不规则形，中心位于前纵隔，沿气管及血管间隙攀藤样生长，1 例病变延伸达颈部及腋窝，平扫病灶内见分隔，边缘清楚，囊壁薄，增强扫描囊壁及囊内分隔强化。胸腺囊肿均位于胸腺区，密度均匀，边缘规整；胸内甲状腺囊肿位于上纵隔高位

气管旁，类圆形囊性均匀水样密度，边界清，与伸入纵隔的甲状腺组织相连；囊性畸胎瘤病变内部出现脂肪者 4 例，同时有脂肪及钙化者 2 例，1 例囊内密度均匀似良性囊肿；神经鞘瘤瘤囊性变 5 例均位于后纵隔或脊柱旁区，呈类圆形，边界清晰，直径约 3.0～11.8cm，4 例密度欠均，囊性为主，囊壁厚，增强后呈环形不均匀强化。1 例包虫囊肿位于上纵隔，呈类圆形、多房，与邻近胸膜分界不清，囊内可见多个子囊，囊壁厚薄均匀，增强后囊内容物未见强化。

结论 纵隔少见囊性病变具有特征性影像特征，CT 对纵隔囊性病变的诊断及鉴别诊断具有重要价值。

EPO-0604

食管癌肉瘤的影像表现与鉴别诊断

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目的：探讨食管癌肉瘤的 X 线钡餐造影、CT 表现，总结影像学特征，提高对食管癌肉瘤的影像诊断及鉴别诊断认识。方法：回顾性分析我院经手术或活检病理证实的食管癌肉瘤 12 例患者的 X 线钡餐造影、CT 表现，结合文献总结影像学表现。结果：12 例均为息肉型食管癌肉瘤，其中中段 6 例，中下段 4 例，下段 2 例，X 线造影表现为食管梭形扩张伴充盈缺损，可见钡剂涂抹征及圆顶征，钡剂通过呈缓慢分流但梗阻不明显。CT 表现为腔内生长肿块影，2 例肿瘤充满食管腔，未见肿瘤-空气界面征，4 例肿瘤边缘欠光整，可见残留肿瘤-空气界面，6 例肿瘤边缘光滑，肿瘤-空气界面清楚，增强扫描 2 例呈均匀轻度强化，2 例呈均匀明显强化，7 例呈不均匀明显强化,1 例呈液性低密度未见强化。结论：息肉型食管癌肉瘤影像学表现具有一定的特征性，术前影像学检查结合胃镜多点取材活检，能在一定程度上提高食管癌肉瘤的诊断准确性，为临床诊治提供依据。

EPO-0605

The Importance of CT Quantitative Evaluation of Emphysema in Lung Cancer Screening Cohort with Negative Findings by Visual Evaluation

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Introduction One-stop quantitative evaluation of emphysema and lung nodule in lung cancer screening is very important for patient.
Objective To evaluate the role of quantitative emphysema in the large-sample LDCT lung cancer screening cohort with negative CT findings by subjective visual assessment.
Methods 1231 participants with negative visual evaluation were included in this retrospective study. The lungs were automatically segmented and the following were calculated: total lung volume (TLV), total emphysema volume (TEV), emphysema index (EI) ,15th percentile lung density (PD15) and mean lung density (MLD). EI ≥ 6% was defined as emphysema. The quantitative parameters were compared between different genders and ages. The quantitative parameters and risk factors were also compared between emphysema and non-emphysema groups.

Results The proportion of smokers, TLV, TEV, and EI of men were greater than that of women(P<0.001). The TEV and EI of people aged 60 years or older were greater than those in people younger than 60 years (P<0.05). 102 participants showed emphysema, accounting for 8.29%. The incidence of emphysema in men was significantly greater than that in women in total (P<0.05). All the CT quantitative parameters were significantly different between emphysema and non-emphysema groups. The ratio of male, second hand smoke exposure and chronic bronchitis history was greater in emphysema than that in the non-emphysema group (P<0.05).
Conclusion CT quantitative emphysema evaluation is recommended in people aged 60 years or older, especially in males, which can provide more precise information, aiding the early diagnosis of emphysema and informing early intervention.

EPO-0606
老年股骨转子间骨折后急性肺损伤 CT 影像学评价与伤后隐性失血量相关性研究

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目的 探讨老年股骨转子间骨折（≧65 岁）后急性肺损伤的 CT 形态学分级评分与伤后隐性失血量（HBL）的相关性。
方法 回顾性分析我院收治的 78 例新鲜老年股骨转子间骨折患者（受伤时间≦8h，年龄≧65 岁），平均年龄为 77.3±11.7 岁（65～89 岁），其中男 24 例，女 54 例。所有患者入院后第 3 天均完善胸部 CT，以确定是否存在急性肺损伤，通过肺损伤 CT 表现形态学分级评分：A 级，胸部 CT 正常，肺部及胸膜腔均未受累；B 级，仅胸膜腔受累，表现为胸膜增厚、胸腔积液或积血；C 级，在 B 级基础之上出现肺间质受累，表现为肺内条索状或网格状影；D 级，在 C 级基础上出现肺实质受累，表现为肺内磨玻璃状、斑片状模糊影或实变影。入院即刻、第 1 天、第 2 天、第 3 天记录血红蛋白及红细胞压积水平，Gross 方程计算伤后隐性失血量（HBL），采用 Pearson 相关分析胸部 CT 形态学分级评分与 HBL 之间的相关性。
结果 A 级 4 例，胸部 CT 见肺部及胸膜腔均未受累；B 级 28 例伴胸膜增厚、胸腔积液，其中单侧 11 例，双侧 17 例，15 例有胸腔积血。C 级 31 例中， 19 例出现肺内条索状、网格状影， 12 例伴有胸膜增厚、胸腔积液或积血。D 级 15 例，在 C 级基础上出现肺内磨玻璃状模糊影或斑片状实变影。4 例 A 级 HBL 为 405.68±33.26，28 例 B 级 HBL 为 423.52±18.13，31 例 C 级 HBL 为 453.78±39.67，15 例 D 级 HBL 为 521.16±41.95，急性肺损伤 CT 形态学分级评分与伤后隐性失血量（HBL）呈正相关（P<0.05）。
结论 老年股骨转子间骨折（年龄≧65 岁）后急性肺损伤 CT 表现为胸腔积液、积血，胸膜增厚，肺内条索状或网格状影，肺内磨玻璃状模糊影或斑片状实变影；CT 形态学分级评分与伤后隐性失血量（HBL）呈正相关，有效降低老年股骨转子间骨折伤后隐性失血量可有效减轻患者伤后急性肺损伤的严重程度。

EPO-0607
老年髋部骨折后急性肺损伤 CT 影像学评价与氧合指数相关性研究

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目的 探讨老年髋部骨折（≧65 岁）后急性肺损伤的 CT 形态学分级评分与氧合指数的相关性。
方法 回顾性分析我院收治的 128 例新鲜老年髋部骨折患者（受伤时间≦8h，年龄≧65 岁），平均年龄为 76.3±10.7 岁（65～91 岁），其中男 54 例，女 74 例，股骨颈骨折 69 例，股骨转子间骨折 59 例。所有患者入院后 48h 内均完善胸部 CT 检查，所有图像经 2 名高年资主治医师以上 CT 诊断医师采用盲法分别阅片，并达成一致意见，以确定是否存在急性肺损伤，通过肺损伤 CT 表现形态学分级评分：A 级，胸部 CT 正常，肺部及胸膜腔均未受累，计为 0 分；B 级，仅胸膜腔受累，表现为胸膜增厚、胸腔积液或积血，计为 1 分；C 级，在 B 级基础之上出现肺间质受累，表现为肺内条索状或网格状影，计为 2 分；D 级，在 C 级基础上出现肺实质受累，表现为肺内磨玻璃状、斑片状模糊影或实变影，计为 3 分。通过入院后 48h 内动脉血气分析结果计算氧合指数，氧合指数的计算为动脉氧分压/吸入氧气分率。采用 Pearson 相关分析胸部 CT 形态学分级评分与氧合指数之间的相关性。
结果 A 级 10 例，胸部 CT 见肺部及胸膜腔均未受累；B 级 43 例伴胸膜增厚、胸腔积液，其中单侧 19 例，双侧 24 例； 28 例有胸腔积血。C 级 42 例中， 19 例出现肺内条索状、网格状影， 23 例伴有胸膜增厚、胸腔积液或积血。D 级 33 例，在 C 级基础上出现肺内磨玻璃状模糊影或斑片状实变影。10 例 A 级氧合指数为 432.18±28.91，43 例 B 级氧合指数为 338.21±18.13，42 例 C 级氧合指数为 297.26±22.67，33 例 D 级氧合指数为 217.15±17.95，急性肺损伤 CT 形态学分级评分与氧合指数呈负相关（P<0.05）。
结论 老年髋部骨折后急性肺损伤 CT 表现为胸腔积液、积血，胸膜增厚，肺内条索状或网格状影，肺内磨玻璃状模糊影或斑片状实变影；CT 形态学分级评分与氧合指数呈负相关。

EPO-0608

肺部粘液性腺癌的ＨＲＣＴ诊断

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目的：通过对我院２０１６年１０月——２０１８年１２月２７例患者原发性粘液腺癌的临床表现、影像特征以及病理特性的诊断、分析、总结，提高对这一类病变的认识。
方法：对我院２７例粘液性腺癌患者的临床、影像及病理资料进行回顾下分析，并复习相关的文献资料。
结果：２７例粘液性腺癌患者中，平均年龄为５２岁，其中男性１２例，女性１５例.９例患者无症状，大都在体检中发现肺部病变，１８例患者有临床症状，发热、咳嗽、胸痛及胸闷为主，体温最好未超过３９度。所有患者均行胸部ＨＲＣＴ检查，其影像特征多种多样，包括大片实变、肿块、多发结节，小空洞、癌性淋巴管炎、胸闷牵拉及肥厚，胸膜下结节，胸腔积液，纵膈淋巴结肿大等等。最多见于大片实变及结节，结节以分叶、毛刺、小空泡、胸膜牵拉征象为主。增强扫描，轻中度强化，可见轻度坏死。２７例中患者的肿瘤标志物均有不同程度升高。１５例患者行胸腔镜手术，１２例患者行ＣＴ引导下穿刺活检证实。两例患者放弃治疗，１３例患者靶向药物和放疗治疗。后期随访，死亡５例，均出现远处转移，脑转移３例，肝脏转移２例。
结论：原发性粘液腺癌（ＰＰＭＡ）大都以周围性的实变、结节为主，无特异性的影像及临床特点，早期易于误诊，唯一可以确诊的手段就是病理，免疫组化不仅仅可以肯定组织来源，更能帮助判断预后。发现肺部病变，而且血清标志物升高，中老年患者等高危因素，应该早期明确诊断，早期治疗。

EPO-0609

Prediction of lower legs muscle ischemia: A preliminary study of dynamic CTA

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The purpose of this study was to predict the lower legs muscle ischemia based on dynamic computed tomographic angiography.
Material and method:
A population of 35 patients with known peripheral arterial occlusive disease was examined with a combined CTA protocol consisting of a standard CTA (s-CTA) of the lower leg runoff from the diaphragm to the toes and dynamic CTA (dyn-CTA) of the calves (scan range, 45 cm; 8 phases; 2.5s×4 cycle, 5s ×4cycles; 70 kVp; 80 mAs; contrast volume, 30 mL, saline water, 50ml, 4.0 mL/s). The scan protocol of s-CTA was intravenous administration of 50 mL of Iopromide (370 mgI/ml, 30ml with flow rate of 3ml/s, 20ml with flow rate of 2.5ml/s) followed with 40ml saline water (2.5ml/s), pitch 2.2.
For each of four lower leg artery segments, runoff score according to stenosis percentage and occlusion length was evaluated based on s-CTA. This score ranges from 0 to 19, with a higher score indicating more severe disease, and is calculated by assessing the patency and degree of stenosis/occlusion in the popliteal artery and the three tibial vessels. A score of 0 is assigned to a vessel with <20% stenosis, a score of 1 for a 21% to 49% stenosis, 2 for 50% to 99% stenosis, 2.5 for a vessel occluded over an area less than half its length, and 3 for an occlusion greater than half the vessel length.
All the muscle pixels on the 10th to 80th slices for each leg (20HU<attenuation<100 HU) were retrieved from dyn-CTA data at time point of 0s to 10s. Three indexes were calculated which were E_1 (initial enhancement,), E_{peak} (peak enhancement,) and SER (signal enhancement ratio,). S_0, S_1, S_{peak} and S_{last} represented muscle attenuation before enhancement, attenuation at first time point after enhancement, attenuation of peak enhancement and attenuation at last time point. Top 25%, 10% and 5% cut-off of the three indexes were used to do statistical analysis with SPSS 19.0.

Results:
35 patients (average age=66.6±11.7 years old; 11 female, 24 male) with 70 lower legs were included. The legs were divided into two groups, group 1 was normal group with runoff score ≤7 as well as the score of each vessel segment ≤1. The rest legs belonged to group 2 which was ischemia. Finally there were 22 legs in group 1 and 48 legs in group 2. The three indexes from top 25% to 5% cut-off were compared between the two groups with T-test (table 1). Compared with the ischemia group, E_1 and E_{peak} were higher in normal group and there was statistical difference. There wasn't statistical difference with SER in two groups. There was weak correlation of E_1 and E_{peak} with runoff score (figure 1). The ROC area of E_1 with top 25% cut-off was best which was 0.77.

EPO-0610

Pathological-based Radiomics improve prediction of lymph node metastasis of Lung Cancer compared with conventional SUVmax

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Purpose: To develop a radiomics model for prediction of lymph node metastasis of lung cancer,irrespective of the specific lung cancer entity.
Methods: Preoperative PET-CT imaging data from one hundred and twenty-six lung cancer patients(training dataset: n =84, validation cohort: n =42) with lymph node Pathological result between Jan. 2017 and May 2019 were included in this study.The radiomics features were extracted from the native CT of the 126 primary tumors and 186 lymph nodes(LNs) and the value of metabolic parameters (both tumor and lymph nodes) from the PET.Non-redundant and stable features were evaluated using the area under the curve (AUC) (all p-values were corrected for multiple hypothesis testing). Classification performance of each feature set was evaluated using random forest and nested cross validation.
Results: Of the 186 lymph nodes, 93 were benign, 93 malignant.Based on lymph node radiomic signature, a model was developed and showed excellent predictive ability for LN metastasis (AUC 0.86 and 0.92 in training dataset and validation cohort, respectively).
Conclusions: the radiomics model can be used to prediction of lymph node metastasis of lung cancer and also can reduce the false positive of PET.

EPO-0611

基于 CT 征象可手术切除的周围型肺癌预后因素分析

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目的：对 200 例手术切除的周围型肺癌患者术前 CT 征象进行回顾性分析，以评估影响预后的 CT 征象，为可手术切除的肺癌患者的预后及管理提供参考。
方法：回顾分析 2010.7 至 2013 年 1 月手术周围型肺癌 200 例，术前具有完整的 CT 影像资料、血 CEA 水平检测，术后规律随访。患者总生存（OS）定义为手术日至随访截止日期，以月为单位计算。分析因素包括：性别、年龄、肿瘤部位、肿瘤最大径、形状、毛刺、胸膜凹陷征、病灶含 GGO、术前 CEA 水平及病理类型。采用 SPSS 22.0 统计分析软件，使用 kaplan-meier 法绘制生存曲线,采用 log-rank 检验比较生存曲线的差别；采用 cox-regression 单因素及多因素分析，获得生存独立影响因素及风险比(Hazard ratio)。P<0.05 认为统计学有差异。
结果：200 例患者中男 84 例，女 116 例，年龄 27-79 岁，平均 59.9±9.2 岁。死亡 54 例，存活 146 例。单因素分析显示，肿瘤最大径（p<0.01）、病灶含 GGO(p=0.004)、术前 CEA 水平(p=0.001)与总生存显著相关。性别、年龄、肿瘤部位、形状及毛刺、病理类型、胸膜凹陷征与总生存无显著

相关（p>0.05）。多因素分析显示肿瘤最大径（HR=2.331，95%CI，1.351-4.022）、CEA 水平（HR=1.951，95%CI，1.046-3.639）及含 GGO（HR=0.49，95%CI，0.258-0.932）是影响总生存的独立预后因素。
结论：术前 CT 显示肿瘤较大、CEA 水平升高是影响总生存的不良预后因素，而显示肿瘤内含有 GGO 成分是预后的有利因素。

EPO-0612

Imaging-guided monitoring and management of pulmonary alveolar microlithiasis

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OBJECT:Pulmonary alveolar microlithiasis (PAM) is a rare geneticlung disease characterized by progressive intra-alveolar calcificationwith poor prognosis. Most reports concentrated in the radiological imaging such as high-resolution CT (HRCT) and X-ray, while the nuclear imaging reports were rare. We aims to use nuclear imaging modalities18F-FDG PET/CT to provide metabolism information to evaluate the activity, as well as the severity of the disease and lung function. We report a case of PAM and propose an optimized imaging-guidedmanagement based on the current state of the art.
Method: A 46-year-old woman was admitted to our hospital in 2012 for dyspnea. There was no history of expectoration, hemoptysis, and/or chest pain.
Resullts: Chest X-ray revealed widespread, hyperdense, micronodular shadows producing a characteristic snowstorm appearance, which predominated in the middle and lower lung areas with obscured cardiac borders.HRCT images showed bilateral diffuse both intra-alveolar and interlobular septal calcifications showing crazy-paving pattern composing of diffuse ground-glass opacity and small calcified parenchymal nodules. Pleura and fissures calcification and subpleural cystic changes also were observed. Whole body bone scan by HDP-Tc99m- SPECT-CT showed an intense pulmonary uptake which was diffuse and symmetrical.
Conclusion: The way to manage and optimize the imaging modalities is a key factor to guide clinicians and radiologists. The recent discovery of the etiology of PAM suggests an imminent paradigm shift in treatment.

EPO-0613

肺 CT 靶重建成像对于可疑肺肿瘤的应用范围筛选

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目的:探讨肺 CT 靶重建成像在可疑肺肿瘤诊断中的应用范围及价值 。方法:对 99 例可疑原发肺肿瘤的首次受检者分别行常规肺 CT 扫描(5mm)及局部肺野小 FOV 薄层 CT 靶重建成像（层厚：1.25mm，FOV：20cm）。记录 CT 可疑原发肺肿瘤的大小、分型、肿大淋巴结、其它肺野结节等 CT 表现。采用单独常规肺 CT 成像和联合肺小 FOV 薄层 CT 成像两种不同方法，根据肺结节的形态、密度、边缘及与相邻结构的关系等等共同读片，分别对可疑肺肿瘤来进行良恶性判断，以病理诊断为

金标准，对可疑肺肿瘤的两种诊断方法进行 ROC 分析。 结果： 86 名获得活组织病理学结果（恶性病变 72 例、良性病变 14 例）；单独采用常规肺 CT 成像和 结合肺小 FOV 薄层 CT 成像两种方法对于可疑肺肿瘤诊断的 ROC 曲线下面积未见统计学差异（p=0.067）。联合肺小 FOV 薄层 CT 靶重建成像后，对于 72 例可疑周围型肺癌、54 例无肺门或纵隔肿大淋巴结、72 例无其它肺野结节病例时，两种方法诊断的 ROC 曲线下面积可见明显统计学差异（p＜0.05）。
结论：对于所有可疑原发肺肿瘤的常规肺 CT 的诊断中，肺 CT 靶重建成像可能没有提供额外的帮助。但是，当可疑为周围型肺癌、没有肺门或纵隔肿大淋巴结，没有其它肺野可疑肺结节时，肺 CT 靶重建成像能为诊断提供一定的帮助。

EPO-0614
肺 CT 靶重建成像对于可疑肺肿瘤的影像征象的判断价值

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目的:探讨肺小 FOV 薄层 CT 靶重建成像在辨别可疑周围型肺肿瘤异常影像征象中的价值 。方法:搜集具有完整临床资料并经病理证实的 72 例可疑周围型肺肿瘤，行常规肺 CT 扫描(5mm)，并对局部进行后处理小 FOV 薄层 CT 靶重建成像（层厚：1.25mm，FOV：20cm）。两名医师采用单独常规肺 CT 成像和联合肺小 FOV 薄层靶重建 CT 成像两种方法，分别判断肿瘤的直接征象（大小、形态、密度、边缘）及间接征象（支气管、支气管动脉、肺动静脉、胸膜改变等）进行评估及记录。统计学分析采用 SPSS18.0 软件包，对两种方法显示每种异常征象间的差别；良恶性病变间影像征象的比较均采用卡方检验或 Fisher 精确检验。结果： 常规肺 CT 成像与肺小 FOV 薄层 CT 成像比较，对形态、边缘、分叶、毛刺、支气管、肺动静脉的改变征象的判断均有统计学差异（P<0.05）。其中常规肺 CT 成像中的分叶征，肺小 FOV 薄层 CT 靶重建成像边缘、分叶、毛刺在良恶性病变中有统计学差异。

EPO-0615
非增强 MRA 技术评估中央型肺癌与肺门及纵膈大血管关系研究

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目的：探讨非增强磁共振血管成像（MRA）在中央型肺癌中的表达及与纵膈大血管的关系。**方法：**60 例未接受放化疗及其他任何辅助性抗肿瘤治疗，后经手术病理或支气管镜活检证实为中央型肺癌的患者纳入研究，术前均行二维自由呼吸 TrueFISP 序列，二维屏气 TrueFISP 序列和三维呼吸触发 SPACE 序列检查。对三种成像序列的图像质量评价包括定量评价和定性评价。最后，将肿瘤与血管关系的形态类型分为 1-6 型，评价并记录每一种非增强 MRA 方法中，肿瘤与各大血管之间的形态关系类型。**结果：**三种非增强 MRA 技术的 CNR 无显著性差异，两种 TrueFISP 技术的 VTR（p=0.000）和图像质量（p=0.000）评分高于 SPACE 技术。三种 MRA 技术和增强 MDCT 对肺癌与血管关系评价的一致性好。**结论：**TrueFISP 和 SPACE 技术都能满意的显示肺门及纵膈大血管并准确评价肺癌与大血管的关系，与增强 MDCT 结果一致性好。TrueFISP 序列的图像质量和 VTR 比 SPACE 序列稍好，在评价肺癌与肺门、纵膈大血管的关系中，与增强 MDCT 结果一致性稍好。

EPO-0616
薄层 CT 特征鉴别同时多原发肺腺癌与肺腺癌伴肺转移

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目的 探讨同时多原发肺腺癌与肺腺癌伴肺内转移瘤之间薄层 CT 特征的差异。
方法 回顾分析经手术证实的同时多原发肺腺癌 62 例 131 个病灶及肺腺癌伴肺内转移瘤 31 例 67 个病灶的临床及影像特征。按照病灶类型（纯磨玻璃结节，pure ground glass nodule/pGGN；部分实性结节，partial solid nodule/PSN 和实性结节，solid nodule/SN），将患者分为 7 种影像配对组，比较同时多原发肺癌（原发组）和肺癌伴肺内转移（转移组） 影像配对类型的差异。将肺内多发病灶按照大小分为主病灶和伴随病灶。记录并分析主病灶和伴随病灶的大小（长径，实性成分长径），是否含磨玻璃成分，形态，分叶，边界，毛刺，空泡征、胸膜牵拉，贴邻胸膜，分别比较主病灶，伴随病灶在两组间的等影像学特征之间的差异。
结果 原发组整体影像类型以 pGGN+PSN 及 PSN+PSN 较多见，至少有一个病灶内含磨玻璃成分的占 96.77%（60/62）。转移组仅有两种类型，PSN+SN 2 例（6.5%，2/31），SN+SN 29 例（93.5%，29/31）。两组间影像配对类型差异有统计学意义（$P<0.001$）。两组间主病灶多因素 logistic 回归分析，男性（OR 值 5.742，$P=0.010$），不含磨玻璃成分（OR 值 41.291，$P<0.001$）及病灶贴邻胸膜（OR 值 9.288，$P=0.001$）是转移组主病灶伴发肺内转移的独立风险因素。
结论 薄层 CT 上薄层 CT 同时多原发肺腺癌以含磨玻璃成分的病灶（pGGN 或 PSN）较多见，而肺腺癌伴肺转移以 SN 较多见。男性、不含磨玻璃成分及贴邻胸膜是主病灶发生肺内转移的风险因素。

EPO-0617
心脏磁共振组织追踪技术评估肥厚型心肌病心室心肌应变

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目的：探讨心脏 MR 组织追踪技术(CMR-TT)评价肥厚型心肌病（HCM）心室功能的可行性。
研究方法：本研究纳入 HCM 患者组 32 例和正常对照组 32 例，行 3.0 T SSFP 电影序列扫描，使用加拿大 CVI 公司 CVI42 后处理软件的 CMR-TT 技术测量左心功能及左、右心室应变参数。收集 HCM 组及对照组两组的临床特征资料（性别、年龄）及左心功能基本参数（左心室射血分数、舒张末期容积、收缩末期容积、左心室质量），计数资料采用独立样本卡方检验分析，计量资料用`x±s 表示。两心室的应变按部位分包括整体应变及节段应变（基底部、中间部、心尖部应变），按方向分又包括圆周应变、径向应变及纵向应变；两组间的左、右心室应变参数两两比较使用独立样本 t 检验。
结果：HCM 组左心室质量较对照组明显增高（t=1.41，P<0.01），余左心功能参数(左心室射血分数、舒张末期容积、收缩末期容积)2 组差异均无统计学意义。与对照组比较，HCM 组左心室、右心室整体应变参数均明显减低（P 均<0.01）；除左、右心室基底部径向应变外，HCM 组各节段局部应变较对照组减低（P 均<0.05）。
结论：右心室节段应变、整体应变能敏感地反应 HCM 右心室心肌收缩功能；HCM 患者在左心室射血分数减低前左、右心室心肌收缩功能就已存在受损。

EPO-0618

影像组学应用于非小细胞型肺癌化疗疗效评估及预测 EGFR 突变的初步研究

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目的：本回顾性研究通过影像组学方法，评估胸部增强 CT 影像对预测非小细胞肺癌（NSCLC）患者化疗反应的价值，并探讨 CT 影像特征与表皮生长因子受体（EGFR）突变的相关性，结合临床特征构建预测模型。**方法**：回顾性分析经病理证实的 148 例非小细胞肺癌，收集患者治疗前胸部 CT 增强图像，通过影像组学方法，由一位经验丰富的放射科医生在开源软件 3D-Slicer 上描绘感兴趣区域（ROI）半自动完成病变的分割，并通过 pyradiomics 软件包进行感兴趣区特征提取，每个患者共提取了 849 个图像特征。通过计算两两特征间皮尔逊相关系数和 LASSO 算法进行特征筛选，最后采用逻辑回归方法构建预测模型，通过受试者工作特性（ROC）曲线下面积（AUC）评价模型的诊断效能。**结果**：在预测患者化疗反应上，最终选择七个特征来构建预测模型，在训练集，ROC 曲线下面积为 0.791，敏感性和特异性分别为 73.1%和 70.5%。在验证集，ROC 下曲线下面积为 0.753，敏感性和特异性分别为 84.2%和 61.1%;对预测 EGFR 突变，结合临床和影像学特征的模型表现最佳，ROC 曲线下面积为 0.947，敏感性和特异性分别为 91.2%和 81.8%。**结论**：本研究的初步结果表明，影像特征与患者的化疗反应和 EGFR 突变有关，通过影像组学方法，基于胸部 CT 增强影像的预测模型能在治疗前有效预测非小细胞型肺癌患者化疗反应并分层 EGFR 突变型和野生型患者，指导临床采取及时有效治疗。

EPO-0619

Accuracy in diagnosing lung cancer types and subtypes by CT-guided percutaneous core needle biopsy specimens

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Purpose Evaluated diagnostic accuracy of CT-guided percutaneous core needle biopsy (PCNB) specimens in diagnosing lung cancer histological types and subtypes. And analyze the diagnostic differences between pathologists with different working experiences.

Patients and methods The pathological slices of 160 consecutive patients who underwent CT-guided PCNB and resections for lung lesion between January 2007 and December 2015 were retrospectively analyzed. All biopsy and surgery slices were diagnosed into three levels according to the 2015 WHO classification of lung tumors by group A and B pathologists with different working experiences. Firstly, diagnose malignant and benign lesions. Secondly and thirdly, diagnose histological types and subtypes.

Results Of the 160 cases, 139 were malignant and 21 were benign. On the first level, substantial agreement was seen in group A and B (*Kappa*=0.74, 0.78). The diagnostic accuracy of two groups were 90.63%, 94.38% (*P*=0.20). On the second level, substantial agreement was seen in group A and B (*Kappa*=0.63, 0.60). The overall diagnostic accuracy of two groups were 67.50%, 72.50% (*P*=0.33). On the third level, fair agreement was seen in group A and B (*Kappa*=0.38, 0.25). The diagnostic accuracy for adenocarcinoma were 26.39%, 55.56% (*P*<0.01), for squamous cell carcinoma were 28.57%, 38.10% (*P*=0.36).

Conclusion CT-guided PCNB specimens could diagnose lung cancer histological types with high accuracy. While the diagnostic accuracy for lung cancer subtypes was low. No difference of diagnostic accuracy for lung cancer types was found in pathologists with different working experiences. More experienced pathologists were better at diagnosing lung adenocarcinoma subtypes.

EPO-0620
环境空气 PM2.5 暴露大鼠动物模型的建立与评价

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目的 使用 $PM_{2.5}$雾化吸入、$PM_{2.5}$滴注及蛋白酶+$PM_{2.5}$滴注的方法成功构建大鼠 $PM_{2.5}$肺损伤模型，并从大鼠疾病情况、影像及病理多方面对模型进行评价。**方法** 使用 $PM_{2.5}$雾化吸入、$PM_{2.5}$滴注及蛋白酶+$PM_{2.5}$滴注的方法进行 $PM_{2.5}$肺损伤大鼠造模，每组大鼠分别为 6 只、16 只、16 只。同时设置对照组 38 只。$PM_{2.5}$雾化吸入组及滴注组大鼠分别于造模前、造模 4、8、12 周及滴注组大鼠造模 16 周进行活体 microCT 成像。雾化吸入组大鼠于第 12 周后全部处死，进行病理学检查。滴注组大鼠根据滴注剂量的不同，分别于造模 4、8、12、16 周各处理 4 只大鼠，所处理大鼠分别接受 Micro-CT 检查及病理检查。**结果** 模型建立病理表现：雾化吸入暴露组主要表现为双肺的慢性炎症改变，包括气管壁的淋巴组织浸润，肺间隔增厚及肺泡壁的炎性细胞浸润，血管壁的增厚。$PM_{2.5}$滴注低剂量 4 周组病理改变较轻微，可见小气道壁上皮增厚和小血管壁增厚，肺间质微量的碳末沉积；$PM_{2.5}$滴注中剂量 8 周组可见肺泡间隔的增厚，小气道壁上皮增厚更明显，肺间质内可见较大量的碳末沉积；$PM_{2.5}$滴注高剂量 12 及 16 周组可见肺气腔的扩大，肺泡间隔的增厚，肺间质内大量的碳末沉积。活体 microCT 检查结果为：雾化吸入大鼠暴露 12 周后，活体 micro CT 表现为不同程度的实变影。滴注组大鼠双肺内均未见明显异常。**结论** 使用 $PM_{2.5}$雾化吸入、$PM_{2.5}$滴注及蛋白酶+$PM_{2.5}$的方法均可成功构建大鼠 COPD 模型。Micro-CT 可用于 $PM_{2.5}$雾化吸入组的动态评估，对于滴注组肺损伤改变需要寻找敏感性更高的影像学检查方法。

EPO-0621
AI 联合低剂量肺部 CT 扫描在肺原位癌与微浸润腺癌中的价值

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【摘要】目的 探讨 AI 联合低剂量肺部 CT 扫描在肺原位癌与微浸润腺癌中的价值。 **方法** 在锁定机器上安装人工智能软件（我院选用北京推想科技软件），挑选 2018 年 10 月到 12 月在我科行肺部体检的患者，剔除条件为有基础肺疾病患者及患者配合欠佳图像质量不好的。在指定机器（安装人工智能的机器）选用低剂量肺部扫描，然后在报告系统打开患者报告，人工智能自动检索出各种类型结节并对每个结节进行详细分析，主要从结节所在肺段、结节的大小、密度、CT 值、结节体积、结节性质及恶性风险评估，最后可以生成图文报告供诊断医师参考。诊断医师对照检索出的结节结合临床病史做出诊断，提出合理化建议。**结果** 人工阅片效率较低，且在工作量较大时极易漏诊，人工智能可以建立客观、统一的阅片标准，迅速发现并多方位分析结节，低剂量扫描可以减少患者因对射线剂量的恐惧而拒绝检查从而耽误病情，在我们随访的患者中发现有价值的肺内结节 34 人，磨玻璃结节 21 人，有 11 例因为结节变化，临床采取手术治疗，其中病理微浸润腺癌 6 例，原位癌 3 例，不典型瘤样增生 2 例，所有手术后患者恢复良好。 我们用常规剂量的百分之

二十结合利用人工智能软件快速找出各种类型结节，对肺部微小结节系统分析、管理，病灶有轻微变化则提醒临床处理，在微浸润或者原位的时候临床就介入，从而提高患者生存率及生活质量。**结论** AI 联合低剂量可以让患者从心里接受肺部筛查，不会因为射线剂量而拒绝检查，AI 对肺部结节的检出率敏感性达 98%，极大减少漏诊，真正达到早发现、早治疗的目的， 让微浸润腺癌及原位腺癌无发展机会，可极大提高患者生存率及生活质量。

EPO-0622
多层螺旋 CT 血管成像及后处理技术对主动脉夹层动脉瘤破口的诊断价值

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目的：探讨 MDCT 不同后处理技术评估主动脉夹层破口大小及位置的准确性价值 。方法 选择我院 2017 年 1 月-2019 年 6 月期间确诊主动脉夹层的 20 例患者为研究对象，比较 MDCT 轴位图像、不同后处理技术对破口大小及位置的显示情况。MDCT 后处理技术主要包括最大密度投影（MIP）、多平面重建（MPR）、曲面重建（CPR）、容积再现（VR）。利用不同后处理技术对主动脉夹层破口大小进行测量；记录夹层破口距离左锁骨下动脉开口远侧的距离，与术中 DSA 造影测量数据结果进行比较。分别在 MDCT 轴位图像、MPR 矢状位图像、VR 图像测量破口的大小并记作（CT-W、MPR-W、VR-W），比较三种测量方法对破口大小显示的结果。在 MPR 矢状位图像中沿主动脉外侧缘，主动脉弓内侧缘、并在 VR 图像中分别测量破口距主左锁骨下动脉开口距离，分别记作（MPR-OD、MPR-ID、VR-D），与术中 DSA 造影下测量数据(DSA-D）进行比较。结果：MPR、及 CPR 对破口位置显示阳性率 100.0%（20/20）；VR 显示破口阳性率 90%（18/20）。CT-W 及 MPR-W 两者之间无统计学差异（P<0.05）；VR 三维图像测量的破口大小值（VR-W）要大于 MPR 图像、CT 轴位断层图像测量破口大小值；CT-W、MPR-W 两者之间相关系数为(r=0.992，P<0.001）； MPR-OD、VR-D 与 DSA-D 之间差异无统计学意义（P<0.05）；MPR-OD、VR-D 与 DSA-D 的相关系数 r 分别为 0.895(P<0.001)和 0.863(P<0.001)。结论 显示破口位置 MPR、CPR 图像更具有优势。MPR 矢状位沿主动脉外侧缘测量破口距左锁骨下动脉的距离与术中 DSA 测量数据相关性最好，更能准确的评估破口的位置；利用 MDCT 的 MPR、CPR、VR 后处理技术测量主动脉夹层破口的位置及大小可以准确的进行术前评估。

EPO-0623
创伤性肺假性囊肿的 MSCT 征象分析

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目的：分析创伤性肺假性囊肿的 MSCT 特征。方法：回顾性分析 14 例经临床和随访证实创伤性肺假性囊肿患者的胸部 CT 和临床资料,观察病变的位置、形态、大小、内部特征及邻近肺组织改变,分析肺假性囊肿的动态变化。结果：14 例患者经 MSCT 检查共检出创伤性肺假性囊肿 39 个,其中单发 6 例,多发 8 例。病变呈单纯性含气囊肿 26 个,气液囊肿 13 个,未见单纯性含液囊肿。69.2%（27/39）的囊肿位于胸膜下区,其中 13 个邻近叶间胸膜,肺叶外周带胸壁下方 10 个,纵隔旁 4 个。病灶呈圆形或类圆形 28 个,不规则形 11 个。6 个病灶内可见细线样分隔,5 个病灶腔壁可见小尖角

样突起,6 个病灶囊腔旁可见细小裂隙样影。邻近肺组织均有不同程度挫伤改变。所有患者于伤后 4～85d 内进行复查,发现 74.4%（29/39）的病灶不同程度缩小、吸收。结论：创伤性肺假性囊肿的 CT 表现具有一定的特征性,结合临床明确胸部创伤病史,以及随访过程中病变的自愈趋势,可作出较准确诊断。

EPO-0624

胸部孤立性纤维瘤的 MSCT 表现

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目的 探讨胸部孤立性纤维瘤（solitary fibrous tumor，SFT）的影像特征，提高对该病的认识。
方法 回顾性分析 18 例经手术（16/18）或穿刺活检（2/18）病理证实的胸部 SFT 患者的 CT 表现。1 例行 CT 和 MRI 平扫，11 例行 CT 增强检查，6 例同时行 CT 平扫+增强检查。
结果 18 例胸部 SFT 中，右侧胸腔 4 例，左侧胸腔 11 例，后纵隔 2 例，肺内 1 例。CT 表现为胸部单发肿块，直径 2.7～23.1cm，呈圆形或卵圆形 9 例，浅分叶 9 例。边界清楚 14 例。CT 平扫 3 例密度均匀，未见囊变、出血、坏死及钙化，4 例呈混杂密度，见多发囊变区，1 例周围骨质破坏。CT 增强扫描 13 例病灶中央可见坏死区，动脉期不均匀强化，内见低密度无强化区,4 例病灶动脉期呈轻中度强化，5 例见迂曲血管影，3 例见钙化；静脉期 14 例呈渐进性强化。
结论 胸部不均匀的富血供肿瘤要考虑到 SFT 的可能，CT 增强扫描呈进行性不均匀强化的强化模式可能是有诊断价值的影像特点。

EPO-0625

ASiR、ASiR-V 重建对体模内不同密度肺结节图像质量的比较

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目的：探讨基于多模态的自适应迭代重建算法（Adaptive statistical iterative reconstruction，**ASiR-V**）对体模内不同密度肺结节图像质量的影响，旨在寻找提升不同密度肺结节 CT 图像质量并相应降低辐射剂量的新途径。**方法：**设置管电压 120kV,采用 9 种管电流对体模内 3 种直径（8.0 mm、10.0 mm、12.0 mm）、3 种 CT 值（100HU、-630HU、-800HU）的 9 个结节进行多次 CT 扫描，采用 9 种（10%、20%、30%、40%、50%、60%、70%、80%、90%）ASiR、9 种 ASiR-V 算法分别重建，分别测得结节 SD 值，计算其信噪比（SNR）和对比噪声比（CNR）。使用 T 检验分别比较 3 种不同密度的肺结节在使用 ASiR 重建和使用 ASiR-V 重建之后的 SD、SNR、CNR 的差异。**结果：**对 100HU 的结节，ASiR 与 ASiR-V 重建的结节 SD、SNR、CNR 均不存在明显差异（t=-0.30,P=0.76；t=-0.25,P=0.80；t=-0.30,P=0.76）。对-630HU、-800HU 的结节 ASiR-V 重建后结节 SD 值均低于 ASiR 重建（t=1.55,P=0.045；t=3.12,P=0.002），SNR（t=-2.82,P=0.005；t=-4.71,P＜0.001）、CNR（t=-2.53,P=0.012；t=-3.57,P＜0.001）均明显升高。**结论：**对于密度为-630HU 和-800HU 的磨玻璃结节而言，ASiR-V 重建算法在降低图像噪声、提高图像的信噪比与对比信噪比方面明显优于 ASiR，在保持同等图像质量的前提下，ASiR-V 可以相应降低扫描过程中的辐射剂量，为后续使用 ASiR-V 来进行结节低剂量随访的研究奠定了基础。

EPO-0626

肺内占位影像误诊 1 例分析

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目的：报道 1 例误诊为肺癌的肺内原发性滑膜肉瘤，通过分析该病例，提高诊断医师对这罕见疾病的认识。

方法：临床资料：患者男，78 岁，胸痛 1+月入院。患者 1+月前无明显诱因出现胸痛，以左侧胸背部为著，呈刺痛，牵扯肩背部疼痛。自行于家中口服“氨酚曲马多片”可缓解。后患者于“贵州医科大学附属医院”行“胸部 CT”示：左肺上叶占位，未行相关诊治。个人史：吸烟 30+年，40 支/天，已戒 10+年。入院辅助检查：癌胚抗原 CEA45.58ng/ml，糖类抗原 724（CA72-4）11.75U/ml。CT 增强：倾向考虑左肺上叶后段肺 Ca 并阻塞性肺炎，邻近肋骨骨质破坏征象。临床初步诊断：左肺上叶肺 Ca？入院后经系统检查无手术禁忌征，于局麻下行穿刺活检术。

结果：术中病理结果：“左肺包块”结合 HE 切片组织形态及免疫组标记结果较支持为滑膜肉瘤。

结论：肺原发滑膜肉瘤罕见，恶性程度高，临床表现无特异，易复发、转移，临床初诊困难。

EPO-0627

影像学对单中心型及多中心型 Castleman 病合并 POEMS 综合症的诊断价值

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目的　分析单中心型及多中心型 Castleman 病（CD）的 CT、MRI、PET 影像学特征，评估各种影像方式对 Castleman 病分型及合并 POEMS 综合症的诊断价值。

方法 对 2015.1-2019.7 本院经病理证实的 37 例 Castleman 病的影像学资料进行回顾性分析。25 例为单中心型，12 例为多中心型，其中 5 例合并 POEMS 综合症。12 例仅行 MR 增强，16 例仅行 CT 增强，6 例仅行 PET-CT，2 例行 CT 增强、MR 增强、PET-CT，3 例行 CT 增强及 PET-CT，1 例行 MR 增强及 PET-CT。

结果　25 例单中心型 CD 中 9 例发生于腹腔及腹膜后，6 例发生于纵隔，6 例发生于颈部，1 例发生于腮腺，1 例发生于眼眶，1 例发生于腘窝，1 例发生于腹股沟。单中心型 CT、MR 表现为单发肿块，边界清楚，病变大小为 2cm-13cm。CT 平扫密度为等密度，增强扫描均明显强化，动脉期 CT 增强幅度达 30-140HU，部分较大病变内可见未强化低密度坏死灶，实质期密度较动脉期均匀，2 例肿块内可见明显强化的纤细分隔。MR 扫描 T1WI 为低或等信号，T2WI 为稍高信号，3 例 CD 可见坏死呈长 T1WI 长 T2WI,增强扫描动脉期明显强化，延迟期肿块持续强化。14 例肿块边缘可见扩张扭曲血管影及供血动脉。

12 例多中心型中，8 例多中性型行 PET-CT，3 例行 CT 增强，1 例行 MR 增强。　10 例可见全身多发淋巴结肿大，最大淋巴结 2.5x1.2cm，1 例为双侧颈部淋巴结肿大，1 例双侧颈部及锁骨上窝淋

巴结肿大，累及鼻咽。5 例合并脾、双肾肿大，2 例合并胸腔腹腔积液，皮下水肿。2 例治疗前后 PET-CT 随访淋巴结部分变小，SUVmax 减低。
结论 对于单中心 CD，应用 CT 增强及 MR 增强对 CD 具有诊断价值；对于多中心型 CD，应用 PET-CT 可以评估病变的范围及是否合并 POEMS 综合症，以及检测治疗前后的效果。

EPO-0628
超声与 MSCT 平扫及增强扫描对甲状腺结节良恶性鉴别诊断的应用价值

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【摘要】 目的 探讨超声与 MSCT 平扫及增强扫描联合应用对甲状腺结节良恶性鉴别诊断的价值。 **方法** 回顾性分析 2018 年 1 月到 2019 年 6 月在我院同时行超声与 MSCT 平扫及增强扫描的 280 名甲状腺结节患者的影像资料。 **结果** 280 名患者，共 324 枚结节，均经手术或者超声引导下穿刺病理证实，病理结果显示良性结节约 113 枚，恶性结节约 211 枚，MSCT 增强扫描的诊断结果与病理诊断符合率高于超声检查，差异具有统计学意义（*P<0.05*），超声与 MSCT 增强扫描的总体符合率显著低于二者联合应用的符合率，差异具有统计学意义（*P<0.05*）。 **结论** 超声与 MSCT 平扫增强扫描联合应用，可以有效提高甲状腺恶性结节的检出率及诊断的准确率，可作为当前临床诊断甲状腺结节良恶性及术前评估病变范围首选无创检查方法。

EPO-0629
前纵隔肿瘤的 CT 影像学特征与术后病理对照的临床分析

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[摘要]目的：探讨前纵隔肿瘤的 CT 影像学特征与术后病理对照的临床分析。**方法：**回顾性分析 2016 年 1 月-2018 年 12 月于我院证实胸腺瘤患者 28 例、淋巴瘤患者 18 例、畸胎瘤患者 20 例共 66 例临床资料。所有患者均行 CT 影像学和术后病理学检查，比较 CT 检查在确诊胸腺瘤、淋巴瘤及畸胎瘤不同病理类型上与病理学检查一致性，分析胸腺瘤、淋巴瘤及畸胎瘤鉴别特点。**结果：**CT 检查与病理学检查在诊断前纵隔肿瘤上无统计学差异(*P*>0.05)且一致性较强；CT 检查下胸腺瘤、淋巴瘤及畸胎瘤 CT 密度、临床特征有统计学差异(*P*<0.05)。**结论：**CT 检查在对前纵隔肿瘤诊断上有较高准确性，且能够通过 CT 密度及临床征鉴别胸腺瘤、淋巴瘤及畸胎瘤。
关键词：前纵隔肿瘤；CT 影像学；病理学

EPO-0630
左室血流定向动能在扩张型心肌病中的特征

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目的采用二维磁共振成像相位对比血流成像法显示左心室内血流动力学状态，分析扩张型心肌病患者左心室内血流的定向动能（Signed Kinetic Energy，SKE）的变化表现，探讨 SKE 对扩张型心肌病（DCM）的诊断作用。
资料与方法纳入 21 例健康志愿者及 25 例 DCM 患者作为研究对象，采用 Philips 1.5T Multiva 磁共振扫描仪,采用 8 通道 Torso SENSE 线圈，心电向量触发，配置感应式呼吸门控，采集常规的电影成像、黑血对比序列，以及对 DCM 病人进行 Gd-DTPA 延迟强化检查后，选取左心室短轴位心底、中部和心尖 3 个层面和 LVOT 层面进行 2D-PC flow 成像，流速编码预设值 120 cm/s，流动方向为垂直成像平面，每个心动周期划分为 24 个时相。采用 Segment 软件对电影成像和血流成像序列图像进行后处理，获取左室内血流动力学相关参数，包括血流速度、血流流量、血流定向动能（SKE），以及左室射血分数（LVEF）。分析 DCM 患者 SKE 的变化特征，并进行合理的血流动力学解释。
结果在视觉判断上，正常志愿者的血流在整个心动周期内心室心底和中部可见双向血流，在流量曲线上表现为正向和负向血流共存，这种双向血流特征向心尖逐渐减弱。DCM 心室容积参数明显增大，功能参数明显减低。收缩期 SKE 较正常组无显著差异，舒张期心室中部 SKE 明显下降，其余各水平舒张期 SKE 无显著差异，但整体数值均比正常组减低。DCM 患者 SKE 曲线复杂，根据曲线形态、同步性、峰值将曲线分为 I、II、III 类可以对 DCM 的心室内血流动力学进行初步的解释。
结论 心室内血流呈双向特征，SKE 的峰值和达峰时间可以作为简单的心室内血流动力学指标比较稳定地反映心室内不同层面的血流动力学特征。SKE 曲线可直观地反映 DCM 患者的收缩舒张功能，用于解释 DCM 心衰的病理生理机制，SKE 曲线有望成为衡量心衰分级的新指标。

EPO-0631
深度学习在肺结节检出和良恶性判别的效能验证

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【摘要】 目的 评估基于常规扫描肺 CT 数据训练的深度学习模型，在靶扫描 CT 图像上的良恶性分类效能。 方法 本研究回顾性分析了上海交通大学附属胸科医院 2016 年 1 月至 2018 年 12 月间胸部 CT 扫描发现并行手术切除的肺结节患者 938 例，共收集有病理检测报告且在常规扫描和靶扫描数据集上可对应的结节 969 个。使用基于常规扫描 CT 数据训练的深度学习良恶性分类模型，对于本研究中搜集的常规扫描和靶扫描数据集进行评测，评估指标包含两者的曲线下面积（AUC）、准确率、敏感性和特异性，并使用综合判别改善指数及 Delong 测试比较两者的性能差异。并进一步地，本研究使用统计学方法，探讨常规扫描 CT 上和靶扫描 CT 上结节的良恶性分类的样本间差异。 结果 常规扫描数据集上的曲线下面积、准确率、敏感性和特异性分别为 0.81、0.82、0.86 和 0.57，靶扫描数据集上的曲线下面积、准确率、敏感性和特异性分别为 0.84、0.85、0.89 和 0.60。综合判别改善指数为 0.056（Z 检验，$p<0.05$，有统计学差异），且 ROC 曲线存在差异（Delong 检验，$p=0.01$）。对比常规扫描的结果和靶扫描数据上的结果，靶扫描正确而常规扫描错误的结节，最长径显著低于总体水平（t 检验，$p<0.001$）。结论 基于常规扫描 CT 数据训练的深度学习模型，在靶扫描数据上可以取得更好的诊断效能。

EPO-0632

探讨双源 CT Flash 模式非门控扫描在支气管动脉成像中的应用价值

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目的：探讨双源 CT Flash 模式非门控扫描在支气管动脉成像中的临床应用价值。方法：前瞻性收集 100 例在本单位行支气管动脉检查患者，并且将其随机分为 A、B 两组，每组 50 例。A 组采用 Flash 模式非门控扫描，B 组采用回顾性心电门控扫描。两组均应用第三代双源 CT 进行扫描。结果：A 组扫描时间为 0.78±0.13S，B 组扫描时间为 13±4 S，两组比较 P＜0.05，具有统计学意义。A 组有效辐射剂量为 1.68±0.4 mSv，B 组有效辐射剂量为 9.6±0.7 mSv，两组比较 P＜0.05，具有统计学意义。A 组升主动脉 CT 值为 330±37 HU，B 组升主动脉 CT 值为 360±42 HU，两组比较 P＞0.05，不具有统计学差异。A 组图像质量主观评分为 4.3±0.5，B 组主观评分为 4.5±0.3，两组比较 P＞0.05，不具有统计学意义。结论：双源 CT Flash 模式非门控扫描与回顾性心电门控扫描均可以获得满足诊断的支气管动脉图像，双源 CT Flash 模式非门控扫描可以在更短的时间内完成检查，并且可以大幅度的降低有效辐射剂量，双源 CT Flash 模式非门控扫描支气管动脉成像更加适用于临床，值得推广。

EPO-0633

能谱 CT 多参数评估 5 种不同分子结构及浓度碘对比剂胸主动脉增强效能研究

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【摘要】 **目的** 探讨在相同碘注射率（1.2 g I/s）和碘总量（420 mg I/kg）的条件下，比较五种不同浓度碘对比剂在能谱 CT 增强胸部血管的增强效能。**方法** 选取体重指数（BMI）在 18.5~24.9 Kg/m^{2}范围的患者 200 人，随机分为五组，最终每组符合条件者 30 人。根据对比剂浓度不同分为 270 mg I/ml（270 组）、300 mg I/ml（300 组）、320 mg I/ml（320 组）、350 mg I/ml（350 组）和 370 mg I/ml（370 组）。利用单能量序列进行测定，测量气管隆突水平胸主动脉动脉期 CT 值（$CT_{胸主动脉}$）、同层面竖脊肌 CT 值（$CT_{竖脊肌}$）及皮下脂肪 SD，分别计算得出 CNR、SNR，同时保存并记录相关能谱数据，得出能谱曲线斜率、碘（水）基值及有效原子序数；比较上述五组间胸主动脉血管 CT 值、CNR、SNR、能谱曲线斜率、碘（水）基值及有效原子序数，运用 SPSS 软件，采用 LSD-t 法进行两两比较，观察 5 组间数据差异是否存在统计学意义，进而比较 5 种不同浓度碘对比剂在相同碘注射率与碘总量条件下胸部血管 CT 增强效能。**结果** 270 组、300 组、 320 组、350 组、370 组胸主动脉 CT 值、CNR、SNR、能谱曲线斜率、碘（水）基值及有效原子序数差异均无统计学意义。**结论** 不同分子结构及浓度碘对比剂按照相同的碘注射率、碘总量运用个体化对比剂注射方案行 CT 增强扫描时，能够获得相似的胸部血管增强效果和优质的图像质量。

EPO-0634

基于常规 CT 影像训练的深度学习模型在靶扫描 CT 对肺结节分割的影响

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目的：
评估常规 CT 影像与靶扫描影像使用卷积神经网络模型分割肺结节的差异。
方法：
测试数据集由 263 例患者组成，每例均包括常规 CT 和靶扫描 CT，共 526 个结节，然后由一位高年资医师对每个结节的轮廓进行勾画，使用三维卷积神经网络，并在 LIDC-IDRI 数据集上进行肺结节自动分割训练。验证集上的 3D Dice 相似系数为 0.8174，然后分别对常规 CT 和靶扫描 CT 的肺结节进行自动分割，将分割结果与人工勾画轮廓的标签进行比较。评价指标包括 3D Dice 相似系数的均值和方差以及敏感性。
结果：
常规 CT 扫描的 263 个结节的实验结果表明，所有结节均成功分割（交并比>0），因此敏感性为 100%。各结节间 3D Dice 相似系数的均值和方差分别为 0.79 和 0.008。对于大小在 6mm 范围内的结节，期 3D Dice 相似系数的均值和方差则是 0.607 和 0.035。靶扫描 CT 扫描的 263 个结节的实验结果表明，所有病灶均成功分割，敏感性为 100%。各结节间 3D Dice 相似系数的均值和方差分别为 0.60 和 0.025。对于大小在 6mm 范围内结节，其 3D Dice 相似系数的均值和方差分别为 0.685 和 0.029。
结论：在本研究中使用常规 CT 训练的肺结节分割模型，其在常规 CT 和靶扫描 CT 下的表现存在明显的差异。与常规 CT 相比，模型对于靶扫描 CT 下的小结能取得更好的分割效果。

EPO-0635

DWI 与血清肿瘤标志物评价非小细胞肺癌化疗疗效的对比研究

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目的：探讨磁共振扩散加权成像（DWI）和血清肿瘤肿瘤标志物（MT）在评价非小细胞肺癌化疗疗效中的价值及相关性。**方法**：选择 40 例经病理证实为非小细胞肺癌并首次接受化疗的患者，在治疗前一周内、治疗一周期及两周期后进行 MRI-DWI 扫描和 MT 检测， 比较肺癌治疗前后 ADC 值及 MT 值变化情况，分析 DWI 及 TM 在评价肺癌疗效中的敏感性、特异性，同时进行 ADC 值与肿瘤标志物变化的相关性分析。**结果**：非小细胞肺癌化疗后 ADC 值逐渐上升，治疗前后的 ADC 值差异具有统计学意义；肿瘤标志物值逐渐下降，但治疗前后差异无统计学意义。ADC 和癌胚抗原（CEA）化疗两周期后的变化在有效组和无效组间差异具有统计学意义（P＜0.05），鳞癌组 ADC 和 CEA 评价疗效的敏感性分别为（88.9%，77.8%），特异性分别为（86.7%，88.6%），腺癌组 ADC 和 CEA 评价疗效的敏感性分别为（90.0%，63.5%），特异性分别为（84.6%，76.4%）， 两组均以 ADC 变化诊断效能最高。非小细胞肺癌治疗后 ADC 值的改变与肿瘤大小、NSE、Cyfra21-1 变化存在负相关关系（r^2=0.120、0.176、0.149，P＜0.05），而 ADC 与 CEA 变化之间无显著的相关性（P＞0.05）。**结论**：DWI 和 MT 在评价非小细胞肺癌疗效中具有一定的临床价值，以 ADC 值变化的诊断效能更高，ADC 和 MT 的变化具有一定的相关性。

EPO-0636

单纯烟熏所致早期 COPD 大鼠模型的评价：活体 micro CT 容积量化、肺功能及病理学相比较

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目的 建立单纯烟熏所致的 Wistar 大鼠的早期 COPD 模型，运用 micro CT 容积量化分析、肺功能及病理进行模型评价，分析早期 COPD 病理形态学、microCT 量化参数及肺功能的差别。**方法** 共 16 只建模成功大鼠（9 雄、7 雌；200-220g）与 10 只对照组（7 雄、3 雌），建模方法：SPF 级实验室；烟熏每次持续 1 小时（每次 10 支）；每天两次，间隔 6 小时；持续 4 个月。其中 6 只模型鼠、6 只对照鼠行有创肺功能（PFT）及肺泡灌洗液细胞涂片检查；14 只行活体 microCT 扫描（ GE explore Locus SP），26 只均行病理形态学检查。肺功能测量指标包括：FEV_1、FVC;FEV_1/FVC 等；microCT 量化指标包括：阈值-550HU--700HU;-600HU--900HU; -700HU--900HU 的肺气肿指数,平均总肺密度。对照组及实验组两者间比较运用 t 检验或 Bonferroni 法。**结果** 早期 COPD 模型大鼠病理示小气道管壁及管周见炎症细胞浸润；肺泡的破坏不显著；其中雄性大鼠的肺实质破坏较雌性大鼠明显。肺泡灌洗液细胞涂片示模型组可见较多的嗜酸性细胞及巨噬细胞。与雄性对照组相比，雄性模型组 FEV_1/FVC 有所减低(53.18% vs.45.67%);且阈值-550HU--700HU 的肺气肿指数明显小于对照组（P<0.05）。而雌性无上述差别，即对照相与模型组的肺功能及 CT 量化参数的没有明显差别。**结论** COPD 建模成功大鼠：雄性大鼠以肺实质破坏为著，肺气肿程度较高；而雌性组大鼠的气道周围炎症更重，气道重塑程度较高。

EPO-0637

Automated pulmonary lobar quantification: variation in volumetric CT measurements of idiopathic scoliosis

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Objective: Post-processing software tools for lobar volumetric quantification are useful for idiopathic scoliosis (IS) patient. Given the lung volume asymmetry with spinal curve severity, we aimed to evaluate that some lobes of the lung volume might be sensitive to distinguish different severity of IS and normal subjects before and after treatment.

Materials and Methods: 12 moderate and 12 severe IS patients and 12 normal controls were recruited for this retrospective study. The following CT parameters were measured by an automatic software tool: total lung volume (TLV), right lung volume(RLV), left lung volume(LLV) and respective lobar volume (LV_{RUL},LV_{RML},LV_{RLL},LV_{LUL},LV_{LLL}) of the lung .Correlations between PFT and CT parameters were assessed using Spearman correlation analysis. The differences in cobb angle, PFT and CT parameters were compared between different IS severity and the control before and after treatment.

Results: LVRLL shows relatively strong correlations with the PFT parameters (VC,%VC, FVC, %FVC,FEV_1, %FEV_1, %MEF_{75},$DLCO_{SB}$, TLC)(r range 0.448~ 0.916, P <0.05). LV_{RML} of the control was higher than that of moderate IS patients (P=0.012) and LV_{RLL} of moderate IS patients was higher than that of severe IS patients (P=0.005). Each lung lobar volume increase or decrease was not synchronous after treatment.

Conclusion: Lobe-based CT volumetric assessment in IS not only correlated well with PFT results, but also allows an estimation of disease severity according to the Cobb method classification. Severe IS patients who correct spine deformity can improve long term asymmetric CT based lung volume.

EPO-0638
气管主支气管良性肿瘤的多排螺旋 CT 表现及文献回顾

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目的 气管支气管良性肿瘤起源于粘膜上皮、粘膜下涎腺和管壁间叶组织，且以间叶组织来源占大多数。一般呈缓慢生长且有较长病史，当肿瘤阻塞管腔直径超过 1/2 时才会引起阻塞症状，如咳嗽、咳痰、呼吸困难、痰中带血等，伴有感染者可并发发热。为此总结了气管主支气管良性肿瘤的多排 CT 表现，并结合文献综合性分析。

方法 回顾性分析经手术病理证实的 25 例气管主支气管良性肿瘤，男性 16 例，女性 9 例，年龄范围 10-76 岁，均以非特异性呼吸道症状就诊。多形性腺瘤 2 例，神经鞘瘤 2 例，炎性肌纤维母细胞瘤 2 例，脂肪瘤 9 例，错构瘤 6 例，血管瘤 2 例，平滑肌瘤、支气管软骨瘤各 1 例。

结果 肿物位于气管 14 例，位于左主支气管 5 例，位于右主支气管 6 例，肿物大小为 0.5-3.6cm。多排螺旋 CT 表现为息肉样、类圆形或菜花状 19 例，边缘光整；呈不规则形分叶状 6 例。平扫密度均匀 15 例，均匀强化 6 例，无明显强化 12 例，脂肪与软组织成分并存 13 例。腔内生长型 22 例，其中宽基底 12 例，有较宽的蒂 4 例；腔外生长型 3 例，其中 1 例呈“冰山”样改变。纵隔淋巴结肿大 3 例，伴阻塞性肺炎、肺不张及肺气肿各 4 例。纵隔淋巴结肿大 3 例，均存在阻塞炎变或不张者，但手术清扫结果无恶性证据及周围侵犯。病变邻近气道管壁均未见明确增厚。

结论 气管主支气管良性肿瘤有一定的特征性，以腔内规则肿块多见。多排螺旋 CT 及其后处理可直观显示肿瘤的组织构成、范围和与邻近结构的关系：对于结节或肿块内部构成特征、有无伴随管壁增厚有助于良恶性鉴别、定性诊断；对显示的毗邻关系有助于外科手术方案制定。

EPO-0639
Determine the invasiveness of pure ground-glass opacity nodules using dual-energy spectral CT

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AIM: To investigate the clinical application of using quantitative parameters generated in the unenhanced phase (UP) and venous phase (VP) in dual-energy spectral computed tomography (CT) for differentiating the invasiveness of pure ground-glass opacity (pGGO) nodules.

MATERIALS AND METHODS: 51 patients with 55 pGGO nodules who underwent preoperative dual-energy spectral CT in UP and VP and identified by pathology were evaluated retrospectively. Nodules were divided into three groups: adenocarcinoma in situ (AIS, n=19), minimally invasive adenocarcinoma (MIA, n=22) and invasive adenocarcinoma (IA, n=14). The iodine concentration (IC) and water content (WC) in nodules were measured in material decomposition images. Nodule CT numbers were measured on monochromatic images from 40-140keV. All measurements were statistically compared according to their histological groups.
RESULTS: There were significant differences of WC in UP and VP between AIS and IA, MIA and IA and AIS+MIA and IA (all $p<0.05$). The CT attenuation values of the 40-140keV monochromatic images in UP and VP were significantly higher for the invasive nodules. Using WC of 359.97mg/ml in VP as threshold, one would obtain a sensitivity of 92.86% and specificity of 75.61% for differentiating AIS+MIA from IA with an area-under-curve of 0.868 in the receiver operating characteristic study.
CONCLUSION: The quantitative parameters in dual-energy spectral CT in the unenhanced phase and venous phase provide useful information in differentiating IA from AIS and MIA of ground-glass opacity nodules.
Kewords: Lung adenocarcinoma; Dual-energy; Spectral CT; Ground-glass nodule; Invasiveness

EPO-0640
肺癌ＣＴ能谱成像：定量分析及与ＴＴＦ-１和ＥＧＦＲ表达水平的相关性

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目的：探讨能谱 ＣＴ成像相关参数在反映肺癌生物学特征中的作用。方法：搜集我院６０例经病理证实的肺鳞癌和腺癌患者的病例资料，所有患者采用能谱模式行 ＣＴ平扫和增强扫描，获得病灶的定量参数值，包括标准化碘浓度（ＮＩＣ）、能谱曲线斜率（Ｋ）和钙含量。采用免疫组化法测量 ＥＧＦＲ 和 ＴＴＦ １在癌细胞中的表达水平。结果：２７例肺腺癌中 ＥＧＦＲ表达阳性２０例、阴性７例，阳性组和阴性组中 ＮＩＣ分别为０．２７±０．１６和０．１５±０．１０，Ｋ 分别为２．０４±０．１７和１．７９±０．２５，两组间的差异均具有统计学意义（摩＜０．０５）。３３例肺鳞癌中 ＥＧＦＲ表达阳性１９例、阴性１４例，阳性组和阴性组中 ＮＩＣｓ分别为０．３０±０．１８和０．１６±０．０４，Ｋ 分别为２．７５±１．１０和２．０６±０．３８，病灶内钙含量分别为６．５７±０．６７和４．７３±１．５６，两组间的差异均具有统计学意义（摩＜０．０５）。结论：能谱 ＣＴ成像参数中标准化碘含量和曲线斜率（Ｋ）可反映肺癌病灶的血供情况及微血管密度，肺鳞癌中钙含量是反映肺鳞癌生长状态的参考指标。

EPO-0641
原发性纵隔囊性肿块的 MSCT 诊断价值

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目的 探讨纵隔囊性肿块的 MSCT 影像学特征和鉴别诊断，提高 CT 对纵隔囊肿肿瘤诊断的准确率。**方法** 33 例经手术或穿刺活检及病理证实的纵隔肿瘤，回顾性分析其临床表现及 MSCT 影像学特征。 **结果** 33 例纵隔肿瘤中，支气管囊肿 7 例，好发于中纵隔气管旁及隆突附近，呈扁平状或 D 字形；食管囊肿 5 例，常见于后纵隔食管旁；心包囊肿 4 例，典型位于右心膈角区，多平面重组呈泪滴状；皮样囊肿 4 例，好发于前纵隔，其内见脂肪、钙化密度；胸腺囊肿 7 例，见于前上纵隔胸腺区，壁薄、密度均匀；淋巴管瘤 2 例，发生于 前上纵隔，包绕邻近结构、沿间隙生长；囊性神经鞘瘤 4 例，发生于后纵隔椎旁，椎间孔扩大或脊椎、肋骨畸形、侧弯。**结论** 纵隔内囊性病变少见，但涉及的疾病较多，其生长分布位置对确立诊断有重要价值；MSCT 检查可准确显示纵隔肿块的位置及累及范围，对病变的判断具有较高的准确性，并可对临床治疗提供具有重要价值影像学信息。

EPO-0642
基于治疗前磁共振表观扩散系数预测肺癌化疗疗效的初步研究

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目的 探讨磁共振扩散加权成像表观扩散系数(ADC 值)对肺癌化疗疗效的预测价值。**方法** 回顾性收集在我院经病理证实的肺癌患者 32 例，其中男 24 例、女 8 例，年龄 35～72 岁，鳞癌 14 例，腺癌 10 例，小细胞肺癌 8 例，手术或穿刺前一周内行 MRI 检查及 DWI 成像，包括常规 T1WI、T2WI 及 DWI 检查，测量病灶平均 ADC 值。根据第二周期化疗后肿瘤最大径退缩率，按 RECIST 标准将患者分为治疗有效组和无效组，比较两组中肿瘤治疗前的表观扩散系数（ADC 值）的差异。**结果** 按 RECIST 标准患者分为有效组(18 例）和无效组（14 例），有效组化疗前病灶的平均 ADC 值为（1.42±0.35）×10^{-3} mm^2/s；无效组化疗前病灶的平均 ADC 值为（1.30±0.32）×10^{-3} mm^2/s；有效组和无效组化疗前病灶的平均 ADC 值的差异有统计学意义（P 值＜0.01）。**结论** 基于治疗前磁共振表观扩散系数（ADC 值）可对肺癌化疗疗效进行预测。

EPO-0643
99mTc-3PRGD2 SPECT predicts the outcome of Endostar and Cisplatin therapy in xenograft animals.

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Abstract
Aims To investigate the usefulness of ^{99m}Tc-3PRGD$_2$ for monitoring the response of anti-angiogenic treatment.
Methods The xenograft animals were injected on alternate days with saline solution, Endostar, Cisplatin. ^{99m}Tc-3PRGD$_2$ imaging was performed at 0/7/14/21 day. Tumors were harvested at all imaging time points for western blotting and histopathological analysis.
Result There is significant difference of tumor volumes between NaCl and treated group (P<0.05). The intergrin $\alpha_v\beta_3$ expression of Cisplatin and Endostar groups was lower

than NaCl group from day 14 (P<0.05). The intergrin $\alpha_v\beta_3$ expression of Endostar group was significantly lower than Cisplatin group from baseline onward (P<0.05). **Conclusion** The ^{99m}Tc-3PRGD$_2$ could noninvasively visualize and semi-quantify tumor angiogenesis and monitor the response to the antiangiogenic therapy of Endostar and Cisplatin.

EPO-0644

CT 纹理分析鉴别前纵隔胸腺瘤和淋巴瘤的价值

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目的：探讨 CT 纹理分析在前纵隔胸腺瘤和淋巴瘤鉴别诊断中的价值。**方法：**研究对象为经病理证实的前纵隔胸腺瘤和淋巴瘤各 15 例。采用 MaZda 软件分析二组病例术前 CT 平扫和动脉期、平衡期图像（手动勾画 ROI 的方式提取病变的纹理特征），选择出对胸腺瘤和淋巴瘤最具有鉴别诊断价值的纹理特征，再择优选取错判率最小的特征统计方法，最后通过 ROC 分析筛选出最具敏感性和特异性的纹理参数。**结果：**在平扫、增强动脉期和平衡期 3 种 CT 图像中，鉴别前纵隔胸腺瘤和淋巴瘤错判率最小的为平扫图像 POE+ACC 参数选择方法的 NDA 分析方法（原始数据分析 RDA20.00%、主要成分分析 PCA20.00%、线性分类分析 LDA6.67%、非线性分类分析 NDA0.00%）。ROC 曲线分析得出 WavEnLLs4、WavEnLLs3、WavEnLLs2 这 3 种纹理参数在鉴别上述两种病变中最有特征性(敏感性 86.7～93.3%、特异性 100%)。医师对 30 例前纵隔胸腺瘤和淋巴瘤的术前影像诊断中的错判率为 13.33%。 **结论：**采用 CT 图像纹理分析鉴别前纵隔胸腺瘤和淋巴瘤两种病变较医师术前诊断产生的错判率要低，对以上两种病变的鉴别有潜在应用价值。

EPO-0645

肺纯磨玻璃结节浸润性腺癌的免疫组化与病理贴壁成分占比相关性研究

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目的：主要是针对薄层 CT 上呈现为肺纯磨玻璃结节（pure ground-glass nodule, pGGN）的浸润性腺癌（invasive adenocarcinoma, IA），研究其免疫组化指标与贴壁成分占比的相关性。**材料与方法：**回顾性收集薄层 CT 上呈现为 pGGN 并经手术证实为一期肺 IA 的患者 59 例，记录免疫组化情况，记录病理上贴壁成分占比情况，并分为贴壁成分占比＞50%组和贴壁成分占比≤50%组。免疫组化指标与病理上贴壁成分占比之间相关性采用 Spearman 分析，在不同贴壁分组之间采用 Mann-Whitney U test 完成差异性比较。**结果：** p53 突变率（中位数 10%, 0%~95%）与贴壁成分占比之间存在负相关（p=0.02, r=-0.30）。p53 突变率在病理贴壁成分占比＞50%组和≤50%组之间差异没有统计学意义。**结论：**肺纯磨玻璃结节的免疫组化中的 p53 与病理组织贴壁成分占比有弱相关性。

EPO-0646

前纵隔胸腺瘤 MSCT 影像征象与临床诊疗预后相关性探讨

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【摘要】 目的　通过研究前纵隔胸腺瘤 MSCT 的影像特点，以及随访复查胸腺瘤患者预后情况，探讨两者之间是否具有相关性，对临床患者治疗方案的制定及对远期疗效起到一定的提示作用。方法　收集 2019 年 5 月以前经手术病理证实为胸腺瘤并在随访复查中发现肿瘤复发或转移病例 17 例作为实验组，另外收集我院 2014 年 7 月以前经手术病理证实为胸腺瘤并随访观察至今（5 年时间）未见复发或转移病例 23 例作为对照组，对比观察两组病例在 MSCT 上的差异性 。 结果　两组病例在肿瘤最大径线、形态、内部有无钙化、邻近结构受侵情况、最大强化幅度等方面差异性具有统计学意义（ P<0.05）。　两组病例在肿瘤内部有无囊变、纵隔淋巴结肿大等方面比较差异无统计学意义（ P>0.05）。 结论　术前 MSCT 检查仔细分析胸腺瘤 CT 影像征象，肿瘤大小、形态、有无钙化、临近结构有无受累、最大强化幅度等影像征象对远期肿瘤预后评估具有重要的临床意义

EPO-0647
MSCT 常规扫描及后处理技术对支气管黏液嵌塞的诊断价值研究

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目的　分析支气管黏液嵌塞 MSCT 表现特点，旨在进一步提高认识，为临床病因诊断提供依据。
方法　收集我院 2012 年 11 月一 2019 年 4 月收治的 33 例继发性支气管黏液嵌塞患者的影像学资料。所有患者均采用 Philips Brilliance-iCT256 行平扫及增强扫描，对图像主要采用多平面重组(MPR)、曲面重组(CPR) 重组技术，由两名诊断医师独立观察病灶具体部位、外观形态特点、密度、病变范围等情况，并做出病因诊断。
结果　（1）临床类型：本组 33 例均为继发性支气管粘液嵌塞，其中支气管肺癌 15 例，支气管扩张 8 例，陈旧性结核 5 例，变态反应性肺曲霉菌病 3 例，支气管异物 2 例。（2）病变发生部位：发生于右肺上叶 4 例，中叶 4 例，右肺下叶 8 例，左肺上叶 5 例，左肺下叶 7 例，双肺下叶 3 例，右肺中、下叶均受累 2 例。（3）MSCT 表现：本组外周型 23 例，病变主要分布在肺外围部，形态呈树枝状、圆形、柱状或条索状，增强扫描可明确原发病变诊断，粘液栓无明显强化，远端支气管可伴不同程度扩张及局限性肺气肿；中心型 10 例，主要在较大的支气管如叶、段支气管内，表现为典型的“手套征”6 例，4 例合并肺不张，可见支气管内低于软组织密度病灶。
结论　支气管粘液嵌塞为不同疾病的继发改变或合并症，MSCT 常规扫描及后处理技术可清晰显示病变的外观形态、分布范围情况，为临床明确诊断、制定治疗方案提供可靠的影像学资料。

EPO-0648
肺肉瘤样癌的 CT 表现及临床特点分析

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目的 探讨肺肉瘤样癌的 CT 表现及临床特点。方法 收集 2013 年 3 月至 2018 年 9 月河南省人民医院收治的肺肉瘤样癌患者的影像及临床资料进行回顾性分析。15 例患者均经病理证实为肺肉瘤样

癌且均行 CT 检查。 结果：15 例肺肉瘤样癌患者男性 9 例、女性 6 例，60 岁以上老年患者多见，以咳嗽、咳痰、痰中带血及胸闷为主要症状。CT 平扫表现为肺内或叶段支气管腔内软组织密度团块影、结节影，较大病灶密度不均，增强扫描部分呈不均匀边缘明显强化及病灶内斑片状明显强化，静脉期持续强化并强化影增多；部分表现不典型，呈不均匀轻中度强化；部分病例伴有肺门、纵隔、腹腔淋巴结转移及肺内、肝脏、肾上腺转移；一例病灶在随访的 3 月内迅速进展。结论：肺肉瘤样癌好发于 60 岁以上老年人，恶性度高，进展迅速。缺乏典型临床表现。CT 呈恶性肿瘤表现，部分病例具有较型表现，CT 影像检查有助于其定性、分期；缺乏较特异性 CT 表现的病例，与其他类型肺癌较难以鉴别。

EPO-0649

肺癌与 囊性空域早期疾病特征

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摘要：目的探讨囊性肺癌的 CT 分型及影像学特征。方法回顾性分析 22 例囊性肺癌患者的临床资料、CT 分型及特征表现,有随访的病例同时评价病灶 CT 动态变化。结果 22 例囊性肺癌中,CT 分型 I 型 3 例,II 型 4 例,III 型 9 例,IV 型 6 例;14 例有动态随访(3 个月至 3 年),6 例有囊腔增大,1 例囊腔缩小,5 例囊壁均匀或不均匀增厚,6 例新出现软组织成分或软组织成分增多,4 例同时伴有囊壁增厚及新出现软组织成分或软组织成分增多;CT 形态学上,1 例由 I 型转变为 IV 型,3 例由 IV 型转变为 I 型。1 例 II 型由纯磨玻璃结节演变而来。血管穿行、分隔及周围磨玻璃征、实性成分征象有诊断意义。结论囊性肺癌 CT 表现具有一定的影像学特点,CT 分型与特征表现对于囊性肺癌诊断及预后判断有重要价值

EPO-0650

基于图像噪声值的动态扫描条件下超低剂量 CT 应用于肺部小结节的检出分析

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目的：探讨基于图像噪声值的动态扫描条件下超低剂量 CT 应用于肺部小结节检出的可行性。
方法： 34 名受检者采用 GE 公司 Revolution CT 进行胸部 LDCT 检查。在 LDCT 扫描结束后，立即加扫 ULDCT 扫描。LDCT 采用 Assist kv（120 /100kV）管电压和 14.1Hu 噪声指数的 smart mAs 扫描模式，ULDCT 采用 120 kv 管电压和 16Hu 噪声指数的 smart mAs 模式。扫描结束后，LDCT 和 ULDCT 均采用 ASiR-V 70%算法进行图像重建。两名具有丰富经验的放射医师在 LDCT 图像上阅片，记录达成统一后的 LDCT 结节检出情况。三周以后，同样两名放射医师在 ULDCT 图像上进行重复阅片操作。以 LDCT 的阅片结果为参考标准，对 ULDCT 结节检出情况进行统计学分析。
结果：ULDCT 和 LDCT 的平均扫描剂量分别为 0.17±0.03 mSv 及 0.95±0.31 mSv，ULDCT 较 LDCT 下降了 82.1%（P<0.001）。34 名受检者中有 27 人检出肺部结节，LDCT 检出肺部小结节的总数为 76 个（其中包括 46 个实性结节和 30 个非实性结节）。ULDCT 总共检出了 64 个结节，总体检出率为 84.2%,而实性结节和非实性结节的检出敏感度分别为 95.7%（44/66）和 66.7%（20/30）。实性结节和非实性结节 4mm 及以上的检出敏感度分别为 100%（21/21）和 77%（20/26）。在 7 个 LDCT 定性为无肺部小结节的患者中，ULDCT 检出了 1 个假阳性结节，其检出特异度为 85.7%。

结论：在基于图像噪声值的动态扫描条件下，超低剂量 CT 对 4mm 及以上肺部小结节具有良好的检出敏感度和特异度，可以尝试应用于肺部小结节的检出。

EPO-0651

Progress on the medical treatment of malignant pleural mesothelioma

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Malignant pleural mesothelioma (MPM) is a rare primary tumor originating from the pleural mesothelial cells. The disease has insidious onset, long incubation period and high degree of malignancy. The cause is related to exposure to asbestos. The current treatment is mainly chemotherapy, and pemetrexed plus cisplatin is the standard first-line chemotherapy. More and more studies have found that the addition of monoclonal antibody to MPM first-line chemotherapy can achieve better results, such as bevacizumab, nivolumab and so on. In addition, gemcitabine monotherapy, BAMLET and BLAGLET complex, gemcitabine combined with vinorelbine and multiple drug combination therapy have also achieved good results. Currently because lack of the randomized controlled trials in phase Ⅱ/Ⅲ, it requires prospective studies to further evaluate the toxicity of different chemotherapy and the effective on survival.

EPO-0652

恶性胸膜间皮瘤的靶向药物联合化疗进展

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恶性胸膜间皮瘤（malignant pleural mesothelioma，MPM）是一种罕见的起源于胸膜间皮的原发肿瘤，起病隐匿、潜伏期长且恶性程度高，病因与接触石棉有关。目前治疗方式主要为化疗，培美曲塞联合顺铂为标准一线化疗方案。越来越多的研究发现将单抗药物加入 MPM 一线化疗当中能够取得较好疗效，如贝伐单抗、纳武单抗等。针对耐药性 MPM 患者，出现了许多能够改善 MPM 细胞耐药性的化疗方式。当前并没有确切的 MPM 标准二线化疗方案，但对于通过接受培美曲塞为一线化疗并延长无进展生存期的患者，再次接受培美曲塞治疗不失为一种较好的选择。另外，吉西他滨单药、BAMLET 和 BLAGLET 复合物、吉西他滨联合长春瑞滨等多种药物联合治疗也取得了不错的疗效。目前缺少Ⅱ、Ⅲ期的随机对照研究，需要前瞻性研究进一步评估不同化疗方案的毒副作用及对生存的影响。本文对目前恶性胸膜间皮瘤的靶向药物联合化疗研究进展作一综述。

EPO-0653

基于光谱 CT 多参数图像的非小细胞肺癌术前 N 分期初探

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目的：根据 AJCC 肺癌第 8 版 TNM 分期标准，探讨影响非小细胞肺癌淋巴结分期（N）分期的双层光谱探测器 CT（DL-CT）多参数图像特征，结合常规增强 CT（cCE-CT）图像及组织病理结果，探讨其在非小细胞肺癌术前 N 分期的作用。
方法：回顾性分析 1 例经病理证实的非小细胞肺癌患者（女性，69 岁）的 DL-CT（IQon Spectral CT）和 cCE-CT 图像，分别重建肺原发病灶和可疑转移性淋巴结（短径＞1.0cm）的 40keV 虚拟单能量（MonoE）、有效原子序数（Z-eff）和碘密度（ID）图，重建层厚均为 2mm，并基于 DL-CT 定量参数绘制光谱曲线图、直方图和散点图。
结果：cCE-CT 提示“主动脉弓旁（第 6 组）淋巴结”与右肺上叶肿瘤均表现中度-明显不均匀强化，诊断为“肺癌，转移性淋巴结（T1bN2M0，IIIA 期）”。DL-CT 的 MonoE（187Hu vs 47Hu）、Z-eff（8.6 vs 7.2）和 ID（2.7 mg/ml vs 0 mg/ml）图均提示淋巴结和肺部病灶存在明显差别，光谱曲线图、直方图、散点图进一步提示二者定量参数存在差异，考虑为“肺癌，纵隔非转移性病灶（T1bN0M0，IA2 期）”。病理结果证实肺部病灶为周围型浸润性腺癌，纵隔病灶为支气管源性囊肿，符合 DL-CT 诊断结果。
结论：相比于 cCE-CT，基于 MonoE、Z-eff 和 ID 的 DL-CT 多参数成像技术可能有助于非小细胞肺癌可疑转移性淋巴结的“同源性分析”，提高其术前 N 分期的准确性，有待后期大样本研究进一步证实。

EPO-0654

IQon CT 鉴别诊断食管癌淋巴结转移

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目的：探讨光谱 CT 发现食管癌淋巴结转移的临床价值。方法：选取 2019 年 3 月至 2019 年 6 月期间我院收治的食管癌患者供 19 例为研究对象，经手术病理确诊并精确定位转移淋巴结为 21 枚、非转移淋巴结 37 枚，术前均行光谱 CT 平扫和增强检查，比较转移淋巴结、癌肿与非转移淋巴结的能谱曲线斜率（40keV-70keV），碘浓度、标准化碘浓度以及有效原子序数。结果：动脉期曲线斜率转移淋巴结组 2.36±0.95，癌肿 2.86±1.20，非转移淋巴结组 2.57±0.91，差异没有统计学意义；静脉期曲线斜率转移淋巴结 3.10±0.92，癌肿组 3.00±0.80，非转移淋巴结组 3.42±0.88，差异没有统计学意义，动脉期碘浓度及标准化碘浓度，淋巴结转移组 1.22±0.09、0.112±0.007，癌肿组 1.40±0.13、0.117±0.008，非转移淋巴结组 1.27±0.06、0.112±0.006，差异均没有意义；静脉期碘浓度及标准化碘浓度，淋巴结转移组 1.53±0.09、0.381±0.015，癌肿组 1.55±0.11、0.376±0.019，非转移淋巴结组 1.62±0.07、0.408±0.018，差异均没有统计学意义；有效原子序数转移瘤淋巴结 7.37±0.10；癌肿 7.30±0.13，转移淋巴结组 7.49±0.21，非转移淋巴结与转移瘤淋巴结、癌肿间差异有统计学意义 P 值 0.021（P<0.05）;转移淋巴结与癌肿差异没有统计学意义（P>0.05）。结论：光谱 CT 的有效原子序数对鉴别食管癌的转移淋巴结与非转移淋巴结具有一定价值，但能谱曲线斜率、碘浓度及有效碘浓度不能有效鉴别转移与非转移淋巴结。

EPO-0655

食管鳞癌淋巴结转移与 CT 灌注参数及血管生成的关系

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目的：探讨食管鳞癌 CT 灌注参数、MVD 值及 VEGF 表达与淋巴结转移之间的关系，以期为食管鳞癌淋巴结转移的术前诊断提供功能学参考指标。
方法：收集手术切除标本或胃镜病理活检证实食管鳞状细胞癌 100 例患者，应用免疫组织化学技术检测术后标本的 MVD（肿瘤微血管密度）值及 VEGF(血管内皮生长因子)表达。术前通过对患者行多排螺旋 CT 灌注扫描，以食管癌实性部分最大层面为中心选取 8 层行连续动态增强扫描，扫描时间约 45 秒。经 CT perfusion-3 体部肿瘤软件包分析，获得 CT 灌注参数 BV、BF、MTT、PS 值。采用免疫组织化学 SP 法检测 50 例食管鳞癌组织中 MVD 及 VEGF 蛋白表达。采用 SPSS20.0 统计软件进行处理，两样本间 CT 灌注参数及 MVD 值的比较采用 t 检验，两变量相关性采用 Spearman 相关性分析。
结果：食管鳞癌 CT 灌注参数 BV、BF、MTT 值在有无淋巴结转移中的差异均无统计学意义（P＞0.05），而 PS 值在有无淋巴结转移中有显著性差异(P＜0.01)；以 PS 平均值＞10(ml/100 g/min)为标准诊断淋巴结转移的敏感性、特异性、阳性似然比及阴性似然比分别为：95. 8%、65.4%、2.77、0.06；MVD 值及 VEGF 表达与食管鳞癌淋巴结转移呈显著正相关(P＜0.01)。
结论：CT 灌注成像有助于食管鳞癌淋巴结转移的术前诊断，其中 PS 值是最有价值的诊断指标。当 PS 值、MVD 值较高，VEGF 阳性表达时，提示发生淋巴结转移的可能性较大，同时结合淋巴结的形态、大小及强化特征，可以对食管鳞癌淋巴结转移做出更加准确的术前诊断。

EPO-0656
低剂量 CT 扫描在肺部结节性病变筛查中的价值探讨

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目的：探讨胸部低剂量 C T 扫描在肺部结节性病变筛查中的应用价值。方法：回顾性分析美年大健康体检中心 2017 年 1 月—2018 年 12 月体检发现肺结节的 50 例客户的资料，均进行了低剂量 CT 扫描和医院常规剂量 CT 扫描，对两种检查方法肺结节检出数目以及、肺结节良恶性倾向分别进行分析；结果：两种检查方法肺结节检出结节数目、肺结节良恶性倾向均无差异（P ＞0.05）；结论：在对肺结节的诊断中，低剂量 CT 和常规剂量 CT 扫描效果无显著差异，在极大降低了受检者辐射量同时，也保证了准确的诊断结果。

EPO-0657
肺炎性肌纤维母细胞瘤 MDCT 表现与病理对照研究

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摘要:目的 探讨肺炎性肌纤维母细胞瘤（inflammatory myofibroblastic tumor，IMT）良性病变的 MDCT 影像特征。**方法** 收集我院自 2015 年 1 月至 2019 年 6 月经手术或 CT 引导下肺穿刺活检并病理证实肺炎性肌纤维母细胞瘤患者 33 例，从发病年龄、性别、发病部位、是否位于肺的外周、病灶大小、形态、密度、边界、病灶内是否有血管穿行、病灶邻近支气管是否堵塞、与邻近胸膜是否分界不清，病灶内是否有钙化成份，强化方式，临床表现及合并症等进行回顾性分析总结。**结果** 本组 33 例患者共 37 个病灶，多发 4 例；男性 24 例，占 72.7%；女性 9 例，占 27.3%；男女比例约为 7∶3；年龄 33～72 岁，平均年龄 55 岁，年龄 31～40 岁 3 例，占 9.1%，年龄 41～50 岁 6 例，

占 18.2%，年龄 51～60 岁 14 例，占 42.4%，年龄 61～70 岁 9 例，占 27.3%，＞70 岁 1 例，占 3.0%；病灶部位右肺上叶 10 个，占 27.0%；右肺中叶 8 个例，占 21.6%；右肺下叶 9 个，占 24.3%；左肺上叶 3 个，占 8.1%；左肺下叶 6 个，占 16.2%；主支气管 1 个，占 2.7%；肿瘤最小约 0.5 cm，最大约 14.6 cm，平均 3.6 cm；病灶密度均匀 20 例，不均匀 13 例，其中 2 例较大者可见液化坏死；2 例见斑点状、小片状钙化；边界清楚 24 例，边界不清 9 例；周围见晕征 20 例；相邻支气管通畅 25 例，支气管堵塞 4 例，不能评价 4 例；病灶内有血管穿行 28 例，无血管穿行 5 例；与胸膜相连 29 例，4 例未与胸膜相连；增强扫描 30 例，均匀强化 18 例，不均匀强化 12 例；37 个病灶其中 29 个病灶均位于肺外周。33 例患者均未发现病灶周围及胸腔内肿大淋巴结。随访患者 20 例，2 例复发。**结论** 肺炎性肌纤维母细胞 MDCT 影像表现具有一定特征性，结合其临床表现术前能够做出提示性诊断。

EPO-0658

The value of lung nodule quantification by a commercially deep-learning based computer-aided diagnosis (DL-CAD) added to the differentiation between benign and malignant lung nodules

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Purpose: To investigate the added value of objective quantification of lung nodules by a commercially deep-learning based computer-aided diagnosis (DL-CAD) to the conventional imaging-findings-based double reading strategy in differentiating benign and malignant nodules.
Method: In this retrospective study, 233 patients (March 2017 to June 2019) with 247 pathologically confirmed lung nodules (malignant: benign = 192: 55) were selected. For each nodule, we acquired predefined morphological features, including 1) shape; 2) border (ill- or well-defined border, lobulation, spiculation); 3) bubble-like lucency; 4) cavitation; 5) air bronchogram; 6) calcification; 7) vascular convergence; 8) pleura retraction. The parameters quantified by DL-CAD include volume, three-dimensional (3D) diameter, 3D long axis diameter, 3D short axis diameter, and average CT value. Chi Squared test and non-parametric Mann-Whitney U test were used to compare the difference between malignant nodules and benign nodules with $P < 0.05$ indicating statistical significance. Receiver operative characteristic curve was generated with area under the curve (AUC) calculated based on morphological features alone and morphological features plus quantifications by DL-CAD to distinguish malignant nodules from benign nodules.
Results: Among all the morphological features acquired by double reading, lobulation, bubble-like lucency, spiculation, pleura-retraction and vascular convergence sign happened significantly more frequently in malignant nodules than that in benign nodules, while calcification and smooth margin was significantly more commonly detected in benign nodules than malignant nodules. Except for average CT value, all the remaining 4 quantifications by DL-CAD were significantly different between malignant nodules and benign nodules. In differentiating malignant and benign nodules, quantifications by DL-CAD slightly improve the performance with AUC elevated from

0.832 (95% confidence interval: 0.762-0.901) for morphological features alone to 0.840 (95% confidence interval: 0.772-0.909) for combining morphological features and quantifications.
Conclusions: The quantifications by DL-CAD add little value in differentiating malignant nodules and benign nodules, which needs further confirmation.

EPO-0659

Blood supply of early lung adenocarcinoma in mice and tumor-supplying vessel relationship: a micro-computed tomography angiography study

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Objectives: The aim of this study was to investigate the blood supply of early lung adenocarcinomas (LAC) in mouse and the relationship between tumor and supplying vessels by using micro-CT.
Materials and Methods: Early LAC models were established by subcutaneously injecting 1-methyl-3-nitro-1-nitrosoguanidine (MNNG) solution in 10 mice. Micro-CT pulmonary and bronchial arteriography were performed to demonstrate the tumors and their related vessels. The blood supply of early LAC, especially tumor-vessel relationships, were analyzed and correlated with pathology. The changes of supplying vessels for tumors were analyzed by quantitative and texture analysis.
Results: There were 167 early LAC found on micro-CT and confirmed by histopathology. Micro-CT manifested that pulmonary artery (PA) densely distributed in and around tumors in 141 (84.4%) of 167 early LAC, and bronchial artery (BA) was not related to tumors. Tumor-PA relationships were classified into four patterns: type I (n = 45, 32%), PA was intercepted at the margin of the tumor; type II (n = 38, 27%), PA penetrated into the tumor with tapered narrowing and interruption; type III (n = 29, 21%), PA penetrated into the tumor with a patent and intact lumen; type IV (n = 110, 78%), PA ran at the border of the tumor with an intact or compressed lumen. Micro-CT manifestations of tumor-PA relationships correlated well with pathological findings. Among the quantitative parameters and textural features, vessel volume fraction (VVF), vessel thickness (VT), vessel number (VN), vessel separation (VS), vessel surface/vessel volume (VS/VV), correlation, cluster prominence (CP), haralick correlation (HC), grey level nonuniformity (GLN) and run length nonuniformity (RLN) were correlated with the tumor size ($R = 0.529$, $P < 0.001$; $R = 0.177$, $P = 0.022$; $R = 0.601$, $P < 0.001$; $R = -0.589$, $P < 0.001$; $R = -0.172$, $P = 0.026$; $R = -0.223$, $P = 0.004$; $R = 0.204$, $P = 0.008$; $R = 0.155$, $P = 0.045$; $R = 0.526$, $P < 0.001$; $R = 0.475$, $P < 0.001$, respectively); VVF, VN, VS, GLN and RLH correlated with the solid components of tumor ($R = 0.246$, $P < 0.001$; $R = 0.251$, $P < 0.001$; $R = -0.249$, $P < 0.001$; $R=0.235$, $P = 0.002$; $R = 0.220$, $P = 0.004$, respectively).

Conclusion: The blood supply of early LAC mainly originated from PA in mice. Micro-CT can clearly demonstrate the tumor-PA relationships and contribute to quantitative and texture analysis for the changes of supplying vessels.

EPO-0660

肺上皮样血管内皮瘤临床影像表现

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目的：探讨肺上皮样血管内皮瘤的临床及影像表现，提高对该病的认识。方法：总结 8 例肺上皮样血管内皮瘤的 CT 表现、临床特征及随访资料，总结其临床及影像特征。结果：本组 8 例患者，男性及女性各 4 例，年龄 14-49 岁。1 例表现为肺内单发占位，内见小空洞及点状钙化，1 例表现为肺内单发厚壁空洞，5 例表现为双肺内多发直径小于 1cm 的结节， 1 例表现为肺内直径约 2.0cm 结节并多发小于 1.0cm 小结节。另其中 4 例合并胸膜增厚，2 例出现胸腔积液及积血，4 例合并肝脏受累。结论：肺上皮样血管内皮瘤 CT 表现多样，确诊需要病理及免疫组化。

EPO-0661

Assessment of predictors for pulmonary solid nodule detection in Ultralow dose CT reconstructed with a new generation adaptive statistical iterative reconstruction (ASiR-V)

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Purpose The purpose of this study was to assess the independent predictors for sensitivity of pulmonary solid nodule detection by using ultralow dose CT (ULDCT) reconstructed with ASiR-V.

METHOD AND MATERIALS 123consecutive patients (59.3±14.9 years) who underwent chest LDCT with Revolution CT (GE Healthcare, USA) and found solid nodule with diameter>=4mm were additionally scanned with a chest ULDCT. Reference tube voltage and current were set to be 120 kV and smart mAs for LDCT and 120 kV/2.8 mAs for ULDCT. After scanning, LDCT and ULDCT scans were all reconstructed with 50% ASiR-V. A standard of reference (SOR) was established by two board-certified radiologists to determine the presence, type and size of lung nodules on LDCT. All nodules were classified as solid, part-solid, and pure ground-glass nodules. Three weeks later, two radiologists above read ULDCT images and did the same things. Sensitivity of the ultralow dose protocol was compared against the SOR. Then, logistic regression was used to test independent predictors for performance of pulmonary nodule detection.

RESULTS The mean BMI of all patients was 23.8±2.9(16.4-29.9) kg/m^2. The mean effective radiation dose of ULDCT was 0.096±0.007 mSv compared with 0.95±0.34 mSv for LDCT, which was 90% lower(P<0.001). A total of 123 solid nodules (mean diameter 6.5 ± 2.5 mm) were identified in LDCT. There were 116 true-positive nodules detected by ULDCT and overall sensitivity was 94.3%.The sensitivity for nodules with 4mm<=diameter<5mm was 90.4%(66/73) and 100% (50/50) for nodules with diameter >=5mm, which had no difference between them (P=0.063). The mean diameter of true-positive nodules(5.2±1.6mm) was longer than false negative nodules(4.2±0.2 mm)(P<0.001). BMI for true positive groups and false negative groups were 23.8±2.9 and 24.5±3.2 kg/m^2, and there was no significant difference between them (P=0.525).In multivariate analysis, location, size and patients' BMI had no significant effects on the nodule detection(P>0.05).

CONCLUSION For people with BMI<=30kg/m^2 , ultralow dose CT reconstructed with ASiR-V enables a extremely high sensitivity for the detection of pulmonary solid nodules with diameter>=4mm and the sensitivity will not be obviously influenced by patients' BMI ,the location and size of nodules.

EPO-0662

肺癌能谱 CT 相关参数定量与临床应用

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目的：探讨能谱 CT 参数在肺癌诊断及判断病理类型中的应用价值。**方法**：收集我院 2017 年 3 月-2019 年 1 月发现肺部占位行胸部能谱 CT 增强扫描且病灶短径＞2cm 者共 97 例（包括鳞癌 28 例，腺癌 41 例，大细胞癌 4 例，小细胞癌 7 例，炎性病灶 17 例），分为 5 组。测量各组原发病灶能谱 CT 参数（主要包括 IC、NIC、WC、$K_{40-90kev}$和 Eff-Z）；比较肺癌和肺部炎性病灶、不同病理类型肺癌间的统计学差异，采用 ROC 曲线评估诊断效能。**结果**：（1）肺癌与炎性病灶比较：平扫肺癌 IC、$K_{40-90kev}$、Eff-Z 均小于炎性，WC 大于炎性；动脉期肺癌 IC、$K_{40-90kev}$、NIC 均小于炎性；静脉期肺癌 IC、$K_{40-90kev}$、NIC 均小于炎性，WC 大于炎性；ROC 曲线示平扫 WC 诊断肺癌 AUC 为 0.745；以上差异均有统计学意义（P＜0.05）。（2）不同病理类型肺癌比较：鳞癌与腺癌平扫 IC、$K_{40-90kev}$、WC 和 Eff-Z、动静脉期 IC、$K_{40-90kev}$和 WC、静脉期 NIC 有统计学差异；鳞癌与小细胞癌静脉期 NIC 有统计学差异；腺癌与小细胞癌平扫 IC 和 $K_{40-90kev}$、静脉期 IC、$K_{40-90kev}$和 NIC 有统计学差异。（3）以鳞癌和腺癌代表非小细胞癌，ROC 曲线示平扫 WC 诊断肺癌、静脉期 NIC 诊断非小细胞癌、静脉期 IC 和 $K_{40-90kev}$诊断腺癌 AUC 分别为 0.745、0.913、0.852 和 0.853（P＜0.05）。**结论**：能谱 CT 测量平扫 IC、$K_{40-90kev}$、WC 和 Eff-Z、动静脉期 IC、$K_{40-90kev}$和 NIC、静脉期 WC 参数值可用来鉴别肺癌与肺部炎性病灶，其中平扫 WC 值大于 1021.6 时诊断肺癌具有较高准确性。静脉期 NIC 大于 0.375 诊断非小细胞癌、静脉期 IC 大于 17.6 或静脉期 $K_{40-90kev}$大于 2.355 诊断腺癌均具有较高效能。

EPO-0663

囊腔型肺癌的 CT 表现特点及病理基础探讨

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目的 探讨囊腔型肺癌的 CT 表现特征及其对应的病理学表现，以提高此类肺癌的认识及诊断水平。**方法** 回顾性分析 2012 年 1 月至 2017 年 12 月收治的 30 例囊腔型肺癌患者，均经手术、纤维支气管镜和经皮穿刺病理活检证实。30 例患者中男性 17 例、女性 13 例，年龄范围 39~77 岁，平均年龄 60.77±10.12 岁。**结果**（1）CT 特点：囊腔的大小约 0.89~6.65cm，平均 2.46±1.27cm。23 例（76.67%）病灶位于双肺外周，24 例（80.00%）囊腔形态规则。27 例（90.00%）囊壁厚薄不均，3 例（10.00%）囊壁均匀增厚。19 例（63.33%）囊内有分隔，16 例（53.33%）囊壁含磨玻璃影，21 例（70.00%）病灶边缘不规则，有 20 例（66.67%）囊壁外可见贴边血管征。（2）病理基础：30 例患者中腺癌多达 26 例（86.67%），鳞癌 3 例（10.00%），腺鳞癌 1 例（3.33%）。光镜下，囊内分隔、囊壁、囊外磨玻璃影的病理特点各不相同。**结论** 囊腔型肺癌是一种特殊类型的肺癌，它具有典型的 CT 特点及病理改变，熟悉和掌握这些特点有助于提高术前诊断准确率。

EPO-0664

IILS: Intelligent Imaging Layout System for Automatic Imaging Report Standardization and Intra-interdisciplinary Clinical Workflow Optimization

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Objective: To achieve imaging report standardization and improve the quality and efficiency of the intra-interdisciplinary clinical workflow, we proposed an intelligent imaging layout system (IILS) for a clinical decision support system-based ubiquitous healthcare service, which is a lung nodule management system using medical images. **Materials and Method:** We created a lung IILS based on deep learning for imaging report standardization and workflow optimization for the identification of nodules. Our IILS utilized a deep learning plus adaptive auto layout tool, which trained and tested a neural network with imaging data from all the main CT manufacturers from 11,205 patients. Model performance was evaluated by the receiver operating characteristic curve (ROC) and calculating the corresponding area under the curve (AUC). The clinical application value for our IILS was assessed by a comprehensive comparison of multiple aspects. **Results:** Our IILS is clinically applicable due to the consistency with nodules detected by IILS, with its highest consistency of 0.94 and an AUC of 90.6% for malignant pulmonary nodules versus benign nodules with a sensitivity of 76.5% and specificity of 89.1%. Applying this IILS to a dataset of chest CT images, we demonstrate performance comparable to that of human experts in providing a better layout and aiding in diagnosis in 100% valid images and nodule display. The IILS was superior to the traditional manual system in performance, such as reducing the number of clicks from 14.45 ± 0.38 to 2, time consumed from 16.87 ± 0.38 sec to 6.92 ± 0.10 sec, number of invalid images from 7.06 ± 0.24 to 0, and missing lung nodules from 46.8% to 0%. **Conclusions:** This IILS might achieve imaging report standardization, and improve the clinical workflow therefore opening a new window for clinical application of artificial intelligence.

EPO-0665
HRCT 诊断与影像组学研究对肺腺癌纯磨玻璃结节浸润程度分析

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目的：
首先回顾性分析于 HRCT 上表现为纯磨玻璃结节（pGGN）肺腺癌 CT 征象，并结合术后病理对其浸润程度进行分析，探究 HRCT 结合常规影像诊断方法对肺腺癌 pGGN 的浸润性能否作出诊断。其次通过影像组学方法提取以上相同研究对象 HRCT 原始图像数据信息，以期辅助临床对肺腺癌 pGGN 的合理术式选择及远期治疗。
资料与方法：
回顾 2015 年 1 月至 2018 年 10 月于吉大二院行胸部 HRCT 检查，后经手术切除的肺腺癌患者相关资料，共有 65 例经病理证实的 pGGN 病灶入组。同时通过影像组学方法，采用 A.K.分析软件，并建立组学预测模型，将验证组全部 ROI 图像带入组学模型，所得结果经 A.K.软件自动进行统计学分析并获得预测结果。
结果：
常规影像诊断方法中，浸润前组与浸润性组经过定性特征分析，得出分叶征（P=0.000）、毛刺征（P=0.008）、空泡征（P=0.047）及血管集束征（P=0.001）有明显统计学差异；定量特征中结节大小(P=0.001)、平均 CT 值(P=0.000) 有明显统计学差异，定量特征的诊断价值以 ROC 及曲线下面积（AUC）判断，AUC 分别为 0.740 及 0.784。影像组学分析经 A.K.软件自动完成，共获得 385 个组学参数，经 LASSO 降维及 Logistic 迭代回归剔除冗余，保留“熵”及“球度”两个特征参数并以此建立预测模型，该模型对 HRCT 检查 pGGN 浸润程度的诊断价值 AUC 为 0.824。
结论：
常规影像学诊断方法显示分叶征、毛刺征、空泡征、血管集束征、结节大小及平均 CT 值对区分浸润前及浸润性病变有意义，当结节直径大于 12.7 mm 或平均 CT 值大于-544.50 HU 时，可以考虑结节内含有浸润性成分。通过 65 例病灶建立影像组学分析模型，该模型不仅能够定量判断 pGGN 内有无浸润成分，且定量诊断价值高于常规影像学诊断方法。

EPO-0666
硬化性肺泡细胞瘤与周围型肺癌 CT 征象对照分析

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目的 探讨高分辨率 CT 对硬化性肺泡细胞瘤（PSP）与周围型肺癌（PLC）的鉴别诊断价值，以提高认识、减少误诊。
方法 回顾性分析经病理证实的 PSP（19 例）和 PLC（22 例），收集其临床、病理及影像学资料，并对两组病变 CT 征象、强化率进行统计学分析。
结果 ①在动脉期、静脉期强化率、钙化、分叶征、毛刺征、胸膜凹陷征、液化坏死、纵膈及肺门淋巴结肿大等 8 项指标上，PSP 组和 PLC 组间的差异具有统计学意义(P <0. 05)；②当静脉期强化率阈值取 1.500 时，曲线下面积（AUC）为 0.914，敏感性、特异性分别为 86.3%、89.4%（p<0.001）；当动脉期强化率阈值取 1.200 时，A_Z值为 0.878，敏感性、特异性分别为 86.3%、84.2%（p<0.001）；当分叶征阈值取 0 时，AUC 值为 0.906，敏感性、特异性分别为 86.3%、94.7%（p<0.001）。

结论 CT 征象分析对硬化性肺泡细胞瘤与周围型肺癌的鉴别诊断具有一定的参考价值。

EPO-0667

Essentials of Precisely Quantitative Evaluation for Non-small Cell Lung Cancer after Targeted Therapy: pros and cons radiologists should know

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Learning objectives
To explore the essentials of imaging quantitative evaluation for non-small cell lung cancer (NSCLC) after targeted therapy in order to improving the recognition and interpretation of RECIST 1.1, which is conducive to the application of clinical MDT and the standardization of imaging report in China.
Background

By reviewing the evolution process of imaging evaluation criteria from WHO criteria to RECIST and RECIST 1.1, the main different points were stressed among them. Interpretation of the main diagnostic terms and essentials for RECIST 1.1 was demonstrated via the application analysis of specific cases. From a multi-center clinical trial for targeted treatment of NSCLC (23 large general or cancer hospitals in China cooperated with PAREXEL), the conditions (need specific evaluation training or not) of RECIST 1.1 application and report QC (by a test in a case) were studied and compared which were divided into four levels: best, better, good, ordinary.
Findings and procedure details

At present, the evaluation criteria for therapic efficacy was RECIST 1.1, which is characterized by easy generalization, simple operation, small variability, comprehensive evaluation of tumor itself and metastases and lymph nodes. The application essentials and difficulties for NSCLC involved these aspects, such as the selection of target lesion (the most important procedure for the first step), the choice of measuring window width (the accuracy and reliability of the measuring results can be guaranteed.), the definition and screening of new lesions (new lesions directly trigger PD, so they must be substantial, confirmed, and cautious as well.), the mastery of significant progress in non-target lesions (it's strongly subjective, so uniform standard was a focus for training.), etc. (Fig. 1-2) The evaluation reports were issued by radiologists in only three hospitals (3/24), the others 21/24) by the oncologists. As to QC, only 4 hospitals (4/24) for best level without any training; the remaining 20 were all required specialized training, among them 5 for better, 14 for good, 1 for ordinary level.
Conclusion

The imaging evaluation criteria and report standardizations for tumor response were clearly different from the routine reporting format and system, so their promotion

needed to be improved in clinic with a long way in China; recognition and mastery for imaging departments and radiologists will facilitate the application of RECIST 1.1 in NSCLC, which is conducive to the positive interaction and collaboration with other disciplines in the practicing MDT.

EPO-0668

CT characteristics for predicting invasiveness in pulmonary pure ground-glass nodules

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Objective: *To investigate the differences of CT features in atypical adenomatous hyperplasia (AAH), adenocarcinoma in situ (AIS), minimally invasive adenocarcinoma (MIA) and invasive adenocarcinoma (IA) manifesting as pure ground-glass nodule (pGGN) with the aim of finding useful signs for predicting invasiveness.*
Materials and methods: *Fourteen AAHs, 59 AISs, 68 MIAs and 31 IAs manifesting as pGGN in 161 patients were enrolled in this study. CT features including lesion location, size, area, shape, density and its uniformity, margin, nodule-lung interface, lobulation, spiculation, pleural indentation, air bronchogram, vacuole sign and vessel changes in it were evaluated. CT features of each type nodules were analyzed and compared.*
Results: ROC analyses revealed that nodule size (cut-off value, 10.5mm; sensitivity, 78.8%; specificity, 59.8%; $p<0.001$) and area (cut-off value, 86.5 mm^2; sensitivity, 87.1%; specificity, 65.2%; $p<0.001$) were significant larger in IAs than those in AAHs, AISs and MIAs ($p<0.001$), while diameters of the latter three were similar ($p>0.05$). CT attenuation higher than -632 HU in pGGNs usually indicated invasiveness (sensitivity, 78.8%; specificity, 59.8%; $p<0.001$). Compared with AISs, MIAs and IAs, density of AAHs was more likely to be homogenous ($p<0.001$). In contrast with pGGNs without invasiveness, MIAs and IAs usually have irregular shape, coarse margin, lobulation, spiculation, pleural indentation and dilated/distorted vessels (each $p<0.05$).
Conclusion: *The possibility of invasiveness is high in pGGNs with larger size (>* 10.5mm or>86.5 mm^2), higher (>-632 HU) but heterogenous density, irregular shape, coarse margin, spiculation, lobulation, pleural indentation and dilated /distorted vessels.

EPO-0669

基于 CT 征象量化分析非小细胞肺癌脏层胸膜侵犯的风险因素研究

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目的 分析≤3cm 非小细胞肺癌的 CT 特征、临床及病理资料，量化分析非小细胞肺癌脏层胸膜侵犯的风险因素，提高脏层胸膜侵犯的诊断水平。**方法** 回顾性分析 173 例周围型非小细胞肺癌患者的 CT 特征、临床及病理资料，行单因素分析及多因素逻辑回归分析确定胸膜侵犯的独立危险因素，根据其优势比（odds ratios ,ORs）值建立预测胸膜侵犯的风险评分系统，行受试者操作特征（ROC）曲线，评估其预测效能。**结果** 173 例非小细胞肺癌中脏层胸膜侵犯 50 例（28.9%），无脏层胸膜侵犯 123 例（71.1%）。单因素分析显示肿瘤病理分化、分叶征、毛刺征、肿瘤-胸膜关系（Ⅰ型/Ⅱ型/Ⅲ型/Ⅳ型）、肿瘤大小、肿瘤实性成分长径及 C/T 比值在两组间差异均有统计学意义（p＜0.05）。多因素逻辑回归分析结果显示肿瘤-胸膜关系Ⅳ型（胸膜凹陷征）、肿瘤大小、肿瘤实性成分长径是脏层胸膜侵犯的独立危险因素，根据其对应的 OR 值建立总风险评分系统如下，总风险评分=4（肿瘤实性成分长径＞1.3cm）+4（肿瘤大小＞1.8cm）+3（胸膜凹陷征），得到预测脏层胸膜侵犯的 ROC 曲线下面积（AUC）为 0.840，总风险值的 cut-off 值为 7.5，该风险评分系统预测脏层胸膜侵犯的敏感度为 68.0%，特异度为 87.0%，准确度为 81.5%。 **结论** 本研究结果提示肿瘤-胸膜关系Ⅳ型（胸膜凹陷征）、肿瘤大小、肿瘤实性成分长径是非小细胞肺癌脏层胸膜侵犯的独立危险因素，总风险值大于 7.5 时提示可能存在脏层胸膜侵犯。

EPO-0670

基于 CT 特征预测叶间胸膜下浸润性肺腺癌的研究

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目的 建立二元 logistic 回归模型，探究有助于预判叶间胸膜下浸润性肺腺癌的 CT 特征。**方法** 收集 2016-2018 年于大连大学附属中山医院经手术病理证实位于叶间胸膜下（距离胸膜＜1.0cm）且与叶间胸膜存在毗邻关系的周围型肺腺癌 72 例。其中有非浸润性腺癌组 25 例（33.3%），浸润性腺癌组 47 例（62.3%），单因素分析两组肺腺癌 CT 征象，对有统计学差异的变量纳入二元 logistic 回归分析，行受试者工作特征（ROC）曲线，评估其预判效能；在 HRCT 平扫或增强图像中将肿瘤与叶间胸膜的毗邻关系分为 3 型，I 型：肿瘤与叶间胸膜呈 1 条或多条索条影牵拉；II 型：肿瘤紧邻叶间胸膜但未见明显胸膜移位；III 型：叶间胸膜向肿瘤内部凹陷，形成典型的弧凹征，当存在多种类型时，优先判定为 III 型、II 型、I 型。**结果** 浸润性肺腺癌与叶间胸膜毗邻关系 I 型 12 例（25.5%）、II 型 12 例（25.5%）、III 型 23 例（48.9%），与非浸润腺癌组间差异有统计学意义（X^2=19.805　p＜0.001）；而非浸润性肺腺癌多以 II 型为主（80.0%）。单因素分析显示平均长径、平均 CT 值、分叶征、毛刺征、肿瘤-胸膜距离、肿瘤-胸膜毗邻关系在两组间差异有统计学意义（p＜0.05）。二元 logistic 回归分析显示平均长径、平均 CT 值是预测叶间胸膜下浸润性肺腺癌的独立危险因素（OR=8.604，95%CI：2.173-34.074，　p=0.002；OR=1.009，95%CI：1.004-1.014，p=0.001），进一步得出二元 logistic 回归模型预判浸润性肺腺癌的 ROC 曲线下面积（AUC）为 0.912。**结论** 在本研究中，肿瘤与叶间胸膜毗邻关系分为 3 种类型，且肿瘤与叶间胸膜毗邻关系 III 型提示为浸润性肺腺癌可能，平均 CT 值和平均长径值有助于术前预判其浸润性，从而指导临床合理选择治疗或随诊方案。

EPO-0671

Differentiating minimally invasive and invasive adenocarcinomas in patients with solitary sub-solid pulmonary nodules with a radiomics nomogram

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AIM: To evaluate the preoperative differentiation between the minimally invasive adeno- carcinoma (MIA) and invasive adenocarcinoma (IAC) in patients with sub-solid pulmonary nodules using a radiomics nomogram.
MATERIALS AND METHODS: A total of 100 patients with sub-solid pulmonary nodules who had pathologically confirmed MIA (43 patients, 13 male and 30 female) or IAC (57 patients, 26 male and 31 female) were recruited retrospectively. Radiomics features were extracted from computed tomography (CT) images. A radiomics signature was constructed by the least ab- solute shrinkage and selection operator (LASSO) algorithm. Solid presence, lesion size, shape regularity, and margins of pulmonary nodules were assessed to construct a subjective finding model. An integrated model of radiomics signatures and CT-based subjective findings, which was presented as a radiomics nomogram, was developed based on a multivariate logistic regression. The nomogram performance was assessed by its calibration, discrimination, and clinical usefulness.
RESULTS: The radiomics signature, which consisted of 11 radiomics features, showed good discrimination accuracy. The radiomics nomogram showed good calibration and discrimi- nation in the training set (AUC [area under the curve] 0.943; 95% confidence interval [CI]: 0.895e0.991) and validation set (AUC 0.912; 95% CI: 0.780e1.000). The radiomics nomo- gram was determined to be clinically useful in the decision curve analysis (DCA).
CONCLUSION: The proposed radiomics nomogram has the potential to preoperatively differentiate MIA and IAC in patients with sub-solid pulmonary nodules.

EPO-0672
肺癌 MSCT 增强扫描的影像学特征与特异性标记物表达相关性以及联合诊断价值研究

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摘要：【目的】探究肺癌患者的 MSCT 扫描影像学特征与血清 C12 多肿瘤特异性标记物的表达相关性以及两者联用的诊断价值。【方法】2011 年 2 月-2018 年 2 月于我院接受治疗的 760 例确诊原发性肺癌患者为研究对象并搜集其临床诊断资料，另选取 500 名健康体检者为对照组，对肺癌患者及正常人体血清中 C12 多肿瘤特异性标记物进行定量检测以分析 CT 的影像学特征与该血清特异性标记物的表达相关性并评估联用诊断价值。【结果】肺癌组多肿瘤标记物中糖链抗原 199（CA 199）、糖链抗原 242（CA242）、神经元特异性烯醇化酶（NSE）、癌胚抗原（CEA）、铁蛋白（Fe）、人绒毛膜促性腺激素（HCG）、甲胎蛋白（AFP）、癌抗原 125（CA125）、癌抗原 153（CA 153）的值显著高于对照组，两组差异有统计学意义（P<0.05）；而两组间前列腺特异性抗原（PSA）、游离型前列腺特异性抗原（FPSA）和生长激素（HGH）的含量差异无统计学意义（P>0.05）。将肺癌患者根据 CT 影像学特征再分组比较 C12 多肿瘤特异性标记物水平，结果显示肿瘤大于 5cm 患者与肿瘤不足 5cm 的患者组间、有无坏死空洞组间、有无毛刺征象组间、有无深分叶征象组间差异均有显著的统计学意义（P<0.05）；而 CT 影像学特征中的不同病灶部位组间 C12 特异性标记物无显著差异（P>0.05）。【结论】肺癌 MSCT 增强扫描影像学特征中的肿瘤大小、有

无坏死空洞、毛刺征象、深分叶征象与 C12 多肿瘤特异性标记物的表达有相关性，不同病灶部位则与特异性标记物表达无关。可将 CT 影像与特异性标记物联用，有利于更准确的诊断疾病。

EPO-0673
3.0T DCE-MRI 联合 DWI 功能成像在实性孤立性肺结节中的应用研究

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目的：探讨动态对比增强磁共振（DCE-MRI）联合扩散加权成像（DWI）在实性孤立性肺结节（s-SPN）中的诊断价值。**方法：**回顾性分析经病理或临床随访证实的实性孤立性肺结节患者常规 MRI 及 DCE-MRI 影像资料（其中恶性病例 27 例，良性病例 14 例），绘制时间-信号强度曲线（time-signal intensity curves，T-SI 曲线），计算 DCE-MRI 血流动力学相关参数：最大强化增强比（Maximum enhancement ratio，MER）、达峰时间（T_{max}）、平均强化斜率（SLE）、最大上升斜率（steepest slope，SS）、廓清率（washout）、平均强化值（mean enhancement value，ME），并测量不同 b 值时 DWI 信号强度及表观扩散系数值（ADC）。**结果：**良、恶性病例组 T-SI 曲线类型及廓清率（washout）数值差异上无明显统计学意义（$P>0.05$），最大强化增强比 MER、达峰时间 T_{max}、平均强化斜率（SLE）、最大上升斜率 SS 及平均强化值 ME 在良、恶性组中具有统计学意义（$P<0.01$）。良、恶性结节的 DWI 信号强度值随 b 值的增大而减小，恶性组结节的 DWI 值均显著大于良性结节（$P<0.01$），二者的 ADC 值差异最具统计学意义（$P<0.01$）。**结论：**DCE-MRI T-SI 曲线有助于肺部良、恶性结节的鉴别，但对于肺癌及部分活动性炎症存在重叠干扰，联合磁共振扩散加权成像技术（DWI）能够有效提高诊断准确率。

EPO-0674
CT 直方图技术定量分析鉴别肺良恶性纯磨玻璃结节的可行性研究

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目的：探讨 CT 直方图技术定量分析对鉴别良恶性肺纯磨玻璃结节（pGGO）的可行性研究。 **方法：**回顾性分析经穿刺或手术病理证实的 52 例孤立性 pGGO 的 CT 平扫图像，男 14 例，平均（53.7±16.2）岁，女 38 例，平均（51.3±11.7）岁。分为良性组（24 例，直径 1.31±0.4cm）、恶性组（28 例，直径 1.29±0.6cm ）。联影公司 uCT 760 行胸部 HRCT 扫描，层厚 1mm，层间距 1mm，肺窗（窗宽:1500HU；窗位:-400 HU）。联影后处理工作站(规格型号 uWS-CT、版本号 R004)进行直方图分析。选取结节轴位最大层面勾画感兴趣区（避开血管、支气管）生成 CT 像素直方图（画 3 次，取平均值），得到 pGGO 平均 CT 值、最小 CT 值、最大 CT 值、直方图峰度、跨度、峰度对应 CT 值及直方图趋势，直方图趋势分为缓升速降、速升缓降、缓升缓降、速

升速降 4 种类型，分别比较良恶性组间直方图参数及趋势。 **结果：**良性组直方图跨度、最大 CT 值及峰度对应 CT 值分别为 590.3±141.5Hu、-333.5±140.4Hu、-675.1±145.3Hu；恶性组分别为 907.2±298.0Hu、 -105.1±244.4Hu、 -468.4±187.0Hu，经两独立样本 t 检验，差异均有统计学意义(P<0.05)，恶性组跨度、最大 CT 值及峰度对应 CT 值均大于良性组。四种直方图趋势良性组分别为 2、18、4、0 例；恶性组分别为 19、2、5、2 例，采用卡方检验，差异有统计学意义（P<0.05），恶性组以缓升速降为主，良性组以速升缓降为主。二元 Logistic 回归结果显示，两组间峰度对应 CT 值有统计学差异（P<0.05）。ROC 曲线下面积（AUC）峰度对应 CT 值 0.799，临界值-553Hu，灵敏度和特异度分别为 64.3%、87.5%。**结论：**CT 直方图技术分析对于鉴别肺良、恶性 pGGO 具有一定可行性和价值。

EPO-0675

The correlation study between the proportion of the adherent growth main component and CT value of ground-glass opacity pulmonary nodules by energy spectrum CT

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Objective:

To study the clinical application value of energy spectrum CT in analyzing the correlation between the adherent growth main component of ground-glass opacity pulmonary nodules and CT value.

Materials and methods:
Ten patients with ground-glass opacity pulmonary nodules (GGO), confirmed by surgery and pathology, were collected in our study, including invasive adenocarcinoma and microinvasive adenocarcinoma. And there were 6 cases pure GGO(pGGO) and 4 cases mixed GGO(mGGO). According to the pathological results, the average proportion of adherent growth components in pulmonary nodule was calculated. All cases underwent energy spectrum CT scanning under the conditions of mixed energy and 40-140Kev single energy scanning. On the lung window image, ROI was drawn at each level of the lesion from the appearance of the lesion to the disappearance of the lesion. The ROI area was selected based on the maximum coverage of the lesion, with no less than 80% of the lesion, avoiding the vacuolar area. To calculate the average CT value of the overall nodule. To analyze the correlation between the average proportion of the adherent growth main component and average CT value of GGO by spearman correlation method.

Results:
There was no correlation between the average proportion of the adherent growth main component and average CT value of GGO, whatever under the conditions of mixed energy and 40-140kev single energy scanning (P ＞ 0.05). However, there was negative correlation trend between the two parameters under the conditions of 40Kev and 50Kev single energy scanning (r=-0.592, p=0.071).

Conclusion:
The low energy scanning method of energy spectrum CT can provide certain help in analyzing the adherent growth main component of GGO.

EPO-0676

Differentiating Synchronous Double Primary Lung Adenocarcinoma from Intrapulmonary Metastasis by CT Features and EGFR Mutation and ALK Status

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Background The aim of this retrospective study was to investigate the potential of computed tomography (CT) features and two known oncogenic driver mutations (epidermal growth factor receptor (EGFR) and anaplastic large-cell lymphoma kinase (ALK)) to discriminate synchronous double primary lung adenocarcinoma (SDPLA) from one primary pulmonary adenocarcinoma with intrapulmonary metastasis(IPM) diseases. We also identified relationships between EGFR mutation status and clinical features and CT characteristics in SDPLA.
Methods Between January 2013 and April 2018 at the Union Hospital, Tongji Medical College, patients with SDPLA were selected. Patients with IPM served as the control group. All 60 patients (120 lesions) were tested for EGFR mutations and ALK status and underwent chest CT prior to any treatment.
Results A total of 60 patients (40 with SDPLA, 20 with IPM) were included for analysis. No significant differences were found between the two groups in terms of age (p=0.261), sex (p=0.344) or tobacco use (p=0.541). The inconsistency rate of EGFR mutations was significantly higher in patients with SDPLA (p<0.001) than in patients with IPM, while patients with IPM presented with ALK-positive tumors more frequently (p<0.001). SDPLA more frequently occurred in different lobes (p=0.024), presented with less lymphadenopathy (p=0.011), showed a smaller difference in diameter (Δd) between tumors (p=0.008) and more commonly presented as lobulated tumors (p=0.019), spiculate (p＜0.001) , ground-glass opacities (GGOs) (p＝0.001), and air bronchograms (p=0.020) compared to IPM. EGFR mutations in SDPLA were found more frequently in female patients (p=0.002) and those who had never smoked (p=0.037), and the tumors presented as GGOs (p=0.007) and air bronchograms (p=0.045).
Conclusion CT features, EGFR mutations and ALK status may be helpful for differentiating SDPLA from IPM disease. EGFR mutations occurred more frequently in female patients and those who had never smoked, and the tumors manifested as GGOs and air bronchograms.

EPO-0677

2cm 以下磨玻璃结节的空气支气管征像分析

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目的 对 2cm 以下磨玻璃结节的空气支气管征进行分析,提高对磨玻璃结节的诊断与鉴别诊断能力。**方法** 回顾性分析经手术病理组织学证实的 2cm 以下磨玻璃结节共 63 例，均为孤立性结节。按照密度将其分为 2 组，16 例为 pGGN,，47 例为 mGGN。分析不同病理结果与空气支气管征的关系。将空气支气管征分为三型，Ⅰ型：支气管在病灶内走形自然（分叉或不分叉）；Ⅱ型：支气管在病灶内扭曲、扩张；Ⅲ型：病灶内支气管管壁局部增厚或截断。**结果** pGGN 组Ⅰ型、Ⅱ型、Ⅲ型空气支气管征显示率分别为 3/16(18.8%)、1/16(6.3%)、0/16(0%)；mGGN 组Ⅰ型、Ⅱ型、Ⅲ型空气支气管征显示率分别为 18/47(38.3%)、6/47(12.8%)、9/47(19.1%)。癌前病变与浸润性病变的空气支气管征显示率分别为 2/7(28.3%)、35/56(62.5%)。**结论** 对于 2cm 以下磨玻璃结节，空气支气管征分型在 pGGN 组及 mGGN 组有差别，随着实性成分增多，空气支气管征的显示率增加，有助于对其浸润程度进行分析。

EPO-0678

肺微小结节 CT 表现与诊断分析再探讨

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目的 分析直径≤10mm 的肺微小结节的 CT 表现（部位、密度、形态学特征），探讨 CT 对肺微小结节定性诊断的价值。 **方法** 回顾性分析经手术且有病理结果的 102 枚肺微小结节的多层螺旋 CT 图像，总结 CT 影像学特征与病变性质之间的关系。**结果** 102 枚肺微小结节中，良性组、癌前病变组、浸润组分别为 25、27、50 枚。结节的密度、毛刺征、分叶征、血管集束征、胸膜凹陷征在三组间有统计学意义（P＜0.05），其中浅分叶在浸润组发生率明显高于其它两组，差异有统计学意义（P=0.034），而血管集束征中，良性组、癌前病变组主要表现为贴边走形或穿行，无增粗扭曲，浸润组主要表现为穿行并增粗扭曲，差异有统计学意义（P=0.000）。结节的位置、瘤肺界面、空泡征在三组间无明显统计学差异（P≥0.05）。**结论** 通过分析肺微小结节 CT 表现，可对其性质做出较准确的判断，对临床治疗具有重要的指导价值。

EPO-0679

320 排 CT 体部灌注成像首过强化峰值时间（TTP）诊断周围型肺病变的价值

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目的 探讨 320 排 CT 双入口体部灌注成像（DI-CTP）拟合时间-强度曲线（T-DC）定量参数（TTP）诊断周围型肺病变的价值。**方法** 回顾性分析经病理证实的 63 例患者，其中恶性周围型肺病变 40 例、良性周围型肺病变 23 例，应用 DI-CTP 绘制拟合时间密度曲线（T-DC）、依据 T-DC 计算强化达峰时间（TTP），并测量肺动脉灌注量（PF）、支气管动脉灌注量 （BF）、灌注指数（PI= PF/PF+BF），分析周围型肺病变的 TTP、灌注参数否有统计学差异。**结果** TTP 在良性和恶性肺周围型病变间存在显著性差异（P ＜0.01）。BF 和 PI 在良性与恶性周围型病变间均存在显著性差异（P ＜0.05），但 PF 在良恶性周围型肺病变间差异无统计学意义（P＞0.05）；TTP 曲线下面积（AUC）为 0.988，诊断价值高，当 TTP =18.7s 作为预测良恶性结节的临界值时，敏感度为 97.5%，特异

度为 91.7%。**结论** 拟合时间-强度曲线（T-DC）定量参数 TTP 有助于提高周围型肺病变的鉴别诊断效能，为周围型肺病变的诊断提供一种新思路。

EPO-0680

初探肺纯磨玻璃结节 3 年随访期内增长的风险因素

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目的：评估与 pGGN 患者在 3 年随访期内增长相关的临床和放射学因素，为临床个体化管理提供依据。资料与方法 回顾性分析于大连大学附属中山医院利用 HRCT 随访 3 年及以上 pGGN 患者 93 位，共 138 例 pGGN 病灶，并分为增长组及稳定组，分析患者临床资料和 HRCT 征象与 pGGN 3 年随访期内出现增长间的关系。结果 138 例 pGGN 病灶中，25 例在 3 年随访期间出现增长，113 例 pGGN 在 3 年随访期间保持稳定。对以人为基础的分析，随访 3 年内出现增长的 pGGN 的频率为 23.6%（22/93）。而基于对结节的分析中，增长的频率为 18.1%（25/138）。在多变量分析中，初始直径大于 8.5mm（*OR*= 53.774,95%，*CI*：9.658～299.389，*p*= 0.000），pGGN 形状为不规则形（*OR*= 12.828,95%，*CI*：1.559～105.547，*p*= 0.018）是 pGGN 3 年内发生增长的独立危险因素。结论 当 pGGN 患者病灶最大径大于 8.5 mm，形状呈不规则形时，可以不必遵循至少随访 3 年的临床管理方式，而积极的外科干预可能是首选的临床处理方式。

EPO-0681

The diagnostic value of magnetic resonance imaging versus computed tomography for pulmonary nodules: A systematic review and meta-analysis

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Background:
There are few data about the diagnostic value for magnetic resonance imaging (MRI) versus computed tomography (CT) for detecting pulmonary nodules. The purpose of this study was to evaluate the performance of MRI compared to CT for detecting pulmonary nodules.
Methods
We systematically searched three electronic databases including PubMed, EmBase, and the Cochrane Library through September 2017, which diagnosis of pulmonary nodules by using MRI and CT. The summary sensitivity, specificity, positive likelihood ratio (PLR), negative likelihood ratio (NLR) and area under receiver operating characteristic (ROC) curves were conducted. Further, the ratio of diagnostic parameters between MRI and CT were pooled by using random-effects model.
Results
A total of 8 studies involving a total of 653 individuals were included. The summary sensitivity, specificity, PLR, NLR and area under ROC were 0.91 (95%CI: 0.80-0.96), 0.76 (95%CI: 0.58-0.87), 3.72 (95%CI: 2.05-6.76), 0.12 (95%CI: 0.06-0.27), and 0.91 (95%CI: 0.88-0.93) for MRI diagnosis pulmonary nodules respectively. Further, the

pooled sensitivity, specificity, PLR, NLR and area under ROC for CT detecting pulmonary nodules were 1.00 (95%CI: 0.95-1.00), 0.99 (95%CI: 0.78-1.00), 79.35 (95%CI: 3.68-1711.06), 0.00 (95%CI: 0.00-0.06), and 1.00 (95%CI: 0.99-1.00) respectively. In addition, we noted MRI were associated with lower sensitivity (ratio between MRI and CT: 0.91; 95%CI: 0.85-0.98; P=0.010), specificity (ratio between MRI and CT: 0.82; 95%CI: 0.69-0.97; P=0.019), PLR (ratio between MRI and CT: 0.29; 95%CI: 0.10-0.83; P=0.020), and area under ROC (ratio between MRI and CT: 0.91; 95%CI: 0.89-0.94; P<0.001). Finally, MRI with higher NLR for detecting pulmonary nodules when compared with CT (ratio between MRI and CT: 8.72; 95%CI: 1.57-48.56; P=0.013).

Conclusions

The findings of this study suggested MRI were associated with relative high diagnosis parameters for detecting pulmonary nodules, while the diagnosis value was inferior to CT.

EPO-0682

Lung cancer screening with MRI: Comparison of the evaluation of pulmonary nodules of <3 cm using PETRA and LDCT

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Purpose: This study aimed to evaluate the visibility of lung nodules using a respiratory-gated pointwise encoding time reduction with radial acquisition (PETRA) sequence on a 3T magnetic resonance imaging (MRI) scanner compared with that using low-dose computed tomography (LDCT).

Methods: A total of 75 patients with lung nodules, including solid nodules (SN) and partial solid nodules (PSN), underwent both thoracic MRI with the PETRA sequence and LDCT. Radiologists reviewed the MRI and computed tomography (CT) images and calculated the detection rate for lung nodules. Next, the mean diameter of each detected nodule was determined. The detection rates and the diameters of the lung nodules detected by MRI with the PETRA sequence were compared with LDCT as the gold standard. The sensitivity of detection of different subgroups of pulmonary nodules was determined based on location, size, and type of nodules. Pearson's correlation coefficient was used for correlation of nodule size as measured by MRI and CT.

Results: The CT scans detected 256 lung nodules, including 99 SN and 157 PSN, with a mean nodule diameter of 9.3 mm. For SN, the MRI scans accurately detected 30/47 nodules of <6 mm diameter and 52/52 nodules of ³6 mm diameter; for PSN, MRI detected 30/51 nodules of <6 mm diameter and 102/106 nodules of ³6 mm diameter. The PETRA sequence showed a high detection rate (84%). The detection rates of SN, ground glass nodules, and PSN were 82%, 72%, and 94%, respectively. For nodules with a diameter of

>6 mm, the sensitivity of the PETRA sequence reached 97%, and was higher for nodules located in the upper lung fields than those in the middle and lower lung fields. Strong correlation was found between the CT and PETRA images (correlation coefficients = 0.97).
Conclusion: MRI has a potential role in detecting and evaluating pulmonary nodules with a high sensitivity. PETRA enables free-breathing and submillimeter imaging of lung nodules with high sensitivity for nodule detection, and may be an alternative to CT as an effective tool for screening pulmonary nodules.

EPO-0683
肺结节影像分级评估系统（PNI-GADS）对肺结节良恶性评估的应用价值

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目的
制订肺结节分级评估系统（PNI-GARS），评价其在肺结节良恶性评估中的应用价值。
资料与方法
回顾性分析 180 例患者共 200 个肺结节，采用 PNI-GARS 进行分级评定，计算 PNI-GARS 分级的准确度、敏感度、特异度、阴性预测值、阳性预测值。
结果
Ⅰ、Ⅱ级阴性预测值分别为 100.0%、97.2%，ⅢIa、ⅢIb、ⅢIc、Ⅳ级的阳性预测值分别为 53.8%、85.7%、93.3%、100.0%。将Ⅰ、Ⅱ级归为阴性结节，ⅢIa 级及以上归为阳性结节，PNI-GARS 分级的准确度、敏感度、特异度、总阳性预测值分别为 89.5%、99.3%、68.3%、87.2%。将Ⅰ、Ⅱ、ⅢIa 级归为阴性结节，ⅢIb~Ⅳ级归为阳性结节，PNI-GARS 分级的准确度、敏感度、特异度、总阳性预测值分别为 88.5%、89.1%、87.3%、93.8%。排除ⅢIa 级，将Ⅰ、Ⅱ级归为阴性结节，ⅢIb~Ⅳ级归为阳性结节，PNI-GARS 分级的准确度、敏感度、特异度、总阳性预测值分别为 94.8%、99.2%、84.3%、93.8%。
结论
PNI-GARS 能有效地分类 CT 筛查出的肺结节，在肺结节的良恶性评估中有较高的应用价值。

EPO-0684
CT 征象结合影像组学在 T1a,T1b 期肺癌诊断中的应用

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目的　构建基于 CT 征象和影像组学的肺癌诊断模型，探讨在≤2cm 肺实性结节中肺癌诊断准确性

方法：收集 2012-2019 年在我院接受肺部 CT 检查且手术病理证实为肺腺癌患者 106 例，良性性结节 100 例（病理证实或长期随访无变化），按照 7:3 的比例分为训练组和验证组，从 CT 图像中提取有价值的 CT 征象，使用 3D Slicer 软件进行感性兴趣勾画，A. K. 分析软件进行影像特征提取; 使用 lasso logistic 回归比较三种不同的肺癌诊断模型："A"只用 CT 征象，"B"只用影像组学，"AB"结合 CT 征象和影像组学，采用 ROC 曲线评价诊断效能。
结果:在 12 个 CT 征象分析中提取有意义征象 3 个：结节毛刺、胸膜牵拉、充气支气管征；在 320 个影像组学特征中筛选 16 个用于建模。A、B 和 AB 模型的 AUCCV（和 95%置信区间）分别为 0.85（0.72-0.96）、0.88（0.77-0.96）和 0.89（0.77-0.97）。模型在训练集和验证集中均显示出良好的识别和校准。
结论：CT 征象结合影像组学特征构建肺癌诊断模型，提高了肺癌检出准确率，可用于肺内≤2cm 肺实性结节良恶性鉴别。

EPO-0685
CT 扫描联合灌注成像对肺结节良恶性鉴别诊断的价值

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摘要：目的：探讨多层螺旋 CT 扫描联合灌注成像在肺结节良恶性鉴别诊断中的应用价值。方法：将中南大学湘雅医院胸外科 2018 年 1 月～2019 年 1 月收治的肺部结节手术患者中的 128 例作为研究对象，患者术前均接受肺部 CT 扫描及灌注成像检查，检查后进行肺结节血流动力学分析。结合肺结节患者的术后病理诊断结果，分析肺结节病理类型、淋巴结转移和结节感兴趣区 CT 灌注参数值的相关性。**结果：**良性结节与恶性结节的平均通过时间值(MTT)和血流量(BF)值无显著统计学差异(P>0. 05)，其中良性结节中的炎性结节血容量(BV)值显著高于恶性结节(p<0. 05)，而恶性结节的 BV 值又显著高于除炎性结节外的其他良性结节(P<0. 05)；恶性结节的表面通透性(PS)值明显高于良性结节 p<0. 05)；不同组织学类型的肺癌在 MTT、BV、PS 的值上没有显著差异(P>0. 05)，但鳞癌的 BF 值显著低于小细胞肺癌及腺癌（p<0.05）；有淋巴结转移患者肺结节的 BF 及 PS 值显著高于无淋巴结转移组（p<0. 05）。**结论：**CT 扫描联合灌注成像能够有效评估肺部结节的血流情况及微血管密度状况。不同结节及不同组织类型肺癌在灌注参数值上存在规律，对肺结节鉴别有一定的临床价值。

EPO-0686
Value of subtraction-multiphase-CT for differentiation of benign and malignant pulmonary lesions

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ABSTRACT: **Purpose** Toexplore the value of multiphase-subtraction-CT for differentiation of benign and malignant pulmonary lesions.
Methods and materials: 46 patients (age, 61.7 ± 14.9 years) of pulmonary nodules and masses were enrolled in this study. Non-contrast CT and pulmonary arterial and aortic phase CT of the chest were performed on a 320-detector row CT system.Then, based on a non-rigid registration followed by subtraction of non-contrast images from

contrast- enhanced images were generated.The diagnostic performances of the related parameters were evaluated with receiver operating characteristics (ROC) analysis.
Results: Of these 46 patients, 39 cases were pathologically confirmed and 9 were diagnosed based on clinical data. There were 29 lung malignant masses and 17 benign lesions. A significant differences in CT value in aortic phase (Z=-3.391, p=0.001),CT value of aortic-unenhanced (Z=-4.210, p=0.000), CT value of aortic - pulmonary arterial phase(Z=-4.449, p=0.000)were observes between the two groups, while no significant differences in CT value of unenhanced scan (Z=1.309, p=0.191), pulmonary arterial phase (Z=0.421, p=0.674), and pulmonary arterial-unenhanced phase (Z=-1.309, p=0.191). The area under the ROC curve for CT value of arterial-pulmonary arterial phase (0.897) was largest. When the cutoff value was selected as 34.7HU,the sensitivity, specificity, accuracy, positive predicative value, and negative predictive value of diagnosing malignant masses were 96.6%, 82.4%, 91.3%, 90.3%, 93.3%, respectively.
Conclusion: CT value of aortic-pulmonary arterial phase has certain significance in differentiating the benign and malignant pulmonary lesions and has the best diagnostic efficiency.

EPO-0687

Characteristic analysis and prognosis evaluation of I non small cell lung cancer based on spiral CT

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Objective: To investigate the correlation between the morphology of stage I non-small cell lung cancer (NSCLC) tissue and the prognosis of patients. The significance of reconstruction of pulmonary nodules and pulmonary vasculature by spiral CT in the treatment of stage I non-small cell lung cancer.
Methods:
1. Collecting data of 60 patients with stage I NSCLC with complete chest CT examination and surgical pathology from January 2014 to January 2018 in the affiliated hospital of Beihua University, according to the seventh edition of the International Union Against Cancer (UICC) in 2009. Lung cancer staging criteria for postoperative pathological staging.
2. We intend to use spiral CT to show the relationship between the edge and internal structure of NSCLC lesions, peripheral blood vessels, and pleura, and correlate with the 3-year overall survival of patients, reflecting the prognosis of patients.
Results:
1. Of the 60 patients with stage I NSCLC, 38 survived within 3 years after surgery, and 22 died. The 3-year total productivity was 63.3%,the 3-year survival rate of males (63.9%), while the 3-year survival rate of women was slightly lower than that of men (62.5%). After single-factor survival analysis, the difference was not statistically significant (P=0.992); the analysis was based on the site of the disease, pathological type, age and other factors. There was no statistically significant difference between the single factor and multivariate survival analysis (P>0.05)..

2.According to the seventh edition of lung cancer staging, stage I includes T1aN0M0, T1bN0M0, and T2aN0M0. The three-year survival rates are 88.2%, 68.2%, and 33.3%, showing a declining trend.the difference was statistically significant (P<0.05) by univariate and multivariate survival analysis.
3. In the tumor margin, the edges of the tumor were subdivided, and the edges were divided into smooth, well-defined boundaries, leaf segments, and short burrs. The 3-year survival rates were 80.0%, 70.5%, and 37.5%, respectively. The patients with smooth edges had the highest survival rate and had the longest median survival time. Results the univariate and multivariate survival analysis showed that the patient's 3-year survival rate had statistics. Significance (P<0.05).
4. The internal density of the tumor, the tumor density is divided into four categories: uniform density, uneven density (with necrosis area), bronchogram structure, tumor cavity. After single-factor and multi-factor survival analysis, the 3-year survival rate of patients was statistically significant (P>0.05).
5. Relationship between tumor and visceral pleura. Regarding the relationship between the tumor and the visceral pleura, we divided the tumor into: normal pleura or pleural depression with thickening. The corresponding 3-year survival rates were 68.3% and 52.6%, respectively. The patients with normal pleura had a better prognosis and the 3-year survival rate was statistically significant (p<0.05).
Result：The stage, margin, and surrounding conditions of NSCLC tumors are related to the prognosis of patients.

EPO-0688
基于图像噪声值的动态扫描条件下超低剂量 CT 肺部非实性小结节的检出影响因素的分析

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目的：探讨影响基于图像噪声值的动态扫描条件下超低剂量 CT（ULDCT）肺部非实性小结节检出的独立相关因素。
方法： 24 名受检者采用 GE 公司 Revolution CT 进行胸部 LDCT 检查。在 LDCT 扫描结束后，立即加扫 ULDCT 扫描。LDCT 采用 Assist kv（120 /100kV）管电压和 14.1Hu 噪声指数的 smart mAs 扫描模式，ULDCT 采用 120 kv 管电压和 16Hu 噪声指数的 smart mAs 模式。扫描结束后，LDCT 和 ULDCT 均采用 ASiR-V 70%算法进行图像重建。两名具有丰富经验的放射医师在 LDCT 图像上阅片，记录达成统一后的结节类型、长径及 CT 值，以此作为参考标准。三周以后，同样两名放射医师在 ULDCT 图像上进行重复阅片操作。将 ULDCT 结果与 LDCT 进行对比。采用单因素分析法分析影响结节检出的独立相关因素。
结果：受检者的平均 BMI 为 22.7±2.9(18.0-27.6) kg/m^2。ULDCT 和 LDCT 的平均扫描剂量分别为 0.17±0.03 mSv 及 0.95±0.31 mSv，ULDCT 较 LDCT 下降了 82.1%（P<0.001）。LDCT 总共检出 30 个非实性结节。ULDCT 总共检出了 20 个结节，检出敏感度为 66.67%，4mm～6mm 和 6mm 以上结节的检出敏感度分别为 75% (9/12)及 78.6% (11/14)。检出组 BMI 为 22.5±3.5，未检出组为 23.3±2.2，两组间无统计学差异(P=0.462)。检出组结节长径为 6.5±2.2mm，未检出组为 4.8±1.6mm，二者具有明显统计学差异(P=0.04)。同时，检出组（-600±129Hu）结节的 CT 值明显高于未检出组（-780±41Hu），两者间差异显著（P<0.001）。单因素分析表明，结节长径及 CT 值对结节的检出有影响，而 BMI 无显著影响。

EPO-0689
肺结节影像分析技术优化病灶检出与特征显示对比研究

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目的 探讨厚层、薄层及 MIP 不同层厚在低剂量螺旋 CT 筛查肺结节中的检出效能。**方法** 回顾性分析我院 2017 年 3 月-5 月行胸部低剂量螺旋 CT 检查且诊断肺结节的 100 名体检者的影像图像，由两位高年资主治医师双盲阅片，采用厚层（5mm）、薄层(1mm)和 MIP 不同层厚(5mm、10mm、15mm、20mm)分别记录检出不同大小肺结节（≤5mm 结节，5mm-10mm 结节和＞10mm 结节）的数目、密度及形态特征；统计六种阅片技术检出不同大小肺结节的数目和检出率，采用 Friedman 秩和检验比较六种阅片技术检出肺结节的差异，并用 Kappa 分析评估两位观察者检出肺结节的一致性。**结果** 共检出肺结节 472 个，实性结节 439 个（93.01%），亚实性结节 33 个（6.99%）。MIP 所检出的肺结节总数与≤5mm 微小结节的数目明显多于厚层和薄层图像（P<0.001），且以实性结节为主，其中以层厚为 10mm 的 MIP（MIP(10)）检出的结节总数和≤5mm 微小结节的数目最多（观察者 1，391，326；观察者 2，390，322），明显多于其它阅片技术（P<0.001）；不同阅片技术所检出的肺实性结节总数和≤5mm 微小实性结节的数目差异有统计学意义（P<0.001），其中以 MIP(10)检出的实性结节总数和≤5mm 微小实性结节的数目最多（观察者 1，371，320；观察者 2，367，314），明显多于其它阅片技术（P<0.001）。薄层图像观察到肺结节的形态特征：胸膜凹陷征 42 个、血管穿过征 81 个、毛刺征 15 个、分叶征 30 个、空泡征 18 个、宝石征 16 个，多于其他阅片技术。 **结论** MIP 对≤5mm 微小实性结节的检出，以 MIP(10)的检出效能最佳，薄层图像有助于进一步观察肺结节的形态特征。

EPO-0690
外科手术切除肺磨玻璃结节最佳时机的最新研究进展

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目的：熟悉外科手术切除肺磨玻璃结节最佳时机的最新研究进展。
方法：查阅最近 5 年发表在影响因子≥3 的 SCI 收录杂志上关于外科切除肺磨玻璃结节及影响肺磨玻璃结节生长的文献，结合自己多年工作经验，总结归纳使用 CT 来判断切除肺磨玻璃结节的最佳时机。
结果：目前文献建议从以下四个方面综合分析肺磨玻璃结节来判断手术切除磨玻璃结节的最佳时机。1、磨玻璃结节大小：当纯磨玻璃结节≥10 mm 或含有≤5 mm 实性成分的混合磨玻璃结节≥8mm 时则应终止随访，避免结节快速生长，确保安全。2、磨玻璃结节实性成分：日本 TakeshiMatsunaga 等学者通过 5 年研究 775 患者发现：纯磨玻璃肿瘤无淋巴管侵犯和淋巴结转移，磨玻璃为主的肿瘤（即 0 < C/T ratio < 0.5，C/T ratio 为实性成分和肿瘤的直径比）有 0.8%（1/127）淋巴管侵犯、无淋巴结转移，实性为主的肿瘤（即 0.5 ≤ C/T ratio < 1）有 16.8%（31/185）淋巴管侵犯、4.3%（8/185）无淋巴结转移，纯实性肿瘤（即 C/T ratio = 1）有 46.2%（154/333）淋巴管侵犯、23.7%（79/333）淋巴结转移。当混合结节的实性成分 ≥ 5 mm 或 CTR ≥ 0.5 时则应终止随访，避免手术切除结节后出现肿瘤复发和转移。3、患者年龄：年龄：患

者≤65 岁时，磨玻璃结节达到上述第 1、2 条标准时，建议年龄越小越早择期手术。4、患者心理：当患者过度焦虑或抑郁时，早切除结节不失为明智的选择。
结论：建议从磨玻璃结节大小、磨玻璃结节实性成分、患者年龄及心理等四个方面来判断手术切除磨玻璃结节的最佳时机。

EPO-0691

CT and histopathologic characteristics of lung adenocacinoma with persistent pure ground glass mass exceeding 3cm in diameter

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Purpose: To elucidate CT manifestations and histologic features of pure ground glass mass (PGGM) with diameter more than 3cm.
Materials and Methods: From 91074 CT reports with ground glass opacity/nodule diagnosis between June 2006 to Mar 2018, we retrospectively reviewed 33 patients with pathologically proved lung adenocarcinoma which appeared as PGGM. We analyzed the differentiating CT features between adenocarcinoma in situ (AIS) and invasive pulmonary adenocarcinoma (IPA) and between the lepidic predominant adenocarcinoma and non-lepidic predominant lesions.
Results: In 33 cases, 10 were AIS and 23 were IPAs, which including 4 minimally invasive adenocarcinoma (MIA) and 19 invasive adenocarcinoma. Among the 19 invasive adenocarcinoma, 13 were lepidic predominant adenocarcinoma, 2 were acinar predominant adenocarcinoma, and 4 were papillary predominant adenocarcinoma. In PGGMs, IPAs were significantly larger and have greater CT attenuation than AIS ($P<0.05$). Lesion size and CT attenuation had positive correlation with pathological group (rho=0.396, 0.711 respectively, $P<0.05$, $P<0.05$ respectively). In receiver operating characteristic(ROC) curve analyses, the optimal cut-off size for IPAs was more than 3.4cm (sensitivity, 47.8%; specificity, 100%), and optimal cut-off CT attenuation was more than -660HU (sensitivity, 100%; specificity, 80%); and the areas under the curve (AUC) were 0.733 ($P<0.05$) and 0.943 ($P<0.05$), respectively.
Conclusion: In PGGMs, the possibility of IPAs was greater than AIS, almost as twice as AIS. As for the invasive adenocarcinoma, most PGGMs were lepidic predominant adenocarcinoma, which suggested a favourable prognosis. When PGGMs are encountered in clinical practice, lesion size and CT attenuation would be the most important criterion.

EPO-0692

92 例原发性肺浸润性黏液腺癌的 CT 征象分析

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目的：探讨原发性肺浸润性黏液腺癌（Pulmonary invasive mucinous adenocarcinoma，PIMA）患者的 CT 影像特征，以提高对该疾病的认识和影像诊断水平。**材料与方法：**回顾性收集 2006-2018 年大连医科大学附属第一医院经病理证实为原发性 PIMA 的患者 92 例，均完成 CT 平扫，57 例行 CT 增强扫描，均具有较为完善的临床资料。根据其影像特征，PIMA 分为三型：肺泡型、肺炎弥漫型和大气道型。**结果：**92 例 PIMA 患者，其中男性 36 例（39.13%），男女比 1:1.6；平均年龄 62±9.29 岁。92 例 PIMA 中肺泡型 87 例（94.57%），肺炎弥漫型 4 例，大气道型 1 例。25 例（27.17%）分布于左肺下叶，8 例（8.70%）分布于左肺上叶，12 例（13.04%）分布于右肺上叶，6 例（6.52%）分布于右肺中叶，41 例（44.57%）分布于右肺下叶。分叶征 57 例（61.96%）、毛刺征 55 例（59.78%）、空泡征 37 例（40.21%）、支气管充气征 13 例（14.13%）。肺泡型包括：实性结节与肿块 36 例（41.38%）、亚实性结节与肿块 47 例（54.02%），斑片影 4 例（4.60%）。实性结节与肿块包括：1 例（2.78%，1/36）小于 1cm 的实性小结节，26 例（72.22%,26/36）1-3cm 的实性结节，9 例（25%,9/36）大于 3cm 的实性肿块;亚实性结节与肿块中包括，10 例（21.28%，10/47）小于 1cm 的亚实性小结节，35 例（74.47%，35/47）1-3cm 的亚实性结节，2 例（4.26%，2/47）大于 3cm 的亚实性肿块。**结论：**PIMA 多分布在双肺下叶，分叶征、毛刺征及空泡征比较常见，无论是实性还是亚实性，肿瘤都以 1-3cm 结节与肿块多见，这些特征有助于提高该类肿瘤诊断的准确性。

EPO-0693

结直肠癌肺转移的特殊 CT 表现及动态变化

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目的 分析 26 例结直肠癌肺转移的特殊ＣＴ表现，以提高对本病的诊断准确性。方法 回顾性分析 26 例 经 手术病理证实的结直肠癌肺转移瘤的临床及ＣＴ资料。结果 结直肠癌肺转移的特殊ＣＴ表现为 结节/肿块/空洞型肺转移，钙化，空泡征， 分叶征，毛刺征及胸膜凹陷征，增强后病灶均为轻度强化。本组 26 例中，结肠癌 11 例，直肠癌 15 例，10 例空洞型肺转移（结肠癌与直肠癌各 5 例）均和并结节或肿块， 其中 6 例同时有空泡征，
3 例同时有钙化，10 例多发结节/肿块肺转移，6 例单发结节肺转移。 结论 结直肠癌肺转移表现多样，多发者结节、肿块及空洞均具恶性征象，且大小不等特殊 CT 表现，结合临床资料分析，能够做出正确诊断。

EPO-0694

gldm 纹理特征评估纯磨玻璃 IA 的 p-53、ki-67

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目的 探讨利用灰度依赖矩阵（gldm）纹理分析评价纯磨玻璃 IA 的 p-53、ki-67 情况。**方法** 回顾性收集 2015 年 1 月至 2018 年 1 月期间于大连医科大学附属第一医院经手术病理证实为肺浸润

性腺癌（IA），同时薄层 CT 上呈现为肺纯磨玻璃结节（pGGN）的患者总计 40 例。所有病例均为单发 IA 病灶，总计 40 个 pGGNs。回顾性采集所有研究对象的免疫组化情况：p53 突变率，ki-67 增殖指数，观察并测量薄层 CT 上 pGGN 的 gldm 纹理特征：GrayLevelVariance，HighGrayLevelEmphasis，DependenceEntropy，DependenceNonUniformity，GrayLevelNonUniformity，SmallDependenceEmphasis，LargeDependenceEmphasis，DependenceVariance，LargeDependenceHighGrayLevelEmphasis，LowGrayLevelEmphasis。将所有患者的免疫组化指标与 gldm 纹理特征做相关性分析。**结果** p53 突变率与 gldm 纹理特征均无相关性；ki-67 增殖指数与 GrayLevelNonUniformity（p=0.035，r=0.387）、LargeDependenceEmphasis（p=0.012,r=0.451），DependenceVariance（p=0.014，r=0.445）呈正相关。 ki-67 增殖指数与 SmallDependenceEmphasis（p=0.041，r=-0.376）呈负相关。**结论** ki-67 增殖指数与 gldm 纹理特征具有一定相关性，其中 LargeDependenceEmphasis 相关性最强，分析薄层 CT 上 pGGN 的 gldm 纹理特征，对评价患者肿瘤 ki-67 增殖活性有一定的临床价值。

EPO-0695
最大标准摄取值术前预测表现为磨玻璃密度 肺腺癌病理亚型的能力

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目的 探索 PET/CT 对表现为磨玻璃密度的肺腺癌的潜在临床价值，故比较不同病理亚型之间的最大标准摄取值(SUVmax) 是否存在差异。**方法** 纳入 160 例表现为 GGN 的肺腺癌病人，共 183 个病灶。其中男 58 例，女 102 例，年龄 35-87 岁，平均 57.69 ± 9.14 岁。所有受试者都行手术切除治疗，且均接受 PET/CT 检查和病理学检查。根据病理亚型不同，GGO 分为浸润前病变（AAH 和 AIS）、MIA 和浸润性腺癌；浸润型肺腺癌病理亚型又分为附壁生长、腺泡、乳头、微乳头及实性生长为主型。勾画 ROI 测量病灶最大标准摄取值（SUVmax）。运用单因素方差分析或 Kruskal-Wallis H 检验比较多组间的差异。**结果** 浸润前病变（AAH 和 AIS）组和 MIA 组的 SUVmax 之间差异无明显统计学意义（P>0.5）。浸润前病变（AAH 和 AIS）组和 MIA 组的 SUVmax 均低于浸润性腺癌，且差异有统计学意义 (P <0.005)。通过 ROC 曲线，SUVmax 对于诊断浸润性肺腺癌具有显著的意义，其曲线下面积为 0.893（图 1）。当 SUVmax 为 0.705 时，敏感度为 78.6%，特异度为 81.7%。不同病理亚型的 SUVmax 分别为附壁(1.11 ± 0.83)、腺泡(1.26 ± 0.82)、乳头 (1.67 ± 1.17)及实性 (2.38 ± 1.49)。多组别间差异具有统计学意义（P=0.02）,两两组别间差异无统计学意义。**结论** 单纯应用 SUVmax 对浸润前病变（AAH 和 AIS）和 MIA 诊断没有价值。SUVmax 可以用于鉴别表现为 GGN 的浸润性肺腺癌与非浸润的肺腺癌，当 SUVmax 为 0.705 时，敏感度为 78.6%，特异度为 81.7%。

EPO-0696
三维可视化技术对显示靶肺叶和肺段解剖结构的应用价值

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目的 探索基于胸部 CT 增强扫描动脉期薄层数据结合三维可视化技术对显示靶肺叶和肺段肺血管和支气管三维解剖结构的应用价值。**方法** 连续收集 35 例拟行肺结节切除术的患者作为研究对象，将术前胸部 CT 增强扫描动脉期薄层数据导入飞利浦图像后处理工作站，对肺血管、支气管和肺结节行图像分割和融合处理，建立靶肺叶和肺段的三维重建模型，评估病灶情况及三维模型效果。**结果** 35 例患者中，8 例行胸腔镜下肺段切除术，27 例行胸腔镜下肺叶切除术。靶肺叶和肺段三维模型图像质量评分中，4 分 11 例，3 分为 22 例，2 分 1 例，1 分 1 例，成功构建了 33 例靶肺叶和肺段的三维重建模型，有效性为 94.3%。**结论** 利用胸部 CT 增强扫描动脉期薄层数据，结合图像分割与融合技术，能清楚重建出靶肺叶和肺段血管支气管的结构及其与病灶的关系，能为胸外科医师提供肺结节切除手术所需的解剖信息。

EPO-0697

Relationship between bone marrow FDG uptake and recurrence after curative surgical resection in patients with T1-2N0M0 lung adenocarcinoma

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Objectives: The purpose of this study was to evaluate the relationship between bone marrow fluorodeoxyglucose (FDG) uptake on PET/CT imaging in patients withT1-2N0M0 lung adenocarcinoma after curative surgical resection, and the value of bone marrow FDG uptake in disease prognosis.
Methods: We screened 227 T1-2N0M0 lung adenocarcinoma patients who underwent FDG PET/CT imaging before curative surgical resection. We measured the maximum standardized uptake value (Tmax) of the primary tumor, mean FDG uptake of BM (BMSUV), bone marrow-liver uptake ratio (BLR), metabolic tumor volume (MTV),total lesion glycolysis (TLG), along with hematologic parameters such as c-reactive protein (CRP), neutrophil lymphocytes ratio (NLR). The prognostic significance of FDG uptake of BM in predicting recurrence-free survival (RFS) was assessed.
Results: The results showed that 38 of the 227 patients (16.7%) had a recurrence. Compared with the non-recurrence patients, the primary tumor of the patients with recurrence was larger, and the c-reactive protein, SUVmax, TLG, and BLR were higher. Univariate analysis found that BLR, tumor size, SUVmax, TLG (total lesion glycolysis), CRP (c-reactive protein) and NLR (neutrophilic lymphocyte ratio) were significantly correlated with postoperative recurrence. After adjustment for conventional confounding factors, the hazard ratio of BLR was 4.63(95% CI, 1.49－14.44) for the highest tertile of BLR compared with the lowest tertile. In multiple-adjusted spline regression, continuously BLR showed nonlinear relation with recurrence risk.
Conclusion: It is suggested that increased BLR within a certain range is an independent factor to predict the recurrence of T1-2N0M0 lung adenocarcinoma which can be considered as a reference index to evaluate the prognosis of patients with lung adenocarcinoma.

EPO-0698

Nomogram for the Prediction of Malignancy in Small (8–20 mm) Indeterminate Solid Solitary Pulmonary Nodules in Chinese Populations

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Purpose: This study aimed to develop and validate a nomogram for predicting the malignancy of small (8–20 mm) solid indeterminate solitary pulmonary nodules (SPNs) in a Chinese population by using routine clinical and computed tomography data.
Methods: The prediction model was developed using a retrospective cohort that comprised 493 consecutive patients with small indeterminate SPNs who were treated between December 2012 and December 2016. The model was independently validated using a second retrospective cohort comprising 216 consecutive patients treated between January 2017 and May 2018. The investigated variables included patient characteristics (e.g., age and smoking history), nodule parameters (e.g., marginal spiculation and significant enhancement), and tumor biomarker levels (e.g., carcinoembryonic antigen). A prediction model was developed by using multivariable logistic regression analysis, and the model's performance was presented as a nomogram. The model was evaluated based on its discriminative ability, calibration, and clinical usefulness.
Results: The developed nomogram was ultimately based on age, marginal spiculation, significant enhancement, and pleural indentation. The Harrell concordance index values were 0.869 in the training cohort (95% confidence interval: 0.837–0.901) and 0.847 in the validation cohort (95% confidence interval: 0.792–0.902). The Hosmer-Lemeshow test revealed good calibration in each of the training and validation cohorts. Decision curve analysis confirmed that the nomogram was clinically useful (risk threshold from 0.10 to 0.85).
Conclusion: Patient age, marginal spiculation, significant enhancement, and pleural indentation are independent predictors of malignancy in small indeterminate solid SPNs. The developed nomogram is easy-to-use and may allow the accurate prediction of malignancy in small indeterminate solid SPNs among Chinese patients.

EPO-0699
人工智能 Ai 联合肺结节血管成像技术在肺结节病变 CT 定性诊断中的临床运用

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目的:探讨人工智能 Ai 联合肺结节血管成像技术在肺结节病变 CT 定性诊断中的临床运用价值。
材料与方法:前瞻性的对 147 例临床诊断肺结节患者进行 CT 扫描，并行多平面重组及结节周围肺血管成像 MIP 后处理，利用人工智能 Ai 对上述肺结节进行危险级别评估，搜集经手术、病理证实 59 例病例的资料，对照分析术前 CT 诊断、结节有无血管联通疑似供血表现及 Ai 评估结果与手术、病理的相关性。

结果：经手术、病理证实的 59 例病例男性 26 人，女性 33 人，年龄 24 岁至 76 岁，病变大小 0.6X0.5cm 至 3.2X2.6cm；手术病理结果：良性 17 例；恶性 42 例，浸润性腺癌 37 例，原位腺癌并微小浸润 5 例。59 例结节病例中实性结节 13 例，部分实性结节 43 例，非实性结节 3 例；实性结节中良性 6 例，恶性 7 例；部分实性结节中良性 10 例，恶性 33 例；非实性结节中良性 2 例、恶性 1 例。13 例实性结节中结节周围肺血管 MIP 成像显示血管联通疑似供血表现 11 例，人工智能 Ai 提示 11 例为高危结节，1 例为中危结节，1 例为低危结节；43 例部分实性结节中结节周围肺血管 MIP 成像显示血管联通征疑似供血表现 43 例，人工智能 Ai 提示 40 例为高危结节，1 例为中危结节，2 例为低危结节；3 例非实性结节中结节周围肺血管 MIP 成像显示血管联通疑似供血表现 3 例，人工智能 Ai 提示 3 例均为高危结节。综合上述，结节周围肺血管联通征诊断恶性可能在实性结节的准确率 63.6%,部分实性结节的准确率 76.7%，非实性结节的准确率 33.3%；人工智能 Ai 诊断结节恶性可能在实性结节的准确率 63.6%,部分实性结节的准确率 82.5%，非实性结节的准确率 33.3%。**结论**：肺结节血管 MIP 成像显示肺血管联通征提示肿瘤供血表现及人工智能 Ai 在术前诊断部分实性结节恶性概率具有较高的诊断价值，两者联合运用诊断效能更高，对于肺癌的病理亚型诊断上述影像评估方法不具备特征性。

EPO-0700
肺部孤立性球形病变良恶性判别的多因素 logistic 回归分析

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【摘要】**目的** 观察肺部孤立性球形病变的 MSCT 影像特征，构建 logistics 回归模型判别病变的良、恶性。**方法** 回顾分析肺部孤立性球形病变的影像学特点，对影响肺内孤立球形病变良、恶性鉴别的指标进行多因素回归分析，建立多因素 logistic 回归模型，并验证模型的可行性。**结果** 本组 175 例患者中，恶性肿瘤患者 117 例，良性病变患者 58 例。经多因素 logistic 回归分析，深分叶、直边征、晕征、肺门及纵隔淋巴结肿大有助于肺孤立球形病变良、恶性的鉴别，以模型概率预测值绘制 ROC 曲线，其曲线下面积分别为 0. 87、0. 89、0. 78 和 0. 84。**结论** logistic 回归筛选自变量，建立简便、有效的回归模型，对预测肺内孤立球形病变良恶性有良好的临床应用价值。

EPO-0701
Prediction of pathologic stage in non-small cell lung cancer using machine learning algorithm based on CT image feature analysis

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Background: Pathologic staging of non-small cell lung cancer remains an intractable problem for the physician using individual pretreatment variables. The purpose of this study is to explore potential imaging biomarkers that can be used for diagnosis and prediction of pathologic stage in non-small cell lung cancer (NSCLC) using multiple machine learning algorithms based on CT image feature analysis.

Methods: This study consisted of 145 patients with stage IA to IV NSCLC patients, which be divided into training and testing sets (NSCLC, n=87) and an external validation set (Lung adenocarcinoma, LUAD, n=24; Lung squamous cell carcinoma, LUSC, n=34). In order to tackle imbalanced datasets in NSCLC, we generated a new dataset and achieved equilibrium of class distribution by using randomoversampling and SMOTE algorithm. The new data sets were randomly split up into a training set and a testing set. Considering some redundant and irrelevant features that may influence classification accuracy of the prediction model, we calculated the importance value of CT image features by means of Random Forest algorithm, and then selected optimal features in accordance with feature importance (P>0.005) to establish a new model. The performance of prediction model in training and testing sets were evaluated from the perspectives of classification accuracy, average precision (AP) score and precision-recall to each class. Ultimately, the predictive accuracy of the model was re-confirmed using LUAD and LUSC samples in an external validation set.
Results: The prediction model that incorporated nine image features exhibited a high classification accuracy (all AUC>0.70), precision and recall scores (AP = 0.60) in the training and testing sets. In
the external validation, we discovered that the predictive accuracy of the model in LUAD (AP = 0.84) outperformed that in LUSC (AP = 0.62).
Conclusion: The pathologic stage of patients with NSCLC can be accurately predicted based on CT image features, especially for LUAD. Our findings not only extend the application of machine learning algorithms in CT image feature prediction for pathologic staging, but identify potential imaging biomarkers that can be used for diagnosis and prediction of pathologic stage in NSCLC.

EPO-0702
肺磨玻璃密度结节中“实性成分”的影像学定义、显示以及其与肺腺癌浸润性之间的相关性研究

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目的 通过评估肺磨玻璃密度结节中“实性成分”与肺腺癌浸润性的相关性，从而更全面地定义和显示“实性成分”。
方法 回顾性分析 328 例病理证实为肺腺癌患者,采用计算机辅助软件 328 例 GGN 进行半自动逐层分割。3D-CT 密度直方图共设置 11 个 CT 值区间，分别为<-400, -400~-350.....0~50, ≥50HU, 软件自动计算出每个区间的体积百分比。两名放射科医师在肺窗上判断 GGN 的密度均匀性，在纵隔窗和 10 个中间窗（窗宽均为 2 HU, 窗位为-400, -350.....0, 50 HU）判断 GGN 的可见性，同时比较 GGN 的最大 CT 值是否大于同层面血管的最大 CT 值。第 1 种“实性成分”的假设定义为 GGN 在肺窗上密度不均匀，第 2 种“实性成分”的假设定义为 GGN 在纵隔窗上可见，第 3 种“实性成分”的假设定义为 GGN 的最大 CT 值大于同层面血管的最大 CT 值。采用 SPSS21.0 进行统计学分析。
结果 在 3D-CT 密度直方图中，其中 5 个区间的 AUC≥0.797，采用这 5 个 CT 值区间的并联诊断对肺腺癌浸润性具有较好的诊断性能，灵敏度和特异度分别为 78%、73.7%。基于三种不同“实性成

分”定义方式来诊断 IAC 的敏感性和特异性分别为 96.73%&9.65%, 75.70%&75.43%, 57%&80.70%。其中第 2 种“实性成分”的假设定义（即 GGN 在纵隔窗上可见）比其他两种定义方式具有更高的准确性（75.6%，p＜0.01）。中间窗-50 WL/2 WW 显示出比其它 9 个中间窗以及第 2 种假设定义更高的 AUC，特异度和阳性预测值分别为 82.5%、88.5%，优于密度直方图的并联诊断及第 2 种假设定义。

结论 使用中间窗-50 WL/2 WW 来诊断肺结节的“实性成分”以及鉴别浸润性是一种最佳的方式，优于密度直方图的并联诊断及第 2 种“实性成分”的假设定义，同样也是一种在临床工作中十分便于操作的评估方法。

EPO-0703

Efficacy of DL-based AI diagnostic platform in detecting ground-glass nodules in clinical practice

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Objective To explore the efficacy of deep learning-based artificial intelligence (AI) diagnostic platform on the detection of ground-glass nodules, and to validate its feasibility in clinical practice.

Method A total of 117 CT scans were retrospectively collected and enrolled in this study. These CT scans were reconstructed at the slice thickness of 1 to 1.25mm. The gold standard utilized in this study was annotated via the consensus of two senior radiologists with over 15 years of reading chest CT images; a third senior radiologists will make the final decision if there is a disagreement between the two radiologists when annotating ground-glass nodules. DL-based AI diagnostic platform from Infervision was used to detect ground-glass nodules in this study; the detected true positive nodules, false positive nodules and false negative nodules were recorded for statistical analysis. Sensitivity and false positive rate (false positive nodules per CT scan were calculated. Chi-square test was utilized for statistical analysis, $p<0.05$ was considered as significantly different.

Results A sum of 147 ground-glass nodules were annotated in the gold standard. AI diagnostic platform detected 356 ground-glass nodules with the sensitivity of 90.48%. There were 223 false positive nodules detected by AI platform and the false positive rate turned out to be 1.91/CT.

Conclusion DL-based AI diagnostic platform demonstrated a decent sensitivity for detection of ground-glass nodules in the clinical practice.

EPO-0704

MR 延迟增强评估左心房纤维化与肥厚性心肌病左心室应变的相关性

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目的：探讨肥厚性心肌病（HCM）患者的左心房（LA）纤维化程度与左心室（LV）参数变化的相关性。
方法：利用具有心脏电影功能 3.0T MRI 设备对 14 例 HCM 患者进行左心房及左心室钆剂晚期增强（LGE）扫描成像。记录钆剂晚期增强左心房的体积、质量、应变与左心室测量参数的相关性，同时记录其临床相关体征及药物使用情况综合分析左心房与左心室相关参数的相关性。本研究经过医院伦理委员会审批并同患者签署知情同意书。
结果：经过 MR 钆剂晚期增强扫描 14 例患者中 12 例（85.7%）出现左心室存在晚期强化，在研究的所有患者左心房均出现晚期强化。进行相关分析发现左心房纤维化程度与左心室晚期强化的百分率存在显著相关性（r=0.63，p＜0.05），但与左心室质量极最大壁厚无关。左心房纤维化程度与左心室应变减低也存在一定的相关性（横向：r=0.50，p=0.012；周长：r = 0.48，p＜0.05；纵向：r = 0.51，p＜0.05）。左心房收缩期容积增加与左心室舒张末期的容量存在相关性（r = 0.50，p＜0.05）。接受过肾素-血管紧张素-醛固酮系统（RAAS）治疗的患者与未接受的患者左心房延迟强化程度显著降低（19.6%vs 11.8%，p＜0.05）。
结论：通过钆剂延迟强化测量发现左心房纤维化在肥厚型心肌病病中普遍与左心室应变参数变化相关。

EPO-0705
心脏磁共振组织追踪技术评价原发性高血压患者左室心肌应变的研究

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目的 用心脏磁共振组织追踪(CMR-FT)早期发现原发性高血压患者心脏亚临床收缩功能异常，并评估左室应变的影响因素。方法 前瞻招募 57 名原发性高血压者（43.04±10.90 岁；35 男）和 26 名健康者（38.69±10.44 岁；11 男）。高血压组患者 EF 值均正常（≥50%）。t、 U 或卡方检验比较组间差异。用单及多因素线性回归评估左室应变与影响因素间关系。应变参数一致性用组内相关系数（ICC）及 Bland -Altman 图评估。结果 与健康组比，高血压组左室心肌应变降低（整体径向应变（GRS）：35.14±7.27% VS 42.14±7.80%；整体环向应变（GCS）：-19.64±2.46% VS -21.87±2.42%；整体纵向应变（GLS）：-16.48±2.34% VS -17.85±1.83%）；EF 在两组间无差异。高血压组单因素线性回归发现降低 GRS、GCS、GLS 均与平均动脉压（MAP）和左室心肌质量指数（LVM/BSA）存在线性相关。多因素线性回归调整年龄、性别、BSA、高密度脂蛋白和 LVM/BSA 等因素，MAP 对左室心肌应变（GRS、GCS、GLS）的影响仍然有统计学意义。在多因素线性回归模型，GRS 与 MAP 和 LVM/BSA 独立相关（β=-0.219，P=0.009 和β=-0.224，P=0.015；调整 R2=0.4）；GCS 也与 MAP 和 LVM/BSA 独立相关（β=0.084，P=0.002 和β=0.073，P=0.01；调整 R2=0.439）；GLS 与年龄和 MAP 独立相关（β=0.065，P=0.021 和β=0.077，P=0.009；调整 R2=0.289）。应变参数观察者内和观察者间的 ICC 值均＞0.75。结论 心肌应变能早期发现心肌损伤， 先于 EF 出现异常，可望成为预防干预靶点。原发性高血压患者，MAP 升高可能对左室心肌应变有不利影响。CMR-FT 有潜力定量分析心脏运动

EPO-0706

心尖肥厚型心肌病合并和不合并左室心尖部室壁瘤的临床及 CMR 特点的比较研究

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目的：总结分析心尖肥厚型心肌病（Apical Hypertrophic Cardiomyopathy, ApHCM）合并左室心尖部室壁瘤（Left Ventricular Apical Aneurysm, LVAA）的临床及 CMR 特点，并与 ApHCM 不合并 LVAA 的患者进行比较。
方法：回顾性纳入 2010 年 1 月至 2017 年 12 月期间在我院经 CMR 诊断为 ApHCM 合并 LVAA 的患者 25 例，同时期内按性别、年龄匹配 25 例 ApHCM 不合并 LVAA 的患者。收集患者的临床基线资料及 CMR 结果进行分析。
结果：ApHCM 合并 LVAA 以中老年男性多见，多数患者（92%）伴有临床症状，如胸闷、胸痛、心悸及呼吸困难等，12%的患者有肥厚型心肌病家族史。常见心电图改变包括 ST-T 段改变、T 波倒置及左室高电压。超声诊断 LVAA 漏诊率达 68%，其中 88.2%为小室壁瘤。与 ApHCM 不合并 LVAA 组比较，ApHCM 合并 LVAA 组有更多的患者合并左室中部梗阻及心尖部心腔闭塞，差异具有统计学意义（*P* 值均＜0.05）。76%的患者出现瘤壁透壁性强化，出现瘤壁透壁性强化的室壁瘤大小（22.0±10.8mm）与未出现透壁性强化的室壁瘤大小（11.7±4.0mm）比较，其差异具有统计学意义（*P*=0.033）。
结论：ApHCM 合并 LVAA 有一定的临床及心电图特征，CMR 可以全面、客观及准确地评价 ApHCM 伴 LVAA，是目前临床上评估此类疾病的最佳影像学诊断方法。

EPO-0707

The association between the involvement of LAD with the Improvement of right ventricle myocardial strain for STEMI patients with culprit vessel of RCA

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Purpose
To demonstrate the RV myocardium’s change at the 3-month post-STEMI on RCA patients between those with and without the involvement of LAD.
Methods
A number of 32 (M/F: 29/3, age: 53 [47-62] yrs) patients with STEMI and whose culprit vessel included RCA were prospectively include from 2016 to 2017. Consent was acquired from each patient. The baseline MRI was arranged 4-7 days after the primary PCI and the second at 3 months follow-up. Imaging analysis was performed on Cvi 42 (V5.9.3 Canada). Endocardium and epicardium were delineated carefully at the free wall of RV at the diastole on both the short-axis cine images and RV two-chamber images. Peak radial (RVPRS) and circumferential strain (RVPCS) were extracted from the 2D short images and the peak longitudinal strain (RVPLS) was derived from the RV two-chamber views. Patients with more than 50% LGE involvement of the anterior-septal segments

were considered with LAD involvement. Box-plot was used to qualitatively evaluate the change between the twice MRI.

Results

Patients were divided into two groups according to the involvement of LAD (LAD vs non-LAD: 18 vs 14). Figure 1 demonstrated the change between the twice MRI for the two groups. Numerical improvements could be seen in RVPRS, RVPCS, and RVPLS for patients with no involvement of LAD, while for patients with LAD involvement, the RV peak strains didn't show prominent improvement especially the RVGLS. However, no statistical difference was found for both groups. The LGE percentage showed a significant difference between the two groups (LAD vs non-LAD: 78.03% vs 19.04%, P <0.0001).

Conclusion

The LAD involvement might affect the RV myocardial improvement for STEMI patients with culprit vessel of RCA, further studies were needed to demonstrate the mechanism, as well as whether it could help predict the prognosis for these patients.

EPO-0708

Diffusion-weighted Imaging in Hypertrophic Cardiomyopathy: Association with High T2-weighted signal intensity in addition to late gadolinium enhancement

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Diffusion-weighted imaging (DWI) has been confirmed to be associated with late gadolinium enhancement (LGE) in hypertrophic cardiomyopathy (HCM). In this context, we aimed to study whether DWI could reflect the active tissue injury and edema information of HCM which were usually indicated by T2 weighted images. Forty HCM patients were examined using a 3.0 Tesla magnetic resonance scanner. Cine, T2-weighted short tau inversion recovery (T2-STIR), DWI and LGE sequences were acquired. T1 mapping was also included to quantify the focal and diffuse fibrosis. Cardiac troponin I (cTnI) was tested to assess the recently myocardial injury. Student's t-test, Mann-Whitney U test, One-way analysis, Kruskal-Wallis analysis, the Spearman correlation analysis, and multivariable regression were used in this study. The apparent diffusion coefficient (ADC) was significantly elevated in the cTnI positive group (P = 0.01) and correlated with LGE (ρ = 0.312, P = 0.049) and HighT2 extent (ρ = 0.443, P = 0.004) in the global level. In the segmental analysis, the ADC significantly differentiated the segments with and without HighT2/LGE presence (P = 0.00). The average ADC values were higher in segments with HighT2 and LGE coexistence than in those with only LGE presence ($p < 0.05$). Multivariable regression indicated that segmental HighT2 and LGE were both contributing factors to the ADC values. In this study of HCM, we confirmed that ADC as a molecular diffusion parameter reflects the replacement fibrosis of myocardium. Moreover, it also reveals edema extent and its association with serum cTnI.

EPO-0709

CMRI 一站式定量评估肥厚型心肌病患者心肌应变和纤维化与心肌损伤标志物的相关性研究

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目的：探讨 HCM 患者心肌应变、LGE-MRI 定量的心肌纤维化程度和其影响因素，以及与心肌损伤标志物（AST、LDH、CK、CK-MB、hs-cTnT、NT-proBNP）之间的潜在相关性。**方法：**测量 80 例 HCM 患者（LGE（+）n=45；LGE（-）n=35）和 35 例对照组左、右心室和左心房的心功能参数、心肌整体应力值及左心室 总 LGE 率（%）/LGE 体积和 LGE 质量。比较三组间 CMR 参数和心肌损伤标志物差异、相关性。**结果：**①HCM 患者存在多个心肌酶值异常，其中，和 LGE（-）组相比，LGE（+）组 hs-cTnT、NT-proBNP 升高，P<0.01。②和 HC 相比，HCM 两组 LVEF 和 RVEF 升高，而 LGE（-）组左心室 GLS 下降，LGE（+）较 HC 及 LGE（-）组左心室 GLS、GRS 和 GCS 下降； 和 HC 组相比，LGE（-）和 LGE（+）组 LAEF 和 PLAS 下降，P<0.01，但 HCM 两组之间无显著差异，三组之间右心室应力无差异。③相关性分析：心肌总 LGE（%）与 LVEF、GRS 呈负相关，与 CLS、GCS 呈正相关；总 LGE（%）与 hs-cTnT、NT-proBNP 呈正相关；GLS 和和 LVEF 呈正相关，和 NT-proBNP 呈负相关。④多元线性回归分析：总 LGE（%）和 hs-cTnT 独立相关（ standardized β =0.436 , p =0.033)。**结论：**CMRI 一站式技术可定量评估肥厚型心肌病患者心肌应变和纤维化程度，有强化的 HCM 患者心肌整体应力水平受损更明显、心肌酶值异常，和强化程度著相关，且 LGE 定量的心肌纤维化和 hs-cTnT 独立相关，表明血浆 hs-cTnT 水平有助于 LGE 的早期发现，可能是心肌损伤的直接标志物，有助于 HCM 患者的早期诊断和预后干预。

EPO-0710

化学位移饱和成像在轻链型淀粉样变性患者中预测心肌延迟强化的准确性

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目的：探索平扫化学位移饱和成像（CEST）心脏磁共振技术在轻链型淀粉样变性患者中预测心肌延迟强化的准确性。
方法：研究前瞻性纳入 40 名病理诊断的轻链型淀粉样变性患者（年龄，56.2±9.4 岁；男/女，27/13；梅奥 0/I/II/III 期，17/8/9/6），行心脏磁共振扫描，包括 CEST，T1 mapping 等新技术及电影、延迟强化等传统序列。用商业化后处理软件测得心肌总体 CEST 信号值、平扫 T1 值、细胞外容积（ECV）值。以延迟强化有无为金标准，绘制 ROC 曲线。
结果：无延迟强化、斑片状延迟强化、弥漫延迟强化患者分别 9、11、20 名。平扫 T1 值≥1409ms 时，预测延迟强化敏感性为 83.3%，特异性为 100%，曲线下面积 0.944。CEST 值≤0.1235 时，预测延迟强化敏感性为 97.6%，特异性为 55.5%，曲线下面积 0.757。
结论：平扫 CEST 心脏磁共振技术可预测心肌延迟强化，但准确性仍低于平扫 T1。

EPO-0711

探讨 3.0T 磁共振特征追踪技术在慢性肾功能衰竭致心肌损伤中的应用价值

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目的：应用 3.0T 心脏磁共振特征追踪技术(Cardiovascular Magnetic Resonance Feature Tracking, CMR-FT)定量评价慢性肾功能衰竭患者左心室心肌应变各参数的变化情况，旨在探讨 CMR 早期、无创性诊断慢性肾功能衰竭致心肌损伤的可行性。材料及方法：收集川北医学院附属医院 2017 年 1 月-2019 年 1 月期间符合纳入及排除标准的慢性肾功能衰竭患者 43 例，其中男性 25 例，女性 18 例，平均年龄 50.61±8.81 岁，同时纳入 25 例健康志愿者作为对照组。所有纳入者均行 3.0T CMR 检查，分析慢性肾功能衰竭组与正常组左心室功能整体（径向、周向及纵向）峰值应变(Peak strain, PS）间的差异。结果：慢性肾功能衰竭组室间隔厚度（interventricular septum thickness, IVST）及左心室质量(left ventricular mass, LVMass)大于正常对照组，差异有统计学意义（All P＜0.05）；而左心室射血分数(left ventricular ejection fraction, LVEF)及左心室心输出量(left ventricular cardiac output, LVCO)均未见统计学差异（All P＞0.05）。整体心功能方面，慢性肾功能衰竭组左心室整体纵向 PS 低于正常对照组(-14.05±2.15% vs. -15.61±3.01%, P=0.046）。结论：CMR-FT 可 LVEF 正常的情况下早期、定量评价慢性肾功能衰竭患者左心室心肌功能障碍;左心室整体纵向 PS 有望为临床早期诊断慢性肾功能衰竭致心肌损伤提供影像学依据及量化标准。

EPO-0712

Diagnostic value of myocardial strain in left ventricular non-compaction based on CMR tissue tracking

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Purpose
To explore myocardial deformation pattern of left ventricular non-compaction and diagnostic value of myocardial strain based on cardiac magnetic resonance tissue tracking (CMR-TT).
Methods
We retrospectively enrolled 23 patients with LVNC in our hospital and 20 normal people were included as control group. CVI[42] was used to measure global radial strain/circumferential strain/longitudinal strain (GRS/GCS/GLS) and regional myocardial strains (base, mid-cavity, apex) and segmental strains. We calculate the number of non-compaction segments, the ratio of non-compaction (NC) to compaction(C) myocardium, NC mass percentage and distribution of late gadolinium enhancement (LGE) in the left ventricular myocardium. Student *t*-test or Wilcoxon sign rank test was used to analyze the differences between patients and normal people, myocardial strain of NC and C myocardium. Spearman’s rank correlation test was used to analyze the correlation between myocardial deformation and severity of LVNC. Receiver operating characteristic (ROC) was used to evaluate the diagnostic efficacy of myocardial strain parameters.
Results

There were 31 NC segments in mid-cavity section and 49 NC segments in apex section in patients with LVNC. LGE was presented in 6 patients and their LVEF were all less than 50%. Compared with the control group, global and regional myocardial strains in patients with LVNC significantly decreased(P<0.001). And they had much lower left ventricular ejection fraction (LVEF) and higher left ventricular end-diastolic volume index (LVEDVI), left ventricular end-systolic volume index (LVESVI) and NC mass percentage than the control group(P≤0.001). However, there were no differences in mid-cavity strains and apical strains between NC and C myocardium(P>0.05). ROC showed NC mass percentage>17.5%, GCS<13.5% and GLS<11.1% were highly sensitive and specific to differentiate patients with LVNC from normal people. But there was no correlation between myocardial deformation and severity of LVNC.

Conclusions

CMR-TT can be an assistant method to diagnose patients with LVNC by assessing myocardial deformation damage. GCS and GLS may be important factors in differentiating LVNC patients from normal people.

EPO-0713

磁共振成像在心脏罕见心肌病诊断中的应用价值

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目的：探讨罕见心肌病的磁共振影像特点,为临床诊断及判断预后提供依据。
方法：回顾分析疑似少见心肌病并经临床及病理确诊病人 11 例，使用 GE1.5T HD -XT 磁共振扫描仪，心脏 8 通道相控阵线圈，采用回顾性心电门控技术及呼吸门控技术。CMR 平扫：采用 T2 TSE 序列行矢状位、冠状位、轴位扫描；采用 FIEST 序列行心脏电影序列扫描四腔心、两腔心、心脏短轴及左室流出道、流入道层面；采用黑血序列扫描心脏短轴位。 CMR 首过灌注扫描：注射造影剂钆特酸葡胺 0. 2 mmol/kg，速 度 3 mL/s 后 即 刻开始 扫 描 心 脏 短 轴 位，每 层 40 个周 期，采 集 3~ 5 层；CMR 延迟扫描：再次注射造影剂 0.1 mmol/kg，速度 1 mL/s 10 min 后开始扫描，采集左室短轴、两腔心、四腔心、三腔心层面，30 分钟内完成扫描。图像评估由两位影像主治医师以上盲法共同观察分析，以意见一致为评判标准。
结果：3 例心肌淀粉样变性表现为室壁增厚，左、右心室肌弥漫性粉尘样延迟强化。2 例乳腺癌化疗后 1 年及 1 例抗磷脂抗体累及心脏，左室心肌弥漫性运动减弱，室壁变薄，弥漫性透壁延迟强化。3 例致密化不全表现为左室心尖及游离壁心肌局部变薄，运动减弱,非致密化心肌呈栅栏状分布于心肌内层，未见延迟强化灶。2 例嗜酸性心内膜炎磁共振,表现为广泛心内膜下的延迟强化，心肌舒张运动受限，抗磷脂抗体综合征累及心脏 。
结论：磁共振作为一种无创性检查手段可评估各种类型心肌病，尤其在某些罕见心肌病的诊断及判断预后中发挥重要作用。

EPO-0714

心脏磁共振成像技术分析 2 型糖尿病患者左室心肌应变与 HbA1c 水平相关性的研究

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目的：基于多模态心脏磁共振技术定量评估 2 型糖尿病患者和健康对照者左室心肌应变参数值差异情况与 HbA1c 水平的相关性。方法：应用心脏磁共振电影成像、特征追踪技术、心肌标记等技术对 40 例 2 型糖尿病患者和 36 例健康对照者进行 3.0T 心脏磁共振扫描，并应用 CVI42 和 Argus 软件对扫描数据进行后处理分析，并研究相关参数值与 HbA1c 水平的相关性。行心脏磁共振扫描前，收集 2 型糖尿病患者和健康对照者的基线临床数据以及相关血生化指标。结果：反映左室心肌应变的相关参数值，如左室整体舒张功能、左室整体收缩功能、心肌应变率、运动速度、位移及扭转运动等参数，在 2 型糖尿病患者组中较正常对照者有显著差异，并与 HbA1c 水平有一定相关性。结论：2 型糖尿病患者左室心肌应变的改变与 HbA1c 水平有密切相关性，严格控制 2 型糖尿病的血糖水平将可能有助于改善左室舒张功能的降低，提高患者的生存质量。

EPO-0715
利用心脏磁共振特征追踪技术探究左心室心肌应变参数对急性心肌炎患者的诊断价值

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目的：本研究利用心脏磁共振特征追踪技术，对比分析急性心肌炎患者与健康对照组在常规心功能参数及心肌应变参数上的差异，探究左心室心肌应变参数对急性心肌炎患者的诊断价值。
临床资料与方法：收集邵逸夫医院 2014 年 1 月至 2018 年 12 月收治的 41 例临床诊断急性心肌炎患者作为病例组，招募同时段的体检患者及健康志愿者作为对照组，所有 CMR 图像在 CVI[42]软件上进行后处理，获得包括 LVEDV、LVEDVI、LVESV、LVESVI、SV、SVI、LVEF 、GRS、GRSr、GCS、GCSr、GLS、GLSr 在内的左室心肌应变参数，比较两组间的差异分析，确定心肌应变参数的诊断价值。
结果：急性心肌炎患者的 LVESV、LVESVI 高于对照组（LVESV：62.03±27.07vs.45.13±12.32 mL，p=0.004；LVESVI：35.22±17.12vs.26.73±7.62 mL/㎡，p=0.044），LVEF 低于对照组（57.00±14.70vs.65.36±6.09 %，p=0.023），但平均 LVEF＞50%；急性心肌炎组的 GRS、GRSr、GCS、GCSr 均显著低于将康对照组（GRS：22.95±9.88vs.33.87±13.95 %，p＜0.001；GRSr：1.26±1.67vs.2.06±1.58 /s，p=0.025；GCS：-15.01±4.32vs.-18.96±3.30 %，p＜0.001、GCSr：-0.87±0.27vs.-1.02±0.17/s，p=0.004），而 GLS、GLSr 不存在统计学差异。通过绘制 ROC 曲线发现 GRS 的诊断灵敏度及准确率最高，分别为 70.7%、73.6%，GCSr 的特异度最高为 93.5%。
结论：（1）急性心肌炎患者的收缩功能径向及环向心肌应变参数受损，但收缩功能受损程度较轻。
（2）GRS 的诊断灵敏度及准确率最高，GCSr 的特异度最高。

EPO-0716
Feasibility Study of Whole Heart T1 Mapping with SMS in A Single Breath Hold

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Aim: Myocardial T1 mapping is of high importance for the detection of diffuse fibrosis and other myocardial diseases. The modified look-locker inversion recovery (MOLLI) method can only acquire one single slice T1 map in each breath hold (BH) [1]. Recently, an accelerated T1 mapping approach was introduced using simultaneous multi-slice (SMS) imaging technique based on MOLLI approach, which can only cover 1 to 3 slices of the heart in a single BH [2]. This study aimed to propose a novel single BH whole-heart T1 mapping technique based on SMS technique.

Method: To achieve whole heart T1 mapping, a modified saturation recovery (SR) prepared pulse sequence was implemented with SMS technique using balanced steady state free precision (bSSFP) readout kernel, the images were then reconstructed using the slice-GRAPPA algorithm[3]. Both SMS method (multiband factor (MB)=1 and MB=2) and MOLLI method were performed on fifteen normal controls and three patients with old myocardial infarction, on a 3.0T scanner (uMR 790, UIH, Shanghai) with a 24-channel body coil. Mean value of the native T1 map, post contrast T1 map of short-axis slices of the whole heart were calculated and compared.

Result: With MB factor = 2, whole heart T1 maps of 12 short-axis slices at the same cardiac phase can be acquired within one single BH. Our initial results show that in healthy subjects, both the native map and post contrast t1 map values were ranked as: MOLLI<MB=1<MB=2, which might be due to an overestimation of the T1 value of the SMS technique. However, there was no difference in the mean root mean square error (RMSE) across different slices between the SMS and MOLLI method, which indicated that there was a similar consistency of the SMS method as MOLLI. Results in three patients also indicated that the SMS technique might help distinguish lesions in myocardium, despite a lower SNR.

Conclusion: These findings indicated that our whole heart T1 mapping technique might be as accuracy as MOLLI method, and enable a larger coverage and faster acquisition speed in clinic. A clinical evaluation of myocardial fibrosis and other myocardial disorders using this proposed whole heart T1 mapping method is under the way.

EPO-0717

Di use myocardial characteristics of daunorubicin-induced cardiotoxicity by native T1 mapping: an animal study

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Object

The aim of this study is to quantitative evaluation diffuse myocardial characteristics of daunorubicin-induced cardiotoxicity in rabbit model with different cumulative dose and time point by native T1 mapping, and further to explore the association between myocardial injury and different conditions.

Materials and methods

The cardiotoxicity cardiomyopathy rabbit model was generated by injecting 24 adult New Zealand rabbits with 3-4mg/kg of daunorubicin weekly for 2-4 weeks. Cine imaging and pre-contrast T1-mapping CMR using a prototype modified MOCO sequence on a clinical 3-T scanner were performed on all subjects, including 8 control rabbits. Cardiac structure, function, and native T1 values were measurement at baseline and at 2, 4 weeks after different degree of doxorubicin administration.

Results

There were four rabbits (16.7%) occurred LVEF decreased among all of modeling rabbits. For the different time point groups, the cardiotoxicity rabbits with 4mg/kg weekly at 2 and 4 weeks were significantly higher than those measured at baseline (native T1 values: 4 weeks, 1273.25±96.05ms; 2 weeks, 1247.65±38.52ms; baseline, 1119.78±49.48ms; all $p < 0.017$). For the different dose groups, the cumulative dose group with 40-50 mg have higher T1 values than group with 30-40mg (native T1 values: 1289.68 ± 83.16ms vs. 1222.16 ± 75.54ms, $p < 0.05$), but there is no significant difference between groups with cumulative dose with 20-30mg and 30-40mg.

Conclusion

Native T1 mapping is useful for characterizing doxorubicin-induced cardiomyopathy, especially detection of early diffuse myocardial injury. The higher cumulative dose and longer time, the more severe the effect on myocardium. And further monitor study is ongoing.

EPO-0718

T1 mapping and feature tracking by cardiac magnetic resonance in identification and assessment of left ventricular remodeling in severe aortic stenosis: comparison with histology

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Purpose: Multiparametric cardiac magnetic resonance (CMR) imaging was used to investigate left ventricular (LV) remodeling and myocardial fibrosis (MF) in patients with severe aortic stenosis (SAS), as well as validated findings by using histologic confirmation.

Methods: We prospectively enrolled selected 49 patients with SAS and 20 healthy controls, who underwent both CMR and transthoracic echocardiography (Echo) before surgical aortic valve replacement (AVR). A 3.0-T MRI, including non and post-contrast T1 mapping for extracellular volume (ECV) or indexed ECV (iECV) and CMR feature tracking (FT-CMR) for LV strain, was carried out to assess the fibrosis and structural

alterations of the LV remodeling progression. Correlation between T1-derived parameters coexist with LV strain and the degree of fibrosis was assessed by myocardial biopsy specimens obtained by AVR.
Results: The SAS patients had a higher left ventricular mass index (LVMi) than control group (166.03±65.78 vs 36.09±6.97, p<0.001). Pearson's correlation with LVMi were observed for longitudinal global strain (r=-0.71 p<0.001), native T1 (r=0.32, p=0.025), ECV (r=0.182, p=0.21) and iECV (r=0.637 p<0.001). In univariate analysis, there were higher native T1, iECV and GLS values. In multivariate analysis, GLS and iECV values were associated with SAS. iECV and GLS correlated with the degree of fibrosis as assessed by histology (r = 0.634, p = 0.011 and r = 0.517, p = 0.049, respectively), while native T1 (r = 0.325, p=0.273), and ECV (r = 0.014, p = 0.959) did not.
Conclusion: iECV, not ECV and GLS as assessed by CMR was correlated with LVMi and the degree of diffuse MF in patients with severe AS. iECV and GLS as assessed by CMR could be an ideal surrogate marker for diffuse MF in patients with severe AS.

EPO-0719
基于心脏磁共振电影成像快速评价保留射血分数的肥厚型心肌病患者双心房结构及功能改变的临床研究

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目的 采用心脏磁共振电影成像技术快速定量评价保留射血分数的肥厚型心肌病（hypertrophic cardiomyopathy, HCM）患者的双心房局部及整体形变。 方法 前瞻性纳入 2015 年 7 月—2019 年 3 月的在我院进行检查、诊断为肥厚型心肌病，心脏磁共振后处理左心室射血分数（left ventricular ejection fraction ，LVEF）大于等于 50%患者 26 例，为肥厚型心肌病组（HCM 组）；同时选取该时期在我院行心脏 MRI 检查的 21 名健康志愿者为对照组；测量 HCM 组及对照组双心房指标，包括左、右心房收缩期末及舒张期末纵径、横径及面积。 结果 HCM 组左心房收缩期及舒张期末纵径、横径与面积均大于正常对照组，左心房纵径、横径及面积变化率均小于正常对照组，差异有统计学意义（P<0.05）；HCM 组右心房收缩期及舒张期末纵径、横径与面积与正常对照组比较差异均无统计学意义（P>0.05），HCM 组右心房收缩期及舒张期末纵径、横径与面积变化率与正常对照组比较，差异亦均无统计学意义（P>0.05）。 结论 采用心脏磁共振电影成像技术能够快速评价保留射血分数的肥厚型心肌病患者双心房结构及功能的改变，在左室射血功能正常的患者就出现了左房功能的降低。

EPO-0720
Application of the One-stop Cardiac CT scan on 256-row wide detector Revolution CT in myocardial ischemia of Silent Myocardial Ischemia diagnosis

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ObjectiveTo evaluate the diagnostic performance of one -stop cardiac CT myocardial perfusion imaging(CT-MPI) combined with coronary artery angiography (CCTA) for the detection of functionally relevant myocardial ischemia of silent myocardial ischemia (SMI).**Methods**Totally 149(149/480) patients suspect of SMI were prospectively enrolled from January 2017 to December 2018 in our hospital. All patients underwent CT-MPI and CCTA on a wide detector Revolution CT. Myocardial blood flow (MBF) was quantified and compared between perfusion normal and abnormal myocardial segments. Radionuclide myocardial perfusion imaging(MPI) as the gold standard, the diagnostic accuracy of CT-MPI, CCTA, and CT-MPI combination with CCTA in the diagnosis of myocardial ischemia of DHVD with hemodynamic stenosis was evaluated.**Results**All patients underwent CCTA combined with CT - MPI examination, 94 patients(63.09%) with 248 myocardial segments(15. 28%) were detected blood perfusion coming down,, the MBF value was lower than that of normal segments [(82.61±19.81) mL • 100mL- 1 • min - 1 V S (118.43± 25.18) m L • 1 0 0 m L - 1 • m i n - 1 ;t=14.12, P<0.001].There were 2617 segments (97.58%) who sequality can be used for the diagnosis in CCTA, 413 (15.40%) segments have clinical significance in this study. Compare with the MPI, the diagnostic sensitivity, specificity, positive and negative predictive value of CT - MPIfor myocardial ischemia of SMIwere 75.33% 、73.21% 、86.83%、71.02% respectively ,89.97% 、69.25% 、86.40%、73.29% for CCTA, 86.37% 、71.24% 、89.09%、69.71% combine with CT - MPIand CCTA. **Conclusion:**Both good CCTA and CT - MPI images can be obtained at the one stop scanning by Revolution CT. Revolution CT can accurately measure myocardial hemodynamic changes, and provide imaging evidence for the diagnosis and treatment of SMI.

EPO-0721

Cardiac energetics alteration in chronic hypoxia rat model: a non-invasive in vivo 31P magnetic resonance spectroscopy experimental study

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Purpose: Energetics alteration plays a key role in the process of myocardial injury in chronic hypoxic diseases (CHD).31P magnetic resonance spectroscopy (MRS) can investigate alterations in cardiac energetic in vivo. This study was aimed to characterize the potential of 31P MRS in evaluating cardiac energetics alteration of chronic hypoxia rats (CHR).
Materials and Methods: Thirty CHR were induced by SU5416 combined with hypoxia. 31P MRS (Bruker BioSpec 7.0T) was performed weekly (0-5 week) to follow-up the ratio of concentrations of phosphocreatine (PCr) to adenosine triphosphate (ATP) (PCr/ATP). The index of myocardial structure and systolic function, including the left ventricular function (LVEF) and the right ventricular function (RVEF), were also measured by magnetic resonance imaging (MRI) in each rat. The myocardial injury was shown based on hematoxylin and eosin (H&E) staining and Masson’s trichrome staining.
Results: Along weeks, the resting cardiac PCr/ATP ratio decreased from 0 to 5 weeks of modeling. The ratio dropped more markedly after injection of isoproterenol and

recovered slowly thereafter. The declension of resting cardiac PCr/ATP ratio in CHR can be observed at the first week, compared with the healthy ones((3.92±0.43vs.4.48±0.56, P＜0.05). While the LVEF and RVEF in CHR was similar to healthy rats. Also, the myocardial injury cannot be observed in the first week. Conclusions: 31P MRS can sensitivily reveal the cardiac energetics alteration in CHD before the onset of myocardial injury and ventricular dysfunction.

EPO-0722
心脏磁共振快速流程在心脏病中的应用价值

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目的 探讨心脏磁共振快速成像流程在心脏疾病诊断中的应用价值。方法 前瞻性纳入 158 例心脏病患者，每位患者均接受心脏磁共振标准流程检查和心脏磁共振快速流程检查。记录每种检查总时长，并比较分析两种成像方法图像质量评分，优质图像，形态学表现一致性，心功能一致性，诊断一致性，并进行统计学分析。结果 根据超声心动图结果对每位心脏病患者进行心功能分级，分成心功能正常组，轻度心衰组，中度心衰组，重度心衰组。心脏磁共振快速流程检查总时长小于心脏磁共振标准流程检查，具有统计学差异[651±37s 比 2129±173s, P=0.000]。对心功能正常组、轻度心衰组、中度心衰组，传统心脏磁共振成像获得的图像质量评分均显著大于快速流程（P＜0.05）。对于重度心衰组，快速流程获得图像质量评分显著大于传统磁共振成像（P＜0.05）。对于心功能正常组、轻度心衰组、中度心衰组，两种检查方式获取优质图像发生率无统计学差异（P＞0.05），对于重度心衰组，心脏磁共振快速流程检查获取可满足诊断的图像发生率显著大于标准流程成像（P＜0.05）。111 例患者两种成像方式获取的图像均能够满足诊断需求，对于形态学显示率均无统计学差异（P＞0.05），Kappa 值 0.768-1.0。两种检查方法在左心功能评价中无明显统计学差异（P＞0.05,Kappa 值 0.730-0.933。标准电影成像心功能分级与单次屏气下压缩感知电影成像心功能分级相比 kappa 值为 0.756，分别为心功能正常 52.3%比 51.4%，轻度心衰 10.8%比 5.4%，中度心衰 6.3%比 14.4%，重度心衰 30.6%比 28.8%。两种成像方法在心脏疾病诊断中 Kappa 值 0.899。结论 较标准流程成像相比，快速流程成像能够用较短的时间有效评价心脏组织学特征、左心功能，两者在心脏病的诊断中一致性较高，对于重度心衰而无法进行呼吸配合的患者，快速流程优于磁共振标准流程。

EPO-0723
磁共振心肌首过灌注对经皮冠状动脉介入术后心肌微循环障碍的价值

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目的 探讨 MR 心肌首过灌注成像在评估经皮冠状动脉介入术（PCI）后心肌微循环障碍的价值。**方法** 收集行 PCI 治疗的患者 30 例，术前、术后均行心脏磁共振（CMR）心肌首过灌注检查，将右冠状动脉、前降支、回旋支作为独立血管，测量各供血区域的灌注参数（达峰时间 T、峰值信号强度 SI、心肌信号强度最大上升斜率 S_{max}），计算各参数的测值差值（术后-术前），与患者 PCI 术中溶栓治疗临床试验（TIMI）评分进行对比研究，了解两种检查方法的相关性及一致性。**结果** 30 例患者共 90 支评价血管，手术血管 36 支，TIMI 评分≤2 级的血管共计 19 支，对不同血流评分的

T、SI、Smax 指标测值差值进行单因素方差分析，结果示不同组的 T、SI、Smax 指标测值差值 P＜0.05，差异均有显著性，再进一步进行 LSD 法两两比较，各组间的 T、SI、Smax 指标测值差值 p＜0.05，差异均有统计学意义。**结论** 磁共振心肌首过灌注能准确、灵敏地发现心肌微循环障碍，且特异性较高、可重复性好，可作为冠心病患者 PCI 术后早期确诊心肌微循环障碍及心肌微循环疗效评价方法。

EPO-0724

Myocardial deformation assessment in patients with isolated left ventricular non-compaction using deformable registration of cine MRI: Comparison with feature tracking

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Objective: To evaluate cardiovascular magnetic resonance based on a deformable registration algorithm (DRA) and feature tracking (FT) in quantitation of LV myocardium deformation in patients with isolated left ventricular non-compaction (iLVNC) and the accuracy of diagnosis.
Methods: We recruited 30 patients with iLVNC and 50 healthy volunteers to undergo cardiovascular magnetic resonance on a 1.5T MR scanner (MAGNETOM Aera, Siemens Healthcare, Erlangen, Germany). Cardiac cine images of short-axis, long-axis (2- 3- and 4-chamber) were acquired. A prototype post-processing software TrufiStrain (version 2.0, Siemens Healthcare, Erlangen, Germany) based on DRA was used for the myocardial strain analysis. The same datasets were analyzed by FT method using the commercially available software (Medis Suite, version 3.1, Medis Medical Imaging Systems, Leiden, The Netherlands). Global and segmental strain of radial, circumferential and longitudinal directions were semi-automatically calculated. All three available long-axis orientations (2-, 3-, and 4-chamber) were used to quantify global and segmental longitudinal strain. The global longitudinal strain was calculated based on the average of the peak systolic global longitudinal strain from the three long-axis orientations. Short-axis views were used to analyze radial or circumferential strain, including LV basal, mid-ventricular, and apical levels.
Results:
(1) The absolute values of global longitudinal strain(GLS), radial strain(GRS), and circumferential strain(GCS) derived from DRA were lower in the iLVNC group than those in the control group[GLS:(－11.9±3.9)% vs. (－14.5±1.4)%;GRS: (26.3±11.0)% vs.(37.6±7.2)%;GCS:(－12.1±4.2)% vs. (－16.4±1.6)%;p＜0.01 for all];The absolute values of GLS,GRS,and GCS derived by FT were lower in the iLVNC group than those in the control group[GLS:(－17.8±6.4)% vs. (－23.3±2.8)%;GRS: (33.2±23.5)% vs. (56.9±16.4)%; GCS: (－15.5±6.6)% vs. (－22.5±2.6)%;p＜0.01 for all];The global strain values measured by the two methods had notable correlation (GLS:r=0.575,GRS:r=0.392,GCS:r=0.697,p＜0.01 for all);

(2) Among three global strain parameters derived from both DRA and FT, GRS had the highest AUC value in distinguishing patients with iLVNC from normal controls, with an AUC value of 0.850 and 0.854, respectively;
(3) In healthy volunteers,GRS,GCS,GLS measured by DRA, and GCS,GLS measured by FT had good intra- and interobserver agreement evaluated by ICC(all larger than 84%).Intra- and interobserver agreement of GRS measured by FT were not good(intra:0.39, inter:0.51);Intra- and interobserver agreement assessed by DRA were better than those by FT for each segment;
(4) In healthy volunteers,Bland-Altman plots demonstrated large difference and wide limits in GRS[difference:－19.4, limit of agreement(LOA):－48.5,9.8,p＜0.01]. The difference and limit in GLS and GCS were relatively small[GLS: (difference:8.8, LOA:4.3,13.3);GCS: (difference:6.1,LOA:2.3,9.9);p＜0.01 for all].
Conclusion:
Both DRA and FT can reveal the impaired myocardial strain of the left ventricle in patients with iLVNC. Global strain values measured by DRA and FT can distinguish patients with iLVNC from healthy volunteers with high diagnostic abilities.. The reproducibility of both global and segmental strain measured by DRA are better than those measured by FT, and strain values by DRA and FT have good consistency with GCS and GLS.

EPO-0725

Quantitative assessment of double ventricular strain in patients with myocarditis using Cardiovascular magnetic resonance feature tracking techniques : a preliminary clinical study

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Purpose: The present study aims to assess the double ventricular myocardial systolic strain in patients with myocarditis using cardiac magnetic resonance feature-tracking (MR-FT) and their underlying relationships with clinical parameters. **Methods:** We recruited 40 patients with myocarditis and 30 healthy volunteers to undergo CMR examinations. Then we used the routine cine images and MR-FT to analyze the double ventricular myocardial global systolic strain and the strain rates. The patients were divided into two groups according to the left ventricular ejection fraction (LVEF) (group 1-LVEF ≥ 50%, group 2-LVEF < 50%). Before the CMR examination, we collected the baseline clinical and biochemical indices. **Results:** The values of LVGLS、LVGCS、LVGRS and RVGLS were significantly lower in the myocarditis group(LVEF < 50%) than those in the group (LVEF ≥ 50%) and control group [LVGLS：（-7.7±4.3）%、（-13.1±2.0）%、（-15.2±2.0）%; LVGCS：（-10.1±4.6）%、（-19.8±1.9）%、（-21.5±2.2）%; LVGRS：（13.1±8.3）%、（30.9±4.3）%、（38.5±9.1）%; RVGLS：（-15.9±5.3）%、（-19.6±4.8）%、（-19.8±3.5）%; P<0.05]. The values of LVGLS、LVGRS were lower in the myocarditis group(LVEF ≥ 50%) than those in control group[LVGLS：（-13.1±2.0）%、（-

15.2±2.0）%，P<0.05；LVGRS：（30.9±4.3）%、（38.5±9.1）%，P<0.01]. In the myocarditis group, the values of LVGLS、LVGCS and LVGRS had negative correlations with the BUN、CREA levels (P<0.05) ; the values of LVGLS、LVGCS、LVGRS and RVGLS had negative correlations with the BNP level (P<0.01) ; the value of LVGRS had a negative correlation with the CRP level (P<0.05).

Conclusion: Our results suggested that the left and right ventricular systolic function and systolic strain were impaired in the LVEF < 50% group. The left ventricular systolic strain was impaired in the LVEF ≥ 50% group either. We also found that there were negative correlation between the BUN、CREA、BNP、CRP levels and the left and right ventricular strain in patients with myocarditis.

EPO-0726
基于 IVIM 的磁共振成像对急性心肌梗死可挽救心肌 定量的实验研究

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目的：探讨基于体素内不相干运动（intravoxel incoherent motion，IVIM）的 MRI 技术对贵州小型猪急性心肌梗死模型定量评估微循环的可行性。**方法：**
对 10 只小型猪经股动脉置管于电视监视下建立冠心病急性心肌梗死模型。使用 GE3.0T 静音 MR（Discovery MR750W）分别于建模前 1h 及建模后 1-2h 内对实验猪进行在体 IVIM 成像，由 2 名从事心血管影像诊断的高年资医师采取双盲法对心脏 IVIM 图像质量评估等级。将原始数据传至后处理工作站并对正常区、心肌梗死周边区、心肌梗死区进行相应参数测量，其中较高年资者间隔 1 个月以上对相关参数进行第 2 次重复测量。数据测量完后将心脏取出做病理学检查。**结果：**图像质量评估一致性较好（Kappa=0.86）。心率越慢，图像成功率越高（P<0.05），体重及性别在各层面成像差异无统计学意义（P>0.05）。同一名医师重复两次测量以及两名医师分别测量左室心肌所得各参数的重复性和一致性均较好（ICC>0.75）。梗死心肌与梗死心肌周边区域 ADC_{fast}（D*）均低于正常区（P<0.05），而梗死心肌 ADC_{fast}（D*）又低于梗死心肌周边区域（P<0.05）。正常区 f 值高于梗死心肌周边区域（P<0.05），梗死心肌 f 值分别与周边区域及正常值间无统计学差异（P>0.05）。三组间 ADC_{slow}（D）均无统计学差异（P均>0.05）。ROC 曲线分析发现 D*值诊断疾病组的效能相较于 D 值和 f 值更高。病理结果中正常心肌、肿胀心肌及坏死心肌分别与心脏标本的正常区、梗死周边区及梗死区对应。**结论：**IVIM 技术定量评估小型猪急性心肌梗死模型的微循环具有可行性，其中 ADC_{fast}（D*）对急性心肌梗死微循环灌注信息的评价较其他参数效能更优。

EPO-0727
肥厚性心肌病左室结构及舒张功能的磁共振成像研究

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目的：舒张功能不全常见于肥厚型心肌病（ hypertrophic cardiomyopathy HCM）和高血压心脏病（hypertensive heart disease HHD），但有关于舒张功能不全与左心室参数之间的研究并不完善。我们的目的是通过运用心脏磁共振扫描来研究肥厚性心肌病、高血压心脏病和正常人的舒张功

能、左室壁最大厚度、左心室质量指数等各参数之间的关系。同时我们还评估了左心室的参数和舒张功能在晚期钆增强扫描中的关系，以及肥厚性心肌病病人的右心室肥厚情况。
方法：对 41 例 HCM 患者，21 例 HHD 患者和 20 例对照组进行研究。使用 CMR 测量达峰率（peak filling rate PFR），达峰时间（time to early peak filling rate TPF），最大左室壁厚度（ maximum left ventricular wall thickness MLVWT）和左心室质量参数（ left ventricular mass index LVMI）。 最后对 HCM 患者的 LGE 情况和 RV 形态进行评估。
结果：在 HCM（r=0.38；p=0.02）、HHD（r=0.58；p=0.01）和对照组（r=0.54；p=0.01）中，MLVWT 与 TPF 相关。HCM 中 MLVWT 和 TPF 的相关性比 HHD 弱。LVMI 与舒张功能无关。在 HCM 中，LGE 程度与 MLVWT（t=0.41；p=0.002）、TPF（t=0.29；p=0.02）有极大的相关性。伴有右心室肥厚的 HCM 患者比不伴有右心室肥厚的 HCM 患者的 MLVwt（P<0.001）和 TPF（p=0.03）更高。
结论：在 HCM，HHD 和对照组的 MLVWT 与舒张功能（TPF）相关。 LVMI 与 TPF 没有明显的相关性。HCM 的舒张功能障碍并不完全是因为室壁增厚的原因，LGE 和 RV 受累与 LV 舒张功能恶化有关，这进一步也提示了严重的潜在心肌紊乱及心肌纤维化可能导致舒张功能障碍

EPO-0728
128 层 PET-CT 同机融合显像新技术评价冠脉狭窄与心肌存活关系

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目的 探讨冠脉 CTA 显示冠状动脉狭窄与心肌 18F-FDG 代谢显像检测存活心肌之间的关系。方法 总结 2017 年 9 月至 2019 年 7 月皖北煤电集团总医院影像科与核医学科共同在 128 层 PET-CT 上开展冠脉 CTA 与心肌代谢显像同机融合检查 14 例患者，所有患者均在飞利浦 128 层 PET-CT 上行 18F-FDG 心肌代谢显像，显像成功后在该机器行冠脉 CTA 检查，数据传至飞利浦 PET-CT 工作站上进行后处理，依次进行左室功能分析、冠脉 CTA 重建、PET 心肌代谢重建、冠脉 CTA 重建与心肌代谢重建同机融合，根据融合图像评价冠脉三支血管分布区域心肌代谢的改变。结果 7 例检查者心肌代谢显像正常，冠脉 CTA 显像正常；6 例检查者心肌代谢显像显示左室前壁、前外侧壁心肌不同程度代谢减低或缺失，冠脉 CTA 显示前降支近、中段因混合斑块形成，致前降支不同程度狭窄，狭窄程度在 50-80%之间；1 例检查者是左主干闭塞后再通支架植入术后 7 个月，心肌代谢显像示左室前壁、前外侧壁代谢减低，右室壁心肌代谢代偿性增高，冠脉 CTA 显示左主干支架植入后，前降支、回旋支通畅，提示心肌因左主干闭塞后心肌损伤修复不良。结论 128 层 PET-CT 能开展冠脉 CTA 及心肌代谢显像同机融合新技术，为评价冠脉狭窄血管供血区域心肌存活度提供新的途径，能精准指导临床在冠心病治疗方案的选择。

EPO-0729
Timely reperfusion after acute myocardial infarction effectively protect the impaired myocardium evaluated by 7.0T MRI and histopathology

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Purpose: To evaluate the outcomes of different myocardial injury after acute myocardial infarction combined with magnetic resonance imaging (MRI) and histopathology.
METHODS: 60 rats were randomized into two groups (the ischemia group, left anterior descending coronary artery [LAD] ligation 30min and reperfused 2 hours; and the infarction group, LAD ligation permanent 3 hours), then experienced MRI scanning (Cine and LGE) at different times (acute and chronic [14 days]). The left ventricular (LV) function, strain (peak radial strain, PRS; peak circumferential strain, PCS) in LGE positive regions (LGE[+]) and LGE negative regions (LGE[-]), the infarct size (IS), myocardial signal intensity (SI) and segments were analyzed.
RESULTS: In acute phase, LGE showed IS significantly larger than that by TTC in the ischemia group (P=0.02). The absolute values of PSR, PSC were significantly lower than those in the LGE(-) in the ischemia group and those in LGE(+) in the infarction group (all $p<0.05$). LGE segments (%LV) decreased to 15.68 ± 0.11 % (p=0.001) and strain recovered to 44.53 ± 18.59 in PRS-LGE(+) (p=0.035) and -20.91 ± 5.04 in PCS-LGE(+) (p=0.018) when compared between acute phase and chronic phase in ischemia group.
CONCLUSION: The infarcted size, function and strain of the impaired myocardium after acute myocardial infarction would largely benefit from the timely reperfusion evaluated by MRI.

EPO-0730
心脏磁共振成像在左心室扩大疾病中的鉴别诊断价值

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目的 探讨钆对比剂延迟增强心脏磁共振成像在引起左心室扩大疾病中的鉴别诊断价值。方法 回顾性分析 2016 年 6 月~2019 年 2 月收治的 38 例左室扩大患者的 MRI 表现，所有病例均行钆对比剂增强心脏磁共振检查（LGE-CMR），测量左室舒张末期最大横径、左室壁各节段舒张末期厚度，观察心肌延迟强化的部分、程度及范围。结果 8 例扩张型心肌病表现为左室壁普遍变薄；12 例缺血性心脏病表现为肇事血管供血区心肌变薄；7 例心肌炎患者中，有 6 例表现为左室侧壁变薄，1 例表现为左室壁普遍变薄；6 例左心室心肌致密化不全中，有 4 例表现为左室游离壁致密化心肌变薄，2 例表现为心尖部变薄；1 例酒精性心肌病和 1 例围产期心肌病均表现为左室壁普遍变薄；3 例药物性心肌病表现为左室侧壁变薄。LGE 图像上 8 例扩张型心肌病患者中 6 例表现为室间隔肌壁间线样强化，2 例表现为室间隔及左室侧壁肌壁间点片状强化；12 例缺血性心脏病患者强化部位与肇事血管分布区一致，7 例表现为心内膜下强化，3 例表现为透壁性强化，2 例表现为心内膜下及透壁性强化并存；7 例心肌炎患者，4 例表现为室间隔肌壁间及左室侧壁心外膜侧强化，2 例表现为侧壁心外膜侧强化，1 例表现为左室壁弥漫心外膜侧强化；6 例左心室心肌致密化不全患者中，有 2 例表现为室间隔肌壁间线样强化，还有 4 例无延迟强化；1 例酒精性心肌病表现为室间隔及前壁肌壁间线状强化；1 例围产期心肌病无延迟强化；3 例药物性心肌病中，有 2 例无延迟强化，1 例表现为室间隔及下侧壁基底段肌壁间线状强化。结论 心脏磁共振检查能够为左心室扩大疾病提供有价值的资料，钆对比剂延迟强化能够为这些疾病提供有效的鉴别诊断信息。

EPO-0731
光谱 CT 心肌细胞外容积定量测量与 SECT 相比的可行性

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目的 评价光谱 CT(IQON)与单能量 CT(SECT)相比，在无对比采集的情况下获得心肌细胞外容积(ECV)和检测心肌细胞外容积(ECV)的可行性。方法 采用光谱 CT 测量心肌细胞外容积(ECV)，并与单能量 CT(SECT)进行比较。受试者(n=35)，局灶性心肌纤维化(n=17)，弥漫性心肌纤维化(n=10)，对照组(n=9)进行非对比和延迟采集，计算 SECT-ECV。使用延迟采集和导出的虚拟非对比度图像计算光谱 CT-ECV。在对照组和弥漫性心肌纤维化组中，用左心室的整个心肌来计算 ECV 值。局灶性心肌纤维化肿，2 个 ROI，1 个置于正常组织，1 个置于纤维化心肌组织。结果 SECT 法和光谱 CT 的中位 ECV 分别为 35.7%(IQR32.1-38.4%)和 37.8%(IQR35.2-40.2) (p=0.521)，对于这两种技术，局灶性心肌纤维化和弥漫性心肌纤维化的 ECV 值均明显高于正常心肌(均 P<0.05)。光谱 CT 与 SECT 之间无系统偏差(p=0.348)。SECT 的辐射剂量(1.1mSv)高于光 CT(p<0.001)，光谱 CT 对比剂剂量（20ml）低于 SECT（p<0.05）。结论 ECV 可用光谱 CT 测量，仅需延迟采集即可。与 SECT 相比，光谱 CT 在较低的辐射剂量下提供了类似的结果。

EPO-0732

Sex Differences in Type 2 Diabetes Mellitus-Related Left Ventricular Remodeling

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Introduction Type-2 diabetes mellitus (T2DM) can directly cause myocardial remodeling, typically represented as a decreased left ventricular (LV) cavity, an increased LV wall thickness, LV diastolic dysfunction and diffuse interstitial fibrosis, even in the absence of hypertension and coronary artery disease(1). However, sex difference in T2DM related LV structural, functional and interstitial remodeling is not well described. We aimed to explore the influence of sex on LV remodeling patterns of T2DM by using CMR cine and T1 mapping.

Method Sixty-two T2DM patients without history of cardiovascular disease or hypertension and 40 healthy controls were enrolled and underwent CMR. Short-axis cine imaging covering the entire LV and long-axis cine in a standard four-chamber plane were performed. Basal and mid-ventricular short-axis native and post-contrast T1 mappings were acquired. All the cine and T1 maps were offline analyzed to obtain the LV wall thickness, end-diastolic volume index (EDVi), myocardial mass index (MMi), the MMi-to-EDVi ratio (MVR), extracellular volume (ECV), total LV matrix and cell volumes index (MVi, CVi)(2), and longitudinal peak diastolic strain rate (PDSRL).

Results Compared with male controls, female controls were accompanied by thinner wall thickness (p<0.001), smaller MMi (p=0.010), similar EDVi (p=0.191), smaller MVR (p<0.001) , similar PDSRL (p=0.349), smaller CVi (p=0.617) , similar MVi (p=0.001), and thereby larger ECV (p=0.001) than male participants. There were increased wall thickness (p=0.005), decreased EDVi (p=0.005), similar MMi (p=0.270) and CVi (p=0.359) in female T2DM compared to female controls, while, they were similar between male T2DM patients and male controls. T2DM male patients were accompanied by increased ECV (p=0.005) and MVi (p=0.019). However, there was no significant difference in ECV, CVi and PDSRL between female T2DM patients and female controls.

Conclusion Our study highlights the influence of sex on LV structural, functional and interstitial remodeling in T2DM with normotension. Female patients predominantly had a more favorable pattern(3). In contrast, male patients exhibited a less favorable pattern(4).

EPO-0733

Comparison of T1 Value Measurement with Variable-Flip-Angle Technique using Different Flip Angle Combination with B1 field correction for breast

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Introduction and Purpose
we aimed to calculate and compare the T1 relaxation time of breast tissues using different selection of the flip angles with and without B1 correction. For this purpose, T1 maps generated from different FA combinations were compared with and without B1 correction. In addition, we compared T1 values of breast benign, malignant lesions and normal gland tissue to investigate the diagnostic value of the multiple VFA technique.
Material and Methods
MRI was performed using a 3.0 T MRI scanner (MAGNETOM Skyra, Siemens Healthcare, Erlangen, Germany) with a 16-channel phase-array bilateral breast coil. With B1 correction and without B1 correction，T1 mapping sequences were scanned for 52 female patients (mean age, 42.0 years; range, 22-62 years) (17 breast benign tumors, 35 breast cancers). For each case, T1 mapping was based on performing the gradient echo sequence with 10- point variable FAs including 1°, 2°, 5°, 7°, 9°, 11°, 13°, 15°, 17°, and 19° at a 14-second imaging time per angle. All images analysis of T1 maps was performed on OsiriX, an open source image visualization software on MacBook. From multiple gradient echo images acquired with a series of different FAs, a T1 map can be calculated. Centered on 10°, seven T1-map series were obtained, as follows: group1 (1°, 19°), group 2 (5°,15°), group3 (1°, 9°,19°), group 4 (2°, 9°, 15°), group5 (1°, 7°, 13°, 19°), group 6 (1°, 5°, 9°, 13°, 17°), group7 (1°, 2°, 5°, 7°, 9°, 11°, 13°, 15°, 17°, 19°). On these T1 maps, circular regions of interest (ROIs) were drawn by an experienced radiologist using post-contrast images as a reference respectively on the lesions, the lesions- ipsilateral breast gland tissue of the lesions, the lesions-contralateral breast gland, and the fat in the corresponding slices. These ROIs were copied on all seven T1 map-groups images to make all measurement in the same site. When the tumor was heterogeneous, we measured the solid component for the ROI. When drawing the ROIs on the gland, we tried to choose dense area and avoid the fat. Values of $p<0.05$ were treated as significant for paired t-tests.
Results
Among the group1, 3, 5, 6 and 7 before and after B1 correction, the T1 values of lesions and normal gland tissues were close to each other. In group 2 T1 values were significantly different from(higher) that in the other groups (refer to Table 1). Note

that the SDs in group 2 were higher than those in other groups. Though there is no significant difference between T1 values for benign tumors and cancers with t-tests before or after B1 correction, significant differences were examined for abnormal lesions and normal breast gland tissues in all groups ($p<0.005$). B1 correction led to a significantly increase in T1 values of lesions in group 2 and a slightly increase in other groups (except for the contralateral gland in group 2), while T1 values of normal breast gland slightly decreased (refer to Table 1&Fig 1). Without B1 correction, there was no significantly difference between T1 values of lesions and ipsilateral breast gland in group1, 3 and 4 ($P=0.052$, 0.098, 0.347, respectively). With B1 correction, there were significantly difference between them in all groups. More importantly, the T1 values of normal breast gland were much closer to the literature-reported value after B1 correction (T1=1444ms and gray lines in Fig.2&3).

Conclusion

It would be feasible to use two or three FA values instead of more FA values, which can directly benefit saving scan time. FA pairs like group 2(5°, 15°) may not be a good choice for T1 mapping using VFA techniques. B1 correction can improve accuracy of T1 measurements to differentiate breast lesions and normal gland tissues.

EPO-0734

The diagnostic performance of DCE-MRI in the evaluation of the pathological response to neoadjuvant chemotherapy in breast cancer: a meta-analysis

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Abstract:

Purpose: To assess the diagnostic accuracy of dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI) in evaluating the pathological response of breast cancer to neoadjuvant chemotherapy (NAC).

Materials and methods: A systematic search in Pubmed, Cochrane library, and web of science for original studies was performed. The Quality Assessment of Diagnostic Accuracy Studies-2 tool was used to assess the methodological quality of the included studies. The patient, study, and imaging characteristics were extracted, and sufficient data to reconstruct 2 × 2 tables were obtained. Data pooling, heterogeneity testing, forest plot construction, and subgroup analyses were performed using Stata version 12.0 (StataCorp LP, College Station, TX).

Results: Eighteen studies (969 patients with breast cancer) were included in present meta-analysis. The pooled sensitivity and specificity of DCE-MRI were 0.80 (95% confidence interval [CI]: 0.70, 0.88) and 0.84 (95% [CI]: 0.79, 0.88), respectively. Subgroup analyses showed that DCE-MRI had higher sensitivity (0.83 vs 0.72) and equivalent specificity (0.85 vs 0.82) in the evaluation of pCP (n=14) of breast cancer when compared with the evaluation of good response (pCR and near pCR, n = 5), and studies (n=14) using DCE-MRI to early predict (assess the response after one or two cycles of NAC) the pathological response of breast cancer had a higher sensitivity

(0.83 vs 0.71) and equivalent specificity (0.80 vs 0.86) compared to studies (n=5) that were not to early predict (assess the response after NAC completion).
Conclusion:
Our results indicated that DCE-MRI had a good diagnostic performance for evaluating the pathological response of breast cancer to NAC. Subgroup analysis found that setting pCR as pathological responder may improve the diagnostic sensitivity of DCE-MRI. DCE-MRI had good diagnostic performance in early prediction of pathological response of breast cancer in the early stage of NAC as well as evaluation of response after NAC.

EPO-0735
背景实质强化联合乳腺 X 线摄影钙化诊断乳腺癌分子亚型的研究

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目的 探讨乳腺癌 MRI 背景实质强化（BPE）和乳腺 X 线摄影钙化特征诊断不同分子亚型乳腺癌的价值。**方法** 收集同时行乳腺 X 线摄影及 MRI 检查并经手术病理证实的 57 例乳腺癌病例，根据免疫组化结果确定其分子亚型，参照 BI-RADS 分类标准对乳腺 BPE 进行分级。研究乳腺癌患者年龄、肿块大小与 BPE 的关系，以及乳腺 X 线摄影钙化、BPE 与分子亚型的关系。**结果** 年龄和肿块直径在 BPE 分级间有统计学意义（$P<0.05$），以显著强化为主；无钙化最常见于 Luminal A 型，差异有统计学意义（$P<0.05$），而 BPE 分级、钙化形态在乳腺癌分子亚型间无统计学意义（$P>0.05$）。**结论** 年轻女性或肿块较大时乳腺癌 BPE 显著增高，而乳腺癌乳腺 X 线摄影钙化形态及 BPE 对不同分子亚型诊断的价值有限。

EPO-0736
MRI 表观弥散系数及动态增强 TIC 曲线对三阴性乳腺癌的鉴别诊断价值

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目的 探讨表观弥散系数(apparent diffusion coefficient，ADC)、相对表观弥散系数(relative apparent diffusion coefficient，rADC) 及动态增强时间-信号强度曲线（time-intensity curve，TIC）类型在三阴性乳腺癌(triple-negative breast cancer, TNBC)与非三阴性乳腺癌中的鉴别诊断价值。**方法** 回顾性分析 2015 年 8 月至 2018 年 3 月间经病理证实的的 27 例 TNBC 及 65 例非 TNBC 患者的 MRI 资料，测量 b=800 s/mm^{2}时病灶 ADC 值及相对 ADC 值（$rADC_1$=病灶 ADC 值/同侧胸大肌 ADC 值和 $rADC_2$=病灶 ADC 值/对侧正常腺体 ADC 值）；根据动态增强 MRI(DCE-MRI)数据绘制病灶的 TIC。采用独立样本 t 检验比较平均 ADC 值、rADC 值，P<0.05 有统计学意义；以病理结果为金标准，绘制其非参数法受试者工作特征曲线（receiver operating characteristic curve，ROC）；x^2检验比较 TIC 曲线类型。**结果** TNBC 组患者的 TIC 以Ⅱ型为主[1] （37%），非 TNBC 组也以Ⅱ型为主[2] （49.2%），两组 TIC 差异无统计学意义(P>0.05)。TNBC 组的 ADC 值为(1.16±0.29)×10^{-3} mm^2/s、rADC1 为 0.78±0.21、rADC2 为 0.76±0.39，TNBC 组的 ADC 值和 rADC1 值均高于非 TNBC 组，差异具有统计学意义（P＜0.05），

而 rADC2 差异无统计学意义(P >0.05)。**结论** 表观弥散系数(ADC)与相对表观弥散系数(rADC1)对 TNBC 及非 TNBC 有鉴别诊断价值，相对于非 TNBC[3] ，TNBC 有较高的 ADC 及 rADC1 值。

EPO-0737
磁共振成像纹理分析在乳腺良恶性肿瘤鉴别诊断中的价值

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目的 探讨乳腺良恶性肿瘤多 B 值弥散加权成像(DWI)图像纹理特征的差异。**方法** 选取 2017 年 1 月至 2019 年 3 月我院收治的临床乳腺触诊或乳腺 X 线摄影、B 超检查发现肿块的 56 例患者行弥散加权成像 DWI 检查(4 个 b 值,分别为 0、500、1000、2000 s/mm2)，患者包括 36 例肿块样乳腺癌、16 例乳腺纤维腺瘤和 4 例乳腺导管内乳头状瘤,并根据术后病理结果分为良性组(20 例)和恶性组(36 例)患者。对轴向弥散加权成像图像进行纹理分析，计算角秒矩(ASM)、对比度、相关性、逆差矩(IDM)、熵等 5 个特征参数。组间比较采用独立样本 t 检验和 Mann-Whitney U 检验。采用二元 Logistic 回归分析建立回归模型，采用 ROC 分析评价诊断效率。**结果** 乳腺良性肿瘤组与恶性肿瘤组间纹理特征 ASM、对比度、相关性、熵值有显著性差异(PASM=0.014, Pcontrast=0.019, Pcorrelation=0.010, Pentropy=0.007)。上述正构变量 ROC 曲线下面积分别为 0.685、0.681、0.754、0.683,Logistic 回归模型中组合变量(ASM、对比度、熵)ROC 曲线下面积为 0.802。二元 Logistic 回归分析表明，ASM、对比度、熵作为乳腺良恶性肿瘤鉴别诊断的特异性影像学变量。**结论** DWI 纹理分析是一种简便、有效的乳腺良恶性肿瘤鉴别诊断方法。

EPO-0738
Differentiation Between Granulomatous Lobular Mastitis and Invasive Ductal Carcinoma: Dynamic Contrast-Enhanced Magnetic Resonance Imaging as a Useful Tool

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Purpose: Granulomatous lobular mastitis(GLM) is a rare chronic inflammatory breast disease. The clinical and radiological features of GLM substantially overlap with that of breast carcinoma, which leads to misdiagnosis and improper treatment for GLM. This study was to determine whether dynamic-enhanced magnetic resonance imaging(DCE-MRI) can distinguish GLM from invasive ductal carcinoma(IDC) of the breast. Methods and Materials: 45 GLMs and 188 IDCs diagnosed by histopathology were enrolled in the study. Two radiologists evaluated morphologic and kinetic features and measured mean ADC values of the breast lesions. Enumeration and measurement data were compared by using χ^2 and t test respectively. The discriminatory power of the size of maximum ring were determined by the area of ROC curve for the differential diagnosis of the lesions of NME with clustering ring enhancement(CRE). Results: The patients of GLMs were younger than that of IDCs ($p<0.001$). There was a significant difference regarding the categories of the lesions between the two groups ($p<0.001$). NME was present far more commonly in GLMs than in IDCs (43/45 vs 25/188), while mass was more frequently

observed in IDCs(1/45 vs 161/188). For the lesions with NME, the maximum range of GLMs was significant larger than that of IDCs((55.6±15.9)mm vs (33.6±18.0)mm, p<0.001), and CRE in GLMs was detected more frequently(40/43 vs 10/25, p<0.001). In addition, the mean size of the maximum ring in GLMs was greater than that in IDCs((12.6±5.9)mm vs (6.1±1.0)mm, p<0.001). The AUC for the size of maximum ring was 0.912(95%CI, 0.831-0.994) and the cutoff value was determined as 8.05mm based on maximal Youden index. The kinetic features and ADC values did not differ statistically for the lesions with NME. Conclusion: In women of childbearing age, the lesions of NME with the presence of CRE, especially larger ring on DCE-MRI were more suggestive of GLMs, whereas the lesions presenting with mass or NME without CRE in older women were more indicative of IDCs. Clinical Application/Relevance: DCE-MRI can be used to differentiate GLMs from IDCs as a useful tool, thus has potential to influence clinical decision making.

EPO-0739

Differentiation between Pure Mucinous Breast Carcinomas and Fibroadenomas with Strong High-Signal Intensity on T2-Weighted Images from Dynamic Contrast-Enhanced Magnetic Resonance Imaging

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Objective. This study aimed to identify characteristics that can differentiate between pure mucinous breast carcinomas (PMBCs) and fibroadenomas with strong high-signal intensity on T2WI (T2-SHi) on dynamic contrast-enhanced MRI (DCE-MRI).
Materials and Methods. This was a retrospective analysis of 35 PMBCs and 70 FAs with T2-SHi compiled between January 2014 and June 2016. The DCE-MRI tumor characteristics, including maximum diameter, shape, margin, lobulation, dark internal septation, enhancing internal septation, initial enhancement increase, kinetic curve pattern, and delayed internal enhancement were compared between these two groups and analyzed by univariate and multivariate analysis. We also compared the local rim heterogeneous enhancement on delayed phase of PMBCs and FAs
Results. The mean maximum diameter of PMBCs was significantly greater than that of FAs (2.74±1.15 vs. 1.74±0.71 cm, $p < 0.001$). PMBCs had irregular shape, non-circumscribed margin, and strong lobulation more frequently than did FAs (all $p < 0.001$). PMBCs had enhancing internal septation more frequently (31.4% vs. 1.4%, $p < 0.001$) and dark internal septation less commonly than did FAs (34.3% vs. 67.1%, $p < 0.001$). PMBCs had heterogeneous or rim enhancement more frequently than did FAs on delayed phase ($p < 0.001$). For PMBCs and FAs with heterogeneous enhancement, local rim enhancement was more common in PMBC (88.2% vs. 21.7%, $p < 0.001$). Initial enhancement increase and kinetic curve pattern were not significantly different between the two groups (all $p > 0.05$).
Multivariate analysis revealed that delayed enhancement pattern was the only significant independent predictor ($p < 0.05$).

Conclusion. Delayed enhancement pattern is the most reliable characteristic for differentiating PMBCs from FAs with T2-SHi on DCE-MRI.

EPO-0740

A nomogram for individual prediction of peritumoral vascular invasion in breast malignant tumor

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Objectives: To explore the feasibility of preoperative prediction of vascular invasion (VI) in breast cancer patients using nomogram based on multiparametric magnetic resonance imaging (MRI) and pathological reports.
Methods: We retrospectively collected 200 patients with confirmed breast cancer between January 2016 and January 2018. All patients underwent MRI examinations before the surgery. VI was identified by postoperative pathology. The 200 patients were randomly divided into training (n = 100) and validation datasets (n = 100) at a ratio of 1:1. Least absolute shrinkage and selection operator (LASSO) regression was used to select predictors most associated with VI of breast cancer. A nomogram was constructed to calculate the area under the receiver operating characteristic curve (AUC), sensitivity, specificity, accuracy, positive prediction value (PPV) and negative prediction value (NPV).
Results: VI was observed in 79 patients (39.5%). LASSO selected 10 predictors associated with VI. In the training dataset, the AUC for nomogram was 0.94 (95% confidence interval [CI]: 0.89-0.99, the sensitivity was 93.3%, the specificity was 83.7%, the accuracy was 90.0% (95%CI: 82.4%-95.1%), the PPV was 80.0%, and the NPV was 94.7%. In the validation dataset, the AUC for nomogram was 0.89 (95%CI: 0.83-0.95), the sensitivity was 90.9%, the specificity was 82.0%, the accuracy was 80.0% (95%CI: 70.8%-87.3%), the PPV was 69.0%, and the NPV was 95.4%. The nomogram calibration curve shows good agreement between the predicted probability and the actual probability.
Conclusion: The proposed nomogram could be used to predict VI in breast cancer patients, which was helpful for clinical decision-making.

EPO-0741

基于 MRI 影像组学与乳腺癌 21 基因评分的一致性研究

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目的：初步探讨基于 MRI 影像组学与乳腺癌 21 基因评分的一致性。
材料与方法：回顾性分析我院 2018 年 1 月至 2019 年 4 月期间诊断为早期浸润性乳腺癌（激素受体阳性、人表皮生长因子受体阴性、腋窝淋巴结阴性）的患者 76 例，同时在术前 2 周内行乳腺 MRI 检查及术后行 Oncotype DX21 基因检测。应用飞利浦公司提供的放射组学软件在动态增强后第二期图像上绘制肿瘤轮廓并提取其特征，每个病灶可以提取 1765 个放射组学特征，在上述特征降维分

析中，我们应用皮尔逊相关，层次聚类分析和主成分分析(PCA)选择关键特征，并采用 19 种分类器进行训练及验证，通过绘制 ROC 曲线验证其诊断效能。
结果：我们依据 Oncotype DX21 基因评分将患者进行如下三个分类:1) 评分≤10 分，2)评分介于 11～25 分之间 3)评分≥25 分， 应用线性支持向量机分类器、AdaBoost 分类器 和 XGB 分类器分别对上述六组数据进行分类。三种模型的平均 AUC 分别为 0.71、0.86 和 0.78，单一特征的最好 ROC 曲线结果对应的 AUC 分别为 0.80、0.84 和 0.79。
结论：应用基于 MRI 图像得到的影像组学信息可以较好的预测乳腺癌 21 基因评分。

EPO-0742
乳腺动态多期增强 MR 不同增强时相下病灶范围与病理大小的相关性研究

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目的：通过探讨未接受新辅助化疗而直接手术病例组与接受新辅助化疗后手术组的术前 MR 上不同增强时相下病灶大小与术后病理所测量病灶大小相关性，评价不同时相下所测病灶大小的准确性，为选择准确测量时相提供依据。
方法：搜集 2016 年 7 月至 2017 年 3 月本院乳腺癌 MRI 连续病例，分为两组：直接手术组及化疗后术前组。一名放射诊断医师在未知患者分组类型及病理结果的情况下测量增强后矢状位增强早期、矢状位增强晚期及轴位延时期的病灶或化疗后残余灶大小，矢状位及轴位图像上分别测量最长径及与其垂直的短径，并计算面积。评价两组各自不同时相下病灶长径、短径及面积与病理长径、短径及面积的差异性，并进一步评价差异百分比。评价所有病例整体与病理大小的差异性。*结果*：入组病例 61 人，直接手术组 19 人（平均年龄 51.26 岁，36-67 岁），新辅助化疗后术前组 42 人（平均年龄 46.68 岁，34-69 岁）。直接手术组无论早期、晚期或延时期 MR 所示病灶大小与病理测量大小相关性均差，程度无显著差异。对于与病理长径的百分比差异，早期、晚期及延时期无显著差异；对于与病理面积的百分比差异，晚期与延时期无显著差异，延时期>早期，P=0.045，晚期与早期无显著差异。化疗后术前组无论早期、晚期及延时期 MR 所示病灶大小与病理测量大小相关性均差，程度有差异，早期相关性好于晚期。对于与病理长径的百分比差异，晚期与延时期无显著差异，均>早期；对于与病理面积的百分比差异，晚期>早期，P=0.01，晚期与延时期无显著差异，延时期与早期无显著差异。两组病例统一评价，对于与病理长径的百分比差异，延时期>晚期>早期；对于与病理面积的百分比差异，晚期与延时期无显著差异，均>早期。*结论*：MR 上测量病灶大小与病理肉眼大小相关性不佳，增强后早期测量值相对准确性好于其后时相测量值。推荐不管是直接手术病人，还是化疗后病人，均应该选择增强早期进行测量。

EPO-0743
基于药物动力学模型 DCE-MRI 的全肿瘤定量影像组学特征对乳腺恶性肿瘤诊断价值研究

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目的： 探讨基于药物动力学模型动态增强磁共振成像(pharmacokinetic modeling dynamic contrast-enhanced MRI，DCE-MRI) 的全肿瘤影像组学特征对乳腺恶性肿瘤诊断价值。

方法： 回顾分析 85 例乳腺 DCE-MRI 扫描患者。良性组 26 例，恶性组 59 例，其中导管内原位癌 19 例，非特殊类型浸润性癌 40 例。根据后处理软件生成定量影像组学特征，转移常数(K^{trans})、速率常数(K_{ep})、血浆分数 (V_p) 与各自对应直方图特征（共 22 个）及增强后病灶内纹理特征（共 75 个）。采用独立样本非参数检验比较良恶性组间，恶性组内导管内原位癌与浸润性癌间差异，使用 Fisher 判别分析和留一交互验证法分析各定量影像组学特征对乳腺恶性肿瘤判别诊断价值。
结果：恶性组 Voxel Volume（P=0.000），K^{trans}Maximum（p=0.011），K_{ep}Maximum（p=0.000），K_{ep} 75percentile（p=0.008），K_{ep} 75percentile（p=0.001）及所有 V_p 定量参数与直方图特征较良性组升高；良恶性组间 62（62/75）个增强后纹理特征有统计学差异。根据判别分析及交叉验证结果显示，对本组恶性病灶判别正确率为 86.44%，判别效能 ROC 曲线下面积为 0.981（P=0.000）。浸润性非特殊类型癌 Voxel Volume（P=0.044），K_{ep}Median（P=0.013），K_{ep}10percentile（P=0.000），K_{ep}25percentile（P=0.002），V_pMaximum（P=0.003）定量与直方图特征高于导管原位癌组；导管原位癌组和浸润性非特殊类型癌组间有 40（40/75）个增强后病灶纹理特征有统计学差异。
结论： 基于药物动力学模型动态增强磁共振成像的全肿瘤影像组学特征对乳腺恶性肿瘤诊断有很好的临床应用价值。

EPO-0744

The correlation of whole-tumor radiomic features based on pharmacokinetic modeling dynamic contrast-enhanced magnetic resonance imaging (PK-DCE-MRI) with tumor and lymph node stage of human breast cancer

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Objective: To study the correlation of whole-tumor radiomic features based on pharmacokinetic modeling dynamic contrast-enhanced magnetic resonance imaging (PK-DCE-MRI) with tumor and lymph node stage of human breast cancer.
Methods: 224 patients with breast lesions were enrolled retrospectively. All received DCE-MRI check and were confirmed by pathology within one week. The TNM stages were collected from clinical records after surgery. 19 cases were Tis (ductal carcinoma in situ, DCIS) stage , 71 cases were T1 stage,134 cases were T2 stage and 122 cases were N0 stage, 62 cases were N1 stage, 27 cases were N2 stage, 13 cases were N3 stage. The following 97 radiomic features of whole lesions were generated automatically by post-processing dedicated software based on reference pharmacokinetic model, including 22 quantitative parameters (K^{trans}, K_{ep}, and V_p) with their corresponding histogram features and 75 texture features of enhancement. All these radiomic features were compared using the the Kruskal-Wallis-test between different T and N groups.
Results: The results of radiomic features among different T stages show that the Voxel Volume（P=0.000），K_{ep} 10 percentile（p=0.020） of pharmacokinetic quantitative with their histogram were statistially different and 28 （28/75）texture features of enhancement were statistically different among different T stage tumors. In different N stage tumors, only Voxel Volume（P=0.006）shows statistical difference, but 18 （18/75）texture features of enhancement were statistically different.

Conclusion: Some whole-tumor radiomic features based on PK-DCE-MRI show correlation with tumor and lymph node stage of human breast cancer.

EPO-0745
探讨分段读出扩散加权成像在乳腺癌病灶显示中的优势

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【摘要】目的：探讨分段读出扩散加权成像相对于单次激发平面回波扩散加权成像在乳腺癌检查中的价值。**方法：** 分析 47 例经病理证实的检查前未做任何治疗的乳腺癌患者的扩散加权成像的图像，全部病例均采用西门子 3.0T Skyra 磁共振扫描仪进行轴位扫描，均采用 SS-EPI_DWI（single-shot echo-planar imaging diffusion-weightedimaging）序列及 RS-EPI_DWI（readout-segmented echo-planar imaging diffusion-weighted imaging）序列进行扫描，分别测量 b 值为 800 的 DWI 图像上肿瘤区域、正常乳腺区域信号值及图像轴位区域的噪声值，计算出肿瘤区域的信噪比（signal to noise ratio,SNR）、对比噪声比（contrast to noise ratio,CNR），在 ADC(apparent diffusion coefficient,表观扩散系数)图上测量肿瘤区域的 ADC 值，比较两组 ADC 值差异及诊断敏感性差异，对两组序列在腋窝淋巴结显示上进行分级，比较两组在淋巴结显示上的差异。**结果：**RS-EPI_DWI 较 SS-EPI_DWI 图像的 SNR(t=29.88，P<0.01)及 CNR(t=31.65，P<0.01)值高，对 SS-EPI_DWI、RS-EPI_DWI 的 ADC 图肿瘤区进行测值无统计学差异（t=-1.568，P =0.124＞0.05），RS-EPI_DWI 较 SS-EPI_DWI 图像在腋窝小淋巴结显示上更具优势。**结论：**分段读出扩散加权成像较传统的扩散加权成像图像质量更佳，对于腋窝小淋巴结显示更具优势，其临床应用更有价值，

EPO-0746
基于 MRI 图像的影像组学特征预测乳腺癌分子分型

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探讨基于 MRI 图像的影像组学预测乳腺癌分子分型的准确性。
材料与方法：本文回顾性分析了我院 2016 年 10 月至 2018 年 9 月期间诊断为浸润性乳腺癌的患者 135 例，其中包括 17 例(12.6%)三阴型乳腺癌，18 例(13.3%) HER-2 过表达型，Luminal A 型乳腺癌 20 例(16.0%)，Luminal A 型乳腺癌 80 例(59.3%)，同时收集其临床和病理特征。应用飞利浦公司提供的放射组学软件在动态增强后第二期图像上绘制肿瘤轮廓并提取其特征，每个病灶可以提取 1765 个放射组学特征，在上述特征降维分析中，我们应用皮尔逊相关，层次聚类分析和主成分分析(PCA)选择关键特征，并采用 19 种分类器进行训练及验证，通过绘制 ROC 曲线验证其诊断效能。
结果：我们建立了三个模型进行分类:1)三阴性 vs 非三阴性，2) HER-2 过表达型 vs 非 HER-2 过表达型 3)Luminal (A + B) vs . nonluminal， 应用线性支持向量机分类器、AdaBoost 分类器 和 XGB 分类器分别对上述六组数据进行分类。三种模型的平均 AUC 分别为 0.76、0.85 和 0.73，单一特征的最好 ROC 曲线结果对应的 AUC 分别为 0.77、0.84 和 0.70。
结论：应用基于 MRI 图像得到的影像组学信息可以较好的预测乳腺癌分子分型。

EPO-0747

Radiomics base on MRI prediction molecular subtypes of Breast Cancer

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Purpose: Breast cancer molecular subtypes, based on genotype variation, are indicators of disease free and overall survival1. Breast cancer subtypes can be classified by genetic array testing or approximated using immunohistochemistry markers in typical clinical practice. Immunohistochemistry requires tissue specimens typically obtained by a needle biopsy. However, due to the relatively small tissue sample size and tumor heterogeneity, the assessment on a small tissue sample cannot represent the characteristics of the entire tumor. Radiomics, the extraction and analysis of quantitative imaging features that has the ability to capture a broader range of tumor heterogeneity, enables imaging phenotypes to be correlated with genetic information2. This mineable data can be used to build models, which could potentially classify breast cancer subtypes on magnetic resonance imaging (MRI). This study aimed to investigate whether quantitative radiomic features extracted from MRI images are associated with molecular subtypes of breast cancer.unohistochemistry requires tissue specimens typically obtained by a needle biopsy. However, due to the relatively small tissue sample size and tumor heterogeneity, the assessment on a small tissue sample cannot represent the characteristics of the entire tumor. Radiomics, the extraction and analysis of quantitative imaging features that has the ability to capture a broader range of tumor heterogeneity, enables imaging phenotypes to be correlated with genetic information2. This mineable data can be used to build models, which could potentially classify breast cancer subtypes on magnetic resonance imaging (MRI). This study aimed to investigate whether quantitative radiomic features extracted from MRI images are associated with molecular subtypes of breast cancer.

Methods: In this retrospective study, 135 women diagnosed with invasive breast cancer between Oct.2016 and Sep.2018 were enrolled.This cohort included 17(12.6%) triple-negative, 18(13.3%) human epidermal growth factor receptor 2(HER2)-enriched, 20(16.0%) luminal A, and 80(59.3%) luminal B lesions. Clinical and pathologic features were collected. A dedicated software (Philips radiomics tool) was used to draw the contour of the tumors and calculate the features. Total 1765 radiomic features quantified tumor characteristics for each patient using tumor intensity statistics, size and shape, intensity statistics, and texture. These radiomic features quantified tumor characteristics using tumor intensity statistics, size and shape, intensity statistics, and texture.In the following feature dimension reduction analysis, we used Pearson correlation, hierarchical cluster analysis and principal component analysis (PCA) to select the key features. In modeling stage, we investigated 19

classification methods (including Passive Aggressive Classifier, Perceptron, Ridge Classifier, SGD Classifier, Logistic
Regression, AdaBoost Classifier, Bagging Classifier, Extra Trees Classifier, Gradient Boosting Classifier, Random Forest
Classifier, K Neighbors Classifier, Support Vector Classifier, Decision Tree Classifier, Linear Discriminant Analysis, Quadratic
Discriminant Analysis, MLP Classifier, XGB Classifier, Extra Tree Classifier, Gaussian Process Classifier) for training and
prediction. These models were trained on the training cohort and their performance was evaluated on the cross-validation
cohort using the area under ROC curve (AUC).
Results: We build three models to classify: 1) triple-negative vs non‐triple-negative, 2) HER2-enriched vs non‐HER2-enriched, and 3)luminal (A + B) vs nonluminal. The machine learning classifier of this six model are chosen to be LinearSVC, AdaBoostClassifier, XGBClassifier, respectively. The performance and ROC curves of each model are shown in Figure 2 and
Figure 3. The mean AUC of the three models are 0.76, 0.85 and 0.73, respectively. Beside, the best ROC curves of single
feature are also plotted in Figure 4, the corresponding AUCs are 0.77, 0.84 and 0.70, respectively.
Conclusion: Quantitative radiomics features base on MRI is predictive of the molecular subtypes of breast cancer.

EPO-0748
基于 U-Net 对乳腺 MR-DCE 图像中乳腺肿块自动分割模型的研发

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目的 研发基于乳腺 DCE MR 图像的肿瘤病灶自动分割、自动体积测量的模型，并与结构式报告对接植入到临床流程中。
方法 回顾性收集 2015 年 2 月 10 日到 2016 年 12 月 28 日连续病例的乳腺 MR 影像和报告资料，纳入病例均为已取得活检但尚未治疗的乳腺癌患者，总共纳入 88 例数据进行研究，其中 70 例用于训练集，9 例用于测试集，9 例用于验证集。由两位影像专家逐一阅览模型分割结果，评价结果临床满意度。运用乳腺 U-Net 分割模型在 DCE MR 图像中自动分割乳腺轮廓，采用去除最小连通域方法处理图像，根据保留像素数序贯分割乳腺病灶。运用最小体积包围盒的算法规则，测得乳腺肿块的左右、前后和上下径。将实际临床工作中使用的乳腺 MR 结构式报告内医师测量的乳腺病灶径线数据作为金标准，用配对样本 t 检验和 Bland-Altman 散点图比较分析软件自动测量和医师手工测量的乳腺病灶径线结果。**结果** U-Net 分割和径线测量乳腺病灶可自动地返回到结构式报告中，并自动填写到报告内。训练集、测试集的平均 dice 系数分别为 0.92、0、77。软件自动测量和医师手工测量乳腺病灶径线一致性高。对于乳腺病灶左右径和上下径，软件自动测量和医师手工测量结果之间的差异无统计学意义（$p>0.05$），而于乳腺病灶前后径，两种测量方法结果之间的差异均有统计学意义（$p<0.05$）。影像专家对软件自动分割临床满意度高，达 89.3%。**结论** 基于 U-Net 的乳腺病灶分割模型植入临床工作流程是可行的，其测量结果的准确性符合临床要求。

EPO-0749

Prediction of pathological complete response to neoadjuvant chemotherapy in breast cancer using deep learning (DL) method

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Purpose: To develop a deep learning (DL) algorithm to predict pathological complete response (pCR) to neoadjuvant chemotherapy (NAC)in breast cancer.
*Materials and Methods:*An institutional review board-approved retrospective review of our database from January 2015 to December 2016 identified 308 locally advanced breast cancer patients who (1) underwent breast MRI prior to the initiation of NAC and surgery, called baseline(pre-NAC) and after treatment(post-NAC) (2) successfully completed adriamycin/taxane-based NAC, and (3) underwent surgical resection with available final surgical pathology data. All subjects were divided into a training set (n=247) and a validation set (n=61). Tumor regions were manually delineated on the second phase of T1-weighted images with Gadolinium enhancement by an expert radiologist. Pathological results were used as ground truth. Deep learning network was constructed using Python (V3.6) based on Keras (2.15) with TensorFlow (V1.4.0). It contains 5 repetition of convolution and max-pooling layers and ends with 3 dense layers. Augmentation was applied by 80 times to pCR data and 60 times to non-pCR data respectively.Pre-NAC model and post-NAC model inputs 6 phases of enhancement from pre-NAC and post-NAC images respectively. Combined model uses 12 channels from 6 phases of pre-NAC and 6 phases of post-NAC images.
Results: The training set contains 142 non-pCR subjects and 106 pCR subjects. The validation set contains 35 non-pCR subjects and 26 pCR subjects. Chi-square test shows no significant difference between two groups (p=0.987).The accuracy of pre-NAC, post-NAC and combined model is 0.58, 0.78 and 0.84. The combination of pre-NACand post-NAC data in deep learning shows improved accuracy. Post-NAC data is more relevant with pathological result. Our result is better than liu Z (Clin Cancer Res. 2019 Mar 6.)which may indicate that deep learning method is better than radiomics in predication of pCR to NAC in breast cancer.
*Conclusion:*The DL model can be used to predict pCR to NAC from breast DCE-MRI, but the analysis of imaging after NAC treatment is an indispensable part, and the role of the peritumor regions needs further study.

EPO-0750

磁共振弥散加权成像（DWI）纹理分析鉴别乳腺导管原位癌和浸润性导管癌及与 PR、ER、HER-2、Ki-67 的相关性

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目的 探讨使用弥散加权成像（DWI）的纹理分析鉴别乳腺导管原位癌（ ductal carcinoma in situ，DCIS）和浸润性导管癌（invasive ductal carcinoma，IDC）的价值。**方法** 回顾性分析 2014 年 5 月到 2018 年 7 月于大连医科大学附属第一医院经手术病理证实的 10 例单纯性 DCIS 和 22 例 IDC 的患者资料，患者术前均行乳腺 DWI 序列扫描（b=1000 s/mm^2），经后处理获得 ADC 图，采用 Omni-Kinetics 软件，融合后获得肿瘤全域纹理参数，包括方差、SRE、LRE、GLE、RLN、LGLRE、LGLRE、SRLGLE、SRHGLE、LRLGLE 和 LRHGLE。采用独立样本 t 检验或 Mann-Whitney 秩和检验比较 DCIS 和 IDC 各纹理参数的差异，采用 ROC 曲线评价有统计学差异的纹理参数对 DCIS 和 IDS 的鉴别效能。用 R 语言分析两组与 PR、ER、HER-2、Ki-67 的相关性。**结果** ：DCIS 组的 SRE、LRE、LGLRE、SRLGLE、LRLGLE 均大于 IDC 组，方差、GLN、RLN 小于 IDC 组，差异具有统计学意义（P 均<0.05）。两组之间的 HGLRE、SRHGLE、LRHGLE 差异无统计学意义（P 均>0.05）。方差、SRE、LRE、GLN、RLN、LGLRE、SRLGLE、LRLGLE 鉴别两组病灶的 AUC 分别为 0.864、0,914、0.914、0.873、0.914、0.83、0.81、0.90。**结论** DWI 乳腺纹理分析有助于提高肿块型乳腺导管原位癌和浸润性导管癌鉴别诊断的准确性，SRE、LRE、RLN、LRLGLE 是极具潜力的影像学标志物。PR、ER、HER-2、Ki-67 与最大值、阈值、最小值、不一致性、偏度、平均偏差有相关性，可以进一步增加单纯性乳腺导管原位癌和浸润性导管癌的诊断准确性。

EPO-0751

Correlation between the prognostic factors of breast cancer including ER, PR, HER-2 and Ki-67 and intravoxel incoherent motion MR imaging

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Objective: To explore the correlation between the prognostic factors of breast cancer including estrogen receptor (ER), progesterone receptor (PR), human epidermal growth factor receptor 2 (HER-2) and cell proliferation antigen marker Ki-67 and intravoxel incoherent motion diffusion-weighted MR imaging (IVIM).

Materials and methods: 152 patients with suspicious breast cancer who were treated in our hospital from August 2015 to August 2018 were selected, all the patients received T2W1 fat suppression sequence, IVIM scan and dynamic enhancement (DCE-MRI) scan, the expression of ER, PR, HER-2 and Ki-67 in tumor tissues of all patients were detected by calculation of apparent diffusion coefficient (ADC), D value, D* value, F value and other parameters.

Results: According to the exclusion and enrollment criteria of the study, 90 cases of breast cancer were finally enrolled, among the 90 cases,73 cases were positive for ER patients, accounting for 81.92%,17 cases were negative for ER patients, accounting for 18.89%.70 cases were positive for PR patients, accounting for 77.78%,20 cases were negative for PR patients, accounting for 22.22%.33 cases were positive for HER-2 patients, accounting for 36.67%,57 cases were negative for HER-2 patients, accounting for 63.33%.59 cases were positive for Ki-67 patients, accounting for 65.56%,31 cases were negative for HER-2 patients, accounting for 34.44%.There were no statistical differences between the positive and negative expression of ER and PR for ADC value, D value, D* value and f value (P>0.05),there was no statistical difference between the positive and negative expression of HER-2 for ADC value and f value(P>0.05),the D value and D* value of the positive expression of HER-2 were higher than the D value

and D* value of the negative expression of HER-2 (P<0.05).There was no statistical difference between the positive and negative expression of Ki-67 for D* value and f value (P>0.05),the ADC and D value of the positive expression of Ki-67 was lower than the ADC and D value of the negative expression of HER-2 (P<0.05).Spearman correlation analysis results: ADC value and ER factors were negatively correlated, D value and HER-2 factor were positively correlated, negatively correlated with Ki-67, D* value and HER-2 factor were highly positively correlated (P<0.05).

Conclusion：According to the inter-group differences in the expression of breast cancer immune factors ER, her-2 and ki-67, and the correlation between ADC value and ER, D value and her-2, ki-67, D* value and her-2, the expression of some breast cancer immune factors can be predicted and the prognosis of patients can be analyzed.

EPO-0752
乳腺癌多模态 MRI 表现与前哨淋巴结是否转移的临床价值研究

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目的：探讨乳腺癌多模态 MRI 成像表现在评价前哨淋巴结肿瘤是否转移的临床应用价值。**材料与方法**：对 43 例手术病理证实为乳腺癌且术前均行 MRI 检查的患者的 MRI 图像特征进行收集，统计分析患者年龄、乳腺肿块的位置、短长径比、是否环形强化、时间-信号曲线（TIC）、表观弥散系数（ADC）、相对表观弥散系数（rADC）与前哨淋巴结是否转移的关系。**结果**：前哨淋巴结转移阴性 26 例，阳性 17 例；前哨淋巴结是否转移在乳腺原发肿瘤的位置（χ^2=6.831，P＜0.05）、短长径比（t=-2.664，P＜0.05）、环形强化（χ^2=5.965，P＜0.05）、rADC（t=2.099，P＜0.05）等两组间的差异有统计学意义，阳性组短长径比（0.85±0.90）、rADC（3.89±1.12）值更高，阳性组位于肿块外侧、环形强化的比例比阴性组高；两组间患者的年龄（t=1.925，P＞0.05）、ADC 值（t=0.544，P＞0.05）、TIC（χ^2=4.865，P＞0.05）的差异无统计学意义。**结论**：乳腺癌多模态 MRI 的表现有助于判断前哨淋巴结是否肿瘤转移，为乳腺癌治疗策略的选择提供新的思路与方法。

EPO-0753
磁共振动态增强成像与扩散加权成像联合对乳腺良恶性疾病鉴别诊断价值

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【摘要】目的 探讨磁共振动态增强成像中的动态增强时间信号强度曲线(time-signal intensity curve, TIC)类型、早期强化率及扩散成像的表观扩张系数值(apparent diffusion coefficient，ADC)在乳腺良、恶性病变中鉴别诊断价值。

方法 回顾性分析 2017 年 4 月至 2019 年 4 月我院 140 个经病理证实的乳腺病灶的术前磁共振以及临床病理资料，依据病理分为良性病变组及恶性病变组。比较乳腺良、恶性病变间的 TIC 类型及早期强化率有无差异；并比较两组间 ADC 值的差异性。

结果 已行乳腺 MRI 检查的 107 例患者共 140 个病灶纳入研究，良性病变 43 个病灶，恶性病变 97 个病灶。乳腺良、恶性病变的 TIC 类型、第一期早期强化率类型具有统计学差异（P＜0.05）。乳腺恶性病变平均 ADC 值 0.965±0.215×10^{-3} mm^2/s 低于良性病变平均 ADC 值 1.335±0.266×10^{-}

^{3} mm^2/s，两者间有统计学差异（P＜0.05），ADC 阈值取为 $1.085\times10^{-3}mm^2/s$ 时，曲线下面积最大为 0.857，其鉴别乳腺良、恶性病变的敏感性为 73.2%，特异性为 86.0%，准确性 77.1%。TIC 曲线、第一期早期强化率及 ADC 三者联合诊断，诊断乳腺良、恶性病变的敏感性为 83.5%，特异性为 79.1%，准确性为 78.5%，曲线下面积 AUC 为 0.882，高于其他三者单独诊断的曲线下面积（0.728，0.562，0.857）。

结论 动态增强成像中的 TIC 曲线类型及第一期早期强化率与扩散加权成像的 ADC 值三者联合进行诊断，对乳腺良、恶性病变的鉴别诊断具有较好的价值。

EPO-0754

应用动态对比增强和弥散加权 MRI 评估雌激素受体阳性浸润性乳腺癌中定量 MR 参数和 Ki-67 增殖状态之间的相关性

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目的：探讨动态对比增强磁共振成像（DCE-MRI）和弥散加权成像（DWI）定量参数与雌激素受体（ER）阳性浸润性乳腺癌患者 Ki-67 增殖状态之间的关联。
材料与方法：我们回顾性分析了 88 例 ER 阳性浸润性乳腺癌患者的记录，这些患者在 3T 扫描仪上接受了术前 DCE-MRI 和 DWI 检查。记录灌注参数（Ktrans，Kep 和 Ve）和表观扩散系数（ADC），并将这些数据与 Ki-67 状态相关联。 Ki-67 增殖指数分为高（≥14%）或低（<14%）。
结果：在高 Ki-67 组中，平均 Ktrans 显着高于低 Ki-67 组（P <0.001），平均 ADC 显着降低（P <0.001）。然而，两组之间的平均 Kep 和 Ve 值没有差异（分别为 P = 0.248 和 P = 0.055）。单变量分析显示较高的 Ktrans（> 0.274），较低的 ADC（≤0.893×10-3 mm2 / s），较大的肿瘤大小（> 2 cm），较高的组织学分级（3 级），存在腋窝转移和 P53 阳性状态与高 Ki-67 状态显着相关（所有 P 值<0.05）。在这些变量中，较高的 Ktrans（> 0.274;调整后的比值比[OR] = 9.027,95%置信区间[CI] = 1.929-42.245; P = 0.005）和较高的组织学分级（3 级;调整 OR = 7.510， 95%CI = 1.305-43.205; P = 0.024）独立预测高 Ki-67 状态。

EPO-0755

Radiomic Analysis of Pretreatment MRI in Predicting Tumor Response to Neoadjuvant Therapy in Breast Cancer

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PURPOSE
Dynamic contrast-enhanced MRI (DCE-MRI) has been widely used in breast cancer diagnosis and management. For patients undergoing NAT, early changes in DCE-MRI has been used to monitor response during the course of the therapeutic regime, however only a few studies investigated the utility of pretreatment breast MRI to predict tumor response. The purpose of this study was to explore whether the pretreatment MRI

radiomic features are capable of predicting the pathologic complete response (pCR) to NAT in breast cancer.

METHOD AND MATERIALS

3172 patients who have undergone breast MRI at our institution between June 2015 and October 2018 were initially enrolled into this retrospective study, eventually 73 patients who were treated with both NAT and subsequent surgery were eligible, all of whom underwent breast MRI before the start of NAT. All patients were categorized into pCR and non-pCR on the basis of their pathological response after surgery. Two radiologists segmented lesions manually on contrast-enhanced T1-weighted images (the second phase after injection of contrast medium) and 1029 radiomic features were extracted. The patients were randomly divided into training set and validation set at a ratio of 8:2, and radiomic features were selected using LASSO Cox regression to reduce dimensions of the features. Three supervised learning algorithms (LR, RF, and KNN) were used to predict pCR in patients with NAT. The prediction performance of radiomic models in training set and validation set were assessed by the area under the receiver operating curve (AUC), sensitivity, and specificity.

RESULTS

Four features which best relevant to pCR were selected as radiomics signature by LASSO regression. The model that used logistic regression classifier achieved the best performance than the other two methods, the AUC value of the training set was 0.871 (sensitivity was 0.76 and specificity was 0.68), and the AUC value of the validation set was 0.745 (sensitivity was 0.80 and specificity was 0.73).

CONCLUSION

The prediction model used LR classifier had the best performance in predicting pCR to neoadjuvant therapy. Radiomics features extracted from pretreatment breast MRI could be the predictor of NAT response.

EPO-0756

3.0T 磁共振在预测乳头-乳晕复合体 恶性浸润中的作用

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目的：探讨 3.0T 磁共振（magnetic resonance，MR）在诊断乳头-乳晕复合体（nipple-areolar complex,NAC）恶性浸润的准确性，为临床手术方案的选择提供依据，为更多女性选择保留乳头的乳房切除术成为可能。**方法：**收集了 2015 年 1 月至 2017 年 12 月期间在新疆医科大学附属肿瘤医院行西门子 3.0T 核磁共振平扫及动态增强扫描，并接受手术经病理证实的 909 名原发性乳腺癌患者共计 914 个病例，其中 5 例为双侧乳腺癌，比较术前 MRI 和术后组织病理学结果，评估 MRI 在预测乳头浸润的准确性和潜在因素。该研究主要观察肿瘤位置、大小、恶性程度、距乳头的距离，腋窝淋巴洁转移情况，乳头改变（内陷/回缩），乳头强化，乳晕区皮肤增厚，和 NAC 增强后的厚度等乳头-乳晕复合体恶性浸润的潜在预测因子，由两名放射科主治医师独立盲法判读上述观察指标并记录结果，以术后组织病理学作为金标准。**结果：**回顾性分析入选的 914 个病例的 MRI 图像及组织病理学结果，其中 63 例（7%）患者确诊 NAC 受浸。在 MR 图像判读中，一名研究者测得的敏感性、特异性、阳性预测值（PPV）、阴性预测值（NPV）和乳腺 MRI 的准确性分别为 70.4%、82.6%、25.3%、97.5%和 80.0%。，另一名研究者分别为 78.3%、87.1%、36.3%、96.9%和 86.4%。两名放射科主治医师在综合评估 MR 图像 NAC 受浸的 kappa 值为 0.28。**结论：**MRI 动态增强图像因其拥有较高的软组织分辨力和独有的动态增强模式，在诊断乳腺癌具有较高的敏感性和特异性，但

在术前评估 NAC 恶性浸润时 PPV 较低和 FPV 较高。两名研究者在评估每个 MR 预测因子和 NAC 受浸的主观定性观点方面存在实质性差异。单变量分析中，单纯乳头强化是预测 NAC 恶性浸润最理想独立预测因子。

EPO-0757
DCE-MRI 对乳腺黏液癌与 T2 高信号纤维腺瘤鉴别诊断的研究

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目的：乳腺黏液癌是一种较为少见的乳腺恶性肿瘤，T2WI 呈明显高信号是其特征性的 MRI 表现。当纤维腺瘤出现黏液样变时，亦表现为 T2 明显高信号肿块，两者在术前的鉴别诊断是放射科医师面临的难题。因此本研究旨在探讨 DCE-MRI 在乳腺黏液癌与 T2 高信号纤维腺瘤鉴别诊断中的应用价值。
方法：回顾性分析我院 2015—2018 年经手术病理确诊的 13 例乳腺黏液癌及 28 例 T2 高信号纤维腺瘤的临床及 MRI 检查资料。分析比较两者的发病年龄、病灶直径、形态、边缘、ADC 值、T2 信号强度、延迟期强化方式；利用 DynaCAD 软件进行肿块分割，对二者血流动力学参数进行定量分析，获得病灶早期强化峰值、延迟期各不同强化方式在肿瘤内部所占像素的绝对值及百分比。采用 Manny-U 检验比较两组病灶的上述参数，对于差异有统计学意义的参数采用受试者工作特征 (receiver operating characteristic, ROC) 曲线评价其鉴别诊断的效能。
结果：从患者一般情况及形态学分析，黏液癌的病灶体积较 T2 高信号纤维腺瘤大，两组间的差异具有统计学意义（病灶平均体积分别为 18.06±32.29mm^3 vs. 1.22±31.57mm^3，$P<0.001$）；两组间年龄、ADC 值、T2 信号的差异无统计学意义；血流动力学参数定量分析显示，黏液癌内部延迟期平台型强化所占百分比高于 T2 高信号纤维腺瘤，平均值分别为(18.23±15.23)% vs. (5.66±6.12)%，二者间的差异具有统计学意义(P=0.014)。利用体积及平台型强化百分比进行鉴别诊断，其 AUC 值分别为 0.752、0.766；多因素分析显示，体积及平台型强化百分比二者联合具有较高的鉴别诊断效能，其 AUC 值为 0.821（95% CI 0.668-0.973）。
结论：MRI 形态学特征及定量血流动力学参数有助于乳腺黏液癌与 T2 高信号纤维腺瘤的鉴别诊断。

EPO-0758
乳腺复杂型纤维腺瘤多模态磁共振成像特征

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目的 分析乳腺复杂型纤维腺瘤的多模态磁共振成像特征，提高术前诊断准确率，以期为临床治疗方案的制定提供更准确的影像学依据。**方法** 回顾性分析 2011 年 1 月至 2019 年 4 月于我院行乳腺 MRI 检查并经手术病理证实为复杂型纤维腺瘤的 27 例患者。患者均行双侧乳腺平扫、DCE-MRI 以及 DWI 检查。依据美国放射学会（ACR）乳腺影像报告和数据系统（BI-RADS）标准对病变进行分析，观察病变的形态、边缘、平扫 T_1WI 信号、平扫脂肪抑制 T_2WI 信号、强化方式、时间-信号强度曲线（TIC）类型、DWI 信号及 ADC 值。**结果** 本研究中患者平均年龄为（38.8±10.0）岁，病灶平均最大径为（1.69±0.45）cm；27 例均为肿块型病变，81.48%（22/27）形态较规则；70.37%（19/27）边缘清晰；于平扫 T_1WI 序列 62.96%（17/27）病变呈稍低信号，7.41%（2/27）呈等信号，29.63%（8/27）显示不明显；于平扫抑脂 T_2WI 序列 3.70%（1/27）呈较低信号，70.37%

（19/27）呈稍高信号，25.93%（7/27）呈高信号；动态增强后时间-信号强度曲线 62.96%表现为Ⅲ型及Ⅱ型（14/27 呈Ⅲ型、3/27 呈Ⅱ型），动态观察 62.96%（17/27）的复杂型纤维腺瘤病变内部强化方式多由不均匀强化随时间延迟趋向均匀；于 DWI 图像中 96.30%（26/27）呈高信号；b 值为 500s/mm^2时，病变平均 ADC 值为（1.36±0.19）×$10^{-3}mm^2/s$，b 值为 1000s/mm^2时，病变平均 ADC 值为（1.29±0.26）×$10^{-3}mm^2/s$。**结论** 复杂型纤维腺瘤动态增强后时间-信号强度曲线和 DWI 表现与乳腺癌相似，多呈Ⅲ型及Ⅱ型，ADC 值较低，但是大部分复杂型纤维腺瘤的形态形态较规则，边缘较清晰，特别是动态观察下病变内部强化方式随时间延迟强化趋向均匀。

EPO-0759

MRI 对乳腺非肿块样强化病变的诊断及鉴别诊断价值

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目的 探讨 MRI 对乳腺非肿块样强化(none-mass enhancement，NME)良恶性病变的诊断及鉴别诊断价值。
方法 回顾性分析 2015 年 10 月至 2017 年 7 月行 MRI 检查并经病理证实或行 MRI 随诊 1 年半以上无变化的 96 个乳腺 NME 病灶，采用卡方检验比较良恶性组间分布方式、内部强化特征、T2 抑脂信号强度、动态曲线类型的差别。应用多因素分析表现为 NME 的乳腺恶性病变的 MRI 影像特征。
结果 96 例患者共 96 个非肿块样强化病灶，良性病变 28 个（29.2%），恶性病变 68 个（70.8%），良性病变中以腺病及浆细胞性乳腺炎最多见，均占 35.7%（10/28），恶性病变中以浸润性乳腺癌最多见，占 77.9%（53/68），其次为导管原位癌，占 14.7%（10/68）；在形态学上，良恶性组间在内部强化方式表现为均匀强化时的差异有统计学意义(P 值为 0.026），余内部强化方式及分布方式间差异无统计学差异（P>0.05）；在 T2 抑脂信号上，良恶性组间在病变表现为高信号和等信号之间的差异有统计学意义（P 值分别为 0.025、0.045）；在 TIC 类型上，良恶性组间在 I 型（流入型）和 III 型（流出型）之间的差异有统计学意义（P 值分别为 0.013、0.001）；恶性病变的危险因素包括 T2 抑脂等信号及 TIC 为 III 型曲线，病灶 T2 抑脂信号为等信号时其为乳腺癌的概率是非等信号的 5.23 倍，病灶 TIC 为 III 型曲线时，其为乳腺癌的概率是非 III 型曲线的 10.84 倍。
结论 MRI 对于表现为 NME 的乳腺癌具有较高的诊断准确性。

EPO-0760

表皮生长因子的磁共振靶向对比剂的研究

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【摘要】 目的 通过探讨 EGFR 介导的磁共振对比剂 EBP-$(Gd\text{-}DO3A)_2$对肿瘤的靶向性，评估其应用于动态增强磁共振成像(DCE-MRI)中的可行性和价值。**方法** 采用化学方法，将 EGFR 结合肽(CMYIEALDKYAC，EBP）与 2 分子 DO3A 共价结合，再与 $Gd(OAc)_3$反应，制备 EBP-$(Gd\text{-}DO3A)_2$。应用 EBP-$(Gd\text{-}DO3A)_2$孵育高低不同 EGFR 表达水平的人癌细胞后，采用电感耦合等离子体质谱(ICP-OES)检测细胞 Gd^{3+}含量，并与临床使用的对比剂 Gadovist 比较。
结果 EBP-$(Gd\text{-}DO3A)_2$作用细胞后，EGFR 高表达细胞的 Gd^{3+}含量比 EGFR 低表达细胞高，差异有统计学意义(P<0.05)；Gadovist 孵育细胞后，不同 EGFR 表达水平细胞的 Gd^{3+}含量差异无统计学意义(P>0.05)；预先 EGFR 抑制剂作用于细胞后，再用 EBP-$(Gd\text{-}DO3A)_2$孵育细胞，各组细胞 Gd^{3+}含量与

未使用 EGFR 抑制剂相比明显降低，差异有统计学意义(P<0.05)；预先 EGFR 抑制剂作用于细胞后，再用 Gadovist 孵育细胞，各组细胞 Gd^{3+}含量与未使用 EGFR 抑制剂相比差异无统计学意义(P>0.05)；荷 MDA-MB-231 瘤小鼠尾静脉注射 EBP-$(Gd\text{-}DO3A)_2$后，在血中浓度维持时间较 Gadovist 长，肿瘤组织 Gd^{3+}含量随时间延长而增加，至 4h 达峰值，此后逐渐下降。与 Gadovist 组比较，EBP-$(Gd\text{-}DO3A)_2$在肿瘤中 Gd^{3+}含量明显增加，差异有统计学意义(P<0.05)；荷 MDA-MB-231 瘤小鼠尾静脉注射 EBP-$(Gd\text{-}DO3A)_2$后，肿瘤的 T1 信号强度逐渐上升，4 h 达到强化峰值，之后信号强度逐渐降低至正常。**结论** 合成的造影剂 EBP-$(Gd\text{-}DO3A)_2$对细胞 EGFR 具有良好的靶向性。

EPO-0761

Study on Magnetic Resonance Contrast Agents targeting of EGFR

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Purpose To evaluate the feasibility and value of EGFR-mediated magnetic resonance contrast agent EBP-(Gd-DO3A)2 for tumors in dynamic enhanced magnetic resonance imaging (DCE-MRI). **Methods** EGFR binding peptide (CMYIEALDKYAC, EBP) was covalently bound to two molecules of DO3A by chemical reaction, and then reacted with Gd(OAc)3 to prepare EBP-(Gd-DO3A)2. After incubation of human cancer cells with different EGFR expression levels by EBP-(Gd-DO3A)2, the Gd3+ content of cells was detected by inductively coupled plasma mass spectrometry (ICP-OES) and compared with the clinical contrast drug Gadovist. After pretreatment with EGFR inhibitors, Cellular were incubated with EBP-(Gd-DO3A)2 or Gadovist ,and Cellular Gd content was measured by ICP-MS. 5-6 weeks old SPF SCID mice were subcutaneously inoculated with human breast cancer MDA-MB-231 cells as an animal model, and EBP-(Gd-DO3A)2 or Gadovist was injected into the tail vein of mice, then Blood, heart, liver, spleen, lung, kidney and tumor tissues were taken at 30 min, 1h, 2h, 4h, 8h, 12 h, 24h and 48h after intravenous injection, respectively, and Gd3+ concentration was determined by ICP-OES. MRI images were acquired by injection of EBP-(Gd-DO3A)2 or Gadovist into the tail vein of mice bearing MDA-MB-231 tumor at 30min,1h, 2h, 4h, 8h and 12h in the pre and post -injection,respectively. **Results** After EBP-(Gd-DO3A)2 was applied to the cells, the Gd3+ content of EGFR high-expressed cells was higher than that of EGFR low-expressed cells ,and the difference was statistically significant (P<0.05) . After Gadovist was incubated, there was no statistically significant in the Gd3+ content of different EGFR expression cells (P>0.05). After the EGFR inhibitor was applied to the cells, the cells were incubated with EBP-(Gd-DO3A)2. The Gd3+ content of each group cells was significantly lower than that without the EGFR inhibitor, and the difference was statistically significant (P<0.05) .After the EGFR inhibitor was applied to the cells, the cells were incubated with Gadovist. There was no statistically significant in the Gd3+ content of each group cells compared with non-EGFR inhibitors (P>0.05). After injection of EBP-(Gd-DO3A)2 into the tail vein of mice bearing MDA-MB-231 tumor, the blood concentration was maintained longer than that of Gadovist, and the Gd3+ content of tumor tissue increased with time, peaked at 4h, and then gradually decreased. Compared with the Gadovist group, the Gd3+ content of EGP-(Gd-DO3A)2 group in the tumor significantly increased , and the

difference was statistically significant (P<0.05) . After injection of EBP-(Gd-DO3A)2 into the tail vein of mice bearing MDA-MB-231 tumor, the T1 signal intensity of the tumor gradually increased, and reached the peak of enhancement at 4 h, after the signal intensity gradually decreased to normal.**Conclusion** The synthesized contrast agent EBP-(Gd-DO3A)2 has good targeting to EGFR.

EPO-0762
乳腺 DCE-MRI 纹理分析对鉴别 BI-RADS 4 类病灶良恶性的价值

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目的 探讨乳腺磁共振动态增强成像（DCE-MRI）的 DCE 7 个时段、T2-STIR 及 ADC 图像的纹理分析对乳腺影像报告及数据系统（BI-RADS）4 类病灶良恶性的鉴别价值。
方法 回顾性分析 70 例术前经 DCE-MRI 诊断乳腺病灶为 BI-RADS 4 类的患者的影像资料，采用 MaZda4.6 提取病灶的 DCE 7 个时段、T2-STIR 及 ADC 图像的纹理特征，经 Fisher 系数、聚类偏差几率结合平均关联系数（POE+ACC）、协同信息（MI）及上述 3 种方法的联合方法(MI+PA+F)简化纹理特征参数。使用原始数据分析（RDA）、主要成分分析 （PCA）、 线性分类分析 （LDA）、非线性分类分析 （NDA）、单训练集人工神经网络（ANN）分析简化的纹理特征，得出乳腺 MRI 图像的各种纹理简化、分析方法的组合对病灶良恶性鉴别的错判率。
结果 乳腺 DCE-MRI 加权图像的各种纹理简化、分析方法的组合对病灶良恶性鉴别的最低错判率为 2.86%（ADC 图像的 MI+PA+F-ANN、DCE 第一期图像的 MI+PA+F-NDA 和 MI+PA+F-ANN）；DCE 7 个时段、T2-STIR 及 ADC 图像的错判率比较，差异无统计学意义(p＞0.05)；各纹理简化方法的错判率比较差异无统计学意义（P＞0.05）；NDA、ANN 与其他分类分析方法的错判率比较，差异有统计学意义（ P＜0.05）。
结论 乳腺 MRI 各加权图像在诊断病灶为 BI-RADS 4 类的基础上进行纹理分析，并使用 NDA 或 ANN 分类模型，有望对病灶良恶性作出确定性诊断。

EPO-0763
磁共振成像在乳腺原位小叶癌早期切除术后残余预测中的作用

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背景:乳腺磁共振（MR）成像是一种有用的筛查方法，可用于检测有原位小叶癌（LCI）病史的患者的可疑病变。本研究的目的是评价乳腺磁共振成像在早期切除后残余 LCI 病变检测中的有效性。

方法:在 2011 年至 2018 年期间，30 名接受初次切除的 LCI 患者入选。在初次切除后进行乳腺超声检查和乳腺磁共振成像随访。将影像学结果与病理结果进行比较。

结果：初次切除后有 9 例（30.0%）边缘阳性，分别为 LCI（n=7）和非典型小叶增生（n=2）。13 例发现残余病变，分别为浸润性小叶癌（n=1；3.3%）、LCI（n=10；33.0%）、非典型小叶增生

（n=1；3.3%）和原位乳头状癌（n=1；3.3%）。在所有患者中，18 例患者（敏感度 83.3%，特异性 100%）可以通过超声检查发现病变。

结论：乳腺磁共振成像对残余 LCI 病变的检出率高于乳腺超声。如果使用乳腺磁共振成像发现可疑病变，应考虑第二次手术，因为可能存在多灶性，即使在初次手术时确认了 LCI。

EPO-0764
扩散加权成像体素内不相干运动模型参数在局部晚期乳腺癌新辅助化疗疗效预测中价值

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【目的】：探索扩散加权成像体素内不相干运动模型参数在局部晚期乳腺癌患者新辅助化疗(NAC)疗前预测以及治疗早期疗效评价中的价值。
【材料与方法】：36 名局部晚期乳腺癌的患者完成了新辅助化疗前包括多 b 值扩散加权成像序列在内的乳腺 MRI 扫描，多 b 值 DWI 序列采用 0-1000 s/mm^{2}共 12 个 b 值，这些患者中有 28 例在 NAC2 周期后完成了 MRI 复查。根据治疗后手术病理结果，这些患者被分为病理学完全缓解(pCR)和非病理学完全缓解(non-pCR)两组。利用 t 检验或非参数检验的统计学方法，对于 pCR 组与非 pCR 组间各项参数值(包括 D、D*、f)NAC 疗前、2 周期后以及其变化值(△参数)进行比较。不同参数预测 NAC 疗效的诊断效能利用 ROC 曲线分析进行评价。
【结果】：在 NAC 疗前，pCR 组的 f 值明显高于非 pCR 组，差异有统计学意义(32.40% vs. 24.40%, P=0.048)，其余 IVIM 模型参数间均无统计学差异。在 NAC2 周期治疗结束时，pCR 组的 D 值明显高于非 pCR 组(1.36±0.30×10^{-3}mm^2/s vs. 0.98±0.23×10^{-3}mm^2/s)，f 值明显低于非 pCR 组(14.51%±7.25% vs. 20.69%±5.10%)，差异均有统计学意义(P 均＜0.05＝，而 pCR 组的 D*仅略低于非 pCR 组，差异无统计学意义。NAC2 周期治疗后，pCR 组的△D 值要明显大于非 pCR 组，pCR 组的△f 值(17.30%)明显高于非 pCR 组(5.30%)，差异均有统计学意义(P＜0.001)，而 pCR 组与非 pCR 组间△D*值无明显统计学差异。对于所有参数行 ROC 曲线分析得出，△D 值在预测 NAC 疗效上的诊断价值最好，曲线下面积为 0.924。
【结论】IVIM 模型参数，尤其是 D 和 f 值，在局部进展期乳腺癌患者 NAC 的疗前预测、治疗后的早期疗效评价方面显示出了潜在的价值。

EPO-0765
Imaging Findings of Breast Apocrine Carcinoma: A Case Report with Review of Literature

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Abstract: Apocrine carcinoma (AC) is a rare form of breast malignancy,and accounts for 0.3 to 1.0% of all breast cancers.A 58-year-old woman was found with a left breast mass after a health examination,and she was admitted to our hospital.The physical examination found an elastic hard lump in the upper lateral quadrant of the left breast,the tumor size was approximately 2×1.5cm,and the left armpit can touch a

enlarged lymph node,the size was 2×1.5cm.Ultrasound detected a hypoechoic mass at about 21mm from the nipple in the direction of 3-4 o'clock in the left breast.The shape of the mass was irregular and the boundary was unclear.The punctate blood flow signal in the mass was detected by CDFI.Mammography revealed no findings of a primary tumor,Digital breast tomosynthsis (DBT) only found local architecture distortion in the upper lateral quadrant of the left breast.Enhanced magnetic resonance imaging (MRI) showed a unevenly and significantly enhanced mass in the left breast,and the time-intensity curve showed a rapid wash-in followed by wash-out pattern.The patient underwent a modified radical mastectomy of left breast.Histopathologically,the tumor cells showed cribriform growth pattern with stromal invasion,and had particularly abundant eosinophilic granular cyteplasm.Immunohistochemical showed gross cystic disease fluid protein-15 (GCDFP-15) and androgen receptor (AR) positivity,and estrogen receptor and progesterone receptor and human epidermal growth factor receptor 2 negativity.Thus,the pathological djagnosis was apocrine carcinoma with four axillary lymph nodes metastases.We report a case of invasive apocrine carcinoma of breast as it has complete imaging data,and discuss the imaging features of the disease in conjunction with the literature.

EPO-0766

Preoperative prediction of Ki-67 status in breast cancer with multi-parametric MRI-based deep learning radiomics model

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Abstract

Purpose: To establish deep learning radiomics models based on different single magnetic resonance imaging (MRI) sequences and multi-parametric MRI(mp-MRI) respectively and compare their performance in preoperative prediction of the Ki-67 status in patients with breast cancer.

Methods and materials: A total of 328 eligible patients were retrospectively enrolled and divided into a training dataset (n=230) and a validation dataset (n=98) according to inspection time. Quantitative deep learning imaging features were extracted from T2-weighted imaging(T2WI), diffusion-weighted imaging(DWI), and contrast enhanced T1-weighted imaging(T1+C). We applied a pre-trained deep convolutional neural network and the maximum relevance to construct four feature sets based on each of the three single MR sequences and their combination(i.e.mp-MRI). Multilayer-perceptron classifiers were used to make final prediction. Mann-Whitney U test was used to compare the predictive performance of individual models.

Results: The AUC of models based on T2WI、T1+C、DWI and mp-MRI were 0.727,0.873, 0.674 and 0.888 in the training dataset, respectively, and 0.706, 0.829, 0.643 and 0.875 in the validation dataset, respectively. The predictive performance of mp-MRI classification model in the AUC value was significantly better than that of the individual sequence model (P＜0.01).

Conclusions: In clinical practice, a non-invasive, convenient, and inexpensive approach to improve the performance of radiomics in predicting Ki-67 status before surgery can be provided by extracting and screening breast cancer specific structural features from the mp-MRI images obtained from the conventional scanning sequences based on the advanced deep learning methods.

EPO-0767

评价对乳腺磁共振 BI-RADS 4 类病灶进行亚分类的临床可行性

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目的

乳腺 X 线和超声 BI-RADS 4 类病灶可进一步分为 4A、4B、4C 三类。由于缺乏足够数据，磁共振 BI-RADS 4 类病灶尚未有标准分类方法。本研究分析对乳腺磁共振 BI-RADS 4 类病灶进行亚分类的可行性。

方法

参考乳腺 X 线 BI-RADS 4 类病灶的分类方法，本院常规按恶性可能将磁共振 4 类病灶分为 4A（2%~10%）4B（10% ~ 50%）和 4C（50% ~ 95%）三类。回顾性收集 2019.1.1-2019.6.30 于本院行乳腺磁共振检查的患者 6295 例，从 933 个 BI-RADS 4 类病灶中筛选出 757 个经病理证实的病灶。以病理结果为金标准将所有病灶分为良性和恶性，局部侵袭性病灶归入恶性组。诊断医师分为乳腺组和非乳腺组。比较亚分类阳性预测值（PPV）是否与其标识恶性率相吻合。

从 933 个 BI-RADS 4 类病灶中随机抽取 4A、4B、4C 病灶各 20 个，从专业组、非专业组各抽取 1 位诊断医师独立进行分类，1 个月后再次进行独立分类。使用 Kappa 分析比较 2 位医师、同一医师两次分类结果的一致性。

结果

专业组医师（3 名）分类病灶 618 个，包括 192 个 4A、165 个 4B 和 261 个 4C 类病灶，各 PPV 分别为 10.9%（21/192）、55.8%（92/165）和 94.2%（246/261）。非专业组医师（8 名）分类病灶共 136 个，包括 68 个 4A、37 个 4B 和 31 个 4C 类病灶，各 PPV 分别为 8.8%（6/68）、51.3%（19/37）和 80.6%（25/31）。专业组和非专业组医师分类结果具有良好一致性（Kappa = 0.710，P < 0.001）。同一位医师前后两次分类结果具有高度一致性（Kappa = 0.900、0.860，P < 0.001）。

结论

乳腺磁共振 BI-RADS 4 类病灶亚分类阳性预测值与各分类的标识恶性率相吻合，医师分类结果具有良好一致性。证据支持在临床实践中对磁共振 BI-RADS 4 类病灶进行亚分类。

EPO-0768

Evaluation and Validation of Functional Diffusion Imaging -Diagnostic Accuracy, Correlation with Prognostic Factors and Molecular Subtype in Breast Cancer

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Background: The aim of this study was to prospectively compare the diagnostic accuracy of diffusion kurtosis imaging (DKI) and diffusion weighted imaging (DWI) in differentiation between malignant and benign breast lesions independently or jointly, and explore the correlation between functional diffusion parameters and prognostic factors, as well as molecular subtypes of breast cancer.
Methods: Seventy-three patients with 95 breast lesions were obtained between October 2015 and June 2019 in Radiology Department of our hospital. The patients were examined by breast MRI at 3.0 T prior to operation, including DWI and DKI. Apparent diffusion coefficient (ADC), mean kurtosis (MK) and mean diffusivity (MD) values in training set were compared by Mann-Whitney U test and Student's t test. Receiver operating characteristic (ROC) analysis was used to evaluate the diagnostic performance and determine the cut-off value of the imaging parameters in training set. Spearman correlation and Pearson correlation were used to evaluate the associations between imaging parameters and prognostic factors, as well as molecular subtypes of breast cancers. The ROC optimal cut-off value of the parameter screened out with the highest diagnostic accuracy for detecting breast cancer or predicting prognostic factors and molecular subtypes, was further used in validation set to verify their diagnostic accuracy.
Results: MK exhibited higher area under the curves (AUCs) for differentiation between malignant and benign lesions than did ADC and MD (0.978 vs 0.945 and 0.963, respectively, $p<0.05$). MK showed better correlation with histological grade compared with ADC and MD (r=0.733, -0.438 and -0.522, respectively) and showed higher AUCs in distinguishing high- and low-grade breast cancer. MK was the only parameter correlated with Ki-67 expression and luminal A breast cancer (r=0.339 and -0.518).
Conclusion: MK derived from DKI showed higher diagnostic accuracy compared with ADC and MD for detecting breast cancer. And DKI exhibited correlation with prognostic factors (histological grade, Ki-67 expression and HER2) and luminal A breast cancers, showing promise as an in-vivo and sensible imaging marker for characterizing breast lesions and providing valuable clinical information.

EPO-0769
乳腺 X 线与动态增强 MR 对乳腺结构扭曲病变的诊断效能

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目的：探讨乳腺 X 线表现为结构扭曲的病变在动态增强 MR (dynamic contrast enhanced MR images, DCE-MRI) 图像上的表现及 DCE-MRI 联合乳腺 X 线摄影术 (mammography, MG) 对该类病变的诊断价值。方法：回顾性分析 20 例 X 线表现为结构扭曲的病变在 MG 及 MRI 上的影像学特征，并

以病理结果为金标准,比较 MG 及 DCE-MRI 的诊断结果差异。结果:20 例病变中，良性病变 7 例，恶性病变 13 例。良性病变以单纯结构扭曲为主（7/20，35%），恶性病变则以结构扭曲合并多形性钙化或合并细小不定型钙化为主（6/20,30%），部分病变合并局部不对称（2/20，10%）。DCE-MRI 图像上，可疑良性病变多表现为缓慢持续型强化，可疑恶性病变以非肿块样强化多见，TIC 曲线均表现为平台型和廓清型（P <0. 001）。DCE-MRI 检查对 X 线表现为结构扭曲的病变的诊断准确率高于 MG，并且差异具有统计学意义（P <0. 001）。另外，DCE-MRI 检查的灵敏度明显优于 MG（P<0. 05）且具有较高特异度（<0. 05）.与单用 MG 检查相比,MG 与 DCE-MRI 检查相结合可显著提高灵敏度（P<0. 05）。结论:结合 DCE-MRI 能够显著提高临床诊断的效能。

EPO-0770

不同 K0 时间对乳腺动态增强图像的影响

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目的：
探讨高浓度高弛豫率造影剂加乐显在乳腺动态增强扫描中 K0 时间的选择
材料与方法：
选取 240 例乳腺疾病患者，按 K0 时间不同分为 3 组，每组 80 人；分别采用
K0=35s,K0=60s,K0=90s;比较 3 组相同注射速率 1ml/s 下，不同 K0 时间对打药后第一期图像质量进行评估，主要从病灶、腺体血管有无伪影、腺体有无强化三方面对图像质量进行评分。采用双盲法由 3 名具有 12 年以上临床诊断经验的影像科副主任医师对所有患者图像进行综合评价，意见不一致时共同协商直至达成共识。
结果：1.病灶伪影分析结果 K0=35s 组与 K0=60s 组 K0=90s 组有统计学差异（P<0.05），K0=60s 组 K0=90s 组，病灶无伪影；K0=35s 中伪影出现率为 20%（16 例）；
2.腺体血管伪影分析结果 K0=35s 组与 K0=60s 组 K0=90s 组有统计学差异（P<0.05），K0=60s 组 K0=90s 组，腺体血管无伪影；K0=35s 中伪影出现率为 12.5%（10 例）；
3.腺体有无强化分析结果 K0=90s 组与 K0=35s 组 K0=60s 组有统计学差异（P<0.05），K0=35s 组 K0=60s 组，腺体无强化，K0=90s 腺体强化 25%（20 例）；
分析：Ghost 伪影产生的原因为：对比剂自肘静脉注射后，需要 25--30s 到达乳腺的供血动脉，加乐显高浓度高弛豫率；低速率 1ml/s 注射，到达乳腺供血动脉延迟 2-5s，同时患者个体存在循环差异；这时填充 K0 引起 K0 空间中心震荡形成 Ghost 伪影。适当延时取 K0=60s 可以解决该伪影问题。
K0=90s 组，腺体组织有强化会干扰病灶的显示，不利于诊断；
结论：对于高弛豫率高浓度对比剂加乐显做乳腺动态增强，K0=60s 最佳。

EPO-0771

The diagnostic performance of quantitative mapping in breast cancer patients: a preliminary study using synthetic MRI

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Introduction

Recently, the published research works using syMRI have been reported in the neurodegenerative diseases, tumor, and musculoskeletal system. Although the T2 values of breast masses showed a significant position correlation between the syMRI and traditional T2 mapping. However, other relaxation quantitative metrics, such as T1 and PD mapping, were also not investigated. Hence, we hypothesis that the application of syMRI technology in breast cancer is feasible, and the quantitative maps may provide new noninvasive indicators for the differential diagnosis and prognosis prediction of breast cancer. The purpose of our study was to investigate the potential of the quantitative mapping in synthetic MRI for diagnosis of benign and malignant breast lesions.

Methods: In this prospective study, 77 patients with breast space-occupying lesions were submitted to physical examination and enrolled in this study. All patients underwent both the conventional and synthetic MRI before treatment. The quantitative metrics, including T1 (millisecond), T2 (millisecond) and PD (percentage units [pu]) values, derived from synthetic MRI were measured in the pathologically confirmed benign and malignant breast lesions. The diagnostic performance of synthetic MRI was evaluated with unpaired Student's t-test (or Mann-Whitney U test), ROC curve and multivariate logistic regression analysis.

Results: Among 77 patients, 48 were diagnosed as breast cancer and the rest were benign lesions. The breast cancer showed significantly higher T1 (1620.08 ± 233.28 ms) and lower T2 (80.87 ± 7.01 ms), PD (73.91 ± 13.93 pu) values than that of benign lesions. The AUCs were 0.940, 0.864 and 0.661 for T1, T2 and PD maps, respectively, in the diagnosis of breast cancer from benign lesions. Slightly higher AUC of 0.963 was achieved with the combination of those three relaxation quantitative metrics.

Conclusion: Quantitative mapping derived from synthetic MRI showed comparably notable diagnostic capability in the differentiation of benign and malignant breast lesions. Among those quantitative metrics, T1 mapping has the superior differential diagnostic efficiency.

EPO-0772
乳腺浸润性导管癌 MRI 征象与 Ki-67 阳性表达的相关性分析

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目的：乳腺 MRI 检查不仅能够显示病灶的形态特征，功能成像还可以反映病灶微血管的形成及从分子水平反映细胞代谢。目前乳腺癌的分子分型主要依靠免疫组织化学染色明确，但部分病理活检因样本量少等原因，其结果存在一定的偏差性，如能通过其他检查手段比如乳腺 MRI，发现其表现与不同乳腺癌分子亚型之间的关系，就能与病理结果相互补充，从而提高乳腺癌分子分型的准确率。探讨乳腺浸润性导管癌 MRI 征象与 Ki-67 阳性表达间的相关性。

方法：收集病理证实为乳腺浸润性导管癌且术前接受 MR 检查患者的资料，均为女性。MRI 数据均传至 GE AW 4.3 工作站，利用 Functool 软件进行后处理。分析乳腺浸润性导管癌 MRI 征象与 Ki-67 阳性表达间的相关性。

结果：本研究结果显示，ADC 值与 Ki-67 阳性表达呈负相关（P＜0.05，r=-0.131），病灶最大径与 Ki-67 阳性表达呈正相关（P＜0.01，r=0.238），DWI 信号强度与 Ki-67 阳性表达呈正相关（P＜0.01，r=0.300）。早期强化率、延迟强化率、T2WI 信号强度与 Ki-67 阳性表达无相关性（P＞0.05）。

结论：通过对乳腺浸润性导管癌 MRI 征象与 Ki-67 表达情况的分析，本研究显示乳腺浸润性导管癌 ADC 值、病灶最大径、DWI 信号强度与 Ki-67 的阳性表达存在一定的相关性，提示 ADC 值、病灶最大径、DWI 信号强度可作为评价乳腺浸润性导管癌 Ki-67 阳性表达程度的参考指标。

EPO-0773

MR 对乳腺不规则导管内乳头状瘤与浸润性导管癌的鉴别诊断价值

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目的 探讨不规则肿块型导管内乳头状瘤（IDP）和浸润性导管癌（IDC）的 MRI 影像表现和特征，提高 MRI 对于二者的诊断准确率。**方法** 本研究回顾性纳入了经手术病理证实为 IDP 和 IDC 的患者各 33 例，分析了包括病灶大小、边界、内部成分、平扫信号强度、强化方式、ADC 值及 TIC 曲线在内的 MRI 表现。进行 χ^2 检验、t 检验、秩和检验。**结果** 两组相比，病灶边界（$P<0.001$）、大小（$P<0.001$）、ADC 值（$P<0.001$）、强化方式（$P=0.001$）、TIC 曲线达峰时间（$P<0.001$）、斜率（$P<0.001$）和峰值强化率（$P<0.001$）具有统计学差异（$P<0.05$）；病变部位（$P=0.159$）、内部成分（$P=0.778$）、T_2WI 信号（$P=0.438$）、曲线类型（$P=0.406$）无统计学差异。**结论** 不规则肿块型 IDP 与 IDC 虽然具有相似的 MRI 表现，但病灶边缘、ADC 值、强化方式以及曲线达峰时间、斜率和峰值强化率对于二者的鉴别具有重要意义。

EPO-0774

多模态成像技术评价乳腺癌新辅助化疗疗效的价值

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目的：探索乳腺癌患者在新辅助化疗前后行乳腺超声剪切波弹性成像、磁共振 DWI 及动态 MRI 增强多模态影像学联合检查，分析其影像特征改变，评价乳腺癌新辅助化疗疗效的价值。**方法**：收集我院经病理证实为乳腺癌，患者行新辅助化疗 30 例，在新辅助化疗前后行乳腺超声及磁共振检查，测取肿瘤弹性模量值、ADC 值及绘制时间-信号强化曲线。**结果**：病灶肿瘤弹性模量最大值、最小值、平均值、ADC 平均值在新辅助治疗前后病灶体积缩小的病例中差异具有统计学意义（P 值均＜0.05）。新辅助化疗前病灶感兴趣区时间-信号强化曲线：0 例为 I 型曲线，9 例为 II 型曲线，21 例为 III 型曲线；新辅助化疗后 I 型曲线 6 例，II 型曲线 16 例，III 型曲线 8 例。**结论**：多模态影像学检查对乳腺癌新辅助化疗的疗效评估具有重要的临床应用价值。

EPO-0775

Mean and entropy of apparent diffusion coefficient values with standard- and high-b-value diffusion-weighted MR imaging in invasive ductal breast cancer: Association with histologic phenotypes

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Purpose: To study the utility of mean and entropy of apparent diffusion coefficient (ADC) values at standard (800 sec/mm^2) and high (1500 sec/mm^2) *b*-values obtained with diffusion-weighted imaging in identifying histologic phenotypes of invasive ductal breast cancer (IDC).
Methods: Seventy-six patients with histologically confirmed IDC underwent 3.0-T diffusion-weighted imaging with *b*-values of 800 and 1500 sec/ mm^2, and corresponding ADC maps (ADC_{800} and ADC_{1500}) were generated. Mean and entropy of volumetric ADC values measured on all sections of ADC_{800} and ADC_{1500} containing the entire tumor were compared with receptor expression status (oestrogen receptor [ER], progesterone receptor [PR], human epidermal growth factor-2 [HER2], and Ki-67) and histologic phenotype (Luminal A, Luminal B HER2-negative, Luminal B HER2-positive, HER2 positive and Triple negative).
Results: Mean ADC_{800} and ADC_{1500} values were both significantly decreased in ER-positive, PR- positive and HER2-negative tumors (all $P<0.05$, independent Student *t* test). Ki-67 $\geq$20% tumors demonstrated significantly higher ADC_{800} and ADC_{1500} entropy values compared with Ki-67 <20% tumors (both $P<0.001$, Mann-Whitney *U* test). Significant differences were also found among different histologic phenotypes for mean ADC_{800} and ADC_{1500} values ($P = 0.0016$ and 0.0004, respectively, one-way analysis of variance) and ADC_{800} and ADC_{1500} entropy values ($P = 0.0036$ and 0.0016, respectively, Kruskal-Wallis nonparametric test). Luminal A subtype tended to display a lower ADC entropy value compared with other subtypes, while HER2 positive subtype tended to display a higher mean ADC value. Receiver operating characteristic analysis showed that ADC_{1500} metrics exhibited better performance than ADC_{800} for these discriminations.
Conclusion: Mean and entropy of ADC values provided complementary information regarding their associations with histologic phenotypes in IDC. High-*b*-value ADC_{1500} metrics may facilitate better phenotype discrimination.

EPO-0776

Independent Validation of Machine Learning in Diagnosing Breast Cancer on MRI

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Background: As AI methods for the diagnosis of disease advance, we aimed to evaluate machine learning in the predictive task of distinguishing between malignant and benign breast lesions on an independent clinical MRI dataset.
Methods: Computer analysis was conducted on consecutive MRI studies from 1,483 breast cancer and 496 benign patients who underwent MRI examinations between February 2015 and October 2017; with the age ranges of the cancer and benign patients being 19 to 77 and 16 to 76 years old, respectively. Cases were separated into a training dataset (years 2015 & 2016; 1444 cases) and an independent testing dataset (year 2017; 535 cases) based on MRI examination date. After radiologist indication of the lesion, the computer automatically segmented and extracted radiomic features, which were

subsequently merged with a support-vector machine (SVM) to yield a lesion signature. Area under the ROC curve served as the primary figure of merit in the classification task.
Results: In the task of distinguishing malignant and benign breast lesions on DCE-MRI, the trained predictive model yielded an AUC value of 0.89 (95% CI: 0.858, 0.922) on the independent test dataset. AUC values of 0.88 (95% CI: 0.845, 0.926) and 0.90 (95% CI: 0.837, 0.940) were obtained for mass lesions only and non-mass lesions only, respectively. Compared with actual clinical management decisions, the predictive model achieved 99.5% sensitivity with 9.6% fewer recommended biopsies.
Conclusions: On an independent, consecutive clinical dataset from China, a trained machine learning system yielded high performance in distinguishing between malignant and benign breast lesions.

EPO-0777
增强 MRI 影像组学对平台型乳腺癌及乳腺纤维腺瘤的鉴别

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目的 探讨影像组学鉴别平台型乳腺癌及纤维腺瘤的可行性。**方法** 回顾性分析病理证实的乳腺癌 23 例及纤维腺瘤 20 例，评价病灶边界、形态及强化特点。沿病灶边缘勾画感兴趣区，通过 B11 数据包的交互信息（MI）、Fisher 系数和 POE+ACC 共提取 30 个纹理参数。联合十折交叉验证，应用决策树、随机森林、K-最邻近算法、朴素贝叶斯算法进行模型构建。**结果** 乳腺癌组除角二阶矩外，熵值、游程灰度不均匀性及长度不均匀性参数值大于纤维腺瘤，P 值均<0.05，具有显著差异。ADC 值上，乳腺癌组（$0.969\pm0.226\times10^{-3}mm^2/s$）均值低于纤维腺瘤组（$1.424\pm0.345\times10^{-3}mm^2/s$），P 值<0.05，具有显著差异。乳腺癌多呈分叶状、不规则形，边界不清，强化不均。朴素贝叶斯算法构建模型的诊断效能最好，总体准确率 95.25%，敏感度 95.65%，特异度 95.00%。**结论** 影像组学模型能有效鉴别平台型乳腺纤维腺瘤及乳腺癌

EPO-0778
BOLD-MRI 对乳腺癌临床病理因素预测价值的初步研究

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目的 探讨血氧水平依赖功能磁共振成像（Blood oxygen level-dependent functional MRI，BOLD-MRI）对乳腺癌临床病理因素的预测价值。**方法** 收集 79 例乳腺肿块患者，术前行 3.0T 磁共振常规平扫、增强、BOLD 扫描，测量病灶的 BOLD 参数 R2 *值。选择最终经手术病理证实为乳腺癌患者 41 例，根据乳腺癌临床病理因素（包括 ER、PR、Ki-67、HER-2、P53、EGFR、脉管侵犯、腋窝淋巴结情况）进行分组。分析 R2*值在不同分组中的差异，并将有统计学意义的因素用受试者工作曲线分析其对乳腺癌临床病理因素的预测效能。**结果** 所有患者均为女性，年龄范围 28-68 岁，中位年龄 46 岁。共 44 个病灶，其中 ER 阳性 27 例，阴性 17 例；PR 阳性 22 例，阴性 22 例；Ki-67 高表达 30 例，低表达 14 例；HER-2 阳性 18 例，阴性 26 例；P53 阳性 22 例，阴性 22 例；EGFR 阳性 15 例，阴性 29 例；有脉管侵犯 11 例，无脉管侵犯 33 例；腋窝淋巴结转移的 17 例，无腋窝

淋巴结转移 27 例。病灶处的 R2*值与 Ki67、EGFR 的表达及腋窝淋巴结转移情况呈正相关（r=0.483，P=0.009；r=0.593，P=0.006；r=0.498，P=0.002），R2*值在 Ki-67 高低表达组间、EGFR 阴阳性组间、有无腋窝淋巴结转移组间差别有统计学意义（*P*值均<0.05）。病灶 R2*值在不同组间的预测效能：R2*值预测 Ki-67 表达的敏感度、特异度为 64.3%、57.6%，曲线下面积（AUC）为 0.557；R2*值预测 EGFR 表达情况的敏感度、特异度为 65.5%、73.3%，AUC 为 0.660；R2*值预测腋窝淋巴结转移情况的敏感度、特异度为 64.7%、70.4%，AUC 为 0.649。**结论** R2*值对乳腺癌 Ki-67、EGFR 及腋窝淋巴结转移情况具有潜在的预测价值。

EPO-0779

乳腺原发淋巴瘤 MRI 影像特点与临床病理分析

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目的：对乳腺内原发淋巴瘤（PBL）的 MRI 影像表现及病理情况进行观察分析，为今后的诊断总结经验，提高临床对 PBL 的影像学认识。**方法**：对有病理证实的 23 例原发性乳腺淋巴瘤患者回顾分析相对应的 MRI 图像特点及病理情况。**结果**：全部患者均为单侧发病：左侧 15 例，右侧 8 例，其中有 3 例具有多发病灶，直径均＞2.5 cm 团块状软组织信号。20 例病灶无毛刺，3 例病灶有毛刺，19 例伴有淋巴结肿大，10 例为双侧淋巴结肿大，9 例为单侧淋巴结肿大。MR 表现：T1WI 序列呈均匀低信号，T2WI 序列呈稍高或高信号，增强后呈明显均匀强化，（b 值 800-1000）DWI 序列呈明显高信号，ADC 值明显降低。病理分析：23 例乳腺内淋巴瘤中，均为非霍奇金淋巴瘤，其中 19 例为 B 细胞性，4 例为 T 细胞性，在 19 例 B 细胞性非霍奇金淋巴瘤患者中，出现弥漫性大 B 细胞淋巴瘤的患者是 16 例，黏膜相关淋巴瘤的患者 3 例，与相应影像特点比较并都具有统计学意义。**结论**：原发性乳腺淋巴瘤的磁共振影像表现存在一定特异性，可以作为组织病理学的辅助检查手段，为临床诊断提供相关参考。

EPO-0780

Reproducibility in apparent diffusion coefficient (ADC) value: Is it influenced by region of interest (ROI) selection or MR scanners in breast cancer?

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Objectives:
To evaluate the reproducibility in apparent diffusion coefficient (ADC) value on breast cancer through different regions of interest (ROIs) selection at 1.5-Tesla and 3.0 Tesla MR scanners.

Methods:
The retrospective, single-center study was approved by the Institutional Review Board. Between September 2016 and February 2019, 152 patients with breast cancer were scanned by diffusion-weighted MR imaging (b values: 50 to 800 s/mm2). The age, sex, tumor size

and molecular typing (Luminal subtype and non-Luminal subtype) of participants were strictly matched before the study. Three ROIs selection were approached as follows: (1) small circle 2D-ROI (ROI-c); (2) 2D-ROI on the largest slice covering the lesion (ROI-s) and (3) 3D-ROI covering the whole lesion (ROI-w). Comparison of ADC values were obtained at both types of scanners.

Results:
(1)With the same MR scanner and same reader, the ADC values measured by different ROI measurement methods were different: the ADC values of ROI-c, ROI-s and ROI-w were (0.910±0.171)×$10^{-3}$$mm^2$/s, (1.072±0.171)×$10^{-3}$$mm^2$/s, (1.136±0.164)×$10^{-3}$$mm^2$/s at 1.5T, while they are (0.784±0.156) ×$10^{-3}$$mm^2$/s，(0.950±0.181)×$10^{-3}$$mm^2$/s, (0.945±0.174)×$10^{-3}$$mm^2$/s at 3.0T respectively. Generally, ADC of ROI-w-entropy and ROI-w-10^{th} performed better at 1.5T scanner, while ROI-w-10^{th} and ROI-w-90^{th} performed better at 3.0T scanner. (2) The ROI-c, ROI-s and ROI-w-mean ADC values were significantly lower at 3.0T scanner compared with the 1.5T one (all P < 0.001).

Conclusions:
The reproducibility in ADC value is influenced by ROI selection and types of MR scanners in breast lesions. Further studies are required to confirm the influence of different MR scanners with more accurate design and more cases.

EPO-0781
全体积表观弥散系数作为生物学标志物鉴别乳腺病变的价值及与 Ki-67 的相关性研究

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目的：
探讨全体积表观弥散系数作为生物学标志物鉴别乳腺病变的价值及与 Ki-67 的相关性。

方法：
广州市第一人民医院伦理审查委员会批准了这项回顾性研究。2016 年 9 月至 2019 年 2 月，189 名患者（80 例乳腺良性病变及 105 例乳腺癌患者）进行 MR 成像检查， b 值分别为 50 和 800 s/ mm^2。通过全体积 ADC 直方图对整个乳腺病变进行分析以区分良性和恶性乳腺病变及不同亚型分子乳腺癌。使用 Spearman 相关分析进行统计学分析 ADC 各参数和 Ki-67 之间的关系。

结果：
在 189 个乳腺病变中，80 例良性和 105 例恶性病变之间，患者年龄（P <0.001）和病变大小（P = 0.006）存在显着差异，且所有 ADC 直方图参数之间存在显着差异（包括平均值，第 10 百分位数，第 50 百分位数，第 90 百分位数，偏度，峰度和熵）（P <0.001），其中中位数和平均 ADC 直方图参数区别效能更高（AUC 分别为 0.9433 和

0.9303）。ROC 曲线显示全体积 ADC 第 10 百分位数和熵可以区分 Her-2 状态（分别为 p = 0.0010 和 p = 0.0013）和 HR 状态（p = 0.0198，p = 0.0408 分别）。在所有乳腺癌病变中，ki-67 可分为低增殖组（n=35，Ki-67 <14%），高增殖组（n=70，Ki-67≥14）。 ROC 分析显示全体积 ADC 直方图中，熵和偏度可以区分 ki-67 状态（p = 0.0074，p <0.001），并且 ADC 熵（r = 0.383）和偏度（r = 0.209）与 ki-67 之间存在弱相关性。

结论：

全体积 ADC 直方图可作为定量成像标记物区分乳腺良恶性病变，可作为预测乳腺肿瘤增殖指标的补充。

EPO-0782

乳腺单纯包裹性乳头状癌的 MRI 表现

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目的：探讨乳腺单纯包裹性乳头状癌的 MRI 表现。方法：回顾性分析我院经手术病理证实的 4 例乳腺单纯包裹性乳头状癌的 MRI 表现，包括形态学特点、增强特点、时间-信号强度曲线及 ADC 值。结果：4 例乳腺单纯包裹性乳头状癌均表现为圆形或类圆形囊实性肿块，增强可见环形强化包膜，时间-信号强度曲线均呈流出型，ADC 值为$(1.14\pm0.20)\times10^{-3}mm^2/s$。结论：乳腺单纯包裹性乳头状癌的 MRI 表现有一定的特征性。

EPO-0783

表观扩散系数直方图在新辅助化疗前预测 Luminal 型乳腺癌疗效的价值

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目的 探讨表观扩散系数(ADC)直方图在新辅助化疗（NAC）前预测 Luminal 型乳腺癌疗效的临床价值。

材料与方法 回顾性分析 NAC 前穿刺病理及免疫组化证实为 Luminal 型乳腺癌、完善 MRI 检查（包括 DWI 序列）、NAC 后手术的患者 57 例，其中有效组 17 例。记录乳腺癌的 ADC 直方图参数，包括平均值（mean）、最小值（min）、标准差（SD）、最大值（max）、10%、25%、50%、75%及 90%百分位数、偏度（skewness）和峰度（kurtosis）。用组内相关系数（ICC）分析观察者间和观察者内一致性。用独立样本 t 检验对比各参数。应用受试者操作特性曲线（ROC）评价 ADC 直方图参数预测 NAC 疗效的诊断效能。

结果 ADC 直方图参数观察者间 ICC（0.089-0.845）均低于观察者内（0.306-0.906）。min、10%、25%及 50%的一致性较好。有效组的 min、10%和 25%均高于无效组（$p<0.007$），差异有统计学意义，其中 10%的 ROC 曲线下面积最大（0.746），以 $0.746\times10^{-3}mm^2/s$ 为最佳界值，敏感度、特异度分别为 82.35%、65.00%。但 10%的诊断效能未明显高于 25%（ROC 曲线下面积 0.724，$p=0.505$）。

结论 ADC 直方图在 NAC 前预测 Luminal 型乳腺癌有一定的诊断价值，10%、25%的诊断价值较高且一致性较好。

EPO-0784

The application value of DCE-MRI quantitative parameters in the evaluation of the efficacy of neoadjuvant chemotherapy for breast cancer

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Objective: To evaluate the value of dynamic contract enhanced magnetic resonance imaging (DCE-MRI) quantitative parameters and the expression of related biological factors in the evaluation of the efficacy of neoadjuvant chemotherapy for invasive ductal carcinoma of the breast. **Methods:** 56 female patients with invasive ductal carcinoma of the breast were recruited ,all of them had complete clinical data and undertake neoadjuvant chemotherapy. In this study, they were divided into effective and ineffective groups according to the RECIST criteria. The values of K^{trans}, K_{ep} and V_e before ,after two courses and at the end of chemotherapy were compared. Immunohistochemical staining was used to detect the expression of ER, PR, Her-2 and Ki-67 in breast cancer tissues, and the size of DCE-MRI quantitative parameters in different expression states was analyzed. The correlation between the quantitative parameters of DCE-MRI and the expression of Ki-67 was analyzed. **Results:** The K^{trans}max, K^{trans}mean, K_{ep} max, and K_{ep} mean expression in the effective group were significantly decreased than those before neoadjuvant chemotherapy ($P < 0.05$). The K^{trans}min expression was significantly lower at the end of chemotherapy than before neoadjuvant chemotherapy ($P < 0.05$). The K_{ep}max and K_{ep}mean values in the ER-expression and PR-expression negative groups were higher than those in the ER-expression and PR-expression positive groups ($P < 0.05$). The $V_e$max value in the PR-negative group were higher than those in the PR-negative positive group($P < 0.05$). Ki-67 expression was positively correlated with K^{trans}min, K^{trans}max and K^{trans}mean values (r=0.384, P=0.003; r=0.294, P=0.028; r=0.551, $P < 0.01$). There was no correlation between the value of K_{ep}, V_e and Ki-67 expression ($P > 0.05$). **Conclusion:** The quantitative parameters of DCE-MRI and the expression of related biological factors can evaluate the efficacy of neoadjuvant chemotherapy in invasive ductal carcinoma of the breast patients, which is worthy of clinical application.

EPO-0785

多模态磁共振成像联合临床病理特征预测乳腺癌术前腋窝淋巴结转移的价值

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目的：探讨乳腺癌患者腋窝淋巴结转移的临床影像及病理的相关因素。
方法：回顾性分析 2016 年 1 月 1 日-2016 年 12 月 30 日中国医学科学院肿瘤医院经手术病理证实的 219 例乳腺癌患者，术前均行 MR 检查，术后有完整常规病理、免疫组化及腋窝淋巴结病理资料。根据术后病理结果将患者分为有腋窝淋巴结转移（ALNM(+)）和无转移淋巴结组(ALNM(-))，分析乳腺原发灶的 MR 特征及病理特征，包括：年龄、腺体类型、背景强化、肿瘤位置、肿瘤长径、病灶个数、T2WI 信号特征、强化方式、病理类型、ER、PR、Her2、Ki67 及分子分型，并测量肿瘤原发灶的表观弥散系数（Apparent Diffusion Coefficient ，ADC）值、时间-信号强度曲线（Time-Intensity Curve，TIC），进行单变量和多变量分析，探讨 ALNM(+)与 ALNM(-)组间的差异。单变量分析方面，定性资料的比较采用 x 2 检验，定量资料的比较采用独立样本 t 检验（正态分布数据）或 Mann-Whitney U 检验（偏态分布数据）。多变量分析采用 Logistic 二元回归分析。
结果： 单变量分析中，ALNM（+）组与 ALNM(-)组在肿瘤长径、ADC 值、病灶个数、淋巴管浸润以及 Ki67 水平方面的差异有显著统计学差异（P<0.05）。而年龄、家族史、腺体类型、背景强化、肿瘤位置、T2WI 信号特征、强化方式、时间-信号强度曲线（Time-Intensity Curve，TIC）类型、ER、PR、Her2 以及分子分型等方面的差异没有显著统计学差异（P>0.05）。多变量分析中，肿瘤长径、病灶个数、淋巴管浸润和 Ki67 水平仍然是与腋窝淋巴结转移相关的独立变量。
结论：术前 MRI 能够有效的评价乳腺癌腋窝淋巴结转移，乳腺癌原发灶的肿瘤长径、ADC 值、病灶个数、淋巴管浸润以及 Ki67 水平是腋窝淋巴结转移最有力的独立预测因子。

EPO-0786
ADC 图影像组学对预测浸润性乳腺癌脉管浸润的价值

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［摘要］**目的**探讨 ADC 图影像组学对预测浸润性乳腺癌脉管浸润的价值。**方法**收集我院 2016 年 3 月至 2018 年 10 月收治的 192 例浸润乳腺癌患者作为研究对象。根据手术病理结果将其分为脉管浸润阳性组和脉管浸润阴性组。观察、记录乳腺癌的 MRI 形态学特征、年龄及分子亚型并测量、记录 ADC 图影像组学参数，包括直方图参数、纹理参数、形状系数参数、共生矩阵参数、游程矩阵参数、灰度区域大小矩阵共 64 个参数；分别采用两独立样本 x^2 检验、t 检验及 Mann-Whitney U 检验比较两组病例形态学表现、淋巴结情况、年龄、分子亚型及 ADC 直方图影像组学参数。**结果**脉管浸润阳性 58 例，脉管浸润阴性 134 例；肿瘤大小、淋巴结阳性率、瘤周水肿与脉管浸润显著相关(P＝0.006、0.000、0.042)；阳性组与阴性组对比 50thADC、峰度及熵-共生矩阵呈显著相关（P<0.05）；年龄、绝经状态、环形征（环形强化、DWI 环形高信号）、分子亚型两组对比无显著性差异（P>0.05）。**结论** ADC 直方图影像组学对预测浸润性乳腺癌是否有脉管浸润有一定价值。

EPO-0787
比较基于模型与非模型的 DCE-MRI 药代动力学参数对乳腺癌新辅助化疗(NAC)反应的预测价值。

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目的：探索基于模型的 DCE-MRI 药代动力学参数早期预测乳腺癌新辅助化疗（NAC）反应的表现是否优于非模型参数。
方法：61 例病理证实的乳腺癌患者在 NAC 前(T0)、1 周期后(T1)和 4 周期后(T2)行 DCE-MRI 检查，分别测定基于模型(标准 Tofts-Kety 模型)和非模型 DCE-MRI 药代动力学参数。基于模型的参数：K_{trans}、V_e、K_{ep}；无模型参数：前 90s 增强曲线下面积（IAUGC）、最大上升斜率（MaxSlope）、正性增强积分（PEI）、对比增强比（CER）和时间-强度曲线类型（TIC）。根据手术病理 Miller-Payne 分级，患者分为良好反应组(R 组)和不良反应组（NR 组）。采用非参数及卡方检验比较两组三个时间点各参数的差异，包括各参数 T0 到 T1 差值。多因素 logistic 回归分析与 NAC 反应相关的参数，受试者工作特征曲线（ROC）分析其预测性能。
结果：R 组 21 例，NR 组 40 例。T1 时，两组间 K_{trans}、IAUGC、MaxSlope 值及 TIC 类型具有显著差异；T2 时，除 V_e外，余参数组间差异均有统计学意义(P < 0.05)。T1 时，R 组的 K_{trans}、IAUGC、MaxSlope、PEI 变化的百分比明显高于 NR 组。多因素 logistic 分析显示 K_{trans}与 TIC 与 NAC 早期反应相关。T1 时,K_{trans}曲线下面积(AUC)为 0.77 (95% CI：0.64,0.89)，敏感性为 52.4%，特异性为 95%；TIC 的 AUC 为 0.83 (95%CI：0.71,0.94)，敏感性为 66.7%，特异性为 87.5%；二者差异无统计学意义(P > 0.05)，且 K_{trans}联合 TIC 不能提高预测最终化疗反应的效果。
结论：基于模型的 DCE-MRI 药代动力学参数在早期预测乳腺癌 NAC 疗效方面的表现与非模型参数相似，其中 K_{trans}和 TIC 是最有效的参数。

EPO-0788

全容积 ADC 直方图定量分析对不同亚型乳腺癌新辅助化疗后获得病理完全缓解反应的评估和预测价值

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目的 探讨全容积 ADC 直方图参数对不同亚型乳腺癌新辅助化疗获得病理完全缓解反应的评估和预测价值。
方法 搜集我院 121 例经穿刺病理证实为浸润性乳腺癌的患者，治疗前均在我院行 3.0T 乳腺 MRI 检查，化疗后手术病理采用 Miller-Payne（M-P）分级系统评价化疗反应，分为病理完全缓解组（Pathological Complete Response, PCR）和非病理完全缓解组（non Pathological Complete Response, nPCR）。利用 Firevoxel 软件在 DWI 图上（b=800s/mm^2）绘制肿瘤每一层面轮廓，生成 ADC 直方图，记录各参数，包括 ADC 平均值（ADC_{mean}）、偏度系数、峰度系数、ADC 最小值（ADC_{min}）、ADC 最大值（ADC_{max}）、ADC 第 10、第 50 及第 90 百分位数（ADC 10%、ADC 50%、ADC 90%）。统计学方法采用两独立样本 t 检验或 Mann-Whitney U 检验。以 ROC 曲线寻找预测 PCR 的最佳参数阈值。
结果 峰度系数在 HER2+过表达亚型中的 PCR 组和 nPCR 组之间有统计学差异（P=0.039），以 ROC 曲线评价峰度系数预测 NAC 后病理反应，曲线下面积为 0.813，采用阈值 1.861 预测 PCR，其敏感度为 100%，特异度为 68.7%。在三阴性亚型中 PCR 组和 nPCR 组之间 ADC_{mean}以及 $ADC_{50\%}$有统计学差异（P 值分别为 0.028，0.013），$ADC_{50\%}$采用阈值 0.967 预测 PCR，曲线下面积为 0.842，敏感度和特异度分别为 80%、83.3%。
结论 1.峰度系数对预测 HER2+过表达亚型化疗后 PCR 具有一定的价值；2.$ADC_{50\%}$对预测三阴性乳腺癌化疗后 PCR 具有较高的应用价值。

EPO-0789

比较 3.0TMRI 中 IDEAL 序列与 T2WI-FS 序列对乳腺的脂肪抑制效果

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目的：对比研究 IDEAL 序列和 T2WI-FS 序列在 3.0T 乳腺 MR 中的脂肪抑制图像质量，进一步明确 IDEAL 序列与 T2WI-FS 序列脂肪抑制的稳定性。
材料和方法：选取 21 名行乳腺 MR 检查的患者，应用 3.0T GE750w MRI 行 T1WI、DWI、轴位 T2WI-IDEAL 及轴位 T2WI-FS 序列扫描，T2WI-IDEAL 序列的扫描参数为：重复时间（TR）:5230ms;回波时间（TE）：85ms;带宽：62.5khz；视野（FOV）：38×38cm；层厚/层间距:5.0/1.0mm;矩阵：320×256；激励次数（NEX):1。T2WI-FS 序列的扫描参数为：TR:5230ms;TE：85ms;带宽：62.5khz；FOV：38×38cm；层厚/层间距:5.0/1.0mm;矩阵：320×256；NEX:2。用主观和客观两种评价方法进行评价。主观评分标准：1 分为图像质量差，图像无法诊断；2 分为脂肪抑制效果和整体图像质量欠佳，提供部分诊断信息；3 分为脂肪抑制效果和整体图像质量良好，无诊断信息丢失；4 分为脂肪抑制效果和整体图像质量优良。客观方法为：选取两种脂肪抑制方法扫描得到的图像选择同一层面的 21 个感兴趣区测量皮下脂肪的信号强度，并绘空间信号曲线图进行比较。采用 Kappa 分析对 2 名医师主观评分进行一致性分析，Kappa≥0.75 为一致性较好。
结果：2 名医师对乳腺 T2WI 压脂图像质量主观评分一致性良好。T2WI-IDEAL 序列评分 3 分及以上占 95%；而 T2WI-FS 序列评分 3 分及以上占 85%，见表 1。通过统计学证实两种压脂序列的评分有统计学意义（$P<0.05$）。两种脂肪抑制的空间信号曲线图如图 1。T2WI-IDEAL 序列空间信号曲线图较平稳，脂肪抑制效果可靠性较好。
结论：对于乳腺 3.0TMRI,应用 T2WI-IDEAL 序列较 FS 有更好稳定性及图像质量和脂肪的抑制效果。

EPO-0790
乳腺 MRI 定量动态增强参数的重复性与一致性研究

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摘要：目的探讨乳腺 MRI 定量动态增强参数的重复性和一致性。方法两位操作者,记为操作者 1 和操作者 2,分别回顾性测量 250 例患者共 256 个乳腺病灶,所有病灶均术前行 3.0 T 乳腺 MRI 定量动态增强扫描,并经穿刺活检或手术病理证实,分别测量容量转移常数(Ktrans)、速率常数(Kep)和血管外细胞外间隙容积比（Ve）,并进行组间统计分析。运用配对 t 检验评估乳腺 MRI 各定量动态增强参数的差异性,运用组内相关系数（ICC）和 Cronbach’s Alpha 系数评估其重复性,运用 Bland-Altman 分析乳腺 MRI 各定量动态增强参数的组间一致性。结果操作者 1 和操作者 2 测得的乳腺恶性病变各定量参数分别为 Ktrans（1.489±0.636）/min 和（1.469±0.632）/min,Kep（3.220±1.651）/min 和（3.256±1.746）/min,Ve（0.504±0.152）/min 和（0.517±0.162）/min;操作者 1 和操作者 2 测得的乳腺良性病变各定量参数分别为 Ktrans（0.429±0.236）/min 和（0.443±0.251）/min,Kep（0.769±0.431）/min 和（0.794±0.463）/min,Ve（0.564±0.172）/min 和（0.570±0.159）/min。不同操作者间乳腺恶性病变及良性病变的 Ktrans、Kep 及 Ve 值差异均无统计学意义（P>0.05）;不同操作者间所测得的乳腺 MRI 各定量动态增强参数的 ICC 均在 0.7 以上,Cronbach’s Alpha 系数也均>0.8,显示重复性较好。BlandAltman 图像分析结果显示两

个不同操作者之间所测得的乳腺 MRI 各定量动态增强参数的一致性较好。结论乳腺 MRI 定量动态增强参数的测量在不同操作者间具有较好的重复性和一致性。

EPO-0791
肿块与非肿块型乳腺癌病灶扩散加权成像参数的重复性与一致性研究

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目的 探讨肿块与非肿块型乳腺癌病变采用不同 b 值行 DWI 检查,不同操作者间的重复性和一致性.方法 回顾性分析东南大学附属中大医院 2010 年 12 月至 2017 年 10 月经乳腺动态对比增强 MRI(DCE-MRI)检查发现为乳腺非囊性病灶,行乳腺 DWI 检查,且经外科手术病理证实为乳腺癌的 131 例女性患者(133 个病灶).肿块型病变 94 例(96 个病灶),非肿块型病变 37 例(37 个病灶).由 2 名同等资历的放射科医师采用双盲法阅片,分别测量 ADC 值.采用配对 t 检验比较 2 名医师测量参数的差异,采用组内相关系数(ICC)和 Cronbach α 系数评价 2 名医师测量的重复性,采用 Bland-Altman 一致性分析方法评价 2 名医师间的一致性.结果 不同 b 值下乳腺非肿块型和肿块型病变的 ADC 值,2 名医师间测量结果的差异均无统计学意义(P 均>0.05).2 名医师测得的不同 b 值下乳腺非肿块型病变及肿块型病变的 ADC 值，重复性为好或非常好 Cronbach α 值分别为 0.94、0.97、0.99、0.96、0.95,信度高.Bland-Altman 图像分析结果显示不同操作者在不同 b 值下测得的乳腺非肿块型、肿块型病变的 ADC 值一致性均较好.乳腺非肿块型病变在不同 b 值下,分别有 97.3％(36/37)、94.6％(35/37)、93.1％(27/29)、8/8、8/8 的点在 95％一致性界限内;乳腺肿块型病变在不同 b 值下,分别有 97.9％(94/96)、94.8％(91/96)、92.2％(47/51)、95.6％(43/45)、93.3％(42/45)的点在 95％一致性界限内.结论 在不同 b 值条件下测量乳腺 ADC 值,不同操作者间对不同病变类型乳腺癌病灶均具有较好的重复性和一致性.

EPO-0792
探讨乳腺癌 MR 动态增强图像的血管表现与肿瘤形态、大小及病理分级的相关性

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目的探讨乳腺癌 3.0T MR 动态增强图像中血管表现与肿瘤形态、大小及病理分级的相关性。方法对 53 例乳腺癌术前患者(54 个病灶)行双侧乳腺 3.0T MR 动态增强扫描,重建得到 3D MIP 图像,分别对图中病灶邻近血管、患侧与对侧的差异血管数目进行评分,分析其与肿瘤形态、肿瘤最大径及浸润性导管癌病理分级之间有无相关性。结果①肿块型、非肿块型乳腺癌的差异血管数目评分、邻近血管数目评分差异均无统计学意义(P 均>0.05)。②肿块型乳腺癌肿瘤最大径与差异血管数目评分无相关性(P>0.05),与肿瘤邻近血管数目评分呈正相关(r=0.46,P<0.01);非肿块型乳腺癌肿瘤最大径与差异血管数目评分呈正相关(r=0.57,P<0.05),与肿瘤邻近血管数目评分呈正相关(r=0.79,P<0.01);总体乳腺癌的肿瘤最大径与差异血管数目评分及邻近血管数目评分均呈正相关(r=0.37、0.47,P 均<0.01)。③浸润性导管癌的病理分级程度与差异血管数目评分、邻近血管数目评分均无相关性(P 均>0.05)。结论乳腺癌 MR 动态增强图像血管表现与肿瘤最大径有关,与肿瘤的形态及浸润性导管癌的病理分级程度无关。

EPO-0793
非肿块强化乳腺癌不同分子亚型与 MRI 征象和病理特征的相关性

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目的：探讨非肿块强化乳腺癌各分子亚型与 MRI 征象和病理特征的相关性。**材料与方法：**收集 2014 年 1 月至 2019 年 6 月行 3.0T 乳腺 MRI 多模态扫描的患者，回顾性分析 62 例非肿块强化乳腺癌患者 MRI 影像及临床病理资料。依据免疫组化染色对分子亚型进行分类。以卡方检验和 Fisher 确切概率法比较不同分子分型与 MRI 征象和病理特征的差异，采用交叉列联表分析两者的相关性。**结果：**非肿块强化乳腺癌不同分子亚型在病变内部强化方式、瘤周水肿、MRI BI-RADS 分类、病理组织学类型和 Ki67 表达水平上的差异具有统计学意义（P＜0.05），而在病变分布类型、动态增强曲线、瘤周血管异常和腋窝淋巴结转移上差异无统计学意义（P>0.05）。组间分析表明在 NME 乳腺癌中，Luminal A 型不容易出现瘤周水肿，病理组织学类型多为导管内癌，Ki-67 低表达，较低级别的 BI-RADS 分类；Luminal B 型以不均匀强化为主，Ki-67 多中度表达；HER-2 过表达型以簇环状强化为主，易出现瘤周水肿，Ki-67 多中高度表达；三阴性型以簇环状强化为主，易出现瘤周水肿，组织病理类型多为浸润性癌，Ki-67 多中高度表达，以及容易出现腋窝淋巴结转移。**结论：**不同分子亚型非肿块强化乳腺癌具有一定的 MRI 特征，有望为非肿块强化乳腺癌术前治疗方案的制定提供一种无创的评价体系。

EPO-0794
Comparative Analysis of MRI and Pathologic Features between Complex Sclerosing Lesions and Invasive Carcinoma of the Breast

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【Abstract】 **Purpose:** Complex sclerosing lesions (CSL) of the breast are the result of entrapment and distortion of benign ductal and lobular components by fibroelastotic scars. They often mimic invasive carcinoma (IC) on imaging and pathologic examinations resulting in misdiagnosis. **Methods:** To investigate the magnetic resonances imaging (MRI) and pathologic features of those lesions, 27 cases of surgically excised and pathologically confirmed CSL cases which also have accompany MRI available are identified from our hospital database from the period of October 2015 to December 2018 33 invasive carcinoma cases diagnosed in the same period of time are also selected for comparison. The patient’s demography, pathology and MRI data are analyzed and compared. **Results:** The average patient age for the CSL group is 45.7±8.4years and the IC group of 57.8±14.2 years (p=0.000). The average diameter of CSL is 1.19±0.64cm and invasive carcinoma is 2.14±1.35cm (P=0.001). Similar 59.3% of CSL and 69.7% of IC cases are described on both image and pathology reports as “ill-defined” or “speculated”. Comparison of MRI features of CSL and IC groups. T1WI showed statistical differenc while no statistical differences between the two groups on T2WI or STIR. TIC pattern: CSL (19 cases type Ⅰ, 7 cases type Ⅱ), IC (20 cases

type Ⅲ).Mean ADC value: CSL (0.00137 mm^2/s) vs. IC (0.00104 mm^2/s). 3 out of 33 IC cases show rim enhancement while non-in CSL cases. **Conclusions:** Our data suggest that compare to CSL, IC tend to occur in older women with larger lesional diameter. IC often have lower signal intensity on T1WI imaging, less than 0.0012 mm^2/s ADC value and most commonly type Ⅲ TIC pattern.T2WI and STIR data and shape of the boarder are less useful in distinguishing the CSL from IC.

EPO-0795
乳腺背景实质强化结合弥散加权 ADC 直方图对乳腺癌分子分型的研究

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目的：通过全自动化量化分析对正常腺体评估以及高通量挖掘影像组学特征对肿瘤异质性的判断，评估乳腺背景实质强化与 ADC 直方图特征，两者对乳腺癌分子分型评估的价值及其相关性。材料与方法：前瞻性分析 2018 年 1 月至 11 月入组的 142 例进展期乳腺癌患者。利用动态增强磁共振图像行 BPE 的量化分析，采用 MR 多参数分析软件进行直方图分析，利用 DWI 勾画感兴趣体积提取一阶直方图特征进行分析。具体参数包括均数、百分位数（5th 及 95th 的 ADC 值）、偏度、峰度、对比值和熵值。采用单因素方差分析比较影像组学特征及 BPE 特征在不同分子亚型间的差异。采用 Spearman 相关性检验比较影像指标之间相关性。结果：142 名患者共 142 个病灶，包括三阴性乳腺癌 17 例，Luminal A 型 12 例，Luminal B 型 39 例人表皮上皮生长因子受体 2 阳性亚型 74 例。分析 ADC 直方图特征，包括 ADC 均数、5th 百分数，95th 百分数、偏度值、峰度值、对比值及熵值，以及 BPE 在四组不同分子分型中差异。其中 ADC 95th 百分数、峰度及 BPE 在四组分子分型之间具有统计学差异（$p<0.05$）。ADC 95th 百分数、峰度及 BPE 在三阴性与 Luminal A 型、三阴性与 Luminal B 型及三阴性与 HER2 阳性亚型的两两比较中，均存在显著统计学差异（$p<0.05$）。进一步分析 ADC 95^{th} 百分数、峰度及 BPE 的相关性，BPE 与 ADC 95^{th} 百分数无显著相关性($r=0.035$, $p=0.675$)，BPE 与 ADC 峰度值存在弱相关性（$r=-0.176$, $p=0.036$）。结论：基于弥散扩散加权的 ADC 直方图特征（95th 百分位 ADC 值和 ADC 峰度值）与 BPE 特征在不同分子分型乳腺癌中存在差异，尤其是在三阴性乳腺癌亚组中；且 ADC 峰度值与 BPE 存在负相关。

EPO-0796
The volumetric-tumour histogram-based analysis of intravoxel incoherent motion and non-Gaussian diffusion MRI：Association with prognostic factors in HER2-positive breast cancer

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Background: To evaluate the imaging biomarkers of HER2 (Human epidermal growth factor receptor 2) positive breast cancer in comparison to other molecular subtypes and to

determine the feasibility of identifing hormone receptor (HR) status and lymph node metastasis status using volumetric-tumour histogram-based analysis through intravoxel incoherent motion (IVIM) and non-Gaussian diffusion.
Methods: This study included 145 breast cancer patients with 148 lesions between January and November in 2018. Among the 148 lesions, 74 were confirmed to be HER2-positive. The volumetric-tumour histogram-based features were extracted from the combined IVIM and non-Gaussian diffusion model. IVIM and non-Gaussian diffusion parameters obtained from images of the subjects with different molecular prognostic biomarker statuses were compared by Student's t test or the Mann-Whitney U test. The area under the curve (AUC), sensitivity, and specificity at the best cut-off point were reported. The Spearman correlation coefficient was calculated to analyse the correlations of clinical TNM (Tumor nodule metastasis) stage and Ki67 with the IVIM and non-Gaussian diffusion parameters.

Results:
The entropy of Mean Kurtosis (MK) was significantly higher in the HER2-positive group than in the HER2-negative group (p = 0.015), with an AUC of 0.629 (95% CI 0.546, 0.707), a sensitivity of 62.6%, and a specificity of 66.2%. For HR status, the MD 5th percentile was higher in the HR-positive group of HER2-positive breast cancer (p = 0.041), with an AUC of 0.643 (95% CI 0.523, 0.751), while for lymph node status, the entropy of mean diffusivity (MD) was lower in the lymph node positive group (p = 0.040), with an AUC of 0.587 (95% CI 0.504, 0.668). The clinical TNM stage and Ki67 index were correlated with several histogram parameters.
Conclusion:
Volumetric-lesion histogram analysis of IVIM and the non-Gaussian diffusion model can be used to provide prognostic information about HER2-positive breast cancers and potentially contribute to individualized anti-HER2 targeted therapy plans.

EPO-0797
MRI 乳腺背景实质强化对 HER2 阳性乳腺癌新辅助化疗疗效评估的研究

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目的:探索进展期乳腺癌的对侧 BPE 在 NAC 全程的变化特征，以及 BPE 能否早期预测进展期乳腺癌 NAC 的 *pCR*。材料与方法: 回顾性分析 2014 年 8 月至 2016 年 4 月确诊为进展期乳腺癌患者 116 名， 90 例单侧乳腺癌患者纳入本研究。在 NAC 治疗前以及治疗后的第 2、4、6 周期分别行 MRI 动态增强扫描。通过全自动量化分析软件完成对侧 BPE 的量化分析。结果：在完成 NAC 后，25 例(27.78%)患者达到 pCR, 65 例(72.22%)患者为非 pCR。pCR 组与非 pCR 组的组织学类型、激素受体状态以及 HER2 状态的在两组间的差异有统计学意义（P <0.05）。在 NAC 治疗后的第 2、4、6 周期的 BPE 均较基线水平显著降低 (P<0.001)。无论绝经状态如何，BPE 在整个 NAC 治疗全程均呈现相似的变化趋势。同时，在 NAC 的三个不同监测点，BPE 的降低与肿瘤最大径的缩小均存在弱相关性(r=0.373, p<0.001, r=0.249, p=0.018, r=0.264, p=0.012)。Δ*BPE* 的最大 AUC 在 NAC 后第 2 周期，而Δ*Size* 的最大 AUC 在 NAC 后第 6 周期。其中，NAC 后第 2 周期，Δ*BPE* 的 AUC 为 0.726，鉴别 pCR 与 non-pCR 两组之间的分界点是 0.2672 (敏感性和特异性分别为 88%, 52.3%)，而Δ*Size* 的

AUC 为 0.704，预测 pCR 的分界点是 0.3258(敏感性和特异性分别为 80%，61.5%)。多因素分析中，NAC 后第 2 周期和第 4 周期 BPE 的降低是与 pCR 的正相关的自变量，NAC 后第 2、第 4 和第 6 周期，肿瘤最大径的缩小与 pCR 正相关的自变量，HR 状态阴性为与 pCR 正相关的自变量。结论：对侧正常乳腺 BPE 呈持续下降趋势，与 NAC 的肿瘤大小变化类似。NAC 早期 BPE 的降低与 pCR 呈显著正相关，尤其是 HR 受体阴性状态患者。

EPO-0798

乳腺背景实质强化对高危病变的评估研究

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目的：通过分析乳腺高危病变的 MRI 征象及 BI-RADS 诊断，关注 *BPE* 及临床特征与高危病变恶性升级的关系。材料与方法：回顾性搜集 2017 年 1 月-2018 年 3 月我院病理数据库中活检病理为乳腺高危病变，并本院行活检前乳腺 MRI 检查共 230 例（平均年龄 48.26 ± 10.61 岁）。MRI 特征分析包括肿块及非肿块样强化等。将 BPE 程度分为两组进行研究，即几乎没有/轻度强化为一组，中度/重度强化为一组。以病理结果为金标准，分析 MRI 对乳腺高危病变升级率的诊断效能。采用独立样本 t 检验与卡方检验比较临床及病理特征在升级组与未升级组的组间差异。以病理结果为金标准，采用 ROC 检验比较 MRI 对乳腺高危病变升级率的诊断效能。结果：230 例患者为单发病灶，共 230 个病灶。ADH 43 例，ALH 6 例，硬化性腺病 89 例，导管内乳头状瘤 87 例，粘液样肿瘤 4 例，FEA 1 例。47 例伴不典型增生病变在后续手术中升级为恶性病变，升级率为 20.4%。绝经前 BPE 值高于绝经后妇女（χ=8.964，P=0.003）。不同月经周期在背景实质强化轻微/轻度和中度/明显两组间无明显统计学差异（χ=3.367，P=0.338）。乳腺 MRI 征象在升级组与未升级组的组间存在统计学差异（χ= 8.28，P=0.016），MRI 背景实质强化在两组间存在统计学差异（χ=50.32，P<0.001）。以 BI-RADS 4a 为分界点时，乳腺 MRI 评估高危病变有无升级为恶性病变诊断效能最高，敏感性分别为 93.62%，特异性为 86.34%，阳性预测值为 78.1%，阴性预测值为 88.1%， ROC 曲线下面积为 0.913。多因素分析显示，年龄和 MRI 背景实质强化是乳腺高危病变升级的独立因素(P <0.001)。结论： MRI 背景实质强化中重度、患者年龄越大可提示高危病变的恶性升级。

EPO-0799

乳腺背景实质强化对高危人群的评估研究

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目的：以高危人群为研究主体，关注究竟哪些因素会造成乳腺 MRI 上背景实质强化（BPE），探索 BPE 与乳腺癌风险是否存在关联，评估 BPE 的相关影响因素。
材料与方法：回顾性分析 xxx 医院 2008 年 12 月至 2015 年 6 月乳腺高危病人数据库。最终 91 例高危人群（BRCA 突变患者 50 例，41 例基于家族史的风险评估模型评估终身罹患乳腺癌风险>20%）以及 56 例作为正常对照的非高危人群纳入本研究中。BPE 的评估依据 BI-RADS 指南，评估动态增强第一期的整个乳腺腺体情况。BPE 的评估选取原始动态增强图像，正常乳腺腺体的 BPE 分为：1=极少，2=轻度，3=中度和 4=明显。此外病人的运动作为可能影响 BPE 的额外指标评估，分为：1=极少，2=轻度，3=中度和 4=明显。利用线性回归方法分析与 BPE 可能相关的因素，包括 FGT、年龄、绝经状态、乳腺癌、高危状态等。

结果：两位阅片者定性评估的一致性分析显示，两位阅片者对 BPE 及 FGT 定性评估基本一致。线性回归分析显示所有模型中 FGT 与 BPE 呈正相关（P<0.001）。年龄与 BPE 未见明显相关性，但按年龄定义绝经状态后，BPE 与绝经状态相关（P<0.05）；BPE 与患乳腺癌无相关性（P >0.05）。高危状态在最初的模型中，显示 BPE 与高危状态呈负相关，BRCA1、BRCA2 突变或终生患癌风险>20%的患者的 BPE 低于对照组非高危人群。但当纳入患者运动因素后，显示 BPE 与高危状态无相关性。患者运动被纳入为 BPE 的影响因素，与患者轻微运动相比，患者明显运动时 BPE 增加 0.7。
结论：BPE 与 FGT 呈正相关，与绝经状态呈负相关，乳腺癌对 BPE 无显著相关。高危状态起初与 BPE 呈负相关，当纠正运动因素后，高危因素显示与 BPE 无显著相关性。患者外在因素，运动作为一组新的影响因素，与 BPE 存在明显正相关。

EPO-0800
用磁共振动态增强早期剪影图像判断乳腺癌新辅助治疗后残余情况及与病理反应性分级的相关性研究

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目的：评价乳腺癌新辅助治疗后的磁共振动态增强早期剪影图像判断病灶残余情况的能力，并与病理 Miller-Payne 分级进行对照。
方法：收集我院初诊乳腺癌并行治疗前乳腺 MRI 检查的连续性病例，将其中接受新辅助治疗并于治疗后术前再次行乳腺 MRI 检查的患者入组。以手术后病理报告的 Miller-Payne 分级作为判断癌残余情况的依据，MP1 至 4 级为有癌残余（non-pCR），MP5 级（pCR）按照无任何癌残余（pCR0）和残原位癌（pCR1）分为两类。所有患者新辅助治疗前后两次 MRI 检查同时在工作站调阅，以治疗后早期增强剪影图像和 MIP 图像作为是否有强化灶的判断序列，参照治疗前 MRI 所示病变位置进行阅片判断，原癌床位置有任何强化灶出现，即判断有癌残余（non-iCR），否则判断无癌残余（iCR）。计算影像判断有无癌残余情况的总准确性和各 MP 分级中的准确性，以及影像判断 pCR 和判断 pCR0 的阳性预测值（PPV）和阴性预测值（NPV）。
结果：共入组 98 例，MP1-5 级例数分别为 3 例、18 例、36 例、12 例、29 例，MP5 包括 7 例 pCR1 和 22 例 pCR0。 对 MP1-4 级，以影像判断 non-iCR 作为正确诊断，各级判断准确性分别为 100.0%、100.0%、97.2%、100.0%；对 MP5 级，以 iCR 为正确诊断，判断准确性为 65.5%。若仅以 pCR0 作为 iCR 的最终标准，则准确性为 91.8%（90/98）。以 iCR 标准对 pCR 进行判断的 PPV 和 NPV 分别为 95.0%（19/20）和 87.2%（68/78），对 pCR0 进行判断的 PPV 和 NPV 分别为 85.0%（17/20）和 93.6%（73/78）。
结论：以动态增强早期的剪影图像对新辅助治疗后乳腺癌的癌床处进行有无癌活性的判断，可以达到较高的准确性，对 pCR 判断的阳性预测值和判断无任何癌残余的阴性预测值可以达到 90%以上。

EPO-0801
磁共振动态增强早期减影图像对不同分子亚型乳腺癌新辅助治疗后癌残余情况的评价能力研究

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目的：评价乳腺癌新辅助治疗后的磁共振动态增强早期减影图像对不同分子亚型组的癌残余情况判断能力。
材料方法：收集我院初诊乳腺癌并行新辅助治疗并于治疗前后均行乳腺 MRI 检查的患者入组。以手术后病理报告作为判断有无癌残余的金标准（pCR/非 pCR），按照治疗前穿刺病理的免疫组化受体水平分为激素受体（HR）阳/阴、HER2 受体阳/阴分别组合。所有患者新辅助治疗前后两次 MRI 检查同时在工作站调阅，以治疗后早期增强减影图像和 MIP 图像作为是否有强化灶的判断序列，参照治疗前 MRI 所示病变位置进行阅片判断，原癌床位置在减影图像中有任何强化灶出现即判断有癌残余（非 iCR），否则判断无癌残余（iCR）。计算影像判断有无癌残余情况在各分组亚型组的诊断情况。
结果：共入组连续性病例 105 例，29 例达到病理完全缓解。四个分子亚型组 pCR 比例分别为 HR-/HER2-组 42.9%、HR-/HER2+组 77.8%、HR+/HER2-组 5.8%、HR+/HER2+组 43.8%，影像判断准确性分别为 85.7%（24/28）、77.8%（7/9）、96.2%（50/52）、81.3%（13/16）。按照临床总体治疗方式及 pCR 比率，将四组合并为两组，即三阴/HER2 阳性组（53 例）与 HR 阳性组（52 例）。对 pCR 判断的准确性进行分析，三阴/HER2 阳性组的敏感性、特异性、阳性预测值和阴性预测值分别为 65.4%、100%、100%、75%，在 HR 阳性组分别为 66.7%、98.0%、66.7%、98.0%。两组之间敏感性和特异性无显著性差异（P>0.05），阳性预测值和阴性预测值有显著性差异（P<0.05）。
结论：以动态增强早期的减影图像对新辅助治疗后乳腺癌的癌床处进行是否达到病理完全缓解的判断，对不同分子亚型乳腺癌中均为敏感性低但特异性高，但对三阴或 HER2 阳性病例的阳性预测值较高，对 HR 阳性病例的阴性预测值较高。

EPO-0802

不同类型乳腺黏液癌的 MRI 表现

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目的　探讨不同类型乳腺黏液癌的 MRI 表现特征及 ADC 值差异。
方法　回顾性分析 2010 年 1 月至 2019 年 1 月经手术病理证实为黏液癌且术前进行过乳腺 MRI 检查的 55 例患者（共 58 个病变），根据黏液癌占比不同，分为单纯型黏液癌（46 个）和混合型黏液癌（12 个），根据癌细胞与黏液的比例不同，分为经典型黏液癌（39 个）和富于细胞型黏液癌（19 个）。患者均行双侧乳腺平扫、DWI 和动态对比增强 MRI 检查。依据乳腺影像报告和数据系统（BI-RADS）标准进行分析，观察病变形状、边缘、平扫 T1WI 信号、脂肪抑制 T2WI 信号、时间-信号强度曲线（TIC）类型、边缘强化、延迟时相内部强化、DWI 信号特征，并测量病变 ADC 值。定性资料的比较采用 x^2检验，定量资料的比较采用独立样本 t 检验。
结果　58 个黏液癌在 MRI 上均表现为肿块，单纯型与混合型黏液癌在病变形状、边缘、平扫 T_1WI 信号、脂肪抑制 T_2WI 信号、时间-信号强度曲线类型、边缘强化、延迟时相内部强化、DWI 表现及 ADC 值的差异无统计学意义（P均＞0.05）。经典型与富于细胞型黏液癌在时间-信号强度曲线类型、边缘强化及 ADC 值的差异上有统计学意义（P均＜0.05），在病变形状、边缘、平扫 T_1WI 信号、脂肪抑制 T_2WI 信号、延迟时相内部强化及 DWI 表现的差异无统计学意义（P均＞0.05）。
结论　MRI 表现部分特征有助于区分不同类型的黏液癌，经典型黏液癌动态增强早期时相多以边缘强化为著，病变内部多呈渐进性强化，ADC 值通常高于富于细胞型黏液癌。单纯型与混合型黏液癌在 MRI 表现特征及 ADC 值上无明显差异。

EPO-0803

动态增强 MRI 血流动力学定量参数与浸润性乳腺癌分子分型的相关性分析

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目的 确定浸润性乳腺癌动态增强 MRI 血流动力学定量参数与分子分型之间是否存在相关性。
方法 对行动态增强 MRI 并经穿刺或手术病理证实的 116 例女性浸润性乳腺癌患者进行回顾性分析，所有患者均有免疫组化检查结果，包括雌激素受体（ER）、孕激素受体（PR）、人类表皮生长因子-2（HER-2） 以及 Ki67 表达情况，并以此结果分为 Luminal A 型、Luminal B 型、HER-2 阳性型和三阴型 4 个分子亚型。利用人工辅助诊断软件（DynaCAD）进行乳腺动态增强 MR 图像后处理，得到时间信号强度曲线，并据此计算出血流动力学参数，包括最大增强率（PE）、平均增强率（ME）、最大上升斜率（MS）、峰值时间（tP）。利用单因素方差分析进行分子学亚型与动态增强 MRI 时间信号强度曲线类型及各血流动力学定量参数之间的相关性分析。
结果 与其它分子学亚型相比，HER-2 阳性乳腺癌呈现 “流出型”时间信号强度曲线的几率较高，而 Luminal A 亚型乳腺癌则相反（p＝0.004）； 与 HER-2 阴性乳腺癌相比，HER-2 阳性乳腺癌与较高 PE（p＝0.03）、MS（p＝0.04）相关，并同时更具有较高 ME 的趋势（p＝0.06）。
结论 动态增强 MRI 时间信号强度曲线类型及其血流动力学定量参数与浸润性乳腺癌分子亚型之间具有一定相关性，可以作为一种影像生物学标志对治疗方案的选择和预后判断提供依据。

EPO-0804
双模态磁性二维纳米片用于肿瘤 MRI/CT 诊断及治疗一体化的研究

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目的：设计一种基于二维纳米材料体系（MXene）的双模态磁性造影剂，并将其应用于肿瘤 MRI/CT 成像诊断及肿瘤光热治疗的一体化研究。
方法：采用化学剥离的方法制备超薄二维碳化钽（Ta_4C_3）纳米片，利用 Ta_4C_3 表面官能团的氧化还原反应，在原位生长超顺磁性铁氧颗粒（IONP），并采用仿生磷脂（SP）进行表面修饰，从而构建一种生物相容性好、体内安全性高的二维磁性碳化钽纳米复合材料（Ta_4C_3-IONP-SPs）。使用多种材料表征手段检测 Ta_4C_3-IONP-SPs 的晶体结构、表面官能团、价态、磁力学性质等。在体外、体内实验中验证该材料的光热转换能力、光热治疗效果和增强 MRI/CT 成像能力，并评价该材料在细胞水平和动物体内的生物安全性。
结果：体内、外实验结果表明 Ta_4C_3-IONP-SPs 具有明显的肿瘤 MRI/CT 增强效果。体内、外光热治疗实验结果表明，这种二维结构 Ta_4C_3-IONP-SPs 复合纳米片在可见光区域具有良好的光热转换能力（32.5%），在近红外光的激发下可产生局部高热杀死肿瘤细胞，可作为一种 MRI/CT 双模式成像引导下的光热诊疗剂。另外，该复合纳米片对健康小鼠的血液和组织没有明显影响，因此具有较高的生物安全性。
结论：本研究成功设计出一种基于二维纳米材料体系（MXene）的磁性多功能复合造影剂，该材料不仅有良好的 CT 和 MRI 增强效果，还具有较好的肿瘤光热治疗效果。这种二维磁性纳米复合材料，不仅可以作为一种有效的 MRI/CT 造影剂，还可以作为新型光热剂有效杀灭肿瘤细胞，为未来肿瘤的个性化和精准诊疗提供了新思路。

EPO-0805

乳腺导管内乳头状癌的影像学与病理的对照研究

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目的：分析乳腺导管内乳头状癌（Papillary Ductal Carcinoma in situ）的乳腺 X 线与乳腺磁共振影像学特点及病理基础。
材料与方法：回顾性分析 2010 年 1 月-2016 年 1 月之间接受乳腺 X 线与乳腺 MRI 检查并经手术病理证实的 10 例乳腺导管内乳头状癌的临床特点、乳腺 X 线与乳腺磁共振的影像学特征，并与病理结果对比分析。
结果：患者平均年龄 55.5 岁，临床表现为可触及肿块（9/10）及 1 例乳头血性溢液。术后病理肿块平均最大径为 2.9cm。乳腺 X 线表现：10 例病例共 11 个病灶均表现为肿块，其中 8 个肿块边缘清楚，2 个肿块边缘示短小毛刺，所有病灶均未伴随钙化与结构扭曲，所有病例均未见腋窝肿大淋巴结。MRI 表现：所有病灶的实性部分在 T1WI 上均表现为低信号，T2WI 上为高信号，增强后为明显不均匀强化。
结论：导管内乳头状癌为一种少见类型的原位癌，恶性程度较低。影像上具有一定特征，表现为边缘清楚的分叶状或卵圆形、圆形肿块，毛刺少见，乳腺 X 线上罕见恶性钙化，极少伴有腋窝肿大淋巴结。乳腺 X 线表现不易与良性病变鉴别，联合乳腺 MRI 检查能够提高诊断准确性。

EPO-0806

乳腺浸润性小叶癌的 MR 影像学特征分析

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目的：探讨乳腺浸润性小叶癌的 MR 影像学特征。**方法**：收集 2011 年 2 月至 2016 年 12 月期间于我院行乳腺 MRI 检查并经手术病理证实的 39 例浸润性小叶癌，系统性分析病变的病灶数量、形态学表现、平扫信号、DCE 表现及时间-信号强度曲线类型、表观扩散系数（ADC）值。**结果**：（1）单发病灶 25 例，多灶、多中心及双侧同时发生病灶 14 例。（2）15 例表现为肿块，呈类圆形或不规则形，边缘毛糙；24 例表现为非肿块，7 例呈段性分布，17 例表现为局限异常强化，76.5%（13/17）结构纠集。（3）除 11 例平扫显示不明显外，其余均于平扫 T_1WI 呈低信号，16 例于脂肪抑制 T_2WI 呈等或低信号，12 例呈稍高信号。动态增强后 39 例病变均呈明显强化，97.4%（38/39）时间-信号强度曲线呈平台型及流出型。b 值为 500 s/mm^{2}及 1000 s/mm^{2}时平均 ADC 值均低于正常乳腺组织 ADC 值（P<0.05）。**结论**：乳腺浸润性小叶癌的 MR 表现尤其是病灶数量及形态学表现具有一定特征性，有助于该疾病的术前诊断。

EPO-0807

Role of T2 mapping in diagnosis and neoadjuvant chemotherapy of breast cancer

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【Abstract】**Purpose**: To investigate 1) use of quantitative analysis of T_2 relaxation time in differentiating malignant from benign breast lesions and therefore increase the diagnostic accuracy of breast MRI; 2) change in T2 relaxation time of breast cancer before and after neoadjuvant chemotherapy (NAC). **Materials and methods**: Of the total 67 patients, 46 have malignant tumors while 21 have benign pathology. Twenty-six of the 47 malignant cases underwent NAC. MRI T_2mapping was performed in all patients. In patients with NAC, T2-mapping was performed before and after NAC. T_2 relaxation times were obtained by using Funtool software on AW 43 workstation. Pathological response to NAC was assessed according to Miller＆Payne response score. Statistical analysis was performed on T2 relaxation times of malignant and benign lesions, before and after NAC. **Results**: The mean T_2 relaxation time in the malignant cases was 82.69±15.37ms, whereas the T2 relaxation time in benign cases was 95.48±26.51ms. Difference in T_2 relaxation time between malignant and benign cases is statistically significant（P=0.015 <0.05）. In 26 cases with NAC, the mean T_2 relaxation time was 81.34±13.68ms and 64.50±8.71ms before and after NAC respectively. Difference in T_2 relaxation time between the pre— and post— NAC is significant（P=0.00<0.05）. Based on the MP response score, the mean post-NAC T_2 relaxation time in 23 responders out of 26 NAC cases (63.18±8.37ms) was significantly shorter than that in non-responders (74.62±2.32ms)(P=0.029＜0.05). **Conclusion**: T_2 relaxation time in benign lesions was found to be significantly longer than that in malignant lesions. Quantitative measurement of T_2 relaxation time might provide new diagnostic parameter to breast MRI. T2 relaxation time in breast cancer was reduced after NAC, particularly in the responders. Measurement of T2 relaxation time change is a potential new tool to assess the response to NAC.

EPO-0808

扩散加权成像与乳腺浸润性导管癌分子生物学相关性研究

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目的：研究表观扩散系数(apparent diffusion coefficient, ADC)与乳腺浸润性导管癌分子生物学标志物之间的关系，以指导临床判断预后及选择治疗方案。**方法：**对 67 例乳腺浸润性导管癌患者进行磁共振扩散加权成像检查，并测量病灶 ADC 值。术后免疫组化分析人表皮样生长因子受体-2（HER-2）、雌激素受体（ER）、孕激素受体（PR）、Ki67，统计学分析 ADC 值与 ER、PR、HER-2、Ki67 相关性；并研究不同分子分型病灶 ADC 值的差别。**结果：**Spearman 相关性分析表明 ADC 值与 Ki67 之间无相关性（P>0.05）；ER、PR、HER-2 阴性表达者 ADC 值大于阳性者（P<0.05）；三阴性病灶的 ADC 值明显高于 Luminal A 型、Luminal B 型、HER-2 过表达型（P<0.05）；HER-2 过表达型病灶的 ADC 值高于 Luminal B 型；**结论：**ADC 值与乳腺浸润性导管癌分子生物学表达及分子分型具有相关性，可辅助指导临床选择治疗方案及判断预后。

EPO-0809

Quantitative assessment of fibroglandular tissue and background parenchymal enhancement on breast MRI correlates with the risk of breast cancer

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Objectives: To evaluate the relationships between breast cancer and both the intensity(BPE_I)/volume(BPEv) of background parenchymal enhancement and the amount of fibroglandular tissue (FGT) in pre- and post-menopausal women used by automatic quantitative assessment method on breast MRI.

Methods: Among 14033 women who underwent breast MRI, we randomly selected 101 normal women, 101 women with benign breast lesions and 101 women with breast cancer who were matched by age and menopausal status. The Mann-Whitney U test was used to evaluate FGT, BPE_I and BPE_V. The area under the curve(AUC) value of receiver operating characteristic (ROC) was compared in the cancer, benign and control groups to measure correlations and associations between variables.

Results: (1) FGT and BPE_V decreased by around 40% ($P<0.001$) and BPE_I decreased by 20% ($P<0.05$) in post- menopausal women. (2) Compared with the benign and control groups, the breast cancer group had a significant difference of BPE_V with the maximum AUC (compared with the control group: 0.704 for premenopausal women, 0.668 for the postmenopausal women, respectively; compared with the benign group: 0.622 for premenopausal women, 0.633 for the postmenopausal women, respectively). (3) FGT was significantly higher in the cancer ($P=0.035$) and benign ($P=0.035$) groups than in the control group after menopause.(4) Compared with the benign and control groups, BPE_I had a slight difference in the cancer group ($AUC \leqslant 0.648$)。
Conclusion: BPE_V could correlate with the high risk of breast cancer in both pre- and post- menopausal women. BPE_I had weak correlation with breast cancer. However, FGT was only associated with breast cancer risk after menopause.

EPO-0810

Preoperative Prediction of Axillary Lymph Node Metastasis in Breast Carcinoma Using Radiomics Features Based on the Fat-suppressed T2 Sequence

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Purpose: To investigate the value of radiomics method based on the fat-suppressed T2 sequence for preoperative predicting axillary lymph node (ALN) metastasis in breast carcinoma. **Methods:** The data of 329 invasive breast cancer patients were divided into the primary cohort (n=269) and validation cohort (n=60). Radiomics features were extracted from the fat-suppressed T2-weighted images on breast MRI, and ALN metastasis-related radiomics feature selection was performed using Mann Whitney U-

test and support vector machines with recursive feature elimination(SVM-RFE); then a radiomics signature was constructed by linear SVM. The predictive models were constructed using a linear regression model based on the clinicopathologic factors and radiomics signature, and nomogram was used for a visual prediction of the combined model. The predictive performances are evaluated with the sensitivity, specificity, accuracy and area under the receiver operating characteristic (ROC) curve (AUC). **Results:** A total of 647 radiomics features were extracted from each patient. 23 ALN metastasis-related radiomics features were selected to construct the radiomics signature, including 17 texture features, 5 first-order statistical features and one shape feature; patient age, tumor size, HER2 status and vascular cancer thrombus accompanied or not were selected to construct the cilinicopathologic feature model. The sensitivity, specificity, accuracy and AUC value of radiomics signature, clinicopathologic feature model and the nomogram were 65.22%, 81.08%, 75.00% and 0.819 (95% confidence interval [CI]: 0.776-0.861), 30.44%, 81.08%,61.67% and 0.605 (95% CI: 0.571-0.624) and 60.87%, 89.19%, 78.33% and 0.810 (95%CI: 0.761-0.855), respectively. **Conclusion:** Radiomics methods based on the fat-suppressed T2 sequence and the nomogram are helpful for preoperative accurate predicting ALN metastasis.

EPO-0811
定量动态增强磁共振评估乳腺癌新辅助化疗疗效的应用研究

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背景与目的：乳腺癌的新辅助化疗已成为成熟的治疗方法，但疗效评估尚未有统一有效的方法。本研究即探讨定量动态增强磁共振在乳腺癌新辅助化疗疗效评估中的价值。**方法**： 24 例术前行新辅助化疗的乳腺癌确诊患者（24 例均为浸润性导管癌），分别于新辅助化疗前、化疗第 2 疗程后、化疗结束但术前三个时间点行定量动态增强磁共振检查，分析化疗前后肿瘤最长径及动态增强磁共振定量参数：容量转移常数（K^{trans}）、速率常数（K_{ep}）、血管外细胞外间隙容积比（V_e）的变化。**结果**：24 例患者均为单侧单发乳腺癌病灶，以 RECIST 标准分为有效组（17 个）和无效组（7 个），有效组与无效组 K^{trans}、K_{ep} 在化疗前与第 2 疗程、化疗前与化疗结束差值均有统计学意义，V_e 在有效组与无效组治疗前后差异均无统计学意义。**结论**：定量动态增强磁共振可用来评估新辅助化疗疗效，并且 K^{trans}、K_{ep} 可做到定量，使评估结果更为客观真实，但 Ve 对判断治疗效果未见明显优势。

EPO-0812
MRI 对于乳腺 X 线摄影可疑恶性微钙化的诊断价值

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【摘要】目的 探讨 MRI 对于乳腺 X 线摄影可疑恶性微钙化的诊断价值。**方法** 回顾性分析 2015 年 2 月到 2018 年 6 月在我院行乳腺 X 线摄影发现可疑恶性微钙化病变，同时行乳腺 MRI 检查的患者 118 例的临床病理及影像资料。以手术病理为金标准，计算 MRI 检查的敏感度、特异度、准确率、阳性预测值（PPV）、阴性预测价值（NPV）。采用 Spearman 相关分析和 Bland-Altman 法评价 X 线、MRI 与病理测量乳腺癌肿瘤大小的相关性和一致性。**结果** 乳腺 MRI 检查的敏感度、特异度、准确率、PPV、NPV 分别为 97.3%、 41.3%、75.6%、72.4%、90.5%。MRI 诊断可疑恶性微钙

化病变的 ROC 曲线下面积为 0.774（P=0.000）。病理、X 线摄影及 MRI 测量肿瘤大小的中位数（四分位间距）分别为 1.5（1.4）cm、1.6（3.0）cm、2.2（3.0）cm。X 线摄影与病理大小相关系数为 0.602（P=0.000）；MRI 与病理大小的相关系数为 0.603（P=0.000）。Bland-Altman 分析显示：与病理结果比较，X 线摄影及 MRI 均高估肿瘤大小，平均差值分别为-0.98cm（95%CI 为-5.35～3.39）、-1.09cm（95%CI 为-4.42～2.24）。**结论** 乳腺 MRI 检查对于 X 线摄影可疑恶性微钙化的敏感度和阴性预测价值较高。而对于微钙化型乳腺癌病灶大小评估方面，MRI 与 X 线摄影相比无明显优势。

EPO-0813

水成像及 MRI 对病理性乳头溢液的诊断价值

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研究目的：通过比较磁共振水成像、乳腺磁共振成像(magnetic resonance imaging ,MRI)、磁共振水成像与乳腺 MRI 相结合以及超声检查,探讨磁共振水成像及 MRI 对病理性乳头溢液的诊断价值。
材料与方法：对 2015 年 6 月至 2016 年 6 月病理性乳头溢液患者，行磁共振水成像、乳腺 MRI 扫描及超声检查。以术后病理结果为金标准，比较磁共振水成像、乳腺 MRI、磁共振水成像与乳腺 MR 增强相结合以及超声检查对于病理性乳头溢液的诊断价值。并进一步分析比较扩张乳导管与病变的关系。
结果：共 47 名患者入组（48 处病变），其中恶性病变 20 例，良性病变 28 例。利用重 T2 加权的水成像序列（3D T2-SPACE 序列）来实现导管间接造影。采用两独立样本秩和检验分析磁共振水成像、乳腺 MRI、磁共振水成像与乳腺增强 MRI 相结合以及超声检查对病灶良恶性诊断价值，P 值分别为 0.069、0.001、0.000、0.001。对 48 处病变中扩张的乳导管与病变的关系分析，分为四类：导管与病灶无关、导管充盈缺损、病灶非肿块样强化周边导管扩张以及病灶肿块样强化周边导管扩张，Fisher 检验显示 p=0.004。
结论：磁共振水成像与乳腺增强 MRI 相结合对于诊断病理性乳头溢液病变有价值。通过进一步分析扩张乳导管与病变的关系，有助于鉴别病变的良恶性。

EPO-0814

Comparing the detectability of digital mammography alone vs. dual-mode digital breast tomosynthesis

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Abstract
Purpose: This study compares the detectability of digital mammography (DM) alone versus DM plus dual-mode digital breast tomosynthesis (DBT), and the detectability of high-resolution-mode (HR mode with 40° -angle imaging) DBT versus standard-mode (ST mode with 15° -angle imaging) DBT for the diagnostic evaluation of breast tissue.
Method: This prospective comparative study enrolled 210 patients. Patients were randomly allocated into a standard mode (ST) group (n=109) and a high-resolution mode (HR) group (n=100). Diagnostic efficacy of DM, DBT with HR mode and ST mode was

analyzed and compared. Areas under the receiver operating characteristic curve (AUC) and visibility scores were calculated.
Results: The mean average glandular dose (AGD) for ST-mode was almost equal to that of DM (DBT:1.39mGy vs. DM:1.35mGy), while that of HR-mode DBT was nearly twice of that of DM (DBT:2.80mGy vs. DM:1.40mGy). Adding DBT to DM significantly increased the sensitivity (78.44% vs. 91.22%), specificity (86.63% vs 90.70%), AUC (0.91 VS 0.96) and visibility scores (4.80 vs. 7.25), without significant differences between HR and ST modes. Mean image conspicuity ratings of DBT for the HR group were higher than those of the ST group (8.16 vs 7.22). DBT improved sensitivity in dense breast tissue by 20.52% in the HR group and 15.1% in the ST group. Compared to DM, visibility scores for dense breast tissue improved by 91.02% and 42.40% for DBT in the HR and ST groups, respectively.
Conclusions: DBT sensitivity and visibility are superior to those of DM, and HR-mode DBT has higher visibility scores for lesions than ST-mode DBT. The ST-mode is most suitable for screening while HR-mode is preferable for clinical examination.

EPO-0815

Reliability of Automated Breast Density Estimation--- an end-to-end deep learning model: A comparison with visual assessment in clinic

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Purpose/Objective(s):
To investigate the reliability of an end-to-end deep learning model in the estimation of breast density using fifth edition of the BI-RADS Lexicon by comparing with visual assessment in clinic.
Materials/Methods:
Breast density assessments of 200 cases were retrospectively reviewed by three radiologists of different seniority from the same institution who together had recently undergone retraining in mammographic breast density classifcation based on the fifth edition of BI-RADS. The radiologists assigned breast density grades (a－d) on the basis of the BI-RADS classification scheme. Consensual classifications among radiologists were used as visual assessment. An end-to-end deep learning model was adopted to evaluate all images for the automated breast density classification on four- category scale. We also grouped the BI-RADS assessments into two categories (a－b and c－d). The agreement between visual and model's assessment was measured by Cohen's weighted kappa on both four- and two-category scale. While the reliability of model's assessment was revealed by its classification accuracy.
Results:
Of the 200 images evenly distributed to category a, b, c, and d, 48, 29, 49, and 41 images of category a, b, c, and d were accurately measured by the automated model. While 94 and 98 cases were accurately measured by the automated model on a two-category scale(a－b and c－d). Compared with the clinical standard classification, the accuracy of model on four-category scales was 0.84, that of model on two-category

scales was 0.96. The agreement between model's and visual assessment was substantial (κ = 0.78) on four-category scale and almost perfect (κ = 0.92) on two-category scale.

Conclusion:

The end-to-end deep learning model showed a satisfactory accuracy and consistency compared to radiologists' BI-RADS categorization, which suffers from high inter-observer variation.

EPO-0816

DBT 联合超声对乳腺小肿块（≤2cm）的定性诊断及病理对照

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目的：通过对比 DBT（Digital Breast Tomosynthesis,DBT）和超声（Ultrasound,US）对乳腺可疑恶性小肿块型病变（≤2cm）的诊断价值，从而推广 DBT 联合超声的临床运用价值。

方法：收集我院 2014 年 1 月-2018 年 12 月传统乳腺 X 线判断为可疑恶性乳腺小肿块型病变（≤2cm）共 108 例女性，发病年龄 28-76 岁，中位年龄 48.5 岁；肿块最大径 6-20mm，平均最大径 14.97mm。受检者同时行 DBT 和 US 检查。分析 DBT、US 及 DBT+US 的 ROC 曲线下面积、敏感性、特异性、假阳性及阳性预测值。并进一步对照病理分析乳腺可疑小肿块的 DBT 及 US 表现。

结果：108 例乳腺肿块型病变包括单纯肿块 68 例及肿块伴钙化 40 例；良性病变 9 例，乳腺恶性病变 99 例。相对于乳腺小肿块型病变，DBT+US 总的 ROC 及特异性高于 DBT 及 US (DBT+US:0.965,0.913 vs. DBT 0.917,0.787 vs.US:0.901,0.711)。乳腺良、恶性病变 DBT 上的肿块形态、边缘及周围小梁结构在的差异具有统计学意义（P＜0.05），良性病变肿块形态圆形/椭圆形（55.6%）、边缘模糊（66.7%），恶性病变肿块形态不规则形（80.8%）、边缘模糊（63.6%）；而肿块大小及密度差异不具有统计学意义（P＞0.05）。小肿块在超声上的生长方向及边缘在乳腺良恶性病变间差异具有统计学意义（P＜0.05），良性病变多平行生长（100%）、边缘清晰（66.7%），恶性病变不平行生长（52.4%）、边缘成角（39.4%）；而肿块形态、回声、后方回声特征、病灶周围组织及血管分布差异不具有统计学意义（P＞0.05）。

结论：DBT 联合 US 对于乳腺小肿块型病变具有较高的临床应用价值。

EPO-0817

Imaging findings of periductal stromal sarcoma - a case report

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Purpose: Periductal stromal sarcoma (PSS) is a rare type of malignant fibroepithelial tumor of the breast. It shows a biphasic histology with benign ductal elements and a sarcomatous stroma lacking phyllodes architecture. Because of the rareness of PSS, its radiological features were rarely reported. In this study, we represent a case of PSS with mammographic and sonographic data.

Methods: A case of patient who underwent a mastectomy for breast mass was investigated. Full-field digital mammography (FFDM), digital breast tomosynthesis (DBT) and

ultrasonography (US) were performed before the operation. Clinical features and imaging findings were analyzed.
Results: Clinical features: A 48-year-old women was presented to our hospital 1 month ago with a mass of the right breast which had been palpable for 8 years and was increasing in size. A 8.5×8.5 cm mass was palpable behind the areola. It was tough, with a clear edge, good mobility and without tenderness. **US findings:** Several low echo lesions were found in the right breast. The large one was located in areola area, 7.1 x 9.1×5.6 cm in size, irregular in shape, slightly lobulated at the edge and uneven in internal echoes. Banded median-high echogenic septum was seen inside the mass. CDFI: Abundant blood flow signals were seen in the mass. BI-RADS 3. **FFDM findings:** An irregular slightly high-density mass was seen behind the right papilla. It was about 7.8 x 9.1×7.4 cm in size, with clear margins and multiple lobulations. BI-RADS 4A. **DBT findings:** An irregular slightly high-density mass was seen behind the right papilla. It was about 7.2 x 8.6×7.9 cm in size, with clear margins and multiple lobulations. A few low-density septations were seen inside the mass. BI-RADS 4A. **Pathological findings:** It was a grey-pink nodule, 8.5x6.5x5cm in size, with a smooth surface and a gray-pink section. Focal area is gray-white or gray-yellow. The nodule was solid, medium texture and lobulated. Pathological diagnosis: periductal stromal sarcoma of the breast (mitosis > 5/HPF).
Conclusion: PSS lacked specificity in FFDM, DBT and US. It was an irregular and heterogeneous soft tissue mass, with septations inside. Blood signals could be seen inside the tumor, and microcalcification was not found. The diagnosis depends on pathological and immunohistochemical results.

EPO-0818
基于乳房几何模型的多视图乳腺 X 线图像病灶位置相关性研究

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目的：多视图乳腺 X 线图像中同一病灶的匹配分析在乳腺癌筛查及诊断中至关重要。本研究旨在开发和评估多视图乳腺 X 线图像的病灶位置相关性分析方法，为临床医生提供精确的位置参考。
方法：通过模拟乳房压缩过程构建乳房几何模型，实现压缩乳房、自由乳房与平面图像之间的对应关系。然后收集我院已知匹配关系的以粗大钙化为主要表现的乳腺 X 线图像（CC 和 MLO 视图）进行模型测试，共纳入钙化 482 对。测量钙化几何中心至预测曲线之间的最短距离作为评价指标，并分析不同腺体密度、病灶位置分组下几何模型的匹配误差差异，探讨临床应用价值。
结果：①乳房几何模型的平均匹配误差为（3.741±3.204）mm，最小点到线距离的第 95%百分位数为 10.048mm。
②腺体密度。脂肪类、散在纤维腺体类、不均匀致密类及致密类组之间的差异有统计学意义（P=0.003）。其中，脂肪类与致密类乳房的匹配误差较大，脂肪类与散在纤维腺体类、脂肪类与不均匀致密类、致密类与不均匀致密类之间的差异均有统计学意义（P 均＜0.05）。
③病灶深度。前带与中带、后带之间的差异有统计学意义（P＜0.05）。前带尤其是乳晕下区的匹配误差较小。
④病灶位置。将 MLO 视图分为乳房上部、中央区及下部，各部之间的差异有统计学意义（P＜0.05）。乳房上部匹配误差较中央区及下部大，差异均有统计学意义（P 均＜0.05）。
结论：本研究提出的乳房几何模型具有较好的匹配性能，对 95%的目标病灶而言，均能在预测曲线周围半径≤10mm 的范围内找到其对应病灶。当腺体密度及病灶所处位置不同时模型匹配效果有差

异，脂肪类、致密类乳房及乳房上部在压迫过程中发生的形变较大，模型的匹配误差大，提示本几何模型可能不完全适用于高度变形的乳房。但总体而言，乳房几何模型可为临床医师提供较为精确的位置参考。

EPO-0819
乳腺 X 线摄影和乳腺 MR 成像与 Oncotype DX 检测结果的相关性

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目的：评估乳腺成像报告和数据系统（BI-RADS）乳房摄影和磁共振（MR）成像特征与接受 Oncotype DX 测定的雌激素受体阳性乳腺癌患者的乳腺癌复发风险之间的关联。
方法：
通过收集 2013 年至 2018 年间接受过 Oncotype DX 检测的 408 例诊断为浸润性乳腺癌的患者。根据 BI-RADS 词典回顾性地收集乳腺摄影和 MR 成像特征。线性回归评估了成像特征与 Oncotype DX 测试复发评分（ODxRS）之间的关联，并且通过使用成像特征评估 ODxRS 的事后配对比较。
结果：
乳腺摄影乳房密度与 ODxRS 呈负相关（P <0.05）。密度类别 A 的平均 ODxRS 为 24.4，密度类别 D 的平均 ODxRS 为 16.5（P，.02）。乳房 X 线照相术中不明显的质量边缘和精细线性分支钙化与较高的 ODxRS（分别为 P，.01 和 P，.03）显着相关。边缘模糊的群体的平均 ODxRS 为 31.3，与其他所有质量边缘的 ODxRS 显着不同（P <0.01）。精细线性分支钙化的平均 ODxRS 为 29.6，而所有其他可疑钙化形态的 ODxRS 为 19.4（P <0.03）。 MR 成像中不规则质量边缘的平均 ODxRS 显着高于毛刺质量边缘（24.0 vs 17.6; P，.02）。 MR 成像中非肿块增强的存在与较低的 ODxRS 相关（16.4 vs 19.9; P，.05）。
结论：
乳腺 X 线摄影乳房密度，钙化形态，乳腺 X 线摄影和磁共振成像质量边缘以及 MR 成像非质量增强的 BI-RADS 特征有可能成为乳腺癌复发风险的成像生物标志物，并需要进一步的研究更大的患者队列来验证这些初步结果。

EPO-0820
Comparative the average glandular dose between digital breast tomosynthesis (DBT) and full-field digital mammography (FFDM): correlation with breast thickness and density

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Objectives: To compare the average glandular dose (AGD) between single-view digital breast tomosynthesis (DBT) and single-view full-field digital mammography (FFDM), and to evaluate the correlation of AGD with breast thickness and density.
METHODS: A total of 318 female patients who underwent both DBT and FFDM (DBT and FFDM were performed in the same compression thickness in each breast) were included. 636 DBT images of unilateral breast mediolateral oblique (MLO) view and 636 FFDM images of

unilateral breast mediolateral oblique (MLO) view were analyzed. Mammographic breast density was determined according to BI-RADS breast density grading, and breast thickness and AGD per exposure in MLO views retrieved from DICOM headers were recorded. Breast thickness were divided into the following four groups: ≤ 30cm, 31 ~ 45cm, 46 ~ 60cm and > 60cm. The statistical analyses used variance analysis and Pearson's correlation for parametric tests.
Results: (1) The AGD of DBT had a weak negative correlation with breast density (correlation coefficient =-0.305, P<0.001), decreased as the breast density increased. The AGD of FFDM did not change significantly with breast density increased (correlation coefficient =-0.027, P=0.501). (2) Breast thickness was significantly associated with AGDs, and both AGDs of FFDM and DBT increased with increased breast thickness (correlation coefficient =0.771 and 0.935, respectively, all P<0.001). (3) When breast density was >75% and breast thickness was >60cm, the AGD of DBT was lower than that of FFDM, and the difference was statistical significant (P = 0.031).
Conclusion: The AGD of DBT increased with breast thickness increased and decreased with breast density. For thick and dense breast, the radiation dose of DBT was lower than that of FFDM.

EPO-0821

Dual-layer detector spectral CT based iodine density for the diagnosis of benign and malignant breast masses: compare with BIRADS categories in mammography

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PURPOSE: To compare the diagnostic accuracy of benign and malignant breast masses using dual-layer detector spectral CT (DLCT) based iodine density (ID) versus BIRADS categories in mammography
METHOD AND MATERIALS: A total of 34 patients with breast masses proved by pathology underwent venous phase (VP) contrast enhanced DLCT scan and digital mammography. The patients were classified into two groups (malignant group, n=18; benign group, n=16).The ID was extracted and normalized to the ID in the aorta (NIDvp) . BIRADS categories were performed by three radiologists for all lesions respectively. Receiver operating characteristic (ROC) curves, sensitivity, and specificity were compared .
RESULTS: BIRADS category of 1, 2, 3, 4A, 4B, 4C, 5 of breast masses were 0,1,5,9, 8, 11, 0 cases respectively. The area under the curve (AUC) of area NIDvp and BIRADS categories respectively were 0.816 and 0.910, while 95% confidence interval were 66.40%-96.80% and 80.30%-100.00%, respectively. With a threshold of 0.21 for NIDvp, and 3.5 for BIRADS categories , the sensitivity, specificity value were 88.90%, 68.75% and 88.90%, 87.50%, respectively.
CONCLUSION: DLCT based ID was observed to perform equally with BIRADS categories in mammography in the differentiating between benign and malignant breast masses.

EPO-0822
乳腺三维断层摄影技术辐射剂量与图像质量的研究

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目的：探究并分析乳腺三维断层摄影技术辐射剂量（AGD）与图像质量之间的关系。**方法：**收集来我院采用乳腺三维断层摄影技术进行检查的 236 例患者的临床资料，根据患者乳腺厚度的不同，分为四组，每组各 59 人。采用非参数统计以及相关性分析的方法，对不同厚度乳腺的曝光条件和 AGD 的相关性进行分析。对同一厚度，不同 AGD 条件下成像的乳腺图片，分析其图像信噪比与 AGD 之间的关系。**结果：**当乳腺厚度增加时，曝光条件与 AGD 均随之增加，具有明显的相关性（r=0.977，P<0.05）。对于相同厚度的乳腺图片，AGD 越高，图像信噪比越高，具有明显的相关性（厚度≤29mm：r=0.977，P=0.023；厚度 30-45mm：r=0.994，P=0.006；厚度 46-59mm：r=0.998，P=0.002；厚度≥60mm：r=0.980，P=0.020）。**结论：**乳腺的厚度越厚，其曝光条件与 AGD 就越大，对同一厚度的乳腺，AGD 越高，成像的图像信噪比越高，图像质量越好。

EPO-0823
乳腺浸润性微乳头状癌的影像学表现与免疫组化的相关性研究

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目的:探讨乳腺浸润性微乳头状癌（invasive micropapillary carcinoma ,IMPC）的影像学表现、免疫组化与影像学表现的相关性、病理与淋巴结转移的关系。**方法**:回顾性分析 46 例乳腺浸润性微乳状癌的 X 线、超声表现及病理特征。**结果**:IMPC 的 X 线表现以肿块伴钙化型（54.3%）为主，肿块形态不规则（69.7%）或分叶状（18.2%）、毛刺状边缘（48.5%）或边界不清（36.4%）、高密度(81.8%)或等密度(18.2%)，60%以不定形钙化为主。超声表现以肿块型（76.1%）或肿块伴钙化型（17.4%）为主，肿块形态不规则（81.4%）或分叶状（14.0%）、边界不清（81.4%）或清楚（18.6%）、95.3%呈混杂回声，纵横比＜1 占 86%，后方可伴声影（32.6%）或正常（67.4 %），RI 为 0.57-0.90，平均为 0.74。ER+PR+HER2-阳性率 67.4%，在 ER+PR+的情况下，单纯型 IMPC 中 HER2- 46.1%， HER2+ 23.1%，混合型 IMPC 中 HER2- 75.7%，HER2+ 9.1%。乳腺 X 线摄影中肿块型 IMPC HER2- 72.7%，HER2+ 9.1%，非肿块型 IMPC 中 HER2- 53.8%，HER2+ 23.1%。IMPC 的淋巴结转移率及转移个数与浸润性导管癌相比差异有统计学意义(P＜0.05)。**结论**：IMPC 的 X 线及超声表现符合乳腺恶性肿瘤的特征。IMPC 的淋巴结转移率及转移个数较浸润性导管癌高，IMPC 类型、HER2 表达及肿瘤大小与淋巴结转移率无明显相关性。IMPC 以 ER+PR+HER2-多见，混合型 IMPC 中 ER+PR+HER2-较单纯型 IMPC 中多见，单纯型 IMPC 中 ER+PR+HER2+较混合型 IMPC 中多见。乳腺 X 线摄影中肿块型 ER+PR+HER2-较非肿块型多见，非肿块型 ER+PR+HER2+较肿块型多见。

EPO-0824
数字乳腺断层摄影与磁共振成像在乳腺癌新辅助化疗监测中的对比研究

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目的：比较数字乳腺断层摄影（DBT）与磁共振成像（MRI）在乳腺癌新辅助化疗（NAC）监测中的应用价值，为临床分期及治疗提供依据。方法：选取 2015 年 12 月至 2017 年 12 月间在我院连续收治的 54 名经病理诊断为乳腺癌的患者并行新辅助化疗。患者在新辅助化疗前、中、后均行 DBT 和 MRI 检查。在新辅助化疗进行后，应用 DBT 和 MRI 测量的残余病灶的大小与手术标本（金标准）的病理结果比较，对每一位患者的治疗后的反应进行评估。使用 LIN 系数评价两种测量方法之间的一致性，应用 DBT 和 MRI 在新辅助化疗前、中、后分别对病灶进行测量。最后，根据 ReCIST 1.1 标准中设定的参数，以病理完全缓解（Pathological complete response，PCR）为中心，在 DBT 和 MRI 中分别评估肿瘤最大尺寸的变化。结果：在新辅助化疗（NAC）后，DBT 与手术标本组织学的一致性优于 MRI(LIN‘s 系数分别为 0.81 和 0.59，DBT-MRI 的一致性为 0.22，CI 0.07~0.58；PCC 0.85 和 0.67)；两种测量方法均倾向于低估残余肿瘤的真实范围(DBT 平均低估 4.1mm，MRI 低估 7.5mm)。DBT 图像的测量结果与 MRI 有很强的一致性，尤以 NAC 前 LIN‘s 系数（0.96，CI 0.94~0.98）和中(LIN’s 系数 0.94，CI 0.89~0.97)最为明显。NAC 后的一致性系数为 0.76(LIN‘s 系数，CI 0.61~0.86)，差异很大，反映出与组织病理学评估的不同相关性。DBT 与 MRI 测量结果的一致性在 NAC 前中后分别为 0.96、0.94 和 0.76。在组织病理学结果评估中，DBT 的敏感性和特异性分别为 100%和 84%，MRI 的敏感性和特异性分别为 87%和 60%。结论：DBT 与 MRI 对乳腺癌患者病变大小的测量高度相关。DBT 在评估 NAC 的反应方面与 MRI 一样可靠，是另一种选择。

EPO-0825

Diagnostic value of DR examination for breast cancer patients and its relationship with clinical pathology

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[Abstract] **Objective:** To investigate the diagnostic value of digital radiography in patients with breast cancer and its relationship with clinicopathology. **Methods:** Prospectively selected 170 breast cancer patients in the hospital were divided into three negative breast cancer group (TNBC) group (33 cases), estrogen positive group (ER) positive group (91 cases) and human according to immunohistochemistry results. The epidermal growth factor 2 positive group (HER2) positive group (46 cases). Forward-looking? 170 cases of breast cancer patients in the hospital were selected according to the results of immunohistochemistry, divided into three negative breast cancer group (TNBC) group (33 cases), estrogen positive group (ER) positive group (91 cases) and human epidermal growth Factor 2 positive group (HER2) positive group (46 cases). Results: Compared with the three groups, the TNBC group and the HER2 positive group had larger tumors and the ER positive group had smaller (χ^2=9.327, P<0.05). The lymph node metastasis rate in TNBC group was higher than that in ER positive group and HER2 positive group (χ^2=9.431, P<0.05). The number of marginal burrs in ER positive group was higher than that in TNBC group and HER2 group (χ^2=4.272, P<0.05). The number of patients with microcalcifications in HER2 positive group and ER positive group was higher than that in TNBC group (χ^2=44.332, P<0.05). **Conclusion :** Large and accompanied by significant calcification, digital X-ray examination can provide effective evidence for early diagnosis of breast cancer.

EPO-0826

The Contrast Between Radiologists and Artificial Intelligence in Mammographic Breast Density Assessment

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OBJECTIVE: To evaluate the performance of breast density assessment by radiologists and Artificial Intelligence (AI) in different views.
METHODS: In current study, 2548 mammography images in 637 patients were collected from November 2018 to March 2019 by randomly selected 50 cases per week. Independent density assessments were recorded by four experienced radiologists. The majority assessment of the four breast imagers became the consensus. Compared to previous studies, these four radiologists evaluated the breast density for each patient from seven different views: Double breast view, right breast view, left breast, Craniocaudal (CC) view and mediolateral oblique (MLO) view for each breast. Evaluations were blinded to each other. The AI model, using a deep convolutional neural network, ResNet-18, also assessed the density evaluation of corresponding images obtained from these views.
RESULTS: The accuracies and consistencies of AI assessments for single person, unilateral breast, single film, CC view and MLO view were 0.821,0.667, 0.776,0.600, 0.818,0.675, 0.840,0.698, 0.795,0.650, respectively. The accuracies and consistencies of radiologists assessments were 0.856、0.751, 0.834、0.718, 0.825、0.696, 0.831、0.696, 0.822、0.700, respectively. Judging from point of the clinical practice, the best performance of AI was single film. While, radiologists obtained the best performance from the single person view. From the position point of view, the best performance for AI is the CC view, while, there is almost no difference between the CC view and the MLO view for radiologists.
Conclusion: With the increasing number of mammography, the performance of manual evaluation got better. Therefore, the categorial assessment of breast density recommended by BI-RADS13 is more scientific. AI assessments for single breast and person were not as good as which obtained from single view. This may due to the difference between the input and output modes. And the CC view performance was better than the MLO view, as the MLO view may interfered by the structural overlap among the pectoralis major, fat and axillary lymph nodes. Also Density assessments varied for different body positions.Therefore ,The results suggested radiologists should evaluate breast density integrally, while AI would show a better result from the CC view. Moreover, future studies should emphasize in establishing different input and output models for each view.

EPO-0827

数字乳腺断层合成 X 线成像技术在乳腺导管造影中的应用

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目的：数字乳腺断层合成 X 线成像（Digital Breast Tomosynthesis，DBT）是新兴的乳腺 X 线检查技术，在诊断乳腺疾病中表现出了明显的优势，本研究对乳头溢液的患者运用 DBT 技术进行导管造影检查，并且采用不同浓度的碘对比剂进行检查，探究 DBT 在乳腺导管造影检查中的应用价值及碘对比剂浓度对图像质量的影响。
方法：自 2019 年 5 月至 2019 年 7 月在我院行乳腺导管造影病人共 81 例，对其中 33 个患者运用 DBT 技术进行乳腺导管造影，对两种图像中导管分支的显示及病灶的显示进行评价，评估 DBT 在乳腺导管造影诊断中的价值。此外，用 35mg/100mL 的碘海醇与生理盐水不同比例混匀，分别配制 20%、30%、40%、50%、75%、100%的对比剂，将不同比例的对比剂注入留置针软管内，包裹于五花肉中摄片，比较不同比例下造影剂显影情况；将 30%、50%及 100%比例的对比剂运用于 3 例乳腺导管造影中，比较不同比例下造影剂显影的图像质量。
结果：33 例病例中，血性溢液 11 例，黄色溢液 9 例，清亮溢液 12 例，乳白色溢液 1 例；X 线表现为充盈缺损 8 例，显影中断 4 例，导管扩张 10 例，导管炎 10 例，囊肿 1 例；传统 2D 与 3D 图像显示导管的分支情况中，3D 图像比 2D 显示较好的有 21 例，传统 2D 与 3D 显示相当的有 12 例。不同比例的对比剂中，30%比例以下的对比剂显影欠佳；在 3 例乳腺导管造影图像中，100%比例下的图像太锐利，对比度过高，30%及 50%比例下的图像柔和，对比度适中。
结论：本研究显示 3D 图像可以更好的显示导管分支，特别是远段细小分支，体现导管分支的走行及造影剂填充情况，尤其是 2D 图像中导管结构重叠的病人，可以显示出 2D 图像中因结构重叠而隐藏的病变，提高导管造影中病变的检出率，减轻阴性患者的担忧。另外，适当减少碘对比剂浓度，不会影响图像质量，但可以减轻碘对比剂引起的不良反应。

EPO-0828
基于乳腺 X 线摄影及超声等影像学特征构建机器学习模型预测浸润性乳腺癌分级

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研究目的：乳腺癌是我国女性恶性肿瘤发病率最高的肿瘤。乳腺癌的预后与很多种因素有关，其中组织学分级是乳腺癌独立的预后预测指标。然而生物学采样是一种侵入性的方法，因此研发一种可在治疗前无创、准确地预测乳腺癌组织学的分级的方法显得尤为重要。乳腺 X 线摄影联合超声检查被认为是乳腺癌筛查及诊断的“黄金组合”。因此本研究通过开发和验证一种可解释和可重复的机器学习模型，依托临床信息联合乳腺 X 线摄影和超声影像学特征预测浸润性乳腺癌的分级。
研究方法： 回顾性收集 2010 年 1 月至 2016 年 12 月在术前同一时间段内行乳腺 X 线摄影及超声检查并经病理学诊断证实为浸润性乳腺癌的患者 250 例，其中 I 级约 78 例，II 级别 80 例，III 级别约 92 例，通过查阅病例资料，收集每例患者的临床数据信息；而乳腺 X 线摄影及超声影像学特征均由两位具有 5 年以上诊断经验的乳腺诊断医生根据第五版 BI-RADS 通过共同阅片后所决定，总共提取 65 个特征。将所收集的数据按照 7:3 的比例将数据分为训练组、测试组，对收集数据处理，并构建决策树模型。应用受试者工作特征(receiver operating characteristic，ROC)曲线并计算曲线下面积(AUC)、敏感度、特异度及准确度以评价该模型术前预测浸润性乳腺癌组织学分级的效能；并在测试组中测试其效能。

研究结果：该模型在术前预测浸润性乳腺癌组织学分级的效能 AUC 值为 0.802(95% CI：0.729~0.875)，敏感度、特异度和准确度分别为 79.47%、75.47%和 77.42%。
研究结论：基于第五版乳腺 BI-RADS 特征描述，通过结合乳腺 X 线摄影和超声的影像学特征，并加入临床信息，构建的决策树模型预测浸润性乳腺癌组织学的分级是可行的。同时由于 BI-RADS 分类的普用性和可接受性，其所提出的方法可以很容易地广泛应用，而不需要考虑成像供应商和设置的可变性。

EPO-0829

Deep Learning Model used in Mammographic Breast Density Assessment

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Purpose: To investigate the clinical value of Deep learing (DL) model can be used to help radiologists improving the diagnostic efficiency of mammography.

Materials and Methods: In this prospective study, Fifty cases were randomly selected each week, 2,548 digital mammograms of 637 women from November 2018 to February 2019 involved in this study. All evaluations were performed by four radiologists with five years of experience in mammography who was blinded to the clinical diagnosis, including once overall evaluating, twice unilateral breast evaluating and quartic single image evaluating. The ResNet-18 model used to evaluate breast density compared with four radiologists' evaluations. 4 weeks later, 200 digital mammograms of 50 women in March 2019 were collected. The density of each mammogram was evaluated by machine, and four radiologists provide breast density classification based on the DL model results independently. The final gold standard was determined by majority decision and joint discussion.

Results: The consistency of four images' overall assessment evaluated by the four radiologists in each patient (K=0.75) was higher than assessment of unilateral breast images (K=0.718) and single image(K=0.696). The accuracy of four images' overall assessment, unilateral breast images assessment and single image assessment in patients were 0.856, 0.834, 0.825. The consensual assessment of single image evaluated between DL model and four radiologists (K=0.675;95% confidence interval [CI]: 0.648,0.702) was higher than the overall assessment given by single radiologist (K=0.675; 95% CI: 0.612, 0.722) and the assessment of unilateral breast images (K=0.599; 95% CI: 0.558, 0.640). The consistency of 200 breast densities in March evaluated by four radiologists who refer to AI results increased to 0.825. leapfrog-grade-evaluation will emerge When four radiologists evaluating same breast density, and machines will prevent this from happening.

Conclusion: Adding four experienced radiologists evaluating all cases independently is where we differ from previous studies. The evaluations of DL model and four

radiologists agree well with each other, the consistency of evaluations by four radiologists assisting with DL model increase.

EPO-0830

A New Method in Mammographic Breast Density Assessment Using AI: Explore a More Efficient AI Model for Clinical Implementation

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Purpose: To verify the effectiveness of the existing mammographic breast density evaluation AI model and further explore a more suitable DL algorithm for clinical use.
Materials and methods: we randomly selected 50 cases per week from november 2018 to february 2019, and finally collected 2,548 digital screening mammograms from 637 patients (excluding who had undergone single mastectomy). Density evaluation was conducted by four doctors with more than 5 years of experience in mammography diagnosis independently, and the test set gold standard was obtained after unified evaluation results. AI Model output was at the same time, which was built based on ResNet-18 neural network, by collecting 80000 digital screening mammograms obtained in 22000 women from multicenter of multiple mammography machines. Our test method is different from the literature has reported, that we assess seven times for each patient's breast density respectively, including double breast overall evaluation, unilateral breast overall evaluation, right breast CC, right breast MLO, left breast CC, left breast MLO. The AI model also inputs corresponding images to obtain the results of 7 times density evaluation.
Results: the AI model and radiologists both showed a high(＞0.77) accuracy rate in density evaluation. In evaluating the single mammogram, the accuracy and consistency of AI (κ = 0.675; 95% CI: 0.648,0.702) and radiologists (κ =0.696)were similar. In evaluating the unilateral breast or the whole patient, the accuracy and consistency of the AI were slightly worse than the radiologists' evaluation (κ = 0.559 vs 0.718; κ = 0.667 vs 0.751), and the difference was statistically significant. The accuracy and consistency of AI in evaluating single mammogram film were as high as double breast overall evaluation, (κ = 0.674; κ =0.667), while the result of unilateral breast overall evaluation was not that so good(κ =0.599; 95% CI: 0.558,0.640).However, the accuracy and consistency of radiologists on the single mammogram, unilateral breast and double breast were gradually increased(κ = 0.696; 0.718;0.751 respectively).
Conclusion:the AI model can be used for breast density evaluation.However, if AI integrated with human logic, AI will be more applicable to clinical practice.

EPO-0831

Mammographic Breast Density Assessment Using Deep Learning Especially For Asian Women : Clinical Implementation

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Purpose: As the proportion of breast density classification is different from Asian and and European and American women (more high density in Asian women), emphasis of the assessment and doctor's cognition are also different, so the existing evaluation model of European and American women's breast density is not applicable in China. The aim of this work was to investigate a deep learning(DL)-based breast density classifier to consistently distinguish "dense" categories, aiming at provid a potential computerized tool to assist radiologists in assigning a BI-RADS category in the current clinical workflow.

Materials and Methods: In this prospective study, we have randomly selected 50 patients per week, an between November 2018 and February 2019d finally collected 2,548 digital mammograms from 637 women. An independent assessment of breast density was performed by four experienced radiologists, and then unified conclusions were obtained for to form a gold standard for reference. Then we used the gold standard to verify the performance of the existing AI model, which was based on the ResNet-18 neural network trained on the original interpretation by an experienced radiologists of 80156 digital screening mammograms obtained in 22000 women screened by different machines in the polycentric institutions not including our hospital.

Results: The DL model showed excellent accuracy(81%) and good agreement with radiologists in the test set (k = 0.67; 95% confidence interval [CI]: 0.64,0.70).The recall and precision were 49.42% and 66.15% in group A, 82.87% and 67.05% in group B, 86.00% and 87.83% in group C, and 67.65% and 96.72% in group D respectively.

Conclusion: We found that the proportion of each classification affects the accuracy of training set before the prospective study. The accuracy of training set was poor in group A because of the low proportion (1.25%), which had improved significantly by increasing the data by eight times in internal test set. The better performance we got in test set of group D compared to other studies is again because of the higher proportion. So our DL model are more suitable for Asian women (19% in training set and 12% in test set of group D), which will help to establish the risk assessment models of breast cancer for Asian women. In the following research, we will explore the relationship between the proportion of each group and the performance of the model to optimize the DL model. In addition, we found that there was a category of error because of masses or dense vascular calcifications. In future studies, we are intending to increase the number of images of this part, which may be helpful to improve the performance and the universality of the model.

EPO-0832
基于深度学习的乳腺 X 线摄影对乳腺密度评估的临床应用

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目的 致密乳腺与乳腺癌具有强相关性，随着乳腺癌早期筛查在中国越来越多地获得政府的支持和人民的重视，中国人群的乳腺密度分类也也越来越获得医生的重视。而亚洲人群的乳腺密度分类比例和欧美有所不同（高腺体密度更多），评估的侧重点以及医生的认知也有所不同，所以现有国外腺体密度评估模型并不是很适用于中国的人群。本研究旨在开发一种适用于亚洲女性乳腺密度评估的深度学习算法。

方法 在这项前瞻性研究中，我们每周随机抽取 50 名在 2018 年 11 月至 2019 年 2 月期间来我院就诊的患者，最终从 637 名女性中收集了 2548 张数字乳房 x 线照片。由 4 名乳腺钼靶诊断经验 5 年以上的医师对乳腺密度进行独立评估，并按少数服从多数原则得出统一的结论作为测试集金标准。然后使用金标准验证现有的人工智能(AI)模型的性能（该模型采用 ResNet-18 算法，采集了本院之外的多中心多钼靶机型的 22000 人的 80156 张图像数据进行训练）。

结论 AI 模型与放射医生在测试集中的结论一致性很高，准确率高达 81%(k = 0.67;95%置信区间[CI]: 0.64,0.70)；不同密度分型的召回率和准确度分别为 49.42%和 66.15%（A 型）、 82.87%和 67.05%（B 型）、86.00%和 87.83%（C 型）、67.65%和 96.72%（D 型），其中 C 和 D 型乳腺中的性能最令人满意。

讨论 在前瞻性研究之前我们曾做过简单的测试，发现 AI 模型在不同密度分型中的准确率与它们在训练集中的占比相关。训练集中 A 型乳腺仅占 1.25%，性能很差；在对 A 型乳腺进行了 8 倍的数据增强后性能在内部测试集获得了显著的提升。而本研究中 D 型乳腺的性能表现比其他文献的结果好很多，可能也是因为 D 的占比更高，所以这个模型也更加适合致密乳腺更多的亚洲女性。

EPO-0833
乳腺癌不同受体表达的影像学特征

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目的：探索 4 种乳腺癌不同受体表达的影像学特征。方法：选取 439 例术前进行乳腺 DBT 检查且进行免疫组化乳腺癌患者。分析乳腺癌不同受体表达的影像学与临床特征。**结果**：Luminal A 型出现毛刺肿块比例最大，钙化分数均值最小，有显著统计学差异(均 P＜0.01)；HER2 过表达型平均年龄、绝经后比例、肿块大小均值、钙化分数均值及钙化分数≥9 分比例最高,有统计学差异(年龄 P＜0.05，余均 P＜0.01)；三阴性型表现为肿块、形状规则、边缘模糊及高级别浸润性导管癌比例最高，有统计学差异(均 P＜0.01)。ER+和（或）PR+组与无绝经、毛刺肿块表达成正相关，有显著统计学差异(均 P＜0.01)；HER2+组及 KI-67 表达与钙化分数、肿块长径和高级别浸润性导管癌表达成正相关，有统计学差异(P＜0.05）。**结论**：乳腺癌不同受体表达在影像及临床特征上存在一定相关性，可为临床诊断与治疗方案的选择提供一定依据。钙化是 X 线诊断的巨大优势，在本项研究中 62%患者出现钙化，其中 Her-2 过表达型更高达 82%，钙化分数平均值也居 4 种分子亚型的首

位。Luminal A 型钙化分数更多集中在 4-8 分，而 HER2 过表达型钙化分数更多集中在 9-12 分（P＜0.01），因而我们认为钙化分数是预测分子亚型的一个指标。三阴性型最常出现肿块，比例为 93.88%。肿块伴钙化则在 HER2 过表达型中最常见，约达 54.9%。HER2 过表达型肿块平均长径最大，Luminal A 型最小；从受体层面分析，KI-67 值和 HER2 阳性组与肿块长径存在正相关。对于肿块形状及边缘特征，Luminal A 型肿块更多为不规则毛刺肿块，出现该现象为低 KI-67 值与 ER 或（和）PR 受体阳性相作用结果，三阴性型倾向为相对规则模糊肿块，推测与其受体全阴也存在一定关系。因而肿块形状、边缘特征有助于对分子亚型起到一定鉴别作用。

EPO-0834
探讨低危团簇状分布钙化灶在 BI-RADS 的合理归类以及第二眼超声的应用价值

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【摘要】目的：探讨在 FFDM 筛查性检查中，低危团簇状分布钙化灶的 BI-RADS 合理归类，以及第二眼超声检查在协助鉴别诊断中所起到的作用。**方法：**收集我院经 FFDM 筛查性检查发现 99 例共计 114 处团簇状分布钙化灶，一周内进行针对性第二眼超声检查，一个月内经病理组织学结果证实。**结果：**发生于左乳 51 例，右乳 45 例，双乳 3 例。穿刺活检 59 例，24 例麦默通活检，单纯乳房切除 5 例，区段手术切除活检 11 例，其中良性 94 例，乳腺癌 5 例，恶性占比约 5.05%。99 例 FFDM 共发现团簇状分布钙化灶 114 处，单侧单纯点状钙化灶 42 处，单侧单纯粗糙不均质钙化灶 20 处，单侧点状钙化灶伴局限致密影 15 处，单侧粗糙不均质钙化灶伴局限致密影 9 处，双侧多发钙化灶 7 处，单侧多发单纯点状钙化灶 21 处。FFDM 检出疑似恶性 34 处，良性 80 处，其中真阳性 4 处，假阳性 30 处，真阴性 79 处，假阴性 1 处。第二眼超声检出恶性 13 处，良性 101 处，其中真阳性 3 处，假阳性 10 处，真阴性 99 处，假阴性 2 处。FFDM 联用第二眼超声检查，诊断灵敏度从 80%上升至 100%，误诊率从 27.5%小幅上升至 30.3%，特异度从 72.5%小幅降至 69.7%，漏诊率从 20%降至 0%，阴性似然比从 0.28 降至 0，阳性似然比从 2.91 升至 3.3。**结论：**在筛查性检查中发现低危团簇状分布钙化灶后，给予临床清晰的处理策略指导。通过针对性的第二眼超声检查，规避了患者在短期随访期间的等待恐惧，更重要的是避免了不必要的穿刺活检甚至切除活检，同时提高了乳腺癌的检出率，研究中提出的“团簇状分布钙化灶处理流程图”及增设“BI-RADS 4F 类”的建议值得在临床实践中推广使用。

EPO-0835
全数字化乳腺 X 线摄影、数字乳腺断层摄影及乳腺超声对导管内乳头状瘤的诊断价值研究

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目的：乳腺导管内乳头状瘤是女性常见的乳腺良性肿瘤，临床表现缺乏特异性，其诊断主要依赖于影像学检查。本研究结合传统全数字化乳腺 X 线摄影及超声，探讨数字乳腺断层摄影对乳腺导管内乳头状瘤的诊断价值。

方法：回顾性收集南方医科大学南方医院 2014 年 03 月-2018 年 12 月期间经病理证实为导管内乳头状瘤的患者 104 例，所有的患者均行全数字化乳腺 X 线摄影（FFDM）、数字乳腺断层摄影（DBT）和超声（US）检查。首先由 3 年高年资放射科医师对影像图像进行分析，内容包括病变可见性、病灶最大径、BI-RADS 分类等。将 BI-RADS 评分 3 或 4a 归为正确分类，当意见不一时，通过协商得出最终结果，对比 FFDM、DBT 和 US 三种模式对病例诊断的敏感度、特异度及 ROC。然后按照发病部位将病例分为乳晕下区病灶和非乳晕下区病灶，分别对比 FFDM、DBT 及 US 诊断两组病例的准确率。
结果：共收集 104 例患者，其中乳晕下区 39 例，其他部位 65 例。FFDM、DBT 和 US 对导管内乳头状瘤诊断的敏感度分别为 0.793、0.891 和 0.937，差异有统计学意义（p＜0.05）；特异度分别为 0.740，0.779 和 0.821，差异有统计学意义（p＜0.05）;ROC 曲线下面积分别为 0.851,0.906 和 0.919，差异有统计学意义（p＜0.05）。在乳晕下区病例的诊断结果中，FFDM、DBT 和 US 的准确率分别为 0.858,0.914 和 0.923，对于非乳晕下区病例，三者的准确率分别为 0.813,0.895 和 0.901，差异均有统计学意义（p＜0.05）。

EPO-0836

通过 AI 模型辅助提高乳腺 X 线腺体密度评估效能

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目的:通过放射科医生之间对乳腺 X 线密度评估的一致性和人工智能（AI）模型与放射科医生之间的一致性分析，评价 AI 模型能否用于临床以及 AI 模型能否帮助诊断医生提高乳腺 X 线评估效能。
材料和方法：前瞻性研究，我们从 2018-2019 年，收集了 637 位患者共 2548 张 X 线图像；由四位高年资医生（5 年以上乳腺诊断经验）独立进行乳腺密度评估，包括单个病人四张图像总体、单侧乳房及单张图像评估，评估参考 2013 年 ACR 乳腺 X 线 BI-RADS 密度标准；用 AI 模型（该模型采用 ResNet-18 算法，采集了本院之外多中心多机型 22000 人共 80156 张图像进行训练）评估乳腺 BI-RADS 密度。统计四位放射科医生之间的一致性、4 位医师评估的共识(盲标之后，医生对齐原则)与 AI 模型一致性。
之后我们收集 2019 年另外 50 个病人共 200 张乳腺 X 线片，分别由 AI 模型、3 位高年资医生、3 位低年资医生（小于 2 年诊断经验）分别对单张图像进行密度评估（金标准由高年资医生多数决定），分别统计出一致性和准确率；再让 3 位低年资医生参考 AI 的结果，选择是否同意 AI 结果，评估 AI 模型是否能提高准确率或保证准确率前提下提高一致性。
结果：4 名放射科医生对以人为单位评估一致性为 0.75、对单乳评估一致性为 0.718、对单张图像评估一致性为 0.696。AI 模型与共识评估对以人为单位总体评分的一致性为 0.667、对单乳评分的一致性为 0.599、对每张图像评分的一致性为 0.675。
针对 3 月份共 200 张钼靶片进行密度评估结果，高年资医生和 AI 模型的一致性和准确率均较高；低年资医生参考 AI 结果对每张图像评估，一致性上升，且准确率也提高了。
结论：该 AI 模型与我们有经验的四位医生在测试集的一致性较好，故该 AI 模型可用于临床评估乳腺密度。低年资医生在 AI 辅助下一致性及准确率有所上升，所以该 AI 模型能够帮助低年资医生提高乳腺诊断效能。

EPO-0837

乳腺核磁共振、断层融合、数字 X 线摄影诊断早期乳腺癌 的对比研究

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目的：探讨乳腺动态增强磁共振成像（DCE-MRI）、数字断层融合摄影（DBT）、数字 X 线摄影（DM）在乳腺癌早期诊断中的应用价值。**方法：** 收集 2017 年 1 月至 2018 年 12 月经手术病理证实的早期乳腺癌患者 65 例，术前均行乳腺 DCE-MRI、DBT、DM 检查。以病理结果为金标准绘制 ROC 曲线，评价不同影像检查方法的诊断效能，用 Z 检验对 ROC 曲线下面积进行比较；采用 χ2 检验比较 DCE-MRI、DBT、DM 对早期乳腺癌检出率、准确率、灵敏度、特异度的差异；采用 Pearson 相关性分析不同影像检查方法评估早期乳腺癌病灶大小的准确率。**结果：** DCE-MRI、DBT、DM 基于 BI-RADS 分类诊断早期乳腺癌的 ROC 曲线的曲线下面积(AUC)分别为 0.91、0.832、0.700，差异有统计学意义（Z 值为 2.132，*P*= 0.001）；DCE-MRI、DBT、DM 对早期乳腺癌敏感度分别为 92.3%、70.8%、52.5%，DCE-MRI、DBT、DM 对早期乳腺癌特异度分别为 65.0%、85.0%、79.3%，DCE-MRI 、DBT、DM 对早期乳腺癌的诊断准确率分别为 83.1%、70.8%、50.8%，MR 及 DBT 的诊断准确率均高于 DM，差异均有统计学意义（ χ2 值分别为 15.33、5.45，P<0.01、*P*=0.02）；DM、DBT、DCE-MRI 测量值与病理测量结果呈正相关(r=0. 767，r=0. 905，r=0. 955，*P* 均<0. 01)。**结论：**DCE-MRI、DBT 在早期乳腺癌检出和诊断准确率具有明显优势，相较 DM 能显著提高早期乳腺癌的诊断效能，未普及乳腺磁共振检查广大基层医疗单位可采用 DBT 提高乳腺癌早期检出。

EPO-0838
联合 DBT 及 CESM 提高致密类乳腺肿块型病变的诊断价值

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目的：通过对比 CESM、DBT 和 US 对致密类乳腺可疑恶性肿块型病变的诊断价值，从而推广 CESM 联合 DBT 的临床运用价值.
方法：收集我院 2018 年 1 月-2019 年 5 月传统乳腺 X 线判断为可疑恶性乳腺肿块型病变共 109 例女性，发病年龄岁 24-74 岁，中位年龄 46.0 岁。受检者同时行 CESM、DBT 和 US 检查。同时根据 BI-RADs 5th将乳腺纤维腺体组织类型分为非致密类（共 18 例，包括脂肪类和散在纤维腺体类）和致密类（共 91 类，包括不均匀致密类和极度致密类）两组。并进一步分析 CESM、CESM+DBT 及 CESM+US 的 ROC 曲线下面积、敏感性、特异性、假阳性及阳性预测值。
结果：相对于乳腺肿块型病变，CESM+DBT 总的敏感性及假阳性高于 CESM 及 CESM+US (CESM+DBT:0.986,0.513 vs. CESM 0.957,0.487 vs.CESM+US:0.971,0.411)。再进一步对比 CESM、CESM+US 及 CESM+DBT 对于非致密类及致密类乳腺的诊断价值。相对于致密类乳腺，CESM+DBT 相比于 CESM 及 CESM+US，具有更高的敏感性、阳性预测值和阴性预测值(CESM+DBT:0.606, 0.814,0.952 vs. CESM:0.545,0.785,0.857 vs.CESM+US:0.525,0.781,0.944)。然而对于非致密类乳腺，相比于 CESM 及 CESM+DBT，CESM+US 具有更高的诊断价值，尤其是 ROC 曲线下面积、特异性和阳性预测值更高 (CESM+US: 0.750,0.5,0.785 vs. CESM:0.715, 0.333, 0.75 vs. CESM+DBT:0.701, 0.333, 0.75).
结论：CESM 能够有效检出乳腺可疑肿块型病变，联合 DBT 能更好的提高致密类乳腺肿块型病变的诊断价值；同时 CESM 联合 US 具有较高的临床应用价值。

EPO-0839

Clinical Histopathologic and Imaging Manifestations of Breast Carcinomas with Neuroendocrine Features

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Objective: This study aimed to describe the clinical, histopathologic, and multimode imaging features of primary breast carcinomas with neuroendocrine features (BCNEF). **Materials and Methods:** The multimode images (according to the 2013 BI-RADS lexicon) and clinical and histopathologic characteristics of BCNEF patients were reviewed, documented and compared with the historical controls of neuroendocrine carcinoma of the breast (NECB) and invasive ductal carcinoma (IDC). **Results:** Thirty-four patients (35 lesions) were included, with an average age of 62.8 years. Twenty-nine patients (85.3%) were postmenopausal at diagnosis, which was more than in those found with historical IDC. Most cases (82.4%) presented clinically as a palpable mass, with a mean tumour diameter of 23.8 mm. Compared to historical IDC, more patients were ER positive (91.4%), PR positive (80%), and HER2 negative (100%). After surgery, only two patients were found to have distant metastases during follow up, and so far, every patient is alive. BCNEF appeared as an irregular (63%) mass (84.4%) with an indistinct (55.6%) margin on mammography (n=32), as an irregular (87.1%), parallel orientated (87.1%), indistinct (54.8%), margined mass (100%) on sonography, and as an irregular (68.8%) mass (94.1%) with an irregular (80%) margin and a rapid (50%) initial enhancement/plateau (64.7%) kinetic curve on MRI. **Conclusion:** BCNEF mostly occurred in elderly postmenopausal women in clinical settings with good outcomes. BCNEF mostly appeared as irregular masses with an uncircumscribed margin in imaging. Most imaging findings of BCNEF were considered suggestive of malignancy, but it is still difficult to differentiate BCNEF from IDC.

EPO-0840

数字乳腺断层融合摄影与超声检查对乳腺黏液癌诊断价值比较

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目的　对比分析数字乳腺断层融合摄影（DBT)、数字乳腺 X 线摄影（DM)及超声检查（US）对不同亚型乳腺黏液癌（MBC）的诊断价值。
方法　回顾性分析 64 例经手术病理证实的 MBC 的影像资料，其中 37 例为单纯型 MBC，27 例为混合型 MBC。以 2013 年第 5 版乳腺影像报告及数据系统（BI-RADS）为诊断标准，比较 3 种检查方法对不同亚型 MBC 检出率及诊断符合率的差异。
结果　DM、DBT 及 US 对所有 MBC 的检出率分别为 89.1%、96.9%、98.4%，对单纯型 MBC 的检出率分别为 89.2%、97.3%、97.3%，对混合型 MBC 的检出率分别为 88.9%、96.3%、100.0%，3 种检查方法的检出率两两比较差异均无统计学意义（P>0.05）。DM、DBT 及 US 对所有 MBC 诊断符合率分别为 71.9%、93.8%、89.1%，对单纯型 MBC 诊断符合率分别为 62.2%、91.9%、83.8%，对混合型 MBC 诊断符合率分别为 85.2%、96.2%、96.2%。对于所有 MBC 及单纯型 MBC，US 及 DBT 的诊断符合率均高于 DM，差异有统计学意义（ x 2=4.385~10.785，P<0.05）；DBT 的诊断符合率稍高于 US，但差异

无统计学意义（P>0.05）。对于混合型 MBC，3 种检查方法的诊断符合率两两比较差异均无统计学意义（P>0.05）。
结论　3 种检查方法对 MBC 的检出率差异不明显；对于 MBC 尤其是单纯型 MBC，US 及 DBT 的诊断符合率均高于 DM，而 DBT 与 US 差异不明显。

EPO-0841

Comparison of the diagnostic performance of synthesized two-dimensional mammography and full-field digital mammography alone or in combination with digital breast tomosynthesis

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Purpose: To investigate whether digital breast tomosynthesis (DBT) and subsequently generated synthesized mammography (SM) images have better performance than full-field digital mammography (FFDM) images for diagnosing malignant breast lesions. In addition, the radiation doses for SM using different procedures were compared.
Materials and methods: This prospective study enrolled 212 women (age≥ 25 years) with clinically suspicious breast lesions. All participants underwent FFDM and DBT with the same breast compression. Finally, 222 lesions were confirmed by pathological analysis. The mammogram results were evaluated according to the BI-RADS criteria and compared with the pathological results. The diagnostic performances, morphological features and average glandular doses (AGDs) were compared.

Result: In total, 141 malignant lesions and 81 benign lesions were confirmed by pathological analysis. The overall AGD showed no significant difference between FFDM and DBT. Compared with 2D imaging, the AUC values of FFDM plus DBT and SM plus DBT were both significantly different overall (p=0.0002) and remained significantly different in dense breasts (P<0.0001). In terms of morphologic characteristics, lesions showed similar morphology between FFDM and SM, while the lesion characteristics were discordant from 2D imaging to DBT in 33 lesions in dense breasts.
Conclusion: Compared to FFDM, 2D SM images generated from DBT had significantly improved diagnostic efficacy for detecting malignant breast lesions without increasing radiation doses. This new procedure is useful for characterizing breast lesions, particularly in dense breasts.

EPO-0842

FFDM 联合 MRI 对乳腺小病灶的诊断价值

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目的：
分析乳腺小病灶 FFDM 与 DCE-MRI 及参数的影像学特征，探讨 FFDM 联合 DCE-MRI 检查对乳腺小病灶的诊断价值。
方法：
回顾性研究 2017-2018 年间在我院经过临床检体和 FFDM 检查后，仍不明确乳腺疾病的患者，最后进行了均 MRI 检查的 48 人。入选标准为病灶≤1cm,患者均具有临床表现和或 FFDM 检查异常，但性质不定，最终行穿刺或手术后得到病理结果。其中 FFDM 检查阳性患者为 31 名。
由 2 名具有多年乳腺影像诊断的医师采用 BI-RADS 分类法盲法评阅患者乳腺 X 线摄影片和磁共振扫描图像，对影像资料进行分析评估。由高年资医师绘制感兴趣区域（ROI），以尽可能地包围整个病变。DCE-MRI 需对每个 ROI 用于提取每个时间点的信号增强的平均值，确定最大强度时间比（MITR）。根据 *Hoffman U* 等的药代动力学模型，分析数据得出三个参数：振幅（信号-时间曲线的初始斜率），交换速率常数和廓清速率常数。 然后可以从模型中计算另外两个参数：最大增强指数和分布容积（幅度与交换速率的比率）。
使用 SPSS 20.0 进行数据分析，计数资料最终结果以百分率显示，组间采用 x 2 检验，P＜0.05 时差异有统计学。
结果：
在 48 名患者中，以最后的病理诊断作为金标准，对 FFDM 及 MRI 的诊断进行统计学分析。FFDM 较 MRI 表现为相对低的敏感性（FFDM 为 65%，MRI 为 87%）和相对高的特异性（FFDM 为 82%，MRI 为 56%）。但结合动力学参数，MRI 对病灶的特异性可所提高（DCE-MRI 约为 68%）。FFDM 结合 MRI 检查对小病灶的评估，较单独进行 FFDM 或 MRI 检查的准确率有明显提高（准确率约为 89%）。
结论：
1. FFDM 联合 DCI-MRI 可以提高对乳腺小病灶诊断的准确率。
2. DCE-MRI 动力学参数的引入对病灶的良恶性诊断有很大帮助。

EPO-0843
全数字化三维乳腺断层摄影对乳腺良恶性疾病的诊断价值

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目的探讨全数字化三维乳腺断层成像对乳腺良恶性疾病的诊断价值,并与常规二维乳腺 X 线成像和乳腺超声结果进行比较。方法回顾性分析 2019 年 6 月至 7 月之间 67 例患者，均接受常规二维乳腺 X 线成像、数字化三维乳腺断层成像及乳腺超声检查，并经穿刺活检或手术病理证实，依照 BI-RADS 评分分别计算三维乳腺断层成像、二维乳腺 X 线和超声检查对乳腺良恶性病变的准确率、敏感度、特异度、阳性预测值、阴性预测值。用 Kappa 分析分别评价三维乳腺断层、二维乳腺 X 线、超声检查与病理结果的一致性。用 Fisher 确切检验法，评价三维乳腺断层、二维乳腺 X 线和超声检查对恶性病变的敏感性、特异性差异。结果三维乳腺断层、二维乳腺 X 线和超声检查对乳腺良恶性病变诊断的准确率分别为 85.07％、64.18％、76.12％,敏感度分别为 90.32％、67.74％、69.44％,特异度分别为 80.56％、61.11％、69.44％；三维乳腺断层乳腺成像、二维乳腺 X 线和超声检查与病理结果进行一致性评价，Kappa 值分别为 0.70、0.28、0.52。不同检查方法对恶性病变检出的敏感性比较：三维乳腺断层与二维乳腺 X 线间有统计学差异（P<0.05）,三维乳腺断层与超声及二维乳腺 X 线与超声间无统计学差异（P>0.05）。不同检查方法对恶性病变检出的特异性比较：三维乳腺断层的特异性最高，但三种方法的特异性在统计学上均无明显差异（P>0.05）。 结论三维

乳腺断层成像对乳腺良恶性病变诊断的敏感性、特异性、准确率均高于二维乳腺 X 线及超声检查，与病理结果高度一致，恶性病变评价敏感性优于常规二维乳腺 X 线成像，是乳腺癌筛查、诊断更为准确的检查方法。

EPO-0844

The relationship between mammographic features and clinicopathological parameters in Chinese data base

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Objective:
To assess the relationship between mammographic features and clinicopathological parameters in Chinese data base.

Materials and Methods:
In this institutional review board-approved HIPAA-compliant study, in which the requirement for informed patient consent was waived. A retrospective review of mammographic images from a total of 198 breast cancer patients imaged between January 2016 and March 2016 were conducted. The mammographic features were assessed according to BI-RADS by three experienced breast radiologists. The clinical information, including age, tumor size, grade, and axillary lymph node status, were collected from our database. Estrogen receptor (ER), progesterone receptor (PR), human epidermal growth factor receptor 2 (Her2) and Ki-67 were analyzed on the surgically removed tumor samples by immunohistochemical staining analysis. Statistical analysis was performed to assess the correlation between mammographic features and clinicopathologic characteristics.

Results:
54.0% (n=107) of the patients had a mammographic mass, 38.4% (n=76) had calcifications, 14.1% (n=28) had both a mass and calcifications on the mammogram, and 1.5% (n=3) had architectural distortion. Twelve masses had a regular shape, and ninety-five masses were irregular. Thirty-five masses had a spiculated margin, and seventy-two masses were non-spiculated. The shape of the mass was significantly related to molecular factors. Irregular masses had a significantly higher PR-positive than regular masses (73/94, 77.7% vs. 5/11, 45.5%, $p<0.05$). In addition, the majority of irregular masses were invasive breast cancer ($p<0.05$). Based on pathologic analysis, the IDC grade of III in mass was 16.7% (n=25), which were obviously higher than those in nonmass as 6.0% (n=9) ($p<0.05$), whereas 4.7% (n=7) in architectural distortion/asymmetries, which were obviously lower than those in non-architectural distortion/asymmetries as 18.0% (n=27) ($p<0.05$). The lesions appeared as calcification or architectural distortion/asymmetries on the mammogram, the tumor was usually larger than 2 cm in size ($p<0.05$) and with Her2 positive in calcification lesions($p<0.05$), whereas the masses was usually smaller than 2 cm in size ($p<0.05$).

Conclusions:

There is a relationship between mammographic features and clinicopathological parameters in Chinese data base. The mammography imaging recognition of breast cancer can assist in both pretreatment planning and prognosis as well as adding to a greater understanding of the biological behaviour of the disease entity.

EPO-0845
数字乳腺断层摄影与合成二维图像的联合在诊断乳腺疾病中的应用价值

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背景：随着数字乳腺断层摄影在世界范围内的广泛应用，传统的数字乳腺 X 线摄影将逐渐被断层摄影取代。然而断层摄影所带来的辐射剂量亦随之增加，因此有学者研究了断层合成二维图像是否可以取代传统的的数字乳腺 X 线摄影图像等问题，但目前为止仍然无足够的循证医学研究证据来证实这一问题。
目的：通过该研究探讨数字乳腺三维断层摄影（DBT）联合合成 X 线二维图像（C-view）对乳腺病变的诊断及鉴别诊断价值。
方法：回顾性收集 2019 年 1 月至 2019 年 6 月在云南省肿瘤医院住院且诊断经穿刺活检或手术病理证实的 387 例(401 个病灶)女性乳腺疾病患者,年龄≥30 岁，筛选入组的所有患者均进行过数字乳腺 X 线摄影检查（FFBM）、三维断层摄影检查（DBT）,重组 DBT 检查获得合成 2D 图像(C-view 图像)。所有入组病例均由四名医师独立进行阅片分析，其中两名对 DBT 结合 FFDM 图像进行分析，另外两名对 DBT 结合 C-view 图像进行分析,判读结果参照乳腺影像报告和数据系统(BI-RADS)分类,记录诊断结果，包括发现病灶的数目、位置及良恶性。以病理和临床诊断结果为标准,采用 ROC 评价采用不同类型图像鉴别乳腺良、恶性病变的效能。
结果：检查发现良性病灶 233 个、恶性病灶 168 个。DBT 结合 FFDM 及 DBT 结合 C-view 诊断乳腺良、恶性病变的敏感度和特异度分别是 70.4% vs 68.9%（P=0.76），
94.9% vs 95.3%(P=0.23)，而两者的 ROC 下面积均为 0.878。差异均无统计学意义。
结论：数字乳腺三维断层摄影（DBT）联合合成 X 线二维图像（C-view）与数字乳腺三维断层摄影（DBT）联合 X 线摄影（FFDM）具有相似的敏感度、特异度及诊断效能。因此笔者认为乳腺断层合成的 2D 图像可代替常规 FFDM 图像,结合 DBT 诊断在不增加辐射剂量的前提下,可提高鉴别诊断良、恶性病变的效能。

EPO-0846
乳腺癌及肿瘤新生血管的同步辐射成像研究

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目的：探讨同步辐射相位对比 X 线成像技术在离体人体乳腺癌及其新生血管成像中的实验研究，并与传统乳腺 X 线成像进行比较。材料和方法：选取 34 例人体乳腺癌离体标本在上海光源 X 射线成像与生物医学应用光束线站上（BL13W）成像，储存环电子束能量 3.5GeV，BL13W 线站的光子为 8-72kev，光斑 45mm(H)*5mm(V)(@20keV)，本研究两维成像方法采用的能量为 13~16 keV，探测器 13um 和 9um，样品-探测器距分别选择 0cm, 60cm, 100cm 和 120cm，曝光时间 10ms，三维成像方法采用的能量同上，探测器 9um，样品-探测器距为 100cm，每幅投影图像曝光时间 32ms，旋转台转

速 0.36°/s，每个位置记录 2 帧图像，旋转 180°，总投影数约 1000 张。以 Image Pro Plus 和 Amira 进行图像后处理。同时，所有标本进行传统乳腺 X 线成像，并将两种影像学图像与最后的病理图像进行比较分析。结果：同步辐射相位对比 X 线成像能比传统乳腺 X 线成像更清楚的显示乳腺癌中的微小钙化灶数目、边缘和分布，并且在不使用造影剂的情况下即可显示 9um 左右直径的乳腺癌肿瘤新生血管，并可观察到肿瘤新生血管主要分布在肿瘤周边区域，中心部分血供较少，坏死较多。结论：同步辐射相位对比 X 线成像技术具有很高的衬度分辨率和空间分辨率，具有很高的医学应用前景。

EPO-0847
对比增强乳腺 X 线摄影平均腺体剂量与乳腺病变的相关性研究

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目的 探讨乳腺病变类型、病变良恶性及病变大小对对比增强乳腺 X 线摄影（contrast-enhanced spectral mammography，CESM）低能图、高能图及减影后图像的乳腺平均腺体剂量（average glandular dose, AGD）的影响。**方法：**收集 2018 年 2 月-10 月于本院行 CESM 检查且经过组织学病理学证实的 123 例女性患者作为研究对象。根据病变良恶性、主要病变类型（非肿块型与肿块型）、及肿块型病变大小进行分组，比较患侧与健侧乳腺 MLO 位的低能图 AGD、高能图 AGD 及减影后图像的 AGD。**结果：**恶性病变 65 例，良性病变 58 例。肿块型病变 86 例，非肿块型病变 37 例；其中恶性肿块 57 例，良性肿块 29 例。肿块大小≥2cm 44 例，＜2cm 32 例；其中恶性肿块≥2cm 32 例，＜2cm 25 例。恶性病变的患侧 MLO 位高能图 AGD 较健侧高 12.74%（Δ=0.065）；良性病变的患侧 MLO 位高能图 AGD 较健侧高 7.91%（Δ=0.035）。肿块型病变的患侧 MLO 位高能图 AGD 较健侧高 12.55%（Δ=0.061）；其中，恶性肿块型病变的患侧 MLO 位的高能图 AGD 较健侧高 10.91%（Δ=0.057）。肿块长径≥2cm 组的患侧 MLO 位的高能图 AGD 较健侧高 14.67%（Δ=0.08）；其中，恶性肿块长径≥2cm 组的患侧 MLO 位的高能图 AGD 较健侧高 20.88%（Δ=0.113）。以上各组间差异均具有统计学差异（P＜0.05）。低能图像两侧乳腺 AGD 差异无统计学意义。**结论：**病变良恶性、病变类型和肿块大小对 CESM 高能图 AGD 有影响。

EPO-0848
对比增强能谱 X 线摄影对乳腺癌诊断价值的系统评价

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摘要：目的：乳腺 X 线摄影是乳腺癌筛查首选的检查方式，微钙化是钼靶检查的优势，但乳腺钼靶检查的假阳性仍然是个关注的焦点问题，对比增强能谱 X 线乳腺摄影是一项新技术，检查方便，诊断效能高，可以应用于乳腺癌的筛查、诊断及随访等方面，正逐渐广泛应用于临床。本研究目的在于通过系统评价和荟萃分析评价对比增强能谱 X 线摄影对乳腺癌的诊断价值。方法:检索 PubMed、Embase 以及 Cochrane 数据库，所有数据库检索时间截止到 2018 年 7 月，筛选能获得 CESM 独立诊断乳腺癌的真阳性值（TP）、假阳性值（FP）、假阴性值（FN）、真阴性值（TN）等原始数据并在国内外公开发表的 CESM 对乳腺癌的诊断性试验。所有入选文献研究对象必须为 18 岁以上患者，性别、病例来源不限；目标病灶行 CESM 且有明确的病理诊断（不论是穿刺或手术切除活检）。研究的结局指标包括其诊断实验的合并敏感性（Sen）、合并特异性 （Spe）、合并诊断比值比（DOR）以及受试者工作特征（SROC）曲线下面积（AUC）、诊断实验准确性指标

（TPR），用 Revman 软件进行 meta 分析。结果:此次研究检索到如何纳入标准的 18 篇文献进行分析，meta 分析结果显示合并后的灵敏度和特异度分别为 84.03%、77.59%，表明对比增强能谱 X 线摄影在乳腺癌的诊断中具有较好的灵敏度和特异度。本研究 SROC 曲线下面积为 0.874，诊断试验准确性指标 TPR 为 81.62%，SDOR 值为 15.05（95%CI：10.32%～21.95%）），说明对比增强能谱 X 线摄影对乳腺癌的诊断价值较高，具有较好的准确性，是乳腺癌筛查和诊断的一种较好的影像学方法。结论:尽管对比增强能谱 X 线摄影对乳腺癌的诊断价值较高，具有较好的准确性，是乳腺癌筛查和诊断的一种较好的影像学方法。本研究认为，对比增强 X 线能谱对乳腺癌的早期诊断效果较好。

EPO-0849
对比增强能谱乳腺 X 线摄影积分诊断模型对乳腺癌的诊断价值分析

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目的：联合对比增强能谱乳腺 X 线摄影（CESM）中病灶强化程度、强化类型以及低能图中的 BI-RADS 分类进行合成积分，研究其与乳腺病理学良恶性的关系。**材料与方法：**对临床或超声怀疑乳腺病变的患者行 CESM 检查，由三名放射科医师对图像进行分析诊断，将取得病理结果的 124 个病灶纳入研究。定性分析剪影图中病灶的强化程度、强化类型。将强化程度分为无强化、轻度强化、中度强化、重度强化，并将其分别记为积分 0、1、2、3；对比病灶在两个体位（头尾位、内外斜位)图像中的强化程度的差异，将病灶的强化类型分为无强化、上升型、平台型、下降型，并分别记为积分 0、1、2、3。对低能图中的病灶进行 BI-RADS 分类，积分 1 定义为 BI-RADS≥4 类，积分 0 定义为 BI-RADS≤3 类。将剪影图与低能图的积分相加得到合成积分，并将其与病理学良恶性进行对比。采用受试者工作特征曲线(ROC)和约登指数法获得不同评分方法的最佳截断值，并得出诊断效能。**结果：**124 个病灶，经病理证实乳腺癌 33 个，良性病变 91 个。CESM 强化程度对乳腺病灶的诊断敏感性,为 78.8%，特异性为 74.7 %，准确性为 75.8%，ROC 下面积（AUC）为 0.818。CESM 强化类型对乳腺癌的诊断敏感性为 90.9%，特异性为 62.6%，准确性为 70.2%，AUC 为 0.833。低能图 BI-RADS 分类对乳腺癌的诊断敏感性为 63.6%，特异性为 76.9%，准确性为 73.4%，AUC 为 0.703。CESM 合成积分模型的最佳截断值为 3，其诊断敏感性为 84.9%，特异性为 71.4%，准确性为 76.9%，AUC 为 0.859。在多项评分指标中，合并积分模型具有较高的诊断效能。**结论：**本研究初步探索并建立了一个简单的 CESM 积分诊断模型，联合病灶强化程度、强化类型以及低能图中的 BI-RADS 分类进行合成积分，该模型对乳腺病变的鉴别诊断具有一定价值。

EPO-0850
CESM 对乳腺肿块型病变的定性诊断及免疫组化分析

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[目的]分析 CESM 对乳腺肿块型病变的良恶性诊断及其免疫组化的相关性。**[方法]**收集我院 2018 年 1 月-2019 年 5 月传统乳腺 X 线判断为可疑恶性乳腺肿块型病变共 109 例女性，发病年龄岁 24-74 岁，中位年龄 46.0 岁。分析 CESM 的诊断效能，并分析不同病理类型及分子亚型乳腺癌的 CESM 特

点。[结果] 109 例包括单纯肿块 66 例及肿块伴钙化 43 例；良性病变 39 例，乳腺癌 70 例。CESM 检查的 ROC 曲线下面积 0.860(95% Confidence Interval, 0.784~0.935)、敏感性 0.957、特异性 0.513 及阳性预测值 0.986。109 例乳腺肿块型病变是否强化、强化形态、边缘及强化程度在良性病变与乳腺癌间的差异具有统计学意义（P＜0.05）；而肿块样强化的内部强化特征在良性病变与乳腺癌间的差异不具有统计学意义（P=0.184）。良性肿块型病变未强化率（17.9%）高于乳腺癌（1.4%）。良性肿块型病变多表现为圆形/椭圆形肿块样强化（22/39,56.4%）；乳腺癌多表现为不规则形肿块样强化（46/70,65.7%）。良性病变及乳腺癌肿块样强化的边缘均以模糊多见，且以浸润性导管癌多见（55/70，78.5%）。良性病变多表现为轻度强化（14/39,35.9%），而肿块型乳腺癌以明显强化为主（57/70,81.4%）。良性病变及乳腺癌肿块样强化的内部特征均以均匀多见（56.2%：65.2%），但不均匀强化多见于乳腺癌。不同分子分型乳腺癌肿块样强化形态、边缘及程度差异均不具有统计学意义（P＞0.05）；但肿块内部的强化特征差异具有统计学意义（P＜0.05），三阴性型以不均匀（42.9%）或环形强化（42.9%）多见，而其他三种类型均以均匀强化多见。

[结论] CESM 对于判断乳腺肿块型病变良恶性具有较高的诊断效能，且根据肿块样强化内部特征可初步推断乳腺癌分子分型。

EPO-0851

基于 CESM 影像组学诺莫图预测乳腺癌腋窝淋巴结转移

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目的：建立并验证术前预测乳腺癌腋窝淋巴结转移的影像组学诺莫图。

材料与方法：148 名符合条件的乳腺癌患者被分为训练组（n=100）和验证组（n=48）。从每个病人的 CESM 图像中提取影像组学特征。然后在训练集中用 LASSO 算法建立影像组学标签。结合独立的危险因素，采用多元 Logistic 回归模型建立诺莫图。诺莫图的效能在训练集中进行评估，并在验证集中进行验证。最后，结合训练和验证集进行决策曲线分析，以评估诺莫图的临床实用性。

结果：由 9 个淋巴结状态相关特征组成的影像组学标签，具有良好的预测效果。包括影像组学标签和 CESM 报告的淋巴结状态的诺莫图在训练集（AUC 0.79；95%CI，0.73-0.85）和验证集（AUC 0.76；95%CI，0.69-0.84）中也显示出良好的效能。决策曲线表明了我们列线图的临床实用性。另外，诺莫图在 CESM 报告的淋巴结状态为阴性的亚组（AUC 0.88；95%CI，0.83-0.94）也显示出良好的鉴别能力。

结论：影像组学诺莫图是一种非侵入性术前预测工具，结合影像组学特征和 CESM 报告的淋巴结状态，对乳腺癌患者淋巴结转移具有一定的预测效能，具有良好的应用前景，需要大数据进一步提高模型的效能和多中心验证获得临床应用的高水平证据。

EPO-0852

Cone-beam breast CT features associated with HER2/neu overexpression in patients with primary breast cancer

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Objectives To retrospectively identify the relationship between human epidermal growth factor receptor 2 (HER2) status and cone-beam breast CT (CBBCT) characteristics in surgically resected breast cancer.
Methods This study was approved by institutional review board, and informed consent was obtained from all patients. Preoperative CBBCT findings were retrospectively evaluated in 181 surgically resected breast cancer between October 2012 to August 2015. A set of 27 CBBCT descriptors was semiquantitatively assessed by consensus double reading. Multivariate logistic regression analyses using backward elimination method (BEA) were performed to identify independent predictive factors of harboring HER2/neu. Principle component analysis (PCA) was used to found characteristics that might separate HER2 positive/negative. Receiver operating characteristic (ROC) curve analyses were conducted to determine the ability of predicting HER2 status.
Results HER2 positive were found in 101 (55.8%) of 181 patients. Based on BEA, pathologic grade, maximum dimension, lobulation, ΔCT, and calcification morphology were confirmed as independent predictive factors of HER2/neu overexpression. PCA showed that calcification- and border-related characteristics were the most important for differentiation. ROC curve analyses showed that CBBCT features (area under the ROC curve (AUC) = 0.853) was superior to clinical features (AUC = 0.613, $P < 0.001$), and comparable to combination with clinical features (AUC = 0.856, $P = 0.866$).
Conclusions CBBCT features can be used to prognosticate HER2 status independently, which are potentially useful to support automated analyses and develop decision-support clinical tools.

EPO-0853
对比增强能谱乳腺 X 线摄影与 CE-MRI 诊断乳腺癌的对比研究

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【摘要】 目的 探讨对比增强能谱乳腺 X 线摄影（contrast enhanced energy spectrum mammography-CESM）诊断乳腺癌的价值。**方法** 回顾性分析经乳腺 X 线摄影（mammography-MG）筛查 BI-RADS 分类为 4A 类及以上病例进行乳腺 CESM 及 MRI 检查，并且最终经病理证实的 50 例 52 个病灶。所有患者均行双侧乳腺 CESM 和 MRI 检查。对病理标本进行判读，获得病理分类诊断结果，观察 CESM 和 MRI 表现，记录病灶检出情况，并对病灶进行定性诊断。以病理结果为金标准，采用卡方检验分析 CESM 及 MRI 的诊断效能。**结果** 50 例患者病理共检出 52 个病灶，良性病灶 13 个，恶性病灶 39 个。CESM、MRI 各检出病灶 38 个，定性诊断判读错误病灶各 1 个。以病理结果为金标准，CESM 诊断乳腺癌的敏感度、特异度和准确度分别为 97.40%、84.6%和 73.8%，MRI 分别为 97.4%、76.9%和 73.8%，差异均无统计学意义。**结论** CESM 诊断乳腺癌与 MRI 检查的诊断效能接近。

EPO-0854
对比增强能谱乳腺 X 线摄影与动态增强磁共振成像诊断乳腺结节的对比研究

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目的：探讨对比增强能谱乳腺 X 线摄影（Contrast-Enhanced Spectral Mammography，CESM）与动态对比增强磁共振成像（Dynamic Contrast-Enhanced Magnetic Resonance Imaging，DCE-MRI）在乳腺结节中的诊断性能
方法 收集在 2017 年 2 月-2018 年 12 月期间临床怀疑或超声诊断为乳腺结节的 69 例患者，均进行过 CESM 和 CE-MRI 检查。采用双盲法和非随机研究。用配对 T 检验对病灶的大小和强化程度进行统计学分析。以病理结果作为金标准。计算诊断敏感度、特异度、准确性和阳性预测值。并采用问卷的方式让病人对两种检查的满意度和耐受度进行调查，分析患者更偏向哪一种检查 。
结果 69 例患者有 42 例良性病变， 27 例恶性病变。CESM 检测乳腺结节的敏感度、特异度、阳性预测率、阴性预测率和准确率分别为 83.21%、91.32%、88.67%、93.56%和 84.21%。DE-MRI 分别为 86.32%、95.44%、90.27%、96、33%和 88.75%。乳腺病变强化程度在 CESM 中显著低于 DCE-MRI，P<0.01。两种检查方法均能检测出直径大小约 3 mm 的病变。在耐受度的问卷调查中 73.5%的患者选择了 CESM，26.5%的患者选择了 DCE-MRI. 差异有统计学意义（P<0.01）
结论 CESM 显示和诊断乳腺结节疾病优于低能图，与 MRI 检查的诊断效能相当，更大的舒适性和较低的噪音水平与 DCE-MRI 相比，CESM 的焦虑率明显降低让患者更耐受。

EPO-0855

Contrast-enhanced spectral mammography: Can it improve positive predictive value of different type of suspicious calcifications?

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Purpose:To assess the positive predictive value(PPV) of contrast-enhanced spectral mammography(CESM) of different types of calcifications.***Material and Methods:***Patients with mammographic calcifications without associated mass or distortions and were originally reported as BI-RADS 4 during March 2017 to Dec 2018 were retrospectively collected.Lesions received CESM and proven through pathological diagnosis by biopsy were enrolled.Types of morphology and distribution of calcifications on low-energy images were classified based on the fifth ACR BI-RADS.For morphology types,calcifications were classified as higher risk type(fine linear or fine linear branching) and lower risk type(amorphous, coarse heterogeneous, fine pleomorphic and others).For distribution,calcifications were classified as higher risk type(linear and segmental) and lower risk type(regional,grouped and diffuse).Meanwhile,the enhancement of calcification was evaluated on subtracted images.ACR BI-RADS 4 or 5 calcifications on low-energy images and calcifications with enhancement on subtracted images were diagnosed as malignant.Statistical differences of the two images were compared using Chi-square test.***Result:***73 lesions(26 malignant and 47 benign) from 73 patients were enrolled.The PPV were 35.62% and 76% for low-energy image and subtracted image for all calcifications($p<0.05$).The PPV of calcifications with higher risk morphology and higher risk distribution(type A),higher risk morphology and lower risk distribution(type B),lower risk morphology and higher risk distribution(type C),lower

risk morphology and lower risk distribution(type D) were 100%,75%,66.67%,72.73% for subtracted image, and were 83.33%,75.00%,40.00%,24.07% for low-energy image.The PPV of subtracted image of type D calcifications was significantly higher than that of low-energy image($p<0.05$). ***Conclusion***:CESM improve the PPV on mammographic calcifications,especially calcifications with lower risk morphology and lower risk distribution.

EPO-0856

乳腺对比增强 X 线摄影的临床应用

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目的：探讨分析乳腺对比增强 X 线摄影(Contrast-enhanced spectral mammography,CESM)在乳腺病灶的检出及鉴别良恶性方面的应用
方法：回顾性分析 29 例女性患者，均为临床怀疑或超声发现乳腺病变后进一步行 CESM 检查，最终经过穿刺活检或手术切除取得病理结果。CESM 又称双能量技术，指注射对比剂后，对双侧乳房进行低能量（低于碘的 K 值 33.2 keV）和高能量（高于 33.2 keV）曝光，分别获得低能图和高能图，通过图像后处理对两者进行减影，最终得到双侧乳房头尾位、内外斜位的低能图及减影图，共八幅图像。由两位具有十年以上工作经验的放射诊断医师进行图像分析，记录的内容包括：低能图上病灶是否存在及病灶类型，减影图上病灶是否存在及病灶类型（参照 2013 版 BI-RADS 中乳腺 MRI 的描述）。
结果：29 例女性患者，共检出病灶 29 例。病理证实恶性的病灶有 9 例，包括浸润性导管癌、导管原位癌、粘液癌及囊内乳头状癌，其中强化的有 7 例，均表现为肿块样强化（形态：6 例形态不规则、1 例圆形，边缘：4 例清晰、3 例不规则，强化特点：1 例均匀，5 例不均匀，1 例环形强化），无强化的有两例，病理分别为导管内原位癌、浸润性导管癌，后一例病灶位置较深，考虑可能是行 CESM 检查时未摄入。病理证实良性的病灶有 20 例，包括乳腺病、纤维腺瘤、导管内乳头状瘤等，其中 12 例强化、8 例无强化，10 例表现为肿块样强化（6 例形态为圆形或卵圆形，9 例边缘清晰，7 例强化均匀），2 例表现为非肿块样强化（均为局灶强化）。
结论：CESM 的初步应用结果表明，乳腺良恶性病灶均可以表现为强化，但恶性病灶倾向于表现为形态不规则、边缘清晰或不规则、强化不均匀，而良性病灶倾向于表现为圆形或卵圆形、边缘清晰、强化均匀，这表明 CESM 在乳腺病灶的检出及鉴别良恶性方面有着潜在的价值，有待于进一步的研究证实。

EPO-0857

Radiation dose of Contrast-enhanced Spectral Mammography: Comparable to conventional mammography and more friendly to patients with denser breast tissues

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Objective:
To compare the radiation dose of contrast-enhanced spectral mammography (CESM) with that of full field digital mammography (FFDM) under the same mammography

equipment, and compare the dose differences among patients with varying breast tissue densities.

Materials and methods:

This is a retrospective study enrolling 51 consecutive patients who received CESM examination and 62 randomly chosen patients who received FFDM during the same period and on the same mammography equipment (GE Senographe Esse). All values of the entrance skin exposure (ESE) and the average glandular dose (AGD), as well as the thickness and pressures, were all recorded on both right and left sides of craniocaudal projections (RCC and LCC) for each patient. Breast tissue densities were classified by two radiologists in consensus as a to d referring to the 5th BI-RADS, and then were divided as denser group (a and b types, n=39) and non-dense group (c and d types, n=11). Mann-Whitney tests were used to compare the dose differences between low-energy CESM and FFDM, total dose (plus low and high energy doses) of CESM and FFDM, and between denser and non-dense groups.

Results:

For both RCC and LCC, ESE (6.58±2.89 and 6.85±2.67 mGy) and AGD (1.52±0.49 and 1.57±0.47 mGy) of the low-energy projection of CESM were significantly lower than those of FFDM (ESE 9.07±2.92 and 8.82±2.73 mGy, AGD 2.01±0.51 and 1.98±0.48 mGy) ($P<0.01$). The total AGD of CESM (2.06±0.67 and 2.13±0.66 mGy) had no significant difference with FFDM ($P>0.05$). The total AGD of CESM non-dense group (2.40±0.76 and 2.36±0.54 mGy) were much higher than that of denser group(1.97±0.62 and 2.06±0.68 mGy)($P<0.05$).

Conclusion:

Data from one single device found total radiation dose of CESM was comparable to FFDM, while the dose from CESM low-energy projection was much lower. Furthermore, the patients with denser breast tissue received less radiation dose than non-dense patients in CESM examination, which may indicate a favorable application.

EPO-0858

Diagnostic performance of Dual-energy contrast-enhanced spectral mammography (CESM)

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【Abstract】**Objective:** To compare contrast-enhanced spectral mammography (CESM), low energy image (LE), and magnetic resonance imaging (MRI) in the detection of breast cancer, using postoperative histology as the gold standard.

Methods: Prospective collected 145 patients. Analysed the diagnostic efficacy of LE, CESM and MRI with ROC curve. Compared lesion size measured by LE,CESM and MRI with pathologic size, using Pearson correlation coefficient and Bland-Altman.

Results: 153 lesions were found in 145 patients, 36 were benign and 117 were malignant. The sensitivity of LE, CESM and MRI was 89.83%, 95.80%, 94.17% ,the specificity was 62.86%, 86.11%,80.56%,the positive predictive value was 89.08%, 97.44%, 96.58%, the negative predictive value was 64.71%, 91.76%, 87.88% and the accuracy was 83.66%, 94.77%, 92.81%, respectively .The area under ROC curve of LE, CESM and MRI was 0.87、

0.96 and 0.97. The correlation coefficients of the pathologic size and the lesion size measured by LE, CESM and MRI was 0.61, 0.84 and 0.83 respectively. For consistency with pathology, the average difference between LE, CESM, MRI and pathologic size was -1.7mm, 1.1mm and 0.3mm, respectively. CESM and MRI slightly overestimated lesion size, and MRI was closer to pathological size.
Conclusion: CESM can significantly improve the diagnostic efficacy of breast lesions, and can be comparable with MRI.

EPO-0859
乳腺纤维腺体密度与乳腺癌的关系分析

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目的：通过分析乳腺纤维腺体密度在乳腺癌患者及正常人群中的分布情况，并进行比较研究，为进一步探究乳腺纤维腺体密度与乳腺癌患癌风险间的关系提供更多的信息和依据。**方法：**回顾性分析 2015 年 8 月至 2016 年 8 月于我院就诊行双侧乳腺 X 线摄影检查并经病理确诊为乳腺癌的女性患者 1941 例，作为实验组。分析同时间段行双侧乳腺 X 线摄影检查无阳性发现的门诊体检患者 1503 例，作为对照组。所有乳腺 X 线摄影原始图像经计算机辅助诊断系统 Quantra 软件全自动测量乳腺纤维腺体密度。采用 SPSS19.0 统计学分析软件。实验组计算健侧乳腺纤维腺体密度值；对照组计算双侧乳腺纤维腺体密度值后取平均值。采用秩和检验分别评价＜45 岁，45～54 岁，55～64 岁，≥65 岁女性人群中实验组与对照组的乳腺纤维腺体密度间差异。以 P＜0.05 为差异有统计学意义。**结果：**经秩和检验分析，实验组与对照组的乳腺纤维腺体密度差异有统计学意义（P＜0.01）。将实验组与对照组根据年龄均划分为 4 组，分别对＜45 岁，45～54 岁，55～64 岁以及≥65 岁人群进行秩和检验分析，评价实验组与对照组的乳腺纤维腺体密度，其中＜45 岁组的乳腺纤维腺体密度实验组高于对照组，差异有统计学意义（P＜0.05）；45～54 岁组、55～64 岁组及≥65 岁组中对照组乳腺纤维腺体密度高于实验组，差异均有统计学意义（P＜0.05）。**结论：**年龄与乳腺纤维腺体密度呈负相关，随着年龄的增长，乳腺纤维腺体密度逐渐降低。年轻人群中，乳腺癌患者较正常人群具有较高的乳腺纤维腺体密度。然而随着年龄不同，乳腺癌患者与正常人群的乳腺纤维腺体密度分布情况也随之改变，这可能预示着乳腺纤维腺体密度与乳腺癌患癌风险间的关系会随着年龄的不同而存在差异，因此，乳腺纤维腺体密度如何影响乳腺癌的患癌风险还仍需要进一步探讨研究。

EPO-0860
锥光束乳腺 CT（CBBCT）引导下穿刺：不同体模实验的初步研究

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摘要 目的 采用不同体模模拟 CBBCT 引导下乳腺肿物穿刺术。 **材料与方法** 在 CBBCT 引导下采用 2 种穿刺路径分别对不同体模表浅及深部靶目标进行穿刺，评价各组穿刺的可行性和准确性。**结果** ①不同穿刺路径对于有效标本获取的准确度不同，穿刺路径 2（以靶点小格为中心取 2 条组织，在其邻近的上下左右每格各取 2 条组织）相对于穿刺路径 1（以靶点小格为中心，该小格四个象限各取 1 条组织）整体获取有效标本的准确性更高（p＜0.05）；②不同体模获取有效标本的准确性不同，其中模拟乳房体模的准确率最高，其次是煮 6 分熟土豆、茄子、芒果（p＜0.05）；③穿刺不

同体模深浅部靶目标准确性无差异（$p>0.05$）；④不同操作者穿刺准确性组间无差异（$p>0.05$）；⑤综合经济学及穿刺准确性因素，煮 6 分熟土豆作为体模具有较高的性价比及可重复操作性。**结论** CBBCT 引导下体模穿刺实验具有可行性及可重复操作，穿刺准确性高。

EPO-0861

乳腺 X 线三维钩丝穿刺定位减少并发症及辐射剂量的研究

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【目的】：在乳腺 X 线三维钩丝穿刺定位中，根据患者具体病灶情况，调整细微操作及曝光条件，减少并发症，降低辐射损伤。【方法】收集我院 2016 年 1 月至 2018 年 8 月期间行 X 线三维钩丝穿刺定位的女性患者 28 例，14 例在低剂量摄片个体化条件下进行定位操作，另外 14 例摄片条件不变，分别记录两组平均腺体剂量（AGD）值与入射剂量（ESD）值,定位成功后,手术室切除病灶进行病理检查。【结果】两组患者针丝头均距离穿刺中心<20mm，指导手术切除效果满意。28 例患者中出现定位软件计算错误 3 例，迷走神经反应 4 例，钩丝扭曲 3 例；两组患者 AGD 值与 ESD 值差异有统计学意义（P<0.05），两组患者钩丝距穿刺中心距离差异无统计学意义（P>0.05），两组患者定位效果无明显差异，低剂量组患者 AGD 值与 ESD 值明显下降。【结论】根据乳腺病灶的特征，通过调整乳腺三维钩丝定位中一些细微操作及曝光条件，可有效减少并发症，降低患者所受辐射剂量。

EPO-0862

Quantifying Non-alcoholic Fatty Liver using Fat Concentration Measurement in Dual-Energy Spectral CT: Correlation with Magnetic Resonance Q-dixon Method

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Objective: *To determine the accuracy of using fat concentration (FC) measurement in spectral CT to detect and quantify non-alcoholic fatty liver using the fat fraction (FF) measured with magnetic resonance Q-dixon (MRQd) technique as a reference standard.* ***Methods:*** *Retrospectively analyzed 80 liver patients who underwent both MRQd and spectral CT with fast tube switching within one week. Using the MRQd results, patients were divided into normal and fatty liver groups (normal: n=20, FF<5%; mild: n=26, FF=5%-10%; moderate: n=20, FF=11%-25%; and severe: n=14, FF>25%). The liver FC were measured on the lipid-based material decomposition images in spectral CT by 2 senior abdominal radiologists by placing regions of interest in two different hepatic lobes over 7 image slices centered at the hepatic portal level. Final FC was obtained by averaging the measurements. Measurements were repeated three times weekly to evaluate the repeatability using intra-group or inter-group correlation coefficient (ICC). The correlation between MRQd and spectral CT results was analyzed. The diagnostic efficacy of using FC in spectral CT for differentiating normal and mild fatty livers was tested by ROC curve.*

Results: The ICC values were high indicating excellent intro- and inter-group measurement consistency. There were differences in FC between any groups (P<0.05), and higher FC values corresponded to more fat in the liver. There was an excellent positive correlation between FC in spectral CT and FF in MRQd (r=0.959, P<0.001). ROC curve analysis showed that with a cut-off value of 351.19mg/ml for FC, the sensitivity, specificity and area under curve were 95%, 100% and 0.990, respectively in differentiating the normal and fatty liver groups.

CONCLUSION: The fat concentration measurement in spectral CT has excellent correlation with the fat fraction by MR Q-dixon. The fat concentration in spectral CT has high accuracy to differentiate normal and fatty liver for non-alcoholic fatty liver patients.

Clinical Application/Relevance: The fat concentration measurement in spectral CT can be used as an imaging method for the diagnosis of fatty liver, and its accuracy is high.

EPO-0863

胰腺腺鳞癌的特征性影像学与病理对照研究

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目的 胰腺腺鳞癌是胰腺癌一种极为罕见的变异类型，分析胰腺腺鳞癌的影像学表现，并与病理对照，提高对该病的认识。

方法 收集 2011 年 2 月至 2018 年 12 月经病理确诊为胰腺腺鳞癌 108 例，同时设立对照组，随机选取同时期经手术切除病理证实，并与 PASC 组性别、年龄相匹配的 PDAC 患者 100 例。术前均进行胰腺 CT 或 MRI 增强检查。分析胰腺腺鳞癌 CT 和 MRI 影像学特征，包括肿瘤部位、瘤体直径、主胰管扩张、胰腺实质萎缩、中央囊变、环形强化，与胰腺导管腺癌对照。两组各种影像学特征组间比较采用卡方检验。P＜0.05 为差异有统计学意义。

结果 腺鳞癌位于胰头部 58 例、胰体尾部 50 例，导管腺癌位于胰头部 63 例、胰体尾部 37 例，差异无统计学意义。腺鳞癌瘤体直径（38.9±16.3）mm 大于导管腺癌瘤体直径（30.1±10.1）mm，差异有统计学意义（P＜0.05）。由于扩张的胰管和萎缩的实质均位于肿瘤远端，故在评估主胰管扩张、胰腺实质萎缩这两组指标时，需排除发生于胰尾部的腺鳞癌 28 例、导管腺癌 10 例，胰管扩张腺鳞癌（48/80）少于导管腺癌（82/90），胰腺萎缩腺鳞癌（32/80）少于导管腺癌（65/90），差异均有统计学意义（P＜0.001）。腺鳞癌中央囊变（65/108）多于导管腺癌（12/100），并且腺鳞癌 65 例发生中央囊变的瘤体直径（45.3±16.9）mm 大于 43 例中央无囊变的瘤体直径（29.2±9.2）mm，差异均有统计学意义（P＜0.001）。腺鳞癌环形强化（69/100）多于导管腺癌（25/100），差异均有统计学意义（P＜0.001）。

结论 胰腺腺鳞癌具有中央囊变和环形强化的影像学特征，肿瘤越大，越易发生囊变。相对于导管腺癌，腺鳞癌的瘤体直径更大，胰管扩张和胰腺实质萎缩更少见。虽然两者采用的治疗策略相似，但术前的准确诊断有助于指导术前管理和术后预后评估。

EPO-0864

Impact of splenomegaly on survival after bland transarterial embolization for HCC

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Objective
The purpose of this study was to analyze whether splenomegaly impacts survival after transarterial embolization (TAE) for HCC in a cirrhotic patient population.
Materials
A retrospective review of TAE procedures was performed to identify patients undergoing lobar or bilobar TAE for the treatment of HCC. Superselective treatments were not included for analysis. 152 patients were included for analysis (119 male, mean age 63 years, range 31-85). Using the pre-procedure CT or MRI, the splenic volume was measured using manual contour tracing volumetric software. The medical records were reviewed to ascertain survival. Using a severe splenomegaly threshold volume of 400mL, the survival was estimated and compared using the Kaplan-Meier and log rank test. A multivariate analysis on factors associated with survival was performed using the Cox proportional hazards test.
Results
A total of 90 patients (59.2%) undergoing TAE for HCC had severe splenomegaly. A lobar TAE was performed in 125 patients and a staged bilobar embolization was performed in 27 patients. Based on the Kaplan-Meier method, the median survival for patients with severe splenomegaly was 23.5 months, compared to 38.1 months for patients without severe splenomegaly ($p=0.003$). Multivariate analysis of predictors of worse survival revealed a significant correlation with a higher total splenic volume ($p<0.001$) and bilobar treatment ($p=0.004$). Patient age, AFP levels and maximum tumor diameter were not significantly correlated with survival ($p=0.337$, 0.070 and 0.769, respectively).
Conclusions
In patients undergoing TAE for HCC, the presence of severe splenomegaly is significantly correlated with poorer survival.

EPO-0865

Gastric hepatoid adenocarcinoma: differentiation from gastric adenocarcinoma with dynamic contrast-enhanced computed tomography findings

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Purpose
To describe the computed tomographic (CT) findings of gastric hepatoid adenocarcinoma (GHA) and determine features distinguishing it from gastric adenocarcinoma (GA).
Methods
CT images of pathologically verified GHA (n=11) and GA (n=38) were retrospectively reviewed. Alpha-fetoprotein (AFP), carcinoembryonic antigen (CEA), and CT findings were assessedin our study. CT findings included the location, distribution, growth

pattern, ulceration, thickness of gastric wall, enhancement pattern, and ratio of lesion attenuation to aorta CT attenuation. Short diameter (SD) of the metastatic lymph nodes, mean SD of metastatic lymph nodes, and the ratio of the number of enlarged lymph node on CT to the number of metastatic lymph nodes pathologically (ELN/MLN) was measured and calculated. Data were compared by $x^2$and student's t-test; significant CT criteria were identified using receiver operating characteristic curve.

Results

AFP, CEA, and a variety of CT findings were statistically significant predictors for the differentiation of GHA from GA ($p < 0.05$). When only CT findings were used as criteria, the sensitivity and specificity for diagnosing GHA were 82.86% and 90.91%, respectively. When AFP, CEA, and CT findings were used as criteria, sensitivity of 97.14% and specificity of 90.91% were achieved.

Conclusions

Elevated serum AFP level and CT findings could distinguish GHA and GA with a high degree of accuracy.

EPO-0866

MRI T1 反相位纹理分析对肝纤维化分期诊断价值初步研究

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目的：探讨 MRI T1 反相位图像纹理分析（texture analysis，TA）在肝纤维化分期中的潜在价值。方法：搜集共 67 例经肝穿刺活检证实的肝纤维化患者，依据 Scheuer 法将其分为 S0~S4 期共 5 组。应用 GE Omin-Kinetics 软件经手动在 T1 双回波反相位上分割勾画病灶感兴趣区(region of interest，ROI)，得出基于灰度共生矩阵（Gray-level Co-occurrence Matrix，GLCM）的熵值（Entropy）、能量（Energy）、惯性矩（inertia）、自相关（Correlation）以及 Haralick 纹理特征共 15 个参数，首先单因素方差分析比较不同肝纤维化分期间纹理参数是否有差异性，再进一步两两比较有差异的特征。结果：排除 9 例 MRI 图像有明显呼吸运动伪影，共筛选出 58 例进行纹理分析，其中 S0 期 8 例，S1 期 16 例，S2 期 21 例，S3 期 8 例，S4 期 5 例。不同肝纤维化分期间能量、熵值两个特征的差异有统计学意义（P<0.05），进一步两两比较结果显示，S0 期与 S3 期的熵值及 S0 期分别与 S2 期、S3 期的能量间的差别有统计学意义（P<0.05）。且熵值随着肝纤维化级别的增高有升高趋势，而能量有减低趋势。结论：基于 MRI T1 反相位图像的能量、熵值两种纹理特征有助于鉴别不同阶段的肝纤维化。

EPO-0867

HISTO、q-DIXON 技术评价肝泡型包虫病患者铁沉积及脂肪沉积的定量研究

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目的 鉴于肝泡型包虫病恶性程度高，严重的危害青海省牧民的生命健康，且肝功能损害程度高，大多数患者血清铁蛋白明显升高，故运用 HISTO 及 q-DIXON 成像技术分析肝泡型包虫病（HAE）患者肝脏铁沉积和脂肪沉积的情况，并与血清铁蛋白进行相关性分析。
方法 选择 19 例在我院就诊的 HAE 患者和 20 名健康志愿者。 使用西门子 Prisma 3.0T 设备，行 q-Dixon 序列和 HISTO 序列扫描，HISTO 可以对选定的感兴趣进行自动扫描并计算区域曲线下面积，得出目标区域的 R2 值及脂肪分数。在通过 Dixon 序列得到的 R2 *弛豫图及脂肪分数图中测出 R2 *值和脂肪分数，所测的感兴趣区的测量应尽量与 HISTO 的范围一致。同时，根据 NASH 标准将肝脏脂肪变性分为 0-3 级。
结果 HAE 组和正常组的 R2 *值分别为（133.05±99.74）和（88.74±52.77），HAE 组和正常组的 R2 值分别为（39.98±8.71）和（51.07±15.94），HAE 组大多数患者的 R2 *值及 R2 值高于正常组，两组间 R2 *值和 R2 值存在统计学差异。HAE 组 R2 *值、R2 值与血清铁蛋白呈正相关（P <0.05，r＝0.601，0.612）。但两组的脂肪分数差异无统计学意义。
结论 我们新发现 HAE 患者肝脏多存在异常铁沉积，但不存在异常的脂肪沉积，而血清铁蛋白检测可辅助判断 HAE 患者肝脏内的异常铁沉积。HISTO 和 q-Dixon 成像可以作为一种 HAE 铁沉积及脂肪沉积的无创和定量评估的有效方法。

EPO-0868

A Study of Magnetic Resonance Imaging of Iron Deposition in Hepatic Alveolar Echinococcosis

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Objective The study is aimed to analyze the liver iron deposition and liver function in hepatic alveolar echinococcosis(HAE) patients using MRI together with serum ferritin.
Methods 96 HAE patients and 30 normal volunteers were all scanned with 1.5T MR, and relevant data of laboratory inspections were collected. The signal intensity ratios of liver to the paraspinous muscles (L/M-SIR) were measured on TSE T2WI-SPAIR.The correlation between L/M-SIR and serum ferritin, L/M-SIR and liver function were analyzed. Futhermore, 96 HAE patients were divided into normal serum ferritin group[（4.63-204）μg/L, 30 patients] and increased serum ferritin group(＞204μg/L, 66 patients), and laboratory markers determining the liver function were analyzed.
Results The L/M-SIR of HAE group and normal group were （1.95±0.57) and （2.22±0.28) seperately, which indicated significant differences between groups. Moreover, there was a negative correlation between L/M-SIR and serum ferritin(r=-0.446,P＜0.01) in HAE group. Significant differences(P＜0.05) of liver function data were found between normal serum ferritin group and increased serum ferritin group in HAE patients.
Conclusion We found a new finding is that iron deposition is common in HAE, serum ferritin can be used to detect liver iron deposition of HAE patients, and the degree of liver damage is related to iron deposition. MRI, a non-invasive method, is efficient to assess liver iron deposition in HAE.

EPO-0869

A new valuable diagnostic tool for non-invasive assessment of liver fibrosis: PET/MR combined with Gd-EOB-DTPA enhanced T1 mapping and 18F-FDG

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Purpose: To investigate the feasibility of gadolinium ethoxybenzyl diethylenetriamine pentaacetic acid (Gd-EOB-DTPA) and 18F-fluorodeoxyglucose (18F-FDG) positron emission tomography/magnetic resonance (PET/MR) imaging to quantitatively estimate liver fibrosis.
Materials and Methods: We included 56 male New Zealand rabbits. Carbon tetrachloride (CC14) was injected intraperitoneally in rabbits to induce different stages of liver fibrosis (n=48), while control rabbits (n=8) received normal saline. All rabbits were subjected to 18F-FDG PET imaging and five multi-turn angle T1 mapping scans (plain period and 5, 10, 15, and 20 min after Gd-EOB-DTPA injection). The experimental scan was performed using an integrated PET/MR scanner and a special rabbit body coil. Images were processed to obtain the mean standardized uptake value (SUV_{mean}) of regions of interest and T1 reduction rate at the different timepoints. Rabbits were sacrificed within 4 h after imaging to evaluate liver fibrosis stage. We compared our PET/MR parameters against liver biopsy.
Results: In total, 34 rabbits had both pathological results and imaging data. The included rabbits were divided into three groups according to the METAVIR: no fibrosis (n=10), mild fibrosis (n=16), and severe fibrosis (n=8). △T1-15min% and △T1-20min% were effective in diagnosing different degrees of fibrosis, with △T1-20min% having a better effect. Similar to △T1-20min%, the $SUV_{mean}$was effective in distinguishing between mild and severe fibrosis, while combined △T1-20min% and SUV_{mean}showed higher specificity than the separate parameters in assessing liver fibrosis.
Conclusion: This study demonstrated the value of simultaneous assessment of liver fibrosis using Gd-EOB-DTPA and 18F-FDG PET/MR imaging and the combination of $SUV_{mean}$and △T1-20min% as an important diagnostic tool in patients with liver fibrosis.

EPO-0870

Evaluation and validation of multiparametric radiomics nomogram for predicting the severity of esophageal varices in cirrhotic patients

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Aim:
To explore the performance of multiparametric radiomics nomogram on computed tomography (CT) images based on radiomics and relevant parameters of esophageal varices (EV) for predicting the EV severity in patients with liver cirrhosis.
Materials and Methods:
The prediction model was developed based on 136 consecutive patients with clinicopathologically confirmed liver cirrhosis, which were divided into non-conspicuous EV group (mild-to-moderate EV, n=46) and conspicuous EV group (severe EV, n=90) according to standard endoscopy validation. The radiomic scores (Rad-scores) were constructed from radiomics features of regions of interest (ROI) in left liver(LL) and right liver(RL) respectively. The multiparametric nomogram was combined the best performance Rad-score and relevant factors of EV[EV grade(EVG), EV diameter(EVD), cross-sectional surface area(CSA), EV volume(EVV), diameter of left gastric vein (DLGV), and spleen volume(SV)], and the calibration, discrimination and clinical usefulness of developed nomogram were evaluated.

Result:
The Rad-score calculated from radiomics features in left liver was selected with relatively higher area under the curve (AUC; 0.88, training cohort; 0.865, validation cohort). The multiparametric nomogram containing LL Rad-score and CSA showed better predictive performance and good calibration in training (C-index, 0.953[95% CI, 0.892 to 0.973]) and validation cohort(C-index, 0.938[95% CI, 0.841 to 0.961]), resulting in an improved net reclassification index (categorical NRI of 25.9% (P=0.0128), continuous NRI of 120%(P=0)) and integrated discriminatory improvement (IDI=13.9%, P=0.00013). Decision curve analysis demonstrated that the multiparametric radiomics nomogram was clinically useful.
Conclusion:
Multiparametric radiomics nomogram, which incorporates the liver radiomics signature and CSA or EV-relevant indices, is a useful tool for predicting EV severity and has marked discrimination accuracy compared to conventional radiomics.

EPO-0871

Histogram Analysis Parameters T2WI for Distinguishing Pancreatic Neoplasms of Adenocarcinoma,Neuroendocrine and Solid Pseudopapillary

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Objective:To determine if histogram of T2WI can be used to differentiate pancreatic adenocarcinomas (PACs), neuroendocrine tumors(pNETs) and solid pseudopapillary neoplasms(PSPNs).

Methods: 160 patients from January 1, 2015 to Qctorber 1, 2018 were retrospectively reviewed. In the end, 48 patients with confirmed histologically PACs in 26(54.17%) patients,pNETs in 10(20.83%) patients, and PSPNs in 12(25.00%) patients were

enrolled in this study, accepting MRI at 3T. The T2WI histogram features were derived and then compared by one-way ANOVA and Welch's ANOVA, respectively. Bonferroni test and Games-Howell test were used to compare the two groups and the ROC curve was drawn to evaluate the diagnostic efficacy.

Results: pNETs were significantly higher mean and Perc.50% than PACs. PACs were significantly lower Perc.90% and Perc.99% than PSPNs group. A threshold value of 112.70 for mean and of 113.00 for Perc.50% had the best diagnostic efficacy to predict PACs (AUC= 0.769 and 0.777, sensitivity = 85.70%,specificity = 69.20%, respectively). Optimal diagnostic performance (AUC= 0.776, sensitivity = 66.70%, specificity =96.20%) was obtained when setting Perc.90%= 175.50 as the threshold value. Optimal diagnostic performance (AUC = 0.763, sensitivity=66.7%, specificity= 100.00%) could be get when setting Perc.99% = 218.00 as the threshold value.

Conclusions:The T2WI histogram analysis may help to discriminate PACs,pNETs and PSPNs.

EPO-0872

Target Sign on Liver Diffusion Weighted Imaging: An Important Sign of Metastases

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Objective: To evaluate the role of diffusion weighted imaging (DWI) in exhibiting the target sign in liver metastases.
Materials and methods: Diffusion weighted imaging (DWI) of 45 confirmed liver metastatic lesions in twelve patients have been retrospectively reviewed. The signal intensity was visually assessed, and the presence of "target sign" defined as central facilitated diffusion and peripheral restricted diffusion was recorded. The maximum diameter (in millimeters) of each lesion was measured and ROI-based quantification of ADC value on the solid part of the lesion, with careful avoidance of the necrotic and hemorrhagic areas, was performed. Independent samples *t*-test was used to compare the size and ADC values between the target and non-target appearing lesions.
Results: Forty-five liver metastatic lesions from six different primaries [breast (n=18), colon (n=14), rectum (n=6), pancreas (n=4), vulva (n=2), duodenum (n=1)] have been evaluated. Lesions size ranged from 6 to 52 mm (mean, 16.14 mm). Twenty two lesions (48.9%) exhibited central facilitated diffusion and peripheral restricted diffusion representing the target sign. ADC values of the lesions ranged from 0.78 x 10^{-3} mm^2/s to 1.53 x 10^{-3} mm^2/s (mean ± Std, 1.08 ± 0.162 x 10^{-3} mm^2/s). There was no statistically significant difference in size or ADC values between the target and non-target appearing metastatic lesions (*p* values = 0.1 and 0.09, respectively).
Conclusion: Target sign presenting as central facilitated diffusion and peripheral restricted diffusion can be conspicuously seen on diffusion weighted imaging in near half of the liver metastatic lesions.

EPO-0873

Hepatoid Adenocarcinoma of the Stomach: CT Findings

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[Abstract]Purpose To summarize the CT findings of hepatoid adenocarcinoma of the stomach and to improve the diagnosis. Materials and Methods The CT features of six patients with hepatoid adenocarcinoma of the stomach confirmed histologically were retrospectively studied. All patients underwent contrast, enhanced computed tomography on
a multidetector CT scanner. CT images were retrospectively evaluated including lesion size, morphologic features, enhancement patterns, adjacent organ invasion lymphadenopathy and portal venous thrombosis. Results For 6 patients, five were male and one was female; age ranged 6 1—78 years, mean 67. 3 years. Tumors appeared as eccentric gastric mass(n=5)and diffused wall thickening(n=1). Mild to moderated heterogeneous enhancement was revealed in 5 cases with gastric mass. Five patients had elevated serum alpha fetoprotein level. All six patients had regional lymphadenopathy Liver metastases were noted in 3 cases and portal venous tumor thrombosis was identified
in 2 cases. Conclusion Hepatoid adenocarcinoma of the stomach is more common in old male patients. The patients may have elevated sel21m alpha fetoprotein level. On CT scan,
hepatoid adenocarcinoma of the stomach appears as an eccentric gastric mass with mild to
moderate heterogeneous enhancement, and shows strong tendency of hepatic metastasis and regional lymphadenopathy

EPO-0874

多发性内分泌肿瘤综合征（MENs）影像诊断并实例分析

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目的：介绍多发性内分泌肿瘤综合征（Multiple endocrine neoplasia，MEN）及其分型，探讨 MEN 的影像特点和影像分析思路。
方法： 回顾性分析经临床、病理及基因检测确诊的 14 例 MEN。所有病例均有相关部位的影像学检查，CT 检查包括相应部位的颈胸腹部扫描，MR 检查包括垂体及上腹部扫描。11 例行甲状旁腺核素显像。结合临床表现，分析各型 MEN 的影像特点及其诊断联系。
结果：MEN 表现为两个或以上内分泌腺肿瘤或增生，并引起一系列相关内分泌异常。①MEN-1 型 7 例：均出现垂体腺瘤、肾上腺增生/腺瘤、甲状旁腺腺瘤或异位甲状旁腺腺瘤，其中合并胃肠胰神经内分泌肿瘤 3 例、胸腺瘤或类癌各 1 例、其他软组织肿瘤 2 例。②MEN-2A 型 5 例：3 例表现为甲状腺髓样癌、肾上腺嗜铬细胞瘤及甲状旁腺增生（功能亢进）；2 例表现为甲状旁腺瘤和肾上腺嗜铬细胞瘤或腺瘤，其中 1 例同时伴发胰腺神经内分泌肿瘤。③MEN-2B 型 1 例：表现为甲状腺髓样癌及舌黏膜神经瘤、肛周神经内分泌肿瘤。④MEN-4 型 1 例：表现为垂体腺瘤、甲状旁腺腺瘤、胰

腺胃泌素瘤和胸腺类癌。本例基因检测存在 pD418D 同义突变，无 MEN1 基因变异。各型 MEN 出现的内分泌腺肿瘤或增生均具有典型的临床表现和影像学特征。
结论：MEN 表现为两个或两个以上内分泌腺的病变，并具有典型的临床症状和影像表现。MEN 分型诊断需结合累及器官，应注意观察扫描区域内可能的受累器官，避免漏诊。

EPO-0875

The efficacy of ADC value of DWI for the evaluation of the pancreas changes in biliary obstruction

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PURPOSE
The aim of this study was to investigate the usefulness of apparent diffusion coefficient (ADC) value of diffusion- weighted imaging (DWI) for the evaluation of the pancreas changes in biliary obstruction.

METHOD AND MATERIALS
Abdominal MRI was performed with sequences including T1-weighted, T2-weighted, diffusion-weighted imaging and MR cholangiopancreatography (MRCP) with a 3.0-T imager (GE, signa). 75 patients were divided in 4 subgroups: Group A- no hepatobiliary or pancreatic pathology (34 patients), Group B- acute bilary pancreastitis (ABP) based on clinical diagnosis (10 patients), Group C- lower biliary tract obstruction due to stone (19 patients), Group D- obstruction of low bilary obstruction by carcinoma (12 patients). The pancreas of Group C and D had not reached diagnosis standard of clinical pancreatitis. A region of interest (ROI) was placed on pancreatic head, body and tail of each patient and the average ADC values were acquired. The ADC value was analyzed by Mann-Whitney U test with SPSS 19.0 software package, a difference with $p<0.05$ was regarded as statistically significant.

RESULTS
(1)The Median and Interquartile Range of ADC values (×10-3mm2/s) in Group A, B, C and D were (1.587, 0.355), (1.470, 0.431), (1.497, 0.173), (1.527, 0.303); (2)The Median of ADC value of Group A was higher than Group B, C and D with a significant statistical difference. The p values were 0.031, 0.029, 0.020 respectively; (3)There were no significant statistical difference between Group B, C and D.

CONCLUSION
The ADC value of ABP was lower than healthy people. And the ADC value could reflect the changes of early acute pancreatitis with low biliary obstruction. But it couldn’t distinguish the causes of obstruction.

EPO-0876

Differentiating hypovascular pancreatic neuroendocrine tumor from pancreatic ductal adenocarcinoma based on CT texture analysis

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Purpose: Hypovascular pancreatic neuroendocrine tumor (hypovascular PNETs)is usually misdiagnosed as pancreatic ductal adenocarcinoma. We aimed to investigate the value of texture analysis in differentiating hypovascular PNETs from pancreatic ductal adenicarcinomas (PDACs) on contrast-enhanced computed tomography (CT) images.
Materials and MEthods: Twenty one patients with hypovascular PNETs and 63 patients with PDACs were included in this study. All patients underwent preoperative unenhanced and dynamic contrast enhanced CT examinations. Two experienced radiologists independently and manually contoured the region of interests (ROIs) of each lesion using texture analysis software on pancreatic parenchymal and portal phase CT images. Multivariate logistic regression analyses were performed to identify significant features to differentiate hypovascular PNETs from PDACs. ROC curves were performed to ascertain diagnostic ability and cutoff values.
Results: The most discriminative CT texture features to differentiate hypovascular PNET from PDAC were RMS (root mean square) (P<0.001, OR [odds ratio) =0.50), Quantile50 (P<0.001, OR=1.83) and sumAverage (P=0.007, OR=0.92) in parenchymal images and ″contrast″ was the independent texture features in portal phase images (OR=6.08, p < 0.001). The AUCs were 0.76 for RMS (sensitivity=0.75 and specificity=0.67), 0.73 for Quantile50 (sensitivity=0.60 and specificity=0.77), 0.70 for sumAverage (sensitivity=0.65 and specificity=0.82), 0.85 for the model combining RMS, Quantile50 and sumAverage, with sensitivity of 0.77 and specificity of 0.85.
Conclusions: CT texture analysis parameters may be helpful to differentiate hypovascular PNETs from PDACs. The three combined texture features showed acceptable diagnostic performance in differentiating hypovascular PNETs from PDACs.

EPO-0877

BOLD MRI 评价 BOLD MRI 评价兔肝热缺血再灌注损伤调控部分肝切除术后肝再生的研究兔肝热缺血再灌注损伤调控部分肝切除术后肝再生的研究

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目的：探讨 BOLD MRI 评价不同程度兔肝热缺血再灌注损伤（WIRI）及其对部分肝切除术后肝再生影响的价值。**方法：**健康成年雄性新西兰大白兔 30 只，随机分为 5 组，即对照组和不同热缺血时间组，每组 6 只，均行肝尾叶切除术。各组于再灌注后 6h、3 天、7 天、14 天、30 天分别进行常规 MR 及 BOLD MRI 扫描。测得各组 T2*值和肝体积值，并根据公式计算出 R2*值及肝再生率（LRR）。术后 30 天结束扫描后检测血清丙氨酸转氨酶（ALT），天冬氨酸转氨酶（AST）、乳酸脱

氢酶（LDH）水平，最后处死实验兔，获取冻存肝组织血清丙二醛（MDA）、总超氧化物歧化酶（SOD）、髓过氧化物酶（MPO）、肿瘤坏死因子α（TNF-α）、白介素-6（IL-6）和增殖细胞核抗原（PCNA）水平及肝脏病理切片。采用重复测量方差分析评估各组不同随访时间、不同热缺血时间的 R2*值、LRR 的变化及其影响。采用 Pearson 或 Spearman 相关分析评价 R2*值与 LRR 及各生化指标的相关性。**结果：**不同随访时间和不同热缺血时间的交互作用及两者的单独效应对 R2*值的影响均具有统计学意义（*P*均<0.05）。不同随访时间和不同热缺血时间的交互作用对 LRR 的影响无统计学意义（*P*=0.528），但二者对 LRR 的主效应均具有统计学意义（*P*均<0.05）。同一随访时间，除 A4 组外，R2*值与 LRR 均呈显著正相关（r 均>0.5，*P*均<0.05）。同一热缺血时间，R2*值与 LRR 均呈显著负相关（r 均<0.5，*P*均<0.05）。术后 30 天 R2*值与各生化指标无相关关系（*P*均>0.05）。**结论：**BOLD MRI 可无创、定量评价兔肝 WIRI 的微观结构改变及其对部分肝切除术后肝再生的影响。一定程度的 WIRI（≤30min）对兔肝部分切除术后肝再生具有促进作用，且热缺血时间越长，促进作用越明显；超过 30min 促进作用明显减低。

EPO-0878

肝细胞癌的 Gd-EOB-DTPA 动态增强 MRI 表现：LI-RADS（2018 版）定义辅助征象的识别率及其对于病灶 LI-RADS 分级的影响

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目的分析肝硬化背景下肝细胞癌（HCC）的 Gd-EOB-DTPA 增强 MRI 表现，探究 2018 版肝脏影像报告及数据系统（LI-RADS）所定义的辅助征象的出现率及其对 HCC 病灶 LI-RADS 分级的影响。**材料与方法**分析 2015 年 1 月至 2019 年 7 月经病理证实为 HCC 的肝硬化患者术前影像资料，包括行 Gd-EOB-DTPA 增强 MRI 检查者 75 例，86 枚 HCC 病灶。由两名具有腹部影像诊断经验且接受过 2018 版 LI-RADS 培训的医师采用盲法分别在同一 PACS 工作站上分析所有入组患者的 Gd-EOB-DTPA 增强 MRI 图像，对每个病灶的主要征象（动脉期高强化、“廓清”表现、“包膜”表现）和辅助征象（T2WI 中高信号、弥散受限、肝胆期低信号、马赛克征、结节中结节、出血、晕状强化、病灶内脂肪）进行评估并计算其出现率。先根据主要征象表现对病灶进行 LI-RADS 分级，再加入辅助征象表现对病灶的 LI-RADS 分级进行调整。采用 Kappa 检验评估两名医师病灶征象评估的一致性。**结果** Gd-EOB-DTPA 增强 MRI 对 86 枚 HCC 病灶的辅助征象（T2WI 中高信号、弥散受限、肝胆期低信号、马赛克征、结节中结节、出血、晕状强化、病灶内脂肪）的识别率分别为 94.19%、96.51%、94.19%、52.33%、34.88%、22.09%、26.74%、17.44%，两名医师辅助征象（T2WI 中高信号、弥散受限、肝胆期低信号、马赛克征、结节中结节、出血、病灶内脂肪）的评估具有高度一致性（Kappa 值均>0.606），两名医师对于“晕状强化”征象的评估一致性中等（Kappa=0.464）。有 12 枚 HCC 病灶在加入辅助征象后分级从 LR-3 上调到 LR-4，上调率为 13.95%。**结论**基于 LI-RADS 的诊断标准，Gd-EOB-DTPA 增强 MRI 对肝硬化背景下 HCC 的辅助征象识别率高，辅助征象对于病灶恶性潜能的评估意义重大。

EPO-0879

Hilar Cholangiocarcinoma: Value of High-resolution Enhanced MR Imaging for Preoperative Evaluation

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Objectives—To assess the accuracy of high-resolution enhanced MR images in the preoperative evaluation of biliary and vascular invasion in hilar cholangiocarcinomas.
Methods—This prospective study included 36 patients with surgically confirmed hilar cholangiocarcinoma who underwent high-resolution enhanced MR imaging with an effective section thickness of 1.2 mm at 3.0 T before surgery. A standardized surgical approach was performed in all patients. Two observers reviewed the high-resolution images. The bile duct system and vascular invasion were recorded. The correlation between imaging findings and surgical and histopathology records was statistically analyzed. The interobserver agreement was calculated.
Results—The high-resolution enhanced MR findings agreed with the surgical and histopathologic findings with regard to the assessment of the common hepatic duct, primary biliary confluence, left hepatic duct, main portal vein, and portal vein bifurcation (accuracy = 100%). The overall accuracy in assessing the involvement of bile duct was 97.7%. Defining >180° of circumferential contact of the tumor with the vessel as the criterion for predicting invasion, the overall accuracies were 96.5% and 94.6% for the portal venous and hepatic arterial systems, respectively. Defining >90° of circumferential contact of the tumor with the vessel as the criterion for predicting invasion, the overall accuracies were 98.6% and 98.0% for the portal venous and hepatic arterial systems, respectively. Interobserver agreement was high with respect to biliary tract, portal venous and hepatic arterial system involvement.
Conclusions—High-resolution enhanced MR images showed excellent capability for preoperatively assessing tumor extent and vascular invasion in hilar cholangiocarcinomas. For high-resolution MRI, >90° of circumferential contact of the tumor with the vessel may be a more accurate criterion for predicting invasion.

EPO-0880

弥散加权（DWI）和体素内不相干运动成像（IVIM）容积直方图对肝细胞癌病理分级的术前评估

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一 目的

探讨弥散加权的 ADC 值，以及体素内不相干运动成像的 D、D*、f 值的容积直方图对肝细胞癌术前病理分级。

二 方法

2015 年～2019 年的经 MR 诊断且有病理分化的肝细胞癌患者 51 例（52 个病灶）。行 3.0T MR T_1WI、T_2WI、增强、DWI（b=0，800s/mm^2）、eDWIb=（b=0~3000s/mm^2）检查。重建出 ADC、D、D*、f，导入 Omni-Kinetics 软件。参照 DWI（b=800）和 eDWI（b=200），在 ADC、D、D*、f 图上，沿每层病灶边缘勾画 ROI，融合成容积 ROI，计算直方图。组内相关系数 ICC 进行一致性，符合正态分布采用两独立样本 t 检验；不符合正态分布采用 Mann-Whitney 检验。P<0.05 差异有统计学意义。绘制 ROC 曲线，分析诊断效能。

三 结果

两次测量一致性佳，ICC＞0.75。两组的 ADC 值的 range 为 1650.333±733.688 和 1227.311±650.987，D 值的 mean、5th、10th、25th、50th、sd、range 分别为 539.488±105.554 和 613.380±113.825、332.261±100.549 和 450.684±118.810、379.920±93.367 和 488.429±117.722、481.239±343.286 和 551.681±166.828、538.692±109.224 和 617.880±115.170、127.570±55.469 和 94.763 ±31.193、784.600±332.792 和 537.162±216.298。

D-10th 的 ROC 的 AUC 最大，达 0.778，以 361.653 诊断低分化组，敏感度 66.7%，特异度 78.4%。

四 结论

DWI 的、IVIM 容积直方图可对 HCC 分化进行术前评估，其中 D-10th 最佳

EPO-0881

ASIR-V 联合低 kVp 在肝脏 CT 增强中降低辐射剂量的应用

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目的 研究基于多模型的迭代重建算法（ASIR-V）联合低 kVp 在肝脏 CT 增强中降低辐射剂量的应用。**方法** 对 60 例疑有肝脏病变的患者进行肝脏 CT 增强扫描，根据管电压不同分为 A、B、C 三组（120kVp、100kVp、80kVp），每组 20 例。扫描条件：A 组管电压 120kVp，B 组管电压 100kVp，C 组管电压 80kVp；噪声指数（NI）为 10，自动管电流技术，前置 ASIR-V 为 0%，三组后置 ASIR-V 分别固定为 0%、80%、80%，后重建层厚为 1.25mm。扫描方法：监测膈肌下 1-2cm 的腹主动脉，阈值达到 120HU 后延迟 10s 自动触发扫描动脉期，延迟 30s 扫描门静脉期，延迟 120s 扫描延迟期。在肝门层面的肝实质内及同层面背部皮下脂肪放置感兴趣区（ROI），分别测量 3 次求其平均值，记录其 CT 值及 SD 值，并计算肝脏的信噪比(SNR=CT/SD）及对比噪声比(CNR=（$CT_{肝脏}$-$CT_{脂肪}$）/$SD_{脂肪}$。对患者一般资料及客观测量结果进行统计学分析，并采用 5 分法对各组图像质量进行双盲法主观评分（5 分，图像质量最好；1 分，图像质量最差）。**结果** 三组患者一般差异均无统计学意义（P＞0.05）；图像质量主观评分存在明显差异(P＜0.001)；客观测量的 CT 值无统计学差异（P＞0.05），而 SD 值、SNR 及 CNR 均存在明显差异(P＜0.05)，且三组间的辐射剂量存在明显统计学差异（P＜0.001），80kVp 较 100kVp 与 120kVp 辐射剂量分别降低了 49%、56%。**结论** 在肝脏 CT 增强扫描中，低 kVp 联合 ASIR-V 技术在保证优质的利于诊断的图像质量前提下，能大幅度降低辐射剂量。

EPO-0882

基于多期对比增强 CT 成像鉴别腹膜后副神经节瘤和神经鞘瘤

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摘要

研究背景和目的：异位嗜铬细胞瘤和神经鞘瘤都是腹膜后少见的实性肿瘤，手术治疗是首选的治疗方式，然而手术过程中对异位嗜铬细胞瘤的接触可能会造成严重的结果。两者在临床表现和影像学表现上有诸多类似之处，鉴别这两种肿瘤一直是临床医生和影像科医生的挑战。本研究的目的是回顾性分析腹膜后肾上腺外副神经节瘤和神经鞘瘤的 CT 影像学差异，以期能找到一些重要的特征用于鉴别这两种少见肿瘤。
研究方法：本研究回顾性分析了 2013 年 3 月-2019 年 6 月在兰州大学第二医院经病理学证实的腹膜后异位嗜铬细胞瘤和神经鞘瘤的临床资料和影像学资料。用统计学方法比较两种肿瘤在临床和影像指标上存在的差异。
研究结果：异位嗜铬细胞瘤共 32 例，平均年龄为 50.3 ± 13.6 岁；神经鞘瘤共 24 例，平均年龄为 50.3 ± 11.0 岁，13 例嗜铬细胞瘤（43.8%）和 12 例神经鞘瘤（50.0%）是偶然情况下发现的。两种肿瘤在临床指标上无明显显著性差异。通过分析两种肿瘤的影像特征，我们发现两种肿瘤各自有一些特征性的征象可用于鉴别诊断。1）：腹膜后嗜铬细胞瘤好发于椎前区域，神经鞘瘤则好发于椎旁区域；2）：嗜铬细胞瘤瘤体周围可见迂曲血管较神经鞘瘤常见；而神经鞘瘤内分隔较嗜铬细胞瘤常见；3）两种肿瘤在 CT 平扫及动态增强上呈现明显差异。嗜铬细胞瘤平扫 CT 值一般较神经鞘瘤高，增强后大部分肿瘤强化明显并且动态增强上呈现快进快出的影像表现，而大部分神经鞘瘤强化幅度较低并表现为渐进性强化模式。
结论：腹膜后嗜铬细胞瘤和神经鞘瘤在临床和影像上有诸多类似之处，然而术前 CT 多期动态增强扫描可以为两种肿瘤的鉴别提供一些重要的信息。

EPO-0883
增强 CT 对肝细胞肝癌和肝上皮样血管平滑肌脂肪瘤的诊断作用探讨

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目的分析增强 CT 对肝细胞肝癌和肝上皮样血管平滑肌脂肪瘤诊断作用。方法抽取入住我院经病理证实的 30 例肝细胞肝癌患者和 8 例肝上皮样血管平滑肌脂肪瘤患者和（2016 年 1 月至 2017 年 12 月）作为本次实验的研究对象,对 30 例肝细胞肝癌(HCC)患者和 8 例肝上皮样血管平滑肌脂肪瘤(EMAL)患者和的临床资料进行回顾性分析,分析和比较 30 例肝细胞肝癌患者和 8 例肝上皮样血管平滑肌脂肪瘤患者和的 CT 增强表现(病灶大小、形态增强模式、"假包膜"征及远端扩张胆管、是否存在早期静脉引流、中心血管影等现象)。结果两组患者比较可得,组间形态增强模式、"假包膜"征早期静脉引流、中心血管影、的结果存在差异,P<0.05,统计学具有意义,但组间病灶大小、远端扩张胆管的结果不存在差异,P>0.05。结论增强 CT 诊断可用于鉴别诊断肝上皮样血管平滑肌脂肪瘤和肝细胞肝癌。

EPO-0884
胰腺转移瘤的 MSCT 诊断（附 23 例分析）

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摘　要： 目的 探讨胰腺转移瘤的 CT 表现特点，提高多层螺旋 CT 诊断胰腺转移瘤的准确率。方法 收集 23 例胰腺转移瘤，回顾性分析原发肿瘤性质、原发肿瘤诊断与胰腺转移瘤发现间隔时间及胰腺转移瘤的 CT 表现。结果 ①原发肿瘤：主要包括肺癌（12 例）、食管癌（2 例）、结肠癌（5 例）及肾癌（4 例）等。②原发肿瘤诊断与胰腺转移瘤发现间隔时间：10 例在原发肿瘤的同时发现有胰腺转移瘤。③CT 表现：包括单发结节（16 例）、多发结节（9 例）及胰腺弥漫性增大（3 例）三种形式，肿块大小主要在 1.5～6cm（14 例），大部分无强化（18 例），大部分没有合并胆管及

胰管扩张（19 例）。结论 综合分析原发肿瘤病史及 CT 表现对胰腺转移瘤的诊断具有较高应用价值。

EPO-0885

Noninvasive prediction the risk of esophageal variceal bleeding with cirrhosis by spectral Computed Tomography

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Background and Aims: *Esophageal variceal bleeding (EVB) is a fatal complication of cirrhosis and/or portal hypertension caused by various causes. The Baveno VI Consensus confirms the possibility of non-invasive monitoring of esophageal varices (EV). But vibration-controlled transient elastography (VCTE) has a high rate of measurement error. We therefore aimed to develop noninvasive prediction model for the risk of esophageal variceal bleeding with cirrhosis using spectral computed tomography(CT).*
METHODS: *We retrospectively collected a tatal of 317 EV patients with hepatitis B virus-related cirrhosis from January 2018 to December 2018, which were divided into 1 training cohort and 1 validation cohort. All patients underwent spectral CT scans within 14 days before/after endoscopy. According to the results of gastroscopy, the patients were divided into EVB-positive group and EVB-negative group. The spectral CT prediction model was developed with the selected independent predictors of EVB. The prediction accuracy was evaluated by ROC curve. The accuracy and reproducibility of the model for EVB risk prediction of cirrhosis were tested by an external cohort.*
RESULTS: *Diameter of splenic vein(Dspv), Diameter of esophageal vein (Dev), ascites (AS), Iodine concentration of short gastric vein (ICsgv), Iodine concentration of spleen (ICsp) were independent predictors of EVB risk(all P<0.05), and a spectral CT scan model of these 5 factors was developted. The area under the ROC curve of the training cohort was 0.839 (95% CI 0.776-0.901), P<0.001, sensitivity and specificity were 0.75 and 0.828, respectively. The area under the ROC curve of the validation cohort was 0.804 (95% CI 0.705-0.904), P<0.001, and the sensitivity and specificity were 0.714 and 0.784, respectively.*
Conclusion: *The non-invasive spectral CT prediction model developed by Dspv, Dev, AS, ICsgv, and ICsp has a good prediction ability for EVB risk, and may have significant clinical implications on early prevention and treatment of EVB.*

EPO-0886

9 例胰周淋巴结结核 MSCT 表现及病理分析

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摘要 目的:分析胰周淋巴结结核的 CT 表现及临床病理特点，旨在提高放射医师对该病的 CT 诊断符合率。方法:收集 9 例经手术或穿刺活检病理证实胰周淋巴结结核病例，所有病例均行常规上腹部 CT 平扫及三期增强扫描，回顾分析及总结其 MSCT 表现。手术切除或穿刺活检标本，均行常规

HE 染色及抗酸染色或结核 DNA 检测。结果:9 例胰周淋巴结结核中，8 例病灶为胰头周围淋巴肿大，其中 3 例伴腹膜后淋巴结肿大，1 例合并胰腺体部结核，所有病例均平扫为低密度影，胰头周围肿大淋巴结边界欠清，密度欠均，部分融合，形态呈分叶状,增强扫描呈渐进性边缘环形强化，内部呈渐进性分隔样及多房样强化，胰体周围肿大淋巴结病灶边界清,密度均匀,形态呈类椭圆形，增强扫描呈均匀轻度渐进性强化。病理改变均可查见典型或不典型肉芽肿形态，其中抗酸染色 2 例阳性，结核 DNA1 例阳性；所有病例中 2 例伴有肺结核，1 例伴结核性胸膜炎病史。结论:胰周淋巴结结核的 MSCT 表现为胰周淋巴结肿大，部分融合，呈分叶状低密影，边界欠清，增强扫描呈渐进性边缘环形强化、内部分隔样及分房样强化，影像表现具有一定特征性，结合临床及病理，可显著提高诊断率。

EPO-0887
初探弥散加权成像图像纹理分析鉴别肝脓肿与肝转移瘤的价值

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目的 探讨弥散加权成像图像结合纹理分析对肝脓肿和肝转移瘤进行鉴别诊断的可行性。**方法** 回顾性分析 2015 年 6 月至 2018 年 12 月于我院行上腹部 1.5T MRI 检查的肝脓肿和肝转移瘤患者 43 例(共 66 个病灶)，其中肝脓肿 24 个(均经穿刺引流后病理证实或治疗随诊病灶缩小，临床化验指标恢复正常而证实)，转移瘤 29 个(均经影像表现及随访，结合临床病史而证实)。在 AW4.5 工作站上，导出弥散加权成像(diffusion weighted imaging, DWI)图像用于纹理分析，选择病灶 DWI 高信号区域的最大层面，沿病灶内侧缘约 2mm 勾画感兴趣区(region of interest, ROI)。应用灰度直方图及灰度共生矩阵纹理分析方法测定平均值(mean intensity)、中位数(median intensity)、标准偏差(standard deviation)、方差(variance)、像素数量(voxel count)、偏度(skewness)、平均偏差(mean deviation)、能量值(energy)、熵值(entropy)及逆差矩(inverse difference moment)10 个参数。采用独立样本 t 检验(正态分布)或 Mann-Whitney U(非正态分布)比较两组间各参数差异性，绘制受试者工作特征曲线(receiver operator characteristic, ROC)，比较各参数诊断效能。**结果** 肝脓肿平均值、中位数、标准偏差及方差大于肝转移瘤，像素数量、偏度、平均偏差及逆差矩小于肝转移瘤，差异有统计学意义(P<0.05)。肝脓肿熵值大于转移瘤，能量值小于转移瘤，差异无统计学意义(P>0.05)。其中逆差矩为诊断效能最佳参数，诊断转移瘤 AUC=0.868，敏感度 91.7%，特异度 79.3%。**结论** 弥散加权图像纹理分析能够有效鉴别肝脓肿与肝转移瘤，逆差矩为最佳纹理参数。

EPO-0888
磁共振 IDEAL-IQ 序列评估肝功能分级的可行性研究

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目的：探讨 1.5T 磁共振 IDEAL-IQ 序列评估肝功能分级的可行性。
方法：回顾性分析 2016 年 2 月至 2018 年 12 月我院收治的行 1.5T 磁共振 IDEAL-IQ 序列扫描，且经临床、实验室及影像学检查诊断为肝硬化的患者，依据肝功能 Child-Pugh 分级标准分为 A、B、C 三级。记录患者肝功能相关化验检查结果。由两名医师分别在 GE AW4.6 工作站通过脂肪分数图、R2*驰豫率图定量测定肝脏脂肪含量、R2*值，所测数据分别取均值。利用 Kruskal-Wallis H

进行三组间脂肪分数和 R2*值的比较。将 A、B 两组并组，利用 Mann-Whitney U 非参数检验与 C 组比较。利用二元 logistics 回归分析联合脂肪分数及 R2*值建立诊断 C 组的预测模型。通过绘制 ROC 曲线分析诊断效能，得出曲线下面积，计算最佳阈值时的敏感度和特异度。利用 Pearson 相关系数检验脂肪分数和 R2*值与各种血清学检查结果之间的相关性。
结果：两名医师测量数据一致性较好。随肝功能减低，肝脏脂肪分数及 R2*值呈递增趋势。肝功能 A、B、C 三级的脂肪分数分别为(3.31±0.56)%、(4.25±1.62)%、(7.35±4.31)%。肝功能 A、B、C 三级的 R2*值分别为(28.62±5.23)Hz、(33.44±10.21)Hz、(51.97±24.76)Hz，三组间脂肪分数及 R2*值均具有统计学差异。联合脂肪分数及 R2*值诊断肝功能 C 级的 AUC 为 0.938，敏感度和特异度分别为 81.1%和 95.2%。脂肪分数与总胆红素、总胆汁酸、g-谷氨酰转肽酶和凝血酶原时间呈正相关，与白蛋白呈负相关；R2*值与总胆红素和凝血酶原时间呈正相关，与白蛋白和前白蛋白呈负相关。
结论：1.5T 磁共振 IDEAL-IQ 序列能够通过脂肪分数及 R2*值初步对肝硬化患者进行肝功能分级，尤其对处于肝功能 C 级肝硬化患者的诊断具有较高的敏感度和特异度。

EPO-0889
非富血供胰腺神经内分泌肿瘤与导管腺癌肝转移多层螺旋 CT 影像研究

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目的 探讨非富血供胰腺神经内分泌肿瘤（PNET）与胰腺导管腺癌（PDAC）肝转移 CT 影像特征及其在两者鉴别诊断中的价值。方法 回顾性纳入 2014 年 1 月至 2018 年 10 月间伴肝转移的非富血供 PNET21 例及 PDAC56 例患者资料，分析其肝转移病灶数目、分布、大小、病灶融合、周围肝组织异常灌注、增强扫描强化程度等 CT 特征。结果 非富血供 PNET 与 PDAC 肝转移病灶的数目、分布、病灶融合之间无统计学差异，非富血供 PNET 及 PDAC 肝转移灶的最大径之间差异有统计学意义（P=0.03），PDAC 肝转移灶周围肝组织异常灌注出现率（67.86%）多于非富血供 PNET 肝转移灶（28.57%），二者差异有统计学意义（P＜0.01），非富血供 PNET 肝转移动脉期、门静脉期、平衡期强化指数高于 PDAC，二者差异有统计学意义（P＜0.01）。Logistic 多因素分析显示动脉期强化指数为鉴别非富血供 PNET 与 PDAC 肝转移的独立预测因素，ROC 曲线显示动脉期强化指数判断二者的 AUC=0.97。结论 非富血供 PNET 与 PDAC 肝转移灶的 CT 影像特征有助于鉴别伴有肝转移的非富血供 PNET 与 PDAC。

EPO-0890
Gd-EOB-DTPA 增强 MRI T1 mapping 结合标准肝脏体积率评估肝功能的价值

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【目的】探讨 Gd-EOB-DTPA 增强 MRI T1 mapping 成像结合肝脏标准体积率在肝功能评估中的价值。

【方法】收集我院行 Gd-EOB-DTPA 增强 MRI 扫描的患者 80 例，分别于增强前、增强后 20min 行 T1 mapping 成像，根据 Child-Pugh 评分将患者分为 3 组： NLF（n = 26），LCA（n = 30），LCB+LCC（n = 24）；根据 MELD 评分将患者分为 2 组： MELD≤8 分（ n = 57）及 MELD≥9 分（n = 23）。选择增强前、后 T1 图测量 T1 值并取均数，分别记作 T1pre、T1post ，计算 ΔT1 =（T1pre －T1post）/ T1pre。根据患者身高、体重计算标准肝脏体积 SLV，经后处理工作站绘制测量患者肝脏体积 LV，并计算标准体积率 LV/SLV。单因素方差分析 Child-pugh 各肝功能组间 T1post、T1post×LV/SLV、ΔT1、ΔT1×LV/SLV 的差异；t 检验比较 MELD≤8 和 MELD≥9 组间各影像学指标的差异。绘制 ROC 曲线，观察并比较各指标 AUC，以评估 T1 弛豫时间相关指标及结合标准肝脏体积率后各指标鉴别不同肝功能组的效能。
【结果】T1post、T1post×LV/SLV、ΔT1、ΔT1×LV/SLV 在 Child-Pugh 和 MELD 不同肝功能组间的差异均具有统计学意义（P＜0.05）；ΔT1×LV/SLV 在鉴别 MELD≤8 与 MELD≥9 组、NLF 与 LCA、NLF 与 LCB+LCC、LCA 与 LCB+LCC 组的 AUC 均最高。
【结论】1、Gd-EOB-DTPA 增强 T1 mapping 中 T1post、ΔT1 能有效评估 Child-Pugh 评分及 MELD 各组患者的肝脏功能，结合标准肝脏体积率后，ΔT1×LV/SLV 对肝功能评估的价值更高。

EPO-0891
脾脏体积增大对评估奥沙利铂诱导肝损害的临床意义

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[摘要] 目的：以奥沙利铂为基础的化疗可能引起患者肝窦损害，严重者可能出现肝窦阻塞综合征、门静脉高压，甚至导致死亡。因此，对进行奥沙利铂化疗的患者，我们除了要关注肝功能的变化外，还要密切关注影像学上发生的变化，早期预防、干预。方法：本文收集了自 2017-07-01 到 2018-12-31 期间 60 例患者信息进行回顾性分析，主要关注以奥沙利铂为基础的胃癌、结直肠癌化疗患者在化疗期间 CT 扫描中脾脏体积改变与奥沙利铂剂量、肝脏纤维化指标及血小板的关系，以及脾脏体积改变与肝功能 DIBL、TBIL、AST、ALT 等生化指标发生改变、患者年龄、性别的关系。脾脏体积改变=（化疗后脾脏体积-化疗前脾脏体积）/化疗前脾脏体积；脾脏体积改变与奥沙利铂剂量、血小板计数、肝功能各生化指标、患者年龄、性别进行 logistic 分析；奥沙利铂剂量与脾脏体积改变采用 Spearman 相关性分析；肝纤维化指标：脾脏体积改变与 AST/PLT 采用 Spearman 相关性分析；可信区间估计。预期结果：奥沙利铂化疗中大部分病人有脾脏体积增大现象，且增大体积与奥沙利铂所用剂量密切相关。脾脏体积改变与肝纤维化指标 AST/PLT 变化密切相关。脾脏体积改变发生在肝功能变化之前，可以作为预测肝损害的的无创性指标之一。

EPO-0892
两种基于模型迭代重建算法在腹部低剂量 CT 中的应用

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目的 对比两种基于模型迭代重建算法（MBIR,商品名“VEO”）在腹部低辐射剂量扫描时的图像质量及辐射剂量减低率。**方法** 连续纳入 20 例患者接受腹部增强常规剂量（NI=10）CT 扫描并 ASiR40%重建；两周内复查时，接受增强低剂量扫描(NI=20)，并分别进行 40%ASiR、VEO-STND 和 VEO-NR40 重建。由 2 名医师通过锐利度、噪声、伪影和诊断接受度对图像进行主观评分，并客观测量图像噪声值和 CT 值，计算 SNR 和 CNR。记录每例患者每次检查的剂量长度乘积（DLP）和 CT

剂量指数（CTDIvol），计算剂量减低率。**结果** 低剂量扫描的 DLP 值和 CTDI 值分别为（95.56±47.17）mGy/cm 和（3.04±1.48）mGy，而常规剂量 ASiR 40%重建的 DLP 值和 CTDI 分别为（376.39±160.40）mGy/cm 和（12.16±5.18）mGy。对于腹部脏器，低剂量 VEO-STND 图像比常规剂量 40%ASiR 在图像噪声（SDn）、信噪比（SNR）和对比噪声比（CNR）方面无统计学差异（P＞0.05）,而低剂量 VEO-NR40 图像比常规剂量 40%ASiR 在图像噪声（SD）、信噪比（SNR）和对比噪声比（CNR）方面有明显统计学差异（P＜0.001）。VEO-STND、VEO-NR40 重建可以提高图像的密度分辨力，降低硬化伪影，且低剂量 VEO-STND、VEO-NR40 重建比 40%ASIR 图像有更低噪声和伪影，主观评价结果更佳。 **结论** 在保证图像质量的前提下，相比常规剂量扫描 ASiR40%重建，低剂量扫描 VEO-STND、VEO-NR40 重建可以明显降低扫描剂量，低剂量 VEO-STND 可以代替常规剂量扫描 40%AsiR 重建，低剂量扫描 VEO-NR40 相比常规剂量 ASiR40%重建及低剂量 VEO-STND 重建能提供更佳图像质量，具有进一步降低扫描剂量的潜力。

EPO-0893

IVIM-DWI 联合 T1-mapping 技术对肝癌介入治疗效果评估的研究

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摘要：目的 本研究通过应用基于体素内不相干运动（IVIM）双指数模型肝脏多 b 值 DWI 扫描联合 T1-mapping 技术对肝癌介入治疗前、后及多次介入治疗的的病灶的 ADC 值及增强前、后的 T1 值进行分析，对肝癌介入治疗后的效果进行定量分析，从而以定量的方式评估肝癌患者介入治疗的疗效及预后。**方法** 选取 30 例确诊为肝细胞肝癌的患者，在每次行肝动脉化疗栓塞术（TACE）前、后分别行 DWI、IVIM-DWI 及肝脏动态增强扫描，其中动态增强扫描中动脉期采用 Twist vibe 技术，同时每次扫描时进行增强前、后的 T1mapping 扫描，共取兴趣病灶 40 个，对每一次的病灶的 ADC 值及增强前、后的 T1 值进行分析。**结果** 1、40 个兴趣病灶介入治疗前、后的 ADC 值及 T1 值均具有差异性；2、介入治疗后 ADC 值明显高于治疗前，两者呈明显负相关，相关系数 r2 为-0.72； 治疗后 T1 值低于治疗前，两者呈显著正相关，相关系数 r2 为 0.76 ，差异有统计学意义（P＜0.05）；3、同一病灶增强前后 T1 值具有显著差异性，治疗后较治疗前 T1 值增加率显著下降。**结论** IVIM-DWI 联合 T1-mapping 技术，可以定量的判断肝癌介入治疗前、后的病灶活性度，有效的评估肝癌介入治疗的疗效及病灶预后情况。

EPO-0894

Evaluation of texture analysis for the differential diagnosis of chronic mass-forming pancreatitis from pancreatic ductal adenocarcinoma on contrast-enhanced CT images

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Background: Imaging findings of chronic mass-forming pancreatitis (CMFP) and pancreatic ductal adenocarcinoma (PDAC) often overlap. The aim of this study was to determine the potential of computed tomography (CT) imaging features and texture analysis in differentiation between CMFP and PDAC.

Materials and methods: Thirty patients with pathologically proved CMFP and 79 patients with PDAC were included in this study. Two radiologists evaluated the morphologic characteristics and enhancement pattern of the tumors in consensus. CT texture features were extracted from CT images at the arterial and portal phases using a commercial available software (AnalysisKit). Multivariate logistic regression analyses were adopted to identify relevant CT imaging features and texture parameters to discriminate CMFP from PDAC. Receiver operating characteristic (ROC) was performed to determine the diagnostic performance of prediction.
Results: CMFP showed a larger size compared to CMFP (p=0.009). Cystic degeneration, pancreatic duct dilatation, vascular invasion, and pancreatic portal hypertension were more frequent and duct penetrating sign was less frequent in PDAC compared with CMFP. CT attenuation at the arterial phase, arterial enhancement ratio and portal enhancement ratio of CMFP were higher than those of PDAC (p<0.05). In multivariate analysis, arterial contrast enhancement and pancreatic duct penetrating sign were independent predictors. Texture features at the arterial phase including SurfaceArea, Percentile40, InverseDifferenceMoment_angle90_offset4, LongRunEmphasis_angle45_offset4, and uniformity were independent predictors. Texture features at the portal phase including LongRunEmphasis_angle135_offset7, VoxelValueSum, LongRunEmphasis_angle135_offset4, and GLCMEntropy_angle45_offset1 were independent predictors. The areas under the curve (AUC) of imaging-based diagnosis, and texture analysis-based diagnosis at the arterial and portal phase were 0.84, 0.96, and 0.93.
Conclusions: Texture analysis has great potential to improve the diagnostic efficacy of CT in differentiating CMFP from PDAC.

EPO-0895
体素内不相干运动成像对四氯化碳诱导的大鼠肝纤维化及肝炎的评估能力

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目的 评估体素内不相干运动（IVIM）成像对四氯化碳诱导的大鼠肝纤维化分期及炎症分级的价值。**材料与方法** 购入 75 只正常 SPF 级 SD 雄性大鼠（150g±10g），适应性饲养 1 周后，随机分为 3 组：进展组，恢复组，对照组。所有大鼠于建模前完成基线扫描。肝纤维化模型由颈背部皮下注射 40%四氯化碳溶液建立。进展组在注药后 2、4、6、8、10、12 周末分别进行扫描，恢复组于注药后 2、4、6 周末及停药后 1、2、4、6 周末分别进行扫描。每次扫描结束后每组随机选取 5-6 只大鼠进行病理学检查。2 名观察者独立盲法测量所有大鼠肝脏 IVIM 参数值，取相应平均值进行统计学分析。采用 Spearman 检验分析大鼠肝脏 IVIM 参数值与肝纤维化程度及炎症程度间的相关性。采用单因素方差分析或 Kruskal-Wallis 检验分析不同程度肝纤维化及肝炎间的差异，事后进行两两比较。并以 ROC 曲线确定诊断效能。**结果** 真扩散系数（D）、假扩散系数（D*）及灌注分数（f）与肝纤维化分期具有低度相关性。在评估 S0 与 S1-4 时，D、D*、f 均具有中度诊断效能；在评估 S0-1 与 S2-4 时，D 具有中度诊断效能，D*及 f 具有低度诊断效能；在评估 S0-3 与 S4 时，D、D*及 f 均具有低度诊断效能。D*与肝炎分级无相关性，在不同程度肝炎间均无统计学差异。D 及 f 与肝炎分级具有中度相关性。D 和 f 均在 G0 与 G1、G3 间，G2 与 G3 间具有统计学差异。在评估 G0 与 G1-3、G0-1 与 G2-3 时，D 及 f 均具有中度诊断效能；在评估 G0-2 与 G3 时，D 和 f 具有低度诊断效能。**结论** IVIM 参数对于肝纤维化程度的评估具有一定意义，可用于评估是否存在肝纤维

化，是否需要进行干预治疗，但无法评估是否存在肝硬化；IVIM 参数中 D 及 f 可用于肝炎程度的评估，可用于评估是否存在肝炎以及是否是轻或中重度肝炎，但对于中度及重度肝炎无法鉴别。

EPO-0896

胰腺小实性假乳头状瘤 MSCT 特征分析

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目的 探讨胰腺小实性假乳头状瘤(SPT)的 MSCT 典型特征。
方法 回顾性分析 2005 年 3 月~2017 年 7 月,在我院明确病理诊断的 47 例胰腺 SPT 患者的临床和影像学资料,根据肿瘤大小分为最大径≤3cm 组(小 SPT 组,n=15 例)和>3cm 组(大 SPT 组,32 例)2 组。对比 2 组一般特征、MSCT 表现、影像学诊断情况。
结果 与大 SPT 组相比,小 SPT 组胰腺实性假乳头状瘤 MSCT 影像学诊断误诊率高[80.0%(12/15)vs 28.1%(9/32),X~2=11.1192,P=0.001]。小 SPT 组 MSCT 影像学表现为纯实性肿块[100%(15/15)vs 18.75%(6/32),X~2=27.277,P=0.000]、边界模糊[33.3%(5/15)vs 3.13%(1/32),X~2=8.369,P=0.004]、未见明显包膜[73.3%(11/15)vs 31.25%(10/32),X~2=7.318,P=0.007]、增强扫描呈现均匀强化[46.7%(7/15)vs 15.6%(5/32),X~2=5.176,P=0.023]的比例更高。2 组在 MSCT 表现的肿瘤形状、边缘、钙化、胰腺导管扩张、胰腺实质萎缩方面差异无统计学意义(均 P>0.05)。
结论 胰腺小(≤3cm)SPT 的 MSCT 影像学表现为纯实性肿块,平扫为均匀低密度,增强呈现均匀渐进性强化,往往肿瘤边界模糊,未见明显包膜,与胰腺大的 SPT 典型表现有所不同,容易误诊。

EPO-0897

肝脏影像报告和数据系统（LI-RADS）中 MRI 辅助特征的解读

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目的：详细阐述肝脏影像报告和数据系统（LI-RADS）中 MR 影像辅助特征所描述的影像表现。**方法：**回顾性搜集 LI-RADS 中 MR 影像辅助特征的相关图像，并复习相关文献，详细分析相关图像特征。**结果：** HCC 的典型表现为动脉期明显强化和门静脉/平衡期廓清（附图），但直径<20 mm 的结节常表现为非典型的强化模式，因此 LI-RADS 中描述的辅助征象可以帮助 HCC 进行准确诊断和分期。这些辅助征象包括（1）非特异性恶性特征：①轻至中度 T_2 高信号（附图），可以用于小 HCC 于 DN 以及其他肿瘤性病变的鉴别，还可以用于 HCC 级别的划分。②DWI 扩散受限，表现为 DWI 序列上的高信号表现（附图），其与常规 MR 序列结合可以提高 HCC 诊断的灵敏度和特异度。③病灶中乏脂（附图），即在脂肪肝背景下出现缺乏脂肪成分的病灶，则有利于 HCC 的诊断。④病灶中乏铁（附图），即在铁过载的肝实质内出现乏铁的实性结节时则高度提示癌前病变或恶性肿瘤。⑤直径增加小于阈值生长（附图），阈值增长有其自身定义，当病灶直径增加小于这一规定范围时则高度提示 HCC。⑥晕环状强化（附图），表现为病灶边缘的带状明显强化影。（2）HCC 特异性征象：①病灶内含脂（附图），即病灶内含有脂肪成分为 HCC 的特异性征象，该特点可以在同反相位图像上观察到。②结节中结节（附图），即母结节中含有子结节，其两者在不同序列上有各自表现，代表病灶不同成分的分化程度有所不同。③马赛克结构（附图），即在 HCC 病灶中出现的随机分布的结节和分隔，结节通常由纤维分隔隔开，且其形状和大小以及信号强度、强化表现均不相同。④出

血（附图），即在 HCC 病灶中出现血液成分。**结论：**通过对 LI-RADS 中 MR 辅助征象的详细阐述可以进一步加深对 HCC 病灶的认识，提高 HCC 诊断的准确性。

EPO-0898
肝脏恶性孤立性纤维性肿瘤 1 例并文献复习

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目的：孤立性纤维肿瘤（solitary fibrous tumor， SFT）是一种少见的梭形细胞间叶型软组织肿瘤，多发生在胸部，以胸膜最多见，也可发生在胸外，包括头颈部、腹盆部及肢体。肝脏 SFT 十分少见，国内外报道不到 100 例，且大多为良性，肝脏恶性 SFT 的报道更为罕见，因此其临床表现、影像特征、治疗和预后尚不为人所熟知。本文将对一例肝脏恶性 FST 进行报道，并进行文献复习，对该病的临床表现、放射学研究、外科治疗、免疫组化研究和预后进行更新和综合探讨，以期提高对本病的进一步认识。方法：①病例报道：患者女，66 岁，入院前 1 周体检发现肝占位性病变，伴上腹部胀满不适，饱食后加重，伴纳差。既往“乙肝”病史 40 余年，未予治疗。CT 示肝右前下方巨大混杂密度肿块，大小约 15.5×9.6×15.3cm，动脉期病灶明显不均匀强化伴迂曲血管，肿物有延迟强化，呈“巧克力饼干”样表现（附图）。MR 示肝右前下方巨大混杂信号肿块，T2WI 可见流空血管，动脉期明显不均匀强化，静脉期及平衡期延迟强化，肝胆期病灶强化略减低（附图）。术后病理回报肝脏低级别恶性孤立性纤维性肿瘤。②常规检索有关“肝脏孤立性纤维瘤”的国内外文献，并整理复习。结果：肝脏恶性 SFT 极其罕见，包括本例在内，国内外报道不超过 40 例，患者平均年龄约为 57.6 岁，男女发病率相似。肝脏 SFT 的典型影像表现为边界清楚的较大肿物，T2WI 有低信号流空血管，“巧克力饼干”样明显、持续或进行性、延迟强化，当病灶≥10cm，侵犯周围结构或短期内快速增大时应考虑恶性，恶性病灶可有局部复发和转移。确诊需病理免疫组化检查。手术切除是治疗的主要方法。结论：虽然肝脏 SFT 罕见，但其也有自身的影像特点，应注意观察并了解该特征，以期提高诊断的准确性。

EPO-0899
宝石能谱 CT 多参数成像在肝脏肿瘤鉴别诊断、术前分期应用价值研究

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摘要：目的：探讨宝石能谱 CT（GSI）多参数成像在肝脏肿瘤鉴别诊断、 术前分期应用价值。**方法：**回顾性选择 92 例疑似肝脏恶性肿瘤患者，所有患者均行 GSI 扫描，获得定量参数(能谱曲线斜率(s-SHC)、动脉期标准碘浓度值(NIC)、门静脉期 NIC、碘浓度差值(ICD)、肝动脉碘分数(AIF)]，以病理诊断结果为准，ROC 分析 s-SHC、动脉期 NIC、门静脉期 NIC、AIF 值对肝癌的鉴别价值。Kappa 一致性检验 GSI 对肝癌术前分期与病理诊断结果的一致性。**结果：**本组肝癌 54 例（恶性组），肝脏良性病变 38 例（良性组），恶性组 s-SHC[（1.93±0.62）VS（0.85±0.36）]、动脉期 NIC[（0.13±0.05）VS（0.06±0.02）]、门静脉期 NIC[（0.47±0.14）VS（0.40±0.13）]、AIF[（0.65±0.19）VS（0.31±0.12）]高于良性组（P＜0.05），ICD[（7.15±2.39）×10^2μg/cm^3VS（11.82±3.56）×10^2μg/cm^3]低于良性组（P＜0.05）。s-SHC、动脉期 NIC 诊断肝癌的效能较高，AUC 分别为 0.830、0.719，AIF 无诊断价值。GSI 诊断肝癌术前分期准确率 77.78%，与病理诊断一致性较好（*Kappa* 值=0.6 12，P＜0.05））。

结论：GSI 参数 s-SHC、动脉期 NIC 在肝脏肿瘤鉴别诊断中具有较高应用价值，GSI 技术可准确对肝癌进行术前分期，为临床手术治疗提供可靠指导。

EPO-0900

Gadobenate dimeglumine-enhanced hepatobiliary-phase MR imaging of primary hepatic lymphoma: Three case reports and review of literature

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Background: Primary hepatic lymphomas (PHLs) are extremely rare. Clinically, PHL is easy to be misdiagnosed as other focal hepatic lesions. Gadobenate dimeglumine (Gd-BOPTA)-enhanced MR imaging is a promising method to characterize the hepatic lesions. To date, there is lacking literature describing Gd-BOPTA-enhanced hepatobiliary-phase MR features of PHL.
Case presentation: We report three cases with PHL. The first one is a 52-year-old male patient was admitted to our hospital with the complaint of right upper abdominal pain and distension. On physical examination, he was found to have an abdominal bulge and enlarged lymph nodes. Non-enhanced MRI showed a solitary oval mass was located in segment 5, demonstrating homogeneously low signal intensity on T1-weigted images (T1WI) and high signal intensity on T2-weighted images (T2WI). After the administration of Gd-BOPTA, the lesion was intensely enhanced in the arterial phase and washed out in the equilibrium phase without a delayed fibrous capsule enhancement. In the hepatobiliary phase, the mass showed obvious hypointensity compared to the normal liver tissue. The patient received a local resection and was confirmed as mucosa-associated lymphoid tissue (MALT) lymphoma by histopathology with CD20, CD79α and LCA positive in immunohistochemical stains. The second is A 74-year-old male patient presented to our hospital with the complaint of right upper abdominal distension, painless jaundice and fever. Non-enhanced MRI demonstrated diffused lesions were located in the right and left lobes, showing heterogeneously low signal intensity on T1WI and high signal intensity on T2WI with ill-defined margins and obvious central necrosis. After the administration of Gd-BOPTA, the lesions were moderately enhanced with ring-like patterns in the arterial phase, and showed delayed enhancement in the equilibrium phase. In the hepatobiliary phase, the lesions showed obvious hypointensity compared to the normal liver tissue. The patient underwent fine needle aspiration biopsy and were confirmed as diffuse large B cell lymphoma (DLBCL). The last one is A 62-year old male was admitted to our hospital with a history of PHL and he received a resection combined with postoperative chemotherapy 4 years ago. He had no discomfort. His physical examinations were normal. Precontrast enhanced MRI demonstrated a round mass located in the right lobe, showing heterogeneously hypointensity on T1WI and hyperintensity on T2WI. After the administration of GD-BOPTA, the mass exhibited obvious hypointensity in the hepatobiliary phase. The patient received a biopsy and was confirmed as DLBCL by pathology.
Conclusion: PHL is an extremely rare condition that lacks specific imaging findings, clinical manifestations and biochemical markers; therefore an accurate diagnosis is

very difficult. A biopsy or surgical resection should be performed in such cases, since only histological examination can ensure an accurate differential diagnosis. PHL does not contain functioning hepatocytes and thus cannot retain Gd-BOPTA. These lesions appear hypointense as seen on Gd-BOPTA-enhanced hepatobiliary-phase MR imaging.

EPO-0901

胆管浸润性癌的动态增强 CT 和 MR 诊断

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目的 探讨胆管浸润性癌(BEIC)的 CT 和 MR 表现。**方法** 回顾性分析我院经手术或穿刺病理证实的 30 例 BEIC 的 CT、MR 平扫和多期动态增强扫描图像资料，总结其影像学特征，并与病理作对比。**结果** 肝内型及肝外型 BEIC 均表现为肿瘤沿胆管纵轴浸润生长，胆管壁不均匀增厚，伴局部肿块形成（16/30）或无明确肿块（14/30），肿块均为边界不清、不成形，动态增强扫描增厚之胆管壁、肿块呈持续性、延迟强化；肿块可沿胆管壁浸润扩散从而侵犯邻近胆管，伴有梗阻部周围及远端胆管不同程度的扩张。无明确肿块形成的 BEIC 易误诊为胆管炎。**结论** BEIC 的生长方式、形态学特征、生物学行及影像学表现均有其特点，胆管壁厚薄不均匀并延迟强化、管腔不规则狭窄及梗阻部以远胆管“软藤状”扩张等特点，在影像诊断上具有重要意义。

EPO-0902

不同管电压对胆道闭锁患儿肝移植术前 CT 评估肝血管图像质量及辐射剂量的影响

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目的 探讨不同管电压对胆道闭锁患儿肝移植术前行上腹部 CTA、CTV 扫描评估肝血管检查图像质量和辐射剂量的影响。**方法** 回顾性收集行上腹部 CTA、CTV 的胆道闭锁患儿，根据管电压不同分为 80Kv 组和 100Kv 组，每组各 21 例。测量客观评价指标包括肝动脉 CT 值、门静脉 CT 值、肝静脉 CT 值及对比噪声比（CNR）、信噪比（SNR），记录图像总体质量主观评分，记录辐射剂量包括容积 CT 剂量指数(volume CT dose index，CTDIvol)，剂量长度乘积（Dose Length Product,DLP）并计算全身有效剂量（Effective Dose,ED）。两组间图像的客观评价、血管 CT 值、CNR、SNR、CTDIvol、DLP 及 ED 采用独立样本 t 检验，主观评分的比较采用非参数 Mann—whitney U 检验。以 P＜0.05 为差异有统计学意义。**结果** 图像质量客观评价：两组之间门静脉 CT 值、肝静脉 CT 值、门静脉 CNR、肝动脉 SNR、肝静脉 SNR、CTDIvol、DLP、ED 有统计学意义（P＜0.05），肝动脉 CT 值、肝动脉 CNR 值、肝静脉 CNR、门静脉 SNR 无统计学意义（P＞0.05）。图像质量主观评分：两组肝动脉整体图像质量、门静脉整体图像质量主观评分差异无统计学意义（P＞0.05），肝静脉整体图像质量主观评分差异有统计学意义（P＜0.05）。辐射剂量：80Kv 组的 CTDIvol 为（6.53±3.19）mGy，ED 为（2.06±1.19）mGy，100Kv 组的 CTDIvol 为（15.01±4.43）mGy，ED 为（4.63±1.60）mGy，两组辐射剂量差异有统计学意义（P＜0.05），80Kv 组有效剂量较 100Kv 组下降了 124.8%（2.57/2.06）。**结论** 对胆道闭锁患儿行肝移植术前评估肝血管时，采用低管电压扫描可以明显有效减低辐射剂量并获得理想的图像质量。

EPO-0903
基于儿童一站式 MR 的儿童胰胆管合流部及其毗邻结构解剖及变异研究

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背景：本研究评估儿童一站式 MR 对胰胆管合流部解剖结构及变异显示情况，为胰胆管合流异常患者术前提供详细信息。

方法：采用前瞻性研究，对 65PBM 患者进行研究。儿童一站式 MR（动态增强结合 MRCP、冠状位 T2ssfse）。所有患者采用三期扫描（注射后 2-3 秒扫描肝动脉期和门静脉期，每次扫描 40-50 秒，连续扫描 3 次）。所得图像与 MSCT 图像、IOC 图像相对比，两位放射科医生独立评估所得图像，并通过讨论形成共识。

结果：65 例确诊 PBM 患者， 38 例为 C-P 型，21 例为 P-C 型，6 例为复杂型 PBM。11 例肝右动脉位置变异（位于胆总管腹侧）。46 例患者同时行 MSCT、IOC、儿童一站式 MR，其中肝动脉类型正常者 37 例，肝动脉变异者 9 例，37 例胆管类型正常，9 例胆管变异。儿童一站式 MR 和 IOC 能清楚显示胰胆管合流部结构分别为 38 例、43 例。儿童一站式 MR 和 IOC-MSCT 均能明确检出 32 例合并胆结石。21 例患儿均经儿童一站式 MR 和 IOC-MSCT 明确发现胆道感染。儿童一站式 MR 组与 IOC-MSCT 组比较无显著性差异。儿童一站式 MR 组胆管、胰胆管交界处的检出率高于 MSCT 组（$P<0.05$）。儿童一站式 MR 组肝动脉、胆石症、胆管炎的检出率高于 IOC 组（$P<0.05$）。

结论：儿童一站式 MR 可清楚显示肝动脉、胆管、胰胆管交界处解剖结构及相关变异，同时可以显示胆总管壁慢性炎症的变化。术前行儿童一站式 MR 对于降低 Roux-en-Y 手术医源性损伤的发生率具有潜在的作用。

EPO-0904
T2*校正的双翻转角梯度三回波技术与 1H-MRS 对肝脏脂肪含量定量分析的对照研究

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目的 探讨 T_2^*校正的双翻转角梯度三回波技术对肝脏脂肪含量定量分析的价值。**方法** 前瞻性纳入 30 例经 CT 或超声确诊的脂肪肝患者作为研究对象，对所有患者行梯度三回波及 ^{1}H-MRS 检查，翻转角分别设 20° 及 70° 各行一次三回波扫描，并计算脂变指数（fat index，FI）及肝细胞相对脂肪含量（relative lipid content，RLC）。以 ^{1}H-MRS 为参考标准，对梯度双回波、三回波测得的 FI 进行统计学分析。**结果** 20° 双回波、20° 三回波、70° 双回波、70° 三回波测得的 FI 分别为 10.79(8.59，17.14)%，7.62（4.00，13.21）%，14.45（10.75，22.54）%，11.07（6.09，18.74）%，^{1}H-MRS 测得的 RLC 为 12.72（6.91，21.75）%，与 70° 三回波测得的结果最为接近。双回波、三回波测得的 FI 与 RLC 均呈正相关（$r_{20°双}$=0.881，$P<0.01$；$r_{70°双}$=0.898，$P<0.01$；$r_{20°三}$=0.946，$P<0.01$；$r_{70°三}$=0.935，$P<0.01$），且 Bland－Altman 分析显示各指标与 RLC 一致性均良好；三回波测得的相关系数均高于双回波；20° 三回波测得的相关系数较 70° 三回波略高，但图

像质量较后者有所下降。**结论** 经 T_2^*校正的梯度三回波技术可在纵向研究中替代 ^{1}H-MRS，将在脂肪肝早期筛查、疗效监测中发挥重要作用，但其成像参数（翻转角）有待进一步优化。

EPO-0905

3.0T 1H-MRS、梯度双回波和三回波技术在定量评估脂肪肝治疗效果中的价值

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目的 探讨 3.0T ^{1}H-MRS、梯度双回波和三回波技术在定量评估脂肪肝治疗效果中的价值。方法 前瞻性收集 30 例经 CT 或超声确诊的脂肪肝患者作为研究对象，于治疗前和治疗后 3 个月各行 1 次梯度双回波、三回波及 ^{1}H-MRS 检查，并计算脂变指数（fat index，FI）及肝细胞相对脂肪含量（relative lipid content，RLC）。同期测量血液生化指标、腹围、体质量指数（body mass index，BMI），并拟合成临床脂肪肝指数（the fatty index，FLI）。以 FLI 为参考标准，对治疗前后的 MRI 测得结果进行统计学分析。结果 干预治疗后，与治疗前比较，FLI、$FI_{双}$、$FI_{三}$及 RLC 均降低（t=5.281，P<0.001；Z=－3.651，P<0.001；Z=－3.630，P<0.001；Z=－4.762，P<0.001）。治疗前，$FI_{双}$和 $FI_{三}$与 FLI 均呈正相关（r=0.413，P<0.05；r=0.396，P<0.05），治疗后 $FI_{双}$和 $FI_{三}$与 FLI 亦均呈正相关（r=0.395，P<0.05；r=0.519，P<0.05），以治疗后的 $FI_{三}$与 FLI 的相关系数为最高；治疗前及治疗后 RLC 与 FLI 之间的相关性均无统计学意义（P>0.05）。结论 采用 ^{1}H-MRS、梯度双回波和三回波技术定量评估脂肪肝治疗效果是可行的，梯度三回波技术的准确性更好，技术上容易实现，更适合在临床广泛开展。

EPO-0906

CT-Value（△HU and CT-Value ratio）in Differential Diagnosis of Small Hepatocellular Carcinoma from Focal Nodular Hyperplasia

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Purpose: The objective was to explore the Lesion- Liver parenchyma -Attenuation Difference (△HU) and the CT-value ratio (CVR) of the lesion and the surrounding normal liver parenchyma between the hepatic arterial phase, portal phase, and the delayed phase to differentiate the small hepatocellular carcinoma (SHCC, ≤ 3 cm) from the focal nodular hyperplasia (SFNH, ≤ 3 cm).
Materials and Methods: Total 111 SHCC lesions in 108 cases and 36 SFNH lesions in 33 cases, confirmed by clinically and /or pathologically, were analyzed retrospectively. All the patients underwent plain scan, arterial phase (AP), portal phase (PP) and delayed phase (DP) CT scans. The lesions' CT values (LCV) and the surrounding normal liver parenchyma (NCV) of the three-phase enhancement (AP, PP, DP) were measured separately , the △HU= LCV-NCV and the CVR= LCV/NCV were calculated.

The △HUand CVRof AP, PP, and DP were analyzed by the Wilcoxon rank sum test and the receiver operating curve (ROC) separately.
Results: The median age and the male /female ratios of 111 SHCC lesions in 108 patients and 36 SFNH in 33 patients were statistically significant, and the size wasn't statistically significant. The △HUand CVRof the AP, PP, and DP of the SHCCs and the SFNHs were statistically significant, respectively. Thearea under the curve (AUC) of △HU and CVR of AP, PP and DP were increased gradually, which were 0.895 vs. 0.838, 0.913 vs. 0.914, and 0.990 vs. 0.991,respectively.When the △HU and CVR of the AP, PP and DP were 105.800HU vs. 1.516, -12.600HU vs. 0.949, -19.750 HU vs. 0.951, obtained the maximum You-den indexes which were 0.707 vs. 0.610, 0.811 vs. 0.811, and 0.908 vs. 0.908, respectively. Besides, the corresponding sensitivity and specificity were 80.6 % and 90.1 % vs. 88.90% and 72.1%, 100% and 81.1% vs. 100% and 81.1%, 94.4 % and 96.4% vs. 94.4 % and 96.4%, respectively.
Conclusions: The △HU and CVR had important value in distinguish SHCC from SFNH. TheSHCC was highly suggested when △HU and CVR are no greater than the threshold value in the enhancement phases in the middle-aged and elderly male patients, especially in the DP.

EPO-0907
体素内不相干运动扩散加权成像预测肝细胞肝癌微波消融治疗疗效的价值

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目的 探讨体素内不相干运动扩散加权成像（IVIM）对肝细胞肝癌微波消融治疗疗效的预测价值。
方法 回顾性分析 2015 年 1 月至 2017 年 12 月间在我院行微波消融治疗的 32 例肝细胞肝癌患者，将入组患者依据半年内有无局灶性复发分为未复发组和复发组。所有患者在消融治疗前 1 月、消融治疗后进行 MRI 平扫、增强、DWI 及 IVIM 检查，使用全容积画法勾画感兴趣区（ROI），测量肝癌患者病灶表观扩散系数（ADC）、及 IVIM 相关参数值（D、D*、f）。统计方法采用独立样本 t 检验，比较病灶复发组与未复发组各参数间差异，以是否复发为因变量进行二分类 Logistic 回归分析，判断影响复发的参数。采用受试者工作特征曲线（ROC），计算相关参数的诊断效能。采用 Z 检验比较两组间曲线下面积（Az）。
结果 两组间肿瘤最大径分别为（36.00±6.841）mm、（31.36±8.061）mm，两组间差异具有统计学意义（t 值为-2.026，P <0.05）。患者 MWA 术后两组间 1 月 ADC、D 值间存在差异，且差异具有统计学意义（$P<0.05$）。多因素二分类 Logistic 回归分析，MWA 术后 1 月 ADC、D 值均为预测局部复发的参数。以 ADC 值 $1.365\times10^{-3}mm^2/s$ 为阈值，预测消融疗效的敏感度为 87.5%，特异度为 72%。以 D 值为 $1.962\times10^{-3}mm^2/s$ 为阈值，预测消融疗效的敏感度为 81.25%，特异度为 72.22%。MWA 术后 1 月两组间 D 值较 ADC 值诊断效能略高，但两组间差异无统计学意义。
结论 微波消融治疗术后 1 月 D 值对预测肝细胞肝癌患者微波消融疗效有一定的价值，体素内不相干运动扩散加权成像可帮助临床医师监测肿瘤治疗后疗效。

EPO-0908

能谱 CT 定量评价胰腺癌组织分化的临床研究

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目的：探讨宝石能谱成像（GSI）对胰腺癌定量和定性评价组织分化中的价值。
方法：回顾性分析使用 GSI 模式对 49 例胰腺癌患者行增强三期腹部 CT 扫描图像。通过 GSI Viewer 软件，测量不同组织分化类型胰腺癌实体部分的 CT 值、碘值和有效原子序数值，并测量同层面脂肪及腹主动脉 CT 值，对肿瘤的 CT 值进行标准化处理。所有数据进行统计分析。
结果：病理结果确诊 8 例高分化腺癌，21 例中分化腺癌，20 例低分化腺癌。高分化腺癌，中分化腺癌和低分化腺癌在动脉期和实质期的标准化 CT 值均呈逐渐增加的趋势（0.15±0.04HU，0.08±0.13HU，0.15±0.05HU）（0.38±0.22HU，0.26±0.01HU，0.51±0.11HU），均有显著统计学差异（所有 P <0.05）；但在延迟期无显著统计学差异（P> 0.05）。碘值和有效原子序数值在三期均有统计学差异（P <0.05）。高分化腺癌，中分化腺癌和低分化腺癌动脉期和门静脉期最佳 CNR 的单能 CT 图像值分别为(63 ± 2, 68 ± 7, 72 ± 9) keV 和 (76 ± 4, 63 ± 3, 66 ± 5) keV。
结论：高分化腺癌，中分化腺癌和低分化腺癌在动脉期和实质期的标准化 CT 值均逐渐增加。不同组织分化程度胰腺癌的碘值和有效原子序数值在动脉期、实质期及延迟期均有显著差异，能谱 CT 可以进行胰腺癌的术前评估。

EPO-0909

磁共振弥散峰度成像定量评估肝纤维化分期的初步研究

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目的 探寻磁共振弥散峰度成像技术（DKI）对肝纤维化的分期价值及诊断效能。 **方法** 选取 59 例经病理学确诊并分期的肝纤维化患者（其中 S1 级 15 例、S2 级 14 例、S3 级 13 例、S4 级 17 例；）及 18 例健康志愿者（S0 期），所有受试者均行肝脏 DKI 功能性磁共振检查。利用 GE 750w 3.0T 磁共振扫描仪进行数据采集，采用头先进仰卧位呼吸门控触发，DKI 模型 b 值设定为 0、500、1000s/mm^2。利用 GE AW4.6 工作站 Functool 软件进行图像后处理，并以患者穿刺部位为 ROI 测量相关参数，获得 DKI 的参数指标。统计学分析利用单因素方差分析和组间多重比较进行组间差异性比较；采用 Spearman 分析正常肝脏和肝纤维化不同病理分期之间各参数值的相关性，最后利用 ROC 曲线评价相应参数指标的诊断效能。 **结果** 随着肝纤维化的进展，不同纤维化分级间的 DKI 指标（MD、MK、FA、FAK、Ka）的数值差异具有统计学意义（P 值均<0.05），Pearson 相关性分析显示，上述指标中 MD 值与肝纤维化病理分期呈负相关（r= -0.667），MK、FA、FAk 值与肝纤维化病理分期呈正相关（r 值分别为 0.426、0.769、0.812），其中 FA 值与肝纤维化分期相关性最大。ROC 曲线分析示 MD 对于诊断≥S1 级肝纤维化诊断效能较高（ROC 曲线下面积为 0.922）；FA 及 FAk 值对于诊断 S2-S4 级肝纤维化诊断效能均高于其他参数。FAk 值对于诊断≥S2 级（ROC 曲线下面积为 0.876）和 S4 级（ROC 曲线下面积为 0.794）肝纤维化诊断效能较 FA 值高，FA 可鉴别≥S3 级（ROC 曲线下面积为 0.847）肝纤维化。 **结论** DKI 能定量评估肝纤维化分期，MD 值可敏感地识别早期肝纤维化，FAk 及 FA 值则对中、晚期肝纤维化的区分有更大的优势，从而为评价肝纤维化的严重程度提供依据。

EPO-0910

动态增强 MRI 评估胰腺导管内乳头状粘液性肿瘤恶性潜能的价值

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目的 探讨采用动态增强 MRI 评估胰腺导管内乳头状粘液性肿瘤（intraductal papillary mucinous neoplasms，IPMNs）恶性潜能的价值。
方法 回顾性分析经手术病理证实 IPMNs 患者动态增强 MRI 的影像学表现、临床及病理资料。分析 IPMNs 在 DCE-MRI 上影像学表现，包括病灶位置、壁结节、主胰管管径、胰腺周围组织及血管侵犯情况等。参照 2016 年修订版福冈共识对 IPMNs 进行影像学分类。
结果： 115 例 IPMNs 分为轻-中度不典型增生组、重度不典型增生组以及 IPMN 伴浸润性癌共 3 组。男性 75 例，女性 40 例；年龄 41~83 岁，平均年龄（63.8±7.9）岁。低-中度不典型增生与重度不典型增生、浸润性癌 IPMNs 在可强化壁结节≥5mm、主胰管≥10mm、主胰管改变伴远端实质萎缩、实性成分或壁结节弥散受限上均有统计学差异（P＜0.05）。肿瘤指标 CA19-9 升高在低-中度不典型增生与浸润性癌 IPMN 有统计学差异（P＜0.05）。重度不典型增生与浸润性癌 IPMN 在本研究统计的“令人担忧的特征”、“高危特征”影像学上表现均无统计学差异（P＞0.05）。
结论 DCE-MRI 评估 IPMNs 恶性潜能有一定的价值，特别在强化壁结节≥5mm、主胰管管径≥10mm、主胰管改变伴远端实质萎缩、实性成分或壁结节弥散受限等方面。

EPO-0911

肝胆管囊腺瘤影像诊断

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目的：探讨肝胆管囊腺瘤（BCA）的临床表现及影像学特征，提高对此病的认识，提高早期诊断率、减少误诊率。
方法：收集 PubMed 等数据库报道的 39 例 BCA，详细分析其临床特点及影像学特征。
结果：（1）性别：32 例女性患者，7 例男性患者；临床表现：27 例患者早期表现为上腹痛或不适，4 例患者出现腹部肿块，2 例患者无临床症状；实验室检查：18 例患者表现为 CA199 升高。（2）影像学表现：17 例病灶位于肝左叶，11 例位于肝右叶，3 例位于肝中央叶。CT 平扫示肝内单发或多发低密度肿块，其内可见分隔和附壁结节。15 例患者行 MRI 检查显示，T1 加权像示低信号，T2 加权像示高信号；增强扫描后囊壁及其内分隔明显强化，其内液体成分未强化。MRCP 检查示 3 例病灶上方胆总管扩张。
结论：影像学检查在发现病变方面具有重要价值，MRI 和 MRCP 的使用，使得 BCA 的检出率有所提高，并有助于其与肝囊肿的鉴别，为术前的正确诊断，帮助临床医生选择最适宜的手术方式，实现 BCA 的完全切除提供了很好的依据。

EPO-0912

脾脏硬化性血管瘤样结节性转化的 CT、MRI 特征及影像诊断分析

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目的 探讨脾脏硬化性血管瘤样结节性转化（ssclerosing angiomatoid nodular transformation,SANT）的影像学特征，提高对脾脏 SANT 的认识及诊断水平。
方法 回顾性收集并分析我院经手术病理证实的 13 例脾脏 SANT 患者的临床、病理基础及影像学资料，分析患者临床特点、病灶的大小及位置、CT 和（或）MRI（magnetic resonance imaging,MRI） 的影像表现。
结果 13 例脾脏 SANT 患者中均无特殊临床症状、多因体检发现就诊，女性 9 例，男性 4 例，患者年龄 35~岁，中位年龄 50 岁；病灶均为单发类圆形、多数位于脾脏边缘，病灶较大时突出脾轮廓外，病灶最大直径 9.8cm、最小直径 2.2cm，其中 8 例病灶大于 5cm；病理学特征为纤维硬化间质中形成多个血管瘤样结节。病灶在 CT 上表现为平扫类圆形等密度占位，CT 值多在 40-50Hu，增强扫描动脉期病灶周围小结节样、病灶中细网格状强化及病灶整体缓慢渐进性强化。病灶在 MRI 的 T2-weighted imaging（T2WI）表现为低信号以及典型的“轮辐征”，增强扫描早期强化特点与 CT 类似，5min 延迟扫描病灶中心区域见星芒状强化。
结论 脾脏 SANT 多单发、位于脾缘，影像增强特点及方式多呈缓慢渐进性强化，典型 MRI 表现为 T2WI 低信号及“轮辐征”，延迟期病灶中心星芒状强化。MRI 对于脾脏 SANT 的诊断优于 CT。

EPO-0913

Acute pancreatitis events in type 2 diabetes mellitus: are having set of particularities on magnetic resonance imaging compared with nondiabetic acute pancreatitis?

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Aims To study magnetic resonance imaging (MRI) appearances of type 2 diabetes mellitus (T2DM)-related acute pancreatitis (AP) and to determine whether set of particularities on MRI between groups of T2DM-related AP and nondiabetic AP.
Materials and methods This retrospective study from 2015 to 2018 included consecutive 262 patients with AP who were made up of 53 (20.2%) patients with T2DM complicated by AP and 209 (79.8%) with nondiabetic AP. Between the two groups, both clinic features and MRI characteristics including patterns of AP, the extent of pancreatic necrosis, MR severity index (MRSI) scores, and the occurrence of hemorrhage, the abdominal wall edema, local complications and infected complications were examined.
Results Among the 262 patients with AP, including 133 males and 129 females, their mean age was 51.8 years (range, 23 - 75 years). There were 53 (20.2%) patients with T2DM with AP and 209 patients (79.8%) without diabetes. The prevalence of mild, moderately severe, and severe pancreatitis was 35.9% (94/262), 54.6% (143/262), and 9.5% (25/262). Of 262 patients with AP, the prevalence of necrotizing pancreatitis ($P < 0.001$) and extent of pancreatic necrosis ($P = 0.006$) were higher in patients who presented T2DM complicated by AP, compared with nondiabetic AP. Median MRSI score was 5.1 in 53 patients with T2DM complicated by AP and 3.4 in 209 patients with nondiabetic AP ($P < 0.001$). The incidence of the presence of hemorrhage ($P = 0.009$), edema in subcutaneous spaces of flank abdominal wall ($P = 0.006$), local complications like walled-off necrosis ($P < 0.001$), and infected collections ($P <$

0.001) were more common in patients with T2DM with AP than in those without diabetes. The incidence of infected collections was higher in patients with T2DM complicated with AP (30.2% [16/53]) than in those without diabetes (10.5% [22/209]) (χ^2 = 13.181, P < 0.001). Compared to nondiabetic AP, patients with AP of T2DM sustained more likely to develop organ failure (P = 0.001), and had a longer hospital stay (P < 0.001).
Conclusion T2DM-related AP may present more frequency of moderate and severe pancreatitis. On MRI, AP onset of T2DM is at higher incidence of hemorrhage, abdominal wall edema, the development of fluid collections and infected collections, compared with nondiabetic AP.

EPO-0914
原发性肝肉瘤样癌误诊为肝脓肿 3 例影像特征及误诊原因分析

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目的 :探讨肝肉瘤样癌((Sarcomatoid hepatocellular carcinoma, SHC)的临床及影像学特点并分析误诊原因。
方法:对浙江大学医学院附属第一医院医院收治的 3 例误诊为肝脓肿的原发性 SHC 的临床和影像学资料进行回顾性分析,并复习相关文献。
结果 : 3 例患者因畏寒、低热，上腹部持续性疼痛不适症状入院，病史从 1 月至 3 月不等。病初曾在当地医院超声、CT 或 MR 检查诊断为肝脓肿，给予抗炎对症治疗果不佳，来我院后复查超声及 CT，病灶较前增大。CT 表现为较大不规则低密度肿块，病灶内密度不均匀，低密度肿块内可见更低密度且不强化影; *MRI* 检查示 T2WI 呈高信号，DWI 呈高信号灶，增强后边缘环状强化，见“囊壁样”结构。实验室检查均有白细胞及中性粒细胞增高，白细胞总数最高达到 24.2 10E9/L，中性粒细胞最高达到 78.9%，甲胎蛋白(AFP)未发现异常增高。3 例均行超声引导下穿刺活组织病理检查结果为恶性肿瘤伴坏死（倾向于低分化腺癌或肉瘤样癌）。经手术切除，术后病理及免疫组织化学检查诊为 SHC。
结论: SHC 是一种少见的上皮恶性肿瘤，临床表现、影像学检查及实验室检查均缺乏特异性。临床症状及影像学酷似肝脓肿，易误诊。当影像学发现肝脏体积较大肿瘤、密度不均匀，且予抗生素治疗无效时，应考虑 SHC 的可能性，及时行病理及免疫组织化学检查,以减少或避免 SHC 误诊。

EPO-0915
动态增强 MR 定量参数在吉西他滨联合紫杉醇对胰腺癌疗效预测方面的探究

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目的 为了探究动态增强 MR 的定量参数在吉西他滨联合紫杉醇对胰腺癌疗效预测方面的价值
方法 回顾性分析 40 例经超声内镜引导下穿刺病理证实的胰腺癌患者，这些患者均在治疗前一周内行动态增强 MR 检查。根据三个疗程化疗的结果，将患者分为有效组和无效组。在治疗前的增强 MR 图像上描绘出不同的感兴趣区，包括病灶最大层面、中心区、周围区及邻近的非肿瘤区域，然后测量并分析定量参数 K^{trans}、v_e、k_{ep}、iAUC60。

结果 在病灶周围区、最大层面区及邻近非肿瘤区，有效组的 K^{trans} 大于无效组（*P*=0.015, 0.043, 0.025）。在病灶周围区，有效组的 k_{ep} 大于无效组（*P* =0.013）。而在不同感兴趣区内，有效组和无效组之间的 v_e 和 iAUC60 均无统计学差异。虽然，在区分有效组和无效组方面，病灶周围区的 k_{ep} 表现出最大的 AUC 值（0.806），但与周围区、整个层面区及邻近非肿瘤区的 K^{trans}(AUC=0.744, 0.735，0.681)相比并无统计学差异。病灶周围区的参数（K^{trans}, k_{ep}, v_e, iAUC60: 1.605±0.795, 1.662±0.651, 0.761±0.171, 1.162±0.374)均大于中心区(K^{trans}, k_{ep}, v_e, iAUC60: 1.186±0.745, 1.399±0.691, 0.702±0.213, 0.953±0.328)，与邻近非肿瘤区的参数相比(K^{trans}, k_{ep}, v_e: 2.047±0.933, 1.738±0.951, 0.578±0.235, 0.986±0.341)，周围区、中心区及整个最大层面区的 K^{trans} 是低的，v_e 是高的，而 k_{ep} 并无差异。邻近非肿瘤区的 iAUC60（0.986±0.341）小于周围区，而与中心区及整个最大层面区并无明显差异。

结论 动态增强 MR 的定量参数可作为预测吉西他滨对胰腺癌疗效的潜在指标，且其数值受感兴趣区位置的影响。

EPO-0916

35 例混合型肝细胞胆管细胞癌的磁共振表现

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目的：回顾性分析混合型肝细胞癌和胆管癌（cHCC-CC）的 MRI 表现。
方法：经病理证实的 35 例混合型 cHCC-CC，32 例行增强 MR，3 例行平扫 MR。根据 HCC 和 CC 特征分析 MR 表现。
结果：所有混合型 cHCC-CC 均为孤立性实体瘤，33/35 例边界清晰，23/35 有规则形状，10/35 为 T1 加权图像低信号，所有病例均在 T2 加权像上显示高信号。在增强 MR 扫描中，18/32 例为流出型，23/32 显示早期动脉期外周增强，20/32 显示延迟期边缘增强，5/32 例中心性延迟期增强。同时，24/35 显示肝硬化，11/35 显示邻近肝囊收缩，3/35 显示肿瘤周围肝内胆管扩张，9/35 显示淋巴结转移。使用 HCC 和 CC 的 MR 特征，平扫 MR，增强 MR 以及平扫联合增强 MR 扫描的诊断灵敏度分别为 37.5%，78.1%和 90.6%。
结论：HCC 和 CC 的两个特征都应作为 cHCC-CC 的诊断特征。

EPO-0917

肝脏局灶性结节增生(FNH)螺旋ＣＴ表现

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目的 分析肝脏局灶性结节增生（ＦＮＨ） 的螺旋 ＣＴ 各期表现，加以归纳进一步提高 ＦＮＨ 的诊断符合率。**方法** 25 例患者，对经手术及病理证实的ＦＮＨ的临床、病理和各期ＣＴ资料进行回顾性分析。16 例患者行双源螺旋螺旋 CT 扫描，9 例患者行双层螺旋 CT 扫描，上述病例均行 CT 增强扫描。**结果** CT 共发现 31 个病灶，4 例患者为多发。31 例病例病灶平扫均呈等密度或低密度，密度均匀或不均匀，7 个 FNH 病灶发现钙化灶。增强动脉期，除了中央疤痕和纤维分隔外，所有病灶都明显均匀强化；门脉期和延迟期大部分病灶呈等密度或稍高密度，4 个病灶呈稍低密度。13 个 FNH 病灶中发现中央疤痕，在延迟期均有强化，16 个病灶于动脉期中央及外周发现异

常增粗、迂曲动脉，12 个病灶于延迟期可见强化的假包膜。**结论** 平扫和动态增强螺旋ＣＴ能较全面显示 ＦＮＨ 的病理特征及血供特点，多排ＣＴ对显示ＦＮＨ供血动脉及引流静脉有较强优势，可提高与其他富血管恶性肿瘤的鉴别能力。

EPO-0918
基于 T2WI 直方图纹理分析在胰腺实性病变中的诊断价值

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目的 探讨 3.0T 磁共振 T2WI 灰度直方图纹理特征在胰腺实性病变中的诊断价值。**方法** 回顾性分析 39 例胰腺实性占位患者的临床及 MRI 影像学资料，经手术病理证实导管腺癌 23 例、实性假乳头状瘤 2 例、神经内分泌肿瘤 7 例及肿块型胰腺炎 7 例，将其分成恶性肿瘤组别（导管腺癌）、良性到低度恶性肿瘤组别（实性假乳头状瘤+神经内分泌肿瘤）、非肿瘤组别（肿块型胰腺炎）。采用 GE Omni-Kinetics 软件在 T2WI 序列病变最大及前后共 3 个层面勾画 ROI 并自动生成灰度直方图纹理参数，三组间比较采用单因素方差分析（ANOVA），组间两两比较采用 LSD-t 检验（方差齐）或多个独立样本 Kruskal-Walls 检验（方差不齐）；筛选有统计学差异的参数绘制 ROC 曲线，评价其鉴别诊断胰腺实性病变的效能。**结果** 均值、变异度、能量、熵、第 5 百分位数、第 10 百分位数、第 25 百分位数、第 50 百分位数、第 75 百分位数、第 90 百分位数及第 95 百分位数在三组中差异有统计学意义（P均<0.05）；偏度、峰度在三组间无统计学差异（P均>0.05）；PDAC 与 MFCP 之间变异度的敏感度为 82.6%，特异度为 85.7%，曲线下面积为 0.899，最佳临界值 5915.87；PDAC 与 SPT+pNET 间均值的敏感度为 64.4%，特异度为 87.0%，曲线下面积为 0.688，最佳临界值 1113.55；MFCP 与 SPT+pNET 之间第 90 百分位数的敏感度为 88.9%，特异度为 85.7%，曲线下面积为 0.924，最佳临界值 837.59，具有较高的鉴别效能。**结论** T2WI 直方图纹理参数在胰腺来源实性病变之间存在显著性差异，其中均值、百分位数对胰腺实性病变定性及良恶性鉴别具有重要的临床价值。

EPO-0919
CT and MR imaging features of fistulas from intraductal papillary neoplasm of the bile duct penetrating into adjacent organs

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Purpose: Intraductal papillary neoplasm of the bile duct (IPNB) with fistulization to adjacent organs is rare. The purpose of this study was to describe the computed tomography (CT) and magnetic resonance imaging (MRI) findings for this specific complication.

Methods: Consecutive patients with histologically confirmed IPNBs between January 2015 and May 2019 were retrospectively reviewed. The clinical and imaging files of all patients were evaluated for the fistula formation into other organs. Two radiologists determined the number and size of visible fistulas, the involved adjacent organs and

the presence of imaging findings suggestive of malignant transformation of the IPNB. The presence of fistulas on imaging was confirmed in resection specimens and during endoscopic examinations. Pathologic examination was performed, and both gross and microscopic findings were analyzed.

Results: A total of 28 patients were included. A total of 5 fistulas were identified. These fistulas involved the duodenum (25%), stomach (60.0%) and abdominal wall (25%). Magnetic resonance imaging commonly showed obvious enhanced papillary nodules on the wall of cystic solid tumor and markedly dilated bile duct. By multiplanar reformation, all fistulas were definitely present on the reformatted CT images. All fistulas appeared to develop from a malignant IPNB based on the imaging studies.

Conclusions: Mucin-filling of tumor and inflammatory stimulation lead to the fistula penetrating into other neighboring organs. Preoperative CT and MR imaging is useful for detecting, locating and determining the fistulization of IPNBs.

EPO-0920
腹腔及腹腔脏器原始神经外胚层肿瘤的 CT 特征

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目的　探讨腹腔及腹腔脏器原始神经外胚层肿瘤 （PNET）的 CT 特征。 方法　回顾性分析经手术病理证实的 CT 资料齐全的 11 例腹腔及腹腔脏器 PNET，分析其病理特点，结合文献资料，探讨 PNET 的 CT 特征，以提高对该疾病的认识。 结果 PNET 多见于青中年，中位发病年龄为 21 岁，男性 5 例，女性 6 例， 11 例中有 9 例为单发，2 例为多发，其中肾脏 4 例，腹腔 2 例，腹盆腔 5 例，均可见软组织肿块，直径 2.2～ 18.0cm，平均 9.5cm，肿块呈不规则形或类球形，9 例边缘清晰，与周围结构分界清，10 例肿块内密度不均，见囊性坏死区，其中有 2 例伴有钙化，增强扫描肿瘤实性成分中度或明显不均匀强化，坏死区无明显强化。 结论　PNET 可发生于腹盆腔及腹腔脏器，CT 可准确显示肿瘤的位置、大小、形态、边缘及与周边组织的关系，CT 表现具有一定特征性，但并无特异性，诊断依靠病理组织检查。

EPO-0921
应用 3D mDIXON 定量成像探讨人体胰腺脂肪含量与 BMI、性别、年龄的关系

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目的：应用 3D mDIXON 定量成像技术分析健康志愿者胰腺脂肪含量与 BMI、性别、年龄的关系。
材料与方法：前瞻性纳入 19 名志愿者，男 11 例，女 8 例，BMI 范围 17.71-34.29 kg/m^2，平均 23.45±3.97kg/m^2；年龄范围 22-62 岁，平均 34.89±14.99 岁。所有患者行 3.0T 磁共振扫描仪（Ingenia CX, Best，the Netherlands）3D mDIXON Quant 序列扫描。扫描参数如下:FOV=375mm×300mm×168mm, TR=6ms，层厚及层间距=5.0mm/2.5mm,CS=2，Echo=6。图像导入在

ISP 工作站，在脂肪分数图像上有两名放射科医师进行胰腺脂肪分数测量。所有数据经 SPSS v19.0 (IBM, Chicago, III)进行统计分析。采用组内相关系数(ICC)分析两个观察者测量数据一致性。采用 Spearman 检验评价胰腺脂肪分数与年龄的相关性。
FF 结果：两个观察者的测量结果 ICC 值均大于 0.75，一致性良好，测量的胰腺脂肪分数值取平均值进行后续分析。平均胰腺胰腺脂肪分数值与年龄、性别、BMI 呈显著相关(r=0.593, 0.633, 0.642,P<0.05)。男性和女性的 FF 分数(%)分别为 6.48±4.80、2.94±0.94。
结论：胰腺脂肪分数随年龄和 BMI 的增加而增加，男性的胰腺脂肪分数大于女性。

EPO-0922
肝脏局灶性结节增生的 MSCT 、MRI 和 DSA 影像表现及其病理基础

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[摘要] 目的 探讨肝脏局灶性结节增生（FNH）的 CT 、MRI 及 DSA 影像表现特征及其病理基础，以提高其诊断准确率。方法 回顾性分析经病理证实的 18 例 20 个 FNH 的影像表现，12 例行 CT 平扫及动态增强扫描，8 例同时行 MRI 平扫及动脉增强扫描，6 例行 DSA 肝动脉造影，其中 5 例同时做三种检查。结果 18 例 20 个 FNH 病灶 CT 平扫均呈等或稍低密度结节或团块，其中 2 例在脂肪肝背景下呈高密度结节表现；增强扫描动脉期示病灶均呈均匀显著强化，7 例可见扭曲扩张的供血动脉；13 例病灶中央瘢痕区无明显强化；门静脉期及延时期示病灶稍高于、等于周围肝实质，中心瘢痕区于门脉期开始强化延续至延时期；动态增强时间-密度强度曲线 20 个病灶均为动脉期迅速升高，门脉期至延迟期期缓慢下降，呈速升-缓降型。M RI 检查示病变呈等或稍低 T 1 信号及稍高 T 2 信号，增强扫描动脉期示病灶均匀显著强化，门脉期和延时期呈稍高信号或等信号，7 例显示病灶中央疤痕呈稍高或稍低 T1、T2WI，增强后呈延迟强化。6 例行血管造影均显示 FNH 的供血动脉来自肝动脉系统，供血动脉主干进入病灶中心后呈离心性放射状向四周分布，分支供血动脉明显增粗、 扭曲，6 例均见粗大引流静脉。结论：大多数 FNH 在 MRI 、MSCT 、DSA 上有特征性的影像表现，MRI 能清晰显示其中央瘢痕病理特征，MSCT 对病灶周边或中央增粗、扭曲血管病理特征的显示上较清晰，DSA 能清晰显示中央瘢痕畸形血管及畸形的中央动脉离心性的向外供血的病理特征；三者结合能提高对 FNH 的诊断率。

EPO-0923
肝脏局灶性结节增生的 CT 表现与病理对照分析

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目的:研究 CT 在此类疾病的临床诊断中的应用价值。
方法:对 17 例经病理检查确诊为 FNH 的患者进行回顾性总结，通过 CT 检查方式进行病灶扫查，观察记录患者病灶数量、大小以及影像学特征。
结果：14 例 FNH 单发，其余 3 例患者肝内 FNH 均为 2 个，5 个位于肝左叶，14 个位于肝右叶，有 1 个累及患者的肝右前叶与左内叶。结节直径（2.98±1.02）cm，CT 征象明显。
结论：CT 技术可以明确反映 FNH 病灶内血供特点，具有较为明显的影像特征，可以提高临床 FNH 的确诊率，提高临床诊断水平，对于 FNH 症状不典型者应行手术病理检查。

EPO-0924
256 层 CT 肝灌注成像评估肝移植术后肝血流动力学

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目的： 探讨 256 层 CT 全肝灌注成像对肝移植术后肝脏血流动力学的评估能力。
方法：对 10 例行肝移植术后（术后 2 周-1 月）患者肝脏及 12 例正常肝脏作为对比组，进行全肝灌注检查，后处理软件分别测量肝脏各段血流灌注参数：肝动脉灌注量(HAP)、门静脉灌注量(HPP)、肝总灌注量(TLP)、肝动脉灌注指数(HAPI)以及门静脉灌注指数(HPPI)，对正常组及肝硬化组行肝段性灌注测量，对肝脏各段血流灌注参数行统计学分析。**结果：**正常肝脏及移植肝 HAP 分别为(12.38±9.53)ml·min $^{-1}$ ·ml、(11.71±12.03)ml·min $^{-1}$ ·ml，两者无显著差异，HPP 分别为(34.23±12.46)ml·min $^{-1}$ ·ml、(40.21±15.25)ml·min $^{-1}$ ·ml，两者间存在显著性差异（P<0.05），TLP 分别为(35.79±13.20)ml·min $^{-1}$ ·ml、(49.92±13.54)ml·min $^{-1}$ ·ml，两者间存在显著性差异（P<0.05），HPPI 分别为 78.36±11.29%、82.51±14.32%，两者无显著差异；其中 3 例患者 5 个肝段在肝动脉灌注彩图中可见灌注相对减低，均经超声及 CTA 发现肝动脉吻合口狭窄，4 例患者 8 个肝段在肝动脉灌注彩图中可见灌注相对减低，3 例经 CTA 发现肝门脉吻合口狭窄。**结论：**256 层 CT 全肝灌注成像可直观定量反映肝脏血流灌注情况，肝移植术后肝各段 HPP 及 TLP 值高于正常肝，通过各参数灌注图可发现灌注减低区，可提示发生移植术后并发症如动脉及门脉吻合口狭窄可能。

EPO-0925
多层螺旋 CT 肝脏增强扫描技术的探讨与应用

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目的：多层螺旋 CT 肝脏增强扫描技术的探讨与应用。多层螺旋 CT 增强病变检出率普遍高于普通螺旋 CT 扫描，增强扫描利用造影剂的强化效果，可实现多时相的动态扫描，在短时间内获得动脉期、门脉期和延时期的数据，有利于肝癌、血管瘤、结节增生等病变的鉴别。**方法：**扫描前 4h 禁食禁水，做碘过敏实验，并告知患者扫描期间注意事项，扫描前半小时喝水 400~600mL，采用螺旋方式、准直器 2.5mm 屏气扫描，收集 2018 年 3 月-2019 年 4 月患者 656 例，随机分为研究组和对照组，各 328 例。研究组采用多层螺旋 CT 进行肝脏增强扫描，根据患者体重以及血管流速承受能力注入造影剂,对比剂用量为 1.5ml/kg，注射流率为 2.5ml/s~3.0ml/s 造影剂总量 70~100ML 经手臂静脉用高压注射器注射，注药前扫描一次（注药前为对照组），注药后 28s 扫描一次获取动脉期图像，注药后 65s 扫描一次获取静脉期图像，注药后 180s 扫描一次获取延时期图像。**结果：**研究组诊断结果为肝癌 86 例（26.2%），肝血管瘤 62 例（18.9%），脂肪肝 112 例（34.1%），肝囊肿 32 例（9.8%），肝脓肿 36 例(11.0%).对照组诊断结果为肝癌 80（24.4%），肝血管瘤 58（17,7%），脂肪肝 60（18.3%），肝囊肿 28（8.5%），肝脓肿 32（9.8%），有 70 例（21.3%）得到明确诊断。两组患者检出率进行比较，差异有统计学意义（P<0.05）。肝脏增强三期病情诊断最大强化峰值各不同。**结论：**多层螺旋 CT 肝脏增强扫描技术在肝脏疾病诊断中检出疾病率较高，并能完成动脉期和门脉期在全肝扫描，可为肝脏疾病患者提供明确诊断，值得临床推荐。

EPO-0926

自身免疫性胰腺炎的 CT 及 MRI 诊断

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目的 探讨自身免疫性胰腺炎的 CT 及 MRI 表现。**方法** 收集 12 例经病理及临床证实的自身免疫性胰腺炎病例，回顾分析其 CT、MRI 所见及临床资料。**结果** 12 例自身免疫性胰腺炎患者中，胰腺弥漫性肿大者 9 例，局限性病灶者 3 例，所用病灶平扫呈均匀等密度或稍低密度，MRI 平扫 T1WI 呈稍低信号，T2WI 呈高信号；CT 及 MRI 增强扫描均表现为门脉期及延迟期强化；胆总管胰腺段及主胰管向心性狭窄 6 例，管壁增厚 4 例，肝内胆管扩张 3 例； 6 例可见胰周“包鞘样”改变，其中 4 例延迟期出现轻度强化；DWI (b=1000) 6 例病灶表现为高信号 4 例，等信号 2 例， ADC 值为（0.756±0.542）×$10^{-3}mm^2/s$。**结论** 自身免疫性胰腺炎的正确诊断需结合影像学表现、血清学 IgG4 水平及病理所见。增强三期扫描自身免疫性胰腺炎表现出的延迟强化征象有助于其与胰腺癌的鉴别诊断。

EPO-0927

肝脏血管内皮细胞瘤影像学诊断

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目的：婴儿型血管内皮瘤作为婴儿肝脏血管肿瘤中最常见的类型，且表现多样，需要结合多种检查方式进行诊断。首先应关注患儿的临床表现。常见的临床表现有：①肝肿大±呼吸衰竭巨大肿块可压迫膈肌；②动静脉畸形±充血性心力衰竭肝内血管分流量大时，可出现充血性心力衰竭；③皮肤血管瘤本病可为肝内单发多发病灶，20％伴有皮肤血管瘤；④消耗性凝血功能异常（Kasabach-Merrit 现象）及弥散性血管内凝血。
方法：影像学检查方法应结合该病的病理分型。I 型较为常见，表现有一定特征，与病理一致性较高。肿瘤组织由大小不等的血管构成。II 型少见，主要表现为血管内皮细胞明显增生，不形成管腔或管腔结构不清楚，部分可形成乳头样结构，无散在胆小管成分。1、超声检查：是诊断本病的首选方法，其特点表现为高低回声相混不均匀实性包块，界清，可表现为囊状无回声。2、CT 检查：IHHE 的 CT 表现可以分为肿块型，结节型和弥漫型。CT 增强检查可出现边缘强化，周围可见血管影是其典型特征。3、MRI 检查：T2WI 表现为不均匀高信号 T1WI 表现为低信号，动态钆增强磁共振成像早期中心增强，180 s 后肿瘤完全增强。
结果：肝脏血管内皮细胞瘤表现与其他肝脏肿瘤有重叠处，因此在临床过程中仍需与多种肿瘤进行鉴别诊断。①肝母细胞瘤 ：婴儿型肝脏血管内皮瘤的平扫和肝母细胞瘤相似。不过在动脉期的强化程度 ， 肝母细胞瘤明显低于婴儿型肝脏血管内皮瘤。②肝脏转移瘤 ：肝脏转移瘤在动脉期强化程度轻微 ， 而婴儿型肝脏血管内皮瘤在动脉期出现明显强化 ， 且延迟扫描时病灶密度明显高于肝实质。③肝脏海绵状血管瘤 ：较少见于 〈1 岁的婴幼儿 ， 多见于年长儿和成年人。
结论：IHE 的 CT 及 MRI 表现具有一定的特征性，结合临床表现和影像学特征，可以提高 IHE 的诊断准确率。

EPO-0928

Whole-liver apparent diffusion coefficient histogram analysis for the diagnosis and staging of liver fibrosis

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Abstract
Purpose: To explore the value of apparent diffusion coefficient (ADC) histogram parameters based on the whole liver in the diagnosis and staging of liver fibrosis.
Materials and Methods: In total, 86 patients with liver fibrosis, including 30 with chronic viral hepatitis, 29 with autoimmune hepatitis and 27 with unexplained liver fibrosis patients, who underwent diffusion-weighted magnetic resonance imaging (DWI) were included in this retrospective study. A region of interest (ROI) covering the entire liver were drawn in each slice of axial diffusion-weighted images with dedicated software. The 3D ROI ADC value histogram and its parameters were obtained by accumulating all ROIs in each slice. The differences of ADC histogram parameters between different pathological fibrosis stages were calculated and compared using the Mann–Whitney U test, and then ROC curves were constructed to evaluate the effectiveness of the histogram parameters with significant differences in predicting stage 1 or greater (≥F1), stage 2 or greater (≥F2), and stage 3 or greater (≥F3) liver fibrosis.
Results: Kurtosis, entropy, skewness, mode, and 90^{th} and 75^{th} percentiles exhibited significant differences among the pathological fibrosis stages ($P<0.05$). Kurtosis was the most meaningful parameter in distinguishing different fibrosis stages. In the viral liver fibrosis group, the minimum cut-off value of 1.538 had the highest AUC (0.793; 95% CI: 0.656, 0.931; sensitivity: 0.750; specificity: 0.783) in predicting fibrosis stage ≥F2. In the autoimmune hepatitis group, the minimum cut-off value of 2.025 had the highest AUC (0.771; 95% CI: 0.623, 0.919; sensitivity: 0.750; specificity: 0.850) in predicting fibrosis stage ≥F1. In the unexplained liver fibrosis group, the minimum cut-off value of 1.471 had the highest AUC (0.798; 95% CI: 0.662, 0.934; sensitivity: 0.739; specificity: 0.800) in predicting fibrosis stage ≥F1.
Conclusion: Whole-liver apparent diffusion coefficient histogram analysis contributes to the diagnosis and staging of liver fibrosis.

EPO-0929
磁共振成像能够预测小肝癌的组织学分级和 Ki-67 表达

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背景：小肝细胞癌被认为是早期肿瘤，但也有一小部分具有侵袭性，预后较差。
目的：通过探究术前磁共振成像参数与 Ki-67 表达及组织学分级之间的关系来确定侵袭性小肝癌的预测指标。

材料与方法：回顾性分析经病理证实的 60 例小肝癌（肿瘤直径≤3cm，数量≤2）患者的增强磁共振表现。对整个病灶及竖脊肌的信号进行定量测量，计算出病灶与肌肉信号比值。然后用统计学分析所获得的定量和定性资料与组织学分级和 Ki-67 水平之间的关系。
结果：平扫、动脉期、门脉期 T1WI 及 ADC 图上所测量的病灶与肌肉信号比值与组织学分级有显著相关性（P 值分别为 0.001、0.001，0.036、0.027），动脉不均匀强化也与 Ki-67 高表达相关（P=0.032）。
结论：术前磁共振成像可以预测侵袭性小肝癌，对临床的治疗和预后有重要价值。

EPO-0930
肝细胞肝癌的 IVIM-DWI 多定量参数与病理的相关性研究

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目的 探讨 IVIM-DWI 多定量参数对肝细胞肝癌微循环状态的评估价值。 **方法** 随机入选拟于新疆生产建设兵团医院行上腹部 3.0T 核磁共振检查的患者 67 例，均完成肝脏 IVIM-DWI 序列扫描。最终纳入经病理证实的肝细胞肝癌（Hepatocellular Carcinoma，HCC）病例 30 例，所有纳入研究的病例图像经 ADW4.6 Functool 自动后处理软件分析，获取多衍生参数（ADC、D^*、D、PF 值）。将 IVIM-DWI 序列多衍生参数 ADC、D^*、D、PF 值与肝细胞肝癌的病理分级及 CD34-微血管密度（CD34-Microvascular Density，CD34-MVD）、α-平滑肌激动蛋白（α-Smooth Muscle Actin，α-SMA）数量进行统计学分析。 **结果** ADC、D 值与 CD34-MVD、α-SMA 呈负相关，相关系数分别为 r=-0.373、r=-0.295，r=-0.541、r=-0.565，而 D^*、PF 值与 CD34-MVD、α-SMA 呈正相关，相关系数分别为 r=0.526、r=0.456，r=0.474、r=0.468；ADC、D 值与 HCC 病理分级呈负相关，相关系数分别为 r=-0.482， r=-0.463，D^*、PF 值与 HCC 病理分级呈正相关，相关系数分别为 r=0.447，r=0.462，并 ADC、D 及 PF 值在不同病理分级组间具有显著差异性（P<0.05），D^*值在不同病理分级组间无统计学意义（P>0.05）；CD34-MVD、α-SMA 与不同病理分级呈正相关，相关系数分别为 r=0.927，r=0.840，并不同病理分级组间具有显著差异性（P<0.05）。 **结论** IVIM-DWI 获取的多定量参数 ADC、D、D^*及 PF 值可反应肝细胞肝癌的病理分级及微循环功能状态，可以为肝细胞肝癌的诊治评估提供活体检测的客观指标。

EPO-0931
肝脏上皮样血管平滑肌脂肪瘤影像诊断与鉴别诊断

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目的 探讨肝脏上皮样血管平滑肌脂肪瘤（HEAML）的临床、CT 及 MR 影像征象，以提高 HEAML 诊断准确性。**方法** 回顾性分析 9 例经病理证实的 HEAML 临床及影像学征象。CT 检查 5 例，MR 检查 4 例。同时，收集 30 例经病理证实的肝细胞癌（HCC）,分析两组患者临床及影像学表现，并行 c^2检验，将差异有统计学意义（P＜0.05）的特征纳入 logistic 回归分析，采用受试者工作特征曲线（ROC 曲线）分析这些特征对鉴别 HEAML 与 HCC 的效能。**结果** 9 例 HEAML 中 8 例为女性、1 例为男性，AFP 均为阴性，病灶均为单发，平扫呈稍低密度或稍长 T1 稍长 T2 信号（8/9），增强扫描呈“快进快出”（6/9）表现，可见中心血管征（6/9）及静脉早显（5/9）；统计结果显示：性别、AFP 水平、中心血管征及静脉早显有统计学差异（P＜0.05）；联合上述四项指标行回归分析，并采用 ROC 曲线评估其鉴别 HEAML 与 HCC 的效能，其 AUC 为 0.969，敏感度和特异度分别是 77.8%、100%，具有较高诊断价值。**结论** 患者性别、AFP 水平、中心血管征及静脉早显等临床、影像征象

有助于 HEAML 与 HCC 的鉴别诊断。当患者为女性、AFP 阴性、具有中心血管征和静脉早显时，提示 HEAML 可能性较大。

EPO-0932
回顾性分析胰腺连续动态增强 CT 术前诊断胰岛素瘤的价值

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目的 探讨胰腺连续动态增强 CT(PDCE-CT)术前诊断胰岛素瘤的价值，以提高胰岛素瘤检测敏感性，并分析常规增强 CT 检测胰岛素瘤的最佳图像采集时间窗。
方法 回顾性分析 23 例经手术、病理证实的胰岛素瘤，共计 17 例患者行胰腺连续动态增强 CT，另共计 9 例患者行胰腺常规增强 CT（其中 4 例患者常规 CT 增强阴性者进一步行胰腺连续动态增强），比较胰腺动态增强 CT 与常规增强 CT 对胰岛素瘤术前诊断的敏感性，探究胰岛素瘤增强峰值（PH）、胰岛素瘤及周围正常胰腺组织密度差值（T-P 差值）峰值以及 T-P 差值大于 35HU 的时间段，并总结胰岛素瘤 CT 图像特征。
结果 1. PDCE-CT 与常规增强 CT 敏感性分别为 94.1% (16/17)、55.6% (5/9)，两者具有统计学差异（P=0.035,P＜0.05）。 2.PDCE-CT 的 PH 值为 174.6±45.4HU(时间点为 23.4±13.1s)， T-P 差值 PH 值为 65.8±34.4HU(时间点为 32.4±12.3s),T-P 差值＞35HU 时间段为 25.3±14.4--51.3±18.9s。
结论 PDCE-CT 较常规增强 CT 对于术前诊断胰岛素瘤具有更好的敏感性；行常规增强 CT 时，在注入对比剂后 25.3±14.4--51.3±18.9s 时间窗内采集图像对于术前诊断胰岛素瘤价值更大，但个体差异较大。

EPO-0933
胰腺切除体积与血糖水平相互关系的 CT 定 量评估

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目的：探讨 CT 测量胰腺切除的体积与短期血糖水平变化的关系。**方法：**回顾性分析
2010 年 1 月至 2012 年 12 月华中科技大学同济医学院附属协和医院，85 例行手术切除部分胰腺的良性
及恶性肿瘤患者。患者术前及术后 1 周行胰腺 CT 平扫及增强检查。采集术前 5 d 至术后 20 d 内每日
空腹血糖及餐后 2 h 血糖资料。在 CT 图像上测量两组患者术前胰腺体积、术后 1 周剩余胰腺体积进
行测量，为排除个体差异，术前、术后胰腺体积均需转化为单位体表面积的胰腺体积，计算得出 85 例
患者的胰腺切除体积比。将 85 例患者分为良性组和恶性组，良性组和恶性组再根据胰腺切除体积比
分别划分 5 个亚组，分别为切除体积<40%组、切除体积 40%~49%组、切除体积 50%~59%组、切除体

积 60%~69%组、切除体积≥70%组。采用配对 t 检验比较术前与术后血糖水平差异，采用独立样本 t 检
验比较良性组与恶性组间血糖水平的差异。采用单因素方差分析比较良性组和恶性组肿瘤血糖水平亚组间的差异，采用相关回归分析对胰腺术后切除体积比与血糖水平进行相关性分析。**结果：**良性组和恶性组患者间比较，术前及术后的空腹血糖、餐后 2 h 血糖差异均有统计学意义（P<0.05）；术前和
术后组比较，良性组的空腹血糖、餐后 2 h 血糖及恶性组的空腹血糖差异均有统计学意义（P<0.05）。
不同切除胰腺体积组间比较，良性组、恶性组患者的术后空腹血糖及餐后 2 h 血糖差异均有统计学意
义（P<0.05）。85 例肿瘤、39 例良性肿瘤、46 例恶性肿瘤的不同切除体积比与空腹血糖水平均呈正相
关（r 值分别为 0.80、0.85、0.77，P 均<0.01）。**结论：**手术前、后良性肿瘤与恶性肿瘤间血糖水平存在差
异，术后血糖水平与胰腺切除体积相关，且术后血糖水平与切除体积比呈线性正相关。

EPO-0934
双低对比剂联合能谱 CT 成像技术 在门静脉成像中的应用研究

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目的：探讨双低对比剂联合能谱 CT 成像技术在门静脉成像中的应用价值，并评价其辐射剂量。
方法：收集 2015 年 12 月～2016 年 2 月期间于我院行肝脏门静脉 CT 扫描的患者 72 例，均采用宝石能谱 CT 进行扫描。随机分为两组，A 组为双低对比剂联合单能量成像组，共 36 例；B 组为常规组，共 36 例。A 组使用低浓度对比剂碘克沙醇，浓度为 270mgI/ml，低对比剂总量（按 1.2ml/kg 计算）；采用能谱扫描模式，80kVp 和 140kVp 电压快速切换。B 组使用常规对比剂碘海醇，浓度为 350 mgI/ml，常规对比剂总量（按 1.5ml/kg 计算）；采用螺旋扫描模式，120kVp 混合能量。比较两组图像中门静脉主干的 CT 值、SNR、CNR 及噪声，通过这些客观参数来评价图像质量，由两名高年资放射科专家采用双盲法对图像质量进行主观评分，并比较两组图像的 CTDI、DLP 及 ED。对所得的数据使用 SPSS19.0 统计软件进行统计学分析。
结果：①A 组平均对比剂总量（84.43±11.17ml）明显低于 B 组（93.50±9.53ml），二者之间差异有统计学意义；②A 组门静脉 CT 值及 CNR（226.65±17.99Hu、5.83±1.64）显著高于 B 组（195.01±23.98Hu、4.00±1.64），差异有统计学意义；③A 组中 CTDI、DLP 及 ED（10.32±2.22mGy、264.54±57.44mGy.cm、4.50±0.98mSv）明显低于 B 组（CTDI、DLP 及 ED 分别为 13.20±2.35 mGy、363.89±75.40mGy.cm、6.19±1.28mSv），差异有统计学意义。
结论：在门静脉 CT 血管成像中，使用低总量、低浓度对比剂联合能谱 CT 单能量成像技术，在获得满足临床需求图像的同时，不仅有效的减少了对比剂的用量及提高图像的信噪比，还降低了辐射剂量，具有在临床广泛推广的价值。

EPO-0935
不同压缩感知加速因子对 3D mDIXON quant 序列测量胰腺体积的影响

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目的：探讨不同 CS 加速因子对胰腺体积的影响，并寻找最佳加速因子。
材料与方法：前瞻性纳入 10 名志愿者，男 4 名，女 6 名，平均年龄 24.91±1.64 岁；年龄范围 22-27 岁；平均体重指数 21.75±3.35kg/m^2；体重指数范围 17.71-28.73kg/m^2。所有志愿者行 3.0T 磁共振扫描仪（Ingenia CX，Best，The Netherlands）3D mDIXON quant 序列扫描。扫描参数为：FOV=375mm×300mm×168mm，TR=6ms，层厚= 5.0mm，层间距=2.5mm，加速因子参数分别设置为：SENSE=2、4，COMPRESSED SENSE=2、4、5、6。图像导入飞利浦 ISP(IntelliSpace Portal, Philips)工作站，测量胰腺体积。在胰头、胰体、胰尾和双侧竖脊肌的最大水平上放置 ROI，测量信号值和噪声。计算胰腺和竖脊肌的平均信号值及噪声值，计算其信噪比（SNR）和对比噪声比（CNR）。所有数据经 SPSS19.0 统计分析。采用 The Friedman 检验比较各组间的标准差、SNR、CNR 和胰腺体积的差异。P<0.05 被认为具有统计学意义。
结果：两组间 SD 值、SNR 值、CNR 值均无显著性差异（P>0.05）。采用六种加速因子：SENSE=2、4；COMPRESSED SENCE=2、4、5、6 所测得的胰腺体积（cm^3）分别为 61.3±8.5、59.5±8.4、59.3±7.6、58.9±9.8、59.5±8.7、61.3±7.8，各组间体积差异无统计学意义（P>0.05）。
结论：COMPRESSED SENCE=6 序列能保证图像质量，缩短扫描时间，是评估胰腺体积的最佳序列。

EPO-0936
双能量 CT 定量参数分析对胰腺占位性病变鉴别诊断的价值

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目的 探讨双能量 CT 增强标准化碘浓度、标准化 CT 值定量参数对胰腺癌、囊腺瘤、肿块型胰腺炎鉴别诊断的价值。 **方法** 筛选双能量 CT 增强扫描且经手术病理证实的胰腺占位性病例，共 30 例。其中胰腺癌 19 例，囊腺瘤（包括浆液性和粘液性囊腺瘤）6 例，肿块型胰腺炎 5 例。分别计算 NICnod 值（Normalized Iodine Concentration,标准化碘浓度）、标准化 CT 值，比较三种胰腺占位性病变的以上两个定量参数的差异。 **结果** （1）动脉期，胰腺癌、囊腺瘤、肿块型胰腺炎的 NICnod（标准化 CT 值）分别为：0.014±0.013（0.023±0.014）、0.161±0.021（0.106±0.023）、0.025±0.017（0.033±0.010）。胰腺癌与肿块型胰腺炎间 NICnod、标准化 CT 值差异均无统计学意义（*P*>0.05），胰腺癌与囊腺瘤、肿块型胰腺炎与囊腺瘤差异均匀统计学意义（*P 均*<0.05）。（2）静脉期胰腺癌、囊腺瘤、肿块型胰腺炎的 NICnod（标准化 CT 值）分别为：0.081±0.011（0.089±0.012）、0.633±0.165（0.559±0.132）、0.339±0.176（0.314±0.120）。三组间两两比较差异均有统计学意义（*P 均*<0.05）。三者强化程度分别为：囊腺瘤>肿块型胰腺炎>胰腺癌。 **结论** 双能量 CT 增强扫描静脉期 NICnod 及标准化 CT 值对胰腺癌、囊腺瘤、肿块型胰腺炎的诊断有一定价值，且三者强化程度由高到低为囊腺瘤>肿块型胰腺炎>胰腺癌。

EPO-0937
128 层螺旋 CT 结合结肠仿真内镜对结肠癌的诊断价值

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目的：探讨 128 层螺旋 CT 扫描结合仿真内镜后处理对结直肠癌的诊断价值。
方法：回顾性分析 45 例患者均行 CT 增强结合仿真内镜后处理检查，患者均行肠道准备及肠腔内注气后用 Definition AS+ 128 层螺旋 CT 进行扫描。行仰卧位及俯卧位各扫描一次，然后将扫描获得

的图像进行层厚 1mm 重建后传到后处理站，并应用后处理工作站 colon 软件进行图像后处理，来仔细观察病变的部位、形态、大小、侵犯范围、有无其它器官及淋巴结转移。
结果：45 例患者在 CT 仿真内镜检查中 40 例考虑为肿瘤性病变、3 例为正常、2 例为息肉，经手术病检结、直肠癌 42 例，炎症 3 例。42 例直肠癌分型为 17 例肿块型、10 例浸润型、 6 例溃疡型、9 例混合型。其中发现 4 例肝脏转移、36 例患者淋巴结转移。增强 CT 结合 CT 结肠仿真内镜检查对结直肠肿瘤的检出、定性及定位与手术病检比较准确率很高。
结论：多层螺旋 CT 结合仿真内镜对结直肠肿瘤的检出、定位、定性的准确率较高，CT 仿真内镜对观察病灶周围的侵犯情况及有无远处器官和淋巴结转移的情况有很大的优势，同时还可以了解肠腔内病变的形态及病变累及肠腔的长度。

EPO-0938
Blade 联合膈肌导航技术在上腹部 MRI 扫描中的应用价值

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[摘要] 目的：评价 blade 联合膈肌导航技术对上腹部 MRI 扫描运动伪影的校正和图像质量的影响。方法：采用 SEIMENS Avant 1.5T MRI 分别对 60 例行上腹部扫描患者同时行常规呼吸触发扫描和 blade 联合膈肌导航技术扫描，扫描前均嘱患者平静均匀呼吸，扫描参数除增加 blade 和膈肌导航外其他参数均完全相同，常规呼吸触发扫描时间为 2′ 45″，blade 联合膈肌导航技术扫描时间为 4′ 00″。扫描图像分别由两位高年资诊断医师对图像质量进行评价，通过比较分析观察 blade 联合膈肌导航技术对图像伪影的消除和对图像质量的影响。结果：blade 技术联合膈肌导航扫描的图像优良 53 例（88.3%）、图像一般 5 例（8.3%）、图像差 2 例（3.3%）；常规呼吸触发序列扫描的图像优良 41 例（68.3%）、图像一般 9 例（15.0%）、图像差 10 例（16.6%）；通过比较两种扫描方法的 P<0.05 ，差异有统计学意义。结论：blade 技术联合膈肌导航扫描能明显减少上腹部的运动伪影，改善图像质量，特别对于呼吸紊乱的患者作用较大，由于会增加扫描时间，可根据患者呼吸情况酌情采用。

EPO-0939
双能 CT 物质分离技术对大鼠肝脏铁沉积的量化评估

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目的：探讨双能 CT 物质分离技术对铁过载大鼠肝脏铁含量定量测量的准确性。方法：将 36 只 SPF 级 6 周龄大鼠分为 9 组，每组 4 只，自由进食进水。分别向腹腔内注射 1-8 次 200mg/kg 右旋糖酐铁（Sigma，100mg/kg），间隔一周，最后一周达到目标剂量 200、400、600、800、1000、1200、1400 和 1600mg/kg，余注射等量 0.9%的生理盐水。最后一次给药后一周，大麻醉状态下用双能 CT150KV/90KV 和 150KV/70KV 的管电压扫描大鼠肝脏，扫描完成后处死，取部分肝脏实质用电感耦合等离子体光谱仪法测定肝铁浓度。用西门子后处理软件测量虚拟肝铁浓度。分析 CT 虚拟肝铁浓度与以 ICP 为金标准测得的肝铁浓度的相关性。结果：①给药后大鼠肝脏有不同程度铁沉积，1000mg/kg 以上剂量组，大鼠铁沉积量与 100mg/kg 相近；②150KV/90KV 测得的虚拟铁浓度与 ICP 测得的铁浓度 R^2=0.846，150KV/70KV 测得的虚拟铁浓度与 ICP 测得的铁浓度 R^2=0.799。结论：①大鼠给药剂量为 1000mg/kg 为大鼠肝铁过载的阈值，达到最大吸收剂量；②不同管电压条件下拟合出的虚拟铁浓度曲线斜率不同；③高管电压对肝脏铁定量测量的准确性比低管电压的高。

EPO-0940
不同 b 值在评估食管癌同步放化疗疗效中的价值

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摘要
目的：利用不同 b 值的 ADC 值评价食管癌放化疗的疗效。**方法**：前瞻性分析我院行放化疗的食管癌患者 30 例。于放化疗前及放化疗结束后分别行常规 MRI 及多 b 值的 DWI 扫描，b 值选择为 500、800 和 0-1000 sec/mm²。测量并观察食管癌灶 ADC（ADC2max、ADC2min 及 ADC2mean） 值的变化，疗效根据 RECIST 标准评价。**结果**：30 例食管癌患者中，除 5 例未完成磁共振检查，3 例病灶无法测量外，其余 22 例食管癌患者完全缓解 13 例（59.1 %）、 部分缓解 9 例（40.9%）。放化疗后 ADC 值较放化疗前均升高。当 b=0-500 及 0-800sec/mm²时，治疗后病灶 ADC 值（ADC2max、ADC2min 及 ADC2mean）在不同疗效组间均存在显著差异（P < 0.05）。而当 b 值为 0-1000 sec/mm²时，病灶的 ADC 值在不同疗效组间均无显著差异（P > 0.05）。b 值区间(b=0-500 及 0-800sec/mm²),ADC 值（ADC2max 、ADC2min 及 ADC2mean）在预测食管癌放化疗疗效时的曲线下面积为 0.817 ~ 0.897。**结论**：b 值 0-500 sec/mm²、0-800 sec/mm²时 ADC 值均可准确、客观评价食管癌的放化疗效果，其中 b 值为 0-800 sec/mm²时 ADC 值可作为预测食管癌放化疗效果的较好指标。

EPO-0941
术前 GD-EOB-DTPA 增强 MRI 联合肝脏体积评估肝储备功能的研究

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目的：术前应用肝脏钆塞酸二钠（Gd-EOB-DTPA）增强 MR 联合肝脏体积的测量，探讨功能性参数对肝储备功能的预测及定量评估的价值，并尝试得到更优的肝储备功能的评价方法。
方法：前瞻性地收集我院肝局灶性病变并拟行手术治疗的患者 54 例。所有患者术前均行肝脏 Gd-EOB-DTPA 增强 MR、吲哚菁绿（ICG）试验，患者手术后 1 周行 Gd-EOB-DTPA 增强 MR。利用海信计算机辅助手术系统、PACS 系统、Siemens MapIt 后处理软件完成术前肝脏体积（LV）、术前平扫及肝胆期肝实质信号强度（SI_{pre}、SI_{pos}）、T_1弛豫时间（T_{1pre}、T_{1pos}）的测量。用于评估肝储备功能的功能性参数计算公式分别为：T_1减低率$\triangle T_1$=（T_{1pre}-T_{1pos}）/T_{1pre}、功能性肝体积 FV=LV×$\triangle T_1$、相对信号强度 RE=（SI_{pos}-SI_{pre}）/SI_{pre}、相对信号强度 RE×体积=RE×LV。模拟肝脏切除手术，计算模拟术后功能性参数；患者手术后，计算术后功能性参数。用 Spearman 相关性检验分析术前功能性参数(LV、$\triangle T_1$、FV、RE、RE×LV)与吲哚菁绿 15 min 滞留率(ICG-R15)的相关性，采用受试者工作特征曲线(ROC)分析各参数的诊断效能及最佳临界值；采用单因素方差分析比较模拟术后功能性参数与术后功能性参数的差异。
结果：ICG-R15 与 LV 无显著相关性(p>0.05)，ICG-R15 与$\triangle T_1$、FV、RE、RE/LV 呈显著负相关(r=-0.551、-0.673、-0.547、-0.648；p <0.05)，其中 FV 相关性最高；模拟术后功能性参数与术后功能性参数的差异无统计学意义（p >0.05）。
结论：术前肝脏 Gd-EOB-DTPA 增强 MR 联合肝脏体积测量能够用于预测及定量评估肝储备功能，其中△T1 结合 LV 是评估肝储备功能更有效的方法。

EPO-0942

A preliminary study of optimizing and translating ioversol-based ratiometric chemical exchange saturation transfer (CEST) MRI to a 3 T clinical scanner

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Objective—we attempt to translate ioversol-based ratiometric chemical exchange saturation transfer (CEST) MRI from high field to lower field strengths and establish quantitative liver tumors pH using a 3T MR scanner.
Materials and methods—Different schemes of radio frequency irradiation power were investigated for ioversol-based pH measurements at 3T . In-vitro MRI studies , the CEST sequence was applied to five tubes filled with 70-mM ioversol solutions with pH values ranging from 6.0 to 7.2. CEST effects were quantified with the asymmetric magnetization transfer ratio (MTRasym) at 4.3 ppm from the corrected Z-spectrum .Calibration curves for pH quantification were determined .a generalized ratiometric analysis was conducted by ratioing resolved ioverso CEST effects at 4.3ppm obtained with flip angle of 50° and 350° , respectively. In-vivo MRI studies , fifteen patients (four female, eleven male; age 58.6 ± 18.9 years) with recently diagnosed and confirmed hepatic carcinoma and two patients diagnosed hepatic hemangioma (two females; age 35.8 ± 13.4 years) were included in this prospective study. Patient with Liver tumors who had undergone a contrast-enhanced computed tomography (CT) scan with ioversol was performed on a clinical 3T MR scanner.
Results— In-vitro MRI studies ,We calculated the function equation between the CEST effects of ioversol and pH values, in the range of 6.0 to 7.2. In the patient with hepatic carcinoma, the average pHe value of the tumor was 6.84. Ioversol signal intensities in the tumor region of patients with hepatic carcinoma were attenuated but were not different in patients with hepatic hemangioma. The lesion size showed in the tumor PH imaging was slightly greater than that identified by conventional TWI2.Our study shows the feasibility of using CEST imaging with ioversol for pH mapping in vitro and in vivo at 3T.
Conclusions—An effective imaging protocol of the ioversol-based ratiometric CEST MRI was translated to a 3 T clinical scanner successfully. Furthermore, The extracellular pH (pHe) of liver tumor was measured, warranting future CEST PH MRI of patients to contribute to its diagnostic value.In summary,CEST PH MRI imaging may help distinguish benign from malignant tumors at 3 T clinical scanner.

EPO-0943

肝脏实质内异位脾脏的影像学特征分析

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目的：对肝脏内异位脾脏病例的 CT 及 MR 平扫及增强表现进行分析。**材料和方法：**回顾性分析 2010 年 1 月至 2019 年 6 月病理诊断为肝脏内异位脾脏的病例的 CT 及 MR 影像学资料，并进行对病灶、病灶包膜、相邻肝脏实质、脾窝处脾脏进行测值，并进行两两比较，增强后比较动脉与静脉期、静脉期与延迟期。**结果：**共搜集 3 例病人，5 个肝脏内病灶，其中男性 2 名，女性 1 名，年龄 37-52 岁，病灶大小为 16-41cm，其中一名既往有外伤后脾切除史，一名有胰体尾及脾脏切除手术病史，另一名无手术病史，三位患者正常脾脏均未见，但两名患者脾窝处有脾脏样结构。病灶均呈结节状，可见包膜结构，边界清晰。CT 增强及 MR 增强示，动脉期及门脉期病灶强化较肝脏明显，与包膜相比，病灶动脉期明显强化、延迟明显减低，延迟期包膜较肝脏强化明显。MR 平扫及 DWI 示，与肝脏相比，包膜 T1 信号稍低、T2 信号稍高，而与病灶相比，包膜 T2 信号减低、DWI 信号减低；与肝脏相比，病灶 T1 信号稍低、T2 信号明显增高、DWI 信号增高。**结论：**肝脏内异位脾脏呈结节状，均可见包膜结构，病灶与周围包膜、相邻肝实质相比，MR 平扫、CT 及 MR 增强、DWI 均有一定的影像学特点，对临床诊断有重要帮助。

EPO-0944
评价多模型 DWI 对肝细胞肝癌术前诊断及病理分级的应用价值

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目的 评估三种模型 DWI 的各参数分别对诊断肝细胞肝癌及其分级的价值。**方法** 前瞻性收集 2016 年 3 月～2018 年 8 月在本院肝胆外科住院的肝细胞肝癌患者 50 例，20 例健康者的肝脏作为对照组。对肝癌病理进行分级Ⅰ级（2 例）、Ⅱ级（25 例）、Ⅲ级（14 例）、Ⅳ级（9 例），将Ⅰ-Ⅱ归为高分化组，Ⅲ-Ⅳ为低分化组。采用 GE750 3.0T 磁共振，行常规 MRI 检查和多 b 值 DWI 扫描。将多 b 值 DWI 原始图像传入 ADW4.6 后处理工作站上对 DWI 图像进行后处理。分别获得单指数模型（Standard ADC）、双指数模型（D_{slow}、 D_{fast}、FF）和拉伸指数模型（DDC、α）各参数值。分别采用 *Mann-Whitney U* 检验比较正常肝脏与肝癌和采用 *Kruskal-Wallis H* 检验比较正常肝脏、肝癌Ⅰ-Ⅱ组与Ⅲ-Ⅳ组的各参数值之间差异。采用 *Pearson* 检验分析各参数值在肝癌分级间的相关性。采用 ROC 预测各参数值诊断肝癌及其分级的效能。**结果** 正常肝与肝癌、肝癌Ⅰ-Ⅱ组与Ⅲ-Ⅳ组之间的 Standard ADC、D_{slow}、FF、DDC、α 值存在差异，均有统计学意义（$P<0.05$），而 D_{fast} 无差异，无统计学意义（$P>0.05$）。通过 *Pearson* 检验得出 Standard ADC、D_{slow}、FF、DDC、α 值与肝癌分级呈负相关，相关系数依次为（-0.705，-0.798，-0.773，-0.797，-0.658，$P<0.05$）。通过 ROC 曲线分析各参数（Standard ADC、D_{slow}、FF、DDC、α）对肝癌的诊断效能均达到中等，其中 D_{slow} 诊断肝癌的 ROC 曲线下面积最大，为 0.891；其次为 DDC，AUC 为 0.851。**结论** 三种模型 DWI 均可用于评估肝癌及其分级的定量分析。其中双指数模型参数 Dslow 及拉伸指数模型参数 DDC 诊断肝癌及其分级时，能为临床提供重要诊断依据。

EPO-0945
肝腺瘤的 CT 表现

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目的 ：分析肝细胞腺瘤（HA）多排螺旋 CT 表现,提高其诊断准确性.方法 ：回顾性分析我院 2018 年 10 月～2019 年 5 月期间，14 例经手术或穿刺活检病理证实的肝细胞腺瘤的患者，行多排螺旋 CT 平扫和动态增强扫描。结果显示为：14 例患者均为单发肿块。平扫呈等密度 2 个,均匀略低密度

6 个,不均匀低密度 3 个,混杂密度 3 个。增强显示动脉期明显强化，门脉期持续强化，延迟期表现均匀或略高密度，可见有包膜

EPO-0946

Radiomic Analysis of Contrast-Enhanced CT Predicts Microvascular Invasion and Outcome in Hepatocellular Carcinoma

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Abstract
Background & Aims:
Microvascular invasion (MVI) impairs surgical outcomes in hepatocellular carcinoma (HCC) patients. As a single highly reliable factor to preoperatively predict MVI is lacking, we developed a computational approach integrating large-scale clinical and imaging modalities, especially radiomic features from contrast-enhanced CT, to predict MVI and clinical outcomes in HCC patients.
Methods:
In total, 495 surgically resected patients were retrospectively included. MVI-related radiomic scores (R-scores) were built from 7,260 radiomic features in six target volumes. Six R-scores, 15 clinical factors, and 12 radiographic scores were integrated into a predictive model, the Radiographic-Radiomic (RR) model, with multivariate logistic regression.
Results:
Radiomics related to tumor size and intratumoral inhomogeneity were the top-rankedMVI predicting features. The related R-scores showed significant differences according to MVI status ($p < 0.001$). Regression analysis identified 8 MVI risk factors, including 5 radiographic features and a R-score. The R-score (odds ratio [OR], 2.34) was less important than tumor capsule (OR, 5.12), tumor margin (OR, 4.20), and peritumoral enhancement (OR, 3.03). The RR model using these predictors achieved an area under curve (AUC) of 0.909 in training/validation and 0.889 in the test set. Progression-free survival (PFS) and overall survival (OS) were significantly different between the RR-predicted MVI-absent and MVI-present groups (median PFS: 49.5 vs. 12.9 months; median OS: 76.3 vs. 47.3 months). RR-computed MVI probability, histologic MVI, tumor size, and Edmondson-Steiner grade were independently associated with disease-specific recurrence and mortality.
Conclusions:
The computational approach integrating large-scale clinicoradiologic and radiomic features demonstrates good performance for successfully predicting MVI and disease clinical outcomes, but radiomics with current CT imaging analysis protocols do not provide statistically significant added value to radiographic scores.

EPO-0947
双能量 CT 虚拟平扫与真实平扫在急性胰腺炎影像中的初步对比研究

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目的：初步比较双源 CT 急性胰腺炎双能量虚拟平扫与真实平扫的图像质量差异。
方法：回顾性分析 32 例确诊急性胰腺炎患者(年龄 47±12 岁)的双能量 CT 胰腺动脉期、门脉期虚拟平扫图像与真实平扫（TNE）图像，比较三组图像中的胰腺 CT 值、图像噪声、胰腺信噪比、胰腺-竖脊肌对比噪声比、图像主观质量评分以及辐射剂量。
结果：动脉期 VNE、门脉期 VNE 和 TNE 三组图像中的胰腺 CT 值的差异无统计学意义（$P>0.05$）；三组中图像噪声、胰腺信噪比和胰腺-竖脊肌对比噪声比的差异有统计学意义（$P<0.05$），且动脉期 VNE 图像噪声最低，信噪比最高；三组图像主观质量评分均满足临床诊断，且评分 TNE＞动脉期 VNE＞门脉期 VNE（$P<0.05$）；采用动脉期 VNE 的总有效剂量（ED）和采用门脉期 VNE 的总 ED 均低于采用 TNE 的总 ED（$P=0.001$）。
结论：急性胰腺炎双能量虚拟平扫的图像质量接近于真实平扫，并且动脉期虚拟平扫图像质量优于门脉期，在临床胰腺三期增强扫描中可能替代真实平扫并且减少辐射剂量。

EPO-0948
基于低剂量 CT 的中重度肥胖患者脂肪肝与肝功能和 糖脂代谢的相关性分析

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目的：研究中重度肥胖患者非酒精性脂肪肝与肝功能、糖脂代谢指标的相关性
研究对象： 30 例中重度肥胖患者（平均 BMI 42.03±7.06kg/m2） 均进行低剂量多层螺旋 CT 扫描，计算肝脏 CT 值、脾脏 CT 值及肝脾 CT 比值。研究中重度肥胖患者脂肪肝分度情况，及其与 ALT、糖脂代谢指标的相关性。
结果： 30 例中重度肥胖患者中， 13 例无脂肪肝， 7 例轻度脂肪肝， 4 例中度脂肪肝， 6 例重度脂肪肝。 肝脏 CT 值与 ALT 负相关（r=-0.584， P=0.001），与 HOMAIR 负相关（-0.610，P=0.001）； 肝脾 CT 比值与 ALT 负相关（r=-0.616， P<0.001），与 TG 负相关（r=-0.385，P=0.035）。 男性肥胖患者患脂肪肝的比例显著高于女性（P<0.040）， 脂肪肝组的 TG（2.08±0.96 vs. 1.19±0.32， P=0.003）、 HOMAIR 水平显著高于非脂肪肝组（12.63±4.21 vs. 8.35±4.91， P=0.022）。
结论： 低剂量多层螺旋 CT 可用于评估中重度肥胖患者脂肪肝的情况，脂肪肝与肝功能异常、糖脂代谢紊乱有关。

EPO-0949

Diagnostic Performance of DWI for microvascular invasion of hepatocellular carcinoma: A Systematic Review and Meta-Analysis

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Purpose: To assess the diagnostic performance of diffusion-weighted imaging (DWI) for predicting microvascular invasion (MVI) of hepatocellular carcinoma (HCC).

Methods: A systematic literature search was performed in PubMed, EMBASE, Web of Science, China National Knowledge Infrastructure databases and The Cochrane Library. Two independent reviewers used the Quality Assessment of Diagnostic Accuracy Studies 2 tool to assess methodologic quality. Patient, study and MRI characteristics were extracted, and 2 × 2 tables were reconstructed to calculate the pooled sensitivity and specificity. Heterogeneity testing, meta-regression and sensitivity analyses were performed for heterogeneity exploration.

Results: Nine studies (934 patients with 973 HCCs) were included in the analysis. The pooled sensitivity and specificity of ADC values in predicting MVI were 0.77 (95% confidence interval [CI]: 0.73–0.81) and 0.66 (95% CI: (0.61–0.70), respectively. Potential heterogeneity was observed in sensitivity (I^2 = 67.2%) and specificity (I^2 = 78.5%) of ADC values among the studies. Meta-regression analyses did not find any factors that contributed significantly to the heterogeneity. IVIM-derived D values from three studies showed superior diagnostic performance, with the pooled sensitivity and specificity of 0.80 and 0.75, respectively.

Conclusion: Mono-exponential DWI had moderate diagnostic performance for the detection of MVI. IVIM-DWI was superior to mono-exponential DWI in assessing MVI and further studies may be needed.

EPO-0950

Differential Diagnosis of Bland and Neoplastic Portal Vein Thrombosis with Dual Energy Spectral CT

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PURPOSE

To investigate the value of dual energy spectral CT in differential diagnosis of neoplastic and bland portal vein thrombosis.

METHOD AND MATERIALS

68 cases of portal vein thrombosis (PVT) ,including 33 cases of bland PVT(BPVT) and 35 cases of neoplastic PVT(NPVT) were confirmed by following pathological experiments or diagnosed as having hepatitis B- or C-related cirrhosis, were analyzed retrospectively. All patients underwent dual phase contrast enhanced CT with dual energy spectral mode. For each case, the CT value on monochromatic images of 40～140keV, thrombus iodine concentration (I) and thrombus blood concentration (IB)in the portal venous phase(PVP)were measured, thrombus-aorta iodine concentrations ratio(IT/IA,NICA),and thrombus-PV iodine concentrations ratio(IT/IP ,NICP)were calculated and spectrum curve slope was calculated according to the formula: the slope=(CT40keV-CT70keV)/30. Data was compared with independent samples t-test. Sensitivity and specificity of the quantitative parameters were analyzed by receiver operating characteristic curve.
RESULTS
The CT40keV, CT70keV, the mean slope, I, IB and NICP of NPVT differed significantly from those of BPVT during PVP (P=0.007, P=0.012,P=0.007,P=0.005,P=0.009,P＜0.001,respectively).(Table1).NICA had no statistically significant during PVP (P=0.162). The CT threshold value, slope, I, IB and NICP had high sensitivity and specificity during PVP in differentiating NPVT from BPVT.
CONCLUSION
Dual energy spectral CT with the quantitative analysis of iodine concentration, the CT value and slope in the PVP may help increase the accuracy of differentiating neoplastic and bland of portal vein thrombosis.Differentiating the nature of the thrombus is of great clinical significance in determining the therapeutic approach, predicting survival, and assessing candidates for liver transplantation. Dual energy spectral CT may contribute to diagnosis of portal vein thrombosis preoperatively.

EPO-0951

能谱 CT 碘基值对胃癌分化程度的价值研究

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目的：探讨能谱 CT 碘基值对胃癌分化程度的应用价值。**方法：**收集 2016 年 1 月至 2018 年 12 月间，经我院病理证实为胃癌患者 47 例。所有患者均行能谱 CT 增强扫描，包括平扫、动脉期及静脉期，其中动脉期及静脉期采用 GSI 增强扫描模式，测量病灶的碘浓度以及计算标准化后的标准化碘浓度。采用独立样本 t 检验进行统计比较不同分化程度胃癌间的碘浓度及标准化碘浓度差异。**结果：**病理证实低分化胃癌 15 例，高中分化胃癌 32 例。静脉期的碘浓度及标准化碘浓度改变幅度高于动脉期。增强各期低分化胃癌均高于高中分化胃癌的碘浓度，其中动脉期分别为（15.99±0.36）（100 μg/ml）和（14.53±0.95）（100 μg/ml），静脉期分别为（24.11±0.53）（100 μg/ml）和（19.38±0.69）（100 μg/ml）。低分化胃癌的标准化碘浓度亦高于高中分化胃癌，其中动脉期分别为（0.20±0.02）和（0.16±0.02），静脉期分别为（0.71±0.01）和（0.47±0.02）。**结论：**胃癌的碘浓度和标准化碘浓度与其分化程度有一定相关性，对评估胃癌分化程度有一定的应用价值。

EPO-0952

基于多层螺旋 CT 影像学征象与原发性肝癌微血管侵犯相关性研究

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目的：探讨多层螺旋 CT 影像学征象与原发性肝癌微血管侵犯的相关性。
材料与方法：回顾性分析本院 2017 年 1 月至 2019 年 6 月经外科切除的 69 例（男 48 例，女 21 例，平均年龄 54.84 岁，年龄范围 32-82 岁）孤立性原发性肝癌患者 CT 及临床资料，根据病理结果将其分为微血管侵犯组和非微血管侵犯组，采用 Kolmogorov-smimov 和 levene 检验对两组各指标进行正态分布和方差齐性检验，采用独立样本 t 检验比较两组患者的年龄、甲胎蛋白(AFP)水平及肿瘤最大直径，采用 x 2 检验比较两组患者的性别、乙肝表面抗原、肝功能分级、肿瘤边缘、瘤周异常强化、瘤内动脉、低密度晕环、肿瘤是否贴近肝包膜。
结果：微血管侵犯 39 例，非微血管侵犯 30 例，两组间肿瘤的最大直径、肿瘤边缘是否光滑、瘤内动脉、瘤周异常强化具有统计学意义，P 值分别为 0.004、0.017、0.035、0.002；而两组在年龄、性别、乙肝表面抗原、肝功能分级、AFP 水平、低密度晕环、肿瘤是否贴近肝包膜比较，差异无统计学意义(P >0.05)。
结论：多层螺旋 CT 影像学征象与肝癌微血管侵犯具有一定相关性。

EPO-0953
初步评价 T1 Mapping 技术在肝纤维化病变分期中的应用价值

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目的 初步评价 T1Mapping 技术在肝纤维化病变分期中的临床应用价值。**方法** 收集经病理证实为肝纤维化或临床证实为肝硬化的患者 36 例，男 23 例，女 13 例，年龄 45 ～80 岁，中位年龄 57 岁；选取 15 例健康志愿者，男 9 例，女 6 例，年龄 29 ～59 岁，中位年龄 45 岁。 应用西门子 3.0T skyra 扫描仪，采用头先进仰卧位屏气下双翻转角 VIBE 序列扫描，由两名观察者分别在肝 S4、S6、S7 处分别取三个相等大小 ROI 独立测量 T1 Mapping 值并取其平均值，通过方差分析及 t 检验比较 T1Mapping 值在肝纤维化患者组及正常健康人组的组内及组间差异。 **结果** T1 Mapping 值在肝纤维化病人组与正常健康人组间存在显著差异（P＜0.05），重复测量方差分析显示组内、组间差异分别为 0.445、0.023，且随着肝硬化的进展，T1 Mapping 值有逐渐升高的趋势。T1 Mapping 值在诊断肝纤维化及肝纤维化分级中存在统计学差异。 **结论** T1 Mapping 技术可以作为无创性的磁共振新技术，较早且准确地反映肝纤维化过程中病理生理改变及组织微观结构的变化，且能作为肝纤维化动态变化过程的监测。

EPO-0954
肝脏弥散峰度成像（DKI）的直方图分析对于同种异体肝移植术后出现急性排斥反应的预测价值

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背景：同种异体肝移植术后患者发生急性排斥反应最常见于术后 6 周之内，临床上可以表现为无其他诱因的血清胆红素和肝酶进行性升高，典型的组织病理学表现包括汇管区淋巴细胞和嗜酸性粒细胞浸润、小胆管上皮变性以及静脉内皮炎，早期诊断和及时激素冲击治疗对于出现急性排斥反应患者的预后至关重要，目前磁共振成像对于肝移植术后急性排斥反应的诊断意义尚未明确。
目的：通过对比经病理证实的术后急性排斥患者和其他原因（胆管/血管并发症、药物不良反应）导致的术后肝功能异常患者的肝脏 DKI 的直方图分析结果评价其对于肝移植术后急性排斥反应的预测价值。
材料和方法：本研究为回顾性分析。病例组为 2014 年 3 月至 2019 年 1 月期间肝移植术后因肝功能异常行穿刺病理确诊为急性排斥反应且穿刺前后 1 周之内行 DKI 检查的 24 例患者，对照组为同时期术后因肝功能异常行穿刺病理确诊为非急性排斥反应且穿刺前后 1 周之内行 DKI 检查的 27 例患者。两组患者间年龄、性别、胆红素水平、肝酶水平（ALT、AST）和距离手术时间均无显著性差异，均使用同一台 3.0T 磁共振机器扫描且 DKI 扫描参数一致。通过 MatLab 后处理软件分析得到全肝组织的 D 值、K 值和 ADC 值的直方图并得到各自的平均值、中位数、偏度、峰度以及第 5、25、50、75、95 百分位数。通过 SPSS 软件利用单因素方差分析（One-way ANOVA）或 K-W 检验比较两组间各参数的差异并绘制具有显著性差异的参数 ROC 曲线评估诊断效能。
结果：急性排斥组 D 值和 ADC 值的平均值、中位数和各百分位数值均显著高于对照组（P=0.001-0.026）,K 值的平均值、中位数和第 25、50、75 百分位数均显著低于对照组（P=0.010-0.035），所有参数中，K 值的第 50 百分位数 AUC 最大（0.886）。
结论：肝脏 DKI 直方图分析结果可以作为肝移植术后急性排斥反应

EPO-0955

肝脏双源双能量 CT 成像中对比剂适宜碘剂量探讨

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目的 探讨双源双能量 CT（DSDECT）80-kVp 及模拟 120-kVp 图像中，肝脏强化程度达 50HU 时，基于体表面积（BSA）或去脂体质量（LBW）确定的对比剂碘剂量。**方法** 200 例患者行肝脏双源 CT 双能量增强扫描,对比剂碘剂量 17.1gI/m^2 BSA，注射时间 25s。在 PACS 系统结合自动跟踪及 ROI 复制功能，测量平扫、80-kVp 及模拟 120-kVp 图像中主动脉及肝脏的 CT 值。计算门静脉期每克碘肝脏强化程度（ΔHU/gI）、基于 BSA 和 LBW 调整的最高肝脏强化程度（MHE；MHE_{BSA}=ΔHU/gI/m^2；MHE_{LBW}=ΔHU/mgI/kg）、肝脏的估计强化值（EEV）。ΔHU/gI 与 BSA 和 LBW 之间的关系采用回归分析，相关系数的比较采用 Steiger's Z 检验。肝脏 EEV 之间的变异程度，采用 Levene 检验比较平均绝对离差值。 **结果** 80-kVp 的 MHE_{BSA} 和 MHE_{LBW} 均值分别为 5.3322 HU/(gI/m^2)、0.1535 HU/(mgI/kg)；模拟 120-kVp 的 MHE_{BSA} 和 MHE_{LBW} 均值分别为 3.0786 HU/(gI/m^2)、0.0887 HU/(mgI/kg)。ΔHU/gI 与 BSA 和 LBW 的相关系数，80-kVp 分别为 0.726、0.711（P>0.05），模拟 120-kVp 分别为 0.657、0.629（P>0.05）。每一系列图像内，ΔHU/gI 与 BSA 或 LBW 与呈负相关，R_{BSA} 与 R_{LBW} 差异没有统计学意义（P>0.05）；基于 BSA 与 LBW 的 EEV 平均绝对离差值之间，差异没有统计学意义（P>0.05）。**结论** 肝脏 DSDECT 增强扫描中，可以根据 BSA 或 LBW 调整碘剂量；肝脏强化程度达 50HU 所需的碘剂量，80-kVp 为 9.5 gI/m^2 BSA 或 333 mgI/kg LBW，模拟 120-kVp 为 16.5 gI/m^2 BSA 或 572 mgI/kg LBW。

EPO-0956

The value of intravoxel incoherent motion (IVIM) in detecting and staging liver fibrosis: a systematic review and meta-analysis

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Purpose
To evaluate the diagnostic performance of intravoxel incoherent motion (IVIM) in detecting and staging liver fibrosis (LF).

Material and methods
A comprehensive literature search was conducted to identify studies on the diagnostic accuracy of IVIM for the assessment of histology-proven LF. The degrees of LF were defined as F0 (no fibrosis), F1 (portal fibrosis without septa), F2 (periportal fibrosis with few septa), F3 (septal fibrosis) and F4 (cirrhosis), according to METAVIR scoring system. Data were extracted to calculate the pooled sensitivity, specificity, positive and negative likelihood ratios, as well as the area under the summary receiver operating characteristic curve (AUC) in each group.

Results
10 studies with 679 subjects were included in this meta-analysis. The pooled sensitivity, specificity, positive likelihood ratio and negative likelihood ratio were estimated to be 0.77 (95% confidence interval: 0.71-0.83), 0.82 (0.74-0.87), 3.99(1.89-8.41) and 0.33 (0.18-0.60) for ≥F1 detection with IVIM; 0.87 (0.82-0.91), 0.77 (0.71-0.83), 3.51 (2.16-5.71) and 0.18 (0.09-0.37) for ≥F2 detection; 0.86 (0.79-0.92), 0.84 (0.78-0.90), 5.33 (3.69-7.71) and 0.20 (0.06-0.63) for ≥F3 detection, and 0.85 (0.79-0.91), 0.78 (0.73-0.82), 3.56 (2.49-5.09) and 0.22 (0.11-0.44) for ≥F4 detection, respectively. The AUCs for ≥F1, ≥F2, ≥F3, ≥F4 detection were 0.86(0.79-0.94), 0.90(0.86-0.94), 0.90(0.88-0.93) and 0.89(0.87-0.93), respectively. Substantial heterogeneity was observed. No publication bias was detected.

Conclusion
IVIM shows high diagnostic accuracy in detecting and staging LF and may serve as a noninvasive tool for LF evaluation.

EPO-0957

肝结核的 MSCT 表现与影像分型

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【摘要】：目的 探讨肝结核 MSCT 表现及其影像分型，减少肝结核 CT 漏诊率。**方法** 回顾性分析 2006-2019 年本院确诊 28 例肝结核患者 MSCT 影像学特点，并结合文献报道进行初步影像分型。**结果** 包膜型肝结核 15 例，CT 表现为肝包膜增厚，环状强化；结核性肝脓肿 4 例，CT 表现为肝脏低密度区，环状强化或无强化；肝结核瘤 5 例，CT 表现为 30mm 以下低密度结节，明显均匀强化

或环状强化或不强化；混合型肝结核 2 例，CT 表现为肝包膜和肝实质同时受累；粟粒型肝结核 2 例，CT 表现肝内多发低密度小结节，动脉期轻度不均匀边缘强化，静脉期仍呈低密度。本组 28 例中合并肺结核 14 例，脊柱结核 1 例，盆腔结核 2 例,胸膜结核 2 例。**结论** 肝结核 CT 表现可以分为 5 型，包膜型具有影像特征，其余类型无特征性，容易误诊，结合肝外病史，有助于肝结核的诊断。

EPO-0958

3.0T 磁共振 T1-mapping 成像及弥散加权成像（DWI）对肝脏血管瘤及囊肿的鉴别诊断价值

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目的：探讨磁共振 T1-mapping 成像及弥散加权成像（DWI）对肝脏血管瘤及肝囊肿的鉴别诊断价值。
方法：搜集 80 个病人的肝脏 125 个 T2WI 高亮病灶（血管瘤 65 个，肝囊肿 60 个），病灶短径均大于 8mm。肝血管瘤诊断标准为：（1）T2WI 高亮信号；（2）DWI（b=1200 s/mm^2）高信号；（3）动态增强呈典型“早进晚出”表现，肝囊肿诊断标准为：（1）T2WI 高亮信号；（2）DWI（b=1200 s/mm^2）低信号；（3）动态增强无强化。应用 Siemens Skyra 3.0T 磁共振进行扫描，T1-mapping 序列包括 B1 场校准序列（扫描时间 10s）和双翻转角(3°、15°)VIBE 序列（扫描时间 18s），T1-mapping 伪彩图自动计算生成。分别测量病灶 T1 值及 ADC 值，应用 ROC 曲线对 T1 值及 ADC 值进行分析，并对 T1 值及 ADC 值进行相关性（ICC）分析。
结果：在 3.0T 磁共振中肝脏血管瘤（1670.7±320 ms）的 T1 值明显低于肝囊肿（2599.5±450 ms）T1 值（p<0.001），ROC 诊断界值为 1580ms 时，肝脏血管瘤的诊断敏感性及特异性为 88.1%、86.5%。在 3.0T 磁共振中肝血管瘤（1.587±0.67）的 ADC 值（×10^{-3} mm^2/s）明显低于肝囊肿（2.613±0.56）ADC 值（p<0.001），ROC 诊断界值为 1.492×10^{-3} mm^2/s 时，肝血管瘤的诊断敏感性及特异性为 85.2%、87.3%。T1 值及 ADC 值对鉴别肝血管瘤及肝囊肿具有很高一致性（ICC=0.965）。
结论：对于肝脏 T2WI 高量信号病变的磁共振诊断，磁共振 DWI 成像是动态增强技术之外的最重要诊断方法之一，T1-mapping 技术具有扫描时间短、可定量等优点，能弥补 DWI 成像对肝血管瘤及肝囊肿鉴别诊断的部分不足，并可避免不必要的增强对比剂使用，具有重要的潜在临床应用价值。

EPO-0959

肝脏血管平滑肌脂肪瘤的 CT 和 MRI 影像表现

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目的 探讨肝脏血管平滑肌脂肪瘤（hepatic angiomyolipoma， HAML）的 CT 和 MRI 影像学特征，提高对该病的认识。方法 回顾性分析本院 2013-2019 年经手术病理证实的 18 例 HAML 患者的临床及影像学资料。其中 14 例行双期增强 CT 检查，4 例同时行增强 CT 及 MRI 检查。结果 18 例 HAML 患者男性 2 例，女性 16 例，年龄 32～61 岁。18 例患者均无肝硬化背景，AFP 均为阴性。18 例均为肝脏单发病变，边界清楚，位于肝右叶 11 例，肝左叶 6 例，同时位于右叶及尾叶 1 例，肿瘤最大径范围约 3cm～22cm。CT 平扫呈稍低密度，6 例密度均匀，12 例密度不均，内可见低密度囊变区，其中 8 例内可见脂肪密度影，1 例内可见稍高出血密度影；MRI 平扫 2 例呈 T1WI 低信号、

T2WI 高信号影，1 例内见短 T1 短 T2 出血信号影，1 例内见稍短 T1 长 T2 信号，压脂信号减低；增强扫描 10 例呈“快进快出”强化方式，8 例呈“快进慢出”强化方式；8 例病灶内或周边可见网状、粗大或畸形血管影，6 例可见连续或不连续“假包膜”结构。结论 HAML 的 CT 和 MRI 影像学表现具有一定的特征性，了解这些征象有助于提高该病术前诊断的准确性。

EPO-0960
Assessing Portal Flow using Four-dimensional Flow MRI in Healthy Volunteers - A Reproducibility Study

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Purpose: To evaluate the reproducibility of four-dimensional (4D) flow MRI as a noninvasive imaging tool for portal vein flow quantification.
Materials and Methods: Ten healthy subjects were prospectively enrolled for MR exam at 3.0 T (Ingenia CX, Philips Healthcare, the Netherlands) with a 16-channel abdominal array coil. The MR protocol included a 2D quantitative flow measurement (axial, TR/TE = 4.4/2.7 ms, FOV = 200×200 mm^2, resolution = 1.5×1.5×8 mm^3, PC direction = RL, PC velocity = 200 cm/s, scan time = 13 s) to measure the flow velocity in portal vein as a reference for velocity encodings (VENC) and a 4Dflow sequence with compressed sensing (CS) acceleration (axial, TR/TE = 5.0/3.2 ms, FOV = 300×350 mm^2, resolution = 2.5×2.5×2.5 mm^3, PC direction = RL-AP-FH, CS =8, scan time = 370 s) for hemodynamics quantification. VENC was set to 30 cm/s for the 4D flow sequence to slightly surpass the measured velocity and avoid phase wrapping. The acquired images were processed in CVI42 (Canada Circle Cardiovascular Imaging) by a single radiologist to obtain a 3D angiogram. Three planes placed at the proximal, middle and distal of the main portal venous to measure the flow velocity(cm/s), volume rate (ml/cardiac cycle), axial-wall shear stress (axial-WSS, Pa). The intra-class correlation coefficients(ICC)was used to check the consistency of the data measured by the two observers.
Results: Measurements from the two observers matched well with each other (Table 1, ICC value > 0. 75), and all the measured parameters remained relatively consistent among the healthy volunteers with a reasonable standard deviation.
Conclusion: The consistent flow velocity measurements among different healthy volunteers have indicated 4D flow MRI a reliable tool to quantify the portal system flow velocity.

EPO-0961
动态增强 CT 在腹腔间质瘤和神经内分泌瘤鉴别诊断的应用价值

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目的 探讨动态增强 CT 在腹腔间质瘤和神经内分泌瘤鉴别诊断中的应用价值。**资料与方法** 回顾性分析经病理或免疫组化证实 30 例间质瘤及 30 例神经内分泌瘤的临床及 CT 动态增强检查资料

并测量其各期 CT 值；采用 Spss17.0 软件进行统计学分析，同一种肿瘤增强各期 CT 值的比较使用单因素方差分析，两种肿瘤同期两两比较，均采用 t 检验，P<0.05 为差异有统计学意义。**结果** （1）间质瘤三期比较：静脉期 CT 平均值>动脉期 CT 平均值，延迟期 CT 平均值>动脉期 CT 平均值，均有统计学意义，静脉期 CT 平均值与延迟期 CT 平均值的比较无统计学意义。（2）神经内分泌瘤各期之间 CT 值差别无统计学差异，强化方式多样。（3）神经内分泌瘤在三期的 CT 值均高于间质瘤。 **结论** 间质瘤三期强化特点为持续强化为主，延迟期可以出现持平或下降，神经内分泌瘤在各期的 CT 值均高于间质瘤，这些 CT 特点在腹腔间质瘤和神经内分泌瘤鉴别诊断中有一定的应用价值。

EPO-0962
罕见病例：宫内节育器移位至盆腔引起绞窄性小肠梗阻 1 例

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病例：女，48 岁。因“下腹痛伴肛门排气、排便减少 10 小时”入院。查体下腹部压痛明显，无明显反跳痛及肌卫。肠鸣音 8-10 次/分。WBC：9.85*10↑。
CT 平扫：盆腔内一段小肠肠管疝入环形致密影内并嵌顿，周边数段小肠扩张伴积液，考虑盆腔内异物（节育环）伴小肠疝入、嵌顿及绞窄性肠梗阻。剖腹探查术，探查到腹腔内少量淡血性渗液，小肠扩张明显，子宫后壁上嵌一金属节育环，距回盲部约 50cm 处一段回肠卡入节育环内，嵌顿小肠段约 10cm，肠壁暗红。遂进行腹腔异物取出和肠梗阻松懈术，用热生理盐水纱布热敷肠段五分钟后，观察肠段颜色逐渐好转。将剪断的金属节育环从子宫壁上抽出，观察子宫壁无明显出血。结合手术诊断为节育环伴小肠梗阻。
讨论：宫内节育器（IUD）对全身干扰较少，具有安全、有效、经济等优点，是最常用的节育用具之一。采用节育环避孕者在我国占 40%以上。但由于很多原因，在放置 IUD 短时或数年后会出现并发症。宫内节育器部分或全部嵌入肌层，或异位于子宫阔韧带、腹盆腔等处，称为宫内节育器移位，常见原因有 IUD 压迫子宫壁、流产后或足月产后即放置 IUD 等多种，此外，IUD 移位还与子宫、膀胱收缩及内脏蠕动有关。我国节育器移位以位置下移或嵌入子宫肌层多见，移位至腹盆腔并引起小肠套入其中导致绞窄性肠梗阻在临床中极为罕见。该患者入院时有肠梗阻的典型临床表现，通过全腹部 CT 扫描及重建发现盆腔内有环形金属异物且伴有小肠套入，引起肠梗阻。问病史，患者于 20 年前放置节育环。M 等认为 CT 能敏感地发现 IUD 移位导致的内脏穿孔、腹腔脓肿、肠梗阻等并发症，规划最佳的手术方法。此较病例正是应用 CT 扫描发现宫内育环的移位并通过急诊手术成功治疗。为了防止 IUD 移位的发生，首先要加强对医务人员的技术培训，对于放置 IUD 的妇女应定期体检确认环位正常，对于已经绝育的妇女建议取出节育环。一旦发现节育移位，应及时取出。

EPO-0963
磁共振弥散加权成像与 CT 对急性胰腺炎严重程度的分级评估

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【摘 要】目的：探讨磁共振弥散加权成像（DWI）与 CT 在急性胰腺炎（AP）严重程度分级诊断中的价值。回顾性分析我院收治的 54 例急性胰腺炎患者的临床、含有 DWI 的 MRI、CT 资料。采用 MRI 严重指数（MRSI）、CT 严重指数（MCTSI）与临床的 Ranson 评分进行对照，比较两种指数与临床诊断的符合率；测量各级炎症胰腺的 ADC 值，应用单因素方差分析（ANOVA）对各级别 AP 之间的

ADC 值进行统计学分析。**结果：**在判断急性胰腺炎严重程度 的分级诊断符合率方面 MRSI（89.5% ，17/19）高于 MCTSI（78.5% ，15/19）， 但是两者符合率差异也没有统计学意义（x^2=0.198，P=0.656））。A、B、C、D、 E 级 AP 的平均 ADC 值分别为(1.120±0.015)、(1.185 ±0.165)、(1.410 ±0.123)、(1.450±0.168) 、(1.830±0.540)×10^{-3} mm^2 /s。A、B 级 AP 的 ADC 值低于 E 级，但差异没有统计学意义(P 值＞0.05) ，D、E 级之间的 ADC 值差异无统计学意义(P 值均 ＞0.05) 。**结论：**MRI 与 CT 在评价急性胰腺炎严重程度方面具有一致性，但磁共振 DWI 成像有利于 Balthazar 中 A、B 、C 级 AP 的早期诊断。

EPO-0964
扩散峰度成像 DKI 对正常肝脏左右叶差异的研究

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目的 部分肝脏病变发生部位具有特异性，不同肝叶间是否具有结构及功能差异不得而知。DKI 是观察组织微观结构、反应细胞密度的重要手段，以往较多应用于中枢神经系统，近年来逐渐应用肝脏，了解正常肝脏 DKI 参数特征是将其应用于病变评估的前提。本课题探究 DKI 在肝脏的稳定性及重复性，应用 DKI 技术评估健康成年人肝脏各叶段是否存在差异。**方法** 32 名健康志愿者纳入本研究，采用 GE 3.0T 磁共振行两次 DKI 扫描，间隔时间为两周。利用 Glisson 系统分段法将肝脏分为八个肝段，分别测量各肝段的 Md、Mk、FAK、Ka、Kr、Da、Dr 等参数。应用统计学软件 SPSS22 对数据进行处理，通过 Bland-Altman 图分析同一测量者两次测得的数据的重复性；比较 S1-S8 段的各参数的分布特征及各参数均值在肝段间的具体差异，进一步评估肝叶的差异；检验各个参数之间是否有相关性。**结果** 除 FAk 外两次测量的各参数具有良好的一致性；肝左外叶下段（S3）及肝右叶前叶下段（S5）重复性最好（ICC=0.9429、0.8772），而肝右前叶上段（S8）重复性最差（ICC=0.8599）。 肝尾状叶（S_1）与左叶（S_{2-4}）各个参数值均不具有统计学差异（P>0.05）所以后期将肝尾状叶与肝左叶参数合并处理。除 FAk 外，肝左右叶其余参数均存在统计学差异(P<0.05)。Mk 与 Md 呈负相关，Mk 与 Ka、Kr 呈正相关，Md 与 Da、Dr 呈正相关，FAk 与其他参数之间未发现明确相关性（r<0.3）。**结论** 研究表明 DKI 在肝脏内具有良好的重复性；除 FAk 之外，DKI 其余各参数在肝左、右叶存在差异，提示肝各段叶水分子扩散受限程度不同，推测参数结果一方面受位置的影响，另一方面肝叶段本身存在微观结构或灌注差异。

EPO-0965
下腔静脉造影检查在布加综合征患者下腔静脉阻塞端形态与下腔静脉阻塞端钙化相关性研究中的应用价值

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目的 探讨下腔静脉造影检查在布加综合征（BCS）患者下腔静脉阻塞端形态与下腔静脉阻塞端钙化相关性研究中的应用价值。
方法 采用回顾性队列研究方法。收集 2009 年 1 月至 2016 年 12 月徐州医科大学附属医院收治的 41 例患者的临床资料；男 29 例，女 12 例；年龄为（53± 10）岁，年龄范围为 34～70 岁。41 例 BCS 患者均行 CT 平扫及下腔静脉 CT 造影检查，于 2 周内行数字减影血管造影（DSA）检查及介入治疗。观察指标：（1）患者下腔静脉阻塞端钙化情况：是否存在钙化，钙化位置、形态、分布 。

（2）下腔静脉阻塞端形态与下腔静脉阻塞端钙化之间的相关性。采用似然比检验分析下腔静脉阻塞端形态与下腔静脉阻塞端钙化之间的相关性。
结果（1）BCS 患者下腔静脉阻塞端钙化情况：41 例患者中，24 例检测到下腔静脉阻塞端钙化。其中，17 例为下腔静脉阻塞远端钙化，4 例为下腔静脉阻塞近端钙化，3 例为下腔静脉阻塞远端及近端均钙化。钙化灶形态多样，呈点状、不规则状等，呈散在、簇状及弥漫性分布。（2）下腔静脉阻塞端形态与下腔静脉阻塞端钙化之间的相关性：41 例患者中，24 例存在下腔静脉阻塞端钙化，其中 7 例阻塞端呈锥形，13 例阻塞端呈圆顶形，4 例阻塞端呈平顶形。统计学结果显示：下腔静脉阻塞端形态与阻塞端钙化的存在具有相关性（G =9.293，P<0.05）。
结论 BCS 患者下腔静脉阻塞端形态与阻塞端钙化具有相关性。利用 CT 技术评估下腔静脉阻塞端钙化情况对术前预估下腔静脉阻塞端形态及术中介入引导具有重要意义。

EPO-0966
肝泡球蚴病 MR 扩散成像与组织病理特点的对照分析

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目的：应用 MR 扩散成像技术（diffusion-weighted imaging ,DWI）观察肝泡球蚴病（hepatic alveolar echinococcosis, HAE）的影像特征，并分析病灶内不同区域 MR-DWI 参数 ADC 值与组织病理学指标的关系，探讨 ADC 值在评价 HAE 病变组织病理特征方面的价值。**方法：**26 例 HAE 患者行肝脏常规 MR 扫描并加做 MR-DWI 扫描序列，获得病灶中心、边缘区域及周围肝脏组织的 ADC 值，并与周围正常肝脏的 ADC 值进行比较；其中 19 例患者行手术治疗者，观察新鲜手术标本的特点，取病灶边缘区域行 HE 染色和免疫组化测定微血管密度（MVD），分析 DWI-ADC 值与 MVD 的相关性。**结果：**26 例中选取独立 HAE 病灶 32 个，测得病灶中心、病灶边缘区域及周围肝脏组织的 ADC 值的均值之间的差异均有统计学意义(P＜0.05)；组织病理观察提示病灶内不同成分表现不同的 DWI 图像；19 例手术者病灶边缘区域 MR-DWI ADC 值与 MVD 无相关性(P＜0.05)；**结论：**MR-DWI 图像可以反映 HAE 病灶的组织异型性特征，并有助于判别病灶生物学特点；病灶边缘区域的 ADC 值与该区域微血管密度（MVD）无相关性。

EPO-0967
肝脏遗传性毛细血管扩张症的 CT 表现

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目的：探讨肝脏遗传性出血性毛细血管扩张症的 CT 表现。方法：回顾性分析经临床证实的肝脏遗传性毛细血管扩张症的 CT 表现，并对国内外相关文献复习。结果：27 例肝脏遗传性毛细血管扩张症患者，CT 表现如下：①21 例毛细血管扩张，表现为动脉期肝实质内弥漫分布结节状强化灶，门静脉期和延迟期呈等密度；②20 例肝动静脉畸形，动脉期肝实质强化不均，其内弥漫分布点状、结节状、斑片状强化灶，肝动脉增粗迂曲，肝静脉早显；③12 例肝动静脉瘘，肝动脉增粗迂曲，肝静脉增粗早显，肝实质内弥漫分布点状、结节状强化灶；④19 例肝动脉-门静脉瘘，肝动脉增粗迂曲，门静脉增粗早显；⑤4 例混合型动静脉瘘，同时伴有肝动静脉瘘和肝动脉-门静脉瘘特点；⑥6 例门静脉-肝静脉瘘，门静脉及其分支增粗，肝静脉早显。结论：肝脏遗传性毛细血管扩张症的 CT 多期增强表现具有特征性。

EPO-0968
基于磁共振扩散加权成像评价肝泡状棘球蚴病肝脏功能的初步研究

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目的：探讨扩散加权成像（Diffusion weighted imaging DWI）及表观扩散系数值（Apparent diffusion coefficient ADC）在评价肝泡状棘球蚴病（Hepatic Alveolar Echinococcosis HAE）肝脏功能的应用价值。**方法**：回顾性分析 68 患者及 30 健康志愿者，均行肝脏常规 MRI 和 DWI，b 值为 0 和 600s/mm^2，根据 Child-Pugh 分级标准将病例组分为 3 组，A 组共 45 例，B 组共 19 例，C 组共 4 例，测量正常肝实质内的 ADC 值，并以同层面椎管内脑脊液的 $ADC_{椎管}$进行标准化处理即 $ADC_{比值}$=ADC/ $ADC_{椎管}$；首先分析病例组 $ADC_{比值}$与 Child-Pugh 评分的相关性；其次对照组与病例组采用独立样本 t 检验，病例组组间采用单因素方差分析。**结果**：正常对照组 $ADC_{比值}$为 0.29±0.03；病例组 $ADC_{比值}$为 0.27±0.05；病例组 A 组的 $ADC_{比值}$是 0.28±0.05；B 组 $ADC_{比值}$是 0.25±0.04；C 组 $ADC_{比值}$是 0.21±0.02；病例组 ADC 值与 Child-Pugh 评分呈中度相关，r=0.432(P<0.01)；正常组与病例组间差异有统计学意义（P<0.01），病例组 A 组与 B 组、A 组与 C 组间差异均有统计学意义（P<0.01），病例组 B 组与 C 组间差异无统计学意义（P>0.05）。**结论**：ADC 值有望评估肝泡状棘球蚴病的肝脏功能，并且随着肝脏功能的下降。

EPO-0969
定量 MRI 评价肝泡型包虫病肝储备功能的初步探讨

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目的 探讨磁共振 T1mapping、T2mapping 成像定量评价肝脏泡型包虫病残肝功能的临床应用价值。**方法** 收集我院行磁共振常规序列、T1maping 及 T2maping 序列检查病例，共 56 例，患者平均年龄 48±7 岁，分成两组（正常对照组、病例组），对照组纳入 20 例正常志愿者，男性 10 名，女性 10 名，病例组纳入 36 例经临床综合诊断肝泡型包虫病的患者，男性 17 名，女性 19 名，扫描前病例组均有抽取静脉血行肝功能测定，然后根据肝功能 Child-Pugh 评分分级再次进行分组，分为 A（n=14）、B（n=12）、C（n=10）三组，扫描完成后的图像传输至西门子后处理工作站进行测量病例组残肝实质及正常对照组肝实质 T1mapping 序列的 T1 值及 T2mapping 序列的 T2 值。采用方差分析两两比较四组间 T1、T2 值。**结果** 对照组 T1 值为 338.9±95.6ms，T2 值为 42.7±3.1ms；A 组 T1 值为 393.47±158ms，T2 值为 43.74±5.3ms；B 组 T1 值为 351.5±84.7ms，T2 值为 57.85±7.7ms；C 组 T1 值为 460.9±76.0ms，T2 值为 65.9±3.0ms。各组 T1 值两两比较差异均无统计学意义（P＞0.05），T2 值四组间两两比较正常组对照组与病例组 A 组差异无统计学意义（P＞0.05），正常对照组与病例组 B、C 组及病例组 A、B、C 三组间差异有统计学意义（P＜0.05）。**结论** 磁共振 T2mapping 成像技术有望用于定量评价患者肝泡型包虫病残肝储备功能，为临床医生制定治疗方案提供帮助。而 T1mapping 成像技术定量评价肝泡型包虫病患者残肝功能的价值仍需论证。

EPO-0970

腹部磁共振增强结合 DWI 技术对肝脏良恶性肿瘤的鉴别诊断价值研究

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目的 探讨腹部磁共振（MRI）动态增强扫描（DCEI）结合弥散加权成像（DWI）技术对肝脏良恶性肿瘤的鉴别诊断价值。**方法** 回顾性分析 2017 年 3 月至 2019 年 3 月我院 64 例（91 个病灶）肝肿瘤患者的临床资料，经手术病理证实为恶性病灶 61 个，良性病灶 30 个。患者均行 MRI DCEI 及 DWI 检查，观察肝脏病灶在上述序列上的表现特征，评估 MRI DCEI 联合 DWI 对肝脏良恶性肿瘤的鉴别诊断价值。**结果** 恶性病灶中 DCEI 表现为快进快出、DWI 呈高信号者占比大于良性病灶（P＜0.05）。DCEI 联合 DWI 诊断灵敏度、准确度高于 DCEI、DWI 单独诊断（P＜0.05）；特异度与 DCEI 诊断差异无统计学意义（P＞0.05），均高于 DWI（P＜0.05）。**结论** 良性、恶性肝肿瘤 DCEI、DWI 表现特征差异显著，DCEI 联合 DWI 诊断肝肿瘤可显著提高诊断准确度和灵敏度，对肝肿瘤良恶性鉴别诊断有重要价值。

EPO-0971
肝泡球蚴病边缘区域 MR 弥散加权成像成像与组织病理对照研究

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目的：应用 MR 扩散成像技术（diffusion-weighted imaging ,DWI）观察肝泡球蚴病（hepatic alveolar echinococcosis, HAE）的影像特征，并分析病灶边缘区域 MR-DWI 参数 ADC 值与组织病理学指标的关系，探讨 ADC 值在评价 HAE 边缘区域血流状态的应用价值。方法：26 例 HAE 患者行肝脏 MR-DWI 扫描检查，获得病灶中心、边缘区域及周围肝脏组织的 ADC 值，对病灶中心、病灶边缘及周围正常肝脏的 ADC 值进行比较；其中 19 例患者行手术治疗，观察新鲜手术标本后，取病灶边缘区域行 HE 染色和免疫组化测定微血管密度（MVD），分析 DWI-ADC 值与 MVD 的相关性。结果：26 例中选取独立 HAE 病灶 32 个，测得病灶中心、病灶边缘区域及周围肝脏组织的 ADC 值的均值之间的差异均有统计学意义(P＜0.05)；19 例术后病灶边缘区域 MR-DWI ADC 值与 MVD 无相关性(P＜0.05)；结论：MR-DWI 图像可以反映 HAE 病灶边缘浸润带组织异型性特征，并有助判别病灶浸润范围及生物学边界；边缘带 ADC 值与该区域微血管密度（MVD）无相关性。

EPO-0972
基于普美显增强 MRI 不同时间点下不同肝叶的静态肝功能指数诊断肝硬化效能的研究

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目的：研究在不同时间点下普美显增强的磁共振扫描的静态肝功能指数在鉴别肝硬化和正常肝脏的价值。
方法：收集我院从 2016 年 12 月到 2019 年 1 月的肝硬化病例(41 例)，入组患者通过腹部超声检查提示肝硬化改变，有 49 例健康志愿者入组，所有受试者行 MRI 平扫+增强检查，磁共振为西门子

3.0 T 扫描仪，使用平扫序列包括屏气 T1 加权双梯度回波同反向位相序列，屏气半傅立叶采集单次激发快速自旋回波 T2 加权成像，呼吸触发单次激发 T2 加权序列和呼吸触发单次激发平面回波成像序列(b 值为 0, 500, 和 1000 s/mm^2)。增强扫描使用肝胆特异性对比剂钆乙氧基苄基二乙烯三胺五乙酸注射液，商品名普美显，以 1ml/s 的剂量注射 0.025 mmol/kg。增强扫描动脉期图像使用 TWIST-VIBE 序列在单一屏气期(对比剂注射后 15-20s)获得。所有受试者均采用相同的方法获得门静脉(注射对比剂后 60-90s)、移行期(注射对比剂后 120~240 s)和注射对比剂后 5min、10min、15min 及 20 min 扫描图像。另有分别在不同时间点扫描图像上肝左右叶及脾脏作 ROI，避开血管及胆管，测得信号值，计算静态肝功能指数 LSC-N，
统计学分析采用两因素重复测量方差分析，探究对于正常受试者和肝硬化患者左右肝叶注射造影剂后不同时间点测得 LSC-N 差异是否具有统计学意义，ROC 曲线分析不同时间点区分效能的灵敏度和特异度。
结果：不同时间点下的正常受试者和肝硬化患者肝左右叶的 LSC-N 差异具有统计学意义（p＜0.05)，肝硬化者左右叶的 LSC-N 均低于正常受试者，在 20min 时，差异最大，左右叶敏感性分别为 0.781 和 0.816，特异性为 0.635 和 0.724，在 15min 时，右叶敏感性和特异性为 0.794 和 0.710。
结论：注射造影剂后 15min 的肝右叶 LSC-N 值可有望诊断肝硬化，能增加病人的舒适度，且降低医疗成本。

EPO-0973
“黑环征”联合胰胆管形态改变对恶性低位胆道梗阻性疾病 诊断的鉴别价值

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摘要 目的 探讨“黑环征”联合胰胆管形态改变对恶性低位胆道梗阻性疾病诊断的鉴别价值。**方法** 病理证实恶性低位胆道梗阻 67 例，行常规 MRI、MRCP 扫描。观察肿瘤是否出现 “黑环征”及胰胆管形态学改变。**结果**胰头癌可见“黑环征”，胆总管下段癌、壶腹癌未见。三组间胆道梗阻水平、管征存在显著统计学差异（P<0.01）。胰头癌为胆总管胰腺段梗阻，常见分离型双管征；胆总管下段癌、壶腹癌为胆总管壁内段梗阻，常见平行或聚拢型双管征。仅胆总管下段癌见三管征，胰头癌见四管征。三组间胆道梗阻面管腔形态存在统计学差异（P<0.05）,胰头癌、胆总管下段癌常见截断型，壶腹癌为漏斗或鸟嘴型。三组间肝内胆管扩张形态无统计学差异。胰胆管形态改变诊断胰头癌的 ROC 曲线下面积、灵敏度、特异度分别为 0.864、85.7%、87.2%。“黑环征”诊断胰头癌的 ROC 曲线下面积、灵敏度、特异度分别为 0.714、42.9%、100%。“黑环征”与胰胆管形态改变诊断胰头癌的 ROC 曲线下面积、灵敏度、特异度分别为 0.882、89.3%、87.2%。**结论**“黑环征”联合胰胆管形态改变对恶性低位胆道梗阻性疾病鉴别诊断具有重要价值。

EPO-0974
双源 CT 灌注成像对胰腺疾病的诊断价值

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目的 探讨双源 CT 灌注成像对正常胰腺、胰腺癌和慢性胰腺炎的灌注参数特征及诊断价值。

资料与方法 对正常者、胰腺癌及慢性胰腺炎者共 45 例进行腹部增强 CT 及胰腺灌注成像,得到灌注图像和时间密度曲线（TDC）,测量正常组织及病灶区的血流量（BF）、血容量（BV）、平均通过时间（MTT）、表面渗透性值（PS）、灌注起始时间（TTS）、峰值（PE）及达峰时间（TTP）,比较正常胰腺各部位间、正常组与病变组的非病变区之间以及病变区之间各灌注参数差异的统计学意义。
结果 正常组、胰腺癌组和慢性胰腺炎组的病变区,除 TTS 外各参数的差异均有统计学显著性（P〈0.05）。正常胰腺头、体、尾间灌注参数的差异无统计学意义（P〉0.05）。三组的非病变区各参数的差异无统计学意义。
结论 双源 CT 胰腺灌注对胰腺癌及慢性胰腺炎的鉴别诊断有重要意义,能为临床诊断及治疗提供线索。

EPO-0975

标题:肝脏肿瘤术前 3D 融合成像对手术的影响

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目的：探索肝脏恶性肿瘤术前 3D 融合成像对外科手术术中的影响。方法：收集来自我院 9 例肝脏肿瘤住院患者进行了肝脏多期增强薄层 CT 扫描，并对患者的 CT 图像进行 3D 融合成像，并收集其手术方式、手术时间、手术难易程度、手术过程中是否有出血、及预后信息。另外收集 9 例本院患者有 CT 图像但未做 3D 融合成像的患者的手术方式、手术时间、手术难易程度、手术过程中是否有出血，及预后信息进行多方面比较。结果：两组手术时间做对比，做了 CT 图像 3D 融合成像的组为 164.22±29.786，未做 CT 图像 3D 融合成像组为 213.00±59.127,p=0.042，术中出血两组无显著差异，患者预后两组无显著差异。结论：肝脏肿瘤术前 3D 融合成像对手术的时间减少有指导意义，提前判断肿瘤位置，形状、大小及周围组织情况，减少术中的判断时间，以做到更精准下刀，减少病人痛苦，帮助临床医生解决了很大难题。

EPO-0976

肝脏细胞外体积分数对于肝细胞肝癌与转移瘤的鉴别诊断价值

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目的：探索肝脏细胞外体积分数（fECVs）对肝细胞肝癌与转移瘤的鉴别诊断价值。
方法：选取我院经病理确诊为肝细胞肝癌的患者 33 例（有肝纤维化病史），肝转移肿瘤患者 7 例（无肝纤维化病史），进行肝脏常规多期 CT 增强扫描，通过平扫及平衡期（注射对比剂 3min 后）计算肝脏肿瘤（Etumor）、正常肝脏（Eliver）及主动脉（Eaorta）绝对强化值，并通过以下公式计算肝脏肿瘤部分及肝脏正常实质部分 fECV 值：fECV1（%）=Etumor/Eaorta（100-Hct[%]）,fECV2（%）=Eliver/Eaorta（100-Hct[%]），分析不同类型肝脏肿瘤之间 fECV1、fECV2 值的差异。
结果： 原发性肝癌与肝转移瘤患者的正常肝实质部分细胞外体积分数 fECV2 差异具有统计学意义（p=0.032），肝脏肿瘤部分细胞外容积无显著差异（p=0.985）
结论：肝硬化背景基础上的肝细胞肝癌与无肝硬化背景的转移瘤细胞的肝脏肿瘤部分细胞外容积无差异，而肝脏实质部分的细胞外容积可用来鉴别肝细胞肝癌与转移瘤。

EPO-0977
应用术前 CT 纹理分析预测肝癌 TACE 术后疗效的研究

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目的 探讨术前 CT 纹理分析预测肝癌 TACE 术后疗效。方法 回顾性分析首次 TACE 术前行增强 CT 检查，术后按时复查的肝癌病人，共有 101 人，104 个目标病灶。根据实体瘤 mRECIST 评价标准，将完全缓解及部分缓解合为缓解组，共 46 例；稳定及进展合为非缓解组，共 58 例。导入 CK（CT Kinetics，GE Healthcare）软件，构建类灌注图及勾画目标病灶得出类灌注图的纹理参数。对两组数据行正太分布检验后行独立样本 T 检验及秩和检验。对有统计学差异参数行 ROC 曲线分析。结果 两组病人均一性、偏度、中值、聚类分析、相对偏差、Haralick 相关、逆差矩、GreyLevelnonuniformity、ShortRunEmphasis 、 LongRunEmphasis 等参数明显统计学差异。AUC 值多个>0.6。结论 表明不同 TACE 疗效的病人术前 CT 纹理分析是不一样的，术前 CT 纹理分析预测肝癌 TACE 术后疗效有一定的价值。

EPO-0978
Gd-EOB-DTPA（钆塞酸二钠）增强 MRI 在肝脏局灶性病变诊断与鉴别诊断中的应用

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目的：
比较钆塞酸二钠增强 MRI 剂及螺旋增强 CT 对肝脏局灶性病变诊断效能，探讨钆塞酸二钠（Gd -EOB -DTPA）增强 MRI 在肝脏局灶性病变（focal liver lesions ，FLLs）诊断及鉴别诊断价值。
材料和方法：
收集 2017 年 10 月至 2018 年 11 月厦门大学附属第一医院诊断肝脏局灶性病变明确，研究组包括 42 例同时经钆塞酸二钠增强 MRI 和螺旋 CT 增强扫描的患者，42 例患者均经过病理或随访证实。由 2 名放射科医生对不同的肝脏病灶进行独立盲法分析，同时对阅片对病灶分类的诊断信息作以评估，比较钆塞酸二钠增强 MRI 和螺旋增强 CT 在肝脏局灶性病变上的检出率、准确率及典型图像之间的差异。
结果：
51 例肝脏局灶性病变。经病理或临床随访 6-9 个月诊断肝细胞肝癌（HCC）8 例、肝硬化结节 5 例，肝血管瘤 16 例，局灶性结节增生 8 例（FNH），肝转移 14 例。钆塞酸二钠增强 MRI 发现肝细胞肝癌（HCC）8 例、肝硬化结节 5 例、肝血管瘤 16 例、有 8 例局灶性结节性增生（FNH）和 14 例肝转移，病灶检出率 100.0%，螺旋增强 CT 共发现肝细胞肝癌（HCC）5 例、肝硬化结节 4 例、肝脏血管瘤 9 例，肝脏局灶性结节性增生（FNH）8 例，肝转移瘤 10 例，病灶检出率 70.6%。钆塞酸二钠增强 MRI 诊断肝细胞肝癌（HCC）6 例、肝硬化结节 5 例、肝血管瘤 16 例、有 8 例局灶性结节性增生（FNH）和 14 例肝转移，诊断准确率 96.1%，螺旋增强 CT 共诊断肝细胞肝癌（HCC）3 例、肝硬化结节 3 例、肝血管瘤 9 例、局灶性结节性增生（FNH）3 例，肝转移 7 例,诊断准确率 49.0%。钆塞酸二钠增强 MRI 检出率及准确率均明显优于螺旋增强 CT 的结果，得到与临床相似的结果。
结论：
钆塞酸二钠（Gd -EOB -DTPA）增强 MRI 能够提高病变的诊断及鉴别诊断准确率。

EPO-0979
肝外胆管神经内分泌癌的影像学表现和临床分析

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目的：回顾性地分析肝外胆管神经内分泌癌的影像学表现和临床症状，以提高对该疾病的认识。**方法：**收集我院从 2009 年 1 月—2016 年 4 月 6 例肝外胆管神经内分泌癌的资料，其中男性 2 例，女性 4 例，年龄从 41—78 岁，发生在胆囊者 2 例，肝总管 2 例，胆总管 2 例。所有患者均行 MSCT 增强扫描，其中 5 例患者还行 MRI 增强扫描。分析 6 例神经内分泌癌的生长形态（结节型、管内生长型和管外浸润型）、平扫 CT 值、MRI 信号特点、增强强化程度（与肝脏相比）等征象，收集 6 名患者临床病史，包括有无胆道手术史、有无黄疸、腹痛腹泻，肝功指标、CA199 和 CEA 是否增高等。**结果：**4 例神经内分泌癌在 CT 上呈结节样生长型，1 例为管内生长型，1 例向管外浸润。6 例肿瘤 CT 平扫均为软组织密度影，CT 值为 29—36HU，增强动脉期 5 例肿瘤强化程度与肝脏强化一致，1 例（管内生长型）强化程度高于肝脏，增强静脉期 5 例强化程度低于肝脏组织，1 例强化程度与肝脏基本一致。在 MRI T1WI 上所有 5 例肿瘤的信号均低于肝脏，在 T2WI 上 3 例肿瘤信号高于肝脏，2 例与肝脏呈等信号，在 DWI（b=1000）上 5 例肿瘤明显弥散受限。增强动脉期，1 例患者强化程度高于肝脏组织，4 例与肝脏强化程度一致，静脉期 2 例强化程度与肝脏一致，3 例低于肝脏强化程度。1 例患者有胆囊切除病史，1 例患者有长期腹痛腹泻，2 例患者 CA199 和 CEA 增高，5 例患者 AST、ALT 高于正常值。**结论：**肝外胆管神经内分泌癌是临床上罕见的肿瘤，可出现腹痛、腹泻等症状，肿瘤多呈结节样生长，除管内生长型外其余类型的肿瘤动脉期强化程度低于肝脏组织，CT 和 MRI 可准确显示肿瘤的生长部位和与周围组织的关系，根据其强化特点和临床表现可对胆管神经内分泌癌的诊断提供有价值的信息，最后确诊仍依靠病理学诊断。

EPO-0980
MSCT 误诊漏诊肝外胆管癌的特征分析及对策

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目的：回顾性分析经手术病理证实的肝外胆管癌（EHCC）患者的 MSCT 影像特征，探讨其误诊及漏诊的原因。
方法：对 77 例术前行 MSCT 上腹部平扫及增强扫描、术后病理证实为肝外胆管癌的患者的图像进行分析，观察病变的形态、发生部位、范围、强化程度、胆道梗阻程度。
结果：77 例患者中，5 例在 MSCT 检查前进行了胆道外科操作，因此在之后的研究中排除这 5 例。余 72 例患者中，22 例未能诊断 EHCC，误漏诊率为 30.6%。浸润型 EHCC 和肿块型 EHCC 的误漏诊率分别为 56.3%、10.0%。肝门部 EHCC、胆总管 EHCC 总的误漏诊率分别为 23.3%、35.7%；肿块型 EHCC 组中，发生于肝门部和胆总管的 EHCC 误漏诊率分别为 13.6%、5.9%；浸润型 EHCC 组中，发生于肝门部和胆总管的 EHCC 误漏诊率分别为 50.0%、58.3%。肿块型和浸润型 EHCC 组中，＜1.5cm、1.5-2.0cm、＞2.0cm 的肿瘤误漏诊率分别为 16.7%、6.7%、11.1%及 66.7%、40.0%、60.0%。肿块型和浸润型 EHCC 组中，病变轻度、中度、明显强化患者的误漏诊率分别为 25.0%、10.0%、6.7%及 50%、55.6%、57.1%。42 例胆总管 EHCC 中，胆总管不扩张、胆总管轻度、中度、重度扩张患者的误漏诊率分别为 27.2%、62.5%、50.0%、20.0%。72 例 EHCC 病例均伴有肝内胆管不同程度扩张，Ⅰ级胆管分支轻度、中度、重度扩张患者的误漏诊率分别为 33.3%、47.1%、25.0%；Ⅱ级胆管分支轻度、中度、重度扩张患者的误漏诊率分别为 57.1%、39.3%、15.6%。

结论：EHCC 的误漏诊与肿瘤的形态、Ⅱ级胆管分支的扩张程度有关，浸润型 EHCC 误漏诊率高于肿块型 EHCC，Ⅱ级胆管分支扩张越明显，误漏诊率越低。EHCC 的误漏诊与肿瘤的大小（长度范围）、发生部位、强化程度关系不大。

EPO-0981
术前 CT 影像分站评估肝内胆管细胞癌淋巴结转移

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目的：探讨肝内胆管细胞癌（ICC）患者有无转移的淋巴结的计算机断层扫描（CT）指标的差异，以第 12 站和第 8 站淋巴结为例，分别计算预测淋巴结转移的单独最佳截止值和它们的预测效能。
方法：在已知术后病理结果的基础上回顾性分析 63 例 ICC 患者每站淋巴结转移情况。比较转移淋巴结和非转移淋巴结的术前 CT 指标的差异，包括短轴径，长轴径，短-长比，形状（规则/不规则）,边界轮廓（光整/不光整），CT 密度（均质/不均质），钙化（有/无），边缘强化(有/无)，邻近脂肪间隙（清晰/不清晰）,动脉期 CT 值,门静脉期 CT 值和平衡期的 CT 值。采用受试者工作特征分析测试淋巴结的尺寸和增强 CT 值在预测第 12 站淋巴结和第 8 站淋巴结淋巴结转移中的单独最佳截止值和预测效能。
结果：转移性淋巴结占所有淋巴结的 13.2%。第 12 站和第 8 站淋巴结在所有 16 个站中的转移阳性率最高（分别为 17.1%和 16.2%）。当第 12 和站第 8 站均无转移性淋巴结时，ICC 患者不发生淋巴结转移的概率为 93.5%（43/46）。转移性淋巴结和非转移性淋巴结在短轴径，长轴径，动脉期 CT 值，门静脉期 CT 值和平衡期 CT 值，形状，边界轮廓，CT 密度和边缘强化方面存在显著差异。第 12 站淋巴结的短轴径，长轴径，动脉期 CT 值，门静脉 CT 值和平衡期 CT 值的单独最佳截止值分别是 11.8 mm,15.5 mm,74.5 HU,81.5 HU,73.0 HU（AUC：0.730 - 0.956）。第 8 站淋巴结的短轴径，长轴径，动脉期 CT 值，门静脉 CT 值和平衡期 CT 值的单独最佳截止值分别是 9.0 mm，14.2 mm,65.5 HU,92.5 HU,75 HU（AUC：0.735 - 0.921）。
结论：转移性淋巴结和非转移性淋巴结在短轴径，长轴径，动脉期 CT 值，门静脉期 CT 值和平衡期 CT 值，形状，边界轮廓，CT 密度和边缘强化方面存在显著差异。分站评估可以提高预测 ICC 淋巴结转移的准确性。

EPO-0982
Waldenstrom 巨球蛋白血症的影像学表现及临床特点

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Waldenstrom 巨球蛋白血症(Waldenstrom macroglobulinemia，WM)一种罕见的 B 细胞淋巴瘤，临床上以骨髓或淋巴结中浆细胞样淋巴细胞浸润和血清中存在大量的单克隆 IgM 为特征。目前，关于 WM 的影像学表现报道非常少见。本研究回顾性分析 32 例 WM 的影像学表现及临床特点，以期为积累临床经验。
目的：探讨 Waldenstrom 巨球蛋白血症(WM)的影像学表现及临床特点。
方法：回顾性分析 32 例 WM 的临床特点、实验室检查结果及影像学表现。
结果：32 例 WM 患者中，男性 20 例女性 12 例，发病年龄 39-78 岁（中位年龄 62.5 岁）。乏力及高粘滞综合征是其最常见的首发症状。3 例行全身磁共振检查的患者，可见 DWI 序列骨髓弥漫性信号增高，平均 ADC 为 0.85(0.6-1.3)。8 例患者脾脏肿大，13 例患者淋巴结肿大。其它影像学表现包括：多浆膜腔积液（心包积液，胸腔积液，腹盆腔积液），肝脏增大。多数患者伴有β2 一微球

蛋白及血清单克隆 IgM 升高。血清单克隆 IgM 升高与患者的预后相关(P<0. 5)。结论：WM 的影像学表现具有一定的特征性，有助于患者个体化治疗方案的制定。

EPO-0983

MR T2 -mapping 及 T1 -mapping 定量分析大鼠部分肝切除术后残肝再生的价值

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目的：探讨 MR T2 -mapping 及 T1 -mapping 定量分析大鼠部分肝切除术后残肝再生的价值
方法：对 24 只大鼠不同比例肝部分切除模型术前、术后 2 小时内，术后 1、2、3、5、7、14、21 天共 9 个时间点进行 MR T 1 mapping、T 2 mapping 成像，并测量肝实质 T 1 值(ms)、T 2 值(ms)，采用单因素方差分析比较组内各时间点以及组间同一时间点间 T 1 值， T 2 值差异。
结果:术后不同时间点 T1、T2 值均有上升，且 T1 值的上升早于 T2 值，上升程度也大于 T2 值，上升高峰在术后第 3 天，随后逐渐恢复至术前值。70%肝切除组 T2 值明显高于 30%组肝切除组的 T 2 值，且两者之间具有统计学意义（P<0.05）。
结论：MR T2 -mapping 及 T1 -mapping 定量分析技术对评估大鼠部分肝切除术后残肝再生均具有一定价值。T1 -mapping 及 T2 -mapping 有望早期监测残肝再生情况及预后。

EPO-0984

Comparison of the severity between recurrent pancreatitis and acute pancreatitis based on computed tomography

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Objective: the purpose of the study was to compare the severity of recurrent pancreatitis with acute pancreatitis.

Methods: Inpatients with acute pancreatitis and recurrent pancreatitis in affiliated hospital of North Sichuan Medical College from January 2017 to June 2019 were collected in this retrospective study. The patients were divided into initial group and recurrent group based on initial and recurrence events. Clinical information including age, sex, etiology, length of hospital stay, diabetes, the revised 2012 Atlanta classification (RAC), acute physiology and chronic health evaluation score (APACHEⅡ) and bedside index for severity in acute pancreatitis score (BISAP) were analyzed. Radiological features based on computed tomography included computed tomography severity index (CTSI), extrapancreatic inflammation on CT (EPIC), pancreatic and/or extrapancreatic necrosis and local complications.

Results: A total of 297 people were included in the study, 222 in the initial group and 75 in the recurrent group. Age, sex, length of hospital stay, diabetes, APACHEⅡ,pancreatic and/or extrapancreatic necrosis and local complications were not statistical difference between the two groups. Hyperlipidemic pancreatitis was more common in the recurrent group (p=0.026) and RAC was higher in the recurrent group than in the initial group (P=0.039). CTSI in the recurrent group was higher than those in the initial group (P=0.025). EPIC was lower in the recurrent group (P = 0.018).
Conclusions: The RAC and CTSI are higher in recurrent pancreatitis than in acute pancreatitis, but EPIC is lower in recurrent pancreatitis.

Key Words: severity, acute pancreatitis, recurrent pancreatitis.

EPO-0985

扩散加权成像（DWI）结合肝细胞特异性对比剂普美显对术前化疗后结直肠肝转移的评估

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目的：比较肝细胞特异性对比剂普美显和弥散加权（DWI）序列单独和联合成像用于检测术前化疗结直肠肝转移患者的诊断准确性和敏感性。
材料与方法：本实验回顾性分析了我院 2015 年 1 月 1 日-2018 年 12 月 31 日 3 年期间 78 例结直肠癌肝转移患者的临床资料，共 239 个病灶，其中，211 例（88.3%）经病理证实为结直肠癌肝转移灶。 将图像分三组，分别为：肝细胞特异性对比剂普美显组; DWI 组;肝细胞特异性对比剂普美显和 DWI 的联合组，分别由两名经验丰富的放射科专家独立阅片， 存在不一致时，由两名专家协商讨论达成一致。
结果：肝细胞特异性对比剂普美显组正确识别的病变： 239/183（准确性：76.6%; 95% CI :69.3-82.7）和 211/155 转移灶（敏感性：73.5%，95%CI： 65.6-80.6），DWI 组正确识别的病变：239/155（准确性：64.9%，95%CI ：57.3-72.3）和 211/127 转移灶（灵敏度：60.2%，95%CI ：51.9-68.5），肝细胞特异性对比剂普美显和 DWI 的联合组正确识别的病变：239/213（准确性：89.1%，95%CI ：83.4-93.4）和 211/192 转移灶（敏感性：91.0%，95% CI ：85.1-95.1），差异具有统计学意义（P <0.001）。并且，值得注意的是，联合组在诊断直径小于 1cm 的转移灶时具有意义（P <0.001）。
结论：DWI 与肝细胞特异性对比剂普美显联合应用，可显著提高术前化疗结直肠癌肝转移患者的诊断准确性和敏感性，对直径小于 1cm 的转移灶有较好的诊断效果。

EPO-0986

Development of a radiomics nomogram for prediction of lymph node metastasis of intrahepatic cholangiocarcinoma

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Objectives This study was to develop a radiomics nomogram for preoperative prediction of lymph node metastasis (LNM) of intrahepatic cholangiocarcinoma (ICC).
Methods A total of 247 mass-forming ICC patients who underwent hepatectomy, lymph node dissection and preoperative CT scan from January 2010 to December 2016 were included. Of them, 70% (172 cases) were randomly selected as the training cohort and the remaining 30% (75 cases) as the validation cohort. All the CT image data are extracted by using PACS system (GE), whose extraction format is DICOM. The Pyradiomics package of Python was used to extract statistical features, shape features, texture features and wavelet features. The random forest model was used to optimize the super-parameters of the model and the relative importance of each radiomics feature and the radiomics score were obtained. The radiomics nomogram was established based on the Logistic regression.
Results: 832 radiomics features were successfully extracted by Pyradiomics, 26 of which were further screened. The radiomics score had a good performance in predicting lymph node metastasis (AUC: 0.784). Multivariate Logistic regression analysis showed that the independent predictive factors of lymph node metastasis were: preoperative imaging tumor diameter, tumor located in left lobe, diagnosis of lymph node metastasis by CT and radiomics score. The radiomics nomogram for prediction of lymph node metastasis was developed based on the results of Logistic regression and the RCS transformation of preoperative imaging tumor diameter. The optimal threshold to discriminate high or low risk of lymph node metastasis was 10.5 points.
Conclusion: The radiomics score had a good performance in predicting lymph node metastasis. The radiomics nomogram for prediction of lymph node metastasis of ICC was an individualized prediction tool for clinical use.

EPO-0987
探讨普美显 MRI 强化联合 DWI 在肝硬化背景下对于小肝癌的诊断价值

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目的：探讨普美显动态增强联合 DWI 对肝硬化背景下的小肝癌的诊断价值。
方法 收集本院确诊的小肝癌患者（67 例），均进行 MRI 普美显增强联合 DWI 检查。比较普美显增强及 DWI 对病灶的检出率及两者联合 DWI 对肝癌的诊断效能。
结果：67 例患者中共计 92 个小肝癌。其中肝胆期低信号 80 例，DWI 高信号 60 例，稍高信号 10 例，等信号 22 例。普美显增强病灶检出率显著高于 DWI（P 约 0.05）。与常规增强+DWI 相比， 普美显结合 DWI 表现诊断肝癌的信心评分增加（P 约 0.0001）。
结论 ：普美显动态增强联合 DWI 有助于肝硬化背景下小肝癌的检出，两者联合总诊断敏感性达到 95%以上。

EPO-0988
基于多排螺旋 CT 不同强化类型肝癌与介入术后疗效对比的研究

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探讨原发性肝癌多期强化 CT 表现与经肝动脉化疗栓塞(TACE)疗效的关系.方法:选择 2012 年 4 月-2019 年 4 月间行多期多排螺旋 CT 强化并进行 TACE 治疗的原发性肝癌患者 80 例,根据多期强化 CT 表现,将患者分为富血供组(62 例)和中等血供组(13 例),乏血供组 5 例术后随访 3 个月至 2 年,以 mRECIST 标准评估肿瘤疗效,分析 DSA 血供分型与患者疗效及预后的关系.结果:TACE 术后 2 个月,富血供组完全缓解(CR)2 例(4.5%),部分缓解(PR) 29 例(65.9%),疾病稳定(SD)6 例(13.6%),疾病进展(PD)7 例(8.6%),客观有效率(CR+PR) 70.4%,疾病控制率(CR+PR+SD) 84.0%;中等血供组 CR 0 例(0.0%),PR 5 例(29.4%),SD 4 例(23.5%),PD 8 例(47.1%),客观有效率 29.4%,疾病控制率 52.9%.富血供组、中等血供组中位生存期分别为 14 与 7.9 个月,6、12、24 个月累计生存率分别为 91.0%、68.0%、20.4%与 59.1%、23.0%、12.1%,差异均有统计学意义(均 P＜0.05).结论:原发性肝癌 CT 血供分型与 TACE 治疗效果密切相关,富血供型肝癌 TACE 治疗效果较好.

EPO-0989

多层螺旋 CT 评价直肠癌 TNM 分期与病理的对比研究

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目的

直肠癌是我国最常见的恶性肿瘤之一。目前直肠癌的治疗是以外科手术为主，术前、术后可以辅以放化疗，准确合理的术前分期，有利于最佳治疗方案制定，降低术后复发率，提高患者生存质量。本研究通过对比多层螺旋 CT 术前影像分期和术后病理分期，探讨多层螺旋 CT 三维成像对直肠癌病变术前分期价值。

方法

收集 76 例临床确诊为直肠癌的患者，使用多层螺旋 CT 进行扫描，通过二维、三维后处理方法，多角度、多方位地显示肿瘤的大小、部位、范围、肠管周围及远处脏器情况，并与术后病理比较进行对比研究，使用 SPSS17.0 软件，数据分析采用 Kappa 一致性检验。

结果

实验结果显示，MSCT 对肿瘤 T 分期总准确率为 81.6%。T1-T2 期准确率为 83.3%，T3 期准确率为 75.0%，T4 期准确率为 84.4%，对浆膜外侵犯的灵敏度、特异度分别为 94.2%、83.3%，阳性预测值和阴性预测值分别为：92.5%、87.0%。本组中，被高估 7 例，低估 7 例，经 Kappa 一致性检验分析，k 值=0.72，*P*=0.000，*P*＜0.01。

MSCT 对淋巴结 N 分期总准确率为 81.6%，对于 N0、N1、N2 评估，准确率分别为 83.3%、75.0%、84.4%，对转移淋巴结灵敏度、特异度评估分别为：80.8%、88.0%，阳性预测值和阴性预测值分别为 77.8%、89.8%，k 值=0.65，*P*=0.000，*P*＜0.01。

本实验中 CT 对直肠癌远处转移总准确率为 98.3%，M0、M1 准确率分别为 100%、40.0%，灵敏度、特异度分别为：40.0%、100%，阳性预测值和阴性预测值分别为：100%、95.9%，k 值=0.56，*P*=0.000，*P*＜0.01.

结论

MSCT 对于直肠癌原位肿瘤 T 术前分期与病理有很好一致性，可作为临床医生直肠癌术前分期常规影像学手段。对于早期（T1-2 期）和中晚期直肠癌准确性较好，对 T3 期评估准确性有待进一步研究提高。

EPO-0990

肝脏原发性神经内分泌肿瘤的三期增强 CT 特征

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目的 探讨肝脏原发性神经内分泌肿瘤的三期增强 CT 特征。
方法 回顾性分析 2014 年 7 月至 2018 年 3 月贵州省人医院，经手术或穿刺病理证实且进行过肝脏三期 CT 增强检查的 7 例肝脏原发性神经内分泌肿瘤患者资料。患者均行肝脏三期增强 CT 扫描。根据肿块最大径将病变分为≥30 mm 组和<30 mm 组，观察病变的 CT 表现（边缘、囊变、坏死、钙化、出血、胆管扩张、强化特征、淋巴结情况）和病理表现。
结果 7 例病灶均为多发（其中 2 例弥漫多发），共有病灶 96 个。病灶最大径 3～65 mm。最大径≥30 mm 组病灶 22 个，最大径<30mm 组 74 个。（1）≥30 mm 组：3 个病灶边界不清，19 个病灶边界均清楚；20 个病灶有囊变坏死；增强扫描动脉晚期 9 个病灶呈环形强化，13 个病灶明显强化，门静脉期及延迟期 14 个病灶肿块呈持续强化，8 个病灶呈廓清征象。（2）<30 mm 组：68 个病灶边界清楚，6 个病灶边界模糊；14 例病灶可见囊变、坏死；增强扫描动脉期 28 个病灶呈环形强化，46 个病灶明显强化；门静脉期及延迟期 60 个病灶持续强化，14 个病灶表现廓清。两组病灶周边均无胆管扩张、出血、钙化征象病灶。2 例患者肝门区可见肿大淋巴结。
结论 肝脏原发性神经内分泌肿瘤较大病灶易囊变、坏死，无论病灶大小均不易出现出血、钙化、周边 胆管扩张 。动脉期病灶呈花环形、明显强化，静脉期及延迟期持续强化多见。

EPO-0991
对比增强 CT 对肾透明细胞癌的血管生成评估

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研究目的：探究肾透明细胞癌中多个血管形态学指标与 CT 动态增强参数的关联。
材料与方法：本实验回顾性研究了本中心 37 例手术后被确诊为肾透明细胞癌的患者。CT 增强参数包括病灶的绝对及相对增强 CT 值。血管参数包括微血管/成熟血管直径、微血管/成熟形态因子、微血管密度、成熟血管数目、微血管/成熟总面积。求得 Spearman 相关系数以揭示动态增强 CT 参数与血管形态指标之间的相关性。
结果：成熟血管直径与静脉期和延迟期的相对增强值呈正相关，微血管直径与增强参数未见显著相关性。微血管密度和成熟血管数目与所有增强期的相对及绝对增强 CT 值呈正相关。微血管及成熟血管总面积与三个增强期的绝对增强值呈正相关。微血管及成熟血管的形态因子与增强参数未见显著相关性。
结论：CT 增强参数与多个形态学指标有相关性，这使我们对肾透明细胞癌的 CT 增强机制有进一步了解。

EPO-0992
胰胆管汇合类型和夹角与复发性急性胰腺炎的相关性研究

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目的：通过磁共振胰胆管水成像技术比较正常对照者、初发急性胰腺炎和复发性急性胰腺炎的胰胆管汇合类型和夹角的相关性，预测急性胰腺炎复发的风险因素。**方法**：按纳入和排除标准收集我院 2012 年 1 月至 2018 年 4 月初发急性胰腺炎 112 例为 A 组（AP），复发性急性胰腺炎病例 55 例为 B 组（RAP），正常对照组 69 例为 C 组（NORMAL）。每例均行常规磁共振和胰胆管成像（MRCP）检

查，在 MRCP 图像上测量胰胆管汇合夹角，测量三次取平均值；按照胰胆管汇合类型，将其分为 V 型、P-B 型和 B-P 型。对三组病例的胰胆管汇合夹角、汇合类型分别进行统计学分析，将三组患者的年龄、性别、汇合类型、汇合夹角采用多元 logistic 回归统计预测风险因素。**结果：**1.A、B、C 组之间汇合夹角两两比较均有统计学差异（p＜0.05）2.A（AP）组中 V 型 23 例，B-P 型 60 例，P-B 型 29 例；B（RAP）组中 V 型 14 例，B-P 型 37 例，P-B 型 4 例；C 组 V 型 14 例，B-P 型 23 例，P-B 型 32 例。A、B、C 三组间汇合类型两两比较均有统计学差异（p＜0.05）。3.V 型和 B-P 型、P-B 型和 B-P 型两组之间的平均汇合夹角有统计学意义（p＜0.05），V 型和 P-B 型的平均汇合夹角没有统计学意义（p＞0.05）。4.多元 logistic 回归分析显示：和正常对照组相比，年龄是 RAP 的保护因素；汇合夹角、V 型和 B-P 型都是 AP 和 RAP 的风险因素；RAP 相对于 AP 的保护因素是年龄，危险因素是 V 型和 B-P 型汇合。**结论：**胰胆管汇合夹角和汇合类型是复发性急性胰腺炎和初发急性胰腺炎的风险因素，随着汇合夹角的增大，或汇合类型是 V 型或 B-P 型者，患急性胰腺炎及复发的风险增加；发病时年龄越小的急性胰腺炎患者复发的风险越大。

EPO-0993
CT 和 MRI 在青少年肝脏未分化胚胎性肉瘤诊断价值分析

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目的 总结及分析青少年肝脏未分化胚胎性肉瘤（undifferentiated embryonal sarcoma of liver ，UESL）的 CT 及 MRI 表现，提高术前影像诊断准确率。**方法** 回顾性分析本院诊治的 10 例青少年（8-22 岁）UESL 的临床资料及 CT 及 MRI 影像学资料，并结合文献复习。**结果** CT / MRI 表现为单发或多发边界清晰的囊、实性肿块，其中实质性肿块 3 例，囊性肿块 4 例，囊实性 3 例，密度不均，病灶边界清楚，大小在 8.9cm ～ 25cm 之间囊内不规则分隔，囊壁边缘见少许软组织密度 / 信号影，病灶内易出血，增强后囊壁及分隔轻度渐进性强化。**结论** UESL 的 CT / MRI 平扫和动态增强表现有一定影像学特征，结合临床资料，有助于术前正确诊断。

EPO-0994
对比双能量与常规扫描模式在肝脏 CT 平扫中的图像质量和辐射剂量

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目的 对比双源双能量与常规扫描模式在肝脏 CT 平扫中的图像质量和辐射剂量。
方法 分别采用双源 CT 双能量扫描模式和常规扫描模式对腹部仿真体模进行扫描。两种扫描模式扫描范围一致。扫描完成后，分别重建 1 组常规扫描模式薄层图像（M 组）和 11 组双能量薄层图像。其中，双能量薄层图像包括线性融合图像 3 组[A 组（m=0.5）、B 组(140kV)、C 组（80kV）]、非线性融合图像 4 组[D 组（C=150HU，W=200HU）、E 组（C=100HU，W=200HU）、F 组（C=100HU，W=150HU）和 G 组（C=150HU，W=150HU）]和虚拟单能谱图像 4 组[H 组（70keV）、I 组（80keV）、J 组（60keV）、K 组（50keV）]。连续选择 10 层肝脏图像测量肝脏的 CT 值（$CT_{肝脏}$）和标准差（噪声），测量时运用复制、粘贴功能确保各组图像 ROI 的大小、形状、位置和层面保持一致，计算图像信噪比（SNR），其中，$SNR=CT_{肝脏}$/噪声。对比 M 组与双能量各组的图像质量（SNR、CT 值、噪声），并比较两种扫描模式的辐射剂量（CTD、DLP）。

结果 双能量各组与常规方案组的 CT 值差异均无统计学意义(P>0.05)。I 组的噪声低于 M 组，A、D、E、F、G、H 组的噪声高于 M 组，差异均无统计学意义(P>0.05)；其余各组噪声高于 M 组，差异均有统计学意义(P<0.05)。I 组的 CNR 高于 M 组，A、D、E、F、G、H 组的 CNR 低于 M 组，差异均无统计学意义(P>0.05)；其余各组 CNR 低于 M 组，差异有统计学意义(P<0.05)。双能量扫描模式的 CTD、DLP（8.40 mGy、88.3 mGy·cm）明显低于常规扫描模式（10.29 mGy、116.4 mGy·cm）。

结论 应用双能量扫描模式进行肝脏平扫并采用虚拟单能谱图像（80keV）重建时，在获得良好图像质量的同时，可有效降低辐射剂量。

EPO-0995

Magnetic resonance morphologic features predict progression of incidental pancreatic cystic lesions during follow-up

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PURPOSE: To evaluate which magnetic resonance (MR) morphologic features could predict the progression of pancreatic cystic lesions which were suitable for follow-up.
METHODS: A total of 2,176 MR images of PCLs were retrospectively reviewed between January 2009 and December 2016. The study population was composed of 223 patients. Clinical data and MR morphologic features of PCLs were recorded. We divided the individuals into two sub-groups according to the final MR features. Univariable and multivariable regression analyses were performed to identify independent risk factors for progression of PCLs.
RESULTS: 37.7% (84/223) PCLs progressed during follow-up, compared to 62.3% (139/223) PCLs that were stable. Age (odds ratio (OR) = 1.042; p = 0.017), number of lesions (OR = 0.491; p = 0.048), communication to pancreatic duct (PD) (OR = 2.425; p = 0.007) and the septa (OR = 6.105; p < 0.001) were significant independent factors for progression of PCLs. Among 84 lesions of progression, 27.4% (23/84) lesions increased to ≥ 30 mm or showed worrisome imaging features at the end of follow-up which needs clinical interventions. The initial size and communication to PD were independent factors for progression of PCLs which needs clinical interventions (p < 0.001 and 0.011, respectively).
CONCLUSION: Age, number of the lesions, communication to PD and the septa were independent risk factors for the progression of PCLs, and the initial size and communication to PD could potentially predict PCLs needing clinical interventions.

EPO-0996

胰腺癌胰周静脉侵犯的影像与病理 对照研究及预后分析

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目的：回顾性分析胰腺癌患者门静脉（PV）/肠系膜上静脉（SMV）血管壁侵犯的影像学表现与病理之间的关系，并探讨其预后价值。**材料与方法：**回顾性收集 2012 年 1 月至 2016 年 12 月于我院行胰腺切除联合 PV 和/或 SMV 切除重建的胰腺癌患者的临床、影像及病理学资料。影像学表现主要记录肿瘤与 PV/SMV 关系、肿瘤包绕 PV/SMV 角度、肿瘤与 PV/SMV 接触长度。肿瘤与 PV/SMV 关系的影像学分型为Ⅰ型：血管与肿瘤无接触或血管与肿瘤接触，管壁光滑，血管无或轻度变形；Ⅱ型：血管凸面与肿瘤接触，狭窄小于 1/2；Ⅲ型：血管凹面与肿瘤接触，狭窄小于 1/2；Ⅳ型血管狭窄大于 1/2；Ⅴ型：（6）血管闭塞或栓子形成。PV/SMV 血管壁侵犯的病理学分级为 A 级：血管壁未受侵犯；B 级：血管外膜受侵犯；C 级：血管中膜受侵犯；D 级：血管内膜受侵犯。**结果：**肿瘤与 PV/SMV 关系为Ⅰ型患者 18 例，PV/SMV 血管壁均未受侵犯；Ⅱ型患者 18 例，10 例 (55.6%)血管壁受侵犯；Ⅲ型患者 18 例，15(83.3%)血管壁受侵犯；Ⅳ型患者 13 例，12 例 (92.3%)血管壁受侵犯；Ⅴ型患者 7 例，血管壁均受侵犯。肿瘤与血管关系的影像学分型联合肿瘤包绕血管角度、肿瘤与血管接触长度的积分体系评估血管壁是否受侵犯的灵敏度为 0.932，特异度为 0.867，阳性预测值 0.911，阴性预测值 0.897，ROC 曲线下面积为 0.934。采用 K－M 曲线进行预后分析，PV/SMV 血管壁未受侵犯的患者较血管壁受侵犯患者累积生存率高；肿瘤与 PV/SMV 关系不同影像学分型患者累积生存率不同，影像学积分小于 7 分的较大于等于 7 分的患者累积生存率高。**结论：**影像学分型联合肿瘤包绕血管角度、肿瘤与血管接触长度的积分体系能很好预测 PV/SMV 是否受侵犯，影像学积分体系预测的 PV/SMV 血管壁是否受侵犯与预后相关。

EPO-0997

胰腺滤泡树突状肉瘤并副肿瘤天疱疮一例

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【目的】滤泡树突状肉瘤(follicular dendritic cell sarcoma, FDCS)是一种较为罕见的起源于树突状细胞的恶性肿瘤。副肿瘤性天疱疮（paraneoplastic pemphigus，PNP）是并发于肿瘤的一种特殊类型的天疱疮。腹膜后滤泡树突状细胞肿瘤并副肿瘤天疱疮较为罕见，本文报道 1 例腹膜后 FDCS 并 PNP 的临床及影像学表现，旨在提高对该病的认识。【方法】患者女性，49 岁。患者 1 月前劳累后出现左侧眼睑下垂，晨轻暮重，休息后稍微缓解。于 2017 年 9 月 4 日入院。查体舌肌及口角多处溃烂，唇肿胀、粘膜糜烂伴血痂形成，张口困难。肌电图：左侧眼轮匝肌记录，重复电刺激轻-中-重频实验呈弱阳性。肿瘤指标：糖类抗原（CA125）：65U/ml，糖类抗原 72-4（CA72-4）：16.79U/ml，胸苷激酶 1（TK1）：2.02PM/L。抗 ACHR 抗体阳性，抗 Titin 抗体 IgG 阳性。血常规：红细胞沉降率 92mm/60min。腹部彩超：左侧肾上腺区实性占位。全腹部增强 CT 检查（2017-09-11）：胰腺体尾部见一大小约 6.9cm×5.6cm×8.0cm 混杂密度团块影，边缘清楚，病灶中央呈液体密度（图 1A），增强病灶实性成分明显强化（图 1B），腹膜后见多个淋巴结显示。手术见：包块位于胰尾上缘，质韧，无明显浸润，包块基底部与脾脏动静脉关系紧密，盆腔、大网膜及肝脏均未见转移结节。【结论】术后病理诊断为“胰腺”滤泡树突状细胞肉瘤。【讨论】病灶多呈不均匀延迟中等强化，病灶较大时可出现坏死，整体血供较丰富，边界清楚。

EPO-0998

CT 和 MRI 检查在壶腹周围癌诊断及术前评估的应用

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背景及目的

壶腹周围癌主要包括胰头癌、胆总管下段癌、壶腹癌及十二指肠腺癌。这些肿瘤解剖位置相近使其表现出相同的临床症状，并且壶腹周围癌大多具有相互重叠或非特异性的影像学表现，壶腹周围癌准确的定性定位与分期对指导临床医生选取正确的治疗方案及评估术后具有重要价值，CT 和 MRI 在壶腹周围癌诊断方面取得了相应的进展，CT 和 MRI 检查可为临床术前评估可切除性及侵润范围，具有一定价值。

方法

2017 年 3 月至 2018 年 12 月，在我院就诊，行 CT 及 MR 扫描，并且病理结果为壶腹周围癌患者 67 例，由放射科医师分析图像信号及增强特征。

结果

（1）CT 扫描中，胰头癌和十二指肠腺癌的诊断准确率高于 MR 检查。MR 扫描中，胆总管下段癌及壶腹癌诊断准确率高于 CT 扫描。

（2）在 MRCP 图像中，壶腹癌、胰头癌及十二指肠腺癌出现双管征的比例大于胆总管下段癌，胰头癌出现暗环征的比例最大。在胰头癌中胆管和胰管汇合角度最大。

（3）CT 平扫结合增强对壶腹周围癌可切除性的预测灵敏度、特异度、准确率、阳性预测值、阴性预测值均低于 Propeller LAVA 结合 DWI 对壶腹周围癌可切除性的预测。

结论

CT 和 MRI 检查在壶腹周围癌诊断中取得了相应的进展，由于 CT 具有良好的空间及时间分辨率，后处理技术定位准确率较高，有助于术前发现病变，降低漏诊及误诊率，尤其是对肿瘤的大小以及明显与周围组织的关系，MRI 具有较好的组织分辨率，肿瘤与周围明亮脂肪的高对比度使 MRI 能够准确显示病变的局部范围，DWI 能通过病变信号变化及 ADC 值辨别出转移淋巴结，MRCP 可多方位旋转，多角度观察，显影成功率高、梗阻处定位准确率高，胆胰管汇合角度的测量有易于恶性肿瘤之间鉴别。CT 和 MRI 检查可为临床术前评估可切除性及侵润范围，具有一定价值，但对个别疾病的各种病理亚型的鉴别诊断较难，相信在不久的将来，影像学检查将在壶腹周围癌中发挥重要作用。

EPO-0999

基于动态增强扫描 MRI 的影像组学方法术前预测肝切除术后肝细胞癌两年复发

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目的 探讨动态增强扫描 MRI 的影像组学方法术前预测肝切除术后肝细胞癌（HCC）两年复发的能力。**方法** 回顾性收集本院 105 例接受肝部分切除术且经病理证实的肝细胞癌患者，并在术后两年内规律随访。所有患者于术前 2 周内进行动态增强 MRI 检查（动脉期、门静脉期和延迟期）。按照 7:3 将患者随机分为训练组和验证组。应用 Radcloud 软件，于动态增强 MRI 三期图像的各个层面沿着病灶边缘手动勾画 HCC 轮廓，生成三维容积 ROI。每个序列分别提取 1029 个影像组学特征，包括一阶统计特征、形状特征、灰度共生矩阵（GLCM）、灰度游程矩阵（GLRLM）和灰度区域大小矩阵（GLSZM），以及经指数、平方、平方根、对数和小波变换后获得的高阶特征。使用假设检验、Spearman 相关性分析及 LASSO 算法对组学特征进行依次降维。利用 logistic 回归分别构建增强三期 MRI 图像预测肝癌术后两年内复发的模型。利用 ROC 曲线评价模型的效能，获得曲线下面积（AUC）、准确性、灵敏度、特异度和阈值。**结果** 经过降维处理，动脉期、门静脉期和延迟期图像分别提取 7、23 和 2 个与预后相关的最有价值的影像组学特征。基于动脉期、门静脉期和延迟期构建的组学模型的验证组 AUC 分别为 0.80、0.75 和 0.74，其中基于动脉期图像构建的模型术前预测 HCC 术后两年复发的效能最佳，其验证组的准确性、灵敏度和特异度分别为 0.72、0.59 和 0.87。

结论 基于 MR 动态增强三期构建的影像组学模型可以在术前预测肝细胞癌术后两年复发，其中动脉期构建的组学模型效能最佳。

EPO-1000
术前肝内胆管细胞癌的 CT 特征预测淋巴结转移和总生存期

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目的：比较有无淋巴结转移的肝内胆管细胞癌（ICC）原发灶的计算机断层扫描（CT）特征的差异并构建术前预测 ICC 淋巴结转移和 ICC 患者总生存的诺谟图。
方法：分析了 63 例 ICC 患者的临床病理特点和 ICC 原发灶的对比增强 CT 特征。 进行多变量逻辑回归分析以构建术前预测淋巴结转移的诺模图。 用 Kaplan-Meier 方法绘制存活曲线并比较存活率差异。
结果：有和无淋巴结转移的 ICC 在临床症状，肿瘤部位，分型，动脉期（AP）CT 值 （均值），AP CT 值（最大值），门静脉期 CT 值 （最大值），平衡期（EP）增强比率，EP CT 值（最大值）和 EP CT 值（最大值） /肝脏 CT 值存在显着差异。由分型，EP CT 值（最大值）和 EP 增强比率的构建的诺谟图可以术前预测 ICC 淋巴结转移，曲线下面积为 0.814（p <0.001）。 基于诺谟图的淋巴结转移风险≥0.20 的 ICC 患者总体生存率显着低于淋巴结转移风险<0.20 的患者（平均总生存期分别是 39.5±5.2 个月 和 51.1±4.7 个月）。
结论：ICC 的术前对比增强 CT 特征在有无淋巴结转移的患者中差异显着。 基于这些特征的诺谟图可以预测淋巴结转移和总生存率甚至优于 N 分期。

EPO-1001
多层螺旋 CT 动静脉期联合扫描在严重多发伤中的应用研究

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目的 采用多层螺旋 CT 动静脉期联合扫描法，缩短严重多发伤患者扫描时间，减少患者辐射剂量，为临床医生争取最佳的救治时间。 **方法** 收集 2014-2018 年在我院行多层螺旋 CT 的严重多发伤患者（ISS>16）131 例，将这 131 例随机分为实验组和对照组，其中对照组常规扫描（增强三期）患者 73 例，实验组采用动静脉期联合扫描（动静脉期+延迟期）患者 58 例。两组均使用 GE64 排螺旋 CT 扫描，固定延迟 22-25s，视野 50cm,管电压 120kV，采用自动管电流调节技术（200 mAs~400 mAs），球管旋转时间 0.5s，螺距 0.984，扫描层厚 0.625mm，重建层厚，层间距 3.0~5.0mm。注射对比剂前，注射生理盐水 21ml，速率为 4ml/s。注射对比剂时，对比剂用量为胸腹部（400mg/kg）、头颈胸腹部（400mg/kg）、胸腹部+双下肢（450mg/kg），速率为 3.5-4.5ml/s。最后再注射生理盐水 40~50ml，速率为 4-5ml/s。分别统计两种方法胸腹部、头颈胸腹部、胸腹部+双下肢的辐射剂量动静脉启动时间及扫描总时间（第一幅图像-最后一幅图像），测量起始主动脉和结束主动脉、肝动脉、脾动脉、肾动脉、肠系膜上动脉的 CT 值（用 HU 表示），采用 Philips EBW 工作站对动静脉期图像分别进行多平面重建(MPR)，容积再现重建(VR)，最大密度投影(MIP)，曲面重建(CPR)。最后邀请 1 名高年资诊断医生和 1 名主管技师对图像进行回顾性分析，观察有无血管创伤，并将 CT 血管成像结果与临床结果进行对比。**结果** 采用常规扫描（增强三期）比动静脉联合扫描平均耗时多 15-20 秒，辐射剂量动静脉联合扫描较常规三期增强下降

21.73%。有 95.8%血管动脉 CT 值高于 150 HU，95%的血管后处理与临床术中所见符合。**结论** 动静脉期联合扫描有效缩短患者检查时间 减少辐射剂量，为临床早期救治提供保障。

EPO-1002

Volumetric apparent diffusion coefficient histogram analysis on gallbladder diseases.

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Objective: To evaluate the diagnostic performance of histogram analysis of apparent diffusion coefficient(ADC) derived from diffusion-weighted imaging (DWI) for differentiating malignant from benign gallbladder diseases.
Materials and methods: Our study collected 789 patients with gallbladder disease who had undergone DWI scan for preoperative evaluation in Tongji Hospital from Septemper2017 to December2018,and finally 86 patients were enrolled after excluding unqualified cases.Preoperative DWI images of 86 patients with gallbladder disease confirmed by surgery or puncture pathology were measured by two radiologists. Volumetric ADC maps were generated using all slices of the DWI images to obtain histogram parameters, including mean, median, 10th percentile, 25th percentile, 75th percentile, 90th percentile ADC, and SD ADC values, as well as skewness, kurtosis, and entropy.The weighted-K test was used to examine the consistency of the results measured by the two radiologists. Comparisons of these parameters were made by Mann-Whitney U test .The sensitivity and specificity were calculated according to the area under the ROC curve (AUC) to evaluate the differential diagnosis on malignant and benign gallbladder diseases.
Results:1.The consistency analysis of the measurement data has good credibility that ICC range from 0.715 to 0.872.
Mean ADC, median ADC, 10th,25th,75th and 90th percentile ADC of gallbladder cancer were significantly lower than those of benign diseases ($p<0.001$).
SD and entropy of gallbladder cancer were higher than those of benign disease,but there were no differences in kurtosis and skewness among these gallbladder diseases.
The areas under the ROC curves (AUC) of the parameters ,including ADC mean, 10th percentile, 25th percentile, 50th percentile, 75th percentile, 90th percentile, standard deviation, kurtosis, skewness，entropy were 0.856、0.963、0.959、0.942、0.908、0.721、0.861、0.526、0.513、0.612，respectively.The 10th percentile yielded the highest AUC that range from 0.959 to 0.968. It had the largest Yoden index when the critical value is 95,and its specificity and accuracy are 89.5% and 95.4% respectively.
Conclusions: Volumetric apparent diffusion coefficient histogram analysis could be helpful for diagnosing gallbladder cancer.

EPO-1003
基于自制水模探究梯度场非线性对单次激发 EPI 获得的 ADC 值影响

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目的：扩散加权成像（DWI）在疾病诊断、疗效评价中具有重要临床价值。不同医疗机构使用的 MRI 设备品牌及型号可能不同，而多数 MRI 设备的梯度场非线性，其对 DWI 获得的表观扩散系数（ADC）存在影响。随着对 DWI 定量分析要求不断提高及多种心研究的开展需要，设计标准水模进行 DWI 参数校准从而减小梯度场非线性影响是必要的。本研究将利用自制水模，初步探究梯度场非线性对 3.0T 单次激发平面回波（ss-EPI）序列获得的 ADC 影响。
方法：基于临床检查患者腹部图像，设计软件提取腹部轮廓形态数据。利用 51 个内径 29mm、长度 300mm 的圆柱形亚克力圆柱设计类似人体形态的水模；容器中装入纯水。水模置于磁体间 24 小时以上，实验前记录室内温度。利用腹部线圈、基于单次激发平面回波序列行 3.0-T DWI（b 值=0，500，1000 s/mm2）扫描。基于单指数模型计算 ADC 图，并重建为 FOV 500*500mm2 及矩阵 128*128；利用统一直径 20mm 的感兴趣区 ROI（面积：320 mm2）测量不同空间位置圆柱内水的 ADC 值。分析 ADC 测量值与理论值的差异，计算不同位置测量 ADC 值带来的误差范围。
结果：室温下 23 度，水模 ADC 标准值为 $2.187*10^{-3}$ mm^2/s；51 个柱体中测量 ADC 均值为 $2.295*10^{-3}$ mm^2/s （$2.202-2.390*10^{-3}$ mm^2/s）；靠近水模中间位置 ADC 值较小，偏离中心位置上下左右 ADC 均值均增大，其中水平方向离中心位置 140 mm 处 ADC 均值增加约 7.8%；上下方向距离中心位置 90mm 处 ADC 均值增加约 5.0%。Z 方向距离水模中心位置 60 mm 出测量的 ADC 变化范围约 2%。
结论：临床 3-T MRI 设备中梯度非线性对 ADC 有明显影响，特别是距离磁体中心位置左右方向的影响较为显著。对于临床研究的器官较大时，如胰腺，肝脏疾病等应考虑梯度非线性对 ADC 的影响。

EPO-1004
容积 ADC 直方图对胆囊疾病的诊断价值

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目的：探讨 DWI 所得的容积 ADC 直方图对胆囊癌的诊断价值。
材料与方法：收集华中科技大学同济医学院附属同济医院 2017 年 9 月-2018 年 12 月确诊并有完整的 MRI 资料的胆囊病变患者 789 例。经过随访，排除不合格样本，最终 86 例胆囊病变患者纳入研究。由两位医师测量病理证实的 86 例胆囊疾病患者术前进行的 DWI 检查，通过第三方软件生成 ADC 值灰度直方图，并计算出胆囊癌的灰度平均值、第 10 百分位数、第 25 百分位数、第 50 百分位数、第 75 百分位数、第 90 百分位数、标准差、峰度、偏度、熵。对两位医师的测量结果采用 weighted K 检验评估一致性。用曼-惠特尼 U 检验对比两组病变均值差异的显著性，并根据受试者操作特性曲线(ROC)下面积（AUC）来判断其诊断准确性，评价直方图参数对于良恶性病变的鉴别诊断效能。
结果：1.一致性分析：两名医师的测量数据一致性分析具有较好的可信度，ICC 为 0.715-0.872。

2.胆囊癌的灰度平均值、第 10 百分位数、第 25 百分位数、第 50 百分位数、第 75 百分位数、第 90 百分位数均低于胆囊良性病变（p 均<0.001）。
3.恶性病变的 SD 和熵显著高于良性病变，但是良恶性病变间的峰度和偏度没有显著差异（p<0.05）。
4.ADC 的平均值、第 10 百分位数、第 25 百分位数、第 50 百分位数、第 75 百分位数、第 90 百分位数、标准差、峰度、偏度和熵在 ROC 曲线上对应的 AUC 分别为 0.856、0.963、0.959、0.942、0.908、0.721、0.861、0.526、0.513 和 0.612。第 10 百分位数具有较高的鉴别诊断效能，其 AUC 范围为 0.959-0.968。当临界值为 95 时具有最大的约登指数，其特异度、准确度分别为 89.5%、95.4%。
结论：ADC 容积定量直方图可以对胆囊良恶性病变鉴别诊断提供一定的帮助，直方图参数在胆囊癌诊断中具有较大价值。

EPO-1005
多模态 MRI 的影像组学模型术前预测肝切除术后肝细胞癌两年复发

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目的 探讨基于多模态 MRI 的影像组学模型术前预测肝切除术后肝细胞癌（HCC）两年复发的能力，并将其应用于不同的临床场景。**方法** 回顾性收集 2007 年 7 月-2017 年 7 月本院 105 例接受肝切除术且经病理证实的肝细胞癌患者，在术后两年内规律随访。所有患者术前两周内进行了磁共振检查，包括同反相位 T_1WI、T_2WI、弥散加权成像（DWI）和动态增强扫描（动脉期、门静脉期和延迟期）。按照 7:3 将患者随机分为训练组和验证组。将 DICOM 格式的各序列图像上传至 Radcloud 软件，于 MRI 各序列图像的连续层面沿着病灶边缘手动勾画 HCC 轮廓，获得 3D 容积感兴趣区，每个序列均可提取 1029 个影像组学特征，包括一阶统计特征、形状特征、二阶统计特征即纹理特征（灰度共生矩阵（GLCM）、灰度游程矩阵（GLRLM）和灰度区域大小矩阵（GLSZM）），以及经指数、平方、平方根、对数和小波变换后获得的高阶统计特征。分别使用假设检验、Spearman 相关性分析及 LASSO 算法对组学特征依次降维。使用 logistic 回归分别构建不同序列预测肝癌术后两年复发的模型，并构建 4 种不同临床应用场景的组合模型：模型 1：同反相位 T_1WI+T_2WI；模型 2：模型 1+DWI；模型 3：模型 1+增强三期；模型 4：模型 2+增强三期。利用 ROC 曲线评价模型的效能，获得曲线下面积（AUC）、准确性、灵敏度、特异度和阈值。**结果** 基于同反相位 T_1WI+T_2WI+增强三期图像构建的组学模型术前预测 HCC 术后两年复发的效能最佳，其训练组和验证组的 AUC 分别为 0.86 和 0.82，准确性、灵敏度和特异度分别为 0.82、0.76、0.89、0.69、0.59 和 0.80。**结论** 本研究提出了应用于不同临床场景的术前预测肝癌切除术后两年复发的多模态 MRI 组学模型，其中基于同反相位 T_1WI+T_2WI+增强三期图像构建的组学模型预测效果最佳。

EPO-1006
普美显肝胆特异期联合 DWI+T2WI 对乏血供肝癌的早期检测价值

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目的：探讨普美显肝胆特异期联合 DWI+T2WI 在肝硬化患者乏血供肝癌早期诊断中的应用价值。
方法：回顾性分析 2017 年 4 月至 2019 年 7 月期间 32 例肝硬化患者乏血供结节的 MRI 影像资料（平扫、DWI、普美显增强），所有病例结果均经穿刺活检、手术病检或随访确诊，由 2 位有经验的医师采用双盲法分析普美显肝胆特异期联合 DWI+T2WI 对乏血供肝癌的诊断能力。
结果：32 例乏血供结节中，22 例为乏血供肝癌，10 例为高级不典型增生结节（high grade dysplastic, HDN）。所有结节在肝胆特异期均呈低或相对低信号，单纯利用普美显增强无法区分乏血供肝癌与 HDN（P＞0.05）。而肝胆特异期联合 DWI 和 T2WI 高信号的影像表现能显著提高乏血供肝癌的诊断信心，对肝硬化患者乏血供肝癌与 HDN 具有一定的鉴别诊断价值（P＜0.05）。DWI 相对于 T2WI 有着更高的灵敏度。
结论：普美显肝胆特异期联合 DWI+T2WI 高信号能提高乏血供肝癌的早期诊断准确率，具有广阔的临床应用前景。

EPO-1007
扩散加权成像评价 CCL4 所致大鼠纤维化中的炎症反应

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目的：探讨 MR 扩散加权成像对 CCL4 所致的大鼠肝损伤模型中急性炎症的敏感性。
材料和方法：共 34 只成年 SD 雄性大鼠，所有大鼠随机分为三组，对照组（n=10），肝纤维组（n=12），肝纤维化伴急性炎症组(n=12)。所有大鼠分别行横断位 T2WI， DWI（b=0,600），IVIM（b=0,20,50,100,200,400,600,800），DKI（b=0,200,400,600,800,1100,1700；单方向）扫描并计算相关定量参数 DWI-ADC, IVIM-D, IVIM-D*, IVIM-f, DKI-MD, DKI-MK. 对所有实验大鼠肝组织坏死性炎症、纤维化进行组织学评分。采用成组 t 检验评价两疾病组及对照组间的差异。
结果：在肝纤维化均为 F3 级的基础上，随着肝组织炎症的发展，DWI-ADC (1093.06±107 vs 964.64±62.89; P=0.020)及 IVIM-D（1276.85±100.02 vs 1036.51±55.78; P=0.024)逐渐降低，MK 逐渐增加（0.5476±0.1121 vs 0.7456±0.1718; P=0.014）。
结论：在动物模型中，DWI-ADC, IVIM-D 的减低及 MK 的升高与慢性肝纤维化中的急性炎症反应有关。

EPO-1008
食蟹猴不同程度肝纤维化的 3.0T MR-PWI 定量参数的对比研究

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目的 分析食蟹猴不同程度肝纤维化的磁共振灌注加权成像(MR-PWI)定量参数值的变化规律，探讨评价肝纤维化严重程度的 PWI 最佳检测指标。 **材料和方法** 以四氯化碳（CCl_4）成功建立 22 只食蟹猴的肝纤维化模型，其中发展至早期肝硬化的有 15 只。采用配伍组设计对具有肝纤维化完整发展过程的 15 只食蟹猴进行 Exchange 肝脏双血供模型的 PWI 对比研究，分析不同程度肝纤维化的 PWI 定量参数（对比剂容积转运常数(Ktrans）、速率常数（Kep）、血管外细胞外间隙容积分数（Ve）、血浆容积分数（Vp）、肝动脉灌注指数（HPI））的变化规律及其与肝纤维化严重程度的相关性，采用受试者工作特征曲线(ROC) 判断 PWI 参数值对肝纤维化的诊断效能，探讨评价肝纤维化严重程度的最佳检测指标。 **结果** 食蟹猴 PWI 的 Ktrans、Kep、Vp 随着肝纤维化进展而下降，肝纤维化各期（S1～S4）与正常肝组织（S0 期）比较、重度肝纤维化 S3、S4 期与轻度肝纤维化 S1、

S2 期比较，Ktrans、Kep 均有统计学差异（$P<0.01$）；HPI 随肝纤维化进展逐渐增大且组间比较差异均有统计学意义（$P<0.01$）。Ktrans、Kep 与肝纤维化严重程度呈负相关（r_s =-0.875、-0.797，$P<0.01$），HPI 与肝纤维化程度呈高度正相关（r_s =0.959，$P<0.01$）。ROC 曲线分析显示，PWI 定量参数诊断不同程度肝纤维化的效能由高到低依次为：HPI＞Ktrans＞Kep，即 HPI 是肝纤维化最具诊断意义的指标。 **结论** 食蟹猴肝纤维化模型的 PWI 参数值随着肝纤维化发展而发生规律性变化，其中 HPI 是定量评价肝纤维化严重程度的最佳检测指标。

EPO-1009
胰腺实性假乳头状瘤影像学表现及 3 例误诊分析

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目的：通过胰腺假乳头状瘤(Solid-pseudopapillary Tumor of the pancreas, SPTP)CT、MRI 表现与病理特征对照分析，提高对 SPTP 影像表现的认识并降低误诊率。**材料与方法：**回顾性分析 17 例经手术病理证实的 SPTP 的临床及 CT、MRI 影像学资料，16 例术前均接受 CT 增强检查，另 1 例为外院 CT 增强检查，有 11 例接受 MRI 增强。**结果：**女性 13 例，男性 4 例，平均年龄约 36.2 岁，肿瘤均为囊实混合性，平均最大直径为 8.3cm；CT 增强扫描 17 例肿瘤的实性部分均呈渐进性强化，16 例双期增强 CT 扫描均低于胰腺实质，1 例在静脉期强化程度与胰腺实质相当，囊性部分未见强化；10 例可见完整包膜，呈延迟性强化，4 例包膜中断，3 例未见包膜；9 例可见粗大或蛋壳样钙化；17 例均未见胰管扩张；11 例 MRI 显示肿瘤为混杂信号，1 例内可见明确出血，增强后强化方式类似 CT。SPTP 的病理特征性表现为假乳头状结构形成伴局部区域性坏死。3 例误诊为 SPTP 患者 2 例为局灶性慢性炎症，1 例为神经内分泌肿瘤。**结论：**SPTP 多见于年轻女性，好发于胰腺头部及体尾部，CT、MRI 等影像学检查具有一定特征，肿瘤边缘区易出现钙化，增强扫描实性部分呈渐近性强化，但极少数也会出现一些非特征性表现，如肝脏、淋巴结转移、胰胆管扩张等，因此掌握 SPTP 特征性影像学表现对诊断非常重要。

EPO-1010
肝癌严重程度与 QCT-BMD 的相关性分析及临床意义

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目的 基于临床治疗的肝癌进行 QCT-BMD 检测， 评价 HCC 与发生骨质疏松发生之间关系，探讨监测 HCC 治疗评价中 QCT 的应用价值。**材料和方法** 1276 例接受 QCT 骨密度（bone mineral density, BMD）检测。QCT 定量骨密度根据美国标准：1.正常（BMD>120mg/cm^3）；2.骨量减低（BMD=80-120mg/cm^3）；3.骨质疏松（BMD<80mg/cm^3）。分组：正常组；骨量减低组；骨质疏松组。采用 SPSS19.0 软件统计分析。
结果 分析 HCC 病人的性别，年龄，肝癌严重程度与 BMD 组间结果比较，经方差和卡方检验统计显示差异有统计学意义(p<0.05)。骨质疏松与肝癌严重程度之间为正相关，回归系数 0.562，相对危险度（OR）1.754。骨量减低组、骨质疏松症与性别之间差异无显著性（P>0.05）。
结论 肝癌容易并发骨质疏松症，检测 BMD 对肝癌诊疗监控有指导价值，提示临床进行早期干预治疗。

EPO-1011
DWI 容积直方图分析在壶腹周围腺癌组织病理分型中的诊断价值

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目的：探讨 DWI 容积直方图分析在鉴别肠型及胰胆管型壶腹周围腺癌中的诊断价值。
材料和方法：回顾性分析从 2015 年 1 月至 2018 年 10 月因怀疑壶腹周围肿瘤在我院行磁共振平扫及弥散加权成像的 476 名患者。将其中在 3.0T 磁共振上完成图像采集并且 DWI 图像包含 b800 及 b1000 的患者纳入进一步分析,最后将行胰十二指肠切除术后病理证实为壶腹周围腺癌的患者纳入统计分析。由两名腹部影像诊断经验的放射科医师对获得的壶腹周围腺癌病灶进行容积直方图定量分析，分别计算整个病灶在 b800 和 b1000 的弥散加权成像（diffusion weighted imaging，DWI）的平均 ADC 值、第 5、第 10、第 25、第 50、第 75、第 90、第 95 百分位数,ADC 最小值（ADC_{min}）、ADC 最大值（ADC_{max}）及峰度、偏度、熵。将病灶根据组织病理结果分为肠型和胰胆管型两组，行独立样本 t 检验或曼-惠特尼 U 检验比较两组间差异，并分别作 ROC 曲线分析。根据 ROC 曲线下面积（Area under the ROC curve，AUC)判断其诊断准确性。按照 Yoden 指数（灵敏度+特异度-1）筛选出相应参数的截断值（cut-off 值），计算其诊断敏感度、特异度，评价其诊断效能。
结果：最终共 40 名病理确诊为壶腹周围腺癌的患者纳入研究分析，其中肠型腺癌 17 名，胰胆管型腺癌 23 名。在 b1000 的 DWI 图像上，肠型组的 ADC 平均值及第 5、第 10、第 25、第 50、第 75、第 90、第 95 百分位数显著高于胰胆管组（$P<0.05$），而从 b800 的 DWI 图像上提取出的各直方图参数均无统计学差异。b1000 图像上的第 75 百分位数获得最大的 ROC 曲线下面积(AUC, 0.781; 敏感度, 91%; 特异度, 59%; 截断值, 1.50 $\times 10^{-3}mm^2/s$).
结论： b 值为 1000 s/mm^2时，ADC 容积直方图分析能够帮助区分肠型和胰胆管型壶腹周围腺癌。

EPO-1012
双源 CT 灌注成像定量分析正常胰腺组织的血流灌注研究

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目的：研究正常胰腺血流灌注参数及特点，为胰腺疾病的灌注值提供对比依据。 **方法**：收集接受双源 CT 上腹部轴位 CT 灌注扫描且胰腺无病变的患者 60 例，使用 VPCT Body 软件分别测量胰腺头、体、尾部的 CT 灌注参数，如血流量（BF）、血容量（BV）等，并绘制胰腺时间-密度曲线（TDC），对灌注值进行统计学分析。 **结果**：38 例男性胰腺头、体、尾部的的灌注参数为：BF 均值分别为（115.06±28.90）mL• $100g^{-1}$• min^{-1}、（128.70±32.27 ）mL• $100g^{-1}$• min^{-1}、（120.65±30.42）mL• $100g^{-1}$• min^{-1}；BV 均值分别为（28.62±19.22）mL/100g、（30.29±19.26）mL/100g、（29.63±19.05）mL/100g；22 例女性胰腺头、体、尾部的的灌注参数为：BF 均值分别为（125.23±26.86）mL• $100g^{-1}$• min^{-1}、（140.62±35.60 ）mL• $100g^{-1}$• min^{-1}、（132.72±28.53）mL• $100g^{-1}$• min^{-1}；BV 均值分别为（37.82±23.26）mL/100g、（43.63±25.81）mL/100g、（39.05±23.95）mL/100g。男性胰腺头、体、尾部 BF、BV 值均低于正常女性相同部位，差异有统计学意义（P 值均< 0. 05） ；相同性别胰腺头、体、尾部 BF、BV

之间无显著性差异(P ＞ 0．05)。 **结论：** 胰腺头、体、尾部之间灌注参数 BF、BV 具有一致性，不同性别之间血流灌注存在一定差异。

EPO-1013

Analysis of imaging characteristics of mass-forming chronic pancreatitis

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Objective To investigate the features of multi-modality imaging of mass-forming chronic pancreatitis (MFCP) of the pancreatic head to improve the early precise diagnosis of this challenging condition in the clinic. **Material and methods** Clinical and imaging data (including CT, MRI and PET / CT) of 24 cases (22 males and 2 females with an average age of 51.92 ± 6.7) with MFCP, which were confirmed by surgery and pathology between January 2012 and May 2017, were analyzed retrospectively. All cases underwent multidetector computed tomography (MDCT) scanning, including multiphase dynamic contrast-enhanced CT (n=24), abdominal plain film (n=13), MRI (n=5) and PET/CT (n=16) imaging. The images were reviewed independently by two expert radiologists using the double-blind method. **Results** Of the 24 cases of MFCP, 18 (75%) were correctly diagnosed, and 6 (25%) were misdiagnosed as pancreatic carcinoma or other malignant tumor based on CT examination. The main imaging findings included the following features: ① A mean diameter of 5.44 cm ± 1.27 cm with lobular sign (n=3) and significant exudation around the lesion (n=20). ② Calcification was found in 14 cases (58.33%), including mixed calcification (n=8), patchy calcification (n=4) and punctate calcification (n=2); necrosis cyst occurred in 7 cases (29.17%). ③ Pseudocyst occurred in 14 cases with tension and honeycombed cystic change. ④ Sixteen cases (66.67%) exhibited dilation of the pancreatic duct, including bead-like expansion (n=14), smooth uniformity dilation (n=2), dilated pancreatic ducts passing through the lesion area (n=19) and interrupted in the lesion area (n=2), and accompanied by bile duct dilatation (n=17) with a gradual narrowing in the lesion area, double-duct sign (n=7), and pancreatic duct stones (n=13). ⑤ The time-density curve of lesion dynamic enhancement increased and decreased slowly (n=18). ⑥ Lymph nodes were enlarged (n=11) with a mean diameter of 11 mm and a slight uniformity enhancement around the pancreas and retroperitoneum. ⑦ Peri-pancreatic vessels (n=17) with regular and smooth vascular shapes were compressed and displaced. Two cases were accompanied by portal vein thrombosis. ⑧ Thickening of the right renal fascia occurred in 20 cases. ⑨ SUVmax values of the lesions during the early and delayed phases were 2.51 ± 0.42 and 2.10 ± 0.31, respectively, without significant change over time. **Conclusion** Multi-modality imaging yielded certain image characteristics, which are of significant clinical value for the early diagnosis and differential diagnosis of MFCP.

EPO-1014

优化前后置多模型迭代重建技术低剂量腹部 CT 扫描

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目的：观察多模型实时迭代重建技术（ASiR-V）对腹部 CT 图像质量和辐射剂量的影响，并优化 ASiR-V 前置联合后置百分比方案。**方法：**将 160 例上腹部 CT 扫描的患者随机分为试验组或对照组，各 80 例。对试验组在平扫、动脉期、门静脉期和延迟期分别采用前置 20% ASiR-V 扫描联合后置 20%、40%、60%、80% ASiR-V 重建，前置 40%联合后置 40%、60%、80%，前置 60%联合后置 60%、80%及前置 80%联合后置 80%的扫描及重建方法；对照组采用前置 0% ASiR-V 扫描，并分别采用 FBP 和后置 20%、40%、60%和 80% ASiR-V 两种方式进行重建。对所有图像进行客观评价[噪声（SD）和 CNR]和主观评分，并进行对比分析。**结果：**试验组各期相的 CT 剂量指数、剂量长度乘积及有效剂量均低于对照组（*P*均＜0.001）。相同期相内，随着后置迭代比例增加，SD 值逐渐减小而 CNR 值无变化或增加；试验组图像随着后置 ASiR-V（20%~60%）增高，图像主观评分增加，ASiR-V 为 80%时图像质量较差；除试验组平扫前置 20%联合后置 40%、60%图像与对照组平扫 ASiR-V 重建图像、试验组动脉期前置 40%联合后置 60%图像与对照组动脉期 ASiR-V 重建图像质量评分差异无统计学意义（*P*均＞0.05）外，余试验组图像质量评分均小于对照组 ASiR-V 图像。**结论：**一定比例 ASiR-V 重建可提高腹部 CT 图像质量，推荐使用在 ASiR-V 前置 40%联合后置 60%的扫描方案。

EPO-1015

胰腺癌合并胰腺炎的多模态影像学特征及 CT 漏诊分析

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目的 探讨胰腺癌合并胰腺炎的多模态影像学特征并分析 CT 漏诊原因。**方法** 回顾性分析以急性胰腺炎为首发表现且首次 CT 漏诊并经临床手术病理证实的 13 例胰腺癌合并胰腺炎患者的临床资料及多模态影像学资料。所有病例行多排螺旋 CT 平扫,同时 11 例行多期增强 CT 检查、9 例行 MRI 平扫及 6 例行 PET/CT 检查。在飞利浦影像工作站由两位高级职称腹部放射医学医师双盲法评价图像，并通过商议达成一致诊断意见。**结果** 所有 13 个病例首次 CT 平扫均仅诊断为急性胰腺炎，胰腺癌漏诊率 100%，诊断延误时间 3 天～240 天不等，平均延误时间 45 天。主要临床特点为所有患者均有不同程度上腹痛及 CA19-9 明显升高（平均 340.34 U/dl±140.65U/dl），血清淀粉酶轻度升高（平均 359.05 U/dl±117.85 U/dl）。 影像学表现：胰腺癌灶位于胰头部 7 例、胰体部 6 例，大小 1.7cm～3.5cm，平均直径为 2.8cm±0.67cm；类圆形 10 例，斑片状 3 例，10 例未引起胰腺局部形态明显改变，3 例胰腺局部稍增大变形；等密度 10 例，3 例呈稍低密度，6 例呈稍长 T1、稍长 T2 信号，增强 CT/MRI 动脉期均呈低强化，5 例出现小斑片状坏死，边界均不清楚；6 例 PET/CT 显示癌结节呈明显高摄取；所有 13 例均出现胰腺炎征象，表现胰腺不同程度肿胀伴周围渗出及肾前筋膜增厚，11 例出现病变段胰管扩张，5 例出现胰腺尾部周围假性囊肿形成，伴胰腺周围淋巴结肿大伴环形强化 4 例。**结论** 胰腺癌合并胰腺炎具有一定的影像学特征，认识不足与影像学检查方法不当是漏诊与误诊的主要原因，综合分析临床资料及合理应用多模态影像学对胰腺癌合并胰腺炎早期精准诊断至关重要。

EPO-1016

IVIM-DWI 在肝细胞癌的诊断及鉴别诊断的中的应用价值

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目的：探讨体素内不相干运动扩散加权成像（IVIM-DWI）在肝细胞癌（HCC）的诊断及其与肝胆管细胞癌、肝转移瘤鉴别诊断中的应用价值。
材料与方法：收集肝脏恶性肿瘤患者 81 例。其中肝细胞癌 55 例，肝内胆管细胞癌 10 例，肝转移瘤 16 例。所有研究患者均在治疗前或活检前使用 GE3.0T 核磁共振行常规 MRI 平扫、IVIM-DWI 扫描（b=0,20,40,80,100,200,400,800,100）及动态增强扫描。根据 T1WI、T2WI 压脂图像，采用单指数及双指数模型获得以下定量指标：（ADC）、（Dslow）、（Dfast）、(f)。原发性肝癌、肝胆管细胞癌、肝转移瘤及正常肝实质的相关参数进行正态分布检验。
结果：（1）HCC 与 ICC 的 ADC、Dslow 有统计学差义，（2）HCC 与 ICC、HCC 与 LM 的 Dfast 有统计学差义（3）当 ADC、Dslow、Dfast、f 的阈值分别是 1.20×10-3mm2/s、0.88×10-3mm2/s、38.09×10-3mm2/s、19.23×10-3mm2/s 时，诊断肝细胞癌的 ROC 曲线下面积分别是 0.773、0.801、0.777、0.803；当 ADC、Dslow、Dfast 的阈值分别是 1.27×10-3mm2/s、0.81×10-3mm2/s、26.04×10-3mm2/s，其对肝细胞癌和肝胆管细胞癌的鉴别诊断的 ROC 曲线下面积分别是 0.687、0.721、0.896；当 Dfast 的阈值分别是 29.62×10-3mm2/s，其对肝细胞癌和肝转移瘤鉴别诊断的 ROC 曲线下面积分别是 0.805。
结论：IVIM-DWI 对肝细胞癌的诊断及其与肝内胆管细胞癌、肝转移瘤的鉴别诊断具有一定的影像诊断价值。IVIM-DWI 可作为必要的补充序列，为肝细胞癌的诊断及鉴别诊断提供信息，从而为临床早期诊断、治疗方案的制定提供帮助。

EPO-1017
急性胰腺炎导致的胰周动静脉血管改变有何临床意义？

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目的 探讨急性胰腺炎患者在发病 1 周内和发病 1w 后胰周动静脉血管征象的临床价值。**方法** 回顾性收集本院 301 例（女 153：男 148；年龄 52 岁(18 - 67 岁)）连续性急性胰腺炎患者且在发病 5 天内行首次 MRI 检查且有至少一次 MRI 复查者。综合常规序列、DWI 和动态增强序列判定胰周动脉、静脉的各类改变。用 Spearman's 相关分析影像学征象和 MRSI 评分和 APACHE II 评分的关系。**结果** 本组基于首次 MRI 基于影像学分级，轻度、中度、重度分别为 46.8% (141/301), 44.6% (134/301), 8.6% (26/301)。24.9% (75/301) 的病例可见至少一种动静脉受累表现(*Kappa* > 0.85)。早期的血管改变包括脾静脉静脉炎症、门静脉静脉炎症、肠系膜上静脉炎症分别为 24.9% (75/301), 22.3% (67/301), 15.3% (46/301)。在 75 例脾静脉静脉炎症患者中， 44% (33/75)存在脾静脉狭窄[3.5 mm (2 mm - 5.5 mm)]。脾动脉炎症发生率为 19.9% (60/301)；6.3% (19/301) 继发脾动脉出血表现。而脾静脉血栓形成、门静脉血栓形成、肠系膜上静脉血栓形成和侧枝循环建立的早期发生率为 4% (12/301), 3% (9/301), 2.3% (7/301), 4% (12/301)。依据临床评分分类，动静脉受累在轻度和重度胰腺炎发生率分别为 13.8% (26/189)、 43.7% (49/112) (χ^2= 33.82, p < 0.001)。脾静脉炎症、脾动脉炎症、静脉血栓与胰腺炎严重程度相关性分别为 *r*=0.532, p < 0.001；*r*=0.456, p < 0.001；*r*=0.435, p < 0.001）。**结论** 急性胰腺炎所致发病 1 周内和发病 1w 后胰周动静脉血管受累改变常见且疾病谱较广，各类并发症对胰腺炎的严重度有预测价值。

EPO-1018

MRI T1mapping 及 ECV 在肝脏定量中的可行性研究

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目的：评估 MRI T1mapping 及 ECV（细胞外容积分数）在肝脏定量中的可行性。
方法：收集正常肝脏患者 12 例，行 3.0T 磁共振 T1mapping 成像，注入造影剂增强后 15 分钟后再次行 T1mapping 成像。由两名高年资医师按四分法对图像质量进行评价，并分别画取感兴趣区得到肝脏、腹主动脉增强前、后 T1 值及肝脏 ECV 值。
结果：两名医师对图像质量评价 Kppa 值为 0.894，所有图像均符合诊断要求（≥3 分）。两位医师对肝脏、腹主动脉 T1 值及肝脏 ECV 值测量不存在统计学差异。肝脏增强前、后 T1 平均值分别为 809ms±11.53ms 及 535ms±16.13ms，肝脏 ECV 平均值 16.62±1.45。
结论：MRI T1mapping 能够获得良好的图像质量，定量测量肝脏增强前、后 T1 值，获得肝脏 ECV 值，为进一步研究肝脏各种病变提供了一种新的诊断方法。

EPO-1019

孤立性纤维瘤的 MSCT 诊断及鉴别

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目的：探讨孤立性纤维瘤的多层螺旋 CT（MSCT）表现特征，提高对该病的影像学认识。方法：回顾性分析经手术病理证实的 12 例胸腹部孤立性纤维瘤的病例，术前行增强 CT 扫描，并复习文献,，总结其 CT 影像特征。结果：本组 12 例均行增强 CT 扫描，均为单发原发灶，1 例位于左侧胸膜，10 例位于腹腔，1 例位于盆腔。10 例肿块边缘均光整,无毛刺，2 例有分叶。肿瘤长径 1.2~13.5 cm,平均(7.0±5.1)cm。8 例不均匀强化，增强后呈不均匀＂地图样＂轻中度强化，其中 2 例其内可见血管影，呈“肿瘤包绕血管征”；余 4 例表现为均匀强化。结论：孤立性纤维瘤一般表现为孤立的、边界清楚的软组织肿块，密度不均，增强扫描多数不均匀轻度强化，少数明显不均匀强化伴迂曲样血管样强化。

EPO-1020

Free-breathing Dynamic Contrast Enhanced Magnetic Resonance Imaging with Compressed Sensing Reconstruction of Liver Perfusion: Utility for Prediction of Microvascular Invasion in Small HCC (≤5cm)

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Purpose: To evaluate perfusion parameters at three-dimensional (3D) perfusion magnetic resonance (MR) imaging of the liver in diagnosis of microvascular invasion (MVI) in small hepatocellular carcinoma (≤5 cm).
Materials and Methods: This study was approved by the institutional review board, and written informed consent was obtained. There were 43 MVI positive sHCC and 42 MVI negative sHCC in 80 patients. Whole-liver 3D perfusion MR imaging in free-breathing using Cartesian k-space undersampling with compressed sensing, combined with T1 mapping and B1 inhomogeneity correction, was performed at a 3.0-T system (uMR 770, United Imaging Healthcare, Shanghai, China). After 5-8 pre-contrast baseline acquisitions, 0.1 mmol/kg gadopentate dimeglumine was injected and immediately followed by a 20-mL saline flush through a power injector at a rate of 4 mL/s, and another 40-43 phases of post contrast acquisitions were obtained. A square was manually placed on the proximal abdominal aorta at the level of the celiac axis for AIF calculation, another square on the main portal vein at the level of the porta hepatis for the portal vein input function (Fig.1). The analytical parameters derived from a dual-input single-compartment model of arterial flow (Fa), portal venous flow (Fp), total blood flow (Ft=Fa+Fp), arterial fraction (ART), distribution volume (DV), and mean transit time (MTT) were measured. The significant parameters between the two groups were correlated with the MVI at simple and multiple regression analysis.
Results: In both groups, Fa, ART, and DV were significantly higher in HCC than in normal liver parenchyma, whereas reversed in Fp ($P < .001$). In the MVI-positive HCC, Fp was significantly higher than that in the MVI-negative HCC, whereas reversed in ART ($P < .001$) (Table 1). Tumor size ($\beta = 1.2$, $P = .004$; odds ratio, 3.20; 95% CI: 1.45, 7.06), Fp ($\beta = 1.1$, $P = .004$; odds ratio, 3.09; 95% CI: 1.42, 6.72), and ART ($\beta = -3.1$, $P = .001$; odds ratio, 12.13; 95% CI: 2.85, 51.49) were independent risk factors for MVI (Table 2, Fig.2). The AUC value of the combination of all three metrics was 0.931 (95 % CI: 0.855, 0.975), which was significantly better than the performance of each used alone ($P < .05$) (Fig.3).
Conclusion: Whole-liver 3D perfusion MR imaging is a promising tool for preoperative detection of MVI in sHCC (≤5cm).

EPO-1021
探索联合肝脏分割与门静脉支结扎的分步肝切除术后肝脏体积变化规律

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目的：探索联合肝脏分割与门静脉支结扎的分步肝切除术（ALPPS）后肝脏体积变化规律。
方法：回顾性收集在我院进行 ALPPS 手术的肝癌患者共 10 人（平均年龄 54.5±10.2 岁，男性 8 人，女性 2 人）。患者于术前进行腹部增强 CT 检查，利用西门子后处理工作站体积测量软件进行肝脏体积测量，以肝中静脉及胆囊窝为界，测量右半肝去瘤体积及左半肝体，并于第一步术后（肝脏分割与门静脉支结扎）不同时间点进行 2 次腹部平扫 CT 检查，测得右半肝去瘤体积及左半肝体。计算获得术前、术后左半肝/全肝体积比，利用配对 T 检验比较患者术前、术后第一次、术后第 2 次右半肝去瘤、左半肝肝体积差异。

结果：术后第 1 次检查距第 1 步手术平均 7.6±1.2 天（6-9 天），术后第 2 次检查距第 1 步手术平均 14.4±1.9 天（11-17 天）。术前平均全肝体积（去瘤）为 1025.7±246.5ml，术前平均左半肝/全肝体积比为 42.6%±13.1%，术后第 1 次复查，平均左半肝/全肝体积比为 46.5%±11.1%，术后第 2 次复查，平均左半肝/全肝体积比为 54%±11%。术后第 1 次复查左半肝体积显著高于术前（P=0.037），术后第 2 次复查左半肝体积显著高于术前及第 1 次（P=0.002、0.020）。术前、术后第 1 次、术后第 2 次右半肝（去瘤）体积无明显统计学差异（所有 P>0.05）。
结论：ALPPS 手术第一步术后，左半肝体积明显增长，右半肝体积无明显变化，约 14 日可达左半肝体积达肝脏总体积比 50%以上。

EPO-1022
DCE-MRI 评估索拉非尼抑制兔 VX2 肝种植瘤血管生成实验研究

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目的：DCE-MRI 定量检测兔 VX2 肝种植瘤模型经索拉非尼靶向治疗前后的变化情况，将定量参数与免疫组化指标 MVD、VEGF 进行相关性分析，验证 DCE-MRI 进行疗效评估的可行性。
方法：选取 3.2±0.5kg 健康的新西兰大白兔 36 只，雌雄不限，采用开腹瘤组织块穿刺包埋法制备兔 VX2 肝种植瘤模型，术后 7 天，通过 MRI 筛选形状规整、大小基本一致的兔 VX2 肝种植瘤 30 只，随机分为两组（各 15 只），实验组索拉非尼灌胃治疗，对照组同等剂量 5%葡萄糖灌胃治疗。实验兔分别于治疗前、治疗后 7 天、治疗后 14 天进行 DCE-MRI 扫描，并记录定量参数 K_{trans}（单位：min^{-1}）、K_{ep}（单位：min^{-1}）、V_e、V_p，最后一次扫描结束后，处死实验兔，行 HE 染色、MVD 及 VEGF 免疫组化检查。
结果：
1 实验组与对照组之间 DCE-MRI 参数 K_{trans}、K_{ep}有差别，差别有统计学意义(P<0.05),V_e、V_p差别无统计学意义(P0.05)。实验组值 K_{trans}治疗前为 0.34±0.12 min^{-1}，治疗后 7 天为 0.23±0.04 min^{-1}，治疗后 14 天为 0.13±0.03 min^{-1}；对照组 K_{trans}值治疗前为 0.35±0.06 min^{-1}，治疗后 7 天为 0.36±0.07 min^{-1}，治疗后 14 天为 0.42±0.09min^{-1}；
2 治疗 7 天后，两组间肿瘤直径增大差异没有统计学意义（P>0.05）；治疗 14 天后，两组间肿瘤直径增大差异有统计学意义（P<0.05）。
3 免疫组化分析两组间 MVD 差别有统计学意义(P<0.05)。相关性分析 K_{trans}与 MVD、VEGF 之间呈正相关（r 值分别为 0.792 和 0.651）。
结论：MRI 灌注可以定量评估索拉非尼治疗兔 VX2 肝种植瘤的疗效。容积转移常数 K_{trans}与 MVD、VEGF 呈正相关。

EPO-1023
肝脏磁共振成像在 CT 检测到的乳腺癌肝转移患者中的增量价值：扩散加权成像、钆酸增强磁共振成像的前瞻性比较。

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目的:前瞻性比较弥散加权成像(DW)、普美显核磁增强成像(MR)和计算机断层扫描(CT)对乳腺癌肝转移的诊断效果，评价 MR 对 CT 诊断乳腺癌肝转移的增量价值。材料与方法:46 例乳腺癌肝转移患

者经 CT 检查均行肝 MR 检查，包括 DW 成像和普美显增强 MR。利用自由响应接收机工作特性分析和广义估计方程，分析了表征各图像集总体诊断性能、灵敏度和正预测值的 FOM 值。结果:46 例患者发生肝转移 94 例。普美显增强 MR 的综合 FOM 值、敏感性和 PPVs (FOM 值，0.92;敏感性,95%;PPV(90%)明显高于 CT (FOM 值 0.82;敏感性,85%;(P ＜ .006)。DW 成像显示敏感性(79%)和 PPV(60%)明显高于 CT(敏感性，50%;转移瘤(≤1 cm 直径)(P≤.004)。结论:普美显增强 MR 对乳腺癌肝转移的检测较 CT 更准确，单独加 CT 对其他转移的检测有增量价值，可常规应用于 CT 检测肝转移患者。

EPO-1024
改良的屏气压缩感知 3DMRCP 在胰腺及胆道疾病中的应用探索

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目的：前瞻性评估具有小视场（FOV）和更高空间分辨率的改良 3D BH-CS-MRCP 序列的临床可行性，并将其性能与原始 BH-CS-MRCP 和 NT-CS-MRCP 进行比较。
材料和方法：前瞻性招募 82 例临床疑诊胰胆疾病的患者，包括 7 例不能配合呼吸指令的患者，在 3TMR 设备进行 3DMRCP 检查。每位患者中以随机顺序进行改良 BH-CS-MRCP，原始 BH-CS-MRCP 和 NT-CS-MRCP 扫描。记录每个协议的采集时间。由两名放射科医师独立对图像进行盲法评估，以 5 分法评价图像质量，背景抑制，胰胆管显示清晰度，以及胰胆管解剖变异和胰胆管相关疾病的诊断自信度。用 Wilcoxon 符号秩检验比较个体内差异。用 kappa 系数评价观察者间的一致性，用受试者操作特性曲线（ROC）计算诊断性能。
结果：两种 BH-CS-MRCP 方案的采集时间均为 17 秒，NT-CS-MRCP 的采集时间为 127.5±36.9 秒。两种 BH-CS-MRCP 的背景抑制程度相似（原始 BH-CS-MRCP 为 3.67±0.77，改良 BH-CS-MRCP 为 3.70±0.57），均低于 NT-CS-MRCP（4.41±0.68，两者 p 值<0.001）。改良的 BH-CS-MRCP 和 NT-CS-MRCP 对于胰管和胆管的二级分支显示清晰度优于原始 BH-CS-MRCP（p 值均<0.01）。三种扫描序列对于胆道的解剖变异和疾病诊断准确度相似（p = 0.53-0.87），而对于胰管的解剖变异和疾病，改良 BH-CS-MRCP 和 NT-CS-MRCP 比原始 BH-CS-MRCP 诊断效能更优秀（p 值均<0.01）。在 7 名不能配合的患者中，NT-CS-MRCP 比两种 BH-MRCP 的图像质量更好（p 值均<0.01）。
结论：改良的 BH-CS-MRCP 可用于胰腺和胆道疾病。然而对于不能配合呼吸指令的患者而言，NT-CS-MRCP 可能更有用。

EPO-1025
MSCT 检查对中弓韧带压迫腹腔动脉的诊断价值

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目的 探讨和总结 MSCT 评估正中弓状韧带（MAL）压迫腹腔动脉（CA）的影像表现。**方法** 回顾性分析 2016 年 8 月—2019 年 6 月我院诊断 MAL 压迫腹腔动脉患者 23 例，总结其影像学表现和特点。**结果** 23 例诊断 MAL 压迫腹腔动脉患者中，男 15 例，女 8 例；轴位图像清楚显示腹腔动脉狭窄 19 例，矢状位 MPR、MIP 及 VR 图像 23 例均显示腹腔动脉狭窄，腹腔动脉狭窄严重程度为 16%~87%，最狭窄点距腹主动脉 2.5~19,8mm（平均 9.4mm），狭窄后轻度扩张 18 例，无扩张 5 例，7 例侧支循环形成，15 例腹主动脉硬化。**结论** MSCT 和血管后处理技术可以清楚显示 MAL 对腹腔动脉的压迫和血管狭窄程度，能够为临床诊断和治疗提供重要的信息。

EPO-1026
同时性肝细胞癌和肝内胆管细胞癌双原发癌（附 1 例报告及文献复习）

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病史：49 岁女性患者，主因“间断乏力、右上腹疼痛 3 年余”入院。既往慢性乙肝、肝纤维化病史。肿瘤标记物 AFP 109.4 IU/ml，CA199 321.6U/ml。CT 平扫+增强示肝 S4 见一大小约 40mm×44mm 的类圆形低密度影，边界尚清，增强动脉期呈高强化，门脉期及延迟期廓清；同时肝 S6 见一大小约 26mm×27mm 的类圆形低密度影，边界清，增强动脉期边缘轻度强化，门脉期边缘强化程度增加，延迟期略向中央填充。MR 平扫+特异性增强示 S4 病灶呈长 T1 混杂长 T2 信号，弥散受限，增强动脉期呈环形强化，门脉期及延迟期呈渐进性强化，肝胆期呈混杂低信号；S6 病灶呈长 T1 稍长 T2 信号，T1WI 上内可见点状高信号，弥散不受限，增强动脉期呈等强化，门脉期强化程度增加，过渡期呈低信号，肝胆期呈低信号。影像诊断肝 S4、6 肿块，考虑恶性肿瘤，HCC 或 cHCC-CC 可能。患者行肝肿物切除术，术后病理诊断：（肝四段）：中-低分化胆管细胞癌，（肝六段）：低分化肝细胞癌。
讨论：原发性肝癌主要包括 HCC、ICC 以及 cHCC-CC。WHO(2010 版)对 cHCC-CC 进行了重新分类，将同时发生于肝的独立 HCC 和 ICC 称为双原发癌（dpHCC-ICC）；而将在同一部位发生包含肝细胞癌与胆管癌两种成分且相互混杂或移行者，称为 cHCC-CC。dpHCC-ICC 发病率较 cHCC-CC 更低。临床表现类似 HCC，如患者以男性为主、有肝炎或肝硬化病史、AFP 增高等。其影像特点是不同的病灶分别表现为 HCC 及 ICC 影像征象，当 AFP 和 CA199 同时升高可提示双原发肝癌的可能，但 cHCC-CC 也同时具备 HCC 和 ICC 成分，也可有 AFP 和（或）CA199 升高，有时鉴别困难，明确诊断依靠病理学检查。

EPO-1027
灌注 CT 诊断胰岛素瘤最佳融合期相数目的初步研究

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研究目的：本研究拟通过不同期相数目融合得出的自定义容积图像进行比较，找到灌注 CT 诊断胰岛素瘤的最佳融合期相数目。
研究方法：本研究回顾性纳入因怀疑胰岛素瘤，在我院行灌注 CT 检查且经病理证实为胰岛素瘤的患者 39 名。将灌注检查的患者调入后处理工作站 syngovia，后处理软件为 dynamic angio。首先，在腹主动脉画取 ROI，得到主动脉的时间-密度曲线。之后，将腹主动脉峰值及其邻近 2、4、6、8、10 期，共计 3、5、7、9、11 个时间点融合，得到五组自定义容积成像。并对 5 组融合图像的噪声、肿瘤的 SNR、CNR 及总体图像质量进行比较。统计学方法采用随机区组方差分析及 Friedman M 秩和检验。
研究结果：3 期融合容积成像倾向于图像噪声更高及胰腺 SNR 更低，与 7、9 及 11 期比较，p 值均＜0.05，但与 5 期融合容积成像相比均无明显统计学差异（p＞0.05）。11 期融合容积成像倾向于图像噪声更低及胰腺 SNR 更高，图像噪声与 3 期及 5 期容积成像相比有统计学差异（p＜0.05），而胰腺 SNR 仅与 3 期相比有统计学差异（p＜0.05）。5、7、9 期融合容积成像具有中等噪声及

SNR。尽管 3 期融合成像倾向于更高的胰岛素瘤 CNR，但与其他四组相比均无明显统计学差异。两位评估者对于 5 组容积成像的主观图像质量评估有良好的一致性（κ 值为 0.614-0.730）。3 期融合的图像质量与 5 期相比无明显统计学差异（两位评估者 p 值均＞0.99），而与 9 期及 11 期相比均有统计学差异（两位评估者 p 值均＜0.05），3 期与 7 期图像质量比较，观察者 1 发现有统计学差异（p＜0.05），观察者 2 无明显统计学差异（p＞0.05），余图像质量间均无明显统计学差异。研究结论：3 期融合容积成像，倾向于肿瘤 CNR 更高，且图像质量在可接受范围内。因此最佳融合期相数目为 3 期。

EPO-1028
腹部含脂性肿瘤的诊断思维路径（专题讲座）

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脂肪组织具有重要的内分泌和免疫功能，也是构成肠系膜、网膜及腹膜后结构的重要部分。腹部肿瘤内脂肪成分的识别对病变来源及定性至关重要。计算机断层扫描和磁共振成像对脂肪的识别十分敏感。腹部含脂性肿瘤可分为腹腔及腹膜后脏器来源和非脏器来源，如髓样脂肪瘤、血管平滑肌脂肪瘤、腹腔内或腹膜后脂肪肉瘤、畸胎瘤等。本文将分别以腹腔内及腹膜后两个空间结构为起点，从脏器及非脏器来源两方面，汇总及回顾腹部含脂性肿瘤的影像学特点，以期为临床工作提供清晰的影像诊断思路，为青年医师的规范化培养提供参考。

EPO-1029
多排螺旋 CT 对腹部巨大囊性病变的诊断价值

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目的：探讨多排螺旋 CT 对腹部巨大囊性病变的诊断价值。方法：回顾性分析腹部巨大囊性病变 34 例,均经手术或病理证实其来源,对其良恶性诊断进行统计学分析,计算 CT 诊断的符合率、敏感度及特异度,并对其中良性病变 CT 表现的形态、边界、周围组织变形、移位等征象与金标准进行对照。结果：与金标准对比,CT 诊断良恶性病变之间无统计学意义(P >0.05),CT 诊断的符合率、敏感度及特异度分别为 85.3%、92.3%、62.5%,其中 24 例良性病例中,上腹囊性包块 10 例,中下腹 5 例,占据整个腹部 9 例。肝囊肿 5 例,胰腺囊肿 4 例,输卵管卵巢囊肿 5 例,胆总管囊肿 3 例,卵巢浆液性和黏液性囊肿各 1 例,神经鞘瘤 2 例,包裹性结核性腹膜炎 1 例,囊性淋巴管瘤 2 例。结论：CT 诊断腹部巨大囊性病变绝大多数为良性,囊性病变临近组织的变形和移位方向对囊肿的定位诊断具有重大作用,多平面三维重建能更清晰地显示其关系。

EPO-1030
腹部 CT 不同调制强度对图像质量与辐射剂量影响的临床研究

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目的 探讨西门子 CT 联合管电流调制在成人腹部 CT 扫描中不同调制强度对图像质量与辐射剂量影响，分析体质量指数（BMI）与调制强度关系。**方法** 连续收集行上腹部 CT 平扫和双期增强扫描 235 例患者，分 5 组（A、B、C、D、E），每组纳入 47 例分别对应五种调制强度[Very Strong（VS）、Strong（S）、Average（A）、Weak（W）、Very Weak（VW）]下扫描，每组患者扫描规范相同。比较各组辐射剂量（CTDIvol、DLP）及图像客观指标[噪声（SD）及肝、脾、胰腺、腹主动脉和门静脉对比噪声比（CNR）]，对各组图像质量行主观评价。同时将每组患者 BMI 分两亚组（≥24 与<24）kg/m^2行亚组分析。**结果** 5 组 BMI 间无统计学差异（P≥0.63）。5 组 $CTDI_{vol}$ 和 DLP 分别为（32.76、39.61、40.67、48.09、53.98）mGy 与（846.57 、1007.15、1046.17 、1165.96、1295.53）mGy·cm，A 与 C、D、E 组均有统计学差异（P≤0.04），A 与 B 组差异较小（P=0.08、0.31）。5 组动、静脉期 SD 分别为（5.56、7.01、5.32、4.69、4.71）和（5.62、6.81、5.59、5.08、4.87），肝、脾、胰腺、腹主动脉和门静脉 CNR 各组差异较小。图像质量主观评价满足诊断要求。对 BMI≥24kg/m^2患者，A、B、C 组 $CTDI_{vol}$ 低于 D、E 组，但图像噪声差异不大（P>0.05），对 BMI<24kg/m^2患者，随调制强度增加，图像噪声明显增加。**结论** 联合管电流调制在腹部 CT 应用中，随调制强度降低（VS、S、A、W、VW）辐射剂量增加，噪声减少。对 BMI≥24kg/m^2患者，各调制强度间图像质量相似，为减少曝光剂量，建议选择 VS、S、A 调制强度，对 BMI<24kg/m^2患者，建议选择 W、VW 调制强度。

EPO-1031

肝淤血的 CT 诊断

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目的：探讨导致肝脏淤血性疾病的多层螺旋 CT（MSCT）表现特征，提高相关疾病影像诊断水平，为临床诊治肝淤血性疾病提供帮助。**方法**：对 58 例经临床诊断的肝脏淤血性疾病，包括 11 例肝小静脉闭塞症、13 例布-加综合征、34 例心源性肝淤血进行回顾性研究，分析其 CT 征像。**结果**：肝脏淤血性疾病共同表现为肝脏增大，慢性期肝脏缩小或出现肝硬化，门静脉期肝组织地图样强化不均匀，多伴发脾大、门静脉高压、腹水、胆囊壁水肿及肝内淋巴瘀滞等征象。肝小静脉闭塞征多表现为典型肝淤血表现，布-加综合征可出现肝静脉或下腔静脉肝段及以上管腔狭窄、阻塞或闭塞征像，增强检查肝尾状叶及肝门区明显强化，肝外周实质强化不明显，并出现肝内外侧枝循环静脉；心源性淤血性肝病增强检查可出现动脉期下腔静脉逆向性对比剂充盈征像。**结论**： CT 检查表现对肝淤血性疾病的诊断、鉴别诊断及病因诊断具有重要价值。

EPO-1032

CT Perfusion Imaging Can Predict Early Response to and Survival with Transarterial Chemo-lipiodol Infusion for Patients with Colorectal Cancer Liver Metastases

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Objective: To prospectively evaluate the performance of computed tomography perfusion imaging (CTPI) in predicting the early response to and survival with transarterial

chemo-lipiodol infusion (TACLI) for patients with colorectal cancer liver metastases (CRLM).
Materials and Methods: CTPI was performed before and 1 month after TACLI in 61 consecutive patients. Therapeutic response was evaluated on CT scans 1 month and 4 months after TACLI; the patients were classified as responders and non-responders based on 4-month CT scans after TACLI. The percentage change of CTPI parameters of target lesions of the responders and that of the non-responders 1 month after TACLI were compared. The optimal parameter and cutoff value were determined. The patients were divided into two subgroups according to the cutoff value. The log-rank test was used to compare the survival rates of the two subgroups. $P < 0.05$ indicates a significant difference.
Results: Four-month images were obtained from 58 patients, of which 39.66% were responders and 60.34% were non-responders. The percentage change in hepatic arterial perfusion (HAP) 1 month after TACLI was the optimal predicting parameter ($P = 0.003$). The best cut-off value was -21.51%. Patients who exhibited a $\geq 21.51\%$ decrease in HAP had a significantly higher overall survival rate than those who exhibited a $< 21.51\%$ decrease ($P < 0.001$).
Conclusion: CTPI can predict the early response to and survival with TACLI for patients with CRLM. The percentage change in HAP after TACLI with a cutoff value of -21.51% is the optimal predictor.

EPO-1033

肝硬化胆道系统异常的 MRI 评估

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目的：通过 MRI 评估肝硬化患者胆道系统的改变，并探讨其与肝硬化 Child-Pugh 分级的相关性。
材料与方法：搜集 2014 年 2 月至 2018 年 12 月在我院住院治疗的 166 例肝硬化患者，按肝硬化 Child-Pugh 分级分为 3 组。在 MRI 图像上观察患者胆道系统的改变，包括胆囊窝扩大，胆囊壁增厚，胆囊浆膜下水肿，胆道结石，胆囊体积增大，胆总管扩张.。采用卡方检验分析肝硬化胆道系统异常与 Child-Pugh 分级不同严重程度之间的差异性，并采用 Spearman 等级相关来分析两者之间的相关性。
结果：166 例患者中，有 111 例患者（67%）存在胆道系统的异常，包括胆囊窝扩大 68 例（41%），胆囊壁增厚 62 例（37.3%），胆囊壁浆膜下水肿 50 例（30.1%），胆囊窝积液 51 例（30.7%），胆道结石 32 例（19.3%），胆囊体积增大 18 例（10.8%），胆总管扩张 10 例(6%)。根据肝硬化 Child-Pugh 分级，A 级 86 例，B 级 55 例，C 级 25 例，其中胆道系统异常的发生率，A 级为 38 例（44%），B 级为 49 例（89%），C 级为 96%（24 例），A 级与 B、C 两级级间比较有统计学意义（$P \leq 0.05$），B 级与 C 级间比较差异无统计学意义（$P=0.31$），胆道系统异常的发生率与肝硬化 Child-Pugh 分级之间具有正相关关系($r=0.491, p=0.000$)。
结论：MRI 能可靠评价肝硬化患者胆道系统异常，可以作为肝硬化严重程度分级的辅助参考指标。

EPO-1034

全模型迭代重建在Ⅰ、Ⅱ级肝硬化患者低辐射剂量 CTPV 中的应用

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目的 探讨全模型迭代重建（IMR）技术在低辐射剂量 CTPV 中的应用价值。**方法** 将 60 例临床诊断肝硬化的患者行 256 层螺旋 CT 门静脉成像，根据随机表法将患者随机分为常规组（A 组）和实验组（B 组），每组 30 人。A 组：管电压为 100kV，剂量指数（DRI）为 20,图像采用 iDose4 重建；B 组：管电压为 80kV，DRI 为 17,图像采用 IMR 重建。对比 A、B 两组以下指标的的差异性。①门静脉图像噪声（SD）、信噪比（SNR）、对比信噪比（CNR）及主观评分。②肝实质 SD 和 SNR。③两组患者容积 CT 剂量指数（$CTDI_{VOL}$）、辐射剂量长度乘积（DLP）和有效辐射剂量（ED）。**结果** B 组肝实质及门静脉的 SD 均低于 A 组（P＜0.01）；B 组肝实质 SNR、门静脉 SNR、门静脉 CNR 及主观评分均高于 A 组（P＜0.01）；B 组 $CTDI_{VOL}$、DLP 及 ED（2.03±0.43mSv）分别较 A 组减低 26.7%、27.4%及 27.2%（P＜0.01）。**结论** 全模型迭代重建技术联合低管电压可进一步降低Ⅰ、Ⅱ级肝硬化患者 CTPV 辐射剂量并显著提高图像质量，值得临床应用推广。

EPO-1035
磁共振多种成像技术对于肝门部胆管癌的准确分期及早期诊断的价值

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目的:探讨多种磁共振功能成像技术 IVIM、DCE-MRI、DKI、DWI 对于肝门部胆管癌的准确分期的价值，探讨多种磁共振功能成像技术 IVIM、DCE-MRI、DKI、DWI 对于常规磁共振表现阴性的肝门部胆管癌的早期诊断价值。

方法:拟采集 100 例肝门部胆管癌患者，常规磁共振（T2WI、T1WI、MRCP）检查，并同时进行 DWI、DCE-MRI、IVIM 及 DKI 成像，分析每种成像技术所得参数，并比较不同成像技术参数间的相关性。数据应用 SPSS25.0 进行统计学分析，分析不同成像技术参数间的相关性，绘制 ROC 曲线。

结果：DCE-MRI、IVIM、DKI 的多个成像参数可以更准确地对肝门部胆管癌进行分期，并且能够早期诊断常规磁共振表现阴性的肝门部胆管癌。通过术后随访，发现 Ktrans、Kep 对于肝门部胆管癌周围血管受累的情况有较好的显示，ADC fast、ADC slow、ffast、MK 对于常规磁共振检查隐阴性的肝门部胆管癌有早期诊断的效能。

结论:DCE-MRI、IVIM、DKI 成像技术能更准确地对肝门部胆管癌进行分期，并且能够早期诊断常规磁共振表现阴性的肝门部胆管癌。

EPO-1036
能谱 CT 在肝脏泡型包虫病诊断中的应用研究

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目的 通过分析肝脏泡型包虫病双能量 CT 成像特点，探讨双能量 CT 多参数成像技术在显示 HAE 组织和血供特点上的临床诊断价值。**方法** 自 2016 年 7 月至 2017 年 3 月间收集来我院就诊并经手术或综合影像学诊断为肝泡型包虫病患者 45 例。所有患者均行腹部双能量 CT 三期增强扫描（动脉期，门静脉期，静脉期）。根据病灶影像特征进行影像学分型。对所有患者双能量扫描图像并通过图像重建获得病灶的碘基物质图、单能量图像、最佳对比噪声比（Contrast to noise ratio, CNR）图及能谱曲线图，分析各组图像的特点并进行相应的定量测算，包括 CT 值、碘定量、最佳 CNR 值，曲线斜率，同时在显示病灶组织细节及血供情况上与常规 CT 图像进行比较。**结果** 45 例肝脏泡型包虫共检出 53 个病灶；病灶直径 87.6±50.7mm。所有病灶中实体型占 36%（19/53），假囊肿型占 11%(6/53)个，混合型占 52.8%（28/53）。双能量 CT 碘图成像较常规 CT 更容易显示 HAE 病灶边缘 5~12mm 的强化区域，检出率比较分别为 71.6% 和 50.9%；在对病灶大小的测量上，双能

量碘图（79.53±53.77mm）高于常规 CT（71.36±50.16mm），二者之间无明显统计学差异（P=0.52）。肝泡型包虫病灶的囊性成分、实性成分、边缘区域及正常肝实质之间的碘值均数差异具有统计学意义(P<0.05)。HAE 病灶边缘区碘值高于病灶内及正常肝实质。不同影像分型病灶边缘区的碘值无明显统计学差异（P<0.05）。**结论** 双能量 CT 多参数成像较常规 CT 能够提供更多的关于 HAE 病灶组织结构和血供方面的信息，其中碘图有助于评估病灶血供情况并可进行碘含量测定；单能量图像提高了图像质量和病灶的对比度，有助于病灶范围的确定。

EPO-1037
体素不相干运动 IVIM 与肝胆特异性造影剂 Gd-BOPTA 增强 MRI 技术联合临床实验室指标预测肝癌微血管侵犯 MVI 的研究

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摘要：
肝细胞癌（hepatocellular carcinoma, HCC）是目前世界上最常见的原发性肝脏恶性肿瘤。肝癌切除和肝移植术后 5 年复发率分别达 70%、25%[1, 2]。肿瘤侵袭性生物学行为最主要的表现就是微血管侵犯（MVI），作为最有价值的指导 HCC 治疗及预测预后的独立因素之一。若能在术前无创地对 HCC 是否存在 MVI 进行诊断，将对治疗方案的合理选择起到重要指导作用。本课题重点采用分子影像学方法（细化定量及半定量的常规影像学指标，并采用最新 MR 技术，包括自由呼吸状态下 MR 灌注、多 b 值弥散成像、肝胆特异性对比剂），并结合临床实验室指标、肿瘤标记物（AFP、DCP 等）等手段，对肝细胞癌微血管侵犯进行回顾性和前瞻性分析，旨在提取术前判断微血管侵犯的磁共振特征和临床实验室定量指标，为肝细胞癌的临床诊疗及预后判断提供策略依据。HCC 具有高复发率，切除术后的 5 年复发率达 70%，肝移植后的 5 年复发率约 25%[1,2]。其中血管侵犯是反映肿瘤侵袭性生物学行为的主要表现之一，而微血管侵犯（MVI）是最有价值的指导 HCC 治疗及预测预后的独立性因素[4]。国际各肝细胞癌诊治指南中，血管的侵犯情况是其重要的组成部分，但微血管侵犯目前尚未纳入术前评价体系，因此，术前预测肝细胞癌微血管侵犯指标的研究，即可为指南的修订提供重要的依据，也将对临床 HCC 治疗方案的合理选择起到重要指导作用。综上所述，本课题重点采用体素不相干运动 IVIM 与肝胆特异性造影剂 Gd-BOPTA 增强 MRI 技术，并结合临床实验室指标，对肝细胞癌微血管侵犯进行回顾性和前瞻性分析，旨在提取术前判断微血管侵犯的磁共振特征和临床实验室定量指标，即可为指南的修订提供重要的依据，也对临床 HCC 治疗方案和预后判断的合理选择起到重要的策略依据。

EPO-1038
磁共振 IDEAL-IQ 技术在急性胰腺炎中的应用价值

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目的：探讨磁共振非对称回波与最小二乘法估算铁定量的迭代水脂分离(IDEAL-IQ)序列在急性胰腺炎中的临床价值。

方法：收集本院 40 例急性胰腺炎患者和 40 例健康志愿者（对照组），使用 GE Pioneer 3.0T 磁共振仪及 8 通道相控阵腹部线圈进行上腹部常规及 IDEAL-IQ 序列的 MRI 扫描，所有受试者采用仰卧位，先行常规磁共振序列扫描，然后在屏气状态下行 IDEAL-IQ 序列的 MRI 扫描。IDEAL-IQ 序列扫

描参数：TR6.2ms，TE3.0ms,激励次数 0.5，视野 38cmX38cm，层厚 10cm，相位数 160。扫描结束可自动重建出水像、纯脂肪像、脂肪对比像、R_2*弛豫率像四组图像，由一位高年资影像诊断医师使用 GE 后处理工作站在四组图像上分别测量胰腺头、体尾最大层面勾画 RIO，取 3 个部位的所有测量值的平均值作为该组图像上胰腺组织的最终测量结果。

结果：实验组的脂肪含量为（15.5±4.6）%，对照组的脂肪含量为（3.78±1.11）%，两者之间差异具有统计学意义（P<0.05）；实验组的铁含量为（598±101）Hz,对照组铁的含量为（38±16）Hz，两者差异具有统计学意义（P<0.05）。

结论：磁共振 IDEAL-IQ 序列一次扫描即获得多组图相比，即水像、纯脂肪像、脂肪对比像、R_2*弛豫率像四组图像，其中脂肪对比像、R_2*弛豫率像可以对急性胰腺炎患者肝脏内的脂肪的含量、铁含量行定量分析，对急性胰腺炎诊断具有重要的临床价值

EPO-1039
基于 CT 和 MRI 成像肝脏影像报告系统的一致性研究

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探讨基于 CT 和 MRI 成像 LI-RADS 分级标准对原发性肝癌的诊断价值。 方法 收集 2018 年 1 月至 2019 年 6 月期间术后病理证实的 72 例原发性肝癌患者的影像学资料，均行 CT 及 MRI 成像，由 2 名诊断医师在不知道病变的病理结果的情况下对图像资料进行审阅，按 LI-RADS 标准给予分级，并标记出 CT 和 MRI 显示的主要征象，比较两组诊断原发性肝癌的一致性采用 Kappa 分析。结果 72 例患者共检出 158 个病灶，（1）CT 组，医师 A，共识别动脉期强化（138 个）廓清（146 个）包膜（76 个），医师 B，共识别动脉期强化（129 个）廓清（145 个）包膜（81 个），K 值约 0.91，一致性强；（2）MRI 组，医师 A，共识别动脉期强化（141 个）廓清（153 个）包膜（115 个），医师 B，共识别动脉期强化（144 个）廓清（153 个）包膜（112 个），K 值约 0.93，一致性强；（3）CT 组及 MRI 组平均诊断率比较，MRI 对肝癌主要征象的显示率高于 CT，对包膜的显示以及发现小于 1CM 的病灶表现出特有的优势。结论，基于 LI-RADS，CT 和 MRI 均对肝癌有较高的诊断效能，并均有较高的诊断一致性，根据具体情况，适时结合两种检查方法，共同作出判断。

EPO-1040
肝细胞特异性对比剂 Gd-BOPTA 动态增强 MRI 鉴别肝脏血管平滑肌脂肪瘤与高分化肝细胞癌

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目的：探讨肝脏血管平滑肌脂肪瘤（HAML）肝细胞特异性对比剂 Gd-BOPTA MRI 平扫、动态增强及肝胆期的影像学表现，以及与高分化肝细胞癌（HCC）的鉴别诊断。
方法：回顾性分析病理证实的 HAML 8 例，高分化 HCC 11 例，比较两组病例的临床特征；测量两组病例的 T2WI、T1WI、DWI、ADC 和动脉期（AP）、门脉期（PP）、实质期（TP）、肝胆期（HBP）的信号强度 $SI_{病灶}$，并测得相同层面同侧竖脊肌的信号强度 $SI_{肌肉}$，SR（SI Ratio）=$SI_{病灶}/SI_{肌肉}$；并选取与病灶同一层面测量肝脏左外叶、内叶、右前叶、后叶及脾脏四个 SI，计算平均值 $SI_{肝脏}$、$SI_{脾脏}$，$RE_1=(SI_{病灶AP}-SI_{病灶平扫})/SI_{病灶平扫}$，$RE_2=(SI_{病灶PP}-SI_{病灶平扫})/SI_{病灶平扫}$，$RE_3=(SI_{病灶TP}-SI_{病灶平扫})$

/SI 病灶平扫，RE_4=（SI 病灶 HBP-SI 病灶平扫）/SI 病灶平扫，RE_5=SI 病灶 HBP/SI 肝脏 HBP， RE_6= SI 病灶 HBP/SI 脾脏 HBP，并用相应统计学方法比较两组病例各指标的差异性。
结果：HAML 更常见于女性；HAML 发病年龄比高分化 HCC 小；两组间病灶大小无统计学差异；HAML 比高分化 HCC 更容易出现病灶内脂肪。HAML T2 SR、ADC 值高于高分化 HCC，而 T1 SR、DWI SR 二者无统计学差异；HAML RE_2、RE_3 高于高分化 HCC，而 RE_1、RE_4、RE_5、 RE_6均无统计学差异。HAML 动脉期出现引流静脉早显的概率高于高分化 HCC，供血动脉出现率二者无统计学差异，高分化 HCC 假包膜更常见。
结论：HAML 很容易误诊为 HCC，当一个年轻女性病人，在 Gd-BOPTA 增强 MRI 中，病灶动脉期明显强化、门脉期及实质期呈持续强化、引流静脉早显、没有假包膜要考虑 HAML 的可能。

EPO-1041
三维可视化系统在肝脏血管变异分析中的应用价值

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目的：通过收集在本院行肝脏肿瘤手术的病人的影像学三维可视化资料，评价其对血管分型及变异分析的应用价值。方法： 选取 2016 年 1 月至 2017 年 1 月于我院肝外三科行肝脏肿瘤手术的 287 例患者的影像学资料，采用三维可视化软件进行三维肝脏重建，依据 Couinoud 分段标准进行肝脏分段，分别对肝动脉、门静脉、肝静脉进行分型。结果： 因肝脏肿瘤过大或肿瘤位置原因，无法完整显示 3 支血管者 19 例。肝动脉变异率为 31.7% ，门静脉变异率为 12.3%，肝静脉变异率为 81.7%，其中副肝右静脉出现率为 27.7%。结论： 三维可视化系统能准确、快速评估肝脏血管变异，具有一定应用价值。

EPO-1042
Potential Clinical Factors Affecting Liver Enhancement in the Hepatocyte Phase on Gadobenate Dimeglumine (Gd-BOPTA)-enhanced Magnetic Resonance (MR) Imaging

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Objectives: To evaluate the relationships between clinical factors and the degree of liver parenchymal enhancement in the hepatocyte phase on gadobenate dimeglumine (Gd-BOPTA)-enhanced magnetic resonance (MR) imaging and clarify clinical predictive factors affecting the degree of liver parenchymal enhancement.
Materials and methods: 238 patients were divided into 4 groups: normal liver function without liver cirrhosis (group NLF) and cirrhosis with Child-Pugh Classes A, B, and C (groups LCA, LCB, and LCC). The relative enhancement ratio (RE) of liver parenchyma was calculated from measurements of the signal intensity before (SI_{pre}) and 90 min after (SI_{post}) intravenous injection of Gd-BOPTA with the following formula: $RE = (SI_{post} - SI_{pre})/SI_{pre}$. Statistical analysis was used to access the relationships between the RE of the liver parenchyma and clinical factors, and clarify clinical predictive factors.

Results: Increased RE of liver parenchymal enhancement showed correlations with decreased total bilirubin, prothrombin time, international normalized ratio, alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase, Child-Pugh scores and elevated albumin, cholinesterase. The RE in group NLF was significantly higher than those in groups LCA, LCB and LCC (all $P < 0.001$). The RE in group LCA was significantly higher than those in groups LCB and LCC (both $P < 0.001$). Total bilirubin, albumin, alkaline phosphatase, and the presence of ascites were the only factors affecting liver parenchymal enhancement.
Conclusions: The degree of hepatic parenchymal Gd-BOPTA enhancement in the hepatocyte phase was affected by liver function parameters, revealing Gd-BOPTA-enhanced MR imaging could be a non-invasive method for evaluating liver function.

EPO-1043
术前增强 CT 对肝细胞癌切除术后早期复发风险评估研究

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目的：本研究拟探讨基于术前动态增强 CT 对肝细胞癌切除术后早期复发风险评估的价值。
方法：搜集 2012 年 1 月至 2012 年 12 月期间在南方医科大学珠江医院及中山大学肿瘤防治中心择期行根治性切除的孤立性肝细胞癌患者的术前动态增强 CT 资料，最后纳入 117 例肝癌患者作为研究对象，其中男性 102 例，女性 15 例，年龄 22～82 岁（50.4±11.2）岁。由两名从事腹部影像学诊断的医生分别独立对增强 CT 图像是否存在瘤内动脉、坏死、晕环及边缘是否清楚进行分析，当征象判别结果不一致时，经两位医生讨论后得出最终结果。随后所有患者定期进行随访，随访时间截止到 2019 年 5 月，记录患者的无病生存时间及判断患者是否早期复发（复发时间小于 2 年）。Kaplan-Meier 法绘制生存曲线，生存率比较采用 log-rank 检验，多因素 Cox 回归分析无病生存影响因素。
结果：截止随访结束，共 107 例（91.5%）患者获得随访，获得随访的患者术后中位无病生存时间是 33 个月，单因素分析显示瘤内动脉（RR=2.27，95%CI：1.39～3.71）、坏死（RR=1.99，95%CI：1.21～3.27）、及边缘（RR=1.89，95%CI：1.19～3.01）是肝癌切除术后无病生存的危险因素，多因素回归分析显示瘤内动脉（RR=2.10，95%CI：1.39～3.46）及边缘不清（RR=1.69，95%CI：1.05～2.71）是肝癌切除术后无病生存的独立危险因素。其中 35 例患者无此征象，43 例患者有其中一个征象，39 例患者有两个征象，其早期复发率分别为 22.9%、37.2%、69.2%（P＜0.001），其中位生存时间分别为 61 个月、44 个月、8 个月（P＜0.001）。
结论：术前增强 CT 瘤内动脉及边缘不清是肝癌切除术后无病生存的独立危险因素，可用于预测肝癌患者的早期复发。

EPO-1044
Phase-Contrast MRI in the assessment of portal vein hemodynamic changes in patients of ALPPS

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Purpose： To assess the value of Phase-Contrast MRI in evaluating portal flow changes in patients of ALPPS (associating liver partition and portal vein ligation for staged hepatectomy).
Methods： A total of 8 patients with ALPPS from November 2018 to March 2019 were included prospectively. All cases were approved by the ethics committee of the hospital. Phase-contrast MRI of portal vein trunk (PV) and left portal vein (LPV) were performed 1 day before and 7 days after ALPPS for each patient. Then MR cardiac function post-processing software was used to evaluate the morphology of portal veins （diameter, area) and hemodynamic changes (average/peak velocity, average/peak flow, pressure gradient) . Correlation analysis was used to assess the relationship between the left hepatic hyperplasia rate and the Ishak inflammation score.
Results: The diameters of portal trunk before and after ALPPS were 12.75±2.53mm and 15.07±2.19mm (p=0.0366). The diameters of left portal veins(LPV) pre- and postoperative were 8.79±2.35mm and 11.441±1.49mm（p=0.0105）respectively. The peak flow rates of LPV were 7.551±1.80ml/s and 13.10±1.09ml/s (p=0.0016). The average flow rate of LPV were 0.360±0.09 l/min and 0.553±0.10 l/min (p=0.0337). Additionally, the left hepatic hyperplasia rate had a negative correlation with Ishak inflammation score (P= 0.0331, r= -0.7474).
Conclusion： Phase-Contrast MRI allows comprehensive assessment of portal vein in one breath-hold, it may potentially reflect vascular changes due to ALPPS. However, the relationship between portal flow and left hepatic hyperplasia needs further study.

EPO-1045
钆塞酸二钠增强 MRI 与肝细胞肝癌分化程度的相关分析

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目的探索肝细胞肝癌(HCC)磁共振成像(MRI)平扫及钆塞酸二钠(Gd-EOB-DTPA)增强肝胆期信号与其分化程度的相关性。方法回顾性分析 2014 年 5 月至 2016 年 5 月该院收治的肝功能 Child-Turcotte-Pugh(CTP)A 级的 32 例 HCC 患者的 Gd-EOB-DTPA 增强 MRI 平扫及肝胆期图像,分为肝硬化组及非肝硬化组,其中肝硬化组 17 例,非肝硬化组 15 例;分别计算病灶信号噪声比(SNR)、强化率(ER)和相对强化率(RER)及相对信号强度比(RIR),并统计患者年龄、血清甲胎蛋白(AFP)水平及病灶最大径。并对不同分化程度 HCC 与平扫、肝胆期各信号指标,以及年龄、血清 AFP 水平、病灶最大径进行相关分析。结果 32 例患者(40 个病灶)中,分化程度为高分化 10 个,中分化 22 个,低分化 8 个;肝硬化组高、中及低分化 HCC 与对应 SNR、ER、RER、RIR、年龄、血清 AFP 水平、病灶最大径之间无相关性(P>0.05);非肝硬化组高、中及低分化 HCC 与相应 RER、年龄之间存在相关(P<0.05),而与 SNR、ER、RIR 及血清 AFP 水平及病灶最大径之间无显著相关(P>0.05);总体样本分析 HCC 分化程度与对应 RER 之间有相关性(P<0.05),而与 SNR、ER、RIR 及年龄、血清 AFP 水平及病灶最大径之间无相关性(P>0.05)。结论 Gd-EOB-DTPA 增强 MRI 肝胆期信号预测非肝硬化患者 HCC 分化程度有一定价值,而对预测肝硬化患者 HCC 分化程度的价值有限。

EPO-1046
基于 AFP-L3 不同表达类型的原发性肝细胞癌 MRI 特点分析

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【摘要】 目的 分析甲胎蛋白异质体（AFP-L3）阴性及阳性表达的原发性肝细胞癌（HCC）高场 MRI 特点，提高对 AFP-L3 不同表达类型原发性肝细胞癌的早期影像诊断水平。**方法** 收集经杭州师范大学附属医院诊治并确诊的 AFP-L3 阴性原发性肝细胞癌 29 例(阴性组)和 AFP 阳性原发性肝细胞癌 43 例（阳性组），总结归纳两组 MRI 征象，统计学对照。**结果** 阴性组中有 18 例（62.1%）肿瘤长径多位于 3cm 以下，单发瘤灶 23 例（79.3%）， 肿瘤表现为边缘规则者 17 例（58.6%），病灶内发生坏死、出血者阴性组 11 例（37.9%）， 另有 7 例（24.1%）出现门脉癌栓或转移，以上数据与对照组（阳性组）对比具有显著统计学差异（$P<0.05$）。 MRI 增强扫描：阴性组 29 例中表现为动脉期高度强化 8 例（27.6%）、中度强化 13 例（44.8%）、轻度强化 8 例（27.6%），阴性组中静脉期高度强化 5 例（17.2%）、中度强化 17 例（58.6%）、轻度强化 7 例（24.2%）；而阳性组中动脉期高度强化 25 例（58.1%）、中度强化 14 例（32.6%）、轻度强化 4 例（9.3%），阳性组中静脉期高度强化 6 例（14.0%）、中度强化 15 例（34.9%）、轻度强化 22 例（51.1%）。**结论** AFP-L3 阴性原发性肝细胞癌相对于阳性者，其 MRI 特点具有体积相对偏小、瘤灶多单发、边缘相对规则、不易发生坏死及出血、较少出现门脉癌栓或转移、动脉血供相对偏少而静脉血供相对优势。

EPO-1047
重症急性胰腺炎：新亚特兰大分类下的临床和影像——放射科医师须知

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目的 探讨新亚特兰大分类下重症急性胰腺炎临床和影像学特征。**方法** 收集我院 2015 年 1 月至 2019 年 1 月间急性胰腺炎住院的临床资料且发病 7 日内行 CT/MRI 检查。**结果** 368 例按 1992 年亚特兰大分类归入重症急性胰腺炎。按 2012 新亚特兰大分类，中度重症急性胰腺炎（MSAP）占 84%（309/368）和重症急性胰腺炎（SAP）占 16%（59/368）。SAP 入院时 Ranson、APACHEII、Marshall、CTSI/MRISI 评分高于 MSAP（3.5±1.5 vs. 1.3±1.4），（18±6 vs. 7.1±4），（3.9±3 vs. .2± .5），（7.3±3 vs. 5.5±2）（P均 ＜.01）。MSAP 组：呼衰 26.2%（81/309）、肾衰 3.2%（10/309）、循环衰竭 0.3%（1/309）；2 个脏器衰竭 2.5%（8/309）、3 个脏器衰竭 0.9%（3/309）。SAP 组对应上述比例：67.8%（40/59）、8.5%（5/59）、3.3%（2/59）；15.3%（9/59）、5%（3/59）（P均 ＜.01）。SAP 入 ICU 比例和时间高于 MSAP[86.4%（51/59）vs. 56.6%（175/309）；25±22 d vs. 10±13 d，P ＜.01]。SAP 假性囊肿（PP）或包裹性坏死（WON）需 B 超或 CT 引导下引流术多于 MSAP[33.9%（20/59）vs. 11.3%（35/309），P ＜.01]；SAP 手术率高于 MSAP[16.9%（10/59）vs.4.9%（15/309），P ＜.01]；SAP 死亡率高于 MSAP[16.9%（10/59）vs. 1.6%（5/309），P ＜.01]。SAP 组住院时间长于 MSAP 组（40±28 d vs. 21±16 d，P ＜.01）。**结论** 新亚特兰大分类标准下真正 SAP 预后明显差于 MSAP，放射科医师需早期识别并及时诊断。

EPO-1048
先天性下腔静脉畸形的 MSCT 诊断（附 12 例报告）

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摘要目的 探讨先天性下腔静脉畸形的 64 层螺旋 CT 影像表现，评价 MSCT 诊断价值。**方法** 回顾性分析经 MSCT 证实的 12 例先天性下腔静脉畸形患者的影像表现及临床意义。**结果** 12 例先天性下腔静脉畸形包括下腔静脉肝段缺如 2 例，其中 1 例伴有奇静脉代偿引流至上腔静脉，肝静脉直接回流右心房；1 例为单纯性。左肾静脉畸形 5 例，CT 横断面显示腹主动脉后左肾静脉、左肾静脉环绕腹主动脉分别为 4 例、1 例。双下腔静脉 3 例，CT 表现为肾下段腹主动脉左右两侧上行的下腔静脉。左位下腔静脉伴下腔静脉肝段缺如 1 例。下腔静脉后输尿管 1 例。4 例患者出现镜下血尿，2 例有高血压病史，1 例患者为多脾综合征，1 例合并右肾血管平滑肌脂肪瘤，其余为偶然发现。**结论** MSCT 能清晰显示下腔静脉及属支的畸形，是诊断先天性下腔静脉畸形的重要方法，可降低手术及介入诊治中的风险，临床应根据影像学表现及血流动力学等指标综合诊治。

EPO-1049
相对表观扩散系数在术前评估低危型子宫内膜癌中的应用价值

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目的：探讨最小表观扩散系数(minADC)、平均表观扩散系数（meanADC）及相对表观扩散系数（rADC）对术前评估低危型子宫内膜癌（endometrial carcinoma，EC）的应用价值。
材料与方法：回顾性分析 2011 年 7 月—2015 年 12 月我院经手术病理证实的 81 例 FIGO Ⅰ期 EC。根据 ESMO- ESGO-ESTRO 分型标准将其分为低危型组和高危型组，比较两组之间的临床指标、常规 MRI 指标、meanADC 值、minADC 值和 rADC 值。利用 ROC 曲线确定术前评估低危型 EC 的最佳 ADC 值及其诊断阈值。
结果：低危型组病灶的 meanADC 值、minADC 和 rADC 值均显著高于高危型组（1.095 vs. $0.902\times10^{-3}mm^2/s$, 0.755 vs. $0.657\times10^{-3}mm^2/s$, 0.754 vs. 0.603）。ROC 曲线分析表明 meanADC、minADC 和 rADC 的曲线下面积（AUC）分别为 0.840、0.681、0.876，当以 rADC=0.669 作为诊断阈值，最大约登（YI）指数为 0.683，预测低危型 EC 的敏感度、特异度和准确率分别为 81.8%，86.5%，84.0%。
结论：meanADC 值和 rADC 值对术前评估 I 期 EC 分型有较高价值，其中 rADC 的诊断效能最佳，可作为优化参数帮助识别低危型 EC，为临床合理选择手术方案提供影像学依据。

EPO-1050
多模态影像联合检查在肾上腺区不同来源病变的定位及定性诊断

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目的 探究多层螺旋 CT、MR 及彩色多普勒超声多模态联合检查在肾上腺区不同来源的肿瘤与肿瘤样病变定位及定性的诊断价值。 方法 回顾性分析我院经手术、病理或临床追踪证实的的 156 例肾上腺区占位性病变，比较患者多层螺旋 CT、MR 及彩色多普勒超声多模态诊断在定位诊断准确率与定性诊断准确率间的差异。 结果 其中 125 例为肾上腺来源,分别为肾上腺皮质腺瘤 75 例、髓样脂肪瘤 8 例、嗜铬细胞瘤 20 例（异位嗜铬细胞瘤 4 例）、囊肿 10 例、皮质增生 9 例、血肿 5 例、皮脂

癌 5 例、节细胞神经 3 例、转移瘤 2 例、结核 1 例、畸胎瘤 1 例;17 例为非肾上腺来源,分别为腹膜后脂肪肉瘤 8 例、囊性肾癌 6 例、胰腺假性囊肿 2 例、肾脏淋巴瘤 1 例。超声与多层螺旋 CT、MR 定位诊断准确率比较，差异有统计学意义(P＜0.05)。 CT、MR 定性诊断准确率高于超声(P＜0.05)，而多模态联合诊断准确率高于超声、CT 及 MR(P＜0.05)。 结论 多层螺旋 CT、MR 及彩色多普勒超声在肾上腺区不同来源的肿瘤与肿瘤样病变诊断中均有重要意义，而 3 种检查方法多模态联合检查可提高定位及定性的准确性，能更准确判断病变性质，为临床选择最佳的治疗方案提供依据。
CT 及 MR(P＜0.05)。 结论 多层螺旋 CT、MR 及彩色多普勒超声在肾上腺区不同来源的肿瘤与肿瘤样病变诊断中均有重要意义，而 3 种检查方法多模态联合检查可提高定位及定性的准确性，能更准确判断病变性质，为临床选择最佳的治疗方案提供依据。

EPO-1051
基于表观扩散系数的子宫肉瘤与非典型子宫肌瘤的鉴别诊断

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目的 探讨不同 ADC 值对子宫肉瘤与非典型子宫肌瘤鉴别诊断价值，联合不同 ADC 值提高鉴别诊断准确性。**材料与方法** 回顾性分析我院在 2011 年 6 月至 2016 年 12 月期间经病理证实为子宫肉瘤与非典型子宫肌瘤的患者？例，术前均行 3T MRI 检查。测量并记录 mADC 值、minADC 值以及 rADC 值。分析并比较两组患者不同 ADC 值的差异性以及诊断效能。通过纳入 3 种 ADC 值建立多因素 logistic 回归诊断模型，采用 ROC 曲线评估诊断模型鉴别诊断子宫肉瘤及非典型子宫肌瘤的诊断效能。**结果** mADC 值、minADC 值以及 rADC 值均可鉴别诊断子宫肉瘤及非典型子宫肌瘤，差异均具有统计学意义（*P*值<0.00）。当 mADC 值取阈值为 1.21×10^{-3} mm^2/s、minADC 值取阈值为 0.95×10^{-3} mm^2/s 时，诊断准确度都为 86.6%，当 rADC 值取 0.59 为阈值时诊断准确度为 81.0%。根据多因素 Logistic 回归模型可选取 mADC 值与 minADC 值作为诊断模型的独立因素，根据 ROC 曲线评估诊断模型诊断效能的 AUC 为 0.907（95%可信区间为 0.850～0.965），敏感度为 97.5%，特异度为 82.5%，准确度为 91.5%，阳性预测值为 40%，阴性预测值为 17%。 **结论** 3 种 ADC 值都可鉴别诊断子宫肉瘤及非典型子宫肌瘤，mADC 值与 minADC 值诊断准确性相差不大，当 mADC 值与 minADC 值联合诊断时准确性最高。

EPO-1052
前列腺移行区癌 T2WI 影像特征的多因素分析

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目的 探讨 T_2WI 影像特征对前列腺移行区癌的诊断价值并筛选诊断价值较高的影像征象。 **方法** 回顾性分析经过病理证实的 43 例移行区前列腺癌的 T_2WI 图像，另选取 91 例前列腺增生患者作为对照组，采用多因素 Logistic 回归筛选影像征象，将筛选出的影像征象联合，计算联合诊断的敏感度、特异度、阳性预测值、阴性预测值及准确度。 **结果** T_2WI 上 7 种影像征象中，多因素 Logistic 回归筛选出三种影像征象：病灶形态、前列腺包膜、患侧移行区与外周带分界。联合诊断中，形态+前列腺包膜的特异度、阳性预测值、准确度最高，分别为 88.5%、67.8%、83.41%，形态+患侧移行区与外周带分界的敏感度、阴性预测值最高，分别为 82.8%、93%。 **结论** T_2WI 上病灶形态、前列腺包膜、患侧移行区与外周带分界是诊断移行区前列腺癌的独立危险因素。

目的 探讨 T2WI 影像特征对前列腺移行区癌的诊断价值并筛选诊断价值较高的影像征象。 方法 回顾性分析经过病理证实的 43 例移行区前列腺癌的 T2WI 图像，另选取 91 例前列腺增生患者作为对照组，采用多因素 Logistic 回归筛选影像征象，将筛选出的影像征象联合，计算联合诊断的敏感度、特异度、阳性预测值、阴性预测值及准确度。 结果 T2WI 上 7 种影像征象中，多因素 Logistic 回归筛选出三种影像征象：病灶形态、前列腺包膜、患侧移行区与外周带分界。联合诊断中，形态+前列腺包膜的特异度、阳性预测值、准确度最高，分别为 88.5%、67.8%、83.41%，形态+患侧移行区与外周带分界的敏感度、阴性预测值最高，分别为 82.8%、93%。 结论 T2WI 上病灶形态、前列腺包膜、患侧移行区与外周带分界是诊断移行区前列腺癌的独立危险因素。

EPO-1053

多模态 MRI 诊断创伤致高血流量性阴茎异常勃起一例

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资料与方法：
临床资料 患者，男，29 岁，既往体健，无相关性功能疾病史。因“骑跨伤致阴茎持续勃起 1 月余，加重 1 天”入院。骑跨伤后当即感会阴部麻木感，约十余分钟后出现会阴部疼痛，逐渐出现会阴部、阴茎肿胀，伴阴茎持续勃起状态，硬度约Ⅱ级，排尿前后未见明显好转加重，伴局部淤血，无开放性出血，无排尿困难，无尿血，无尿痛，无发热，患者未重视，自行服用消炎药物后，会阴部疼痛及淤血逐渐好转，阴茎勃起状态如前，触压时有疼痛，未见明显好转。1 天前患者工作时再次伤及会阴部，感阴茎勃起硬度较前增加遂入院。入院查体：阴茎发育可，呈勃起状态，硬度约Ⅱ级，阴茎中部呈向背侧弯曲，按压痛阳性。双侧阴囊皮肤色泽正常，睾丸附睾未及明显异常。入院尿常规提示尿红细胞 8，尿白细胞 28，血常规无明显异常。血气分析：pH 7. 445，PCO2 34.3 mmHg，PO2 145.0 mmHg，SO2 99.3%等指标提示符合动脉血气结果。
影像学资料 入院后行进行 MRI 多模态扫描，示：右侧阴茎海绵体根部见结节状异常信号影，T1WI 以高信号为主伴内部低信号影，FS-T2WI 呈不均匀环形结节样高信号伴周边环绕低信号影，DWI 呈明显高信号，ADC 显示为低信号，大小约 1.2*1.8cm，增强扫描上述异常信号内部及周边均见明显强化，右侧阴茎海绵体提前显影并呈持续强化改变，右侧阴茎动脉、阴茎背动脉略增粗；左侧阴茎动脉、阴茎海绵体未见异常对比强化，形态大小未见明显异常，诊断为右侧阴茎海绵体根部阴茎动脉假性动脉瘤亚急性血肿形成，伴阴茎动脉-海绵体瘘（图 1）。
随后对患者进行选择性动脉介入造影，显示右侧阴茎动脉可见假性动脉瘤形成，长径约为 2.0cm，内可见血栓形成，并可见海绵体瘘形成，佐证了 MRI 的诊断。再对患者给予弹簧圈进行栓塞，栓塞成功后造影可见瘤体及瘘消失，患者异常勃起消失，术后给予性刺激能正常勃起，患者恢复良好。（图 2）。

EPO-1054

Renal Tumors with Predominantly high Signal Intensity on T2-Weighted Images: Differentiation of Mixed epithelial and stromal tumor of the kidney From Renal Cell Carcinoma

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Purpose: To determine useful magnetic resonance (MR) imaging and clinical features to differentiate Mixed epithelial and stromal tumors of the kidney (MESTK) from renal cell carcinoma (RCC) with predominantly high signal intensity on T2-weighted MR images.
Materials and Methods: The institutional review board approved this retrospective study and waived the informed consent requirement. 9 patients with surgically confirmed MESTK and 28 patients with extensively necrotic cystic cc-RCCs who underwent conventional MR and enhanced MR imaging were included. Two radiologists independently evaluated the clinical features including age, sex, the first symptoms and the MRI morphologic characteristics, the characteristics of DWI, and enhancement patterns of each tumor. Quantitativeanalysis, including measurement of tumor size, thickness of tumor fibrous capsule and Relative percentage losses of enhancement (RPLE, RPLE=(SIa-SId)/SIa). Quantitative analysis were calculated with Independent t test. Receiver operating characteristic (ROC) analysis was performed to evaluate the diagnostic accuracy of the RPLE and to extract the optimal cut-off values in the differentiation of MESTK and cc-RCCs.
Results：The shape of tumor and located in sinus renalis showed significant difference in MESTK and cc-RCCs. The mean RPLE of MESTK was statistically lower than that of the cc-RCCs group ($P < 0.001$). The RPLE between MESTK and cc-RCCs (21.0%±19.2 vs -3.2%±11.4) was statistically different ($P < 0.001$). The area under the ROC curve was 0.928 for Relative percentage losses of enhancement (RPLE). And a RPLE threshold value of -128%permitted the differentiation of MESTK from cc-RCCs with sensitivity of 95.7%, specificity of 67%.
Conclusion: A middle-aged females with tumor located in sinus renalis and hyper- or isoenhancement in the delay phase are useful MR imaging features that are more common in MESTK and may help discriminate MESTK from cc-Rccs.

EPO-1055
宫颈绒毛管状腺癌的影像学表现及临床因素分析

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摘要： 目的:系统分析宫颈绒毛管状腺癌影像学表现及其临床相关特点.方法:选取宫颈绒毛管状腺癌 34 例,其中 20 例有超声检查结果,16 例有 CT 检查结果,13 例有 MRI 检查结果.结果:宫颈绒毛管状腺癌患者较年轻,临床症状多为阴道不规则流血,多伴有人乳头瘤病毒(human papillomavirus,HPV)感染.宫颈绒毛管状腺癌超声表现为低回声或混合回声肿块,形态较规则,边界清晰,偶尔可见少许血流信号.CT 上,多表现为宫颈形态改变,平扫时宫颈平均 CT 值比正常宫颈、鳞癌低($P<0.05$),与普通型宫颈腺癌相比差异无统计学意义($P>0.05$).MRI 上,肿块平均体积比普通型腺癌、鳞癌小,差异有统计学意义($P<0.05$);宫颈间质及宫旁浸润情况较普通型腺癌、鳞癌为好.结论:宫颈绒毛管状腺癌临床表现缺乏特征性,超声、CT、MRI 能提供形态学和解剖学信息,MRI 可准确地判断宫颈病灶及宫旁受累情况,提高术前诊断准确性,从而优化治疗.

EPO-1056

MRI 和超声检查对输卵管积液的诊断价值评价

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目的 探讨 MRI 和超声检查对输卵管积液的诊断价值。
方法 回顾性分析经病理或临床确诊为输卵管积液的 36 例患者 46 个积液输卵管的 MR 及超声检查资料，对比分析 MRI 和超声检查在输卵管积液影像学征象的表现差异，评价影像学检查对输卵管积液诊断效能。
结果 本组 36 例 46 个病灶，单纯性输卵管积水 41 条，积脓输卵管 5 条，双侧发病 10 例，单侧 26 例 。MRI 和超声检查积液形态个数分别为腊肠样改变（20：16），管样合并囊状改变（3：4），囊状改变（23：26）；液液分层（2：2）;合并子宫内膜异位症（2：2）。输卵管积脓 DWI 表现为高信号，ADC 值平均约 1.27 $X10^{-3}mm^2/s$，输卵管积液 DWI 表现为低信号，ADC 平均约 2.42 X10-3mm2/s 。MR 及超声检查对输卵管积液诊断的特异度分别为 86.96%、69.57%，敏感度 95.65%、91.30%，在敏感性及特异性诊断方面具有统计学差异（c^2=4.08，P<0.05 ）。MRI 和超声检查对输卵管积液形态、液液分层等的诊断效能均较高，但超声检查难以准确区分输卵管积水/积脓的性质。
结论 输卵管积液的 MR 及超声检查表现具有一定特征性，两者均可反应输卵管积液的形态、盆腔情况等，但 MRI 可准确区分输卵管积液的性质及与邻近组织脏器的关系，对该病的诊断和鉴别诊断具有重要价值。

EPO-1057

Evaluation of clinical value in monitoring and predicting treatment efficacy of advanced cervical cancer under concurrent chemoradiotherapy with IVIM-MRI and DWI

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Objective: To evaluate the value of parameters related to intravoxel incoherent motion (IVIM) and diffusion weighted imaging (DWI) in monitoring and predicting the treatment efficacy of locally advanced cervical cancer under concurrent chemoradiotherapy.
Methods: 21 patients with locally advanced cervical cancer underwent pelvic MRI scan within 1 week before concurrent chemoradiotherapy, 2 weeks and 4 weeks after treatment, and 4 weeks after treatment. The parameters at different time points before and after treatment were measured. Including ADC, D, f, D* as well as the maximum tumor diameter at each scan time point, and calculate the change rate of each parameter after treatment and the maximum diameter reduction rate of tumor. All patients were divided into complete remission (CR) and partial remission (PR) groups according to RECIST 1.1 criteria, the parameters and their percentages were compared between the two groups at different time points by independent-samples-t test, ROC curves were applied to analyze the effect of the response evaluation of parameters and their change percentages (Δ%), Pearson correlation test were applied to analyze the

relationship between the parameters as well as their change percentages (Δ%) and tumor regression rate (TSO).

Results: The ADC, D, f and D* values of cervical cancer tissues before treatment were lower than those of normal cervical muscle layer. The ADC of CR group was lower than that of PR group before treatment while f value was higher than that of PR group (P<0.05) , After treatment,the ADC, D and f of CR group were higher than those of PR group before treatment. the Δ%ADC and Δ%D of CR group were higher than that of PR group (P<0.05). the Δ%f was lower than that of PR group after treatment,(P<0.05). The TSO revealed a negative correlation with pre ADC(r=-0.462, P<0.05), and a positive correlation with pre f, Δ%ADC and Δ%D 2 weeks after trearment, Δ%ADC and maximum diameter reduction rate of tumor 4 weeks after treatment(r=0.614, 0.487, 0.64, 0.451, 0.676, all P<0.05).In the prediction of CR group and PR group, theAUC of pre f , pre ADC, Δ%D,Δ% ADC at 2 weeks and 4 weeks after treatment were (0.923, 0.788, 0.868, 0.846, 0.803, 0.798 respectively)

Conclusion: The quantitative parameters of IVIM and DWI and their change percentages are helpful in predicting and monitoring the treatment efficacy of chemoradiotherapy for cervical cancer before and after treatment, IVIM has higher evaluation efficiency.

EPO-1058

肾嗜酸细胞腺瘤的 MSCT 表现

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目的 认识、总结肾嗜酸细胞腺瘤(RO)的 MSCT(多排螺旋 CT)表现特征，以提高对本病的 CT 诊断认识。

方法 回顾性分析本院 8 例 RO 的资料，所有病例均实行 MSCT 平扫加多期增强扫描，观察肿瘤的部位、大小、形态、边界，以及有无钙化、坏死与囊变、星状瘢痕、平扫及增强扫描各期强化情况、肾周组织侵犯及淋巴结转移，分析病灶的 MSCT 特点。

结果 所有 8 例 RO 均为单发，CT 平扫所有病例均无钙化灶，其中两例病灶内伴有出血。病灶直径 2.3cm-6.8cm，6 例(75%)病灶边缘清楚，形态规则，无分叶，2 例(25%)病灶边缘部分不清楚，形态不规则，可见浅分叶。5 例(62.5%)见星状或条索状瘢痕。增强扫描，RO 病灶均呈明显不均匀中高度强化，其中 6 例于动脉期明显不均匀血管样强化，部分实质强化程度等于或稍高于肾皮质，门脉期持续强化并强化范围增大，延迟期强化程度降低与周围肾实质分界清楚，其内星状瘢痕范围逐渐缩小。另 2 例动脉期呈不均匀中度强化，强化程度低于肾皮质，门脉期及延迟期呈进一步强化但各期均低于肾皮质，中心纤维瘢痕可见缩小。另有 5 例于动脉期见粗大血管影穿行于肿块实质内。

结论 肾嗜酸细胞腺瘤的影像表现有一定的特征性，位于肾皮质区，大部分病灶边界清楚，肿瘤富血供，CT 平扫部分病灶可伴出血，增强后强化具有一定的特征，部分病灶呈血管样强化，并见粗大血管穿行，中心多伴星状瘢痕。MSCT 平扫加多期增强扫描有助于该病的诊断。

EPO-1059

产前胎盘植入的对比影像学研究

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目的：分析超声及磁共振在产前胎盘植入的诊断价值，了解诊断胎盘植入的特异性影像学征象。
方法：收集 158 例具有胎盘植入高危因素的孕产妇资料，分析产前胎盘植入的临床高危因素，将 MRI 及超声结果、胎盘植入的各种典型诊断征象与手术病理结果进行对照，比较 MRI 与超声诊断胎盘植入的差异。
结果：MRI 及超声诊断胎盘植入的灵敏度分别为 87.3%及 70.9%，特异度为 82.8%及 79.3%，符合率为 85.7%及 73.8%；前壁胎盘植入超声及 MRI 诊断的灵敏度分别为 85.7%及 90.5%，特异度为 80%及 70%，符合率为 81.3%及 81.3%。后壁胎盘植入超声及 MRI 检查的灵敏度分别为 44%及 80%，特异度为 76.9%及 76.9%，符合率为 55.3%及 78.9%。超声对诊断胎盘植入的分型有很高的价值，超声诊断植入型的灵敏度最高（78.5%），穿透型的特异度最高（100%）；超声征象中胎盘陷窝的诊断灵敏度（78.5%）及特异度（71.3%）最高；MRI 征象中胎盘信号不均的诊断灵敏度最高（80%）,膀胱帐篷征的诊断特异性最高（ 96.6%）。
结论
1、MRI 及超声诊断胎盘植入均具有较高的诊断价值，当胎盘位于子宫后壁时，MRI 优于超声。
2、超声声像图征象包括胎盘陷窝，子宫肌层连续性中断，胎盘周围间隙消失，其中胎盘陷窝的灵敏度及特异度最高。
3、MRI 征象包括胎盘信号不均匀，T2WI 上低信号带，胎盘内增粗迂曲血管影，胎盘子宫边界欠清，其中胎盘信号不均匀的灵敏度最高，膀胱帐篷征诊断胎盘植入特异性最高。

EPO-1060
IVIM 对广西巴马小型猪早期糖尿病肾病模型成像的初步研究

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目的
探讨体素内不相干运动（IVIM）序列对早期糖尿病肾病模型成像的特点。
方法
12 头广西巴马小型猪随机分为实验组（7 头）和对照组（5 头），实验组予高脂高糖饲料喂养并多次经耳缘静脉注射小剂量（50mg/kg）链脲佐菌素（STZ），对照组予普通饲料喂养并注射相同剂量柠檬酸-柠檬酸钠缓冲液。造模成功后每个月固定时间在实验组和对照组分别随机选择一头猪行 MRI 扫描，扫描序列包括 T1WI、T2WI、IVIM。在后处理工作站伪彩图上分别测量双肾皮质及髓质的 IVIM 参数值 standard ADC、slow ADC。扫描结束后取双侧肾脏做病理检查。采用配对 t 检验对同一肾脏的 standard ADC 值及 slowADC 值进行比较，采用配对 t 检验对肾脏的皮、髓质参数值进行比较，采用独立样本 t 检验对实验组和对照组的参数值进行比较。
结果
实验组 7 头猪有 6 头猪共 12 个肾脏病理符合糖尿病肾病改变，将其纳入分析。1、standard ADC 与 slow ADC 比较：同一肾脏 standard ADC 值均高于相应的 slow ADC 值，差异有统计学意义（P＜0.05）；2、皮髓质比较：实验组及对照组皮质 standard ADC 值均高于本组髓质 standard ADC 值，差异有统计学意义（P 均＜0.05），两组皮质 slowADC 值均稍高于髓质，但差异无统计学意义（P 均＞0.05）；3、实验组与对照组比较：实验组皮、髓质 standard ADC 值及髓质 slow ADC 值均高于对照组，差异有统计学意义（P 均＜0.05），实验组皮质 slow ADC 值稍高于对照组皮质 slow ADC 值，但差异无统计学意义（P＞0.05）。
结论
IVIM 序列能反映正常肾脏组织皮、髓质的真性弥散状态，并能除去血流及肾小管内液体弥散的干扰，敏感、准确的反映早期糖尿病肾病的弥散状态及血流灌注状态。

EPO-1061
28 例 XP11.2 易位/TFE3 基因融合性肾癌的 CT 表现与病理对照

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摘要 目的 对照分析 XP11.2 易位/TFE3 基因融合性肾癌（Xp11.2/TFE3 RCC）的 CT 表现与病理结果。方法 回顾性分析 28 例病理证实的 Xp11.2/TFE3 RCC 的 CT 征象，其中 2 例行 CT 平扫，2 例行 CTU，10 例行 CTA，14 例行 CT 三期增强。男 13 例，女 15 例，年龄 20～75 岁，平均年龄 44 岁。分析病变的位置，大小，形态，假包膜，密度，内部特征，增强，侵犯或转移等。结果 右肾 10 例，左肾 18 例，2 例位于髓质，1 例累及髓质、肾盂，其余均累及皮髓质，长径 1.7~11.5cm ，平均长径 6.1cm。类圆形 24 例，不规则形 4 例，有假包膜 17 例，3 例呈等密度，2 例呈低密度，23 例呈高密度，多数肿瘤见囊变（17 例），出血（18 例），钙化（9 例），增强后明显强化 5 例，轻度强化 21 例，乳头状结节样强化 15 例，实性片状强化 9 例，分隔样强化 2 例。肾门或腹膜后淋巴结转移 6 例，肾静脉或下腔静脉癌栓 7 例，远处转移 4 例。结论 Xp11.2/TFE3 RCC 通常肿瘤较大，平扫为高密度，密度不均匀，出血、囊变、钙化多见，常出现假包膜，增强后呈轻度强化、乳头状强化，Xp11.2/TFE3 RCC 的 CT 表现有一定特点。

EPO-1062
DWI 及 ADC 对肾透明细胞癌及非透明细胞癌的鉴别诊断价值

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【摘 要】**目的：**探讨 DWI 及 ADC 对肾透明细胞癌及非透明细胞癌的鉴别诊断价值。**方法：**回顾性分析本院 2016 年 3 月~2019 年 3 月 100 例经病理检查证实为肾细胞癌的患者的影像资料(包括 DWI 及 ADC),其中肾非透明细胞癌 32 例（包括 21 例嫌色细胞癌、11 例乳头状细胞癌）,肾透明细胞癌 68 例，所选患者均给予弥散加权成像（包括高低 B 值 DWI 及 ADC）比较两组影像学特征，并测量肿瘤部位的表观扩散系数(ADC)。**结果：**DWI 及 ADC 在两组对比差异有统计学价值（P＜0.05）；透明细胞癌 DWI 多为低、等或稍高信号，ADC 多为等或稍高信号，并且高 B 值 DWI 信号低于低 B 值 DWI；非透明细胞癌 DWI 多为明显高信号， ADC 多为较均匀的明显低信号，并且高 B 值 DWI 信号明显高于低 B 值 DWI，非透明细胞癌 ADC 值比透明细胞癌 ADC 值低，ADC 值低于 1.42±0.48×10.3mm2 / s 大多为非透明细胞癌。**结论：**DWI 及 ADC 对肾透明细胞癌及非透明细胞癌的有很大的鉴别诊断价值。

EPO-1063
64 排动态多期 CT 阴茎海绵体造影评价静脉性勃起功能障碍

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［摘要］ **目的：**应用 64 排动态多期 CT 阴茎海绵体造影成像技术，显示阴茎海绵体静脉漏的类型，为临床诊断及治疗静脉性勃起功能障碍提供参考。 **方法：**筛选 33 例临床确诊为血管性勃起功能障碍，彩色多普勒超声检查除外动脉性勃起功能障碍患者，行 64 排动态多期（动脉期、静脉期）CT 阴茎海绵体造影术，而后进行三维重建（包括容积再现 VR、多平面重建 MPR 及最大密度投影 MIP）等，充分显示阴茎海绵体、尿道海绵体、龟头、阴茎背浅静脉漏-阴部外静脉-大隐静脉-股静脉-髂外静脉、阴茎背深静脉漏-前列腺周围静脉丛膀胱下静脉-髂内静脉、阴茎脚静脉漏-阴部内静脉等不同海绵体静脉漏的 CT 征象，并进行分类统计。 **结果：**33 例中，9 例（27.27%）显示为混合性静脉漏（阴茎背深静脉漏、阴茎背浅静脉漏、阴茎海绵体与尿道海绵体间瘤及脚静脉漏均存在），15 例（45.45%）单独显示阴茎背深静脉漏，7 例（21.21%）单独显示阴茎脚静脉漏,2 例（6.06%）单独显示阴茎背浅静脉漏。其中 6 例患者膀胱部分显示显影。**结论：**64 排动态多期 CT 阴茎海绵体造影可准确显示静脉漏的部位及类型，指导临床治疗。

EPO-1064
膀胱癌影像报告及数据系统对膀胱癌肌层浸润的诊断价值

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目的：探讨膀胱癌影像报告及数据系统（VI-RADS）对评估膀胱癌有无肌层浸润的诊断价值。
方法：回顾性分析经病理证实的 54 例膀胱癌患者共 66 个病灶的影像资料，所有患者均行多参数磁共振检查，包括 T1WI、小视野 T2WI、DWI 及动态对比增强（DCE）扫描。分别由 2 位医师通过 PACS 系统采用盲法分析全部病例病灶的 T2WI、DWI 及 DCE 图像，并根据膀胱癌影像报告及数据系统进行 VI-RADS 评分，通过 Kappa 检验验证两位观察者评分一致性。以各病灶的术后病理结果为金标准，利用 ROC 曲线分析 T2WI、DWI、DCE 及 VI-RADS 评分对膀胱癌肌层浸润的诊断价值（计算敏感度、特异度、阳性预测值、阴性预测值及曲线下面积）。采用独立样本 t 检验比较非肌层浸润膀胱癌与肌层浸润膀胱癌病灶在 T2WI、DWI、DCE 序列及 VI-RADS 评分上的差异，$P<0.05$ 为差异有统计学意义。
结果：两位观察者 VI-RADS 评分一致性良好（Kappa 值=0.939）。T2WI、DWI、DCE、T2WI+DWI+DCE 的 VI-RADS 评分对判断膀胱癌肌层浸润的敏感度分别为 64.7%、82.4%、76.5%、94.1%、，特异度分别为 100%、80%、80%、80%，阳性预测值分别为 92.8%、94.4%、94.4%、95.2%，阴性预测值分别为 88.2%、93.8%、93.8%、100%。T2WI、DWI、DCE 及 T2WI+DWI+DCE 上非肌层浸润与肌层浸润病灶 VI-RADS 评分差异均有统计学意义（$P<0.05$）。
结论：VI-RADS 评分系统对评估膀胱癌病灶有无肌层浸润具有较好的诊断价值。

EPO-1065
基于肿瘤全域表观扩散系数纹理分析预测上皮性卵巢癌复发的研究

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［摘要］ **目的** 探讨基于肿瘤全域的表观扩散系数(apparent diffusion coefficient,ADC)纹理分析对上皮性卵巢癌复发的预测价值。**方法** 回顾性分析 49 例经病理证实为上皮性卵巢癌患者的术前 DWI 成像（b=0、800s/mm^2），利用后处理软件在 ADC 图上绘制全瘤的感兴趣区，分析提取出纹理参数，包括偏度、峰度、熵值、惰性、相关性、对比度、变异等共 77 个参数。采用多因素

Logistic 回归分析确定可作为复发的最佳预测因素，绘制 ROC 曲线评价其预测效能。**结果** 两组患者肿瘤大小及腹水复发组均高于非复发组，差异有统计学意义（P<0.05），FIGO 分期两组间差异有统计学意义（P<0.05）。复发组纹理参数惰性、对比度、变异、熵值显著高于非复发组，峰度、第 10、25 百分位数、相关性显著低于非复发组，差异均有统计学意义（P<0.05）。ROC 曲线分析显示峰度、惰性、相关性、肿瘤大小、FIGO 分期联合预测复发的曲线下面积最大，为 0.929。**结论** 基于全肿瘤容积的 ADC 纹理分析有助于预测 EOC 患者复发。

EPO-1066
子宫内膜异位症合并卵巢恶性肿瘤 MR 征象分析

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目的：探讨子宫内膜异位症合并卵巢恶性肿瘤的 MR 特征，以提高该病的诊断准确率。
资料与方法：收集本院 2007 年 8 月至 2019 年 7 月有完整临床、手术病理资料及 MR 检查的患者 16 例，与手术病理结果对照分析，回顾性综合分析其 MR 表现。
结果：17 例囊实性肿瘤，囊性部分 T1WI 成高信号者 3 例，成混杂高低信号者 3 例；T1WI 低信号、T2WI 高信号者 8 号；T1WI 等信号、T2WI 等信号者 2 例。肿瘤实性成分 T1WI 呈等信号，T2 WI 呈稍高、等信号，DWI 实性成分呈明显高信号，ADC 图像信号减低，实性成分明显不均匀强化。2 例实性肿瘤，成椭圆形、分叶状，实性部分 T1WI 混杂低、稍高、T2WI 稍高，DWI 等高信号、ADC 图像成等信号。

结论：MR 上囊实性病变囊液 T1WI 成高信号、混杂高信号为其特点，结合临床子宫内膜癌、子宫内膜异位症的病史及 MR 特点，能提高子宫内膜异位症合并卵巢恶性肿瘤诊断准确率。

EPO-1067
高清能谱 CT 对肾动静脉与 CTU 的融合技术在肾脏占位性病变术前评估的应用价值

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目的：探究高清能谱 CT 对肾动静脉与 CT 尿路造影的融合技术在肾脏占位性病变手术前的诊断和评估价值。**方法：**回顾性的分析 70 例经病理科诊断或者最终于临床确诊为肾脏占位性病变患者的高清能谱 CT 对肾动静脉于 CT 尿路造影融合技术的图像特征，分析不同时相的肾脏病变程度以及 CT 对肾动静脉和 CT 尿路的造影图像中病灶与邻近结构（肾动静脉与肾盂）情况，分析其在术前分析诊断过程中的价值。**结果：**在 70 例肾脏占位性病变患者中，21 例肾动脉与病灶有重叠位置关系，13 例肾静脉与病灶有重叠位置关系，21 例肾盂与病灶有重叠位置关系，其中 10 例肾动脉肾静脉与肾盂与病灶有重叠位置关系。**结论：**高清能谱 CT 对肾动静脉与 CTU 的融合技术在肾脏占位性病变术前评估中，不仅能确定病灶位置，还能够清晰显示在肾动静脉及尿道（肾盂）周围的解剖结构，及邻近结构与病灶的位置关系、融合与否方面有价值的信息，对术前研究提供了可靠的依据，是可靠、安全、行之有效的影像学检查方法。

EPO-1068
CT and MRI of Primary Testicular Non-Hodgkin's Lymphoma

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Objective To analyze the CT and MRI findings of primary testicular non-Hodgkin lymphoma (PTNHL).
Methods Twenty-one patients with PTHL confirmed by pathology were retrospectively analyzed. Ten patients underwent non-enhanced MR scanning, eight underwent enhanced MR examination, 10 underwent DWI examination, and 11 underwent non-enhanced and enhanced CT scanning. The CT and MRI features (including the shape, density/signal, enhancement pattern and surrounding structure of the tumor) were analyzed.
Results 19 cases involved unilateral testis, 2 cases involved bilateral testis, 3 cases involved spermatic cord, 6 cases were complicated by testicular hydrocele, 5 cases involved epididymis, 3 cases were presented with lymph node metastasis. On CT scan, 10 cases showed the lesions were iso-slightly high density, and slightly and moderately homogeneously enhanced. On MRI, 8 cases showed the lesions showed isointensity on T1WI, 7 cases showed slightly low signal on T2WI, 10 cases showed high signal on DWI, and low signal on ADC. After contrast enhancement, the lesions of 6 cases showed mild to moderate enhancement and homogeneous pattern. Two cases with cystic degeneration showed inhomogeneous enhancement.
Conclusion For the elderly male patients with painless testicular enlargement, the possibility of PTNHL should be considered if the tumor shows homogeneous density/signal and slightly or moderately enhancement. Restricted diffusion of the solid part on DWI has important diagnostic value.

EPO-1069
磁化转移成像技术在糖尿病肾病分期中的诊断价值

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目的：评价磁共振磁化转移成像技术（Magnetization transfer，MT）对糖尿病肾病分期的诊断效能。
方法：纳入糖尿病肾病患者 48 例，健康志愿者 35 例。根据肾小球滤过率、尿白蛋白排泄率、血肌酐及尿素氮检查结果，将糖尿病肾病患者分为 I-IV 期。采用西门子 Skyra 3.0T 磁共振扫描仪对所有被试进行双肾磁共振 MT 扫描。MT 扫描采用 3D 扰相梯度回波序列，该序列扫描 2 次，第一次为不添加 MT 射频脉冲信号（MTOFF），第二次为添加 MT 射频脉冲信号（MTON）。根据公式 MTR＝（MTOFF－MTON）×100 / MTOFF 计算出 MT 常用指标磁化传递率（*Magnetization transfer ratio*，MTR），以百分数表示。在双肾上极、肾门、下极肾皮、髓质绘制多个感兴趣区，测量相应磁化传递率并取平均值记录。采用单因素方差分析比较各期糖尿病肾病患者磁化传递率及实验室检查结果的差异。绘制 ROC 曲线分析磁化传递率诊断不同阶段糖尿病肾病的敏感性和特异性。

结果：糖尿病肾病 I 期到 IV 期肾皮质和髓质的 MTR 值逐渐升高（P<0.05）（表 1）。ROC 分析发现，肾皮质和髓质的 MTR 值可以区分健康人和糖尿病肾病患者，特别是鉴别糖尿病肾病 IV 期患者（曲线下面积：0.988；敏感性 100%，特异性 97.0%（表 2-4，图 1）。
结论：磁化转移成像技术对糖尿病肾病分期有较高的诊断价值，特别是鉴别重度糖尿病肾病患者，为糖尿病肾病的临床分期提供更科学客观的诊断依据。

EPO-1070
动态 MRI 评价妊娠和分娩对产后发生盆腔器官脱垂的影响

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目的：使用动态 MRI 全面评估分娩后产妇前、中、后盆腔器官的活动情况，评价妊娠及分娩对女性盆腔器官脱垂情况的影响。
方法：前瞻性收集经阴道分娩和剖宫产后 6~8 周初产妇各 30 例，以及未孕未产女性志愿者 30 例，所有受试者均行动态 MRI 检查，所有产妇在 MRI 检查前均行临床 POP-Q 脱垂评估。采用耻骨尾骨线（PCL）脱垂评分标准对所有受试者的盆腔器官脱垂程度进行评估，并与 POP-Q 分度法的结果进行比较。测量静息期及力排期前、中、后盆腔指示点至 PCL 的距离，并将静息期及力排期的测量结果相减得出盆腔器官的活动度，采用单因素方差分析比较 3 组间各盆腔器官距离参考线的距离及盆腔器官活动度的差异。
结果：POP-Q 分度法共诊断 4 例存在前盆腔脱垂合并子宫脱垂的产妇，动态 MRI 检查力排期均发现相应盆腔指示点位于 PCL 线下超过 1cm，与 POP-Q 分度法的符合率为 4/4。另外，发现有 10 例经阴道分娩产妇、1 例剖宫产产妇 POP-Q 分度法未能诊断为前盆腔脱垂，而在力排期出现前盆腔明显下移，指示点位于 PCL 线下超过 1cm。且有 1 例经阴道分娩产妇 POP-Q 分度法未诊断子宫脱垂的产妇，力排期存在子宫下移，指示点位于 PCL 线下超过 1cm。静息期三组间各盆腔器官至 PCL 距离差异均无统计学意义（$P>0.05$）。力排期，三组间各盆腔器官至 PCL 距离、盆腔器官活动度差异有统计学意义（$P<0.05$），经阴道分娩组各盆腔器官下移程度及活动度均明显大于剖宫产组及未孕未产对照组，而剖宫产组及未孕未产对照组间差异无统计学意义。
结论：与 POP-Q 分度法相比，动态 MRI 的 PCL 脱垂分度法能够准确诊断前盆腔器官 I 度脱垂，对前盆腔轻度脱垂诊断方面有重要的辅助诊断价值。经阴道分娩对产妇盆腔器官脱垂情况影响显著，这个结果在一定程度上提示剖宫产对于未来发生盆腔器官脱垂有一定的保护作用。

EPO-1071
子宫内膜癌磁共振成像：T2-WI、动态增强 T1-WI、DWI 三种序列对比分析

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目的：比较 T2-WI、动态增强 T1-WI、DWI 三种序列在评价子宫内膜癌肌层及宫颈浸润的价值。
材料与方法：回顾性分析 50 例经手术病理证实的子宫内膜患者资料。3.0T MR 检查包括 T2-WI、动态增强 T1-WI 及 DWI 图像。两名 MR 诊断医师根据子宫内膜癌 2009 国际妇产科联盟分期标准，采用单纯 T2-WI、动态增强 T1-WI、DWI 盲法随机阅片，分析肿瘤肌层浸润深度（<或>50%）及是否有宫颈浸润（是/否）；并将 MRI 判断肌层和宫颈侵犯结果与手术病理比较。采用配对卡方检验 Fisher’s 确切概率法比较 3 种序列对子宫内膜癌肌层及宫颈浸润诊断准确性。

结果：
经手术病理证实的 50 例子宫内膜癌，17 例肌层浸润>50%（17/50 34%），9 例宫颈浸润（9/50 18%）。T2-WI、动态增强 T1-WI、DWI 判断肿瘤深肌层浸润的准确度分别为 43/50、43/50、45/50（86%、86%、90%）（p>0.05）。T2-WI、动态增强 T1-WI、DWI 判断宫颈浸润的准确度分别为 46/50、46/50、46/50（92%、92%、92%）（p>0.05）。
结论：T2-WI、动态增强 T1-WI、DWI 三种序列评价子宫内膜癌肌层及宫颈浸润的准确度差异无统计意义。因此，DWI 可以代替动态增强 T1-WI，结合常规 T2-WI 用于子宫内膜癌的 T 分期。

EPO-1072

Value of DWI sequences in cervical cancer recurrence: can we skip contrast?

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Purpose: We aimed to evaluate the accuracy of diffusion-weighted magnetic resonance imaging (DW-MRI) in cervical cancer follow-up, by comparing T2-weighted images (T2-WI) combined with DW-MRI and T2-WI combined with dynamic contrast-enhanced MRI (DCE-MRI) in the assessment of tumour recurrence.
Methods and Materials: We enrolled 39 patients with treated cervical cancer and clinical suspicion of recurrence who underwent follow-up MRI examination on 1.5 T magnet: scanning protocol included multiplanar T2-WI, DCE sequences and DWI-MRI. MR findings were compared with pathology results. Accuracy measures were calculated and compared.
Results: Thirty-seven women (37/39) had histologically proven recurrence. The accuracy to detect recurrence was 76.9% and 92.3% on combined T2-WI/DCE and T2-WI/DWI, respectively. The addition of DCE-MRI did not significantly improve the diagnostic ability of T2-WI alone, and the combination of these two sequences misclassified 2 patients as false positive and 7 as false-negative. The combination T2-WI/DW-MRI had a positive predictive value of 100 % and only 3 false-negative cases.
Conclusion: MR imaging is an effective technique for cervical cancer recurrence detection and DW-MRI combined with T2-WI resulted in a significant rise in MRI diagnostic ability, potentially leaving DCE-MRI as an optional technique in doubtful cases.

EPO-1073

磁共振扩散加权成像预警肾癌微波消融术后疗效的应用研究

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目的 探讨磁共振扩散加权成像（DWI）在评价肾癌微波消融（MWA）术后疗效的价值。**方法** 回顾性分析 93 个肾癌病灶在 MWA 治疗后 1 天、1 个月、3 个月和 6 个月及以上的 DWI 信号变化特点和 ADC 值变化规律。**结果** 完全消融 81 个病灶， 术后 1 天，完全消融区 DWI 呈低信号，周围伴有高信号的环形反应带；1 个月时周围环形反应带变薄，3 个月基本消失，消融灶呈混合信号。部份消融 12 个病灶，复发 6 个，残留和局部进展组织表现为位于消融区和正常肾组织之间的不规则环状

或结节状稍高信号。在 b 值为 800s/mm² 时，术前与术后不同时间、不同组织间的 ADC 值变化显示：①肾癌 ADC 值低于正常肾脏。②术后完全消融区与术前比较有显著差异，ADC 值降低并且呈现逐渐降低的趋势。③术后各随访时间不同组织（完全消融区、周围环形反应带、正常肾实质）间的 ADC 值差异均有统计学意义。④残留/局部进展组织的 ADC 值与术前肾癌的 ADC 值间没有差异。**结论** DWI 能有效区分完全坏死区、活性肿瘤组织和正常肾实质，提供比 MR 常规扫描更多的诊断信息，在肾癌微波消融疗效评估中发挥重要作用。

EPO-1074

病灶大小对肾脏嗜酸细胞腺瘤及嫌色细胞癌 CT 征象的影响

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目的　研究肾脏嗜酸细胞腺瘤（RO）与嫌色细胞癌（CRCC）常见的 CT 鉴别征象在不同大小的病灶中是否存在差异。方法　回顾性分析经病理证实的 10 例 RO 和 9 例 CRCC 的影像学资料，将病例分为≤3cm 组、＞3cm 组，对比分析其 CT 平扫、多期增强特征在组间是否存在差异。结果　①≤3cm 组共 8 例，其中 RO 5 例，CRCC 3 例，＞3cm 组 11 例，其中 RO 5 例，CRCC 6 例；② 9 例病灶中发现中央瘢痕，其中≤3cm 组 1 例（1/8），＞3cm 组 8 例（8/11）；6 例为 RO（6/10），3 例为 CRCC（3/9）；③强化反转 7 例，其中≤3cm4 例（均为 RO），＞3cm 组 3 例（1 例 RO，2 例 CRCC）；④5 例病变内见钙化，均为＞3cm 组，其中 RO 1 例，CRCC 4 例；⑤皮髓期强化程度，其中 8 例病灶接近（相差±10HU）或高于肾皮质（＞10HU），均为 RO，11 例低于肾皮质（相差＞10HU，其中 3 例 RO，8 例 CRCC）；⑥ RO、CRCC 大小及≤3cm、＞3cm 组的构成比无统计学差异，p 值分别为 0.743、0.65；皮髓期强化程度在 RO 与 CRCC 间存在差异，p 值为 0.02；中央瘢痕、节段性强化反转在 RO 与 CRCC 间没有统计学差异，p 值分别为 0.37、0.35，但按大小分组后，中央瘢痕在＞3cm 组、节段性强化反转在≤3cm 组存在统计学差异，p 值分别为 0.032、0.014；病灶内钙化均见于＞3cm 组，CRCC 的发生率（4/6）要高于 RO（1/5），但无统计学差异（p =0.242）。结论　病灶大小是影响肾脏嗜酸细胞腺瘤、嫌色细胞癌 CT 鉴别征象价值的重要的分层因素。

EPO-1075

个案报道：左肾血管周细胞瘤一例

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患者，男，45 岁，体检发现左肾占位，无尿频、尿急、尿痛，无脓尿，无肉眼血尿，无畏寒、发热，无咳嗽、咳痰，无恶心、呕吐，无腹痛、腹泻，无头晕、头痛，无骨痛。CT 扫描表现为左肾体积增大，腹膜后、左肾门偏下方见一不规则形等密度软组织肿块影，呈分叶状，边界清，周围脂肪间隙模糊，增强扫描呈明显持续不均匀强化，其内低密度影呈延迟增大强化，左肾肾盏及上段输尿管受压推挤并扩张积液。术后病理诊断：（左肾）血管周细胞瘤，累计肾盂；免疫组化示：S100(+);CD99(+);bcl-2(+);Ki-67(3%+);CK(上皮+);Vim(3+);CD34(+);EMA(上皮+);Vim(-);CK(-);Des(-);SMA(-);FVIII(血管+);ALK(-) 。

血管周细胞瘤为血管周细胞衍生的软组织肿瘤，占全部血管瘤的 1% ， 好发于下肢、腹膜后、头颈及脑膜， 发生于肾脏的血管周细胞瘤较为罕见。血管周细胞瘤可发生于任何年龄段人群，肿瘤多为单发，患者平时无自觉症状， 发病原因不明确。肾血管周细胞瘤病程不一， 多生长缓慢， 一般界限清楚，易于手术摘除。

EPO-1076

One-stop assessment of renal function and renal vascular anatomy in hypertensive patients: Noncontrast-enhanced MRI using Spatial Labeling with Multiple Inversion Pulses

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Objectives To assess whether noncontrast-enhanced MRI using spatial labeling with multiple inversion pulses (SLEEK) with optimal blood-suppression inversion times (BSP TI) can improve the visibility of renal corticomedullary differentiation and simultaneously display renal vessels clearly in hypertensive patients with renal failure.
Methods and Materials A total of seventy-eight patients with suspected hypertensive renal damage underwent abdominal MRI at 1.5T including a coronal SLEEK sequence and an axial diffusion-weighted imaging (DWI) sequence. 22 of these patients underwent CT angiography (CTA) examination. Image analysis was performed by two experienced radiologists.
Results The performance of SLEEK to present renal artery is accordance with CTA (Kappa=0.713) and can display the stenosis clearly. The corticomedullary contrast ratio, which was positively correlated with estimated glomerular filtration rate (eGFR) (p=0.004, r=0.322), was significantly higher in SLEEK than in DWI in all three groups (p=0.001). There was a significant difference in corticomedullary contrast ratio in SLEEK between Group 1 and Group 3 (p=0.006), however, there were no significant differences between Group 1 and Group 2 (p=0.285) or between Group 2 and Group 3 (p=0.064). A significant positive correlation was observed between renal cortical thickness and eGFR (P<0.001, r=0.729) and a significant difference was seen between Group 1 and Group 2 (p=0.01).
Conclusions SLEEK can improve the recognition of renal corticomedullary differentiation compared with DWI and can display the renal artery clearly simultaneously in hypertensive renal damage patients.

EPO-1077

Whole Lesion Histogram Analysis of Apparent Diffusion Coefficients on MRI Predicts Disease-free Survival in

Locally Advanced Cervical Cancer After Radical Chemo-radiotherapy

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Purpose: The aim was to investigate the prognostic value of MR diffusion-weighted images (DWIs) using histogram analysis (HA) in predicting disease-free survival (DFS) of cervical cancer after chemo-radiation therapy.
Materials: We retrospectively analyzed 103 women with pathologically proven squamous cell uterine cancer who received chemo-radiation therapy between 2009 and 2013.All patients were followed up for more than 2 years after the first radiation treatment. Pre-treatment MR images were retrieved and imported for HA using an in-house developed software program based on 3D Slicer. Regions of interest of whole tumors were drawn manually on DWI with reference to T2WI. HA features (mean, max, min, 50%, 10%, 90%, kurtosis, and skewness) were extracted from apparent diffusion coefficient (ADC) maps and compared between the recurrence and non-recurrence groups after the 2-year follow-up. Univariate and multivariate Cox regression analysis was used to correlate ADC HA features and relevant clinical variables (age, grade, tumor size, FIGO stage, SCC-Ag) with DFS.
Results: 103 patients with stage IB-IV cervical cancers were followed up for 2.0-94.6 months (median 48.9 months). 20 patients developed recurrence within 2 years. In the recurrence group, the min (P = 0.001) and 10% (P = 0.048) ADC values were significantly lower than those of the non-recurrence group.Univariate and multivariate Cox regression analysis revealed that ADC_{min} (P = 0.006, HR = 0.110) was significantly correlated with DFS.
Conclusion: Pre-treatment volumetric ADC_{min} in histogram analysis is an independent factor that is correlated with DFS in cervical cancer patients treated with chemo-radiation therapy.

EPO-1078

多层螺旋 CT 增强扫描在肾癌诊断中的价值

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目的：探讨多层螺旋 cT 增强扫描及后处理技术在肾癌术前诊断、显示肿瘤血供及周围关系等方面的临床应用价值。

方法：回顾性分析 2012 年 5 月-2017 年 5 月我院 40 例经手术病理证实为肾癌的 CT 平扫及多期增强扫描的影像资料，并与临床病理对照，对肿瘤的形态、大小、范围进行分析，并按照最大密度投影、多平面重组和容积再现进行后处理，观察肿瘤的供血动脉及周围浸润情况，病患者的临床及螺旋 CT 检查资料， 通过观察其影像学特征，并与病理诊断结果进行对照分析。

结果：CT 扫描显示 38 例病灶突出肾轮廓外，2 例局限于肾轮廓内。平扫密度较为复杂，部分出血表现为高密度影，部分伴随囊变、出血，部分可有钙化，CT 平扫表现为肾实质占位病变，瘤体与肾实质分界不清。动脉期均有不同程度中度强化和明显强化，15 例动脉期增强后可见清晰边界，16 例可见假包膜，9 例可见“短刺”征： 肾实质期扫描，强化程度明显减弱， 静脉期强化程度进步一减弱肿瘤的形态主要为圆形或类圆形、不规则形，绝大部分呈“快进快出”特征性强化。

结论：多层螺旋 CT 增强扫描及 CT 后处理技术在肾癌中的诊断价值较高，其影像具有一定的特征性，可提高对肾癌的诊断准确性，对肿瘤的供血情况、瘤体的浸润程度可以作出分析、评估，为临床合理选择手术方式、降低手术风险及评估预后具有重要价值。

EPO-1079

1.5T 磁共振在输卵管卵巢脓肿中的应用价值

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目的：分析输卵管卵巢脓肿的磁共振（MRI）影像表现，以提高对该病的诊断与鉴别诊断能力。**方法：**回顾性分析我院确诊的 15 例输卵管卵巢脓肿影像学资料，所有患者均行磁共振平扫、增强扫描以及弥散加权成像（DWI）。使用 GE BRIVO MR355 1.5T 磁共振扫描仪，腹部线圈，仰卧位，呼吸门控。平扫为 TSE 序列，增强为 T1WI 压脂 3D-LAVA 序列；DWI 序列 b 值为 800s/m ㎡。由 3 名副主任医师分析病变形态，边缘、信号特点强化类型及其周围组织情况。**结果：**双侧附件发病 6 例（40.00%）、单侧发病 9 例（60.00%），MRI 表现均位于附件区囊性或囊实性包块，病变呈弯曲管状或腊肠样 7 例（46.67%）；串珠状改变 1 例（6.67%）； 单房状 2 例（13.33%）；多房蜂窝状 5 例（40.00%）；合并盆腔脓肿 3 例。增强扫描囊壁呈厚壁强化，多环状强化，囊内可见不全分隔影；病灶周围见水肿带 13 例（86.67%）。DWI 表现为均匀高信号 13 例（86.67%），囊内稍高信号 2 例（13.33%）。**结论：**输卵管卵巢脓肿典型 MRI 影像学表现为附件区多房状、腊肠样或管状扩张囊性结构，管壁增厚无壁结节。增强扫描及弥散加权成像（DWI）有利于提高鉴别诊断能力。

EPO-1080

Prediction of stage, differentiation and Ki-67 status of locally advanced cervical cancer by DCE-MRI texture analysis

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Purpose

To determine the value of texture analysis of DCE-MRI maps in prediction of advanced stage, poor differentiation and high Ki-67 status of advanced cervical cancer.

Methods

Thirty-nine patients were enrolled in this retrospective, institutional review board (IRB)-approved study. DCE-MRI was performed on 3.0T scanner by a 3D T1W High Resolution Isotropic Volume Examination (THRIVE) sequence with 36 phases. Co-

occurrence matrix -based texture features were extracted from each tumor on maximum enhancement (ME) and maximum relative enhancement (MRE) maps from DCE-MRI using in-home radiomics tool based on Mat-Lab software. Multivariate models were trained on the training cohort and their performance was evaluated on the 5-fold cross-validation cohort using the area under ROC curve (AUC), accuracy, specificity and sensitivity. P value<0.05 was considered statistically significant.

Results

Mean age was 56.5±10.3 years. Histopathology revealed 9 adenocarcinoma and 30 squamous cell cancer; 7 well-differentiated, 21 moderately differentiated or moderately to poorly differentiated, and 11 poorly differentiated tumors; 7 FIGO Ⅰb, 18 FIGO Ⅱa, 8 FIGO Ⅱb, 6 FIGO Ⅲa, none of FIGO Ⅲb and Ⅳ. Lymph nodes were involved in 12 patients. On ME maps, two GLSZM, two GLRLM and one GLCM features correlated with the grades: LAHGE (r=0.37, P=0.02), GLN(GLSZM) (r=0.386, P=0.015), GLN(GLRLM) (r=0.325, P=0.044), RLN (r=0.444, P=0.005), correlation(GLCM) (r=0.467, P=0.003); On MRE maps, three GLSZM and two GLRLM features correlated with the grades: LAHGE (r=0.38, P=0.017), GLN (GLSZM) (r=0.354, P=0.027), and SZN (r=0.332, P=0.039), GLN(GLRLM) (r=0.392, P=0.014), RLN (r=0.361, P=0.024) respectively. Among all texture features derived from ME and MRE maps, correlation (GLCM) on ME showed a correlation with tumor differentiation. A multivariate logistic regression showed AUC was 0.737 (95%CI: 0.572 - 0.865) for FIGO Ⅱb-Ⅲa, 0.705 (95%CI:0.537-0.840) for poor differentiation on MRE features. We also used a machine learning-XGB classifier to build a prediction model using all the radiomics features. Twenty-nine features were chosen to build the model and results showed the mean sensitivities of predicting FIGOⅡb-Ⅲa, poor differentiation and high Ki-67 status were 0.767, 0.963 and 0.967 respectively; specificities were 0.958, 0.361 and 0.694 , and AUCs were 0.910, 0.920 and 0.840 respectively. The ROC curves were shown in Figure 2-4.

Conclusion

Volumetric texture analysis on DCE-MRI maps can potentially help to predict tumor with poorly differentiation, higher stages and Ki-67 status for cervical cancer stage FIGO Ⅰb-Ⅲa.

EPO-1081

MR Defecography in the Assessment of Functional Changes of Stress Urinary Incontinence before and after Tension-free Vaginal Tape Surgery

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Objective: Magnetic resonance defecography (MRD) was used to evaluate the pelvic floor functional changes in women with stress urinary incontinence (SUI) before and after mid-urethral tension-free vaginal tape (TVT) intervention and to confirm the mechanism of urinary control.

Materials and Methods: The patient group consisted of thirty-three females clinically diagnosed with SUI who underwent preoperative MRD. Static MR images were used to describe the appearance and abnormalities in the levator ani muscle and periurethral

ligaments. Dynamic MR images were used to depict the function of the urethra and the pelvic floor. Among the 33 SUI patients, 12 cases rechecked MRD after TVT insertion, we assessed the following MRI parameters before and after TVT: (a) the vesicourethral angle and urethral hypermobility; (b) the bladder neck descent and bladder neck funneling; (c) the pelvic organ prolapse (POP).(d) H and M line. The quantitative data were analyzed by multigroup analysis of variance. The differences with $p<0.05$ were defined as having statistical significance.

Results: Periurethral ligament defects was present in 75.4% and discontinuity or complete loss of pubococcygeal muscle was 67.7% in SUI patients. The dynamic MR images showed the presence of urethral hypermobility (63.4±35.1°) and a shortening of the functional urethra length (0.2±0.5cm) at the defecation pahse in the SUI patients. Besides, approximately 81.82% SUI patients were associated with the bladder neck funneling, 42.42% with urethral opening, 63.64% with cystocele, and 42.42% with uterine and vaginal prolapse. Postoperative MRI showed that SUI patients after TVT surgery had lower risk of the bladder funneling and urethral opening at defection phase ($p<0.01$). No functional changes of the urethral hypermobility, the bladder neck descent and pelvic floor prolapse were seen postoperatively ($p>0.05$).

Conclusion: MRD provides the detailed anatomic and functional evaluation of the pelvic floor in female SUI. SUI patients had a visible defect in the pubococcygeal muscle instead of puborectalis. Defecation phases provides a spectrum of functional disorders in SUI patients. Urinary continence after TVT is mostprobably achieved by creating a dynamic mid-urethral knee angulation by which the urethra is closed at stress or defecation phase.

EPO-1082

睾丸及附睾病变的影像诊断

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目的 探讨睾丸附睾病变的 CT 表现及其诊断价值。

资料与方法 回顾性分析 40 例经手术病理证实的睾丸附睾病变的 CT 表现，影像特征。

结果：40 例病变中，41 个睾丸附睾病变，CT 表现为阴囊内边界清楚软组织肿块，9 例为生殖细胞肿瘤，其中精原细胞瘤 5 例，平扫呈低密度改变，增强扫描中度不均匀强化，肿块最大直径为 65mm，内见囊变坏死区；非精原细胞瘤中 2 例混合型生殖细胞瘤，最大肿块为 50*55mm，平扫呈略低密度，增强扫描后呈轻度强化；畸胎瘤 2 例，肿块较大，约 78*85mm，平扫呈低密度改变伴分隔影，增强扫描后，病灶血供丰富，呈明显强化；非生殖细胞肿瘤 4 例，为淋巴瘤，病灶平扫呈略高密度或等密度，最大肿块 9*7*6mm，增强扫描呈均匀强化，并可见粗大血管影；附睾病变 5 例，其中，腺瘤样瘤 1 例，附睾囊肿 4 例；睾丸外伤破裂 4 例；隐睾 2 例；阴囊病变 4 例，脂肪瘤 1 例，平滑肌肉瘤 1 例，脓肿 2 例；精索囊肿 5 例；鞘膜积液 7 例。

结论：CT 对睾丸附睾病变的检出具有重要价值,同时结合患者发病年龄及临床资料可对不同病理类型的肿瘤及其它病变作出鉴别诊断。

EPO-1083

肾上腺皮质癌 CT 影像学表现与免疫组化的相关研究

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目的：根据 10 例肾上腺皮质癌的 CT 征象与免疫组化部分指标的相关研究，预测其应用价值。
方法：回顾性分析 2015 年 2 月至 2019 年 1 月来广西医科大学第一附属医院就诊的经病理确诊为肾上腺皮质癌患者 10 例的 CT 影像特征，并分析不同征象与部分免疫组化的表达。
结果：10 例肾上腺皮质癌患者中，均为类圆形、单发，左右各半；5 例直径超过 10cm；8 例为囊实性，2 例为实性；9 例边界清，1 例边界不清；4 例其内见斑片状钙化；2 例下腔静脉及肾静脉癌栓形成；2 例有腹主动脉淋巴结转移；5 例实性成分明显不均匀强化；其中 Syn（+）7 例，Ki-67（+）9 例，CgA(-)9 例，CK（-）7 例，EMA（-）7 例。
结论：肾上腺皮质癌体积较大、形态不规则、钙化、星芒状囊变区等，增强扫描肿瘤不均匀强化，坏死与出血区不强化，CT 检查可发现下腔静脉受累、淋巴结转移及其他脏器转移。免疫组化 Syn（+）、Ki-67（+）有可能对肾上腺皮质癌的诊断提供帮助，而 CgA、CK、EMA 有待于进一步研究。

EPO-1084
基于全肿瘤体积的 T2WI 信号强度直方图分析鉴别子宫内膜癌和子宫间质肉瘤

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目的：探讨基于全肿瘤体积的 T2WI 图像直方图分析对子宫内膜癌和子宫间质肉瘤的鉴别诊断价值，并经 MRI 检查。方法与资料：回顾性分析 60 例经病理证实的子宫恶性肿瘤患者，其中子宫内膜癌 40 例，子宫间质肉瘤 20 例。在肿瘤水平每层两组 T2WI 横轴图像的每一层上绘制感兴趣区域(ROI)，并进行直方图分析，这两个步骤都是在 Mazda 软件上进行的。对直方图参数进行统计分析，找出两组间显着差异的特征。结果：从直方图中提取的 9 个参数中，方差具有统计学意义，ROC 曲线下的最大面积为 0.698。区分子宫内膜癌和子宫间质肉瘤的最佳方差为 453.76(特异性为 55%，敏感性为 80%)。结论：T2WI 直方图分析可为子宫内膜癌与子宫间质肉瘤的鉴别提供可靠的客观依据。

EPO-1085
T2WI 全瘤直方图分析在子宫内膜癌和子宫肌瘤变形鉴别诊断中的应用

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目的：评价 T2WI 直方图分析在鉴别子宫内膜癌和子宫肌瘤变性中的价值。方法与材料：对我院 64 例子宫肿瘤患者的子宫 MRI 检查及病理诊断进行回顾性分析。其中子宫内膜癌 40 例，子宫肌瘤变性 24 例。在 T2WI 横轴图像肿瘤水平的每一层上绘制感兴趣区域(ROI)，并进行直方图分析，这两个步骤都是在 Mazda 软件上进行的。对直方图参数进行统计分析，找出两组间显着差异的特征。结果：通过直方图分析 9 个参数，均值，偏度，峰度，Perc.1%，Perc.10%，Perc.50%，有统计学意义。ROC 曲线下最大面积分别为 0.676，0.738，0.674，0.732，0.718，0.679。鉴别子宫内膜癌和子宫肌瘤变性的最佳偏度为 0.39(特异性 75.0%，敏感性 77.5%)。结论：T2WI 图像直方图分析可为

子宫内膜癌与子宫肌瘤变性的鉴别提供可靠的客观依据。可作为两种肿瘤的一种新的辅助诊断方法。

EPO-1086
多 B 值 DWI 在妊娠晚期胎盘植入分级诊断中的临床价值研究

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目的 研究分析多 B 值下的磁共振弥散加权成像（Diffusion weighted imaging，DWI）在妊娠晚期胎盘植入分级诊断中的临床价值研究。**方法** 选取 2013 年 5 月~2017 年 8 月　在我院 68 例待产并怀疑 出现胎盘植入的晚期孕产妇作为研究对象，对其进行常规磁共振 T2 加权成像（T2WI）检查与 DWI 扫描，同时 DWI 选用 0s/mm2，400s/mm2、800s/mm2、1000s/mm2 四种不同的 B 值参数进行扫描，利用方差分析法来测定不同 B 值检测组之间胎盘植入区域与子宫肌壁区域的信号强度比（SI Ratio），结合后期的分娩结果与手术情况为标准，将 SI Ratio 指数最高的 B 值组与 T2WI 的检测结果进行比较，判断两者对于产妇妊娠晚期胎盘植入分级的诊断效能。**结果** 68 例产妇当中有 12 例因不能坚持完成扫描检查而放弃，13 例未能确诊胎盘植入，其余产妇中有 18 例为Ⅰ级胎盘植入，16 例为Ⅱ级胎盘植入，9 例为Ⅲ级胎盘植入　；当 DWI 的 B 值=800s/mm2 时，胎盘植入区域与子宫肌壁之间的 SI Ratio 值为（5.44±1.62），较其他 B 值下的 DWI 更高且差异具有统计学意义（P＜0.05）；同时，当 DWI 的 B 值=800s/mm2 时，对于Ⅰ级胎盘植入与常规 T2WI 检查无显著差异（P＞0.05），但对于Ⅱ级、Ⅲ级胎盘植入的检测效能较常规 T2WI 检查更好，且差异具有统计学意义（P＜0.05）。**结论** 当 B 值选取为 800s/mm2 时，DWI 的扫描结果能够较好地显示产妇的胎盘植入情况，为胎盘植入的临床诊断和治疗提供更加准确地依据。

EPO-1087
CT 增强图像纹理分析技术鉴别肾脏嗜酸性细胞腺瘤和透明细胞癌的应用价值

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目的 探讨 CT 增强图像纹理分析技术在肾脏嗜酸性细胞腺瘤和透明细胞癌中的诊断及鉴别诊断价值。**方法**　回顾性分析经手术病理证实的 11 例肾脏嗜酸性细胞腺瘤和 46 例透明细胞癌患者，所有患者术前均进行肾脏 CT 增强检查，利用 Omni-Kinetics 纹理分析软件分析两组肿瘤的纹理特征，包括平均灰度值、标准差、偏度、峰度、能量及熵。采用独立样本 t 检验比较两组计量资料之间的差异，构建 ROC 曲线评价其诊断效能。**结果**　在 CT 增强图像上，肾脏嗜酸性细胞腺瘤的标准差和熵小于透明细胞癌，差异均具有统计学意义，能量大于透明细胞癌，差异具有统计学意义；平均灰度值、偏度小于透明细胞癌，峰度大于透明细胞癌，差异均无统计学意义。在两组肿瘤的鉴别中，标准差曲线下面积为 0.875，以 25.03 为阈值，敏感性为 80.77%，特异性为 87.50%；能量曲线下面积为 0.946，,以 0.013 为阈值，敏感性为 92.59%，特异性为 88.89%；熵曲线下面积为 0.880，,以 6.593 为阈值，敏感性为 81.48%，特异性为 88.89%。**结论**　肾脏嗜酸性细胞腺瘤和透明细胞癌之间的纹理特征存在显著差异，标准差、能量及熵对两者之间的鉴别具有重要价值。

EPO-1088
应用 PET-CT 与 DWI 成像评估前列腺癌淋巴结转移的荟萃分析

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目的：比较 PET-CT 和 DWI 成像对前列腺癌淋巴结转移的诊断价值。
方法：检索 PubMed， the Ovid, MEDLINE, EMBASE，Cochrane Library 和 Web of Science databases 数据库中发表于 1979 年 1 月之后出版的文章。文章的语言为英文。纳入的文章必须包括四格表；文章的研究内容是 PET-CT 或 DWI 成像对前列腺癌淋巴结转移诊断价值，金标准是病理。
结果：33 和 8 项研究（包括 516 和 109 患者）分别评估 PET-CT 和 DWI。双变量分析显示 PET-CT 的平均敏感性和特异性分别为 0.92（95% CI 0.84 - 0.93）和 0.88（95% CI 0.87～0.89）曲线下面积(AUC)为 0.9474。DWI 平均敏感性和特异性的 87.1% (CI, 83.0% to 90.3%) and 70.3% (CI, 58.8% to 79.7%)。曲线下面积(AUC)为 0.745。
结论：PET-CT 比 DWI 更能准确诊断前列腺癌淋巴结转移。

EPO-1089
Diffusion-weighted imaging and Intravoxel incoherent motion in the diagnosis of prostate cancer: A preliminary retrospective study

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Purpose
This study explored and compared the value of Intravoxel incoherent motion (IVIM) with diffusion-weighted imaging (DWI) in distinguishing prostate cancer from non-cancer tissues (including benign prostate hyperplasia and normal tissue) and compared their performances in the peripheral zone and the central lobe.

Methods
A retrospective review was performed in 212 consecutive patients (108 patients with prostate cancer and 104 patients with hyperplasia of the prostate) who underwent examination on a 3-T MR scanner (MAGNETOM Skyra, Siemens Healthcare, Erlangen, Germany) in our hospital from March 2015 to May 2016.All patients were confirmed by pathology. A multi-b DWI sequence was performed with the following parameters: TR/TE = 5100/89ms, FOV = 280x224 mm^2, scan matrix = 150x120, slice thickness = 4mm, slice number = 20, bandwidth = 1755Hz/Px, iPAT factor = 2, b-values =0, 50, 100, 250, 500, 800, 1000, 1500, 2000, 2500 mm^2/s, scan time = 4min10s. D, D^*, f and apparent diffusion coefficient (ADC) derived from conventional DWI were calculated and analyzed by using an in-house-developed software based on MATLAB (Mathworks, Natick MA). The diagnostic accuracy of D, D^*, f and ADC values were evaluated with sensitivity, specificity, and

area under receiver operating characteristic (ROC) curve (AUC). Student's t-test and ROC curves were used for statistical analysis.

Results

There was a significant difference between non-cancerous tissues in the peripheral zone and central lobe (P <0.001) for D、D*、f and ADC; while these parameters show no significant difference between prostate cancers in the peripheral zone and the central lobe (p>0.05). For the peripheral zone, D、D*、f and ADC had sensitivities of 0.987, 0.000, 0.000, 0.993, specificities of 0.994, 1.000, 1.000, 0.993, and AUCs of 0.9997, 0.5547, 0.5702, 0.9998, when using cutoff values of 0.981 mm^2/s, 4.241 mm^2/s, 0.150, and 1.141x$10^{-3}mm^2/s$, respectively. While for the central lobe, the diagnostic performance of D、D*、f and ADC got sensitivities of 0.826, 0.870, 0.581,0.855, specificities of 0.975, 0.991,0.967, 0.981, and AUCs of 0.9546, 0.6770, 0.8580,0.9569, when the cut-off points were 0.842 mm^2/s, 6.128 mm^2/s, 0.164, 0.997x$10^{-3}mm^2/s$, respectively.

Discussion

IVIM and DWI may depict microstructure changes of prostate cancer, and can potentially provide quantitative information for the prostate tissue and have similar good diagnostic performance to distinguish prostate cancer from non-cancer tissues. For both of the two diffusion models, the diagnosis values in the peripheral zone were slightly better than in the central lobe.

EPO-1090

基于体质指数急性肾绞痛患者低剂量 CT 扫描方案研究

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目的 探讨如何在不同体质指数的急性肾绞痛患者之间实现泌尿系低剂量 CT 扫描。**方法** 133 例急性肾绞痛患者拟行泌尿系 CT 扫描，按常规参数（三种体型均 120kV，CARE Dose4D）、低 kV（BMI≤22.6：80kV、22.6＜BMI＜30：100kV、BMI≥30：120kV，CARE Dose4D）、低 mAs（120kV，三种体型均在 CARE Dose4D 基础上 mAs 降低 40%）三种扫描方式完成。测量各组图像噪声、信噪比（SNR）及对比噪声比(CNR)作为图像质量客观评价指标，主观评价由两名具有 5 年以上工作经验的医师采用双盲法进行 5 分制评价。记录各组患者 CT 剂量报告中辐射剂量值（$CTDI_{vol}$、DLP、E）。采用单因素方差分析（*One-Way ANOVA*）或 *Kruskal-Walli H*检验，若三者之间存在显著差异，两两比较采用 *LSD*检验或 *All pairwise*检验，*P*＜0.05 具有统计学意义；采用 *Cohen kappa*检验对两位放射科医师图像质量主观评价的一致性进行分析。**结果** 80kV、100kV 扫描的有效剂量分别下降了 78.3%、41.1%，图像噪声、SNR、CNR 差异具有统计学意义（*P*＜0.05），但放射科医师对图像质量主观评分均≥3 分；三种体型患者低 mAs 扫描的有效剂量分别下降了 38.3%、41.1%、33.6%，图像噪声、SNR、CNR 差异无统计学意义（*P*＞0.05），放射科医师对图像质量主观评分均≥4 分。**结论** 本研究中针对不同体质指数患者采用的低 kV、低 mAs CT 扫描方案可以有效降低患者的辐射剂量，并能达到临床诊断要求。

EPO-1091

Clear cell carcinoma of the prostate: a case report

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Abstract

We report on a rare case of a clear cell carcinoma in the prostate, occurring in a 21-year-old man presenting with sudden onset of acute urinary retention who had lower urinary tract obstructive symptoms with no obvious incentive 7 days ago. Clear cell carcinoma occurring in the prostate is extremely rare, and information reported in the literature is quite limited. We report a case of clear cell carcinoma of the prostate confirmed with surgical histopathology and immunochemistry, and review the medical literature with emphasis on their imaging feature.

1. Introduction

Clear cell carcinoma, as one of infrequent carcinomas occur in the lower urinary, is similar to metastatic renal cell carcinoma. In 2003, Sing[1] found a clear cell carcinoma of the prostate, which is very similar to renal clear cell carcinoma histologically and immunohistochemically, then the renal-type clear cell carcinoma of the prostate was named after an excluded diagnosis of prostate metastatic adenocarcinoma. Our case reveals a patient with congenital absence of the right kidney, which is similar to the case reported by Zachary Klaassen[2]. Herein, we reported a case of a 21-year-old man who was diagnosed with clear cell carcinoma of the prostate. The histopathological, immunohistochemical and imaging features, which are vital examinations for clear cell carcinoma of the prostate in its diagnosis and differential diagnosis, are discussed.

2. Case report

A 21-year-old male came to the attention of his urologist for sudden onset of acute urinary retention, and he had lower urinary tract obstructive symptoms with no obvious incentive 7 days ago. No gross hematuria or abdominal pain was presented. Physical examination found a palpable mass in the suprapubic region, accompanied by tenderness. Genitourinary examination revealed penis and testicles were normal, and no palpable mass was found. On rectal examination, a large, firm and movable mass was touched in the pelvic. Except for a moderate hematuria showed in urine routine test, three or more mixed bacteria were growing showed in urine culture. Other laboratory examinations, including a complete blood count, biochemical tests, liver and renal function test results, and the level of prostate-specific antigen (PSA, 0.31 ng/mL), were both within the normal range.

Urinary tract ultrasonography revealed a mass with mixed ingredients in the pelvic, and a right renal atrophy since there's a hyperechoic area in the right kidney area. Computed tomography (CT) of the upper abdomen demonstrated congenital solitary kidney (right renal agenesis)(Fig.1). A huge mass with mixed-signal in the prostate area was displayed in both CT and conventional magnetic resonance imaging(MRI), measuring 9.8cm×9.9cm×12.3cm, with numerous cystic components in it, and there is a cystic lesion showed in the right seminal vesicle region. After intravenous administration of gadolinium (Gd-DTPA), the tumor showed heterogeneous

enhancement, while no enhancement was performed on the cystic part (Fig.2). A diagnosis of seminal vesicle cyst was confirmed because there was no enhancement showed on the cystic in the right seminal vesicle region. In addition, there was no evidence of metastasis in any organ.

Depending on all the clinical and imaging information above, a preoperative diagnosis of prostate sarcoma was made. Subsequently, the patient received transurethral resection of the prostate tumor. The total tissue of prostate tumor was removed. Grossly, the surgical specimen was a well-defined encapsulated mass, with the characteristic of cystic and solid areas, located in the prostate. The cyst contained brown yellow material.

Microscopic finding (Fig.3) and immunohistochemical examination concluded that this mass represented primary clear cell carcinoma of the prostate.

After six months of follow-up, the patient is doing well with no evidence of distant metastasis and local recurrence.

EPO-1092

膀胱低度恶性潜能乳头状尿路上皮肿瘤 CT 影像表现

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目的 分析膀胱低度恶性潜能乳头状尿路上皮肿瘤(Bladder papillary urothelial neoplasm of low malignant potential，PUNLMP)的 CT 表现，提高术前诊断正确率。**方法** 回顾性分析 11 例经病理证实的 PUNLMP 的 CT 表现，病灶的发病年龄、性别，发生部位、边界、大小、形态、密度、强化特征及伴随征象。**结果** 男性 8 名，女性 3 名，年龄 22-73 岁，平均年龄约 52.5 岁，其中 10 例为无痛性间歇性肉眼血尿就诊，1 例为左腰痛就诊，11 例病例中均行泌尿系 CT 平扫及增强扫描+三维重建，观察病灶发生部位为 6 例位于左后壁，3 例位于右后壁，2 例位于膀胱颈口，边界清楚，形态呈结节状、乳头状或带蒂条状，病灶长径范围约 0.5-3.0cm，1 例表面见点状钙化，内部密度均匀，余 10 例呈均匀软组织密度影，强化特征呈中度强化、渐进性强化，术前 3 例考虑膀胱癌，3 例考虑尿路上皮瘤，3 例考虑肿瘤性病变，2 例考虑炎性病变。**结论** 了解低度恶性潜能乳头状尿路上皮肿瘤的 CT 表现，有助于提高诊断的正确率，尝试与膀胱癌鉴别，最后确诊依然需要病理。

EPO-1093

CT 在获得性肾囊肿中的应用价值

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目的 通过 CT 对肾衰长期血液透析患者获得性囊肿的检查，了解该病的发生及 CT 表现特点。**方法** 回顾分析 2016 年至 2018 年间共计 29 例肾衰长期血液透析患者获得性肾囊肿的 CT 影像特点及临床相关资料，进行对照研究。**结果** 78 例肾衰长期血液透析患者中有 29 例发生获得性囊肿（约 37%），通过 CT 明确囊肿的形成及囊肿大小，直径从 5mm—30mm 不等；获得性囊肿的形成与透析时间的长短有一定的正相关，透析时间越长，获得性囊肿越容易发生，CT 的检出率越高。 **结论** 肾

衰长期血液透析患者随透析时间的延长而容易发生获得性囊肿，CT 可有效进行检出并测量囊肿大小、数量及观察囊肿对邻近肾实质压迫情况，以对临床提出相关的诊断及处理依据。

EPO-1094
扩散加权成像“尺蠖征”的缺失和形态异常预测膀胱癌肌层浸润的诊断价值

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目的：探讨扩散加权成像(DWI)上“尺蠖征”的缺失和形态异常对膀胱癌肌层浸润的诊断性能。

方法：本研究回顾性纳入经病理证实的膀胱尿路上皮癌 136 例患者，共 209 个病灶，每例患者术前均接受了 3.0T(飞利浦)MRI 检查，包括平扫、 动态增强和 DWI (b0，1000)成像。两位放射科医生对影像进行了独立评估，并通过达成共识解决争议。DWI 序列观察指标为“尺蠖 征”的缺失和形态扭曲。平扫观察指标包括膀胱癌非乳头型、膀胱壁扩张受限、膀胱周围脂肪浸润。动脉增强观察指标为肌层早期出现强化。用皮尔森卡方检验对观察结果与组织病理学进行比较，计算各项特征的诊断性能。

结果：常规平扫、动态增强以及扩散加权成像(DWI),不同序列的特征指标对判膀胱癌肌层浸润均有统计学意义(P<0.01)。ROC 曲线分析显示，病灶大小与“尺蠖征”的存在呈正相关（p 值<0.001），预测“尺蠖征”存在的截断值为 1.2cm，小于 1.2cm 的病灶绝大部分无“尺蠖征”。扩散加权成像(DWI)上“尺蠖征”的缺失和形态扭曲判断膀胱癌肌层浸润的敏感性最高(88.5%)，特异性亦最高(91.4%)。非乳头型、膀胱壁扩张受限、膀胱周围脂肪浸润和肌层早期出现强化等指标判断肌层浸润的敏感性(分别为 61.7%、56.7%、68.3%和 52.6%)和特异性(分别为 65.5%、62.2、71.7%和 56.7%)均较低。

结论：扩散加权成像(DWI)上“尺蠖征”的缺失和形态异常对预测膀胱肌层浸润有较好的诊断性能。

EPO-1095
探讨体素非相干运动（IVIM）扩散加权成像（DWI）联合常规 MRI 在宫颈癌放化疗效监测中的价值

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目的：探讨体素非相干运动（IVIM）扩散加权成像（DWI）联合常规 MRI 在宫颈癌放化疗效监测中的价值。

方法：对 62 例 接受同步放化疗的宫颈癌患者于治疗前、治疗后 1 个月 分别行盆腔 MRI 常规序列，盆腔 MRI 常规 T1WI、T2WI、轴位 DWI（B 值为 0s/mm^2,800s/mm^2）及 IVIM 序列（b 值为 0s/mm^2,50s/mm^2,100s/mm^2,150s/mm^2,200s/mm^2,300s/mm^2,400s/mm^2,600s/mm^2,800s/mm^2,1000s/mm^2）扫描,测量各扫描时间点肿瘤最大面积及相关参数,并分析其动态变化及相关性。

结果：对两组的 IVIM 参数进行定量分析比较，结果放化疗前的平均 d 值和 f 值明显低于放疗后（P<0.05）；常规 MRI/IVIM-DWI 组合对宫颈癌放化疗后检测的敏感性和准确性明显高于常规 MRI。
结论：体素非相干运动（IVIM）扩散加权成像（DWI）联合常规 MRI 对宫颈癌治疗前、后 IVIM 参数值改变对评价治疗效果具有重要作用。

EPO-1096

The Diagnostic Evaluation of PI-RADS V2 based on Simplified Biparametric MRI for Clinically Significant Prostate Cancer

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Synopsis
This study compare the performance of the PI-RADS scores obtained by using biparameter MRI (T2W and diffusion) and multi-parameter MRI (T1W, T2W, diffusion and DCE) for clinically significant PCa, respectively. The results show that the PI-RADS score acquired from biparameter MRI is comparable with that from the traditional multi-parameter MRI.

Propose This study compare the performance of the PI-RADS scores obtained by using biparameter MRI (bpMRI, including T2W and diffusion) and multi-parameter MRI (mpMRI including T1W, T2W, diffusion and DCE) for clinically significant PCa, respectively. In addition, the consistency of bpMRI based PI-RADS score was also investigated among different radiologists.

Materials and Methods MpMRI was performed for 333 patients with suspicious lesions on a 3T MR scanner (MAGNETOM Skyra, Siemens Healthcare, Erlangen, Germany) including high-spatial-resolution structural imaging in several planes, diffusion-weighted imaging and DCE MR imaging. For bpMRI, two radiologists (9 years and 4 years prostate MRI reading experience, respectively) scored only the cross-sectional T2W image and DWI for all cases in strict accordance with the PI-RADS V2 scoring standard without knowing the patient's clinical data and pathology results. Then, Standard PI-RADS V2 scores for all mpMRI was performed after two weeks by the same readers. Interobserver agreement of all PI-RADS V2 scores of two radiologists was investigated. All cases were scored by the author based on mpMRI-based PI-RADS V2 before biopsy. The patients with suspicious tumors PI-RADS V2 assessment category of≥3 were selected for MRI-TRUS targeted biopsy within two weeks after MRI. The other patients with PI-RADS V2 assessment category of 1and 2 were selected for TRUS biopsy. The receiver operating characteristic curves were obtained by PI-RADS V2 scores based on bpMRI and mpMRI sequences, respectively, to record the AUC, accuracy, sensitivity, specificity, positive predictive value and negative predictive value. The diagnostic efficacy of bpMRI and mpMRI for prostate disease was evaluated by MRI-TRUS targeted biopsy and TRUS biopsy.

Results A cohort of 333 patients was performed including 162 PCa (including 150 clinically significant and 12 non-clinically significant PCa) and 171 non-PCa. bpMRI detected PCa in 131 patients and clinically significant PCa in 126 patients; mpMRI detected PCa in 138 patients and clinically significant PCa in 127 patients; Interobserver agreement of bpMRI and the mpMRI of two radiologists was substantial (k = 0.678 and 0.660). The AUC of PI-RADS V2 score based on bpMRI and mpMRI for the diagnosis of benign and malignant prostate lesions was 0.869 and 0.889, respectively, and the difference was not statistically significant (P=0.0638). The accuracy of bpMRI in the diagnosis of benign and malignant prostate diseases is 81.68% (272/333), the sensitivity is 80.86% (131/162), the specificity is 82.46% (141/171), the positive predictive value is 81.37 % (131/161), and the negative predictive value is 81.98 % (141/172). The accuracy of mpMRI score in the diagnosis of benign and malignant prostate lesions was 84.98% (283/333), the sensitivity was 85.18% (138/162), the specificity was 84.80% (145/171), the positive predictive value was 84.15% (138/164) and the predicted value is 85.8% (145/169). The AUC of PI-RADS V2 score based on bpMRI and mpMRI for the diagnosis of clinically significant prostate cancer was 0.879 and 0.890, respectively, and the difference was not statistically significant (P=0.1685). The diagnostic accuracy of bpMRI for clinically significant prostate cancer was 84.38% (281/333), the sensitivity was 92.42%(122/132), the specificity was 79.10%(159/201), the positive predictive value was 74.39%(122/164), and the negative predictive value was 94.08%(159/169); The diagnostic accuracy of mpMRI was 85.59%(285/333), the sensitivity was 93.94% (124/132), the specificity was 80.10% (161/201), the positive predictive value was 75.61% (124/164), and the negative predictive value was 95.27%(161/169).

Conclusion BpMRI can effectively detect clinical significant prostate cancer; the diagnosis performance of bpMRI is similar to that of mpMRI for detecting prostate cancer. As a result, using bpMRI method can significantly shorten the acquisition and interpretation time and avoid the potential risk of DCE injection of contrast agent.

EPO-1097

Semi-quantitative dynamic contrast-enhanced MR imaging in predicting prognosis of cervical cancer patients undergone concurrent chemo-radiotherapy

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Abstract

Objective: To investigate the role of semi-quantitative dynamic contrast-enhanced (DCE) magnetic resonance (MR) imaging (DCE-MRI) in predicting the long-term prognosis of patients with advanced cervical cancers undergone concurrent chemo-radiotherapy (CCRT).

Methods and Materials: Thirty-eight patients (48.8 ± 11.7 years old) with advanced cervical cancers underwent DCE-MRI before CCRT, 2 and 4 weeks after CCRT. Semi-quantitative DCE-MRI parameters were measured and compared between patients with well and poor long-term prognosis.

Results: Patients with well long-term prognosis had significantly higher wash-in rate of tumor at time point 3 (95.26 ± 25.55 L/s) and change rate from time point 1 to 3 (42.30 ± 72.48 %) compared with those with poor prognosis (46.94 ± 26.62L/s, 16.93 ± 22.09 %, $p < 0.000$, =0.001). Wash-in rate of tumor at time point 3 could predict a well long-term prognosis with an AUC of 0.910.
Conclusion: Semi-quantitative DCE-MRI parameters hold potential in predicting long-term prognosis of patients with advanced cervical cancers treated with CCRT.

EPO-1098
T1 和 T2 加权成像全域直方图分析的联合诊断在鉴别肾上腺腺瘤和嗜铬细胞瘤的价值

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目的：因为治疗和预后有显著差异，肾上腺腺瘤和嗜铬细胞瘤之间需要准确的鉴别。本研究的目的是探讨 T1 和 T2 加权成像全域直方图分析的联合诊断在嗜铬细胞瘤和肾上腺腺瘤的可行性。
材料与方法：回顾性评价 7 年来的病理数据库，获得 40 例经组织病理证实的肾上腺腺瘤和 12 例嗜铬细胞瘤。用 Mazda 软件对各患者的 T1 和 T2 加权成像图像进行分析。选择 9 个参数作为比较指标，分别为方差、偏态、峰度、均值、1 分位数、10 分位数、50 分位数、90 分位数和 99 分位数。采用具有鉴别诊断意义的参数构成新的联合诊断预测因子。计算并比较各个指标的诊断效能。
结果：在用直方图分析提取的 9 个参数中，T1 加权成像的 1 分位数、10 分位数以及 T2 加权成像的偏斜度具有统计学意义。T1 加权成像的 1 分位数和 10 分位数的曲线下面积分别为 0.776 和 0.700。1 分位数和 10 分位数区分嗜铬细胞瘤与腺瘤的最佳鉴别值分别为 49.57 和 60.9（特异性均为 75%，敏感性均为 75%）。T2 加权成像偏态的曲线下面积为 0.760，最佳鉴别值为 0.51（特异性 72.5%，敏感性 75%）。联合预测因子的曲线下面积为 0.840，最佳鉴别值为 38.01（特异性 72.5%，敏感性 83.3%）。
结论：T1 和 T2 加权成像的全域直方图分析有助于肾上腺腺瘤与嗜铬细胞瘤的鉴别。此外，T1 和 T2 加权成像直方图的联合诊断比单个直方图分析更有效。

EPO-1099
基于弥散加权成像的放射组学分析对于散布型与致密型前列腺癌的诊断研究

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目的：探究基于弥散加权成像（diffusion weighted imaging, DWI)的放射组学分析对于散布型与致密型前列腺癌的诊断效果
方法：61 例穿刺行 DWI 检查并行前列腺癌根治术的前列腺癌患者，根据病理结果在整体病理切片上区分和选取散布型与致密型前列腺癌。依据切片上的病变位置和大小，在 ADC 图上绘制感兴趣区并应用组学分析软件提取图像纹理特征，同时选取部分正常组织作为对照。选取一半病例作为建模组，应用 Spearman 相关系数以 0.95 为阈值去除高相关性特征，再使用 L1 正则化逻辑回归方法进行特征选择，分别筛选可鉴别散布型前列腺癌与非癌组织、致密型前列腺癌与非癌组织的参数，建

立诊断模型。将诊断模型应用于另一半病例（测试组），评估诊断效能，应用受试者工作特征(Receiver Operating Characteristic，ROC)曲线与常规 ADC 值进行比较。
结果：共计纳入 86 处致密型前列腺癌、64 处散布型前列腺癌、110 处正常外周带组织作为样本，测量 396 种特征。建模组致密型前列腺癌与非癌组织有意义的参数特征有 32 项，模型鉴别测试组的 ROC 曲线下面积（Area Under ROC Curve，AUC）值为 0.91，与常规 ADC 值结果（0.90）接近（P>0.05）。建模组散布型前列腺癌与非癌组织有意义的参数特征有 11 项，模型鉴别测试组的 AUC 值为 0.82，高于常规 ADC 值结果（0.76）（P<0.05).
结论：基于 DWI 的放射组学分析可应用于散布型前列腺癌诊断的特征较少，但可提高散布型前列腺癌诊断效果，对致密型前列腺癌的诊断效果与常规 DWI 相近。

EPO-1100

Combined diagnosis of whole-lesion histogram analysis of T1- and T2-weighted imaging for differentiating adrenal adenoma and pheochromocytoma

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Background and purpose: Accurate differentiation between adrenal adenoma and pheochromocytoma is needed because treatment and prognosis differ significantly. This study is to determine whether a combined diagnosis of whole-lesion histogram analysis of T1- and T2-weight imaging can distinguish pheochromocytoma from adrenal adenoma.
Material and Methods: A pathology database was retrospectively appraised over a period of 7 years and we obtained 40 histopathologically proven adrenal adenomas and 12 pheochromocytomas with MR images. The T1- (T_1WI) and T2-weighted imaging (T_2WI) images of each patients were analyzed with Mazda software. Nine parameters were selected as indicators of comparison and they were variance, skewness, kurtosis, mean, 1^{st}percentile, 10^{th}percentile, 50^{th}percentile, 90^{th}percentile and 99^{th}percentile. The parameters with differential-diagnosis significance were used to form a combined predictor. Then the diagnostic efficiency of each index was calculated and compared.
Results: Among the nine parameters extracted using histogram analysis, the 1^{st}percentile and 10^{th}percentile of T_1WI and the skewness of T_2WI showed statistical significance. The AUC of 1^{st}percentile and 10^{th}percentile were 0.776 and 0.700, respectively. The optimum of 1^{st}percentile and 10^{th}percentile to distinguish pheochromocytomas from adenoma were 49.57 and 60.93 (both 75% specificity and 75% sensitivity). The AUC of skewness was 0.760 and the optimum of skewness was 0.51 (72.5% specificity and 75% sensitivity). The area under the curve (AUC) of the combined predictor showed higher value of 0.840 and the optimum of combined predictor was 38.01 (72.5% specificity and 83.3% sensitivity).
Conclusion: Histogram analysis of T_1WI and T_2WI may help differentiate adrenal adenomas from pheochromocytomas. Furthermore, the combined diagnosis of T_1WI and T_2WI histogram was more effective than either individual histogram.

EPO-1101

能谱 CT 碘水图纹理分析在肾透明细胞癌 WHO/ISUP 分级的应用

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目的：探讨能谱 CT 碘水图纹理分析在肾透明细胞癌 WHO/ISUP 分级的应用初探。
方法：回顾性分析 2018 年 5 月至 2019 年 6 月行 Revolution CT 泌尿系增强患者 150 例，其中经手术及病理后证实为肾透明细胞癌患者 120 例，根据 WHO/ISUP 病理分级分为高级别（WHO/ISUP 3、4 级）患者共 20 例，按照时间顺序选取低级别（WHO/ISUP 1、2 级）患者共 30 例。在能谱工作站中导出肿瘤最大层面及邻近层面动脉期碘水图（1.25mm 层厚/层间距）。将碘水图导入 3D Slicer 软件，勾画肿瘤全层面 ROI。使用 Radiomics 模块对 ROI 进行纹理分析，导出数据结果。使用独立样本 t 检验对两组纹理数据结果进行差异性检验，P<0.05 为差异有统计学意义。
结果：肾透明细胞癌动脉期碘水图纹理参数：偏度、10%分位数、IDN（GLCM）、Dependence Non Uniformity（GLDM）对肾透明细胞癌高低级别鉴别具有统计学差异（P<0.05）。其中高级别组偏度、IDN、Dependence Non Uniformity 平均值分别为 0.481、0.971、5832.49，高于低级别组 0.099、0.964、3117.36；高级别组 10%分位数平均值为 10.75，低于低级别组 19.67。
结论：通过纹理分析结合能谱 CT 碘水图可对肾透明细胞癌 WHO/ISUP 高低分级进行鉴别，为指导肾透明细胞癌治疗提供一定帮助。

EPO-1102

睾丸肿瘤影像诊断及误诊分析

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目的 提高对睾丸肿瘤 CT 或 MRI 影像特征的认识及鉴别诊断的准确性。方法回顾性分析我院及外院 2014 年 6 月至 2019 年 6 月经手术病理证实的睾丸肿瘤的 CT 或 MRI 影像资料，收集其临床资料（包括临床症状及肿瘤指标等），将睾丸肿物的病理诊断类型、肿瘤标志物、临床症状与影像特征进行对照分析。结果 共收集睾丸肿物 69 例，其中睾丸肿瘤 57 例，睾丸肿瘤样病变 12 例（9 例附睾炎、2 例结核、1 例皮样囊肿）。睾丸肿瘤包括精原细胞瘤 32 例、混合型生殖细胞瘤 12 例、淋巴瘤 5 例、畸胎瘤 3 例、胚胎性癌 1 例、内胚窦瘤 1 例、间质瘤 1 例、平滑肌瘤 1 例、多形性未分化肉瘤 1 例。精原细胞瘤影像表现多样，可表变为轻中度强化均匀实性肿块、也可出现不同程度坏死、囊变、纤维化改变。均质低密度或 T2 低信号及纤维间隔样强化是精原细胞肿瘤的特征性表现。典型睾丸淋巴瘤形态规则、整体密度及信号较均匀，增强扫描较明显强化。炎性肿瘤样病变可表现边界不清的环形强化团块影，但往往有阴囊肿痛的临床症状。结论 睾丸肿瘤病理类型多样且具有明显的年龄分布及标志物特征。结合患者影像资料及临床起病症状、肿瘤指标有助于睾丸肿瘤及肿瘤样病变的鉴别诊断。

EPO-1103

Differential Diagnosis of Chromophobe cell renal carcinoma and Renaloncocytoma using quantitative iodine parameters determined by spectral CT.

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Objective To evaluate the value of single-source dual-energy CT quantitative iodine parameters in differential Chromophobe cell renal carcinoma (CCRC) and Renaloncocytoma (RO). **Methods** The present study retrospectively enrolled 37 patients underwent spectral CT scan from January 2013 to January 2019,who were pathologically or follow-up imaging confirmed as CRCC or RO, including 17 CRCCs and 20 ROs, respectively.All cases underwent abdominal contrast enhanced spectral CT scan before operation. The iodine (water) concentrations (IC) in the lesions that marked as ROI_T (ROI of tumor), and the iodine (water) concentrations that marked as ROIA in the abdominal aorta communis of the three phases CT enhanced scan were measured, and the normalized iodine (water) concentrations (NIC, NIC = ROI_T/ ROI_A) value was calculated on a GSI comprehensive analysis platform by two observers. The intra-class correlation coefficients (ICC) was used to check the consistency of the data measured by the two observers. The above parameters between the two groups were compared by t-test.The receiver operating characteristic curve (ROC) was used to analyze the diagnostic performance. **Results** The consistency of the data obtained by the two observers were good (ICC value > 0. 9). The normalized iodine (water) concentration ratio in group RO were significantly higher than those in group CCRC in the cortical phase (P＜0.05). Using 0.33 as a threshold, one obtained an area-under-curve (AUC) for ROC study of 0.903 with sensitivity of 80.0% and specificity of 94.1% for differentiating Chromophobe cell renal carcinoma and Renaloncocytoma. In medullary and excretion phase, there was no difference for parameters between the two groups (P>0.05). **Conclusion** The normalized iodine concentration in cortical phase of single-source dual-energy CT could quantitatively differentiat Chromophobe cell renal carcinoma and Renaloncocytoma, which has certain application value.

EPO-1104
钆喷酸葡胺对肾功能轻度异常者齿状核 T1 信号的影响

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目的 探讨钆喷酸葡胺对比对肾功能轻度异常者磁共振平扫齿状核 T1 高信号的影响。 **方法** 回顾性分析 59 例我院进行三次或以上 MR 增强扫描病例的临床及影像资料，测量右侧小脑齿状核及右侧额叶白质平均信号强度。以右侧额叶白质的信号强度作为基数，计算小脑齿状核的信号强度比。首末两次磁共振检查小脑齿状核与额叶白质的信号比值（I_0，I_1）比较采用配对 t 检验；使用独立 t 检验分析肾功能与小脑齿状核-额叶白质信号比值差值（ΔI）的关系；采用 Spearman 检验分析信号强度比值差值与磁共振增强检查次数的相关性。多重线性回归分析方法分析信号强度比值差值与年龄、性别及增强检查次数的关系。 **结果** 在肾功能正常组，I_0为 0.892±0.098， I_1为 0.951±0.106；肾功能轻度异常组中，I_0为 0.845±0.101，I_1为 0.949±0.121。两组 I_1均高于 I_0（P＜0.01）。肾功能正常组 ΔI 为 0.059±0.048，肾功能轻度异常组为 0.103±0.078，后者较前者大（P＜0.05）。在所有患者中， ΔI 与 MR 增强扫描次数存在正相关（r=0.794，P＜0.05）。进一步的多重线性回归分析显示，MR 增强扫描的次数与首末次信号差值 ΔI 有统计学差异，每增加一次增强扫描次数， ΔI 增加 0.764，而年龄、性别与首末次信号值差值 ΔI 无明显统计学差异。 **结论** 在多次使用钆喷酸葡胺（Gd-DTPA）进行 MR 增强扫描后，颅内小脑齿状核平扫 T1WI 出现高信

号，与增强扫描次数成正相关，且随着次数增加，信号强度增高；肾功能轻度异常组小脑齿状核 T1 加权图像的信号强度增高，信号差值较肾功能正常组大，且两组信号差值具有统计学差异。

EPO-1105
非对比剂磁共振功能成像在评价狼疮性肾炎中的价值

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目的：研究非对比剂 MRI 功能成像参数与狼疮肾炎肾功能和肾脏疾病活动的标准测量值的相关性。
方法：收集本院经活检确诊狼疮性肾炎（LN）的患者以及健康志愿者（HV）各 30 名，将受试者分为对照组(志愿者)、早期（CKD1、2 期）、中晚期（CKD3、4、5 期）三组,对其进行多模态肾脏 MRI 检查，包括动脉自旋标记（ASL）测量肾血流灌注（RBF），及弥散峰度成像（DKI）测量双肾皮质及髓质的表观扩散系数(ADC)及各向异性(FA)。在整个研究人群中将 MRI 测量结果与尿蛋白/肌酸酐比率（uPCR）和计算的肾小球滤过率（eGFR）进行比较，然后探索各组之间的成像测量值的差异。
结果：47 名受试者（17LN，30HV）完成了该研究。正常对照组双肾肾皮质 RBF 值差异无统计学意义(t=0.830，P > 0.05)；LN 患者双肾皮质 RBF 值差异无统计学意义(t=1.210，P > 0.05)；对照组与 LN 早、中晚期病例组肾皮质 RBF 值有显著性差异(F=15.360，P＜0.05)，且肾皮质 RBF 值随肾损程度加重逐渐减低；对照组与早期组肾皮质 RBF 值差异无统计学意义(P > 0.05)；对照组与中晚期组肾皮质 RBF 值差异有统计学意义(P＜0.05)；早期组与中晚期组肾皮质 RBF 值间差异有统计学意义(P＜0.05)；eGFR 与髓质中 DKI 的表观弥散系数测量值显著相关（r=0.47，p < 0.05）。uPCR 与皮质中的分数各向异性（FA）DTI 测量相关（r=-0.71，p<0.001）。在 LN 受试者中发现延迟的血液流向髓质，并且在皮质中存在降低的 FA 值的趋势，表明微结构破坏（分别为 p=0.04 和 p=0.08）。
结论:该初步研究表明，非对比性肾脏 MRI 功能成像参数与系统性红斑狼疮的疾病活动的标准测量具有相关性。这些非侵入性的定量测量参数的潜在效用值得进一步研究，以作为狼疮性肾炎疾病活动的可靠生物标志物。

EPO-1106
多参数 MR 在肾脏小肿瘤诊断与鉴别诊断中的价值

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目的：探讨肾脏小肿瘤(直径＜4 cm) 的 MR 特征，鉴别小肿瘤的良恶性及肾细胞癌的不同亚型。
方法：回顾性分析经手术病理证实的 61 例肾脏小肿瘤患者的 MR 及临床资料。所有病例均行 MR 平扫、DWI 扫描。结果：61 例中恶性肿瘤 50 例，透明细胞癌 34 例中 4 例出现出血，3 例伴有囊变，11 例有假包膜；乳头状细胞癌 9 例，1 例伴有出血，4 例出现假包膜；1 例低度恶性潜能多房囊性肾肿瘤伴有小灶钙化。嫌色细胞癌 4 例，出现假包膜 3 例。血管平滑肌脂肪瘤 6 例，T2WI 均为低信号，T1 反相位肿瘤部分信号较同相位减低。嗜酸细胞腺瘤 2 例，均未见包膜。结论：多参数 MR 有助于肾脏小肿瘤的良恶性及肾细胞癌不同亚型的诊断及鉴别诊断。

EPO-1107

基于 CT 图像的纹理分析：体外冲击波碎石术后不同疗效组间的特征对比及分析

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目的 体外冲击波碎石术（Extracorporeal shock wave lithotripsy，ESWL）后不同疗效组间的定量 CT 纹理特征对比及分析。**方法** 回顾性分析 82 例进行 ESWL 碎石的患者的临床资料及 CT 平扫图像，男性 63 例，女性 19 例，评估性别、年龄、结石位置、体重指数（Body Mass Index，BMI）、结石最大长径及最大横径、45° 结石距体表距离（Skin-to-stone Distance，SSD）、平均 CT 密度值及纹理参数平均灰度值、标准差、偏度、峰度、熵、异质性对碎石结果的影响，依据治疗后残余结石是否＜4mm 将患者分为碎石成功组及失败组，并对比两组间各纹理参数的特征，及不同参数组合判断碎石结果的效能。**结果** 碎石成功组与碎石失败组的平均 CT 密度值（699.47±176.32，848.48±191.69，t=-3.495，*P*＜0.01）、CT 纹理参数平均灰度值（1723.47±176.32，1872.48±191.69，t=-3.495，*P*＜0.01）、峰度（-0.82±0.34，-1.07±0.28，t=3.400，*P*＜0.01）及熵（4.26±0.87，4.76±0.44，t=-2.809，*P*＜0.01）的差异具有统计学意义，平均灰度值、峰度以及参数组合平均灰度值+标准差、平均灰度值+熵、平均灰度值+标准差+熵、偏度+峰度、峰度+异质性、偏度+峰度+异质性的组合判断碎石结果的效能良好（0.7＜AUC＜0.9），余各纹理参数的 AUC 均在 0.5—0.7 之间，预测碎石结果的诊断效能一般。**结论** 纹理分析定量参数或利用不同参数的组合有助于预测 ESWL 术后碎石的效果。

EPO-1108
扩散峰度成像术前评估Ⅰ期子宫内膜癌脉管侵犯的价值

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子宫内膜癌是女性生殖系统常见的恶性肿瘤之一。目前公认基本的手术范围是子宫切除和双侧输卵管卵巢的切除。淋巴结切除术并不能提高子宫内膜癌患者的生存率反而引起一系列手术并发症。因此，早期子宫内膜癌患者是否进行淋巴结切除存在争议[1,2]。脉管侵犯与淋巴结转移密切相关。脉管侵犯是子宫内膜癌患者淋巴结转移重要的预测因子[3]，但传统的 MRI 成像方法无法评估脉管侵犯情况。

EPO-1109
乳头状肾细胞癌的 CT 表现及鉴别诊断

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目的 分析探讨乳头状肾细胞癌的 CT 表现，提高对于本病的诊断认识。**资料与方法** 回顾性分析 27 例经手术病理证实为乳头状肾细胞癌的 CT 特点，分析肿瘤部位、形态、大小、有无包膜、边界（瘤肾交界）、平扫肿块密度（与对侧正常肾实质密度比较）、肿块密度的均匀性（有无囊变、坏死、钙化、出血）、乳头结节、动态增强扫描后强化均匀度、强化方式和强化程度、有无肾周浸润、淋巴结肿大及远处转移。**结果** 27 例均为单发肿块，8 例位于肾皮质，19 例位于肾实质，肿

瘤呈圆形或类圆形 18 例，9 例为不规则形、分叶状。肿瘤有假包膜 16 例，无包膜 11 例，瘤肾交界清楚 21 例，不清楚 6 例。CT 平扫 16 例实性部分密度稍高于正常肾皮质和肾髓质,8 例呈稍低密度，3 例呈等密度；肿块密度均匀 5 例，不均匀 22 例，其中见斑片状、大片状囊变、坏死 9 例。动态增强扫描，皮质期 PRCC 肿瘤强化程度呈轻度强化 23 例，中度强化 4 例，皮质期，PRCC 强化程度均低于肾皮质强化程度，实质期，PRCC 强化程度低于肾实质强化程度 26 例，等高于肾实质强化程度 1 例，肾盂期及所扫描 12 例排泄期肿瘤均低于肾实质强化程度。强化方式：26 例呈轻度持续性强化，1 例表现为升-降型。**结论** 乳头状肾细胞癌 CT 表现具有一定特征性，平扫实质部分多为等、稍高密度，动态增强扫描呈轻度持续强化，可见乳头状结节的显示，均有助于本病与其他肾癌的鉴别诊断。

EPO-1110

Non-enhanced contrast MRI for assessment of uterine fibroids' early response to ultrasound-guided high-intensity focused ultrasound thermal ablation

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Purpose: To examine non-enhanced contrast MRI value to evaluate necrotic area and ablation rate of uterine fibroids after high-intensity focused ultrasound (HIFU) thermal ablation.

Method: In total, 508 patients with 598 fibroids who underwent HIFU treatment were enrolled (3.0T pelvic conventional MRI before treatment and within two days post-treatment). Diffusion-weighted imaging (DWI) signal performance of post-operative fibroids was observed; apparent diffusion coefficient (ADC) and DWI signal values pre- and post-operation were measured. The volume of pre-operative T2-weighted imaging (T2WI) sequence fibroids, post-operative DWI signal change area and enhanced fibroid necrosis area were compared.

Results: Average ADC and DWI signal values before HIFU treatment were higher than those post-operation; the difference was statistically significant before and after ablation ($P < 0.05$). There was no correlation between ADC and DWI signal values before ablation ($p > 0.05$), but there was a significant correlation after ablation ($P < 0.05$). After HIFU, 78.09% (467 / 598) of DWI showed complete regular or irregular high-signal rings and 21.91% (131 / 598) showed incomplete high-signal rings. No significant difference was noted between the complete high-signal ring volume on DWI and the non-enhanced volume ($P > 0.05$); however, this difference was statistically significant compared with the incomplete high-signal ring volume on DWI ($P < 0.05$). Two doctors had good agreements on evaluating the morphology of high-signal rings ($\kappa > 0.75$, $P < 0.05$).

Conclusions: Combined with pre-operative T2WI and post-operative DWI, non-enhanced contrast MRI can effectively evaluate ablation rate for most patients with uterine fibroids.

EPO-1111

扩散加权成像对 I 型与 II 型子宫内膜癌的鉴别诊断价值

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目的
探讨扩散加权成像对 I 型与 II 型子宫内膜癌的鉴别诊断价值。
材料与方法
搜集 2017 年 1 月至 2019 年 6 月大连医科大学附属第一医院行 DWI 检查并经手术病理证实的 I 型（15 例）与 II 型（15 例）子宫内膜癌患者 30 例。图 1 和图 2 显示 I 型子宫内膜癌组和 II 型子宫内膜癌组病灶情况。在 ADC 图上测量表观扩散系数（ADC）值。采用两独立样本 t 检验比较 I 型子宫内膜癌组和 II 型子宫内膜癌组 ADC 值的差异。
结果
I 型子宫内膜癌组 ADC 值高于 II 型子宫内膜癌组，两组间差异有统计学意义（$p<0.05$），如表 1 所示。ADC 值鉴别 I 型与 II 型子宫内膜癌的 ROC 曲线下面积为 0.778，如图 3 所示。
结论
DWI 可作为评价子宫内膜癌组织学分型的重要检查方法，ADC 值有助于鉴别 I 型与 II 型子宫内膜癌。

EPO-1112

卵巢透明细胞癌的 CT 影像特征

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【摘要】 目的 探讨卵巢透明细胞癌的 CT 影像特征。材料与方法 由两名有经验的放射医师回顾经手术病理证实的 11 例（37-66 岁，平均 52.3 岁）卵巢透明细胞癌的影像资料。总结影像特征：位置、大小、边缘，囊实性、囊性部分 CT 值、实性部分 CT 值和强化程度，腹水、腹膜转移和淋巴结转移情况。结果 10 例为单侧发生，双侧 1 例。9 例表现为囊实混合性肿物；2 例为实性肿物。最长径 10.5～22.5cm，平均值 16.1cm。囊实混合性囊性部分 CT 值 11-55HU，平均值 18.2HU，肿块内均可见不规则乳头状结节或团块样实性成分，实性部分 CT 值 34-49HU；增强动脉期 CT 值约 46-57HU，静脉期 CT 值 56-66HU。2 例为实性肿物 CT 值 39 和 46HU。5 例伴有腹水，3 例腹膜不规则絮状或结节状增厚，未见淋巴结肿大。结论 卵巢透明细胞癌的 CT 表现为:巨大囊实混合性或实性肿物，多为单发，肿物内含有较高密度液性成分，乳头状突起和分隔结构，轻中度强化。

EPO-1113

Histogram analysis in prostate cancer: a comparison of diffusion kurtosis imaging versus monexponential model

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Purpose

To verify the utility of diffusion kurtosis imaging (DKI) histogram analysis indetection and assessment of aggressiveness of prostate cancer, compared with histogram analysis of monexponential model (MEM).

Methods

Twenty-three patients were enrolled in this study. The scan protocol included single-shot echo-planar imaging DW sequence (diffusion direction number = 3; b values = 0, 20, 50, 100, 200, 500, 1000, 1500, 2000 s/mm^2); transverseT1W turbo spin-echo sequence; transverse, coronal, and sagittal T2W turbo spin-echo sequence. For DKI, the D_{app} and K_{app} is obtained using all b values. For MEM, the ADC is obtained using two b values (b = 50, 1500 s/mm^2). The pathologies were confirmed by subsequent in-bore MR-guided biopsy, totally including 16 prostate cancer (5 in peripheral zone, 11 in transition zone) and 17 noncancerous foci (2 in peripheral zone, 15 in transition zone). ROIs were drawn manually right in the position where biopsy needle was put, and images of b0 were used as a reference. The values of mean ADC, mean D_{app}, mean K_{app} and their histogram parameters in cancer and noncancerous foci were compared using independent-samples T test. Receiver operating characteristics (ROC) curves and binary logistics regression model were used to test the diagnostic efficiency of DKI and MEM. The Spearman test was used to evaluate the correlation of these parameters and Gleason scores of prostate cancer.

Results

The mean,10th, 25th, 50th, 75th, 90th percentiles of ADC and D_{app} were significantly lower in prostate cancer than noncancerous foci (p < 0.001). The mean, 50th, 75th, 90th percentiles of K_{app} were significantly higher in prostate cancer than noncancerous foci (p < 0.05). The ADC_{10th} decreased (ρ = -0.583, p = 0.018) with the Gleason scores increasing. The K_{90th} increased (ρ = 0.642, p = 0.007) with the Gleason scores increasing. There is no significant difference between the AUCs of ADC and DKI histogram analysis (0.971 vs 0.963, p > 0.05).

Conclusion

Histogram analysis of DKI is feasible for detection and assessment of aggressiveness of prostate cancer, but it has no significant advantage over MEM.

EPO-1114

卵巢甲状腺肿的 CT 影像学特点分析

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目的 分析卵巢甲状腺肿的 CT 影像学特点，提高对本病的认识。**方法** 回顾性对 5 例经手术病理证实的卵巢甲状腺肿 CT 资料进行分析。**结果** 5 例卵巢甲状腺肿均为单侧附件囊实性肿块，边界清楚，椭圆形或分叶状，直径 4.5cm-24.5cm。3 例囊性为主，2 例实性为主，实性部分密度较高，囊间密度多变，CT 值 20-87HU，4 例见高密度囊腔。增强扫描实性部分明显强化。5 例病灶内均见点条状、蛋壳样钙化。**结论** 单发、边界清楚的囊实性肿块，囊间密度多变，高密度囊腔，实性部分、囊壁及分隔内点条状、弧形钙化，增强扫描实性部分显著强化是卵巢甲状腺肿的 CT 特征性表现。

EPO-1115

MSCTA 评价右侧正常及肾癌状态下肾静脉及肿瘤肾外引流静脉的研究

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目的：从临床手术需求角度出发，利用 MSCTA 观察正常肾脏及透明细胞癌状态下右肾静脉的形态，对其进行分类，并总结肿瘤肾外引流静脉的特点。
方法：对行腹部平扫及增强扫描的 100 例无肾脏疾病患者及 61 例右肾透明细胞癌患者的原始数据进行后处理，利用 MPR、MIP 观察右肾静脉支数、位置及肿瘤肾外引流静脉。
结果：1.在 100 例正常组中，单支右肾静脉 71 例，其中右肾静脉延迟汇合 23 例；多支右肾静脉 29 例，其中，2 支右肾静脉 26 例,3 支右肾静脉 3 例。
在 61 例肿瘤组中，单支右肾静脉 47 例,其中右肾静脉延迟汇合 17 例；多支右肾静脉 14 例，其中，2 支右肾静脉 13 例，3 支右肾静脉 1 例。
2. 在正常组 132 支右肾静脉中，113 支汇入下腔静脉侧壁（85.6%），19 支汇入后壁（14.4%），其中在汇入后壁者，单支肾静脉占 17.6%（3/17），多支肾静脉占 82.4%（14/17）。
在肿瘤组 76 支右肾静脉中，59 支汇入下腔静脉侧壁（77.6%），16 支汇入后壁（21.1%），1 支汇入前壁（1.3%），其中在汇入后壁者，单支肾静脉占 40%（6/15），多支肾静脉占(60%)（9/15）。
3.61 例肿瘤组中，18 例肿瘤存在肾外引流静脉，其中 13 支引流入右侧生殖静脉，5 支直接汇入下腔静脉，4 支引流入右侧肾上腺静脉。
肿瘤组中，肿瘤突破包膜与未突破包膜者相比，肾外引流静脉的差异有统计学意义（x^2=36.334，P＜0.001），肿瘤体积大于 4cm 与小于 4cm 者相比，肾外引流静脉的差异有统计学意义（x^2=8.319，P=0.004＜0.05）。
结论： 虽然，右肾静脉汇入下腔静脉后壁、多支肾静脉以及肿瘤肾外引流静脉不常见，但在腹腔镜手术中不容忽视，通过 MSCT 血管造影及其后处理技术，能够多方位、多角度的显示肾静脉解剖位置、走行、变异以及肿瘤肾外引流静脉，从而在术前为外科医生提供详尽、有用、全面的影像资料。

EPO-1116

Diagnostic value of multislice spiral computed tomography (CT) combined with CT angiography for intra-abdominal undescended testis secondary seminomas

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Abstract Objective: To discuss the diagnostic value of multislice spiral tomography (CT) combined with CT angiography (CTA) technology in intra-abdominal undescended testis secondary seminoma cases. Methods: We retrospectively analyzed the CT and CTA imaging features of CT and CTA findings of nine patients with an intra-abdominal undescended testis secondary seminoma. Results: The tumors in all nine patients were mainly solid, and the average CT value was 38.4±3.4 HU. Low-density areas of various

sizes were visible in the tumors, and calcifications were detected in two patients. The tumors in eight patients had a complete capsule, which pressed on the surrounding structures. In one patient, the tumor had an incomplete capsule, which invaded the surrounding structures. Some of the solid tumors showed progressive and slight enhancement on the CT-enhanced scans. The values in the arterial phase, venous phase, and delayed phase were 46.3±5.1 (40–55 HU), 57.3±7.3HU (48–68 HU), and 65.1±7.2HU (56–77 HU), respectively, with an average increase rate of 27.0±7.2 HU. No enhancement was found in low-density areas on the CTA scans, and the supply arteries of the tumors in the nine patients all originated from the abdominal aortic wall 2–3cm below the renal ostia. These arteries became thickened and tortuous when near the tumors, and there were no branching vessels. In eight patients, the supply arteries of the tumors originated from the posterior tumor and ended inside the tumor, and they originated from anterior of the tumor in one patient. Testicular venous drainage was detected in three patients, and lymph node metastasis in the abdominal aorta detected in two cases. Conclusion: An intra-abdominal undescended testis secondary seminoma exhibits a characteristic appearance on CT. CTA shows a three-dimensional testicular vascular pedicle sign of a seminoma. A combination of CT and CTA can improve the diagnostic accuracy of an intra-abdominal undescended testis secondary seminoma.

EPO-1117
肾上腺原发性皮质腺癌的 CT 与 MRI 表现及其病理基础

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目的：总结肾上腺原发性皮质腺癌（PACC）的 CT 与 MR 表现及其病理基础，并比较 CT 与 MR 在显示 PACC 征象中的价值。**材料与方法：**回顾性分析经病理证实的 PACC 病例 28 例，均行 CT 检查，15 例同时行 MRI 检查。观测项目包括察肿瘤部位、大小、形态、边界、包膜、内部密度与信号及强化方式等。通过与病理对照，总结 PACC 的影像特征，并比较 CT 与 MRI 显示上述征象的能力。**结果：**本组 28 例 PACC 共发现 29 个原发病灶，1 例双侧发病，左侧 15 例，右侧 12 例。肿瘤直径 *7.2±3.1 cm*。16 个病灶呈类圆形，13 个病灶呈分叶状或哑铃状。21 个病灶边界清楚，8 个病灶局部与周围结构分界不清。MRI 上呈 T1WI 稍低，T2WI 稍高信号，囊变坏死区呈 T1WI 信号更低，T2WI 信号更高。13 例病灶内可见短 T1 出血信号。反相位上 4 例肿瘤局部有信号下降。CT、MRI 三期增强示肿瘤实性部分均呈渐进性强化，病灶中央瘢痕及出血坏死区无明显强化，包膜呈渐进性强化。CT 与 MRI 比较，CT 与 MR 在肿瘤的发生部位、大小形态、强化方式以及与周围结构关系等的显示能力相似。CT 显示钙化优于 MRI（χ^2=10.00，P<0.01）。而 MRI 对出血、瘢痕、脂质成分及肿瘤包膜的显示能力均高于 CT（χ^2=11.73,8.10,8.00,9.88，P 均<0.01）。**结论：**原发性肾上腺皮质腺癌有一定的影像学特征，CT 和 MRI 在诊断本病时各有优势，联合检查有助于全面反映肿瘤的病理特征，最终确诊仍需病理学检查。

EPO-1118
小剂量呋塞米及对比剂分次团注法 CTUA 在肾脏、尿路和血管一站式成像技术的临床应用研究

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目的：探讨联合应用小剂量呋塞米及对比剂分次团注法，在肾脏、尿路和血管的一站式成像技术中的临床应用价值
方法：选择我院 2018 年 1 月至 2019 年 6 月 41 例有泌尿系疾病需要行 CT 尿路成像（CT urography，CTU）检查的成年患者，排除 CT 检查及碘造影禁忌症者。采用检查前静脉注射小剂量呋塞米（0.1mg/Kg 体质量，最大剂量 10mg），进行平扫后推注 40%总量造影剂（350 mg I/mL 碘海醇 1.2mL/Kg 体质量），15-30min 后再次进行检查；推注 60%总量造影剂约 25s 后进行皮质期（动脉期）扫描，90s 后进行实质期扫描，5min 后进行分泌期扫描；用第二次扫描皮质期数据完成肾脏、尿路和血管(CT urography and angiography，CTUA)同步成像，第二次扫描分泌期数据完成肾脏、尿路 CTU 成像进行对比。由 2 名主治医师采用双盲发独立阅片，分别对肾实质、肾动脉及周围血管、肾盂输尿管膀胱 CT 值、输尿管连续性及盂旁硬化性伪影等方面图像质量进行评价，通过统计学分析，判断联合 CTUA 的可行性及效果。
结果：CTUA 对肾脏实质、肾脏血管、肾盂输尿管膀胱显示良好，显示率分别为：0.88、0.94 、1，常规 CTU 相应显示率分别为：0、0、0.92；与常规 CTU 对比，在显示区分肾脏皮髓质及肾脏血管方面，CTUA 与 CTU 差异明显，CTUA 明显优于常规 CTU；在显示肾盂输尿管膀胱方面两者无明显差异，均显示良好。而 CTUA 对盂旁硬化性伪影及输尿管连续性显示率分别约 0.29、0.91，常规 CTU 相应显示率分别为：0.43、0.90；与常规 CTU 对比，在盂旁硬化性伪影 CTUA 与 CTU 差异明显，CTUA 优于常规 CTU；在显示输尿管连续性方面两者无明显差异，均显示良好。
结论：CTUA 技术优于常规 CTU 检查，常规剂量对比剂采用分 2 次团注 1 次扫描方法能同时显示肾脏、尿路及血管等信息。

EPO-1119

单房囊性小肾癌 MSCT 表现及误诊分析

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目的：探讨单房囊性小肾癌 MSCT 表现及误诊原因分析。方法:对 11 例单房囊性小肾癌 MSCT 平扫及增强检查后的影像学结果与手术病理结果进行回顾性分析。结果:MSCT 平扫及增强检查虽然能够完全显示单房囊性小肾癌病变， 但由于病变直径小（<3cm），影像缺乏特异性，加之定性较难 ，所以很容易误诊。

EPO-1120

多排螺旋 CT 尿路成像（CTU）在膀胱癌术前分期和评估的应用价值

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目的：探讨 CTU 在膀胱癌术前 TN 分期和评估的应用价值，为临床诊断及治疗提供依据。
方法:收集 2017 年 1 月至 2019 年 3 月在我院经膀胱镜及病理证实诊断为膀胱癌 56 例患者资料，通过术前 CTU 影像判断 TN 分期；并将影像分期结果及评估结果与患者手术后病理结果对照分析。
结果：CT 尿路造影术前对肿瘤 T 分期对照术后病理符合率分别为 88.89％、72.73％、82.35％、86.67％ ，CTU 诊断膀胱癌与病理结果两者一致性较好。

结论：多排螺旋 CTU 可准确的对膀胱癌患者术前分期和评估，透过影像资料，可以真实反映出病情，准确判断疾病的发生和进展情况，是临床诊断及治疗疾病的良好选择。

EPO-1121

Performance of Triphase Contrast-enhanced CT for the Differentiation of Papillary Renal Cell Carcinoma (RCC) From Clear Cell and Chromophobe RCC Subtypes and Oncocytoma

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Objective The purpose of our study was to investigate the performance of triphase contrast-enhanced CT for the differentiation of papillary RCC from clear cell and chromophobe RCC subtypes and oncocytoma.
Materials and methods We derived a cohort of 10 papillary RCCs(7 men, 3 women; mean age: 60±10), 68 clear cell RCCs(50 men, 18 women; mean age: 61±12), 7 chromophobe RCCs(3 men, 4women; mean age: 63±7) and 5 oncocytoma(4 men, 1 women; mean age: 60±10) with a preoperative triphasic dynamic contrast-enhanced CT study with up to three phases (i.e., cortical, medullary, excretory) and unenhanced CT from 2017 September to 2019 July. All patients were divided into four groups:1)the papillary RCCs group, 2)the clear cell RCCs group, 3)the chromophobe RCCs group, 4)the oncocytoma group. Quantitative tumor cortical enhancement, medullary enhancement, and excretory enhancement were calculated. These groups were evaluated for triphasic enhancement and were compared using Mann-Whitney tests. ROC curves were constructed to evaluate the performance of triphasic enhancement in differentiating papillary RCCs from the other three groups.
Results The cortical enhancement of papillary RCC show significantly lower than clear cell RCC (P<0.0001) and oncocytoma (P=0.0047),and the medullary enhancement of papillary RCC show significantly lower than clear cell RCC (P=0.0013) and oncocytoma (P=0.0047). The papillary RCC showed significantly lower excretory enhancement compared with clear cell RCC (P=0.0027). Comparison of triphasic enhancement between papillary RCC and chromophobe RCC did not show significantly differences. And the excretory enhancement of papillary RCC show no significantly differences when compared with oncocytoma. The cortical enhancement differentiated papillary RCC from clear cell and chromophobe RCC subtypes and oncocytoma with an AUC of 0.922,and with an sensitivity of 90%,and specificity of 86.25%. The medullary and excretory enhancement differentiated papillary RCC from clear cell and chromophobe RCC subtypes and oncocytoma with an AUC of 0.814 (medullary) and 0.783(excretory), respectively. Comparison of receiver operating characteristic curve analyses showed significant differences between cortical enhancement and excretory enhancement.

Conclusion Triphasic contrast-enhanced CT can assist in differentiating papillary RCC from clear cell and chromophobe RCC subtypes and oncocytoma, and the cortical enhancement showed the best performance.

EPO-1122
基于增强 CT 的肾上腺肿瘤分类及高血压预测模型

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目的 高血压是临床常见疾病之一。目前，临床上对于高血压的病因仍没有有效的依据，肾上腺作为人体内十分重要的内分泌器官，不仅参与了机体代谢作用，还与人体的血压升高、兴奋性增强相联系。本文主要是研究高血压与肾上腺增生、肿瘤的关联程度，建立一种高血压的预测模型，从而为高血压的诊断提供更多的依据。**方法** 选取健康对照组 50 例，经病理证实的肾上腺增生及肿瘤患者 102 例，结节状增生 17 例，皮质腺瘤 57 例，嗜铬细胞瘤 10 例，神经鞘瘤 4 例，其他肿瘤 14 例。对两组被试行薄层 CT 平扫及增强扫描，利用计算机半自动分割算法，对正常及病变的肾上腺进行分割，后用灰度共生矩阵的纹理特征提取方法，分别提取得到能量、对比度、相关性及熵等 22 个特征，利用支持向量机进行分类并输出结果，同时将被试的这 22 个特征与血清学及病理学结果进行相关性分析，从而建立预测模型；**结果** 本文利用计算机辅助诊断算法能够有效地对肾上腺增生及肿瘤做出分类，分类结果与病理结果一致性高达 80%，并提出一种基于肾上腺病变的高血压预测模型。**结论** 高血压肾上腺病变患者的疾病较为隐匿，对患者的身体健康危害较大。在高血压患者接受血清学检验之前，结合影像学检查，可提高高血压肾上腺病变的检出率，降低漏诊率。而且，早期对高血压肾上腺病变进行诊断，并给予患者相应的对症治疗对逆转患者的心血管损害以及预防并发症意义重大。

EPO-1123
单源能谱 CT 诊断体内泌尿系结石成分分析

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目的：探讨单源能谱 CT 诊断分析体内泌尿系结石成分的价值。**方法：**选取 2017 年 12 月~2019 年 6 月我院收治的 88 例行单源能谱 CT 的结石患者，将其结石成分分析结果与术后红外光谱结石成分分析结果进行对比，探讨单源能谱 CT 诊断分析体内泌尿系结石成分分析中的应用价值。**结果：**以红外光谱结果为参照，单源能谱 CT 分析 93 枚结石，含尿酸盐结石 18 枚，非尿酸盐结石 75 枚，单源能谱 CT 显示的特异度、灵敏度、准确度、阴性预测值、阳性预测值分别为 98.63%（72/73）、90%（18/20）、96.77%（90/93）、97.29%（72/74）、94.74%（18/19）。**结论：**单源能谱 CT 可以准确的区分体内泌尿系结石成分，为临床治疗提供重要的参考依据。

EPO-1124
卵巢卵泡膜纤维瘤的 CT 表现

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目的：卵巢卵泡膜纤维瘤是一种起源于卵巢性索-间质细胞的少见肿瘤，约占所有卵巢肿瘤的 1.0%～4.0%，多数为良性，通常发生于绝经前后女性。临床症状多样，肿瘤大小、形态、内部成分差异较大，术前常不能正确诊断，尤其当肿瘤体积较大、伴有胸腹腔积液且 CA125 水平升高时，可能会被误诊为恶性肿瘤[5]，影响临床治疗方案的制定。本研究试图寻找此类肿瘤的特异性影像学表现，利于临床术前评估。现收集我院 18 例经手术病理证实为卵泡膜纤维瘤的完整资料，对其临床、CT 特征及病理表现进行回顾性分析，以期提高对该病的认识和影像诊断能力。结果：18 例患者共计 18 个病灶，均为单侧，10 例位于左侧，8 例位于右侧。肿瘤最大径范围从 1.5～18cm，平均 8.7cm。13 例腹腔见积液，其中 4 例同时合并有胸腔积液。18 个病灶多数呈类圆形或椭圆形，1 例伴有浅分叶，4 例形态不规则，边界或大部分边界清晰和光整。肿瘤呈较均匀实性密度 7 例；囊实性密度 11 例。增强后囊性部分三期均未出现强化；实性肿块或囊实性肿块实性部分增强后动脉期强化不明显，静脉期及延迟期呈持续或渐近性轻度强化，增强后延迟期与平扫比较实性部分 CT 值增加幅度为 2～18HU，未超过 20HU。结论：卵泡膜纤维瘤好发于绝经前后妇女，具备如下 CT 征象：主要表现为单侧卵巢良性肿块，肿瘤边界较清晰，大部分可出现粘液样变、囊变和出血，时有钙化，导致肿瘤密度不均，瘤体实性部分呈等密度，增强扫描以渐进式强化为主，动脉期强化不明显，且常合并恶性肿瘤可见的腹水；部分肿瘤由于雌激素作用的存在，出现子宫内膜增厚，绝经后阴道出血等，综合以上征象可进一步提高对该病的认识，有助于卵泡膜纤维瘤的诊断。

EPO-1125

CT 纹理分析对卵巢囊实性占位的鉴别价值

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目的：探讨 CT 纹理分析对鉴别卵巢囊实性占位良恶性的价值。 **方法**：回顾性分析经病理证实的 45 例卵巢囊实性占位的术前 CT 和临床资料，其中 20 例为原发恶性肿瘤，25 例为良性肿瘤及非肿瘤病变。采用 MITK-Work 软件于轴位 CT 平扫图像上提取病灶的 CT 纹理参数，包括平均数、标准差、RMS、均匀性、能量和熵。卵巢良恶性囊实性病灶间纹理参数比较采用独立样本 t 检验或 Mann-Whitney U 检验，并对有统计学意义的参数进行受试者操作特征（ROC）曲线分析，评价其鉴别诊断卵巢囊实性良恶性病灶的效能。 **结果**：恶性组的平均值、均匀性均高于良性组（P 均＜0.01），RMS 低于良性组（P＜0.01），均具有统计学差异；2 组间标准差、能量、熵的差异无统计学意义（P＞0.05）。ROC 曲线结果显示，平均值、RMS 和均匀性诊断卵巢囊实性良恶性的 AUC 值分别为 0.80、0.76 和 0.81（P 均＜0.05），敏感度分别为 72%、88%和 76%，特异度分别为 85%、60%和 85%。其中均匀性的诊断效能最高。多参数联合分析对鉴别诊断的诊断效能均较高（AUC 均＞0.800），各组合间 AUC 的差异均无统计学意义（P 均＞0.05）。 **结论**：CT 纹理分析的部分参数（平均值、均匀性、RMS）对鉴别诊断良恶性卵巢囊实性占位具有一定的价值。

EPO-1126

Quantitative evaluation of the pathological features of cervical cancer using T2 mapping

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Purpose: To investigate the feasibility of evaluating the pathological type, tumor grade, and lymphovascular space invasion (LVSI) of cervical cancer (CC) using quantitative T_2 mapping.
Materials and Methods: 57 patients with pathologically proven cervical cancer underwent conventional MRI, diffusion-weighted imaging (DWI), and a prototype radial-TSE sequence before therapy on a 3T system (MAGNETOM Skyra, Siemens Healthcare, Erlangen, Germany). The T_2 maps were generated inline from the radial-TSE images. Differences in T_2 and apparent diffusion coefficient (ADC) values were assessed between tumor (n = 57) and normal tissue (myometrium) (n = 42), squamous cell carcinomas (SCC, n = 46) and adenocarcinomas (n = 11), well/moderately differentiated tumor (n = 39) and poorly differentiated tumor (n = 18), and LVSI-positive (n = 38) and LVSI-negative (n = 19) CC. The diagnostic performances were calculated using receiver operating characteristic (ROC) curve analyses. A $P<0.05$ was considered statistically significant.
Results: There were significant differences between T_2 and ADC values for cervical cancer and normal tissue (all $P < 0.05$). No significant differences were seen in the T_2 and ADC values of SCC and adenocarcinomas (all $P > 0.05$). Compared to the well/moderately differentiated tumor, poorly differentiated tumor showed decreased T_2 and ADC values ($P = 0.020$ and $P = 0.004$, respectively). The T_2 values were significantly lower in LVSI-positive CC than in LVSI-negative CC ($P = 0.002$), while the ADC values were not found to have a significant difference ($P = 0.675$). The areas under the ROC curves of T_2 and ADC values for distinguishing tumor grade were 0.709 and 0.747, respectively. The ROC curve analysis yielded a cut-off T_2 value of 89.6ms in the differentiation of LVSI-positive and LVSI-negative CC, with a sensitivity of 83.3%, specificity of 80.0%, and area under the curve of 0.856.
Conclusion: This pilot study demonstrates that quantitative T_2 mapping effectively differentiates between grades of CC. Moreover, quantitative T_2 values showed better discriminative values than ADC for determining the presence of LVSI.

EPO-1127

T2 mapping for evaluation of concurrent chemoradiotherapy response in patients with advanced cervical cancer: a pilot study

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Purpose: To investigate the role of T_2 mapping in the assessment of treatment response of advanced cervical cancers to concurrent chemoradiotherapy (CCRT).
Materials and Methods: 27 patients diagnosed with advanced cervical cancer by pathological or clinical study underwent conventional MRI and quantitative T_2 mapping on a 3T system (MAGNETOM Skyra, Siemens Healthcare, Erlangen, Germany) before CCRT (pre), in the beginning of the 4th week of CCRT (mid), and immediately after CCRT completion (post). Patients were classified into complete response (CR) (n = 10) or partial response (PR) groups (n = 17) according to RECIST (Response Evaluation

Criteria in Solid Tumors) after CCRT. The T_2 parametric maps were acquired using a Turbo Spin Echo-based prototype sequence with radial k-space trajectory (Siemens Healthcare, Erlangen, Germany). The T_2 values (T_2-pre, T_2-mid and T_2-post) and percentage of T_2 change (ΔT_2-mid and ΔT_2-post) were obtained at each timepoint. The Mann-Whitney U test was used to compare differences of T_2 values and percentage T_2 change between response group and non-response group. Diagnostic performances were calculated using receiver operating characteristic curve (ROC) analysis. A P value of <0.05 was considered to indicate a statistically significant difference.

Results: Both the T_2-mid and T_2-post values of the CR group were lower than those of the PR group ($P = 0.010$ and $P = 0.036$, respectively). The CR group showed greater ΔT_2-mid and ΔT_2-post values ($P = 0.004$ and $P = 0.033$, respectively). No significant difference was found in the T2-pre between the two groups ($P = 0.588$). ROC analysis gave area under the curve values of 0.574, 0.812, 0.747, 0.835 and 0.706 for T_2-pre, T_2-mid, T_2-post, ΔT_2-mid, and ΔT_2-post, respectively, for predicting complete response of advanced cervical cancer to CCRT. The optimum threshold for T_2-mid and ΔT_2-mid was 81.3 ms and 7.7%, resulting in a sensitivity of 82.4% and 90.0%, and a specificity of 80% and 70.6%, respectively.

Conclusion: It is feasible to use quantitative T_2 values and percentage T_2 change during CCRT to monitor treatment response in patients with advanced cervical cancer.

Clinical Relevance: In patients with advanced cervical cancer treated with CCRT, the T_2 value and percentage T_2 change may be used to monitor treatment response and enable individualized treatment planning.

EPO-1128

DCE-MRI 及 DWI 对卵巢癌的分期及 Ki67 表达的相关性研究

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目的：通过研究 DCE-MRI 的 TIC 曲线及肿瘤实性部分 DWI 的 ADC 值与卵巢肿瘤的临床分期及 Ki67 的表达相关性，为卵巢癌的临床术前精准化疗及术后预后提供精准评估。

方法：回顾性分析我院经手术病理证实卵巢癌患者 28 例，所有患者均行 DCE-MRI 及 DWI 的检查，并绘制肿瘤的 TIC 曲线及测量肿瘤实性部分的 ADC 值；术后均行免疫组化检查，取得 Ki67 的值。以肿瘤分期分组，对组间的 TIC 曲线类型及 ADC 值、Ki67 进行统计学分析，得出 TIC 曲线、ADC 值与临床分期的相关性；以 40%为界，将 Ki67 分为高表达组（≥40）和低表达组（＜40%），统计两组间 TIC 曲线及 ADC 值相关性。

结果： Ⅰ期，9 例，ADC 值 1.33+0.37；Ⅱ期 3 例，ADC 值 1.14±0.12；Ⅲ期 13 例，ADC 值 0.87±0.25； Ⅳ期 2 例，ADC 值 1.2。其中Ⅰ期 TIC 曲线Ⅰ型 1 例，Ⅱ型 2 例，Ⅲ型 6 例；Ⅱ期 TIC 曲线Ⅰ型 1 例，Ⅱ型 1 例，Ⅲ型 1 例；Ⅲ期 TIC 曲线Ⅰ型 0 例，Ⅱ型 1 例，Ⅲ型 12 例；Ⅳ期 TIC 曲线Ⅲ型 3 例；通过 Spearman 等级相关分析发现： ADC 值和卵巢肿瘤的临床分期不具有相关性；TIC 曲线分型和卵巢肿瘤分期有相关性，且为正相关。将 Ki67 分为高表达组和低表达组，其中高表达组 12 例，ADC 值 0.92±0.32，TIC 曲线Ⅰ型 0 例，Ⅱ型 2 例，Ⅲ型 10 例；低表达组 14 例，ADC 值 1.16±0.45，TIC 曲线Ⅰ型 2 例，Ⅱ型 5 例，Ⅲ型 7 例；通过不同 Ki67 组间 ADC 值和 TIC 曲线比较分析发现，组间 ADC 值比较差异无统计学意义，且组间 TIC 曲线比较差异亦无统计学意义。

结论 DCE-MRI 的 TIC 曲线在卵巢肿瘤的分期中有正相关性，DWI 的 ADC 值测定和卵巢癌的分期没有相关性；在 K67 高表达组和低表达组中，TIC 曲线和 ADC 值均没有发现相关性。

EPO-1129

女性继发性附件扭转的 CT 征象分析

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目的 探讨女性继发性附件扭转的 CT 征象以提高诊断正确率。 **方法** 回顾性分析 34 例女性附件病变伴扭转患者的临床和 CT 影像资料，对附件原发病变和扭转蒂的 CT 表现（位置、大小、形态、子宫移位、盆腔积液等）进行观察和分析，对附件扭转患者的临床表现、CT 征象和手术病理结果进行对照分析。 **结果** 34 例女性继发性附件扭转，均单侧发病，平均年龄 38.8±20.6 岁。下腹部急、慢性疼痛 30 例（88.2%，30/34）、盆腔包块 4 例（11.8%，4/34），并伴恶心呕吐 7 例（20.6%，7/34）、发热 5 例（14.7%，5/34）和血白细胞升高 11 例（32.4%，11/34）。原发病变多为良性肿瘤和肿瘤样病变（91.2%，31/34），手术前 CT 对原发病变的正确诊断率达 73.5%（25/34），对附件扭转正确诊断率为 11.8% （4/34），漏诊率为 88.2%（30/34）。原发病灶伴附件扭转的 CT 征象为双瘤征（50.0%，17/34）、新月征（70.6%，24/34）、绳索征（14.7%，5/34）、漩涡征（11.8%，4/34）。 **结论** CT 对附件原发病变诊断准确率较高，但对继发性附件扭转的正确诊断率低。对下腹部急、慢性疼痛的女性患者，出现双瘤征、新月征为继发性附件扭转的常见影像表现，而漩涡征、绳索征为其特征影像征象，但出现率低，认识这些 CT 征象有益于提高附件扭转正确诊断率。

EPO-1130

肾脏非霍奇金淋巴瘤影像诊断

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目的：探讨肾脏非霍奇金淋巴瘤（NHL）影像表现。**方法：**总结我院 2003-05~2012-01 以来 3 例肾脏非霍奇金淋巴瘤临床资料，均接受 CT 和 MRI 平扫和增强检查。**结果：**3 例非霍奇金淋巴瘤，均表现为多发病灶，肾脏体积增大，肾门肿块，直接蔓延腹膜后淋巴结，包绕腹主动脉和下腔静脉，下腔静脉壁局部增厚。CT 平扫呈稍高密度，MRI 平扫 T1 呈稍低信号和中等信号，T2 呈稍低信号或中等信号，增强扫描动脉期略有强化，实质期和延迟期强化明显，但信号低于周围正常肾实质。**结论：**肾脏非霍奇金淋巴瘤少见，在 CT 和 MRI 上有一定特征，MRI 增强有助于诊断，CT 和 MRI 对临床诊断有一定指导意义。

EPO-1131

磁共振定量动态增强参数直方图在术前评估子宫内膜癌肿瘤分化程度中的价值

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目的：评估磁共振定量动态增强成像（dynamic contrast enhanced magnetic resonance imaging，DCE-MRI）的参数直方图对术前子宫内膜癌肿瘤分化程度的评估价值。
方法：收集 2016 年 1 月至 2019 年 2 月于南通大学附属医院术前行 DCE-MRI 检查子宫内膜癌患者 76 例,图像清晰且术后具有明确病理分级和 Ki-67 表达结果患者 70 例。根据病理分级和 Ki-67 表达结果，患者分别被分为高/低级别组（42/28 例）和高/低表达组（37/33 例）。通过后处理软件测量容积转移常数（volume transfer coefficient，K^{trans}）、转运速率常数（exchange rate constant，K_{ep}）、血管外细胞外容积分数（extracellular extravascular volume fraction，Ve）的直方图参数，包括均值（mean）、偏度(skewness)、峰度（kurtosis）和第 10、25、50、75 和 90 百分位数。对于不同组间的直方图参数进行独立样本 t 检验分析(正态分布)或 Mann-Whitney U 检验（偏态分布）。采用受试者工作特性(ROC)曲线分析来比较不同参数的诊断效能。
结果： DCE-MRI 直方图参数中共 19 个指标分别在不同的病理分级和 Ki-67 表达子宫内膜癌患者中具有显着差异（P <0.05），其中 K^{trans} 第 50 百分位数在对区分子宫内膜癌不同的病理分级和 Ki-67 表达均具有最高的诊断效能，AUC 为 0.903，灵敏度和特异性分别为 70.6％和 94.6％，AUC 为 0.723，灵敏度和特异性分别为 100％和 42.9％。
结论：DCE-MRI 直方图参数可以有助于评估子宫内膜癌分化程度,其中 K^{trans} 第 50 百分位数是最佳鉴别参数。

EPO-1132
卵巢透明细胞癌的临床、CT 特征与 FIGO 分期的相关性研究

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目的:探讨卵巢透明细胞癌的临床、CT 影像特征，及其与 FIGO 分期的相关性.
材料与方法：51 例手术病理证实的卵巢透明细胞癌纳入研究.收集临床资料和实验室检查（CA125, CA199 和 CA725）。患者均接受全腹 CT 增强检查，由两名放射医师协商分析 CT 影像特征，包括：病灶大小、边缘、肿瘤类型（囊性为主、囊实混合和实性）、实性部分百分比、内部间隔、钙化、腹水、腹膜受累、淋巴结受累,定量测量病灶实性部分平扫和增强的 CT 值。使用卡方检验、t 检验和秩和检验比较早期(FIGO I-II)和晚期患者(FIGO III-IV)的肿瘤标志物、CT 影像特征的差异。
结果：早期透明细胞癌 37 例，进展期 14 例；14 例早期患者存在子宫内膜异位症，仅 1 例晚期患者同时合并子宫内膜异位症，两者有显著统计学差异。66.7%, 31.4% 和 27.5% 的患者存在 CA125, CA199 和 CA72-4 的升高， 早期和晚期患者的 CA125 和 CA72-4 存在显著差异，CA199 无显著差异. 肿瘤表现为单囊或多囊状肿物，边界清晰或者不清晰，病灶大小在 4.3~22.3 cm 之间, 囊性为主型占 54.9%, 囊实混合型占 33.3%，单纯实性型占 11.8%. 早期和晚期患者的肿瘤的类型和实性成分百分比存在显著统计学差异，病灶囊性和实性部分的 CT 值无差异. 10 例病灶存在薄弧样钙化，均是早期病例.
结论: 卵巢的透明细胞癌的 CT 征象有一定的特征，肿瘤标志物、肿物囊实性成分有助于判别术前临床分期的诊断。

EPO-1133
子宫内膜间质肉瘤ＣＴ、ＭＲＩ表现

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目的 分析子宫内膜间质肉瘤（ESS）的 CT、MRI 表现。方法 回顾性分析经术后病理证实为 ESS 的 11 例患者的 CT、MRI 资料。11 例中，5 例接受 CT 检查， 6 例接受 MR 检查，均包括平扫及增强扫描。结果 病理结果为低级别 ESS 9 例，未分化肉瘤 2 例。11 例病灶均为单发，病灶位于宫腔内 7 例、肌壁间 4 例，其中类圆形肿块 8 例、不规则形肿块 3 例，病灶最大径（9.18±1.36）cm，肿块边界清晰 4 例、边界不清 7 例；病灶 CT、MRI 表现以实性为主 4 例、呈囊实性 6 例、以囊性为主 1 例。CT 平扫示 5 例病灶实性部分密度均近似于或低于子宫肌层，其中 4 例病灶密度不均，1 例密度均匀。MRI 平扫示 6 例病灶 ADC 图信号均减低，其中 5 例呈 T1WI 等或低信号、T2WI 高或稍高信号且 DWI 呈明显高信号，另 1 例（以囊性为主）呈 T1WI 稍高信号、T2WI 高信号且 DWI 呈中心高信号。10 例增强扫描表现为渐进性、持续性强化，1 例以囊性为主的病灶未见强化。8 例肿块内可见囊变、坏死，6 例肿瘤浸润、破坏子宫深肌层。11 例中，伴子宫腺肌症 2 例、子宫肌瘤 5 例，合并少量盆腔积液 5 例、宫腔内积血 1 例、输卵管积液 2 例。结论 ESS 的 CT、MRI 表现具有一定特征，可为诊断提供依据。

EPO-1134
容积 CT 灌注对于宫颈鳞癌同步放化疗疗效的预测价值初探

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目的: 评价容积 CT 灌注对于宫颈癌同步放化疗疗效的预测价值。
材料与方法:对 33 例晚期宫颈鳞癌患者进行全子宫容积 CT 灌注扫描.获得病灶的动脉血流量（AF),血容量(BV) 和毛细血管通透性(PS). 感兴趣（ROI）的放置采用两种方法：方法一为大 ROI（在连续三个显示宫颈癌灶最大的横轴位层面测量，尽量包括病灶全部，避开坏死和周边血管，结果取均值，定义为 ROI_{whole}），方法二为小 ROI（分别在肿瘤灌注最高和最低的区域放置小 ROI，三次测量取平均值，定义为 ROI_{HOT}、ROI_{COLD}）. 按照 RECIST 标准，将患者分为不完全应答组（疗效 PD 或 SD 或 PR）和完全应答组（疗效 CR）。对两组患者的一般资料、AF、BV 及 PS 进行 t 检验或 Fisher 精确概率检验，探讨可以预测宫颈鳞癌放化疗疗效的临床指标及 CT 灌注参数。对不同疗效组有统计学差异的 CT 灌注参数进一步采用受试者操作特征（ROC）曲线进行描述，评价其预测宫颈鳞癌放化疗疗效的效能。
结果：在放化疗后达 CR 组 23 例，PR 组 10 例。两组患者年龄、BMI、FIGO 分期、病理分级、治疗前肿瘤最大径及最大面积均无统计学差异（$P>0.05$）；不同疗效患者宫颈鳞癌局灶高灌注区和低灌注区的 AF 值比较均有统计学意义（$P<0.05$），CR 组明显高于 PR 组；而宫颈癌整体的 AF 值无统计学差异，各个 ROI 的 BV、PS 组间无统计学差异（P＞0.05）。宫颈鳞癌局部高、低灌注区的 AF 值均有较高的诊断效能，ROC 曲线下面积分别为 0.822 和 0.865。以 AF=185.8ml/min/100g 为阈值，预测宫颈鳞癌放化疗后达 CR 的敏感度、特异度分别为 82.6%、70.0%。以低灌注区 AF= 98.4 mL/min/100g 为阈值，敏感度、特异度分别为 69.6%和 90.0% 。
结论：宫颈鳞癌容积 CT 灌注参数 AF 值有助于预测宫颈鳞癌放化疗疗效，特别是局灶低灌注区的血供情况更有价值。

EPO-1135
Application of the DCE-MRI combined with MRS in prostate cancer diagnosis

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Objective： To investigate the application of the dynamic contrast enhanced MRI combined with magnetic resonance spectroscopy in prostate cancer diagnosis. **Method：** In our hospital outpatient department from January 2011 to January 2014 the patients who were diagnosed with prostate disease were choosed in a random sample of prostate cancer patients60, benign prostatic hyperplasia patients60, 60 healthy subjects and turned them out into the prostate cancer group, proliferation and control groups. Used Siemens Avanto1.5 T high field superconducting MRI for DCE-MRI scan and MRS scan, after the MRS scan was finished, we used the workstation spectroscopy tab spectral analysis, and eventually got prostate metabolites choline (Cho), muscle acid (Cr) and citrate (Cit) crest lines and Cho / Cit, (Cho + Cr) / Cit. **Results：** The group of subjects in 21sec, 1 min, 2 min dynamic contrast-enhanced MR carried out a comparison between the test results were statistically significant, checking the existence of significant differences. Three groups of subjects performed a comparison between the results of spectral analysis with statistical significance, check the existence of significant differences. DCE-MRI and MRS combined application of two methods sensitivity of 89.67% and a specificity of 95.78%, accuracy of 94.34%. **Conclusion：** DCE-MRI combined with MRS greatly improves the sensitivity , specificity and accuracy of the diagnosis of prostate cancer， it has a great application value in the diagnosis of prostate cancer.

EPO-1136
CT 值直方图分析技术对肾脏乏脂性血管平滑肌脂肪瘤的诊断价值

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目的：探讨 CT 值直方图分析技术对肾脏乏脂性血管平滑肌脂肪瘤（fp-AML）的诊断价值。
方法：回顾性地收集经病理证实的 20 例肾脏 fp-AML 的临床和影像学资料，所有肿瘤短径小于 4cm，并排除瘤体完全位于肾实质内者，根据 fp-AML 的大小、生长位置、患者年龄、性别等选择相对应的 26 例没有钙化和大面积坏死的透明细胞癌（CCRCC）作为对照组。所有病例均由 2 名副主任医师通过 CT 后处理软件进行分析，先通过容积再现的后处理方式重建出整个肿瘤的体积，将脂肪 CT 值分别定义为 0HU 以下、-5HU 以下、-10HU 以下、-15HU 以下、-20HU 以下、-25HU 以下、-30HU 以下等几个阈值，再通过 CT 值直方图技术得出相应 CT 阈值的脂肪成分所占整个肿瘤体积的比例。通过绘制受试者工作特征曲线（ROC）得出在各个 CT 阈值上肿瘤内脂肪含量诊断肾脏 fp-AML 的敏感性、特异性、AUC 值、P 值和 Youden 指数，从而评价其诊断性能。
结果： fp-AML 和 CCRCC 其内含有的脂肪成分比例在我们定义的所有 CT 阈值上的差异均有统计学意义（P＜0.001），ROC 曲线上 7 个 CT 阈值所对应的 AUC 值为 0.790 — 0.872，最高的 AUC 值所对应的是脂肪阈值＜-15HU，在该组根据 Youden 指数得到最优截断值（optimal cut-off value）为大于 5%，即在定义脂肪组织的 CT 值为＜-15HU 时，如果肿瘤内脂肪成分大于总体积的 5%，fp-AML 与 CCRCC 的鉴别特异性为 75%，敏感性为 92.3%，阳性预测值（PPV）为 82.4%，阴性预测值（NPV）为 79.3%。

结论：根据我们的方法，fp-AML 相对于 CCRCC 在各个脂肪阈值上有更高比例的脂肪含量。选择脂肪阈值＜-15HU，其 AUC 值明显高于以往文献所报道的 AUC 值，该方法在一定程度上作为鉴别肾脏乏脂性血管平滑肌脂肪瘤和肾透明细胞癌的指标之一。

EPO-1137
腹内未降睾丸精原细胞瘤 10 例 MSCT 分析并文献复习

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[摘要] 目的 分析腹内未降睾丸精原细胞瘤的 MSCT 表现,以提高对该肿瘤的认识。方法 回顾性分析经病理证实的 10 例腹内未降睾丸精原细胞瘤患者的影像学资料。结果 10 例腹内未降睾丸精原细胞瘤的 MSCT 表现均为腹腔内孤立性实质性肿块样病变,边缘光滑，密度不均匀,其中,9 例病变内可见星芒状低密度区,增强后病变呈渐进性轻度强化,病灶周围于动脉起可清楚显示血管蒂，其内星芒状低密度区无明显强化，MIP、CTA 及 CTV 可见清楚显示肿瘤供血动脉来自睾丸动脉，引流静脉为睾丸静脉。结论 腹内未降睾丸精原细胞瘤是一种少见肿瘤,MSCT 检查能为临床诊断提供有价值的信息。

EPO-1138
Tumor irregularity on preoperative imaging can predict metastatic disease in papillary renal cell carcinoma

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Objective To evaluate the prognostic implications of morphological irregularity in papillary renal cell carcinoma (pRCC).
Materials and methods We retrospectively reviewed the records of 274 patients with pRCC who underwent nephrectomy at our institution. Based CT or MR imaging, irregularity was defined as following: margins were smooth but not round, not smooth, or unclear, and irregularity of whole lesion was calculated. Patient-, treatment-, pathologic-, and radiological-level features were analyzed with progression free survival (PFS). Meanwhile,
Results Of 274 cases, thirty-five (13%) patients progressed. Overall highest accuracy for the detection of metastatic disease in terms of lesion irregularity achieved using a threshold of 50%. On univariable analysis, symptoms, surgical approach, tumor size, perinephric or renal sinus fat invasion, positive lymph node, thrombus, Fuhrman grade, sarcomatoid differentiation and irregularity were significantly associated with PFS (all $P < 0.05$). And no statistic difference existed in type 1, 2 or unclassed ($P > 0.05$) . On multivariable analysis, perinephric or renal sinus fat invasion (HR = 3.046, 95% CI = 1.332- 6.962) and irregularity (HR = 79.796, 95% CI = 13.881-458.701) were independently associated with PFS.

Conclusion Lesion irregularity based on imaging, can be a reliable biomarker in the preoperative prediction of metastatic disease in pRCC.

EPO-1139
探讨低 kVp 结合 ASIR-V 技术在肾动脉 CT 血管成像中的可行性研究

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目的 探讨低 kVp 结合 ASIR-V 在肾动脉 CT 血管成像中降低辐射剂量的可行性研究。**方法** 前瞻性连续收集 40 例进行肾动脉 CT 血管成像的患者，并随机分为 A、B 两组。扫描条件：A 组管电压 100kVp，噪声指数 NI（Noise Index）为 10，自动管电流技术（Smart mA），采用滤波反投影法（FBP）重建，重建层厚为 1.25mm；B 组管电压 80kVp，NI 为 10，Smart mA，迭代重建分别为 0%、20%、40%、60%、80%、100%，间隔 20%，图像后重建层厚为 1.25mm。客观测量双肾动脉及同层面皮下脂肪，记录其 CT 值及 SD 值，计算信噪比（SNR=CT/SD）及对比噪声比(CNR=（CT 肾动脉-CT 脂肪）/SD 脂肪)，采用 5 分法对各组图像质量进行双盲法主观评分（5 分，图像质量最好；1 分，图像质量最差）。对患者一般资料及客观测量结果进行统计学分析，并对各组图像质量进行 5 分法主观评分（5 分，图像质量最好；1 分，图像质量最差）。**结果** 两组间的一般均无统计学差异（p＞0.05）；图像质量主观评分存在明显差异(P＜0.001)，客观测量值均具有统计学差异（p＜0.05）；两组间的辐射剂量分别为（4.14±0.64）mSv、（2.11±0.22）mSv，且 B 组辐射剂量较 A 组减少约 49%；**结论** 在 80kVp 条件下进行肾动脉 CT 血管成像时，随着迭代重建递增，能得到优于 100kVpFP 重建图像质量，且能大幅度降低辐射剂量，故推荐 80kVp 进行肾动脉 CT 血管成像。

EPO-1140
睾丸精原细胞瘤和肿瘤样病变的 CT 表现及对照研究

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目的 研究睾丸精原细胞瘤和肿瘤样病变的 CT 表现，提高对其诊断和鉴别诊断能力。
方法 回顾性分析经手术病理证实的 20 例睾丸精原细胞瘤和肿瘤样病变患者，其中 12 例精原细胞瘤，8 例肿瘤样病变。12 例精原细胞瘤中，2 例行 CT 平扫，10 例行 CT 平扫+动态增强扫描；8 例肿瘤样病变中，1 例行 CT 平扫，7 例行 CT 平扫+动态增强扫描。观察精原细胞瘤和肿瘤样病变病灶的形态、密度和强化表现，并采用 Fisher 检验进行比较。
结果 12 例精原细胞瘤中，7 例病灶呈分叶或结节状，4 例呈混杂密度；8 例肿瘤样病变中，仅有 1 例呈浅分叶状，7 例呈混杂密度。10 例行 CT 动态增强扫描的精原细胞瘤病灶中，4 个可见纤维间隔明显强化，7 例行 CT 动态增强扫描的肿瘤样病变均未见纤维间隔。精原细胞瘤和肿瘤样病变患者以上征象的出现率差异均有统计学意义（P 均<0.05）。
结论 睾丸精原细胞瘤和肿瘤样病变的 CT 表现有一定的特征，对于鉴别诊断有一定的价值。

EPO-1141

原发性左肾巨大滑膜肉瘤破裂伴腹腔浸润 1 例

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患者，女性，33 岁，患者左腰部胀痛不适 1 月余，1 天前患者无明显诱因下出现左腰及左肩部疼痛，剧烈难忍，伴恶心、呕吐。
CT 表现：左上腹巨大团块混杂高密度影，与左肾关系密切，脾脏及胃明显受压并与团块分界不清，增强后呈轻度不均匀强化，团块右上方局部包膜连续性中断，向前下延伸至肝胃间隙及中下腹腔。直径约 16cm，密度不均匀，平扫 CT 值约 17~107HU，增强扫描动脉期强化未见明显强化，CT 值约 16~105HU，门脉期呈轻度不均匀强化，CT 值约 26~139HU。
MRI 表现：团块呈混杂信号，以短 T1WI 长 T2WI 信号为主，DWI 高 b 值呈不均匀高信号，增强后呈轻度不均匀持续强化，肝胃间隙及中下腹腔见类似信号影。
手术及病理：入院后行左肾巨大肿瘤切除术，示左侧腹膜后巨大肿块，约 20*15cm 左右，囊实性，肿块表面可见怒张血管，内可见大量陈旧性血块。肿块从左肾上极向腹中线、膈顶等延伸，大网膜包裹，脾脏、胰腺、胃、结肠等受压移位明显并紧密粘连。病理：滑膜肉瘤，伴大片坏死。
讨论：原发于肾脏的滑膜肉瘤非常罕见，由 Faria 等人于 1999 年首次报道。平均发病年龄为 40 岁，男女比例约 1:1。其发病机制可能与染色体易位为 t（X；18）（ p11.2 ；q11.2 ），导致 18q11 的 SYT 基因近端与 Xp11 的 SSX 基因远端融合，形成 SYT-SSX 融合基因相关。临床表现缺乏特异性，以腹痛、血尿及腹部包块为主。CT 表现为囊性或囊实性的软组织肿块，边界清晰，囊壁光整且较厚，病理学上显示为肿瘤包埋扩张的肾小管，邻近肾实质受压可形成假包膜；肿块内可有分隔、钙化及出血。增强后实性部分持续强化，呈“快进慢出”征象。MRI 表现为 T1WI 肿瘤实质部分信号为等或稍高于正常肌肉组织，T2WI 信号混杂，内有出血、坏死、囊变，表现为高、等、低三重信号。

EPO-1142

A CT-based Radiomics Approach to Preoperatively Differentiation between Borderline and Malignant Ovarian Cancer

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PURPOSE
The purpose of this study is to develop and validate a radiomics model for the preoperative differentiation between borderline and malignant ovarian cancer.
METHOD AND MATERIALS
62 patients who underwent preoprative CT examinations for suspected ovarian cancer were enrolled into this retrospective study (31 lesions were pathologically proven to be malignant epithelial ovarian cancer and 31 were borderline epithelial ovarian cancer). A Dedicate Radiomics prototype was used to segment lesions on preoperative portal phase axial CT images and extract texture features. Two experienced radiologists(6 and 12 years of experience in abdominal radiology, respectively) double-blinded segmented the entire volume of lesions semi-automatically. Patients were resampled using down-sampling method to keep the unbalancing between pathological types and then randomly split into training and validation subset with a ratio of

8:2.High consistent features (ICC>0.8) were chosen to study the association between radiomics features and pathological type using a random forest model. ROC analysis was performed to validate the capability of the radiomics model on the training and testing cohorts.
RESULTS
The random forest radiomics model achieved favorable prediction efficacy in both the training and testing subset. AUC in the training and testing subset were 0.93 (95%CI, 0.855-0.998) vs. 0.92 (95%CI, 0.797-1) respectively. Prediction sensitivity and specificity in training subset were 0.86 and 0.89 at cut-off value 0.64, which is also validated to be high in the testing subset (sensitivity 0.89, specificity 0.83).
CONCLUSION
The study showed that CT-based radiomics model holds promise in the preoperative differentiation between borderline and malignant ovarian cancer, which may help gynecologists make accurate decision and avoid excessive surgical or medical treatment.

EPO-1143

The diagnostic accuracy of CT cavernosography for venous leakage with erectile dysfunction - A retrospective, diagnostic study of 163 ED patients

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Objectives
To assess the diagnostic accuracy of computed tomography (CT) cavernosography for venous leakage evaluation in erectile dysfunction (ED) patients.
Methods
One hundred sixty-three consecutive patients who underwent CT cavernosography were enrolled. All patients were randomized into training set and validation set according to 7:3. One hundred and fourteen patients were in the training set, and 49 patients in the validation set.
The inclusion criteria: 1) preliminarily diagnosed with organic ED; 2) patients did not achieve a rigid erectile response in 10 minutes or did not last for 30 minutes after intracavernosal injection (ICI).
The exclusion criteria: 1) patients with accompanying disease; 2) history of urological surgery; 3) using medications that might effect sexual function within 30 days; 4) contrast agent hypersensitivity or contraindication; 5) failed to achieve a rigid erection during cavernosography according to a modified version of the erection hardness score.
The infusion velocity (IV) and flow-to-maintain velocity (FMV) during cavernosography were recorded. The diagnostic accuracy of IV and FMV were assessed by the area under the receiver-operating characteristic curve (AUC) with clinical diagnosis as references.
Results
In the training set, the AUC value was 0.957 (95% CI 0.902 to 0.986) for IV, and was 0.857 (95% CI 0.780 to 0.916) for FMV. For IV, the maximal Youden index was 0.757, the

associated criterion was > 30 ml/min, the sensitivity and specificity were 97.6% and 78.1% respectively. For FMV, the maximal Youden index was 0.725, the associated criterion was > 6 ml/min, the sensitivity and specificity were 75.6% and 96.9% respectively. When using cut-offs to compare with clinical diagnosis, the κ value was 0.795 for IV and 0.614 for FMV.
Parallel combined test increased the diagnostic agreement, the κ value to 0.816. In validation set, the AUC value was 0.957 (95% CI 0.858 - 0.994) for IV, and 0.743 (95% CI 0.599 - 0.857) for FMV; the κ value was 0.754 for IV, 0.590 for FMV and 0.878 for the parallel combined test.
Conclusions
The accuracy of IV and FMV for diagnosing venous leakage is similar to the clinical diagnosis. Therefore, CT cavernosography may be a suitable examination for patients who want to pursue surgical ligation or embolization of penile veins.

EPO-1144

泌尿系横纹肌肉瘤的影像表现分析

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目的：探讨泌尿系横纹肌肉瘤的影像学表现，提高对该肿瘤的认识。
方法：回顾性分析 7 例经病理证实的泌尿系横纹肌肉瘤患者的临床及影像学资料，与手术病理结果进行对照分析，并作文献复习。
结果：7 例泌尿系横纹肌肉瘤患者，男 6 例，女 1 例，发病年龄 16～51 岁，平均 29.5 岁。肿瘤位于肾脏 1 例，前列腺 3 例，睾丸 2 例，膀胱 1 例。6 例（来源于肾脏、前列腺、睾丸）表现为较大软组织肿块，密度/信号不均匀，以实性为主，其内可见不规则坏死区；1 例膀胱横纹肌肉瘤表现为膀胱壁广泛不规则增厚，CT 和 MR 增强后实性部分呈中度-明显强化，肿瘤内不规则坏死区无明显强化。4 例发生肺转移。3 例发生腹膜后淋巴结转移。
结论：泌尿系横纹肌肉瘤较少见，其 CT 和 MR 具有一定的特征性，但诊断较困难，最终确诊需依赖病理。

EPO-1145

3.0T MR 多参数成像对卵泡膜纤维瘤与附件区平滑肌瘤的鉴别诊断价值

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目的 探讨 3.0T 磁共振（MR）多参数成像对卵泡膜纤维瘤与附件区平滑肌瘤的鉴别诊断价值。
方法 收集经手术病理证实的 15 例卵泡膜纤维瘤和 38 例附件区平滑肌瘤（阔韧带平滑肌瘤 15 例，子宫浆膜下平滑肌瘤 23 例），回顾性分析两者的临床资料、肿瘤大小、腹水、病变侧卵巢情况、MRI 信号、增强特点及肿瘤成分特征，采用单因素对比分析和多因素回归分析寻找能有效鉴别这两种疾病的临床和影像学特征。**结果** 单因素对比分析结果显示两组资料在病变侧卵巢情况、表观扩散系数（ADC）、强化程度及肿瘤成分这 4 个特征的差异具有统计学意义（$p<0.05$）。具体表现为：15 例卵泡膜纤维瘤病变侧卵巢可见 3 例，ADC 值为（1.22±0.14）$\times 10^{-3}$ mm^2/s，12 例呈轻

度强化、2 例呈中度强化、1 例呈明显强化，6 例呈纯实性病变、2 例以实性为主、6 例呈囊实性、1 例以囊性为主；38 例附件区平滑肌瘤病变侧卵巢可见 21 例，ADC 值为（1.37±0.23）×10^{-3} mm^2/s，10 例呈轻度强化、21 例呈中度强化、7 例呈明显强化，21 例呈纯实性病变、15 例以实性为主、1 例呈囊实性、1 例以囊性为主。两组间其他临床资料（包括行经情况、临床症状）、肿瘤大小、腹水、MRI 信号特征（T1 加权成像、T2 加权成像、扩散加权成像）之间的差异没有统计学意义。多因素回归分析结果显示 ADC 值、强化程度这 2 个因素是鉴别卵泡膜纤维瘤与附件区平滑肌瘤的重要预测因子，采用回归模型对 53 例进行预报，其受试者工作特征曲线下面积为 0.908，其灵敏度、特异度及约登指数分别为 93.3%、73.7%和 0.720。**结论** 3.0T MR 多参数成像可以提供较多的反映卵泡膜纤维瘤与附件区平滑肌瘤组织学特征的影像学信息，其中 ADC 值及肿瘤强化程度在术前两种疾病鉴别诊断方面具有一定意义。

EPO-1146

Bokhman II 型（非激素依赖型）子宫内膜癌 MRI 诊断

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目的 ：回顾性分析 II 型子宫内膜癌的 MRI 表现，以提高对本病影像学表现的认识。
方法 ：回顾性分析本院 2007-2012 年收治的 16 例 II 子宫内膜癌的 MRI 表现，与病理结果对照，并按 FIGO2009 手术病理分期标准分期[1]。
结果 ：13 例子宫浆液性乳头状癌中 2 例 T1W 子宫形态欠规则，呈不均匀低信号肿块影，T2W 子宫正常 3 层结构消失，呈高低混杂信号肿块影，子宫浆膜面毛糙，双侧子宫角及输卵管间质部信号不均匀，增强 T1W 动脉期呈不均匀强化，延迟期仍强化，双侧髂血管旁均见肿大淋巴结，诊断子宫内膜癌Ⅳ期，与手术病理分期相符；10 例子宫形态正常，T2W 子宫内膜局限性或弥漫性不规则增厚，局部结合带中断，侵犯肌层（8 例>1/2 肌层，2 例<1/2 肌层），1 例与子宫浆膜分界欠清，4 例宫颈管积液，宫颈粘膜增厚，宫颈间质信号连续，2 例宫颈间质信号连续性中断，7 例发现盆腔肿大淋巴结，1 例子宫内膜不规则增厚，结合带显示不清，肌层似有侵犯，子宫周边脂肪间隙清晰，诊断 7 例子宫内膜癌III期，1 例Ⅱ期，2 例Ⅰ期；1 例子宫内膜不规则增厚，结合带显示不清，肌层似有侵犯，子宫周边脂肪间隙清晰，诊断为 1 期。3 例透名细胞癌 T2W 均表现为子宫内膜局限性增厚，结合带中断，侵犯肌层，1 例宫颈粘膜增厚，宫颈间质信号连续性中断，诊断Ⅱ期 3 例。
结论： Ⅱ型子宫内膜癌的磁共振表现与普通子宫内膜癌的表现有相似性，由于Ⅱ型子宫内膜癌手术病理分期较Ⅰ型晚，恶性度高，预后差，增强对本病的认识及敏感性，有助于本病的早期发现及正确诊断，为临床制定合理治疗方案提供重要依据。

EPO-1147

良性卵巢肿瘤合并腹水的影像分析(附 13 例报道)

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:目的 分析良性卵巢肿瘤合并腹水的 CT 表现,提高其诊断准确性.方法 收集经病理证实为良性卵巢肿瘤且合并腹
水患者的资料,分析肿瘤的种类、临床表现、肿瘤标志物及 CT 表现.结果 在伴发腹水的 1 0 6 例卵巢肿瘤中良性卵巢肿瘤 1 3 例,

约占１２．３％.其中,卵巢纤维泡膜细胞瘤 5 例、卵巢甲状腺肿 3 例、卵巢纤维瘤 2 例、卵巢粘液性囊腺瘤 2 例和卵巢硬化性间质瘤 1
例.患者平均年龄(４４±１６．５)岁.病灶长径平均(１３．２±４．７)cm.除黏液性囊腺瘤为完全囊性成分外,其他 4 类肿瘤均为囊实性成
分.增强扫描,卵巢甲状腺肿和卵巢硬化性间质瘤明显强化,其余 3 类肿瘤轻度强化. 1 例卵巢甲状腺肿有钙化.腹水 CT 值约
(１３±４)HU.所有良性卵巢肿瘤 CT 检查均未见腹腔淋巴结肿大及腹膜增厚等表现.结论　卵巢良性肿瘤合并腹水时,肿瘤实性
部分影像学形态及强化特征很难与恶性卵巢肿瘤进行鉴别诊断,而腹水密度低、腹膜无明显增厚及腹腔无明显肿大淋巴结可能是
诊断卵巢良性肿瘤最有价值的线索.

EPO-1148

卵巢甲状腺肿的 MDCT 和 MRI 表现

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目的:分析卵巢甲状腺肿（Struma Ovarii，SO）的多排螺旋 CT（MDCT）和 MRI 表现，总结具有诊断价值的征象。**材料与方法:**回顾性分析经手术病理证实的 10 例 SO 患者的临床资料及 MDCT 和 MRI 表现，其中 2 例同时行 CT 和 MRI 检查，图像分析包括病灶数目、位置、大小、形态、边界、密度、囊实性比例、强化幅度等；**结果:**10 例 SO 均为单发附件区囊实性肿块， 9 例为多房囊实性肿块，3 例伴高密度囊腔，MRI 显示大部分囊性成分 T1WI 为低信号，T2WI 为高信号，其中 1 例含高密度的囊液在 T2WI 呈极低信号；6 例病灶实性为主，平扫肿瘤边缘显示欠清，增强后轮廓清晰伴实性病灶明显强化（CT 增强幅度平均 87.5Hu）。此外，9 例伴有盆腔积液；3 例伴钙化，表现为实性区及囊壁簇状、蛋壳样钙化；4 例合并同侧成熟畸胎瘤。**结论:**SO 的 MDCT 及 MRI 表现具有一定的特征，当病灶内高密度囊液在 T2WI 呈极低信号、实性成分明显强化同时合并成熟畸胎瘤时，应考虑到 SO 可能。

EPO-1149

Iodine Concentration in Spectral CT: the Value of Differential Diagnosis for Urothelial Carcinoma of Bladder with Different Pathological Grades

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ObjectiveTo investigate the differential diagnosis value of single-source dual-energy CT iodine content in different pathological grades of Urothelial Carcinoma of the Bladder (UCB). **Methods 41**patients (male: female = 36:5, age:33-90y) with histopathologically proven urothelial carcinoma of bladder (UCB)were retrospectively analyzed, which included 25 cases of high grade of urothelial carcinoma of bladder

(HGUCB), and 16 cases of low grade of urothelial carcinoma of bladder (LGUCB). All patients underwent pelvic spectral CT three phases enhanced scans. The iodine (water) concentrations(IC)in the lesions that marked as ROI_T (ROI of tumor), and the iodine (water) concentrations that marked as ROI_Ain the arteria iliaca communis of the arterial and venous phase were measured, and the normalized iodine (water) concentrations (NIC, NIC = ROI_T/ROI_A) value was calculated on a GSI comprehensive analysis platform by two observers. The intra-class correlation coefficients (ICC) was used to check the consistency of the data measured by the two observers. The above parameters between the two groups were compared by t-test, and the ROC curve was used to evaluate the diagnostic efficacy of these parameters. **Results** The consistency of the data obtained by the two observers were good (ICC value > 0. 9). In arterial phase, both the IC and NIC ofHGUCB were significantly greater than those of LGUCB (P<0.05); and there were no differences for parameters between the two groups in the venous phase(P>0.05). The AUC (Area under the Curve) value for using the IC and the NIC in the arterial phase were retrospectively 0.692、0.778, which yielded sensitivity and the specificity of 88% and 56.2, 92% and 62.5%, respectively.**Conclusion** The iodine concentration and normalized iodine concentration in arterial phase of single-source dual-energy CT could quantitatively identify different pathological grades of urothelial carcinoma of the bladder, which has certain application value.

EPO-1150
单侧肾缺如或肾发育不良的真相：泌尿生殖系统联合畸形影像表现

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目的 探讨腹部影像检查表现为“单侧肾缺如/肾发育不良”患者的 CT 和/或 MRI 影像特征及其发病规律。 **方法** 回顾性分析 2010 年-2019 年影像诊断为“单侧肾缺如/肾发育不良”的 41 例患者 CT 或 MRI 资料，分析其影像特征并进行分类。 **结果** 所有病例均存在单侧肾缺如/肾发育不良，且经临床或手术证实为泌尿生殖系统联合畸形。男性 14 例，包括 12 例单侧肾缺如并同侧精囊腺囊肿（Zinner 综合征）；1 例伴嗅觉缺失的低促性腺激素型性功能减退症（Kallmann 综合征）；1 例右侧腹肌缺如，右肾缺如，左肾重复畸形，右侧隐睾，即梅干腹综合征（Prune-Belly 综合征）。女性 27 例，包括 12 例 Herlyn-Werner-Wunderlich 综合征，其中Ⅰ型有孔斜隔 3 例，Ⅱ型无孔斜隔 9 例，均伴双子宫畸形及单侧肾缺如；5 例双子宫并单侧肾缺如及中肾管残余； 4 例先天性无子宫并单侧肾缺如（Mayer-Rokitansky-Kuster-Hauser 综合征）；3 例单角/残角子宫并单侧肾缺如；2 例双子宫并单侧发育不良低位肾，输尿管异位开口于阴道；1 例盆腔融合肾伴输尿管异位开口于阴道，并胸 12 半椎畸形。影像特征及发病规律：①单侧肾缺如/肾发育不良常合并其它泌尿生殖系统畸形，且大部分为同侧泌尿生殖系统异常。②发育不良的肾均出现在输尿管走行区，体积一般小于正常，大部分为低位（腰 3 椎体水平以下至盆腔内）。③性别特异性：男性多见于 Zinner 综合征（中肾管未发育导致肾缺如，残留于精囊腺形成囊肿），女性见于多种子宫畸形，女性更易同时出现输尿管异位开口。 **结论** 对于腹部影像检查表现为“单侧肾缺如/肾发育不良”的患者，完善全腹部及盆腔影像学检查十分重要，有助于进一步明确诊断。这类患者常合

并泌尿生殖系统联合畸形，其病变位置及类型有一定的规律，应重点观察同侧输尿管、精囊及子宫。

EPO-1151

The Value of Spectral Curve in the Differential Diagnosis of Urothelial Carcinoma of the Bladder with different pathological grades

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Objective To investigate the value of spectral curves of the single-source dual-energy spectral CT in differentiating different histopathological grades of urothelial carcinoma of the bladder (UCB).**Methods 55** patients (male: female = 47:8, age:47-97y) with histopathologically proven single nodule UCB were retrospectively analyzed. Lesions were divided into two groups according to histopathological results, group A contains32 cases of HGUCB, group B contains 23 cases of LGUCB. All patients underwent abdominal spectral CT unenhanced and three phases enhanced scans. The CT values of the 140kVp polychromatic and 40-140keV monochromatic images in non-enhanced, arterial, and venous phases were measured, and the slopes of the spectral curves (CT value as function of energy) were calculated by two observers on a GSI comprehensive analysis platform. The intra-class correlation coefficients (ICC) was used to check the consistency of the data measured by the two observers.All the above parametersbetween the two groups were compared by t-test, and the ROC curve was used to evaluate thediagnostic efficacy of these parameters. **Results** The consistency of the data obtained by the two observers were good (ICC value > 0. 75). In the arterial phase, the CT values of the 40-100keV images, and the slope the curves in Group A were greater than those in Group B (P<0.05). There were no differences for all parameters between the two groups in the non-enhanced phase and venous phases (P>0.05). Among above parameters, The AUC value of the spectral curve slop was 0.740, which yielded sensitivity of 60.9%% and specificity of 84.4%. **Conclusion**the arterial phase spectral curve of single-souse dual-energy CT can identify different pathological grades of UCB, which provides clinical application values.

EPO-1152

多层螺旋 CT 血管重建在原发性腹膜后肿瘤诊断及术前评估的应用价值

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多层螺旋 CT 血管重建在原发性腹膜后肿瘤诊断及术前评估的应用价值
摘要：**目的** 探讨多层螺旋 CT 血管重建在原发性腹膜后肿瘤诊断及术前评估的应用价值。

方法 选择我院于 2018 年 1 月—2019 年 5 月期间收治的原发性腹膜后肿瘤患者 47 例,所有患者均经过手术病理检查确诊为原发性腹膜后肿瘤,以多层螺旋 CT 对 47 例患者进行扫描检查,并行 CT 血管重建，并将 CT 检查结果与手术病理检查结果进行比对,分析原发性腹膜后肿瘤临床诊断及术前评估中多层螺旋 CT 血管重建的应用价值。
结果 多层螺旋 CT 血管重建检测肿瘤病变定位诊断准确率为 98.65%;以病理诊断结果为依据,定性准确度 90.50%,灵敏度 87.85%,特异度为 92.34%;多层螺旋 CT 判断腹膜后肿瘤对周围脏器、血管有无侵犯和病理诊断结果对比具有一致性(P<0.05)
结论 原发性腹膜后肿瘤术前评估中,多层螺旋 CT 血管重建能够对腹膜后肿瘤术前进行精准评估,对于制定个体化治疗方案及手术具有一定的应用价值。

EPO-1153

Diagnostic performance of MR imaging-based features and texture analysis in the differential diagnosis of ovarian thecomas/fibrothecomas and uterine fibroids in the annexal area

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Purpose: To investigate the value of MR imaging-based features and texture analysis (TA) in the differential diagnosis of ovarian thecomas/fibrothecomas (OTCA/f-TCAs) and uterine fibroids in the annexal area (UF-iaas).
Materials and methods: This retrospective study included 16 OTCA/f-TCA and 37 UF-iaa patients who underwent conventional MRI and DWI between August 2014 and September 2018. Three-dimensional TA was performed with T2-weighted MR imaging. The clinical, MR imaging-based and texture features were compared between OTCA/f-TCAs and UF-iaas. Multivariate logistic regression analysis was performed to investigate the factors differentiating OTCA/f-TCAs from UF-iaas. ROCs were generated to analyse MR imaging-based features, texture features and their combination for discriminating the two diseases.
Results: Ipsilateral ovaries, arterial period enhancement, lesion components, peripheral cysts, “whorl signs”, mean ADC values and 6 texture features (Histogram-energy, Histogram-entropy, Histogram-kurtosis, GLCM-energy, GLCM-entropy, and Haralick Correlation) were significantly different between OTCA/f-TCAs and UF-iaas (P<0.05). Multivariate analysis of the clinical and MR imaging-based features revealed that arterial period enhancement (OR=0.104), peripheral cysts (OR=16.513), and “whorl signs” (OR=0.029) significantly differentiate OTCA/f-TCAs from UF-iaas (P<0.05), with accuracy, specificity and sensitivity of 83%, 75%, and 86.5%, respectively. Multivariate analysis of texture features showed that Histogram-energy (OR=0.011) significantly differentiated OTCA/f-TCAs from UF-iaas (P<0.05), with accuracy, specificity and sensitivity of 75.5%, 43.8% and 89.2%, respectively. The area under the curve (AUC) of imaging-based diagnosis was 0.907,

and the combination of imaging-based diagnosis and TA improved the AUC to 0.959 (P<0.05).
Conclusions: MR imaging-based features can be useful to differentiate OTCA/f-TCAs from UF-iaas. Furthermore, combining imaging-based diagnosis and TA can improve diagnostic performance.

EPO-1154

瘢痕子宫胎盘植入的 MRI 征象分析

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目的 探讨瘢痕子宫胎盘植入的 MRI 征象，EADC 值在胎盘植入中的作用。
方法 回顾性分析 2011 年 4 月至 2014 年 6 月期间。收集经手术病理或临床诊断证实的 30 例瘢痕子宫胎盘植入患者，患者均行 MR 检查；分析患者子宫异常隆凸、胎盘信号不均匀、T1wl 低信号条带、胎盘内出血、胎盘下血管增多、胎盘下肌层变薄或消失情况，并采用 EADC 值对胎盘植入处胎盘子宫内膜接触面进行精确分析。
结果 30 例瘢痕子宫胎盘植人组患者中，子宫局部异常隆凸 39 例，胎盘信号不均匀 32 例，胎盘内 T2WI 低信号条带 29 例，T1WI 胎盘下血管增多 26 例。胎盘植人患者中，胎盘植入处胎盘子宫内膜接触面 EADC 值 0.995±0.03（P≤0305）高于正常胎盘子宫内膜接触面 EADC 值 0.332±0.03（P≤0305）。
结论 瘢痕子宫胎盘植入的 MR 征象主要包括子宫局部异常隆凸、胎盘信号不均匀、T2WI 胎盘内低信号条带、胎盘下血管增多等，同时 EADC 值在瘢痕子宫胎盘植入鉴别有较好的鉴别价值。

EPO-1155

低浓度碘对比剂、低辐射剂量扫描结合体重指数在泌尿系 MSCT 一站式检查中的应用研究

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目的 探讨低浓度对比剂、低辐射剂量结合患者体重指数（BMI），在泌尿系 MSCT 一站式检查中的应用价值。
方法 前瞻性分析陆军军医大学大坪医院 2018 年 12 月至 2019 年 7 月拟行泌尿系 MSCT 一站式检查的患者，筛选体重指数小于 25（BMI<25kg/m^2）的，纳入 200 名屏气配合优良患者分为 4 组，每组 50 例。A 组为：BMI<20kg/m^2，对比剂浓度为 270mg/ml，管电压 100Kv；B 组为：20kg/m^2<BMI<25kg/m^2，对比剂浓度为 270mg/ml，管电压 120Kv；C 组为：BMI<20kg/m^2，对比剂浓度为 350mg/ml，管电压 100Kv；D 组为：20kg/m^2<BMI<25kg/m^2，对比剂浓度为 350mg/ml，管电压 120Kv；4 组均采用自动管电流调制法，进行容积扫描，扫描平扫期、动脉期、实质期及排泄期。对各组图像进行主观评分，在 CT 后处理工作站进行测量并记录客观评价指标（包括：图像噪声、腹主动脉 CT 值、肾动脉 CT 值、肾脏实质 CT 值），并记录辐射剂量。采用 Mann-Whitney U 检验比较图像的主观评分结果，对客观评价打的各项 CT 值进行配对样本 t 检验。

结果 各组图像均能满足诊断，且 A 与 C 组、B 与 D 组图像组间评分差异无统计学意义（P>0.05）；A 与 C 组、B 与 D 组间图像噪声、腹主动脉 CT 值、肾动脉 CT 值、肾脏实质 CT 值的差异均有统计学意义（P<0.05）；对于辐射剂量明显 A 组低于 C 组，B 组明显低于 D 组；组间差异均有统计学意义（P<0.05）。
结论 在行泌尿系 MSCT 一站式检查时，根据患者的体重指数（BMI），采用低浓度碘对比价、低管电压自动管电流调制技术进行扫描，能够获得理想的图像质量并有效的降低患者的辐射剂量。具有极大的应用价值。

EPO-1156

肾脏淋巴瘤的 CT 和 MRI 影像表现

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目的：探讨肾脏淋巴瘤的 CT 和 MRI 的影像表现，提高对此病的认识，以帮助临床诊断。
方法：回顾性分析我院手术病理证实的肾脏淋巴瘤患者 20 例，详细分析其临床特点及影像学特征。CT 检查 10 例，MRI 检查 10 例，男性 13 例， 女性 7 例，分析所有患者 CT 以及低场 MRI 弥散加权成像的影像资料， 总结其诊断价值。
结果：CT 以及低场 MRI 弥散加权成像结果显示，多发病灶与单发病灶分别是 7 例、3 例， 与此同时，腹膜后淋巴肿直接蔓延、肾窦受累、肾脏弥漫性浸润、肾周淋巴瘤患者分别是 6 例、4 例、3 例、2 例。所有患者中病灶境界模糊但信号（密度）均匀的 17 例，所有患者中 CT 平扫显示密度较高者 9 例，等密度者 1 例，在 MRI 平扫过程中，7 例患者在 T1WI 上与在 T2WI 上分别呈稍低信号与低信号。行增强扫描结果可见，20 例患者的病灶强化均明显低于正常肾实质，其中 15 例为渐进性强化，5 例为皮髓质期明显强化。
结论：在影像学中，肾脏淋巴瘤的图像资料表现多种多样，由于其表现形式多样，所以分析难度较大，CT 和 MRI 表现有一定特征，是诊断、分期和随访的重要方法，所以能够为临床诊断提供参考。

EPO-1157

Arterial spin labeling MR imaging for predicting microvascular invasion of renal cell carcinoma: initial experience

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PURPOSE

Microvascular invasion is the former step of vein cancer embolus, which depends on pathological diagnosis after the operation. The accurate prediction before the operation will provide valuable information on operation strategy, since according to the European Association of Urology Guideline Panel for Renal Cell Carcinoma, tumors with renal vein cancer embolus should be radical nephrectomy . This study aimed to

prospectively evaluate the performance of functional ASL imaging for predicting microvascular invasion of renal cell carcinoma which was confirmed histopathologically.

METHOD AND MATERIALS

Subjects

This study was approved by the institutional review board, and written informed consent was obtained from all patients before imaging. Between August 2017 and March 2018, a total number of 12 consecutive patients were enrolled in this study. The 12 consecutive patients underwent pre-surgical MR imaging evaluation of suspected renal masses.

MR Imaging

All patients underwent imaging using a clinical 3.0 T MR scanner (MAGNETOM Trio, Siemens AG, Erlangen, Germany) with a six-channel body matrix array coil. In all patients, image acquisition consisted of a coronal T2-weighted HASTE sequence (TR/TE, 1000/90 ms; flip angle, 150° ; slice thickness, 3.0 mm; matrix, 320x256; field of view, 45 x45 cm^2) and an axial T2-weighted TSE sequence (TR/TE, 1800/95 ms; flip angle 140° ; slice thickness, 5.0 mm; matrix, 320 x256; field of view, 38x 28 cm^2) for morphologic evaluation of kidneys.

For quantitative assessment of the renal perfusion, a coronal renal ASL was performed using a prototype flow-sensitive alternating inversion recovery trueFISP (FAIR-trueFISP) sequence with TI of 1200 ms for perfusion images and without inversion for M_0 images with the following parameters: TE/TR, 2.24/4.48 ms; flip angle, 70° ; slice thickness, 5.0 mm; matrix, 128x128; field of view, 30x 30 cm^2; measurements 12. ASL MR imaging was performed using a single section through the tumor pseudocapsule defect or through the center of the tumor without the pseudocapsule defect. A modified look-locker inversion-recovery (MOLLI) sequence was used for T1 mapping of the same slice. The images had the same special resolution with field of view of 30x30 cm^2 and matrix of 128x128. Respiration triggering was applied to minimize the motion artifact for perfusion imaging and M_0 imaging. A short breath-holding (5 second) was applied for T1 mapping. Renal blood flow was calculated using a homemade Matlab protocol (MATLAB 2012, Mathworks, Natick, MA) on a pixel by pixel basis using a one compartment model.

Imaging analysis

Quantitative analysis

Renal blood flow was measured on ASL images using region-of-interest (ROI) analysis by a single reviewer with 5 years experience in abdominal MRI. The ROI was drawn covering the whole tumor and the solid part of the tumor. The same ROI was then copied to the area outside the body to measure the background signal noise.

Reference standard

Results of histopathologic analysis served as the reference standard. The final histopathologic diagnosis was provided by two pathologists, both with more than 5 years experience. The diagnosis included tumor category and microvascular invasion.

Statistical analysis

Statistical analysis was performed using SPSS 19.0 software (SPSS Inc., Chicago, IL). The difference between perfusion of renal tumors and the background noise was assessed using paired samples t-test. $P<0.05$ was considered statistically significant. The diagnostic performance of ASL images for predicting microvascular invasion was

assessed using diagnostic test index: sensitivity, specificity, positive predictive value and negative predictive value.

Results

Image acquisition was completed successfully in 12 patients (7 males and 5 females, age range, 33-70, mean age, 51 years ± 14.1). Histopathologic diagnosis was obtained by means of radical nephrectomy (n = 2) or partial nephrectomy (n = 10). The mean interval between MR imaging and histological analysis was 4.2 days ± 2.5. The final diagnosis in the remaining masses included clear cell RCCs (ccRCCs) (n=11) and chromophobe RCC (n=1). None of the tumors had perinephric fat invasion and all of the tumors were classified as stage pT1. In the histopathologic analysis of the 10 ccRCCs (1 case was excluded since lack of perfusion), 5 cases presented with microvascular invasion and the other 5 cases with no features of microvascular invasion.

Imaging Features

The maximum diameter of the tumor ranged from 1.9 to 6.0 cm (mean, 3.3 cm ± 0.99): 2 tumors were localized on the left kidneys and 10 tumors were on the right kidneys. The majority of ccRCCs showed heterogeneous hyper signal intensity, and chromophobe RCC showed moderate signal intensity on T2-weighted images.

ASL perfusion

Within the 11 ccRCCs, 10 cases showed hyper blood flow in the solid part of the tumor (Fig. 1 and Table 1), but 1 case did not. Consistent with the T2-weighted images, the chromophobe RCC showed no hyper blood flow of the whole tumor. The mean perfusion value of the tumor was higher than the background noise (325.12 mL/min/100g versus 17.74 mL/min/100g, n = 10, $P<0.01$). Within the 10 ccRCCs, the mean perfusion value of the solid part of the tumor with microvascular invasion was higher than tumors without microvascular invasion (893.85 mL/min/100g versus 294.45 mL/min/100g, n = 10, $P<0.01$)

Diagnostic performance

Diagnostic test's index was used to compare the performance of ASL images for predicting microvascular invasion. Sensitivity, specificity, positive predictive value and negative predictive value were 100%, 66.7%, 90%, 100%, respectively. The area under ROC curve was 0.84.

Conclusions

In conclusion, ASL images produced promising diagnostic accuracy for predicting microvascular invasion of renal cell carcinoma, which could be an important step for improving clinical management of renal cell carcinoma.

EPO-1158

前列腺脓肿的影像诊断及鉴别诊断

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目的：探讨前列腺脓肿的 MRI 表现，提高对该病的诊断水平，更好地指导临床治疗。
方法：收集我院 2012 年至 2015 年经手术病理或临床证实的前列腺脓肿 8 例，年龄 49-74 岁。主要临床表现：6 例患者出现全身感染症状，如发热、血尿白细胞升高，5 例患者出现会阴部压痛明

显、急性尿潴留、尿频尿急等局部症状。全部患者接受了前列腺 3.0T MR 常规及 DWI 序列检查，回顾性分析其 MRI 表现。

结果：8 例前列腺脓肿均表现为长 T1 长 T2 囊性病变；脓肿有完整壁，囊壁 T1 信号略高于周围正常前列腺组织，T2 信号呈等低信号为主。4 例脓肿壁可见多发不连续分隔，信号与脓肿壁一致。8 例前列腺脓肿患者 DWI 序列：脓液均呈明显高信号（高于前列腺增生及前列腺炎）；ADC 图呈低信号，ADC 值明显低于正常前列腺、前列腺增生，平均 ADC 值为（0.623±0.087）×$10^{-3}mm^2/s$；脓腔较大时，ADC 图多表现为周围低信号，中央等信号。2 例患者病灶突破前列腺包膜，侵入前列腺直肠间隙。

结论：高场强 MRI 对前列腺脓肿的诊断具有很高的敏感性及特异性，尤其 DWI 序列对于鉴别前列腺脓肿与其它囊性病变具有独特优势；同时 MRI 可清晰显示前列腺脓肿的部位、侵犯范围及周围结构等。有助于临床医生对前列腺脓肿的 MRI 表现及其侵犯范围有一个直观、全面的认识，对临床治疗方案的制定提供客观依据。

EPO-1159

肾上腺少见和罕见肿瘤的 CT 分析

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目的 分析肾上腺少见和罕见肿瘤的 CT 表现，以提高影像工作者对此类肿瘤的认识。 **方法** 回顾性分析经手术及病理证实的 17 例肾上腺少见及罕见肿瘤的 CT 表现，观察肿瘤的发生部位、大小、边缘、密度、内部特征（钙化、囊变坏死等）及强化方式。 **结果** 17 例中脂肪瘤、支气管源性囊肿、皮质癌各 3 例；囊肿、淋巴管瘤各 2 例；畸胎瘤、血管瘤、节细胞神经母细胞瘤、平滑肌肉瘤各 1 例。CT 表现各具特征性，脂肪瘤呈均匀一致脂肪样低密度影；囊肿呈均匀一致水样密度影；畸胎瘤内部常出现脂肪、骨骼或钙化影；节细胞神经母细胞瘤可见伪足征；平滑肌肉瘤增强后呈延迟强化等。 **结论** 肾上腺少见和罕见肿瘤的 CT 表现有一定的特征性，需仔细分析，以提高诊断准确性。

EPO-1160

多层螺旋 CT 对输卵管炎的诊断价值

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目的：分析输卵管炎的多层螺旋 CT（Multisliecs helieal CT，MSCT）影像学特点，评估 MSCT 对输卵管炎的鉴别诊断价值。

方法：回顾性分析 15 例经手术、病理证实的输卵管炎的 MSCT 表现。CT 机为 GE LightSpeed 16 排和飞利浦 Brilliance iCT128 排机器。检查前 5 ~ 6 h 禁食，扫描前让患者饮水，使膀胱充盈；患者取仰卧位，扫描范围由耻骨联合下缘至病灶上缘水平，根据病灶大小适当调整扫描范围。图像层厚 5 mm，层距 5 mm 连续扫描，管电压 120 kV，管电流为机器自动调整。全部病例均行平扫及增强扫描。增强扫描采用动脉期（25 s）、静脉期（60 s）双期扫描。采用非离子型对比剂 100 mL，以 3 mL/s 流速，经肘前静脉由高压注射器注入。以常规算法重建图像（窗宽 250 Hu，窗位 80 Hu）。由 2 位放射医师以双盲法分别对 15 例患者的 MSCT 影像进行评估，共同分析病变位置、形态、大小、密度、内部结构、强化程度、边界。病理组织学检查方法包括：宫颈病理组织学检查和子宫内膜病理检查，检查结果阳性者可确定病变的性质。

结果：15 例病例共 26 个病灶，双侧 11 例，单侧 4 例。化脓性输卵管炎 7 例 13 个病灶，MSCT 表现为管壁增厚伴有明显强化，其中管壁呈管状及腊肠状 5 例，管径增粗，囊状及囊实性 2 例，囊壁及分隔可见强化；输卵管卵巢脓肿 2 例单侧，呈囊实性混杂密度，壁厚伴强化；慢性输卵管炎 6 例，输卵管壁略增厚伴强化，其中伴有积水 3 例。
结论：MSCT 检查能较好地显示输卵管炎症引起的形态结构改变，并可观察盆腔器官组织的受累及粘连情况，可对输卵管炎症做出准确诊断，对附件区包块的鉴别诊断有重要价值。

EPO-1161

MRI 诊断产后胎盘残留的临床价值

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目的：探讨产后胎盘残留的 MRI 表现及临床价值，方法： 分析 30 例临床诊断产后胎盘残留的 MRI 平扫及增强扫描表现特征。结果： 临床或手术病理证实的胎盘残留 3 例，胎盘粘连 5 例，胎盘植入 22 例，其中有 2 例为穿透性植入。MRI 诊断胎盘残留 28 例，有 2 例胎盘粘连诊断为胎盘植入，1 例穿透性植入只诊断为胎盘植入。MRI 表现：子宫明显增大；结合带局部模糊，中断；胎盘附着处子宫壁肌层变薄，平扫残留胎盘一般为稍长 T2 稍长 T1，等 T2 等 T1 混杂信号，其内间杂细小血管留空信号以及低信号线状胎盘小叶间隔。增强扫描可见残留胎盘明显不均匀强化，呈花瓣状或结节样强化，胎盘植入处可见多数迂曲、留空血管影像，增强扫描有明显强化。结论：MRI 检查能够发现产后产后胎盘残留的形态、大小、部位，判断胎盘植入的位置、大小以及深度。

EPO-1162

输卵管妊娠破裂和卵巢黄体囊肿破裂的 CT 诊断价值

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目的 探讨输卵管妊娠破裂和卵巢黄体囊肿破裂的 CT 特征及诊断价值。**方法** 回顾性分析 28 例经手术病理证实的输卵管妊娠破裂和卵巢黄体囊肿破裂的临床及 CT 资料，分析两者的 CT 表现特征及鉴别诊断要点。**结果** 28 例均表现为腹盆腔积血，以子宫及附件周围明显，而输卵管妊娠破裂出血通常量较多。18 例输卵管妊娠破裂表现为一侧宫旁或附件区混杂密度包块，周围积血包绕，其中 15 例包块中见圆形或卵圆形低密度孕囊；2 例病例同时合并另一侧附件的囊性占位（病理证实为黄体囊肿）。10 例黄体囊肿破裂出血中 8 例表现为一侧宫旁或附件区不规整的囊状低密度影，囊肿壁较厚呈环状，周围积血或伴血肿；2 例未见明确囊性密度影，仅见腹盆腔积血。**结论** 输卵管妊娠破裂和卵巢黄体囊肿破裂的 CT 表现均具有一定的特征，术前 CT 扫描可为临床提供较准确的诊断信息。

EPO-1163

糖尿病肾病 CT 和 MRI 征象及病理特点的综合分析

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目的：提高 CT 和 MRI 对糖尿病肾病的诊断水平。**方法**：回顾性的分析经临床确诊的 32 例糖尿病肾病，全部病例行 CT 或 MRI 动态增强扫描。**结果**：发现 6 例肾脏多灶性或单灶性的斑片状异常病灶，强化程度低于肾组织，18 例 MR-DW 序列双肾呈不均匀改变，肾脏肿大 10 例，萎缩 7 例，肾周间隙模糊 18 例伴肾周筋膜增厚 7 例，8 例伴脂肪渗出，肾动脉及分支弥漫性钙化 16 例，双肾细线状稍高密度影或肾乳头局灶性密度增高 14 例。.**结论**：糖尿病肾病在 CT 和 MRI 上能表现出一定的影像征象，并与其病理相关，认识这些征象，有助于提高诊断。

EPO-1164

Primary Fallopian Tube Carcinoma: characteristic imaging features with clinicopathological correlation

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Objective: To retrospectively evaluate the clinical, pathological, and Magnetic Resonance imaging features of primary fallopian tube carcinoma. **Materials and Methods:** The MR imaging features were analyzed including the tumor size, laterality, morphological nature, signal intensity, contrast enhancement, and presence of ascites, lymphy node metastasis were also evaluated .Clinical and pathological features, such as age, clinical symptoms, serum CA125 levels, treatment methods, and surgical-pathologic findings, outcomes on follow-up were analyzed. **Results:** 11 tumors in 10 patients were evaluated, Their ages ranged from 29 to 60 (mean age 50.5±5.1), 6 cases presented with the signs of vaginal discharge, 2 cases complaint pelvic pain, while 6 cases presented with adnexal mass, the serum CA125 levels elevated in 9 cases (33.5-117.7U/ml). Mean largest tumor diameter was 3.9 cm In MR imaging , 9 cases were unilateral (3 were right, 6 were left), 1 patient had bilateral involvement, the sausage-shaped lesion were noted in 8 tumors, cauliflower-shape nodular was seen in another 3 tumors, The solid tumors were low signal intensity on T1WI in all cases, slightly high sinal intensity on T2WI in 8 tumors, equal signal intensity in 3 tumors on T2WI, all 11 tumors were high signal intensity on diffusion weighted imaging with low signal intensity on apparent diffusion coefficient maps, moderately enhanced were found in 6 tumors , The “vestigital fallopian tube” sign were found in 9 tumors, hydrosalpinx were observed in 7 cases.10 serous carcinomas and 1 carcinosarcoma were found at final pathological diagnosis , 5 cases were staging Ia, another 5 case was staging Ic, IIa, IIb, IIIa, IIIb respectively in FIGO staging .**Conclusion:** Primary fallopian tube carcinoma, which has a worse prognosis, should be considered as a diagnosis for patients who have sausage-shaped solid masses with “vestigital fallopian tube” sign or hydrosalpinx.

EPO-1165

CT 多期改良增强参数对肾脏良恶性肿瘤鉴别诊断的研究

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目的 探讨基于 CT 平扫及三期增强的改良参数对肾脏良恶性肿瘤的诊断价值。**材料与方法** 回顾性分析肾恶性肿瘤（143 例肾透明细胞癌，25 例乳头状细胞癌，29 例嫌色细胞癌）及良性肿瘤（10 例嗜酸细胞瘤，19 例乏脂性血管平滑肌脂肪瘤）患者术前初诊 CT 扫描图像，比较①肾恶性肿瘤与肾良性肿瘤组、②肾恶性肿瘤与嗜酸细胞瘤组及③肾恶性肿瘤与乏脂性血管平滑肌脂肪瘤组改良增强参数的差异。**结果** 肾恶性肿瘤平扫期的相对灰度值低于肾良性肿瘤及乏脂性血管平滑肌脂肪瘤，为患者诊断的独立影响因素（$P<0.001$）。肾恶性肿瘤皮髓质期增强变化值（$P=0.006$）、实质期相对主动脉校正 CT 值（$P=0.028$）、相对肾皮质校正 CT 值（$P=0.025$）及排泄期相对主动脉校正 CT 值（$P=0.012$）均低于嗜酸细胞瘤，为肾恶性肿瘤患者诊断的独立影响因素，其中，多因素联合诊断区分肾恶性肿瘤与嗜酸细胞瘤的诊断效能 AUC 值达到 0.990。**结论** 多组改良增强参数对肾脏良恶性肿瘤鉴别的诊断效能优于直接测得的肿瘤 CT 值。

EPO-1166
基于身体质量指数优化管电流的低剂量 CTA、CTU 在滤波反投影法的应用研究

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【摘要】目的 探讨基于身体质量指数优化管电流的低辐射剂量、低对比剂量 CTA、CTU 在滤波反投影法的应用研究。 方法 回顾性分析 100 例怀疑泌尿系统病变行 CTA、CTU 检查根据拟定标准随机分的 A 组和 B 组的患者。A 组:常规剂量组（对照组），B 组：基于身体质量指数优化管电流组（观察组）。两组图像均经 Philips EBW 工作站对动脉期及延时期图像分别进行多平面重建(MPR)，容积再现重建(VR)，最大密度投影(MIP)，曲面重建(CPR)。 利用统计学软件 SPSS25 对两组肾动脉 CT 值、辐射剂量、SNR、CNR 以及图像质量评分进行分析。结果 观察组相比对照组辐射剂量降低统计学分析 P<0.05，总碘含量 P<0.05 观察组相较对照组具有统计学差异；肾动脉 CT 值统计学分析 P>0.05，图像 SNR、CNR 统计学分析 P>0.05，无统计学差异；两组在图像质量评分统计学分析上 P>0.05，两组腹区各血管系统以及泌尿系集合系统均很好显影，在解剖组织结构以及泌尿系统整体连贯性上对照组较观察组组要稍好。 结论 基于身体质量指数优化管电流的低剂量 CTA、CTU 在满足图像质量诊断的同时降低患者检查所接收的辐射剂量辐射剂量。

EPO-1167
Exploring the diagnostic value of CT multi-phase Radiomics models and traditional imaging models in the diagnosis of clear cell renal cell carcinoma

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Objective:

To explore the diagnostic value of differentiating clear cell renal cell carcinomas based on the CT multi-phase Radiomics features and traditional imaging features.

Materials and Methods:

A total of 197 pathologically proven renal masses from January 2013 to October 2018 treated in Nanfang hospital was included in our study. The above patients with renal tumors were divided into clear cell and unclear cell renal cell carcinomas groups.

First, a traditional imaging feature model was constructed. The CT values of the lesion and the corresponding attenuation of the aorta and adjacent normal renal cortex were measured by two radiologists to obtain the improved enhanced parameters. The three most discriminative features identified with each phase were entered as predictors in logistic regression models to construct a traditional diagnosis model. Secondly, a diagnostic model of Radiomics features was constructed. Two radiologists manually segmented the 3D tumor images and extracted the image radiomics features. LASSO regression screening was used to construct the Rad-scores based on the unenhanced and three enhanced phases.

Finally, all the above parameters with statistical difference in single factor comparison and rad-scores were included in the multivariate logistic regression analysis to build the combined diagnosis prediction model. The AUC, sensitivity, specific, positive predictive value, negative predictive value and accuracy were also concluded.

Results:

Differences in Rad-scores and enhancement changes of aortic version in the corticomedullary, nephrographic, and excretory phase were independent influencing factors in differential diagnosis of clear cell renal cell carcinoma and unclear cell renal cell carcinoma ($P < 0.001$). AUC values of the traditional diagnostic model, Rad-score model and the combined diagnostic model in differentiating the two groups were 0.748-0.823, 0.776-0.887 and 0.864-0.9, respectively. The AUC values of the three models were statistically significant ($P < 0.001$).

Conclusions:

By combining traditional CT improved parameters and Radiomics features to construct a combined diagnostic model, the predictive efficacy of clear cell renal cell carcinomas was significantly improved, which provided a reliable basis for clinical treatment options.

EPO-1168

Diffusion-weighted Imaging of Cervical Cancer: Feasibility of Ultra-high b value at 3T

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Objectives We sought to evaluate imaging quality and compare the signal intensity and apparent diffusion coefficient (ADC) maps of ultra-high b-value (2,000 s/mm^2) images

against those of 800 s/mm^2 b-value images in diffusion-weighted imaging (DWI) for cervical cancer.
Methods Sixty patients diagnosed with cervical cancer by biopsy were prospectively included. Female pelvis magnetic resonance imaging using a 3T magnetic resonance scanner was performed; B-value of 800 s/mm^2 and 2,000 s/mm^2 images were obtained for evaluation. Two radiologists blinded to the scan parameters evaluated the images for background suppression, spatial distortion, image ghosting, lesion diagnostic confidence, and whole imaging quality using a 5-point scoring system. Scores were compared using a paired Wilcoxon test.Interobserver agreement was evaluated by Cohen's kappa analysis. Signal intensity (SI) of tumour tissue was measured in b=800 s/mm^2 and b=2000 s/mm^2 images for tumour and normal reference tissues. Additionally, SI contrast ratios (CRs) were calculated and compared using the Mann-Whitney U test, ADC values of tumours and normal tissues were measured, and tumour maximum diameters were calculated with T2-weighted imaging.
Results Background suppression, lesion diagnostic confidence, and whole imaging quality scores were higher in b=2,000 s/mm^2 than b=800 s/mm^2 images (all $p < 0.001$). No statistically significant differences between the ultra-high and normal b-value images were noted in spatial distortion and image ghosting.Interobserver agreement was very good for all five aspects in both types of b-value images (all $\kappa > 0.8$).CRs of tumour-to-normal SI were also higher for b=2,000 s/mm^2 (0.63±0.11) than b=800s/mm^2 (0.55±0.12) images ($p<0.01$). CRs of tumour-endometrium (T-E) signal intensities also higher for b=2,000 s/mm^2(0.44 ± 0.14) than b=800 s/mm^2(0.26 ± 0.14) images ($p < 0.001$). Mean ADC values derived from b=2,000 s/mm^2 images showed better correlations with tumour differentiation grades than did those from b=800 s/mm^2 images. Tumour diameters measured by B2 imaging experienced smaller bias.
Conclusions Ultra-high b-value (2,000 s/mm^2) images in DWI demonstrated superiority in image quality and cervical cancer diagnosis to the commonly used normal b-value (800 s/mm^2) images in female pelvis.

EPO-1169

肾上腺占位 115 例影像及病理分析

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目的:分析、总结肾上腺占位的影像特点，提高肾上腺占位的诊断水平和疾病的综合分析水平,以期为患者提供更经济有效的临床策略。对象和方法:以 2018 年 3 月-2019 年 3 月经手术或穿刺病理证实的肾上腺占位作为研究对象，回顾性分析归纳肾上腺占位影像学表现及病理结果。结果:收集有病理诊断的肾上腺占位 115 例，分析其影像学表现。腺瘤 70 例：肾上腺腺瘤 CT 平扫的密度较低，对于密度较高的腺瘤增强延迟强化扫描 washout 明显，常大于 50%，磁共振反相位信号明显减低；腺瘤伴恶性肿瘤病史 9 例，伴良性肿瘤病史 1 例，其余为单一肾上腺腺瘤。嗜铬细胞瘤 9 例，影像表现为肾上腺区肿块，直径多为 3cm 以上，界限清楚，容易出血、坏死、囊变，一般强化较明显，T2WI 表现为高信号。由于肿瘤出血、坏死、囊变的比例不同及肿瘤间质间血管和纤维含量比例不同而导致强化程度及 T2WI 信号高低不同。嗜铬细胞瘤具备一定的转移倾向。肾上腺皮质癌 1 例，表现为肾上腺区巨大约 10cm 不规则形肿块,密度及计强化不均, ,内有坏死及陈旧性出血所致的不规则低密度区;肿块内见散在点片状钙化影。其强化程度不及时嗜铬细胞瘤。囊肿 4 例，表现为圆形或椭圆形肿块，边缘光滑锐利、壁薄而一致，少数囊肿边缘有弧线状钙化。肾上腺转移癌

16 例，形态不规则,大小不等,强化不均,其中 2 例为双侧转移,其中乳腺癌来源 1 例，肺癌来源 6 例，肝癌来源 2 例，肾癌来源 3 例；肠癌来源 1 例；胃癌来源 3 例。另髓脂肪瘤 3 例,脂肪瘤 1 例,肾上腺神经鞘瘤 1 例,肾上腺海绵状血管瘤 1 例,神经节细胞瘤 2 例,肾上腺增生 7 例。结论 本次回顾分析肾上腺占位病例的良性、恶性、转移性及有恶性转移倾向的嗜铬细胞瘤的比例分别为 77.4%，0.8%，13.9%，7.8%，其中腺瘤良性占位伴有恶性肿瘤的病例占 12.8%.应注意与恶性病变区分，CT 和 MR 能够为术前疾病的诊断提供正确思路及合理分期。

EPO-1170

原发性肾脏滑膜肉瘤的 CT 及 MRI 影像表现

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目的 分析原发性肾脏滑膜肉瘤的 CT 及 MRI 影像表现，提高诊断水平。**方法**回顾性分析本院经手术或穿刺病理证实的 4 例原发性肾脏滑膜肉瘤的临床及影像资料。1 例行 CT 平扫，1 例行 MRI 平扫，2 例行 CT 平扫及三期增强扫描（其中 1 例同时行 MRI 平扫），记录病灶的位置、形态、大小、边缘、密度/信号特点、强化特点、肾周侵犯情况、有无下腔静脉及肾动静脉瘤栓、有无淋巴结及远处转移。**结果** 4 例原发性肾脏滑膜肉瘤患者中，男 2 例，女 2 例，年龄 30～60 岁，平均年龄 44 岁。4 例病灶均表现为边界清楚的单发囊实混杂软组织肿块，3 例位于右肾，1 例位于左肾。肿块最大径 6.8～15.4cm(平均大小 11.2cm)。3 例病灶与邻近肾实质分界清晰。4 例病灶均发生出血，其中 1 例破裂至肾包膜下。3 例病灶显示假包膜。4 例病灶囊壁均清晰光整，1 例伴有壁结节。4 例病灶均可见分隔。2 例 CT 增强扫描病灶实性软组织成分、壁结节及分隔均呈轻中度渐进性强化。1 例 MRI 平扫可见三重信号征、液液平。1 例病灶出现片状钙化伴出血。2 例出现下腔静脉瘤栓，1 例出现肾静脉瘤栓，1 例伴有腹膜后淋巴结转移，1 例伴有肺转移。**结论** 当年轻成人出现囊壁边界清楚、有假包膜、伴有分隔及出血的囊实性肿块，增强扫描实性成分、囊壁、分隔呈“快进慢出”型轻中度渐进性强化，且无腹膜后淋巴结肿大时，应考虑到原发性肾脏滑膜肉瘤的可能性。

EPO-1171

肾脏上皮样血管平滑肌脂肪瘤影像学表现

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目的：肾脏上皮样血管平滑肌脂肪瘤((epithelioid angiomyolipoma,EAML ），是血管平滑肌脂肪瘤(AML) 的一种罕见亚型，以上皮样细胞增殖为主，是具有恶变潜能的间叶组织肿瘤。探讨肾脏上皮样血管平滑肌脂肪瘤与肾脏血管平滑肌脂肪瘤的影像学特征。
方法：回顾性分析 2017 年 1 月至 2019 年 6 月经手术病理证实的 6 例（男 4 例女 2 例）EAML 和 6 例 AML(男 3 例女 3 例)的影像学表现，所有病例术前均进行了双肾 MSCT 平扫及动态增强扫描。4 例患者行腹部超声检查。
结果：EAML6 例患者中 4 例为单发，2 例为多发，AML 组中 6 例患者中 5 例为单发，1 例为多发，但两组患者多发病灶中仅最大病例行手术切除病理证实。EAML 组中 6 例患者共计 9 处病灶，其中乏脂病变为 5 处（占 56%），乏脂病变大小为（1.41±0.16）×（1.18±0.18），AML 组中 6 例患者共计 8 处病灶，其中乏脂性病变为 5 处（占 62.5%），病变大小为（2.68±0.13）×

（2.36±0.33），两组患者数值有统计学差异（P＜0.001）；EAML 组病例病灶中 8 处病灶突出于肾脏轮廓之外,1 处病灶位于肾实质轮廓之内； AML 中 4 处病灶突出于肾轮廓之外，3 处病灶位于肾轮廓之内，1 处病灶位于肾盂内。EAML 及 AML 组病变平扫 CT 值分别为（49.56±10.14），（45.4±1.97），EAML 及 AML 皮髓质期病变 CT 值为（111.72±18.20），（91.9±21.09）;EAML 及 AML 组实质期病变 CT 值为（94.13±14.99），（93.48±14.82），两组患者 CT 平扫及增强之间没有统计学差异（p 均＞0.05）。EAML 组中 3 例行超声检查，回声为低回声、混合回声、中等回声；AML 组中 3 例行超声检查，1 例误诊为肾囊肿，2 例为中等回声、稍高回声。所有病例均无局部浸润、血管受累和远处转移。

EPO-1172

基于双源双能量 CT 双能量扫描模式下低管电压联合迭代重建在泌尿系结石诊断中的临床应用研究

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目的 基于双源双能量 CT 双能能量扫描模式探讨低管电压联合迭代重建（SAFIRE）技术对泌尿系结石检查的可行性。**方法** 前瞻性纳入因怀疑泌尿系结石来我院行全腹部 CT 平扫检查的患者 55 例，均采用双能量扫描模式，A、B 球管电压及参考 mAs 分别是 80kVp/419mAs、Sn140kVp /162 mAs，旋转时间 0.5s，螺距 0.7，准直 32×0.6mm。采用线性融合技术，权重因子 M=0.5，滤波反投影重建（FBP）技术，获取类似于 120kVp 的标准管电压图像（a 组），作为本研究图像质量的参考标准；低管电压 80kVp（b 组）图像采用迭代重建（SAFIRE）技术；重建层厚和间距均为 3mm。记录低管电压和标准管电压组检查的结石数量、大小及 CT 值，肾实质的 CT 值及噪声（SD），并计算其信号噪声比（SNR）。采用 SPSS17.0 软件进行统计学分析，计量资料以`x±s 表示，采用配对样本 t 检验进行组间比较，以 P<0.05 有显著性统计学差异。**结果** a、b 两组均检出所有结石，共计 189 粒，其中肾结石 134 粒，输尿管结石 50 粒，膀胱结石 6 粒。结石大小（1.07±0.55cm/1.06±0.64cm）、肾实质 SD（11.64±2.30/11.81±2.29）及肾实质 SNR（3.09±0.72/3.08±0.73）均无统计学差异（t=-1.462，t=1.013，t=-0.290，P 均>0.05）；结石 CT 值（802.67±398.08HU/1003.18±513.98HU）和肾脏 CT 值（34.55±3.18HU/34.92±3.91HU）存在统计学差异（t=12.635，P<0.001；t=2.15，P<0.05）。**结论** 低管电压联合迭代重建图像质量与标准管电压图像质量大致相当，并不影响泌尿系结石的准确诊断。

EPO-1173

Value of PI-RADS Version 2 scores and PSA levels for the diagnosis of prostate cancer

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PURPOSE

To explore the value of Prostate Imaging Reporting and Data System Version 2 (PI-RADS V2) and serum prostate specific antigen (PSA) for the diagnosis of prostate cancer (PCa).

METHOD AND MATERIALS
932 males who underwent multi-parametric MRI (MP-MRI) in our hospital. 245 patients with prostate cancer confirmed by biopsy. Receiver operating characteristic curve(ROC) analysis was used to analyze the efficacy of PI-RADS V2 and PSA in the diagnosis of clinically significant prostate cancer (sPCa), in addition, ROC was performed to analyze the efficacy of PI-RADS V2 in peripheral zone(PZ) and transitional zone(TZ)

RESULTS
he correlation coefficient between the PI-RADS V2 scores and the prognostic Gleason grade groups was r=0.703 (p<0.01); the correlation coefficient between the PSA level and the prognostic Gleason grade groups was r=0.446 (p<0.01). When using PI-RADS V2 for the diagnosis of clinically sPCa, the area under the curve (AUC) was 0.942, the optimal diagnostic threshold was 4 category, the sensitivity was 0.949, and the specificity was 0.806, P<0.01; When using the PSA level for the diagnosis of clinically sPCa, the AUC was 0.786, the optimal diagnostic threshold was 13.23ng/ml, the sensitivity was 0.836, and the specificity was 0.581, P<0.01. In the peripheral zone (PZ), when using PI-RADS V2 for the diagnosis of clinically sPCa, the AUC was 0.924, the optimal diagnostic threshold was 4 category,the sensitivity was 0.947, and the specificity was 0.765, P<0.01; In the transitional zone (TZ), when using PI-RADS V2 for the diagnosis of clinically sPCa, the AUC was 0.964, the optimal diagnostic threshold was 4 category, the sensitivity was 0.950, and the specificity was 0.857, P<0.01.

CONCLUSION
Significant positive correlation were found between the PI-RADS V2 score and prognostic Gleason grade groups, some extent positive correlation were found between PSA and prognostic Gleason grade groups. PI-RADS V2 performs better than PSA level and is slightly better for diagnosing TZ lesions than PZ lesions. PSA has certain value for the diagnosis of clinically sPCa.

EPO-1174
基于 TNM 分期的膀胱癌结构式报告系统在医学影像中的应用

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基于 TNM 分期的膀胱癌结构式报告系统在医学影像中的应用
目的：本研究开发了用于评估膀胱癌的结构式报告模板，以自动确定肿瘤分期，从而提高诊断信息的可用性，并促进影像学科的信息化。
方法：膀胱癌结构式报告模板包含两个部分。 一，临床评价：如病理类型、病理等级等。二，图像评价：i，病变描述，如位置，形态，数量等; ii，肿瘤侵犯，包括肌层浸润和外周侵犯，以及肿瘤与前列腺、精囊、直肠、盆腔壁、腹壁之间的关系; iii，淋巴结转移，包括淋巴结短径、位

置、数量; iv，远处转移，如非区域淋巴结转移、内脏转移。膀胱癌分期采用的是第 7 版的 AJCC。肿瘤描述后，TNM 分期可以自动获得并植入结构式报告中。
结果：放射科医师可以通过轻松点击并填充结构式报告，自动生成膀胱癌的肿瘤分期。 由于报告中使用了 Redlex 标准化词典，减少了诊断医师之间的差异，提高了报告和临床信息的质量，并促进了数据挖掘，因此结构式报告被广泛接受并成为将图像信息转换为数据的理想载体。它还为医学影像教学提供了一种新模式，帮助医师开发膀胱癌的影像诊断思路，并减轻肿瘤分期的记忆困难。
结论：疾病特异性的结构式报告可以在医学中被接受和推广，因为它可以完整、清晰地传输图像检查信息，并提高医学影像工作的质量。

EPO-1175

Comparative Study of DCE-MRI Pharmaceutical Kinetic Models and MVD for Characterizing Endometrial Carcinoma Microcirculation

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Porpose: To compare five pharmacokinetic models for the analysis of dynamic contrast enhanced (DCE) magnetic resonance imaging (MRI) and study the angiogenic profile based on histomorphological marker in assessing microcirculation in endometrial carcinoma.
Methods: From April 2017 to July 2018, 69 female adults(mean age, 52 years; age range, 24－78 years) were recruited who were pathologically confirmed as endometrial cancer. Pelvic DCE-MRI was acquired with a temporal resolution of 2.5 s. Regions of interest were drawn by radiologists and the data was analyzed where Tofts, extended Tofts, adiabatic tissue homogeneity (ATH), conventional compartmental (CC) and distributed parameter (DP) models. Immunohistochemical staining with CD105 allowed assessment of microvessel density (MVD). Transfer constant(Ktrans), efflux rate constant(Kep), Blood flow (F), permeability surface area product (PS), plasma space fractional volume (Vp), extravascular extracellular space fractional volume (Ve), and extraction fraction (E) were derived. For all the derived imaging parameters and MVD, 95% confidence interval (CI) of the median were calculated. And the parameters were compared using receiver operating characteristic (ROC) analysis to differentiate tumor and normal myometrium.
Results: Permeability parameters Kep, E and PS in tumor were lower than normal myometrium. Areas under ROC curves(AUCs) for PS were >0.7 in three models. And AUCs for E was >0.75 in DP model, >0.65 in ATH and CC models. Kep was >0.75 and >0.6 for Tofts and Extended Tofts models respectively. The difference in Ktrans between two tissues was not significant. F in tumor was slower, with all AUCs >0.7. Ve and Vp in tumor were significantly lower, Vp with AUC >0.75 for DP and CC models, and <0.6 for ATH and Extended Tofts models. AUCs for Ve attained the largest value with AUCs >0.8 for four models except CC model(AUC<0.65). ATH-derived Ve attained the largest AUC value of 0.8474.MVD in tumor was lower than the normal myometrium, with AUC value of 0.879.
Conclusion:endometrial carcinomais characterized by low permeability and low blood flow in comparison with most solid tumours. Of the models investigated, the adiabatic

tissue homogeneitymodel was the best predictor of predict the depth of myometrial invasionin endometrial cancer patients.

EPO-1176
动脉自旋标记 MRI 在慢性肾功能不全分肾功能评估中的应用价值

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目的 探讨动脉自旋标记 MRI（ASL-MRI）评估慢性肾功能不全分肾功能的价值。
方法 回顾性分析 22 例慢性肾功能不全者 3.0 T 磁共振进行 ASL 扫描及常规 MRI 扫描，得到分肾肾皮质的肾血流量(renal blood flow，RBF)，且所有受试者均行 99mTc-DTPA 肾动态显像 Gates 法测定肾小球滤过率（Gates-GFR），并作为评价分肾功能的临床参考标准。根据两肾总的 Gates-GFR 将所有受试者分为三组：Ⅰ组（GFR ＞ 60 mL/min），Ⅱ组（30<GFR≤60 mL/min），Ⅲ组（GFR ≤30 mL/min）。采用独立样本 t 检验比较各组肾皮质 RBF 值的差异，两肾肾皮质的 RBF 值分别与分肾 eGFR 进行 Pearson 相关性分析及 Bland-Altman 一致性检验。
结果 Ⅲ组 RBF 值（152.37±19.82）ml/100g/min 显著低于Ⅰ组（221.60±15.47）ml/100g/min 和Ⅱ组（189.92±16.45）ml/100g/min，其差异有统计学意义（P<0.05）。两肾肾皮质的 RBF 值分别为:左肾（191.28±18.63）ml/100g/min、右肾（197.39±17.15）ml/100g/min，每侧肾皮质 RBF 值与其同侧肾 eGFR 具有很好的一致性，且呈正相关（r=0.79，P<0.05）。
结论 ASL-MRI 可以无创、无辐射评估分肾功能，是分肾功能检测的潜在替代。

EPO-1177
磁共振定量测量腹部脂肪评估子宫内膜癌生物特征的应用价值

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目的：探讨通过磁共振测量腹部脂肪量及脂肪分布评估子宫内膜癌生物特征的应用价值。**方法**：回顾性收集经手术及病理确诊正常患者 50 例和子宫内膜癌患者 104 例，获取生物特征信息包括病理分期、分级、脉管浸润和 Ki-67 表达，通过 MRI 测量入组患者腹部脂肪参数包括腹部皮下脂肪厚度，腹部皮下脂肪面积、腹部内脏面积和腹部总脂肪面积。采用 Mann-Whitney U 检验比较各组腹部脂肪参数，腹部脂肪参数和 Ki-67 阳性表达率的相关性采用 Spearman 方法评价。**结果**：子宫内膜癌患者各腹部脂肪参数均明显高于正常患者（P<0.001）；高分化子宫内膜癌患者腹部脂肪参数明显高于低分化组（P<0.05）；I 期子宫内膜癌患者腹部脂肪参数均明显高于 II 和 III 期患者（P<0.05），IIA 和 IIB 期患者腹部脂肪参数明显高于 III 期患者（P<0.05）；无脉管浸润患者腹部脂肪参数明显高于有脉管浸润患者（P<0.05）。Ki67 的表达与腹部脂肪参数呈负相关性（P<0.05）。**结论**：腹部脂肪含量较高者更易罹患子宫内膜癌，但其分化程度和侵犯性较低，利用磁共振定量测量子宫内膜癌患者腹部脂肪可用于评估这些生物特征。

EPO-1178

用 mDixon-quant 序列定量睾丸和附睾中脂肪沉积：与年龄和射精的相关性

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目的：本研究的目的是通过用 mDixon-quant 定量测量脂肪/水信号比，定量评估睾丸和附睾中的脂肪沉积，并探讨其与年龄和射精的关系。
材料与方法：对 120 例患者进行常规盆腔 MR 成像和 mDixon-quant 定量分析。根据 mDixon-quant 定量的脂肪/水信号强度，测量睾丸和附睾的脂肪/水信号比值。
结果：早年成年组（0.952～3.550%，P<0.05，5.182～12.725%，P<0.05）睾丸和附睾的脂水信号比值明显高于幼儿组（0.611～2.198%，1.310～4.520%）和青年组（0.659）；-2.360%和 1.568-4.469%，但均低于中年成年组（1.538-4.249%，P<0.05，5.830-19.002%，P<0.05）。青年组每月射精 10 次以上（0.750～2.022%，P<0.05），12 小时内射精 3 次的一名受试者睾丸脂肪沉积减少，附睾的脂水信号比下降。
结论：本研究结果表明，mDixon-quant 定量法可作为评价睾丸和附睾脂肪沉积的无创、定量和客观方法。该方法可指导不同年龄组不同射精经验的睾丸和附睾脂肪沉积。此外，我们的研究结果还可以通过定量测量睾丸和附睾的脂肪沉积，从而更准确地诊断和监测睾丸和附睾的生殖功能。

EPO-1179
肾脏及肾上腺肿瘤伴下腔静脉瘤栓的影像诊断

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目的 下腔静脉瘤栓为起源于血管壁的从邻近器官如肝脏、肾脏、肾上腺、等肿瘤，向下腔静脉腔内延伸引起。诊疗方案的制定，需要准确的影像评肿瘤的类型、分期、下腔静脉瘤栓分级。本研究结合原发肿瘤病理特征，分析瘤栓超声及 CT、核磁影像表现，并探讨超声在瘤栓诊断的价值。
方法 回顾性分析我院 2014.1-2019.1 经手术、穿刺病理或其他影像学证实的肾脏及肾上腺肿瘤伴下腔静脉瘤栓患者共 146 例。分析原发肿瘤的病理类型及超声、CT 或/和核磁的影像学表现及其瘤栓的影像特征。
结果
1. **不同病理类型瘤栓**。病理结果明确患者共 116 例，肾透明细胞肾细胞癌 86 例（74%），乳头状肾细胞癌 13 例（11%）其他类型共 17 例（15%）。
2.**下腔静脉瘤栓**。超声提示静脉管径内均可见低、等或高回声填充。下腔静脉瘤栓长度 2.6-14.4cm。下腔静脉瘤栓可分为充满型及未充满游离瘤栓。
3.**心房内瘤栓。**MayoⅣ级的心房内瘤栓共 11 例，其中 8 例手术治疗，4 例选择保守治疗。超声心动图可以评估心房瘤栓大小、形态、活动度，动态监测，判断心房内瘤栓对麻醉血流的影响、协助心外医生判断是否需打开心包取栓，具有重要临床价值。
4.**下腔静脉瘤栓伴血栓**。下腔静脉例瘤栓伴血栓 17 例。核磁主要依据增强是否强化来鉴别癌栓血栓。超声通过二维形态、血流频谱及超声造影表现可以提高血栓鉴别的准确性。
5.血管异常情况。CTA 及增强核磁对于多支静脉、侧枝循环显示优于超声。
结论 不同病理类型肾及肾上腺肿瘤伴下腔静脉瘤栓肿瘤影像表型不同，需全面综合评估。其中超声可以显示原发肿瘤、瘤栓范围、活动度鉴别瘤栓有无信号及动脉或静脉频谱、下腔静脉的管径大小、观察下腔静脉血流，及残余管腔血流信号及是否伴下肢静脉血栓。超声造影可以增加瘤栓伴血

栓鉴别的准确率。超声心动可以动态、直观地评估心房内瘤栓，对治疗方案及术前影像评估、预后随访有重要临床价值。

EPO-1180

Radiomic models based on enhanced-CT scanning to distinguish renal clear cell carcinoma from non-clear cell carcinoma

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Objectives: To establish predictive radiomic models based on enhanced-computed tomography (CT) scan images of renal cell carcinoma (RCC), and assess the accuracy of the predictive model for distinguishing clear cell RCC (ccRCC) from non-clear cell renal cell carcinoma (non-ccRCC).
Methods: This retrospective study analyzed 100 cases with RCC which were confirmed by pathology. The region of interest (ROI) of all the lesions were delineated in cortical phase. The samples were randomly divided into two groups, including training set and testing set according to the ratio of 7:3, a total of 396 radiomic features were computationally obtained. The ANOVA test, general linear model, and the first 10% mutual information were used to decrease the dimension of features. Finally, 8 features were selected, Logistic Regression model (LR) and Random Forest model (RF) were established to discriminate RCC subtypes, and were validated using 4-fold cross-validation.
Results: RF model and LR model were established based on the 8 features of enhanced-CT scan images of 100 cases (cortical phase). The RF model had an area under the curve (AUC) value of 0.988 (0.972), a sensitivity of 0.93 (0.875), a specificity of 1(1), and an accuracy of 0.943 (0.9) in the training (testing) set. The LR model had an AUC value of 0.865 (0.868), a sensitivity of 0.667 (0.75), a specificity of 0.923 (1), and an accuracy of 0.714 (0.8) in the training (testing) set.
Conclusion: We can conclude that RF model had higher accuracy than LR model in distinguishing ccRCC from non-ccRCC, and showed high sensitivity and specificity.

EPO-1181

卵巢卵泡膜纤维瘤组肿瘤的 CT 诊断价值

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目的：分析卵巢卵泡膜纤维瘤组肿瘤的影像表现，提高其诊断水平。
方法：回顾性分析 28 例卵巢卵泡膜纤维瘤组肿瘤的临床及 CT 资料，分析 CT 征象，并与病理进行对照。

结果：28 例患者中 27 例（96.4%，27/28）表现为单侧肿块， 1 例（3.6%，1/28）为双侧肿块，共计 29 个病灶。病理证实纤维瘤 21 个，卵泡膜-纤维瘤 7 个，卵泡膜细胞瘤 1 个。肿块大小约 4.0cm×4.0cm×3.2cm～14.0 cm×12.2 cm×10.7 cm，最大径平均约 9.7±2.3cm。15 个（51.7%，15/29）可见卵巢血管蒂征阳性，能判断肿瘤起源，14 个（48.2%，14/29）未见卵巢血管蒂征，无法准确判断起源。19 个（65.5%，19/29）呈圆形或类圆形，7 个（24.1%，7/29）形态不规则，3 个（10.3%，3/29）呈分叶状。25 个（86.2%，25/29）病变边界清楚、与子宫及周围肠管分界清楚，3 个（10.3%，3/29）局部与子宫分界不清，1 个（3.4%，1/29）因蒂部扭转与周围肠管分界不清、但与子宫分界清楚。25 个（86.2%，25/29）肿块以实性成分为主；2 个（6.8%，2/29）肿块呈囊实性，最后经病理证实 2 个囊实性肿块分别为卵泡膜细胞瘤和卵泡膜-纤维瘤；2 个（6.8%，2/29）肿块以钙化为主，患者年龄较小均为 21 岁，经病理证实均为纤维瘤。增强扫描 15 个（51.7%，15/29）为轻度强化，11 个（37.9%，11/29）为无强化，2 个（6.9%，2/29）为中度强化，1 个（3.4%，1/29）为重度强化，1 个中度强化者内可见纤细的血管影。13 例（46.4%，13/28）合并腹水，其中 11 例为少量腹水，2 例为中等量腹水。

EPO-1182
超低管电压（80kVp）在低体重患者肾动脉 CT 成像中最佳 ASIR-V 权重的探索

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目的：探索超低管电压（80kVp）在低体重患者肾动脉 CT 成像中的最佳 ASIR-V 权重。
方法 前瞻性收集我院进行 Revolution CT 肾动脉成像患者 20 例，排除标准为：①BMI≥25Kg/m²；②有造影剂过敏史者；③肝、肾功能不全者。扫描条件管电压 80kVp，噪声指数（NI）为 10，自动管电流技术，对比剂浓度 350mgI/kg，对比剂种类选取碘帕醇 370mgI/ml。扫描完成后采用 0%-100% ASIR-V 重建（重建间隔 20%），重建层厚为 1.25mm。分别在双肾动脉及同层面背部皮下脂肪放置感兴趣区（ROI），记录其 CT 值及 SD 值，计算信噪比（SNR=CT/SD）及对比噪声比(CNR=（CT 肾动脉-CT 脂肪）/SD 脂肪)，采用 5 分法对各组图像质量进行双盲法主观评分（5 分，图像质量最好；1 分，图像质量最差）。采用单因素方差分析比较各组间 CT 值、SD 值 SNR 及 CNR，两名医师主观评分一致性采用 Kappa 检验，评分采用 Friedman 秩和检验。结果：随着 ASIR-V 权重由 0%增加至 100%，SD 值逐渐降低，SNR、CNR 值逐渐增加，且各组间差异具有明显统计学意义（p<0.001）。 当 ASIR-V 比例由（0%）增加至（80%）时，图像主观评分依次增高，从 90% ASIR-V 开始，图像主观评分逐渐降低，80% ASIR-V 的主观图像质量最好。80kVp 肾动脉成像时平均辐射剂量约为（2.11±0.22）mSv。

EPO-1183
基于常规 MR 原发肿瘤大小对于 IB 期宫颈癌淋巴结转移的预测价值

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目的：评估常规 MR 原发肿瘤大小对于ⅠB 期宫颈癌淋巴结转移的预测价值。

方法：回顾性分析 2015 年 1 月-2018 年 12 月间在辽宁省肿瘤医院收治的宫颈癌的患者，由影像医师测量肿瘤径线及淋巴结短径依据患者淋巴结有无转移，将数据分为淋巴结转移组及非淋巴结转移组，比较两组间肿瘤径线的差异，并使用 ROC 曲线分析，计算曲线下面积(area under the curve, AUC)评估肿瘤径线对于淋巴结转移与否的诊断价值。再依照患者淋巴结短径大小，将数据划分为三组，分别为短径＜5mm、短径≥5mm 且＜10mm 及短径≥10mm 组，并分别评估肿瘤径线在亚组间的诊断价值是否存在差异。
结果：肿瘤前后径在淋巴结转移组与无转移组两组间的差异无统计学意义（p＞0.05）。肿瘤上下径、左右径及最大径在两组间的差异有统计学意义（p＜0.05）。鉴别淋巴结是否为转移淋巴结时，上下径 AUC（0.727）最大，其次是最大径（0.715）及左右径（0.686）。淋巴结短径＜5mm 组未见转移淋巴结，淋巴结短径≥10mm 组各项均无统计学意义（p＞0.05），只有淋巴结短径≥5mm 且＜10mm 组的肿瘤上下径和最大径在淋巴结转移组与无转移组间差异存在统计学意义，在鉴别淋巴结是否为转移淋巴结时，上下径 AUC（0.710）最大，其次是最大径（0.695）。
结论：在评估肿瘤径线对淋巴结转移的诊断价值中，上下径较最大径的表现更优异，尤其是对于判断正常大小淋巴结性质。前后径及左右径对诊断淋巴结情况的价值有限。

EPO-1184

原发性肾上腺肉瘤样癌一例

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患者，男，55 岁，因“体检发现白细胞明显升高 1 周”一般情况良好，既往史无特殊，骨穿提示：髓像粒系比值增高，CT 扫描：右侧肾上腺巨大类圆形等/稍低混杂密度肿块影，大小约 10×7cm，边界尚清，增强扫描动脉期不均匀强化，静脉期持续强化，，腹膜后多发小淋巴结。手术及病理诊断：经右侧沿肋缘下逐层切开入腹，完整移除肿瘤并清扫淋巴结。标本切面灰白灰黄质韧，似有包膜；镜下见：细胞核深染，胞浆丰富，见核分裂象，伴坏死及炎细胞浸润，IHC:PCK(+) 、CK8/18(+)、 VIM(+)、 LCA(-) S-100(-) 、SOX-10(-) 、SMA（-）、 Desmin（-）、KP-1(弱+) 、PGM-1(-)、、INI-1（+）、HMB45（-）、Ki-67(Li:50%)病理诊断：（右肾上腺）肉瘤样癌，灶性区见少许肾上腺组织残存；（腹主动脉旁）淋巴结（1/3）查见转移。肉瘤样癌是由上皮细胞和间质细胞成分构成的恶性肿瘤，在形态上存在癌细胞向肉瘤样细胞分化状态，好发于 60 岁以上男性，常见发病部位有呼吸道、胃肠道及乳腺，也见于肾及膀胱等部位[2]，原发于肾上腺肉瘤样癌（ASC）是肾上腺皮质腺癌的一种特殊亚型，临床十分罕见，通常患者无明显症状或症状较轻，表现为腰腹痛、腹部肿块、体重减轻及全身乏力，可有激素分泌异常表现。ASC 在国内外均为单个病例报道，临床表现缺乏特征性，无特异性肿瘤标志物，影像检查亦不具典型征象，一般表现为单侧肾上腺巨大肿块，内见多发片状坏死区，增强扫描实性部分呈持续轻中度强化。由于 ASC 术前确诊比较困难，同时是高度侵袭性肿瘤，临床预后极差，多数患者确诊时分期较晚或已转移，即使行手术切除及完整转移灶切除，大部分患者仍会因肿瘤复发或远处转移在术后 1 年内而死亡，早期 ASC 患者行根治术后辅助化疗及手术区域放疗可能会控制疾病进展，肾上腺皮质腺癌的靶向药物对 ASC 的预后可能会有所改善。

EPO-1185

腹膜后非典型类癌一例

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背景：

腹膜后类癌是一种罕见的腹膜后肿瘤，它与胃肠道、呼吸道等其他部位的类癌一样，起源于神经内分泌细胞。腹膜后类癌的恶性程度，应以肿瘤是否有局部侵犯、播散或远处转移为依据。

临床病例：

一名 66 岁女性患者，无意间发现右肾区占位。剖腹探查，术中见右后腹膜区囊实性占位与周围组织分界清楚。病理报告显示腹膜后非典型类癌病人恢复良好，出院后无并发症，随访。

结论：

腹膜后非典型类癌影像学检查缺乏特异性，增强扫描可明显强化，出现坏死、囊变、钙化，确诊依靠病理。

EPO-1186

IgG4 相关肾病与肾脏恶性肿瘤 CT 影像对照研究

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摘要：目的 探讨 IgG4 相关肾病 CT 影像特点，与肾脏恶性肿瘤进行鉴别诊断。方法 回顾性分析 36 例 IgG4 相关肾病患者，其中累及肾实质 26 例，累及肾盂 10 例，双肾发病或多病灶 24 例，单病灶 12 例，研究其影像学特征，包括临床病史、病灶的大小、形态、密度、分布范围、增强后强化的特点、峰值、肾盂受累情况、有无淋巴结肿大等，与肾脏恶性肿瘤包括肾癌、肾盂癌、淋巴瘤进行鉴别诊断。结果：IgG4 相关肾病具有较为特有的临床及影像学特征，虽然肾脏或肾盂受累，但无肾积水及血尿等恶性肿瘤常见临床表现，边界多清楚完整，其具有典型的持续性渐进性强化的特点，峰值多位于实质期及排泄期，病变无液化、坏死、囊变及钙化等影像学表现，即便肾盂受累明显而且病灶较大也无周围肾实质侵犯，肾盂形态依然存在，管壁光整，无周围淋巴结增大的发生。结论 IgG4 相关肾病 CT 影像与肾脏恶性肿瘤相似之处，结合其临床、CT 影像和血 IgG4 相关实验室检查，可以做出明确诊断，避免不必要手术。

EPO-1187

CT 平扫直方图参数对卵巢低密度囊性病变中不典型子宫内膜异位囊肿的诊断价值

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目的：通过对单纯卵巢低密度囊性病变囊液的分析，评估 CT 平扫直方图参数对不典型子宫内膜异位囊肿的诊断价值。**材料及方法：**回顾性分析 2011 年 7 月－2017 年 6 月间，于我院行腹部 CT 扫描并经手术病理证实卵巢低密度（类圆形，病灶直径小于 3cm，CT 值低于 45HU 且高于 0HU，无实性成分，囊壁厚度小于 2mm）囊性病变患者共 46 名患者：卵巢子宫内膜异位囊肿 12 例，卵巢囊腺瘤 22 例，卵巢囊肿 15 例，输卵管积水 5 例。应用 Omni-Kinetics 软件测量病灶最大层面囊液的直方图各参数。使用独立样本 t 检验进行卵巢子宫内膜异位囊肿与非卵巢子宫内膜异位囊肿比较，使用 logistics 回归将直方图参数中可鉴别两者的参数进行联合，使用 ROC 曲线评估 CT 值、直方图参数及直方图参数联合后对卵巢子宫内膜异位囊肿的诊断价值。使用 Medcalc 比较两者间的诊断效

能。**结果**：CT 值、RMS、MeanDeviation、kurtosis、Quantile5、Quantile10、Quantile25、Quantile50、Quantile75、Quantile90 在卵巢子宫内膜异位囊肿与非卵巢子宫内膜异位囊肿间差异有统计学意义，P 值分别为 0.007、0.019、0.005、0.005、0.001、0.003、0.009、0.017、0.032、0.036，ROC 曲线下面积分别为：0.762、0.730、0.762、0.694、0.760、0.782、0.770、0.736、0.740、0.736。CT 值、联合后直方图参数 ROC 曲线下面积分别为：0.762、1.000，95%CI 分别为：（0.615,0.909）、（1.000,1.000），后者诊断效能高，P=0.0018。**结论**：CT 平扫囊液直方图参数可以为诊断卵巢低密度囊性病变中不典型子宫内膜异位囊肿提供可靠信息，直方图参数联合诊断能够提供有效诊断。

EPO-1188
压缩感知技术在子宫 3D T2WI 中的初步应用

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目的 探讨压缩感知技术在子宫 3D T2WI 扫描中的可行性。**材料与方法** 招募 17 例健康人在我院行 3.0 T MRI 子宫 3D T2WI 结合压缩感知序列扫描，CS 加速因子为 3、4、5、6、7、8，每位志愿者共获取 6 组图像，扫描时间分别为 253 s, 190 s, 155s, 128s, 110 s, 98s。由两位医师分别对 6 组图像质量进行 3 分制主观评分。两位医师采用双盲法，使用 Philips IntelliSpace Portal 3.0T MR 工作站对子宫外肌层与同侧同层臀大肌以及相邻上下层面分别各放置 1 个感兴趣区（regionofinterest, ROI），测量数据包括子宫外肌层的信号强度（SIm）与同侧同层臀大肌的信号强度(SIg) 及标准差(SDg)，并计算信噪比(SNR)和对比噪声比(CNR)，所测量数据分别取均值，利用 SPSS 22.0 软件进行统计学分析。采用 ICC 比较两位医师所测得数据的一致性，选择高年资医师所测数据进行后续统计学分析。应用单因素方差分析检验 6 组 SNR、CNR 的差异性，采用配对样本 t 检验比较 CS3 组与其他组间 SNR、CNR 的差异性，采用 Wilcoxon 秩和检验比较组间的主观评分。**结果** 两位医师测量数据一致性良好（ICC 均>0.8）。与 CS3 组相比，CS4 组、CS5 组之间的 SNR、CNR 差异性无统计学意义（P>0.05），而 CS6 组、CS7 组、CS8 组与 CS3 的之间的 SNR、CNR 的差异性有统计学意义(P<0.05)。 随加速因子增加，各组图像质量评分随之下降。CS3 组与 CS4、CS5、CS6 组图像质量评分差异无统计学意义（P>0.05），CS3 组与 CS7、CS8 图像质量评分差异有统计学意义。**结论** CS 技术可用于 3.0T MRI 子宫 T2WI 扫描，在保证图像质量前提下缩短扫描时间，CS5 是最佳加速因子。

EPO-1189
单源双能 CT 碘定量鉴别卵巢囊腺瘤与卵巢癌的价值

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目的 探讨单源双能 CT 碘定量对卵巢囊腺瘤与卵巢癌的鉴别诊断价值 **资料与方法** 回顾性分析经手术病理证实，且采用单源双能 CT 行 GSI 三期增强扫描，且实性成分直径大于 1cm 的卵巢癌 19 例和卵巢囊腺瘤 14 例。在 ADW4.5 工作站上，生成三期碘（水）浓度图。两名观察者采用双盲分别测量三期增强扫描各病灶实性部分的碘(水) 浓度值(Iodine Concentration，IC)，记为 ROI_T，同时测量同侧髂内动脉的碘（水）浓度值,记为 ROI_A，计算标准化碘浓度（Normalized Iodine Concentration, NIC，NIC= ROI_T/ROI_A）。使用组内相关系数（ICC）分析两名观察者测量结果一

致性。采用独立样本 t 检验或 Mann-Whitney U 检验分析两组病灶增强三期的碘（水）浓度值及标准化碘（水）浓度值的差异，并使用诊断效能的受试者工作特征曲线（ROC 曲线）评估有统计学意义参数的诊断效能。 **结果** 两位医师测量数据一致性良好（ICC 均>0.9）。动态三期增强两者的 IC 值、NIC 值的差异具有统计学意义（P<0.05）。动脉期 IC 值和 NIC 值鉴别两者的 AUC 分别为 0.827、0.870，敏感度和特异度分别为 78.9%和 71.4%、78.9%和 73.7%；静脉期 IC 值和 NIC 值鉴别两者的 AUC 分别为 0.812、0.856，敏感度和特异度分别为 68.4%和 71.4%、73.7%和 73.7%；延迟期 IC 值和 NIC 值鉴别两者的 AUC 分别为、0.752、0.786，敏感度和特异度分别为 63.2%和 71.4%、73.7%和 71.4%。**结论** 单源双能 CT 碘定量鉴别卵巢癌与卵巢囊腺瘤提供了重要的信息。

EPO-1190

Zoom into uterus microstructure - A pilot study in healthy volunteers

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Purpose:
To evaluate the feasibility of high resolution diffusion weighted imaging (DWI) in uterus with small FOV.
Methods:
Ten healthy subjects (mean age 25.7±1.95 (23－29) years) were prospectively enrolled for uterus MRI at 3.0T (Ingenia CX, Philips) with a 16-channel abdominal array coil. The MR protocols included traditional DWI and small FOV DWI (for both sequences, axial orientation, b = 0/600/1000 s/mm^2, slice thickness = 3 mm. In-plane resolution for traditional and small FOV DWIs were 3x3 mm^2 and 2.5x2.5mm^2, and scan time were 180 s and 270 s). All image analysis was performed on ISP workstation (Philips). Two radiologists independently placed the ROIs on myometrium and the gluteus muscle of the same level to measure SNR, CNR, and the apparent diffusion coefficients (ADC). The image SNRs, CNRs, and ADCs between different sequences were tested using Paired-sample t test.
Results:
At b value 0 and 600, the CNRs from traditional DWI were significantly higher than those from small FOV DWI (P<0.05). For other groups, there was no statistical difference of SNR and CNR between traditional DWI and small FOV DWI groups. At b value 1000, the ADCs measured with traditional DWI appeared higher than those from small FOV DWI (P<0.05). There was no statistical difference of ADCs between traditional and small FOV DWI when b = 600.
Conclusion:
Diffusion imaging in uterus is feasible in uterus, and the small FOV scheme could provide higher resolution than traditional one with negligible sacrifice of SNR, at the cost of longer scan time. Small FOV scheme could yield in more accurate ADC measurement, especially at high b value, due to the reduced image distortion.

EPO-1191

CT 灌注成像鉴别肾上腺乏脂性腺瘤和对侧正常肾上腺的价值

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目的 探讨 CT 灌注成像鉴别肾上腺乏脂性腺瘤与对侧正常肾上腺的价值。**方法** 回顾性收集行 Revolution CT 灌注扫描且经病理证实的肾上腺乏脂性腺瘤 10 例（平扫 CT 值 ＞ 10HU）。CT 灌注(CT perfusion, CTP)成像采用 16 cm 探测器覆盖的轴扫模式，ASIR-V 50%，注射对比剂 6 s 后开始行 CTP 数据采集，共获得 26 期图像，每期采集时间 2 s，在第 22 s、51 s 及 153 s 获取动脉期、静脉期及延迟期图像，总灌注时间 593 s。测量乏脂性腺瘤（A 组）和对侧正常肾上腺结合部（B 组）的 BF、BV、MTT、TP 和 PS 值。使用配对样本 *t* 检验或非参数 Wilcoxon 检验比较两组各参数值的差异。应用 ROC 曲线分析 CT 灌注参数对腺瘤的诊断效能。**结果** A 组和 B 组的平扫 CT 值（HU）分别为（25.24±11.02）和（33.32±9.72），差异无统计学意义（P＞0.05）；MTT(s)值分别为(9.60±4.31)和(14.51±4.56)，差异有统计学意义（P = 0.027）；两组的 BF、BV、TP 和 PS 值差异均无统计学意义（P＞0.05）。MTT 鉴别两者的 ROC 曲线下面积为 0.79，MTT 以 13.02 s 为阈值时，诊断乏脂性腺瘤的敏感度为 80 %，特异度为 70 %。**结论** CT 灌注灌注 MTT 值对鉴别肾上腺乏脂性腺瘤与正常肾上腺有一定价值。

EPO-1192
两种不同超高 b 值扩散加权成像在前列腺癌 MR 检查中对图像质量的影响

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目的 超高 b 值对前列腺癌的检出有较高的敏感度，但却使图像质量明显下降，本研究比较超高 b 值读出方向分段采样平面回波成像（RS-EPI）和常规单次激发平面回波成像（SS-EPI）在前列腺癌 MR 检查中对图像质量的影响。**资料与方法** 回顾性分析 33 例在 3.0T MR 均行 SS-EPI 和 RS-EPI 超高 b 值 DWI 检查的前列腺癌病例的影像资料(分别选取 b=1000、2000 和 3000 s/mm^2)，分别由一位有 10 年以上工作经验的副主任医师和技师在不提供任何临床资料及 MR 序列信息的情况下，以轴位 T2WI 抑脂序列作为参照，针对两种扩散加权成像(diffusion weighted imaging, DWI)从病灶显示的清晰度、图像解剖变形、图像锐利度、细节显示四个方面按 5 个等级（1－5 分）进行独立主观评分。由第三位副主任医师在工作站上测量图像的信噪比（SNR）、对比噪声比（CNR）和对比度，常规 SS-EPI 和 RS-EPI 两组间图像比较采用配对 Wilcoxon 秩和检验或配对 t 检验。**结果** 两位阅片者在共同评价两序列图像(选取 b=1000、2000 和 3000 s/mm^2)病灶显示的清晰度、解剖变形、图像锐利度及细节显示方面具有很好的一致性，Kakpa 值均大于 0.70。两位医师在对两种序列（RS-EPI 和 SS-EPI）在不同超高 b 值的主观综合评分中，RS-EPI 序列图像质量的各项指标明显优于 SS-EPI（P<0.05）。**结论** 超高 b 值 RS-EPI 序列与常规 SS-EPI 序列相比明显提高了图像质量的多个指标，更有利于早期前列腺癌的检出及鉴别。

EPO-1193
两种不同超高 b 值扩散加权成像序列在前列腺癌和前列腺增生中的临床应用

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目的 探讨分段读出扩散加权成像序列（Rs-EPI）与单次激发平面回波成像（SS-EPI）超高 b 值在前列腺癌和前列腺增生诊断中的应用。**方法** 纳入 37 例经外科手术或穿刺、病理证实的前列腺疾病患者，其中前列腺癌 15 例，前列腺增生 22 例，所有患者于手术或穿刺前行 MR 扩散加权成像，b 值选择 0、1000、2000、3000s/mm^2，由两名高年资医师用双盲法观察两种不同扩散加权成像不同 b 值时的扩散加权图像，对两名观察者的判断结果进行一致性检验，并比较两种不同 b 值对前列腺癌及前列腺增生的定性诊断准确率。**结果** 两名观察者的判断结果存在一致性（P＜0.001），Kappa 值为 0.88。当 b 值分别为 1000s/mm^2、2000s/mm^2、3000s/mm^{2}时，RS-EPI 诊断前列腺癌和前列腺增生的灵敏度及特异度分别为 66.7%和 81.8% 、80.0%和 90.9% 、93.3%和 95.5%。SS-EPI 诊断前列腺癌和前列腺增生的灵敏度及特异度分别为 66.7%和 77.3% 、73.3%和 81.8% 、80.0%和 86.4%。RS-EPI 的诊断符合率分别为 75.7%、86.5%、94.6%，而 SS-EPI 的诊断符合率分别为 73.0%、78.4%、83.8%。RS-EPI 在超高 b 值诊断前列腺癌和前列腺增生的灵敏度及特异度明显高于 SS-EPI。**结论** 选择超高 b 值（1000、2000、3000s/mm^2）对前列腺癌和前列腺增生的鉴别具有较高的灵敏度和特异度，在鉴别前列腺癌和前列腺增生时，RS-EPI 较 SS-EPI 可能作为一种更好的辅助方法。

EPO-1194
常染色体显性多囊肾病相关梗阻性无精子症的 MR 诊断及临床分析

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目的：探讨常染色体显性多囊肾病（ADPKD）相关梗阻性无精子症的 MR 影像学特征，确定适合该类患者的 MRI 检查方案，提高对该病的认识和诊断水平。
方法：回顾性分析我院确诊为 ADPKD 相关梗阻性无精子症患者 14 例，均以男性不育就诊，经实验室检查（精液分析、精液酶学检查，血清激素）和临床体检确诊为梗阻性无精子症,完善腹盆腔 MR 检查以确定梗阻原因及部位。全部患者均完成腹盆腔 MR 平扫加增强检查。由两名有经验的 MR 医生共同分析 MRI 影像特征，总结诊断经验。
结果：本组 14 例 MR 结果分为 4 类：①双侧多囊肾并双侧精囊囊肿 10 例，其中精囊囊肿较小者（轻型）为 3 例，精囊囊肿较大者（重型）7 例。②双侧多囊肾并多囊肝及双侧精囊囊肿者 2 例。③双侧多囊肾并多囊肝并双侧精囊缺如、射精管扩张 1 例。④双侧多囊肾并双侧精囊囊肿及前列腺苗勒管囊肿 1 例。腹盆腔大范围冠状位 T_2WI 可同时清楚显示肝、双肾的多囊状改变和盆腔精囊区的异常。所有患者的精道梗阻部位均位于射精管-精囊水平，双侧精囊囊肿表现为双侧精囊管明显扩张成囊状，其内可见絮状或结节状沉积物，T_1WI 为等/稍高信号，沉积物 T_2WI 为等/稍低信号；增强扫描后囊内容物无强化,壁轻度强化。1 例精囊腺缺如、射精管扩张患者表现为双侧精囊腺区未见腺管结构，射精管明显扩张。1 例合并前列腺苗勒管囊肿患者表现为前列腺中线区可见一倒置的水滴样囊性信号，亦表现为 T_1WI 低、T_2WI 高信号，增强扫描无强化。
结论：ADPKD 相关性梗阻性无精子症以双侧多囊肾和射精管-精囊水平梗阻为主要 MR 表现，可同时合并其他异常。合适的腹盆腔 MRI 检查方案有助于发现病变，确定病变的内在联系，为临床治疗的选择提供参考。

EPO-1195

输精管盆腔段及周围结构的 MSCT 多期图像融合显示及影响因素分析

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目的：探讨 MSCT 多期图像融合显示输精管盆腔段及周围结构的可行性，并对影响输精管显示的因素进行分析。
方法：收集 2018 年 1 月~2018 年 4 月中山大学附属第一医院有多期 MSCT 盆腔扫描资料的男性住院患者资料，年龄范围 20~50 岁，共纳入 174 例。根据 MSCT 平扫期、静脉期及排泄期图像，分别行容积重组（VR）获得输精管盆腔段、髂血管、输尿管及膀胱图像，再进行图像融合。由 2 名有经验的医师对融合图像进行评定，归纳影响图像显示的因素，并进行统计学分析。
结果：双侧输精管清晰显示且重组图像可用于临床分析者作为合格图像，共 72 例（41.4%）；不合格图像共 102 例（58.6%）。影响图像显示的因素有：体质指数（BMI）、盆腔小肠积聚、邻近器官（膀胱和/或直肠）过度充盈、年龄。所有受检者 BMI 范围为 14.17~31.49（kg/m^2），平均 BMI=22.13（kg/m^2）；合格图像的 BMI 范围为 17.19~31.49（kg/m^2），不合格图像的 BMI 范围为 14.17~27.95（kg/m^2），BMI≥22.55（kg/m^2）为获得合格图像的界值，敏感度 77.8%，特异度 73.6%（ROC 曲线下面积 0.821，P<0.001）。盆腔小肠积聚（73 例）直接影响输精管盆腔段的显示，无法获得合格图像。无邻近器官过度充盈者获得合格图像的比例较高[84.6%（44/52）比 56.0%（28/50）]，差异有统计学意义（P<0.05）。按年龄段分组统计，合格图像比例随年龄增大而提高[20~30 岁组 26.7%（8/30 例）， 31~40 岁组 39.6%（19/48），41~50 岁组 46.9%（45/96）]，但不同年龄组的合格图像比例差异无统计学意义（P=0.221）。
结论：对于 BMI 中等以上人群，做好检查前准备，可获得输精管盆腔段及周围结构 MSCT 多期融合的合格图像，为临床提供直观、立体的影像资料。

EPO-1196
基于 3D-ROI 能谱曲线斜率鉴别肾透明细胞癌 WHO/ISUP 简化分级

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目的：基于 3D-ROI 能谱曲线斜率鉴别肾透明细胞癌(ccRCC)WHO/ISUP 简化分级
方法：收集经病理证实的 ccRCC 患者 99 例。根据 2016 版肾癌 WHO/ISUP 分级将 I 级及 II 级定义为低级别(68 例)，III 级及 IV 级定义为高级别(31 例)。皮质期图像被导入 AW4.6 工作站中手动勾画肾癌全肿瘤感兴趣区(3D-ROI),测量肿瘤 40-140keV 的 CT 值，根据 CT 值计算 40～70keV 能谱曲线斜率。比较两组 ccRCC 斜率和 40keV 的 CT 值差异。以简化病理分级为金标准，以斜率、40keVCT 值、肿瘤大小、包膜、静脉侵犯及区域淋巴结肿大为自变量，采用二元 *Logistics* 回归多因素分析控制混杂因素。绘制 ROC 评价各参数的诊断效能，并计算曲线下面积（AUC）、敏感度及特异度。
结果：两组患者的肿瘤大小、包膜、静脉侵犯、区域淋巴结肿大及 40keV 的 CT 值差异均有统计学意义(all p<0.01)。低级别 ccRCC 斜率为-6.77±2.85，高级别 ccRCC 斜率为-3.62±1.66，两组差异有统计学意义（t=-5.729,p<0.001）。多因素二元 *Logistics* 回归结果表明斜率和区域淋巴结肿大是鉴别低、高级别 ccRCC 的独立危险因素，OR 值分别为 1.588（95%CI:1.218-2.070）及 5.686（95%CI:1.910-16.929）。两者联合 AUC 最大，为 0.872(95%CI:0.805-0.940)。斜率、区域淋巴

结肿大及两者联合的诊断效能经两两比较（Delong 法），联合诊断的 AUC 与区域淋巴结肿大差异有统计学意义（Z=3.45,p<0.001），与斜率差异无统计学意义（Z=1.864,p=0.062）。
结论：ccRCC 的 3D-ROI 的能谱曲线斜率与其联合区域淋巴结肿大的诊断效能相当，对鉴别 WHO/ISUP 简化分级具有一定诊断效能。

EPO-1197
MRI 定量参数在凶险性前置胎盘胎盘成熟度分级诊断中的应用价值

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摘要：
目的：探讨定量 MRI 参数在凶险性前置胎盘(dangerous placenta previa ,DPP)胎盘成熟度分级诊断中的应用价值；
材料与方法：分析我院生产的 128 例凶险性前置胎盘 MRI 资料，包含超声确诊前置胎盘后行多平面 HASTE T2WI 及多 b 值 DWI 扫描，b 值包含 0，400，800s/mm^2。根据胎盘最大面 T2WI 图像分别测量绒毛膜板、胎盘实质、基底膜最大厚度（mm）；分别测定感兴趣区 b=400，800s/mm^{2}的 ADC 值。根据剖宫产时胎盘成熟度评分，采用回归分析方法对孕周，T2WI 图像上胎盘不同面的径线值、不同 b 值 ADC 与胎盘成熟度评分关系；采用 ROC 分析不同定量参数在诊断胎盘成熟度中的诊断效能。

结果：128 例 DPP 孕周为 19-38 周，中孕 46 例，晚孕 82 例；其中胎盘成熟度分级： I 级 18 例，II 级 69 例，III 级 41 例；胎盘实质最大面测量：I 级 19.2±1.1mm，II 级 23.4±3.4mm，III 级 28.6±4.2mm；胎盘 ADC（b=400）： I 级 2438±189 mm^2/s ，II 级 1864±201 mm^2/s，III 级 1539±261mm^2/s；胎盘 ADC（b=800）：I 级 2312±211 mm^2/s，II 级 1763±341 mm^2/s，III 级 1321±428mm^2/s；回归分析：胎盘实质径线与胎盘成熟度分级存在较高相关；ROC 提示胎盘成熟度分级中，ADC 存在较高诊断效能，AUC 为 0.71-0.92。其中 b=800 s/mm^{2}时诊断准确效能相对更高。

结论：常规 T2WI 经线测量结合 ADC 值能准确对凶险性前置胎盘胎盘成熟度分级；

EPO-1198
CT 三维纹理分析对输尿管结石激光碎石术成功性的预测

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【目的】应用 CT 纹理分析多参数预判输尿管结石激光碎石术的成功性。【资料与方法】回顾性连续收集纳入国家单中心三级医疗机构自 2016 年 1 月至 2018 年 9 月经东芝 640 层 CT 诊断并行输尿管激光碎石术的输尿管结石患者，分为完全击碎组与非完全击碎组，测量结石 CT 值并采用 Mazda 纹理分析软件勾画三维 VOI 提取每颗目标结石的 15 项纹理分析参数，应用独立样本 t 检验比较 2 组样本各纹理参数间的差异，绘制 ROC 曲线，评价其对结石是否完全击碎的诊断效能。【结果】127 名样本纳入分析，72 名（共 80 颗结石）最终确定为合格受试者。2 组结石样本的 CT 值及包括体积、直方图方差、直方图偏度、直方图峰度、Z 轴游程不均匀性、Z 轴灰度不均匀性在内的六项纹理参数存在显著差异，部分纹理参数较临床常用指标 CT 值更具诊断价值，其中 2 组间结石 Z 轴

灰度不均匀性的差异最具有统计学意义(P＜0.0001)，其 ROC 曲线下面积为 0.851，最佳临界值为＞64.885，其预测结石是否完全击碎的敏感度、特异度分别为 77.78%、77.36%。【结论】三维纹理分析可作为输尿管结石患者应用激光碎石术能否完全击碎结石的量化预测性指标。

EPO-1199

肉瘤样肾细胞癌的 CT 和 MRI 表现

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目的：探讨肉瘤样肾细胞癌的 CT 和 MRI 表现。**方法：**回顾性分析经病理学证实的 12 例肉瘤样肾细胞癌患者的临床、影像学和病理学资料，平均年龄为 61.5 岁，其中男 7 例，女 5 例，8 例行多期 CT 增强扫描，4 例行 MRI 多序列、多期增强扫描。分析肿瘤的大小、密度/信号改变，位置、出血、钙化、强化方式以及是否有肾门、腹膜后淋巴结转移、肾静脉瘤栓、远处转移等影像学表现。**结果：**12 例肉瘤样肾细胞癌病灶均累及肾髓质，累及肾盂、肾盏 9 例，均为囊实性病灶，最大径（9.5±1.8）cm。CT 平扫 12 例病灶均呈不均匀稍高密度影，病灶内见较多不规则囊变、坏死区，增强扫描病灶轻度渐进性强化 10 例，中度渐进性强化 2 例。平扫、皮质期、实质期及排泄期病灶平均 CT 值分别为 33.25Hu、56.75Hu、72.15Hu 及 57.25Hu,5 例出现钙化及出血，合并肾静脉瘤栓 3 例，肾门、腹膜后淋巴结转移 4 例，肝转移 1 例。12 例病灶 T1WI 均呈不均匀低信号影，T2WI 均呈不均匀混杂高信号影，囊变、坏死区呈不规则更长 T2 信号影，病灶内均可见不规则条片状短 T2 信号影，增强扫描病灶轻度渐进性强化 10 例，中度渐进性强化 2 例。**结论：**肉瘤样肾细胞癌的 CT 及 MRI 表现具有一定的特征性，有助于诊断及鉴别诊断。

EPO-1200

IVIM-DWI 参数及纹理特征术前鉴别宫颈癌亚型的价值

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目的：探讨利用 IVIM-DWI 及纹理分析（TA）术前鉴别不同亚型宫颈癌的价值。
方法：回顾性分析 60 例经本院病理结果证实的宫颈癌患者，其中鳞癌（SCC）38 例、腺癌（AC）16 例、小细胞癌（SCCC）6 例。所有患者术前均行 MRI 检查，并行 10 b 值 DWI 扫描。在横轴位 T_2WI 图像上手动勾画宫颈癌全病灶，获得其纹理特征，包括平均值、标准差、峰度、偏度、熵和一致性。绘制受试者工作特性曲线（ROC），并计算曲线下面积（AUC）。
结果： IVIM-DWI 分析中，ADC_{stand}、D 值可以鉴别 SCC 与 SCCC（P＜0.001，AUC=0.867；P=0.001，AUC=0.920），D、D^*值鉴别 SCC 与 AC 时差异有统计学意义（P=0.024，AUC=0.774；P=0.023，AUC=0.753），而 f 值鉴别 AC 与 SCCC 时差异有统计学意义（P=0.034，AUC=0.850）。纹理特征分析时，熵值鉴别 AC 与 SCCC、峰度鉴别 SCC 与 AC 及偏度鉴别 SCC 与 SCCC 时差异具有统计学意义（P＜0.001，AUC=0.875； P=0.027，AUC=0.910； P=0.020，AUC=0.766）。
结论： IVIM-DWI 参数或 TA 特征术前鉴别宫颈癌三种不同组织学亚型有一定价值。IVIM-DWI 多参数结合纹理特征，有助于提高在术前评估不同类型宫颈癌准确性。

EPO-1201

基于能谱 CT 平扫鉴别肾盂旁囊肿与非结石性肾积水

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目的 目前临床确诊肾盂旁囊肿和肾积水首选 CT 尿路造影（CTU）检查，但 CTU 会给患者带来额外的辐射剂量和对比剂负荷。本研究目的是探讨能谱 CT 平扫定量参数在鉴别肾盂旁囊肿与非结石性肾积水的应用价值。
方法 回顾性收集经能谱 CT 平扫、动态增强扫描及 CTU 确诊的肾盂旁囊肿患者 42 例，肾积水患者 46 例。于能谱成像（GSI）平扫图像上分别测量肾盂旁囊肿或肾积水 70keV 的 CT 值、有效原子系数（Z_{eff}）、碘(水)浓度（IC）及水(碘)浓度（WC），并计算能谱曲线斜率（λ）=(HU_{100keV}-HU_{40keV})/(100-40)。比较两组以上参数的差异。以差异有统计学意义的参数作为自变量，CTU 结果作为金标准，采用二元 Logistics 回归筛选鉴别两种疾病的独立危险因素。
结果 肾盂旁囊肿及非结石性肾积水两组患者的年龄、70keV 的 CT 值、及 WC 差异均有统计学意义(all p<0.05)。两组患者的性别、位置、能谱曲线斜率、有效原子系数及碘基值差异均无统计学意义(p>0.05)。二元 Logistics 回归结果表明年龄和 70keV 的 CT 值是鉴别两种疾病的独立危险因素。OR 值分别为 0.94(95%CI：0.90-0.97)及 0.80(95CI：0.73-0.89)。ROC 曲线下面积为 0.850。
结论 能谱 CT 平扫定量参数对鉴别肾盂旁囊肿与非结石性肾积水具一定鉴别诊断效能，对无症状的肾盂旁囊肿患者可避免 CT 增强或 CTU 检查而降低电离辐射剂量及对比剂负荷。

EPO-1202
体素不相干运动多模型参数鉴别Ⅰ期子宫内膜癌与子宫内膜息肉的价值

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目的 探讨体素内不相干运动（introvoxel incoherent motion，IVIM）多模型参数对Ⅰ期子宫内膜癌（endometrial carcinoma，EC）与子宫内膜息肉（endometrial polyp，EP）的鉴别价值，以期治疗前准确定性。**方法** 回顾性分析经手术病理证实的 31 例Ⅰ期 EC 和 14 例 EP 的患者资料，术前均行 1.5T MRI 检查（含 IVIM 序列）。测量病灶的 IVIM 多模型参数值，包括单指数模型的标准表观扩散系数（ADC-stand）值，双指数模型的慢速表观扩散系数（ADC-slow）、快速表观扩散系数（ADC-fast）、灌注分数（f）值，以及拉伸指数模型的扩散分布指数（DDC）、拉伸指数（α）值。根据数据符合正态分布与否，采用独立样本 t 检验或 Mann-Whitney 秩和检验比较两组病灶各参数值的差异，采用 *ROC* 曲线评估有统计学差异的参数对两组病灶鉴别诊断的效能。**结果** EC 组的 ADC-stand 值、ADC-slow 值、f 值、DDC 值及 α 值均小于 EP 组，ADC-fast 值大于 EP 组，差异具有统计学意义（P<0.05）。ADC-stand 值、ADC-slow 值、ADC-fast 值、f 值、DDC 值及 α 值预估 EP 的 ROC 曲线下面积（*AUC*）分别为 0.885、0.877、0.919、0.926、0.906、0.902，临界值分别为 $0.797\times10^{-3}mm^2/s$、$0.543\times10^{-3}mm^2/s$、$3.600\times10^{-3}mm^2/s$、40.000%、$1.105\times10^{-3}mm^2/s$、0.756。**结论** IVIM 序列多模型参数能够有效鉴别Ⅰ期 EC 与 EP，可为临床治疗方案制定、预后评估提供全面的指导信息。

EPO-1203

腹部脂肪与透明细胞肾细胞癌病理 Fuhrman 核分级的相关性研究

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【摘要】 目的 探讨基于 CT 测量的腹部脂肪对预测透明细胞肾细胞癌（ccRCC）病理 Fuhrman 核分级的效能。方法 回顾性收集经手术及病理证实的 171 例 ccRCC 患者术前中腹部 CT 影像学资料，根据病理 Fuhrman 核分级标准分为 Fuhrman 低级别组（n=124；男性：90 例，女性：34 例）与 Fuhrman 高级别组（n=47；男性：33 例，女性：14 例）。采用 ImageJ 软件在患者 CT 图像上分别测量腹部脐水平皮下脂肪面积（SFA）与内脏脂肪面积（VFA），并获得相对内脏脂肪比值（rVFA）。运用二分类 logistic 回归对预测因素进行分析，并进一步采用受试者工作特性曲线（ROC）获得预测 ccRCC Fuhrman 病理核分级的最佳测量参数。结果 （1）男性 ccRCC 患者中：Fuhrman 高、低级别组间 SFA、VFA 及 rVFA 值均无统计学差异（P＞0.05）。（2）女性 ccRCC 患者中：Fuhrman 高、低级别组间 SFA 值无统计学差异（P＞ 0.05），rVFA 及 VFA 值 Fuhrman 高、低级别间有显著统计学差异（P＜0.001，P＜0.001）。单变量及多变量 logistic 回归分析中，rVFA 均为 Fuhrman 分级的独立预测因子；rVFA 对应的准确度（ACC）为 0.813，相应 ROC 曲线下面积（AUC）为 0.859（95% CI：0.751-0.968）。结论 CT 腹部脂肪测量指标 rVFA 及 VFA 对 ccRCC 的 Fuhrman 病理核分级预测具有性别差异，其中女性 ccRCC 患者 rVFA 对 Fuhrman 病理核分级具有较高的预测效能，具有潜在的临床应用价值。

EPO-1204

双参数和多参数磁共振对前列腺癌诊断效能的比较

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目的：对比双参数磁共振（bpMRI）和多参数磁共振（mpMRI）对前列腺癌（PCa）和临床显著性前列腺癌（csPCa）的诊断效能，并探讨动态增强 MRI（DCE-MRI）在前列腺成像中的应用价值。**方法：**本研究回顾性地纳入本院 2016-2017 年疑诊前列腺癌患者 235 例。根据第 2 版前列腺癌影像报告和数据系统（PI-RADS v2)）对前列腺病灶进行评分。记录病灶的 bpMRI 和 mpMRI 评分并绘制受试者特异性曲线（ROC），计算相应的曲线下面积（AUC）、诊断准确性、敏感性和特异性，并进行对比。再根据 bpMRI 评分对患者进行分层分析进一步探讨 DCE 的应用价值。**结果：**bpMRI 和 mpMRI 诊断 PCa 的效能相当（AUC 分别等于 0.790，0.791），bpMRI 诊断 PCa 的准确性、敏感性、特异性分别为 76.2%，79.5%和 72.6%，而 mpMRI 的各值分别为 77.4%，84.4%和 69.9%。对于诊断 csPCa，bpMRI 和 mpMRI 的 AUC 分别为 0.781 和 0.779，bpMRI 诊断 csPCa 的准确性、敏感性、特异性分别为 74.0%，83.8%和 66.9%；mpMRI 的各值分别为 73.6%，87.9%和 63.2%。对 bpMRI 评分 ≥ 3 的患者，DCE 在 PCa 与非 PCa 之间，在 csPCa 与非 csPCa 之间均有显著性差异（*P*均 = 0.001）。进一步分层分析结果显示，对于 bpMRI 评分=4 的患者，DCE 在 PCa 与非 PCa 之间，csPCa 及非 csPCa 之间差异均有统计学意义（*P* = 0.003，*P* < 0.001）。 **结论：**bpMRI 和 mpMRI 在诊断 PCa 和 csPCa 上总体效能相当。DCE 有助于进一步识别 PCa 和 csPCa 病灶，对于 bpMRI ≥ 3 尤其是 bpMRI = 4 的患者，DCE 或许有助于实现更为准确的前列腺癌诊断及风险分层，有利于临床诊疗方案的制定。

EPO-1205

初探基于肿瘤全域 ADC 图的灰度共生矩阵纹理分析与子宫内膜癌 Ki-67 表达的相关性

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目的 初步探讨基于肿瘤全域 ADC 图的灰度共生矩阵（gray level co-occurrence matrix，GLCM）纹理分析与子宫内膜癌（endometrial carcinoma，EC）增值抗原 Ki-67 表达的相关性。**方法** 回顾性分析 37 例经手术病理证实为 EC 的患者影像资料，免疫组化分析指标含 Ki-67，患者术前行 DWI 序列扫描，经后处理获得 ADC 图。按照 EC 的 Ki-67 表达指数（<50%为低表达，≥50%为高表达）将患者分别分为 Ki-67 低表达组（n=17）及 Ki-67 高表达组（n=20）。采用 Omni-Kinetics 软件，在包含肿瘤实质的 ADC 图像上沿肿瘤边缘逐层勾画 ROI，融合后获得肿瘤全域 GLCM 纹理参数，包括能量、熵、惯性矩、相关性、逆差距。采用独立样本 t 检验（正态分布）或 Mann-Whitney 秩和检验（偏态分布）比较两组病例 GLCM 纹理参数的差异，采用 Pearson 相关分析评价各 GLCM 参数值与 Ki-67 表达指数的相关性。**结果** Ki-67 低表达组的能量、熵、惯性矩、相关性、逆差距分别为 0.027±0.007、5.572±0.356、21.816±13.849、0.016±0.032、0.210（0.184，0.351），Ki-67 高表达组的上述参数分别为 0.022±0.005、6.076±0.323、9.046±4.200、0.057±0.035、0.417（0.387，0.487），Ki-67 低表达组的能量、惯性矩大于高表达组，熵、相关性、逆差距小于高表达组，差异具有统计学意义（P<0.05）。能量、惯性矩与 EC 的 Ki-67 表达指数负相关（P<0.05），熵、相关性、逆差距与 Ki-67 表达指数正相关（P<0.05）。**结论** 基于肿瘤全域 ADC 图的 GLCM 纹理分析有助于术前评估 EC 的 Ki-67 表达情况，具有一定临床应用价值，熵为最佳参数。

EPO-1206

The Relationship between Magnetic Resonance Spectroscopy of Estrogen-dependent Endometrial Cancer and ki-67 Expression and local invasiveness

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Objectives
To investigate the relationship between magnetic resonance (MR) spectroscopy of estrogen-dependent endometrial Cancer (type I ECa) and Ki-67 staining index (SI) and local invasiveness
Methods
Forty-five patients with type I ECa underwent preoperative multi-voxel MR spectroscopy at 3.0 T. The ratio of the sum of the choline-containing compounds (Cho) peak integral to the sum of the unsuppressed water peak integral (Cho/water) of the tumor was calculated. All the metabolite quantification was performed within jMRUI v.5.2 software. Immunohistochemical staining for Ki-67 was used to determine the Ki-67 SI of type I ECa. The Cho/water of type I ECa with different level of Ki-67 SI, as well as with and without local invasion, was compared using an independent-sample t-test. The receiver operating characteristic (ROC) curve analyses was used to determine an

optimal Cho/water threshold to distinguish between two groups. The Pearson correlation test was used to examine the relationship between Cho/water and the Ki-67 SI.

Results

The mean Cho/water (± standard deviation [SD]) of type I ECa with Ki-67 SI ≤40% (2.28±0.93) was lower than that of type I ECa with Ki-67 >40% (4.08±1.00) (P<0.001). The area under the ROC (AUC) was 0.912. The Cho/water threshold was 2.89; the sensitivity and specificity were 0.917 and 0.788, respectively. The mean Cho/water (±SD) of type I ECa with deep and superficial myometrial invasion was 3.41±1.26 and 2.43±1.11, respectively (P=0.011). There is no significant difference of Cho/water between type I ECa with and without cervical invasioin (2.68±1.00 and 2.77±1.28, P=0.866). The mean Cho/water (±SD) of type I ECa with and without lymph node metastasis was 4.02±1.90 and 2.60±1.06, respectively (P=0.014). The Cho/water was positively correlated with the Ki-67 SI (r=0.701, P<0.001).

Conclusion

The Cho/water of type I ECa was positively correlated with tumor proliferative activity and can predict the local invasiveness of the tumor to some extent.

EPO-1207

能谱 CT 在结直肠管状腺癌区域淋巴结性质判定中的运用价值

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目的：通过能谱相关参数观察与分析，探讨能谱 CT 在结直肠管状腺癌区域淋巴结性质判定中的运用价值。 **方法**：回顾性分析 2017 年 1 月～2018 年 12 月我院收治的经结肠镜诊断或手术证实为结直肠管状腺癌患者 46 例，术前应用 GE 宝石能谱 CT 进行 GSI 能谱模式扫描,分别将动、静脉期增强扫描图像载入 GE ADW4.7 工作站 GSI 后处理软件"Liver ND",测量原发灶及区域淋巴结实性部分的动、静脉两期的 CT 强化值、碘浓度（IC）、标准化碘浓度（NIC）及能谱曲线斜率 K 值。采用独立样本 t 检验进行两两比较,以 P<0.05 为差异具有统计学意义；且对各参数敏感度、特异度及受试者工作特征曲线(ROC)曲线下面积(AUC) 进行分析，评估各参数的诊断效能。 **结果**：46 例结直肠管状腺癌患者共检出 136 枚局域淋巴结，其中转移性淋巴结 74 枚，反应性增生淋巴结 62 枚。原发病灶、转移性淋巴结组与反应性增生淋巴结组间能谱参数比较，原发病灶、转移性淋巴结组动脉期强化 CT 值差异、动静脉期 IC、NIC 的绝对值均低于反应性增生淋巴结组，且三者之间差异具有统计学意义，P 值均＜0.05；静脉期强化 CT 值差异不具有统计学意义(P>0.05)；原发病、转移性淋巴结组能谱曲线斜率 K 值高于反应性增生淋巴结组，且三者之间差异具有统计学意义，P 值均＜0.05；两两比较，仅原发病灶与转移性淋巴结间 IC、NIC 及曲线斜率 K 值的差异无统计学意义(P 均>0.05)。且动脉期 NIC 诊断转移性淋巴结的诊断效能最高(敏感度为 88.7%，特异度为 74.1%，AUC 为 0.875)。 **结论**：能谱 CT 多参数对结直肠管状腺癌转移性淋巴结及反应性增生淋巴结影像鉴别诊断具有一定的价值，特别是动脉期标准化碘浓度(NIC)诊断效能最高。

EPO-1208

系统性红斑狼疮累及腹部脏器的 CT 影像征象：重点评价缺血性胃肠炎

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目的 评价系统性红斑狼疮在急性腹痛、腹胀患者中的 CT 影像表现，重点对缺血性胃肠炎进行分析。**材料和方法** 通过回顾性分析 23 例伴有急性腹痛、腹胀的系统性红斑狼疮患者的全腹 CT 平扫和增强检查图像，评估胃肠壁改变，肠系膜改变，腹盆腔积液，腹腔腹膜后淋巴结病变，腹膜强化，肝肿大以及其他腹部器官的改变。如果系统性红斑狼疮患者至少出现以下三个 CT 表现：胃肠壁增厚，靶征，肠管扩张，肠系膜血管充血，肠系膜脂肪密度增高，即可诊断为缺血性胃肠炎。**结果** 23 例检查中有 21 例(91%)CT 表现为缺血性胃肠炎，包括对称性胃肠壁增厚(n=21)、靶征(n=19)、肠系膜血管充血、肿胀和增粗(n=20)。在 17 例患者中，肠壁增厚是多节段的，且长度不等，并不局限于单一的血管区域。**结论** 伴有急性腹痛、腹胀的系统性红斑狼疮患者最常见的腹部脏器受累的 CT 表现是缺血性胃肠炎。CT 增强检查可以发现腹部症状的主要原因，有助于规划治疗和监测脏器坏死或穿孔等严重并发症。

EPO-1209
临床病理学及影像学特征在预测结肠癌肿瘤沉积中的价值

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目的 研究疗前临床病理学及 CT 影像学特征在预测结肠癌肿瘤沉积中的价值。**方法** 回顾性分析 2014 年-2015 年在我院行结肠癌根治术的 83 例结肠癌患者的临床病理及影像学特征，分析其预测肿瘤沉积的价值。临床特征包括疗前 CA19-9、CEA、患者性别、年龄、是否合并肠梗阻、腹腔积液；病理学特征包括肿瘤病理类型、病理学淋巴结良恶性；影像学特征包括疗前肿瘤 T 分期、静脉期肿瘤强化均匀性、轴位动静脉期肿瘤最大层面 CT 值及其与腰大肌比值、淋巴结强化及边缘、淋巴结长短径及比值。SPSS 软件对所有的单因素变量进行 logistic 回归分析，将 $P<0.1$ 的单因素变量纳入多因素 logistic 回归分析，利用 ROC 曲线评估变量预测效能。 **结果** 疗前 CEA、性别、静脉期肿瘤强化均匀性、腹腔积液、病理学淋巴结良恶性、影像 T 分期、淋巴结长径 7 个单因素变量 $P<0.1$ 纳入多因素 logistic 分析。多因素分析结果表明：男性相对于女性预测肿瘤沉积的 OR 值为 0.160（95% CI：0.035-0.742，$P=0.019$），差异具有统计学意义；病理学淋巴结阴性相对于阳性预测肿瘤沉积的 OR 值为 0.242（95% CI：0.056-1.042，$P=0.057$），具有交界性统计学意义；疗前 CEA、静脉期肿瘤均匀强化、无腹腔积液、T2 期病变、淋巴结长径预测肿瘤沉积的 OR 值为 0.305-1.815，P 值为 0.196-0.438，差异无统计学意义。ROC 分析性别、病理学淋巴结预测肿瘤沉积的 AUC 分别为 0.613、0.760。 **结论** 女性患者、肿瘤强化不均匀、T 分期较晚患者出现肿瘤沉积的风险更高。病理学检查中 pN 阳性结肠癌患者需仔细评估其有无 TDs。

EPO-1210
基于 CT 图像及纹理分析技术预测胃癌患者 HER2 蛋白表达情况

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【摘要】

目的：基于 CT 图像及纹理分析技术预测胃癌患者 HER2 蛋白表达情况
方法：对来自浙江中医药大学附属第一医院的 89 例临床病理证实为胃癌的患者进行回顾性研究。所有患者均在术前接受 CT 增强检查。使用开源软件 ITK-SNAP 3.6 软件对每个原发病灶进行全体积勾画后再进行纹理特征的提取与分析。数据集分为训练组（n = 62）和验证组（n = 29）。从每位患者中各提取总共 1305 个影像学特征，使用 LASSO 逻辑回归模型以及学习矢量量化方法来选择影像图像中纹理特征。免疫组织化学法（Elivision）方法检测胃癌组织中 HER2 蛋白表达情况作为金标准。

结果：89 例胃癌原发灶组织中 HER2 蛋白阳性表达与胃癌 TNM 分期、浸润深度及淋巴结转移有关（P＜0.05）。其中 3 个影像组学纹理特征与 HER2 蛋白阳性表达有显着相关（训练组 P <0.001，验证组的 P = 0.002）。在训练队列中曲线下面积（AUC）为 0.799（95％置信区间[CI]，0.748-0.879），验证队列中证实，AUC 为 0.776（95％CI，0.714-0.876）。训练组中的特异性和敏感性分别为 0.789、0.756 和验证组中的 0.805、0.818。

结论：本研究提取并分析了胃癌原发病灶 CT 影像纹理特征，其中 3 个权重较大的纹理特征 HER2 蛋白阳性表达有着明显相关性。通过 CT 图像及纹理特征来间接检测 HER2 蛋白阳性表达，对于胃癌患者（尤其是无法手术的进展期胃癌患者）后续靶向治疗的选择带来重要指导意义。

EPO-1211
小肠炎性肌纤维母细胞瘤的 MRI 诊断及鉴别诊断

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[摘要] 目的 分析小肠炎性肌纤维母细胞瘤的 MRI 表现，提高对该病诊断的正确性。方法 回顾性分析经手术病理确诊并行免疫组织化学检查的 11 例小肠炎性肌纤维母细胞瘤患者的临床、影像及病理资料，分析其 MRI 特征（包括平扫及增强）及其与病理特征的联系。结果 ①11 例病灶均单发，位于十二指肠 1 例、空肠者 4 例、回肠者 4 例、空回肠交界处者 2 例。②T1WI 为混杂略低信号、T2WI 为混杂略高信号、DWI 信号为略高混杂信号，5 例病灶周围见渗出，增强后呈轻中度逐渐强化者 10 例，呈均匀中度强化者 1 例。结论 炎性肌纤维母细胞瘤 MRI 表现多种多样、缺乏特异性，瘤周渗出、增强后呈渐进性强化且有助于提示该病的诊断，但确诊仍需病理学检查。

EPO-1212
CT 评估肝硬化食管下段静脉曲张程度的预测价值

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目的：
评估多层螺旋 CT（multi-slice spiral CT，MSCT）在预测食管下段静脉曲张程度的诊断效能和临床价值，探讨 CT 能否在一定程度上辅助内镜检查。
方法：
回顾性分析我院临床上诊断为肝硬化食管下段静脉曲张（esophageal varices , EV）患者 136 例，以内镜检查为金标准，136 例患者分为非显著性食管静脉曲张（EV）组（轻度+中度 EV）（n = 30），显著性 EV 组（重度 EV）（n = 106）。观测曲张静脉的直径（EV diameter,EVD），截面总

面积（cross-sectional surface area,CSA），体积（EV volume,EVV），脾脏体积（spleen volume,SV），胃左静脉直径（diameter of left gastric vein,DLGV）。计算纳入指标的灵敏度和特异性，拟合 ROC （receiver operating characteristic）曲线，计算 AUC（area under the ROC curve），两组间数据采用成组设计的两样本均数的 t 检验或秩和检验，以 P＜0.05 为差异有统计学意义。
结果：
食管下段 EVD、CSA、EVV、SV、DLGV 在显著组中均较非显著组大（P ≤ 0.01），两组间差异有统计学意义（P ≤ 0.01）。EVD、CSA、EVV、SV 及 DLGV 在预测重度 EV 时的 AUC 分别为 0.729，0.762，0.75，0.641，0.721，EVD 敏感度为 73.3%，特异度为 69.8%，CSA 敏感度为 93.3%，特异度为 54.7%，EVV 敏感度为 80%，特异度为 65.1%，SV 敏感度为 80%，特异度为 46.2%，DLGV 敏感度为 83.3%，特异度为 53.8%。
结论：
MSCT 可作为一种预测 EV 程度的方法，可在一定程度减少内镜的侵入性检查。曲张静脉面积及体积作为新指标，对于诊断重度 EV 有较高的诊断效能。

EPO-1213
双能量 CT 多参数分析对结直肠癌区域淋巴结性质术前判定的临床研究

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目的：探讨利用双能 CT 多参数定量分析，术前鉴别结直肠癌区域淋巴结转移癌与反应性增生性淋巴结的应用价值。
材料与方法：2015 年 5 月至 2017 年 5 月到我院就诊，肠镜病理确诊为高位直肠癌及结肠癌患者，术前进行全腹部双能量 CT 三期增强扫描（动脉期 A、门静脉 P 期及平衡期 E）。根据原发灶淋巴结引流方向，在 CT 中选取引流区域最大淋巴结为研究对象，并对其形态学特征、淋巴结最短径 D、能谱参数（包括碘含量 IC、有效原子序数 Z_{eff} 及能谱曲线斜率 λ_{HU}）进行测量及记录，并测量腹主动脉碘含量及有效原子序数，计算校正碘含量 nIC 及校正有效原子序数 nZ_{eff}。术中单独分离术前 CT 选定的淋巴结进行病理检查。分析淋巴结转移癌和反应增生性淋巴结之间形态学特征、淋巴结短径及能谱参数的差异，构建术前判定结直肠癌区域淋巴结性质的能谱参数模型，并进行 ROC 曲线分析。
结果：178 例结直肠癌患者，结肠癌 112 例，高位直肠癌 66 例，男女比例 119：59。178 个淋巴结纳入分析，其中淋巴结转移癌 72 例，反应增生性淋巴结 106 例。转移组与非转移组淋巴结最短径及 9 个能谱参数（双能 CT 三期增强 nIC，nZ_{eff} 及 λ_{HU}）差异均有统计学意义（P<0.001-0.007）。能谱参数二元逻辑回归分析选出动脉期 nIC（nIC_A）及门脉期 nZ_{eff}（nZ_{eff-P}）构建模型。ROC 曲线分析示单一能谱参数门脉期 nZ_{eff}（AUC：0.871；准确率：84.8%）及逻辑回归构建模型（AUC：0.916；准确率：87.1%）的 AUC 及准确率明显高于形态学特征（AUC：0.505-0.624；准确率：47.8%-62.4%）及淋巴结最短径（AUC：0.647；准确率：66.3%）（P<0.05）。
结论：双能 CT 定量多参数分析能够提高结肠癌患者区域淋巴结性质术前判定的准确性。

EPO-1214
多 b 值 DWI 结合定量分析在直肠腺癌病理分级中的应用研究

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目的 探讨多 b 值 DWI 扫描结合 ADC 值定量分析在直肠腺癌病理分级中的价值
方法 收集未经治疗的直肠癌患者 60 例，男 42 例，女 18 例，年龄 36-84 岁，平均 60.6±10.7 岁。首先对盆腔扫描野进行 ASSET CAT 校正，使用 SE-EPI 序列执行轴位 DWI 扫描，b 值取 0、700、1000 及 1500s/mm2，激励次数分别为 4、4、4、8 次。将原始图像传输至 Function 工作站并校正，再重建出轴位表观扩散系数图（ADCmap）。选择肿瘤最大层面，并避开囊变坏死、血管及伪影，结合 HR-MRI T2WI 及 DCE-MRI 图像，手动勾画感兴趣区域（ROI），分别测量病灶不同 b 值的 ADC 值，总共测量 3 次，取平均值。并收集患者的临床及病理资料。
结果 依据病理将 60 例患者分为 5 组：低分化组 5 例，中-低分化组 10 例，中分化组 33 例，中-高分化组 8 例，高分化组 4 例。运用方差齐性检验比较不同病理分级 ADC 值的差异， b=700s/mm2，F=12.619； b=1000s/mm2，F=24.900；b=1500 s/mm2， F=37.986。以上 p 值均小于 0.05，差异均有统计学意义。
结论 多 b 值 DWI 扫描结合 ADC 值定量分析对直肠腺癌术前病理分级预测价值较高

EPO-1215
阑尾周围脂肪 CT 值对阑尾炎诊断及严重程度评估的价值

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目的：对急性阑尾炎患者及正常人阑尾周围脂肪 CT 值进行研究，探讨阑尾周围脂肪 CT 值的改变对正常阑尾、各病理类型阑尾炎鉴别诊断的价值。
材料与方法：回顾性分析经手术、病理证实的急性阑尾炎患者 308 例及正常对照组 243 例。使用 Siemen 后处理系统对两组的阑尾进行 MPR 及 CPR 重建以显示阑尾全长，采集阑尾周围脂肪、肠系膜脂肪、腹部前、后壁皮下脂肪、臀部皮下脂肪及腰大肌的 CT 值；并进一步计算阑尾周围脂肪 CT 值/其他六组 CT 值的比值的绝对值。通过 SPSS19.0 软件进行统计学分析，比较病例组与对照组之间 7 组 CT 值的差异以及各组 CT 值的比值的绝对值的差异。
结果：阑尾周围脂肪的 CT 值在对照组与病例组之间有显著的统计学差异（F=489.138，*P*=0.001）；而其他 6 组中仅臀部皮下脂肪 CT 值（F=0.918，*P*=0.338）及腰大肌 CT 值（F=1.138，*P*=0.287）在两组之间无显著的统计学差异。本研究使用阑尾周围脂肪的 CT 值/腰大肌 CT 值的比值的绝对值作为阑尾炎病理类型的鉴别诊断指标，得出各组的最优界值分别为：对照组为 1.603（AUC：0.891；敏感性：94.6%及特异性：71.4%）、单纯组为 0.449（AUC：0.531；敏感性：91.5%及特异性：20.8%）、化脓组为 0.623（AUC：0.845；敏感性：76.3%及特异性：81.7%）、坏疽组为 0.692（AUC：0.763；敏感性：85.7%%及特异性：67.7%）。除单纯组的 AUC 较小外，其他三组的 AUC 介于 0.763~0.891，说明该组绝对值具有较好的鉴别诊断效能。
结论：阑尾炎周围脂肪浸润导致的 CT 值改变可作为阑尾炎诊断的定量辅助指标。阑尾周围脂肪 CT 值/腰大肌 CT 值的比值的绝对值不仅可以作为阑尾炎诊断的定量辅助指标，亦有助于判断阑尾炎患者的病理类型，进而指导临床选择合理的治疗方案。

EPO-1216
标准化碘浓度鉴别胃癌 Lauren 分型的价值

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目的 探索动脉期及静脉期标准化碘浓度（NIC）术前诊断胃癌 Lauren 分型的价值。**方法** 收集有完整双能扫描资料并经手术病理证实的 67 例胃癌患者，通过双能量后处理软件得到碘图并测得动脉期、静脉期病灶及同层腹主动脉的碘浓度值，计算动脉期及静脉期的标准化碘浓度（NIC=病灶碘浓度/同层腹主动脉碘浓度），比较不同 Lauren 分型 NIC 值的差异。采用单因素方差分析多重比较进行统计学分析，并绘制受试者工作特征曲线（ROC 曲线），分别评价动静脉期 NIC 值的诊断效能，按约登指数最大为原则得出诊断阈值及 AUC（ROC 曲线下面积）。（$P<0.05$）**结果** 弥漫型胃癌动脉期及静脉期的 NIC 值（0.136±0.063、0.630±0.141）明显高于肠型胃癌（0.089±0.050、0.353±0.081）及混合型胃癌（0.100±0.029、0.425±0.131），两两比较，弥漫型-肠型、弥漫型-混合型动脉期与静脉期 NIC 值差异均有统计学意义（$P<0.05$），肠型-混合型动脉期与静脉期 NIC 值差异均无统计学意义（$P>0.05$）。动脉期及静脉期 NIC 值诊断胃癌 Lauren 分型的 AUC 分别为 0.693、0.925，Youden 指数分别为 0.319、0.791，以动脉期 NIC 值大于 0.091 为阈值诊断弥漫型胃癌时，敏感度为 84.8%，特异度为 47.1%；以静脉期 NIC 值大于 0.477 为阈值诊断弥漫型胃癌时，敏感度为 90.9%，特异度为 88.2%。**结论** 双能量成像的 NIC 值有助于诊断胃癌 Lauren 分型，其中静脉期 NIC 值诊断效能较动脉期 NIC 值高，且有较高的敏感度及特异度。

EPO-1217

Non-invasive MR Assessment of the Microstructure and Microcirculation in Regional Lymph Nodes for Rectal Cancer: A Study of Intravoxel Incoherent Motion Imaging

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Purpose The aim of this study is to evaluate the microstructure and microcirculation of regional lymph nodes (LNs) in rectal cancer by using non-invasive intravoxel incoherent motion MRI (IVIM-MRI), and to distinguish metastatic from non-metastatic LNs by quantitative parameters. ***Methods*** All recruited patients underwent IVIM-MRI (b=0, 5, 10, 20, 30, 40, 60, 80, 100, 150, 200, 400, 600, 1000, 1500 and 2000 s/mm^2) on a 3.0T MRI system. 168 regional LNs with a short-axis diameter equal to or greater than 5 millimetres from 116 patients were evaluated by two radiologists independently, including 78 malignant LNs and 90 benign LNs. The following parameters were assessed: the short-axis diameter (S), long-axis diameter (L), short- to long-axis diameter ratio (S/L), pure diffusion coefficient (D), pseudo-diffusion coefficient (D^*), and perfusion factor (f). Intraclass correlation coefficients (ICCs) were calculated to assess the interobserver agreement between two readers. Receiver operating characteristic (ROC) curves were applied for analyzing statistically significant parameters. ***Results*** Interobserver agreement of IVIM-MRI parameters between two readers was excellent (ICCs>0.75). The metastatic group exhibited higherS, L and D (P<0.001), but lower f (P<0.001) than the non-metastatic group. The AUC (95% CI, sensitivity, specificity) of the multi-parameter combined equation for$D$, f and S was 0.811 (0.744~0.868, 62.82%, 87.78%). The diagnostic performance of the multi-

parameter model was better than that of an individual parameter (P<0.05). *Conclusion* IVIM-MRI parameters provided information about the microstructure and microcirculation of regional LNs in rectal cancer, also improved diagnostic performance in identifying metastatic LNs.

EPO-1218
胃肠道非霍奇金淋巴瘤 MSCT 诊断与临床分期对比分析

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探讨多层螺旋 CT（MSCT）应用于胃肠道非霍奇金淋巴瘤的诊断价值，并与临床分期结果对比。**方法：**选择我院 2013 年 1 月~2016 年 6 月经手术病理检确诊为胃肠道非霍奇金淋巴瘤患者 41 例为研究对象，对所有患者均或胃肠道镜活进行 MSCT 检查，对比 MSCT 诊断结果与临床病理分期的差异。**结果：**MSCT 诊断胃肠道非霍奇金淋巴瘤与病理结果的诊断符合率为 85.37%（35/41），I 期符合率为 100%（10/10），II 期符合率为 73.68%（14/19），III 期符合率为 100.00%（5/5），IV 期符合率为 100.00%（6/6）；**结论：**胃肠道非霍奇金淋巴瘤术前应用 MSCT 诊断具有较高价值，在术前临床分期中具有指导作用，可为制定治疗方案提供参考，值得推广。

EPO-1219
多层螺旋 CT 征象对黏连性肠梗阻绞窄的诊断价值

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目的：探讨 MSCT 征象对粘连性肠梗阻绞窄发生的诊断价值。材料与方法：回顾性分析我院收治的 134 例粘连性肠梗阻患者的 CT 图像，评价与绞窄相关的 CT 征象及不同征象对绞窄发生的诊断价值。结果：本研究 61 人接受手术治疗，32 人手术证实存在绞窄，其中 26 人有既往手术史；73 人采取药物保守治疗。手术证实发生绞窄的患者中，MSCT 诊断 29 例发生绞窄性肠梗阻，诊断的敏感性为 90.63%（29/32），准确率为 95.08%（58/61）。手术患者中 53 人术中确诊为单发梗阻，8 例为多发梗阻，术前 CT 诊断单发梗阻的准确率为 100%，多发梗阻准确率为 62.50%（5/8）。对各 CT 征象的单因素及多因素分析结果显示，肠壁强化程度减低（OR:16.392，95%CI：4.576,58.718）、弥漫性肠系膜水肿及血管增粗（OR:10.028，95%CI：2.746,36.628）、C/U 型肠袢（OR:5.453，95%CI：1.577,18.861）三种征象可能与绞窄密切相关。当三种 CT 征象皆未出现时，表明绞窄的可能性很低（NPV：97.65，-LR：0.07）。结论：MSCT 对判断粘连性肠梗阻绞窄发生具有较高的价值。

EPO-1220
磁共振体素内不相干运动扩散加权成像对小肠型克罗恩病炎症活动性的诊断价值及效能比较

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【摘要】目的 探讨体素内不相干运动扩散加权成像（IVIM-DWI）不同参数对小肠型克罗恩病炎症活动度的诊断价值及效能。**方法** 前瞻性收集小肠型克罗恩病患者 30 例为克罗恩病组，收集无肠道疾病及相关病史的志愿者 30 例为对照组。所有受试者均行 MR 平扫和 IVIM 检查，测量肠壁 ADC 值、真性水分子扩散系数（D）、微循环灌注系数（D*）和灌注分数（f）值。克罗恩病组与对照组各参数的比较采用独立样本 t 检验，采用 ROC 曲线评估 IVIM 各参数对炎症性肠病的诊断效能。**结果** CD 组参数 ADC 值、D 值、D*值及 f 值分别为（0.78±0.29）×$10^{-3}mm^2/s$、（1.02±0.37）×$10^{-3}mm^2/s$、（22.2±7.7）×$10^{-3}mm^2/s$ 和（37.1±14.7）%，对照组分别为（1.53±0.32）×$10^{-3}mm^2/s$、（1.15±0.41）×$10^{-3}mm^2/s$、（36.9±21.2）×$10^{-3}mm^2/s$ 和（56.5±18.5）%，两组间 ADC 值、D*、f 值两组间差异有统计学意义（P<0.05），而 D 值两组间差异无统计学意义（P>0.05）。IVIM 相关参数 ADC 值、D*值、f 值诊断克罗恩病的 ROC 下面积分别为：0.952、0.726、0.799。**结论** IVIM 相关参数 ADC 值、D*值、f 值对克罗恩病有一定的诊断价值，其中 ADC 值诊断效能最高。

EPO-1221

MR 扩散加权成像评估克罗恩病活动性的价值

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目的：探讨磁共振 DWI 信号及 ADC 值对克罗恩病（CD）活动性的诊断价值。**方法：**收集 2017 年 1 月--2019 年 5 月本院收住入院经临床、肠镜、病理证实为 CD，同时行磁共振小肠造影（MRE）和 DWI 检查的 67 例患者；所有患者均行 3.0TMRI 常规序列和 DWI 序列扫描，重点观察末端回肠、升降结肠 DWI 和 ADC 图像，对病变肠壁与正常肠壁厚度及 ADC 值进行测量，以 CD 活动指数（CDAI）作为基本活动性参考标准，并将其结果与肠镜活检进行对比分析。**结果：**67 例病例中 CD 缓解期（CDAI＜150)25 例，活动期(CDAI≥150)42 例。病变肠段 135 段，缓解期和活动期病变肠壁 ADC 值分别为（1.55±0.27）× 10-3mm^2/s 、（1.26±0.15）× 10-3mm^2/s。ADC 值和 DWI 信号评分差异有统计学意义（ρ 均＜0.01），采用 ADC 和 DWI 信号评分鉴别缓解期和活动期 CD 的 ROC 下面积 ≥ T2 信号评分、肠壁厚度评分和强化程度评分的 ROC 下面积。**结论：**磁共振 DWI 可以准确评估肠道 CD 活动性。

EPO-1222

胃肠道间质瘤的 CT 表现分型及意义初探

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目的 探讨胃肠道间质瘤（GIST）的 CT 影像表现的特点及分型，并分析各型危险度分级、Ki67 指数的差异。
方法 回顾性分析经手术和病理证实的 74 例单发胃肠道间质瘤的 CT 资料，根据 GIST 的 CT 形态学特点对 GIST 进行分型，用秩和 WH 检验分析各型的险度分级、Ki67 指数差异。
结果 ①将 GIST 的 CT 表现分为以下 3 型：经典型 62 例、囊性型 8 例、壁增厚型 4 例；按照 2008 年 NIH 版危险度分级标准进行评估：极低危险度 2 例、低危险度 23 例、中危险度 18 例、高危险度 31 例；按照 Ki67 指数分为：Ki67 指数≥10% 19 例；Ki67 指数＜10% 55 例。②经典型、囊性型、

壁增厚型三型的危险度分级及 Ki67 指数有统计学差异，P＜0.05，壁增厚型组的危险度分级及 Ki67 指数明显高于经典型组及囊性型组。
结论：GIST 的分型研究细化了 GIST 的 CT 表现，有助于术前 CT 诊断及鉴别诊断，对术前 GIST 的危险度、Ki67 指数的预测有重要意义。

EPO-1223
双能量 CT 虚拟单能谱成像对克罗恩病肠壁血管显示的价值

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目的：探讨双能量 CT 虚拟单能谱成像在克罗恩病肠壁血管显示中的应用价值。
方法：回顾性收集南通大学第二附属医院 2017 年 7 至 2019 年 6 月炎症性肠病患者 36 例的临床和影像学资料，所有患者均经手术、内镜或者临床诊断最后证实。采用双源 CT 新单能谱软件(syngo.Dual energy Mono+)分别获得 40keV、50keV、60keV、70keV、80keV、90keV 6 组单能量图像,并与常规混能 120kvp 图像对比,分析并比较各组图像间肠系膜上动脉血管的 CT 值、对比噪声比(CNR)、信号噪声比（SNR）以及显示血管分支数评分、总体图像质量评分和图像锐利度评分。计量资料以均数±标准差(x±s)表示，使用 Kolmogorv-Smirnov 检验分析变量是否符合正态分布。对于连续正态分布的变量采用单因素方差分析，组内两两比较采用 Tukey 法；非正态分布的变量使用 Kruskal-Wallis H 检验，P<0.05 为差异有统计学意义。使用组内相关系数（ICC）评估观察者间的一致性。
结果：分析 36 例患者的 7 组图像得出，在客观图像评估中，40keV VMI+的血管 CT 值明显高于其他能级的图像，均有统计学差异；40 keV 组 CNR 值高于 60-90 keV 组和 120 kVp 组，与 50keV 组的差异无统计学意义；40keV 组 SNR 值高于其他能级图像，仅与 90keV 有统计学差异。在主观图像评估中，40keV 组观察血管分支数及图像锐利度均高于其他 6 组，与 50keV、60keV 无统计学差异；60keV 组总体图像质量评分均高于其他 6 组，但与 40keV、50keV 无统计学差异。两位观察者间对图像评估有很高的一致性（ICC=0.82）。
结论：虽然低于 70keV 能级的图像均能较好的显示克罗恩病肠壁血管，但是 40keV VMI+可以在不降低图像质量的同时显著提高细小血管的显示，有利于克罗恩病的诊断。

EPO-1224
CT 小肠造影对克罗恩病肛瘘发病 与短期手术预后的预测价值

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目的：分析 CT 小肠造影（CTE）预测克罗恩病肛瘘发病与一年内接受手术治疗风险的可行性与价值，为指导临床病情评估、合理选择治疗方案提供依据。
方法：回顾性收集 2015 年 1 月到 2017 年 2 月确诊为克罗恩病（CD）患者共 204 例。分析初诊 CTE 图像参数，测量病变的位置，病变最严重处肠壁的厚度、平扫与肠期的 CT 值及强化方式，并评价是否合并梳样征、淋巴结肿大、脂肪爬行征、肠管狭窄与肠瘘；利用 MRI 检查评价是否合并肛瘘；统计分析 CTE 图像中能够预测肛瘘发病的参数。所有合并肛瘘患者均随访一年，分析取得完整随访资料的患者初诊 CTE 图像，统计分析能够预测一年内需接受手术干预的参数。

结果：共纳入 204 例初诊 CD 患者进行分析。CD 肛瘘组共有 88/204（43.14%）例，无 CD 肛瘘组为 116/204（56.86%）例。一年内接受手术治疗风险分析手术组 18 例，无手术组 53 例。结肠受累 CD 肛瘘组为 47/88 例（53.41%），无 CD 肛瘘组为 38/116 例（32.76%），差异具有统计学意义（P=0.006）。CD 肛瘘组肠壁强化以 1 型和 2 型为主，共 69/88 例（78.41%）；无 CD 肛瘘组以 3 型和 4 型为主，共 78/116 例（67.25%），差异具有统计学意义（P＜0.001）。直肠受累手术组与非手术组分别为 12/18 例（69.62%）与 22/53 例（41.51%）；肠管狭窄两组分别为 15/18 例（83.33%）与 33/53 例（62.27%）、肠瘘两组分别为 4/18 例（22.22%）与 2/53 例（3.77%），以上有统计学意义（P＜0.005）。直肠受累、肠管狭窄与肠瘘会增加 CD 肛瘘患者一年内接受手术风险（OR＞1）。

结论：结肠受累与肠壁强化方式能较好预测 CD 肛瘘发病。直肠受累、肠管狭窄与肠瘘会增加 CD 肛瘘患者一年内接受手术干预的风险。CTE 对 CD 肛瘘发病与一年内内需接受手术干预预后的预测具有良好的价值。

EPO-1225
小肠 CT 造影评估炎症性肠病的骶髂关节炎 影像学表现及临床意义

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目的 利用小肠 CT 造影评估肠病性关节炎之骶髂关节炎的影像学表现及其对炎症性肠病的诊断意义。**方法** 回顾性分析嘉兴市第二医院 2016 年 1 月至 2018 年 12 月经临床病理和肠镜证实且 CTE 检查资料完整的 101 例 IBD 患者，按照骶髂关节有无病变将患者分为肠病性关节炎阳性（EA（+））组和肠病性关节炎阴性（EA（-））组，EA（+）组按肠镜及病理结果进一步分为克罗恩病（Crohn's disease，CD）组和溃疡性结肠炎（Ulcerative colitis，UC）组。EA（+）组 35 例（CD 组 21 例，UC 组 14 例），EA（-）组 66 例。统计结合骶髂关节炎前后 CTE 对 IBD 诊断的准确率。按 ASAS）评估标准对 EA（+）组的骶髂关节进行评分，评估 EA（+）组、CD 组及 UC 组各组内的骶髂关节炎各征象评分间是否有统计学差异。统计 EA（+）组 IBD 的分型（蒙特利尔分型），并评估总评分与分型之间的相关性。各组患者间的计量资料采用独立样本 t 检验（正态分布）或非参数检验（偏态分布）比较，计数资料采用交叉表 Pearson 卡方检验比较，相关性采用 Pearson 相关性检验。**结果** EA（+）组与 EA（-）组的一般临床指标及炎性指标无统计学差异（P 均>0.05）。在结合骶髂关节炎征象前后，CTE 对 IBD 诊断的准确率有统计学差异（P<0.05）。EA（+）组、CD 组及 UC 组的骶髂关节炎表现以关节面硬化为主，EA（+）组及 UC 组骶髂关节炎各征象的评分有统计学差异（P<0.05），但 CD 组无统计学差异。评分与分型不相关（P>0.05）。中青年患者的骶髂关节中出现气体。**结论** IBD 患者中骶髂关节炎的发病率较高，主要表现为关节面硬化。骶髂关节炎有助于提高 CTE 对 IBD 诊断的正确率。

EPO-1226
正常肠管与活动期 Crohn 病 MR 灌注成像初步对比研究

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目的：对小肠 MR 灌注成像方法及其在 Crohn 病诊断及活动性评估中的可能应用价值进行初步探讨。

方法：收集我院 2018 年 8 月至 12 月间应用 Siemens skyra 3.0T 超导型 MR 机器对 128 例病例行常规 MRE 及小肠 MR 灌注成像，选取回肠末段做为研究肠段，回顾性分析病变组（经临床及病理确诊 Crohn 病且处于活动期）21 例，正常对照组（常规 MRE 阴性并经临床、肠镜及病理证实阴性）回肠末段 14 例，采用 Syngo.via 软件 tissue4D 工作流勾画感兴趣区计算所研究肠段 24 例灌注参数：Ktrans，其中病变组 16 例，正常对照组 8 例；同时收集 Crohn 病患者 CDAI 评分、CRP 值。统计学方法对比受累回肠末段间 Ktrans 值差异性。
结果：正常对照组及活动期 Crohn 病 Ktrans 值差异有统计学意义（P＜0.001）。
结论：对比正常肠管，小肠 MR 灌注成像定量参数 Ktrans 能够反映 CD 微血管及微循环的变化，具有一定的临床应用价值。

EPO-1227

MR 平扫及增强扫描联合 DWI 及 ADC 值定量分析对直肠癌术前 T 分期的诊断价值研究

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一、研究目的：通过此项研究，鉴别直肠癌肠周侵犯与直肠周围纤维反应增生，更准确的进行直肠癌术前 T 分期，制定更有效合理的治疗方案，避免不必要的放化疗，更好的掌握手术时机。
二、研究方法：本项研究选取 本院胃肠外科收治的 77 例直肠癌患者的临床资料。采用美国 G E 公司 3.0 T 静音 MRI 系统进行扫描，GE 公司 AW 4 .6 版本后处理工作平台进行后处理。病理学 T 分期标准根据 UICC（国际抗癌联盟）发布的第八版恶性肿瘤 TNM 分期，将采集的 DWI 图使用工作站专用分析软件进行后处理，生成表观扩散系数(ADC) 图。避开坏死区，测量所有直肠癌壁外侵犯的肿瘤、纤维反应增生的 ADC 值，与术后病理结果进行比较分析。分别计算常规 MR 及常规 MR 结合 DWI 及 ADC 值定量分析对直肠癌术前 T 分期的诊断符合率，对比分析其诊断价值。评估纤维反应增生与直肠癌周围侵犯 DWI 的信号特征和 ADC 值的最佳分界值。使用 SPSS19,0 统计软件进行统计学分析。对每组数据均行独立样本 t 检验。P ≤0. 05 为差异有统计学意义。
三、结果：肠周侵犯的直肠癌与纤维反应增生的 ADC 值分别为 $1.13\pm0.43\times10^{-3}mm^2/s$、$1.56\pm0.48\times10^{-3}mm^2/s$、前者明显低于后者，差异具有统计学意义。可是 ADC 值存在重叠，本研究的 ADC 值的最佳分界值为 $1.25\times10^{-3}mm^2/s$。MRI 平扫及增强扫描对直肠癌术前 T 分期的诊断符合率为 72.72%（56/77)；MRI 平扫及增强扫描联合 DWI 及 ADC 值的定量分析对直肠癌术前 T 分期的诊断符合率为 90.90%（70/77)。
四、结论：DWI 及 ADC 值的定量分析可以有效的鉴别直肠癌肠周侵犯与纤维反应增生，MRI 常规扫描联合 DWI 及 ADC 值的定量分析对直肠癌术前 T 分期的准确率明显提高，值得在临床上推广。

EPO-1228

胃肠间质瘤影像学研究进展

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胃肠间质瘤(GIST)常用的影像学检查手段包括超声、CT、磁共振及 PET，这些检查手段可辅助临床进行病变的检出定位、诊断和鉴别诊断、生物学行为评估及危险度评价、手术方案制定、靶向药物疗效预测及随访监测等，在 GIST 个体化治疗中发挥着重要作用。规范化前处置、多平面重组及多期增强等技术对 GIST 小病灶的检出意义较大。肿瘤引流血管及强化特征的差异有助于区分小肠 GIST 和胰腺癌、神经内分泌肿瘤及其他腹腔非 GIST 肿块。影像学可提供多种反映 GIST 危险度的

定性定量指标，近期有研究发现 GIST 危险度分级与坏死有关，而与囊变无关。双能 CT 对胃肠道 GIST 进行危险度分层研究显示，高危险度肿瘤的动静脉期及延迟期 CT 值及标准化碘浓度值均显著高于非高危险度肿瘤。关于肿瘤强化模式与危险度的关系目前还存在争议。近期影像组学和深度学习研究的兴起，为 GIST 危险度评价提供了新的方向，多项研究利用各种模型及参数，预测 GIST 危险度分级 AUC 值达到 0.85 以上，预测 11 外显子突变、核分裂像及生存方面也优于传统指标和医生的主观判断。近期 PET 及磁共振扩散成像的发展，为 GIST 靶向治疗疗效的预测和早期评价提供了更为精准的功能定量指标。

EPO-1229

DCE-MRI 4D-Tissue 预测胃癌化疗疗效的研究

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目的：探讨磁共振动态增强成像（DCE-MRI）参数预测及判断胃癌新辅助化疗疗效的价值。材料与方法：前瞻性纳入 48 例行 DCE-MRI 检查的胃癌患者，所有患者在新辅助化疗前接受磁共振检查。经连续随访， 48 例患者中 26 例手术前一周内行 DCE-MRI 检查。由后处理软件自动计算 DCE-MRI 参数（Ktrans、Kep、Ve）。在治疗前后分别测量 DCE-MRI 相应的指标（X_{pre} 和 X_{post}），同时计算上述定量参数治疗前后的差值（△X）及变化率（%△X）。病理肿瘤退缩分级为参考标准 （NCCN 分级）：有效组为 pTRG 0-2 级，反应不良组为 pTRG 3 级。统计学分析采用 SPSS 22.0，双侧 $P<0.05$ 代表有统计学意义。采用 Mann-Whitney U 检验和 Spearman 秩检验比较有效组与反应不良组治疗前后各参数及其变化的差异及相关性。受试者工作特征曲线(ROC)用于比较诊断效能。结果：26 例 DCE-MRI 患者中有效组 13 例，反应不良组 13 例。新辅助治疗前后，在治疗有效组及治疗无效组，治疗前的 Kep、Ve 值、Ktrans 值及治疗后的 Kep 和 Ve 值及其变化差值、变化率均无统计学意义改变（（$P>0.05$）。反应不良组治疗后的 $Ktrans_{post}$ 值（0.119±0.046）min^{-1} 高于有效组（0.08±0.03）min^{-1}，差异具有统计学意义（$P<0.05$）。$Ktrans_{post}$ 的 AUC 为 0.760，诊断反应不良组的敏感性 76.90%，特异性 69.20%。治疗后 $Ktrans_{post}$ 与治疗疗效成正相关，随着治疗后 $Ktrans_{post}$ 值增加，治疗效果趋向于无效。结论： DCE-MRI 可以用于筛选胃癌新辅助化疗反应不良组的患者。

EPO-1230

腹膜后腺泡状软组织肉瘤个案报道

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背景：腺泡状软组织肉瘤是罕见的软组织恶性肿瘤，组织来源不明，好发于青年人，女性多于男性，成年人常见于四肢，儿童则为头颈，腹膜后罕见，多数早期出现血液转移，切除后易复发，预后差。

临床资料：女性，49 岁，体检行腹部彩超提示左上腹实性占位，与左肾关系密切，建议进一步检查。

影像资料：增强 CT: 左肾前方见一类圆形囊实性肿块影，边界清晰，左肾及周围肠管受压，局部与右肾分界不清，密度不均，其内可见出血、囊变，实性部分增强扫描呈不均匀轻-中度强化，囊性部分无强化。CTA：左肾前方肿块血供丰富，病灶内及边缘可见迂曲血管影，腹主动脉分支腰动

脉、左肾实质内动脉、肠系膜上及肠系膜下动脉参与供血，其中病灶紧邻左肾处可见部分供血动脉呈瘤样扩张。

行开腹手术，术中见：肿瘤位于左上腹脾脏及胃后壁下方、左肾前方，约 15*10*15cm，软，呈鱼肉状，其后方、下方左肾关系致密，有血管浸润；术中标本冰冻示恶性肿瘤。

病理诊断:<左腹膜后>恶性肿瘤，肿瘤细胞胞浆丰富，异型性大，易见病理性核分裂像，可见瘤巨细胞，其中见坏死出血，局部区域见血窦分隔细胞巢，结合形态学及免疫组化，符合腺泡状软组织肉瘤。**免疫组化：**CK（-），EMA（-），TFE-3 小部分（+），MyoD1 浆（+），Vim（+），CD68（+），CD99（-），S-100（-），HMB45 小灶（+），MelanA（+），desmin（-），SMA(-)，CD34(-)，CD31 部分（+），Myogenin（-），a-inhinbin（-），ER(-)，PR(-)，CD117（-），Syn（-），CgA（-），SOX-10（-），CKH（-），Ki67 50%（+）。

治疗与随访：根治性手术切除+EI 方案（表柔比星 100mg D1-2+异环磷酰胺 3g D1-5）+贝伐珠单抗 300mg D1 抗肿瘤血管生成，规律化疗 6 周期。术后 1 年，局部复发，再次行手术切除，规律随访。

EPO-1231

CT 观察胃癌侵犯胰腺程度对胃癌原发灶可切除评估中的价值

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【 摘要 】目的：探讨 CT 观察胃癌侵犯胰腺程度对评估胃癌原发灶可切除性的价值。方法：本院 2017 年 1 月～2018 年 12 月共收治 65 例胃癌患者，均进行 CT 检查。经手术证实胃癌与胰腺关系。计算 CT 诊断胃癌侵犯胰腺程度的准确率，分析胃癌与胰腺接触面形态与清晰度、外侵形态、胰腺受侵犯部位、胰周 CT 值。结果：65 例患者中，18 例经术前 CT 诊断为胃癌侵犯胰腺但术中证实未侵犯胰腺。47 例经证实为胃癌侵犯胰腺，CT 诊断胃癌侵犯胰腺的准确率为 72.31%（47/65）。47 例确诊的胃癌侵犯胰腺患者中，16 例术中探查发现无法行根治性切除，31 例患者采取原发灶与胰腺联合切除后成功切除。18 例误诊患者主要表现为Ⅰ型与Ⅱ型，47 例胃癌侵犯胰腺患者则以Ⅱ型、Ⅲ型、Ⅳ型为主，其中 16 例无法手术切除患者均为Ⅳ型。误诊患者以接触面清晰居多，而确诊胃癌侵犯胰腺患者则均表现为接触面模糊。3 组患者接触面形态与接触面清晰度均存在显著差异（P ＜ 0.05）。误诊患者外侵形态以毛刺条状为主，多侵犯胰体；根治手术患者外侵形态以结节外突为主，多侵犯胰体；无法根治患者外侵形态以模糊片状为主，多侵犯胰头。3 组患者肿瘤外侵形态与胰腺受侵犯部位的差异有统计学意义（P ＜ 0.05）。误诊患者与胰腺接触处的胰周 CT 值为（-47.21±7.85）HU，显著高于根治手术患者的（-33.46±6.10）HU 与无法切除患者的（-11.02±3.13）HU，差异有统计学意义（P ＜ 0.05）。同时根治手术患者的接触或受侵犯胰周 CT 值也显著高于无法切除患者（P ＜ 0.05）。结论：胃癌侵犯胰腺的接触面多发生在胃癌外侵明显处，且接触面模糊，胰腺呈内凹或嵌插征；若接触面清晰，则提示二者仅是相贴，并无侵犯。当胰腺与胃癌的脂肪间隙密度明显增高或出现索条、淡片征时，原发灶可能无法根治切除，应引起重视。

EPO-1232

MRI Evaluation of Lateral Pelvic Lymph Node in Locally Advanced Rectal Cancer: Optimized Cutoff Value Chosen and the Relationship to Overall Survival

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PURPOSE
To study the relationship between MRI-detected pretreatment lateral pelvic lymph node (LPLN) metastasis and prognosis in patients with locally advanced rectal cancer treated with neoadjuvant chemotherapy-radiation therapy (CRT).
METHOD AND MATERIALS
This retrospective study included 517 patients with locally advanced rectal cancer evaluated from August 2008 to December 2014. Baseline and post-CRT MRI and follow-up data were retrieved for all patients. MRI findings of LPLN metastasis were evaluated. Kaplan-Meier curves and ROC analysis were used to determine the relationship of baseline MRI findings to overall survival.
RESULTS
227 patients (43.9%) had visible LPLNs with short axis of at least 5mm on pretreatment MRI. Univariate cox analysis indicated that the short axis (HR=1.12, 95%CI: 1.04-1.21, p<0.01) as well as the long axis of the largest LPLN (HR=1.07, 95%CI:1.02-1.13, P=0.01) were associated with the overall survival (OS). However, there was no significant relation to the metastasis free survival or the local recurrence free survival. A cut-off of 8mm and 12mm were selected for short and long axis respectively by using survival ROC analysis. Kaplan-Meier method showed LPLNs with a short axis greater than 8 mm resulted in a significantly poor OS (3-year OS 92.5% vs 79.7% for less than 8mm vs equal to or greater than 8mm, P<0.01). LPLNs with a long axis greater than 12 mm resulted in a significantly poor OS (3-year OS 92.3% vs 77.3% for less than 12mm vs equal to or greater than 12mm, P<0.01).
CONCLUSION
The presence of lateral pelvic lymph node (LPLN) was associated with overall death in patients with locally advanced rectal cancer. Further research is needed about which pretreatment features of the LPLN predict prognosis and what is needed to prevent these from developing.

EPO-1233
光谱 CT 碘图定量参数对局限性结肠壁增厚的定性评估价值

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目的：本研究旨在探究应用光谱 CT 碘图相关参数，对 CT 图像上发现的局限性结肠壁增厚（LCWT，厚度≥5mm，累及长度≤3cm）的定性评估价值，以期为后续的临床治疗提供较为可靠的诊断信息。方法：收集 2018 年 9 月至 2019 年 5 月在我院就诊，且在一个月之内同时接受光谱探测器 CT （IQon，Philips Healthcare)腹盆部增强扫描和电子结肠镜检查的患者。排除标准：已行结肠癌手术和新辅助放化疗者、肿块型结肠壁增厚者。将图像传至 Philips 后处理工作站，由两位医师共同阅片，并选取含 LCWT 病灶的增强扫描静脉期图像。由另一位医师选择碘图模式，在选定图像的病灶处以及同层面的腹主动脉或右侧髂动脉分别勾画类圆形感兴趣区（ROI），系统将自动生成

该处的碘浓度值（IC）。记录 LCWT 病灶处的 IC 和标准碘浓度值（NIC，NIC=病灶处 IC/同层面腹主动脉或右侧髂动脉 IC）。统计分析良、恶性 LCWT 组之间的差异。
结果：最终入组 80 例患者，其中 47 例被内镜确诊为结肠癌，3 例为结肠腺瘤，余患者结肠镜检查未见明显异常。良、恶性 LCWT 组肠壁厚度分别为（11.63±2.64）mm、（11.87±2.96）mm，二者之间没有统计学差异（P=0.718）。结肠癌患者的 IC 和 NIC 均明显高于良性 LCWT 组相应的值[IC:(1.88±0.36)mg/mL、(1.25±0.37)mg/mL；NIC：0.44±0.10、0.27±0.07，P 均为 0.00]。ROC 曲线显示，当 IC 为 1.475mg/mL 时，曲线下面积（AUC）为 0.890，诊断结肠癌的敏感性和特异性分别为 91.5%、72.7%；当 NIC 为 0.341 时，AUC、诊断结肠癌的敏感性和特异性分别为 0.921、85.1%和 90.9%。
结论：应用光谱 CT 碘图相关的定量参数能够对局限性肠壁增厚的良恶性可以做出较为准确的判断，为临床诊治提供重要的诊断依据。

EPO-1234

Post lymphangiographic CT (PLCT) Sequential with Direct Lymphangiography (DLG) in Primary Intestinal Lymphangiectasia: A Retrospective Study

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Purpose

To investigate the clinical feasibility and imaging features of Post lymphangiographic CT (PLCT) in primary intestinal lymphangiectasia (PIL).

Materials and Methods

Forty-three PIL patients were performed with PLCT, and the imaging data were reviewed by two radiologists separately. The assessments for PLCT included intestinal lesions, edematous lesions, intestinal and mesenteric lymphangiectasia, lymphatic-abdominal leakages, lymph fluid reflux, lymphangioma and other lymphatic abnormalities. The intestinal lymphangiectasia and lymphatic-intestinal leakages were confirmed by enteroscopy and histology.

Results

PLCT imaging features included: (1) 86% intestinal wall thickening; (2) 72.1% anasarca; (3) 37.2% intestinal and mesentery lymphangiectasia, as the specific imaging sign, (4) abnormal dilated lymphatics in other places, including 34.9% in chest, 14.0% only in abdomen, and 14.0% around neck area, (5) 20.9% lymph reflux, indicating lymphatic circulation abnormalities (6) 2.3% lymphatic-abdominal leakage (7) 7.0% lymphangioma. (8) 4.7% bone lesions were detected, mainly osteolysis. Intestinal and mesentery lymphangiectasia was considered as the direct imaging sign for PLCT in primary intestinal lymphangiectasia. Patients with this positive imaging feature demonstrated younger first-episode age, higher ratio of neonatus onset, intestinal wall thickening and edematous lesions than negative group.

Conclusion

PLCT is feasible in detecting the location, range and distribution of abnormal dilated lymphatics, lymphatic leakage and lymphangioma in primary intestinal lymphangiectasia. Intestinal and mesenteric opacification is the direct imaging sign for primary intestinal lymphangiectasia, while lymphatic fluid reflux is the indirect imaging feature for lymphatic circulation abnormalities. Dilated lymphatics distributed in other places indicated potential possibility of systematic lymphatic abnormalities for part of primary intestinal lymphangiectasia patients.

EPO-1235

Evaluation of the Imaging Features and Biological Behavior of the Enhanced MSCT Scanning for 83 Cases of Advanced Gastric Cancer

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[Abstract] **Objective** To investigate the application value of the enhanced MSCT scanning in the evaluation of the biological behavior of the advanced gastric cancer. **Methods** A total of 83 patients with advanced gastric cancer in our hospital from September 2010 to January September 2010 were selected. All patients underwent MSCT examination and pathological examination. In comparison of pathological examination results, the relationship between imaging features of local serous surface of gastric cancer and the cancer penetrating serous membrane, and the conditions of the enhanced MSCT scanning checking the invasion of peripheral viscera were statistically analyzed. **Results** Pathological examination confirmed that there were 45 cases of penetrating serous membrane and 38 cases of non penetrating serous membrane among those 83 cases in this group. The diagnostic sensitivity (93.33%) and accuracy (83.13%) of the MSCT local signs of serous surface were higher than those of the local protruding signs of cancer (17.78%, 55.42%) and the signs of the fat space (57.78%, 59.04%) ($P<0.05$). The diagnostic specificity of local protruding signs in MSCT cancer (100%) was higher than that in signs of serous surface (71.05%) and the signs of fat space (60.53%). Pathological examination confirmed that there were 21 cases of invasion of the pancreas and 62 cases of non invasion of the pancreas, 22 cases of invasion of the transverse colon and mesangial and 61 cases of non invasion of the transverse colon and mesangial, 7 cases of invasion of the spleen and 76 cases of the non invasion of the spleen. There was insignificant difference in the sensitivity (57.14%), specificity (98.39%), and accuracy (87.95%) among the invasion of the pancreas, the transverse colon and mesangial (68.18%, 95.08%, 87.95%) and the spleen (57.14%, 96.05%, 92.77%) examined by the enhanced MSCT scanning ($P>0.05$). **Conclusion** Using MSCT to scan the advanced gastric cancer can accurately evaluate the invasion and infiltration of the lesion and other conditions, which can provide some reference for clinical formulation and adjustment of the treatment plan.

EPO-1236

单源双能 CT 综合分析平台在鉴别 T2 及 T3 期胃癌中的应用价值

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目的 探讨单源双能 CT 能谱综合分析平台对 T2 期及 T3 期胃癌鉴别诊断中的应用价值。**方法** 回顾性分析 37 例行单源双能 CT 三期增强能谱扫描，并经手术病理证实为胃癌的影像资料，其中 T2 期 20 例，T3 期 17 例。由两名观察者分别在互不知晓病理分期的情况下在三期增强上进行感兴趣区的勾画，感兴趣区为最大层面的上下三个层面，得到的数据以 EXCEL 表格输出。统计各期 40~140 keV 下单能量 CT 值、碘浓度（Iodine concentration，IC）值，并计算标准化碘浓度（Normalized iodine concentration，NIC）值和 40~70 keV 下单能量的能谱曲线斜率（K）。取三次测量结果的平均值进行后续的统计学分析。采用组内相关系数（ICC）检验两位观察者测量各期各参数结果的一致性；根据正态分布与否，采用独立样本 *t* 检验或 Mann-Whitney U 检验比较两组病灶各期各参数间的差异；采用 ROC 曲线评估有鉴别价值的参数对两者鉴别诊断的效能。**结果** 静脉期 40~70ke V 下单能量的 CT 值、K 值和 NIC 值在 T3 期胃癌均大于 T2 期胃癌，P<0.05，AUC 分别是 0.837、0.837、0.816、0.816、0.837、0.959。其中 NIC 的诊断效能最高，以 NIC≥0.3802 时，敏感度为 85.7%，特异度 100%。动脉期 40~140 keV 下单能量的 CT 值、K 值、NIC 值、静脉期 80~140keV 下单能量的 CT 值在 T2 与 T3 胃癌组间差异均无统计学意义，P>0.05。**结论** 静脉期 40~70ke V 下单能量的 CT 值、K 值、NIC 值可以进行 T2 期和 T3 期胃癌的鉴别诊断，其中静脉期的 NIC 为最佳参数。

EPO-1237
胃神经内分泌肿瘤 CT 表现、临床特征及病理对照分析

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目的 :探讨胃神经内分泌肿瘤（G-NETs）的 CT 表现、临床特征与不同病理分级的相关性。**方法:** 回顾性分析 55 例胃神经内分泌肿瘤的临床资料、病理资料及 CT 影像资料。**结果 ：**55 例 G-NETs,其中 NET（G1,G2 级）16 例，NEC（G3 级）28 例，MANEC 11 例。平均发病年龄为 56.4 岁，男女比例为 3.6:1。临床多以间断上腹胀痛不适为主。NET（G1,G2 级）不易侵犯浆膜，不易淋巴结转移及远处转移，NEC（G3 级）和 MANEC 易侵犯浆膜外，易淋巴结及肝转移。NET（G1,G2 级）最多见于胃体，约 62.5%（10/16），病灶直径多小于 3.0cm，不伴溃疡，密度多均匀，增强明显均匀强化。NEC（G3 级）和 MANEC 多以贲门胃底最多见，约 64.1%（25/39），病灶直径多大于 3.0cm，伴较大溃疡，增强后明显均匀/不均匀强化。G-NETs 强化方式为延迟强化，静脉期达强化峰值（61.7%）。**结论 ：**不同病理分级的 G-NETs 临床及 CT 平扫和增强表现有一定特征性。

EPO-1238
EMVI 阳性直肠癌原发肿瘤边缘形态 MRI 分析

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目的： 分析 EMVI 阳性直肠癌原发肿瘤边缘形态的 MRI 特征。
方法：回顾性分析 2017 年—2018 年期间本院 73 例（44-89 岁，男=50 例，女=23 例）经病理学证实的直肠癌患者的 MRI 资料。在 HRT2WI 逐一观察并记录肿块边缘结节样突起、肿块边缘触角样改

变及两种改变共存的病例数，以病理结果为“金标准”，分成 EMVI 阳性组（n=23）及 EMVI 阴性组(n=50)，以卡方检验在组间比较上述三个观察指标有无统计学差异，并分别绘制各观察指标的受试者工作特性曲线（ROC），记录各指标的线下面积（AUC）， 分析各参数诊断 EMVI 的效能。
结果： EMVI 阳性患者 23 例（23/73，31.5%）人，其中男 13 例，女 10 例。直肠癌肿块边缘结节样突起 19 例，其中 12 例 EMVI 阳性（12/19,63.2%）；肿块边缘触角样改变有 20 例，其中 13 例 EMVI 阳性（13/20,65%）,两种征象共存在者 15 例，其中 11 例 EMVI 阳性（11/15,73.3%）。经卡方检验阴性组及阳性组间三个征象的差异均有统计学意义，P <0.05。肿块边缘结节突起的曲线下面积（AUC）为 0.697，灵敏度及特异度分别为 52.22%及 86.00%；肿块边缘触角样改变的 AUC 为 0.732，灵敏度及特异度分别为 56.50%及 86.00%；两种征象共存的 AUC 为 0.739，灵敏度及特异度分别为 86.00%及 60.9%。
结论：EMVI 阳性直肠癌原发肿瘤边缘形态的 MRI 表现有一定特征，认识这些特征有助于术前诊断 EMVI。

EPO-1239

Value of Abdominal CTA in Diagnosis of intestinal vascular malformation

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Purpose
Features of intestinal vascular malformation on Dual-Source CT angiography (DSCTA) were retrospectively analyzed, thus to evaluate the value of DSCTA in intestinal vascular malformation displaying and to improve the diagnosis.
Materials and Methods
Five patients with intestinal vascular malformation confirmed by surgery were retrospectively reviewed. All patients were underwent abdominal angiography by using dual source CT, MIP and VR images were used to assist the axial images for lesions displaying. Age, lesion location and the imaging feature were analyzed.
Results
Among the five patients, three originate from the small intestine and one from the colorectal region and one from ileocecal junction, they were conformed in surgery. There were two patients with the age less than 30 years old. Partial vascular plexus increased, dilated, abnormal and uneven thickened were the most common performance on DSCTA images. Two cases showed tumor like vascular dilation, and in one case expanded artery and earlier draining veins was found. Pooling of contrast medium was found in four of five patients. The superior mesenteric artery and/ or vein were the main feeding artery and draining vein.
Conclusion
DSCT angiography is a rapid, noninvasive, and accurate method in intestinal vascular malformation diagnosis. And it was also very useful in localizing bleeding sites for other gastrointestinal bleeding diseases.

EPO-1240

结肠癌病理 T 分期与肿瘤沉积的相关性分析

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目的 探讨结肠癌患者肿瘤沉积的发生率与病理 T 分期之间的相关性。**方法** 回顾性分析 2017 年-2018 年于我院就诊的经手术病理证实为结肠癌的 257 例患者的病理资料，按照第 8 版 AJCC 结直肠癌分期指南将患者分为 T2 期、T3 期、T4 期三组以及肿瘤沉积阳性组、阴性组。采用卡方检验对三组间计数资料进行分析。**结果** T2 期患者出现肿瘤沉积 2 例（5.6%），T3 期 30 例（14.6%），T4 期 10 例（66.7%）。采用行×列卡方检验对三组结肠癌患者肿瘤沉积的发生率比较，差异有统计学意义（c^2=31.327,P＜0.05），进一步采用卡方分割法进行两两比较，结果显示 T2 期、T3 期结肠癌患者肿瘤沉积的发生率均低于 T4 期患者（c^2=21.976, 25.606, P 均＜0.016），T2 期与 T3 期结肠癌患者肿瘤沉积发生率无明显差异（P=0.141）。**结论** 结肠癌病理 T 分期与肿瘤沉积具有相关性，相对于 T2 期、T3 期结肠癌患者，T4 期患者出现肿瘤沉积的风险更高，病理上对于 T4 期的结肠癌患者应仔细评估其有无肿瘤沉积。

EPO-1241

肠道白塞氏病的小肠 MSCT 造影表现

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目的：探讨肠道白塞氏病的小肠 MSCT 造影表现。材料与方法：回顾性分析 24 例经临床及内镜病理证实的肠型 BD 患者的小肠 MSCT 造影特征，并对肠壁厚度及增强特征进行统计学分析。结果：病变位于末端回肠及回盲瓣 19 例，回肠中段 2 例，盲升肠 4 例，降结肠 1 例，乙状结肠 2 例，全结肠 1 例；其中多部位累及 9 例。共发现巨大纵深溃疡 17 例、环形溃疡 2 例（1 例较深、1 例表浅）、椭圆形浅溃疡 2 例、弥漫性溃疡 3 例。周围肠系膜脂肪间隙清晰 18 例、模糊 6 例；有 3 例可见肠系膜小血管增多的梳状征；伴发回盲瓣变形 19 例，其中畸形挛缩 2 例，17 例为瓣口变形扩大；溃疡伴 2 例穿孔及 1 例肠道内瘘。20 例表现为病变段肠壁环形增厚，4 例为非对称性增厚；病变段厚度高于正常肠壁，差异有统计学意义。肠型 BD 静脉期强化绝对值高于动脉期强化绝对值，差异有统计学意义。9 例有明显强化且轻度增大淋巴结影，其中 7 例位于系膜缘。结论：肠型 BD 的小肠 MSCT 造影检查多表现为肠壁环形增厚及深大溃疡形成，静脉期强化程度高于动脉期，回盲部好发且回盲瓣口多变形扩大，结合典型的临床特征及内镜检查，MSCT 有助于该病的明确诊断。

EPO-1242

腹部滤泡树突细胞肉瘤 1 例报告

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滤泡树突细胞肉瘤（Follicular Dendritic Cell Sarcoma，FDCS）是一种来源于滤泡树突细胞的罕见肿瘤。最常发生于淋巴结，也发生于扁桃体，腹部脏器等节外部位[1]。由 Monda 等[2]于 1986

年首次报道，截至目前，影像学表现仅见个案报道。笔者报道 1 例经手术和病理证实的腹部 FDCS 影像表现，并复习相关文献，总结 FDCS 影像学特点.

EPO-1243
基于 DWI 序列的纹理分析在鉴别直肠腺癌中低分化程度的应用研究

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【摘要】 目的 探讨基于 MR DWI 序列的纹理分析在预测直肠腺癌中低分化程度中的价值。**方法** 回顾性分析 82 例经手术病理证实的直肠腺癌患者临床及影像资料，依据病理将其分为中分化组 66 例和低分化组 16 例。使用 ITK-SNAP 软件对肿瘤实性成分最大层面进行 ROI 手动勾画，并将勾画好的 ROI 文件导入美国 GE 公司 AK 软件内，利用不同的纹理参数进行特征提取，从而得到肿瘤内部的纹理特征值。选取熵、偏度、峰度、均匀度、标准差和平均值 6 个纹理参数作为分析指标。采用独立样本 t 检验及 Mann-Whitney U 检验分析两组之间纹理参数的差异，并采用受试者工作特征曲线下面积评估各参数的诊断效能。**结果** 中分化组的熵值、偏度、均匀度、标准差和平均值分别为 6.14±0.45、-0.36±0.35、0.78±0.04、57.40±14.42、265.40±59.06，低分化组上述各参数值分别为 6.17±0.67、-0.09±0.54、0.78±0.48、55.05±16.82、250.30±55.94。偏度在直肠腺癌中低分化程度间差异有统计学意义（t 值为-2.379， $P<0.05$）。熵、峰度、均匀度、标准差和平均值差异均无统计学差异（$P>0.05$）。ROC 曲线分析显示，以偏度-0.464 为鉴别中低分化直肠腺癌的阈值，其 ROC 曲线下面积（AUC）、敏感度和特异度分别为 65.3%、93.8%、60.6%。**结论** 基于 DWI 序列的 MR 纹理特征参数队鉴别直肠腺癌中、低分化程度有一定的价值。

EPO-1244
肠道及肠系膜损伤的 MDCT 诊断

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目的：探讨肠道及肠系膜损伤的多层螺旋 CT(multi-slice spiral CT, MSCT)表现。**方法：**回顾性分析 96 例 MSCT 诊断为肠道及肠系膜损伤的 MSCT 检查，其中男 52 例，女 44 例，年龄范围 31~76 岁，平均 46.2±3.2 岁。全部患者均行 MSCT 平扫及多期增强扫描，结果与手术或临床诊断对照。**结果：**96 例肠道及肠系膜损伤的患者中，单纯小肠损伤 31 例(32.29%)，单纯结肠损伤 4 例(4.17%)，单纯肠系膜损 21 例（21.88%），肠道损伤合并肠系膜损伤 40 例（41.67%）。表现为肠壁中断的 17 例（17.7%），肠壁血肿 12 例（12.5%），腔外游离气体 67 例（69.79%），局部-节段性肠壁增厚 43 例（44.79%），肠壁异常增强 38 例（39.58%），腹腔内积液 75 例（78.13%），肠系膜活动性出血 8 例（8.33%），肠系膜血肿 7 例（7.29%），肠系膜血管征 15 例（15.63%），肠系膜雾（渗出）征 55 例（57.29%），对比手术或临床诊断，其敏感性分别为 72%和 95%，特异性分别为 95%和 100%。**结论：**MSCT 能对肠道及肠系膜损伤作出准确的评估，进而早期诊断此病，提高患者的生存率及生活质量。

EPO-1245
磁共振弥散加权成像感兴趣区的选择在直肠癌术前分化程度和淋巴结中的应用

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目的 评价磁共振弥散加权成像感兴趣区（region of interest，ROI）的选择在直肠癌术前分化程度和淋巴结中的应用价值。 **方法** 收集在我院经病理组织学检查确诊为直肠癌患者 56 例。所有患者均使用 Aera1.5T 磁共振行 MRI 常规扫描序列及 DWI 序列检查。根据术后病理分期，将肿瘤分化程度分为高中低分化三组；将淋巴结是否转移分为两组。两名不同年资医师在直肠癌 DWI 图像上采用三种 ROI 法（小 ROI、面积 ROI、容积 ROI）独立的进行测量病灶的 ADC 值。不同组间定量资料采用方差分析或 t 检验；运用受试者操作特性（receiver operating characteristic ROC）曲线将存在显著差异的参数进行分析，获得相应的最佳临界值、曲线下面积（area under the curve AUC）和诊断性能。**结果** 三种 ROI 法获得的 ADC 值差异有统计学意义（$P<0.05$），其中容积 ROI 法测得的 ADC 值更高、重复性最好。三种 ROI 法测得的 ADC 值在直肠癌高中低分化、有无淋巴结转移中差异有统计学意义（$P<0.05$）。绘制 ROC 曲线，高、中分化组容积 ROI：AUC=0.901，最佳临界值为 $1.125\times10^{-3}mm^2/s$；中、低分化组容积 ROI： AUC=0.848，最佳临界值为 $0.965\times10^{-3}mm^2/s$；淋巴结转移阳性与阴性组容积 ROI：AUC=0.915，最佳临界值为 $0.975\times10^{-3}mm^2/s$。 **结论** 三种 ROI 法中容积 ROI 法测得直肠癌的 ADC 值可重复性最好；ADC 值可用于区分高中分化、中低分化、淋巴结转移阳性与阴性的直肠癌，而容积 ROI 法测得的 ADC 值预测价值最好。

EPO-1246
FLT-PET/CT and CECT 在胃癌各种远处转移方面诊断价值的比较

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背景和目的：
到目前为止，没有关于使用 FLT-PET/CT 和 CECT 在胃癌远处转移方面的比较研究。因此，我们评估 FLT-PET/CT 和 CECT 在胃癌各种远处转移方面的诊断价值。
材料和方法：
研究纳入了 2015 年 1 月至 2019 年 1 月我院经胃镜活检证实为胃癌，并同时具有 FLT-PET/CT 和 CECT 两种检查的共 103 例患者。分别分析和比较两种检查在肝、骨、肾上腺、远处淋巴结和其他转移方面的敏感性，特异性，正确指数。同时评估并比较两种检查对腹膜转移分期的一致性。统计学方法采用卡方检验和 McNemar 检验。
结果：
FLT-PET/CT 在肝转移、骨转移、肾上腺转移和其他转移方面的正确指数分别是 0.88，0.99，0.98，0.99。均高于 CECT 的正确指数 0.79，0.65，0.54，0.89。两种检查在肝，骨，肾上腺，其他和远处淋巴结转移的诊断价值比较方面，*P* 值分别是 0.727，0.039，0.549，0.25，0.039。在骨和远处淋巴结转移的判定方面两者差异有统计学意义，余部位差异均不明显。在腹膜转移分期方面，P 值为 0.802，差异不明显。

结论：

总体而言，PET/CT 在评估远处转移方面优于 CECT。在远处淋巴结转移的评估时，两者差异明显。在腹膜转移及分期方面 CECT 较 PET/CT 有优势，但差异不明显。

EPO-1247
多层螺旋 CT 小肠成像诊断肠道病变的临床应用价值

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目的:分析肠道病变的多层螺旋 CT 小肠成像（CTE）影像征象，评价 CTE 在诊断肠道疾病时，对不同肠道疾病患者诊断的价值。**方法:**回顾性分析 2014 年 1 月～2017 年 2 月于我院消化内科住院治疗，怀疑肠道病变行 CT 小肠造影的患者 150 例，在后处理工作站利用后处理软件对 ASI 数据进行多平面重建（Multi-Planar Reformation，MPR）及最大密度投影（Maximum Intensity Projection，MIP）进行图像重建，部分病人根据病情需要增加血管容积再现（volume rendering，VR）重建。
由两位经验丰富的医师在不知道病理及其他影像资料的情况下按照随机顺序分别对 CTE 图像进行分析并独立给出诊断意见。采用 Kappa 一致性检验比较诊断者诊断结果的差异。采用卡方检验或 Fisher 确切概率法比较两位医师的 CTE 诊断结果与临床结果，分别统计两位诊断医生采用 CTE 诊断肠道病变的敏感性、特异性、阳性预测值、阴性预测值及准确度。**结果:**150 例患者中，150 例中经肠镜证实 111 例，经胶囊内镜证实 8 例，经手术证实 17 例，余 14 例经临床治疗后症状缓解。炎症性肠病 62 例，肠道一般炎症 38 例，病毒性肠炎 3 例，急性胃肠炎 12 例，肠道肿瘤 15 例，息肉 7 例，憩室 2 例，肠系膜血管病变 6 例，肠道功能紊乱 5 例；两位阅片者间的诊断一致性很好（K>0.75）；两位医生诊断小肠病变的准确度分别为 89.3%和 92.7%；CTE 能有效发现炎症性肠病、肠道一般炎症、肿瘤、憩室、肠系膜血管病变（两位阅片者 P<0.05），而 CTE 对小肠息肉的诊断无明显优势（$P_{甲}$=0.076，$P_{乙}$=0.076）。**结论：** CTE 能观察肠管内外的异常改变，对肠道疾病有较高的灵敏度和特异度，评价病变的严重程度，为临床制定治疗方案及评估病情提供帮助，另外，CTE 检查操作简便、易于被患者接受，可以作为小肠病变的重要检查方法。

EPO-1248
食管胃结合部腺癌膈肌旁及下纵隔淋巴结转移的 CT 与病理对照研究

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目的：探讨多排螺旋 CT 对食管胃结合部腺癌（AEG）膈肌旁及下纵隔区域淋巴结转移的诊断价值。**方法：**回顾性收集 2013 年 3 月至 2019 年 1 月我院收治的 53 例 AEG 患者的临床病理资料。患者均行根治性手术，术前 2 周内接受胸部及腹部多排螺旋 CT 检查。手术均清扫膈肌附近区域淋巴结（包括第 19 组膈下淋巴结，第 20 组食管裂孔淋巴结，第 111 组膈肌上淋巴结）和下纵隔区域淋巴结（第 110 组胸下部食管旁淋巴结，第 112 组后纵隔淋巴结），并按淋巴结分组记录手术病理情况。两名影像医生共同阅读患者 CT 图像，按淋巴结分组观察检出以上各组淋巴结并达成一致，在轴位图像测量淋巴结长径、短径及门脉期 CT 值，与术后病理淋巴结分组对照。统计以上各组淋巴结转移阳性组与阴性组的测量数据，评价 CT 诊断淋巴结转移的诊断效能。

结果： 53 例 AEG 患者中，有 23 例患者手术清扫了以上 5 组淋巴结区域，但病理大体标本未检出淋巴结。剩余 30 例患者病理共检出 55 枚淋巴结，其中有 7 枚淋巴结转移阳性。医生阅读 CT 图像在这 5 组区域共检出 35 枚淋巴结，其中第 19 组膈下淋巴结 7 枚，第 20 组食管裂孔淋巴结 7 枚，第 111 组膈肌上淋巴结 2 枚，第 110 组胸下部食管旁淋巴结 18 枚，第 112 组后纵隔淋巴结 1 枚。与病理淋巴结按组对照后，发现第 19 组 1 枚淋巴结转移，第 20 组 1 枚淋巴结转移，其余淋巴结无转移。这 5 组淋巴结中转移阳性淋巴结与阴性淋巴结的平均长径分别为 4.5±0.7mm 和 5.4±1.6mm，平均短径分别为 3.0mm 和 3.7±1.3mm，平均 CT 值分别为 6.5±3.5Hu 和 30.5±28.5Hu。转移阳性与阴性淋巴结的长径、短径及 CT 值均无统计学差异（P＞0.05）。**结论：** CT 可以检出食管胃结合部腺癌膈肌旁及下纵隔的淋巴结，为手术清扫淋巴结范围提供参考，但 CT 无法根据淋巴结的长径、短径和 CT 值对这五组淋巴结转移做出准确诊断。

EPO-1249
双源双能量 CT 对胃窦癌肠系膜淋巴结转移的诊断价值初步探讨

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【摘要】 目的 探讨双源双能量 CT 成像对提高胃窦癌肠系膜淋巴结转移术前诊断准确性的价值。**方法** 回顾性分析 37 例胃窦癌并行肠系膜淋巴结转移清扫患者的术前双能量 CT 扫描图像，并重建碘基物质分解(MD)图像和 40 ~ 140 keV 的融合图像。在 MD 图像上测量淋巴结碘浓度(IC)，归一化至腹主总动脉碘浓度，得到归一化碘浓度(NIC)。动脉期和门脉期测得的能谱曲线的斜率（λHU）。对转移性和非转移性淋巴结的测量值进行统计学分析，并利用 ROC 曲线分析确定测量值诊断淋巴结转移的最佳阈值。**结果** 经病理证实 111 枚淋巴结中转移性 89 枚(80%)，非转移性 22 枚(20%)。转移性淋巴结 IC、NIC、λHU 分别为 2.93±1.08 mg / mL, 0.67±0.45,3.73±1.91。非转移性淋巴结分别为 1.27±0.51 mg/mL、0.21±0.12、1.79±0.61，差异有统计学意义(P 均<0.001)。ROC 分析确定 IC 的最佳诊断阈值为 2.26 mg/mL，敏感性为 80.7%，特异性为 89.7%，准确性为 84.5%。NIC 的最佳阈值为 0.267mg/mL，灵敏度为 94.7%，特异性为 77.1%，准确度为 93.2%。λHU 最佳阈值为 2.381,其敏感性,特异性和准确性为 87.1%，分别为 81.9%和 87.1%。**结论** 双源双能量 CT 检查结果提高了术前诊断胃窦癌肠系膜淋巴结转移术前诊断的敏感性和准确性。

【关键词】 双能量 CT 胃窦癌 肠系膜淋巴结 术前诊断

EPO-1250
症状性肠系膜脂膜炎的 CT 表现及临床意义

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目的 探讨症状性肠系膜脂膜炎的 CT 表现及其临床意义。**方法** 收集 2016 年 1 月 1 日至 2018 年 12 月 31 日 34 例症状性以及 57 例无症状性肠系膜脂膜炎的 CT 表现，回顾性分析其 CT 影像学特点。**结果** 91 例肠系膜脂膜炎患者中，临床有症状者 34 例（37.4%）、无症状者 57 例（62.6），其 CT 表现主要有下述 5 种征象：肠系膜周围脂肪组织密度不均匀增高 21/16 例（62%/28%）、“假包膜征”14/46 例（40%/84%），血管增粗 20/15 例（60%/30%），肠界面模糊 22/18 例（71%/32%），结节“脂肪环征”25/18 例（74%/32%），肠系膜末梢血管“脂肪环征”20/14 例（60%/26%）；症状性与无症状肠系膜脂膜炎存在明显组间差异（P<0.05）。**结论** 症状性肠系膜

脂膜炎的 CT 表现有一定特异性，反映了病变处于急性炎症期，能够及时指导临床治疗肠系膜脂膜炎。

EPO-1251
胃低张力螺旋 CT 扫描技术对胃占位性病变的诊断价值评估

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目的 通过胃低张力螺旋 CT 平扫加增强与电子胃镜对照分析，探讨胃低张力螺旋 CT 平扫加增强扫描技术对胃占位性病变的诊断价值。**方法** 随机选择经电子胃镜检查和/或外科手术及病理证实的 60 例胃低张力螺旋 CT 平扫加增强扫描的双对比造影片进行回顾性分析。扫描采用 GE Lightspeed 64 层螺旋 CT,扫描参数：管电压 120KV，管电流 300mA，螺距 1.375，层厚 5mm，层距 7.5mm，重建层厚 1.25mm，矩阵 512X512，扫描范围自膈肌上缘平面至髂嵴平面。所有患者检查前禁食 4h，检查前 30 min 饮水 500~ 1000ml 检查时再饮水 200~ 300ml，以充分充盈胃和十二指肠，于 CT 扫描前 10 min 肌肉注射 654-2，10mg，并在扫描前即刻口服产气粉 6.0g，CT 增强扫描经肘静脉注射非离子型造影剂碘伏醇(300mg/ml) 80/ml, 注射流率 3. 5ml/s，经高压注射器注射碘伏醇后，于 25~30s 行动脉期扫描，随后 40s 行静脉期扫描，所得图像进行多平面重建。**结果** 胃低张力螺旋 CT 平扫加增强扫描对于胃癌以及某些隆起性病变的诊断与胃镜的诊断较一致，本组 23 例二者完全相符，12 例 CT 提示胃壁增厚或结节，胃镜报告为息肉或隆起性病变；而对于正常、表浅性病变二者有差异，本组 25 例 CT 未见异常者，胃镜有 7 例提示小息肉或溃疡，胃低张力螺旋 CT 平扫加增强对于胃壁增厚及病变向壁外生长及壁周淋巴结增大的显示优于电子胃镜。**结论** 胃低张力螺旋 CT 平扫加增强较常规检查为优越，有利评估及决定手术方案与了解肿瘤向外生长和转移情况。采用低张力加大量喝水，能消除胃肠的蠕动、使胃充分扩张；由于胃壁有良好的供血,增强明显，在腔内低密度水的衬托下,能清晰地显示胃壁的形态。因此，我们认为胃低张力螺旋 CT 平扫加增强扫描技术，对胃病变的诊断有一定的临床应用价值。

EPO-1252
能谱 CT 定量评估结直肠管状腺癌分化程度

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目的 研究能谱 CT 成像（GSI）定量分析在评估结直肠管状腺癌分化程度中的价值。**方法** 纳入经纤维镜或手术病理确诊的结直肠管状腺癌共 46 例，按照病理结果将其分为中高分化组 27 例、低分化与未分化组 19 例。应用 GE 宝石能谱 CT 在能谱扫描模式(GSI)下行数据采集。所有患者术前均行全腹部 GSI 双期增强扫描，获得动、静脉期能谱图像，测量并比较两组病灶的碘浓度 IC、标准化碘浓度 NIC 及各期能谱曲线斜率 K 值的差异。进一步分析各能谱参数评定结直肠管状腺癌分化程度的各参数受试者工作特征曲线(ROC)、 曲线下面积(AUC) 、敏感度、特异度、最佳诊断阈值及 Youden 指数，评估各项参数的诊断效能。**结果** 中高分化组、低分化与未分化组组间能谱参数比较，发现中高分化组动脉期碘浓度 IC、标准化碘浓度 NIC 及能谱曲线斜率 K 值的绝对值均高于低分化与未分化组，且二者之间差异具有统计学意义，P 值均＜0.05；而静脉期所见能谱各参数差异不具有统计学意义。动脉期碘浓度、动脉期 NIC、动脉期能谱曲线斜率的 AUC 分别 0.798、0.721、0.733，当其诊断阈值分别设为＞1.09 mg/ml、＞0.18、>1.34 时，其判定结直肠管状腺癌分化程度的敏感度、特异度、Youden 指数分别为 75.8%、76.3%、0.47；79.5%、79.7%、0.52；

69.9%、67.2%、0.43。**结论** 结直肠管状腺癌能谱 CT 多参数定量分析评估肿瘤组织学分化程度有一定的特异度和敏感度，特别是 动脉期 NIC 具有更加可靠的诊断效能。

EPO-1253
多层螺旋 CT 血管成像和图像融合技术对腹腔镜直肠癌根治术的术前评估

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目的 观察肠系膜下动脉及其分支走行与变异情况，探讨 CT 血管成像和图像融合技术对腹腔镜直肠癌根治术术前评估的临床价值。**方法** 采用回顾性描述性研究方法。收集 2018 年 2 月至 2019 年 3 月本院收治的 60 例行腹腔镜直肠癌根治术的临床病理资料。患者术前均行腹部多层螺旋 CT 平扫和双期增强扫描，将原始图像进行血管成像重建，并将其融合，得到血管三维图像。观察指标：(1) 肠系膜下动脉分支分型情况。（2）三维血管重建图像中测量肠系膜下动脉根部至腹主动脉分叉点的距离 （D1）， 肠系膜下动脉根部至第一分支的距离（D2）。（3）二维视图及三维视图在肠系膜下动脉起点水平评价肠系膜下动脉、肠系膜下静脉、左结肠动脉三者之间的空间关系。在三维视图中评估左结肠动脉和肠系膜下静脉两者之间的交叉模式。 **结果** 60 例患者的扫描图像均达到诊断要求并获得良好的血管成像效果。VR 图像上的各血管与术中镜下裸化血管后实际观察到的走形情况进行对比，吻合率为 100%。**结论** CT 血管成像和图像融合技术可以直观地显示肠系膜下动脉及其分支走行与变异，具有较高的临床应用价值。

EPO-1254
上消化道异位胰腺与小于 3cm 胃肠道间质瘤 MDCT 特征的比较

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目的
比较上消化道异位胰腺(heterotopic pancreas, HP)与胃肠道间质瘤(gastrointestinal stromal tumors, GIST)多排螺旋 CT(multidetector computed tomography, MDCT)形态学及多期增强特征。
方法
回顾性分析 21 例上消化道 HP 和 22 例长径小于 3 cm GIST 的 MDCT 形态学及多期增强特征，并对两组病例的 MDCT 特征进行比较分析。
结果
MDCT 平扫 HP 平均 CT 值高于 GIST，增强扫描动脉期 CT 实测值两者相似，但 GIST 动脉期绝对强化值高于 HP 动脉期绝对强化值，且动脉期绝对强化值两者比较有意义(P<0.05)。门静脉期及平衡期 HP 的 CT 实测值均高于 GIST，但 HP 门静脉期绝对强化值高于 GIST，平衡期绝对强化值两者相似，增强扫描门静脉期及平衡期 HP 与 GIST 绝对强化值的比较差异无统计学意义(P>0.05)。HP 门静脉绝对强化值高于动脉期绝对强化值，而 GIST 门静脉期绝对强化值低于动脉期绝对强化值。
结论
本研究比较 HP 与 GIST 平扫 CT 值、动态增强扫描各期 CT 值、绝对强化值、以及两者之间的相关性，发现 HP 平扫 CT 值、动脉期、门静脉期及平衡期 CT 值均显著高于 GIST，表明 HP 强化程度高于 GIST。但 GIST 动脉期绝对强化值高于 HP 动脉期绝对强化值，而 HP 门静脉期绝对强化值高

于 GIST，说明 GIST 由动脉供血，所以动脉期绝对强化值明显升高，而 HP 由于组织学成分与正常胰腺相关，导致静脉回流较慢，所以门静脉期绝对强化值明显升高，切强化平台期延长，最终平衡期 HP 与正常胰腺 CT 值相近。

MDCT 动态增强扫描显示 HP 与 GIST 的强化值及绝对强化值之间存在差异。由于 MDCT 可提供上述有助于 HP 与 GIST 诊断和鉴别诊断的影像学信息， MSCT 动态增强扫描可作为一种重要的检查技术。

EPO-1255

小儿肠套叠空气灌肠+手法复位影像特点分析

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摘要：目的 分析空气灌肠+手法复位整复小儿肠套叠 X 线影像特点。**方法** 回顾性分析我院 2010 年 1 月至 2019 年 1 月 959 例临床疑似小儿肠套叠行空气灌肠+手法复位整复术，分析术中、术后的 X 线影像特点。**结果** 959 例临床疑似小儿肠套叠患儿均于整复前行超声检查，并均在超声下见到同心圆征，959 例中仅 2 例未见肠套叠 X 线征象，957 例均确认为肠套叠，其中整复成功 872 例（91.11%），失败 85 例（8.88%），整复成功后复发 63 例（7.22%），复发 63 例患儿再次行空气灌肠+手法复位整复术后均成功整复。整复术中及术后均未见肠管破裂及穿孔。X 线影像特点：套头多位于结肠内，最远处位于乙状结肠下段，套头常表现为圆形或类圆形；套头退缩至回盲部并最终消失、小肠内见大量气体进入提示整复成功；套头退缩至回盲部并固定或于某一位置固定，小肠内未见气体进入或进入气体极少，均提示整复失败。**结论** 空气灌肠+手法复位整复小儿肠套叠是较为安全有效的诊断和治疗方法，能有效减少手术对患儿的创伤，熟悉其 X 线影像特点可有效提高小儿肠套叠的诊断与治疗成功率，可作为小儿肠套叠首选治疗方法。

EPO-1256

结直肠癌动态能谱扫描病灶碘值峰值时间与主动脉 CT 值峰值时间的差异性研究

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目的：应用 640 层 CT 一站式动态能谱成像模式，分析病灶部位碘值达到峰值时间与主动脉达到峰值时间的差异性。
方法：纳入经结肠镜病理确诊为结肠腺癌的 29 例患者，所有患者术前均行一站式动态能谱扫描，同时获得能谱成像数据。在副台 Dual Energy 能谱处理程序中处理每一组能谱数据获得碘图，通过碘图测得肿瘤的碘分布值，并进行动态的碘图分析。根据 CT 图像的时间-密度曲线及碘图的时间-碘值曲线获得病灶部位碘值峰值及主动脉 CT 值峰值，进行统计学分析。结果：病灶部位碘值峰值时间均值为 31.04±9.05s，主动脉峰值时间均值为 22.67±4.66s，两组间差异具有统计学意义 P<0.05(P=0.00)。患者有效辐射剂量为 16.56mSv。结论：病灶部位碘值达到峰值时间明显迟于主动脉 CT 值达峰时间。
临床意义：动态能谱成像能获得随着造影剂的注入病灶碘分布的动态变化情况，能为临床提供更多的有用信息。

EPO-1257

Application of dynamic dual-energy CT imaging in colorctal cancer for assessing the correlation between blood perfusion and iodine uptake on 320-row multidetector CT

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PURPOSE
To evaluate the characteristics of blood perfusion and iodine uptake in colorectal cancer using dynamic dual-energy imaging on 320-row CT.
METHOD AND MATERIALS
29 patients with colonic adenocarcinoma diagnosed by colonoscopy were enrolled. Each patient was scanned for 10 dual-emerge acquisition phases, with 3-second intervals for 1 to 7 phases, 5-second intervals for 8 to 10 phases, and total scanning time was 53s. Iodine map and perfusion map were generated, and iodine uptake peak (IUP), arterial flow (AF, ml/min/100ml), blood volume (BV,ml/100ml) and permeability (ml/min/100ml) of tumor were measured.
RESULTS
The IUP, AF, BV and permeability of tumor were 71.46±2.19, 158.26±80.40, 17.33±17.80, 60.14±20.59, respectively. The IUP of tumor was significantly associated with the AF ($r=0.440$, $P<0.05$) and BV ($r=0.382$, $P<0.05$) There was no significant correlation between IUP and permeability($P>0.05$). The average DLP of dynamic dual-energy CT imaging was 1104 mGy·cm with an effective radiation dose of 16.56 mSv.
CONCLUSION
Dynamic dual-energy CT imaging can generate dynamic iodine map and perfusion map at the same time. The correlations of iodine uptake peak and perfusion parameters AF and BV of colorectal cancer are significant.
CLINICAL RELEVANCE/APPLICATION
Dynamic dual-energy CT imaging of coloractal cancer provides iodine uptake and perfusion data in just one scan. It can be used to evaluate the hemodynamic characteristics of colorectal cancer and provide more diagnostic information for the clinical doctors.

EPO-1258

Diagnostic values of IVIM- DWI analyses in esophageal Cancer

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Background: To investigate the potential value of parameters derived from stretched exponential diffusion-weighted imaging model in the diagnosis of early esophageal Cancer.
Materials and methods: 25 cases of patients with pathologically confirmed early esophageal cancer without treatment and 15 healthy individuals under-went MRI plain scan and IVIM-DWI scan with 10 b values(0~1500s/mm^2).The distributed diffusion coefficient (DDC) and water molecular diffusion heterogeneity index (α) obtained from the stretched-exponential model were calculated and compared between the esophageal cancer group and normal esophageal tissue group. Comparisons between the tumour and normal esophagus were performed by two independent sample *t* test or Mann-Whitney U test .The prediction parameters and diagnostic efficiency were compared by ROC curve. $P<0.05$ was considered to indicate a significant difference.
Results: The DDC and α in esophageal cancer group were (2.05±0.16)×$10^{-3}$$mm^2$/s, (0.65±0.22) respectively; those in normal esophageal group were(3.13±0.72) ×$10^{-3}$$mm^2$/s, (0.74±0.13) respectively. The DDC and α in esophageal cancer group were significantly lower than those in normal esophageal group ($P<0.05$). The areas under the ROC curve (AUC) of DDC and α values were 0.84 and 0.75 respectively. The AUC of combining DDC with α value was 0.90.
Conclusion: The parameters derived from stretched exponential models could be offer additional information for diagnosis of esophageal cancer.

EPO-1259

Additional value of MRI-detected EMVI in rectal cancer; Applicability in predicting Lymph node metastasis

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Abstract
Introduction: Extramural vascular invasion (EMVI) has been recommended as an independent prognostic factor for poor overall survival rate in rectal cancer and can be used as a potential biomarker. Early prediction of prevalence of lymph node metastasis can elevate the disease free survival rate. We aimed to evaluate the MRI-detected extramural vascular invasion (mrEMVI) in predicting lymph node metastasis in T3 rectal cancer.

Methods: Post-operative histopathologically confirmed T3 rectal cancer patients without previous treatment from July 2014 to December 2015 were enrolled for this study. Two blinded radiologists evaluated MRI detected extramural vascular invasion (mrEMVI) status. mrEMVI was categorized into EMVI positive and EMVI negative in T2 weighted image using mrEMVI scoring system. The results along with other clinical

characteristics (Age, Sex, Tumor location, Depth of Tumor invasion, mrEMVI, pre-operative CEA, perineural invasion) were then correlated with lymph node metastasis to determine the risk factors using univariate and multivariate analysis.

Results: In 180 patients, 32 patients were confirmed to be mrEMVI-positive. There were total 78 patients with lymph node metastasis in which 25 were mrEMVI-positive. Four factors were significantly associated with lymph node metastasis: age (p=0.026, 95%CI 0.023-0.344), mrEMVI (p=0.049; 95%CI 0.001-0.390), perineural invasion (p=0.005; 95%CI 0.062-0.345) and preoperative CEA (p=0.014; 95%CI 0.036-0.313).

Conclusions: mrEMVI positive, preoperative CEA level and post-operative perineural invasion are independent risk factor for lymph node metastasis in rectal cancer. mrEMVI score 4 is a strong risk factor for lymph node metastasis than mrEMVI score 3 in rectal cancer.

EPO-1260

多层螺旋 CT 曲面重组技术在早期胃癌术前病灶显示及临床 TNM 分期中的应用价值

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目的 将曲面重组（CPR）技术应用于 MSCT 图像，探讨其对早期胃癌（EGC）术前病灶显示及临床 TNM 分期（cTNM 分期）的价值。方法 收集我院 97 例 EGC 患者的 MSCT 图像，比较轴位（AXI）、多平面重组（MPR）及 CPR 图像对 EGC 的检出率、形态准确率、cTNM 分期准确率及对区域淋巴结的检出能力。**结果** ①EGC 检出率：AXI 组 55.7%，MPR 组 84.5%，CPR 组 89.7%；AXI 组与 MPR 组、AXI 组与 CPR 组差异有统计学意义，MPR 组与 CPR 组差异无统计学意义。②形态准确率：AXI 组 18.6%，MPR 组 47.4%，CPR 组 71.1%；三组组间差异均有统计学意义。③cT 分期准确率：AXI 组 43.3%，MPR 组 64.9%，CPR 组 83.5%；三组组间差异均有统计学意义。④cN 分期准确率：AXI 组 86.6%，MPR 组 86.6%，CPR 组 87.6%，三组组间差异无统计学意义。⑤区域淋巴结：AXI 组发现淋巴结 438 个，第一站 336 个，第二站 102 个；MPR 组 544 个，第一站 437 个，第二站 107 个；CPR 组 509 个，第一站 491 个，第二站 18 个；三组间第一站及第二站站内淋巴结数目构成比无统计学差异，第一站与第二站站间淋巴结数目构成比有统计学差异；三组间总淋巴结阳性例数无统计学差异，第一站及第二站站内淋巴结阳性例数均有统计学差异；CPR 组对第一站淋巴结的检出率优于 AXI 组及 MPR 组，但对第二站淋巴结的检出率不如 AXI 组及 MPR 组。 **结论** CPR 可以提高 CT 对 EGC 的检出率、形态准确率及 cT 分期准确率，对 1～6 组淋巴结有较好的观察能力，但对提高 cN 分期准确率无帮助。

EPO-1261

Comparative study of tumor response by Choi and RECIST with CT in patients treated with imatinib for gastrointestinal stromal tumor

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Objective Choi and RECIST criteria was used to evaluate the efficacy of imatinib in patients with gastrointestinal stromal tumor recurrence and metastasis. Our aim was to explore a more effective evaluation criteria for imatinib and to provide an effective treatment option for subsequent therapy in patients with gastrointestinal stromal tumors. **Methods** CT examination results of 35 patients with gastrointestinal stromal tumor recurrence/metastasis before and after treatment with imatinib weren retrospectively analyzed and Choi and RECIST criteria were used to evaluated the efficacy of imatinib. **Results** The recurrence/metastasis of 35 patients with gastrointestinal stromal tumors focus location distribution: 10 cases of gastric stromal tumor recurrence, 7 cases of small intestinal stromal recurrence, 1 case of mesenteric recurrence, 1 case of rectal and pelvic recurrence, 15 cases of liver metastasis, 1 case of hepatic peritoneal and abdominal metastasis. The measurable target lesions distribution of 35 patients with gastrointestinal stromal tumors: 1 measurable target lesion in 4 cases, 2 measurable target lesions in 5 cases, 3 measurable target lesions in 3 cases, 4 measurable target lesions in 6 cases, ≧5 measurable target lesions in 17 cases by CT examination. Choi and RECIST Methods were used to evaluate the efficacy of imatinib in 35 patients with gastrointestinal stromal tumor recurrence/metastasis receiving imatinib. Choi analysis showed that 28 patients were partially relieved, 7 patients were no relieved and the remission rate was 80%. RECIST analysis showed that 17 patients were partially relieved, 18 patients were no relieved, and the remission rate was 48.57%. The difference in the results of the two evaluation methods was statistically significant. The Choi criteria for the evaluation of gastrointestinal stromal tumor imatinib treatment was higher than the RECIST evaluation criteria. **Conclusion** Choi criteria is superior to RECIST criteria when evaluating the efficacy of imatinib in treatment of gastrointestinal stromal tumors. Choi evaluation can objectively reflect the tumor retraction and remission rate at early stage, and can provide an important basis for the subsequent treatment in patients with gastrointestinal stromal tumor.

EPO-1262
应用 640 层动态能谱 CT 成像对结直肠肿物的初步研究

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目的:评估动态能谱 CT 成像定量参数对结直肠癌分化程度及结直肠良恶性肿物鉴别的诊断价值。方法：收集 84 例结直肠肿物患者行术前一站式动态能谱扫描，同时获得能谱及灌注成像数据。根据手术病理结果分为 A 组（腺瘤，n=15）,B 组（腺癌，n=69），C 组（高分化腺癌,n=36）,D 组（中低分化腺癌,n=33）。将不同组间的一般资料、病灶碘值（IC）、标准化碘值（NIC）、动脉期血流量（AF）、血容量（BV）、表面渗透性（PS）进行统计学分析， ROC 曲线用于评估其诊断效能。结果： 静脉期 IC 和 NIC 对鉴别腺瘤和腺癌存在显著差异（P <0.001）。 ROC 分析显示，静脉期 NIC 为 3.52 时鉴别腺癌与腺瘤的敏感性为 72.0%，特异性为 91.9%。腺瘤和腺癌组之间的 AF，BV 和 PS 均存在显着差异（P <0.001）。ROC 分析表明， AF 值为 175.13 ml·min·100 g 时鉴别腺癌

和腺瘤的敏感性为 80.0%，特异性为 86.4%；高分化腺癌和中低分化腺癌之间的 AF、BV 和 PS 均存在显着差异（P< 0.001）。BV 值为 7.76 ml / 100 g 时鉴别低级别癌症和高级别癌症的灵敏度为 90.9%，特异性为 77.7%。结论：一站式动态能谱 CT 扫描能同时得到能谱参数及灌注参数对鉴别结直肠良恶性肿物及肿瘤的分化程度有重要诊断价值。

EPO-1263
多层螺旋 CT 对（≤10 cm）胃神经鞘瘤与胃间质瘤的鉴别诊断价值

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摘要 目的 探讨多排螺旋 CT 对（≤10 cm）胃神经鞘瘤（GS）和胃间质瘤（GIST）的鉴别诊断价值。**方法** 回顾性分析 31 例 GS 和 126 例 GIST 的 CT 表现，分析内容包括肿瘤大小、部位、形态、边界、生长方式、强化程度、溃疡、钙化、囊变坏死、周围脂肪间隙淋巴结及不同 CT 测量值（平扫、动脉期及静脉期 CT 值）和动脉期增强幅度(DE1)、静脉期较动脉期增强幅度（DE2）、静脉期增强幅度（DE3），并对患者临床资料进行分析。两组间分类变量采用 x^2 检验或 *Fisher* 检验，连续变量采用 Mann-Whitney 秩和检验，将有意义的变量纳入多元 Logistic。**结果** 统计结果表明患者性别、肿瘤发生部位、形态、边界、生长方式、囊变坏死和淋巴结在两组中差异有统计学意义（P ＜ 0. 05）；患者年龄、肿瘤大小、强化程度、溃疡、钙化及各不同 CT 值差异无统计学意义（ P ＞ 0. 05)；多因素 Logistic 回归分析表示：肿瘤发生部位和淋巴结是两组肿瘤鉴别诊断的独立危险因素（P ＜ 0. 05）。 **结论** CT 检查结合患者临床资料在（≤10 cm ）GS 和 GIST 的鉴别诊断中：女性、肿瘤位于胃体或胃窦、形态规则、边界清楚、呈腔内或腔外生长、周围脂肪间隙伴淋巴结有利于 GS 诊断；肿瘤位于胃底或胃体、形态不规则、边界不清、呈腔外或腔内外生长、同时伴囊变坏死有利于 GIST 诊断。其中肿瘤发生部位和淋巴结是两者鉴别诊断的独立危险因素。

EPO-1264
胃神经内分泌肿瘤的影像特征

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目的

探讨动态增强 CT 对于胃 NET（神经内分泌瘤）和胃 NEC（神经内分泌癌）的鉴别诊断价值。

材料与方法

对经病理确诊为胃 NET 的患者进行回顾性分析，共 79 例，其中男性 58 例，女性 21 例，平均年龄(61.13±9.55)岁。观察患者的影像资料，包括病灶位置、大小、形态、密度、浆膜面、平扫及强化 CT 值、动脉期强化程度、强化方式、特殊类型强化及有无淋巴结转移。采用 SPSS23.0 软件进行统计分析，符合正态分布的定量资料采用独立样本 t 检验比较，不符合正态分布分布的定量资料采用 u 检验比较。定性资料的比较采用卡方检验。对于单因素分析有统计学意义的变量纳入 Logistic 回归模型。

结果

1、胃 NET 患者共有 9 例，其中男性 1 例，女性 8 例,平均年龄(50.52±7.50)岁；胃 NEC 患者有 70 例，其中男性 57 例，女性 13 例，平均年龄(62.81±9.09)岁，两者在性别、年龄方面差异有统计学意义。
2、胃 NET 与胃 NEC 的分布存在差异，NET 多位于胃体，NEC 多位于胃窦。胃 NET 与胃 NEC 的病灶的最大厚度、病灶的最大范围、形态、密度、浆膜面存在差异，差异有统计学意义。
3、胃 NET 和胃 NEC 的动脉期 CT 值、静脉期 CT 值、动脉期强化程度及线状强化无显著差异（p>0.05）。胃 NET 和胃 NEC 的平扫 CT 值、强化方式、淋巴结转移差异有统计学意义（p<0.05）。
以上所有因素中，性别、肿块最大厚度是鉴别胃 NET 和胃 NEC 的独立影响因素。

结论

1、胃 NET 和胃 NEC 患者的性别和年龄存在差异，NET 多为女性，NEC 多为男性，NEC 发病的年龄通常较 NET 大。
2、胃神经内分泌肿瘤的动态增强 CT 表现具有一定特征，病灶的分布、肿块的大小、形态、密度、浆膜面、平扫的 CT 值、强化方式及淋巴结转移对 NET 和 NEC 的鉴别具有重要意义。
3、性别、肿块最大厚度是鉴别胃 NET 和胃 NEC 的独立影响因素。

EPO-1265
单、双指数模型扩散加权成像对直肠癌转移性 LN 的诊断价值

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摘要:目的 探讨常规单指数模型扩散加权成像(DWI)及基于体素内不相干运动双指数模型扩散加权成像(IVIM-DWI)在直肠癌转移性 LN 中的诊断价值。**方法** 40 例经病理确诊为直肠癌的患者,术前行常规 DWI 及 IVIM-DWI 检查。比较转移性 LN 与非转移性 LN 的平均短、长径值、长短径比、常规 DWI 的 eADC、值、ADC 值和 IVIM-DWI 参数值 D、 D^*和 f 值的差异，并分析有差异参数值的 ROC 曲线。**结果** 转移性与非转移性 LN 在[短径(10.23±5.77mm）vs(5.07±1.45mm)、长径（13.08±7.47mm）vs（6.06±1.56mm）、 eADC 值（0.725±0.19）vs（0.273±0.09）、ADC 值（0.761±0.18）×10^{-3} mm^2/s vs（1.510±0.22）×10^{-3} mm^2/s、D 值(0.610±0.18) vs（1.49±0.24）×10^{-3} mm^2/s、D^* 值（28.661±25.51） vs（8.62±2.60）×10^{-3} mm^2/s)]上的差异有统计学意义。短径、长径、eADC 值、D^*值鉴别转移性 LN 与非转移性 LN 的 ROC 曲线下面积分别为 0.847、0.828、0.981、0.978，其中以 eADC 值的 ROC 曲线下面积最大。**结论** eADC 值与 D^*值对直肠癌转移 LN 的诊断均具有较大的价值,eADC 值在直肠癌转移性 LN 的诊断中具有最高的诊断效能。

EPO-1266
非对比增强磁共振肠道显像评估对阑尾炎及其并发症中的价值

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目标：评估非对比增强磁共振肠道显像对阑尾炎及其并发症中的价值。
材料和方法：运用磁共振肠道显像（Magnetic Resonance Enterography， MRE）对 2013 年 2 月至 2017 年 8 月 86 名以右下腹痛为首诊症状的患者进行检查，由两名腹部影像学医师分别对 MR 图像进行分析，对阑尾及其并发症的情况进行评估，并与手术以及内镜活检病理结果进行对照；

结果：通过与手术及随访结果对比，非对比增强磁共振肠道显像对阑尾炎及其并发症的检出率及准确性分别为 97.6%、95.5%；
结论：非对比增强磁共振肠道显像能够对阑尾炎及其并发症进行有效的评估。

EPO-1267

超声技术在胃癌诊断中的应用

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来源于食管胃结合部（EGJ）和胃的上消化道（GI）肿瘤构成了一个主要的全球性健康问题。胃癌诊断时常已为中晚期，失去了治愈的时机，因此在早期应用影像学检查对胃癌进行准确诊断具有较高的临床意义。
本文就当前胃癌的研究热点，综合评价不同的超声检查方法，着重于超声新技术在诊断胃癌的研究现状，对其临床意义进行客观性评价。
超声诊断早期胃癌的诊断准确率较低，仅有 60%左右，而对进展期胃癌诊断符合率较高，可达 90%~95%。与二维超声相比较，三维超声可显示肿瘤的大体结构及病灶间的凹陷溃疡面，图像清晰逼真、形态直观。胃肠超声造影操作简便，检查过程无创、无辐射，患者更易接受；对胃壁五层结构观察清晰，并且对胃内占位性病变、黏膜下占位性病变的敏感性较高，可以很好地显示肿瘤的浸润程度，指导胃癌的 TNM 分期。超声双重造影检查（DCUS）不仅可以清晰显示肿瘤的部位、大小、浸润程度，还能反映病灶及胃周淋巴结的微血管和血流灌注情况，帮助鉴别肿瘤的良恶性，为术前分期提供更好的依据 。内窥镜已经成为胃癌患者在诊断、分期、治疗和姑息性处理中重要的检查手段。EUS 是将传统胃镜检查与超声相结合，既能直接观察消化道管壁的形态，又能对其进行实时超声扫描，获得各管壁层次结构的组织学特征和邻近器官的超声图像。线阵超声内镜(LEUS)是结合内镜、超声及超声内镜引导下穿刺、活检三种作用，能准确判断肿瘤浸润程度，同时对邻近淋巴转移也具有诊断价值 。随着染色内镜、放大内镜窄带成像技术（ME-NBI） 等新型内镜技术的运用，诊断癌前病变及早期胃癌的敏感性和特异性不断提高 。
综上所述，随着超声技术、设备的更新，对胃癌的检出、分期及评估疗效的准确率将不断提高，超声检查可以发挥更重要的临床应用价值。

EPO-1268

Initial Expericence with Cinematic Rendering for Diagnosis in Spontaneous Isolated Superior Messenteric Artery Dissection

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Objective: Cinematic rendering (CR) is a new three-dimensional data visualization technology. This study aims to investigate the value of CR in the image post processing of Spontaneous Isolated Superior Messenteric Artery Dissection (SISMAD).

Materials and Methods: CT data of 42 patients with SISMAD who were admitted to our hospital were retrospectively analyzed. All cases received conventional CTA and were posttreated with MPR, VR and CR. The two radiologists independently examined and analyzed the images of traditional CT and MPR, VR and CR, recorded the perforation, intimal valve, true and false lumen, branches, lesion area and diameter enlargement, and evaluated the diagnostic effect of CR on SISMAD by χ^2test.
Results: CT enhanced images and MPR could visually display the intima film, true and false lumen, lesion range and the shape of branch vessels; VR and CR had strong stereoscopic sense, which could clearly show the whole course of lesion and the spatial relationship with branch vessels; CR could improve the display rate of rupture of superior mesenteric artery dissection and show more clearly the small branches.
Conclusion: On CR images, SISMAD showed localized enlargement of superior mesenteric artery, low-density linear intima patches could be seen in cross-section, and the true and false lumens moved in a straight line, and the display rate of breaks increased. Therefore, CR has a certain value in the diagnosis and treatment evaluation of SISMAD.

EPO-1269

Reduced Field-of-View Diffusion-Weighted Imaging in Histological Characterization of Rectal Cancer: Impact of Different Region-of-Interest Positioning Protocols on Apparent Diffusion Coefficient Measurements

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Objectives: To compare four region-of-interest (ROI) protocols for apparent diffusion coefficient (ADC) quantifications derived from reduced field-of-view diffusion-weighted imaging (rDWI) in histological characterization of rectal cancer.
Methods: Two readers independently performed mean and minimum ADC measurements using four ROI positioning protocols (whole-tumor volume [WTV], single-slice [SS], three-slices observer-based sampling [TSOB] and three-slices predefined sampling [TSPD]) on forty-nine patients who underwent rDWI at 3.0T. Inter-observer variation was evaluated with Bland-Altman analysis and interclass correlation coefficient (ICC). Mean and minimum ADC values obtained from each method were compared in terms of different histological factors of rectal cancer by nonparametric tests. The diagnostic ability was evaluated by receiver-operating characteristic curve. The corresponding times for ADC measurements were recorded and compared between ROI methods.
Results: The inter-observer agreement was excellent for ADC values obtained by the two readers using the above four ROI methods (ICC range, 0.906-0.994). Mean and minimum ADC values by WTV method were significantly higher and lower than other methods respectively for both readers ($P<0.05$). Utilizing WTV method, the AUCs of mean ADC measurements (0.936, 0.840 and 0.714) for assessment of well-differentiated tumors, T2 and N0 categories were greater than those by SS method (0.782, 0.761 and 0.677). The WTV method required longer measurement time than other ROI methods ($P<0.001$).

Conclusions: ADC measurements based on rDWI were influenced by ROI positioning protocols. rDWI technique had diagnostic value for histological characterization of rectal cancer, using WTV method with overall best inter-observer reproducibility, but with the longest measurement time.

EPO-1270

Assessment of Histological Differentiation of Rectal Cancer Using Whole-Volume Histogram Analysis of Apparent Diffusion Coefficient Based on Reduced Field-of-View Diffusion Weighted Imaging

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Purpose: To explore the role of whole-lesion histogram analysis of apparent diffusion coefficient (ADC) derived from reduced field-of-view (rFOV) diffusion-weighted imaging (DWI) technique in discriminating histological grades of rectal carcinoma.

Materials and Methods: 102 patients with rectal cancer were enrolled in this retrospective study. All patients received preoperative 3.0T MR scan, including rFOV DWI sequence obtained at two b values (0 and 800 s/mm^2). Lesions were delineated on each slice of native DWI images and a histogram for the whole lesion volume was produced. Histogram parameters from rFOV DWI method were calculated and correlated with histological differentiation of rectal cancer. The parameters were compared between different histological grades of rectal cancer by independent student t test or Man-Whitney U-test. Correlations between histological grade and histogram parameters were analyzed by Spearman correlation test. The diagnostic performance of individual parameter for distinguishing poorly from well/moderately-differentiated tumors was assessed by receiver operating characteristic curve (ROC) analysis.

Results: There were significant differences for ADCmean, 25th, 50th, 75th, 90th, 95th percentiles, skewness and kurtosis of rFOV DWI sequence between well, moderately and poorly-differentiated rectal cancers ($P<0.05$). Significant correlations were noted between histological grades and above histogram parameters ($r= 0.679$, 0.540, 0.701, 0.730, 0.669, 0.574, -0.730, and -0.769 respectively, $P<0.001$). Among the individual histogram parameter, kurtosis achieved highest AUC of 0.882 with optimal cutoff value of 1.934 in distinguishing poorly from well/moderately-differentiated rectal cancers. The combination of ADCmean, 75th percentile and kurtosis yielded the highest AUC of 0.927 with sensitivity (88%) and sensitivity (91.7%) by using logistic regression.

Conclusion: Quantitative whole-lesion ADC histogram analysis based on rFOV DWI technique could help differentiate histological grades of rectal cancer. The combination of ADCmean, 75th percentile and kurtosis may be best choice.

EPO-1271

MRI 对直肠海绵状血管瘤的临床价值

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目的 分析直肠海绵状血管瘤的 MRI 表现，探讨 MRI 对直肠海绵状血管瘤的临床价值。**方法** 搜集经手术及病理证实的直肠海绵状血管瘤 8 例，均行 MRI 平扫与增强检查，回顾性分析直肠海绵状血管瘤的 MRI 表现。**结果** 8 例均表现为直肠壁明显增厚，黏膜下层增厚为著，T_2WI 呈显著高信号，其中 7 例直肠系膜内可见大量迂曲条索状异常信号影，T_2WI 呈等信号，FS-T_2WI 呈高信号，直肠系膜呈明显不均质改变。增强扫描病灶呈进行性强化。病灶内可见多发结节状低信号无强化静脉石。1 例病灶局限于直肠黏膜下层，7 例病灶累及直肠系膜、肛管或乙状结肠，其中 1 例病灶累及范围更广，达直肠固有筋膜、骶前间隙、骶管、骶盆壁、子宫颈及子宫周围间隙。**结论** 直肠海绵状血管瘤 MRI 表现具有特异性，MRI 能对直肠海绵状血管瘤进行定性诊断，并能全面评价其累及范围，对临床诊断、合理治疗方案的制订具有重要临床价值。

EPO-1272

The Value of Three-phase Enhanced Energy Spectrum CT Scanning in the Diagnosis of Early Gastric Cancer under the Optimum Single Energy Image

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PURPOSE
[Objective] To obtain the energy spectrum curves of gastric cancer lesions, normal gastric wall and image noise by three-phase enhanced scanning of early gastric cancer patients with energy spectrum CT. The CNR and SNR curves of lesions were calculated to evaluate the ability of different enhancement delays to display gastric cancer lesions at the optimum single energy level.
METHOD AND MATERIALS
50 patients with early gastric cancer confirmed by gastroscopy were scanned by revolution CT. Smrt mA technique was used to perform energy spectrum scanning at arterial phase (25s), portal phase(45s) and venous phase(65s) after 80 ml of contrast agent was injected through elbow vein. Using ADW4.6 post-processing workstation energy spectrum analysis software, energy spectrum curves of gastric cancer lesions, normal gastric wall and image noise were obtained using 0.625mm slice thickness images. The CNR and SNR curves of the lesions were obtained by calculation. The quantitative indicators were expressed by X + s. SPSS 13.0 software was used to analyze the data. CNR, SNR and image noise of arterial, portal and venous lesions were compared. Paired t-test was performed for those with normal and homogeneous variance, and non-parametric test was used for those with non-conformity. The difference was statistically significant ($P < 0.05$).

RESULTS

CNR: arterial phase > portal phase > venous phase under 70 keV condition. There were statistical differences between arterial phase and venous phase, and between portal phase and venous phase. There was no statistical difference between arterial phase and portal phase. SNR: venous phase > portal phase > arterial phase. There were statistical differences between groups.

CONCLUSION

At 70 KeV, arterial phase and portal phase have greater advantages in showing early gastric cancer lesions, while venous phase has greater advantages in showing the internal structure of early gastric cancer lesions and the relationship with surrounding tissues. The comprehensive ability of portal phase to detect lesions and display details is superior to other phases.

EPO-1273
CT 多期增强在结直肠癌同时性、异时性肝转移预测中的应用价值

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目的：探讨结直肠癌 CT 衰减值与结直肠癌同时性、异时性肝转移的关系。
方法：回顾性分析 2013 年 1 月至 2016 年 12 月本院术后病理为结直肠腺癌，并有完整临床资料、行三期增强 CT 的 100 例患者；确定增强峰值并测量各时相结直肠病变的 CT 值；比较同时性肝转移、异时性肝转移及未转移组的相关参数。
结果：同时性肝转移、异时性肝转移两组患者峰值增强有显著差异（P＜0.05）。大多数同时性和异时性肝转移在动脉期或静脉期达到高峰。延迟期同时性和异时性肝转移的 CT 衰减值均明显高于未转移组的 CT 衰减值（P＜0.05）。
结论：结直肠癌同时性、异时性肝转移在 CT 增强上有早期增强的趋势。这一结直肠癌 CT 增强特征对患者术后随诊有重要应用价值。

EPO-1274
用于术前预测结直肠癌患者腹膜转移的临床放射组学模型的建立

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目的：开发和验证用于术前预测结直肠癌腹膜转移的临床放射组学列线图。
方法：我们招募了 779 名经临床病理证实为结直肠癌的患者（训练组 585 名，验证组 194 名）。纳入 8 个重要临床危险因素（年龄、性别、肿瘤大小、preCA19-9 水平、preCEA 水平、肿瘤位置、病理分级、组织学类型）来构建临床模型；采用 LASSO 算法构建放射组学特征（包括原发病灶和外周淋巴结的影像学特征），以开发影像组学模型；并应用逐步逻辑回归选择重要变量来构建临床影像组学模型。然后使用 Akaike 信息准则（AIC）来比较不同模型的相对强度，以及用曲线下面积（AUC）来量化预测准确性。最后，应用决策曲线分析（DCA）来评估该模型的临床应用价值。最后我们纳入 2018 年 2 月至 9 月 139 名结直肠癌患者作为外部验证集对模型进行外部验证。

结果：临床影像组学模型（AIC = 1043.2）（其 AIC 值低于临床模型（AIC = 1277.7）和放射组学模型（AIC = 1280.5））被确定为最佳模型。临床放射组学模型在训练组（AUC = 0.855）和验证组（AUC = 0.793）和良好校准方面都表现出良好的区分。决策曲线分析证明临床放射组学列线图在临床上是有用的。
结论：本研究提出了一个由影像组学特征和临床危险因素创建的临床放射组学列线图，该列线图可应用于对结直肠癌患者腹膜转移的个体化术前预测。

EPO-1275
胃间质瘤 CT 征象学在高危险度肿瘤定量评价中的价值

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目的 探讨胃间质瘤(Gastric stromal tumor, GST)的 CT 征象在术前预测高危 GST 的价值。**方法** 回顾性纳入经手术病理和免疫组化证实的 46 例 GST 患者的 CT 检查资料，总结其特征性影像学征象，包括大小、形态、腔内外生长方式、强化程度以及是否存在 GST 内坏死。根据 Fletcher 分级标准，将 GST 分为高危、低危组。采用 SPSS 分析患者年龄、腔内、外、腔内外生长方式，肿块是否规整、肿瘤内是否存在明显坏死行逻辑回归分析，将最终确认有价值参数纳入 ROC 诊断效能分析。**结果** 46 例 GST 患者中，极低危险度 5 例，低危险度 14 例，中危险度 8 例，高危险度 19 例；腔内生长 24 例，腔内外跨壁生长 11 例，腔外生长 11 例；边界规则 34 例，不规则 12 例，无坏死 25 例，21 例坏死。逻辑回归显示年龄、肿块规则程度、腔内外生长方式等特征是 GST 的高危险因素（β＞0）。持续强化及强化程度是高危险度 GST 的保护因素（β＜0）。通过对不同特征的效能诊断分析发现，肿块是否规则与体积对独立诊断高级别 GST 具有一定准确性（）。GST 是否合并有坏死在一定程度上具有低度诊断准确性；肿块分叶与腔内外生长方式作为联合特征预测高级别 GST 时，AUC=0.67。分叶型 GST 合并瘤内坏死作为联合特征，AUC=0.622。但是，当联合年龄，肿块规则程度、腔内外生长方式及坏死程度特征后诊断效能反而降低（AUC=0.598）。**结论** 高危 GST 在 CT 上表现具有一定特征性，综合患者年龄，肿瘤大小（体积）、腔外生长及肿块不规则分叶是术前预测高危险度 GST 的可靠依据。

EPO-1276
系统性红斑狼疮累及消化道的 CT 表现

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目的：分析系统性红斑狼疮累及消化道的 CT 表现，提高对该病的诊断及鉴别诊断水平。**方法：**收集 2016 年 1 月-2019 年 3 月共 17 例经临床确诊为系统性红斑狼疮累及消化道患者的临床及 CT 资料，其中 15 例行 CT 平扫及增强扫描，2 例行 CT 平扫，记录病变累及消化道的具体部位、肠壁厚度、CT 征象及伴随表现。**结果：**累及胃 8 例，十二指肠 2 例，空肠 9 例，回肠 9 例，升结肠 9 例，横结肠 1 例，降结肠 6 例，乙状结肠 8 例，直肠 8 例；表现为肠壁肿胀增厚者 15 例， “同心圆征”12 例，“靶征”11 例，肠腔扩张伴积气、积液 13 例，其中假性肠梗阻 4 例；肠系膜“梳征”或“栅栏样”改变 11 例，肠系膜脂肪间隙模糊 9 例；伴随腹、盆腔积液 15 例，胸腔积液 12 例，心包积液 3 例，泌尿系病变者（输尿管炎性狭窄、膀胱壁增厚、双肾或输尿管积水等）5 例。**结论：**系统性红斑狼疮累及消化道时典型的 CT 表现为消化道壁及肠系膜异常，提示病变程度较重。

EPO-1277

多层螺旋 CT 对成人梅克尔憩室的诊断价值

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目的 通过分析成人梅克尔憩室（MD）CT 表现，探讨多层螺旋 CT 对 MD 的诊断价值。
方法 对 34 例经手术病例证实为 MD 患者的 CT 图像与临床资料进行回顾性分析，包括图像质量评分、MD 影像特点及憩室开口位置、长度、最大径、最小径等，并与术中所见进行对比研究评估 CT 对 MD 的诊断价值，同时将有、无并发症的复杂型、单纯型憩室进行对比研究，评估 CT 对 MD 分型及远期预测的价值。
结果 34 例患者影像质量评分 2.73±0.4 分，其中未行严格肠道准备者评分较低；MD 开口于肠系膜对侧肠壁者 31 例（91%），开口于侧壁者 3 例（8.82%）；影像分型为单纯型 MD 者 14 例（41.18%），复杂型憩室者 20 例（58.82%），复杂型憩室均伴发憩室炎；将 CT 测量值与手术测量值进行对比研究，发现 MD 长度、最大径、最小径均高于术中测量值，两种测量方法差异有统计学意义(P<0.05)。对单纯型与复杂型 MD 进行对比研究，发现单纯型开口直径、最小直径、开口直径与最小直径之差均高于复杂型，示两种分型差异有统计学意义(P＜0.05)。
结论 多层螺旋 CT 对成人 MD 诊断、分型、远期预测及手术指导具有重要的临床价值，拟诊 MD 患者应常规行严格肠道准备及增强扫描。

EPO-1278

Comparison between bi-exponential model and mono-exponential model of Intravoxel incoherent motion MR imaging in the evaluation of esophageal cancer

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Objective: To investigate the application value of bi-exponential and mono-exponential intravoxel incoherent motion (IVIM) MRI in the early diagnosis of the esophageal cancer.
Materials and Methods: We performed a perspective study of 54 esophageal cancer patients, who were admitted to our hospital between May 2015 and November 2016. The 54 patients were performed MRI plain scan and IVIM - DWI sequence scan with multi b-values (b value= 0, 30, 50, 80, 150, 200, 400, 600, 800, 1000, s/mm2). Mono-exponential diffussion-weighted imaging parameters include Slow ADC_mono, Fast ADC_mono, Fraction of Fast ADC_mono (Ff_mono) and bi-exponential model parameters include Slow ADC_bi, Fast ADC_bi, Fraction of fast ADC_bi (Ff_bi), which were measured in tumor lesions and normal esophagus tissue on the same individual. The Bland-Altman plot (Bland & Altman, 1986 and 1999) was used to evaluate consistency of two measurements between bi-exponential model and mono-exponential model. Paired samples t-test was performed to compare the mean value of parameters between bi-exponential model and mono-exponential model, as well as the

differences between cancer tissues and normal tissues. Receiver operating characteristic curve (ROC) was drawn to compare the prediction parameters and diagnostic efficiency.
Results: The Bland-Altman analysis indicates the Slow ADC, Fast ADC and Fraction of two exponential model all could be evaluated as a very good agreement in normal esophagus and esophageal cancer. Statistical significant differences were found in the comparison of mono-exponential and bi-exponential model of Slow ADC, Fast ADC and Fraction in normal esophagus tissues ($p<0.05$). The Slow ADC and Fast ADC are significant differences between mono-exponential and bi-exponential model in esophageal cancer ($P<0.05$), but no significant differences compareing Fraction_mono with Fraction_bi ($P>0.05$). In the mono-exponential model, the differences of Fast ADC_mono value and Ff_mono valuein ESCC and normal esophageal tissue indicate statistical significance ($P<0.001$) . However, no significant difference was found in the average value of Slow ADC_mono in ESCC and normal esophageal tissue($P>0.05$). In the bi-exponential model, the average values of Ff_bi in normal esophagus tissues and ESCC suggest statistical significance ($P<0.05$). No significant differences were found in the mean value of Slow ADC_bi and Fast ADC_bi in the normal tissues and ESCC($P>0.05$). The area under the receiver operating characteristic curve (AUC) of the mono-exponential model was significantly better than that of the bi-exponential model for the Fast ADC_mono and Fraction of_bi (0.827 vs. 0.67, $p=0.024$). The AUC of the mono-exponential model for the Fast ADC_mono and Ff _mono were no statistical significance (0.827 vs. 0.689, $p=0.053$).
Conclusion: The mono-exponential model and bi-exponential model are not mutually replaceable in the evaluation of esophageal cancer. The mono-exponential model of IVIM-DWI proves superior to bi-exponential model in the diagnosis and differentiating of esophageal cancer.

EPO-1279

MR 动态增强 DCE 成像在进展期胃癌中的应用

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目的：探讨 3.0TMR DCE 序列在进展期胃癌 T 分期的应用，分析动态增强 DCE 各参数和胃癌病理特征的相关性。
方法：将 38 例手术病理标本证实为进展期胃癌（T3、T4 期），由两位对病理结果未知的影像科医师各自独立对胃癌病灶的 DCE 图像和 C-VIBE 图像进行 T 分期判读，其结果和金标准（病理 T 分期）相对照；在 DCE 后处理图像上测量胃癌病灶的 DCE 参数：Ktrans、Kep、Ve，探讨 DCE 各参数与病理 T 分期及病理类型的关系。
结果：MR 动态增强 DCE 序列对进展期胃癌总的诊断准确率为 78.9%，常规 MR 增强 C-VIBE 序列对进展期胃癌总的诊断准确率为 81.6%，经配对卡方检验，两种序列对 T3、T4 期胃癌的诊断结果无统计学差异（$P>0.05$），T3、T4 期胃癌的 Ktrans 值比较无差异($P>0.05$)，T3 期胃癌病灶的 Kep、Ve 值高于 T4 期，结果具有统计学意义($P<0.05$)；不同组织学类型胃癌的 Ktrans 均值从大到小依次为：非粘液腺癌>印戒细胞癌>粘液腺癌

(P<0.05)，粘液腺癌的 Kep 值明显低于非粘液腺癌和印戒细胞癌(P<0.05)，非粘液腺癌的 Ve 值明显低于粘液腺癌和印戒细胞癌(P<0.05)。肠型组和弥漫型组的 Ktrans、Kep 值比较无差异(P>0.05)，弥漫型胃癌的 Ve 值高于肠型组 (P<0.05)。
结论：动态增强 DCE 序列和常规 C-VIBE 序列对进展期胃癌 T 分期的诊断结果无差异，DCE 图像可以代替常规 MR 增强图像进行胃癌 T 分期的评估；不同组织学类型的胃癌进行比较，部分 DCE 参数具有显著差异，提示可以通过某些 DCE 参数预测胃癌的组织学类型。

EPO-1280
胃肠道间质瘤的 MRI 征象与不同危险度的相关性

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摘要 目的 分析胃肠道间质瘤(Gastrointestinal stromal tumors, GISTs) MRI 征象，探讨不同 MRI 征象与其危险度间的相关性。**方法** 回顾性分析 54 例经手术病理证实为 GISTs 患者临床、病理及 MRI 资料，分析 GISTs 的 MRI 征象：大小、部位、形态、边界、生长方式、有无囊变坏死、转移、信号均匀性、肿瘤时间-信号强度曲线及扩散加权成像（DWI）上表观扩散系数（ADC）值（平均 ADC 值），并将上述 MRI 征象与 GISTs 侵袭性做相关性分析。**结果** 54 例 GISTs 中，低危险度 16 例，中危险度 13 例，高危险度 25 例。统计结果表示肿瘤大小、部位、形态、边界、有无囊变坏死、信号均匀性及 ADC 值在预测 GISTs 侵袭性中差异有统计学意义（$P < 0.05$）。肿瘤生长方式、有无转移及强化曲线与 GISTs 的侵袭性差异无统计学意义（$P > 0.05$）。随着 GISTs 危险度增高，肿瘤体积增大、形态不规则、边界不清，肿瘤内部信号不均，更易发生囊变坏死，ADC 值越低。**结论** MRI 不同征象可以对 GISTs 的侵袭性术前初步进行评价，为临床治疗及预后提供参考。

EPO-1281
基于多排螺旋 CT 门静脉血管三维成像对门静脉高压消化道出血风险因素的评估

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目的：通过分析肝硬化门静脉高压食管及胃底静脉曲张的 CT 征象，评估其上消化道出血的风险因素，并对主要因素相关性进行评估。
方法：随机选择肝硬化门静脉高压并发食管出血患者 60 例为出血组，未出血患者 60 例为未出血组。随机选择肝硬化门静脉高压并发胃底曲张静脉出血患者 60 例为出血组，未出血患者 60 例为未出血组。检测所有患者门静脉主干最大径及最大截面积、食管及胃底曲张静脉直径，凸出黏膜下血管截面数量及截面积，计算敏感性、特异性，并算出约登指数，并选择约登指数最高的临界点。
结果：出血组门静脉主干最大径约为 8.24±1.20mm，最大截面积为 3.18cm^2 ，未出血组门静脉主干最大径约为 6.23±2.30mm，最大截面积为 2.65cm^2 。食管及胃底曲张静脉出血组直径为(8．65±2．85)mm，未出血组(5．65±3．35)mm，约登指数为 0．34，临界点为 6．55 mm，ROC 曲线下面积(AUC)为 0．72；出血组静脉血管数量为(4．5±2．5)支，未出血组为(4±2) 支，约登指

数为 0．35，临界点为 4 支，AUC 为 0．68；出血组血管面积为(1．64±1．26)cm^2，未出血为(1．64±1．26) cm^2，约登指数为 0．45：临界点为 1．03cm^2，AUC 为 0．82。
结论：食管及胃底凸向黏膜下曲张静脉血管截面面积、直径、截面数量、门静脉主干直径及面积 5 个指标中，食管及胃底曲张静脉血管截面总面积及数量作为两种新的预测出血的检测指标具有较高价值，能较好的预测出血风险。

EPO-1282
MR 影像组学对直肠癌区域淋巴结转移的预测价值

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目的：探索 MR 影像组学（radiomics）预测直肠癌患者术前区域淋巴结转移的价值。
材料和方法：收集经手术和病理证实、术前行高分辨率 MR 成像、术前无放化疗的 183 例直肠癌患者，将患者按 7:3 比例随机分为训练组（128 例）和验证组（55 例）。采用 ITK-SNAP 勾画病灶感兴趣区（VOI），采用 A.K 软件提取病灶内直方图、形态及纹理特征等放射组学特征。采用独立样本 T 检验、Kruskal-Wallis 检验、Pearson 相关分析进行特征降维。采用多因素回归分析对筛选的放射组学特征参数以及相关的临床-影像特征建立最优模型，用于预测直肠癌患者术前区域淋巴结转移。采用受试者工作特征曲线（ROC）、曲线下面积（AUC）以及决策曲线分析评估模型的价值。
结果：通过后处理软件提取病灶内部 385 个放射组学特征参数，经过特征降维后 9 个特征参数纳入研究，联合 6 个临床-影像特征参数，建立淋巴结转移的预测模型。采用临床-影像特征参数预测淋巴结转移的诊断效能中等（训练组为 79.4%，验证组为 72.3%），联合 MR 影像组学参数后，训练组和验证组的诊断效能可分别提高至 82.7%、83.5%。经决策曲线分析后，联合 MR 影像组学参数后的预测模型亦优于仅采用临床-影像特征参数建立的模型。
结论：MR 影像组学有助于预测直肠癌术前区域淋巴结的转移，有助于患者术前治疗方案的选择。

EPO-1283
经腹 MR 弹性成像定量评估的直肠癌硬度：一种潜在的直肠癌预后风险预测因子

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目的：评估一种定量评估直肠肿瘤刚度的磁共振弹性成像 (MRE) 方法的可行性，并探讨其相关定量参数与直肠腺癌预后相关的临床影像病理因素的关系。
材料与方法：每位受试者在 3.0TMR 成像仪上进行体外经腹气动装置驱动的多频 MRE (40、50、60、70Hz)及常规直肠 MRI 检查。招募 12 名健康志愿者并对其行两次重复性实验，前瞻性连续性 80 例直肠腺癌患者 MRI 及其临床病理资料。采集健康志愿者两次检查获得的直肠硬度信息进行可靠性检验。收集直肠癌患者的常规“DISTANCE”参数、MRE 定量参数及其预后相关的临床病理信息，评估 MRE 获得的直肠癌及远癌旁肠壁硬度信息与 MR 分期、病理分期及其独立预后风险因子的相关性，并探究 MRE 在术前预测直肠风险分级中的价值。
结果：在正常志愿者中，MRE 评估直肠肠壁的硬度具有良好的可重复性（Cronbach's α=0.87，ICC=0.77）。在直肠癌患者中，直肠癌组织与远癌旁肠壁组织的硬度差异具有统计学意义（p＜.0001），直肠癌患者远癌旁肠壁与健康志愿者肠壁硬度无统计学意义（p>.05）。根据第八版的

AJCC 癌症分期手册进行术前 MR 分期（mTN）、术后病理分期（pTN），mT4 期肿瘤硬度显著高于 mT3 期及 mT1+2 期（p＜.0001），mN2 、mN1+2 期肿瘤硬度显著高于 mN0 组（p＜.01），EMVI 阳性及 CRM 阳性组的肿瘤硬度显著高于阴性组（p＜.0001）。在 35 名行 TME 术后的直肠患者中，pT3 期肿瘤硬度显著高于 pT1 期组（p<.05），pN1 期组肿瘤硬度显著高于 N0 期组（p＜.001）。存在 mT4、mN 阳性、EMVI 阳性、CRM 阳性的高风险组的直肠癌硬度显著高于不存在以上风险因素的低风险组（p<.001）。
结论：直肠 MRE 获得直肠硬度信息与 MR 分期、EMVI、CRM、病理学分期等预后风险因子具有一定的相关性，可能是新的预后风险因子。

EPO-1284

Pre-treatment ADC based texture analysis of locally advanced gastric cancer might not be a good response predictor for neoadjuvant therapy

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PURPOSE:
The aim of this study was to investigate the possibility of preoperative texture analysis from diffusion weighed imaging (DWI) in the prediction of the response rate to neo-adjuvant therapy in patients with gastric cancer.
MATERIAL AND METHODS:
Forty-eight patients with biopsy-proven gastric cancer were examined by DWI before neo-adjuvant therapy, and treated with radical surgery after treatment completion. Response at final histology was assessed according to College of American Pathology (CAP) from 0 to 3. Image features from texture analysis of ADC were quantified, such as mean , SD, entropy, mpp, skewness, kurtosis, with and without filters for fine to coarse textures (SSF 0,2,3,4,5,6). Patients with CAP 0-2 were considered responders while CAP 3 as non-responders. Texture features was compared using Wilcoxon test..
RESULTS: Thirty-two patients were classified as responders while sixteen were non-repsonders. All of the thirty-six parameters were not significantly different between responders and non-responders (p>0.05). The mean ADC without filters was 1.398±0.333 $\times 10^{-9} mm^2/s$ and 1.374±0.233 $\times 10^{-9} mm^2/s$ for responders and non-responders separately (p=0.556).
CONCLUSION:
Pre-treatment ADC based texture analysis might not be able to provide additional information regarding the response rate to neo-adjuvant therapy for gastric cancer.

EPO-1285

苏氨酸锰螯合物——一种新型的磁共振肠道对比剂：健康大鼠在体初步实验

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目的：口服肠道对比剂在胃肠道 MR 成像中起到重要的作用。然而，目前关于使用何种口服肠道对比剂尚无统一的标准。苏氨酸锰螯合物（Mn-Thr）是一种常见的营养食品添加剂。本研究拟采用体外实验测定 Mn-Thr 的纵向弛豫率与横向弛豫率，并进一步利用大鼠在体实验探讨 Mn-Thr 作为 MR 肠道对比剂的可行性。

方法：配制不同浓度的 Mn-Thr 水溶液置于体外模具，室温下在 3T 应用一系列反转恢复序列以及多回波序列进行扫描，测定 Mn-Thr 的纵向弛豫率与横向弛豫率。根据测定的弛豫率，配制一系列浓度的溶液进行体外模具扫描，最终确定在 T1WI 和 T2WI 上均能使肠道呈现“黑腔”的 Mn-Thr 浓度。为了进一步在体验证体外实验的结果并与常用的肠道对比剂——水作对比，将 8 只健康 SD 大鼠随机分为两组，分别经肛门注射 2g/L 的 Mn-Thr 水溶液和生理盐水作为肠道对比剂进行 MR 扫描。一周后，将两组大鼠的肠道对比剂对调后再次进行 MR 扫描。第二次扫描后处死动物，测定两组大鼠组织锰含量并行组织病理学检查以评估安全性。定性评估并比较同一只大鼠两次 MR 扫描的图像质量。

结果：在室温 3T 场强下体外测定 Mn-Thr 的纵向弛豫率为 8.12±0.80 $s^{-1}\cdot mM^{-1}$，横向弛豫率为 98.50±13.72 $s^{-1}\cdot mM^{-1}$。体外模具和大鼠在体实验均显示，2g/L 的 Mn-Thr 溶液在 T1WI 和 T2WI 上均能使肠道呈现“黑腔”。在图像质量评分方面，与生理盐水相比，Mn-Thr 作为肠道对比剂时，肠腔信号均一度和肠壁对比度均明显更高。两组大鼠在组织锰含量上无明显统计学差异。组织病理学切片均无明显异常。

结论：Mn-Thr 具有较好的纵向弛豫率与横向弛豫率。使用 Mn-Thr 作为肠道对比剂，在健康大鼠肠道内可形成 T1WI 和 T2WI 均为黑腔的成像，且无明显的毒副作用。作为常见的商用营养食品添加剂，Mn-Thr 有望作为新型的 MR 肠道对比剂。

EPO-1286

The value of CTE and non-contrast MRE in patients after intestinal surgery

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TEACHING POINTS

1.To demonstrate the advantages of computed tomography enterography(CTE) and magnetic resonance enterography (MRE) in the evaluation of patients after intestinal surgery.
2.The two methods were compared to provide the indications for clinicians and radiologists.

TABLE OF CONTENTS/OUTLINE

Findings confounded with pathological status were listed and clarified in MRE with assistance of multiple functional sequence and comparison of CTE. Surgical materials

when existed were identified particularly to assist in discerning normal anatomic structures after surgery. Assist-function of multiple alternative pulse sequence of MRE including cine and DWI was evaluated.
1.Enumerate various intestinal surgery
2.Discuss the common postoperative complications of intestinal surgery
3.Superiority of CTE and MRE in the diagnosis of complications
4.Provide indications of CTE and MRE

EPO-1287

MRI texture analysis based on 3D tumor measurement in differential diagnosis of benign and malignant presacral lesion after resection of rectal carcinoma

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Objective: To evaluate the diagnostic value of 3D MRI texture analysis based on T1WI, T2WI, DKI and contrasted-enhanced T1WI MRI sequences in differential diagnosis of benign and malignant presacral lesion after resection of rectal carcinoma
Materials and methods: Postoperative MRI and clinical data of 26 patients with histopathologically confirmed presacral lesion (12 postoperative granulation or fibrous tissue and 14 local recurrence tumors) were retrospectively analyzed. The regions of interest (ROIs) covering the entire lesion were manually delineated on axial slices using O.K. (Omni Kinetics, GE Healthcare, China) software; and the histogram and GLCM features based on T1WI, T2WI, DKI and contrasted-enhanced T1WI MRI sequences were automatically generated. Statistical package for social science (SPSS) 12.0 and R language (RStudio Version 1.0.143 2009-2016 RStudio, Inc.) were used for data analysis.
Results: Based on contrasted-enhanced T1WI features, the uniformity resulted as the best feature for diagnosis, with the AUC of 0.738. The presacral lesions were differentiated on T1WI, T2WI and DKI with the highest AUC of 0.952, 0.833 and 0.869, which corresponded to range, entropy and standard deviation. After modeling, the accuracy of the contrasted-enhanced T1WI, T1WI, T2WI and DKI features model was 0.892, 0.857, 0.844and 0.914, respectively.
Conclusion: MRI texture analysis could be used as a new noninvasive method for identification of benign and malignant presacral lesion for the patients of rectal cancer after operation.

EPO-1288

3D MRI texture analysis based on contrasted-enhanced T1WI in differential diagnosis of benign and malignant presacral lesion after resection of rectal carcinoma

Jian Jiang,Ji Yuan,Liu Ailian

The First Affiliated Hospital of Dalian Medical University

Objective: To evaluate the diagnostic value of 3D MRI texture analysis based on contrasted-enhanced T1WI in differential diagnosis of benign and malignant presacral lesion after resection of rectal carcinoma.
Materials and methods: Postoperative MRI and clinical data of 26 patients with histopathologically confirmed presacral lesion (12 postoperative granulation or fibrous tissue and 14 local recurrence tumors) were retrospectively analyzed. The regions of interest (ROIs) covering the entire lesion were manually delineated on axial slices using O.K. (Omni Kinetics, GE Healthcare, China) software; and the histogram and GLCM features based on contrasted-enhanced T1WI sequence were automatically generated. Statistical package for social science (SPSS) 12.0 and R language (RStudio Version 1.0.143 2009-2016 RStudio, Inc.) were used for data analysis.
Results: In texture analysis of contrasted-enhanced T1WI features, volumecount, relativedeviation, GLCM inertia and cluster prominence were significantly decreased in benign group compared to malignant group; while kurtosis, uniformity, GLCM energy and correlation of benign group were significantly increased (P=0.02~0.038). According to ROC analysis, the uniformity (cutoff value=0.524, area under the curve (AUC) = 0.738) was considered the best parameter for the diagnosis of two groups, with the sensitivity of 85.7% and specificity of 66.7%, respectively. Multivariate logistic regression was used for modeling. The modeling formula of contrasted-enhanced T1WI was as follow: $f_{\text{contrasted-enhanced T1WI}}$ =684.779-0.057×Volumecount +0.022×cluster prominence -10.840×inertia -750.323×uniformity. The AUC of the contrasted-enhanced T1WI model was 0.892 (cutoff value=0.647, sensitivity of 86.3% and specificity of 89.5%).
Conclusion: MRI texture analysis based on contrasted-enhanced T1WI could be used as a new noninvasive method for identification of benign and malignant presacral lesion for the patients of rectal cancer after operation.

EPO-1289

CT 灌注联合增强成像感兴趣区的选择对胃癌灌注及增强参数的影响

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目的：探讨 CT 灌注联合增强成像中不同感兴趣区（ROI）选择方法对测量结果准确性、一致性的影响。
材料与方法：前瞻性的收集病理确诊为胃癌且术前需要行上腹部 CT 灌注联合双期增强扫描的患者 30 例，均在 GE Revolution 上进行扫描。在灌注 CTP、平扫及双期增强图像中选取胃癌病灶最大横断层面，感兴趣区（ROI）分别采用肿瘤显著强化区的圈画法和肿瘤轮廓勾画法，记录病灶的灌注参数、平扫及双期增强 CT 值。2 名放射科医师（A 和 B）独立对图像进行分析、测量和评价。其中医师 A 在间隔 2 个月后再次对数据进行测量。采用组内相关系数（ICC）评价 2 名医师采用同一方法对相同患者测量的一致性以及相同观察者在不同时间测量数据的一致性，采用配对样本 t 检验或 Wilcoxon 符号秩和检验评价两组间灌注参数及增强参数。
结果：同一医师在不同时间采用肿瘤轮廓法所有参数一致性均优秀（ICC＞0.80），圈画法测量的 MTT 值一致性良好，其余参数一致性优秀；2 名医师采用肿瘤轮廓法测得的灌注参数、平扫加双期

增强 CT 值一致性优秀（ICC 均＞0.80），强化区圈画法测得参数一致性良好（ICC 在 0.61-0.80）；2 种不同 ROI 方法测量灌注参数中 TTP、PEI、MSI、BV 等、平扫加双期增强参数均有统计学意义（*P* 均＜0.05）。

结论：1.同一观察者不同时间或两名不同观察者间，ROI 采用手动勾画肿瘤轮廓法、圈画法测得的灌注参数、平扫加双期增强 CT 值一致性均优秀或良好，但轮廓法一致性更高，临床可重复性更强。2.两种不同感兴趣区选择测量的 TTP、PEI、MSI、BV 等灌注参数、平扫加双期增强 CT 值差异均有统计学意义，对 BF、MTT、Tmax 以及 PS 等灌注参数影响不大。

EPO-1290

结肠癌患者肝转移影像特点分析

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目的：归纳总结结肠癌患者发生肝转移的影像学特点，并比较青年、中年及老年组结肠癌患者肝转移的差异。

方法：回顾性分析南方医科大学南方医院 2016.9-2017.12 共 78 名结肠癌肝转移患者影像资料；采用社会科学统计软件包（Statistical Product and Service solution 20.0，SPSS20.0）进行统计分析，采用卡方检验比较各年龄组结肠癌肝转移患者原发病灶部位、转移分布、转移数目的差异，*P*<0.05 为差异有统计学意义。

结果：78 名结肠癌肝转移患者，男性 47 例，女性 31 例，年龄 28-84 岁，平均年龄 56.44 岁，60 岁以上（含 60 岁）老年组 27 例（34.6%），40-60 岁中年组患者 45 例（57.7%），40 岁以下（含 40 岁）青年组患者 6 例（7.7%）；原发肿瘤位于左半结肠者 45 例（57.7%），位于右半结肠者 33 例（42.3%）；同时性肝转移患者 66 例（84.6%），异时性肝转移患者 12 例（15.4%）；转移瘤主要分布于左半肝者 15 例（19.2%），右半肝者 55 例（70.5%），弥漫分布者 8 例（10.3%）；肝转移数目≤5 个者（有限组）38 例（48.7%），＞5 个者（多发组）40 例（51.3%）；转移瘤的最大直径范围为 5mm-115mm，平均值约 36.03mm。有限组与多发组的转移瘤主要分布区域不同，差异有统计学意义（p=0.012）；青年组、中年组与老年组患者比较，其原发肿瘤部位、转移瘤分布、转移数目无显著统计学差异（p＞0.05）。

结论：总体来说结肠癌肝转移发病高峰年龄为 40-60 岁，同时性肝转移多见，左半结肠发生肝转移的几率更高，结肠癌肝转移瘤更多分布于右半肝，一旦发生肝转移，多发转移的可能性更大，有限转移与多发转移的转移瘤主要分布区域有差异，但结肠癌肝转移患者各年龄组间的原发肿瘤部位、转移瘤分布及转移数目无明显差异。

EPO-1291

Rectal Cancer invasiveness：Whole-Lesion Diffusion-Weighted Imaging (DWI) Histogram Analysis by Comparison of Reduced Field-of-View and Conventional DWI Techniques

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Objective: To explore the role of whole-lesion histogram analysis of apparent diffusion coefficient (ADC) for discriminating between T stages of rectal carcinoma by comparison of reduced field-of-view (FOV) and conventional DWI techniques.

Materials and methods: 102 patients with rectal cancer were enrolled in this retrospective study. All patients received preoperative MR scan at 3T, including reduced and full FOV DWI sequences. Histogram parameters from two DWI methods were calculated and correlated with histological T stage of rectal cancer. The diagnostic performance of individual parameter for differentiating stage pT1-2 and pT3-4 tumors from both DWI techniques was assessed by receiver operating characteristic curve analysis.

Results: There were significant differences for the parameters of ADCmean, 50^{th}, 75^{th}, 90^{th}, 95^{th} percentiles, skewness and kurtosis of both DWI sequences in patients with pT1-2 as compared to those with pT3-4 tumors ($P<0.05$), in addition to parameters including ADCmin ($P=0.015$) and 25^{th} percentile ($P=0.006$) from rFOV DWI. Correlations were noted between T staging and above histogram parameters from rFOV DWI (r: -0.741-0.682) and fFOV DWI (r: -0.449-0.449), besides parameters of ADCmin (0.370) and 25^{th} percentile (-0.425) from rFOV DWI. The AUCs of 75^{th} and 90^{th} percentiles from rFOV DWI were significantly higher than that from fFOV DWI ($P=0.0410$ and $P=0.0208$).

Conclusion: The 75^{th} and 90^{th} percentiles from rFOV DWI may be optimum for differentiating pT1-2 from pT3-4 stage of rectal cancer. The rFOV DWI technique performs better than fFOV DWI technique in assessment of rectal cancer invasiveness.

EPO-1292
比较小肠胃肠道和非胃肠道间质瘤的宝石能谱 CT 特征性表现

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目的 通过分析比较小肠胃肠道和非胃肠道间质瘤的宝石能谱 CT 特征性表现，提高 GIST 的诊断与鉴别诊断。
方法 回顾性分析了 2011 年 10 月至 2018 年 10 月在山西省肿瘤医院经手术病理证实的 112 例 GIST 均行 GSI 扫描的患者的影像资料及相关临床资料，其中胃肠道 GIST 90 例，非胃肠道 GIST22 例，分析评估内部同质性，生长模式、钙化，肿瘤内出血、变性、溃疡和淋巴结肿大；定量分析测量肿瘤的最大直径;在平扫期和动脉、静脉期的增强 CT 上的肿瘤实体部分的标准碘浓度值；动脉期及静脉期供血动脉的直径和标准碘浓度值；动脉期及静脉期引流静脉的直径和标准碘浓度值。

结果 两组观察者瘤内出血占 GIST 的 16.2%和 24.7%，非 GIST 得 0%和 0%（p=0.081 和 0.010）；两组观察一致性较好。引流静脉直径与早期静脉回流相关的 GIST 最大直径呈正相关（r=0.712）。动脉期和静脉期实体瘤部分的标准碘浓度值（p＜0.01）和动脉期引流静脉的标准碘浓度值（p＜0.05）对于 GIST 而言高于非 GIST。

结论 GISTs 中肿瘤内出血和早期静脉回流的发生率高于非 GISTs。GIST 显示动脉期和静脉期的增强强度比非 GISTs 强；在 GIST 和非 GISTs 的动脉期可观察到增强的峰值。GIST 动脉期引流静脉 CT 值高于非 GIST。引流静脉直径与早期静脉回流相关的 GIST 最大直径呈比例。GIST 与非 GIST 宝石能谱 CT 形态学特征、能谱 CT 定量指标有一定的特点，能够为 GIST 术前制定治疗方案及预后提供更多有效的信息和依据。

EPO-1293

CT 增强扫描动脉期有助于儿童腹型过敏性紫癜的鉴别

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目的：探讨 CT 增强扫描动脉期对儿童腹型过敏性紫癜的诊断价值.
方法：回顾性分析。实验组：15 例经临床确诊并通过激素治疗有效的腹型过敏性紫癜的患儿。对照组：15 例以腹痛为症状临床确诊为非过敏性紫癜的患儿（肠炎等）。比较两组患儿的 CT 增强扫描图像，综合分析病变部位分布、形态、强化方式等。
结果：病变分布腹型过敏性紫癜以十二指肠和空肠多见，对照组以回结肠多见；形态上实验组及对照组均出现多发或单发的节段性肠壁水肿、肠壁增厚,肠壁分层无明显差异，实验组周围渗出少见，对照组周围渗出多见；强化方式上腹型过敏性紫癜在 CT 增强动脉期表现出特征性的明显强化，静脉期同周围肠段相仿，而普通肠炎为持续性强化或静脉期显示更好。
结论：儿童腹型过敏性紫癜的病变分布特点和 CT 增强扫描动脉期的特异性强化特点有助于与普通肠炎鉴别。同时 CT 增强扫描有助于排除外科急腹症，如肠套叠、肠梗阻或肠穿孔，为临床确定治疗方案提供影像学依据。

EPO-1294

Assessment of the Prognostic Factors for Rectal Cancer Treated with Neoadjuvant Chemoradiation: Utilizing Whole-Tumor Histogram Analysis of Diffusion Kurtosis Imaging

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Purpose: To determine the whole-tumor histogram analysis of diffusion kurtosis imaging in evaluating the prognostic factors for a locally advanced rectal cancer treated with neoadjuvant chemoradiation.
Materials and methods: Between June 2016 and November 2017, totally 37 patients with rectal cancer were retrospectively collected and followed in our study. All patients received neoadjuvant chemoradiation followed by total mesorectal excision. The enrolled patients were examined using MRI at two time points: 1-7 days before neoadjuvant chemoradiation (pre-MRI), within 1-7 days of NCRT completed (post-MRI). Pretreatment T stage, N stage, mesorectal fascia (MRF), extramural vascular invasion (EMVI), tumor location and length, pretreatment CEA and CA19-9 levels were recorded. Tumor response, TN stage, circumferential resection margin(CRM), perineural invasion (PNI) and lymphovascular invasion(LVI) were evaluated. Whole tumor volume of interest

(VOI) was obtained by semi-automatic segmentation method in both pre- and post-MRI. Then, ADC, K and D histograms and corresponding parameters, difference histograms value between pre-MRI and post-MRI were calculated. The predictor of DFS was analyzed by using Cox proportional hazards model.

Results: Pre-D5% was able to discriminate prognosis of DFS and the cut-off value as $0.717\times10^{-3}mm^2/sec$, AUC=0.724 (p=0.033). Pretreatment N2 (HR=8.417 (1.074-65.975), p=0.043), EMVI(+) (HR=18.929 (2.414-148.432), p=0.005), MRF(+) (HR=3.767 (1.136-12.488), p=0.030), high rectal cancer (HR=4.110 (1.234-13.688), p=0.021), CEA≥5ng/ml (HR=4.129 (1.094-15.584), p=0.036), low pre-D5% (HR=14.428 (1.833-113.588), p=0.011), ypT3-4 (HR=6.732 (1.949-23.351), p=0.003) and ypN(+) (HR=6.083 (1.781-30.775), p=0.004) could be associated with worse DFS in univariate analysis. Multivariate analysis identified the pretreatment EMVI(+) (HR=18.718 (1.469-238.546), p=0.024), ypT3-4 (HR=14.240 (1.485-208.527), p=0.029) and low pre-D5% (HR=61.659 (3.686-1031.500), p=0.004) were independent risk predictors for worse DFS.

EPO-1295

18F-FDG PET/CT 诊断直肠癌根治术后骶前复发

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目的 探讨 ^{18}F-FDG PET/CT 半定量参数诊断直肠癌根治术后骶前复发的价值。**资料与方法** 回顾性分析经 ^{18}F-FDG PET/CT 扫描并经手术或临床随访证实的直肠癌根治术后骶前复发的患者 31 例，未复发患者 28 例。应用 PET VCRA 软件测量脾脏平均标准摄取值（SUVmean）和肝脏 SUVmean，以最大标准摄取值（SUVmax）的 40%为阈值自动勾画感兴趣区（ROI），软件自动测量 SUVmax 和 MTV。比较复发者与未复发者骶前病灶 SUVmax、MTV、脾脏与肝脏 SUVmean 比值，并应用受试者工作特性曲线评价各代谢参数诊断直肠癌根治术后骶前复发的效能。**结果** 骶前复发者与未复发者 SUVmax、MTV 差异有统计学意义（$P<0.05$）。SUVmax、MTV 诊断直肠癌根治术后骶前复发的曲线下面积分别为 0.911、0.653。SUVmax 判断直肠癌根治术后骶前复发的敏感度及特异度高于 MTV，SUVmax、MTV 诊断骶前复发的敏感度和特异度分别为 100%、71.4%；71%，60.7% 。**结论** SUVmax 及 MTV 对诊断直肠癌根治术后骶前复发有一定价值。

EPO-1296

Low-dose spectral insufflation computed tomography protocol preoperatively optimized for T stage esophageal cancer - preliminary research experience

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AIM

To evaluate the T stage of esophageal squamous cell carcinoma (ESCC) using preoperative low-dose esophageal insufflation CT (EICT).

METHODS
One hundred and twenty ESCC patients confirmed by surgery or esophagoscopy were divided into three groups. Groups B and C were injected with 300 mgI/kg contrast medium for automatic spectral imaging assist (GSI assist), while group A underwent a conventional 120 kVp CT scan with a 450 mgI/kg contrast medium injection. EICT was performed in group C. Group A was reconstructed with filtered back projection (FBP), and groups B and C were reconstructed with 50% adaptive statistical iterative reconstruction (ASIR). The contrast-to-noise ratio (CNR) of lesion-to-mediastinal adipose tissue and the radiation dose were measured. Specific imaging features were observed, and T stage ESCCs were evaluated.

RESULTS
The sensitivity and accuracy of the T1/2 stage were higher in group C than in groups A and B (sensitivity: 43.75% vs.31.82% and 33.33%; accuracy: 54.29% vs. 46.67% and 52.50%, respectively). With regard to the T3 stage, the sensitivity and specificity in group C were higher than those in groups A and B (sensitivity: 56.25% vs. 41.17% and 44.44%; specificity: 73.68% vs. 67.86% and 63.64%, respectively). The diagnostic sensitivity, specificity and accuracy of the T4 stage were similar among all groups. There were no significant differences in volume CT dose index (CTDIvol) [(5.91±2.57) vs. (3.24±1.20) vs. (3.65±1.77) mGy], dose-length product (DLP) [(167.10±99.08) vs. (113.24±54.46) vs. (117.98±32.32) mGy• cm] and effective dose (ED) [(2.52±1.39) vs. (1.63±0.76) vs. (1.73±0.44) mSv] among the groups (P>0.05). However, groups B and C received similar effective doses but lower iodine loads than group A [(300 vs. 450) mgI/kg].

CONCLUSION
EICT combined with GSI assist allows differential diagnosis between the T1/2 andT3 stages. The ability to differentially diagnose the T3 and T4 stages of medullary ESCC can be improved by quantitatively and qualitatively analyzing the adipose tissue in front of the vertebral body.

EPO-1297
64 排螺旋 CT 诊断回盲部朗格汉斯细胞组织细胞增生症伴小肠梗阻 1 例报道并文献复习

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目的：分析小肠朗格汉斯细胞组织细胞增生症的多层螺旋 CT 征象，包括 CT 平扫及增强表现，加强对该疾病的临床认识，提高胃肠道朗格汉斯细胞组织细胞增生症的影像诊断及鉴别诊断水平，减少误诊。
方法：搜集 2017 年 11 月在我院行全腹部 CT 平扫及增强检查并经临床手术证实的回盲部朗格汉斯细胞组织细胞增生症 1 例，进行回顾性分析总结。使用飞利浦 Brilliance 64 排螺旋 CT 扫描仪。扫描参数：120kv，350mA,FOV 40cm,螺距 1.375:1，层厚 5mm，间隔 5mm，扫描完后行 1.5mm 薄层重建及 MRP、MIP 等图像后处理。MSCT 图像由 2 名经验丰富的主治及以上 CT 诊断医师共同进行分析并双盲读片，意见不一致时相互协商。

结果：患者男，23 岁，因腹痛 1 周，加重伴肛门停止排气排便 1 天。CT 平扫所见右下腹回盲部肠壁不规则明显增厚呈肿块状改变，肠腔变窄，CT 平扫 CT 值约 42HU，动脉期 CT 值约 75HU，门静脉期 CT 值约 86HU，平衡期 CT 值约 79HU，动态观察呈持续性明显均匀强化；外周脂肪间隙模糊及邻近肠系膜散在多发淋巴结显示并部分肿大，动态增强观察淋巴结持续性均匀性明显强化；近端空回肠肠腔明显积气、积液并扩张，邻近肠系膜血管增多增粗；腹盆腔散在少量积液，以膀胱直肠陷凹为甚，CT 值约 11HU；腹膜后未见肿大淋巴结；肝脏密度均匀，增强均匀性明显强化。病理结果：考虑 langerhans 细胞组织细胞增生症，肠周淋巴结呈反应性增生（23 枚）。
结论：小肠朗格汉斯细胞组织细胞增生症罕见影像诊断报道，其多层螺旋 CT 征象具有一定的特征性，有助于鉴别小肠间质瘤、淋巴瘤、腺癌及 Crohn 病、肠结核等，从而进一步指导临床制定有效的治疗方案及临床预后评估。

EPO-1298
基于 CT 的 logistic 回归模型在预测胃肠道间质瘤 转移风险中的应用价值

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目的
建立并验证胃肠道间质瘤原发病灶 CT 特征的 logistic 回归模型，探讨其预测术后转移风险的应用价值。
材料和方法
回顾性分析 231 例手术病理证实为胃肠道间质瘤（Gastrointestinal stromal tumors, GISTs）的 CT 影像资料(男 93 例，女 138 例；年龄为 22-84 岁，平均：59±12 岁)，并将其分为训练集(168 例)和测试集(63 例)。搜集所有患者的临床资料、Ki67 增殖指数及间质瘤生物学行为的病理资料。采用单因素和多因素分析进行检验，并经十倍交叉验证挑选最优参数，将独立危险因素纳入 logistic 回归模型，并基于训练集上创建诺谟图。通过对比传统分类方法，评价模型受试工作者特征曲线、校准能力以及临床实用性，对模型的应用价值进行评估。
结果
Logistic 回归模型由 3 个 CT 特征(肿瘤位置、最大径和溃疡)组成，在训练集和测试集中能成功地预测 GISTs 转移风险的高低 (P< 0.001)。该模型在训练集及测试集上 ROC 曲线下面积及 95%置信区间（CI）分别为:0.895, 95%CI 0.846-0.944、0.932,95%CI: 0.857-1。仅由最大径组成的传统分类法在训练集及测试集上 ROC 曲线下面积及 95%置信区间分别为 0.765, 95%CI: 0.692-0.838；0.867,95%CI: 0.770-0.965。经 Hosmer-Lemeshow 检验，logistic 回归模型在训练集及测试集上显示有良好的拟合能力，P 值分别为 0.885、0.328。在 10% ~ 80%的阈值概率下，logistic 回归模型预测 GISTs 转移风险高低的净效益优于传统分类方法。
结论
由三个 CT 危险性特征组成的 logistic 模型有望预测 GISTs 转移风险高低，为间质瘤患者术前临床决策提供帮助。

EPO-1299
结肠癌急性并发症的 CT 表现

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目的 探讨结肠癌急性并发症的 CT 表现，更好的了解结肠癌急性并发症，以便临床及时正确处理。**方法** 回顾性分析 2016 年 1 月-2018 年 6 月间行结肠癌急性并发症术后病理确诊的 35 例的 CT 影像与 X 线检查资料。**结果** 结肠癌合并肠梗阻共 30 例，接受 CT 检查诊断为结肠癌合并肠梗阻 29 例，确诊率为 96.67%，CT 表现为结肠肠壁不规则增厚，肠腔狭窄，近端肠腔扩张；X 线检查诊断为结肠癌合并肠梗阻 25 例，确诊率为 83.33%。CT 与 X 线检查肠套叠均为 2 例，小肠-结肠型 1 例，乙状结肠套叠 1 例，CT 表现表现为套头部肿块；CT 与 X 线检查肠穿孔 3 例，CT 表现为结肠肠壁不规则增厚，肠腔狭窄，肠腔外局限性小气泡，粘膜线中断，脓肿形成。**结论** 结肠癌急性并发症不少见，CT 在术前病变的准确判断具有很高的临床指导价值，尤其是在结肠梗阻方面的征象要优于 X 线，对于确保及时、适当的治疗是至关重要的。

EPO-1300
CT 纹理分析对原发性胃肠道淋巴瘤和胃肠道腺癌的定量对比研究

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目的：探讨 CT 纹理分析在鉴别原发性胃肠道淋巴瘤和胃肠道腺癌中的潜在价值。
方法：我们回顾性分析了本院 2013 年 3 月至 2018 年 5 月期间病理数据库中的 118 例（包括 47 例原发性胃肠道淋巴瘤和 71 例胃肠道腺癌）患者，这些患者均在术前进行了腹部增强 CT 检查。从动脉和静脉图像中提取纹理参数（平均值，中位数，第 5、第 10、第 25、第 50、第 75、第 90、第 95 百分位数，偏度，峰度和熵），并使用适当的统计学方法进行统计分析。
结果：与胃肠道腺癌相比，在动脉期，原发性胃肠道淋巴瘤在 CT 纹理分析中的第 5、第 10 百分位数较高，差异具有统计学意义（P = 0.003 和 0.009）；同时熵值较低，差异也具有统计学意义（P = 0.006）。在静脉期，原发性胃肠道淋巴瘤的平均值，中位数，第 75、第 90 及第 95 百分数，熵值较低，差异也具有统计学意义（分别为 P = 0.049,0.034,0.019,0.006,0.004 和 0.001）。然而，在动脉期，这两种肿瘤的平均数，中位数，第 25、第 50、第 75、第 90 及第 95 百分数，偏度及峰度值均没有统计学差异（P = 0.501,0.478,0.112,0.329,0.729,0.271,0.141,0.326 及 0.408）；在静脉期中，这两种肿瘤的第 5、第 10、第 25、第 50 百分数，偏度及峰度值也没有统计学意义（分别为 P=0.268,0.556,0534,0.138,0.305 及 0.280）。
结论：CT 纹理分析的特征对于区分原发性胃肠道淋巴瘤和胃肠道腺癌具有一定的作用。

EPO-1301
自发孤立性肠系膜上动脉夹层： 临床症状与 MSCTA 征象及影像学转归相关性的研究

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目的：研究自发孤立性肠系膜上动脉夹层(SISMAD)的临床症状与 MSCTA 征象及影像学转归的相关性

方法：回顾性分析我院 2008 年 6 月至 2018 年 9 月诊治的 74 例自发孤立性肠系膜上动脉夹层的影像及临床相关资料，根据病人是否有腹部症状将其分为症状组和无症状组，分析比较两组病例的 MSCTA 征象特征以及保守治疗后影像学转归的差异。
结果：症状组 55 例，无症状组 19 例。症状组与无症状组平均年龄分别为 52.36±7.45 岁和 64.38±8.86 岁，两组比较差异有统计学意义（P<0.001）。症状组与无症状组夹层长度分别为 64.38±8.86 和 29.25mm±21.74mm ，两组比较差异有统计学意义（P<0.001）。症状组与无症状组真腔狭窄率分别为 54.03±28.29 和 38.36±26.21，两组比较差异无统计学意义（P=0.091）。症状组与无症状组夹层血管直径分别为 12.15mm±4.23mm 和 12.36mm±2.12mm，两组比较差异无统计学意义（P=0.794）。症状组与无症状组在影像分型、分支血管受累及血管周围炎性反应、假腔血栓形成、假腔钙化方面差异有统计学意义（P<0.001）。症状组与无症状组在保守治疗后影像学转归方面差异有统计学意义（P<0.001）。初始影像 I 型及 II 型保守治疗后影像形态多保持不变，初始影像 III 型及 IV 型保守治疗后影像形态多吸收改善。
结论：症状性 SISMAD 和无症状 SISMAD 在初始 MSCTA 检查影像征象方面存在显著差异。症状性 SISMAD 保守治疗后影像学转归趋向好转吸收。无症状 SISMAD 保守治疗后影像学转归趋向稳定不变，这种差异可能是由于 SISMAD 各亚型形态学变化不同所致。

EPO-1302

Differentiation of Gastric Schwannoma from Gastric Gastrointestinal Stromal Tumor with Dual Phase Contrast-Enhanced Computed Tomography

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Objective: To identify the computed tomographic features to differentiate gastric schwannoma from gastric gastrointestinal stromal tumor.
Materials and Methods: Computed tomographic images of 103 pathologically confirmed patients with gastric schwannoma (n=23) or gastric gastrointestinal stromal tumor (n=80) were retrospectively studied. Sex, morphology, location, border, growth pattern, enhancement pattern, necrosis, calcification, ulceration and perigastric lymph nodes were analyzed. Age, short diameter (SD), long diameter (LD) and the degree of enhancement were measured. Statistical analyses, receiver operating characteristic curve and sensitivity, specificity values were performed and analyzed.
Results: Female, age younger than 57.5 years, round or ovoid morphology, extraluminal growth, homogeneous enhancement, lack of necrosis, presence of perigastric lymph nodes, and an enhancement degree of less than 15.4 Hounsfield units in the arterial phase were significant variables for differentiating gastric schwannoma from gastric gastrointestinal stromal tumor (P<0.05).
Conclusions: Dual phase contrast-enhanced CT can help to differentiate gastric schwannoma from gastric gastrointestinal stromal tumor.

EPO-1303

3.0T 核磁共振动态增强扫描及弥散加权成像 在进展期胃癌 M 分期评估中的临床应用

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目的:旨在研究利用 MRI 评估进展期胃癌 M 分期的临床应用。方法:选取河北医科大学第四医院 2014 年 2 月至 2015 年 2 月的 369 例进展期胃腺癌患者,根据 MSCT 进行术前评估分期,对于怀疑 M1 状态(D3 站淋巴结转移、肝脏转移、腹膜种植转移)的患者行 MRI 检查,并将 MSCT、MRI 影像与术中探查及术后病理进行对比分析。结果:MRI 对于进展期胃癌患者 M1 小的 D3 站转移淋巴结、多发小肝转移灶、无腹水的小腹膜种具有较强诊断效能。

EPO-1304
CT 灌注联合增强成像对不同分化程度胃腺癌诊断价值

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目的：通过比较不同分化程度胃癌在 CT 灌注联合增强检查中灌注参数及增强参数的差异，以期提供诊断价值。
材料与方法：前瞻性的收集病理确诊为胃癌且术前需要行上腹部 CT 灌注联合双期增强扫描的患者 90 例，均在 GE Revolution 上进行扫描。所有扫描数据传送至 GE 后处理 ADW 4.6 工作站利用 CT Perfusion 4D 体部灌注模型（Body Tumor 软件）进行分析。所有扫描数据传送至 GE 后处理 ADW 4.6 工作站利用 CT Perfusion 4D 体部灌注模型（Body Tumor 软件）进行分析。在灌注 CTP、平扫及双期增强图像中选取胃癌病灶最大横断层面，感兴趣区灌注图像采用全肿瘤勾画法，增强图像采用明显强化区圈画法，记录病灶的灌注参数、平扫及双期增强 CT 值。采用 c^2 检验对影响胃腺癌分化的相关特征参数进行分析；对不同年龄、性别、肿瘤位置、分化程度胃癌的灌注参数采用独立样本 t 检验或单因素（ANOVA）方差分析，灌注参数中有意义者制作 ROC 曲线。
结果：本研究一共纳入 90 例胃腺癌患者，非黏液腺癌 78 例（高分化腺癌 7 例，中分化腺癌 27 例，低分化腺癌 44 例），黏液性腺癌 7 例，混合型腺癌 5 例。结果显示 Lauren 分型、淋巴结转移、神经或脉管侵犯与否与胃癌分化程度相关，分化型组中 Lauren 分型肠型比例多于低分化组，弥漫型比例少于低分化组，而混合型比例在两组间无统计学差异；分化型组神经、脉管均无侵犯者多于低分化组，均有侵犯者少于低分化组。胃癌患者性别、年龄分组、部位在不同分化程度胃癌无明显相关性，其灌注参数也无明显的统计学差异。分化型组与低分化组胃癌患者灌注参数中仅 PS 有统计学差异（$P<0.01$），其余参数无明显统计学差异。
结论：1.PS 值是灌注参数中最有意义的指标，对鉴别中高分化与低分化胃腺癌有重要作用。2.胃癌患者 Lauren 分型、淋巴结转移、神经或脉管侵犯与否与胃癌的分化程度密切相关。

EPO-1305
阑尾粘液性肿瘤的 CT 表现及临床分析

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目的 探讨阑尾粘液性肿瘤的 CT 特征及临床表现，以提高其早期诊断水平。方法 回顾性分析 15 例经手术病理证实的阑尾粘液性肿瘤的临床资料及 CT 表现。结果 病灶位于右下腹 9 例、右侧盆腔 5 例及左腹 1 例，呈大小不等囊性肿块 9 例（不规则形多房囊性 5 例，其中巨大葫芦状 2 例、长管状 2 例、分叶状 1 例，类圆形单房囊性 4 例）及阑尾增粗 6 例。囊性区 CT 值 7HU~32HU，囊壁毛糙 9 例，囊壁厚薄均匀 6 例、不均匀 3 例，囊壁连续性中断 5 例，囊内见分隔 5 例，憩室形成 2 例，见壁结节 3 例，PMP 形成 1 例，病灶见钙化 8 例。7 例增强示囊壁均匀强化 6 例，不均匀强化 1 例，分隔强化 5 例，囊内均无强化。病灶边界清楚 13 例，边界欠清 2 例。11 例与阑尾相连（大部分呈带蒂状连接）或关系密切，4 例阑尾显示不清并与盲肠关系密切。病理结果示阑尾低级别黏液性瘤 10 例，低级别并高级别黏液性瘤 2 例，高级别黏液性瘤 1 例，阑尾粘液腺癌 2 例。结论 阑尾粘液性肿瘤具有一定影像学特征，CT 表现对其具有早期诊断价值。

EPO-1306

原发性小肠淋巴管扩张症的胶囊内镜分型与 CT 淋巴管成像相关性的初步研究

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目的

回顾性探讨小肠淋巴管扩张症（PIL）的胶囊内镜分型与 CT 淋巴管成像（CTL）相关性的初步研究。

方法

收集我院经临床和/或病理确诊为 PIL 的患者 64 例，其中男 34 例，女 30 例，年龄 5-70 岁（中位年龄 27）。所有患者术前均行 CTL 及小肠胶囊内镜检查，临床上根据 PIL 的内镜表现分为分型：Ⅰ型，表现为绒毛肿胀、扩张，偶见点状、短棒状不明显白斑样变；Ⅱ型，表现为散在点片状黄白色淋巴管扩张，累及范围多小于 2 个 1/3 肠段；Ⅲ型，表现为明显的片状及鱼鳞状黄白色改变，弥漫分布，常同时累及全部三段 1/3 小肠。PIL 的 CTL 评价指标包括：（1）小肠肠壁增厚；（2）淋巴管扩张及分布异常，包括对比剂在肠系膜、肠壁或肠腔内以及肝门、胰腺、脾脏或肾脏等区域的异常分布；（3）腹膜腔积液；（4）胸部的异常，包括胸膜腔积液、肺部和纵膈的淋巴水肿、对比剂在纵膈或心包或胸膜或肺内的异常分布；（5）颈部和胸导管末端的异常，对比剂的堆积和异常分布、胸导管末端狭窄和梗阻等。本研究的主要内容是临床内镜的不同类型与 CTL 表现是否存在相关性进行比较及统计学分析，以 $P<0.05$ 差异有统计学意义。

结果

64 例患者胶囊内镜检查表现为Ⅰ型者 17 例、Ⅱ型者 34 例和Ⅲ型者 13 例。不同类型患者的 CTL 表现详见表，其中肠壁增厚、心包积液多见于 I 型，肠壁及肠系膜、腹腔内、纵膈对比剂异常分布、胸腔积液多见于 II 型，腹腔积液、胸膜下、胸导管对比剂异常沉积多见于 III 型;肠壁及肠系膜、腹腔内对比剂异常分布多见于胶囊内镜 II 型，明显多于 I、III 型，差异有统计学意义（P=0.016,0.041）。

结论

PIL 的胶囊内镜分型反映了肠腔黏膜区域受累的病变程度和范围，而 CTL 更系统地显示全身淋巴管是否异常和存在回流异常，二者表现为一定程度相关性，对于临床上更精准地评价 PIL 的分期分级、选择合理的治疗方法和疗效预警等具有重要意义。

EPO-1307

磁共振弥散加权成像联合外周循环肿瘤细胞对食管鳞癌放化疗疗效的研究

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目的探讨放化疗前后磁共振弥散加权成像（diffusion weighted imaging，DWI）和外周循环肿瘤细胞（circulating tumor cells，CTCs）对食管鳞癌放化疗疗效预测的价值。**方法**回顾性收集经活检证实为食管鳞癌的 40 例患者（18 例缓解组，22 例未缓解者），所有患者治疗前及治疗结束后一月均进行食管 MRI 检查及 CTCs 检测。采用 CanPatrol ™ CTC-二代分离富集技术将 CTCs 分为上皮型、间质型和混合型。根据实体瘤的疗效评价(RECIST 1.1)标准进行短期疗效评价，分为缓解组(CR、PR)和未缓解组(SD、PD)。统计学分析比较治疗前、后缓解组和未缓解组之间 ADC 值、CTCs 值、ΔADC、ΔCTCs 之间的差异。采用受试者工作特征曲线分析有效因素对食管鳞癌疗效评价的效能。**结果**治疗后病变 ADC 值升高，治疗前高 ADC 值组及高混合型 CTCs、CTCs 总数对放化疗疗效更为敏感（$P<0.05$）。治疗期间两组之间病变有效因素变化率差异具有统计学意义（P均＜0.05）。Pre/Post-ADC、Pre/Post -CTCs 总数、Pre/Post -混合型 CTCs、ΔADC、Δ混合型 CTCs、ΔCTCs 总数预测食管鳞癌放化疗疗效 ROC 曲线下面积（area under curve，AUC）分别为（0.904/0.957、0.766/0.712、0.715/0.707、0.793、0.893、0.944,P均＜0.05）。治疗前 ADC 及 CTCs 有效因素的联合因素及其有效因素变化率联合因素预测食管鳞癌放化疗疗效的 AUC 分别为 0.924、0.996，敏感度 93.7%、94.4%，特异度 72.2%、94.7%，（$P<0.001$）。**结论**治疗前、后 ADC 值，混合型 CTCs，CTCs 总数及其变化率均可以反应食管鳞癌放化疗的疗效，其联合因素预测价值更高，可作为检测肿瘤消退的可靠指标。

EPO-1308
DCE-MRI 定量参数全域直方图分析法对食管鳞癌放化疗短期疗效的预测价值

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目的 探讨动态增强 MRI 扫描（DCE-MRI）定量参数全域直方图分析法在预测食管鳞癌（Esophageal squamous cell carcinoma，ESCC）放化疗短期疗效的价值。
方法 回顾性分析 2016 年 11 月-2018 年 4 月经病理证实 ESCC 并接受放化疗治疗的 52 例患者，所有患者治疗前行常规磁共振及 DCE-MRI 检查；于美国 GE Omni-Kinetics 软件后处理软件上绘制全域肿瘤并获得感兴趣区内动态增强扫描定量参数容积转运常数(K^{trans})、血浆速率常数(K_{ep})，血管外细胞外间隙容积比(V_e)的直方图参数，包括平均值、中位数及各百分位数值(10%，25%，50%，75%， 90%)，放疗结束 1 月后，根据实体瘤的疗效评价(Response evaluation criteria in solid tumors， RECIST 1.1)标准进行短期疗效评价，分为缓解组(CR、PR)和未缓解组(SD、PD)。分别比较缓解组、非缓解组间各参数值的差异，其中差异有统计学意义的参数采用受试者工作特征曲线(Receiver operating characteristic curve，ROC) 计算其诊断效能。**结果** 52 例患者中，缓解组 36 例，非缓解组 16 例。缓解组 K_{ep} 平均值、K_{ep} 中位数、50%K_{ep}、75%K_{ep}、90%K_{ep} 及 10%V_e、25%V_e 大于非缓解组，差异有统计学意义 ($P<0.05$)。所有参数中，K_{ep} 中位数诊断效能最大，受试者工作特征曲线下面积（AUC）为 0.717。K_{ep} 中位数的临界值为 0. 672 时，敏感度为 81.25%，特异度为 66.67%。结论：动态对比增强磁共振(DCE-MRI)定量参数全域直方图分析法在预测食管鳞癌放化疗短期疗效有重要价值，有助于临床治疗方案的选择。

EPO-1309

急性阑尾炎的 CT 表现与病理的对照分析

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【摘要】**目的**：探讨急性阑尾炎的 CT 表现及特征，并与病理分型对照分析。**方法**：搜集 300 例临床拟诊为急性阑尾炎的病例，采用 3 2 层螺旋 C T 进行扫描，以 1． 2 5 mm 层厚行薄层多平面容积重组图像后处理，分析其 C T 表现及特征，并将诊断结果与手术及病理结果进行对照分析。**结果**：300 例急性阑尾炎患者中，CT 检出 289 例，其中，单纯性阑尾炎 68 例，化脓性阑尾炎 126 例，合并阑尾腔内肠石 35 例，坏疽性阑尾炎 71 例，并穿孔 16 例，阑尾脓肿 20 例，慢性阑尾炎 4 例。**结论**：急性阑尾炎有典型的 CT 表现，MSCT 的平扫及图像后处理技术的联合应用，能直观地显示阑尾的形态及病理改变，在急性阑尾炎的分型诊断中，有重要的临床应用价值。

EPO-1310

ADC 值对胃癌淋巴结转移的预测价值

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【**摘要**】**目的**：探讨 ADC 值对胃癌患者有无淋巴结转移的预测价值。**方法**：回顾性收集 2012 年 10 月-2019 年 5 月昆明医科大学第三附属医院诊疗的胃癌患者的临床资料和 MRI 资料。所有患者均行常规 MRI 序列和 DWI 检查，DWI 扫描 b 值取 0 和 800 $\times 10^{-3}mm^2/s$。分别测量每位患者病灶 ADC 的平均值（ADC_{mean}）和最小值（ADC_{min}）。所有患者 MRI 检查后均经手术切除后病理学证实有无淋巴结转移，分为淋巴结转移组和无淋巴结转移组。采用 t 检验分别比较 ADC_{mean} 和 ADC_{min} 在两组胃癌病灶间有无差异。利用受试者工作曲线（ROC 曲线）下面积（AUC）来评价胃癌组织的 ADC_{mean} 和 ADC_{min} 对有无淋巴结转移的预测效能，并采用 DeLong 检验比较 ADC_{mean} 和 ADC_{min} 的 AUC 值有无统计学差异。**结果**：最终入组 59 例胃癌患者，其中男 42 例，女 17 例，年龄 28-77(56.20±9.82)岁；无淋巴结转移者 23 例，有淋巴结转移者 36 例。无淋巴结转移组的 ADC_{mean} 和 ADC_{min} 分别为：$1.143\pm0.170\times10^{-3}mm^2/s$ 、$1.011\pm0.145\times10^{-3}mm^2/s$ ，均高于有淋巴结转移组的 $1.023\pm0.146\times10^{-3}mm^2/s$（P=0.006）和 $0.858\pm0..119\times10^{-3}mm^2/s$ （P<0.001）。胃癌组织 ADC_{mean} 与 ADC_{min} 预测胃癌患者淋巴结转移的 AUC 分别为 0.717（P=0.005）与 0.801（P<0.001），二者的差异有统计学意义（Z=3.005，P=0.0027）。以胃癌组织 $ADC_{min}=0.976\times10^{-3}mm^2/s$ 作为阈值预测胃癌患者有无淋巴结转移时，敏感度为 69.6%，特异度为 88.9%。**结论**：ADC_{min} 值对预测胃癌患者有无淋巴结转移具有重要的价值，可作为胃癌术前一个无创性的预测指标辅助临床决策。

EPO-1311

体素内不相干运动成像在食管鳞癌病理学特征术前评估中的应用

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目的 探讨体素内不相干运动成像（IVIM）在食管鳞癌病理学特征术前评估中的应用价值。**方法** 前瞻性收集 2016 年 4 月至 2017 年 12 月拟行食管癌切除术的患者，于术前行 MRI 常规扫描及

IVIM 检查，计算表观扩散系数（ADC）、真实扩散系数（D）、灌注系数（D*）及灌注分数（f）值，分析其与术后病理参数（浸润深度、淋巴结转移、分化程度、脉管癌栓、神经侵犯）的关系。**结果** 共入组患者 40 例，侵犯外膜组（T3）ADC、D 及 f 值明显低于未侵犯外膜组（T1+T2），其差异均有统计学意义，以 ADC 值为 2.245×10^{-3} 、D 值为 1.820×10^{-3}、f 值为 0.435 作为阈值判断肿瘤浸润深度的诊断效能最高，敏感性和特异性分别为 52.4%和 78.7%，57.9%和 66.7%、42.1%和 61.9%；脉管癌栓组 ADC、D 及 f 值明显低于无脉管癌栓组，其差异均有统计学意义，以 ADC 值 2.610×10^{-3}、D 值 1.690×10^{-3}、f 值 0.406 为阈值判断脉管癌栓形成的诊断效能最高，其敏感性和特异性分别为 60.0%和 85.0%，75.0%和 70.0%，70.0%和 85.0%；淋巴结转移组的 ADC 值明显低于无淋巴结转移组，其差异有统计学意义，以 ADC 值 1.955×10^{-3} 为阈值判断淋巴结转移的诊断效能最高，敏感性和特异性分别为 95.0%和 45.0%；ADC、D、D*及 f 值在食管癌不同分化程度及有无神经侵犯组间的差异无统计学意义。**结论** IVIM 可作为食管鳞癌术前评估新的影像学方法，ADC、D 及 f 值有助于判断食管癌浸润深度及脉管癌栓的形成，ADC 值可反映食管癌淋巴结转移状况。

EPO-1312
MSCT 对结直肠原发性印戒细胞癌与黏液腺癌的影像诊断价值

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目的 探讨结直肠原发性印戒细胞癌和黏液腺癌的 MSCT 影像表现，以提高对两种疾病的影像学认识。**方法** 收集 2015 年 3 月至 2018 年 2 月期间我院经手术病理确诊的结直肠印戒细胞癌患者 56 例和黏液腺癌患者 115 例,比较两组患者的肿瘤发生部位、病变肠管的长度和厚度、病变的局部表现（增厚形式、密度、有无钙化、强化形式）、肠周浸润情况、有无肠梗阻、淋巴结和远处器官转移的 CT 表现。**结果** 56 例印戒细胞癌患者中,男性 31 例,女性 25 例；115 例黏液腺癌患者中,男性 70 例,女性 45 例。92.8%（52／56）印戒细胞癌和 81.7%（94／115）黏液腺癌出现肠壁环形增厚；印戒细胞癌和黏液腺癌的病灶密度分别为（42.0±3.0）Hu 和（28.5 ± 1.5）Hu；印戒细胞癌未见钙化，17.4%（20／115）黏液腺癌出现钙化；53.6%（30／56）印戒细胞癌和 13.9%（16／115）黏液腺癌强化程度明显；3.6%（2／56）印戒细胞癌和 45.2%（52／115）黏液腺癌强化后具有大量低密度区；14.3%（8／56）印戒细胞癌具有靶环征，而黏液腺癌不具有靶环征；41.1%（23／56）印戒细胞癌和 17.4%（20／115）黏液腺癌出现肠周重度浸润。两组在病灶位置、长度、厚度、肠梗阻、淋巴结转移、肝脏转移和腹膜转移等方面差异无统计学意义。**结论** 结直肠原发性印戒细胞癌和黏液腺癌的 CT 表现比较：印戒细胞癌 CT 平扫密度偏高，无钙化，增强扫描表现为靶环征；黏液腺癌 CT 平扫密度偏低，可见钙化，增强扫描表现为片状低密度无强化区；另外印戒细胞癌肠周侵犯较黏液腺癌更为常见，与两种病变的病理分化程度也较符合。

EPO-1313
多层螺旋 CT 纹理分析预测胃癌淋巴结转移的价值

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目的 探讨多层螺旋 CT 纹理分析预测胃癌淋巴结转移的价值。**方法** 回顾性分析 2017 年 7 月至 2018 年 8 月在宁夏医科大学总医院经手术病理证实的 174 例胃癌患者临床资料，所有患者

术前均行腹部 CT 平扫及动脉增强扫描。以术后病理结果为金标准，分为非淋巴结转移组和淋巴结转移组。利用 CT Kinetics 纹理分析软件分别测量动脉期、门脉期胃癌原病灶的 CT 纹理参数（平均值、偏度、峰度、熵值、自相关）。采用两独立样本 t 检验（正态分布）或 Mann-Whitney U 检验（非正态分布）比较两组间纹理参数差异。计数资料采用 x^2 检验比较两组间差异。对两组间差异有统计学意义的参数进行 ROC 分析，评价其预测淋巴结转移效能，并利用多因素 Logistic 回归分析得出判断胃癌淋巴结性质的独立预测因素。**结果** 174 例患者中，非淋巴结转移组 49 例，淋巴结转移组 125 例。动脉期、门脉期，胃癌淋巴结转移组的熵、自相关均高于非转移组，差异有统计学意义（$P<0.05$），而平均值、偏度、峰度的差异均无统计学意义（$P>0.05$）。动脉期，熵、自相关诊断胃癌淋巴结转移的 ROC 曲线下面积（AUC）分别为 0.751、0.661；门脉期，熵、自相关诊断胃癌淋巴结转移的 AUC 分别为 0.754、0.714。对于动脉期的熵、自相关，门脉期的熵、自相关 4 个自变量进行 Logistic 多因素回归分析，得出动脉期的熵（OR=3.33，95%可信区间为 2.03～5.48，$P<0.001$）是判断胃癌淋巴结转移的独立预测因素。**结论** 多层螺旋增强 CT 图像纹理分析对预测胃癌淋巴结转移有一定价值。

EPO-1314

The Significance of Enhancement of Ascites on Hepatobiliary Phase of Gd-BOPTA-enhanced MRI

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Objective: To evaluate the signal intensity of peritoneal fluid effusions in patients without biliary leakage on the hepatobiliary phase of Gd-BOPTA-enhanced MRI.
Methods: From January 2016 to May 2018 102 patients with ascites without biliary leakage who underwent Gd-BOPTA-enhanced MRI were included In this retrospective study. The relative enhancement of effusions on every phase was calculated.The difference of the relative enhancement of hepatobiliary phase in different degree of ascites and between malignant and benign ascites was analysed .
RESULTS: Ascites in 102 cases without biliary leakage showed high signal on hepatobiliary phase of Gd-BOPTA-enhanced MRI. The relative enhancement of peritoneal fluid effusions on arterial phase, portal phase, delayed phase and hepatobiliary phase were -0.14, -0.08, 0.40, 3.32, respectively. The relative enhancement was significantly higher for hepatobiliary phase than the arterial, portal venous and delayed phases (p-values <0.05). The amount of ascitic fluid were significantly inversely correlated with elevated ascitic fluid signal intensity.No significant difference in ascitic enhancement in patients who have malignant disease and those who have benign disease.
Conclusion: Peritoneal effusion without biliary leakage can be enhanced on hepatobiliary phase after intravenous injection of Gd-BOPTA,which is a common phenomenon.It is nonspecific, occurring in a wide spectrum of clinical conditions.Do not misdiagnose as biliary injury or other abnormalities, especially in the recent surgery,especially in patients with a recent history of surgery, trauma or interventional procedures Patients.

EPO-1315

基于 T2WI 序列的纹理分析在鉴别直肠腺癌与粘液腺癌中的应用研究

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【摘要】 目的 探讨基于 MR T2WI 序列的纹理分析在鉴别直肠腺癌、腺癌合并粘液腺癌及粘液腺癌中的价值。**方法** 回顾性分析 40 例经手术病理证实的直肠腺癌患者临床及影像资料，依据病理将其分为直肠腺癌组 22 例、直肠腺癌合并粘液腺癌组 11 例和粘液腺癌组 7 例。使用 ITK-SNAP 软件对肿瘤实性成分最大层面进行 ROI 手动勾画，并将勾画好的 ROI 文件导入美国 GE 公司 AK 软件内，利用不同的纹理参数进行特征提取，从而得到肿瘤内部的纹理特征值。选取熵、偏度、峰度、均匀度、标准差和平均值 6 个纹理参数作为分析指标。采用 SPSS 软件中的 LSD-t 检验对三组数据间进行两两比较，分析三组之间纹理参数是否有统计学差异。**结果** 腺癌组的熵值、偏度、峰度、均匀度、标准差和平均值分别为 6.16±0.27、0.41±0.56、1.49±1.64、0.88±0.03、50.48±13.26、423.05±107.27；腺癌合并粘液腺癌组上述各参数值分别为 6.67±0.33、0.33±0.78、1.00±1.48、0.81±0.62、91.25±37.24、463.89±112.15；粘液腺癌组上述各参数值分别为 7.07±0.30、0.19±0.80、-0.03±1.12、0.73±0.55、148.26±52.60、535.07±121.23。熵值、均匀度和标准差在鉴别三组数据间差异有统计学意义（F 值分别为 28.529、32.924 和 28.769， $P<0.05$），此外，平均值和峰度在鉴别直肠腺癌组与粘液腺癌组间差异有统计学差异（$P<0.05$）。**结论** 基于 T2WI 序列的 MR 纹理特征参数在鉴别直肠腺癌、直肠腺癌合并粘液腺癌及粘液腺癌有一定的价值。

EPO-1316
基于 CT 图像的纹理分析预测结肠癌肝转移癌的 初步研究

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目的：本研究的目的是探讨结肠癌原发灶的 CT 纹理特征是否有可能作为预测结肠癌患者肝转移的影像学标志物。
材料和方法：回顾性研究（n = 138）三个亚组：：A 组：同期肝转移（n = 49），B 组：异时性肝转移（n =41）和 C 组：随访两年无肝转移的患者（n = 48）。所有患者均包括完整的术前 CT 增强图像。在 ITK-SNAP 软件上手动 3D 勾画 ROI 图像。应用 AK 软件提取动门脉期各 396 个特征，将预处理后数据随机分组，按照 7：3 构建训练集和测试集，通过秩和检验、相关性检验、Lasso 等方法对数据进行降维 ，接下来将所选取的纹理特征输入到四个不同的机器学习分类器中进行分类，分别为 K 邻近、支持向量机、朴素贝叶斯、逻辑回归，选取最优的分类模型。两两比较 ABC 三组动脉期、门脉期、动门脉期联合数据，以获得准确度、敏感度、特异性、测试集 ROC 曲线、测试集 AUC 值及 95%可信区间。
结果：对 A、B、C 三组患者结肠癌原发灶动脉期、门脉期的纹理特征进行两两比较，结果显示三组患者动脉期、门脉期的训练集及测试集准确性均大于 70%，测试集 AUC 值从最低的 0.771 到最高的 0.902。对 ABC 三组动门脉期联合数据建模后，各组测试集的 AUC 值均大于 0.8。
结论：利用结肠癌原发灶 CT 增强扫描的放射组学特征建立的机器学习模型，对于同时肝转移、异时肝转移以及随访两年内未转移的三组都具有良好的诊断性能。另外，动静脉联合建模的诊断性能高于单独期相建模。综上，结肠癌原发灶的纹理特征有望成为预测结肠癌患者肝转移的影像学标志物。

EPO-1317
双能量 CT 结肠成像部分自动个体化充注空气扩张结直肠

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目的 研究双能量 CT 结肠成像部分自动及个体化充注空气扩张结直肠，受检者可接受性和结直肠充气扩张效果。 **方法** 46 例没有影响胃肠道运动功能病史并且知情同意本研究的健康志愿者，其中女 25 例、男 21 例，年龄 32～77 岁。CT 检查前 1 天开始，志愿者 5 次分别口服 4.0%泛影葡胺 60ml 标记肠内容物。利用充气机部分自动、个体化充注空气扩张结直肠，充气速率开始为 1.5L/min，后期降低到 0.5L/min，再根据 CT 侦察图像上结直肠充气扩张效果、志愿者自我感觉及肠腔压力确定是否需要增补充气及其充气量。仰卧位双能量 CT 容积扫描，并获得双能量融合图像。对志愿者可接受性进行问卷调查，可接受性分为 4 级：1 级，容易接受；2 级，尚可接受；3 级，稍难接受；4 级，难以接受。两位富有经验的放射科医生采用盲法在双能量融合图像上逐个肠段评价结直肠充气扩张效果，以两位的一致性意见为评价结果。以每段肠腔充气扩张最差的部分评价该段肠腔充气扩张效果，分为 4 级：1 级，肠腔充气扩张佳；2 级，肠腔充气扩张欠佳；3 级，肠腔充气扩张差；4 级，肠腔没有充气扩张。统计分析志愿者可接受性和结直肠充气扩张效果，p＜0.05 时差异有统计学意义。 **结果** 46 例志愿者均没有出现腹痛、腹胀、恶心或呕吐等，容易接受结直肠充气扩张，可接受性 1 级达 100%。可接受性 2 级、3 级、4 级，均为 0 例。276 个肠段中，结直肠充气扩张 1 级、2 级、3 级、4 级效果分别为 92.8%、5.1%、2.1%、0.0%；256 个肠段肠腔充气扩张效果为 1 级，其中盲肠、升结肠、横结肠、降结肠、乙状结肠、直肠分别占 44 段、44 段、45 段、42 段、40 段、41 段。结直肠各部分肠段肠腔充气扩张效果比较，差异没有统计学意义(c^2=6.19，p=0.288)。 **结论** 双能量 CT 结肠成像部分自动个体化充注空气扩张结直肠，受检者可接受性非常高，结直肠充气扩张效果良好。

EPO-1318
Combined CT texture analysis and tumor markers in predicting suspicious peritoneal metastasis of gastric cancer: a pilot study

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Background: *The predictive value of computed tomography (CT) texture analysis combined with tumor markers to peritoneal metastasis (PM) of gastric cancer is still unclear. This study aims to evaluate the feasibility of the multivariate model combining CT texture analysis parameters and positive tumor markers for reliably predicting suspicious PM preliminarily.*
Methods: *A total of 174 patients with gastric cancers who underwent surgery were retrospectively enrolled in our cohort and 39 patients were confirmed with PM pathologically. Regions of interest were drawn manually using in-house software to cover the boundary of the suspicious omentum majus and mesocolon in venous phase.*

CT texture analysis was performed and a total of 14 parameters were generated. Six tumor markers of venous blood were also collected. Depending on the normality test results, univariate analysis was performed by the Mann-Whitney U test for continuous characteristics. The diagnostic performance of CT texture and tumor marker parameters and multivariate model in differentiating different groups were evaluated with receiver operating characteristic (ROC) analysis.

Results: *The parameters of Mean, Standard deviation (SD), Mode, 5^{th}-90^{th} Percentiles, Skewness, Entropy, Histogram width and Carbohydrate antigen (CA)125 differed significantly between the two groups of the presence or absence of PM. ROC analysis showed that the above 13 features performed well in distinguishing gastric cancers with PM from those without PM.*

For multivariate model analysis, when SD, 90th percentile, Histogram width and CA125 participated together, the area under the ROC curve of the presence or absence of PM was the highest, reaching 0.920.

Conclusions: *The combination of CT texture parameters and tumor markers could improve the diagnostic accuracy of PM in patients with gastric cancers.*

EPO-1319

100kvp,80mAs 低剂量大肠充气 CT 造影联合 iDOSE3 迭代技术 在大肠癌 T 分期中的应用

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目的 探讨 100kvp、80mAs 低剂量大肠充气 CT 造影联合 iDOSE^{3}迭代技术在大肠癌术前 T 分期中的应用价值。**方法** 选取 204 例经肠镜病理确诊为大肠癌（包括结、直肠癌），体重指数（18.5kg/m^2＜BMI≤25kg/m^2）的患者，随机分为 A、B 两组（每组各 102 例），术前均行大肠充气 CT 造影检查，A 组为常规剂量组：120kv，自动毫安秒，运用滤波反投影（FBP）重建技术，B 组为低剂量组：100kv，80mAs，运用 iDose^{3}迭代重建技术。记录每位患者接受的辐射剂量，包括容积剂量长度乘积（DLP）及 CT 剂量指数（CTDIvol），根据公式计算有效剂量（ED），并比较有效剂量下降幅度；以术后手术病理分期为金标准，计算两组 T 分期的诊断符合率，比较两组符合率差异是否有统计学意义。**结果** 两组 T 分期诊断符合率分别为 85.3%（A 组）及 80.3%（B 组），差异无统计学意义（c^2=1.148，P＞0.05）。DLP 、CTDIvol 及 ED 分别为：1574.94±484.06、38.23±10.24 及 23.57±7.25（A 组）； 493.17±32.14，10.57±0.11 及 7.40±0.48（B 组）；下降幅度分别约为 69%、72%及 69%。**结论** 100kvp、80mAs 低剂量大肠充气 CT 造影联合 iDOSE^{3}迭代技术在大肠癌术前 T 分期中具有重要价值，同时可以大幅度降低辐射剂量，可作为大肠癌术前分期的有效评估方法。

EPO-1320

Evaluating the Inflammatory Activity in Crohn’s disease Using Magnetic Resonance Diffusion Kurtosis Imaging

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Objectives: To explore the feasibility of diffusion kurtosis imaging(DKI) for the evaluation of inflammatory activity in Crohn’ s disease(CD).
Materials and Methods: In all, 51 patients diagnosed with CD were included, who were performed with consecutive enteroscopy, Magnetic Resonance Enterography(MRE) and DKI (b values = 0 - 2000 mm^2/s). The lesions of bowel segments were graded as inactive (0-2), mild (3-6), and moderate-severe group(>6) based on simplified endoscopic activity score for Crohn’s disease (SES-CD). Parameters of DKI and DWI were correlated with SED-CD. The difference of these parameters among three groups were analyzed by ANOVA (analysis of variance) or K-W test(Kruskal - Wallis test). Receiver operating characteristic (ROC) curve analysis for these parameters was used for differentiating inactive from active group and inactive-mild from moderate-severe group.
Results: 127 bowel segments including inactive(15), mild(45) and moderate-severe(67) were analyzed. ADC($r = -0.627$, $P < 0.001$), D_{app} ($r = -0.381$, $P < 0.001$) and K_{app} ($r = 0.641$, $P < 0.001$) were correlated with SES-CD. These parameters were significantly different among the three groups(all $P < 0.001$). ROC analysis found ADC had the highest accuracy (AUC = 0.884, $P < 0.001$) to differentiate inactive from active group with the threshold at 0.865×10^{-3} mm^2/s, which was slightly higher than Kapp (AUC = 0.867, $P < 0.001$) with the threshold at 0.645, and was obviously higher than Dapp (AUC = 0.726, $P = 0.005$). Similarly, ADC also had the highest accuracy (AUC = 0.846, $P < 0.001$) to differentiate inactive-mild from moderate-severe group with the threshold at 0.825×10^{-3} mm^2/s, and minimally higher than Kapp (AUC = 0.843, $P < 0.001$) with the threshold at 0.695, and obviously higher than Dapp (AUC = 0.690, $P < 0.001$).
Conclusion: DKI is feasible and comparable to conventional DWI for the evaluation of inflammatory activity in Crohn’s disease.

EPO-1321
应用 IMR 技术超低管电压管电流 CT 结肠成像的动物模型研究

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目的
评估猪结肠模型中 100kVp20mAs 超低剂量条件下采用 IMR 重建技术与 120kVp50mAs 常规低剂量下采用 FBP 重建技术 CT 结肠成像的辐射剂量及图像质量，探讨 IMR 技术在超低剂量 CT 结肠成像中的应用价值。
材料与方法
取 5 段猪结肠，长度约 100-120cm，并人工制作息肉 73 枚，分为大（直径 11-15mm）、中（直径 6-10mm）、小（直径小于 5mm）三组。扫描机器采用飞利浦 CT 机（Brilliance iCT Elite FHD），扫描参数分为两组：超低剂量组（管电压 100kVp，管电流 20mAs，IMR 技术重建）和低剂量组（管电压 120kVp，管电流 50mAs，FBP 技术重建）。两位医生采用 5 分法评估图像质量，并对比两组图像的图像噪声、信噪比、对比信噪比及辐射剂量，并测量两组图像中息肉的检出量。采用 Wilcoxon 秩和检验统计方法分析图像质量等级资料数据，采用配对 t 检验统计方法分析信噪比、对比信噪及辐射剂量等数据。
结果
超低剂量组和低剂量组中图像质量评分无明显统计学差异(p=0.059)，超低剂量组中图像噪声、信噪比和对比信噪比([24.05±2.11] HU vs. [50.04±3.45] HU, 2.40±0.68 vs. 0.62±0.20, and

42.56±6.11 vs. 20.48±1.46, respectively; p=0.001)明显优于低剂量组，同时辐射剂量明显减降低(0.26±0.03 mSv vs. 2.21±0.23mSv; p=0.000)，而息肉检出率无明显统计学差异(68/73 vs. 73/73, p=0.07)。
结论
采用 IMR 重建技术的超低剂量 CT 结肠成像在图像质量和病变检测率上可媲美采用 FBP 技术重建的常规低剂量 CT 结肠成像，同时辐射剂量明显减低约 88.2%，临床应用前景广阔。

EPO-1322

Effect of Iterative Model Reconstruction algorithm on Radiologist’s Performance in CT Colonography

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PURPOSE
To assess radiation dose and image quality of CT colonography (CTC) at 100 kVp with iterative model reconstruction algorithm (IMR) at 20 mAs compared with filtered back projection (FBP) at 50 mAs.
METHOD AND MATERIALS
Thirty-two patients suspected with colon adenomatous polyp or adeno-carcinoma were enrolled in this study. All of patients underwent CTC examination at 50mAs in supine position and 20mAs with prone position with the same tube voltage at 100 kVp about two hours before fibro-colonoscope. Images were reconstructed using FBP and IMR. Two radiologists independently evaluated image quality. Qualitative image quality was assessed with a five-score scale. Image noise, signal-to-noise ratio (SNR), contrast-to-noise ratio (CNR), and effective radiation dose were recorded and calculated. Qualitative and quatitative values were analysed by using Wilcoxon signed rank test and the paired t test, respectively.
RESULTS
Totally 38 colon polyps or adeno-carcinoma were detected in fibro-colonoscope examination. For 20 mAs with IMR (A group) and 50 mAs with FBP (B group), there is no statistically significant difference in lesion detection (reader 1: 35/38 vs 36/38, and reader 2: 31/38 vs. 33/38, $p>0.05$). However, qualitative image quality scores (3.9 vs 2.5), image noise ([12.77± 0.91] HU vs. [50.04±5.45] HU), SNRs (3.13±0.28 vs. 1.02±0.20) and CNRs (81.42±6.11 vs. 19.93±1.46) were significantly superior of 20 mAs with IMR, respectively ($p<0.05$) . Compared with B group, radiation dose of A group decreased significantly (0.42±0.03 mSv vs. 1.07±0.12mSv).
CONCLUSION
Image quality of CTC using 20 mAs with IMR reconstruction could be comparable to 50 mAs with FBP at the same tube voltage while with no significant detection of poply, and radiation dose of the former was only 0.42 mSv, which was reduced by about 39.3%.

EPO-1323

小肠肿瘤 CT 引导下穿刺活检的临床应用价值及安全评估

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目的：评估 CT 引导下穿刺活检技术在小肠肿瘤诊断中的应用价值及安全性。方法：总结我院 2016 年 9 月至 2018 年 9 月期间经 CT 引导下穿刺活检明确诊断的小肠肿瘤患者 26 例，总结其穿刺阳性率、病理结果及手术并发症等进行分析,评价穿刺活检对小肠肿瘤患者诊断中的应用价值。结果：本组 26 例患者中，男性 11 例，女性 15 例，年龄 43-83 岁，平均年龄 60 岁。所有患者中临床就诊症状为腹痛及腹部不适 19 例（73.1%）、消瘦待查 11 例（42.3%）、发热 6 例（23.1%）、腹部肿块 2 例（7.7%）等。其中 12 例患者为局部晚期单发病灶，14 例患者为多部位发病或合并多发转移，穿刺病例结果提示淋巴瘤 8 例，腺癌 8 例，炎症 5 例，间质瘤 3 例，平滑肌肉瘤 1 例，梭形细胞肿瘤 1 例。除一例患者取材量少进行二次活检外，余患者均一次穿刺成功，阳性率 100%。所有患者均无出血、感染、穿孔等并发症发生。结论：CT 引导下穿刺活检技术是一项安全、有效的临床应用技术，在局部晚期或者累及多部位患者的临床诊断中具有很高的应用价值。

EPO-1324
原发性腹茧症的 CT 及 MRI 表现（附 6 例分析）

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【摘要】目的：探讨原发性腹茧症的 MR 及 CT 影像学特征，以提高对该病的认识和诊断水平。
方法：回顾性分析 6 例经手术、病理证实的腹茧症患者的临床资料，其中 CT 平扫 1 例，CT 平扫+增强 3 例，磁共振平扫+增强 2 例。
结果：腹茧症的主要表现为小肠异常聚集成团，位置固定，聚集小肠呈拧麻花状、手风琴状、假肿瘤样改变；其中 2 例表现为部分性小肠受累，4 例为全部小肠受累，肠管外缘光滑，周围可见茧样纤维膜包裹，包膜轻中度延迟强化，近端肠管不全性或完全性肠梗阻。
结论：熟悉腹茧症的典型 CT 表现和临床特征，有利于该病的准确诊断及鉴别诊断。

EPO-1325
第二代双源 CT 虚拟平扫对胃肠道间质瘤显示能力的评估

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目的 评价第二代双源 CT（dualsourcecomputedtomography，DSCT）虚拟平扫（virtualnon-contrast，VNC）对胃肠间质瘤的显示能力，及其取代真实平扫的可行性。**方法** 分析经手术病理证实的 28 例胃肠道间质瘤患者的术前 CT 图像，患者均于术前接受常规平扫和西门子公司第二代双源 CT 双能量增强扫描。将 5mm 层厚、D30 卷积核的静脉期双能量图像传送至 syngoMMWP VE36A 工作站，应用 Dual-Energy 软件“Liver VNC”模式产生 VNC 图像。选择肿瘤最大层面，分别在常规平扫图像和静脉期 VNC 图像上沿肿瘤轮廓勾画感兴趣区，测量并比较肿瘤的真实平扫（truenon-contrast，TNC）值及 VNC 值。**结果** 本组 28 例患者共检出间质瘤瘤灶 30 个，其中胃间质瘤瘤灶 21 个，小肠间质瘤瘤灶 9 个，肿瘤平均直径（3.6±1.2）cm，所有瘤灶均可在 VNC 图像上显示，其 VNC 均值为（35.06±4.52）HU，TNC 均值为（28.53±5.24）HU，两者间的差异有统计学意义（$P<0.05$），但其绝对差异值在 10HU 之内。Pearson 相关检验两者一致性较好（$r=0.62$）。**结论**

第二代双源 CT 虚拟平扫可显示胃肠道间质瘤，其虚拟平扫 CT 值与真实平扫 CT 值的一致性较好，虚拟平扫具有取代常规平扫以降低患者辐射剂量的可能。

EPO-1326
原发性胃肠道间质瘤危险度分级：形状是其重要的独立预测因素

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背景：本研究旨在探讨形状与胃肠道间质瘤（GISTs）危险度分级之间的相关性。
方法：将 2014 年 6 月至 2019 年 6 月在我院手术后经病理及免疫组织学确诊的原发性 GISTs 患者 189 例作为研究对象。入组标准：①大小在 1-9.9cm（RECIST 标准）；②增强 CT 检查且采用迭代重建（IMR）对图像进行 1mm 的横断位、冠状位及矢状位的多平面重建（MPR）；③未发生破裂。本研究以角度和角度比的方式对形状进行量化（长径对应角 A 和角 B 且 A≥B，短径对应角 C 和角 D 且 D≥C。当肿瘤为规则形时，选取角 A 和角 B 进行分析；当肿瘤为不规则形时，将 A/B 与 D/C 值进行比较，大者进行分析）。采用卡方检验、t 检验或非参数检验、ROC 分析、等级逻辑回归或二元逻辑回归对定量数据（长短径及其比值、角度、角度比、各期强化绝对值）和定性数据（发病部位、生长方式、强化峰值期、核分裂象、Ki-67、坏死及钙化等）进行统计分析。
结果：经过等级逻辑回归分析，角度比值是 GISTs 危险度分级的独立预测因子（P＜0.05）。在 ROC 曲线中将角度、角度比及长径的截止值分别设定为 90.5°、1.35、6.15cm 时，GISTs 为高危险性的敏感度分别为 82.4%、85.3%和 83.8%，特异性分别为 87.1%、71%和 77.4%，AUC 分别为 0.852、0.818 和 0.844。但在两两比较中 LD 不能有效区分中度风险和高风险 GIST（P＞0.05），但角度可以有效区分两者（P＜0.05）。此外，在二元逻辑回归分析中，形状和 Ki-67 是有丝分裂计数的独立预测因子（P 值均小于 0.05），预测准确率为 87.8%。此外，较高的动脉期强化绝对值预示较高的有丝分裂计数（P＜0.05）。
结论：形态在 GIST 的危险分级和有丝分裂计数方面比长径具有更好的预测效果，尤其是对于高风险分级和有丝分裂计数＞5/50HPF 的 GISTs。

EPO-1327
MR 功能成像在局部进展期胃癌新辅助治疗疗效评价的应用

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目的：探究磁共振成像功能对局部进展期胃癌新辅助放化疗后疗效评价的临床应用价值。
方法：收集自 2017 年 8 月至 2018 年 12 月就诊于我院的局部进展期胃癌病例。测量肿瘤动态对比增强定量参数变化值ΔKtans、ΔKep、ΔVe 及ΔADC。术后 TRG 分为 0,1,2,3,级。应用 Spearman 检验分析各参数变化值与 TRG 的相关性。应用独立样本 t 检验或 Mann-Whitney U 检验分析两组间ΔKtans，ΔKep，Δve 及ΔADC 值的差异性；再制作受试者工作特征 ROC 曲线，进一步分析最佳诊断效能值。*P*＜0.05 认为有统计学差异。
结果：有效组治疗后ΔKtrans、ΔADC 大于无效组，差异有统计学意义（*P*＜0.05）。ΔKtrans、ΔKep 与 TRG 之间呈负相关（rho=-0.554,P=0.009;rho=-599,P=0.004）。ΔADC 与 TRG 之间呈正相关（rho=0.603,P=0.005）。做 ROC 曲线，AUC 为 0.754，当ΔKtrans 大于 0.0075min^{-1}时，预测胃癌 NACR 有效的诊断准确率为 80%，敏感性为 92.9%，特异性为 55.6%。做ΔADC 的 ROC 曲线，AUC

为 0.857，当ΔADC 绝对差值大于 0.406×$10^{-3}$$mm^2$/s 时，预测胃癌 NACR 有效的准确率为 76%，敏感性为 100%，特异性为 71.4%。

结论：1、磁共振功能成像较传统影像学评估准确率高，可重复性强，且可以早期反映肿瘤内部变化；2、DCE-MRI 的ΔKtrans 及 DWI 成像的ΔADC 值可以作为局部进展期胃癌新辅助放化疗后疗效评价方法。

EPO-1328
原发性肠道淋巴瘤、克罗恩病及肠结核的 CT 影像诊断对比研究

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目的探究原发性肠道淋巴瘤、克罗恩病及肠结核的 CT 影像诊断价值。方法选取本院 2014 年 10 月至 2016 年 10 月收治的 21 例原发性肠道淋巴瘤、25 例克罗恩病及 30 例肠结核患者为研究对象。对入组患者进行 CT 检查,比较其临床特征、发病部位及 CT 检查结果。结果原发性肠道淋巴瘤出现血便及腹部包块的患者占比明显高于克罗恩病和肠结核(P<0.05);克罗恩病出现腹泻症状的患者占比明显高于原发性肠道淋巴瘤和肠结核(P<0.05);肠结核出现发热、盗汗症状的患者占比明显高于原发性肠道淋巴瘤和克罗恩病(P<0.05)。原发性肠道淋巴瘤好发于回肠[20 例(95.24%)]和回盲部[14 例(66.67%)];克罗恩病同样好发于回肠[23 例(92.00%)]和回盲部[10 例(40.00%)]例;而肠结核好发于回盲部[27 例(90.00%)]和结肠[14 例(46.67%)]。3 种疾病均可致肠壁增厚,CT 结果显示:原发性肠道淋巴瘤单层偏心增厚和淋巴结肿大表征突出;克罗恩病则多节段性病变和假憩室征像较为明显;肠结核多表现为分层增厚和中空淋巴结。结论原发性肠道淋巴瘤、克罗恩病及肠结核发病部位相似,但临床表现及 CT 检查结果有一定差异,临床医师应综合多种检查结果进行诊断,以降低疾病的误诊率。

EPO-1329
经颈静脉肝内门体支架分流术和内镜下套扎组织胶注射术治疗胃底静脉曲张破裂出血的疗效比较

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目的：评价经颈静脉肝内门体支架分流术(TIPS)治疗胃底静脉曲张破裂出血的疗效。

方法：2013 年 1 月至 2019 年 5 月，天津市第三中心医院医院 90 例肝硬化合并 IGV1 型胃静脉曲张破裂出血病例纳入回顾性分析，其中 TIPS 治疗者 32 例(TIPS 组)、内镜下套扎组织胶注射术(GVO)治疗者 58 例(GVO 组)，对比分析 2 组的远期随访结果。

结果：2 组手术均成功，术后并发症总体发生率 TIPS 组和 GVO 组分别为 12.5%(4/32)和 12.6%(8/58)组差异无统计学意义(P＝0.801)；TIPS 组有 9 例(25%)发生肝性脑病(病情均较轻)，GVO 组未发生。TIPS 组平均随访(20.18±6.90)个月，2 例(7.14%)死亡，6 个月、12 个月、18 个月时累积未出血率分别为 88.4%、83.7%、76.1%；GVO 组平均随访(16.14±6.03)个月，5 例(13.51%)死亡，6 个月、12 个月、18 个月累积未出血率分别为 86.5%、70.2%、60.9%。2 组随访期死亡率比较差异无统计学意义(P＝0.690)，18 个月累积未出血率比较差异有统计学意义(log-rank 检验，ｘ2＝6.304，P＝0.012)。

结论：在控制胃底静脉曲张破裂出血方面，TIPS 远期疗效优于 GVO，但应警惕术后肝性脑病的发生.

EPO-1330

早发型先天性梅毒的影像学及临床特征分析

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【摘 要】目的:评估早发型先天性梅毒患儿的影像特点和临床特征的诊断价值。方法:回顾性分析 2012 年 9 月至 2018 年 10 月我院 21 例血清学诊断阳性的早发型先天性梅毒患儿的影像和临床资料。结果:21 例患儿均有骨骼的影像学改变，累及部位多对称，以四肢长骨为主，受累部位包括股骨 21 例，胫、腓骨 20 例，肱骨 8 例，尺、桡骨 6 例，骨盆 2 例，锁骨 1 例。其中干骺端炎 18 例，骨膜炎 15 例，骨髓炎 12 例。临床表现无特异性，累及多系统多脏器，皮肤损害及肝脾肿大最常见。结论:早期先天性梅毒患儿影像表现典型，可辅助临床早期诊断并改善预后。

EPO-1331

IVIM in the differential diagnosis of brucellosis spondylitis,tuberculus spondylitis

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Objective To quantitatively analyze brucellosis spondylitis and tuberculus spondylitis by applying IVIM, and to evaluate the value of quantitative IVIM in the differential diagnosis of brucellosis spondylitis and tuberculus spondylitis . Then compare the coincidence rate with the routine MRI examination. We know that IVIM can identify the brucellosis spondylitis and tuberculus spondylitis by the Slow ADC (D), Fast ADC(D*),and fraction of fast ADC(f),but we can’t find the threshold value to identify these diseases.
Methods A paper collected 30 brucellosis spondylitis patients with complete biochemical detection(SAT 1:100++ or RBPT++),30 patients with tuberculus spondylitis, and diagnose 30 cases of other spinal diseases (control group) at the same time. Analyze and compare the diagnostic coincidence rate of routine MRI to these diseases with IVIM. All patients recieved routine and IVIM examinations, D,D*,f of diseased vertebral bodies of the patients with brucellosis spondylitis,tuberculus spondylitis were measured on maximal region. The results were compared among the diseases ,P＜0.05 was regarded as statistically significant.
Results The sensitivity and specificity of IVIM in diagnosing two diseases of brucellosis spondylitis, spinal tuberculosis were 90%、80%; 86%、83.3% respectively. The diagnostic coincidence rates of routine MRI for two diseases were 67%, 73% respectively. The diagnostic coincidence rate of IVIM for the diseases was 89%, 85% , which was higher than that of routine MRI, and the difference was statistically significant (x2=4.81,4.32, P <0.05).The area under AUC of D、D*、f for brucellosis spondylitis with tuberculus spondylitis were 0.825、0.651、0.598, corressponding diagnostic sensitivity and specificity were 100%、88.9%; 95.2%、77.8%; 95.2%、88.9%，cut value were0.00025、0.00328、0.276。

Conclusion The diagnostic coincidence rate of IVIM for two diseases was significantly higher than that of conventional MRI; In the IVIM quantitative analysis, the value of D and f have value in the differential diagnosis of brucellosis spondylitis, tuberculus spondylitis

EPO-1332

Gout involved the cervical disc and adjacent vertebral endplates misdiagnosed infectious spondylodiscitis on imaging: case report and literature review

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Background: Gout in spine is rare and commonly mimics some infectious or tumoral lesions, the differentiation of spinal gout from other diseases is not always easy. We report a case of gout involved cervical disc and adjacent vertebral endplates which was misdiagnosed infectious spondylodiscitis on preoperative imaging and give a brief literature review for concerning cervical gout.
Case presentation: A 50-year-old male with a 5-year history of neck and shoulder pain had progressive muscle atrophy and weakness in both arms. Physical examination revealed bilateral superficial sensory declined below level of mastoid portion. Laboratory findings showed hyperuricemia and the C-reactive protein level was very high. Imaging studies including Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) showed abnormality of the C5-6 intervertebral disc and irregular osteolytic destruction of both adjacent C5-6 endplates, narrowing of C5-6 disc space and swelling of prevertebral soft tissue. Based on the diagnosis of infectious spondylodiscitis and nerve root symptoms, surgical treatment was performed and pathological examination of the specimen revealed deposited uric acid crystals surrounded by granulomatous inflammation.
Conclusions: Cervical spinal gout involving the disc and adjacent vertebral endplates is uncommon and may misunderstand infectious spondylodiscitis. With atypical symptoms and low specificity of imaging studies, final diagnosis should be combined closely with previous history and clinical manifestation.

EPO-1333

磁共振水-脂分离成像与双能骨密度仪对甲亢患者骨量评价的初步研究

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目的 通过利用磁共振水-脂分离成像技术对甲亢患者椎体脂肪含量的测定，来评估不同年龄段甲亢患者随着患病时间的延长及甲状腺素水平的改变所对应的椎体脂肪含量的变化，从而间接评估椎体

骨质量。 方法 纳入 50 例甲亢患者为研究对象，按年龄分为 18～25 岁组 20 例，25～50 岁组 20 例，>50 岁组 10 例，不同年龄组在治疗前行双能骨密度仪测骨密度值（ BMD 值） 与 MR 所测腰椎脂肪分数（ FF） 进行相关性分析；按性别分男组 30 例，女性组 20 例；并分别对不同年龄组按甲状腺水平高低分组及男女性别组进行腰椎椎体脂肪分数进行比较；骨髓脂肪 FF 计算公式：FF = ［ Mfat / （ Mfat ＋ Mwater） ］* 100%，式中 Mwater、Mfat 分别指水像及脂像 ROI 总像素信号强度值。
结果 不同年龄组甲亢患者治疗前 BMD 均值组间比较差异有统计学意义（ P = 0. 01）；所有患者椎体 BMD 值与 FF 值呈显著相关性；甲状腺素高水平高脂肪分数上升的程度明显高于甲状腺素低水平组，且>50 岁年龄组、40～50 岁年龄组脂肪分数增加的程度要高于 18～ 25 岁年龄组；同一甲状腺水平组女性组的脂肪分数增加程度要高于男性组。
结论 甲亢患者椎体内随年龄的增加脂肪分数明显增加；甲状腺素高水平组患者腰椎脂肪分数高于甲状腺素低水平组，同一甲状腺激素水平组女性的脂肪含量较男性高，椎体骨量下降明显，易发生骨质疏松性骨折。

EPO-1334
膝关节髌下脂肪垫的 MRI 信号及体积与血友病性关节炎相关性的 MRI 研究

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目的：分析髌下脂肪垫的 MRI 信号强度及体积变化与血友病性关节炎病理改变的相关性，探讨髌下脂肪垫的变化在血友病性关节炎中的作用。
方法：共纳入 50 例经临床证实的血友病患者(男 30 例，女 20 例，年龄 10-50 岁)，志愿者 30 例(男 20 例，女 10 例，年龄 20-60 岁)，所有患者均有关节出血经历、出血次数不等，按性别、年龄、体重指数(BMI)、血友病患者出血次数进行分组。经 MRI 三维脂肪抑制质子密度加权快速自旋回波序列测定髌下脂肪垫（IPFP）的信号强度及容积，用三维双回波稳态序列(3D-DESS)测定髌骨、胫骨、股骨软骨容积，继而根据 outerbridge 分类系统对髌骨、胫骨、股骨软骨损伤程度进行分级，统计分析软骨体积与 IPFP 的信号强度及体积的关系，同时比较血友病组与对照组之间 IFP 的信号强度及体积的差异。
结果：IPFP 信号强度及容积与年龄、性别、BMI 有明显相关性，所有 p 值均＜0.05。Logistic 回归分析结果显示：消除年龄、性别、BMI 等其他因素的混杂后，IPFP 信号强度及容积与血友病患者髌骨、股骨、胫骨软骨缺损、骨赘形成呈明显正相关(OR 为 1.311~2.157，P 为 0.005~0.021)。血友病患者组 IPFP 信号强度及容积大小高于对照组，其差异有统计学意义(P=0.024)。
结论：膝关节髌下脂肪垫 MRI 信号增高及容积增大是血友病性关节炎的影像学表现之一；膝关节髌下脂肪垫的炎症和内分泌异常可能是血友病性关节炎的一个危险因素。

EPO-1335
DECT 能谱曲线在慢性肾衰继发甲旁亢术前定位中的应用价值

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]目的 探讨双能 CT（DECT）对甲状旁腺切除术前定位的可行性及准确性。**方法** 前瞻性收集慢性肾功能衰竭继发甲状旁腺功能亢进且有临床症状、具有甲状旁腺手术切除指征患者 10 例，

采用 CT 平扫和双期增强扫描。以术后病理结果作为金标准，分别测量甲状旁腺、甲状腺及淋巴结平扫期、动脉期 HU 值，并通过单能谱图像测量及计算动脉期标准化碘浓度（normalized iodine concentration ,NIC)及能谱衰减曲线斜率(slope of the spectral Hounsfield unit curve,λHU)值。采用受试者工作特征（receiver operating characteristic，ROC）曲线分析甲状旁腺平扫期与动脉期 HU 值、NIC 及λHU 的最佳诊断阈值，评价诊断效能。**结果** 术后病理结果显示 10 例患者共 37 枚甲状旁腺，双能量 CT 结果显示 10 例患者共 31 枚甲状旁腺。平扫期甲状旁腺 63.8±11.9HU、甲状腺 151.1±42.9HU、淋巴结 34.5±11.5HU；动脉期甲状旁腺 99.4±17.6HU、甲状腺 195.3±54.5HU、淋巴结 54.1±16.6HU；甲状旁腺平扫期最佳诊断阈值为 73HU、甲状旁腺动脉期最佳诊断阈值为 103.2HU、NIC 最佳诊断阈值为 70KeV、λHU 最佳诊断阈值为 2.73。其中 NIC 对甲状旁腺诊断效能最高，曲线下面积（area under curve，AUC）为 0.924。**结论** DECT 能谱曲线较常规 CT 提供了额外的诊断信息，提高了甲状旁腺切除术前定位的敏感性和特异性。

EPO-1336
双能 CT 与高频超声诊断痛风性关节炎临床价值的对照研究

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目的 探讨 DSCT 双能量技术及高频超声对痛风性关节炎（Gout Arthritis，GA）的诊断价值。**方法** 收集疑痛风性关节炎均行关节超声及 DSCT 二种检查且临床资料完整的病人 63 例（共 222 个关节）。DSCT 双能扫描后经双能 Gout 软件后处理在任何一个关节内、周围软组织及痛风石内见尿酸盐结晶沉积为阳性表现。高频超声出现关节内痛风石、双轨征、高回声点或韧带内高回声为阳性表现。参照 1977 年美国风湿病学会（ACR）制订的痛风诊断标准查见尿酸盐结晶及关节镜检为 GA 组：GA 51 例（188 个关节）。临床完全排外 GA 的为对照组：12 例（34 个关节）。计算两者诊断的灵敏度、特异度、假阳性率、假阴性率、阳性预测值、阴性预测值。并绘制 ROC 曲线，对高频超声与 DSCT 诊断 GA 的一致性进行评估。**结果** 双能 CT 诊断的准确性：灵敏度（真阳性率）74.5%，特异度（真阴性率）83.3%，假阳性率（误诊率）16.7%，假阴性率（漏诊率）25.5%，阳性预测值 95.0%，阴性预测值 43.5%。ROC 曲线面积为 0.713，P值<0.014。超声诊断的准确性：灵敏度（真阳性率）96.1%，特异度（真阴性率）41.7%，假阳性率（误诊率）58.3%，假阴性率（漏诊率）3.9%，阳性预测值 87.5%，阴性预测值 71.4%。ROC 曲线面积为 0.795，P值=0.012。表明说明两种方法均具有一定的诊断价值。Kappa 一致性检验 ，P<0.05，说明两种检测手段一致性差异有统计学意义，说明两种检测的一致性较差。双能 CT 特异度较高，高频超声敏感度较高。双能 CT 能更好的显示骨质破坏情况及尿酸盐沉积情况，高频超声对早期 GA 可以提供更多信息。对于一些不典型病例同时行两种方法联合检查可以提高诊断率。

EPO-1337
坐骨神经 DTI 测量值与腰椎间盘突出症临床症状及预后的相关性分析

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目的 探讨单一节段椎间盘突出症导致的坐骨神经 DTI 测量值变化，分析坐骨神经 DTI 测量值与患者临床症状严重程度及手术治疗预后的相关性。 **方法** 回顾性收集 2017 年 12 月至 2018 年 7 月共 42 例因单侧单节段腰椎间盘突出症于南方医科大学珠江医院行手术治疗患者资料。统计采集患者

的 MRI 突出类型、手术方式等资料。此外，通过 DTI 扫描评价神经根术前 DTI 测量值。采用视觉模拟评分（Visual Analogue scale,VAS）、日本骨科协会评估治疗分数-腰椎（Japanese Orthopaedic Association scores,JOA）和 Oswestry 功能障碍指数问卷（Oswestry disability index,ODI）指数评估手术前与手术后 1 年患者的疼痛与神经功能。将 DTI 测量值和上述评分进行相关性分析确定其与腰椎间盘突出症患者临床症状及临床预后的相关性 **结果** 急性腰椎间盘突出可导致患者腰神经根 FA 值降低、ADC 值升高，患侧 FA 值（0.286±0.022），健侧（0.319±0.020），差异有统计学意义（t=6.735,P=0.000），患侧 ADC 值（1.788±0.209)mm^2/s，健侧（1.423±0.182）mm^2/s，差异有统计学意义（t=5.838,P=0.001）。患者临床症状经手术治疗后显著改善，术前及术后一年进行 VAS、JOA、ODI 评分，FA 值与 VAS 改善值正相关（r=0.624，P=0.003）、与腰椎 JOA 改善值正相关（r=0.615，P=0.003）、但与 ODI 改善值无相关性（r=-0.025,P=0.836）。ADC 值与 VAS、ODI 改善值无相关性,ADC 值与，JOA 改善值负相关（r=一 0.854,P=0.001）**结论** 急性单节段腰椎间盘突出症患者单一神经根的受压可导致其神经根 DTI 值的改变，这种改变与患者的临床症状的严重程度和临床预后密切相关。

EPO-1338
MR 功能成像结合肌力分析股四头肌与骨关节炎关系研究

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【摘要】目的 定量评估大腿股四头肌质量与膝关节骨性关节炎（ knee osteoarthritis，KOA）严重程度的关系及特点。 方法 纳入 K-L 分级≤Ⅲ级的 KOA 患者 25（男 7，女 19）例，年龄 55~69 岁，入组 50 例膝关节，进行膝关节矢状位 T1WI、3D-VIEV-SPAIR-HD、冠状位 T2WI-fs 及大腿轴位 mDixon-Quant 序列扫描，通过肌力测试椅（德国产 Cybex-Norm 等速肌力测训系统）获得股四头肌功率。由医师根据 WORMS 评分标准，对膝关节退变程度进行评分[1]；用后处理软件，手动画取 ROI，测量股骨远端 1/3 处股四头肌（股内侧肌、股中间肌、股外侧肌、股直肌）横截面积及脂肪分数。通过 SPSS20.0 软件，分析 WORMS 评分与股四头肌功率、横截面积及脂肪分数的相关性。根据 BMI 分组，通过 Mann-Whitney 检验，比较肥胖组（BMI≥25，n=14）与正常组（n=36）之间关节炎严重程度差异。 结果 膝骨性关节炎严重程度与股四头肌横截面积呈负相关，P≤0.05；膝骨性关节炎严重程度与股四头肌功率呈负相关，P≤0.05；肥胖组 WORMS 评分明显高于正常组，P≤0.05。 结论 较大的股四头肌横截面积及功率为 KOA 的保护因素，较大的 BMI 为 KOA 的危险因素。

EPO-1339
II 型糖尿病的腹部脂肪定量分布研究

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【摘要】
目的 探讨应用定量 CT 骨密度测量(Quantitative Computed Tomography,QCT)检测 2 型糖尿病腹部脂肪分布的特点。
方法 收集 2018 年 12 月-2019 年 6 月在内分泌科住院的 2 型糖尿病病人（41 例）及慢性腰腿痛患者（52 例）共 93 例，平均年龄 35-64 岁，平均（45.4±12.6）岁。所有研究对象均计算体重指数（BMI），BMI 均在 18-24mg/m^3。行定量 CT（QCT）腹部扫描，测量 L3 及肚脐层面的腹部总脂肪

体积（TVFA）、内脏脂肪（VAT）、腹部皮下脂肪（SAT）的面积和体积（TFV、VFV、SFV）及 VFV/SFV（V/S）值。分别比较两组间脂肪分布的特点，比较糖尿病组不同治疗方式之间脂肪体积及分布的差异，不同部位脂肪组织（AT）体积与总 AT 体积的相关性。

结果 （1）糖尿病组与对照组 TVFA、TFA 差异无统计学意义，糖尿病组 VAT、VFV 高于对照组，差异有统计学意义（P＜0.05），两组间 V/S 值差异有统计学意义。（2）药物控制组与胰岛素治疗组各项指标差距有统计学意义，激素治疗组 VAT 及 VFV 明显高于药物控制组，V/S 差异有统计学意义。（3）所有病例的腹部 VFV、SFV 与 TFV 均呈正相关。

结论 糖尿病患者内脏脂肪含量较皮下脂肪含量增高，尤其是胰岛素治疗患者，其 VAT 及 VFV 增高，且与 TVFA 相关性高，是肥胖的主要组成部分，早期提示临床，避免内脏脂肪聚集过多造成的危害。

EPO-1340

骶髂关节常见病变的 MRI 诊断及鉴别

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目的：探讨骶髂关节常见疾病的 MRI 表现，提高诊断和鉴别诊断能力。

方法：回顾性分析 2012 年 6 月至 2016 年 5 月在我院行骶髂关节 MRI 并经手术或临床诊断的强直性脊柱炎、致密性骨炎、结核和肿瘤共 307 例患者临床和影像学资料，其中强直性脊柱炎 216 例，致密性骨炎 69 例，结核 12 例，肿瘤 10 例（转移瘤 8 例，骨巨细胞瘤和骨髓瘤各 1 例）。其中结核 9 例、骨巨细胞瘤和骨髓瘤各 1 例经手术诊断，其余病例为结合实验室检查和临床表现、并经治疗后随访复查治疗有效的临床诊断。

结果：（1）强直性脊柱炎常见于青少年（本组 16-46 岁，平均 26.5 岁），多为双侧对称发病，同时累及骶骨和髂骨双侧关节软骨下骨。早期 MRI 表现包括关节面锯齿状不光整伴小囊状骨质破坏，关节滑膜增生，并见强化；软骨下骨散在斑片状骨髓水肿样信号；中晚期除关节面不光整及间隙不规则狭窄外，软骨下骨髓可见脂肪沉积和骨质增生硬化，代表病变修复期改变。（2）致密性骨炎均发生于中青年女性，大部分病例亦为双侧受累；受累部位主要位于髂骨面前下份，主要累及骨髓；关节软骨及关节面连续完整，无囊状破坏；急性期骨髓内散在片状骨髓水肿样信号，边界不清；中晚期表现与平片类似，以增生硬化为主，在髂骨软骨下呈低信号区。（3）结核均为青少年发病（本组 17-28 岁，平均 22 岁），主要为单侧受累，表现为骶髂关节大范围骨质破坏，关节周围骨髓可见大面积的骨髓水肿样信号，信号不均，破坏区内散在点片状或大片状低信号死骨形成，周围软组织明显肿胀及脓肿形成。（4）肿瘤中以转移瘤最多见，中老年好发，同样表现为单侧发病，大范围骨质破坏，无死骨，骨皮质中断伴周围有明显的软组织肿块形成。

结论： 强直性脊柱炎、致密性骨炎、结核和肿瘤是常见的骶髂关节病变，其各自 MRI 表现如累及部位、单双侧受累、关节间隙及软骨、骨质破坏信号和周围软组织等改变均有一定特征性，结合年龄及临床可以做成较正确的鉴别诊断。

EPO-1341

基于 MR 影像的膝关节炎患者功能评估预测模型的设计及对比研究

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目的：目前对膝关节炎患者功能评估主要采用 WOMAC 和 KOOS 量表，评估过程主要依赖受评估者对量表的理解以及对日常生活中的体验和总结归纳，主观影响较大。膝关节 MR 图像可清晰反映膝关节的结构特征，可为患者功能水平提供结构基础。本文研究了膝关节 MR 结构特征与其功能水平之间关系，分析并建立对应模型用于患者功能水平的预测。
方法：本文基于 NIH 公开数据库 Osteoarthritis Initiative 中的 Osteoarthritis Biomarkers Consortium FNIH Project 项目。我们提取了该项目中 600 名膝关节炎患者初次入组时的 MR 图像、MR 影像半定量评分 SQ-MOAKS（软骨形态学、骨髓病变、半月板和骨赘等）以及患者功能评分（WOMAC 和 KOOS）。首先，我们分析了患者膝关节半定量评分 SQ-MOAKS 与患者功能评分指标间的相关性。然后，基于 SQ-MOAKS 和 MR 图像分别建立了用于患者功能评估预测的人工神经网络模型（ANN）和卷积神经网络模型（CNN）。
结果：所有单项 SQ-MOAKS 评分指标与单项 WOMAC 和 KOOS 评分指标间均无显著相关性（$p>0.05$）。在 400 例训练集和 200 例测试集数据上，针对 WOMAC/KOOS， ANN 模型获得 0.16/0.21 和 0.21/0.32 的平均绝对误差，CNN 模型获得 0.06/0.11 和 0.11/0.19 的平均绝对误差。多次测试（$N>100$）发现预测平均绝对误差 CNN 模型显著小于 ANN 模型（$p<0.001$）。
结论：膝关节 MR 图像可有效地反映和预测膝关节炎患者功能水平。对膝关节 MR 图像进行单项半定量评分或将它们进行简单线性组合，均无法有效反映膝关节炎患者功能水平。将半定量评分进行非线性组合（人工神经网络）之后可有效地对膝关节炎患者功能水平进行评估。CNN 模型可对膝关节 MR 图像进行深度挖掘，能更加有效地反映膝关节炎患者功能水平。

EPO-1342
腰椎体骨松质 CT 值在老年女性骨质疏松骨折诊断中的价值

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目的：探讨基于常规腹部 CT 检查获得的腰椎体松质骨 CT 值在老年女性骨质疏松骨折诊断中的价值。
方法：前瞻性纳入 17 例在我院行常规腹部 CT 平扫的 60 岁以上伴有脆性骨折的女性患者，另纳入年龄、性别及 BMI 指数匹配的无骨折女性患者 21 例。采用单 ROI 法获得患者 L1 椎体松质骨的 CT 值，双能 X 线骨密度仪（DXA）获得 L1 椎体的骨密度 T 值。比较脆性骨折和无骨折两组患者 L1 椎体 CT 值和骨密度 T 值的差异及相关性，采用受试者工作曲线分析松质骨 CT 值及骨密度 T 值对脆性骨折的诊断价值。
结果：两组患者椎体松质骨 CT 值和骨密度 T 值均呈显著正相关，伴有脆性骨折组 $R=0.879$（$p<0.05$），无骨折组 $R=0.452$（$p<0.05$）。骨折组患者的 L1 椎体 CT 值和骨密度 T 值均明显低于无骨折患者（65.94±24.54 Hu vs 112.90±18.01 Hu，-1.23±0.92 vs -3.05±1.33）（$p<0.05$）。L1 椎体松质骨 CT 值 ROC 曲线下面积为 0.936（$p<0.001$，95%CI：0.806-0.989），cut-off 值为 77HU（敏感度：0.824，特异性：1），骨密度 T 值的 ROC 曲线下面积为 0.884（95%CI：0.738-0.965），cut-off 值为-2.2（敏感度：0.882，特异性：0.905），两种方法对两组患者的鉴别诊断能力无显著差异性。
结论：腰椎体骨松质 CT 值 能够鉴别老年性女性骨质疏松骨折和无骨折患者，具有较高的敏感性。

EPO-1343
神经营养性关节病的 X 线表现及鉴别诊断

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目的 探讨神经营养性关节病的临床 X 线表现，提高对该病诊断和鉴别诊断的认识，减少误诊和漏诊。**材料与方法** 神经营养性关节病 14 例，搜集其临床与 X 线表现并进行总结分析。**结果** 14 例患者中肘关节病变 6 例（其中 1 例为双侧），足 3 例（其中 2 例为双侧），足部与膝关节同时累及 1 例，肩、腕、膝及踝关节病变各 1 例，其 X 线表现：关节明显肿胀 7 例，关节的正常结构紊乱 8 例，10 例关节面不规则骨质破坏吸收、碎裂，5 例伴残端增生硬化并出现骨膜反应，关节内和关节周围有大小不等的条片、点结状及块状骨化或钙化影；2 例曾考虑为：恶性骨肿瘤。**结论** 关节严重破坏与患者自觉症状极不相符是其临床特点，同时出现骨质破坏和骨质硬化为特征的关节结构严重紊乱，了解患者的临床病史，结合 X 线表现就能正确诊断及鉴别诊断，注意以骨质破坏为主伴周围软组织肿胀、骨膜反应及骨化影者，易误诊为恶性骨肿瘤，本病需与退行性关节病、痛风、血友病性关节病、滑膜骨软骨瘤病及关节区恶性肿瘤等疾病鉴别。鉴别诊断：（1）退行性骨关节病：关节骨端增生硬化 ，边缘有骨赘形成 ,相应关节间隙变窄,关节面下有囊状透亮区，即退变性囊肿形成，关节无碎裂吸收，关节内无大量游离骨片，脱位少见。（2）痛风性关节炎：血尿酸升高，关节液可有尿酸盐结晶，用秋水仙碱有特效，多在四肢小关节，有典型疼痛及突然缓解发作史，关节周围有痛风结节。（3）血友病性关节病 :早期关节肿大、密度增高，关节面硬化和囊状改变,股骨髁间凹和尺骨鹰嘴窝增宽、加深为本病的特征性改变，有家族史。（4）滑膜骨软骨瘤病：关节骨端一般保持正常，游离体多呈圆形，较规则，边缘清楚，部分伴有退行性骨关节病表现。（5）关节区恶性肿瘤：骨端骨质破坏，骨膜反应，软组织肿块，瘤骨形成等表现。

EPO-1344

MRI Findings of the Anterior Chest Wall in SAPHO Syndrome

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Objective
The aim of our study was to describe the magnetic resonance (MR) imaging findings of the anterior chest wall (ACW) in patients with Synovitis, acne, pustulosis, hyperostosis and osteitis (SAPHO) syndrome.
Materials and Methods
71 SAPHO syndrome patients with ACW involvement was cross-sectional recruited. All patients were scanned by sagittal, axial and oblique coronal T_1 and Dixon T_2-weighted imaging sequence. For each individual, the location of distribution, involvement pattern, and characteristics of the active and structural inflammatory lesions were evaluated.
Results
All 71 patients had lesions in the ACW. And all patients are suffered from active inflammation of the bone or surrounding soft tissues.Bone marrow edema (BME) is seen in 63(88.7%) patients, located in manubrium sterni(61, 85.9%), sternal angle(19, 26.8%), body of stermum(11, 15.5%), left calvicle (29, 40.8%), right calvicle (27, 38.0%), first rib (5, 7.0%), second rib (2, 2.8%). All patients have inflammation in surrounding soft tissues, or joint fluid. There were egg shell-like soft tissue edema around the first anterior rib in 44(62.0%) patients. Structural changes are also

detected in MRI, such as fat infiltration(39, 54.9%), bone destruction(19, 26.8%), hyperosteosis(60, 84.5%), hypetrophy(24, 33.8%), and bony bridging(13, 18.3%). Patients with hyperosteosis, hypetrophy or bony bridging, rather than fat infiltration and bone destruction, have significantly longer disease course, indicating the long course results of this disease.
Conclusions
MR imaging is useful for detection of active inflammation and structural changes distribution asscociated with SAPHO syndrome in one-stop mode. All of the involvement patterns of the diseases demonstrated characteristics of the anatomaical basis and the course of this disease.

EPO-1345
T2 mapping 在强直性脊柱炎骶髂关节炎早期诊断及活动性评估中的临床应用价值

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目的探讨 T2 mapping 诊断早期强直性脊柱炎（AS）骶髂关节炎及判断 AS 活动性的临床应用价值。**方法**前瞻性收集 80 例早期 AS 患者及 30 例健康志愿者，根据 AS 病情活动指数(BASDAI)调查表、实验室检查结果将 AS 患者分为活动组 48 例和非活动组 32 例，所有研究对象均行双侧骶髂关节常规 MRI 及 T2 mapping 检查，由 2 名放射诊断医师独立测量骶髂关节软骨及关节面下病变区骨髓的 T2 值。比较健康志愿者、活动组、非活动组软骨及软骨下骨髓 T2 值的差异。分析软骨 T2 值诊断早期 AS 的能力，软骨下骨髓 T2 值鉴别骶髂关节炎活动性的效能。**结果** AS 患者的软骨的 T2 值为 41.31±6.02，显著高于非活动组 23.71±4.72，P<0.05。活动组关节面下骨髓的 T2 值为 53.65±9.32，显著高于非活动组 43.16±6.51，P<0.05。骶髂关节软骨 T2 值诊断 AS 的最佳阈值为 32.03，特异度、敏感度分别为 89. 2%、88.0%。关节面下骨髓 T2 值判断 AS 活动性的最佳阈值为 49.37，特异度、敏感度分别为 87.6%、90.3%。**结论** T2 mapping 有助于早期诊断 AS，并定量评价 AS 患者骶髂关节炎的活动性。

EPO-1346
Sarcopenia is associated with the neutrophil/lymphocyte ratio in metastatic pancreatic cancer patients

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Abstract. *Background/Aim: We aimed to show the connection between sarcopenia and systemic inflammatory response (neutrophil/lymphocyte ratio [NLR], platelet/lymphocyte ratio [PLR]) in metastatic pancreatic cancer. Materials and Methods: The disease of the sarcopenia in 92 metastatic pancreatic cancer patients as definited as total*

abdominal muscle area was measured from computed tomography images L3 vertebal levels. x^2 test, fisher' s exact test, rank sum test and multivariate logistic regression analysis were used to identify whether NLR or PLR was associated with sarcopenia. Results: We found 67 patients (72.83%) were diagnosed as sarcopenia and 25 patients (27.17%) were non-sarcopenia. NLR has diagnostic significance for sarcopenia. The low NLR (≦4.2) was the more sensitive predictor of sarcopenia (p<0.05). Conclusion: This research demonstrated that sarcopenia was in connection with NLR in patients with metastatic pancreatic cancer. Because of the complicated muscle conditions, NLR could be used as a initial screening for sarcopenia.

EPO-1347
数字 X 线摄影在成骨不全脊柱侧弯中的应用

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目的 了解数字 X 线摄影在成骨不全（OI）脊柱侧弯诊断与治疗中的应用，分析总结不同体位的摄影要点。**方法** 回顾分析 2017 年 1 月-2019 年 6 月 30 日 83 例 OI 脊柱侧弯患者（男：41 人，女 42 人，年龄：3-45 岁，平均年龄：15.8 岁）的脊柱数字 X 线摄影影像资料，包括站立位，坐立位及仰卧位脊柱全长正侧位，术前仰卧左右侧屈位及侧卧支点前后位。**结果** 随访站立（和坐立）位组中共 63 个结构性弯曲（胸弯 36 个，腰弯 27 个），>60° 的重度侧弯有 7 个，≤60° 的轻中度侧弯有 56 个；仰卧位组中共有 25 个结构性弯曲（胸弯 16 个，腰弯 9 个），>60° 的重度侧弯有 4 个，≤60° 的轻中度侧弯有 21 个。手术矫正前站立位组中有 10 个结构性胸弯（4 个胸弯无手术前仰卧左右侧屈位及支点位），4 个结构性腰弯，侧弯角度均>50° 。术前仰卧侧屈位及支点位同手术矫正后 Cobb 角之间均有显著性差异(P〈0.05)， 手术矫正前后全脊柱站立正位 Cobb 角之间有显著差异(P<0.05)，无论是腰弯组还是胸弯组仰卧侧屈位同支点位之间无明显的差异(P〉0.05)。**结论** 通过综合运用不同体位的数字 X 线拍摄方法，可以为 OI 脊柱侧弯初步判断，随访监测，以及术后矫正情况提供重要帮助。

EPO-1348
特发性脊柱侧弯中影响椎间盘磁共振表现的影像分析

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目的：探讨特发性脊柱侧弯 Cobb 角等指标与椎体、椎间盘信号改变之间的关系。
方法：搜集我院 2017 年 1 月至 2019 年 7 月收治经临床、DR 与 MRI 检测确诊为特发性脊柱侧弯的门诊、住院患者完整资料 16 例，其中椎间盘信号改变 6 例，椎间盘信号正常 10 例，回顾性分析其影像学特征。
结果：患者年龄 4-45 岁不等，临床症状以体态改变为主，1 例有疼痛史。16 例均伴有不同程度脊柱曲度改变，5 例出现椎体、肋骨融合。其中椎间盘信号改变组 6 例，椎间盘信号正常组 10 例，侧突中心分别位于胸椎（4 例，66.7%；6 例，60%），腰椎（2 例，33.3%；4 例,40%）。DR 检查 cobb 角 11° - 53° ，其中椎间盘信号改变组 31° -53° ，椎间盘信号正常组 11° -33° 。MRI 检查，椎间盘信号改变组中，侧突椎体出现许莫式结节 3 例，终板 T2 信号增高 2 例，肋骨、椎体融合 1 例；椎间盘单侧 T2 信号减低 4 例，椎间盘信号全面减低 2 例。椎间盘信号正常组中，肋骨、椎体融合 4 例。 经 Fisher's 检验两组病例 Cobb 角（P=0.001<0.05）存在统计学差异；两组中年

龄、侧突中心位置、肋骨及椎体畸形无统计学差异。其中 Cobb 角与椎间盘变性程度呈轻度正相关，r=0.397，*P*=0.031。

结论： 在特发性脊柱侧弯中 Cobb 角的大小在一定程度上可以反映椎间盘的损伤、变性情况，有助于临床及早了解疾病情况。

EPO-1349

MRI 在缓解期 RA 亚临床关节炎诊断中的应用

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目的　探讨 MRI 在缓解期 RA 亚临床关节炎中的诊断与其在 RA 疾病进展预测中的应用价值。　方法　回顾性分析 76 例活动期与缓解期早期 RA 的 MRI 影像资料，比较初诊及 1 年后伴骨侵蚀影像学进展者与不伴骨侵蚀影像学进展者 MRI 滑膜炎、骨侵蚀、骨髓水肿等影像学征象差别。　结果　缓解期 RA 在压痛关节数（TJC28）、肿胀关节数（SJC28）、DAS28、ESR、CRP、滑膜炎、骨髓水肿均低于活动期（P < 0.001）；一年后经治疗达到缓解期的 RA 在 MRI 上发现了亚临床关节炎，其中滑膜炎（42/76，55.3%）、骨髓水肿（30/76，39.5%），有 25 例（25/76，32.9%）早期 RA 伴有骨侵蚀影像学进展。一年后有骨侵蚀影像学进展者在初诊时骨髓水肿及 CRP 均高于不伴有骨侵蚀影像学进展者（P < 0.05），而 MRI 滑膜炎及骨侵蚀初诊时差异无明显统计学意义（P > 0.05）；一年后，伴骨侵蚀影像学进展者骨髓水肿及骨侵蚀评分均高于不伴骨侵蚀影像学进展者（P < 0.05），而两者滑膜炎评分差异无明显统计学意义（P=0.13）。　结论　缓解期 RA 仍存在一定亚临床关节炎，MRI 上提示的骨髓水肿能预测未来 RA 影像学疾病进展。

EPO-1350

坐骨结节滑囊炎的 MRI 诊断价值

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目的 探讨坐骨结节滑囊炎的 MRI 诊断价值。方法 回顾性分析经手术病理确诊的 17 例坐骨结节滑囊炎的 MRI 表现，分析其影像特征。结果 本组病例共 20 个病灶，其中 3 例两侧发病。病灶均位于坐骨结节与臀大肌之间，可达皮下。病灶为单个或多个囊性液体样信号影；囊内为单纯滑液或伴有少量纤维素 T1WI 呈低信号，T2W 呈高信号，信号均匀；囊内纤维素分泌较多或合并出血者 T1WI 呈等或高信号，T2W 呈高信号，信号多不均匀，可见液-液平面。增强扫描囊壁、间隔轻度或中等度强化，囊壁厚，内壁不光滑，囊液无强化；合并周围软组织感染时呈环形强化。部分病灶可见蒂或宽基底与坐骨结节相连。1 例病灶因合并感染并与皮肤穿通形成瘘道。结论 坐骨结节滑囊炎 MRI 表现具有特征性，MRI 平扫及增强检察诊断坐骨结节滑囊炎能提供准确的解剖信息及了解并发症，为手术提供帮助，具有重要的临床意义。

EPO-1351

类风湿性关节炎累及颈椎的影像学特点分析

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【摘要】 目的 分析和探讨类风湿性关节炎累及颈椎的影像学特点及诊断，提高对本病的认识。**方法** 回顾分析 104 例类风湿性关节炎累及颈椎的相关影像学资料，对其影像学特点进行分析、总结。**结果** 104 例中 4 例（3.8%）为病变早期，X 线平片或 CT 无明显异常改变；100 例（96.2%）于 X 线平片或 CT 中可见不同程度骨质破坏；32 例（30.8%）可于 MRI 显示血管翳形成。104 例中 73 例（70.2%）单独存在一种或同时存在数种的颈椎不稳定，其中 50 例寰枢关节前后半脱位，39 例垂直半脱位，34 例下颈椎半脱位；20 例（19.2%）存在脊髓受压、变性。**结论** 类风湿性关节炎累及颈椎在破坏颈椎骨质及周围组织结构的同时，常造成颈椎的不稳定，继而引起一系列临床症状及并发症，需要引起临床医生及影像医生的重视。

EPO-1352
Revolution HD CT 能谱扫描及后重建对痛风结节诊断的临床价值

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GE Revolution HD 能谱 CT 一台超高端能谱 CT 采 用 高（140 kV）、低（80 kV）能量瞬时切换，几乎在同时同角度得到 2 种能量 X 线的采样数据，并根据这两种能量数据确定体素在 40～140 keV 能量范围内的衰减系数，进一步得到 101 个单能 量图像，这种相对纯净的单能量图像能够大大降低硬化伪影的影响并获得相对纯净 CT 值的图像，即 CT 值无论在整个视野不同位置、不同扫描，还是不同病人中，都更为一致和可靠。 由于不同物质对于不同能量的 X 射线有不同的、特异性的吸收系数，这是能谱 CT 相比传统单能 CT 相比最大的优势所在。

痛风确诊的金标准是通过受累的关节穿刺找到特征性的尿酸盐结晶，但该项检查有创；同时关节滑液内尿酸钠结晶数量少，穿刺部位较深或操作员的技术水平不足，都可能使假阴性结果增多，导致对部分不典型发病部位、血尿酸水平正常的患者诊断困难。因此，通过影像方法进行无创性早期关节内尿酸盐结晶的检测成为目前临床工作的重点，现在用于确诊并监测痛风的影像学技术包括常规 X 线、超声波、CT 及 MRI。

X 线检查：早期急性关节炎仅表现为软组织的肿胀，关节显影正常。随着病情的进展，与痛风石邻近的骨质可出现不规则或分叶状的缺损，边缘呈翘状突起；关节软骨缘破坏，关节面不规则。进入慢性关节炎期后可见关节间隙变窄，软骨下骨质有不规则或半圆形的穿凿样缺损，边缘锐利，缺损边缘骨质可有增生反应。

CT 与 MRI 检查：沉积在关节内的痛风石，根据其灰化程度的不同在 CT 扫描中表现为灰度不等的斑点状影像。痛风石在 MRI 检查的 T1 和 T2 影像中均呈低到中等密度的块状阴影，静脉注射钆可增强痛风石阴影的密度。但这些方法的特异性不高。GE Revolution HD 能谱 CT 所独有的能谱分析功能，是近些年来发展起来的影像学检查方法，它可以无创性评价痛风患者尿酸盐结晶的沉积，协助诊断痛风，监测疾病进展。

EPO-1353
类风湿关节炎 MRI 表现与血清 RF、抗 CCP 抗体的相关研究

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摘要：目的 探讨类风湿关节炎（rheumatoid arthritis，RA）腕关节 MRI 表现与血清学类风湿因子（rheumatoid factor，RF）、抗环瓜氨酸多肽抗体(anti-cyclic peptide containing citrulline,anti-CCP)指标的相关性。**方法** 回顾性分析经 2009 年美国风湿学会及欧洲风湿联盟(American College of Rheumatology/the European League Against Rheumatism,ACR/EULAR)发布的诊断标准诊断为 RA 而未经任何治疗的患者的腕关节 MRI，并收集其血清 RF、抗-CCP 抗体结果，共收集 67 例资料齐全的病例，对每例患者的腕关节滑膜炎、骨髓水肿及骨侵蚀进行 MRI 评分分级。按 RF、抗-CCP 抗体结果阴阳性对 67 例患者的 MRI 评分进行分组，并对各组 MRI 评分进行统计分析。**结果** 67 例患者中 RF 阴性者 22 例，其中抗-CCP 抗体阴性 21 例，抗-CCP 抗体阳性 1 例。RF 阳性者 45 例，其中抗-CCP 抗体阴性 24 例，抗-CCP 抗体阳性 21 例。RF 阴性组 MRI 滑膜炎、骨髓水肿评分均低于 RF 阳性组且差异具有统计学意义(p 均＜0.05)，而骨质侵蚀的评分二者没有差异(p＞0.05)。RF 阳性组中不管是否出现抗-CCP 抗体阳性其滑膜炎、骨髓水肿及骨侵蚀的评分均没有统计学差异(p 均＞0.05)。**结论** RF 阳性的 RA 患者腕关节 MRI 所表现的病理改变较 RF 阴性者更严重，抗-CCP 抗体对 RA 腕关节病理改变程度影响不显著。

EPO-1354
基于 QCT 对内蒙古地区蒙古族与汉族健康人群腰椎 BMD 的应用研究

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目的：利用 QCT 对内蒙古地区蒙古族与汉族健康人群腰椎骨密度进行测量，对比分析两个族群骨密度值及不同年龄组别骨量丢失情况，进一步探讨 QCT 无体模测量腰椎 BMD 的可行性，以提高骨质疏松症早期诊疗水平。
材料与方法：拟从内蒙古自治区中西部地区蒙古族、汉族健康人群中选各 400 名健康志愿者进行 QCT 骨密度测量，严格制定并执行志愿者民族纳入标准。有、无校准体模组均行腰椎螺旋 CT 扫描，采集容积数据，范围包括 L2～L4 椎体。选用美国 Mindways 公司的 5 样本固体体模。骨密度测量使用 Mindways 公司的 QCT-PRO 分析软件进行测量。测量 L2～L4 椎体松质骨 BMD。测量时需避开骨皮质及椎体后中央静脉走行区。无校准体模组测量步骤：①通过腰椎矢状面图像选取平行终板的腰椎中心横断面；②在腰椎中心横断面手动设置感兴趣区包括：骨质区及作为内部参考区域的椎旁肌肉区和皮下脂肪区。有校准体模组及无校准体模组数据分析均采用 SPSS19.0 进行统计学分析。计量资料采用均数±标准差表示；对男女腰椎 BMD 按每 10 岁年龄段进行分组，获取各年龄段骨密度均值及骨密度丢失率。相邻组间骨丢失的显著性及两民族间腰椎 BMD 差异性采用 t 检验进行比较。无校准体模法 QCT 和有校准体模法 QCT 测量结果相关性分析，P<0.05 时有统计学意义。
结果：通过有校准体模 QCT 对蒙古族和汉族健康人群腰椎 BMD 进行测定，对蒙古族、汉族健康人群腰椎 BMD 及各年龄段骨丢失情况进行对比分析有统计学意义(P<0.05)；无校准体模 QCT 与有校准体模 QCT 测量 BMD 具有相关性(P<0.05)。
结论：QCT 测量蒙古族、汉族健康人群腰椎 BMD 以期对骨质疏松症进行早期预测、预防和治疗，提高骨质疏松症的诊治水平，为国人 BMD 大样本数据库、定量 CT 随机性筛查提供临床依据。

EPO-1355

Quantitative evaluation of subchondral bone microarchitecture in knee osteoarthritis using 3T MRI

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Background: Osteoarthritis (OA) is now increasingly recognized as being related to the whole joint instead of the cartilage alone. In particular, the importance of subchondral bone in OA pathogenesis has drawn a lot of interest.The aim of this study is to investigate subchondral bone microstructural features in two femoral condyles of human knee osteoarthritis.

Methods: Eighty subjects were enrolled in our study and divided into three groups: without OA (group 0), mild OA (group 1), and severe OA (group 2). Sagittal 3D Balanced Fast Field Echo (3D-FFE) images were obtained by 3TMRI to quantify trabecular bone structure, and sagittal FatSat 3D Fast Field Echo (3D-FFE) images were acquired to assess cartilage thickness. Trabecular bone parameters, including bone volume fraction (BVF), erosion index (EI) and the trabecular plate-to-rod ratio (SCR), and trabecular thickness were evaluated using digital topological analysis.Subchondral bone and cartilage parameters between different groups and different locations were compared,and their correlations were analyzed.

Results: Within two femoral condyles, subchondral bone structure was deteriorated in mild OA, showing a lower BVF (−0.011 to −0.014 $P < 0.001$), a higher EI (0.346 to 0.310 $P < 0.001$), a lower SCR (−0.581 to −0.542 $P < 0.001$)) and lower trabecular thickness (−6.588 to −4.759 $P < 0.05$). In severe OA, BVF was further decreased, but EI, SCR and trabecular thickness showed no significant difference than mild OA($P > 0.05$). Moreover, there was a lower BVF, SCR and higher EI in the medial femoral condyle in each group. Interestingly, cartilage attrition mainly occurred in the medial femoral condyle. Medial cartilage thickness was not only positively correlated with the ipsilateral femoral BVF ($r = 0.321$ $P = 0.004$) but also with the opposite femoral BVF ($r = 0.270$ $P = 0.015$).

Conclusions: Our results indicated that deterioration in the trabecular bone structure in both femoral condyles could more sensitively reveal early OA, and BVF could be a better biomarker to evaluate OA severity.

EPO-1356

Cannabinoid receptor 2 agonist prevents local and systemic inflammatory bone destruction in rheumatoid arthritis

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Abstract

Cannabinoid receptor 2 (CB2) has been implicated as an important clinical regulator of inflammation and malignant osteolysis. Here, we observed that CB2 expression was markedly higher in the collagen-induced arthritis (CIA) mice synovium and bone tissues than in the non-inflamed synovium and bone tissues. The CB2 selective agonist (JWH133) but not antagonist (SR144528) suppressed CIA in mice without toxic effects, as demonstrated by the decreased synovial hyperplasia, inflammatory responses, cartilage damage, and periarticular and systemic bone destruction. JWH133 treatment decreased the infiltration of pro-inflammatory M1-like macrophages and repolarized macrophages from the M1 to M2 phenotype. Similarly, activation of CB2 increased the expression of anti-inflammatory cytokine interleukin (IL)-10 and reduced the expression of pro-inflammatory cytokines, including tumor necrosis factor-α, IL-1β, and IL-6. In addition, JWH133 treatment attenuated osteoclast formation and osteoclastic bone resorption, and reduced the expression of receptor activators of the nuclear factor-κB (NF-κB) ligand (RANKL), matrix metallopeptidase-9, tartrate-resistant acid

phosphatase, cathepsin K, and nuclear factor of activated T-cells 1 in CIA mice and osteoclast precursors, which were obviously blocked by pretreatment with SR144528. Mechanistically, JWH133 inhibited RANKL-induced NF-κB activation in the osteoclast precursors. We found that JWH133 ameliorates pathologic bone destruction in CIA mice via the inhibition of osteoclastogenesis and modulation of inflammatory responses, thereby highlighting its potential as a treatment for human rheumatoid arthritis.

EPO-1357
磁共振化学位移成像联合体质指数评估青年骨量减少的价值

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目的 评估磁共振化学位移成像联合体质指数（BMI）对于青年骨量减少的诊断价值。**方法** 将 67 名被试按照双源 X 线吸收法（DXA）骨密度测量结果分为骨量偏少组（n=38）及骨量正常组（n=29）。利用 MRI 对两组人员膝关节进行扫描获取髌骨脂肪含量分数（FF），同时计算受试者的 BMI 值。运用独立样本 t 检验对两组的 FF 及 BMI 值进行比较，运用 ROC 曲线分别评价两种指标诊断骨量减少的敏感性、特异性及曲线下面积（AUC）；应用 ROC 曲线评价两种指标联合诊断骨量减少的敏感性、特异性及 AUC，并对比两种指标联合与单个指标的诊断准确性。**结果** 两组人员在年龄上无差别（$P>0.05$）；骨量偏少组髌骨 FF 值大于骨量正常组[（80.5±1.4）vs（78.6±1.2），$P<0.01$]，而骨量正常组 BMI 值大于骨量偏少组[（23.1±2.0）vs（20.2±1.9），$P<0.01$]。ROC 曲线分析显示：FF 及 BMI 值诊断骨量减少的敏感性、特异性、AUC 分别为 68.4%、75.9%和 0.808（95%CI：0.693-0.894）；73.4%、89.7%和 0.858（95%CI：0.751-0.931）；两种指标联合诊断骨量减少的敏感性、特异性、AUC 分别为 86.8%、86.2%、0.920（95%CI:0.858,0.982）；两种指标联合对于骨量减少的诊断效能优于单个指标（P=0.0136，P=0.0187）。**结论** 磁共振化学位移成像联合 BMI 指数可以较为准确地诊断青年骨量减少，可以作为评估青年骨量的一种可靠办法。

EPO-1358
Changes of density in lumbar Paravertebral muscles of healthy subjects estimated by virtual monochromatic image technique

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Objective: To evaluate age-,sex- and lumbar level-dependent changes of density in lumbar Paravertebral muscles of healthy subjects by virtual monochromatic image technique.
Methods: Data from 124 healthy participants(61 men and 63 women), who underwent lumbar spine examinations were retrospectively collected. The measurement was performed using virtual monochromatic spectral 70keV images. For checking the age-dependent changes, the mean densities of the muscles were compared between the young, middle and old groups. For the level-dependent changes, those muscle were compared at each disc level

in each age group. The same to sex-dependent changes, which were compared between men and women. Statistical significance was P <0.05.
Results: The density of ES, MF and PS decreased markedly with age ,which were significantly different among each age group (P<0.05). The MF decreased the most, followed by the ES. There was no significant age-dependent changes in the mean density of the PS muscle. The density of Paravertebral muscle at L4/5 and L5/S1 level were significantly lower than upper levels and degenerated first (P<0.05) .Significant sex-dependent differences were found among the three age groups, with men showing higher than women(P<0.05).
Conclusion: Degeneration of the lumbar Paravertebral muscles of healthy subjects were affected by age, gender and disc level.

EPO-1359

The correlation between bone mineral density and coronary artery disease in postmenopausal women

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ObjectiveTo analyze the relationship between frequent risk factors for cardiovascular disease and BMD in postmenopausal women with asymptomatic coronary artery disease, and to investigate the correlation between the change of BMD and coronary atherosclerosis score. **Methods** One hundred twelve Han patients underwent quantitative CT of their lumbar vertebrae for BMD, and within 2 weeks, multislice spiral CT of their coronary arteries for calcification score and total calcification score. Based on the T-score of the lumbar spine, patients were divided into three groups: control, osteopenia, and osteoporosis groups for analysis of variance for continuous variables. The clinical data and BMD were analyzed by multiple regression. **Result** Age was significantly greater in the osteoporosis group than in the other two groups ($P < 0.05$). The BMD and total coronary calcification score (TCS) were significantly different among three groups. 25-hydroxyvitamin D levels were significantly different between the osteoporosis group and the control group ($P < 0.05$). Multiple regression analysis showed that the factors for TCS in patients included age, smoking, HDL, and BMD, while age and TC were risk factors and HDL and BMD were protective factors. There was a negative correlation between the coronary artery calcification score and BMD.
Conclusions The results showed postmenopausal women with asymptomatic coronary heart disease along with osteopenia or osteoporosis may have a higher risk of developing calcified plaque. BMD could be considered a new index for assessing coronary atherosclerosis. Vitamin D deficiency may be another factor which affects both BMD and vascular calcification.

EPO-1360

64 排 128 层螺旋 CT 双能量成像技术在痛风结石诊断中的临床应用

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[摘要] 目的：探讨 64 排 128 层螺旋 CT 双能量成像技术（dual-energy computed tomography ,DECT）在检测关节痛患者尿酸盐结晶沉积情况的应用价值。方法：对 70 例关节痛患者进行 DECT 扫描，根据血尿酸浓度是否超出正常范围将其分为病例 35 例实验组和 35 例对照组。图像由三名医师独立进行评价，并采用三维容积再现（VR）、最大密度投影（MIP）、 多平面重组（MPR）技术重建，比较两组尿酸盐沉积的差异，进一步评价患者血尿酸浓度、病程长短与病灶数目的相关性。结果：本组 35 例血尿酸浓度超出正常范围患者中均发现有尿酸盐沉积，对照组均未见尿酸盐沉积。结论：64 排 128 层螺旋 CT 双能量成像技术能够灵敏的检出单独存在或合并痛风性关节炎的患者，对早期、无创性诊断痛风性关节炎具有重要应用价值。

EPO-1361

3.0 T MRI mDixon 技术对骨质疏松症患者腰椎功能性骨骼-肌肉单元的定量研究

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目的：骨骼肌质量和肌力的下降与骨质疏松症的发生密切相关。本研究的目的是通过 3.0 T MRI 多回波 Dixon 技术定量研究不同骨量水平患者腰椎椎体和椎旁肌肉的骨骼-肌肉单元的变化规律。
方法：本研究共纳入 56 名受试者，根据定量 CT（QCT）检查分成三组，包括骨质疏松组（n = 16,年龄= 61.0±9.5 岁，T 值 = -3.32±0.68），骨量减少组（n = 20，年龄= 54.2±10.3 岁， T 值 = -1.84±0.29），正常组（n = 20,年龄= 45.9±10.7 岁，T 值= 0.15±0.83）。所有患者使用西门子 3.0T MRI（MAGNETOM Skyra，Siemens AG，Germany）检查。使用 18 通道脊柱线圈，在在单次屏气（15s）期间，使用 3D 梯度多回波 Dixon 化学位移序列，具体参数如下：TR：9.0ms; TE：1.23 ms，2.46 ms，3.69 ms，4.92 ms，6.15 ms 和 7.38 ms;翻转角度：4.0°，读出回波带宽 1080 Hz /像素;层厚：2.5 毫米，FOV：380x380mm,分辨率：256×256。扫描完成，自动生成 FF-mapping 图，在腰 3 椎体中间水平，分别绘制 ROI，测量椎体（VB），竖脊肌（ES），腰大肌（PMM），腰方肌（QLM）和腹直肌（RAM）的脂肪分数（FF）。不同组之间 FF 采用单因素方差分析以评估组间差异。
结果：总体而言，随着 T 值的降低，椎体和椎旁肌肉的脂肪含量增加。具体而言，与正常组相比，骨量减少组 VB、ES 和 RAM 的 FF 显著增加有统计学差异（P < 0.05），而 QLM 和 PMM 的 FF 增加无统计学差异（P> 0.05）。与骨量减少组相比，骨质疏松组 VB、ES、PMM、QLM 和 RAM 的 FF 均显著增加有统计学差异（P < 0.05）。
结论：多回波 Dixon 技术可以定量反映腰椎功能性肌骨单位脂肪含量的变化，可作为骨质疏松症进展的无创定量监测工具。

EPO-1362

3.0T MRI mDixon 技术和 IVIM-DWI 在原发性骨质疏松症患者中的应用研究

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材料与方法：本研究共纳入 56 名受试者，根据定量 CT（QCT）检查分成三组，包括骨质疏松组（n = 16,T 值 = -3.32±0.68），骨量减少组（n = 20，T 值= -1.84±0.29），正常组（n = 20,T 值 = 0.15±0.83）。所有患者使用西门子 3.0T MRI（MAGNETOM Skyra，Siemens AG，Germany）检查，使用 18 通道脊柱线圈。IVIM-DWI 的扫描参数：TR/TE，1600/72.4ms，8 个 b 值（0,50,100,150,200,250,300,400,600 和 800 秒/mm ^{2}）。mDixon 的扫描参数如下：TR 9.0 ms，TE 1.23 ms，2.46 ms，3.69 ms 4.92 ms，6.15 ms 和 7.38 ms，层厚 3 mm。分别在正中矢状位 IVIM 参数图和 FF 图的腰 2-4 椎体中心手动绘制 ROIs。 进行单因素方差分析以评估不同组之间 FF 和 IVIM 参数（f 值，D 值和 D*值）的组间差异的显著性。
结果：正常组的 FF，D 和 D*分别为 43.63±7.88，0.393±0.105，78.19±16.06；骨质疏松组分别为 49.58±5.02，0.356±0.097，87.36±21.39；骨质疏松组为 57.88±10.01，0.303±0.069，97.27±29.65。骨质疏松组，骨质减少组和正常组的 FF，D 和 D*差异存在统计学意义（p <0.05）。D 值与 T-score 之间呈显著正相关（r = 0.854，P <0.001），D*值（r = -0.785，P <0.001）和 FF（r = -0.882，P <0.001）与 T-score 呈显著负相关。
结论：mDixon 技术结合 IVIM-DWI 可以定量反映腰椎微循环灌注和脂肪含量的变化，可作为监测骨质疏松症进展的生物标志物。

EPO-1363
双能 CT 痛风石软件参数对提高尿酸盐结晶检出敏感性的初步研究

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目的：文献报道 DECT 痛风石成像有一定的假阳性和假阴性，对于痛风石较小（小于 2mm）时可能存在假阴性，而双能 CT 痛风石软件 GOUT 80 KV 下默认的 Soft Tissue 阈值 50 hu 可能存在一定假阴性。本文有可能提供一种改善假阴性的后处理方法。**方法：**回顾性分析 47 名临床疑似痛风患者，其中 15 例已取得病理结果证实为痛风，均已行双源 CT 双能量成像，所得图像传至双能量痛风结晶分析软件 GOUT 进行分析，调整 GOUT 软件的 80KV 下软组织（Soft Tissue）CT 阈值，根据阈值的不同分为 50HU 组（对照组，机器默认参数），90HU 组（实验组），实验组的斜率（Ratio）调整为 1.10，其余参数均不变，在伪彩图上观察并记录三组显示痛风结石的部位、数目及体积，并做统计学分析。**结果：**,2 组资料显示痛风结晶部位数及痛风结晶体积具有明显差异，实验组 2 较对照组多（$P<0.05$）。2 组显示痛风石数目分别为 3.76 ± 3.88、4.88 ± 4.55（$P<0.05$）。2 组显示痛风石体积分别为 136.89±482.01 mm³、149.6±491.94 mm³，实验组较对照组明显增加（$P<0.05$）。**结论：**双能 CT 痛风石软件 GOUT80KV 下不同 Soft Tissue 阈值对显示尿酸盐结晶的部位、数目和体积具有显著差异，高阈值结合斜率调整有助于提高尿酸盐结晶的检出率，尤其对早期痛风结晶的检出更为敏感，值得临床进一步深入研究。

EPO-1364

双源 CT 识别尿酸盐结晶对痛风诊断的临床价值

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目的　　分析广西籍痛风病人临床特点，探索 DSCT 在痛风诊断的价值及所示 MSU 沉积特点。
材料与方法　1、收集广西医科大一附院风湿免疫科疑似痛风 102 例患者的临床资料。2、判断 DSCT 诊断痛风的敏感性与特异性。3、测量确诊痛风病例 DSCT 所示的尿酸盐结晶体积，与其年龄、病程、结节数目及生化指标进行相关性分析及其沉积部位。4、分析足趾趾甲绿色伪彩的真实性。5、20 例患者治疗前后，DSCT 检查 MSU 部位及体积变化。
结果　本组确诊痛风 86 例，非痛风 16 例。平均年龄 55.8±12.7 岁，平均病程 91.7±63.6 月，平均发病年龄 47.8±11.8 岁；男女比例约 11.3:1。急性发作时平均血尿酸水平 497.3±122.9μmol/L；平均肌酐水平 122.2±67.8μmol/L；C 反应蛋白阳性率 89.7%，血沉加快阳性率 85.9%；44 例测得类风湿因子阳性 20 例，即 42 例单纯痛风患者类风湿因子阳性率为 42.9%。83.7%患者存在合并症。

双源 CT 诊断痛风的敏感性为 96.5%，特异性为 87.5%。测得 MSU 体积 1mm3~279.55cm3，中位数 2.52cm3。尿酸盐沉积体积与年龄、病程、血尿酸水平及肌酐水平均无相关性，但与结节数呈正相关。尿酸盐沉积好发于下肢关节，依次是足部关节、膝关节、踝关节。痛风组与非痛风组甲部伪彩体积差异有统计学意义。痛风结晶手术标本组最大径与 DSCT 测量组差异有统计学意义，且前者均数较大。复查病例治疗前后体积大小变化与临床治疗效果相符。
结论 1、痛风多发于中青年男性，常单关节起病，常伴发多种代谢性疾病。
2、双源 CT 对诊断痛风有较高的敏感性与特异性。
3、双源 CT 显示 MSU 体积与年龄、病程、单次血尿酸、肌酐水平均无相关性，与结晶数呈正相关。
4、足趾趾甲处绿色伪彩显示，对临床诊断有一定指导意义。影像医师应仔细分辨其形态、大小。
5、双源 CT 可用于痛风病情监测。

EPO-1365

《Asir 重建技术在青少年全脊柱侧弯 CT 低剂量扫描中的应用研究》

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目的：应用 Asir（自适应统计迭代重建）技术，可以从图像中删除多余的噪声，改善图像质量，降低辐射剂量。**方法：**筛选 10-15 岁临床确诊全脊柱测弯病人 50 名（男:10 名，女：40 名）。在非高清模式下，采用自动毫安控制技术，改变 NI（噪声指数），随机分成 NI10（10 例）、NI15（10 例）、NI20（10 例）、NI25（10 例）、NI30（10 例）进行扫描，其余参数完全相同，从工作站记录辐射剂量 DLP,然后五组分别应用 Asir 重建技术：SS=0,10,20,30,40,50,60,70,80,90,100 降噪比，0.625mm 后处理重建。**结果：**从默认序列 NI10 组和增加 NI25 两组发现具有代表性，遂进行比较，两组所接受的辐射剂量差异有统计学意义（P＜0.05），两组图像评分结果无显著差异（P＞0.05）。**结论：**采用自动毫安控制技术，改变 NI（噪声指数）为 25 时，并应用 Asir 降噪比 70%对于青少年全脊柱侧弯的 CT 低剂量扫描较为满意，随着 CT 在临床应用中的不断深化，人们对 CT 的射线剂量，对人体造成的潜在危害和如何保证图像质量的前提下有效地降低剂量越来越关注。尤其对青少年的辐射剂量降低意义更大，从而真正实现国际放射防护委员会（ICRP）主张 X 射线诊断实践正当化，防护最优化的原则。

EPO-1366

低剂量全脊柱 CT 成像联合模型迭代技术应用于青少年特发性脊柱侧弯术前评估的可行性研究

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目的 评价联合模型迭代技术的低剂量 CT 全脊柱成像应用于青少年脊柱侧弯术前评估的可行性。**方法** 48 例青少年脊柱侧患者随机分为两组，A 组 20 例，B 组 28 例。患者行全脊柱平扫，扫描范围从颅底至骶椎下缘。扫描方案管电压 A 组 120kV，B 组 80kV， 管电流均采用自动管电流调节技术，参考管电流 100mAs；原始数据 A 组采用 FBP 技术重建，B 组采用模型迭代技术重建。对两组图像质量进行主客观评估。主观评价采用 5 分制量表根据图像噪声，图像伪影，脊柱病变结构显示，诊断信心几方面进行评分，客观评价针对颈段、胸段、和腰段分别进行，评价指标包括 CT 值，图像噪声，和对比噪声比（CNR）。比较两组图像主观评分及客观指标，并记录有效辐射剂量。**结果** B 组平均有效辐射剂量为（1.19±0.28） mSv，较 A 组（4.43±0.85）mSv 降低 73.1%。两组主观图像质量评分无统计学差异（Z=0.940，p=0.347），客观图像质量各层面 CT 值无统计学差异；图像噪声颈段无统计学差异，胸腰段 B 组低于 A 组；SNR 及 CNR 各层面低 B 组均高于 A 组。**结论** 与采用常规剂量扫描及 FBP 重建所得图像相比较，采用低剂量扫描联合迭代模型重建能提高图像质量，可用于青少年特发性脊柱侧弯术前评估。

EPO-1367

第三代双能 CT 对膝关节骨髓水肿的诊断价值

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目的：评估第三代双能 CT 虚拟去钙技术（Virtual Non-calcium , VNCa）对膝关节骨髓水肿的诊断价值。**方法：** 50 例膝关节外伤患者行双能 CT 及 3.0T MR 检查。两名放射学医师分别在第三代双能 CT 虚拟去钙伪彩图上对膝关节是否存在骨髓水肿进行评估，测量并记录 CT 值。将 MR 图像作为参照标准，评估第三代双能 CT 对膝关节骨髓水肿诊断的灵敏度、特异度、准确度、阳性预测值及阴性预测值，并对所测得的 VNCa CT 值进行 ROC 曲线分析。**结果：**在定性分析中，股骨下端双能 CT 虚拟去钙伪彩图像评估骨髓水肿的敏感度、特异度、阳性预测值、阴性预测值及准确度分别为 91.7%，98.7%，95.7%，97.4%，97%；胫骨上端以上各值分别为 96%，100%，100%，98.7%，99%，较一、二代双能 CT 得到提高。定量分析时，骨髓水肿区域与非骨髓水肿区域所测得的 VNCa CT 值存在统计学差异（P<0.001）。ROC 曲线分析显示曲线下面积（AUC）为 0.931±0.025。截止值-67HU 对区分膝关节水肿区的敏感度为 84.7%，特异度为 99.5%，准确度为 92.1%，阳性预测值为 99.4%，阴性预测值为 86.7%。**结论：**第三代双能 CT 虚拟去钙图像对膝关节骨髓水肿的诊断价值较一、二代双能 CT 高。

EPO-1368

断层融合在髋关节置换 假体周围骨折中的应用

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目的：比较人工髋关节置换后假体周围骨折的不同影像学检查方法，为临床髋关节假体周围骨折预防提供最优的检查方法。
方法：收集我科自 2015 年以来的人工髋关节置换假体周围骨折的影像检查 15 例，图像均采用 DR 常规正斜位及大平板多工功能透视摄影系统患侧髋关节体层摄影。DR 常规髋关节摄影正侧位均包全置换假体，大平板多功能透视摄影系统选取断层摄影采集患侧髋关节正斜位图像，原始图像采集经后处理软件处理显示患侧逐层的断层图像。
结果：常规 DR 检查中发现假体周围骨折明显确诊 10 例，余 5 例不明显漏诊。采用断层融合采集处理的 15 例均明确诊断，随访观察断层融合诊断与临床诊断相符。
结论：人工髋关节置换后假体周围骨折有较大隐蔽性及不可预见性，提早检查发现预知，可作出合理的预防处理，关系假体的稳定性及功能恢复。女性、高龄、肥胖、骨质疏松及非骨水泥固定型假体柄等均是假体周围骨折的危险因素。常规 DR 摄影因重叠影像对较为隐蔽的骨折不易确诊，断层融合解决了深在部位和复杂部位的透照诊断问题，降低了漏诊和误诊。此检查比 CT 简单、经济、辐射剂量低，是髋关节假体置换术后的高价值影像检查方法

EPO-1369

3.0 T MRI mDIXON 序列在评估骨质疏松症患者的腰椎旁肌肉脂肪浸润的研究

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目的：骨质疏松症已成为严重的全球公共卫生问题。据报道，肌肉力量是骨骼结构的重要决定因素。然而，肌肉脂肪浸润与骨质疏松症的相关性仍不清楚。本研究的目的是探讨应用多回波 Dixon 技术定量评估原发性骨质疏松患者的椎旁肌肉脂肪浸润程度的变化规律。
方法：本研究共纳入 56 名受试者，根据定量 CT（QCT）检查分成三组，包括骨质疏松组（n = 16,7 名男性，年龄= 61.0±9.5 岁，T 值 = -3.32±0.68），骨量减少组（n = 20，9 名男性，年龄= 54.2±10.3 岁， T 值= -1.84±0.29），正常组（n = 20,6 名男性，年龄= 45.9±10.7 岁，T 值= 0.15±0.83）。所有患者使用西门子 3.0T MRI（MAGNETOM Skyra，Siemens AG，Germany）检查，使用 18 通道脊柱线圈。为了定量评估椎旁肌肉脂肪含量，使用 3D 梯度多回波 Dixon 化学位移序列，具体参数如下：TR 9.0 ms，TE 1.23 ms，2.46 ms，3.69 ms 4.92 ms，6.15 ms 和 7.38 ms，翻转角度 4.0°，读出回波带宽 1080 Hz /像素，层厚：2.5 mm，FOV：400×400mm，矩阵 256×256。通过 Liverlab 软件自动生成脂肪分数图（FF mapping），手动勾画出竖脊肌（ES），腰大肌（PMM），腰方肌（QLM）和腹直肌（RAM）的轮廓，软件自动测量 FF。进行单因素方差分析以评估不同骨量组椎旁肌肉 FF 差异的显著性。
结果：总体而言，随着 T 值的降低，受试者椎旁肌肉脂肪含量增加。具体而言，与骨量减少组和正常组相比，骨质疏松组的 FF_{EM}，FF_{PMM}，FF_{QLM} 和 FF_{RAM} 显著增加（P <0.05），而正常组的 FF_{QLM} 和 FF_{PMM} 与骨质减少组相比无统计学差异（P> 0.05）。
结论：3.0T MRI mDIXON 技术具有定量检测椎旁肌肉脂肪含量的能力，FF 的可作为骨质疏松症进展的生物标志物。

EPO-1370

3.0T MR 磁化转移成像（MT）技术在原发性骨质疏松症中的应用研究

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目的：骨质疏松症已成为全球公共卫生和前沿研究热点问题。磁化传递（MT）技术可以间接地反映大分子蛋白质含量的变化。因此，本研究的目的是利用 3.0T MR 磁化传递成像技术评估不同骨量水平腰椎椎体磁化传递率的变化规律。
材料与方法：共 56 名接受椎体定量 CT（QCT）骨密度检测的患者入选本次研究，根据 WHO 骨质疏松诊断标准 T 值分为三组（骨量正常，骨量减少和骨质疏松组）。所有患者使用西门子 3.0T MRI（MAGNETOM Skyra，Siemens AG，Germany）检查。矢状位 flash2D 序列扫描两次，一次包含 MT 序列（Ms），另一次不含 MT 序列（Mo），MT 序列是用以下参数进行的：TR = 405 ms，TE = 3.69 ms，Flip Angle（FA）= 70°，iPAT= 2，空间分辨率= 1.1×1.1×3 mm，带宽= 250 Hz /像素，采集矩阵= 192×192，FOV = 280 mm，层数= 15。每个受试者总成像时间为 2 分 58 秒。分别在正中矢状位 Ms 和 Mo 图上腰 2-4 椎体手动绘制 ROIs（面积约 1.0 cm^2）。 MT 效应通过磁化传递率（MTR）量化：MTR =（Mo-Ms）/ Mo×100%。进行单因素方差评估不同组之间 MTR 的显著性。
结果：骨质疏松组（n = 16,年龄= 61.0±9.5 岁，T 评分= -3.32±0.68），骨质减少组（n = 20，年龄= 54.2±10.3 岁），T 评分= -1.84±0.29），并且正常组（n = 20,年龄= 45.9±10.7 岁，T 评分= 0.15±0.83）。骨质疏松，骨质减少和正常 BMD 组的 MTR 分别为（3.67±2.61），（7.50±4.57）和（12.71±7.50），差异有统计学意义（P <0.05）。 T-评分与 MTR 之间呈正相关（r = 0.894，P 值<0.001）。
结论：MT 技术能够提供有关大分子对 MR 信号的贡献的定量信息。 MTR 值可用作骨质疏松症进展的生物标志物。

EPO-1371
全身低剂量 CT 与 DR 对多发性骨髓瘤的评估效能比较

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【摘要】目的：比较全身低剂量 CT（LDCT）与 DR 评估多发性骨髓瘤（MM）的效能差异。**方法**：前瞻性对 2019-02--2019-06 我院共 40 例确诊 MM 且有 DR 检查史的初诊患者短期内（≦1 月）行 LDCT 复查，在病灶识别、放射剂量、检查时长、满意度、意外发现等进行两两比较（配对 *t* 检验或 *Wilcoxon* 符号秩和检验）。**结果**：LDCT 与 DR 平均检出全身溶骨性病灶个数分别为：69.9.*vs.*31.2，DR 总漏诊率 55.3%，差异有统计学意义（*P*<0.001）；肩胛骨、颈椎、锁骨、胸椎、肋骨、腰椎、胸骨、骨盆依次为 DR 漏诊率>50%的部位。LDCT 与 DR 的有效辐射剂量（ED）、检查时长、满意度分别为：9.4mSv.*vs.*3.6mSv，3.5 分钟.*vs.*15.6 分钟，100%好.*vs.*65%中、35%差，差异均有统计学意义（*P*<0.001）。肱骨髓腔浸润（85.0%）、股骨髓腔浸润（72.5%）、肋骨骨折（35.0%）、髓外浸润（20.0%）依次为本组 LDCT 常见的重要意外发现。**结论**：LDCT 在溶骨性病灶识别、检查时长、满意度、意外发现均明显优于 DR，仅辐射剂量稍高。

EPO-1372

256 层螺旋 CT O-MAR 技术对髋关节置换术后伪影减除效果研究

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目的：
评价 256 层 CT 减金属伪影技术 O-MAR（Orthope-dic Metal Artifact Reduction ）对髋关节置换术后患者图像金属伪影减除的效果，以期达到在不增加患者辐射剂量的前提下获得符合诊断要求的图像，从而辅助髋关节置换术后影像学评估。
材料和方法：
本研究共包括 40 例接受全髋关节置换术的患者（男女比例 21:19）。所有患者均接受飞利浦 256 iCT 检查，采用相同的 CT 扫描技术参数。系统重建图像自动生成原始数据图像和 O-MAR 图像，随即分为两组，即：非 O-MAR 组和 O-MAR 组。对图像质量的评价通过客观评价和主观评价两种方式进行。客观评价通过对近端伪影最大层面和远端伪影最小层面减金属伪影有效程度进行量化来评估，即通过测量并比较客观图像噪声(Objective Image Noise，OIN)来进行评估。主观评价通过双盲独立的两名阅片者在 CT 轴位图像分别对金属伪影、图像清晰度、结构自然逼真度及诊断信心评分，记录并进行统计学分析。
结论：
应用 O-MAR 技术能减少髋关节假体周围的金属伪影，减低图像噪声，获得更好的图像质量。同时 O-MAR 技术增强了观察者对髋关节置换假体附近解剖结构的能力和诊断信心，从而提高对存在金属伪影患者影像诊断的可靠性。

EPO-1373

基于定量 CT 对不同性别、年龄人群血尿酸与腰椎骨密度的相关性分析

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摘要：目的　应用定量 CT(QCT)测量腰椎骨密度(BMD)，研究不同性别、年龄人群腰椎 BMD 和血尿酸(SUA)之间的相关性。　资料与方法　选取 2018 年 7 月-8 月在我院健康体检中心的体检人群 1622 例，其中男性 923 例，女性 699 例，年龄 40~93 岁，平均年龄（55.28±10.17）岁。询问研究对象既往史，测量其身高、体重，并计算体重指数（BMI）；空腹采集静脉血检测血尿酸；使用 QCT 软件测量腰椎 BMD，根据 QCT 骨质疏松诊断标准将研究对象分为骨量正常组、骨量减少组及骨质疏松组，分析不同性别中老年人腰椎 BMD 与血尿酸之间的相关性。　结果　男性人群的血尿酸及 BMI 均高于女性，差异均有统计学意义（均 $P<0.01$）；男女年龄和腰椎骨密度间差异无统计学意义（均 $P>0.05$）。男性腰椎 BMD 与年龄呈负相关（$P<0.01$），与 BMI 呈正相关（$P<0.01$），与血尿酸水平无明显相关性($P>0.05$)。女性腰椎 BMD 与年龄、血尿酸和 BMI 均呈负相关（$P<0.01$，$P<0.05$）。进一步行多元线性回归结果显示年龄是影响中老年人腰椎 BMD 的危险因素。　结论　本研究发现男性人群的血尿酸及 BMI 均高于女性；血尿酸与中老年女性腰椎 BMD 下降存在着负相关，未发现与中老年男性腰椎 BMD 存在相关关系；年龄是影响中老年人腰椎 BMD 的危险性因素。

EPO-1374

Bending 位腰椎仰卧侧屈加压位片评估术前退变性脊柱侧凸脊柱柔韧性的价值

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目的：探讨 Bending 位腰椎仰卧侧屈加压位片评估术前退变性脊柱侧凸脊柱柔韧性的价值。Bending 位 X 线片是评估侧凸畸形患者脊柱柔韧性最常用的影像学手段，具有易操作、重复性好、预测术后矫形效果可信度好等优点。X 线片预测退变性脊柱侧凸（DS）手术矫形效果的研究。退变性脊柱侧凸由于椎间盘和关节突退变导致的侧凸尤其僵硬，而术前评估往往更关注患者椎管狭窄或者椎间盘突出问题，常常忽略对脊柱柔韧性的评估。

方法：使用自制 Bending 位拍摄辅助装置，选择我院 2014 年 7 月-2019 年 7 月间的腰椎侧凸患者 30 例，年龄 39-68 岁，平均年龄 55.4 岁，接受脊柱后路矫形手术的 DS 患者。患者术前 1 周拍摄立位全脊柱正位 X 线片、Bending 位 X 线片，站立位弯曲 X 线片，术后 1 周拍摄立位全脊柱正位 X 线片。分析术前 Bending 位片 Cobb 角与术后立位 X 线片 Cobb 角及弯曲柔韧性（bending flexibility，BF）与矫形率（correction rate，CR）的相关性。

结果：立位全脊柱正位 X 线片主弯平均 Cobb 角 43.54°，术前 Bending 位平均 Cobb 角 27.17°，术后立位全脊柱平均 Cobb 角 16.45°，平均弯曲柔韧性 38.69%，平均矫形率 62.22%，差异均有统计学意义(P 值均 <0.01)。

结论：Bending 位平片是临床上预测脊柱侧凸柔韧性最常用的影像学手段,其优点在于可操作性和重复性较好，并且直接作用于冠状面，能按照侧凸矫正程度来反映脊柱的柔韧性,用以辅助侧凸分型、选择融合范围、判断预期的矫形度等。柔韧性的测定提供了一项关于畸形脊柱对抗矫正时的动态力学指标 。在施加矫形力后拍摄脊柱侧凸矫正影像，可用于预测矫正效果，为设计手术方案提供参考依据。

EPO-1375

Percentage fat fraction in magnetic resonance imaging: Upgrading the osteoporosis-detecting parameter

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Purpose Osteoporosis (OP) is a common metabolic bone disorder and orthopedic imaging approaches were commonly used with some limitations. The aim of this study was to explore the diagnostic value of magnetic resonance 1-H MRS and m-Dixon-Quant in the evaluation of osteoporosis

Methods We enrolled 76 subjects and used a quantitative computed tomography (QCT) technique to determine the subjects' bone mineral density (BMD). Those with a BMD >120 mg/cm^3 were categorized as the normal control; those with a BMD ranging from 80-120 mg/cm^3 were classified as having osteopenia; and those with a BMD <80 mg/cm^3 were diagnosed as having OP. The following parameters were recorded for each patient: sex, age, body height, body weight, waist circumference, and hip circumference.

Simultaneously, the FF% values from 1-H MRS examinations and m-Dixon-Quant scans were acquired.
Results In both 1-H MRS and m-Dixon-Quant MRI, the FF% exhibited a negative correlation with BMD. Among the different groups, the OP patients had a significantly higher FF% compared to healthy subjects. In addition, the FF% in the m-Dixon scans exhibited a positive correlation with age, while BMD showed a negative linear relationship with age. Further, females had a higher FF% compared to males, and body height was correlated with BMD but not with FF%.
Conclusion MRI investigations ,especially FF% in the 1-H MRS and m-Dixon-Quant imaging system,are useful in OP assessments. Also, parameters such as sex, age, and height are important factors for predicting and diagnosing OP.

EPO-1376

冈上肌出口位的摄影方法探讨

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【摘　要】目的：研究冈上肌出口位的最佳摄影方法，探讨对肩关节损失的临床诊断价值。**方法：**患者直立面向摄影板，两足稍稍分开，被检查的肩部紧贴暗盒，身体的冠状面与板面约 55-65°，被检肢体下垂，避免肩胛骨与肱骨重叠，中心线向足侧倾斜 10-15°，从肩胛冈喙突垂直摄入成像板。曝光条件为：75-85KV，12-14mAs。**结果：**肩胛骨内缘投影于肩胛骨外缘中央，与喙突、肩峰一起组成“Y”字形投影，并与肋骨缘完全分离。所得的图像测量肩缝下间隙。**结论：**冈上肌出口位的拍摄常用于诊断肩峰下撞击综合征，而肩缝- 肱骨头（A-H）间距值是对于肩缝下间隙是否狭窄的重要依据，有很高的临床诊断价值。

EPO-1377

3D-VISTA 结合压缩感知技术踝关节成像初探

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目的：比较快速 3D-VISTA 结合压缩感知技术与常规 3D-VISTA 序列在踝关节成像中的应用评估
材料与方法：收集 30 例正常志愿者 60 个踝关节，所有受检者均在 3.0T 飞利浦 Ingina CX 扫描仪上行踝关节 3D-VISTA（体素大小 0.45x0.45x0.45mm³，扫描时间 11min47s ）成像序列与 CS-3D VISTA（体素大小 0.45x0.45x0.45mm³，扫描时间 5min50s ）序列扫描。2 位 10 年以上肌骨影像专家对两组图像质量按 5 分法进行评估。分别比较两组图像软骨、肌肉、韧带、骨小梁的 SNR 及 CNR。采用独立样本 t 检验进行统计学分析，p≤0.05 具有统计学差异。
结果：两组图像图像质量主观评分无统计学差异（P=0.15）。对于软骨与关节内液体诊断质量 CS-VISTA 明显高于 VISTA 序列。对于肌肉、韧带、骨小梁的图像评估上 CS-VISTA 与常规 VISTA 无明显差异。与常规 3D VISTA 序列相比，CS-VISTA 序列的 SNR 和 CNR 在软骨，肌肉，韧带，骨小梁的测值中均显著增高（P＜0.01）。
结论：结合压缩感知的 CS-VISTA 成像技术在踝关节成像中不牺牲图像质量的情况下，可降低扫描时间。高空间分辨率压缩感知技术可应用踝关节三维成像评估。

EPO-1378
能谱 CT 对 Ilizarov 技术治疗胫骨大段骨缺损术后骨质疏松的影响因素分析

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［摘要］目的　探讨应用能谱 CT 对 Ilizarov 技术治疗胫骨大段骨缺损术后骨质疏松的影响因素分析。方法　回顾性分析经我院行 Ilizarov 技术纵向骨搬移患者 42 名，男 37 例，女 5 例，年龄 25～69 岁，平均 48.1 岁。收集患者术前术后的能谱 CT 数据，根据基物质对分离技术，测得胫骨平台基物质对羟基磷灰石-水 HAP（Water）浓度值反应骨密度，测量三次取平均值，收集的潜在影响因素有：性别、年龄、体重指数、病因、患侧、戴环形外固定架时间、骨缺损范围、周围软组织脂肪浸润浸润情况、是否合并腓骨骨折、术后并发症、功能锻炼等，采用单因素分析及 logistic 回归分析确定影响术后骨质疏松的因素。 结果　42 名患者平均 HAP（Water）为 (55.40±6.32)mg/cm^3，周围软组织脂肪浸润情况 (P=0. 012)、功能锻炼（P=0.047）和环形外固定架佩戴时间(P=0. 027)是 IIizarov 技术治疗胫骨骨缺损术后骨质疏松的独立影响因素。结论　能谱 CT 能定量识别微量骨变化，所测参数显示出与周围软组织脂肪浸润情况、功能锻炼、环形外固定架佩戴时间等的相关性。对于胫骨骨搬移患者，要加强术后功能锻炼，及通过各种临床治疗能促进患者术后牵拉成骨，减少外固定架佩戴时间，以早期达到预期治疗效果，也减少了术后并发症。

EPO-1379
Utility of 3-Dimensional Constructive Interference in Steady State Sequence in Evaluating the Anterolateral Ligament of Knee

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PURPOSE: The purpose of the study was to determine the feasibility of 3-dimensional constructive interference in steady state (CISS) sequences for evaluating the anterolateral ligament (ALL).
MATERIALS AND METHODS: MR scanning of the right knee joint in 30 healthy volunteers was performed on a 3.0T MR scanner. Axial T2-weighted image with fat saturation (T2WI-FS), coronal PDWI-FS, and 3D-CISS were included in the protocol. Multiplanar reconstruction (MRP) and rotating stretched curved planar reconstructions (CPRs) of the ALL at 30°, 60°, 90°, 120°, and 150° were generated from 3D-CISS images. The visibility of the femoral part, meniscal part, tibial part, meniscal insertion, femoral footprint, and tibial footprint of the ALL on imaging of all sequences were recorded.
RESULTS: Based on the CPR of 3D-CISS MR imaging, the presence of tibial and femoral footprints of the ALL was rated superior to MPR and PDWI-FS (96.67% and 96.67%, respectively; P＜0.017). Rotating CPR of 3D-CISS MR imaging was rated superior to PDWI-FS with respect to the tibial part, meniscal part, and meniscal insertion of the

ALL (96.67%, 83.33%, and 83.33%, respectively; P＜0.05). Rotating CPR of 3D-CISS MR imaging was rated superior to PDWI-FS with respect to the femoral part of the ALL, but the difference was not statistically significant (P=0.095). The angle between the ALL and lateral collateral ligament (LCL) on the oblique sagittal image was 18.34° ±1.88°.

CONCLUSIONS: The MR 3D-CISS sequences significantly enhanced the ability to identify the ALL compared with the 2D MR sequences.

EPO-1380
双能量 CT 虚拟去骨图不同对比物质相对比值对膝关节创伤性骨髓水肿的诊断价值

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目的 探讨双能量 CT（DECT）虚拟去骨图（VNCa）不同对比物质相对比（Rel.CM）值对膝关节创伤性骨髓水肿的诊断价值。

方法 前瞻性搜集有明确外伤史和膝关节活动障碍等症状的 23 例（24 个膝关节）患者，行膝关节 MRI 和 DECT 平扫，获得常规 CT、VNCa 图和 MRI 图像。将每个膝关节划分为 12 个区域，分别观察 MRI 和 VNCa 图表现。首先，以 MRI 为参考，对不同 Rel.CM 值（分别取 1.25、1.35、1.45、1.55、1.65、1.75）所对应的 VNCa 图对膝关节创伤性骨髓水肿的诊断效能进行分析，优选出最佳 Rel.CM 值。然后，在最优 Rel.CM 参数所对应的 VNCa 图上分别测量骨髓正常、骨髓损伤区域的 CT 值。采用 ROC 评价不同 Rel.CM 值的 VNCa 图诊断创伤性骨髓水肿的效能，采用秩和检验比较最优 Rel.CM 值 VNCa 图上骨髓损伤区域与骨髓正常区域 CT 值的差异。

结果 23 例（24 个膝关节）患者均完成了 DECT 和 MRI 检查。24 个膝关节共分为 288 个区域。MRI 显示 121 个区域出现骨髓水肿，其中股骨下端 49 个，胫骨上端 72 个。Rel.CM 值为 1.25、1.35、1.45、1.55、1.65、1.75 的 VNCa 图诊断膝关节创伤性骨髓水肿的 ROC 下面积分别为 0.633、0.674、0.882、0.684、0.651、0.649，其中 Rel.CM=1.45 所对应的 VNCa 图诊断准确性最高。在最优 Rel.CM 参数（1.45）所对应的 VNCa 图上，骨髓水肿区域和正常区域的 CT 值分别为－67.9（1.7～－100.1）HU、－94.5（－69.7～－144.9）HU，差异有统计学意义（Z=－9.804，P<0.05）。

结论 Rel.CM 值为 1.45 所对应的 VNCa 图对膝关节创伤性骨髓水肿的诊断效能较佳。VNCa 图上 CT 值测量可用于创伤性骨髓水肿的定量分析。

EPO-1381
磁共振 T2 值定量评价健康成年人腕关节三角纤维软骨复合体

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目的 探讨磁共振 T2mapping 成像技术对健康成年人腕三角纤维软骨复合体(TFCC)定量评价的可行性。

方法 经知情同意纳入 81 名健康志愿者（平均年龄 23.7±5.38 岁），行腕关节 3.0T 磁共振冠状位 8 回波 T2 mapping 成像。由 1 名肌骨影像诊断医师在 AW 4.6 工作站进行后处理，选择桡侧软骨、三角纤维软骨盘（TFC）、纤维血管、类半月板、TFC 的尺侧附着处 5 个感兴趣区（ROI）测量 T2 值，对比分析各 ROI 间 T2 值的差异及不同性别间、利手与非利手间 T2 值差异。

结果 所纳样本桡侧软骨、TFC、纤维血管、类半月板、TFC 尺侧附着处 T2 值范围分别为（41.37±7.04）ms、（29.8±7.23）ms、（34.22±6.85）ms、（39.26±8.88）ms、（32.57±7.23）ms，总体差异有统计学意义（F=32.235，P＜0.01）。除了纤维血管组织与 TFC 尺侧附着处、软骨与类半月板之间 T2 值无统计学差异，其他 ROI 之间 T2 值差异有统计学意义（P＜0.05）。不同性别间、利手与非利手 T2 值差异均无统计学意义(P＞0.05)。

结论 T2 mapping 成像技术可以评价 TFCC 软骨成分的变化，对定量评价早期腕关节软骨退变具有潜在的临床价值。

EPO-1382

Isotropic three-Dimensiona(3D) Cube Fat-Suppression PD imaging versus without Fat-Suppressed imaging of the wrist at 3.0T: A pilot Sturdy.

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Purpose: To evaluate the three-dimensional fast spin-echo (3D FSE Cube) with fat suppression (FS) for assessing TFCC of the wrist in term of image quality and diagnostic performance, using comparison to 3D FSE Cube without fat suppression (NFS).

Materials and Methods: 60 volunteers were enrolled in the study with an average age 24.6 years (range 22-29 years), informed consent was obtained from all volunteers. All MR images were acquired with a 3.0T whole-body MR imager (Signa HDxt, GE Healthcare, Milwaukee, WI) with a receive-only dedicated wrist coil. Two radiologists retrospectively and independently reviewed 60 MRI studies. Each study consisted of 3D Cube images with fat suppression and without fat suppression. Coronal 3D Cube images with fat suppression parameters:TR=1400ms, TE=36.1,Matrix=256×192, FOV=10×8cm^2, Slice thickness=0.4mm, gap=0.2mm, NEX=0.5, acquisition time=195s. Fat suppression was achieved with chemical shift selective (CHESS) fat saturation. Delineation of anatomic structures of the wrist, amount of artifact, effect of fat suppression, image blur, and overall quality were qualitatively evaluated using the 5-point scoring system (5: excellent, 4: good,3: satisfactory, 2: poor, and 1: nonidentified.Signal-to-noise-ratios (SNR) of each structure and contrast-to-noise ratios(CNR) between structures of the TFCC were quantitatively measured using vendor supplied software (AW4.6work station, GE).

Results: The 3D FSE Cube NFS imaging demonstrated higher scores than 3D FSE Cube FS in anatomic structure of the TFC(0.033),SL ligament(P=0.043), the LT ligament(P=0.022) and cartilage(P=0.043).However,there were no statistical significance between FS and NFS MRI in image blur and overall quality. There was significant difference of fluid and bone marrow. Higher SNR values of bone marrow were found for in the NFS sequence (58.14±17.64)than the FS

(7.19±1.59).There had no significant differences in CNR values between FS and NFS,except for cartlage to bone marrow and fluid to bone marrow, and higher CNR values of fluid to bone marrow was found for in the FS sequence (7.29±4.47) than the FS (0.86±0.64).
Conclusion: 3D Cube-NFS imaging showed similar image quality in image blur and overall quality compared to FS imaging, unlike TFC and ligament. 3D Cube-NFS imaging has higher diagnostic performance than FS imaging for evaluation of TFCC tears,subtle fracture and cartilaginous defects.

EPO-1383
人体冠状面在髋臼几何参数 CT 测量中的价值

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目的：探讨人体冠状面在髋臼几何参数 CT 测量中的价值。**方法：**选取行髋关节 CT 检查患者，正常成人髋关节 50 例（两侧共 100 个），单侧先天性髋关节脱位 20 例，对所有患者图像进行冠状面重建和三维重建，比较正常成人髋臼上外倾角冠状位和三维测值，比较先天性髋关节脱位组患侧与正常侧髋臼上外倾角，用配对 t 检验进行统计学处理；P<0.05 时差异有显著性意义，P<0.01 时差异有非常显著性意义。选择配伍组设计方差分析，分别比较常规方法和以身体冠状面为参照面测量左侧和右侧髋臼后外展角、左侧和右侧前髋臼指数以及左侧和右侧后髋臼指数，P<0.05 时差异有显著性意义。**结果：**髋臼上外倾角在冠状位测值为 39.99°±6.1°，在三维图像上测值为 40.13°±5.80°，两组比较 P>0.05，差异无统计学意义。小儿先天性髋关节脱位双侧上外倾角在冠状位的测量值，正常侧 48.95°±3.80°，脱位侧 63.56°±6.35°，二者之间差异有非常显著性意义(P<0.01)。以扫描床面为参照面测量正常髋臼后倾角、前髋臼指数、后髋臼指数左右侧比较 P<0.05，差异有统计学意义；以身体冠状面为参照面测量髋臼后倾角、前髋臼指数、后髋臼指数左右侧比较 P>0.05，差异无统计学意义。比较以床面为参照面测量和以冠状面为参照面测量髋臼后倾角和前、后臼指数，P<0.01 差异有显著性意义。**结论**：以冠状面为参照平面测量双侧后外展角和前、后髋臼角最为可靠，可客观准确反映髋臼情况，为髋关节区病变的诊断和治疗提供确切的量化指标。

EPO-1384
股骨颈隐形骨折投照水平侧位的价值

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摘要　　目的：悬吊式数字化 X 线（DR）平片诊断股骨颈隐形骨折的价值。
方法：选择悬吊式数字化 X 线摄影（DR），无线探测器，进行股骨颈正侧位、水平侧位进行检查，摄影方法为：患者平躺摄影床上或不宜搬动的担架车上，做好辐射防护工作，患侧臀部髋部垫高，患肢伸直外展且内旋约 10 度，健侧肢体上抬与躯干成 90 度，无线探测器横立在被检髋部外侧，上缘包括髂骨嵴，下缘无线探测器与躯干分开约 45 度角使无线探测器长轴与股骨颈平行。摄影距离：75～100 厘米。中心线：X 线呈水平投照，对准股骨颈垂直射入探测器中心。摄影条件：150KV、80mA、0.8S。

结果：我们利我用现代悬吊数字化 X 线 DR 进行正位、侧位、水平侧位进行检查，3 年中发现，25 例男性、20 例女性，正侧位漏诊患者 8 例，水平侧位漏诊 1 例。相对比较水平侧位检查漏诊率明显减低。
结论：股骨颈隐形骨折，早期利用普通 X 线系统进行正侧位检查时，不错位的易发生误诊和漏诊，虽然有 CT/MRI 设备，由于价格昂贵，来自农村患者难以接受，利用水平侧位检查患者平躺时体位不动，患者减少疼痛，相反侧位检查时患者病侧外翻时加重患者疼痛，不利于医患关系和谐。

EPO-1385
成年女性骨盆骨髓 DCE-MRI 特征和影响因素初探

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目的 探讨月经状态及年龄对成年女性骨盆骨髓动态对比增强磁共振成像（dynamic contrast enhanced MRI,DCE-MRI）定量灌注参数的影响
方法 回顾性分析自 2017 年 9 月至 12 月在本院行骨盆 DCE-MRI 的 98 名成年女性的检查资料，测量其骨盆骨髓 DCE-MRI 定量灌注参数（Ktrans、Kep、Ve）并取平均值。依据月经状态将研究对象分为未绝经组和绝经组，未绝经组 41 人，绝经组 57 人；未绝经组按照年龄分为≤40 岁组和>40 岁组，≤40 岁组 17 人，>40 岁组 24 人；绝经组按照年龄分为≤60 岁组和>60 岁组，≤60 岁组 39 人，>60 岁组 18 人。分析 DCE-MRI 定量灌注参数不同月经状态及年龄间的差异及相关性。
结果 未绝经组的各灌注参数 Ktrans、Kep 和 Ve 值均大于绝经组，差异有统计学意义。总体年龄与 Ktrans（r=0.587，p<0.001）、Kep（r=0.348，p<0.001）、Ve（r=0.386，p<0.001）均存在显著负相关；未绝经组两亚组间 Ktrans、Ve 的差异有统计学意义，Kep 无统计学意义，未绝经组的年龄与 Ktrans（r=-0.344,P=0.032）、Ve（r=-0.334,P=0.038）存在显著负相关，与 Kep 不存在显著相关性（p>0.05）；绝经组两亚组间 Ktrans、Kep 的差异有统计学意义，Ve 无统计学意义，绝经组的年龄与 Ktrans（r=0.460，p<0.001）、Kep（r=0.303，p=0.022）存在显著负相关，与 Ve 不存在显著相关性（p>0.05）。
结论 月经状态对成年女性骨盆骨髓 DCE-MRI 定量灌注参数（Ktrans、Kep、Ve）有明显影响，成年女性骨盆骨髓不同年龄段微环境变化不同。DCE-MRI 定量灌注参数可以反映成年女性骨盆骨髓微环境的改变。

EPO-1386
双能 CT 虚拟去钙技术诊断骨质疏松症：与定量 CT 的相关性研究

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目的：研究双能 CT 虚拟去钙技术的测量参数值与定量 CT（QCT）所测得骨密度值（BMD）的相关性，探讨双源 CT 双能量在骨质疏松评价中的应用价值。
方法：对 55 例慢性腰痛患者的腰椎进行前瞻性双能 CT 扫描。在行 DECT 检查时，将 Mindways 公司的定量 CT（QCT）标准校正体模放置于患者的检查部位，以获得椎体的 QCT 扫描数据，进行椎体松质骨密度（BMD）测量。参照西门子双能量分析软件（syngo.via 3.0）中的骨髓分析配置文件，对肝脏 VNC 配置文件中的默认参数进行修改，用于钙和脂肪的定量分析，统计参数包括钙相关 CT 值（CM）、钙浓度（CaD）、脂肪分数（FF）。以 QCT 测量的 BMD 为金标准，利用多元线性回归分析，评价钙和脂肪的定量参数（CaD、FF）与 BMD 的相关性，并进行 ROC 评价。

结果：总计 318 个椎体纳入分析。CM、CaD、FF 与 BMD 具有显著相关性（p<0.01），相关系数分别为 0.885、0.877、0.492，回归方程为 rBMD =87.82+21.03×CaD-1.34×FF，决定系数为 0.915（P<0.01）。ROC 曲线分析显示 CM、CaD、 FF 及回归方程 rBMD 的曲线下面积分别为 0.941、0.938、0.696、0.966。以 rBMD<81.94mg/cm^{3}为阈值，诊断骨质疏松的敏感度为 90.0%，特异度为 92.0%。

结论：双能 CT 虚拟去钙技术的测量参数值与 QCT 测得的 BMD 值具有良好的相关性，可从骨髓脂肪组成和矿物质含量两个方面对骨质疏松进行定量评价。

EPO-1387

8 回波 CSE-MRI 同时评估骨髓脂肪及 R2*

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目的：探讨 8 回波化学位移编码 MRI（CSE-MRI）同时定量骨髓质子密度脂肪分数（PDFF）及 R2*的可行性，评估 PDFF 和 R2*预测低骨量和骨质疏松症的诊断性能。**方法**：183 例绝经后妇女按骨密度分为正常骨量组(n=112)、低骨量组（n=46）及骨质疏松组（n=25），同时行 T2*校正 MRS 及 8-echo CSE-MRI 扫描获取骨髓 PDFF 及 R2*。18 位受试者做三次 CSE-MRI 重复扫描，评价 CSE-MRI 定量 PDFF 及 R2*的可重复性。ICC 评估观察者内及观察者间测定 PDFF 及 R2*的一致性。计算 Linear regression、Lin’s 一致性、Bland-Altman 95%的一致性以评估 2 种影像方法定量 PDFF 的可互换性。Pearson 相关分析每个亚组中 PDFF、R2*与骨密度的相关性。ROC 确定预测低骨量和骨质疏松的诊断效能，并利用 ROC 比较 PDFF、R2*、PDFF 联合 R2*的 Logistic 回归模型。**结果**：CSE-MRI 重复扫描，PDFF 及 R2*均方根绝对误差分别为 1.45%、1.57%。MRS、CSE-MRI 定量 183 位受试者 PDFF 的线性回归分析，相关系数为 0.979，Lin’s 一致性相关系数为 0.962。MRS_{PDFF}与 $CSE\text{-}MRI_{PDFF}$差值均落在 Bland-Altman 95%可信区间内。观察者内及观察者间测定 PDFF 具有实质性的一致性，观察者内 ICC=0.993，不同骨密度组观察者间 ICC=0.976～0.982。$CSE\text{-}MRI_{PDFF}$及 MRS_{PDFF}与腰椎骨密度呈中度负相关(r= －0.683、－0.617)，R2*与骨密度呈中度正相关(r= 0.706，P<0.001)。PDFF 联合 R2*预测骨质疏松的 AUC 最高（AUC = 0.875，P<0.001）。**结论** 8-echo CSE-MRI 可同时定量骨髓 PDFF 和 R2*作为低骨量和骨质疏松的预测因子。

EPO-1388

Clinical value of artifact Identification in ankle dual-energy CT for gout diagnosis

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Objective: To study the clinical value of artifact identification in ankle dual-energy CT for gout diagnosis. **Methods**: A total of 58 patients with gout , definitely diagnosed in Peking University Third Hospital , were included in the case group, which were composed of 57 men and 1 woman. And 37 individuals without gout were regarded as control group, which were composed of 36 men and 1woman. There were no significantly difference in gender and age between two groups. DECT were performed for one foot, and the affected side or the more serious side was chosen in the case group. The dual-energy data were used in gout-recognition software to highlight the monosodium urate

(MSU) with green-colored. And to compare the difference in MSU relevance ratio on the images of toenail, submillimeter spots , skins , movements and vascular calcification between two groups. **Results:** In the case group , 55 patients were revealed with MSU green-colored toenails(relevance ratio 94.8%), while 22 cases in the control groups(relevance ratio 59.5%). The mean toenails numbers in the case group and control group for individual were (2.02 + 1.13) and (1.19 + 1.35). And the MSU distribution scores were (1.84 + 0.93) and (1.05 + 1.12) .There were significantly statistical difference in the two groups on toenail numbers and MSU distribution (P<0.01). In the case group ,47 patients were revealed with green-colored submillimeter spots(relevance ratio 81%),while 5 cases in the control group(relevance ratio 13.5%). The relevance ratio of submillimeter spots on tendon and ligament in the case group and control group were 75.9% (44/58) and 13.5% (5/37). There were also significantly statistical difference in the two groups on submillimeter spots (P<0.01). Except for the tendon and ligament in dorsum pedis and calf anterior area, submillimeter spots distribution in the other tendon and ligament had significantly statistical difference in two groups. And there were no significantly statistical difference in the two groups on MSU green-colored skins, movements and vascular calcification. **Conclusion**: There were great value for gout clinical diagnosis when green-colored MSU were detected on toenails and submillimeter spots, which should not be judged as artifact simply.

EPO-1389

基于能谱 CT 多参数成像提升骨岛与肿瘤成骨性转移瘤的鉴别诊断精确性

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目的：探讨能谱 CT 成像在鉴别骨岛与肿瘤成骨性转移瘤中的价值。
方法：收集我院病理证实为成骨性转移瘤的 11 例患者 23 处病灶（OBM），同时收集临床及影像学证实为骨岛的 16 例患者的 21 处病灶（BI）。两组患者均行能谱 CT 成像检查。测量各转移瘤病灶和骨岛 40keV 至 140keV 的单能量 CT 值、钙浓度和水浓度，并计算能谱曲线斜率[λ=(CT 值 40keV-CT 值 140keV）/（140-40）]。采用独立样本 t 检验比较分析两组能谱参数间的差异。绘制受试工作者特征曲线（ROC）评价诊断效能。
结果：两组患者人口特征资料无显著统计学差异（P>0.05）。骨岛 40keV 至 140keV 的单能量 CT 值、能谱曲线斜率、钙浓度显著高于成骨性转移瘤（P<0.05），骨岛水浓度显著低于成骨性转移瘤（P<0.05）,且 CT 值、曲线斜率、钙浓度和水浓度的差异均具有统计学意义（P<0.05）。以 40keV 的 CT 值 1730.63HU 为阈值鉴别骨岛和成骨性转移瘤，AUC 为 0.920，敏感性 94.0%，特异性 90.4%，显著高于其它能谱参数诊断效能。
结论：能谱 CT 成像可以帮助鉴别骨岛与肿瘤成骨性转移瘤。

EPO-1390

Application of 3.0T magnetic resonance diffusion tensor imaging in diagnosis of discogenic low back pain

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Purpose
The aim of our study is to observe the morphology and integrity of annulus fibrosus by diffusion tensor imaging (DTI), and quantitatively analyze the annulus fibrosus by measuring the apparent diffusion coefficient (ADC) and fractional anisotropy (FA).

Methods
Patients with low back pain were enrolled in the study over a continuous period of time. Patients with discogenic low back pain confirmed by discography were selected as the low back pain (LBP) group and healthy volunteers without symptoms as the healthy control (HC) group. The ADC, FA and λ1, λ2, λ3 values at the posterior margin of the annulus fibrosus were measured by conventional lumbar MR sequence and axial DTI of L3-S1 levels (3.0T). The responsible intervertebral segment of discogenic low back pain was determined by discography. The differences of ADC, FA and λ1, λ2, λ3 values between the two groups were compared. The data conforming to normal distribution were tested by t test, while the data not conforming to normal distribution were tested by nonparametric test.

Results
From September 2017 to March 2018, 30 subjects in the LBP group and 24 subjects in the HC group were included in the study. There was no significant difference in demographic parameters between the two groups, and there was no significant difference in the area of region of interest (ROI) measured manually between the two groups. The ADC value of ROI in the LBP group was significantly lower than that in the HC group (6.10 ± 3.17 versus 9.84 ± 4.01, P = 0.0002), and the FA value was significantly higher than that in the HC group (0.341 ± 0.201 versus 0.231 ± 0.150, P = 0.007). Compared with the HC group, the LBP group showed significantly lower λ1 (4.44 ± 0.36 versus 4.75 ± 0.35), λ2 (4.19 ± 0.34 versus 4.50 ± 0.36), and λ3 values (3.97 ± 0.34 versus 4.27 ± 0.38; all P < 0.05).

Conclusions
3.0T magnetic resonance DTI has guiding significance in clinical diagnosis of discogenic low back pain and preoperative localization of the responsible segment. ADC and FA value can provide objective indicators for intervening intervertebral discogenic low back pain.

EPO-1391

The Histopathologic Basis of Modic Changes on MRI in Early Assessment of Intervertebral Disc Degeneration

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Human intervertebral discs (IVDs) may undergo a series of biochemical and then morphological changes as early as the second decade of life [1]. These degenerative changes can be induced by lumbar pressure changes, spinal instability, annular injury, chemical damage, or gene deficiency, and usually deteriorate further with aging Simultaneously, a clinical in vivo MRI of the presence of modic changes (MCs) in the vertebral endplates may show morphological deterioration and represent the “early standard” in IVDD diagnosis [?]. MCs are characterized by three progressive morphology stages of MRI to represent pathological changes situated in both the body of the vertebrae and the endplates of the neighboring discs, and provide endplate information of IVDD in the early stage.
Thus, to show associations between biomarkers and imaging in the early stage of IVDD, the roles of reactive oxygen species, superoxide dismutase, and MCs of MRI during IVDD initiation are equally examined in this study. For this purpose, animal models were studied longitudinally *in vitro* through histopathology and immunobiology, and *in vivo* by high-field MRI.

Materials and Methods

IVDD animal models

All procedures were approved by the Institutional Animal Care and Use Committee of Xiamen University.Institute of Cancer Research (ICR) mice (male, 5 weeks of age, 22-25 g) were obtained from the Animal Center of Xiamen University. All animals were individually housed and fed with standard rat pellets. The mice were divided into five groups (12 randomly selected animals each group) and labeled with the corresponding group label (A, B, C, D, and E). Each mouse in group A was put in a slender PVC pipe (internal diameter 35 mm, height 150 mm) to enable the mouse to stand on both front feet 8 hours per day for 1 day [12]. The mice in groups B, C, D, and E were placed in the same pipes 8 hours per day for 3, 5, 7, and 9 days, respectively. Net lids were used to cover the pipes. When the mice were forced to stand or squat on their hind feet in the pipe, their whole-body weight was supported by the lumbar and the strain caused IVDD, mimicking the lumbar spine injury in humans during prolonged standing and sitting **(Figure 1).** High-field MRI scanning was performed and analyzed for each group to verify the severity of IVDD. The lower lumbar spine is the parts thbiae mechanic stress is concentrated, where is prone to degenerate. For convenience of measurement, the L4-L5 segment was selected as the Region of Interesting because the segment of L4-5 is straight but L5-S1 curved. The IVD and vertebral bodies of L4-L5 were collected for obtaining the nucleus pulposus (NP) tissues and endplates immediately after all *in vivo* experiments and homogenized for oxidative stress analysis. Tissues from the IVD and vertebral bodies were subsequently selected for histomorphometry, cell morphology, and immunohistochemistry.

EPO-1392
绝经后妇女肌肉减少与骨质疏松、胰岛素抵抗之间的关系

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目的：肌少症（sarcopenia），是一种年龄相关性疾病。目前有关肌少症与骨质疏松及胰岛素抵抗的数据在亚洲及中国人群中是有限的。本研究旨在探讨肌少症在骨质疏松和胰岛素抵抗方面的相对重要性。
材料与方法：本研究纳入 200 例绝经后妇女(72.39±6.07 岁)。我们通过能谱 CT 测量了 L3 椎体水平的肌肉横截面积(CSA)和相应肌肉内的脂肪含量、L3 椎体骨密度(BMD)。采用握力试验和短物理性能电池(SPPB)评定肌肉强度和物理性能。采用 Pearson 相关分析和线性回归分析，评价肌肉特性与体内平衡模型评估—胰岛素抵抗(HOMA-IR)或骨密度(BMD)之间的关系。
结果：肌肉 CSA、握力、SPPB 评分与 L3 骨密度(BMD)呈显著正相关，与胰岛素抵抗无显著正相关。L3 椎体水平的肌肉脂肪含量与 HOMA-IR 呈正相关($p<0.001$)，但与 BMD 无关。与对照组相比，骨质疏松症患者的肌肉 CSA 明显降低；肌肉内脂肪含量增高，仅发现糖尿病患者。
结论：肌少症与骨质疏松有关，肌肉内脂肪的积累(肌肉长期受损的组织学特征)可能在绝经后妇女胰岛素抵抗的形成中发挥重要作用。

EPO-1393
光谱 CT 去金属伪影技术在膝关节肿瘤假体中的应用

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目的　评估光谱 CT 单能级（MonoE）图像与 O-MAR 技术去除膝关节肿瘤假体伪影的效能，并初步探讨其在膝关节肿瘤患者术后随访中的临床应用价值。
材料和方法　首先使用膝关节肿瘤假体体外模型进行光谱 CT 扫描获得原始数据，分别按照常规方法和使用 O-MAR 技术重建获得两组相应的光谱 CT 图像。在两组图像中，分别调节光子能量，进行 40～200 keV(间隔 10 keV)单能级成像。通过对比不同 keV 下的图像质量，找到去除膝关节肿瘤假体的最佳 keV，获得膝关节肿瘤模型的常规 CT 图像、O-MAR 图像、最佳 MoneE 图像和最佳 MoneE +O-MAR 图像。在金属伪影最重的假体关节平面，分别选择不同方向的 8 处感兴趣区进行测量，得到上述四幅图像的各感兴趣区的其 CT 值和标准差（SD 值）。采用配对样本 t 检验比较不同感兴趣区的 CT 值和 SD 值。
结果　光谱 CT 单能级（MonoE）图像去膝关节肿瘤假体伪影的最佳 keV 为 110keV。常规 CT 图像、O-MAR 图像、最佳 MoneE 图像、最佳 MoneE+O-MAR 图像的 SD 值分别为 63.9±15.3、36.9±14.1、42.5±11.5、27.9±7.7。相对于常规 CT 图像，三组图像的 SD 值与其均具有统计学差异（$P<0.05$），但 O-MAR 图像与最佳 MoneE 图像不具有统计学差异（$P=0.16$）。
结论　相对于常规 CT 图像，最佳 MoneE +O-MAR 图像、O-MAR 图像、最佳 MoneE 图像均能有效去除膝关节肿瘤假体产生的金属伪影，其中最佳 MoneE +O-MAR 图像去除金属伪影的效果最佳，O-MAR 图像和最佳 MoneE 图像去除金属伪影的效果相同。

EPO-1394
3.0T MR 腕关节三角纤维复合体双回波稳态序列参数优化及多序列成像比较

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研究目的：

1、通过改变 MRI 3D-DESS 序列成像参数翻转角（FA）的方法，探讨在 3.0T 超高场磁共振机的条件下，3D-DESS 序列成像参数 FA 与腕关节 TFCC、腕骨间软骨及骨髓信噪比的相关性研究。

2、通过测量并计算 3D-DESS、3D-SPACE、3D-FLASH 及常规 SE 腕关节扫描序列中 TFCC、腕骨间软骨及骨髓的信噪比（SNR），TFCC 与骨髓及腕骨间软骨与骨髓间的对比信噪比（CNR），比较各序列上显示腕关节 TFCC 及其他结构的差异。

材料与方法：

将 22-30 岁之间健康成年 30 人分成两组，一组 18 人，另一组 12 人，第 1 组志愿者行腕关节 3D-DESS 序列，第 2 组志愿者行常规 SE 序列及 3D-SPACE、3D-FLASH 序列。采用设备为 Siemens 3.0T Magnetom Avanto 超导型磁共振机，腕关节专用线圈。

2、全部数据均采用双盲法由 2 名影像科医生测量获得。取 MRI 各序列扫描所得 TFCC 正中层面图像，测量相同位置 TFCC、腕骨间软骨及骨髓的信号强度（signal intensity,SI)。观察各组序列上 TFCC、腕骨间软骨及骨髓的表现，计算 9 组不同 FA 的 3D-DESS 序列以及其他序列的 TFCC、腕骨间软骨及脊髓的信噪比（SNR）和 TFCC 与骨髓、腕骨间软骨与骨髓的对比信噪比（CNR）。

结论：

腕关节磁共振 3D-DESS 序列在翻转角 FA 为 15 度时为成像参数最为优化的一组。
3D 及常规 SE 6 组序列比较，3D-DESS 显示 TFCC 最佳。

EPO-1395

1.5T MR Haste 动态扫描技术在颞下颌关节紊乱中的应用

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目的 探讨 Haste 动态扫描技术在颞下颌关节紊乱中的应用价值。**方法** 回顾性分析经临床随访或手术后证实的颞下颌关节紊乱病(TMD)患者 48 例共 96 个颞下颌关节的 MRI 表现，将常规静态 MRI 图像与 Haste 动态扫描图像进行对比分析。**结果** Haste 动态扫描序列可以清晰显示颞下颌关节的运动轨迹，显示运动过程中关节盘及髁状突的位置改变、关节盘的形态改变及关节腔积液，对于关节盘前后移位、关节活动度异常、关节腔积液均能正确诊断，本组 48 例 96 个颞下颌关节中 83 个 Haste 动态扫描与常规静态 MRI 扫描诊断结果一致，诊断符合率为 86．5%。**结论** Haste 动态扫描序列在发挥其动态显示颞下颌关节运动过程优势的同时对于大多数颞下颌关节紊乱病可正确诊断，在临床工 作中可作为常规 MRI 检查的补充。

EPO-1396

基于 CT 数据的 3D 打印在 DDH 精准手术中的应用价值

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摘要 目的：探讨 CT 数据的 3D 打印在儿童发育性髋关节脱位手术中的应用。方法：我院 2015.11 至 2018.2 月我院骨科收治的发育性髋关节脱位病人，随机分为传统手术组和 3D 打印组，并记录手术时间、髋臼指数矫正值、沈通氏线是否连续。结果：手术时间传统手术组和 3D 打印组时间分别约 165.0±20.1min 和 124.0±10.8min（P＜0.05），髋关节髋臼指数矫正值差异 2.8° ±1.1° 和 2° ±0.7° （P＞0.05），术后沈通氏线连续的比率 26/30 和 18/20（P＞0.05）。结论：应用基于髋关节 CT 影像数据的 3D 打印技术辅助行发育性髋关节脱位手术，能缩短手术时间,使截骨更加精确，提高手术成功率。

EPO-1397
正常四肢骨骼肌 T1-mapping 的定量研究及变异度对比分析

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【摘要】目的 比较分析 T1-mapping 的 Look-locker 和 B1-corrected VFA 两种成像技术在正常四肢骨骼肌的 T1 值及变异度。方法 对 55 名患者分别行 Look-locker 和 B1-corrected VFA 扫描，采用组内相关系数对不同医师所测 T1 值进行一致性分析；用配对样本 T 检验比较在 Look-locker 和 B1-corrected VFA 成像技术上所测正常四肢骨骼肌 T1 值的差异，以 $P < 0.05$ 为差异有统计学意义；用变异系数（coefficient of variation，CV=方差/平均值）评价所测 T1 值的变异度。 结果 共收集 55 例患者。两位医师分别在 Look-locker 和 B1-corrected VFA 成像技术上所测正常四肢骨骼肌的 T1 值一致性较高，ICC 值分别为 0.856、0.833；在 Look-locker 和 B1-corrected VFA 成像技术上所测正常四肢骨骼肌的 T1 值差异有统计学意义（$P = 0.000$，t 值为-29.907），其变异度分别为 0.062、0.121。结论 在正常四肢骨骼肌上采用 Look-locker 和 B1-corrected VFA 成像技术所得 T1 值间存在差异，在 Look-locker 成像技术上所测正常四肢骨骼肌的 T1 值变异度小，数据稳定性高。
[关键词] 磁共振成像；T1 mapping；正常四肢骨骼肌；T1 值

EPO-1398
UTE-adiabatic T1rho 定量技术诊断早期软骨退变：与 UTE-T2*mapping、T2mapping 比较

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目的：探讨 UTE-adiabatic T1rho 定量技术诊断膝关节早期软骨退变的可行性，比较其与 UTE-T2* mapping、T2 mapping 诊断效能。
方法：取 20 例膝关节炎患者关节置换术手术后股骨前外侧髁标本，经中心失状面取厚度为 4mm 切片。采用 GE 3.0T 磁共振，对 20 个切片行 UTE-adiabatic T1rho、UTE-T2* mapping、常规 T2 mapping 扫描，每个样本通过手绘感兴趣区（ROI）均等分为四个区域，在相应的区域画取 ROI 分别测定 T1rho 值、T2*值、T2 值。扫描后标本行 Safranin O-Fast Green 病理染色。根据 Mankin 病理学评分标准将对应 ROI 分正常、轻度、中度、重度退变四组，分析 T1rho 值、T2*值、T2 值与病理 Mankin 评分相关性及不同软骨退变组间 MTR 值、T2*值、T2 值的差异，比较各成像技术对早期软骨退变的诊断效能。
结果：Mankin 评分与 T1rho 值呈显著正相关(r=-0.598，$P<0.001$)，与 UTE-T2*值呈中度负相关(r=0.501，$P<0.001$)，而 T2 值呈仅轻度正相关(r=0.331，$P<0.006$)。正常组 T1rho 值与轻度、中

度和重度退变组均有显著差异（*P*<0.05）。正常组 T2*值与中度、重度组有显著差异（*P*<0.05），而与轻度组无差异（*P*>0.05）。T2 值偏态分布，正常组 T2 值与轻度、中度组间均无差异（*P*>0.05），仅与重度组间有显著差异（*P*<0.05）。T1rho 值（AUC=0.828）对早期软骨退变的诊断效能优于 UTE-T2* mapping(AUC=0.604)和 T2 mapping (AUC=0.644)。

结论：UTE-adiabatic T1rho 定量技术对早期软骨退变敏感，诊断效能优于 UTE-T2* mapping 及常规 T2 mapping，有望成为诊断早期膝关节炎的新技术。

EPO-1399

SPECT/CT 融合显像评价四肢骨折愈合

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目的 探讨 SPECT/CT 融合显像技术评价四肢骨折愈合情况的应用价值。**方法** 回顾性分析四肢骨折经治疗 6 个月后骨折端的 SPECT/CT 融合显像特征，判断骨折远期愈合能力。**结果** 68 例四肢骨折，X 线和 CT 检查均不能明确判断骨折能否远期愈合，SPECT/CT 融合显像，52 例放射性浓聚连续性通过骨折线并跨越两侧骨折端，提示骨折处于愈合进程中，具有远期愈合的可能，经对症保守治疗，证实 46 例骨折愈合，远期骨折愈合率达 88.5%（46/52），6 例未愈合。16 例骨折端未见明显连续性通过骨折线的放射性浓聚，提示骨折不愈合，且远期愈合的可能性较小，均进行了手术治疗并证实为骨折不愈合，诊断准确性达 100%（16/16）。**结论** SPECT/CT 融合显像能准确地评价四肢骨折愈合情况，对骨折远期愈合能力和骨折不愈合的判断具有重要应用价值。

EPO-1400

减少剂量对双能量 CT 虚拟无钙盐扫描技术探测骨髓病变无影响

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原理和目的：本研究的目的是评估如果减少剂量，中性剂量双能量 CT 虚拟无钙盐扫描技术同样可以检测膝盖非外伤性骨髓病变（BMLs）。
材料和方法：对 2017 年 11 月至 2018 年 5 月间于我院就诊的五十例患者进行双能量 CT 成像与标准剂量（A 组）或等于单能量 CT 扫描 72%剂量（B 组）和膝关节外伤患者磁共振成像检查。钙几乎是子提取图像。两位工作 20 年以上的资深放射科副主任医师各自对所得图像的软组织进行客观评价。存在像共 12 个股骨和胫骨骨髓中的衰减和地区测量 CT 值。使用接受者操作特征曲线分析四个点并进行评分，分别测量四点的 CT 值。对所有骨折类型进行分类。
结果：磁共振成像描绘的 170 群体之间（35 组股骨，135 组胫骨 BMLs）平均年龄、骨折数衰减值和一些地区的 BMLs 并没有显著不同。两位资深放射科副主任医师 1 和 2 分别对显示整体面积的曲线 0.983 和 0.979 进行视觉评分。视觉判断优于衰减测量的股骨区域方面的应用剂量少。所有 CT 值的方差分析显示水肿的存在显着影响（P。001），但所用的辐射剂量无显著差异（P = .424）。两名观察者间一致性良好（k = 0.944）。
结论：双能量 CT 虚拟无钙盐扫描技术中减少剂量不影响创伤后 BMLs 的探测，从而相比单能量 CT 成像提供了潜在的额外信息,并且双能量 CT 虚拟平扫相对普通单能量 CT 扫描方式能有效减少辐射剂量。

EPO-1401
颞颌关节 MR 扫描新技术在 GE HDXT 3.0T 设备下的序列及线圈改良

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背景：目前，临床上公认为颞下颌关节紊乱综合征是最常见的颞下颌关节疾病，也是一种疑难性的疾病，在全国颞下颌关节紊乱的比例应该占到百分之三十，女性患者远多男性患者。磁共振成像对于软组织、关节盘显示分辨率高，关节骨性磨损病变亦在时间进程上优于任何 X 线检查，目前是颞下颌关节病变检查的第一选择。
目的：湖南颞下颌关节修复手术进展迟缓，此次对颞下颌关节 MR 扫描技术做出了效果十分可观的优化，并设置额外的动态序列，获得优秀的 MR 图像，满足临床以及 TMD 的诊断需要。对于地区的颞下颌关节 MR 检查技术及治疗有推动性的意义。
方法与过程：主体设备：GE HDXT 3.0T 超导型全身核磁共振扫描仪。
对照组线圈：【GE 3.0T HD NEUROVASCULAR,头颈联合线圈】，实验组线圈：【GE CG-CTU8-H300-AG,颈部动脉线圈】。
在患者均良好配合的情况下，使用**双变量分组对照**扫描方式：**实验组序列**及部分摘要参数：3-pl loc（双 FOV 定位图）；sag PD fs：TR4560,TE30,matrix320*320，nex 4，TA 3'07,slice 20；cor PD fs：TR3360,TE30,matrix256*256，nex 3，TA 2'38,slice 16;fiesta cine:TR4.1,TE1.6,matrix192*224，nex 1，TA 0'34,slice 1。**对照组序列**：3-pl loc；cor PD fs；sag PD fs；sag T2* GRE。参数详见主文。均采用张闭口双状态采集，实验组 fiesta cine 采用运动相采集。　　两组序列两个线圈共采集 4 组对照数据进行对比。
定位方法：斜矢斜冠，先矢、次动态、后冠，详见主文。
讨论和结论：从线圈选用、序列设置、扫描角度以及顺序、动态意义以及扫描参数 5 个方面肯定此次研究改良的意义及实用性大，对于地区 TMD 的诊断和治疗指导有实际临床优势，详见主文。

EPO-1402
能谱技术在脊柱内固定术后复查中的应用

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目的：脊柱内固定术广泛应用于脊柱外伤、脊柱退行性病变的治疗中。脊柱内固定术后影像随访是临床常见的问题，需要及时了解手术区椎体、椎管及椎间盘的状况。由于金属伪影的影响，CT 检查的价值明显受限。能谱 CT 采用单能量技术可以降低 X 线硬化伪影，同时配合 MARs 技术可进一步减少大块金属所致的明显伪影。本文诣在了解能谱技术在脊柱内固定术后影像随访中的应用。
方法：脊柱内固定术后能谱 CT 扫描一般采用平扫为主。首先进行目标位置的定位像的扫描，然后行能谱 CT 平扫。能谱扫描方式选择 Helical-musculoskeletal-large-40mm,螺距 0.984:1 或者 1.375:1,对于特别致密的金属假体可以通过减少螺距来达到更好的减除金属伪影的效果，将单能量图像载入 GSI viewer,调整能量滚动条，选择伪影较少、对比较好的能量水平作为重建二维和三维图像用。
结果：将能谱图像载入能谱分析浏览器（GSI），依次观察单能量及多平面重建图像，观察手术区软组织情况以单纯单能量图像为佳，能量水平在 80-90kev;对于金属植入物周围骨质情况的观察，以单能量图像结合 MARs 技术为佳，能量水平在 70-80kev。

结论：能谱 CT 单能量成像对脊柱内固定术后影像随访中的效果明显。

EPO-1403
Revolution CT 测量腰椎体膜骨密度的准确性及可重复性研究

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目的 探讨 Revolution CT 能谱成像对腰椎骨密度测量的准确性及同型号不同机器之间的可重复性。**材料和方法** 应用 GE 公司 Revolution CT，采用不同管电流（mA）及不同转速（s）组合，对欧洲腰椎体膜（ESP）重复进行 10 次扫描，在工作站利用能谱物质分离功能分别测量体膜 L1、L2、L3 椎体的 HAP 值，比较所测得的 HAP 值与真实值之间的差异；记录各组能谱 CT 的辐射剂量 $CTDI_{vol}$；在同型号不同 Revolution CT 机器上进行重复扫描 10 遍，对比不同机器间测量的可重复性；同时，在最佳单能量 40KeV 图像上测量 L1、L2、L3 椎体的 CT 值，探讨 CT 值与 HAP 值之间的函数关系。**结果** 管电流 230mA、球管转速 0.8s 条件下测得体膜 L1、L2、L3 椎体 HAP 含量分别为（50.58±0.88）mg/cm^3、（100.82±1.24）mg/cm^3和（200.43±0.8）mg/cm^3，与其实际值差异无统计学意义（P＞0.05），而且辐射剂量最低，$CTDI_{vol}$仅为 9.09；其他扫描条件下测得的数据准确性也高，但辐射剂量会有不同程度升高；同型号不同机器间所测得的数据没有统计学差异；40KeV 单能量图像测得体膜椎体 CT 值与 HAP 值之间具有高度相关性，两者关系可用一元线性关系式表达：腰椎骨密度(HAP)=0.3106CT_{40KeV}+0.02。 **结论** Revolution CT 扫描对欧洲腰椎体膜骨密度测量的准确性高，球管转速 0.8s 配合 230mA 条件下测量骨密度准确性高，而且辐射剂量最低，可重复性好。

EPO-1404
磁共振去金属伪影序列 MAVRIC-SL 在骨折内固定术后复查中的应用

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目的：合理内固定是治疗骨折的优先选择，但金属植入物会在磁共振常规序列中形成较大伪影，影响感染、骨髓炎、缺血坏死等并发症的诊断，本研究探讨去金属伪影序列 MAVRIC-SL 对骨折术后金属植入物患者磁共振图像的影响，以评价其临床应用价值。
材料与方法：纳入 2018 年 8 月至 2019 年 7 月的 25 例骨折术后体内含有金属植入物的患者（男 14 例，女 11 例），年龄 23-82 岁（45.36±15.96 岁），其中锁骨 1 例、肱骨 1 例、腰椎 1 例，髋关节 11 例、膝关节 7 例、股骨干 2 例、胫骨 2 例。使用 3.0T SIGNA PIONEER 磁共振，对患者进行常规序列各对比度扫描，并加扫 MAVRIC-SL 序列。由两位有经验的放射科医师共同阅片并对常规序列及 MAVRIC-SL 进行对比评分，有争议的部分商议后取得共识。评分内容：金属植入物伪影程度及其对周围结构诊断的影响：1、无伪影；2、几乎看不到伪影；3、可见伪影，但不影响诊断质量；4、中度伪影，中度诊断质量受损；5、严重伪影且不可诊断。抑脂序列的脂肪抑制效果：1、抑脂效果差，扫描范围内大片未抑脂区域；2、抑脂效果中等，抑脂不佳存在于植入物周围；3、抑脂效果好，不存在大片未抑脂区域。对评分行 Wilcoxon 秩和检验，$p<0.05$ 有统计学意义。
结果：对比常规序列，MAVRIC-SL 得到的图像金属伪影程度更小，诊断质量受损程度更小（常规序列：4.52±0.65；MAVRIC-SL：2.32±0.90；$p<0.01$）；MAVIRC-SL 能获得更好的抑脂效果（常规序列：1.64±0.49；MAVRIC-SL：2.72±0.46；$p<0.01$）。

结论：影响骨折金属内固定患者磁共振图像的因素众多，例如序列的选择、植入物等材质、植入物的数量及大小等。MAVRIC-SL 能有效减少金属伪影，并得到更好的脂肪抑制图像，对于骨关节病变的诊断提供更多帮助，有更高的诊断价值。

EPO-1405
后纤维环 T2 弛豫时间与腰椎间盘突出的相关性研究

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目的 探讨腰椎间盘后纤维环 T_2 弛豫时间和腰椎间盘突出之间的相关性。**方法** 采用 3.0T 磁共振成像系统对 54 例腰痛受试对象共 256 个腰椎间盘进行矢状位 T_2WI 和 T_2 mapping 扫描，分析扫描图像并根据椎间盘突出或膨出的程度进行分级及分组；正常椎间盘为 G1 组，存在侧面突出和膨出的椎间盘为 G2 组，存在正中、中间侧面和旁正中局限性后部突出的椎间盘为 G3 组。计算各分组的 Pfirrmann 得分，通过后处理计算得到各纤维环、后 10%椎间盘（posterior annulus fibrosus 10%, PAF-10）和后 20%椎间盘（posterior annulus fibrosus 20%, PAF-20）的 T_2 弛豫时间，进行统计学分析。**结果** 256 个椎间盘中 G1 组 104 个（40.6%），G2 组 116 个（45.3%），G3 组 36 个（14.1%），各组的 Pfirrmann 的平均得分依次为 2.16±0.55、2.59±0.71、3.21±0.74。经过后处理计算，各组椎间盘 PAF-10 和 PAF-20 的 T_2 弛豫时间分别为 G1 组：32.6±5.6 ms/67.8±12.3 ms、G2 组:34.2±5.4 ms /55.6±10.2 ms、G3 组:40.2±7.2 ms /46.9±9.8 ms。PAF-20 的 T_2 值从 G1 到 G3 组逐渐降低，而 PAF-10 的 T_2 弛豫时间呈现相反的变化趋势，从 G1 到 G3 组逐渐升高。和 G2 组比较，G3 组 PAF-10 的 T_2 值明显升高，且和髓核的 T_2 弛豫时间无相关性。而 G3 组 PAF-20 的 T_2 弛豫时间和髓核之间存在一定的相关性。**结论** MR T_2mapping 能对腰椎间盘 T_2 弛豫时间进行定量评估，且 PAF-10 的高 T_2 值与椎间盘突出存在明显的相关性。

EPO-1406
应用 3D-DESS 序列评估膝关节骨性关节炎软骨损伤的可行性及可重复性

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目的 探讨应用 T2 加权三维双回波稳态进动序列（3D-DESS）显示膝关节软骨的可行性和可重复性。**方法** 前瞻性搜集膝关节骨性关节炎患者 106 例，分别采用脂肪抑制质子密度加权序列（PDWI-FS）、自旋回波 T1 加权序列（SE -T1WI）和 T2 加权三维双回波稳态进动序列（3D-DESS）分别进行膝关节扫描。首先，2 名放射科医生按照预先设定的评分标准通过双盲法分别对图像质量进行主观评分，比较评分一致性。然后，分别测量不同序列上膝关节软骨的信号噪声比（SNR）、关节液的信号噪声比（SNR）和软骨-关节滑液的对比度噪声比（CNR），比较不同序列显示膝关节软骨的效果。最后，2 名放射科医生分别应用三个序列对膝关节软骨损伤情况进行半定量诊断，分析诊断一致性。 **结果** 2 名放射科医生对图像质量的主观评分一致性结果显示，三个序列（PDWI-FS、SE -T1WI、3D-DESS ）主观评分一致性较好（kappa 值分别为 0.756、0.823、0.879，均>0.6），其中 3D-DESS 序列最高，且差别具有统计学意义（P<0.05）。客观测量结果显示，3D-DESS 序列的关节液 SNR、软骨 SNR、软骨-关节滑液 CNR 分别为 15.09±3.67、9.43±2.57、5.65±2.34，均高于常规序列，且差异具有统计学意义（P<0.05）。半定量诊断一致性结果显示，2 名放射科医生对 PDWI-FS 序列、SE-T1WI 序列及 3D-DESS 序列的半定量诊断评分一致性较好

（kappa 值分别为 0.805、0.736、0.851），其中 3D-DESS 序列一致性最高，但差异没有统计学意义(*P*>0.05)。 **结论** 3D-DESS 序列较常规序列能更好地显示膝关节骨性关节炎软骨损伤，且具有较好的观察者间一致性。

EPO-1407
数字摄影不同测量方法在骨折矫形中的对比研究

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目的：比较数字化影像直接测量数据及去除放大率影响测量数据和模型实际测量数据的差异
资料与方法：诊断 X 线机 GE（Discovery Xr656），摄影距离 100cm，摄影条件 50KV，5mas，中心线对胫骨中段，1：测量六组胫骨不同部位骨折的模型矢状面和冠状面骨折移位数据，2：将直径 25cm 金属球放置于胫骨中段平胫骨高度，进行正侧位投照，3 对数字化图像测量矢状面和冠状面骨折移位数据 4：对数字化影像金属球直径测量，减去金属球实际直径，计算放大率后再计算影像一比一数据，5：骨折移位测量方法：选取骨折处两端骨皮质做延长线，测量其垂直移位，所有测量数据都由此方法测量
结果：应用统计学软件 SPSS 13.0 进行比较，正位实际测量与模型测量相比 F 值为 18.482，两者有统计学差异（P＜0.05），组内相关系数为 0.997；正位去放大率测量与模型测量相比 F 值为 1.570，两者无统计学差异（P＞0.05），组内相关系数为 1；正位实际测量与模型测量有差异，去放大率测量与模型测量无差异；侧位实际测量模型测量准相比 F 值为 9.629，两者有统计学差异（P＜0.05）组内相关系数为 0.999，；侧位去放大率测量与模型测量相比 F 值为 0.412，两者无统计学差异（P＞0.05），组内相关系数为 1；侧位实际规测量与模型测量有差异，去放大率测量与模型测量无差异
结论：在不同类型胫骨骨折矫形治疗中，数字摄影准确计算放大率的方法其数据准确性高于数字摄影直接测量数据，为临床矫形提供可靠依据，本研究缺点是样本量较小，会扩大样本量并进行临床测量验证此研究的准确性

EPO-1408
双源 CT 对痛风性关节炎尿酸盐结晶检测的临床应用

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目的：研究双源 CT(DECT)双能量扫描对各关节痛风性关节炎尿酸盐结晶（痛风石）的诊断价值。
方法：回顾性分析 2017 年 4 月至 2018 年 7 月，38 例临床诊断为高尿酸血症痛风性关节炎的患者，病程 3 年至 10 年平均 6.1 年，男（34 例）女（4 例）比例为 8.5∶1， 平均年龄(50.4 ± 11.5)岁。其中手关节 3 例，肘关节 2 例，膝关节 2 例，足 31 例。所有患者均为双侧关节同时经 DECT 双能量扫描，扫描参数：A 球管 80 kV/250 mAs，B 球管 140 kV/125 mAs，螺距 0.7；阵矩 512 × 512，平均加权系数 = 0.4，卷积核值 D = 34 s，启动实时动态曝光剂量调节 CARE Dose 4D。重建参数：层厚 0.75 mm，层距 0. 5mm。将获得的 80 kV、140 kV 及平均加权 120 kV 三组数据传输至 MMWP 工作站，加载入 GOUT 软件内，应用程序内的痛风分析软件进行痛风结节评估，以轴位、冠状位、矢状位及容积再现（VR）技术重建形式显示有无尿酸盐结晶（痛风石）的绿色标

记图，分析 DECT 对慢性痛风性关节炎患者痛风石检出率。检测痛风结石作绿色标记（皮肤、指甲及足跟等部位不纳入标记区域），紫色标记松质骨。由 5 年以上医师记录绿色标记区域的位置，观察其周围软组织肿胀情况。
结果:DECT 双能量检查对痛风性关节炎痛风石的检出率为 60.5% (23/38)；检出痛风石 71 处，其中 53 处发生在第一跖趾关节处;15 例高尿酸血症未检测出痛风石。所有患者疼痛关节中骨质破坏缺损 9 处，关节周围软组织肿胀 16 处。
结论: DECT 双能量扫描对痛风性关节炎痛风石敏感性高，并且可以直观无创地显示患者检测部位尿酸盐结晶的沉积情况，可应用于痛风病情的监测，具有重要的临床推广应用意义。另外 DECT 痛风石成像常出现伪影，指甲和皮肤处较常见，了解这些伪影的特点有助于提高诊断的准确率。

EPO-1409

改良髌骨轴位摄影角度的关联性探讨

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目的 探讨膝关节仰卧水平侧位摄影中，股胫角、股胫外角和胫前髌后角与水平髌后角、水平胫骨角和水平股骨角的关联性，从而指导髌骨轴位摄影的入射角度。**方法** 选取 100 例患者进行膝关节仰卧水平侧位摄影，屈膝角度在 135° 时，分别统计上述各角度对应的数据，对测量数据进行相关分析和回归分析。**结果** ① 屈膝在 135° 时，以股胫角在 112.1°-146.7° 范围内，股胫角和水平髌后角、水平胫骨角、水平股骨角存在直线相关关系，r=Pearson 相关系数为-0.471，-0.818 和-0.801，统计量 F 及 P 值分别为 27.948,198.376,175.455，P＜0.001；线性回归模型分别为 Y=141.060-0.560X，Y=164.172-1.318X 和 Y=161.984-1.286X；② 股胫外角在 33.3-67.90 范围时股胫外角与水平髌后角、水平胫骨角、水平股骨角存在直线相关关系，r=Pearson 相关系数分别为 0.471，0.818,0.801，统计量 F 及 P 值分别为 27.948，198.376，175.455，P＜0.001；线性回归模型分别为 Y=38.940+0.560X；Y=15.828+1.318X 和 Y=18.106+1.286X。③胫前髌后角在 4.20-25.40 时，胫前髌后角与水平髌后角存在直线相关关系。r=Pearson 相关系数为-0.709，统计量 F 及 P 值分别为 85.217，P＜0.001；线性回归模型分别为 Y=21.36-0.491X。胫前髌后角与水平胫骨角和水平股骨角无直线相关关系。④对 58 例髌骨轴位患者影像中，优片 53 例，占 91.3%；良片 4 例，占 6.8%；差片 1 例，占 1.7%。**结论** 股胫角、股胫外角及胫前髌后角与水平髌后角存在直线相关性，髌骨轴位摄影中可根据膝关节屈曲角度，求出相应的水平髌后角，进而得到 X 线入射角度。

EPO-1410

超短时间回波（UTE-MRI）及 T2*mapping 序列对颞颌关节紊乱（TMD）中关节盘定量分析评价

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目的：应用磁共振超短回波时间(ultrashort echo time,UTE)及双回波脉冲序列 T2*mapping 定量评价颞颌关节紊乱患者及正常对照组中关节盘 T2 值、关节盘信号及运动移位情况改变，用于识别及评价 TMD 关节盘损伤的早期特征信号。
方法：常规序列观察盘突关系，髁突骨质改变，关节腔积液，关节盘形态改变，并进行 UTE-MRI 及 T2* mapping 序列颞颌关节定量分 25 例临床确诊为 TMD 患者及相匹配的正常对照组 25 例。采用 t 检验左右两侧关节盘自身比较及 TMD 组与正常对照组的 T2 值定量差别。

结果:常规序列虽能较好的显示盘突关系，髁突骨质改变，关节腔积液，大多数关节盘的形态学参数评价良好，但 UTE 序列能将低信号的关节盘显示为高信号，特别是对于常规序列无法识别的关节盘的显示，UTE 序列能更好的观察关节盘的移位关系；25 例中其中 21 例双侧关节盘前移、2 例左侧前移、2 例右侧前移；25 例中其中 9 例伴有少量关节腔积液；25 例中 19 例髁突骨质改变；并由 3 个经验丰富的独立人单独各评估关节盘感兴趣区域(ROI)的 T2 值。自身对照双侧颞颌关节关节盘无统计学意义（TMD 组 P＞0.05；正常对照组 P＞0.05）。TMD 组与正常对照组 T2*值平均值分别为(27.6±5.4)ms 和(32.76±8.41)ms,两者差异有统计学意义(P<0.05)。
结论：磁共振超短 TE 回波脉冲序列可用于 TMD 的关节盘的定量研究 ， (UTE)多回波脉冲序列成像可使传统 MR 成像序列不能显示信号或表现为低信号的主要含短 T2 成分的组织显示出来并检测到其信号，不仅可以更好的诊断关节盘移位、髁突的骨质改变，其 T2*mapping 技术对 T2 值的测定可以早期、敏感地反映软骨水含量和生化成分的改变，成功实现对关节盘的定量分析，为今后广泛开展关节盘损伤定量研究提供了新途径。

EPO-1411

肢体细小玻璃异物在影像学中的显示

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【摘要】目的 人们在日常生活和工作中会有意外被玻璃物品刺伤，但在清创过程中，体积相对较大的异物被清除出体外，细小异物因显示不明显而存留于体内。被细小玻璃异物存留后会有不同程度的异物感，细小玻璃异物在影像学检查设备中的不同表现，可以指导临床选择对细小玻璃异物敏感显示的检查项目，影像学对细小玻璃异物的检查项目有：DR、CT、MR 及钼靶。选择正确的检查设备项目，不仅可以显示异物是否存在，还可以显示异物的数量、大小、多少等等。
材料与方法 患者在日常生活中被普通玻璃物品意外爆炸伤或刺伤后，临床清创前/后需对创伤部位进行影像学检查，临床要求检查申请单可能有:（1）首先 DR，（2）CT, (3)MR, (4)钼靶。（1.2）利用 DR X 线机对创伤部位进行低千伏 X 线正位、侧位、创口切线位摄影；（2.2）利用 CT 机对创伤部位进行横断面扫描后、再进行冠状面及矢状面后处理；（3.2）利用 MR 机对创伤部位进行横断面、冠状面、矢状面进行扫描；（4.2）利用钼靶 X 线机对创伤部位进行正位、侧位、创口切线位摄影。
结果 在钼靶 X 线机摄影中清晰显示的细小玻璃异物；在 MR 检查中未发现异物影；在 CT 扫描中降低千伏后隐约可见；在 DR X 线机常规曝光条件摄影中亦不可显示，利用 DR 设备最低千伏值并适当增加毫安摄影隐约可见异物影。
讨论与结论 DR、CT 及钼靶检查是利用异物吸收 X 线量的多少而显示的，DR 及 CT 设备的最低千伏值都超过 40KV,为硬 X 线，能穿透细小异物不被吸收，钼靶设备的千伏值一般为 25-35KV,为软 X 线，易被细小异物吸收，MR 是通过静磁场使人体组织中的氢质子收到激励而发生核磁共振现象，是利用氢质子在驰豫过程中感应出的 MR 信号而成像的，普通玻璃的主要成分为:Na2SiO3、CaSiO3、SiO2,
而普通玻璃中没有氢离子，所以细小玻璃异物在 MR 检查中不显示。

EPO-1412

3D MEDIC WE 和 3D SPACE STIR 磁共振序列在腰丛神经根成像的对比研究

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目的 本文旨在结合 3D MEDIC WE 和 3D SPACE STIR 序列提供显示神经根纤维束的对比研究方法，提供合理选择 MR 序列的效价比。**方法** 20 例患者行 3D MEDIC WE 和 3D SPACE STIR 序列的腰丛神经根成像，最大密度投影（MIP），曲面重建（CPR）用以定性评价图像质量；多平面重组（MPR）用以充分显示神经根结构，定量测量两序列图像质量参数 SNR，CNR 以及 CR。**结果** 3D MEDIC WE 和 3D SPACE STIR 两种序列均能不同程度清晰显示腰丛神经根。3D MEDIC WE 对比 3D SPACE STIR 序列，影像评级占优（60 vs.55, P<0.05）；3D SPACE STIR 对比 3D MEDIC WE 序列，SNR（58.37±11.81vs. 10.71±0.80），CNR（28.05±7.85 vs. 2.79±0.40），CR（6.75±0.63 vs. 1.31±0.05）(P<0.05)占优。两序列联合诊断敏感性 92.7%，特异性 97.3%，准确率为 92.7%。**结论** 3D MEDIC WE 和 3D SPACE STIR 序列应用于神经根成像效果显著，可不同程度不同重点直观清晰显示腰丛神经根走行及局部解剖细节，影像技术操作应考量图像可读性并结合图像技术参数为临床提供影像支持。

EPO-1413

双能量 CT 成像在脊柱转移瘤中研究进展

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【摘要】：脊柱是骨转移瘤最常见部位。影像学检查是其诊断的主要检查手段，其中 CT 对骨质破坏显示较好，但其对骨髓浸润灵敏度不高，容易遗漏一些早期隐匿性病变。双能量 CT 成像技术在常规 CT 基础上还能进行骨髓成像，使其在脊柱转移瘤中应用越来越广泛。本文对双能量 CT 成像技术主要成像方法及其在脊柱转移瘤的研究进展进行综述。

双能量 CT 成像技术主要方法：

1.1 **骨髓水肿**

相较于常规 CT，双能量 CT 能通过收集两个不同能级的 CT 数据集对物质的混合成分进行分解，根据物质原子量及电子密度、X 线束不同程度的吸收和衰减、特征性双能量指数，通过颜色编码区分不同物质的化学成分。基于这一成像原理，放射科医生可以通过对伪彩图、灰阶图以及三维重建图进行综合评估，在显示解剖细节及骨髓水肿情况下识别脊柱转移瘤，从而提高脊柱转移瘤的诊断效能。

1.2 **虚拟单能量曲线及斜率**

双能量 CT 是根据能量衰减变化，利用从两种不同材料 X 射线能量中获取的不同图像数据集，对材料进行能量分析。双能量 CT 虚拟单能量成像提供了不同物质在不同能级下的 CT 值及能量曲线特征，为虚拟单能量曲线在转移瘤的临床应用中提供了依据。相比于常规 CT 只能产生单一参数图像，双能量 CT 在一次扫描检查中可以提供不同能级数据，将 CT 扫描从单参数成像转变为多参数成像，为疾病的评估提供了新的手段。

1.3 骨-碘物质分离

双能量 CT 能将骨和碘两种不同物质成分进行分割并重建骨-碘图，使 CT 图像能够将碘从骨中分离出来，用于脊柱转移瘤的定性及定量分析。与常规 CT 相比，骨-碘物质分离技术能更直观地反应病灶组织内的碘浓度差异，更敏感地显示细微强化病灶，并通过量化分析评估病灶内血供情况。

综上所述，双能量 CT 的多成像技术对脊柱转移瘤具有较好的应用价值。我们相信，在不久的将来，随着应用的进一步增多，其在诊断脊柱转移瘤方面会有更多的优势，为临床治疗决策的选择提供帮助，提高患者预后生活质量。

EPO-1414
双能量 CT 虚拟单能量成像在鉴别脊柱良恶性压缩性骨折中应用价值

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目的 本研究旨在探讨双能量 CT 虚拟单能量成像在脊柱溶骨型转移瘤所致恶性压缩性骨折与良性压缩性骨折中的鉴别诊断价值。
方法 本研究前瞻性纳入脊柱压缩性病变患者，进行双能量 CT 扫描，根据病理及随访最终诊断，分为溶骨型转移瘤所致恶性压缩性骨折和良性压缩性骨折两组。分析病灶椎体虚拟单能量不同能级下 CT 值及能量曲线斜率。通过 ROC 曲线，比较虚拟单能量成像对脊柱溶骨型转移瘤所致恶性压缩性骨折、良性压缩性骨折的鉴别诊断效能。
结果 共纳入脊柱压缩性病变患者 51 例，其中为溶骨型转移瘤所致恶性压缩性骨折 21 例（共 50 个椎体）、良性压缩性骨折患者 30 例（共 37 个椎体）。脊柱溶骨型转移瘤所致恶性压缩性骨折与良性压缩性骨折的虚拟单能量曲线斜率均随着 Kev 值的增加而降低，且脊柱溶骨型转移瘤所致恶性压缩性骨折在虚拟单能量不同能级下（40-120Kev）CT 定量值、曲线斜率均低于良性压缩性骨折($P<0.001$)。ROC 曲线结果显示，在 120Kev 能级下 AUC 值最高为 0.882，其诊断敏感性、特异性分别为 95%、76%。另外，虚拟单能量曲线斜率测得 K=2.20 时 AUC 值最高为 0.792，相应敏感性为 89%。
结论 通过虚拟单能量下 CT 值、能量曲线分析可以鉴别脊柱溶骨型转移瘤所致恶性压缩骨折与良性压缩性骨折，具有较高的临床应用价值，推荐使用 120Kev 能级显示效果较佳。

EPO-1415
Evaluation of prosthetic complications and tumor recurrence with the single energy metal artifact reduction algorithm in patients with hip tumor prostheses

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Purpose: To evaluate the effect of the single energy metal artifact reduction (SEMAR) algorithm with a 320 Multidetector computed tomography (MDCT) volume scanner on complications and tumor recurrence detection in patients with hip tumor prosthesis. Materials and methods: From February 2016 to June 2019, 45 consecutive patients with tumor prostheses of hip joint underwent 320-MDCT scan. Prosthetic complications and tumor recurrence were confirmed by other imaging examination, clinic or pathology. The images were reconstructed by two different methods: iterative reconstruction (IR) alone and IR associated with SEMAR. Two radiologists visually graded the diagnostic confidence on a 6-point ordinal scale from 0 (lesions are completely obscured by metal artifact) to 5 (lesions are recognized with high confidence). Standard deviation (SD)

of CT attenuation defined as the index of artifact (AI) were compared between the two reconstructed methods. Paired sample t test was performed with AI values of the ROIs on without/with SEMAR images. Wilcoxon matched-pairs signed rank test were used to compare the scores of lesions without/with SEMAR. A p value less than 0.05 was considered statistically significant.
Results: Reviewers 1 and 2 detected 15 and 10 more lesions with SEMAR, respectively. The mean score of prosthetic lesions without SEMAR was 19.2 ± 4.3 and 22.0 ± 2.7 for reviewers 1 and 2; with SEMAR the score was significantly higher, 35.7 ± 2.3 and 37.9 ± 2.8, ($p < 0.05$). The artifact of the SEMAR images was lower than that of the IR images (19.28 ± 5.96 vs 143.50 ±87.28 HU, $P < 0.001$).
Conclusion: The SEMAR can significantly reduce the metal artifact and increase diagnostic confidence of prosthetic complications and tumor recurrence in patients with hip tumor prostheses.

EPO-1416
动态容积灌注 CT 定量评价糖尿病足血流情况

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目的：利用动态容积灌注 CT 系统地针对糖尿病足发生、发展的病理基础，得到相应的灌注参数，从而预测糖尿病足的发生及预后，为临床治疗提供指导。
方法：
一、按纳入标准筛选后将所有出现糖尿病足症状的患足作为一组，将无糖尿病无动脉大血管疾病的足作为正常对照组（依托单位有部分外伤患者行双足灌注 CT 成像评估远端血供情况，可将其未受伤正常侧足未作正常对照组），两组行 CTP 检查并将数据导入工作站后处理软件，生成伪彩图，取 ROI 测量患足组灌注异常区各参数值，在正常足组每只足灌注图上取相应位置 ROI，测出各参数值并记录。两组参数值采用配对 t 检验，结果是否差异具有统计学意义。
二、按纳入标准筛选后将对象分为正常对照组、有症状无溃疡组、溃疡组、截肢组四组，分别行 CTP 检查经后处理生成伪彩图，后三组分别于灌注异常区取 ROI，并在正常组相应位置取 ROI，测量并记录各参数值，采用单因素方差分析法，分析四组间 CTP 灌注参数的差异。
结果、结论：预测糖尿病足各组数据较正常足灌注减低，且按进展程度的不同表现不同。

EPO-1417
低管电流联合 idos4 迭代重建技术对腰椎骨密度 CT 的临床应用

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【摘要】 目的：通过降低管电流来降低辐射剂量，从而得到腰椎骨密度(BMD)准确度的可行性。方法：应用飞利浦 256iCT，在 4 种不同的剂量条件下（管电压 120 kV，管电流 60、100、140 和 180 mA），将 40 岁到 80 岁的 120 例患者随机分为 4 组进行扫描，并进行 idos4 迭代重建。应用 EBW 工作站中的 Bone Mineral Density 软件分别在 L1、L2、L3 和 L4 正中间置感兴趣区(ROI)，将患者的肌肉和脂肪组织用作内部参考，测量其 T 分数值。结果：在不同辐射剂量、同一迭代权重下，ESP(L1、L2、L3 和 L4)的 BMD 差异均无统计学意义(P>0.05)。腰椎 BMD 准确度误差均在 5%以内。

结论： 120 kV、60 mA 低剂量条件下，不影响 BMD 准确度，实现了腰椎骨密度的准确测量，并显著降低辐射剂量，为临床评估患者骨质疏松提供了有效的参考价值。

EPO-1418

磁共振 3D-cube 在膝关节各韧带的定性研究

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研究磁共振 3D-cube 在膝关节韧带中的临床应用。
方法：50 例患者（20 个膝关节）行常规 MRI 扫描加 3D-cube 扫描，通过多平面成像（Multi-planar reformation, MPR）对所有病例的膝关节二维和三维图像进行重建，依据韧带的边缘及附着点，由两位放射科医生按照膝关节韧带等级评分独立进行评估。
结果：髌韧带、后交叉韧带、前交叉韧带、外侧副韧带能够被清晰的显示，内侧副韧带显示欠佳，横向韧带（如髌骨内侧、外侧支持带）与后韧带（如腘斜韧带）不能够显示。
结论：磁共振 3D-cube 可较清晰的呈现维持膝关节稳定的主要韧带，是一项有价值的呈现膝关节主要韧带的新方法。

EPO-1419

DTI 在颈椎间盘突出症致臂丛神经受累中的应用

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目的 探讨 DTI 对颈椎间盘突出所致臂丛神经受累病变的应用价值。

方法 选择臂丛牵拉试验阳性，存在单侧颈椎间盘突出患者（病变组）及健康成人（健康组）各 10 例，分别行 DTI 扫描后测量病变组患侧、健侧以及对照组同病变组患侧的臂丛 FA 值和 ADC 值，并行臂丛 DTT 成像。比价两组资料中三者的 FA 值和 ADC 值。

结果 病变组患侧、健侧以及对照组同病变组患侧的臂丛 FA 值和 ADC 值比较，分别行成组 t 检验，差异存在统计学意义（t=4.13，p＜0.05；t=4.52，p＜0.05）。通过进一步两两比较，健康对照组和病变组患者同侧对应的臂丛束的平均 FA 值和 ADC 值存在差异（P 值均＜0.05），病变组患侧臂丛的 FA 值显著低于健康对照组的，ADC 值显著高于健康对照组；病变组患者健侧与患侧对应的臂丛束的平均 FA 值和 ADC 值存在差异（P 值均＜0.05），病变组患侧臂丛的 FA 值显著低于健侧，ADC 值显著高于健侧；病变组患者健侧与健康对照组同侧臂丛的 FA 值和 ADC 值没有显著性变化（P＞0.05）。

结论 臂丛 DTI 成像，可以显示臂丛神经解剖形态及走行，并可通过量化分析，提供神经根病变的定量数据，更能反映出导致患者临床症状的臂丛神经情况。

EPO-1420

四肢孤立性纤维性肿瘤 MR 影像分析

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目的：分析发生于四肢的孤立性纤维瘤 MR 平扫和增强的影像学表现，探导其影像学诊断价值。
方法：回顾性分析 7 例经手术病理证实的四肢孤立性纤维瘤，7 例全部术前经 MR 动态增强检查。所有病例影像资料均经 2 名高年医师分析阅片，分析病灶边界、大小、内部信号特点和强化程度、血供情况、对邻近结构的侵犯、是否合并转移等，并与手术病理进行对照。
结果：7 例孤立性纤维瘤病例中，发病年龄 19-80 岁，主要集中在中老年；女性 4 例，男性 3 例。肿瘤大小不等，直径 1-39cm,平均约 8cm,<5cm 1 例，5—10cm 4 例，>10cm 2 例。病灶边缘多光滑，境界清楚。瘤体呈卵圆形或类圆形 5 例，梭形 2 例；3 例肿瘤信号相对均匀或略不均匀，4 例可见不规则坏死区。较小病灶形态规则，巨大病灶多呈分叶状。主要 MRI 表现为 T1WI 上肿瘤呈等、稍低信号，1 例呈稍高信号； T2WI 信号变化多样，分别表现为高信号、略高信号和低信号区，高信号反映肿瘤黏液样变区，略高信号反映肿瘤细胞密集区，低信号反映致密胶原纤维。增强扫描 5 例呈明显强化，2 例呈轻中度强化，坏死区不强化。 病理学检查提示肿瘤均由梭形细胞构成， 免疫组化染色 CD34、CD99 阳性，3 例 BCL-2 阳性。
结论：SFT 典型影像学表现包括：肿瘤多呈卵圆形或类圆形，境界清楚，瘤内 MR T2WI 信号不均匀，T2WI 等或略高信号中存在片状或结节状低信号是大多数 SFT 典型 MR 表现，动态增强强化明显。

EPO-1421
DR 及 CT 联合评价地诺单抗治疗骨巨细胞后疗效的应用

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目的 探讨 DR 及 CT 对地诺单抗治疗骨巨细胞瘤效果的应用评价。
方法 2018 年 6 月至 2019 年 6 月入我院治疗的骨巨细胞瘤患者 12 例，地诺单抗治疗前后均行 DR 及 CT 检查。患者平均年龄为 31.3（ 18～48 ）岁，男 7 例，女 5 例。病变位于骶骨或骨盆 3 例（ 骶骨 1 例，髂骨和坐骨各 2 例 ），位于四肢骨 9 例（ 胫骨 3 例，桡骨 2 例，肱骨、股骨各 2 例 ）。采用 DR 及 CT 骨创评价骨包壳形成、CT 软组织窗测量肿瘤最长径及 CT 增强强化增加值变化评价地诺单抗用药后的变化。
结果 ①用药后 DR 及 CT 骨窗较用药前均显示骨包壳形成（P＜0.01）②用药后 CT 软组织窗测量肿瘤平均最长径较用药前变小（P＜0.01）。③用药前病灶 CT 平均增加强化值 60.8，用药后病灶 CT 平均增加强化值 40.6，用药后 CT 增加强化值降低 (P＜0.01)。
结论 地诺单抗治疗后，DR 及 CT 骨窗显示骨包壳形成，显示了病变内新生骨形成；CT 增加强化值得减低显示骨巨细胞瘤病变治疗后血运降低；肿瘤长径的变小是地诺单抗治疗效果直接的反应。

EPO-1422
5 例躯干体壁滑膜肉瘤的影像学特征

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【摘要】目的 总结原发性躯干体壁滑膜肉瘤的影像学特征，提高对该病的认识。方法 回顾性分析经病理证实的 5 例原发于躯干体壁的滑膜肉瘤影像及临床资料，重点分析其影像学特征。结果 5 例中，胸壁 1 例，腹壁 3 例，盆壁 1 例。CT 平扫病灶呈等低密度，增强扫描呈不均匀强化；2 例病

灶边缘可见斑点状钙化灶。其中一例 MRI 检查显示病灶在 T_2WI 上呈高、稍高、低混杂信号。结论 躯干体壁滑膜肉瘤影像学表现与其他部位表现相似，由于该病的恶性程度高，侵袭性强，在初诊时应综合 CT 及 MRI 表现，做出诊断并评估病灶对周围组织的侵犯情况。此外，该病局部复发率高并且多发生晚期转移，后期应长期密切随诊。

【关键词】原发性躯干体壁 滑膜肉瘤 体层摄影术 X 线计算机 磁共振成像

EPO-1423

骨肿瘤影像学检查规范

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目的：提高各类影像学检查对骨肿瘤诊断的准确率，进一步规范扫描方法。方法：系统性查阅近年文献资料，并结合我院放射线科扫描经验，对原发性骨肿瘤的影像学检查方法提出最佳的处理模式。结果：对原发性骨肿瘤的扫描图像提出一种合理的图像处理方法，研究最佳扫描模式。，X 线平片还能够整体观察病变概况，明确判定病变的部位、范围、形态和密度改变，判别骨质破坏、增生硬化和骨膜反应的性质、软组织肿块、肿瘤骨与肿瘤钙化等。CT 通常采用螺旋扫描，重建层厚 1mm 以下，对图像进行骨算法及软组织算法重建，最佳矩阵 1024×1024。2、必要时使用增强扫描。增强扫描层厚参数与平扫一致，采用软组织重建算法。3、骨算法重建是 CT 计算机重建图像的一种计算方式，空间分辨率明显提高，图像细致清楚，层次丰富，提高骨质与周围结构的对比，使骨皮质及骨小梁结构显示清晰，细微的骨折线也能显示出来。适用于二维 MPR 重组。4、CT 增强扫描。增强扫描是通过反映血供程度和血流灌注水平在不同组织和同一组织不同部分间的差别，提高病变与正常组织间的对比度，进而提高病变的检出率，对疾病的定位、定性及鉴别诊断起着重要的作用。MRI 检查对于不同疾病应用不同的扫描序列，以达到病变显示的最优化。1、T1/T2 序列主要观察肿瘤内部成分；2、T2 脂肪抑制序列用于鉴别脂肪性病变和瘤周水肿，帮助临床确定手术切除范围；3、T1 脂肪抑制增强序列可以对 T1 脂肪抑制序列进行增强处理，观察病灶强化方式，评估肿瘤性质；4、DWI 序列用于评估肿瘤良恶性，测量 ADC 值；5、Gd-DTPA 增强扫描。由于 Gd-DTPA 具有缩短 T1 的作用，所以常先使用 MR 平扫 T1WI 及 T2WI，然后作增强的 T1WI。肌骨系统 Gd-DTPA 的常用剂量为 0.1mmol/kg。结论：本文从影像学多种检查的各类图像处理结果分析骨肿瘤的影像学诊断进展，总结最佳的扫描策略。

EPO-1424

腱鞘巨细胞瘤与色素沉着绒毛结节性滑膜炎的 MRI 诊断

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【摘要】：目的 分析腱鞘巨细胞瘤与色素沉着绒毛结节性滑膜炎的 MRI 特征,及 MRI 在两者鉴别诊断中价值。**方法** 回顾性分析 52 例经手术病理证实的腱鞘巨细胞瘤及 PVNS 患者，术前均接受 MRI 检查，其中 17 例行增强扫描。2 名有骨关节系统影像诊断经验的医师对病灶的部位、形态、大小、信号特征、强化方式、邻近结构改变进行分析。**结果** 57.7%(30/52 例)的患者为局限性腱鞘巨细胞瘤型，病灶主要位于手足部(占 67 %)，MRI 表现为境界清晰的结节状的长/等 T1 稍长 T2 信号；17.3%(9/52 例)的患者为弥漫性腱鞘巨细胞瘤型，病灶主要位于足部(占 44 %)，MRI 表现为边界欠清的结节状或团片状长 T1 稍长/短 T2 信号；25%(13/52 例)的患者为色素沉着绒毛结节性滑膜

炎，病灶主要位于膝关节(占 54 %)，MRI 表现为关节腔内弥漫性肿块影,呈长 T1 短 T2 信号，其内大量增生的滑膜组织，易累及周边结构。**结论** MRI 检查有助于显示肿块的信号特征、范围及与周围组织结构的关系，有助于腱鞘巨细胞瘤与色素沉着绒毛结节性滑膜炎的鉴别诊断。

EPO-1425

胫骨骨性纤维结构不良影像、病理再认识

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目的：分析胫骨骨性纤维结构不良（OFD）的影像、病理。**方法**：回顾性分析 7 例临床资料完善的 OFD 病例，分析 WHO（2013）骨肿瘤分类下，骨性纤维结构不良的影像、病理特点，以及与临床上非常容易混淆的骨纤维结构不良、非骨化性纤维瘤的鉴别诊断。**结果**：骨性纤维结构不良好发于儿童，复发率极高，其影像表现主要为 6 例患者为胫骨上段前缘骨干骨皮质下的囊状多房性、膨胀性、溶骨性病变，多房病灶间为宽窄不等的骨性间隔。所有例病灶边缘有硬化边，均未见骨膜反应及软组织肿块。6 例病灶凸向髓腔累及骨松质。MRI 表现不一 6 例均见条带状低信号间隔；6 例病灶增强明显强化。镜下：病变由纤维组织和骨小梁构成，纤维组织疏密不等，病灶中央纤维成分较多、骨小梁相对较少，周边见丰富宽窄不等骨小梁，纤维成分相对较少。4 例骨小梁周围有较多骨母细胞、破骨细胞围绕，2 例偶见骨母细胞（可能与取材有关）。5 例免疫组化标记角蛋白系列抗体(CK19、CKpan、CK5/6、CKHMw 阳性率分别为 63.2%、100%、100%、100%），且高分子量角蛋白表达较强。**结论**：1.因为大多数骨肿瘤命名为音译而来，故往往有多种翻译，如 FCD 又称为干骺端纤维性缺损；FD 又称为骨的纤维结构不良、纤维结构不良、纤维异样增殖症、纤维性骨结构不良症、骨纤维性发育不良等。以往有学者认为 FCD 有两个发展趋势，一个方向是 NOF，另一个方向是骨化性纤维瘤（OF）。现 WHO（2013）将 NOF 中小的不累及髓腔的病变归为 FCD。ODF 与 FD 影像、病理极为相似。2.OFD 虽与 FD 在影像表现及病理上极为相似，但是二者性质差别较大，对临床及手术指导极其重要，前者发病年龄较小，10 岁前手术复发率接近 100%；后者相对发病年龄较大，复发率相对较低。OFD 发病率远小于 FD，加深对 OFD 影像及病理的认识、根据现有影像学检查提高对 OFD 诊断正确率，将对患者及临床起着较为积极的作用。

EPO-1426

骨母细胞瘤的影像表现特征

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目的
探讨骨母细胞瘤的 CT 和 MRI 表现特征。
方法
回顾性分析经手术病理证实的骨母细胞瘤 21 例，术前行 MRI 和（或）CT 检查。MRI 检查使用 T1WI、T2WI 及 T2 抑脂序列进行平扫，增强采用 T1 抑脂序列。CT 扫描采用横断面平扫加增强，矩阵 512×512，管电压 120 kV，采用自动管电流调制技术。
结果
21 例骨母细胞瘤中，良性骨母细胞瘤 11 例，侵袭性骨母细胞瘤 10 例。6 例发生在脊椎（1 例颈椎、2 例胸椎、2 例腰椎、1 例骶椎），其中 5 例发生在椎板，1 例发生在椎板和棘突；7 例发生在长骨（4 例股骨、1 例胫骨、2 例尺骨）；发生在罕见部位肩胛骨 2 例，耻骨、肋骨、软组织内各 2

例；病理表现为显微镜下可见丰富的骨母细胞、间质可见丰富的血管以及丰富的骨样组织相互连接成索状。影像表现为 13 例瘤灶内见钙化及骨化影，良性病变边界清楚，边缘可见完整的硬化边，2 例侵袭性病变边界模糊，形态不规整，周围硬化边不完整。 MRI 检查，T1WI 以低信号为主，T2WI 上信号不均匀，恶性程度高的较大肿瘤以显著高信号为主，钙化及骨化在 T1WI 和 T2WI 均为低信号，增强检查多呈不均匀强化。

结论

CT 和 MRI 能较准确地显示骨母细胞瘤的病变特征，对良恶性骨母细胞瘤定性诊断也有一定的提示作用。

EPO-1427

Synthetic MRI 对前列腺癌骨转移的诊断价值

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目的：本研究旨在探讨应用 synthetic MRI 诊断前列腺癌骨转移的可行性。

材料与方法：本研究共纳入 2018 年 4 月至 10 月于我院进行前列腺 MRI 检查的 26 例患者，其中 4 名经病理诊断为前列腺癌，并经 MRI 和骨显像证实为骨盆骨转移；22 名患者经病理证实无前列腺癌。

所有前列腺 MRI 检查均在 GE SIGNA Pioneer 3.0T 磁共振扫描仪进行，采用 32 通道体相控阵线圈。首先进行常规前列腺 MRI 序列扫描，包括轴位 T1WI、轴位 T2WI、冠状位、矢状位、轴位脂肪抑制 T2WI、轴位 DWI。之后进行 synthetic MRI-MAGiC 序列扫描，扫描参数如下：FOV=30cm；矩阵=320×256；层厚/层间距=4/1mm，采集时间约 4~5 分钟。MAGiC 图像在工作站后处理得到 T1 map、T2 map 和 PD map。在 T2WI 和 DWI 序列勾画感兴趣区（region of interest, ROI）。在前列腺癌患者骨盆骨 DWI 高信号区以及骨显像高摄取区勾画转移灶 ROI。在无前列腺癌患者 T1WI 和 T2WI 图像骨盆骨高信号（接近皮下脂肪信号）区域勾画黄骨髓 ROI，在骨盆骨低-中等信号区域勾画红骨髓 ROI。采用 SPSS 20.0 软件进行统计学分析。应用单因素方差分析比较骨转移、红骨髓、黄骨髓的 T1、T2、PD 值差异。

结果：研究共纳入 11 处骨转移灶，黄骨髓和红骨髓区域各 19 处。骨转移 T1 值显著高于红、黄骨髓（$p<0.001$）。骨转移 T2 值显著低于红、黄骨髓（$p<0.001$）。骨转移 PD 值显著低于红骨髓（$p<0.05$）。但骨转移与黄骨髓之间 PD 值无显著统计学差异（$p=0.089$）。

结论：Synthetic MRI 可用于鉴别骨转移与正常红、黄骨髓。

EPO-1428

非骨化性纤维瘤 21 例影像学征象分析

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目的 探讨非骨化性纤维瘤的影像学表现，提高对非骨化性纤维瘤诊断与鉴别诊断的准确性。

方法 回顾性分析 21 例经手术病理证实的非骨化性纤维瘤患者的临床及影像学资料。其中 X 线检查 18 例、CT 检查 13 例、MRI 检查 9 例，对患者的性别、年龄、发病部位及影像学征象进行分析。

结果 21 例患者中男性 13 例、女性 8 例，年龄 9~42 岁，平均年龄 16.2 岁。19 例病变位于长管状骨，其中位于股骨下端 7 例，胫骨上端 6 例，胫骨下端 3 例，腓骨上端 2 例，肱骨上端 1 例；2 例位于不规则骨，其中位于髂骨 1 例，肋骨 1 例。19 例长管状骨病变均位于干骺端，呈圆形或椭圆形，偏于一侧生长，其中位于皮质及皮质下 17 例，位于髓腔 2 例，病变长轴均沿骨干长轴方向，其中有 2 例合并病理性骨折。21 例病变呈单房型 5 例，多房型 16 例。按照病变硬化程度进行 Ritschl’s 分阶段，21 例行 X 线或 CT 检查的患者中，A 阶段 6 例，B 阶段 11 例，C 阶段 3 例，D 阶段 1 例。9 例行 MRI 检查的患者中，病变呈长 T1 短 T2 信号 7 例，长 T1 长 T2 信号 2 例。

结论 非骨化性纤维瘤的影像学检查，尤其是 X 线及 CT 的影像学特征对其具有重要的诊断价值，对进一步对病变分阶段有较大意义，结合患者的发病年龄及发病部位可以提高鉴别诊断的准确性。

EPO-1429

Analysis of CT Imaging Features of Primary Sacrococcygeal Chordoma

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【Abstract】 **Objective** To raise awareness of CT features and improve diagnostic accuracy by analyzing pretreatment CT imaging of 101 primary sacrococcygeal chordoma (PSC). **Methods** pretreatment CT imaging and demographic of 101 patients with a pathologically confirmed PSC, including age and sex of patients, location, morphology and extent of tumor, were analyzed from December 2011 to April 2019, retrospectively. Independent-Samples T Test was analyzed ages at diagnosis for sex of patients. **Results** The age at diagnosis of 101 patients was 10-78 (58.04±12.59) years, with predilection 45-70 years. Men-women-ratio was 2:1, the age at diagnosis has no difference statistical (P =0.279); another one was a 10-year-old boy. In 101 cases, 96 (95%) presented osteolytic bone destruction, while osteosclerosis appeared in 5 (5%) cases . Three or more than three vertebrae were destroyed in 87 (86.1%). 86 (85.1%) located in the middle line of sacrococcygeal. Lobulated margin appearance displayed in 84 (83.2%). "Metameric segmentation", "rat gnawing sugarcane" and "floating bone fragments" were observed in 82 (81.2%), 80 (79.2%) and 72 (71.3%) respectively. Bilateral sacral nerves were involved in 70 (69.3%), while unilateral sacral nerves were involved in 15 (14.8%). Calcification in tumor, soft tissue mass encroached on paravertebral muscles and "anti-quote" were 53 (52.5%), 51 (50.5%), 49 (48.5%) respectively. Soft tissue mass encased vertebrae in 39 (38.6%), 37 (36.6%) tumors had the blurred boundaries with colorectum. 13 (12.9%) encroached on sacroiliac joint. **Conclusions** The common age at diagnosis of PSC was 45-70 years. PSC apppeared more often in men. CT features of PSC were heterogeneous. Osteolytic bony destruction, more than three vertebrae were destroyed, tumor located in middle line of sacrococcygeal, lobulated margin appearance, "metameric segmentation", "rat gnawing sugarcane", "floating bone fragments" and bilateral sacral nerves involved were common CT imaging features of PSC. Calcification in tumor, “anti-quote” and soft

tissue mass encroached on paraspinal muscles were observed in around half of cases. Soft tissue mass encased vertebrae, and part of tumours had the blurred boundaries with colorectum. Tumor seldom encroached on sacroiliac joint.

EPO-1430

伴发液-液平面骨病变的影像诊断分析

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目的 探讨伴发液-液平面骨病变影像学表现及影像诊断要点。 **方法** 以收集我院 2017 年 1 月到 2018 年 10 月在我院诊治的 3 例伴发液-液平面的骨病变患者为研究对象。最终诊断为毛细血管扩张型骨肉瘤、动脉瘤样骨囊肿、骨巨细胞合并动脉瘤样骨囊肿。**结果** 动脉瘤样骨囊肿及毛细血管扩张骨肉瘤在 MRI 上均出现了多发的液-液平面，但毛细血管扩张型骨肉瘤表现出骨皮质连续性中断、软组织成分等恶性征象。骨巨细胞瘤合并继发动脉瘤样骨囊肿，其在 MRI 上其内囊性灶内可见少量的液-液平面；但其骨皮质连续，无骨膜反应及硬化边等良性骨肿瘤征象。**结论** 多种性质的骨病变均可伴发液-液平面。毛细血管扩张型骨肉瘤、动脉瘤样骨囊肿、骨巨细胞合并动脉瘤样骨囊肿虽都伴有多发液-液平面但影像学各具有特征性，而 MRI 在诊断上述病变更具优势，同时结合患者临床表现可明显提高本病确诊率。

EPO-1431

下颌骨囊性病变的 MSCT 表现及鉴别诊断

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目的：提高对下颌骨囊性病变的 MSCT 表现认识及诊断、鉴别诊断能力。
方法：回顾性分析 73 例病理证实的下颌骨囊性病变的临床和 CT 资料。
结果：下颌骨牙源性囊性病变共 65 例，其中根尖囊肿 20 例，CT 表现为根尖周围的类圆形低密度影，边界清楚，根尖吸收；含牙囊肿 7 例，CT 表现为内含牙（阻生牙或埋伏牙），以牙冠侧为中心围绕牙根交界区形成的类圆形或不规则形低密度囊肿，受累牙齿的根尖通常位于囊肿外；成釉细胞瘤共 19 例，单囊者 2 例，CT 表现为边缘规则的局部骨质膨胀性病变，多囊者 17 例，呈皂泡样或蜂房样改变，可见壁结节，增强后病灶分隔、壁结节等实性成分明显强化；牙源性角化性囊腺瘤 19 例，主要 CT 表现为沿下颌骨长轴生长椭圆形低密度影。下颌骨非牙源性囊性病变共 8 例，其中下颌骨骨囊肿 6 例；静止性骨空腔 2 例。
结论：下颌骨囊性病变有不同的影像学特征，CT 检查可用于下颌骨病变的发病部位、骨质破坏形式、内部结构及对邻近结构侵犯情况综合分析，为其诊断和鉴别诊断提供重要依据。

EPO-1432

下肢粘液型脂肪肉瘤的 MRI 影像及相关病理分析

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目的：通过探讨下肢粘液型脂肪肉瘤的 MRI 影像学表现及其病理特征，提高对粘液型脂肪肉瘤的认识和术前诊断的准确率。
资料与方法：搜集 10 例经病理证实的粘液型脂肪肉瘤患者的临床和 MR 影像学资料，观察和评价肿瘤的位置、深度、大小、形态、边缘，是否侵犯邻近结构、信号的均匀性、强度及强化表现，并对照病理学结果对影像学特征进行分析。
结果　在 10 例病例中，4 例表现为以长 T1、长 T2 信号为主的肿块,边缘相对清楚,内见间隔和结节样脂肪信号区；间隔主要由包含胶原原纤维的胶原束构成 ；3 例表现为以等或长 T1、长 T2 信号为主的肿块,边缘清楚,内见斑片状短、长 T1 信号,增强扫描呈不均匀强化 ；3 例表现为以长 T1、长 T2 信号为主的混杂信号肿块,边缘不清楚,其内见斑片状脂肪信号,10 例均不伴有邻近骨皮质侵蚀，1 例临近关节积液；其中 4 例增强扫描呈明显不均匀强化，呈网格状或花边样。
结论　下肢肌肉黏液型脂肪肉瘤比较多见,因该肿瘤富含脂肪,常伴有黏液变性或水肿，与其他良性肿瘤鉴别困难，根据其 MRI 表现可以推测肿瘤的组织学分化程度，提高术前诊断准确率，为临床治疗提供可靠的信息。

EPO-1433

SAPHO 综合征的临床及影像表现

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目的：探讨 SAPHO 综合征的临床表现及影像学特征。**材料与方法：**回顾性分析 27 例 SAPHO 综合征患者的临床及影像表现，并复习文献。**结果：**SAPHO 综合征是累及骨、关节及皮肤的一种慢性疾病。27 例中 20 例主要临床表现为骨、关节肿痛，7 例表现为皮肤脓疱病、痤疮、化脓性汗腺炎等。影像表现均为骨及关节的骨质破坏、硬化、肥厚，髓腔狭窄、消失等慢性炎症性改变，主要累及前胸壁、脊柱及骶髂关节，分别为 23 例、9 例、8 例；累及椎体者表现为椎角炎及终板炎且骨质硬化；18F-FDG　PET/CT 表现受累骨质 FDG 摄取增高、骨显像出现典型“牛头征”等。**结论：**SAPHO 综合征临床表现不具有特异性，但影像如前胸壁骨硬化、骨肥厚等表现较为特征性，应结合临床及影像表现综合分析，提高对本病的认识及诊断正确率。

EPO-1434

可动脊柱骨巨细胞瘤的少见影像表现与病理对照分析

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目的：探讨可动脊柱骨巨细胞瘤的少见影像学表现，以提高对可动脊柱骨巨细胞瘤的术前诊断准确性。方法：回顾性分析经病理证实的 19 例可动脊柱 GCT 影像表现，分析总结其少见影像学表现及其病理对照分析。结果：19 例可动脊柱 GCT 中 17 例主体位于椎体，2 例主体位于附件；肿瘤分别位于颈椎 8 例，胸椎 8 例、腰椎 3 例；1 例累及 3 个椎体；13 例呈膨胀性、溶骨性骨破坏，CT 上 5 例可见硬化边，而 MR 上 7 例可见低信号环。11 例伴有不同程度压缩性骨折；1 例肿瘤伴有半脱位；1 例肿瘤累及椎间盘。结论：可动脊柱 GCT 主体位于附件的少见；肿瘤周围硬化边及合并钙化少见；累及多个椎体及椎间盘的少见；伴有半脱位的少见。

EPO-1435

手足短管状骨神经鞘瘤文献复习-附 1 例报告

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发生于骨内的神经鞘瘤较为罕见，据统计，骨内此肿瘤占所有骨内骨肿瘤的 0.1% ～ 0.2%［1］，多为个案报道，而位于腕掌骨者尚未见报道。现将本院经手术病理证实的 1 例报告如下。

病例资料 患者女，54 岁，10 余年前无意中发现左手第一掌指关节背侧肿物，偶有压痛，劳累后疼痛加重，休息后缓解，未予诊治。近一个月，肿物逐渐增大，且手掌大鱼际处出现肿块，压痛明显。专科检查：左手第一掌指关节背侧可触及一大小约 3cm×2cm 肿物，质韧，表面尚光滑，无明显压痛，肿物可随拇指屈伸活动；左手掌大鱼际处触及一大小约 3cm×3cm 肿物，轻压痛，质硬，表面粗糙，肿物无明显活动度；肿物处皮肤无明显发红及色素沉着；左拇指及掌指关节活动度可，无明显感觉障碍。X 线及 CT 检查示：左手第一掌骨膨胀性溶骨性骨质破坏，骨皮质变薄，局部中断消失，残存骨皮质内緣呈扇贝样改变，骨质略硬化，周围可见软组织肿块影突出。MR 检查示：左手第一掌骨可见不规则膨胀性骨质破坏，达掌指关节面下，病灶突破骨皮质累及周围软组织 ，呈分叶状等长 T1 混杂长 T2 信号。病理检查：巨检：灰白灰黄色软组织一块，大小约 2cm×2.8cm×0.8cm，较破碎。免疫组化：SOX-10(+)，S-100(+)，GFAP(小灶+)，Clusterin(-)。病理诊断：（左手第一掌骨）神经鞘瘤。

EPO-1436

非普通型骨肉瘤的影像学表现

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目的：皮质旁型骨肉瘤、髓内高分化骨肉瘤不需要新辅助化疗，骨膜骨肉瘤术前可辅助化疗可不辅助化疗。小细胞型骨肉瘤、上皮样骨肉瘤、巨细胞瘤型骨肉瘤对传统的骨肉瘤化疗方案不敏感。分析上述非普通型骨肉瘤的影像学表现，有助于临床治疗方案的制定

方法：收集非普通型骨肉瘤病例，分析总结其影像学特征。

结果：皮质旁型骨肉瘤与骨皮质之间有较大的蒂，MRI 有助于评价病灶是否累及骨皮质。骨膜骨肉瘤与骨皮质宽基底相连，MRI 有助于评价病灶是否累及骨皮质及对骨皮质的侵犯范围。髓内高分化骨肉瘤易误诊为骨纤维结构不良，骨皮质的侵犯及软组织块影有助于鉴别诊断。小细胞型骨肉瘤病灶进展快，病灶范围广，早期远处转移。毛细血管扩张型骨肉瘤需与动脉瘤样骨囊肿鉴别，前者骨皮质可有侵犯。

结论：非普通型骨肉瘤有一定的影像学特征，术前预测骨肉瘤的病理类型，有助于指导术前穿刺活检，避免误诊，做到精准治疗，提高患者术后存活率。

EPO-1437

骨孤立性浆细胞瘤的影像学表现分析

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目的 探讨骨孤立性浆细胞瘤（SBP）影像表现，以期提高影像诊断准确率。**方法** 收集经手术病理证实的 19 例骨孤立性浆细胞瘤的临床和影像学资料，回顾性分析其影像学特征。**结果** 病灶均为单发，发病部位：脊柱 10 例（胸椎 7 例，腰椎 3 例），扁骨 3 例（上颌骨 1 例，髂骨 2 例），长骨 6 例（肱骨 3 例，股骨 2 例，胫骨 1 例）。大部分病灶为膨胀性溶骨性骨质破坏，边界较清楚，骨皮质不完整，未见骨膜反应。病灶膨胀程度差异较大，内见粗大或细小骨嵴影，伴软组织肿块。MRI 显示 T_1WI 类似肌肉信号，T_2WI 及 STIR 高信号，无骨髓水肿。CT 及 MRI 增强扫描示明显强化。6 例脊柱病灶可见“微脑征”。脊柱外病灶仅 3 例征象类似“微脑征”。**结论** “微脑征”是脊柱 SBP 的特征性表现,脊柱外 SBP 可见骨皮质扭曲呈花边状。CT 及 MRI 表现，对本病的术前诊断有一定的价值。

EPO-1438
探讨脊柱骨原发性侵袭性骨母细胞瘤影像学表现

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摘要：目的 探讨脊柱骨原发性侵袭性骨母细胞瘤影像学表现。方法:回顾性分析经病理证实的 10 例脊柱骨原发性侵袭性骨母细胞瘤的影像学表现及临床资料，其中男 6 例，女 4 例；年龄 10～51 岁，平均 30 岁。临床症状以脊柱区疼痛为主，其中 5 例并伴随周围神经症状。病程 2 周～6 月，平均 11 周。CT 平扫 8 例，CT 平扫及增强 5 例；6 例 MRI 平扫及增强扫描；5 例同时行 CT 及 MRI 检查。对病灶的部位、骨质改变、形态、密度/信号特点及强化特征进行观察。结果：3 例起源于椎体及附件,7 例起源于附件。CT 表现为膨胀性骨质破坏，病灶内有钙化或骨化，周围见薄壳样硬化带，骨皮质变薄，6 例出现局部皮质中断、消失，所有病例均未见骨膜反应。MR 表现不均匀长 T1 长 T2 膨胀性骨质破坏，部分病变的软组织肿块呈分叶状，增强扫描明显不均匀强化。结论：脊柱骨原发性侵袭性骨母细胞瘤年轻患者多见，好发于脊柱附件，影像学大多表现为膨胀性溶骨性骨质破坏，边界常清晰，伴或不伴硬化边；可伴骨皮质中断、分叶状软组织肿块，多无骨膜反应，多不累及椎间盘；可累及椎管致椎管狭窄。

EPO-1439
典型 Maffucci 综合征 1 例

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患者，男，50 岁，右膝疼痛半月，发现右股骨异常 1 周，患者分别于 1980 年、1987 年、2000 年行右手、右腕部血管瘤切除术。

专科检查：右腕、右手见陈旧性手术瘢痕，右侧腰背部、右侧颈项部、右侧肩部、右前臂、右腕、右手近腕关节处见多发大小约 2cmx3cm 软组织包块，边界不清，活动度可，质软，局部皮肤无红肿破溃，未见明显静脉曲张，无压痛及叩痛。X 线、CT 及 MRI 示：双侧股骨下段及右脚第 2、3 趾近节趾骨内多发性内生软骨瘤，右腕关节-大鱼际皮下多发血管瘤（图 1-7）。

讨论：Maffucci（马弗西）综合征为一种罕见的先天性的软骨发育不良伴多发血管瘤的病变，属于软骨及脉管系统类的肿瘤，病因尚不清楚，一般认为是中胚层的发育异常所致[1]，因软骨与血管均由中胚层衍化而来。该病发生无种族、家族差异，无遗传倾向，男女比例基本相等，多数发生在 30 岁之前，50 岁发病后较少见。

Maffucci 综合征以多发性内生软骨瘤合并软组织血管瘤为特征，其软骨瘤主要依靠 X 线平片诊断，其典型表现为：长骨干骺端及指趾骨膨胀性骨质破坏，其间可见骨性间隔，并可见斑点状、环状钙化灶，早期多不累及骨骺，晚期可见长骨短缩和畸形发育。除骨质异常外，X 片还常可见软组织肿块及多数静脉石[2]，Maffucci 综合征中骨骼及软组织均有恶变的可能，但以骨骼恶变的风险更高，尤以软骨肉瘤最常见，风险率为 20%-30%[3]。CT 及 MRI 是对 X 线片的重要补充，尤其是怀疑软骨瘤有恶变的情况下，后两种检查可以更清楚的显示骨质破坏的范围与程度，骨皮质有无破坏，有无骨膜反应及软组织肿块等情况。本例患者右股骨下段病灶较大，且患者有疼痛症状，提示有恶变的可能，遗憾的是，患者不同意活检，未能得以证实。而患者软组织内的血管瘤，术后多次复发。多发性软骨瘤的治疗和预防尚无有效方法，以矫正影响功能的畸形为主，若畸形严重影响功能或有恶变倾向，应截除相应肢体。

EPO-1440

脊椎旁粒细胞肉瘤的 MRI 影像表现

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目的：分析脊椎旁粒细胞肉瘤的 MRI 影像特征，以及这些影像特征在与其他常见原发肿瘤鉴别诊断中的意义。**资料与方法**　回顾性分析本院 2011 年 3 月至 2012 年 2 月的 4 例经手术切除及病理证实的粒细胞肉瘤患者的 MRI 影像表现，病理结果及临床表现。患者年龄 10 岁~35 岁，平均 20 岁，所有患者均经过手术及病理证实。4 例患者均行常规 T1WI、T2WI 及增强扫描。**结果**　本组 2 例发生于胸椎旁，2 例发生于腰骶椎旁。MRI 平扫，肿瘤边界模糊、实性占位.，T1WI 上呈等信号，T2WI 上呈等信号，增强扫描:其中 3 例病例呈均匀中等强化，1 例病例呈边缘强化明显，中心轻度强化。**结论** 粒细胞肉瘤影像表现具有一定特征，MRI 能清晰显示病变，但与脊椎旁其他原发肿瘤鉴别较困难，多序列成像有助于鉴别诊断及预后的估计，确诊仍然需要病理检查。

EPO-1441

多发性骨髓瘤的全身弥散加权成像与骨髓穿刺及血清学指标的相关性研究

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目的：探讨多发性骨髓瘤（MM）全身弥散加权成像（WB-DWI）特点与骨穿结果及血清学指标的相关性。

方法：前瞻性招募 MM 初诊患者 53 例及治疗后完全缓解（CR）患者 18 例。所有患者进行在 3.0T 的 MRI 扫描仪上行 WB-DWI。记录 WB-DWI 所示局灶病变（FL）数，FL 最长径及 ADC 值、弥漫浸润程度，并测量所有患者颈胸腰椎（ C7\T7\L3）、肱骨头、锁骨头、骶骨及髂骨的髓腔 ADC 值。所有患者均完成骨髓穿刺及血清学检查。分析骨穿结果及血清学指标与 FL 数、最大 FL 长径、病灶 ADC 均值及骨髓 ADC 均值相关性。

结果：初诊患者局灶性病变 ADC 均值（891.75±150.86×$10^{-6}mm^2/s$）显著低于 CR 患者局灶性病变 ADC 均值（1685.28±541.04）（p=0.000），区分二者的 ADC 临界值为 1022.35×$10^{-6}mm^2/s$，其敏感性为 85.7%，特异性为 85.0%，曲线下面积值为 89.6%（p=0.000）。初诊弥漫浸润型患者骨髓 ADC 均值（614.60±132.57×$10^{-6}mm^2/s$）显著高于 CR 患者局灶性病变外 ADC 平均值（257.36±70.08×$10^{-6}mm^2/s$）（p=0.000），区分二者的 ADC 间临界值为 395.49×$10^{-6}mm^2/s$，其敏

感性为 78.0%，特异性为 100.0%，曲线下面积值为 100.0%（p=0.000）。初诊患者骨髓 ADC 值与血红蛋白水平呈负相关（r=-0.533,P=0.000），与β2MG 水平呈正相关（r=0.446,P=0.000）。
结论：DWI 序列的半定量参数 ADC 值可以鉴别 MM 患者活动性病变；初诊患者骨髓 ADC 值与血红蛋白及β2MG 存在相关性，可以用来协助评价患者病情严重程度。

EPO-1442

腱鞘巨细胞瘤的 MRI 表现

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目的 探讨腱鞘巨细胞瘤的 MRI 表现及临床特点。方法 收集 2013 年 3 月至 2019 年 3 月河南省人民医院收治的腱鞘巨细胞瘤患者进行回顾性分析。28 例患者均经手术病理证实为腱鞘巨细胞瘤，均行 MRI 平扫检查，部分行 MRI 增强扫描。结果 腱鞘巨细胞瘤患者中 16 例为局限型、12 例为弥漫型。23 例以手足部或大关节旁无痛性肿块就诊，3 例为切除后反复发作。与骨骼肌肌腹相比，MRI 平扫病灶 T1WI 为稍低信号、T2WI 为稍高信号，病灶信号混杂，其内 T1WI 及 T2WI 双低信号为其特征性表现；增强扫描呈不均匀明显强化。结论 腱鞘巨细胞瘤具有较典型 MRI 表现及临床特点，MRI 能够准确显示病变的信号特点、病变范围及与周围组织关系，为腱鞘巨细胞瘤的临床诊治提供有力依据。

EPO-1443

MRI 对四肢肿块型血管瘤和外周神经鞘瘤的鉴别诊断价值

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【目的】探讨 MRI 对四肢肿块型血管瘤和外周神经鞘瘤的鉴别诊断价值。
【材料和方法】回顾性分析 2010 年 6 月至 2018 年 8 月北京肿瘤医院经临床和病理证实为四肢肿块型血管瘤 24 例，良性外周神经鞘瘤的 53 例患者。患者均行 MRI 平扫和增强扫描。收集患者的临床资料，并对 MRI 图像进行分析评价，评价和测量指标包括肿瘤大小、位置、深度、MRI 特异征象（靶征、脂肪分离征、葡萄征，有无静脉石等）和一般征象（信号强度、边缘是否清晰、是否存在脂肪成分，是否存在囊变等）。采用 c2 检验和 Fisher 确切概率法比较血管瘤和神经鞘瘤位置、深度、MRI 特异征象、MRI 一般征象等。采用独立样本 t 检验比较血管瘤和神经鞘瘤的发病年龄、长/短径的差异。【结果】 四肢肿块型血管瘤与神经鞘瘤比较，年龄、肿瘤位置、深度、长/短径的差异有统计学意义(p<0.05)，血管瘤更易发生于下肢和肌肉内部。MRI 特异征象，两组比较均有明显统计学差异(p<0.001)。MRI 一般征象中，边缘是否清晰、是否囊变、是否含脂肪成分、肿瘤内部低信号分隔、瘤周包膜、肿瘤强化和流空血管这些特征，两组比较均有统计学差异(p<0.05)。【结论】MRI 的特异征象和一般征象均有助于四肢肿块型血管瘤和神经鞘瘤的术前鉴别诊断。

EPO-1444

腺泡状软组织肉瘤的临床表现与 MRI 特征

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目的 探讨腺泡状软组织肉瘤的临床表现及 MRI 特征，为临床诊断提供一定帮助。**方法** 回顾性分析病理证实的 17 例腺泡状软组织肉瘤的临床表现及 MRI 表现，临床表现主要观察患者性别、年龄、部位、是否有远处转移；MRI 主要观察肿瘤的大小、形态、信号、边界、肿瘤血管、肿瘤强化特点。观察肿瘤 TIC 类型，测量病灶 ADC 值，分析 ADC 值与大小、是否转移的相关性。**结果** 患者 7 例男性，10 例女性。年龄 14～44 岁，中位 27.1 岁。肿瘤部位:下肢 8 例，臀部 4 例，上臂 2 例，腰大肌 1 例，手 1 例，腰椎 1 例。11 例肺转移，3 例骨转移，4 例淋巴结转移，1 例脑转移。MRI 显示肿瘤位置较深，边界较清，部分可见周围浸润，内部及周围见多发迂曲增粗流空血管影。肿瘤最大径为 22～159mm。17 例均呈 T1WI 稍高信号 T2WI 呈不均匀高信号，DWI 高信号 ADC 图低信号。MIP 显示肿瘤血供丰富，周围见多发血管丛。9 例增强显示 5 持续显著强化，4 例中度强化。3 例 TIC 呈“速升-平台型”，6 例为“速升-缓降型”。17 例 ASPS 平均 ADC 值为（0.89±0.20）$10^{-3}mm^2/s$。ADC 值与肿块大小、是否远处转移均呈负相关，且具有统计学意义。病理显示肿瘤细胞排列成腺泡状，周围见血窦样结构。**结论** ASPS 为罕见的富血供恶性肿瘤，临床表现及 MRI 表现有一定特征性，好发于中青年女性，肌间隙及肌肉深部的软组织肿块，易发生远处转移，肿块及周围多发流空血管，T1WI 稍高信号，DWI 高信号，ADC 值较低，再结合 TIC 类型，对于临床诊断 ASPS 具有一定的帮助。

EPO-1445

滑膜肉瘤 CT 及 MRI 影像学表现探讨

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【摘要】 目的：结合文献回顾，探讨滑膜肉瘤的 CT、MRI 影像学表现特征。方法：回顾性搜集我院 2012 年 1 月-2018 年 3 月经病理证实的 9 例滑膜肉瘤患者的 CT 或 MRI 影像表现。结果：肿瘤位于四肢 6 例，胸壁 1 例，纵隔 1 例，眶周 1 例，均表现为不均匀软组织肿块。5 例 CT 表现：3 例等密度，1 例稍高密度，1 例稍低密度；2 例钙化；3 例骨质破坏；4 例明显不均匀强化，1 例轻-中度均匀强化。6 例 MRI 表现：肿瘤实质 6 例 T1WI 为等信号，4 例 T2WI 稍高信号，2 例高信号，T1WI/T2WI 见低信号分隔 3 例。2 例可见多发囊灶呈“卵石”样改变，囊灶 T1、T2 均呈稍高/高信号。增强肿瘤实质明显强化，分隔不强化。结论 （1）滑膜肉瘤具有一定的影像学特征，综合分析其影像表现有助于术前诊断，若见“卵石”征，诊断较具有特异性。（2）当肿瘤较小时，类似于良性肿瘤表现，应尽量避免漏误诊。

EPO-1446

可动脊柱骨巨细胞瘤及浆细胞瘤影像鉴别诊断

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【摘要】目的 探讨可动脊柱骨巨细胞瘤及浆细胞瘤影像特征，并总结鉴别要点。方法 回顾性收集经手术病理证实的可动脊柱骨巨细胞瘤 15 例及浆细胞瘤 21 例，所有患者均行 MSCT 平扫+增强扫描

及 CT 平扫，对比分析 2 者影像学特征，并与病理结果对照。结果 骨巨细胞瘤患者中位年龄 35.5 岁，明显低于浆细胞瘤患者（P＜0.05）；2 组患者男女性别比无差异（P＞0.05）。2 组患者均主要位于椎体，并残留少量骨嵴，差异无统计学意义（P＞0.05）；10 例骨巨细胞瘤呈膨胀样骨质破坏，明显高于浆细胞瘤（10/15，66.7% VS 6/21，28.6%）。2 组患者在 T2WI 均以等/稍低信号为主，增强扫描呈明显强化，差异无统计学意义（P＞0.05）。14 例浆细胞瘤硬膜外软组织肿块呈钻孔生长，脊髓移位不明显；4 例骨巨细胞瘤硬膜外软组织呈膨胀性生长，脊髓推压、移位；2 者比较具有统计学意义（P＜0.05）。结论 可动脊柱骨巨细胞瘤及浆细胞瘤影像表现具有相似性，但浆细胞瘤发病年龄相对较大，且膨胀性骨质破坏较少，硬膜外软组织肿块生长方式多为钻孔样生长，具有一定特征性。

EPO-1447

《MR imaging features and a redefinition of the classification system for nodular fasciitis》

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ABSTRACT
Objective: To analyse magnetic resonance (MR) imaging features of nodular fasciitis and introduce a redefinition of the classification system for this class of lesions.
Materials and methods: Twenty-five patients who underwent surgery or biopsy due to nodular fasciitis were retrospectively analysed. Demographic information, medical history, and MR imaging features were collected. Classification of nodular fasciitis was performed based on a redefined system. Sensitivity and specificity of special signs were calculated.
Results: For nodular fasciitis, the longest average diameter was 22.5 mm (range, 5.2-54.6 mm), and 44% were located in the upper extremities, 28% in the head and neck, 20% in the lower extremities, and 8% in the trunk. Compared with skeletal muscle, most lesions exhibited isointensity on T1WI and hyperintensity on T2WI.

EPO-1448

DKI 技术评估原发性骨肉瘤术前新辅助化疗疗效的应用初探

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目的：探讨 DKI 技术对原发骨肉瘤术前新辅助化疗疗效评估的价值。

方法：2015 年 3 月-2016 年 2 月经病理证实的原发性四肢骨肉瘤 29 例，新化疗辅助前 3 天，化疗后术前 3 天行常规 MRI 和 DKI 检查，在 T1 图像上测量病灶的最大延伸，在 T2 抑脂图像上测量病灶的大小，然后根据椭圆公式计算病灶的体积，DKI 图像导入专用的图像分析软件，在病灶的最大层面，测量 ADC 值，MD，MK 值，并计算化疗前后的 ADC，MD，MK 值相对变化率，以病灶术后病理坏死率为参照标准分为 2 组，（坏死率小于 90% 为化疗效果差），采用 t 检验比较 2 组各个参数的差异，病灶体积，ADC，MK，MD 值预测术后坏死率的诊断效能比较用 ROC 曲线。

结果：29 例患者男性 20 例，女性 9 例，平均年龄 17.66 岁（7-34 岁）。化疗前，2 组患者的病灶体积，ADC 值，MK，MD 值没有统计学差别（P>0.05）。化疗后术前病灶 MD，ADC 值明显较前增加，(1.97±0.21vs1.39±0.39，1.39±0.24vs1.00±0.31，P<0.05)， MK 值明显下降 (0.68±0.14vs0.86±0.26，P=0.042)。病灶的体积无明显变化(379.59±372.49vs339.05±196.67 p=0.706)。比较化疗效果差者，化疗效果好的患者ΔMD，ΔADC 值变化较大(55.54±26.09 vs7.02±25.16，47.24±43.15vs10.07±28.81；P<0.05)，但ΔMK 值及和Δ体积变化不明显。 术后 MD 值和ΔMD 较其他参数具有相对高的诊断效能，敏感性 100%。

结论：DKI 技术有助于评估原发性骨肉瘤的新辅助化疗的疗效，术后 MD 值 和ΔMD 可作为潜在的影像评价指标。

EPO-1449

应力性骨折的影像学分析体会

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目的：DR 平片、CT、MRI 检查对应力骨折的影像学分析。
方法：选择 DR 平片、CT 平扫（3D、MPR 重建），MRI 常规序列进行检查。
结果：本组选择 30 例患者，年龄 50-75 岁，平均为 63 岁，18 例腰椎检查，12 例膝关节检查，其中 18 例行 DR、CT、MRI 同时检查。12 例行 MRI 检查。本组 18 例腰椎患者均年龄偏大，无直接外伤史，多因弯腰、坐凳子骶起身快后出现腰部不适。膝关节 12 例患者 9 例跑步运动量过大，3 例患有严重骨性关节炎。
结论：应力性骨折指由节律性的反复阈值损伤所引起的骨连续性破坏[1]。分疲劳骨折与衰竭骨折。前者发生于正常骨质，多见于参运动后或行军时[2]。后者发生于骨矿物质含量减少或弹性降低等异常骨组织，在正常重复应力刺激下发生，一般无明显异常外力，多见于老年人。诊断应力性骨折患者首选 MRI 为著，CT，X 线为辅价值更高[1]。

EPO-1450

定量 CT（QCT）测量骨质疏松症的体会

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摘要
目的：骨密度测量、16 排 CT 加装体膜及软件骨质疏松测量（定量 CT）QCT。
方法：CT 机床上装载体膜，用低剂量 CT 扫描参数，对腰椎、髋关节骨密度进行 CT 常规扫描，扫描结束将扫描数据传到指定软件，进行骨质密度分析。
结果：一次性扫描，骨科可以获得 2 个结果，腰椎、髋关节骨密度、骨病、骨折等多方位成像进行疾病分析。自 2017 年 3 月-2018 年 3 月，共收集腰椎 65 例，男性 30 例，女性 35 例，髋关节 20 例，男性 8 例，女性 12 例，其中腰椎骨折 20 例，腰椎骨病 10 例，髋关节骨折 8 例，髋关节骨病 3 例。在进行普通 X 线检查后诊断不理想，高度怀疑骨折或疾病时进行 MRI 或 CT 扫描，CT 扫描增加 QCT 数据后处理分析。骨密度正常的 10 例，低骨量 17 例，骨质疏松 30 例，骨病或骨折 8 例。
结论：定量 CT（QCT）是体积骨密度，单位是 mg/cm3，能更敏感反映骨质疏松的骨变化，与平面骨密度相比，具有不受脊柱退变、增生、血管钙化、骨折、畸形等的影响，可以避免上述因素影响造成的假阴性。腰椎 QCT 骨质疏松诊断标准采用骨密度绝对值，2018 年 10 月宣布了中国人的骨密度标准为：腰椎松质骨骨密度绝对值>120mg/cm^3为骨密度正常，骨密度绝对值 80-120 mg/cm^3范围内为低骨量，骨密度<80mg/cm^3为骨质疏松。髋部 QCT 骨质疏松诊断标准与 DXA 相同，同样需要根据中国人群的骨密度正常参考值计算 T 值。髋关节单侧有骨折、疾病时不用重新扫描，可以进行对侧髋关节骨密度测量。

EPO-1451

Multisystemic imaging findings in Chinese patients with Erdheim-Chester disease

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Objective: Radiology is crucial for diagnosing and managing Erdheim-Chester disease (ECD), a rare multisystemic non-Langerhans histocytic neoplasm. Much is still unknown about Chinese ECD patients, and this study is to systemically investigate imaging characteristics of Chinese patients with ECD.
Methods: X-ray, CT and MRI images of 28 Chinese patients (14 males, aged 5-65 years) pathologically diagnosed with ECD in our medical center between January 2014 and January 2019 were retrospectively analyzed. Two radiologists in consensus analyze the brain MRI, contrast enhanced chest-abdomen-pelvis CT images, skeletal survey, and other dedicated images if available. The location, number, size, density or signal intensity, and contrast uptake of each lesion was carefully measured qualitatively.
Results: Among these patients, some rare imaging appearances were noted including: infiltration of callosum, choroid plexus in lateral ventricle, pineal body, walls of middle cerebral artery and coronary artery, mastoid process, tarsal bones, hands and wrists, mesenterium, peritoneum, and omentum; brain nodules with broad peri-nodular edema mimicking metastases; pathological fracture caused by bone involvement; and mesenteric panniculitis like lesions. Of the 23 patients evaluated for central nervous system, 17 patients (73.9%) had positive findings both supertentorial and infratentorial, intra-axial and extra-axial. Regarding facial & orbital regions, masses (34.8%) in bilateral post-orbit, nasal sinuses, and mastoid process were observed. Moreover, bone involvement was found in 27 (96.4%) of the 28 ECD patients, with lower extremities (85.7%) most commonly affected. In chest CT, pulmonary parenchyma, mesenchyme, pleura and mediastinum can all be seen with infiltration by ECD (57.1%). Half (50.0%) of the 28 patients had cardiovascular involvement; infiltration of aorta and its branches could result in stenosis and ischemic symptoms. Besides retroperitoneal involvement in 13 patients (46.4%), presacral mass wrapping bilateral pelvic ureters was also detected.
Conclusions: There seems to be a greater heterogeneity in Chinese ECD patients, with a predilection of CNS, axial skeleton, and arterial involvement.

EPO-1452
原发周围型肺癌侵犯肋骨 CT 三维重建早期诊断

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目的：肋骨病变 CT 三维重建及早提高诊断率，平片对比极易发生漏诊现象。
方法：使用 16 排 CT 根据体表设定扫描区域，扫描时间 20S，120KV，100mA，常规训练呼吸运动，扫描时深吸气然后闭气，取得数据减薄数据三维重建。**胸部薄层轴位扫描，训练**

结果：患者早期即有右侧腋中线腋下疼痛，在当地卫生院治疗一月，效差，拍 X 片肋骨未见明显异常，CT 扫描重建后清楚显示肋骨破坏，骨皮质连续部分中断，可见虫蚀样改变，局部胸壁软组织影增厚，肺窗示右肺中叶外侧段占位。
结论：胸部疼痛原因颇多，不外乎肋间神经痛、肺炎、胸膜炎、肋骨外伤以及肿瘤转移等，考虑肋骨所致的疼痛时单纯依靠 X 线片极易漏诊、误诊，利用 CT 三维重建可以清楚显示病变形态、大小、与占位组织关系，彻底解决体位厚度、重叠所引起的漏、误诊现象，所以临床遇到胸部疼痛应尽早 CT 三维重建很有必要。

EPO-1453
继发性甲状旁腺功能亢进性骨病 X 线平片及 CT 表现

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目的：骨、关节不同部位的 X 线平片及 CT 表现。
方法：对患者分别进行 X 线平片和 CT 检查，观察 X 线片和 CT 的骨病的表现。
结果：各关节在 X 线平片和 CT 上表现为骨密度减低、骨吸收、骨硬化，患者均存在关节疼痛，疼痛部位常在肩、髋、腕、膝关节及腰椎等，可见多个部位受累。
结论： 继发性甲状旁腺功能亢进性骨病，是长期血液透析患者的常见并发症，属于透析骨关节病的一种类型，患者血清钙增高，血清磷降低，血清 PTH 升高；X 线表现：多骨受累，以弥漫性骨密度减低及纤维囊肿形成为主要变化；继发性甲状旁腺功能亢进性骨病容易被误诊为骨质疏松、骨性关节炎、骨肿瘤等；继发性甲旁亢的患者经常合并全身骨质疏松，肌肉组织内的转移性钙化，全身骨骼广泛、普遍性骨质疏松是继发性甲旁亢性骨病的重要放射学表现；X 线平片示诊断继发性甲状旁腺功能亢进性骨病的重要手段，但 X 线有明显骨质改变时，骨量丢失已在 30%以上，已为病理的中晚期。

EPO-1454
动脉瘤样骨囊肿的影像学诊断分析与探讨

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目的 分析、探讨动脉瘤样骨囊肿的影像学特征及不同影像学检查方法的诊断价值，提高动脉瘤样骨囊肿术前诊断正确率。
方法 回顾我院 8 例经病理证实的动脉瘤样骨囊肿病人并结合文献资料，分析动脉瘤样骨囊肿的各种影象学表现及其病理基础，总结动脉瘤样骨囊肿较特征性的影像学征象。
结果 病变表现为囊状膨胀性骨质破坏 6 例，平片显示膨胀骨皮质呈线形包壳者 2 例，CT 显示囊内纤维性或骨性间隔 3 例，密度不均呈多囊状，病变大部为液性低密度区 2 例，MRI T2WI 显示病变内部信号极不均匀呈海绵状液性信号 3 例。
结论 动脉瘤样骨囊肿有较特征性的影像学表现，平片、CT、MRI 可从不同方面反映动脉瘤样骨囊肿的影像学特征，三者结合可提高动脉瘤样骨囊肿的术前诊断正确率。

EPO-1455
小骨巨细胞病变的影像学诊断与鉴别诊断

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目的：分析小骨巨细胞病变的 X 线、CT、MRI 的影像表现，总结其影像学特征，并复习文献，以提高对此病的认识及鉴别诊断能力。**方法**：对我院经手术或穿刺病理证实的 7 例小骨巨细胞病变的影像学表现进行回顾性分析。 分析病变的发病部位、密度、信号、生长及骨质破坏方式、增强信号特点等影像学表现。男 3 例，女 4 例；年龄 2-60 岁，平均年龄 22 岁。1 例同时行 X 线、CT、MRI 检查，2 例行 X 检查，5 例行 CT 检查，7 例行 MRI 检查，6 例增强。**结果**：2 例位于掌骨，4 例位于颞骨，1 例位于硬腭。位于掌骨的病变表现为掌骨骨干及干骺端膨胀性溶骨性骨质破坏，内密度较均匀，CT 值约为 45HU，未见钙化灶，骨皮质变薄，未见明显骨皮质中断及硬化边，内部可见条索状高密度分隔影，周围软组织未见明显肿块形成；MRI 表现为 T1W 等低信号，STIR 稍高信号，未见明显液液平面，内见间隔，DWI 高信号，ADC 值约：0.67X10-3mm2/s，增强后周边及少许分隔有强化。颞骨病灶 4 例均累及颞骨鳞部，1 例同时累及蝶骨大翼，3 例伴有乳突积液。CT 表现为稍膨胀性溶骨性骨质破坏，边缘散在残留骨质碎片，周围轻微骨质硬化。MRI 表现 T1WI 呈等、低信号 4 例； T2WI 呈等低信号 3 例，1 例表现为混杂信号，伴液液平；注入对比剂 Gd-DTPA 后 4 例均表现为明显强化。1 例位于硬腭的病变累及右侧鼻腔，T1WI 呈稍低信号，T2WI 呈等信号，增强后不均匀环形强化。**结论**：小骨巨细胞病变 CT 多表现为膨胀性、溶骨性骨质破坏,部分可见边缘散在残留骨质碎片、周围轻微骨质硬化，周围无明显软组织肿块; MRI 中多以 T1 WI 和 T2 WI 表现为低至中等信号,增强扫描呈明显强化。发生于手足短管状骨的病变易误诊为内生软骨瘤，发生于颞骨的病变易于 LCH 相混淆，注意分析病变的影像表现，有助于小骨的巨细胞病变的明确诊断。

EPO-1456

斜坡脊索瘤影像表现与病理对照分析

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目的：分析斜坡脊索瘤 CT 和 MRI 影像学表现，并对比其与病理表现之间的关系，提高斜坡脊索瘤的影像诊断及鉴别诊断水平。**方法**：回顾性分析经病理证实的 25 例斜坡脊索瘤的 CT、MRI 资料，包括病变的位置、形态、信号/密度、与周围结构关系及强化方式、程度，并与病理表现进行对照分析。**结果**：位于斜坡上部 8 例，中部 4 例，下部 2 例，中上部 6 例，累及上中下部 5 例；中线区 12 例，中部偏右生长 8 例，偏左生长 5 例。边界清楚，分叶状，膨胀性、溶骨性骨质破坏并软组织肿块。CT 多呈不均匀等或稍高密度，无硬化边。T1WI 多呈不均匀等/稍低信号，T2WI 均为明显高信号内见低信号分隔，矢状位部分出现“拇指压征”。增强扫描不均匀轻中度延迟强化，呈“蜂窝状”、“颗粒状”。**结论**：斜坡脊索瘤的 CT、MRI 表现有一定的特征性，T2WI 明显高信号内见低信号分隔以及增强扫描呈“蜂窝状”、“颗粒状”轻中度不均匀强化的特点有助于诊断及鉴别诊断。

EPO-1457

MRI 在浅表软组织肿块诊断中的应用

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目的:利用 MRI 具有软组织分辨率高特点探讨 MRI 在浅表软组织肿块诊断中的价值。**资料与方法**:回顾分析 56 例单发浅表软组织占位的手术病理、临床及 MRI 资料，患者术前均行常规轴位 T1WI 抑脂

及不抑脂、T2WI 抑脂，冠状位（或矢状位）T1WI 抑脂及不抑脂、T2WI 抑脂，增强扫描轴位 T1WI 抑脂、冠状位（或矢状位）T1WI 抑脂及不抑脂。探究患者发病年龄、肿块发病部位、平扫及增强图像信号特点。**结果各病例数为**:恶性纤维组织细胞瘤 4，平滑肌肉瘤 2，淋巴瘤 2，转移瘤 3，纤维瘤 5，脂肪瘤 10，血管瘤 4，神经鞘瘤 1，粘液瘤 2，腱鞘巨细胞瘤 8，结节性筋膜炎 2，滑囊炎伴积液 6，表皮样囊肿 2，毛囊囊肿 4。脂肪瘤、腱鞘巨细胞瘤发病率较高，在本研究中分别为 17.86%、14.29%。**结论**:浅表软组织占位种类繁多，MRI 表现多种多样，系统分析发病年龄、发病部位、MRI 平扫及增强扫描特点，可以缩小鉴别诊断范围，提高诊断正确性。

EPO-1458

骨外骨肉瘤的临床及影像学分析

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目的 探讨骨外骨肉瘤的临床及影像学表现，提高对该病的认识及鉴别诊断水平。**方法** 回顾性分析经病理证实为骨外骨肉瘤患者的临床和影像资料。**结果** 9 例中,位于小腿、大腿、前臂、肺、腰段跨椎管内外、肾及颅内各 1 例,腹膜后 2 例；男 6 例，女 3 例，年龄 8 岁～86 岁，平均 40.1 岁。影像表现为①边界尚清或不清的软组织肿块②肿块与周围骨骼多不相连③体积较大、密度不均，部分内可见棉絮样骨样密度或信号，可伴囊变、坏死、出血④CT 上除骨样物质及出血外、病灶相对于肌肉多呈不均匀低密度；MR 上信号缺乏特异性,呈不均匀长 T1、长 T2 混杂信号，DWI 结合 ADC 多表现为扩散受限⑤增强扫描呈轻中度不均匀强化⑥可转移至颅内及肺肝脾骨等，术后短期易复发（9 个月至 1 年）。**结论** 若巨大软组织肿块中出现不均匀分布的不定形肿瘤样成骨则有助于骨外骨肉瘤的诊断，但缺乏骨样物质时也不能排除诊断，应密切结合临床及影像特征进行诊断和鉴别诊断。

EPO-1459

5 例儿童髋骨朗格汉斯细胞组织细胞增生症 CT 表现

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目的：探讨儿童髋骨朗格汉斯细胞组织细胞增生症（LCH)的计算机体层摄影术(CT)表现，以提高对本病的认识。
方法：回顾性分析经手术病理证实的 5 例儿童髋骨 LCH 的临床病理资料及 CT 影像资料，分析病变的位置、形态及边缘等 CT 特征。患者均行 CT 平扫加增强检查；免疫组化染色检测 CD1a、S-100 及 CD68。
结果：5 例均为单发病灶，其中 3 例病灶位于髋臼，2 例病灶位于髂骨，5 例病灶均呈不规则形溶骨性骨质破坏，其中 2 例骨质轻度膨胀，骨质破坏区均可见软组织密度影，病灶边界清楚，其中 1 例可见轻微的边缘硬化带，4 例边缘未见骨质硬化，5 例均未见明显的骨膜新生骨，密度不均匀，3 例位于髋臼病灶均累及关节面；5 例病灶增强扫描后呈轻至中度强化。5 例免疫组化示：CD1a、S-100 及 CD68 呈阳性。
结论：儿童髋骨 LCH 的 CT 主要表现为不规则形溶骨性骨质破坏，边界清楚，具有一定的特征性，可以为本病诊断提供依据；确诊仍需结合病理组织学检查。

EPO-1460

Feeding arteries and arteriovenous shunt for discrimination of soft tissue tumors

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Time resolved magnetic resonance angiography with interleaved stochastic trajectories (TWIST) allows for identification of tumor
feeding arteries and arteriovenous shunt (AVS). We used TWIST to obtain number of feeding arteries (NFA) and detect AVS for 43
cases of pathology-confirmed soft tissue tumors. We compared normalized number of feeding arteries (nNFA) and AVS between
malignant and benign tumors, and found nNFA was significantly greater in malignant tumors versus benign tumors (2.1 vs 1.3, P <
.05). The incidence of AVS was significantly higher in malignant tumors versus benign tumors (87.5% vs 10.5%, P < .05). TWIST
derived nNFA and AVS could be useful in the discrimination of benign and malignant soft tissue tumors.

EPO-1461

隆突性皮肤纤维肉瘤的影像学特征研究

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资料与方法 回顾性分析 30 例经手术病理证实的 DFSP 患者的影像资料，其中 8 例行超声检查，9 例行 CT 检查（1 例行增强检查），13 例行 MRI 检查（5 例行增强，1 例行动态增强，6 例行 DWI 检查），2 例同时行超声、CT 检查，3 例同时行超声、MRI 检查。**结果** 肿瘤均位于皮下浅表，13 例呈“多结节融合征”， 11 例呈“子结节外突征”，肿瘤长径平均（4.5±2.6）cm；超声表现为不均匀低回声肿块，彩色多普勒示病灶内部血流信号丰富；CT 平扫均呈等密度，T1WI 多呈低信号，T2WI 呈混杂高信号，其中 8 例呈“双低信号征”，增强扫描多呈不均匀明显强化，1 例动态增强扫描时间信号呈速升-缓降型；肿瘤周围浸润征象中，“脂肪尾征”最为多见，为 21 例，“皮肤尾征”发生率次之，为 18 例，“筋膜尾征”出现率最低，为 12 例。**结论** DFSP 的影像表现具有特征性，有助于术前诊断。

EPO-1462

原发性骨淋巴瘤的 CT、MRI 诊断价值分析

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[目的]分析原发性骨淋巴瘤的 CT、MRI 影像学特点，探讨其诊断价值。

[方法]回顾分析 11 例原发性骨淋巴瘤的影像学资料，所有病例均经临床及病理（包括免疫组化）证实。其中 8 例行 CT 检查，10 例行 MRI 平扫检查，5 例行 MRI 增强检查。
[结果]本组 11 例中，男 7 例，女 4 例。年龄 25～ 68 岁,平均 40.3 岁。10 例为单骨发病，骨盆 4 例，股骨 2 例，胸腰椎 3 例，肋骨 1 例；1 例为多骨发病，发生于骶椎。8 例行 CT 检查，7 例表现为溶骨型骨质破坏，边缘不清，1 例为囊状膨胀型；7 例见骨皮质中断，2 例见骨膜反应。10 例行 MRI 检查，表现为不同程度骨质破坏，骨髓信号异常，T_1WI 信号与肌肉相仿或稍低，T_2压脂序列呈较明显信号；10 例均有软组织肿块，8 例肿块范围超过骨质破坏区并侵犯邻近组织，肿块部分或全部包绕病变骨骼。5 例行 MRI 增强扫描呈轻-中度均匀强化。
[结论]原发性骨淋巴瘤的影像学特征表现为骨质不规则破坏并软组织肿块。CT 多见于溶骨破坏型，骨皮质破坏中断，骨膜反应多见于长管状骨，可形成 Codman 三角。MRI 表现主要为病变区骨髓信号异常、骨皮质破坏及软组织肿块。CT、MRI 各有优缺点，两者相结合有助于原发性骨淋巴瘤的诊断，对明确诊断及确定治疗方案有重要价值。

EPO-1463
DWI 及 ADC 值在评估软组织肿瘤新辅助化疗中的临床意义

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目的 研究 DWI 及 ADC 值在恶性软组织肿瘤新辅助化疗后疗效评估的价值。
方法 根据肿瘤实质疗效评价标准，回顾性分析新辅助化疗后肿瘤缩小幅度小于 30%的恶性软组织肿瘤 14 例，分别在化疗前、第 2 及第 4 个周期新辅助化疗后行 MRI 检查并加扫 DWI 序列，分别测量三个不同时期肿瘤实质部分的 ADC 值。
结果 治疗前肿瘤平均 ADC 值为 0.877± 0.060×$10^{-3}$$mm^2$/s ， 第 2 周期化疗后平均 ADC 值为 1.369± 0.058×$10^{-3}$$mm^2$/s ，第 4 后期后平均 ADC 值为 1.828± 0.066×$10^{-3}$$mm^2$/s。治疗前与第 2、第 4 个周期化疗后肿瘤实质部分的 ADC 值差异均存在统计学意义(P=0.017、P=0.045，P<0.05)；第 2、第 4 个周期化疗后肿瘤实质部分的 ADC 值差异不存在统计学意义(P=0191，P＞0.05)。
结论 DWI 及 ADC 值对新辅助化疗疗效的评估较形态学更迅速、精准，具有前瞻的指导意义。

EPO-1464
Multimodality imaging and clinical features of flat bone osteosarcoma

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Objective
This study aims to assess the clinical and multimodality imaging features of osteosarcoma in flat bones and compare the characteristics with that of the extremity osteosarcoma.

Methods
249 patients with osteosarcoma were treated in the orthopedics department across four institutions from June 2005 to November 2018. We searched across all available electronic pathologic databases and identified a total of 56 cases [age 34.3 ± 17.1

(range 9－68) years, with 32 males and 24 females which met the inclusion criteria with a diagnosed with osteosarcoma in flat bones based on open surgical resection (n=16) and biopsy (n=40). The tumour location, size, imaging appearance and presence of metastases were documented.

Results
Among all, 31 (55.4%) osteosarcoma originated from flat bones of the craniofacial region (mandible, maxilla, sphenoidalia, frontal and temporal bone), 12 (21.4%) from the pelvic region (ilium, ischium), 9 (16.1%) from the chest (rib, clavicle or scapula) and 4 (7.1%) from the vertebrae (Thoracic, lumbar, sacrum). 15 patients (26.8%) received radiotherapy for nasopharyngeal carcinoma. Two patients (3.6%) developed osteosarcomas related to a primary bone disease (fibrous dysplasia and osteoblastoma). Histological examination revealed that 51 tumour cases (91.1%) were of high-grade tumours. These tumours were presented as soft-tissue masses with a diameter of 7.5±3.2 (3.7－15.7) cm. Matrix mineralisation was found to be present in 48 cases (85.7%). Lamellar periosteal reaction occurred in 6 cases (10.7%) with spiculated periosteal reaction in 37 patients (66.1%) and no periosteal reaction occurred in 13 cases (23.2%). Heterogeneous signals were shown on T2-weighted images with enhancement across all (45) contrast-enhanced studies. 5 out of 56 cases (8.9%) had lung metastases. Compared the characteristics of 56 flat bone osteosarcomas (FBOS) patients and 193 patients with extremity osteosarcoma (EOS). The FBOS patients had the following characteristics: a higher age of onset (P = 0.022), a more spiculated periosteal reaction (P = 0.000), a less mix plain radiographic/CT pattern (P = 0.017) and Pathologic fracture(P=0.024). The two groups were similar with regard to gender, extent of tumour (P > 0.05).

Conclusions
Though the occurrence of osteosarcoma is rare in flat bone, matrix mineralisation is thought to be a critical finding in differentiating osteosarcoma from other types of flat bone tumours. The possibility of FBOS may therefore be considered in the presence of matrix mineralisation early in the third and fourth decade of life. The T2 hyperintense signal and heterogeneous enhancement in MRI (Magnetic Resonance Imaging) is non-specific.

EPO-1465

Myofibromatosis in adult: Findings on MDCT and MR Imaging and Pathologic Correlation

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Objectives To characterize the radiologic appearance of myofibromatosis on CT, and MR and to correlate the imaging findings with histopathologic features.
Materials and methods The imaging findings of ten myofibromatosis on CT (n=5), and MR (n=5) were retrospectively evaluated. The images were retrospectively reviewed for size, shape, location, margin, CT attenuation and MR signal intensity compared with

skeletal muscles, and enhancement patterns. Pathologic specimens of all cases were reviewed and compared with imaging findings.
Results We included 10 consecutive patients with 10 histologically proven myofibromatosis (4men, 6 women; age range, 19－65 years; mean age, 38.3 years; median age, 37 years), The tumors were located in the face (n=1), parotid gland(n=1), mandible(n=1),upper extremities (n=2), psoas muscle(n=1), rectus abdominis(n=1), pelvic cavity(n=1),scrotum(n=1) ,lower extremities (n=1),The maximum tumor diameter was in the range of 1.4－12.4cm(mean, 5.4 cm).All of the masses were isodense relative to adjacent skeletal muscle on the unenhanced, no calcification and necrosis been seen, and 3 lesions showed mild enhancement on contrast-enhanced CT, but the other 2 lesions showed obvious enhancement after contrast agent administration. All of the lesions showed persistent enhancement on contrast-enhanced CT. On MR, three of 5 patients with the multicentric form, two of 5 patients with the solitary form, and the multicentric lesions were characterized by multiple nodules distributed around tendon and nerve. On T2-weighted images and fat-suppressed T2W images, all of the 5 tumors showed inhomogeneous hyperintensity, the center of the masses showed strip and reticular hypointensity . On T1-weighted images, all of the tumors showed homogeneous hypointensity. On fat-suppressed gadolinium-enhanced T1-weighted images, all of the tumors showed obvious enhancement, whereas the strip and reticular hypointensity on T2-weighted images and fat-suppressed T2W images showed no enhancement. Histologically, mitoses and chronic inflammation were more frequent in the multicentric and generalized forms than in the solitary form. Fibrosis, necrosis, calcification, and hyalinization in the center of the lesion, replacing primarily the vascular component were more frequent in the he solitary form than in the multicentric forms. The strip and reticular hypointensity on T2W images and fat-suppressed T2W images corresponded to the distribution of the fibrosis and calcification on pathologic specimens. The more the vascular component remains on pathologic specimens, The degree of enhancement is more significant on CT and MRI.
Conclusion: The imaging characteristics of myofibromas in adult are nonspecific, the diagnosis of myofibromas must be confirmed histopathologically. The diagnosis can be suggested when a adult with a mass or masses around the tendon and nerve on MR. Pathologic findings are well correlated with imaging findings.

EPO-1466
软组织肉瘤 IVIM 及 DKI 与 Ki-67 表达水平的对照研究

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目的：探讨 IVIM 及 DKI 参数在预测软组织肉瘤（Soft tissue sarcomas，STSs）Ki-67 表达水平中的应用价值。
材料与方法：收集经手术病理证实为软组织肉瘤患者 29 例，所有患者均于术前行常规 MRI、IVIM 及 DKI 检查，并由两名放射科医生手工描绘感兴趣区 ROI，测得 IVIM 单指数、双指数、拉伸指数模型及 DKI 各参数 StandardADC、D、D*、f、DDC、α、MD、MK、FA 值。利用 MRI-病理对照方法，获取病理取材点，根据该点免疫组织化学 Ki-67 染色结果将患者分为 Ki-67 高表达组（LI≥25%）18 例，Ki-67 低表达组（LI＜25%）11 例。分析各参数与 Ki-67 表达水平的相关性及诊断效能。

结果： 29 例软组织肉瘤 IVIM 及 DKI 参数 Standard ADC 值、D 值、DDC 值、MK 值、MD 值在 Ki-67 高低表达组间差异具有显著性（$p<0.05$），且 Ki-67 高表达组 Standard ADC 值、D 值、DDC 值、MD 值均低于低表达组，MK 值高于低表达组。当 Standard ADC 值、D 值、DDC 值、MK 值、MD 值的曲线下面积分别为 0.907、0.926、0.907、0.963、0.981 时，对 STSs Ki-67 高、低表达组鉴别诊断阈值分别为 $1.430\times10^{-3}mm^2/s$、$1.100\times10^{-3}mm^2/s$、$1.405\times10^{-3}mm^2/s$、0.592 及 $1.537\mu m^2/ms$，应用此诊断阈值对 Ki-67 高、低表达组鉴别诊断的敏感度分别为 83.3%、100%、83.3%、100%及 100%，特异度分别是 100%、77.8%、100%、83.3%及 88.9%。

结论： IVIM 参数 Standard ADC 值、D 值、DDC 值及 DKI 参数 MK 值、MD 值均可用于界定 Ki-67 表达范围，其中 DKI 参数诊断效能较 IVIM 参数更好，即 DKI 对 Ki-67 表达水平的预测能力较 IVIM 更佳。

EPO-1467

脊索瘤 MR 诊断价值研究

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目的： 通过分析脊索瘤的 MR 图像表现，探讨 MR 平扫及增强图像、动态增强图像、弥散加权成像诊断脊索瘤的价值。

材料方法： 搜集经手术或穿刺病理证实的脊索瘤 36 例，颅底 10 例，颈椎 4 例，腰椎 1 例，骶尾部 21 例，采用西门子 3.0T 磁共振，36 例均行 T1WI、T2WI 及常规钆剂增强扫描；其中 10 例颅底脊索瘤行动态增强 MRI 扫描，6 例颅底脊索瘤行 DWI 扫描，并测量肿瘤实质部分的 ADC 值。

结果：（1）肿瘤在平扫及常规 MR 增强表现：肿瘤常突破周围骨质，形成软组织肿块，边缘界限清楚，形态呈多不规则，伴分叶样改变，周围结构呈受侵推挤样改变。当肿瘤侵蚀及多个椎体时，邻近椎间盘正常结构及形态消失。36 例在 T1WI 多呈等低信号，其信强度接近邻近肌肉；其中 18 例病变内可见斑片状稍高信号影；当邻近骨质受侵时，肿瘤组织取代正常髓质的 T1WI 高信号影，T2WI 呈不均匀中至高信号，其内多见线样低信号分隔影，部分肿瘤内见散在斑片状低信号。MRI 增强肿瘤多呈轻中度强化，4 例强化较均匀，32 例呈不均匀网格样或颗粒样强化。（2）动态增强 MRI 表现：10 例颅底脊索瘤随扫描时间推移，其强化程度越来越明显，表现为持续缓慢强化，时间-信号强度曲线呈持续上升型

（3）DWI 表现：6 例颅底脊索瘤 DWI 呈等或稍高信号影，平均 ADC 值约 $1264.5\pm100.3\times10^{-6}mm^2/s$。与 Ginat al.提出的颅骨恶性病变 ADC 值多低于界值 $1010\times10^{-6}mm^2/s$ 结果不符。

（4）误诊分析：颅底部误诊 2 例，因 T2WI 呈较高信号，伴斑片低信号，误诊为软骨肉瘤。腰椎部误诊 1 例，因侵及上下椎体，伴腰大肌周围肿块形成，误诊为结核。骶尾部误诊 2 例，因信号特征不明显，误诊为转移。

结论： T2WI 上中至高信号伴低信号分隔及动态增强图像的持续缓慢强化为脊索瘤较为特征性征象。ADC 值对脊索瘤良恶程度的评估价值尚不确定。

EPO-1468

正常小儿髌臼盂唇影像特征

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目的：应用 3.0TMR 研究小儿正常髋臼盂唇发育变化规律，旨在探讨正常小儿髋臼盂唇影像特征及其与年龄相关性。
材料与方法：回顾性分析 49 例正常小儿髋臼盂唇 MR 表现，年龄：0-14 岁。采用 Philips Intera Achieva 3.0 T 超导型磁共振扫描系统，体线圈，患者仰卧位，行轴位及冠状位扫描。层厚 3～5mm，层间距 3～5mm，FOV 505mm×505mm。采用快速自旋回波序列(TSE)和短时反转恢复序列(SPAIR)扫描：TSE 序列 T1WI：TR/TE=600/25ms,T2WI：TR/TE=6073/125ms；TSE-SPAIR 序列 T2WI：TR/TE=4018/58ms。所有图像由 2 名 MR 诊断医师分别进行评价，对不同部位（包括冠状位髋臼盂唇顶点，横断位髋臼盂唇前部及后部图像显示最清晰层面）髋臼盂唇的形状（三角形，扁平形或缺如）和信号进行分析。利用 χ^2 检验进行统计学分析，应用 SPSS 软件进行数据处理。
结果：1.在所获得的 234 个髋臼盂唇断面图像中，三角形盂唇最多见，占 75.2%，扁平形次之，占 18.2%，缺如情况最少见，占 6.6%。斑片状或结节状稍高信号在髋臼盂唇内的出现率为 19.7%。2.不同部位髋臼盂唇的形态构成之间有统计学差异，其中上部未见缺如情况，而后部缺如情况的构成比最高，占 14.9%；三角形在前部的构成比最高，为 91.9%。3.髋臼盂唇内部出现的稍高信号在不同部位间有统计学差异（$p<0.001$），最常见于前部，出现频率为 40.5%。
结论：正常小儿髋臼盂唇 3.0TMR 显示小儿髋臼盂唇的形态和信号强度因部位的不同而各异，髋臼盂唇内部的高信号在盂唇前部的出现率最高。

EPO-1469

Task-state fMRI study of numbness of the limbs induced by electrical stimulation in normal subjects

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Objective To provid a paradigm for numbness of the limbs, and a biological basis for further study of the brain mechanism of numbness, task-state functional magnetic resonance was used to evaluate the activation of the brain regions in normal human under the condition of numbness induced by electrical stimulation. **Materials and Methods** 22 healthy subjects were recruited, aged 24-30 years. A numbness model was made, with stimulation above the right ankle, by using the Pulse Electrical Stimulator while fMRI data were acquired. The electrical stimulations of low frequency and high frequency were used with block design in the test, and the subjects were asked to score the numbness of electrical stimulation. The statistical parameter map software package SPM12 software was used to analyze the fMRI data, and the activation maps of the brain region were obtained for the low frequency electrical stimulation and high frequency electrical stimulation, and the paired sample *t* test was used between the low and high-frequency electrical stimulation. **Results** The brain areas of increasing activation in the high frequency electrical stimulation compared to the lower frequency involved: left insular operculum, left middle cingulate gyrus, left planum temporal, right parietal operculum, left postcentral gyrus, posterior to the right insular lobe, left thalamus (FWE, corrected, $p<0.05$). There were no brain areas of decreasing activation in the high frequency compared to the lower. **Conclusion** The brain areas related to numbness of the limbs induced by electrical stimulation involved the posterior central cortex of primary sensation, and cingulate gyrus, thalamus and insular

lobe related to the sensory conduction, as well as temporal lobe related to evaluation of emotion.

EPO-1470

MSCTA 在下肢动脉病变的临床应用研究

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目的： 通过多层螺旋 CT 血管成像（MSCTA）技术与数字减影血管造影（DSA）技术比较，探讨 MSCTA 技术在下肢动脉检查中的技术优势及临床应用。
方法：对疑有下肢动脉病变的 60 例病人进行 128 层螺旋 CTA 检查，采集数据传输至工作站，通过 syngo workplace 系统，应用如 MIP、VRT、MPR、CRP 等后处理技术，对图像质量进行评估。以 DSA 为准做比较，经统计学分析，对狭窄程度进行评估。
结果：
1.对临床怀疑有下肢动脉疾病的 60 例患者行 128 层螺旋 CTA 检查，图像优良率达 96.81%，显示率达 100%，所有图像均能满足诊断要求。
2.40 例行下肢动脉 128 层螺旋 CTA 和 DSA 检查，与 DSA 比较，128 层螺旋 CTA 诊断血管狭窄程度为 0 级、I 级时的敏感性和特异性皆为 100%。128 层螺旋 CTA 诊断动脉狭窄程度为 II 级时的特异性和敏感性分别为 99.73%和 100%，阳性预测值和阴性预测值分别为 93.36%和 100%，与 DSA 比较具有很高一致性，K 值=0.9608；动脉狭窄程度为 III 级、IV 级时的特异性和敏感性分别为 98.73%和 100%，阳性预测值和阴性预测值分别为 96.37%和 100%，K 值=0.9738，与 DSA 比较具有较高的一致性。
3.本组研究的 128 层螺旋 CTA 与 DSA 对下肢动脉狭窄诊断符合率比较，显示髂骨组和股动脉组血管狭窄符合率最高达 100%，小腿组动脉与 DSA 比较符合率欠佳，狭窄符合率达 98.68%，闭塞符合率为 97.33%。
结论：
1.128 层螺旋 CTA 能以高质量、高清晰度的显示下肢动脉。
2.128 层螺旋 CTA 能清晰显示病变动脉腔内、动脉管壁及相应周围组织情况,并对下肢动脉腔狭窄程度分级进行评估。

EPO-1471

四肢肌内异位腱鞘囊肿的 MRI 影像学分析

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目的 分析四肢肌内异位腱鞘囊肿的 MRI 影像学征象，提高其 MRI 诊断准确性。
方法 回顾分析 30 例 35 个病灶，经我院病理证实的四肢肌内异位腱鞘囊肿的临床和 MRI 资料。
结果 30 例四肢肌内异位腱鞘囊肿中均呈长 T1 长 T2 信号，STIR 呈高信号，未侵犯邻近骨骼与关节，其中 11 例病灶见边缘云絮状或花边状水肿信号，19 例病灶内见低信号分隔带。钆喷替酸葡胺（Gd－DTAP）增强，整个病变无强化。
结论 光整无强化的囊样病灶及病灶内均匀一致的窄飘带状无强化低信号分隔带是四肢肌内异位腱鞘囊肿的特征性表现。

EPO-1472
非体力劳动者职业人群各椎体骨密度的比较分析

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目的 比较分析非体力劳动者职业人群各椎体骨密度的分别情况。**方法** 抽取河南省新乡市卫辉市 51 例非体力劳动职业人共 51 例，记录志愿者的基线资料，包括籍贯、性别、年龄、身高、体重、腰围、有无骨折史、影响骨密度相关病史以及女性记录月经情况。采用东软公司 Neuviz 128CT 行腰椎 CT 扫描时同时将 QCT 体膜(Mindways，Texas，USA) 放置在志愿者身体下。扫描条件为 kVp:120 k Vp，SFOV：500，mA291，层厚（mm）：1.000，扫描床高：370.3。扫描结束后将图像传至 QCTpro 软 件 (Mindways Software Inc. ，USA) 进行 QCT 骨密度分析。应用 SPSS 22.0 统计软件行统计学描述及单因素方差分析，显著性检验采用双尾检验，α=0.05。**结果** T11、T12、L1、L2、L3、L4 的 BMD 分别为 140.40±37.28，
134.93±38.14,129.42±36.98,124.76+37.80,118.71±37.40 及 120.66±36.32，各椎体的 BMD 值有差别，F=12.091，P=0.01；其中 T11 与 L2、L3 及 L4 间有差别，P 值分别为 0.035，0.004 及 0.008，T12 与 L3 间 有差别，P 值为 0.029。 **结论** 非体力劳动者职业人群各椎体骨密度差异有统计学意义，其中 T11 及 T12 椎体骨密度较高，而 L3 及 L4 椎体骨密度较低。

EPO-1473
T2-mapping 对腰椎旁肌肉运动后恢复的研究

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[摘 要] **目的** 探讨 T2-mapping 评估健康志愿者运动后腰部背伸肌群(多裂肌、最长肌、髂肋肌）恢复过程的价值。**方法** 对 100 名健康志愿者运动后不同时间节点行 T2-mapping 序列扫描，于 L3、L4 上缘层面测量运动前后多裂肌、最长肌、髂肋肌的横截面积（CSA）及 T2 值，比较运动后不同时间节点背伸肌群 CSA、T2 值的差异。**结果** L3、L4 层面左右两侧背伸肌群运动前、运动后不同时间点的 T2 值之间有显著性差异。运动后不同时间点各层面两侧背伸肌群的平均 T2 值都有“升高-下降-回升”的变化趋势。L4 水平左右两侧背伸肌群在运动前及运动后 0min 点的 T2 值比较，差异有统计学意义。L3、L4 层面两侧背伸肌群运动前、运动后不同时间点的 CSA 之间无显著性差异。 **结论** T2-mapping 可用于评估腰部背伸肌群运动后功能恢复变化。

EPO-1474
成人骨盆病变 135 例的影像分析

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目的：分析成人骨盆病变的影像表现,以提高其诊断及鉴别诊断。**材料与方法：**回顾分析经临床确诊或病理证实的 135 例骨盆病变的影像表现, 强直性脊柱炎所致骶髂关节炎 26 例，骶髂关节结核 1 例，致密性髂骨炎 6 例，髋关节病变 102 例，包括：退行性骨关节病 24 例，成人股骨头缺血坏死 17 例，类风湿性关节炎 6 例，强直性脊柱炎累及髋关节 15 例，髋臼覆盖不良继发骨关节病 10

例，髋关节结核 4 例，骨折与脱位 15 例，滑膜骨软骨瘤病 2 例，多发性骨髓瘤 2 例，髂骨肉瘤 1 例，骨纤维异常增殖症 2 例，多发外生性骨疣累及髋关节 1 例，周围软组织骨化 3 例。**结果：**强直性脊柱炎所致的骶髂关节炎表现为髂骨端关节面的模糊、波浪样改变及局部增生硬化与关节间隙假性增宽；骶髂关节结核为关节骨端破坏，边缘硬化；致密性髂骨炎表现为关节骨端类三角形、宽带状增生硬化灶，与正常骨分界清楚，骶髂关节间隙无异常；髋关节退行性骨关节病以承重区骨性关节面增生硬化为主伴软骨下囊变，相应关节间隙变窄；股骨头缺血坏死显示股骨头变扁塌陷、硬化、囊变及软骨下骨折，晚期继发骨性关节炎改变；髋关节类风湿性关节炎：关节间隙狭窄，骨质疏松，股骨头不同程度向内上突出；强直性脊柱炎累及髋关节表现为关节间隙一致性或非对称性狭窄，髋臼及股骨头关节面下囊变，边缘骨突形成；髋臼覆盖不良可见髋臼变浅，髋臼骑跨在股骨头上方，继发骨关节病时骨端增生硬化及囊变；髋关节结核：关节面骨质破坏,其间沙砾样死骨与钙化和寒性脓疡；滑膜骨软骨瘤病：关节周围大小不等骨性密度增高影，可伴有关节退变。**结论：**骨盆病变的影像表现不同, X 线平片是首选和重要的检查方法，CT 和 MRI 检查能清楚显示骨盆病变的部位、形态、范围和内部结构及邻近软组织改变的细节,是骨盆病变的重要补充检查，对病变诊断和鉴别诊断有较高的临床价值。

EPO-1475

髋关节撞击综合征的影像与临床分析

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目的：髋关节撞击综合征（FAI）是指由于股骨头和髋臼盂唇解剖形态异常，或解剖正常但长期不正常外力作用于髋关节，导致两者长期不正常接触、碰撞，产生反复的微型创伤致使关节盂缘和关节软骨退变，从而引起一系列临床症状。本研究应用 MRI、CT 及 X 线成像技术诊断及评估 FAI 的关节结构改变及关节结构随时间改变的规律，多模态早期诊断 FAI。
方法：回顾性纳入 270 例患者，其中 90 例（病例组）为确诊髋关节撞击综合征的患者，180 例（对照组）为其他疾病进行髋关节检查的患者，并至少行一种影像学检查，MRI、CT 或 X 线。定性或定量记录所有患者的各种观察指标，年龄、性别及其他相关临床指标， α 角、EE 角、髋臼深浅、髋臼唇退变及其他相关影像学指标。
结果：FAI 病例组的髋臼较对照组的髋臼更深。在病例组中 α 角的值比对照组的 α 角的值大；FAI 病例组 CCD 角的值较对照组的 CCD 角的值大；病例组的 EE 角的值较对照组的 EE 角值小。FAI 病例组与对照组的 EE 角、 α 角值及“髋臼变深”差异有统计学意义（P ＜ 0. 05）；CCD 角的值差异无统计学意义（P ＞ 0. 05）。病例组患者髋臼唇的改变早于骨质改变（P＜ 0. 05）。
结论： α 角、“髋臼变深”及 EE 角的值对评估髋关节撞击综合征意义重大；MR 可以早期诊断不具有骨质改变但具有髋臼唇改变的 FAI 患者，同时评估骨质及髋臼唇随时间演变的规律；FAI 的诊断需要临床与影像的密切结合。

EPO-1476

人工髋关节置换术后并发症磁共振 SEMAC 序列影像评估

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目的　探讨 1.5T 西门子 SEMAC 序列中人工髋关节置换术后并发症的影像学表现。

方法　前瞻性使用 1.5T 西门子 SEMAC 序列扫描并分析 29 例人工髋关节置换术后出现并发症而接受髋关节翻修术患者，观察其影像学表现。
结果　29 例中，术后诊断无菌性松动 22 例，表现为假体-骨界面存在层状高信号，同时被层状低信号环绕；感染 4 例，表现为假体周围分层增厚的高信号滑膜组织，关节囊外积聚和连通皮肤的窦道，骨破坏等；异位骨化 3 例，表现为髋臼假体周围软组织大量低信号影或不成熟骨的混杂信号团。
结论　人工髋关节置换术后关节松动较为常见，假体周围异常信号带是最重要的磁共振影像表现，SEMAC 序列有助于减轻金属伪影提高磁共振图像质量。

EPO-1477
磁共振 Dixon 技术对椎体压缩性骨折病因分析应用价值研究

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目的：探讨 MRI 双回波水-脂分离 Dixon 技术在良恶性椎体压缩性骨折中的应用价值。方法：回顾性收集椎体压缩性骨折患者 56 例。利用西门子 1.5T 超导 MR 扫描仪(MAGNETOM Aera1.5T)对 56 例椎体压缩性骨折患者（共 89 个椎体）进行常规 MR 扫描和 T2WI Dixon 序列扫描获得同相位、反相位、纯水相、纯脂相。其中良性骨折 36 例，47 个椎体(包括单纯外伤 15 例，骨质疏松 20 例，结核 1 例)，恶性骨折 20 例，42 个椎体(包括转移性肿瘤 18 例，骨髓瘤 2 例)。测量并计算两组椎体水脂像、同反相位的信号强度比值 SIR(脂像信号强度/水像信号强度，反相位信号强度/同相位信号强度），并对 SIR 进行统计学分析。结果：良性组椎体压缩骨折同反相位 SIR 0.57±0.22，恶性组压缩骨折同反相位 SIR 0.73±0.30，两者差异有统计学意义(P＜0.05)；良性组椎体压缩骨折水脂像 SIR 0.81±0.13，恶性组压缩骨折水脂像 SIR 0.48±0.66，两者差异有统计学意义(P＜0.05)。结论：良性组水脂像 SIR 明显高于恶性组；良性组同反相位像 SIR 低于恶性组。MRI 双回波水-脂分离 Dixon 对良恶性椎体压缩骨折的鉴别有较高的应用价值，值得推广使用。

EPO-1478
DR 站立位全脊柱影像与 MSCT 全脊柱影像 Cobb 角对比分析

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目的：对比分析 DR 站立位全脊柱影像与 MSCT 全脊柱图像 Cobb 角之间的差异，探讨 DR 站立位全脊柱影像在青少年特发性脊柱侧凸中的诊断价值。
方法：回顾性选取 2014 年 1 月-2017 年 1 月间，解放区总医院第三医学中心收治的特发性脊柱侧凸畸形患者 102 例，年龄 8-20 岁，平均年龄 16 岁，所有病例均含有站立全脊柱正侧位 X 线片，全脊柱左右 Bending 位 X 线片，MSCT 全脊柱图像和 VR 重建图像，对 DR 站立位全脊柱和 MSCT 重建的全脊柱 VR 图像进行 Cobb 角测量并记录。
结果：DR 站立位全脊柱影像测量 Cobb 角的平均值为（35.6±12.1）°，MSCT 后处理 VR 图像测量 Cobb 角的平均值为（28.8±9.4）°，将两组数值进行 t 检验，p＜0.05，差异具有统计学意义。DR 全脊柱影像共发现脊柱侧凸 166 处，其中胸椎侧凸 55 例，腰椎侧凸 26 例，胸腰段 85 例，MSCT 发现侧凸数量与 DR 完全相同。

结论：DR 站立位全脊柱影像能反映人体功能位的 Cobb 角度，能为临床提供准确的数据，不能被其他检查方法所取代；DR 站立位全脊柱影像还能显示脊柱侧凸的部位和数量，脊柱和骨盆的倾斜程度，脊柱旋转和脊柱柔韧性等，是脊柱侧凸畸形诊断和术前评估首选的影像学检查方法。

EPO-1479

1.5T 磁共振在颞下颌关节乱中的应用

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目的 由于颞下颌关节紊乱综合征有着复杂的病因及临床表现，故在诊断过程需要可靠的检查手段，本文目的旨在探讨 1.5T 磁共振诊断颞下颌关节紊乱疾病的价值。**方法** 回顾性分析 2015 年 3 月至今共 283 例患者，男 11 例，女 272 例,年龄 11 岁-63 岁，平均年龄 37 岁。所有病人均与疼痛、弹响或开口受限来诊。272 例患者均采用西门子 Avanto1.5T 磁共振成像仪扫描，行闭口位斜矢状位 T1WI、PD-FS，人体正中矢状位 3D，张口位斜矢状位 PD-FS，其中 72 例行动态扫描，6 例加扫横断位 T2-FS。斜矢状位时扫描方向与髁突长轴垂直，斜冠状位扫描时，扫描方向与髁突长轴平行。动态扫描采用 HASTE 序列，设置为单层多期扫描，扫描 18 期，总扫描时间 54 秒，定位与斜矢状位一样。当常规扫描难以确定关节盘病变时，需了解髁突活动度才加用动态扫描以提供更多信息。**结果** 272 例患者中，最多见为关节盘移位，有 171 例，约占 62.9%，各种关节盘移位包括关节盘前移位、关节盘侧向移位和关节盘旋转移位，其中前外侧旋转移位及关节盘前移位较为常见。检出髁突病变的 131 例，主要为髁突吸收、增生、水肿。42 例患者关节周围软组织有水肿信号，包括翼外肌水肿渗出病变、关节积液等。**结论** 颞下颌关节紊乱综合征是口腔颌面部的最常见疾病之一。磁共振能检出各种关节盘移位,是其他影像方法无法比拟的。能早期发现髁突骨髓内充血、水肿。能显示翼外肌水肿渗出,对早期诊断具有重要价值。动态扫描对关节盘穿孔和粘连极为敏感，但不能区分，并能看到关节盘在运动过程中的位置和形态，对髁状突及关节盘的运动功能及髁盘关系的评价很重要，对区别可复性与不可复性前移位具有重要作用。因此在颞下颌关节紊乱疾病研究中，磁共振能在很多方面被当作颞下颌关节疾病诊断的“金标准”。

EPO-1480

针灸治疗颞颌关节盘移位的磁共振疗效评估

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目的 观察中医针灸对颞下颌关节盘移位的治疗效果，探讨磁共振成像在疗效评估中的作用。**方法** 以经 MRI 检查诊断为颞下颌关节盘移位并接受中医针灸治疗的 20 例患者作为研究对象。根据患者的情况，取听宫、下关、颊车、耳门、上关、合谷、阿是穴，留针时间 20 分钟。以上穴位不必一次全部选用，可交替使用。治疗每日一次，7 次一个疗程。治疗结束后，再行磁共振检查，并测量张口度评估下颌运动功能及评估关节盘位置，并与治疗前进行比较。**结果** 治疗结束后，患者张口度平均为（41.25±5.14）mm，明显大于治疗前的(27.6±5.23) mm（P<0.001）。与治疗前比较，治疗结束后大部分患者症状明显改善，其中有 2 例患者 MRI 复查表现为关节腔积液减少，其中 1 例关节盘移位回复至正常位置，另 1 例由关节绞锁恢复为可复性关节盘移位。**结论** 中医治疗颞下颌关节盘移位能明显减轻疼痛，改善下颌运动功能，MRI 可以作为评估针灸治疗颞颌关节盘移位的最重要的手段之一。

EPO-1481
铁螯合剂对兔出血性关节病进程影响的 MRI 与病理学对照研究

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目的： 探讨 3.0T MR 动态监测铁螯合剂对兔出血性关节病治疗作用的可行性。
方法： 利用 30 只日本大耳兔自体血注入右膝关节腔成功诱导产生出血性关节病模型， 随机将动物分为 2 组：去铁敏组、 对照组。去铁敏组动物在关节腔注血后 24 小时开始予关节腔内注射铁螯合剂（100mg/kg），一天一次，连续七天；对照组的动物关节腔注血后 24 小时开始予关节腔注入等量的生理盐水，剂量及方法与铁螯合剂相同。利用 3.0TMRI 成像 3D-FS-SPGR、T2mapping 及 SWI 序列动态监测两组兔给药前后膝关节软骨、滑膜、积液/积血及 T2 值变化。并分别于 1 周，2 周，4 周磁共振检查后处死 1 只行病理学对照。
结果： 去铁敏治疗后 1 周，2 周，4 周关节腔内积血/积液逐渐减少。第 1 周，去铁敏组软骨平均 T2 值明显低于对照组（P<0.05），有统计学意义；且第 2、4 周 T2 值持续降低，但并不显著（p>0.05）。第 2 周及第 4 周，去铁敏组的 T2-mapping 伪彩图见股骨远端软骨色阶红黄色阶逐渐减少。SWI 显示关节腔内异常低信号逐渐减少。去铁敏组关节影像学改变与关节软骨及滑液的病理学划分相一致。（Kappa=0.965，P＜0.01）
结论：铁螯合剂-去铁敏通过螯合铁离子能明显改善出血性关节病兔模型的软骨损伤情况，减慢出血性关节病的进展。磁共振成像能够成功帮助临床筛选出适合出血性关节炎治疗相关的药物。

EPO-1482
Disrupted interhemispheric functional coordination in patients with chronic low back-related leg pain: A multiscale frequency-related homotopic connectivity study

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Objective: Chronic low back pain has been observed decreased movement coordination. However, it is unclear whether the existing alteration of inter-hemispheric synchrony of intrinsic activity in patients with chronic low back-related leg pain (cLBLP). The present study aims to investigate the alteration of homotopic connectivity and its clinical association with the cLBLP patients.
Participants and methods: A cohort of cLBLP patients (n=25) and well-matched healthy controls (HCs) (n=27) were recruited and underwent MRI scanning and a battery of clinical tests. The voxel-mirrored homotopic connectivity (VMHC) was used to analyze the interhemispheric coordination in the typical (0.01－0.1 Hz) as well as five specific (slow-6 to slow-2) frequency bands and associated with clinical index in cLBLP patients.

Results: We observed that cLBLP patients with lower homotopic connectivity than HCs in the inferior temporal gyrus, the superior temporal gyrus, the basal ganglia, the middle frontal gyrus, and the medial prefrontal cortex in the typical and five specific frequency bands, respectively. In the typical and five specific frequency bands, significant positive correlations were observed between the VMHC values of medial prefrontal cortex and the visual analogue scale scores, while the VMHC values of basal ganglia negative correlated with the values of two-point tactile discrimination (2PD) test for the right hand in cLBLP patients, etc. Further receiver operating characteristic curve analysis revealed that VMHC in the above regions with decreased could be used to differentiate the cerebral functional plasticity of cLBLP from healthy individuals with high sensitivity and specificity.
Conclusion: Our results imply that multiscale frequency-related interhemispheric disconnectivity may underlie the central pathogenesis of functional coordination in patients with cLBLP.

EPO-1483
脊髓空洞症合并多发夏科氏关节病一例报告

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目的 探讨一例脊髓空洞症合并多发夏科氏(Charcot)关节病的影像诊断及鉴别诊断，以提高对本病的认识。 方法 对一例脊髓空洞症合并多发夏科氏关节病进行回顾性分析，研究其发病原因、诊疗过程及鉴别诊断。 结果 48 岁女性患者，2 月前因发现右上臂肿块 10 日伴间断性疼痛、右上臂肿胀就诊某院，按右上臂恶性骨肿瘤行手术切除，病理结果显示右上臂肿块符合骨化性肌炎。近日右肩关节肿痛明显，为求进一步治疗，遂来本院就诊并行右肩部 CT 检查，因疑肩关节恶性肿瘤又行右肩关节 MRI 检查。查体：右上臂呈术后改变，右肩部肿胀，活动减弱，右手指多个关节半脱位，呈“爪状”变形。术前 X 线检查示右肱骨内侧软组织增厚，其内可见条索状高密度影。右肩关节 X 线示关节结构失常，肱骨头部分缺如，呈“刀切征”，周围软组织肿胀，其内可见片状高密度影。右肩关节 CT 示右侧股骨头及肩胛骨关节盂形态失常，右肱骨头部分缺如，右肩关节周围软组织肿胀，其内可见骨碎片。右肩关节 MRI 检查示关节关系紊乱，肱骨近端骨质破坏，周围软组织内可见大片状水样信号，其内斑片状长 T1 短 T2 信号影提示钙化。通过询问病史、结合临床表现及辅助检查结果，考虑右肩关节夏科氏关节、右上臂外伤性血肿伴骨化性肌炎术后、右手指多个指间关节夏科氏关节，建议进一步做颈椎 MRI 检查以查因。颈椎 MRI 示脊髓 C2-T3 段条状长 T1 长 T2 信号影，符合脊髓空洞症诊断。 结论 脊髓空洞症合并多发夏科氏关节病罕见，尤其是容易误诊为恶性肿瘤，但夏科氏关节的临床及影像学均具有一定特点，两者相互结合，可以提高诊断准确率。

EPO-1484
联合 X 线片及 MRI 评估颈椎前路手术治疗平山病疗效

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目的 联合应用中立位、屈曲位、过伸位 X 线片及中立位、屈曲位 MR 探讨颈椎前路融合或非融合内固定术治疗平山病的临床疗效。方法 回顾性分析 23 例我院采用颈椎前路手术治疗的平山病患者。根据手术方式不同分为融合组和非融合组。融合组 11 例，男 9 例，女 2 例；年龄 15~29 岁。非融合组 12 例，男 11 例，女 1 例；年龄 15~23 岁。术后随访，摄颈椎中立位、过伸位、过屈位 X 线片，颈椎中立位及屈曲位 MRI，测量参数如下：（1）颈椎最大屈曲角：颈椎屈曲位 C2 椎体下缘延长线与 C7 椎体下缘延长线的夹角 α 。（2）颈椎活动度：颈椎过伸位测量 C2 椎体下缘延长线和 C7 椎体下缘延长线之间 Cobb 角 β，α 、β 角的差值即活动度。（3）屈曲位下颈椎相邻椎体曲度：颈椎过屈位 X 线片上测量。（4） 脊髓横截面面积：选取中立位 C4~C7 节段 MRI 横截面影像测量脊髓的面积。结果 （1）随访时融合组最大屈曲 Cobb 角平均 16.10° ± 1.93°；非融合组平均 13.74°±2.19°，较术前改善（P<0.01）；（2）随访时融合组颈椎活动度平均 36.47° ± 3.48° ；非融合组平均 29.82°±3.38°，均较术前减少（P＜0.05），随访时两组间的差异无统计学意义（P＞0.05）；（3）C5，6、C6，7 相邻椎体曲度分别由术前 12.34°±1.31°、11.62°±1.22°减小至随访时 8.06°±0.97°、7.14°±0.69°，差异有统计学意义（P＜0.05）。（4）随访时融合组 C4、C5、C6、C7 水平中立位脊髓横断面面积分别为（0.93±0.03）cm^2、（0.86±0.04）cm^2、（0.89±0.05）cm^2、（0.81±0.04）cm^2，与术前比较 C4、C5 节段的差异无统计学意义，C6、C7 节段的差异有统计学意义。结论 联合 X 线片及 MRI 可用于临床评估颈椎前路融合或非融合内固定术的疗效。

EPO-1485

糖尿病下肢动脉病变双源 CT 血管成像分析

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摘要：目的：研究糖尿病下肢动脉病变 双源层 CT 血管成像（CTA）特征。方法：回顾性分析 80 例临床诊断为糖尿病，并行双源 CTA 检查的患者资料。下肢动脉分为 4 段（髂动脉段、股动脉段、腘动脉段和小腿动脉段）。统计下肢动脉病变部位、数目、性质、长度（< 5 cm， 5～10 cm 和 > 10 cm）并分析其特点。结果：根据 4 分段法，80 例患者中病变动脉 149 条，多节段病变 56（37.58%）条，其中受累股动脉 104（67.80%）条，受累的小腿动脉 134（89.93%） 条。总病变 326 处，其中闭塞性疾病 180（55.21%）处，狭窄性病变约 146（44.79%） 处。> 10 cm 闭塞病变主要发生在小腿动脉 66 处，占小腿动脉病变的 49.25%，以胫前动脉和胫 后动脉为主。结论：糖尿病下肢动脉病变 CTA 表现主要以多节段硬化闭塞为主，多累及股动脉 和小腿动脉。无创性 CTA 可用于下肢动脉病变的常规评估。

EPO-1486

青海地区围绝经期妇女骨密度、血清钙磷及其代谢相关激素水平变化

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摘要：目的 分析青海地区围绝经期妇女的骨密度及其相关因素。**方法** 选取西宁、同仁及德令哈市 2016 年 5 月到 2017 年 5 月期间进行健康体检的 218 例围绝经期妇女作为研究对象（A 组），同时选取西宁、同仁及德令哈市地区围绝经期前妇女 120 例为 B 组，成都平原地区围绝经期妇女 120 例为 C 组。比较 A、B、C 组研究对象骨密度、骨量、血清雌二醇、促卵泡生成素、血钙、磷、骨钙

素及甲状旁腺激素检测及相关性分析，**结果** A 组骨量正常率显著低于 B、C 组，骨量减少及骨质疏松发生率均明显高于 B、C 组（P<0.05），A 组 1-4 腰椎、大转子、股骨颈及全身骨密度均明显低于 B、C 组（P<0.05）。A、C 组血清雌二醇及磷含量明显低于 B 组、促卵泡生成素、骨钙素、甲状旁腺激素明显高于 B 组（P<0.05），三组血钙离子比较无明显差异（P>0.05）。Enter 法相关相性分析结果显示：围绝经期妇女骨密度与年龄、骨量、血清雌二醇、磷、促卵泡生成素、骨钙素及甲状旁腺激密切相关（P<0.05），而与身高、体重、脂肪含量、肌肉含量、血钙离子无明显关系（P>0.05）。**结论** 高原地区围绝经期妇女的骨密度会受到年龄、骨量、血清雌二醇、促卵泡生成素、骨钙素、磷及甲状旁腺激等影响。临床可通过对相关影响因素进行检测分析，为围绝经期妇女骨质疏松的诊断、预防及治疗提供一定的理论依据。

关键词：骨密度；围绝经期；高原地区；相关因素

EPO-1487

不同单层面 CT 测量腹腔脂肪面积与肥胖及其健康风险因素相关性研究

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目的 探讨肥胖患者不同 CT 层面测量的腹腔脂肪面积（VAF）与双能 X 线吸收检测法（DEXA）测量的腹部脂肪及其健康风险因素的相关性，从而探寻最佳的 CT 层面。

方法 2016~2017 年间于我院欲行减重手术的患者 85 例，平均年龄 *29.94±9.07* 岁，男性 25 例，女性 60 例。全部患者均行全腹 CT 检查测得脐水平、L3、L3-4、L4、L4-5 及 L5 水平腹腔脂肪面积（VAF）及 DEXA 检查测得代表腹部的 A 区脂肪含量，同时根据临床资料获得患者静脉血总胆固醇(TC)、甘油三酯（TG）、高密度脂蛋白胆固醇（HDL-C）、低密度脂蛋白胆固醇（LDL-C）、空腹血糖（FBG）及胰岛素抵抗指数（HOMA1-IRI）。按性别对不同层面 VAF 与 A 区脂肪含量及以上健康风险因素进行相关性分析。

结果 男性及女性肥胖者均于 L5 水平测得的 VAF 与 A 区脂肪含量具有相关性（r=0.652，0.536），结果具有统计学意义（p<0.001）。对于女性肥胖者，不同层面 VAF 与 TC、LDL-C、FBG 及 HOMA1-IRI 具有相关性（p<0.05），其中以 L3-4 为最优层面（r=0.397，0.403，0.459，0.414）；对于男性肥胖者不同层面与测得的健康风险因素均无明显相关性（p>0.05）。

结论 单层面 CT 测量 VAF 能够预测男性及女性的腹部脂肪含量以及女性的部分肥胖相关健康风险因素，且最佳层面分别为 L5 及 L3-4 水平。

EPO-1488

Imaging evaluation: the affected and non-affected hip of children with unilateral Legg-Calvé-Perthes disease at diagnosis and follow-up

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Background: Legg-Calvé-Perthes disease (LCPD) is a self-limiting disease that recovers with changed morphology of the affected and non-affected hip. We performed

imaging assessment of both hips in children with unilateral LCPD at diagnosis and follow-up. **Methods:** The subjects were 25 unilateral children with LCPD (23 boys and 2 girls) with a follow-up period of 7 months to 5.9 years. Radiological parameters included acetabular width (AW), acetabular depth (AD), acetabular depth-to-width ratio (ADR), acetabular index (AI), femoral neck width (NW), femoral neck length (NL) and femoral neck-shaft angle (NSA). The data changes of the affected and non-affected hip at diagnosis and follow-up were analysed using paired-samples *t* test. **Results:** Comparison between the affected and non-affected hip at diagnosis and follow-up assessment revealed significant differences in AW, AD, ADR and NW ($P < 0.05$), but no significant difference in NSA or AI ($P > 0.05$). For NL, there was significant difference at diagnosis ($P < 0.05$), but no difference at follow-up m($P > 0.05$). Comparison of each side from the time of diagnosis to follow-up revealed that AW, AD, NW and NL increased significantly ($P < 0.05$) in both sides. ADR and AI showed significant differences in the non-affected hips ($P < 0.05$) and no difference in the affected hips ($P > 0.05$). No significant difference was found in NSA ($P > 0.05$) in either hip.
Conclusion: Significant differences of the affected and non-affected hip at diagnosis and follow-up were obtained, especially AW, AD, NW, and NL.

EPO-1489
糖尿病足患者跟腱的 CT 表现及灌注成像特征

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目的：分析糖尿病足患者跟腱的 CT 平扫及灌注成像特征，并探索糖尿病足患者跟腱的形态学改变及微循环状态。
方法：搜集 2017 年 2 月至 2018 年 5 月在广西医科大学第一附属医院骨关节外科就诊并确诊为糖尿病足的 33 例患者作为研究对象，并按照患者足部是否合并溃烂分为溃烂足组和非溃烂足组，按照糖尿病足 Wagner 分级分为 0、Ⅰ、Ⅱ、Ⅲ及Ⅳ级组。选择同时段来我院就诊的血糖正常患者 10 例作为对照组。所有研究对象均行双侧下肢 CT 平扫及小腿下段、足部 CT 灌注成像扫描，对照组均行双下肢 CT 平扫检查。在 PACS 上观察患者跟腱图像，测量并记录患者跟腱 CT 形态学表现（包括厚度、密度、边缘、钙化灶及周围软组织）。将 CT 扫描所得的动态图像导入 CT 后处理软件(CT Perfusion 4D，ADW4.7)，获得灌注伪彩图。选择跟腱起点、中点、止点所在层面画感兴趣区（ROI）得到各灌注参数值，包括 BF、BV、MTT、TTP 和 PS。 应用 SPSS17.0 软件进行统计学分析，以 $P<0.05$ 为差异有统计学意义。
结果：
1.对照组、非溃烂足组及溃烂足组跟腱的厚度逐渐增加，密度逐渐减低，差异具有统计学意义。对照组、非溃烂足组及溃烂足组跟腱出现边界模糊、腱内钙化灶及周围软组织肿胀的比率逐渐增高。
2.溃烂足组的 BF、BV 值较非溃烂足组增加，差异有统计学意义（P均<0.05），而 MTT、TTP、PS 值差异均无统计学意义。
3.随着糖尿病足 Wagner 分级的增加，跟腱的厚度逐渐增加，差异具有统计学意义；跟腱的密度、BF、BV 不同分级之间均未见统计学差异。
结论：
1.糖尿病足患者跟腱的 CT 形态学表现具有一定特征。
2.CT 灌注成像能定量分析糖尿病患者合并与不合并足部溃烂时跟腱的血流动力学改变，能为糖尿病跟腱病变的早期诊断、治疗提供一些帮助。

3.糖尿病跟腱的厚度能够在一定程度上反映糖尿病足的病程，为临床及时控制糖尿病足具有一定的意义。

EPO-1490
MRI 神经成像在椎间孔镜术前责任神经根定位中的价值探讨

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摘要 目的 探讨 MRI 神经成像在在椎间孔镜术前责任神经根定位中的价值 方法 回顾性分析 2012.1-2017.5 我院行 MRI 平扫及腰骶丛神经成像且手术证实的腰骶神经根受压所致的腰腿痛病例 16 例，分析其 MRI 平扫与神经成像在定位责任神经根中的差异。结果 8 例患者 MRI 平扫显示腰椎间盘突出、膨出或脱出并压迫相应神经根，出现一侧或两侧神经根受压、变细甚至移位，MRI 神经成像对此显示明确。4 例患者 MRI 平扫未能明确神经根受压，而 MRI 神经成像则显示出其责任神经根受压情况。2 例患者 MRI 平扫显示骶管囊肿，神经根显示欠佳，MRI 神经成像则显示出责任神经根受压，2 例为手术所致责任神经根粘连。所有患者在手术解除压迫后腰腿痛症状改善。结论 MRI 神经成像可较好的显示腰骶神经的解剖细节，较 MRI 平扫能更好定位责任神经根部位及范围，为临床提供更多的诊断依据。

EPO-1491
脊柱生理曲度的 DR 与 MRI 比较及年龄相关性研究

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目的：本研究计划先采 MRI 来测量仰卧位状态下脊柱生理曲度，并与 X 线测量进行对比，再在此基础上，采用仰卧位 MRI 来分析脊柱生理曲度随年龄的变化。

方法：招募符合条件的志愿者 73 人作为被检查者，按照年龄分为三组：20—39 岁，23 人；40—59 岁，25 人；≥60 岁，25 人。对所有的被检查者均行站立位侧位全脊柱 X 线摄片及仰卧位全脊柱 MRI 扫描，并进行图像拼接获取全脊柱矢状面影像。测量两种检查方法所获得的 CL、TK、LL、SS、SVA 值，并进行相关性分析以探究这两种方法之间的相关性及差异性。招募无症状正常成年人 120 人，按照 10 岁一个梯度分为 20—29 岁、30—39 岁、40—49 岁、50—59 岁、60—69 岁、70 岁及以上 6 个年龄组，每组 20 人。对每组志愿者行仰卧位全脊柱 MRI 扫并进行图像拼接，获得全脊柱 T1WI 及 T2WI 正中矢状面影像，并测量 CL、TK、LL、SS、SVA 值。

结果：除了在年龄≥60 岁组，CL 测量结果在两种方法之间的差异无明显统计学意义（$p = 0.17$），其余组两种测量方法所测量的参数之间的差异均具有显著统计学意义（$p < 0.05$）。CL 在 30-60 岁之间先略微上升后又下降，在 60-70 岁年龄组有显著上升；TK 在 50 岁之前变化幅度不大，在 50 岁以后，呈逐渐上升的趋势；LL 在 50-60 岁有显著的上升，60 岁以后逐渐降低；SS 变化趋势和 LL 大致相仿；SVA 则随着年龄的增加而逐渐增加。

结论：站立位 X 线与仰卧位 MRI 测量脊柱矢状面生理曲度具有相关性，仰卧位 MRI 测量结果提供了人体无负重状态下的生理曲度，可与 X 线结合为评估脊柱矢状面形态提供一定的参考。

EPO-1492
第三代双源 CT“双低”技术在下肢血管成像（CTA）中的运用价值

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[摘要] 目的 探讨第三代双源 CT“双低”（低管电压（70 kVp）及低造影剂量）联合高级建模迭代重建（advanced modeled iterative reconstruction ,ADMIRE）技术在双下肢血管成像（CTA）中的运用价值。**方法**：连续收集临床疑双下肢血管病变患者 40 例，随机分为实验组和对照组；实验组（20 例）：低管电压（70 kVp）扫描，采用 ADMIER 重建，强度 3 级；50ml 造影剂；对照组（20 例）：常规 100 kV，滤波反投影法（filtered back-projection，FBP）重建；100ml 造影剂；其余扫描参数不变。比较两组图像质量的客观指标（CT 值、图像噪声、SNR、CNR）、辐射剂量及造影剂用量。**结果** 两组辐射剂量比较差异有统计学意义（P<0.05），试验组较对照组辐射剂量降低约 69.58%；两组造影剂用量比较差异有统计学意义（P<0.05），试验组较对照组造影剂用量减少 50%；两组图像客观评价指标比较差异无统计学意义（P>0.05）。**结论** 第三代双源 CT 低管电压（70kVp）、低造影剂用量联合 ADMIRE 重建技术行下肢血管成像（CTA），有效降低辐射剂量且保证图像质量。

EPO-1493

推拿治疗慢性下腰痛的功能连接分析

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目的：本研究诣在通过静息态 BOLD fMRI 技术探讨推拿缓解慢性下腰痛中的脑功能连接变化。
方法：前瞻性收集 20 例腰椎间盘源性慢性下腰痛受试者，慢性下腰痛病程大于 3 个月，VAS 评分高于 30 分，ODI 功能指数大于 20，受试者在治疗前、治疗后即刻、治疗后 20 天分别进行静息态 BOLD fMRI 检查。同时募集年龄和性别匹配的 20 例健康志愿者，进行一次静息态 BOLD fMRI 检查。分别比较慢性下腰痛受试者治疗前与健康志愿者间、慢性腰痛受试者治疗后即刻与治疗前、治疗后 20 天与治疗前、治疗后即刻与健康志愿者、治疗后 20 天与健康志愿者间后扣带回与各脑区功能连接的差异。
结果：以后扣带回为种子点进行全脑功能连接分析显示，慢性下腰痛受试者治疗后即刻后扣带回与左侧内侧额上回、后扣带回功能连接程度减低，治疗后 20 天显示后扣带回与左侧楔前叶功能连接减低。治疗后 20 天与治疗后即刻比较，扣带回与左侧额上回功能连接增加。在治疗前，与健康志愿者比较，后扣带回与左侧楔前叶、颞中回和小脑前叶表现为脑功能连接增加的趋势，而与左侧额上回脑功能连接表现为受到破坏的趋势。慢性下腰痛受试者治疗后即刻，上述存在异常的脑功能连接得以恢复正常水平，同时出现后扣带回与左侧额叶值回脑功能连接的减低。在治疗后 20 天，治疗前存在的后扣带回与左侧颞中回、左侧小脑前叶及左侧额上回的异常连接得以恢复，同时相对于健康志愿者，慢性下腰痛受试者表现为后扣带回与左侧楔前叶脑功能连接减低的趋势。
结论：推拿治疗主要通过纠正异常升高的默认脑网络活动发挥治疗作用。

EPO-1494

The brain immediate analgesia mechanism of Tuina in low back pain

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Synopsis: In order to seek the brain changes of patients with low back pain after Tuina therapy, this study analyzed the ALFF parameters before and after treatment, and observe the relationship of ALFF and clinical parameters (VAS/ODI). The results showed that the patients with low back pain have abnormal brain activity, and after Tuina therapy, these abnormal brain activity restores.
Background: Chronic low back pain is a major health issue, and more than 70% patients with chronic low back pain need to accept treatment. Some research indicated that spinal Tuina therapy was an effective therapy. However, the mechanism of Tuina relief chronic low back pain is unclear.
Objective: To explore the immediate analgesia mechanism of Tuina in low back pain by the rest blood-oxygen-level dependent functional magnetic resonance imaging (BOLD fMRI) .
Methods: Twenty patients with low back pain were recruited for Tuina therapy and the rest BOLD fMRI were performed before and after the therapy. Meanwhile twenty volunteers who were age- and gender- matched with the patients were recruited and the rest BOLD fMRI were performed once. MR examinations were performed by 3T Verio (Siemens Healthcare, Erlangen, Germany) with 8 channel birdcage coil. The sequences included three dimensional sagittal T1WI (MP-RAGE) and rest BOLD fMRI. The parameters of sequences were as following: (1) T1WI TR/TE=2100ms/4.38ms, flip angle=8°, FOV=220mm, slice thickness=1mm, resolution =0.861*0.861mm^2; (2) rest BOLD fMRI EPI sequence, TR/TE= 2500ms/30ms, slice thickness=3mm, interslice distance=0.5mm, FOV=256mm*256mm, matrix=64*64, flip angle=90°. The data of rest BOLD fMRI was processed by SPM 12.0. The difference of amplitude of low frequency fluctuation (ALFF) was calculated between the patients before therapy and volunteers, between the patients after therapy and volunteers, between the patients before and after Tuina. Use visual analogue scale(VAS) and Oswestry disability index(ODI) scores as indicators of low back pain levels. The correlation analysis of ALFF value and clinical indexes was calculated.
Results: The VAS and modified ODI of patients were 53.25±14.26 and 30.10±12.73. After the therapy, they were reduced into 31.00±10.71、21.45±9.85. There was significant statistical difference. Compared to volunteers, the patients showed higher ALFF value in the right posterior cingulate, superior frontal gyrus and lower ALFF value in the left supplementary motor area. After the Tuina, the patients showed lower brain activity in the left and right precuneus. The left and right middle frontal gyrus, right cingulate gyrus, right angular gyrus were showed lower ALFF value, and the posterior lobe of cerebellum showed higher ALFF value in the patients after Tuina, compared to them without Tuina. In the paired t-test of patients, the ALFF value of the right middle frontal gyrus was negatively correlated with the changes of VAS and modified ODI.
Conclusion: The immediate analgesia effect of Tuina is embodied in rectifying the abnormal changes in the pain matrix, and bringing the changes of brain cognitive area.

EPO-1495

50 岁以上女性身体成分与骨折相关性研究

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目的 探讨≥50 岁女性骨折患者的身体成分与骨折的相关性。方法 收集 315 例来自福建医科大学第二临床医学院行双能 X 线骨密度检测和身体成分分析的≥50 岁的女性，依据是否骨折分为骨折组和无骨折组，其中骨折组 142 例，无骨折组 173 例，收集的数据包括四肢、躯干、全身瘦组织和脂肪组织，脂肪组织指数，瘦组织指数及股骨颈、全髋、腰椎骨密度、全身平均骨密度。结果 女性骨折患者的四肢、躯干、全身瘦组织和脂肪组织，脂肪组织指数，瘦组织指数及股骨颈、全髋、腰椎骨密度、全身平均骨密度均明显低于无骨折组（p＜0.05）。结论 ≥50 岁女性骨折患者的身体成分与骨折发生存在相关性，加强营养与运动，提升体质量及骨密度对骨折的预防具有重要意义。

EPO-1496
多模态磁共振成像技术在脊髓型颈椎病中的应用研究进展

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脊髓型颈椎病(Cervical Spondylotic Myelopathy, CSM)是一种由于颈椎及周边软组织退变对脊髓产生慢性进行性压迫的常见颈椎病。患者常表现为上肢或下肢麻木无力、僵硬、触觉障碍，双足踩棉花感，后期发生尿频或排尿、排便困难等严重的神经功能障碍。CSM 的传统诊断主要基于临床表现及症状体征。然而随着影像学技术的发展，通过影像学早期诊断 CSM 的重要性得以显现。 其中 MRI 作为一种先进、客观的成像技术逐渐成为评估 CSM 的最佳影像学手段，其可以提供高分辨率的软组织结构图像，显示颈髓的形态变化和压迫程度，已成为临床常规的检查方法。近年来，随着 MRI 多种新技术的开发与应用，正逐步在 CSM 患者中应用研究，本文就多模态磁共振成像新技术在脊髓型颈椎病中的应用研究进行综述。

EPO-1497
蜡油样骨病影像学表现

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目的 探讨蜡油样骨病的影像表现特点，以 X 线为主，CT、MRI 及全身骨显像核素检查为补充。
材料与方法 回顾性分析蜡油样骨病的影像表现。搜集 2014 年 1 月～2018 年 7 月间武汉协和医院蜡油样骨病患者 15 例，男性患者 11 例，女性患者 4 例，年龄 3～51 岁，中位年龄 38 岁，平均年龄 31.8 岁。临床表现为患肢疼痛，麻木，活动受限，邻近软组织肿胀，病程 1～6 年不等，症状呈进行性加重。两例儿童表现为患肢较短小，肌肉萎缩。因外伤意外发现者 2 例。15 例患者均行 X 线检查，7 例行 CT 检查，4 例行 MRI 检查，3 例行全身骨显像核素检查。
结果 15 个病例均为单侧骨骼发病，无双侧骨骼发病病例。其中 8 例为右侧发病，7 例为左侧发病。累及上肢骨者 3 例，下肢骨者 12 例。15 个病例均可见病变区域骨膜增生，骨皮质增厚，骨髓腔变窄甚至闭塞，骨小梁结构消失，其中骨干上新骨堆积呈波浪状 5 例，长管骨呈蜡泪样流淌状骨肥厚 5 例，软组织内斑片状或不规则钙化 8 例，软组织肿胀 8 例。合并骨斑点症者 2 例。其中 15 例中有 7 例行 CT 检查，4 例行 MRI 检查，3 例行全身骨显像核素检查。其中 CT 发现关节间隙变窄甚至消失 4 例，共累及 27 个关节，与以前认为的蜡油样骨病不累及关节相悖。本病在 MRI 上表现为长 T1 短 T2 信号，MRI 可显示邻近软组织受增生骨质压迫见条片状长 T2 信号，其中一例患者胫

骨内见骨髓水肿，对 X 线和 CT 在软组织及骨髓显示不足进行了补充。本组病例中有 3 例病人行骨显像核素检查，病灶部位在骨核素扫描时显像剂摄取均增高，提示本病为成骨性疾病。
结论 蜡油样骨病 x 影像表现典型，常规 X 线检查即可以明确诊断，CT、MRI 及骨的 ECT 显像可作为有效的补充。

EPO-1498

Analysis of the bone mineral density of 461cases of the elderly male measured by quality CT(QCT) and the related factors

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Abstract
Ojictive The purpose of this study is to investigate the bone mineral density condition of the elderly male and seek the correlation between the bone mineral density and the related factors. Subjects and Methods A total of 461 cases of elderly male' bone mineral density was measured by quality CT (QCT). Their age ,height ,weight ,smoking and drinking history ,diabetes history, as well as the results of the biochemical indexes of bone metabolism were collected and analyzed by statistical methods. Results Compared with the normal group ,in the osteopenia group, osteoporosis group and severe osteoporosis group, bone mineral density reducing was positively correlated with age, the Odds ratio(OR) were 1.107, 1.163, 1.174,and other factors had no statistical significance; The PINP value of the osteopenia group is lower than the normal group (P<0.05); The P -CXT, N-MID and PTH value of the osteoporosis group is higher than the normal group and the osteopenia group (P<0.05); between the normal group and the osteopenia group ,the β-CXT、N-MID and parathyroid hormone had no significant difference (P >0.05) . Conclusion QCT can reflect the trend of bone density changes with the age , the results of QCT examination have a good correlation with the biochemical indexes of bone metabolism.

EPO-1499

Study on the normal fetal development of cervical, thoracic and lumbar spine on postmortem MR imaging

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Background and purpose:
Measures for spine have become increasingly important in the prenatal diagnosis of spinal abnormalities.Before evaluating spinal pathology,it is essential to have knowledge of the normal appearances of the fetal spine at different gestational ages. The aim of this study is to measure the normal fetal cervical, thoracic and lumbar

centrum ossification center volume and study their developmental changes with gestational ages.

Methods Postmortem MR imaging was performed on 55 fetuses ranging from 17 to 42 gestational weeks by using sequence of 3D-T2WI,then measurements of the cervical, thoracic,lumbar and L1-L5 centrum ossification center volume were obtained by a post-processing workstation.

Results The cervical, thoracic and lumbar centrum ossification center volume increased linearly with gestational ages (P＜.05) ;No gender differences are found in the volume development of cervical, thoracic and lumbar centrum ossification center.The average volume growth rate and multiple of lumbar single centrum ossification center were larger than those of cervical and thoracic single centrum ossification centers.The volume of L1-L5 centrum ossification centers increases linearly with gestational age.

Conclusions The cervical,thoracic,lumbar and L1-L5 centrum ossification center volume show a good correlation with the gestational age in the second and third trimester. Measures of L1 centrum ossification center volume are better suited as fetal cervical,thoracic,lumbar development.Understanding the normal development of the fetal spine on postmortem imaging is essential before studying abnormal fetal spine.

EPO-1500

肌肉减少症对胃癌不同 TNM 分期患者手术预后影响研究

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目的：探讨肌肉减少症（CT 测量 L3 平面骨骼肌面积法）对胃癌不同 TNM 分期患者根治术后短期临床结局的影响。

方法：我们选取 50 岁以上、体重指数在 18.5-27.9kg/m^2 、行根治性切除术的胃癌患者作为研究对象，术前测量其握力及 4 米步速，通过 CT 测量 L3 椎体中间水平的骨骼肌面积，计算 L3 骨骼肌指数（SMI）：L3 肌肉面积／身高²（cm^2 /m^2）。SMI 下降合并步速或握力的减低，即可诊断为肌肉减少症。根据术后的病理结果，按照 TNM 分期将胃癌患者分为早中期（Ⅰ-Ⅱ期）和晚期（Ⅲ-Ⅳ期），每一期根据有无肌肉减少症分为少肌组和非少肌组，对可能影响手术预后的基本情况及术后结果的数据进行对比分析，探究肌肉减少症对胃癌不同 TNM 分期患者根治术后短期临床结局的影响。

结果：

早中期胃癌患者少肌组具有更高的年龄（P＜0.001），更高的合并症指数（P＜0.001），和更高的营养风险（P=0.038）。两组在术后结果对比显示少肌组并发症发生率（46.88%）高于非少肌组（14.61%），两者有统计学意义（P＜0.001），logistic 二元回归分析显示：肌肉减少症（P=0.002）、合并症指数（P＜0.001）是早中期胃癌根治术后并发症的独立危险因素。

晚期胃癌患者少肌组具有更高的年龄（P＜0.001），具有更高的合并症指数（P=0.001），和更低的血红蛋白浓度（P=0.001）。两组的术后结果对比显示少肌组并发症发生率与非少肌组相比，两者无统计学意义（P=0.089），且 logistic 二元回归分析显示：晚期胃癌根治术后并发症的独立危险因素是全胃切除术（P=0.006）。

结论：

1 肌肉减少症是早中期胃癌患者根治术后发生并发症的独立危险因素。

2 利用胃癌患者 CT 检查时的影像资料，评估患者肌肉状况的方法简单可行，有利用对早中期胃癌患者合并的肌肉减少症进行早诊断、早干预。

EPO-1501

The effect of CT scan position on the image quality in the cervical and thoracic segments under the positive positioning image

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purpose:
To investigate the effect of different position of dual-source CT on the quality of CT scan of cervical and thoracic segments and the radiation dose.
Materials and Methods:
We collected 120 non-postoperative adult patients who underwent CT scan of the cervical and thoracic segments in our hospital. Patients were randomly divided into two groups, A and B (60 in each group). The gender, age, and body mass index of each group of patients were recorded. In group A, the patient's head is raised, the lower jaw is tightened, the vertebral body is parallel to the bed surface as much as possible, the arms are relaxed on both sides of the body, and the spiral scan is performed by the positive positioning image; the patient in group B is reclined, so that The mandible is placed as perpendicular to the bed as possible, the arms are relaxed on both sides of the body, and a spiral scan is performed by a positive positioning image.
Equipment: Siemens Somatom Definition dual source CT; open CARE Dose 4D technology, detector width: 128x0.6mm, pitch: 0.6, rotation time: 0.5s / week, layer thickness / spacing: 3mm, scanning range: C4 - T6.
Objective image evaluation: Record and compare volume CT dose index (CTDIvol), dose length product (DLP), effective radiation dose (ED) for each scan. ROI and the same level of air were selected at the upper edge of the first thoracic vertebra (T1) to select the ROI, and the SD value (SD_{air}) was used as the image noise (N). The CT values of the trapezius muscles were measured and averaged. ($CT_{trapezius}$), calculate and record the contrast-to-noise ratio (CNR), signal-to-noise ratio (SNR).
Subjective evaluation of images: Two experienced radiologists assessed the subjective assessment of image quality to assess the hardening artifacts and diagnostic acceptability based on the 3-point sub-system. Scoring standard: 1 is divided into poor, the harness is severely hardened, the edge of the vertebral body is unclear and cannot be used for diagnosis; 2 is good, the wire beam hardening artifact is lighter, most of the vertebral body edge is clear, can be used for diagnosis, but accurate Sex may be affected; 3 is excellent, there is basically no artifact of wire bundle hardening, the vertebral body is clear, and there is no impact on the diagnosis; the two are divided equally into the final score.

Statistical methods: The two groups of data were analyzed using SPSS 23.0 software package. The statistical methods included one-way ANOVA and independent sample T test. P<0.05 was considered statistically significant.
RESULTS: All the above images were satisfactory. The gender, age and body mass index of the A and B groups were P>0.05. The difference was not statistically significant. The signal-to-noise ratio (SNR) of the A and B groups was P>0.05, and the difference was not statistical. Significance; the contrast-to-noise ratio (CNR) of the two groups was significantly lower than that of the two groups. The difference between the two groups was statistically significant.
Conclusion: Siemens second-generation dual-source CT, open CARE Dose 4D technology, using positive positioning like scanning the chest and thoracic CT, the patient's head is reclined, so that the mandible is as perpendicular as possible to the bed surface, and the arms are relaxed and placed in the body. On the side, it can not only ensure excellent image quality, but also reduce the radiation dose of the patient by about 20%. It is recommended for clinical promotion.

EPO-1502
中年人体质分布及血脂含量与骨密度变化的相关性研究

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[摘要] **目的：**探讨中年人体质成分的分布及血脂的含量与骨密度变化的相关性，进而给予临床治疗提供一定的指导意义。**方法：**随机抽取年龄为 45-60 岁之间的中年体检患者 1000 例，其中男性 563 例，女性为 437 例，1000 例患者均已行胸部 CT 平扫，扫描范围由肺尖至腰 2（L2）椎体下缘，所得图像数据传至骨密度分析软件（QCT Pro），得到患者腰 2 椎体层面的体质分析相关数据与腰 1-腰 2 椎体的骨密度数据，并由检验系统收集对应病人的血脂含量数据，所得数据进行统计学相关性分析。**结果：**体质分布数据可见，1000 份数据中腹腔内脂肪高于 15g 以上者 817 例；由体检系统所得的血脂数据，1000 例体检者中，血脂升高者有 724 例，正常者有 276 例；骨密度减低者有 695 例，骨密度正常者 305 例；结合血脂与骨密度数据可见，695 例骨密度减低患者中，伴有血脂升高者 618 例，血脂正常者 77 例；通过 3 组数据的统计学分析可见，腹腔内脂肪含量、血脂及骨密度 3 组数据之间任意两者均具有一定的相关性（*P<0.05*）。**结论：**椎体骨密度的变化与腹腔内脂肪的含量及血脂含量呈负相关，对于骨量减低患者的临床治疗具有一定的指导性意义。

EPO-1503
骨质疏松性骨折患者术前双能 CT 一站式扫描方案的初步探索

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目的：本研究通过研究双能 CT 虚拟去钙技术定量评价骨质疏松性骨折患者的腰椎骨髓水肿和骨密度，探讨该技术作为 MRI 和 DXA/QCT 的替代方法，进行术前一站式扫描方案的可行性。
方法：对我院 2019 年 3 月脊柱外科 20 例住院患者行 DECT 和 MRI 检查。在行 DECT 检查时，将 Mindways 公司的定量 CT（QCT）标准校正体模放置于患者的检查部位，以获得椎体的 QCT 扫描数据，进行椎体松质骨密度（BMD）测量。参照西门子双能量分析软件中骨髓分析配置文件，对肝脏

VNC 配置文件中的默认参数进行修改，用于骨髓水肿以及钙和脂肪的定量分析，统计参数包括钙浓度（CaD）、脂肪分数（FF）。分别在 MRI 的 T2 脂肪抑制图像上和 DECT 的 VNCa 图上观察椎体骨髓水肿情况，并以前者作为金标准，评价 DECT 对椎体骨髓水肿的诊断效能。以 QCT 测量的 BMD 为金标准，利用多元线性回归分析，评价 CaD、FF 与 BMD 的相关性，并进行 ROC 评价。
结果：128 个椎体纳入骨髓水肿分析，MRI 诊断骨髓水肿 37 个，DECT 的 VNCa 图诊断骨髓水肿的敏感度、特异度及准确度分别为 86.58%（32/37）、92.31%（84/91）和 90.62%（116/128）。102 个椎体纳入 BMD 多元回归分析，CaD、FF 与 BMD 具有显著相关性（$p<0.01$），相关系数分别为 $r=0.877$，$r=0.492$，回归方程为 rBMD =87.82+21.03×CaD-1.34×FF，决定系数为 0.915。ROC 曲线分析显示 CaD、 FF 及回归方程 rBMD 的曲线下面积分别为 0.938，0.696，0.966。以 rBMD<81.94mg/cm^{3}为阈值，诊断骨质疏松的敏感度为 90.0%，特异度为 92.0%。
结论：双能 CT 虚拟去钙技术对骨质疏松骨折患者的骨髓水肿和骨密度评价均有较高的诊断价值，可以作为作为 MRI 和 DXA/QCT 的替代方法进行一站式扫描。

EPO-1504
新型核磁共振鸟笼线圈检查四肢小关节的装置与应用

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目的 ：设计一种新型用核磁共振鸟笼线圈检查四肢小关节的装置，此装置让鸟笼线圈不仅仅用于检查头部，还可以用于检查四肢掌指（趾）关节， 且图像质量完全达到诊断要求。**方法** ：包括鸟笼线圈本体、 鸟笼线圈基座、与人体头部后脑相适应的内凹弧 形头部垫板和用于放置手或者脚的两用垫板，鸟笼线圈本体安装在鸟笼线圈基座上并与鸟笼线 圈基座滑动配合，内凹弧形头部垫板伸向鸟笼线 圈本体的内部，内凹弧形头部垫板的一端固定在 鸟笼线圈基座的一端上，两用垫板放置在内凹弧 形头部垫板内，两用垫板的底部与内凹弧形头部 垫板的内壁贴合，两用垫板的顶部形成一平面，检查腕关节及指间关节时，将手放在两用垫板上，手臂平放在手臂支撑板上，通过其中的绑扎带将手腕位置固定，对手腕关节或指间关节进行有效的核磁共振成像检查。同理，将脚掌直接放在两用垫板上，通过其中的绑扎带将其固定，行脚掌及趾骨核磁共振成像检查；拆开连接带，可将两用垫板从内凹弧形头部垫板上取下，便可对头部进行核磁共振成像检查。**结果**：新型核磁共振鸟笼线圈检查四肢小关节的装置，功能多用，在一定程度上保护了因频繁更换线圈造成的损坏，克服了线圈的单一功能，节省了更换线圈耽误的时间，单位时间内检查人数增加；因位置固定良好且扫描部位和线圈之间接触良好，图像无运动伪影，图像质量好。**结论**：新型核磁共振鸟笼线圈检查四肢小关节装置的应用让线圈由单一功能变成多功能使用，经济实惠，性价比高，单位时间内加快了检查患者的数量，且扫描过程中患者体位舒适，配合好，图像质量佳。此装置的应用各项性能可满足扫描体位要求且图像质量均达诊断标准。

EPO-1505
布氏杆菌性脊柱炎的 CT 及 MRI 影像学特征分析

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【摘要】目的：探讨布氏杆菌性脊柱炎的 CT、MRI 影像学特征，以提高对该病的认识。**方法：**收集 2014 年 6 月至 2018 年 12 月于宁夏医科大学总医院脊柱骨科收治的布氏杆菌性脊柱炎患者 70 例，所有患者经流行病学、实验室检查、影像学及病理检查确诊并分析其 CT、MRI 特征。 **结果：**70 例

患者共累及 172 个椎体，其中腰椎 123 个（71.51%），以下腰椎受累为著；骶椎 18 个（10.47%）；胸椎 17 个（9.88%）；颈椎 14 个（8.14%）；累及相邻 2 个椎体为 46 例（65.71%）；累及相邻 3 个及以上椎体 21 例（30%），最多累及连续 5 个椎体，“跳跃征”3 例（4.29%）。影像特征：虫蚀状骨质破坏伴骨质增生、硬化为布氏杆菌性脊柱炎最经典的骨质破坏类型；碎片状骨质破坏较虫蚀状骨质破坏更容易发生死骨（86.36% vs 13.64%）、椎体压缩（85.71% vs 14.29%）及后凸畸形（100% vs 0）。椎间隙正常或轻度狭窄，可伴有“周围真空现象”、终板破坏呈“类许莫氏结节”。椎旁或硬膜外脓肿较局限，不会形成溶通性脓肿，脓肿内钙化少见；病变很少累及脊髓、竖脊肌及前、后纵韧带。**结论：**布氏杆菌性脊柱炎 CT、MRI 具有一定的影像特征，结合流行病学、实验室检查及临床表现可及时作出鉴别诊断。

EPO-1506
颌骨低剂量多层螺旋 CT 成像技术在口腔种植定位术前评估中的临床价值

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目的：研究颌骨低剂量多层螺旋 CT 成像技术在口腔种植定位术前评估中的临床价值。**方法：**收集我科接收的行口腔种植术的患者 100 例，数字表法随机将所选患者均分为 4 组，每组 25 例。其他参数不变，Definition AS40 CT 机（西门子，德国）管电流分别调至 60mA、50mA、40mA，实施颌骨低剂量多层螺旋 CT 扫描，并与常规管电流（90mA）对比。记录并对比 4 组间的 CT 剂量指数、放射线剂量长度乘积，观察图像质量。**结果：**4 组间对比，CT 剂量指数差异明显（P＜0.05），90mA 组与 60mA 组之间的差异不明显（P＞0.05），其他组间两两对比差异明显，具有统计学意义（P＜0.05）。4 组间对比，放射线剂量长度乘积差异明显（P＜0.05），90mA 组与 60mA 组之间的差异不明显（P＞0.05），其他组间两两对比差异明显，具有统计学意义（P＜0.05）。采取不同的管电流进行多层螺旋 CT 扫描，图像质量评分基本类似，4 组图像质量无明显差异（P＞0.05）。**结论：**利用 40mA（低剂量）的管电流进行多层螺旋 CT 扫描，不但能够降低患者所需接受的辐射剂量，又能确保图像质量，在口腔种植定位术前评估中的临床价值较为理想。

EPO-1507
MRI 的测量值对坐骨股骨撞击综合征诊断价值

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目的　探讨 MRI 图像定量测量指标对坐骨股骨撞击综合征的诊断价值。
方法　回顾性分析我院就诊并行髋关节 MRI 检查患者 110 例，其中确诊为 IFIS 的 70 例患者（IFIS 组）作为病例组；40 名正常志愿者作为对照组。于轴位脂肪抑制 MRI T2WI fs 轴位图像测量两组患者坐骨股骨间隙（Ischial femoral space,IFS）宽度、股方肌间隙（Quadratus femoris space，QFS）宽度，轴位 T1WI 轴位图像上测量坐骨角度，于冠状位；COR T2WI STIR 序列上测量股骨颈干角，比较 2 组间的差异，分析 IFS 宽度与其他 3 个指标的相关性，绘制 ROC 曲线，评价其对 IFIS 的诊断效能。
结果　IFIS：IFS 宽度、QFS 宽度、坐骨角度及股骨颈干角分别为(11.76±2.22)mm、（8.33±2.20）mm、（132.59±1.39）°、（132.73±1.81）°，对照组患者 IFS、QFS、坐骨角度及股骨颈干角分别为（26.29±4.61）mm、（18.59±3.18）mm、（126.89±2.96）°、

（127.69±2.36）°，病例组 IFS、QFS 较对照组明显变窄，差异均具有统计学意义（P 均<0.001）；病例组坐骨角度及股骨颈干角均大于对照组，差异具有统计学意义（P<0.001）。IFS 宽度、QFS 宽度、坐骨角度、股骨颈干角诊断 IFIS 的 ROC 曲线下面积界值分别为 1.000、0.999、0.996、0.975。IFS 与 QFS 呈正相关，差异具有统计学意义（r=0.743,，P<0.001）；IFS，与坐骨角度及股骨颈干角呈负相关，差异具有统计学意义(（r=一-0.273,，P=0.022;；r=一-0.332,P=0.005））。
结论 ：IFIS 患者的 IFS、QFS 均明显狭窄，股方肌水肿是 IFIS 患者常见的 MRI 表现

EPO-1508
小儿先天性复拇指畸形的 MR 影像学表现的初步探究

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目的：探讨和研究小儿先天性复拇指畸形的 MR 影像学表现，以更好地指导临床对先天性复拇指畸形的诊断和治疗。方法：收集我院 2019 年 3 月至 2019 年 5 月住院收治的先天性复拇指畸形患儿 12 例，于术前行磁共振 3D 序列扫描，分析每例患儿的 MR 影像学征象，并与手术中发现做对比。结果：经过三维重建分析每例患者拇指的 MR 影像学征象，可以清晰显示主、复拇指各节指骨及相应骺软骨的形态发育、信号特点，各骨间关节的对位对线情况及相应关节囊的形态发育、各侧副韧带的起止、走行及形态特征，并对主、复拇指屈肌腱全程、伸肌腱近段及手掌大鱼际肌群的起止、走行及形态显示良好。其中，11 例患儿行手术治疗，将其手术中形态学及屈伸肌腱、大鱼际肌群起止的异常发现与 MR 影像学征象做对比发现二者一致性达 91%（10/11 例）。结论：小儿先天性复拇指畸形的 MR 影像学可以清晰地显示出各拇指指骨、软骨、关节囊的形态发育异常及关节旁韧带、屈伸肌腱及大鱼际肌群的形态、起止及走行异常，可进一步精确指导先天性复拇指畸形的临床诊断、分型及手术方式的选择，从而有利于提高患者术后拇指功能的恢复以及降低二次手术的发生率。

EPO-1509
DWI 信号评估放化疗后骨盆骨髓转化的价值

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目的：应用 MRI（T1WI，DWI）评估晚期直肠癌新辅助放化疗后骨髓转化的价值。
方法：回顾性分析经结肠镜活检证实的晚期直肠癌患者新辅助放化疗前后的盆腔 MRI 资料，入组标准：①结肠镜活检证实为直肠癌，②MRI 评估为晚期直肠癌（除 T1-2N0 之外），③术前准备进行新辅助治疗，④放化疗前后均进行盆腔 MRI 检查；排除标准：①影像学证实骨髓转移，②患者存在血液系统疾病及放化疗史。首先根据骨盆骨髓整体 T_1WI、DWI 信号进行分型:T1WI 根据骨盆骨髓整体（50%以上）信号与邻近肌肉及周围皮下脂肪信号强度比对分为如下：1 级：小于肌肉；2 级：等于肌肉；3 级：大于肌肉，小于脂肪；4 级：等于脂肪。DWI（b= 1000s/mm^2）根据骨盆骨髓整体（50%以上）信号与邻近肌肉信号强度比对分为比如下：1 级：小于肌肉；2 级：等于肌肉；3 级：大于肌肉。然后测量骨盆骨髓与肌肉信号强度比。
结果：共 36 例纳入本研究，男 22 例，女 14 例，年龄范围 34-83 岁，平均年龄为 58.0±12.3 岁，放化疗前，骨盆骨髓 T_1WI 分型中：3 型 30 例，4 型 6 例；DWI 分型：1 型 3 例，2 型 7 例，3 型 26 例；放化疗后，骨盆骨髓 T_1WI 分型中：4 型 36 例；DWI 分型：1 型 17 例，2 型 18 例，3 型 1 例。

放化疗前 T1WI、DWI 骨盆骨髓信号强度比分别为 2.24±0.31、2.20±0.67，放化疗后 T1WI、DWI 分别为 2.76±0.34、0.90±0.12，放化疗前后 T1WI、DWI 骨盆骨髓信号强度比变化绝对值分别为 0.53±0.34、1.31±0.61。放化疗前后骨盆骨髓 T1WI、DWI 分型及信号强度比变化明显（$P<0.05$），放化疗前后 DWI 较 T1WI 信号强度比变化更明显（$P<0.05$）。

结论：放化疗可加速骨盆骨髓转化，T1WI、DWI 均可反映骨盆骨髓放化疗前后转化过程，DWI 信号较 T1WI 对骨髓成分变化更敏感。

EPO-1510

MRI 诊断距腓前韧带损伤的准确性与其损伤后相关疾病影像对比研究

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目的:评估 3.0T 磁共振成像(MRI)在诊断距腓前韧带（ATFL）损伤的准确性和损伤持续时间对核磁共振诊断准确性的影响，并回顾性分析距腓前韧带损伤后引发相关疾病即踝关节外侧不稳和前外侧软组织撞击综合征的 MRI 表现。

方法:收集自 2016 年-2017 年在我院行踝关节 MRI 检查及具有明确临床手术诊断的患者 84 例进行回顾性分析，并将这些患者根据受伤时间间隔分急性组（<=3 个月）和慢性组（>3 个月），结果分为距腓前韧带正常或损伤。MRI 诊断结果与临床手术结果相比较，用统计分析评估其准确度。收集的病历中经过临床及手术证实的踝关节前外侧软组织撞击综合征和外侧踝关节不稳的病例分别为 40 例和 23 例，记录及分析其 MRI 图像，并利用以下类别对 ATFL 形态学及信号改变进行了评估:（1）厚度：正常、增厚、纤细、显示不清（2）韧带出现局部不连续层面（3）波浪状或不规则轮廓（4）在 T2 加权图像上韧带信号强度增加（5）ATFL 周围积液。对比分析两种疾病的 ATFL 的形态学改变及其他伴随的影像学表现。

结果：MRI 诊断 ATFL 损伤的准确性为 69%，敏感性和特异性分别为 70%和 60%，距腓前韧带慢性损伤组 MRI 诊断的准确性较急性损伤组有所下降。两种 ATFL 损伤相关疾病的中韧带纤细、波浪状及不规则轮廓的改变具有统计学差异，其他影像学表现中前外侧沟内的软组织信号影及韧带撕裂纤维的填充是诊断前外侧软组织撞击综合征的直接征象。

结论: MRI 检查对 ATFL 损伤的诊断有一定价值，且诊断距腓前韧带急性损伤的准确度更高。ATFL 形态学改变对其损伤后相关疾病的诊断有一定意义。前外侧沟内的软组织信号影及韧带撕裂纤维的填充信号是诊断踝关节前外侧软组织撞击综合征的直接征象。

EPO-1511

Fast KV switching dual-energy CT in evaluation for the change of lumbar paraspinal muscle/water content with age in healthy participants

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Objective To quantitatively evaluate the change of lumbar paraspinal muscle/water content with age in healthy participants by using fast KV switching dual-energy CT.

Methods The data from 125 healthy participants who underwent lumbar spine examination using dual-energy CT (Revolution CT, GE Medical healthcare,Milwaukee,WI,USA)were retrospectively collected. The participants were divided into three age groups: young (20-39 years old),middle (40-59 years old), and old (60-89 years old).The measurement included muscle content and water content of the bilateral erector spinae muscle at L1/2-L4/5 levels, multifidus and psoas muscle at L2/3-L5/S1 level, 3 times for average. Taking muscle/water decomposition technique, muscle/water content of the paraspinal muscles among different age groups and lumbar levels were compared. *P* values less than .05 (two-tailed) were considered to indicate a statistically significant difference.
Results The muscle content of the multifidus muscle:the old group was lower than the middle group at L3/4 level, lower than the young group at L4/5 level, respectively lower than the young and middle group at L5/S1 level(all $P < 0.05$).There was no significant difference in each age group and each level between the erector spinae and psoas muscle ($P > 0.05$).The water content of the multifidus muscle:the elder group was higher than those in the young and middle groups respectively at the L2/3 and L3/4 levels , and in the L4/5 and L5/S1 levels the age group increased with the age($P < 0.05$). The water content of the erector spinae muscle: the elder group was higher than the young and middle group at L1/2, L2/3 and L3/4 levels, and the age group increased with age at the L4/5 level($P < 0.05$). The water content of the psoas muscle:the old group was higher than that in the young and middle group at L2/3-L5/S1 level($P < 0.05$).The muscle/water content of the lumbar paraspinal muscles began changing at the L5/S1 or L4/5 level and extends upward from the lower part of lumbar level with age.
Conclusions Dual-energy CT muscle-water decomposition technique is helpful for quantitatively evaluating the changes of the lumbar paraspinal muscles, muscle and water content decreases and increases with age, respectively.

EPO-1512

Diagnostic performance of dual-energy CT HAP-Water separation technique in identifying bone marrow edema of vertebral compression fractures: Do different reconstruction kernels matter?

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Objective: To evaluate the diagnostic performance of dual-energy CT hydroxyapatite (HAP)-water separation technique with different reconstruction kernels for acute and chronic vertebral compression fractures (VCFs).
Methods: Data from 31 patients with VCFs who underwent both dual-energy CT and MRI were retrospectively collected from October 2018 to January 2019, MR images served as the standard of reference. Data from STND and bone reconstruction kernels of HAP-Water separation technique were analyzed separately. For qualitative analysis, two independent and blinded radiologists evaluated VCFs on Sagittal color-coded virtual non-HAP (VNHAP) images for the presence of bone marrow edema (BME) using a binary

classification (0= chronic compression fracture; 1= acute compression fracture). For quantitative analysis, CT numbers of acute and chronic VCFs were measured and compared. ROC analysis was conducted. Diagnostic performance between different kernels was compared.

Results: A total of 80 VCFs including 45 acute and 35 chronic. For visual assessment, the sensitivity, specificity and area under the ROC curve (AUC) of STND and Bone kernels were 93.33%, 97.14%, 0.952 and 91.11%, 97.14%, 0.941, respectively. For quantitative analysis, CT numbers and AUC of acute and chronic VCFs of STND and Bone kernels were 1016.31±11.30, 995.44±10.14(mg/cm^3), and 1015.82±11.91, 996.99±9.29 (mg/cm^3) respectively ($P < 0.001$). There was no difference in the diagnostic efficacy between the two kernels (visual assessment: p=0.658; quantitative analysis: p=0.895).

Conclusion: Dual-energy CT HAP-water separation technique has excellent diagnostic performance for identifying acute and chronic VCFs. There is no difference in diagnostic performance between different reconstruction kernels. And the diagnostic efficiency of visual assessment and quantitative analysis is similar.

EPO-1513

常见半月板相关性膝关节病变解剖学浅析

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半月板是垫在股骨内、外侧髁关节面之间的两块半月形纤维软骨版，结构呈半环形，外周较厚，内缘薄锐；其上面凹陷，与股骨髁相适应，下面平坦，与胫骨平台相适应，其中股骨（富含细胞）和胫骨（大量换向纤维为特征）的不同组成也反映了他们不同的生物学功能。半月板结构为楔形，对于稳定股骨髁和胫骨平台非常有效，可以补偿胫骨髁面与股骨髁面的不适应、增加关节的稳定性；半月板质韧并具有一定的弹性，能缓冲撞击，吸收震荡，还能散布滑液，增加润滑，减少摩擦，保护关节。半月板程度重要运动作用，一旦损伤，则半月板功能减退甚至丧失，因此正确认识半月板病变的类型对患者能否及时治疗至关重要。本篇浅析三大半月板常见损伤征象，其中包括“盘状半月板”、“双后交叉韧带征”、“半月板周缘性移位”。

EPO-1514

坐骨股骨撞击综合征 MRI 诊断

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目的：分析 MRI 诊断坐骨股骨撞击综合征的临床应用价值。**方法：**回顾性分析 2018 年期间诊断坐骨-股骨撞击综合征 13 例患者影像学资料并与 16 例髋关节正常者作为对照组进行对比。采用美国 GE 公司超导型 1.5T BRIVO MR355 磁共振仪，由诊断医师对比观察两组人群的坐骨结节-股骨大转子间隙的差异，并判别其间软组织及其坐骨-股骨影像学改变。**结果：**坐骨-股骨撞击综合征主要影像学表现为股方肌受压、变形（77%），以肌腹为中心出现 T2WI 压脂高信号 92%；股方肌脂肪浸润、肌萎缩 23%。伴髂腰肌腱止点水肿 1 例；腘绳肌腱止点水肿或损伤 1 例；伴臀大肌损伤 1 例。坐骨结节-股骨大转子间隙病例组和对照组分别为(10±4)mm、(22±8)mm，病例组与对照组单因素

结果分析差异有统计学意义（$P<0.05$）。**结论：**坐骨结节-股骨大转子间隙变窄并其间软组织受挤压是坐骨股骨撞击综合征主要影像学表现，利用 MRI 可准确判断坐骨股骨撞击综合征。

EPO-1515
髌股关节稳定性与髌股关节撞击综合征 MRI 相关性研究

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目的 通过 MRI 进行髌股关节形态学参数测量，分析髌股关节稳定性与髌骨撞击综合征之间的相关性。**方法：**本院膝关节 MRI 检查的成人患者，诊断为髌骨撞击综合征 30 例者纳入病例组（n=30），对照组 15 例（n=25）健康志愿者与病例组进行对照，测量髌股指数、Insall 指数、滑车沟深度(SA)、外侧髌股角四项指标，所有图像均统一标准位置扫描并由 3 名放射科医师评估，分析髌股内外侧关节面软骨形态改变和软骨损伤、骨髓水肿病变的相关性。**结果：**髌骨撞击综合征影像学表现：1）25 例显示髌股关节软骨损伤，髌骨内侧缘软骨损伤 10 例，股骨外侧髁前外侧缘软骨损伤 15 例。2）骨挫伤 23 例，其中髌骨挫伤 19 例，损伤部位位于髌骨内侧缘皮质下，部分挫伤范围延伸至髌骨嵴，并累及内外侧髁共 15 例；股骨下段及胫骨平台骨挫伤 6 例；3）韧带损伤，内侧支持带损伤 25 例，10 例外侧支持带损伤，腘肌腱损伤 15 例，表现为韧带增粗，走行方向见线状及片状压脂高信号影。4）28 例出现髌下脂肪垫损伤，髌上囊及髌下深囊、关节腔内积液，滑膜增厚 15 例。髌骨撞击综合征病例组与对照组髌股指数分别为 1.98±0.76、1.19±0.29；Insall 指数分别为 1.12±0.55、1.05±0.15；滑车沟深度(SA)分别为 4.74±1.56，5.8±1.32，病例组与对照组单因素结果分析差异有统计学意义（$P<0.05$），病例组外侧髌股角开口平行 5 例，开口向内为 6 例，与正常组对比，外侧髌股角开口平行或向内比例明显高于对照组。**结论：**外侧髌股角开口平行或向内、髌股指数＞1.9、Insall 指数＞1.6 或＜0.6、滑车沟深度(SA) 位于 3-6mm 区间，提示髌股关节稳定性下降，与髌股关节骨及软骨损伤、髌骨内下缘及股骨外侧髁前外侧面骨损伤及内侧支持带损伤、髌下脂肪垫损伤均存在相关性。

EPO-1516
下腰棘间关节撞击综合征与腰椎退行性变 MR 表现分析

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目的：探讨下腰椎棘间关节撞击综合征与腰椎退行性变 MR 影像学表现，提高认识。
资料与方法： 我院就诊的下腰痛病人中，回顾性分析 2017 年元月-2018 年 5 月期间 822 例腰椎 MR 资料，根据临床症状、体征及腰椎 MRI 检查确诊棘间关节撞击综合征的患者 39 例，男 23 例，女 16 例，占本组总数的 7.4%；年龄 25～76 岁（平均 48 岁）。STIR 或 WATER-T2-IDeal 序列横断面及矢状位观察腰椎生理曲度情况，椎间盘退变，棘间关节及其骨质情况。**结果：**腰椎生理曲度变直 30 例（77%），棘间关节撞击出现的部位位于下腰部 L3/4 节段 7 例（占 17.9%），L4/5 节段 12 例（占 30.7%），L5/S1 节段 10 例（占 25.6%）；两个节段以上的 10 例（占 25.6%）。L3-5 节段总发生率 48%，L4-S 节段发生率为 82%，影像学表现为棘上韧带及棘间关节软组织肿胀，脂肪信号增加，压脂序列呈斑片状高信号影（39 例），合并棘突融合 10 例、棘突骨髓水肿（18 例），同时峡部裂伴滑脱 9 例。腰椎间盘 Pfirrmann 分级为 L3/4 椎间盘Ⅳ级 15 个、L4/5 椎间盘（Ⅳ-Ⅴ级）21 个、L5/S1（Ⅳ-Ⅴ级）25 个；单纯椎间盘突出 20 例，椎间盘膨出 45 例，椎间盘膨出合并突出 22 例，纤维环撕裂 45 个（51%）；同时伴黄韧带肥厚，继发性椎管狭窄 18 例，L5、S1 椎体相邻终

板炎症，表现为压脂高信号影或混合信号影 28 例。**结论：**棘间关节撞击综合征主要发生于 L4-S1 棘突水平节段，与腰椎生理曲度改变、椎间盘退变膨出或突出及椎体滑脱等腰椎后柱生物力学失稳互为因果，应该值得临床工作者重视。

EPO-1517
MRI 与步态分析对膝关节前交叉韧带重建术后的临床康复评价

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目的:探讨常规 MRI、三维运动捕捉步态分析系统（步态分析）、膝关节 Lysholm 评分表对前交叉韧带重建术后的康复评价。
方法 试验组：搜集 2015 年 7 月至 2018 年 6 月在我院行自体腘绳肌腱解剖型前交叉韧带重建术者 20 例，于术后 12~40 个月采集 3.0TMR 平扫图像、步态分析相关数据并同步进行 Lysholm 评分。MR 图像评价包括骨隧道、移植物的评价、有无并发症。若骨隧道形态良好、移植物完整且无异常信号、无并发症者为康复好组(A 组)，反之为康复差组（B 组），且 A、B 两组患者分别利用步态分析测得膝关节最大摆动期屈伸转角，屈伸转角在正常范围内记为 M，反之记为 N；并进行 Lysholm 评分，分数≥90 分记为优，分数＜90 分记为差。将 M、N 两种步态角度分为 M 组、N 组，两组间 Lysholm 评分以优、差进行统计学分析。对照组：收集正常成年人 10 例共 20 膝，进行步态分析，计算其最大摆动期屈伸转角范围。实验数据采用卡方检验进行统计分析，$p<0.05$ 具有统计学意义。
结果 20 例术后患者中，A 组 17 例(85%)，其中 M 17 例(100%)、N 0 例(0%)，B 组 3 例(15%)，其中 M 2 例(66.7%)、N 1 例(33.3%)，两组间 $p>0.05$，即 ACL 重建术后常规 MRI 平扫与步态分析两种评价方法差异不存在差异。A、B 两组 Lysholm 评分 $p<0.05$，有统计学意义。 步态 M、N 两组间 Lysholm 评分：M 组 19 例中，优 18 例（94.74%），差 1 例（5.26%），N 组 1 例中，优 0 例（0%），差 1 例（100%），$p<0.05$，有统计学意义。
结论 常规 MRI 平扫通过观测移植物形态及信号强度能较好对 ACL 术后组织学、形态学的恢复情况进行评价；步态分析技术将运动过程量化，评估术后生物力学恢复的恢复情况；Lysholm 评分将运动功能与临床相结合进行术后评价。三种评价方法的侧重面不同，均对术后康复评价有重要意义。

EPO-1518
MRI 与步态分析对膝关节前交叉韧带重建术后的康复评价

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目的 本研究的目的是探讨常规 MRI 扫描、三维运动捕捉步态分析系统（以下简称步态分析）对前交叉韧带（anterior cruciate ligament， ACL）重建术后的康复评价。

方法: 实验组：搜集 2015 年 7 月至 2018 年 6 月在我院行自体腘绳肌腱（HT）解剖型前交叉韧带重建术者 20 例，于术后 12~40 个月采集 3.0TMR 平扫图像、步态分析相关数据。两名经验丰富的影像科医师评估受检者 MR 图像，包括骨隧道的评价、移植物的评价、及有无并发症的评价，若各评价项目均为趋于正常者为移植物良好(A 组)，骨隧道异常、移植物不完整和(或)出现异常信号、有并发症者为移植物损伤（B 组），且 A、B 两组患者分别利用步态分析系统测得患者膝关节承重期及

最大摆动期屈伸转角，分析屈伸转角在对照组范围内即为 a，反之即为 b。对照组：收集正常成年人 10 例共 20 膝，进行步态分析，得到最大摆动屈伸转角并计算其范围。实验数据采用卡方检验进行统计分析，$p<0.05$ 具有统计学意义。

结果：20 例术后患者中，A 组 17 例(85%)，其中屈伸转角在正常范围内 17 例(100%)、小于正常范围 0 例(0%)，B 组 3 例(15%)，其中屈伸转角在正常范围内 2 例(66.7%)、小于正常范围 1 例(33.3%)，两组间 $p>0.05$，即 ACL 重建术后常规 MRI 平扫与步态分析两种评价方法差异不存在差异。

结论：MRI 通过显示移植物形态及信号强度程度，能较好对 ACL 术后组织学、形态学的康复情况进行评价；步态分析技术是将运动过程量化，对评估术后生物力学恢复有重要意义，两种评价方法的侧重面不同但两者对术后康复的评价结果无差异。

EPO-1519

Effects of Assessment of Cup Orientation on Anteroposterior Pelvic Radiographs

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Background
Cup orientation is routinely measured on a postoperative anteroposterior (AP) pelvic radiograph. Previous studies have generally focused on comparison among various arithmetic methods . The aim of this study was to perform a detailed analysis on factors affecting the measurement of cup orientation, besides arithmetic methods.
Methods
A total of 125 patients (148 hips) were enrolled in this study. Digitally reconstructed radiographs were generated from postoperative computed tomography (CT) images. Cup orientation measured on 3D reconstructed pelvic models was considered as golden standard. Both cup anteversion and inclination were measured on the conventional radiographs at supine position and on virtual radiographs generated when anterior pelvic planes (APP) were parallel with virtual films. Multiple statistical analyses were conducted to evaluate the bias of the cup orientation caused by pelvic position and the offset of X-ray beam.
Results
Statistical difference of cup orientation was found on CT-based measurements between male and female. Cup anteversions in patients with developmental dysplasia of the hip (DDH) wasere inclines to have greater changes when pelvic posture changing from supine position to APP adjusted positionthey were measured on Virtual radiographs []. Cup anteversion on AP pelvic radiographs are conventionally compensated by adding an offset angle of X-ray beam, which Traditional cup anteversion measurement on pelvic radiograph overestimates the offset effect on anteversion by 1.33°.
Conclusion
Pelvic position should be considered when AP pelvic radiographs are applied to evaluate the cup orientation, especially for DDH patients. A simple linear formula is

proposed to adjust the bias of the offset of X-ray beam than simply adding an offset angle.

EPO-1520

Short Follow-up Study of Double-Bundle Anterior Cruciate Ligament Reconstruction

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Purpose This study aimed to analyze whether early bone tunnel early enlargement correlates with abnormal graft signal 1-1.5 years after double-bundle anterior cruciate ligament(DB-ACL) reconstruction and whether graft signal abnormality is associated with knee function.

Methods Thirty-seven patients who underwent arthroscopic DB-ACL reconstruction were included. All patients were followed up for 1-1.5 years. Patients were divided into a group with good graft signal and a group with increased graft signal, according to intra-articular graft signal intensity on magnetic resonance imaging. The signal noise ratio (SNR) data were measured. Differences in the international knee documentation committee (IKDC) score and knee tension were compared. The degree of bone tunnel enlargement was measured on thin cross-sectional computed tomography images 1 week and 3 months postoperatively. The correlation between bone tunnel enlargement and SNR was assessed.

Results No significant correlation was found between the early enlargement of bone tunnel and SNR in the group with good graft signal ($P>0.05$). There were significant correlations for bone tunnel early enlargement in the anteromedial (AM) tibial tunnel, AM femoral tunnel, and posterolateral(PL) femoral tunnel with SNR of the grafts in the group with increased signal. There was a significant difference in IKDC score between the two groups ($P<0.05$) and no significant difference in knee tension ($P>0.05$).

Conclusion Early enlargement of the AM tibial tunnel, AM femoral tunnel, and PL femoral tunnel can indicate increased graft signal 1-1.5 years after DB-ACL reconstruction. Simple increased signal may indicate poor function of the knee but does not suggest knee tension.

EPO-1521

The optimal timing of decompression surgery for patients with traumatic cervical spinal cord Injury: Focus on mortality

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Purpose: This study aimed to investigate the in-hospital mortality of patients when receiving surgery at different time after injury and to explore the risk factors of death in patients with TCSCI.

Methods: A retrospective study was conducted to evaluate the medical records of 392 TCSCI patients who underwent decompression surgery. Patients were divided into four groups according to the time from injury to surgery (≤ 3 days, 4 - 7days, 8 - 14days and > 14 days). The clinical and procedure-related data were obtained and compared between these groups. Relationships between perioperative factors and in-hospital mortality were evaluated by univariate and multivariate regression analyses.

Result: In this study, the majority (82.4%) of patients were men. Of these patients, timing of the surgical intervention within 3 days had the highest in-hospital mortality (P = 0.045). Pulmonary infection (P < 0.001), hypertension (P = 0.017), systolic pressure (P = 0.041), Frankel grade A (P < 0.001), operative segments (P < 0.001), operative level on C4/5 (P < 0.001) were found to be the independent risk factors for in-hospital mortality of TCSCI. A history of hypertension and operation segments were the two strongest risk factors (odds ratio = 37.861 and 38.117) for in-hospital mortality of patients.
Conclusion: Surgical intervention within 3 days was associated with a higher incidence of in-hospital mortality, indicating that surgery after 3 days might be relative safe in assessment of mortality.

EPO-1522

Morel-Lavallée 损伤的临床及影像表现

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目的 探讨 Morel-Lavallée 损伤（Morel-Lavallée lesion,MLL）的临床及影像表现。
方法 回顾性分析 56 例 MLL 患者的临床及影像表现，内容包括临床病史、症状和体征、病变部位、CT 和（或）MRI 影像特征等。
结果 56 例患者中单纯 MLL30 例，合并骨折 26 例。无症状患者 12 例，有症状患者 44 例。CT 检查 22 例，MRI 检查 34 例。MLL-I 型 8 例，MLL-II 型 15 例，MLL-III 型 30 例，MLL-IV 型 2 例，MLL-V 型 1 例。病变部位：髋部或大转子旁 27 例，大腿 11 例，膝部 8 例，肘部 4 例，腰背部 5 例，踝部 1 例。病变影像表现：CT 表现为囊状或卵圆形低密度影，囊壁薄或无壁；MRI 表现由于不同时期血肿成分不同而异，以 T1WI 低信号、T2WI 高信号为主。
结论 MLL 的临床和影像表现具有一定特征性，外伤史伴相应部位皮下脂肪层和肌肉表面深筋膜间的囊性病灶是诊断的重要依据。结合临床病史、病灶部位及影像特征可提高诊断准确性。

EPO-1523

DECT VNCa 图联合常规 CT 对膝关节非移位骨折的诊断价值

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目的：探讨双能量 CT 虚拟去钙(VNCa)图联合常规 CT 对膝关节非移位骨折的诊断价值。
方法：连续选取 25 例因膝关节急性外伤而怀疑有骨折的患者，根据病例的纳入及排除标准，最终纳入 17 例患者（共 18 个膝关节）。17 例患者均行双能量 CT(DECT)及 MRI 检查，分别获得常规 CT 图像、VNCa 图像及常规 MRI 图像。将每个膝关节分成股骨下端、胫骨上端、腓骨头及髌骨 4 区。首先由 2 名不同年资影像诊断医师（分别从事影像诊断工作 3 年、10 年）分别运用常规 CT 对区域内的骨折情况进行初步判定，接着分别对 VNC 图骨髓水肿情况进行判定，然后联合应用 VNCa 图和常规 CT 对骨折进行再次判定，以术中探查和/或经 X 线、CT、MRI 随访证实作为非移位骨折的诊断标准，分别对其敏感性、特异性、阳性预测值及阴性预测值进行比较，一致性分析采用 Kappa 检验。
结果：最终证实存在 14 处非移位骨折。2 名医师利用 VNCa 图进行骨髓损伤分级与 MRI 一致性均较高（Kappa 值分别为 0.81 和 0.85，*P*值均＜0.05）。联合应用常规 CT 和 VNCa 图，2 位医师对膝关

节非移位骨折的诊断准确率均有所提高，低年资医师从 57.1%提高到 78.5%，高年资医师从 78.5%提高到 92.8%。低年资医师额外发现了 3 处、高年资额外发现 2 处常规 CT 漏诊的非移位骨折。
结论： DECT VNCa 图联合常规 CT 能提高膝关节非移位骨折的诊断水平，尤其对低年资医师。

EPO-1524

MRI 评肩袖损伤：与关节镜检查的对照分析

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目的：通过磁共振成像和关节镜检查对肩袖损伤结果进行对比，探讨肩袖损伤诊断的有效评价方法。**方法**：回顾性分析昆明医科大学第一附属医院运动医学科收治的 60 例经肩关节镜证实的肩袖损伤患者的 MR 图像，计算出 MRI 诊断肩袖损伤的灵敏度、特异度、符合率。采用 x 2 检验分析来评价 MRI 与关节镜检查肩袖损伤有无差异。采用 Kappa 值来检验 MRI 与关节镜诊断肩袖损伤的一致性。**结果**：MRI 对肩袖 I 度损伤与关节镜诊断的符合率为 92%，对肩袖Ⅱ级损伤诊断的符合率为 90.5%，两者差异无显著意义(P>0.05)。MRI 对肩袖III度损伤诊断的灵敏 90.9%，特异度 95.4%，符合率为 94.7%，Youden 指数为 85.3%，经一致性检验，两者具高度一致性(Kappa 值为 0.827，统计量 x 2=16.9，P=0.000)。**结论**:MRI 是肩袖损伤很有价值的无创性诊断方法，对于 MRI 表现为肩袖损伤Ⅰ、Ⅱ度损伤的患者，应谨慎行关节镜检查；然而对于 MRI 表现为III度信号的患者应尽早行关节镜检查，关节镜观察更直观，能对肩袖损伤作出准确的判断并及时治疗。

EPO-1525

利用 MRI 评价严重股骨滑车发育不良

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目的：利用 MRI 寻求一种能客观定量评价严重股骨滑车发育不良的新方法，提高对其的认识。
方法：回顾性分析 59 例（61 膝）根据 Dejour 分型确定的严重股骨滑车发育不良患者及 30 膝正常人 MRI 图像，并利用软骨标志进行测量，测量参数包括股骨滑车沟深度、股骨滑车沟角度、股骨滑车外侧面倾斜度、和关节面对称性。
结果：正常人中，利用软骨标志测量股骨滑车沟深度为 4.2±0.16mm，股骨滑车沟角度为 146.9±0.74°，股骨滑车外侧面倾斜度为 20±0.8°，关节面对称性为 0.54±0.02。患者组中，利用软骨标志测量股骨滑车沟深度为 2.4±0.14mm，股骨滑车沟角度为 160.3±0.1，股骨滑车外侧面倾斜度为 13.7±0.72°，关节面对称为 0.4±0.01。上述 4 个测量值正常人和患者均有显著差异（P＜0.05）。
结论：MRI 具有显示关节面软骨的优势，能够作为定量评价严重股骨滑车发育不良的方法。
关键词：股骨滑车发育不良 磁共振成像 Dejour 分型 定量

EPO-1526

3.0T MRI 定量研究冈上肌腱损伤程度与脂肪浸润及肌肉萎缩程度的相关性

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【摘要】 **目的** 测量冈上肌腱损伤患者冈上肌脂肪含量及肌肉萎缩程度，研究其与冈上肌腱损伤程度之间的相关性。 **方法** 选取 40 例肩关节冈上肌肌腱损伤患者及 14 例健康对照组纳入本研究，对其均进行常规肩关节 MRI 检查及脂肪定量扫描（mDixon-Quant）。获取冈上肌脂肪分数图及冈上肌相对大小值。按冈上肌肌腱 MRI 不同表现将病例组分为退变组、部分撕裂组和完全撕裂组，加上正常对照组，共四组。采用单因素方差分析比较各组间冈上肌脂肪含量及相对大小值，采用 Spearman 相关分析冈上肌脂肪含量及相对大小值与冈上肌腱损伤程度间的相关性。**结果** 各组间冈上肌脂肪含量及相对大小值均有统计学意义（P＜0.05）；完全撕裂组冈上肌脂肪含量明显高于其他组(P＜0.05)；完全撕裂组冈上肌相对大小值低于其他组（P＜0.05）；冈上肌脂肪含量与肌腱损伤程度呈正相关（r=0.95，p=0.00）；冈上肌相对大小值与肌腱损伤程度呈负相关（r=-0.80，p=0.00）。 冈上肌脂肪含量与和相对大小值呈负相关（r=-0.73，p=0.00）。 **结论** 3.0T MRI 可定量评价冈上肌脂肪浸润及萎缩程度，同时显示其与肌腱损伤程度的关系。
关键词：冈上肌腱；MRI；脂肪定量

EPO-1527

Fast KV switching dual-energy CT virtual decalcification technique for identifying Bone Marrow Edema in vertebral compression fractures : Do Different Reconstruction Kernels Matter?

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Objective: To investigate whether different reconstruction kernels (STND V.S. BONE) affect the diagnostic performance of dual-energy CT virtual decalcification (VNCa) technique in the identification of acute and chronic vertebral compression fractures(VCFs).
Materials and Methods: This institutional review board-approved study included 31 consecutive patients with 80 vertebral fracturesVCFs who underwent both a 256-rows dual energy CT and a a 3-T MR examination of the spine between August 2018 and March 2019. MR images served as the reference standard. Two independent and blinded readers visually evaluated all vertebral bodies for the presence of abnormal bone marrow attenuation on color-coded overlay virtual VNCa images by using a binary classification system. Two readers performed a quantitative analysis on VNCa images. Area under the curve (AUC) value was calculated using Receiver operating characteristic curve (ROC) analysis was conducted. Images of different reconstruction types were separately evaluated with a four-week interval.
Results: MR imaging depicted 45 edematous and 35 nonedematous VCFs. In the visual analysis, the AUC_{STND} and AUC_{BONE} was 0.932 and 0.942 respectively. In quantitative analysis, water content results was significantly different between vertebrae with and without bone marrow edema on MR ($P < 0.001$).And the AUC_{STND} and AUC_{BONE} was 0.89 and 0.886 respectively. The AUC of visual image analysis was larger than that of quantitative VNCa image evaluation.

Conclusion: Visual and quantitative analyses of fast KV switching dual-energy CT VNCa technique had excellent diagnostic performance for identifying acute and chronic compression fractures, different reconstruction kernels might does not matter. And the diagnostic efficiency of the visual image analysis was higher than that of quantitative image evaluation.

EPO-1528
T2*mapping 定量分析新兵奔袭训练对胫股关节软骨的影响

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目的 运用磁共振 T_2*mapping 定量分析新兵奔袭训练对胫股关节软骨的影响。**方法** 集训前后分别对 22 例新入伍健康男青年的右侧胫股关节进行 MRI 扫描，将关节软骨分为股骨内侧髁（Medial femoral condyle,MFC）承重区与非承重区、股骨外侧髁(Lateral femoral condyle,LFC)承重区与非承重区、胫骨内侧平台(Medial tibial platform,MTP)、 胫骨外侧平台(Lateral tibia platform,LTP)等 6 个区域，将各区域划分为浅、深两层。采用配对样本 *t* 检验，比较集训前各区域浅层与深层软骨 T_2*值的差异、集训前后各区域软骨 T_2*值的差异；采用单因素方差分析，比较集训前后各区域软骨 T_2*值的变化百分率差异。**结果** 集训前胫股关节各区域软骨 T_2*值浅层均高于深层且具有统计学差异（MFC 非承重区 *P* 值为 0.001，其余区域 *P* 值<0.001）；集训后，LFC 承重区浅层（*P*=0.005）、LFC 承重区深层（*P*=0.028）、MFC 承重区浅层（*P*=0.001）、LTP 浅层（*P*=0.027）、MTP 浅层（*P*<0.001）、MTP 深层（*P*<0.001）等 6 个区域 T_2*值均显著上升；集训前后各区域软骨 T_2*值变化百分率间有统计学差异（*P*<0.001），以 MTP 浅层变化为著。**结论** 3.0T 磁共振软骨 T_2*mapping 成像可以定量检测新兵奔袭训练后软骨的早期变化。

EPO-1529
膝关节内侧副韧带松紧度与内侧半月板脱位的 MRI 相关性研究

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目的 通过分析有内侧半月板脱位的膝关节 MRI 影像表现，探讨内侧半月板脱位与内侧副韧带的松紧程度的相关性，为预测及诊断内侧半月板脱位提供依据。 **方法** 收集重庆医科大学附属永川医院 2015 年 1 月至 2019 年 1 月膝关节 MRI 表现正常及存在膝关节内侧半月板脱位的患者各 50 例，脱位患者分为 A 组，表现正常分为 B 组，。在膝关节 MRI 冠状面上分别测量 A、B 组内侧副韧带的长度 a 和 b，其起止点的直线距离 l_a、l_b，计算内侧副韧带的松紧度 R_a=a/ l_a、R_b=b/ l_b，以及 A 组患者半月板边缘距胫骨平台关节面边缘的最大距离 c。用 t 检验比较 A、B 组间松紧度的差异性，再分析 A 组内侧副韧带的松紧度与半月板脱位程度的相关性。**结果** 半月板脱位组与正常组的 R 值存在显著性差异（P <0.05）。A 组 R 值与半月板脱位程度 c 存在正相关性。**结论** 内侧副韧带的松紧度与内侧半月板脱位存在相关性，内侧副韧带越松弛，内侧半月板脱位程度越重。

EPO-1530
急性髌骨一过性外侧脱位的 MR 分析

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目的：分析急性髌骨一过性外侧脱位（TLPD）伴发损伤的 MRI 表现。**方法：**回顾性分析 44 例 TLPD 患者的 MRI 及临床资料，记录骨及软骨损伤、内侧支持带复合体（MRC）及股内斜肌(VMO)损伤、髌骨位置、髌骨倾斜及股骨滑车发育不良、关节积液及其他伴发性损伤情况。其中 20 例进行了关节镜探查术。**结果：**44 例（100%）均出现髌骨内下侧份和股骨滑车外侧髁的对吻性骨髓水肿，22 例（50%）合并髌骨的骨软骨损伤，4 例（9%）合并股骨的骨软骨损伤，16 例（36%）存有关节内游离体；34 例（77%）伴发 MRC 撕裂，21 例（48%）伴发 VMO 损伤；27 例(61%)存在股骨滑车发育不良； 24 例（55%）合并髌骨半脱位，4 例(9%)合并高位髌骨；关节积液出现率为（100%），3 例出现关节积脂血症，1 例有关节囊破裂；36 例有半月板或其他韧带的伴发性损伤。**结论：**髌骨内下侧份和股骨滑车外侧髁的对吻性骨髓水肿是 TLPD 的典型 MRI 表现，常伴发髌骨内下侧缘骨软骨的骨折和 MRC 的损伤，常合并股骨滑车发育不良和髌骨位置异常。

EPO-1531

大腿肌肉损伤的 MR 表现及分类

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目的： MR 在肌肉损伤中的运用越来越广泛，旨在提高对于肌肉损伤的 MR 诊断及分类。
方法： 回顾性的分析我院有肌肉损伤病史，并行大腿 MR 检查的患者 28 例，统计其受伤类型（直接损伤、间接损伤）、累及肌群、肌肉损伤部位（肌肉、肌肉肌腱结合部、肌腱）、散在出血、血肿、水肿范围、损伤分级等。
结果：1）直接损伤 5/28 例，累及前群者 4/5 例，累及后群者 1/5 例，均有血肿形成，4/5 例为肌内血肿，1/5 为肌间血肿，最大水肿范围均匀肌群横断面积 50%以上。 2）间接损伤 23/28 例，9/23 后群（腘绳肌），10/23 前群（股四头肌），4/23 损伤内收肌群。累及肌-腱结合处者 9/23 例（7 例位于腘绳肌内）；8/23 例位于肌肉内；单纯损伤肌腱者 6 例（股直肌肌腱 3 例，腘绳肌腱 2 例，股四头肌肌腱 1 例）。伴有散在出血者 3/23 例，形成 2cm 以上血肿者 1/23 例。 8/23 为临床分期 I 期（水肿），表现为 MRT2 上为羽毛状高信号，伴或不伴肌间积液，不伴肌肉肌腱断裂。13/23 例为肌肉部分撕裂，表现为 MR 上肌肉的断裂或肌腱的张力降低。1/23 例为肌肉或肌腱的完全断裂，断端圆钝挛缩。
结论 :1）直接损伤以前群多见，多伴有较大的血肿形成，水肿明显。 2）间接损伤以股四头肌及腘绳肌损伤多见，血肿较为少见，累及肌-腱结合部较多。 3）本文中发生在肌肉内的损伤较多，可能包含了延迟性肌肉酸痛。 4）大腿的肌腱损伤，以股直肌肌腱、腘绳肌肌腱损伤较为多见。

EPO-1532

膝关节 MR 多征象对前交叉韧带损伤的诊断价值研究

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目的 评价膝关节 MR 多征象对前交叉韧带（ACL）损伤的诊断价值。**方法** 收集本院 2017 年 07 月-2019 年 06 月膝关节 MR 及同时关节镜检查患者 207 例，男性 138 例，女性 69 例，MRI 均诊断为 ACL 损伤，关节镜证实 160 例（观察组）（完全断裂 13 例，部分撕裂 147 例），余正常 47 例（对照组）。**结果** ACL 损伤直接征象 观察组 ACL 消失 13 例，萎缩、变细 25 例，不连续 114 例，行

走异常 121 例，水肿、变粗 115 例；对照组分别 0 例，1 例，2 例，2 例，2 例。2 组对比，5 个直接征象的发生率观察组明显高于对照组，差异有统计学差异，P＜0.05。ACL 损伤间接征象　观察组 Blumensaat 角 94 例，后交叉韧带角 90 例，后交叉韧带指数 73 例，对吻性骨挫伤 101 例，股骨外侧髁凹陷征 61 例，胫骨前移 99 例，空髁间窝征 37 例，半月板后角裸露征 73 例，后交叉韧带单层显示 95 例，外侧副韧带单层显示 86 例；对照组分别 4 例，6 例，3 例，6 例，1 例，5 例，0 例，1 例，7 例，10 例。10 个间接征象的发生率观察组明显高于对照组，差异有统计学差异，P＜0.05。ACL 损伤 2 种及 2 种以上间接征象同时存在　观察组 2 种征象同时存在 69 例，对照组 2 例；3 种征象同时存在 13 例，1 例；4 种征象同时存在 3 例，1 例；5 种及 5 种以上征象同时存在 2 例，0 例；2 种间接征象同时存在发生率观察组明显高于对照组，差异有统计学差异，P＜0.05；3 种及以上间接征象同时存在差异无统计学差异，P＞0.05。**结论**　直接征象是 ACL 损伤的主要诊断依据，不连续、行走异常、水肿增粗诊断价值较高；间接征象具有辅助诊断价值，股骨外髁凹陷征、空髁间窝征、半月板后角裸露征辅助诊断价值较高；2 种间接征象同时存在有较好的提示诊断价值。

EPO-1533

MRI 在坐骨-股骨撞击综合征的诊断应用研究

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【摘要】　**目的** 探讨ＭＲＩ在诊断坐骨－股骨撞击综合征的临床价值。**方法**　回顾性选取本院有临床症状的坐骨-股骨撞击综合征 12 例患者与无临床症状的且仅坐骨－股骨间隙狭窄的 12 例患者 MRI 图像，分析两组患者的股方肌信号、坐骨结节与股骨小转子间距（IFS）、股方肌通过 IFS 的最窄间隙（QFS）、坐骨角（α角）、股骨颈前倾角（FNA）；对比其两组患者上述测量指标的差异性。**结果**　临床有症状组：股方肌均有信号异常； IFS、QFS、α角、FNA 分别为(9.37±2.70)mm、（6.12±1.85）mm、（124.6±1.8）°、（29.5±0.8）°。临床无症状组：股方肌信号未见异常；IFS、QFS、α角、FNA 分别为(11.23±2.50)mm、（7.82±1.35）mm、（129.5±2.6）°、（22.5±1.2）°。两组间 IFS、QFS、α角差异无统计学意义（P>0.05）。FNA 差异有统计学意义(P<0. 05)； **结论**　MRI 扫描对于坐骨-股骨撞击综合征的诊断具有重要价值，其股方肌信号异常是其临床诊断的重要参考依据，股骨颈前倾角增大对于诱发坐骨-股骨撞击综合征可能有一定意义。

EPO-1534

Automated classification and localization of rib fractures on thoracic CT using convolutional neural networks: Accuracy and feasibility

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Objectives: To analyse a convolutional neural network (CNN) model that can automatically classify and locate rib fractures and output structured reports from CT images.
Methods: A total of 1049 patients (25054 annotations) from three hospitals were divided into a monocentric training set (n = 876) and multicentre/multiparameter validation sets (n = 173). Three classifications (fresh fractures, healing fractures and old fractures) combined with fracture locations (corresponding CT slices) were detected automatically and delivered in structured reports. Precision, recall and F1-score were selected as metrics to measure the optimum CNN model. Detection/diagnosis time, precision, and sensitivity were employed to compare the diagnostic efficiency of automatic structured reporting and experienced radiologists.
Results: The detection efficiency was higher for fresh fractures and healing fractures than for old fractures (F1-score: 0.834, 0.856 > 0.77, respectively, $P = 0.039$), and there were no significant differences in detection efficiency across five multicentre/multiparameter validation sets (all $P > 0.05$). The precision of five radiologists improved from 80.33% to 91.16%, and the sensitivity increased from 62.4% to 86.35% with the implementation of artificial intelligence assisted (AI-assisted) diagnosis. The diagnosis time of the radiologists was reduced by an average of 73.9 seconds with AI assistance.
Conclusions: Our CNN model for automatic rib fracture detection could assist radiologists in improving diagnostic efficiency and reducing diagnostic time. These effects would be helpful for the clinical prognosis of patients and could expedite the treatment of severe injuries by shortening diagnostic time. Additionally, AI-assisted diagnosis could reduce the eye-strain and workload of radiologists.

EPO-1535
双能量 CT 扫描虚拟去钙技术对膝关节骨挫伤的诊断价值

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目的：探讨双能量 CT（DECT）扫描虚拟去钙技术（VNCa）对膝关节骨挫伤的诊断价值。 **方法：**选取 2018 年 11 月-2019 年 3 月来我院就诊膝关节损伤病人 56 例，分别行双能量 CT 扫描（A 管球 60mAs/rot,B 管球 200mAs/rot）和核磁共振（MRI）扫描（轴位扫描行 T2WI 加脂肪抑制，层厚与 CT 扫描一致为 3mm）。DECT 扫描后行 VNCa 技术，由两位高年资（副主任医师）诊断医生对膝关节骨挫伤程度进行分级并与 MRI 轴位抑脂 T2WI 进行比较。 **结果：**DECT 扫描后行 VNCa 对膝关节骨挫伤的分级与 MRI（膝关节骨挫伤分级金标准）高度一致（P<0.05）。 **结论：**DECT 扫描 VNCa 技术对膝关节骨挫伤的诊断具有重要的指导意义。

EPO-1536
Detection of Bone Marrow Adema in Fatigue Fractures: Utility of a Virtual Noncalcium Dual-Energy CT Application

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Purpose: To quantify the sensitivity and specificity of dual-energy computed tomographic (CT) virtual noncalcium images in the detection of fatigue fractures and to assess whether obtaining these images as a complement to bone reconstructions alters sensitivity, specificity, or diagnostic confidence.
Materials and Methods: The clinical research ethics board approved chart review, and the requirement to obtain informed consent was waived. The authors retrospectively identified 30 patients who presented to the Orthopedic clinic and who underwent dual-energy CT for suspicion of afatigue fractures. Clinical follow-up was the standard of reference. Two radiologists interpreted virtual noncalcium images for traumatic bone marrow edema. Bone reconstructions for the same cases were interpreted alone and then with virtual noncalcium images. Diagnostic confidence was rated on a scale of 1 to 10. McNemar, Fleiss k, and Wilcoxon signed-rank tests were used for statistical analysis.
Results: Eighteen patients had fatigue fractures (13 filbula fractures,5metatarsal fractures),and 12 did not have fractures. Sensitivity with virtual noncalcium images was 94% and 89% (16 and 17 of 18 patients), and specificity was 92%-100% (11–12 of 12 patients). Sensitivity increased by 6%–5% over that with bone reconstruction images alone for two readers when both bone reconstruction and virtual noncalcium images were used. Specificity remained unchanged (92% and 100%). Diagnostic confidence in the exclusion of fracture was improved with combined bone reconstruction and virtual noncalcium images (median score: 10and 10) compared with bone reconstruction images alone (median score: 7and 8).
Conclusion: When used as a supplement to standard bone reconstructions, dual-energy CT virtual noncalcium images increased sensitivity for the detection of fatigue fractures and improved diagnostic confidence in the exclusion of these fractures.

EPO-1537
能谱 CT 双基物质成像在椎体骨髓水肿诊断中的应用研究

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目的：探讨能谱 CT 双基物质成像在椎体骨髓水肿诊断中的应用价值。
方法：收集 2019 年 1 月至 2019 年 6 月期间脊柱外伤患者 24 例，所有患者均用 Discovery CT750 HD 宝石能谱 CT 行能谱扫描，并在 48 小时之内行相同部位 MR 扫描。能谱扫描参数：管电压为 80-140 kVp 瞬时切换，自动 mAs 调制，层厚 1.25 mm，间隔 1.25 mm ，矩阵 512×512 ，螺距为 0.984，转速为 0.6 秒/周。扫描后用 AW4.4 后处理工作站 Functool 软件行 Ca/Water 及 Water/Ca 双基物质成像后处理，选取矢状位正中层面色彩异常区画兴趣区，面积大于 60mm，得出 Ca/Water 及 Water/Ca 值作为诊断参考，并应用彩图重建；同时获得传统 CT 扫描图像，行矢状位重建。两位有 4 年以上工作经验的放射科医生，在不知道 MR 表现的情况下，对能谱 CT 及传统 CT 扫描的脊柱水肿情况进行评分，应用李克特量表（1=没有水肿；2=可疑没有水肿；3=可疑有水肿；4=水肿）作为评分标准。两种方法所得的的准确性、敏感性（李克特量表 3 和 4）分别与 MR 诊断结果对比。

结果：传统 CT 扫描的敏感性，准确性分别为 0.73-0.76，0.78-0.83，能谱 CT 扫描的敏感性，准确性分别为 0.93-0.95，0.89-0.92。比较差异有统计学意义（ P<0.05 ）。
结论：能谱 CT 基物质成像技术提高了椎体水肿的诊断准确率。这可以避免患者进行额外检查。

EPO-1538
双源 CTVNCa 技术在骨骼肌肉系统外伤性隐匿性骨折（骨髓水肿）及肌腱韧带成像中的应用研究

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探讨双能 CT(DECT)虚拟去骨(VNC)图及 CT 值测量在脊柱四肢急性骨髓损伤中的诊断价值。方法对急性脊柱四肢外伤的患者分别行 MR 及 DECT 成像,以 MRI 作为参考标准,DECT 数据经双能去骨后处理得到显示骨髓信息的 VNCa 图,分别测量 VNC 图中骨髓正常区域和损伤区域的 CT 值,采用单因素方差分析法进行统计分析,比较骨髓正常区域与骨髓损伤区域的 CT 值是否存在差异,并与 MR 进行对照。结合 DECT 伪彩图,DECT VNCa 图中骨髓 CT 值的测量评价对急性骨髓损伤的诊断及临床应用价值。双源 CT 根据物质的不同化学成分在两种不同能量水平下对 X 射线的衰减不同（即物质分解技术）来区分不同的物质，随着双源 CT 的发展，可以通过虚拟非钙质（Virtual non-calcium，VNC）技术使 BME 可视化。因此双源 CTVNCa 图像能够视觉分析及定量分析 BME 的相关衰减变化，在临床工作中这种异常衰减的可视化分析比定量分析更实用简便。双源 CTVNCa 技术的价值主要是检测 CT 骨三维重建图像上不易发现的骨折。双源 CT 可以根据骨挫伤的位置和形状来推断骨关节内部结构紊乱及相关软组织异常情况，双源 CT 将会成为评估创伤继发的骨关节内部结构紊乱的一种实用性方法。在此过程中还可细观察韧带损伤，进行韧带可视化三维成像，可以更早地联合 MRI 来评估损伤程度并为临床手术治疗提供影像学依据。

EPO-1539
第 1 跖骨头下籽骨与踇外翻的相关性

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目的 研究第 1 跖骨头下籽骨与踇外翻的相关性。**方法** 对 300 例正常足及 300 例踇外翻足拍摄足正、斜位片，并测量以下参数：踇外翻角（HVA）、第 1、2 跖骨间角（IMA）、第 2 跖骨长度（CD）、胫侧籽骨与第一跖骨中线长轴相交值（TSP）、籽骨与第一跖骨外侧皮质相切值（FSP）、胫侧籽骨至第一跖骨中线长轴距离(AB)、籽骨至第 1 跖骨中线长轴距离(EF)和胫侧籽骨与籽骨距离（GH），并计算 AB 与 CD 的比值（K_1）、 EF 与 CD 的比值（K_2）和 GH 与 CD 的比值（K_3）。采用多重线性回归分析 FSP、K_1、K_2、K_3与 HVA 的线性相关关系，并获得线性回归方程。**结果** 踇外翻组与对照组间 TSP、 FSP、K_2、和 K_3值差异均有统计学意义（P均＜0.05）。所有受试者中，FSP、K_2、K_3与 HVA 具有相关性，其线性回归方程为 HVA=63.976－10.541FSP－0.446K_2－1.115K_3。经多重线性相关分析，剔除了变量 K_2和 K_3，结果显示在 HVA≥20° 的受试者中，HVA 与 TSP、FSP 呈中度负相关（r=－0.494，P<0.05），线性回归方程为 HVA=27.720+5.044×TSP-6.028FSP；在踇外翻足组中，HVA 与 TSP、FSP 呈高度负相关（r=－0.824，P<0.05），其线性回归方程为 HVA=26.842+5.021×TSP-6.011FSP。**结论** 第 1 跖骨头下籽骨脱位是导致踇外翻的一个重要病理因素，HVA 与 TSP 呈正相关、与 FSP 呈负相关。

EPO-1540
弥散加权成像对膝骨关节炎早期软骨损伤的诊断研究

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目的：探讨弥散加权成像对膝骨关节炎早期软骨损伤的诊断价值。**方法**： 40 例早期膝骨性关节炎患者纳入病例组。40 例正常膝关节纳入对照组，两组除常规序列及三维抑脂扰相梯度回波序列外再行 DWI 序列扫描。应用 DWI 序列测量对比两组膝关节软骨 ADC 值。**结果**：对照组膝关节软骨 ADC 平均值为（13.9±1.3）x$10^{-4}$$mm^2$/s；病例组膝关节软骨 ADC 平均值为（15.7±1.4）x$10^{-4}$$mm^2$/s，二者差异有统计学意义（$t$=14.397，$P$<0.001）。股骨及胫骨内侧面软骨 ADC 值高于外侧面（股骨组 t=2.056，P=0.046；胫骨组 t=2.362，P=0.023）。**结论**：DWI 作为一种生理成像技术应用于软骨损伤诊断，表现为损伤软骨 ADC 值升高。损伤软骨 ADC 值分布有一点的空间特性，与膝关节生理力学特点之间有密切关系。

EPO-1541
MRI 三维扰相脂肪抑制梯度回波序列在三角纤维软骨复合体损伤诊断中的应用

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摘要：目的:探讨 MRI 三维扰相脂肪抑制梯度回波序列在腕关节三角纤维软骨复合体(TFCC)损伤诊断中的应用价值。方法:因腕关节尺侧疼痛就诊的患者 50 例,均经非手术治疗症状不缓解超过 1 个月。按入组顺序采用随机数字表分为常规序列组和常规加三维扰脂相组,每组 25 例。常规序列组行 MRI 常规序列(冠状位 T1 加权、T2 加权脂肪抑制序列及横断位 T1 加权、T2 加权脂肪抑制序列和矢状位 T2 加权脂肪抑制序列)检查,常规加三维扰脂相组在常规序列的基础上加上三维扰相脂肪抑制梯度回波序列检查。由 2 名高年资影像医师阅片后出具影像诊断报告。MRI 检查后 1 周内均行腕关节镜检查,明确诊断为 TFCC 损伤者镜下行 TFCC 修复术。根据腕关节镜检查结果分别计算 MRI 常规序列和常规序列加三维扰相脂肪抑制梯度回波序列诊断 TFCC 损伤的灵敏度、特异度、阳性预测值和阴性预测值。结果:MRI 常规序列上,TFCC 损伤表现为关节盘内中等信号、条带状异常高信号,严重者关节盘磨损、变薄或出现裂隙,可见连续性中断;MRI 三维扰相脂肪抑制梯度回波序列上,TFCC 损伤表现为在高信号的软骨盘中出现相对低信号的软骨损伤及缺损改变。常规序列组,MRI 检查诊断为 TFCC 损伤 15 例,腕关节镜检查诊断为 TFCC 损伤 18 例。MRI 常规序列检查诊断 TFCC 损伤的灵敏度为 72.2%,特异度为 71.4%,阳性预测值 86.7%,阴性预测值 50.0%。常规加三维扰脂相组,MRI 检查诊断为 TFCC 损伤 17 例,腕关节镜检查诊断为 TFCC 损伤 18 例。MRI 常规加三维扰相脂肪抑制梯度回波序列检查诊断 TFCC 损伤的灵敏度为 88.9%,特异度为 85.7%,阳性预测值 94.1%,阴性预测值 75.0%。结论:在 TFCC 损伤的诊断中,MRI 常规序列和常规序列加三维扰相脂肪抑制梯度回波序列均具有较高的灵敏度、特异度、阳性预测值和阴性预测值,且后者的诊断价值高于前者。

EPO-1542

双足 CT 不同扫描方向对辐射剂量和图像质量的影响

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目的：探讨双足 CT 扫描时足部放置方向对辐射剂量和图像剂量的影响。**方法**：收集因足部外伤需要进行 CT 检查 60 例，以检查时双足放置方向不同，随机分为两组。A 组：30 例，年龄 18-75 岁，男/女：20/10，双足长轴方向与检查床垂直。B 组：30 例，年龄 20-65 岁，男/女：17/13，双足长轴与检查床平行。2 组方案扫描条件相同：参考管电压 120kV，参考管电流 150mAs，CARE Dose4D 均打开。由两名骨关节系统影像诊断医生分别对 2 组图像的跟骨、第三趾骨、第三趾中节趾骨骨质结构进行主观评价，并测量邻近软组织的噪声作为足跟部、足掌部和足尖部客观评价指标，记录两组患者的 CTDI 和 DLP，采用统计分析软件对两种方案的图像质量和辐射剂量进行比较。**结果**：2 组图像的主观评分差异无统计学意义（P>0.05）。A、B 两组足跟部、足掌部和足尖部分别为（43±12.5、36.5±14.3、42.5±9.9）&（36.2±15、44.5±11.1、42.3±19.8），差异均无统计学差异（P>0.05），与 B 组双足长轴平行与扫描床相比，A 组 DIP 降低约 36.3%，差异有统计学意义（P<0.05）。**结论**：双足 CT 扫描时，与双足平行扫描床的扫方案相比，垂直于扫描床方向摆位可以降低辐射剂量，且图像质量没有显著差异。

EPO-1543
股骨外侧髁比率增大与非接触性前交叉韧带断裂中前外侧韧带损伤的风险增加相关

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目的：探讨膝关节非接触性前交叉韧带（anterior cruciate ligament，ACL）断裂中股骨外侧髁比率（Lateral Femoral Condyle Ratio，LFCR ）与前外侧韧带（anterolateral ligament，ALL）损伤的相关性。
方法：回顾性分析 2013 年 1 月至 2018 年 3 月我院收治的 3332 例关节镜半月板或 ACL 重建手术患者的临床资料。通过纳入排除标准共纳入 40 例 ACL + ALL 损伤患者（研究组），40 例孤立性 ACL 损伤患者（孤立性 ACL 损伤组）和 40 例无 ACL 及 ALL 损伤的半月板撕裂患者（对照组），且按年龄、性别和 BMI 以 1：1 的比例与研究组（ACL + ALL 损伤）进行匹配。LFCR 在标准侧位片上以盲法测量。通过 ANOVA 分析三组之间的差异，产生受试者工作特征（Receiving Operator Characteristic，ROC）曲线。
结果：ACL + ALL 损伤组平均 LFCR 为 71.9％±3.1％，ACL 损伤组为 68.4％±3.2％，对照组为 66.8％±2.6％。ACL + ALL 损伤组的 LFCR 明显高于孤立性 ACL 损伤组（p <0.017）。ACL 损伤组（包括孤立性 ACL 损伤和 ACL + ALL 损伤）的 LFCR 值显著高于对照组 LFCR（p <0.05）。ROC 曲线分析表明，LFCR> 68.3％可预测 ACL 损伤的风险增加，LFCR> 69.4％可预测非接触性 ACL 断裂患者 ALL 损伤的风险增加。
结论：非接触性 ACL 断裂患者的股骨外侧髁比率增大与 ALL 损伤风险增加有关。此外，研究进一步证实股骨外侧髁比率增大与亚洲人群 ACL 损伤风险增加相关。

EPO-1544
CT 定量测量指标对髋关节撞击综合征在中国无症状人群中的应用价值

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目的：通过多层螺旋 CT 重建图像探讨中国无髋关节症状人群中与髋关节撞击综合征（FAI）相关的参数在性别、年龄的差异性，并分析符合凸轮型和钳夹型的异常参数所占的人群在无症状总人群中的发生率。
材料与方法： 搜集我院 2017 年 2 月～10 月因与髋关节症状无关的其他原因行下腹部或盆腔 CT 扫描的病人共 235 名，即 470 例单髋。通过 CT 测量与 FAI 相关的参数包括:髋臼前倾角(AV)、髋臼前方区域角(AASA)、髋臼后方区域角(PASA)、中心边缘角(LCE)、α角(AA)以及偏心距(FHNO)。
结果：在男女性别上分析，所有测量的参数均具有显著性的统计学差异。男性的髋臼前倾角在三个层面的平均值均小于女性，男性的髋臼后方区域角平均值小于女性，而髋臼前方区域角、中心边缘角、α角和偏心距的平均值均大于女性。在年龄组上分析，年轻男性三个层面的髋臼前倾角平均值均小于老年男性，而老年女性三个层面的髋臼前倾角平均值均小于年轻女性，因此，年轻男性和老年女性更容易出现髋臼后倾的可能性。CT 测量结果显示，25 %的女性和 34.5 %的男性至少具有一个与 FAI 相关的异常参数，其中 FAI 钳夹型的患病率(19.2 %)高于凸轮型 (9.2 %)。
结论：多排螺旋 CT 对评估 FAI 具有很重要的临床价值。本研究显示，中国无症状人群也存在患有 FAI 的风险，其中男性的发生率高于女性，钳夹型所占的比例比凸轮型更多。另外，对于 FAI 相关的解剖参数，我们应该根据性别、年龄和其他因素重新考虑这些异常参数的阈值来提高诊断的准确性。

EPO-1545
膝关节 MR 检查中对前交叉韧带斜冠状位的研究

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在 MR 冠状位多角度扫描膝关节的前交叉韧带，探索膝关节前交叉韧带冠状位最佳显示的影像表现。方法：选择 40 例膝关节前交叉韧带受检者，每组均以横断位 T1WI 序列定位，以膝关节为扫描范围，从 5 种不同的角度进行扫描。第 1 组以股骨内、外髁后缘连线做基准线进行扫描；第 2~ 5 组以股骨髁间窝水平后缘连线偏离基准线 5°、-5°、10°及-10°进行扫描。将各扫描所得数据进行统计学分析。结果:5 种扫描方式中，第 2、3 组完全显示前交叉韧带分别为 72.5% (29/40)和 70% (28/40)，两者与其余组进行统计学分析，P < 0.05，差异具统计学意义。结论：膝关节采用斜冠状位 5°扫描方式时，前交叉韧带的显示度、清晰度最佳，是临床理想的扫描倾角，同时能清晰地显示前交叉韧带的正常解剖及便于发现病变，为可靠的诊断提供良好的影像学资料。

EPO-1546
继发性半月板撕裂在膝关节前交叉韧带损伤中的 MR 误诊病例分析

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背景 目前前交叉韧带损伤的 MR 主要关注前交叉韧带，而对半月板的继发性损伤 MR 表现的相关报道较少。 **目的** 分析 ACL 断裂合并半月板撕裂的 MRI 误诊原因， 以提高对继发半月板撕裂的术前 MRI 诊断正常率。**方法** 回顾性分析我院经手术证实的 ACL 断裂合并半月板撕裂患者的临床及 MR 资料，统计术前 MR 诊断的正确率，分析合并半月板撕裂的误诊原因。**结果** ACL 断裂合并半月板撕裂共 180 例，其中误诊合并半月板撕裂 28 例。误诊病例中，内侧半月板后角关节囊缘撕裂 21 例（75%），外侧半月板后角撕裂 3 例（11%），外侧半月板根部撕裂 4 例（14%）。**结论** ACL 断裂继发的半月板后角关节囊缘撕裂较容易漏诊，需加强对 ACL 断裂合并半月板撕裂 MR 征象的认识。

EPO-1547

膝关节损伤 MRI 与关节镜对比研究

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目的：
研究膝关节损伤 MRI 及关节镜表现，探讨 MRI 对膝关节损伤的诊断价值以及对临床的指导意义。
方法：
对 90 例膝关节损伤患者行 MRI 检查，并且所有患者均经关节镜证实为膝关节损伤。主要扫描序列包括：自旋回波序列：SE2D T1WI ,TSE2D T2WI。多回波数据图像联合序列：MED3D T2WI。翻转回波序列 : TIR2D T2WI。将 MRI 诊断膝关节损伤与关节镜结果进行对照，应用 SPSS17.0 统计学分析软件，采用 Kappa 检验分析 MRI 诊断膝关节损伤与关节镜诊断膝关节损伤结果之间的一致性。
结果：
1. MRI 与关节镜共同诊断半月板正常 45 例，损伤 140 例，对照分析后 Kappa 值=0.830；MRI 与关节镜共同诊断前交叉韧带正常 4 例，损伤 188 例，对照分析后 Kappa 值=0.643；MRI 与关节镜共同诊断后交叉韧带正常 10 例，损伤 173 例，对照分析后 Kappa 值=0.556；MRI 与关节镜共同诊断内侧副韧带正常 7 例，损伤 175 例，对照分析后 Kappa 值=0.530；MRI 与关节镜共同诊断外侧副韧带正常 45 例，损伤 140 例，对照分析后 Kappa 值=0.426。
2. MRI 诊断半月板损伤的敏感性为 83.3%、特异性为 97.2%、准确性为 93.4%；MRI 诊断前交叉韧带损伤敏感性为 72.9%、特异性为 91.3%、准确性为 86.9%；MRI 诊断后交叉韧带损伤敏感性为 57.1%、特异性为 98.4%、准确性为 97%；MRI 诊断内侧副韧带损伤敏感性为 62.5%、特异性为 95.1%、准确性为 92.4%；MRI 诊断外侧副韧带损伤敏感性为 63.6%、特异性为 93.6%、准确性为 91.9%。
结论：
MRI 对膝关节损伤的诊断价值很高，与关节镜诊断膝关节损伤结果之间有较好的一致性。

EPO-1548

膝关节内侧副韧带损伤及常见合并损伤的高场强 MRI 诊断

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【摘要】目的 探讨内侧副韧带损伤及其合并损伤的磁共振影像表现。方法 回顾性分析 60 例内侧副韧带损伤的高场强 MRI 资料，60 例中，MRI 诊断内侧副韧带轻度损伤 9 例，中度损伤 34 例，重度损伤 17 例。17 例 MRI 诊断为重度损伤的患者符合率为 100%。轻度损伤表现为韧带内外缘纵行线条样高信号；中度损伤主要表现为低信号内见条状或斑点样 T2WI 高信号，重度损伤为低信号带完

全中断，韧带区呈不均匀高信号。本组合并邻近股骨远端骨损伤 40 例，合并半月板损伤 37 例，合并前交叉韧带损伤 19 例。结论 磁共振可以准确诊断内侧副韧带损伤程度，特别是重度损伤，并发现其合并损伤，为临床治疗或康复提供有用信息。

EPO-1549

半月板下表面撕裂的 MRI 诊断

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目的：探讨半月板下表面撕裂的 MRI 表现及特征。**方法：**回顾性分析 28 例半月板下表面撕裂患者的 MRI 资料，观察其撕裂发生的特定部位、半月板碎片的移位方向及 MRI 典型征象。**结果：**24 例患者中，内侧半月板 17 例（60.7%），外侧半月板 11 例（39.3%）；下表面部分缺失 28 例（100%）；水平方向撕裂 28 例（100%）；半月板碎片向后角移位 19 例（67.9%），向髁间窝移位 14 例（50.0%），向下隐窝移位 10 例（35.7%），向前角移位 9 例（32.1%）；半月板上表面完整 24 例（85.7%）；双后交叉韧带征 4 例（14.3%）；后角异常肥大征 15 例（53.6%）；半月板翻转征 9 例（32.1%）；双前角征 5 例（17.9%）；空领结征 3 例（10.7%）；领结残破征 18 例（64.3%）；碎片内移征 6 例（21.4%）；外周残半月板征 6 例（21.4%）；熔岩流动征 8 例（28.6%）。**结论：**上表面完整、下表面部分缺失是半月板下表面撕裂的直接征象，领结残破征、后角异常肥大征、半月板翻转征、熔岩流动征是其特征性的间接征象。

EPO-1550

儿童巨大肝脏未分化胚胎性肉瘤影像表现 1 例

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1 病例 患者女，6 岁，因腹胀 1 周入院，无腹痛、腹泻、呕吐等不适。查体：体温 36.70C，脉搏 86 次/分，呼吸 24 次/分，血压 90/54mmHg。专科检查：腹膨隆,右下前胸壁及右上腹局限性膨出，触及包块，下界达脐上两横指，内侧达前正中线，质地硬，无活动，无压痛。
辅助检查：（1）实验室检查：甲胎蛋白未见明显升高（1.76ng/ml），CA199 明显升高（265.04IU/ml）。（2）全腹部 CT 增强：肝内见巨大囊实性肿块影，大小约 13.3×11.5×13.0cm，内见多发分隔及少许结节影，增强扫描分隔及包膜明显强化，病灶内见迂曲血管影。（3）全腹部 MRI 平扫及增强：肝内见巨大类圆形囊性为主的囊实性肿块影，大小约 12.8×10.5×12.0cm，内见多发分隔及少许结节影，T1WI 呈低信号；病灶内液性成分信号不均，T2WI 及 SAPIR 呈高信号；DWI 呈混杂稍高信号；增强扫描分隔及包膜明显强化。（4）手术所见：肝脏增大，肿瘤位于右半肝，大小约 13.0×12.0×12.0cm，为囊实性成分，具有较完整的包膜，囊性成分占 80%左右，呈多房分隔，部分为深褐色胶冻状，部分为黄绿色清澈液；实性部分呈鱼肉状，质脆，部分坏死。（5））病理检查：病检提示右肝“梭形细胞瘤”，结合免疫组化，病理诊断符合肝脏未分化胚胎性肉瘤(undifferentiated embryonal sarcoma，UES)。
2 讨论 UES 是发生于肝原始间叶组织的恶性肿瘤，发病年龄主要在 6 到 10 岁左右[1-2]。UES 的临床表现无特异性,主要有肝脏肿大或上腹部包块等 [3]。
UES 的影像表现主要为巨大单囊或多囊性病灶,边界清楚,其内有不同程度的实性部分，多分布于边缘,病灶内可多见分隔，UES 为少血供肿瘤，CT 和 MRI 增强扫描实质常轻度强化，边缘较明显[4]。鉴别诊断包括肝母细胞瘤、原发肝细胞癌、肝间叶错构瘤等。

EPO-1551

Images of giant undifferentiated embryonal sarcoma of the liver in a child: a case report

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1 Case
The 6-year-old female patient was admitted to hospital with abdominal distension for 1 week. Physical examination: body temperature 36.7℃, pulse 86 times/min, respiration 24 times/min, blood pressure 90/54mmhg. Specialist examination: abdominal distention and touching mass. Lower boundary reach two horizontal fingers above umbilicus, medial reach anterior median line, hard texture.
Auxiliary examination: (1) Laboratory examination showed no significant increase in alpha-fetoprotein (1.76ng/ml), and CA199 was significantly increased (265.04IU/ml). (2) Total abdominal CT enhancement: large cystic solid mass shadows were seen in the liver, the size was about 13.3×11.5×13.0cm, multiple septa and a few nodular shadows were seen in the liver, the septa and capsule were significantly enhanced in the enhanced scan. (3) Total abdominal MRI enhancemen: a large round cystic mass with a size of 12.8×10.5×12.0cm was observed in the liver, with multiple septa and a few nodules, showing low signal on T1WI. The signals of liquid components in the lesion were uneven, and T2WI and SAPIR showed high signals. DWI showed slightly higher mixed signal. Enhanced scan septa and capsule markedly enhanced. (4) Surgical findings: the liver was enlarged and the tumor was located in the right half of the liver, about 13.0×12.0×12.0cm in size. The cystic component accounted for about 80%, showing multilocular septa. (5) Pathological examination: spindle cell tumor was found in the right liver. Combined with immunohistochemistry, the pathological diagnosis accorded with undifferentiated embryonal sarcoma (UES) of the liver.
2 Discussion
UES is a malignant tumor in the primitive mesenchymal tissue of the liver, which mainly occurs between 6 and 10 years old [1-2].UES's clinical manifestations are not specific, mainly liver enlargement or epigastral mass [3].
UES is mainly presented as a huge cystic lesion with clear boundaries, and there are solid parts in it to varying degrees, which are mostly distributed on the edges, and much space can be seen within the lesion. UES is a tumor with little blood supply, and the parenchyma is often slightly enhanced in CT and MRI enhanced scans, with obvious edges[4].The differential diagnosis includes hepatoblastoma, primary hepatocellular carcinoma, and hepatic mesenchymal hamartoma.

EPO-1552

儿童能谱 CT 单能量结合 ASiR 技术对肠系膜上动脉的研究

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目的：采用能谱单能量，比较不同水平的自适应迭代重建算法（ASiR）在儿童肠系膜上动脉成像中的图像质量，进而优化肠系膜上动脉的成像参数。
方法：选取儿童上腹部增强扫描检查患者 30 例，所有患儿体重均大于 20kg，均采用能谱 C+方案，固定时间注射法进行扫描。通过后处理工作站，选取每个患者动脉期，采用 120kVp，范围从膈顶部下至肾下缘，不同体重组采用相同 dFOV，用从 0%到 100%的算法进行重建，每组间间隔 10%，共 11 组。分析比较各组图像中肠系膜上动脉的 CT 值、图像噪声 SD、CNR 及 SNR。采用双盲法对 11 组数据进行主观评估并记录评分。
结果：所有患儿在 120kVp 情况下，肠系膜上动脉的密度值在 170HU-300HU。该 11 组在 SD、CNR 及 SNR 均具有统计学差异（P ＜ 0.05），在 CT 值方面无统计学差异（P ＞ 0.05）。随着 ASiR 比例的增加，图像噪声逐渐降低，在 120kVp 联合 100%ASiR 时图像噪声最低，但是随着 ASiR 比例的增加，蜡像感也越明显。该 11 组在主观评分差异方面有统计学意义（P ＜ 0.05）。50%ASiR 组图像质量主观评分高于其他组。
结论：单能量（120kVp）+50%ASiR 在能谱 CT 中可以提高细小动脉的显示率，有助于诊断方面的应用，同时有进一步减少辐射剂量的趋势

EPO-1553

同相位和反相位成像在腹部病变中的应用

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目的 探讨同相位与反相位成像在腹部含脂病变中的应用价值。
方法 回顾性分析 12 例腹部含脂病变的患儿，均采用常规 MR 扫描及同相位与反相位成像 T1WI 序列，直接观察脂肪信号在常规 MR 图像及同相位与反相位成像 T1WI 序列中的信号变化，测量病变在 T1WI 同、反相位图像上的信号强度比值。
结果 12 例包括肝脏局灶性脂肪浸润 5 例，弥漫性脂肪浸润 4 例，肝腺瘤 2 例，肾上腺腺瘤 1 例，脂肪信号在常规 MR 图像及同相位与反相位成像 T1WI 序列中的信号存在明显差异，反相位脂肪信号明显抑制。
结论 含脂病变在 MRT1WI 梯度回波同相位与反相位图像上有明显的信号强度差异，诊断敏感准确。 在 US 或 CT 变现不典型的含脂病变具有重要诊断价值。

EPO-1554

儿童美克尔憩室的 MSCT 诊断价值

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目的：分析小儿美克尔憩室的临床及影像资料，以提高对本病的认识。方法：回顾性总结分析我院 2010 年 10 月～2019 年 5 月本院经手术及病理证实 78 例小儿美克尔憩室的临床及 MSCT 表现。结果：美克尔憩室是小儿较常见的消化道畸形之一，系胚胎期卵黄管退化不全所致，往往以消化道出血、肠梗阻、肠穿孔等症状就诊或因其他手术探查而诊断，因此该病术前诊断率不高，时有误诊。我院病例临床表现主要为腹痛、呕吐、消化道出血，经手术证实并发消化道穿孔 2 例，肠梗阻 2 例，肠套叠 2 例，腹股沟疝并嵌顿 1 例，脐部包块 1 例，阑尾炎 10 例，脐膨出 1 例。MSCT 表现包括腹腔囊性占位（肠重复畸形或肠系膜囊肿），肠扭转，阑尾炎、消化道穿孔、肠梗阻、肠套叠

（多发肠套叠）、结肠细小、腹腔积液、肠间隙模糊、肠管积气积液、腹膜炎、感染性病变并脓肿形成、腹股沟疝并嵌顿、脐部包块（脐膨出）、肠壁增厚及肠管积血等。78 例中仅 7 例术前明确诊断，其余病例术前均未能诊断。结论：美克尔憩室是真性憩室，包括有回肠肠壁的各层及异位的组织（胃及十二指肠粘膜，胰腺组织，空肠黏膜等），以胃粘膜最多见，异位的胃粘膜分泌液（胃酸）可以损伤憩室粘膜引起憩室壁炎性增厚和毛细血管增生，从而引起溃疡、出血及穿孔；闭塞而未吸收的卵黄管索带导致憩室与脐恒定连接，憩室引流不畅或有粪石、异物、寄生虫滞留，可引起肠梗阻、肠套叠、肠扭转或内疝，内翻型憩室。美克尔憩室多数在无合并症的情况下，可终身不表现出任何症状，往往因并发症发现，如消化道出血、肠梗阻、阑尾炎、肠穿孔、肠套叠、肠扭转等，术前诊断较困难。MSCT 增强扫描结合临床病史能提高本病的诊断率。

EPO-1555
先天性门体分流的影像学特点与临床表现相关性

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目的：探讨先天性门体分流的影像学特点及其与临床相关性。
材料与方法：回顾性分析 21 例先天性门体分流患儿的临床资料和影像学表现。由 2 名放射科医生独立读片，观察门静脉及其属支的形态及走行，门体分流血管形态及侧枝血管分布。
结果：本研究包括 21 例先天性门体分流患儿，其中 12 例为肝外型门体分流（Ib 型 4 例，II 型 8 例），回流静脉包括:下腔静脉 2 例、左肾静脉 3 例、髂内静脉 5 例、胃冠状静脉 2 例，回流入髂内静脉/胃冠状静脉患儿均合并直肠静脉丛/胃底静脉丛扩张及上、下消化道出血。肝内型门体分流共 9 例（I 型 4 例，II 型 2 例，III 型 2 例，IV 型 1 例），门静脉及肝内属支发育正常。2 例肝外型 II 型因 CTA 未明确显示肝内门脉属支而误诊为 Ib 型，DSA 准确性高，应作为诊断金标准。
结论：先天性门体分流解剖结构多变，CTA / MRA 诊断准确率高，但对于肝外型 I 型诊断需谨慎，以 DSA 结果为金标准。

EPO-1556
儿童卵巢肿瘤的影像学鉴别诊断

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【目的】提高对儿童卵巢肿瘤临床及影像学表现的认识。
【材料和方法】对我院经病理证实的儿童卵巢肿瘤总结分析其临床表现、实验室检查及影像学表现。
【结果】小儿卵巢肿瘤尽管较为少见，但却是小儿最常见的生殖系统肿瘤。因儿童骨盆狭小及肿瘤生长迅速，临床常表现为腹部包块；肿瘤蒂扭转的发生率明显高于成人，易导致小儿急腹症。儿童原发性卵巢肿瘤大多 数是生殖细胞源性肿瘤，约占 60%-90% ，性索间质肿瘤占 10%-13% ，上皮源性肿瘤仅占 5%-11%。约 75% 的小儿卵巢肿瘤为良性，以囊性畸胎瘤、上皮样囊肿等常见；恶性肿瘤常见为无性细胞瘤、卵黄囊瘤、未成熟畸胎瘤、混合性生殖细胞瘤等。
超声是卵巢肿瘤首选的影像学检查方法，但 CT 和 MRI 能更准确的显示肿瘤内部成分，判断肿瘤是否为卵巢来源，是否有腹水、腹膜种植灶，是否有淋巴结肿大，肝、脾、肺等器官有无转移等，有助于临床术前分期。
儿童卵巢肿瘤表现多样，但在诊断上仍有一定的规律性。实验室检查：AFP 升高可见于内胚窦瘤、未成熟畸胎瘤、无性细胞瘤等；HCG 升高可见于绒癌、无性细胞瘤、胚胎癌等；E2 升高则见于性索间质肿瘤、绒癌。影像学表现：囊性为主最常见于囊肿、囊性畸胎瘤、浆液性/粘液性囊腺瘤；实

性为主最常见于无性细胞瘤；囊实性最长见于畸胎瘤、内胚窦瘤、绒癌等；多样性常见于颗粒细胞瘤。特征性的影像学特点：畸胎瘤：脂肪、钙化；无性细胞瘤：实性为主，可有小钙化、囊变、强化的纤维分隔；内胚窦瘤：钙化少、强化显著、瘤内见增粗血管；颗粒细胞瘤：子宫增大；粘液性囊腺瘤：各囊信号不一。
【结论】儿童卵巢肿瘤实验室检查结合影像学表现特征，可对多数肿瘤做出正确的术前诊断及分期。

EPO-1557

新生儿先天性巨结肠的影像表现分析

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目的 提高对新生儿先天性巨结肠的影像表现的认识
材料和方法 回顾性分析本院经 X 线诊断、并经手术及病理证实的新生儿先天性巨结肠影像学资料 30 例，男 23 例，女 7 例，年龄 2 天-28 天，临床表现：胎便排出延迟，伴不同程度腹胀、呕吐。
结果 腹平片小肠、结肠不同程度充气扩张，或表现为功能性低位肠梗阻。钡灌肠检查中，8 例表现为直肠远端狭窄，9 例表现为直肠至乙状结肠远端狭窄，5 例直肠至升结肠狭窄，2 例全段结肠狭窄，6 例未见明显狭窄段，24 小时后延时观察均有不同程度钡剂残留。
讨论 先天性巨结肠是以先天性肠壁肌间神经节细胞缺如为特征的肠道发育畸形。病理学特征上分为痉挛段、移行段和扩张段，且随病程时间越长，表现越明显。新生儿病程短，病变近段肠管尚未形成代偿性扩张，移行段、扩张段可不明显，或由于对新生儿期先天性巨结肠的表现认识不足，导致新生儿先天性巨结肠是影像诊断的难点之一。影像学检查方法主要为腹 X 线平片和钡灌肠。腹平片不具特异性。钡灌肠为诊断先天性巨结肠的首选影像学方法，典型表现为痉挛段僵直、不规则收缩，移行段呈漏斗状，移行段以上肠管扩张，结肠袋减少。依痉挛段的长短分为短段型、常见型、长段型、全结肠型和全肠型，超短段型病变限于肛门括约肌部位，痉挛段不明显，尚存争议。不典型表现包括：（1）延时 24 小时观察钡剂残留；（2）直肠下段及乙状结肠螺旋形或不规则锯齿状收缩；（3）直肠下段局限性切迹；（4）直肠/乙状结肠最大横径比值异常；等。具有不典型表现的患儿多为短段型或超短段型。全结肠型巨结肠多在新生儿早期出现症状，腹平片表现为低位、中位或高位小肠梗阻，钡灌肠典型表现为结肠框短缩，肝脾曲钝化，呈“？”征。
结论 新生儿期先天性巨结肠是巨结肠诊断中的难点，腹平片表现不具特异性，钡灌肠为首选检查方法，短段型及超短段型表现可不典型，延时 24 小时观察对于诊断尤为重要。钡灌肠难以诊断者应结合临床其它检查或定期复查。

EPO-1558

儿童非酒精性脂肪肝的磁共振成像定量评估

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目的 多回波（multi-echo，ME）Dixon 技术结合 MRS 定量评估儿童非酒精性脂肪肝（Nonalcoholic fatty liver disease, NAFLD）的准确性。
方法：对 50 例 NAFLD 儿童及与之年龄、性别相匹配的正常儿童志愿者行 ME Dixon 及 MRS 检查，观察 NAFLD 组和正常对照组间质子密度脂肪分数（hepatic proton density fat fraction，PDFF）的变化。**结果：**NAFLD 组的 PDFF 较正常对照组明显升高，两组间差异有统计学意义

（P<0.01）。采用 Spearman 分析表明两种技术测量的结果间高度相关（r=0.783，P=0.000）。Bland-Altman 分析显示他们之间具有良好的一致性。**结论：**ME Dixon 技术和 MRS 能准确地测量儿童肝脏的 PDFF，有助于早期诊断儿童的 NAFLD。

EPO-1559
探讨 GE revolution ct 最佳单能量图像在学龄儿童肾脏 CTA 的运用

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目的：探讨使用 revolution ct 在学龄儿童肾脏 CTA 检查中最佳单能量的选择，进而对儿童胡桃夹综合征的影像诊断提供最佳对比。
方法：选取我院因血尿行肾脏 CTA 检查的学龄儿童，男 30 例，女 25 例，平均年龄（10±2.1）岁，采用 GE revolution CT GSI 能量扫描模式，运用智能 mA，NI 为 13，转速为 0.5s/r，螺距 1.375:1，层厚 5mm，扫描范围从腹主动脉起始部至耻骨联合层面，使用 24s 固定注射时间进行剂注射，ROI 选择腹主动脉起始部，触发对比值设 220HU 团注跟踪，触发阈值后开始扫描，对静脉期图像进行 40%ASIR 重建，重建得到 40keV～80keV 共 41 组单能量图像，测量各组单能量图像竖脊肌和左肾静脉最大截面积轴位、冠状位的 CT 值及标准差，测量 ROI 均为 10mm2。计算各组单能量图像左肾静脉 CNR 及 SNR，将所算得最优 CNR 与工作站 optional CNR 进行比较，选择最优 CNR 的单能量 keV。
结果：55 例行肾 CTA 检查的患儿中，肾静脉都显示清晰，40 例肾静脉正常，15 例肾静脉符合胡桃夹综合征表现；各单能量组图像的 CNR 的变化曲线总体呈下降趋势，SNR 的变化曲线总体呈上升趋势，40keV CNR 值最大，SNR 最低，80keV CNR 值最低，SNR 最高，而在 50keV 附近 CNR 与 SNR 综合最优，和工作站 optional CNR 显示值相符；在不同 mA 条件下，相同光子能量图像的 CNR 及 SNR 随着 mA 的增大而增大；在显示胡桃夹综合征时，50keV 能量下 CNR 与 SNR 最优。
结论：单能量图像能够为影像诊断提供丰富信息，50keV 能量下在显示肾静脉时 CNR 与 SNR 综合最优，尤其在对胡桃夹综合征的显示对比更突出。

EPO-1560
婴幼儿先天性中胚叶肾瘤临床及影像表现分析

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目的：研究并探讨分析婴幼儿先天性中胚叶肾瘤的临床及影像学表现特点。
方法：回顾分析在广州市妇女儿童医疗中心 2009 年 7 月至 2019 月 7 月经手术病理证实的 14 例先天性中胚叶肾瘤的影像学及临床学资料，并进行文献复习。
结果：14 例患儿年龄 2 天至 14 月不等，平均年龄约为 1-3 月。其中，1 例行 MRI 检查，表现为右肾一巨大占位性病变，边缘清晰，T1WI 呈略低信号，T2WI 呈略高信号，增强扫描呈明显强化，肿物局部向前突，未越过中线生长。13 例行 CT 检查，位于左肾者 5 例、右肾者 8 例、肾外腹膜后 1 例：肿瘤均表现为巨大低-等混合密度肿物占位影，边界清晰，平扫密度均匀或欠均匀，以低密度为主，增强扫描肿物呈不均匀强化。其中，9 例可见肾动脉穿行其中，6 例伴有囊变坏死，2 例伴有散在钙化。1 例伴有肾包膜下积液。12 例肿瘤较大，超出肾轮廓，瘤周见残余肾实质。

结论：典型婴幼儿先天性中胚叶肾瘤可表现为巨大等-低密度肿物占位影，大部分可超越肾轮廓，囊变坏死多见，伴或不伴有钙化，且常伴肾动脉穿行其中。婴幼儿先天性中胚叶肾瘤与肾母细胞瘤易于混淆，通过分析总结其影像学表现，可有助于两者的鉴别诊断。

EPO-1561

CT 对小儿肠重复畸形的诊断价值

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目的：探讨 CT 平扫和增强扫描对小儿肠重复畸形的诊断价值 **方法：**回顾性分析我院 2015 年 1 月~2019 年 6 月 18 例经手术证实的肠重复畸形的临床资料及 CT 表现。采用 GE Optima 64 排螺旋 CT 扫描仪，扫描参数：层厚 0.625mm，层间距 0.625mm，螺距 1.25：1，矩阵 512×512，管电压 100kV，管电流 100mA。扫描方法：螺旋扫描，平扫后高压注射离子型造影剂碘普罗胺行双期增强扫描，注射量为 1.5~2.0ml/kg，注射速率：0.8~1.5ml/s，注射 26~30s 行动脉期扫描，注射 60~70s 行实质期扫描。扫描范围：剑突下至耻骨联合水平。得到图像后利用后处理软件 Reformat 进行冠状位、矢状位、斜位重建，观察病灶部位、大小、形态、边缘以及与周围脏器的关系。**结果：**18 例肠重复畸形中，发生在十二指肠 1 例，空肠 3 例，回肠 5 例，回盲部 6 例，结肠 2 例。病理类型：肠外囊肿型 16 例，肠内囊肿型 2 例。CT 平扫均表现为囊性肿块，18 例中 17 例囊壁较厚，增强扫描囊壁均有强化，CT 表现特征为圆形、椭圆形或管形、单房、液性低密度、厚壁囊肿。术前 CT 诊断 10 例，误诊 5 例，漏诊 3 例。其中 8 例有其他合并症，4 例并发不全性肠梗阻，1 例穿孔并发感染，3 例并发肠套叠。结论：小儿肠重复畸形常合并急腹症发病，容易误诊、漏诊。CT 表现具有一定的特征性，可作为本病定位、定性诊断的重要影像学手段。

EPO-1562

小儿腹部肠系膜淋巴管瘤的 CT 表现

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目的 分析小儿腹部肠系膜淋巴管瘤的 CT 影像学征象。
方法 收集我院经手术病理证实为肠系膜淋巴管瘤的儿童 12 例，采用回顾性分析方法，总结其 CT 影像特征。
结果 12 例患者年龄为 7 个月-5 岁，病灶均为单发，手术证实 12 例病灶中 6 例起源于结肠系膜，4 例起源于小肠系膜，2 例起源于大网膜。其 CT 征象如下：①病灶大小：12 例病灶最长径为 7-21cm，平均径长 14cm，其中 10 例最长径超过 10cm。②病灶形状：12 例病灶形态均欠规则，略呈“爬行”生长。③病灶生长部位：11 例病灶位于腹腔内，其中 7 例位于上腹部-下腹部，4 例位于下腹部-盆腔，另有 1 例位于腹膜后。④病灶与周围组织及血管关系：12 例病灶边界均光整，与周围组织脏器分界清晰，其中 8 例病灶局部钻入肠间隙内，推压周围肠管， 2 例包绕部分肠管，肠管受压狭窄； 10 例增强患者病灶边缘均可见多条肠系膜血管走行，5 例病灶包绕血管，血管未见进入病灶。⑤囊壁及分隔：12 例病灶囊壁均较薄且均匀，囊壁厚度＜2mm，均未见壁结节，7 例可见分隔，其中 6 例分隔厚薄均匀，1 例局部分隔欠均，较厚处厚度＞3mm，囊壁及分隔密度均匀，未见钙化影。⑥囊腔密度：10 例囊腔密度均匀，CT 值为 3-17Hu，2 例局部可见稍高密度，CT 值约 26Hu，其中 1 例另可见小片状脂肪密度，病灶内均未见出血及钙化。⑦CT 增强方式：10 例增强病

灶囊内容物均未见强化，9 例囊壁呈轻度强化，1 例中度强化，7 例存在分隔病例均行增强检查，其中 6 例分隔轻度强化，1 例中度强化（此例与上述囊壁中度强化病例为同一患者）。
结论 当腹部出现边界清楚、体积较大的单房或多房囊性病灶，囊内密度均匀，病灶呈塑性生长，推压或包绕邻近血管，病灶更大时包绕邻近肠管，囊壁及分隔薄且均匀，增强扫描时囊壁及分隔轻度均匀强化，病灶边缘见肠系膜血管走行，可对诊断肠系膜淋巴管瘤有较高提示作用。

EPO-1563
儿童罕少见肾脏原发肿瘤的影像表现

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目的：分析儿童罕少见肾脏原发肿瘤的 CT 表现特点，提高对该类疾病的认识及诊断水平。
方法：回顾性分析 15 例经病理证实的儿童罕少见肾脏原发肿瘤的临床及影像资料，分析其 CT 表现特点，并复习相关文献，总结其影像特征。
结果：15 例患儿中，先天性中胚层肾细胞瘤 4 例，肿块平均最大径（6.75±2.75）cm，平扫呈不均匀等低密度密度，增强扫描多呈渐进性强化，实质期肿块边缘出现环形强化为其经典表现（3 例）；多房囊性肾瘤 3 例，肿块平均最大径（9.67±3.79）cm，表现为单发多房囊性灶，轮廓光整，3 例囊壁和囊内分隔均显示清晰，增强后部分囊壁和间隔显示较清；肾透明细胞肉瘤 3 例，肿块平均最大径（9.17±1.53）cm，平扫呈不均匀等低密度，增强扫描皮质期呈轻中度不均匀絮片状强化，3 例均有不同程度的坏死；Xp11.2 易位/TFE3 基因融合相关性肾细胞癌 2 例，肿块平均最大径（7.75±4.25）cm，瘤内可见低密度囊变坏死区及斑片状稍高密度出血影，增强扫描病灶皮质期呈轻中度不均匀强化，实质期强化程度可略低或略高于皮质期，1 例见肾门淋巴结转移；其余 3 例为囊性部分分化肾母细胞瘤 1 列，肾恶性横纹肌样瘤 1 列，后肾腺瘤 1 例，参考相关文献均具有较典型 CT 表现。
结论：本组儿童原发肾脏肿瘤均罕少见，影像学表现有一定的特征性，工作中对儿童肾脏占位性病变应考虑上述肿瘤的可能性，以减少漏诊、误诊，提高诊断准确率。

EPO-1564
临床表现为黄疸的婴儿卡波西样血管内皮瘤——5 例病例报道

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目的：卡波西样血管内皮瘤多发生于躯干、四肢和头面部，发生在胰腺、肝门区卡波西样血管内皮瘤罕见。由于肿块容易压迫胆总管，临床上有黄疸表现。肿块形态不规则，表现为侵袭性生长，容易误诊为恶性肿瘤。本文通过分析其临床、影像学表现，提高对此病的认识。
材料与方法：收集、分析我院成功治疗的 5 例临床表现为黄疸的卡波西样血管内皮瘤的临床、影像资料。
结果： 5 例病例中 2 例为 CT/MR 检查，3 例为 MR 检查。均为男性，年龄最小 23 天，最大 120 天，平均 70 天。临床都表现为黄疸和血小板减少（卡梅现象）。5 例病例肿块均累及胰腺、肝门区，其中 2 例沿着肝内胆道分布，3 例肝内胆管扩张。病灶形态不规则，CT 平扫为低密度；MR 检查 T1WI 为低信号，3 例 T2WI 表现为低信号，2 例 T2WI 表现为低信号为主、夹杂少许高信号；增强肿块均明显均匀强化。所有病例均口服西罗莫司治疗，其中两例黄疸严重者予以经皮胆管引流术，治疗后随访病灶均明显缩小、消失。

结论：临床上卡波西样血管内皮瘤临床容易伴发血小板减低（卡梅现象）； MR 检查病灶 T2WI 呈低信号或低信号为主，增强明显均匀强化。口服西罗莫司治疗有效。上述特点可助于和其他肿瘤鉴别。

EPO-1565
易被忽视的儿童腹部急症： 网膜轴型胃扭转的影像学特征

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目的：探讨儿童急性胃扭转的影像学特征：急性胃扭转的上消化道钡剂造影的影像特点已得到了广泛的描述。然而，被送到急诊室的急腹症的病人往往直接进行 CT 扫描，并将其作为首先的影像学检查方式。因此，放射科医师应该熟悉该该疾病 CT 影像特征。
材料与方法：回顾性分析 22 例患者的临床、影像学和手术结果，所有患者均接受上消化道钡剂造影，其中 10 例术前行 CT 检查。分析了上消化道钡剂造影和 CT 的影像学特征，并与手术结果进行对比。
结果：影像和手术结果证实所有病人都存网膜轴型胃扭转。上消化道钡剂造影显示了胃扭转的典型 GI 表现。10 例患者 CT 影像颇具特征：（1）定位像显示一个巨大球状扩张胃腔。断面图像证实了巨大的扩张胃腔内另见巨大气液平面;（2）“假贲门征”：异常高位的胃窦出现在食管下段层面上，形似“贲门”，幽门靠近胃食管连接处；（3）MPR 冠状位显示“倒置幽门征”。正常情况下，胃窦位于上腹右前份，呈现的层面较贲门位置低；正常贲门与胃窦幽门有较长的间距。（4）胃左动脉牵拉征。
结论：上消化道钡剂造影及 CT 扫描均能准确的诊断和描述急性胃扭转。 “假贲门征” 或“倒置幽门征”系网膜轴型胃扭转的 CT 影像学特征。

EPO-1566
能谱 CT 对肝硬化患儿肝移植受体术前肝脏血流动力学变化的评估

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目的：探讨能谱 CT 对肝硬化患儿肝移植术前肝血流动力学评估的价值。方法：分别回顾性选取 20 例肝移植术前行 CT 检查的胆道闭锁致胆汁淤积性肝硬化患儿（A 组）及 20 例遗传代谢性疾病患儿（B 组）。A 组患儿肝功能 Child-Pugh 分级为：A 级 8 例，B 级 7 例，C 级 5 例。B 组肝功能均正常。增强 CT 扫描采用能谱 GSI 模式。选取动脉期及门脉期的碘（水）基图像，分别在肝 S2、S4、S7 和 S8 四个肝段内设立一类圆形 ROI（面积约 60～80mm2）以测量碘基值，动脉期、门脉期的 ROI 保持一致；分别取其平均值作为动脉期、门脉期肝实质的碘含量（IA，IP），并计算出肝动脉碘分数（AIF）：AIF=IA/IP。对两组患儿的 IA，IP 及 AIF 行单因素方差分析，以 $P<0.05$ 为差异有统计学意义。结果：A 组肝硬化患儿的 IA，IP 及 AIF 分别为肝功能 A 级:（4.25±1.8）100μg/cm3，（11.44±2.7）100μg/cm3 及 0.37±0.11；肝功能 B 级:（5.61±2.8）100μg/cm3，（14.30±3.6）100μg/cm3 及 0.39±0.13；肝功能 C 级:（7.23±2.7）100μg/cm3，（13.49±3.6）100μg/cm3 及 0.53±0.15。两独立样本 t 检验结果显示，两组间的 IA 及 AIF 的差异具有统计学意义（$P<0.05$），A 组的 IA 及 AIF 均大于 B 组，而 IP 差异不具有统计学意义

（P>0.05）。结论：能谱 CT 扫描获得的 IA 及 AIF，可以用于简单、便捷的定量评价不同原因肝硬化肝移植受体术前血流动力学状况的评估。

EPO-1567
儿童 Xp11.2 易位/TFE3 基因融合性肾癌的影像学表现——附 7 例病例报道

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目的 分析儿童 Xp11.2 易位/TFE3 基因融合性肾癌的 CT 和 MRI 的影像学表现。

材料与方法 回顾性分析 7 例经手术病理证实的 Xp11.2 易位/TFE3 基因融合性肾癌患者的影像表现。男 6 例，女 1 例，年龄最小岁，最大 10 岁。3 例行 CT 检查，4 例行 MRI 检查。4 例因体检偶然发现，2 例血尿,1 例自己扪及肿块。评估肿瘤的位置、大小、密度 / 信号、钙化、出血和强化特点及是否有转移等影像学特征。

结果 所有肿瘤均为单发,4 例位于左肾,3 例位于右肾； 3 例肿瘤位于肾皮质，3 例累及肾皮髓质，1 例侵犯全肾；肿块类圆形 5 例，不规则形 2 例，最大径范围为 2.4-118 cm。6 例为实性肿瘤，1 例为囊性。肿瘤内坏死 4 例，出血 2 例，钙化 2 例，3 例出现假包膜。3 例 CT 检查患者 1 例呈囊性，增强边缘可见小结节状强化；2 例为实性，平扫表现为等、稍高密度，均有钙化，增强 1 例为均匀中等强化；1 例为不均匀强化，可见条索状间隔强化。4 例 MR 检查患者均表现为实性肿块，T1WI 稍低、等信号，T2WI 稍低信号,增强不均匀中等强化。肾周淋巴结转移 3 例。7 例病例无肾静脉癌栓，无远处转移。

结论 Xp11.2/TFE3 肾癌多为类圆形实性肿瘤，可见假包膜，容易出现出血、坏死。CT 平扫肿块呈稍高密度，T2WI 呈稍低信号，增强后强化较周边肾脏组织低。Xp11.2/TFE3 肾癌影像学表现有一定特征性。

EPO-1568
利用空气灌肠评估婴幼儿结肠正常解剖测量值

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目的：利用研究没有便秘的 3 岁以下婴幼儿空气灌肠的结肠解剖学特征，以提供正常婴幼儿结肠大小比例的正常值。
方法：收集我院自 2018 年 1 月至 2018 年 12 月总计 1 年期间因为怀疑肠套叠经经空气灌肠整复治疗后并无便秘症状的 3 岁以下婴幼儿 403 例。选定清晰显示完整结肠圈的图像，测量主要指标包括预定结肠段（包括直肠，乙状结肠，降结肠，横结肠和升结肠）的直径以及分别与 L3 椎体宽度的比率。所获图像由两名有经验的影像诊断医师进行测量，最终值取两者平均值。
结果：在 403 例病例中，年龄最小的 5 月龄，年龄最大的 2 岁 11 月龄，中位年龄 1.5 岁，男性 225 例，女性 178 例。各结肠段与椎体长度比率随年龄没有显着变化（P ＜0.05）。直肠和升结肠直径与 L3 椎体宽度的比率随着年龄显着增加，而其他结肠段的直径与 L3 椎体宽度的比率则没有明显增加。3 岁以下婴幼儿对于性别和种族的差异并不显著。

结论：利用对 3 岁以下无便秘婴幼儿空气灌肠的图像进行测量，获得正常结肠解剖学测量值，为进一步研究婴幼儿结肠相关疾病提供例基础性数据。

EPO-1569
儿童炎性肌纤维母细胞瘤的影像诊断及病理特征对照分析

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目的：探讨炎性肌纤维母细胞瘤(IMT)的病理分型与 CT、MRI 特征性表现。方法：回顾性分析我院经手术病理证实的 16 例 IMT 患者的影像学资料，16 例均行 CT 平扫及增强扫描，5 例同时行 MRI 平扫及增强扫描，记录患者的一般临床资料、病理表现及基本影像学特征，比较不同病理分型的 IMT 影像形态学差异。结果：肺内、肝脏、胆囊、胃、腹腔及腹膜后区 IMT 各 7 例、3 例、1 例、1 例、4 例。病灶密度或信号多不均匀，5 例伴少量点状钙化，出血及坏死少见。增强扫描胸部肿瘤表现为明显均匀强化，腹部肿瘤多表现为动脉期瘤内轻度片絮状强化，或边缘花环样明显强化，静脉期及延迟期强化范围持续扩大，强化程度无明显衰退。强化方式与瘤内组织成分比例有关，而恶性程度及预后转归与瘤细胞的核异型性有关。结论：IMT 的影像表现具有特征性，CT 能精准显示病灶的血供及解剖结构特征；MRI 有助于评价病灶组成成分及预判病理分型。CT 和 MRI 结合有利于提高 IMT 良恶性倾向诊断的符合率。

EPO-1570
应用全身扩散加权成像探查小儿腹部恶性肿瘤原发及转移灶的初步研究

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目的 评价 MR 全身扩散加权成像(WBMR-DW IBS)探查小儿恶性肿瘤原发及转移灶的价值。**方法** 选取我院经影像及临床共同确诊为腹部恶性肿瘤的小儿患者 30 例及健康志愿者 20 例行 WBMR-DW IBS 检查。对比分析 WBMR-DW IBS 图像、常规 MR 图像和 CT 图像。测量原发灶及可疑转移病灶的平均表观扩散系数（ADC）值，并与正常对照组平均表观扩散系数（ADC）值对比。**结果** WBMR-DW IBS 均检出小儿腹部恶性肿瘤患者的原发灶，并检出除原发灶外的全身转移灶 115 处，检出率 90%（115/128），病变部位在 WBMR-DW IBS 呈像为高信号，平均表观扩散系数（ADC）值低于相应部位正常对照组。**结论** WBMR2DW IBS 适用于探查小儿腹部恶性肿瘤原发及转移灶，具有较高的检出率，可以作为小儿恶性肿瘤全身转移灶筛查的有力工具。

EPO-1571
3D 打印技术在小儿先天性门体静脉分流中的应用价值

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目的：运用 3D 打印技术建立具有精确解剖结构的先天性门体静脉分流病例的三维模型，探讨 3D 打印的模型对于该症临床诊断和手术计划制定的意义。方法：收集我院两例诊断明确的先天性门体静脉分流病例进行回顾性分析，两例病例均行 CT、DSA 检查及手术治疗。根据 64 排增强 CT 图像资料，通过 MIMICS 19.0 软件将 CT DICOM 数据导入并对感兴趣区（ROI）进行图像后处理，使用区域生长的方法分割图像之后生成标准镶嵌语言（Standard Tessellation Language，STL）文件数据，将数据导入 OBJET 260 3D 打印机后完成建模。结果：3D 打印模型能够准确清晰显示门体静脉分流的异常分支，且能更好显示该异常分支与周围血管的关系。结论：3D 打印模型能够在辅助诊断先天性门体静脉分流的基础上，更好地显示其与周围血管的空间关系，能有效地应用于术前手术方案的制定，为手术治疗提供帮助。

EPO-1572
CT 能谱 MAR 去金属伪影技术对儿童体内消化道金属异物的应用

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要:**目的** 研究 GE revolution CT 能谱 MAR 去金属伪影技术对儿童体内消化道异物的临床作用.**方法**:选取误食消化道金属异物的患儿(15)例,分为两组,在相同扫描条件下分别行 120kvp 和 120kvpMAR 重建，A 组为患儿进行普通腹部 CT 扫描.B 组为患儿进行能谱 CT 的腹部扫描.能谱 CT 采用专用软件进行重建,在传统螺旋扫描和单能量扫描重建图像上放四个 ROI。选取靠近金属异物区域,测量图中的 CT 方差值,记为 SDr,再选取以空气为背景的区域,测量其 CT 的方差值记为 SD,按照公式可描述硬化伪影的指标-伪影指数(AI)的计算,即 AI=√(SD2-SDr2).硬化伪影去除率(BAR)=(AI120kvp-AIkvpMAR
) /AI120KVPX100%。**结果**：在 120kev 的单能量成像上，通过伪影指数 AI 的计算，比较 A 组与 B 组，有明显差异 P<0.05，有统计学意义。**结论**：CT 能谱能够有效的去除消化道金属异物的伪影，提高图像质量，增加医学影像诊断的准确性。

EPO-1573
1 例造血干细胞移植后淋巴组织增生性疾病 MSCT 影像表现及文献复习

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目的 移植后淋巴组织增生性疾病（post-transplantation lymphoproliferative disease，PTLD）是指实体器官、骨髓或造血干细胞移植后发生的一种严重并发症，临床表现及病理类型多样，发生率低，主要与移植后免疫抑制治疗和 Epstein-Barr 病毒（EBV）感染相关。本文旨在探讨造血干细胞移植后肺部及胰腺淋巴组织增生性疾病（PTLD）的 MSCT 影像表现及诊断价值。
方法：回顾性分析我院一例 β 地中海贫血患儿行造血干细胞移植后半年确诊为 EBV 相关淋巴组织增生性疾病的临床资料及 MSCT 影像表现。
结果：MSCT 平扫表现为双肺散在大小不等的软组织结节及肿块影，边界清晰，部分病灶中央密度稍减低，胰头及体尾部形态局部饱满，实质密度欠均匀；增强后扫描，双肺病灶呈轻度不均匀强化，胰头及体尾部分别可见斑片状低密度影，与正常胰腺组织强化对比明显，边界清楚，局部见类圆形更低密度灶。

结论：MSCT 影像表现结合移植病史对于 PTLD 的初步诊断、活组织检查术前定位及治疗后效果评估等方面有很大的参考价值。

EPO-1574
基于体重指数调整的不同体重儿童上腹部低剂量 CT 扫描研究

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目的：研究基于体重指数调整的儿童上腹部低剂量 CT 扫描方案的辐射剂量、主客观图像质量和诊断准确性。**方法：**对比分析不同体重指数儿童上腹部低剂量 CT 扫描中的差异，前瞻性分析 50%ASIR 重建常规剂量和基于体重指数调整的上腹部低剂量 CT 扫描方案检查，年龄范围 1 月-14 岁。使用五点量表主观评估包括噪音，清晰度，伪影和诊断可接受性在内的图像质量。使用配对 t 检验比较两组之间的辐射剂量。**结果：**各组图像质量主观评分的一致性大，图像质量可接受。基于体重指数调整的上腹部低剂量组所有辐射剂量参数均显着降低（P <0.01），超重儿童剂量减少 44%以上。**结论：**在正常体重和超重儿童中，50%ASIR 重建的个性化低剂量 CT 扫描方案平均剂量明显低于常规剂量，而不会显着影响儿童上腹部 CT 检查的诊断图像质量。

EPO-1575
多层螺旋 CT 对小儿骶尾部恶性生殖细胞瘤的诊断价值

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目的：回顾性分析小儿骶尾部恶性生殖细胞瘤多层螺旋 CT 表现、病理学及临床特征，评估多层螺旋 CT 对小儿骶尾部恶性生殖细胞瘤的诊断价值。
方法：经过临床、病理或影像证实的恶性生殖细胞瘤 9 例，男 5 例，女 4 例。年龄 5 月-4 岁，中位年龄 16 月。全部患者术前均进行螺旋 CT 增强检查，依据肿瘤的螺旋 CT 表现，按照 Altman 分型系统，对肿瘤进行分类，并分析肿瘤大小、形态、密度、血运情况、转移情况及血清 AFP 值。
结果：Altman 分型中，本组 II 型 1 例，III 型 3 例，IV 型 5 例。全部肿瘤均较大，大小范围 42mmx43mm-132mmx21mm，实性肿瘤居多，占 67%，肿瘤密度不均匀，无脂肪成分或仅含有点状脂肪成分肿瘤占 89%，全部肿瘤均可见丰富血运，增强后肿瘤呈不均匀明显强化，均可见局部浸润或远处器官转移，其中骶骨及椎体骨破坏最常见，呈虫蚀样改变，占 89%；其次为下腔静脉或髂静脉瘤栓，占 67%；并可见肝转移、肺转移及椎管浸润。全部病例中血清 AFP 均升高，明显升高者（大于 300ng/ml）占 89%。CT 诊断敏感度为 89%；病理学检查敏感度为 67%。
结论：螺旋 CT 不仅能显示骶尾部恶性生殖细胞瘤原发灶特征，更能显示其在不同器官上转移灶特点，结合血清 AFP 明显升高不难做出定性诊断，因此，多层螺旋 CT 可以补充并完善病理组织学对骶尾部恶性生殖细胞瘤的诊断不足。

EPO-1576
巨大肝母细胞瘤术前介入治疗的疗效评价及影响因素

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目的　探讨肝母细胞瘤术前介入性肝动脉化疗栓塞(transarterial chemoembolization,TACE)的疗效及影响因素。方法　2014 年 2 月～ 2018 年 3 月不能Ⅰ期手术切除的 18 例巨大肝母细胞瘤患儿(男 10 例,女 8 例)接受 1～ 4 次栓塞化疗。年龄 3 月～ 7 岁(中位年龄 1 岁 2 月)。每次栓塞化疗前均行数字减影血管造影(DSA)检查,栓塞化疗时首先超选择进入肿瘤的供血动脉,经该动脉先灌注化疗药物，注入超液化碘油的混悬乳液。介入术后评估其疗效及影响因素。结果　18 例患儿行介入治疗的次数 1-4 次不等，其中 7 例患儿一次，8 例 2 次，2 例 3 次，1 例 4 次。TACE 后，15 例（83%）肿瘤体积缩小明显（30-50%），在肿瘤缩小后做了手术切除，14 例（77%）无瘤存活至今，其中 1 例出现门静脉海绵样变性，1 例手术切除后相继出现肺转移及脑转移。2 例肝母细胞瘤 TACE 效果不佳，1 例为肝母细胞瘤伴肝动脉门静脉瘘，未行碘油栓塞，仅注入化疗药物，做了 3 次化疗药物灌注后，肿瘤缩小不显著，未能施行外科手术；1 例为肝左叶肿瘤，主要由肝左动脉供血，但导管未能进入肝左动脉，仅在肝右动脉行肿瘤碘油栓塞治疗，治疗效果不明显。结论　TACE 能有效杀死肿瘤细胞，控制肿瘤生长，使大部分不能Ⅰ期手术的患儿重新获得手术机会，改善预后，无严重并发症，是一种安全、有效、实用的肝母细胞瘤的辅助治疗方法, 术中尽可能进入肿瘤供血血管，使碘油混悬剂能均匀分布整个瘤体是治疗的关键所在。导管难以进入靶血管及肝母细胞瘤伴肝动脉门静脉瘘是影响肝母细胞瘤介入治疗疗效的原因。

EPO-1577

阴道斜隔综合征的影像学表现及其诊断价值

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目的　探讨阴道斜隔综合征的影像学表现及其诊断价值。
方法　回顾性分析 1 例 12 岁女性阴道斜隔综合征患儿的临床及影像学资料并复习相关文献。患儿主诉反复下腹坠痛数月，与月径周期相关，可自行缓解。此例患儿术前行超声、CT 及 MRI 检查，并分析其斜隔的位置，隔后腔的大小，隔后腔与宫颈的位置关系，双侧附件及泌尿系统的伴发改变。
结果　该患儿因腹痛急诊入院，CT 平行显示盆腔不规则软组织团块影，向会阴部延伸。第二日行超声、MRI 增强检查，超声示右下盆腔探及琵琶状子宫，宫腔内及无回声平段，下方阴道探及弱回声区，内及数个低回声团块；左下盆腔探及子宫组织。MRI 检查显示右下腹盆腔见葫芦状异常信号灶，其内见液体信号，向会阴部延伸。左下盆腔内另见一子宫样组织信号。双侧卵巢正常。故术前诊断为双子宫、双宫颈、双阴道且右侧阴道闭锁，斜隔位于右侧，斜行附着于左侧阴道壁；同时 MRI 发现斜隔侧右肾缺如。
结论　阴道斜隔综合征又称 Herlyn-Werner-Wunderlich 综合征。典型表现为双子宫、双宫颈、双阴道且一侧阴道完全或不完全闭锁，均伴闭锁阴道侧泌尿系统畸形，以肾脏缺如多见。本病多于青春期发病，主要表现为周期性下腹痛、痛经、月经不规则、阴道流脓、盆腔包块以及因盆腔炎引起的一系列症状。超声检查因其简易、便捷、无创、重复性好等优点，常作为该病的首选筛查方法。MRI 检查在阴道斜隔综合征的显示方面更具优势。MRI 检查可非常清晰地显示子宫畸形的类型，斜隔的位置及走行，隔后腔与积液宫颈的关系，且在斜隔及阴道全貌的显示、子宫内膜及宫颈发育情况的判断、积液性质的确定方面更具优势，隔后腔积血在 T1 WI 呈高信号或在 T2 WI 呈低信号，隔后腔积脓在 DWI 呈高信号。阴道斜隔综合征的影像学表现颇具特征性，超声、CT 和 MRI 对准确诊断有一定价值。

EPO-1578

儿童睾丸肿瘤的 CT、MRI 表现

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目的 探讨儿童睾丸肿瘤的 CT 与 MRI 影像征象，提高对睾丸肿瘤的影像诊断能力。 **方法** 回顾性分析 60 例经手术和病理证实的儿童不同类型睾丸肿瘤的 CT 和 MRI 资料。**结果** 60 例睾丸肿瘤样病变中，睾丸肿瘤 54 例，其中良性畸胎瘤 17 例（成熟性畸胎瘤 15 例，未成熟性畸胎瘤 2 例），卵黄囊瘤 10 例，其中混有成熟性畸胎瘤 1 例，伴有肺转移 1 例，良性囊肿 23 例（皮样囊肿 5 例、表皮囊肿 14 例、胚胎残留囊肿 4 例），睾丸性索间质细胞瘤 2 例，血管来源肿瘤（毛细血管瘤）1 例，副脾 1 例，多睾 1 例。5 例未手术者分别为白血病双侧睾丸浸润 5 例（穿刺取病理证实）。其共同表现为睾丸不同程度增大，不同类型的睾丸肿瘤及肿瘤样病变有其各自的较为特征的 CT 和 MRI 征象，对病变检出、定性和肿瘤分型、分期有重要诊断价值。**结论** CT 及 MRI 对儿童睾丸肿瘤的检出、分型诊断和分期等具有重要价值。

EPO-1579
儿童睾丸生殖细胞肿瘤的 MRI 诊断与良恶性鉴别

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目的 探讨不同病理类型儿童睾丸生殖细胞肿瘤的 MRI 诊断与良恶性鉴别。**方法** 回顾性分析 56 例儿童睾丸生殖细胞肿瘤的临床资料、MRI 表现和病理结果，依据病理结果分为畸胎瘤组、表皮样/皮样囊肿组和卵黄囊瘤组。分组比较畸胎瘤组、表皮样/皮样囊肿和卵黄囊瘤组肿瘤的部位、大小、边界、形态、信号特征、脂肪变、患侧精索增粗情况、强化程度、MRI 诊断肿瘤良恶性的符合率等。**结果** 56 例儿童睾丸生殖细胞肿瘤中，良性肿瘤组 41 例（41/56，73.2%），恶性肿瘤组 15 例（15/56，26.8%），最常见的良性肿瘤为畸胎瘤,其次为表皮样囊肿，最常见的恶性肿瘤为卵黄囊瘤。**结论** MRI 检查诊断睾丸肿瘤良恶性符合率较高，患侧精索静脉增粗和强化程度方面鉴别不同病理类型的儿童睾丸生殖细胞肿瘤有特异性，可作为超声的替代检查手段。

EPO-1580
儿童卵巢恶性肿瘤的 CT 特征的再认识

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目的 总结和分析儿童卵巢恶性肿瘤的 CT 特征，提出与良性卵巢肿瘤的鉴别要点。**方法** 回顾性分析 2015 年 1 月至 2017 年 12 月经手术病理诊断为卵巢肿瘤且术前经螺旋 CT 增强扫描的女性患儿的术前 CT 图像，包括卵巢肿物的性质、肿物内有无钙化或脂肪成分、囊壁及囊内分隔情况、肿物强化程度及强化方式、有无瘤内血管及肿物最大径、实性成分比等影像特征；统计分析不同 CT 影像特征在良恶性卵巢肿物之间的差异采用 c^2 检验或 Mann-Whitney U 检验；计量资料在良恶性卵巢肿物之间的差异有统计学意义时绘制相关卵巢恶性肿物的 ROC 曲线。**结果** 共 74 例卵巢肿物患儿接受了 CT 增强扫描，其中卵巢恶性肿瘤 11 个（14.9%），卵巢良性肿瘤 63 个。卵巢肿物的性质、实性成分比、强化程度、强化方式及有无瘤内血管等 CT 影像特征在良恶性卵巢肿瘤之间的组间差异具有统计学意义（P=0.004、0.001、0.013、0.038、0.003）。肿物实性成分比大于 0.17 作为判定卵巢恶性肿物的临界值时，其敏感度为 81.8%，特异度为 82.5%。**结论** 儿童卵巢恶性肿物的 CT 特征

包括实性成分多、增强后强化明显、强化不均匀、瘤内出现迂曲血管影等，特别是实性成分比大于 0.17。

EPO-1581

CT manifestation of retroperitoneal neuroblastoma in children

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Abstract: Objective To study CT scan finding of retroperitoneal neuroblastom. **Methods** 32 cases confirmed by surgery and pathology were retrospectively analyzed, **Results** In 15 cases of neuroblastom , round mass was presented in 12 cases, tumor with poorly defined margins in 2 cases, tumorous calcifications in 2 cases, involvement of retroperitoneal vessels in 2 cases ,and invasion of retroperitoneal lymph nodes in 3 cases .None of the nephroblastoma invaded retrocrural lymph nodes .Irregular mass with calcification, involvement of retroperitoneal vessels, retrocrural and retroperitoneal lymp nodes were more common in cases of neuroblastoma than in nephroblastoma .Moreover, involvement of retrocrural lymph nodes and encasement of retroperitoneal vessel had higher positive predication value on neuroblastoma .**Conclusion** CT scan is able to localize the primary retroperitoneal tumors accurately, involvement of retrocrural lymph nodes and encasement of retroperitoneal vessels were the specific CT findings of neuroblastoma.

EPO-1582

婴幼儿原发性小肠淋巴瘤的 CT 表现

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目的：探讨小儿原发性小肠淋巴瘤的 CT 特征。旨在提高诊断率，为临床诊断治疗提供依据。方法：对 39 例手术病理证实的原发性小肠淋巴瘤 CT 表现和临床资料进行回顾性分析，所有病例行 CT 平扫加增强扫描。结果：39 例小肠淋巴瘤中 16 例有病变段管腔扩张 13 例主要表现为肠壁的局限或弥漫性增厚，5 例表现为腔内溃疡型肿块，39 例肠淋巴瘤中 5 例误诊为肠重复畸形和炎性肿块 21 例伴有淋巴结肿大。结论：CT 可以清楚显示原发性淋巴瘤的病变特点及其周围组织浸润情况，典型 CT 征象对定性诊断有较大价值。

EPO-1583

LCH 累及肝脏的 CT 表现

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目的 探讨婴幼儿朗格罕细胞组织细胞增生症（Langerhans cell histiocytosis, LCH ）侵犯肝脏的 CT 特点，提高对本病的认识。**方法** CT 检查发现 6 例仅侵及肝脏并经病理及免疫组化证实的朗格罕细胞组织细胞增生症进行回顾性分析。其临床表现与受累程度关，主要为发热、黄疸、肝功的异常。**结果** CT 平扫表现为肝脏弥漫增大，肝内病灶呈多发性结节状及片状低密度病灶。朗格罕细胞组织细胞增生症侵犯肝脏的基本病理是汇管区的组织细胞增生，中央汇管区有较好的框架，易沿框架发展，周围汇管区不明显，容易形成局灶性结节样堆积，故增强扫描呈多发性结节状强化，部分结节呈环形强化。**结论：**朗格罕细胞组织细胞增生症侵犯肝脏的影像表现有一定的特点，但最终需结合临床及病理明确诊断。

EPO-1584

MRI 在先天性肛门直肠畸形诊断中的应用

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目的：探讨 MRI 检查在先天性肛门直肠畸形患儿术前诊断的价值。
方法：搜集我院 2018 年 6 月~2019 年 7 月行 MRI 检查的先天性肛门直肠畸形患儿 36 例，其中男性患儿 25 例，女性患儿 11 例，年龄范围为 2 月~10 月，中位年龄为 3 月。入组患儿均已于新生儿期行一期横结肠双腔造瘘术，二期术前均行 MRI 检查。
结果：36 例患儿中包括高位闭锁 3 例，中位闭锁 13 例，低位闭锁 21 例。25 例男性患儿中，有 22 例合并泌尿系生殖瘘，其中尿道球部瘘 9 例，尿道前列腺部瘘 9 例，直肠膀胱瘘 3 例，直肠会阴瘘 1 例；11 例女性患儿为直肠会阴瘘。36 例患儿合并其他发育异常 17 例，其中脊椎发育异常 9 例，终丝脂肪变性 7 例，子宫发育畸形 4 例，肾脏发育异常 2 例，脊髓栓系 2 例，脊髓中央管扩张 2 例。
结论：MRI 可以准确、无创、全面地显示先天性肛门直肠畸形的类型、瘘管存在与否及瘘口位置以及伴发的其他畸形情况，为手术方式的选择、手术预后的评估提供可靠依据。

EPO-1585

儿童肾脏少见原发性恶性肿瘤临床及影像特征

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目的：对比分析儿童肾脏少见原发性恶性肿瘤的临床与影像特征，为临床手术和治疗方案的制订提供依据。
方法：回顾性分析我院 11 例肾脏少见原发性恶性肿瘤患儿，其中男性 6 例，女性 5 例，年龄最大 12 岁，最小 11 月。采用 GE-Optima 64 排螺旋 CT 机进行腹部 CT 扫描。增强扫描对比剂为欧乃派克，剂量为 2ml/kg 体重(最大不超过 100ml)。不能合作的患儿 1 0 %水合氯醛灌肠（2ml/kg 体重），待患儿睡熟后进行腹部 CT 扫描。扫描结束后将原始图像数据重建成层厚 0.625mm 的图像，传输至工作站，采用多种后处理对图像进行分析。患儿临床症状表现包括血尿，发现腹部肿块，持续间断发热，反复白细胞升高，或者行超声检查发现。所有患儿均行腹部 CT 平扫和增强扫描，并经手术、病理证实，术后部分患儿进一步予以化疗，分析其临床特点、腹部 CT 影像表现以及与肾母细胞瘤的鉴别要点。
结果：11 例患儿中，包括恶性横纹肌样瘤 3 例，透明细胞肉瘤 2 例，肾细胞癌 6 例。1 例发生于双侧肾(恶性横纹肌样瘤)，其余 10 例均发生于单侧。1 例恶性横纹肌样瘤合并中枢神经系统肿瘤；1

例恶性横纹肌样瘤合并两肺转移；2 例肾细胞癌复发，再次行手术切除；1 例恶性横纹肌样瘤放弃治疗，1 例恶性横纹肌样瘤去世。
结论：虽然儿童肾脏原发性恶性肿瘤的术前诊断有一定的困难，但综合患儿的临床资料及影像特征，比如年龄，临床症状，肿瘤的大小，影像特征以及转移及合并症等，有助于肾脏原发性恶性肿瘤的术前诊断，从而可以帮助临床医生精密地制订手术方案和后续治疗方法，提高患者的生存率。

EPO-1586

8 例儿童嗜铬细胞瘤 CT 影像及临床分析

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目的：探讨儿童嗜铬细胞瘤的 CT 影像征象及临床特点。材料与方法：收集 2000 年 1 月至 2017 年 12 月收治的 8 例经手术病理证实的嗜铬细胞瘤病例，回顾性分析临床表现及 CT 影像征象。结果：女孩 2 例，男孩 6 例；年龄 1.6-13 岁，中位年龄 5.2 岁。仅 2 例患儿儿茶酚胺代谢产物增高，临床出现典型的阵发性高血压；1 例患儿伴神经纤维瘤病，1 例出现性早熟；其余 4 例无典型临床症状。本组肿瘤位于左侧肾上腺者 3 例，右侧肾上腺者 3 例，腹膜后者 2 例；肿瘤均为单发。良性 5 例，表现为类圆形实性肿瘤，边界清晰，直径 17-113mm，中位直径 30mm；增强扫描中可见肿瘤明显强化，边缘显著。恶性 3 例，为囊实性肿瘤，囊性成分显著，直径 104-186mm,中位直径 134mm，增强扫描中可见实性成分强化程度低于良性嗜铬细胞瘤；1 例肝脏转移，1 例淋巴结转移，1 例椎管、骨骼、肌肉转移。2 例恶性嗜铬细胞瘤可见腹主动脉的供血动脉。结论：通过典型临床表现及 CT 影像学征象可于术前提出嗜铬细胞瘤的诊断。肿瘤的供血动脉有助于分辨肿瘤的起源。

EPO-1587

胡桃夹综合征——“肾淤血”的 CT 影像表现及临床相关性研究

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目的： 利用影像学技术分析胡桃夹综合征(nutcracker syndrome，NCS）肾淤血对肾功能的影响。
方法： 收集我院（2016.1-2018.12）的 86 例经临床筛查排除性诊断为 NCS 的患儿的临床、影像资料，根据增强实质期双肾髓质强化程度是否有差异、侧支循环情况分组，分析腹主-肠系膜上动脉夹角（aortomesenteric angle, AMA）、左肾静脉（left rein venous，LRV）受压段与扩张段的径线之比、CT 增强实质期双肾髓质 CT 值差值的绝对值、侧支循环发生等主要影像特征，比较上述征象与 24 小时尿蛋白定量、血尿发生率的关系。数据统计学处理采用统计软件 SPSS 17.0，检验方法包括两独立样本 t 检验、曼尼-惠斯 U 秩和检验、卡方检验。**结果：** 1．淤血 A 组与非淤血 A 组：增强实质期淤血 A 组的双肾 CT 值之差显著高于非淤血 A 组（P=0.000,＜0.05），其 AMA 角较小（P=0.001, ＜0.05），其径线之比较高（P=0.001, ＜0.05），发生侧支循环的比率明显较低（P=0.040,＜0.05）。2．淤血 B 组与非淤血 B 组：增强实质期淤血 B 组的双肾 CT 值之差显著高于非淤血 B 组（P=0.000,＜0.05），其 AMA 角较小(P=0.008, ＜0.05)，其径线之比较高（P=0.008,＜0.05）；24 小时尿蛋白定量的差异有统计学意义（P=0.041, ＜0.05）。**结论：** 在 AMA 角偏小、径线之比较大（LRV 受压较明显）、侧支循环发生率较低的情况下，NCS 患儿在 CT 实质期双肾髓质的强化程度可能会发生明显的差异，其 24 小时蛋白尿定量可能会增加，提示胡桃夹综合征对患儿的影响较大，左肾淤血程度较高。

EPO-1588

儿童阴囊淋巴管瘤 3 例报道

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【摘要】目的：探讨儿童阴囊淋巴管瘤的 MR 表现及鉴别诊断。**材料和方法：**本组 3 例患者均为男性，年龄 1-3 岁。均以一侧阴囊肿大就诊。查体均无明显红肿、触诊无疼痛。无发热，血常规白细胞计数正常。3 例患者均采用西门子 1.5T 磁共振仪扫描完成检查。其中 2 例同时行增强检查。**结果：**2 例患者为右侧阴囊内包块。1 例为左侧阴囊内包块，且延伸至同侧腹股沟区。超声显示肿块均匀低回声不规则形包块，其内可劲分隔，未检测到血流信号。3 例 MR 平扫显示阴囊内不规则形包块，以长 T1 长 T2 液体信号为主，内部见多发短 T2 线样分隔影像，其中 1 例延伸至同侧腹股沟区。同侧睾丸稍显受压，但与包块分界清楚。睾丸信号未见异常。2 例行增强检查包块内部均未见强化，包块边缘及内部分隔轻度强化。3 例均行手术切除，术后病理淋巴管瘤。**结论：**淋巴管瘤是儿童常见的先天性脉管畸形，是由间叶组织的原始淋巴囊及淋巴管发育形成，极少发生癌变。泌尿生殖系统淋巴管瘤可发生于肾脏、膀胱、输尿管、阴囊及精索。根据病理和临床表现可分为单纯性、海绵状和囊性三类。MR 平扫上淋巴管瘤为多房囊性包块，形态不以则，沿组织间隙蔓延生长，内部以长 T1 长 T2 液体信号为主，如合并出血可见液液平面。增强后一般内部无强化，仅边缘和内部分隔轻度强化。儿童阴囊淋巴管瘤影像上需与睾丸畸胎瘤、睾丸鞘膜积液等疾病鉴别。睾丸畸胎瘤常引起同侧睾丸显示不清，且包块内部可见液体、脂肪甚至钙化成分。而淋巴管瘤一般不累及同侧睾丸，信号以液体成分为主，比较容易鉴别。睾丸鞘膜积液一般为液体信号，但其内部无明显分隔，可与淋巴管瘤鉴别。

EPO-1589

GALD-NH 2 例报道

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目的：提高对妊娠(胎儿期)同族免疫性肝病(gestational alloimmune liver disease，GALD) 所造成新生儿血色病（NH）的认识。
方法：回顾性分析产妇 2 次足月顺产新生儿均于出生后数天死亡病例的临床及影像学资料。
结果：1、同一产妇分别于 2016 年 4 月及 2018 年 2 月分别足月顺产 1 男婴，2 名患儿出生后均以新生儿低血糖收入院，后出现重度黄疸、凝血功能障碍、心功能衰竭、DIC，分别于出现后 70 天死亡及 5 天后放弃治疗自动出院（后死亡）。2、既往史：产妇 2015 年人工流产一次，否认遗传病及传染病。3、实验室检查：患儿 1：生后 5 分钟血糖 1.2mmol/l，外院治疗 5 天，转入我院后，出现肝功异常，转氨酶高，直接胆红素高；巨细胞病毒定量<500.00；腹水逐渐增加，直接胆红素高，总胆汁酸盐 177.91umol/L；AFP>2000ug/L；肾功正常；出现凝血功能异常、心功能异常。患儿 2：生后发现血糖低 1 小时，血糖 0.6mmol/l；临床表现同第一胎，低蛋白，凝血功能异常，休克。4、影像学检查：患儿 1：头颅 MRI 平扫（外院）示 1）双侧枕顶部改变，不除外低血糖脑损伤；2）右侧额叶皮层下及右侧脑室体旁异常信号影，弥散轻度受限，考虑损伤性改变；西京医院肝胆核素检查：不考虑完全性胆道闭锁，肝脏炎症明显；本院腹部 MRI 平扫示大量腹水，胰腺呈短 T2 信号影。患儿 2：腹部 CT 平扫+增强检查示腹水。5、分子遗传学检查：患儿 1：全外显子基因检测阴性；线粒体相关基因检测阴性；血尿串联质谱：酪氨酸高 350（25-250）。患儿 2：无。
结论：对产前或生后短期内即有肝病表现均应疑诊 NH；对于无法解释的新生儿死亡或死产也应考虑 GALD-NH。

EPO-1590
MRU 在儿童先天性泌尿系疾病中的临床应用价值

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【摘要】**目的**：评价磁共振尿路造影(MRU)对儿童先天性泌尿系疾病的临床应用价值。**材料和方法**：我院就诊有完整病史患儿 205 例，女 98 例，男 107 例，年龄 1 月-17 岁。采用快速自旋回波(FSE)重 T2 加权序列对患者进行泌尿系冠状位扫描，将图像按最大强度投影(MIP)法重建出 MRU 图像。经手术、临床随访或病理证实为单侧及双侧肾积水 168 例，其中伴有输尿管扩张 77 例，伴重复肾 5 例，单侧肾发育不良 3 例，多囊肾 2 例，尿路结石 1 例；单侧异位肾脏 1 例，马蹄肾 2 例，输尿管囊肿 10 例，膀胱憩室 1 例，膀胱外翻 1 例，双侧及单侧重复肾 18 例，单侧肾发育不良或缺如 3 例，髓质海绵肾 1 例。**结果**：各例的 MRU 均清晰显示泌尿性病灶，尤其对肾盂积水及尿路梗阻部位显示良好，解剖结构清晰。结合 MRI 与其他影像资料，可对先天性泌尿系疾病作出定性定位诊断。**结论**： MRU 是无创伤的检查方法，不接触射线，不需碘对比剂，诊断儿童先天性泌尿系疾病定位、定性准确，是一种新的安全的影像检查手段，尤其适用于因严重梗阻 IVP 显影不良的病例。

EPO-1591
探讨彩色多普勒超声与 MSCT 在小儿非外伤性急腹症中的临床应用价值

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目的 探讨彩色多普勒超声与 MSCT 在小儿非外伤性急腹症中的临床应用价值 **方法** 取本院 2018 年 1 月至 2019 年 3 月收治的 90 例小儿非外伤性急腹症患儿，收集患者临床及影像学资料。将 MSCT 检查和彩色多普勒超声检查的诊断结果进行讨论和分析；对比经 MSCT 检查和彩色多普勒超声对小儿非外伤性急腹症的诊断准确度、敏感度和特异度。 **结果** 经彩色多普勒超声检查对小儿非外伤性急腹症的诊断灵敏度、特异度和准确度分别为 67.78%、70.00%、74.44%，MSCT 检查对小儿非外伤性急腹症的诊断灵敏度、特异度和准确度分别为 88.89%、91.11%、87.89%。MSCT 检查对小儿非外伤性急腹症的诊断灵敏度、特异度和准确度明显高于彩色多普勒超声检查。两者比较差异有统计学意义（*P<0.05*） **结论** 彩色多普勒超声和 MSCT 检查均可有效的显示小儿非外伤性急腹症的影像学特点，但 MSCT 检查鉴别诊断小儿非外伤性急腹症的能力优于彩色多普勒超声。

EPO-1592
新生儿及小婴儿卵巢囊肿的 MRI 诊断价值

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目的 分析总结 3 月龄以下新生儿及小婴儿卵巢囊肿的 MRI 表现特点及其诊断价值。**方法** 收集 18 例经手术病理证实的卵巢囊肿患儿，年龄范围 1 天～2 月 10 天，中位年龄为 23 天。所有入组患儿均行 MRI 平扫及增强检查，分析其临床资料及 MRI 表现，观察内容：1.病灶大小、形态、位置、囊壁及囊内信号特征、强化方式；2.如根据基本征象疑为卵巢来源者，需注意病灶同侧及对侧附件、病灶与子宫的位置关系、腹盆腔内有无明显渗出等。**结果** 18 例中 16 例患儿产前超声诊断出腹部

囊性占位，MRI 显示 18 例均为单侧发病。11 例未发生扭转者在 MRI 上均表现为囊肿信号特点，呈薄壁均匀的长 T_1 长 T_2 信号，囊内无分隔，增强后囊内无强化或囊壁局部轻度强化，病灶边界清楚且周围无明显渗出，子宫位置正常或偏向病灶同侧。另 7 例卵巢囊肿扭转者病灶张力较大，于 T_1WI 序列信号不同程度增高，其中 3 例出现液-液平面，2 例囊壁出现弧形增厚，2 例病灶外带卵泡增大呈串珠状排列，2 例与同侧子宫角之间存在条索状等 T_1 信号，3 例病灶转向子宫对侧，子宫发生牵拉移位。**结论** 新生儿及小婴儿卵巢囊肿的发病率不高，临床常无明显症状或体征，主要依靠影像学检查来明确诊断。MRI 可清晰显示卵巢囊肿的形态、信号，明确是否合并囊内出血、囊肿继发蒂扭转等，同时可评估同侧残存卵巢组织，为手术治疗提供依据。本病需与其他腹部脏器外囊性病变相鉴别，如卵巢畸胎瘤、肠系膜囊肿、肠重复畸形，MRI 可根据病变的信号特点及子宫附件的显示情况作出鉴别诊断。

EPO-1593

腹内疝的分型及多层螺旋 CT 诊断思路

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目的 腹内疝（intraperitoneal hernias）是指腹腔内脏器或组织（主要是小肠及其系膜）通过腹膜或肠系膜正常或异常的孔道、裂隙离开原有位置而进入腹腔内的某一解剖间隙。探讨多层螺旋 CT（MSCT）多平面重建（MPR）技术在腹内疝诊断及分型中的临床应用价值。**方法** 回顾性分析 2010 年 8 月～2018 年 2 月经临床随访或手术证实的 27 例腹内疝患者的横轴面 CT 及 MPR 表现。发病至首次 CT 时间为 2h～5d，CT 随访检查 16 例。**结果** 27 例腹内疝包括肠粘连束带疝 13 例，右侧十二指肠旁疝 4 例，盆腔内疝 3 例，乙状结肠周围疝 2 例，盲肠周围疝 2 例，左结肠系膜裂孔疝 1 例，经肠系膜疝 1 例，吻合口后方疝 1 例，疝内容物均为小肠及其系膜。13 例肠粘连束带疝包括 7 例术后小肠粘连、小肠系膜粘连、小肠与腹壁粘连、大网膜与小肠及回盲部肠系膜粘连和 6 例无手术小肠系膜粘连、空肠与大网膜粘连、升结肠系膜与侧腹壁粘连、胆囊与结肠粘连、大网膜及小肠与回盲部肠系膜粘连束带疝。3 例盆腔内疝均为 Douglas 疝，其中 2 例有子宫肌瘤手术史。CT 表现为小肠形态异常，小肠管移位，扩张积液小肠袢呈肿块状、囊袋状、簇状聚集、扇状排列，小肠系膜血管增粗、曲张、牵拉、移位，肠系膜皱缩呈条状，血管纠集及皱缩条状肠系膜向疝口部位集中形成缆绳征 18 例，疝口呈鸟嘴征 19 例，小肠壁水肿增厚 11 例，部分见粘连束带。合并闭襻性小肠梗阻 17 例，近端小肠梗阻 13 例，小肠扭转 3 例。腹盆腔积液 13 例，盆腔积液 7 例。CT 随访检查中 8 例闭襻性小肠梗阻或近端小肠梗阻加重，4 例减轻，4 例无明显变化。**结论** 多层螺旋 CT 多平面重建能较准确地诊断腹内疝，并可进行分型，不但能清晰地了解肠袢位置变化，同时可以了解肠系膜血管情况及肠壁血供情况，为临床诊断和手术治疗提供了可靠依据，已成为目前腹内疝诊断及分型的首选检查手段。

EPO-1594

DIXON 水脂分离联合 T2mapping 技术评价杜氏肌营养不良儿童骨骼肌炎性水肿的应用价值

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目的：杜氏肌营养不良（Duchenne Muscular dystrophy, DMD）是一种常见的 X 连锁隐性遗传性疾病，因肌营养不良蛋白（Dystrophin）基因突变或缺失，导致渐进性肌肉变性、最终纤维化及脂肪

替代等病理改变。本研究旨在应用 DIXON 水脂分离联合 T2mapping 技术量化评价 DMD 儿童骨骼肌炎性水肿情况，分析两种技术的对骨骼肌水肿的诊断价值。
材料及方法：纳入标准为临床基因测定诊断为 DMD，所有患者均进行臀部肌肉 MRI 检查，包括 DIXON 水脂分离序列及 T2mapping 序列。选取臀部肌肉作为目标测量肌肉，采用 DIXON 水脂肪分离图中的水图对所有患者的炎性水肿及脂肪变程度进行评分（评分标准：轻度为 1 分、中度为 2 分、重度为 3 分）；采用 T2mapping 技术量化对应区域肌肉的 T2 值。
结果：通过 DIXON 水脂分离序列中生成的水图发现，20 例患者中，8 例（40%）患者水肿评分为 1 级，10 例（50%）患者水肿评分为 3 级，仅 2 例（10%）患者水肿评分为 2 级；评价脂肪图发现，脂肪替代达 1 级患者共 12 例（60%） 达 2 级患者共 5 例（25%） 达 3 级患者共 3 例（15%）。通过双变量相关性分析发现，患者 T2mapping 测量所得的 T2 值与 DIXON 水肿评分成正相关（r=0.652，p=0.002）,与脂肪替代程度评分成负相关（r=-0.514，0.020）。同时水肿评分 3 级患者其 T2 值明显高于水肿评分为 1 组患者（32.95ms vs.23.92ms，p=0.001）。
结论：DIXON 水脂分离序列可以分别成水像及脂肪像，其生成的水图脂肪信号，使水肿信号更为突出，能初步评价 DMD 骨骼肌的水肿情况，但其量化价值有限。T2mapping 技术可量化骨骼肌信号，其信号值与 DIXON 水脂肪分离技术所得水图的水肿评分有较好的一致性。

EPO-1595
儿童四肢长骨郎格汉斯组织细胞增生症的影像诊断

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目的：探讨儿童四肢长骨郎格汉斯细胞组织细胞增生症（LCH）的影像表现及病理特点，提高影像诊断水平。方法：方法回顾性分析 19 例经手术及病理证实的四肢长骨 LCH 患儿临床及影像资料。本组 19 例行 X 线及 CT 检查，5 例行 MR 检查，对其影像特征进行分析。结果：本组均为单发病灶，其中股骨 9 例、胫骨 4 例、肱骨 4 例、腓骨 1 例、尺骨 1 例。X 线及 CT 检查病灶表现为溶骨性、虫蚀样或膨胀性骨质破坏，骨膜反应常见；CT 及 MR 显示周围软组织肿胀常见，未见软组织肿块。结论：四肢长骨 LCH 好发于长骨骨干及干骺端，表现为溶骨性、虫蚀样或膨胀性骨质破坏伴软组织肿胀，发病部位及影像征象具有一定特点，但与恶性骨肿瘤等鉴别仍有一定难度。综合 X 线、CT 及 MR 表现能提高本病的术前诊断率，并为评估预后提供重要依据。

EPO-1596
SAPHO 综合征临床及影像学表现

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【目的】提高对 SAPHO 综合征临床及影像学表现的认识。
【材料和方法】对我院一例 13 岁男性 SAPHO 综合征患者个案报道并文献复习。
【结果】患者右上臂及右膝关节疼痛 1 周，发热 2 天。8 月前面部、后颈部反复出现少量痤疮。2 月前痤疮大量增多，分布于颈部、前胸及后背，皮疹顶端有脓点、脓疱。血常规示血象略高，C 反应蛋白增高，血沉增快。MRI 显示右肩关节、右膝关节滑膜炎并积液，右肱骨、右胫骨、右腓骨骨髓炎。CT 显示右侧锁骨近端骨质破坏，胸锁关节破坏。
滑膜炎(synovitis)、痤疮(acne)、脓疱病(pustulosis)、骨肥厚(hyperostosis)和骨髓炎(osteomyelitis)综合症简称 SAPHO 综合征，是主要累及皮肤骨和关节的一种慢性疾病，其病因和

发病机制研究尚不明确。发病年龄以青年和中年多发，发病年龄最小 10 岁，最大 59 岁。女性报道稍多于男性。影像学表现：CT 及 MRI 对本病滑膜炎和骨炎的早期诊断有很大意义。90%的患者出现骨关节病，可累及中轴骨及外周骨，主要表现为滑膜炎、骨肥厚和骨炎。骨炎常累及骨皮质、骨髓腔或者同时累及两者，但是典型病变是累及胸骨上端，锁骨内端及第一对肋软骨的骨质硬化和骨肥厚。胸骨为 62%，其次为骶髂关节(33%)，脊柱(24%)，周围骨(19%)，周围关节(10%)；81%的病人有两处以上病变，同时可伴有关节周围炎症。52%～66%的病人有掌跖脓皮病，14%～15%的病人有痤疮，9%～24%的病人有银屑病。皮肤病变可发生在骨关节病之前或之后。本病预后良好。本病进展缓慢，无明显的致残性，无严重的并发症发生。大部分病例为自限性，疾病平均持续时间约 4-5 年。

【结论】SAPHO 综合征临床及影像表现典型，了解此病多数可做出正确的诊断。

EPO-1597

Value of both Tumor and Peritumoral MR Parameters in Osteosarcoma Patients for Monitoring Chemotherapy Response

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Purpose: To evaluate the diffusion weighted imaging (DWI) and dynamic contrast-enhanced MRI (DCE-MRI) as early imaging indicators of tumor histologic response to preoperative neoadjuvant chemotherapy and as probable prognostic factors for event-free survival (EFS) and overall survival in osteosarcoma (OS) with the region of both tumor and peritumoral area.
Materials and Methods: Thirty-four osteosarcoma patients received three courses of neoadjuvant chemotherapy followed by surgery during 2014-2018 were enrolled in this study. All patients underwent baseline and post-chemotherapy diffusion-weighted and dynamic contrast-enhanced MRI to monitor the response to preoperative neoadjuvant chemotherapy. Lesion region was defined as tumor area and peritumoral area (periphery within 2cm) and delineated in the workstation. Parameters of ADC, Ktrans, Kep, Ve and IAUC as well as corresponding differences (ΔADC, ΔKtrans, ΔKep, ΔVe and ΔIAUC) between pre- and post- chemotherapy in both tumor and peritumoral area were evaluated. Receiver operating characteristic analysis was used to evaluate the diagnostic performance of these parameters. The associations of all parameters with tumor histologic response, EFS, and overall survival were also calculated.
Results: Ktrans and ADC were significantly decreased in responders and non-responders post-chemotherapy in both area. ΔKtrans and ΔADC were significantly difference between groups in both area. Lower post-Ktrans in tumor area and lower pre-Ve in peritumoral area significant prognosticate for longer EFS (P=0.002, P=0.026) and overall survival (P=0.003, P=0.023).
Conclusion: In osteosarcoma, DW- and DCE-MRI parameters in both tumor and peritumoral area can well reflect chemotherapy response and prognosticate EFS and overall survival.

EPO-1598

64 排螺旋 CT 对儿童骨骺损伤的诊断价值

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目的：探讨 64 排螺旋 CT 在儿童骨骺损伤的诊断价值。材料和方法：回顾性分析 2016-2019 年 981 例因关节损伤在我院检查的儿童骨关节 CT 片，使用 GE 64 排螺旋 CT 扫描，轴位扫描，扫描后重建图像为层厚 0.625mm，层间距 0mm，于 GE 工作站行多平面重建及 SSD，调整窗宽窗位，清晰显示骨骺的骺软骨及骺板。所有患者均治疗后 X 线平片随访。79 例行 MRI 检查。343 例行切开钢针固定手术并术后石膏固定，638 例石膏固定治疗。结果：CT 扫描诊断为骺板损伤 I 型 11 例，II 型 891 例，III 型 41 例，IV 型 33 例，V 型 5 例，多平面重建时窗宽为 210-260，窗位为 30-60，清晰显示骨骺的骺软骨及骺板。X 线平片诊断为无骨折 31 例，骺板损伤 I 型 11 例，II 型 894 例，III 型 6 例，IV 型 34 例，V 型 5 例；将 21 例 II 型骨折误诊为无骨折，1 例 III 型骨折误诊为无骨折， 4 例 III 型骺板损伤误诊为 II 型，3 例 IV 型骨折误诊为无骨折，7 例 IV 型骺板损伤误诊为 II 型。当长骨干骺端有骨片撕脱并有移位时，往往是骺板损伤。MRI 检查可以敏感显示损伤水肿信号及血肿，但细小骨片不易显示。结论：64 排螺旋 CT 可以较为清晰显示 X 线平片无法显影的骺软骨、骺板，能为儿童骨骺损伤的诊断和分型提供较为准确可靠的信息，并能显示 MRI 不易诊断的细小骨片，为临床制定合理有效的治疗方案、判断预后提供客观的而有价值影像依据。

EPO-1599

MRI 诊断儿童孟氏骨折骨间膜损伤的临床价值

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目的 探讨 MRI 检查在诊断儿童新鲜孟氏骨折骨间膜损伤中的临床应用价值。**方法** 2017 年 1 月至 2018 年 1 月，我院接受手术治疗的儿童新鲜孟氏骨折 30 例，其中男 17 例，女 13 例；年龄 4∽13 岁，平均 7.2 岁；左侧 9 例，右侧 21 例；所有患儿术前均进行了 MRI 检查，包括矢状位（T2WI；T2WI+FAT）、冠状位（T1WI;T2WI;T2WI+FAT）、横轴位（T2WI+FAT）。观察并记录儿童孟氏骨折的 MRI 表现及损伤程度，并与手术中表现进行对比分析并统计 MRI 影像诊断符合率。**结果** MRI 检查显示单纯膜部撕裂 23 例，单纯腱部撕裂 7 例，两者均撕裂 9 例，后期经手术证实对于骨间膜连续性中断的诊断符合率达到 95%，经手术治疗所有 7 例腱部撕裂均进行修补，膜部撕裂 9 例进行手术修补；30 例患者均进行了 3∽12 个月的随访，治疗后影响旋后功能的 8 例，愈后未影响生理功能的 22 例。**结论** MRI 检查可以清晰的显示出儿童新鲜孟氏骨折骨间膜损伤的程度及范围，对其临床治疗方案的判断及手术方式的制定具有一定的指导意义。

EPO-1600

浅析儿童肘关节隐匿性骨折的 X 线征像

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摘要

目的 分析儿童肘关节隐匿性骨折的 X 线征像，增强对此病 X 线征像的认识。

方法 回顾性收集 201701-201901 期间因肘关节外伤来我院就诊并首次 X 线平片阴性诊断的 100 例患儿的影像学资料，将随诊确诊为隐匿性骨折的 20 例患儿作为研究组，回顾性分析研究组的 X 线征象。
结果 研究组中脂肪垫征阳性率为 100%，除此之外骨皮质丘状突起/皮质凹陷、骨小梁中断及肱骨前线阳性的检出率也较高。
结论 X 线检查能够发现许多对诊断儿童肘关节隐匿性骨折有参考价值的征象，深入分析各种 X 征象有助于降低隐匿性骨折的漏诊率，提高临床诊断准确性。

EPO-1601

Imaging findings of inclusion body fibromatosis with bone destruction:a case report and literature review

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A 3-year-old boy was admitted to hospital with a markedly enlarged mass on his left foot.A lump on the middle toe of his left foot was found at birth. It was not obvious at that time, and his parents had not paid attention to it. In the last 8 months, the mass increased significantly. After admission, the MRI and X-ray examination of the foot showed that the mass grew around the phalanx and invaded the adjacent phalanx. At the same time, the mass squeezed the toes on both sides, affecting joint activity. Therefore, his parents asked for surgery for him. The postoperative pathological results were inclusion body fibroids. At present, the patients recovered well and no recurrence was found. Here, We report a rare case of Inclusion body fibromatosis with bone invasion..

Foot MRI (Magnetic resonance imaging) showed a lump with a maximum cross-section of about 2.3*3.2*3.3cm in the soft tissue near the third phalanx of the left foot. It showed a hypointense on T1WI and slightly hyperintense on T2WI, and a sheet and strip signal which is isointense to muscle on T2WI was seen inside.Also, the mass showed a non-uniformly hyperintense on the Fat suppression sequence and a unevenly and obvious enhancement on contrast enhanced T1-weighted image.Most of the mass is subcutaneously located on the dorsolateral side of the 3rd phalanx, enclosing the 3rd phalanx of the left foot,the bone of the 3rd toe is invaded ,and the 4th toe is pushed outward (fig.1).Also,The X-ray shows a soft tissue shadow between the 3rd-4th toes of the left foot, and the 4th toe is pushed outward. The proximal bone of the third toe was locally damaged, with slight hardening of the edges (fig.2).

EPO-1602

儿童颅锁骨发育不全综合征 3 例并文献复习

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目的

目的：探讨儿童颅锁骨发育不全综合征的临床表现和 X 线特点，提高对颅锁骨发育不全综合征的认识。

方法
方法：在文献数据库中对颅锁骨发育不全综合征的病例报道进行检索，收集本院近期 3 例颅锁骨发育不全综合征病例资料，利用 X 线检查全面了解患者骨骼发育情况并总结分析。

结果
结果：颅锁骨发育不全综合征是一种累及骨骼和牙齿的常染色体显性遗传性疾病，具有明显的家族聚集性，男女发病率无明显差别。颅锁骨发育不全综合征可以出现牙颌面畸形、锁骨发育不全、锥形胸、跗跖关节外移畸形、耻骨联合增宽等是诊断颅锁骨发育不全综合征的主要 X 线特征，骨盆畸形、掌指及跖趾关节的畸形是诊断该病重要的辅助 X 线特征。本组 3 例病例均存在上述表现。

结论
结论：颅锁骨发育不全综合征存在特征性临床及影像学表现，通过详细的临床资料采集，不难对本病作出早期诊断。

EPO-1603
儿童骨龄评价—《中国人手腕骨发育标准-中华 05》及其应用

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骨龄是一种生物年龄，是生长发育的重要参数。骨龄评价可确定发育年龄、预测身高、预防生长迟缓，是性早熟的重要诊断依据，同时在司法鉴定中有重要作用。本文初步介绍《中国人手腕骨发育标准-中华 05》，并通过实例着重介绍 RUS－CHN 法计算儿童骨龄具体操作过程及应用。

EPO-1604
儿童钙化性椎间盘炎的影像学诊断

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【目的】提高对儿童钙化性椎间盘炎临床及影像学表现的认识。
【方法】总结我院确诊的儿童钙化性椎间盘炎 4 例并文献复习。
【结果】儿童钙化性椎间盘病是一种罕见的综合征。1858 年 Luschka 第一次提及。本病可以发生在从新生儿到青春期，但其发病高峰为 6～10 岁，无性别差异。全身症状有颈部疼痛、活动乏力、发热和乏力等。病变有自愈性，症状体征在短期内能很快减轻或消失
影像学表现：多发生在颈椎，以单个椎间盘发病为主 ，偶有多椎间盘钙化发生，X 线表现为椎间盘钙化，髓核脱出，椎体改变和曲度失常。椎间盘钙化可表现为团块状、盘状、碎裂状，团块状髓核钙化代表髓核整体钙化，盘状钙化表示髓核钙化并被压扁，碎裂状钙化可能是团块状钙化灶处于吸收、消散期改变，也可能为髓核破裂。髓核可脱出或移位，向后脱出可表现神经系统压迫症状。向前脱出一般无明显症状，严重者可表现为食管吞咽异常。椎体形态异常，椎体的改变主要为:椎

体变扁、楔状改变，椎体缘尖刺样改变，严重者呈“口钳征”， 椎间隙一般无明显改变。患者随访观察，钙化一般在 3～6 个月内消失，最短的为 2 周，最长则有 11 年的报道。
鉴别诊断：本病有自限性，时间对于本病的诊断与鉴别诊断有重要意义。如果在诊断上有疑虑，通过密切观察，定期复查 x 线片都可以得到确诊。需要鉴别的疾病主要有：颈椎结核，椎间盘的感染或创伤。二者症状体征可类似钙化性椎间盘炎，但均无椎间盘钙化。
临床治疗上，主要采取保守治疗，本病有自愈性，症状可很快缓解，一般只需对症处理。对有神经压迫症状的患者，经保守治疗不缓解或有进行性加重的脊髓压迫症状者应进行手术治疗。
【结论】钙化性椎间盘炎的临床及影像学表现具有特征性，随访可自愈，因此认识此病对临床治疗具有重要意义。

EPO-1605

儿童胸腔骨外尤文氏肉瘤一例

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病例：患者女性，7 岁 2 月，因“咳嗽十天，伴发热”入院。入院查体：右肺呼吸音粗，左肺呼吸音明显低，肋骨无压痛，右肺叩诊清音，左肺叩诊浊音，心律齐，心音有力，心界偏右。胸片检查：左白肺改变，炎症伴胸腔积液。B 超提示：左侧胸腔内稍高回声团，占位考虑。CT 检查：左侧纵隔及左侧胸腔可见巨大软组织肿块影，呈多个大小不等的团状及分叶状改变，其边界欠清晰，其内可见砂砾样高密度影，增强扫描可见明显不均匀强化，肿块内见多出杂乱迂曲肿瘤血管影，纵隔结构明显受压右偏，左侧支气管受压变窄，左侧第 3 肋骨骨质密度不均匀，部分呈虫蚀样破坏。右肺可见多发大小不等的结节影及团状高密度影。左侧胸膜腔可见较多液体密度影。两侧锁骨上窝可见多发小淋巴结影。病理检查肉眼：质地软、切面灰白、实性。镜下：成片的肿瘤细胞增生浸润、细胞形态较一致，呈圆形或卵圆形，伴灶性坏死。免疫组化：KI67(60%+),INI1(+),WT1(-),BCOR(+),NKX2.2(+),NTRK(弱+)，DES(-),AE1/3(-)。病理诊断:（左胸腔）骨外尤文氏肉瘤/外周原始神经外胚层瘤（E-EWS/pPNET）。
讨论：骨外尤文氏肉瘤是一种罕见的肿瘤，通常见于骨盆、躯干和四肢。Tefft 等人于 1969 年首次报道了 4 例骨外尤氏肉瘤。其形态学上与骨尤文氏肉瘤相似，病理组织化学染色为小而圆形的蓝色细胞，细胞核深染，免疫组织化学染色 CD99 阳性。临床上早期症状不典型，后期常表现为软组织肿块伴疼痛。转移最常见通过血液转移至肺。影像学表现：超声显示，轮廓清晰的低回声肿块及肿块内的血流信号；CT 表现为与肌肉密度相似的肿块影，密度欠均匀；MRI：T1 加权图像上常表现为低至中等信号强度的肿块，在 T2 加权图像上表现为高信号强度的肿块，并伴有不均一增强。骨外尤文氏肉瘤的影像学表现与其他的小圆形恶性肿瘤难以鉴别，确诊多依赖于病理学和免疫组化检查。

EPO-1606

X 线测量在在脑瘫患儿继发髋关节发育不良中治疗评价中的应用

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目的　通过对 20 名脑瘫患儿继发髋关节发育不良治疗前后的观察，评估 X 线测量治疗中评估的应用价值。方法 通过对 2012.6-2018.6 于我院治疗的 1-3 岁 20 名继发性儿髋关节发育不良采用家庭髋关节姿势管理治疗前后观察，行骨盆正位片检查，测量治疗 6 月、12 月、18 月、24 月的颈干角（ NSA)、髋臼指数（AI）及股骨头偏移百分比(MP)，并进行步行功能评估采用粗大运动功能量表（GMFM）的 E 区评定，平衡能力评估采用 Berg 平衡功能量表（BBS）评定。结果 颈干角(NSA)、

髋臼指数（AI）及股骨头偏移百分比(MP)逐渐减低；治疗 6 月、治疗 12 月 差异无统计学意义（P>0.05）。治疗 18 月、治疗 24 月差异有统计学意义（P<0.05）；颈干角(NSA)、股骨头偏移百分比(MP)与粗大运动功能量表（GMFM）、Berg 平衡功能量表（BBS）呈负向相关，差异有统计学意义 （P＜0.05）。髋臼指数（AI）与粗大运动功能量表（GMFM）、Berg 平衡功能量表（BBS）呈负向相关，差异无统计学意义 （P>0.05）结论 X 线测量在治疗评价中具有良好的应用价值，通过骨盆正位片评估发育髋臼发育情况 ,对临床制定进一步治疗方案、指导手术有着重要作用。

EPO-1607

AI 骨龄评价（以 TW 法为基础）的临床应用

宁刚
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比较研究五种骨龄测定方法——CHN 法、TW2 法中英日三种标准和 TW3 法骨龄（skeletal age, SA）对中枢性性早熟患儿的诊断价值。CHN 法 ROC 曲线下面积 A_{CHN}为 0.919±0.024，TW_2法英国人标准 A_{TW2}为 0.931±0.022，TW_2法中国南方人标准 $A_{TW2\text{-}CHN}$为 0.945±0.019，TW_2法日本人标准 $A_{TW2\text{-}JP}$为 0.936±0.023，TW_3骨龄测定法 A_{TW3}为 0.926±0.023。 五种方法的诊断价值没有统计学差异（u=0.85，P<0.2）。表明五种骨龄测定方法对于中枢性性早熟患儿的诊断价值都较高；而 TW_2法中国南方人标准（TW2-CHN）的诊断价值最高。
我们以 TW2 中国南方人标准、TW3 两种诊断标准为基础，利用 U-NET 卷积神经网络结合传统图像处理的算法对原始 DICOM 数据进行预处理，包括图像灰度值归一化、手骨区域图像分割、正位校正、大小匹配等，以减少图像采集过程中差异性对图像识别的干扰；然后，利用基于区域的卷积神经网络（region-based convolutional neural network, R-CNN）对手腕部骨龄片中 13 块桡尺骨、掌指骨，以及 7 块腕骨进行了骨骺位置及骨化中心的识别定位；用类似 VGG CNN 的深度网络分类回归算法进行 9 个级别的骨龄自动评级（A-I），将骨龄分级转换成相应的分值并最终换算成骨龄（TW2-20 骨、TW2-13 骨、TW2-7 骨、TW3-13 骨及 TW3-7 骨骨龄）。同时建立骨龄大数据平台系统，每一个患儿自动生成个人电子档案、纳入样本数据库，并自动生成骨龄报告并支持自助打印。

EPO-1608

LCH 累及多器官的影像学表现

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目的 探讨朗格汉斯细胞组织细胞增生症(Langerhans cell histiocytosis, LCH）累及多器官的影像学表现及鉴别诊断, 提高对本病认识。 方法 我们复习 59 例经组织病理学免疫组化证实朗格汉斯细胞组织细胞增生症的影像学及临床资料。结果 59 例中，15 例为孤立性骨病变, 23 例为多灶性骨病变，主要表现为溶骨性骨质破坏，病变一般境界清楚，6 例出现骨膜反应。其中 23 例可见软组织肿块；术前诊断为骨肿瘤 5 例, 炎症或其他良性病变 4 例。59 例中有 21 例进行了手术治疗，38 例穿刺活检。侵犯实质脏器的主要影像多发密度软组织肿块或结节, 因部位不同形态各异。本病的病因尚未明确，可累及全身多个器官 , 包括骨、肺、肝、脾、垂体、皮肤 、黏膜以及淋巴组织。临床表现取决于单器官或多器官以及受累的程度，当单器官受累时常常需要与肿瘤、炎症及结核等病变鉴别。 结论 朗格汉斯细胞组织细胞增生症，结合临床特点及影像表现能准确显示病变范围及邻近的组织病变，且结合临床基本作出诊断。

EPO-1609
磁共振测量声门下环状软骨水平最狭窄处气道数值用于小儿无囊气管导管选择的临床效果

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目的 探讨磁共振测量声门下环状软骨水平最狭窄处气道前后径、左右径及面积用于小儿无囊气管导管选择的临床效果。
方法 测量 120 例 0～12 岁患儿颈椎磁共振声门下环状软骨水平最狭窄处气道前后径、左右径及面积，其中行手术需气管插管的 1～11 岁患儿 59 例，通过磁共振测量选择气管导管(磁共振声测量法)；插管后视临床实际情况决定是否更换导管，至临床插管成功(临床最适)；同时应用年龄公式法计算每位患儿的气管型号，以插管成功导管型号为标准，对磁共振测量法与年龄公式法选择导管的准确率进行统计学分析。
结果 120 例患儿，其中女患儿 54 例，男患儿 66 例，男患儿声门下环状软骨水平最狭窄处气道前后径：5.76mm～13.94mm，左右径：5.30mm～12.32mm，面积：21.80mm^2～120.71mm^2；女患儿声门下环状软骨水平最狭窄处气道前后径：5.95mm～15.83mm，左右径：5.25mm～16.33mm，面积：21.80mm^2～173.8mm^2；男女患儿各径线差异无统计学意义（P>0.05）。90%患儿左右径小于前后径，差异有统计学意义（P<0.05）。120 例患儿中 59 例行手术需气管插管，其中女患儿 32 例，男患儿 27 例，声门下环状软骨水平最狭窄处气道前后径：5.95mm～13.69mm，左右径：5.25mm～10.82mm，面积：20.69mm^2～127.62mm^2。磁共振测量法和年龄公式法的准确率分别为 96％和 64％，差异有统计学意义(P＜0.05)。
结论 根据磁共振测量声门下环状软骨水平气道数值选择小儿无囊气管导管优于根据年龄选择。

EPO-1610
3.0TMR 在先天性尺桡骨融合治疗前后的指导意义

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目的：探讨并研究 3.0TMR 在先天性尺桡骨融合治疗前后的作用。
方法：收集 2016 年 5 月 25 日至 2019 年 7 月 14 日在我院就诊的先天性尺桡骨融合的病例 33 例 45 侧，年龄分布自 6 月至 16 岁，平均 3.3 岁，其中女 11 例，男 22 例，其中 13 例 20 侧经我院手术治疗，余 25 侧保守治疗，并选取 20 侧先天性尺桡骨患儿健康对侧和因前臂皮肤血管瘤而就诊的患儿作为对照组，分为三组，手术组，保守治疗组，健康组，分析治疗前后的肘关节 MR 图像，通过测量 3D-PD 像上每层图像旋前圆肌、旋后肌的肌肉的面积，计算其体积；对手术组及保守治疗组进行跟踪随访 1.5 年到 3 年，并比较治疗前后的差异，以及三组之间的差异，采用 t 检验和 q 检验分别对两组之间以及组间进行比较，P<0.05 为差异有统计学意义。
结果：1.先天性尺桡骨融合的患儿的旋前圆肌、旋后肌的体积与相同年龄对照组相比，P<0.05，差异具有统计学意义。2.手术组中两例术后发生再融合，一例发生缺血性肌筋膜室综合征。3.比较治疗前后，旋前圆肌、旋后肌体积增加比例：手术组>保守治疗组>健康对照组（P<0.05），差异具有统计学意义。

结论：本院先天性尺桡骨截骨术可明显改善患儿前臂旋前功能，但手术有一定的风险，前臂保守治疗在一定程度上也能改善患儿的肘关节功能，MR 在指导先天性尺桡骨融合病变的治疗中有重要意义。

EPO-1611
儿童郎格罕细胞组织细胞增生症的影像学表现

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目的：回顾性分析郎格罕细胞组织细胞增生症(LCH)的影像学表现特点,做到早期、准确诊断,以提高临床治愈率。
方法：收集 2017 年 1 月至 2018 年 12 月郑州大学第三附属医院收入院的 32 例 LCH 患儿临床资料，总结其影像学检查结果。32 例中年龄最小患者 1 个月,年龄最大患者 15 岁 3 月,32 例患儿中男性患儿 18 例,女性患儿 13 例。32 例患者中，夏季发略高于其他季节。临床表现主要为发热、皮疹、肝脾和/或淋巴结肿大、贫血、耳溢、突眼、尿崩、骨骼表现、腹泻等；28 例胸部影像学（平片+CT）检查，异常 23 例，骨影像学检查（平片+CT+MRI）30 例，异常 26 例，多个部位骨损害比单个部位骨损害多见，10 例腹部检查，3 例异常。
结果：1、胸部影像学检查 28 例,23 例异常,主要为两肺中上野较对称分布的多发小结节影，部分可见囊泡影，晚期可见反复气胸出现；
骨影像学检查 30 例(头颅骨 28 例、躯干骨 23 例、四肢骨 23 例、骨盆骨 15 例),30 例有骨质破坏，多为溶骨性骨质破坏，多个部位骨损害比单个部位骨损害多见。骨质破坏常见部位依次为颅骨、股骨、椎体、肋骨、髂骨、肱骨。蝶鞍破坏 4 例(2 例有尿崩、2 例无尿崩)。垂体 CT 或 MRI 检查 10 例,垂体影像学异常 5 例(2 例有尿崩,3 例无尿崩)。肝脾肿大患儿中有 3 例腹部 CT 检查可见多发结节影，增强扫描轻度强化。
结论：儿童郎格罕细胞组织细胞增生症可累及多个脏器,表现多样，影像学检查结合临床有助于本病的早期诊断。

EPO-1612
儿童肱骨上段骨肿瘤临床特点与影像学分析

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目的　分析儿童肱骨上段骨肿瘤的临床特征及影像学表现，以提高对该部位骨肿瘤的认知及疾病诊断水平。
方法　回顾 2010 年至 2018 年本院收治的经病理证实的 63 例肱骨上段骨肿瘤。总结分析患儿的年龄、性别、病理类型及影像学表现。两名放射科诊断医师分别对 DR、CT、MRI 诊断骨肿瘤的价值进行评价。
结果　发病年龄 1～18 岁，平均 10.81 岁，最高发病年龄集中于 6～16 岁组之间。男 42 例，女 21 例，男女比为 2:1。其中，动脉瘤样骨囊肿 20 例，纤维结构不良 12 例，单纯骨囊肿 11 例，朗格汉斯细胞组织细胞增多症 5 例，骨软骨瘤 4 例，骨肉瘤 4 例，软骨母细胞瘤 2 例，非骨化性纤维瘤 2 例，内生软骨瘤 2 例，纤维黄色瘤 1 例。良性骨肿瘤 32 例，占 50.79%，常见病种是纤维结构不良、单纯骨囊肿；中间型骨肿瘤 27 例，占 42.86%，常见病种是动脉瘤样骨囊肿、朗格汉斯细胞组织细胞增多症；恶性骨肿瘤 4 例，占 6.35%，全部是骨肉瘤；朗格汉斯细胞组织细胞增多症患儿年

龄较小，平均发病年龄为 7.60 (2～12)岁，肱骨上段肿瘤以未明确肿瘤性质的肿瘤为主，占 76.19%。排在前三位的动脉瘤样骨囊肿、纤维结构不良和单纯骨囊肿共计 43 例，占 68.25%。动脉瘤样骨囊肿：轻度膨胀性骨质破坏，病灶内可有骨嵴或分隔，“液-液平面”为特征性表现。纤维结构不良：典型表现为磨玻璃样及丝瓜瓤状骨质破坏，常有硬化边。单纯骨囊肿：病灶边界清楚，可无硬化边或细薄硬化边，其中液性成分有助于诊断。其中，骨肿瘤诊断符合率 CT 及 MRI 高于 DR ($P<0.05$)，良性、中间型骨肿瘤诊断符合率 CT 高于 MRI，CT 和 MRI 两者没有统计学意义 ($P>0.05$)。

结论　儿童肱骨上段骨肿瘤发病年龄集中于 6～16 岁，绝大多数为良性及中间型骨肿瘤，以未明确肿瘤性质的肿瘤为主，发病率前三位分别是动脉瘤样骨囊肿、纤维结构不良和单纯骨囊肿。儿童肱骨上段骨肿瘤诊断符合率 CT 检查最高。

EPO-1613

儿童钙化上皮瘤的影像学诊断

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目的：总结分析儿童钙化上皮瘤的影像学特点，提高诊断水平，减少误诊。

方法：2012-2019 年经手术病理证实的钙化上皮瘤 128 例，其中男 75 例，女 53 例，年龄 3 月-15 岁，中位数 5 岁。回顾性分析其影像学（122 例 CT，其中平扫 28 例，增强 94 例；8 例 MR，其中平扫 7 例，增强 1 例）表现，包括肿瘤钙化、轮廓、增强后改变、瘤周皮下脂肪（间隙）及局部皮肤改变等，并据此总结其影像学特征性改变。

结果：128 病例中，单病灶 119 例，2 病灶 7 例，3 病灶 2 例，共 139 个病灶，CT、MRI 上病变均（100%）表现为轮廓清晰的真表内软组织密度/信号结节或肿块影，增强后无强化 16 例（16.8%），轻度非均质强化 49 例（50.5%），中度度非均质强化 30 例（31.6%）。瘤内钙化表现为：弥漫砂砾样浅淡钙化 71 例（51.1%）、散在斑点状浅淡钙化 42 例（30.2%）、斑块状/结节样浓钙化 25 例（18.0%）和无钙化 1 例（0.01%）。0.625mm 或 0.5mm 层厚的薄层图像软组织窗或中间窗显示钙化特征佳，骨窗能清晰显示浓钙化斑块但浅淡钙化几无显示。肿块向皮下或同时（病变巨大时）向皮肤表面突出，前者呈“吸顶灯征”、后者呈“戴帽征”表现，均出现“皮下脂肪间隙撑宽征”，部分病灶毗邻皮肤增厚并呈“皮肤尾征”改变。

结论：儿童钙化上皮瘤在 CT、MRI 上多为轮廓清晰、呈软组织“硬”结节影，具有 “吸顶灯征”、“戴帽征”、“皮下脂肪间隙撑宽征”、“皮肤尾征”等特征性表现；瘤内钙化常见为多发砂砾样钙化、散在斑点状浅淡钙化和斑块状/结节样浓钙化，钙化显示以 1mm 以内薄层图像为佳，软组织窗或中间窗显示为主；增强扫描后大部分病灶有轻-中度非均质强化。其特征性影像表现有助于其术前正确诊断，为临床早期诊断、及时治疗提供有益帮助。

EPO-1614

儿童进行性骨化性肌炎影像诊断及临床特征

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目的：探讨儿童进行性骨化性肌炎（MOP）的影像诊断及临床特征。

方法：通过 1 例进行性骨化性肌炎病例报告并复习相关文献, 总结该病临床特点及影像学表现。

结果：本病多在儿童期出现，临床表现以先天性拇趾(指)畸形（双侧对称性踇趾短小外翻、手指弯曲畸形）、全身进行性软组织内异位骨化为特点。骨化出现具有一定规律：从上到下；从背部到腹侧；从近端到远端(躯干首发，四肢远端受累较晚)，
MRI 能早期发现异位骨化前软组织肿胀及其内信号异常，CT 可发现相关部位软组织内的骨化及软组织肿胀,在病变急性期后 X 线可整体反映病变部位、形态及钙化情况。
结论：对于小儿发现先天性拇趾(指)畸形，存在进行性全身软组织包块，影像学检查提示多中心进行性异位骨化，应考虑到本病可能，且一旦确诊，应避免一切穿刺创伤及医源性损伤，防止继发感染，加重病情。

EPO-1615

探讨儿童罕见部位动脉瘤样骨囊肿的影像学特点

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回顾性分析 1 例位于斜坡，1 例位于下颌骨，经手术病理证实的动脉瘤样骨囊肿患者为研究对象，2 例患者均施行 CT 及 MRI 扫描检查。结果：斜坡及下颌骨 CT 显示囊内骨性间隔及囊状膨胀性骨质破坏；MRI T2WI 示病灶内信号不均呈海绵状液性信号并见液-液平。结论：儿童罕见部位动脉瘤样骨囊肿患者 CT、MR 影像学表现都具有特征性的， CT、MRI 从不同的角度反映动脉瘤样骨囊肿的影像学表现，二者结合可显著提升动脉瘤样骨囊肿的术前诊断率。

EPO-1616

儿童跟距联合症及时手术治疗与影像表现

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摘要：
目的：探讨儿童疼痛性跟距联合症及时手术的必要性与影像表现。
方法：初步选定 X 线平片（侧轴位）、CT 平扫（3D 重建+MPR）进行检查。
结果：跟距联合局限于距跟后关节面，影像表现为；CT 断层所示关节面不光整，跟距关节间隙变窄，有明显骨赘表现、骨桥连接。临床表现疼痛、痉挛、距下关节僵硬、活动受限，时常出现足或踝部损伤，这些症状通常定于距下关节，并随活动量增加而加重，甚至有些病例会导致畸形改变。在我手术切除治疗后随访，影像表现跟距关节面光整、距下关节间隙可，恢复正常解剖功能。临床症状消失，日常活动不受限制。
结论：儿童跟距联合症及时手术治疗可以获得满意的临床治疗效果。

EPO-1617

儿童脂肪母细胞瘤的磁共振表现

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【摘要】**目的：**探讨儿童脂肪母细胞瘤的磁共振表现特点 **方法：** 回顾性分析 14 例脂肪母细胞瘤患儿磁共振表现，男 7 例，女 7 例，年龄范围为 2 月-7 岁，平均 1 岁 6 个月。所有患儿行磁共振平扫，其中 8 例患儿同时行磁共振增强检查，探讨该病发病部位，肿瘤形态、边界、信号及强化特点，其中臀部、肩部、骶尾部、背部、上臂、胸壁、腰背部、右内踝各 1 例，腋下及右小腿、右大腿各 2 例。所有病例均有完整临床资料、磁共振检查图像，手术及病理证实为脂肪母细胞瘤。 **结果：**磁共振表现：分为局限型及弥漫型，病灶多不规则，以脂肪信号为主，T1WI 呈高信号 可稍低于皮下脂肪组织，T2WI 呈中高信号，而脂肪抑制序列呈低信号，脂肪信号被抑制。病灶内可见粗细及多少不等间隔 呈线条状或网格状，部分病例含结节状或团块状软组织信号影，增强扫描瘤体分隔呈轻度不均匀性强化。与局限型相比较，弥漫型肿块较大、形态不规则、边界不清、术后复发率高。部分病例无特征性改变。本组病理 13 例表现为局限型，1 例表现为弥漫型。局限型手术完整切除，随访未见明显复发。1 例弥漫型病变位于肩部，瘤体较大，边缘不规整，与周围肌肉及肩胛骨紧密相连，术中见肩胛骨破坏，术后复发。**结论：** 脂肪母细胞瘤患儿磁共振表现有一定特征性，有助于脂肪母细胞瘤术前诊断、术前评估及预后的判断。

EPO-1618

Assessing cerebral white matter microstructure in children with congenital sensorineural hearing loss: a tract-based spatial statistics study

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Objectives: To assess the microstructural properties of cerebral white matter in children with congenital sensorineural hearing loss (CSNHL).
Methods: Children (> 4 years of age) with profound CSNHL and healthy controls with normal hearing (the control group) were enrolled and underwent brain MRI scans with diffusion tensor imaging (DTI). DTI parameters including fractional anisotropy, mean diffusivity, axial diffusivity and radial diffusivity were obtained from a whole brain tract-based spatial statistics analysis and were compared between the two groups. In addition, a region of interest approach focusing on auditory cortex, i.e. Heschl's gyrus, using visual cortex, i.e., forceps major as an internal control was performed. Correlations between mean DTI values and age were obtained with the region of interest method.
Results: The study cohort consisted of 23 children with CSHNL (11 boys and 12 girls; mean age±SD: 7.21±2.67 years; range: 4.1–13.5 years) and 18 children in the control group (11 boys and 7 girls; mean age±SD: 10.86±3.56 years; range: 4.5–15.3 years). We found the axial diffusivity values being significantly greater in left anterior thalamic radiation, right corticospinal tract, and corpus callosum in the CSHNL group than in the control group (p<0.05). Significantly higher radial diffusivity values in

the white matter tracts were noted in the CSHNL group as compared to the control group (p<0.05). The fractional anisotropy values in the Heschl's gyrus in the CSNHL group were lower compared to the control group (p=0.0015). There was significant negative correlation between the mean fractional anisotropy values in Heschl's gyrus and age in the CSNHL group < 7 years of age (r=-0.59, p=0.004).

Conclusion: Our study showed higher axial and radial diffusivities in the children affected by CNHNL as compared to the hearing children. We also found lower fractional anisotropy values in the Heschl's gyrus in the CSNHL group. Furthermore, we identified negative correlation between the fractional anisotropy values and age up to 7 years in the children born deaf. Our study findings suggest that myelination and axonal structure may be affected due to acoustic deprivation. This information may help to monitor hearing rehabilitation in the deaf children.

EPO-1619

Application of a 3D pseudocontinuous arterial spin-labeled perfusion MRI scan combined with a postlabeling delay value in the diagnosis of neonatal hypoxic-ischemic encephalopathy

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Background

Currently, there are many studies on the application of the 3D pseudocontinuous arterial spin-labeled (3D-pcASL) perfusion MRI technique for adult brain examinations, but few studies exist on the application of the technique for child brain examinations.

Objective

To explore the application of a 3D-pcASL perfusion MRI scan combined with postlabeling delay (PLD) for assessing neonatal hypoxic-ischemic encephalopathy (HIE).

Materials and Methods

Two-hundred neonates diagnosed with neonatal HIE were equally divided into five groups (40/group): 0- to <24-hour-old HIE group, 1- to <3-day-old HIE group, 3- to <7-day-old HIE group, 7- to <15-day-old HIE group and 15- to 28-day-old HIE group; 200 healthy neonates were equivalently divided. All 10 groups received a conventional and a 3D-pcASL perfusion MRI scan. For groups <3 days old, PLD values for the 3D-pcASL cerebral perfusion MRI scan were preset at 1025 ms; in all other groups, PLD values were preset at 1525 ms. CBF values for the 3D-pcASL cerebral perfusion MRI were compared between the HIE and corresponding control groups to determine the distinguishing characteristics of CBF values in HIE neonates.

Results

On the 3D-pcASL cerebral perfusion MRI scan, in the 1- to <3-day-old groups, HIE neonate CBF values were higher than those of controls in all brain regions (excluding the frontal lobe); in the 0- to <24-hour-old and 3- to <7-day-old groups, HIE neonate CBF values were lower than those of corresponding controls in all brain regions; in

the 7- to <15-day-old and 15- to 28-day-old groups, there were no significant differences in the CBF values between groups in any brain regions.

Conclusions

The 3D-pcASL perfusion MRI scan combined with a PLD can assist in the early diagnosis of neonatal HIE, as this method more comprehensively reflects the HIE pathological process.

EPO-1620

对比剂分次注射方式在儿童头颈部 CT 动静、脉血管成像中的应用

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目的：探讨对比剂分次注射方式对儿童头颈部 CT 动、静脉血管成像图像质量和辐射剂量的影响。**方法：**前瞻性选取 3-4 岁年龄段病情需要做头颈部 CT 动静脉血管成像患儿 100 名，随机分为对照组和研究组，每组 50 名，使用相同的扫描参数和重建方法，右肘正中静脉注射对比剂欧乃派克（350mg I/ml）；对照组为一次性团注未稀释对比剂(剂量为 2ml/kg，上限为 50ml),分别扫描头颈部血管的动、静脉期相；研究组：先团注用生理盐水稀释为 20％浓度对比剂(剂量为 1ml/kg，上限为 25ml)，再团注未稀释对比剂（剂量为 1ml/kg，上限为 25ml），使用阈值触发扫描头颈部动脉期相。对比分析两组患儿头颈部动、静脉血管 CT 图像质量、辐射剂量和对比剂剂量。**结果：**动脉血管 CT 图像质量主观评价：对照组 4 分 46 例，3 分 4 例，研究组 4 分 33 例，3 分 17 例；静脉血管 CT 图像质量主观评价：对照组 4 分 48 例，3 分 2 例，研究组 3 分 47 例，2 分 3 例；两组病例脑部动脉血管强化 CT 值对比，对照组高于研究组，差异有统计学意义（P＜0.05）；静脉血管强化 CT 值对比，对照组高于研究组，差异有统计学意义（P＜0.05）；X 线辐射剂量研究组比对照组低 53％；对比剂剂量研究组比对照组低 45％。**结论：**儿童头颈部增强 CT 检查时先团注稀释浓度为 20％对比剂，再团注未稀释对比剂的注射方式，可一次扫描清晰显示头颈部动、静脉血管，减少 X 线辐射剂量和对比剂剂量，在儿童头颈部疾病增强 CT 检查中具有临床实用价值。

EPO-1621

儿童急性坏死性脑病 MRI 诊断

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目的 探讨儿童急性坏死性脑病的 MRI 特点，提高对本病影像学表现的认识。**资料与方法** 回顾性分析 14 例急性坏死性脑病患儿的临床资料和颅脑 MRI，其中男性 6 例，女性 8 例，年龄范围 1 岁 8 个月～13 岁，平均年龄 5.8±3.5 岁。患儿均有前驱感染病史，临床表现主要为发热、抽搐、头痛、呕吐、局灶性神经功能障碍、精神差、意识障碍。14 例患儿均行常规 MRI 平扫，5 例扫描磁敏感加权成像 SWI 序列。其中 4 例行增强检查。常规平扫包括轴位 T_1WI、T_2WI、FLAIR、DWI 序列以及矢状位 T_1WI。增强检查为注入造影剂后行轴位 FLAIR 以及轴位、冠状位、矢状位 T_1WI 扫描。14

例中有 11 例患儿进行多次复查。**结果** 14 例患儿常规 MRI 平扫均显示脑实质内多发病变，大多数病变呈对称性分布，主要累及双侧丘脑、脑干、基底节区、侧脑室周围白质区、小脑半球。所有患儿脑实质内病变首次 MRI 平扫表现为 T_1WI 稍低信号，T_2WI 及 FLAIR 高信号，病变边界模糊，其中 12 例于 DWI 序列呈不同程度高信号。1 例患儿脊髓受累，颈胸段脊髓内于 T_2WI 可见稍高信号。14 例中 5 例行 SWI 序列扫描，双侧丘脑区可见斑片状低信号。4 例行 MRI 增强检查患儿中，2 例患儿双侧丘脑对称性病变呈不规则环形强化，余患儿病变部位均未见强化。14 例患儿中有 11 例进行复查，其中 8 例在首次复查中显示双侧丘脑区病变出现 T_1WI 高信号。**结论** 急性坏死性脑病 MRI 表现具有特点，常为多部位受累，且均累及双侧丘脑并呈双侧对称性，随访复查双侧丘脑病变易发生出血。SWI 序列对双侧丘脑病变内出血的显示敏感性优于常规序列。

EPO-1622
基于小波变换的常规 MRI 图像在儿童颅后窝 脑肿瘤分类中的应用

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目的 评估基于小波变换的肿瘤全域 T1 加权像(T1WI)、T2 加权像(T2WI)与表观扩散系数(ADC)序列的特征参数对于鉴别儿童颅后窝三种常见脑肿瘤的价值。**方法** 回顾性分析经手术及病理证实的 59 例髓母细胞瘤、13 例室管膜瘤与 27 例星形细胞瘤的术前 MRI 图像，进行不同序列间的配准，获得三个序列感兴趣区的小波特征参数，按照基尼指数排名得到对分类贡献排名前十的特征参数，并利用随机森林分类器进行特征训练和测试，根据分类结果进行对比分析。**结果** 对分类器贡献排名前十的小波特征参数均来自 ADC 序列，随机森林分类器在训练集中达到 100%的准确性，测试集中由排名第一和第三的小波特征构建的模型对三种脑肿瘤鉴别的准确性最优为 0.868，室管膜瘤、髓母细胞瘤和星形细胞瘤三种脑肿瘤的敏感度分别为 1.000，0.948，0.769；特异性分别为 0.976，0.880，0.988。**结论** 基于肿瘤全域 ADC 序列感兴趣区的小波特征能提供更多量化信息特征，可帮助鉴别诊断儿童三种常见颅后窝脑肿瘤。

EPO-1623
儿童癫痫发作间期脑血流量的应用研究

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目的 观察癫痫发作间期患儿脑血流量情况 ,探讨 ASL 在癫痫诊断中的意义
方法 回顾 2017 年 11 月-2018 年 11 月 1-14 岁癫痫患儿，MRI 结果阴性的 63 例，收集 30 例健康儿童作为对照组，应用 GE Discovery 750 3.0T 超导磁共振扫描仪 ASL 技术得到全脑定量脑血流量（CBF）图。记录 CBF 图高灌注和低灌注的脑叶分布情况，分析 CBF 阳性率与癫痫发作类型、脑叶位置有无关联，比较癫痫组 CBF 与脑电图（EEG）的阳性率有无差异。
结果 1.对照组 CBF 两侧对称，皮质 CBF 值略高于白质，而癫痫患者中有 36 例 CBF 出现了高灌注，单侧不对称分布，多位于两叶，高灌注对侧仅 2 例出现低灌注。2.额颞叶的 CBF 阳性率高于顶枕叶，而 CBF 阳性率与癫痫发作形式无关 3. 癫痫患者 CBF 和脑电图的阳性率无显著性差异。

结论 对于 MRI 阴性的癫痫，ASL 可以探及不对称分布的高灌注改变,癫痫患儿脑灌注的变化，对于癫痫的诊断和评估会有重要意义。

EPO-1624

新生儿脑梗塞的病因及影像学表现分析

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摘要：目的：探讨新生儿脑梗塞的病因、临床表现及影像学特点；**方法**：回顾性分析山西省儿童医院 2016 年 1 月至 2018 年 10 月间经临床及磁共振检查确诊为脑梗塞的 17 例住院患者的临床及影像学资料。其中男性 8 例，女性 9 例，日龄：7 小时-19 天，平均日龄 5.606 天，其中足月 15 例，早产 2 例；Apgar 评分 10 分 4 例，＜10 分 1 例，不详 12 例；分娩史异常者 3 例（胎动减少 1，难产 1，双胞胎姐胎死宫内 1），宫内窘迫 3 例；母亲孕期合并糖尿病 2 例，合并低血压 1 例；**结果**：临床诊断：新生儿缺氧缺血性脑病 3，羊水粪染 3，肺炎 8，化脑 2，败血症 2，低氧血症 1，低血糖症 1，溶血病 2（ABO 不合 1，RH 不合 1），先心病 4，颅内出血 7。临床表现：惊厥 12 例，反应差 4 例，呻吟 4 例，烦躁 1 例，易激惹 1 例，生后阵发性口唇青紫 1 例，生后窒息 1 例，拒乳 1 例，发热 1 例，黄疸 4 例。影像学表现：病变部位：累及单侧者多见，病变位于左侧 10 例，位于右侧 5 例，双侧 2 例；其中累及多个脑叶 11，基底节区 7，胼胝体压部 3，大脑脚 5，侧脑室旁 1，半卵圆中心 3，放射冠 2，背侧丘脑 8； MRI 信号特点： 所有病例 T1WI 以等信号为主，T2WI 为高信号，FLAIR 以等-稍高信号为主，DWI 序列为明显高信号，ADC 图呈低信号；8 例行颅脑 MRA 检查，其中 2 例未见明显异常，余 6 例中大脑中动脉异常 3 例，大脑前动脉异常 2 例，大脑中动脉及大脑前动脉异常 1 例，均表现为不同程度的纤细、分支减少或狭窄。
结论：新生儿脑梗塞的病因、临床表现种类多样，进展迅速，影像学表现具有一定特征性，MRI 可做为首选检查对新生儿脑梗塞做出早期诊断，另需结合其他相关检查以明确病因，对于指导临床治疗以及促进预后都有很大的帮助。

EPO-1625

儿童流行性乙型脑炎的临床、MRI 表现及预后分析

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目的：探讨儿童流行性乙型脑炎的临床特点及 MRI 特征。**方法**：回顾分析 28 例经临床及血清学检测确诊的儿童流行性乙型脑炎患儿的临床及 MRI 资料，平均年龄：7.1 岁（1-13 岁），男 17，女 11，所有患者治疗前后均行头颅 MRI 扫描，获得 T1WI，T2WI，T2FLAIR，DWI 等图像，分析脑部 MRI 表现：病变累及部位、各序列信号特点、ADC 值以及病变随访变化等。**结果**：病程：2-9 天，平均 3.9 天；症状：发热 25，惊厥抽搐 14，意识障碍 11，嗜睡 4，呕吐 4，昏迷 2，气促 1，胡言乱语 1。MRI 表现：病变累及部位：双侧丘脑 26（其中 2 例仅见于丘脑，1 例伴丘脑出血），中脑大脑脚 21，基底节区 16，累及广范围大脑皮层及皮层下 8，颞叶 5，额叶 3，海马区 3，顶叶 2，桥脑 1，延髓 1，内囊后肢 1；病变 T1WI 呈等或稍低信号，T2WI 及 FLAIR 相均呈稍高信号或高信号，DWI 序列多呈高信号。其中 19 例经时随访复查 MRI，随访时间最短 0.5 月，最长 7 月，平均 2.24 月，MRI 发现：2 例未出现软化灶，17 例出现软化灶，软化部位：丘脑 9 例，丘脑+大脑脚 5，丘脑+大脑脚+部分脑叶 2，大脑脚 1 例；测量出现软化灶部位首次 MRI 检查时的 ADC 值，平均

为 0.803×$10^{-3}$$mm^2$/s，未出现软化灶部位 ADC 值平均为 1.004×$10^{-3}$$mm^2$/s，其差异具有统计学意义（$P$<0.05）。对于出现软化灶的病例继续随访，随访时间最短 4 月，最长 2 年，平均 9.083 月，发现软化灶缩小消失 6 例（35.1%），其中缩小 2 例，明显缩小 3 例，消失 1 例；**结论**：儿童流行性乙型脑炎起病急，临床以发热、抽搐及意识障碍为主，病变主要累及丘脑、大脑脚及基底节区，以长 T1 长 T2 信号为主要表现，FLAIR 相及 DWI 序列均呈高信号，大多数患儿于治疗后出现软化灶，ADC 值对于软化灶出现的预测具有一定意义，可为流行性乙型脑炎的早期诊断及预后评估提供帮助。

EPO-1626

儿童基底节生殖细胞瘤的影像学特点

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目的：颅内生殖细胞瘤是最常见的恶性颅内生殖细胞肿瘤。它通常发生在儿童和年轻人中，并且通过目前的疗法，许多患者经历长期存活。早期放化疗可以显著改善生活质量,但早期诊断有一点难度。方法：共有 23 个儿科患者基底神经节的生殖细胞瘤治疗,其中 14 例经手术或活检,另 9 患者诊断凭借诊断放射治疗与临床和放射学特征、临床特征、影像学检查、治疗和结果病人进行回顾性分析。结果：男女比例为 10:1，平均年龄为 11 岁。最主要的临床症状为偏瘫。CT 显示为高密度，部分内见钙化灶。所有患儿均行 MRI 检查，1 例显示为 T1WI、T2WI 及 DWI 等高信号；9 例呈斑片状、13 例呈团块状，实性部分信号不均匀，呈 T1WI 等低信号，T2WI 上 3 例呈等信号、19 例呈等高信号，DWI 上 7 例显示等信号，13 例显示等高信号。增强后，5 例无强化，16 例不均匀强化，2 例明显强化。结论：对于,儿童及青少年男性基底节病变，同时出现偏瘫时，需高度怀疑生殖细胞瘤的可能。

EPO-1627

儿童胚胎发育不良性神经上皮瘤的 MRI 诊断

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目的　探讨胚胎发育不良性神经上皮瘤(DNT)的 MRI 影像特点，提高对 DNT 的诊断。方法　收集经手术病理证实的 10 例 DNT 患者临床资料，回顾性分析其影像学表现及临床特点。结果　10 例患者中，9 例位于幕上大脑半球皮层，颞叶 3 例，额叶 5 例，顶叶 1 例，其中 2 例累及皮层下白质。MRI 平扫中，T1WI 呈低、等低混杂信号，T2W1 呈高信号，FLAIR 呈稍高信号，可见高信号“环征”，部分瘤内见分隔。3 例表现为高信号“环征”，2 例表现为“三角征”，3 例表现为“脑回征”，1 例表现为圆形病灶。肿瘤均无明显瘤周水肿及占位效应，增强扫描仅 1 例有轻度不均匀强化。1 例肿瘤位于小脑半球，表现为囊实性肿块，壁结节较明显强化，可见瘤周水肿及占位效应。结论　DNT 的 MRI 表现有一定的特征性，有助于术前正确诊断。

EPO-1628

磁共振多序列联合检查对早产儿脑损伤的早期诊断的临床意义

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摘要］目的 探讨磁共振多序列联合检查对早产儿脑损伤的早期诊断临床意义。**方法** 回顾性分析新生儿重症监护室收治的 160 例早产儿的头颅磁共振影像表现。**结果** 160 例早产儿，76 例发生脑损伤，发生率为 47.5%。早产儿脑损伤以缺血性病灶多见，最常见是脑白质损伤，尤其是脑室周围白质软化。缺血性脑损伤表现半卵圆中心、侧脑室周围斑片状或大片状 T1 加权成像（T1WI）高信号、T2 加权成像（T2WI）低信号影，弥散加权成像(DWI)序列呈明显高信号。脑室周围白质软化 MRI 表现为斑片状 T1WI 低信号、T2WI 高信号影，DWI 序列呈低信号。出血性损伤以脑室周围-脑室内出血多见，出血灶因其出血时期不同其信号表现不同，急性期 MRI 表现为 T1WI 等信号或稍低信号、T2WI 高信号；亚急性早期呈 T1WI 高信号，T2WI 稍低信号，亚急性晚期呈 T1WI 和 T2WI 高信号,在磁敏感加权成像（SWI）上呈明显低信号。DWI 对缺血灶的检出率高于常规扫描，比常规 MRI 能更早地显示早产儿脑白质损伤。SWI 对出血灶的检出率高于常规扫描，比常规 MRI 能更早地显示出血性脑损伤。与常规 MRI 比较，DWI 与 SWI 序列对缺血及出血性病灶的检出差异具有统计学意义。**结论** 磁共振检查，尤其是多序列联合检查，可以给早产儿脑损伤的早期诊断提供了准确的影像学依据。

EPO-1629
3.0TMR 多 b 值 DWI 在急性复杂型儿童热性 惊厥海马应用研究

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目的 探寻复杂型儿童热性惊厥急性发作时双侧海马组织的弥散特点。
方法 收集 2017 年 8 月-2018 年 2 月期间急性期复杂型热性惊厥患儿 20 例作为研究实验组，同年龄段非中枢系统疾病儿童 20 例为对照组，进行两组双侧海马多 b 值（0－1000s/mm2）DWI 扫描，ADC 图重建，及 ADC 值测量。最后用 SPSS17.0 统计软件包进行统计分析。
结果 在 b 值等于 1000 时，左侧海马实验组与对照组之间 ADC 值，有统计学差异（t=2.690，p=0.01）。在 b 值等于 1000 时，右侧海马实验组与对照组 ADC 值，有统计学差异（t=3.02，p=0.005）。
结论 当 b 值等于 1000 时，相应 ADC 值可以敏感捕捉到急性复杂型儿童热性惊厥海马损伤证据，具有一定临床应用价值。

EPO-1630
高场强 MRI 在儿童脑颜面血管瘤综合征诊断中的应用价值

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目的：探讨 MRI 在儿童 Sturge-Weber 综合征影像学表现及其临床应用价值。**方法：**搜集 PACS 系统中 8 例 Sturge-Weber 综合征患儿的 MRI 图像进行回顾性分析，8 例患儿均行 MRI 平扫及增强检查，2 例行 SWAN 序列扫描。**结果：**本组患儿均存在面部三叉神经分布区的血管瘤，MRI 扫描显示 7 例病变累及单侧大脑半球，1 例累及双侧大脑半球，5 例见患侧侧脑室脉络丛扩大，4 例伴有局部脑萎缩，5 例可见病变区脑白质 T2WI 信号明显减低。8 例均行增强 SET1WI 及增强 T2FLAIR 序列扫描，患侧脑回表面软脑膜均有强化，其中软脑膜血管瘤在增强 T2FLAIR 序列显示 5 例，在增强

SET1WI 序列显示 2 例。SWAN 序列检查可见多发扩张增粗深静脉影。**结论：**对临床高度怀疑 Sturge-Weber 综合征的儿童，MRI 可以明确诊断及确定病变范围，增强 T2FALIR 序列可更好的显示脑部病变，对临床早期干预及评估患儿预后有重要价值。

EPO-1631

苍白球与壳核 T1WI 比值在新生儿亚临床胆红素脑损伤诊断中的价值

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目的 探讨双侧苍白球与壳核 T1WI 比值（G/P）在诊断亚临床胆红素脑损伤中的价值。**方法** 回顾性分析 109 例新生儿头颅磁共振 T1WI 信号特征，并将其分为对照组、非脑损伤组、脑损伤组；测量各组双侧苍白球、壳核 T1WI 信号值并计算 G/P 值；各组间采用独立样本 t 检验进行比较分析。通过 ROC 曲线分析 G/P 值在诊断亚临床胆红素脑损伤中的价值。**结果** （1）对照组、非脑损伤组、脑损伤组间 G/P 值依次递增，各组间差异有统计学意义（$P<0.05$）。（2）当足月新生儿患病理性黄疸且未出现临床症状，通过 ROC 曲线分析发现：左、右侧 G/P 比值分别位于 1.45~1.68、1.44~1.70 时，则可以考虑为新生儿亚临床胆红素脑损伤。**结论** G/P 值具有简单易行的实用特点，其与 TSB 相结合，可以提高新生儿亚临床胆红素脑损伤诊断的准确性，推广至广大基层医院。

EPO-1632

MELAS 综合征的 MRI 随访分析

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[目的]随访分析线粒体脑肌病合并高乳酸血症与卒中样发作（MELAS）综合征的动态 MRI 影像学特征。[方法]回顾性分析 2005 年 9 月至 2015 年 4 月确诊的 MELAS 综合征患者 15 例，男 9 例，女 6 例，平均 15.5 岁。所有病例在急性发作期（30 d 内）均行常规 MRI 检查（包括 T1WI 平扫、T2WI、FLAIR 及 DWI ），14 例在急性发作后（30～60 d）复查 MRI，其中 8 例随访时行磁共振波谱（MRS）检查；10 例在缓解期（＞60 d）复查常规 MRI。着重分析病变的部位、信号、范围及其动态变化。[结果]在急性发作期（30 d 内），单侧大脑皮层或皮层下受累占 46.7%（7/15），　双侧大脑皮层或皮层下同时受累占 53.3%（8/15），双侧基底节受累 4 例，脑干受累 1 例。病灶在 T1WI 上呈低信号，在 T2WI 上呈高信号，在 DWI 上呈等或高信号。在急性发作后（30～60 d），14 例中，64.3%(9/14)病例的部分病灶范围扩大；71.4%（10/14）病例的部分病灶缩小，42.9%(6/14)的病例出现新的病灶。8 例 MRS 检查中均出现 Lac 峰增高，　2 例病灶对侧脑组织出现 Lac 双峰，6 例出现 NAA 峰降低。在缓解期（＞60 d），40%（4/10）的病灶出现脑萎缩，40%（4/10）的病灶出现软化灶。[结论]MELAS 综合征的病灶多为大脑皮层或皮层下游走性病灶，MRS 会出现增高的 Lac 峰，随着病程发展会出现脑萎缩和病灶减小，结合临床资料，可早期提高其诊断的准确性。

EPO-1633

新生儿低血糖脑病的 MRI 分析及研究进展

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葡萄糖为人体大脑所必需的能源物质，稳定的血糖对于人体正常的代谢发挥着重要的作用，如果葡萄糖量减少将导致一系列短暂的或持续的脑功能障碍。新生儿期是大脑发育最关键的时期，此时期葡萄糖的利用率较低，而且随着年龄的增长，脑功能活动增强，能量的需求越来越多，因此葡萄糖的需要量也在增加。新生儿特别是早产儿，由于其糖原储备较少,容易出现血糖的波动,常导致低血糖的发生,又因为低血糖临床症状常不典型，多为其他疾病的合并症，常被原发病所掩盖，当出现低血糖持续时间过长或程度加重时常导致大脑的损伤，还可能导致新生儿远期的学习和记忆功能障碍。

1.新生儿低血糖范围及与脑损伤的关系

我国临床上对于诊断标准:足月儿全血血糖值< 1.7 mmol /L （ 30 mg/dL ）;早产儿< 1.1mmol /L (20 mg/dL)。目前多主张无论胎龄及日龄大小,全血血糖测定<2.2 mmol /L (40 mg/dl)可以诊断为低血糖。

研究表明新生儿低血糖的严重程度及持续时间对神经系统损伤程度及预后发挥着重要的作用。当血糖越低时损伤程度越重，持续时间越长,脑损伤程度也同样加重，且预后效果将更差，低血糖持续的时间较血糖降低的程度对脑损伤作用更显著。

2.新生儿低血糖脑损伤的 MRI 表现

在成人中，影像学及有关病理研究发现低血糖脑损伤主要累及海马、尾状核、豆状核；新生儿中主要累及顶枕叶、额叶、海马、丘脑、基底节区、内囊后肢。akeuchi 等认为胼胝体压部、内囊和放射冠等部位也与低血糖脑的损伤有关。Filan 等认为与新生儿低血糖有关的脑损伤较少累及深部灰质核团. Dolinak 等认为与低血糖有关的脑损伤一般不累及小脑和脑干，但主要见于顶枕叶区，这是由于枕叶皮层的视觉皮层的 4 层明显增厚，有较多的神经元和突触，新生儿期枕叶的轴突和突触形成，增减了对葡萄糖的需求所致；大脑后动脉供应枕叶的血流，代谢较活跃，更敏感，更容易损伤。

EPO-1634

新生儿胆红素脑病临床与 MRI 特征的再认识

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新生儿胆红素脑病是指胆红素引起脑组织的病理性损害，主要病变有大脑基底核，视丘下核、苍白球等神经核被黄染。是新生儿高胆红素血症的严重并发症，后遗症严重，死亡率高。根据新生儿胆红素脑病的神经系统毒性表现分为急性胆红素脑病（新生儿期）、慢性核黄疸后胆红素脑病（即慢性胆红素脑病，发病后 1-2 月）。

急性期胆红素脑病的临床诊断标准：临床症状加上血清总胆红素高于 342mmol/L(20mg/dl)。其临床初期: (1)轻度迟钝; (2)轻度肌张力低下,运动减 少;(3) 吸吮不好, 哭声稍高尖。 中期表现: (1)中度迟钝、激惹,肌张力变化不一、常增高; (2)有些出现颈后仰、角弓反张; (3)吃奶极少,哭声高尖。 进展期表现: (1)极度迟钝至昏迷; (2)张力常增高,有些有颈后仰、角弓反张; (3)不进食,声高尖。慢性胆红素脑病急性胆红素脑病到慢性胆红素脑病即核黄疸的后遗症期有一个演变过程。慢性胆红素脑病的典型表现通常在 1 岁前，婴儿喂养困难，进而高调哭声和肌张力减低，但持续颈强直，运动发育迟缓。

双侧苍白球在 T1WI 呈对称性高信号是急性期胆红素脑病相对特征性表现，与临床预后无必然联系 。病理基础：苍白球对称性 T1WI 高信号可以反映急性损伤时胶质细胞的饲肥星型细胞反应,也可能是超胆红素本身引起的 。 双侧苍白球在 T2WI 呈对称性高信号是慢性核黄疸所致脑性瘫痪的 MRI 特征性表现，有助于判断脑性瘫瘫的类型。病理基础：组织学上胆红素脑病后期胶质增生。

EPO-1635
儿童病毒性脑炎、ADEM 及 ANE 的 1.5T MRI 诊断价值

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目的：探讨儿童病毒性脑炎、ADEM 及 ANE 的 MRI 诊断价值。**材料与方法：**回顾 2014 年 1 月-2019 年 5 月我院 42 例患儿(男 27 例,女 15 例 , 年龄 7 月 ～11 岁, 平均 6.8 岁)，其中病毒性脑炎 23 例、ADEM 14 例，ANE 5 例，临床表现相似，如发热、头痛、四肢抽搐、眩晕、失语、嗜睡等。使用 Siemens Magnetom Essenza 1.5 T MR ,常规行 SE 序列横断位及矢状位成像, 13 例行 T1WI 增强扫描，静脉注射 Gd-DTPA 0.1mmol/kg 体重，所有病例均在发病后 2-7d 内行 MRI 检查。**结果：**由两位有经验医师回顾阅读患儿 MR 影像，发现病毒性脑炎、ADEM 及 ANE 病变的分布、信号特征及强化方式有差异。23 例病毒性脑炎均位于皮质、皮质下脑实质，以额颞叶为主，11 例累及基底节，5 例累及单侧丘脑，5 例同时累及脑白质，病灶为斑片状、脑回状及片状 ,T1WI 为不均匀低信号、T2WI 为稍高信号，DWI 为高信号，3 例额颞叶见斑片状出血、一例单侧丘脑见斑状出血，增强 14 例未见明显强化，7 例出现斑片状、脑回状强化，2 例为斑点状强化，1 例出现脑膜强化。14 例 ADEM 10 例位于侧脑室周围白质、2 例位于额顶颞枕白质区，2 例累及小脑，3 例二者同时受累，3 例累及胼胝体，2 例同时累及皮质 ，病灶 T1WI 低信号、T2WI 高信号，DWI 为高信号，12 例为斑点状、小片状, 2 例为结节状，不对称分布，增强 1 例未见强化，13 例均为环形、斑点状强化。5 例 ANE 均累及双侧丘脑，1 例累及脑干，3 例累及脑室旁白质、1 例累及小脑半球、内囊、豆状核，3 例双侧丘脑 T1WI 出现斑片状高信号，2 例 T1WI 等略高信号、DWI 见磁化率伪影提示出血，2 例增强出现环形强化。**结论：**儿童病毒性脑炎、ADEM 及 ANE 病灶的分布、信号特征、强化方式存在明显差异(P <0.05)，1.5T MRI 对病毒性脑炎、ADEM 及 ANE 具有较高的诊断价值。

EPO-1636
基于多模态磁共振对于早产儿脑白质损伤的应用研究

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摘要：目的采用弥散加权成像 (DWI)及弥散张量成像（DTI）成像方法，对诊断为早产儿脑白质损伤的患儿进行成像分析，并对损伤的脑白质区域进行定量的 ADC 值及 FA 值的测量。方法：选取 29 例符合临床诊断标准的早产儿患者和 29 例性别、年龄匹配的正常儿童对照。采用梯度回波序列和 32 通道头线圈采集镇静状态下被试儿童的 DWI 及 DTI 脑功能成像，经过预处理时间校正,头动校正,空间标准化,获得两组的 DWI/DTI 图，并通过软件计算出表观弥散系数（ADC)及分数各向异性值（FA）,进行两组之间的独立样本 t 检验,观察早产儿组和对照组之间的组间图像差异及数值差异。簇水平的校正水准为 0.05(即 P<0.05)。结果：与对照组相比,早产儿组 DWI 信号在脑的白质区域明显增高， DTI 在运动纤维和躯体感觉纤维亦存在差异性改变。与对照组相比,早产儿组 ADC 值及 FA 值明显增高（P＜0.05）。结论：通过回顾性分析发现早产儿患者脑白质区域 DWI、DTI 较正常儿童明显改变，ADC 值及 FA 值明显增高，差异在统计学上有意义，故在临床工作中，DWI 及 DTI 成像对早产儿脑白质损伤的临床诊断中具有重要意义。
关键词：DWI；DTI；早产儿脑白质；

EPO-1637

小儿四脑室区肿瘤影像学鉴别诊断

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目的：四脑室区是小儿脑肿瘤的好发部位，术前影像学明确诊断有助于手术方案的制定和对预后的判断，本文目的是探讨小儿四脑区肿瘤的影像诊断和鉴别诊断。
方法：回顾性分析 2010.1-2018.10 四脑区肿瘤 127 例，男 71 例，女 56 例。其中髓母细胞瘤 60 例、室管膜瘤 16 例、毛细胞星形细胞瘤 35 例、脉络丛乳头状瘤和 AT/RT 各 5 例，其它 5 例。研究参数：年龄、性别、部位、钻孔生长、CT 密度、钙化、FLAIR 信号比值、ADC 值等。影像分析由二位有经验小儿放射医师完成。统计软件采用 SPSS 16.0。
结果：
1、Flair 上信号比值：髓母 < 室管膜瘤 < 毛星，$p < 0.05$。
2、CT 值：髓母≈室管膜瘤：$p=0.233$，髓母 > 毛星：$p < 0.05$，室管膜瘤 > 毛星：$p < 0.05$，髓母≧室管膜瘤 > 毛星。
3、钻孔生长：室管膜瘤多，$p < 0.05$。
4、大囊变：毛细胞星形细胞瘤，$p < 0.05$。
5、ADC：髓母 < 室管膜瘤 < 毛星， $p < 0.05$。
结论：CT 检查：肿瘤密度有助于区分胚胎性还是非胚胎性肿瘤；胚胎性肿瘤 ADC 低、FLAIR 等或稍低；室管膜瘤钻孔生长；毛细胞星形细胞瘤常有大囊；认真分析影像学表现，四脑区肿瘤大多术前能做出正确诊断。

EPO-1638
初发 1 型糖尿病儿童静息状态脑血流灌注改变研究

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研究目的：
糖尿病与脑血管功能障碍和血管性认知障碍有关。本研究的目的是使用 3 维伪连续式动脉自旋标记（3D-PCASL）功能磁共振成像技术比较 1 型糖尿病儿童（T1DM）及正常对照组之间脑血流灌注（CBF）的差异，并对脑灌注差异与认知和临床参数进行相关分析，探讨初发 T1DM 儿童的脑血流灌注变化情况及其与认知及临床参数的相关性。
研究方法：
本研究纳入 2017 年 1 月至 2018 年 2 月之间在我院就诊的初发 1 型糖尿病患儿 34 例及年龄性别相匹配的正常对照组儿童 34 例。收集两组人口社会学资料、临床资料及智力测评资料。使用 3D-PCASL 功能 MRI 评估两组受试者脑血管灌注情况。我们通过 REST 软件中双样本 t 检验检测两组之间局部脑血流灌注差异，并且对差异脑区的 CBF 值与认知和临床参数进行偏相关分析。
结果：
糖尿病组和对照组间在年龄、性别上无统计学差异（$p > 0.05$）。 糖尿病组 HbA1c 和血糖水平均高于对照组，差异有统计学意义（$p < 0.05$）。而糖尿病组总智商并无明显差异（$p < 0.05$）。
与正常对照组相比，T1DM 患儿在左侧楔前叶、距状沟、中央后回和右侧中央前回的 CBF 下降。相关分析表明中央后回的脑血流灌注与患儿 IQ 表现相关。但在 T1DM 儿童中，我们并没有发现其他脑区的 CBF 值与 HbA1c,血糖水平和 IQ 呈相关性。
结论：

初发 1 型糖尿病儿童表现为默认模式网络（DMN），视觉和感觉运动区域 CBF 的下降，中央后回脑血流灌注的下降可能对 IQ 表现产生不利影响。我们的研究结果可能有助于了解 T1DM 诱发的行为 - 认知缺陷的潜在病理生理学。

EPO-1639
增强 MRI 直方图鉴别儿童后颅窝髓母细胞瘤和室管膜瘤的价值

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目的 探讨增强 MRI 直方图分析鉴别儿童髓母细胞瘤和室管膜瘤的价值。**材料和方法** 回顾性分析我院经手术病理证实的 36 例儿童后颅窝肿瘤，其中髓母细胞瘤 20 例、室管膜瘤 16 例。收集该两种肿瘤的 T_1、T_2加权和增强 T_1磁共振图像，用软件 MaZda 提取肿瘤的感兴趣区（region of interest,ROI),针对肿瘤最大层面的感兴趣区进行直方图分析，利用平均值、方差、偏斜度、峰度、第 1、10、50、90、99 百分位数特征，找出两种肿瘤之间的显著性差异。**结果** 利用直方图提取出的 9 个纹理参数中,1 百分数具有统计学意义（），并绘制 C1 ROC 曲线，ROC 曲线下的最大面积为 0.82，取 46.5 的特异性和敏感性分别为 82%、75%。**结论** 直方图分析可以提供更多量化信息特征，为儿童髓母细胞瘤和室管膜瘤的鉴别诊断提供了新的思路和方法。

EPO-1640
DTI 在早产儿 HIBD 中的应用价值

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目的： 探讨扩散张量成像（diffusion tensor imaging,DTI）在早产儿缺氧缺血性脑损伤（hypoxic-ischemic brain damage,HIBD）中的应用价值。 方法 选取 2017 年 9 月至 2018 年 6 月入住我院新生儿科的 HIBD 早产儿 46 例为研究对象，应用 3.0T 磁共振扫描仪对所有研究对象行常规 MRI 及 DTI 扫描。待到患儿纠正年龄 7～8 个月时，到我院儿童保健科使用贝利婴幼儿发展量表（bayley scales of Infant Development,BSID）进行神经行为发育评分，并根据评分结果将研究对象分为预后好组和预后差组两组。进而比较两组患儿感兴趣区（region of interest,ROI）的各向异性分数（fractional anisotropy,FA）及表观扩散系数（apparent diffusioncoefficient,ADC）的差异是否有统计学意义。
结果： DTI 技术与常规 MRI 相比，对脑白质异常区域更为敏感；预后分组中，两组间参数的差异具有统计学意义（ $P<0.05$）。
结论： 与常规 MRI 相比，DTI 对早产儿 HIBD 的早期诊断更为可靠；DTI 可作为病情判断和预后预测的影像学参考指标。

EPO-1641
正常足月儿胼胝体发育的 MR 初步观测

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目的： 探讨正常婴儿胼胝体生长发育变化，为评价生后胼胝体发育状态寻找可靠的判断依据。
方法：采用高场 MR 液体衰减反转恢复成像观察正常婴儿胼胝体生长发育中各部厚度变化及信号特点。
结果： 膝、压部厚度呈不均匀增加趋势，膝部最早增厚，约在 2~3 月龄时超过压部，4~5 月龄时压部迅速增厚，约 7 月末膝部与压部厚度接近，体部厚度增加缓慢。各部信号不均匀增高，与厚度增加具有相关性。
结论： 每 3 月龄可代表胼胝体的一个发育阶段，可以初步评价生后胼胝体的发育状态，间接反映脑发育情况。

EPO-1642
特发性中枢性性早熟患者大脑微结构改变的 TBSS 及 VBM 研究

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摘要: 目的 应用功能磁共振弥散张量成像(DTI）及基于体素形态学测量(VBM)方法观察特发性中枢性性早熟患者大脑白质纤维束细微结构的损伤及灰质体积的改变并探讨其改变的意义。方法:本研究通过纳入 21 名经本院内分泌科确诊的符合我国性早熟诊断标准及卫生部发布的性早熟诊疗指南的特发性中枢性性早熟患者及 21 名年龄、性别与之相匹配的正常对照组。采用我科 3.0T 磁共振机器扫描并采集大脑结构图像和 DTI 数据,应用 VBM 和基于纤维束示踪的空间统计（TBSS）方法比较两组受试者间的大脑灰质体积,白质纤维束部分各向异性(FA)值差异,并进一步探讨结构损伤与患者临床症状间的潜在联系。结果:与正常对照组相比,特发性中枢性性早熟患者大脑中央后回脑灰质体积存在差异，(P＜0.05);双侧大脑半球部分白质纤维束完整性受损,主要以左侧前放射冠、双侧丘脑前辐射、胼胝体辐射线额部 FA 值减低为著(P＜0.05);结论:特发性中枢性性早熟患者较正常对照组大脑中央后回脑灰质体积存在差异及双侧大脑半球部分白质纤维束受损,并且初步推测脑结构损伤可能就是影响患者临床上情绪不稳及出现各种心理问题等的组成原因。

EPO-1643
完全性生长激素缺乏患儿大脑皮质形态变化的 3.0 T MRI 研究

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目的：应用 3.0T MRI 及图像后处理技术分析完全性生长激素缺乏（CGHD）患儿与特发性矮小（ISS）患儿大脑结构的灰质体积、皮层表面积及皮层厚度差异情况。
方法：24 例 CGHD 患儿（男 14 例、女 10 例，年龄 5~14 岁，GH 刺激实验峰值浓度小于 5.0 μg/l）与 24 例 ISS 患儿（男 15 例、女 9 例，年龄 5~14 岁，GH 刺激实验峰值浓度大于 10.0 μg/l）被纳入本研究中。在首次就诊时采集患者高分辨率、高信噪比三维（3D）T_1WI MRI。利用 FreeSurfer 软件图像后处理方法获得两组患儿左右大脑半球及全脑灰质体积、皮层表面积与皮层厚度值，并统计分析组间的差异情况。将每组患儿的上述形态学参数值分别进行平均以获得该

组患儿的均值分布图。将两组患儿的测量均值进行相减，即获得两组患儿该测量均值的差异值分布图。

结果：CGHD 患儿与 ISS 患儿的双侧半球与全脑的灰质体积（$F_{左}$=17.884, $F_{右}$=20.115, $F_{全}$=19.009）、皮层表面积（$F_{左}$=11.105, $F_{右}$=11.453, $F_{全}$=11.337）及皮层厚度（$F_{左}$=5.907 $F_{右}$=6.109, $F_{全}$=6.066）的差异均具有显著性意义（P值均<0.05）。测量值的均值分布图与均值的差异值分布图发现两组患儿的灰质体积、皮层表面积与皮层厚度在诸多脑区存在差异。

结论：CGHD 患儿较 ISS 患儿的大脑灰质体积、皮层表面积与皮层厚度均较小，这可能与其智力、运动或其它功能发育相对落后相关。

EPO-1644

EV-D68 脊髓炎的 MRI 诊断

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目的：肠道病毒 D68(EV-D68)脊髓炎是近几年新发现的疾病实体，国内未见报导，认识较浅，本文回顾性分析其 MRI 表现，归纳其特点，从而提高认识，为临床诊断和治疗提供参考。

方法：回顾性分析 2018 年 8-10 月间在我院收治的经浙江省疾病预防控制中心病毒分离确认的 18 例 EV-D68 脊髓炎的临床及 MRI 表现，其中男 10 例，女 8 例，平均年龄 4.3 岁。诊断标准包括：临床表现，MRI 表现和实验室病毒分离。MR 检查采用 Achieva 3.0T 超导检查仪(Philips, Best, The Netherlands)。扫描序列包括：矢状位和横断位 STIR-T2WI，矢状位 T1WI；增强扫描采用矢状位和横断位 T1WI+SPIR。

结果：18 例均有脊髓 MRI 检查，其中 15 例有脊髓炎表现，共 19 个病灶，累及颈髓 10 例、胸髓 4 例、腰骶髓 5 例；矢状位上呈长段型脊髓炎共 8 个病灶，短段型 11 个病灶，未见有播散型病灶；横断面全部病灶主要累及灰质为主，其中仅累及灰质 16 个病灶，同时累及白质 3 个病灶。其中 2 例有增强扫描，1 例在脊髓病灶见斑片轻度强化灶；2 例均有腰骶段脊神经和前组马尾神经强化，呈轻度均匀强化。

结论：EV-D68 脊髓炎高发季节是夏季和初秋，大多累及脊髓灰质，以前角为主，呈弛缓性脊髓表现；少数表现为横贯性脊髓炎。累及长度不一。病变以颈髓多见，其次是腰髓；增强扫描病灶内可斑片状强化，大多有神经根和马尾强化。尽管 MRI 表现缺乏特征性，但 MRI 检查是临床不可获缺的诊断依据。

EPO-1645

DWI 在新生儿低血糖脑损伤中的应用价值

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目的：探讨新生儿低血糖脑损伤的 MRI 特征及扩散加权成像(DWI)在低血糖脑损伤诊断中的应用价值。

方法：分析 39 例经临床证实的新生儿低血糖症患者的 MRI 资料，所有病例均在出生后 1～5 天行 MRI 检查；扫描序列包括常规 T1WI、T2WI、FLAIR 及 DWI 序列。

结果：双侧顶枕叶皮层及皮层下白质均见受累，其中伴发胼胝体受累 7 例、侧脑室旁脑白质受累 12 例，基底节受累 4 例，其中表现为弥漫性脑损伤 6 例，损伤部位广泛累及脑皮质及皮质下白

质，所有患儿小脑与脑干均未见明显异常信号。DWI 序列均表现为高信号，表现为斑片状、条状及脑回样高信号，胼胝体及基底节病变于常规 T1WI 及 T2WI 信号改变不明显。
讨论：1、低血糖是新生儿时期最常见的代谢紊乱之一，可引起较为严重的后遗症，因此，早期诊断早期干预对预后尤为重要；2、鉴于新生儿脑发育由下向上、由后向前的特点，在影像学上新生儿低血糖脑损伤以双侧枕顶叶后部脑组织及胼胝体压部最常受累，常对称性分布，具有定特征性；3、小脑与脑干均未见明显异常信号，主要是因为新生儿在出生前该处的神经纤维发育基本完成；因此 DWI 序列较常规 T1WI 及 T2WI 在低血糖脑损伤的发现及评估上更具优越性，具有重要的诊断价值。

EPO-1646
儿童首发精神分裂症患者脑功能异常：一项磁共振低频振幅的研究

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目的：通过研究儿童首发精神分裂症患者基于静息态功能磁共振低频振幅（ALFF）值的改变，探讨早发精神分裂症患者静息态下功能异常的脑区。
方法：分别入组 30 例首次诊断精神分裂症、并未经过治疗的儿童，以及 30 例年龄、性别、IQ 和教育程度等人口学资料相匹配的对照组儿童。患者和对照组儿童符合美国精神障碍诊断与统计手册第 4 版诊断标准（DSM-Ⅳ）对首发未用药精神分裂症患者以及健康志愿者的诊断标准。采集人口统计学资料、临床量表评分后分别对其进行静息态功能磁共振扫描，处理影像学数据后计算低频振幅值，并进行统计学分析。
结果：与正常对照组相比，儿童首发精神分裂症组左侧枕叶、双侧楔前叶、双侧后扣带回、左侧丘脑、左侧海马旁回，左侧距状沟 ALFF 值增高（P<0.05，经过 FDR 校正）；同时右侧颞上回，右侧小脑后叶 ALFF 值降低（P<0.05，经过 FDR 校正）。
结论：儿童首发精神分裂症患者在静息态下有多处脑区 ALFF 值改变，提示其在静息态下存在脑功能异常。

EPO-1647
0-12 月婴儿脑组织 T1W-3D 序列的优化研究

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背景和目的：众所周知，婴儿大脑图像对比度低且快速变化，这对解剖定义和自动分割具有极大的挑战性。本次研究将使用相对对比度作为度量标准，通过优化中心编码 3D-MPRAGE 序列来实现 0 - 12 月婴儿颅脑理想的灰白质图像对比度。

方法：弛豫图：使用 MIX 序列同时量化 T1、T2 和质子密度（PD）图，以测定颅脑不同部位灰白质的 T1、T2 和 PD 值。

Bloch 仿真：根据颅脑灰白质 T1 和 PD 值进行 Bloch 仿真，定义了三组：1）0 - 3 月，与成人相比呈相反对比；2）3 - 7 月，灰白质具有等对比；3）7 - 12 月，与成人具有相似对比。对于第 1 组和第 3 组，我们根据具有高相对对比度的确定最佳反转时间（TI_S）；而对于第 2 组，我们使用产生相反对比度的双 TI_S 获取图像。

结果：在 0 - 3 月的婴儿中，TI=800ms 的中心编码前后脑灰白质对比度最高（呈负性对比）（$P < 0.01$）。我们通过基于脑图谱的自动分割结果证明了 TI800ms 图像具有最高的分割准确度。在 3 - 7 月的婴儿中，中心编码 500 ms 和 700 ms 的 TI 产生了相反的对比。差异图像（TI700 - TI500）明显增强了灰白质对比度。在 7 - 12 月婴儿中，TI=700 ms 的对比度最高，与模拟结果一致。

结论：0 - 3 月婴儿使用中心编码的 MPRAGE 序列 TI≈800 ms，7 - 12 月婴儿使用 TI≈700 ms，而 3 - 7 月婴儿则使用双 TI 差异图，可以获得颅脑灰白质最佳相对对比度。这种针对婴儿特定年龄阶段优化的方法能，能方便地应用于临床常规检查，也有利于对婴儿大脑发育的定量分析。

EPO-1648

1.5T 磁共振多功能表面组合线圈在新生儿颅脑扫描中的应用研究

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背景与目的：在 1.5T 磁共振检查中，由于场强较 3.0T 低一半，而且自带标准头颅适合成人颅脑检查，对于新生儿头颅来说，线圈内径偏大，新生儿颅脑图像信噪比差。本研究旨在利用多功能高性能表面线圈进行自由组合，探索搭建与新生儿颅脑大小匹配的自制线圈，提高信噪比，提高病变检出率。

方法：根据新生儿颅脑大小 3D 打印支撑与新生儿颅脑弧度相匹配的有机玻璃架，进而搭建多功能高性能表面线圈新生儿头颅线圈。然后，先进行水模测试，最后进行新生儿颅脑扫描验证。

结果：机器自带颅标配脑线圈扫描得出水模前部信噪比为 172.81，多功能高性能表面组合线圈扫描得出的水模前部信噪比为 369.9，两者差异 P>0.05；机器自带标配颅脑线圈扫描得出水模后部信噪比为 300.34，多功能高性能表面组合线圈扫描得出的水模前部信噪比为 406.92，两者差异 P>0.05。多功能高性能表面组合线圈扫描新生儿颅脑图像显示信噪比很高，结构显示细腻、清晰。

结论：使用多功能高性能表面组合线圈扫描新生儿颅脑能获得较常规标配自带头颅线圈所得图像明显改善的图像质量，值得推广应用。

EPO-1649

Clinical and Imaging Analysis of Acute Necrotizing Encephalopathy of Childhood

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Acute necrotizing encephalopathy of childhood (ANEC) is a rare and rapidly progressive encephalopathy.Occurrence of ANEC is usually associated with diefferent virus infection after febrile diseases,presented with rapid neurological

deterioration[1].Death frequently occurs after onset,approximately 65% of patients will have different degrees of neurological sequelae or death [2].

1 Objective

To investigate the clinical and imaging features of acute necrotizing encephalopathy of childhood (ANEC), and try to find a correlation between them.

2 Materials and method

23 children patients with ANEC admitted to Wuhan Children's Hospital from January 2013 to October 2018 were retrospective analyzed. The male to female ratio is 0.9,and the age is (3.5±2.7) years old.Except for one dead patient, the remainer underwent CT and/or MR examination.

3 Results

All children were presented with hyperpyrexia and rapidly developed into rapid neurological deterioration after prodromic infection.The neuroradiologic hallmark of ANEC typically involved in bilateral thalamus(100%). Other lesions included the brain stem, white matter, basal ganglia and cerebellum. Except the symmetrical thalamus, the other lesions may be asymmetrical. The typical head MRI showed "tricolor pattern"[2] with the thalamus on DWI.Without the disadvantage of T2 penetration effect,the typical feature is more obvious on ADC map[3]. In mild cases, the ADC map may only show "bicolor pattern".

The long follow-up imaging(18 patients) demonstrated patients with white matter lesions disappeared(hypo-intense on T_1WI ang hyper-intense on T_2WI), while the thalamic lesions did not disappear.There are varying degrees of residual performance, mainly brain softening (8 cases), brain atrophy (9 cases) and ventricular enlargement (6 cases).

Wong and colleagues[4] created a scoring system to evaluate patients with ANE based on MRI.Our children's score showed hemorrhage and encephalomalacia on MRI may suggest poor clinical outcome.

4 Conclusion

ANEC is a rapid progressive encephalopathy with typical imaging features and poor prognosis. Hemorrhage and encephalomalacia on MRI may contribute to predicting clinical prognosis.

EPO-1650

Congenital TORCH infections of the head CT and MRI manifestation

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Abstract: Objective: To study the CT and MRI manifestation and clinical in congenital TORCH infections. **Materials and Methods :**CT and MRI feature of 90 cases

of congenital TORCH infections demonstrated by serum examination were retrospectively analyzed. **Results:** CT and MRI scan of brain revealed in-tracranial calcification in 15 patients, encephalic hyperplasia in 20 cases, dilated ventricles in 31 cases, brain anomalies in 38 cases. Simultaneous subependymal and brain tissue calcification occurred in 55 cases.he extent and appearance of calcification in brain were related to the degree and course of TORCH infection .The earlier the infection ,the more severe the brain developmental anomalies. **Conclusion:** Our findings indicated that injury of central nervous System following TORCH infections was severe. Typical CT and MRI feature together Clinical picture may suggest TORCH infection.

EPO-1651

儿童 HIV 相关颅内感染的 CT 表现特点

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目的 分析儿童 HIV 相关颅内感染的 CT 表现特点，以提高对该疾病的认识。**方法** 回顾性分析 2016 年 5 月-2017-5 月在赞比亚大学教学医院经实验室检查证实的 HIV 相关颅内感染患儿 24 例的 CT 表现特点。**结果** 24 例患儿中，结核性感染 13 例，其中脑脓肿 2 例，HIV 脑炎 5 例，弓形虫感染 3 例，隐球菌感染 2 例，非洲锥虫病 1 例。CT 表现，18 例见年龄不相关脑萎缩；15 例见脑实质低密度病变（结核性感染病变多见基底节区、丘脑且多无强化，脑膜强化明显；HIV 脑炎低密度影多对称见于侧脑室旁，无强化；弓形虫感染多见于灰白质交界处，呈结节状或环状强化伴脑回样强化，隐球菌感染病变见于基底节区、丘脑、脑干、小脑半球，伴环形强化，锥虫病见于基底节区、大脑半球，无强化）；14 例脑膜强化，6 例脑积水。**结论** 儿童 HIV 相关颅内感染的 CT 表现有一定特点，但缺乏特异性，定性诊断仍需结合临床及实验室检查。

EPO-1652

Diffusion tensor imaging study of brain in children with congenital hypothyroidism

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Abstract: Objective To investigate the white matter microstructure changes by using DTI in children with congenital hypothyroidism(CH). Methods 50 children with CH and 50 normal children matched in terms of age and gender accepted routine MRI examinations and DTI scanning of whole brain. FA values of Frontal subcortical white matter, Anterior limb of internal capsule, Posterior limb of internal capsule, Genu of corpus callosum , Splenium of corpus callosum, Centrum semiovale were measured. The group t-text was used to compare the FA values of the white matter between the case group and noraml group.Results FA values of Frontal subcortical white matter, Anterior limb of internal capsule, Genu of corpus callosum, Splenium of corpus callosum, Centrum semiovale in the case group were significantly lower than that in normal group(P<0.05).There was no significant difference in FA of Posterior limb of internal

capsule between case group and normal group (P>0.05). Conclusion DTI can reflect the changes of the cerebral white matter
microstructure and provides a realiable objective evdience for assessing brain development quantitatively in children with congenital hypothyrodism.

EPO-1653
脑瘫患儿认知功能损害的 3T 多模态脑功能磁共振成像研究

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目的 DKI、BOLD 技术与常规 T2WI、高分辨 T1WI 及 DTI 联合应用，探讨磁共振功能成像对伴有认知功能损伤的脑瘫患儿的早期诊断及预后评价。**资料与方法** 对 30 例临床诊断为伴有认知功能损伤的脑瘫患儿及 20 例年龄相匹配的正常小儿行头颅常规 MRI、DTI、选择性 DKI 及 BOLD 扫描，观察患儿的大脑皮层功能与白质损伤信号改变特点，多模态着重分析探测异常功能区域白质损伤微结构的关系，对临床干预的脑瘫患儿 6 月-12 月进行纵向跟踪。**结果** 30 例伴有认知功能损伤的脑瘫患儿，T2WI 像呈脑室旁高信号 12 例，高分辨 T1WI 像呈低信号 14 例，DTI 像纤维束部分缺失和纤维束走行欠规则 21 例。左侧额叶、左侧顶叶、左侧枕叶、右侧枕叶、左侧颞叶、右侧颞叶、左侧后扣带回、右侧后扣带回 FA 值低于正常对照组；左侧额叶、右侧顶叶、左侧枕叶、右侧枕叶、左侧颞叶、左侧后扣带回 MD 值高于正常对照组；左侧颞叶、右侧颞叶、左侧后扣带回 MK 值低于正常对照组。后扣带回、楔前叶、双侧额叶及双侧顶下小叶的 ALFF 值低于正常对照组；双侧海马旁回、右侧额顶叶、右侧小脑后叶和双侧基底节区的 ALFF 值高于正常对照组。**结论** DTI、DKI、BOLD 技术对伴有认知功能损伤的脑瘫患儿可更敏感、更准确的探测脑白质微观结构的改变，为进一步探讨脑白质异常与认知功能损害之间的关系提供影像学支持。

EPO-1654
小儿代谢性脑病临床 MR 特点

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代谢性脑病系由不同代谢障碍引起全脑功能紊乱的一种临床综合征。轻者表现为行为障碍、精神异常，可伴惊厥、偏瘫等局灶性脑损害，重者昏迷、去大脑或去皮质强直。引起代谢性脑病的原因很多，包括氨基酸、有机酸、脂肪酸、糖等代谢异常，以及线粒体功能障碍等，导致高氨血症、低血糖、酸中毒和能量缺乏，引起脑功能障碍。
临床以急性或亚急性起病，于感染、饥饿、手术等应激时好发。引起代谢性脑病的系统疾病众多，发病机制复杂，总结其机制为：脑血流量的变化、流体的变化，干扰神经递质物质的变化，大脑的能量状态和脑屏障功能的改变，自由基损伤和细胞凋亡等。代谢性脑病常常在婴儿期与儿童期发病，少数延迟至成人期。除线粒体病外，其他急性代谢性脑病在发病早期积极治疗，大多可完全恢复，但如果延误治疗或反复发作，有可能导致不可逆的神经系统损伤或死亡。在发育落后或有慢性神经系统异常的儿童，尤其是既往有过脑病的患儿，出现上述症状时应首先除外代谢性脑病。
多数代谢性脑病 MR 表现为两侧大脑半球白质水肿，背侧丘脑、基底节区、脑干、皮质脊髓束走行区及皮层下 U 形纤维对称性扩散受限。如鸟氨酸氨甲酰基转移酶缺乏症 OTCD--X 连锁显性遗传基因突变，尿素循环障碍导致高氨血症的中枢神经系统功能障碍的疾病。MR 表现为双侧额顶枕叶的皮层弥漫性长 T1 长 T2 信号；肾上腺脑白质病-性联隐性遗传病伴外显不全、过氧化物体病，乙酰辅

酶 A 缺乏使长链脂肪酸(C25-26)产物聚集于各系统而致病，MR 表现为双顶枕白质对称性长 T1 长 T2 信号，脑室三角区更显著，形成特征性蝶翼状。由于小儿代谢性脑病的临床症状不具特异性，病因复杂，无明确的影像学诊断标准，临床早期基因检测诊断，对患儿早期救治、降低死亡率、减少神经系统损害具有重要临床意义。

EPO-1655

急性淋巴细胞性白血病髓外浸润的影像学表现

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目的：探讨儿童急性淋巴细胞性白血病(acute lymphoblastic leukemia，ALL)病髓外浸润的 CT、MRI 表现，旨在提高对本病的诊断、疗效观察及预后评估。方法：回顾性分析我院 2013 年 1 月至 2018 年 12 月，56 例经临床诊治和病理证实的白血病髓外浸润患者的临床和影像资料。主要临床表现为发热， 淋巴结肿大， 肝、 脾肿大，皮肤出血点和贫血等。结果：69 例中，累及脑实质 9 例；累及脑膜 16 例并伴有颅骨破坏；眼眶浸润 14 例；累及肝 6 例，呈弥漫性及结节性；脾脏 3 例均表现为弥漫性；肾脏 9 例，均为双侧肾弥漫性增大；有 5 例肝脏、肾脏、脾脏同时累及。肺部浸润 7 例伴胸腔积液 4 例。结论：CT、MRI 可充分显示白血病髓外浸润所累及器官，但缺乏特征性，注意与淋巴瘤、 肝母细胞瘤、肾母细胞瘤及转移瘤等相鉴别。 单从影像学表现无法确定是白血病浸润， 最终诊断应该密切结合临床表现、病史、组织学、免疫组化检查等。

EPO-1656

侧脑室旁白质软化症的影像诊断

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探讨小儿侧脑室旁白质软化症(Periventricular Leukomalaeia ；PVL)的病因与临床及影像诊断价值。方法 选择临床证实的 130 例 PVL 典型病例进行回顾性分析。结果 早产儿 85 例,占 65. 4%。患有缺氧缺血性脑病的足月儿 45 例,占 34. 6%。MRI 表现脑室不同程度扩大,侧脑室旁白质减少。根据脑白质减少及脑室扩大程度将 PVL 分为轻、中、重 3 度。①轻度:表现为双侧侧脑室周围白质减少,灰质达侧室缘,脑室无扩大。其中足月儿 31 例,早产儿 15 例。②中度:侧脑室周围白质明显减少或部分消失,灰质达侧室缘,侧室外侧壁不规则,脑室轻度扩大。足月儿 9 例,早产儿 28 例。③重度:侧脑室周围白质消失,被灰质代替,侧脑室明显扩大且外侧壁不规则呈锯齿状或波浪状。结论 MRI 扫描在 PVL 的诊断方面有着重要的价值。

EPO-1657

儿童颅内幕上 PNET 影像学表现及鉴别诊断

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目的:探讨儿童颅内幕上原始神经外胚层肿瘤 (PNET)影像学表现，以提高儿科影像学诊断水平。**方法**:回顾性分析我院经手术和病理证实颅内幕上 PNET 患儿 8 例 CT 和 MRI 影像学表现，其中行 CT

平扫检查 2 例，CT 平扫及增强检查 2 例，行 MRI 平扫检查 1 例， MRI 平扫及增强检查 7 例。**结果**:8 例 PNET 病灶均位于幕上大脑半球实质内,其中额叶 4 例，额颞叶 2 例,额顶叶 1 例，颞顶叶 1 例,病变 体积均较大,边界较清，呈类圆形、分叶状或不规则形。CT 平扫 4 例病变密度明显不均匀性改变，呈囊实性，伴散在斑点状钙化 3 例，伴出血 1 例；CT 增强实性成分明显异常强化 2 例。MRI 平扫 8 例 T1WI 上均呈稍低信号,T2WI 上均呈高低混杂信号,DWI 上 7 例未见明显弥散受限征象，1 例部分轻度弥散受限，病灶内出血 2 例,瘤周无明显水肿 2 例,轻度水肿 6 例；MRI 增强扫描 7 例病灶内实性成份均呈明显不均匀性强化,囊变区未见强化。**结论**:儿童颅内幕上 PNET 影像学表现具有一定的特点，可根据肿瘤发生部位、形态、囊实性成分、无或轻度瘤周水肿、伴钙化、出血等特征可为该病的影像诊断和鉴别诊断提供可靠依据。

EPO-1658

MRI 在新生儿胆红素脑病中的诊断价值(摘要)

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目的：
本研究旨在探讨 MRI 成像在新生儿胆红素脑病（Newborn bilirubin encephalopathy-NBE）中的诊断价值。
材料与方法：
研究对象日龄为 2-9 天新生儿 10 例，临床症状主要表现为拒乳、双目凝视、角弓反张、颈强、四肢肌张力高等。黄疸时间最早者在出生后第 2 天，MRI 检查时血清总胆红素峰值均＞164.5umol/L（正常参考值 3.4-17.1umol/L），最高为 448.3 umol/L，其中 3 例新生儿在血清总胆红素高峰值期过后进行 MRI 检查。
采用 Phlips3.0T 全数字磁共振，头颈联合神经血管专用线圈。婴儿检查前 15～20 min 使用 10%水合氯醛 1ml/kg 直肠给药镇静并双耳塞好耳塞。全部影像资料经 2 名有经验的高职影像医师共同读片评价苍白球和底丘脑的信号高低及有无。苍白球 T1WI 有高信号的评价参照同一患儿的壳核 T1WI 信号差别。底丘脑 T1WI 高信号的评价参照同一患儿的背侧和腹侧丘脑 T1WI 信号。
结果：10 例新生儿中全部双侧苍白球 T1WI 可见对称性高信号；2 例丘脑外侧 T1WI 可见对称性高信号，两侧小脑齿状核 T1WI 呈高信号；2 例豆状核信号略高。
结论：由于新生儿的特殊性，临床诊断 NBE 还存在一定的难度，CT 不能显示颅内病变受累情况，因此 MRI 技术的应用成为诊断 NEB 的重要影像学方法。

EPO-1659

非综合性唇腭裂腭成形术及语音康复后儿童脑网络改变

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目的：语言问题困扰唇腭裂（CLP）患者，甚至发生在腭裂术后[1]。通过神经成像技术已经确定了 CLP 患者大脑的结构和功能变化[2,3]。语音训练已广泛应用于非综合征 CLP（NSCLP）患者腭成形术后的语言恢复治疗[4]。本研究采用静息状态功能磁共振成像（fmri）和图论方法，探讨非综合性唇腭裂（NSCLP）患儿术后全脑网络是否能恢复正常。

方法：28 名 NSCLP 患儿（平均年龄 10.0±2.3 岁）和 28 名年龄和性别匹配的健康对照组在 3.0 T MRI 扫描仪上进行静息态功能 MRI 检查，获得功能拓扑属性。用双样本 t 检验（Bonferroni 校正 $p<0.05$）评估这些拓扑属性的组间差异[5]。对非综合性唇腭裂患者进行汉语语言清晰度（CLCDS）评分，计算其所有拓扑属性与 CLCDS 评分的相关性。
结果：在 0.05-0.50（step=0.01）的稀疏度范围内，在语言相关脑区[6]检测到在局部节点属性上具有显著组间差异的节点。组间集聚系数、特征路径长度、网络的全局效率和局部效率和标准化的特征路径长度差异无统计学意义。两组间标准化的集聚系数（P=0.0006，T=3.64）和小世界属性（P=0.0015，T=3.33）有显著差异。进一步相关分析，右顶上小叶节点度（正）和左岛叶皮质节点介数（负）与 CLCDS 评分显著相关。
结论：语言网络在 NSCLP 儿童言语训练中发挥了重要作用。与健康对照组相比，语音矫正后的患者在全局网络指标方面没有显著差异，但有更高的小世界指数。局部节点参数，标准化的集聚系数和小世界指数可作为临床语音矫正的生物标志物。左岛叶和右顶上小叶的拓扑属性可作为预测语音治疗效果的影像生物标志物。

EPO-1660
基于静音磁共振序列的 IVIM-DWI 联合 SWI 对新生儿缺血缺氧性脑病的应用价值的研究

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摘要：目的 探讨应用静音磁共振中的体素内不相干运动扩散加权成像(IVIM-DWI)及磁敏感成像（SWI）在新生儿缺血缺氧性脑病诊断中的价值。**方法** 应用西门子 Skyra 3.0T 超导型磁共振中的静音模式下的 IVIM-DWI 及 SWI 序列，对 50 例临床怀疑缺血缺氧性脑病的新生儿进行检查，同时采集常规 T2WI、T1WI 及 DWI,回顾性的分析联合两种检查方法对缺血缺氧性病灶的检出率，比较常规 DWI 与 IVIM-DWI 对疾病的诊断及病灶检出敏感性的差别，同时比较 IVIM-DWI 联合 SWI 与常规 MR 对病灶检出的效果。**结果** 1、在 50 例患儿中，常规 DWI 序列检出 19 例患儿有缺血缺氧性脑病，检出率 38%；IVIM-DWI 序列检出 25 例，检出率 50%；IVIM-DWI 联合 SWI 检出 30 例，检出率 60%。2、在共同检出的 19 例患儿中，常规 DWI 共发现病灶 76 处，IVIM-DWI 共发现病灶 100 处，IVIM-DWI 联合 SWI 共发现病灶 120 处，相比常规序列 IVIM-DWI 联合 SWI 检出病灶数明显增多，敏感性显著提高。3、对于同一病灶的显示，联合使用 IVIM-DWI 及 SWI 更为清晰，病灶范围更大。**结论** 基于静音磁共振序列的 IVIM-DWI 联合 SWI 对新生儿缺血缺氧性脑病的诊断价值明显高于常规的 DWI，对病灶的检出率及敏感性都有很大的提升，为临床治疗提供了可靠依据，同时此方法还可对患儿的预后情况做更为准确的评估。

EPO-1661
多模态功能磁共振成像诊断急性播散性脑脊髓膜炎

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摘要：目的 探讨多模态功能磁共振成像对急性播散性脑脊髓炎（ADEM）的诊断价值。 **方法** 选取 ADEM 患儿 4 例为观察组 4 例正常同龄儿为对照组。收集患儿多模态磁共振资料，对两组患儿颅脑感兴趣区(ROI)测得各向异性分数(FA)值并进行统计学分析。**结果** 疾病早期脑磁共振波谱（MRS）示额叶、颞叶、基底节及胼胝体 Cho 上升，NAA 下降，其中额叶可见 Lac 峰及高大 Lip

峰，NAA/（Cho+ Cr）降低。观察组壳核、额叶白质、胼胝体膝部、胼胝体压部 FA 值明显小于对照组，差异有统计学意义（*P*＜0.05）。丘脑、内囊后肢、内囊前肢与对照组比较差异无统计学意义（*P*＞0.05）。随访时壳核 FA 值上升最多。**结论** 多模态磁共振成像发现 ADEM 早期脑多处代谢异常，壳核处受累且恢复较慢，为疾病早期诊断、临床治疗及预后提供影像学证据。

EPO-1662
DTI 评价高危妊娠新生儿脑发育及与胎儿期脐动脉血流频谱相关性

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【摘要】 目的 探讨 DTI 评价高危妊娠早产儿脑发育的价值及与脐动脉（UA）血流频谱的相关性。 **方法** 选择本院 51 例妊娠期高血压孕妇（HDP）、32 例妊娠期糖尿病孕妇（GDM）及 18 例妊娠期高血压合并糖尿病孕妇（HDP+GDM）分娩的新生儿为观察组，无合并症孕妇分娩新生儿 54 例为对照组。比较两组新生儿头颅感兴趣区（ROI）各向异性分数(FA)值，并与胎儿 UA 收缩期峰值流速(PSV)与舒张末期流速(EDV)的比值(PSV/EDV,S/D)及搏动指数(PI)等其他数值做相关性分析。**结果** HDP 及 HDP+GDM 组额叶、内囊后肢、尾状核及豆状核的 FA 值低于对照组，差异有统计学意义（*P*＜0.05），GDM 组内囊后肢、豆状核 FA 值低于对照组，差异有统计学意义（*P*＜0.05）。组内比较，GDM 组的尾状核的 FA 值与 HDP 及 HDP+GDM 组比较差异有统计学意义（*P*＜0.05），GDM 组的豆状核 FA 值与 HDP 组比较差异有统计学意义（*P*＜0.05）。内囊后肢 FA 值与 S/D 值及 PI 值、张路指数（ZLI）正相关（P＜0.05）。豆状核 FA 值与 PI 值正相关（*P*＜0.05）。**结论** 高危妊娠新生儿脑多处 FA 值减低，内囊后肢的 FA 值与 S/D 值相关性更大。

EPO-1663
妊高症新生儿脑发育与胎儿期血流频谱的相关性研究

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【摘要】 目的 探讨妊高症新生儿脑发育与胎儿期脐动脉(UA)及大脑中动脉（MCA）血流频谱的相关性，应用扩散张量成像（DTI）评价。**方法** 选择本院高血压疾病孕妇分娩新生儿 37 例为观察组，无高危围产因素孕妇分娩新生儿 54 例为对照组。比较两组的新生儿头颅感兴趣区（ROI）各向异性分数(FA)值，FA 值与两组胎儿期 UA 和 MCA 的搏动指数(PI)、收缩期峰值流速(PSV)与舒张末期流速(EDV)的比值(PSV/EDV,S/D)等其他数值进行相关性分析。**结果** 两组内囊后肢、胼胝体压部及额叶白质的 FA 值差异有统计学意义（*P*＜0.05）。内囊后肢的 FA 值与 MCA-S/D 及 UA-PI 呈明显正相关（*P*＜0.05），胼胝体的 FA 值与 UA-S/D 及 ZLI 值呈明显正相关（*P*＜0.05），额叶的 FA 值与 UA/MCA-S/D 呈明显正相关（*P*＜0.05）。UA-PI 与内囊后肢、额叶及胼胝体的 FA 值总和及其均值呈明显正相关（*P*＜0.05）。张路指数（ZLI）与所有 ROI 的 FA 值总和及其均值呈明显正相关（*P*＜0.05）。 **结论** DTI 表明胎儿大脑中动脉联合脐动脉可以预测妊高症早产儿脑发育情况。

EPO-1664

评价磁共振 T2-Flair 序列对诊断儿童颅脑髓鞘发育不良的敏感性

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目的 应用磁共振 T2-Flair 序列诊断评价儿童脑白质髓鞘化发育情况。**方法** 将 150 例经儿保确认为脑发育障碍的患儿（3 岁内）分为 4 组:新生儿（至生后满 28 天）组共 16 例(A 组)；1 月-1 岁组共 35 例(B 组)；1 岁-2 岁组共 39 例(C 组)；2 岁-3 岁组共 60 例(D 组)。采用同年龄段 MRI T1WI、T2WI、DWI 显示的正常脑髓鞘发育的标准，对每组患儿 12 个脑区域 MRI 检测结果进行评定。应用 SPSS 23.0 软件进行统计学分析。**结果** 病史以 HIE、早产为主，约 73.2%；临床表现以运动障碍或语言发育迟缓为主，约 82.5%。头颅 MRI T2-Flair 所示脑白质髓鞘化延迟 A 组 66.2%；B 组约 72.6%；C 组 86.2%；D 组约 92.7%。**结论** 头颅 MRI T2-Flair 对诊断儿童脑白质髓鞘化延迟临床意义重大，且其诊断 3 岁年龄组脑发育迟缓敏感性最大。

EPO-1665
磁共振 MOLLI（Modified Look-Locker Inversion Recovery）序列在新生儿高胆红素血症脑部定量测定评估中的应用

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目的
新生儿高胆红素血症患者定量测定苍白球的 T1 值能够为精确描述影像特征提供依据。本研究拟采用 MOLLI 序列对新生儿高胆红素血症患者脑部苍白球区进行定量评估，并且与其血胆红素水平进行相关性分析，为影像诊断新生儿胆红素脑病提供技术依据。
方法
采用 3T 磁共振扫描仪（Siemens, Skyra），32 通道头线圈，采用 MOLLI 对新生儿进行脑部扫描。扫描具体参数如下：重复时间= 520.47ms, 回波时间= 1.73ms,采集及恢复时间：5（7）3（5）10， TI=312ms，翻转角=35o,层厚= 3.0mm, FOV = 360mm×360mm, 体素大小= 1.2×1.2×3.0mm3,全脑共采集 104 层矢状位图像。图像处理：对生成的 T1 mapping 图像在双侧苍白球区用 Siemens Workstations 的 Circle 进行感兴趣区（ROI）的画取，并提取该 ROI 区域的 T1 值。计算双侧苍白球 T1mapping 测值的平均值，进行两组双样本 t 检验比较，再将病例组的 T1mapping 测值与患儿血总胆红素水平进行 Pearson 相关性分析。
结果
本研究纳入 10 名新生儿高胆红素血症患儿作为病例组，7 名健康新生儿作为对照组。病例组和对照组性别构成比（χ2=0.460）、年龄（t=0.769）差异无统计学意义。病例组苍白球 T1mapping 测值平均值为 1510.30±197.33，对照组苍白球 T1mapping 测值平均值为 1212.86±146.45，两组测值差异有统计学意义（t=0.004）。病例组苍白球 T1mapping 测值与血总胆红素水平进行相关性分析显示两者呈正相关（r=0.671）。
结论
MOLLI 序列优势在于可以定量测值。本研究通过 MOLLI 序列能够提取出 ROI 的 T1 值，并且与临床指标血总胆红素水平呈正相关，揭示了 MOLLI 序列为新生儿脑部定量扫描提供了有力的技术依据。

EPO-1666
左侧中颅窝蛛网膜囊肿儿童脑微结构 MRI 研究

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目的：探讨左侧中颅窝蛛网膜囊肿（AC）儿童脑微结构改变。
材料与方法：入组 2015-2018 年间经湖南省儿童医院手术证实为 AC 的 12 名患者，在术前应用西门子 3.0T Skyra 磁共振扫描仪获取 T1 结构像数据。12 名儿童均为男性（年龄范围为 5-7 岁）。同时获得与之年龄及性别匹配的健康对照者 12 例。基于体素的形态学测量（VBM）及基于体素的皮质厚度测量（VBCT）的方法，应用双样本 T 检验比较组间双侧额顶枕叶脑结构差异。以上指标比较在 Statistical Parametric Mapping12 自带统计软件中进行，$p<0.001$ 为差异有统计学意义。
结果：VBM 结果表明与对照组相比，AC 患者颅内体积及灰质体积均增高（p 值分别为 0.002，0.007），左侧额极及右侧顶上小叶灰质体积增加（$p<0.001$）。VBCT 结果显示 AC 组右侧顶上小叶、角回、缘上回、岛盖部及左侧枕叶皮层厚度较正常组增高（$p<0.001$）。
结论：左侧中颅窝 AC 患者较正常儿童存在皮质微结构差异，以语言、视觉及体感联络相关脑区主。T1 结构像可作为术前定量评估脑结构的有效手段。

EPO-1667
儿童白血病中枢神经系统并发症的影像表现

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目的 探讨儿童白血病中枢神经系统并发症（CNSCL）的影像表现及临床联系。**方法** 回顾性分析 52 例儿童 CNSCL 的 CT、MR 表现及临床资料。**结果** （1）血管性病变 26 例，其中出血 23 例，脑梗塞 2 例，静脉窦栓塞 1 例。23 例颅内出血包括硬膜外出血 1 例，脑内出血 22 例，均为多发。CT 表现为团状或斑片状高密度影，MR SWI 序列呈低信号；（2）中枢神经系统浸润 23 例，其中硬膜和（或）颅骨浸润 18 例，表现为硬膜和（或）颅骨梭形增厚或肿块，CT 呈高密度，T1WI 呈低信号，T2WI 呈中等信号，明显强化；软脑膜浸润 6 例，表现为软脑膜增厚、强化；脑实质浸润 2 例，肿块形成，CT 呈偏高密度；2 例动眼神经、1 例视神经浸润，MR 显示增粗、强化。（3）脑白质病变 2 例，表现为片状 T2WI 高信号影。（4）二次 肿瘤 1 例，为脑干胶质瘤。**结论** 儿童 CNSCL 影像表现多样，CT、MR 具有重要诊断价值，根据患者的临床症状、检验结果等选择最优影像检查方式及序列能为临床提供更多有价值的信息，对临床诊治有重要意义

EPO-1668
儿童视神经脊髓炎在常规磁共振表现

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目的：视神经脊髓炎（neuromyelitis optica，NMO）是视神经和脊髓同时或相继受累的急性或亚急性脱髓鞘病变；探究常规磁共振成像在儿童视神经脊髓炎诊断中的价值。

方法：回顾性分析我院 2011 年-2015 年临床确诊的 3 例患儿的常规磁共振成像，包括头颅磁共振平扫和脊髓磁共振平扫。所有 3 例患儿的血清抗 NMO IgG 抗体均为阳性结果。
结果： 3 例患儿中，男 2 例，女 1 例，年龄 8 岁-12 岁。脊髓磁共振影像显示均为颈、胸髓长节段病灶 T1WI 低信号，T2WI 高信号，病灶未见明显偏侧性。2 例患儿随访脊髓磁共振成像，其中 1 例可见颈胸髓明显萎缩。头颅磁共振影像显示 1 例为阴性，1 例为左侧内囊及右顶叶斑片状状异常信号，但是临床检查无相应区域神经损伤，且随访后未见其范围缩小及范围增大。1 例为延髓 T1WI 低信号 T2WI 高信号，与其颈髓病灶相连。头颅及脊髓病灶中均未见明显出血信号。
结论：NMO 的特异性抗原抗体：水通道蛋白-4 主要存在于视神经与脊髓，同时在下丘脑室上核、室管膜细胞的基底外侧面也有明显表达。主要影像表现是视神经炎和脊髓炎；在脊髓病变多为对称长节段病灶，病变位于脊髓中央，范围超过脊髓断面的一半，纵向跨度超过 3 个椎体节段；病灶早期表现为肿胀，晚期则呈萎缩改变。而其在头颅磁共振表现却是多变的。

EPO-1669
小儿脊髓非典型畸胎瘤样/横纹肌样瘤的 MRI 表现

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目的 探讨小儿脊髓非典型畸胎瘤样/横纹肌样瘤（AT/RT）的 MRI 表现，以期提高对该病的认识。
方法 收集我中心自 2016 年 6 月至 2018 年 6 月经手术病理及免疫组化证实的小儿脊髓 AT/RT 8 例，结合临床及病理资料回顾性分析其 MRI 表现。 **结果** 8 例患儿中男性 4 例，女性 4 例,平均年龄为 5.14±3.99 岁。小儿脊髓 AT/RT 临床症状以下肢乏力伴疼痛多见。MRI 表现为椎管内境界不清的长条样肿块，病变范围约为 2.3-11.7cm， T1WI 和 T2WI 肿瘤呈混杂信号，T2WI 图像呈略高/等信号，T1WI 图像呈等/略高信号，增强扫描呈不均匀强化。8 例均合并出血。其中肿瘤累及胸腰段脊柱的 5 例，累及腰骶段脊柱的 2 例，仅累及腰段脊柱的 1 例。马尾神经受侵的 7 例，发生椎旁组织转移的 3 例，椎管内转移的及颅内多发转移的 3 例。**结论** 小儿脊髓 AT/RT 罕见，MRI 的表现具有一定特征性，如肿瘤境界不清，并且常伴出血或血肿形成，马尾神经受累，这些表现有助于该病的诊断。

EPO-1670
ADC histograms and texture feature for evaluating brain alterations in neonates with cardiac septal defect: single-slice or multi-slice measurements?

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Background and Purpose *Cardiac septal defect is associated with the phenotype information of lesions that reflect in diffusion weight imaging (DWI), while quantitative descriptors of brain tissues might improve the diagnostic accuracy. We aimed to evaluate neonatal brain alterations with congenital heart disease through single and multi-slice DWI.*
Materials and Methods Functional imaging data was acquired from sixty neonates with cardiac septal defect (CSD) confirmed by echocardiography and twenty-two normal

controls in Nanjing Children's Hospital, China from January 2012 to December 2016. Histograms of apparent diffusion coefficient (ADC) and texture features were extracted and correlated to gestational weeks for both single and multiple slices of the whole brain. Diagnostic performance of the two measurements for CSD was then evaluated and compared through independent-samples *t* test and receiver operating characteristics.
Results *In both the two groups, single-slice measurement suggested a significant inverse correlation between histogram metrics and gestational ages (P<0.05), and multi-slice measurement suggested a significant correlation between ADC values and gestational ages (P<0.05). The ADC histogram showed significant difference between the two groups (P<0.05), but no differences in texture features.While multi-slice DWI showed better diagnostic performance than single-slice DWI. The area under the curve for the 90th ADC value of single-slice was the largest, which was 0.698, multi-slice was 0.759.*
Conclusion *Quantitative analysis of DWI provide beneficial information of brain development in neonates with CSD. Multi-slice DWI with selected texture features could provide better diagnostic performance for CSD in clinical practice.*

EPO-1671
妊娠期高血压对早产儿脑发育影响的 DTI 评估

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【摘要】目的 采用弥散张量成像（DTI）评估母亲妊娠期高血压对早产儿脑发育影响。**方法** 选取 2018 年 2 月至 2019 年 4 月在河南郑州大学第三附属医院新生儿重症监护室收治的进行 DTI 筛查的早产儿 78 例，妊娠期高血压疾病孕妇分娩的 36 例早产儿作为观察组，另 42 例无高危围产因素孕妇分娩的早产儿作为对照组，应用 3.0T 磁共振扫描仪对所有研究对象行常规 MRI 序列扫描和 DTI 扫描，分析两组围生期资料、颅脑损伤情况和脑白质微结构的改变。对病例组额叶白质 FA 值与出生时 Apgar 评分进行相关性分析，计算相关度。**结果** 两组早产儿的内囊后肢、胼胝体压部、额叶白质、顶叶白质、大脑脚 FA 值平均值差异有统计学意义（均 *P*<0.05），病例组早产儿额叶白质 FA 值与出生后 1min、5minApgar 评分无明显相关性（r=0. 244，*P*>0.05；r=0.273，*P*>0.05）。**结论** 母亲妊娠期高血压疾病可导致早产儿脑发育落后，以磁共振 DTI 序列检测内囊后肢、胼胝体压部、额叶白质、顶叶白质以及大脑脚的 FA 值对于评估母亲妊娠期高血压疾病对早产儿脑发育的影响具有重要的价值。

EPO-1672
MRI features of reversible corpus callosum compression lesions in children

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Objective: In order to raise awareness of the disease to explore the clinical manifestations and MRI features of reversible corpus callosum compression lesions

(MERS) in children. **Methods:**The clinical features, imaging changes, electroencephalogram and follow-up results of 16 children with MERS were retrospectively analyzed, including7 males and 9 females, aged from 4 months to 6 years, with an average age of 3.7 + / -2.4 years.All the 16 cases were performed with GE Signa Excite 1.5t scanner, and MRI cross-sectional T1WI, T2WI and DWI were performed.**Results:**16 cases of imaging changes involving the corpus callosum, lesion characteristics show class circular, T1WI, or slightly low signal, T2WI and FLAIR is slightly high signal, DWI is obviously high signal, can the corresponding apparent diffusion coefficient (ADC) sequences in low signal as the typical characteristics, including 11 cases in DWI showed corpus callosum can isolation of involvement and diagnosed MERS I type;The other 4 cases were extended to the whole corpus callosum, 1 case was extended to a half egg circle center white matter was diagnosed MERS Ⅱ type, 7 d ~ 1 month follow-up with review of cranial MRI in addition to involving more than half egg white circle center are back to normal.**Conclusion:** MERS is clinically manifested as acute mild encephalitis/encephalopathy, which is a good clinical syndrome.MRI is of great value for its diagnosis, differential diagnosis and clinical treatment.

EPO-1673

儿童罕见脑室内中枢神经细胞瘤 1 例

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目的：探讨儿童脑室内中枢神经细胞瘤相关特征性影像学表现，以进一步提高临床及放射科医生儿童脑室内中枢神经细胞瘤的认识。
方法：回顾性分析本院一例因“左眼向内斜视”入院，最终病检查证实为中枢神经细胞瘤患儿的流行病学资料、临床特点、影像学表现及并复习总结相关文献。
临床资料：患儿男，10 岁，主因“左眼向内斜视 5 天”入院。入院查体：患儿眼球活动自如，左眼向内斜视，无眼震，双侧瞳孔等大等圆，对光反射存在。头部 CT 平扫示：右侧脑室内可见混杂稍高密度肿物影，其内可见多发小片状低密度影，大小约 3.8cm×3.7cm×3.7cm，右侧脑室扩张（图 1）。头部 MRI 平扫及增强检查示：右侧脑室内可见不规则等-长 T1、等-长 T2 信号肿物影，于 DWI 上呈高信号，右侧脑室明显扩张，透明隔向左侧移位；增强后可见右侧脑室内肿物实性部分呈不均匀强化，其内多发囊性部分未见明显强化（图 1）。初步诊断：右侧脑室内混杂信号肿物伴囊变、坏死，呈不均匀强化，考虑室管膜或脉络丛来源可能。最终病理诊断为右侧脑室内中枢神经细胞瘤。
结论：CNC 是一种非常罕见的神经元起源肿瘤，其发病率低，2016 年 WHO 中枢神经系统肿瘤将其归属于神经元和混合神经元-神经胶质肿瘤，WHOⅡ级，占原发性中枢神经系统肿瘤的 0.25%~0.5%。CNC 好发于 20~40 岁的青年人，在儿童极其罕见。其主要发生于侧脑室及第三脑室近 Monro 孔区，少数位于四脑室或脑实质内。CNC 在影像学上具有一定特征性，多囊和钙化被认为是 CNC 特征性 CT 表现。其在 MRI 上可表现为 6 种特征性征象：扇贝征、宽基底征、周围泡泡征、皂泡征、液-液平面及宝石征。儿童脑室内 CNC 十分罕见，综合分析病变的 CT 及 MRI 表现，熟悉以上所述特征性征象，尤其是扇贝征及其在 DWI 上的信号特点，可在术前提供相对准确的诊断信息。

EPO-1674

Multimodal Image Analysis of Sexual Dimorphism in Developing Childhood Brain

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Objective: It is well known that there are great differences in human brain anatomy and functions between males and females. With the development of noninvasive neuroimaging techniques, the sex differences in adult human brain have been well studied in some works. However, the sexual dimorphism of human brain anatomy and functions has not been well-studied during the developmental period of childhood brain. The objective of this study was to identify specific patterns of the sexual dimorphism of developing human brain structure in children using multimodal brain image analysis.
Methods: We performed a multivariate and data-driven analysis by combining multiple neuroimaging technologies including the T1-weighted structural MR images (sMRI) and diffusion tensor imaging (DTI) in a prospective cohort of 198 children (133 male) with their ages varying from 0 to 15. First, we segment the brain images into 50 regions of interests and extract the ROI volume and connectivity features. Then, we identify the individual multimodal imaging biomarkers associated with sex differences. Finally, we make the classification of the selected features into male or female.
Results: Results show that our method achieved sex classification accuracy 66% for the children with their ages below 3 and 71% for the children with their ages above 3. We found that the volumes of right middle occipital gyrus, right middle frontal gyrus, and left superior marginal gyrus are more related to sexual dimorphism of developing brain structure than those of other regions. In DTI, the connectivities between right middle occipital gyrus and right suboccipital gyrus, between left superior marginal gyrus and left middle temporal gyrus, and between right triangle inferior frontal gyrus and right putamen are also related to the sexual dimorphism. These sexually dimorphic patterns of brain may be related to the observed sex differences in developing childhood brain structure and function.
Conclusion: The sexual dimorphism in developing childhood brain is identified in brain structures and neural network connectivity using the multimodal MRI analysis.

EPO-1675
基于 rs-fMRI 动态度中心度对伴中央颞区棘波儿童良性癫痫研究

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目的：现代脑网络科学研究表明，人脑功能架构是一个复杂动态交互网络，异常发育和电活动都会影响功能网络节点配置和动态交互。静息态功能磁共振成像（resting-state functional MRI, rs-fMRI）是目前无创研究人脑功能最重要手段之一。因此，本研究旨在使用 rs-fMRI 衡量 BECTS 患儿动态度中心度改变，为理解 BECTS 患儿一段时间内动态网络信息提供帮助，进而探讨 BECTS 静息态自发活动的分布及时间变异。

方法：纳入 26 例（8~14 岁）BECTS 患儿作为病例组，26 例性别、年龄、社会地位相匹配的儿童作为对照组。使用 GE HDxt 3.0T 磁共振扫描仪采集 rs-fMRI 数据。静息态数据处理采用 DPARSF_V3.0 软件，在基于 MATLAB7.6 和 SPM8 的基础上进行计算，先对原始图像预处理，继之构建全脑体素水平的功能连接矩阵，设置基于体素功能连接相关系数 r=0.25 为阈值，构建正向的二值化（binary）和加权（weighted）体素水平连接邻近矩阵，然后使用 6mm 空间平滑和 z 标准化，基于 hamming 时间窗动态度中心度变异，最后采用软件分别进行组内分析和组间两样本 t-test 统计学分析。
结果：通过计算病例组和对照组每个体素的平均 DC 值，分别获得两组动态 DC 空间分布图（TFCE 团块校正，$p<0.05$）。两组 DC 空间分布图视觉显示广泛的相似性。进一步行动态 DC 时间变异分析，病例组二值化增加脑区位于双侧楔前叶、右侧颞上回，然而二值化减少脑区位于左颞下回；加权组间分析显示增加脑区位于双侧楔前叶、右侧颞上回、左侧丘脑及左侧角回，减低脑区位于左侧颞下回、右侧梭状回及右侧额下回三角部。
结论：本研究结果表明中央节点，特别是异常功能网络节点配置内高度连接脑区选择性和特异性破坏可能与 BECTS 发病机制有关。

EPO-1676
儿童中枢神经系统非典型畸胎样／横纹肌样瘤的影像学表现

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目的：探讨儿童中枢神经系统非典型畸胎样／横纹肌样瘤（ＡＴ／ＲＴ）的影像学特征。方法：回顾性分析 ２０１７ 年 １ 月－２０１９ 年 ６ 月经病理和免疫组化诊断为 ＡＴ／ＲＴ 的 8 例患者的 ＣＴ（ｎ＝3）和 ＭＲＩ（ｎ＝6）表现，并复习相关文献。结果：8 名患者平均年龄 2.5 岁。肿瘤位于幕上 6 例，幕下 2 例。其中含有囊变 6 例，出血 2 例，钙化 2 例。CT 平扫多表现为混杂密度，肿瘤实质部分密度稍高，增强扫描中重度强化，周边部分强化较明显，强化多不均匀，肿瘤周围常有水肿带。 磁共振检查瘤体信号混杂，实质部分以稍长 T1 稍长 T2 信号为主，坏死囊变区呈长 T2 信号，T２WI-FLAIR 上呈混杂等高信号，扩散加权成像（ＤＷＩ）呈高信号或稍高信号，增强扫描实质部分强化较明显 ，肿瘤内常可见偏心性坏死囊变区。增强扫描表现多样，周边呈环形条带样不均匀强化，中央坏死区无明显强化、也可呈结节状强化、斑片样强化，或者无强化。幕上肿瘤体积多大于幕下，有明显的占位效应。结论：中枢神经系统非典型畸胎样／横纹肌样瘤是多发生在婴幼儿高度恶性胚胎性肿瘤，影像表现多样，肿瘤周边呈环形条带样不均匀强化，中央不均匀多样可变的强化，应考虑 AT／RT 的可能性，但确诊最终要靠病理和分子遗传学特征。

EPO-1677
儿童睡眠中癫痫性电持续状态患儿的的静息态脑功能研究

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目的：采用区域一致性（Regional Homogeneity, ReHo）方法分析 ESES 患儿和正常对照组的静息态脑网络，探讨患儿认知功能损害神经网络改变的机制。**方法：**ESES 患儿 25 例，8.57±1.99 岁；正常对照组共 6 例，9.50±1.80 岁。利用西门子 MAGNETOM Skyra 3.0T 超导型磁共振成像系统采集结构图像和脑功能数据。使用 REST 和 DPARSF 等软件对数据进行处理分析，处理步骤包括：①去

除 EPI 数据前 10 个时间点；②头动校正；③时间校正；④空间平滑；⑤时域滤波；⑥配准；⑦标准化。舍去头部平动＞2mm 或转动＞2° 的数据。对 ESES 组和正常对照组分别进行单样本 t 检验，经 AlphaSim 校正，最小簇大于 10 个体素，P＜0.001 视为有统计学意义，得到 t-map 后观察相对于全脑平均水平的 ReHo 峰值所在脑区。随后进行独立样本 t 检验，将性别、年龄作为协变量，对比两组间的 ReHo 值差异，经 AlphaSim 校正，最小簇大于 10 个体素，P＜0.01 视为有统计学意义。**结果：**与正常对照组比较，1、ReHo 值降低的区域包括：（1）默认网络：扣带回后部、左侧前额叶内侧部及左侧楔前叶；（2）语言网络：双侧颞叶上部和右侧颞区岛盖；（3）思维知觉相关网络：左侧额叶中部。2、ReHo 值增高的区域包括：（1）语言网络：双侧小脑半球 Crus1 区和 Crus2 区；（2）视觉网络：双侧枕叶中部及下部、左侧枕叶上部、左侧额叶中部以及左侧舌回。**结论：**1、ESES 患儿的语言中枢、默认网络及额叶等区域的神经活动功一致性降低，能较好地解释患儿在临床上出现的语言功能及知觉推理能力等认知能损害。2、大脑半球语言功能下降，与语言功能相关的小脑半球 Crus1 区和 Crus2 区的功能可能会代偿性地增高。静息态脑功能磁共振能够反映病理状态下 ESES 患儿神经网络的改变，是深入探讨患儿认知功能损害机制的良好技术。

EPO-1678

3.0T 磁共振 ASL 联合 DTI 技术对早产儿缺氧缺血性脑损伤及预后研究

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目的 DTI、ASL 技术与常规 T2WI、T1WI 及 DWI 联合应用，探讨多模态功能磁共振成像对早产儿及 PVL 后遗患儿的大脑异常发育的早期诊断及临床干预疗效的评估。**方法** 对 36 例临床诊断、常规 MRI 明确诊断为缺氧缺血性脑白质损伤的患儿及 15 例日龄相匹配的早产儿行头颅常规 MRI、DWI、DTI 及 ASL 扫描，观察患儿的大脑结构以及白质和灰质损伤、功能异常信号改变特点，多模态着重分析探测异常功能区域白质损伤微结构的关系，并对其病例进行随访，对临床干预治疗及未干预治疗的患儿进行纵向跟踪。**结果** 1、早产儿缺血缺氧性脑损伤组与正常早产儿对照组脑组织 rCBF 值比较：早产儿缺血缺氧性脑病组低于同日龄正常新生儿灌注值（P＜0.05）。2、早产儿缺血缺氧性脑损伤后遗症患儿组及正常对照组脑组织 rCBF 值比较：后遗患儿组低于同月龄正常对照组灌注值（P＜0.05）；后遗患儿组及正常对照组 DTI：PVL 后遗患儿组不同程度稀疏或部分缺失，伴走行异常，FA 值不同程度降低，两者间差异有统计学意义（P＜0.05）。3、脑瘫 PVL 患儿临床系统早期干预与未系统干预组脑兴趣区 rCBF 值、FA 值两组比较差异有统计学意义（P＜0.05）。**结论** ASL 联合扩散张量成像 DTI 技术，用以评估小儿脑部疾病尤为早产儿缺氧缺血性脑损伤及预后不同阶段血流灌注情况，并可以监测局部区域脑血流量与该区域神经活动的关系，同时提供病变血流动力学特征和治疗后组织灌注情况；PVL 后遗的早期临床干预方案制定和疗效评价，积极实施综合康复治疗，减少脑瘫儿的发病率；为今后对多种脑部疾病的临床早期干预、疗效评价、随访及科研等活动提供重要的影像学指导依据。

EPO-1679

磁共振动脉自旋标记(ASL)和磁共振波谱(1H-MRS)对儿童偏头痛的诊断价值

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目的 儿童偏头痛是常见的一种病症,常规磁共振检查无异常发现。动脉自旋标记 ASL 磁共振灌注成像是通过对循环动脉血液中的水分子进行磁化标记，使其成为可扩散的示踪剂的一种技术，此技术可以无侵袭性的测定动脉血流。磁共振质子波谱(^{1}H proton MR spectroscopy, ^{1}H-MRS 可以在活体无创地检测组织代谢物浓度,已广泛应用于神经系统多种疾病的诊断。本文目的主要是应用磁共振动脉自旋标记(ASL) 和磁共振波谱(^{1}H-MRS)评估儿童偏头痛,以了解发病机制。
资料和方法 65 例临床诊断偏头痛的儿童（年龄 3-15 岁）排除其他疾病引起的头疼。使用 GE 1.5T 磁共振扫描仪，应用头部 8 通道线圈，患者仰卧，行轴位、冠状、矢状位位扫描，层厚 5mm，使用标准化的兴趣区域（ROI），总扫描时间约 7min。在后处理平台对所要研究的数据处理。
结果 我们发现了偏头痛侧颞叶区明显低灌注，相对 CBF 降低和 NAA/Cr 比值下降。
结论 磁共振动脉自旋标记(ASL)不用注射对比剂，直接定量 CBF 和磁共振波谱(^{1}H-MRS)观察神经元细胞的情况可能因此成为有用的工具，无创检测儿童偏头痛，为临床提供一个有力的影像学依据。

EPO-1680

磁共振扩散张量/扩散张量纤维束示踪成像对小儿脑瘫早期诊断及康复评价的意义

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目的：从脑功能影像学角度，探讨 MRI 扩散张量成像/扩散张量纤维束示踪成像（DTI/DTT）对小儿脑瘫早期诊断的意义，评价临床康复和干预疗效。
方法:2008 年 1 月年-2018 年 5 月，1 月～ 3 岁临床怀疑脑瘫的 60 例患儿作为研究组，分 1～6 个月、6 个月～1 岁、1～3 岁三段研究；设 60 例年龄匹配为正常对照组。行 DTI/DTT 检查，对脑瘫接受正规康复治疗 6 月随访 DTI/DTT。选取胼胝体、内囊后肢、半卵圆中心、额顶叶深部白质、小脑中脚区域作为感兴趣区，测定各向异性 FA 值。选定连合束、皮质脊髓束及弓状纤维等区作为研究区，重建三维纤维束图。分析各选定区纤维束的形态、数量、走行、分布及间联系。判定方法：与同龄组正常儿童脑白质纤维束（DTT 图）及 FA 值比较；复查患儿的 DTI/DTT 结果与同年龄组正常儿童对比。
结果： 1、年龄段研究组和对照组胼胝体膝部、胼胝体压部、内囊后肢、半卵圆中心、额叶深部白质、顶叶深部白质、小脑中脚区域 FA 值分别行组间 t 检验，$P < 0.05$，差异有统计学意义。 2、研究组与正常组对比 DTT 扩散张量纤维束示踪成像结果：正常 6 例、中度异常 36 例、重度异常 18 例。3.15 例研究组接受规范干预治疗半年后复查，显示健侧白质纤维束纤维数量增多，ADC 值降低，FA 值增高。
结论：1、DTI： 研究组患儿各兴趣区 FA 值低于正常对照组。提示研究组脑白质发育髓鞘化迟缓或损伤，测量 FA 值可对临床怀疑脑瘫患儿进行量化分析。
2、DTT：研究组 54 例（90%）脑白质纤维束不同程度损伤，对临床脑瘫早期诊断的确立有重要意义，可立体直观显示白质纤维束的发育和损伤情况。3、随访接受规范干预治疗半年后的脑瘫患儿，显示健侧白质纤维束纤维数量明显增多，ADC 值降低，FA 值增高，提示发生代偿。4、上述技术联合应用有助于临床对小儿早期脑瘫诊断；定期随访可对脑瘫康复和临床干预疗效做出客观影像学评价。

EPO-1681

eswan 和 dwi 成像评估早产儿不同程度脑损伤的深部髓静脉表现

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目的：评估纠正足月的早产儿缺血缺氧损伤后深部髓静脉表现。
材料和方法：连续收集 2012 年 10 月至 2014 年 7 月在华中科技大学同济医院就诊行磁共振检查的纠正足月早产儿患者。其中，新生儿缺血缺氧性脑损伤满足以下标准：（1）胎儿或新生儿窒息史，如胎心或/和胎动减少、Apgar 评分≤7 分、呼吸衰竭等；（2）生后一周出现新生儿脑损伤的临床指征，如精神状态异常（激惹、昏睡或昏迷）、肌张力异常（增高或减低）、原始反射减弱或消失等；（3）异常的磁共振或经颅多普勒超声表现。排除怀疑/合并存在颅内感染、代谢性疾病或不能解释的脑积水的患儿，以及中枢神经系统先天发育缺陷的患儿。最终，50 例缺血缺氧损伤的早产儿纳入研究。另外，收集 8 例没有窒息史和其他可能引起脑损伤疾病的足月儿作为对照。评估所有纠正足月早产儿的常规磁共振和 DWI 表现。其中，基底节损伤、多发点状白质损伤、囊性 PVL、DEHSI、III-IV 度出血为预后不良组。在 ESWAN 幅度图上侧脑室体部层面及半卵圆中心层面，进行七分法评估深部髓静脉表现。应用 GE 后处理工作站(GE, Advantage workstation, edition 4.4)处理 DWI 数据得到 ADC 图，在半卵圆中心层面从前向后放置大小约 20mm2 的圆形感兴趣区，得到前额叶白质、中心白质和顶叶白质的 ADC 值。
结果：BG/PWML/PVL/DEHSI/HE III 组的 DMVs 评分低于 HE I-II 组和 NA 组，以上各组的髓静脉扩张程度评分低于 HE IV 组。DWI 各损伤组 ADC 值高于正常组，严重损伤组与轻度损伤组间没有统计学差异。
结论：ESWAN 可检测到不同损伤程度组之间的差异，可作为常规和弥散检查的有效补充。

EPO-1682

儿童脑血管炎 MR 进展

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目的：研究探讨小儿颅内血管炎的 MR 进展。方法：患儿进行颅脑 MRI 平扫、增强及 3D-TOP MRA 检查。**结果**：头颅 MRI 典型表现为血管分布区域局灶急性缺血改变。T2 相高信号多具有偏侧性、多灶性特点，常常累及白质及灰质结构。传统的脑血管造影或磁共振血流成像(MRA)是诊断大-中血管炎的必要手段，后者在影像学上主要表现为血管狭窄、扭曲、串珠形成和闭塞。MRA 在检测远端血管异常方面较传统脑血管造影来说具有一定局限性，但对明确异常血流动力学，MRA 是相当可靠的。**结论**：儿童脑血管炎确诊较困难，并非所有的病例都有炎症的典型临床和实验室表现，经典脑血管造影所见是非特异性的，尤其小血管炎造影常常显示为阴性，需要临床进行必要的鉴别诊断，包括血管性及非血管性疾病。只有认识到该疾病的特点，才有利于临床早期评估并逆转神经系统功能损伤。

EPO-1683

儿童颅内非典型畸胎瘤样/横纹肌样瘤 MRI 表现及与髓母细胞瘤对比研究

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【摘要】目的探讨比较磁共振成像（MRI）及磁共振加权成像（DWI）儿童颅内中枢神经系统非典型畸胎瘤样/横纹肌样瘤(AT/RT)与髓母细胞瘤两者诊断及鉴别诊断中的价值。
方法 回顾性分析我院 2015 年-2018 年经病理及免疫组化证实为 AT/RT 的 21 例患儿及髓母细胞瘤的 40 例患儿术前影像学表现与特征，探讨比较两种肿瘤实质部分的 DWI 多个参数。
结果 21 例 AT/RT 确诊中位年龄(2.33±2.9)岁，40 例髓母细胞确诊中位年龄(5.64±3.7)岁，除年龄外，性别、病灶部位及病灶最大径差异均无统计学意义，常规 MRI 征象中偏中线生长、幕上脑室扩张、囊变及强化方式的差异具有统计学意义，而 T1WI、T2WI、瘤周水肿、出血、播散的差异均无统计学意义。两组 ADCmean 差异具有统计学意义，肿瘤实质 ADCmean 诊断 AT/RT 与髓母细胞瘤的曲线下面积（AUC）为 0.786，界限值为 0.796×10-3 mm2/s，此时诊断敏感度为 61.9%，特异度为 87.5%。
结论 常规 MRI 特征与 DWI 参数可为儿童颅内 AT/RT 与髓母细胞瘤的鉴别诊断提供相对可靠的信息，肿瘤实质 ADCmean 的特异度较高，当呈现囊变、幕上脑室扩张以及瘤周水肿等征象时，结合患儿年龄以及病灶部位等特征有助于该病的诊断和鉴别诊断。

EPO-1684

儿童椎管粒细胞肉瘤 MRI 表现分析

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目的 ： 国内外对于儿童椎管粒细胞肉瘤影像表现报道甚少，当外周血指标未见异常时，探讨儿童椎管粒细胞的 MRI 表现分析并结合临床表现有助于诊断。
方法 ： 回顾分析并比较经手术病理证实的 6 例儿童粒细胞肉瘤的临床特点与 MRI 征象。
结果 ： 6 例儿童椎管粒细胞肉瘤其中 5 例为男性，1 例为女性，平均年龄为 7.9 岁，其中 5 例以脊髓压迫为首发症状，其余 1 例以骶尾部外伤入院。有 2 例是由多发或相邻的多发病灶组成，4 例为孤立的单发病灶。其中累及胸段椎管 2 例，腰骶段椎管 2 例，胸腰段及胸腰骶椎管各 1 例。6 例椎管粒细胞肉瘤的髓外位置均在硬膜外，其中 4 例合并有椎旁或椎前软组织肿块，2 例合并有神经根增厚，所有病例均浸润单侧或双侧椎间孔，5 个病例有椎体和/或附件浸润。6 例均侵犯椎管及椎间孔；椎管硬膜外病变包绕脊髓，呈“围髓”样生长。与骨骼肌信号相比，椎管内病灶在 T1WI 呈略高信号，在 T2WI 呈稍高或高信号；增强扫描时椎管内病灶呈中度-明显均匀强化，椎间孔、椎旁及椎前病灶多呈边缘性强化。
结论 ： 儿童椎管粒细胞肉瘤发病率较低，但较成人多见，男性多见，常累及胸段，椎管及椎旁受累时常常会同时侵犯椎间孔，甚至沿椎间孔沟通椎管内外。因此，当儿童或青少年以脊髓压迫为首发临床表现，即使无出血、贫血、感染等白血病的典型临床表现，无外伤史，脊髓神经压迫症状发展快，病程短，MRI 提示病灶位于椎管内硬膜外并向椎间孔浸润，且信号均匀时，需考虑本病的可能性。

EPO-1685

儿童脊柱 Ewings 肉瘤、PNET 的 CT、MRI 的表现分析

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目的 ：探讨儿童椎管内尤文肉瘤/原始神经外胚层肿瘤的 CT 及 MRI 表现分析。
方法 ：回顾分析并比较经病理证实的 6 例儿童椎管内尤文肉瘤/原始神经外胚层肿瘤与 CT 和 MRI 征象。
结果 ：6 例儿童椎管内尤文肉瘤/原始神经外胚层肿瘤，5 例表现为椎管内硬膜外肿物，1 例表现为椎管内硬膜下、髓内肿物，全部病例在 T1WI 上为等、稍低或低信号，在 T2W I 为稍高或高信号，脂肪抑制序列上为高信号，增强扫描 5 例呈不均匀明显强化，1 例呈不均匀轻度强化，6 例强化不均匀 ，可见坏死囊变；全部病例的软组织肿块同时侵犯椎管内外 ,其中 5 例在椎管内硬膜外呈弥漫性生长，其中侵犯椎管全周 3 例，侵犯椎管达 1/2 周 2 例 。
周围脊柱骨质受累 5 例，同时累及椎体及附件 3 例，其中胸椎 1 例，腰椎 2 例，单纯累及附件 2 例，胸椎、腰椎各 1 例。CT 检查显示 3 例表现为溶骨性骨质破坏，边缘呈虫蚀状，有膨胀性改变 1 例，有骨膜反应 1 例，椎体压缩 1 例；2 例病变呈成骨性改变，椎体有膨胀，可见骨膜反应。
结论 :儿童椎管内尤文肉瘤/原始神经外胚层肿瘤的 CT/MRI 表现具有一定特征性，多表现为硬膜外软组织肿块，其 T1WI 上为等信号，在 T2W I 为稍高信号，容易发生囊变，增强扫描多呈明显不均匀强化，且多累及椎管内外，形成椎旁软组织肿块，并且对周围脊柱的骨质产生很大的破坏。

EPO-1686
儿童神经系统副肿瘤综合征诊断思路

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摘要
目的：副肿瘤综合征（paraneoplastic syndrome）是发生在某些恶性肿瘤患者体内，在未出现肿瘤转移的情况下即已产生能影响远隔自身器官功能障碍而引起的疾病。如影响到神经系统则称之为神经系统副肿瘤综合征(neurologic paraneoplastic syndrome)。本文主要介绍儿童神经副肿瘤综合征的临床表现，影像学表现，诊断和治疗。提高对儿童神经系统副肿瘤综合征的认识。
方法：收集我院 3 例神经系统副肿瘤综合征的病例，进行回顾性分析。
结果：（1）患者 1，女，7 月龄，出现发作样抽搐，影像学表现为骶前实质性占位性病变，病理结果为神经母细胞瘤，诊断为神经系统副肿瘤综合征；
（2）患者 2，男，10 月龄，出现持续发热 9 天，阵发性肌张力增高 10 小时，影像学表现为左侧腹部软组织肿块，病理结果为神经母细胞瘤，诊断为神经系统副肿瘤综合征；
（3）患者 3，女，18 月龄，出现全身抖动 1 周，影像学表现为右侧肾上腺区条片状高密度影及软组织密度影，右侧肾上腺显示欠清，病理结果为肾上腺神经母细胞瘤，诊断为神经系统副肿瘤综合征；
结论：神经系统副肿瘤综合征在儿童中十分罕见，常发生在肿瘤临床表征出现之前。常见的特异临床表现主要为眼阵挛，共济失调或肌阵挛，行为改变或睡眠障碍，精神病学特征（焦虑，抑郁，精神分裂症，精神病），短期记忆丧失，情绪变化和癫痫发作，病毒样前驱症状等。当患者出现这些症状，且常规治疗无明显改善时，应进一步进行肿瘤相关筛查，并且对血清或脑脊液中相关自身抗体进行检测，可以及时发现和治疗肿瘤，有助于稳定或改善神经疾病。

EPO-1687
基于高分辨率 MRI 婴儿痉挛症患儿神经功能损害研究

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目的：采用 DARTEL－VBM 法及 SBM 法，分析 IS 患儿脑精细结构改变，联合临床资料，探讨 IS 患儿神经功能损害的机制。

方法：同时纳入确诊 IS 的患儿（IS 组）及健康志愿者（HC 组）各 20 例。利用西门子 MAGNETOM Skyra 3.0T 采集结构像数据。再用 CAT12 和 TOM 生成基于本研究被试的脑模板及组织概率图；通过 SPM12，用 DARTEL 算法分割图像； VBM 法分析两组间脑灰、白质体积差异，SBM 法分析两组间皮层厚度差异，不校正 P 值。独立样本 t 检验比较两组间灰、白质体积及皮层厚度差异，性别、年龄为协变量，cluster size＞10，P＜0.001 认为差异有统计学意义。

结果：1、组间比较：（1）颅内总容积（cm^3）：IS 组为 1064.40±156.45，HC 组为 1188.24±140.59；与 HC 组相比，IS 组颅内总容积减少（P＝0.026）。（2）灰质总体积（cm^3）：IS 组为 581.93±93.77，HC 组为 661.59±76.51；与 HC 组相比，IS 组灰质总体积减少（P＝0.015）。（3）白质总体积（cm3）：两组间的白质体积差异无统计学意义。2、差异脑区分析：（1）IS 患儿的左侧岛叶及前扣带回灰质体积较 HC 组增加（P＜0.001）；右侧颞上回、颞中回、颞极、额上回、顶上小叶及楔前叶灰质体积较 HC 组减少（P＜0.001）。（2）两组间的白质体积及皮层厚度均未见有统计学意义的差异脑区（P＞0.001）。

结论：1、IS 组颅内总容积及灰质总体积减少，反映 IS 患儿脑发育受影响是其运动和认知整体发育落后的基础。2、IS 患儿右颞叶、额叶、顶上小叶及楔前叶灰质体积减少，反映了其听觉、视觉及语言功能受损的解剖基础，能解释临床中表现出的追声、追物功能下降及认知功能发育迟滞。3、IS 患儿右侧额上回灰质体积减少，反映了其复杂肢体运动功能受损的解剖基础，能解释临床中表现出的精细运动差。

EPO-1688

学龄前孤独症儿童的磁共振脑功能脑网络研究

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目的：目前针对学龄前孤独症儿童的脑功能的研究较少，其脑网络特性尚不明确，本研究拟通过构建学龄前孤独症儿童的功能脑网络，分析其与正常发育儿童的脑功能网络的异同，以进一步理解学龄前期儿童的孤独症发病机制。

对象与方法：本研究采用静息态功能磁共振的方法对孤独症学龄前儿童及对照组学龄前儿童进行了扫描，其中孤独症组 32 人（年龄：3.03±0.99 岁），对照组 22 人（年龄：2.95±0.90 岁），然后先计算两组人群的功能连接的差异，再采用图论的分析方法获得功能连接的网络属性。

结果：孤独症功能网络的研究中，静息态磁共振的功能连接的结果显示：孤独症组相对于对照组有 25 组脑的功能连接增强，11 组脑的功能连接减弱；在功能连接的网络属性中，孤独症组的功能网络的集群系数及局部效率较对照组增高，其中左侧岛盖部额下回、右侧颞中回的节点效率增高，左侧距状裂周围皮层、左侧舌回、右侧海马较对照组的节点效率减低。

结论：本研究发现在功能连接中，学龄前孤独症患儿的默认网络及颞叶部分脑区的连接增高，而与记忆相关的海马区的连接降低；同时在脑网络的属性中，功能及结构的局部网络效率均增加，功能网络全局效率无明显提高。

EPO-1689

胎儿静脉窦畸形影像表现的再认识

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目的：利用超声及磁共振评价胎儿静脉窦畸形的影像表现。
方法：收集自 2013 年 7 月至 2016 年 2 月的 4 例胎儿静脉窦畸形的病例。所有孕妇因超声发现颅内占位性病变而行磁共振检查。
结果：4 例患静脉窦畸形的胎儿中，两例磁共振表现为典型的静脉窦扩张伴窦汇内血栓形成。而另两例分别不典型病例位于上矢状窦及横窦并伴有其他畸形。两例妊娠终止，另两例出生后失随访。
讨论：超声医师应对不典型部位的静脉窦畸形提高警惕，必要时行磁共振检查提高诊断信心。综合以上 4 例病例影像学特点，对胎儿静脉窦畸形的发生及演变有了进一步认识。

EPO-1690
超声及磁共振诊断胎儿 Joubert 综合征的经验

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目的：描述超声及磁共振的胎儿 Joubert 综合征的影像特征。
方法：我们收集 2012 年 1 月至 2015 年 3 月我院 3 例胎儿 Joubert 综合征。所有孕妇均行超声检查，两例进行了产前磁共振检查后终止妊娠，1 例活产行产后磁共振检查。
结果：超声及磁共振均诊断正确有 1 例胎儿，1 例胎儿仅磁共振诊断正确，1 例活产胎儿超声诊断错误。
讨论：超声医师提高认识后可以发现胎儿 Joubert 综合征，但在大多数情况下，Joubert 综合征容易被超声医师漏诊。超声医师应认识 Joubert 综合征的典型表现，必要时行磁共振检查提高诊断信心。

EPO-1691
探讨产前 MRI 对胎儿 Ganlen 静脉动脉瘤样畸形的诊断及预后评估价值（附 3 例报道）

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摘要：目的：探讨产前 MRI 对胎儿 Ganlen 静脉动脉瘤样畸形的诊断及预后评估价值。方法：回顾性分析、采集广州市妇女儿童医疗中心 2013 年 9 月至 2019 年 12 月经产前超声及磁共振成像检查诊断为 Galen 静脉动脉瘤样畸形的 3 例胎儿影像学及临床学资料，并进行文献复习。结果：3 例胎儿病例均在孕晚期行胎儿头颅平扫并诊断为 Galen 静脉动脉瘤样畸形，3 例 MRI 表现如下：1 例表现为胎儿脑内大脑大静脉增宽，上矢状窦、下矢状窦均明显增宽，以左侧乙状窦增宽为明显，并伴有心脏增大表现；另外 2 例则均表现为大脑大静脉及镰窦呈囊样扩张，边界清晰，T1WI 呈等信号，T2WI 呈低信号，其中一例伴有右侧额叶脑出血、双侧脑室轻度扩张的表现。结论：胎儿 MRI 能清楚的显示胎儿 Ganlen 静脉动脉瘤样畸形的形态及信号改变，并观察脑室大小、脑实质是否缺血损伤等，对胎儿的诊断及预后评估具有重要价值。

EPO-1692
MRI 在胎儿脊柱与脊髓发育异常的产前诊断中的应用

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目的: 探讨 MRI 在产前诊断胎儿脊柱与脊髓发育异常中的临床应用。 **方法**: 回顾性分析在我院产前彩超怀疑胎儿脊柱、脊髓发育异常的 89 例单胎胎儿，行产前脊柱和脊髓 MRI 检查，分析其影像学表现，并与其产前彩超诊断结果对比。89 位孕妇年龄 21-41 岁，平均 27±4 岁，孕龄 22-39 周，平均 28±4 周。评价最终诊断以产后超声或 MRI 检查结果为准。**结果**: 89 例胎儿包括椎体发育异常 26 例，脊髓发育异常 24 例，椎体脊髓复合畸形 35 例，产前 MRI 对其诊断符合率分别 100%(26/26)、91.7%(22/24)、85.7%(30/35)，产前 US 对其诊断符合率分别为 88.5%(23/26)、45.8%(11/24)、45.7%(16/35)，其中产前 MRI 和 US 对于单纯椎体发育异常的诊断符合率无统计学差异（p>0.05），MRI 对胎儿脊髓发育异常及椎体脊髓复合畸形的诊断符合率高于 US（p<0.05）。MRI 结果与超声诊断一致 50 例，进一步完善产前超声诊断 18 例，纠正超声诊断 14 例。**结论** MRI 检查特别是磁敏感加权成像（ sensitive weighted imaging ，SWI）序列对胎儿脊髓发育异常具有更好的诊断价更具优势，对于胎儿脊柱与脊髓发育异常的产前诊断具有重要的临床应用价值，是产前超声检查的重要补充方法。

EPO-1693
MRI 在胎儿泌尿系统畸形中的应用

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目的 探讨 MRI 在胎儿先天性泌尿系统畸形中的应用价值。 **方法** 46 例产前超声检查怀疑胎儿泌尿系统畸形的孕妇，行产前 MRI 检查，并与产前彩超相对比。所有胎儿均为单胎。评价最终诊断以产后超声或 MRI 检查结果为准。**结果** 46 名孕妇年龄为 21-40 岁，平均 26±4 岁，孕龄为 20-39 周，平均 28±3 周。46 例先天性泌尿系统异常胎儿中，包括羊水量正常的 30 例（羊水正常组）、羊水过少 16 例（羊水过少组）。羊水过少组胎儿通过 MRI 测量胎儿肺肝信号强度比(LLSIR)评估是否存在胎儿肺发育不良。产前 MRI 改变产前 US 检查结果 5 例，产前 MRI 证实产前 US 检查结果 4 例，产前 MRI 进一步完善产前 US 检查 12 例，产前 US 诊断准确而 MRI 诊断不正确 2 例，产前 US 及 MRI 诊断均不正确 1 例。产前超声诊断符合率为 73.9%（34/46），产前 MRI 总诊断符合率为 93.5%（43/46）。羊水过少组胎儿均合并肺发育不良，LLSIR 为 1.01～1.87，平均值为 1.19±0.05，较正常组明显减低(P=0.000<0.05)。 **结论** MRI 检查在胎儿泌尿系统异常的诊断中具有较高的临床应用价值，是产前超声检查的重要补充方法，特别是在胎儿肾脏异常合并羊水过少的产前诊断具有更好的发展前景。

EPO-1694
MRI 对胎儿骶尾部畸胎瘤的评价

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目的：探讨产前 MRI 对胎儿骶尾部畸胎瘤影像学诊断及意义。

资料与方法：回顾性分析我院 2015 年 01 月至 2019 年 1 月有病理结果证实，并进行了产前 MRI 检查的 28 例胎儿，分析骶尾部畸胎瘤的位置、大小、成分、邻近器官受压情况及是否合并其他畸形。结果：产前 MRI 骶尾部的畸胎瘤表现为囊性/囊实性,可向体腔内、外突出，呈 T1WI 低信号，T2WI 高信号为主。MRI 能准确对胎儿骶尾部的畸胎瘤进行分型（定位及累及范围）、无创，多次测量肿瘤大小、评估生长情况、评价瘤体成分（囊实性比），能显示与毗连器官的关系、能提示合并其他畸形。结论：MRI 能够作为产前超声的有效补充，提供更全面的信息；MRI 为骶尾部畸胎瘤的胎儿的预后判断及后期的临床治疗提供依据。

EPO-1695

The correlation research between ADC value and gestational age in normal fetal brain region with b value = 1000 s / mm2

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Objective Using diffusion weighted imaging with B value 1000 s / mm^2 to analayse the relationship between apparent dispersion coefficient (ADC) value of the fetal brain region and gestational age.The ADC values in different regions of the normal fetal brain during the middle and late pregnancy were measured, and the relationship between the ADC values in this region and the gestational age was studied to assist prenatal diagnosis and prognosis evaluation **Methods** 106 normal fetuses in the middle and late pregnancy were scanned using DWI sequence (b value = 1000 s / mm^2).DWI examination (b value =1000 s/mm 2) was performed on 106 fetuses with suspicious prenatal ultrasound abnormality and normal MRI results in the middle and late pregnancy.The ADC values of white matter (frontal lobe, parietal lobe, temporal lobe and occipital lobe), basal ganglia, thalamus, brainstem and cerebellum were measured, and the relationship between the ADC values in different areas of fetal brain and fetal age was analyzed by linear regressionADC values of supratentorial white matter (frontal, parietal, temporal, and occipital), basalganglia, thalamus, pons, and cerebellum were measured.Linear regression was used to analyze the relationship between ADC values in different regions of fetal brain and gestational age. **Results** The ADC value of Fetal brain were variable in these regions,The order from high to low is:parietal white matter>other white matter>cerebellar>basalganglia>thalamus,pons.ADC values of supratentorial white matter (parietal,temporal,occipital), basalganglia , thalamus, cerebellum and pons were negatively correlated with fetal age.There was no linear correlation between ADC values and gestational age in the white matter of the frontal lobe.With the increase of gestational age, the ADC value of cerebellum decreased fastest, the ADC value of thalamic decreases the second fast.**Conclusion** The ADC value of normal fetal brain region is variable, it changes regularly with the increase of fetal age, it can reflect the development process of fetal brain, and provide the imging evidence for prenatal diagnosis and prognosis evaluation of fetus brain.

EPO-1696

基于胎儿磁共振的胎儿脑结构图谱构建

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目的：探讨利用胎儿磁共振技术分析正常孕晚期胎儿脑部发育情况及脑结构图谱构建。方法：选择 MRI 3D-FIESTA 检查孕晚期（孕周 28-40 周）脑部正常发育胎儿各 10 例，共 130 例，利用纵向数据群组配准以及稀疏学习的方法，分割胎儿颅脑额叶，顶叶，颞叶，基底节，脑室系统，小脑，并计算胎脑脑室与脑横径比率。结果：所有 130 例胎脑均分割成功。孕 28-33 周，胎儿大脑皮层可见脑沟形成，其中枕叶和中央回区域较明显，37 周后脑实质分区与成人相类似。脑室与脑横径比例逐渐缩小，但差异不明显。结论：利用胎儿磁共振技术构建胎脑图谱，为准确评价胎儿大脑随着孕龄有规律发育成熟过程中的变化提供依据。

EPO-1697

MRI 对胎儿空回肠闭锁的诊断价值

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目的：探讨 MRI 对胎儿空回肠闭锁的诊断价值。方法：收集我院 2010 年 1 月至 2018 年 12 月间经产后手术及病理证实为空肠或回肠闭锁且产前曾接受 MR 检查的病例共 13 例。所有病例均为单胎妊娠，男胎 8 例，女胎 5 例。回顾性分析 13 例胎儿的产前 MRI 及产后临床资料。 结果：最终诊断 9 例为回肠闭锁，其中 2 例为多处闭锁；4 例为空肠闭锁，其中 1 例为多处闭锁。9 例回肠闭锁患儿中有 5 例合并有肠穿孔，MRI 呈现大量腹水，肠管聚拢，无肠管扩张。4 例空肠闭锁患儿中有 1 例合并肠穿孔，MRI 表现为假囊肿并小肠扩张。7 例未合并肠穿孔的胎儿，小肠均有单个或多个肠袢扩张。11 例胎儿结肠内无胎粪充盈，无法分辨其结构；2 例胎儿结肠形态纤细，T1WI 上呈细条状高信号。8 例胎儿直肠内无胎粪充盈，无法分辨其结构；2 例直肠胎粪充盈少，形态纤细；3 例直肠胎粪充盈良好，形态正常。4 例孕妇羊水过多。3 例男胎合并鞘膜积液。结论：胎儿小肠闭锁具有肠管扩张、腹腔积液、假囊肿、小结肠及小直肠等特征性 MRI 表现。产前 MRI 可较准确地诊断空回肠闭锁并判断病情严重程度，为产后对新生儿的及时治疗提供重要依据。

EPO-1698

Added value of fetal magnetic resonance imaging in diagnosis of malformations of cortical development: a retrospective analysis of 35 cases

xu li
APCH

http://Abstract Objective: To explore the added value of fetal MRI to ultrasound in diagnosis of fetal malformations of cortical development (MCD), which may help with clinical decision marking. Methods: From January 2013 to May 2019, we performed 3153

fetal MRI examinations, 35 fetuses in our medical center were diagnosed as MCD by fetal MRI (including one case was misdiagnosed by fetal MRI and confirmed after birth) after a prenatal ultrasound diagnosis of brain abnormalities or other anomalies, the images were analyzed by two radiologists, and the results were compared with findings on US. Results: Thirty-five cases were diagnosed as MCD. On prenatal ultrasound, the findings included ventriculomegaly (n=19), agenesis of the corpus callosum(n=5), dysplasia of the cerebellar hemisphere or vermis (n=5), absent septum pellucidum (n=3), small head circumference(n=3). Holoprosencephaly (n=2), midline cyst(n=2), thoracic and abdominal wall lymphangitic deformity (n=1), posterior fossa pool widened(n=1), suspected schizencephaly (n=1). MRI diagnosed 17 cases of lissencephaly (13 cases of type I and 4 cases of type II); 6 cases of open-lip of schizencephaly (2 cases of bilateral and 4 cases of unilateral); 6 cases of heterotopia (combined with one case of lissencephaly type I), included one case was misdiagnosed by fetal MRI while confirmed after birth by MRI; 4 cases of polymicrogyria, 4 cases of microcephaly and one case of hemiegalencephaly. Additional findings by MRI included agenesis of the corpus callosum(n=9), absent of corpus callosum(n=2), right side diaphragmatic eventration (n=1), Cleft lip and palate(n=1), duplex kidney(n=1). Conclusions: Compared to US, fetal MRI has a wide field, higher soft tissue resolution and an higher sensitivity in diagnosis of MCD, It can be used as a complementary means to US in diagnosis of fetal MCD and help clinical decision marking.

EPO-1699

胎儿脊柱及脊柱发育畸形产前 MRI 诊断

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胚胎发育的第四周，体节开始形成，第六周，椎体结构开始融合，并诱导软骨化；第八周开始矿化，胎儿脊柱在椎体及两侧的椎弓根出现三个骨化中心。如果脊索退化发生异常，则会导致椎体发生先天畸形，常见的先天畸形有半椎体、蝴蝶椎、融合椎及椎体冠状裂等畸形，椎体异常的发生率为 0.5-1/1000，可累及一个或多个椎体，最常受累的为胸椎，其次依次为腰椎及骶椎。

胎儿脊柱影像检查首选超声，MRI 具有软组织分辨率高、多参数、多平面成像等优点，胎儿骨化中心、软骨及软组织成份可显示为明显不同的信号对比，在脊柱骨骼畸形的诊断方面也具有一定优势。

由于胎儿活动范围大，脊柱椎体较小，组织成分较为复杂，含有椎体骨化中心、软骨、纤维环及髓核等成分，在 MRI 尤其是 1.5T 磁共振许多序列上观察受限，易于漏诊和误诊。3.0T 磁共振仪的梯度场强及切换率均高，以及高通道的高密度一体化线圈系统，图像信噪比高；稳态自由进动（Steady state free precession sequence）序列可以清晰地显示低信号的胎儿脊柱骨骼骨化中心，高信号的髓核、软骨及纤维环，能够明确诊断胎儿脊柱的常见畸形，如半椎体、蝴蝶椎、冠状裂以及椎管狭窄等。极大地增强了产前影像诊断医师对胎儿脊柱骨骼畸形的诊断信心，提高了胎儿脊柱畸形的产前检出率；为优生优育提供较为准确的信息。
其他如 EPI 序列、SWI 序列也可以很好地显示骨骼，但 EPI 序列较多用于长骨的评估，对脊柱的显示没有明显的优势。SWI 序列可清晰地显示胎儿脊柱结构，但不属于常规，增加扫描序列可能会增加扫描时间及 SAR 值，扫描成功率相对偏低，扫描时间相对较长、需要孕妇屏气；另外，SWI 序列是通过牺牲软组织之间的对比度而达到椎体显示的效果。需要进一步研究。

EPO-1700
3.0T MRI 半傅立叶单激励快速自旋回波序列在胎儿头颅扫描中的参数优化

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目的 探讨 3.0T MRI 半傅立叶单激励快速自旋回波序列在胎儿头颅扫描中的参数优化。方法 对我院 Siemens 公司的 skyra 3.0T MRI 成像仪对胎儿头颅正中矢状位半傅立叶单激励快速自旋回波序列参数进行初步优化。结果 对比初始参数为 TR1400，TE63，FA120，FOV400，初步调整参数为 TR1400，TE105，FA160，FOV300，层厚均为 5mm，间隔 5.5mm。对小脑蚓部细微结构进行分析，发现初步调整后参数在更小胎龄下（孕 24 周）能够对小脑蚓部细微结构进行更好的区分，在较大孕周（大于 30 周）对小脑蚓部脑沟进行观察，优化后的参数能够分辨出更多脑沟。结论 目前我院原始胎儿正中矢状位半傅立叶单激励快速自旋回波序列约于 28 周可较明确分辨小脑原裂，这与国外文献报道 21 周可以分辨仍存在一定差距，初步优化后的参数对比分析图像质量，能够更好的对小脑蚓部细微结构观察。

EPO-1701
产前核磁诊断胎儿颅脑发育异常的分析

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目的：探讨胎儿颅脑发育异常中产前磁共振检查的价值。
方法：从 2017 年 1 月至 2018 年 7 月在我中心接受产前磁共振检查且孕周在 28-34 周的孕妇中，选出 30 例胎儿颅脑发育异常的病例进行研究，并经病理或产后相关检查证实者。
结果：30 例胎儿中，磁共振检查侧脑室增宽 17 例、后颅窝增宽 8 例、胼胝体发育不良 4 例、小脑蚓部发育异常 1 例。经病理或产后相关检查发现有 27 例颅脑发育异常，侧脑室增宽 17 例、后颅窝增宽 7 例、胼胝体发育不良 2 例、小脑蚓部发育异常 1 例。符合率 90%，$P<0.05$。
结论：随着磁共振技术的不断发展，MRI 已成为产前检查的重要手段，尤其是对胎儿颅脑发育异常中的侧脑室、后颅窝、胼胝体、透明隔等检查效果显著。对于胎儿颅脑出现发育异常的产妇，产前予以核磁检查，可以获得更加准确、全面的信息，为临床的下一步诊疗提供帮助，具有较高的临床应用价值。

EPO-1702
胎儿大脑中线结构异常的 MRI 表现

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目的 通过总结胎儿大脑中线结构异常的 MRI 特点，探讨中线结构胼胝体缺如的间接征象出现概率和相关关系。

方法 收集我院产前胎儿 MRI 检查诊断为大脑中线结构异常（胼胝发育不全、透明隔腔缺如、前脑无裂畸形）的中晚孕病例 45 例，39 例纳入研究。回顾分析胎儿大脑中线结构异常的 MRI 图像，总结 MRI 特点，记录胼胝体缺如的 MRI 直接及间接征象，并对间接征象两两之间进行相关分析。
结果 39 例病例，胼胝体发育不全（ACC）31 例，透明隔腔缺如（ASP）33 例，前脑无裂畸形（HPE）2 例。31 例 ACC 的 MRI 间接征象出现概率从高到低排列依次为：侧脑室增宽（VM）93.5%(29/31 例)、ASP83.9%（26/31 例）、半球间裂异常 71.0%（22/31 例）、“牛角形”侧脑室 61.3%（19/31 例）、“泪滴状”侧脑室 54.8%（17/31 例）、第三脑室异常接近纵裂 51.6%（16/31 例），大脑半球内侧面脑沟回呈放射状改变 35.5%（11/31 例）。7 组间接征象中 VM、脑沟回放射状改变与其他 5 种间接征象不存在线性相关关系，“泪滴状”侧脑室与“牛角形”侧脑室、“泪滴状”侧脑室与第三脑室异常接近纵裂、“泪滴状”侧脑室与半球间裂异常、“牛角形”侧脑室与第三脑室异常接近纵裂间线性相关性均较大(r=0.876、0.678、0.659、0.661，P 均<0.001)。
结论 ：
1 MRI 能较好的显示大脑中线结构异常的直接及间接征象。
2 本组研究中 ACC 的 7 个间接征象中，VM 和 ASP 的出现概率相对较高；VM、ASP、半球间裂异常等间接征象对 ACC 产前诊断具有一定价值，且大部分 ACC 的间接征象之间存在相关关系。
3 本组研究中单纯型 ASP 较少见，ASP 伴 ACC 的病例较多见，因此当产前 MRI 发现 ASP 时，应仔细观察是否存在合并发育异常情况。

EPO-1703
磁共振弥散加权成像在胎盘植入临床诊断价值的初步探讨

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目的
探讨磁共振弥散加权成像(DWI)诊断胎盘植入的价值。
方法
产前超声检查怀疑前置胎盘或胎盘植入的病例 26 例，均在我院生产及行 MRI 检查影像学检查。所有资料采用西门子 1.5 T（Avonto）超导型 MRI 扫描系统，8 通道体表线圈。孕妇首选仰卧位，如有不适，可采用左侧卧位。足先进，防止幽闭恐怖感。不予以镇静剂。正确输入孕妇体重，以精确控制 SAR 值。
序列；①梯度回波序列（Gradient Ech GRE）T1WI，TE 2ms，TR 6ms，层间距 0.5mm，层厚 5mm，矩阵 320-256，视野 20-320mm②半傅里叶采集单次激发快速自旋回波序列（half Fourieracquisition single shotturbospin echo HASTE）T2WI 及 T2WI-FS， TR 2500ms，TE 86.7ms，其他参数同横断面 T1WI 一致；③DWI 扫描采用单次激发 SE-EPI DWI 序列，取 b 值=0、500、1000s/mm2 分别进行扫描。
结果
26 例患者均取得了手术病理结果，其中 2 例为前置胎盘、无胎盘植入， 5 例为粘连性胎盘，16 例为植入性
胎盘，3 例为穿透性胎盘。各型胎盘植入的影像表现如下：①粘连性胎盘，DWI 序列上胎盘信号与肌层表现不同，肌层表现为中等稍低信号，胎盘表现为中等稍高信号，二者间的底蜕膜间隙消失，胎盘局部出现轻微凸出；②植入性胎盘，DWI 图像均可以显示子宫肌层的局部变薄，程度不同，胎盘基底面信号欠均匀，中等稍低信号的子宫肌层内见点状、斑片状不均匀稍高信号；③穿透性胎盘， DWI 图像上显示胎盘基底面与子宫壁相互融合，分界不清楚，中等稍低肌层信号部分中断，胎盘浆膜层成幕顶状突起或与周围分界不清。
结论
DWI 序列上子宫肌层与胎盘的信号不同、较易区分，可以显示不同植入程度的病例影像特征。

EPO-1704

磁共振在胎儿唇腭裂诊断中的应用

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目的：评价 MRI 对胎儿唇裂和腭裂畸形的诊断价值。**材料和方法：**分析 20 例临床提示胎儿唇颚裂畸形的孕妇前瞻性行 MRI 扫描。扫描序列半傅立叶单激发自旋回波（half-Fourier single-shot turbo spin echo, HASTE 序列）和真性快速稳态进动（true fast imaging with steady-state precession, TRUE-FISP 序列）。所有图像经两名 10 年以上产科 MRI 诊断经验医师进行阅片。分别对唇腭裂的有无以及图像质量进行评分。**结果：**针对唇裂：医师 1 在 HASTE 和 TRUE-FISP 两个序列的诊断准确性分别为 100%和 95%；医师 2 诊断准确性为分别为 95%和 95%。针对腭裂：医师 1 在 HASTE 和 TRUE-FISP 序列的诊断准确性分别为 85%和 90%；医师 2 诊断准确性为分别为 85%和 100%。扫描失败的层面：HASTE 序列中 6 个扫描关键层面缺失。TRUE-FISP 序列中 12 个扫描关键层面缺失。**结论**：MRI 扫描时合理运用序列可以更好地评价胎儿唇腭裂畸形。

EPO-1705

探讨三种磁共振脉冲序列在胎盘植入诊断中的应用价值

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目的 本研究旨在探讨 SSFSE 序列、2D-FIESTA 序列以及 DWI 序列在胎盘植入诊断中的价值 **方法** 选取 28 例临床或 B 超疑为胎盘植入的孕妇，应用 GE signa HDX t 1.5T 磁共振成像仪行轴位、矢状位、冠状位扫描，行 DWI 序列轴位扫描。**结果** 本研究发现 SSFSE 序列对胎盘信号不均匀、胎盘内条状低信号影、胎盘内增粗的血管影的显示率高于 2D-FIESTA 序列；而 2D-FIESTA 序列对子宫结合带中断、胎盘突入子宫肌层、胎盘突出子宫浆膜层的显示率更高；DWI 序列，植入性胎盘中，植入与非植入部分 ADC 值差异具有统计学意义。**结论** 三种脉冲序列在胎盘植入诊断中各具价值，SSFSE 序列、2D-FIESTA 序列联合 DWI 序列一起应用，可以提高胎盘植入诊断的正确率。

EPO-1706

胎儿尿道下裂的 MR 诊断并 4 例报告

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【摘要】 **目的** 分析男性胎儿尿道下裂的的 MRI 表现，并与产后临床诊断及分型对照。**方法** 在超声筛查的基础上，超声检查怀疑尿道下裂后后均做胎儿泌尿系 MR 检查。搜集 4 例超声怀疑尿道下裂的胎儿，并在产后进入小儿外科诊治，有明确临床诊断分型。**结果** (1)胎儿泌尿系 MRI 检查诊断胎儿尿道下裂 4 例，产后随访结果显示，确诊 4 例，误诊 0 例，准确率为 100% ，确诊的 4 例尿道下裂患者中 1 例有并发畸形，并发畸形包括胎儿左肾旋转不良，左肾轻度积水。(2)胎儿尿道下裂的 MR 表现：①阴茎末端变钝，②阴茎向腹侧弯曲；③阴茎短小；阴囊分离和阴茎阴囊部分转

位形成特征性的“郁金香征”。④尿道显示异常（尿道开口于阴茎体部、根部，或尿道显示不清）。⑤尿道下裂可单独发生或合并其他异常，如隐睾、斜疝、膀胱尿道反流、泌尿系统异常等。也可作为综合征的表现之一。本组中 1 例合并有左肾旋转不良及轻度积水。

结论 MRI 可清楚显示胎儿尿道下裂的病变程度及范围,同时能够发现其他生殖系统发育畸形。但不能准确分型，需在产后临床诊断分型。

EPO-1707

胎儿先天性中胚叶肾瘤产前ＭＲＩ表现、生后 CT 表现及病理分型

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胎儿先天性中胚叶肾瘤产前ＭＲＩ表现、生后 CT 表现及病理分型

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［摘 要］ 目的 观察胎儿先天性中胚叶肾瘤产前ＭＲＩ表现、生后 CT 表现及病理分型。方法 回顾性分析经病理确诊的 3 例 CMN 患儿的 产前ＭＲＩ资料，生后 CT 资料及病理资料， 观察肿瘤的位置、大小、形态、产前 MRI 信号特点、生后 CT 强化特点及病理特征。结果 3 例 CMN，2 例为左侧肾区， 1 例为右侧肾区。3 例均呈类圆形。2 例产前 MR 特点为 T2WI 稍高信号，T1WI 等信号，1 例产前 MR 特点为 T2WI 稍高信号，T1WI 稍低信号。2 例生后 CT 强化特点呈“包裹征”，1 例生后 CT 呈结节状不均匀强化并瘤内出血。2 例病理分型为经典型，1 例为细胞型。1 例突发宫内窘迫、心包积液且肿物明显增大。1 例孕期羊水过多。结论 胎儿中胚叶肾瘤具有一定影像特征，孕晚期密切随访有助于提高预后。

EPO-1708

胎儿侧脑室扩张的 MRI 诊断价值评价

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目的：通过对胎儿侧脑室扩张 MRI 分析，探讨 MRI 在胎儿脑发育结构异常的诊断价值。

材料和方法：收集本院 2017 年 3 月至 2019 年 7 月间，行超声筛查后一周内行 MR 检查病例 203 例。MRI 有胎儿侧脑室扩张 122 例，其中 30 例 B 超阴性者为自愿做 MR 检查，患者年龄 18-44 岁，平均年龄 27 岁，MR 检查时间为妊娠 23-40 周，平均 28.5 周，胎位头位 95 例，臀位 21 例，足位 1 例，横位 5 例。使用 GE、PHILIPS1.5T 超导 MR 机，扫描序列 2D FIESTA、2D Balance FFE，层厚 4mm，对胎儿头部行横断面、冠状面、矢状面扫描。

结果：

MR 表现：侧脑室扩张 122 例，两侧脑室扩张 48 例，单侧脑室扩张 74 例；左侧脑室扩张 65 例，右侧脑室扩张 9 例，轻度扩张 69 例，中度扩张 5 例；两侧脑室轻度扩张 41 例，两侧脑室中度扩张 7 例，对称性扩张 7 例，不对称扩张 41 例；后颅窝池增宽 36 例，7 例单纯增宽，23 例伴有小脑下蚓部发育小，5 例变异型 D-K 畸形，1 例典型 D-K 畸形；胼胝体发育不良 14 例，其中胼胝体缺如 5 例；透明隔腔增宽 34 例；蛛网膜下腔增宽 17 例；大脑皮层发育不良 2 例；左侧脉络丛增大 1 例，

左侧脑室脉络丛囊肿 1 例，左侧脑室脉络丛出血 1 例；小脑幕下蛛网膜囊肿 1 例；叶状全前脑 2 例，脑叶发育异常 1 例。97 例侧脑室扩张同时伴发其它一种或多种脑结构异常。
B 超表现：侧脑室扩张 73 例，两侧脑室扩张 26 例，单侧脑室扩张 47 例，分别为 MR 同比检出的 59.8%，54.2%，63.5%；后颅窝池增宽 20 例；两侧脉络丛囊肿 1 例，叶状前全脑 1 例，胼胝体缺如 1 例，下蚓部欠规整 2 例，脑内无回声区 7 例。B 超阴性者 30 例。14 例侧脑室扩张同时伴发其它脑结构异常。
结论：MRI 对胎儿侧脑室扩张诊断明确且不易漏诊，较超声具有明显的优势，同时诊断伴发的其它脑发育结构异常增多；胎儿脑 MRI 应用需要及早普及，有利于优生优育。

EPO-1709
不同类型胎儿轻度脑室扩张的扩散加权成像变化

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目的：评估双侧脑室轻度扩张胎儿与孤立性单侧脑室轻度扩张胎儿各区域 ADC 值变化。
方法：选择 2015 年 1 月至 2019 年 7 月期间 64 个轻度脑室扩张的胎儿（其中 47 个胎儿孤立性单侧脑室轻度扩张，17 个胎儿双侧脑室轻度扩张，脑室扩张程度（1.1cm-1.5cm），孕周位于 22-35。另选择 36 个正常胎儿。进行扩散加权成像（DWI），两个 b 值为 0 和 800s/mm^2，测量胎儿两侧额叶、颞叶、枕叶、顶叶、基底节区、丘脑、小脑半球、脑桥及脑室脑脊液 ADC 值，每个区域测量三次、计算平均 ADC 值；比较各组 ADC 值差异。
结果：对照组与脑室扩张组之间，孕妇的年龄，胎龄没有统计学差异（P=0.905；P=0.922）;三组胎儿左右两侧额叶、两侧颞叶、两侧枕叶、两侧顶叶、两侧基底节区、两侧丘脑、两侧小脑半球之间无统计学差异（P>0.05），计算各脑区平均 ADC 值。与对照组相比，孤立性单侧轻度脑室扩张胎儿的额叶 ADC 值减低（对照组 1.81±0.12 vs 1.72±0.11），颞叶 ADC 值减低(对照组 1.72±0.14 vs 1.63±0.13)，差异有统计学意义(P=0.001；P=0.003)。两侧脑室轻度扩张组与对照组各脑区 ADC 值差异无统计学意义。与对照组相比，孤立性单侧脑室轻度扩张组、双侧脑室轻度扩张组脑脊液的 ADC 值均升高（对照组 2.74±0.19 vs 2.83±0.16 vs 2.89±0.13），差异有统计学意义(P=0.025；P=0.002)。
结论：脑室轻度扩张的不同类型与 ADC 值存在相关性；双侧脑室轻度扩张组与对照组各部位 ADC 值无统计学差异，可能提示双侧脑室轻度扩张对脑微结构的影响较小；孤立性单侧脑室轻度扩张胎儿额叶及颞叶 ADC 值降低，提示孤立性单侧脑室轻度扩张胎儿存在潜在额叶及颞叶的变化，ADC 值的变化可能有助于了解脑室微结构的损伤。

EPO-1710
儿童格兰尼格（岩尖）综合征的 MR 和 CT 的影像表现

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格兰尼格综合征是急性岩尖炎较为罕见的一种临床症状，通常是中耳炎治疗不及时而引起的更严重的临床症状，另外外伤、肿瘤病变等也可以引起此症状，其特点是中耳炎、眶后疼痛和外展神经麻痹(CN VI 麻痹)影响外侧直肌(CN VI 麻痹)，因为岩尖部的解剖位置特点，当出现岩尖部的炎症时，可引起格兰尼格综合征的一系列症状，尤其是颅脑神经症状，如果不及时治疗，其后果会很严重，所以需要及时诊断并且了解病变的范围。

通过影像资料（CT 及 MRI），能清楚病显示变累及的范围，给予临床足够的诊断证据，尤其是当病变累及到海绵窦区时，应警惕颅内感染的可能性，本文旨在通过其影像资料及临床资料，总结出格兰尼格综合征的影像特点，并尝试对格兰尼格综合征行感染程度分级，及时提醒及指导临床治疗病人。

本文通过使用我院电子病历系统，筛选出我院曾患有格兰尼格综合征的儿童 10 名，这些患者曾于我院型 CT 及 MRI 检查，其中 CT10 例，MRI2 例，通过观察这些患者的影像资料及查询其电子病历系统了解其临床病史，部分提早出院或转院的病人则行电话询问其治疗情况及预后。

结果显示本院 10 名患儿的影像图像均可见岩尖部水肿，强化明显；CT 可见 2 例患儿岩尖部骨质欠光整，可见破坏并形成脓肿；2 例 MRI 均提示岩尖周围有长 T1、T2 液性信号影，DWI 显示弥散受限；其中 1 例患儿海绵窦内还可见栓子形成。MR 及 CT 有助于病变的定位及其累计范围，影像表现有一定的特征性，通过观察我院影像图片，在此对其影像特征进行总结。

结论：笔者结合部分文献资料尝试将岩尖综合征的感染分级如下：I 级：岩尖部只有水肿而无骨质破坏或栓子形成；II 级：岩尖部除了水肿还并发骨质破坏，但没见到栓子形成；III：单见到栓子形成，无论有无骨质破坏均应列为此级别。

EPO-1711

在婴幼儿内耳神经显示中 3.0TMRI 的诊断价值的探讨

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目的 在婴幼儿内耳神经显示中的 3.0T MRI 的影像表现特点及其对临床诊断中的应用探讨
方法：回顾性分析哈尔滨市儿童医学医院影像科经 Philips 3.0T MRI 检查的 25 例 50 耳先天性听力筛查未通过怀疑神经性耳聋患儿的内耳神经影像学资料.所有患儿均进行 T2WI 3D DRIVE 内耳水成像序列检查。
结果：轴位像示前庭蜗神经及面神经均显示为 19 例 34 耳，其中单侧显示 4 例 ，双侧均显示 15 例。仅面神经显示前庭蜗神经显示不清为 4 例 4 耳 ，均为单侧。前庭蜗神经显示、面神经显示不清 1 例 1 耳。
面神经与前庭蜗均未见显示的为 1 例 2 耳。经斜矢状位后处理内耳道底示：面神经、蜗神经、前庭上神经、前庭下神经四根神经的影像表现可分为以下几种情况：1、四根神经均清晰显示 19 例 34 耳，其中单侧 4 例　双侧 15 例；2、面神经和蜗神经正常显示，前庭上下神经呈混合细条状显示 14 例 28 耳，均为双侧；3、面神经正常显示，前庭上下神经与蜗神经呈一根显示的为 2 例 4 耳；4、所有四根神经均为未见的为 2 例 3 耳;5、面神经未见显示，前庭蜗神经显示 1 例 1 耳。统计发现：耳蜗神经显示程度与患儿耳聋程度呈正相关，与患儿年龄呈负相关。
结论：3.0T MRI 可以清晰显示婴幼儿耳部面神经及前庭蜗神经，能够给临床提供神经性耳聋明确的证据。

EPO-1712

Nasal Chondromesenchymal Hamartoma (NCMH): a systematic review of the literature with a new case report

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*[Abstract] **Purpose** To present a systematic review of NCMH cases alongside a case report of an infant with asymptomatic NCMH. **Methods** A systematic review was conducted in accordance with PRISMA guidelines from March, 2015 to November, 2018. A PubMed, EMBASE, CNKI, WANFANG Med Online and manual search through references of relevant publications was used to identify all published case-reports of NCMH. Data was collected from each case-report on: patient demographics, laterality, size and location of NCMH, presentation, treatment and follow-up. **Results** On the basis of Mason's article in March 2015 (48 patients), The systematic review updated 21 patients (including ours): 12 male, 8 female, 1 not mention. Mean age of NCMH was 9.1 years (range: 1 day–70 years). Presentations were mostly nasal congestion (n = 28). NCMH also involved the paranasal sinuses (n = 40). DICER1 mutations in 5 NCMH patients, establishing a link to the DICER1 tumor spectrum. Only 12 patients had tumor recurrence in the follow-up. For the 21 updated-cases of NCMH, 17 cases underwent CT examination and most of them presented as well-defined soft tissue mass with surrounding bone destruction and calcification (n=5). 15 patients underwent MRI examination, with solid (n=9), cystic-solid (n=5) or cystic lesions (n=1). NCMH demonstrated a heterogeneous mass on T1 weighted images and T2 weighted images show the presence of cystic components. **Conclusion** NCMH is a rare benign tumor causing of nasal masses, but with malignant imaging trait of extensive bone destruction. It is associated DICER1 tumors in young children and adults, and should be known by more people.*

EPO-1713

外层渗出性视网膜病变的 CT 和 MRI 表现

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目的：总结外层渗出性视网膜病变的 MRI 和 CT 表现，以提高对本病的认识，为临床诊断及治疗提供帮助。资料与方法：2008 年-2019 年在我院经临床确诊的 6 例患者纳入本次研究，6 例皆为男性，无女性患者，年龄 6 个月～6 岁，平均 3 岁。单眼发病 6 例，无双眼发病。6 例均经 MRI 和 CT 检查。回顾性总结 6 例视网膜渗出性病变的 MRI 和 CT 征象。结果：6 例均累及单侧眼球。CT 表现：6 例均表现为玻璃体内密度增高影、程度较均匀，呈扁平的“Y”形，边界清晰；4 例结膜区见含气密度影；6 例视网膜区皆有不同程度增厚，外观呈线样或新月形。5 例病变玻璃体内无钙化，1 例表现为玻璃体内多发点状钙化灶；6 例均无眶外侵犯，视神经、眼肌及眶周、眶内各脂肪间隙未见明显异常密度。MRI 表现：5 例 T1WI 和 T2WI 呈等信号,信号均匀，1 例表现为病变主体等 TIWI 等 T2WI 信号，病变边缘近视网膜区及内部线状短 T2WI 信号；4 例病变异常信号区位于颞上象限，2 例异常信号区位于颞下象限；3 例异常信号区呈大片状，前和晶状体、后与视网膜分界不清，2 例同视网膜紧密相连，而与晶状体不相邻，且视网膜区可见条形等信号影，1 例限于玻璃体内，与周围组织结构（晶状体及眼环）分界尚清晰；4 例双侧眼球大小对称，2 例患侧眼球体积减小；6 例晶状体位置均正常、未见明显脱位；3 例表现为前房深度变浅，3 例前房深度无异常；5 例视神经无异常，6 例眼环均完整，未见颅内侵犯，视神经、诸眼外肌及眶内脂肪间隙无异常信号，眼睑部软组织未见明显增厚、均未见异常信号或密度影浸润。结论：外层渗出性视网膜病变具有典型的影像学征象，总结其 MRI 和 CT 表现，对指导临床选择治疗方案有实用意义。

EPO-1714

儿童鼻眶部原始神经外胚层肿瘤的影像学表现及临床、病理特征

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【摘要】目的：总结发生于儿童鼻腔鼻窦及眼眶部原始神经外胚层肿瘤（primitive neuroectodermal tumor，PNET）的 CT 和 MRI 表现，结合其临床、病理特征，进一步提高对本病的认识。 **方法** 回顾性分析 10 例经手术病理证实的鼻腔鼻窦及眼眶部原发性 PNET 的 CT 和 MRI 征象，患者年龄 4~13 岁，10 例 PNET 例均行 CT 平扫，8 例同时行 MRI 平扫，7 例行 MRI 普通增强扫描，另有 1 例同时行 MR 动态增强扫描检查，后处理得到时间信号变化强度曲线（TIC 曲线）及其非定量参数。**结果** 10 例肿瘤主体均位于鼻眶部并向颅底或颅内浸润，呈不规则状、边缘不清。CT 表现：8 例病变主体均呈等密度，2 例呈稍低密度，病变内部密度欠均匀；10 例肿瘤主体均呈纵向生长，周围骨质均呈明显溶骨性骨质破坏，肿块突破筛板侵及颅内，其中脑组织受累 8 例，前颅凹 7 例，中颅凹 4 例。MRI 表现：行 MRI 平扫的 8 例肿瘤主体在 T1WI 上呈等信号 4 例，低信号 4 例，T2WI 呈等信号 3 例，高信号 5 例，内部信号皆不均匀，硬脑膜均见受累，MRI 普通增强示肿块明显不均匀强化，硬脑膜均见强化，4 例海绵窦异常强化。1 例 MRI 动态增强扫描所得 TIC 曲线呈速升-平缓型，T_{peak} 为 56.25s，SI_{peak} 为 1792.5，MSI 为 1.26%，WR 为 3.03%，ER 为 78.57%。**结论** 儿童患者发生累及鼻、眶部的实性肿块，内部伴坏死灶、呈不均匀明显强化，沿纵轴生长侵犯硬脑膜以及易向颅底、颅内转移是鼻眶部 PNET 较具特异性的表现。

EPO-1715
126 例儿童眼眶眶周肿瘤的 CT 影像学特征分析

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目的 分析 126 例儿童眼眶眶周肿瘤的影像学特征，了解儿童眼眶眶周肿瘤在眼眶周围的分布特点，提高术前疾病的诊断率和为手术入路提供影像学依据。**方法** 回顾性分析上海儿童医院 2015 年 1 月-2018 年 12 月儿童眼眶眶周肿瘤患儿共 126 例，结果均由手术后病理学检查或组织活检证实。总结各种不同类型眼眶肿瘤的 CT 影像学特征，为术前定位定性诊疗提供影像学依据，比较良、恶性肿瘤的 CT 影像学差异。**结果** 在 126 例儿童眼眶眶周肿瘤中，排在首位的是皮样囊肿及表皮样囊肿，占所有眼眶肿瘤的 73%，其次为钙化上皮瘤（6%）及脂肪纤维组织增生（6%）。非良性肿瘤比例少，仅为 4 例。**结论** 儿童眼眶眶周肿瘤中最常见的为皮样囊肿及表皮样囊肿，恶性肿瘤的突眼度较良性肿瘤高;良恶性肿瘤的 CT 影像学特征进行对比，发现恶性肿瘤的骨质破坏比例较良性肿瘤高，且更易压迫或侵犯眼外肌。而视神经改变的 CT 影像学特征在良、恶性肿瘤中鉴别诊断中意义不大。眼眶肿瘤的 CT 影像学特征在疾病的诊断和术前定位方面应用价值高。

EPO-1716
我国 6 岁以下汉族儿童正常咽腔上气道和周围软组织的 MRI 图像线性测量

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目的:获得不同年龄组咽腔上气道和周围软组织的正常参考值范围，并分析其在各组内的性别差异和年龄进行相关性
方法:选取 521 名 6 岁以下无睡眠呼吸障碍的中国籍汉族儿童为研究对象，选择标准依据睡眠呼吸障碍量表评分、临床病史和颅脑 MRI 图像制定执行。所有的颅脑 MRI 扫描均在受试者镇静状态下使用同一台 GE 公司 1.5T Signa HDx MRI 扫描仪（GE, Healthcare, Waukesha, WI, USA）进行。在颅脑 MRI 图像上以垂体柄和中脑导水管同时显示来确认正中矢状面，然后在正中矢状面上确定 11 个标志点用于后续线性测量。咽腔上气道和周围软组织共有 12 个测量项目在正中矢状面上获得，分别是：软腭长度、软腭厚度、腺样体厚度、鼻咽腔高度、舌长度、舌高度、咽腔上气道长度、颏棘-斜坡间距离、沿着颏棘-斜坡连线的舌、软腭、鼻咽腔、腺样体宽度。在轴位 MRI 图像上以双侧扁桃体的最大层面作为目标层面，获得双侧扁桃体宽径和扁桃体间腔 2 个测量项目
结果:1）六组受试者年龄、身高、体重和 BMI 值组内性别之间无统计学差异（P ＞ 0.05），BMI Z-score 均在标准±1.96 范围内；2）获取了六组受试者咽腔上气道及周围软组织 MRI 线性测量项目的平均值和 95%置信区间参考值；3）所有的 MRI 线性测量项目在不同性别间未表现出显著差异（P ＞ 0.05）；4）所有的 MRI 线性测量项目均与年龄呈正相关（P ＜ 0.05）；5）上气道的长度与身高呈正相关(P ＜ 0.001)，与 BMI 不相关（P ＞ 0.05）
结论： 本研究采集了我国 6 岁以下各年龄段无睡眠呼吸障碍的汉族儿童咽腔上气道和周围软组织线性测量的正常值，在 6 岁以下儿童中不存在性别间差异，与年龄之间存在密切的相关性。

EPO-1717

MRI 在诊断半侧巨脑畸形的价值

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目的 分析并总结半侧巨脑畸形（HME）的磁共振（MRI）表现，以提高对 HME 的认识及诊断准确率。
方法 回顾性分析自 2015 年 1 月至 2019 年 6 月本院收治的 20 例 HME 患者的临床及 MRI 表现。
结果 20 例 HME 患者临床表现为单纯精神运动发育迟滞者 9 例，合并顽固性癫痫者 5 例，单纯表现为癫痫者 6 例。MRI 表现为 10 例大脑半球体积增大，10 例部分脑叶体积增大；3 例广泛皮层发育不良伴白质大面积异常信号，17 例单脑叶皮层发育不良伴受累脑叶白质异常信号；胼胝体膝部增厚者 15 例，压部增厚者 2 例，二者同时增厚者 3 例；枕极摇摆征阳性者 12 例，中线结构前份向对侧移位者 15 例；同侧侧脑室增宽者 10 例，侧脑室前角变窄、拉直 13 例，其中 3 例同时合并对侧侧脑室增宽；3 例合并中脑及小脑体积增大。2 例行 MRI 波普分析，病变侧基底节区及受累脑白质 NAA/(Cho+Cr)比值降低，P 值小于 0.05。
结论 HME 临床表现主要为精神运动发育迟滞及癫痫；MRI 表现具有一定特征性，在诊断半侧巨脑畸形方面具有很大应用价值。

EPO-1718

三叉神经根部与周围血管关系的临床意义

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方法 观察脑干薄层 3D-TOF 扫描的病例 150 例，MR 检 查采用 SIMENS3.0T 磁共振机，使用头部 8 通道线圈平扫，采用 3DTOF 扫描程序，扫描参数 :TR 23 ms，TE 3.6 ms，翻转角 15°，FOV

165×220，层厚 1 mm。 统计分析了三叉神经痛组 69 例及无三叉神经痛组 81 例的三叉神经与周围血管的关系。

结果压迫三叉神经及有接触关系的血管有小脑上动脉、小脑前下动脉、基底动脉。原发性三叉神经痛组 69 例中，表现为压迫关 系 15 例，占 21.7%;接触关系 47 例，占 68.1%;无接触关系 7 例，占 10.1%。 非三叉神经痛组 81 例中，表现为接触关系 24 例， 占 29.6%;无接触关系 57 例，占 70.4%。 经 x2 检验，三叉神经痛组与非三叉神经痛间压迫关系、接触关系及无接触关系间均 差异有统计学意义(P<0.05)。
结论 脑干薄层 3D-TOF 磁共振扫描可清晰显示三叉神经与血管的关系，是指导临床治疗血管 压迫三叉神经痛的非常有价值的无创检查，从而为三叉神经痛的病因诊断及临床的治疗提供一定的影像学依据。

EPO-1719

HRCT 与 MRI 联合应用在小儿内耳畸形的对照研究

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目的：研究 HRCT 与 MRI 在小儿耳部畸形的影像诊断方面的应用价值，通过两者的比较及综合应用分析，更加准确的对小儿耳部畸形进行诊断，探讨实行 HRCT、MRI 检查的对小儿耳部畸形诊断意义，为临床治疗提供更有利的帮助。
方法： 2010 年 1 0 月～2 0 1 2 年 5 月我院临床诊断听力障碍的儿童 5 5 例，男 31 例，女 24 例，年龄最小者 6 月，最大 10 岁，平均年龄 6±2.6 岁，分别进行 HRCT 及 MRI 检查。CT 采用 Philips64 排螺旋 CT，检查病人仰卧,头位摆正, 以听眶上线为扫描基线自外耳道下缘扫至岩骨上缘, 获得横轴面 CT 图像。层厚、层距均为 0.675mm, 窗位 500-600Hu,窗宽 3500-4000Hu。扫描结束后在专业工作站上分别进行垂直于双侧颞骨的多平面及多参数重建。
磁共振技术采用 3D FIESTA 序列，是采用 GE Signa 1.5T 超导型 MR 系统，相控阵头线圈，。常规冠状面 T1WI、T2WI 及横断面 T2WI 扫描后，行 3D-FIESTA 序列扫描，扫描参数 TR=4.9 ms，TE=2.9ms，翻转角 65 度 FOV=20cm，Bandwidth：31.25 kHz，Matrix=320×256，层厚 0.6mm，NEX=4，扫描时间 3 分 10 秒。扫描结束后在 GE AW4.3 工作站上分别进行垂直于双侧内耳道的重建，重建范围自内耳道底至桥小脑角区。
结果：本组 55 例患儿，未见明显中内耳畸形患儿 23 例，内耳畸形患儿 32 例，其中双侧畸形 21 例，单侧畸形 11 例，其中 Mondini 畸形 4 耳，单纯前庭导水管扩大 16 耳，前庭导水管扩大伴有内淋巴囊扩大 23 耳， Michel 畸形 1 耳，共腔畸形 2 耳， 内耳道畸形 3 耳，蜗神经不发育或发育不良 4 耳。

EPO-1720

儿童眼部疾病的影像学表现

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目的 提高对儿童眼部先天性及后天性疾病认识，旨在准确诊断。方法 对我院近 2013 年 1 月-2018 年 12 月经病理证实的小儿眼部病变进行回顾性分析。结果 先天性无眼球畸形 1 例。先天性小眼球合并眼眶囊肿 1 例，影像表现为眼球各径线明显缩短，眼球内结构正常，球后见境界清楚的水样低

密度囊肿。双侧上直肌发育不良 2 例。双侧外直肌发育不良 2 例。眼球后部缺损或视网膜脉络膜缺损 3 例；进行性视网膜毛细血管扩张伴有不同程度的视网膜渗出及视网膜脱离 6 例，好发年龄为 5-10 岁，男性多见，单眼发病，球内均匀的梭形高密度影，无强化、钙化及眼球缩小。永存原始玻璃体增生症（ PHPV）9 例，单眼发病，病眼变小，玻璃体密度增高，有不规则肿块，典型者承“高脚酒杯”形略高密度影直达视盘，未见钙化。骨纤维异常增殖症 7 例，影像表现为眼眶壁、筛骨、蝶骨骨质膨大弥漫性增厚，呈磨玻璃样改变，视神经管狭窄。血管性病变 15 例，影像学表现为类圆或椭圆形，边界清楚，表面较光滑，部分有钙化或静脉石，眼球、眼外肌、视神经有移位或分界不清，眼眶扩大，骨受压变形或吸收，增强扫描大部分肿瘤呈渐进性明显均匀强化。颈动脉海绵窦瘘 5 例，眼球突出，眼上静脉扩张，增强明显强化呈迂曲扩张的静脉团，海绵窦扩张，眼外肌常呈弥漫性梭形肥厚。视网膜母细胞瘤 19 例，单侧发病 15 例，双眼发病 4 例；主要临床表现为“白瞳症”， 影像表现为团块状软组织影，常伴有钙化；眼球内期眼球大小正常，眼球内有肿块，常有钙化，其发生率高达 90%以上；青光眼期：眼球玻璃体内甚至前房充满肿块，眼球增大，眼压增高；眼球外期：肿瘤沿视神经向眼眶侵润，视神经增粗>4mm，沿视神经侵犯至颅内。远处转移期：肿瘤转移至肺、肝等全身器官。转移瘤 6 例，白血病浸润 7 例，横纹肌肉瘤 4 例。 结论 眼部病变影像表现虽有一定特点，但病史和临床决不能忽视，某些病变最终诊断仍然依靠病理学。

EPO-1721

MRI 内耳水成像技术在内耳畸形诊断的应用价值

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目的：探讨磁共振内耳水成像在人工耳蜗植入术前影像学评估中的应用价值
方法：对 115 例临床拟进行人工耳蜗植入的患儿常规行 MRI 平扫及内耳水成像检查。采用 GE 公司生产的 1.5TMRI 头部相控阵线圈,快速三维自旋回波。头颅必须摆放正确,使两侧对称。MRI 检查技术：颞骨横断面三维快速稳态自由进动梯度回波序列(3D-FIESTA)。层厚 0.8mm,TR 4.8ms,TE 1.5ms,矩阵 256×256。在 GE ADW4.1 工作站行最大强度投影(MIP)内耳重建。内耳与内耳道的 MRI 水成像检查，并将原始图像传送至工作站，分别用多平面重组影像（MPR）、最大信号强度投影（MIP）和立体透视技术（VRT）3 种方法进行三维重建。对不能自然入睡的患儿给予 10%水合氯醛 0.5 ml/kg 通过口服或肛门给药镇静。
结果：所有患者顺利完成检查，115 例中，耳蜗与蜗神经显示正常 70 例，Mondini 畸形 13 例，其中伴有半规管异常 5 例，Michel 畸形 2 例，耳蜗未发育 2 例，共同腔畸形 2 例，蜗神经发育不良 7 例，大前庭导水管综合征 14 例，
结论：磁共振内耳水成像能清晰显示内耳膜迷路与前庭蜗神经的解剖形态和发育状况，作为术前影像学评价的一种重要手段，能够为人工耳蜗植入的成功实施提供重要的信息。

EPO-1722

The value of DTI in the evaluation of auditory pathway in children with bilateral hearing loss

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Objective:To study the difference of auditory pathway in children with different degrees of bilateral hearing loss (USNHL), and to observe the changes of auditory pathway with age in normal children.
Materials and methods :Patients with USNHL were involed and divided into three groups subjectivley according to the audiometery threshold value(A/mild, B/moderate and C/severe), severe sensorineural deafness patients also involved in . 24 normal subjects with the age of 3 - 42 days as a control group Before the examination for infants and young children ,10% hydration of chlorine aldehyde enema was implemented with the does of accurately. Start scanning when the subjects fall asleep, soft ear insertion to reduce noise and wearing a SIEMENS special anti noise headphones. All subjects examined using a3.0T scanner(MAGNETOM Skyra,Siemens Healthcare,Erlangen Germany). DTI was performed using a prototype sequence of 2.2×2.2×4mm^3,TR=3700ms, TE=92ms, B=1000mm^2/s.MPRAGE imaging was acquired using a prototype sequence with voxel size of 2.3×2.3×1.0 mm^3 ,TR=2200ms, TE=2.48ms, flip angle 8 degrees. SIEMENS 3T SKYRA postprocessing station position measurement of The FA vulue of inferior colliculus and medial geniculate were measured using the SIEMENS Syngo Via workstation.
1) inferior colliculus in the horizontal plane through the mammillary body (the brain) level of the suprasellar cistern is located in the central section (Figure 1).
2) the medial geniculate body in the horizontal plane: choice of mound skull (by side horizontal section of midbrain level) (Figure 2).
Using the Wilcoxon rank test for statistical data postprocessing 1.4 statistical analysis, linear correlation analysis using Pearson correlation method, using SPSS17.0 for data processing and statistical analysis, and $P<0.05$ statistical test standard.

Results: there was no statistically significant difference between group A and control group about FA value ($P>0.05$); group B, group C and control group of inferior colliculus and medial geniculate body between the FA value difference was statistically significant ($P<0.05$), and were less than the control group; there is a linear relationship at FA value of inferior colliculus and the medial geniculate body in the control group,and the control group at FA value of 2 ROIs increase with age. See Figure 3, figure 4.
Conclusion:as for now ,CI is an important way of treating children with bilateral hearing loss,and DTI is very important to evaluate the microscopic change of auditory pathway,and it can tell us more valuable information that if the patient can performent CI.Moderate and severe USNHL were inferior colliculus, medial geniculate body FA decreased; FA value in the diagnosis of normal and mild USNHL in limited value.

EPO-1723

学龄期儿童鼻咽癌 MRI 影像学分析

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【摘要】目的 探讨学龄期儿童鼻咽癌临床症状、影像学特征，以提高早期诊断能力，减少误诊漏诊。 **方法** 回顾性分析 2011.3—2019.3 期间经病理组织学证实的 10 例学龄期儿童鼻咽癌的临床资料及 MRI 影像学表现，主要分析鼻咽部病灶及颈部、咽后淋巴结的影像学特征。 **结果** 10

例患儿年龄 9-14 岁， 平均年龄 12.5 岁。 临床表现因颈部肿块 7 例，鼻出血 1 例，头痛 1 例，鼻塞 1 例，痰中带血 1 例，耳部不适 1 例，耳鸣 1 例症状就诊，出现 2 种及以上症状 7 例，无视力下降、复视或斜视等症状患者。影像诊断结核 1 例，纤维血管瘤 1 例。病理结果未分化性非角化性癌 7 例，分化性非角化性癌 1 例，非角化型鳞状细胞癌 1，未分化性癌 1 例。MRI 表现为鼻咽部局限性不规则软组织肿块 9 例，鼻咽粘膜弥漫均匀增厚 2 例，边界不清并向深部软组织浸润 9 例，颅底骨质破坏 9 例；T1WI 均呈等信号，T2WI 呈稍高信号为主，其中 7 例内见斑片状液化坏死高信号，增强扫描肿瘤均呈明显强化，不均匀强化 7 例，均匀强化 3 例。两侧颈部及咽后淋巴结肿大 10 例，其中出现淋巴结融合成团 9 例，增强扫描不均匀明显强化 9 例，均匀明显强化 1 例。合并鼻窦炎 9 例，合并中耳炎 9 例。据 2017 年鼻咽癌分期，T3N2M0 7 例，T3N3M0 1 例，T4N3M0 1 例，T2N2Mx 1 例。 **结论** 学龄期儿童 MRI 表现为鼻咽部不规则软组织肿块合并周围深部软组织浸润、颅底骨质破坏及颈部、咽后转移性淋巴结肿大，应考虑到鼻咽癌的可能。

EPO-1724
磁共振电影相位对比法评估婴幼儿脑血流量

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目的 用磁共振电影相位对比法（cine phase contrast MRI，Cine PCMRI）观察婴幼儿颈内动脉血流动力学参数，评估婴幼儿大脑血流量。**方法** 收集我院 2019 年 1～5 月因临床需要做磁共振检查的年龄为 11～132 周的婴幼儿 37 例。采用多个编码速度的 Cine PC MRI 序列测量颈内动脉的峰值流速（Peak velocity，Vp）、颈内动脉的供血流量。在 MRIcron 及 ImgJ 软件上勾画测量脑体积，进一步计算单位体积大脑脑血流量（cerebral blood flow，CBF）。采用线性相关分别分析婴幼儿年龄与颈内动脉 Vp、颈内动脉供血流量、CBF、颈内动脉血管直径、大脑体积之间的关系。采用线性相关分析颈内动脉 Vp 与血管直径、心率之间的关系。**结果** 本组婴幼儿颈内动脉 Vp 平均值为 67.6±4.8cm/s，与年龄没有明显相关性（P = 0.532）。颈内动脉供血流量、颈内动脉直径、大脑体积及 CBF 随着年龄增长而增长（均 P<0.01）。本组婴幼儿 CBF 为 12～68ml/100g/min,与年龄的拟合曲线中以三次多项式的 R^2 最大。峰值流速与血管直径、心率之间无明显相关性。**结论** Cine PC MRI 能无创获得婴幼儿颈内动脉血流动力学特点，可为量化评估婴幼儿的脑发育情况提供更多的信息。

EPO-1725
磁共振成像在儿童颈部肿瘤中的应用价值

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目的 探讨磁共振成像(MRI)检查在儿童颈部肿块中的应用价值。方法 回顾性分析 2006 年 5 月至 2013 年 12 月因颈部肿块行 MRI 检查的 140 例患儿的临床资料，其中 34 例行病理检查。结果 MRI 诊断 140 例患儿中，良性肿块 103 例(73.6%)，主要为脉管性畸形 62 例、血管瘤 30 例，其余为囊肿、错构瘤、感染性肿块等;恶性肿瘤 29 例(20.7%)，主要 为淋巴瘤 22 例、横纹肌肉瘤 3 例、朗格罕细胞组织细胞增生症 3 例、神经母细胞瘤 1 例;另 8 例(5.7%)未定性。在 103 例良 性肿块患儿中 4 例行病理检查，与 MRI 诊断一致;29 例恶性肿瘤患儿中 25 例行病理或骨

髓细胞形态学检查，与 MRI 诊断一 致 22 例。结论 MRI 有助于儿童颈部肿块的诊断，以及治疗方案的选择及随访。

EPO-1726

儿童胆脂瘤性中耳炎诊断及鉴别诊断

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目的：儿童慢性化脓性中耳炎是常见病、多发病，其中分成单纯性、骨疡性和胆脂瘤型三类，但临床误诊较多，需要探索该病的影像特点及鉴别要点。
材料和方法：收集了本院最近两年的发生误诊的 6 例患者的图像，其中慢行化脓性中耳炎三例，郎格罕组织细胞综合症 2 例，横纹肌肉瘤 1 例，纤维血管瘤 1 例。在临床上这些病变都表现为颞部肿块，外耳反复流脓、耳部疼痛，听力下降，在临床上鉴别存在一些困难。然后这些病变都做出 CT、MRI 平扫及增强检查。同时这些病人都做了手术及病理，诊断结果明确，我们随后回顾性分析这些病变的影像表现特点，以便我们能在未来提高影像诊断水平。
结果：首先化脓性中耳炎又分三个类型，影像上表现不一样，单纯性中耳炎比较常见，骨疡性和胆脂瘤性比较少见，特别容易误诊的是胆脂瘤性中耳炎，影像表现为乳突小房呈膨胀性、溶骨性破坏，骨壁变薄，部分可以有破坏。郎罕乳突也可以有破坏，呈大范围溶骨性破坏，增强后病灶内可以有明显强化。横纹肌肉瘤发病位置一般在颞骨下方，向上可以累及破坏乳突，病变以软组织肿块为主。
结论：慢性化脓性中耳炎是临床常见病，与郎罕、横纹肌肉类、纤维血管瘤表现有一定的相似性，因此误诊较多，影像表现各有一定特点，掌握他们之间的鉴别要点对临床早期正确诊断、合理治疗，具有重要意义。

EPO-1727

儿童脑实质室管膜瘤的 CT、MRI 诊断

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目的：探讨儿童颅内脑实质室管膜瘤的 CT、MRI 影像特点及其组织病理相关性，提高其影像学术前诊断能力。**方法** 回顾性分析 2015-2018 年我院经手术病理证实的异位室管膜瘤 9 例 CT、MRI 及组织病理学资料。所有患儿均行了 CT、MRI 检查，其中 CT 增强 9 例，MRI 检查至少包括轴位 SE-T1WI、T2WI、T2-FLAIR、DWI（b 值为 0 和 1000）和矢状面 T1WI 或 T2WI 及 Gd-DTPA 增强轴位、矢状面、冠状面 T1WI。**结果** 9 例病理均为间变型室管膜瘤、WHO III 级。肿瘤起源于幕上脑实质 8 例、起源于幕下脑实质 1 例，7 例位于大脑凸面，均为不规则多分叶团块状， CT 表现为等低或等高混杂密度，瘤内均可见颗粒状及斑片状钙化灶，增强后呈中等至明显强化改变；MRI 表现为 T1WI 等低信号、T2WI 等高混杂信号，DWI 均为等-稍高信号为主改变、部分区域 ADC 值下降，增强扫描显示实质部分不均匀明显强化及不典型环形强化，9 例均出现囊性变、囊变区域无强化，瘤周脑水肿较明显。**结论** 颅内脑实质室管膜瘤多为间变性室管膜瘤，CT、MRI 表现有一定的特征性，有助于术前明确诊断

EPO-1728

研究探讨 3.0TMR 超高 b 值 DWI 在新生儿缺血缺氧性脑病的应用

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摘要：目的:研究探讨 3.0TMR 超高 b 值 DWI 对新生儿缺血缺氧性脑病（HIE）诊断应用价值.方法:选取本院自 2019 年 1 月至 6 月 100 例结合病史、临床表现诊断为新生儿缺血缺氧性脑病的患儿行 3.0TMR 高 b 值 DWI 检查，b 值分别为 1000s/mm2,2000s/mm2 **结果:**,比较两组 b 值的 DWI 检查结果.结合 ADC 图，结果:b 值=1000s/mm2 与 b 值=2000s/mm2 时检查出的新生儿缺血缺氧性脑病的敏感性,特异性,准确性以及阳性预测值比较,差异具有统计学意义(P<0.05).**结论：**经过我们对 100 例患儿扫描图像的对比研究，虽然超高 b 值 DWI 较常规 b 值 DWI 的 SNR 更低，但超高 b 值 DWI 的脑组织中的多成分扩散，慢速扩散成分比常规 b 值更敏感，3.0TMR 超高 b 值 DWI 对新生儿缺血缺氧性脑病尤其是微小病灶的缺血灶敏感度更高，对患儿的诊断及临床治疗很大的价值。

EPO-1729
624 例生长激素缺乏矮小儿童垂体的 MRI 表现及常见病因分析

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摘要：目的 探讨生长激素缺乏(GHD)矮小儿童垂体疾病的 MRI 表现，提高对该类疾病的诊断水平。**方法** 回顾性分析 624 例经临床确诊为 GHD 矮小儿童垂体病变的 MRI 表现及临床资料。**结果** GHD 矮小儿童垂体疾病包括腺垂体发育不良 383 例(61.4%)，垂体柄阻断综合征（PSIS）49 例(7.9%)，原发性甲状腺功能减退性垂体增生 16 例(2.6%)，Rathke 囊肿 41 例(6.6%)，空泡蝶鞍综合征 74 例(11.9%)，朗格汉斯细胞组织细胞增生症（LCH）垂体侵犯 17 例(2.7%)，鞍区蛛网膜囊肿 2 例(0.3%)，颅咽管瘤 42 例(6.7%)。腺垂体发育不良表现为垂体前叶高度小于正常值，垂体后叶位置及信号正常，垂体柄未见中断、变细及异常信号。PSIS 表现为垂体前叶发育不良，垂体柄缺如或变细，垂体后叶异位。垂体增生由甲状腺功能减退所致，表现为垂体前叶体积增大，上缘隆起，增强扫描呈明显均匀强化，垂体柄未见中断及异常信号，激素替代治疗后垂体缩小。LCH 垂体侵犯表现为垂体柄增粗，垂体后叶在 T1 上失去高信号，垂体前叶大小及信号可正常。Rathke 囊肿、空泡蝶鞍综合征、鞍区蛛网膜囊肿及颅咽管瘤均表现为垂体前叶萎缩变薄。**结论** MRI 能清晰地显示垂体及鞍区的微细结构，是检出垂体病变的重要手段，能够准确的显示 GHD 矮小儿童各种垂体疾病的特点，具有很高的临床实用性，有助于临床疾病的早期诊断和鉴别诊断，并可监测其治疗效果。

EPO-1730
磁敏感加权成像技术在早产儿颅内微小出血的应用

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目的 探讨 3.0T 磁敏感加权成像（SWI）技术在早产儿颅内微小出血的临床应用价值。**方法** 收集我院 2016 年 1 月至 2019 年 1 月早产儿患者 126 例，均行常规 T1WI、T2WI、FLAIR 及 SWI。**结果** 126 例头颅 MR 平扫 T1WI、T2WI、FLAIR 像均显示阴性，SWI 清楚地显示了脑内微出血灶，表现为点状

及斑点状低信号，相位图呈高信号，一共发现病灶 168 个。**结论** 在早产儿颅内微小出血患者中，SWI 较常规 MRI 扫描序列更多的显示微出血状况，为临床提供更多的诊断信息，可作为早产儿颅内微小出血诊断的常规扫描序列。

EPO-1731

Survival outcomes of patients with advanced retinoblastoma: a multi-center comparative analysis of different treatment strategies

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Purpose: To compare the survival outcomes and high-risk histopathological features of intravenous chemotherapy (IVC), ophthalmic artery chemosurgery (OAC), and IVC plus OAC in patients with advanced retinoblastoma.
Design: Retrospective, comparative, multi-center study.
Participants: From April 2006 to February 2017, 492 patients with advanced retinoblastoma (group D and E eyes according to the International Intraocular Retinoblastoma Classification) from multi-centers were included for analysis. They underwent IVC (n = 279), IVC plus OAC (n = 103), or OAC (n = 110).
Methods: Kaplan-Meier analyses were performed to compare 1-year and 3-year rates of ocular survival, overall survival (OS) and event-free survival (EFS) among the three groups. Details of enucleation and histopathological results were recorded.
Main outcome measures: Ocular survival, OS, EFS, and histopathological results.
Results: The corresponding ocular survival rates at 1, 3 years were 20.7% and 8.8%, 79.3% and 61.7%, and 84.2% and 63.2% in the IVC, IVC plus OAC, and OAC groups, respectively. The IVC group showed obviously worse ocular salvage compared with the other two groups ($P < 0.001$), while the IVC plus OAC and OAC groups had no difference ($P = 0.612$). The corresponding OS rates at 1, 3 years were 95.1%% and 85.0%, 97.4% and 94.5%, and 97.2% and 93.5% in the IVC, IVC plus OAC, and OAC groups, respectively. The OS rates of the three groups showed no significant differences. The EFS rates at 1, 3 years also had no significant differences between the IVC plus OAC group and OAC group (86.0% vs 85.6%, $P = 0.884$; 73.2% vs 71.5%, $P = 0.884$; respectively). After histopathologic examination of enucleated eyes, high-risk features were identified in 31.5% (76/241) of the IVC group, 10.5% (4/38) of the IVC plus OAC group, and 16.7% (5/30) of the OAC group eyes, with a p value of 0.010.
Conclusions: Our findings indicated that traditional treatment strategy of enucleation after IVC for advanced retinoblastoma maybe no longer applicable. The combination of IVC and OAC or OAC alone could save more eyes and lead to an improved prognosis. Therefore, OAC may be recommended as the primary treatment for children with advanced retinoblastoma to avoid the side effects of IVC. However, the role of IVC still needs to be investigated by randomized controlled trials in the future .

EPO-1732

HRCT 在正常儿童耳蜗的标准化测量

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目的 利用 HRCT 多平面重建耳蜗标准方位图像并测量正常耳蜗的相关径线,为评价内耳发育提供影像依据。
资料与方法 收集本院颞部 CT 内耳正常和听力正常的儿童 200 例（400 耳），按年龄分为 A 组 100 例（200 耳，8 月-6 岁）和 B 组 100 例（200 耳，>6 岁且<18 岁）。通过多平面重建技术((MPR)得到标准方位图像，根据国际认定的耳蜗标准坐标系统，测量耳蜗相关径线：耳蜗底转长径（BL）、耳蜗底转宽径（BW）、耳蜗高度（CH）、斜轴位蜗神经管宽度(CNCa)、斜矢位蜗神经管宽度(CNCs)，曲面重建（CPR）测量耳蜗管长度（CL）。
结果 男性耳蜗的 BL、BW、CL 较女性长，差异有统计学意义，CH、CNCa、CNCs 性别间无统计学差异（$p<0.05$）；耳蜗各径线在年龄及左右侧间相比，差异无统计学意义（$p>0.05$）.

结论：儿童正常耳蜗的标准化径线测量有助于了解内耳结构的发育特点，对诊断耳蜗发育异常有重要意义。

EPO-1733

3D-FIESTA 联合高分辨 CT 对儿童内耳不完全分隔畸形并自发性脑脊液耳漏的诊断价值

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目的：探讨三维稳态进动快速成像（3D-FIESTA）序列联合高分辨 CT（HRCT）对儿童先天性内耳不完全分隔畸形并自发性脑脊液耳漏的诊断价值。**方法：**回顾性分析本院 6 例内耳不完全分隔Ⅰ型畸形并自发性脑脊液耳漏患儿的 3D-FIESTA、HRCT 表现及临床资料，总结其影像及临床特点。**结果：**共 6 例患儿，4 例为单侧畸形，2 例为双侧畸形，6 例脑脊液耳漏均为单侧发病；6 例耳蜗与前庭间均可见分隔，耳蜗均呈囊状，无蜗轴，5 例耳蜗内可见少许残余分隔，1 例耳蜗为完全囊状，6 例均伴前庭扩大及水平半规管增粗；6 例均可见乳突蜂房、鼓室及咽鼓管积液；6 例冠状位 HRCT 均可见内耳道底骨质缺损及前庭窗扩大，6 例冠状位 FIESTA 均可显示位于前庭窗与中耳鼓室间的瘘道。5 例患儿有反复化脓性脑膜炎病史，1 例有脑外伤病史。**结论：**内耳不完全分隔Ⅰ型畸形伴反复化脓性脑膜炎病史时，HRCT、3D-FIESTA 可精准显示内耳、中耳的细微结构，尤其冠状位 HRCT 及 FIESTA 可显示内耳道底骨质缺损及漏口的位置，对于明确病因有重要价值。

EPO-1734

MSCT 在婴幼儿上呼吸道梗阻诊断中的应用价值

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【摘要】**目的**探讨多层螺旋 CT（MSCT）及多平面重组（MPR）重建技术在婴幼儿上呼吸道梗阻的病因诊断中应用价值，以期早期诊断、治疗，改善预后。**方法**回顾性分析 2014 年 2 月至 2018 年 12 月上海市儿童医院的 117 例上呼吸道梗阻（除外气道异物）患儿的临床资料，年龄 3 天～5 岁，女

39 例，男 78 例，全部病例(110 例颈部，9 例鼻咽部)行 MSCT 平扫+增强，并 MPR 及三维重建检查，59 例进一步行喉镜检查，49 例术后行病理检查。**结果** MSCT 扫描结果：舌根部囊肿 50 例，其中 1 例（喉镜证实）伴有先天性喉软骨软化病，咽喉部淋巴管瘤 3 例，舌根部异位甲状腺 1 例，舌根部、咽喉侧壁及声门下血管瘤 7 例，颈部多发纤维瘤压迫咽部气道 1 例，巨舌症 1 例，鼻后孔闭锁 9 例（4 例为单侧，5 例为双侧），声带赘生物 2 例，咽喉部乳头状瘤 1 例，脂肪瘤 1 例；另 41 例中 39 例显示咽喉部气道左右径较窄，经喉镜检查结果确诊为先天性喉软骨软化症，2 例显示声门区局部软组织影略增厚，经喉镜检查结果诊断为喉蹼。MSCT+MPR 诊断上呼吸道梗阻的病因定位准确率达 100%，定性准确率达 92%。**结论**婴幼儿上呼吸道梗阻多数以吸气性喉鸣为首发症状，除先天性喉软骨软化症外，还有很多器质性病变，其中囊肿最常见。对以喉喘鸣发病或不明原因的上呼吸道梗阻，应尽早完善 CT 扫描。MSCT 薄层图像结合 MPR 后处理技术对病灶定性定位准确率高，为临床的诊断治疗起到有效快捷的指导作用。

EPO-1735

64 排螺旋 CT 对多生牙的定位诊断应用

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目的　探讨螺旋 CT 三维重建对上颌埋伏牙定位诊断的应用价值　口腔上颌埋伏牙由于其埋伏生长于牙槽骨内以及多生牙相混交错生长的结构特点，临床医师定位常较困难，临床定位常依据根尖位片、曲面断层片及咬合片、侧斜位片和 CT 二维图像等,工作站后处理成像，来探讨 3D 技术对于埋伏阻生牙及多生牙的定位在临床诊治中的价值。

方法　使用美国 GE 螺旋 CT 机，患者仰卧位，听眦线定位，咬住棉签。轴位扫描范围:上颌窦底至口咽部。扫描参数:层厚 3.75mm;重建间隔 0.625mm 电流 100mA，电压 100kV。将所得到的二维图像传送到 ADW4.5 工作站，利用 3D 软件及二维成像软件。3D 成像后以 SSD 方法切割去除不感兴趣区域或伪影区域，再利用 MPR 技术选择最佳显示窗，多方位、多角度进行观察和存储图像。

结果　三维重建后多角度观察单个牙埋伏阻生,三维重建图像在多生牙埋伏阻生定位诊断中明显优于二维图像。

三维重建技术在上颌埋伏牙及多生牙定位诊断中的意义在于:（1）可确定埋伏阻生牙的位置是软组织阻生还是颌骨内阻生;（2）可确切显示骨内埋伏多生牙的数目、大小和形态;（3）可确切显示埋伏多生牙的方向是在牙列的唇颊侧还是舌侧;（4）可确切显示所在颌骨中位置的高低;（5）可确切显示埋伏多生牙与相邻牙胚和牙根的距离或嵌入关系等，提供了可靠的依据，便于临床医师确诊和选择最佳治疗时机

EPO-1736

基于颞骨 CT 平扫的面神经曲面重建技巧

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目的：分享基于颞骨 CT 平扫的面神经曲面重建（CPR, curved plannar reconstruction）技巧，辅助临床诊断，提高工作效率。

方法：用 Philips 公司 Brilliance iCT 行颞骨 CT 平扫，120kV，200mA，调节窗宽 3200、窗位 700，原始图像在 GE 公司的 AW4.7 后处理工作站上进行 reformat 处理，左右两侧面神经分开做 CPR。首先在横断面层面找到内耳入口处，通过逐渐变换横断面层面可以完成面神经内耳道段、迷路段的 CPR；随后找到膝状神经节处，此处面神经迷路段近似垂直于岩大浅神经和面神经鼓室段，呈“T”型结构，借助三线定位，将中心位置放于鼓室段，然后在斜矢状面上可以清楚的看到面神经鼓室段和乳突段的走形，沿此路径即可轻松完成面神经鼓室段和乳突段的 CPR。
结果：面神经出脑桥后全长可分为 6 段：小脑、桥小脑角段；内耳道段；迷路段；鼓室段（水平段）；乳突段（垂直段）；颞骨外段。一般在颞骨 CT 扫描范围包含内耳道段、迷路段、鼓室段和乳突段。从解剖上看，面神经出迷路段后有一膨大区，为膝状神经节，由此向前有一分支为岩大浅神经，向后为面神经鼓室段，此结构呈“T”型，即面神经迷路段垂直于岩大浅神经和面神经鼓室段，这就是做 CPR 时显著的定位参考标志。因此，借助此方法做面神经 CPR 方便快捷，极大提高了工作效率。
结论：随着低剂量 CT 应用普及和临床诊断需要，越来越多的临床医生在检查申请单上特意备注要了解患者面神经情况。因此，该面神经 CPR 技巧简化了工作流程、提高了效率、有益于影像诊断和满足临床需要。

EPO-1737
64 排 MSCT 后处理技术在儿童正畸埋伏阻生牙诊疗中的价值分析

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目的 探讨 64 排螺旋 CT 后处理技术在儿童正畸埋伏阻生牙诊疗中的价值分析。**方法** 分别搜集近期 50 例我院生多生牙患儿 CT 影像资料信息，通过容积再现（VR），最大密度投影（MIP），多平面阻重组（MPR)和曲面重组（CPR)等技术对扫描图像进行后期处理，对颌骨内埋伏阻生多生牙进行三维定位，辅助临床进行正畸治疗。**结果** 50 例患者共有 56 颗埋伏牙，通过 64 排螺旋 CT 多种重建技术的组合应用，CT 扫描能清晰看清多生牙生长位置、大小、形态、萌出方向、比邻关系，与正畸手术符合率 100％。**结论** 64 排螺旋 CT 后处理技术可充分显示埋伏牙的位置，给临床正畸治疗提供了客观依据，具有重要的临床应用
价值。

EPO-1738
128 层螺旋 CT 低剂量扫描对儿童腺样肥大的诊断价值

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[摘要] 目的 探讨 128 层螺旋 CT 低剂量扫描技术对儿童腺样体肥大的诊断价值。方法：连续收集临床诊断腺样体肥大患儿 60 例，且术前均行 128 螺旋 CT 扫描，随机分为实验组和对照组；实验组（30 例）：80 kV 扫描，参考管电流 150 mAs；对照组（30 例）：常规 100 kV，参考管电流 150 mAs；两组均采用滤波反投影法（filtered back-projection，FBP）重建。比较不同扫描条件下两组鼻咽气腔前后径 A/N 比值、图像主观评分及有效辐射剂量。结果 两组腺样体 A/N 比值比较差异无统计学意义；两组图像的主观评分差异无统计学意义（P>0.05）且均能达到诊断要求；两组辐射剂量比较差异有统计学意义（P<0.05），实验组较对照组辐射剂量降约 15.58%；结论 128 层螺旋 CT 儿童腺样体低剂量扫描，有效降低辐射剂量的同时保证了图像质量。

EPO-1739
基于 aw4.7 工作站的儿童胸部气管树 CT 重建应用体会

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目的：分享日常工作中儿童胸部气管树 CT 三维重建应用体会，旨在提升 CT 后处理工作效率。

方法：本科室购买使用 GE 公司的 aw4.7 工作站，在该工作站上对需要行气管树三维重建的患儿薄层图像进行后处理。回顾性分析重建流程，对于气管树 CT 三维重建主要包含如下内容：1 虚拟内窥镜，旨在查看气道有无堵塞、是否通常；2 矢、冠状面 batch 图，旨在从不同平面诊断是否异常；3 做横、矢、冠状面 MinP(最小密度投影)图，旨在观察完整气道是否流畅或异常；4 玻璃肺，即透明肺，主要是看形态、发育是否异常；5 单独的（支）气管树，可以很清楚的看气道是否发育异常或是否有异物堵塞。

结果：儿童胸部气管树 CT 重建常规包含以上五个步骤，而 aw4.7 工作站在前几个版本基础上 UI 界面有所优化。因此当用 aw4.7 工作站行儿童胸部气管树 CT 重建时更方便快捷，整个流程 3 分钟左右即可完成。

结论：儿童胸部气管树 CT 重建常见于临床需求诊断肺部炎症、气道发育异常、（支）气管异物等，在本院所占比例较大，以上五个步骤的重建可以全方位的对儿童肺部病变进行诊断，在 aw4.7 工作站上熟练操作可以极大提高工作效率。

EPO-1740
Application of artificial intelligence(AI) assisted cardiac function analysis in pediatric patients

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Purpose: to testify the feasibility and potentiality of artificial intelligence (AI) in cardiac function analysis of CMR examination in pediatric patients, and further comparing the consistency with traditional manual analysis.

Methods and Materials : We enrolled 26 pediatric patients (age: 3-13) coming for CMR examination. All patients were scanned 8-10 slices cardiac short axis cine_tf2d sequence (Siemens, 3T Skya) covering the whole LV. Both AI (Siemens, inline VF technique) and manual analysis (Simpson volume method) were used. All patients were divided and compared according to age (>10/≤ 10 years old), heart rate(HR) (> 80 / ≤80/min), and whether holding breath. Bland–Altman and Pearson correlation were performed.

Results: AI traced 16(61.5%) patients with the wrongly endo-/ epi-cardial border, located in liver, aorta, atrium, right ventricle respectively. In patient with older age, AI show better consistency (bias: -1.6±13.7; r=0.748.)with manual method than

younger patients (bias: 2.6±21.6; r=-0.041). Patients with lower HR also displayed good conformity (bias: -1.9±11; r=0.748.) for these two techniques than high HR ones (bias: 3.0±17.6; r=-0.041). More importantly, in our study, the two methods had good agreement in these holding breath patients, and poor consistency in those with free-breathing.

Conclusion: AI technique assisted cardiac function analysis had good agreement with manual method in older, low HR or breath holding pediatric patients. However, for some high HR, young or free breathing patients, computer generated contours may not be accurate, and may not correspond to anatomy. Thus, the AI technique need more improvement for the accuracy and clinical feasibility.

EPO-1741
肺动脉闭锁 II 型合并室间隔缺损影像分析

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患者 男 3 岁，出生时颜面青紫、反应差，听诊心脏杂音，我院心脏彩超示：先天性心脏病：肺动脉闭锁 室间隔缺损（漏斗部 右向左）主-肺动脉交通支形成，主动脉瓣少量反流。建议手术治疗，家属因风险大拒绝手术。期间患儿哭闹口唇紫绀加重，伴杵状指，无昏厥、抽搐，为求进一步诊治再次就诊于我院。行心脏 CTA 检查：右室流出道级肺动脉瓣、肺动脉干未见显示， 左右肺动脉直接连通，管腔细小；主动脉根部顺时针旋转并轻度骑跨，室间隔上部见缺损。考虑肺动脉闭锁Ⅱ型合并室间隔缺损；右上肺尖后段肺动脉分支与右侧支气管动脉于右主支气管后方形成侧枝循环，并局限管径扩张；左右支气管动脉近心段级肺门段扩张，升主动脉及近段降主动脉相对增宽，降胸比＞2。经心外科学术委员会讨论，认为患儿无手术指证，与家属沟通后，患儿出院。
讨论：肺动脉闭锁合并室间隔缺损（PAVSD）是一组少见的严重紫绀型先天性心脏病。其定义是心室与肺动脉之间不存在管道连接，也无血液流通，合并室间隔缺损。本畸形占先天性心脏病的 0.2%。根据 Castaneda 等分型法，肺动脉闭锁合并室间隔缺损分为四型：肺动脉瓣及肺动脉主干近段闭锁为Ⅰ型；肺动脉融合分叉的近端闭锁，左右肺动脉连接为Ⅱ型；闭锁累及肺动脉分叉处至左右肺动脉连续性中断为Ⅲ型；无中央肺动脉，为Ⅳ型。本病例为Ⅱ型，且形成支气管动脉-右上肺尖后段肺动脉侧枝循环，主动脉根部旋转并轻度骑跨。

EPO-1742
基于 Revolution CT 的非镇静状态下婴幼儿快速低剂量胸部扫描的可行性研究

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目的 探讨未镇静婴幼儿采用 Revolution CT 16cm 宽探测器行胸部轴扫前的患儿检查准备时间、扫描所得图像质量及辐射剂量；并与同月龄、口服镇静剂后、行 64 排 CT 胸部螺旋扫描的患儿其准备时间、图像质量、辐射剂量做比较，评价 Revolution CT 在婴幼儿胸部断层扫描中的重大意义。
方法 分别随机抽取我院 2019 年 6 月至今，2 岁内因肺部感染，使用 Revolution CT 及 64 排 CT 进行胸部断层扫描的婴幼儿各 40 例，收集此 80 例患儿胸部 CT 检查所有数据资料并按月龄分组。

结果 1、Revolution CT 转速快、总扫描时间短，有效解决了婴幼儿检查依从性差的问题，确保患儿在未镇静状态下能顺利完成胸部 CT 扫描，节省检查前准备时间。2、Revolution CT 使用 16cm 探测器，较传统 64 排 4cm 探测器范围更宽，可一次轴扫完成整个胸部断层扫描，较 64 排螺旋扫辐射剂量大大下降。3、同月龄婴幼儿 Revolution 及 64 排 CT 所得胸部断层的图像质量相仿，均具有客观诊断价值。4、婴幼儿采用 Revolution CT 进行胸部检查，无需镇静，缩短准备时间，效率提高工作流程改进，与临床工作更进一步接轨。**结论** 与口服镇静剂后采用传统 64 排螺旋 CT 检查相比，未服用镇静剂婴幼儿所使用的 Revolution CT 16cm 宽探测器胸部轴扫成像能够有效减少辐射剂量、检查前准备时间及总扫描时间，同时呈现相仿的胸部图像质量；Revolution CT 的快速扫描及宽体探测器给 CT 检查带来全新代技术，能更好地服务于临床。

EPO-1743
基于模型的迭代重建算法对儿童低电压低浓度对比剂胸部 CT 图像质量的优化

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目的 评价基于模型的迭代重建算法（full model-based iterative reconstruction，MBIR）对联合应用 100kV、低浓度对比剂儿童胸部增强 CT 图像质量的优化能力。**方法** 收集低剂量胸部增强的儿童患者 56 例作为观察组，扫描电压 100kV，自动管电流调节技术设置管电流，根据年龄设置噪声指数 11-15，增强扫描注射对比剂浓度为 270mgI/ml，重建为 50%自适应迭代重建算法图像（adaptive statistical iterative reconstruction，ASIR）图像与 MBIR 图像；对照组选取 56 例应用 120kV 扫描的病例，扫描方案相同，对比剂浓度为 320mgI/ml，对比剂注射方案相同，图像重建为 50%ASIR 图像。评价 3 组图像的主观质量及客观质量，图像主观质量包括整体图像噪声、强化程度、病变显示以及硬化伪影情况；客观质量分别测量左心室最大层面的左心室、背侧竖脊肌的噪声值，并计算相应的信噪比（SNR）以及对比噪声比（CNR）。**结果** 观察组放射剂量 CTDIvol=1.79±1.45mGy，对照组为 1.68±0.92mGy，两组放射剂量无统计学差异（p=0.65）；观察组平均用碘量为 5837.13±2689.32mgI，对照组用碘量较对照组的 7272.00±3803.75mgI 减少了 19.73%（$p<0.05$），整体图像噪声、强化程度、病变显示以及硬化伪影情况观察组 MBIR 图像均可以满足诊断要求，优于 2 组 ASIR 图像；MBIR 图像噪声较 ASIR 图像降低了 42.80-59.93%；两组 ASIR 图像 SNR、CNR 差异不明显，但 MBIR 图像 SNR、CNR 明显增高，观察组 MBIR 图像较对照组的 ASIR 图像 CNR 提高了 165.70%。具有统计学差异。**结论** MBIR 可以优化儿童 100kV 低对比剂浓度胸部 CT 图像质量，达到减少肾脏损伤的目的。

EPO-1744
idose4 重建技术在儿童气管及支气管 CT 低剂量扫描的应用

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目的研究迭代重建技术 idose4 在儿童气管及支气管 CT 低剂量扫描的应用及对图像质量的影响。**方法** 60 例年龄为 5 个月至 5 周岁气管及支气管 CT 检查患儿纳入研究，随机分成两组，每组 30 例。常规剂量组（A 组）：管电压 80kV，管电流 55mAs，采用 idose^{4}3 级重建。低剂量组（B 组）：管电压 80kV；管电流 30mAs，分别采用 idose^{4}2～6 级五种重建技术。两组均采用自动管电流调制技术。比较两组患儿 CT 容积剂量指数（CTDIvol）、剂量长度乘积（DLP）、有效辐射剂量（ED）及

体型特异性剂量评估（SSDE）之间的差异，并研究各参数值与患儿身高及体重的相关性。比较 A、B 两组图像噪声、信噪比（SNR）、主观图像质量。**结果** B 组 CTDIvol、DLP、ED 及 SSDE 值（0.54±0.08，16.78±4.16，0.41±0.05，1.18±0.16）均较 A 组（1.09±0.13，31.91±6.16，0.70±0.11，2.37±0.19）显著降低约 50%（t=14.53，8.63，10.11，20.22，P<0.05）。SSDE 值与患儿身高（r = 0.49, P<0.05）及体重（r = 0.64, P<0.05）有强相关性。B 组所有图像噪声较 A 组高，差异有统计学意义(P<0.05)；B 组图像 SNR 降低，在 idose^{4}2,3,4 级时与 A 组差异显著(P<0.05)，在 idose^{4}5,6 级时，与 A 组 SNR 无明显差异(P >0.05)；主观图像质量评价 B 组 idose^{4}2,3,4,6 级低于 A 组，差异显著(P<0.05)，idose^{4}5 级与 A 组间差异不具统计学意义(P > 0.05)。**结论**儿童胸部 CT 检查，管电压 80KV，管电流 30mAs（自动管电流调制技术），结合 idose^{4}5 级重建技术，图像质量满足临床诊断要求，同时辐射剂量比常规扫描降低约 50%；SSDE 评价辐射剂量与受检者体型因素关系较大。

EPO-1745
不同权重多模型迭代算法（ASIR-V）对“双低”儿童胸部 CT 图像质量的影响

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[摘要] **目的** 探究不同权重迭代重建技术（ASIR-V）对“双低”（低剂量、低 kVp）儿童胸部 CT 图像质量的影响。**方法** 随机选取 19 例儿童胸部 CT 平扫;年龄（5.82±3.47）排除标准：患有心脏病、胸廓畸形、胸部肿瘤及肥胖患儿。采用 GE Revolution CT，扫描条件与方法：嘱患儿自由呼吸，从胸廓入口扫至肺底，80kVp，自动毫安技术（ATCM），噪声指数（NI）为 14，前置 Pre-ASIR-V 为 0%，对图像进行不同权重 Pos-ASIR-V 重建（从 0%-100%，重建间隔为 10%），重建层厚为 0.625mm，共 11 组不同权（ASIR-V）图像；测量并计算每组图像胸廓入口、气管分叉及膈肌层面感兴趣区的皮下脂肪、竖脊肌及降主动脉的 CT 值及 SD 值，计算 SNR（CT 值/SD 值）并记录 CTDI、DLP，并计算有效辐射剂量 （ED）；统计学分析：由两位住院医师采用双盲法对各组图像进行 5 分法主观评分（≥3 分被认定为临床可诊断）采用单因素方差分析比较 11 组间各组织的 CT 值及 SNR 进行统计学分析，主观评分：采用 Kappa 检验两名医生一致性良好，秩和检验对各组图像进行主观评价。**结果：客观评价： 有效辐射剂量 ED 为（0.40± smv）较常规小孩胸部辐射剂量（1.00±0.20 smv）减少了 60%；噪声指数 SD 值，**随着迭代重建权重的递增而下降，图像质量逐步提升，采用 80%的迭代重建权重时图像质量最好。**结论** “双低”儿童胸部 CT 扫描中，Pos-ASIR-V 重建可显著降低图像噪声，提高图像质量，采用 80% Pos- ASIR-V 重建算法图像质量最好。**临床相关性与应用：**不同权重多模型迭代算法（ASIR-V）对“双低”儿童胸部 CT,采用 80% Pos- ASIR-V 重建算法图像质量最好，值得临床借鉴和推广应用。

EPO-1746
儿童毛细支气管炎的影像学表现

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目的：探讨胸部 X 线片及高分辨率 CT(HRCT)对儿童毛细支气管炎的诊断价值。**方法：**回顾分析 136 例经临床诊断证实并有影像学资料的毛细支气管炎患儿的病历资料，其中男 59 例，女 77 例，年龄 2 月～2 岁 8 月，所有患儿为首次喘息发作并有典型临床表现。患儿行胸片检查 71 例，行 HRCT 检

查 104 例，既行胸片又行 HRCT 检查 49 例。**结果：**胸部 X 线片表现为：未见异常 39 例；肺野局部透光度不均匀 15 例；肺纹理增强 21 例；斑片状阴影 9 例。HRCT 表现为：未见异常 18 例；局部肺过度充气征 77 例；斑片状浸润影或（和）磨玻璃影 53 例；局部肺不张 19 例；支气管周围炎 28 例。**结论：**儿童毛细支气管炎影像表现有一定特征性，HRCT 比胸片更能显示儿童毛细支气管炎影像改变及影像特征，诊断儿童毛细支气管炎可基于临床表现、胸部 HRCT 及实验室检查。

EPO-1747
CT 在儿童纵隔神经母细胞源性肿瘤诊断、分期及治疗方案选择中的应用价值

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目的 探讨 CT 在儿童纵隔神经母细胞源性肿瘤诊断、分期及治疗方案选择中的应用价值。 **方法** 回顾性分析经病理证实的 29 例儿童纵隔神经母细胞源性肿瘤的临床资料、CT 表现及分期，并与病理结果进行对照分析。其中神经母细胞瘤（NB）20 例，节细胞神经母细胞瘤（GNB）4 例，节细胞神经瘤（GN）5 例。平均发病年龄 NB 为（34.35±24.12）个月，GNB 为（91.75±53.65）个月，GN 为（67.40±68.00）个月。所有病例均行 CT 平扫及增强扫描。**结果** 29 例神经母细胞源性肿瘤均位于后纵隔。80.0%（16/20）NB、25.0%（1/4）GNB 密度不均匀，100.0%（5/5）GN 密度均匀。80.0%（16/20）NB 呈不规则斑片状、点条状钙化，75.0%（3/4）GNB 和 80.0%（4/5）GN 呈点状钙化。增强后 75.0%（15/20）NB、50.0%（2/4）GNB 呈不均匀强化，且 85.0%（17/20）NB 和 75.0%（3/4）GNB 呈中度及明显强化，而 100%（5/5）GN 呈渐进性轻度强化。70.0%（14/20）NB、50.0%（2/4）GNB 见局部侵犯或远处转移。肿瘤 INRGSS 分期中 L1 期 3 例，L_2期 15 例，M 期 11 例。随访中 3 例 M 期 NB 发生复发转移。肿瘤生物因子检测显示 7 例 NB VMA 升高，8 例 NB、1 例 GNB 及 1 例 GN 的 NSE 升高，6 例 NB 的 *N-myc* 基因阳性。**结论** CT 在纵隔神经母细胞源性肿瘤的诊断、分期及治疗方案的选择中具有重要价值。

EPO-1748
儿童副心支气管的 MSCT 表现及分型

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【目的】探讨儿童副心支气管（accessory cardiac bronchus, ACB）的 MSCT 表现及分型，以期提高儿科医生的认识。
【材料与方法】回顾性分析我院 2017 年 6 月至 2019 年 1 月诊断的 7 例副心支气管患儿的临床资料及胸部 MSCT 表现。7 例患儿中 4 例男孩，3 例女孩，年龄 9 个月～5 岁，平均年龄 2 岁。7 例患儿均行胸部 MSCT 扫描，并进行图像后处理，包括多平面重组（MPR）、最大密度投影（MIP）和容积再现（VR），分析总结其 MSCT 表现并分型。
【结果】7 例患儿的副心支气管均起源于右侧中间段支气管内侧壁，直径为 2.2㎜~3.8㎜，平均为 2.9㎜，长度为 3.1㎜~6.9㎜，平均为 5.0㎜。副心支气管与右侧中间段支气管的夹角为 27.0 °~63.9 °，平均为 47.8 °，与气管隆突的距离为 11.1㎜~18.9㎜,平均为 14.4㎜。7 例患儿中 2 例患儿副心支气管末端为盲端（Ⅰ型：憩室型），1 例患儿副心支气管末端伴有囊状结构（Ⅱ型：囊变型），4 例患儿副心支气管末端伴有通气肺小叶（Ⅲ型：副叶型）。

【结论】副心支气管是一种少见的气管支气管先天性异常，在临床上可并发反复感染。MSCT 可以清晰地显示儿童副心支气管的起源部位、直径、长度以及末端形态，为临床诊断提供重要依据。

EPO-1749

低剂量肺部 CT 在小儿支气管肺炎的诊断价值

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目的：利用低剂量肺部 CT 成像，提高小儿支气管肺炎肺部 CT 的诊断价值。
方法：回顾性分析 2016 年 1 月-2018 年 12 月来我科行肺部 CT 检查，采用 GE16 排螺旋 CT，扫描条件为 120KV、30mA、0.5s、5mm 层厚，均经细菌学和病毒学检查者共 252 例资料，其中男 142 例（占 56.3%），女 110 例（占 43.7%），年龄 2 月-10 岁，平均年龄 2.8 岁；所有患儿出现不同程度的发热、咳嗽、气促，肺部固定性的中、细湿罗音等临床表现。
结果：单侧肺病变者 39 例，占 15.1%；双侧肺病变者 213 例占 84.9%；其中，肺段实质侵润性病变（大片实变影）为主 113 例；肺小叶实质侵润性病变（斑点状或斑片状实变影）为主 57 例；肺间质侵润性病变（散在斑点或斑片状影）为主 49 例，淡薄磨玻璃影为主 27 例，伴发脓肿或肺气囊者 6 例，多数大片实变影和斑点或斑片状实变影共同存在。
结论：
1、低剂量肺部 CT 成像越来越受到影像科医师和患者家属的重视，在不影响诊断质量的前提下，应推广低剂量 CT 成像，本组低剂量扫描条件的患儿接受剂量均控制在平均每人 0.5msv 以内。
2、支气管肺炎，又称小叶性肺炎，是儿科常见的呼吸系统疾病，发病率较高，2 岁以内儿童多发，多发生于冬春寒冷季节及气温骤变时。
3、病毒性肺炎以间质受累为主，细菌性肺炎以肺实质损害为主，但常由病毒和细菌混合感染，CT 表现多样化；治疗不及时会出现脓胸、脓气胸、肺气囊等。
总之，低剂量肺部 CT 虽然与常规扫描条件相比图像质量有降低，但并不影响图像的诊断质量，且显著降低患儿接受的辐射剂量，是值得推广和广泛应用的技术，有着很好的临床应用价值和社会效益。

EPO-1750

CTA 在 TOF 伴发畸形中的诊断价值

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目的：探讨 CTA 在法洛四联症及其伴发畸形诊断中的诊断价值。 方法：对 64 例法洛四联症患者 CT 资料进行回顾性分析, 与手术或 B 超结果对照。选取 2017 年 1 月—2019 年 3 月郑州大学第三附属医院经手术证实的法洛氏四联症患儿 64 例的 MSCTA 资料，所有病例均行 MSCT 和心脏超声（ECG）检查，其中男 37 例，女 27 例。年龄 11 天—12 岁，所有病例均采用西门子 64 排 CT 扫描机检查，扫描范围为胸廓入口至左膈面下 5 cm ,常规进行第二期扫描, 延迟时间为 19～23s, 对于显示异常静脉引流有很大帮助。为避免腔静脉内高浓度对比剂干扰周围结构显示，经头皮或手背静脉增强者，扫描方向为足头方向,经足背静脉增强者，扫描方向为头足方向。 将轴位图像传 AW4.2 工作站对薄层图像连续滚动观察并进行三维重建，主要进行多平面重建(multipleplanar reformation ,MPR)，最大密度投影(,MIP)，曲面重组(,CPR)，容积成像

(volumerendering ,VR) 等方法重建。所有图像胶片由 2 位放射科主治医师进行分析，共同商讨得出一致
结论。对结果采用计数资料 x2 检验，P < 0.05 为差异有统计学意义。 结果：多层螺旋 CT 对 64 例患者均显示了肺动脉狭窄、室间隔缺损、主动脉骑跨及右室壁肥厚。合并畸形包括肺动脉闭锁 3 例，房间隔缺损 10 例，残存左侧上腔静脉 27 例，镜面右位心 4 例，左侧无名静脉低位 7 例，迷走右侧锁骨下动脉 35 例，右位主动脉弓 9 例，动脉导管未闭 4 例，双主动脉弓 2 例，迷走左头臂静脉 3 例，单支冠状动脉 1 例，大的主肺侧支动脉 16 例。 结论：多层螺旋 CT 不仅能显示心脏的解剖畸形，还清晰显示肺动脉及分支发育、伴发畸形，为外科手术方案制定提供依据，对术后评估提出依据。

EPO-1751
MSCT 及多平面重建及 CVE 对儿童气管支气管疾病的诊断价值

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目的：评价胸部 CT 多平面重组及仿真内窥镜技术在气管支气管疾病诊治中的应用价值。
方法：回顾性分析 30 例反复咳喘患儿的影像学表现，检查设备选用西门子公司生产的 Definition AS+128 排螺旋 CT，胸部 MSCT 扫描前，患儿口服或灌肠 10%水合氯醛，剂量 0.5ml/Kg，最多不超过 10ml。扫描模式：螺旋扫描，螺距 0.875：1。扫描参数：120KV，200mA，层厚 1.25mm，层间隔 1.25mm。常规行多平面重组(MPR) 、最大密度投影(M IP)及容积再现(VR)等技术重组图像。由两名高年资 医师在工作站上对气管及支气管的内径分别进行测量，然后进行比较。
结果：CT 气道重建及仿真内窥镜技术检出气管支气管狭窄 8 例，支气管桥 1 例，原发性气管憩室 1 例，支气管发育不全 2 例，肺动脉吊带所致的气管压迫 2 例，双弓畸形所致的气管压迫 2 例，气管性支气管 4 例，气管性支气管是指叶或段支气管直接开口于气管的一种气道的先天发育异常,均起自于气管隆突上方右后侧壁，气管支气管异物 6 例，其中发生在左侧支气管异物 2 例，右侧支气管异物 4 例，MSCT 及仿真内窥镜正常 4 例。
结论：CT 气道重建及仿真内窥镜技术对气管支气管疾病具有重要的价值。MSCT 平扫在显示气管支气管的微小狭窄、气道与临近纵隔的关系方面存在一定的限制,而气道重建可清晰显示气管、支气管狭窄的部位、形态、内部特征及程度。对于生后不久出现喘息、呼吸困难、吸气性喉鸣等患儿，活尤其是活动后加重并严重气道狭窄者可伴有慢性缺氧、生长发育迟缓的患儿常常伴有心血管发育畸形，胸部 MSCT+多平面重建及气道仿真内窥镜可发现异常表现。

EPO-1752
先天性肺气道畸形的 CT 学表现

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探讨先天性气道畸形的 CT 表现，旨在提高对本病的诊断。资料及方法 对 11 例进行回顾性分析，其中男 6 例，女 5 例，年龄最大的 4 岁 6 个月，最小的 6 天。平均年龄 2 岁 7 月。临床以反复呼吸道感染，咳嗽、发热，气喘等来就诊。病史 9 天至 4 年。11 例均经手术、病理证实，术前胸部 CT 平扫，7 例病变区高分辨率 CT 扫描。结果 双肺受累 3 例，右肺受累 5 例，左肺受累 3 例，CT 表现单个或多个含气囊腔（直径≥2cm）6 例，多发蜂窝样囊腔（直径≤1cm）的 5 例，囊内含气 9 例，2 例囊内含少量液体,7 例伴有不同程度肺气肿，5 例合并纵隔疝。1 例合并先天性肺隔离

症。所有病变有一定的占位效应。结论 X 线平片虽然有一定的价值但定位和定性均不如 CT。CT 可更好地显示病变细节、间隔及邻近肺组织改变，明显地提高了 CCAM 小囊腔病变的检出率，有利于鉴别诊断及临床治疗方案的选择。

EPO-1753

宽体超高端能谱 CT 在小儿体部肿瘤性病变的应用

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小儿原发性体部肿物的最常见部位为纵隔。肿瘤种类繁多，良恶各异。常见肿瘤为神经源性肿瘤、恶性淋巴瘤、气管囊肿及脉管畸形等，少见肿瘤为胸膜肺母细胞瘤等。患儿临床症状不典型，随肿瘤增长可出现压迫症状或并发感染，临床最常见的症状为咳嗽，呼吸困难和发绀咯血。不同病理类型肿瘤有其特殊的好发部位及影像学特征。

随着超高端 CT 影像技术的迅猛发展，能谱 CT 已应用于各部位肿瘤诊断中。能谱 CT 的水基图一定程度上可替代常规平扫图像，用于病灶内钙化成分的显示；碘基图反映肺组织的血供状态，选择合适的扫描时间，碘基图及碘浓度定量测量结果，可一定程度替代常规 CT 动态增强所获得的灌注信息。能谱 CT 可选择合适时间直接进行肺部增强扫描，免去增强前平扫，从而减少辐射剂量。单能量图像或基物质图像上所显示的病灶及最佳单能量的检测，采用最佳对比噪声比技术，将病灶作为目标，周围组织作为背景，获取最佳单能量，调整能量滚动条至最佳单能量水平观察病灶，可对病灶进行散点图，直方图及能谱曲线的分析。对判断肿瘤的良、恶性及其组织来源有较高的诊断价值；还能精确反映肿瘤与邻近脏器的解剖关系及其外侵和转移情况，有助于评估手术切除的风险和可能性，有助于术前拟定手术路径和切除方案，判断患者的疗效和预后。掌握小儿纵隔肿瘤能谱 CT 影像学特点对疾病诊断、手术方式的选择、风险评估和预后有重要意义。

EPO-1754

CT A ppearances of Pulmonary Sequestration in Children

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Abstract：Objective To study CT appearances of congenital pulmonary sequestration in children. Methods 71 children with pulmonary sequestration from 2013 to 2018 confirmed by surgery and pathology were retrospectively analyzed. All cases were examined with plain CT scans and contrast--enhanced CT scan. There were intra—pulmonary type in 63 and extra—pulmonary type in 8. Results The lesions in all cases located in the posterior basal segments of low lobes on CT images .The lesions appeared as cystic in 23 cases, solid in 11,cystic-solid in 37. Abnormal systemic feeding arteries were revealed by thin slice enhanced CT scans. Conclusion The main CT sign of pulmonary sequestration is a soft tissue shadow in the posterior basal segments of low lobes. Contrast--enhanced CT scans can show the supplying arteries of the lesions.

EPO-1755

64 排 CT 在先天性主动脉缩窄及合并其它畸形中的诊断价值

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【摘要】**目的** 探讨 64 排螺旋 CT 血管成像(CTA)对先天性主动脉缩窄及合并其它畸形中的应用价值。**方法** 回顾性分析 2010 年 1 月至 2018 年 3 月临床诊断先天性主动脉缩窄合并其它畸形并经手术证实的 126 例患者资料，在工作站利用容积再现（VR），最大密度投影（MIP），多平面重组(MPR)等三维重建方法进行图像后处理。**结果** 64 排螺旋 CT 血管成像清晰显示 126 例主动脉缩窄（单纯主动脉缩窄 24 例，102 例合并心血管复杂畸形），24 例单纯主动脉缩窄中，12 例伴狭窄后扩张，12 例伴广泛侧支循环，6 例伴升主动脉瘤样扩张；102 例主动脉缩窄伴复杂畸形中，合并动脉导管未闭 19 例，合并肺动脉高压 33 例，合并室间隔缺损 44 例，合并房间隔缺损 48 例，合并静脉异位引流 3 例，合并大动脉转位 1 例，合并法洛四联症 1 例，合并双奇静脉弓 6 例，合并右室双出口 3 例，合并迷走右锁骨下动脉 10 例，合并动脉异位起源 8 例。结论：64 排螺旋 CT 血管成像可以清晰显示主动脉缩窄的类型、程度、范围、侧支循环及合并的心血管发育畸形，可以作为先天性主动脉缩窄合并心血管发育畸形的首选影像学检查，为临床诊断及治疗方案的选择提供最有价值的指导。

EPO-1756
主动脉缩窄儿童的主动脉弓 CTA 影像分析

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目的: 探讨儿童主动脉缩窄患儿的主动脉弓发育的影像学特点。
方法: 回顾性分析本院 2014 年 10 月至 2017 年 4 月期间经手术确诊主动脉缩窄患儿 47 例及同期非心血管疾病的 47 例儿童的 CTA 影像及临床资料，两组均排除主动脉弓分支变异者。分别测量升主动脉平肺动脉主干水平最大内径（AOA）、横弓前部最大内径（D1）、横弓后部最大内径（D2）、峡部最大内径（D3）、主动脉缩窄最窄处内径（MD）及降主动脉穿横隔最大内径（DA），计算 D1/AOA、D2/AOA、D3/AOA、DA/AOA 进行组间比较；计算 MD/AOA 与 D1/AOA、D2/AOA、D3/AOA 进行相关性分析；若 D1/AOA≤0.6、D2/AOA≤05、D3/AOA≤0.4，则认为合并主动脉弓发育不良。
结果: CoA 组 D1/AOA、D2/AOA、D3/AOA 均低于对照组（P均<0.01），2 组 DA/AOA 差异无统计学意义（P=0.33）。COA 组 MD/AOA 与 D1/AOA 的相关性分析无统计学意义（P > 0.01），但与 D2/AOA、D3/AOA 呈正相关（P < 0.01）。CoA 组合并主动脉弓发育不良 26 例（55.3%），其中 D1/AOA≤0.6 11 例（23.4%）、D2/AOA≤0.5 15 例（31.9%）、D3/AOA≤0.4 13 例（29.8%）。
结论: CoA 患儿的主动脉弓发育较差，且 CoA 程度越重，主动脉横弓后部及峡部的发育越差，部分可合并主动脉弓发育不良，以横弓后部最多见。

EPO-1757
婴幼儿 II 型右位主动脉弓的 CT 影像表现与临床意义

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目的：探讨先天性 II 型右位主动脉弓的 CT 影像表现以及对该疾病的诊断价值。 方法：回顾性分析 2014.6 至 2016. 5 在本院就诊发现的 3 例 II 型右位主动脉弓患儿的影像资料，认识并分析其解剖结构，总结其形态特点。结果：3 例 II 型右位主动脉弓中，1 例合并心内畸形及肺动脉韧带，1 例合并主动脉弓狭窄，1 例产生气管压迫。3 例中合并 Kommerell 憩室者 2 例。CT 增强扫描断层图像及重建图像能很好的显示大血管的解剖结构及位置关系，最小密度投影可以显示气管有无受压及程度。结论：临床诊断目前以动脉 CTA 诊断最为确切，可以很好的显示心脏大血管的形态学改变，对临床提供直观的治疗依据。

EPO-1758

Revolution CT 单次快速轴扫联合低管电压条件在儿童胸部大血管低剂量 CT 成像的临床研究

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目的 探讨和分析应用 Revolution CT 宽探测器单次轴扫在低管电压条件下扫描对儿童胸部 CT 血管成像图像质量及辐射剂量的影响。
方法 随机选择行胸部大血管 CTA 成像的 28 例儿童患儿为 A 组，行单次轴扫联合低管电压扫描。患儿年龄 3 月-6 岁，扫描条件：管电压：BMI≥15，80kVp，BMI＜15， 70kVp；管电流：SmartmA,噪声指数 10.0；扫描模式：axial，探测器宽度 120-160mm，单圈扫描时间 0.28s，迭代重建 ASIR-V:50%。选择 28 例同年龄段采用东软 NeuViz 128 多排螺旋 CT 行胸部 CTA 成像的病例作 B 组对照，扫描条件：100kv，自动管电流，噪声指数 1.2，扫描模式：helical，探测器 40mm，单圈扫描时间：0.35s，迭代重建: 50%。对比剂 1-1.5ml/kg@1.5-3ml/s 在 10s 内经留置针注入，采用肺动脉主干阈值 100HU 触发扫描肺动脉期，并于 5s 后扫描主动脉期。两组图像分别测量肺动脉主干、左右肺动脉、肺静脉，主动脉期升\降主动脉的 CT 值及标准差，计算信噪比(SNR)进行客观影像评价。并由两名高年资诊断医师以 5 分制对各组图像质量进行评分。同时记录患者扫描剂量长度乘积（DLP）数值。
结果 比较两组患儿年龄及体重指数，无统计学差异。A 组各点的 CT 值和 SNR 均高于 B 组，经 t 检验对比有统计学差异（P＜0.001）。主观图像评价比较，A 组评分为 4.36±0.86, B 组为 3.48±1.12，A 组显著高于 B 组（P＜0.001）。辐射剂量比较，A 组 DLP 为 86.46±12.86mGy*cm，显著低于 B 组 148.84±18.32mGy*cm。
结论 Revolution CT 采用探测器单次轴扫联合低管电压扫描行儿童胸部大血管成像，辐射剂量较 64 排螺旋 CT 常规成像下降了 40%, 图像质量却有较大程度提高。

EPO-1759

先天性支气管闭锁的多层螺旋 CT 诊断

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目的:探讨先天性支气管闭锁的多层螺旋 CT 表现。
方法:回顾性分析我院收治的 3 例先天性支气管闭锁的病例，患儿均为男性，年龄 5 月～5 岁，分析多层螺旋 CT 上病变的位置、边界，病灶内支气管及肺血管情况，占位效应等特征。

结果：先天性支气管闭锁发生于上肺病灶 2 例，下肺病灶 1 例。单个肺段发生 1 例，多个肺段发生 2 例。所有病例病灶表现为局限性透亮度异常增高区，与正常肺组织分界欠清，其内肺血管细小，可见正常肺组织呈尖角状突入病灶内。所有病变内均见支气管扩张合并支气管黏液栓 3 例，指套状改变 3 例，病灶具占位效应 2 例，合并感染 1 例。
结论：支气管闭锁为支气管树的先天性发育畸形。当肺野内局限性肺过度充气合并管状、指套状密度影，以及肺血管细小时需考虑到支气管闭锁。

EPO-1760

儿童肺淋巴增殖性疾病影像诊断与鉴别

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目的：探讨儿童多种肺淋巴增殖性疾病的 CT 及临床表现，提高 CT 对该类病的诊断及鉴别诊断的准确性
材料与方法：搜集并回顾性地分析了我院 15 例经病理检查确诊为肺淋巴增殖性疾病患儿的临床、影像资料，并对相关文献做一复习。
结果：我们收集了 15 例例经病理检查确诊为肺淋巴增值性疾病患儿，包括 1 例淋巴肉芽肿，1 例淋巴样间质性肺炎，1 例滤泡性细支气管炎，1 例病毒感染相关的 T 细胞增殖性疾病，5 例肺粘膜相关淋巴组织淋巴瘤（MALT），6 例弥漫大 B 细胞淋巴瘤。淋巴肉芽肿 CT 表现为沿支气管血管束分布的多发大小不等结节或肿块,部分结节周围伴磨玻璃影，未见明显环形强化。淋巴样间质性肺炎可见双肺对称分布的磨玻璃影，及边缘不清结节影。滤泡性细支气管炎临床表现及肺功能无特异性,影像学以小结节、支气管扩张及间质改变多见。病毒感染相关的 T 细胞增殖性疾病 CT 表现为影像学检查呈局灶-弥漫样变化，结节早期边界清晰，晚期相互融合，并伴有磨玻璃影。MALT 的 CT 表现为两侧肺单发或多发结节或实变影，多位于支气管血管束旁，肺门或纵隔淋巴结肿大。弥漫性大 B 细胞淋巴瘤 CT 表现为肺内结节或肿块，可见空洞影。
结论：儿童各类肺淋巴增殖性疾病的 CT 表现多种多样，缺乏特异性，影像表现、临床表现相结合，可以初步诊断部分肺淋巴增殖性疾病，但其最终确诊需依赖病理结果。

EPO-1761

MRI 诊断儿童心脏肿瘤的价值

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目的：探讨儿童常见心脏肿瘤的 MRI 特点。
方法：13 例经手术证实的心脏肿瘤病例，男 10 例，女 3 例，年龄 1 个月～11 岁。心脏 MRI 检查采用西门子 Magnetom Avanto 1.5T 磁共振机，序列包括 TrueFISP 心脏多断面成像、TSE T1/T2WI 和 T2WI 抑脂平扫、对比剂注射后肿块层面 TurboFLASH T1WI 动态增强、TSE T1WI 增强和延迟 10 分钟 TurboFLASH T1WI PSIR 增强扫描。对比剂采用欧乃影，剂量 0.2mmol/kg。
结果：13 例肿块中横纹肌瘤 6 例（4 例位于左心室，2 例位于右心室），纤维瘤 5 例（2 例位于左心室，3 例位于右心室），左心室错构瘤 1 例，右心房粘液瘤 1 例。平扫 T1WI 和 T2WI 肿瘤信号与心肌相仿，增强后延迟 10 分钟 TurboFLASH T1WI PSIR 序列扫描横纹肌瘤强化程度和心肌相仿，其余肿瘤强化程度明显高于心肌。

结论：心脏 MRI 能明确心脏肿瘤的部位和强化特征，对肿瘤类型的判断及是否需要手术干预具有重要的价值。

EPO-1762
多排螺旋 CTA 技术在诊断婴儿右心室双出口的价值

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目的：评价前门控 128 层螺旋 CTA 技术在术前诊断婴儿右心室双出口中的应用价值。
方法：128 层螺旋 CTA 技术诊断右心室双出口 9 例，均采用前门控扫描技术，图像后处理技术包括：多平面重组（MPR）、容积重建（VR）、最大密度投影（MIP）及最小密度投影（MinP）。诊断性评价右心室双出口分型及其病理特征。
结果：右心室双出口按室间隔缺损的部位分为主动脉下室间隔缺损型 3 例，肺动脉下室间隔缺损型 3 例，双动脉下室间隔缺损型 2 例，远离大动脉室间隔缺损型 1 例；按有无肺动脉狭窄分为无肺动脉狭窄型-艾森曼格型 3 例，合并肺动脉狭窄-法罗四联症型 6 例；术前 CTA 诊断与手术结果完全相符。
结论 128 层螺旋 CTA 前门控技术在术前诊断右心室双出口中具有重要价值，能够为心外科术前手术方案制定提供十分可靠依据。

EPO-1763
不打药儿童磁共振冠状动脉血管成像质量的初步研究

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摘要：
目的：评价儿童自由呼吸状态下不打药膈肌导航 3D 平衡式自由稳态进动序列（3D B-TFE)全心扫描序列在儿童磁共振冠状动脉成像中的图像质量。
方法：用 3.0TMRI 三维(3D)B-TFE(balanced turbo field echo)全心扫描序列，膈肌导航技术，心电门控技术，自由呼吸状态下对 2 例（13 岁、14 岁 4 月）儿童进行磁共振冠状动脉成像（MRCA），经最大信号强度投影（MIP）,多平面重建（MPR）,曲面重建（CPR),容积再现（VR）后处理获得冠状动脉图像.观察冠状动脉的显示率,测量各冠状动脉的显示长度及心肌,冠脉的信号强度及信噪比。
结果:2 例受检者均完成检查,右冠状动脉、左冠状动脉主干、前降支全部显示;左冠状动脉回旋支显示良好。
结论:自由呼吸不打药膈肌导航 3D B-TFE 序列冠脉成像方法显示成功率高,图像信噪比好,可作为不能屏气，心率快，需药物镇静儿童心脏冠脉检查的一种无创性手段

EPO-1764
320 排动态容积 CT 在诊断婴幼儿肺静脉畸形引流中的应用价值

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目的 探讨 320 排动态容积 CT 血管成像对诊断婴幼儿肺静脉畸形引流 (anomalous pulmonary venous drainage,APVD)的临床应用价值。**方法** 回顾性分析 320 排 CT 血管成像诊断 21 例 APVD 患儿的影像资料，并将 APVD 影像学表现与手术结果进行对照。**结果** 21 例患儿的术前影像诊断均与手术观察到的情况一致。其中,完全型 APVD 17 例(心内型 5 例，心上型 12 例)，部分型 APVD 4 例(心下型 3 例，心内型 1 例)。所有 APVD 患儿均合并房间隔缺损,13 例并存室间隔缺损，3 例存在动脉导管未闭，10 例存在肺动脉狭窄或闭锁，2 例存在气管性支气管，1 例存在左冠状动脉起源变异。**结论** 320 排动态容积 CT 血管成像可以全面、准确、清晰显示婴幼儿 APVD 情况以及合并心血管发育畸形。

EPO-1765

Graft-versus-host disease after hematopoietic stem cell transplantation: A retrospective analysis of chest CT features in pediatric recipients

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Objective: To investigate the chest CT features of graft-versus-host disease (GVHD) in pediatric recipients after hematopoietic stem cell transplantation (HSCT) in order to improve early diagnosis.

Methods: 1637 consecutive allogeneic HSCT pediatric recipients at Beijing Ludaopei Hematonosis Hospital and the Affiliated Children's Hospital of Capital institute of pediatrics (Beijing, China) between January 2014 to August 2018 were reviewed. And a total of 133 pediatric patients who were clinically diagnosed pulmonary GVHD were enrolled. Two observers evaluated the presence, extent and distribution (bilateral, unilateral) of the chest CT. The evaluation of ground-glass opacity (GGO) (localized, patchy, diffuse), consolidation (localized, patchy, diffuse), reticulation (localized, patchy, diffuse), nodules (localized, multiple), bronchiectasis, pleural effusion, air trapping, tree-in-bud sign and pneumomediastinum were included.

Results: The range of onset time was 10 to 664 days. There was no significant difference of the incidence of GVHD between sex. The top three underlying disorders for HSCT were acute lymphoblastic leukemia, acute myeloid leukemia and aplastic anemia. GGO, consolidation, reticulation and nodules were commonly seen in GVHD patients. In the distribution pattern of GGO in acute phase, there difference was significant ($p<0.02$) which was more diffuse than that of the other group. Bronchiectasis, air trapping and tree-in-bud sign were commonly seen in the chronic phase, and the difference showed statistically significant.

Conclusion: The common signs of pediatric GVHD includes GGO, consolidations, reticulations and nodules. The diffuse interstitial and alveolar opacities could resemble pulmonary edema. Diagnosis should be made in combination with clinical manifestations, signs and laboratory tests.

EPO-1766

儿童肺动脉闭锁的 MSCTA 表现

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目的：探讨儿童肺动脉闭锁及合并畸形的 MSCTA 表现。方法：搜集 2015 年 1 月至 2019 年 4 月间郑州大学第三附属医院术前超声及术后确诊为 PA 的 29 例 MSCTA 资料，男 16 例，女 13 例。结果：29 例 PA 中，PAVSD 23 例，PAIVS 6 例；PA 伴 PDA 11 例，伴右位主动脉弓及右位降主动脉 5 例，伴房间隔缺损 10 例，伴左侧上腔静脉 4 例，镜像右位心并矫正型大动脉转位 1 例，双主动脉弓伴左弓闭锁 1 例。其中 PAVSD 伴 PDA 5 例，6 例 PAIVS 均伴 PDA 存在。23 例 PAVSD 中 5 例伴 PDA 病例未见明显 MAPCAs，18 例不伴 PDA 的可见不同程度的 MAPCAs，侧支血管数目 1～10 支不等，共 32 支，多来源于降主动脉和主动脉弓，未见肋间动脉、内乳动脉供血侧枝；PAVSD 病例均存在升主动脉扩张，不同程度的主动脉骑跨 21 例（>50%），对应连接不良型室间隔缺损，主动脉完全起自右心室 2 例，20 右心室均发育可，3 例右心室存在发育不良，形态偏小；PAVSD 中 PA 闭锁的部位右室流出道 2 例，肺动脉瓣闭锁 2 例，肺动脉干近心端闭锁 15 例，肺动脉干全段闭锁 2 例，肺动脉干及左右肺动脉均未见 2 例。6 例 PAIVS 病例均存在 PDA 与肺动脉分叉处或左肺动脉相连接，PA 闭锁部位右室流出道 1 例，肺动脉干闭锁 1 例，肺动脉瓣闭锁 4 例。29 例 PA 中 9 例可见典型的“海鸥征”。结论：肺动脉闭锁常见不同数量和不同程度的侧枝血管，PAIVS 均伴 PDA 开放，而 PAVSD 部分存在 PDA 且少见侧枝血管。

EPO-1767

3D 打印在儿童先天性胸骨缺如诊疗中的应用

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目的：运用 3D 打印技术建立儿童先天性胸骨缺如术后补片移位再行手术模型，探讨 3D 打印建模对于临床诊断、手术评估和手术计划制定的意义。**方法：**1 例胸骨缺损重建术后补片移位的患儿，行 CT 扫描后获得影像资料；使用 Mimics 17.0 软件导入 CT DICOM 数据并对感兴趣区域（ROI）做图像重建后处理，得到三维重建模型；再运用 Magics19.0 软件对三维模型等进行添加支撑、表面修整、光滑处理等操作；将胸骨缺如三维重建模型保存成 STL 格式；最后把三维数据导入 OBJET 260 3D 打印机后即完成建模过程。**结果：**依据 3D 打印模型，进行胸骨缺损术后评估，发现补片移位并设计再次修补手术方案。**结论：**本研究通过 3D 打印技术按 1:1 的比例打印了患儿的胸骨缺如模型，给先天性胸骨缺如术前辅助诊断、手术方案设计和术后评估提供有效的帮助。

EPO-1768

儿童肺炎支原体感染的胸部 CT 表现

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目的：分析儿童肺炎支原体感染的胸部 CT 特征。方法： 2017 年全年上海交通大学医学院附属新华医院儿呼吸内科住院治疗并行病原学检查和胸部 CT 平扫检查的患儿共 1103 例，其中 266 例为病

原学明确的单纯性肺炎支原体（MP）感染，纳入分析，主要评价影像表现和临床特征。结果：1. 临床和流行病特征：单纯 MP 感染患儿男女比例约为 0.8：1，年龄 1 月-11 岁，平均年龄（4.0±2.2）岁，中位年龄 4.0 岁。2. 胸部 CT 特征：两肺广泛性病变（≥4 叶）最多见（41.3%）；具体征象以实变/不张（66.1%）最常见，其中 22.7%伴有支气管充气征，全部为不典型支气管充气征；其次为肺门淋巴结肿大(62.8%)及弥漫性支气管壁增厚(60.5%)，后者中 81.3%伴有磨玻璃影、40.1%伴有网合结节、39.1%伴有空气潴留。其余表现包括胸腔积液（6.4%）、胸膜增厚（8.2%）、马赛克样分布（4.5%）、结节（0.4%）以及纵隔积气（0.8%）。结论 肺 MP 感染好发于学龄前期儿童，女童发病率略高，两肺弥漫性分布多见，最常见 CT 征象包括伴有不典型支气管充气征的实变/不张、肺门淋巴结肿大以及支气管壁弥漫性增厚，结合流行病学及影像学特征，可提出肺炎支原体肺炎感染的诊断。

EPO-1769

肺炎支原体感染所致儿童坏死性肺炎 胸部 CT 表现（附 30 例分析）

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【摘要】 目的 总结肺炎支原体感染所致儿童坏死性肺炎的胸部 CT 表现、转归及 CT 检查临床指标。**方法** 回顾性分析 30 例肺炎支原体感染所致儿童坏死性肺炎的临床与 CT 资料，比较坏死性肺炎组与对照组临床指标，统计坏死性肺炎不同病程的 CT 表现，绘出坏死性肺炎大叶肺实变及相关征象动态变化曲线。**结果** 肺炎支原体感染所致坏死性肺炎占同期坏死性肺炎的 57.7％（30／52）。坏死性肺炎组高热持续时间、外周血 WBC 峰值、中性粒细胞比率、WBC 异常持续时间、CRP 峰值、CRP 异常持续时间均高于对照组，两组间有极显著性差异（$P<0.01$）。肺炎支原体感染所致坏死性肺炎胸部 CT 表现包括：93.3％为单侧大叶肺炎，56.7％为 1 个肺叶实变，行增强 CT 扫描者肺实变内均存在强化减低区，90％见空腔。50.0％强化减低区或空腔累及肺段范围，33.3％为整个肺叶受累，16.7％为 2 个肺叶受累。中位时间 6 个月（范围 4 个月～3.5 年）10 例坏死性肺炎复查 CT，2 例肺实变吸收，4 例肺不张，4 例肺叶囊性变，其中 1 例行囊性变肺叶切除术。**结论** 肺炎支原体感染所致儿童坏死性肺炎临床表现与非坏死性肺炎支原体肺炎有显著区别，坏死性肺炎病程迁延，转归包括痊愈、肺不张或肺叶囊性变，肺叶囊性变长期不闭合需手术切除。

EPO-1770

智能曝光参数的临床运用探索

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目的 通过进行数据的分析建立智能化的 X 线曝光参数(kV mAs)，为实现全自动化影像摄片模式进行前瞻性数据分析。**方法** 本研究过程分三个阶段，第一阶段为收集 500 例患儿的数据，包括基本的身高、体重、年龄，使用常规的拍摄方法获得用于影像诊断的图像。第二个阶段通过分析图像数据和计算出 BMI 值，结合实际年龄和收集以 AEC 方式获取的 mAs 值，分析出可用的 mAs 值并建立相关的参数表 Age-kV、Age-mAs 和 Age-BMI 表。最后在验证阶段，通过查表获得的曝光参数再

经由经验丰富的技师认可才能用于实际拍摄工作，再进行图像分析。**结果** 分段建立了十条以 BMI 为依据的曝光参数表，在验证阶段使用模拟全自动拍摄模式的方式获取的参数运用于实际拍摄，经高年资的诊断医师评估得到认可。**结论** 实验证明以 BMI 为依据分段建立的曝光参数表给出的曝光参数完全可以获得达到临床诊断要求和质量控制要求的图像。

EPO-1771

Vascular imaging findings with MRI in children with Kawasaki disease

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PURPOSE
Determining the presence of aneurysms, thrombosis, and stenosis is very important for the diagnosis of Kawasaki disease (KD) and in the follow-up of KD patients with aneurysms. We aimed to demonstrate MRI angiography and cardiac MRI findings in pediatric patients with KD.
METHODS
Over a 2-year period, MRI angiography and cardiac MRI were performed to determine vascular aneurysms or occlusions in 15 patients who had diagnosed KD. The patients ranged from 6 months of age to 12 years, with a median age of 3 years. The American Heart Association's criteria were used to diagnose KD.
RESULTS
Arterial aneurysms were present in 15 patients (aged 6 months to 12 years; median age of 3 years; 11male, 4 female). Coronary artery aneurysms were detected in 15 patients and systemic artery aneurysms were detected in 5 patients. In 5 patients, there were thrombus at coronary arterial aneurysm.
CONCLUSION
Our results suggest that MRA and CMR can detect all types of aneurysms, stenosis and occlusions of vessels in patients with KD who were not previously diagnosed. This useful, easy, robust and fast technique may be preferred to diagnose KD.

EPO-1772

Characteristics and Fate of Systemic Artery Aneurysm after Kawasaki Disease

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Objective
To determine the long-term outcome of systemic artery aneurysms (SAAs) after Kawasaki disease (KD).
Study design

We investigated the characteristics of SAAs in 25 patients using medical records and MR angiograms. The age of onset of KD ranged from 1 month to 20 months. The interval from the onset of KD to the latest angiogram ranged from 16 months to 12 years.

Results

The mean duration of fever was 7-12 days. All 25 patients had at least 1 symmetric pair of aneurysms in bilateral peripheral arteries, and 21 patients had multiple SAAs. The distributions of SAAs was as follows: brachial artery, 10; common iliac artery, 6; internal iliac artery, 5; abdominal aortic aneurysm, 5; and others, 20. The diameter of all SAAs in the acute phase leading to stenotic lesions in the late period was >10 mm.

Conclusion

SAAs occurred symmetrically and were multiple in younger infants and those with severe acute vasculitis. Larger SAAs can lead to stenotic lesions in the late period.

EPO-1773

CCTA 在儿童先天性冠状动脉瘘诊断及术后评估中的应用

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目的

冠状动脉瘘(CAF)是指冠状动脉绕过正常的毛细血管系统与心腔（CCF）或大血管（CAVF）形成的异常交通，影像表现复杂，对其解剖结构的精确显示有利于恰当手术方式的选择。本文通过回顾性分析儿童先天性 CAF 的 CT 冠状动脉成像（CCTA）表现，评估 CCTA 在儿童先天性 CAF 术前诊断及术后评估中的应用价值并熟悉其影像表现。

方法

回顾性分析 2013 年 1 月至 2018 年 12 月间于我所行 DSCT 冠状动脉成像检查的 21 966 例患者的影像资料。统计年龄小于 18 岁患者中 CAF 的发生率及类型，重点描述瘘管的起源、终点及受累冠状动脉走形及管腔扩张情况，并对患儿进行术后 CTA 评估。

结果

1. 本组共检出 73 例冠状动脉瘘（0.33%，73/21966）。小于 18 岁者 15 例，发生率 0.07%(15/21 966)。

2. 冠状动脉-肺动脉瘘（CPAF）3 例(20%，3/15)，均源于右冠状动脉；冠状动脉心腔瘘（CCF）12 例（80%），右冠状动脉 6 例，左冠状动脉 4 例，回旋支 1 例，左、右冠状动脉同时受累 1 例；其中右心室瘘 7 例，左心室瘘 3 例，右心房 2 例，其中 1 例右心房瘘伴两个瘘口。CAF 为独立发育畸形者占 73.3%（11/15）。

3. CCF 主要表现为异常血管扩张、迂曲延长（8 例），瘤样扩张（2 例）；结合 VR 和 MIP，可清晰显示瘘血管的整体形态。瘘口处出现高密度“喷射征”是 CPAF 的典型征象。

4. 术后随访 9 例，随访时间 1 个月-3 年，术后瘘血管远端出现血栓时间长短不一，最短 1 周，最长 7 个月，1 例封堵血管内大量血栓形成伴右心室心肌梗死表现。

结论 先天性冠状动脉瘘是一种少见的冠状动脉发育畸形，本组小于 18 岁者中发生率为 0.07%，以 CCF 最常见。DSCT 冠状动脉成像可多方位清晰显示冠状动脉瘘的整体形态，明确其类型及瘘口情况，为 CAF 诊断及术前术后评估提供重要信息。

EPO-1774

儿童重症肺炎的病原菌与影像表现分析

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目的：分析不同病原菌导致的重症肺炎影像的表现特点。**方法**：选取 2018 年 3 月 ～2019 年 2 月期间在我院 PICU 进行治疗的 115 例重症肺炎患儿，回顾性分析所有患儿病原菌结果以及胸部检查影像表现特点。**结果**:115 例重症肺患儿支原体感染有 11 例，腺病毒有 13 例，流感嗜血杆菌 15 例，肺炎链球菌 8 例，金黄色葡萄球菌感染有 6 例，肺炎克雷伯菌 10 例，白假丝酵母感染有 9 例，铜绿假单胞菌感染 16 例，嗜麦芽窄食单胞菌 14 例，孢曼不动杆菌 7 例，其他菌类 6 例，其中多重病原体感染 12 例。所有患儿的一般临床表现均符合重症肺炎的临床诊断标准。不同病原菌影像表现多样化，呈斑片状、片状、团块状等，可累及整个肺叶、肺段，小叶间隔，部分形成空洞、肺气囊、合并胸腔积液，部分病原菌感染后期可发展闭塞性毛细细支气管炎。**结论**： 重症肺炎患儿不同的呼吸道病原菌与影像学表现有一定的特点。

EPO-1775

儿童系统性疾病胸部 HRCT 影像

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目的：儿童系统性疾病累积肺部较常见。HRCT 可用于评估该类患儿肺部受累情况。可以帮助发现异常，寻找特征性表现，评估疾病范围，协助鉴别诊断，随访评价及引导肺部穿刺活检。许多情况下 CT 影像不能作出明确诊断，某种 CT 表现较其他表现更常见，但并不具特异性，其组织病理学来源各异。
方法：本文回顾儿童系统性疾病胸部 HRCT 影像表现，涉及：结缔组织病（青少年特发性关节炎、皮肌炎、系统性硬化、系统性红斑狼疮以及混合结缔组织病）、血管炎、原发性及获得性免疫缺陷、纤毛不动综合征、囊性纤维化、朗格罕斯细胞组织细胞增生症。
结果：结缔组织病特点是以免疫系统异常，有各器官炎症。该病可累及肺泡、肺间质、血管及气道，HRCT 反映了炎症和纤维化的相对比率。CT 影像表现在疾病种类间无特异性，但可代表扫描期间肺部累及严重程度。青少年特发性关节炎以胸膜和心包渗出常见，60%患者可见。最初常表现为磨玻璃样改变，逐渐发展为小叶间隔增厚以及肺纤维化。皮肌炎肺部 CT 表现与其他结缔组织病相似，取决于疾病的进展情况，但皮肌炎累及肺部，病变可迅速进展且具致命性，需结合影像表现与肺功能测试对症状可疑患儿进行细致评估。系统性硬化肺脏受累为该病患儿最常见死因。次常见表现有胸膜及心包渗出，食道扩张。可有主肺动脉扩张，肺部病变晚期肺动脉高压，硬皮病患者更常见。系统性红斑狼疮最常见的影像表现是胸膜及心包积液，肺炎、肺出血、狼疮性肺炎以及隐源性肺炎属于该病急性表现，HRCT 可出现实变。肺出血是该病常见且致命的并发症，HRCT 表现为磨玻璃样改变，合并出现小叶间隔增厚则形成所谓“铺路石”征。
结论：临床可疑系统性疾病，HRCT 用于发现病变，显示病变特征以及确定病变严重程度与累及范围。对于无呼吸道症状，肺功能检测正常的儿童，HRCT 可发现其肺部病变，有助于此类疾病早期诊断与及时治疗，对病程可有较大影响。

EPO-1776

Revolution CT 能谱扫描模式在儿童漏斗胸胸廓内支架固定术后的图像评价

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目的：Revolution CT 最佳单能量技术在儿童漏斗胸胸廓内支架固定术后的图像评价；材料与方法：A 组：20 例漏斗胸胸廓内支架植入术后的患儿，年龄 8-12 岁，GSI 扫描模式，扫描参数：80-140Kv，NI：10，ASIR-V：50%，最佳单能量重建+MAR，重建 110Kev 图像，B 组：20 例，回顾性分析漏斗胸胸廓内支架植入术后的患儿的常规胸部平扫，100Kv，自动毫安，NI：10，ASIR-V：50%，由两位副主任医师对两组病例读片并主观评分，评分标准 1-5 分，3 分以上图像可以满足诊断要求，并对评分进行一致性分析。结果：A 组图像质量良好，均>3 分（3.83±0.20），DLP：90.22±6.31mGy·cm，ED：1.52±0.15mSv；B 组图像质量不能满足诊断要求<2 分（1.63±0.13），DLP：36.43±4.20mGy·cm，ED：0.62±0.34mSv，两位医师读片一致性良好（K=0.726），A 组 DLP、ED 大于 B 组，差异具有统计学意义（P<0.05）。结论：GSI 扫描模式下的单能量图结合 MAR 算法可以有效去除漏斗胸胸廓内支架造成的伪影，但辐射剂量高于普通胸部平扫。临床应用：Revolution CT 能谱扫描模式下的最佳单能量结合 MAR 算法的图像大幅提高漏斗胸胸廓内支架术后患儿的 CT 图像质量，对临床治疗效果的评估有重要意义。

EPO-1777
磁共振成像 T2*测量与地中海贫血不同基因型的临床评估初步研究

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目的 β地中海贫血症不同的基因型组心血管磁共振（CMR）T2*测量评估是否与心脏功能受损水平相关。
方法 以 2014 年 11 月至 2019 年 3 月期间我院收治的地中海贫血患者，根据基因组分组确定了三组患者：杂合子β+/β°（N=45），纯合子β+（N=20），纯合子β°（N=39）接受过 MRI 横向弛豫时间(T2*)检查为研究对象，心肌铁超负荷（MIO）。通过 T2*技术评估 MIO。同时通过心脏超声获得左心室射血分数(LVEF)，检测双心室功能。预估心肌铁负荷与心功能关系。
结果 研究对象心脏 T2*与患者的年龄(r=-0.276，P=0.008)、LVEF(r=0.288，P=0.007)间存在相关性，其中有输血史的患者心脏 T2*与输血量呈明显负相关(r=-0.701，P<0.001)。LVEF 是否正常与组间心脏 T2*值升高有统计学意义(P=0.005)，但心脏铁过载比例(T2*<20ms)在各组中无统计学意义。与其他组相比，纯合β+TM 患者的输血需求显着降低。纯合β+组与杂合和纯合β°组相比，心脏 T2*值更高（P<0.0001），心脏 T2*值<20ms 的患者数量更少（P<0.001）。纯合子β+显示病理性左心室射血分数（LVEF）患者数量低于其他两组（P<0.05）
结论 心脏 T2*技术测量患者脏器铁过载结合 LVEF 对心肌功能评估有早期预测性。β+纯合子的患者较少出现铁过载的现象并且该基因型患者心脏收缩功能较其他组型更好。

EPO-1778
儿童胸膜肺母细胞瘤的影像表现与病理对照

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目的：探讨儿童胸膜肺母细胞瘤（Pleuropulmonary Blastoma，PPB）的影像学表现，并与其病理学表现进行对比分析，以提高对本病的认识。材料和方法：收集我院 7 例经穿刺活检、手术病理确诊为 PPB 患儿的临床资料。7 例患儿年龄 2 个月-8 岁，平均年龄 3 岁。临床表现以呼吸困难和咳嗽为主。7 例患儿均行 X 线和 CT 平扫，5 例同时行 CT 增强扫描，回顾性分析 7 例 PPB 的 X 线和 CT 表现。按 Dehner 分型法（根据病理及免疫组织化学结果）可将 PPB 分为Ⅰ、Ⅱ、Ⅲ三型；对照分析不同病理分型 PPB 的 X 线和 CT 特点。结果：本组 7 例均为单发，肿瘤位于右侧 4 例、左侧 3 例；其中Ⅰ型 1 例，Ⅱ型 2 例，Ⅲ型 4 例。X 线表现：Ⅰ型表现为巨大囊状含气密度影，内见纤细分隔；Ⅱ型和Ⅲ型 PPB 表现为一侧胸腔高密度占位性病变，2 例伴有肺纵隔疝，3 例病灶体积较大而表现为
一侧“白肺”，心缘消失，5 例伴有胸腔积液。CT 表现：7 例均表现为胸膜下巨大团块状、不规则状或占据整个胸腔的肿块影，密度不均匀，伴患侧肺不张并纵隔移位。Ⅰ型肿块以囊性为主，表现为单侧局限性薄壁囊肿， 内见多个纤细分隔，增强后囊性区域未见强化；Ⅱ型表现为囊实性混杂密度肿块，1 例病灶内可见多个气液平面，增强后实性部分呈明显强化， 内可见强化的迂曲血管影， 1 例伴有患侧胸腔积液；Ⅲ型表现为实性肿块，密度不均匀，增强扫描呈明显不均匀强化，肿块边缘强化显著。7 例 PPB 肿块均压迫支气管和临近肺组织而引起肺不张，5 例与纵隔组织分界不清，4 例与主动脉、肺动脉关系密切。5 例伴有胸腔积液，2 例侵犯胸膜导致胸膜增厚。3 例伴有纵隔淋巴结肿大，2 例伴有肺门淋巴结肿大。结论：不同病理分型的 PPB 具有一定的影像学特点，分析其 X 线和 CT 表现，有助于本病诊断。

EPO-1779

儿童塑型性支气管炎的 CT 表现

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目的 探讨儿童塑型性支气管炎（plastic bronchitis，PB）的 CT 表现、诊断及鉴别诊断，提高对儿童塑型性支气管炎影像学特点的认识。方法 回顾性分析天津市儿童医院自 2016 年至 2018 年收治确诊的 22 例塑型性支气管炎患儿的 CT 表现。结果 22 例患儿均以发热咳嗽为主要症状，均行纤维支气管镜检查，取出粘液栓，内镜诊断支气管塑型。CT 表现均可见肺实变影像，其中肺不张（ 6 例），支气管远端显示不清（16 例），管腔内分泌物阻塞（ 3 例），合并胸腔积液 11 例，累及胸膜 11 例。结论 儿童塑型性支气管炎是一种发病凶险的罕见病，其临床表现无特异性，诊断较困难，早期进行 CT 检查，有助于提高该病的诊断，最终需依靠纤维支气管镜及病理组织学检查进行确诊及治疗。

EPO-1780

儿童胸壁病变的影像学表现与临床分析

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目的 探讨儿童胸壁病变的临床及影像表现特点，提高对胸壁病变的诊断水平。

方法 收集我院 2009 年 10 月—2018 年 6 月间手术及病理证实的 50 例胸壁病变患儿，包括感染组（4 例）和非感染组（46 例），非感染组进一步分为良性肿瘤组（41 例）和恶性肿瘤组（5 例）。50 例患儿均行超声、CT 或 MRI 检查。对所有病例的临床及影像表现进行回顾性分析。
结果 3 组病例的临床及影像表现的发生率各有不同。①临床表现：感染组病人全部出现发热、胸痛、局部红肿热的临床表现，且病变均质软；良性肿瘤组中质软出现率为 90.2%（37/41）；恶性肿瘤组全部病变均质韧。3 组病变移动性均差。感染组及恶性肿瘤组全部病例均有局部压痛，而良性肿瘤组压痛的发生率仅为 7.3%（3/41）。②影像表现：良性肿瘤组中，75.6%（31/41）病变显示内部均匀，65.9%（27/41）边缘清晰；而感染组及恶性肿瘤组病灶内部不均匀，边缘模糊。良性肿瘤组中仅 9.8%（4/41）病灶可见钙化，2.4%（1/41）病灶有出血，19.5%（8/41）病灶内部出现囊腔影，14.6%（6/41）病例可见肋骨破坏；恶性肿瘤组全部侵犯入胸腔并破坏肋骨；感染组均无肋骨破坏。感染组与恶性肿瘤组病变均呈明显强化，而良性肿瘤组中 80.5%（33/41）表现为无/轻度强化。
结论 不同性质胸壁病变临床特点各异，熟悉影像特征有利于胸壁病变的定性诊断。

EPO-1781
磁共振检查在评价胎儿先天性膈疝预后中的价值

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目的：评估胎内先天性膈疝患儿的磁共振影像表现及其与预后的关系

方法：回顾性分析产前检查怀疑先天性膈疝的胎儿 35 例，所有胎儿均行磁共振检查，检查序列包括横断面及冠状面单次激发快速自旋回波序列（SS-FSE）及平衡稳态自由进动序列（bSSFP）。评价膈疝内容物、是否含有疝囊、测量并计算肺头比、全肺体积（TFLV）、观察肺体积与正常预期肺体积比值（O/e FLV）、胎肺体积与胸腔容积比值(FLV/FCV)。所有胎儿均成功生产并进行手术，将患儿分为预后良好组及预后不良组（包括长期感染、并发症、死亡）。运用卡方分析、logistic 回归等统计方法分析胎儿影像结果与预后间的关系。
结果：含有疝囊的患儿预后较无疝囊患儿预后好（86% vs 34%，P<0.05）,预后不良患儿的实测肺体积与正常预期肺体积比值较预后良好患儿明显减低（23.6% ± 12.2vs.36.1% ± 13.0, P < 0.001)），预后良好组中胎肺体积与胸腔容积比值(FLV/FCV)也较预后不良组高（0.357±0.096vs0.195±0.201）。Logistc 回归分析结果示是否有疝囊、实测肺体积与正常预期肺体积比值、胎肺体积与胸腔容积比值与患儿预后相关，且以胎肺体积与胸腔容积比值为 0.24 作为阈值判断膈疝患儿预后有最大的诊断效能。
结论：胎儿磁共振检查对于评价患儿肺发育情况及预后有很大价值

EPO-1782
胸部 X 线及 CT 在小儿坏死性肺炎的诊断和治疗中的价值

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目的：探讨胸部 X 线及 CT 在小儿坏死性肺炎的诊断和治疗中的价值。

方法：回顾性分析并总结 2017 年 10 月至 2019 年 7 月住院确诊为坏死性肺炎的 59 例患儿的影像学及临床资料，包括胸部 X 线、胸部 CT、病原学特征、炎性指标、治疗方法及预后。
结果：59 例坏死性肺炎患儿，男 31 例，女 28 例；中位年龄 2 岁。59 例患儿初次（病程第 3-10 天）均行胸部 X 线检查显示肺内实变影，其中 20 例显示实变内密度不均及多发小空洞，32 例患儿于病程第 10-22 天行胸部 CT，其中 30 例显示实变内大小不等的空洞，8 例见支气管扩张，52 例并发胸腔积液。患儿的临床症状重，病情进展迅速，C 反应蛋白高；其中肺炎支原体感染 21 例，肺炎链球菌 18 例，肺炎衣原体感染 6 例，金黄色葡萄球菌 1 例，10 例细菌培养阳性。17 例采用纤维支气管镜肺泡灌洗，10 例采用胸腔闭式引流术，1 例行患侧肺大部切除术。56 例患儿预后良好。
结论：对于影像学表现为肺部实变并内部密度不均，甚至出现小空洞的患儿，结合临床表现，如同时持续高热，炎性指标明显升高时，应考虑坏死性肺炎。治疗上除积极抗感染及对症支持治疗外，还需采用纤维支气管镜肺泡灌洗及胸腔闭式引流甚至部分肺切除术等侵入性治疗，提高患儿长期预后。

EPO-1783

合并有其他血畸形的肺静脉异位引流

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目的：研究合并有其他血畸形的肺静脉异位儿童的影像学表现。
方法：回顾性分析我院 2008 至 2018 年期间 382 名肺静脉异位引流患儿，发现 5 名患儿合并其他血管畸形。
结果：这 5 名合并肝静脉畸形的患儿，均为男性，年龄分别为 6 天、2 个月、5 个月、6 个月和 12 岁。先心类型均为右下肺静脉异位，均异位静脉均回流入下腔静脉，即弯刀综合征。五名患儿中有 4 名合并有右下隔离肺，有 2 名合并有肝静脉畸形。合并肝静脉畸形的其中一例为肝右静脉起源异常，由下腔静脉发出后环形下行，最后汇入下腔静脉。另一肝静脉畸形患儿为肝内出现多发异常静脉分支。有 3 名患儿出现右侧膈疝，均为肝脏疝入。其中有 4 名患儿进行了手术治疗，预后良好。
讨论：弯刀综合征这一名称由 Halasz 等人首次提出[1]。弯刀综合征发病率约 2/100000，男女比例约 1:2。它有 2 种类型，婴儿/儿童型和成人型，婴儿/儿童型临床症状较轻、死亡率较低。另一方面，下腔静脉肝内段梗阻常常引发异常肝内静脉侧枝形成[2]。Çullu 等人曾报道过一例 37 岁下腔静脉发育不良的患者在肝右静脉与下腔静脉之间出现一巨大分流血管[3]。但是我院的两例肝静脉畸形患者下腔静脉未见异常。弯刀综合征中合并出现肺隔离症、肝静脉畸形较其他肺静脉异位引流多见，是否为弯刀综合征所特有，还需要后续更多的临床数据来佐证。

EPO-1784

新生儿气胸早期床边胸片特殊征象分析

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目的：探讨新生儿床边胸片上特殊影像学征象在气胸早期诊断中的应用。**方法：**回顾性分析 2017 年 3 月至 2018 年 2 月的新生儿气胸患儿，由 2 位高年资放射科医师共同评估每张胸片是否存在少量气胸影像学征象。**结果：**共发现 50 例新生儿少量气胸病例，其中 5 例同期有胸部 CT 检查，26%床边胸片上发现单个征象，74%有多个征象。**结论：**肋膈角“深窦征”、纵隔及心缘异常透亮影，是少量气胸的特征性表现；膈面锐利、膈下透亮度增高、肺纹理压缩、双膈面提示气胸局限于于膈

面上部。由于漏诊气胸与死亡率相关，因此关注危重婴儿的临床医生应确保他们能够识别这些体征，对隐匿性气胸的影像学征象的识别将有助于医生在气胸病程中更早地识别气胸。

EPO-1785
评估智能期相选择重建在低剂量儿童冠状动脉 CTA 中的应用

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目的　评估智能期相选择重建技术在低剂量儿童冠状动脉 CT 血管成像（CCTA）中应用的可行性及准确性。方法　收集我院 2019 年 4 月—6 月拟诊为川崎病冠状动脉瘤或冠状动脉起源发育异常要求行 CCTA 检查的患儿 28 例，其中男 13 例，女 15 例，平均年龄（4.4±3.0）岁，平均心率（99.2±18.0）次/min。使用 GE-Revolution 256 排宽体 CT 行低剂量 CCTA 检查扫描方案，根据扫描后本机自动记录的剂量报告记录剂量长度乘积（Dose Length Product，DLP），并计算有效辐射剂量（effective dose，ED）。扫描原始数据使用 2 组方法重建图像，一组使用智能期相选择技术重建图像（SP 组）；另一组手动选择期相重建图像（MP 组）。重建图像由两位医师采用美国心脏病协会推荐的冠状动脉 15 分段法进行评分。评分采用 4 分制。采用配对样本 t 检验统计学方法比较 MP 组和 SP 组重组影像中冠状动脉及其分支的主观评分。2 位评分者之间的一致性采用 Kappa 分析。 结果　患儿受到有效辐射剂量 ED 为（0.96±0.74）mSv 全部冠状动脉血管及其分支显示 386 支(386/420),其中 S10 节段有 15 例患儿显示，S14 节段有 24 例患儿显示，S15 节段有 11 例患儿显示。其余血管节段均为 28 例患儿全部显示。两位医师图像评分一致性适中（κ=0.62）。重建期相一致性为 85.7%（24/28）。重组图像主观评分均>2 分，即满足诊断要求。 结论　在儿童低剂量 CCTA 扫描方案中配合使用智能期相选择重建技术可以获得满足诊断的影像质量，在降低患儿所受到的辐射剂量的同时节省影像技师时间提高工作效率。

EPO-1786
儿童坏死性肺炎的胸部 CT 诊断

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【摘　要】目的：总结儿童坏死性肺炎的胸部 CT 表现和特点。
材料和方法：回顾性分析 2018-2019 年 29 例因肺部感染确诊为坏死性肺炎者在我院检查的儿童胸部 CT 片，使用 GE 64 排螺旋 CT 扫描，横断位扫描，扫描后重建为层厚 0.625mm，层间距 0mm，于 GE 工作站行 SSD、多平面重建及表面遮盖法重建，其中 7 例行增强 CT 扫描。所有患者均行治疗前 X 线平片检查，并治疗后 X 线平片随访。21 例行支气管镜检查。
结果：临床确诊腺病毒感染 11 例，支原体感染 10 例，8 例为合并腺病毒及支原体感染。CT 扫描均显示肺叶实变，其中一叶实变 21 例，两叶实变 8 例；实变伴散在高密度影 13 例；实变内均低密度坏死区，7 例增强检查均显示坏死区不强化或低强化，周围环形强化；实变内见多发类圆形、弯曲条形气体密度影 23 例；支气管堵塞 12 例；伴肺气囊 5 例；伴胸腔积液 9 例；伴心包积液 1 例。
结论：因腺病毒、支原体所致儿童坏死性肺炎胸部 CT 显示为大叶实变伴坏死、气体影，影像表现有特征性，能为临床诊断肺炎致病菌提供有力参考，并未临床提供病变程度准确指导，为临床制定合理有效的治疗方案、判断预后提供客观的而有价值影像依据。

EPO-1787

Validity and clinical significance of multi-slice spiral CT in evaluation of small airway changes in patients with pectus excavatum before and after operation

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Objective: To observe the effect of small airway changes and the value of multi-slice spiral CT by CT observation of small airway changes before and after operation in funnel chest patients. **Methods:** A total of 58 children with funnel chest who were treated with cardiothoracic surgery in our hospital were enrolled in the study group (study group), and 58 normal children (control group) were selected. Multi-slice spiral CT was used to examine Haller index and small airway changes. The lesions in the left lower lobe and the changes in the angle of rotation of the heart. **Results:** The multi-slice spiral CT was used to observe the contrast of the different degrees of depression of the funnel chest. The depth of sternal sag (L) increased, the CT sag index (b/a) increased, and the sternal sag angle (∠dAc) became smaller. The heavier the sternum to the thoracic vertebrae, the Haller index, the small airway lesions, and the left lower lobe lesions in different degrees of sag by multi-slice CT scan, the Haller index in the degree of chest sag (light, moderate, severe), The changes of small airway lesions and left lower lobe changes were significantly increased in moderate and severe cases ($P<0.05$). In the analysis of Haller index and cardiac rotation angle before and after surgery, preoperative and there was a significant difference in the Haller index and the angle of rotation of the heart after surgery, and there was a significant difference between the preoperative and control groups in the study group ($P<0.05$). The Haller index and the angle of rotation of the heart were measured before and after surgery. In the measurement analysis, there was a significant difference between the Haller index and the heart rotation angle before and after surgery ($P<0.05$), and the Haller index and heart rotation angle of the preoperative and control groups in the study group. There was a significant difference between the two groups ($P<0.05$), but there was no difference between the Haller index and the heart rotation angle of the postoperative control group ($P>0.05$). In the analysis of small airway changes before and after surgery in different age groups, the results of preoperative and postoperative patients <3 years old and >6 years old were not significantly different ($P>0.05$), but in 3-6 There was a significant difference between the preoperative and postoperative years ($P<0.05$), indicating that the preoperative small airway changes were less severe in children less than 3 years old, and the postoperative recovery was rapid; 3-6 years old children The preoperative small airway function was changed to a higher degree, and the postoperative recovery was normal. However, the small airway function was significantly lower in children older than 6 years old, and the airway function was also reduced, and the postoperative recovery was poor. **Conclusion:** Multi-slice spiral CT has significant efficacy in small airway changes before and after surgery in patients with funnel chest.

EPO-1788

Pediatric superior vena cava syndrome

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Superior vena cava syndrome (SVCS) is rare in childhood. Twelve cases of SVCS were seen in children ranging from 8months－11 years with a mean age of 5.6 years. There were 8 males and 4 female children. Diagnosis was confirmed by pathology. The commonest cause of SVCS was lymphoma (7/12). Non-Hodgkin’s lymphoma (NHL) was more common than Hodgkin’s disease. In two cases the final diagnosis was leukemia. The diagnosis of the other two cases was rhabdomyoid tumor and another one was primitive neurotodermal tumour. The computed tomography imaging characteristics were analyzed and compared in different groups. Superior vena cava syndrome (SVCS) results from various pathologies.

EPO-1789

A case of posterior mediastinal thymoma

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A 11-month-old male infant was referred to our hospital after a mass was detected on a chest computed tomography (CT) because of fever 8 days ago.
Findings from the physical examination and laboratory workup were within normal ranges. Serum antiacetylcholine receptor antibody (anti-AchR Ab) CT showed a tumor measuring 40 mm in the upper posterior mediastinum. Enhanced CT showed slight enhancement.
The patient underwent surgical intervention without preoperative pathologic or cytologic diagnosis. The tumor could be dissected from the surrounding tissue. Macroscopically, the resected specimen was an encapsulated firm tumor measuring 1.4×2.4cm. The cut surface was milky white and solid, featuring fibrous septa.
On pathological examination, infiltrating lymphocytes, and large oval or spindle-shaped thymic epithelial cells were recognized in sections stained with hematoxylin and eosin. Immunohistochemical staining showed the thymic epithelial cells to be positive for parakeratin and CKA1－AE3. The nuclei were regular, devoid of mitotic activity and CD20-negative. Consequently, a diagnosis of type thymoma(B1, World Health Organization classification) was made.
Thymoma is a neoplasm that arises from the thymus. Although most thymomas are located in the anterior mediastinum, 4% arise from other locations, including the neck and posterior mediastinum.
Embryologically, thymic epithelium arises bilaterally from the third and probably the fourth bronchial pouches and migrates into the anterior-superior mediastinum. Ectopic thymomas are considered to arise from distributed thymic tissues that fail to migrate into the anterior-superior mediastinum.

Regarding the differential diagnosis for posterior mediastinal tumors, ganglion tumors and paraganglioma.Although rare, thymoma should be included in the differential diagnosis for posterior mediastinal tumors.

EPO-1790

肺隔离症伴蒂扭转的影像表现

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目的　提高对肺隔离症伴蒂扭转的认识。
方法　收集本院经病理证实的 3 例肺隔离症伴蒂扭转的病例并复习相关文献，分析总结影像表现及临床特点。
结果　3 例患儿均以腹痛为主，偶伴有胸闷，CT 扫描发现肺底可见异常稍高密度软组织影，密度均匀，增强扫描未见强化或轻度强化，周围未见明显异常供血血管影，患侧可见少量胸腔积液，并且胸水量增加迅速。
结论　肺隔离症是一种儿童常见的先天性肺发育畸形，但肺隔离症伴蒂扭曲比较罕见，其影像表现与典型的肺隔离症有所不同，常因异常供血动脉未见明确显示而误诊。因此，术前提升影像医师对此病的认识具有重要意义。

EPO-1791

256 层 iCT 低剂量技术、低浓度等渗对比剂联合前瞻性心电门控技术在婴幼儿复杂性先天性心脏病中的应用

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目的　探讨应用低浓度等渗对比剂、低管电压、高级混合迭代重建技术（iDose 4）联合前瞻性心电门控方法的优化 CTA 扫描方案在降低婴幼儿复杂先天性心脏病的辐射剂量和对比剂用量的价值。
方法 采用 256 层 iCT 低剂量技术、低浓度等渗对比剂联合前瞻性心电门控技术对临床诊断为复杂先天性心脏病的患儿 51 例进行心脏 CTA 检查，采用 5 分法评价图像质量。以手术结果或 DSA 检查为金标准，对比心脏 CTA 和心脏彩超对疾病的检出率和诊断准确率，分析该扫描方案的应用优势。
结果　51 例患儿共 24 种独立的先天性心血管畸形，包括 9 种心内结构畸形，6 种心脏-大血管连接畸形，9 种心外大血管畸形。对于先天性心内结构畸形，心脏彩超的检出率为 96%（86/87）高于 CTA 的检出率 89%（77/87）；心脏-大血管连接畸形，两者的检出率一致，均为 90%（28/31）；心外大血管畸形，CTA 的检出率 97%（89/91）高于心脏彩超的检出率 89%（81/91）。对于先天性心外大血管畸形，CTA 的诊断符合率高于心脏彩超（$\chi^2=7.86$，$p<0.05$）。CTA 的有效辐射剂量为（0.45±0.14）mSv，碘对比剂用量为（3.1±0.9）g，图像质量评分为（4.19±0.69）分，均符合影像诊断要求。
结论　采用 256 层 iCT 低剂量技术、低浓度等渗对比剂联合前瞻性心电门控技术在降低婴幼儿复杂先天性心脏病患儿的有效辐射剂量和碘对比剂用量的同时，能获得良好的图像质量和诊断效能，对婴幼儿复杂先天性心脏病的术前诊断具有重要的临床应用价值。

EPO-1792
子宫腺肌症合并不良孕产史或不孕症的 MRgFUS 诊疗策略初探

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目的：探讨子宫腺肌症合并不良孕产史或不孕症的磁共振引导聚焦超声(MRgFUS)诊疗策略。方法：36 例子宫腺肌症合并不良孕产史或不孕症的患者进行 MRgFUS 治疗，通过术前临床预估及药物准备方案，术中定位调整及消融方案及术后联合诊疗方案的实施，以增强 MRI 比较手术前后子宫腺肌症体积 、非强化体积（NPV）、宫腔空间、月经量、疼痛评分、Ca125、血红蛋白（Hb）、自然受孕或 IVF（in vitro fertilization，体外受精)成功率的变化来判断诊疗效果。结果 ：MRgFUS 诊疗策略的实施，手术治疗后子宫腺肌症体积缩小 50%以上占 80.6% ，NPV 大于 70%占 83.3%，宫腔空间增大 50%以上占 41.7% ，月经量、疼痛评分及 Ca125 下降占 100%，Hb 增高占 100%，自然受孕或 IVF 成功率占有怀孕计划的 19.2%。术中及术后无严重并发症。结论 ：子宫腺肌症合并不良孕产史或不孕症的 MRgFUS 诊疗策略具有 良好的安全性和有效性。

EPO-1793
经皮微创双通道髓芯减压人工骨支撑棒联合异体骨植入治疗早期股骨头缺血性坏死探讨

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目的：探讨经皮髓芯减压人工骨支撑棒联合异体骨植入治疗早期股骨头缺血性坏死临床疗效探讨。**材料与方法：**收集我院 2016 年 7 月至 2019 年 6 月的手术适应症患者 44 例，47 个关节，男性 40 例，女性 4 例，最大年龄 71 岁，最小年龄 30 岁，平均年龄 55.6 岁。术前分期采用股骨头坏死 ARCO 分期(国际分期）分 4 期，其中 2a 期股骨头缺血性坏死 32 个关节；2b 期股骨头缺血性坏死 15 个关节。影像学资料：所有患者术前标准的双髋关节正位片、双髋关节多层螺旋 CT 的薄层重建及双髋关节 MRI 成像。临床症状为无疼痛及轻度疼痛。手术方法：采用腰麻，患者置于可透视的多功能手术床上，取仰卧位，患髋垫高，患肢维持外展内旋位固定，经皮髓芯减压至坏死区。沿减压通道用刮匙进一步刮除股骨头内坏死骨。准备植骨，选取异体骨 9-12g 置于减压通道最顶端的软骨下骨坏死区域，专用器械打压夯实，确认股骨头范围内减压区被植骨完全覆盖。根据减压通道再次旁入路钻孔将人工骨支撑棒植入，逐层缝合伤口。术后卧床休息，单侧手术者术后 2-3 天可拄双拐下床活动，术后 3 个月内患肢避免负重， 3 个月后部分负重，根据随访情况直至完全负重。随访评估其疗效及并发症情况。**结果：**49 例患者中，术后使用 Harris 髋关节综合评分标准（满分 100 分），90 分以上为优良，80-89 分为较好，70-79 为尚可，小于 70 分为差。本组病例术后随访优良 14 例（31.8%）；较好的 59.1 例（63.3%）；尚可的 3 例（6.8%），差 1 例（无效）（2.3%），1 例患者术后 1 后负重致股骨颈骨折行人工髋关节置换。本组病例未出现严重并发症。**结论：**经皮髓芯减压人工骨支撑棒联合异体骨植入术具有微创、恢复快、保髋、保头的优点，患者易于接受，对早期股骨头缺血性坏死的患者治疗的难点，不失为一种治疗方法，远期疗效待随访观察。

EPO-1794
磁共振介入的技术优势　未来发展普及措施

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磁共振介入在引导与监测技术上必须优于超声与 CT，发挥磁共振介入的优势只能在高场强设备上实现，低场强设备成像时间长、图像质量不够，无法实现磁共振特有的功能，如以消融为例：MRI 透视实时引导、术中热图监测、DWI 即刻监测。低场强磁共振介入相关设备的研发已经终止。高场强 MRI 介入已经成功地用于全身各个脏器，其中包括颅脑肿瘤消融、切除及放射性粒子植入，MRIg 颅脑聚焦超声治疗肿瘤、功能靶点毁损，磁共振联合腔镜治疗、磁共振引导干细胞治疗等等。目前国内面临的主要问题是仅仅局限在少数医院应用、缺乏配套产品和耗材、基层医院医生在观望厂家生产磁共振介入相关产品是否齐备。
未来普及措施：一定是医工结合公共研发、携手推广应用、填补空白、造福广大中国患者。

EPO-1795

Preliminary effect and safety of image-guided irreversible electroporation ablation in the treatment of renal cell carcinoma

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Objective To investigate the preliminary effect and safety of irreversible electroporation (IRE) for renal-cell carcinoma. Methods 4 patients with renal-cell carcinoma having no indication of operation were enrolled. Operations were performed under genetal anesthesia. The therapeutic efficacy was evaluated according to response evaluation criteria in solid tumors of WHO. Results All the procedures were completed successfully. The tumour volume was (16.84±16.45) cm3 (0.9-40.8 cm3). The procedure time were (76.40±19.40) minutes (42-88 minutes). The total procedure rounds were (7.00±0.71) times (6-8) times. The total number of pulses were (1706.00±587.78) times (750-2240) times. No obvious complications occurred during and after IRE. Enhanced CT and/or MRI scans were performed immediate postoperative, 1month and 3 months after operation. All lesions showed hypodense / low signal ablation areas without enhancement and the peritumoral tissue were undamaged. The postoperative 3 months dynamic imaging showed complete response (CR) in all 5 lesions. Conclusion CT-guided percutaneous IRE is safe and effective in patients with renal-cell carcinoma and can be a promising alternative way to treat renal-cell carcinoma with no indication of operation.

EPO-1796

Experimental study of biological effects of 125I seeds and 60Co radiation on non-small cell lung cancer cells

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To investigate the biological effects of ^{125}I seeds compared with ^{60}Co radiation on non-small cell lung cancer (NSCLC) cells A549 and normal bronchial mucosa epithelial cells BEAS-2B. **Methods:** A549 and BEAS-2B cells were exposed to ^{125}I seeds radiation and ^{60}Co radiation, respectively. The experimental groups were exposed to ^{125}I seeds radiation and ^{60}Co radiation at 2, 4, 6 and 8Gy, control groups were subjected to the same procedure without radiation (0Gy). The survival fraction, cell apoptosis, cell cycle, and the expression of apoptosis related proteins were detected, respectively. **Results:** The surviving fraction of A549 and BEAS-2B cells induced by ^{125}I seeds radiation and ^{60}Co radiation were significantly decreased compared with control group. And the surviving fraction induced by ^{125}I seeds radiation was significantly lower than that of ^{60}Co radiation. A G1 arrest in A549 cell was observed after irradiation with ^{125}I seeds at 4, 6 and 8Gy. Both ^{125}I seeds radiation and ^{60}Co radiation led to a markedly increase of apoptotic cells at 4, 6 and 8Gy on A549 cells. ^{125}I seeds radiation led to a higher percentage of apoptotic cells than that of ^{60}Co radiation. Both ^{125}I seeds radiation and ^{60}Co radiation significant up-regulated the expression of Bax protein and down-regulated the expression of Bcl-2 protein at 4 and 8Gy on A549 cells, moreover the effects induced by ^{125}I seeds radiation were more obvious than that of ^{60}Co radiation. The apoptotic ratio and the expression of apoptosis-ralated protein in BEAS-2B cells had little difference between two types of radiation. **Conclusions:** Both ^{125}I seeds radiation and ^{60}Co radiation led to a remarkable growth inhibition and apoptosis promotion on NSCLC cells, ^{125}I seeds radiation was more prominent compared with ^{60}Co radiation. The imbalance of Bcl-2/Bax and the activation of Caspase-3、PARP proteins may play an important role in the antiproliferative effect induced by ^{125}I seeds radiation.

EPO-1797

The efficacy evalution of image-guided 125I radioactive seed interstitial brachytherapy for advanced non-small cell lung cancer in clinical study

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Objective: The aim of this study was to examine the clinical efficacy of image-guided ^{125}I radioactive seed implantation therapy in patients with advanced non-small cell lung cancer (NSCLC).

Methods: 28 patients with advanced NSCLC who had medical contraindications for surgical resection were treated with CT-guided iodine 125 seeds implantation between December 2013 and March 2015. Treatment planning system (TPS) was used to reconstruct 3-Dimensional image of lung tumor. According to the target imaging, the quantity and distribution of ^{125}I seeds were defined before treatment. The visual analog scale (VAS) was used to determine pain intensity one month before and after treatment. The karnofsky performance scale (KPS) was used as a measure of functional status before and after treatment. Tumor curative effect was evaluated according the the newly revised solid tumor curative effect evaluation in 2000. Serum CEA and CYFRA21-1 were detected by radioimmunoassay in NSCLC

Results: Median implanted number of seeds was 25 (range 8~45). The tumor matched peripheral dose (MPD) was 80~130Gy. Follow-up period was 1~37 months. Pain symptoms were significantly reduced post-treatment (P<0.05). VAS decreased from 4.14±1.69 points before treatment to 2.29±1.41 points one month after treatment. Karnofsky score went up dramatically (P<0.05). Median control time for all patients was 15.5 months. The 1-, 2-year cumulative local control rate were 58.04%, and 20.31%. The median survival period for all enrolled patients was 17 months. The 1-, 2-, and 3-year cumulative survival rates were 71.95%, 30.84%, and 6.17%. The levels of serum CEA and CYFRA21-1 were induced significantly (P＜0.05) one and three months after planting. The mortality rate was 53.85% in increased levels group and 86.67% in decreased levels group in serum CEA detection. Similarly the mortality rate was 36.36% in increased levels group and 94.12% in decreased levels group in serum CYFRA21-1 detection. A small amount of bleeding of lung tissue was observed in all patients. 11 cases patients had pneumothorax with no obvious self-conscious symptoms and improved after conservative treatment. 5 patients appeared with small amount of blood in phlegm one week post-treatment and with no special handling to ease. No seed migration was found in radiographic follow-up. There were no serious complications such as haemoptysis, tracheal fistula and radioactive pneumonia detected during the follow-up period.
Conclusions: The study suggested that CT-guided ^{125}I seeds implantation was a safe, effective, less complicated option in treating advanced NSCLC. However, this result required further evaluation to determine its long-term efficacy.

EPO-1798

MRI and 3D reconstruction used in microwave ablation: initial research

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Purpose: To verify the feasibility of the multi-series MRI and three-dimensional (3D) reconstruction in planning and evaluating the treatment response of liver metastasis microwave ablation (MWA). Material and methods: From Aug.2015 to May.2016, according to enrolled standard, 16 patients (21 lesions) were enrolled. MRI (T1WI/T2WI/multi-b value DWI) were performed for Pre-operation and follow up. All data were auto-transfer to work station syngo.via for analysis. Results: Till 1-3 month after operation, no serious or fatal complication, no recurrence was observed. Operation train was 100% match with 3D reconstruction planning. Compared with CTA, MRI shows 99% (29/30) small vessel nearby. No dilated biliary duct was fund in all case; MRI shows 12 normal biliary ducts 1cm area around. Multi-series 3D reconstruction efficiently showed post-operation signal change and ablation margin. Conclusion: three-dimensional (3D) reconstruction of MRI is feasible and effective in the treatment planning and evaluating the treatment response of MWA for liver metastasis.

EPO-1799

Bioinformatics analysis reveals new genes and outcomes in HBV-related hepatocellular carcinoma

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Hepatocellular carcinoma (HCC) is the most common malignant neoplasm in the world with a high morbidity and mortality. Extensive research has been done concerning the morphology of HCC. However, the molecular mechanism of the development of Hepatitis B virus (HBV)-related HCC has not yet been fully understood. This article aims to identify crucial genes and pathways associated with the development and progression to HCC. First, we downloaded expression profiles GSE121248 from the GEO database and then identified the differentially expressed genes (DEGs). The gene ontology (GO) and Kyoto Encyclopedia of Gene and Genome (KEGG) analyses were performed by using DAVID. Next, protein-protein interaction (PPI) networks were constructed for detecting hub genes. In this article, 1153 DEGs (777 up-regulated genes and 376 down-regulated genes) and 15 hub genes were discovered. GO analysis revealed that the DEGs were prevailingly enriched in protein binding, cytoplasm and extracellular exosome. KEGG analysis discovered that DEGs gathered in metabolic pathways, chemical carcinogenesis and fatty acid degradation. After constructing the PPI network, CDK1 (cyclin-dependent kinase 1), CCNB1 (cyclin B1), CCNA2 (cyclin A2), MAD2L1 (mitotic arrest deficient 2 like 1), CCNB2 (cyclin B2), TOP2A (DNA topoisomerase II alpha), BUB1 (BUB1 mitotic checkpoint serine/threonine kinase), TTK (TTK protein kinase), NCAPG (non-SMC condensin I complex subunit G), NDC80 (NDC80 kinetochore complex component), AURKA (aurora kinase A), KIF11 (Kinesin family member 11), CDC20 (cell division cycle 20), BUBIB and ASPM (abnormal spindle microtubule assembly) were identified as hub genes, based on the high degree of connectivity, by using the Cytoscape software. Additionally, overall survival (OS) and disease-free survival (DFS) analyses were performed by the GEPIA online database, and the receiver operating characteristic curve (ROC) was conducted using the Graphpad prism 7.0 software. Furthermore, we selected 3 genes to identify the expression level in tumor sample and normal sample by The Human Protein Atlas database. The above mentioned findings could offer supplementary information about the underlying mechanisms of HCC, as well as provide potential therapeutic targets for the treatment of HCC.

EPO-1800
可降解镁金属对人胆管癌细胞抑制作用的实验研究

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目的分析可降解性质的镁金属对人胆管癌细胞是否具有抑制作用。
方法培养 RBE 细胞生长至对数期时用于实验。使用铸态纯镁、挤压态纯镁及 Ti，消毒后按体表面积为 1.25cm^2/ml 加入含 10%FBS 的细胞培养液内，置于 37℃恒温箱中浸提，第 1、3、5 天检测各组

PH 值，分别用各组浸提液处理 RBE 细胞，作用时间为 24h，使用 CCK-8 试剂盒检测细胞毒性，使用 Annexin V-FITC/PI 双染法检测细胞凋亡。将一定数量 RBE 细胞接种在铸态纯镁、挤压态纯镁、MAO 及 Ti 金属片表面，共培养 30min、60min、120min 后使用 DAPI 试剂盒进行荧光染色，对各组金属片上粘附细胞数量进行拍照并计数；共培养 24h 后使用 Phalloidin-FITC 试剂盒对细胞骨架进行免疫荧光染色观察各组金属片上的细胞形态。

结果镁金属对 RBE 具有细胞毒性，铸态纯镁组毒性最大，挤压态纯镁组次之，与对照组相比有统计学意义。随着可降解 Mg 浸提天数增加，浸提液 PH 值逐渐增加，其对 RBE 细胞毒性也逐渐增高。Ti 组浸提液对 RBE 的细胞毒性，与对照组相比无统计学意义。镁金属能诱导 RBE 细胞凋亡，铸态纯镁组诱导作用最大，挤压态纯镁组次之，与对照组相比有统计学意义。随着浸提时间延长，细胞凋亡率逐渐增高。Ti 组浸提液对 RBE 凋亡无诱导作用，与对照组相比无统计学意义。共培养后，不同状态的可降解镁金属对 RBE 细胞的粘附能力有抑制作用，铸态纯镁组对其抑制作用最强，挤压态纯镁次之，MAO 组虽减弱了 Mg 的降解速率但其对 RBE 粘附能力抑制作用仍高于 Ti 组，相同时间段各组差异有统计学意义。铸态纯镁组和挤压态纯镁组可以抑制 RBE 细胞的铺展和延长，对 RBE 细胞形态有明显影响；Ti 组可见大量细胞骨架染色。MAO 组仍有少量的 RBE 细胞粘附在涂层上，但细胞铺展的形态比 Ti 组的差。

结论具有可降解性质的镁金属对人胆管癌细胞生长具有抑制作用，其机制暂不清楚。

EPO-1801
CT 引导经皮不可逆电穿孔消融治疗肾细胞癌的临床应用与研究

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目的 探讨经皮穿刺不可逆电穿孔（irreversible electroporation，IRE）消融术治疗肾细胞癌的初步临床效果及安全性。

方法 临床经穿刺病理证实的 7 例无手术适应症的肾细胞癌患者的 8 个病灶，经术前评估后，在全身麻醉下行 IRE 消融治疗。术后采用 2000 年新修订的实体瘤疗效评价标准评价治疗的有效性，并观察并发症。

结果 7 例患者均顺利完成治疗。病灶大小 0.9～40.8cm^3，平均（12.41±13.92）cm^3，消融时间 42～174min，平均（88.63±37.49）min，消融次数 6-9 次，平均（7.13±1.25）次，总脉冲数 750～2240 次，平均（1710.00±466.60）次。术中、术后均无明显并发症。术后即刻及 1 个月、3 个月、6 个月、9 个月行增强 CT 和/或增强 MRI 复查，病灶消融区均呈低密度/低信号改变，增强扫描未见异常强化区，肿瘤周围组织形态、密度（信号）未见异常。术后复查评价疗效，8 个病灶均完全缓解。

结论 CT 引导下经皮 IRE 消融术治疗肾癌安全、有效，近期疗效显著，是临床上无手术适应症肾癌患者可选择的治疗方法。

EPO-1802
CT-guided percutaneous irreversible electroporation ablation in the treatment of renal cell carcinoma:clinical application and research

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Objective To investigate the preliminary effect and safety of irreversible electroporation (IRE) for renal-cell carcinoma.
Methods Seven patients with renal-cell carcinoma having no indication of operation were enrolled. Procedures were performed under general anesthesia. The therapeutic efficacy was evaluated according to response evaluation criteria in solid tumors of WHO.
Results All procedures were completed successfully. The average tumor volume was (12.41±13.92) cm^3 (0.9-40.8 cm^3). The average procedure time were (88.63±37.49) minutes (42-174 minutes). The average procedure rounds were (7.13±1.25) times (6-9) times. The average number of pulses were (1710.00±466.60) times (750-2240) times. No sever complications occurred during and after IRE procedure. Enhanced CT and/or MRI scans were performed immediate post procedure, 1 month and 3 months after procedure. All lesions showed hypodense/low signal ablation areas without enhancement and the peritumoral tissue were undamaged. The post procedure 3 months dynamic image showed complete response (CR) in all 8 lesions.
Conclusion CT-guided percutaneous IRE is safe and effective in patients with renal-cell carcinoma and can be a promising alternative way to treat renal-cell carcinoma with no indication of operation.

EPO-1803

Preliminary clinical study of biliary tract irradiation stent for hilar cholangiocarcinoma with malignant obstructive jaundice

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Objective To evaluate the efficacy and safety of biliary stent loaded with ^{125}I seeds in treatment of hilar cholangiocarcinoma with malignant obstructive jaundice.
Methods Totally 43 patients with malignant obstructive jaundice caused by cholangiocarcinoma were included. All the paitents were underwent percutaneous transhepatic puncture ,of, the left and right side branch of the bile duct. In the hilar stenosis, the biliary stent with ^{125}I seeds were implanted, and the biliary drainage tube had been kept in 3 to 5 days after procedures. The drainage tube was removed and the puncture road was closed after the patency of stents were confirmed by cholangiography. The changes of liver function before and after procedures were recorded, and the survival time was observed. **Results** Five biliary stents loaded with ^{125}I seeds were implanted in type Ⅰ (n=5), 36 in type Ⅱ (n=18), 8 in type Ⅲ (n=4) and 25 in type Ⅳ (n=16). The Serum total bilirubin and direct bilirubin of paitents before procedures were (145.54±65.35) μmol/L and (124.73±35.04) μmol/L respectively, and (65.91±29.43) μmol/L and (35.50±15.12) μmol/L respectively after procedures. Compared with preoperative, the alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase, C-reactive protein and gamma glutamic transaminase decreased significantly (all P<0.05); and the lactate dehydrogenase increased significantly (P=1.05). The median survival time was 13 months (3.0 to 22.5 months). The serious complications such as biliary puncture, pancreatitis, severe

biliary tract infection or biliary bleeding were not occurred. **Conclusion** Biliary stent loaded with ^{125}I seeds is an effective therapy to alleviate symptoms of jaundice and prolong the survival time of patients with malignant obstructive jaundice caused by hilar cholangiocarcinoma.

EPO-1804

CT 四维电磁导航在引导 125I 放射性粒子植入脊柱转移瘤术中的作用研究

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目的：通过对 CT 四维电磁导航和传统 CT 在引导 ^{125}I 放射性粒子植入治疗脊柱转移瘤术中的对照研究，记录并分析两种影像引导方法下穿刺靶目标的时间、辐射剂量等方面的差异，从而对两种引导技术的优劣做出初步评价。
方法：共收治 45 例椎体转移性肿瘤伴脊髓压迫的患者，其中男性 22 例，女性 23 例，年龄 52-76 岁，平均年龄 62 岁。随机分为两组，其中 20 例患者行 CT 四维电磁导航引导下经皮穿刺 ^{125}I 放射性粒子植入脊柱转移瘤，对照组 25 例患者行常规 CT 引导下经皮穿刺 ^{125}I 放射性粒子植入脊柱转移瘤。记录两种引导方法下穿刺靶目标时间、穿刺针调整次数、CT 扫描次数及 CT 辐射剂量（剂量长度乘积）等进行对比分析。
结果：两组 ^{125}I 粒子植入针穿刺操作均获得成功。经统计分析，两组引导方式下的扫描次数、穿刺针调整次数、穿刺靶目标时间、辐射剂量差异均有统计学意义(均为 $P<0.0001$)，导航组的穿刺靶目标时间、调整次数、扫描次数均较 CT 组少，辐射剂量也小于 CT 组。电磁导航图像瞄准精度<5 mm 为 18 例，5～10 mm 为 2 例，未出现>10 mm 的情况。两组手术过程中均未出现大出血、脊髓损伤等相关严重并发症。
结论：在引导 ^{125}I 放射性粒子穿刺针置入脊柱转移瘤的过程中，CT 四维电磁导航较传统 CT 引导能有效减少穿刺调整次数、缩短手术时间、减少扫描次数、降低辐射剂量，穿刺精确度较高。两组引导方法均具有较好的安全性。

EPO-1805

Percutaneous intraductal radiofrequency ablation in the treatment of biliary stent occlusion: A preliminary result

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AIM: This study sought to assess the feasibility and effectiveness of a novel application of percutaneous intraductal RF(Radiofrequency) for the treatment of biliary stents obstruction. We specifically report a retrospective study presenting the results of percutaneous intraductal RF in patients with biliary stent occlusion.

METHODS: A total of 43 cases involving biliary stents obstruction were treated by placing an EndoHPB catheter and performed percutaneous intraductal RF to clean stents.

The stents patency was evaluated by cholangiography and follow-up by contrast enhanced CT or ultrasound after the removal of the drainage catheter.

RESULTS: Following the procedures, Of the 43 patients, 40/43 survived and 3/43 die with a median survival of 80.5 days (range:30－243). One patient was lost to follow-up. One patient had their stent patent at the time of last follow-up.Two patients with stent blockage at 35days and 44days after procedure underwent percutaneous transhepatic drain insertion only.
The parameters of bilirubin before and after the procedure were 128(±65) to 63(±29)μmol/L, There were no related complications(haemorrhage,bile duct perforation, bile leak or pancreatitis) and all patients' stent patency was confirmed by cholangiography after the procedure,with a median patency time of 107 (range:12~ 180 days).

CONCLUSION: This preliminary clinical study demonstrated that percutaneous intraductal RF is safe and effective for the treatment of biliary stent obstruction, increasing the duration of stent patency, although randomized controlled trials are needed to confirm the effectiveness of this approach.

EPO-1806

Clinical application of CT-guided RFA combined immediately postoperative biopsy of pulmonary GGO

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Abstract Objective To investigate the effectiveness and safety of an innovative method of CT-guided RFA combined immediately postoperative biopsy of GGO in lung. **Method** 31 patients with 42 pulmonary GGOs had found during October, 2015 to October, 2017 in our department. 39 lesions had underwent CT-guided RFA combined with immediately postoperative biopsy whereas 3 had history of proven metastatic tumors were excluded. Postoperative 1-, 4-, 12-, and 24 month follow-up enhanced CT and adjuvant serum tumor markers were performed to evaluate the therapeutic effectiveness of RFA. The endpoints include 2-year local control rate and positive incidence of immediate post-op biopsy. **Result** All the procedures were completed successfully. 32 of 39 (82.1%) lesions got expectative pathologic results. 18 of 39 (46.2%) got subtype results. The complications after RFA include 9 (22%) pneumothorax with 5 (55.6%) needed catheter drainage, 1 (11.1%) needed air aspiration and 3 (33.3%) did not need to deal with. 4 (10.3%) patients had suffered local hemorrhage without hemoptysis. Post-op 1-month follow-up showed enlargement and consolidation of the ablation area than Pre-op GGOs ((2.41±0.98) cm vs (1.53±0.79) cm, p＜0.0001 on CT images whereas 4-month follow-up images showed a shrink of the ablation area than 1-month ones ((1.97±0.74) cm vs (2.41±0.98) cm, p=0.0015) .2-year local control rate after RFA was 96.97% (95%CI, 80.38%-99.57%) and 2-year OS was 100%. **Conclusion** CT-guided RFA combined immediately postoperative biopsy of GGO in lung is safe, effective, and

minimal invasive. This innovative method can bring clinical benefit to the control and diagnosis of GGO lesions in lung.

EPO-1807
探索 MR 成像 ADC 图联合 CT 成像在肺穿刺活检中的应用

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目的：分析 MR 成像 ADC 图联合 CT 图在肺穿刺活检中的作用，探讨该技术在临床肺部病变中的诊断价值。
方法：根据严格的纳入条件及排除标准，将 2017 年 11 月至 2018 年 12 月符合要求的 CT 引导下肺穿刺病例术前按照穿刺体位进行 MRI 检查，得到的 MR 扩散加权 ADC 图与穿刺时第一期轴位 CT 图通过工作站中图像融合软件根据骨性结构或形态解剖结构进行精准融合，获得“类 PET/CT”图像。根据融合图像判断肿瘤实性区并选择该区域为穿刺靶区进行穿刺活检。术后常规随访每一个病例的脱落细胞、组织学、免疫组化及基因检查结果。将使用该方法穿刺病例的临床基本资料（年龄、性别、有无肺气肿）、病灶情况（大小、位置）、穿刺情况（穿刺体位、深度、取材满意度、取材次数）、并发症情况（有无出血、气胸、种植、空气栓塞）和病理结果作为实验组数据。根据严格的纳入条件及排除标准，回顾性收集 2016 年 1 月~2017 年 10 月本院开展的通过 PET/CT 图辅助肺穿刺病例 53 例及常规 CT 引导的肺穿刺病例 120 例，将使用这两种方法穿刺的相关数据作为两组对照组数据。对三组数据分别进行两两对比，根据统计学分析结果，评价三种穿刺方法在临床中应用价值及优缺点。
结果：3 组数据在病人年龄、性别、有无肺气肿，病灶大小、位置，穿刺体位、深度，并发气胸、出血方面均无统计学差异（P＞0.05）。实验组、PET/CT 图辅助组在穿刺次数、取材满意度及病理结果阳性率方面均与常规 CT 引导下肺穿刺组有统计学差异（P＜0.05）。实验组与 PET/CT 图辅助组各项数据均无统计学差异（P＞0.05）。1 次穿刺及 2 次穿刺分别引起的并发症（气胸、出血）有统计学差异（P＜0.05）。
结论：相比于常规 CT 引导的肺穿刺，MR 扩散加权 ADC 图联合 CT 图辅助肺穿刺等效于 PET/CT 图辅助肺穿刺，病理结果阳性率更高，并且可以明显减少二次进胸活检次数，减少并发症的发生。

EPO-1808
经皮穿刺介入栓塞成功治疗乳糜漏

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目的：探讨经皮穿刺介入栓塞治疗乳糜漏的有效性。方法：4 例经严格内科保守治疗失败的腹部外科手术后乳糜漏的患者行经皮穿刺介入栓塞，其中两例为经皮穿刺乳糜池后注入无水酒精和碘化油混合物；一例为经皮穿刺乳糜池后注入微弹簧圈后再注入组织胶水；一例为经皮穿刺瘘口位置注入组织胶与碘化油混合物。结果：所有患者介入栓塞术后即刻乳糜引流量即显著减少，平均 3-5 天拔除引流管，平均随访 6 个月到一年，所有患者均无复发，未发现手术相关并发症。结论：直接经皮穿刺介入栓塞治疗乳糜漏为一种快速有效安全且微创的治疗方式。

EPO-1809

FTRO 联合微弹簧圈用于输卵管积水介入栓堵的效果分析

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目的：探究 FTRO 联合微弹簧圈用于输卵管积水介入栓堵的治疗效果。
方法：随机抽取 2015 年-2018 年输卵管积水来院进行介入栓堵的病例 80 例，对照组传统方法栓堵 40 例，观察组采用 FTRO 联合微弹簧圈栓堵 40 例。随访栓堵后超声复查情况、造影情况、月经改善情况、胚胎移植、宫内妊娠情况。
结果：FTRO 联合微弹簧圈栓堵组超声复查积水明显改善，82.5%患者月经改善，与对照组相比有显著性差异；胚胎移植及宫内妊娠率较对照组也有所提高。
结论：FTRO 联合微弹簧圈用于输卵管积水介入栓堵，临床效果明显优于传统栓堵法，技术简单，值得推广。

EPO-1810
TIPS 分流术后对肝硬化逆转的临床研究

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目的：揭示经 TIPS 手术治疗后肝硬化逆转的现象。**方法**：回顾性分析 2000.1- 2013.1 期间 1950 例肝硬化门静脉高压合并消化道出血和难治性腹水患者的临床资料。评价 TIPS 治疗的临床效果，并揭示肝硬化程度、年龄、肝脏影像学表现与肝脏病理改变之间的关系。**结果**：所有患者 TIPS 技术成功，成功率为 100%，无严重手术相关并发症，平均门静脉压力下降，大部分临床症状得到控制。5 年随访影像学评分与病理 METR 评分改善共 72 例，其中术前 Child-pugh A 级 3 例，B 级 67 例，C 级 2 例；术前 40（含 40 岁）岁以下 41 例，40 岁以上 31 例。年龄（R=0.019,P=0.106）对影像学评分、病理评分不具有相关性,Child-pugh 分级（R=0.0180,P=0.0109）对影像学评分、病理评分具有相关性。**结论**：肝硬化门静脉高压患者经 TIPS 手术治疗后肝硬化可有逆转现象的发生。

EPO-1811
影像学及病理学对土三七所致肝窦阻塞综合征术前诊断及 TIPS 术后疗效的评估

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目的：探讨 MRI 和 CT 影像学检查及病理学在土三七所致肝窦阻塞综合征（HSOS）患者术前诊断及术后恢复情况评价的价值；**方法**：选取 2014 年 09 月至 2018 年 12 月在我院行 TIPS 治疗的 HSOS 患者 54 例，其中因外伤或脑卒中等病因服用土三七浸泡药酒或中药病史，且服药后 10 天-6 个月出现临床症状的患者共 19 例，分别于术前一天及术后一月行腹部 CT 或 MR 平扫增强及超声引导下肝脏穿刺活检术，标本进行 HE 染色；**结果**：19 例患者中男性 11 例，女性 8 例；有 14 例患者行 CT 检查，5 例患者行 MRI 检查。术前：CT 平扫肝脏体积增大，密度不均匀减低，腹腔中-重度积液；增强扫描动脉期肝动脉增粗、扭曲，门静脉期及实质期肝实质灌注不均，呈斑片状不均匀强化，邻近肝静脉三大分支走行处的肝实质强化程度较余部分肝实质高且均匀。MRI 平扫较 CT 可清楚显示

肝实质的不均匀情况，增强可见沿肝静脉三大分支走行处的肝实质信号较余部分的肝实质信号更高及均匀，三支肝静脉纤细或显示不清，肝段下腔静脉纤细或扁平，但仍然通畅。病理：肝细胞呈广泛水肿变性，点状或轻度碎屑状坏死，肝窦明显淤血、扩张，汇管区扩大，纤维结缔组织增生，纤维间隔内有扩张的小静脉。术后一月：CT 及 MR 提示肝脏密度及信号均匀，其内未见明显异常密度及信号灶，肝动脉走形自然，腹腔积液明显较少甚至消失；术后病理提示肝细胞水肿明显好转，未见明显淤血、扩张的肝窦及小静脉。**结论：**土三七所致肝窦阻塞综合征（HSOS)的 CT 和 MRI 表现具有一定的特征性，反映了其病理特征，同时 MRI 和 CT 影像学检查及病理学亦能够评价 TIPS 治疗该病的有效性。

EPO-1812
微弹簧和钩针用于 CT 引导下肺小结节术前穿刺定位的前瞻性对照研究

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目的：比较微弹簧和钩针用于肺小结节电视辅助胸腔镜切除术（video-assisted thoracoscopic surgical, VATS）前定位的有效性和安全性。
方法：本研究于 2017 年 10 月至 2018 年 10 月共纳入 60 例肺小结节患者。入选标准如下：（1）拟行 VATS；（2）放射学特征符合：1）肺结节<20 mm；2）病灶位于肺 1/3 外周，可进行楔形切除或节段切除；3）病灶无胸膜牵拉；（3）同意参加本研究并签署知情同意书。所有患者随机分为两组。A 组 30 例患者于手术当天行 CT 引导下肺小结节经皮穿刺微弹簧圈定位术；B 组 30 例患者于手术当天行 CT 引导下肺小结节经皮穿刺钩针定位术。比较这两种方法的成功率和并发症发生率。
结果：所有患者的 VAST 均成功，无转为开胸手术者。A 组定位术成功率为 96.7%（29/30），B 组定位术成功率为 93.3%（28/30）（P>0.05）。A 组总并发症发生率为 26.7%（8/30），无症状气胸 5 例，轻度肺出血 3 例。B 组总并发症发生率为 66.7%（20/30），14 例无症状气胸，7 例轻度肺出血，1 例胸痛需药物干预（P=0.002）。
结论：CT 引导下肺小结节微弹簧圈定位与钩针定位均有高成功率，两者有效性无统计学差别；而使用微弹簧进行定位发生的并发症更低，其安全性更好。

EPO-1813
HIFU 治疗子宫肌瘤患者的妊娠结局分析

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摘要：目的　探讨高强度聚焦超声（HIFU）治疗子宫肌瘤患者的妊娠结局。方法　回顾性分析我院 2012 年 1 月-2019 年 1 月行 HIFU 治疗的子宫肌瘤患者 220 例，随访患者术后的妊娠情况并分析其影响因素。结果患者平均年龄 32.95±4.85 岁，均顺利完成 HIFU 治疗（成功率 100%）。HIFU 术后，92 名患者怀孕（妊娠率 41.82%），妊娠期并发症发生率为 2.17%，围产期并发症发生率为 1.08%。两组患者一般情况比较结果表明,年龄、术后临床症状改善情况、术后 3 月肌瘤体积≤30%、术后 3 月影像学疗效评价差异有统计学意义（P<0.05）；经多因素分析后发现年龄、术后 3 月疗效为影响术后妊娠结局的主要因素，差异有统计学意义（P<0.05）。结论　HIFU 可以提高子宫肌瘤患者的生育能力，影响其术后妊娠的主要因素为年龄和术后 3 月影像疗效评价,表明越年轻的患者更易怀孕，术后 3 月疗效越明显的患者更容易怀孕。

EPO-1814
介入治疗股骨头缺血性坏死的临床研究

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目的 观察基于血管内溶栓和改善微循环理论的血管介入技术治疗股骨头缺血性坏死的疗效。**方法** 对于单侧患者，超选择插管患侧旋股内动脉、旋股外动脉造影了解股骨头血液供应情况，脉冲式注入扩血管、溶栓药物。对其中 7 例两侧股骨头病变患者我们尝试利用成袢技术，一次完成两侧股骨头溶栓、扩血管治疗。间隔 1 周、1 个月后行第二、三次介入手术。**结果** 11 例患者均成功超选择插管目标血管。对其中 7 例两侧股骨头病变患者一次性完成两侧旋股内、外动脉插管。术后评价：①按照 Harris 髋关节评分系统，6 例显效，3 例有效，2 例无效。②按照治疗前后影像学检查的变化情况：通过对比介入治疗前后 X 线、CT 及 MRI 等影像学资料，9 例患者病情得到改善或稳定。2 例患者股骨头继续塌陷。**结论** 股骨头缺血性坏死的动脉溶栓治疗是一种操作简单、微创、安全、治疗并发症少、高效的治疗方法。为患者提供了一条新的治疗途径。尤其是对于年轻患者，可以大大延缓换髋时间。

EPO-1815
经眼动脉灌注化疗视网膜母细胞瘤并发症的影响因素分析

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目的：评估经眼动脉灌注化疗（Intraophthamic artery Chemotherapy，IAC）作为一线治疗视网膜母细胞瘤（RB）的临床疗效及安全性，并探讨影响其眼球内陷并发症的因素。方法：回顾性分析 2014 年 9 月至 2016 年 9 月期间我科收治的视网膜母细胞瘤患儿 23 例 24 只患眼行 IAC 治疗的临床资料，并对患儿的性别、年龄、单-双侧眼别，眼球的供血情况（介入手术的途径）、肿瘤分期、药物灌注方案因素与 IAC 眼球内陷并发症的关系进行单因素和多因素分析。结果：总体保眼率为 83.3%（20/24）。局部并发症主要为眼睑水肿（41.6%）、眼睑下垂（20.1%）、斜视（4.2%）、眼球内陷（45.8%），全身并发症主要为发热和骨髓抑制。经单因素和多因素分析结果显示，影响 IAC 眼球内陷发生率的独立预后因素为术中灌注药物方案(P<0. 01)。结论：IAC 是治疗 RB 有效的治疗方法，但需重视其相应的并发症，尤其是灌注化疗药物引起的血管毒性。

EPO-1816
无水乙醇栓塞治疗儿童四肢动静脉畸形的临床疗效分析

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目的评价无水乙醇栓塞(PEE)治疗儿童四肢动静脉畸形的安全性及疗效。**方法**回顾性分析 2007.02-2017.01 年我科收治的 31 例无水乙醇行治疗的儿童四肢动静脉畸形患儿临床资料,评估临床症状、瘤巢分型、疗效及术后并发症。**结果**（1）31 例患儿，其中男 16 名，女 15 名，平均年龄 6 岁。共行 PEE93 次，平均 3 次/例。随访时间为 6～48 个月，平均随访时间为 24 月。（2）临床症状表现为明显肿物 21 例（67.7%），疼痛 18 例（58%），跛行 8 例（25.8%），皮肤缺血溃疡 5 例（16.1%）。（3）Do 分型Ⅲb28 例（90.3%），Ⅱ型 3 例（9.7%）。按照 Yakes 分型Ⅳ型 30 例

（96.7%），Ⅱa 型 1 例（3.3%）。（4）有效 27 例（90%），其中治愈 17 例（54.8%），部分缓解 12 例（38.7%）；治疗失败 1 例（3.2%），其中无缓解 1 例（3.2%），恶化 0 例。（5）并发症其中水疱 2 例（6.4%），局部皮肤溃疡 3 例（9.6%）术中一过性血氧下降 3 例（9.6%），足趾一过性缺血 5 例（16.1%）。未见严重并发症。**结论** PEE 是一种治疗儿童四肢动静脉畸形安全有效的方法。

EPO-1817

First-line intra-arterial chemotherapy versus two cycles of intravenous plus intra-arterial chemotherapy for treating retinoblastoma: A comparative study

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Objective: The aim of this study was to compare the outcomes of retinoblastoma (RB) patients treated with either first-line intra-arterial chemotherapy (IAC) or two cycles of intravenous plus intra-arterial chemotherapy (IV-IAC).
Methods: A total of 83 patients diagnosed with RB between September 2013 and February 2016, without any treatment history, were included. Of these, 45 patients were treated with primary intra-arterial chemotherapy and defined as the IAC group, while 38 patients were treated with primary two cycles of intravenous plus intra-arterial chemotherapy and defined as the IV-IA group. Eye salvage rate, enucleation-free survival and mid-to-long term complications were assessed.
Results: A total of 52 eyes of 45 patients in the IAC group were classified according to the International Intraocular Retinoblastoma Classification (IIRC) as group B (n=3, 5.8%), group C (n=3, 5.8%), group D (n=37, 71.2%), or group E (n=9, 17.3%). IAC was performed for 1–7 sessions (median: 3.3). During the median follow-up period of 22.2 months, overall eye salvage rate was 86.8%, six eyes developed recurrence, and two patients died due to metastasis. Complications included enophthalmos (n=21), cataract (n=4), vitreous hemorrhage (n=1), orbital edema (n=17) and ptosis (n=12). A total of 49 eyes of 38 patients in the IA-IVC group were classified as group B (n=3, 6.1%), group C (n=2, 4.1%), group D (n=33, 67.3%), and group E (n=11, 22.4%). IAC was performed for 1–5 sessions (median: 2.9). Overall eye salvage rate was 79.6%, with a median follow-up period of 21.2 months. Seven eyes developed recurrence, and one patient died due to metastasis. Complications were enophthalmos (n=10), orbital edema (n=15) and ptosis (n=12). The differences in the overall eye salvage rate, recurrence rate, metastatic rate and death rate between the IAC and IV-IAC groups were not statistically significant, but the enophthalmos rate was higher in the IAC group (p=0.006).
Conclusions: Two cycles of IVC plus IAC for RB may not reduce the overall metastatic rate. The risk of developing cataract and enophthalmos should be considered during IAC treatment.

EPO-1818

介入治疗在介入后复发的视网膜母细胞瘤中的应用价值

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目的 探讨经眼动脉灌注化疗术在经眼动脉灌注化疗治疗后复发的视网膜母细胞瘤（Retinoblatoma, RB）中的应用价值。**方法** 回顾性分析 2010 年 1 月至 2016 年 12 月我院收治的 41 例行经眼动脉灌注化疗术（Transcatheter Ophthalmic Arterial Chemotherapy, TOAC）治疗后复发再次行 TOAC 治疗 RB 的临床资料，其中双眼 23 例，单眼 18 例，患眼共 51 只（其中 13 例双眼患儿只有一直患眼复发）；男性 20 例，女性 21 例。行 TOAC 术 176 次，平均每例行 3.4 次。随访时间 3~72 月，平均随访 23.6 月。**结果** 176 次眼动脉插管中，174 次成功插至眼动脉，技术成功率为 98.9%。术后 33 只眼（33/51，64.7%）稳定；其余 25 只眼行眼摘。**结论** TOAC 对治疗 TOAC 术后复发的 RB 患儿依然是安全有效的治疗方法，但远期疗效有待继续观察。

EPO-1819
CT 引导下非小细胞肺癌耐药后再次肺穿刺活检的临床应用

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目的：探讨 NSCLC 患者治疗耐药后再次肺穿活检的可行及安全性
方法：回顾分析 2017 年 1 月至 2018 年 9 月在我院行肺穿刺活检的 185 例 NSCLC 患者临床资料、并发症及影响因素。
结果：（1）共穿刺 185 次，成功率 100%，诊断率 100%，恶性肿瘤细胞检出率 89.7%。病理诊断：腺癌 137 例，鳞癌 18 例，大细胞癌 4 例，低分化癌 1 例，肉瘤样癌 3 例，小细胞癌 2 例，炎症细胞 19 例，双源性肺癌 1 例；（2）病灶平均直径 3.3cm，进针平均深度 6.6cm，平均调针次数 2.4 次，手术平均时间 13.7min。并发症包括：气胸 16 例（8.6%），肺内出血 15 例（8.1%），咯血 3 例（1.6%），皮下气肿 2 例（1.1%），胸膜腔出血 2 例（1.1%），液气胸 1 例（0.5%）。
结论：CT 引导下肺穿活检对 NSCLC 治疗失败后需再次活检来重新评估肿瘤组织时是安全可行的。

EPO-1820
Value of Virtual Monochromatic Spectral Images with Metal Artifact Reduction Algorithm in Dual-Energy Spectral CT-guided Microcoil Localization for Pulmonary Nodules

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Objective: To evaluate the clinical value of virtual monochromatic spectral (VMS) images with metal artifact reduction (MAR) algorithm in dual-energy CT (DECT)-guided microcoil localization for pulmonary nodules.

Methods: 51 consecutive patients underwent DECT after placement of microcoils nearby small pulmonary nodules before video-assisted thoracoscopic surgery (VATS) for tagging purpose. The optimal energy level (in keV) was defined as the level at which CT values of nodules were equivalent to those of the conventional 120kVp and with no serious metal artifacts. VMS images at the optimal keV and at 50, 90, 110 and 140keV with and without MAR were reconstructed. Image quality was assessed qualitatively by visual rating utilizing a three-point scale: 1=excellent, minimal artifacts; 2=good, mild artifacts; 3=poor, extensive artifacts. Image quality scores between the VMS-only and VMS+MAR groups were compared using the Mann-Whitney U test, and reader consistency was evaluated using Kappa analysis.
Results: 74±5.7keV was found to be the optimal level for VMS images to have similar CT value as the 120kVp images. The image quality scores of the VMS+MAR images at 74keV were significantly better than those of VMS-only images (1.35±0.59 vs. 2.11±0.87, P=0.005), and were all diagnostically acceptable. There was no difference in image quality score among VMS+MAR images at 74keV and higher energy levels. Inter-reader agreements of evaluation were high (K=0.78).
Conclusion: Virtual monochromatic spectral (VMS) images at 74keV with metal artifact reduction (MAR) algorithm (VMS+MAR) can reduce artifacts from microcoils and improve image quality for accurate microcoil localization of pulmonary nodules.

EPO-1821

Prognostic Nomogram for the Combination Therapy of Percutaneous Catheter Drainage and Antibiotics in Pyogenic Liver Abscess Patients

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Aim: To identify the predictors of recovery in pyogenic liver abscess (PLA) patients treated with combination therapy of percutaneous catheter drainage (PCD) and antibiotics, and then develop an effective prognostic nomogram.
Materials and Methods: The study was approved by the institutional ethics review boards. This retrospective study included consecutive PLA patients treated with PCD plus antibiotics. We defined the overall recovery time (ORT) as the time from PCD procedure to the confirmation of clinical outcomes. Based on the ORT, the predictors of ORT were identified with univariate and multivariate analyses, and a prognostic nomogram was developed and internally validated using Harrell's *c* statistic.
Results: A total of 116 patients and 142 PCD procedures with a median ORT of (15.0±10.6) days were included. Gas-formation (GF; HR: 0.486 [95% CI: 0.312- 0.757]; $P=0.001$), diabetes mellitus (DM; HR: 0.455 [95% CI: 0.303- 0.682]; $P<0.001$) and preinterventional septic shock (PSS; HR: 0.276 [95% CI: 0.158- 0.483]; $P<0.001$) were identified as predictors for ORT of combination therapy after univariate and multivariate analyses, which indicated a significantly longer ORT than those patients without. The prognostic analyses demonstrated that the more predictors (GF, DM and PSS) a patient exhibited, the longer ORT for the combination therapy. A prognostic nomogram was developed and revealed high accuracy, with Harrell's *c* statistic of 0.73.

Conclusion: GF, DM and PSS were predictors for recovery of PLA patients treated with PCD plus antibiotics. The nomogram was effective to predict the ORT of combination therapy.

EPO-1822
不同拔针方式对减少肝脏造影术后职业暴露的影响

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目的 通过在对门诊进行超声造影的患者实施两种不同取针方法来对留置针延长管回血发生率进行比较，为门诊患者行肝脏超声造影检查时，短时留置静脉留置针护理提供高效的取针方式，大大地减少了职业暴露风险。**方法** 将 570 例使用 BD 留置针患者随机分为对照组和实验组各 285 例，对照组采取传统拔针方法直接快速拔除留置针，实验组采取改良拔针方法即先静脉推注预充式生理盐水 3ml，推注完成后夹闭留置针的开关，并快速拔除留置针，夹闭部位位于延长管中前 1/3 段，观察两组留置针延长管内回血发生率。**结果** 实验组留置针延长管回血发生率明显低于对照组，两组比较差异有统计学意义（P＜0.001）。**结论** 改良取针方法优于传统取针方法，留置针延长管回血发生率低，减轻护理人员对留置针回血的顾虑，减少职业暴露的风险，值得推广应用。

EPO-1823
DSA Xper-Guide 引导下肺穿刺活检术的临床应用

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目的：研究讨论 DSA Xper-Guide 在肺穿活检的临床应用价值。
方法：回顾分析我科 DSA Xper-Guide 引导下行肺穿刺活检患者共 30 例，男 20 例，女 10 例，其中周围型肺癌 17 例，中央型肺癌 10 例，结核 3 例。结果：30 例患者穿刺成功率 100%。其中少量气胸 1 例，其余患者均无并发症出现。追踪病理结果阳性 25 例，阳性率 83%。结论：相较传统 CT 定位下肺穿刺活检，Xper-CT 能更加清楚显示肺部病灶。其 XPerGuide 功能可实时生成各角度 MIP 图像与实时透视图像融合，可即时调整穿刺方向。有效减少穿刺次数，降低出血、气胸等并发症的发生几率。

EPO-1824
小儿肺淋巴管灌注综合征的介入治疗

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目的：探讨儿童肺淋巴灌注综合征介入治疗的可行性。
方法：搜集我科所行治疗，分析治疗过程，手术相关并发症，结果等。
结果：所有治疗未出现严重并发症，证明安全有效。
结论：介入治疗微创，可行，可作为首选治
疗 。

EPO-1825

外周动静脉畸形的分型及治疗策略

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目的 ：根据 CHO 及 YAKES 分型系统，了解分型意义，指导介入治疗。
材料及方法：分析我科室 2008 年至 2018 年确诊外周动静脉畸形，并行介入资料 321 例，分析分型疗效，并发症及分析的指导意义。
结果：CHO 及 yakes 在不同方面指导介入治疗，对路径选择及栓塞硬化方式给予支持。
结论：两种分型系统各有侧重，联合理解对治疗具有重要意义。

EPO-1826

Morphological Effects of Power-Treatment Duration Settings and Microcirculation on Thermal Ablation Zones -- a Preliminary in Vivo Animal Study with an MRI-Compatible Microwave Ablation Device

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Objectives: To explore the morphological effects of power-treatment duration settings and preoperative intravoxel incoherent motion diffusion-weighted imaging (IVIM-DWI) parameters on microwave ablation (MWA) zones in porcine livers.
Methods: According to the liver parenchyma available, the power and treatment duration were assigned as five groups based on experience: A, 60W×5min (n=5); B, 80W×3min (n=3); C, 80W×5min (n=9); D, 100W×5min (n=8) and E, 100W×5min (n=5). Morphological metrics among the five groups were compared with analysis of variance and Bonferroni post-hoc test / Student-Newman-Keuls test. Pearson correlation and linear regression analysis between power settings, preoperative IVIM parameters and morphological metrics were performed.
Results: There was significant difference in short axis of the white zone (WS) (P=0.04) among the five groups, but no significant difference in the long axis (WL) (P=0.281) , the area (Wz) (P=0.242) or the spherical ratio (P=0.417) of the white zones among the five groups. Post-hoc tests showed significant difference in WS between group A and D (and E in Student-Newman-Keuls test) .There was correlation between WL (r=0.375, P=0.041), Wz (r=0.417, P=0.022), WS (r=0.539, P=0.022) and wattage, and the r^2s of the regression models were 0.352, 0.148, 0.257 for WS, WL and Wz. No correlation between treatment duration IVIM parameters and morphological metrics was observed (P all >0.05).
Conclusions: For MRI-compatible MWA device, greater short axis of the white zone can be produced at higher wattage with shorter treatment duration.

EPO-1827

Acute ischemic dissection of an ‘‘S”-shaped carotid artery: The ‘‘one-stop” value of using a detachable Solitaire AB stent

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This study aimed to evaluate the efficacy and safety of endovascular repair using detachable Solitaire AB stents for acute ischemic dissection of ‘‘S”-shaped carotid arteries. From May 2015 to December 2016, a total of 127 patients with acute ischemic stroke (AIS) underwent endovascular treatment in our center. Among them, five AISs were due to acute dissection of an ‘‘S”-shaped carotid artery. Coexisting carotid embolism was identified in all five patients, who first underwent successful Solitaire AB stent-based retrieval of the embolism. All patients then underwent Solitaire AB stenting to reopen the occluded car- otid arteries, all of which were successfully recanalized. There were no procedure-related complications, except for minor hemorrhage transformation in one patient. The mean NIHSS scores were 12 ± 3.7 and 3.8 ± 3.4 at admission and 90 days after stenting, respectively (P = 0.018). The median modified Rankin Scale score at 90 days was 2.0 ± 1.4. Follow-up computed tomography angiography demonstrated in- stent patency in four of the five patients. Dissection of an ‘‘S”-shaped carotid artery infrequently leads to AIS. Such dissected arteries can be safely and reliably repaired by this stenting, ensuring successful reconstruction of the carotid arterial circulation.

EPO-1828

125I 粒子植入联合经皮椎体成形术治疗伴硬膜囊受压的脊椎转移瘤

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目的 探讨 125I 粒子植入联合经皮椎体成形术（PVP）治疗伴硬膜囊受压的脊椎转移瘤临床疗效。

方法 回顾性分析 2015 年 6 月—2017 年 12 月行 125I 粒子植入联合 PVP 治疗累及硬膜囊的脊椎转移瘤 43 例患者 56 节病变椎体。采用视觉模拟评分（VAS）、体力状况评分（KPS）和肿瘤病灶大小（mm3）3 方面评价其疗效。 分别记录术前 VAS、KPS 评分；术后 24 h， 1、3 和 6 个月 VAS 及 KPS 评分；利用图像处理软件计算出术前肿瘤病灶大小、测量术后 1、3 和 6 个月残余肿瘤病灶大小，观察肿瘤有无增大。

结果 43 例患者手术均成功，每个椎体骨水泥平均注射量为（3.4±1.3）ml，每节椎体粒子平均植入量为（34±5）粒。 随访 6 个月 ~ 1 年，平均 9 个月。术前 VAS 平均得分为 7.8 ± 1.1；术后 24 h，1、3 和 6 个月 VAS 平均得分

分别降为 5.5 ± 0.8、3.9 ± 0.9、3.2 ± 0.7 和 2.7± 0.7；术前 KPS 平均得分为 58.6 ± 11.7；术后 24 h，1、3 和 6 个月 KPS 平均得分分别为 68± 7.2、80.3 ± 4.5、84.5± 5.1 和 82.1± 6.2。术前肿瘤病灶平均大小为（550 ±18）mm3，术后 1、3 和 6 个月残余肿瘤病灶大小分别为（315±12）、（139± 11）和（127±9）mm3，术后 1、3 和 6 个月肿瘤控制有效率达到 70.5%、76.8%和 88.9%。

结论 125I 粒子植入联合 PVP 治疗累及硬膜囊脊椎转移瘤在技术上可行，可有效控制病灶累及脊髓，保护脊髓神经功能健全。

EPO-1829
射频消融术联合经皮骨成形术治疗椎外转移性骨肿瘤的临床应用

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的 探讨 DSA 引导下射频消融术（Radiofrequency ablation，RFA）联合经皮骨成形术（Pecutaneous Osteoplasty，POP）治疗椎体外转移性骨肿瘤的手术方法及临床疗效。

方法 回顾性分析 38 例（54 个病灶）行 RFA 联合 POP 治疗的椎外骨转移性肿瘤患者资料，年龄 23~75 岁，平均(52.6±12.2)岁。共 54 个转移灶得到治疗，其中髂骨 24 处、髋臼 21 处、股骨 7 处、坐骨 1 处、胫骨 1 处。所有病人至少随访 3 个月，通过术前、术后视觉模拟评分（Visual Analog Scale，VAS）、止痛药服用剂量的变化以及运动功能的改善情况评价临床效果。

结果 38 例手术均获得成功。术后 24 小时 VAS 评分由术前平均（7.1±1.5）分降至术后（2.2±2.0）分，术后 3 个月降至（1.6±1.8）分，术后 6 个月降至（1.3±1.8）分。术后 7 例(18.4%)疼痛完全缓解，25 例(65.8%)完全不需止痛药，10 例(26.3%)止痛药用量减少或止痛药级别降级，2 例(5.3%)维持原剂量，1 例(2.6%)使用止痛药级别升级。33 例行走困难的患者中 20 例（61%）术后行动功能改善，其中 4 例完全可以正常行走；12（36.4%）仍然行走困难；1 例（3%）行动不便加重，稍微活动即疼痛难忍。术后患者中位生存时间为 15 个月，一年生存率为 68.9%，两年生存率为 27.3%。8 例(21.1%)发生肿瘤周围软组织骨水泥渗漏，但无明显临床症状，1 例(2.6%)发生皮肤灼伤。

结论 DSA 引导下行 RFA 联合 POP 治疗椎外转移性骨肿瘤临床效果良好、创伤小、并发症少，可以明显提供患者生存质量。

EPO-1830
经皮经腹前入路髓核摘除术治疗复杂 L5-S1 椎间盘突出的临床应用

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目的 探讨经皮经腹前入路髓核摘除术（TPLD）治疗复杂 L5-S1 椎间盘突出的手术方法和临床疗效。

方法 收集从 2013 年 1 月到 2018 年 3 月因 髂骨棘过高、或腰骶角过大或过小的复杂 L5-S1 椎间盘突出症在我院行 TPLD 术治疗的 56 例患者资料，疗效评价采用 VAS 评分、 ODI 指数及影像学评价，至少随访 3 月。

结果 56 例患者均顺利完成手术。腰腿痛 VAS 评分及 ODI 指数在随访中改善（术前腰部及下肢平均 VAS 评分分别为 6.5 ± 1.1、7.5 ± 1.2，ODI 指数平均为 64.5 ± 7.4， 术后腰部及下肢平均 VAS 评分分别为 1.8± 0.9、1.5 ± 0.7、 ODI 指数平均为 14.6±4.2），均具有统计学意义（P<0.01）。无其他严重并发症发生。

结论 经皮经腹前入路髓核摘除术是治疗复杂 L5-S1 椎间盘突出症的一种可行、 疗效好、 并发症少的微创治疗手段。

EPO-1831
A Case of Brachiocephalic Artery Stenting Through the Carotid Artery

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As the population ages and people's living standards gradually improve, the incidence of cerebrovascular disease in China is increasing annually, posing a serious threat to people's health[1-4]. Ischemic cerebrovascular disease is the main type of cerebrovascular disease, accounting for more than 70% of cerebrovascular disease patients. It mainly includes vertebrobasilar insufficiency, cerebral insufficiency, transient ischemic attack and cerebral infarction, and its main cause is atherosclerosis[5-6]. Regardless of the location, interventional therapy and open

surgery are the standard methods of treatment. The stenosis or occlusion of the origin of the brachiocephalic artery has unique characteristics. If endarterectomy is used, making the incision in the neck makes it difficult to reach the target blood vessels and requires thoracotomy. These open surgeries are traumatic, risky and difficult to perform. Interventional minimally invasive surgery has therefore become the main method to treat stenosis at the beginning of the brachiocephalic artery. The femoral artery approach is the most common approach used for endovascular exclusion of the aorta. However, in cases involving an abnormal aortic arch or obvious distortion of the arteries, the trans-femoral approach is difficult to use because of its low success rate and high incidence of complications during the perioperative period. In addition to avoiding the occurrence of this situation and achieve faster and more effective hemostasis, we used a Perclose Proglide vascular stapler to suture the carotid puncture point. Herein, we report a case of sustained the possibility and safety of brachiocephalic arterioplasty through a carotid artery. It also illustrates the feasibility of suturing the carotid puncture site with a suturing device.

EPO-1832
miRNA-155 通过 Notch 信号通路对脑缺血再灌注损伤的影响

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目的：研究 miRNA-155 在小鼠大脑中动脉闭塞(middle cerebral artery occlusion,MCAO)所造成脑缺血/再灌注损伤(ischemia/reperfusion,I/R)中的调控作用。**方法：**用 C57BL/6 小鼠建立 MCAO 模型，通过 2，3，5-氯化三苯基四氮唑（TTC）染色及神经功能评分了解脑缺血/再灌注损伤对小鼠神经功能的影响，采用定时荧光定量 PCR 技术测定 miRNA-155 的表达；用苏木精-伊红染色法（ hematoxylin-eosin staining，HE ）染色观察 miR-155 对脑组织病理学的影响；通过测定伊文氏蓝和脑含水量观察 miR-155 对血脑屏障通透性的影响；通过测定一氧化氮（nitric oxide，NO）含量和内皮型一氧化氮合酶（endothelial nitric oxide synthase，eNOS）的表达来了解 miR-155 对血管内皮功能的影响；采用免疫印迹（westernblot，WB）法检测 Notch 1、NICD、Jagged 1 和 Hes 1 的表达并用 RT-qPCR 技术对 Notch 1 和 Hes1 mRNA 水平进行了分析以明确 miR-155 在 Notch 信号通路中的作用。**结果：**miRNA-155 的缺失会提高 Notch1、NICD 和 Hes1 的表达，此外还能降低 TUNEL 阳性细胞的百分比和 caspase-3 水平。另外，干扰 miRNA-155 的表达能够增加 NO 的产生和 eNOS 的表达，导致脑含水量和伊文氏蓝含量的下调，但 miRNA-155 的过度表达却能使所有这些改变恢复到脑 I/R 损伤的水平。Notch1、NICD 和 Hes1 的表达能减轻脑 I/R 损伤的状态。**结论：**miRNA-155 将来可能是脑卒中治疗的一个潜在靶点。

EPO-1833
HDL 抑制 NLRP3 炎性小体对脑缺血再灌注损伤的保护作用及机制

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目的: 研究高密度脂蛋白（high density lipoprotein，HDL）对大鼠缺血再灌注脑损伤的保护作用及相关机制。**方法：**建立缺血再灌注脑损伤模型（middle cerebral artery occlusion，MCAO），模型组缺血后 1.5h，分别再灌注 12h、24h、72h 后处死大鼠，取脑损伤组织进行 TTC 染色，检测不同再灌注损伤时间后大鼠脑梗死体积，根据 Bederson 评分标准对大鼠神经功能损伤进行评分，实时荧光定量 PCR（Quantitative Real-time PCR， qRT-PCR）检测不同灌注时间脑损伤后炎性小体 NLRP3 的 mRNA 表达情况。选择脑损伤程度严重的缺血再灌注模型在缺血前 15min，尾静脉注射 10mg/kg、25mg/kg、50mg/kg 不同剂量的 HDL，缺血 1.5h 后再灌注 72h 后处死大鼠，取脑损伤组织进行 TTC 染色，检测不同剂量的 HDL 对缺血再灌注大鼠脑梗死体积的改善程度。利用酶联免疫（enzyme-linked immunosorbent assay，ELISA）和 qRT-PCR 检测大鼠缺血半暗带脑损伤组织中 IL-18 和 IL-1β 因子的蛋白和 mRNA 表达情况。免疫印迹法（Western blotting，WB）检测 NLRP3 和 caspase1 的表达。**结果：**随着缺血再灌注时间的延长，大鼠脑组织梗死程度加剧，大鼠神经功能损伤更严重，炎性小体 NLRP3 的 mRNA 表达水平显著上调。中、高剂量 HDL 治疗对缺血再灌注引起的大鼠脑部有保护作用，中、高剂量的 HDL 可显著降低缺血再灌注大鼠神经功能评分，改善缺血再灌注 72h 后缺血再灌注大鼠脑梗死体积，下调脑缺血再灌注引起的 IL-18 和 IL-1β 因子的蛋白和 mRNA 的表达。**结论：**高密度脂蛋白可通过抑制脑组织中炎性小体 NLRP3 的激活而对缺血再灌注损伤的脑组织起到保护作用。

EPO-1834

miRNA-29b 调控 COL4A1 在 N2a 细胞氧糖剥夺/再灌注损伤中的机制研究

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目的:通过对 N2B 神经细胞氧糖剥夺/再灌注(oxygen and glucose deprivation/reperfusion，OGD/R)模型的构建，验证 miR-29b 对神经细胞的保护作用，探索 COL4A1 在 miR-29b 对神经细胞 OGD/R 损伤的保护作用中的机制。**方法：**正常和缺氧条件培养 N2B 细胞，实时荧光定量核酸扩增检测（Real-time Quantitative PCR，qPCR）miR-29b 的表达水平；分别用 CCK-8、克隆形成、Hoechest 和流式细胞术、蛋白印迹试验（Western Blot，WB）检测两组细胞的增殖、凋亡情况；双荧光素酶验证 miR-29b 的靶基因是否为 COL4A1；N2B 细胞转染 miR-29b mimics，qPCR 和 WB 检测 COL4A1 的表达。构建 COL4A1 的 3’UTR 的野生和突变载体，靶基因；设计合成 COL4A1，转染 N2B 细胞，缺氧培养，CCK8、克隆形成、Hoechest 和流式细胞术、WB 检测不同处理组细胞的增殖、凋亡情况。**结果：**OGD/R 细胞中 miR-29b 的表达较正常细胞组降低；在相同缺氧/复氧条件下培养的细胞中，上调 miR-29b 的表达，细胞的增殖能力明显增强，细胞的凋亡明显受到抑制。上调 miR-29b 的表达能够抑制 COL4A1 的表达；而在转染 COL4A1 及其对照后，COL4A1 对照组的细胞增殖较过表达组细胞明显增加，COL4A1 对照组的细胞凋亡较过表达组细胞明显降低。**结论：**miR-29b 对 N2B 神经细胞 OGD/R 模型具有保护作用，其通过抑制 COL4A1 的表达降低缺氧对 N2B 神经细胞的损伤，miR-29b 能够通过调节 COL4A1 的表达降低缺血/缺氧再灌注对神经细胞的损伤。

EPO-1835

Endovascular treatment for acute large artery occlusion due to intracranial atherosclerosis and cardioembolism

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ABSTRACTION
Background and Purposes Intracranial atherosclerosis disease(IAD) and cardioembolism(CE) are two main reasons of large artery occlusion in acute ischemic stroke, Our aims were to evaluate the efficiency and safety of endovascular revasculization in the management acute large artery occlusion due to intracranial atherosclerosis and cardioembolism.
Methods Patients with acute large artery occlusion due to IAD and CE underwent endovascular treatment were analyzed retrospectively. The clinical and angiographic data were recorded, endovascular treatement methods were compared, and outcome was measured using modified Rankin Scale (mRS) scores at 90 days.
Results A total of 192 cases with large intracranial artery occlusion enrolled in the study, 101 in the IAD group and 91 in the CE group. Male, diabetes, CHD and dyslipidemia were more frequent in patients in IAD group, and the rate of atrial fibrillation was significantly higher in the CE group. The initial recanalization rate was significantly lower (18.75%) with stent retriever as first method in the IAD group than in the CE group, 77% of patients in the IAD group received one (or more) adjunctive treatment, which was significantly higher than in the CE. The final rate of recanalization, clinical outcome, complications, and mortality were comparable between two groups.
Conclusions There were differences of risk factors between IAD and CE, patients with acute large artery occlusion due to IAD react poorly to stent retrieval when compared with CE. However, the successfully revascularization rate at the end of procedure, the outcomes and complications at 90d were comparable among two groups.

EPO-1836
Wingspan 支架治疗术后即刻残余狭窄与疗效及预后的关系研究

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目的 探讨颅内动脉狭窄血管内治疗的安全性及有效性，以及术后即刻残余狭窄率与疗效及长期临床预后的相关性。**方法** 回顾性分析本中心 2014 年 1 月至 2018 年 6 月 Wingspan 支架治疗的 59 例患者，62 处颅内动脉狭窄，评价手术技术成功率，手术前后血管狭窄率的改善，围手术期并发症及转归，比较高术后即刻残余狭窄率组（>30%）及低术后即刻残余狭窄率组（≤30%）围手术期并发症及预后的差异。**结果** 手术技术成功率 93.5%（58/62），术后血管狭窄率（22.5±9.7%）较术前（60.8±7.8%）明显下降（Pp<0.001）；围手术期并发症 6 例（6/59，10.2%），其中术中出血 2 例，术中血栓形成 1 例，术中夹层形成 2 例，术后再灌注损伤出血 1 例；5 例术中并发症患者出院时 mRS 评分无增加，1 例术后再灌注损伤患者，病情稳定后转外院康复。59 例患者中 53 例临床随访，，48 例影像随访。术后随访 mRS 评分（0.83±1.40 分）较入院时（1.63±0.98 分）显著下降(p<0.01)；Barthel 指数（87±17 分）由较入院（时 69±20 分）显著升高升高至随访时 87±17 分（Pp<0.001）。62 处狭窄病变中 51 例影像随访中影像随访 3 例（3/51，5.88%）再狭窄，其中 1 例（1/51，1.96%）再治疗[1] 。与低术后即刻残余狭窄率组相比，高术后即刻残余狭窄率组更多见于椎-基底动脉汇合处病例(Pp<0.05)、高术中并发症率率(Pp<0.05)及高手术风险（Pp=0.08）的病例。但是两组长期随访 mRS 评分及日常生活活动能力等级无明显变化。**结论** 颅内动脉狭窄的

Wingspan 支架治疗安全有效，高术后即刻残余狭窄率可能与椎-基底动脉汇合处、高风险病例、高术中并发症率相关，并不能作为血管内治疗的长期临床预后的预测指标。

EPO-1837
血管内栓塞治疗脑动静脉畸形合并动脉瘤的疗效分析

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【目的】探讨介入栓塞治疗脑动静脉畸形（BAVM）合并动脉瘤疗效的影响因素，帮助制定治疗策略。
【方法】回顾性分析 49 例 BAVM 合并动脉瘤行介入治疗的患者，以 Redekop 分型对 47 例患者进行分型，分析不同分型患者颅内出血的风险。采用多重线性回归分析术后格拉斯哥转归评分（GOS）的影响因素并构建回归模型。所有患者术后 3 个月复查脑血管造影。
【结果】BAVM 合并动脉瘤的患者颅内出血的风险，合并供血动脉远端型及团内型动脉瘤者明显较高。通过多因素分析发现性别、年龄、Redekop 分型、动脉瘤最大径及 BAVM 位置与 GOS 评分无明显相关性，而 GCS、Spetzler-Martin（SM）
分级、动脉瘤形态及 BAVM 栓塞体积与 GOS 评分明显相关。多重线性回归分析显示 GCS 评分、BAVM 栓塞体积与 GOS 评分呈正相关，SM 分级、动脉瘤形态与 GOS 评分呈负相关。49 例患者中有 2 例合并有多发动脉瘤。除 1 例多发动脉瘤患者的两个血流相关性动脉瘤未予治疗，其余动脉瘤均给予栓塞治疗；畸形血管团给予不同程度栓塞。所有患者中，视力受损患者 1 例，肢体活动障碍患者 2 例，死亡患者 1 例。其余 48 例患者在术后 3 个月后复查脑血管造影均未见病灶残余及复发。
【结论】BAVM 合并动脉瘤的患者出血风险高，合并团内型和供血动脉
远端型动脉瘤的患者更容易发生颅内出血，而 Redekop 分型对术后 GOS 评
分无明显影响，因此患者应尽早治疗。
对于 GCS 评分较高、SM 分级较低、动脉瘤形态较规则的患者一般疗效较好，可积极栓塞治疗。通过回归模型可以对患者术后疗效进行预评估，制定合适的治疗策略，可减少术后出血等并发症，提高介入治疗的安全性及有效性。治疗 BAVM 合并动脉瘤时应优先处理其相关动脉瘤，以降低术后压力增高导致相关动脉瘤破裂出血的风险，且治愈性栓塞 BAVM 可提高疗效，降低复发。

EPO-1838
• Quantitative Assessment of Correlation between Wall Enhancement Degree and Rupture Risk PHASES score of Intracranial Saccular Aneurysms based on 3D HR-MRI

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BACKGROUND: Aneurysm wall enhancement related to inflammatory was considered the intracranial aneurysm unstable risk factor. PHASES score was a model providing absolute risk of aneurysm rupture and growth risk. The relationship between aneurysm

wall enhancement and aneurysm rupture risk is still not clear. This study aims to investigate the relationship between intracranial aneurysm wall enhancement index (WEI) and PHASES score based on the 3D HR-MRI quantitative approach.

METHODS:From March 2016 to October 2017, 108 consecutive patients 127 intracranial saccular aneurysms were prospectively enrolled in our center. PHASES score including six specific predictors and WEI calculated by 3D HR-MRI were analyzed.
RESULTS:
1.WEI was positively related with PHASES score (Spearman r=0.487, P<0.001). WEI can predict PHASES score based on the linear regression analysis.
2. After compared WEI with six predictors of PHASES, aneurysm size was the critical element on aneurysm wall enhancement (ANOVA P<0.001).
3. In post hoc test, significant difference was between <7.0mm and ≥7.0mm groups (7.0-9.9mm P=0.015; 10.0-19.9mm P<0.001; ≥20.0mm P=0.003 respectively).
4. WEI was positively correlated with maximum diameter (Spearman r= 0.507, p<0.001) instead of age (Pearson r=0.025, p=0.783).
5. After the WEI comparison in various PHASES score level, statistical difference was revealed among three risk level groups (ANOVA P<0.001).
6. In post hoc test, significant difference was between high risk group and intermediate (P<0.001), low risk group (P<0.001) respectively.
7. The receiver operating characteristic curve (ROC) analysis can efficiently differentiate between the high risk and intermediate-low risk group (AUC =0.780, P<0.001), which have a reliable WEI cutoff value (1.04; sensitivity ,0.815; specificity 0.65) to predict high rupture risk.
CONCLUSIONS: Higher WEI is associated with an increased PHASES score which can provide absolute risk of aneurysm rupture and growth risk. Therefore, High WEI might be quantitatively predicting high rupture risk aneurysm.

EPO-1839
经静脉途径栓塞破裂颅内动静脉畸形的前瞻性单中心研究

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目的：本研究通过分析影响畸形巢出血的相关因素，旨在评估经静脉途径血管内栓塞技术治疗国人破裂颅内动静脉畸形的安全性和有效性。

方法：本研究连续纳入自 2016 年 11 月至 2018 年 12 月在郑州大学人民医院颅内动静脉畸形专科住院行经静脉途径治疗的颅内动静脉畸形患者，收集患者的基线资料和临床资料。共纳入 21 例患者（21 个动静脉畸形），详细记录患者基线资料及随访资料。术后 1、3、6、12、24、36 个月对患者行临床随访，采用 mRS 评分对预后进行评估；术后 6、12、24、36 个月对患者行影像学随访，评估动静脉畸形治疗效果。采取有关统计学方法分析影响畸形巢闭塞及并发症发生的相关因素。
结果：共纳入 21 例患者，手术技术成功率为 90.5%。共实施 34 次手术，其中行经静脉途径栓塞 21 次，血管内经动脉栓塞 8 次，外科开刀 3 次，立体放射治疗 2 次。19 例技术成功患者中静脉端入路有 6 例通过上失状窦，9 例通过直窦，其余 4 例经过横窦进入。供血动脉控制方式使用弹簧圈者 6 例，3 例采取液体栓塞剂，4 例单独应用球囊辅助，液体栓塞剂结合球囊者 4 例，弹簧圈加液体栓塞剂者 1 例，1 例同时应用弹簧圈、球囊和液体栓塞剂。有 15 例患者获得影像学随访，中位影

像学随访时间为 5（2-15）个月，其中 14（93.3%，14/15）例患者的畸形巢获完全闭塞，且无畸形巢复发。其中 1 例在 13 个月随访时 DSA 证实残余畸形巢自行闭塞。21 例患者获得临床随访，中位随访时间 15.5（2-26 个月）个月，mRS 评分≤2 分的患者 19 例（90.5%,19/21）。严重致残致死性并发症者 2（9.5%，2/21）例。1 例患者于术后第 3 天 CT 证实脑室出血，另 1 例术后发生脑水肿和脑梗塞。

结论：本研究随访结果显示经静脉途径治疗国人破裂颅内动静脉畸形中期随访治愈率明显提高，随访期间未见畸形复发，但其安全性有待提高和大样本数据论证。

EPO-1840

如何做好冠状动脉血流储备分数测定技术

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目的

目前各地的冠脉介入手术量日益增加，新技术新设备也不断增加，相应地对介入技师也有了新的更高的要求。在当前实践中，基于冠状动脉造影（CAG）对病变进行主观视觉评估依旧主导着冠心病患者的治疗决策。通常认为，CAG 显示的狭窄程度超过 70%的病变会引起明显的心肌缺血，主张对其行 PCI。而对于狭窄程度为 50%～70%的临界病变，无论是有创的解剖形态学评估血管内超声（IVUS）和光学相干断层扫描技术（OCT）还是无创的生理学评估均不能准确判断狭窄对远端血流的影响程度，而血流储备分数（FFR）作为一种通过压力测定推算冠状动脉血流的指标，可以弥补上述检查的技术缺陷，为证明 CAG 显示的狭窄是否导致心肌缺血提供了一种非常好的方法。目前各地的情况并不一致，但介入技师负责 FFR 的非无菌操作部分，辅助心血管医师规范做好每一台 FFR，得出准确结果是一种趋势，也是介入技师能力与价值的体现。因此，让更多的介入技师可以掌握 FFR 在各种适应证中的应用，学会规范测量方法，获得准确数值，正确解读 FFR 数值十分必要。

材料与方法

从最大充血药物（主要是腺苷或 ATP）、校零和 EQ、测量与记录、压力导丝回撤、校验等各个 FFR 步骤了解其中的意义及标准操作、注意事项，排除各个步骤中由于不规范操作引起的故障以得出准确 FFR 数值。

结果

影响 FFR 数值准确性的常见因素包括：使心肌达到最大充血状态的药物的选择、剂量及给药方式；Pa 传感器的高度、EQ 时压力导丝的位置；测量时压力导丝的位置；压力导丝回撤的时机及速度；信号漂移。规范操作，排除这些因素引起的故障，才能得出准确的 FFR 数值。

结论

1 FFR 可以证明 CAG 显示的狭窄是否导致心肌缺血，可以辅助指导治疗策略，改善患者预后。
2 FFR 技术看似简单，但影响 FFR 数值准确性的因素繁多。
3 介入技师需掌握 FFR 各操作步骤的意义及影响因素，懂得规范操作及排除故障，配合心血管医师做好每一台 FFR。

EPO-1841

心脏介入手术术中的 X 线剂量管理

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心脏介入手术必须在 X 线下进行，其 X 线的辐射危害不可忽视。**目的：**术中优化 X 线照射方式，做好术中 X 剂量管理，使 X 线剂量尽量控制在较低水平。**方法：**我院 2018 年 1 月至 2018 年 12 月共行心脏介入手术 7671 例，其中冠脉介入手术 5510 例，高血压、结构性心脏病介入治疗 458 例，心率失常介入治疗 1703 例。使用的机器为飞利浦公司的 Xper FD20 和 Xper FD10 机。术中采用不同的 X 线采集方式，针对患者的不同的治疗目的，个性化定制。① 冠脉介入治疗可选择心脏冠脉模式， 15 帧/秒（Cardio-Cardiac-Left Coronary 15fps）或心脏电生理模式，7.5 帧/秒（Electrophysiology-Cardiac EP-Exposure 7.5fps）；遇慢性闭塞性（CTO）病变介入治疗，在看清侧枝血管显影后，可采用小视野开通血管，诺操作时间过长，DSA 机器上显示患者体表入射剂量值 ESD (Entrance skin dose)过大，超过 2000 mGY 以上，提醒术者，考虑分次治疗。② 高血压、结构性心脏病介入治疗，儿童采用心脏冠脉模式， 15 帧/秒；成年人可采用心脏电生理模式， 7.5 帧/秒，在看清心脏、血管解剖结构后可小视野透视采集进行下一步的介入治疗。③ 心率失常介入治疗采用心脏电生理模式， 3.75 帧/秒（Electrophysiology-Cardiac EP-Exposure 3.75fps），小视野透视采集。每台介入治疗均需做好术者、患者非照射部位的辐射防护；充分利用 DSA 机的固有防护；治疗床台升高适当位置，尽量使影像平板靠近患者，以减少散射线的产生。**结果：**经过有效的 X 剂量管理，可有效的减少术者及患者的 X 剂量 60%左右，使其控制在尽可能低的水平。结论：满足介入图像诊断质量要求的情况下,使用尽可能低的 X 线脉冲透视频率。介入治疗过程中，采用对 X 线剂量的综合管理措施，可以有效的减小 X 剂量

EPO-1842
三维旋转血管造影在射频消融治疗房颤术中的指导价值

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目的：探究三维旋转血管造影在射频消融治疗房颤中的临床价值。方法：选取 2018-2019 年我院收治的 40 例要行射频消融的房颤患者，研究组采取三维旋转血管造影，对照组按传统方式进行射频消融，比较两组的治疗效果，手术时间，X 线曝光时间等。结果：在治疗效果上，研究组 100%，对照组 95%。研究组手术时间短于对照组，差异有统计学意义。结论：三维旋转血管造影能缩短射频消融手术时间，缩短 x 线曝光时间

EPO-1843
室间隔缺损 XA 术中猪尾型导管造影危险因素分析

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目的:探讨室间隔缺损(ventricular septal defect,VSD),在 x 线心血管造影(XA)介入诊疗术中猪尾型（Pigtail）导管造影可能出现的危险因素,以利于造影前及时干预,并减少不良事件的发生.

方法:回顾分析 2017 年 6 月至 2019 年 8 月在贵州省人民医院、贵州省心血管病研究所心内科、心外科,术前超声心动图(Transthoracic echocardiography,TTE)检查示 VSD,并行 VSD 介诊疗术患者,术中猪尾型导管造影出现的危险因素.

结果:共有 220 例行 VSD 介入诊疗患者,其中男性 101 例(48.8%),女性 119 例(51.2%),年龄 2 岁至 17 岁 146 例,年龄 18 岁至 73 岁 74 例.本研究发现其中 11 例 VSD 行介入诊疗患者中,其中 4 例猪尾型导管误入右心室,并行造影,然后将猪尾型导管重新调整至左心室造影(图 1),7 例猪尾型导管误入右心室,及时发现重新调整猪尾型导管进入左心室造影(图 2).其中 5 例猪尾型导管置于左心室位置不当,造影时引起二尖瓣返流(图 3).3 例造影时诱发频发早搏.

结论:猪尾型导管误入右心室造影,不但不能达到 VSD 造影的目的,而且增加右心室损伤的风险.重新左心室造影不仅增加患者对比剂用量,增加患者辐射剂量,而且延长手术时间,增加手术风险.因此 VSD 术中行左心室造影时,一定要仔细研判猪尾型导管的影像学位置,造影前先测量导管所在位置的心腔压力,并加以分析,如是右心室压力要及时调整导管,防止猪尾型导管通过缺损进入右心室误造影.导管过于接近心尖部时,易诱发频发室早,影像左心室正常收缩,舒张.用猪尾型导管进行左心室造影时,将导管放置于后乳头肌正上方的位置最好,诱发期外收缩的频率较少,而且不影响二尖瓣[2],优良的左心室造影为 VSD 介入诊疗提供有益的影像学支持和帮助(图 4).

EPO-1844
血流动力学数值模拟结合 3D 打印在髂总动脉瘤腔内治疗中的应用

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摘要

目的
基于医学影像资料利用医学三维可视化软件重建出髂总动脉瘤，获得的动脉瘤三维模型用于血流动力学数值模拟和 3D 打印。通过分析髂总动脉瘤的解剖结构和血管内血流情况，对髂总动脉瘤做风险评估，分析血流动力学参数对动脉瘤疾病的影响 ，有助于手术方案的制定及降低手术风险提高手术成功率。
方法
选择 2019 年 7 月 25 日赣州市立医院介入血管外科住院部收治的经过 CTA 诊断为右髂总动脉瘤一例，用 mimics21 读取 CTA 数据，三维重建得到髂总动脉瘤模型，包括腹主动脉部分，左右髂总动脉分叉部。应用 ansys-fluent 软件模拟出人体髂总动脉瘤血管内血流情况及用 3D 打印机将髂总动脉瘤模型打印出来。分析探讨髂总动脉瘤的解剖结构和血流动力学的改变，利于手术方案的制定及风险的规避。
结果
通过三维可视化技术 1；1 还原髂总动脉瘤，可了解人体真实解剖下的动脉瘤。基于三维重建模型应用血流动力学数值模拟计算和 3d 打印。可计算出髂总动脉瘤内血流速度流线分布，涡流，壁面压力等血流参数，3D 打印出血管模型可在三维可视化的基础上更加直观的了解动脉瘤的解剖结构，方便手术医生全面评估动脉瘤的风险。分析不同部位的壁面压力，动脉瘤体内涡流明显，血流速度缓慢，瘤体壁面压力高于正常血管壁面压力。近心端与远心端的血流速度明显高于瘤体部的血流速度。
结论
基于高分辨率下的 CTA 数据通过三维可视化技术构建人体真实解剖血管模型，在三维可视化的基础上 3D 打印出动脉瘤型，可更加精准的反映出血管的病变解剖部位。血流动力学数值模拟方法是分

析人体血管内血流动力学参数的有效手段。在血管畸形中，髂总动脉瘤血流流场复杂，复杂的血管模型对流动方式有很大的影响。通过仿真分析，印证了髂动脉瘤体部壁面压力最大，涡流明显，血流速度最小，此处破裂风险最高。同时更加利于手术方案的制定和风险的规避。

EPO-1845
铁死亡在造影剂肾病中的作用机制研究

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目的：探索铁死亡在造影剂肾病中的作用机制，为防治造影剂肾病提供新的作用靶点。
方法：SD 大鼠采取外科切除 5/6 肾脏组织的预处理，随机分为对照组、CIN 组、及 CIN+Fer-1 组。对照组为术后 6 周时的大鼠；CIN 组为经尾静脉注射造影剂碘克沙醇（10mg/kg）；CIN+Fer-1 组为经尾静脉注射造影剂碘克沙醇（10mg/kg），并经腹腔注射铁死亡抑制剂 Fer-1（5mg/kg）。测定血中尿素氮、肌酐的水平， HE、Masson、qRT-PCR、WB、IHC 等检测肾损伤水平和氧化应激、铁死亡及炎症相关的基因、蛋白的表达。
结果：CIN 组及 CIN+Fer-1 组肾脏组织中 Nrf2 及 HIF-1 表达水平明显高于对照组（P＜0.01），肾脏组织中 GSH 表达水平显著低于对照组（P＜0.01）。CIN 组 48 小时的血清肌酐及尿素氮水平、肾小管纤维化、脂质过氧化程度显著高于对照组（P＜0.01），而 CIN+Fer-1 组各项指标显著低于 CIN 组（P＜0.05）。CIN 组肾脏组织中 IL-33 表达水平显著高于对照组（P＜0.01），而 CIN+Fer-1 组则明显低于 CIN 组（P＜0.05）。且 CIN 组肾脏组织中 TNF-α、MCP-1、RANTES mRNA 表达水平显著高于对照组（P＜0.01），而 CIN+Fer-1 组各 mRNA 表达水平明显低于 CIN 组（P＜0.05）。CIN 组肾脏组织中 F4/80－阳性表达面积显著高于对照组（P＜0.01），而 CIN+Fer-1 组干预后明显低于 CIN 组（P＜0.05）。
结论：造影剂肾病发生发展过程中存在氧化应激损伤，且 Fer-1 能减轻氧化应激所致的脂质过氧化，并能改善肾功能，减轻肾组织损伤。同时 Fer-1 能降低肾组织中 IL-33、TNFα及 MCP-1 的水平，提示了铁死亡在造影剂肾病中可能是炎症及细胞死亡的早期始动因子。调节细胞铁死亡水平可能为防治造影剂肾病提供新的干预手段。

EPO-1846
一种用于虚拟介入造影剂示踪的血流动力学仿真方法

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目的：研究一种基于计算流体力学仿真的方法是否可以用于虚拟介入手术中造影剂示踪，减少造影剂的注入和辐射剂量。
方法：基于 3D-DSA 图像或 CTA,MRA 图像，在 MIMICS 软件中提取血管三维几何结构，对烟雾病患者的脑血管，包括颈内动脉和颞浅动脉【2】，在有限元仿真软件 Comsol 中进行计算流体力学瞬态仿真。瞬态仿真的边界条件由超声或磁共振相位对比法测得，将流体建模设置为血液和造影剂的不可压缩非牛顿液体混合物。其中碘造影剂密度为 1349kg/m^3, 黏度为 0.0063Pa.s，血液的密度为 1060kg/m^3, 黏度为 0.0035Pa.s 【1】。将混合物黏度建模为受造影剂注入浓度和流速影响的函数。仿真周期为 5 个心动周期，仿真步长为 0.01s，将仿真结果与注入碘剂后真实的 DSA 成像示踪结果做对比。对比指标为造影剂浓度变化曲线及不同时刻的造影剂分布图。

结果：虚拟介入造影剂示踪仿真结果与 DSA 成像结果在不同时间点的造影剂分布图和浓度变化曲线接近，无显著差异。
结论：一种用于介入造影剂示踪的血流动力学仿真方法，可能可以在烟雾病搭桥介入术中模拟不同角度、不同流速造影剂注入后的仿真结果，达到减少造影剂的注入和手术辐射剂量的目的。该仿真方法同样可以用于人体其它血管介入造影剂示踪。

EPO-1847
一站式治疗左髂静脉压迫综合征并左下肢静脉血栓回顾性研究

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【摘要】 **目的：**回顾性研究“一站式”介入治疗左髂静脉压迫综合征并下肢深静脉血栓效果及对凝血系统影响。**方法：**对 46 例 IVCS 合并 DVT 患者行“一站式”的疗效进行了回顾性研究，比较术前与术后 1 周凝血指标和与小腿中点周径测量值差异、开通显效率和总有效率、通畅评分及开通率，观察并发症。术后随访 6 个月。**结果：**46 例患者治疗前后静脉通畅评分，差异有统计学意义（t =27.234, P ＜ 0.05），治疗后静脉通畅率(94±8.7)%，总有效率 100%；患者凝血指标术后、前相比，APTT[（22.77±3.61）s 比（17.92±2.61）s P ＜0.05]、PT[（14.12±1.61）s 比（14.42±1.81）s P ＞0.05]、血栓弹力图 R 值[（4.48±8.1）min 比（3.12±0.41）min, P ＜0.05]、D-二聚体[（2876.32±3476.31）ug/L 比（4625.18±3692.24）ug/L, P ＜0.05]、小腿中点周径[（62.14±0.64）cm 比（41.32±0.71）cm, P ＜0.05]较术前好转。46 例患者治疗期间无出血和肺动脉栓塞，术后随访髂静脉支架通畅，35 例耐受正常体力活动，未出现下肢肿胀，5 例活动后出现轻度肿胀，休息后消失，1 例出现静脉血栓后综合征。**结论：**一站式治疗急性静脉血栓型髂静脉压迫综合征疗效确切，并发症少并且能改善患者内源性凝血系统。

EPO-1848
低浓度 1%聚多卡醇注射治疗 60 例淋巴管畸形临床分析

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郭铁群广州妇儿中心:
疗儿童囊性淋巴管瘤 60 例的临床资料；60 例术前均经彩色超声、CT 或 MRI 检查确诊,治疗时在彩色超声联合 DSA 引导下经皮穿刺抽尽囊液后注入药物,对多囊性患儿则彩超引导下依次抽液后分别注入药物；根据瘤腔位置和大小不同，对颈部、颌下、腹股沟及瘤腔内淋巴管液体超过 10ml 的 42 例采用 1%聚多卡醇+空气（按 1:3 比例）泡沫进行泡沫硬化注射,其余 18 例淋巴管瘤瘤体淋巴管液小于 10 毫升及微囊型均采用 1%聚多卡醇原液进行瘤内注射。术后 1 月复查彩超或 MRI，观察瘤体大小变化、治疗次数和并发症；评价标准：a 治愈：瘤体消失,1 年后无复发;b、有效：瘤体缩小 50％以上,1 年后无增大。c、无效：瘤体缩小 50％以下或治疗后 1 年内复发。结果：60 例治疗 2～5 次,平均(3.5±0.8)次。治愈 49 例(81.7％)；有效 6 例(10.0％),无效 5 例(8.3％),总有效率为 91.7％(55/6)。注射治疗常见的并发症有 1、发热,通畅体温不超过 38.5° 可予物理降温后缓解。2、局部肿胀 60 例，几乎全部患儿经过治疗后均有肿胀，可给予喜辽妥外用及局部热毛巾外敷，一

般约 2~3 周左右可缓解。3、轻微疼痛 52 例，无需特殊处理，观察 1～3d 后消失；4、局部皮肤淤青或类似色素沉着 2 例。未发现其它明显并发症。结论：1%聚多卡醇瘤腔内注射治疗儿童囊性淋巴管瘤是一种微创、安全、有效的方法，在传统硬化剂平阳霉素缺乏的情况下不失为一种安全有效的替代方案。

EPO-1849

228 例布-加综合征血管造影表现

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目的 分析布-加综合征(BCS)的数字减影血管造影(DSA)的表现，为 BCS 的诊断和选择合适的治疗方法提供科学依据。方法 采用回顾性分析的方法收集我院的 228 例 BCS 患者病例资料，分析其 DSA 表现。结果 患者中下腔静脉隔膜型 29 例，节段型 184，肝静脉型 10 例，混合型 5 例。DSA 图像特征：下腔静脉或肝静脉梗阻，不同分型表现不一。结论 DSA 能够清晰显示下腔静脉及肝静脉的部位和范围，认识这些表现有助于对 BCS 的分型及治疗方式的选择具有重要意义。

EPO-1850

改良导管介入治疗输卵管阻塞的疗效观察

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【目的】探讨改良导管介入治疗输卵管阻塞的临床疗效。
【方法】回顾性分析山西医科大学第一医院与山西现代妇产医院介入科 2012 年 1 月至 2013 年 12 月收治的不孕患者均经子宫输卵管造影诊断输卵管阻塞 198 例，年龄 22～43 岁，平均年龄 32 岁，不孕平均年限 2～6 年，其中原发性不孕 82 例，继发性不孕 116 例，198 例患者共 387 条输卵管不同部位阻塞（其中因输卵管宫外孕术后切除一条输卵管 7 例，单角子宫 2 例），输卵管近段阻塞（间质部与峡部）263 条，输卵管远端阻塞（壶腹部与伞端）124 条。经改良导管介入治疗输卵管阻塞观察其再通率，并通过随访记录妊娠情况。
【结果】387 条阻塞输卵管经改良导管再通治疗后，其中 263 条输卵管近段阻塞（间质部与峡部）疏通 252 条，再通率 95.8%。失败 13 条，失败率为 4.94%。124 条输卵管远端阻塞（壶腹部与伞端）疏通 98 条，再通率 79%。失败 26 条，失败率为 20.97%。总共疏通 350 条，总疏通率 90.4%。术后随访 162 例患者 1～24 个月，妊娠 63 例，妊娠率 38.9%，其中 1 例胎停育，3 例输卵管妊娠。输卵管近段疏通率明显高于远段疏通率，$P<0.05$，有统计学差异。
【结论】应用改良导管行输卵管阻塞介入治疗，取材方面经济，插管容易，操作时间短，可以与进口专用输卵管导管相媲美。为基层医院提供使用简便经济的介入器材治疗输卵管阻塞提供理论依据。本文结果提示输卵管近段疏通率明显高于远段疏通率, 再通术后 1 年内宫内妊娠率明显高于 1 年以上宫内妊娠率。
【关键词】：改良导管 输卵管阻塞 介入治疗

EPO-1851

Transcatheter Obligation Feeding Artery Embolization for Management of Hemoptysis:Follow-Up- Eight-Year Single-Center Experience

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PURPOSE: To review the authors' 8-year experience with transcatheter obligation feeding artery embolization (TOFAE) for the treatment of hemoptysis.
MATERIALS AND METHODS: TOFAE were performed in 169 patients (121:48 F:M) with mean age of 56.22 years (range:17-86), using coaxial catheter technique. The technical and clinical outcomes were followed in terms of immediate control of bleeding, recurrence of hemoptysis and complications of the procedure. Cumulative survival, correlations and the relapse rate were evaluated using the Kaplan-Meier method, Binary logistic and Pearson's Chi-Square test or Likelihood Ratio's test, respectively. All P value < 0.05 was considered statistically significant.
RESULTS: The average number of obligation feeding arteries embolized per patient was 1.62. Technical success rate was 98.82% (167/169), immediate clinical success rate (ICSR) 96.45% (163/169). The follow-up period ranged from one day to eight years (mean 25.04 months). The relapse rate was 18.44% (26/141) during the entire follow-up period of 8 years. The mean of the first recurrent time was 16.04 ± 2.96 months in benign lung diseases, 14months in malignant lung diseases. Among 26 recurrent patients, 9 patients were treated with1 TOFAE once again, 2 with 2 TOFAE, 11 with antibiotics treatment and 3 underwent a lung resection of lesion lobe, and 1died of recurrent hemoptysis. Severe complications took place in 3 patients(infarction of spleen and left kidney 1, brain infarction 1 and spinal cord infarction 1, respectively). The median survival time after TOFAE (Kaplan-Meier estimate) was 83.95 ± 2.31 months in benign diseases, 11.66 ± 2.12 months in malignant lung diseases (x^2 = 103.99, P < 0.001). PIA correlated with pleural thickening and aetiology of the haemoptysis (x^2 = 47.114, P < 0.001; x^2 = 69.476, P < 0.001). The relapse rate correlated with the aetiology (x^2 = 26.528, P = 0.005).
CONCLUSIONS: TOFAE was effective and palliation hemostatic techniques. It was critical for successfully finding and embolizing of obligation feeding arteries. A multidisciplinary team approach was the key to improve the long-term curative effect.

EPO-1852
TACE 及 MWA 联合 TIPS 治疗肝癌并门脉高压患者的疗效分析

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目的 回顾性分析经导管肝动脉化疗栓塞术（TACE）及微波消融（MWA）联合经颈静脉肝内门体分流术（TIPS）治疗肝癌合并门脉高压患者的疗效分析。**方法** 收集 2012 年 6 月至 2018 年 7 月 42 例肝癌合并门脉高压患者，其中 10 例在我科行 TACE+MWA+TIPS 术；11 例行 TACE+TIPS 术；21 例行 TACE+MWA 术；记录手术技术成功率、术前及术后门静脉压力变化情况、再出血率、治疗前后肿瘤指标变化及死亡事件等。**结果** （1）TACE+MWA+TIPS 组，手术成功率 100%，门静脉压力平均减低

14cmH2O,症状缓解率 100%，肝性脑病 14.7%（轻度），1 年内支架通畅率 97%，再出血率 15%,肿瘤复发转移 2 例，1 例死于肝衰竭。（2）TACE+TIPS 组，手术成功率 100%，门静脉压力平均减低 15cmH2O,症状缓解率 100%，肝性脑病 15.2%（轻度），1 年内支架通畅率 96%，再出血率 16%,肿瘤复发及转移 5 例，1 例死于肿瘤破裂。（3）TACE+MWA 组 手术成功率 100%，随访期内，4 例死于消化道出血，肿瘤复发及转移 5 例，2 例死于肝衰竭。**结论** 1、TIPS 对肝癌合并门静脉高压症患者能够有效降低门静脉压力，减少消化道出血风险；2、TACE+MWA 可有效治疗肝癌,明显降低病灶复发及转移概率；3、TACE+MWA+TIPS 在抑制肿瘤复发的同时，可明显降低出血风险，改善患者生存时间及生存质量，增加患者获益。

EPO-1853

Efficacy and safety of hepatic artery embolization in patients with delayed postoperative hemorrhage following hepatobiliary pancreatic surgery

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Purpose: To evaluate the efficacy and safety of hepatic artery embolization in patients with delayed postoperative arterial hemorrhage after hepatobiliary pancreatic surgery.
Material and Methods: We retrospectively reviewed 28 patients who underwent proper or common hepatic artery embolization for delayed postoperative arterial hemorrhage after hepatobiliary pancreatic surgeryin our hospital between January 2008 and December 2018. To evaluate the frequency and severity of ischemic liver injuries, the liver enzyme levels and CT findings before and after hepatic artery embolization were retrospectively compared and the clinical outcomes after hepatic artery embolization were analyzed.
Results: Successful hemostasis was accomplished with the hepatic artery embolization in all patients, except for one. Eight patients with portal vein stenosis. Ischemic liver injuries were observed in 23 (85%) of 27 patients. Injuries included subsegmental hepatic infarction in 17 (74%) patients, and transient hepatic ischemia/dysfunction in six (26%).
Conclusion: Proper or common hepatic artery embolization is sage for delayed postoperative arterial hemorrhage after hepatobiliary pancreatic surgery, even if a patient has portal vein stenosis .

EPO-1854

门静脉分支选择对于经颈静脉肝内门体分流术治疗食管胃静脉曲张出血的疗效影响

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目的 探讨门静脉右支分流及左支分流对于经颈静脉肝内门体分流术（TIPS）治疗食管胃静脉曲张出血（EGVB）的疗效影响。**方法** 回顾性分析 68 例接受 TIPS 治疗的 EGVB 患者临床资料，包括 34 例行穿刺门静脉右支建立分流道（门静脉右支组），34 例行穿刺门静脉左支建立分流道（门静脉左支组），比较两组疗效差异。**结果** TIPS 手术成功率 100%。门静脉右支组患者术后 6、12 及 24 个月累积无消化道再出血率 80.87%、76.61%及 69.64%，而门静脉左支组分别为 84.87%、80.83%及 75.44%（*P*=0.67）。门静脉右支组患者术后 6 及 12 个月分流道累积通畅率分别为 84.58%及 68.34%，而门静脉左支组分别为 90.23%及 83.78%（*P*=0.78）。门静脉右支组患者术后 12 及 48 个月累积生存率分别为 90.14%及 72.12%，而门静脉左支组分别为 91.08%及 70.06%，差异无统计学意义（*P*=0.57）。门静脉右支组和门静脉左支组术后肝性脑病发生率分别为 17.65%和 26.47%，差异无统计学意义（*P*=0.38）。**结论** 门静脉分支选择对于经颈静脉肝内门体分流术治疗食管胃静脉曲张出血的疗效无影响。

EPO-1855
胎盘植入患者子宫血供来源分析及术后出血栓塞血管选择

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目的：分析胎盘植入患者子宫血供来源及各分支供血区域，并为产后出血责任动脉栓塞止血提供指导。**方法：**回顾性搜集 2015 年 9 月至 2019 年 6 月在我院接受治疗的 968 例胎盘植入患者资料，所有患者均经超声及磁共振明确胎盘植入。超声评分 5 分以下 193 例、5-8 分 516 例、8 分以上 259 例。所有患者均行介入辅助下剖宫产术，术后给予患者行腹主动脉、双侧髂内动脉、双侧髂外动脉造影明确子宫供血动脉来源。**结果：**968 例患者共存在 4719 支供血动脉，其中子宫动脉 2193 支（左侧 1108 支、右侧 1085 支）；阴部内动脉 887 支（左侧 403 支、右侧 484 支）；子宫圆韧带动脉 659 支（左侧 323 支、右侧 336 支）；卵巢动脉 980 支（左侧 416 支、右侧 564 支）。其中子宫动脉供应全子宫血供；阴部内动脉供应宫颈及宫体部血供；子宫圆韧带动脉供应宫体及宫底部血供；卵巢动脉供应宫底部血供。所有患者均未见卵巢动脉造影剂外溢。**结论：**胎盘植入患者子宫血供来源丰富，对于术后出血患者在介入栓塞过程中需仔细查找供血动脉并做到彻底栓塞。卵巢动脉供应宫底部位，非出血责任动脉，无需栓塞。

关键词：胎盘植入；供血动脉；栓塞；选择

EPO-1856
介入治疗在移植肾血管并发症中的应用

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【目的】探讨介入治疗在移植肾血管并发症处理中的安全性和可行性。【方法】收集 2009 年-2016 年于武汉协和医院行肾移植后出现血管并发症患者 11 例，男 7 例，女 4 例；年龄 32-61 岁；起病时间为肾移植术后 1-24 月，影像学检查提示移植肾动脉狭窄 5 例，假性动脉瘤 3 例，肾动静脉瘘 2 例，移植肾静脉狭窄 1 例；所有 11 例患者均行介入治疗术。【结果】5 例移植肾动脉患者（3 例行单纯球囊扩张术，2 例行球囊扩张+支架置入术），随访期间肾动脉未出现再狭窄，血压控制满意。2 例移植肾动静脉瘘患者再无血尿等，肾功能正常。3 例假性动脉瘤患者瘤腔血栓化，支架内血流通畅。1 例移植肾静脉狭窄患者，尿量、肾功能正常，移植肾静脉血流通畅。【结论】肾移植

血管并发症的患者基础情况差，外科手术难度大、风险高，介入治疗安全、有效、微创，可以有效挽救肾功能，减少移植肾丢失。

EPO-1857
动脉置管术中溶栓治疗肝移植术后近期肝动脉急性血栓性闭塞

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目的：解决肝移植术后短期内肝动脉血栓性闭塞，全身抗凝溶栓效果差、出血风险高，目前国内外报导较少的动脉内溶栓成为降低溶栓风险，提高治疗成功率的新方法，本文在传统介入溶栓的基础上，仅运用术中溶栓，进一步缩短溶栓时间，希望达到进一步减少并发症的可能性，同时探讨脾动脉盗血综合征所致肝动脉供血不足引起的血栓形成的介入治疗方法。本文主要研究肝移植术后近期肝动脉急性血栓性闭塞时动脉术中溶栓的可行性及安全性。
材料与方法：经典式原位全肝移植术后患者 4 例，其中男性 3 例，女性 1 例，年龄 45 岁到 55 岁，均于术后 3 天内出现转氨酶及胆红素升高，行急诊超声检查显示肝动脉急性血栓形成，均行急诊介入治疗。造影显示肝动脉吻合口明显狭窄，肝动脉分支未见显影，微导管超选通过狭窄段，先经外周静脉团注 5000 单位肝素，再经微导管以 1ml/min 的速度缓慢注射 20 万单位尿激酶，边注射边适当退微导管，注入完成后等待 30 分钟后造影，如肝动脉不通，重复注射尿激酶 10 万单位，如显示肝动脉通畅，分支显影，则中止手术 。所有病例均未留置溶栓导管。4 例患者中有 1 例溶栓 2 天后超声示肝动脉血流信号差，再次造影显示肝动脉吻合口狭窄，分支未见显影，脾动脉增粗迂曲，脾大，考虑为脾动脉盗血综合征，遂行肝动脉置管溶栓及球囊辅助脾动脉主干弹簧圈栓塞。
结果：4 例肝移植术后肝动脉急性血栓形成的患者经过动脉术中溶栓后，肝动脉均成功开通，其中 3 例未再次出现肝动脉血栓形成，另外 1 例短期内再次出现肝动脉血栓形成，造影发现脾动脉盗血，置管溶栓及脾动脉近端栓塞后肝动脉开通，并且未再次出现血栓形成，4 例患者随访三个月未见异常表现。
结论：肝移植术后肝动脉急性血栓形成不仅有吻合口本身的原因，也有脾动脉盗血所致的肝动脉供血不足的因素，急诊肝动脉内溶栓治疗具有可行性及较高安全性，而对于脾动脉盗血所致肝动脉血流缓慢，血栓，辅助脾动脉主干栓塞是安全及有效的治疗方法。

EPO-1858
急性下肢深静脉血栓形成（LEDVT）患者在经导管直接溶栓（CDT）过程中血浆 D-二聚体（D-D）及纤维蛋白原（FIB）的变化规律的临床应用价值

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目的 通过分析急性下肢深静脉血栓形成（LEDVT）患者在经导管直接溶栓（CDT）过程中血浆 D-二聚体（D-D）及纤维蛋白原（FIB）的变化规律，评估其临床应用价值。方法 选取 2015 年 12 月至 2016 年 12 月在我院行 CDT 疗的急性 LEDVT 的患者 18 例，均采用 CDT 治疗，治疗过程中每隔 8h 测定患者血浆 D-D 及 FIB 浓度，治疗后计算血栓溶解率并进行疗效分级。计算每位患者的 D-D 峰值、D-D 上升速度、FIB 下降速度及 D-D 增高时间，用统计学方法分析 D-D 及 FIB 的变化规律，同时分析 D-D 峰值与血栓量、D-D 上升速度与血栓溶解率、D-D 上升速度与 FIB 下降速度、D-D 增高时间与血栓溶解率之间的相关性。结果 平均血栓溶解率为 78%，其中 6 例患者血栓完全溶解。疗效达到“优”或“良”的患者占 72%，无脑出血等严重并发症发生。在 CDT 治疗过程中，尿激酶剂量不变的情况下，D-D 先上升后下降，FIB 为持续下降；尿激酶剂量减半后，D-D 下降速度变缓，FIB 则逐渐上升。统计学分析显示 D-D 峰值与血栓量呈正相关（Pearson ratio=0.81，p<0.01），D-D 上升速

度与 FIB 下降速度呈正相关（Pearson ratio=0.49，p=0.04），D-D 上升速度与血栓溶解率之间没有相关性，D-D 增高时间与血栓溶解率之间没有相关性。结论 在 CDT 治疗急性 LEDVT 过程中对 D-D 及 FIB 进行监测及分析，有助于指导溶栓药物的使用，延长血栓溶解的时间，提高 CDT 治疗的有效性。

EPO-1859

三七皂苷 Fc 调控自噬和氧化应激促进大鼠颈动脉损伤后的再内皮化

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再内皮化是放射介入治疗后血管损伤修复的重要过程，糖尿病中的高血糖在损伤内皮层完整性方面发挥主导作用，导致再内皮化的延迟和新内膜的过度增生。三七皂苷 Fc 是一种从三七叶中分离出来的新型化学单体，能有效地抵抗血小板聚集，且大量研究已经证明三七皂苷具有良好的心血管保护作用。研究表明血管介入损伤后大量血小板聚集和沉积是导致再内皮化延迟的重要原因，然而，Fc 对血管再内皮化的潜在作用和分子机制目前仍没有研究。

体内实验，将 SD 大鼠分为四组：假手术组、对照组、糖尿病组、糖尿病+Fc 组。使用高脂喂养加 40mg/kg 链脲霉素腹腔注射造成二型糖尿病，通过大鼠颈动脉导丝损伤模仿血管介入损伤后状态。伊文蓝和 HE 染色分别用来评估再内皮化率和新生内膜的形成。体外实验，用 30mM 葡萄糖加入细胞培养基模拟高糖环境，通过细胞周期实验、划痕实验、Transwell 小室实验观察内皮细胞的增殖和迁移；通过自噬相关蛋白的表达、双荧光标记自噬流形成以及电镜下观察自噬小体数量反映内皮细胞自噬程度；通过测定细胞产生的 ROS、MDA、SOD 含量评估氧化应激水平；此外，通过小干扰 RNA 转染抑制相关蛋白表达阐明其作用的信号通路。

在体内，损伤后第 7,14 天糖尿病组大鼠再内皮化率均显著降低，而糖尿病+Fc 组相对于糖尿病组再内皮化率显著增加，并且随后的新内膜增生在 Fc 治疗组中也显著降低。体外研究中，实验数据证明了 Fc 通过增加自噬来促进高糖环境下的内皮细胞增殖和迁移。同时，用 Fc 处理后的内皮细胞氧化应激水平降低。然而，当 AMPK-PGC-1α-Sirt3 信号通路被抑制时，高糖条件下 Fc 对内皮细胞的保护作用消失。

三七皂苷 Fc 可通过 AMPK-PGC-1α-Sirt3 信号通路促进自噬、抑制氧化应激，从而加速糖尿病大鼠颈动脉损伤后的再内皮化，提示 Fc 可能对糖尿病血管病变介入治疗后的早期内皮损伤的恢复和减轻再狭窄具有潜在的治疗益处。

EPO-1860

Endovascular treatment of subclavian artery pseudoaneurysm

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Purpose: The aim of this study is to evaluate the safety and efficacy of the endovascular treatment of subclavian artery pseudoaneurysm (SAP).
Materials and Methods: A total of 8 consecutive patients with SAP were treated with endovascular treatment in our hospital between 2010 and 2018. We retrospectively reviewed the patient’s clinical characteristics, physical examinations findings, diagnostic imaging results, endovascular treatment, clinical outcome, and follow-up results.
Results: All the 8 patients received endovascular treatment using covered stents initially. The primary technical success rate was 87.5%, one patient complicated with severe tortuosity of the proximal subclavian artery failed to release stent through the femoral artery approach in the primary operation and successfully released stent via the brachial artery approach in the secondary operation. No complications occurred in the perioperative period. All the symptoms and signs were significantly relieved.

During a follow-up of 4.5-84.5 months (average 31.5 months), one patient developed endoleak 4 months after operation and re-intervention was attempted but failed. No adverse events occurred in other patients during the follow-up period.
Conclusion: Endovascular treatment of SAP is safe and effective, and should be used as a first-line treatment. Stent placement through the brachial artery approach is recommended for SAP with severe proximal vascular tortuosity.

EPO-1861

复杂腹主动脉瘤腔内治疗策略

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目的：目前腔内治疗成为腹主动脉瘤（AAA）的主要选择，对于复杂的 AAA，无论从治疗的技术策略和疗效，都有深入探讨的必要。本研究通过复杂和非复杂 AAA 的对比，分析器材和技术对疗效的影响。材料和方法：本院共有 155 例 AAA 患者实施完成了 EVAR，将高危复杂 AAA 患者进行回顾性分组，凡符合标准的患者纳入高危复杂组（A），剩余患者纳入普通组（B）。A 组围手术期成功率：全部成功完成 EVAR，1 例患者因髂动脉入路困难，手术辅助后获得成功。手术成功率合计为 100%。围手术期死亡率：4 例入院时动脉瘤破裂立即急诊行 EVAR，其中 1 例死于术后多器官衰竭，围手术期死亡率为 1.6%。结果：A 组在围手术期：1、内漏、血管损伤较多；2、住院天数较高。A 组在随访期：需要处理的内漏（Ⅰ型）、髂支阻塞的发生率较高；3、因其它系统疾病死亡率较高。但多项指标的差异无统计显著性。提示：两组患者实施 EVAR 的近、中期临床疗效大致相当。结论：EVAR 微创，适合高危人群。动脉瘤解剖复杂可能导致内漏等并发症增加，随访对维持长期疗效非常重要。随着器材和技术进步，复杂解剖 AAA 疗效提高。

EPO-1862

经颈静脉肝活检 25 例分析

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目的： 探讨经颈静脉肝活检术（TJLB）的有效性及安全性。
方法： 通过对我院自 2018 年 9 月至 2019 年 7 月行 TJLB 的 25 例患者所获取肝脏组织特征和诊断结果，以及术中术后相关并发症等资料进行回顾性分析，统计分析 TJLB 的技术成功率、诊断效能，以及并发症的发生率。
结果： 25 例患者 TJLB 的技术成功率为 100%，平均手术持续时间为 25.4±6.6 分钟，平均穿刺针数为 3.1 次，所获取肝组织平均长度为 12.1±4.7mm，平均汇管区数目为 6.8 个，所有患者均完全或部分达到肝活检相关预期目标；2 例患者发生轻微并发症，分别为误穿颈部动脉及术后腹痛，并发症发生率约为 8%。
结论： TJLB 是一项技术成功率高且安全的肝活检技术。

EPO-1863

门静脉闭塞的介入治疗策略探索

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目的 探索介入方式治疗门静脉闭塞（portal vein occlusion，PVO）的有效性、安全性及适用人群。
方法 回顾性分析 2017 年 1 月至 2019 年 4 月间的 13 例接受介入治疗的 PVO 患者， 其中 2 例急性 PVO 患者接受经皮门静脉再通术（portal vein recanalization，PVR）治疗，10 例慢性肝硬化 PVO 患者接受经颈静脉肝内门体分流联合门静脉再通术（transjugular portal vein recanalization with creation of intrahepatic portosystemic shunt，PVR-TIPS）治疗，另外 1 例先天性门静脉闭锁患者接受肝内门静脉分支-粗大侧枝血管分流术治疗。
结果 所有患者均完成介入技术操作，技术成功率达 100%。13 例 PVO 患者中，7 例患者同时合并肠系膜上静脉近端血栓，8 例患者同时合并门静脉海绵样变。接受 PVR-TIPS 治疗的患者门静脉压力梯度（portal pressure gradient，PPG）从 31±4mmHg 降至 12±3mmHg。所有患者术前临床症状均有效控制，术中未发生危及生命的并发症，术后随访期间患者均存活，未发现再出血、显性肝性脑病发生的患者，1 例患者发生支架内血栓形成，累积支架通畅率为 92%。
结论 介入方式治疗 PVO 是一种安全有效的方式。对于不合并肝内高阻力因素的 PVO 患者，只要有可见的流入道（肠系膜上静脉或脾静脉）和流出道（肝内门静脉三、四级分支），可考虑使用 PVR 方式；如果仅具有可见的流入道而流出道闭塞，应考虑 PVR-TIPS 方式。对于合并肝内高阻力因素的 PVO 患者，只要有可见的流入道，均推荐使用 PVR-TIPS 方式。对于流入道和流出道均闭塞的患者，介入方式已无法开通门静脉，可考虑其他介入治疗方式如部分脾栓塞（partial splenic embolization，PSE）进行对症处理。

EPO-1864
慢性下肢深静脉血栓应用球囊挤压联合置管溶栓效果观察

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目的：探讨球囊挤压联合置管溶栓治疗慢性下肢深静脉血栓（LEDVT）的安全性和临床效果。**方法：**选择既往健康的外伤后慢性 LEDVT 成年患者，植入下腔静脉滤器，用小于目标血管（腘静脉）直径 2mm 的球囊扩张挤压碎裂血栓，然后在球囊扩张状态下拖移使血栓移位，随后留置导管溶栓 3～7 d，拔出导管后继续顺行溶栓 3 d，1 个月内取出滤器，随访观察疗效和并发症。**结果：**用球囊挤压联合置管溶栓治疗慢性 LEDVT 29 例均成功，球囊扩张后血管全部即时再通；溶栓 3～10 d 后下肢肿痛消褪，超声复查腘静脉以上深静脉均再通、局部狭窄显著改善，无严重并发症；随访平均近 5 年，临床效果好、其中病程≤3 月者效果最好。**结论：**既往健康的外伤后慢性 LEDVT 患者应用球囊挤压联合置管溶栓治疗安全有效，以病程≤3 个月者为佳。

EPO-1865
Application of the separate gene/drug release segment-covered stent for the treatment of intracranial internal carotid artery aneurysm in dog models and the study of

its endothelialization promotion and in-stent stenosis prevention

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The self-expandable segment-covered stent we have developed demonstrated excellent flexibility, target lesion arrive ability and arterial wall adherence ability when applied to treat aneurysm models and achieved good outcomes. However, after stent placement in vivo, it runs high risks of the endothelial cell creeping delay, prolonged endothelialization, increased chances of thrombosis in stent due to complicated hemodynamic changes in the curved arterial lumen, the coverage of the membrane material and absence of the normal arterial wall component at the aneurysm neck. The covered membrane outside the stent may also increase the foreign bodies contacted to the arterial wall, likely to induce obvious inflammatory reaction, and to result in intimal hyperplasia and in-stent stenosis. In view of this, based on our preliminary studies, we are intend to develop a new kind of self-expandable segment-covered stent based on the separate release of gene/drug techniques, which is able to capture the endothelial progenitor cells in circulation and promote division and growth of the endothelial cells (endothelialization promotion) and inhibit smooth muscle cell proliferation (in-stent stenosis prevention), and to assess its feasibility, safety and efficacy via placing in the aneurysm models, furthermore, to investigate the detailed mechanism of the interactions among the hemodynamics, endothelialization and in-stent stenosis.

EPO-1866
单导丝门静脉定位技术在 TIPS 中的应用

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【摘要】 目的：探讨采用单导丝定位门静脉辅助经颈静脉肝内门体分流（transjugular intrahepatic portosystemic shunt, TIPS）术中肝内门静脉穿刺的有效性及其安全性。**材料与方法：**连续性收集 2017 年 1 月至 2018 年 8 月期间我院 12 例 TIPS 术中采用单导丝定位穿刺门静脉的患者资料。术前通过门静脉 CTV 观察门静脉解剖并预先选定肝内门静脉穿刺点；术中在 B 超引导下采用 21G Chiba 针经皮经肝穿刺肝内门静脉分支，引入 0.014in 导丝，将其远端置于脾静脉内；再以导丝为靶向经肝静脉穿刺门静脉左支或右支主干；穿刺成功后完成后续 TIPS 操作；最后拔除门静脉定位导丝，无需封堵穿刺道。观察门静脉穿刺次数、穿刺成功率及穿刺相关并发症。**结果：**12 例 TIPS 患者肝内门静脉穿刺均获成功，其中 8 例患者采用经III段门静脉分支入路放置细导丝导向经肝静脉穿刺门静脉左支主干建立分流道，4 例患者采用经Ⅷ段门静脉分支入路放置细导丝导向经肝静脉穿刺门静脉右支主干建立分流道。平均穿刺次数为 1.25±0.45 次(1～2 次),穿刺成功率为 100%,患者术后均未出现门静脉穿刺相关并发症。**结论：**采用单导丝定位门静脉辅助 TIPS 术中门静脉穿刺操作简单、安全、有效，适合于 TIPS 分流道穿刺高风险患者。

EPO-1867
血管腔内介入治疗联合抗凝对预防深静脉血栓形成后综合征的价值

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目的：探讨血管腔内介入治疗联合抗凝治疗对预防深静脉血栓形成后综合征的临床价值。**方法：**选取贵州省人民医院介入科 2014 年 2 月至 2016 年 5 月 32 例急性下肢深静脉血栓形成（中央型）患者，分为置管溶栓（CDT)+抗凝（A 组，15 例）， AngioJet 机械血栓抽吸(PTM）+抗凝（B 组，5

例），单纯抗凝治疗（C 组，12 例）。A 组采用经健侧股静脉入路置入下腔静脉滤器，然后在 B 超引导下患侧腘静脉入路插管，保留溶栓导管于股、腘静脉血栓内，定时定量导管内泵人溶栓药物，同时给予全身抗凝治疗。B 组入路选择方法同 A 组，采用 AngioJet 6F 导管予距离病变处 1cm 开始吸栓。C 组采用单纯全身抗凝治疗。比较 3 组患者血栓溶解率及随访期间静脉通畅情况。**结果：**A、B 两组患者均全部置入滤器，溶栓及吸栓治疗后全部成功取出。A 组平均溶栓时间为（78h-120h），B 组平均溶栓时间为（3-58h），P<0.05、差异有统计学意义。溶栓后造影显示 A 组血栓完全溶解 13 例（86.67%）、B 组完全溶解 4 例（80.00%），两组溶栓结果比较差异无统计学意义（P>0.05）。治疗 2 周后 3 组复查下肢静脉 B 超提示：A 组髂股静脉完全通畅 14 例（93.33%）、部分通畅 1 例（6.67%），B 组髂股静脉完全通畅 5 例（100.00%）。C 组髂股静脉 2 例完全再通（16.67%）、10 例部分再通（83.33%），A、B 组间比较差异无统计学意义（P<0.05),A、B 两组与 C 组通畅率比较明显改善、差异有统计学意义（P<0.05）。**结论：**CDT 与 PTM 联合抗凝治疗急性髂股静脉血栓疗效确切，对溶解血栓、预防深静脉血栓形成后综合征疗效优于单纯全身抗凝治疗，其中 PTM 疗效优于 CDT、且 PTM 在治疗时间上较 CDT 明显缩短。

EPO-1868

急诊腔内修复术治疗破裂腹主动脉瘤疗效分析

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目的：探讨急诊腔内修复术治疗破裂腹主动脉瘤的临床疗效。**方法：**纳入 2013 年 7 月至 2018 年 12 月在贵州省人民医院就诊并行急诊腔内修复术的破裂腹主动脉瘤患者 20 例，对其临床资料进行回顾性分析。患者均经急诊全主动脉 CT 血管成像（CTA）确诊为腹主动脉瘤破裂，明确诊断后在全麻下行急诊破裂腹主动脉瘤腔内修复术。术后 1、6 和 12 个月复查主动脉 CTA，其后每年复查 1 次。**结果：**患者的年龄中位数为 65（43，89）岁，男性 15 例、女性 5 例。合并肠系膜血管夹层 1 例，腹主动脉瘤支架术后 I 型内瘘并破裂 1 例、合并双髂动脉瘤 2 例。除 1 例患者于支架术后即刻并发急性心肌梗死抢救无效死亡外，其余 19 例（占 95%）患者均成功完成腹主动脉瘤腔内修复术。就诊至进入手术室时间为（125±23.6）min，手术时间为（118±10.5）min。置入腹主动脉覆膜支架主体共 20 枚，支架延长体 65 枚。术后 48 小时有 1 例患者因“失血性休克死亡”、其余患者随访 30 天内病情稳定、无主要并发症发生。随访 2 年内无内瘘及支架塌陷等并发症发生。**结论：**急诊腔内修复术治疗破裂腹主动脉瘤安全、有效。

EPO-1869

12-months outcomes of uterine artery embolization in patients with symptomatic adenomyosis with and without ovarian endometriosis

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Abstract
PURPOSE *To investigate the mid-term outcomes of uterine artery embolization in patients with symptomatic adenomyosis withand without ovarian endometriosis(OE).*
METHODS *This was a retrospective, single-institute study of 76 patients with adenomyosis who underwent UAE between 2009 and 2016,. These patients were divided into two groups based on whether their diagnosis was complicated with ovarian endometriosis.*

The follow-up review lasted 12 months after UAE. Improvements in dysmenorrhea and menorrhagia were evaluated based on the symptom relief criteria. The improvement rates in both groups were analyzed and compared.
RESULTS *Among the 76 patients, 17 (22.3%) patients had adenomyosis combined with ovarian endometriosis, and 59 (77.6%) patients did not have ovarian endometriosis. In the group with OE, all patients(17/17,100%) had dysmenorrhea and 11 patients(11/17,64.7%) had menorrhagia. In the group without OE, 57 patients(57/59,96.6%) had dysmenorrhea and 50 patients(50/59,84.7%) had menorrhagia. The improvement rates for dysmenorrhea in the two groups[a6] were 47.1% (with OE) and 86.0% (without OE) separately, at the* 12-month follow-up (*P* < 0.05). *The improvement rates for menorrhagia in the two groups were 63.6% (with ovarian endometriosis) and 84.0% (without ovarian endometriosis) at 12 months* (*P*=0.263).
CONCLUSION *Improvement of dysmenorrhea in patients with adenomyosis companying ovarian endometriosis after UAE might be less than those without endometriosis according to the mid-term outcomes. The improvement of menorrhagia in patients with adenomyosis after UAE might not be affected by the ovarian endometriosis.*

EPO-1870
血液透析患者上腔静脉闭塞后锐性再通的有效性和安全性研究

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目的：随着维持性血液透析患者数量的不断增加，血管通路维护的重要性日益凸显，上腔静脉闭塞无疑是对血液透析患者血管资源的巨大破坏。在常规血管内血管成形术无效的情况下，导管相关性上腔静脉闭塞常需要采取锐性再通。本研究旨在评估难治性上腔静脉闭塞后锐性再通的可行性和安全性。
方法：本研究回顾性纳入 2014 年 1 月至 2017 年 11 月在四川大学华西医院诊断为上腔静脉闭塞的血液透析患者。在数字减影血管造影定位引导技术的辅助下，纳入的患者在常规血管内血管成形术失败后接受了上腔静脉闭塞后锐性再通和球囊扩张术，术后置入隧道式涤纶套管，记录并评估相关影像学资料和临床指标。
结果：本研究共纳入了 16 名维持性血液透析患者，所有患者经 DSA 提示中心静脉闭塞的存在，常规介入方法无法穿过导丝，在获得知情同意后接受锐性再通手术。14 名患者手术成功，1 名患者因上腔静脉全节段及部分无名静脉闭塞（闭塞节段长度 7 厘米）导致再通失败，1 名患者因术中突发心律失常而中止手术，手术成功率为 87.5%。2 名患者术后出现了中等程度的心包积液，但在住院期间其血流动力学稳定，未接受其他特殊治疗顺利出院。1 名术中心搏骤停患者在心肺复苏成功后入住重症监护室，3 天后因胃肠道出血去世。出现并发症的 3 名患者使用的球囊直径为 12 毫米，未出现并发症的患者使用的球囊平均直径为 8.67±1.30 毫米。在 5 个月随访中，只有 1 名患者出现了导管功能不良，使用尿激酶封管后恢复通常。随访中未发现手术相关远期并发症。
结论：本研究证实了难治性上腔静脉闭塞后锐性再通的有效性，同时也提示了并发症风险的存在。长节段中心静脉闭塞再通一直是临床难题，该类患者在接受锐性再通之前必须经过严格的准入筛选。本研究亦提示在扩张上腔静脉时应控制球囊的直径以避免相关并发症。严格的患者筛选、精湛的手术操作以及避免上腔静脉的过度扩张，是降低严重手术并发症（如心律失常、心包填塞）风险的有力保证。

EPO-1871
静脉透析右上肢动静脉瘘并右侧头臂静脉闭塞直接穿刺开通疗效及安全性

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目的：右侧头臂静脉狭窄及右侧头臂静脉闭塞为同侧肢体动静脉瘘(arteriovenous fistula, AVF)透析的常见并发症。随着血管内治疗技术的发展，经皮腔内血管成形术（PTA）及经皮血管支架植入术（ PTS ）已成为右侧头臂静脉狭窄性病变的首选治疗方法，但对于少数右侧头臂静脉闭塞患者，常规血管导丝导管介入技术开通失败的患者，我们采用直接穿刺再通技术，具有较高成功率且较安全。**方法:**收集从 2016 年 1 月 1 日至 2018 年 12 月 31 日共 455 例因终末期肾脏病长期在我院接受规律血液透析治疗的患者，筛选出使用右上肢动静脉内瘘作为血液透析通路且因右侧头臂静脉闭塞不能满足血液透析需求或出现肿胀手综合征患者，在我院接受常规导管、导丝开通不成功，最终选择经皮直接穿刺右侧头臂静脉再通治疗的 20 例患者的临床资料，分别在直接穿刺再开通术后 24 小时、第 3、6、12 个月对患者进行随访复查，随访的主要内容为肿胀手症状消退情况、右侧头臂静脉通畅率检查及透析时 AVF 流量监测，对直接穿刺开通术后右侧头臂静脉的通畅时间进行生存资料分析。**结果：**右侧头臂静脉闭塞直接穿刺开通技术成功率 100%，一次性开通技术成功率 17 例(17/19，89.5%)，19 例（19/19，100%）患者术后 24h 肿胀手症状均明显消退。术后 24 小时右侧头臂静脉的首次通畅率为 100%，术后 3 个月首次通畅率为 100%（19/19），术后 6 个月为 89.5%（17/19），术后 9 个月为 78.9%（15/19），术后 12 个月为 68.4%（13/19）。术中出现 2 例胸腔积血，3 例出现纵隔小血肿，2 例出现气胸。**结论：**对于静脉透析右上肢动静脉瘘患者，右侧头臂静脉通路闭塞或有肿胀手综合征，利用经皮直接穿刺闭塞头臂静脉的再通术，为我们延长或再建上肢通路提供的了一种方法。

EPO-1872
射频消融和再切除术治疗原发性肝癌根治性切除术后复发（≤5cm）的疗效对比研究

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背景与目的
肝细胞癌根治性切除后 5 年内复发的风险高达 70%。然而，肝细胞癌切除后复发的最佳治疗方法尚未确。目前，射频消融和再切除是临床上治疗复发肝癌的常用治疗方法。此研究目的是比较射频消融和再切除治疗切除后复发肝癌的疗效和安全性。

材料与方法
本研究为多中心回顾性研究,纳入 2006 年 1 月至 2016 年 1 月原发性肝癌根治性切除术后复发接受射频消融或再切除的病例共 290 例（复发肝癌结节≤3 个，最大结节长径≤5cm），来自山东大学

附属山东省立医院、齐鲁医院、山东第一医科大学第二附属医院、斯坦福大学医学中心和新加坡国立大学医院。研究比较了射频消融和再切除患者并发症、住院时间、总体生存和无进展生存情况及危险因素分析。运用倾向性评分配对，并在配对队列和乙肝患者队列中进行了同样的研究。在亚组分析中，对比了不同肿瘤大小（≤3cm 和 3-5cm）、肿瘤个数（单个和 2-3 个肝癌结节）和 Child 分级（Child A 和 B）的复发肝癌患者接受射频消融和再切除后的总体生存和无进展生存。

结果

研究纳入的 290 例病例中，射频消融 191 例，再切除 99 例。中位随访期为 27 个月(1-149 个月)。总队列中，射频消融和再切除后 1 年，3 年和 5 年总体生存率（p=0.11）和无进展生存率（p=0.80）无统计学差异。射频消融并发症发生率和住院时间优于再切除（严重并发症 0.5%vs.9.1%；轻微并发症 39.3% vs.94.9%；中位住院时间 5 天 vs.14 天，all $p\leqslant 0.001$）。在 PSM 队列和乙肝队列中观察到了类似的结果。亚组分析发现，总队列中 2 或 3 个复发肝癌结节患者，射频消融后的中位总体生存期明显优于再切除 (6.4 年 vs.2.5 年，p=0.009)。

结论

射频消融对切除后复发肝癌与再切除疗效相当，但并发症较少。对于 2 或 3 个复发性肝癌结节的患者，射频消融比再切除更有效、更安全。

EPO-1873

Efficacy and safety of short-term interval TACE-RFA sequential therapy for advanced hepatocellular carcinoma

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To investigate the efficacy and safety of short-term TACE-RFA sequential therapy for advanced hepatocellular carcinoma(HCC). **Method** The clinical data of 117 patients with advanced HCC enrolled in our hospital from March 2010 to January 2019 were retrospectively analyzed. All patients received TACE-RFA sequential therapy. The patients were divided into two groups including short interval (S group, 61 cases) and long interval (L group, 56 cases) according to the interval between TACE and RFA. The differences of response rate and complication between the two group were compared. The median survival time (OS), median progression-free time (PFS) and survival rate were calculated by Kaplan-Meier. The risk factors affected the efficacy of TACE-RFA sequential therapy for advanced HCC were analyzed by cox multivariate analysis. **Result** The total response rate in S group was significantly higher than that in L group (72.13% vs. 41.07%, χ^2=11.50, P=0.00). The PFS (14.9 months vs. 9.1 months, χ^2=5.96, P=0.01) and OS (34.7 months vs. 20.3 months, χ^2=6.66, P= 0.01) in S group was longer than that in L group. Cox analysis showed tumor size (HR=2.42, 95% CI: 1.26～3.69, P=0.001), cirrhosis (HR=2.04, 95% CI: 1.27～3.26, P=0.003), interval (HR=0.44, 95% CI: 0.27～0.71, P=0.001), AST (HR=1.71, 95% CI: 1.05～2.77, P=0.029) were the independent risk factors affecting the efficacy of TACE-RFA sequential therapy for advanced HCC. There was no significant difference in the complication incidence between the two groups (P>0.05). **Conclusion** Short-term interval improves the efficacy of TACE-RFA sequential therapy for advanced HCC, which is a protective factor for advanced HCC

receiving TACE-RFA sequential therapy. Short-term interval TACE-RFA sequential therapy is a safe and effective treatment for advanced HCC.

EPO-1874

Lipiodol-based clinical efficacy prediction and survival prognostication for transcatheter arterial chemoembolization for patients with hepatocellular carcinoma

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Purpose To propose a guidance for lipiodol deposition (LD) classification after transcatheter arterial chemoembolization (TACE) in patients with hepatocellular carcinoma (HCC), and propose non-invasive preoperative and postoperative prognostic models to optimize the potential benefit of TACE for primary HCC.
Methods Existing LD evaluation methods one month after TACE were systematic reviewed to propose the quantitative LD stratification guidance. Potential survival benefit of TACE in first diagnosed HCC patients was quantitatively predicted by a non-invasive preoperative model consisting of preoperative clinical biomarkers. These biomarkers and postoperative LD were then integrated to construct the postoperative prognostic model for time to progression (TTP) prediction. All the results were tested in multiple independent validation datasets.
Results 40 literatures in total 3683 TACE-treated HCC patients were reviewed to propose the LD stratification strategy. The strategy, based on synergetic prognosis effect of LD percentage, pattern, and distribution, and tumor necrosis, classifying LD into three levels. Independent validation on 1302 HCC patients indicated that those who probability unable to benefit from TACE could be detected one-month after TACE by this strategy, without need for conventional imaging monitoring programmes to observe tumor response. Primary tumor size, tumor capsule, and metastasis was employed to construct the preoperative prognostic model based on the training cohort (205 HCC patients, C-index: 0.743). Its prognostic value was demonstrated in internal validation dataset, and two independent validation datasets from another center (192, 103, and 181 patients, C-index<0.69). By adding the postoperative LD, TTP prediction accuracy was significantly improved by the postoperative prognostic model ($p<0.0001$).
Conclusions Based on the proposed LD stratification method, our study provides suggestions for clinical efficacy prediction and survival prognostication of TACE in individual HCC patients.

EPO-1875

Liver Abscess Formation Following Transarterial Chemoembolization: Clinical Features, Risk Factors, Bacteria Spectrum, and Percutaneous Catheter Drainage

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Purpose—To investigate the clinical features, risk factors, and bacterial spectrum of liver abscess following transarterial chemoembolization (TACE) and evaluate the therapeutic effect of percutaneous catheter drainage (PCD) on the abscesses.
Patients and Methods—A retrospective review of patient charts was performed in 3613 patients who suffered from liver malignancies (2832 patients with hepatocellular carcinoma and 781 with metastatic hepatic tumor) and had undergone 11,054 TACE procedures from January 2005 to October 2013. Liver abscesses were found in 21 patients. PCD was performed in all abscess patients. The clinical features, risk factors, and bacterial spectrum of liver abscess following TACE were investigated and the therapeutic effect of PCD was evaluated.
Results—The incidence of liver abscess was 0.58% per patient and 0.19% per procedure. Approximately 57.1% of the patients had a medical history of bilioenteric anastomosis or biliary stent implantation. On CT scans, the abscesses appeared as low-attenuation lesions and high-density iodinate oil scattered in the abscesses. The ultrasound showed the well defined, heterogeneously hypoechoic lesions. Positive microbiological isolates were obtained in all pus cultures and in 47.6% of blood cultures. The most common bacterium was Escherichia coli (52.4%). Twenty patients (95.2%) were cured from abscesses by using PCD, and one died of sepsis.
Conclusions—Patients with predisposing factors are prone to an increased risk of liver abscess following TACE. Bacterial culture and antibiotic sensitivity tests on pus and blood help on the antibiotics selection. PCD combined with aggressive antibiotics can be recommended as the first-line therapeutic regimen.

EPO-1876

Microwave ablation versus cryoablation for treatment of primary and metastatic pulmonary malignant tumors

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Objective At present, minimally invasive surgery is prevalent at home and abroad. Although, there are some comparative studies between microwave ablation and radiofrequency on treatment of lung malignant tumors, there are few studies between microwave ablation and cryoablation. The aim of this study was to retrospectively compare the efficacy and complications of microwave ablation (MWA) and cryoablation in the treatment of malignant pulmonary tumors.**Methods** A retrospective analysis was performed on 48 patients with malignant lung tumors, who were treated with microwave

ablation or cryoablation in our hospital from June 2013 to June 2016. Of these patients, 29 received microwave ablation and 19 received cryablation. Intraprocedural pain was evaluated by using visual analog scale (VAS).. The Intraprocedural pain, response rates, overall survival (OS), and complications rates between the MWA group and cryoablation group were compared. **Results** The results showed that the patients in the MWA group felt more pain than those in cryoablation group. The VAS scores in the MWA group were much higher than those in cryoablation group ($P<0.05$). The overall response rates of microwave ablation group [72.41% (21/29)] was not significantly different from cryoablation group [73.68% (14/19)] ($P = 0.92$). The 6-, 12-, 24-, 36-month overall survival (OS) rates in MWA group and cryoablation group were 92.72%, 81.28%, 64.54%, 54.91% and 94.07%, 81.13%, 57.33%, 43.04% respectively. No significant differences were found in the OS rate between the two groups ($P = 0.79$). The complication rates in the microwave ablation group was 34.48% (10/29) and in the cryoablation group was 42.10% (10/19). There was no significant difference between the two groups ($P = 0.59$). No patients died during the peri-operative period. **Conclusion** Cryoablation had similar therapeutic effect compared with microwave ablation in the treatment of pulmonary malignant tumors, but with less pain.

EPO-1877

Efficacy of Transcatheter Arterial Chemoembolization (TACE) Combined with Microwave Ablation (MWA) in The Treatment of Early And Intermediate Stage Hepatocellular Carcinoma > 5cm: A Meta-analysis

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Background For early and intermediate stage (BCLC classification) hepatocellular carcinoma (HCC) with a diameter >5 cm that cannot be surgically resected, hepatic arterial chemoembolization (TACE) or ablation alone has limited curative effect. The purpose of this study was to summarize the clinical efficacy of hepatic arterial chemoembolization combined with microwave ablation (MWA) compared with TACE alone in the treatment of early and intermediate stage hepatocellular carcinoma with tumor size > 5cm.

Method PubMed, The China National Knowledge Infrastructure (CNKI) and Wan Fang electrotic databases were searched according to inclusion and exclusion criteria to collect randomized controlled trials (RCTs) and cohort studies which were evaluated according to the Cochrane risk Assessment tools and Newcastle - Ottawa Quality Assessment Scale (NOS), respectively. For the homogeneous study, Meta-analysis was performed using Stata15.0 software. The relative risk (RR) was used as the effect indicator to analyze the clinical efficacy and the 1-, 2-, and 3-year survival rates of the MWA+TACE group (combined group) and the TACE group (control group).

Result A total of 20 articles (1736 patients) were included. Meta-analysis showed that the 1-, 2-, and 3-year survival rates of the combination group were significantly higher than those of the control group (1 year survival rate: RR = 1.36, 95% CI: 1.28-

1.44, P < 0.001; 2-year survival rate: RR = 1.31, 95% CI: 1.40-1.74, P < 0.001; 3-year survival rate: RR = 2.07, 95% CI: 1.67-2.57, P < 0.001). Complete response (CR), partial response (PR) and effective rate were higher in the combined group than in the control group, and the difference was statistically significant (P < 0.001). stable disease (SD), progress disease (PD) rate in the combination group were lower than those in the control group, and the difference was statistically significant (P < 0.001). Egger test or Begg test showed no significant publication bias. Sensitivity analysis did not show statistical significance.
Conclusions The short-term and long-term effects of TACE combined with MWA on early and intermediate stage hepatocellular carcinoma with tumor size >5cm were superior to TACE alone.

EPO-1878
脊柱肿瘤外科治疗前血管栓塞术的意义与价值

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目的：探讨椎体肿瘤外科手术前血管栓塞术对脊柱肿瘤外科手术治疗的意义与价值。方法：选取近年来我院十来例有椎体肿瘤及其相关临床症状的患者，在手术前行“椎体肿瘤血管栓塞术”，再进行外科椎体肿瘤切除及重建术，并与对照组（选取近年来术前未行椎体肿瘤血管栓塞术的患者）进行对比。结果：栓塞组的术中出血量平均约 2100ml，手术时间约 3～4 小时，术中出血量及手术时间明显缩短，手术视野更清晰，异体血的输注及其所带来的并发症和不良后果将大大减少，手术成功率比非栓塞组高，术后并发症也相对减少。结论：在脊柱肿瘤行外科手术治疗之前，行“椎体肿瘤血管栓塞术”，可降低术中出血量及异体血的输注，并且减少肿瘤血供有利于降低手术操作的难度，提高肿瘤的切除率。因此，椎体肿瘤血管栓塞术具有较好的临床应用前景与价值，是椎体肿瘤患者临床治疗的一种新方法，也为临床医生处理椎体肿瘤手术提供了一种全新的思路和全新的视角。

EPO-1879
Intra-procedural Transcatheter Intra-arterial Contrast-enhanced Ultrasonography as a Predictor of Tumor Response in Conventional Transarterial Chemoembolization for Hepatocellular Carcinoma

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PURPOSE
To evaluate whether intraprocedural corona enhancement and intratumor perfusion features of intra-procedural transcatheter intraarterial contrast-enhanced ultrasonography(ICEU) can predict tumor response on follow-up contrast-enhanced magnetic resonance imaging (CE-MRI) in patients with hepatocellular carcinoma (HCC) treated with conventional transarterial chemoembolization (cTACE).

METHOD AND MATERIALS
This IRB approved, prospective analysis included 39 patients with 51 HCC target lesions, who underwent cTACE with ICEU. CE-MRI was acquired at baseline and 1 month after cTACE. Tumor response on CE-MRI was assessed using modified Response Evaluation Criteria in Solid Tumors (mRECIST). Nonparametric spearman rank order correlation were used to correlate the percentage of intratumor perfusion,, and the peak value and sickness of corona enhancement of ICEU immediately after cTACE with tumor response.

RESULTS
39 patients with 51 target lesions were assessed tumor response. CR were 22(43.1%) PR SD PD The percentage of intratumor perfusion correlated strongly with tumor response on CE-MRI (Spearman rho=0.513, p<0.001). The peak value and sickness of corona enhancement showed the more strongly correlation with tumor response on CE-MRI respectively (Spearman rho=0.671, p<0.001, rho=0.704, p<0.001)

CONCLUSION
Combination of intratumor perfusion and corona enhancement features on intra-procedural ICEU can be used to predict tumor response on follow-up CE-MRI.

EPO-1880
TACE 治疗原发性肝细胞肝癌中洛铂导致血小板减少的回顾性研究

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目的 探讨经导管肝动脉化疗栓塞术治疗原发性肝细胞肝癌中，单用洛铂作为化疗药物，术后发生血小板减少的情况 **材料与方法** 回顾性分析我院 2013 年 5 月至 2018 年 5 月行 TACE 治疗的 HCC 患者 1945 人次，其中第一次使用洛铂患者 1289 例，第二次使用洛铂 417 例，第三次及以上使用洛铂 239 人次，回顾性分析其性别、年龄、术前多项检查指标（血小板水平、肝功能评级、AFP 水平）及腹水情况、术前有无消化道溃疡、术后初期（3-7 天）和远期（21-90 天）两期的血小板水平。按照 WHO 抗癌药血液学毒副反应的分度标准评价血小板水平。 **结果** 介入前血小板水平正常（WHO 标准 0 度）的 HCC 患者，经单用洛铂为化疗药的 TACE 治疗后，介入后初期轻度减少（WHO 标准 I 度）、中度减少（WHO 标准 II 度）、重度减少（WHO 标准 III 度和 IV 度）发生率分别为 16.50%、10.47%、4.88%，介入后远期血小板三种程度减少的发生率分别为 13.25%、4.73%、1.65%。介入前血小板水平轻度减少患者，介入后初期血小板三种程度减少的发生率分别为 29.52%、47.14%、16.19%，介入后远期的发生率分别为 30.92%、26.32%、8.55%。介入前血小板水平中度减少患者，介入后初期三种程度减少发生率分别为 6.63%、43.09%、48.07%，介入后远期发生率分别为 15.71%、46.43%、30.71%。介入后初期减少程度更重，与远期的差别有统计学意义。介入后血小板减少的水平与使用洛铂的周期无关。 **结论** 单用洛铂为化疗药的 TACE 治疗 HCC 患者，介入后远期的血小板减少发生率不高，比较安全；且介入后血小板减少的发生有一定的特点，探讨这些特点可以指导临床，可以减少血小板减少的发生率或有效地针对性给予对症支持治疗。

EPO-1881
经眼动脉灌注化疗治疗视网膜母细胞瘤的临床研究

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目的：探讨经眼动脉灌注化疗（Intra-arterial chemotherapy, IAC）治疗视网膜母细胞瘤（Retinoblastoma，RB）患儿保眼率、生存率以及不良反应，为临床评估 RB 患儿预后及指导个体化治疗提供临床参考。
材料与方法：回顾性分析广州市妇女儿童医疗中心 2009 年 4 月至 2016 年 4 月介入血管瘤科收治行 IAC 治疗的 271 例(305 只患眼)视网膜母细胞瘤患儿，对其临床特征、治疗情况、患者保眼率及生存率进行研究；采用 Kaplan-Meier 法绘制保眼率生存曲线与生存曲线，对性别、国际眼内 RB 肿瘤的分级、年龄、术前的治疗史等因素与疗效的关系进行单因素分析，用 COX 比例风险模型探讨 RB 预后影响因素。
结果：共有全部 271 例患儿纳入研究，患儿 IAC 术后中位随访时间为 15 个月（1～96 个月），246 例生存（5 年生存率 92.8%），15 例死亡。经眼动脉灌注化疗共 943 次（中位 3 次）。246 例生存患儿自最后一次 IAC 治疗日开始，RB 患儿最短保眼时间 1 月，最长保眼时间 96 月，5 年总体保眼率为 63.1%，根据 IIRC 分期，其中 A 期（n=1）、B 期（n=12）、C 期（n=22）RB 患者随访时间内保眼率为 100%，D 期（n=208）1 年保眼率为 77.4%，2 年保眼率为 74.1%，3 年保眼率为 70.0%，5 年生为 64.1%；E 期（n=42）1 年保眼率为 42.9%，2 年保眼率为 32.2%，3 年保眼率为 26.8%，5 年保眼率为 26.8%； 经单因素分析结果显示，临床分期与 RB 患儿保眼率有统计学关联。多因素 COX 回归分析显示 IIRC 分期(RR3.866, 95% CI：2.558-5.843)是 RB 患者保眼率的影响因素。
结论：IAC 是一种安全有效的治疗 RB 方法。肿瘤分期是影响其保眼率的重要因素，治疗史、性别、治疗时年龄对保眼率无统计学意义，为临床提供了重要参考。
关键词：经眼动脉灌注化疗

EPO-1882
磷脂酰肌醇-3 激酶调节亚基 1 的过度表达对肝细胞癌进展的影响

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目的： 研究磷脂酰肌醇-3 激酶调节亚基 1（Phosphoinositide-3-kinase, regulatory subunit 1，PIK3R1）的表达对肝细胞癌（Hepatocellular carcinoma，HCC）进展的影响。**方法：**HCC 组织中 PIK3R1 的表达由免疫组化和 qRT-PCR 检测。不同 HCC 细胞系中 PIK3R1 的 mRNA 和蛋白表达通过 qRT-PCR 和 Western blot 检测，然后选择 MHCC97H 和 HCCLM3 细胞作为模型研究 PIK3R1 对 HCC 进展的影响。 通过 MTT 实验，克隆形成实验，划痕愈合实验和流式细胞术评估 PIK3R1 下调对 HCC 细胞株增殖、迁移和凋亡的影响。 进行蛋白质印迹分析以评估 PI3K/AKT/mTOR 信号传导途径的表达变化。**结果：**下调 PIK3R1 的表达能够抑制 HCC 细胞株的增殖和迁移并促进细胞凋亡。另外，我们证明了 PIK3R1 的下调抑制了 MHCC97H 和 HCCLM3 细胞中的 p-PI3K、p-AKT 和 p-mTOR 的表达。**结论：**PIK3R1 在 HCC 中表达显著上调，沉默 PIK3R1 能抑制 HCC 细胞株的增殖、迁移并加速凋亡，其可能是将来肝癌治疗的一个潜在靶点。

EPO-1883
长链非编码 RNA 尿路上皮癌相关基因 1 的表达在宫颈癌顺铂耐药性中的研究

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目的： 研究长链非编码 RNA (long non-coding RNA, lncRNA)尿路上皮癌相关基因 1(urothelial cancer associated 1, UCA1)的表达对宫颈癌顺铂耐药性的影响。**方法：**使用递增剂量顺铂和高剂量刺激建立顺铂耐药的宫颈癌 HeLa 细胞株，然后用实时荧光定量 PCR 法检测 UCA1 在 HeLa 细胞和 Hela/DDP 细胞中的表达水平，并采用 CCK-8 法、EDU 法、流式细胞仪分析 HeLa 细胞的增殖活性，了解 UCA1 过表达对宫颈癌细胞生长的影响；通过 qRT-PCR 分析评价 UCA1- siRNA 敲除 UCA1 表达，用 CCK-8 法、EDU 法和流式细胞术测定 Hela/DDP 细胞的增殖活性；最后用 qPCR 法分析 caspase-3、p21、survivin 和 CDK2 在各组细胞中的表达水平。**结果：**UCA1 的过表达能够通过促进宫颈癌细胞的增殖和抑制其细胞凋亡来诱导顺铂耐药，敲除 UCA1 可显著降低宫颈癌细胞对顺铂的耐药性；UCA1 参与了调控宫颈癌细胞凋亡和增殖的信号通路，其通过下调 caspase-3 和上调 CDK2 来抑制宫颈癌细胞的凋亡，通过增加 survivin 水平和降低 p21 水平来促进宫颈癌细胞的增殖。**结论：**UCA1 可能在宫颈癌顺铂耐药中发挥重要作用，UCA1 表达水平的上调会促进宫颈癌细胞对顺铂的耐药性。因此，UCA1 将来可能是一个宫颈癌治疗新策略的潜在靶点。

EPO-1884
M2 型丙酮酸激酶同工酶的表达对肝细胞肝癌化疗敏感性的影响

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目的： 研究 M2 型丙酮酸激酶同工酶(Pyruvate kinase isozyme type M2，PKM2)对肝癌细胞 HepG2 增殖、迁移、侵袭及细胞凋亡的影响，探讨 PKM2 的表达对肝细胞癌化疗敏感性的影响。**方法：**通过免疫印迹（Western blotting，WB）和荧光定量聚合酶链式反应（Quantitative Real-time PCR，qRT-PCR）检测正常肝细胞株 HL-7702 与肝癌细胞株 HepG2 中 PKM2 的蛋白和 mRNA 的表达水平，构建靶向 PKM2 基因的重组质粒（PKM2-siRNA）及其对照质粒（siRNA-NC）并转染到 HepG2 细胞中，WB 和 qRT-PCR 检测 PKM2 的敲低情况，细胞克隆形成实验、Transwell 趋化实验及 TUNEL 实验分析 PKM2 的表达对细胞增殖、迁移侵袭能力以及凋亡的影响。用不同浓度的多柔比星（Doxorubicin，DOX）处理各组细胞后通过 CCK-8 实验及 TUNEL 实验检测细胞活性及凋亡情况。**结果：**HepG2 细胞株中 PKM2 的蛋白和 mRNA 的表达较 HL-7702 显著上调（mRNA 1.01±0.01 vs. 5.04±0.02;蛋白 1.34±0.04 vs. 4.03±0.02，$P<0.05$）。转染 PKM2-siRNA 的 HepG2 细胞中 PKM2 在转录和翻译水平的表达显著降低；细胞克隆形成率、细胞侵袭数均低于空白转染组和转染 siRNA-NC 的对照组；细胞凋亡率高于空白转染组和转染 siRNA-NC 的对照组；DOX 的半数抑制浓度（IC50）为 7.25μg/ml，转染 siRNA-NC 的对照组 IC50 为 18.51μg/ml，随着 DOX 给药浓度增加，细胞凋亡率明显增加，转染 PKM2-siRNA 细胞组的凋亡数明显高于转染 siRNA-NC 的对照组

（P<0.05）。**结论：**敲低 PKM2 的表达能抑制其细胞增殖及迁移侵袭能力，促进细胞凋亡并增强对多柔比星化疗的敏感性

EPO-1885
CT 引导下经皮肺穿刺活检减少并发症的研究

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目的：探讨 CT 引导下经皮肺穿刺活检对于肺部疾病诊断的应用价值及操作安全性。
方法：回顾性分析 2017 年 1 月至 2018 年 7 月在淄矿集团有限责任公司中心医院及中国人们解放军总医院行 CT 引导下经皮穿刺活检的患者 861 例，分析其穿刺结果及并发症发生情况。
结果：861 例患者均成功完成穿刺操作，结节性病变 296 例，团块状病变 405 例，肺实变病变 77 例，磨玻璃样病灶 83 例。病理学诊断恶性病变 736 例，明确诊断率 90.7%，提示性诊断率 6.3%，非特异性诊断率 3%。良性病变 125 例，明确诊断率 49.6%，提示性诊断率 21.6%，非特异性诊断率 28.8%。并发症出现气胸 77 例（8.9%），结节样病变发生率最高（15.2%）；肺出血 103 例（11.9%），磨玻璃样病变发生率最高（20.4%）；胸膜反应 17 例（1.9%）；穿刺后心腔内出现气体 2 例（0.2%）。
结论：在 CT 引导下经皮肺穿刺活检术，安全实用，并发症少，有助于尽早明确诊断，对恶性病变的确诊率高于良性病变。

EPO-1886
CT 引导下非小细胞肺癌耐药后再次肺穿刺活检的可行性及突变分析

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目的：探索非小细胞肺癌耐药后再次行 CT 引导下肺穿刺活检后的可行性及突变状态分析。
方法：回顾性研究 2017-2018 年郑州大学第一附属医院进行的 220 例 CT 引导下非小细胞肺癌经过 EGFR-TKI 和（或）化疗治疗后再次活检患者病例。
结果：220 例患者平均年龄 58.7±9.8 岁，腺癌多见；共活检 220 次，穿刺成功率 100%，55.9%在原发病灶取材，多为实性结节，肺内进针平均深度为 2.4±1.8cm，平均手术时间 13.8±5.6min；并发症发生率为 31.8%，主要包括气胸 41 例（18.6%）和出血 24 例（10.9%）；恶性细胞检出率为 91.8%（202/220），4 例（2%）肺腺癌 EGFR-TKIs 治疗后转化为小细胞肺癌；治疗后 EGFR 基因突变不一致率为 53.8%（49/91），45 例（49.5%）出现 T790M 获得性耐药突变；19 缺失突变伴 T790M 突变最常见，占 38.5%。
结论：NSCLC 患者治疗耐药后再次行肺穿刺活检是安全可行的，可为病理诊断及分子分析提供足够样本；治疗前后 EGFR 基因突变具有较大差异性；组织学活检可以阐释耐药机制，为靶向药物治疗失败或耐药的患者后续治疗方案提供指导意义。

EPO-1887

肝癌合并门静脉癌栓术后辅助肝动脉化疗栓塞联合门静脉化疗的效果评价：meta 分析

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目的：系统评价肝癌（HCC）合并门静脉癌栓（PVTT）患者术后辅助肝动脉化疗栓塞（TACE）联合门静脉化疗（PVC）的临床疗效及安全性。
方法：通过计算机检索 Cochrane Library、PubMed、Medline、EMbase、Web of Science、中国生物医学文献数据库、中国知网、万方及维普等数据库，纳入比较 HCC 合并 PVTT 患者术后辅助 TACE、TACE 联合 PVC 临床效果的对照研究，检索时间均从建库至 2019 年 5 月 31 日，采用 Review Manager 5.3 进行 meta 分析，用比值比（OR）及 95%可信区间（CI）评价生存率、无复发生存率。
结果：共纳入 10 项研究，其中术后 TACE 组 355 例、TACE 联合 PVC 组 319 例。Meta 分析结果表明：联合组 1 年、2 年、3 年生存率均优于单纯 TACE 组，两组差异有统计学意义（*OR*=2.20，95%*CI*：1.53-3.17，*P*＜0.001；*OR*=2.44，95%*CI*：1.69-3.53，*P*＜0.001；*OR*=2.30，95%*CI*：1.52-3.46，*P*＜0.001）。同时，联合组 1 年、2 年、3 年术后无复发生存率也优于单纯 TACE 组，两组差异有统计学意义（*OR*=2.30，95%*CI*：1.52-3.46，*P*＜0.0001；*OR*=2.27，95%*CI*：1.19-4.32，*P*=0.01；*OR*=3.03，95%*CI*：1.55-5.92，*P*=0.001）。主要不良反应为发热、恶心呕吐、肝功能不全，未发现 TACE 联合 PVC 治疗相关死亡病例报道。
结论：HCC 合并 PVTT 患者辅助 TACE 联合 PVC 治疗可提高术后生存率并降低复发率，且明显优于单纯辅助 TACE 治疗。但由于纳入病例数较少，文献质量不高，该结论尚需多中心、前瞻性随机对照研究进一步证实。

EPO-1888

Perioperative nursing care of patients with renal hamartoma undergoing interventional therapy

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Objective: to explore the perioperative nursing care of patients with renal hamartoma. Methods: the perioperative nursing points of patients with renal hamartoma were summarized.The contents include: psychological nursing of patients before intervention, patients due to lack of knowledge of related diseases, and to be treated under local anesthesia, will produce tension and fear. To give patients more sympathy, care and consideration before operation, and according to the characteristics of psychological changes, psychological nursing can improve patients' compliance to operation by means of psychological counseling, help and encouragement.Fasting for 4 hours and water forbidding for 2 hours before operation, we should also pay attention to the pulsatility of the distal artery at the puncture site, which is convenient for the control during operation and after operation. The vital signs of the patients were observed closely after intervention, and the bleeding and hematomas occurred at the puncture site. Observe the fluctuation of the dorsal artery of the affected foot, as well as the temperature, color and so on.Encourage patients to eat more fresh vegetables, fruits, drinking more water, promote defecation and diarrhea, if necessary, use Kaisailu. Tell the patient to reduce activity to reduce bleeding.Postoperative complications include vascular bleeding, injury and edema, arteriovenous fistula and thrombus complications, so it is necessary to closely observe the changes of the

disease, pay attention to the body temperature and, if necessary, cooperate with physical and drug cooling. To observe whether the patients have embolic side renal pain and gastrointestinal reaction, mild nausea and aneurysm rupture are serious complications of endovascular intervention, The patient must be told to stay in bed to reduce the activity of the patients, monitor the changes of vital signs, and effectively prevent the occurrence of this complications.
Results: After careful care, 5 patients with renal hamartoma were discharged from hospital without complications.
Conclusion: strengthening the perioperative nursing care of patients with renal hamartoma can reduce the occurrence of postoperative complications and improve the satisfaction of patients, which is worthy of clinical promotion.

EPO-1889

Arsenic trioxide delivery by mitochondrial-targeted triphenylphosphine-coated mesoporous nano-zirconium dioxide combined with microwave therapy improves the efficacy of hepatocellular carcinoma treatment

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Background: Arsenic trioxide is effective in the treatment of hematological malignancies and solid tumors. However, its toxicity and side effects are severe, posing an obstacle in its clinical application, especially in tumors which are not sensitive to chemotherapeutic drugs. **Methods:** We constructed a controlled-release arsenic trioxide carrier with mitochondrial targeting. The safety and efficacy *in vitro* were investigated using a hemolysis test, cytotoxicity, proliferation, migration, apoptosis, and other changes in cell behavior. The safety and efficacy were verified *in vivo* by hematoxylin-eosin staining, TdT-mediated dUTP nick end labeling staining and blood test in tumor-bearing mice. Immunohistochemical and western blotting experiments were conducted to explore the mechanism of combination therapy of the material and microwave hyperthermia *in vitro*. **Results:** We demonstrated that the nano-zirconia loading platform may be used to administer the broad-spectrum chemotherapy drug, arsenic trioxide, with local, precision-controlled release, and mitochondrial targeting. Furthermore, we showed the safety of this approach for delivering high doses of arsenic trioxide. In addition, we explored this new method in combination with *in vitro* microwave heat therapy, providing a potentially novel intravenous chemotherapy approach. **Conclusion:** We described a new non-invasive treatment that improved the efficacy of arsenic trioxide chemotherapy for hepatocellular carcinoma through nano-zirconia carriers.

EPO-1890

The efficacy of transarterial chemoembolization combined with iodine 125 seeds implantation versus transarterial chemoembolization combined with radiofrequency ablation in the treatment of early-intermediate hepatocellular carcinoma

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Abstract
Background
Radiofrequency ablation (RFA) plus transarterial embolization (TACE) does present good efficacy on patients with early-intermediate hepatocellular (HCC). However, RFA cannot be used to treat some special patients with early HCC. This study is to evaluate the efficacy of TACE with iodine 125 seeds implantation compared with TACE combined with RFA in the treatment of patients with early-intermediate HCC.
Methods
From January 1, 2014 to May 31, 2018, 134 patients with early-intermediate HCC were included in this research. Among them, 47 patients received TACE-iodine 125 treatment, 87 patients received TACE-RFA treatment. The efficacy of both treatments was compared. To reduced selective bias, propensity score matching (PSM) analysis was used to analyze the outcomes of both treatments.
Results
Before PSM, the median OS of TACE-RFA group was slightly longer than TACE-iodine 125 group (42 months vs 37 months), and the median PFS of TACE-RFA group was slightly longer than TACE-iodine 125 group (18 months vs 15 months). However, there was no significant difference of median OS and PFS between the two groups (P>0.05). There was no significant difference of ORR between the two groups (P>0.05). Subgroup analysis results showed that TACE-RFA subgroup had similar median OS and PFS compared with TACE-iodine 125 subgroup (P>0.05). After PSM, 35 pairs patients were matched, and there was no significant difference of median OS and PFS between the two groups.
Conclusion
TACE-iodine 125 seeds implantation might be an efficient treatment for patients with early-intermediate HCC.

EPO-1891

125I 粒子腹腔神经节植入术治疗局部进展期胰头癌疼痛的价值研究

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目的　评价超声引导下 ^{125}I 粒子腹腔神经节植入治疗不可切除及复发胰头癌顽固性癌痛的疗效以及其安全性。
方法　对 18 例不能切除的胰头癌患者及 7 例术后局部复发患者行超声引导下 ^{125}I 粒子腹腔神经节植入术，术前禁食 4—6h，静脉输注 0.9%氯化钠 500～1000ml，仰卧位，常规腹部皮肤消毒，术者及助手做放射防护，经皮经胃穿刺，于腹腔动脉干旁，调整超声探头方向，进行穿刺距离测量，采用血流多普勒避开血管，经活检孔道插入穿刺针，负压持续吸引下进行穿刺，到达靶部位后，拔出穿刺针针芯，粒子枪释放粒子，通过针芯送入粒子至靶部位，穿刺完毕，拔出穿刺针；按照同样方法，对其他神经节种植粒子。术中全程监测氧饱和度及心率、呼吸、血压等生命体征。术中及术后 3 天静滴盐酸环丙沙星 400mg。术后 2 天行上腹部 CT 增强扫描及摄腹部平片了解粒子定位情况术后每周随访 1 次，观察腹痛评分、麻醉药物的使用情况并记录手术相关的并发症。

结果　所有患者均一次性手术成功，平均每例患者植人 4 枚粒子(2—6 枚)。术后 1 周，1 例患者出现疼痛缓解，4 例患者疼痛略有进展。术后 2 周，患者的疼痛评分由平均 7.56 分降至 3.36 分($P<0.05$)，所需要麻醉药物的剂量由术前 87.60　mg 迅速减少到 50.00mg($P<0.05$)，随访过程中在其生存期内一直维持在较低水平，无 1 例出现进展；并发症胃潴留 1 例，腹泻 2 例，站立性晕厥 1 例，辅助治疗后消失。

结论　超声引导下 ^{125}I 粒子腹腔神经节植入术，对效缓解不可切除及复发胰头癌顽固性癌痛安全有效。

EPO-1892

NRF2/ABCB1-mediated efflux and PARP1-mediated dampening of DNA damage contribute to doxorubicin resistance in chronic hypoxic HepG2 cells

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Transarterial chemoembolization (TACE)-induced hypoxia can trigger residual liver cancer cells to present a more aggressive phenotype associated with chemoresistance, but the underlying mechanisms are still unknown. In this study, the human liver cancer cell line HepG2 was pre-cultured in different oxygen environments to examine the possible mechanisms of hypoxia-induced doxorubicin resistance. Our study showed that HepG2 cells pre-cultured in a chronic intermittent hypoxic environment exhibited significant resistance to doxorubicin, evidenced by increased intracellular doxorubicin efflux, relatively higher cell proliferation, lower apoptosis and decreased DNA damage. These changes were accompanied by high levels of NRF2 and ABCB1 under conditions of both chronic and acute hypoxia; and PARP1 gene expression only under conditions of chronic hypoxia. SiRNA-mediated silencing of NRF2 gene expression down-regulated the expression of ABCB1 and increased the intracellular doxorubicin accumulation and cell apoptosis both in acute and chronic hypoxic HepG2 cells. Moreover, silencing of PARP1 gene expression increased the doxorubicin-induced DNA damage and cell apoptosis in chronic hypoxic cells. On the basis of these findings, we concluded that NRF2/ABCB1-mediated efflux and PARP1-mediated DNA repair contribute to doxorubicin resistance in chronic hypoxic HepG2 cells.

EPO-1893

Combining transcatheter arterial embolization with iodized oil containing Apatinib inhibits HCC growth and metastasis

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PURPOSE
To investigate the treatment effect and mechanism of combining transcatheter arterial embolization (TAE) with adopted iodized oil containing Apatinib on suppressing tumor growth and metastasis.
METHOD AND MATERIALS
In vivo study, 40 tumor-bearing rabbits were randomly divided into four groups and respectively treated transarterially with saline (Group NS); iodized oil containing Apatinib (Group AI); iodized oil alone (Group I); Apatinib solution (Group A). Tumor harvest, sectioning and Immuno-histochemistry, and the tumor growth rates of each group were measured. And in vitro experiment, HUVECs were cultured with different concentration gradients Apatinib(0, 1, 10, 50μmol/L, 24h) in the culture medium of HepG2 with normal oxygen or hypoxia. The effect and mechanism of Apatinib was explored by bioassays, and the PI3K-akt, RAF-mek-erk and P38MAPK pathways were detected.
RESULTS
The tumor growth rate of Group AI was significantly lower than other three groups ($P=0.000<0.01$), and the result was further confirmed by CCK-8 assays. Immunohistochemistry results showed that CD31 of Group AI was significantly lower than that of the other three groups ($P<0.01$). Apatinib have a stronger inhibitory effect of multiplication, migration and invasion of HUVECs in anoxic environment rather than in normoxia. Apatinib inhibits HUVECs proliferation by down-regulating the PI3K-akt, RAF-mek-erk and P38MAPK pathways.
CONCLUSION
Combining TAE with adopted iodized oil containing Apatinib has a stronger inhibitory effect in VX2 liver tumors. Apatinib inhibits the angiogenesis and growth of liver cancer by down-regulating the PI3K-akt, RAF-mek-erk and P38MAPK pathways, and has a stronger inhibitory effect in hypoxic environments.

EPO-1894

肝动脉化疗栓塞联合射频消融治疗巴塞罗那 A 或 B 期肝癌的 临床分析

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目的：评估经导管动脉化疗栓塞术联合射频消融术对巴塞罗那 A 期或 B 期原发性肝癌患者的治疗效果和安全性，并且探讨适合联合治疗的肿瘤直径大小，从而评估哪些患者能够从中获益。
方法：回顾性分析我科 2009 年 9 月至 2018 年 9 月 399 例符合条件的患者。其中 TACE 联合 RFA 组有 128 例患者，单纯 TACE 组有 271 例患者。治疗后观察比较两组患者的总生存期，无进展生存期，肿瘤的治疗应答反应和并发症等方面的差异。
结果：TACE 联合 RFA 组患者 1，3，5，8 年的生存率高于单纯 TACE 组患者的生存率（*P*<0.001）。TACE 联合 RFA 组患者 1，3，5，8 年的无进展生存率明显高于单纯 TACE 组患者的无进展生存率（*P*<0.001）。亚组分析结果显示，对于 3-5cm 组的患者，TACE 联合 RFA 治疗与单纯 TACE 治疗的 1 年生存率无统计学差异（*P*=0.05），而接受联合治疗的患者的 3，5，8 年生存率均明显优于接受单纯 TACE 治疗的患者的 3，5，8 年生存率。采用 TACE 联合 RFA 治疗的其余三个亚组患者的 1，3，5，8 年生存率均高于采用单纯 TACE 组患者。四个亚组患者的 1，3，5，8 年无进展生存率统计结果显示，TACE 联合 RFA 组优于单纯 TACE 组。死亡风险曲线和决策树模型结果表明，单纯 TACE 组患者死亡风险明显高于 TACE 联合 RFA 组。
结论：TACE 联合 RFA 能够显著提高 BCLC A 或 B 期 HCC 患者的 OS，延长患者的 PFS，同时较为安全。此外，对于不同肿瘤直径大小的 BCLC A 或 B 期 HCC 患者，TACE 联合 RFA 治疗均能使其获益，并且肿瘤直径越大，获益程度越高。

EPO-1895
中性粒细胞与淋巴细胞比值在晚期肝细胞癌接受肝动脉化疗栓塞联合阿帕替尼治疗的预后意义

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目的：中性粒细胞与淋巴细胞比值（NLR）被认为是肝癌治疗预后的一个影响因素。目前，肝动脉化疗栓塞术（TACE）联合阿帕替尼治疗晚期肝细胞癌在临床上已经有前瞻性的应用。本研究目的在于探讨 TACE 治疗术前 NLR 水平在接受 TACE 联合阿帕替尼治疗晚期肝细胞癌的预后意义。
材料和方法：本研究回顾性分析符合纳入和排除标准的 57 名巴塞罗那分期 C 期（BCLC-C）的肝细胞癌并接受 TACE 联合阿帕替尼治疗的患者的临床资料，分析第一次 TACE 术前外周血 NLR 的水平与预后生存的关系。采用受试者工作生存曲线（ROC）确定 NLR 的最佳截止值，并采用 COX 回归多因素分析影响晚期肝细胞癌的预后因素。
结果：ROC 曲线求得出在接受 TACE 联合阿帕替尼的肝癌患者中，在 TACE 术前患者 NLR 的截止值是 2.46。NLR>=2.46（54%）定义为 NLR 高水平组，该组患者的中位生存时间为 6.2 月{95%CI：5.0-7.4}，NLR<2.46（46%）定义为 NLR 低水平组，该组患者的中位生存时间为 8.9 月{95%CI：7.2-11.2}，两组患者的中位生存时间差异具有统计学意义（P<0.05）。在 COX 回归多因素分析结果显示，ECOG 评分>=1 分（P<0.05）、腹水（P<0.05）、肝性脑病（P<0.05）均为影响患者预后的危险因素。
结论：在 BCLC-C 期肝细胞癌患者接受 TACE 联合阿帕替尼治疗的患者中，在第一次 TACE 术前监测外周血 NLR 水平对患者的治疗效果具有预测意义，NLR 水平越高，则患者可能预后越差。

EPO-1896

Transcatheter arterial embolization combined with hypoxia-replicative oncolytic adenovirus perfusion enhances the therapeutic effect of hepatic carcinoma

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Abstract
Purpose: Transcatheter arterial embolization (TAE) or transcatheter arterial chemoembolization (TACE) has become a critical therapy for unresectable hepatocarcinoma (HCC). Although hypoxia caused by embolization can induce apoptosis and necrosis of the majority of tumor cells, a small proportion of cells can survive with hypoxia and chemotherapy resistance. HIF-1α induced by hypoxia is the key factor rendering surviving tumor cells invasive and metastatic properties. Thus, we generated a synthetic hypoxia-replicative oncolytic adenovirus (HYAD) expecting to further eliminated the surviving tumor cells which expressed HIF-1α.
methods: In our study, we detected protein expression, proliferation, apoptosis and necrosis of hepatic tumor cell line when infected with HYAD under hypoxia and normoxia. And we constructed VX2 hepatic cancer rabbit models to explore the therapeutic effect of transcatheter arterial embolization combined with HYAD perfusion under Digital Subtraction Angiography (DSA). Inhibition of tumor growth and invasion was detected by histopathological examination and contrast-enhanced CT scan.
Results: Experiments in vitro verified that HYAD expressed and replicated along with HIF-1α expression or hypoxia. Compared with wild adenovirus type 5 (WT), HYAD expressed more higher under hypoxia, which was the main principle of HYAD killing surviving tumor cells post transarterial embolization. In vivo experiment of VX2 models, HYAD perfusion combined with PVA embolization achieved the highest expression quantity and the longest expression duration compared with simple HYAD perfusion, WT perfusion combined with PVA embolization and simple WT perfusion. Because adenovirus expression protein E1A had the properties of promoting apoptosis, inhibiting invasion and inhibiting metastasis, HYAD perfusion combined with PVA embolization group efficiently repressed tumor growth and intrahepatic metastases compared to other processing groups.
Conclusion: HYAD can overcome the hypoxic tumor microenvironment post-embolization and target the surviving tumor cells with specificity. In turn, HYAD perfusion combined with PVA embolization can bring out the best effect in each other.

EPO-1897

急症介入放射学体系-

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急症介入诊疗学是介入放射学的重要组成部分,经过近 40 年的发展，其早已由成为临床急救的重要手段，经血管和非血管途径的介入技术在救治危重患者中的作用也受到肯定和重视；急症介入诊疗

学的特点包括：微创性、可重复性、定位准确、疗效好，见效快、并发症发生率低和可与其他诊疗技术配合，而与介入放射学相比，外科治疗风险大,内科疗效不佳。介入急症诊疗范围包括：1.活动性出血疾病的急症介入诊疗，其中创伤是导致出血的最常见原因，其次是溃疡、肿瘤、炎症等腐蚀血管造成出血。当药物治疗、支持治疗（输血及血液制品）、外科治疗等止血失败者，应首先考虑做血管内介入止血治疗。活动性出血性疾病的急症介入诊疗技术包括定位诊断（有时可提供疾病的定性诊断信息）和治疗双重作用。2. 急性缺血性疾病的急症介入诊疗，急性动脉栓塞：常由于风湿性心脏病、房颤、心梗后、心内膜炎等激发心腔内血栓脱落，引起急性动脉闭塞；急症介入可了解血管闭塞部位和范围，酌情做经导管取栓、抽吸血栓和溶栓治疗，必要时可置入支架开通阻塞血管；急性动脉血栓形成：继发于动脉粥样硬化、创伤、邻近肿物或肿块压迫等。其中急性脑梗塞的急症介入溶栓治疗对出现急性脑梗死症状 6h 内的患者是行之有效的方法(注意急症 CT 鉴别脑出血和梗死)；3. 急性静脉系统血栓形成的急症介入诊疗，包括肺动脉栓塞，上肢-上腔静脉血栓形成和急性肠系膜静脉血栓形成等急症的介入诊疗；4.医源性并发症的急症介入诊疗，包括穿刺活检术后大出血，血管损伤及医源性异物等急症的介入诊疗；5. 器官移植术后的急症介入诊疗，主要包括肝脏、肾脏移植术后发生的急性出血、血管吻合口狭窄及闭塞等急症的介入诊疗；6.其他疾病的急症诊疗，包括各部位的急性炎症、急性腔道阻塞和重症梗阻性黄疸等急症的介入诊疗。

EPO-1898

Image-Guided Radiofrequency Hyperthermia-Enhanced Direct Chemotherapy of Hepatic Tumors: The Underlying BioMolecular Mechanisms

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For thermal ablation of unresectable primary and metastatic liver malignancies, RFA is universally adapted, well studied, and recommended by different organizations around the world, while use of MWA has been increasing in the recent years. Both techniques can be applied for up to 3-5 lesions in a single treatment session. However, to date the two thermal ablations are basically best suited for treatment of small tumors (< 3 cm). For ablation of medium (3-5 cm) to large (5-7 cm) hepatic lesions, these thermal ablations usually suffer from the drawback of incomplete ablation at the tumor periphery, leaving a positive tumor margin. This is attributed to the challenge of creating an effective and safe ablative zone with a 1-cm surgical margin or “clear safety margin” beyond the tumor confinement using the current thermal ablation technology. This setback is often caused by 1) RFA heat carried away by neighboring vasculatures at the tumor periphery (so-called “heat-sink” effect); 2) intentional avoidance of MWA’s rapid over-heating by the operator in order to protect adjacent critical structures (such as vasculatures, bile ducts, gastrointestinal tracts, and diaphragm); and 3) infiltrative growth patterns of malignant tumors to form micro-satellite lesions or micro-venous tumor emboli at the 1-cm surgical margin of ablated tumors. Recent studies from our group and others have successfully confirmed that image-guided interventional radiofrequency hyperthermia (RFH, at a sub-lethal

temperature <60℃) can greatly enhance chemo-, gene-, and immunotherapies of various malignancies, including hepatic tumors.[1, 2]
The recognized mechanisms of RFH-enhanced therapies include tissue fracture via heating, increased permeability of cytoplasmic membranes, disruption of cellular metabolism, and activation of the heat shock protein pathway.[3] These mechanisms effectively facilitate the entrance of therapeutic agents into target tumor cells, and thereby promote the destruction of tumor tissue.
In this project, we aimed to revolutionize the treatment capability of RFA technology in medium-to-large liver tumors, by developing a novel, "one-stop-shop" interventional oncologic technique, named "Image-guided and RFA-associated RFH-enhanced direct chemo-destruction of tumor cells at malignant tumor margin"

EPO-1899
膈下肝癌经肝动脉化疗栓塞联合射频消融的临床疗效分析

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目的 评估经肝动脉化疗栓塞（TACE）联合射频消融（RFA）治疗膈下肝癌的安全性与有效性。
方法 选取我科 2014 年 3 月～2018 年 11 月行肝动脉化疗栓塞联合射频消融治疗的膈下肝癌患者 55 例。随访期间，评估所有患者术后肿瘤反应及生存率，比较治疗前后血生化、AFP 及肝功能指标变化，并总结患者术后并发症的发生情况。
结果 在 55 例肝癌患者共 61 处膈下病灶中，30 处病灶（49.2%）完全缓解（CR），24 处病灶（39.3%）部分缓解（PR），7 处病灶（11.5%）疾病稳定（SD），无病灶疾病进展（PD）。客观反应率（ORR）为 88.5%，疾病控制率（DCR）为 100%，所有患者均获益。治疗前后肝功能及血生化指标无明显差异（P＞0.05），但 AFP 差异具有统计学意义（t=3.277,p＜0.05）。所有患者在围手术期内未出现严重并发症。
结论 经肝动脉化疗栓塞联合射频消融对膈下肝癌治疗效果显著。在射频消融治疗过程中出现的疼痛，通过术前静脉滴注氟比洛芬酯或地佐辛并联合利多卡因局麻，术中加入适量利多卡因与生理盐水 1:1 稀释液经进水孔对肿瘤病灶进行灌注麻醉，必要时给予吗啡肌注，可显著缓解患者疼痛。

EPO-1900
双模式自显影栓塞微球介入治疗肝癌的实验研究

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目的：栓塞剂是评价经导管肝动脉栓塞治疗肿瘤疗效的关键。本研究采用微流控技术制备一种具有双模式 T1/T2 加权磁共振成像的聚乙烯醇复合微球，证实其具有良好的磁热效应、显影性及栓塞效果。
方法：本研究将 Gd_2O_3和 Fe_3O_4纳米粒子分别作为 T1 和 T2 加权磁共振成像造影剂，通过微流控一步法制备纳米聚乙烯醇微球。采用 VX2 荷瘤兔模型，评价其安全性，观察 TAE 对肝癌生长、坏死和增殖的影响。采用瘤内注射法对微球在动物体内 MR 成像效果进行评价。
结果：Gd_2O_3/Fe_3O_4@PVA 微球具有良好的 MRI 显影效果、栓塞效果及磁热效应，生物安全性高。

结论：Gd_2O_3/Fe_3O4@PVA 微球不仅可以作为栓塞剂用于 TAE 治疗，而且由于 Fe_3O_4纳米粒的超顺磁性和 Gd_2O_3纳米粒的成像性，使其具有良好的磁热效应和双模式 T1 和 T2 加权磁共振成像的特性。
关键词：纳米栓塞微球；微流控；自显影

EPO-1901
联合改良呼吸训练方案与对比剂稀释法：减少磁共振 GD-EOB-DTPA 上腹部增强肝脏动脉期一过性伪影的初步研究

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目的：对比渐进式与非渐进式呼吸训练方案磁共振(Magnetic Resonance, MR)钆塞酸二钠(Gadoxetic acid，GD-EOB-DTPA)上腹部增强检查肝脏动脉期图像质量，选取优势训练方案对比剂稀释 50%采集动脉期图像与非稀释法对比，优化呼吸训练和扫描方案。
方法：2019 年 5 月-8 月在我科行 MR 上腹部 GD-EOB-DTPA 增强检查患者，纳入人口统计资料(性别、年龄、体重指数和疾病分布)无差异且完成 MR 检查的两组患者，第一组，渐进式呼吸训练法，26 名患者，先行吸气后 5 秒闭气，全腹无起伏达标，之后闭气时间延长至 10 秒，15 秒到 20 秒。第二组，33 名患者，吸气后直接闭气 20 秒，达标要求同第一组。两组患者对比剂均采用每秒 1 毫升的注射速度进行高压注射，之后相同速度注射 20 毫升生理盐水，GD-EOB-DTPA 注射剂量为每千克 0.1 毫升，透视法采集。动脉期图像质量评分标准，1 分=无呼吸伪影，2 分=轻度呼吸伪影可诊断，3 分=中度呼吸伪影可诊断，4 分=重度呼吸伪影可诊断，5 分=无法诊断。评估每名患者动脉期图像呼吸伪影，肝动脉，门静脉，腹主动脉，肝脏实质的图像评分，计算总分，Mann-Whitney 检验比较差异性。图像优质组训练法纳入第三组人口统计学无差异患者 21 名，对比剂稀释 50%，注射速度变为每秒 2 毫升，再行动脉期图像评估比较。
结果：第一组呼吸伪影，肝动脉，门静脉，腹主动脉，肝脏实质评分及总分略优于第二组对应指标评分，但差异显著性不大（P=0.141, 1, 0.192, 0.733, 0.529, 0.318）。第二组呼吸训练方案，对比剂稀释法动脉期各项评分略优于对比剂非稀释法动脉期各项评分，其中肝动脉更优(P=0.023)。
结论：采用直接闭气 20 秒呼吸训练方案，GD-EOB-DTPA 稀释 50%注射法可明显降低一过性呼吸运动产生的呼吸伪影。

EPO-1902
Gd-EOB-DTPA MRI 上类似肝细胞癌强化的肝脏结节：影像诊断困境

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背景：肝细胞癌（HCC）是最常见的原发性肝脏恶性肿瘤，其诊断可基于影像诊断而不依赖病理学。 HCC 的典型表现是动脉期高强化、门静脉或延迟期廓清、假包膜。CT 和 MRI，尤其是 Gd-EOB-DTPA MRI，提高了 HCC 检出和诊断准确性，但 HCC 的误诊在临床实践中并不少见，假阳性诊断可导致不必要的治疗。
方法：我们报告了 8 例类似 HCC 强化的肝脏结节的假阳性病例，分析其临床和病理特征，加强认识，以减少误诊。

方法：回顾性分析 8 例患者（5 例男性，3 例女性，年龄范围 46-69）包括 9 个肝脏病变的临床特征和病理特征，所有患者均行 Gd-EOB-DTPA MRI 检查，所有病灶强化类似 HCC。
结果：术前诊断为 HCC 1 例，肝腺瘤可能但 HCC 不能排除 1 例。仅 1 例 AFP 轻度升高，1 例 AFP 及 CA199 轻度升高。7 例患者接受肝切除术，2 例行穿刺活检。最终结果为 2 例（3 个病灶）是混合型肝细胞-胆管癌（cHCC-CC）、1 例恶性 T 细胞淋巴瘤、1 例 DN，这些患者伴肝硬化或慢性肝炎病史；1 例淋巴滤泡瘤样增生和 1 例血管平滑肌脂肪瘤（AML）、1 例肝转移性胃肠道间质瘤、1 例非肝细胞来源恶性肿瘤（因组织坏死严重未能定性），这些患者无 HCC 危险因素。
结论：总之，虽然 HCC 患者通常伴有慢性肝病，但一些良性病变如 AML、DN 和淋巴滤泡瘤样增生以及恶性病变例如 cHCC-CC、淋巴瘤等表现可类似 HCC，导致诊断困难。当血清 AFP 正常且患者没有 HCC 的危险因素，应考虑其他鉴别诊断。

EPO-1903
磁化传递技术评价 II 型糖尿病患者早期肾功能改变的初步研究

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目的：采用磁共振磁化传递技术（Magnetization transfer，MT）研究 II 型糖尿病患者早期肾脏微观结构的改变。
方法：选择 14 例临床诊断为Ⅰ期 II 型糖尿病肾病的患者作为观察组，35 例健康志愿者作为对照组。采用西门子 Skyra 3.0T 磁共振扫描仪，体部 18 通道相控阵表面线圈对所有被试进行双肾磁共振 MT 扫描。MT 扫描采用 3D 扰相梯度回波序列，该序列扫描 2 次，第一次为不添加 MT 射频脉冲信号（MTOFF），第二次为添加 MT 射频脉冲信号（MTON）。根据公式 MTR＝（MTOFF－MTON）×100／MTOFF 计算出 MTR，以百分数表示。在双肾上极、肾门、下极肾皮髓质绘制多个感兴趣区，测量相应磁化传递率并取平均值记录。采用两样本 t 检验比较组间皮髓质 MTR 值差异（P＜0.05 有统计学意义）。ROC 曲线分析 MTR 值在Ⅰ期 II 型糖尿病肾病诊断中的敏感性和特异性。
结果：两组被试肾髓质的 MTR 值均高于皮质（表 1）。相较对照组，观察组肾皮质和髓质的 MTR 值升高，且具有统计学意义（p <0.05）（表 1，图 1）。ROC 分析发现，肾髓质 MTR 值Ⅰ期 II 型糖尿病肾病诊断效能曲线下面积（*Area under the curve* ，AUC）为 0.798，敏感性和特异性分别为 78.60％和 85.70％；肾皮质 MTR 值的诊断效能与肾髓质无统计学差异 （Delong’s 检验，$Z = 0.718$，$P = 0.473$），AUC 为 0.843，敏感性和特异性分别是 78.60％和 80.00％（表 2，图 2）。
结论：MT 可用于早期糖尿病肾病的筛查，为早期糖尿病肾病的临床变化提供更科学的依据；MTR 值可以评估早期糖尿病肾病引起的肾脏微观结构损害，对肾功能的评价具有潜在应用价值。

EPO-1904
IVIM 联合 DTI 对急性胰腺炎定量诊断与严重程度分级研究

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目的：研究体素内不相干运动扩散加权成像（intravoxel incoherent motion diffusion-weighted imaging, IVIM-DWI）与扩散张量成像（diffusion tensor imaging, DTI)对急性胰腺炎（Acute Pancreatitis, AP）的定量诊断和严重程度分级的评估价值。**方法**：采用 3.0T MR 对 85 例 AP 患者和 30 例健康自愿者行上腹部常规、IVIM 和 DTI 序列扫描，测量胰腺单指数模型下参数（Standard average diffusion coefficient, ADC)及双指数模型下的参数（Slow ADC、Fast ADC 及 Fraction of fast ADC，Ff ADC）和 DTI 的参数（ADC 和 fractional anisotropy, FA)。比较其对 AP 的诊断效能，并与 AP MR 严重程度指数（MR severity Index, MRSI）进行相关分析。**结果**：AP 组与健康组 Standard ADC、Ff ADC 及 DTI 的 ADC、FA 差异具有统计学意义，Slow ADC、Fast ADC 值差异无统计学意义。Standard ADC、Ff ADC、DTI 的 ADC、FA 有诊断效能（曲线下面积分别为 0.692、0.707、0.676、0.669， P ＜0.05)，但四者之间诊断效能差异无统计学意义。Standard ADC、Ff ADC、DTI 的 ADC、FA 与 AP MR 严重程度指数之间呈负相关（R 分别为-0.419、-0.271、-0.391、-0.339，P＜0.05)，而 slow ADC、fast ADC 值与 MRSI 评分不具有相关性。 **结论**：胰腺的 IVIM 和 DTI 参数对 AP 有较好的诊断价值，其值的大小与 AP MR 严重程度指数呈负相关。因此，胰腺的 IVIM 和 DTI 参数的测量可作为诊断 AP 和严重程度影像分期的依据之一。

EPO-1905
国产压缩感知技术在肝脏磁共振检查中的应用研究

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磁共振在疾病诊断与鉴别诊断的应用日益重要，但肝脏扫描期相精准捕捉较困难，与病 屏气配合程度、自身体循环及对 剂注射流速相关，在 定程度上影响了对肿瘤不同期相的表现捕捉。压缩感知是 种新的信号采集理论，利用信号的稀疏性特点，通过非相 式采样及 线性迭代重建来恢复完整的图像信息。通过结合压缩感知技术使磁共振极大地提高扫描速度，且同时保证不牺牲空间分辨率，一次 屏气获得 48 个期相（0.5 秒/期相），全 肝覆盖。因此，在一定程度上它对于肝脏肿瘤磁共振血供动态捕捉具有独 特优势，可以精确获得多动脉期图像 ，为 HCC 的检出提供最直接的诊断依 据。

虽然发展迅速，各项研究均表明其应用的可行性，但是到目前仍然没有在临床进行广泛的应用。主要原因有以下几点：一次性采集多个期相会产生大量的临床图像数据，虽然较传统方法可以提供更为充足的信息，但从中筛选最有诊断价值的图像往往需要花费较多时间，给报告医生增加了工作负担；由于 CS 重建技术需要大量迭代计算，传统的方法往往需要花费很长时间，不能满足高通量临床检查的日常需求；如何与其他成像技术结合也是亟待解决的问题。

无论如何，CS-MRI 快速成像都能极大地缩短扫描时间，提高了 MR 检查的舒适性，减少了运动伪影，提供肿瘤不同期相的血供捕捉，如同并行采集技术一样，必将成为肝脏磁共振检查革命性的新技术。

EPO-1906
流入反转恢复 MR 血管成像在肾动脉成像的可行性研究

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目的 比较肾动脉流入反转恢复 MR 血管成像（NC FIRM MRA）和增强 MR 血管成像（CE-MRA）的图像质量，探讨肾动脉 NC FIRM MRA 的价值。

方法 前瞻性收集因病情所需行肾动脉 CE-MRA 检查的 73 例患者，均行肾动脉 NC FIRM MRA 检查。由 2 名高年资放射科医师单独阅片，分别对不同检查方法的图像行肾动脉图像质量评分及肾动脉分支显示评分，分别采用配对样本的 Wilcoxon 符号秩检验和 2 检验进行比较。结果 NC FIRM MRA 和 CE-MRA 的肾动脉图像质量评分差异无统计学意义（P＞0.05），对各程度狭窄的正确诊断率之间不具有统计学差异(P＞0.05)。NC FIRM MRA 和 CE-MRA 图像的肾动脉分支显示差异有统计学意义（P<0.05）。

结果 NC FIRM MRA 和 CE-MRA 的肾动脉图像质量评分差异无统计学意义（P＞0.05）。NC FIRM MRA 和 CE-MRA 图像的肾动脉分支显示差异有统计学意义（P<0.05）。

结论 CE-MRA 和 NC FIRM MRA 对肾动脉各级分支的显示差异有统计学意义，而对于肾动脉主干及狭窄及图像质量的显示差异无统计学意义。由于 NC FIRM MRA 成像无需注入对比剂，没有对比剂肾病的潜在危险，并且可以短期内重复检查，可以作为肾动脉狭窄的初步筛查手段。

EPO-1907
主胰管胰头段水平角及开角方向与急性胰腺炎相关性的 MRI 研究

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目的：探讨主胰管胰头段水平角及开角方向与急性胰腺炎相关性。材料与方法：回顾性连续收集临床及上腹部 MRI 检查确定为急性胰腺炎患者 119 例，按纳入和排除标准入选 32 例为观察组，同期收集 49 例正常胰腺为对照组。两组均行 MRCP，数据上传至工作站行图像处理，在主胰管显示清晰完整的层面上连续三次测量主胰管胰头段及主胰管头尾两端连线与水平线的夹角，记录平均数值及主胰管胰头段水平角方向并行统计学分析。结果：急性胰腺炎组，主胰管胰头段及主胰管头尾两端连线与水平线的夹角分别为 28.19±18.97° 和 31.24±11.74°，其中，而正常胰腺组为 28.77±18.38° 和 28.16±10.52°（t=0.137/-1.168; P=0.981/0.247 ）。32 例急性胰腺炎组中，主胰管胰头段开角向上 19 例，主胰管胰头段与水平线的夹角为 30.93±19.76°， 向下 13 例，其夹角为 15.67±6.93°；49 例正常胰腺组，开角方向上 40 例，主胰管胰头段与水平线的夹角为 31.72±18.91°， 向下 9 例，其夹角为 24.18±17.75°。急性胰腺炎组与正常胰腺组，向上或向下开角方向，主胰管胰头段与水平线的夹角均无统计学意义（t=-0.146/0.883; P=-1.360/0.189 ），而主胰管胰头段与水平线的开角方向具有统计学差异（ x^2=4.847，P=0.041）。全部病例中向上开角的角度（31.46±19.12°）与向下开角的角度（20.69±14.72°）间有统计学差异（t=2.398，P=0.019）。结论：急性胰腺炎与主胰管胰头段水平角大小无关，但与水平角的开角方向密切有关，临床急性胰腺炎多以开角向下方向为主。

EPO-1908
DCE-MRI 灌注成像对中低位 LARC 新辅助放化疗应答的预测及评估价值

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目的 探讨 DCE-MRI 灌注成像对中低位局部进展期直肠癌（LARC）新辅助放化疗（CRT）疗效的预测及评估价值。方法 前瞻性纳入 41 例符合纳入排除标准的中低位 LARC 患者作为研究对象。每位患者均在 CRT 前 1 周内、完成 CRT 后 6-10 周后行常规 MRI 及 DCE-MRI 检查，在完成 CRT 且 MRI 检查

后 1 周内行全系膜切除术及术后标本病检。根据肿瘤退缩分级（TRG）评分系统，将患者病理结果分为 CRT 有应答组与无应答组、CRT 反应良好组与不良组，比较灌注参数在各组间及组内的差异性；差异有统计学意义的参数绘制相应 ROC 曲线、计算 AUC 并确定阈值。结果 ①有应答组 CRT 前 Ktrans 高于无应答组（$p<0.05$），CRT 后两组间各灌注参数差异均无统计学意义。Ktrans 预测 CRT 有应答组 AUC 值 0.954，当 Ktrans=0.122 min^{-1} 时约登指数最大。②应答良好组 CRT 前 Ktrans 值高于不良组、CRT 后低于不良组（$p<0.05$）。Ktrans 值预测 CRT 反应良好组 AUC 值 0.953，当 Ktrans=0.158 min^{-1} 时约登指数最大。③CRT 应答良好组与应答不良组 CRT 治疗前、后自身灌注参数比较，应答良好组 CRT 前 Ktrans、kep 值高于 CRT 后（$p<0.05$），应答不良组 CRT 前 Ktrans 值高于 CRT 后（$p<0.05$）。CRT 前、后灌注参数变化百分比结果显示应答良好组 ΔKtrans 和 ΔKep 高于应答不良组，ΔKtrans 及 ΔKep 值评估 CRT 反应良好的 AUC 分别为 0.952、0.764，且 ΔKtrans 的 AUC 值大于 ΔKep（Z=2.063,p=0.039），当 ΔKtrans=-38.8%时约登指数最大。结论 DCE-MRI 灌注参数特别是 Ktrans 值对中低位 LARC 患者的 CRT 疗效预测及评估具有一定的指导价值。

EPO-1909

IVIM-MRI 与 DCE-MRI 在鉴别直肠癌良恶性淋巴结的价值比较

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目的： 评估体内不相干运动成像（intravoxel incoherent motion magnetic resonance imaging，IVIM-MRI）和磁共振动态对比增强（dynamic contrast-enhanced MRI，DCE-MRI）对直肠癌患者转移性和非转移性淋巴结的鉴别诊断价值。 并探讨 IVIM 与 DCE 相关灌注参数在鉴别直肠癌良恶性淋巴结之间的关系。
方法： 所有患者术前行 IVIM 及 DCE 检查，将淋巴结的原始 IVIM 及 DCE 数据导入后处理工作站，分别得相关参数（standard ADC， D，D*，f， Ktrans，Kep， Ve，Vp ，TTP，MAX Conc ，AUC and MAXSlope)，应用独立样本 t 检验比较良恶性淋巴结之间短径、IVIM 及 DCE 参数之间的差异性，利用 Pearson 相关性分析分析 IVIM 与 DCE 灌注参数之间的相关性。

结果： 本研究共收集 60 例（149 个淋巴结）经手术病理证实的直肠癌患者。转移性淋巴结的 D，Ktrans，Ve 及 TTP 值明显大于非转移性淋巴结，并具有统计学意义(P <0.05)；转移性淋巴结的 standard ADC 和 Kep 大于非转移性淋巴结，转移性淋巴结的 D*, f , Vp, MAX Conc ,AUC 和 MAXSlope 小于非转移性淋巴结，但是以上均无统计学意义（P> 0.05）。

结论： D，Ktrans，Ve 及 TTP 对鉴别直肠癌良恶性淋巴结具有价值，但 IVIM 与 DCE 相关灌注参数在鉴别直肠癌良恶性淋巴结之间无相关性。

EPO-1910

宫颈小细胞神经内分泌癌的 MRI 诊断

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摘要 目的 分析宫颈小细胞神经内分泌癌（SCCC）的 MRI 表现，以提高对该病的诊断水平。**方法** 回顾性分析 3 例 SCCC 患者的临床及影像学资料，重点分析其 MRI 表现。**结果** SCCC 平扫 T1WI 均为

低信号，T2WI 信号混杂，以中等稍高信号为主，DWI 上扩散受限呈明显高信号，ADC 图呈明显低信号，3 例平均 ADC 值为 0.699×$10^{-3}$$mm^2$/s。增强后扫描，2 例动脉期不均匀明显强化，1 例不均匀轻度强化，延迟期 3 例持续性强化。3 例发生盆腔淋巴结转移，2 例发生远处骨转移，转移淋巴结融合呈块状，边界模糊，较大者 T2 信号不均匀，增强后呈花环状或结节状明显强化。**结论** SCCC 有特征性表现，T2 信号不均匀，ADC 值比较低，淋巴结转移常见，且较易融合成大块状，这些有助于临床精确诊断 SCCC。

EPO-1911

附件区肿瘤与同侧卵巢关系的磁共振成像研究

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【目的】探讨附件区肿瘤与同侧卵巢的 MRI 形态学关系，为肿瘤的定位和定性诊断提供帮助。
【材料与方法】回顾性分析经手术和病理证实的 496 个附件区肿瘤患者（卵巢来源 400 个，非卵巢来源 96 个；良性 183 个，交界性 120 个，恶性 193 个）的临床及 MRI 资料，观察和比较不同来源、良恶性、构型的附件区肿瘤同侧卵巢显示情况及所显示的卵巢形态，同时分析附件区肿瘤同侧卵巢的显示与患者年龄、月经状态以及肿瘤大小的关系。
【结果】卵巢来源的肿瘤同侧卵巢显示率为 23%，非卵巢肿瘤同侧卵巢显示率为 45%，两者差异有统计学意义（$p < 0.001$）；卵巢肿瘤中仅 7%可见正常的卵圆形同侧卵巢，而非卵巢肿瘤中有 26%可见正常形态的同侧卵巢结构（$p < 0.001$）。良性肿瘤同侧卵巢显示率为 38%，交界性肿瘤为 35%，恶性肿瘤为 11%，差异有统计学意义（$p < 0.001$）；囊性肿瘤同侧卵巢显示率为 24%，囊实性肿瘤为 27%，实性肿瘤为 28%，差异无统计学意义（$p = 0.737$）；附件区肿瘤同侧卵巢显示在绝经前患者为 40%，绝经后仅为 7%，差异有统计学意义（$p < 0.001$）。同侧卵巢显示组患者平均年龄 35 ± 10 岁小于未显示组 48 ± 15 岁，差异有统计学意义（$p < 0.001$）；附件区肿瘤同侧卵巢显示组最大径平均为 9.2 ± 4.8 cm，未显示组最大径平均为 10 ± 5.3 cm，两组肿瘤在最大径方面差异没有统计学意义（$p = 0.148$）。
【结论】附件区肿瘤同侧卵巢的显示与肿瘤来源、肿瘤良恶性、及与患者的年龄和月经状态有关。同侧卵巢的显示有助于附件区肿瘤的定位和定性诊断，它更多见于非卵巢来源肿瘤，也可见于卵巢良性或交界性肿瘤。

EPO-1912

Value of clinical application of MRCP on the biliary anastomotic stricture after liver transplantation

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Objective Combining with the clinical manifestations and the follow-up changes of laboratory indicators after the treatment for biliary stricture, to investigate the correlation between imaging findings of biliary anastomotic stricture (AS) following orthotopic liver transplantation on MRCP and its prognosis.
Methods Collect a total of 21 patients with 29 cases of MRCP examinations. Two readers independently observe and record the findings of MRCP about the anastomotic

site, abnormal signal inside or around the biliary and the degree of biliary dilation. Combined with the follow-up changes of patients clinical symptoms (abdominal pain, fever, jaundice, etc.) and laboratory indicators (T - BIL, D - BIL, CRP, GGT and ALP, AST, ALT, etc.) after the treatment for biliary stricture to evaluate the prognosis including the single treatment effect, biliary stricture recurrence, showing up other biliary complications. Then we analyze the correlation between imaging findings of biliary AS on MRCP and its prognostic indicators.

Results In the 29 cases of MRCP examinations, 20 cases of single treatment were effective, 9 cases of single treatment was ineffective. Fisher's exact test was conducted on the correlation between the MRCP sign of biliary AS and the single treatment effect. The test results suggest that the single treatment effect of different stricture sites had statistical significance, P value < 0.05, and the single treatment effect of stricture site in the lower common biliary was poor. The difference in the therapeutic effect of different degrees of stricture was statistically significant, P < 0.05. The single treatment effect of mild to moderate stricture was better. There was no statistically significant difference in single treatment between different degrees of biliary dilation and abnormal signals inside or around the biliary lumen, and both with P value of > 0.05.

Conclusions This study preliminarily explored the correlation between some MRCP findings of biliary AS and the prognostic indicators. The single treatment effect of mild to moderate AS was better, and stenosis in the lower common bile duct was worse. MRCP findings has certain application value in evaluating prognosis of patients and guiding the clinical decision.

EPO-1913

Deep learning with Convolutional Neural Network for Predicting Fuhrman Grade of Clear Cell Renal Cell Carcinoma at MSCT

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Purpose: To investigate diagnostic performance by using a deep learning method with a convolutional neural network for the prediction of histologic grade in clear cell RCC at dynamic contrast agent-enhanced computed tomography.

Methods and Materials: In this institutional review board-approved clinical retrospective study from January 2013 to July 2018, patients with clear cell RCC were identified from the pathology database. There were 69 low grade ccRCC patients and 28 high grade ccRCC patients. The 97 cases comprised 72 males and 25 females with a mean age of 55.64 years (range 28-83 years). All patients were examined with a 320-slice dynamic volume CT by using same four phase renal protocol (unenhanced phase, corticomedullary phase, nephrographic phase and excretory phase). The first and second step of preprocess are in the same method with section one. A total number of 4936

segmented images (there were 390, 1499, 1547, and 1500 images for unenhanced phase, corticomedullary phase, nephrographic phase and excretory phase respectively) assign for 97patients were collected as the experiment data. The third step is to place all the images into the train folder containing two folders with two categories, category 0=negative (with all images of low grade ccRCCs) and category 1=positive (with all images of high grade ccRCCs). The CNN was composed of four convolutional layers, four maximum pooling layers, a flatten layer and three fully connected layers. The process used in building models was consistent with section one. The diagnostic performance of CNN models in differentiating grade of ccRCC were evaluated by using a receiver operating characteristic (ROC) analysis. The area under the receiver operating characteristic curve (AUC) for each model was calculated. The mean AUCs of six different models were compared by DeLong's test. A P value of less than 0.05 was considered to indicate a statistically significant difference.
Results: The mean AUC for distinguishing low-grade ccRCC and high-grade ccRCC inmodel unenhanced, model corticomedullar, model nephrographic, model excretory, model enhanced and model quadruple with the test data cohorts was 0.55 (95% CI: 0.49,0.61), 0.77 (95% CI: 0.74,0.79), 0.76 (95% CI: 0.74,0.79), 0.69 (95% CI: 0.66,0.72), 0.78 (95% CI: 0.76, 0.79), 0.75 (95% CI: 0.74, 0.77).
Conclusion: Our results show that maybe the CNN models except model unenhanced could be used to differentiate the Fuhrman grade of ccRCC at dynamic CT. This technique requires further validation on a larger scale prior to implementation into clinical practice.

EPO-1914
自身免疫性胰腺炎假包膜征的 MRI 表现及诊断价值研究

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目的：分析自身免疫性胰腺炎（AIP）假包膜征在不同 MR 脉冲序列的表现，探讨其诊断价值。
方法：回顾性分析北京友谊医院 2014 年 12 月-2019 年 2 月间收住院的 46 例 AIP 患者的临床及 MRI 影像资料。收纳标准：有完整的 MRI 影像学资料，经过血清学检查、病理检查及临床治疗随访观察确诊为 AIP，所有患者均有随访记录。排除标准：检查资料不全，未确诊以及中断随访的患者。最终共纳入符合诊断标准的 AIP 患者 46 例。其中男性 40 例，女性 6 例，平均年龄 58±7.4 岁。分析胰腺病变的 MRI 表现，观察胰腺周围是否出现“假包膜征“及其假包膜征在不同 MR 脉冲序列的表现。
结果：MRI 显示“假包膜征“39 例，占比为 84.8%。包膜部分覆盖胰腺 24 例，完全覆盖胰腺 15 例。包膜在双回波 T1WI 及 FSE T2WI 呈低信号，DWI（b=800）呈低信号，静脉注射钆对比剂后脂肪抑制 FSPGR T1WI 动态增强扫描呈渐进性强化，延迟期强化较明显。
结论：自身免疫性胰腺炎假包膜征的 MRI 表现有一定特征，认识不同 MR 脉冲序列上假包膜征的表现有助于提高 AIP 诊断水平。

EPO-1915
前列腺 MR 集合序列重建高 b 值 DWI 图像临床价值

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目的：探究前列腺 MR 集合（MAGIC）序列用低 b 值 DWI 图像重建高 b 值 DWI 图像的临床应用价值。
材料与方法：56 例患者均采用（Siemens, MAGNETOM Prisma, 3.0T）行前列腺常规序列 MR 扫描及 MAGIC 序列 MR 扫描，以常规 DWI 图像与 MAGIC 序列以低 b 值重建的高 b 值 DWI 序列（MAGIC DWI）为研究对象，由两位由 2 年以上读片经验的影像科大夫分别就常规 DWI 与 MAGIC DWI 的图像质量进行评分，并分别读片，意见不同时由 5 年以上读片经验的上级大夫做最终评判。以常规 T2 图像为参照计算病灶检出率。采用 SPSS. Statistics. 25.0 行配对 t 检验，比较常规 DWI 与 MAGIC DWI 之间病灶检出率及信噪比（signal-noise ratio, SNR）是否存在统计学差异，行配对秩和检验比较常规 DWI 与 MAGIC DWI 之间图像质量评分是否存在统计学差异。
结果：前列腺常规 DWI 与 MAGIC DWI 的图像质量、病灶检出率及信噪比组间没有统计学差异。
结论：MAGIC 序列重建的高 b 值 DWI 与 DWI 图像质量、病灶检出率、及信噪比方面临床应用价值相当。

EPO-1916
肝脏相位导航和膈肌导航在腹部自由呼吸 T2WI 压脂序列中 的对比研究

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目的:比较肝脏相位导航和膈肌导航技术应用在上腹部自由呼吸 T2WI 压脂序列的图像质量以及采集时间。
方法:使用 Siemens Avanto 1.5TMR 成像仪、Syngo 工作站和 16 通道体部相控阵线圈,对 20 例患者行上腹部 MR 检查运用相位导航技术和膈肌导航技术在腹部 T2WI 压脂序列扫描,记录两组图像的采集时间。计算并比较两组图像间同一层面包括：肝脏的右后叶（门静脉主干及其右分支层面），脾脏的中部以及胰尾部的 SNR 以及 CNR。由两名有丰富经验的高年资医生单独评价 2 组图像运动伪影,肝内外脉管显示的清晰度及图像的整体质量。呼吸运动伪影评价标准:1 分，无伪影/轻微伪影；2 分，中等伪影；3 分，严重伪影；肝内外脉管显示的清晰度的评价标准:1 分，清晰/轻微模糊；2 分，中等伪影；3 分，非常模糊；整体图像质量的评价标准:1 分，图像质量差；2 分，质量一般；3 分，质量较好；4 分，图像质量好。采用配对 t 检验比较 2 种图像的噪声、SNR、CNR；以 Kappa 检验评估 2 名医师不同评价的一致性，并计算 Kappa 值。（P＜0.05 为差异有统计学意义）
结果:(1)主观评价上，20 例患者的上腹部 T2WI 压脂图像中，应用相位导航技术肝内外脉管显示的清晰度更佳，解剖细节显示更清晰；两者图像运动伪影无统计学意义；应用膈肌导航技术和和相位导航技术的图像质量相当，差异无统计学意义。关于图像质量评价，两位观察者之间的一致性结果为优（Kappa=0.86，P＜0.05）。
比较三种导航回波技术采集时间,20 例患者扫描中相位导航技术平均采集时间为 4min10s；膈肌导航平均采集时间为 4min35s。
SNR 和 CNR 两组的比较：应用相位导航技术显示图像肝脏、胰腺、脾脏的 SNR 和 CNR 更高些。
结论:肝脏相位导航技术应用在上腹部自由呼吸 T2WI 压脂序列的图像 SNR 和 CNR 高，解剖细节显示更清晰，扫描时间较短，图像质量好。

EPO-1917
MRI 在早期宫颈癌局部浸润中的研究价值

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目的：探讨 MR 成像对早期宫颈癌深间质浸润、脉管癌栓（LVSI）等的术前评估价值。
方法：对 206 例早期宫颈癌患者术前行盆腔常规 MRI 和 DWI 扫描。在横轴位上测量各序列肿瘤最大径，在经肿瘤最大层面 ADC 图上测量 ADC 值。在 T2W 序列上评估宫颈癌的深间质浸润状态并与病理结果对比，并比较临床（年龄和绝经状态）及 MR 各参数对深间质浸润及 LVSI 的预测价值。采用卡方检验评价 MR 判断深间质浸润的准确度及手术方式对病理 LVSI 状态的影响。两组间比较应用独立样本 t 检验或秩和检验。采用 Logistics 多因素回归分析判别预测的独立影响因素，建立预测回归方程，应用受试者工作特征曲线（ROC）验证模型的诊断效能。
结果：（1）共 132 例患者存在深间质浸润。MR 上直接判断深间质浸润的准确度为 80.1%，敏感度为 98.5%，特异度为 47.3%，阳性预测值为 77.0%，阴性预测值为 94.6%；MR 深间质浸润状态与病理结果差异无统计学意义（$p>0.05$）。各 MR 参数及临床指标与病理上深间质浸润情况无显著关联（$p>0.05$）。回归分析将 DWI 序列肿瘤最大径、ADCmin、ADCmean、ADCmin/ ADCmean、MR 深间质浸润状态纳入模型；模型的 ROC 曲线下面积为 0.843，敏感度为 0.879，特异度为 0.689。（2）共 83 例患者存在 LVSI，手术方式对 LVSI 状态无显著影响（$p>0.05$）。LVSI 阳性组 MR 各序列所测肿瘤最大径大于 LVSI 阴性组（$p<0.001$），而病灶 ADC 值及各临床指标与 LVSI 状态无显著关联（$p<0.05$）。回归分析将增强 T1WI 及 DWI 序列上肿瘤最大径纳入模型；模型的 ROC 曲线下面积为 0.568，敏感度为 0.373，特异度为 0.764。（3）共 1 例患者存在宫旁浸润。
结论：MR 可对早期宫颈癌深间质浸润情况进行较准确的评估与预测；宫颈病灶越大，存在 LVSI 的机率越大。

EPO-1918

Advanced diffusion-weighted imaging with multiple parameters in differential diagnosis of prostate transitional zone carcinoma and benign prostatic hyperplasia

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Objective: To evaluate the value of traditional DWI, incoherent motion magnetic resonance diffusion-weighted imaging (IVIM-DWI), tensile index DWI and DKI in the differential diagnosis of prostate transitional zone carcinoma and prostatic hyperplasia.
methods: 35 cases of prostate transitional carcinoma and 40 cases of benign prostatic hyperplasia were collected. MRI routine sequence, single index DWI, double index DWI, tensile index DWI and DKI scan were performed before operation. The apparent diffusion number (ADC), slow diffusion ADC value (ADC-slow), rapid diffusion ADC value (ADC-fast), perfusion score of tumor and hyperplastic nodules were measured respectively. The number (Ffast), diffusion distribution index (DDC), diffusion anisotropy (FA), mean diffusion coefficient (MD), axial diffusion coefficient (Da), radial diffusion coefficient (Dr), diffusion kurtosis anisotropy (FAK), average diffusion kurtosis (MK), axial diffusion kurtosis (A) and radial diffusion kurtosis (Kr) are used in two groups of parameter values of two alone. Samples were analyzed by T test, and ROC curve

values were drawn, and the diagnostic efficiency of each parameter was analyzed, and the diagnostic threshold was determined.

Results: the values of ADC, ADC-slow, DDC, alpha, Md, Da and Dr in the cancer group were lower than those in the hyperplastic group ($p<0.01$). The areas under the ROC curve were 0.912, 0.985, 0.991, 0.796, 1.445, 0.963 and 0.984 respectively,The diagnostic thresholds were 0.836×10-3mm2/s, 0.785×10-3mm2/s, 0.882×10-3mm2/s, 0.705, 1.36um2/ms, 1.65um2/ms and 1.16um2/ms. The FA, MK, Ka and Kr values in the cancer group were higher than those in the proliferative group ($p<0.01$), The areas under the ROC curve were 0.730, 0.995, 0.948 and 0.991 respectively, and the diagnostic thresholds were 0.193, 0.835, 0.824, 0.793 respectively. The diagnostic efficiency of ADC-slow, DDC, Md, Da, Dr, MK, Ka, Kr was high, and the sensitivity was 100%, 95%, 85%, 100%, 90%, 100%, 95%, 100% respectively. The specificity was 91.3%, 91.3%, 91.3%, 82.6%,95.7%,91.3%,82.6%, 91.3%, the ADC-fast,Ffast and FAK were unable to identify the prostate transitional zone cancer and hyperplasia..

Conclusion: ADC-slow, DDC, Md, Da, Dr, MK, Ka and Kr have great help in differentiating prostate cancer from hyperplasia. Multiparametric quantitative analysis of advanced diffusion weighted imaging can improve the accuracy of differentiating prostate transitional zone carcinoma from benign prostatic hyperplasia.

EPO-1919

DCE-MRI 纹理分析鉴别宫颈鳞癌与腺癌及预测分级的价值

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【摘要】目的：探讨基于动态增强 MRI（DCE-MRI）的影像组学特征鉴别宫颈鳞癌与腺癌及预测肿瘤分级的价值。**方法**：回顾性分析 2016 年 1 月－2018 年 6 月本院经手术病理证实且行子宫 DCE-MRI 的 39 例宫颈癌患者的临床和影像资料。分析宫颈癌的常规 MRI 表现，对 DCE-MRI 数据进行后处理，获得最大强化率（ME）和最大相对强化率（MRE）伪彩图，对病灶进行手动分割后[11] 提取一阶灰度直方图和二阶纹理特征的共 64 个特征参数值[12] 。比较鳞癌与腺癌纹理特征参数值的差异，分析肿瘤纹理特征参数值与病理分级和分化程度的相关性。采用 ROC 曲线分析有统计学差异的纹理特征对腺癌和高 FIGO 分期的预测价值。**结果**：64 个纹理参数中，基于 MRE 图提取的 13 个纹理特征参数和基于 ME 图提取的 1 个纹理特征在鳞癌与腺癌间的差异有统计学意义（$P<0.05$）。在 MRE 图提取的纹理特征参数中，3 个灰度区域大小矩阵（GLSZM）和 2 个灰度游程长度矩阵（GLRLM）特征[13] 参数与肿瘤的 FIGO 分级呈正相关（r=0.332～0.392，P=0.014～0.039[14] ）。多参数预测宫颈腺癌的 *AUC[15]* 为 0.830（95%CI：0.675～0.931），预测 FIGOⅡb～Ⅲa 宫颈癌的 AUC 为 0.737（95%CI：0.572～0.865），预测低分化肿瘤的 AUC 为 0.705（95%CI：0.537～0.840）。**结论**：基于 DCE-MRI 的纹理分析有助于在术前预测宫颈癌的组织病理学分型和 FIGO 分级，尤其是对腺癌与鳞癌的鉴别诊断有较大价

EPO-1920

钆贝葡胺肝胆期成像在肿块型胆管细胞癌和低分化肝细胞癌鉴别诊断中的应用价值

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目的：比较肝脏特异性对比剂钆贝葡胺在动态增强扫描及肝胆期图像特征，以了解莫迪司肝胆期成像在鉴别肿块型胆管细胞癌和低分化肝癌的临床价值。**方法：**回顾性分析经病理证实为 24 例肿块型胆管细胞癌和 44 例低分化肝细胞癌患者的临床资料，所有患者均已接受钆贝葡胺肝胆期扫描且影像资料完整，测量两组肝胆期 SNR 和 CNR。**结果：**肿块型胆管细胞癌和低分化肝癌在年龄、性别构成、肿块大小及形态的差异均无统计学意义，38 例（86.3%）低分化肝癌有慢性肝病病史，动态增强扫描两者均可表现为环形渐进性强化，在肝胆期图像上，16 例（66.4%）胆管细胞癌中央区域呈不均匀云絮样或均匀高信号，典型者呈“靶环”征，而 30 例（68.2%）低分化肝癌在肝胆期呈低信号，肝胆期 SNR 和 CNR 在两组差异有统计学意义；病灶出现强化包膜提示肝癌的可能性大，肝包膜皱缩、肝叶节段性或叶段萎缩及远端胆管扩张有助于诊断肿块型胆管细胞癌。**结论：**结合钆贝葡胺肝胆期成像特点，有助于鉴别肿块型胆管细胞癌和低分化肝细胞癌。

EPO-1921
磁共振扩散加权成像对肝细胞癌化疗栓塞术后疗效的随访价值

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目的　探讨磁共振扩散加权成像(DWI)对肝细胞癌(HCC)经导管肝动脉化疗栓塞术(TACE)术后疗效评估的应用价值。方法　选取安徽省某三甲医院 2014 年 1 月至 2016 年 12 月收治的经临床或病理检查确诊的 52 例 HCC 患者为研究对象，所有患者均经 1～3 次 TACE 治疗，并于 TACE 术前、术后 4～6 周行上腹部磁共振平扫及 DWI 检查，术后 4 个月行磁共振增强扫描，上述检查均在 1 周内完成。依据实体肿瘤疗效评估标准(mRECIST)，将病例分为稳定组和进展组，分析 TACE 术前、术后病灶的坏死、复发转移情况以及表观弥散系数(ADC)值；采用受试者工作特征曲线(ROC)确定鉴别稳定组和进展组的诊断效能以及 ADC 的最佳截断值。结果　52 例 HCC 患者术前共计检出 68 个病灶；参照 mRECIST 标准，评价为稳定的病例为 20 例，进展的为 32 例；术前病灶以稍长 T1 和 T2 信号为主，DWI 序列上呈高信号，ADC 图上呈低信号，TACE 术后，肿瘤坏死区呈等或稍长 T1、T2 信号，DWI 序列上呈等或稍低信号，进展组于 T1WI 和 T2WI 序列上信号表现多样，DWI 序列上呈不均性高信号；稳定组和进展组术前肿瘤病灶的 ADC 值差异无统计学意义(P=0.473)，稳定组术后 ADC 值较术前升高(P＜0.05)，其手术前后 ADC 的增加量高于进展组(P＜0.01)。ROC 分析提示：鉴别稳定组和进展组 ADC 的最佳截断值为 1.28×10-3　mm2/s，此时曲线下面积(AUC)为 0.773(P＜0.05)、灵敏度为 76.3%、特异度为 68.9%。结论　DWI 扫描能够及时、客观的评估 HCC 患者化疗栓塞术后疗效，具有较高的随访价值。

EPO-1922
不同亚型腹膜后脂肪肉瘤 CT 和 MRI 表现及病理基础

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目的 探讨不同亚型腹膜后脂肪肉瘤（RLS）的 CT 和 MRI 影像学特征及其病理基础。
方法 回顾性分析经手术病理证实的 172 例 RLS 患者的影像和病理资料（包括组织成份、出血、坏死、钙化/骨化、纤维分割、包膜、脂中结节、强化特点及免疫组化），其中 97 例行 CT 平扫+增强检查，53 例行 MRI 平扫+增强检查。

结果 高分化型脂肪肉瘤（WDLS）81 例，去分化型脂肪肉瘤（DDLS）63 例，黏液型脂肪肉瘤（MLS）18 例，多形性脂肪肉瘤（PLS）10 例，89 例为原发肿瘤，83 例为继发肿瘤，40.7%（70/172）的患者合并肾积水，其中四组 WD/DDLS、MLS 及 PLS 的影像学特征：出血、坏死、钙化/骨化、纤维分割、脂中结节、远处转移及强化方式均匀有显著的统计学差异（P=0.000）；病理所见 MDLS 以成熟脂肪成份为主（>75%），DDLS 和 PLS 以低分化软组织成份为主，MLS 以粘液成份为主，其中四组免疫组化指标 MDM2（P=0.023）、CD34（P=0.000）和 S-100（P=0.000）具有显著统计学差异，而 CDK4、CD68、CK、HMB45、SMA 和 MyoD1 无统计学差异（P>0.05）；FNCLCC 肿瘤危险度评分显示四组肿瘤危险度具有显著统计学差异（P=0.000）。
结论：不同类型 RLS 的影像学表现和生物学行为具有显著特征，WDLS 以成熟脂肪、脂中结节和纤维分割样强化为特征，DDLS 和 PLS 生物危险度较高，常见腹膜和腹壁种植转移，DDLS 的钙化/骨化发生率较其他亚型高，MLS 中粘液成份可明显强化及肺转移等特点，掌握 RLS 的 CT 和 MRI 影像学表现和病理特征有助于临床诊断和鉴别诊断。

EPO-1923

The Differential Diagnostic Value of Intravoxel Incoherent Motion Diffusion-Weighted Imaging in Cervical Squamous Cell Carcinoma

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Objective. To explore the correlation between intravoxel incoherent motion diffusion-weighted imaging (IVIM-DWI) and pathological differentiation of cervical squamous cell carcinoma.
Methods. 87 patients with pathologically confirmed (poor differentiation group, 50; moderate differentiation group, 26; high differentiation group, 11) underwent IVIM-DWI examinations with 10 b values (b = 0, 10, 20, 50, 100, 200, 400, 800, 1200, 2000 s/mm^2) to calculate the ADC_{stand}, D, D* and f values. All parameters were analyzed by the steps of normality test, homogeneity test for variance, analysis of variance or nonparametric test, pearson or spearman correlation analysis. Finally, the receiver operating characteristic curve was extracted.
Results. First, the comparison of D, D*, f values for the different pathological differentiation reached statistically significant levels ($p<0.05$). The D and D* values were positively correlated with the pathological differentiation (r = 0.853, 0.880; $p<0.05$), while the correlation between f value and the pathological differentiation was negative (r = -0.730; $p<0.05$). In the diagnosis of poor differentiation group, the D value had the best diagnostic efficiency (cutoff value = 0.53*10^{-3}mm^2/s, AUC = 0.992); in the diagnosis of moderate differentiation group, the f value had the best diagnostic efficiency (cut-off value = 27.00%, AUC = 0.820); in the diagnosis of high differentiation group, the D value had the best diagnostic efficiency (cut-off value = 0.63*10^{-3}mm^2/s, AUC = 0.996).
Conclusion. The D, D* and f values of IVIM-DWI had the potential to evaluate the pathological differentiation of cervical squamous cell carcinoma.

Key Words. Intravoxel Incoherent Motion Diffusion-Weighted Imaging, Magnetic Resonance Imaging, Cervical Squamous Cell Carcinoma, pathological differentiation

EPO-1924
非对比剂 IFIR 序列在腹部血管的临床应用

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目的：探讨非对比剂 IFIR 血管成像序列在腹部血管的临床应用价值。**材料与方法:**收集本院 20 例腹部平扫加增强扫描的正常患者（患者签署知情同意书）MRI 影像学资料,回顾性分析非对比剂 IFIR 序列扫描、增强腹部序列的腹部血管成像。采用美国 GE 公司超导型 1.5T BRIVO MR355 扫描仪，IFIR 扫描参数：TR4.5ms，TE 2.2ms，TI1200，FA70ms，序列视野 38cm×38cm，层厚层间距 2thk/0.9sp，Matrix=256×256,NEX=auto，采用呼吸导航扫描，将非对比剂 IFIR 和增强腹部序列分别进行血管后处理重建。图像效果评价：由 3 位有经验的放射科医师对非对比剂 IFIR 和增强腹部序列后处理血管成像进行双盲 3 分法评分。使用 SPSS22.0 统计学软件对所得资料进行分析处理。图像的血管成像效果评分、信噪比的比较采用配对 t 检验，以 $P<0.05$ 为差异有显著性意义。**结果：**经三位医师对比非对比剂 IFIR 和增强腹部序列图像血管的吻合性，发现在 1、2 级血管的显示上，两个序列的吻合性极高，两者对比的差异有统计学意义($P<0.05$)。**结论：**通过非对比剂 IFIR 序列能获得腹主动脉、门静脉、肝静脉及下腔静脉成像，避免由于不容易把握循环时间和造影剂浓度低等原因而导致显影不佳，有利于减少对比剂肾病，值得推广应用。

EPO-1925
慢性胰腺炎患者胆总管病变的 MRCP 特征及其解剖基础研究

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目的：探讨慢性胰腺炎患者胆总管病变的 MRCP 特征与胆总管胰腺段解剖分型的关系。
方法：搜集符合入组标准的 98 例慢性胰腺炎患者的 MRCP 和 MRI 资料，在 MRCP 上观察每一例患者胆总管形态改变，并测量胆总管最大直径及胆总管狭窄段长度；在轴面 T2WI 上观察胆总管胰腺段与胰头病变的相对解剖关系并归纳分为无覆盖型、部分覆盖型、完全覆盖型。用卡方检验比较不同分型之间慢性胰腺炎患者胆总管形态改变发生率的差异，用 *Kruskal-Wallis* 检验比较不同分型之间慢性胰腺炎患者的胆总管扩张程度和胆总管狭窄长度的差异。
结果：本组 98 例慢性胰腺炎患者胆总管病变的 MRCP 表现为：胆总管扩张（41 例）、胆总管外形粗细不均（48 例），胆总管远端逐渐变细（46 例）。本组病例扩张胆总管的最大直径范围 8.6～15.9mm，平均值为（11.2±2.1）mm，胆总管狭窄段长度范围 4.4～19.5mm，平均值为（9.9±2.9）mm。将本组病例根据胆总管下段通过胰腺区域的方式分型，无覆盖型有 28 例（28.6%），部分覆盖型有 63 例（64.3%），完全覆盖型有 7 例（7.1%）。无覆盖型、部分覆盖型、完全覆盖型三组慢性胰腺炎患者的胆总管扩张程度及胆总管狭窄长度差异具有统计学意义（$P<0.05$），完全覆盖型慢性胰腺炎患者胆总管扩张最明显，胆总管狭窄段的长度最长。无覆盖型、部分覆盖型、完全覆盖型三组慢性胰腺炎患者胆总管外形粗细不均发生率的差异没有统计学意义（$P>0.05$）。

结论：慢性胰腺炎患者胆总管病变的 MRCP 表现与胆总管胰腺段解剖分型有一定关系，覆盖型（部分覆盖型、完全覆盖型）慢性胰腺炎患者胆总管扩张及胆总管远端逐渐变细的发生率高于无覆盖型，完全覆盖型慢性胰腺炎患者不仅发生胆总管狭窄及其上游胆管扩张的几率最高，而且病变程度最重。

EPO-1926
磁共振成像胰外炎症评分早期预测急性胰腺炎严重程度研究

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目的：探讨磁共振成像（MRI）上胰腺外炎症 (EPIM) 对急性胰腺炎 (AP) 早期严重程度的预测价值。
目的和方法：本回顾性研究共纳入了 337 例 AP 患者，他们在发病后三天内接受了 MRI 检查。对所有纳入患者的 EPIM 评分、磁共振严重程度指数（MRSI）评分、急性生理和慢性健康评估（APACHE-II）、床旁 AP 严重程度指数（BISAP）以及血清超敏 C 反应蛋白（Hs-CRP）浓度进行评估和计算。其中 86 例 AP 患者进行了 CT 检查，他们的 CT 上胰腺外炎症（EPIC）评分也将被评估。采用受试者工作曲线 (ROC) 分析评估这些评分系统及实验室数据对严重 AP 和器官衰竭的预测价值。
结果：在 337 个 AP 患者中，55 (16.3%) 例有器官衰竭，其中 17 (5.0%) 例发展为持续性器官衰竭，诊断为重症 AP。EPIM 评分与 EPIC 评分有较强的正相关性(r= 0.794, P<0.001)，且 EPIM 评分与 APACHE-II、住院时间的相关性均高于 EPIC 评分。EPIM 评分预测重症 AP 和器官衰竭的准确性(AUC=0.844 和 0.817)与 APACHE-II(0.894 和 0.850)和 BISAP(0.866 和 0.818)预测的准确性无明显差异，且均高于 MRSI 预测的准确性(0.683 和 0.716)；在预测器官衰竭上也高于 hs-CRP(0.688)。短暂性和持续性器官衰竭患者之间的 EPIM 评分无统计学差异(P=0.163)。
结论：EPIM 评分比 EPIC 评分更有助于评估 AP 的严重程度，且 EPIM 评分可以早期提示潜在的重症 AP 和器官衰竭的发生。

EPO-1927
MRI 观察进展期浆液性卵巢癌肝脾受侵与 BRCA 基因突变型和预后的相关性研究

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目的：评价进展期浆液性卵巢癌伴有肝脏和脾脏受侵的 MRI 特点，并分析其与 BRCA 基因突变型和预后的相关性。
方法：本研究为回顾性研究，经医院伦理委员会审查并豁免患者知情同意。回顾性收集自 2012 年 1 月到 2015 年 12 月间于我院妇瘤科收治、经病理检查证实为浆液性卵巢癌、临床分期处于进展期（FIGO 临床 III 期和 IV 期）、并接受盆腔 MRI 平扫和增强检查的患者共计 121 例（平均年龄±标准差：58 岁±12.1，全距：36-72 岁）。MRI 检查主要序列包括 T2WI、DWI 和动态增强扫描。分析肝脏和脾脏受侵的类型、部位和影像学特点。所有患者的平均随访时间为 23 个月（随访时间范围为 6-33 个月）。采用单因素和多因素方差分析、COX 风险比例回归模型和 Kaplan-Meier 生存曲线来分析肝脾受侵的 MRI 特点与 BRCA 基因突变型和生存期之间的相关性。
结果：共有 35 例患者（28.93%）出现肝脏受侵，其中 30 例为肝脏表面腹膜侵犯伴有 8 例被膜下肝实质侵犯，有 5 例为肝实质血行转移；共有 33 例患者（27.27%）出现脾脏受侵，其中 31 例为脾脏

表面腹膜侵犯伴有 4 例被膜下脾实质侵犯，有 2 例为脾实质血行转移。不同肝脾受侵类型与 BRCA 基因型（非致病突变型和致病突变型）之间无显著关联性（P=0.18）；患者年龄、CA125、组织分化程度与肝脾受侵的类型有关（P=0.01）；肝脾的单纯被膜侵犯和被膜下伴有实质侵犯两者的总生存期无显著性差异（中位数，21 个月，P=0.6）；肝脾血行转移的总生存期明显短于单纯被膜侵犯和被膜下实质侵犯（中位数，12 个月，P=0.006）。

结论：进展期浆液性卵巢癌肝脾血行转移患者的总生存期明显小于单纯被膜侵犯和被膜下实质侵犯，MRI 观察肝脾实质转移较有优势；被膜下是否伴有实质侵犯并不影响总生存期，在影像鉴别困难时可暂不做分类。不同肝脾受侵类型与 BRCA 基因型之间无显著关联性。

EPO-1928

Value of Normalized Apparent Diffusion Coefficients in Differentiating Between Borderline and Malignant Epithelial Ovarian Tumors

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Purpose: To compare the diagnostic performance of normalized apparent diffusion coefficients (nADCs) of different references with that of ADCs at different *b* factors in differentiating borderline epithelial ovarian tumors (BEOTs) from malignant epithelial ovarian tumors (MEOTs).

Method: This retrospective study included 53 BEOTs and 148 MEOTs. Conventional magnetic resonance and diffusion-weighted imaging with *b* factors of 800 and 1000 s/mm^2 were performed. ADC was measured three times at solid components of tumors, gluteus maximus muscle (GMM), iliopsoas muscle (IM) and urine and then averaged. ADC_{tumor}, nADCs were then obtained. Differences and the diagnostic performance of ADC_{tumor} and nADCs between BEOTs and MEOTs with different *b* factors were compared.

Results: ADC_{tumor}, nADCs regardless of *b* factors were significantly higher in BEOTs than MEOTs. The diagnostic performance of $nADC_{urine}$ regardless of *b* factors was significantly larger than that of $nADC_{GMM}$ and $nADC_{IM}$. There was no significant difference in the diagnostic performance between ADC_{tumor} and $nADC_{urine}$ regardless of *b* factors. A significantly lower ADC_{tumor} and a larger diagnostic performance for ADC_{tumor} was found with a *b* factor of 1000 s/mm^2 than 800 s/mm^2. There were no significant differences in $nADC_{urine}$ of BEOTs or MEOTs or in the diagnostic performance of $nADC_{urine}$ with *b* factors between 800 and 1000 s/mm^2.

Conclusions: ADC_{tumor} and nADCs were both capable of differentiating BEOTs from MEOTs. $nADC_{urine}$ was the best of all nADCs and was superior to ADC_{tumor} because of its stable performance in differentiating BEOTs from MEOTs, regardless of *b* factors.

EPO-1929

Effect evaluation of magnetic resonance R2* combined with t1-mapping on liver iron overload deironing in patients with blood transfusion

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Objective：this study used magnetic resonance R2* and T1-mapping technology to quantitatively analyze liver iron overload, quantitatively analyze liver iron overload of patients with long-term repeated blood transfusion, and quantitatively analyze the degree of liver iron deposition before, after and during iron removal therapy.**Methods** ：the experimental group included 40 patients with liver iron overload due to long-term blood transfusion.Patients were divided into two groups of 20, one group was treated with ferritin alone, and the other group was treated with ferritin combined with ferritin. The correlation between R2* value and T1-mapping before and after treatment and serum ferritin concentration and transferrin saturation was explored to evaluate the iron overload clearance effect of the two treatment schemes.**Results**： the correlation coefficients of liver R2* value and SF and ASF R2 in 40 patients with iron overload were 0.678 and 0.647, respectively, which were statistically significant (P < 0.05).The correlation coefficients of T1 SF and ASF r in liver were -0.625 and -0.639, respectively, with statistical significance (P < 0.05).There were differences in R2* and T1 values between the two treatment groups before and after iron removal.**Conclusion**： the combination of R2* and T1-mapping can detect liver iron overload with higher accuracy, with a high consistency with serum ferritin, and can effectively evaluate the degree of liver iron overload before and after treatment with iron removal.The therapeutic effect of deferrine combined with deferrine on liver iron overload was significantly higher than that of deferrine alone.

EPO-1930

IVIM DWI 评估糖尿病肾病的初步临床应用

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目的 GFR（肾小球滤过率）可反应肾脏损伤，但通常需要侵入性方法测量并受许多因素干扰。IVIM DWI（体素不相干运动扩散加权图像）是一种非侵入性成像技术，能够根据 D，D *和 f 值评估肾功能。本研究旨在探讨 IVIM DWI 评估 DN（糖尿病肾病）肾损伤的可行性。
方法
糖尿病肾病组招募 46 名患者。根据 eGFR（估计肾小球滤过率），将患者分为三组：早期 18 例;中期 15 例;末期 13 例。对照组招募了 17 名健康志愿者，IVIM DWI 采用飞利浦 3.0-T MR 扫描仪，并使用 10 个 b 值。FOV32cm，层厚 3.0mm，间距 0.6mm，TR3,000ms，TE60.3ms，矩阵 96×96，NEX = 8。扫描时间 2 分 06 秒。测量 ADC，D，D *和 f 值。选择右肾皮髓质定位感兴趣区（ROI）。
结果
结果显示，在早期 DN 组中，皮髓质中的 ADC 值低于对照组（P <0.05），与对照组相比，皮髓质中的 D 值降低（P <0.05）。在中期 DN 组，皮髓质中的 ADC 值和皮髓质中的 D 值低于早期 DN 组（P <0.05）。在末期 DN 组，皮髓质中的 ADC 值皮髓质中的 D 值低于（P <0.05）中期 DN 组；三组 D 值

始终低于 ADC 值（P <0.05），ADC 值和皮质 D 值均高于髓质组（P <0.05）。在早期 DN 组中，皮髓质中的 D *值低于对照组（P <0.05），皮髓质中的 f 值高于对照组（P <0.05）。在中期 DN 组，皮髓质中的 D *值和皮髓质中的 f 值低于早期 DN 组（P <0.05）。在末期 DN 组，皮髓质中的 D *值、f 值与中期 DN 组相比明显降低（P <0.05）；在三组中，皮质中的 D *值总是低于髓质（P <0.05）。

结论

本研究表明，IVIM DWI 可以无创并有效地显示糖尿病肾病肾功能的动态变化过程，反映了糖尿病肾病病理变化的微观机制。对糖尿病肾病肾功能进行评估，为临床诊断和治疗提供参考，因此，IVIM DWI 显示出临床应用的潜在价值。

EPO-1931

Preliminary Application of Incoherent Motion Diffusion Weighted Imaging (IVIM) in Normal People

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Objective: Evaluate the correlation between different parameters of IVIM and baseline data in normal people.

Methods:35 healthy volunteers with nothing renal disease were included in the study.The gender, age, BMI(Body Mass Index), WHR((Waist-to-Hip Ratio), family history of diabetes and hypertension of all subjects were recorded. MRI examinations were performed with a 3.0T MRI system (MAGNETOM Skyra; Siemens Healthcare,Germany) equipped with an 18-channel body phased-array surface coil.The IVIM(b=0,50,100,150,200,400,600,800sec/mm²) and Diffusion weighted imaging(DWI,b=50,800 sec/mm²) sequence were obtained . A total of 12 regions of interest were drawn for each subject in the cortex and medulla region of the upper pole, the renal hilum and the lower pole of the kidneys.The average value of all results is taken to ensure consistency of measurement results.ADC map was automatically generated on the Siemens MRWP workstation after DWI sequence executed. IVIM parameters(ADC,D,f and D* values) were generated by using a prototype software body diffusion toolbox(Siemens healthineers). The Pearson correlation analysis was performed to determine the relationship between between the age, BMI, WHR and blood pressure with different parameters of IVIM. A two-sample t-test was used to compare the difference in ADC,D, f, and D* values between gender and family family history.

Results: In healthy volunteers kidneys with nothing renal disease , the ADC, D values of the cortex and medulla were decreased with age and BMI, D values of the cortex were decreased with WHR,with statistical significance (p<0.05) (Figure 1).The ADC value of no family history of hypertension was higher than that with hypertension, , with statistical significance (p<0.05) (Figure 2).

Conclusion: IVIM is feasible in the examination of healthy volunteers kidneys. IVIM can supply useful information for kidney,especially the ADC, D values.

Clinical significance: IVIM can reflect changes in microstructure and provide a more scientific basis for clinical changes in the kidney.This is a preliminary study of the basic assessment of IVIM in kidney disease.

EPO-1932

3.0T 磁共振 PC 法评价健康青年志愿者门静脉血流的可行性

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目的 探讨 3.0T 磁共振相位对比（Phase-contrast，PC）法测量并评估健康自愿者门脉血流的可行性。
方法 招募年轻健康自愿者 14 名，男性 7 名，女性 7 名。所有自愿者均应用 3.0T MR 行肝脏 T_2WI 及 PC 扫描。每名志愿者扫描两次，两次间隔一周。利用流速分析软件分析门脉血流量（AF）及血流速度（PPV）。采用组内相关系数（ICC）检验两次扫描及测量数据的一致性。应用两独立样本 t 检验，比较性别对 AF、PPV 值的影响；采用单因素方差分析，检验不同编码流速对 AF、PPV 值的影响。P< 0.05 认为差异有统计学意义。
结果 两次不同流速编码门脉 AF、PPV 测量值一致性良好，ICC 值均大于 0.75；编码流速为 30cm/s 时一致性最好，此时男性门脉 AF、PPV 值（10.07±3.01 ml/beat, 20.72±3.33cm/s）均高于女性（5.38±1.04 ml/beat, 17.07±2.38 cm/s），差异有统计学意义（P< 0.05）。不同编码流速间 AF、PPV 值差异无统计学意义。
结论 3.0T 磁共振 PC 法测量门脉血流值结果稳定，健康青年志愿者男性门脉 AF、PPV 值均高于女性；不同编码流速对 AF、PPV 值无影响。

EPO-1933

Comparison of diagnostic imaging modality including Gadoxetic Acid-Enhaned MRI,Contrast-Enhanced CT and Contrast-Enhanced Ultrasound for the detection of liver metastases.

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Purpose: To compare the diagnostic performance of Gadoxetic acid enhanced MRI(Gd-EOB-DTPA) , Contrast Enhanced Computed Tomography(CECT) and Contrast Enhanced Ultrasonography(CEUS) for the detection the of Liver metastases.
Material and Method: Retrospective study carried out from January 2014 to June 2019 ,included 60 patients who were pathologically and clinically diagnosed as the Liver metastases.Lesions detected by EOB-MRI, CECT and CEUS were interpreted. Patients with recent hepatic surgery, diffuse hepatic metastases and recent undergone chemotherapy treatment were excluded. Sensitivity were calculated and compared.
Results: Total 153 lesions were detected by EOB- MRI, which was significantly higher than other modality, 77 lesions by CECT and 51 lesions by CEUS . Sensitivity of Gadoxetic acid enhanced MRI, CECT and CEUS were 100%,74.4% and 80% respectively.EOB-MRI has higher significant difference than CECT and CEUS($p<0.05$) .CECT and CEUS have no significant difference ($P>0.05$).
*Conclusion:*EOB-MRI was significantly performed better than other diagnostic modality, It was also better to diagnose lesion <1cm.It should be the first choice of diagnosis modality for the suspected case of Liver metastases.

EPO-1934
常规弥散加权成像表观弥散系数在局部进展期直肠癌新辅助放化疗疗效评价中的应用价值

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目的探讨 ADC 值在评价局部进展期直肠癌患者新辅助放化疗疗效中的价值。**方法**收集 2017 年 1 月—2019 年 6 月本院收治的符合标准的局部进展期直肠癌患者 58 例（T3、T4 期），新辅助放化疗前后各行一次 3.0TMRI 检查,DWI 序列分别取 4 个 b 值（0、700、1400 和 2100s/mm^2）。手工画取整个肿瘤的感兴趣区（ROI），避开病灶周围伪影及肉眼可见的囊变坏死区，以 T2 加权图像为参照在 ADC 图上画 ROI，从而获得治疗前 ADC（ADC_{pre}）、治疗后 ADC（ADC_{post}）及 ADC 比值（ADC_{ratio}）。分别采用病理完全缓解（pCR）、肿瘤退缩分级（TRG）作为评判标准。**结果** pCR 组 ADC_{post}、ADC_{ratio}均高于非 pCR 组；TRG 缓解组 ADC_{post}、ADC_{ratio}均高于 TRG 非缓解组；ADC_{pre}评价 pCR 最佳阈值≤$0.84\times10^{-3}mm^2/s$ 时，灵敏度 60%，特异度 70%，正确率 67.2%。ADC_{post}评价 pCR 最佳阈值＞$1.19\times10^{-3}mm^2/s$ 时，灵敏度 93.3%，特异度 67.4%，正确率 72.4%。ADC_{ratio}评价 pCR 最佳阈值＞0.44 时，灵敏度 80%，特异度 74.4%，正确率 75.8%。ADC_{pre}评价 TRG 最佳阈值≤$0.90\times10^{-3}mm^2/s$ 时，灵敏度 78.3%，特异度 51.4%，正确率 62.1%。ADC_{post}评价 TRG 最佳阈值＞$0.21\times10^{-3}mm^2/s$ 时，灵敏度 73.9%，特异度 80%，正确率 77.6%。ADC_{ratio}评价 TRG 最佳阈值＞0.38 时，ROC 曲线下面积 0.743，灵敏度 69.6%，特异度 71.4%，正确率为 71.6%。**结论** ADC_{post}及 ADC_{ratio}在预测及评价局部进展期结直肠癌患者新辅助放化疗后的疗效中具有较高的诊断效能。

EPO-1935
DCE-MRI 联合 DKI 对前列腺影像报告和数据系统指南（PI-RADS）评分中 3 分良、恶性病变诊断的初步探索及与其 KI-67 表达水平关系

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目的：探讨磁共振动态增强成像（DCE-MRI）联合扩散峰度成像（DKI）对前列腺影像报告和数据系统指南（PI-RADS）评分中 3 分良、恶性病变诊断的初步探索及与其 KI-67 表达水平关系。
方法：由两名高年资影像诊断医师采用盲法阅片，基于 PI-RADS 评分 3 分共计 45 例，术前均未经过任何放化疗，经病理证实的有 30 例，30 例患者均有行术前 DCE-MRI、DKI 检查，并测定动态增强参数（时间-信号曲线 TIC 及其参数增强峰值到达时间 T_{peak}、最大流入曲线率 K_1、最大增强线性斜率 S_{max}）、DKI 参数（平均扩散峰度 MK 值），将这些参数与病理结果进行统计分析，采用 ROC 曲线用于识别最佳参数。使用 spearman 相关分析来评估 KI-67 表达水平与每个参数的相关性。
结果：前列腺癌 PI-RADS 评分 3 分中恶性病变 S_{max}、MK 值均高于良性病变（S_{max}：2.02±0.8，P＜0.05；MK 值：0.87±0.23，P＜0.05）；S_{max}联合 MK 值时，诊断效能优于各自诊断价值，AUC 为 0.91。MK 值与前列腺癌中 KI-67 的表达水平具有统计学意义（P＜0.05）。

结论：磁共振动态增强成像（DCE-MRI）联合扩散峰度成像（DKI）可以提供一种准确诊断前列腺影像报告和数据系统指南（PI-RADS）评分中 3 分良、恶性病变的方法，并且 MK 值似乎与前列腺癌中 KI-67 的表达水平具有一定相关性。

EPO-1936
直肠癌患者经肛门注入耦合剂行磁共振扫描 的图像质量分析

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目的：探讨直肠癌患者行 MR 扫描的最佳方法，且用常规法与注入耦合剂法的图像质量对比。方法：收取我院 2018 年 3 月-2019 年 5 月 78 例患者（内镜确诊为直肠癌），分为常规组 39 人实验组 39 人，常规组正常灌肠排空肠道，进行扫描。实验组灌肠排空肠道后注入 280ml 超声耦合剂进行扫描。结果：常规法患者肠腔内空气与自由水干扰较大，尤其 DWI 序列高 B 值时有部分空气干扰和水干扰伪影，，观察肿瘤位置显示不佳，图像质量优秀率为 84.3%，观察肿瘤外周切缘与 T 分期图像优秀率 95.6%。注入耦合剂患者肠腔充盈后肿瘤位置清晰，DWI 序列减小了伪影干扰图像优秀率为 94.8%，外周切缘与 T 分期图像优秀率为 94.3%（P<0.001）。结论：注入超声耦合剂可以在高 B 值 DWI 序列内减小伪影，但是由于注入耦合剂扩大了肠腔观察外周切缘与 T 分期要比未注入耦合剂的图像优秀率稍低。

EPO-1937
Diagnostic value of quantitative analysis of ADC value and DCE-MR parameters for prostate cancer with seminal vesicle invasion

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【Abstract】 **Objective** To investigate the diagnostic value of quantitative analysis of ADC value and parameters of dynamic contrast-enhanced MR(DCE-MR) for prostate cancer (Pca)with seminal vesicle invasion(Svi). **Methods** The collected case datas were divided into five groups according to the surgical pathology: Pca with Svi group (Pca+Svi), Pca with normal seminal vesicle group (Pca), Pca with seminal cystitis group (Pca+Sc), benign prostatic hyperplasia (BPH) with seminal cystitis group (BPH+Sc), BPH with normal sminal vesicle group (BPH). The preoperative MR images of the five groups of patients were retrospectively analyzed, and the values of ADC ,K^{trans}, K_{ep}, and V_e of the five groups were quantitatively measured. **Results** ① In the Pca+Svi group, the signal of the seminal vesicles on T2WI was decreased, and the signal on DWI was significantly increased. The Pca+Sc group and BPH+Sc were similar to the Pca+Svi group. There was no abnormality in the seminal vesicles in the Pca group and the BPH group. ② The value of ADC in the Pca+Svi group was significantly lower than that of the other four groups ,The values of K^{trans} and Kep were significantly higher than the other four groups, and

the difference was statistically significant. ③There was no satatistical significance in values of ADC , K^{trans} and Kep between Pca+Sc group and BPH+Sc group. There was no satatistical significance in values of ADC , K^{trans} and Kep between PCa group and BPH group. ④ The difference of Ve values in the four groups were not statistically significant. . **Conclusion** Quantitative analysis of ADC values and DCE-MR parameters may contribute to the diagnosis of Pca with Svi.

EPO-1938

Evaluation of hepatic fibrosis in chronic hepatitis B with parameters obtained from multi-models of diffusion-weighted MR imaging

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Objective To quantitatively compare the value of various diffusion parameters obtained from monoexponential, biexponential and stretched exponential diffusion-weighted imaging models in assessing hepatic fibrosis in patients with CHB.
Methods: 52 patients with CHB had undergone prospectively muti-b values DWI on a 3.0T magnetic resonance imaging (MRI) unit. ADCst was calculated by using the monoexponential model. Dt, Dp, and f were calculated by using the biexponential model. DDC and α were calculated by using the stretched exponential model. The Kruskal-Wallis test was employed for the comparison of each parameter among the fibrosis stage groups. The Mann-Whitney U test was adopted to compare each parameter between fibrosis stage≤S1and≥S2, between fibrosis stage≤S2 and≥S3. Spearman rank correlation coefficients were obtained to assess the correlation of all the parameters with the fibrosis stages. ROC analysis was used to evaluate the performance of various diffusion parameters in predicting the presence of the fibrosis stage≥S2 and ≥S3.
Results:
The ADCst, Dt, f and ADCst all showed a negative correlation with the fibrosis stages, and the correlation of Dt value was the best (r=-0.630, P<0.001) , followed by DDC (-0.603, *P*<0.001), ADCst (r=-0.464, *P*<0.001), f (r=-0.464, *P*<0.05). The ADCst, Dt, f and DDC values all showed significantly different between fibrosis stage≥S2 and ≤S1,between fibrosis stage≥S3and≤S2 (all *P*<0.05). Dt had the highest AUC(0.835) in detecting fibrosis stage≥S2, followed by DDC(0.831), ADCst(0.738), f(0.740). And Dt also had the highest AUC(0.811) in detecting fibrosis stage≥S3, followed by DDC (0.798), ADCst (0.716), f (0.672).
Conclusion: The Dt value derived from biexponential and DDC value derived from stretched exponential of DWI could be helpful for the staging of hepatic fibrosis in chronic hepatitis B patients.
Keywords: magnetic resonance imaging; hepatic fibrosis; intravoxel incoherent motion; stretched exponential

EPO-1939

Evaluation of the changes of blood supply pattern in Hepatocellular Carcinoma for mice by Dynamic Contrast-Enhanced MR Perfusion Weighted Imaging

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Objective To investigate the value of dynamic contrast-enhanced MR perfusion weighted imaging (DCE-PWI) for evaluation of the changes of blood supply pattern in hepatocellular carcinoma for mice.
Materials and methods Ten MHCC97-H tumor bearing mice were scanned DCE-PWI at 2nd, 3rd, 4th and 5th weeks after inoculation. The perfusion parameters, including volume transfer constant (Ktrans), rate constant (Kep), fractional volume of extravascular extracellular space (Ve), initial areas under the curve (IAUC) and pattens of time signal-intensity curve (TIC) were derived using postprocessing software. The perfusion parameters and patterns of TIC at different time points were compared and correlated with microvessel parameters.
Result Three TIC patterns were identified as follows: (I) rising (10/23, 43.5%); (II) plateau (4/23, 17.4%); (III) washout (9/23,39.1%). The Ktrans value at the 3rd week was significantly lower than that at the 5th week [0.077±0.006(min^{-1}) vs 0.141±0.053(min^{-1}), P=0.000], and significantly higher than that at the 4th week [0.105±0.006(min^{-1}) vs 0.141±0.053($min^{-1)}$, P=0.031]. The Kep value at the 3rd week was significantly higher than that at the 4th week [0.325±0.023 (min^{-1}) vs 0.174±0.008 (min^{-1}), P=0.048]. The Ve value at the 3rd week was significantly lower than that at the 4th week [0.416±0.027 vs 0.640±0.011, P=0.001], and significantly higher at the 5th week [0.416± 0.027 vs 0.633±0.009, P=0.005]. The IAUC value at the 2nd week was significantly higher than that at the 3th week [7.136±0.614 (mmol·min/L) vs 4.039±0.446 (mmol·min/L), P=0.018], and significantly higher at the 5th week [4.039±0.446 (mmol/min/L) vs 9.540±0.449 (mmol·min/L), P<0.001], and from the 4th week to the 5th week [5.025 ± 0.271 (mmol·min/L) vs 9.540 ± 0.449 (mmol·min/L), P=0.012]. The Ktrans was positively correlated with the microvascular density (MVD) in the overall sample (r=0.338, P=0.029)
Conclusion The quantitative parameter Ktrans of DCE-PWI was a useful tool to evaluate the changes of blood supply pattern in hepatocellular carcinoma in mice at the level pf microcirculation

EPO-1940
门静脉非对比增强磁共振血管成像的可行性研究

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目的：

联合时间空间标记反转脉冲（Time-SLIP）技术和真稳态自由进动（true-SSFP）序列，探讨健康志愿者非对比增强磁共振门静脉成像（NCE-MRP）的可行性及最佳的黑血反转恢复时间（BBTI）参数。

材料与方法：

本研究纳入 36 名健康志愿者，男性 15 例，女性 21 例，使用 1.5T 磁共振设备采用 Time-SLIP 技术结合 true-SSFP 序列，获得原始图像，进行减影后得到门静脉非对比增强血管图像。BBTI 值均设置 700ms、900ms、1100ms 及 1300ms 共 4 组进行扫描，对原始图像及减影图像根据门静脉系统显示分支级数、图像质量评分、减影图像血管信号强度、血管-肝脏相对信号强度（vessel-to-liver ratio, VLR）进行评估。使用 Kruskal-Wallis 检验比较不同 BBTI 值设定下门静脉系统分支显示级数的差异。使用 One-way ANOVA 分析和 SNK 检验比较肝实质、门静脉系统信号强度及 VLR 在不同 BBTI 值设定下的差异。

结果：

36 例志愿者门静脉系统显现至 5 级分支 8 例（22.22%），至 6 级分支 18 例（50%），至 7 级及以上分支 10 例（27.78%）。BBTI 值为 1100ms 时显示 5 级以上血管分支及图像质量评分达 4 分的例数均较其他值明显增多。门静脉主干、左支、肝 4 段（3 级 P4）、肝 8 段（3 级 P8）门静脉分支信号强度在 BBTI 值为 1100ms 时明显高于其他值（$P<0.05$）。门静脉主干、左支、3 级 P4 分支及 3 级 P8 分支 VLR 在 BBTI 值为 900ms、700ms、1100ms 及 1300ms 时依次递减。

结论：

通过 Time-SLIP 技术结合 true-SSFP 序列获得原始图像，最终减影获得的门静脉非对比增强磁共振血管成像在显示血管结构、图像质量等方面均是可行的，并且在 BBTI 值等于 1100ms 时能获得最优秀清晰的磁共振门静脉系统血管图像。

EPO-1941
高场开放式磁共振自由手透视技术引导肝顶部结节穿刺活检术

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目的：分析及评估 1.0T 高场开放式磁共振自由手透视技术引导穿刺肝顶部结节的准确性、安全性及有效性。**方法**：选取 57 例肝顶部占位患者，病灶最大直径范围为 6-38mm，采用 MR 引导自由手透视技术行病灶穿刺活检。与外科手术病理诊断或临床和影像学随访至少 12 个月的诊断进行对比，计算穿刺活检诊断的准确性、特异性、敏感性和平均手术时间。同时，根据结节最大直径分为两组：≤1.5cm 组（n=21）和＞1.5cm 组（n=36），两组之间采用卡方检验行相关参数对比。**结果**：57 例患者穿刺成功率达到 100%，且均取得了足量的病理组织。MR 引导经皮穿刺肝顶病变诊断疾病性质的准确性、敏感性和特异度分别为 98.2%、97.9%、100%。≤1.5cm 病灶的准确性、敏感性、特异性分别为 95.2%、93.8%、100%。＞1.5cm 病灶的准确性、敏感性、特异性分别是 100%、100%、100%。两组之间没有明显的统计学差异（P＞0.05）。穿刺针通过皮肤到病变的平局时间为 1.1min，穿刺手术平均时间为 27.7min。穿刺过程中无严重并发症的发生。**结论**：1.0T 高场开放式 MR 自由手透视技术引导穿刺肝顶部病灶是一种准确、安全及有效的技术。

EPO-1942
初探压缩感知技术（CS）对于 3D mDIXON Quant 肝脏脂肪定量中的应用

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目的 初探压缩感知技术（CS）对于 3D mDIXON Quant 肝脏脂肪定量中的应用。**方法** 前瞻性收集利用飞利浦 3.0 T MR scanner（Ingenia CX, Philips Healthcare, the Netherlands）扫描的 10 名志愿者，男 8 例，女 2 例，年龄 24.8±1.62 岁。扫描序列包括常规 SENSE 和 CS（加速因子分别为 2、4、5、6）的 3D mDIXON Quant。扫描后将数据传到工作站通过软件进行分析，由两名影像科诊断医师分别在志愿者肝门水平的左外叶、左内叶、右前叶和右后叶各放置一个圆形的 ROI(大小 300mm^2，尽量避开肝内血管和胆管)，ROI 的放置确保在 SENSE 序列和 CS 序列的不同加速倍数下在相同的位置和相同的大小（图 1），分别记录每个 ROI 对应的 Mean 值和每个序列的扫描时间。采用组内相关系数（ICC）检验两位观察者测量结果的一致性，取两名观察者的平均值进行统计学分析，取四个叶段 Mean 值的平均值进行统计学处理，采用 Mann-Whitney 秩和检验比较 SENSE 组分别和不同加速倍数下的 CS 组 Mean 值之间的差异,统计结果采用中位数±四分位间距表示。**结果** 两位观察者测量各组数据的一致性较好（ICC 值为 0.988-0.994），Mean 值在 SENSE 技术下和 CS 在不同加速倍数下（2、4、5、6）均无统计学差异（P>0.05），扫描时间分别为 13.01s，15.02s，7.69s，6.18s，5.1s。**结论** CS 技术在不影响肝脏脂肪定量分析的情况下，可以明显缩短扫描的时间，其中 CS 在加速因子为 6 时，扫描时间最短，且数据的稳定性较好。

EPO-1943
磁共振同时多层（SMS）技术在肾脏扩散加权成像中的可行性研究

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目的：探讨应用磁共振同时多层（Simultaneous Multi-slice, SMS）加速技术对肾脏扩散加权成像（DWI）图像质量进行系统分析。
材料和方法：前瞻性收集接受双肾磁共振扫描的 60 名患者。采用西门子 Skyra 3.0T MRI 扫描仪。三套 DWI 扫描协议分别为：A、平面回波 DWI（EPI-DWI）：FOV 400mm×318mm、TR/TE 5700ms/93ms、层数 24、分辨率 1.1×1.1×6、b 值为 50s/mm^{2}及 1000 s/mm^2，扫描时间为 2min47s；B、C（SMS-DWI）：除 TR 时间外其他参数与 A 协议完全一致，B、C 协议的 TR 为 2900ms、2000ms，层数加速因子为 2（AF2）、3（AF3），扫描时间为 1min25s、54s。图像质量评估：以 A 协议为参考标准，（1）主观评价：应用 5 点量表法对三组图像质量进行分级评估；（2）客观评价包括信噪比（SNR）及 ADC 值对比。图像质量分级的差异采用秩和检验比较；采用配对 t 检验比较 A 和 B、A 和 C 图像 SNR、ADC 值的差异。
结果：与 A 协议相比，C 协议图像质量明显降低，分级差异具有统计学意义（p=0.002），B 协议表现出稳定的图像质量，组间图像质量分级差异无统计学意义（p=0.325）。B 协议与 A 协议具有相似的 SNR，差异无统计学意义（p=0.162），C（AF3）SNR 明显低于 A 标准协议，差异具有统计学意义（p<0.05）。B、C 与 A 协议肾皮质、肾髓质 ADC 值比较，差异均无统计学意义（p=0.17 、p=0.85）。
结论：在显著减少扫描时间且不会对图像 SNR、ADC 值定量产生影响的情况下，使用 SMS-DWI（AF2）扫描协议能取得很好的临床应用效果；SMS-DWI（AF3）图像 SNR 明显下降，无法满足临床诊断需求。因此，SMS 作为一种新的磁共振加速技术，在肾脏 DWI 中具有良好的应用前景。

EPO-1944

Gadolinium retention in mother and pup mice after administrations of gadolinium contrast in a rat model: effect of pregnancy and type of gadolinium- based contrast agents

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Objectives: To investigate the effect of pregnancy and type of gadolinium (Gd)-based contrast agents (GBCAs) on organ retention of Gd in mother and pup mice after maternal administration.
Materials and methods: Gd-DTPA-BMA (gadodiamide) or Gd-DOTA (gadoterate dimeglumine) was administered (2.0 mmol/kg of maternal weight) four times to pregnant Balb/c mice from gestational day 16–19, respectively. At 28 days after birth, they were euthanized and their organs (blood, brain, liver, kidney, spleen, and bone) were removed for the measurement of Gd by inductively coupled plasma mass spectrometry.
Results: Gd retention in maternal organs was generally lower than that in the organs of non-pregnant mice in both Gd-DTPA-BMA and Gd-DOTA groups. Significantly higher Gd retention was observed in the organs of pups whose mothers were administered Gd-DTPA-BMA as compared to those whose mothers were administered Gd-DOTA. Tissue-to-muscle ratio in the brains of pups was higher than that of mothers.
Conclusions: We demonstrated in utero transplacental Gd retention in pups. In various organs in both mothers and pups, Gd retention was consistently higher for Gd-DTPA-BMA than Gd-DOTA administration. Pregnancy affected Gd retention in many maternal organs.

EPO-1945
局部晚期直肠癌新辅助放化疗后早期扩散加权成像参数值对疗效的预测

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目的 探讨局部晚期直肠癌新辅助放化疗（NCRT）后早期 DWI 参数的变化值对 NCRT 最终疗效预测价值。**方法** 前瞻性收集局部晚期直肠癌患者，将 NCRT 治疗后 1 周作为疗效评估的观测点，在 NCRT 规定周期完成后行 TME 术式获取完整病理结果。记录 37 例患者 NCRT 前、一周后病灶最小 ADC 值，最小 ADC 值变化值（最小ΔADC）、最小 ADC 变化率（最小ΔADC%）。结合术后病理将患者分为病理完全缓解组（pcR 组,18 例）和非病理缓解组（非 pcR 组，19 例）。采用 Mann-Whitney U 检验比较 pcR 与非 pcR 组间最小 ADC 值及其变化值、变化率的差异。绘制 ROC 分析早期最小 ADC 各参数值预测 pcR 组和非 pcR 组疗效评价的诊断效能。**结果** 37 例患者直肠癌 NCRT 治疗前 pcR 组和非 pcR 组病灶最小 ADC 值分别为（0.783±0.15）×10-3 和（0.721±0.16）×$10^{-3}mm^2/s$，NCRT 治疗后 1 周的最小 ADC 值为（0.975±0.15）×10-3 和（0.857± 0.16）×$10^{-3}mm^2/s$，差异有统计学意义（t=－3.175，P=0.010），NCRT 治疗前、后 1 周 pcR 组和非 pcR 组病灶Δ最小 ADC 为

（0.192±0.233）×$10^{-3}$$mm^2$/s，（0.136±0.341）×$10^{-3}$$mm^2$/s，差异有统计学意义（$t$=－4.734，$P$=0.010）。以 ADC 最小值为 0.756×$10^{-3}$$mm^2$/s 为阈值绘制 ROC 曲线，曲线下面积为 0.687，对新辅助化疗效预测的敏感度为 77.3%，特异度为 65.2%；以Δ最小 0.106×$10^{-3}$$mm^2$/s 为阈值绘制 ROC 曲线，曲线下面积为 0.790，对新辅助化疗效预测的敏感度为 84.1%，特异度为 73.4%；

结论 早期扩散加权成像有助于局部晚期直肠癌患者临床及时调整化疗方案，ΔADC 最小值的敏感度最高，特异度最好。

EPO-1946

DCE-MRI 量化分析在早期评估肝转移瘤化疗疗效的应用价值

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目的 探讨 DCE-MRI 技术定量评估结直肠癌肝转移瘤抗肿瘤药物早期疗效的应用价值。方法 收集接受贝伐单抗及细胞毒性药物联合化疗的结直肠癌肝脏转移患者，分别在化疗前、化疗后第 4 天、化疗 3 个周期后行常规 MRI 及 DCE-MRI 检查，动态观察转移病灶的影像学表现，根据 RECIST 标准将病灶分为治疗有效组（CR，PR，SD）和治疗无效组（PD）；测量 DCE-MRI 技术中微血管转运常数（K^{trans}）、血浆容积分数（V_p）、血管外细胞外容积分数（V_e）、反流速率常数（K_{ep}）等定量指标，动态观察其在治疗前后不同时期的变化情况，与血清 VEGF 水平之间行相关性分析。结果 结直肠癌肝脏转移瘤患者化疗前及化疗后第 4 天，治疗有效组及治疗无效组中病灶横径差异无统计学意义；结直肠癌肝转移瘤化疗前，治疗有效组的 K^{trans}、K_{ep} 值大于治疗无效组的相应参数值；结直肠癌肝转移瘤化疗后第 4 天，治疗有效组肿瘤病灶的 K^{trans}、K_{ep} 值明显下降；K^{trans}、K_{ep} 值与血清 VEGF 水平之间存在正相关性。结论 DCE-MRI 定量参数可无创性的评价结直肠癌肝转移瘤联合化疗的早期疗效，且可通过 K^{trans}、K_{ep} 值在治疗前的高低来预测结直肠癌肝脏转移瘤的治疗效果。DCE-MRI 定量指标可为抗肿瘤药物疗效的早期评估、药物敏感性的预测及治疗方案的个体化选择提供重要的影像学依据。

EPO-1947

Comparison of Intravoxel Incoherent Motion, Diffusion Kurtosis Imaging and Dynamic Contrast-Enhanced MRI for Differentiating Borderline from Malignant Epithelial Ovarian Tumors Using Histogram Analysis

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Objectives: To compare the value of whole-tumor histogram analysis of intravoxel incoherent motion (IVIM), diffusion kurtosis imaging (DKI) and dynamic contrast-enhanced (DCE) MRI in the differentiation of borderline from malignant epithelial ovarian tumors (BEOTs vs. MEOTs), and to identify the correlations between the perfusion parameters derived from IVIM and DCE-MRI.

Methods and materials: IVIM, DKI and DCE-MRI were performed in 21 patients with BEOTs and 42 patients with MEOTs. The whole-tumor histogram metrics were calculated on

parametric maps of IVIM (pure diffusion coefficient [D], pseudo-diffusion coefficient [D*], perfusion fraction [f]), DKI (diffusion kurtosis [K], diffusion coefficient [Dk]) and DCE-MRI (volume transfer constant [K^{trans}], rate constant [k_{ep}], and extravascular extracellular volume fraction [v_e]). The Mann-Whitney U test and the receiver operating characteristic (ROC) curves comparison were constructed to determine the best diagnostic accuracy. Spearman's rank correlation was used to analyze the correlations between DCE-MRI and IVIM parameters.
Results: Most of the metrics of D and Dk, and 90th percentile and root mean squared of f were significantly higher in BEOTs than in MEOTs ($P < 0.05$). While most of the metrics of K and K^{trans} and median of k_{ep} were significantly lower in BEOTs than in MEOTs ($P < 0.05$). Additionally, the 10th percentile of Dk value appeared to be the most reliable for tumor differentiation as it yielded a sensitivity of 93.75%, a specificity of 88.00%, an accuracy of 90.24%, and an AUC of 0.928, with a cut-off value of 1.406×10^{-3} mm^2/s. However, there were no differences in the diagnostic performances among Dk, D and D* (all $P > 0.05$). Moreover, weak inverse correlations were found between D and K^{trans} ($r = -0.346$, $p = 0.027$), D and k_{ep} ($r = -0.460$, $p=0.003$).
Conclusions: Whole-tumor histogram analysis of IVIM, DKI and DCE-MRI are valuable for differentiating BEOTs from MEOTs. The 10th percentile of Dk is the best diagnostic parameter. IVIM findings correlate with DCE-MRI results and may represent an alternative to DCE-MRI.

EPO-1948

Using the DKI Technology to Explore Normal Hepatic Microstructure Difference Between Left and Right Lobe

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Rationale and Objectives: In addition to to test the feasibility of DKI in normal liver and explore hepatic preliminary DKI parameters, to make a basis for DKI better application on intrahepatic lesions.Besides to assess the left and right lobe diffusion and structural differences in the liver, in view of the different locations of different lesions in the liver.
Meterials and Methods: The livers of 32 healthy volunteers were examined twice on the GE 3.0 T MR scanner on the 2th weekend after first scan.Eight liver segment (S1-S8)DKI derived parameter MK, MD,FA, KA、KR、DA、DR data were collected. Statistical analysis was to evaluate correlation between parameters and differences of parameters in the left and right liver lobe. Bland-Altman method was used to assess Intra-observer and inter-observer reproducibility.
Results: The kurtosis coefficient (MK, KA, KR) of the left liver lobe of the was significantly lower than the right liver lobe , while the diffusion coefficient (MD, DA, DR) was lower than right lobe of the liver, and the difference was statistically significant($P<0.05$).According to the principle of DKI,There is a positive correlation between the three kurtosis metrics MK、KA、KR,and also positive correlation between

the three diffusion metrics MD、DA、DR，besides we found negatively correlation between MK and MD(r=-0.638).No significant correlation was found between FAk and other parameters (r<0.3).Except for FAk, the consistency of each parameter in the two scans is better, among all parameters the consistency of DR is the highest(ICC=0.827);Regarding the repeatability of each segments, we found that the lower right lobe of the right lobe (S5, S6) possess the best repeatability, while the upper left lobe of the liver (S2) deserved the worst repeatability.

Conclusions In addition to FAk, the remaining DKI parameters in the left and right liver lobe exist significantly difference,which suggests that there should be microscopic structures or perfusion differences in the left and right liver lobe. In addition, studies have shown that DKI possess good repetitiveness in the liver. especially in the lower segments of right liver (farthest away from the heart and lungs)which suggests that when DKI is applied to the liver, the segment or lobe of lesion should be selected or chose the relatively stable liver segment(S5,S6)as the control group .

[Key word]Diffusion Kurtosis Imaging;Normal Liver ;Feasibility;Repeatability;Perfusion Difference

EPO-1949

ADC 值联合纹理特征评估宫颈鳞癌分化程度的价值

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目的：探讨 MR 扩散加权成像(DWI)表观扩散系数(ADC)值联合纹理特征评估子宫颈鳞癌病理分化程度的价值。 **方法：**对 88 例经病理证实宫颈癌患者行常规 MRI 及 DWI 扫描，b 值取 1 000 s/mm2，获得病灶的 ADC 值。在 T2WI 序列进行纹理分析，获得熵值、能量、峰度、标准差、均值及偏度等参数。所得结果应用 SPSS 软件,采用单因素 ANOVA 分析及 LSD 进行两两比较,P＜0.05 有统计学意义。并采用受试者工作特征（receiver operating characteristic curve, ROC）曲线判断有统计学差异的 ADC 值及纹理值评估不同分化程度宫颈鳞癌的价值，计算曲线下面积（area under the curve, AUC）、灵敏度及特异度，AUC＞0.5 表示差异有统计学意义。 **结果：**88 例患者中，低分化组 47 例，平均 ADC 值(0.71±0.027)×10^{-3} mm^2/s;中分化组 30 例，平均 ADC 值(0.77±0.046)×10^{-3} mm^2/s;高分化组 11 例，平均 ADC 值(0.78±0.075)×10^{-3} mm^2/s;中、高分化组分别与低分化组之间差异有统计学意义(P＜0.05)，而中分化组与高分化组之间差异无统计学意义(P＞0.05)。3 组间纹理特征比较，标准差和熵值具有统计学差异(P＜0.05)，而能量、峰度、均值及偏度比较无统计学差异(P＞0.05)。除低分化组与高分化组间纹理参数标准差的 AUC 小于 0.5 外，其余均大于 0.5，差异有统计学意义。 **结论：**单一 ADC 值只能区分低分化宫颈鳞癌与中高分化鳞癌，但不能鉴别中分化与高分化宫颈鳞癌；ADC 值结合纹理特征可以在术前提高子宫颈鳞癌的分化程度的效能。

EPO-1950

高分辨 MRI 诊断壁外血管侵犯与直肠癌肿瘤局部微循环相关性的初步研究

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目的：探讨高分辨 MRI 诊断直肠癌患者有无壁外血管侵犯（extramural vascular invasion, EMVI）与动态对比增强 MRI（dynamic contrast-enhanced MRI, DCE-MRI）各定量灌注参数的相关性。**方法：**收集 2014 年 11 月至 2015 年 12 月经病理证实为直肠腺癌的患者，共纳入未接受新辅助治疗且于直肠 MRI 检查 2 周内行直肠癌根治术的患者 72 例。基于高分辨 MRI 评价患者 EMVI 情况，并在 DCE-MRI 上勾画全肿瘤体积获得该患者的定量灌注参数（K^{trans}、k_{ep}和 v_e）。比较分析 mrEMVI 阴性组与阳性组间 DCE-MRI 各定量灌注参数及临床病理资料的差异。**结果：**mrEMVI 阳性患者的 k_{ep} 值较阴患者显著降低（0.938 min^{-1} vs. 0.710 min^{-1}, P = 0.012），v_e值较阴性患者显著升高（0.288 vs. 0.344, P = 0.021），而 K^{trans}值在 mrEMVI 阴性组和阳性组间无显著差异（0.238 min^{-1} vs. 0.217 min^{-1}, P = 0.390）。另外，mrEMVI 阳性患者的肿瘤体积更大、具有更高的肿瘤病理分期及更易出现区域淋巴结转移（2.9 cm vs. 3.5 cm, P = 0.011; 63.8% vs. 92.0%, P = 0.010; 36.2% vs. 76.0%, P = 0.001）。**结论：**本研究首次发现 mrEMVI 阳性的直肠癌患者的肿瘤局部微循环发生改变，k_{ep}值显著降低，v_e值显著升高，且肿瘤体积更大、肿瘤病理分期更高及更易出现区域淋巴结转移。

EPO-1951
临床结合多参数 MRI 评分模型对子宫肉瘤及不典型子宫肌瘤的鉴别诊断

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目的：寻找能够鉴别子宫肉瘤及不典型子宫肌瘤的临床指标、MRI 定性及定量参数，得出子宫肉瘤的预测指标，并对其量化评分。
方法：在 2011 年 6 月至 2016 年 12 月间，收集到由我院病理证实的 96 例子宫肉瘤和 88 例不典型子宫肌瘤的临床资料，术前曾行 MRI 扫描并符合条件的有 63 例子宫肉瘤和 79 例不典型子宫肌瘤。分析并比较两组肿瘤在临床参数、MRI 定性图像特点、DWI 及增强定量参数方面的差异性，通过逻辑回归等统计学方法计算出术前预测子宫肉瘤的参数评分。
结果：单变量分析证明患者年龄、临床症状、肿瘤部位、形态、前后径、边界、实质 T2WI 信号、mADC（平均表观扩散系数）值、minADC（最小表观扩散系数）值、TIC（时间-信号强度曲线）均能准确区分子宫肉瘤及不典型子宫肌瘤（P均＜0.001）。通过多元逻辑回归模型及参数估计最后得出：年龄＞50.5 岁（1 分）、以阴道流血流液为主诉（3 分）、病灶主要位于宫腔（4 分）、边界不清（4 分）、实质存在 T2WI 稍高信号（2 分）、minADC 值＜0.951×$10^{-3}$$mm^2$/s（4 分）均能用于术前预测子宫肉瘤。当总评分≥8 时，敏感性、特异性、准确性、阳性及阴性预测值分别为 90.5%、98.7%、95.1%、98.3%、 92.9%。
结论：临床结合多参数 MRI 制定出的子宫肉瘤预测评分模型能够准确区分子宫肉瘤及不典型子宫肌瘤，以利于治疗方式的选择。

EPO-1952
DCE-MRI 对早期宫颈癌盆腔淋巴结转移的评估

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目的:探讨 DCE-MRI 在评估早期宫颈癌盆腔转移淋巴结与非转移淋巴结中的应用价值。材料与方法:回顾性分析经病理证实的 57 例 IB1～IIA1 期宫颈癌患者，其中 19 人存在盆腔淋巴结转移，纳入术前 DCE-MRI 与术后病理相对应淋巴结 94 枚（转移性淋巴结 30 枚，非转移性淋巴结 64 枚），其中包括正常大小淋巴结（短径＜10mm）78 枚（转移性淋巴结 17 枚，非转移性淋巴结 61 枚）。测量各淋巴结短径及其 DCE-MRI 定量灌注参数（K^{trans}、K_{ep}、V_e）以及原发肿瘤的 DCE-MRI 定量灌注参数。通过秩和检验对各参数进行比较分析；通过 Logistic 回归模型拟合联合预测因子；绘制淋巴结短径、DCE-MRI 定量灌注参数及联合预测因子的 ROC 曲线，获取诊断界值。结果:转移性与非转移性原发肿瘤之间 K^{trans}、K_{ep}、V_e均无统计学差异。转移淋巴结组短径、K^{trans}、K_{ep}、V_e均大于非转移淋巴结组，且差异有统计学意义（P＜0.05）；淋巴结短径、K^{trans}、K_{ep}、V_e、淋巴结短径与 Ktrans 值的联合预测因子 pre1 的 ROC 曲线下面积分别为 0.834、0.784、0.648、0.703、0.883。在正常大小的淋巴结中，转移淋巴结组短径、K^{trans}、V_e均大于非转移淋巴结组，且差异有统计学意义（P＜0.05）；淋巴结短径、K^{trans}、V_e、淋巴结短径与 K^{trans}值的联合预测因子 pre2 的 ROC 曲线下面积分别为 0.759、0.768、0.727、0.839。结论:DCE-MRI 定量灌注参数可用于评估早期宫颈癌盆腔淋巴结转移，且在不同径线的淋巴结中有较好的诊断稳定性，以 K^{trans}结果最佳；在正常大小淋巴结中，K^{trans}诊断性能优于淋巴结短径。淋巴结短径联合淋巴结 K^{trans}值评估早期宫颈癌盆腔淋巴结转移效果最优。但 DCE-MRI 无法表明早期宫颈癌患者原发肿瘤的转移潜能。

EPO-1953
磁共振扩散峰度成像与拉伸指数模型评价裸鼠原位肝细胞癌异质性

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目的 探讨磁共振（MRI）扩散峰度成像（DKI）和拉伸指数模型（SEM）评估自然生长状态下裸鼠原位肝细胞癌（HCC）异质性的价值。**方法** 将 25 只原位 HCC 裸鼠模型随机分为 A、B、C、D 和 E 组，每组 5 只，分别于原位种植瘤生长至第 21、28、35、42 和 49 天进行 1.5T MRI 扫描，获得 DKI 和 SEM 以下各参数：平均峰度（MK）、平均扩散系数（MD）、扩散异质性指数 a 和扩散分布指数（DDC）。比较各组间肿瘤 DKI 和 SEM 各参数的差异。使用 Spearman 相关分析评价 DKI 和 SEM 各参数与组织病理学上坏死分数（NF）、微血管密度（MVD）、肿瘤细胞增殖指标 Ki-67 指数、苏木精伊红染色肿瘤最大径切面直方图异质性指标标准差（SD）和峰度以及肿瘤大小之间的相关性。**结果** 各组间肿瘤 MK、MD、a 和 DDC 值均有显著统计学差异（P 均< 0.05）。D 组肿瘤 MK 值明显高于 A、B 和 E 组，a 值明显低于 A、B 和 E 组，D 组肿瘤 MD 和 DDC 值显著高于 B 组，E 组显著高于 B 组和 C 组，P 均< 0.05。5 组肿瘤的 MK 值与 SD 和峰度值显著高度正相关（r = 0.603 和 0.604），a 值与 SD 和峰度值显著高度负相关（r = -0.627 和 -0.620）。从第 21 天至第 42 天肿瘤 MK 值与 NF（r = 0.587）、MVD（r = 0.490）、Ki-67 指数（r = 0.569）和肿瘤大小（r = 0.503）中度正相关，a 值与 NF（r = -0.577）、MVD（r = -0.490）、Ki-67 指数（r = -0.574）和肿瘤大小（r = -0.488）中度负相关。从第 28 至第 49 天肿瘤 MD 和 DDC 值与 NF（r = 0.706 和 0.664）显著高度正相关，与肿瘤大小（r = 0.492 和 0.525）中度正相关，P 均< 0.05。**结论** DKI 和 SEM 可反映 HCC 的异质性，或可成为临床无创性评价 HCC 肿瘤异质性的生物影像学指标。

EPO-1954
基于压缩感知技术的 3D-MRCP 的临床应用探索

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目的：探讨压缩感知技术（CS）在 3D-MRCP 成像中的可行性。
方法：对 30 名志愿者在 3.0T-MRI 仪上行 3D-MRCP 扫描，完成常规 MRCP 扫描和 CS-MRCP 扫描，两次扫描的采集范围、空间分辨力相同。CS 组图像按不同降噪（denosing，DS）水平进行重建：DS_{weak}（5%）、CS-DS_{medium}（10%）、CS-DS_{strong}（20%）。每位志愿者共获得 4 组图像，通过主、客观对图像质量进行评价。主观图像质量评价：由 2 名高年资影像诊断医师分别独立阅片，采用 3 级评分标准分别对图像质量进行评价，标准如下：1 分，图像伪影较重、SNR 较低、不能用于临床评估；2 分，图像伪影较轻、SNR 尚可、可用于临床评估；3 分，图像无明显伪影、SNR 高、可用于临床评估。图像质量主观评价采用 Wilcoxon 符号秩和检验，采用 Kappa 系数对阅片者之间评价结果进行一致性分析（k≥0.75 代表一致性较好）。客观评价：选取胆总管显示最佳层面，测量该层面表观信噪比（signal-to-noise ratio，SNR）和对比信噪比（contrast-to-noise ratio，CNR）。客观评价采用单因素方差分析，组间两两比较采用 LSD 法检验。以 p<0.05 为差异具有统计学意义。
结果：2 位高年资影像诊断医师的对图像质量的主观评价结果的评分一致性高(k=0.94)，阅片者倾向将 CS-DS_{strong}组图像作为最佳诊断图像。客观评价中，CS-DS_{strong}在 4 组图像中 SNR 最高(p<0.05)，且 CS-DS_{strong}组与常规 MRCP 组的 CNR 差异无统计学意义。
结论：CS 技术可用于 3.0T MRI 仪行 MRCP 检查，在保证了图像质量的同时，大大缩短了扫描时间。

EPO-1955
Gd-EOB-DTPA 增强后 Look-Locker 评估肝细胞分数诊断慢性乙型/丙型肝炎后肝纤维化的临床研究

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目的：探究钆塞酸二钠（Gd-EOB-DTPA）增强后 Look-Locker 测量肝细胞分数（HeF）的方法在评估肝纤维化等级上的价值，并与肝细胞期相对下降率（RE）进行对比。拟为肝纤维化的定量评估，特别是早期肝纤维化的评估提出一种新的影像学方法。
研究方法：研究共纳入慢性肝炎患者 109 人，采用 3.0T 磁共振设备进行 Gd-EOB-DTPA 增强磁共振扫描。所有患者均进行包含 2 次（Gd-EOB-DTPA 注射前及注射后第 20min）Look-Locker 同层图像采集及 2 次（Gd-EOB-DTPA 注射前及注射后第 18min）的 T1 图像采集。患者于磁共振检查后 48 小时内行肝脏穿刺活检。计算感兴趣区肝实质的 HeF 值及 RE 值，将 HeF、RE 与患者病理分期结果进行比较。
结果：共 73 人同时具备肝纤维化病理结果和磁共振检查结果，这些纳入分析患者按照肝纤维化病理 METAVIR 等级分为:F0，n=23(31.5%)；F1，n=19 (26.0%)；F2，n=13 (17.8%)；F3，n=6 (8.2%);F4，n=12（16.4%）。随着肝纤维化等级升高，肝细胞分数值减小，肝纤维化程度与肝细胞分数存在相关性(r = -0.81，P < 0.05)。HeF 在评估有纤维化(≥F1)，显著纤维化(≥F2)，进展期纤维化(≥F3)和肝硬化(F4)的 ROC 曲线下面积分别为 0.84(0.73－0.91)，0.89(0.80－0.95)，0.96 (0.88－0.99)和 0.96 (0.88－0.99)，诊断效果优于肝细胞相对增强分数。

结论：Gd-EOB-DTPA 增强后 Look-Locker 肝细胞分数技术可作为定量评估肝纤维化等级的一种有效的影像学诊断方法。

EPO-1956
基于 MR Dixon 技术定量分析 2 型糖尿病患者肝胰脂肪含量

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目的：应用磁共振（MR）Dixon 技术测量 2 型糖尿病患者与健康对照组的肝胰脂肪含量，分析两组肝胰脂肪含量的差异及影响 2 型糖尿病的因素。 **方法：**收集 2 型糖尿病者 118 例，健康者 39 例，所有研究对象均行腹部 MR Dixon 序列扫描。采用图像后处理软件得出腹部脂肪分数图，测量肝脏、胰腺的脂肪分数及胰腺径线，同时进行人体学参数、FPG、HLD、LDL、TG、CHOL 指标的检测，比较两组间肝脏、胰腺脂肪含量的差异，分析影响 2 型糖尿病的因素。 **结果：**2 型糖尿病患者的肝脏脂肪分数为（10.6±8.14）%，胰腺脂肪分数为（9.26±3.47）%，均高于对照组[（4.7±2.95）%、（7.37±2.45）%]，差异有统计学意义。2 型糖尿病患者的 FPG、TG、CHOL 显著高于对照组，HLD 低于对照组，以上差异具有统计学意义。FPG、HDL、TG、CHLO、肝脏平均脂肪分数、胰体脂肪分数、胰尾脂肪分数、胰腺平均脂肪分数为 2 型糖尿病的影响因素。 **结论：**应用 MR Dixon 技术能够准确测量肝脏、胰腺脂肪含量。2 型糖尿病患者肝胰脂肪含量与高于健康人，且肝胰脂肪含量为 T2DM 的影响因素。

EPO-1957
联合使用体内非相干运动（IVIM）和磁化转移成像（MT）检测早期糖尿病肾病的初步研究

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目的：体内非相干运动（IVIM）和磁化转移技术（MT）用于评估早期糖尿病肾病（DN）患者肾功能的初步研究。
方法：共纳入 14 例确诊为Ⅰ期 DN 的患者作为观察组，35 例健康志愿者作为对照组.IVIM（b = 0,50,100,150,200,400,600,800sec /㎜²）和弥散加权成像（DWI， b = 50,800sec / ㎜ 2）序列在 3T 扫描仪（Skyra，Siemens Healthineers）上获得。执行 DWI 序列后，在 Siemens MRWP 工作站上自动生成 ADC 映射。通过使用原型软件体扩散工具箱（Siemens healthineers）生成 IVIM 参数（ADC，D，f 和 D *值）。使用 3D 快速低角度拍摄（FLASH）序列进行 MT 研究，该序列运行两次;第一个没有 MT 饱和脉冲（MToff），第二个没有 MT（MTon）饱和脉冲。对于 MT 成像后处理，MTR =（MToff MTon）×100 / MToff，MTR 值以百分比单位表示。在每个受试者的 MT 图上使用以下区域测量肾皮质和髓质的磁化传递速率（MTR）。在上极，肾门和肾的下极的皮质和髓质区域中，每个受试者共绘制了 12 个感兴趣的区域。所有结果的平均值用于确保测量的一致性。
结果：采用 IVIM，肾皮质 D 值是区分健康志愿者和早期 DN 的最佳参数，曲线下面积（AUC）为 0.835，诊断敏感性和特异性分别为 74.3％和 92.9。通过 MT，肾皮质的 MTR 值是区分健康志愿者和早期 DN 的最佳参数，AUC 为 0.843，诊断敏感性和特异性分别为 78.6％和 80.0％。结合使用肾皮质的 D 和 MTR 值，AUC 为 0.916，诊断敏感性和特异性分别为 85.7％和 88.6％。
结论：体内非相干运动和磁共振磁化转移成像相结合，对早期 DN 的检测具有较高的诊断效率。

临床意义：源自 IVIM 的 D 值和源自 MT 的 MTR 值可能是用于检测 DN 的早期变化的潜在成像生物标志物。

EPO-1958
MRI 定量参数在凶险性前置胎盘成熟度分级诊断中的应用价值

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摘要：
目的：探讨定量 MRI 参数在凶险性前置胎盘(dangerous placenta previa ,DPP)胎盘成熟度分级诊断中的应用价值；
材料与方法：分析我院生产的 128 例凶险性前置胎盘 MRI 资料，包含超声确诊前置胎盘后行多平面 HASTE T2WI 及多 b 值 DWI 扫描，b 值包含 0，400，800s/mm^2。根据胎盘最大面 T2WI 图像分别测量绒毛膜板、胎盘实质、基底膜最大厚度（mm）；分别测定感兴趣区 b=400，800s/mm^{2}的 ADC 值。根据剖宫产时胎盘成熟度评分，采用回归分析方法对孕周，T2WI 图像上胎盘不同面的径线值、不同 b 值 ADC 与胎盘成熟度评分关系；采用 ROC 分析不同定量参数在诊断胎盘成熟度中的诊断效能。

结果：128 例 DPP 孕周为 19-38 周，中孕 46 例，晚孕 82 例；其中胎盘成熟度分级： I 级 18 例，II 级 69 例，III 级 41 例；胎盘实质最大面测量：I 级 19.2±1.1mm，II 级 23.4±3.4mm，III 级 28.6±4.2mm；胎盘 ADC（b=400）： I 级 2438±189 mm^2/s ，II 级 1864±201 mm^2/s，III 级 1539±261mm^2/s；胎盘 ADC（b=800）：I 级 2312±211 mm^2/s，II 级 1763±341 mm^2/s，III 级 1321±428mm^2/s；回归分析：胎盘实质径线与胎盘成熟度分级存在较高相关；ROC 提示胎盘成熟度分级中，ADC 存在较高诊断效能，AUC 为 0.71-0.92。其中 b=800 s/mm^{2}时诊断准确效能相对更高。

结论：常规 T2WI 经线测量结合 ADC 值能准确对凶险性前置胎盘胎盘成熟度分级；

EPO-1959
颈椎动力位磁共振检查在评估椎间盘突出中的价值研究

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目的：颈椎磁共振检查是诊断评估椎间盘突出的常用方法，但颈椎中立位不能模拟日常颈椎的“工作”状态，因此常规体位（中立位）的颈椎磁共振检查不能很好的评估椎间盘突出。由此进行颈椎动力位磁共振检查，并结合中立位，对颈椎椎间盘突出症进行诊断评估分析。**方法：**搜集我院 2019 年 6 至 2019 年 7 月，临床拟诊断为颈椎椎间盘突出的患者并行 MR 检查共 47 例，同时行颈椎中立位与动力位检查，并对颈椎磁共振中立位及动力位的椎间盘检出率与临床症状进行对比。**结果：**颈椎磁共振中立位椎间盘突出 35 例，颈椎磁共振动力位椎间盘突出 41 例，临床症状符合率中立位 74.5%，临床症状符合率动力位 87.2%，动力位与中立位在评估椎间盘突出中存在差异，有统计学意义(P ＜ 0.05) 。**结论：**颈椎动力位磁共振检查可以辅助颈椎中立位，更好的提供椎间盘突出的诊断价值，从而为颈椎椎间盘突出的评估诊断，临床进行椎间盘手术提供更好的影像学依据。

EPO-1960
3.0T 磁共振 IDEAL 技术联合 T2 mapping 成像在下腰痛中的诊断价值

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目的：探讨 3.0T 磁共振 IDEAL 技术联合 T2 mapping 成像技术对腰椎间盘退行性变的诊断价值及在下腰痛疾病中的应用。
方法：前瞻性纳入 2018 年 3 月－2019 年 4 月因下腰痛（low back pain,LBP）于甘肃省中医院就诊并行腰椎 3.0T MRI 检查的患者 150 例(女性 70 例 ，男性 80 例 ，年龄 43-85 岁)。所有病例均采用 GE Signa HDxt 3.0T 磁共振行常规矢状位 T1WI 及 T2WI、横断位 T2WI，并行正中矢状位 T2 mapping 成像。根据 Pfirrmann 标准将 L1-S1 腰椎间盘分级，标准化感兴趣区域后测量髓核（NP）及纤维环（AF）前、后缘的 T2 及 WSF 值（water signal fraction,水的信号分数）。分别比较各级 NP 和 AF 前、后缘 T2 值及 WSF 值，并分析 NP 及 AF 前后缘 WSF 值分别与 Pm 分级、T2 值、位置、年龄及性别间的相关性。
结果：共计测量 490 个椎间盘。① 腰椎间盘各分级 NP 的 T2 值除 IV 级与 V 级间差异无统计学意义（P>0.05）外，其余各级间差异均有统计学意义（P<0.05）；② 腰椎间盘 NP T2 值与各分级呈高度负相关（r=－0.77）；30 例腰痛患者间隔半年测得椎间盘 AF 前、后缘及 NP T2 值间差异均无统计学意义（P>0.05）；③ 各分级椎间盘髓核 WSF 值总体随分级的增加而减小；I-III 级分别与各级间比较差异均有统计学意义；④ 髓核的 WSF 值与 Pm 分级呈高度负相关（r=-0.771，p＜0.01），与 T2 值呈高度正相关（r=-0.662，p＜0.01），与年龄呈中度负相关（r=-0.532，p＜0.01），与椎间盘解剖部位呈弱负相关（r=-0.360，p＜0.01）。
结论：IDEAL 成像及 T2 mapping 成像技术能够无创性定量评估活体椎间盘微结构的变化，椎间盘髓核 WSF 值及其空间分布联合 T2 值的改变有助于早期评价下腰疼。

EPO-1961
钙化性腱膜纤维瘤的临床及 MRI 影像特征

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目的：通过探讨钙化性腱膜纤维瘤（CAF）的临床及 MRI 表现，提高对 CAF 的诊断水平。

方法：收集经病理证实的钙化性腱膜纤维瘤 6 例，回顾性分析其临床资料及 MRI 表现并复习相关文献。所有病例均行 MRI 检查，其中 1 例行 MRI 增强检查。

结果：本组病例发病年龄 1-44 岁，平均年龄 13 岁，中位年龄 8 岁，性别比例 1:1，分别位于足底部 3 例、腕掌侧 2 例、椎管后方（硬膜外）1 例，其中单发 5 例，多发 1 例，临床均以无痛性包块就诊。MRI 均表现为类圆形结节影，长径 0.8cm-4cm 不等，5 例紧贴肌腱生长，其中 3 例边界不清，侵犯周围肌腱、肌肉及脂肪组织。本组 5 例 CAF 均表现为 T1WI 等、T2WI 等信号，压脂序列呈稍高信号，1 例 T1WI 呈不均匀高信号、T2WI 及压脂序列均为低信号改变；增强扫描可见病灶呈轻中度均匀强化；本组病例中 2 例病灶内可见特征性双低信号改变。镜下见瘤细胞梭形，束状排列，局灶有软骨样细胞分化，并见钙化，免疫组化：SMA(-)、S-100(-)、CD68(-)、CD34(-)

结论：钙化性腱膜纤维瘤是一种罕见的具有局部侵袭性的软组织肿瘤，结合临床特点及特征性影像表现可确诊，MRI 能够清楚显示钙化性腱膜纤维瘤的病灶部位、大小、信号特点以及病灶周围组织关系，是目前钙化性腱膜纤维瘤的重要术前检查方法。

EPO-1962
腰椎管狭窄患者中马尾神经冗余 MRI 定量分析的临床价值

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目的 分析 MRI 对腰椎管狭窄患者中马尾神经冗余(RNRs)定量检测数据，探讨其对手术方式选择和预后的临床指导价值。**方法** 收集 2017 年 7 月至 2018 年 6 月我院临床确诊腰椎管狭窄患者 275 例。采用 Siemens 3.0T Skyra 磁共振成像仪，腰椎 MRI 常规序列扫描。根据是否存在 RNRs 分为冗余组和非冗余组。测量腰椎管狭窄程度、RNRs 相对长度；完成腰椎 JOA 评分和腰椎 ODI 评分；对有 RNRs 并做椎管减压手术者行术后 3-6 个月随访。两组数据采用独立样本 t 检验；冗余相对长度与相关指标做相关性分析。**结果** 冗余组 122 例，非冗余组 153 例，RNRs 发生率为 44.36%。年龄：冗余组 31～81 岁，平均(63.16±7.76)岁、非冗余组 18～78 岁，平均(58.39±9.09)岁；椎管狭窄程度：冗余组(0.85±0.20)、非冗余组(1.17±0.21)；JOA 评分：冗余组(8.45±1.91)、非冗余组(13.15±2.46)；ODI 评分：冗余组(73.11±5.22)、非冗余组(69.89±8.12)，两组间比较，差异均有统计学意义。冗余组中，RNRs 相对长度(4.35±1.41cm)与 JOA 评分呈负相关(r=-0.678)，与 ODI 评分呈正相关(r=0.626)，与病程呈弱正相关(r=0.297)。共随访术后患者 39 例，31 例 RNRs 解除，8 例仍存在 RNRs。两组术后 JOA 评分、ODI 评分对比差异有统计学意义(P<0.05)，RNRs 未解除影响患者椎管狭窄的手术疗效。两组术前 RNRs 相对长度对比差异有统计学意义(P<0.05)。**结论** 在腰椎管狭窄患者中，RNRs 较为常见，且冗余长度越长，临床症状越严重。单纯椎管减压术可以解除多数 RNRs，但有少数 RNRs 未解除，认为与 RNRs 相对长度因素有关。因此，MRI 对腰椎管狭窄患者 RNRs 的定量分析对选择手术方式和判断预后具有临床指导意义。

EPO-1963
高场强磁共振应用于膝关节隐匿性骨折诊断的临床分析

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目的 分析膝关节隐匿性骨折诊断采用高场强磁共振的临床价值。方法 本次研究对象为我院收治的 90 例膝关节隐匿性骨折患者，选取时间段为 2018 年 5 月至 2019 年 5 月，按照诊断方式的不同将患者随机分为两组，分别为对照组（45 例）、观察组（45 例），其中对照组采用多排螺旋 CT 诊断方法，观察组给予 MBI 诊断方法，对两组患者的诊断效果进行比较。结果 与对照组相比，观察组患者的诊断准确率更高（P＜0.05）；且观察组检查表现优于对照组（P＜0.05）；另外，观察组所采用的检查诊断符合度高于对照组，两种检查方法的数据的比较具有统计学意义（P＜0.05）。结论 在诊断膝关节隐匿性骨折过程中采用高场强磁共振能取得良好效果，尤其体现在诊断准确率的提高，以及有着较为明显的检查表现方面，因此，该诊断方法具有重要临床应用价值，其值得推广使用。

EPO-1964
3.0TMRI 造影及平扫对诊断髋臼盂唇撕裂差异的比较

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目的：本研究旨在比较单髋 3.0TMRI 平扫及直接造影对诊断髋臼盂唇撕裂敏感性及准确性的差异。方法：收集我院两年内 39 例因髋关节疼痛而拟诊为髋臼盂唇撕裂并经关节镜检查确诊患者的影像学资料，其中 22 例行单髋 3.0TMRI 关节直接造影，17 例行单髋 3.0TMRI 平扫。将所有患者髋臼盂唇均分为前上、前下、后上及后下 4 个区域，以关节镜检查为金标准，比较 MRI 髋关节直接造影及平扫对诊断盂唇撕裂的敏感性及准确性。结果：MRI 造影诊断盂唇损伤撕裂部位共 24 处。包括前上 21 处、前下 1 处及后上 2 处。关节镜所见损伤部位共 20 处，均位于前上盂唇。后下盂唇在 MRI 及关节镜均未见撕裂。其中，前上盂唇直接造影及关节镜同时诊断为撕裂的共 19 处，直接造影对前上盂唇撕裂敏感度为 95%、准确度 86.4%。前下及后上部位直接造影诊断的盂唇撕裂均为假阳性。MRI 平扫 2 例为阴性，余 15 例患者发现髋臼盂唇撕裂共计 18 处。包括前上 14 处、后上 2 处及后下 2 处。关节镜所见损伤部位共 19 处，17 例位于前上盂唇，后上及后下各 1 例。前下盂唇在 MRI 及关节镜均未见撕裂。MRI 平扫对前上盂唇撕裂敏感度为 82.4%、准确度 82.4%。单髋 3.0TMRI 髋关节直接造影与平扫对诊断盂唇撕裂敏感性及准确性差异无统计学意义(P >0.05)。讨论：单髋 3.0TMRI 直接造影在诊断髋臼盂唇撕裂时敏感性及准确性高于 3.0TMRI 平扫，但两者之间并无统计学差异。因此，单髋 MRI 平扫可以基本满足髋臼盂唇损伤的诊断要求。如果临床医生有更精确的要求，可行髋关节直接造影检查。

EPO-1965
肺腺癌与鳞癌骨转移的鉴别：MR 影像组学

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摘要　目的 探讨采用影像组学的方法分析骨转移 MR 影像特征鉴别肺腺癌和鳞癌的可行性。**方法** 回顾性分析 2016-2018 年经病理证实的 80 例肺癌患者（腺癌 40 例，鳞癌 40 例）的影像及临床资料，所有患者经综合影像学（CT、骨扫描或 MR）或病理证实为脊柱骨转移。应用 ITK-SNAP 软件对 MR 发现的骨转移病灶进行手动分割，通过 AK 软件提取纹理特征，然后通过训练组使用 ANOVA+MW 和 Correlation Analysis 方法进行筛选，最后根据筛选后的特征集使用随机森林（RTree）构建影像组学模型。用受试者工作特性曲线下面积（AUC）和准确度来评价该模型在鉴别肺鳞癌与肺腺癌中的表现。**结果**　T1WI 上，模型诊断准确度和 AUC 在验证组中分别为 0.701 和 0.687；T2WI 上，模型诊断准确度和 AUC 在验证组中分别为 0.663　和 0.579；T2WI 脂肪抑制上，模型诊断准确度和 AUC 在验证组中分别为 0.601 和 0.554。**结论** 采用影像组学研究方法分析骨转移 MR 影像特征对鉴别肺腺癌和鳞癌具有一定的参考价值。

EPO-1966
基于 MRI 在腰椎滑脱中对腰椎间盘变化与中医证型间相关性的研究

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目的：了解腰椎滑脱症中医证型与 MRI 变化的相关性研究。方法：回顾分析 112 例腰椎滑脱患者的 MRI 资料。观察椎间盘的 Pfirrmann 分级、软骨终板的 Modic 改变、突出症、真空征、许莫氏结节的情况。同时辩证分析腰椎滑脱症的证型。结果：研究发现：中医证型与滑脱椎体未见显著差异（$P>0.05$）；与滑脱段椎间盘的形态变化和信号分级变化程度差异显著（$P<0.05$）；**风湿痹阻**

证：椎间盘的 Pfirrmann 分级Ⅰ-Ⅱ级约占 87%；软骨终板的 Modic 改变Ⅰ-Ⅱ级约占 67%；突出程度较轻；真空征较少；许莫氏结节形成较少；**寒湿痹阻证**：椎间盘的 Pfirrmann 分级Ⅰ-Ⅱ级约占 57%；软骨终板的 Modic 改变Ⅰ-Ⅱ级约占 65%；突出程度较轻；真空征较少；许莫氏结节形成较少；**气滞血瘀证**：椎间盘的 Pfirrmann 分级Ⅱ-Ⅲ级约占 46%；软骨终板的 Modic 改变Ⅱ-Ⅲ级约占 51%；突出程度较中；真空征少；许莫氏结节形成较少；**湿热痹阻证**：椎间盘的 Pfirrmann 分级Ⅱ-Ⅲ级约占 66%；软骨终板的 Modic 改变Ⅱ-Ⅲ级约占 61%；突出程度较重；真空征较增多；许莫氏结节形成增多；**肾阳虚衰证**：椎间盘的 Pfirrmann 分级Ⅱ-Ⅲ级约占 74%；软骨终板的 Modic 改变Ⅱ-Ⅲ级约占 68%；突出程度重；真空征增多；许莫氏结节形成增多；**肝肾阴虚证**：椎间盘的 Pfirrmann 分级Ⅲ级约占 51%；软骨终板的 Modic 改变Ⅲ级约占 62%；突出程度重；真空征增多；许莫氏结节形成增多。结论：MRI 的变化与中医各证型之间有着相对的内在联系,为腰椎滑脱症的中医辨证提供了较为可靠的影像学依据。

EPO-1967

Multi-compositional MRI evaluation of repair cartilage in knee osteoarthritis with treatment of allogeneic human adipose-derived mesenchymal progenitor cells

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Background: *We used multimodal compositional magnetic resonance imaging (MRI) techniques, combined with clinical outcomes, to differentiate the alternations of composition in repair cartilage with allogeneic human adipose-derived mesenchymal progenitor cells (haMPCs) in knee osteoarthritis (KOA) patients.*
Methods: *Eighteen patients participated a phase I/IIa clinical trial. All patients were divided randomly into three groups with intra-articular injections of haMPCs: the low-dose (1.0*$\times 10^7$ cells), mid-dose (2.0×10^7), and high-dose (5.0×10^7) group with six patients each. Compositional MRI examinations including quantitative T1rho, T2, T2 star, R2star and ADC mappings were performed at 1 day before first injection to collect the base time point and 48 weeks to collect terminal point, and clinical evaluations including WOMAC and the SF-36 scores were conducted at 1, 3, 4, 8, 12, 24weeks after the first injection. Changes from base time in all measures that were scale variables were determined with a paired t-test (two-tailed) followed by Mann-Whitney U tests. We used the difference before and after treatment (D-values) as the object to avoid errors caused by individual differences.
Results: Compared with base time, significant differences were observed in quantitative measurements, including T1rho ($P < 0.0001$), T2 ($P = 0.0001$), T2 star ($P < 0.0001$), R2star ($P = 0.0001$) and ADC ($P = 0.0003$), suggesting a possible compositional changes of cartilage with the treatment of allogeneic haMPCs. Significant reduction in WOMAC ($P < 0.0001$) and SF-36 ($P < 0.0001$) scores showed the symptoms might be alleviated with this innovative treatment. Multiple comparisons showed significant differences in T1rho values among three dose groups ($F = 6.31$, $P = 0.025$), whereas no

significant differences in other measurements, which suggested different sensitivities of these mappings to detect compositional changes of cartilage.
Conclusions: *Multi-compositional MRI sequences could evaluate the promotion of the repair of cartilage with allogeneic haMPCs by providing supplementary information of compositional alterations of articular cartilage, which might be an effective tool for demonstrating efficacy of this new drug and guiding clinical decision-making in the follow-up treatment.*

EPO-1968

Diffusion weighted cardiovascular magnetic resonance imaging for discriminating acute from non-acute deep venous Thrombus

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Background: The importance of discriminating acute from non-acute thrombus is highlighted. The study aims to
investigate the feasibility of readout-segmented diffusion weighted (DW) cardiovascular magnetic resonance (CMR)
for discrimination of acute from non-acute deep venous thrombus (DVT).
Methods: For this prospective study from December 2015 to December 2017, 85 participants (mean age = 53 years,
age range = 34~74) with DVT of lower extremities underwent readout-segmented DW CMR. DVT of ≤14 days were
defined as acute (n = 55) and > 14 days as non-acute (n = 30). DVT visualization on b = 0, b = 800, and apparent
diffusion coefficient (ADC) images were assessed using a 4-point scale (0~3, poor~excellent). DW CMR parameters
were measured using region of interest (ROI). Relative signal intensity (rSI) and ADC were compared between acute
and non-acute DVT using a Mann Whitney test. Sensitivity and specificity for ADC and rSI were calculated.
Results: ADC maps had higher visualization scores than b = 0 and b = 800 images (2.7 ± 0.5, 2.5 ± 0.6, and 2.4 ± 0.6
respectively, P<0.05). The mean ADC was higher in acute DVT than non-acute DVT (0.56 ± 0.17 × 10- 3 vs.
0.22 ± 0.12 × 10- 3mm2/s, P<0.001). Using 0.32 × 10- 3mm2/s as the cutoff, sensitivity and specificity for ADC to
discriminate acute from non-acute DVT were 93 and 90% respectively. Sensitivity and specificity were 73 and 60% for
rSI on b = 0, and 75 and 63% for rSI on b = 800.
Conclusions: Readout segmented diffusion-weighted CMR derived ADC distinguishes acute from non-acute DVT.

EPO-1969
高分辨率毁损梯度回波序列在脊髓动脉磁共振成像中的应用研究

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介绍
脊髓动脉成像一直是临床难以解决的问题，解剖复杂，直径小，仅 0.5mm 左右,常规影像学检查技术难以显示。为了开发能够可视化最相关的脊髓动脉新型成像技术，必须满足高空间分辨率，时间分辨率和范围足够覆盖这三个条件，因此进行 MR 序列参数优化更具有挑战性。常规的 MRA 序列如 TOF、PC 等方法均因脊髓动脉细小，且血流速度较慢均不适用。因此我们在本研究中实施了一种创新方法，使用 3D 高空间分辨率+Keyhole 技术的可控时间分辨率血管造影序列，以更好地观察脊髓动脉。
方法
征集 30 名正常志愿者，随机分 A,B,C 三组，每组 10 名，平均年龄 45.25±6.52 岁，使用扫描仪 Philips Ingenia3.0T，12 通道相控阵脊柱线圈对下胸段脊髓进行扫描，
A 组：使用 4D Trak XD 高时间分辨率序列并绘制 TIC 曲线，测量其造影剂达峰时间，key-hole20%。
B 组：使用高分辨率 3D T1FFE 毁损梯度回波序列，不开 Keyhole,TR / TE /Flip：2.9ms / 5.6ms / 25°，体素 0.5x0.5x1 mm，层间距：-0.5mm，层数：70，NSA:2.Time: 3：28 min
C 组：使用高分辨率 3D T1FFE 毁损梯度回波序列，keyhole20%，DYN：4，48s/期，其余几何参数与 B 一致，扫描时间= 5：36 min
结果
1：对 A 组数据进行 t 检验统计分析，得出脊髓动脉的造影剂达峰时间比肾皮质晚，呈慢血流型，达峰时间约为 50-110 秒
2：由两位高年资影像诊断医生对 BC 两组图像进行评分（根据信噪比，对比度，伪影等参数制定评分表），结果显示 C 组评分远高于 B 组。
结论
脊髓动脉是呈慢血流型的，对时间分辨率要求不高，使用高分辨 3DT1FFE 序列结合 key-hole 技术可以实现脊髓动脉的良好可视化，其效果均优于其余的影像学检查方法，可以清楚显示病变血管的形态，且成功率很高，对临床的诊疗方案具有重要的指导价值。

EPO-1970
基于 CycleGAN 网络模型从下肢骨肉瘤 CT 图像生成伪 MRI 图像的方法及质量评价

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目的：和 CT 图像相比，MR 图像具有更高的软组织对比度，但其价格昂贵，采集时间长，检查禁忌症多。本文旨在研究基于 CT 图像转化成伪 MRI（sMRI）的方法，以帮助有需要的患者无需进行 MR 扫描便可获取 MR 图像，辅助临床诊疗。
方法：数据来自中科大附属第一医院西区的 24 例下肢骨肉瘤患者。首先对原始 CT 和 MR 图像进行预处理：去噪并结合 Canny 边缘检测算子和 Otsu 阈值算法获得 ROI（Region of Interest），校正偏差场，重采样体素大小至 $0.8\times0.8\times5mm^3$，并以参考病例为基准进行直方图标准化，重设图像

分辨率至 256×256；然后采用 CycleGAN 网络模型，生成器为 ResNet 网络，鉴别器为 PatchGAN 网络，使用 18 例病人的 CT 和 MR 图像进行训练，学习两者之间的映射关系。通过设置循环一致性损失，判断由输入 CT 生成的 sMRI 是否可以再转回成原输入 CT，从而增强输入 CT 与输出 sMRI 间的结构相似性，减少无效输出图像的产生；最后使用另外 6 例病人的 CT 图像进行测试。以两名主治以上高年资医师在不知 MR 真伪的情况下进行主观评分，分别评价健侧下肢解剖结构的显示以及患侧骨肉瘤瘤体信号的显示，评分标准均采取 5 分制（1 分：极差；2 分：差；3 分：一般；4 分：良好；5 分：优秀）。

结果：使用 CycleGAN 网络模型成功将 6 例测试病人的下肢 CT 图像转化成 sMR 图像，健侧下肢解剖结构显示的得分为（3.83±1.03）分，骨-软组织对比度较好，层次分明；患侧骨肉瘤瘤体信号显示的得分为（2.05±0.63）分，骨肉瘤病变能够辨识，瘤体内部信号对比度差。

结论：CycleGAN 网络模型可以有效地根据下肢骨肉瘤的 CT 图像生成质量较高的 sMRI 图像，能够帮助无法进行 MR 图像采集的患者得到更好的影像诊断及相应治疗。未来增大训练集的数量以及改进网络，可能进一步提高 sMRI 的质量以及瘤体的显示，以满足临床需求。

EPO-1971

T2mapping 定量评价健康成年人腰椎间盘早期退变

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目的：探讨 T_2mapping 技术对健康成年人腰椎间盘早期退变的定量评价价值，分析髓核（nucleus pulposus,NP）及纤维环(anulus fibrosus,AF)T_2值与椎间盘退变 Pfirrmann 分级及性别的相关性。**方法**：经知情同意，纳入 28 例健康志愿者，男性，16 人，女性 12 人，平均年龄（25.6±2.13）岁。在 3.0 T 磁共振扫描仪上行 Sagittal T_2mapping，T_2WI，T_1WI 和椎间盘轴位 T_2WI 数据采集。T_2mapping 序列参数设定为 8 个回波时间（9.4, 18.9, 28.3, 37.8, 47.2, 56.7, 66.1, 75.6）ms。图像传至 AW4.6work station，采用 Functool T_2mapping 软件测量 T2 值。分别在椎间盘前后 AF 及 NP 选择兴趣区（ROI）。利用 Sagittal T_2WI 对椎间盘进行 Pfirrmann 分级，Spearman 等级资料相关性分析纤维环及髓核的 T_2值与椎间盘退变分级的相关性。方差分析椎间盘 NP 和 AF 不同性别之间的差异。**结果**：所有纳入的椎间盘，NP 都明显高于 AF，有 115 个（PfirrmannⅠⅡ级的椎间盘显示了一定范围的 T_2值。在 NP 和 Pfirrmann 分级（r=-0.505，p<0.001）呈中等的负相关。AF 和 Pfirrmann 分级之间没有显著的相关性（r=-0.053，p=0.265）。此外，在不同性别之间，AF 的 T_2值差异有统计学意义（z=-3.508，p<0.001），NP 的 T2 值差异无统计学意义（t=-0.455，p=0.650）。**结论**：磁共振 T_2mapping 对定量评价椎间盘退变具有较为可靠的潜在临床价值。椎间盘 NP 的 T_2值与 Pfirrmann 分级负相关。不同性别之间椎间盘 AF 的 T_2值存在差异。

EPO-1972

回顾性分析 45 例外周原始神经外胚层肿瘤的 CT 和 MRI 影像特征

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背景:外周型原始神经外胚层肿瘤(pPNET)是一种罕见的起源于神经外胚层的恶性肿瘤，准确的影像诊断对 pPNET 的早期发现及治疗至关重要。

方法：收集我院 2012 年 3 月至 2019 年 6 月经临床病理结果证实的 pPNET 患者 45 例进行回顾性分析，以回顾 pPNET 独特的 CT 和 MRI 影像特征。评估 45 例 pPNET 患者的肿瘤位置、形态学特征、密度及信号强度、CT、MRI 增强特征及局部软组织受累情况。
结果:本组病例中男性(28/45)多于女性，未增强 MRI(17 例)显示 T1WI 等强 14 例，低信号 3 例。T2WI 等信号强度 9 例，高信号 8 例。大多数 pPNETs 病灶的信号/密度不均匀，小坏死(CT: 14/20;MRI: 23/25)。肿瘤通常边界不规则，形状不规则(CT: 17/20;MRI: 22/25)。病理检查显示所有肿瘤均有小范围坏死，pPNET 的病理结果中均有 CD99+的高度表达。
结论:在年轻男性中，当影像学表现为单个大的病变实性肿块伴小范围坏死时，应考虑 pPNET 的诊断，尤其是在 T1WI 和 T2WI 上表现为软组织肿块大部分为等信号强度、不均匀性强化的患者。

EPO-1973
磁共振 mDixon Quant 技术对腰椎骨质疏松型压缩性骨折的应用

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目的：利用飞利浦 3.0T 磁共振 mDixon Quant 技术测量腰椎骨质疏松型压缩性骨折的邻近椎体骨髓脂肪含量（FF），计算平均值，间接代表压缩椎体的 FF，为骨质疏松症（OP）致压缩性骨折提供量化方法。方法：收集 2018 年 7 月至 2019 年 7 月在本院就诊的腰椎压缩性骨折患者 46 例,收集患者的临床资料和病史等,剔除 11 例，包括服用过激素 2 例，明确的重大外伤、高处跌落致骨折 2 例，青少年椎体骨骺发育不良致骨折 1 例，肿瘤性骨折 5 例，其中转移瘤致骨折 4 例，多发性骨髓瘤致骨折 1 例，图像金属伪影干扰 1 例，研究对象剩余 35 例，均进行压缩骨折椎体邻近椎体 FF 指标的测量，由两位主治医师分别、独立测量，后录入统计学软件，求得平均值 FF。结果：FF 在 57.60~79.54 之间，均数 X=68.57＞65.20。结论：MRImDixon Quant 技术测得压缩性骨折邻近椎体的 FF，快速间接的反映压缩骨折椎体骨质疏松的程度,并且为 OP 致压缩性骨折提供量化方法。

EPO-1974
T2WI 水脂分离成像（T2WI-Dixon）技术在中轴型脊柱关节炎诊断中的临床应用研究

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目的：通过比较单独采用 T2WI-Dixon 序列与常规序列（SPAIR-T2WI 和 T1WI）对中轴型脊柱关节炎（axSpA）的诊断效能，探讨单独采用 T2WI-Dixon 序列的对 axSpA 的诊断价值。
材料和方法：收集并分析临床怀疑 axSpA 并行 3.0T 骶髂关节 MRI 检查患者 107 例。MRI 扫描序列包括常规序列（SPAIR-T2WI 和 T1WI）以及 T2WI-Dixon 序列（正相位、反相位、脂像、水像）。两名影像科医师先独立分析常规序列，间隔两周后再独立分析 T2WI-Dixon 序列。分析内容包括“MRI 阳性骶髂关节炎”、急性和慢性骶髂关节炎、SPARCC 评分和 SSS 评分；第二名影像科医师测量 T2WI-Dixon 序列和常规序列骨髓水肿和脂肪沉积的 SNR 和 CNR。以临床诊断为金标准，比较 T2WI-Dixon 序列和常规序列“MRI 阳性骶髂关节炎”诊断 axSpA 的效能；使用 Kappa 检验比较急性、慢性骶髂关节炎的诊断一致性；使用组内相关系数（ICC）比较 SPARCC 评分和 SSS 评分的一致性；使用配对 t 检验比较信噪比（SNR）和信号噪声比（CNR）。

结果：常规序列和 T2WI-Dixon 序列“MRI 阳性骶髂关节炎”诊断 axSpA 的敏感性分别为 0.67-0.70、0.73、特异性为 0.78-0.86、0.74-0.78。Kappa 检验和 ICC 表明各指标观察者内和观察者间一致性相似；其中 T2WI-Dixon 序列对骨髓水肿和脂肪沉积的观察者间一致性稍高于常规序列。T2WI-Dixon 序列骨髓水肿和脂肪沉积的 SNR 和 CNR 均优于常规序列（P 均＜0.05）。
结论：单独采用 T2WI-Dixon 序列与常规序列（SPAIR-T2WI 和 T1WI）对 axSpA 的诊断效能相似。因此，单独采用 T2WI-Dixon 序列的 MRI 检查可以作为临床诊断、评估以及随访 axSpA 简便、有效的影像学方法。

EPO-1975
成人脊柱朗格汉斯组织细胞增生症骨质破坏修复形式探讨

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【摘要】目的 探讨成人脊柱朗格汉斯组织细胞增生症（LCH）骨质破坏修复形式。方法 对 9 例 11 个椎体病理确诊的明显骨质破坏的成人脊柱 LCH 骨质修复过程的跟踪随访，通过 CT、MRI 影像变化，分析骨质修复的形式。结果 9 个病例 11 个病灶，其中颈椎 5 例 6 个病灶，胸椎 2 例，腰椎 1 例 2 个病灶；单纯放疗 3 例，化疗 2 例，放化疗 1 例，另外 3 例随访观察；其中 2 例只进行 CT 复查，其余 7 例均有 CT、MRI 复查。从确诊到修复最短 6 个月，最长 50 个月；复查最少 3 次，最多 6 次；修复形式以破坏区中残存骨为中心修复 3 例，破坏区内斑点状多中心修复 5 例，多中心修复加边缘硬化边增生修复 1 例。结论 脊柱 LCH 骨质修复完全破坏区以斑点状多中心修复为主，中心有残存骨的以残存骨为中心修复为主，少部分以多中心加边缘硬化缘增生修复，这与文泽军[13]等单纯从边缘残存骨向中心推进看法略有不同。部分存在破坏区边缘骨质硬化带的病灶在随访中病灶破坏区仍有扩大，硬化带外移，压缩更明显，然而随后病灶缩小时硬化带却逐渐吸收，密度下降，所以破坏区边缘的硬化带可能是机体在应力下快速成骨反应，不能作为认定进入修复期的依据。

EPO-1976
Value of evaluating the risk of osteoporosis in diabetic patients by IDEAL-IQ

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Objective: To investigate the value of IDEAL-IQ in the assessment of osteoporosis risk in diabetic patients .**Materials and Methods :**After providing informed consent,16 diabetic patients underwent magnetic resonance lumbar vertebraIDEAL-IQ sequence scan and dual-energy X-ray absorptiometry (DXA) scan ,body mass index(BMI)20.21～28.08kg/m^2. After the dual-energy X-ray absorptiometry (DXA) was performed, all patients with diabetes were divided into three groups: Group A was normal bone mass group, group B was bone mineral density decrease group, and group C was osteoporosis group. The IDEAL-IQ sequence automatically generates 6 images, including Fat Fractionimages, R2* relaxation rate images, water images, fat images, in-phase and out-phase images. The FF values of vertebral bone marrows were measured on GE AW4.6 post processing workstation. The FF values of lumbar vertebra in groups A, B and C were analyzed and compared. The data were analyzed by SPSS 19.0 statistical software, P <0.05 was considered statistically significant .**Results :**There was no significant difference in age between groups A, B and C (P>0.05).The average FF values of lumbar vertebral

bodies between groups A, B and C were 43.65±3.91, 49.78±6.67 and 57.85±3.84, respectively .One-way ANOVA showed significant difference in FF values between different groups (ANOVA,F=5.515,P=0.036). There was a statistically significant difference in FF between group A and group C (Post-Hoc LSD, P=0.013). There was no significant difference in FF between group A and group B, group B and group C (Post-Hoc LSD, P=0.084; Post-Hoc, P=0.171) .**Conclusion** :IDEAL-IQ can quantitatively evaluate the fat fraction of lumbar vertebral and invasively evaluate the risk of osteoporosis in diabetic patients, which has guiding value for clinical diagnosis and treatment.

EPO-1977
MR 双斜冠状位扫描肩关节诊断肩袖损伤的临床价值

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目的:探讨 MR 双斜冠状位扫描肩关节诊断肩袖损伤的临床价值。
方法:对 2017 年 2 月~2018 年 10 月期间我院收治的 64 例疑似患有肩关节肩袖损伤患者的临床资料进行回顾性研究分析。将这 64 例患者分为对照组和研究组,每组各有 32 例患者。我科为对照组患者进行肩关节 MR 斜冠状位扫描,对研究组患者进行肩关节 MR 双斜冠状位扫描。然后比较两组患者图像显示的结果。
结果:研究组患者进行的肩关节 MR 双斜冠状位扫描可以完全将冈上肌、冈上肌腱和肱骨长轴同时显示在一张图像上(显示率为 100%)。而对照组患者进行的肩关节斜冠状位 MR 扫描不能将冈上肌、冈上肌腱和肱骨长轴同时显示在一张图像上(显示率为 0%)。研究组患者采用肩关节 MR 双斜冠状位扫描诊断肩袖损伤的敏感性(指在诊断过程中未漏诊的几率)为 93.33%。对照组患者采用肩关节 MR 斜冠状位扫描诊断肩袖损伤的敏感性为 66.67%。敏感性与准确性分别为 93.33%与 89.29%，均明显较对照组高，P＜0.05；两组的特异性对比，无明显差异，P＞0.05。
结论:进行肩关节 MR 双斜冠状位扫描可以清楚地显示标准的肩关节冠状位图像,其对冈上肌腱病变的显示效果要优于肩关节 MR 斜冠状位扫描。对临床诊断治疗有很大指导意义，因此,此检查方法可作为临床上诊断肩袖损伤的首选方法。

EPO-1978
经皮椎间孔镜下治疗椎间盘突出症术后 MRI 疗效评价

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[摘要]目的 探讨经皮椎间孔镜下治疗椎间盘突出症术后不同时间 MR 检查疗效评价。方法 选取本院 51 例行 TESSYS 髓核摘除及神经根松解术患者，均在术前、术后一周及术后一月做 MRI 检查，对术区图像对比分析。结果 51 例术前检查结果为椎间盘突出并单侧神经根症状，测量侧隐窝矢状径（4.483mm 平均值，最大值 7.8mm，最小值 2.3mm）；术后一周 MR 检查无法精确测量侧隐窝矢状径，发现并发症 3 例（2 例术后血肿形成，1 例术后髓核再脱出）；1 例髓核再脱出再次行 TESSYS 髓核摘除术；术后一月 MR 检查术区渗出吸收、神经根水肿消失，2 例术后血肿吸收；测量侧隐窝矢状径（12.834 平均值，16.4mm 最大值，最小值 8mm）；术前与术后隐窝矢状径比较增大（P＜

0.05）。结论 术后一周 MR 检查对术后并发症的发现有较大价值；术后一月渗出、神经根水肿吸收，测量量侧隐窝矢状径与术前对比增大，对术后并发症（血肿形成）吸收有较大意义。

EPO-1979
浅谈波谱不同体素大小的选择对乳腺胆碱 Cho 峰的影响

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目的：探讨波谱不同体素大小的选择在乳腺胆碱 Cho 峰中的影响，获取更精准的谱线基线。方法：选取女性乳腺 MRI 检查患侧、健侧各 10 例（体质指数 BIM<30），年龄段为 20-55 岁，排除术后、外伤、遗传性疾病等因素后纳入本次研究，取增强后 ROI①患侧病灶和 ROI②周边正常乳腺组织容积定位（避免脂肪、骨骼），可忽略不计对比剂对病灶 MRS 的影响。分 A 组（2.0X2.0X2.0cm）、B 组（1.8X1.8X1.8cm）、C 组（1.5X1.5X1.5cm）、D 组（1.0X1.0X1.0cm）。扫描参数：检查方法为单体素，TR2000ms,TE155ms，将对 MRS 做后处理量化分析：谱线的共振频率、谱峰高、半峰全宽 FWHM 及谱线下面积。3.2ppm 处由胆碱和含胆碱复合物组成的复合胆碱峰,可以作为恶性肿瘤的标志，故使 Cho 峰的基线平稳、突出以及与周边峰的间距大，方可作为评价标准。由 2 位副主任医师采用扫盲法评价，运用 SPSS 24 软件对其数据进行对比性分析。结果：A 组总采集次数为 96 次，总扫描时间 2min48s；基线平稳，ROI①胆碱峰突出明显，敏感性为 50.6%，特异性为 82.4%，ROI②敏感性为 30.4%；B 组总采集次数为 180 次，总扫描时间 5min；基线较平稳，ROI①胆碱峰较明显，敏感性为 39.6%，特异性为 58.2%，ROI②敏感性为 30.4%；C 组总采集次数为 540 次，总扫描时间 14min；基线较波折，ROI①胆碱峰陡平，涵盖病灶不全，敏感性为 27.6%，特异性为 33.1%，ROI②敏感性为 18.7%；D 组总采集次数为 6144 次，总扫描时间 2.5h；基线波浪短小曲折，涵盖部分病灶，但获取的谱线成分多，ROI①胆碱峰较陡平，敏感性为 15.6%，特异性为 23.4%，ROI②敏感性为 12.3%。结论：乳腺波谱单体素可实现量化分析，大体素的选择可涵盖大病灶范围，波谱的谱线基线稳定。

EPO-1980
乳腺癌 MRI 影像学征象与 Her-2 表达关系的研究

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目的：探讨乳腺动态增强 MRI(Dynamic contrast-enhancement magnetic resonance imaging, DCE-MRI)影像表现与人表皮生长因子受体 2 (Human epidermal growth factor receptor 2, Her-2)表达状态之间的关系。**方法：**收集我院 2019 年 3 月-2019 年 7 月经手术病理证实为乳腺癌患者 82 例，所有患者术前均行 GE 750 MRI 3.0 乳腺 DCE-MRI 扫描。主要观察的 DCE-MRI 影像学征象包括病灶大小、形态、边缘、T2WI 信号强度、强化类型和时间-信号强度曲线(time-signal intensity curve,TIC)类型，肿块形态分为圆形、椭圆形和不规则形；边缘分为清晰、模糊、分叶和毛刺；T2WI 信号分为等信号和高信号；强化类型分为均匀强化、不均匀强化和环形强化；TIC 类型分为Ⅰ型（持续上升型）、Ⅱ型（平台型）和Ⅲ型（廓清型）。将术后病理组织进行 Her-2 免疫组织化学(Immunohistochemistry, IHC)染色分为 Her-2 阳性组(3+)和阴性组(0+或 1+)，2+进行荧光原位杂交检测并根据结果纳入阳性组或阴性组。观察乳腺癌 DCE-MRI 影像学征象与 Her-2 表达之间的关系。**结果：**乳腺癌 MRI 影像学征象与 Her-2 表达状态中肿块大小、形态、边缘、强化类型和

时间-信号强度曲线类型(time-signal intensity curve,TIC)与 Her-2 表达状态之间具有统计学意义，P 值＜0.05。乳腺癌 Her-2 阳性肿块大小为 2.68±1.52cm，肿块形态多不规则形、边缘毛刺、强化类型以不均匀样强化居多、TIC 类型多为III型（廓清型）。**结论：**乳腺癌 DCE-MRI 影像学征象可以反映 Her-2 表达状态，对指导临床治疗决策和预后判断有一定意义。

EPO-1981

DCE-MRI 联合 DKI 在提高 BI-RADS-MR 中Ⅲ、Ⅳ类良恶性病变鉴别及与 Ki-67 表达水平的关系

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目的：探讨磁共振动态增强成像（DCE-MRI）联合扩散峰度成像（DKI）对乳腺磁共振报告数据系统（BI-RADS-MR）中III-Ⅳ类良、恶性病变诊断的初步探索及与其 KI-67 表达水平的关系。
方法：由两名高年资影像诊断医师采用盲法阅片，基于 BI-RADS-MR 分类共计III、Ⅳ类 35 例，术前均未经过任何放化疗，经病理证实的有 30 例，30 例患者均有行术前 DCE-MRI、DKI 检查，并测定动态增强参数（时间-信号曲线 TIC 及其参数增强峰值到达时间 T_{peak}、最大流入曲线率 K_1、最大增强线性斜率 S_{max}）、DKI 参数（平均扩散峰度 MK 值），将这些参数与病理结果进行统计分析，采用 ROC 曲线用于识别最佳参数。使用 spearman 相关分析来评估 KI-67 表达水平与每个参数的相关性。
结果：乳腺癌III-Ⅳ类恶性病变 S_{max}、MK 值均高于良性病变（S_{max}：2.02±0.7，P＜0.05；MK 值：0.87±0.21，P＜0.05）；S_{max}联合 MK 值时，诊断效能优于各自诊断价值，AUC 为 0.94。MK 值与乳腺癌中 KI-67 的表达水平具有统计学意义（P＜0.05）。
结论：磁共振动态增强成像（DCE-MRI）联合扩散峰度成像（DKI）可以提供一种准确诊断乳腺癌磁共振报告数据系统（BI-RADS-MR）中III-Ⅳ类良、恶性病变的方法，并且 MK 值似乎与乳腺癌中 KI-67 的表达水平具有一定相关性。

EPO-1982

基于影像组学诺莫图预测乳腺癌腋窝淋巴结转移

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目的：建立并验证术前预测乳腺癌腋窝淋巴结转移的影像组学诺莫图。
材料与方法：148 名符合条件的乳腺癌患者被分为训练组（n=100）和验证组（n=48）。从每个病人的磁共振图像中提取影像组学特征。然后在训练集中用 LASSO 算法建立影像组学标签。结合独立的危险因素，采用多元 Logistic 回归模型建立诺莫图。诺莫图的效能在训练集中进行评估，并在验证集中进行验证。最后，结合训练和验证集进行决策曲线分析，以评估诺莫图的临床实用性。
结果：由 9 个淋巴结状态相关特征组成的影像组学标签，具有良好的预测效果。包括影像组学标签和磁共振报告的淋巴结状态的诺莫图在训练集（AUC 0.79；95%CI，0.73-0.85）和验证集（AUC 0.76；95%CI，0.69-0.84）中也显示出良好的效能。决策曲线表明了我们列线图的临床实用性。另外，诺莫图在 MR 报告的淋巴结状态为阴性的亚组（AUC 0.88；95%CI，0.83-0.94）也显示出良好的鉴别能力。

结论：影像组学诺莫图是一种非侵入性术前预测工具，结合影像组学特征和磁共振报告的淋巴结状态，对乳腺癌患者淋巴结转移具有较好的预测效能，具有良好的应用前景，需要大数据进一步提高模型的效能和多中心验证获得临床应用的高水平证据。

EPO-1983

The Effect of Temporal Resolution on Quantitative Parameters of DCE-MRI in Benign and Malignant Breast Lesions

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Purpose
To explore the effect of different temporal resolutions on the pharmacokinetic parameters of breast lesions and its value in differential diagnosis of benign and malignant breast lesions.
Materials and Methods
30 patients with 31 masses were scaned with Siemens MAGNETOM Skyra 3T scanner, 16-channel breast special array coil. DCE-MRI was performed with a temporal resolution of 6s for 60 phases, and spatial resolution is 1.0 × 1.0 × 1.5 mm. Different image acquisition resolutions are constructed for the dynamic sequence after injection of contrast agent (phases 4th to 60th) using the method of isochromatic sampling. A total of eleven sets of image sequences of different data acquisition resolutions are composed of 6s, 12s, 18s, 24s, 30s, 36s, 42s, 48s, 54s, 60s and 90s. Quantitative pharmacokinetics parameters (Ktrans and Kep) were then calculated for all lesions at the different temporal resolution, using the Extended Tofts model. The Kruskal-Wallis test was used to compare the quantitative parameters obtained at different temporal resolutions. The areas under ROC curve of each quantitative parameter of different temporal resolutions were compared to judge the influence of temporal resolution on the quantitative parameters and the ability to distinguish benign and malignant breast lesions.
Result
No matter benign or malignant lesions, when the temporal resolution is reduced from 6s to 90s, the Ktrans and Kep decrease. Ktrans and Kep of different temporal resolutions were statistically significant. The Ktrans and Kep values of malignant lesions were higher than that of benign lesions. The differences of Ktrans and Kep values between benign and malignant lesions at different temporal resolutions were statistically significant ($P < 0.01$). The temporal resolution decreased from 6s to 90s, and the AUC values of Ktrans and Kep decreased as a whole. When the temporal resolution is 6s, the AUC value of Ktrans and Kep are the maximum, which are 0.889 and 0.915, respectively.
Conclusion
With the decrease of temporal resolutions, the Ktrans and Kep of benign and malignant breast lesions showed a decreasing trend, and the diagnostic efficiency in differentiating benign and malignant lesions decreased gradually. When the temporal resolution is 6s, Ktrans and Kep are the best for differential diagnosis between benign and malignant lesions.

EPO-1984

The Role of Deep network framework based on "divide and conquer" strategy (DC-DNN) in Classification of Breast Lesions

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【 **Abstract**】 ***Purpose*** *Combining Multi-sequence MRI features of breast lesions, Deep network framework based on "divide and conquer" strategy (DC-DNN) was used to classify benign and malignant breast lesions, and the effectiveness of this method was also be evaluated.* ***Materials and Methods*** *A retrospective analysis was made of 90 lesions in 90 patients from May 2015 to May 2017. Dynamic Contrast Enhanced MRI and Diffusion Weighted Imaging images were adopted. All lesions were confirmed by pathological results obtained by surgery and biopsy or by follow-up observation for at least 2 years. All lesions were randomly allocated to 80% as the training group and 20% as the test group. Deep network framework based on "divide and conquer" strategy (DC-DNN) was used to classify benign and malignant lesions. The sensitivity, specificity and accuracy of the method were calculated.* ***Results*** *Experiments on 90 MRI studies with 1835 images have demonstrated that the proposed DC-DNN achieves sensitivity, specificity, and accuracy respectively of 96.9%, 78.6% and 91.1%* ***Conclusion T****he DC-DNN can provide an effective tool for radiologists to analyze breast multi-sequence MRI.*

EPO-1985

磁共振酰胺质子成像联合动脉自旋标记灌注成像鉴别胶质瘤复发与治疗反应

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目的　旨在探讨酰胺质子（Amide proton transfer, APT)成像和伪连续动脉自旋标记（pseudo-continuous arterial spin labeling, pcASL)灌注成像在鉴别高级别胶质瘤治疗后复发与治疗相关反应中的诊断价值

资料与方法　对 19 名有临床症状的怀疑复发的胶质瘤患者行 APT 和 pcASL 磁共振扫描，并获取 APTw 及灌注伪彩图。在病变的最大横截面，参照 Gd-T1w 图像上异常强化区域进行感兴趣区的勾画。记录每名患者病灶的所有 ROI 最大、平均 APTw 值（即，mAPTw、aAPTw）和 CBF 值（即，mCBF、aCBF）。同时还评估了病变的相对 APTw 值[病变的减去对侧正常白质（CNAWM）的 APTw 值]和相对 CBF 值（病变的除以 CNAWM 的 CBF 值）。采用 Student t 检验或 Mann-Whitney U 检验（非正态分布时）比较复发病变与治疗相关反应病变之间的 aAPTw 值、mAPTw 值、aCBF 值、mCBF 值、相对 APTw 值和相对 CBF 值。

结果　所有病例均经外科手术病理诊断或临床影像学随访证实，其中 5 例为治疗相关效应（图 1），14 例为肿瘤复发（图 2）。复发病变的 mAPTw 值、aAPTw 值、相对 APTw 值、mCBF 值、aCBF 值和相对 CBF 值明显高于治疗相关反应的病变（P<0.05）。
结论　磁共振 APT 成像和 pcASL 灌注成像有助于区分高级别胶质瘤手术并同步放化疗后的状态，这两种非侵入性成像有鉴别胶质瘤复发与治疗相关反应的能力。

EPO-1986

On the nodal degree configuration of multimodal brain connectomics in severe asymptomatic carotid stenosis

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INTRODUCTION

Severe asymptomatic carotid stenosis (SACS) refers to severe (70-99%) stenosis of the internal carotid artery but without previous stroke or transient ischemic attack (TIA). SACS is frequently associated with cognitive impairment (vascular cognitive impairment) and gait disturbance, [1] and an independent risk of future ischemic strokes. [2] Although SACS represents a clinically significant condition, [3] the remote brain consequences of the “silent” stenosis are less well known. Therefore in this study we have two aims, the first is to inquiry the topological configurations of multimodal connectomics that correlated with cognitive impairment in the patients with SACS. The second is sought to explore the vulnerable foci and predict the cerebrovascular risks. We utilized a unique MRI dataset to build multimodal imaging derived connectomics (networks) and investigated their nodal configuration, network resilience, and wiring cost. We calculated lesion loads of hypoperfusion and white matter hyperintensity (WMH) and drew a meta-analytical coactivation map of stroke from previous publications. We hypothesized that SACS will lead to burdens on nodes and network operation, followed by changes in nodal configurations and ultimately the cortical hierarchy.

MATERIALS AND METHODS

Twenty-four SACS patients and 24 comorbidity- and demographically-matched healthy controls (HCs) were recruited. MRI was performed with a 3.0-T MR system (Siemens, Germany) including T1 anatomical, resting-state BOLD, 64 directions diffusion tensor, susceptibility-weighted imaging (SWI), fluid-attenuated inversion recovery (FLAIR) and pulsed arterial spin labeling (PASL) sequences covered the whole brain.
Multimodal MRI data were preprocessed and connectomics were constructed using the 90 regions as nodes and correlation coefficients (connectivity) as edges. Normalized measures (i.e., degree centrality, global and local efficiency) were obtained by comparison with 1000 constrained null (i.e., random) networks. Meta-analytic map of stroke and MRI brain imaging in humans were conducted (coordinates in the MNI space, a total of 108 publications) in *Neurosynth* (www.neurosynth.org).[4] Cerebral microhemorrhages and WMHs were calculated using the SWI, FLAIR and T1-weighted images.

RESULTS

Patients with SACS showed significant converging decreases in nodal degree, mainly across sensorimotor, posterior cingulate/parietal, thalamic, and insular regions ($p < 0.05$, FDR corrected), and many of these are also located in the hub topography (Figure 1 & 2B), and better matched with the stroke meta-analytical map (Figure 2A). Subsequent multimodal degree rank identified a shift in hub distribution from association to the sensorimotor cortex in the patients with SACS (Figure 2B & 3). In addition, a significantly higher efficiency of functional networks and a higher wiring cost of structural networks were found in the patients with SACS ($p < 0.05$) (Figure 2C). The brain lesions of SACS patients were mainly located around the periventricular region (Figure 4). *Lastly,* structural wiring cost was significantly negatively correlated with WMH lesion size (Spearman $r = -0.47$, 95% CI -0.77 to -0.01, $p = 0.04$) and MMSE (Spearman $r = -0.55$, 95% CI -0.81 to -0.11, $p = 0.02$), and positively correlated with delayed recall (Spearman $r = 0.49$, 95% CI 0.04 to 0.78, $p = 0.03$).

CONCLUSION

Our study suggests that patients with SACS is predominantly characterized by hub pathology and maladaptive pattern of network efficiency and wiring cost, following primary sensorimotor-transmodal cortical gradient. These results will contribute to a better understanding of the cognitive impairment and future cerebrovascular events in these patients with SACS, from multimodal information and network perspective.

EPO-1987
基于激素冲击疗效分组的甲状腺相关眼病(TAO)患者眼眶软组织差异化研究

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目的：应用 cube flex 序列定量分析甲基强的松龙冲击（MPPT）治疗好转 TAO 患者与治疗未见好转 TAO 患者的眼外肌(ETM)及眶脂肪(OF)治疗前后体积及水分数，探讨 TAO 患者眼眶软组织测量值与 MPPT 治疗效果的联系。

材料和方法：20 名志愿者在 1 周内接受两次 CUBE FLEX 成像。39 例 TAO 患者（19 例治疗好转 TAO 患者；20 例治疗未见好转 TAO 患者）均在 MPPT 前后进行 CUBE FLEX 成像。测量了 39 例 TAO 患者及 20 例志愿者的总 ETM 及 OF 的体积及水分数。使用阈值法(MDT)和人工分割法(MS)对 Cube Flex 中的总 ETM 及 OF 体积进行测量。ETM 及 OF 的 ROI 被绘制在水图像上，并复制到相应的 in-phase 图像中，记录平均信号强度(SI)。定义并计算了 TEM 及 OF 的水分数为(SI 水/SIin-phase 相)。对 TAO 患者与志愿者 ETM 及 OF 的 WAF 与体积分别进行比较。对比治疗好转组与治疗未见好转组 ETM 及 OF 治疗前后体积及 WAF 之间的差异。TAO 患者的治疗后的好转程度由一位经验丰富的眼科医生进行。

结果：(1)MPPT 治疗前，好转组与未见好转组的 ETMS 及 OF 的水含量和体积均显著高于对照组。(2)MPPT 治疗后，TAO 患者的 ETMs 及 OF 的 WAF 和体积均显著降低(P<.001)。(3)治疗好转组治疗前眼外肌 WAF 显著高于治疗未见好转组(P<.001)。(4)好转组与未见好转组治疗前后容积无明显差异。

结论：TAO 患者对激素冲击治疗有不同的反应，我们发现，眼外肌水分数更高的 TAO 患者对激素冲击治疗的效果更明显。

EPO-1988

Altered Long- and Short-range Functional Connectivity Density Associated with Poor Sleep Quality in Patients with Chronic Primary Insomnia: A Resting-state fMRI Study

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Previous neuroimaging studies have suggested that brain functional impairment and hyperarousal occur during the daytime among patients with chronic primary insomnia (CPI); however, alterations to the brain’s intrinsic functional architecture and their association with sleep quality have not yet been documented. In this study, our aim was to investigate the insomnia-related alterations to the intrinsic connectome in patients with CPI (n=27) at resting state, with a data-driven approach based on graph theory assessment and functional connectivity density (FCD), which can be interpreted as short-range (intraregional) or long-range (interregional) mapping. Compared with healthy controls with good sleep, CPI patients showed significantly decreased long-range FCD in the anterior hub regions of the default-mode network and the putamen. These patients also showed decreased short-range FCD in their multimodal-processing regions, executive control network, and supplementary motor-related areas. Furthermore, several regions showed increased short-range FCD in patients with CPI, implying hyper-homogeneity of local activity. Together, these findings suggest that insufficient sleep during chronic insomnia widely affects cortical functional activities, including disrupted FCD as well as increased short-range FCD, which is associated with poor sleep quality.

EPO-1989

The increased neurovascular coupling pattern in reward related loop in smartphone addiction

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Introduction

Smartphone addiction has become an increasingly common public mental health problem [1]. However, the neurological mechanism of smartphone addiction remains unknown. Neurovascular coupling (NVC) is appreciated to be functional unit of high-level information organization by magnetic resonance imaging [2]. Besides, previous functional connectivity studies strengthened the reward-memory-executive loop to be

the target impaired regions in addiction. Therefore, this study attempts to explore the neurovascular coupling pattern in reward related loop in smartphone addiction population.

Methods
Eleven smartphone addicts and 11 control subjects were recruited. All subjects were examined with the Mobile Phone Addiction Index (MPAI). Oxygen level dependent signals and arterial spin labeling imaging were performed to calculate indicators for neuroactivity and cerebral perfusion. Potential NVC dysfunction was investigated by exploring the relationship between neuronal activity and cerebral perfusion maps. The Pearson correlation coefficients between these 2 maps were defined as the NVC biomarkers. Besides, the correlations between NVC coefficients and addiction index were also estimated.

Results
Comparing to control subjects, MPAI scores of the addiction group generally decreased. NVC coefficients in hippocampus, putamen, orbitofrontal cortex and caudate increased significantly implicated in mediating the memory, motivation and reward circuit, respectively. No intergroup difference was found in anterior cingulate cortex and amygdala which implicated in mediating control circuit. In addition, there was a positive correlation between NVCs and addiction index.

Conclusions
Smartphone addition might result from the strengthening of memory, motivation and reward circuit rather than impairing control circuit. NVC may be a promising indicator for evaluating smartphone addiction.

EPO-1990

Influence of the low and high b-value distribution on the pseudodiffusion parameter derived from IVIM DWI in normal brain?

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Background: This study aims to answer whether the low b-values distribution, high b-values upper limit, and the number of excitation (NEX) influence the accuracy of the intravoxel incoherentmotion(IVIM) parameter derived from multi-b-value diffusion-weighted imaging (DWI) in the brain.
Methods: This prospective study on five consecutive multi-b DWI with different b-value protocols (0 - 3500 s/mm^2) were performed in 22 male healthy volunteers on a 3.0-T MRI system. The IVIM parameters from normal white matter (WM) and gray matter (GM) including slow diffusion coefficient (D), fast perfusion coefficient (D*) and

perfusion fraction (f) were compared for differences among defined groups with different IVIM protocols by one-way ANOVA.
Results: The D* and f value of WM or GM in groups with less low b-values distribution (less than or equal to 5 b-values) were significantly lower than ones in any other group with more low b-values distribution (all $P < 0.05$), but not significant among groups with more low b-values distribution ($P > 0.05$). Besides, no significant differences among the D, D* and f value of WM or GM were found between group with one and more NEX of low b-values distribution (all $P > 0.05$). IVIM parameters in normal WM and GM strongly depended on the choice of the high b-value upper limit.
Conclusions: Metrics of IVIM parameters can be influenced by low and high b value distribution. Eight low b-values distribution with high b-value upper limit of 800 - 1000 s/mm^{2}may be the relatively proper set when performing brain IVIM studies.

EPO-1991

Increased Iron Levels in Injured Hippocampus of T2DM Detected with MRI quantitative susceptibility mapping

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Background: Type 2 diabetes mellitus (T2DM) is associated with cognitive impairment. T2DM-related cognitive impairment may be the early stage of dementia. Iron can catalyze destructive free radical reactions and accumulate in the gray matter of the brain, increasing the risk of cognitive-related diseases. Previous studies have shown an increase in iron deposition in deep gray matter nuclei. However, in T2DM, the severely impaired hippocampus and the comparative areas of anti-cognitive impairment, such as thalamus, have rarely been studied. In the current study, we examined the hypotheses that elevated tissue iron and tissue breakdown is associated with T2DM-related cognitive impairment by assessing the hippocampus, a region affected early and severely by the disease, and the thalamus, a comparator region that is relatively spared.
Methods: Twenty T2DM patients and age, sex, and education matched healthy controls (HCs) were recruited. The high‐resolution Quantitative susceptibility mapping (QSM) data were subsequently acquired on a 3.0T MR scanner. QSM values were used as an index of tissue iron deposition. Cognitive function was evaluated by using Mini-Mental State Examination (MMSE), Montreal Cognitive Assessment (MoCA) and auditory verbal learning test(AVLT). Brain region volumes and densities were also evaluated among these participants.
Results: Neuropsychological tests showed impaired short-term and long-term free recall in patients with T2DM (all $P<0.05$). The QSM ratio of hippocampus to thalamus significantly decreased in T2DM groups. The QSM ratio of hippocampus to thalamus were closely related with the decreased short and long delayed free recall scores in T2DM($P<0.01$).
Conclusions: This study a has shown that hippocampal injury occurred in conjunction with iron accumulation in T2DM. The abnormal iron concentration of the hippocampus may be a biomarker of T2DM-related cognitive impairment.

EPO-1992
后循环缺血性脑卒中患者的临床因素及椎-基底动脉形态学相关性分析

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目的 探讨脑血管病临床相关危险因素、椎-基底动脉形态学定量测量指标及椎-基底动脉形态学的四种分型对急性及亚急性期后循环缺血性脑卒中患者的评价价值。**方法** 回顾性分析急性及亚急性期后循环缺血性脑卒中患者 24 名及同期 14 名无脑卒中的志愿者（对照组）的脑血管病临床相关危险因素、头颅 MRI 检查及头颅 MRA 血管成像资料，采用多元 Logistic 回归分析,比较卒中组与对照组的临床相关危险因素（高血压、高脂血症、糖尿病及吸烟史）、椎-基底动脉形态学定量测量指标（mid-BA 角、BA-VA 角，基底动脉长度、基底动脉弯曲长度、基底动脉管径及椎动脉优势）和椎-基底动脉椎形态学的四种分型（行走型、音叉型、优势 λ 型和不全 λ 型），筛查急性及亚急性期后循环缺血性脑卒中患者的危险因素。**结果** 经多因素 logistic 回归分析，用似然比前进法筛选变量，引入变量的检验水准 α =0.10，显示高血压（OR=5.96，95%CI：1.04~43.16，P=0.045）、高脂血症（OR=16.64，95%CI：2.15~128.83，P=0.007）及椎-基底动脉形态学的四种分型（OR=2.65，95%CI：0.89~7.83，P=0.079）均是急性及亚急性后循环缺血性脑卒中患者的危险因素。卒中组中，椎-基底动脉形态学的四种分型：优势 λ 型占 62.5%（15 例）、行走型占 16.7%（4 例）、音叉型占 12.5%（3 例）、不全 λ 型占 8.3%（2 例）。对照组中，椎-基底动脉形态学的四种分型：优势 λ 型占 64.3%（9 例），行走型占 16.7%（4 例），音叉型占 14.3%（2 例）。**结论** 高血压、高脂血症及椎-基底动脉形态学的四种分型是急性及亚急性期后循环缺血性脑卒中的危险因素，椎-基底动脉形态学的定量测量指标无统计学意义。

EPO-1993
磁共振灌注成像在烟雾病评估的应用初探

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目的：运用核磁灌注成像技术评价烟雾病的血流动力学情况，探讨代偿性侧支循环形成与灌注的关系，探讨核磁灌注成像在烟雾病中对病情的应用价值。
方法：选取本院 2015 年 4 月~2018 年 10 月在吉林大学白求恩第一医院神经血管外科确诊为烟雾病的住院患者 98 名，其中男 47 例，女 51 例，年龄 10-63 岁，所有患者均行脑血管造影（DSA）和核磁灌注检查。并选取 15 名无神经系统病史的患者作为对照组。运用西门子 TrioTim3.0T 设备进行 MRI、MRA 及核磁灌注扫描。
以 MTT 图像为标准，将异常灌注范围划为感兴趣区（Region of Interest，ROI），勾画 ROI 避开明显大血管部位及陈旧梗死区域，用镜面法测得对侧的绝对灌注值，每个感兴趣区测量 3 次，取其均值。将病例分组对比，一为双侧烟雾病组与健康组，二为单侧烟雾病患者的健侧和对侧，三为临床急性起病组与慢性起病组，四为出血型烟雾病组与缺血型烟雾病组。分别记录相应的灌注参数值，并对两组参数值间进行配对样本 t 检验，检验标准为 0.05。
结果：①以 40-49 岁为最高发，50-59 次之；②双侧烟雾病患者额颞叶、基底节区血流可见异常，与健康组比较均有统计学差异（P<0.05）；③单侧烟雾病患者患侧与健侧各参数比较均有统计学差异（P<0.05）；④急性与慢性起病组感兴趣区 MTT、TTP 时间均延长，统计学差异不明显，CBV、

CBF 对比有统计学差异；⑤CBF 缺血组较出血组有所升高，有统计学差异，余各项参数相差不明显；出血组与健康组相比较，结果均无统计学差异。
结论：①磁共振灌注成像能够直观形象的显示烟雾病患者脑血流灌注及血流动力学情况；②急性起病与慢性起病组的对照，可评价烟雾病侧支循环的代偿作用；③分别评价缺血型与出血型烟雾病的血流状态，可对烟雾病的预后疾病转归提出预测；④通过灌注成像呈现的血流状态，结合临床表现，可以为外科手术治疗的时机及术式提供可靠依据。

EPO-1994
帕金森病大脑运动控制及调节网络的研究及临床相关性分析

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目的：通过独立成分分析方法(ICA)观察帕金森病例组(PD)与正常对照组(NC)之间大脑感觉运动控制与调节功能网络空间结构及时间动态功能网络连接(tdFNC)状态，比较两组之间的差异并分析空间网络结构内连接强度与临床运动评分的相关性。
方法：本研究运用西门子 3.0Tesla 磁共振扫描仪，对 30 例 PD 患者及 34 例对照组进行静息态功能成像扫描，通过独立成分分析软件将全脑分为 33 个独立成分(IC)，对双侧感觉运动功能网络、岛叶网络及双侧小脑网络各 IC 之间的空间网络结构及所选取 IC 之间的 tdFNC 行双样本 t 检验比较(p<0.05，FDR p<0.05)，观察两组空间结构变化及时间序列中各之间的动态功能连接的差异，并对各功能网络 IC 的功能连接强度与帕金森病统一评分量表运动功能部分评分做相关性分析。
结果：本研究发现 PD 组较 NC 组空间网络结构中存在双侧补充运动脑区(SMA)、左侧初级运动皮层、中央旁小叶及躯体感觉皮层功能减低，双侧小脑半球功能减低，双侧岛叶网络中发现岛叶后部较 NC 组出现功能升高改变；在 tdFNC 分析中 state 2 存在功能连接的差异性，其中感觉运动网络内存在双侧躯体感觉皮层之间连接功能减低，岛叶网络 IC30 与小脑网络 IC8 功能连接减低，同时在 state 2 出现在平均驻留时间明显升高的差异性。另外各感觉运动功能网络连接强度与帕金森统一评分运动评分量表之间相关性评价发现存在显著负相关性分别为感觉运动网络内的左侧躯体感觉皮层、感觉运动皮层及小脑网络。
结论：本研究通过对比发现 PD 组与 NC 组之间感觉动态网络空间结构的改变及动态功能网络之间的连接的差异，并通过分析得出与 PD 运动评分之间具有显著相关性的脑网络的独立成分，从脑功能网络的空间、时间网络属性等多个方面解释了 PD 所导致的感觉运动功能异常等临床症状的机制及原因并为今后该病的进一步研究及疾病的诊断提供可靠的依据和方法。

EPO-1995
Sex differences of brain cortical thickness in major depressive disorder

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Objective: Major depressive disorder(MDD) is a serious mental disease.There are significant differences in incidence rate and clinical features of male and female MDD patients. The purpose of present study was to explore the sex differences of the brain cortical thickness in MDD patients and the relationship between these differences and clinical manifestations in different gender . Methods: High-resolution T1-weighted

images was acquired from 61 MDD (25 female [F] and 36 male [M]) and 61 (25 F and 36M) healthy control (HC). The cortical thickness differences among four groups was analyzed by the two-factor ANCOVA model, and Post-hoc test was used to compare the differences of cortical thickness between every two groups. Result: The MDD groups and healthy control groups did not differ significantly in terms of age, and years of education(P＞0.05), while the illness duration of male MDD was longer than female MDD group(P＜0.05). The sex difference of cortical thickness located in left caudalmiddle frontal gyrus, right fusiform, precentral gyrus, superiorfrontal gyrus and superiorparietal gyrus. After post-hoc comparison, we found that the thickness of right fusiform and precentral gyrus of males MDD was thinner than that in the female MDD group (P＜0.05). In addition, the cortical thickness of right precentral gyrus were negatively correlated with the illness duration in male MDD patients(r=-0.444,p=0.03). Conclusion: The differences of brain cortical thickness in different gender may associate with the different clinical characteristics and morbidity in male and female MDD patients. The negative correlation between cortical thickness of right precentral gyrus and illness duration in male MDD patients may used to evaluate the illness duration.

EPO-1996

脑结构 MRI 的多维度应用：从疾病分型、神经调控到疗效预测

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背景：

磁共振成像(MRI)是临床疾病诊断与脑科学研究是不可或缺的影像学技术。随着分析方法的不断革新，在皮层厚度、灰质体积等传统形态学测量的基础上，脑结构 MRI 在分辨老化与认知障碍症，以及辅助非侵入性脑刺激治疗等领域展现出多个维度的新应用。头皮-皮层距离(Scalp-to-cortex distance, SCD)，作为脑形态学的新指标 [1]，目前国际上尚未有基于大数据结构 MRI 的头皮-皮层距离及其临床应用的研究。

目的：

(1) 探索老化相关和脑区特异性 SCD。

(2) 检测脑区特异性 SCD 在认知障碍症诊断中的作用。

(3) 检测 SCD 在经颅磁刺激治疗老年抑郁症中的疗效预测作用。

方法：

(1) 基于剑桥老化研究的 MRI 数据库（N=643），我们选取临床最为常用的左侧初级运动皮层(M1)和背外侧前额叶（DLPFC）。通过头皮与皮层的重建，个体化定位左侧 M1 和 DLPFC 的 MNI 坐标，SCD 即三维空间内头皮 MNI 坐标到皮层 MNI 坐标的矢量 [2]。

(2) 在一项随机、单盲、安慰剂对照的临床试验中，我们探索神经导航下 rTMS 对老年期抑郁症状和认知的临床效用以及 SCD 的预测作用。60 名老年重症抑郁合并认知障碍症患者被随机分配至真实 rTMS 组或虚拟 rTMS 组。刺激部位为左侧 DLPFC。康奈尔痴呆抑郁量表（CSDD）用于评估抑郁症状，蒙特利尔认知量表（MoCA）用于评估认知功能。

结果：

在老化群体中年龄相关的 SCD 仅见于左侧 DLPFC，并且这一距离可以预测三年后的认知功能下降（R^2 = 0.326, p = 0.011）。TMS 的临床试验中，治疗后两组在 CSDD 和 MoCA 评分中均有明显改善（组内效应），左侧 DLPFC 的 SCD 可以预测治疗 CSDD 和 MoCA 的分数改变。

结论：

基于结构 MRI 的头皮-皮层距离属于脑形态学的个体化指标，并且可以较好地区分正常老化与认知障碍，并且在临床试验中可以作为预测疗效的指标。

EPO-1997

多发性硬化患者在 3T 磁共振动脉自旋标记技术中的灌注异常发生率

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目的 灰质在多发性硬化（MS）中的作用越来越明显，以前很少有研究评估复发-缓解型多发性硬化（RRMS）患者灰质灌注异常的发生率。本研究的目的是确定 RRMS 患者灰质灌注异常的发生率，并评估 RRMS 患者灌注异常与临床数据的相关性。
方法 对 37 例 RRMS 患者和 50 例与之年龄、性别相匹配的健康对照组行 3T MRI 扫描，其中包括 3D 伪连续动脉自旋标记(3D pCASL)的扫描。由两名影像科医师在后处理工作站通过双盲法将患者分为灌注正常组和灌注异常组，并提取灌注异常患者异常部位的灌注值。进一步分析有或无灌注异常患者的临床参数与灌注改变之间的关系。
结果 37 例患者中，12 例出现灌注异常，其中额叶占 91.7%、顶叶占 33.3%、颞叶占 50%、枕叶占 58.3%、深部灰质占 25%、小脑占 8.3%。1 例表现为高灌注，12 例表现为低灌注。灌注异常和灌注正常患者在认知、抑郁、疲劳、病程中有统计学差异。
结论 RRMS 患者灰质存在较高的灌注异常率，主要累及额叶。灌注异常患者往往可表现出特定的症状，具有一定的临床价值。

EPO-1998

强制戒断与美沙酮维持治疗一年对海洛因成瘾者脑功能 影响的低频振幅 fMRI 研究

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[摘要] **目的** 探讨强制戒断和美沙酮维持治疗两种干预措施一年对海洛因成瘾者大脑功能影响的差异。**方法** 招募 17 名强制戒断约 1 年的海洛因成瘾者（PA 组）、16 名美沙酮维持治疗约 1 年的海洛因成瘾者（MMT 组）与 35 名正常对照组（HC 组）参加本研究，对所有受试者进行功能磁共振扫描采集静息态数据，利用低频振幅（ALFF）方法计算三组大脑局部自发性脑活动的强度，方差分析及事后分析比较 PA 组与 MMT 组脑活动变化趋势。**结果** 三组间在右侧距状回、左侧小脑上回、右侧内侧额上回、右侧辅助运动区 ALFF 值存在显著性差异；事后分析发现 PA 组在距状回与辅助运动区脑活动更趋近于正常组；MMT 组右侧内侧额上回 ALFF 值与美沙酮维持治疗时间（月）呈负相关性（r=-067，*P*=0.004），PA 组右侧距状回 ALFF 与强制戒断时间（月）呈负相关性（r=-0.54，*P*=0.02）。**结论** 经过 1 年干预后，美沙酮维持治疗者与强制戒断者在部分成瘾脑区仍存在异常，但强制戒断可能更有利于海洛因成瘾者脑功能恢复。

EPO-1999

Faster temporal resolution yields optimal BOLD sensitivity in olfactory fMRI

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Objective: Currently, olfactory functional magnetic resonance imaging (olfactory fMRI) is applied as a non-invasive mapping technique as it is able to efficiently localize the primary and secondary olfactory area using blood oxygen levels dependent (BOLD). BOLD sensitivityin fMRI is dependent on acquisition parameters such as echo time (TE), repetition time (TR), and voxel size and magnetic field strength. The current study investigated the influence of TR on odor-induced brain response signals within the primary olfactory area (POC) and some secondary olfactory areas.
Methods: Sixteen healthy participants (age range 21 to 30 years, mean age 25 years) underwent a block-design fMRI with odor stimulation. Every subjects went throuth three times of olfactory experiment at their same time of three.days in a week. To investigate the effects of imaging resolutions on BOLD sensitivity, fMRI images were acquired during the olfactory tasks using three different TRs (500ms, 1000ms and 3000ms) by applying the recently introduced multiband (MB) or simultaneous multi-slice (SMS) EPI technique .We compared volumes and t-scores of significant activation, and evaluated performance of hemodynamic response function (HRF) of bilateral POC, amygdala, hippocampus and insula. Repeated measures analysis of variance (rmANOVA) was used to study significant changes of BOLD sensitivity across TRs. Pairwise comparisons testing with Bonferroni correction were carried out when significant changes were observed.
Results: After odor stimulus onset timing correction, results demonstrate that the BOLD sensitivity can be increased significantly with temporal resolution.With the TR time reduced, the image sampling point and brain activation of area of interest (ROI) increased and HRF tended to be more standardized and improved especially in TR=500ms. These results indicated that the improved sensitivity to neural activity of certain olfactory areas in block-design olfactory experiment could be obtained in TR=500ms.
Conclusion: Multiband EPI shortened the TR, increased temporal sampling and more comprehensive acquired brain activation information in certain olfactory areas . This shows the faster temporal resolution accompanys with robust BOLD sensitivity in olfactory fMRI.

EPO-2000
非均匀磁化转移（IhMT）在抑郁症伴自杀意念患者大脑白质结构改变中的应用研究

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目的： 非均匀磁化转移（inhomogeneous magnetization transfer, IhMT）技术因其对髓鞘磷脂成像具有高度的敏感性和特异性的特点，是近年来大脑结构成像研究的新兴技术。本研究旨在探究

其在伴或不伴自杀意念的重度抑郁症（major depressive disorder, MDD）患者大脑白质结构改变中的应用价值 。
方法： 共纳入自杀意念 MDD 患者 12 例（DS 组，男 3 例；年龄 30.2±11.8 岁），无自杀意念 MDD 患者 22 例（DP 组，男 11 例；年龄 35.7±12.5 岁）及健康志愿者 25 例（HC 组，男 15 例；年龄 33.6±11.7 岁）。采用 GE 3.0 T 磁共振扫描仪采集各被试大脑 T1 结构像及 IhMT 图像，经后处理得到各被试大脑白质纤维束的定量 IhMT（qIhMT）及 IhMT 比率（IhMTR）。运用协方差分析比较三组被试 qIhMT 及 IhMTR 值的差异，结果进行 Bonferroni 校正，并对 DP 及 DS 组的 qIhMT 及 IhMTR 值分别与汉密尔顿抑郁量表（HAMD）评分进行 Pearson 相关分析， $p<0.05$ 认为差异有统计学意义。
结果： 与 HC 组相比， DP 及 DS 组胼胝体压部/双侧丘脑放射后部/左侧内囊后肢及上纵束的 qIhMT 值明显升高，左侧内囊后肢及钩束的 IhMTR 值明显升高；DP 组左侧钩束的 qIhMT 值，DS 组左侧下纵束/下额枕束的 qIhMT 值及胼胝体压部的 IhMTR 值均较 HC 组明显升高 。DP 组左侧上纵束的 qIhMT 值与 HAMD 呈显著负相关($r=-0.498, p=0.018$)，而 DS 组左侧扣带束的 IhMTR 值与 HAMD 呈显著正相关（$r=0.681, p=0.015$）。
结论： 本研究结果与既往关于 MDD 自杀相关的大脑结构研究结果基本一致，这说明 IhMT 技术在 MDD 患者大脑白质结构改变的研究中具有较大的临床应用价值，qIhMT 及 IhMTR 值有望成为大脑白质结构改变的生物学标记 。

EPO-2001
DWI 及 SWI 在孤立性纤维性肿瘤/血管外皮细胞瘤与脑膜瘤鉴别诊断中的价值

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目的 探讨扩散加权成像（DWI）和磁敏感加权成像（SWI）在孤立性纤维性肿瘤/血管外皮细胞瘤与脑膜瘤鉴别诊断中价值。**方法** 回顾性分析 14 例和 28 例经手术病理证实为孤立性纤维性肿瘤/血管外皮细胞瘤与脑膜瘤患者的常规影像学表现及 DWI、SWI 表现，分别测量 DWI 的表观扩散系数（ADC）值和 nADC 值、评估 SWI 的肿瘤内磁敏感信号（ITSS）分级。采用秩和检验和受试者工作特性曲线（ROC）分析各参数，并联合筛检 DWI、SWI 各自的最佳参数。**结果** 孤立性纤维性肿瘤/血管外皮细胞瘤组的 nADC 值与 ITSS 分级均高于脑膜瘤组的，差异均具有统计学意义（$P<0.05$）。ROC 曲线分析结果显示，以 nADC 值〉1.17 鉴别孤立性纤维性肿瘤/血管外皮细胞瘤和脑膜瘤时，诊断的敏感性和特异性分别为 64.29%、92.86%；以 ITSS 分级〉1.00 鉴别诊断时，诊断的敏感性和特异性分别为 71.43%、78.57%。联合 nADC 值和 ITSS 分级诊断时，敏感性和特异性分别为 71.43%、92.86%。**结论** DWI 和 SWI 在孤立性纤维性肿瘤/血管外皮细胞瘤和脑膜瘤的鉴别诊断中具有重要价值，联合应用 DWI 和 SWI 可提高诊断正确率。

EPO-2002
颈部血管 3D-TOF-MRA 图像质量与高血压患者的相关性研究

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【摘要】 目的： 探讨颈部血管 3D-TOF-MRA 图像质量与高血压患者是否存在相关性。方法： 回顾性研究我院 84 例行颈部血管 3D-TOF-MRA 的患者，分为高血压组（收缩压>140nnHg 或舒张压

>90mmHg）42 例、非高血压组(对照组)42 例，并由两名高资历阅片者分别对两组图像进行主观评价（5 分法），比较两组间的图像质量差异。结果：高血压组 3 分 8 例、2 分 21 例、1 分 13 例，平均得分 1.88:；对照组 4 分 5 例、3 分 15 例、2 分 18 例、1 分 4 例，平均得分 2.5，两组的评分差异具有统计学意义（p<0.05）。其中高血压 1 级 26 例，2 级 8 例，3 级 8 例，平均得分分别为 1.96，1.75，1.75。收缩压与图像质量呈负相关（r=-0.419，p<0.001）；舒张压与图像质量呈正相关（r=0.588，p<0.001）。结论：高血压对颈部血管 3D-TOF-MRA 图像质量有影响，容易造成信号丢失，造成误诊，且高血压分级越高图像质量越差。

EPO-2003

The relationship of functional connectivity between rest and task states

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Purpose: To study the functional connection relationship between resting and task state functional magnetic resonance imaging (fMRI). **Methods:** Sixteen healthy subjects were recruited to participate in this study. Each participant first undertook a 9 min resting-state (rs) run and then a 9 min task run. During the rs run, the participants were instructed to close their eyes and try not to think of anything but remain awake for the whole scan. During the task run, they performed two tasks, the first task trial consisted of rubbing five fingers of the right hand for 8 sec followed by a 22 sec rest period; and the second task trial consisted of opening the eyes for 8 sec and then closed them for the 22 sec rest period. These two task trials were repeated for 8 times, resulting in a total of 8 min task period. **Results:** Comparing to the resting state, the motor task not only substantially expanded the common FC map but also recruited several additional areas such as both the left and right anterior and posterior motor areas of the cerebellum. The common FC map of visual region was mainly limited within the visual cortex, and the areas evoked by the visual task were mainly in other cortical areas outside the visual cortex. In particular, the signal of the motion area task in the central gyrus region is missing compared with that in the resting state. **Conclusions:** A widely accepted hypothesis is that spontaneous and task-evoked brain activity is linear, but we have proved that this is not exactly the case. In addition, we also find that compared with the resting state, the motion task not only extends the common FC map greatly, but also adds several additional regions.

EPO-2004

Predicting H3K27M mutation status in diffuse midline gliomas using amide proton transfer-weighted MRI

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Background: To assess the amide proton transfer-weighted (APTw) MRI features of H3K27M-wildtype and H3K27M-mutant diffuse midline gliomas (DMG) and to test the hypothesis that the APTw signal is a surrogate imaging marker for identifying H3K27Mmutation status preoperatively.
Methods: Forty-two patients with pathologically confirmed DMG and molecularly classified as H3K27M-mutant (22 subjects) and wildtype (20 subjects) who underwent APTw MRI, were retrospectively analyzed. The Mann-Whitney test was used to evaluate relationships between APTw intensities for H3K27M-mutant and H3K27M-wildtype groups, and receiver operator characteristic (ROC) analysis was used to assess the diagnostic performance of APTw parameters.
Results: The maximum and minimum APTw values, based on multiple regions of interest, as well as the whole-tumor histogram-based mean and 40th percen- tile APTw values, were significantly higher in the H3K27M-mutant DMG than in the H3K27M-wildtype groups. This corresponded to the areas under the ROC curves of 0.94, 0.76, 0.77, and 0.79, respectively, for the prediction of the H3K27M mutation status.
Conclusion:H3K27M-mutant lesions typically were associated with relatively high APTw signal intensities as compared with H3K27M-wildtype lesions. The APTw signal could be a valuable imaging biomarker by which to identify H3K27M mutation status in DMG.

EPO-2005

Susceptibility and Volume Changes of the Mammillary Bodies as a Function of Age for Healthy Individuals and Early Stage Dementia

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Purpose： To investigate the susceptibility and volume change of the mammillary bodies in mild cognitive impairment (MCI), Alzheimer’s Disease and healthy individuals.
Methods： Two sites were used in the QSM and T1 analysis. At site one, 171 healthy controls between 20 and 70 years old were imaged on a 1.5 Tesla GE Signa with a GRE sequence to collect magnitude and phase images with a voxel resolution of 0.46x0.46x3mm³. At site two, 16-echo GRE data and T1 data for 75 MCI subjects were collected on a 3.0 Tesla Philips Ingenia. In addition, 16-echo GRE data and T1 data for 51 age-matched healthy controls were collected on a 3.0 Tesla GE Signa HDxt scanner. All QSM data were collected with a voxel resolution of 0.86x0.86x1mm³ and T1 data were collected with a 1mm isotropic resolution.The mammillary bodies were traced on all T1 data (75 MCI, 9 AD, and 51 HC) zoomed 8x to collect volumes. The mammillary bodies were traced according to the contrast on QSM at a magnification of 8x using a full-width half maximum threshold, with manual adjustments as needed. Volumes, mean susceptibility, and maximum susceptibility were output. The correlation of susceptibility and volume values with age was applied with Pearson’s correlation analysis.

Results
For healthy individuals between 20 and 70 years old, there appears to be a slight increase in mean susceptibility and a significant increase in maximum susceptibility with age. For MCI patients, AD patients and their age-matched healthy controls, it shows a slight increase in mean susceptibility in HC group and it appears to be no change in the MCI group. A significant increase in maximum susceptibility with age in the HC group and no change in the MCI group was found. There was a slight reduction in volume with age for both MCI patients and HC. Nevertheless, there appears no statistical differences of either susceptibility or volume among AD patients, MCI patients and healthy controls.
Conclusion
There was a slight reduction in volume and increase in mean susceptibility of the mammillary bodies with age. In addition, there was a significant increase in local iron content with age in healthy individuals. These data serve as a starting point for incorporating age effects on volume and susceptibility for any future study of the mammillary bodies.

EPO-2006
基于 SCALE 序列的定量灌注技术在鉴别 WHO II/III 级别胶质瘤的应用

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目的：动态磁敏感增强磁共振灌注成像(DSC-MRI)作为评价脑血流动力学指标的重要手段，被广泛用于脑胶质瘤的鉴别诊断[1]。相对灌注参数（rCBF/rCBF）在鉴别 WHO II/III 级胶质瘤存在挑战[2]。定量脑磁共振灌注成像(Scale-PWI)通过获得绝对定量灌注参数（qCBV/qCBF）对脑胶质瘤血流动力学改变进行精准评价[3]。本研究目的证明 SCALE-PWI 技术在鉴别二、三级胶质瘤具有较高的临床效能。
方法：2017 年至 2018 年，前瞻性收集神经影像疑似胶质瘤患者 32 例于西门子 1.5T MR scanner 成像仪行 SCALE-PWI 扫描。其中病理验证 WHO II/III 级胶质瘤（n=8）用于进一步分析。扫描参数：TE/TR = 34/1090 ms, flip angle = 20°, *FOV= 220× 220 mm², GRAPPA 加速因子= 2, 13 层，层厚=5 mm, 50 次。参照 T1 增强图像在 qCBV 和 qCBF 图上肿瘤实质区分别画 ROI 取平均值。ROC 曲线用于鉴别诊断。Student's t-test 用于比较组间差异。*
结果：WHO II 级和 III 级胶质瘤定量灌注参数具有显著差异(II 级胶质瘤 qCBV: 2.3 ± 0.3 ml/100g , III 级胶质瘤:5.7 ± 1.1 ml/100g for grade III, $p < 0.05$). ROC 分析曲线证明 SCALE-PWI 在鉴别 WHO II/III 胶质瘤具有较高的效能（曲线下面积 AUC: qCBV, 0.978; qCBF, 0.875）
讨论：我们的研究结果表明，基于 CBV 和 CBF 的精确定量，可以精确鉴别 WHO II 级和 III 级胶质瘤。本研究的主要不足为样本量较小，qCBV / qCBF 和 rCBV / CBF 之间缺乏比较。

EPO-2007

3.0T 磁共振纤维束示踪成像对脊髓型颈椎病的诊断和预后预测价值研究

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【摘要】目的：探讨 3.0T 磁共振纤维束示踪成像对脊髓型颈椎病（cervical spondylotic myelopathy，CSM）的诊断和预后预测的应用价值。方法：选择我院在 2016 年 1 月至 2017 年 12 月期间收治的 60 例 CSM 患者作为研究对象，均行常规磁共振成像和弥散张量成像，再 DTT 成像处理。采用日本骨科学会 JOA 评分标准将患者恢复情况氛围优、良、可和差 4 个等级，根据常规 MRI 信号将患者氛围 A 级、B 级和 C 级，根据 DTT 显示的纤维束连续程度分成 1 级、2 级和 3 级。比较常规 MRI 分级、DTT 分级与术前 JOA 评分和 JOA 改善情况之间的相关性。结果：MRI 分级 A 级、B 级和 C 级各 15 例、32 例和 13 例，DTT 分级 1 级、2 级和 3 级各 14 例、33 例和 13 例。两种分级体系中，三种级别患者术前
JOA 评分比较差异显著，两两比较均有显著差异（P<0.05）。MRI 分级中，A 级患者 JOA 评分改善率显著高于 C 级（P<0.05），但与 B 级无显著差异（P>0.05）；B 级与 C 级患者 JOA 评分改善率比较，差异无统计学意义（P>0.05）。DTT 分级中，1 级和 2 级患者 JOA 评分改善率比较无显著差异（P>0.05），但均显著高于 C 级（P<0.05）。pearman 相关分析结果显示，MRI 分级与术前 JOA 评分和术后 JOA 评分改善率的相关系数分别为-0.649（P<0.05）和-0.184（P>0.05）；二 DTT 分级与术前 JOA 评分和术后 JOA 评分改善率的相关系数分别为-0.839（P<0.05）和-0.462（P<0.05）。结论：DTT 对于脊髓型颈椎病分级诊断和预后预测价值优于常规 MRI。

EPO-2008

Spontaneous Brain Activity after Acupuncture Treatment in Chronic Tinnitus Patients: A fMRI study

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Abstract

Introduction:

Patients suffered with tinnitus increased in the prevalence with age, which have the possibility of causing hearing loss, sleepless, depress and so on. Research showed tinnitus syndrome could be relieved by means of acupuncture.

We aimed to investigate the change of amplitude of low-frequency fluctuation (ALFF) in resting-state functional magnetic resonance imaging (fMRI) in patients with chronic tinnitus and in patients taking acupuncture treatment.

Material and methods

We recruited 6 healthy volunteers and 5 chronic tinnitus patients (some of them with hearing loss). All subjects were first scanned by normal sequence (T1WI, T2WI DWI) to exclude organic disease in brain, inner and outer ears. Then they accepted the Resting-state fMRI scan. 6(4 volunteers and 2 patients) of them accepted acupuncture treatment according to the same acupuncture protocol.

Resting-state fMRI data were acquired on a 3.0T magnetic resonance Scanner. All data were analyzed with ALFF based on auditory cortex mask using the software of Data Processing Assistant for Resting-State fMRI (DPARSF). Comparison and statistical analysis were performed on the ALFF maps between patients group and Healthy control group, also between Pre-acupuncture group and post-acupuncture group.

Results

Comparing to control group, the ALFF of tinnitus patients group showed a significant increase in right superior temporal gyrus, and a significant decrease in bilateral middle temporal gyrus. While comparing to Pre-acupuncture group, the post-acupuncture group showed a significant increase in right middle temporal gyrus.

Conclusion

The activation changes in auditory cortex regions of patients with chronic tinnitus indicate the potential mechanisms of the brain function remodeling. While the activation changes after the stimulation of acupuncture showed reverse brain function remodeling.

Key Words: *Tinnitus, Resting-state fMRI, BOLD, Auditory Cortex, Acupuncture, ALFF.*

Clinical Relevance/application

According to our results, Acupuncture do accelerate the spontaneous brain activity which is opposed to the effect caused by the chronic tin

EPO-2009

磁共振扩散峰度成像与磁共振灌注成像对确定脑梗死核心区的对比研究

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目的：DKI 结合 PWI 在确定脑梗死核心区及评价预后的优势。

方法：收集我院 2017 年 8 月-2018 年 8 月初诊 23 例急性期脑梗死患者，行 MRI 平扫、DKI 及 PWI 扫描，分别测量 DKI、PWI 图像上病灶的体积及不匹配面积，并于 1 个月之后进行 MRI 复查，测量 T2WI 上病灶的体积大小，比较急性期各参数图病灶体积与随访最终体积的相关性。

结果：1、16 例患者复查 MRI，T2WI 显示的病灶体积与 DKI、PWI 显示的病灶体积有相关性(P 值 <0.001),与 DKI 显示病灶的体积呈高度相关,与 PWI 显示的病灶体积呈中度相关；2、DKI 相关参数 MK 值较高的区域，复查 T2WI 上更靠近病灶梗死的中心区。

结论：急性期脑梗死患者 DKI 较 PWI 能更准确的确定梗死核心区,DKI 相关参数 MK 值较高的区域，更靠近病灶梗死的中心区，因此 DKI 有助于早期预测急性脑梗死患者病灶的最终转变及预后。

EPO-2010

Multi-parametric quantitative mapping of brain metastasis using synthetic MR: a feasibility study

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Purpose

To investigate the longitudinal relaxation R1, transverse relaxation R2, and proton density in metastasis tumors(MT), peritumoral edema area(pEA) and normal white matter (NWM) in patients with history of brain metastasis, before and after Gadolinium(Gd) contrast agent administration.

Materials and Methods

This study was approved by the local institutional review board and all patients sigMulti-parametric quantitative mapping of brain metastasis using synthetic MR: a feasibility study
ned informed consents. 30 patients with a total of 46 brain metastases which were confirmed by a long term following-up study of malignant tumors were included in this study. All subjects underwent Magnetic Resonance Image Compilation(MAGiC) sequence and conventional T1WI sequence scan before and after Gadolinium contrast agent administration on a 3.0T scanner (Signa Pioneer, Milwaukee, USA). MAGiC images were then processed on vendor supplied workstation to generate multi-parametric mappings. Metastasis tumors, peritumoral edema area, normal white matter(NWM) and cerebrospinal fluid(CSF) were identified on T1WI images, and quantitative measurements including Longitudinal relaxation R1(R1), transverse relaxationR2(R2), and proton density(PD) were obtained. Paired samples t-test was used to compare multi-parameter before and after Gd contrast agent administration and t-test was used to compare the same parameter obtained from different part of brain. All the statistical analyses were performed using SPSS software (SPSS for Windows, release 24.0.0.0, IBM).

Results

The following observations were made by comparing the quantitative measurements of different areas: R1 Value: NWM>MT>pEA>CSF(P=0.000); R2 Value: NWM>MT>pEA>CSF(P=0.000), PD value: CSF>MT>pEA>NWM(P=0.000). Comparing the quantitative measurements before and after Gd contrast agent administration: in the tumor area, R1 showed increased(P=0.000, t=7.201), R2 slightly increased (P=0.023, t=2.422) PD value slightly increase(P=0.001, t=3.668); the quantitative measures obtained in other part of the brain such as peritumoral edema area, normal white matter(NWM) and cerebrospinal fluid(CSF) showed no significant difference before and after contrast agent administration (P>0.05). Significant differences were observed in R1 (P=0.000, t=7.011) and PD (P=0.000, t=4.175) MT-to-NWM ratio, while no significant difference was observed in R2 ratio (P=0.107, t=1.668).

Conclusion

The multiple quantitative parametric mapping from synthetic MR may differentiate different components of brain metastasis, especially with the use of contrast administration.

A Clinical Relevance

Multi-parametric mapping offered by synthetic MR may have potential in assessing brain metastasis.

EPO-2011

Differentiating gliosis and low grade Astrocytoma with mean apparent propagator (MAP) MRI

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Purpose:
To differentiate gliosis and low grade Astrocytoma using High Angular Resolution Diffusion Imaging (HARDI) sequence and mean apparent propagator (MAP)-MRI model, whose parameters include the mean squared displacement (MSD), return-to-the-origin probability (RTOP), return-to-the-plane probability (RTPP), return-to-the-axis probability (RTAP), Q-space Inverse Variance (QIV) and non-Gaussianity (NG).
Methods:
Patients whose MR imaging scan and diagnosis suggested be low grade Glioma were recruited. Patients who underwent surgery after High Angular Resolution Diffusion Imaging (HARDI) scan less than one week, and pathology proved to be gliosis and WHO grade Ⅱ Astrocytoma would be included in our research. 3.0 T MR scanner (MAGNETOM Prisima, Siemens Healthcare, Erlangen, Germany) with a 64-channel head-neck coil was used. The HARDI sequence was used with following parameters: FOV = 220×220 mm^2, matrix = 128×128, slice thickness = 2.2 mm, slices = 60, TR/TE =3800/72 ms, b-value=0, 3000 sec/mm^2, diffusion model is MDDW, and 64 directions for every b value. The MAP-MRI parameters were calculated using post-processing software developed in-house, which is based on an open-resource tool DIPY (Diffusion Imaging In Python, http://nipy.org/dipy). The calculated parameters included the mean squared displacement (MSD), return to the origin probability (RTOP), return to-the plane probability (RTPP), return to the axis probability (RTAP), Q-space Inverse Variance (QIV), perpend non-Gaussianity (NG|), and parallel non-Gaussianity (NG//) and non-Gaussianity (NG). The region-of-interest (ROI) was manually drawn around the entire tumor or abnormal signal on DWI (b=0). Statistical analyses were performed using SPSS statistics software (version 21.0, IBM). Independent-samples T test was used. A value of $P < 0.05$ was considered statistically significant.
Results: There were significant differences of MSD, NG, NG|, NG//, QIV, RTPP between gliosis (n=9) and WHO grade Ⅱ Astrocytoma (n=9). Gliosis group has a higher MSD and QIV value than WHO grade Ⅱ Astrocytoma, but when it comes to NG, NG|, NG//, RTPP value the situation is reversed. RTPP has a highest AUC, sensitivity and specificity value.
Conclusions: MAP-MRI model may be a useful way to distinguish gliosis and WHO grade Ⅱ Astrocytoma, especially RTPP has a highly differential efficacy. According to histocyte pathological, there are difference between the two groups mentioned above. So MAP-MRI model may be reflect the difference of microstructure between gliosis and WHO grade Ⅱ Astrocytoma, such the density and proliferation of cell, texture of tissue and so on.

EPO-2012

Surveillance of unruptured intracranial saccular aneurysms using non-contrast 3D black blood MRI: Comparison of 3D TOF and CE-MRA with 3D DSA

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Background and purpose: Patients with unruptured intracranial aneurysms (UIAs) routinely undergo surveillance imaging to monitor growth.Angiography is the gold standard for aneurysm diagnosis, but is invasive.This study aims to evaluate the accuracy andreproducibilityof a 3D non-contrast black-blood (BB) MR technique for UIA measurement, in comparison with 3D TOF- and CE-MRA, using 3D rotational angiography (3DRA) as a reference standard.
Methods:64 patients (age 57.3±10.9 years, 41 female) with 68 saccular UIAs were recruited. Patients underwent 3T MRI with 3D TOF-MRA, 3D BB MRI and CE-MRA, and patients had a 3DRAwithin 2 weeks. The neck, width, height of the UIAs were measured by two radiologists independently on 3DRA and three MRI sequences. The accuracy and reproducibility was evaluated by Bland-Altman plots, coefficient of variance (CV), and intra-class coefficient (ICC).
Results: 3D BB MRI demonstrates the best agreement with DSA, with the smallest limit of agreement (LOA) and measurement error (CVs range 5.87% to 7.04%). 3D TOF-MRA had the largest LOA and measurement error (CVs range 12.73% to 15.78%). The average CV was 6.26% for 3D BB MR, 7.03% for CE-MRA and 15.54% for TOF-MRA. No bias was found among three MRI sequences compared with 3DRA.All three MRI sequences had excellent inter-reader agreement (ICCs>0.95). 3D BB MRI performed the best for patients with intraluminal thrombus (n=10).
Conclusions: 3D BB MRI achieves superior accuracy for intracranial aneurysm size measurements over 3D TOF, using 3DRA as a gold standard, although all MRI measurements did not significantly differ from 3DRA.This non-contrast technique is promising for surveillance of patients with UIAs.

EPO-2013

White matter damage and cognitive deficits in ESRD patients with SHPT: A diffusion-tensor study

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Objective End-stage renal disease(ESRD) patients with secondary hyperparathyroidism(SHPT) show severe metabolic disturbance which can affect cerebral function, but little is known about brain structure alternation characters. We therefore investigated white matter microstructure alternation and

cognitive deficits.**Method** ESRD patients with SHPT(N=25) and controls(N=20) underwent diffusion tensor imaging (DTI), Mini Mental State Examination (MMSE) and Montreal Cognitive Assessment (MOCA).DTI images were analyzed using tract-based spatial statistics(TBSS).**Result** ESRD patients with SHPT showed significant decreased FA and increased MD,RD in widespread regions, and significant cognitive deficits. **Conclusion** The white matter damages were symmetrical and widespread, more severer than prior research which study on ESRD patients. The axonal injury was as serious as demyelination. Expect traditional risk, its potential mechanism may involve metabolic disorders caused by elevated PTH levels.

EPO-2014
明显肝性脑病发作对肝硬化患者行肝移植术后短期脑水肿影响的弥散峰度成像研究

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目的：探究明显肝性脑病发作对肝硬化患者行肝移植术后脑水肿的影响，以及弥散峰度成像(DKI)技术对于评估脑水肿的价值。

方法：共纳入拟行肝移植的肝硬化患者 44 例，依据术前有无明显肝性脑病(OHE)发作分为有 OHE 组 21 例和无 OHE 组 23 例。所有入组患者在肝移植术前及术后 1 个月进行磁共振检查，采集 DKI 序列。采用 FSL 软件进行分析，通过基于体素水平的全脑分析，计算各向异性分数(FA)、平均弥散率(MD)、径向扩散系数(RD)、轴向扩散系数(AD)、轴向扩散峰度(AK)、平均扩散峰度(MK)和径向扩散峰度(RK)，采用配对样本 t 检验比较两组术前术后各弥散指标差异，对差异结果的多重比较校正采用体素水平的 FWE 校正($p<0.05$)。

结果：与术前相比，无 OHE 组术后在右侧内侧前额叶及双侧前扣带回 AD($t=8.746\sim9.420$, $p<0.05$)、RD($t=8.427\sim10.516$, $p<0.05$)、MD($t=7.348\sim10.323$, $p<0.05$)值增高。有 OHE 组在双侧海马及海马旁回、左侧颞上回及颞中回、右侧丘脑、左侧内侧前额叶 AD($t=7.452\sim8.795$, $p<0.05$)值增高，左侧前额叶及左侧前扣带回 RD($t=7.341\sim8.781$, $p<0.05$)及 MD($t=7.225\sim8.589$, $p<0.05$)增高。其他弥散指标包括 FA、AK、MK、RK 等无组间差异($p>0.05$)。

结论：肝硬化患者行肝移植术后早期在前扣带回、额叶等脑区仍存在脑水肿情况，术前伴有明显肝性脑病发作会加重脑水肿程度，AD、RD、MD 三项指标可作为对于评价移植术后脑水肿的神经影像标记物。

EPO-2015
皮层-纹状体-丘脑-小脑网络在癫痫分型中作用的模式分类影像学研究

谢心瑀,许强,张其锐,郝竞汝,张志强
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目的
全面强直阵挛发作型癫痫可分为原发性全面强直阵挛发作型性癫痫及继发全面强直阵挛发作型。由于 IGTCS 和 SGTCS 都具有全面强直阵挛发作的特点，且在常规 MRI 检查下均无脑结构异常检出，因此临床上鉴别困难。而影像分型能为这些情况提供客观证据，针对不同类型的癫痫患者，辅助进行个体化临床决策，有利于精准诊疗。因此，本研究通过 SVM 技术探讨该网络影像学指标对这两类癫痫分类诊断中的作用价值。
方法
本研究纳入 IGTCS、SGTCS 患者，及年龄性别匹配的健康志愿者各 60 例，采用 bold 及 T1 序列，用 dparsf 软件进行数据预处理和统计分析，预处理包括时间校正、头动校正、配准、平滑、滤波、协变量回归。根据 Zhang 等文章，定义皮层五个结构种子感兴趣区，并通过 AAL 模板定义了包括丘脑，基底节和小脑的皮层下结构。通过 SVM 技术，应用留一法对实验进行交叉验证，使用分类精确度、敏感性、特异性作为性能度量来量化结果。
结果
通过 SVM 分类可以得到，I-GTCS 与正常对照组，运动皮层与皮下核团准确率为 87.5%，敏感性 85%，特异性 90%，ROC 曲面下面积为 0.95，S-GTCS 与正常对照组，感觉皮层与皮下核团准确率为 83.33%，敏感性 86.67%，特异性 80%，ROC 曲面下面积为 0.92，I-GTCS 与 S-GTCS 组额叶皮层与皮下核团准确率 84.17%，敏感性 81.67%，特异性 86.67%，ROC 曲面下面积为 0.91。
结论
通过 SVM 分类技术可以鉴别原发全面性强直阵挛及继发全面性强直阵挛癫痫，为磁共振成像技术的临床转化奠定基础，有利于精准诊疗。

EPO-2016

Disrupted intraregional brain activity and functional connectivity in unilateral acute tinnitus patients with hearing loss

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Purpose: The present study combined fractional amplitude of low-frequency fluctuations (fALFF), regional homogeneity (ReHo) and functional connectivity (FC) to explore brain functional abnormalities in acute tinnitus patients (AT) with hearing loss.
Methods: We recruited twenty-eight AT patients and 31 healthy controls (HCs) and ran resting-state functional magnetic resonance imaging scans. fALFF, ReHo, and FC were conducted and compared between AT patients and HCs. After that, we calculated correlation analyses among abnormal fALFF, ReHo, FC and clinical data in AT patients.
Results: Compared with HCs, acute tinnitus patients showed increased fALFF values in the right inferior temporal gyrus (ITG). In contrast, significantly decreased ReHo values were observed in the cerebellar vermis, the right calcarine cortex, the bilateral precuneus, the right supramarginal gyrus (SMG) and the right middle frontal gyrus (MFG). Based on the differences in the fALFF and ReHo maps, the latter of which we defined as the ROIs for FC analysis, the right ITG exhibited increased connectivity with the right precentral gyrus. In addition, the right MFG demonstrated decreased

connectivity with both the bilateral anterior cingulate cortex (ACC) and the left precentral gyrus.
Conclusions: By combining ReHo, fALFF, and FC analyses, our work indicated that acute tinnitus patients with hearing loss had abnormal regional neural activity and disrupted inter-regional connectivity in several brain regions which mainly involving the partial auditory and non-auditory area, and these regions are major components of default mode network, attention network, and executive control attention network. These findings will help us enhance the understanding of the neuroimaging mechanism in tinnitus populations. Moreover, these abnormalities remind us that we should focus on the early stages of this hearing disease.

EPO-2017

轻度认知障碍患者有氧舞蹈干预后认知功能和静息态 fMRI 低频振幅的改变

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目的：本研究针对于轻度认知障碍患者（MCI）采用一套自主编制有氧舞蹈进行干预，探讨其对患者认知功能和静息态 fMRI 低频振幅(ALFF)的影响。
方法：本研究中 38 例 MCI 患者随机分组：训练组（19 例）和对照组（19 例）。分别接受不同干预方式。对于训练组，给予有氧舞蹈进行干预，共 3 个月；对照组则以健康教育为主，周期与训练组相同。期间所有患者均未接受任何药物治疗。在接受干预前对所有患者进行评分，了解他们的认知情况，评估工具为认知功能量表，同时进行静息态 fMRI 扫描，干预结束后再次进行评分和扫描。了解患者脑功能活动情况，根据低频振幅图像结果进行分析。
结果：训练组干预完成后，认知功能量表结果显示训练组的简易精神状态评分、蒙特利尔认知评估量表、韦氏逻辑记忆和符号数字模式测试评分显著改善，与干预前相比差异显著。两组患者干预前后韦氏逻辑记忆评分皆发生变化，其中以训练组更为明显，相比有显著差异（$p < 0.05$）。对照组的各项认知功能量表评分均无显著差异。静息态 fMRI 扫描结果显示，训练组干预前后发生明显变化，其双侧额颞叶、前扣带回、内嗅及海马旁皮层的 ALFF 值显著增高（$p < 0.05$），而对照组 3 个月后仅右侧颞叶和后扣带回皮层的 ALFF 值显著增高（$p < 0.05$）。
结论：本套自主编制的中等强度有氧舞蹈能有效提高 MCI 患者的认知功能。静息态 fMRI 为评估有氧训练对认知功能的影响提供了一种量化方法。

EPO-2018

Feasibility of evaluating the histologic and genetic subtypes of WHO grade II-IV gliomas by diffusion-weighted imaging

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Purpose: To explore the feasibility of diffusion-weighted imaging (DWI) metrics in predicting histologic subtypes and genetic status (e.g., IDH, MGMT, TERT and concurrent genetic status) of glioma noninvasively.
Methods and Materials: One hundred and eleven patients with pathologically confirmed WHO grade II-IV gliomas were recruited retrospectively. Apparent diffusion coefficient (ADC) metrics were measured in solid parts of gliomas on co-registered T2-weighted images and were compared concerning WHO grading, single genotypes and concurrent genotypes. Receiver operating characteristic analysis were performed to assess the diagnostic performances of ADC. Subsequently, multiple linear regression was used to find independent variables affecting ADC values.
Results: The overall mean ADC (omADC) and the normalized ADC (nADC) values had statistical significance between higher grade glioma and lower grade glioma, IDH mutation and IDH wildtype, as well as TERT mutation and TERT wildtype in WHO grade II-IV gliomas. The areas under the curve (AUC) of omADC and nADC were, respectively, 0.716 and 0.749, 0.777 and 0.838, 0.617 and 0.607. The nADC could also distinguish MGMT methylation from MGMT unmethylation, with an AUC of 0.651. There were no statistical differences presented in TERT mutation-IDH mutation and TERT mutation-MGMT methylation. Only tumor grading and IDH mutation were tightly associated with ADC.
Conclusion: DWI can predict glioma grading and detect IDH mutation, TERT mutation, and MGMT methylation noninvasively. TERT mutation-IDH mutation and TERT mutation-MGMT methylation have little influence in DWI parameters.

EPO-2019

应用平均表观传播模型磁共振成像(MAP-MRI)分析早期帕金森病患者脑深部核团的微结构变化

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目的：探讨早期帕金森病(PD)所致脑深部核团的微结构变化[1]，为 PD 的早期诊断提供帮助。材料和方法：我们招募了 14 名早期 PD 患者(组 1)和 14 名年龄性别匹配的健康对照组(组 2)，在 MAGNETOM Prisma 3T 磁共振扫描仪上使用 64 通道头部线圈进行弥散序列扫描。使用来自 MRICron(https：/People.cas.sc.edu/Rorden/mricron/)的 dcm2nii 工具将所有扩散数据转换为 Nifti 格式。使用开放资源工具 DIPY(Python 中的扩散成像，http：/nipy.org/dipy)从弥散数据中计算 MAP-MRI 参数。从 8 个参数图中获得的 8 个参数值是 MSD，NG，NGparallel，NGperpend，QIV，RTAP，RtoP，RTPP。感兴趣区域(ROI)是双侧尾状核头部，壳核，苍白球，丘脑，红核和黑质，用 MRIcroN 在每个核团的最大截面绘制 ROI。通过双样本 t 检验分析两组参数值的差异，通过受试者操作特征(ROC)曲线评价参数值的诊断效能。结果：PD 组的左侧黑质(5.722±0.062)和右侧红核(6.601±0.061)的 RTPP 值明显低于对照组(5.982±0.087，6.907±0.100)(t=-2.419，P=0.023；t=-2.605，P=0.015)。PD 组的右侧黑质 NG parallel 值(0.106±0.003)明显低于对照组(0.120±0.004)(t=-2.635，P=0.014)。左侧黑质 RTPP 值诊断效率最高，ROC 曲线下面积(AUC)为 0.791。当阈值为 5.849 时，诊断敏感性和特异性分别为 85.7%和 78.6%。结论：MAP-MRI 弥散方法可检测到早期 PD 患者脑深部多个核团的微结构发生了改变，有助于早期诊断。

EPO-2020

单体素与多体素¹H-MRS 在帕金森病检测中的差异性研究及价值

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目的:评价使用单体素与多体素¹H-MRS 技术在帕金森病患者丘脑区检测的差异性，探索单体素与多体素¹H-MRS 技术在帕金森病诊断中价值。**材料与方法:**选取 30 例 PD 患者纳入研究，24 名年龄、性别等相匹配的志愿者作为对照组，两组分别使用单体素及多体素¹H-MRS 两种技术对研究对象的双侧丘脑区进行检测，获取一系列代谢物比值及相应谱线。**结果:**使用单体素与多体素¹H-MRS 对 PD 组及对照组双侧丘脑区测量均未表现出统计学差异。单体素测量 PD 组丘脑区 NAA/Cr 与 Cho/Cr 值较对照组降低（P<0.05），多体素测量 PD 组丘脑区 NAA/Cr 与 NAA/Cho 值较对照组减低（P<0.05），余指标未见明显差异。单体素及多体素对同侧丘脑区测量获取左、右侧丘脑区 Cho/Cr 值及右侧丘脑区 NAA/Cho 存在统计学差异（P<0.05）。单体素和多体素对 PD 患者症状严重侧以及对侧丘脑区测量，多体素测量所得 NAA/Cr、Cho/Cr 值表现出统计学差异（P<0.05）。**结论：**¹H-MRS 能够为帕金森病的诊断提供辅助依据；单体素与多体素¹H-MRS 对于同一感兴趣区的测量值不完全相同，测量上具有一定的差异性；多体素技术对于帕金森病临床诊断具有更好的运用前景。

EPO-2021

Local functional connectivity of patients with acute and remission multiple sclerosis: A multi-voxel KCC-ReHo and Cohe-ReHo study

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Object: Using regional homogeneity(ReHo) based on multi-Voxels(7,19,27)Kendall's coefficient of concordance(KCC-ReHo) and Coherence(CoheReHo) to explores brain functional changes of acute and remission relapsing-remitting multiple sclerosis(RRMS) associated with clinical indicators.
Methods: Resting-state functional magnetic resonance imaging and several clinical variables(EDSS,PASAT and disease duration) were acquired in 18 acute RRMS(A-RRMS),26 remission RRMS(R-RRMS) and 20 age-matched healthy controls(HC),processed in MATLAB,calculated the KCC-Reho and Cohe-ReHo values of the three groups.Identify which brain areas has changed Reho values among the three groups and analyse the relationship between the changed Reho values and the bove clinical variables.
Results: The multi-Voxels KCC-ReHo and CoHe-ReHo analyses showed that the ReHo values in the superior frontal gyrus(SFG),medial frontal gyrus(MFG) and middle occipital gyrus(MOG) were increased between the three groups:the changed Reho values between A-RRMS and R-RRMS was uncorrelated with clinical indicators;the Reho value of SFG was increased in A-RRMS and was negatively correlated with disease duration($r<-0.5, P<0.05$).compared to HC,The difference as follows:multi-Voxels KCC-ReHo analysis found the Reho values of cuneus also increased between three groups($P<0.05$,FDR correction).In A-RRMS,the Reho value of MFG was increased relative to the HC and was negatively correlated with the disease duration($r < -0.5, P < 0.05$),the difference

between R-RRMS and HC was uncorrelated with clinical indicators(r＜0.5);while CoHe-ReHo analysis showed the ReHo value of SFG in R-RRMS was increased and negatively correlated with the disease duration(r=-0.571,P=0.041) compared to HC.In addition,KCC-ReHo(7,19 voxel) analysis showed the Reho value of the SFG was increased in the A-RRMS compared with HC and was negatively correlated with EDSS score(r＜-0.5,P＜0.05).
Conclusions: Compared with R-RRMS,A-RRMS patients show more extensive changes in local functional connectivity,and this change related to disease state reflects the clinical function of patients.different Reho calculation methods(KCC-,Cohe-ReHo)can provide more useful information,and is beneficial to further explore the pathophysiology of RRMS.

EPO-2022

The Brain Network Changes Accompanied with Memory Function Decline in End-stage Renal Disease Patients before Dialysis Initiation

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Purpose This study aimed to explore the underlying neural mechanisms of memory impairment in end-stage renal disease (ESRD) patients before dialysis initiation using functional MRI techniques, in order to provide objective evidence for the medical treatment decisions and prognosis assessment.
Methods 49 ESRD patients before dialysis initiation (mean age 35.41±10.04 years) and 42 healthy volunteers (mean age 38.25±8.93 years) were included in our study. Three-dimensional T1-weighted imaging and BOLD were acquired using a GE 3.0T scanner. The MELODIC and dual regression of FSL tools were used to analyze the changes of large-scale brain networks. All the subjects were evaluated memory function by Auditory Verbal Learning Test (AVLT). We collected the laboratory blood tests in all patients.
Results Compared with the healthy controls, the functional connectivity of the medial prefrontal cortex (mPFC) which was the core region of default-mode network (DMN) was decreaed (P<0.05, FWE correction) in ESRD patients before dialysis initiation. The functional connectivity of core regions of bilateral frontoparietal networks (FPN), that was the dorsolateral prefrontal cortex (DLPFC) and the inferior parietal lobule (IPL), was decreased in ESRD patients before dialysis initiation (P<0.05, FWE correction). The correlation analysis showed the functional connectivity of mPFC, DLPFC and IPL were positively correlated with short-term delayed recall and long-term delayed recall scores in ESRD patients (P<0.05, FWE correction). The decreased functional connectivity of IPL was associated with the level of anemia (P<0.05, FWE correction).
Conclusion Our findings revealed that large-scale resting brain networks dysfunction has existed in ESRD patients before dialysis initiation. The abnormal connectivity of FPN, especially the prefrontal cortex and posterior parietal cortex, played an important role in mechanism of memory function decline in ESRD patients before

dialysis initiation. This study might help us better understand the pathophysiology of neural damage in ESRD patients.

EPO-2023
颞下颌关节紊乱患者翼外肌功能变化：纹理分析初步研究

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目的：采用纹理分析的方法评估颞下颌关节紊乱患者翼外肌功能变化。方法：纳入 29 例颞下颌关节功能紊乱患者，并在 3.0T 磁共振上进行扫描。根据关节盘移位将患者分为：关节盘无移位组（DWoD），关节盘可复性移位组（DDWR）及关节盘不可复性移位组（DDWoR）。在横轴位 T2WI 图像上对翼外肌进行基于灰度共生矩阵的纹理分析。纹理分析参数包括角二阶矩，对比度，自相关、逆差距及熵。结果：DDWoR 组翼外肌对比度[46.30(27.63, 152.60)] 显著低于 DWoD 组(123.88±29.31)（P value = 0.000）。DWoD(7.620±0.327)、DDWR(6.757±0.348)及 DDWoR(6.455±0.392)之间纹理参数熵显著不同(PDWoD-DDWR = 0.000, PDWoD-DDWoR = 0.000 and PDDWR-DDWoR = 0.014)。ROC 曲线分析证实熵对于 DWoD-DDWR (AUC = 0.96) and DWoD-DDWoR (AUC = 0.98)具有较好的诊断准确性。结论：纹理参数对比度及熵证实颞下颌关节紊乱患者翼外肌功能变化，可以被认为是评估其翼外肌功能变化的影像学标记物。

EPO-2024
Cortical Alteration in Non-comorbid Drug-naïve Patients with Social Anxiety Disorder: a Surface-based Morphometry Study

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Purpose Social anxiety disorder (SAD) is a disabling psychiatric disease characterized by excessive fear in social or performance situations. Given grey matter volume (GMV) is a product of cortical thickness (CT) and cortical surface area (CSA)[1], investigation of CT and CSA respectively may offer further insight into the neurobiological mechanisms[2]. Thus, the primary aim of the present work was to explore the cortical anomaly in SAD using surface-based morphometry analysis.
Methods Thirty two non-comorbid drug-naïve SAD patients and 32 demography-matched health controls (HCs) were recruited to undergo magnetic resonance image. Morphometry indices including CT, CSA, and subcortical GMV were estimated by software Freesurfer. Then theory-driven region of interest (ROI) analysis was performed to compare aforementioned parameters. Additionally, associations between morphometric change and clinical features were assessed.
Results Compared to HCs, patients with SAD showed increased CT in bilateral postcentral, right medial orbitalfrontal cortex (mOFC), right lingual, left

rostralmiddlefrontal, and thinner cortex in right superiorfrontal, right paracenral, right inferiorparietal, right precuneus, right supramarginal, and left precentral. Besides, increased CSA of left mOFC and lower subcortical GMV of left hippocampus were also observed in SAD group (FDR corrections of $p<0.05$). Furthermore, the CSA in left mOFC was positively correlated with Liebowitz Social Anxiety score in SAD cohort. *Conclusions* To the best of our knowledge, the present study is the first to investigate the CT, CSA, and subcortical volume simultaneously in non-comorbid medication-naïve SAD patients via a ROI analysis. Our study revealed the structural abnormality in the fronto-parietal and limbic system, the crucial part related to social cognition, attention, and emotion[3], which may indicate the aberrant psychopathological underpinning of disturbed social information processing and emotion regulation in SAD.

EPO-2025
应用基于体素的形态学测量方法与独立成分分析对聋哑儿童执行功能的研究

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目的：利用功能及结构磁共振的研究方法结合行为学测试为聋哑儿童执行功能缺陷提供相关证据，进一步探讨聋哑儿童执行功能缺陷与脑结构及脑功能连接之间的关系。方法：从特殊教育学校招募 28 名聋哑儿童和 27 名人口指标匹配的健康儿童作为对照。两组儿童间人口指标同质。（年龄[t（42）=1.54；P=0.13＞0.05]、性别（ x 2=0.0452,P=0.83＞0.05））。分别选用磁共振基于体素形态学测量（VBM）方法评估聋哑儿童与听力正常儿童在脑灰质体积之间的差异、采用功能磁共振独立成分分析（ICA）的方法探究聋哑儿童与正常听力儿童脑功能连接的差异、用执行功能测试工具评价聋哑儿童各执行子功能与听力正常儿童的差异。结果：1）聋哑儿童的脑灰质体积在左侧角回（ANG.L; MIN coordinates: -48, -72, 45;700 voxels）、右侧顶上回（SPG.R; MIN coordinates: 20, -62, 57;594 voxels）和左侧枕中回（MOG.L; MIN coordinates: -32, -87, 42;782 voxels）较听力正常儿童减小；2）聋哑儿童在左侧眶部额中回/左侧额下回（ORBmid.L/IFG.L; MIN coordinates:-24, 21, 3; 54 voxels）功能连接较听力正常儿童减弱；3）在行为学测试结果中，聋哑儿童在转换功能上较正常儿童存在缺陷，并具有统计学意义[t(42)=2.02,P=0.02<0.05]。讨论：本研究首次整合脑功能及脑结构，并参考行为学测试结果揭示了聋哑儿童与听力正常儿童间的差异。聋哑儿童执行能力较差的神经机制可能与其在执行功能相关的脑区的功能连接减低与灰质体积减小相关，且结构与功能之间存在不匹配性；在行为学测试中，聋哑儿童转换功能较差。此研究为聋哑儿童执行功能的缺陷提供了多方面的证据，为进一步寻求聋哑儿童执行功能改善的研究提供了基础。

EPO-2026
脑干综合征与磁共振成像解剖定位的系统分析

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脑干的解剖结构复杂，它包含许多脑神经核、连接脑与脊髓的纤维束、网状结构。随着 MRI 分辨率的不断提高，使得脑干解剖结构显示更加细致化，对于脑干功能解剖的深入理解将为正确认识脑干综合征提供重要信息。脑干综合征较为常见的原因包括后循环障碍或肿瘤性病变的占位效应。这些综合征影像学改变可能较为细微，容易被忽视而造成漏诊、误诊。脑干综合征按部位分为中脑综合征、桥脑综合征以及延髓综合征。中脑综合征包括 Weber 综合征、Benedikt 综合征(中脑旁中央综合征)、Claude 综合征、Parinaud 综合征(中脑背侧综合征)、Nothnagel 综合征等，桥脑综合征包括 Marie-Foix 综合征(桥脑外侧综合征)、Foville 综合征(桥脑下内侧综合征)、Locked-in 综合征(假昏迷综合征)、桥脑腹侧综合征、面神经丘综合征等，延髓综合征包括 Wallenberg 综合征(延髓外侧综合征)、Dejerine 综合征(延髓内侧综合征)、Babinski-Nageotte 综合征(半延髓综合征)、肥大性橄榄核变性等。本文将对这些综合征的功能障碍对应的 MRI 解剖定位进行系统总结，从而为影像科医师提供诊断参考依据。

EPO-2027

Extraventricular Ependymomas: Tumor Grade Stratification Using DWI and DSC-PWI Combined with Conventional MR Imaging

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ABSTRACT

BACKGROUND AND PURPOSE: Anaplastic extraventricular ependymoma, an extremely rare malignant central nervous system neoplasm, have worse prognosis compared with low-grade lesions for its more aggressive biological behavior and higher risk of dissemination, metastasis and recurrence. The aim of this study was to investigate whether DWI and DSC-PWI combined with conventional MR imaging is predictive of tumor grades in this rare entity.

MATERIALS AND METHODS: 20 patients with high-grade (anaplastic) ependymoma and 9 patients with low-grade ependymoma who underwent preoperative MR imaging were enrolled in this retrospective study. Conventional MRI and DWI were performed in 26 patients (19 with anaplastic ependymoma, 7 with low-grade ependymoma); and DSC-PWI, in 15 patients (11 with anaplastic ependymoma, 4 with low-grade ependymoma). Demographics, conventional imaging characteristics (location, side, size, peritumoral edema, necrotic and cystic degeneration, enhancement, pial and cortical involvement, ependymal extension, and deep white matter invasion), minimum relative ADC ratio, and maximum relative CBV ratio were compared between the anaplastic ependymoma and low-grade groups.

RESULTS: Anaplastic ependymoma tended to have a more superficial supratentorial cerebral hemisphere location (P=.026), more frequent pial and cortical involvement (P=.028 and .013, respectively), and necrotic degeneration (P=.014). Minimum relative ADC ratio was significantly lower in anaplastic ependymoma than in low-grade ependymoma (0.8±0.2 versus 1.2±0.3, P=.002). Maximum relative CBV ratio was statistically higher in anaplastic ependymoma than in low-grade ependymoma (15.7 ±5.3 versus 9.0±4.4, P=.042).

CONCLUSIONS: A combination of conventional MR imaging, DWI, and DSC-PWI techniques may aid in the characterization and grade stratification of extraventricular ependymomas.

EPO-2028
一种改进的定量磁化率成像多回波场图拟合算法

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目的：开发并验证一种基于相位线性度的多回波场图拟合算法，以提高定量磁化率分布图的图像质量。
方法：本文提出了一种多回波场图拟合的改进算法，其通过场图线性拟合的残差来判断数据点相位的可靠性。采集 5 名健康被试的模图和相位图，分别采用常规算法和改进算法拟合得到场图，再经过场图解缠绕、背景场去除和磁化率反演等步骤获得磁化率分布图。选取黑质、红核、尾状核、苍白球和壳核作为感兴趣区，对比研究了两种算法得到的磁化率分布图上感兴趣区的噪声水平。
结果：采用改进的场图拟合算法后，定量磁化率图像质量得到明显提高，伪影得到明显抑制。双侧黑质、右侧红核和左侧苍白球区域的噪声水平显著下降。
结论：本文提出的一种改进的定量磁化率成像多回波场图拟合算法可以提高磁化率分布图的图像质量。

EPO-2029
早盲青少年大脑功能连接的异常改变模式

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目的：探究早盲青少年大脑中默认网络（Default mode network, DMN）、执行控制网络（Executive control network, ECN）、背侧注意网络（Dorsal attention network, DAN）及突显网络（Silence network, SN）的功能连接改变模式。
方法：采集 30 名早盲青少年（男性 19 例，女性 11 例，年龄 14.6±1.9 岁）及 22 名视力正常青少年（男性 11 例，女性 11 例，年龄 14.6±2.5 岁）的静息态 MR 脑功能数据，分别取 8 个感兴趣区作为种子点，即后扣带回（DMN, x/y/z=0/-52/30）、双侧背外侧前额叶（ECN, x/y/z=-42/34/20, 44/36/20）、双侧顶下小叶（DAN, x/y/z=-25/-53/52, 25/-57/52）、扣带回前部（SN, x/y/z=7/33/19）及双侧前脑岛（SN, x/y/z=-32/25/-10, 35/26/-6），运用 Matlab 及 DPABI 软件计算每个被试种子点与全脑的功能连接。采用双样本 t 检验对两组被试的功能连接进行统计分析，以年龄及性别为协变量并对统计结果进行多重比较校正（false discovery rate, FDR ），$p<0.05$ 且集群体素＞50 的脑区认为差异有统计学意义。

结果：与正常青少年相比，早盲青少年右侧背外侧前额叶与右侧枕下回及左侧枕中回的功能连接增强，与右侧楔前叶的功能连接减弱， 左侧前脑岛与左侧楔叶的功能连接增强。
结论：早盲青少年双侧视觉皮层参与了执行控制网络及突显网络的神经通路，而默认网络及背侧注意网络未见明显异常改变。

EPO-2030

Chemotherapy-induced gray matter abnormalities in cancer survivals: a voxel-wise neuroimaging meta-analysis

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INTRODUCTION:
“Chemobrain” is the term used to describe the alterations of cognitive function reflecting the central nervous system (CNS) toxic effects of systemic chemotherapy [1]. Chemobrain symptoms significantly impact multiple activities of cancer survivors such as in maintaining work performance, social interaction, and carrying out daily tasks such as cooking and driving [2, 3]. Neuroimaging findings on brain grey matter volume (GMV) changes of chemobrain are not consistent. We aimed to investigate the grey matter abnormalities in non-CNS cancer survivals treated with chemotherapy for the first time.
METHODS:
We identified studies published up to Sep 2018 that compared grey matter in non-CNS cancer survivals treated with chemotherapy (CT+, 10 data sets including 433 individuals) and cancer survivals without chemotherapy (CT-, 7 data sets including 210 individuals) or healthy controls (HC, 7 data sets including 539 individuals). All the process of this meta-analysis was according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guides.
RESULTS
Four hundred and thirty three cancer survivals treated with chemotherapy (CT+) (mean age 51.92 years), 210 cancer survivals without chemotherapy (CT-) (mean age 49.87 years) and 539 healthy controls (HC) (mean age 56.84 years) were included. Compared with CT- and HC, CT+ groups exhibited lower GMV mainly in prefrontal- anterior cingulate cortex (ACC) pathway, including right fusiform gyrus (FG), right ACC and right superior frontal gyrus, medial orbital (SFG.med.orb) and dorsolateral part(SFG.dl). Smaller GMV in FG and prefrontal cortex were found in CT+ groups compared to CT-groups and in CT+ groups with impaired cognition. GMV in two areas were positively associated with the time since chemotherapy.
CONCLUSION
The present results suggested that non-CNS cancer survivals treated with chemotherapy exhibit widespread grey matter abnormalities in brain, especially in prefrontal-ACC pathway. This pattern of grey matter volume changes might improve our understanding of the pathophysiological nature of cognitive impairments in cancer survivals after chemotherapy.

EPO-2031
视网膜光凝术后颅内硅油异位 MR 表现和检查方法探讨

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目的　探讨视网膜光凝术后硅油注入导致颅内硅油异位的 MR 表现和检查方法。
方法　回顾性分析 1 例视网膜光凝术后硅油填充患者的临床病史、MR 表现及 MR 检查方法。
结果　本例为 45 岁女性。头晕头痛不适一个月来神经内科就诊，常规行头部 MR 检查，MR 平扫发现左侧侧脑室前角，中脑导水管及右侧眼球内小结节状异常信号灶，T1WI 病灶上部呈高信号，下部呈低信号。T2WI 呈低信号，DWI 呈低信号，性质不明，随即行增强检查后无明显强化。改变体位检查，俯卧位扫描，右侧眼球、左侧侧脑室前角及中脑导水管内病灶位置均发生明显移动。
结论　眼内硅油填充常用于治疗复杂性视网膜脱离。硅油填充的常见并发症也被人们所熟知 ,甚至眼内填充硅油进入视神经间质的报道也不少见,并且乳化的小油珠可以到达视神经周围蛛网膜下腔。但眼内硅油填充进入脑室的并发症实为罕见。本例女性患者头晕头痛不适在神经内科就诊，头部 MR 检查无意中发现脑室内异常信号灶，性质不明。行增强检查也未发现异常强化。后来追问病史，患者曾经在眼科做过视网膜光凝术硅油填充。眼内硅油填充进入脑室是比较少见。因为眼内填充硅油的患者很少进行头部的影像学检查 ,可能有些病例未被发现。我们可以得知，影像表现需要紧密结合临床病史，发现脑室内异常信号灶，由于硅油的比重要低于脑脊液，改变体位扫描，因此位置会发生移动。我们检查的思维不仅仅局限在常规检查方法，有时往往需要开拓我们的思维，才能得到更明确的诊断，从而服务于临床。

EPO-2032
联合 QSM 及 DKI 在原发性帕金森病中的研究

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目的：通过对帕金森病人及正常对照组基底神经节的 QSM 及 DKI 研究，定量追踪铁沉积及评估神经元丢失情况，在挖掘这两种磁共振技术在帕金森病诊疗中的价值的同时，探索帕金森病人基底神经节的病理生理改变。
方法：对来自佛山第一人民医院就诊的 35 名帕金森病患者及 40 名健康志愿者在 GE Discovery MR 750w 3.0T 超导扫描仪上进行 QSM 及 DKI 扫描。其中早期 PD 组 25 例，进展期 PD 组 10 例。右侧肢体严重者 24 例，左侧肢体严重者 11 例。QSM 及 DKI 图像后处理后分别获得 QSM 图及 DKI 参数图。于显示面积最大层面处手动测量双侧黑质、红核、尾状核、壳、苍白球、丘脑的 QSM 值及 MD、FA、MK 值。
结果：QSM 结果:早期 PD 组、进展期 PD 组相对于正常对照组黑质、红核、尾状核、壳、苍白球 QSM 值升高，均有统计学差异（$p<0.05$），其中黑质 QSM 值与疾病病程呈正相关关系($r=0.417$, $p=0.01$);右侧肢体严重者，左侧黑质、壳 QSM 值较右侧升高，有统计学差异($p<0.05$)；QSM 关于 ROC 曲线分析显示，黑质、红核、壳、苍白球诊断效能较高。DKI 结果：早期 PD 组、进展期 PD 组相对于正常对照组黑质、苍白球 MK 值下降，有统计学差异（$p<0.05$）；进展期 PD 组相对于正常对照组尾状核、红核 MK 值升高，有统计学差异（$p<0.05$）；进展期 PD 组相对于正常对照组黑质、红核、壳、尾状核、丘脑 FA 值升高,有统计学差异（$p<0.05$）；其中黑质 MK 值与疾病病程呈负相关

关系(r=-0.537，p=0.004)；DKI 关于 ROC 曲线分析显示，黑质 MK、红核 MK、红核 FA、壳 FA 诊断效能较高。
结论：QSM 及 DKI 是定性诊断 PD 的 MRI 新技术，两者的联合应用，揭示了 PD 患者多个灰质核团铁沉积现象，并且存在微观结构的改变，对于 PD 患者疾病诊断和分期具有重要意义。

EPO-2033
2 型糖尿病周围神经病变脑结构共变网络拓扑结构异常的磁共振成像研究

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背景及目的：2 型糖尿病的周围神经病变 (Diabetic peripheral neuropathy, DPN) 的神经影像研究已经表明包括躯体感觉皮层以及非躯体感觉皮层在内的多个脑区存在脑结构、功能的变化，提示 DPN 在中枢神经系统存在多系统受累，进而我们推测大尺度脑网络可能受累。因此，本研究基于上述研究背景探讨 DPN 患者全脑结构共变网络的拓扑结构是否异常。
方法与材料：采用 3.0 T Prisma 磁共振扫描仪对入组被试进行数据采集，包括 64 例 DPN 患者及 88 例正常健康对照 (Healthy controls, HCs) 的 3D T1 结构像数据。运用 Freesurfer 软件对所有被试 3D T1 结构像进行数据处理，得到每个脑区的平均皮层厚度，用于后续脑结构共变网络的构建。基于图论的方法构建 DPN 及 HCs 的脑结构共变网络，采用置换检验的统计学方法比较两者结构共变网络局部和全局属性的组间差异。
结果：DPN 患者与 HCs 对比，其脑结构共变网络表现为向规则脑网络 (Regularized architecture) 方向转变。具体的说，DPN 患者结构共变网络的标准化特征路径长度 (Normalized characteristic path length)、标准化聚类系数 (Normalized clustering coefcient)、小世界属性指数 (Small-world index) Sigma 及模块化 (Modularity) 显著增加，而全局效率 (Global efficiency) 显著下降。以上的研究结果表明 DPN 患者全脑的功能整合在减低而区域脑区功能分离现象在增加。
结论：本研究发现 DPN 患者存在脑结构共变网络的拓扑结构异常。脑网络局部和全局属性一致证实 DPN 患者已出现全脑功能整合和功能分离的失衡，为 DPN 的中枢发病机理提供了新的研究视角。

EPO-2034
鼻腔鼻窦横纹肌肉瘤的 MR 诊断（附 8 例报告）

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目的：分析鼻腔鼻窦横纹肌肉瘤的 MR 图像，探讨鼻腔鼻窦横纹肌肉瘤的 MR 影像特征。方法：回顾性分析本院 2011 年 1 月至 2019 年 1 月经病理证实的 8 例鼻腔鼻窦横纹肌肉瘤患者的临床及 MR 影像特征，分析肿瘤发生的年龄及性别差异，以及通过观察肿瘤的位置、边界、MR 信号特点、邻近骨质破坏、淋巴结肿大以及病灶强化特点，回顾性分析鼻腔鼻窦横纹肌肉瘤的特征性 MR 表现。结果：8 例病例中，男性患者 5 例，占 62.5%（5/8）；女性患者 3 例，占 37.5%（3/8）。儿童或青少年 2 例，占 25%（2/8）；成人 6 例，占 75%（6/8），平均年龄 42.25。肿瘤发生于单个鼻窦 4 例（4/8），其中 2 例发生于上颌窦、2 例发生于筛窦；发生于多个鼻窦 4 例（4/8），其中同时累及上颌窦和筛窦 3 例（3/4）。肿瘤边界不清 5 例（5/8）。MR 平扫 8 例，T1WI 呈等信号 6 例（6/8），T2WI 呈高信号 8 例（8/8），信号不均匀 8 例（8/8）；MR 增强扫描 6 例，MR 增强扫描呈

不均匀强化 100%（6/6）。邻近骨质破坏 7 例（7/8）；斜坡骨质信号改变 4 例（4/8）；血管包绕 1 例（1/8）；淋巴肿大 7 例（7/8）；侵犯颅底结构 6 例（6/8）。所有患者均未出现出血及远处转移。结论：鼻腔鼻窦横纹肌肉瘤的 MR 影像表现较不具特征性，诊断该病较为困难。在 8 例鼻腔鼻窦横纹肌肉瘤患者中，男性多于女性，成人多于儿童或青少年，可发生于单个或多个鼻窦，其中最常发生于上颌窦和筛窦，多为 T1WI 等信号、T2WI 高信号，肿瘤呈不均匀强化，大多数病例存在邻近骨质破坏、淋巴结肿大以及颅底侵犯。

EPO-2035

MRI Features of Brain Metastases of Lung Cancer with Different Pathological Types

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Objective: To analyze the MRI features of brain metastases with different pathological types of lung cancer, and to improve the understanding of the imaging manifestations of lung cancer brain metastases.
Methods:115 patients with primary lung cancer confirmed by histology in the Beijing chest hospital from October 2017 to September 2018 were enrolled, there were 63 males and 52 females, aged 39～80 years old, with a median age of 63 years. Clinical manifestations include cough, irritating dry cough, cough, blood in the sputum, chest tightness, fatigue, chest and back pain, discomfort, limb pain, dizziness, headache, black eyes, etc. The primary tumors were confirmed by pathology in all cases. Among them, 64 cases were confirmed by CT-guided biopsy, 28 cases were confirmed by thoracoscopic resection, 16 cases were confirmed by bronchoscopy, and 7 cases were confirmed by thoracotomy. The clinical data and MRI images of the patients were collected, two independent doctors with more than 10 years of work experience observed different MRI sequence images of the enrolled cases. and observe the image features in different MRI sequences. The size, number, degree of peritumoral edema, DWI signal and enhancement mode of brain lesions were analyzed, when the two observers disagreed, the agreement was reached after the discussion as the final data. According to the number of lesions detected in the brain, the lesions were divided into single-lesion group and multiple-lesion group. The maximum diameter d of the lesion in the brain was measured on the axial enhanced scan image, and the maximum diameter d of the lesion was divided into d<1.0cm 1.0≤d<3.0cm and d≥3.0cm three levels, expressed as I, II, III, if multiple lesions, the maximum diameter of the lesions was choosed. Combined with T2 FLAIR and Gd-DTPA enhanced scanning sequence, the peritumoral edema was revealed. Because the metastasis was easily distributed in the junction area of the cerebral cortex, the maximum diameter of the edema was subtracted from the diameter of the corresponding lesion. The maximum diameter r of the edema was divided into r=0; r<1.0cm; 1.0≤r<3.0cm; ≥ 3.0cm four grades. The enhanced form of brain metastases revealed by Gd-DTPA enhanced scan was divided into ring enhancement, nodular enhancement and irregular enhancement; DWI signal was divided into hyperintensity and isointensity/hypointensity. Statistical analysis was performed with IBM SPSS 20.0. According to different data characteristics, the count data was analyzed by χ^2 test

or non-parametric rank sum test. The measurement data were analyzed by t test, P<0.05 was considered statistically significant.
Results: A total of 115 cases were collected in the study. Among them, 2 cases of small cell lung cancer were simple meningeal metastasis in the brain, no brain parenchymal lesions, 1 case of primary lung lesions were adenosquamous carcinoma, and 1 case was sarcomatoid carcinoma, all of which were excluded. The remaining 111 patients were enrolled, 60 males and 51 females, aged 39～80 years, with a median age of 62 years. In this study, 45(40.5%) patients with 45 lesions in the single-lesion group, 66(59.5%) patients with 652 lesions in the multiple-lesion group, a total of 697 lesions were detected. 579 lesions were distributed on the cerebellum, and 118 lesions were located under the cerebellum. There was no significant difference in the number of metastases between the single-lesion group and the multiple-lesion group (χ^2=21.593, p=0.800>0.05). The multiple brain metastasis group was analyzed, and the squamous cell carcinoma group was excluded from the data. In the remaining two groups, there were 54 cases of multiple metastases in the adenocarcinoma group, the number of metastases was 2 to 43 lesions with an average of (7.79±10.51), and the multiple cell metastasis of small cell lung cancer group was 9 cases, the number of metastases detected ranged from 2 to 3 lesions, with an average of (1.57 ± 0.79). The mean number of lesions in the adenocarcinoma group was significantly greater than that in the small cell lung cancer group. The t-test analysis showed that the mean difference in the number of metastases between the two groups was statistically significant. Furthermore, with the number of metastases 12 as the boundary, the multiple components of brain metastasis of lung adenocarcinoma and small cell lung cancer were divided into a minority (2～11) and a majority (12 or more). The percentage of minority group and majority group of adenocarcinoma brain metastasis was (63.2%, 36.8%), and the percentage of brain metastasis of small cell lung cancer was (100%, 0%). The χ^2 test was performed, indicating that the difference between the two groups was statistically significant (χ^2=8.211, p=0.006<0.05), that is equivalent to brain metastasis of small cell lung cancer, brain metastasis of lung adenocarcinoma is more likely to occur 12 or more lesions. There were 42(37.8%) cases in grade I, the maximum diameter ranged from 0.3cm to 0.9cm, and the mean was (0.64±0.18) cm, including 27 cases in adenocarcinoma, 6 cases in squamous cell carcinoma, and 9 cases in small cell lung cancer. There were 60(37.8%) cases in grade II, the maximum diameter range was 1.0cm to 2.9cm, and the average value was (2.0±0.48) cm, including 51 cases in adenocarcinoma group and 9 cases in small cell lung cancer group. There were 9(8.1%) cases in grade III, the maximum diameter ranged from 3.1cm to 5.9 cm, and the mean was (4.23±0.81) cm, including 6 cases in adenocarcinoma group and 3 cases in small cell lung cancer group. Statistical analysis of the difference between the size of metastatic tumors was not statistically significant(χ^2=7.690, p=0.104>0.05).There were 48(43.2%) cases of brain metastases without peritumoral edema, including 42 cases of adenocarcinoma group and 6 cases of small cell lung cancer group, and 43(38.7%) cases of mild peritumoral edema, including 27 cases of adenocarcinoma group, 1 case of squamous cell carcinoma group and 15 cases of small cell lung cancer group. There were 7(6.3%) cases with moderate peritumoral edema, including 3 cases in adenocarcinoma group and 4 cases in squamous cell carcinoma group. There were 13(11.7%) cases with severe peritumoral edema, including 12 cases in adenocarcinoma group and 1 case in squamous cell carcinoma group. Intergroup analysis showed statistically significant differences in peritumoral edema (χ^2= 34.437, p = 0.000<0.05). Further grouped into

no edema and peritumoral edema, with no significant difference between the groups (χ^2=1.306, p=0.309>0.05). There were 55(49.5%) cases of DWI hyperintensity, a total of 98 lesions were detected, including 36 cases of adenocarcinoma group with 68 lesions, 19 cases of small cell lung cancer group with 30 lesions. There were 56(50.5%) cases with 599 lesions of isointensity/hypointensity, including 48 cases in adenocarcinoma group, 6 cases in squamous cell carcinoma group and 2 cases in small cell lung cancer group. There were 19(90.5%) cases of hyperintensity in DWI and 36(32.5%) cases of isointensity/hypointensity in DWI, after combination of adenocarcinoma and squamous cell carcinoma into non-small cell group. Then χ^2 test was performed between the two groups, indicating that the difference was statistically significant (χ^2=16.267, p=0.006<0.05). In the enhanced form, there were 46 cases of ring enhancement with 143(20.5%) lesions, 36 cases of adenocarcinoma group with 125 lesions, 4 cases of squamous cell carcinoma group with 8 lesions, 6 cases of small cell lung cancer group with 10 lesions. There were 53 cases of nodular enhancement with 332(46.3%) lesions, 45 cases of adenocarcinoma group with 323 lesions, 2 cases of squamous cell carcinoma group with 2 lesions, 6 cases of small cell lung cancer group with 7 lesions. Irregular enhancement of 57 cases with a total of 222(31.9%) lesions, 48 cases of adenocarcinoma group with 202 lesions, 9 cases of small cell lung cancer group with 20 lesions, and there were no statistically significant differences between the three enhanced forms(χ^2=21.209, p=0.171>0.05).
Conclusions: The number of brain metastases and hyperintensity of DWI have a certain correlation with the pathological type of lung cancer. There was no significant correlation between the size, the degree of peritumoral edema and the enhanced form and the pathological type of lung cancer.

EPO-2036

Brain structural alteration patterns in COPD with different levels of pulmonary function impairments and their associations with cognition deficits

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Background: To explore patterns of brain structural alteration in chronic obstructive pulmonary disease (COPD) patients with different levels of lung function impairment and the associations of those patterns with cognitive functional deficits using voxel-based morphometry (VBM) and tract-based spatial statistics (TBSS) analyses based on high-resolution structural MRI and diffusion tensor imaging (DTI).
Methods: A total of 115 right-handed participants (26 severe, 29 moderate, and 29 mild COPD patients and a comparison group of 31 individuals without COPD) completed tests of cognitive (Montreal Cognitive Assessment [MoCA]) and pulmonary function (forced expiratory volume in 1 s [FEV1]) and underwent MRI scanning. VBM and TBSS analyses were used to identifychanges in grey matter density (GMD) and white matter (WM) integrity in COPD patients. In addition, correlation analyses between these imaging parameter changes and cognitive and pulmonary functional impairments were performed.

Results: There was no significant difference in brain structure between the comparison groups andthe mild COPD patients. Patients with moderate COPD hadatrophy of the left middle frontal gyrus and right opercular part/triangular part of the inferior frontal gyrus, and WM changes were present mainly in the superior and posterior corona radiata, corpus callosum and cingulum. Patients with severe COPD exhibited the mostextensive changes in GMD and WM. Some grey matter (GM) and WM changes were correlated with MoCA scores and FEV1.
Conclusions: These findings suggest that patients with COPD exhibit progressive structural impairments in both the GM and WM, along with impairedlevels of lung function, highlighting the importance of early clinical interventions.

EPO-2037

Advanced MRI features of IDH1 mutation epithelioid glioblastoma coexistence with low-grade diffuse astrocytoma: a case report and literature review

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Background:
Epithelioid glioblastoma(E-GBM) as a newly revised subtype of glioblastoma in 2016 which is much less frequently found in other types of glioblastomas.A low-grade gliomas has been identified as preexisting or coexisting with an epithelioid glioblastoma in several cases,but the radiological imaging features,especially the advanced MRI manifestations of epithelioid glioblastoma with low-grade diffuse astrocytoma haven't been reported.
CASE DESCRIPTION:
We present a case of a 46-year-old female patient with an E-GBM with IDH1 mutation in her bilateral frontal lobe and corpus callosum. Advanced MRI showed the following tumor characteristics: increased perfusion on perfusion imaging;Solid part hyperintense on diffusion-weighted imaging, the white matter fiber tracts in the fractional anisotropy color map had shifted and partially damaged compared to the adjacent brain tissue, Choline showed markedly elevation, and N-acetylaspartate peak showed slightly reduction on magneticresonance spectroscopy. Postoperative pathological examination confirmed that the tumor composed of E-GBM and diffuse astrocytoma-like components, and dehydrogenase 1 (IDH1) mutation was detected in both.
Conclusion:
The conventional as well as advanced MRI manifestations of this rare tumor with two coexisting components have rarely been reported previously. In addition, Only one secondary epithelioid glioblastoma manifesting positive IDH1 immunoreactivity is known at present, this is the first case demonstrating IDH1 mutation in between primary epithelioid glioblastoma and colocalized low-grade astrocytoma.

EPO-2038

未治疗抑郁症患者岛叶—皮层静息态功能连接研究

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目的 探讨未治疗抑郁症（major depressive disorder, MDD）患者静息态岛叶功能连接特征。**方法** 选取 50 例未服药的抑郁症患者（患者组）和 51 例健康对照（对照组）进行静息态功能磁共振（resting-state functional magnetic resonance imaging, rs-fMRI）扫描，对 rs-fMRI 数据进行常规预处理并基于岛叶分区为双侧岛叶前部、双侧岛叶中部、双侧岛叶后部 6 个种子点进行全脑功能连接分析，采用双样本 t 检验比较两组间脑功能连接值的差异，经过不依赖阈值集群增强（Threshold-Free Cluster Enhancement, TFCE）的多重比较校正，并将差异有统计学意义脑区的 FC 值与 24 项汉密尔顿抑郁量表（Hamilton Depression Scale, HAMD-24）评分等临床变量进行相关分析。**结果** 双样本 t 检验分析，与对照组相比，患者组左侧岛叶前部与双侧前扣带回之间功能连接减低（$p < 0.05$，TFCE 校正），左侧岛叶前部与左侧额中回、双侧后扣带回/楔前叶之间功能连接增强（均 $p < 0.05$，TFCE 校正）。左侧岛叶前部与双侧前扣带回（$r = -0.125$，$p = 0.387$）、左侧额中回（$r = 0.149$，$p = 0.302$）、双侧后扣带回/楔前叶（$r = -0.207$，$p = 0.148$）的功能连接值与 HMAD-24 评分无相关性。**结论** 抑郁症患者左侧岛叶前部与边缘系统、额叶皮层功能连接异常。

EPO-2039

Multi-modal MRI reveals the neurovascular coupling dysfunction in chronic migraine

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Purpose
Previous studies reported that long-term nociceptive stimulation could result in neurovascular coupling (NVC) dysfunction in brain, but these studies were based mainly on unimodal imaging biomarkers, thus could not comprehensively reflect NVC dysfunction.
Materials and Methods
We investigated the potential NVC dysfunction in chronic migraine by exploring the relationship between neuronal activity map derived from blood oxygen level dependent (BOLD) signal and cerebral perfusion maps. The Pearson correlation coefficients between these 2 maps were defined as the NVC biomarkers.
Results
NVC biomarkers in migraineurs were significantly lower in left inferior parietal gyrus (IPG), left superior marginal gyrus (SMG) and left angular gyrus (AG), but significantly higher in right superior occipital gyrus (SOG), right superior parietal gyrus (SPG), and precuneus. These brain regions were located mainly in parietal or occipital lobes. Visual language related gyri as well as sensory system and pain transmitting network related gyri were involved in neurovascular coupling dysfunction. ALFF-CBF in right SPG was positively correlated with disease history and that in right precuneus was negatively correlated with migraine persisting time. fALFF-CBF in left SMG was negatively related to headache frequency and positively related to health

condition. fALFF-CBF in left AG was negatively related to headache frequency and positively related to disease history and health condition.

Conclusion

Multi-modal MRI could be used to detect NVC dysfunction in patients with chronic migraine, which benefits to assess the impact of chronic pain to the brain.

EPO-2040

AD 患者脑核团的磁敏感值与认知功能相关性的研究

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背景：阿尔茨海默病（Alzheimer’s disease，AD）患者一个重要的病理特点是深部灰质核团过多的铁沉积。定量磁敏感图（quantitative susceptibility mapping，QSM）比其他影像学为基础的铁测量方法更具特异性，并且能够非侵入性的评估组织的磁敏感值，而组织的磁敏感值与铁含量具有很好的相关性。

目的：探索轻中度阿尔茨海默病人深部灰质核团的磁敏感值与认知功能是否具有相关性。

方法：轻中度 AD 患者 30 名以及性别及年龄相匹配的健康对照者 30 名，使用美国 GE 3.0T 磁共振扫描仪进行 QSM 扫描，并通过 GE4.6 工作站进行后处理，勾画出 7 个感兴趣区，即尾状核、壳核、苍白球、丘脑、红核、黑质、齿状核，并测量其磁敏感值。认知功能采用简易精神状态量表（mini-mental state examination，MMSE）和蒙特利尔认知量表（montrealcognitive assessment，MoCA）进行评估。通过相关性分析探索各 ROI 的磁敏感值与认知功能的相关性。

结果：控制性别和年龄因素的影响，左侧尾状核增高的磁敏感值与降低的 MMSE 和 MoCA 量表分数呈显著负相关（P<0.05）。控制性别因素后，对照组中双侧壳核、双侧齿状核、右侧尾状核的磁敏感值与年龄之间呈线性相关，而 AD 组中双侧壳核、双侧齿状核、右侧丘脑、右侧红核的磁敏感值与年龄呈线性相关。左右侧大脑磁敏感值的比较结果提示，在 AD 组和对照组中尾状核、红核、黑质、齿状核的右侧磁敏感值明显高于左侧。男性和女性之间各个核团的磁敏感值均无显著性差异（P>0.05）。AD 组与对照组磁敏感值比较的结果显示，AD 组患者的双侧尾状核、壳核的磁敏感值明显高于对照组，而双侧红核的磁敏感值明显低于对照组（P< 0.05）。

结论：由 QSM 测定的左侧尾状核的磁敏感值有望成为一种新的评估轻中度 AD 患者疾病严重程度的生物标志。

EPO-2041

3D-TOF 与 3D-FIESTA-C 序列融合技术在面神经血管减压术前的应用优势

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目的 探讨 3.0TMR 三维时间飞跃(3D-TOF)序列与三维稳态采集快速成像(3D-FIESTA-c)序列融合技术在面神经微血管减压术前评估中的应用。**方法** 回顾性分析 47 例经微血管减压术治疗的原发性面肌痉挛患者，手术前均行 3D-TOF 序列、3D-FIESTA-c 序列检查。由两位经验丰富的主治以上医师采用双盲法分别对 3D-TOF 结合 3D-FIESTA-c 序列多平面重组图像(A 组)及融合图像(B 组)显示脑池段神经血管关系的情况进行评判，以手术探查结果为金标准，采用 χ^2 检验比较 A、B 组图像血管压迫的阳性率、责任血管术前诊断符合率，P＜0.05 有统计学意义。**结果** 47 例受检者术中均见血

管压迫，发现责任血管 61 根，A 组诊断神经血管关系的阳性率、责任血管术前诊断符合率分别是 91.5%(43/47)、63.9%(39/61)，B 组诊断神经血管关系的阳性率、责任血管术前诊断符合率分别是 97.9%(46/47)、91.8%(56/61)，均高于 A 组，差异有统计学意义(P＜0.05) 。**结论** 3D-TOF 序列与 3D-FIESTA-c 序列融合图像能清晰显示面神经与周围血管的空间结构关系，在面神经微血管减压术前评估中具有一定优势。

EPO-2042

Changes in white-matter functional network efficiency across the adult lifespan

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Previous studies have used resting-state functional MRI (rs-fMRI) and graph-theory approaches to investigate the lifespan trajectory of the topological organization of the gray-matter functional networks. Recent evidences have suggested that rs-fMRI data can also be used to estimate white-matter function, challenging the conventional practice of taking white-matter signals as noise or artifacts. Here, we examined the correlation between age and white-matter functional network efficiency by applying graph-theory to a large sample of rs-fMRI data of 435 participants. We found that age was correlated negatively with both global and local efficiency of the white-matter functional networks. These findings suggest decreasing white-matter functional network efficiency during the aging process, which provides a complement to conventional gray-matter functional network studies.

EPO-2043

Altered structural－functional connectome in Unilateral Sudden Sensorineural Hearing Loss

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Purpose
To investigate the alterations of brain structural and functional connectome in two large samples of unilateral sudden sensorineural hearing loss (USSHL) patients within the acute period.
Methods
We constructed functional and structural connectome for USSHL patients (41 for left side and 44 for right side) and 85 healthy controls. Graph theoretical analysis was employed to evaluate the network properties of functional and structural brain connectome. Moreover, for each subject, we quantified coupling between functional and structural connectome by the correlation between functional and structural connectome edges within non-zeros structural connectivity areas. The coupling of functional-

structural brain connectome between USSHL patients and healthy controls was compared by using permutation tests. To investigate the clinical relevance of altered brain network topologies in USSHL, pearson's correlation analysis was performed between the clinical variables and the topological properties or the strength of functional-structural connectome coupling.

Results

Compared with the control groups, both groups of USSHL patients exhibited a significantly increased clustering coefficient, global efficiency, and local efficiency but a significantly decreased characteristic path length in functional brain connectome, while a significantly decrease clustering coefficient and local efficiency in structural brain connectome. In addition, the primary increased nodal strength was observed in limbic and paralimbic systems primarily as well as in the auditory network brain areas. More importantly, the coupling strength of structural-functional connectome was decreased, and exhibited a negative correlation with some USSHL clinical variables in patients.

Discussion and Conclusion

Detectable alteration of network organization already occurred in USSHL patients within the acute period at the global and regional level. The functional connectome is characterized by a shift toward small-worldization while the structural connectome is toward randomization, which may indicate a plastic reorganization procedure of the brain to compensate for the loss hearing in USSHL. Moreover, the degree of coupling between structural and functional connectome was decreased, which may reflect the pathophysiological mechanisms of USSHL.

EPO-2044

多次静脉注射线性钆对比剂后人脑齿状核、苍白球 T1 加权信号变化的研究

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目的 研究多次静脉注射线性钆对比剂后，齿状核、苍白球在 MRI 颅脑平扫 T1 加权图像上的信号强度变化情况。

方法 回顾分析 2011 年 1 月至 2018 年 12 月期间在徐州医科大学附属医院行磁共振增强检查（连续进行至少 4 次）的 127 例患者的临床及影像学资料。在多次增强前后的首、末次颅脑平扫 T1 加权上分别测量齿状核、脑桥、苍白球、丘脑及脑脊液的平均信号强度，计算齿状核/脑桥、齿状核/脑脊液、苍白球/丘脑及苍白球/脑脊液的信号强度比值，采用配对样本 t 检验分析每一位患者首、末次平扫 T1 加权上信号强度比之间是否存在统计学差异；采用线性回归分析方法，分析多种临床因素与首、末次颅脑平扫 T1 加权上信号强度变化之间的相关性。

结果 多次静脉注射线性钆对比剂后末次颅脑平扫 T1 加权齿状核/脑桥、齿状核/脑脊液、苍白球/丘脑及苍白球/脑脊液的信号强度比均大于增强前首次平扫 T1 加权信号强度比，差异有统计学意义[首、末次颅脑平扫 T1 加权信号比分别为 0.986±0.055、1.054±0.053；3.781±0.613、5.360±0.974；1.045±0.047、1.181±0.059；4.301±0.854、6.451±1.561；P 值均<0.001]。各信号强度比差值与 MRI 增强次数存在正相关（齿状核/脑桥 b=0.009，P<0.001；齿状核/脑脊液 b=0.090，P=0.015；苍白球/丘脑 b=0.008，P<0.003；苍白球/脑脊液 b=0.147，P=0.009）；与年

龄、性别、是否进行放化疗、肝功能是否正常及多次检查之间时间间隔长短无关（*P*值均＞0.05）。

结论 多次接受线性钆对比剂注射的患者，T1 加权齿状核、苍白球信号增高，且与 MRI 增强检查次数呈正相关，与患者的年龄、性别、是否进行放化疗、肝功能是否正常及多次检查时间间隔长短无明显相关。

EPO-2045

磁共振多序列三维成像在显示下牙槽神经中的应用

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目的：磁共振成像的三维薄层扫描可以清晰显示下牙槽神经及其解剖结构与周围组织结构的关系，研究磁共振 3D-mprage 序列与 3D-TSE 序列在下牙槽神经成像的应用，对临床治疗有较大的指导价值。

方法：收集我院 20 例智齿拔除志愿患者进行颌面部磁共振成像检查，所有患者均知情同意。使用西门子 3.0T Verio 高场强超导 MRI 扫描仪，头颈部线圈，患者采用仰卧位、头先进方式，先进行常规颌面部检查序列，以下颌骨为中心扫描。常规平扫后进行 3D-mprage 序列（层厚：1.0mm，TR：2410ms，TE：4.2ms，TI：1400ms，翻转角度：10°，采集矩阵：512*512，FOV：256*256）和 3D-TSE 序列（层厚：0.9mm，TR：3800ms，TE：194ms，TI：160ms，采集矩阵 436*512，FOV：198*220）扫描，检查结束后对两序列进行多曲面重建处理，得到下牙槽神经长轴面的完整显示。由我科两名高年资医生及口腔科主任医师分析评价后处理图像，评价下牙槽神经形态结构、走行、组织关系及其连续性，并得出两种序列在显示下牙槽神经各自的意义。

结果：根据实验后处理图像所得，在 20 例智齿拔除患者中，8 例患者下牙槽神经有损伤或轻度损伤，3D-mprage 序列能够清晰地显示下牙槽神经，且较明显地显示了损伤部位，3D-TSE 序列显示下牙槽神经不如 3D-mprage 序列清晰，但 3D-TSE 序列在神经与周围组织之间的关系有较好的显示。

结论：本实验研究结果表明，磁共振多序列三维成像在显示下牙槽神经中的应用，结合两种磁共振三维薄层成像序列，可以清楚地显示下牙槽神经的形态、连续性、走行及其与周围组织关系，对下牙槽神经损伤的诊断和治疗具有重要的临床意义。

EPO-2046

Grey Matter Atrophy in Relapsing and Progressive Multiple Sclerosis Associated with Neurologic Disability and Cognitive Impairment: A Largescale MRI study

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Objective: To identify the consistent findings from whole‐brain voxel‐based morphometry (VBM) studies in grey matter volume (GMV) of patients with relapsing remitting multiple sclerosis (RRMS) and primary progressive multiple sclerosis (PPMS). Methods: A systematic search was conducted based on PRISMA guidelines using the anisotropic effect-size-based algorithms (ASE-SDM). We conducted a meta-analysis of

voxel-based morphometry (VBM) studies of patients with subtypes of MS to quantitatively estimate regional GM changes.
Results: Twenty-six studies with 32 datasets comprising 1067 patients with MS and 776 healthy controls (HCs) were included. Our results revealed that compared with HCs, GMV reductions were found in the left insula, right superior temporal gyrus (STG), right median cingulate/paracingulate gyri (MCPG), right anterior thalamic nucleus (ATN) and bilateral postcentral gyri in patients with RRMS, and in the bilateral lenticular nucleus, putamen (LNP), left ATN, left anterior cingulate/paracingulate gyri (ACPG) and right precentral gyrus (PCG) in patients with PPMS. Meta-regression revealed that the expanded disability status scale (EDSS) score and smooth kernel level in patients with MS were negatively correlated with specific deep GM (dGM) regions.
Conclusions: The cingulate and thalamus may be the pivotal biomarker of neurodegeneration in both RRMS and PPMS. dGM atrophy abnormalities in PPMS patients may represent structural brain underpinnings of social cognitive disability in MS. The association between cognitive impairment and GMV reduction should be addressed in future studies.

EPO-2047

高分辨 DTI 在颈段脊髓应用

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目的:比较 reslove-DTI 与 zoomit-DTI 的序列成像，探讨高分辨 DTI 在颈段脊髓中的应用价值。
材料和方法：2019 年 1 月至 3 月招募 18 名志愿者，年龄 20-23 岁（平均年龄 21.56±1.04 岁），其中 8 名男性，10 名女性。所有志愿者均排除颈椎病史，均行 reslove-DTI 和 zoomit-DTI 扫描，对图像质量进行评估，且针对各个椎间盘水平进行 FA 和 ADC 测值比较。
结果：zoomit-DTI 对颈段脊髓成像质量明显优于 reslove-DTI。且随着椎间盘水平的降低，FA 值逐渐降低 ADC 值升高，FA 值在 C2/3 与 C4/5、C5/6、C6/7 之间存在统计学差异（p＜0.05），FA 值在 C4/5 与 C5/6 之间存在统计学差异（p＜0.05）。ADC 值在各个椎间盘水平不存在统计学差异。
结论：zoomit-DTI 相较于 reslove-DTI 对颈段脊髓成像具有更大的优势，且随着椎间盘水平的降低，FA 值逐渐降低 ADC 值升高。

EPO-2048

比较高 b 值 DWI 和标准 b 值 DWI 在胶质瘤术前评估中获得的表观弥散系数

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目的：评估从高 b 值 DWI 获得的 ADC 在术前评估分级，Ki-67 指数和胶质瘤结果方面是否更有价值。
方法：招募了 85 名患有神经胶质瘤的患者，他们接受了 3T 磁共振术前高 b 值 DWI 检查。

并获得 ADC_{1000}，ADC_{2000} and ADC_{3000}图像，进行接受者操作特征分析，为了鉴别低级别胶质瘤（LGG）和高级别胶质瘤（HGG）确定曲线下面积（AUC）。计算相关系数（R 值），以研究 Ki-67 参数之间的相关性。通过使用 Coox 回归进行生存分析。

结果：在区分 HGG 和 LGG 时，平均 ADC_{1000}值（0.760）的 AUC 低于平均 ADC_{2000}值（0.840）和平均 ADC_{3000}值（0.810）。平均 ADC_{1000}值（-0.499）的 R 值小于平均 ADC_{2000}值（-0.530）和平均 ADC_{3000}值（-0.567）。平均 ADC_{3000}值是胶质瘤的独立预后因素（p = 0.075），而平均 ADC_{1000}和 ADC_{2000}值不是。

结论：从高 b 值 DWI 获得的 ADC 值可能是胶质瘤术前评估中较好的成像生物标志物。

EPO-2049
脑胶质瘤多序列 MRI 影像学表现及其鉴别诊断价值探讨

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目的 旨在探讨脑胶质瘤多序列 MRI 影像学表现及其鉴别诊断价值。**方法** 选取我院 2016 年 1 月~2018 年 3 月收治的经病理证实的脑胶质瘤患者 65 例，患者均进行了 MRI 检查，扫描序列包括常规横断位、矢状位及冠状位 T1WI、T2WI、液体衰减反转恢复（fluid attenuated inversion recovery，FLAIR）、扩散加权成像（diffusion weighted imaging，DWI），总结不同病理类型脑胶质瘤患者 MRI 扫描各序列图像表现，以病理学检查结果为对照，计算 MRI 检查对不同类型脑胶质瘤的诊断符合率。**结果** MRI 检查对星形细胞瘤、少枝胶质瘤、室管膜瘤、髓母细胞瘤诊断符合率分别为 97.61%、100.00%、83.33%、83.33%， MRI 检查对脑胶质瘤诊断总符合率为 95.38%（62/65）；星形细胞瘤主要为水瘤型、囊型、混合型，水瘤型、囊型边缘模糊，未出现明显强化，混合型瘤体主要表现为混合密度，出现环形或结节状强化，低级星形细胞瘤 T1WI 为低信号，T2WI、FLAIR 呈现高信号，DWI 缺乏限制性弥散。少枝胶质瘤患者中，多边界较模糊、水肿程度严重，强化不均匀；室管膜瘤 MRI T1WI 序列呈现稍低信号，T2WI 序列为等信号，中度不均匀强化。髓母细胞瘤 MRI T1WI 序列呈现低信号，T2WI 序列为等或稍高信号，外观呈现类圆形，病灶常可见水肿带。**结论** MRI 多序列扫描中均可有效显示不同脑胶质瘤的影像学图像特征，鉴别诊断符合率高。

EPO-2050
脑小血管病影像表现与血管性认知功能障碍相关性研究

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摸要:目的探讨脑小血管病(cvs)影像字表现与血管性认知功能碍之间的关系及 CsvD 相关危险因素。方法将 60 例经脑 M 阳证实的 CvsD 患者按具体病俩分为单纯腔隙性脑梗死(LD)组、L|+脑白质疏松(WM)组、L|+脑微出血(CMB)组、LWML+CMB 组收集所有研究对象一资料进行家特尔认知评估量表(MoCA)、简易精神状态量
表(MMsE 评分,并与脑 MR 阴性的正常者(对照组)进行对照比较。结果各 CVSD 组 MMSE 评分和 MoCA 评分均明显低于对照组(P4005)纯 L 组、L+WML 组、L+CMB 组间 MMsE 评分和 MoCA 评分比较差异均无统计字悬义(p 均 005),但 3 组均明旦离于 L+wML+CMB 组(p 均<0.05)。 Pearson 相关分析显示各组 MMSE 评分与 MoCA 评分呈正相关(r=0.B77.P=0.000CvsD 各组均以轻度认知功能损害为著其中 L 组、

L+WML 组、LH+cMB 组轻度认知功能损害发生率比较差异无统计字意义(P>005),但 3 组均明显低于 L+ WML.CMB 组(pP 均<0.05)CSVD 各组时间定向注意计算、语言理解及图像描述评分均明显低于对照组(P 均<0.05),LCMB 组、L+ WML.CMB 组短程记忆评分和 L+ML、LwML+CMB 语言表达评分均明显低于对照组(P 均<0.05)。Log 回归模型多因素分析显示高血

压(P=0.009.OR=31.087)、糖尿病(P=0049.OR=16.849)与 CSVD 密切相关。结论腔性脑梗死、脑白质疏松德出血均可导致认知功能障碍,三者并存时最为明显,且以轻度认知功能碍为主,其认知功能损害以时间定向、注

意计算、短程记忆、语言理解、言语表达及图像描述为主。高血压、糖尿病均与可导致血管性痴呆的 cSvD 密切相

EPO-2051
磁共振 NODDI 对帕金森患者黑质病变的临床应用

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摘要：目的 探讨磁共振神经突方向离散度与密度成像（NODDI）对帕金森病患者的临床应用价值。**方法** 收集我院 41 名帕金森病（PD）患者和 22 名年龄和性别匹配的正常志愿者作为对照组进行磁共振平扫和 NODDI 成像，量化分析 PD 患者黑质致密部（SNpc）的变化，在组间比较黑质致密部（SNpc）的细胞内体积分数（Vic），方向分散指数（OD）和各向同性体积分数（Viso）。多变量逻辑回归分析确定 PD 的独立预测因子。**结果** PD 患者 SNpc 中的 Vic、OD 明显低于健康对照组（P <0.05）多变量逻辑回归分析显示，回归模型具有统计学意义，F（6,62)=8.286(P＜0.01)，调整 R^2=0.414。帕金森病患者 SNpc 中的 Vic 值的变化与 PD 的相关性具有统计学意义（P <0.05），SNpc 中的 Vic 值是 PD 的独立预测因子。在 ROC 分析中，患者对侧 SNpc 中的 Vic 显示出最佳的诊断性能。**结论** NODDI 可以反映 PD 患者大脑微观结构的变化，其参数值可以作为 PD 患者的评估指标。

EPO-2052
ADC 直方图在中枢神经系统淋巴瘤鉴别诊断中的价值

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目的:研究 ADC 全域灰度直方图在鉴别原发性中枢神经系统淋巴瘤（Primary central nervous system lymphoma，PCNSL）与多形性胶质母细胞瘤（Glioblastoma multiform，GBM ）和单发脑转移瘤（Solitary brain metastasis，SMT)的诊断价值。**方法：**回顾性分析在我院做过脑部 MRI 检查并经病理证实的 95 例患者，其中中枢神经系统淋巴瘤 38 例（男 19 例、女 21 例，平均年龄 57.1 ± 12.5，范围 33～81 岁），胶质母细胞瘤 29 例（男 13 例、女 17 例，平均年龄 51.2 ± 14.5，范围 10～69 岁），单发转移瘤 28 例（男 15 例、女 13 例，平均年龄 59.8，范围 36～76 岁）。分别在三组 MR ADC 轴位图像上用 Mazda 软件将肿瘤的每一个层面勾画感兴趣区并进行灰度全域直方图分析，并分别对这三组直方图参数特征进行统计学分析，比较各参数的统计学意义。**结果：**经灰度直方图中分析得到的 9 个参数，即均值（Mean）、变异度（Variance）、峰度（Kurtosis）、偏度（Skewness）、第一百分位数（Perc.01%）、第 10 百分位数（Perc.10%）、

第 50 百分位数（Perc.50%）、第 90 百分位数（Perc.90%）及第 99 百分位数（Perc.99%）这 9 个参数差异有统计学意义（P 均<0.05）。**结论：**直方图分析有助于中枢神经系统淋巴瘤与胶质母细胞瘤和单发转移瘤的鉴别，均数、偏度及 Perc.50%具有较高诊断效能。

EPO-2053
3D CISS 序列在评估原发性三叉神经痛三叉神形态学中的价值

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目的 探究 3.0T MRI 三维稳态构成干扰（3D CISS）序列在原发性三叉神经痛（PTN）三叉神经形态学改变中的应用价值。**方法** 回顾性分析本院 36 例 PTN 患者的影像及临床资料，运用 3D CISS 序列及 MPR 技术，测量两侧三叉神经脑池段最大长度及面积、三叉神经-桥脑夹角及桥小脑角池截面，对其结果进行比较。**结果** 三叉神经脑池段最大长度分别为（9.87±2.71）mm（症状侧）及（9.96±2.20）mm（非症状侧），二者比较差异无统计学意义（P＞0.05）；三叉神经脑池段最大截面分别为（27.28±8.59）mm^2（症状侧）及（34.11±11.66）mm^2（非症状侧），二者比较差异有统计学意义（P＜0.05）；三叉神经-脑桥夹角分别为（41.80±8.02）°（症状侧）及（47.75±11.01）°（非症状侧），二者比较差异有统计学意义（P＜0.05）；三叉神经桥小脑角池截面分别为（204.42±8.20）mm^2（症状侧）及（229.19±58.47）mm^2（非症状侧），二者比较差异有统计学意义（P＜0.05）。**结论** 3D CISS 序列在评估 PTN 三叉神经脑池段形态学改变中，能给其定性及定量诊断；其中，三叉神经脑池段最大截面偏小、三叉神经-脑桥夹角锐利以及桥小脑角池截面狭窄时更易造成三叉神经痛的发生。

EPO-2054
Abnormal intrinsic brain amplitude of low-frequency fluctuations in patients with tremor-dominant Parkinson’s disease

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Purpose: Parkinson’s disease (PD) is one of the most common neurodegenerative disorders in the elderly and 70% patients manifest resting tremor. [1] Resting-state fMRI shows the high test-retest reliability for depicting local brain activity, especially the amplitude of low-frequency fluctuation (ALFF). This study aimed to determine alterations in intrinsic brain activity in patients with tremor-dominant PD using ALFF method.

Methods and materials: The study was approved by the local ethics committee. The written informed consent was obtained for all subjects. *Subjects:* 31 tremor-dominant PD patients (59.7±7.8 years, 20 female, righthanded) and 28 healthy controls (HCs,

57.4±5.2 years) closely matched in age, sex, and education were enrolled in the study. Participants were assessed with Mini-mental state examination (MMSE), Hoehn and Yahr disability scale, and the unified Parkinson's disease rating scale motor part (UPDRS-III). FMRI was performed on a multimodal 3.0 T MRI Scanner (GE Healthcare, Discovery 750w, Piscataway, NJ, USA) using rsfMRI (TR/TE=2000/25 ms, thickness=3.0mm, gap=1.2mm, acquisition matrix=64×64, flip angle=90°, field of view=240×240 mm^2, voxel size=3.6×3.6×3.6 mm^3, 35 axial). Data were analyzed using SPM12 (www.fil.ion.ucl.ac.uk/spm) and REST (www.restfmri.net). The ALFF method was applied to compare different intrinsic brain activities between the PD group and the HC group. (voxel-level $P < 0.01$, cluster-level $P < 0.05$) The relationship between the mean ALFF signal values of different brain regions and UPDRS-III of PD group was analyzed by Pearson correlation.

Results: Compared with HCs, PD group had significantly lower ALFF values in the left putamen and left precentral gyrus/middle frontal gyrus (BA 6,9). Moreover, the ALFF values of the left putamen showed negative relationship with the UPDRS-III ($r = -0.570$, $P = 0.021$) in PD.

Conclusions: Decreased ALFF of the left putamen is in accordance to reduced dopamine uptake among PD patients, which is the most consistent finding, indicating the striatal dysfunction. [2] The ALFF changes in the left precentral gyrus could be attributed either to the motor dysfunction, or to the right-handedness.[3] The modulation of the motor regions together with basal ganglia contributes to enhancing movement and improving the daily life activities of PD patients.

EPO-2055
磁共振 ADC 值在鼻咽癌颅底侵犯放射治疗前的应用价值

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目的：探讨磁共振 ADC 值在鼻咽癌颅底侵犯放射治疗前的应用价值
方法：选择 2018 年 5 月起所有颅底侵犯的鼻咽癌病历材料，通过查阅患者的影像检查以及相关实验室检查资料，结合电话随访，其中有一半的患者资料显示转移或复发，定为复发组，同时选择在随访过程中各类检查一直正常的另一半病例为对照组。所有颅底侵犯的病例必须经过穿刺活检，病理诊断为鼻咽癌的初诊患者。在治疗前均要接受 CT 增强扫描、颈和鼻咽 MR 平扫和增强扫描、鼻咽镜检查及相关病理检查以明确分期及排除远处转移。对两组病例在弥散加权成像上测量其治疗前颅底表观弥散系数（ADC）值，采用 SPSS13.0 统计软件对两组进行 t 检验，研究 ADC 值在鼻咽癌颅底病变复发和转移中的临床价值。
结果：T3T4 分期与 ADC 值大小的关系，复发组 T3 期和对照组 T3 期的患者颅底受侵犯病灶 ADC 值分别为（0.816±0.024）和（0.851±0.039），两者间无统计学意义（P>0.05，t＝0.906）；复发组 T4 期和对照组 T4 期的患者颅底受侵犯病灶 ADC 值分别为（0.797±0.033）和（0.829±0.036），两者间无统计学意义（P 大于 0.05，t＝1.25）。复发组与对照组患者颅底病灶 ADC 值分别为（0.804±0.031）以及（0.813±0.035），t＝1.60，P＝0.112，两组间无明显统计学差异。并且两组间 T3T4 颅底病灶 ADC 均值的 P>0.05，两组间无意义。
结论：放疗前鼻咽癌颅底侵犯部位的 ADC 值结合常规序列和 DWI 序列可以更准确地诊断鼻咽癌颅底的侵犯情况；但其治疗前 ADC 值的高低与鼻咽癌颅底的复发或转移并无联系，与鼻咽癌的 T 分期无关联，我们不能从放疗前颅底部位的 ADC 值来判断患者的预后情况。我们也许可以这样理解，有颅

底侵犯的鼻咽癌患者，和他的 T 分期无关，只有经过科学的计划和精确的照射后，才能得到最好的结果。

EPO-2056
机器学习方法分类原发性帕金森病冻结步态的价值

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目的：研究通过采用静息态功能磁共振（Rs-fMRI）和机器学习方法，建立分类帕金森病（PD）冻结步态（FOG）和健康对照组（HC）的个体诊断模型，并进一步推测该病的相关病理机制。
材料和方法：采集 55 名 PD 病人和 26 名 HC（平均 60.19±3.71 岁）的多模态 MR 数据（包括 Rs-fMRI 序列、高分辨 T1WI 结构像及常规 MR 序列），PD 患者根据“步态与跌倒问卷”、“冻结步态问卷”及经神经科医生评价后诊断为冻结步态（FOG+）组 25 例（平均 68.52±8.57 岁）与无冻结步态（FOG-）组 30 例（平均 60.00±10.32 岁）。采用基于 MATLAB 2013b 的 DPABI V3.0 软件进行影像数据的预处理和基于自动解剖标记模板构建全脑大尺度功能连接网络，并将其作为分类特征。然后，采用基于 MATLAB 2013b 的 LIBSVM 软件包运用 F 分值法进行特征降序排列并使用径向核函数（RBF）构造的支持向量机（SVM）模型进行分类，使用留一法交叉验证来评估该模型的性能。
结果：当取 F 分值最高的前 7 个特征时，对 FOG+、FOG-和 HC 受试者的正确区分率为 74%。本研究得到 28 个选定频率相对高的用于区分 FOG+、FOG-和 HC 的脑网络连接特征，这些连接特征主要位于背侧注意网络（左背外侧额上回、右眶部额上回、左眶部额中回、双侧眶内额上回）、默认网络（双侧角回、双侧顶下缘角回、左楔叶）、视觉网络（双侧距状裂周围皮层、右枕中回）、听觉网络（双侧颞横回、左颞中回、右颞上回）、感觉运动网络（右中央前回、右辅助运动区）的网络内部或网络之间的连接。
结论： 基于脑功能网络属性的 SVM-RBF 分类器能对 FOG+、FOG-和 HC 的进行较好的分类。PD FOG+、FOG-病人在背侧注意网络、默认网络、视觉网络、听觉网络、感觉运动网络的功能连接性方面出现异常，推测这些静息态脑网络对于判别 FOG+及 FOG-的 PD 患者具有较大的价值

EPO-2057
成人中重度 OSAHS 患者网络拓扑属性规则化的结构磁共振研究

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目的：通过图论的方法探讨成人中重度 OSAHS 患者脑结构共变网络的拓扑属性是否发生改变及其变化规律，旨在从连接组学的角度去揭示 OSAHS 的神经影像机制。
方法：本研究从大连大学附属中山医院招募 31 例未经治疗的中重度 OSAHS 患者（41.23±8.22 岁）和 26 位性别、年龄、利手情况及教育年限相匹配的睡眠良好的对照被试（good sleeper，GS，39.50±7.92 岁）。所有被试行西门子 3.0T 核磁共振头部薄层 T1WI 扫描，然后本研究基于结构磁共振数据提取 90 个感兴趣区（ROI）的灰质体积构建大尺度结构共变网络，运用图论的方法去分析 OSAHS 结构共变网络的拓扑属性。
结果：与睡眠良好被试相比，尽管成人中重度 OSAHS 结构共变网络都符合小世界特征，但是其结构共变网络拓扑属性异常，更加趋向于规则网络特征，表现为聚类系数增高（p=0.009）、传递系数增加（p=0.029）和局部效率增高（p=0.031），最短路径长度在网络密度 0.22～0.24 增加

(p<0.05)，以及随机故障抵抗力降低（p=0.044）。此外，本研究还发现 OSAHS 和 GS 结构共变网络中的度分布满足指数截断的幂律分布。

结论：本研究结果表明成人中重度 OSAHS 结构共变网络的多项拓扑属性发生异常，这为成人中重度 OSAHS 患者认知障碍的神经生物学机制提供了新的神经影像学见解。

EPO-2058
基于 DTI 的急性脑梗死患者基底节白质纤维束重建研究

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【摘要】**目的：**运用扩散张量成像（Diffusion tensor imaging, DTI）技术对急性脑梗死患者进行检查，并依据 DTI 数据对白质纤维束行三维重建，根据白质纤维束受累情况评估患者运动功能并预测患者预后。

方法：选取 2018 年 12 月至 2019 年 4 月在随州市中心医院治疗的 24 例急性脑梗死患者，对他们均进行 DTI 检查，测量每个患者梗死灶与健侧相对应区域的 FA 值，并重建出双侧白质纤维束示踪图，从三维视角观察梗死灶是否累及神经纤维束，评价纤维束受累情况，同时按照美国国立研究院卒中评分（NIHSS)标准对患者进行评分，研究 FA 值、白质纤维束受累分级与临床评分的关系，预测患者预后情况。

结果：患侧白质的平均 FA 值（0.329±0.142），明显比健侧（0.406±0.154）低 p<0.05，差异具有统计学意义；白质纤维束受累分级 2 级患者患侧白质 FA 值（0.216±0.134）低于分级 1 级（0.312±0.147）患者；白质纤维束受累分级 1 级患者患侧白质 FA 值（0.312±0.147）明显低于分级 0 级（0.432±0.149）的患者；3 个不同白质纤维束受累分级比较 p<0.05，差异具有统计学意义；白质纤维束受累越严重，NIHSS 临床评分分值数相对越高，其相关系数为 1，相关性具有统计学差异 p<0.01。

结论：基于 DTI 对急性脑梗死患者的基底节白质纤维束行三维重建，可以直接观察到基底节区白质纤维束的损伤程度同时对患者肢体功能进行 NIHSS 评分，预测患者肢体运动功能恢复情况。

EPO-2059
磁共振纹理分析在良恶性腮腺肿瘤鉴别诊断的应用价值

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目的：通过对腮腺肿瘤的磁共振图像进行纹理分析，并用支持向量机 (SVM)评价纹理特征，评价纹理分析在鉴别腮腺良恶性肿瘤中的价值。方法：回顾性搜集分析徐州医科大学附属医院 50 例经病理证实腮腺肿瘤患者的磁共振图像，对提取的肿瘤的感兴趣区进行纹理分析，避免肿瘤内坏死、囊变区域。结果：利用灰度共生矩阵提取出 3 种纹理分析方法，提取 10 个纹理参数，通过进行线性判别联合 K 值最比邻法证实，基于 T1 平扫及 T1 加强图像鉴别良恶性结节准确性为 80%。10 个参数在上述两种不同类别的数据集之间具有统计学意义 (P<0.05)，对于所有不同类别的数据集，ROI 区域灰度值的方差参数均有统计学意义。讨论：纹理特征的分析可以提供更多量化信息特征，为腮腺肿瘤影像学的鉴别诊断提供了新的思路和方法。

EPO-2060
多模态 MRI 对高级别胶质瘤术后复发和假性进展的研究探讨

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【摘要】目的　探讨多模态 MRI (平扫＋增强、DWI、1H-MRS、PWI)在鉴别高级别胶质瘤术后复发与假性进展中的应用价值。资料与方法　收集我院 2016.1~2018.12 期间高级别胶质瘤复发 21 例和假性进展 17 例患者，对常规 MRI 及 DWI、1H-MRS、PWI 影像和病史采集进行分析。结果　高级别胶质瘤复发与假性进展区 rCBV 比值分别是（3.38±2.23）、（1.24±1.58），rCBF 比值是（3.55±2.28）和（1.21±1.04），差异具统计学意义（P＜0.05），而 rMTT，rTTP 均不具有统计学意义（P＞0.05）。胶质瘤术后复发和假性进展 rADC 比值分别是（1.35±0.36），（1.27±0.44），差异不具统计学意义（P＞0.05）。胶质瘤术后复发区及假性进展 Cho/NAA 比值是（3.79±2.00），（3.66±3.19）和 Cho/Cr 比值是（2.26 士 1.27）和（3.13 士 2.98），差异均无统计学意义(P>0.05)。结论　PWI 在鉴别高级别胶质瘤术后复发与假性进展中具有较高的价值，联合常规 MRI 增强及 DWI、1H-MRS 的多模态模式更能提高诊断准确性。

EPO-2061
MSDE BB 成像技术在脑微小转移瘤诊断中的应用价值

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目的 研究 MSDE BB 成像技术影像特点，对比其他常规 MRI 序列在脑微小转移瘤影像特点，探讨 MSDE BB 成像技术在脑微小转移瘤诊断中的应用价值。方法：回顾性分析经临床证实的脑转移瘤患者 30 例。所有病例均行 MR 常规平扫、常规 T1　WI 增强扫描及 MSDE BB 增强扫描。对比分析 MSDE BB 成像序列和其他常规序列对于脑微小转移瘤的检出差异。结果 常规 TI WI 序列检出的病灶为 86 个，所漏诊 123 病灶中，其中 73 个位于脑表面皮层区，50 个位于脑深部实质区。增强后 MSDE BB 序列共检出病灶 209 个，其中脑表面皮层区 124 个，脑深部实质区 85 个。两种增强序列在脑皮层区、脑实质区及总病灶数的检出率差异均具有统计学意义（P<0.05）。结论 增强后 MSDE BB 序列对比其他常规平扫及增强序列，对脑微小转移瘤的检出率和敏感性具有较高的优势，能够在脑转移瘤特别是微小转移瘤的诊断中提供更多的影像信息。

EPO-2062
定量脑磁共振灌注技术对颞叶癫痫患者海马灌注情况的研究

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目的：研究定量磁共振灌注技术对海马的检查方法，评估颞叶癫痫海马硬化患者海马灌注血流量的变化情况以及预测颞叶癫痫海马 CBF 临界值。
方法：收集我院 2018 年 3 月-2019 年 3 月因癫痫行头颅海马 MRI 检查，并通过磁共振波谱成像证实存在海马硬化的 30 例癫痫患者作为实验组，海马正常的另外 30 例患者作为常规组。采用西门子公司 Aera 1.5T 超导型磁共振扫描仪，使用头部相控阵线圈，患者取仰卧位，平静呼吸。实验组和常规组的 30 例患者均先行常规头颅 MRI 常规检查，再行常规海马斜轴位、斜冠状位 T2_Flair 扫

描，之后行海马磁共振波普检查，最后行海马斜轴位定量磁共振灌注检查，自动生成 CBF 灌注函数图像。扫描结束后首先做波普后处理，再结合常规海马斜轴位、斜冠状位 T2_Flair 图像定位海马异常部位，最后在定量磁共振灌注 CBF 函数图像上测量海马异常部位的 CBF 灌注函数值。如果为海马正常的常规组患者，其定量磁共振灌注 CBF 函数图像的测量部位为最易发生海马硬化的海马头部。分析比较实验组和常规组海马的血流量变化情况，并通过 ROC 曲线预测 CBF 临界值。
结果：分别测量实验组、常规组全定量磁共振灌注 CBF 函数值。统计分析实验组、常规组海马 CBF 灌注函数值。实验组 CBF 灌注函数平均值为 15.15±3.17ml/(100g.min)，常规组 CBF 灌注函数平均值为 25.48±8.46ml/(100g.min)，实验组海马 CBF 灌注函数平均值低于常规组海马 CBF 灌注函数平均值。运用 ROC 曲线计算 CBF 最佳临界值为 19.60。
结论：定量磁共振灌注技术能够很好的应用于海马 CBF 的定量检测。硬化海马血流量相对于正常海马血流量有明显下降。颞叶癫痫患者海马灌注量的变化要先于影像学的改变，定量灌注定量测量海马 CBF 有助于颞叶癫痫的早期诊治。

EPO-2063

The interhemispheric coordination and hemispheric dominance pattern in hemiparkinsonism

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Purpose: The motor dysfunctions always affect hemi-body first in Parkinson's disease (PD). However, the interhemispheric relationships in patients with unilateral motor impairment were barely known to date. We aimed to investigate the interhemispheric coordination and hemispheric dominance pattern in hemiparkinsonism using resting-state functional Magnetic resonance imaging (RS-fMRI) for further understanding the pathogenesis of PD.
Materials and Methods: Forty-there unilateral-symptomatic PD patients (UPD, Hoehn-Yahr staging scale, H-Y: 1-1.5), and 54 age-, gender-, education-matched normal controls (NC) were recruited. All subjects underwent MRI scanning and clinical evaluations. The interhemispheric coordination (Voxel-Mirrored Homotopic Connectivity, VMHC) and hemispheric dominance pattern (laterality index of eigenvector centrality mapping, LI-ECM) were calculated. Afterwards, correlation analyses were employed to examine the relationships between each abnormal parameters and motor variables and receiver operating characteristic (ROC) curve analysis was employed to validate the discriminating ability of abnormal parameters.
Results: Compared with NC, UPD group showed significantly decreased VMHC in bilateral sensorimotor regions which was negatively correlated with the motor score. Furthermore, at the cut-off homotopic connectivity of 0.604, statistically significant ability of VMHC to discriminate UPD from NC with area under ROC curve (AUC) = 0.759, $p < 0.001$; specificity = 74.4%; sensitivity = 68.5% was observed. No difference was detected in UPD patients as for ECM and LI-ECM.
Conclusion: The disrupted interhemispheric coordination in homotopic sensorimotor regions was a potential neural basis for the hemiparkinsonism and was shown to be valuable for the diagnosis and assessment of early PD. However, the unchanged functional connectome and hemispheric dominance pattern indicating the global

functional connectivity was fairly reserved in the early stage of PD. These findings provided new insights into the pathogenesis of PD from an interhemispheric perspective.

EPO-2064
高清增强 T2Flair 纹理分析在脑胶质瘤术后放疗定位 MRI 中的应用

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目的：探究磁共振高清 T2flair 序列增强后纹理分析在脑胶质瘤术后放疗定位患者治疗中的意义，明确复发肿瘤信号与水肿脑实质信号范围。
方法：回顾性分析 2018 年 6 月至 2019 年 5 月脑胶质瘤术后患者在我科进行磁共振颅脑放疗定位的患者 41 例。所有病例均有我院手术及病检报告证实。所收集患者术前及术后均在 3T GE750W 磁共振上采用专用头线圈进行平扫 T2,T1，高清 T2Flair（采集次数 3 次层厚 3mm 层距 1mm 矩阵 256x256）后按患者体重进行钆造影剂（0.1ml/Kg）行增强 3DT1+C,3DLAVE+C 三维常规影像检查及与高清 T2Flair+C 扫描（扫描成像参数与平扫一致）；经 3 位影像专业高年资医生分别采用 T2Flair 高清纹理对比分析脑水肿信号与复发肿块信号，边界对比较常规 T1 增强前后的信号边界清晰明确有诊断意义,对放疗精准定位有帮助。
结果： 41 例患者术后 MRI 增强前后 T2Flair 高清纹理分析对比与常规 T1 平扫增强影像诊断 14 例患者脑胶质瘤复发，27 例术后未见明显复发影像改变手术区边缘脑实质有不同程度水肿信号。
结论：经 3 位高年资的专业影像科医生及 2 位神经外科诊断增强前后高清 T2Flair 图像纹理分析对比常规 T1 增强图像在脑胶质瘤术后复查影像诊断中有明确的磁共振信号显示优势及诊断意义；在放疗定位中有利于精准靶区放疗定位。

EPO-2065
正常人群三叉神经 RS-EPI DTI 定量参数变异范围的初步研究

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目的 通过不同 b 值的高分辨率 RS-EPI DTI 对各年龄组志愿者进行成像，旨在研究正常人群三叉神经的 DTI 定量参数的变异范围，揭示不同 b 值及不同年龄段对三叉神经定量分析指标的影响，为日后深入开展三叉神经痛（trigeminal neuralgia，TN）的诊疗做好前期准备。
方法 入组志愿者共 99 例，排除 1 例头晕症状志愿者实为急性脑梗死，余入组 98 例，其中男性 41 例，女性 57 例，共 196 侧。分为三组，低危老年组（≥60 岁），共 45 例，90 侧，记录为 A 组；高危年龄组（48-59 岁），共 29 例，58 侧，记录为 B 组；低危青年组（≤47 岁），共 24 例，48 侧，记录为 C 组。所有入组志愿者分别进行 RS-EPI DTI 及 T_2WI 序列检查，其中 RS-EPI 中 b 值分别采取（0 s/mm^2，300s/mm^2）、（0 s/mm^2，600s/mm^2）、（0 s/mm^2，900s/mm^2）三组进行扫描，记录为 DTI $_1$、DTI $_2$和 DTI $_3$。由 2 名有 5 年和 10 年神经系统诊断经验的放射科医师，在 Siemens Syngo 后处理工作站上对志愿者 RS-EPI DTI 序列不同 b 值获得图像进行 MD 值、FA 值的测量。
结果 尽管无统计学差异，但是在相同 b 值情况下，A 年龄组与 C 年龄组间存在随年龄的增大 FA 值而逐渐降低的趋势；MD 值则存在随年龄的增大而逐渐升高的趋势。b 值在 300s/mm^2、600s/mm^2

时，B 组人群 MD 值最低，仅在 b 值为 900s/mm^{2}时，MD 值随年龄的升高而增大；各年龄组内左右两侧三叉神经在相同 b 值条件下，所测得的 FA 值、MD 值均无统计学差异（P均＞0.05）。
结论　RS-EPI 对正常三叉神经进行 DTI 定量参数范围的测量是可行的；正常人群中左右两侧三叉神经 DTI 定量参数并无明显差异；各年龄组中不同 b 值测得 FA 值、MD 值均随 b 值的增大而逐渐降低。

EPO-2066
DTI 在评估 2 型糖尿病并发视网膜病变患者视路受损情况的应用

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目的　探讨弥散张量成像技术在评估 2 型糖尿病并发视网膜病变（DR）患者视觉传导通路解剖结构受损情况的应用价值。
方法　利用 DTI 是一种利用水分子在人体不同组织中表现出的不同分子随机不规则运动特征成像的一种评估微细结构异常的技术，入选 7 名 DR 患者及 15 名年龄、性别相匹配的健康对照组，于 Simens Prisma 3.0T 磁共振行 MRI 检查（T1WI、T2WI、T2-FLAIR、3DT1、Resolve-DTI），收集血压、血糖、血脂、眼底照相、既往史等临床数据，测量视觉传导通路全程（视神经、视交叉、视束、外侧膝状体、视放射、初级视觉皮层）的各向异性分数（FA）值。
结果　对照组及 DR 组 T1WI、T2WI、T2-FLAIR 序列形态、信号未见明确异常；与对照组相比较，DR 组视神经、视交叉、视束、外侧膝状体、视放射、初级视觉皮层 FA 值均减小，其中以视束处减小明显。
结论　血糖的长期升高会导致机体出现一系列的改变，其中致盲为影响较为严重的并发症之一。视力的改变除与视网膜微血管受损有关，或与视神经等视觉传导通路的结构改变也有关系。磁共振是目前活体研究视觉传导通路的唯一技术，其中 DTI 以以水分子弥散各向异性为基础，能无创地反应病变对脑白质纤维的破坏，在评估 2 型糖尿病并发视网膜病变患者视路受损情况时有重要应用价值，FA 值可为糖尿病脑相关微观变化的研究提供客观的评价依据。

EPO-2067
Brain amplitude of low frequency fluctuation alterations in optic neuritis patients: a 3-year follow-up study

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The prognosis of visual acuity in optic neuritis (ON) patients varies greatly from individual to individual. Visual acuity (VA) was significantly restored by remodeling neurons of visual pathway in some patients after acute phase, but in the others, VA gradually declined until blindness. The relationship between visual prognosis and brain function alterations in ON patients remain unclear.
Purpose: The objective of this study was to investigate the potential links between brain activity amplitude alteration and VA, during a 3-year follow-up period.

Methods: A total of 43 ON patients and 44 healthy controls (HCs) were examined twice, with a 3-year interval. Based on the VA at the third years, ON patients were divided into two groups: 26 ON patients with good visual outcome (the 4m logarithm of the minimum angle of resolution (logMAR) VA<0.3), 17 ON patients with poor visual outcome (LogMAR VA>0.3). Resting-state fMRI collected to investigate the amplitude of low frequency fluctuation (ALFF) difference among the three groups. The relationship between ALFF in regions with significant group differences and VA was further explored.
Results: Significantly decreased mALFF were observed in visual cortex (left cuneus and left middle occipital gyrus), cognition-related areas (right paracentral lobule), and right anterior cingulate cortex, and bilateral middle temporal gyrus, left middle frontal gyrus in ON patients than HCs. While increased mALFF were occurred in several regions in the frontal and temporal lobes ($P < 0.001$, FDR corrected). We found positive correlations between VA and ALFF in bilateral middle temporal gyrus and significantly negatively related to ALFF in left middle frontal gyrus.
Conclusion: From this follow-up study, we found the ALFF in middle temporal gyrus and middle frontal gyrus might play important role in the prognosis of visual acuity in ON. These findings provide important insights into the underlying neural mechanisms of ON.

EPO-2068

Decreased Cerebellum Subregions Related White Matter Integrity in Type 2 Diabetes Patients

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Background
Type 2 diabetes mellitus (T2DM) is a critical risk factor for mild cognitive impairment and the acceleration of MCI to dementia. Our previous study showed significantly decreased absolute neurovascular coupling (NVC) in subregions of cerebellum cortex in T2DM patients [1]. Besides, NVC coefficients were significantly positively correlated with the total score of Mini-Mental State Examination (MMSE). However, the role of cerebellum subregions in overall brain function remains unknown.
Methods
To assess the cerebellum diffusion kurtosis (DK) pattern in diabetic status, 30 T2DM patients and 30 matched healthy control subjects were prospectively enrolled. General cognition, executive and memory function were estimated respectively. Then, they underwent DK imaging to calculate the mean kurtosis (MK), radial kurtosis (RK), axial kurtosis (AK), kurtosis anisotropy (KA) between cerebellum subregions and the other cerebral voxels. Correlation analysis were also used to calculate the relationship between FCs and cognitive performance.
Results
Poorer performance was found in patients in 6 subitems of the executive and memory function. T2DM group displayed significantly decreased MK, RK, AK values in the precentral-cerebellar branch, superior frontal-cerebellar branch of corticocerebellar track and cross corticocerebellar track, respectively. Meanwhile, the MK and RK values

in the precentral-cerebellar branch were positively correlated with MMSE total scores (P< 0.05).

Conclusion

Decreased white matter integrity is significantly correlated with general cognitive performance in T2DM patients leading impaired cerebellar related white matter fiber tracts to be promising indicator for supervising the general cognitive function in T2DM patients.

EPO-2069

动态技术在眼部 MRI 中的应用初探

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目的：本研究通过调节成像参数，以寻求高信噪比和高分辨率的动态成像，并在眼部运动时观察眼球运动、视神经及眼肌变化，为眼球运动的生理学提供方法和理论依据。
材料与方法：（1）志愿者扫描，在其他所有参数保持统一、单一因素改变的条件下，以需求最佳动态扫描成像的各项参数。（2）选择 2019 年 4 月来我院眼科门诊就诊的甲状腺相关性眼病患者 18 例，给予眼部常规增强扫描及横断位及矢状位动态核磁共振成像，观察眼球、视神经及眼肌运动变化，并观察其动态下相关结构变化情况。
结果：（1）动态眼部磁共振最优参数确认。患者眼球自由缓慢地分别作左右及上下移动，眼部各结构清晰显示。（2）对于健康成人的双侧视觉结构的动态图像仅在约 15 秒的成像时间内进行图像重建。（3）在 18 例甲状腺相关性眼病患者中，眼球及视神经在运动中存在伪影，眼肌显示可，三组具有显著性统计学差异。（4）眼肌运动与疾病的进展程度成反相关，眼球及视神经与疾病的进展程度没有显著性统计学差异。
结论：（1）增强后眼部动态成像显示清晰，信噪比高，可以用于辅助临床诊断。（2）眼部运动的研究为甲状腺相关性眼病的病理学的研究提供了基础。

EPO-2070

Validation of zTE-MRA in the characterization of cerebrovascular diseases: a feasibility study

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Objectives zTE-MRA is less sensitive to field heterogeneity, complex flow and acquisition noise. This study aimed to prospectively validate the feasibility of zTE-MRA for cerebrovascular diseases assessment, compared to TOF-MRA.
Materials and Methods Seventy patients suspected of having cerebrovascular disorders were recruited. Sound levels were estimated for each MRA subjectively and objectively in different modes. MRA image quality was estimated by two neuroradiologists. The degree of stenosis (Grade 0-4) and the z-diameter of aneurysms (tiny group ≤ 3mm and

large group > 3mm) were measured for further quantitative analysis. CTA was used as gold standard.
Results zTE-MRA achieved significantly lower subjective perception and objective noise reduction (37.53%). zTE-MRA images showed higher signal homogeneity (3.29±0.59 vs. 3.04±0.43) and quality of venous signal suppression (3.67±0.47 vs. 2.75±0.46). The intermodality agreement was higher for zTE-MRA than TOF-MRA (zTE, 0.90; TOF: 0.81) in grading of stenosis. zTE-MRA had a higher correlation than TOF-MRA (zTE, 0.84; TOF, 0.74) in the tiny group, and a higher consistency with CTA (intra-class correlation coefficient, 0.83; intercept, 0.7000 to 2.6133, slope -1.0344 to -0.1923) than that of TOF-MRA (intra-class correlation coefficient, 0.64; intercept, 0.7000 to 2.6133, slope -1.0344 to -0.1923). zTE-MRA and TOF-MRA were comparable in large group. zTE-MRA displayed more accurate details than TOF-MRA of AVM and Moyamoya lesions.
Conclusion Compared to TOF-MRA, zTE-MRA achieved more robust performance in depicting cerebrovascular diseases. Therefore, zTE-MRA was demonstrated to be a promising MRA technique for further routine application in the clinic in patients with cerebrovascular diseases.

EPO-2071

Volumetric assessment of glioblastoma can be the biomarkers for IDH1 mutation status

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Purpose Mutation status of isocitrate dehydrogenase is associated with prognosis of glioblastoma, The goal of this study is to determine whether Volumetric assessment on T1-weighted magnetic resonance imaging (MRI) correlate with IDH1 mutation status.
Methods We conducted a retrospective analysis of MR images from 41 patients (28 males and 13 females) harboring a primary glioblastoma, derived from Daping hospital of Army Medical University. Preoperative MR images were scanned by Siemens(1.5T or 3.0T) All patients underwent surgery and obtained pathological tissue. The tumor necrosis, enhancement and edema area were segmented by 3Dslicer, and the necrosis-tumor ratio NTR (necrosis volume/tumor volume) , enhancing volume fraction and edema volume fraction were obtained after 3D reconstruction. The expression of IDH1 was detected by immunohistochemistry.
Results An independent t test showed that IDH1 mutation subgroup had a lower NTR than the wild subgroup(P=0.045). The enhancing volume of IDH1 mutation subgroup (22.4±18.9cm3) was also lower than the wild subgroup(43.8±15.9cm3) (P=0.011) , but there were no significant differences of the edema volume between the two subgroup(P=0.921).ROC analysis showed that area under ROC curve was 0.818 (95% CI:0.615~1.000,P=0.014) and the enhancing volume fraction (AUC=0.845,95% CI: 0.644~1.000, P=0.007), However, ROC analysis of the edema volume fraction yielded an AUC of 0.564, which was insignificantly larger than that of the guessing line (p=0.622).

Conclusions Our study found that quantitative morphological tumor characteristics on T1-weighted MRI can to a certain degree provide insights regarding IDH1 mutation status in patients with glioblastoma.

EPO-2072

Morphologic changes of lumbosacral nerve roots on MRN: diagnostic value in CIDP and correlation with electrophysiological parameters

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Purpose This study aimed to determine the value of morphologic changes of lumbosacral nerve roots on magnetic resonance neurography(MRN) in the diagnosis of chronic inflammatory demyelinating polyradiculoneuropathy(CIDP) and to analyze their correlations with electrophysiological parameters.

Methods Magnetic resonance neurography of lumbosacral plexus was performed in 21 CIDP patients and 21 healthy volunteers matched by sex and age. The cross-sectional areas(CSAs) from L3 to S1 nerve roots were measured on reformatted axial images and compared between two groups. Receiver operating characteristic(ROC) curves were plotted to determine the diagnostic accuracy and optimal cutoff value. All CIDP patients also underwent nerve conduction studies(NCS). Correlations between CSAs of lumbosacral nerve roots and electrophysiological parameters were analyzed.

Results CSAs from L3 to S1 nerve root were significantly larger in CIDP patients than in healthy volunteers (L3:19.77±6.92mm^2 VS 9.95±2.54mm^2, $p<0.001$; L4: 23.05±7.28mm^2 VS 12.09±3.28mm^2, $p<0.001$; L5:32.78±12.94mm^2 VS 15.21±3.51mm^2, $p<0.001$ and S1:37.06±14.76mm^2 VS 22.37±4.17mm^2, $p<0.001$). ROC curves revealed among four nerve roots, CSA of L5 was best at distinguishing CIDP patients from healthy volunteers (AUC=0.957) and the optimal cutoff value was 19.60mm^2. CSAs of L5 and S1 nerve root correlated positively with central latency of tibial nerves ($p=0.046$ and $p=0.002$ respectively) while L5 nerve root CSA correlated negatively with conduction velocity of tibial nerve($p=0.027$).

Conclusion CIDP patients showed increased CSAs from L3 to S1 nerve roots on MR neurography, some of which correlated well with electrophysiological parameters of demyelination. ROC curves showed CSA of L5 nerve root had the best diagnostic value and its optimal value was 19.60mm^2. Quantification of lumbosacral nerve roots may assist the diagnosis of CIDP.

EPO-2073

Multimodal Quantitative Magnetic Resonance Technique in Differential Diagnosis of Different Pathological Patterns of Parotid Gland Tumor

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Purpose: To study the value of diffusion kurtosis imaging (DKI) and dynamic contrast-enhanced (DCE) MRI in differential diagnosis of parotid gland tumor (PGT) among different pathological patterns, and evaluated diagnostic performance of DKI and DCE-MRI-derived parameters.
Methods: Forty-seven patients with different pathological types of PGT were enrolled and underwent routine MRI and DKI, DCE-MRI examinations. The DKI images were analyzed by using the DKE software (http://academicdepartments.musc.edu/cbi/dki/) to obtain DKI-derived parameters Dmean, Dax, Drad, Kmean, Krad, Kax and FA. The DCE-MRI images were analyzed by using the commercial software called Tissue 4D (Siemens AG, Erlangen, Germany) to obtain DCE-MRI -derived parameters Ktrans, Kep, Ve and iAUC. The characteristics of signal intensity in T1WI-TSE,T2WI-TSE and the patterns of contrast-enhanced curve between benign and malignant PGT were analyzed. The difference between benign PGT (include Parotid gland lymphoma) and malignant PGT, between benign PGT (not include PGL) and malignant PGT, parotid mixed tumor (PMT) and PGL, PMT and malignant PGT were analyzed by using Independent-Samples T test and One-way ANOVA was used to compare the difference and a bonferroni adjustment for multiple comparisons. Receiver operating characteristic (ROC) analysis was conducted to assess the cutoff values and diagnostic performance.
Results: (1) The Kmean, Krad, Kax of benign PGT (not include PGL) were significantly lower than malignant PGT ($P<0.05$). The Kmean, Krad, Kax values of PMT were significantly lower than PGL and malignant PGT ($P<0.05$). (2) The Ktrans, Kep values of benign PGT (not include PGL) were significantly lower than malignant PGT, while the value of Ve was significantly higher than malignant PGT ($P<0.05$). (3) The Ktrans, Kep values of PMT were significantly lower than malignant PGT and PGL, while the value of Ve was significantly higher than malignant PGT and PGL ($P<0.05$). ROC analysis demonstrated a high diagnosis performance among them. (4) No significant difference was found between benign and malignant PGT about the characteristic of signal intensity, the deep of invasion to surrounding tissue, the degree of cystic change and enhanced curve patterns between type C indicating benign PGT and type A, B and D which indicate the PGT was malignant ($P>0.05$).
Conclusion: Both DKI and DCE-MRI-derived parameters demonstrated high diagnostic accuracy in diagnosing different pathological PMT, especially in differential diagnosis of PMT and PGL which lack characteristic in morphology.

EPO-2074
计算机认知功能矫正治疗改善抑郁症患者执行功能的脑机制研究

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目的：抑郁症患者常伴随执行功能的受损，即使经过药物治疗后，仍有许多患者会持续存在执行功能异常。NBCCR（Neuroplasticity-based computerized cognitive remediation）是基于神经可塑性设计的计算机认知功能矫正程序，它可能通过激活与执行功能相关的大脑网络（包括背外侧前额叶、眶额回、背侧前扣带回）来改善抑郁症患者的执行功能，但关于 NBCCR 如何改善抑郁症患者执行功能的脑机制尚缺乏深入研究。本研究拟阐明经 NBCCR 治疗后与执行功能改善相关的脑区激活改变。
方法：收集 2018 年 6 月 1 日至 2019 年 7 月 1 日在我院精神科确诊为抑郁症的患者 23 例，排除 3 名头动过大的患者后，剩余对照组 9 人，治疗组 11 人。两组患者均在入组前及入组 4 周后接受 Philips Ingenia Ⅱ 3.0T 磁共振 BOLD 扫描、T1WI 轴位扫描。BOLD 扫描过程中，患者需要完成 stroop 范式。本研究采用一套名为“捉球”的计算机认知功能矫正程序对治疗组患者进行为期 4 周共计 30 小时的认知治疗。
结果：两组患者年龄、性别、受教育程度间无统计学差异。两组患者基线期执行一致任务的正确率、正确反应时间无统计学差异。4 周后，治疗组执行一致任务正确率为 0.9774±0.3039，正确反应时为 0.5039±0.1746；对照组执行一致任务正确率为 0.9295±0.7396，正确反应时为 0.4948±0.2241；两组正确率间存在统计学差异（Z=-2.035,p=0.042），正确反应时间无统计学差异(t=-0.118,p=0.907)。影像结果表明：在一致任务下，4 周治疗交互作用体现在右侧额叶、右侧边缘叶、右侧胼胝体、右侧扣带回前部、中部正性激活(p=0.001 ， 簇大小 20)。
结论：NBCCR 可以改善抑郁症患者执行功能，其机制可能与右侧额叶、右侧边缘叶、右侧胼胝体、右侧扣带回激活改变有关。

EPO-2075

Differential diagnosis efficacy of thymic solid tumors with intravoxel incoherent motion diffusion-weighted MR imaging

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PURPOSE

To retrospectively evaluate the differential diagnosis performance of intravoxel incoherent motion diffusion-weighted imaging (IVIM-DWI) for thymoma, thymic carcinoma and thymic lymphoma.

METHOD AND MATERIALS

Seventy-one subjects (49 men, 22 women; age range, 5–72 years) including thymoma (n=27), thymic carcinoma (n=16) and thymic lymphoma group (n=28) confirmed by pathological analysis underwent thoracic MRI on a 3.0-T MRI system, including conventional sequence and 9 b-value (b-value: 0 - 1,000 s/mm^2) DWI. Multi-b-value apparent diffusion coefficient (ADC_{mb}) were calculated by mono-exponential model.Pure diffusion coefficient (D), pseudo-diffusion coefficient (D*) and perfusion fraction (f) were calculated with bi-exponential model. Mean ADCmb, D, D*, and f values were compared for the differences among thymoma, thymic carcinoma and thymic lymphoma groups by one-way ANOVA, and further post hoc multiple comparisons were performed with Bonferroni test or Dunett's T3 test. ROC curve analyses were performed to determine

the efficacy and optimum thresholds for differentiating the defined groups by various parameters.

RESULTS

The mean D and D* value in thymoma were significant higher than the value from thymic carcinoma and lymphoma (D, 0.90, 0.62 and 0.49 $\times10^{-3}$ mm^2 /s; D*, 9.50, 5.56 and 3.62$\times10^{-3}$ mm^2 /s, and 10.47, 4.76 and 4.01 $\times$ 10^{-3} mm^2 /s, respectively, all P < 0.001),while there were no significant difference between the thymic carcinoma and lymphoma (P > 0.05/3). The mean ADC_{mb} value in thymic lymphoma were significantly lower than thymoma and thymic carcinoma (ADC_{mb}, 0.71, 1.32 and 0.99 $\times10^{-3}$ mm^2 /s, respectively, P<0.001), but no significant difference between the thymoma and thymic carcinoma (P > 0.05/3). As for the f value, no significant difference were found among groups (P > 0.05). The AUC and cutoff value, respectively, for differentiating thymoma from thymic lymphoma: ADC_{mb}, 0.946 and 0.872 $\times10^{-3}$ mm^2/s; D, 0.861 and 0.721$\times10^{-3}$ mm^2/s; D*, 0.878 and 4.80 $\times$ 10^{-3} mm^2/s; for differentiating thymic carcinoma from lymphoma for ADC_{mb}, D and D* were as follows: ADC_{mb}, 0.786 and 0.932$\times10^{-3}$ mm^2/s; D, 0.670 and 0.679 $\times10^{-3}$ mm^2/s; D*, 0.721 and 4.2 $\times10^{-3}$ mm^2/s.

CONCLUSION

We suggest that IVIM-DWI measurements could be used to differentiate thymic solid tumors preoperatively.

EPO-2076

快速自旋回波扩散加权成像在肺部病变应用的可行性研究

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目的 对比单次激发快速自旋回波扩散加权成像与平面回波扩散加权成像在肺部实性病变的图像质量，分析和评价参数 ADC 和 LSR 的测量可重复性和一致性。

方法 前瞻性收集孤立性肺部实性病变患者 27 例，27 个病灶最长径为(3.0±1.7)cm。术前均行胸部 MRI 平扫，包括常规 T1WI、常规 T2WI、TSE-DWI 及 EPI-DWI，其中 DWI 选取 2 个 b 值（b=0、600 s/mm^2）。所有 TSE-DWI 与 EPI-DWI 的原始图像经后处理软件测量并分别计算得出的参数包括变形率 DR、SNR、CNR、ADC mean 及 LSR。

结果 TSE-DWI 对应的 DR 均值明显小于 EPI-DWI（P＜0.05），SNR 及 CNR 的差异均无统计学意义。重复测量 TSE-DWI 的 ADC mean 值对应 ICC 和 WCV 为 0.9373 和 5.8568%；LSR 值对应 ICC 和 WCV 为 0.8783 和 11.8546%。EPI-DWI 的 ADC mean 值对应 ICC 和 WCV 为 0.9730 和 5.7564%；LSR 值对应 ICC 和 WCV 为 0.8061 和 16.1645%。重复扫描 TSE-DWI 对应的 ADC mean 和 LSR 值均稍高于 EPI-DWI，Kendall 系数 τ 分别为 0.590 和 0.464，其差异的 LOA 分别为-48%至 64%和-111%至 166%。

结论 TSE-DWI 在肺部实性病变的图像质量优于 EPI-DWI，其参数 ADC mean 和 LSR 测量都具有好的可重复性。TSE-DWI 对应的参数 ADC_{mean} 和 LSR 均值高于传统 EPI-DWI，其 LOA 达不到一致性的标准。

EPO-2077

肺栓塞磁共振成像：增强与非增强 MR 血管成像诊断准确性

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目的：研究目的在于比较增强 MR 血管成像与非增强空间标记多反转脉冲序列（SLEEK）MR 血管成像诊断肺栓塞的准确性。
方法：本研究经健康保险流通与责任法案（HIPAA）以及伦理委员会审查通过。32 名 CT 血管成像诊断肺栓塞的患者（18 男 14 女，平均年龄 39.4±15.6 岁），于 CT 检查 48 小时内行 MR 成像。MR 包括两种不同的技术：增强 MR 血管成像以及非增强 SLEEK 血管成像。每个序列都由两名放射科医生分别阅片，记录栓塞的数量以及每个栓塞的血管解剖学区域。CT 血管成像由另外两名放射科医生一同评价，结果作为参考标准。计算每种 MR 技术发现肺栓塞的敏感性、特异性、阳性预测值以及阴性预测值，根据效率-积分方法（efficient-score method）计算 95%可信区间。并采用两样本 t 检验比较上述两种 MR 技术。计算加权 κ 值以评价阅片者间一致性。
结果：增强磁共振血管成像诊断肺栓塞的敏感性为 67%，特异性 95%。非增强 SLEEK MR 血管成像诊断肺栓塞的敏感性 72%，特异性 90%。结合两种 MR 方法诊断肺栓塞的敏感性提升至 84%，特异性提升至 100%。两阅片者间存在高度一致性（k = 0.87）。
结论：增强 MR 血管成像和非增强 SLEEK MR 血管成像准确性相似，结合这两种 MR 技术对评价肺栓塞可达到互补的作用。非增强 SLEEK MR 血管成像无需使用对比剂，可成为肺栓塞诊断策略中的一部分。

EPO-2078

Machine learning based computed tomography radiomic analysis for histologic subtype classification of thymic epithelial tumors

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Objectives: To develop and validate the performance of machine learning based computed tomography (CT) radiomic analysis for distinguishing high-risk thymic epithelial tumors (TETs) from low-risk TETs according to WHO classification.
Methods and Materials: This retrospective case-control study comprised 155 patients with a histologic diagnosis of high-risk TETs (n=72) and low-risk TETs (n=83) who underwent unenhanced CT (UECT) and contrast-enhanced CT (CECT). Radiomic features were extracted from UECT and CECT of each patient at the largest cross-section of the lesion. Classification performance was evaluated by a nested cross-validation approach combining two feature selection methods (Mann–Whitney U-test and LASSO) and four classifiers: generalized linear model (GLM), k-nearest neighbor (KNN), support vector machine (SVM) and random forest (RF). Receiver operating characteristic curve (ROC) and area under the curve (AUC) were used to evaluate the performance of the classifiers.
Results: The combination of UECT and CECT radiomic features demonstrated the best performance to distinguish high-risk TETs from low-risk TETs for all four classifiers. For the combined mode of UECT and CECT, the classifier RF had the highest AUC of 0.86

in the testing set, followed by GLM (AUC = 0.85), SVM AUC = 0.84), and KNN(AUC = 0.83).
Conclusions: Machine learning based CT radiomic analysis allow for the differentiation of the high-risk TETs and the low-risk TETs with excellent performance, which can be used as a promising tool to assist in clinical decision- making in patients with TETs.

EPO-2079

Blood Oxygenation Level-Dependent Magnetic Resonance Imaging for Assessing and Predicting Early Response of Esophageal Carcinoma Treated with Chemoradiotherapy: A Preliminary Study

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Objective: To explore the feasibility of blood oxygenation level-dependent (BOLD) Magnetic Resonance (MR) imaging to assess and predict the early treatment response in patients treated with definitive concurrent chemoradiotherapy (CRT) for esophageal carcinoma (EC).
Materials and Methods: 38 patients receiving CRT for inoperable EC underwent BOLD MR examinations on a 3.0-Tesla MR scanner at pre-CRT (within 5 days before CRT) and post-CRT (2 - 3 weeks after the start of CRT). The variation of R2* values at pre- and post-CRT was observed by Paired Student's t test. Independent samples t-test was used to compare differences of parameters between complete response (CR) and partial response groups (PR).
Results: The R2* values significantly increased from 34.59 ± 8.73 s^{-1} to 44.96 ± 9.06 s^{-1} at post-CRT in the overall patients ($p < 0.001$). The R2* values of the lesion at pre- and post-CRT in CR group were significantly higher than those in PR group (37.38 ± 8.18 s^{-1} vs. 29.82 ± 7.72 s^{-1}, $p = 0.008$ and 48.47 ± 7.45 s^{-1} vs. 38.94 ± 8.60 s^{-1}, $p = 0.001$, respectively).Moreover, R2* values at 2- 3 weeks post-CRT showed good prediction, yielding an AUC of 0.818 (95% CI: 0.659 - 0.978, $p < 0.001$) for identifying CR from PR.
Conclusion: BOLD MR imaging contributed to assessing tumor response to definitive concurrent CRT for inoperable EC and a high R2* value at an early stage of treatment suggested a good response after CRT.

EPO-2080

Native T1-mapping of focal pulmonary lesions in 3.0-T magnetic resonance imaging: Display and accuracy of size estimation

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Objective: To compare focal pulmonary lesion display and size-estimation accuracy of native T1-mapping with that of T1-star 3D-volumetric interpolated breath-hold sequence (VIBE), T2-fBLADE turbo-spin echo (TSE), and computed tomography (CT).

Materials and methods: Thirty-nine patients with CT-detected focal pulmonary lesions underwent thoracic 3.0-T MRI using axial free-breathing 3D T1-star VIBE, respiratory triggered T2-fBLADE TSE, breath-hold T1-Turbo FLASH and T1-FLASH 3D. Native T1-mapping images were generated by T1-FLASH 3D with B1-filed correction by T1-Turbo FLASH. The intraclass correlation coefficient (ICC) and Bland-Altman plots were used to evaluate intra-observer agreement and inter-method reliability of diameter measurements.

Results: Forty-five focal pulmonary lesions (3.30±1.90cm, range: 1.00-7.80cm; 27 with a range of 1.00-2.92cm) were displayed by CT, native T1-mapping, T1-star VIBE, and T2-fBLADE TSE. Four lesions showed consolidation on CT, but showed distal obstructive pulmonary atelectasis and/or pneumonia with native T1-mapping. T1-mapping-based diameter measurements yielded an ICC of 0.995 and a mean difference of -0.03 cm. Additionally, inter-method measurements were highly consistent (T1-mapping & T1-star VIBE: ICC 0.982, mean difference 0.23 cm, T1-mapping & T2-fBLADE TSE: ICC 0.978, mean difference 0.17 cm, T1-mapping & CT: ICC 0.972, mean difference 0.15 cm). For lesions < 3.00 cm, T1-mapping intra-observer (ICC 0.982, mean difference 0.01 cm) and inter-method diameter measurements were also highly consistent (T1-mapping & CT: ICC 0.823, mean difference 0.10 cm).

Conclusion: Native T1-mapping displays focal pulmonary lesions clearly (particularly when accompanying obstructive atelectasis and/or pneumonia) and enable accurate and reliable diameter measurement.

EPO-2081
3.0T mDIXON CE-MRA 诊断中心静脉病变：与 DSA 对照

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目的 探讨改良水脂分离技术（mDIXON）在 3.0T 对比剂增强（CE）-MRA 诊断血液透析病人中心静脉病变中的可行性及应用价值。**方法** 19 例有临床症状的中心静脉病变患者 DSA 检查前接受 CE-MRA 检查。2 名 MRI 医师根据 4 分法，分别对 CE-MRA 图像质量进行评分，根据 4 级评分标准评价中心静脉狭窄程度。以 DSA 为金标准，分析计算 CE-MRA 诊断中心静脉狭窄的灵敏度、特异度、准确度、阳性预测值、阴性预测值。采用 Kappa 检验分析 2 名 MRI 医师对图像质量评分一致性及 CE-MRA 与 DSA 诊断中心静脉狭窄一致性。**结果** 2 名 MRI 医师对中心静脉 CE-MRA 图像质量评分一致性 *K*值为 0.23。CE-MRA 诊断中心静脉狭窄病变符合 DSA 金标准比例为 76.47%（13/17），高估率、低估率分别为 17.64%、5.88%。CE-MRA 诊断中心静脉狭窄的灵敏度、特异度、准确度、阳性预测值、阴性预测值分别为 100%、86%、94%、91%、100%。CE-MRA 与 DSA 诊断中心静脉狭窄一致性 *K* 为

0.67。**结论** CE-MRA 能够清晰显示中心静脉狭窄病变，具有较高的图像质量和诊断准确率，可作为一种可靠的替代检查方法及术前评估手段。

EPO-2082
心脏磁共振延迟强化对急性心肌梗死的临床诊断价值

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目的 探讨心脏磁共振延迟强化(LGE)对急性心肌梗死(AMI)的临床诊断价值。**方法** 连续入选 2017 年 12 月 1 日至 2018 年 10 月 31 日于中国医科大学附属盛京医院治疗的 AMI 患者 60 例，对其临床资料进行回顾性分析。患者均在入院 5 天内行心脏磁共振检查，采用多次屏气平衡稳态自由进动快速成像(FIESTA)序列行延迟强化成像，根据检查结果将患者分为 LGE 阳性组(28 例)和 LGE 阴性组 (32 例)，对两组患者进行比较分析。 **结果** LGE 阳性组与 LGE 阴性组患者相比：年龄、性别、吸烟、高血压、糖尿病、陈旧性心梗等指标差异均无统计学意义(均 $P>0.05$)。LGE 阳性组患者的左心室射血分数显著低于 LGE 阴性组{(39.2±16.2)%比(52.3±9.1)%，$P<0.05$}。LGE 阳性组患者的梗死心肌质量与左心室收缩末期容积($r=0.726$)、左心室舒张末期容积($r=0.708$)密切相关(均 $P<0.05$)。**结论** 磁共振延迟强化能有效判断 AMI 患者心肌梗死严重程度，可在临床工作中起到重要的指导作用。

EPO-2083
T1-mapping 和细胞外容积（ECV）定量铁过载所致心肌纤维化巴马猪模型的研究

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目的：通过 T1-mapping 序列及细胞外容积（ECV）技术定量铁过载所致的弥漫性心肌纤维化。
方法：同一品系巴马小型猪共 23 头，随机分为对照组（4 头）、实验组（15 头）及验证组（4 头）；实验组和对照组每周使用右旋糖酐铁经肌肉注射一次，对照组注射相同容积生理盐水，注射 1-15 周。注射后每周抽取 1 头实验组行 MRI 扫描，对照组和验证组分别于 1、5、10、15 周后行 MRI 扫描。扫描前抽静脉血测量红细胞压积（HCT），于心脏短轴位，行 T1-mapping 平扫、增强和多回波梯度回波扫描。扫描后取扫描部位附近组织行病理分析，测量胶原容积分数（CVF）、铁沉积的半定量、心肌铁含量（CIC）；测量室间隔和血池的平扫和增强后的 T1 值，$T2^*$值，计算 ECV。采用比较不同延迟时间段测量 ECV 的差异，分析评价室间隔中部的 ECV 与注射铁剂总量、CIC、CVF、Native T1 值、$T2^*$值等指标的相关性；拟合 ECV 与 CVF 的回归方程并验证。$P<0.05$ 有统计学意义。
结果：当注射铁剂达到 1200mg/kg，CVF、EVC 开始升高。CIC、CVF、EVC 与注射铁剂量高度正相关（$P<0.05$）。病理显示胶原纤维分布不均。Native T1、$T2^*$与 CIC 高度负相关（$P<0.05$）；增强后不同时段的 ECV 差异无统计学意义（$P=0.923$）。ECV 与 CVF 高度相关，建立回归方程 Y(CVF)=0.015+0.399X(ECV)，（$R^2=0.903$，$P<0.001$）。
结论：通过注射右旋糖酐铁可获得铁过载导致的心肌纤维化动物模型。心肌纤维化的胶原纤维分布不均，病理取材可能无法准确评估纤维化程度。评估心肌纤维化时，不应单纯使用 T1-mapping，应结合 $T2^*$或 ECV 综合评估心肌纤维化。通过 ECV 可计算病理测量的 CVF，无创评估心肌纤维化。

EPO-2084

暴发性心肌炎 CMR 表现

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目的：评估 CMR 在暴发性心肌炎应用价值。
材料与方法：回顾性分析 29 例暴发性心肌炎患者及 19 例正常志愿者临床及 CMR 资料，所有受试者均在 3.0T 进行 CMR 扫描，扫描序列包括长轴及短轴心脏电影，黑血 T2 加权成像，首过灌注及延迟强化序列。统计分析左心功能参数，心肌水肿率，延迟强化范围。
结果：暴发性心肌炎患者 hs-cTNT 及 NT-ProBNP 明显升高，与对照组相比，前者 LVEF、LVESV、LVESVi、CO 及 SV 较对照组减低，具有明显统计学差异。疾病组室间隔心肌水肿增厚，且心肌水肿率（2.6±0.7）明显高于对照组，心肌 LGE 平均质量 24.4±18.3g，占总心肌质量 35.3±21.5%。LGE 以室间隔、下壁累及较多，LGE 主要以中外层线性强化为主，38%患者 LGE 呈弥漫性分布。85%患者 CMR 上出现心包积液。
结论：心脏磁共振在暴发性心肌炎中有较高的临床应用价值。

EPO-2085

原发扩张型心肌病的左心整体功能和心肌纤维化基于心脏磁共振的相关研究

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目的 利用 1.5T 磁共振探讨原发扩张型心肌病的心功能和心肌纤维化的特点和相关性。**方法** 研究收集确诊为扩张性心肌病（DCM）患者 30 人为实验组，另外收集健康志愿者 35 人。所有受试者均行 1.5T 心脏磁共振（CMR）平扫和增强检查分别得出左心室整体功能指标及心肌延迟强化信息，并对部分心功能指标体表面积标准化。所测心功能指标包括：左心室收缩末容积(LVESV)、左心室舒张末容积(LVEDV)、左心室射血分数(LVEF)、左室高峰射血率(LVPER)、左室高峰充盈率(LVPFR)、左室心肌质量(LVMM)等等。所有的 30 例扩心患者均已行心脏超声检查（超声组），收集部分心功能指标。比较实验组和超声组间部分心功能指标数值差异；比较实验组和健康组两组之间各项数值的差异；根据实验组内是否出现延迟强化（DE-MRI）再分成两亚组：DE-MRI（+）组和 DE-MRI（-）组，并比较两组心功能指标差异。**结果** 1. 实验组和超声组间部分心功能指标（LVEDV、LVESV、LVEF）无明显差异。 2.DCM 实验组的 LVEDV、LVESV、LVMM 等指标明显高于健康对照组（P＜0.05），而 LVEF、LVPER、LVPFR 等则低于健康对照组（P＜0.05），都具统计学差异；3. DE-MRI（+）组 LVMM、LVESV 指标高于 DE-MRI（-）组（P＜0.05），DE-MRI（+）组 LVEF 指标低于 DE-MRI（-）组（P＜0.05），都具统计学差异。4. DCM 实验组中有 21 例(60%)出现心肌延迟强化，共计 153 个节段出现延迟强化，其中肌壁间 107 个节段（64.85%）强化特点显著，分布部位以室间隔壁 14 例（66.67%）为主。**结论** 1. 1.5T CMR 相比超声可以很好的评价心脏功能；2.1.5T CMR 可以很好评价 DCM 心功能及心肌纤维化；3.LVMM 可以初步评估 DCM 心肌纤维化(MF)。

EPO-2086

心脏磁化准备小角度激发相位敏感反转恢复序列在肥厚型心肌病患者中的应用

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目的：探讨磁化准备小角度激发相位敏感反转恢复序列在肥厚型心肌病患者中的应用价值。
方法：收集到我院就诊的肥厚型心肌病患者 15 例作为研究对象，此 15 例患者均采用西门子 Aera 1.5T 超导磁共振扫描仪进行扫描，线圈采用 16 通道胸部部相控阵线圈。15 例患者均行心脏 MR 检查序列包括心脏电影成像、心肌灌注成像、心脏对比剂延迟强化成像（LGE）、磁化准备小角度激发相位敏感反转恢复序列成像（PSIR Turbo-FLASH）。心脏电影成像采用屏气真性稳态自由进动序列采集心脏左室短轴、左室长轴和四腔心层面；心肌灌注成像采用饱和恢复快速梯度回波序列采集左室短轴位层面；LGE 采用常规二维磁化准备小角度激发序列（Turbo-FLASH）采集左室短轴层面；PSIR Turbo-FLASH 序列于 LGE 成像结束后进行采集，与 LGE 采用相同的空间分辨率、FOV、层厚、层数和层间距。采集结束后，对比受检者 PSIR Turbo-FLASH 图像与 LGE 图像，分析对比两个序列图像对病变的检出率以及对病变的显示程度。
结果：对比分析 15 例患者的 PSIR Turbo-FLASH 和 LGE 两种序列图像，得出 PSIR Turbo-FLASH 序列对延迟强化的检出率为 86.7%，LGE 的检出率为 73.3%，PSIR Turbo-FLASH 序列对病灶的检出率高于 LGE 序列，且前者检出病灶的信号强度都高于后者。
结论：PSIR Turbo-FLASH 序列对肥厚型心肌病的病灶检出率高于 LGE 序列对病灶的检出率，其前者检出病灶的信号强度也高于后者检出病灶的信号强度，并且前者序列所重建的相位图对病灶的显示更为敏感。

EPO-2087
比较使用脉搏门控与心电门控对 3.0T 心脏磁共振电影扫描序列图像质量的影响

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目的：当心电图波形处于不理想状态时，可采用脉搏门控来代替心电门控进行心脏磁共振的电影扫描
方法：本研究连续入选 48 例心脏病患者，年龄（28~63）岁。在国产联影 770，3.0T 磁共振成像系统下，对我院 48 例不同心脏病患者，进行心脏磁共振扫描，均同时连接心电门控和脉搏门控。对心脏四腔，两腔，三腔和短轴位电影分别应用心电门控和脉搏门控扫描。图像质量由两名经验丰富的影像科诊断医生进行比对并用后处理软件进行数据测量。
结果：心电门控组 48 例患者中有 4 例心电门控模式出现 R 波低，T 波抬高，有漏触发和误触发，造成重建伪影，无法进行准确计算。脉搏门控组的 48 例脉搏门控模式扫描出来的图像，仅有一例发现重建伪影。两组图像除去 4 例心电门控有伪影患者和 1 例脉搏门控有伪影患者，其余 43 例患者的两组图像测量心肌厚度、射血分数、舒张末容积和收缩末容积均无明显差别，血池心肌对比、噪声比及图像总体质量亦无明显差别。
结论：在 3.0T 磁共振上做心脏磁共振电影扫描时，当心电图波形处于不理想状态时，采用脉搏门控可在一定程度上替代心电门控，反应心脏的运动情况并能通过后处理软件正确的测量数值。

EPO-2088

The feasibility and diagnostic value of Intravoxel Incoherent Motion Diffusion-Weighted imaging in the assessment of myocardial fibrosis in Hypertrophic Cardiomyopathy

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Purpose: To examine the feasibility and capacity of intravoxel incoherent motion (IVIM) to investigate myocardial fibrosis in patients with hypertrophic cardiomyopathy (HCM).
Method: Fifty-five HCM patients were enrolled and underwent IVIM diffusion-weighted cardiovascular resonance imaging. Cine, T1 mapping, IVIM and late gadolinium enhancement (LGE) were performed. Strain, pre T1, extracellular volume (ECV), IVIM derived parameters (D, D* and f) and LGE were analyzed into 16 American Heart Association segments; and the relationship of these parameters were analyzed. Base on the LGE appearance and ECV quantification, abnormal segments for myocardial fibrosis were defined as: the presence of LGE (LGE+) or ECV ≥ 29.6%.
Results: D values were significantly increased in both LGE+ (1.89 ± 0.14 $\mu m^2/ms$) and ECV ≥ 29.6% (1.84 ± 0.13 $\mu m^2/ms$) group than LGE- (1.63 ± 0.12 $\mu m^2/ms$) and ECV < 29.6% (1.61 ± 0.12 $\mu m^2/ms$) group. Compared to LGE- and ECV < 29.6% group, D* (34.9 ± 6.6 $\mu m^2/m$ vs 55.2 ± 11.4 $\mu m^2/m$, $p < 0.001$;37.5 ± 6.9 $\mu m^2/m$ vs 59.6 ± 9.2 $\mu m^2/m$, $p < 0.00$, respectively) and f values (10.8 ± 1.29 % vs 12.5 ± 1.26 %, $p < 0.001$; 10.9 ± 1.1 % vs 13.00 ± 1.0 %, $p = 0.021$, respectively) were significantly decreased in both LGE+ and ECV ≥ 29.6% group. Moreover, significant correlations were demonstrated between D and ECV, as well as D* and f.
Conclusion: IVIM is proved to be ingenious to investigate myocardial fibrosis and has potential of quantitatively estimating myocardial fibrosis in patients with HCM

EPO-2089

The injury of valves and myocardium in rheumatic heart disease evaluated by CMR

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Introduction: Rheumatic heart disease (RHD) is a major cause of valvular heart disease and can lead to myocardial damage as well, especially in developing countries. Morphological changes of the valves can be clearly detected by echocardiograph. However, it remains a challenge to determine whether there is myocardial injury. It has been suggested cardiac magnetic resonance (CMR) as a new diagnostic imaging modality can provide evaluation of cardiac anatomy and function noninvasively and characterizations of myocardial.

Methods: We prospectively included 51 patients with RHD, 6 patients with evidence of coronary artery disease or cardiomyopathy were excluded. The 45 patients were scheduled for CMR and echocardiography. In our study echocardiography was found to be the gold standard for the diagnosis of valvular disease.
Result: A total of 45 patients (mean age, 53 years old, 71.1% female) were enrolled in our study. Multivalvular disease was manifested in all the patients. The sensibility and specificity of CMR are 86.4% and 66.7% in mitral stenosis (MS), 92.3% and 85.7% in mitral regurgitation (MR), 86.7% and 96.0% in aortic regurgitation (AR), 100% and 93.1% in aortic stenosis (AS), 89.7% and 66.7% in tricuspid regurgitation (TR), respectively.
Seventeen (37.8%) patients showed late gadolinium enhancement on CMR, six patients (35.2%) were in the left atrial wall, eight were (47.1%) in the valves, six (35.2%) were in the left ventricular wall. Patients with delayed enhancement on CMR had higher LA diameters (LA anteroposterior diameter, 5.7cm VS 5.2cm, p=0.023). Nevertheless, there was no association between myocardial contrast uptake with age, cardiac function New York Heart Association (NYHA) classification or the level of B-type natriuretic peptide (BNP).
Conclusion: Combined valvular disease shows prevalence in RHD. CMR can be complimentary to echocardiography in evaluating valvular morphological changes and it plays a significant role in evaluating cardiac function and irreplaceable in characterizing myocardial injury in RHD. Our study also implies patients with the presence of delayed enhancement on CMR may associate remodeling of LA which implaies unfavourable prognosis.
Clinical Reference/ application: At present,determining the severity of RHD is important for the timing and choosing the method of therapy. Our study compared CMR with echocardiography and find out CMR can reveal more information about cardial myocardium noninvasively with advanced cardiac software, more advanced techniques, faster imaging sequences and can be a comlementary tool in elavuating cardiac morphology , function and valvular disease.

EPO-2090
Native T1 mapping 与 LGE 在左室心肌致密化不全中的比较性研究

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目的：分别采用 Native T1 mapping 和 LGE 来检测 LVNC 中的致密层心肌纤维化的程度，并比较二者的差异。
材料与方法：纳入 40 例 LVNC 患者和 10 位健康志愿者。其中 40 例 LVNC 患者根据致密层是否有延迟强化（LGE）分为两组：A 组为 LGE 阳性 21 例，B 组为 LGE 阴性 19 例。10 例健康志愿者作为正常对照组。使用 1.5T 磁共振，心电门控 R 波触发成像，分别采用心脏电影序列、MOLLI 序列和 PSIR 序列获得动态电影图像、Native T1 mapping 图像和 LGE 图像。测量各组的 Native T1 值，应用 ANOVA 进行统计分析。使用 Logistic 回归分析 LGE 的 OR 值和 CI 值。ROC 曲线用于分析 LVNC 致密层心肌出现 LGE 时的 Native T1 阈值及其敏感性和特异性。

结果：40 例 LVNC 患者中，有 21 例致密层有 LGE（A 组），19 例没有 LGE（B 组）。正常对照组、A 组、B 组的 native T1 值分别为 1053.7±39.6ms，1162.4±43.5ms，1118.2±28.1ms，ANOVA 分析差异具有统计学意义（P＜0.001），且任一两组间均有显著性差异，A 组显著高于 B 组，B 组显著高于对照组。Logistic 回归分析，native T1 比值比（OR 值）为 2.757（95%可信区间 CI 为 1.138-7.654，P=0.019），在校正 NC/C 值、年龄、性别、体表面积后，OR 为 3.976（95%可信区间 CI 为 1.168-13.728，P=0.019）。ROC 曲线分析显示 LVNC 致密层心肌可能出现 LGE 时的 native T1 阈值为 1123.6ms，敏感性和特异性分别为 89.7%，80.3%（P＜0.001）。
结论：Native T1 值与 LGE 有显著相关性，并且在早期检测 LVNC 患者致密层心肌纤维化方面，native T1 mapping 优于传统 LGE，是一个有效评价早期纤维化的可靠指标。

EPO-2091
3.0T 磁共振 T2 Mapping 对糖尿病前期患者心肌改变的早期定量研究

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目的：通过 3.0T 磁共振 T2 Mapping 对糖尿病前期患者进行心脏 MRI 扫描，并测量其数值，以探讨该序列对糖尿病前期患者心肌改变早期诊断的临床应用价值。**方法：**按照纳排标准随机选取 2018 年 6 月至 2019 年 6 月宝安区人民医院住院或门诊的 18 例糖尿病患者和 15 例糖尿病前期患者。另选取 20 例正常受试者作为对照组，经体检证实无糖尿病、高血压、冠心病、严重心律失常、心脏瓣膜病、先天性心脏病。采用 Siemens Magnetom Skyra 3.0 T MR 成像系统上对三组进行心脏磁共振 T2 Mapping 扫描，并在蓝网 PACS 系统及 Siemens 后处理工作站上观察并测量、计算心肌的 T2 值。运用 Tamhane's T2 法对三组受试者 T2 Mapping 值进行组间多重比较。**结果：**后处理分析的数据显示（1）2 型糖尿病组、糖尿病前期组及正常对照组 T2 Mapping 值差异具有统计学意义（P＜0.05）；（2）糖尿病前期组（1.382.48±65.12）T2Mapping 值高于正常对照组（1.211.38±41.32），正常对照组（1.211.38±41.32）T2Mapping 值高于 2 型糖尿病组（1007.08±14.61）。**结论：**糖尿病前期患者 T2Mapping 值升高，提示心肌水肿改变，糖尿病组 T2Mapping 值降低，提示心肌纤维化改变，可利用 3.0T 磁共振 T2Mapping 序列对糖尿病前期患者早期心肌损伤进行评价。

EPO-2092
血管壁成像评价颅内动脉粥样硬化斑块强化程度与缺血性脑卒中的关系

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目的　探讨颅内症状性动脉粥样硬化斑块与非症状性动脉粥样硬化斑块常规高分辨磁共振成像强化特征是否存在差异，并探讨斑块强化与缺血性脑卒中的关系。
方法 收集 2018 年 1 月至 2019 年 7 月在宁夏医科大学总医院就诊并接受 HRMRI 检查的疑似症状性颅内动脉狭窄患者入组本研究，行 3.0T 常规头颅 MRI、3D-TOFMRA 及 HRMRI 扫描，比较症状性与非症状性动脉粥样硬化斑块强化特征。信号强度采用手工勾画，兴趣区置于斑块强化最明显

处。责任斑块为梗死区责任血管上管腔最窄处的斑块，非责任斑块为非责任血管上的斑块。应用二分类 Logistic 回归分析法研究斑块强化程度与责任斑块的关系。
结果　共计 57 例符合纳入和排除标准的患者入选本研究。前循环颅内动脉粥样硬化患者 41 例，其中脑梗死及短暂性脑缺血发作（ transient ischemic stroke， TIA)患者分别为 32 例和 9 例; 后循环颅内动脉粥样硬化患者 16 例， 其中脑梗死及 TIA 患者分别为 11 例和 5 例; 前后循环的脑缺血类型无统计学差异（ χ2 = 2. 282， P= 0. 131）。前后循环责任斑块分别判定为 41 个及 16 个， 斑块分布具有统计学差异（ χ2 = 26. 231， P＜0. 001）; 颅内动脉粥样硬化斑块共 118 个，其中责任斑块 57 个，非责任斑块 71 个。责任斑块组中，41 个斑块明显强化，11 个轻度强化，5 个无强化; 非责任斑块组中，6 个斑块明显强化，27 个轻度强化，38 个无强化。责任斑块组斑块强化程度(Z = － 6.823,P ＜ 0. 01)大于非责任斑块组，二分类 Logistic 回归结果显示斑块明显强化为责任斑块的独立影响因素(OR: 51.3，95% CI: 13. 0 ～ 289. 1，P ＜ 0. 01）。
结论　高分辨率磁共振血管壁成像可以评价颅内动脉粥样硬化斑块强化特征，斑块明显强化多见于责任斑块，可能是发生缺血性卒中的重要危险因素。

EPO-2093
心肌形变分析：心脏磁共振特征追踪和可变形配准算法的比较

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目的 分析比较基于心脏磁共振电影序列图像的可变形配准算法（DRA）与特征跟踪（FT）算法进行心肌形变分析的可重复性。
材料与方法 2018 年 9 月至 2018 年 11 月间招募 40 名健康志愿者（60％男性，平均 49.50±8.48 岁）。所有志愿者均在飞利浦 Ingenia 3.0T 磁共振上行心脏磁共振扫描。序列包括平扫短轴、二、三腔心及四腔电影及对比剂注射后的短轴电影序列。使用基于 DRA（TrufiStrain）和 FT（Mass）算法的心肌形变分析软件评估左心室整体径向应变峰值（GPRS）、心内膜整体环向应变峰值（endoGPCS）、心肌中层整体环向应变峰值（midGPCS）及心外膜整体环向应变峰值（epiGPCS）及基底部、左心室中间部以及心尖部环向应变峰值（PCS）和径向应变峰值（PRS）。计算组内相关系数（ICC）和变异度（COV）并进行 Bland-Altman 分析和 Pearson 相关分析比较两种算法基于平扫和增强图像行心肌应变分析的可重复性。
结果 1 无论基于平扫或增强短轴电影序列进行心肌形变分析，FT 测量的 GPRS、endoGPCS、midGPCS、epiGPCS、及基底部、中间部和心尖部 PRS、PCS 均明显大于 DRA 测量相应应变参数（P 值均＜0.05）。2 DRA 基于平扫和增强序列测量应变峰值之间的相关性明显好于 FT 者。3DRA 基于平扫和增强序列测量应变峰值之间的的差异大于基于 FT 算法者。4 无论基于平扫或增强图像，DRA 测量的各应变参数的观察者内和观察者间的 ICC 均较大，COV 较小。5 与基于增强图像，DRA 算法基于平扫电影图像测量的应变参数的观察者间和观察者内的 ICC 较大，COV 更小，而 FT 算法在基于增强电影图像时表现更好。
结论 DRA 算法的测量可重复性优于 FT。此外，对比剂注射对 DRA 算法的影响大于 FT，在临床应用中应保持扫描电影序列采集方式和时间的一致性。

EPO-2094
CMR 参数定量技术对 OSAHS 患者心脏的研究

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目的：通过心脏磁共振成像技术获取 OSAHS 患者和健康正常成人左心结构和功能相关参数、左室心肌组织的 T1 值 T2 值及 ECV 值，了解两者之间的差异性，探讨 OSAHS 患者左心功能及心肌的变化，并对心肌组织进行量化分析。方法：选择符合 2011 年修订版 OSAHS 诊断标准，且经多导睡眠图（PSG）监测后诊断为 OSAHS 的患者 20 例，平均年龄（50±7），及正常成年健康志愿者 25 例进心脏磁共振定位相扫描、快速自选回波序列 T1 对比扫描、look-locker 反转恢复（Modified Look-locker Inversion Recovery，MOLLI）序列对比剂注射前 T1mapping 扫描、T2mapping 扫描、基于梯度回波的多时相电影序列扫描、T1scout 序列扫描、对比剂注射后相位敏感反转恢复的 T1WI 序列扫描、MOLLI 序列对比剂注射后 T1mapping 扫描。获得左心结构、功能参数（左心室射血分数、左室舒张末期容积、收缩末期容积、每搏量、心输出量、心肌质量）、左室心肌 T1 值、T2 值及 ECV 值。结果：（1）结构和功能参数：OSAHS 组左室射血分数、左室舒张末期容积及左室心肌质量均高于正常对照组；收缩末期容积、每搏量、心输出量 OSAHS 组与正常对照组无统计学差异；（2）组织学参数：增强前 T1 值及 ECV 值 OSAHS 组高于对照组，但差异无统计学意义；T2 值 OSAHS 组高于对照组，差异有统计学意义。
结论：（1）心脏磁共振成像技术可以有效的评估 OSASH 患者心脏结构功能及心肌的早期改变，具有重要临床应用价值；（2）OSASH 患者的左心收缩及舒张功能均有不同程度的减低，心肌质量增加；（3）部分 OSASH 患者左心室心肌出现不同程度的炎性改变。

EPO-2095

Left Ventricular Myocardial Deformation Analysis: Study of diastolic function in Chinese male population and its relationship with fat distributions

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Background: Obesity has become an epidemic in China with its increased prevalence especially in male population (1). Overweight/obesity confers elevated risk for adverse health consequences (2). Therefore, early detection of cardiac abnormalities is important for treatment to reverse the progression to heart failure.
Body mass index (BMI) has been proven to be associated with obesity-related comorbidities (2). However, it is not reliable for estimating an individual’s body fat distribution (3). Nowadays, strain analysis based on cardiac magnetic resonance imaging (CMR) has been established to assess myocardial function in diverse cardiac diseases. We aimed to use the Heart Deformation Analysis (HDA)–based strain analysis to assess early subclinical diastolic dysfunction and relationship with fat distributions.
Materials and Methods: A total of 136 male participants with different BMI underwent CMR scanning using a 1.5T MAGNETOM Aera (Siemens Healthcare), 1H-MRS hepatic fat fraction, and computed tomography (CT) scan (Somatom Definition Flash; Siemens Healthcare). They were classified into three groups according to their BMIs with 23kg/m2 and 27.5kg/m2 being cutoff values. A Trufi-Strain prototype software (version 2.0, Siemens Healthcare) was used to quantify strain rate (SR) in both early and late diastole from cine images. Ratios of early and late SRs were calculated. Areas of

epicardial and pericardial adipose tissue (EAT and PAT) were measured on a single 4-chamber-view slice of cine images. Volumes of visceral and subcutaneous adipose tissue (VAT and SAT) were acquired semi-automatically from CT images using the dedicated software Cardiac Risk2.0 (Siemens Healthcare). Analysis of variance or nonparametric tests, correlation and stepwise multivariate regression analysis were applied for statistical analysis.
Results: All SR ratios of obese subgroups were lower than those of lean subgroups(all $p<0.001$). EAT instead of BMI was a significant predictor of SR ratios with β of -0.487, -0.306 and -0.165 for radial, circumferential and longitudinal directions, respectively.
Conclusion: SR ratios derived from cine images might serve as a new imaging marker of early subclinical diastolic dysfunction in obesity. Besides, EAT might be a significant predictor of diastolic dysfunction in obesity

EPO-2096

Agreement and reliability of myocardial fat content measured by m-dixon quant in young normal adults——a preliminary study

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Purpose: Myocardial fat content could potentially reflect early myocardial diseases and metabolic disorders. Magnetic resonance spectrum is the gold standard of measurement of myocardial fat content noninvasively. However, it is poorly reproducible and demands high technique. M-dixon quant is fast and convenient for the clinical settings. To testify the agreement and reliability of myocardial fat content by the way of m-dixon quant in normal adults.
Methods: Between March 2019 and May 2019, 40 volunteers older than 18 years old without evidenced cardiovascular and metabolic diseases were enrolled in our study. All examinations were performed on a 3.0 T MRI scanner (Ingenia, Philips Healthcare, the Netherland) with ECG-gating. Scanning protocol consisted of m-dixon quant sequence including water, fat, in-phase, out-phase and fat fraction map. Scanning range included 4 chambers, apical portion of short-axial, mid portion of short-axial, and basal portion of short-axial of the heart. At first, T2-preparation pulse was added to m-dixon quant sequence (T2-pre m-dixon) in order to enhance the contrast between myocardium and blood pool. Then, m-dixon quant without T2-preparation pulse (m-dixon) was also performed. One senior cardiovascular radiologist manually drew the contour of myocardium on T2-pre m-dixon of all the 4 localizations, and then used ‘copy and paste’ function to duplicate the contour to m-dixon. Measurements of fat fraction were performed on m-dixon. Two weeks later, this senior radiologist and another cardiovascular radiologist performed the measurements again. Reliability was expressed by intraclass correlation coefficient (ICC) and agreement was expressed by standard error mean (SEM).

Results: 20 males and 20 females (mean age: 26.4±6.7 years old) were included in our study. Myocardial fat content of ventricular septum and left ventricle (LV) lateral wall measured by fat fraction map was 1.7±0.7% and 4.3±2.8%, respectively, on 4 chamber sequence. Myocardial fat content of apical ventricular septum and apical portion of LV was 2.4±1.5% and 4.7±3.1%, respectively. Intra- and inter-observer ICC was 0.978 and 0.947 for apical ventricular septum, and 0.915 and 0.971 for apical portion of LV, respectively. Intra- and inter-observer SEM was 0.3±0.06 and 0.2±0.08 for apical ventricular septum, and 0.3±0.07 and 0.4±0.09 for apical portion of LV, respectively. Myocardial fat content of mid ventricular septum and mid-portion of LV was 2.7±1.2% and 4.1±2.4%, respectively. Intra- and inter-observer ICC was 0.907 and 0.951 for mid ventricular septum, and 0.954 and 0.963 for mid-portion of LV, respectively. Intra- and inter-observer SEM was 0.6±0.14 and 0.3±0.07 for mid ventricular septum, and 0.4±0.08 and 0.4±0.05 for mid-portion of LV, respectively. Myocardial fat content of basal ventricular septum and basal portion of LV was 3.2±2.1% and 4.4±2.4%, respectively. Intra- and inter-observer ICC was 0.949 and 0.960 for basal ventricular septum, and 0.981 and 0.935 for basal portion of LV, respectively. Intra- and inter-observer SEM was 0.6±0.10 and 0.7±0.08 for basal ventricular septum, and 0.4±0.05 and 0.3±0.07 for basal portion of LV, respectively. Conclusion: Myocardial fat content measured by m-dixon quant sequence had high intra- and inter-observer reliability and agreement, and could be used in the clinical settings in the future.

EPO-2097

3. 0T 磁共振 FOCUS 扩散成像与常规平面回波扩散成像技术在直肠癌诊断中的应用对比

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目的：比较 3.0T 磁共振 FOCUS 扩散成像与常规平面回波扩散成像技术在直肠癌诊断中的应用。
方法:使用 GE 3.0T Discovery MR750 超导型 MR 系统，扫描线圈使用 16 通道相控阵腹部线圈，对 10 例原发性直肠癌患者分别进行 FOCUS 扩散成像和常规平面回波成像技术的检查。计算并比较两组图像的信号噪声比（SNR）和对比噪声比（CNR），测量两种不同视野弥散加权序列的肿瘤 ADC 值。由 2 名放射科医师独立评判两种扩散加权成像技术的主观图像质量。主观图像质量主要通过图像锐利度，图像扭曲变形，图像伪影，病变显著性以及总的图像质量来进行分析。使用 5 分评价系统，其中 1 分为最差，5 分为最好。采用配对 t 检验比较 2 种图像的噪声、SNR、CNR；两种方法成像的 DWI 图像 ADC 值比较采用配对样本 t 检验。以 Kappa 检验评估 2 名医师不同评价的一致性，并计算 Kappa 值。（P＜0.05 为差异有统计学意义）
结果:10 例原发性直肠患者的弥散图像中，在主观评价上，FOCUS DWI 序列图像空间分辨率较高，直肠图像无变形、无明显伪影，病灶显示较清晰，两者图像比较有显著性意义。
在客观评价上，FOCUS 扩散成像序列的 SNR（44. 17 ± 11. 01 vs. 34. 76 ± 13.30, P<0.001）和 CNR（7. 15 ± 2. 77 vs. 5. 39 ± 2.08, P<0.001），与常规视野弥散加权成像比较，有显著性意义；两种 DWI 序列测量的肿瘤 ADC 值没有显著性差异(0. 991 ± 0. 121 vs. 0. 100 ± 0. 126 X 10-3mmz/s, P=0. 617)。

结论:FOCUS DWI 和常规平面回波 DWI 测量得到的 ADC 值相似，但 FOCUS DWI 可以显著提高图像质量和病变清晰度，减少图像扭曲变形及伪影，提供高分辨率的弥散图像，为直肠癌的精确诊断提供帮助。

EPO-2098

Navigator-triggered or small field-of-view breath-hold 3D MRCP with compressed sensing: An alternative method of traditional MRCP

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Objectives: To compare the image quality and diagnostic performance of three prototypic compressed sensing (CS) accelerated 3D MRCP protocols with conventional MRCP (c-MRCP), and investigatethe effect of phase-encoding (PE) direction upon image quality of small field-of-view(sFOV)breath-hold (BH) CS-MRCP. **Methods:**128 patients prospectively underwent four protocols randomly, including navigator-triggered (NT) CS-MRCP, regular FOV (rFOV) BH-CS-MRCP, sFOV-BH-CS-MRCP in a head-feet PE direction, and c-MRCP. A subgroup of 34 patients were also scanned the sFOV protocol with a left-right PE direction. Two radiologists independently evaluated the image quality and diagnostic confidence on a 5-point scale. **Results:** Acquisition times of CS-MRCP protocols were significantly shorter than c-MRCP (all $P < 0.05$). In 128 patients who underwent the four protocols, the visualization of extrahepatic bile ducts and first-level intrahepatic bile ducts was mostly clear (all $P > 0.05$), whereas that of the second-level intrahepatic bile ducts and pancreatic duct (PD) with rFOV-BH-CS-MRCP was worst (all $P < 0.05$). Both BH-CS-MRCP presented lower background suppression than NT-CS-MRCP (both $P < 0.05$). There were no significant differences among the four protocols when detecting bile duct variants and pancreaticobiliary diseases, whereas sFOV-BH-CS-H/F-MRCP performed better than rFOV-BH-CS-MRCP ($P < 0.05$) when detecting PD variants. The overall image quality and visualization of the common bile duct with sFOV-BH-CS-L/R-MRCP were inferior to sFOV-BH-CS-H/F-MRCP (both $P < 0.05$). **Conclusions:**NT-CS-MRCP provides comparable image quality and diagnostic performance to c-MRCP with significantly shortened acquisition time. sFOV-BH-CS-MRCP can better display the small ductal structures, and the H/F PE direction is recommended.

EPO-2099

Development and validation of an individualized nomogram to identify occult peritoneal metastasis in patients with advanced gastric cancer

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PURPOSE
Occult peritoneal metastasis (PM) in advanced gastric cancer (AGC) patients is highly possible to be missed on CT images, and the patients have high risk to be lately detected during the subsequent laparotomy, or worse, receive improper surgery. We aimed to develop a radiomic nomogram to identify occult PMs.
METHODS
A total of 554 AGC patients from four centers were divided into a training cohort and three validation cohorts. All patients were diagnosed as free from PM by CT, but confirmed the PM status by laparoscopy (PM positive n=122, PM negative n=432). 546 quantitative image features were extracted from both the primary tumor and nearby peritoneum region on CT. Then, radiomic signatures reflecting phenotypes of primary tumor (RS1) and peritoneum (RS2) were built as predictors of PM. An individualized nomogram incorporating RS1, RS2, and clinical factors was constructed and assessed.
RESULTS
The results revealed RS1, RS2, and the clinical factor of Lauren type were significant predictors for occult PM. The nomogram combining RS1, RS2 and Lauren type had powerful predictive ability with AUCs of 0.945 (95% confidence interval [CI]: 0.906-0.985) in the training cohort, 0.880 (95% CI: 0.820-0.941), 0.883 (95% CI: 0.816-0.951) and 0.892 (95% CI: 0.821-0.964) in the three validation cohorts. Moreover, the nomogram demonstrated better diagnostic accuracy than the model with only RS1, RS2, or clinical factors (net reclassification improvement $p<0.05$). Furthermore, the stratification analysis showed that our nomogram had potential generalization ability.
CONCLUSION
CT phenotypes of both primary tumor and nearby peritoneum are significantly associated with occult PM status. A nomogram based on these CT phenotypes as well as Lauren type has an excellent predictive ability of occult PM in AGC.

EPO-2100
基于 MRI 图像的放射组学机器学习分类前列腺癌 Gleason 评分的初步研究

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目的：使用 mpMRI 图像的纹理特征训练放射组学的机器学习模型，通过模型的性能评价探讨其诊断及鉴别 PCa Gleason 评分方面的价值。
材料与方法：本课题回顾性收集我院 2015 年 1 月 1 日至 2018 年 9 月 1 日进行 mpMRI 检查并经病理证实得到确切 GS 的前列腺癌患者，最终的研究人群为 219 例。得到患者的 T2WI、DWI 图像，使用 GE 软件处理 DWI 图得到 ADC 图。将 MRI 图像与组织病理学结果进行匹配，在图像上确定 PCa 大致部位。在 ITK-SNAP 软件上，沿病变边界手动逐层勾画感兴趣区（ROI）最终融合得到三维数据，即感兴趣体积（VOI）。使用 AK 软件中的 One Key 模块，提取出 396 个纹理特征。将数据分成 GS

（3+3）n=36 与 GS（>7）n=103、GS（3+4）n=43 与 GS（4+3）n=49 两组，每组按照 7:3 的比例随机分别分成训练组与验证组。随后进行特征选择并建立六种机器学习模型，为 SVM:C_SVC&LINEAR、SVM:C_SVC&RBF、SVM:C_SVC&sigmoid、Logistic 回归（LR）、K 邻近（KNN）、贝叶斯（Bayes）。同时对这些模型分类器进行训练，得到分类器的准确性、特异性、敏感性，做出 ROC 曲线，得到 ROC 曲线下面积（AUC）及 95%置信区间。

结果：使用 AK 软件自动选出最优模型，其分类性能使用 AUC 评价。AUC 值表现为从最低的 0.590 至最高的 0.915。使用 ADC 图纹理特征训练的 LR 分类器模型 AUC 值为 0.915，在鉴别 GS（3+3）与 GS（>7）组中表现出极好的分类性能；GS（3+4）与 GS（4+3）组中，基于 ADC 图的 C_SVC&RBF 分类器模型的 AUC 值为 0.661，分类性能较好。

结论：使用 mpMRI 的放射组学特征建立机器学习模型，在 PCa GS 中具有良好的分类性能。这对前列腺癌患者采取不同治疗方法及预后预测有着重大的潜力和临床价值。

EPO-2101

Cerenkov imaging of 131I-labeled anti-PD-L1 antibody in xenografted mice model of colorectal cancer

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Objective Antibodies blocking the interaction between programmed death-ligand 1 (PD-L1) and PD-1 exhibit impressive antitumor activity[1], but the expression of PD-L1 in colorectal cancer(CRC) is rarely studied. Our study aims to develop an ^{131}I-labeled tracer that is non-invasive to determine the expression of PD-L1 in CRC in vivo.

Method

1.cell culture

CRC cell lines LS174T, SW480 and HT29 were supplemented with 10% FBS in DMEM, in a humidified atmosphere of 5% CO_2 at 37° C.

2.Radioactive labeling

Radioactive labeling experiments were performed as previously described[2].

3.Flow cytometry

The collected cells were washed 3 times with flow cytometry buffer and stained with anti-PD-L1 antibody (BD, USA) bound to PE according to the manufacturer's plan.

4.Western blot assay

Western blot experiments were performed as previously described[3].

5. Animal models

54 female BALA/C nude mice aged 6-8 weeks weighing 16-20g were selected. All mice were kept sterile for 3 days and divided into 3 groups. Each group was subcutaneously injected with PBS 0.1 mL containing 5.0 x 10^6 LS174T, SW480 and HT29 cells, respectively. When the tumor volume reached 1 cm^3, mice were used for Cherenkov imaging and biodistribution. 3 mice in each group were examined by Cherenkov imaging (24h, 48h, 120h). 5 rats were sacrificed by cervical dislocation at 24h, 48h and 120h, respectively. The isolated organs were dissected and the distribution of ^{131}I-PD-L1-mAb in each organ was evaluated by γ-counter.

Result

The high uptake of ^{131}I-PD-L1-mAb in the liver, lung and thyroid maybe since the liver is responsible for the metabolic clearance of ^{131}I-PD-L1-mAb, while the lung is a blood-rich organ, and ^{131}I-PD-L1-
FCAS and WB results of 3 different CRC cells showed that PD-L1 was expressed on these cells, and the expression level of PD-L1 in 3 cells was LS174T > HT29 > SW480 (Fig. 2 and Fig.3).

Cherenkov imaging of different CRC models was visible(Fig.4). Over time, Cherenkov imaging at different time points showed an increase in contrast between tumors and normal tissues. The uptake level of ^{131}I-PD-L1-mAb was LS174T > HT29 > SW480.
The ratio of tumor muscle radiation intensity (T/M) in 3 tumor models is shown in Fig. 5. The result is consistent with FCAS and WB results.

Conclusion

We have developed a nove l^{131}-labeled anti-PD-L1 monoclonal antibody that demonstrates the feasibility of non-invasive monitoring of PD-L1 expression levels in vivo using Cherenkov imaging.

EPO-2102

Quantitative study of liver hemodynamic changes in rats with small-for-size syndrome by the 4D-CT perfusion technique

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Objective: The microcirculatory hemodynamic changes of small-for-size syndrome (SFSS) are still unclear. In this study, they were investigated by four-dimensional CT perfusion (4D-CTP) technique. Methods: The sham group, 50, 60, 70 and 80 % partial hepatectomy (PH) rat groups were established. At 1 hour (1 h), 1 day (1 d), 3 days (3 d) and 7 days (7 d) post-operation, serological examination, 4D-CTP scan and histopathological examination were performed. One-way analysis of variance and the Kruskal-Wallis test were used for the comparison. Results: Based on the diagnostic criteria of SFSS, the 80 % group was considered to be a successful model. In all the PH groups, portal vein perfusion and total liver perfusion peaked at 1 h and declined at 1d and 3d. Both portal vein perfusion and total liver perfusion were significantly higher in the 80 % group than the sham group, 50 and 60% groups at 1 h ($p < 0.05$), and 80 % group at 3d and 7d ($p < 0.05$). In the 50 and 60 % groups, hepatic artery perfusion decreased at 1 h and maintained at a lower level until at 7 d; whereas, in the 70 and 80% groups, it increased at 1 h, then decreased and reached the lowest level at 7 d. No significant difference appeared in hepatic artery perfusion between any two groups at any time points. At all time points, hepatic perfusion index was lower in all the PH groups than the sham group. Significant differences in hepatic

perfusion index appeared between the 80% group and the sham group at 1 h and 1 d ($p < 0.05$). Conclusions: The CTP parameters quantitatively revealed the microcirculatory hemodynamic changes in SFSS, which were further confirmed to be associated with histopathological injury. It is suggested that the hemodynamic changes in SFSS remnant liver can provide useful information for further revealing the mechanism of SFSS and may help for guiding the treatments. Advances in knowledge: By using the 4D-CTP technique, the hepatic microcirculatory hemodynamic changes could be quantitatively measured in vivo for small animal research.

EPO-2103

Tf 靶向的新型多功能纳米探针在早期前列腺癌的 MRI 分子成像研究

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目的：通过构建集靶向特异性、成像敏感性与体内长循环特性于一体的多功能磁共振成像纳米探针，实现对前列腺癌的早期精确诊断与无创动态监测。**方法：**利用前列腺癌细胞表面高表达的转铁蛋白受体 (Transferrin receptor, TfR) 作为分子探针靶点，以超小金纳米粒子 (Gold nanoclusters, AuNCs) 作载体，将 MRI 成像组件 Gd 及体内长循环特性物质 GSH 进行多功能组装，构建转铁蛋白 (Transferrin, Tf) 靶向的高分辨精准磁共振分子成像纳米探针(Tf-Au@Gd NCs)，并明确探针的生物相容性及体内生物学分布。建立荷人前列腺癌裸鼠移植瘤模型，鼠尾静脉注射纳米探针 Tf-Au@Gd NCs，利用 MR 成像分别从细胞和在体水平监测探针在前列腺癌的分布聚集情况，通过活体动态成像测量肿瘤区 T1WI 信号强度 (Signal intensity, SI) 及对比噪声比 (Contrast to noise ratio, CNR)，评估前列腺癌的负荷和性质，并进行组织学定量分析，验证其实际功效。**结果：**本研究合成的 Tf-Au@Gd NCs 纳米探针具有良好的生物相容性，适合作为早期前列腺癌 MRI 靶向分子成像的造影剂。体外细胞实验表明，Tf-Au@Gd NCs 对前列腺癌细胞 (PC3) 有很高的亲和力；体内动态 MR 成像结果显示，荷瘤裸鼠静脉注射 Tf-Au@Gd NCs 后肿瘤组织 T1 信号强度 SI 及对比噪声比 CNR 随时间延长而显著增强，并可持续至 36 小时；组织切片免疫组化及镀银染色证实 Tf-Au@Gd NCs 在 TfR 高表达的肿瘤处明显聚集。**结论：**本研究构建的 MR 分子成像探针 Tf-Au@Gd NCs 同时具有前列腺癌靶向特异性、成像敏感性及体内长循环特性，可从多角度精准、动态分析早期前列腺癌肿瘤区域病理信息，为实现真正意义的前列腺癌分子水平早期诊断提供了科学依据和实验证据支持，在前列腺癌临床诊疗中有非常广阔的应用前景。

EPO-2104

A TiO2/Ruthenium integrate metal-organic nanostructure: For cancer enhanced X-ray induced photodynamic therapy

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Background and purpose：In recent years, the X-ray induced ROS production was put forward to overcome the restriction of PDT, this study aimed to prepare an efficient

X-ray induced photodynamic therapy (X-PDT) nano-theranostics. **Methods:** The metal-organic nanostructure (MON) for imaging-guided X-PDT were synthesized by the solvothermal reaction, we choose the $[Ti_8Zr_2O_{12}(COO)_{16}]$ cluster reacted with the 2,2′-Bipyridine-4,4′-dicarboxylic acid and the 4,4′-dicarboxylic acid-Tris(2,2′-bipyridine) dichlororuthenium(II) co-organic ligands, preparing the TiZr-Ru MON. The MON could absorb X-ray excitation, and thus enabled the MON possessed outstanding X-PDT and X-ray CT contrast property. Furthermore, the Gd(III) ion was anchored inner the MON and the MON was then possessed unique T1-weighted MRI property. Then the hepG-2 tumor-bearing BALB/c nude mice was applied for the in vivo study. When the tumors reached 80-130 mm^3 in volume, TiZr-Gd MON (5 mg/kg), TiZr-Ru-Gd MON (5 mg/kg), or PBS was injected intravenously and irradiated by X-ray (4 gray) at 12 h post-injection. The mice injected with PBS and TiZr-Ru-Gd MON (5 mg/kg) without X-ray irradiation were selected as control. In addition, to verify good tumor elimination effect the treatments were carried 3 cycles in every three days. And, the tumor volumes and body weights for all groups were recorded every three days. **Results:** the tumors of the TiZr-Ru-Gd MON+X-ray group were exhaustively eliminated, for the PBS+X-ray and TiZr-Gd MON+X-ray groups only partially inhibit tumor growth when compared with the PBS without X-ray group. **Conclusion:** we have constructed an imaging-guided X-PDT strategy for the cancer treatment. The preparation of the MON could open an avenue for the X-PDT nano-theranostics, and fancy properties of the MON could guidance for the X-PDT clinical research.

EPO-2105

Modified Dendrimer nanoparticles for CT imaging and therapy of osteosarcoma.

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PURPOSE

We aim to synthesis dendrimer-entrapped gold nanoparticles (Au DENPs) modified with methotrexate (MTX) for computed tomography CT) imaging and therapy of osteosarcoma.

METHOD AND MATERIALS

At first, we improved the function of generation 5(G5)poly-amidoamine (PAMAM) dendrimers with methotrexate (MTX) moieties. Then, we synthesize Au-G5-MTX DENPs based on the above mentioned G5-MTX-PAMAM. The formed Au-G5-MTX DENPs were characterized by diversified instruments including X-ray attenuation coefficient measurements, UV-vis spectroscopy, transmission electron microscopy (TEM) and so on. A concentration range of 0~100 mM Au-G5-MTX DENPs were prepared in 1.5-mL Eppendorf tubes and placed in a self-designed scanning holder. CT scans were carried out using a clinical LightSpeed VCT CT imaging system with 80 kV, 500 mA, and a slice thickness of 0.625 mm. K7M2 WT cells were cultured in DMEM medium supplemented with 10% FBS, 100 U/mL penicillin, and 100 U/mL streptomycin at 37° C in a 5% CO_2 incubator. Inoculating K7M2 WT cells in female BALB/c mice's caudal vein and back, with cell counting 1×10^6, to establish transplanted and metastatic osteosarcoma models. The

tumor-bearing BALB/c mice established as mentioned above were anesthetized by intraperitoneal injection of pentobarbital sodium (40 mg/kg).

RESULTS

The stability Au-G5-MTX DENPs in either water or PBS solution was proved by UV-vis spectroscopy. TEM images showed that Au-G5-MTX DENPs have the uniform size and distribution. And transverse CT images demonstrated X-ray attenuation intensities increase with the concentration of the nanomaterial improves. The CT values of the transplanted tumor achieved peak value at 30min post subcutaneous injection. ICP test showed that cell uptake of the Au-G5-MTX DENPs increased with the enhancement of the concentration of Au until reach saturation point (200uM). The vitro therapy effect was confirmed by CCK-8 assay of the viability of K7M2 WT cells.

CONCLUSION

In summary, we synthesis a promising Au DENP-based theranostic nanomaterial with anticancer drug complexes. It not only can realize diagnosis of osteosarcoma but also to some extent achieve the therapy of it.

EPO-2106

金纳米飞镖的制备及其 CT 造影效果研究

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一、目的

1、利用一步法制备出金纳米飞镖，其均一性分散性良好，并具有近红外 I 区特征吸收峰。

2、利用 CT 扫描，通过 CT 数值测量评价纳米飞镖金颗粒造影效果并分析其浓度对 CT 造影的影响。

二、方法

1、实验之前，将 $HAuCl_4$（0.25 M）溶于 DMF 中老化一周以上，然后将 400 μL PVP（Mw= 29000，5 wt%溶于 DMF）、80 μL DEA、35 μL $HAuCl_4$（0.25 M）依次加入 8.4 mL DMF 中，室温下搅拌 5 min，最后在 100℃ 油浴锅中搅拌 10 min。最终反应溶液通过高速离心，收集沉淀物。再重悬于去离子水中，重复三次离心操作，得到纯化的金纳米飞镖。对已制备的金纳米飞镖进行电镜扫描和紫外荧光光谱检测。

2、对金纳米飞镖进行 CT 扫描前制样，将装有 0.00、0.25、0.5、1.00、1.50 mg/L 金纳米飞镖溶液样品置于 CT 扫描床上，保持同一水平线；同时测量相同浓度的商用碘照影剂。测量样品同一层面相同面积的 CT 值，并对其进行统计分析。

三、结果

1、由 TEM 图看出金纳米颗粒呈四角飞镖结构，长度大约 180 nm，厚度 50 nm 左右，具有良好的均一性及分散性。从紫外吸收光谱图可以看出，金纳米飞镖具有两个特征吸收峰，第一个峰在 500 ~ 700 nm 之间，为横向表面等离子共振吸收峰；第二个峰在 800 ~ 1200 nm 之间，为纵向表面等离子共振吸收峰，并且第二个吸收峰有着更强的吸收强度。

2、从 CT 图像数值分析可以看出，金纳米飞镖的浓度与其 CT 值呈现良好的线性关系，随着浓度的增加，CT 值也在增加。同一浓度下，金纳米飞镖的 CT 值为商用碘照影剂的 2 倍左右。

四、结论

1、通过一步法制备了金纳米飞镖，由于金纳米飞镖尖端效应，使其在紫外吸收光谱图中具有两个吸收峰，并且第二个峰出现在近红外 I 区。

2、通过 CT 扫描成像，数据分析表明，随着金纳米飞镖浓度的增加，CT 值也随着增加；并且金纳米飞镖具有比商用碘照影剂具有更好。

EPO-2107
靶向神经菌毛素纳米探针制备及对乳腺癌治疗的实验研究

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目的：神经菌毛素 1（NRP-1）与肿瘤血管生成有关，可促进肿瘤的生长和转移。研究表明，NRP-1 在乳腺癌中的过表达，与肿瘤的侵袭性密切相关。 因此，NRP-1 是乳腺癌治疗的潜在靶点。利用 NRP-1 靶向肽 CRGDK 为靶向分子制备纳米探针，研究其对小鼠乳腺癌模型的抑制作用。
方法：以树枝状聚合物（PAMAM）为载体，CRGDK 为靶向分子，通过酰胺化反应，制备靶向 NRP-1 的纳米探针。将小鼠 4T1 细胞种植在小鼠的右腋皮下，制备小鼠乳腺癌模型。
结果：体外细胞实验表明，该纳米探针能够特异性的结合在 4T1 细胞表面，并且对细胞没有明显的毒性，探针组与 4T1 细胞的结合率是对照组的 2.2 倍。体内近红外荧光成像实验结果显示，纳米探针能够特异性的聚集在肿瘤组织中。体内药效实验表明，通过靶向 NRP-1，纳米探针能够有效的抑制肿瘤生长，抑制率达到 58%。
结论：CRGDK 靶向探针能够有效的抑制乳腺癌的生长，为乳腺癌的治疗提供了另一个可能途径。

EPO-2108
The anti-tumor growth and anti-angiogenesis of Xanthain in murine glioma dynamically evaluated by MRI and DCE-MRI

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PURPOSE
To investigate the suppressive effects of Xanthatin on glioma growth in nude mice xenograft model and rat orthotopic implantation model, using MRI to dynamically monitor the anti-tumor growth and evaluate the anti-angiogenesis of Xanthatin

METHOD AND MATERIALS
The nude mice xenograft tumor model and rat orthotopic implantation model were established to observe the anti-tumor effects of Xanthatin in vivo. In rat orthotopic implanted tumor model, the conventional magnetic resonance imaging (MRI) and the dynamic contrast-enhanced magnetic renasance imaging (DCE-MRI) scanning were used to dynamically monitor the anti-tumor growth effect and evaluate the anti-angiogenesis of Xanthatin, respectively. The anti-tumor effect of Xanthatin was confirmed by htoxylin wosin (HE) staining. Vascular endothelial growth factor (VEGF) expression in tumor tissue was detected by immunohistochemical method.

RESULTS

We found that Xanthatin at the dose of 0.4 mg/10g dramatically decreased the growth of xenograft tumor in nude mice. In rat orthotopic implantation model, we also found xanthatin reduced the volume of C6 glioma dynamically detected by the conventional MRI. The anti-angiogenesis of Xanthain in C6 glioma was evaluated by DCE-MRI with comparison of volume transfer constant (Ktrans) value, a parameter that reflects vessel permeability. We found Xanthain at the doses of 8 mg/kg and 16 mg/kg significantly decreased Ktrans value, which suggests that Xanthain has anti-angiogenesis. These results were confirmed by HE staining and immunohistochemistry. By detecting the expression of VEGF in tumor tissues, we found that Xanthain decreased the number of VEGF-positive cells, compared with the vehicle control.

CONCLUSION
These data demonstrate the suppressive effects of xanthatin on C6 glioma via anti-angiogenesis. Meanwhile, this study also provides an evidence for the application of the conventional MRI and the quantitative parameters of DCE-MRI in dynamically evaluating the growth of intracranial tumor and anti-angiogenesis in the experimental and clinical research

EPO-2109
基于 SPECIAL 序列检测肝糖代谢的参数优化和 LCMode 基础集制作研究

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目的：基于试管模型实验，优化 SPECIAL 序列检测活体肝脏磁共振频谱的扫描参数，制作基于上述序列，定量检测肝代谢的 LCModel 基础集，为 SPECIAL 序列增加抑脂脉冲，最后在离体肝脏上验证上述检测葡萄糖浓度的性能。
材料与方法：首先参考肝主要代谢物，配置葡萄糖（50mM）、鱼肝油（12%）、胆碱（100mM）、及以上三种代谢物混合的试管模型，调 pH 至 7.2。所有实验在 7T 磁共振上实验，分别用不同的重复时间（TR）、回波时间（TE）、混合时间（TM）、averages 等扫描参数，以及不同的抑水方法，在试管模型上得到对应的 SPECIAL 序列磁共振波谱。根据上述肝脏频谱中水峰半高宽（FWHM）、信噪比（SNR）及葡萄糖峰半高宽，优化上述扫描参数，并在离体肝脏上进行检验；然后使用 Vespa 软件制作基于 SPECIAL 序列的肝主要代谢物（脂质，胆碱，葡萄糖）的 LCModel 基础集，并在 LCModel 软件上，使用我们制作的基础集，定量分析上述谱线，得到葡萄糖浓度；最后在 7T 磁共振平台上，为 SPECIAL 序列添加 Fat Sat 抑制脂肪脉冲，抑制 1.3ppm 处的脂肪峰，优化葡萄糖检测效果，并在离体肝脏上进行检验。
结果：我们的实验证实，TR = 3500 ms、TE = 4.42 ms、TM = 20 ms、 averages = 256 时，使用 SPECIAL 序列得到的肝脏谱线具有最优信噪比，葡萄糖分辨率更高。 在 LCModel 软件上，使用自制的 SPECIAL 肝脏代谢基础集，可提高肝代谢拟合的准确性。增加抑脂脉冲的 SPECIAL 序列，配合自制基础集，可以提高 LCModel 拟合葡萄糖的准确性。
结论：使用增加抑脂脉冲的 SPECIAL 序列，在优化的采集参数下，配合自制的 LCMdoel 基础集，可以实现离体定量肝脏葡萄糖浓度，有助于实现临床检测肝脏糖代谢异常。

EPO-2110

Varying Correlation between Inflammation and Microvascularization in Carotid Atherosclerotic Plaques with Hybrid 18F-FDG PET/MR

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Objective: *Hallmarks of vulnerable atherosclerotic plaques are inflammation that can be quantitatively assessed with ^{18}F-fluorodeoxyglucose positron emission tomography (^{18}F-FDG-PET), and increased neovascularization that can be evaluated by dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI). It remains unclear whether these parameters are correlated or represent independent imaging parameters. This study determines to investigate the correlation between inflammation and neovascularization in atherosclerotic carotid plaques with hybrid ^{18}F-FDG PET/MR.*
Methods: *Twenty-five patients with transient ischemic attack or minor stroke in the carotid territory and ipsilateral carotid artery stenosis of 30% to 69% were included. All patients underwent hybrid PET/MR a median of 180 min after injection of ^{18}F-FDG. ^{18}F-FDG standard uptake values with target/background ratio (TBR) were determined. Neovascularization was quantified by transfer constant (K^{trans}). Spearman rank correlation coefficients between TBR and K^{trans} were calculated.*
Results: *The correlation between TBR and K^{trans} was only marginal in the whole study sample (r=0.25, p=0.043). The two variables correlated with each other in the symptomatic plaques (r=0.71, p=0.013), but were independent in the asymptomatic plaques (r=0.03, p=0.473). Neither TBR nor K^{trans} was significantly higher in the symptomatic plaques, but both showed inverse relationships with time since last cerebrovascular ischemic event (r=-0.92 and -0.74 for TBR and K^{trans}, respectively).*
Conclusion: *The correlation between inflammation and microvascularization in carotid atherosclerotic plaques with hybrid ^{18}F-FDG PET/MR varied with clinical conditions. Hybrid ^{18}F-FDG PET/MR systems can help to evaluate the correlation between inflammation and microvascularization in carotid atherosclerotic plaques.*

EPO-2111

Specific Soft Tissue Invasion And LMP1 Expression Are Potential Indicators of Extranodal NK/T-cell Lymphoma, Nasal Type Prognostic indicators of ENKTL-NT

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Background: Extranodal NK/T-cell lymphoma, nasal type (ENKTL-NT) is difficult to distinguish from nasal polyps and inverted papilloma, leading to its high misdiagnosis ratio. The aim of this study was to investigate its potential prognostic indicators.

Material and Methods: Kaplan-Meier method was adopted to calculate overall survival (OS) rate. Cox proportional-hazards regression was used to analysis risk ratios (ORs) with 95% confidence intervals (CIs).
Results: Nasal ala infiltration and the nasal floor thickness > 2.0 mm or nasal septum thickness >2.5 mm were potential prognostic factors for OS (p = 0.0323; 0.0072, respectively). Cox proportional-hazards regression indicated that high LMP1 expression and the nasal floor thickness > 2.0 mm or nasal septum thickness > 2.5 mm were the independent risk factor for poor OS rate of ENKTL-NT (HR = 3.0655, p = 0.028; HR = 2.3650, p = 0.0452, respectively). In the subgroup analysis, the OS rate was lower when the nasal floor thickness > 2.0 mm or nasal septum thickness > 2.5 mm in the patients who had high expression of LMP1 (p = 0.0651).Whereas, high LMP1 expression increased the risk of worse prognostic outcome in patients with deep infiltration thickness. Thus, high LMP1 expression may contribute to the tissue invasion of ENKTL-NT.
Conclusion: Any patient with nasal ala soft tissue invasion, nasal floor thickness > 2.0 mm/nasal septum thickness > 2.5 mm on CT imaging or high LMP1 expression should prompt to immediately consider histopathologic diagnosis to rule out ENKTL-NT in clinical.

EPO-2112
阿尔茨海默病的可能机制：脑网络间交互作用异常

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[摘要] **目的**：利用静息态 fMRI 探讨阿尔茨海默病(Alzheimer disease，AD)患者脑网络间交互作用异常。 **方法**：采集 27 名健康老年志愿者及 24 名阿尔茨海默病患者大脑静息态 BOLD-fMRI 数据。采用 SPM8 和 RESTplus 软件包进行数据预处理，选取属于默认网络（default network, DN）和背侧注意网络（dorsal attention network, DAN）的脑区，提取每个脑区的平均时间序列。为量化 DN 与 DAN 之间交互作用，运用功能连接分析法计算每个被试 DN 和 DAN 之间（DN-DAN）的功能连接值，对两组受试者的功能连接值进行独立样本 t 检验，计算两组受试者 DN-DAN 平均功能连接值。**结果**：正常老年人 DN-DAN 平均功能连接值为-0.133，AD 患者 DN-DAN 平均功能连接值为-0.157。与正常老年组相比，AD 患者 DN-DAN 功能连接负值增加（P=0.007）。**结论**：AD 患者 DN 与 DAN 之间交互作用存在异常，可为探寻阿尔茨海默病的发病机制提供新思路。

EPO-2113
小分子影像探针在脑胶质瘤诊断方面的应用探索

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目的 探索磁共振分子影像、活体荧光检测和荧光分子断层成像技术等分子影像学技术在脑胶质瘤诊断方面方面的应用，为胶质瘤的早期诊断、组织类型和 WHO 分期等方面的确认提供参考，帮助临床医生制定个性化的治疗方案，在更长的术后生存期和更高的生活质量之间达到平衡。

方法 首先，我们收集了 30 例术前胶质瘤病例，采集 MRI 平扫增强、MRS、DTI 与灌注方面的数据。利用高通量测序的方法检测胶质瘤与癌旁组织样本中差异表达分子信息；然后挑选其中差异性较大的分子进行组织学与细胞学验证。通过 MRI 磁共振成像和荧光断层成像观测生物体内细胞与分子水平的变化,通过图像重建提供目标物在生物体内的分布等信息,克服平面成像的局限性,有助于疾病的早期诊断。
结果 MRI 平扫增强、MRS、DTI 与灌注等检查项目在恶性胶质瘤的诊断方面具一定的参考价值，但特异性不强。胶质瘤及其癌旁组织样本高通量测序筛选出了差异表达的 miRNA 共有 211 个，EGFR 和 STAT3 等基因的表达均有明显的差异性。同时通过与团队成员的合作，充分论证了 MRI 肿瘤分子成像纳米探针的制备条件。后期将主要筛选与目标 miRNA 分子具有高亲合性、高特异性结合的核酸适配体与磁共振分子成像靶向性 Gd（Ⅲ）螯合物纳米粒子来研究 miRNA 分子的表达水平变化。
结论 MRI 平扫增强、MRS、DTI 与灌注等常规检查在胶质瘤的诊断方面具有价值，但同时存在诸多局限。IDH、EGFR 和 STAT3 及小分子 RNA 与胶质瘤的发生发展密切相关，这为胶质瘤的诊疗提供了新的靶标和不同的思路。这些研究为后期探索分子影像学技术检测体内特征分子表达量从而进行胶质瘤的诊断和预后评价提供了理论前提。

EPO-2114

The relationship between serum concentration of vitamin D, total intracranial volume, and severity of depressive symptoms in patients with major depressive disorder

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Background: Depression has been linked to vitamin D deficiency. However, little attention was paid to the neural substrate underlying this association. Prior neuroimaging studies have demonstrated that serum vitamin D level alterations are associated with brain volume changes and patients with MDD have widespread cortical and subcortical volume abnormalities. Given these findings, one may speculate that there is an association among serum vitamin D concentration, severity of depressive symptoms, and total intracranial volume (TIV, a global and unbiased volumetric parameter) in patients with MDD. In this study, we aimed to clarify this issue and hypothesized that TIV would mediate the relationship between serum vitamin D concentration and severity of depressive symptoms.
Methods: Fifty patients with major depressive disorder (MDD) were enrolled in this study. High-resolution structural magnetic resonance imaging was performed to calculate total intracranial volume (TIV). Peripheral venous blood samples were collected to measure serum vitamin D concentration. Hamilton Rating Scale for Depression (HAMD) was used to assess severity of depression symptoms. The relationship among TIV, serum vitamin D
concentration, and HAMD score was examined using correlation, linear regression, and mediation analyses.
Results: In patients with MDD, HAMD score was negatively correlated with TIV and serum vitamin D concentration, and TIV was positively correlated with serum vitamin D concentration. Linear regression analyses showed that TIV and serum vitamin D concentration were significant predictors of HAMD score. Importantly, mediation

analysis revealed that TIV significantly mediated the relationship between serum vitamin D concentration and HAMD score.
Conclusion: Our main findings are twofold: 1) in patients with MDD, more severe depressive symptoms were related to smaller TIV and lower serum vitamin D concentration, and smaller TIV was related to lower serum vitamin D concentration; 2) TIV was a significant mediator of the association between serum vitamin D concentration and severity of depressive symptoms in the patients. This finding may help to establish TIV as a potential neural biomarker for monitoring responses to adjuvant therapy of vitamin D in patients with MDD.

EPO-2115
产后抑郁症局部神经活动变化的静息态 fMRI 研究

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目的：探讨产后抑郁症（postpartum depression, PPD）患者静息状态下的局部神经活动变化特征及其与抑郁程度的相关性。
方法：选取符合 DSM-5 单相抑郁的诊断标准， 24 项汉密尔顿评定量表（24-item Hamilton Rating Scale，HAMD）评分大于 20 分，爱丁堡产后抑郁量表（Edinburgh Postnatal Depression Scale，EPDS）评分>12 分的 16 例产后抑郁母亲（PPD 组）及与之年龄等相匹配的 16 名产后正常母亲（对照组），使用 3.0T 磁共振采集静息态功能磁共振（resting-state functional magnetic resonance imaging, R-fMRI）数据。 采用双样本 t 检验比较组间低频振幅(amplitude of low-frequency fluctuation，ALFF)和局部一致性（regional homogeneity，ReHo)数。将异常脑区的 ALFF 值及 ReHo 值与 HAMD、EPDS 分别进行相关性分析。
结果：与对照组相比，PPD 患者右侧小脑前叶（山顶）和左背外侧前额叶 ALFF 值增加，右顶叶 ALFF 值降低。产后抑郁症组的左侧眶部额上回、眶部额下回、额上回、额中回、楔前叶及顶下小叶的 ReHo 值比产后对照组的更高。右侧大脑（枕叶、额下回、额叶）和左侧小脑下半月小叶的 ReHo 值降低。 左背外侧前额叶的 ALFF 值与产后妇女的 HAMD 评分呈正相关（r = 0.583，p <0.05）。
结论：PPD 患者存在情绪调节区域神经元活动的改变，左背外侧前额叶的 ALFF 值越高的患者抑郁程度更严重。

EPO-2116
超高场 7T 磁共振及平衡稳态自由进动序列助力超顺磁性纳米铁粒子标记巨噬细胞成像

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目的：
本研究的目的是探究超高场 7T 磁共振（MRI）及平衡稳态自由进动序列（bSSFP）对超顺磁性纳米铁粒子（Feraheme）标记的巨噬细胞的成像效果及其可能的临床应用。

材料与方法：

使用肝素+鱼精蛋白+Feraheme 组成的自组合纳米复合物标记 THP-1 分化的巨噬细胞。将不同数量的标记细胞注射入模型及小鼠脑内分别进行显微镜下及 MRI 成像。分别对约 100、1000 个标记细胞进行了成像并分析 3T 及 7T 磁共振的 SWI 及 bSSFP 序列的成像效果。分别重建出 bSSFP 序列的平均值图像、最大密度投影图像、均方根图像并计算其所得标记细胞成像的信噪比及对比信噪比。

结果：

细胞标记效率达到了 90%以上。3T 及 7T 机器均检测精度均达到约 100 个细胞水平。7T MRI 配合 bSSFP 序列达到了最佳的成像效果。并且通过显微镜图像与 MRI 图像的融合，显示出 7T MRI 比 3T MRI 成像多显示出了约 29%的细胞。由于磁敏感效应，SWI 序列显示的细胞较大，但 bSSFP 序列的图像分辨率高且信噪比高。

结论：

7T 磁共振配合 bSSFP 序列可以显示约 100 个纳米铁粒子复合物标记的巨噬细胞。本研究为细胞标记磁共振成像的临床及科研应用做了探索性研究。

EPO-2117

Spontaneous reduction of KMnO4 with MoS2 quantum dots for targeted magnetic resonance imaging and fluorescence labeling of renal cell carcinoma

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Spontaneous reduction of $KMnO_4$ with MoS_2 quantum dots for targeted magnetic resonance imaging and fluorescence labeling of renal cell carcinoma

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Aim

A one-step method was developed to prepare MnO_2/MoS_2 nanocomplex by a spontaneous reduction of $KMnO_4$ with MoS_2 QDs as the reductive agent.

Methods

A “bottom-up” hydrothermal approach was introduced to synthesize MoS_2 QDs with $Na_2MoO_4{\cdot}2H_2O$ as molybdenum source and glutathione (GSH) as sulfur source. Different technologies such as TEM, AFM, fluorescence spectra scanning, MRI scanning were applied for the characterization and the property evaluation of the fabricated nanocomplex.

Results

The formed MnO_2/MoS_2 nancomplex presented a quenched fluorescence emission of MoS_2 QDs and a weak MRI contrast enhancement of MnO_2 NSs. However, in the presence of GSH, the reduction of MnO_2 NSs to Mn^{2+} activated the MRI signal and broke up the structure of MnO_2 NSs to light up the fluorescence emission of MnO_2 QDs. After conjugated with AS1411 aptamer, the specific *in vivo* MR imaging and fluorescence labeling of 786-O tumor cells were realized, showing their promising potential for biomedial applications.

Conclusion

In this work, we proposed a one-step method to prepare fluorescent/MR contrast agent, MnO_2/MoS_2 nanocomplex by a spontaneous reduction of $KMnO_4$ with MoS_2 QDs as the reductive

agent. The formed MnO_2/MoS_2 nancomplex presented a quenched fluorescence emission of MoS_2 QDs and a weak MRI contrast enhancement of MnO_2 NSs. However, in the presence of GSH, the reduction of MnO_2 NSs to Mn^{2+} activated the MRI signal and broke up the structure of MnO_2 NSs to light up the fluorescence emission of MnO_2 QDs. After conjugated with AS1411 aptamer, the specific in vivo MR imaging and fluorescence labelling of 786-O tumor cells were realized with AS1411-MnO_2/MoS_2 nanoprobes. With the additionally applications of MnO_2 nanosheets such as photothermal therapy, imaging-guided combined therapy and the exploration of MoS_2 QDs with longer emission wavelength as well as the utilization of photocatalytic hydrogen evolution ability and excellent optoelectronic properties of MoS_2 QDs, more promising potential applications might be realized in the near future. Particularly, the emergence of two-photon fluorescence (TPF) MoS_2 QDs, which have been applied for multiphoton fluorescence imaging under the excitation of a low power NIR laser, would further advance the bioimaging applications of MoS_2 QD-based nanomaterials.

EPO-2118
FA-MoS2/BSA-Gd2O3 诊疗一体化纳米探针对乳腺癌的靶向诊疗研究

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目的：构建诊疗一体化纳米探针 FA-MoS2/BSA-Gd2O3，实现乳腺癌的磁共振靶向成像及光热治疗。
方法：
1.制备 BSA-Gd2O3，并剥离出单层 MoS2/BSA-Gd2O3 纳米片及对其进行表征分析及性能测试。
2.检测 MoS2/BSA-Gd2O3 的生物相容性、对不同细胞的细胞毒性；对照观察 MoS2/BSA-Gd2O3 对活体的毒性。
3.构建 FA-MoS2/BSA-Gd2O3 诊疗一体化纳米探针并进行表征分析。
4.检测 FA-MoS2/BSA-Gd2O3 的靶向磁共振成像性能及靶向光热治疗效率。
5.构建乳腺癌载瘤裸鼠模型，探究 FA-MoS2/BSA-Gd2O3 的在体磁共振成像，观察其在裸鼠体内的分布情况及可能的代谢途径。
7.探究 FA-MoS2/BSA-Gd2O3 对乳腺癌载瘤裸鼠的在体靶向光热治疗效果。
结果：
1.成功通过一步法原位剥离制备 MoS2/BSA-Gd2O3 纳米片及构建 FA-MoS2/BSA-Gd2O3 诊疗一体化纳米探针，并通过 TEM、HRTEM、AFM、ICP-MS、UV-vis、FTIR、MRI 等对其进行表征分析及性能测试。
2.单层 MoS2/BSA-Gd2O3 的产率大于 60 wt%，弛豫效率高达 14.35±1.84 $mM^{-1}s^{-1}$。
3.细胞及动物实验证明 MoS2/BSA-Gd2O3 及 FA-MoS2/BSA-Gd2O3 具有良好的生物相容性。
4.细胞实验证明 FA-MoS2/BSA-Gd2O3(Ab(+))组与 FA-MoS2/BSA-Gd2O3(光照组)具有更好的 MR 成像效应及光热转换效率。
5.动物实验证明 FA-MoS2/BSA-Gd2O3(光照组)对 4T1 乳腺癌载瘤裸鼠的在体靶向光热治疗明显优于其他组。
结论：本研究成功构建了诊疗一体化纳米探针 FA-MoS2/BSA-Gd2O3，实现了靶向诊断和靶向治疗的目的，同时实现了乳腺癌的磁共振靶向成像及光热治疗。

EPO-2119

Synthesis of Multifunctional Rare-earth Vanadate Nanoparticles for Magnetic Resonance Imaging and Luminescence Bioimaging

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PURPOSE:
The purpose of our study is to introduce Gadolinium orthovanadate Nanoparticles containing Eu^{3+} and Bi^{3+} ions ($GdVO_4$: Eu^{3+}, Bi^{3+} NPs) and determine the *in vitro* and *in vivo* bimodal imaging characteristics of the NPs.
METHOD:
In this study, $GdVO_4$: Eu^{3+}, Bi^{3+} NPs were synthesized using polyethylenimine-assisted hydrothermal method. The uptake properties on HepG2 cells and optical properties were tested using flow cytometry and confocal laser-scanning microscopy (CLSM). A 3.0 T Magnetic resonance imaging (MRI) system was performed for exploring the MR imaging characteristics of the NPs . The liver orthotopic transplantation tumor-bearing mouse model was established for *in vivo* MRI. Additionally, the Cell Counting Kit-8 (CCK-8) assay and histology studies were conducted to test the safety of the NPs.
RESULTS:
A strong red luminescence in the interior of the cells was observed in a CLSM. The r_2/r_1 ratio of the NPs was calculated as 7.42, which is higher than the clinical value (r_2/r_1 ratio close to 1). As for signal intensity, the liver parenchyma regions showed a significant decrease about 44% and the tumor tissue showed an enhancement of 27% in T_2-weighted images (T_2WI). Furthermore, a negligible proliferation change was detected in the CCK-8 assay and no noticeable abnormalities were observed among the animals.
CONCLUSIONS:
$GdVO_4$: Eu^{3+}, Bi^{3+} NPs are multimodal imaging agents that enable effective MR T_2 imaging and downshifting luminescence (DSL) imaging. The NPs exhibit low toxicity and excellent biocompatibility, indicating the potential in clinical bioimaging applications.

EPO-2120

基于天然黑色素的 MMP2 响应型多模态成像纳米探针

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目的：制备一种新型的 PEG-Pep_{MMP2}@MNP- Gd^{3+}纳米探针，它通过感知肿瘤部位基质金属蛋白酶-2（MMP-2），引发团聚以增强 T1 的核磁共振成像相关系数。同时由于黑色素具有很好的光声特性和较好的近红外吸收，实现核磁共振和光声双模态成像。
方法：1.PEG-Pep_{MMP2}@MNP- Gd^{3+}纳米探针的构建。2.PEG-Pep_{MMP2}@MNP- Gd^{3+}纳米探针的表征及体外实验 2.1 纳米碳针取 1mg/ml,稀释一定倍数，动态光散射（DLS）测其粒径大小，TEM 观察其形貌；2.2 采用 CCK8 法检测不同浓度纳米探针的细胞毒性；2.3 利用 MRI、PAI 成像系统检测按比例稀释后探针和对照溶液的信号强度，找出最佳浓度。3.MMP-2 敏感性响应实验。4.PEG-Pep_{MMP2}@MNP- Gd^{3+}纳米探针的体内多模态成像:建立 4T1 肿瘤动物模型，尾静脉注射纳米探针，并以未连 MMP-2 溶液为对照组，在不同时间段进行 MRI、PAI 成像扫描，观察对比两种探针在肿瘤动物模型中的两种成像效果。
结果：1.制备的 PEG-Pep_{MMP2}@MNP- Gd^{3+}纳米探针水溶性好，通过 DLS 和 TEM 测量，平均粒径在 17nm 左右。2.CCK-8 实验中，当浓度低于 800ug/ml 时，基本对细胞无毒性；3.MMP-2 敏感性响应实验中，与 MMP-2 孵育后探针粒径随时间变大，且在电镜下观察到聚集；4. PEG-Pep_{MMP2}@MNP- Gd^{3+}纳米探针具有良好的 MR、PA 成像信号，且与对照组相比，信号有明显增强。
结论：制备出一种能同时实现双模态成像的新型 PEG-Pep_{MMP2}@MNP- Gd^{3+}纳米探针，其合成工艺简单，毒性低，通过肿瘤部位 MMP-2 响应性聚集，与之前构建的纳米探针相比，增强了核磁共振 T1 和光声成像相关系数。

EPO-2121

DTPAA-Gd Functionalized Ultrasmall Au15NCs Nanohybrids for Multimodal Imaging

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Multimodal imaging agent has potential to overcome the shortage and incorporate the advantages of different imaging tools for extremely sensitive diagnosis. To achieve multimodal imaging, combining multiple contrast agents into a special nanostructure has become a main strategy; However, the combination of all of these functions into one nanoplatform usually requires a complicated synthetic procedure that results in heterogeneous nanostructure. In this study, using ultrasmall gold nanoclusters with 15 gold atoms (Au_{15}NCs) as the core and diethylenetriamine-pentaacetic acid dianhydride (DTPAA-Gd) as the shell, we develop a kind of good biocompatible nanohybrids as an optimized multimodal imaging probe. The Au_{15}NCs-DTPAA-Gd nanohybrids produce strong red fluorescence upon laser stimulation at 485 nm and simultaneously display a better X-ray attenuation property than conventionally used iodine-based contrast agents (e.g., Omnipaque). Meanwhile, the integrated DTPAA-Gd component not only endow the nanohybrids to produce higher T_1 relaxivity (r_1 = 21.4 mM^{-1} s^{-1}) than Omnipaque (r_1 = 3.973 $mM^{-1}s^{-1}$), but also further enhance X-ray attenuation property of Au_{15}NCs. Ultimately, the Au_{15}NCs-DTPAA-Gd nanohybrids are confirmed to be effective and applicable for near-infrared fluorescence (NIRF) imaging, X-ray computed-tomography (CT) and magnetic resonance (MR) imaging *in vivo*. The multimodal imaging based on Au_{15}NCs-DTPAA-Gd may be a promising strategy for precision medicine.

EPO-2122

活体生物发光成像监测 JNK/c-Jun:ATF2 信号通路介导的肿瘤顺铂耐药

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目的：探索 JNK/c-Jun:ATF2 信号通路在肿瘤顺铂耐药中的作用，进一步通过活体生物发光成像监测该通路在肿瘤顺铂治疗后的动态变化。
方法：首先，在 Hep 3B 肝癌细胞，10 μM 顺铂或 DMSO 处理 3-24 h 后，检测 p-JNK、p-c-Jun、p-ATF2 的水平，并检测 c-Jun:ATF2 结合元件 ATF 的活性以及其调控的 DNA 损伤反应（DDR）相关基因的 mRNA 水平。进一步，使用 JNK 抑制剂 SP600125 或 ATF-decoy 抑制该信号通路，检测它们能否与顺铂发挥协同杀伤 Hep 3B 细胞的作用。最后，分别将 CMV-Luc2（反映肿瘤细胞数目）和 ATF-Luc2（反映 ATF 元件的绝对活性）报告基因标记的 Hep3B 细胞种植到裸鼠皮下，腹腔注射顺铂或 PBS 后，活体生物发光成像检测 ATF 元件活性的动态变化。
结果：顺铂处理组的 p-JNK、p-c-Jun 和 p-ATF2 的水平均高于对照组；顺铂处理 12 h 后，ATF 元件活性增强；部分 DDR 相关基因 mRNA 水平在顺铂处理 12 h 或 24 h 后上调。SP600125 或 ATF-decoy 联合顺铂处理 Hep 3B 细胞 36 h 后，双链 DNA 损伤标志物（H2AX、p-H2AX）及细胞凋亡标志物（cleaved-caspase 3、cleaved-PARP）的蛋白水平增加。活体生物发光成像结果显示，药物处理 12 h 后，顺铂处理组的 ATF-Luc2/CMV-Luc2 比值（反映 ATF 元件的相对活性）是 PBS 处理组的 1.7 倍。
结论：顺铂给药导致肿瘤细胞 JNK/c-Jun:ATF2 信号通路激活、c-Jun:ATF2 结合元件 ATF 活化以及其调控的 DDR 相关基因的 mRNA 水平上调；抑制 JNK/c-Jun:ATF2 信号通路能增加肿瘤细胞对顺铂的敏感性；活体生物发光成像证实顺铂给药后肿瘤 JNK/c-Jun:ATF2 信号通路激活。

EPO-2123
MR 成像靶向动脉粥样硬化模型转化生长因子-β1 表达的实验研究

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目的：化学偶连法合成 TGF-β1 靶向的超微超顺磁性纳米氧化铁（USPIO）探针，探讨 MR 靶向 Apo E-/-小鼠主动脉动脉粥样硬化斑块中 TGF-β1 蛋白表达体内成像的可行性。
方法：将聚乙二醇（PEG）包被的 USPIO 与抗小鼠 TGF-β1 抗体结合，构建 anti-TGF-β1-USPIO 靶向探针。以单纯 USPIO 作为对照。应用透射电镜（TEM）、动态光散射法（DLS）、酶联免疫吸附间接法（ELISA）分析探针的物理及特异性特征。靶向探针组（n=10）注射 anti-TGF-β1-USPIO，对照组（n=10）注射单纯 USPIO，分别于注射前、注射后 24 h 进行 7.0T MR 成像。成像后立刻取主动脉标本进行 TGF-β1 免疫组化染色，并行普鲁士蓝染色，观察斑块内铁沉积。
结果：注射 anti-TGF-β1-USPIO 后 24 h，小鼠主动脉斑块信号明显降低，信号减低率为-19.34±0.68%；注入单纯 USPIO 后 24 h，小鼠主动脉斑块信号轻度降低，信号减低为-5.61±0.57%；差别均有统计学意义（P <0.05）。Anti-TGF-β1-USPIO 主要在斑块内膜下及斑块内分布。免疫组化染色显示这些区域 TGF-β1 高表达。普鲁士蓝染色显示斑块内铁沉积。
结论：Anti-TGF-β1-USPIO 可实现小鼠主动脉粥样硬化斑块的靶向 MR 体内成像，能够特异性显示斑块内 TGF-β1 的表达，用于监测动脉粥样硬化斑块的进展及活体评估斑块的稳定性。

EPO-2124
F304&IR-1061@PLGA 自组装纳米探针的制备及其性能研究

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目的 发展一种基于聚乳酸-羟基乙酸共聚物（PLGA）纳米微球的 F_3O_4& IR-1061@PLGA 自组装纳米探针（FIP NPs），评估其理化性质及细胞毒性和体外光热效应。
方法 ①采用单一乳化-溶剂挥发法及磁分离纯化法制备 FIP NPs，并对其稳定性及表征进行研究。②将不同浓度的 FIP NPs 分别与小鼠乳腺癌 4T1 细胞共孵育 24 h 后，通过噻唑蓝比色法（MTT）对 FIP NPs 进行体外细胞毒性研究。③采用 808 nm 激光照射不同浓度的 FIP NPs 进行体外光热效果测试，并采用 MTT 和 Live-Dead 实验检测 FIP NPs 光热杀伤小鼠乳腺癌 4T1 细胞的效果。
结果 ①FIP NPs 电子粒径为 98.4 nm，水合粒径为 182 nm，在水和 FBS 中的动力学尺寸和电势基本保持稳定。FIP NPs 在 700~900 nm 的范围内具有很强的紫外吸收光谱，并且其峰值在 750 nm 处；在 808 nm 激发光激发下，FIP NPs 荧光发射光谱峰值在 1095 nm 处；并且 FIP NPs 紫外和荧光光谱相比于游离 IR-1061 均发生了蓝移。②体外细胞毒性实验结果显示，较高浓度 FIP NPs 对 4T1 细胞无明显毒性作用。③体外光热性成像实验结果表明 FIP NPs 具有很好的光热转换效果及光热稳定性；同时通过细胞实验发现其对肿瘤细胞有显著的光热杀伤消融作用。
结论 FIP NPs 具有良好的胶体稳定性、光学特性和体外光热效应，且无明显的细胞毒性。

EPO-2125
建立 CT 影像组学标签预测非小细胞肺癌 Ki-67 表达水平

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目的：建立基于 CT 图像特征的影像组学标签，预测非小细胞肺癌(non-small cell lung cancer，NSCLC)的 Ki-67 表达水平。方法：回顾性收集 2014 年 1 月至 2017 年 11 月行肺部 CT 平扫及增强扫描并在检查后 2 周内经病理证
实、行 Ki-67 表达水平检测的 108 例 NSCLC 患者。在 MaZda 软件中分别手动勾画出病灶 CT 平扫及增强的三维立体结构影像，提取感兴趣区的纹理特征参数。经过多种特征选择方法[交互信息(mutual information，MI)、Fisher 系数
(fi sher coeffi cient，Fisher)、分类错误概率联合平均相关系数(classifi cation error probability combined with average correlation coefficients，POE+ACC)以及联合方法(Fisher+POE+ACC+MI，FPM)]和分析方法组合建立影像组学标签，以误判率评价其诊断效果。结果：108 例患者中 Ki-67 高表达组 50 例，Ki-67 低表达组 58 例。Ki-67 高表达与低表达两组间性别、年龄和病理类型差异均有统计学意义($P<0.05$)。基于 CT 平扫图像纹理特征的 FPM 特征选择和 NDA 特征分析方法建立的影像组学标签预测 Ki-67 表达水平效果最佳，错判率为 14.81%。基于 CT 增强图像纹理特征建立的影像组学标签错判率并未低于基于 CT 平扫图像纹理特征建立的影像组学标签错判率。结论：基于常规 CT 图像纹理特征建立的影像组学标签有助于预测 NSCLC 病灶 Ki-67 的表达水平，可为评估肿瘤侵袭性和预后情况提供一种无创性技术手段。

EPO-2126

Noncontrast enhanced CT image-based radiomics analysis for predicting the simplified subtype of thymic epithelial tumors

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Objective The simplified WHO subtype of thymic epithelial tumors (TETs) plays very important role in patient treatment and prognosis but is difficult to accomplish by the radiologist's visual inspection. We aimed to establish and optimize the noncontrast enhanced CT image-based radiomics analysis for the simplified subtype of TETs.

Methods A total of 433 patients with pathologically confirmed TETs and complete NECT images in our hospital were retrospectively included in the current study from Jan 1, 2009 to May 31, 2016. Volumes of interest (VOIs) covering the whole tumor were manually segmented on preoperative NECT images. Radiomic features and clinical variables were retrieved and input to establish 14 machine learning models. The diagnostic performances were investigated with varied feature selection strategies and 10-fold cross validation, and then validated on the test set.

Results All models, except Decision Tree, built on the combined features demonstrated larger Areas Under Curve (AUC) of the receiver operating curve (ROC) in differentiating low risk thymoma (LRT), high risk thymoma (HRT) and thymic carcinoma (TC) than those on radiomics features alone. Among them, the support vector machine (SVM) model achieved the highest AUC of 0.84 on the validating set. After the outliers were removed, the best diagnostic performance was achieved using Logistic Regression (LR) model, with the AUC of 0.85, accuracy, sensitivity and specificity of 69.41%, 63.15% and 81.55% on the validating set, respectively. When the discrimination of LRT, HRT or thymic cancer (TC) was considered as a one-vs-the rest task, sensitivities of LR model were 67.49%, 60.82% and 52.78%, with the specificities of 70.00%, 72.38% and 93.95% for LRT, HRT or TC, respectively.

Conclusion The vast majority of the machine learning models are promising in predicting the simplified WHO subtypes of TETs, especially the SVM and LR models. Machine learning with NECT radiomic features may facilitate the differentiation of simplified TET subtypes.

EPO-2127

自组装多肽体系对三阴乳腺癌的诊疗及 DWI-MR 评估研究

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目的：设计及合成一种高效、全安的具有荧光成像以及三阴乳腺癌杀伤的纳米自组装多肽诊疗体系，并通过功能磁共振成像动态评估及疗效。
材料与方法：应用透射电镜、纳米粒度仪及拉曼光谱仪等方法对合成纳米多肽的形貌、粒径、结构进行表征与分析；应用 MTT 法、细胞吸收实验、流式细胞计量分析及细胞 ROS 水平检测等方法研究 Fm-KKF 多肽对三阴乳腺癌（MDA-MB-231 细胞）的抗肿瘤效果及作用机制；并通过体外、体内荧光成像验证其成像性能；应用 DWI-MRI 对荷瘤小鼠给药前及给药后 3d、7d、14d、21d 的肿瘤组织的细胞活性进行定量分析，结合形态学数据、血液指标、病理及免疫组化分析等方法，对多肽体系的活体内抗肿瘤疗效及安全性进行综合评估。
结果：电镜下呈分散性好、大小均一的条形纳米体系，自组装状态下，多肽宽度平均 9.89 ± 1.1 nm；纳米多肽体系对 MDA-MB-231 细胞具有明显杀伤和细胞吸收效率，可以明显上调 MDA -MB -231 细胞中的 ROS 水平；体外、体内具有良好的荧光成像效能；体内动物模型验证显示，Fm-KKF 多肽相比对照组具有更好的抑瘤作用，TUNEl、Ki67 阳性染色率（平均值为 65.5%、55.9%，$P< 0.05$）显著低于其他各组，Cleaved-Caspase-3 阳性染色高于其他各组；DWI-MRI 结果显示治疗组 ADC 值在治疗后第 3d 显著升高，之后各个时间点 ADC 值均高于其他组。各组小鼠体重未见明显异常改变；血液学指标显示，各组谷草转氨酶、谷丙转氨酶、肌酐、尿酸、乳酸脱氢酶以及肌酸激酶水平未见异常。
结论：本研究成功构建一种高效、安全的具有荧光成像以及三阴乳腺癌杀伤的纳米多肽诊疗体系，并应用 IVIM-DWI 技术实现从水分子弥散、微循环灌注功能成像对纳米体系抗肿瘤疗效的无创、动态、定量监测，为下一步新型自组装多肽体系在肿瘤诊疗一体化的应用提供了理论依据。

EPO-2128
扩散加权成像影像组学预测乳腺癌 Ki-67 表达水平的可行性研究

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目的 探讨基于磁共振弥散加权成像的影像组学方法在术前预测乳腺癌 Ki-67 表达水平的可行性。
方法 选取在术前行 MRI 检查的乳腺癌患者的 DWI 图像，并取得检查后病理组织测定 Ki-67 表达水平，共得到 114 个病灶，其中 Ki-67 阴性表达患者 38 例，Ki-67 阳性表达患者 76 例，随机分为训练集和验证集。分别对其 DWI 图像进行影像组学特征分析，并通过 LASSO 回归模型对影像组学特征进行筛选、降维，构建影像组学标签，根据筛选出来的影像组学特征的权重，对每例患者进行影像组学评分，将患者分为 Ki-67 阳性表达和 Ki-67 阴性表达 2 组，对筛选好的特征参数联合病理学诊断检测建立评估乳腺癌 Ki-67 表达水平的预测模型，分类性能使用受试者工作特征曲线下面积（AUC）进行评估。
结果 统计得到熵值、能量和对比度等 76 个影像组学参数中 25 个参数在两组数据中均有统计学意义（P<0.05），采用 LASSO 方法在 76 个影像组学特征中选择均匀性、Haralick Correlation、inverse Difference Moment、difference Variance 4 个标签特征，得到训练集和验证集每例患者影像组学评分的分布情况，影像组学评分在两组患者中有明显的分布差异，联合病理结果进行二分类建模，其中，训练集中 AUC 为 0.83，验证集中 AUC 为 0.76。
结论 乳腺癌 Ki-67 阴性和 Ki-67 阳性在 DWI 图像的影像组学特征显著不同，DWI 的影像组学在两者鉴别方面具有可行性，有助于术前预测乳腺癌中 Ki-67 的表达水平。

EPO-2129
长海痛尺评分法在原发性肝癌行 TACE 患者中的应用效果研究

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【目的】探讨长海痛尺法在原发性肝癌行 TACE 患者中的应用效果研究
【方法】选取原发性肝癌行 TACE 患者 60 例，其中男 52 例，女 8 例。术前给予疼痛筛查及宣教，指导患者掌握“长海通尺”的用途、用法。严格采用“长海通尺”对患者的疼痛做出全面、准确的评估，同时做好疼痛的护理措施并及时评价止痛效果。（0 分属无痛，1-2 分属轻度疼痛，3-4 分属中度疼痛，5-6 分属重度疼痛，7-8 分属剧烈疼痛，9-10 分属无法忍受的疼痛），评估频次及时间，患者回病房后 30 分钟内第一次评估，≤2 分者采用非药物治疗，并继续每小时评估 1 次，连续 3 次均≤2 分后改为每 4 小时一次。评估≥3 分，遵医嘱给予药物治疗，用药后半小时（肌注）或 1 小时（口服）评估用药效果，仍≥3 分者遵医嘱给予相应级别的镇痛药，使疼痛评分≤2 分，并每 4 小时评估 1 次，持续 72 小时。
【结果】轻度疼痛 11 例占 18%，中度疼痛 34 例占 57%，重度疼痛 11 例例占 18%，剧烈疼痛 4 例例占 7%，无法忍受 0 例，经过采取有效的护理措施，疼痛均消失。
【讨论】疼痛已成为继体温、脉搏、呼吸、血压四大生命体征之后的第五生命体征，疼痛评估是规范性疼痛处理的第一步。护理人员学会正确评估疼痛并做好疼痛管理十分重要。目前国内外临床使用的疼痛评估量表种类较多，NRS 一 10 量表的刻度较为抽象；VBS-5 虽容易理解，但精确度不够，有时患者很难找出与自己的疼痛程度相对应的评分。本组患者经疼痛筛查及疼痛宣教，利用“长海痛尺”指导患者掌握痛尺的用途、用法，术毕回房后加强观察，严格采用“长海痛尺”对患者疼痛做出全面、动态的评估，对疼痛的评估更为直观，解决了部分疼痛评分法中随意性过大、精确度不够的问题，能及时了解患者疼痛程度并做出有效处理，减轻了疼痛，而且病人容易理解，医生、护士也容易掌握，疼痛管理满意度明显提高，为促进康复提供了一种有效、可靠、实用的护理方法和手段，可于临床广泛应用。

EPO-2130
风险管理对提高放射科护理管理质量的作用

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【摘要】目的: 分析放射科护理中存在的风险因素, 探讨如何通过制定相应措施进行护理风险管理, 提高护理质量, 减少护患纠纷。方法:回顾随机选取 2018 年 7 月-2018 年 12 月期间 130 例患者作为研究对象（对照组）给予常规护理方案，2019 年 1 月~6 月 130 例患者（研究组）实施风险管理护理方案，比较两组患者不良事件发生率、护理满意度和候诊时间。结果：研究组不良事件发生率明显少于对照组（ $\chi 2=6.94$，$P<0.05$）；研究组护理满意度高于对照组（ $\chi 2=5.91$，$P<0.05$）；患者的候诊时间明显比对照组短，组间差异具有统计学意义（$t=6.1$，$P<0.05$）。结论：在放射科应用风险管理，能明显缩短患者的候诊时间，降低不良事件发生率，提高护理管理质量，可在临床中推广。

EPO-2131

CT 检查中对比剂使用后发生不良反应的种类及相对应护理方案

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目的： 探讨 CT 检查中对比剂使用后发生不良反应的种类及相对应护理方案。**方法：**收集 2017 年 2 月~2019 年 3 月我院进行增强 CT 检查的患者，分析 CT 检查中对比剂使用后患者发生不良反应的情况。**结果：**100 例患者在使用对比剂后，发生一般不良反应最高，发生率为 7%，明显高于肾脏不良反应及其它不良反应，两组结果比较有差异（P<0.05）。**结论：**CT 检中对比剂使用后，患者有一定可能发生不良反应，其中以一般不良反应最高，对比剂使用前加强与患者沟通，评估患者病情、病史，使用中提高护理操作技术是有效减少对比剂相关不良反应发生的重要基础。

EPO-2132
护理干预在 CT 阴茎海绵体造影检查中的应用价值

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目的 探讨护理干预在 CT 阴茎海绵体造影检查中的应用价值。**方法** 将 60 例进行 CT 阴茎海绵体造影检查的患者随机分成两组，每组 30 例。对照组采用常规护理；观察组在常规护理的基础上分别在检查前、检查中、检查后采用相应的护理干预（健康宣教、心理护理、疼痛护理、隐私保护、对比剂外预热等）。比较两组患者一次性完成检查成功率及并发症（皮下血肿及出血、对比剂外渗、对比剂不良反应等）发生率。**结果** 对照组一次性检查成功率（70%）明显低于观察组一次性检查成功率（96.7%），差异有统计学意义（χ^2=7.608,P=0.006）；对照组并发症发生率（26.7%）明显高于观察组并发症发生率（6.7%），差异有统计学意义（ χ^2=4.320,P=0.038）。**结论** 护理干预的实施，不仅提高患者一次性检查成功率、缩短检查时间、减少二次曝光、降低辐射剂量，同时减少并发症的发生，保证了患者的检查安全与舒适，具有实际应用价值，值得推广。

EPO-2133
住院肿瘤患者 CT 检查后留置针保留继续使用的效果分析

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目的 探讨住院肿瘤患者 CT 检查后留置针保留继续使用的效果分析。**方法** 选取 2018 年 3 月-2018 年 11 月我院收治的接受 CT 检查的肿瘤患者 320 例，其中满足留置针延长留置时间的患者 281 例为研究组，其余不符合留置针延长留置的患者 39 例为对照组，分析两组患者并发症发生情况和对患者留置针留置时间造成因素进行分析。**结果** 影响患者检查后留置针留置时间的主要影响因素包含患者年龄、对于留置针相关知识的了解程度、后期所用药品有无刺激性以及有无留置针并发症，以上几项患者留置针留置天数差异显著（P＜0.05）；研究组患者并发症发生情况与对照组无明显差异（P＞0.05）。**结论** 对接受 CT 检查的肿瘤患者延长其留置针使用时间可以减少穿刺次数，降低

对患者血管的刺激，根据影响患者留置针留置时间的影响因素进行护理干预可以有效降低并发症的发生情况，临床上应当进一步推广应用。

EPO-2134

放射科院内感染及其影响因素分析

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摘要：目的探讨放射科相关管理在放射科院内感染中的作用。方法选取 2019 年 1 月至 2019 年 6 月在我院接受放射检查的 548 例患者作为研究对象,调查分析院内感染影响因素,包括患者的性别、年龄、是否存在仪器物品相关污染、医护人员是否洗手消毒及院感意识。结果 548 例接受放射检查的患者,院内感染患者 17 例,感染率为 3.12%。放射检查院内感染患者的性别和年龄比较无统计学差异(p>0.05);而是否存在仪器物品相关污染、医护人员是否洗手消毒及院感意识具有统计学差异(p<0.05)。仪器物品相关污染、医护人员洗手消毒及院感意识是放射科院内感染的独立危险因素。结论放射科院内感染中,仪器物品相关污染、医护人员洗手消毒及院感意识是其危险因素,应根据相关危险因素采取相应管理措施,能够有效减少院内感染的发生。

EPO-2135

放射科碘对比剂静脉外渗管理的证据应用

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目的 探讨基于最佳证据的放射科碘对比剂静脉外渗管理的干预方法并评价其效果。**方法** 应用循证护理的方法得出证据并将证据本土化后应用于临床，制定放射科碘对比剂静脉外渗管理的审查标准，规范护理人员的临床行为；采用线上线下的培训方式，对护理人员进行最佳证据的培训，比较应用最佳证据前后放射科碘对比剂静脉外渗的发生率，培训前后护理人员对最佳证据的知晓情况及执行情况。**结果** 最佳证据应用后，放射科碘对比剂静脉外渗的发生率由 1.01%下降至 0.41%；应用前后高危患者取消检查率从 0.0.8%提高至 1.75%；临床护士对碘对比剂静脉外渗的识别与评估、碘对比剂静脉外渗的相关因素分析、碘对比剂静脉外渗的处理等方面有所提高，差异有统计学意义（$P<0.05$）；临床护士对碘对比剂静脉外渗最佳证据的执行率大于 85%。**结论** 护理人员通过应用最佳证据，以科学的护理方法解决碘对比剂静脉外渗的问题，可提升护理质量。

EPO-2136

下肢动脉硬化闭塞症的介入治疗及围手术期的护理

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目的：探讨下肢动脉硬化闭塞症介入治疗及围手术期的护理。**方法**：选取 34 例下肢动脉硬化闭塞介入治疗的患者，围手术期给予加强患者健康教育、术前严密控制血压，严密的病情观察等积极有效的术前、术后护理措施。**结果**：34 例患者顺利完成下肢动脉腔内介入治疗，术中未有并发症发

生，术后均症状得到明显的改善。**结论**：积极有效的围手术期护理措施对下肢动脉硬化闭塞患者手术成功及术后康复具有重要意义。

EPO-2137
肾脏替代疗法患者在影像检查中的护理干预

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目的　　探讨肾脏替代疗法患者在影像检查中护理干预，为患者提供最佳护理。

方法 本文对 45 例住院患者，在留置套管针、控制摄水量、对比剂的使用、预防交叉感染以及尿毒症急症方面采取针对性的护理干预。

结果 经过针对性护理干预，所有患者顺利完成了检查，未发生对比剂外渗，急症患者得到快速地检查，没有一例患者发生交叉感染。

结论 熟练的穿刺技巧，急诊绿色通道的开放，规范预约流程和碘克沙醇的使用都有利于患者快速安全地完成 CT 检查。

EPO-2138
地塞米松预防性应用在降低碘对比剂不良反应中临床实用价值

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目的　探讨地塞米松预防性使用在降低碘对比剂不良反应发生率中的临床实用价值。**方法**　回顾性收集电子科技大学医学院附属四川省肿瘤医院 2017 年 1 月至 2019 年 4 月 接受碘海醇 CT 检查的患者资料共 325 例,根据是否预防使用地塞米松分成两组：应用组和非应用组。应用组：于静脉注射碘海醇前 30 min 静脉推注地塞米松 5mg；未应用组：不预防静脉推注地塞米松。其中应用组 136 例,未应用组 189 例。对两组患者的不良反应发生率、临床表现和不良反应严重程度进行比较分析。**结果**　药物不良反应：应用组 1 例,发生率为 0.73% ；未应用组 8 例,发生率为 4.23% 。两组不良反应率差异有统计学意义(P ＜ 0. 05) 。不良反应严重程度：应用组轻中度不良反应 1 例,严重 0 例；未应用组轻中度 6 例,严重 2 例,两组严重不良反应发生率无统计学差异(P ＞ 0. 05) 。**结论**　地塞米松预防性应用可以有效降低碘对比剂的不良反应发生率,保证用药安全。

EPO-2139
采用优质护理预防放射科不良反应发生的临床价值分析

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目的 本文主要针对放射科应用优质护理来预防不良反应的措施进行临床价值分析 方法：收集分析我院于 2018 年 4 月 17 日至 2019 年 4 月 17 日之间放射科接收的 200 位患者并随机分为观察组与对照组两组，每组 100 例。观察组采用优质护理的方式，对照组采用传统护理的方式，通过观察两组临床造影检测比较两组间不良反应的情况和满意度情况。结果：观察组不良反应率仅有 4%，数据上可得其概率明显低于对照组 22%的不良反应率。而观察组的满意度概率为 99%， 也明显高于对照组的 87%的概率。差异具有统计学的意义，且 P＜0.05。 结论：放射科采用优质护理在降低不良反应的发生与提高患者满意度上具有重要作用。优质护理预防不良反应发生具有相当重要的临床意义起到了显著作用

EPO-2140
集束化护理程序在预防静脉高压注射外渗中的应用

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目的：探讨集束化护理程序在预防静脉高压注射对比剂外渗的应用效果。方法：将我院放射科 2018 年 5 月 1 日至 6 月 30 日经静脉高压注射高风险患者 100 人作为观察组，实施集束化护理；将 2018 年 7 月 1 日至 8 月 30 日经静脉高压注射高风险患者 100 人作为对照组，实行常规护理。观察比较两组高风险患者在经静脉高压注射对比剂过程中出现的对比剂外渗率、对比剂外渗致不良反应率、护理缺陷、患者及家属满意率。结果：观察组患者出现对比剂外渗率、对比剂外渗不良反应率较对照组明显减少，护理缺陷降低，患者及家属满意度提高，差异有统计学意义（P<0.05）。结论：使用集束化护理程序预防经静脉高压注射高风险患者对比剂外渗能有效降低对比剂外渗发生率和不良反应发生率，降低护理缺陷，提高患者及家属满意率，有效提高了整体护理质量。

EPO-2141
经导管主动脉瓣置换介入治疗的护理

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[摘要]目的 探讨经导管主动脉瓣置换术（TAVR）的风险评估、观察要点与护理措施，减少 TAVR 术后并发症的发生率。方法 收集河南省具备行主动脉瓣内科治疗的三甲医院于 2017 年 4 月-11 月间收治的严重主动脉瓣疾病的患者 50 例，根据胸外科医师协会（the Society of Thoracic Surgeons，STS）系统评估后，对于无胸外科手术禁忌的患者进行病情、身体素质、经济能力、个人意愿的综合调查和评估，最终筛选出在我省接受介入手术治疗患者。总结 TAVR 治疗的风险评估、观察要点及术后并发症的护理，通过随访追踪 TAVR 术后患者的预后情况。结果 50 例患者中主动脉瓣重度关闭不全（AR）6 例，主动脉瓣重度狭窄（AS）44 例，最终在我省成功接受治疗的患者有 7 例，其中 1 例行主动脉瓣球囊扩张（BAV），术后出现严重并发症（心力衰竭），最终病情得到控制；经导管主动脉瓣置换术（TAVR）治疗者 6 例，其中 2 例在治疗过程中出现并发症（房室传导阻滞），其余 4 例生存状况良好，根据随访其心功能分级由 IV 级恢复至 II 级。术前要对适合 TAVR 治疗的患者进行准确的风险评估，包括患者的综合身体素质，手术难度等要素，确定应急方案。护理人员要充分了解患者的术前状况、术中使用的支架瓣膜特点和具体手术过程。术者做好确切的心肌保护，做好心内排气尤其是排尽左心房和心尖的气体，避免气体进入冠状动脉引起心室颤动，损害心功能。结论 对于外科手术禁忌症的患者而言，TAVR 治疗明显优于保守治疗，但由于接

受治疗的患者大多为高龄、高危者，且手术风险大、难度高，经济花费较大，手术并发症发生率较高，因此术后护理，特别是并发症的预防、发现和处理对硬件、术者及护理人员都是挑战。医护的密切配合对患者的预后很关键，因此应进一步总结 TAVR 术后护理经验，规范化 TAVR 治疗的观察要点和护理措施，减少 TAVR 术后并发症的发生率。

EPO-2142
正念减压联合渐进式肌肉放松技术在幽闭恐惧症患者磁共振检查中的应用

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目的 探讨正念技术和渐进式肌肉放松技术在幽闭恐惧症患者行磁共振检查的应用。**方 法** 收集 2017 年 10 月至 2018 年 10 月在柳州市人民医院磁共振科行磁共振检查中筛选符合纳入标准的幽闭恐惧症患者 40 例。按随机抛硬币方法分别进入观察组和对照组，每组 20 例。观察组采用常规心理护理方法。对照组在采用常规心理护理的基础上，对患者行渐进式放松训练及正念技术干预后再进行扫描。分别对两组患者在干预前、后应用焦虑自评量表（SAS）及情绪状态评定量表(POMS)评价患者的焦虑和各种情绪状态，并比较分析两组患者在行 MRI 检查的有效率情况。**结 果** 干预前两组患者的焦虑评分差异无统计学意义,干预后两组患者的焦虑评分差异仍无统计学意义。对照组患者的 POMS 中的各个情绪分值绝对值均显著降低，差异有统计学意。对照组患者的总失效率明显低于观察组，差异有统计学意义。**结 论** 正念技术和渐进式肌肉放松技术能够在幽闭恐惧症患者行磁共振检查时减轻恐惧症状，使患者配合医务人员完成 MRI 检查。

EPO-2143
全程精细化护理干预对降低 CT 增强扫描造影剂不良反应的探讨

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目的：探讨 CT 增强扫描中采取全程精细化护理对降低造影剂不良反应的作用。**方法：**将 170 例行 CT 增强扫描患者随机分为常规组和试验组各 85 例，常规组实施常规护理，试验组在此基础上实施全程精细化护理。对比两组患者的造影剂不良反应及检查情况。**结果：**试验组患者不良反应发生率、检查中断情况发生率、心率异常及血压异常均明显低于常规组，差异显著，有统计学意义（P<0.05）。**结论：**全程精细化护理干预应用于 CT 增强扫描不仅能降低造影剂的不良反应发生率，还能降低患者检查的异常现象发生率，有利于患者的扫描质量的提高。

EPO-2144
构建信息化医学影像科医疗服务模式的探索

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摘要：目的 构建信息化医学影像科，创新医疗服务模式，利用互联网发展线上线下相结合个性化服务，为患者提供实时.便捷.优质的医疗服务。**方法** 通过微信公众号，APP 等平台采用“铁路订票”模式，进行线上登记预约检查，根据检查部位不同，实现分时段.分机器预约，患者可以根据

需求自由选择检查时间。APP 平台会为患者推送检查注意事项和准备工作的指导等。通过 APP 平台查询报告和电子版图像。**结果与结论** 优化患者检查流程，通过这种信息化的影像科医疗服务模式，使患者感受到信息化和无纸化的快捷方便，给患者带来全新的就医体验。

EPO-2145
规范化疼痛管理在骨质疏松性椎体压缩骨折患者中的术前应用效果

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目的 探讨规范化疼痛管理在骨质疏松性椎体压缩骨折患者术前应用的效果。**方法** 按照患者的入院时间将骨质疏松性椎体压缩骨折患者分为两组，2017 年 2 月至 11 月收治的 50 例患者为对照组，2017 年 12 月至 2018 年 7 月收治的 50 例患者为观察组，2 组患者性别、年龄、骨折节段和入院时疼痛状况比较差异无统计学意义，100 例患者均接受经皮椎体成形术（Percutaneous vertebroplasty, PVP）治疗，对照组术前采用常规疼痛护理，即给予健康宣教、心理疏导、疼痛评估、非药物护理干预和药物镇痛等，研究组术前采用规范化疼痛护理，即客观、准确评估患者的疼痛并记录，加强疼痛宣教和心理护理，采用超前镇痛、适时镇痛、个体化镇痛和多模式镇痛等等，对两组患者干预后疼痛护理质量和镇痛效果进行比较，使用 SPSS19.0 统计学软件对所收集的数据进行统计学分析，$P<0.05$ 为差异有统计学意义。**结果** 两组患者术前疼痛状况的记录、镇痛药物肌内注射的病例数、疼痛对睡眠的影响程度、疼痛知识和镇痛方法选择信息的充分程度和对疼痛控制的满意度比较差异有统计学意义（$P<0.05$），但两组患者疼痛对翻身的影响和用数字评估法或描述法记录疼痛强度比较差异无统计学意义（$P>0.05$）。**结论** 实施规范化疼痛管理有助于提高骨质疏松性椎体压缩骨折患者术前疼痛护理质量和镇痛效果。

EPO-2146
“9S”管理法在导管室高值耗材管理中的应用

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【摘要】**目的**：探讨“9S”管理法在导管室高值耗材管理中的应用方法,规范导管室的耗材管理。**方法：**将"9S"管理引入导管室高值耗材管理实践,对高值耗材实施"整理、整顿、清扫、清洁、节约、安全、服务、满意、素养"的"9S"管理,比较常规管理与"9S 管理"的实施效果。**结果：**与"9S"管理实施前的常规管理比较,导管室高值耗材发放准确率显著上升、高值耗材平均发放时间与耗损的平均补充时间均显著缩短、高值耗材过期失效及报损件数明显减少、发放差错次数减少、手术医生对手术护理质量的满意度提升(P<0.05)。**结论：**实施导管室高值耗材的"9S"管理提高了导管室高值耗材的管理效能、优化了导管室的空间布局和管理流程,提高了工作效率，提升了手术医生对导管室手术护理质量的满意度，提升了导管室护士的素养。

EPO-2147
探讨造影剂外渗的原因及对策

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目的:探讨药物外渗的预防、降低外渗的方法、外渗后的护理措施;**方法**：将我中心应用造影剂药物预防外渗采取不同的护理方法及外渗后的护理经验，针对性预防;1.造影剂外渗的表现是指在 CT 增强扫描时注射药物的静脉破裂,注射的造影剂漏出血管渗入周围组织间隙，造成相应组织的肿胀、充血甚至坏死的表现。一般表现为穿刺点的周围组织饱满、肿胀、疼痛,严重者可累及整个穿刺肢体的软组织,偶有水泡发生，并伴有严重的患肢活动受限。2.一旦发生造影剂外渗应立即停止注射。24 小时内用凉毛巾覆盖于渗漏处皮肤，亦可用切开的土豆片贴于患处，反复更换,使局部血管收缩，减少外渗，一般 10 小时左右均可恢复正常，严重者可在 24 小时后改用 50%硫酸镁浸湿纱布完全敷于渗漏处皮肤。其原理是硫酸镁为高渗液,可使局部肿胀的皮肤出现渗透性消肿。同时可抬高患肢，促进局部静脉回流，有利于外渗的吸,减少渗出。亦可配合中药外敷.增加肿止痛的效果。5 例 24 小时内恢复正常,2 例 48 小时恢复正常，**结果**:效果明显。讨论；通过积极有效的预防可减少外渗现象，50%硫酸镁湿敷，应用于造影剂外渗是一种安全、有效、廉价、方便的治疗疗方法.

EPO-2148
造影剂外渗处理流程在 CT 增强检查中的应用研究

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［目的］ 探讨造影剂外渗处理流程在 CT 增强检查中的应用。 **［方法］** 成立造影剂外渗处理小组，并制定处理流程，制定造影剂外渗告知单，对全科护士进行培训考核。对实施流程之后每月患者对高压注射的满意度、病区护士对高压注射的心理压力及满意度、护士对外渗处理流程的认同度及依从性进行比较分析。**［结果］**实施流程后所调查项目逐步提高。**［结论］**造影剂外渗处理流程可以有效减轻本科室护士对高压注射的心理压力，增强安全感，减轻护士长的管理压力。

EPO-2149
影像学增强注射中诱发无菌性炎症的原因与护理方法

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目的 探讨与分析影像检查中增强造影剂静脉注射诱发的无菌性炎症的原因及护理方法。
方法 选取我院自 2017 年 4 月-2018 年 4 月门诊及住院需行静脉留置针注射给造影剂的 200 例患者，采取随机数字表分为常规护理组与专项护理组，观察与对比两种不同护理方法下诱发无菌性炎症的发生率以及两种不同护理方法下患者满意度情况。 结果 常规护理组炎症发生率 33.0%，专项护理组为 12.0%，专项护理组较常规护理组相比无菌性炎症发生率明显降低（P<0.05）。常规护理组满意度为 67%,专项护理组满意度为 98%，常规护理组较专项护理组相比满意度明显提升（P<0.05). 结论 在常规护理基础上加强专项护理，不仅可进一步提升护理质量，减少增强造影剂静脉注射的无菌性炎症，同时可提高患者以及家属的满意度，值得推广。

EPO-2150
影像护理干预对老年患者膝关节核磁共振成像检查的效果研究

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目的 评估影像护理干预对老年患者膝关节核磁共振（Magnetic resonance imaging，MRI）检查结果的效果。**方法：**选取 2018 年 10 月至 2019 年 3 月在我科行膝关节 MRI 检查 60 例老年患者，分为对照组和干预组。对照组 30 例患者，给予常规护理；干预组 30 例患者，给予影像护理干预。比较两组患者的一次检查成功率、患者依从性、患者满意度、MRI 知识掌握率和影像质量评分。**结果** 干预组一次检查成功率、患者依从性、患者满意度、MRI 知识掌握率均较对照显著升高（$p<0.05$），干预组和对照组影像质量评分分别为 3.3±0.7 和 2.4±1.3，差异具有统计学意义（$t=3.339$, $p<0.05$）。**结论** 对老年膝关节 MRI 检查患者给予影像护理干预，有助于患者掌握 MRI 检查相关知识，提高患者检查依从性，提升患者满意度，确保影像像质量。
关键词 影像护理干预；膝关节；核磁共振

EPO-2151
品管圈活动对降低非离子碘对比剂外渗率的应用研究

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目的：分析品管圈活动对降低放射科对比剂外渗发生率的效果。**方法：**纳入研究对象来自本院自 2018 年 6 月至 2018 年 12 月放射科行增强 CT 检查的 4234 例，比较品管圈活动改善前后对比剂外渗的发生率。**结果：**品管圈活动后，非离子碘对比剂外渗发生率由 0.98%降低到 0.38%（ $P<0.05$）。改善后对比剂外渗发生率显著低于活动前，低于目标值 0.51%。**结论：**品管圈活动可有效降低放射科非离子碘对比剂外渗的发生率，为疾病诊断提供及时有效的检查结果，减轻了患者的痛苦，提高患者满意度，提升了团队凝聚力，值得借鉴。

EPO-2152
研究聚乙烯醇载药微球相对碘油治疗原发性肝癌的护理要点

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摘要：目的 本研究旨在研究聚乙烯醇载药微球栓塞治疗术的护理要点，观察、对比与传统碘油栓塞术后并发症、住院时长等，延长中晚期肝癌患者的生存时间以提高其生活质量。**方法** 收集 2017 年 1 月至 2019 年 3 月在我院介入科行介入栓塞治疗的 42 例肝癌患者纳入研究对象，随机分为观察组和对照组，对照组 21 例患者用传统碘油栓塞，观察组 21 例患者用国产载药微球栓塞。**结果** 本研究显示研究组不良反应发生率明显低于对照组，研究组患者肿瘤缓解率、控制率等明显高于对照组，且研究组护理满意度明显优于对照组，表明 DEB-TACE 治疗模式可有效控制患者肿瘤进展，降低患者不良反应发生率，升护理服务质量，改善患者满意度等。**结论** 聚乙烯醇载药微球治疗原发性肝癌的疗效显著，可有效减少患者行介入治疗次数，减少术后不良反应的发生，提高患者生存质量，缓解患者痛苦，提高患者满意度，值得临床推广使用。

EPO-2153

CT 引导下穿刺联合吲哚菁绿定位在肺小结节微创术中的应用

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【摘要】目的　探讨 CT 引导下穿刺联合吲哚菁绿定位在肺小结节微创手术中的应用价值。方法　选取我院 2019 年 4 月－5 月份的 100 例患者行肺小结节胸腔镜微创切除术，术前采用 CT 引导下穿刺联合吲哚菁绿定位。结节共 145 枚，直径 4mm-12mm，统计定位的成功率及并发症。结果联合定位的成功率为 98%，并发症的发生率为 2%，其中气胸 1 例，痰中带血 1 例，少量咯血 0 例，大咯血 0 例。结论　CT 引导下穿刺联合吲哚菁绿定位是一种简便有效的肺部小结节微创术前定位方法，准确率高，并发症少，可提高肺部小结节胸腔镜微创手术的成功率。
【关键词】 CT 引导;穿刺; 吲哚菁绿; 肺小结节; 微创术

EPO-2154
人体面相评估图在护生行增强 CT 检查中碘对比剂 风险评估中的应用探讨

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［**摘要**］**目的** 探讨人体面相评估图在护生行增强 CT 检查中碘对比剂风险评估中的应用效果。**方法** 选取 2016 年 7 月—2018 年 9 月进入我院放射科科实习的 100 名护生作为研究对象，其中 2016 年 7 月—2017 年 5 月实习的 45 名护生作为对照组，2017 年 7 月—2018 年 9 月实习的 55 名护生作为观察组。对照组采用传统的单纯知识点理论授课教学模式，观察组采用人体面相评估图从人体头-颈-躯干-下肢由上到下逐一完成每个知识点及风险点进行评估。2 周 CT 岗位实习结束，对所有护生的碘对比剂风险理论知识掌握情况以及碘对比剂风险评估实践能力进行考核，收集碘对比剂风险禁忌症的漏评率、学习兴趣、沟通能力、自信心等。**结果** 观察组护生碘对比剂风险理论知识及碘对比剂风险评估实践能力考核优良率分别为 81.8%和 87.3%，均高于对照组 60%和 60%，差异有统计学意义(P<0.05)。观察组护生碘对比剂风险禁忌症漏评率为 0，低于对照组 33.3%。同时，实践能力考核也体现观察组以人体面相图的立体形象直观完成知识点的讲授调动护生学习枯燥知识点的兴趣、培养学生沟通能力、提高临床护理操作能力、提升工作自信心及自我价值彰显。**结论**人体面相评估图在护生行增强 CT 检查中碘对比剂风险评估中的应用，能调动护生学习枯燥知识点的兴趣，提高护生学习的主动性及积极性，有效掌握碘对比剂风险理论知识点和提高碘对比剂风险评估实践能力。

EPO-2155
思维导图对初次行 CT 增强扫描患者检查效果的影响

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摘要：目的　探讨思维导图对初次行 CT 增强扫描患者检查效果的影响。方法　将我院 2018 年 12 月收治的 120 例初次行 CT 增强扫描的患者采用 execl2010 软件产生的随机函数分为观察组和对照组，各 60 例。对照组采用常规护理，观察组在对照组的基础上采用思维导图进行健康教育。比较

两组的生命体征变化、不良反应、依从性以及图像检查质量。结果　观察组干预后的心率、收缩压、舒张压均低于对照组，差异有统计学意义（$P<0.05$）。观察组 CT 扫描不良症状少于对照组，检查依从性高于对照组，差异有统计学意义（$P<0.05$）。观察组的 CT 增强扫描的图像质量好于对照组，差异有统计学意义（$P<0.05$）。结论　思维导图能够减少初次行 CT 增强扫描患者不良反应，促进检查的顺利进行，提高图像检查的质量。

EPO-2156

碘造影剂过敏反应的观察预防及护理对策

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探讨离子型和非离子型碘造影剂过敏反应的预防措施和处理原则。结合国内外有关造影剂相关文献，建议使用造影剂原液进行过敏试验。

轻度反应：临床表现全身热感及发痒，面部潮红，结膜充血，头痛头晕，打喷嚏，咳嗽，恶心，轻度呕吐，少数皮疹等。此类反应临床上多见。

中度反应：临床表现约占总反应的 10%。除轻度反应症状外，患者出现心慌，气急，呼吸加速，肢体发抖，全身荨麻疹等。此时若采取对症处理，反应多能减轻至逐渐消失。

重度反应:临床表现患者出现面色苍白，四肢青紫，手足厥冷，心率加快，呼吸困难，血压下降等一系列休克症状，如不及时抢救，将危及生命。

EPO-2157

颈外静脉穿刺在老年患者 CT 增强检查中的护理干预

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摘要：静脉穿刺在 CT 增强检查中是重要环节之一，对于上肢血管质量差，穿刺困难患者，对其进行颈外静脉穿刺以保证检查顺利完成尤为重要。**目的**：在颈外静脉穿刺过程中实施护理干预，减轻患者痛苦，并对护理效果进行讨论。**方法**：纳入标准：对 2019 年 1 月——2019 年 7 月 35 例实行颈外静脉穿刺患者，年龄 60 岁-85 岁，上肢静脉条件差患者，无特殊药物过敏史，无严重心功能障碍史患者纳入实验对象，随机对照组为可进行上肢静脉穿刺，其余纳入条件与实验组相同，按照护理常规进行操作。在检查前对实验组对象进行解释说明，避免其精神过度紧张，说明此处置针的各种益处， 现身说教，并请穿刺置管的病人消除其顾虑，做好配合。在检查过程中指导患者颈部注射部位拉直，避免静脉弯曲，检查结束后常规封管，根据患者意愿可带回病房继续使用。两组患者根据图像质量，患者满意舒适度，外渗率等因素综合进行评分统计。**结论**：对于上肢血管条件差老年患者通过颈外静脉穿刺及相关护理干预可提高图像质量，提高患者满意度。

结果讨论：1 老年人四肢活动度受限，穿刺肘正中时双手上举且伸直动作完成有难度，配合有困难，经颈外静脉穿刺后上肢可弯曲抱头即可;

2：图像质量与注射给药速度有关，颈外静脉粗直作为颈部的最大浅静脉，颈外静脉的管径较粗，是最佳的穿刺部位，可进行高速度注射，保证更高图像质量。据测量，其上段测定平均直径可达(o．61±0．21)cm，在穿刺时，可直接通过直视穿刺，其操作不仅便捷，同时对患者造成的痛感也较低。3：在穿刺前征求患者意见，讲解其优点，一定消除患者紧张顾虑情绪:。4：但由于颈外静脉穿刺时不扎止血带，初次接触部分护理人员经验不足，需科室统一培训操作，穿刺部位方法及穿刺手法需要练习，才能保证其穿刺成功率，前期对护理人员技术要求较高但经培训合格后操作相对容易，穿刺成功率也较上肢高。

EPO-2158
屏气训练与心理疏导在提高冠脉 CTA 检查质量中的临床应用

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目的 探讨屏气训练与心理疏导在提高冠脉 CTA 检查质量中的应用效果。**方法** 回顾性分析经飞利浦 256 层螺旋 CT 扫描的 630 例冠脉 CTA 检查且未使用降心率药物患者，随机分为 ABC 三组(A 组及 B 组均为对照组，C 组为观察组)。分别对 A 组及 B 组患者实施屏气训练指导及心理疏导，对 C 组患者同时实施及屏气训练和心理疏导。在实施护理干预的同时监测患者心律及心率，并保证所有患者心律齐且处于心率≤80 次/分状态时接受检查。分别比较干预实施前后三组患者的平均心率下降幅度以及完成 CTA 检查的优质片所占比例。**结果** 观察组(C 组)患者平均心率下降幅度高于对照组(A 组及 B 组)患者($P<0.05$)，CTA 扫描优质片比例明显高于对照组患者($P<0.01$)，差异有统计学意义。**结论** 冠脉 CTA 扫描前对患者进行屏气训练及心理疏导能明显降低患者心率，从而有效提高检查成功率。

EPO-2159
健康教育视频在 PET/CT 检查中应用效果分析

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目的 对健康教育视频在 PET/CT 检查患者中应用的效果分析。方法 将 420 例 PET/CT 检查者随机分成观察组(随机口头健康教育) 和对照组(健康教育视频播放)，分别按 2 种方式对患者实施健康教育，对 2 组患者的配合性与满意度进行统计学分析。结果 观察组的配合性与满意度均明显高于对照组，差异具有统计学意义(均 P< 0. 01) 。结论 利用健康教育视频对 PET/CT 患者进行健康教育，有利于提高患者对 PET/CT 的认识，健康教育的效果良好，同时还能减轻护士的工作量。

EPO-2160
运用护理干预提高磁共振检查效率

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〔摘要〕磁共振检查因其无辐射损伤的优势成为了临床医生诊断疾病的一线选择，但磁共振检查受一些客观因素限制比如：检查要求高、检查时间长，造成了医患供需矛盾。我们针对检查流程中的细节，采取了一些有效的护理干预措施进行工作，不仅有效地提高了患者满意度和工作效率，而且将影像检查“零预约”彻底落实。

EPO-2161
PDCA 循环管理用于改进磁共振中心护理工作满意度的研究

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【摘要】目的：分析我院磁共振中心护理工作患者满意度的影响因素，利用 PDCA 循环管理进行改进，评价其效果。**方法：**按入组条件随机选择 2017.7-2017.12 间来我院磁共振中心检查的患者 90 例，为对照组。以问卷调查的方式统计中心护理工作出现的问题，施行 PDCA 管理。随机选择 2018.6-2018.11 间检查的患者 90 例，为观察组。同样以问卷调查的形式来统计并比较两组患者的护理满意程度，不足之处进入下一循环。**结果：**观察组患者在预约便捷性、预约检查周期、护理人员态度、护理人员专业水平、检查前宣教方面满意程度显著高于对照组（P＜0.05），在注射室环境方面，满意度差异无统计学意义（P＞0.05），待进入第二循环持续改进。**结论：**PDCA 循环能够有效的提升磁共振中心护理工作患者满意度，值得临床其他科室推广借鉴。

EPO-2162
护理干预对增强 CT 引发迟发性静脉炎的作用探讨

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【摘要】目的：探讨护理干预对增强 CT 引发迟发性静脉炎的作用。方法：选取西南医科大学附属中医医院 2018 年 3 月至 2019 年 2 月 2157 例增强患者中，随机选取 876 例患者分为试验组 438 例，于增强 CT 扫描前，中，后行护理干预及健康教育，告知家属与患者采取干预措施积极应对静脉炎的发生。对照组 238 例，采取常规护理方法。结果：试验组 438 例患者中共 2 例发生静脉炎，发生率为 0.68%（2 例均在检查完次日主动回访过程中发现均采取积极护理措施），对照组 438 例患者中，共 5 例发生静脉炎，发生率为 1.14%。两组差异有统计学意义（P<0.05）结论：护理干预能明显减少因增强 CT 诱发的迟发性静脉炎并有利于提前发现迟发性静脉炎，避免医患矛盾。

EPO-2163
高压注射器在 640 层 CT 增强扫描的应用及护理体会

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目的 探讨高压注射器在 CT 增强的应用与护理干预作用。**方法** 分析 600 例应用高压注射器增强扫描效果及护理干预的体会。 **结果** 利用高压注射器 600 例注射造影剂中 CT 增强扫描检查中，采用预先建立静脉通道法，穿刺及造影成功率为 100%；穿刺区造影剂渗漏 4 例（0.67%）；发生轻度副反 11 例，发生率 1.8% 。**结论** 高压注射器是一种简便高效的增强扫描必备器械，加以必要的护理干预,造影成功率高，还可提升 CT 扫描图像质量。

EPO-2164

脑卒中患者实施临床与影像护理配合对提升磁共振图像质量的有效性评价

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目的：探讨脑卒中患者实施临床与影像护理配合对提升磁共振图像质量的有效性，以便能够有效的患者的健康水平，恢复正常的机体机能。**方法：**选取 2017 年 10 月到 2019 年 5 月我院收治的 110 例脑卒中患者作为研究对象，依据不同的研究方式将其分为对照组（n=55）与试验组（n=55），均对上述患者进行磁共振扫描检查，对照组施以常规护理模式，试验组施以临床与影像护理配合模式，观察两组患者护理前及护理 1 个月后的焦虑（SAS）评分、抑郁（SD）评分，并观察两组患者的护理工作满意度情况及磁共振检查工作的满意度情况。**结果：**通过临床分析显示，护理前，对照组与试验组患者的 SAS 评分与 SDS 评分分别为（52.89±6.39）分、（52.48±5.24）分与（51.23±7.06）分、（51.24±6.98）分，二者相比差异不具有统计学意义（t=1.292 与 1.054，P=0.199 与 0.294）；护理 1 个月后，观察组的 SAS 评分与 SDS 评分分别为（22.37±1.83）分、（40.23±4.62）分，明显低于对照组的 SAS 评分与 SDS 评分分别为（35.24±2.53）分、（48.21±6.42）分，二者相比差异具有统计学意义（t=30.568 与 7.482，P=0.000 与 0.0.在磁共振检查工作的满意度情况方面，观察组的非常满意例数为 39 例，占比 70.91%，满意例数为 12 例，占比 21.82%，不满意例数为 4 例，占比 7.27%，总满意度的例数为 51 例，占比 92.73%；对照组的非常满意例数为 29 例，占比 52.73%，满意例数为 14 例，占比 25.45%，不满意例数为 12 例，占比 21.82%，总满意度的例数为 43 例，占比 78.18%，二者相比差异具有统计学意义（x^2=4.681，P=0.031）。**结论：**脑卒中患者实施临床与影像护理配合对提升磁共振图像质量具有较高的有效性。

EPO-2165
外渗处理盒+冰敷在 CT 增强药物外渗中的应用

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【目的】通过分析某基层医院 2016-2018 年 CT 增强外渗应用外渗处理盒+冰敷的处理方法，探讨外渗的处理效果及防范措施，以期找出更经济便捷实用的方法，尽快解决患者痛苦。【方法】冰敷；外渗处理盒（硫酸镁粉 25 g+盐酸地塞米松 5 m+生理盐水 25 ml 浸湿无菌纱布 2-3 块，外敷于外渗部位，须超出外渗部位 5 cm 并用保鲜膜包裹保湿 1 小时），两者交替进行。【结果】轻度外渗冰敷后迅速解除痛苦及消肿，中重度外渗两者交替，20-56 小时均痊愈。【结论】冰敷可迅速消肿及镇痛，配合硫酸镁及地塞米松外敷可有效促进外渗液的吸收，而达到快速康复的目的，操作简单方便可推广应用。

EPO-2166
载药微球化疗栓塞术治疗原发性肝癌 67 例临床观察及护理

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目的 总结载药微球化疗栓塞术治疗原发性肝癌患者的护理配合经验。**方法** 67 例诊断为原发性肝癌并行肝动脉造影术及载药微球化疗栓塞术的患者在介入治疗过程中进行精细护理干预，包括术前对患者进行访视，询问碘对比剂过敏史，进行心理辅导和疼痛评分，介绍载药微球治疗的重要性，缓解患者焦虑紧张情绪，以便更好的配合手术；术中指导患者正确使用镇痛泵缓解疼痛，严密监测生命体征，及时观察有无对比剂和化疗药物不良反应的发生；术后严密观察并发症及时进行相应的处理。**结果** 67 例患者均完成手术，有 2 例患者出现轻微呕吐，协助患者头偏向一侧避免呛咳；有 3 例患者诉疼痛难忍，暂停注射载药微球，予心理护理，镇痛泵止痛后症状缓解，顺利完成手术。1 月后复查 CT、磁共振 58 例肝脏肿瘤病变缩小，7 例出现新病灶，死亡 2 例。 **结论** 对患者进行手术前、手术中、手术后的精心护理取得了良好的效果，有效的预防并发症的发生，减轻了患者的痛苦，提高了患者的生活质量。

EPO-2167
呼吸训练联合心理疏导对肺部磁共振增强成像影响的研究

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目的 探讨呼吸训练联合心理疏导对肺部磁共振(magnetic resonance imaging，MRI) 增强成像的影响。方法 收集 2016 年 9 月到 2018 年 9 月接受肺部磁共振增强扫描的 65 例患者选为研究对象，随机分为 2 组，其中观察组 33 例，对照组 32 例。对照组行常规护理；观察组在对照组基础上于扫描前 30 分钟对受检患者进行呼吸训练及心理疏导。比较两组磁共振成像质量与合格率。结果 两组患者成功完成检查，观察组磁共振成像质量与合格率均优于对照组。结论 肺部磁共振增强成像检查前对患者进行呼吸训练联合心理疏导的方法，能降低患者的紧张与焦虑，提升磁共振检查的有效配合，减少患者自主性运动图像伪影，提升扫描质量与一次检查成功性，保障影像诊断安全，提升满意度。

EPO-2168
探讨急诊脑卒中患者增强 CT 检查的急诊急救护理

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摘要：目的探讨急诊脑卒中患者增强 CT 检查中急诊急救护理观察方法。方法：选择我院 2019 年 05 月-06 月进行的 114 例行急诊脑卒中增强 CT 检查的急危重症患者的临床资料，予以全程运用优质护理模式及有效急诊急救护理，包括严密观察患者生命体征及病情变化、建立多条静脉通道，备好抢救药品及器材。结果：所有患者均顺利安全的完成急诊脑卒中增强 CT 检查，且图像清晰,效果良好,检查完毕后在医务人员陪同下安全转运至相关科室接受进一步治疗。结论：优质护理模式及有效急诊急救护理是急诊脑卒中患者迅速安全地完成增强 CT 检查的有力保障，也是 CT 室护理工作的一项重要的内容，最后有效的检查结果能为患者得到良好治疗赢得时间。

EPO-2169
“一病一品”在提高深静脉血栓患者护理质量管理中的应用

于洁
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【摘要】 目的：探讨一病一品模式在深静脉血栓患者护理质量管理中的应用效果。 **方法**：（1）成立一病一品项目小组，明确各自职责。一病一品护理小组由护士长、护理组长和责任护士组成，建立科室一病一品项目小组交流群，上传学习资料、探讨学习问题、解决学习困难，分享经验和方法，构建一病一品项目内容的基本框架，制定具体的项目实施方案：确定深静脉血栓疾病作为项目主题，项目负责人对科室成员进行培训，包括：循证护理相关知识即询证护理定义和发展、证据的级别等，文献检索的知识、统计学方法的应用、系统培训与深静脉血栓疾病相关的理论知识及专科操作，并进行科室考核，（2）全程规范化护理，包括入院时、住院期间、出院时、出院随访和延申护理，护士长全程对一病一品工作小组进行指导，及时发现问题并指导，一病一品小组共同制定深静脉血栓疾病健康教育处方及各种导管标识，宣教内容体现专病化、个性化和递进化，护理健康教育单及时发放病人，以便患者学习，并利用医院官微及官网进行深静脉血栓知识的科普，在世界血栓日来临前夕开展了深静脉血栓的义诊活动，（3）制定标准化的护理内容 如制定了专科护理品牌溶栓导管 4E 计划，确保溶栓在位通畅、确保尿激酶泵入剂量百分百准确、确保溶栓导管百分百固定、确保对患者溶栓导管百分百指导到位，从而最终确保患者携管作战、畅通无阻。**结果**： 制定了数个图文并茂的护理流程，包括肢体的测量、溶栓导管的护理流程等，形成了下肢深静脉血栓专科护理框架和标准化护理方案，取代了以往的疾病护理常规。 **结论**：基于循证护理的“一病一品”项目管理模 式深化了护理专业内涵建设，让患者获得专业化、同质化的护理服务，进而塑造专科护理的品牌效应，体现了护士的专业价值。

EPO-2170
伤口一抹得用于钆对比剂外渗的临床疗效观察

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目的：观察伤口一抹得用于钆对比剂外渗的临床疗效。**方法**：选择某医院放射诊断科行核磁共振增强检查高压团注过程中，出现钆对比剂外渗的病人 38 例,随机分为观察组和对照组,每组 19 例。对照组给予 50%硫酸镁湿敷肿胀部位,观察组给予伤口一抹得涂擦肿胀部位,对两组病人的干预效果进行比较。**结果**：干预后 24h-72h 观察组外渗部肿胀消退程度、疼痛评分、换药次数与对照组比较，差异有统计学意义(P<0.05)。**结论**：涂擦伤口一抹得可有效缩短钆对比剂外渗肿胀时间,减轻疼痛,减少换药次数，疗效显著。

EPO-2171
增强 CT 结合结肠仿真内镜对结直肠癌的检查方法及护理

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【摘要】目的：探讨增强 CT 结合仿真内镜后处理对结直肠癌的检查方法及护理。方法：回顾性分析 45 例结直肠癌患者，患者均行肠道准备及肠腔内注气后用 Definition AS+ 128 层螺旋 CT 增强扫描结合仿真内镜后处理检查，评价结直肠癌患者的临床价值。结果：45 例患者在 CT 仿真内镜检查中 40 例考虑为肿瘤性病变、3 例为正常、2 例为息肉。经手术病检结、直肠癌 42 例，炎症 3 例；结直肠癌分型为 15 例肿块型、9 例浸润型、5 例溃疡型、8 例混合型。结论：增强 CT 结合仿真内镜后处理对结直肠肿瘤的检出、定性及定位与手术病检比较准确率很高。增强 CT 结合后处理

对观察病灶周围的侵犯情况及有无远处器官和淋巴结转移的情况有很大的优势，同时还可以了解肠腔内病变的形态及病变累及肠腔的长度。

EPO-2172
基于利益诉求结果的肝癌化疗栓塞治疗患者护理诉求剖析

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目的 对肝癌化疗栓塞治疗患者的利益诉求进行调查分析，从中剖析出护理相关诉求，以期为其提供更优质的护理服务。**方法** 对某三甲医院肝癌化疗栓塞治疗患者展开问卷调查，依据其调查数据，使用因子分析及配对 T 检验进行归纳分析。**结果** 2017 年 9 月至 2018 年 4 月接受肝癌化疗栓塞治疗的 232 名患者，其利益诉求按照从强到弱顺序依次可归纳为 7 个因子：治疗效果诉求、医疗技术服务诉求、合理费用诉求、健康教育诉求、尊重患者及其权利诉求、辅助服务诉求及消费信息公示诉求,其均值分别为 4.20、4.10、3.56、3.51、3.48、3.01、2.84。**结论** 肝癌化疗栓塞治疗患者的利益诉求水平较高，为满足患者的相应措施，护士可采取的干预措施有：基于患者视觉满足患者的治疗效果诉求；努力提高护士专业技术服务水平；尽量降低患者不可报销费用并改善住院费用公示方式；加强健康教育；尊重患者及权益；改善住院环境等。

EPO-2173
围手术期强化护理在介入封堵术治疗小儿先天性心脏病的应用效果

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目的：探讨围手术期强化护理在介入封堵术治疗小儿先天性心脏病的应用效果。**方法：**将 78 例小儿先天性心脏病患者随机分为 2 组，对照组 39 例患儿，行常规围手术期护理干预，观察组 39 例患儿，行围手术期强化护理干预，比较两组住院时间及术后并发症发生情况，同时自制依从性量表，比较两组患儿术后依从度。**结果**：观察组住院时间短于对照组（$P<0.05$）；观察组治疗依从度高于对照组（$P<0.05$）；两组术后并发症发生率比较差异无统计学意义（$P>0.05$）。**结论：**在小儿先天性心脏病介入封堵术期间开展围手术期强化护理干预能提高患儿治疗依从性，缩短患儿住院时间，且并发症发生率少，值得推荐。

EPO-2174
对比剂不良反应及观察与抢救流程的分析与探讨

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目的 探讨 CT 增强检查对比剂注射过程中不良反应发生情况及观察与抢救流程

方法 回顾性分析，采用单纯随机抽样方法，抽取 2018 年 1 月-12 月于我科行 CT 检查应用非离子型碘对比剂病例 11876 例，评估患者一般资料、用药类型与名称、不良反应发生时间与症状表现，观察、处理及抢救措施。

结果： 结果显示不良反应发生率为 7.9%。 其中急性 93.4%，其中 急性不良反应发生率 89.1%；迟发性不良反应发生率为 9.1%。轻中度 96.4%，重度 3.6%。不良反应临床表现及发生频率分别为皮肤、消化道、中枢神经系 统、呼吸系统、循环系统症状。经过护理观察处理及抢救后患者均转危为安，无死亡病例。

结论： 含碘对比剂所致不良反应以急性、轻中度为主，但重度不良反应发生迅速，甚至危及生命，及时有效的观察及抢救流程至关重要

EPO-2175
心理干预在恶性骨肿瘤患儿 CT 增强检查中的意义与价值

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目的：探讨心理干预对恶性骨肿瘤患儿 CT 增强检查流程及影响因素的作用。**方法**：将 152 名恶性骨肿瘤患儿随机分为干预组及对照组，采用一般资料问卷调查表、儿童抑郁评价量表（CDI）、Spence 儿童焦虑量表（SCAS）及家庭功能评定量表（FAD），对患儿及陪检家属进行问卷调查，以评价心理干预在恶性骨肿瘤患儿 CT 增强扫描中的作用。**结果**：干预组和对照组患者一般资料、检查部位、疾病诊断及 ECOG 评分、检查前抑郁、焦虑、家庭功能评分等统计结果显示，差异无统计学意义（$P>0.05$），干预组干预后儿童抑郁评价量表（CDI）、儿童焦虑量表（SCAS）、家庭功能评定量表（FAD）评分均显著降低，差异有统计学意义($P=0.007$，$P=0.015$，$P=0.014$),图像质量明显优于对照组（$P=0.002$）,不良反应发生率明显少于对照组($P=0.042$）。一次检查成功率干预组（95%）高于对照组（85%）。二元回归分析显示：低龄、化疗、无家属陪同检查是 CT 增强扫描图像质量的独立危险因素（$P<0.05$）。低龄、化疗、陪护者文化程度低、无家属陪同是对比剂注射不良反应发生率的独立危险因素($P<0.05$）。**结论**：恶性骨肿瘤患儿行 CT 增强扫描检查中，采用心理干预能缓解患儿抑郁、焦虑症状，增进家庭支持功能，提高一次性检查成功率，保证图像质量。

EPO-2176
CT 辐射剂量评估方法应用体会

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目的：CT 检查关于辐射剂量的评估是通过设备上的剂量统计表得出，常用 DLP 或 $CTDI_{vol}$ 来表示，但在涉及公众接受的辐射剂量和防护等情况时采用的又是 mSv 或 mGy 为单位，对比困难。本文旨在找寻 CT 辐射剂量评估的简易实用方法。

方法：参阅欧洲 CT 质量标准指南、美国 AAPM 第 96 份报告和中国 X 射线 CT 成年人诊断参考水平等文献。

结果：CT 辐射剂量的评估方法包含 CTDI（CT 剂量指数）、$CTDI_{FDA}$、$CTDI_{100}$、加权 $CTDI_{w}$、容积 $CTDI_{vol}$、DLP（剂量长度乘积）等，其中 $CTDI_{vol}$ 和 DLP 被更多使用。目前欧洲和美国在报告中都提到“有效剂量 E”概念，其融入潜在的生物效应，反映不同部位组织等对辐射剂量的不同敏感性，以 Sv 或 mSv 为单位。英国和德国的放射防护委员会都有相应的软件包供有效辐射剂量的计算，除此之外，通过引入转换因子 k 结合 DLP 的方式可以快速估算有效剂量，且该方法被欧洲 CT 扫描质量标准指南工作组推荐。K 的单位为 $mSv \cdot mGy^{-1} \cdot cm^{-1}$，DLP 的单位为 mGy·cm，CT 扫描后记录设备

上显示的 DLP 值，查表获得不同年龄段患者头、颈、胸、腹、盆腔的 k 值，通过 E (mSv)≈k • DLP，即可快速估算出有效辐射剂量。
结论：（1）通过 k 的应用，借助 E (mSv)≈k • DLP 可快速估算出以 mSv 为单位的有效剂量，方便放射技师与患者交流，尤其是被患者问及扫描辐射剂量或 CT 检查伤害程度时。（2）与普通非 CT 的 X 线检查项目或公众日常生活接触的辐射剂量具有了可比性。（3）欧洲和美国的报告中关于 k 值有所差异，如成人头、颈、胸的欧洲版本报告中为 0.0023、0.0054、0.017；而美国版本报告中为 0.0021、0.0059、0.014。但不影响估算使用。（4）有效剂量的估算可以辅助一线放射技师优化扫描方案，通过不同方法降低患者有效辐射剂量从而减少公众辐射。

EPO-2177
细节护理干预模式对颅脑增强 MRI 扫描患者扫描前心理状态影响分析

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摘要：目的：研究探讨细节护理干预模式对颅脑增强 MRI 扫描患者扫描前心理状态影响分析。**方法：**本次研究将 94 例颅脑增强 MRI 扫描患者进行随机分组，分为对照组（47 例，常规护理）和研究组（47 例，细节护理干预）。比较两组患者的心理情绪评分、护理满意度。**结果：**研究组焦虑、抑郁心理评分显著低于对照组，P＜0.05；研究组护理满意度显著高于对照组，P＜0.05。**结论：**细节护理干预模式可有效改善患者负面心理状态，提高护理满意度，具有推广价值。

EPO-2178
循证护理在老年患者 MRI 腹部检查中的应用研究

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目的：探讨循证护理在老年患者 MRI 腹部检查中的应用效果，为临床治疗提供相应的参考依据。方法：选取 2018 年 1 月-2019 年 1 月在本科室 MRI 腹部检查 65 岁以上的 80 例老年患者。随机分为对照组和观察组，其中对照组患者采取常规的护理模式，而观察组患者在常规护理的基础上采取循证护理干预模式，比较两组患者的心理情绪评分、检查完成时间、检查成功率、护理满意度。结果：通过分析研究，观察组焦虑、抑郁心理评分，检查完成时间显著低于对照组；观察组检查成功率、护理满意度显著高于对照组，两组具有显著性差异（P<0.05），即具有统计学意义。结论：MRI 腹部检查老年患者采取循证护理，可以缓解患者紧张、焦虑情绪，减少检查时间，提高检查成功率及护理满意度，具有较好的应用效果。

EPO-2179
介入手术室护理现状调查与分析

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目的：调查全国介入手术室护理现状，分析其相关影响因素，为介入手术室规范化护理管理提供依据。**方法：**采用介入护理专家设计的调查问卷，问卷通过微信方式发放，对全国 224 所三甲医院 224 名介入手术室的护士长或护理负责人问卷调查，收回有效问卷 224 份，有效回收率 100%。**结果：**介入手术室业务管理模式由护理部负责占 55.36%，即护理部监督管理包括人员选拔和培训；由科室负责占 44.64%，即科室负责管理介入手术室所有工作，但医院管理部门未定期进行检查和指导；大部分介入护士在本科室自行培训，但仍然存在科室内无专业培训；专业讲课和自学占多数，全国介入护理学习班与省市介入专科护士培训未超过自学的频次；介入护理会议与微信平台是获得介入护理知识的主要途径；护理人员放射假管理中显示 56.7%的护理人员未休放射假，未享有放射补贴的占 37.05%。介入手术室在全国三甲医院发展较为迅速，但很多医院还存在护理人力资源严重不足，缺乏稳定性；部分医院介入手术室护理人员理论和操作技能培训缺乏规范性，对介入护士岗位培训、准入制度和放射假管理无统一规范。**结论：**我国介入手术室介入护理人员管理、培训和放射假管理等方面还不够完善，在人力配比不足的情况下，充分发掘介入护理人力资源的潜能，稳定护理队伍。在人员配置难以到位的情况下，可以通过优化工作流程，弹性排班，减少非护理工作时间，实现护士资源最优化配置需要建立统一的人力资源管理、培训及防护管理制度。部分人员未接受过正规培训，培训内容也较局限；大部分介入护士在本科室自行培训，但仍然存在科室内无专业培训；专业讲课和自学占多数，全国介入护理学习班与省市介入专科护士培训未超过自学的频次；介入护理会议与微信平台是获得介入护理知识的主要途径。在工作中，要加强培训力度和范围，培训内容不能单一集中在本科室自行培训甚至科室内无专业培训，应扩大培训途径，将互联网、人工智能等平台利用起来。

EPO-2180

“一站式”护理救治模式在介入治疗支气管扩张所致大咯血中的效果分析

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目的 探讨“一站式”护理救治模式在支气管扩张大咯血患者介入治疗中的应用。**方法** 将 2018 年 9 月至 2018 年 12 月收治的 55 例支气管扩张大咯血患者设为研究组，采用“一站式”护理救治模式，组成预检台、急诊室、急诊 CT 室、介入手术室、急诊监护室、介入咯血护士为一体的护理救治团队，以最佳护理资源服务患者。回顾性收集 2017 年 5 月至 2017 年 8 月经传统救治模式收治的 53 例支气管扩张大咯血患者为对照组，比较两组再咯血量、咯血发生率、术后住院时间、并发症及护理满意度。**结果** 研究组再咯血量、再咯血发生率、住院时间低于对照组，差异有统计学意义（ P＜0.05);研究组并发症发生率低于对照组，护理满意度高于对照组，差异有统计学意义（ P＜0.05).**结论** 推广“一站式”护理救治模式是目前可减少再咯血与再咯血量，缩短住院时间，减少并发症，提高护理满意度。

EPO-2181

CT 扫描低剂量影响因素及应用实践

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目的：迎合 CT 扫描 ALARA(as low as reasonably achievable，尽可能低剂量)，对影响 CT 扫描低剂量实现的影响因素及调整办法进行汇总分析，以期实现 CT 扫描进一步低剂量。

方法：基于“pubmed”、“中国知网”等数据库，查阅相关涉及 CT 低剂量扫描的文献结合应用实践，总结 CT 扫描低剂量的影响因素和实践策略。

结果：CT 扫描低剂量的影响因素及调整策略如下：
（1）X 线束的过滤，即球馆与受检者之间有软射线吸收材料以硬化射线束；
（2）射线束准直，存在于受检者与探测器之间，多探测器 CT 采用窄的射线束准直时，CTDI 会更高，因此适宜选用宽体探测器或自适动态准直技术；
（3）探测器材质的几何转换效率，即将光子信号转换为电信号的效率；
（4）技术进步，双能 CT，更低剂量，更高时间分辨率；
（5）扫描 z 轴上的范围；
（6）管电压 kVp 和管电流 mA，与剂量正相关，可采用自动管电流和自动管电压调节；
（7）机架旋转时间，最快的旋转时间被用于最小化移动模糊或伪影；
（8）层厚，与扫描部位、病变范围等匹配；
（9）螺距，有文献报道在不超过 1.5 的情况下不会遗漏病变；
（10）被检者配合程度，减少重复检查次数，不配合者建议镇静；
（11）重建算法，迭代重建算法相较于滤波反投影算法而言更有优势；
（12）噪声指数/剂量指数的调节，对于体部的扫描，儿童比成人剂量降低 4-5 个点；
（13）体位设计，对于不标准的体位需更高剂量；
（14）FOV 与矩阵，影响空间分辨率；
（15）被检者体格尺寸、发育程度、体重、年龄、受检部位等，影响其他参数调节。

结论：为实现 CT 扫描低剂量，厂商在设备硬件软件技术提升上发挥着重要作用，在病人配合的情况下，影像技师扫描时根据被检者不同情况调节相应参数（扫描范围、层厚、机架旋转时间、螺距、kVp、mA 等）可以实现 CT 扫描的更低剂量。

EPO-2182
肝癌患者持续性动脉灌注化疗后生活质量的研究与分析

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目的 研究持续性肝动脉灌注化疗的肝癌患者生活质量。方法：选取我科肝癌行介入治疗（肝动脉灌注化疗栓塞+导管留置术）患者 28 例，应用肿瘤患者生活质量量表（QOL 量表）进行问卷调查。**结果**：持续床边肝动脉灌注化疗的肝癌患者生活质量处于较好水平。其中 10%生活质量良好，46.42%生活质量较好，生活质量一般患者占 39.29%。 得分最高维度为同事的理解与配合,其次为家庭理解与配合。得分最低为饮食状况，其次为治疗的副作用。生活质量低主要表现在食欲差方面，化疗期间恶心、呕吐患者占比达 64.58%。**结论**：肝癌患者持续性动脉灌注化疗后生活质量处于较好水平，提高患者生活质量，在住院治疗期间的营养干预仍然重要。

EPO-2183
循证护理应用于影像诊断科 CT 检查避免医患纠纷的影响研究

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目的：运用循证护理应用于影像诊断科 CT 检查避免医患纠纷的影响因素。
方法：选取 2017 年 4 月到 5 月期间在我院进行 CT 检查就医的患者 800 例，随机分为研究组和对照组，每组各 400 例。对照组采用传统医患沟通方法实施治疗，研究组采用循证护理干预，比较分析两组患者满意度。
结果：研究组调查问卷平均得分为（89.61±5.95 分），明显高于对照组调查问卷平均得分（72.01±5.35 分）；研究组患者护理满意度为 95.1%，明显高于对照组患者满意度 87.2%，组间比有差异（P＜0.05）。
结论：循证护理能够让医患关系更加和谐，避免医患纠纷，提升影像诊断 CT 的护理满意度，值得推广及应用。

EPO-2184
肾动脉成形术治疗移植肾动脉狭窄的术中护理

肾动脉成形术治疗移植肾动脉狭窄的术中护理
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摘要：探讨肾动脉成形术治疗移植肾动脉狭窄的术中护理配合和观察要点。 **方法：**按照随机方法选取 2011 年 2 月-2018 年 12 月期间的 46 例肝癌患者作为本次研究的对象，记录患者术中手术配合器械、各种不良反应及处理方法。**结果：**1 例患者移植肾动脉起始段高度扭曲并狭窄，导丝未能通过狭窄段；1 例患者造影时肾动脉痉挛，停止手术，三个月后再次成功 PTAS。余 44 例患者均成功行 PTAS，术中无严重并发症发生。结论：介入手术中护士必须进行细致的心理护理、熟练掌握各种器械的性能、了解手术过程和并发症和处理才能成功的完成手术。

EPO-2185
有效沟通联合心理干预在 CT 增强检查患者中的应用

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摘要：目的是探讨护理有效沟通联合心理干预在 CT 增强检查患者中，协助患者消除顾虑、减轻不良反应、配合检查的目的。方法：1. CT 增强检查前进行有效沟通联合心理干预的方式，针对不同年龄、不用文化程度、不同心理状况的患者进行沟通交流，设法创造一个舒适的检查环境，有利于消除患者紧张情绪，缓解患者的心理压力。护理人员掌握熟练穿刺技术；2. CT 增强检查中，严格执行检查操作规程，严密观察患者情绪变化及病情变化，协助患者与扫描医生有效配合，有利于患者成功完成检查；3. CT 增强检查完毕后，告知患者相关注意事宜及避免不良反应的发生。结果：通过对我院 2019 年 1 月份 198 例患者进行观察研究，均存在不同程度的焦虑紧张及恐惧心理，不利于 CT 增强检查顺利进行。结论：将护理有效沟通联合心理干预应用于患者 CT 增强检查全过程，有利于消除患者紧张情绪，缓解患者心理压力。患者均能配合扫描医生成功完成 CT 增强检查及有效提高图像质量。值得在临床中推广应用。

EPO-2186

影像科规培护士带教工作体会与管理

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【摘要】目的：通过规培护士的带教工作，加强了影像科护士自身的专业知识，提高了带教水平，也让规培护士学习到更多的影像学专科知识，更好的投入到日常的工作中。方法：按照带教老师的专业水平、工作能力以及整体综合素质进行带教工作的分配，有计划性的带教；理论结合实际，多沟通，通过案例分享及经验交流提升规培生的学习兴趣。结果：带教老师要不断的充实丰富自我，学习新技能和不断更新理论知识，提高自身的护理专业知识、技术和带教水平。结论：根据规培护士的带教基本准则，拟定合理的带教计划，理论结合实际的带教方式教学，在工作之余接触新理念、新知识，培养规培护士的创新力。

EPO-2187

孕妇 MRI 护理干预对胎儿影像质量效果的评价

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【摘要】：目的：探究孕妇 MRI 护理干预对胎儿影像质量效果的评价。方法：选取接受 MRI 受检的孕妇胎儿 72 例，在我院于 2018 年 1 月至 2018 年 12 月进行检查治疗，观察组及对照组，两组各 36 例。取成像前护理干预加 MRI 胎儿成像检查的是观察组，择单纯的 MRI 胎儿成像检查的是对照组。对比两组图像总评分、优质图像比例的差异性。结果：对照组的图像总评分为（6.12±1.35）分，观察组为（8.07±1.44）分，相较于对照组，观察组的图像总评分更优，两组对比差异显著有统计学意义（P＜0.05）；以标准 6 分为阈值，患者的图像质量良好，则判定总评分 6 分以上，观察组中 33/36(91.67%)，对照组 27/36(75.00%)，相较于对照组，观察组的优质图像的比例显著较高，两组对比差异显著有统计学意义（P＜0.05）。结论：针对接受 MRI 受检的孕妇胎儿，采用成像前护理干预加 MRI 胎儿成像检查，可显著改善患者的生活质量，提高胎儿影像质量，具有临床应用价值。

EPO-2188

“一站式”杂交腹主动脉预置球囊阻断术术中护理配合的总结与探讨

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目的：总结腹主动脉阻断球囊置入术在高危前置胎盘剖宫产手术中的护理配合经验，以提高手术成功率。**方法**：进腹后，按腹主动脉阻断球囊置入术中记录阻断腹主动脉血流所需要充盈量注入阻断球囊 0.9%氯化钠 5-8ml,阻断血流切子宫壁，1 分钟内娩出胎儿交由台下新生儿科医生处理，徒手剥离胎盘或子宫切除，以减少出血量，护士在术前应做好充分评估，完善的准备工作，加强患者的心理护理，密切配合手术，及时、正确的护理，保证手术顺利进行。**结果**：20 例患者术中均未发生介入手术相关并发症及护理不良事件，术后痊愈出院。**结论**：腹主动脉球囊阻断术在前置胎盘合并植入患者剖宫产手术中控制出血效果显著，手术时应密切配合、细致、周密的观察，并给与正确的护理，保证手术顺利进行。

EPO-2189
降低放射科检查等待区域高峰时段 高分贝噪音发生频次的品管圈实践

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目的 探讨品管圈（quality control circle ，QCC）活动在降低放射科检查等待区域高分贝噪音发生频次的实践效果。**方法** 2018 年 1 月至 2018 年 7 月，四川大学华西医院放射科成立 QCC 小组，确定“降低放射科检查等待区域高峰时段高分贝噪音发生频次”为活动主题，进行现状调查，分析高分贝噪音发生的原因、制定相应对策并实施，对活动前后相关指标进行评估。**结果** 开展 QCC 活动后，高分贝噪音发生频次由 56 次（62.22%）下降至 15 次（16.67%），差异具有统计学意义（P＜0.05）；对小组成员在 QCC 手法运用、团队精神、专业知识、沟通协调、活动信心、责任荣誉等方面的评价，较实施前均有明显提高（P＜0.05）。**结论** QCC 活动有效改善了放射科检查等待区域高分贝噪音发生情况，营造了相对安静有序的就诊环境，提升了护理质量和护理人员的综合能力。

EPO-2190
新型沙袋在股动脉穿刺处压迫止血的应用研究

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【摘要】**目的** 探讨自行设计的新型沙袋在介入手术患者股动脉穿刺处压迫止血的应用效果。**方法** 采用方便抽样法，选取血管外科 136 例经股动脉穿刺行介入手术的患者作为研究对象，按照随机数字表法将患者分为实验组（68）例，对照组（68）例，实验组：介入手术后在股动脉穿刺处用新型沙袋压迫止血 24 小时后下床活动；对照组：介入手术后在股动脉穿刺处用弹力绷带加压包扎 24 小时，同时用普通沙袋压迫止血 6-8 小时，24 小时后下床活动。比较两组患者沙袋压迫的有效性、舒适度，穿刺处出血、皮肤受损等并发症的发生率。**结果** 使用新型沙袋置于股动脉穿刺处压迫止血与传统的使用弹力绷带加压包扎联合普通沙袋压迫止血相对比，压迫止血的有效性、舒适度高于对照组，穿刺处出血、皮肤受损等并发症低于对照组，差异有统计学意义（P<0.001）。**结论** 新型沙袋制作简单，能明显提高压迫止血的有效性，减少出血、皮肤受损等并发症，改善患者的舒适度。

EPO-2191
影像专科护士核心能力评价指标的构建研究

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目的：近年来，护理专科化发展已成为临床护理实践发展的方向，护士核心能力的培养已成为全球化的趋势。然而对于影像专科护士核心能力评价指标体系的构建尚缺乏相关研究，鉴于影像护理的发展，本文通过构建影像专科护士核心能力评价指标体系，为影像专科护士核心能力测评、培训提供客观、可量化的参考依据。
方法：第一步成立研究小组，共 6 人。主要负责编制专家函询表，选定函询专家，对函询结果进行统计分析及整理等。第二步构建指标体系框架：根据核心能力理论，采用文献检索法、专家访谈法结合影像护士能力的需求，构建影像专科护士核心能力指标体系框架，一级、二级指标涵盖了护士核心能力的共性指标，三级指标通过细化则突显出影像专科护理的个性指标。第三步进行专家函询：确定咨询专家，将构建的问卷运用德尔菲法对全国 20 名护理专家进行 2 轮函询。第四步对数据进行统计分析，运用 SPSS19.0 计算出指标的均数、标准差、满分比，以此分析专家意见的集中程度；用变异系数（CV）与协调系数对专家意见的协调程度进行分析；最后采用层次分析法统计出各指标的权重。
结果：专家积极性：2 轮专家咨询问卷的有效回收率均为 100%，总共 12 名专家提出个人建议；专家权威程度分析：判断依据系数（Ca）为 0.832，熟悉程度系数（Cs）为 0.852，专家的权威系数（Cr）为 0.836；专家意见协调程度：2 轮专家咨询 CV 均＜0.25；专家意见及修改情况最终形成了影像专科护士核心能力评价指标体系，包括 5 个一级指标、18 个二级指标和 80 个三级指标，三级指标中例如健康教育能力、影像相关知识能力、各项检查护理配合能力和检查风险评估能力等则重点突显出影像专科护士的个性指标。
结论：本研究通过德尔菲法对影像专科护士核心能力评价指标体系进行了初步的研究，各级指标条目专家意见集中，具有较高的科学性和可靠性，为影像专科护士核心能力培训提供参考。

EPO-2192
急危重症患者 CT 检查分级评估标准的构建

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目的：国内外有急诊分诊依据、标准和指南，但尚无急危重患者 CT 检查分级标准，影像科护士主要沿用经验分检安排检查，尚未形成统一的分级分检标准，可能会导致延误检查与诊断，存在安全隐患。因此构建一个简便、科学、可量化的急危重症 CT 检查分级标准，使护士在评估时有章可循、有据可依，确保检查有序和患者安全。
方法： 1.成立研究小组，共 8 人。2.研究方法：采用文献分析、理论研究、质性访谈法及德尔菲专家咨询法。3.拟定函询表：调查问卷涵盖急危重患者 CT 检查分级标准分三级,一级 5 个条目包括：“级别”、“病种”、“潜在危险情况”、“分级颜色”、“响应时间”；二级 32 个条目：如“一级为急危患者”，“疑主动脉夹层评为一级”,“一级为红色”、“ 一级为 5 分钟以内”等；三级 18 个条目：如：“收缩压<80 或>200mmHg,评为一级”、“突发意识丧失，评分为 P 或 U 评为一级”等。4.函询实施:选取 20 名医疗、护理专家，采用电子邮件形式进行两轮专家咨询。专家按 Likert5 级评分法对各级指标的重要程度和权重进行评分、赋值；对不合理的描述内容进行修改。4.资料收集统计:采用 SPSS18.0 统计软件进行数据统计。对同时满足重要性赋值均数>4.0、变

异系数<0.25 的条目予以保留，根据数据统计结果以及专家意见,对部分条目进行删除、合并、修改。
结果：两轮问卷的回收率均为 100%。专家熟悉系数为 0.790，判断系数为 0.975，专家权威系数分别为 0.768、0.873。两轮咨询后，共删除二级指标条目 2 项，三级指标条目 9 项，其中修改一级指标条目 1 项、三级指标条目 2 项。各级指标的变异系数为 0～0.23，协调系数 W 为 0.376。最终形成急危重症患者 CT 检查的分级评估标准，包括一级指标 5 项、二级指标 30 项、三级指标 9 项。
结论：急危重症患者 CT 检查分级评估标准具有一定的科学性和可靠性，有待进一步的临床实践进行验证。

EPO-2193
循证护理在品管圈降低增强 CT 对比剂外渗率的应用

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目的：探讨循证护理在品管圈降低增强 CT 对比剂外渗率应用效果。方法：应用品管圈管理方法，对 2017 年 1-6 月发生对比剂外渗 37 例，对外渗原因进行去伪存真找出真因 5 条，针对外渗真因检索文献寻找出相关证据 13 条，经过护理实践验证，最终确定有效证据 6 条，作为降低对比剂外渗的措施。结果：应用循证护理和品管圈活动后，对比剂外渗由干预前 1.48%降低至干预后 0.52%。结论：循证护理为品管圈活动中干预对策的制定提供了科学依据，循证护理和品管圈结合，可以降低增强 CT 对比剂外渗，保证患者安全。

EPO-2194
优质护理服务在老年患者腹部 CT 增强扫描中的作用

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目的：探讨优质护理服务对老年患者腹部 CT 增强扫描的图像质量的影响。
方法：针对 2019 年 1 月至 6 月行腹部 CT 增强 检查 60 岁-80 岁老年患者 126 例，实施优质护理服务个性化跟踪监控，同时对 2017 年 6 月至 12 月行腹部 CT 增强 检查 60 岁-80 岁老年患者 117 例行回顾性分析，对两组检查成功率和图像质量进行对比。优质护理服务细节：实施全流程跟踪，监控检查前胃肠道准备情况、检查中呼吸配合和心理疏导、对比剂使用后不良反应观察。
结果：通过对比，实施优质护理服务的老年患者，所得的图像质量和检查成功率，远比未实施优质护理服务的老年患者高。可见，针对老年患者的个性化护理干预尤为重要。
结论：CT 增强扫描对腹部疾病的诊断是一种不可缺少的检查方法，而老年患者的配合度又是干扰 CT 增强扫描效果的重要因素。通过对上百例老年患者腹部 CT 增强扫描时实施优质护理服务的分析，良好的护理服务是检查成功的重要保证。

EPO-2195
针对门诊 CT 增强患者的水化效果现状调查及管理探讨

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目的：围绕如何最大程度保证门诊 CT 增强患者水化效果，展开分析与探讨，期待能够通过更多的循证依据探索更为标准、可行性高的实施办法。
方法：选取本院门诊 CT 增强患者 204 例，其中 2018 年 6 月至 9 月的 102 例作为观察组,2019 年 3 月至 6 月的 102 例作为对照组，前者针对水化给予常规宣教，后者由护士跟踪给予个性化干预，瞩增强前半小时饮水 500ml、增强后半小时饮水 500ml，之后 24 小时内大量饮水。病例有纳入及排除标准，患者基本资料等无统计学差异。两组均通过尿液颜色和不良反应发生率判断水化效果。
结果：观察组轻中度不良反应发生率明显高于对照组，观察组尿液颜色绝大部分深于对照组。
结论：有关 CT 增强检查应用碘对比剂引起不同程度的不良反应，已经引起临床医生及放射科医技护的关注和重视。如何预防和降低对比剂不良反应的发生，更是个值得重视和必须妥善处理的迫切问题。临床数据及文献显示，对比剂不良反应中轻中度占大多数，给予充分水化可以在一定程度上减少轻中度不良反应的发生。而针对门诊患者，对于水化方法和效果的实施与监控均有困难。针对门诊患者实施个性化水化干预、跟踪管理和观察，能够很好地保证水化效果，此方法易于实施、操控性较强，便于推广。

EPO-2196
优质护理在减少 CT 增强扫描对比剂不良反应发生中的应用价值

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目的：研讨 CT 增强扫描患者在接受优质护理指导后对减少对比剂不良反应发生的作用。**方法**：选择 2018 年 11 月至 2019 年 3 月在我院行 CT 增强扫描的 200 例患者作为研究对象，并按检查先后顺序划入两组，A 组（n=100）接受常规护理指导，B 组（n=100）开展优质护理服务，对 A、B 组对比剂不良反应的发生情况及护理满意度做统计和评估。**结果**：B 组护理期间有 6.0%的患者出现对比剂不良反应，较 A 组的对比剂不良反应率 22.0%显著降低，P＜0.05，有统计学意义。问卷调查显示，B 组有 96.0%的患者对护理服务满意，较 A 组的护理满意度 82.0%提升更加明显，P＜0.05，有统计学意义。**结论**：在行 CT 增强扫描的患者中开展优质护理服务指导，能够有效降低对比剂不良反应的发生率，并可提升患者对护理服务工作的认可度，值得在工作中推广使用。

EPO-2197
探讨放射防护铅衣的消毒方法与效果

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目的：探究应用 HaloFogger™ Hands-Free Dry-Mist Dispensing Device 过氧化氢干雾消毒机），配合使用 Sanosil S010 通用消毒&灭菌剂，用干雾发生方法，在放射防护铅衣的消毒作用和效果。
方法：选择在 CT 扫描间内正常使用的两套铅衣，分为对照组和实验组，保证两套铅衣为同等使用频率。在两组铅衣使用 24 小时后，采取擦拭法分别于两组铅衣正反面的多点位置各自采样。（以 4cm×5cm 灭菌板置于铅衣正反面取样，取样点的位置分别为铅衣正反面的中心点以及左上、左下、右上右下四个角，取样面积各为 20㎠,共 200㎠。）；之后，对照组铅衣进行紫外线灯照射消毒，时间为 60min，实验组铅衣采用过氧化氢干雾消毒，时间为 30min。消毒完毕，再次采取

擦拭法分别于铅衣的正反面各自采样，采样位置与消毒前的位置一致，采样后进行实验室细菌菌落计数，并对俩组计数结果进行比较。
结果； 使用 24 小时后的铅衣，消毒前平均菌落数：对照组 230 CFU/㎡、实验组 400CFU/㎡；消毒后，实验组平均菌落数为 1 CFU/㎡，最多 12 CFU/㎡，最少 1 CFU/㎡，对照组平均菌落数为 2 CFU/㎡，最多 5CFU/㎡，最少 1CFU/㎡，对比观察有统计学意义（p＜0.05）
结论： 采用过氧化氢干雾消毒法对放射防护铅衣进行消毒，杀菌率强，不留死角，适用于铅衣表面消毒，消毒及作用达卫生学检测标准。杀菌达标率、消毒所需时间、便捷程度优于紫外线灯照射消毒。

EPO-2198

局部手法减压联合喜辽妥软膏外敷治疗增强 CT 检查中碘对比剂外渗的效果观察

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目的 探讨局部手法减压联合喜辽妥软膏外敷治疗增强 CT 检查中碘对比剂外渗的临床效果。
方法 选取我院影像科接受增强 CT 检查发生碘对比剂外渗的患者 40 例作为研究对象，随机分为观察组和对照组各 20 例。观察组在发生碘对比剂外渗后立即拔除留置针，用安尔碘消毒外渗部位,并按照无菌操作挤压针眼周围, 尽可能排出渗出液后，再予以安尔碘消毒，喜辽妥软膏外敷并以无菌纱布包扎，24 h 后更换纱布；对照组在发生碘对比剂外渗后采用常规的 24 h 内用 4-7℃ 50%硫酸镁浸湿 2 层纱布后覆盖外渗部位保湿冷敷，24 h 后改用温度为 40～50℃ 50%硫酸镁纱布继续保湿热敷，2-4h 更换 1 次，保持纱布湿润，直到肿胀消除。对 2 组的治疗效果进行评价，以显效率作为指标来评价 2 组患者治疗效果。
结果 观察组显效率明显高于对照组，碘对比剂外渗后总体疗效优于对照组，差异均具有统计学意义（Ｐ＜０．０５）
结论 增强 CT 检查中碘对比剂外渗局部手法减压联合喜辽妥软膏外敷具有较好的临床疗效，可有效缩短外渗部位肿胀消退时间，减轻患者疼痛，效果立竿见影，避免外渗局部组织溃疡及坏死,有效避免并发症的发生，值得临床推广应用。

EPO-2199

探讨在 CT 增强检查中降低对比剂外渗的有效护理预防措施

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目的：探讨在 CT 增强检查中降低对比剂外渗的有效护理预防措施。方法：对 2017 年 1 月至 12 月期间 28 例对比剂外渗的案例进行分析评价，总结分析发生对比剂外渗原因，探讨有效护理预防措施，并实施于 2018 年 1 月至 2018 年 12 月所有 CT 增强检查患者。结果：2017 年 1 月至 12 月 24869 例 CT 增强检查患者中，发生对比剂外渗 28 例，外渗发生率 0.11%；2018 年 1 月至 12 月 26186 例 CT 增强检查患者中，发生对比剂外渗 11 例，外渗发生率 0.04%。结论：CT 增强检查的护理流程中，采取有效护理预防措施可明显降低对比剂外渗的发生率。

EPO-2200

介入手术室护士化疗药职业防护现状调查

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[摘要]**目的：**调查全国部分三甲医院介入手术室护士化疗药职业防现状，分析其相关影响因素，为改善全国三甲医院介入护士化疗药职业防护提供真实的临床依据。**方法：**采用自行设计的调查问卷，问卷通过微信方式发放，对全国 20 余所三甲医院 446 名介入手术室的护理人员进行化疗药职业防护问卷调查。**结果：**将调查对象根据介入手术室工作年限分为两组，分别为年限＜5 年组和年限＞5 年组。化疗药物危害知晓率、防护措施知晓率、药物规范配制知晓率在两组均有明显统计学差异。年限＞5 年的介入护士，对化疗药物危害的知晓率较高（84%，P＜0.001）；对防护措施的知晓率较高（89%，P=0.007）；对药物规范配制的知晓率（85%）也高于年限＜5 年的介入护士（P=0.024）。两组在化疗药物防护态度总体赞同率都较高（P＞0.1），赞同增加防护用品及增加生物安全柜的赞同率都高于 95%，增加对护士心理影响及增加使用化疗药密闭式配置和转运系统的赞同率均超过 90%。两组在坚持穿防水防护衣的坚持率均较低，年限＜5 年组为 27%，年限＞5 年组为 17%，两组具有统计学差异（P=0.017）。但坚持佩戴护目镜的坚持率两组均较低（＜30%，P=0.101）。坚持在生物安全柜中配药、坚持在静脉药物配置中心（PIVAS）进行集中配药的两组坚持率均很低（P＞0.1），均小于 20%。**结论：**工作年限＜5 年的介入护士对化疗药物知识熟悉程度不足，需进一步加强培训；介入护士对化疗药物防护态度认真且积极，但由于介入手术室防护装备较少，导致介入护士对化疗药物防护行为的坚持率很低。因此，医院应改善介入手术室护士化疗药物职业防护的措施，安装必要的防护装备。

EPO-2201
介入手术室高值耗材的信息化管理

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目的：提高手术室的高值耗材的管理效率，规范管理流程。 方法：利用信息化管理手段，将每件物品建立院内唯一身份码，实行代销制，建立虚拟二级库，从验货、入库、保管、使用收费、质量追溯、库存盘点到财务核销结算，实现全程信息跟踪，每月按实际消耗量核销出库，做到每件物品都能全程监控和可追溯，将信息化技术融入高值耗材的日常管理管理流程。 结果：一方面使护士从繁琐的医用耗材管理工作中解脱出来，另一方面使高值耗材的管理更加精确、规范、透明。结论：通过对高值耗材的信息化管理，优化了工作流程，提高了管理水平，有效保障了医疗安全和医院经济运行的安全性。

EPO-2202
组织胶水联合免拆线缝合术在输液港植入患者中的应用及护理

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目的 探讨医用组织胶水联合可吸收缝线在输液港植入术中的应用效果。**方法** 回顾性分析析 2018 年 1 月~2019 年 4 月在我院介入手术室行输液港植入术的 562 例患者的临床资料，按照手术切口闭合方法将其分为试验组（n=264）与对照组（n=298）。试验组患者使用可吸收缝线联合组织胶水闭合手术切口，对照组患者使用传统丝线缝合术。比较两组患者的手术时间、手术切口愈合情况、术

后并发症发生情况及患者满意度。**结果** 两组患者的手术时间比较，差异无统计学意义（P>0.05）；使用生物组织胶水的试验组比用传统手术缝合处理的对照组患者伤口愈合要好，美观度更甚，试验组除了 1 例因双侧乳腺切除手术操作空间不够而出现伤口开裂外，其余患者均愈合良好；试验组患者及家属满意度也显著高于对照组，差异有统计学意义(P<0.05)。两组患者术后并发症发生情况比较，差异同样具有统计学意义（P＜0.05）。**结论** 可吸收缝线联合组织胶水粘合切口简单省时、安全可行，术后并发症发生率低，患者无需来回奔波医院进行换药及拆线，大大提高肿瘤患者满意度。

EPO-2203
乳腺癌患者 MRI 检查改良体位摆置方案探讨

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目的 为提高乳腺癌患者 MRI 检查的舒适度，本文基于 MRI 乳腺检查所需摆置俯卧位的特点，探讨了改良体位摆置方案对提升患者舒适程度的有效性。
方法 本研究纳入我院 2018 年 8 月至 2019 年 4 月的 86 名新辅助化疗女性乳腺癌患者，分别采用常规体位（对照组，43 例）和改良体位（实验组，43 例）进行磁共振检查。患者年龄为 37~56 岁，体重为 50-72kg，且均意识清醒、态度配合。其中，常规体位采用俯卧位线圈、床单等辅助工具，患者头面部俯卧于线圈的头枕上，乳腺组织自然下垂并暴露于线圈中，上举双上肢至头部两侧，双下肢顺着体位架的坡度自然放在检查床上；改良体位增加使用了 U 形托手枕、踝关节垫、等辅助工具。在常规体位摆置的基础上，患者口鼻置于线圈固有的凹槽内，保证呼吸通畅。根据患者的脸型适当置入海绵垫在额、双颧受力点，调整受力面，减少患者面部局部受压。双手前伸，双肘屈曲 30 度，以不触碰磁体内壁为宜，踝关节下放入软枕，使双小腿与大腿屈曲 30°，同时避免脚尖长时间与床面碰顶造成不适。根据磁共振检查后患者的反应情况对不同体位的舒适度进行评估，包括额颧潮红、双上肢麻痹，上下肢麻痹，乳腺外上象限潮红，无不适反应 5 种反应情况。采用卡方检验对实验组和对照组反应情况的差异进行量化测量。
结果 采用改良体位的患者，其检查部位均在磁体内，暴露良好，身体各部分受力均匀，呼吸与循环等功能正常。改良体位和常规体位行 MRI 在额、颧潮红，双上肢麻痹，上下肢麻痹，乳腺外上象限潮红和无不适等反应情况的案例数分别为：36/2，43/4，7/0，9/0，0/39。对照组和实验组 5 种案例数卡方检验 P 值均小于 0.05。
结论 较常规体位而言，改良体位明显减少患者行 MRI 后的不适反应、改善患者检查舒适度。该体位摆置方案可进一步推广使用。

EPO-2204
临床护理路径在急性缺血性脑卒中患者颅内取栓术中的应用效果研究

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目的： 探讨与分析临床护理路径用于急性缺血性脑卒中患者颅内取栓术中的应用效果。
方法：选取我科导管室自 2017 年 1 月~2019 年 5 月收治的急性缺血性脑卒中患者 197 例，将其按照实施颅内取栓术的手术先后顺利排序，奇数顺序患者分为对照组，共 99 例，采用常规手术护理

模式进行手术工作，偶数顺序患者分为实验组，共 98 例，采用临床护理路径模式进行，运用卡方检验和非参数检验的统计学方法，分析并比较两组患者在到达导管室至开始置鞘时间、血管开通率、术中并发症发生率、术后肌力恢复程度及手术医生对护理工作满意度等方面的差异。
结果：（1）两组患者在年龄、性别、婚姻状况、职业、合并高血压、糖尿病、高脂血症等卒中因素、起病时间，术前 NIHSS 评分、梗塞部位等方面无统计学差异（P>0.05）。（2）实验组在到达导管室至开始置鞘时间及术中并发症发生率方面均显著低于对照组，在血管开通率，术后肌力恢复程度及手术医生对护理工作满意度方面均高于对照组。
结论：临床护理路径应用于急性缺血性脑卒中患者介入治疗中，充分调动了护理工作的循证性，能有效提高护理工作质量，改善患者预后，具有一定的积极意义，值得广泛推广。

EPO-2205

介入手术室敏感指标的构建

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构建介入手术室护理质量敏感指标，提高介入手术室护理质量。方法 成立敏感指标构建小组，通过文献回顾，采用头脑风暴法初步构建敏感指标并通过临床试用及专家咨询最终构建。最终确定 4 项指标：术前耗材准备完善率、介入手术安全核查合格率、效期管理实施合格率、介入手术室外科洗手正确率。结论：通过构建敏感指标，促进护理质量的持续有效改进，为科室护理质量管理明确了方向。

EPO-2206

应用根本原因分析法降低 CT 增强检查中静脉留置针非计划性拔管率的实践

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目的：探讨根本原因分析法（RCA）在降低 CT 增强检查静脉留置针非计划性拔管中的作用。
方法：对我院 2017 年 1 月至 12 月 24869 例 CT 增强检查患者中的 415 例静脉留置针非计划性拔管的发生进行根本原因分析，针对原因制定改进措施。分析 RCA 实施前（2017 年 1 月-12 月）与实施后（2018 年 1 月-2018 年 12 月）CT 增强检查中静脉留置针非计划性拔管率。
结果：CT 增强检查静脉留置针非计划性拔管率 RCA 实施前为 1.67%（415/24869），实施后为 0.63%（169/26186）,两组拔管率差异有统计学意义（p<0.01）。
结论：运用根本原因分析法能有效找到 CT 增强检查中静脉留置针非计划性拔管的根本原因，进而给予相应的护理干预，能有效地降低非计划性拔管发生率。

EPO-2207

耐高压 PI CC 导管在 CT 增强中的应用效果分析

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[摘要] **目的**：探讨耐高压 PICC 在 CT 增强扫描中的应用效果和管理模式。**方法**：选取已置 入耐高压 PICC 行 CT 增强的患者 65 例。植入耐高压静脉留置针的患者 100 例纳入观察组，观察比较两 组患者对比剂不良事件发生情况及 CT 增强扫描成像质量及患者的 SAS、SDS 评分 CT 增强扫描患者对比剂发生不良事件发生情况，对照组有 9 例，对比剂外渗 3 例，过敏性不良反应 8 例。观察组有 4 例，对比剂外渗 0 例，过敏性不良反应 3 例。两组对比剂外渗发生率的比较，差异有统计学意义。两组对比剂过敏样反应率的比较差异有统计学意义，观察组患者 CT 增强扫描成像质量优于对照组、观察组患者的 SAS、SDS 评分都低于对照组。**结果**：对置入耐高压双腔 PICC 患者，行 CT 增强扫描时，检查前无须进行血管穿刺操作，无需高外渗风险告知，减轻患者疼痛和焦虑，减少对比剂不良反应的发生，改善了 CT 增强扫描成像质量，值得推广应用。

EPO-2208
穴位刺激调控法对减轻首次磁共振检查患者焦虑状况的效果评价及研究

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摘要：目的 探讨穴位刺激调控法对减轻首次磁共振检查患者焦虑的效果。方法 选取某三级甲等医院 30 例首次磁共振检查的焦虑患者,随机分为试验组和对照组,每组各 15 例。试验组在首次磁共振检查前常规护理的基础上接受穴位刺激调控法,对照组接受磁共振检查常规护理。患者检查前 24 h 和检查日采用汉密尔顿焦虑量表,St.Mary 医院睡眠问卷评估患者的焦虑水平、睡眠状况,测量血压和脉率。结果两组干预前焦虑量表评分、睡眠状况、收缩压、舒张压、脉率的比较,差异均无统计学意义(P>0.05);干预后两组焦虑量表评分、睡眠状况总评分、脉率的比较,差异有统计学意义(P<0.05),收缩压、舒张压的比较,差异无统计学意义(P>0.05)。结论穴位刺激调控法可降低首次磁共振检查患者检查前焦虑水平,改善患者的睡眠状况,减缓焦虑患者的脉率,使患者顺利完成检查,提高检查成功率。

EPO-2209
放射科模块化护理风险管理模式的构建与效果评价

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【**摘要**】**目的** 探讨放射科运用模块化护理风险管理模式对降低不良事件发生率和提高患者满意度的影响。**方法** 选择 2017 年 1 月～2019 年 1 月前来我院做磁共振及 CT 检查的 776304 名患者中实施常规护理管理，选择 2017 年～2019 年 1 月前来我院做磁共振及 CT 检查的 834568 名患者实施模块化护理风险管理，比较两组患者的不良事件发生率和患者的满意度。**结果** 实施模块化护理风险管理后护理满意度高于实施前，实施后不良事件的发生率低于实施前。**结论** 将模块化护理风险管理模式应用于放射科，有利于降低不良事件发生率，提高患者护理满意度，具有一定的临床推广价值。

EPO-2210
院内二维条码在介入耗材信息化管理中的应用

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目的：探讨院内二维条码在介入耗材管理中的应用效果
方法：将 2017 年 7 月-2018 年 6 月院内耗材管理未使用二维条码设为对照组，2018 年 7 月-2019 年 6 月院内耗材管理使用二维条码信息化管理设为观察组，比较院内二维条码使用前后介入耗材收费缺陷发生率和介入医生对介入护理服务质量的满意度以及耗材收费所需时间。
结果：院内二维条码使用前后，观察组收费缺陷发生率<0.01%低于对照组的 1%差异有统计学意义（$p<0.05$）；介入医生对介入护理服务满意度分别为 74%和 90%，差异有统计学意义（$p<0.05$）；院内二维条码使用前后，介入护士收取耗材费所需平均时间为 11.13±2.82 秒，低于对照组的 25.2±2.08 秒。
结论：院内二维条码在介入耗材全过程管理中，可减轻护士的收费工作量；降低了收费缺陷的发生；实现了耗材的全程追溯；提高了医生的满意度；提高了护理管理水平。

EPO-2211
经皮肺穿活检术的临床应用与护理

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肺部经皮针刺活检术是肺部非血管介入技术中的重要内容，1883 年，Leyden 利用此方法获取一名肺炎患者细菌学资料，1886 年，Menetrier 用此方法抽吸肿块儿组织以诊断肺癌，但随后此项技术未向前发展，未能推广应用。瑞典学者于 20 世纪 60 年代采用双向影像增强器透视导向下细针穿刺，明显提高了活检成功率，降低了并发症，此后，经皮肺穿刺活检随着影像导向技术、细针抽吸技术及细胞病理学的发展，而逐渐发展并普及应用。

EPO-2212
意识障碍患者脑部磁共振增强检查的护理配合

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目的 由于磁共振设备的特殊性、检查时间较长，脑部磁共振增强伴意识障碍的患者意识不清、躁动等因素，做好检查前、检查中的护理配合尤为重要，探讨意识障碍患者脑部磁共振增强检查护理配合方法。**方法** 回顾性分析 2018 年 8 月-2019 年 6 月行磁共振增强检查的 41 例意识障碍患者，检查前仔细询问患者既往史和过敏史，排除检查禁忌；配合医生仔细评估患者病情及配合能力，明确无气道危险、生命体征平稳；优化常规磁共振检查流程，采用电话预约，提前送检查单，提前为患者预留时间，节约患者等待时间；建立留置针通道，患者到达磁共振室从准备、扫描、后处理等环节全部由经验丰富、训练有素的护士、技师、医生完成，缩短患者在磁共振室滞留时间，确保患者安全。检查中配合技师为患者安置正确舒适的体位，牢固固定身上的各种管道，确定留置针在位、通畅，氧气袋持续吸氧，监测患者心率、呼吸等。平扫完毕增强时，根据患者的具体情况确定

钆喷酸葡胺对比剂使用的剂量，以 0.5ml/s 的速度推注。注入对比剂时，动态观察患者心率、血压、呼吸的变化，并与注射对比剂前进行对照，有无恶心、呕吐、皮疹等不良反应，及时发现异常，并做好记录。检查中和检查后严密观察生命体征及对比剂不良反应。**结果** 41 例意识障碍患者脑部磁共振增强检查，通过注射对比剂后发现脑占位 24 例，脑炎 15 例，其他 2 例。3 例注射对比剂时心率加快（较检查前增加 8-14 次/min）呼吸加快（较检查前增加 7-13 次/min）；30 例在 12-15 分钟之内顺利完成检查，11 例因躁动配合困难，遵医嘱缓慢推注安定后行增强检查，所有病例均获得高质量的图像。未发现意识障碍患者使用对比剂后出现恶心、呕吐、皮疹等毒副反应。**结论** 脑部磁共振增强检查是脑肿瘤的早期诊断、病变的鉴别和脑炎治疗的有效诊断技术，检查前的准备、检查中的配合、检查后观察对顺利完成检查和早期正确诊断及及时有效治疗有着重要意义。

EPO-2213
体外高频热疗治疗恶性肿瘤患者的护理体会

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【摘要】目的：探讨体外高频热疗治疗恶性肿瘤患者的护理方法，降低体外高频热疗的治疗后的护理并发症发生，减轻患者痛苦，提高患者生存质量。方法：回顾性分析 2018 年 7 月-2019 年 6 月在我科应用珠海和佳 HG-2000 体外高频热疗仪治疗 650 例恶性肿瘤患者，机器频率为 13.56Mhz，每次温度在 42.5-43℃，治疗时间在 30～40 分钟，每周 2～3 操作次，6 次为一个疗程。操作前、中、后都有一名热疗专职技师和一名专科护士进行主机操作及全过程监测。结果：650 例恶性肿瘤患者进行了共计 3000 余次的治疗中发生烫伤 1 例，皮下脂肪硬结 2 例，呕吐 3 例。烫伤 1 例无明显疼痛，指导患者涂抹芦荟胶后，第三日皮肤恢复正常。皮下脂肪硬结 2 例，无疼痛感，8 天后作第二次疗程时皮下硬结自行消失。3 例呕吐患者均为热疗联合化疗的患者。结论：为恶性肿瘤患者进行体外高频热疗治疗的前、中、后，进行全程整体护理，能有效降低并发症发生。

EPO-2214
急性缺血性脑卒中介入治疗术中安全监测及风险管理

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【摘要】目的 探讨分析急性缺血性脑卒中患者介入治疗术中的风险管理分级标准及安全监测。**方法** 回顾性病历分析我院于 2017 年至 2018 年 6 月收治的 199 例急性脑卒中患者，设计专用的脑卒中患者数据统计表单，主要收集患者基础疾病、入院诊断、临床症状、术前 NIHSS 评分、手术方式、术中生命体征、术后生活质量指标等资料统计脑卒中患者的风险因素，根据统计结果对高风险因素逐一分析并进行分级处理（分为四级），针对不同风险级别采取不同的措施进行术中安全监测。**结果** 对行介入治疗的脑卒中患者基础疾病、临床症状、术前 NIHSS 评分、手术方式、术中生命体征、药物使用情况、治愈等评估建立分级标准，并针对性相应风险因素采取安全管理，提高 AIS 介入治疗术中安全性。**结论** 介入溶栓治疗术中对急性脑卒中患者进行风险分级管理，建立安全监测标准，提高脑卒中患者的手术成功率，降低了并发症发生率，值得进一步的研究与应用。

EPO-2215

主动脉夹层患者 CTA 检查的风险管理

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【摘要】 目的：探讨主动脉夹层患者行 CTA 检查的风险和对策。方法：对 2019 年 1 月~7 月共 1816 例主动脉夹层患者行 CTA 检查的过程、精心的护理进行回顾总结性分析。结果：1815 例患者完成检查，其中 2 例患者检查中高压注射对比剂出现外渗，重新静脉穿刺后再次注射对比剂顺利完成检查，其余患者均一次成功顺利安全完成检查。在这组患者中 1815 例及时做出影像学诊断，1813 例得到及时救治，2 例患者因病情危重自动办理出院，1 例患者转运到达 CT 室即出现夹层破裂，返回急诊科急救。结论： 通过对主动脉夹层患者行 CTA 检查体会到：医护人员应有高度的责任心，全面评估患者的风险性，充分做好检查前的准备，与急诊科医务人员的紧密配合，将部分检查前准备工作如给与家属、病人的沟通，交代注意事项等提高患者及家属对检查的认识，签署知情同意书，静脉留针等在急诊科完成，减少患者外出的时间，尽可能的降低风险！同时 CT 室也做好相应的准备如扫描机房的环境、高压注射器、人力等方面。急诊科医务人员携带急救物品转运患者至 CT 室。检查中细致地观察病情，密切监测血压、心率的变化 ，高压注射对比剂的观察，检查后做好交接班及宣教。通过有效的护理干预从而顺利的完成 CTA 检查 ，尽早做出诊断及时给予治疗，积极提高患者的生存率。

EPO-2216

优质护理在放射造影检查中的应用

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研究分析优质护理在放射造影检查中的应用效果。方法：本院于 2018 年 7 月至 2019 年 7 月收治 80 例行放射造影检查患者，遵循奇偶数分组法原则将 80 例患者分为对照组（40 例，给予常规护理）、观察组（40 例，给予优质护理），比较两组一次造影检查成功率、焦虑发生率、护理满意度评分、检查质量评分。结果：观察组的一次造影检查成功率为 95.5%（36 例）、焦虑发生率为 6.0%（4 例），对照组的一次造影检查成功率为 80.6%（28 例）、焦虑发生率为 20.9%（12 例），两组比较有显著差异（P<0.05）。观察组 40 例的护理满意度评分、检查质量评分均高于对照组（P<0.05）。结论：在放射造影检查中应用优质护理，可缓解患者的焦虑情绪，可提高一次检查成功率与检查质量，值得推广。

EPO-2217

综合医院影像专科教学路径在实习护生带教中的应用

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目的：影像护理近几年来发展很快，部分医院影像科逐渐承担实习带教任务，但目前无影像检查护理培训教材和规范的教学方法。在进行护生带教时，由于大影像科岗位多、分散，护生采用轮转的方式培训，很难做到“一对一带教”，同时带教老师对各个知识点的讲解标准也不一致，导致培训效果差。因此，建立影像专科护生规范化教学路径，使带教老师按教学路径逐一实施教学任务，提高护生的培训效果。

方法：1.对象：89 名实习护生；2.成立教学小组：由护士长、教学组长及教员组成。3.设计教学路径：根据护生实习的时间结合教学大纲的要求，确定实习的岗位（CT、MRI、介入、胃肠室等），包括检查环境、物品、流程、健康教育及各项检查前、检查中、检查后的知识点和操作技能，编制《影像科护生实习路径手册》，掌握程度分了解、熟悉、掌握。4.教员培训：带教前参照路径手册结合《医学影像科护理工作手册》进行统一培训，提升教员的专业知识水平。5.应用：护生到科统一发放《实习路径手册》，并进行讲解，让护生熟悉不同岗位不同阶段所需了解、熟悉、掌握的知识点及重难点，护生可提前查阅文献主动学习；带教老师依据《实习路径手册》在不同的实习岗位讲解专科知识和示范专科操作，每个岗位实习结束后，护生与带教老师双签名确认，避免知识点的遗漏。

结果：（1）培训项目的完成率从 90-95%提高到 100%；（2）实习护生对我科的教学满意率从为 96.3%提升到 100%；（3）专科理论知识平均分从 85 分提高到 97 分，操作技能平均得分从 79 分提高到 88 分，合格率达到 100%；（4）考评带教老师的专业知识掌握从 90%提高到 98%。

结论：影像科护生实习路径简单、直观，培训目标明确，培训内容清晰，培训标准一致，具有一定的实用价值，可以提高影像科护生的教学效果，值得进一步应用。

EPO-2218
原发性肝癌与继发性肝癌肝动脉置管电子注药泵持续灌注化疗的观察与护理

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【摘要】目的：探讨肝动脉置管后持续灌注氟尿嘧啶（5-FU）联合奥沙利铂治疗原发性及继发性肝癌患者的观察要点与护理措施。方法：对 14 **例原发性肝癌，**21 例继发性**肝**癌患者采用肝动脉留置导管，经电子注药泵持续导管内灌注氟尿嘧啶（5-FU）治疗肝恶性肿瘤，对置管术后情况、化疗毒副反应进行观察及采用有效针对性护理。结果：35 例中 33 例患者共完成 60 次动脉置管化疗，人均 1.8±0.93 次。35 例患者中，1 例患者因身体状况无法耐受，而中途停止治疗、1 例患者因动脉导管堵塞, 输入 124ml 后拔除导管，其他 33 名患者虽在治疗过程中发生不同程度的不良反应，经积极处理后，无发生严重不良反应，顺利完成治疗。结论：肝恶性肿瘤患者在留置肝动脉导管行区域性持续灌注化疗降低了全身化疗的毒副反应，提高肿瘤局部的药物浓度，从而改善了治疗疗效。治疗过程中细致而规范的护理，为患者减轻了痛苦，提高了生活质量。

EPO-2219
阻塞性黄疸介入治疗患者围手术期的护理与体会

魏雪
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经皮肝穿刺胆道造并引流管置入术（PTCD）是在 X 线或 B 超引导下，利用特制穿刺针经穿入肝内胆管，再讲造影剂直接注入胆道而使肝内外胆管迅速显影，同时通过造影管行胆道引流。此方法创伤小，回复快，为临床较多选用的方法。PTCD 是通过穿刺技术于肝内扩张的胆管内置管形成胆汁的外引流或穿越狭窄部位置管形成胆汁的内外引流，很快缓解肝内胆管的张力，明显减轻黄疸，改善症状和肝功能情况[1]。选取我院 2016 年 9 月-2017 年 12 月份收治的阻塞性黄疸患者，现报到如下。

EPO-2220
一例糖皮质激素相关骨质疏松性脊椎压缩性骨折 PVP 围术期护理

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糖皮质激素(GC)相关骨质疏松 (glucocorticoid induced osteoporosis，GIOP)是一种因为内源或外源 GC 所致的，以骨强度下降、骨折风险性增加为特征的代谢性骨病[1]。糖皮质激素所致的骨质疏松症(GIOP)可导致椎体、肋骨、髋部等多部位骨折，严重影响患者的生活质量并增加社会负担，是 GCs 治疗的严重并发症之一[2]。因糖皮质激素引起的沿脊柱整个胸腰椎长度的骨质疏松性脊椎压缩性骨折(GIOPVCFs)的报道极少。2015 年，我院曾收治一名罕见的 GIOP 患者，在 27 个月时发生一组自发性椎骨骨折，经过我科制定详细的围术期护理计划及落实，为患者 4 次连续 PVP 手术的成功提供保障。患者最终康复出院，持续疼痛减轻，提高了生活质量。
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EPO-2221
Standford B 型主动脉夹层覆膜支架腔内修复术的术中护理

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目的：探讨主动脉夹层（aorticdissection，AD）腔内修复术围术期的护理要点。方法：总结我院进三年年来主动脉夹层覆膜支架腔内修复的患者术中护理措施。包括血压控制、疼痛护理、特殊体位护理、心理护理、并发症的预防及术中配合等。结果：所有患者均在围手术期得到了很好的护理。结论;主动脉夹层覆膜支架腔内修复术的优质术中护理对手术的进展及手术结果满意程度至关重要。

EPO-2222
水合氯醛保留灌肠在婴幼儿磁共振检查中的镇静效果分析

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目的：对水合氯醛保留灌肠在婴幼儿磁共振检查中的镇静效果进行观察，并结合护理措施进行分析。
方法：选取 2014 年 9 月-2017 年 9 月接受磁共振检查的 50 名婴幼儿患者作为研究对象。所有患者均在磁共振检查前接受水合氯醛保留灌肠进行镇静，并接受相应的护理干预。对患者的入睡时间、不良反应和 MRI 图像质量进行记录评价。

结果：41 例患者入睡时间为 8min-10min，9 例患者入睡时间为 10min-30min。所有患者均顺利完成 MRI 检查，无不良反应。所有磁共振图像均无运动伪影。
结论：婴幼儿患者在进行磁共振检查前进行水合氯醛保留灌肠镇静具有很高的安全性，是保证磁共振检查获得良好图像质量的前提。同时加强患者的护理干预，可提高磁共振检查和用药的安全性。

EPO-2223

PDCA 循环在 CT 接诊中满意度调查应用

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目的：探讨 PDCA 循环在 CT 检查接诊中满意度调查的效果应用。方法：将行 CT 检查的 204 人随机分成对照组和实验组各 102 人，对照组采取常规接诊，实验组采取 PDCA 循环的方法接诊。比较两组患者的满意度及投诉率。结果：实验组患者的满意率为 99．02%，对照组患者的满意率为 84.31%，且实验组的投诉率低于对照组，组间差异显著（P<0.5）。结论：PDCA 循环是美国质量管理专家戴明提出的一种循环管理模式［ 1］，是一种促进护理工作安全管理的有效措施，其主要目标为加强护理管理活动和护理服务行为的规范化和标准化，提高服务质量和患者满意度，树立良好的医院形象［ 2］，对于医护工作各个环节服务质量的提升具有重要作用［ 3］，能有效提高患者满意度,减少了技师的工作量，提高了检查的速度，为前来检查的患者节约了时间，同时有效减少投诉率。

EPO-2224

气道全覆膜金属内支架介入治疗胸腔胃-气道瘘的护理

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目的 探讨 Y 型一体化自膨式覆膜支架[1]治疗胸腔胃-右主支气管瘘的疗效及护理体会。
方法 搜集因胸腔胃-右主支气管瘘接受双“Y”型气道全覆膜金属内支架治疗的 16 例患者的临床资料。
结果 本组 16 例患者全部一次性成功地置入了双“Y”（一大“Y”一小“Y”）型气道全覆膜金属内支架，成功率 100%，瘘口完全封堵，无对比剂溢入气道和肺部；未出现与手术有关的并发症。
结论 双“Y”型气道全覆膜金属内支架封堵胸腔胃-气道瘘，操作简单、安全、疗效可靠，是一种值得推广应用的技术。

EPO-2225

胸部病变 CT 引导下穿刺活检的护理体会

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目的 探讨胸部病变 CT 引导下穿刺活检的病情观察和预防并发症发生的护理措施。方法 回顾性分析和总结 82 例患者在 CT 定位下穿刺活检的护理过程：①术前准备及患者心理护理；②穿刺前的呼吸训练；③穿刺过程的病情观察；④与医生密切合作，缩短操作时间，减少肺组织损伤；⑤穿刺后的健康宣教。结果 82 例患者在充分完善的术前准备下 CT 穿刺活检成功，穿刺活检成功率为 100%，78 例穿刺时无气胸、血胸和肺出血等并发症发生；术后 3 例出现气胸，1 周内自行吸收；少量咯血 2 例，均在术后 1 h 内停止。结论 胸部穿刺活检虽是微创检查，出血、气胸是主要常见的并发症，而实施有效的护理能预防并发症的发生，提高穿刺活检成功率，为胸部病变的提供安全高效的诊断方式， 有利临床早期诊治。

EPO-2226
多学科护理干预在小儿磁共振检查中的应用效果

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目的 对多学科（预约中心、儿科病房、磁共振室）综合护理干预在小儿磁共振检查中的作用效果进行分析研究。 **方法** 选取我院 2018 年 4 月至 2018 年 9 月 MRI 检查患儿（0-5 岁）178 例，随机分为实验组和对照组，实验组 91 例，对照组 87 例，其中，实验组在扫描检查中给予多学科综合护理干预，对照组在扫描检查中给予常规护理干预，观察对比两组患儿的护理干预效果。 **结果** 对照组患儿扫描检查一次成功率为 65.5%，实验组患儿扫描检查一次成功率为 85.7%，实验组患儿一次性完成扫描检查的成功率明显高于对照组。 **结论** 多学科综合护理干预应用于小儿磁共振检查中，能显著提高磁共振检查的一次成功率，有助于提高患儿及家属的满意度,值得临床推广和应用。

EPO-2227
延续性护理对肝癌 TACE 术患者治疗依从性的影响

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目的 探讨延续性护理对肝癌 TACE 术患者治疗依从性的影响。**方法** 选择符合纳入与排除标准的行肝癌 TACE 治疗的患者 120 例随机分为观察组和对照组。对照组 60 例采用责任护士在患者出院当天进行常规出院护理。观察组 60 例采用常规出院护理加延续护理，采用通过微信平台，电话随访的方式对患者进行以健康指导为主的延续护理。内容包括症状护理，心理护理，健康知识宣教。 结果 观察组护士对肝癌 TACE 术后患者实施延续护理，患者的治疗依从性与对照组比较有统计学意义（$P<0.05$），同时能改善患者再次介入的焦虑，降低治疗负效应，有效提高患者生活质量。结论 延续护理有效的降低了患者因治疗不舒适感造成的心理压力及焦虑，提高了患者的生活质量，促进身心健康，提高患者对介入治疗的依从性，同时提高了患者远期生存率。

EPO-2228
ＣＴ增强非离子型碘对比剂致过敏性休克的急救与护理体会

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目的：探讨增强 CT 检查中非离子型碘对比剂致严重过敏性休克的抢救与护理。**方法：**选取我院 2016 年 10 月-2019 年 6 月期间行 C T 增强检查注射非离子型碘对比剂发生过敏性休克的 3 例病例进行回顾性分析，对过敏性休克发生的时间、临床表现、急救措施进行分析总结。**结果：**碘对比剂严重致死性不良反应发生率 0.01%，3 例病例中过敏性休克发生时间为注射碘对比剂后 2 分钟内，过敏性休克的临床表现，主要表现为神经系统、心血管系统，消化系统、皮肤症状，包括极度癫痫发作、口吐白沫、喉头水肿、呼吸困难、血压下降、意识丧失、全身抽搐、小便失禁等。经过抗过敏、抗休克对症处理，2 例患者症状缓解送往 ICU 继续治疗，1 例患者症状未缓解，立即对患者进行就地抢救，心肺复苏，经抢救 2h 无效死亡。**结论:**过敏性休克是一种严重的药物不良反应，一旦出现病情发展迅速，多系统器官同时受损，危及患者生命，需立即进行抢救。因此掌握过敏性休克的发生时间和临床表现，及时发现与迅速处理过敏症状至关重要，CT 室急救药物和器材必须随时备用，检查过程中应时刻警惕、密切观察病情变化，医务人员应熟练掌握急救技术，在发生过敏性休克最短时间内做出适当的措施。为避免突发情况处置不力引发医疗纠纷，应建立院级急救支援系统与应急预案。包括院行政部门（主管院领导、医务处、护理部等）、急诊科、ICU 及临床相关科室（心内科、呼吸科等），以此来有效协调调集最优抢救资源，为患者病情转归提供保障。

EPO-2229
替罗非班在颅内动脉瘤栓塞术中急性脑血栓形成时应用的护理措施及体会

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目的：探讨替罗非班在颅内动脉瘤栓塞术中急性脑血栓形成时应用的护理方法及护理要点，以提高专科药物应用的观察水平及护理质量。**方法：**选择我院行脑动脉瘤栓塞术且于术中出现急性脑血栓形成予以导管内推注替罗非班溶栓的颅内动脉瘤患者 30 例为研究对象，随机分为试验组和对照组，每组患者各 15 例。对照组施行常规护理措施，试验组在常规护理措施的基础上探讨个体化、针对性护理方法的实施，比较两组患者相关指标的差异性。**结果：**试验组患者用药后的出血并发症发生率显著低于对照组，对护理服务质量的满意度显著高于对照组（ P＜0.05）。**结论：**对颅内动脉瘤栓塞术中急性脑血栓形成时使用替罗非班的患者施行个体化、针对性的护理干预措施，能够显著降低患者的出血性并发症的发生，提高护理服务的满意率，促进患者术后康复。

EPO-2230
一种核磁共振及其呼吸训练配套快速装卸装置

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目的：（核磁共振及其呼吸训练配套快速装卸装置，包括核磁设备和呼吸机）磁共振成像设备配合呼吸机进行受检，能够保证图像质量清楚诊断病情。

方法：本实用新型涉及医疗设备技术领域，特别是一种核磁共振及其呼吸训练设备配套互联系统。包括核磁设备和呼吸机，核磁设备由床体和核磁扫描线圈组成；所述床体包括支撑腿、侧撑和导向移动机构，床体架体上设有导向移动机构；将核磁共振与呼吸训练设备连接在一起。导向移动机构分为导向轨、锁扣块、核磁扫描线圈安装板和呼吸机安装板，锁扣块与核磁扫描线圈安装板和呼吸机安装板固定连接，锁扣块锁扣在导向轨上，锁扣块沿导向轨移动；通过锁扣块带动呼吸机和核磁设备一并移动。
结果：两套设备同步运动，降低对连接管线的拉扯和调整难度，呼吸机使受检者均匀被动呼吸，并适时调节呼吸频率和幅度保持稳定以保证图像质量清楚诊断病情。
结论：受检过程中整个检查过程会有呼吸的不一致性，在检查过程中常出现呼吸节律紊乱、闭气不佳、每次闭气深度不一导致图像模糊或错层等情况，会直接影响图像质量。为了克服上述技术问题现有磁共振成像设备配合呼吸机进行受检，能够保证图像质量清楚诊断病情。

EPO-2231
ABCDE-D 急救护理模式在碘对比剂急性不良反应救治中的应用体会

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目的 提高护理人员对碘对比剂急性不良反应的认识，提高急救意识，熟练应用 ABCDE-D 急救护理模式对急性不良反应患者进行现场救治，为其后续治疗赢得时间，保证患者安全。**方法** 回顾性分析我院 2018 年 1 月～12 月 CT 增强检查中使用碘对比剂后发生急性不良反应患者 76 例，总结现场救治中 ABCDE-D 急救护理模式的应用体会。**结果** 76 例急性不良反应病例中，男 39 例，女 37 例，≧70 岁 12 例，普通 CT 增强 51 例，CTA25 例，轻度不良反应 56 例，中度不良反应 10 例，重度不良反应 10 例，分别占比 73.68%、13.15%、13.15%。本组病例均按照 ABCDE-D 急救护理模式给予全面评估和现场救治，中、重度不良反应患者 10 例由急救小组接回急诊科继续治疗，10 例由主管医生接回病房继续治疗，轻度不良反应患者观察 30 分钟后离院或者返回病房，患者恢复良好，制作了碘对比剂急性不良反应现场急救护理 ABCDE-D 流程图，护理人员能够熟练掌握。**结论** 影像科工作人员重视碘对比剂的急性不良反应，严格管理对比剂的使用，熟悉急性不良反应的临床表现，培养急救意识和降阶梯思维，具备急救知识和急救技能，使用前综合评估患者，排除禁忌症，重视高危因素，充分水化，做好心理疏导和充分告知，合理掌控对比剂的用量和注射速度，严密观察，早期识别，一旦发生急性不良反应，按照 ABCDE-D 的急救护理模式立即抢救，畅通急救绿色通道，保证了患者安全。

EPO-2232
AngioJet 机械血栓清除术治疗人工血管动静脉内瘘急性血栓患者围手术期护理

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目的 探讨 AngioJet 机械血栓清除术治疗人工血管动静脉内瘘（AVG）急性血栓患者围术期护理措施。**方法** 回顾性分析我院血管外科 2016 年 12 月至 2018 年 10 月行 AngioJet 机械血栓清除术治疗人工血管动静脉内瘘急性血栓患者的临床资料，总结其护理方法。**结果** 18 例患者均一期复通

人工血管内瘘，并于术后当日至次日顺利血透。术后 2 例患者出现穿刺口渗血，2 例血钾＞6.0mmol/L，1 例上消化道出血，1 例急性心力衰竭，本组均得到良好处理后康复出院。**结论** AngioJet 机械血栓清除术治疗 AVG 急性血栓患者，由于维持性血液透析多年，躯体各方面机能下降，围术期易并发心力衰竭、出血、电解质紊乱等并发症。严密监测患者病情变化、早期发现并发症并进行预见性的治疗护理干预、科学合理饮食、合理安排血液透析是患者安全度过围术期的关键。

EPO-2233

一例碘海醇重度皮下外渗的治疗报道

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目的 探讨一例 CT 增强扫描时碘海醇重度皮下外渗患者的治疗、护理。方法 50%硫酸镁联合 0.05%地塞米松 24 小时内保湿冷敷、24 小时后保湿热敷，并抬高上肢制动，辅助肌肉注射地塞米松、静脉滴注丹参。结果 效果理想，74 小时后患者完全康复出院。结论 全面的操作前评估，高压静脉注射对比剂前再次确认浅静脉置管针是否在血管内，选择适宜的对比剂速率与剂量，有效的应急应对措施，确保增强 CT 检查的安全性，降低医疗风险。

EPO-2234

品管圈活动对降低 CT 引导下经皮肺穿刺定位术患者负性情绪的效果观察

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目的 分析品管圈活动对降低 CT 引导下经皮肺穿刺定位术患者负性情绪的效果观察。**方法** 我院放射科自 2016 年 11 月~2017 年 11 月期间开展品管圈活动，以活动前后共 582 例 CT 引导下经皮肺穿刺定位术患者为研究对象，比较品管圈活动前后患者负性情绪、配合程度、无形成果等指标。**结果** 品管圈活动后，患者焦虑（SAS）、恐惧评分均明显低于活动前（P<0.01），配合程度均显著高于活动前（P<0.01）；护理人员责任心、解决问题能力、品管手法、和谐度评分明显高于活动前（P<0.01）。**结论** 品管圈活动有利于降低 CT 引导下经皮肺穿刺定位术患者负性情绪，配合程度提高，有效提高护理质量和病人满意度。

EPO-2235

精准提供氧流量的转运用小氧气筒推车的设计与应用

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目的：设计一种精准提供氧流量的转运用小氧气筒推车确保转运病人的用氧安全。方法：设计一种新型的小氧气筒推车适用于多种方式氧疗病人的转运。该小氧气筒推车有独特挂钩设计，可稳妥的将小氧气钢瓶悬挂于转运床的床头栏板上，使小氧气钢瓶保持直立状态，用于卧床氧疗病人的转

运，可提供精准的氧流量，杜绝因氧流量过高、过低对病人造成的伤害，提高转运病人用氧的安全性；妥善安置小氧气钢瓶，可杜绝使用过程中发生氧气桶的碰撞、跌落；妥善安置小氧气钢瓶，杜绝转运病人推拉小氧气筒时撞击、伤害医务人员；操作者无需弯腰、直立状态轻松的移动 10-25 公斤重的小氧气钢瓶，可用抱于怀中婴幼儿的转运；独特的挂钩设计，可大幅减少转运时人力资源的支出，提高工作效率。结果：自 2017 年 5 月至 2019 年 6 月用该小氧气筒推车转运需氧疗患者 323 例，其中男性 235 例，女性 72 例，新生儿 3 例、小儿 13 例；其中鼻吸氧 198 例，人工气道吸氧 78 例（气管插管 46 例、气管切开 32 例），人工气道辅助急救呼吸机机械通气 47 例（气管插管 13 例、气管切开 34 例）。该组病例未发生因氧流量过高或过低造成的并发症；人工气道使用急救呼吸机转运组病例，每次转运人力资源的支出降低 25-33.3%。结论：对需氧疗的患者进行转运，使用折叠式小氧气筒推车可精准地为病人提供氧流量、迅速、有效的落实氧疗措施、大大降低氧流量不精准造成的并发症，提高转运的安全性；同时降低转运时人力资源的支出，提高工作效率。该装置已申请并获二项国家实用新型专利，专利号为：ZL 201520723938.6、ZL 201621133930.5。该转运用小氧气筒推车，值得在临床推广。

EPO-2236
护理干预在提高老年患者腹部 MRI 检查质量中的效果观察及满意度影响评价

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摘要：*目的*：探讨老年患者腹部 MRI 检查中实施护理干预对检查质量的提升效果及对满意度的影响。***方法：***对影像科实施腹部 MRI 检查的 120 例老年患者（2017 年 1 月到 2018 年 12 月间）实施研究，按随机数表法将患者分为常规组（n=60）和干预组（n=60），对常规组运用常规护理，对干预组运用护理干预，分析总结患者情绪状况、检查舒适度、图像质量、检查安全性及满意度状况。***结果*：**干预组护理后 SAS、SDS 评分、不良反应发生率显著低于常规组，干预组舒适度评分、图像清晰率、满意度显著高于常规组（*P*<0.05）。***结论*：**老年患者腹部 MRI 检查中实施护理干预可提升检查质量，改善患者检查负面情绪、舒适度、安全性及满意度。

EPO-2237
农村永久性肠造口患者适应水平及相关因素的研究

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调查农村地区永久性肠造口患者术后适应水平，分析相关因素。**方法** 采用自行设计的调查表和中文版造口患者社会心理适应量表（Ostomy adjustment inventory-20,OAI-20）对丽水市某三级甲等医院的 67 例永久性肠造口患者进行问卷调查。 **结果** 本组调查中，农村永久性肠造口患者的社会心理适应总分为 21-76 分，平均（45.33±8.90）分，90.9%的患者处于中低适应水平。患者的年龄、自理能力、术后时间与社会心理适应水平相关（$p<0.05$）。**结论** 农村永久性肠造口患者的适应水平为中度水平，护理人员应加强整体护理及延续护理，以提高患者适应水平，从而提高生活质量。

EPO-2238

改良水合氯醛口服法在学龄前儿童 MRI 检查中的制动效果观察

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目的：探讨改良 10%水合氯醛口服法在学龄前儿童 MRI 检查中的制动效果。
方法：以 200 例七岁以下需行 MRI 检查儿童为观察对象，服药前对家长及患儿进行心理疏导、解释用药目的、注意事项以及物品准备，运用改良口服水合氯醛法进行 MR 检查前制动。
结果：全组 200 例在行改良口服水合氯醛法后，5~10min 催眠成功 41 例，10~15min 催眠成功 68 例，15~30 min 催眠成功 87 例，服药后无效 4 例。制动效果满意。
结论：改良口服水合氯醛法，实用性强、无痛苦、安全性高家长易接受、所得图像质量清晰度高、值得临床推广应用。

EPO-2239
一例大隐静脉曲张行射频消融术患者的个案护理

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下肢静脉曲张是一组由于大隐静脉瓣膜功能不全、静脉阻塞、肌泵功能不全导致的下肢血液倒灌、回流受阻所致浅静脉曲张、静脉高压、皮肤微循环障碍的综合征。晚期常合并小腿慢性溃疡。
下肢静脉曲张为外科常见疾病，是慢性下肢静脉功能不全的最常见疾病，患病的人群也随着社会发展而趋于年轻化，许多病人因自觉无明显不适或害怕手术治疗而拒绝手术。
高位结扎包括在大隐静脉汇入股静脉处结扎大隐静脉主干，结扎旋髂浅静脉、腹壁浅静脉、阴部外静脉、股内侧静脉、股外侧静脉五大分支。本文对 1 例晚期下肢大隐静脉曲张行手术治疗患者护理过程中出现的问题进行分析，结合文献资料，提出有效护理对策。

EPO-2240
探讨冠状动脉支架植入术的护理体会

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冠状动脉内支架置入术是疏通狭窄或闭塞的冠脉管腔，从而改善心肌血流灌注，达到血流通畅目的的一种治疗方法。随着我国经济的发展和人民生活水平的提高，相对于传统外科开胸搭桥手术，人们越来越愿意接受损伤小恢复快的介入治疗方法。护理人员做好术前、术后护理对治疗的成功起到重大的作用。现将我院 2017 年至 2018 年期间实行的冠脉支架置入术的护理体会总结如下。

EPO-2241
6 例经导管主动脉瓣置入术治疗主动脉瓣狭窄的护理配合

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目的:总结湖南省人民医院 6 例重度主动脉瓣狭窄患者实施经导管主动脉瓣置入术(Transcatheter aortic valve implantation，TAVI) 的护理经验。**方法:**回顾性分析 2019 年 1 月至 2019 年 8 月 6 例暂时不宜实施外科手术的重度主动脉狭窄患者经导管主动脉瓣置入术的临床护理经验。**结果:**6 例患者经过精心护理，术前准备充足、术中无不良事件的发生，均治愈出院。**结论:**通过术前准备好各种手术物品与仪器、术中做好生命体征观察，尽早发现和处理并发症、有效地减少相关并发症的发生，对患者的康复效果有重要意义。

EPO-2242

放射科 CT 增强扫描时造影剂渗漏的有效预防管理措施

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【摘要】目的：本次实验将针对放射科 CT 增强扫描时造影剂渗漏的有效预防管理措施进行讨论与归纳。**方法：**本次实验选取了 2017 年 1 月-2017 年 12 月在我院就诊的需经过 CT 增强扫描的患者为研究对象，入选的共 350 例，根据患者的入院时间分为对照组和观察组，对照组实施的常规管理，观察组实施造影剂渗漏的预防管理。**结果：**观察组的造影剂渗漏率为 1.71%，明显低于对照组的 3.43%，组间对比差异较为显著，具有统计学意义（P＜0.05）。**结论：**为了更好的应对放射科 CT 增强扫描时造影剂渗漏问题，实施积极的预防管理措施，能够降低该情况的发生率，效用显著。而 CT 增强扫描技术的不断推广与应用，能够为更多的疾病提供诊断依据，不失为安全、有效的检查手段。

EPO-2243

超大心脏良性粘液瘤合并脑梗死患者威视派克严重过敏性休克致死 1 例

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碘对比剂过敏反应不可预测，难以预防，一直困扰着临床医务工作者，本文依据美国和欧洲的对比剂使用最新指南,结合相关文献分析一例威视派克注射液引起过敏性休克的原因并提出相关预防建议,以供临床参考。**临床资料：** 患者性别女，年龄 27 岁，患者自诉除韭菜外无其他过敏史。既往有脑梗死个人史，左心房良性粘液瘤，为排除肺栓塞行胸部 CTA。碘对比剂为碘克沙醇 320mgI/ml（威视派克 320mgI/ml），注射速率为 4ml/s,注射药量为 65ml，此病例过敏性休克发生时间为注射碘对比剂后 2 分钟内患者出现休克症状，主要表现为神经系统：癫痫发作、抽搐、口吐白沫、意识丧失；心血管系统：血压下降、心律失常；消化系统：呕吐；给予患者抗过敏、抗休克对症处理，患者症状未缓解，心脏骤停，立即对患者进行就地抢救，心肺复苏，气管插管等，经抢救 2h 无效死亡。**讨论：**（1）过敏性休克是一种严重的药物不良反应，一旦发生，病情发展迅速，如不及时抢救即可死亡。掌握过敏性休克的发生时间和临床表现，及时发现与迅速处理过敏症状至关重要，医务人员应熟练掌握急救技术，发生过敏性休克要在最短时间内做出适当的措施。（2）患者有超大左心房粘液瘤，大小约 4.1cm×6.5cm,血管 CTA 使用高压注射器注射碘对比剂，流速快，血管壁压力大，短时间内进入大量液体会明显加重心脏负荷，导致心肌损伤。因左心房粘液瘤质地疏松，容易脱落，易引起体循环或者肺循环动脉栓塞，危及患者生命。对于此类患者做血管 CTA 前应于临床医生沟通，高度注意粘液瘤脱落的可能性，慎做此类检查。（3）CT 室护理人员应严格掌握高危人群的用药适应症，严格执行各项医疗护理技术操作，及时正确处理药物不良反应，有利于提高医疗质量、减少医疗纠纷。

EPO-2244
幽闭恐惧症患者行磁共振成像检查的干预研究进展

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[摘要]：本文从幽闭恐惧症的定义与诊断，幽闭恐惧症与磁共振成像的相关性，幽闭恐惧症患者行磁共振检查可能造成的后果、产生的原因及应对措施 5 个方面来综述幽闭恐惧症患者行磁共振成像的干预研究进展，旨在帮助医技护理人员深入了解行磁共振检查的幽闭恐惧症患者，为制定针对幽闭恐惧症患者磁共振检查的预防、干预措施等提供参考。

EPO-2245
医护人员碘对比剂安全使用知信行问卷编制

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目的：编制医护人员碘对比剂安全使用调查问卷并对其进行信效度检验。方法：通过查阅国内外相关文献、专家咨询、开放式半结构式化访谈形成条目池，并通过对 185 位医护人员进行预调查，通过专家筛选法、区分度筛选法、相关系数筛选法、Cronbach's a 系数等方法进行筛选，并通过分半系数、内容效度、因子分析等方法进行问卷的信效度检验。结果：最终保留 46 个条目，问卷的分半信度为 0.724，问卷的 Cronbach's a 系数为 0.946，问卷内容效度为 0.931，问卷各条目内容效度在 0.83-1.00 之间，问卷共提取的 3 个公因子与假设一致，累计方差为 50.05%>40%，负荷值也全部大于 0.35。

EPO-2246
知信行护理干预模式在 128 层 CT 冠状动脉血管造影的检查中的应用价值

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目的 探讨知信行护理干预模式在 128 层 CT 冠状动脉血管造影的检查中的应用价值。**方法** 选择 2019 年 5-6 月本院收治的冠心病患者 200 例（年龄 55-70 岁，BMI 18.5-24.9kg/m^2）作为研究对象。将其分为对照组 100 例，平均年龄（62.4±1.0），男 54 例，女 46 例。干预组 100 例，平均年龄（61.6±1.2），男 52 例，女 48 例。**结果** 比较两组检查过程遵医行为评分，及检查成功率及图像质量。两组检查过程中的遵医嘱行为评分比较，干预组优于对照组。图像质量评分干预组为（3.85±0.21）分和对照组（3.12±0.59）分，两组图像质量差异有统计学意义（t=1.42,P<0.05）。 干预组检查成功率 100/100（100%），对照组检查成功率 92/100（92%）。

结论“知信行”护理模式其对于改善患者相关行为，配合医生顺利完成 CT 冠状动脉血管造影的检查中的有充分应用价值。

EPO-2247

地塞米松湿敷治疗碘对比剂渗漏的疗效观察

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【摘要】 目的：探讨 0.05%的地塞米松湿敷对治疗 CT 增强扫描碘对比剂渗漏的效果。**方法：**对 2015 年 6 月到 2018 年 6 月在我院 64 排 CT 室进行增强 CT 扫描发生对比剂渗漏患者 35 例，分成对照组 17 例采用硫酸镁加土豆片外敷，观察组 18 例用 0.05%的地塞米松持续湿敷。**结果：**通过治疗效果比较，观察组对碘对比剂渗漏治疗效果明显高于对照组，差异有统计学意义（P <0.05）。**结论：**0.05%的地塞米松持续湿敷治疗 CT 增强扫描所致的碘对比剂渗漏效果显著，并且地塞米松价格便宜较为常用，因此这是一种安全、有效、方便的治疗方法，有推广价值。

EPO-2248

胸部 X 线正位片在 PICC 尖端定位中的应用价值

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目的：探讨胸部正位片在 PICC 导管尖端定位中的应用价值。
方法：收集 2017.08.01-2019.07.01 在山西医科大学第一医院置管中心置管后拍摄胸片患者 363 例。
置入 PICC 前，需预测 PICC 置入长度，采用常规体外测量法，即患者取平卧位，穿刺侧手臂外展 90°，测量从穿刺点至右胸锁关节再向下反折至第 3 肋间的距离。选取前臂正中静脉或贵要静脉为穿刺点，铺设消毒巾后行穿刺操作，插入长度以上述测量长度为准，使用透明膜将其固定。完成 PICC 置管后进行 X 线正位片检查。以纵膈右缘上、下两部分交界点为腔房交界处即 CAJ 点，该点及其上方 2cm 为最佳尖端置管范围，尖端未达到该范围或越过该范围以及导管未进入上腔静脉者，为导管尖端异位。在患者知情同意下，对导管位于理想范围者进行卧位拍片。计数资料使用 n (%) 表示。测量两次拍片 CAJ 点间的距离，利用统计学工具求出平均值及标准差。
结果： 收集的 363 例患者中，尖端位于最佳置管范围者 139 例，占总例数的 38.3%，异位者 224 例，占 61.7%，其中位于上腔静脉高位者 159 例，占异位总数的 71.0%，在上腔静脉内翻折 3 例，占 1.3%，位于右心房的 11 例，占 4.9%，位于右心室的 2 例，占 0.9%，位于下腔静脉者 4 例，占 1.8%，位于颈内静脉者 7 例，占 3.1%，位于同侧头臂静脉者 19 例，占 8.4%，位于对侧头臂静脉者 5 例，占 2.2%，位于同侧锁骨下静脉内者 9 例，占 4.0%，位于对侧锁骨下静脉者 3 例，占 1.3%，位于奇静脉者 2 例，占 0.9%。

导管尖端位于理想范围内的 139 例中，49 例于卧位时，尖端在右心房内，占 35.3%。两次拍片 CAJ 点间距离的平均值为 2.6CM,标准差为 0.31。

EPO-2249

心理护理对静脉麻醉下行肝动脉化疗栓塞手术患者的效果分析

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【摘要】 **目的：** 探讨静脉麻醉下行肝动脉化疗栓塞手术患者的心理护理。**方法：** 选择 116 例在静脉麻醉下行肝动脉化疗栓塞术的患者分为 A、B 两组，A 组进行心理护理并总结心理护理的经验。**结果**:A 组经过术前 3 d 、1 d 及术后 2 ～3 d 进行心理护理，所有患者顺利地完成介入手术，安返病房，均无不良心境产生。A 组运动伪影和图像总体质量评分(3．83±0．21)分、(3．82±0．32)分明显强于 B 组的(2．24±0．31)分和(3．39-t-0．40)分(P<0．05)，具有统计学意义。**结论：** 肝动脉化疗栓塞术前及术后有的放矢地做好麻醉患者的心理护理，能够改善、消除及预防患者的不良心境，改善疾病的预后。

EPO-2250
新生儿在消化道碘水造影的护理难点

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目的：对新生儿患者行消化道碘水造影检查的风险因素进行评估，为高质量安全完成新生儿消化道碘水造影提供临床护理依据；
方法：选取 2017-2019 年在我科行新生儿消化道碘水造影的 10 例患者，针对新生儿消化道碘水造影检查的特点及新生儿患者本身特殊性进行分析，制定新生儿患者在消化道碘水造影检查前的充分评估以及检查、抢救物品的准备。检查中严密检测新生儿的生命体征，医师与护士全程紧密配合来确保新生儿的安全。以及检查后确保新生儿的安全以及无不良反应的全程护理模式；
结果：10 例患者均安全地完成检查。新生儿患者行消化道碘水的护理前充分评估，以及检查过程中的全程护理模式可以有效保证 新生儿患者行消化道碘水造影检查的安全，为临床新生儿患者进行消化道碘水造影检查的安全提供了有力保证。
结论：消化道造影是诊断新生儿先天性消化道畸形最快捷，直观，方便的方法。经过探索与实践，由于新生儿是个特殊群体，在检查过程中，医师护士的全程配合模式和操作规范，前期的充分准备，与临床的沟通，检查过程中的密切观察是保证患者检查安全的基础，检查中护士一丝不苟的监护，以及等待过程中的巡视，家属的配合，医师掌握摄片的时间节点是检查成功的关键。

EPO-2251
347 例 CT 引导肺穿刺活检术行全流程护理管理的应用体会

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目的：探索全流程护理管理在 CT 引导穿刺活检术中应用
一般资料：选取我科 2018.01-2018.11 月行 CT 引导下肺穿刺活检的患者为研究对象，共计 347 例，其中男 213 例，女性 134 例，平均年龄 58±17.5 岁，所有患者皆通过 CT 检查存在肺结节或肿块，将全流程应用于围手术期的患者行 CT 引导下的穿刺中，术前签署知情同意书、术中的护理记录、术后并发症处理及随访。
方法：设计并持续改进全流程护理管理体系。

（1）设计表单管理体系，CT 引导穿刺活检术的护理流程包括术前宣教和心理辅导，手术室准备，手术前准备，手术配合，术后观察，术后随访等阶段，针对每一个阶段的特点，都设计相应的表单，并根据表单进行管理。有些流程制作成展板上墙，有些流程根据科室的发展，根据具体实践的问题，进行持续改进。
（2）术前准备、术中护理、术后观察随访的流程设计管理
（3）信息化管理的应用开发
将整个 CT 引导下穿刺活检的流程通过信息化的形式固定下来，使流程更加顺畅
结果：347 例患者穿刺活检成功率 100%，气胸的发生率 21%，其中需要置管的患者约 2%，咯血的发生率 5%，通过积极的护理参与，患者都得到康复。无一例死亡病例。
结论：全流程护理管理为 CT 引导穿刺活检提供了非常好的护理保障，值得推广。

EPO-2252
情景模拟+PBL 教学模式在影像科护生行冠脉 CTA 护理查房中应用效果分析

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［目的］探讨情景模拟联合 PBL 教学模式在影像科护生冠脉 CTA 护理查房中的应用效果。［方法］回顾性收集 2017 年 7 月一 2018 年 5 月 50 名护生以情景模拟+PBL 教学模式完成冠脉 CTA 护理查房。情景模拟+PBL 教学模式是由带教组长主持，所有护生及科室低年资护士参与，主查者汇报病史，让一位护生模拟冠状动脉 CTA 患者行冠脉 CTA 检查的全过程（包括检查前心率、呼吸控制，检查中配合，检查后留观）整个情景，用 PBL 模式让护生以头脑风暴形式利用自己掌握的相关影像理论知识和查房知识提出患者存在的护理问题，并罗列相关的护理措施，最后由主持者做出评价并指出不足。［结果］50 名护生全部能独立完成冠脉 CTA 心率及呼吸准备，合格率为 100%；50 名护生对情景模拟联合 PBL 教学模式应用于教学查房的教学方法满意度为 100%；50 名护生冠脉 CTA 护理查房中提出护理问题及护理措施的正确率为 96%；50 名护生完成冠脉 CTA 患者检查全过程沟通注意事项正确率为 99%；50 名护生工作中协同互助达到 98%。［结论］回顾性查房、情景模拟联合 PBL 教学模式在影像科护生行冠脉 CTA 护理查房中的应用，能调动护生学习枯燥知识点的兴趣和提高同学与同学之间的协同互助能力，提高独立思考问题、解决问题的能力，有效掌握影像科专科护理知识。

EPO-2253
整体护理对氩氦刀冷冻消融术治疗肺癌的效果分析

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摘要：【目的】 了解整体护理对肺癌氩氦刀治疗术后并发症护理的临床效果。【方法】 136 例肺癌及肺转移癌患者，进行氩氦刀冷冻消融治疗及对患者进行整体护理。【结果】：术后护理效果 136 例经过标准程序化精心护理，住院并发症严重程度发生率仅为 10. 29%（ 14 /136），一般程度和轻微程度发生率则高达 26. 47%（ 36 /136）和 63. 23%（ 86 /136），三者发生率两两比较，差异有统计学意义（ x2 值分别为 11. 8602，81. 979，P ＜ 0. 01）。 回访结果通过对患者的回访调查，患者对护理评价优良率和乐观情绪优良率分

别高达 90. 44%、94. 12%。 【结论】 运用整体护理理论指导肺癌氩氦刀治疗术后并发症的护理，可提高临床疗效及病人的生活质量。

EPO-2254
思维导图结合回授法用于肝癌 TACE 术患者健康教育效果讨论

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目的 探讨思维导图结合回授法应用于肝癌 TACE 术患者健康教育的效果。方法 将 66 例肝癌 TACE 术患者随机分为对照组和干预组各 33 例，对照组采用常规健康教育法，干预组采用思维导图结合回授法的健康教育方式；比较两组患者的自我效能得分、患者满意度及术后并发症严重程度。结果 干预组自我效能得分为（2.573 士 0.4125）高于常规组得分 (2.352 士 0.4162)，两组患者在自我效能得分、满意度及术后并发症发热、疼痛、便秘的 严重程度差异有统计学意义 (P<0.05)。结论 运用思维导图结合回授法的健康教育方式能够有效的提高教育效果，促进康复，对临床有很好的实用价值。

EPO-2255
品管圈在提高股动脉穿刺介入术后患者 舒适度中的应用

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【摘要】**目的** 探讨品管圈活动在提高股动脉穿刺介入术后患者舒适度中的应用效果。**方法** 成立品管圈活动小组，确立活动主题，进行现状调查，分析要因，设定目标，制订对策，组织实施、效果确认以及制定标准化股动脉穿刺介入术中、术后护理流程。**结果** 股动脉穿刺介入术后患者的不舒适率由改善前的 182%降低至改善后的 40%。**结论** 应用品管圈活动对股动脉穿刺介入术后患者的护理进行改进，规范了术中、术后护理的时机、方法和流程，提高了股动脉穿刺介入术后患者的舒适度。

EPO-2256
电热恒温培养箱对造影剂过敏发生率的影响

尤艳
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目的：探讨电热恒温培养箱在增强 CT 检查过程中对造影剂过敏发生率的影响。
方法：我科 3000 例增强 CT 患者分为两组，实验组患者使用的造影剂为电热恒温箱加热后 37℃恒温的造影剂。对照组为室温（18℃-28℃） 注射，比较两组过敏反应发生率。
结果：实验组 1500 例中发生过敏反应 3 例占 0.2%。对照组 1500 例中发生过敏反应 8 例占 0.53%。实验组过敏反应发生率显著低于对照组（P＜0・01）。

结论：使用电热恒温培养箱可降低过敏反应的发生率。

EPO-2257
精益六西格玛管理下急诊 CTA 护理流程再造探讨

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目的：探讨应用精益六西格玛管理法对急诊 CTA 检查护理流程再造并分析其应用价值。

方法：回顾性分析采用精益六西格玛管理法优化急诊 CTA 检查护理流程再造前 400 例（2018 年 10 月~12 月）和流程再造后 400 例（2019 年 3 月~5 月），样本随机抽样，统计分析其检查整体时间、医患满意度。采用六西格玛方法论（DMAIC）进行护理流程再造，过程包括：界定（Define）：通过 CTQ 树图分析我科现阶段急诊 CTA 护理流程存在的缺陷，组成管理机制团队进行相关培训和制定计划。测量（Measure）：使用 PEMEA 分析法对该流程进行评估，探索其有效性，分析存在的高风险因素。分析（Analyze）：借助价值流图，头脑风暴工具分析流程中的不足，找出关键问题，建立新的流程价值流图，通过不断地完善使流程更加顺畅，效率更高。改进（Improve）：利用 7S 管理法针对关键因素寻找最佳改进方案，并证明该方案的有效性。控制（Control）：监控新的护理流程，修订标准护理流程文件，制定流程应变计划。

结果：采用 u 检验进行统计学分析，急诊 CTA 护理流程再造后放射科各项质量指标均较再造前提高，从到达检查室，检查过程，离开检查室整体时间由（30.5±5.45）缩短至（15.5±3.16），医患满意度由再造前的 80%提高至再造后的 97.14%，实施前后差异具有统计学意义（均 P＜0.05）。

结论：精益六西格玛管理下急诊 CTA 护理流程再造改进了护理工作流程，提升了放射科急诊护理质量和效率，在放射科急诊 CTA 护理中具有一定应用价值。

EPO-2258
三期对比剂注射方案对头颈部 CTA 检查对比剂外渗率影响的对照研究

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目的：对比剂外渗是影像护理常见的不良事件。本研究旨在评估三期对比剂注射方案对头颈 CTA 检查对比剂外渗率的影响。**方法**：本研究采用随机对照研究方法，入组自 2016 年 4 月至 2018 年 3 月在本研究单位进行头颈 CTA 检查患者共 2763 例，平均年龄：64.87 ± 11.38 岁。病例随机分为两组。对照组使用常规头颈 CTA 检查对比剂注射方案，即首期注射 50 ml 对比剂，随后一期注射 20 ml 生理盐水。研究组使用三期对比剂注射方案，即较常规方案前置一期生理盐水注射，生理盐水使用量为 10 ml。所有病例使用对比剂为 370 mg/ml 碘普罗胺，并通过双筒高压注射器进行自动注射，注射流率为 4 ml/s。分别对比两组患者的总外渗率、女性患者外渗率、老年患者（年龄 ≥ 60 岁）外渗率及外渗高风险患者的外渗率。**结果**：本研究入组患者的总体外渗率为 0.90 %。研究

组患者总外渗率为 0.36 %，对照组患者总外渗率为 1.46 %，差别有统计学意义（P = 0.002）；研究组女性患者外渗率为 0.52%，对照组女性患者外渗率为 2.30 %，差别有统计学意义（P = 0.002）；研究组老年患者外渗率为 0.50 %，对照组老年患者外渗率为 1.82 %，差别有统计学意义（P = 0.006）；研究组外渗高风险患者外渗率为 0.40 %，对照组外渗高风险患者外渗率为 2.52 %，差别有统计学意义（P = 0.007）。**结论：** 采用本研究调整后的头颈 CTA 检查三期对比剂注射方案较常规方案降低了约 75%的总对比剂外渗率，且在常规临床实践中可容易实现。

EPO-2259

基于 FTS 理念的护理策略在脊柱转移瘤患者椎体成形术中应用研究

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[摘要] **目的** 探讨基于快速康复（FTS）理念的护理策略在脊柱转移瘤患者椎体成形术（PVP）围术期的应用效果。**方法** 选择我科 2016 年 2 月至 2018 年 1 月实施经皮椎体成形术的脊柱转移瘤患者 48 例作为观察对象，所有患者原发肿瘤均诊断明确，以 2016 年 2 月至 2017 年 2 月的 26 例患者为对照组，以 2017 年 3 月至 2018 年 1 月的 22 例患者作为观察组。对照组采用常规护理措施，观察组在围手术期护理过程中应用基于快速康复（FTS）理念的护理策略。采用视觉模拟评分(VAS)比较两组患者 PVP 术前 1 d，术后 1 d、3 d、1 个月、3 个月和末次随访疼痛程度、Oswestry 功能障碍指数(ODI)评估两组患者运动功能状态、并同时比较两组患者下床活动时间、住院时间、并发症发生率及患者满意度。**结果** 观察组术前 VAS 评分均明显高于术后 1 d、3 d、1 个月、3 个月和末次随访，差异有统计学意义(P 均<0.05)。术后 ODI 均较前明显降低(P 均<0.05)，患者运动功能状态得到改善。与对照组相比，观察组下床活动时间、并发症发生率、住院时间方面明显降低，差异均有统计学意义(P<0.05)；患者满意度明显升高，差异有统计学意义(P<0.05)。**结论** 基于快速康复（FTS）理念的护理策略在脊柱转移瘤患者椎体成形术（PVP）围术期的应用是可靠的，减轻患者疼痛提高了舒适度，减少了并发症，缩短了平均住院时间，加速了患者康复，值得在临床推广使用。

EPO-2260

不同浓度的碘对比剂对患者 ADR 的影响及安全管理

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目的：探讨如何有效控制不同浓度碘对比剂对患者药物不良反应的影响，为患者安全提供依据。方法：收集自 2018 年 3 月至 2018 年 8 月期间在本院进行东芝 80 排 160 层高端螺旋 CT Aquilion PRIME 增强患者 280 例，本研究已排除肾功能不全者；依据 CT 增强中采用的碘对比剂类型建立低浓度组试验组（碘含量：300mg/ml）和高浓度高组对照组（碘含量：370ml/mg）两个组别；低浓度组采用 22G 留置针注射速度为 2.5ML/S 进行 CT 增强扫描，扫描后对患者留观 30min 观察 并进行尿碘检测，高浓度组采用 22G 留置针注射注射速度为 2.5ML/进行 CT 增强扫描，扫描后留观 30min 观察，并进行尿碘检测。结果：低浓度尿检下含碘量＜高浓度尿检下含碘量，试验组显影速度>对照组显影速度。结论：低浓度碘造影剂 CT 增强扫描和高浓度碘造影剂 CT 增强扫描都可判断一般性质的 CT 增强检察，对诊断学都具有诊断意义，在不影响诊断结果的前提下适当选择低浓度低剂量的碘造影剂是维护患者在检查过程中发生用药安全的重要护理手段。

EPO-2261
个性化优质护理对化疗患者 CT 增强扫描检查的价值分析

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前言：CT 造影是目前临床上常用的一种检查方式，用于患者的检查 和诊断。该方法由于需要在患者身体内注射造影剂【1】，因此如果准备不当，或者护理不当，就会造成患者的检查失败，不仅耽误患者的诊断时间，也会对患者的经济造成一定的压力，为后续的治疗延长了时间，并且患者也会承受一定的痛苦。而化疗患者的身体状况本身就不是很好，且因为长期化疗，血管条件很差，在这种情况下再注射造影剂，很容易使得患者出现不安和焦躁的情绪，从而影响患者的检查和诊断。因此在诊断的过程当中，需要对患者进行相应的护理干预【2】，常规的护理干预往往不能够达到理想的效果，因此个性化优质护理干预应运而生。本文旨在研究，个性化优质护理对化疗患者 CT 增强扫描检查的价值影响，方法如下文。

【摘要】目的：分析和探讨个性化优质护理对化疗患者 CT 增强扫描检查的价值影响。方法：将我院医学影像科 2019 年 1 月 1 日至 2019 年 7 月 31 日之间收治 60 例 CT 增强扫描检查化疗患者，用“随机分组法”分为对照组和观察组，每组 23 例患者，对照组患者采用常规护理干预，观察组患者在对照组的基础上，采用个性化优质护理干预，观察和对比两组患者的 CT 增强扫描检查成功率，以及患者的不良反应发生情况。结果：在检查成功率方面，观察组明显高于对照组(p 值＜0.05)；在不良反应发生概率方面，观察组明显低于对照组(p 值＜0.05)；综合满意度方面，观察组显著高于对照组(p 值＜0.05)。结论：个性化优质护理对化疗患者 CT 增强扫描检查的价值影响深远，效果显著，应用价值高，能够有效的提升患者的检查成功率，降低患者的不良反应发生概率，提高综合满意度，因此，个性化优质护理适合在临床进行推广和使用。

EPO-2262
根本原因分析法在磁共振胆道成像低血糖患者安全管理中的应用

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目的：探讨根本原因分析法（RCA）在磁共振胆道成像(MRCP)低血糖患者安全管理中的应用效果。

方法：回顾性分析统计我科 2018 年 6 月—12 月 RCA 实施前 MRCP 检查患者作为对照组，给予常规护理。将 2019 年 1 月—6 月 RCA 实施后 MRCP 检查患者作为观察组。统计分析两组患者的低血糖不良事件发生率，患者满意度的情况。RCA 实施过程：科室成立 MRCP 检查患者低血糖预防安全小组，在科内组织全科护士采用价值流图对其易发生低血糖进行原因分析探讨，制定相应整改措施，每月底对不良事件进行柏拉图分析，找出高风险因素，采取针对性预防措施，落实整改措施并评价效果。

结果：观察组 MRCP 检查患者低血糖不良事件发生率为 0.12%（3 例），低于对照组六个月的 0.48%（11 例），差异有统计学意义（x~2=4.302，P＜0.05），患者满意度也由 89.8%提高到 97.9%。二者比较存在统计学意义。

结论：实施 RCA 能使磁共振护理安全管理标准化，规范化，制度化，有效降低磁共振 MRCP 检查患者低血糖不良事件发生率，提高患者满意度，对提高护理安全具有重要意义。

EPO-2263
碘对比剂温度在 CT 增强检查中患者静脉血管反应的对比

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目的 探讨加热对比剂的温度，减少患者血管静脉炎的发生，增加患者的舒适感。方法将我科 2450 例接受 CT 增强的患者分为两组。其中一组使用加热后的对比剂做 CT 检查（实验组），另一组采用室温中的对比剂做 CT 检查（对照组）。每组对象均为 1225 例。扫描结束后根据美国静脉输液协会（INC）静脉炎评分标准，查看两组血管反应对比。结果实验组仅为 11 例发生 1 级静脉炎反应，5 例为 2 级静脉炎反应，实验组发生率为 1.3%。对照组有 112 例发生 1 级静脉炎反应，25 例发生 2 级静脉炎反应，对照组发生率为 11%。明显高于实验组（P＜0.02）,结论加热对比剂能有效预防 CT 增强后血管\静脉炎的发生，并且也能大大增加患者的舒适度。

EPO-2264
癌症患者自我效能感和生活质量相关因素的研究和启示

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目的 当前全世界癌症的发病率和病死率很高，恶性肿瘤已成为严重威胁人们生命安全的主要疾病之一，给患者本人及家庭、社会造成极大的心理、经济负担，也严重影响了患者的生活质量。当前癌症的主要治疗方法有手术、化疗、放疗、内分泌治疗、生物免疫治疗等，而且临床上往往采用综合的治疗方法来治疗癌症，使癌症患者带瘤生存期逐渐延长。自我效能指个体对自己是否有能力去实施某一行为的期望，是人们对自我行为能力的认知与评价。这一概念最早由美国斯坦福大学著名心理学家 Albert Bandura 提出的，自我效能理论的提出，首先博得了教育界的极大兴趣与重视，近年来逐渐用于护理研究中。作为一种解释人类行为的理论，自我效能理论从全新的角度揭示了人类行为的形成与维系机制，为我们分析和认识护理对象的行为开辟了新视野，也为护理行为干预的研究开启了新的思路。**方法** 根据 Bandura 的理论，自我效能水平越高，行为的采取、维系和努力程度越高。特别是在慢性病的治疗中，提高自我效能有利于将慢性病患者的健康状况、健康功能维持在一个满意的状态，使其过上独立的生活，以自我效能为理论框架的行为干预的核心就是检验自我效能理论引导下设计的自我效能训练，如认知行为干预和或自我管理教育干预，对病人自我管理效能水平、行为变化以及生活质量的改善起到一定的作用。而癌症患者也具有与慢性病患者相似的症状特征，如失眠、食欲不振、躯体疼痛、焦虑抑郁等躯体和情感障碍，因此，国内外也逐渐将自我效能理论的研究引入癌症患者的护理服务中，以更好地解决癌症患者带瘤生存期的疾病管理问题，以提高癌症患者的生活质量。本文就国内外学者对癌症患者自我效能的评估工具，生活质量的评估工具研究，以及目前国内外学者就癌症患者自我效能和生活质量相关性的研究进展展开如下综述。

EPO-2265
多媒体视频宣教在下肢静脉曲张术后早期活动中的应用与效果评价

钱多
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目的 下肢深静脉血栓形成（deep venous thrombosis，DVT）是下肢静脉曲张手术严重的并发症，发生概率比预期高，近年来国内外报道发生率可达 0.54-5.3%，严重时可进展为肺栓塞（pulmonary embolism，PE），危及患者生命，术后除常规使用抗凝药物外，应鼓励患者早起活动，术后早期活动有利于改善血液循环，预防 DVT。传统的宣教多采用口头方式，由于患者年龄、学历以及社会背景不同，接受能力不同，一般达不到预期效果。随着科技的发展和手机的普及，护理工作模式也发生了改变。我院针对下肢静脉曲张患者术后活动制定了一套血管操，并制作成视频，上传至微信公众号，包括普通话版本和方言版本，因人制宜，以适应不同的患者。本文旨在探讨传统方法进行活动指导与应用多媒体视频进行活动指导的效果评价。**方法** 选择 2018 年 1 月到 2018 年 12 月在本院介入科收治并手术治疗的患者 198 例作为研究对象。198 例患者随机分为研究组（99 例）和对照组（99 例）。对照组采用书面形式和口头形式进行术后活动指导。研究组在对照组的基础上，采用对媒体视频形式代替口头宣教为患者进行术后活动指导。多媒体视频由科室护士扮演标准化病人在真实场景进行演示。比较两组的护理满意度。**结果** 研究组患者出院满意度高于对照组，差异有统计学意义（P<0.05）。**结论** 传统的宣传多采用口头和书面相结合的方式，形式刻板，内容晦涩难懂，示范操作难以理解，尤其是老年患者及低文化程度患者，易产生偏差；且护士个人表达能力不等，容易产生误解。多媒体视频将难以想象的画面用直观的短片表达出来，做到图文并茂，使宣教内容变得生动，便于理解，对老年患者及低文化程度患者是更好的选择。同时保证了宣教内容的标准化及统一化，适应优质护理理念的要求。多媒体视频便于患者接受和理解及充分配合，从而加快患者康复，减少住院时间，提高了护理满意度。

EPO-2266
1 例椎动脉狭窄行球囊扩张合并椎动脉支架植入术患者的护理

张姗姗
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目的：总结了 1 例椎动脉狭窄患者行球囊扩张术合并椎动脉支架植入手术后的综合护理。椎动脉狭窄示引起后循环卒中的重要原因之一。介于后循环供血区脑组织的重要功能，其卒中具有更高的致死率和致残率。目前，单纯的药物治疗难以奏效，随着神经介入技术的进步，血管内支架植入术治疗椎动脉狭窄已成为改善重度椎动脉狭窄、缓解后循环缺血发生最重要的治疗手段[1]。椎动脉支架植入术因其具有创伤小、恢复快、并发症少，安全性高等特点，并随着技术的逐渐成熟，越来越多的患者接受了这种治疗并从中受益。方法：通过对我科收治的患者进行全面综合的护理，患者俞某男性，因“右手食指指尖及舌尖麻木半年余”于 2018 年 8 月 4 日入院。患者入院后自觉右手指及舌尖有麻木感，即行脑血管造影术，造影提示右侧椎动脉开口重度狭窄，左侧椎动脉开口闭塞，完善术前准备后于 08-10 行血管内球囊扩张术合并椎动脉支架植入术，术后患者恢复良好，经过总结和整理，该类患者的护理要点包括：术后常规护理有心理护理，体位护理，穿刺点护理，生活护理，抗凝药物治疗的护理，监测血常规、凝血功能变化，术后并发症的观察与护理，术后健康指导及随访，包括限制重体力活动，避免剧烈活动，保持情绪稳定。 养成良好的生活习惯，戒烟少酒，避免高盐、高脂饮食及过饱，多食蔬菜、水果。向患者说明抗血小板聚集治疗的重要性，严格遵医嘱服用药物。结果 通过给予患者及时、有效、全面的护理，患者快速康复出院。结论 血管内支架成形术作为一种微创的治疗方法，支架具有损伤小、血流阻断时间短、技术成功率高等优点，支架治疗颈内动脉狭窄已逐渐被应用于临床。但需认识到介入治疗仍是侵袭性操作，应客观认识到其危险性。因此，要求护士适应新技术的发展，对术后并发症进行预见性护理，及时将信息反馈给医生，积极有效治疗和处理并发症，是提高介入治疗成功的保证。

EPO-2267
综合护理干预对颈动脉支架置入术后低血压的应用效果

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目的 颈动脉支架置入术（CAS)及颈动脉内膜剥脱术（CEA ）已经成为治疗颈动脉狭窄或闭塞的一种安全有效的新技术。严重低灌注可能导致脑循环缺血产生短暂性或永久性神经系统损伤症状。因此我们在围手术期维持血流动力学稳定尤为重要 **方法** 选取我院 2014 年 10 月—2018 年 7 月在我科进行颈动脉支架置入术的患者 86 例，根据随机分组法分为观察组 43 例和对照组 43 例，对照组采取常规护理包括对照组患者采取常规住院护理主要包括：病区环境介绍、简单手术过程讲解、心理护理、完善术前检查，术区部位清洁备皮、抗凝药物管理、饮食指导、病情观察要点及康复指导等。观察组采取综合护理干预措施包括了风险因素评估、术前适应性训练、术后正确卧床宣教、急救药品、物品准备、麻醉诱导前液体治疗、术后低血压的护理。对比分析 2 组患者术后低血压的发生率、术后正确卧床配合对低血压发生时不适症状的影响、护理满意度、住院天数。**结果** 观察组低血压发生率明显高于对照组； 观察组低血压术后正确卧床配合后无不适症状明显低于对照组；观察组住院天数较对照组有效缩短；观察组护理满意度显著高于对照组，差异均具有统计学意义（$p<0.05$）。单因素分析观察组支架球囊扩张低血压发生率明显高于对照组，差异有统计学意义（$P<0.05$），然而，本研究发现使用球囊预扩张与术后出现低血压发生有着明显的相关性，有文献报道狭窄距分叉处距离≤10㎜、重度狭窄（70%～99%）也是 CAS 相关性血流动力学损害的独立危险因素，与术后发生持续性低血压有关，但本研究未予证实。**结论** 术后低血压的发生与颈动脉支架置入球囊预扩张有关，通过综合护理干预有效避免低血压发生时引起的不适症状，未发生低血压引起的并发症，提升了病人的护理满意度，缩短了住院天数。

EPO-2268
临床护理路径在急诊子宫动脉栓塞术中的应用

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【摘要】目的 探讨临床护理路径在难治性产后出血行急诊介入治疗中的应用。**方法** 将 2018 年 1 月～12 月在我科按临床护理路径实施介入手术护理的 31 例患者作为观察组。将 2017 年 1 月～12 月实施常规护理的 24 例患者作为对照组。观察两组病人的术前准备合格率、手术时间、病人及手术医生满意度进行比较。**结果** 实验组各项指标均优于对照组($P<0.05$)，差异有显著性。**结论** 临床护理路径规范了难治性产后出血患者行急诊介入治疗的围手术期护理程序，有效提高了患者与手术医生的满意度，同时保证了护理质量，值得进一步推广。

EPO-2269
中心静脉导管高压注射碘对比剂的安全性研究进展

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碘对比剂（Iodinated Contrast Media，ICM）是动态 CT 扫描的重要显影剂，并且随着血管成像和灌注成像的发展将变得更加关键，稳定的静脉通道是保证 CT 顺利进行和获得高质量图像的必要条件。一直以来外周静脉是注射 ICM 的主要输注通道，然而并非所有患者都有良好的外周静脉，尤其是急危重症或化疗的患者，可能会导致反复穿刺，甚至无法进行 CT 增强检查。由于 ICM 注射时采用高压力、大剂量注射，加上 ICM 本身具有高浓度、高渗透压、高粘滞度等物理特性，导致注射 ICM 时存在渗漏的风险[1-3]。基于此，通过经皮中心静脉导管（Central Venous Catheter，CVC）或经外周置入的中心静脉导管（Peripherally Inserted Central Catheter，PICC）高压注射 ICM 的安全性引起大家的关注，其观点并不一致。本文就中心静脉导管高压注射碘对比剂安全性的国内外研究进行综述，为穿刺特别困难的患者输注通道的选择提供参考依据，为下一步的深入研究提出指导性建议。

EPO-2270
非离子碘对比剂对相关风险人群甲状腺功能影响的研究进展

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碘对比剂是 CT 检查和介入治疗的首选显影剂，甲状腺疾病是使用碘对比剂的重要危险因素之一。碘对比剂对甲状腺功能的影响机制复杂，国内外关于离子碘对比剂对甲状腺疾病的影响研究基本达成共识，认为有可能影响甲状腺功能，目前已被 NICMs 所替代。 NICMs 已成为电子计算机断层扫描(Electronic computed tomography, CT)及介入的首选显影剂，虽然明显减少了对甲状腺功能的影响，提高了使用的安全性，但在使用范围日益增大的情况下，其对甲状腺功能的影响国内外尚未达成共识，临床上没有可以遵循的明确依据。有研究显示碘诱导的甲状腺功能紊乱并不一定是单一因素引起，可能与 ICMs、结节性甲状腺疾病、药物、老年人以及某些基础疾病等有关。由于甲状腺疾病种类、程度及相关影响因素的不同，使用 ICMs 后给患者带来的不良后果也可能不同。值得注意的是，对于这些风险因素可以通过早期识别和提前干预来降低风险程度，尽可能避免不良后果的发生。目前，CT 及介入对甲状腺功能亢进关注较多，而对其它甲状腺疾病及影响因素关注少。本文就 NICMs 对具有甲状腺疾病及相关风险人群甲状腺功能影响程度的国内外研究进行综述，旨在为该类患者的早期评估和可能的干预提供参考依据，为下一步的深入研究提出指导性建议。

EPO-2271
急危重症患者 MRI 检查风险管理

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摘要 目的：通过优化 MRI 检查流程，保证患者检查转运过程安全，减少不可预测事件发生。方法 通过检查前评估患者做出综合评价，结合现状备齐急救物品，检查中密切观察患者病情，检查后快速转运，提高危重症患者检查成功率。结果 280 例急危重症患者安全完成 MRI 检查，未发生安全风险；结论 优化急危重症 MRI 检查流程，提高护理质量，延伸护理服务。

EPO-2272

两种检查前准备方法对多层螺旋 CT 胃周血管成像效果的影响及护理

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目的 探讨两种检查前准备方法对多层螺旋 CT 胃周血管成像效果的影响及总结护理要点，提高螺旋 CT 胃周血管成像的质量。**方法** 选取 2016 年 1 月-12 月在本院行术前腹部 64 层螺旋 CT 胃周血管成像的胃癌患者 60 例，采用随机数字表法将患者随机分为实验组与对照组，每组各 30 例。对照组患者按常规 CT 扫描前准备，实验组患者在对照组基础上扫描前禁水 6~8h，扫描前 30min 训练患者屏气，10min 前肌内注射 654-2 10mg，扫描前即刻口服 6g 产气粉+10mL 温开水。比较两组患者扫描时胃周血管解剖位置清晰度评分、胃腔充盈满意、及胃形态情况。**结果** 两组患者扫描时胃周血管解剖位置清晰度、胃腔充盈满意及胃形态情况比较，$P<0.05$，差异有统计学意义，实验组患者优于对照组。**结论** 在常规 CT 扫描前准备基础上+禁水 6~8h+训练屏气+肌内注射 654-2 口服+产气粉检查前准备，有助于提高胃周血管空间解剖关系的准确性，对临床进一步诊疗工作提供帮助。

EPO-2273
护理配合对直肠癌高分辨率 MRI 图像质量的影响

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摘要：目的 探讨两种检查前准备方法对直肠高分辨率 MR 图像质量的影响并总结护理要点，提高直肠高分辨率 MR 图像的质量。**方法** 选取中山大学附属第一医院 2016 年 11 月至 2018 年 6 月期间 60 例直肠癌术前检查患者，采用随机数字表法将患者随机分为实验组与对照组，每组各 30 例。对照组患者检查前仅以耦合剂充盈直肠；实验组患者在检查前行直肠充盈耦合剂并加以护理干预，检查 10min 前肌内注射 654-2 10mg，检查前嘱患者排空膀胱。比较两组患者扫描时对直肠高分辨率 MRI 扫描检查图像质量，包括影像清晰度评分、直肠腔充盈满意度。**结果** 60 例患者均顺利完成直肠高分辨率 MRI 检查。对照组图像质量良好率为 73.33%（22/30）；实验组图像质量良好率为 93.33%（28/30）。实验组患者的图像清晰度评分和直肠腔充盈满意度均优于对照组（$P<0.05$）。**结论** 直肠癌高分辨 MRI 检查中，在护理配合下应用适当的检查前准备方法有助于提高直肠高分辨率 MR 图像的质量，对临床进一步诊疗工作提供帮助。

EPO-2274
中西医结合护理对急性冠脉综合征患者主动脉球囊反搏植入术后焦虑状态的效果观察

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目的 评估中医耳穴埋籽法联合传统护理方式对急性冠脉综合征（ACS）患者主动脉球囊反搏植入术后焦虑状态的缓解效果。**方法** 选取 2018 年 6 月—2019 年 8 月于南昌大学第二附属医院就诊的符合纳入标准的 ACS 患者 160 例，依据随机数字表法分为对照组和治疗组，每组 80 例。对照组

采用心理压力管理-增强自信-医护心理疏导综合护理，并耳穴贴敷安慰剂贴膏（糊精、焦糖粉、淀粉组成），模糊外观，与治疗组重量相等。治疗组在常规心理压力管理-增强自信-医护心理疏导综合护理基础上，于睡前选固定穴位，用王不留行（耳籽）贴压耳穴，1 周为 1 个疗程。对比护理前后患者焦虑评分。**结果** 对照组患者试验过程中脱落 4 例，最终完成治疗 76 例。治疗组患者实验过程中脱落 6 例，最终完成治疗 74 例。治疗前两组患者焦虑评分比较，差异无统计学意义（P＞0.05），治疗后两组患者焦虑评分均较前下降且有统计意义（P<0.05）；治疗组中经中医护理后中、重度焦虑评分明显优于对照组，差异有统计学意义（P＜0.05）；但在轻度焦虑亚组，对照治疗组比较无统计学意义（P＞0.05）。两组患者临床疗效比较治疗组患者临床疗效优于对照组。治疗组中三个亚组（UA、NSTEMI、STEMI）治疗后均较治疗前明显降低，有统计学意义（p<0.001）。**结论** 中医耳穴埋籽法联合传统护理方式可以明显减轻 ACS 患者主动脉球囊反搏植入术后的焦虑状态，有助于其更好配合临床治疗。

EPO-2275
不同年龄段动脉化疗栓塞术后肝癌患者抑郁情绪影响因素的差异性研究

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目的 原发性肝癌（Primary hepatic carcinoma, PHC 以下简称肝癌）是世界上最常见的恶性肿瘤之一，其全球发病率和死亡率分别列第 5 位和第 3 位。在中国肝癌的发病率仅次于肺癌和胃癌，而其病死率则列第 2 位。原发性肝癌因其发现时大多已经属于中晚期，恶性程度高，死亡率高。国内外的多项研究调查表明，肝癌患者多存在焦虑、抑郁、恐惧等负性心理情绪，甚至丧失生活信心，进而拒绝接受患病的现实并且拒绝临床治疗。经导管肝动脉化疗栓塞术的方法已经成为了当前肝癌患者的主要治疗方法，其优点是创伤小、疗效确切、病人恢复快，在临床上已经取得了明显的效果，使更多的肝癌患者进入了比较长的带瘤生存期。探讨肝动脉化疗栓塞术后肝癌患者的抑郁状况影响因素以及差异，为临床医务人员进行干预提供依据。**方法** 方便抽取 2018 年 1 月--2018 年 12 月 153 例住院的行肝动脉化疗栓塞术后的肝癌患者，应用一般资料调查表、Zung 的抑郁自评量表、肝癌患者生活质量量表、MSAS 症状评估量表和社会支持量表进行生理、心理和社会方面的全面评估，并将患者分为青年组、中年组和老年组分别进行单因素的筛选和多因素的 logistic 回归分析，比较各组患者抑郁影响因素的差异性。**结果** 是否接受健康培训和客观支持是青年组肝癌 TACE 术后抑郁的影响因素；家庭类型、病程、ECOG 体能评分和主观支持是中年组肝癌患者抑郁的影响因素；谷丙转氨酶值、症状副作用评分和对支持利用度是老年组肝癌患者抑郁的影响因素。**结论** 本研究将不同年龄的肝癌 TACE 术后患者的抑郁情绪进行调查并分析影响因素，抑郁情绪的发生也是多因素相互作用，相互影响的结果不同年龄段肝癌患者的抑郁影响因素也不尽相同，医护人员要有针对性分析各个年龄层次的患者制定有效的政策和干预措施，才可以控制抑郁情绪的发生和发展，提高肝癌患者的生活质量，为今后的治疗和护理提供更有力的循征依据。

EPO-2276
护理专案改善缩短急性缺血性脑卒中介入治疗关键时间的应用

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目的：指南建议急性缺血性卒中(AIS)取栓患者入院至穿刺和再通时间应分别在 90 与 120 分钟内。因接诊、转运、完善检查等不可避免的院内延误，取栓的黄金时间被进一步的压缩，也要求更加高效，而入室至穿刺时间和穿刺至再通时间则成为取栓的关键时间。本文目的通过护理专案改善缩短 AIS 取栓关键时间。
方法：小组调查 2018 年 1-3 月 AIS 取栓的 31 例患者现状，进行原因分析和目标制定，实施如下对策：(1)术前沟通常态化：通过社交软件加强院前沟通，获得患者姓名、年龄、预计抵达时间等信息以提前完成登记，并提前与神经介入医生了解术中耗材、镇静等需求以完善准备；(2)人员配置合理化：由传统的“1 护士+1 技术员”的配合模式调整至由 2 名具有基础影像配合能力的护士配合，共同承担术中护理；(3)业务能力高效化：定期学习新耗材的临床使用，总结术中配合要点并全科培训。分批安排护士到 ICU 轮科学习，以掌握镇静护理、急重症患者护理等业务能力；(4)约束镇静程序化：选择快捷高效的约束工具、合理的镇静评分工具，与医生制定程序化的镇静方案，并术中根据动态评估遵医嘱调整；(5)耗材管理专业化：启用 AIS 耗材机动车，保证必要耗材齐全，可推车随时随地启用，提高接诊反应效率；(6)时间记录科学化：采用客观电子时间记录，影像相关时间节点由统一的 PACS 系统记录，图像产生的同时自动生成时间；非影像相关时间节点，由护士使用带时间记录功能的录音笔进行记录，按下录音时说出时间节点即可。
结果：护理专案改善后，2018 年 10-12 月 41 名患者入室至再通平均时间为 45.3 分钟，其中入室至穿刺平均时间为 12.4 分钟，穿刺至再通平均时间为 32.9 分钟，达到了目标值。
结论：通过护理专案活动，可将 AIS 取栓患者入室-穿刺-再通的流程细化，逐项完善，制定出标准化的工作指引，并加强了全科人员的业务学习与能力培训，有效地缩短了 AIS 患者取栓的关键时间。

EPO-2277
HIMSS 信息平台联合“三查七对”有效降低患者身份识别错误率的研究

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目的 探讨 HIMSS 信息平台联合“三查七对”在降低患者磁共振检查中身份识别错误率的应用。**方法** 选取 2017 年 1 月至 2018 年 12 月我放射科磁共振检查患者 100 例，随机分为对照组与研究组，各 50 例。应用 HIS 和 RIS 系统量化采集核对登记时间，就诊等候时间，技师复验时间以及患者身份识别正确率；再对磁共振室检查环境、登记流程以及护理服务等方面进行患者满意度分析。**结果** 研究组患者较对照组的核对登记时间，就诊等候时间，技师复验时间分别为(1.98 ±1. 03 vs. 1.63 ±0. 87，t =2.112, P <0.05)；(9. 22 ±3. 12 vs. 7. 24 ±2. 84，t =8.223, P <0.05)；(2.28 ±0. 63 vs. 1.03 ±0. 95，t =7.792, P <0.05)；结果显示联合应用 HIMSS 信息平台显著缩短患者登记等候时间。研究组患者身份识别正确率为 100%，对照组漏诊 2 例，正确率为 96%。研究组患者对磁共振室检查环境、登记流程以及护理服务等方面的满意度均显著高于对照组(P <0. 05)。**结论** 在“三查七对”患者身份识别的基础上，联合应用 HIMSS 信息平台技术有利于降低患者身份识别错误率，保证患者医疗检查安全。

EPO-2278
Revolution CT 间接法联合直接法下肢动、静脉成像护理

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[摘要]**目的：**分析总结 Revolution CT 间接法联合直接法下肢动、静脉成像护理要点，并探讨临床价值。**方法：**2018 年 8 月至 2019 年 2 月采用下肢动脉间接法且同时静脉间接法联合直接法成像共 54 例患者，从检查前准备、穿刺方法、准确配制用药和高压注射器使用方面的护理经验进行分析。**结果：**本研究 54 例下肢血管成像患者，均无明显不适和对比剂过敏反应，增强扫描共发生对比剂外渗患者 2 例，其余动、静脉成功显像，动、静脉密度较高且均匀，无假充盈缺损，图像质量符合诊断要求。**结论：**采用正确的护理方法进行 Revolution CT 间接法联合直接法下肢动、静脉成像具有重要的临床意义。

EPO-2279
恶性肿瘤骨转移行经皮椎体成形术对围手术期护理干预的研究

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目的：椎体成形术（vertebroplasty）是将各种可注射性生物材料经椎弓根注射到病变部位来强化椎体，解除疼痛稳定脊柱。经皮椎体成形术（PVP）是通过椎弓根想椎体内注入骨水泥的方法，增强椎体强度和稳定性以缓解腰背部疼痛，甚至部分恢复椎体高度，是治疗椎体肿瘤的一种微创手术。现对 40 名椎体成形术患者分成两组。干预组，进行观察及围手术期及术后、出院指导宣教等宣教；对照组，进行观察及术后对症处理等方法，现报告如下：

1.资料与方法 1.1 资料 将我科 2018 年 1 月至 12 月收治恶性肿瘤骨转移的患者 40 例作为对象，分为两组作为对象，分为 2 组给予不同的护理措施；干预组 20 例，年龄 35-72 岁。对照组 20 例，年龄 42-68 岁。

评定项目 临床预后统计患者睡眠及进食及排便情况（睡眠指每天小于 6 小时；进食指每天需 3 餐，每餐大于 120 克；排便指 3 日未排大便）

组别	例	睡眠	进食	排便	发生率
干预组	20	1	1	0	10%
对照组	20	5	5	3	65%

讨论：椎体转移瘤可由多种恶性肿瘤发生椎体转移而引起，不仅造成顽固性疼痛，而且进一步破坏骨质，导致椎体病理性骨折，进行压迫脊椎，直至死亡。由于椎体成形术是一种新技术，尤其是特殊的手术方法会增加患者心理负担，导致睡眠、进食差及担心出血造成排便困难。对患者病情恢复极为不利的，因此在围手术期的护理是非常重要的，干预组比对照组发生率下降了 55%。所以，围手术期的护理及观察是极为重要的，充分准备，熟练观察病情，一丝不苟的监护是手术成功的重要保证。

EPO-2280
下肢制动水晶腿套在股动脉穿刺术后的应用

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股动脉穿刺手术已经广泛应用到临床，介入手术需穿刺股动脉（ TAE 术，TAI 术，PTA 术，UAE 术， UAI 术，支气管造影及栓塞术），穿刺股动脉易引起出血等并发症。
目的：
1.如何减少出血？除了患者的配合之外，我们还能做些什么呢？
我们在平日的护理工作中观察到，髋关节移动，屈曲会造成出血。那么如何制动髋关节就是我们需要解决的问题。穿刺点在皮肤的皱褶处，是活动最大的区域，患者在睡眠 时并不能控制。
2.如何制动髋关节？
我们通过日常的观察，发现主动制动膝关节，可间接制动髋关节移动。使患者髋关节折曲困难，减少术后出血等并发症。自制水晶腿套就是针对术后出血研制出的器具，可 以通过制动膝关节，禁止髋关节屈曲。自制下肢制动水晶腿套已成功申请实用新型专利（专利号：ZL 2015 2 0198408.4）此专利已被健康报护士频道转载。应用于临床使用下肢水晶腿套效果进行对比观察，现报告如下。
资料与方法
1.1 一般资料 选取 2018 年 1 月-2018 年 6 月股动脉穿刺病人 100 例，其中男 68 例，女 32 例。年龄（50±10）入选患者随机分为两组：
1.1.2 对照组 患者术后安返病房，对患者及家属进行相关的知识教育，告知穿刺点侧下肢肢体制动 12h，局部绷带加压包扎或压迫止血器压迫止血，指导患者采取卧位。
1.1.3 观察组 患者术后安返病房，对患者及家属进行相关的知识教育，告知穿刺点侧下肢肢体制动 12h，局部绷带加压包扎或压迫止血器压迫止血 ，指导患者采取卧位，并采用下肢自制水晶退套进行下肢的固定。
结论：
临床应用中，未用下肢制动腿套的患者 50 例，因髋关节活动不当，42%的患者出现并发症，使用下肢制动水晶腿套患者 50 例，8%患者出现并发症，其并发症比例下降 34%达到了理想效果。使用下肢制动水晶腿套取得患者的认可及较高的一致好评，同时也提高了患者的满意度。

EPO-2281
上肢制动止血舒适垫在主动脉瘤腔内修复术术后的应用

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目的：
随着优质护理服务的开展，减轻患者的痛苦，提高患者的舒适度和满意度成为了护理工作中不可缺少的一部分。肱动脉穿刺是指通过肱动脉为入路径进行介入手术治疗的术式 （如主动脉瘤腔内修复术等），术后患者返回病房，穿刺处的上肢经常需要制动 24 小时，医生常采用弹力绷带加压包扎或无菌纱布缠绕穿刺点进行压迫止血，由于肘关节长时间的制动，易造成患者上肢制动的不舒适，影响到患者情绪及睡眠，并且一旦患者肘部不自觉的活动，非常容易造成穿刺点处出血。因此为了解决这一问题。我们研究设计了一款上肢制动止血舒适垫。现对 2018 年 8 月-12 月期间行肱动脉介入手术的 20 例患者围手术期护理工作进行总结，报道如下。
资料与方法：
1.1 一般资料 该组患者共 20 例，其中男 13 例，女 7 例；年龄 42-72 岁。
1.12 术后护理 监测生命体征 术后返回病房，立即给予心电血压血氧监护等，监测体温、脉搏、呼吸、血压等生命体征.

1.13 体位护理　　返回病房后 给予平卧位，检查患者皮肤受压情况，及穿刺点情况，观察患者桡动脉搏动情况及皮温皮色情况。给予佩戴上肢制动止血舒适垫.
结论
在 2018 年 8 月-12 月需上肢制动患者在临床应用中，患者 10 例，因肘关节活动不当，30%的患者出现并发症；使用上肢制动止血舒适垫患者 10 例，10%的患者出现并发症，其并发症比例下降 30%达到了理想效果。使用上肢制动止血舒适垫取得患者的认可及较高的一致好评，同时也提高了患者的满意度。

EPO-2282
探讨综合性管理对介入导管室护理质量的控制效果

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目的：分析探讨综合性管理方法对介入导管室护理质量控制效果。方法：随机纳入本院 2017 年 1 月至 2017 年 12 月介入导管室收治 100 例患者建立对照组，随机纳入 2018 年 1 月至 2018 年 12 月介入导管室收治 100 例患者建立管理组。对照组采用常规护理管理，管理组采用综合性管理，对比两组患者对护理质量评分情况，术间管理评分与护理失误率情况。结果：管理组患者对护理质量评分相比对照组明显更高；医生对管理组术间管理评分相比对照组明显更高（P<0.05）；管理组患者介入导管室护理失误事件发生率相比对照组明显更低（P<0.05）。结论：综合性管理可提高介入导管室的护理工作质量，患者、医生对于综合性管理的护理质量评分高，该管理方法同时可降低护理失误事件发生率。该管理方法具临床应用价值。

EPO-2283
分析冠脉介入手术（PCI）的导管室护理风险管理措施

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目的：分析并探讨冠脉介入手术（PCI）导管室护理风险管理措施及效果。方法：搜集本院 2018 年 3 月至 2019 年 3 月进行 60 例 PCI 手术治疗患者作为研究对象，随机将患者分为对照组（n=30）与研究组（n=30），对照组 PCI 围术期予以常规护理管理，研究组进行导管室护理风险管理，观察比较两组患者的风险事件发生率。结果：研究组患者手术风险事件发生率为 6.67%（2/30），对照组患者手术风险事件发生率为 26.67%（8/30），研究组患者手术风险率相比对照组明显更低（P<0.05）。结论：对于进行冠脉介入手术治疗患者在导管室护理中进行护理风险管理有助于降低手术风险事件发生率，该方法值得进行临床推广与应用。

EPO-2284
风险管理对提高介入护理管理质量的影响评价

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【摘要】目的：研究风险管理对提高介入护理管理质量的影响。**方法：**选择介入治疗患者作为本次研究病人或研究对象，并采用“电脑随机法”将 200 例介入治疗患者进行分组，主要包括两组，其中观察组、实施风险管理；对照组、实施常规管理，将两组风险事件发生情况、护理质量评分以及患者满意度进行对比。**结果:**观察组介入治疗患者患者投诉率 2.00%、护理差错率 1.00%低于对照组，差异表示为统计学意义，（P＜0.05）。两组介入治疗患者护理质量评分相比较，观察组介入治疗患者护理质量评分更高，差异有统计学意义，（P＜0.05）。观察组介入治疗患者满意度高于对照组，差异有统计学意义，P<0.05。**结论：**风险管理对提高介入护理管理质量具有重要意义，同时能够降低风险事件发生率，提高介入护理管理质量，值得研究。

EPO-2285
罗哌卡因联合利多卡因在永久性心脏起搏器术中镇痛疗效的观察

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目的：观察低浓度罗哌卡因联合利多卡因行永久性心脏起搏器术中镇痛疗效的效果。方法：选取 2017 年 1 月-2017 年 8 月我院行永久性心脏起搏器患者 160 例，随机分为罗哌卡因+利多卡因组（实验组）80 例和利多卡因组（对照组）80 例，选择皮下注射局部麻醉进行手术；实验组：0．2％罗哌卡因+0．5％利多卡因局部麻醉。对照组：0．5％利多卡因局部麻醉。其中实验组 80 例中，男 56 例，女 24 例，年龄在 55-79 岁，平均（65.5±4.9）岁；对照组 80 例患者，男 42 例，女 38 例，年龄在 58-81 岁，平均（64.6±5.3）岁。排除意识障碍、手术禁忌者，本次研究经我院伦理委员会批准，两组患者基线资料均衡可比（p＞0.05）。观察并记录术中镇痛效果评分及不良反应，采用 NRS 疼痛评分表来评分。结果：评分平均实验组为（2．1±0．3）分、对照组为（4．8±0．5）分，实验组患者镇痛评分率显著低于对照组，无不良反应，p 值为 0.039%（p＜0.05），差异有统计学意义，不良反应无显著性差异。结论：观察证明两种方法均可满足临床上病人术中镇痛的需要．采用罗哌卡因+利多卡因麻醉相对有效安全，持续时间较长，可起到良好的术中镇痛作用，故罗哌卡因+利多卡因组优于利多卡因组，永久起搏器植入术中患者镇痛效果较好，从而提高术中患者舒适度和依从性，减少不良反应发生率，有助于预后，值得推广。

EPO-2286
品管圈在介入手术室急诊 PCI 抢救配合中的应用效果

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【摘 要】目的：探讨品管圈在介入手术室急诊 PCI 抢救配合中的应用效果。方法：成立品管圈小组，对介入手术室护士在急诊 PCI 抢救配合中出现的问题进行分析，选定活动主题，进行现状把握、设定目标、分析原因及制定对策。结果：“品管圈”活动开展后急诊 PCI 抢救中护理缺陷的发生率明显降低，医生的满意度显著提高。结论：品管圈活动可有效改进介入手术室护士在 急诊 PCI 抢救中的配合效果，减少护理缺陷，提高护理质量。

EPO-2287

介绍一种改良后具有手部固定装置的 CT 头托的制作与应用

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目的
介绍一种改良后具有手部固定装置的 CT 头托的制作与应用。

方法
详细阐述本改良后具有手部固定装置的 CT 头托的原理和临床应用效果。笔者改良的 CT 头托，包括 CT 手部固定托及托头座套； CT 手部固定座固定在头部容置位的旁侧。托头座套铺展在拖头座之上。头部容置位的两旁侧对应的位置上分别设置有至少两条用于固定手臂位置的第二固定带。病人进行 CT 检查时，双手举向头部，双手就可以通过手部固定装置，即 CT 手部固定托固定，从而使患者更好地进行 CT 检查及伸直肘部利于注射防外渗，外渗率由使用前的 0.118%下降至使用后的 0.043% ， 从而减轻了患者的痛苦。通过 CT 头托座套，一方面可以让患者固定双手舒适，利于检查。另一方面使头托座整洁干净，利于工作人员及时更换头托套预防病人间交叉感染，患者满意度提高。
结果
经临床应用证实改良后具有手部固定装置的 CT 头托，方便 CT 室技术员及护士的操作，增加患者的舒适度利于检查以及减少外渗的发生几率。
结论
本改良具有手部固定装置的 CT 头托具有设计合理、结构简单、使用方便、利于检查及增加患者舒适度等的优点，值得临床推广应用。

EPO-2288
一例小儿肝移植术后胆管瘘介入治疗的护理体会

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摘要：目的 总结小儿肝移植术后胆管瘘介入治疗的护理体会。**方法** 术前对患儿做好心理护理和术前准备，术中严格无菌操作，密切观察病情，做好防护措施，术后做好穿刺口皮肤护理，预防和控制感染，防止引流管堵塞或脱出。**结果** 通过医护人员的治疗和护理改善了患儿及家属的心理状态，积极配合治疗，使患儿的病情得以好转。**结论** 有效的心理护理、积极地沟通、准确把握病情以及及时的术后宣教能减轻患者焦虑，减少和防止并发症，促进小儿肝移植术后胆管瘘的愈合。

EPO-2289
50 例肝癌介入术围手术期护理

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目的：了解肝癌介入围手术期的护理重点。方法：对 50 例肝癌介入术患者出现不良反应的预防及护理进行分析并做出相应的护理措施。结果：通过有效的护理措施，使患者出现的症状得到改善。

结论：有效的肝癌介入围手术期护理对于改善患者术中发生的不良反应，降低患者不良反应发生率有重要意义。

EPO-2290
康复训练对 1 例剖宫产术后下肢深静脉血栓形成患者行介入治疗围手术期的影响分析

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[目的]探讨分析 1 例剖宫产术后下肢深静脉血栓形成的因素与预防措施。[方法]对 1 例剖宫产术后下肢深静脉血栓形成患者术后 DVT 的因素进行分析，并给予积极有效地预防深静脉血栓形成的护理措施,包括术前健康教育、心理护理、康复训练、保护下肢静脉等,术后需严密观察病情、指导并帮助患者早期进行功能锻炼等。[结果]剖宫产术后患者机体组织器官的生理性退变、外伤与手术导致静脉内膜损伤、血流缓慢及血液的高凝状态等是影响剖宫产术后下肢深静脉血栓形成的主要因素。[结论]下肢深静脉血栓形成是剖宫产患者术后较为严重的并发症之一，护理人员术后加强对患者的严密观察与护理,积极有效地预防护理干预措施可预防下肢深静脉血栓形成。

EPO-2291
风险管理对医生及护理人员手卫生依从性的影响

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目的：分析风险管理对医生及护理人员手卫生依从性的影响。方法：选取 2016 年 10 月—2017 年 10 月间接受风险管理的 16 名医生和 41 名护理人员手卫生的依从性资料作为风险管理后组；另选取 2014 年 9 月—2015 年 9 月间未进行风险管理的 16 名医生和 41 名护理人员手卫生的依从性资料作为风险管理前组；比较两组医生、护理人员风险管理前后手卫生知晓率及手卫生的依从率差异情况。结果：风险管理后组医生风险管理后手卫生知识知晓率为 93.75%高于风险管理前组为 62.50%（P＜0.05），风险管理后组护理人员风险管理后手卫生知识知晓率为 100%高于风险管理前组为 63%（P＜0.05）；风险管理后组医生接触患者前手卫生依从率为 61.45%，无菌操作前为 78.13%；接触患者后手卫生依从率为 71.87% 和接触患者体液后为 92.71% 高于风险管理前组，风险管理前组医生接触受检者前、无菌操作前、接触受检者后和接触受检者体液后手卫生依从率分别为 35.42%，61.46%，41.66%和 71.88%（P＜0.05）。风险管理后组护理人员接触患者前手卫生依从率为 83.33%，无菌操作前为 86.99%；接触患者后手卫生依从率为 91.46% 和接触患者体液后为 100%高于风险管理前组，风险管理前组护理人员接触受检者前、无菌操作前、接触受检者后和接触受检者体液后手卫生依从率分别为 47.76%，51.82%，53.24%和 78.45%（P＜0.05）。结论：风险管理应用于健康管理中心的管理中的效果较为显著，强化了医生、护理人员手卫生意识，提高了手部卫生的依从率，降低及避免了院内交叉感染发生。
【关键词】 风险管理；医生；护理人员；手卫生依从性；

EPO-2292
护患沟通实现患者心理期望值补偿在提高 CT 快速流程效益中的价值

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目的：探讨护患沟通实现患者心理期望值补偿在提高 CT 快速流程效益中的作用。
方法：横截面随机选择我院 2018 年 12 月某天上午 200 例计划 CT 检查的患者进行研究，随机均分为两组。设计两种不同的检查前护理模式，创新模式是在护患沟通中注重实现患者心理期望值补偿，入选患者为研究组；一般模式是沿用传统的轻视患者心态的强势护患沟通，入选患者为对照组。观察两组的流程效益，评价指标包括患者满意率、患者投诉率、医患吵架率、患者焦虑率、患者顺从率及检查效率。
结果：研究组患者满意率、患者顺从率及检查效率均高于对照组（95%：84.42%；79%：64.94%；100%：90.91%）； 研究组患者投诉率、医患吵架率及患者焦虑率均低于对照组（2%：14.29%；2%：12.99%；4%：16.88%）。
结论：在我国大医院 CT 检查量大的情况下，护患沟通中注重患者心理期望值补偿有利于提高 CT 快速流程效益。

EPO-2293
CT 增强扫描碘对比剂外渗的护理干预现状分析

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目前，CT 检查患者的 50%患者需进行碘对比剂静脉注射检查，而碘对比剂外渗漏是主要并发症，也是目前研究的热点。但是关于对比剂外渗后外渗程度的分析，现有的《碘对比剂使用指南第二版》及《影像科碘对比剂输注安全专家共识》中，包括《美国放射学院对比剂使用指南》都未有涉及。文献中涉及的对比剂外渗程度分类多数依据个人经验，未有科学的临床指标，对比剂外渗后护理干预方法种类繁多，尚无统一标准。本文通过分析碘对比剂外渗护理干预现状，提出现存问题，旨在请护理专家和同行进一步研究和规范对比剂外渗的护理，为广大患者的安全提供保障。

EPO-2294
整体护理在儿童 320 排 CT-DSA 检查中的应用价值

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【摘要】 目的：探讨整体护理在儿童 CT-DSA 检查中应用价值，以提高儿童 CT-DSA 检查成功率的同时减少 X 线的辐射和碘当量。 方法：回顾性纳入 2017 年 7 月至 2019 年 3 月间在我院行 320 排

CT-DSA 检查的儿童 154 例（其中男 95 例，女 54 例；月龄 17.34±14.95 月），利用广义线性模型和二元 Logistic 回归方法分析检查过程中患儿的陪护人员、亲人的精神状态、检查时段、镇静方式、穿刺部位、患儿上床时状态、患儿试针时状态、不良反应 8 个主观因素与患儿能否一次性完成的相关性。 结果：上床时状态、试针状态与能否顺利成检查密切相关，陪护人的精神状态将之，陪护人、对比剂、对比剂注射速率、对比剂的用量及检查时段与能否顺利完成检查不相关。结论：患儿在行 320 排 CT-DSA 检查时，运用整体护理模式在有效提高检查成功率并同时减少患儿的 X 线辐射当量和碘当量。

EPO-2295
责任制整体护理在原发性肝癌行介入治疗患者中的应用研究

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目的：探讨责任制整体护理在原发性肝癌行介入治疗患者中的应用。**方法：**选择我院于 2017 年 1 月至 2019 年 1 月期间收治的原发性肝癌介入治疗患者 82 例，采用随机数字表法随机分为对照组 41 例与观察组 41 例。对照组患者采用常规护理干预，观察组患者在对照组基础上结合责任制整体护理干预。比较两组介入前后焦虑和抑郁程度、生活质量改善，干预满意度及术后并发症。**结果：**两组介入后 SDS 和 SAS 评分较介入前减少（观察组：t=12.723、13.485，对照组：t=8.842、6.802，$P<0.05$）；观察组介入后 SDS 和 SAS 评分低于对照组（t=6.450、9.524，$P<0.05$）。两组介入后躯体功能、情绪功能、认知功能和整体生活质量较介入前增加（观察组：t=23.296、23.185、15.406、22.592，对照组：t=14.839、10.507、5.147、13.300，$P<0.05$）；观察组介入后躯体功能、情绪功能、认知功能和整体生活质量评分高于对照组（t=14.187、12.976、10.347、13.819，$P<0.05$）。观察组干预总满意率（97.56%）高于对照组（78.05%）（$P<0.05$）。观察组术后并发症（9.76%）低于对照组（34.15%）（$P<0.05$）。**结论：**责任制整体护理在原发性肝癌行介入治疗患者效果良好，可改善患者生活质量，减轻焦虑和抑郁情绪，减少术后并发症，值得临床借鉴。

EPO-2296
腱鞘巨细胞瘤与色素沉着绒毛结节性滑膜炎的 MR 诊断

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【摘要】：目的 分析腱鞘巨细胞瘤与色素沉着绒毛结节性滑膜炎的 MRI 特征,及 MRI 在两者鉴别诊断中价值。**方法** 回顾性分析 52 例经手术病理证实的腱鞘巨细胞瘤及 PVNS 患者，术前均接受 MRI 检查，其中 17 例行增强扫描。2 名有骨关节系统影像诊断经验的医师对病灶的部位、形态、大小、信号特征、强化方式、邻近结构改变进行分析。**结果** 57.7%(30/52 例)的患者为局限性腱鞘巨细胞瘤型，病灶主要位于手足部(占 67 %)，MRI 表现为境界清晰的结节状的长/等 T1 稍长 T2 信号；17.3%(9/52 例)的患者为弥漫性腱鞘巨细胞瘤型，病灶主要位于足部(占 44 %)，MRI 表现为边界欠清的结节状或团片状长 T1 稍长/短 T2 信号；25%(13/52 例)的患者为色素沉着绒毛结节性滑膜炎，病灶主要位于膝关节(占 54 %)，MRI 表现为关节腔内弥漫性肿块影,呈长 T1 短 T2 信号，其内大量增生的滑膜组织，易累及周边结构。**结论** MRI 检查有助于显示肿块的信号特征、范围及与周围组织结构的关系，有助于腱鞘巨细胞瘤与色素沉着绒毛结节性滑膜炎的鉴别诊断。

EPO-2297

25 例误诊为肺癌的肺部真菌感染的临床与影像特征分析

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摘要：目的：分析误诊为肺癌的肺部真菌感染患者的临床与影像学资料，建立基于临床与影像特征综合分析方法，从而避免影像误诊的发生。方法：回顾性分析 25 例初诊为肺恶性肿瘤，确诊为肺真菌感染的患者的临床及 CT 资料。结果：纳入研究患者平均年龄为 56.8 岁（31-80 岁）。最常见的症状为咳嗽（48%），咳痰（44%），胸痛（20%）以及发热（8%）。肿物平均大小为 36.5（10-82）mm。CT 表现包括肺小结节（52%）、肺团块状占位（36%）或者两者皆有（12%）。肿块边缘可表现为分叶状 9（36%），边界不清 5（20%）以及边缘光滑 3（12%）。其余特点包括钙化、胸膜侵犯以及胸腔淋巴结肿大等。结论：某些肺部真菌感染与肺恶性肿瘤具有相似的临床及影像学特征，难以分辨。而由于两者的治疗方式及预后大相径庭，因此建立一个确切的影像学及临床诊断流程可能有助于进一步的诊治。

EPO-2298

淋巴结结核一例并文献复习

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目的：认识淋巴结结核的影像特点及相关鉴别诊断，提高对淋巴结结核的的诊断准确率。方法：回顾分析 1 例全身淋巴结结核患者的临床资料及影像学检查，并复习相关文献。结果：患者表现为双侧颈部、右侧腋窝、锁骨上窝、纵隔、肝门区、胰头周围、腹膜后、右侧腹股沟区及左前胸壁淋巴结肿大，增强呈环形强化。结论：全身多处淋巴结肿大并呈环形强化时，首要考虑为淋巴结结核，影像上难以鉴别时需要做真菌培养或淋巴结穿刺活检明确。

EPO-2299

甲型 H1N1 流感肺炎的胸部影像表现

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目的 探讨甲型 H1N1 流感肺炎胸部 X 线及 CT 表现特点。
方法 回顾性分析经临床及病毒核酸检测确诊的甲型 H1N1 流感肺炎 15 例患者的胸部影像资料，病初均摄胸部 DR 片，11 例连续复查床边胸片，7 例同期行胸部 CT 检查，5 例复查胸部 CT。
结果 甲型 H1N1 流感肺炎根据病程、病灶分布的部位及范围分为如下 4 种类型：(1)支气管炎型：4 例，病变主要累及肺间质；(2)单纯局限型：3 例，病灶仅限于单个肺叶或肺段；(3)多灶型：5 例，病变累及多个肺叶或肺段，呈散在分布；(4)广泛弥漫型：3 例，病变累及双肺多个肺叶，广泛性分布。并发脑炎 1 例，双侧胸膜炎 6 例，气胸 1 例，心包炎 1 例，鼻窦炎 1 例。
结论 甲型 H1N1 流感肺炎的胸部 X 线及 CT 表现多种多样，以片状影及磨玻璃密度影为主，可合并肺间质性浸润，可并发胸膜炎、气胸、心包炎，具有一定特征性，与病程进展有一定关系，可作为病情观察的指标之一。

EPO-2300
Hand-foot-mouth Associated with Myelencephalitis Disease

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Abstract In this study, the pathogeny, route of transmission and pathogenesis of the myelencephalitis associated with hand-foot-mouth disease, damage mechanism of EV71 on central nervous system, pathological change, diagnosis and differential diagnosis were described. With analyzing the existing images of children with myelencephalitis associated with hand-foot-mouth disease and reviewing the literature, the imaging characteristics of the myelencephalitis associated with hand-foot-mouth disease were summarized to improve the diagnosis and recognition of myelencephalitis associated with hand-foot-mouth disease.

EPO-2301
儿童肺炎影像诊断及鉴别诊断

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1、新生儿床边片—肺透明膜病、肺水肿 肺出血
2、喘鸣（喉喘）--气道软化症、异物
3、各类感染—支原体、腺病毒、流感
4、先天性支气管肺发育异常
5、免疫类/遗传类—川崎病、Alagille 综合征
6、肿瘤样及肿瘤--郎格汉斯细胞组织细胞增生症（LCH）、淋巴瘤、转移
小结
1、新生儿床边片—需密切关注病情动态变化及体位因素。
2、持续喘鸣（喉喘）--哮喘、“马赛克”征如小气道、 小血管异常如 BO/PVD、支气管肺发育不良、囊性纤维化等， 还要关注主气道（气道软化、异物）及喉病变如喉蹼、 息肉、异位甲状腺等。

3、各类感染—要密切结合临床，尤其抗炎无效时，“症征” 相符要警惕腺病毒、流感等，“症征不符”支原体要关注。
4、肿瘤样及肿瘤--郎格汉斯细胞组织细胞增生症（LCH） 胸膜肺母细胞瘤、淋巴瘤、转移

5、儿童疾病谱特点—先天性/免疫性/遗传性/代谢性—川崎病

EPO-2302
小儿腺病毒影像诊断再认识

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目的 腺病毒临床发病凶悍、死亡率高、传染性强，因此再次研究腺病毒感染特点。
方法 总结本院 2019 年 4-5 月腺病毒病例。
结果 腺病毒临床高热早于咳嗽，持续时间长，影像特征根据临床进展而不同。
结论 腺病毒影像具有一定特征性。

EPO-2303
胸部不典型肿瘤漏诊或误诊为结核的影像学分析

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【摘要】目的：分析肺结核合并胸部肿瘤病例肿瘤漏诊及胸部早期不典型肿瘤病例误诊为结核的临床及胸部 CT 特征以及漏误诊的原因，减少漏误诊率，提高肺结核合并胸部肿瘤及不典型肿瘤的影像诊断水平，使患者得到急时的治疗。**方法**：收集经细胞学或组织病理学、病原学证实的肺结核合并胸部肿瘤病例及不典型肿瘤病例以及单纯肺结核病例各 50 例，及其临床资料。所有病例行胸部 CT 扫描，对比分析其临床及胸部 CT 特征（肺结核合并肿瘤及不典型肺部肿瘤分别与单纯肺结核比较）。**结果**：18 例肺结核合并肿瘤病例肺癌被漏诊，15 例不典型肿瘤病例误诊为结核。这些被漏误诊的病例均表现出某些与结核相似的临床及影像学特征，影像诊断存在一定的困难，但仔细分析及追踪观察发现与单纯结核的 CT 表现也有一些差异。**结论**：结核与胸部肿瘤有一定的相关性，并相互影响，影像表现与结核相似的不典型肺癌易漏诊或误诊为结核，影像诊断需谨慎，同时需结合临床资料仔细分析及追踪观察，必要时建议行纤支镜、经皮肺穿等检查，以免漏诊或误诊，延误患者的治疗。

EPO-2304
HIV 垂直感染青少年的皮层发育形态学研究

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目的：本研究的目的是探讨 HIV 将会怎样影响青春期儿童的大脑皮层发育，有哪些易感脑区，以及这些脑结构改变与认知能力的相关性。
方法：我们使用结构性 MRI 来检查 16 名 HIV 感染儿童（年龄 13.63±1.83 岁，）和 25 名年龄性别相匹配的 HIV 暴露未感染儿童（年龄 13.32±1.62 岁）的灰质并对其中部分儿童进行每次间隔一年的重复磁共振脑部扫描。我们对每位被试进行了五项神经认知测试以评估不同领域的认知表现。
结果：横断面研究显示 HIV 感染儿童的灰质体积广泛减小（主要在双侧额颞叶等），皮层厚度改变主要发生于右侧颞叶及左侧枕叶；皮层褶皱的改变以增加为主，脑沟裂深度增加的区域主要在左侧缘上回、中央前回及额上回，减少主要在左侧梭状回、海马旁回、内嗅皮层等区域。纵向研究显示 HIV 儿童的灰质体积减小主要发生在右侧前额叶、顶叶的高级功能区及运动区，皮质变薄的脑区多为感觉运动皮层及边缘系统。我们的神经心理学测试结果表明 HIV 感染儿童在书面语言、工作记忆等方面表现正常或欠佳，但执行功能显著受影响(Wisconsin 卡片分类测试,p=0.015)，且部分脑区的改变与之有相关性。
结论：处在青春期的 HIV 儿童表现出了伴有萎缩的多个联合皮层成熟延迟（主要在左顶叶及双侧枕叶）。这种异常的大脑皮层发育模式可能是 HIV 儿童出现认知功能障碍的结构性基础。我们还需要在扩大样本量的基础上，进行长期随访来进一步细化及验证我们的研究结果。

EPO-2305
气管支气管少见原发肿瘤的影像诊断思路

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目的:探讨气管支气管少见原发肿瘤的影像诊断思路。
方法:回顾性分析 20 例气管支气管少见原发肿瘤的临床及 CT 表现，并与手术病理进行对照分析。探索其 CT 影像特征与病理之间的关系，为气管支气管少见原发肿瘤的影像诊断提供参考思路。20 例病例中，14 例行 CT 平扫加增强扫描(动脉期＋静脉期)，另外 6 例仅行 CT 平扫。所有扫描均在 GE Revolution 256 排螺旋 CT 完成。
结果: 本组 20 例病例中,5 例为腺样囊性癌，以中年人多见(平均年龄 45 岁，男女无差别)；其中 4 例位于气管, 表现为宽基底结节,呈均匀的等密度，低于肌肉密度，不均匀强化，腔内外生长多见;1 例位于主支气管，呈腔内息肉样软组织肿块，无蒂，平扫密度均匀，增强后不均匀强化。6 例为黏液表皮样癌多发生于青年人(平均年龄 32 岁，其中男 4 例，女 2 例),好发于叶、段支气管,表现为腔内或腔内外结节或肿块，以腔内型多见，增强后轻度或明显强化。4 例为不典型类癌,均为老年患者(平均年龄 60 岁，其中男 3 例，女 1 例),；均位于主支气管,表现为沿支气管蔓延的肿块,呈特征性的“冰山征”,CT 增强明显均匀强化。2 例为中央型肉瘤样癌,均为老年男性，表现为支气管腔内外沿支气管蔓延的肿块,轻度强化。3 例叶支气管内含脂肪成分的病变,其中 2 例均匀脂肪密度的为脂肪瘤,1 例软组织结节合并钙化灶的为错构瘤。
结论:气管支气管少见原发肿瘤的临床及 CT 表现有一定的特征性,注意分析其影像特征及细节有助于诊断及鉴别诊断。

EPO-2306
OREM 自理理论模式与效应分析在预防老年患者导尿管相关尿路感染管理中的应用

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目的 探究 OREM 自理理论模式与效应分析在预防老年患者导尿管相关尿路感染管理中的应用。方法 选取 2016 年-2017 年我院住院留置导尿管患者 182 例，将患者分为管理组（观察组）和传统方法护理组（对照组），每组 91 例。对照组采用常规留置导尿管护理模式，观察组采用 OREM 模式，对比两组患者高风险系数值（RPN）及 CAUTI 发生率、护理满意度评分。结果 观察组患者 RPN 值均降低，差异有统计学意义 (P<0. 05)；观察组患者 CAUTI 发生率低于对照组，差异有统计学意义 (P<0. 05)；与对照组相比，观察组患者出院后对护理满意度评分较高，差异有统计学意义 (P<0. 05)。结论 OREM 应用于老年患者 CAUTI 管理中，能降低 CAUTI 发生率，提高护理满意度。

EPO-2307
PDCA 模式结合 CBL 及情景教学在职业防护培训中的应用

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目的应用 PDCA 模式探讨病例为基础的教学结合情景模拟教学在职业防护培训中的效果。**方法**选取 2016 年 60 名规培护士作为观察组，2017 年 65 名规培护士作为对照组。岗前培训过程中观察组护士运用 CBL 结合情景模拟教学进行职业防护培训，对照组护士由感染控制护士长进行职业防护讲座，两组分别于培训结束后进行书面理论考核，考核结束后进人临床工作，最后应用 PDCA 模式进行评价。**结果**观察组护士客观试题成绩为(88. 55 ±5. 56)，明显优于对照组(80. 77 ±5. 79)(P<0. 05)。观察组护士人员 1 年内职业暴露发生率、职业暴露后处理正确率分别为 11. 7%和 100. 0%，均低于对照组 30. 8%和 50%，差异有统计学意义(/值分别为 6. 723, 5. 559; P<0. 05)。**结论** PDCA 模式结合 CBL 及情景教学，能有效提高职业防护培训效果，有助于减少职业伤害。

EPO-2308

基于数字平板胃肠机的全脊柱摄影技术

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目的 探讨全脊柱摄影在数字平板胃肠机上的临床应用价值。
方法 选取 20 例脊柱侧弯、后凸等畸形患者,利用数字数字胃肠机进行特殊摄影，应用长骨拼接软件,对拼接后获得的脊柱全景影像质量进行评估。
1.设备 意大利 VILLA APOLLO G100RFA 数字平板胃肠机，17 英寸 X17 英寸非晶硅碘化铯平板，可升降式诊断床，可旋转伸缩式球管立柱，最大 200CM。铅刻度每 1CM 刻度尺。东软 PACS 系统及 e-PACS 2000WS 医学影像工作站。
2.体位与方法 拍摄正位片时，患者站立背靠头部、肩部、臀部紧贴摄影床，双手自然下垂，握住扶手以固定。侧位片时，患者呈侧位站立，双臂向前伸出，屈肘，肘关节置于扶手之上，身体保持不动。
3.确定脊柱摄影范围 上缘包括 C1，下缘 S1 椎体，双肩及骨盆。
4.摄影方法 将球管立柱升至最长距离 200CM，以减小放大失真。对于身高低于 120CM，可一次曝光取得全脊柱影像；身高大于 120CM，可分 2-3 段分别摄影，然后进行拼接获得全脊柱影像。摄影时，摄影床直立保持不动相对固定，球管自上而下移动进行曝光。曝光结束后，将图像发送至随机 e-PACS 工作站，对所获图像进行密度调整，点击“拼接”按钮，进行自动拼接，并根据原图进行微调处理，使全脊柱图像对比度等趋于一致化，获得满意全脊柱图像后上传东软 PACS，并打印照片。
结果 组内 20 例全脊柱图像，经放射科及骨科医生通过阅片、工具测量均符合并能满足临床要求。所有图像均可一次性自动拼接成功，无因技术和设备原因而重摄，照片中影像无明显拼接痕迹，无运动伪影，解剖结构完整无重影，脊柱各椎体及关节细节显示清晰，对比度良好。
结论 通过运用平板胃肠机行站立位全脊柱摄像操作简单，成像速度快，自动无缝拼接，获得图像清晰、细腻，对脊柱畸形的临床诊断或手术矫形方案的制定有重要意义，与常规 DR 站立位全脊柱摄影比较有显著优势。

EPO-2309

儿童椎体结核的 MRI 与 CT 诊断

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目的：探讨儿童椎体结核周围冷脓肿的 MRI 与 CT 表现，提高对儿童椎体结核的影像特征认识与理解。
方法：回顾性分析 20012 年 1 月至 2019 年 2 月我院经手术、活检证实及抗结核治疗痊愈后证实的儿童椎体结核周围冷脓肿 5 例 MRI 或 CT 资料。观察椎体和附件破坏的情况、椎体旁或邻近结构冷脓肿的形态、大小，脓肿壁平扫与增强表现以及硬膜囊和神经根受压的情况，分析儿童脊柱结核的特征性 MRI 与 CT 表现。
结果：5 例儿童腰骶椎结核椎体破坏均表现为以中心型破坏为主，并有不同程度边缘型椎体破坏，椎体破坏边缘见硬化带，未见明显骨膜反应及骨痂形成等征象。本组病例累及椎体 19 节，病变中央区椎体破坏最为明显（5 例）；5 例均见椎弓根及小关节破坏共计 25 处；其中 3 例见椎管内冷脓肿及硬膜囊与神经根受压，MRI 较 CT 更清楚显示椎管内冷脓肿形态及累及邻近结构关系。双侧椎旁冷脓肿 5 例；单侧 2 例，其中 1 例并腹壁冷脓肿（脓腔间见结核蔓延贯通窦道），脓肿壁内或脓腔内均见斑点样及弧形致密钙化斑。增强扫描椎旁或腹壁冷脓肿呈厚壁环形囊状强化，囊内未见强化。3 例均见主动脉旁或系膜增大淋巴结，增强扫描呈环形不均匀强化。
结论：儿童椎体并周围冷脓肿有一定特征性 MRI 与 CT 表现。中心型脊柱结核多见，多节椎体及椎弓根、小关节破坏，骨破坏边缘见硬化环；双侧或单侧椎旁、腹壁厚壁环形冷脓肿，硬膜囊和神经根受压；冷脓肿、淋巴结钙化及其环形强化等征象具一定特征性。MRI 较 CT 对椎体破坏形成的软组织肿块、周围冷脓肿、淋巴结坏死等更具优势；正确认识上述征象，合理选择检查方法有助于提高儿童椎体结核的诊断准确率。

EPO-2310
甲型流感患者在放射科隔离通道的建立和管理

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探讨了甲型流感在放射科的组织管理经验，包括隔离通道的组建、技师的技能培训、严格的消毒流程、图像的质量控制、医护人员的心理支持等方面，保证了病人的检查质量和医护人员的身心健康,在整个隔离通道建立、检查期间患者及技师均未发生科内感染。

EPO-2311
Differentiation of intraspinal tuberculosis and metastasis using MRI

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Purpose: The purpose of this study was to analyze the magnetic resonance imaging (MRI) findings of intraspinal tuberculosis and metastasis in order to discover differences which may be helpful in making the correct diagnosis.
Patients and methods: The clinical features and MRI findings of 15 patients with intraspinal tuberculosis and 11 patients with intraspinal metastasis were retrospectively analyzed.
Results: The mean age of patients with intraspinal tuberculosis and metastasis was 26.3 years (age range: 15 - 42 years) and 52.1 years (age range: 38 - 67 years), respectively. All cases of intraspinal tuberculosis were secondary to primary extraspinal tuberculosis as follows: tuberculous meningitis (11/15), pulmonary tuberculosis (9/15), vertebral tuberculosis (5/15), urinary tract tuberculosis (1/15), abdominal tuberculosis (1/15), cervical lymphonodus tuberculosis (1/15), and multisystem tuberculosis (9/15). Primary cancers in the intraspinal metastasis cases were breast (5/11), lung (3/11), ovarian (1/11), renal (1/11), and nasopharyngeal (1/11) in origin. Both intraspinal tuberculosis and metastasis presented with multiple intra- and extramedullary lesions throughout all regional segments of the spinal canal accompanied by irregularly thickened meninges. Intraspinal tuberculosis lesions had indistinct edges which integrated with each other, and most exhibited obvious enhancement. In contrast, the intraspinal metastasis lesions were distinctly separated with clear edges and exhibited slighter enhancement compared with the tuberculosis.
Conclusion: Combining clinical features with MRI findings may be helpful to differentiate intraspinal tuberculosis from metastasis.

EPO-2312
下肢深静脉血栓滤器植入联合置管溶栓治疗后的康复护理

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摘要：目的：探讨滤器植入联合置管溶栓治疗下肢深静脉血栓的护理方法。方法：通过对 20 例患者采用滤器植入联合置管溶栓治疗下肢深静脉血栓。通过加强介入术前、术后及溶栓药物治疗康复护理工作，及时发现和处理并发症。结果：治愈 5 例，显效 10 例，有效 5 例，总有效率 100%。均未出现肺动脉栓塞及重要脏器出血。结论：滤器植入联合置管溶栓治疗下肢深静脉血栓，结合密切的病情观察和康复护理，具有损伤较小、并发症少和恢复快等特点，能获得较满意的治疗效果。

EPO-2313
The Comparison of Clinical and Imaging Characteristics between AIDS-related Diffuse Large B-cell Lymphoma and Burkitt’s Lymphoma

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Background AIDS-related non-Hodgkin's lymphoma (AR-NHL) is one of the major causes of death in HIV-infected patients. Diffuse large B-cell lymphoma (DLBCL) and Burkitt's lymphoma (BL) are most common types.
Objective This study evaluated the clinical and imaging differences between the two pathological types.
Methods This study was a multi-center retrospective study comparing clinical and CT imaging information in 92 patients with AR-DLBCL and 41 with AR-BL. The imaging characteristics, involved sites, the progression or death time and prognosis were compared in both groups of patients.
Results Homogeneous texture was more common seen in AR-DLBCL both in plain scans (P=.004) and contrast enhancement scans (P = .027). The moderate enhancement was more common seen in AR-DLBCL than that in AR-BL (P = .011). Lesions with irregular shape, fusion tendency and extracapsular infiltration were relatively more common detected in AR-BL. Liver, pancreas, spleen and lung were more prone to be involved in AR-BL. There were no significant differences in clinical parameters and progression or death time between the two groups.
Conclusion Homogeneous texture and moderate enhancement support AR-DLBCL as heterogeneous and poor enhancement support AR-BL.

EPO-2314

SAPHO 综合征的临床和影像学特征分析

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目的：通过分析 SAPHO 综合征患者的临床和影像学(CT)表现，从而探讨 SAPHO 综合征患者的特点和规律，为 SAPHO 综合征的诊断提供新的思路。方法：收集符合 SAPHO 综合征诊断标准的 SAPHO 患者 12 例；所有患者均行 CT 检查；对患者的一般资料和影像学资料进行分析、总结。结果：1.临床表现：12 例 SAPHO 综合征患者中，男性 5 例、女性 7 例；年龄范围为 18-56 岁，平均年龄为 44±13 岁。12 例 SAPHO 综合征患者都存在不同程度的皮肤损害和骨关节损害，其中皮肤损害包括掌跖脓疱病、寻常型银屑病以及皮肤红斑；骨关节损害包括胸肋锁关节骨肥厚、脊柱骨质增生、外周关节病以及骶髂关节炎。2.CT 检查结果：12 例 SAPHO 综合征患者中 8 例患者表现为对称性病变，4 例患者为非对称性病变。CT 扫描影像学特点主要为骨质增生硬化、骨质破坏以及关节间隙的狭窄、关节肥厚融合；其中 3 例表现为骨质增生硬化，3 例表现为骨质破坏，2 例表现为关节间隙变窄，4 例表现为关节肥厚融合。按照 SAPHO 综合征骨骼发病部位进行分类，其中 8 例出现胸骨病变，6 例

出现锁骨病变，8 例出现胸锁关节及胸肋关节病变，5 例出现肋骨病变，1 例出现胸椎病变。结论：SAPHO 综合征是皮肤、骨以及关节异常为主要特征的疾病；CT 能够及时发现骨质变化以及关节软组织病变。通过临床表现与影像学检查可以对 SAPHO 综合征进行有效诊断和分期。

EPO-2315

隐源性机化性肺炎的 CT 特点

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目的 研究隐源性机化性肺炎的 CT 诊断和鉴别诊断。 **材料与方法** 回顾性分析了 2015-2019 年 4 月隐源性机化性肺炎 30 例。其中男性 19 例，女性 11 例，年龄 28 岁至 79 岁，平均年龄 46 岁。临床症状主要有咳嗽、咳痰，发热，呼吸困难，症状常持续数天至数周不等。所有病例均经病理或临床治疗过程证实。全部病例采用抗生素治疗无效，均使用皮质激素注射后完全康复或基本治愈出院。另有 7 例在出院后 1-3 个月后因症状反复，二再入院治疗。所有病例均有 DR 检查和 CT 检查，其中 10 例做了胸部 CT 增强。 **结果 1、3**0 例患者中有 7 例经活组织检查证实，其余 23 例均经临床治疗经过证实。全部病例均经激素治疗，有 21 例痊愈出院，9 例好转。另有 7 例在出院后症状出现反复而再入院。2、多灶性、不对称、双侧和胸膜下分布是主要特点。3、磨玻璃阴影、小结节、反晕征以及支气管血管束周围增厚的束带影是主要 CT 表现。 **结论** 认真分析 CT 表现以及结合临床表现可以做出明确诊断，指导临床的精准治疗。

EPO-2316

肺奴卡菌病临床及 HRCT 表现

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目的：分析肺奴卡菌病临床及 HRCT 表现。**方法：** 回顾性分析例确诊为奴卡菌感染伴有肺部阴影患者临床及影像资料。**结果:**3 例患者，男性 2 例，女性 1 例，年龄分别为 50 岁，55 岁，61 岁，三例均有免疫功能低下基础疾病（淋巴瘤、肾病综合征、HIV 感染），三例均有咳嗽、发热，2 例表现为双肺多发结节，结节边界清晰，灶周少有纤维化形成，有随机分布（血行性）特征，其中 1 例伴左上肺空洞液平，最大者直径约 3CM,最小者直径约 0.8CM，1 例表现为右下肺肉芽肿结节伴纵隔淋巴结多发肿大，增强后纵隔淋巴结呈环形强化伴其内明显液化坏死。**结论：肺**奴卡菌病多有免疫低下的基础疾病，HRCT 为有价值的检查手段，可以很好的显示病灶为来源及生长方式；结合临床及实验室检查可及时行肺奴卡菌病的诊断，以便及时予以治疗改善预后。

EPO-2317

艾滋病合并非结核分支杆菌感染的胸部 CT 影像学表现分析

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目的：探讨艾滋病(AIDS)合并非结核分支杆菌（NTM）肺部感染的 CT 影像学特点，提高对该病认识。方法：回顾性分析 2016 年 10 月至 2018 年 2 月确诊的 35 例 AIDS 合并 NTM 肺部感染患者,所有

受检者均行胸部 CT 检查,分析 CT 影像学表现特征。结果：35 例 AIDS 合并 NTM 患者中，病变累及双侧肺 32 例（91.4%）且多叶多段分布，累及单侧肺 3 例（8.6%）；病灶形态：斑片状 26 例（占 74.3%），结节状 20 例（占 57.1%），条索状 17 例（占 48.6%），磨玻璃样 13 例（占 37.1%），大片实变 5 例（占 14.3%），团块状 1 例（占 2.9%），支气管扩张 13 例（占 37.1%），空洞 6 例（占 17.1%），其中虫蚀样空洞 1 例，肺不张 1 例（占 2.9%），肺气肿 1 例（占 2.9%），气胸 1 例（占 2.9%），合并纵膈淋巴结肿大 15 例（占 42.9%），胸腔积液或胸膜增厚 28 例（占 80%），少量心包积液 8 例(占 22.9%)，35 例患者肺部 CT 表现均未见钙化。结论：AIDS 合并 NTM 感染病变常累及双侧肺脏，分布广泛，无明显好发部位，胸部 CT 表现病灶形态多样无特异性，常见征象为斑片状、结节状、条索状、磨玻璃样及支气管扩张，常合并胸腔积液（或胸膜增厚）及纵膈淋巴结肿大，类似继发性肺结核表现，但钙化少或无，当临床抗痨治疗无效时，应考虑本病可能。

EPO-2318

胸部放线菌病的临床和 CT 表现特征

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目的：通过分析胸部放线菌病的临床特点及 CT 表现，探讨共性特征，提高本病诊断准确率。
方法：回顾性分析浙江大学医学院附属第一医院 2014 年 6 月 2 日至 2019 年 5 月 22 日确诊的 16 例胸部放线菌病患者的临床资料及 CT 影像，结合国内外相关文献，总结共性的临床表现和影像学征象。
结果：16 例患者中，CT 引导下肺活检(1 例)、支气管镜活检(5 例)及手术（10 例）均获得组织病理学诊断为胸部放线菌病。除 5 例患者未行胸部 CT 增强扫描，余 11 例患者均行对比剂增强扫描或血管 CTA 检查。其中男 13 例，女 3 例；年龄（57.9±6.2）岁。高血压病 4 例，乙肝 1 例，痛风 2 例。长期吸烟 8 例，长期饮酒史 6 例。临床表现：慢性咳嗽（14 例）、咳黄脓痰（4 例），痰中带血及咯血（9 例）、发热（3 例）、 胸闷（3 例）、 胸背部痛（2 例），无临床症状（1 例）。中性粒细胞比例增高（6/16）例、CRP＞8mg/dl（5/14）例。16 例放线菌病患者 CT 表现的共同特征：病变均局限于单侧肺叶，以胸膜下分布为主，紧贴胸膜或邻近胸膜改变（5 例）；病变形态以团块影（5 例）、团片影（6 例）表现为主；大小 1.6cm×2.1cm～5.3cm×5.6cm；病灶内伴坏死（7 例）、虫蚀样空洞（5 例）；支气管扩张（1 例）；纵隔及病侧肺门淋巴结肿大（5 例）。增强扫描病变均呈不均匀强化，伴无强化的坏死灶；部分病灶血管穿行其中但均未见侵犯中断（6 例）。
结论：胸部放线菌病的临床和 CT 表现有一定特征，长期吸烟、饮酒伴随慢性疾病基础的患者，CT 上出现胸膜下分布为主的团片/块影，伴灶内多发坏死、虫蚀性空洞需考虑放线菌的可能。

EPO-2319

62 例儿童脑血管病的病因及影像分析

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目的 探讨儿童脑血管病的病因及影像学特点。 **方法** 回顾性分析 62 例脑血管病患儿的临床特点及 CT、MRI 表现。**结果** 男性 38 例，女性 24 例，年龄 5 天～14 岁，起病以急性或亚急性为主（56/62，90%），62 例患儿均有明确病因。影像表现为脑梗死 9 例，病因包括先天性心脏病 1

例、颅脑损伤 1 例、颅内感染 2 例、地中海贫血 1 例、多发性大动脉炎 1 例、Moyamoya 综合征 3 例；脑静脉窦血栓形成 6 例，病因包括颅内感染 5 例、外伤 1 例；脑出血 20 例，病因包括血液系统疾病（白血病 3 例、血小板减少性紫癜 2 例）、新生儿高胆红素血症 2 例，新生儿 ABO 溶血 1 例，新生儿凝血功能障碍 3 例、窒息 2 例、颅内感染 3 例、瘤卒中 2 例、动脉瘤 2 例；脑内血管畸形 27 例，包括动静脉畸形 12 例、海绵状血管瘤 5 例、静脉畸形 5 例、Galen 静脉畸形 2 例、毛细血管扩张症 3 例。不同病因组性别和年龄差异均无统计学意义（P＞0.05）。**结论** 儿童脑血管病病因复杂、种类多，临床特点有其特殊性，借助 CT 和 MRI 等影像学手段能得到尽早诊断、及时治疗，从而改善患儿预后。

EPO-2320

上消化道出血多学科联合诊疗模式分析

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[摘要] **目的：**分析多学科联合诊疗模式应用于上消化道出血患者治疗中的效果。**方法：**回顾性分析我院我院 2013 年 3 月至 2015 年 12 月期间收治的 32 例上消化道出血患者的临床资料，所有患者均给予药物治疗，并给予急诊胃镜检查，胃镜检查结果显示为上消化道溃疡，对溃疡部位予以确定。同时，所有患者均给予 DSA 血管造影检查，检查结果均呈阴性。**结果：**31 例上消化道出血患者治疗成功，1 例上消化道出血患者病情进展。多学科联合诊疗模式的总有效率为 96.9%（31/32）。**结论：**多学科联合诊疗模式应用于上消化道出血患者治疗中的效果十分显著，能够在很大程度上提升上消化道出血患者的治疗成功率。

EPO-2321

AIDS 合并肺隐球菌病的 MSCT 特征分析

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研究背景： 目前主流观点认为 HIV 感染者合并肺隐球菌时其胸部影像学特征多表现为肺弥漫性浸润影，患者病情进展迅速，容易出现呼吸衰竭，病死率高。过去我们从少量病例中发现 HIV 相关肺隐球菌病患者其胸部 CT 出现结节性病灶并不少见。本研究将进一步探索 HIV 相关肺隐球菌病的影像学特征。**材料与方法：**回顾性分析南京市第二医院 2010 年 9 月至 2016 年 5 月感染病科收治的存在隐球菌感染证据，同时胸部 CT 提示肺部异常病灶的 HIV 感染者临床资料。实验性确诊病例定义存在肺病理或是痰培养结果支持，临床明确病例定义为肺部病灶抗隐球菌治疗有效，临床可能病例定义为肺部病灶在抗隐球菌治疗以及其他抗生素治疗的情况下改善。**结果：**共有 60 例患者纳入分析，其中位 CD4 计数为 20 个/uL（0-205 个/uL）。93.3%（56/60）的患者出现结节性病灶，这些结节性病灶常伴有空洞形成 78.6% (44/56)，以孤立空洞性结节最为常见。胸腔积液以及边界不清的炎性浸润影发生率分别为 11.6% (7/60)和 31.7% (19/60)，其中弥漫性肺浸润影见于 21.7%的病例，多同时伴有结节性病灶。对这些病灶进一步分析发现至少有 76.8% (43/56) 的结节性病灶可用隐球菌感染解释，其中 12.5% (7 /56)是实验室确诊病例，48.2% (27/56)为临床明确病例，16.1%(9/56)为临床可能病例，另外有 23.2%（13/56）的结节性病灶由于缺少足够的资料无法对肺部病变性质给予判定。85.7% (6/7)的胸腔积液为临床明确肺隐球菌病。弥漫性肺浸润影病变中，53.8% (7/13)的病例可能为肺孢子菌肺炎，至少有 38.5%的弥漫性肺浸润影可排除肺隐球菌病。**结**

论：与当前流行观点不一致的是，本研究提示肺部结节性病灶是 HIV 相关肺隐球菌病的最常见影像学特征。HIV 感染者出现肺部结节性病灶时应该将肺隐球菌病纳入重要的鉴别诊断。

EPO-2322
植入式静脉输液港在肿瘤化疗患者中的并发症原因分析及护理

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【摘要】目的　分析植入式静脉输液港应用在肿瘤化疗患者中的并发症原因，并提出相应的护理对策。方法　选取我院 2013 年 12 月～2015 年 2 月收治的留置植入式静脉输液港肿瘤患者 44 例作为实验组，选取同期采用外周置入中心静脉导管进行输液的患者 10 例作为对照组，观察两组患者的导管问题、感染、局部红肿、静脉炎等并发症发生率作比较。结果　实验组并发症发生率为 9.4%，对照组并发症发生率 34.4%。结论　植入式静脉输液港应用于肿瘤患者中的并发症，积极做好防治工作，重视对患者的宣教，加强临床护理可以增强应用效果。

EPO-2323
术后中枢神经系统感染影像学评价与临床

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目的：探讨术后中枢神经系统感染的影像学表现及临床价值，提高相应疾病的临床诊治水平。**方法：**通过纵向追踪数个典型病例（包括脑外伤异物、脊柱刺伤术后、腰椎感染术后、脑出血抽吸术后等）的影像学动态变化及临床相关信息，阐明影像学在感染性疾病诊治过程中的价值。**结果：**结合中国神经外科重症患者感染诊治专家共识(2017)，分别总结不同病例在术后神经系统感染过程中影像学的表现及相关临床价值，包括：病变早期发现、早期定性，范围和程度评估，疗效和预后评估等。其中，重点分析了外伤后蛛网膜下腔感染导致的室管膜炎、化脓性炎的影像表现及临床特点，对于临床容易误诊的包裹性血肿周围水肿进行了深入分析，并紧密结合临床阐述了影像学动态评估的临床价值。**结论：**识别术后神经系统感染的相关影像学表现和临床特征，为临床诊治提供有价值的指导信息。

EPO-2324
血行播散性肺结核合并弥漫性肺泡损伤 1 例

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病例 患者，男性，17 岁。间断性咳嗽、咳痰伴发热 10 天，体温最高 39.0℃，于当地医院治疗，给予哌拉西林钠他唑巴坦钠、更昔洛韦抗感染后症状未见好转。实验室检查血常规　WBC：6.32*10^9/L，N：69.3%（当地）；WBC：3.78*10^9/L，N：79.2%（我院）；风湿四项：抗链球菌溶血素 O 170.00U/L；C-反应蛋白 34.60mg/L；抗中性粒细胞抗体阴性；类风湿因子 <20.00U/mL；血浆中真菌 1,3-B-D 葡聚糖含<5.0000pg/mL；抗链球菌溶血素 O157.0IU/ml；

肥达氏反应全阴；甲流病毒阴性；T-SPOT 阳性；HIV 抗体阴性；病毒全套抗体检测（TORCH）均阴性。胸部 CT 表现：双肺以中下肺野为主弥漫分布的磨玻璃密度影（ground-glass opacity, GGO），胸膜下肺野可见弧形肺野透亮度相对增高区（图 1），另 GGO 背景中隐约可见细粟粒结节，以双肺尖为主（图 2），右下胸膜增厚并可见局部包裹性积液，所示肝左叶实质内可见钙化（图 3）。CT 诊断结果：双肺弥漫性间质性改变，考虑病毒性感染可能，建议结合临床相关检查。患者入院后，给予吸氧、心电监护，莫西沙星抗感染，奥司他维抗病毒，异甘草酸镁护肝及对症支持治疗，症状仍有所加重，行胸部 CT 检查发现两肺弥漫性病变较入院时外院 CT 片有所加重。鉴于入院后实验性治疗后患者病情仍有进展，与患者及其家属沟通后行 CT 引导下右下肺穿刺活检，病理结果：肉芽肿性炎，首先考虑结核。特殊染色示：抗酸染色（+），PAS（-），六胺银（-）（图 4）。

EPO-2325
布鲁氏菌病致脊柱炎诊断中 CT 造影的临床诊断价值

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【目的】通过对经病理诊断的布鲁杆菌病性脊柱炎的 CT 造影征象的分析，探讨其临床应用价值。【方法】回顾性分析本院于 2012 年 1 月至 2019 年 1 月诊治的 20 例布鲁杆菌病致脊柱炎的影像资料，对比分析 CT 造影与 X 线平片对布鲁杆菌病致脊柱炎的各种征象的显示及确诊情况。【结果】CT 造影与 X 线平片对布鲁杆菌病致脊柱炎各种征象的显示情况对比发现在椎间隙变化的显示方面 X 线平片比 CT 造影更具优势，CT 造影对椎体破坏、骨质硬化、死骨的显示及韧带变化等方面比 X 线平片更具优势。【结论】对比 X 线平片诊断布鲁杆菌病致脊柱炎，CT 造影横断面扫描的密度分辨率高，可准确显示脊柱病灶的范围、内部情况和软组织异常等，三维重建技术更有利于病变显示，提高对肉芽肿、椎旁脓肿及椎间盘破坏征象的显示率。CT 造影对布鲁杆菌病致脊柱炎的确诊率较高，但需要结合 X 线平片来提高对该病的诊断价值。

EPO-2326
黄色肉芽肿性胆囊炎的误诊分析

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目的 探讨黄色肉芽肿性胆囊炎(xanthogranulomatous cholecystitis，XGC)的 CT 检查表现特点，旨在提高 XGC 的术前诊断率。**方法** 回顾性分析 38 例经手术病理证实 XGC 患者的临床表现、实验室指标及病变的超声、CT、MRI 及 MRCP 表现特点，例如，胆囊壁内结节、黏膜线、胆囊壁增厚情况及强化方式、是否合并结石、胆囊周围脂肪及邻近脏器（肝实质、结肠肝曲）是否受累以及胆道梗阻情况。**结果** 12 例患者均出现右上腹痛，11 例白细胞及粒细胞不同程度升高；7 例 CA 199 轻度升高但低于正常值 5 倍，CEA 轻度升高 1 例；超声、CT、MRI 及 MRCP 表现为胆囊壁增厚，其中弥漫性增厚 9 例，8 例见多发壁内结节，部分结节超声表现为低回声(带)、CT 为低密度、MRI 呈较长 T1 长 T2，CT 及 MRI 增强结节未见明显强化，6 例增强 CT、MRI 粘膜线完整强化，11 例病例合并胆囊结石，仅 1 例出现胆道梗阻，1 例邻近肝实质受累。**结论** 综合分析患者临床表现、实验室指标及影像学检查结果，能明显提高 XGC 诊断准确率，为手术方案选择提供有力依据。

EPO-2327
普美显增强 T1mapping 评估华支睾吸虫感染胆管损伤肝损害的研究

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目的：使用普美显增强 T1mapping 评估兔华支睾吸虫感染模型中肝损伤。**方法：**19 只家兔分为四组，分别为 100 囊蚴组、200 囊蚴组、300 囊蚴组和对照组，分别使用 100 只华支睾吸虫囊蚴灌胃 1 次、2 次及 3 次，每次间隔一个月，对照组用生理盐水灌胃作为对照。30 天后粪检虫卵确认感染成功，末次灌胃一个月后，获取普美显增强前及增强后 10min、15min、20min、25min、30min T1 弛豫时间。根据 ishak 肝炎评分系统对家兔肝脏炎症及纤维化评分**结果：**感染华支睾吸虫的严重程度与肝脏炎症及纤维化评分成成正相关，相关系数分别为 0.503 和 0.513，各时间点肝脏 T1 弛豫时间随着感染程度的增加而增加，使用 t 检验对各组 T1 弛豫时间两两比较，对照组与 300 囊蚴组在 10min-30 分钟扫描中差异有统计学意义，100 囊蚴组与 300 囊蚴组在 25min（p=0.021）及 30min（p=0.044）差异有统计学意义。**结论：**可以使用普美显增强 T1mapping 评估华支睾吸虫感染造成的肝损伤。

EPO-2328
Tips 治疗肝硬化门静脉高压并发症护理

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［**摘要**］**目的** 探讨经颈静脉肝内门体分流术（Tips）治疗肝硬化门静脉高压症的疗效及并发症的护理。**方法：**回顾性分析 Tips 治疗肝硬化门静脉高压症患者 259 例，监测术前术后门静脉压力、血常规、凝血功能、肝肾功能、血氨，影像学及内镜检查。定期随访，观察并发症的发生情况。结果 Tips 技术成功率 98.8%（256/259），控制出血近期有效率为 100%，门静脉压由术前（29.42±5.36）mmHg 降为术后（18.04±4.32）mmHg，差异有统计学意义（P＜0.05）。Tips 治疗后发生分流道狭窄闭塞率为 18.1%（47/259），再发生消化道出血率为 16.9%(44/259)，腹水吸收明显，肝性脑病发生率为 23.5 %（61/259），其中 34 例为Ⅰ期或Ⅱ期肝性脑病，一过性易纠正。**结论**：Tips 是治疗肝硬化门静脉高压症快速有效安全的微创方法，合理选择病人、定期复查能减少并发症提高中远期疗效。

EPO-2329
肾上腺结核的临床特征及 CT 表现

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目的:探讨肾上腺结核的临床特征及 CT 影像学特征，以提高对该病的诊断水平。 **方法:**回顾性分析临床证实 25 例肾上腺结核患者的临床资料及影像表现特征。 **结果:** 25 例中，男性 17 例，女性 8

例；年龄 19-78 岁；临床表现常见为肾上腺皮质功能减退症状，皮肤色素加深 14 例，乏力 20 例，消瘦 22 例。3 例肾上腺结核患者出现肾上腺皮质功能减退症状。10 例合并其他部位活动性结核，其中 8 例肺结核； 2 例肾结核。CT 主要影像表现为：肾上腺结核累及双侧共 20 例，单侧 5 例，肾上腺增粗 22 例，肾上腺出现钙化 20 例，肿块样改变 17 例，结节样改变 5 例。 **结论:**肾上腺结核明确诊断时常已累及双侧肾上腺，临床表现多以肾上腺皮质功能减退症状为主；肾上腺结核的 CT 主要影像学表现为肾上腺钙化、肾上腺增粗、出现肾上腺肿块样或结节改变。

EPO-2330
1H-MRS 定量分析在脑结核瘤、弓形虫脑病与脑转移瘤鉴别诊断中的应用

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【摘要】目的 探讨[1] HMRS 技术在脑结核瘤、弓形虫脑病和脑转移瘤鉴别诊断的作用。方法 收集 2015 年－2018 年就诊于我院且符合纳入标准的弓形虫脑病和脑结核瘤患者各 15 例，脑转移瘤患者 20 例；分别进行脑 MRI 常规扫描、增强扫描和氢质子波谱扫描。观察脑结核瘤、弓形虫脑病和脑转移瘤病灶实质区、病灶水肿区及对侧相应正常部位脑实质，分别观察 N-乙酰天门冬氨酸((N-acetyl-aspartate，NAA)（2. 02 ppm)、胆碱(Choline，Cho)(3. 22 ppm)、肌酸(Creatine，Cr)(3. 02 ppm)、脂质(lipids，Lip)(0. 8-1. 5 ppm)、乳酸(Lactate，Lac)(0. 33～1. 35 ppm)、肌醇（MI）（3.56ppm）；计算 Cho/Cr、Cho/NAA、Cr/NAA、MI/Cr、(Cho+MI)/Cr 、LL/Cr 值。结果 （1）弓形虫脑病病灶实质区 Cho、MI 峰明显低于脑转移瘤，弓形虫脑病病灶实质区 Cho/Cr、Cho/NAA、(Cho+MI)/Cr 值低于脑转移瘤,差异有统计学意义。（2）脑结核瘤病灶实质区 Cho/Cr、Cho/NAA、(Cho+MI)/Cr 值低于脑转移瘤,差异有统计学意义。（3）弓形虫脑病病灶实质区 Cr、NAA、MI、LL 峰明显低于脑结核瘤，弓形虫脑病病灶实质区 Cr/NAA 值低于脑结核瘤,差异有统计学意义。（4）弓形虫脑病、脑结核瘤和脑转移瘤病灶水肿区 Cho/Cr、Cho/NAA、Cr/NAA、MI/Cr、(Cho+MI)/Cr、LL/Cr 比值均无统计学差异。 结论 [1]H-MRS 技术可以提供脑结核瘤、弓形虫脑病和脑转移瘤病灶及病灶周围水肿区组织代谢的特点，为鉴别诊断提供客观依据。

EPO-2331
关于肺结核病的医学影像诊断现状与发展趋势探讨

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目的：分析当前肺结核病的医学影像诊断现状，从而讨论肺结核病诊断的发展趋势。

方法：针对几年来肺结核影像检查手段进行分析总结。

结果：对于肺结核的医学影像诊断仍主要以 X 线胸片为主，但是如有检查发现存在可疑肺结核病变，应该进一步选择 CT 进行确诊以及制定后期治疗随访计划。CT 图像特点以及用于临床诊断的有效性使其在肺结核病的临床诊断中占据着越来越重要的地位。但是由于肺结核病变存在多样性以及复杂性的表现，在必要的时候应该选择 MRI 或者 PET-CT 进行关键信息的诊断。因

此相关组织及部门应该加快制定与我国肺结核病发病情况相符合的 CT 检查规范以及诊断标准，为临床诊断提供指南。

结论：肺结核病作为一类严重传染病对人们健康有严重影响，发病率高、传染性强，以往采用的传统医学影像诊断方式已经无法满足当前日益精细的临床诊断要求。在医学技术不断进步的推动下，临床对于肺结核病的诊断开始应用更多的医学影像方法，提高肺结核病诊断准确率，发展前景广阔，相关专家学者应该继续进行深入研究，正确为肺结核病的临床诊断提供更多、更有效的方法，保障患者的生命健康。

EPO-2332

AIDS 肺部感染的临床及影像学表现分析（附 158 例分析）

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目的:总结艾滋病肺部感染影像学特征，以提高该病影像学诊断水平。方法：回顾分析我院 2018 年全年确诊艾滋病患者 158 例的胸部影像学资料及特点。结果：艾滋病合并肺结核 48 例，艾滋病合并淋巴结结核 22 例，艾滋病肺孢子菌肺炎 8 例，其他间质性肺炎等 80 例。结论：艾滋病合并肺结核影像学表现具有多叶、多段分布特点，具有“三多三少”特点，易发生血行播散性肺结核和继发性肺结核，多部位受累。艾滋病合并淋巴结结核分布于颈部、腋窝、纵隔等，常累及多个部位，影像学表现为淋巴结肿大。艾滋病肺孢子菌肺炎影像学表现具有特征性。结合症状，体征，实验室检查及穿刺，对临床诊断有较好的提示。

EPO-2333

艾滋病相关淋巴瘤的影像表现及病理特点

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目的 分析 AIDS 合并淋巴瘤的影像表现及病理结果，探讨其影像表现及病理特点，提高对 AIDS 相关淋巴瘤的认识。 方法 回顾分析 39 例经临床活检病理确诊为 AIDS 合并淋巴瘤患者的影像资料，总结分析 AIDS 合并淋巴瘤的影像表现及特点。 **结果** 39 例艾滋病合并淋巴瘤的病理类型均为非霍奇金淋巴瘤（NHL）；影像学表现中结内病变共 39 例，以淋巴结肿大为主，其中腋窝淋巴结肿大 16 例，颈部淋巴结肿大 9 例，纵隔及肺门淋巴结肿大 7 例，腹腔淋巴结肿大 6 例，腹股沟淋巴结肿大 1 例；结外病变 34 例，以占位性病变为主，累及部位广泛，包括软组织肿块 20 例，发生于肝 12 例，骨骼/软骨 10 例，消化道 8 例，肺 6 例，肾上腺 4 例，肾及脾各 3 例，胰腺及肌肉各 2 例，腮腺、胆囊、前列腺及精囊腺、膀胱各 1 例。 **结论** 艾滋病相关淋巴瘤主要以 NHL 为主，广泛累及淋巴结及淋巴结以外器官，淋巴结外病变发生率高、且常多脏器受累是其影像学特点，艾滋病相关淋巴瘤的影像表现与病理符合度高，但确诊仍需结合临床。

EPO-2334

登革热的胸腹部影像学研究

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目的 1、观察重症登革热的临床和实验室生化指标，检测血清学相关指标的动态变化特征，为临床诊断、治疗及预后提供重要的指导意义。
2、分析重症登革热患者的胸腹部影像学表现及特点，探讨其影像学特征，形成对该病影像表现的初步认识，为临床诊断提供影像学帮助。
资料和方法 收集经临床确诊的重症登革热患者 75 例，行胸部 X 线平片和/或胸腹部 CT 检查，总结分析重症登革热患者的胸腹部影像表现，
结 果 1、重症登革热患者常见的胸部影像征象有胸腔积液，斑片状渗出、实变、磨玻璃影（GGO），气腔结节，小叶间隔增厚及支气管血管周围间质增厚等，并且肺内病变以多种病变形式混合存在较常见。
重症登革热患者的腹部异常征象包括肝内多发低密度占位病变，肝实质密度减低，血肿（皮下/腹直肌/肾周），胆囊炎、脾大、腹水、肾病变、肝门区、腹膜后及肠系膜淋巴结轻度肿大。

结论 1、重症登革热患者的胸部影像表现以胸腔积液及肺实质病变为主，肺实质性病变以肺实变及磨玻璃影常见，小结节、小叶间隔增厚及支气管血管周围间质增厚相对较少见。
2、重症登革热患者的腹部表现以多脏器受累为主，部分可见血肿（皮下/腹直肌/肾周）。

EPO-2335

Chest Imaging Findings of Adenovirus Pneumonia in Children

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Objective: To explore the chest imaging manifestations of children with adenoviral pneumonia. **Methods:** The imaging and clinical data of 237 children with adenovirus pneumonia (aged from May to 13 years and 4 months, average 3 years and 4 months) were retrospectively analyzed. Among them, 93 were severe cases and 144 were critical cases. The differences of imaging manifestations between severe cases and critical cases were compared.All cases had complete chest X-ray and CT examination data. **Results:** Among 237 cases, 205 children with adenovirus pneumonia had abnormal initial chest imaging findings, including 98 cases of massive consolidation (47.80%), 41 cases of interstitial infiltration (20.00%), 66 cases of mixed type (32.20%) and 35 cases of pleural effusion. No nodular shadow, cavity and enlargement of hilar and mediastinal lymph nodes were found in all cases.In severe cases, 40.85% were lobar consolidation, 30.19% were mixed consolidation and 28.96% were interstitial infiltration. In critically ill cases, 86.67% were large leaf consolidation type, 13.33% were mixed type. **Conclusion:** Chest imaging examination is helpful to discover the pathological changes of lung in children with adenovirus pneumonia, and provides an important basis for clinical diagnosis and treatment.

EPO-2336

青年人结核性脑膜脑炎伴发脑梗死 1 例

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目的：目前青年脑梗死合并结核性脑膜脑炎在国内偶有报道，本文报道 1 例结核性脑膜炎患者再次发病以脑梗死起病，,总结影像学特点并结合其病史、诊断、治疗特点，以期为临床提供参考。方法通过短期内复查头部 MRI 及增强、DWI 及 MRA，影像学依据明确诊断患者脑梗死，腰穿脑脊液细胞学、生化结果提示疑似颅内结核感染，并给予抗栓、抗结核、地塞米松注射液等治疗后并通过随访好。

EPO-2337
肺结核治疗中病灶进展的 CT 影像学表现及临床特征分析

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【摘要】目的：分析肺结核治疗过程中病灶进展的 CT 影像学表现及临床特征。方法：收集 2015 年 12 月至 2018 年 12 月间收治的病灶增多的肺结核患者 48 例，对上述患者的原发灶及进展后病灶的 CT 影像学表现及患者在病灶进展时期内的临床特征进行回顾性分析及总结。结果：总共 48 例病灶进展的肺结核患者中，增多病灶的部位与原发灶同肺段的 46 例（95.8 %），与原发灶跨段同叶分布的 14 例（29.2%），与原发灶同侧不同叶分布的 6 例（12.5%），与原发灶不同侧分布的 3 例（6.3%）。少量增多共 17 例（35.4%），中等量增多共 29 例（60.4%），大量增多者共 3 例（6.3%）。原发灶与增多病灶的形态分别为：磨玻璃影 10 例（20.8%）与 13 例（27.1%）、结节灶 42 例（87.5%）与 26 例（54.2%）、树芽征 39 例（81.3%）与 22 例（45.8%）、斑片影 43 例（89.6%）与 37 例（77.1%）、实变影 23 例（47.9%）与 20 例（41.7%）、空洞 21 例（43.8%）与 4 例（8.3%）、支气管壁增厚 40 例（84.6%）与 12 例（25%）、肿块 4 例（8.3%）与 2 例（4.2%）、肺气肿 10 例（20.8%）与 0、钙化 19 例（49.4%）与 0、支气管扩张 8 例（16.7%）与 1 例（2.1%）、条索灶 40 例（83.3%）与 4 例（8.3%）。临床症状表现为咳嗽 40 例（83.3%）、咳痰 33 例（68.8%）、发热 12 例（25%）。本组病例中结果为阳性的实验室检查为：痰找抗酸杆菌 10 例（25%），痰培养结核杆菌 10 例（25%），耐药 6 例（19.4%），白细胞指数升高 4 例（8.3%），白细胞指数减少 7 例（14.6%），真菌检测 6 例（15.4%）。结论：肺结核治疗中进展的病灶与原发灶分布关系紧密，增多的病灶形态以活动性肺结核 CT 征象为主；临床表现以咳嗽咳痰为主；实验室检查中缺乏特异性指标。

EPO-2338
肺类癌的临床特征及 CT 表现分析

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目的：学习和分析肺类癌的临床及影像特点，以提高其术前诊断水平。方法：回顾性分析我院 50 例经病例证实的肺类癌患者的临床资料及多层螺旋 CT 图像，包括发病年龄、性别、临床首发症状和病变的分布、大小、有无钙化、支气管血管情况等。结果：本组病例的平均发病年龄为 55.4 岁，男女比例为 31:19，男性较多发；临床上超过一半以咳嗽咳痰来就诊（27 例），咯血或痰中带血者 9 例，仅 1 例以类癌综合征来就诊。CT 图像上，肿块位于中央型 21 例（42%），其中包括 4 例为支气管内结节,3 例见跨气管内外生长，呈“冰山征”；周围型 20 例（40%），边界较光整，肺门或纵膈淋巴结一般无明显增大；未见明显结节或肿块者 5 例）（10%）；前纵隔内孤立病灶 4

例（8%）。肿块的边界多较光整，呈浅分叶状，瘤周肺实质炎性改变或阻塞性肺炎 15 例，肺不张 8 例，瘤内见钙化者 11 例，支气管阻塞或截断征 23 例，其中中央型占 19 例；周围型肺类癌可见血管贴边征（10 例）。增强瘤体一般呈轻中度强化。结论：肺类癌存在较明显的性别差异，其中央型和周围型差异不明显。中央型肺类癌气管压迫阻塞截断征象比较明显，其中气管腔内实性结节及骑跨气管的“冰山征”具有重要的诊断价值。周围型肺类癌一般为孤立性结节，边界较光整，鲜少伴有纵膈或肺门淋巴结肿大。以上临床及 CT 征象对其诊断具有一定的价值。

EPO-2339

老年脑深部髓质静脉分布的 SWI 分析

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摘要：目的 应用 SWI 技术对老年脑深部髓质静脉（Deep Medullary Vein, DMV）的分布进行研究。**方法** 回顾性分析 68 例老年人和 25 例正常中年人脑部 MR 影像学资料。根据不同年龄段，进一步将老年组分为 60-70 岁、71-80 岁、81-90 岁三组，两位资深放射科医师共同判定 DMV 对称性、分别判定 DMV 分型，并对数据进行一致性检验（Kappa）。将 DMVs 与同侧脑浅层静脉（superficial cerebral vein, SCV）管径对比分三型，I 型：无 DMVs 显示；II 型：DMVs 直径小于 SCVs 直径（直径比值小于 1）；III 型：DMVs 直径等于 SCVs 直径（直径比值等于 1）。DMV 对称定义为侧脑室旁相同区域内均见 DMVs 显示且其数目差小于 5 根、扩张程度相近。**结果** 两位放射科医师对 DMV 分型数据的一致性分析 Kappa 值为 0.872。中、老年两组 DMV 对称性 X^2检验无统计学差异，X^2=0.246，P=0.620。Kruskal-Wallis 秩和检验分析得出老年组三组间 DMV 分型总体分布无统计学差异，P=0.171。Spearman 检验分析得出老年组中年龄与 DMV 分型无相关性，r_s=0.093，P=0.531。**结论** DMV 在老年人分布以对称性分布和Ⅱ型 DMV 为著。

EPO-2340

CT diagnosis of hepatic tuberculosis

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Objective to analyze the CT manifestations of hepatic tuberculosis in order to explore its imaging characteristics. 24 cases of liver serosal type for liver, capsular thickening and subcapsular solitary or multiple hummocky low-density lesions, enhanced scanning ring improved separated sample improved or without reinforcement. 36 cases of liver parenchyma type, which is divided into millet grain type 21 cases of 10 cases of nodular type 5 cases of liver cyst type. Millet grain type of liver parenchyma multiple scattered in different sizes of millet or focal nodules, no obvious enhancement scanning reinforcement. Nodular type of intrahepatic isolation low density area, pathological substance has no obvious strengthening or circular edge strengthening. Liver cyst type characterized by sample size cyst lesions, circular or irregular shape, enhanced scan without reinforcement, state clearly. Hybrid 8 cases, at the same time with liver size film type and liver parenchyma type. All cases of combined multiple organ tuberculosis. Conclusion CT performance for millet cystic

shadow size focal low density area and isolated hepatic subcapsular hummocky low density area, merge multiple organ tuberculosis, especially in the chest more serous cavity TB, highly suggest possible hepatic tuberculosis.

EPO-2341

晚期 NSCLC 靶向治疗伴发特异性感染对影像学评估疗效的影响：独立影像中心 v. s. 现场评估

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目的：探讨晚期 NSCLC 靶向治疗伴发特异性感染时，对使用 RECIST 1.1 影像学评估疗效时的影响。方法：通过某多中心晚期转移性非小细胞肺癌（NSCLC）III 期重点项目（特罗凯联合贝伐单抗对比特罗凯单药 III 期临床试验），以独立影像中心（IRC）疗效评估结果为金标准，对比现场评估的结果差异并分析其原因。共 300 个病例、7000 个访视点的阅片任务，以客观缓解率（ORR）主为研究终点，一致性主要观察末次访视点结果为主。IRC 采用双人双盲一致性阅片，不一致时采用第三人裁判阅片，并且 IRC 的阅片员均进行过项目启动前专业培训、有至少 2 年以上的 IRC 阅片经验。现场评估采用日常影像工作状态下的非盲法阅片，阅片员由 PI 所在单位指定一诊断医师进行。结果：IRC 组间评估结果一致性为 95%，IRC 与现场评估结果的一致性为 67.2%。IRC 组间阅片差性原因有靶病灶选择不一致（75.2%）、测量准确性（10.6%）、新病灶的确认（11.2%）、非靶病灶触发 PD（3.7%）、其他不可控客观原因（0.3%）；其中测量准确性差异的原因均是 NSCLC 伴发有感染（结核、真菌等）引起，导致测量两点选择不准确、不一致。现场评估结果差异原因有靶病灶测量准确性（73.3%）、新病灶的确认（19.5%）、靶病灶不全（2.1%）、非靶病灶触发 PD（5.1%），其中误为新病灶的主要原因是把继发的感染灶当作新增病灶（98.6%），其他为遗漏新病灶（1.4%）。结论：晚期 NSCLC 伴发的特异性感染是影响现场评估结果质量的最主要因素;现场评估员需专业培训方可提高 NSCLC 靶向治疗的评估水平。

EPO-2342

脊柱结核影像诊断表现

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目的：分析脊柱结核病的影像学特征，提高其影像诊断与鉴别诊断水平。
方法：回顾性分析 2014 年 1 月-2019 年 5 月间，在我院住院治疗的脊柱结核患者 11 例。所有患者术前均接受 X 线、CT、MRI 影像学检查，并经手术后病理结果证实。通过分析对照 X 线、CT、MRI 对该病诊断的影像学特征，提高该病的影像学诊断水平及探讨不同影像学检查对该病诊断的优势及局限性。
结果：该组病人年龄范围为 19-66 岁，中位年龄为 41 岁，其中男性 8 例，女性 3 例。病变位于胸椎 2 例，腰椎 6 例，胸腰椎 1 例 ，腰骶椎 2 例（其中 1 例病灶呈跳跃征）。11 例患者均有局部疼痛、血沉升高、CRP 升高等临床表现，2 例患者具有午后低热、盗汗、乏力症状；2 例患者有近期体重减轻表现；5 例患者合并肺结核病史；3 例患者合并下肢不全瘫。2 例患者结核杆菌培养阳性。切除病灶病理检查镜下见灶性淋巴细胞聚集及肉芽肿结节，内有少许朗格罕斯细胞；干酪样坏死灶及死骨组织，诊断为结核病。本组患者 X 线检查表现为椎体骨质密度减低 7 例、溶骨性骨质破坏 2 例，椎间隙狭窄 5 例，腰大肌影模糊 6 例。CT 扫描表现为椎体边缘溶骨性/虫蚀样骨质破坏 9

例、局部骨质密度减低 2 例，泥沙样死骨形成 4 例，椎体周围脓肿形成 10 例，椎间隙狭窄 8 例，椎管狭窄 1 例。MRI 扫描表现为椎体信号异常 11 例（T1WI 低信号、T2WI 高信号为主），椎间盘破坏 10 例，椎间隙狭窄 8 例，椎管受累 4 例，椎旁脓肿形成 10 例，窦道形成 1 例， 其中 5 例行 MRI 增强检查，表现为病变椎体明显强化，椎旁脓肿环状强化，内部干酪样坏死组织不强化。

EPO-2343

AIDS 并发骨关节感染的影像表现

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目的：探讨 AIDS 并发骨关节感染的影像表现。
方法：回顾性分析我院收治的 12 例 AIDS 并发骨关节感染患者的临床和影像资料。
结果：10 例骨髓炎患者不同程度的骨质破坏，骨膜新生骨形成和死骨，受累骨周围继发溃疡、瘘管、蜂窝织炎和脓肿。2 例化脓性关节炎可见关节腔积液，虫蚀样或斑片状骨质破坏、骨皮质不连，关节周围软组织肿胀、脂肪间隙混浊等改变。9 例为金黄色葡萄球菌感染，3 例为结核分枝杆菌感染。
结论：AIDS 并发骨关节感染的影像表现缺乏特异性，诊断需要临床、影像和实验室相结合。

EPO-2344

不同来源肝转移瘤的影像特征分析

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目的：分析不同器官来源肝转移瘤的影像表现，总结其特征，以期达到精准医疗的要求。
方法：收集 2016 年 1 月至 2019 年 5 月在我院诊断的 126 例肝转移瘤患者的 CT 和 MRI 资料进行回顾性分析。
结果：126 例肝转移瘤患者中，胃肠道转移 81 例（64%），胰腺癌 10 例（8%），乳腺癌和胆管癌各 9 例（7%），泌尿生殖系统肿瘤 7 例（6%），肺癌 6 例（5%），其他 4 例（3%）；共发现转移瘤灶 192 个，其中，单发转移 35 例，多发转移 91 例；“牛眼征”78 例（62%），主要见于胃癌、结肠癌的肝转移，其瘤体的大小不同导致“牛眼征”的表现也不相同；囊变 49 例（39%），多表现为圆形或类圆形病灶，边界清或不清，门静脉来源肝转移瘤囊变率明显高于肝动脉来源，其中以直肠癌、胃癌多见；钙化 32 例（25%），门静脉来源的消化系统恶性肿瘤（胃癌、结直肠癌）肝转移瘤的钙化出现率明显高于肝动脉来源；高灌注区主要见于胰腺癌、结肠癌、胆囊癌肝转移瘤周，胃癌、结肠癌灌注区主要以瘤周环形为主，胆囊癌以片状不规则为主，胰腺癌主要以楔形及不规则为主；肺癌的肝转移瘤的平均 ADC 值明显低于胃直肠癌、乳腺癌、胰腺癌的肝转移瘤的平均 ADC 值；胰腺癌的肝转移瘤的平均 ADC 值明显高于来源于胃癌、直肠癌、乳腺癌、肺癌的肝脏转移瘤的平均 ADC 值。
结论：影像检查对不同器官来源肝转移瘤的诊断和鉴别诊断具有一定的价值，对临床治疗具有指导作用。

EPO-2345

肝脏感染性疾病影像学表现

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目的：分析不同病原体所致肝脏感染性疾病的影像表现。
方法：对肝脏感染性疾病的影像表现进行综合分析。
结果：（1）细菌性肝脓肿 CT 平扫典型表现为多发低密度病灶，增强后脓肿壁呈环形强化，“环靶”征和脓腔内出现小气泡或气-液平面是肝脓肿的特征性表现；多房脓肿病灶内可见多发线样分隔，增强后分隔在门脉期呈蜂窝状改变，即“簇状”征或“蜂窝”征。MRI 平扫 T1WI 脓腔呈低或稍高信号，脓肿壁及分隔呈低信号，T2WI 脓肿壁呈低信号，其内囊性成分呈较高信号，增强后脓肿壁呈花环状或环状强化，中心呈低信号，门脉期及延迟期持续肿块较平扫明显缩小。（2）病毒性感染多表现为肝大、肝密度减低。（3）真菌感染 CT 平扫常表现为多发圆形或类圆形低密度灶，直径多＜2cm，增强后动脉期病灶呈环形强化，周围有异常灌注，门脉期病灶缩小、数目减少；MRI 病灶呈长 T1 长 T2 信号，周边有低密度纤维环影。（4）寄生虫感染 CT 平扫病灶呈不均匀低密度，增强后门脉期病灶呈轻~中等度强化，可见蜂窝样或分隔样强化；肝包虫感染的“水中百合”征、“飘带”征，肝血吸虫感染的“蟹足状钙化”改变，肝片吸虫感染的“隧道样”结构等特征性表现有助于诊断。
结论：肝脏感染性疾病的影像表现各有其特点，CT 及 MRI 在疾病早期发现、定性和定量诊断上起着重要的作用，对于不典型的病灶，结合临床及实验室检查不难鉴别。

EPO-2346

AIDS 并发骨肌感染的影像表现

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目的：探讨 AIDS 并发骨肌感染的影像表现。
方法：回顾性分析我院收治的 20 例 AIDS 并发骨肌感染患者的临床和影像资料。
结果：10 例骨髓炎患者不同程度的骨质破坏，骨膜新生骨形成和死骨，受累骨周围继发溃疡、瘘管、蜂窝织炎和脓肿。2 例化脓性关节炎可见关节腔积液，虫蚀样或斑片状骨质破坏、骨皮质不连，关节周围软组织肿胀、脂肪间隙混浊等改变。4 例软组织脓肿表现为病灶中心呈低密度或长 T1 长 T2 信号，环形强化。2 例蜂窝织炎表现为边界模糊的软组织肿块，肌肉束和皮下脂肪间的界限消失。1 例化脓性肌炎表现为肌肉水肿，增强扫描可见肌肉内积液和脓肿。
结论：AIDS 并发骨肌感染的影像表现缺乏特异性，诊断需要临床、影像和实验室相结合。

EPO-2347

AIDS 并发软组织感染的影像表现

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目的：探讨 AIDS 并发软组织关节感染的影像表现。
方法：回顾性分析我院收治的 8 例 AIDS 并发软关节感染患者的临床和影像资料。

结果：4 例软组织脓肿表现为病灶中心呈低密度或长 T1 长 T2 信号，环形强化。2 例蜂窝织炎表现为边界模糊的软组织肿块，肌肉束和皮下脂肪间的界限消失。1 例化脓性肌炎表现为肌肉水肿，增强扫描可见肌肉内积液和脓肿。
结论：AIDS 并发软组织感染的影像表现缺乏特异性，诊断需要临床、影像和实验室相结合。

EPO-2348
苏北寄宿高中肺结核爆发初期筛查阶段的影像学表现及感染情况分析

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目的 描述苏北某县寄宿式高中爆发肺结核感染后初始筛查阶段的临床及影像学表现，评估 CT 对青少年肺结核感染初期的诊断价值。**方法** 以苏北某县高中一年级 20 个班在校学生作为研究对象，应用结核菌素皮肤试验（TST）结合胸部 X 线或 CT 检查识别肺结核爆发初期的感染者，采用配对 X^2 或 *Fisher* 精确检验分析胸部 X 线及 CT 检查对青少年肺结核感染初期的诊断价值。**结果** 1009 人进行了 TST 检查，阳性反应 239(23.7%)人，阴性反应 770（76.3%）人。860 人（85.2%）进行了胸部 X 线检查，163 人（16.2%）进行了胸部 CT 检查，临床诊断为活动性肺结核 48 人，疑似肺结核 15 人，潜伏结核感染（LTBI）179 人，无肺结核 767 人。73 人（7.2%）依次进行了 TST、胸部 X 线和 CT 检查，TST、X 线胸片、CT 灵敏度为 95.7%、52.2%、95.7%，特异度为 56.9%、98.0%、100.0%，阳性预测值为 50.0%、92.3%、100.0%，阴性预测值为 100.0%、81.7%、98.0%。59.3%活动性肺结核病灶位于上叶，以微结节和树芽征最常见，分别占 93.8%和 77.1%。X 线及 CT 对临床诊断疑似或活动性结核之间的差异具有统计学意义，P 值=0.001（X^2=11.275）。**结论** 寄宿式高中爆发型肺结核感染者初期多无典型肺结核症状且痰菌检查常为阴性，CT 可识别胸片不能发现的病灶，提高肺结核的检出率，加强传染源的控制。

EPO-2349
青少年早期无症状活动性肺结核 CT 征象分析

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目的 分析青少年肺结核爆发感染早期无症状活动性肺结核的 CT 征象，以提高对本病的认识。**方法** 回顾性分析苏北某县寄宿式高中爆发肺结核感染后，参加肺结核筛查并经临床诊断为活动性肺结核的 47 例患者的临床、胸部 X 线、CT 表现并与治疗后 CT 表现进行对照。**结果** 47 例早期无症状活动性肺结核中男性发病率高于女性，27 例胸部 X 线未发现异常病变，X 线和 CT 对早期活动性肺结核检出率的差异有统计学意义（P<0.001）。46 例胸部 CT 表现为肺实质病变，1 例表现为胸腔积液，共计 58 个肺叶 60 个肺段存在病变，35 例病变位于上叶，22 例病变位于下叶，1 例病变位于中叶，其中 CT 表现为树芽征占 68.1%，微结节占 89.4%，实变 21.3%，抗结核治疗后病灶不同程度吸收好转。**结论** CT 是诊断早期无症状活动性肺结核的最佳检查手段，青少年有肺结核接触史者胸部 CT 检查显示肺内微结节或树芽征时要首先考虑活动性肺结核。

EPO-2350

18F FDG PET/CT 联合超声、CTA 在大动脉炎中的价值

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目的：本研究旨在研究 18F FDG PET / CT、超声、18F FDG PET / CT 血管造影融合在大动脉炎早期诊断、活动度评估，疗效监测方面的应用价值。
方法：收集 2018 年 6 月至 2019 年 8 月期间 11 例大动脉炎患者临床资料，均为女性，年龄 18-62 岁，平均年龄（44.6±12.5）岁，11 例患者均行 18F FDG PET / CT 检查并测定血管壁 SUVmax；9 例行超声检查；3 例患者行 CT 血管造影检查。
结果：11 例患者中（3 例发热、3 例急性冠状动脉综合征、1 例头晕、1 例视物模糊、1 例肱动脉、桡动脉搏动减弱，1 例高血压、1 例体检发现颈总动脉闭塞）就诊发现动脉炎。超声显示 24 处血管壁增厚，PET/CT 示相应血管壁 SUVmax 1.02-3.19；8 处颈总动脉内膜增厚，最厚处 1.6-2.6mm，其中 1 处管腔闭塞伴 FDG 代谢增高；11 处锁骨下动脉内膜增厚，最厚处 1.3-2.5mm，其中 1 处管腔闭塞未见 FDG 代谢增高；2 处头臂干内膜增厚，最厚处 1.7-1.9mm，其中 1 处伴 FDG 代谢增高；3 例 CT 血管造影检查示，1 例大动脉炎治疗后多处血管闭塞，累及左侧锁骨下动脉、左侧腋动脉肠系膜上动脉、右侧髂外动脉，但未见 FDG 摄取，提示大血管炎处于静止期，治疗有效；1 例大动脉炎治疗前患者显示升主动脉扩张，周围低密度环绕，累及左侧颈总动脉及左侧锁骨下动脉，管腔重度狭窄，PET/CT 示相应部位 FDG 摄取增高，SUVmax 1.89-2.63，提示大动脉炎处于活动期；另外，PET/CT 显示 1 名治疗后患者超声、CT 血管造影均无异常的主动脉弓管壁 FDG 代谢增高灶。
结论：^{18}F FDG PET / CT 检查对血管炎患者的早期诊断、治疗效果监测有重要价值；^{18}F FDG PET / CTA 融合检查可提供主动脉及深部大血管管腔无有意义狭窄时的代谢情况从而进行早期诊断，同时通过血管壁的代谢情况判定动脉炎的活动度，对指导临床制定治疗方案有重要意义。

EPO-2351

Research on the Function of DSCT With Dual Energy Imaging in the Therapeutic Assessment of Chemotherapy of Lung Cancer

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[ABSTRACT] Objective To explore the variation of CT net enhancement value、iodine value、and energy spectrum cure of dual-energy CT imaging before and after chemotherapy of lung cancer, and provide a theoretical basis for the clinical assessment of lung cancer after chemotherapy。Method To collect 22 cases with primary non-small cell lung cancer in Zhejiang Cancer Hospital from March 2014 to January 2015, and all of them cannot receive operation but chemotherapy through clinical evaluation 。Among the patients,16 cases of male, 6 cases of female ,age range41-76, mean age 61.4 years。All the cases are newly diagnosed and confirmed by pathology results, including 12 cases of adenocarcinoma, 10 cases of squamous cell carcinoma 。Applying the German SIEMENS second generation dual-energy CT to exam the chest in dual-energy mode before and after 2 cycles of chemotherapy 。The scanning time for enhancement were at the aorta peak and 100s after the injection of iodinated contrast material。Transfer the dual-energy date into Dual-energy software of the MMWP workstation and select the “Liver-VNC” mode to obtain the enhanced CT and iodine

value of lesions before and after chemotherapy, selecting the “Monoenergetic” mode to gain the CT value under different condition of Kev ,then analysis the changes of the net enhanced CT value 、iodine value ad spectrum cure of the lesions before and after chemotherapy。Results 1.After chemotherapy the net enhanced CT value and standardization iodine value in PR and SD groups reduced than before in each period of enhancement scannig (P<0.05) 。 2.The change of the net enhancement CT value and standardization iodine value was statistically significantly higher in PR groups compared with that in SD groups in each period (P<0.05) 。3.The ROC curve showed that the change of the net enhancement CT value could predict treatment response with 75% sensitivity, 92.3% specificity at the aortic peak, the area under the curve was 0.813 (P<0.05) , with 87.5% sensitivity, 92.3% specificity at the 100s, the area under the curve was 0.856 (P<0.05) 。The ROC curve showed that the change of the standardization iodine value could also predict treatment response with 100% sensitivity, 69.2% specificity at the aortic peak, the area under the curve was 0.909 (P<0.05) , with 87.5% sensitivity, 100% specificity at the 100s, the area under the curve was 0.971 (P<0.05) 。4. The standardization iodine value of PR groups were higher than SD groups before chemotherapy ,but only at the aortic peak the difference was statistically significant (P<0.05) 。5. After chemotherapy the CT value under different Kev (interval 10Kev) was lower than before ,and the difference was statistically significant (P<0.05) 。6. At aortic time , the cure of CT value in the range of 40Kev-80Kev of SD groups was decreased , and then remained relatively flat state, but in the PR groups, the curve decreased in the range of 40Kev-100Kev。A t 100s, both of the SD and PR groups in the range of 40Kev-100Kev, the cure of CT value were significantly decreased, and then remained relatively flat state 。but the difference between the two groups was that the CT value of SD groups was close before and after chemotherapy in 60Kev, but there was a vast difference in PR groups。7. The change of CT value under different Kev were compared before and after chemotherapy 。At aortic time , the curve of SD groups was decreased in the range of 40Kev-80Kev, and then remained relatively flat state, but in the PR groups, the curve kept a flat state in the range of 40Kev-60Kev, then kept upward trend。A t 100s, the curve of SD groups was decreased in the range of 40Kev-60Kev, and then remained relatively flat state; But the curve of PR groups was decreased in the range of 40Kev-100Kev, and then remained relatively flat state。8. In our experiment , the PR group included only 1 case , the net enhanced CT value、standardization iodine value and the CT value under different Kev were degreased then before。Conclusion After chemotherapy , the net enhanced CT value、standardization iodine value and the CT value under different Kev were decreased than before both in PR groups and SD groups, and the difference were statistically significant, DUCT with dual-energy imaging can be applied to therapeutic assessment of chemotherapy of lung cancer.

EPO-2352
磁共振成像在评价肝癌射频消融术疗效中的应用及其相应影像学特征分析

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目的 探讨磁共振成像在肝癌射频消融术中的应用并结合影像学特征进行分析;**方法** 回顾性分析 2013 年 1 月-2017 年 12 月于本院收治行射频消融治疗患者 75 例，共 106 个病灶，收集患者经皮 RFA 术前后 MRI 表现，并将定期随访影像学资料进行分析，对病灶大小、信号变化及动态增强情况进行收集;**结果** 术后扫描 RFA 区域可见完整环形 T1WI 高信号改变，术后 96.23%病灶较术前增大，术后 12 个月 90.57%的病灶缩小。复发患者表现为 T1、T2 长改变，DWI 信号为高强度信号，增强扫描发现为结节样增强，术后 1 个月 T1WI 高信号环完整共 100 个病灶，术后 12 个月 15 个病灶复发，复发率为 15%；高信号环不完整共 6 个病灶，复发率为 66.67%，两者比较差异有统计学意义（P＜0.05），进行 DWI 动态扫描后计算的治疗前病灶区 ADC 平均值最小，正常区 ADC 值最大。对于边缘残留及复发病灶与完全消融过渡区、正常肝脏组织、消融坏死病灶的 ADC 值比较发现，边缘残留及复发病灶 ADC 值均有下降，差异有统计学意义（P＜0.05）;**结论** 核磁共振技术组织分辨率高，多序列、多方位成像，获得的诊断信息丰富。MRI 结合 DWI 及 ADC 值的测量能够更加准确定性原发性肝癌，辨别残留、复发的肿瘤组织，从而为临床尽早选择有效治疗方案提供支持。

EPO-2353
MR-PROSET 在 1.5T 磁共振中显示下压槽神经的可行性研究

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目的 探讨采用磁共振选择性水激励脂肪抑制技术（MR-PROSET）显示下牙槽神经的可行性。**方法** 采用飞利浦 Ingenia 1.5T MR 对 42 例符合入选标准的患者进行磁共振 MR-PROSET 检查，包括需拔除下牙患者 16 例、种植前定位 12 例、种植后随访 11 例、拔除下牙后仍疼痛 3 例，图像经多方位重组（MPR）后进行以下处理：对于需拔除下牙及种植前患者，在各方位图像上测量牙齿与下牙槽神经的距离，通过 HIS 系统传输至口腔科医生供手术参考；对于拔除下牙后仍疼痛及种植后患者，观察下牙槽神经的完整性。**结果** 16 例需拔除下牙及 12 例种植前定位患者的 MPR 图像清晰，测量准确，在手术过程中均未伤及下牙槽神经；11 例随访的种植后患者显示下牙槽神经完整性较好；3 例拔除下牙后仍疼痛患者的下牙槽神经均有不同程度损伤。**结论** MR-PROSET 序列显示下牙槽神经的可靠性以及稳定性较好，可为临床提供更直观的图像。

EPO-2354
子宫动脉栓塞术在前置胎盘合并胎盘植入凶险性剖宫产术中的疗效观察

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目的 探讨前置胎盘合并胎盘植入剖宫产术中行子宫动脉栓塞术对于防治剖宫产术中及术后出血的疗效分析。**方法** 对 24 例前置胎盘合并胎盘植入患者在剖宫产术中行预防性双侧子宫动脉栓塞术，观察剖宫产术中及术后出血量、并发症及保宫率等。**结果** 本组 24 例患者术中超选择性子宫动脉插管成功率 100%，术中出血量约 400ml～600ml，术后出血量约 50ml～200ml，保宫率为 100%。所有患者术后无严重并发症发生。**结论** 剖宫产术中行超选择性子宫动脉栓塞是微创、安全有效的治疗方法，能增加保宫率，可减少剖宫产术中、术后的出血量及术后并发症的发生。但对胎儿的影响仍需进行多中心大规模随机对照临床研究才能进一步证实其疗效。

EPO-2355
数字乳腺断层合成 X 线摄影在乳腺癌诊断中的应用价值

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目的　探讨数字乳腺断层合成 X 线摄影技术（DBT）在乳腺癌诊断中的应用价值。方法　对经手术病理证实的 80 例乳腺癌患者的 DBT 图像与数字化 X 线钼靶检查（DM）图像进行回顾性对比分析。对乳腺癌的直接影像征象：肿块或结节、分叶征或毛刺征及钙化进行分级评分。结果　DBT 与 DM 在肿块或结节、肿块分叶与毛刺征检出率差异均有统计学意义（均 P＜0.05），但恶性钙化灶的检出率差异无统计学意义（P＞0.05）。结论 DBT 能有效提高乳腺癌肿块直接影像征象的检出率，在乳腺癌的诊断中具有较高应用价值。

EPO-2356
数字乳腺断层融合 X 线成像在 c，d 两类实质构成乳腺中病灶的检出价值（付 182 例病例分析）

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数字乳腺断层融合 x 线成像(digital breast tomosynthesis，DBT)作为一种新的成像技术，能提高少脂肪的纤维腺体类(即 c，d 两类)乳腺中病灶的检出率及病灶形态特征显示的能力：众所周知，全数字化乳腺 X 线成像(full. field digital mammography，FFDM)的应用在一定程度上可提高乳腺疾病检查的灵敏度。利用 FFDM 检查，在 a，b 类腺体中绝大多数乳腺病灶能被检出，但在 c，d 乳腺中，仍有一半乳腺病灶难以清晰显示，有研究表明，FFDM 对病灶检出存在较高比例的假阴性及假阳性，其诊断的灵敏度和特异度仍有待提高。

EPO-2357
CT 扫描联合 MRI 在原发性肝癌的诊断及介入治疗术后的评价应用

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目的：讨论 CT 扫描联合 MRI 对于原发性肝癌的诊断及介入治疗术后的评价中的应用。方法：回顾性分析 2015 年 11 月-2018 年 6 月于我院确诊并住院治疗的 200 例原发性肝癌患者的临床资料，根据患者接受的影像学检查方法分为对照组(n=120)和观察组(n=80)。对两组患者的影像学资料，分析两组与病理结果比较的诊断符合率与介入治疗后的疗效分析。结果：对照组患者与病理结果比较的诊断符合率为 95%，观察组患者与病理结果比较的诊断符合率为 80，观察组高于对照组，两组差异具有统计学意义（P＜0.05）。对照组随访 28 例，查出 41 个病灶，观察组随访 81 例查出 157 个病灶，观察组检出率高于对照组，两组比较差异具有统计学意义（P＜0.05）。结论：CT 联合 MRI 对诊断原发性肝癌具有一定优越性，能够具备较高的检出率，并且对于介入手术的预后评价也更为准确，具有较好的临床效果，值得临床广泛推广和应用。

EPO-2358

PETRA 序列在肺结节检出中的初步应用

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目的：评估 3T 磁共振 PETRA 序列在肺结节检出中的能力，并与 CT 比较在肺结节检出中的应用价值。
材料与方法： 共 45 名 CT 发现肺结节的病人接受了 MRI 检查，检查序列包括 PETRA，T2-HASTE，T2-BLADE，T1-VIBE。回顾性分析 CT 和 MRI 图像，并计算肺结节的检出率（包括实性结节和亚实性结节），同时测量结节的平均直径。以 CT 图像为金标准，计算并比较各序列结节的检出率。应用 SPSS21.0 进行统计学分析。MRI 和 CT 中测量的结节的大小比较应用 Pearson 相关性检验. 计算不同序列对于结节检出的敏感性，比较不同大小、类型、部位结节的检出率。
结果：CT 检出 45 名患者的 104 个肺结节，包括 34 个实性结节，71 个亚实性结节（41 个部分实性结节，29 个磨玻璃结节），结节的平均直径约为 9.3mm。MRI 检出实性结节中的 28 个，其中小于 6mm 结节检出率 65%，大于 6mm 结节检出率 100%。亚实性结节检出 61 个，其中小于 6mm 结节检出率 50%，大于 6mm 结节检出率 100%。PETRA 序列检出率最高（85.5%），实性结节，磨玻璃结节和部分实性结节的检出率分别为 82%，74%和 95%。对于大于 6mm 的结节，PETRA 序列检出率为 97.2%，CT 值大于-600HU 的结节检出率为 88%，对于位于上叶的结节检出率高于中下叶结节，外周结节检出率高于中心结节。
结论：MRI 可以很好的检出和评估肺结节，具有高敏感性和低假阳性率。PETRA 序列可以实现自由呼吸下和亚毫米级成像，可作为肺结节患者 CT 检查和筛查可选择的有效手段。

EPO-2359

艾滋病相关结内淋巴瘤的 CT 影像学表现及病理分析

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目的：探讨艾滋病(AIDS)相关结内淋巴瘤的 CT 影像学表现及病理特征，提高对该病的认识。资料与方法：回顾性分析 2017 年 1 月至 2018 年 9 月本院手术病理确诊的 16 例 AIDS 相关结内淋巴瘤患者的临床病理资料及 CT 影像学表现,所有受检者均行 CT 平扫及增强扫描。结果：AIDS 相关淋巴瘤 16 例，经手术病理确诊 NHL 弥漫大 B 细胞淋巴瘤 13 例， NHL 伯基特淋巴瘤 1 例， NHL 滤泡性淋巴瘤 1 例，霍奇金淋巴瘤（淋巴细胞为主型）1 例。影像学表现以全身多部位淋巴结肿大为主，其中颈部淋巴结肿大 3 例，腋窝淋巴结肿大 3 例，腹部淋巴结肿大 4 例，累及两个及以上部位淋巴结 6 例。病灶类圆形或不规则形，短径通常大于 3cm，较大者大小约 17.5cm×11.6cm；边界清楚或不清楚；平扫密度不均匀 7 例，密度较均匀 9 例；增强扫描呈现均匀 5 例，不均匀强化 11 例，其中肿块中央出现坏死 6 例。以上病例均未出现结外淋巴瘤的表现，出现邻近器官的侵犯 3 例，出现骨转移 1 例。结论：艾滋病合并结内淋巴瘤以非霍奇金淋巴瘤（主要为弥漫大 B 细胞淋巴瘤）为主，广泛累及全身多部位淋巴结，CT 影像表现与病理符合度高，具有一定的特征性，为临床的诊断和预后的评价提供重要的依据。

EPO-2360

膝关节结核的 MRI 表现

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目的 探讨膝关节结核的 MRI 表现，提高对膝关节结核的认识。**方法** 回顾性分析我院 2016 年 3 月~2018 年 12 月经手术及病理检查证实的 23 例患者的影 MRI 资料，分析其影像表现。23 例患者 26 个膝关节结核,其中单纯左膝 8 例,单纯右膝 12 例,双膝 3 例。全部病例行膝关节冠状位、矢状位、横断位 MR 平扫，12 例患者行钆贝葡胺增强扫描。**结果** 单纯滑膜结核 7 例，表现为滑膜增生，关节积液，滑膜增生在 MRI 在 T1WI 上呈较为均匀中低信号，T2WI 上呈不均匀高信号表现，增强扫描见条状及斑片状强化。滑膜结核合并半月板损伤、关节软骨损伤、交叉韧带损伤共 11 例，MRI 表现除滑膜增生外还表现为半月板损伤，以半月板后角 II° 及以上损伤为主，交叉韧带不全性损伤及水肿为主。全关节结核 14 例，表现为骨质破坏以及骨髓水肿，骨髓水肿表现为斑片及片状高信号。**结论** MRI 对膝关节结核病变范围和程度的判断及骨质破坏的早期发现有重要作用。

EPO-2361

7 例神经梅毒的 MRI 表现分析

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目的 分析神经梅毒的 MRI 表现，提高对神经梅毒 MRI 表现的认识。 **方法** 回顾性分析我院收治的 11 例确诊神经梅毒患者的 MRI 资料，分析其 MRI 表现。 **结果** 病变主要位于基底节区，额顶叶脑白质，小脑半球及脑干区域，呈斑片状及结节状，MRI 平扫 T1WI 病灶呈等及低信号，T2WI 呈高信号为主，T2flair 部分中心呈低信号，周围呈高信号，DWI 部分高信号，中心低信号，部分伴有邻近脑沟变窄，钆贝葡胺增强 T1WI 多数病灶无明显强化，部分病灶边缘强化，部分呈小结节状强化，部分脑膜强化。**结论** 神经梅毒的 MRI 表现多样，MRI 对病变形态和范围及治疗后疗效评价有重要价值。但确诊需要实验室检查或病理组织学检查。

EPO-2362

空腔性病变的误诊分析

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目的：空腔性病变的误诊原因分析
方法：在我院 2015-2019 年的 PACS 系统内筛选 CT 表现为空腔样结构的病例，最终病理结果不符的为恶性的，且临床及病理资料完整的共 97 例，记录其影像表现、临床及病理信息。临床资料包括年龄、性别、症状、吸烟史。病理资料包括病变类型、淋巴结转移情况。
结果：临床特点：97 个空腔性病变中，男 58 例（59.8%），女 39 例（49.2%），年龄范围为 37-76 岁，平均为(59.2±8.6)岁；有临床症状的 52 例（53.6%），无症状的 49 例（46.4%）；有吸烟史者 53 例（54.6%），无吸烟史者 44 例（45.4%）。

病理特点：97 个病人中有 80 例腺癌（82.5%），11 例鳞癌（11.3%），6 例腺鳞癌（6.2%）；行 EGFR 基因检查的共 50 例，其中基因无突变 27 个（54%），有突变 23 个（46%），且均为腺癌；患者均行淋巴结清扫，有淋巴结转移的 9 个（9.3%），无淋巴结转移的 88 个（90.7%）。
CT 征象：位于右肺 53 例，左肺 44 例，其中肺气肿患者 33 个（34%）。肿瘤最大径(2.7±1.3) cm，囊腔最大径(1.5±1.0) cm，实性成分最大径(1.6±1.2) cm。56 个病变为实性病变，亚实性 26 个，磨玻璃 13 个。中央型 9 个（9.3%），外周型 86 个（88.7%），混合型 2 个（2.1%）。形态不规则有 65 个（67%），边缘不清楚 65 个（67%），有分叶 62 个（63.9%），毛刺 38 个（39.2%），胸膜牵扯 75 个（77.3%），支气管穿行 41 个（42.2%），支气管截断 17 个（17.5%），血管集束征 83 个（85.6%）。
结论
误诊的原因包括患者症状轻微或无表现，空腔壁薄，软组织影较少，病理恶性程度低，很少有淋巴结转移等。但仍有一特征可以有助于区别良恶性，当 MSCT 中空腔性病变表现为囊壁不均匀，存在壁结节，随访病变有明显变化时高度提示为肺癌。

EPO-2363
对比研究体检中定量 CT 及超声对脂肪肝的诊断价值

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对比研究体检中定量 CT 及超声对脂肪肝的诊断价值并探究β值诊断脂肪肝的阈值。**方法** 筛选 2018 年 8 月至 2019 年 1 月在李惠利东部医院自愿行胸部低剂量 CT 联合脂肪肝定量 CT(quantitative computed tomography，QCT)检查的 500 例健康体检者。统计受检者身高与体重并计算其 BMI 值，统计受检者肝脏超声结果。利用 Mindways 公司的 QCT Pro 系统测量肝脏骨密度(bone mineraldensity，BMD)值，经公式计算得出肝脏脂肪体积百分比β值。根据常规纵膈窗测量肝脾 CT 值，计算肝/脾 CT 比值。独立样本 T 检验分析脂肪肝组与非脂肪肝组之间年龄、BMI 值、BMD 值、β值的统计学差异，并采用 Pearson 相关系数分析年龄、BMI 值、BMD 值、β值与肝/脾 CT 比值之间的相关性。通过受试者工作特征曲线（receiver operating characteristic curve，ROC）评估β值诊断脂肪肝的效能及其阈值。**结果** 脂肪肝的所占比例为 8.6%(43/500)，男性中脂肪肝所占比例为 12.6%(35/278)，明显高于女性的 3.6%(8/222)。脂肪肝组及非脂肪肝组之间年龄没有统计学差异(P>0.05)，BMI、BMD 及β值均具有统计学差异(P<0.05)。年龄与肝/脾 CT 比值之间没有相关性(P>0.05)，BMI 与肝/脾比值呈弱负相关(R=-0.397,P<0.05)，而 BMD、β值与肝/脾比值分别呈显著正相关(R=0.884,P<0.05)和显著负相关(R=-0.881,P<0.05)。β值诊断脂肪肝的 ROC 曲线下面积为 0.996，阈值为 3.13%（敏感度 100%，特异度 96.1%），高于超声的敏感度(93.0%)及特异度(81.2%)。**结论** QCT 诊断脂肪肝的效能高于超声，并且能够定量评估肝脏脂肪化程度，使脂肪肝的诊断及后期随访更佳精准化。

EPO-2364
肝细胞肝癌合并门脉癌栓的影像特征

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探讨肝细胞肝癌合并门脉癌栓的影像特征。方法 收集 2016 年 2 月至 2019 年 2 月期间我院影像诊断合并门脉癌栓的肝细胞癌患者共 34 例，其中 MR20 例，CT14 例，选取同期我院 CT 及 MR 诊断未合并门脉癌栓的肝细胞肝癌患者各 20 例作为对照组。将 CT 与 MR 下两组病例原发灶的影像特征进行对比，并将相关数据行统计学分析。 **结果** 两种检查方法下的病例组与对照组相比较，病灶的分布、形态、边缘、强化方式之间均具有统计学意义 (P<0.05)。**结论** 深入了解肝细胞肝癌合并门脉癌栓的相关影像征象，能提高其诊断率，指导临床治疗计划及预后评估。

EPO-2365

PET/CT 在脊柱结核中的影像表现

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目的：探讨 ^{18}F-FDG PET/CT 在脊柱结核中的影像表现。
方法：回顾性分析 2017 年 9 月到 2019 年 8 月 6 例脊柱结核的 PET / CT 影像表现。6 例患者均进行了全身 PET / CT 扫描，6 例患者共 12 个病灶，4 例患者病变累及相邻两个椎体，其中 1 例为多椎体病变，2 例仅累及单个椎体。2 例颈椎，2 例胸椎，1 例胸椎及腰椎，1 例腰椎，结果均经病理证实。
结果：12 个病灶在 PET 图像上表现为高代谢，SUVmax 平均为 13（6－23.7），延时显像 SUVmax 平均为 15.3（10.1－24.5）。3 例患者有既往肺结核病史，3 例患者图像上有肺部结核病灶，5 例患者图像上纵隔及双肺门淋巴结密度较高，部分有钙化，伴代谢轻度增高。CT 主要表现为不同程度的溶骨性骨质破坏，4 处病灶出现椎旁软组织影，2 处病灶累及椎间盘出现椎间隙变窄。
结论：^{18}F-FDG PET/C 图像上清晰反映受累椎体范围,终板及椎间盘有无累及,椎管内脊髓受压情况,以及椎旁脓肿范围。延迟扫描 SUVmax 的轻度上升，可能与病灶含有大量的葡萄糖代谢旺盛的细胞有关，如郎格汉斯细胞、类上皮细胞、淋巴细胞等。脊柱结核的诊断不仅要依靠影像表现，还应该结合临床表现及结核感染病史。

EPO-2366

Evaluation of the effect of percutaneous transluminal coronary angioplasty on myocardial microcirculation disorder by first-pass myocardial perfusion imaging

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Objective To investigate the value of magnetic resonance first-pass perfusion imaging (MR-FPI) in early evaluation of percutaneous transluminal coronary angioplasty (PTCA) for myocardial microcirculation disorders.

Methods Thirty patients undergoing PTCA were enrolled. Cardiac magnetic resonance (CMR) myocardial perfusion was performed before and within one week after PTCA. The right coronary artery, left anterior descending artery and circumflex artery were taken as independent vessels. The perfusion parameters (peak time T, peak signal intensity SI,

maximum myocardial signal intensity) of each blood supply area were measured. Increasing slope Smax. The clinical trial of thrombolytic therapy (TIMI) before and after PTCA was divided into four groups: normal microcirculation group (3 points), mild disturbance group (2 points), severe disturbance group (1 point) and no reflux group (0 points). The difference of perfusion parameters was studied to evaluate the diagnosis of CMR on myocardial microcirculation disturbance. Then, the TIMI blood flow grading changes before and after PTCA were divided into microcirculation recovery group, unchanged group and aggravated group, and the difference of perfusion parameters between each group was compared to evaluate the value of CMR in the treatment of microcirculation disorders by PTCA.

Results There were 47 surgical vessels in 30 patients. The TIMI blood flow grading of 180 coronary arteries before and after PTCA showed 93 in 3 points, 63 in 2 points, 24 in 1 point and 11 in 0 points. There were significant differences in T, SI and Smax values of CMR myocardial first pass parameters among all grading groups ($P < 0.05$). Characteristic: 21 were enlarged, 15 were unchanged and 11 were decreased. There were significant differences in the first pass parameters T, SI and Smax between the two groups ($P < 0.05$).

Conclusion MR myocardial first pass perfusion imaging can detect the myocardial microcirculation disorder caused by PCI as early as possible, and it is noninvasive and specific. It can be used as a method to evaluate the efficacy of PTCA.

EPO-2367
钆塞酸二钠增强 MRI 肝细胞分数对乙肝肝硬化患者肝脏储备功能的评估价值

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目的：探讨钆塞酸二钠增强 MRI 肝细胞分数对肝脏储备功能的评估价值。**方法**：前瞻性纳入 2017 年 2 月至 2018 年 12 月于我院 MR 室行磁共振检查的连续性患者 98 例，按照 Child-pugh 评分进行分组，其中肝功能正常组（NLF）20 例、Child-pugh A 级组（LCA）60 例及 Child-pugh B 级组（LCB）18 例，于注射对比剂 Gd-EOB-DTPA 增强前及增强后 20 分钟行 T1mapping 成像，获取不同扫描时相肝脏以下参数：肝细胞分数（HeF）、摄取系数（K 值）、平扫肝脏 T1 弛豫时间（T1post）、增强后 20 分钟肝脏 T1 弛豫时间（T1pre）、T1 弛豫率增加值（ΔR1）和 T1 弛豫时间减低率（ΔT1），不同 Child-pugh 分级组各参数的比较采用单因素方差分析，两两比较采用 Bonferroni 检验；采用 ROC 曲线评价各参数鉴别 NLF 组+LCA 组与 LCB 组的效能，并采用 Z 检验比较 ROC 曲线下面积。**结果**：HEF、K 值、ΔT1 及ΔR1 的值随肝功能受损程度增加而减低，T1post 及 T1pre 的值随肝功能受损程度增加而增加。不同 Child-pugh 分级组各参数组间比较差异均有统计学意义（$p<0.05$）。T1pre 不同 Child-pugh 分级各组差异均无统计学意义（$p>0.05$）。T1post、ΔT1、ΔR1 及 HeF 不同 Child-pugh 分级间除 LCA 组与 NLF 组外，各组差异均有统计学意义（$p<0.05$）。K 值不同 Child-pugh 分级各组差异均有统计学意义（$p<0.05$）。HEF、K 值、T1pre、T1post、ΔT1 及ΔR1 评价不同肝功能组的 ROC 曲线下面积分别为：0.979、0.948、0.748、0.972、0.933、0.96。**结论**：钆塞酸二钠增强 MRI 肝细胞分数是有效的乙型肝炎肝硬化患者肝脏储备功能的评估方法。

EPO-2368
钆塞酸二钠增强 MR 对肝脏局灶性病变强化方式的定量评估价值

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摘要 目的 探讨钆塞酸二钠（Gd-EOB-DTPA）增强 MR 对肝脏局灶性病变强化方式的定量评估价值。**方法** 回顾性分析肝脏局灶性病变 63 例，包括肝细胞肝癌（HCC）23 例、转移瘤 9 例、局灶性结节性增生（FNH）11 例、血管瘤 20 例，经手术病理、典型影像表现及随访证实。所有患者均行上腹部平扫及 Gd-EOB-DTPA MR 增强扫描。测量平扫及增强各期（动脉期、门静脉期、移行期、10min 及 20min）肝实质及病灶的信号强度（SI）和同层面背景噪声的标准差（$SD_{噪声}$），计算病灶平扫及增强各期信号噪声比（SNR）、病灶-肝脏对比噪声比（CNR）及病灶相对强化率（RE）。采用单因素方差分析或 *Kruskal-Wallis* H 检验比较四组病变平扫及增强各期 SNR、CNR 及 RE。**结果** HCC、转移瘤、FNH 和血管瘤平扫及增强各期 SNR、CNR 及 RE 组间比较差异均有统计学意义（P<0.05）。HCC 的 SNR 自门脉期明显减低，后持续下降，转移瘤及血管瘤的 SNR 在 10min 及 20min 明显减低，FNH 的 SNR 增强后至 10min 持续上升。HCC、转移瘤和血管瘤 10min 及 20min 时 CNR 为负值，FNH 的 CNR 增强后各期均为正值。门静脉期及移行期 HCC 的 CNR 显著低于其余三组（P<0.05）。10min 与 20min 时 FNH 的 CNR 及 SNR 显著高于其余三组（P<0.05）。除 FNH 外 HCC、转移瘤和血管瘤的 RE 在 10min 及 20min 明显减低，门脉期及移行期四组病变 RE 两两比较差异均有统计学意义（P<0.05），20min 时 FNH 的 RE 显著高于其余三组（P<0.05）。**结论** 采用 GD-EOB-DTPA 增强 MR 对肝脏局灶性病变的强化方式进行定量评估有助于病变的诊断及鉴别诊断。

EPO-2369
基于 MELD 评分探讨钆塞酸二钠增强 MRI 肝细胞分数对肝脏储备功能的评估价值

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目的：探讨钆塞酸二钠增强 MRI 肝细胞分数对肝脏储备功能的评估价值。**方法：**前瞻性收集 2017 年 2 月至 2018 年 12 月于我院 MR 室行上腹部磁共振检查的连续性患者 82 例，按照 MELD 评分进行分组，其中 MELD≤10 组 61 例，MELD＞10 组 21 例；于注射对比剂 Gd-EOB-DTPA 增强前及增强后 20min 行 T1mapping 成像，获取肝脏不同扫描时相以下参数：肝细胞分数（HeF）、摄取系数（K 值）、平扫肝脏 T1 弛豫时间（T1pre）、增强后 20min 肝脏 T1 弛豫时间（T1post）、T1 弛豫率增加值（ΔR1）和 T1 弛豫时间减低率（ΔT1），采用独立样本 t 检验比较两组间 HEF、K 值、T1pre、T1post、ΔR1 及ΔT1 值的差异；采用 Pearson 相关分析评价各参数与 MELD 评分的相关性；采用 ROC 评价各参数鉴别两组的诊断效能。采用多因素 logistic 回归分析获得 MELD 评分＞10 的重要预测因素。**结果：**HEF、K 值、ΔT1 及ΔR1 的值随肝功能受损程度增加而减低，T1pre 及 T1post 的值随肝功能受损程度增加而增加。除 T1pre 外，MELD 评分≤10 及＞10 组各参数差异均有统计学意义（p<0.05）。HEF、K 值、T1pre、T1post、ΔT1 及ΔR1 评价不同肝功能组的 ROC 曲线下面积分别为：0.765、0.844、0.638、0.754、0.746、0.766； T1pre 及 T1post 与 MELD 评分呈正相关（r 分别为 0.460 和 0.732，P均＜0.05），ΔT1、ΔR1、HEF 及 K 值与 MELD 评分呈负相关（r 分别为-0.600、-0.515、-0.730 和-0.490，P均＜0.05）。回归分析显示 K 值是 MELD 评分＞

10 的重要的预测因素。**结论:**钆塞酸二钠增强 MRI 肝细胞分数可以评价乙型肝炎肝硬化患者的肝脏储备功能，K 值具有较高的诊断效能。

EPO-2370
多模态磁共振成像研究在非酒精性脂肪性肝炎的研究应用

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目的：非酒精性脂肪肝（NAFLD）是我国第一大慢性肝病，并且是健康生化指标异常的首要原因，而其疾病机制是复杂且不明确。本研究运用了多模态 MRI 成像方法（Mdixon-Quant、FFE-R_2^*及 DTI）对早期 NAFLD 非酒精性脂肪性肝炎肝脏进行成像，探索非酒精性脂肪性肝炎的疾病机制及病理变化。

方法：本实验选取 20 名到我院就诊的患者（正常志愿者 10 名，非酒精性脂肪性肝炎 10 名）使用飞利浦 Ingenia 3.0T MR 设备进行多模态 MRI 成像扫描肝脏。测量区域选择肝右叶Ⅴ、Ⅵ段，尽可能避免血管和胆管进入选择区，以 T2WI 图像作为参考，分别测定相同位置脂肪分数(HFF)、铁含量相对值(R_2^*)及各向异性分数（FA），同时行 HFF 和 R_2^*、FA 值相关性分析。

结果：此项实验中参与者的平均年龄为 46.4±13.7 岁(25-65 岁)，正常志愿者组 HFF 值为 3.08±0.38，R_2^*值为 667.56±80.10 及 FA 值为 0.89±0.02；非酒精性脂肪性肝炎患者组 HFF 值为 18.49±7.80 %，R_2^*值为 888.45±92.09 及 FA 值为 0.78±0.12。两组间 HFF 值，R_2^*值及 FA 值差异有统计学意义（p 值＜0.05）且 HFF 值与 R_2^*呈正相关，（r=0.683，p 值＜0.05），HFF 与 FA 值呈负相关（r=0.574，p 值＜0.05）。

结论：多模态 MRI 成像方法诊断早期 NAFLD 非酒精性脂肪性肝炎具有较高价值，并且可以揭示非酒精性脂肪性肝炎的疾病病理生理机制：非酒精性脂肪性肝炎肝脏铁含量增加，可能与肝细胞铁过载相关，并且有进展为肝硬化的趋势。

EPO-2371
Pulmonary Sarcoidosis in HIV Patients: A Review

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The status of the sarcoidosis outbreak, including the epidemiology, clinical presentation, radiographic findings, diagnosis and management of sarcoidosis were reviewed to present a better understanding of pulmonary sarcoidosis in HIV patients. Although diagnostic strategies and management of sarcoidosis had improved over the past few years, much is still unknown. Identifying the causes and populations at risk for the disease would not only enhance the diagnosis and management but possibly aid in prevention. While on highly active antiretroviral therapy, Sarcoidosis should consider in the differential diagnosis of patients with pulmonary symptoms. Comparison of the CD4 count and CD4/CD8 ratio in BAL versus peripheral blood may aid

in the diagnosis and management and of these patients. The fact in HIV patients was the cellular immunity is highly variable, following antiretroviral therapy start and discontinuation, with the chance of crossing the threshold of 200 CD4+/mmc several times. This fact mainly influenced by the clinical presentation and diagnosis of sarcoidosis in HIV-infected patients which is similar to that of other non-co-infected patients. Further studies have needed to evaluate the risk of pulmonary sarcoidosis in HIV patients after immunosuppressive therapy. We hope this review can aid practitioners to evaluate accurate diagnosis and follow-up therapy at the right time. Early detection and treatment of sarcoidosis is mandatory to control the mortality rate of these HIV infected populations

EPO-2372

CT 及 MRI 在腰椎间盘突出症诊断中的应用研究

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目的：分析在患有腰椎间盘突出症的患者具体诊断当中，患者分别接受 CT 与 MRI 诊断的具体效果。**方法：**选择我院在 2017 年 5 月至 2018 年 3 月时间段内收治的 60 例腰椎间盘突出症患者为主要对象，所有患者都分别接受 CT 与 MRI 扫描，对比患者接受这两种不同方法诊断后的检出情况。**结果：**患者接受 MRI 扫描后的病情检出例数要多于 CT 诊断，两种方法的相关数据在接受对比后存在明显意义（P＜0.05）。**结论：**在临床患有腰椎间盘突出症患者的临床诊断当中，CT 与 MRI 都是较为有效的诊断方式，但是 MRI 的检出率相对更高一些，所以，医生可以在实际应用中进行科学选择。

EPO-2373

艾滋病并发肺部巨细胞病毒肺炎的影像学与病理对照

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目的:探讨艾滋病并发肺部巨细胞病毒肺炎的 CT 表现，提高对艾滋病并发肺部巨细胞病毒感染的认识。 **方法**:回顾性分析我院 2018.1-2019.7 收治的经临床及病理证实的 15 例艾滋病并发肺部巨细胞病毒感染的 CT 资料。分析其 CT 表现。结果：CT 表现为双肺弥漫性磨玻璃密度影 12 例，伴小叶间隔增厚 5 例，胸膜下线 3 例，囊腔影 2 例，表现为小叶实变 3 例。 病变位于中内带 3 例，肺部与双肺中外部 12 例，淋巴结肿大 6 例，伴胸腔积液 1 例。结论：艾滋病并发肺部巨细胞病毒感染的 CT 表现以磨玻璃及间质性改变为主，病变分布中外的为主，具有一定特征，需与 PCP 相鉴别。

EPO-2374

瑞金医院 2018 年 IBD-MDT 中 35 例中老年 CD 患者影像学初步总结

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【目的】总结 2018-3-1~2018-12 -31 在上海交大医学院附属瑞金医院炎症性肠病-MDT 中确诊的 36 例中老年 CD 患者的临床资料及影像学表现。【材料及方法】通过 MDT 会诊收集门诊患者病史及外院影像资料，其中部分在我院住院患者由 PACS 住院信息系统完成。【结果】1、临床资料：35 例患者，男 15 例，女性 20 例，男女之比 1： 1.33，年龄 50~71 岁，平均年龄 59.31 岁，发病年龄半年~20 年不等。2、临床表现：主要为腹痛 3 例，腹泻伴肛瘘 2 例，30 例表现为小肠不全梗阻，一例反复肝功能异常，入院证实合并自身免疫性硬化性胆管炎（PBC），此病人有甲状腺癌手术病史。2 例合并强直性脊柱炎伴关节疼痛，1 例左肺上叶错构瘤术后，1 例外院卵巢肿块误诊为肠道内瘘包块形成，类克治疗期间出现大量胸腔积液伴包块。本组 12 例患者有 CD 肠道手术病史，各有 3 例阑尾及肛瘘手术病史。3、影像学表现：全部患者均行小肠 CT 检查，其中 5 例表现为克罗恩病慢性伴部分活动期改变，无内瘘及渗出，20 例合并肠管及腹腔相邻脏器间隙内瘘包块形成，病变管腔纤维性狭窄，1 例表现为盆组回肠节段性炎症伴溃疡，2 例回结肠静脉血栓形成，一例合并胆道 PBC 改变。4、诊断及治疗：本组 2 例外院诊断溃结，经我院 MDT 会诊纠正。本组 4 例行类克治疗，三例治疗后病情缓解，其中一例为术后患者；2 例每周一次甲氨蝶呤 Bid 治疗有效，病情缓解控制；10 例多次手术患者术后长期不规则或中断治疗，造成病情复发、加重。【结论】中老年 CD 在我院发病率呈上升趋势，临床及影像学医师应熟悉本病常见及不典型表现，尽早给与患者个性化治疗，类克治疗前重视排除禁忌症，建议胸腹部 CT 检查。类克及或甲氨蝶呤治疗有助于中老年 CD 患者减缓病情进展，长期疗效有待进一步结合临床、内镜及影像观察。IBD-MDT 治疗模式有助提高炎症性肠病患者精准诊治。

EPO-2375

血液病患者并发医院获得性肺炎的肺部 CT 表现

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目的：总结血液病患者在住院期间并发医院获得性肺炎的肺 CT 特征。方法：回顾性分析 2017 年 1 月至 2018 年 7 月间我院血液中心住院患者的肺 CT 资料和住院电子病历信息。结果：40 例血液病患者在住院期间发生了较为严重的肺内感染，其中并发细菌感染者 22 例（55.0%），CT 上表现为局灶性实变（10/22）、磨玻璃密度影（8/22）、结节及肿块（8/22）、空洞（2/22）、节段性肺蜂窝状改变（1/22），其中 2 例出现肺内空洞表现者痰培养检出金黄色葡萄球菌,；并发真菌感染 5 例（12.5%），CT 上表现为结节肿块（5/5）、空洞（1/5）、晕征（2/5）、结节伴卫星灶（1/5）、肺门端支气管受累（1/5），其中 4 例发生在肺野外带；并发肺结核 4 例，发生在非结核好发部位（3/4）、病灶伴有坏死（2/4）、胸膜受累（1/4）；发生病毒感染 3 例，CT 表现为弥漫性磨玻璃密度（2/3）、沿支气管血管束分布多发小结节（1/3）；其中 3 例痰培养同时发现真菌及阳性链球菌患者 3 例，CT 上同时出现结节、磨玻璃密度及局灶性肺实变。结论：血液病患者在治疗期间并发的肺内机遇性感染在肺 CT 上表现出一定特征性，对我们鉴别血液恶性肿瘤肺浸润以及把握激素药物使用有很大帮助。

EPO-2376

IgG4 相关性腹部疾病的影像学表现

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目的：回顾性分析 IgG4 相关性腹部疾病的 CT 及 MRI 表现，提高对该病的认识。
方法：回顾性分析我院 20 例 IgG4 相关性腹部疾病的影像学表现及临床特征，累及部位包括胰腺、胆道、肝脏、肾脏、输尿管、腹膜后。
结果：胰腺受累最常见，可局限性肿大，或弥漫性肿大，胰管不扩张，呈渐进性强化，动脉期强化程度低于正常胰腺，延长期略高于正常胰腺，当胰头部受累时，常有胆总管狭窄，以上肝内外胆管扩张。IgG4 相关硬化性胆管炎多累及大胆管，弥漫对称性胆管壁增厚，引起梗阻性黄疸。累及肝脏主要表现为炎性肿块，炎性假瘤，增强后呈渐进性强化。累及肾脏表现为肿块，类似肿瘤样，增强后渐进性强化。累及输尿管表现为输尿管内占位，肾积水。发生在腹膜后，主要是腹膜后腹主动脉旁纤维化。
结论：IgG4 相关性疾病对激素治疗有效，有时可表现为肿块样，常被误诊为恶性肿瘤而进行手术切除，认识其影像学特点，有助于提高诊断水平及避免不必要的过度治疗。

EPO-2377
颅脑 MR 在急性血行播散性肺结核患者中筛查结核性脑膜炎的价值探讨

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目的 探讨头颅 MR 增强扫描在急性血行播散性肺结核患者中筛查结核性脑膜炎的价值。
方法 搜集我院 2012 年 1 月至 2018 年 5 月住院的急性血行播散性肺结核 415 例患者的临床资料，筛选出进行了头颅 MR 增强扫描及脑脊液常规生化检查的患者 235 例，男：女=1.12：1，年龄 15~87 岁，平均年龄（36±18）岁，15~岁年龄组患者占 62.1%。采用 SPSS 22.0 软件进行统计分析，计数资料组间比较采用卡方检验。当总数＞40，且 1＜理论频数＜5 时采用校正卡方检验。配对计数资料的比较采用配对卡方检验，以 P＜0.05 为差异有统计学意义。**结果** 235 例急性血行播散性肺结核患者，头颅 MR 增强扫描发现的异常率（89.8%，211/235）较脑脊液常规生化高（62.9%，148/235），差异有统计学意义（McNemar 检验，P=0.000）。确诊及很可能结核性脑膜炎 219 例中，头颅 MR 增强扫描发现的异常率（96.3%，211/219）较脑脊液常规生化检查高（67.6%，148/219）高，且差异有统计学意义（McNemar 检验，P=0.000）。有中枢神经系统症状的 143 例患者中，头颅 MR 增强扫描发现的异常率（95.8%，137/143）较脑脊液常规生化发现的异常率（86.0%，126/143）高，差异有统计学意义（McNemar 检验，P=0.035）。无中枢神经系统症状的 76 例患者中，头颅 MR 增强扫描发现的异常率（97.4%，74/76）较脑脊液常规生化高（28.9%，22/76），差异有统计学意义（McNemar 检验，P=0.000）。**结论** 头颅 MR 增强扫描在急性血行播散性肺结核患者中对颅内结核病变的发现率高；特别是对于无神经系统症状的结核性脑膜炎患者，脑脊液常规生化检查发现的异常率偏低，而头颅 MR 增强扫描发现的异常率仍＞95%。

EPO-2378
能谱 CT 成像评价颈动脉粥样硬化斑块类型的临床研究

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目的

回顾性分析颈动脉粥样硬化症患者的能谱 CTA 多参数数据，探讨其对颈动脉斑块成分及易损性界定的应用价值。

方法

收集 27 例拟行颈动脉内膜剥脱术患者，术前均进行超声检查（对照组）及 GE 宝石能谱 CT（GE Discovery CT 750HD）颈动脉 CTA 能谱成像扫描检查（实验组），对两种检查的斑块检出率进行对比分析。将在 70 keV 的最佳单能量水平联合 40%自适应迭代重建（ASIR）的数据传至图像后处理工作站 AW4.5，记录颈动脉斑块的数量和位置，并使用能谱成分技术（Gemstone Spectral Imaging GSI）综合分析颈动脉斑块的组织成分[1]。获得斑块各种成分的能谱曲线及有效原子序数，计算出各种成分的能谱曲线斜率。采用方差分析对斑块中各种成分参数进行统计比较。使用 Kappa 检验评价 GE 宝石能谱 CTA 与病理学切片诊断结果的一致性。

结果

27 例患者中共存在斑块 52 处，能谱 CTA 共检出斑块 49 处，超声共检出斑块 46 处。能谱 CTA 的斑块检出率为 94.23%，超声检查的斑块检出率为 88.46%。能谱 CTA 检出的 49 处斑块中包括纤维斑块 24 处，脂质斑块 18 处，斑块内出血 7 处。3 种斑块组织成分的曲线斜率及有效原子序数均存在差异。GE 宝石能谱 CTA 对颈动脉斑块成分的诊断结果与病理学切片的诊断结果一致性较高。

结论

能谱 CTA 能够准确的分析斑块的组织成分，进而能够有效的评估斑块的稳定性，以期更好的为临床颈动脉斑块治疗的选择提供帮助。

EPO-2379

The Characteristic of MR Imaging in Primary Testicular Lymphoma

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Objective: To explore the characteristics and diagnosis value of MR imaging in primary testicular lymphoma(PTL). **Methods:**MR imaging and clinical information from six patients with PTL were retrospectively analyzed compared with clinical information from six patients diagnosed with testicular seminoma. The characteristic of lesion was analyzed with T1WI/T2WI *Plain Scan* sequences(n=6) and contrast enhanced scan(n=4) including DCE(n= 3) performed with 1.5~3.0T MRI Unit. DWI were performed in 3 cases. **Results:** The average incidence age was 65 years old. The shape of lesion was round or oval. The lesion showed T1W1 iso-intense and T2W1 low signal intensity(one with inhomogeneous signal intensity). On T2W1, there was stratified stepsize signal in lesion site,testicular tissue and hydrocele of testis. On DWI, the lesion showed hyper-intensity and lower ADC value. **Conclusion:** The MRI findings from patients with PTL showed TIW1 iso-signal nodules with gradually moderate enhancement , T2WI low signal intensity and obvious DWI diffusal restriction. The later two findings were specific for PTL.

EPO-2380

MRI 诊断脑膜型囊虫病合并肝内感染一例

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脑膜型囊虫病是脑囊虫病一种少见的形式，同时合并肝脏感染更是罕见，目前国内无相关病例报道。我们报道一例 45 岁女性，患有脑膜型囊虫病合并肝脏感染。患者因间断头痛、抽搐 4 天于 2018 年 11 月 4 日于南昌大学第二附属医院就诊，伴四肢抽搐，意识丧失，持续 20 分钟，无发热，头颅 MRI 平扫+增强示：右侧颞叶外侧皮层下白质肿胀呈长 T1 长 T2 信号，DWI 为等、低信号，增强后结节明显强化，与脑膜分界不清，右侧大脑半球脑膜增厚，呈线状强化。脑脊液生化检查：脑脊液蛋白 667.44mg/L，葡萄糖 3.07mmol/L,氯 123.40mmol/L，脑脊液结核菌涂片（-）、新型隐球菌检查（-）；结合患者血液囊虫抗体阳性，考虑囊虫病诊断。予以阿苯达挫片抗囊虫、奥卡西平抗癫痫。2018-12-17 入院复查，头颅 MRI 提示脑膜下结节缩小；同时患者肝功能异常：碱性磷酸酶：124.19U/L； 丙氨酸氨基转移酶 40.17U/L；r-谷氨酰胺转移酶：56.93U/L，腹部 CT 平扫+增强示：肝实质内多枚低密度，边界欠情，增强后呈斑片状强化，门脉期及延迟期呈相对低度。腹部 MRI 平扫+增强示肝实质内多发斑片状稍长 T1 稍长 T2 信号，DWI 高信号，增强后呈均匀轻中度强化。予以异甘草酸镁、多洗磷脂胆碱护肝降酶，2018-12-30 再次复查，肝脏病灶吸收，且右侧脑膜强化结节明显缩小，脑水肿减轻。脑囊虫病史中枢神经最常见的寄生虫感染，可分为脑实质型、脑膜型、脑室型及混合型。脑膜型囊虫病最少见，以往仅有少数病例报道，可能因为囊虫进入中枢系统时，多由血流进入脑实质，通过脉络膜丛进入脑室内的囊虫大都位于第四脑室，仅少数进入蛛网膜下腔。本例脑膜型囊虫病沿脑膜呈多发结节，并引起脑膜广泛增厚，是典型的脑膜型囊虫病表现，同时伴有肝内多发感染灶，经过抗囊虫治疗后，脑内及肝内病灶均缩小并部分消失。

EPO-2381

磁共振弥散加权成像及表面扩散系数在艾滋病相关性脑实质结核诊断中的价值

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目的 探讨磁共振（MRI）弥散加权成像（DWI）及表面扩散系数（ADC）在脑实质结核诊断中的价值。**方法** 回顾分析本院 2017 年 1 月至 2018 年 12 月确诊的艾滋病相关脑实质结核患者 16 例临床资料及 MRI 表现，所有患者均行头颅 MRI 常规及弥散加权成像 DWI（b 值为 0,1000 s/mm^2）检查，测量并计算脑实质结核灶及对侧正常脑实质的 DWI 相对表观弥散系数（ADC）值，应用 SPSS19.0 统计学软件分析其差异性。**结果** 16 例艾滋病相关性脑实质结核患者 MRI 表现共 54 个病灶，其中小脑（7）、桥脑（3）、海马（2）、颞叶（2）、枕叶（12）、基底节（10）、额叶（11）、顶叶（7）。在 MRI 影像上脑实质结核灶 T1WI 呈等或稍低信号，T2WI 呈环状或结节状高信号，增强后呈环形强化（32）、结节样强化（20）、花簇样强化（2），DWI 病灶呈低信号共 44 个，ADC 值（1.265±0.281）×$10^{-3}mm^2$/s 明显高于对侧正常脑实质（0.758±0.071）×$10^{-3}mm^2$/s，差异具有统计学意义，P＜0.05。**结论** ADC 值能较准确的量化脑实质结核灶的弥散程度，结合 T1WI、T2WI,增强 MR 扫描及脑弥散成像技术联合应用，对艾滋病相关性脑实质结核的诊断具有一定的价值。

EPO-2382

平衡式稳态自由进动序列血管成像对肾动脉狭窄的诊断价值：Meta 分析

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[摘要]:**目的**采用 Meta 分析方法评价平衡式稳态自由进动序列血管成像技术（B-SSFP）对肾动脉狭窄(RAS)的诊断价值。**方法**计算机检索 PubMed、EMABASE、Cochrane Library 数据库,检索关于 B-SSFP 诊断 RAS 的英文文献。文献评价采用诊断研究评价工具 QUADAS-2。数据采用 Meta-Disc1.4 和 Stata 12.0 软件进行分析，检验异质性和发表偏倚，绘制汇总受试者工作特征(SROC)曲线并计算曲线下面积(AUC)，计算合并敏感度、特异度以及诊断比值比。**结果**共纳入 13 篇文献，Meta 分析结果显示 SROC 曲线 AUC 为 0.97，合并灵敏度、特异度分别为 0.85、0.96。**结论** B-SSFP 对 RAS 诊断具有较高的灵敏度和特异度，有望成为肾功能不全患者的首先检查。

EPO-2383

隐球菌性脑膜脑炎的影像学表现与诊断

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目的: 探讨隐球菌性脑膜脑炎影像学表现特征及主要鉴别诊断。
方法:回顾性分析通过脑脊液墨汁染色或培养证实的隐球菌性脑膜脑炎 24 例,其中男 13 例,女 11 例,年龄 8~65 岁,主要症状有头痛、恶心、呕吐、发热。24 例患者均行 MR 检查，其中 14 例同时行头颅 CT 检查。
结果:21 例患者 20 例影像学检查为阳性,主要表现有、弥漫性脑水肿、轻度脑积水；亚急性期及慢性期表现为脑萎缩、脑积水、胶状假囊、脑内多灶低密度区及异常信号区、隐球菌瘤,脑膜增厚、强化,以基底池、环池、侧裂池及四叠池为著;脑内强化血管影增多。
结论: 影像表现能够反映隐球菌性脑膜脑炎的病理学特征,软脑膜强化，胶状假囊及伴发的深部脑组织病变是隐脑的常见表现。

EPO-2384

肾脏平滑肌瘤的 CT 表现分析

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目的：学习及探讨肾平滑肌瘤的多排螺旋 CT 表现，以提高其术前诊断准确率。方法：回顾性分析 4 例手术病理证实的肾平滑肌瘤患者的临床及影像资料，4 例均行 CT 平扫及多期动态增强扫描。结果：4 例肾平滑肌瘤均发生于右肾下极，均为单发病灶，边界清晰，形态较规则，有包膜，CT 横断面上最大径约 1.9～7.1cm。CT 平扫以同侧肾实质为对比，4 例均为稍高密度，其中 3 例密度均匀，1 例密度不均匀，内见斑片状低密度影，周围见结节状高密度影。4 例增强皮质期强化程度均低于肾皮质，3 例实质期及肾盂期见强化程度逐渐增加，1 例肾盂期见强化程度下降。其中 2 例内见多发迂曲紊乱血管影。术前均未正确诊断。术后随访 3～49 个月（平均 26 个月）均未见复发或转移。结论：肾平滑肌瘤是罕见的肾良性肿瘤，术前容易误诊，但肾平滑肌瘤生长部位、平扫密度、强化方式及肿瘤边界等有一定的特征性，分析其 CT 特征以提高诊断水平，有助于临床选择最佳治疗方案。

EPO-2385

颅内动脉粥样斑块 HR-MRI 信号特征-影像与病理学对照研究进展

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随着近年来高分辨磁共振成像（High-resolution magnetic resonance imaging, HRMRI）技术的发展，以及该项技术应用于颈动脉粥样斑块（Carotid atherosclerotic plaque, CASP）的研究中得到了影像学和组织学特征的相关对应，故进一步采用该技术研究颅内动脉粥样硬化斑块（Intracranial atherosclerotic plaque, ICASP）的形态及成分，由于颅内动脉较为细小，且具有独特的组织学特征，以及斑块成分如：纤维帽、脂质核心等在不同场强中的弛豫时间不同，故二者在影像学特征表现方面存在一定的差异。

EPO-2386

AIDS 相关肝脏机会性感染的影像表现

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目的：分析相关肝脏机会性感染的影像表现，探讨其影像特征。
方法：回顾性分析 30 例经实验室检查和临床确诊的 AIDS 患者合并肝脏机会性感染病例的影像表现。
结果：30 例患者中细菌感染 22 例（73.3%），真菌感染 6 例（20.0%），病毒感染和混合性感染各 1 例（3.3%）。细菌感染多表现为多发环形强化的脓肿或弥漫的低密度病灶，其中，结核分枝杆菌多表现为粟粒状结节或肝脓肿，非结核分枝杆菌多表现为细小低密度灶；真菌感染多为环形强化的多发小脓肿、弥漫性微脓肿或脓肿样改变，马尔尼菲蓝状菌感染可见肝脾呈“筛孔状”改变；病毒感染可见弥漫分布的无明显强化的细小低密度灶；混合性感染兼有以上细菌和真菌感染的表现。
结论： AIDS 相关肝脏机会性感染的影像表现无明显特异性，确诊有赖于临床和影像检查的结合。

EPO-2387

Clinical and MRI Imaging Analysis of Neonatal Escherichia Coli Meningitis

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Objective: To explore the clinical and MRI features of neonatal Escherichia coli meningitis. **Methods**: Retrospective analysis of clinical and MRI data of 30 cases of neonatal Escherichia coli meningitis admitted from August 2013 to December 2018.Of the 30 cases, 16 were males and 14 were females, aged from 5 to 28 days, with an average of 18 days.Escherichia coli culture: 30 cases were positive in blood culture and 7 cases were positive in cerebrospinal fluid culture.All patients underwent plain and enhanced MR scans, including DWI and enhanced FLAIR scans. All patients were followed up 2-5 times with MRI. **Results**:Fever or body temperature did not rise, poor reaction, eating less or refusing to breast milk, breathing, heart rate increased as clinical

manifestations.All patients showed meningeal thickening and abnormal enhancement on MRI.Complications occurred in 15 cases, including hydrocephalus in 10 cases (3 communicating cases), ventricular empyema in 8 cases, cerebral infarction in 7 cases (1 arterial case), ependymitis in 7 cases, subdural effusion/empyema in 6 cases, venous sinus thrombosis in 2 cases, thalamic hemorrhage in 1 case.There were 10 cases with 2 or more complications. Conclusion:Atypical clinical manifestations of neonatal Escherichia coli meningitis.MRI can well display the pathological features of neonatal Escherichia coli meningitis and provide objective basis for its early diagnosis and treatment outcome evaluation.

EPO-2388

磁共振 DWI 技术在肝脏占位性病变中的应用

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扩散加权成像技术（DWI）是利用水分子的扩散运动特性进行成像的技术，使 MRI 对人体的研究深入到分子水平，反映人体组织的微观几何结构以及细胞内外水分子的运动等变化。随着 DWI 的表面扩散系数(ADC)值的变化规律及扩散成像的量化分析、背景抑制磁共振弥散加权成像(DWIBS)等技术开发应用，该技术在肝脏占位性病变的诊断与鉴别诊断中的应用与研究越来越受到重视。现就 DWI 技术在肝脏占位性病变诊断与鉴别诊断中的相关研究予以综述。

EPO-2389

肝转移瘤的 CT 表现与病理基础分析

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目的：探讨肝转移瘤的 CT 影像表现和病理基础。**方法：**回顾分析我院 50 例肝转移瘤的 CT 和病理资料，所有病例都经手术和穿刺病理证实，均进行了腹部 CT 平扫和三期增强扫描。**结果：**CT 平扫见 42 例病灶为多发的大小不等的低密度结节影，8 例病灶为单发的低密度结节影。增强扫描后见 35 例（70%）病灶 CT 表现为门静脉期明显的环形强化，即典型的“牛眼征”；8 例（16%）病灶 CT 表现为动脉期环形强化或均匀强化；7 例（14%）病灶 CT 表现为动脉期及门静脉期均无强化。以上肝转移瘤的 CT 表现均以其病理特点为基础的，并与癌灶的大体观相一致。**结论：**肝转移瘤的原发灶以消化道为主，病理类型以腺癌为主，其特征性 CT 表现是门静脉期病灶明显的环形强化，故 CT 增强扫描对肝转移瘤的诊断与鉴别诊断有重要的意义。

EPO-2390

AIDS 合并播散型马尔尼菲青霉菌感染的胸腹部 CT 表现

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目的 探讨艾滋病（AIDS）合并播散型马尔尼菲青霉菌感染（disseminated penicillium marnefei infection, DPMI）的胸腹部 CT 表现及诊断价值。 方法 回顾性分析 16 例 AIDS 合并 DPMI 的胸部 CT 表现，9 例腹部 CT 表现。 结果 胸部 CT 示单侧或双侧肺组织片状实变影 5 例（31.25%），其中双侧 4 例，单侧 1 例，2 例可见空气支气管征；结节 5 例（31.25%），其中 2 例表现为粟粒样结节；空洞 4 例（25.00%），其中单发空洞 3 例，群聚性空洞 1 例；双肺磨玻璃样阴影 4 例（25.00%）；肺门和纵隔淋巴结肿大 3 例（18.87%）；胸腔积液 2 例（12.50%）；肿块、心包积液和腋下淋巴结肿大各 1 例（6.25%）。腹部 CT 示腹膜后及肠系膜淋巴结肿大 5 例（55.56%）；肝局灶性低密度 4 例（44.44%），其中 3 例呈局灶性分布，1 例呈弥漫性分布；肝大 4 例（44.44%）；脾低密度病灶 2 例（22.22%），其中局灶性和弥漫性分布各 1 例；腹水 2（22.22%）；肠壁增厚、脾大各 1 例（11.11%）。 结论 AIDS 合并 DPMI 的胸腹部 CT 表现多种多样。胸部 CT 主要表现为肺部片状实变、结节、空洞、磨玻璃样阴影、肺门和纵隔淋巴结肿大。腹部 CT 主要表现为腹膜后及肠系膜淋巴结肿大、肝脾大和肝脾局灶性低密度病灶。同一患者可有多种病变表现。

EPO-2391

复发性脊柱包虫病的 MRI 特征

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目的 通过回顾性研究探讨术后复发性脊柱包虫与原发脊柱包虫病 MRI 影像差异，阐述脊柱包虫术后复发的 MRI 特征。

方法 收集我院 2012 年 7 月～2018 年 1 月经手术及病理诊断为脊柱包虫病者 19 例，术后复发及资料完整者 9 例（男性 7 例，女性 2 例），年龄 39～62 岁，平均 48.7 岁，术后复发时间 3～12 个月（平均 6 个月）。所有患者均有牧区生活史；术前均行胸部正侧位 X 线、脊柱病变部位 X 线及 MRI 检查。采用西门子公司生产的 Avanto 1.5T 核磁共振进行扫描。主要扫描参数为：T_1WI TR：450ms ，TE ：9.5ms；T_2WI TR：3000ms，TE：98ms；FS T_2WI TR：4000ms ，TE：90ms ，FOV 320mm，矩阵：320×224，层厚 4mm，层距 0.4mm；行轴位、冠状位、矢状位 T_1序列、T_2序列检查和矢状位的脂肪抑制序列检查。

结果 与原发脊柱包虫病 MRI 表现相比，术后复发脊柱包虫 MRI 表现为：原发病灶的典型特征大部分消失，灶围无明显的外膜包裹，T_2WI 上可见“小囊泡”状高信号，但大多无明显的“葡萄串样”改变、无典型的多囊性结构；其椎体骨质破坏区及周围软组织结构显示不清，无 T_1WI、T_2WI 低信号的弧形钙化灶。复发病灶常以多发出现，多发的复发病灶未形成单处簇集状，病灶之间相距较远。椎间盘受累是一种长期被破坏的特征。

结论 复发脊柱包虫病 MRI 表现有其自身显著特点，与原发脊柱包虫病有明显的区别。MRI 检查有其突出的优点且技术成熟、应用广泛，是作为术后复查随访的首选检查。因此脊柱包虫病术后复发的 MRI 表现可为其随访监测提供全面准确的影像学诊断依据。

EPO-2392

Primary retroperitoneal seminoma: A case report

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Abstract
Background: Primary retroperitoneal seminoma is extremely rare. The symptoms and the imaging features are similar to other retroperitoneal tumors, but the primary retroperitoneal seminoma is sensitive to radiotherapy which is different from others. In this paper, we presented a patient of primary retroperitoneal seminoma who was admitted to the Shanghai Public Health Clinical Center.
Case presentation: A 27 years old man had abdominal pain with low fever for a month, and recurred a week ago. His abdomen was bulging, the right upper abdomen touched a hard mass, the border was unclear, accompanied by tenderness, the testes were normal. LDH increased significantly, AFP elevated sightly. CT scan showed a retroperitoneal mass next to the right kindey, and slightly inhomogeneous enhancement. Necrosis and cystic degeneration were seen in the lesion.The mass surrounds the Inferior vena cava, the right renal artery and renal vein, partially surrounds the abdominal aorta, the right common iliac artery and inferior mesenteric artery. The lesion encroached on the ureter and resulted in hydronephrosis. MRI showed that the T1WI of the tumor was low signal, and the signal showed no significant change in the reverse phase. The T2WI was slightly high signal, and the DWI was high signal. After the enhancement, the lesion was unevenly enhanced, and the separation was enhanced.
Conclusions: When young men find a retroperitoneal soft tissue mass, push adjacent organs or surround large blood vessels, delayed enhanced of the separation, elevated β-HCG and AFP level, and OCT4 positive need to consider the possibility of seminoma.

EPO-2393

颅内结核 MRI 表现与临床转归相关性分析

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目的 分析颅内结核患者 MRI 表现和治疗预后情况，探讨 MRI 表现与临床转归的相关性。方法 收集 2015 年 07 月至 2018 年 09 月在重庆三峡中心医院住院的确诊和临床诊断为颅内结核患者 68 例，将其住院时的 MRI 表现和其临床转归进行回顾性分析。结果 脑膜结核 20 例，临床治愈 17 例，临床治愈率为 85.0%；脑实质结核 22 例，临床治愈 17 例，临床治愈率为 77.3%；混合型颅内结核 26 例，临床治愈 18 例，临床治愈率为 69.2%，三组比较差异无统计学意义(P＞0.05)。影像学表现为脑梗死 11 例，临床治愈率 54.5%(6/11)；脑积水 15 例，临床治愈率 60.0%(9/15)；脑梗死+脑积水 4 例，临床治愈率 50.0%（2/4），三组比较差异无统计学意义(P＞0.05)。影像学表现无并发症者 51 例，临床治愈率 84.3%（43/51）；有并发症者 17 例，临床治愈率 58.8%（10/17），两组比较差异有统计学意义(P＜0.05)。结论 颅内结核 MRI 表现并发症者与临床治愈率有相关性，对病情转归评估有一定的临床价值。

EPO-2394

典型肺结核与肺癌的 CT 影像学鉴别诊断分析

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目的：分析典型肺结核与肺癌的 CT 影像学表现对两者的鉴别诊断价值。方法：收集 2014 年 06 月至 2018 年 07 月重庆三峡中心医院收治的典型肺结核患者和肺癌患者各 47 例，典型肺结核作为对

照组，肺癌作为观察组，对比分析两组患者的 CT 影像学征象和 CT 诊断结果。结果：在 CT 征象方面，对照组与观察组患者分叶、壁结节、厚壁空洞、胸膜凹陷、毛刺等影像学征象差异具有统计学意义(P＜0.05) ；在 CT 诊断结果方面，两组患者病变发生部位对比差异也具有统计学意义(P＜0.05)。结论：利用 CT 诊断能够实现典型肺结核与肺癌的有效鉴别诊断，具有较好临床参考价值。

EPO-2395

骨质疏松症磁共振成像的展望

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骨质疏松症的特征是骨强度降低和骨折倾向增加。使用双能 X 线吸收测定法 (DXA) 进行骨骼完整性的评估是骨质疏松症的常规方法。DXA 是一种单位面积骨密度的测量方法，但不能获取所有影响骨质强度的因素。除骨量、密度和含量外，骨小梁和骨皮质的结构、矿物含量、微骨折也有助于判断骨质强度。部分特异性骨质结构信息将有更助于进一步了解增加骨折风险的因素，并影响治疗和疗效。需要花费更多的精力开发非侵入性评估骨小梁微结构的技术。
在评估松质骨结构方面的另一前景是使用磁共振成像 (MRI) 技术作为多个解剖部位骨活检的替代方法。
在未来几年内，MRI 技术与 DXA 常规测量的互补使用，在高危人群中使用 MRI 评估治疗效果，以及设计联合治疗可能对骨质疏松症领域产生相当大的影响。

EPO-2396

Comparative study of virtual non-contrast CT compared to true non-contrast CT images of the chest: A preliminary study

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ABSTRACT Objective: To investigate the potential of virtual non-contrast CT(VNC) for spectral CT imaging of the chest, as an alternative to true non-contrastCT(NC). Methods: Forty-six patients with either lung cancer or clinical suspected lung cancer received CT scans, including a conventional plain scan and dual-phasic contrast-enhanced dual-energy spectral scans. Six types of VNC were reconstructed1 for analysis using a GSI viewer. Water-iodine, 140 kev-monochromatic, and material suppressed-iodine imagesfrom thearterial (WI-A,140MI-A,and MSI-A,respectively) and venous phases (WI-V, 140MI-V, and MSI-V, respectively)were compared with NC in terms of subjective scoring, noise, the contrast-noise ratio(CNR), CT value, effective radiation dose(ED)and the detect ability of lesions. Results: The mean score of each VNC was greater than 3 in a 5-point scale and each VNC achieved the basic requirements for diagnosis, and the VNC score during the venous phase was higher than 4 . The noise associated with the WI-A, 140MI-V,1 9 MSI-V and WI-V either did not differ (P>0.05) or

was less than that of NC(P<0.05).2 0 Each VNC did not differ from NC in terms of the CNR(P>0.05). MSI-A and MSI-V2 1 did not differ from NC in terms of the CT value(P>0.05). VNC and NC showed similar performances with regard to the detection of lesions, except for the small calcifications and lymph nodes near the vena cava; The ED was reduced by approximately31.2%usingVNC. Conclusion:MSI-V showed the best potential as a substitute for conventional plain scan,thusreducingtheradiationdose.

EPO-2397
糖尿病相关性肌肉感染的 CT 表现与糖尿病管理的应用研究

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目的：探讨糖尿病相关性肌肉感染的 CT 表现与糖尿病临床处置的相关性，为糖尿病管理提供依据。**材料方法：**回顾性分析经临床证实的糖尿病肌肉感染 16 例（空腹血糖 25.9±9.8mmol/L，餐后血糖 30.8±9.7mmol/L），其中足 4 例（25.0%）、臀部 3 例（18.8%）、下肢 9 例（56.3%），分析肌肉感染的 CT 影像特点与实验室指标（T 细胞亚群计数、血常规、血肌酐浓度）、抗生素（广谱抗生素和多种抗生素使用天数）应用的关系。**结果：**肌肉溶解坏死形成脓肿 16 例，筋膜增厚强化 14 例，肌间隙增宽 16 例。CD3 降低 12 例 、CD4 降低 11 例、CD8 增加 6 例和 CD4/CD8 减低 16 例，WBC 9.67±3.6×10^9/L 、RBC 3.2±0.7×10^12/L、HGB 88±19g/L、红细胞压积 HCT 31.0±7.6%，Cr 47.0±13.5μmol/l。结论：糖尿病肌肉感染与糖尿病控制不佳、贫血和机体免疫力低下有关。

EPO-2398
糖尿病相关性气性坏疽的 CT 表现及其受累组织器官的分布特点

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目的：探讨糖尿病相关性气性坏疽的 CT 表现与其受累组织器官分布特点。材料方法：回顾性分析经临床证实的糖尿病相关性气性坏疽 23 例，男性 15 例、53±8 岁，女性 8 例、43±6.2 岁，病史 22±6.1 年，所有病例梭状芽孢杆菌均阳性，空腹血糖 26.3±10.6mmol/L、餐后血糖 31.0±11.2mmol/L，CD4/CD8 降低 23 例、RBC 3.1±0.8×10^12/L、HGB 88±27g/L、Cr 42.3±11.6μmol/l，观察分析各组织器官的 CT 表现，并评价其关系。结果：下肢最容易受累，包括下肢 9 例、会阴和阴囊及生殖器 8 例、双足 4 例、臀部 3 例、胸腹壁及背部 3 例、肝脏、脾脏和胃壁 3 例、心包 1 例。影像学表现包括软组织肿胀 20 例、软组织坏死脓腔形成 3 例、肌间隙和生理腔隙积气 23 例（腹膜腔 3 例、包膜下 1 例、心包 1 例、纵膈 1 例、阴囊 8 例）。结论：糖尿病相关性气性坏疽的 CT 表现主要是软组织肿胀、软组织坏死脓腔形成、肌间隙和生理腔隙积气，且受累器官优势分布顺序为下肢、会阴/阴囊/生殖器、双足、臀部、胸腹壁及背部、肝脏、脾脏/胃壁和心包。结合创伤或医疗操作史、免疫力低、贫血及肾功能障碍，达到早期诊断、及时治疗、保存伤肢和挽救生命目的。

EPO-2399

肺毛霉菌病的 CT 影像学表现及动态随诊变化

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目的 探讨肺毛霉菌病的 CT 影像学特征及动态随诊变化，以提高对该病的认识。**方法** 回顾性分析 21 例北京协和医院经手术或穿刺病理证实的肺毛霉菌病患者的胸部 CT 图像。所有患者均行 MSCT 平扫，其中 12 例行增强检查。**结果** 肺毛霉菌病以双侧分布为主（14/21），2 例呈双肺弥漫分布，且无肺叶、肺段分布规律，病变单发者较少。主要表现为实变、结节、肿块影，5 例呈大片实变，16 例以“结节-实变、结节-肿块或结节-肿块-实变”的形式组合出现。16 例病变内见液化坏死；7 例（单发 5 例、多发 2 例）患者出现 12 个空洞，其中 5 例伴气液平，2 例空洞内见空气新月征；14 例病变周围伴晕征，5 例见反晕征；12 例结节或肿块周围伴毛刺征，以长毛刺为主（10/12）；6 例结节或肿块边缘分叶，浅分叶者较多（4/6）；9 例实变影中出现空泡征；5 例伴点状钙化。支气管狭窄、闭塞、局部扩张或袖套样增厚 14 例；12 例伴纵隔、肺门、腋窝或叶间裂旁淋巴结不同程度增大；12 例伴胸腔积液、2 例伴心包少量积液；9 例出现轻-中度胸膜凹陷征。12 例接受增强扫描者病变实性成分呈轻中度强化；2 例实变影中见强化的右上肺静脉穿行。治疗约 1-2 周后病灶趋向扩大、进展，内部继而出现液化坏死及空洞，结节可进展为斑片影，病灶数目可增多；治疗约 3-4 周后病灶逐渐吸收好转。5 例患者在治疗过程中停药，停药后复查 CT 病灶缩小不明显或范围增大，小结节增多，病灶较前致密。**结论：**肺毛霉菌病基线 CT 常表现为实变、结节、肿块影，周围常伴晕征，病变易液化坏死、出现空洞，易侵犯支气管，实性成分可轻中度强化，钙化、反晕征及空气新月征少见，可出现分叶、毛刺、空洞、空泡、胸膜凹陷、淋巴结肿大等恶性征象，应注意鉴别。此外，肺毛霉菌病治疗不同时期出现动态影像学变化，治疗初期易出现胸部影像学的加重，需警惕误判为疗效不佳。毛霉菌病原体顽固，治疗过程中停药可导致病变进展，临床医师应加强对该病的认识。

EPO-2400
Imaging diagnosis of fungal liver infection in children

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Objective: To investigate the imaging features of fungal liver infection in children in order to improve the diagnostic accuracy of the disease.
Methods:The findings of CT and MRI were retrospectively analyzed in 9 patients with clinically-confirmed fungal liver.
Results: There were 1 case with solitary lesion and 8 cases with multiple lesions. All lessions showed low or equal density on plain CT scan. In 7 cases, the liver parenchyma in outer side of most lesions showed transient abnormally hypertransfusion in arterial phase. The lesion usually did not affect the hepatic blood vessel, and blood vessel were seen in the enhanced scan.
Three patterns of lesions in three enhanced phases were observed on CT and MRI.
Type Ⅰ: The lesions displayed uneven iso-T1 and long T2 signal on MRI. Three-phase enhanced scan of CT and MRI showed ″target-ring sign ″ for uneven annular enhancement.
Type II: Delayed enhancement, lesions showed equal or low density in arterial phase and portal phase, and equal density in delayed phase.

Type III: delay ring enhancement, lesions showed equal or low density in arterial phase and portal phase, and ring enhancement in delayed phase.

After antifungal therapy, the lesion disappeared completely or decreased. Conclusion: The CT and MRI findings of fungal liver infection have some specific characteristics, which is helpful for early diagnosis and treatment, as well as detecting the therapeutic effect.

EPO-2401
肝血管周上皮样细胞瘤的 CT、MRI 特征及误诊分析

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目的 探讨肝血管周上皮样细胞瘤（PEComa）的 CT、MRI 特征并分析其误诊原因，以提高对该病的认识及术前诊断准确率。**资料与方法** 回顾性分析经病理证实的 13 例肝 PEComa 患者的临床及影像资料。6 例行肝脏 CT 增强、5 例行全腹 CT 增强、4 例行肝脏 MR 增强、1 例行肝脏 MR 平扫，其中 3 例同时行肝脏 CT 及 MR 检查。**结果** 病灶均为单发，呈圆形或类圆形，最长径 0.8cm-17.5cm（平均 7.6cm），3 例可见分隔者直径均大于 10cm。病灶多位于被膜下 12/13(92%)，边界清晰 12/13(92%)。CT 平扫病灶多呈等或稍低密度，MR 平扫多呈 T1 等低信号、T2 高-稍高信号。其中 5 例信号/密度均匀(38%)，8 例可检出脂肪成分(62%)，2 例含坏死囊变(15%)，1 例含钙化及出血(8%)。增强扫描所有病灶均血供丰富，动脉期明显强化，9 例病变中心或周边可见增粗迂曲血管影（69%）、其中 2 例为早期引流静脉；门/静脉期呈等信号/密度 11 例（73%），呈低信号/密度 3 例（20%）；延迟期呈等信号/密度 4 例（44%），呈低信号/密度 5 例（56%）；5 例可见延迟期强化假包膜。**结论** 在 CT / MRI 上，大多数原发性肝 PEComa 单发、位于被膜下、可检出脂肪成分，增强扫描动脉期病灶中心或边缘可见增粗迂曲血管影，再结合性别、年龄、病史等临床资料可提示该诊断。

EPO-2402
水蜡树果实提取物对结肠癌 HCT-15 细胞的增殖、千移及凋亡诱导因子 AIF 表达的影响

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目的：通过体外实验研究水蜡树果实提取物（Fruit of Ligustrum Obtusifolium Extract，FLOE）对结肠癌 HCT-15 细胞的增殖、迁移及凋亡诱导因子（Apoptosisi Iducing Fctor，AIF）表达的影响，探讨其可能的作用机制，为中药在结肠癌治疗中的研发及 AIF 应用于结肠癌治疗提供更多的理论依据。**方法：**体外培养结肠癌细胞株 HCT-15。将 FLOE 用不完全培养基稀释成不同浓度：0μg/ml（对照组）、2.5μg/ml、5μg/ml、10μg/ml、20μg/ml 组，并设置阴性对照（20μg/ml75%酒精）。分别处理 24h、48h、72h、96h 后，观察各组细胞形态学变化，并计算贴壁细胞数量；采用 MTS 法检测各组不同时间细胞存活率；采用集落实验检测不同浓度 FLOE 对结肠癌 HCT-15 细胞生存能力的影响；划痕实验检测在不同浓度药物处理后，对 HCT-15 细胞迁移能力的影

响；采用 Western bolt 法检测在不同浓度药物作用 48h 后，对 HC15 细胞凋亡相关蛋白及 AIF 表达的影响。**结果：** 随着 FLOE 药物浓度的增高及作用时间的延长，HCT-15 细胞伸展变差、细胞漂浮，细胞计数发现贴壁细胞也随之减少。MTS 结果表明与对照组相比 FLOE 处理后的细胞存活率降低（P＜0.05），且呈时间及浓度依赖性。划痕实验结果表明与对照组相比 FLOE 处理后的细胞划痕区域相对宽度较宽（P＜0.05）。集落实验结果表明 FLOE 处理后细胞集落形成数量明显降低。Western bolt 实验结果表明随着 FLOE 浓度的增高，Survivin、Mcl-1 蛋白表达水平明显降低，而凋亡诱导因子 AIF 表达增加。**结论：** 水蜡树果实提取物能抑制 HCT-15 细胞增殖及迁移，且呈浓度及时间依赖性。其机制可能通过下调抗凋亡蛋白的表达及上调凋亡诱导因子 AIF 的表达实现。

EPO-2403

X 线检查对宝宝危害到底有多大

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生活中经常会遇到孩子不小心吞了各种异物（硬币、果核、小玩具、发夹、螺丝等）、考虑孩子有肺部炎症、外伤需要排除骨折等情况，此时医生会建议做 X 线检查。一提起 X 线检查，很多妈妈就会很纠结，这个对宝宝的辐射到底有多大、究竟这种检查该不该做呢？

EPO-2404

磁共振成像对炎性肠病诊断及病情评估的价值探究

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目的 应用 MRI 平扫、增强 MRI 结合扩散加权成像（DWI）探究各 MRI 指标对炎性肠病（IBD）的诊断效能及其在量化评估 IBD 炎症程度中的价值。方法 选取病理确诊为 IBD 的 20 例患者及 10 例肠镜正常体检患者。分析各肠段 MRI 节段性评分（MR-score-S），测量各个肠段（直肠、乙状结肠、降结肠、横结肠、升结肠和回肠）的 ADC 值及肠壁厚度。以内镜结果为金标准，通过 ROC 曲线分析各个指标对炎性肠病的诊断效能，同时分析其与内镜分级结果的相关性。结果 本研究共分析 162 个肠段。ROC 曲线分析结果显示，MR-score-S、ADC 值和肠壁厚度诊断 IBD 的 ROC 曲线下面积分别为 0.8126，0.7654 和 0.74；MR-score-S（无增强）、MR-score-S（无 DWI）和 MR-score-S（无增强及 DWI）的 ROC 曲线下面积分别为 0.785，0.7988 和 0.7377。在 IBD 患者中，MRI 评分、ADC 值、肠壁厚度与 IBD 内镜分级结果均具有相关性，差异均具有统计学意义（P＜0.05），溃疡性结肠炎（UC）患者各指标的相关系数分别为 0.724、-0.43 和 0.519；而克罗恩病（CD）患者分别为 0.484、-0.392 和 0.331。结论 MRI 平扫结合 DWI、增强 MRI 为 IBD 特别是 UC 患者提供了一种可靠的诊断及定量评估病情的检查方法，从而更好地指导临床进行个性化治疗，改善预后。

EPO-2405

低剂量多层螺旋 CT 三维重建诊断小儿气管支气管非金属异物的价值

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目的 探讨低剂量多层螺旋 CT 三维重建诊断小儿气管支气管非金属异物的价值。
方法 经纤维支气管镜检查确诊的 21 例气管支气管非金属异物患儿均行低剂量 16 排螺旋 CT 扫描，再进行多平面重建、最小密度投影、容积再现和 CT 仿真内镜等后处理技术观察气管支气管异物的大小、形态、位置及其所致的并发症。
结果 左侧支气管异物 13 例，其中左主支气管异物 12 例，左主支气管并左下叶支气管异物 1 例；右侧支气管异物 7 例，其中右主支气管异物 4 例，右中间段支气管异物 2 例，右下叶支气管异物 1 例；气管分叉处异物 1 例。CT 图像显示的并发症有肺气肿 12 例、肺炎 3 例、肺气肿并肺炎 5 例、无明显并发症 1 例。取出的非金属异物有瓜子、核桃仁、花生、玉米粒、肉类等。
结论 低剂量多层螺旋 CT 是一种辐射剂量相对较小、安全无创、容易被小儿及其家属接受的检查方法，小儿气管支气管非金属异物在低剂量多层螺旋 CT 及其后处理技术的图像上有特征性表现，可为临床及时的诊断和治疗提供重要的依据。

EPO-2406

Evaluation of lung nodules induced by pulmonary tuberculosis using MRI

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Purpose: To evaluate the potential of using MRI to evaluate lung nodules, especially calcified nodules induced by pulmonary tuberculosis.
Method: Sixty-three subjects with clinically confirmed pulmonary TB received both CT and lung MRI within 2 hours. All subjects with pulmonary TB were confirmed by Acid-Fast Bacillus (AFB) Testing or detection of mycobacterium TB. With nodules detected on routine lung CT images as references, the sensitivity of MRI was calculated for detecting non-calcified nodules, and depicting completely calcified nodules and partially calcified nodules, respectively. Chi square test was used to compare the sensitivity of detection or depiction by MRI for nodules of different size (< 0.5 cm, 0.5-1.0 cm and > 1.0 cm) with $P < 0.05$ indicating statistical difference.
Results: In total, 275 nodules were detected on CT, including 151 non-calcified nodules, 75 completely calcified nodules and 49 partially calcified nodules. Regardless of size, the detection rate of MRI was 74.2% for non-calcified nodules and dropped to 57.1% for partially calcified nodules and only 16.0% for completely calcified nodules. In terms of size, MRI had excellent performance in detecting non-calcified nodules of larger than 0.5 cm with detection rate higher than 90% but was less competent in detecting nodules of smaller than 0.5 cm with detection rate declined to only 50%. The sensitivity of MRI increased significantly in proportion to the size for detecting non-calcified nodules ($P < 0.001$), depicting completely calcified nodules ($P < 0.001$; **Figure A-C**) and partially calcified nodules ($P = 0.02$; **Figure D-F**) (Table).

Conclusion: MRI is comparable to CT in detecting non-calcified pulmonary tuberculosis-induced nodules of larger than 0.5 cm. However, for detecting tiny nodules (< 0.5 cm) and depicting nodules with calcification, the sensitivity is unsatisfactory, which needs further improvement.

EPO-2407

手足口病合并脑、脊髓炎的 MRI 诊断

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目的：手足口病是多种肠道病毒引起的常见传染病，以发热和手、足、口腔等部位的皮疹和疱疹为主要特征，多数患儿一周左右自愈，少数引起肺水肿、心肌炎、无菌性脑膜炎、脑脊髓炎等并发症，诊断及鉴别诊断有一定难度。通过总结手足口病合并脑、脊髓炎的病例，提高对本病的认识和诊断水平。
方法：阅读手足口病合并脑、脊髓炎相关的中外文图书及文献，收集北京市各大医院的 MR 数据，并进行总结。
结果：引起手足口病的病毒有 20 多种，Cox A16 和 EV-71 最为常见，EV-71 常侵犯神经系统，脑干是其最常侵犯的部位。脑干脑炎临床表现：中脑网状结构或脑桥被盖病变可致肌痉挛，视觉障碍、视幻觉提示中脑或脑桥病变，短暂尿潴留、过度换气、潮式呼吸提示间 脑和中脑病变。
脑干是手足口病相关病毒最常侵犯的部位，Feng Chen 等认为脑干后部对称或非对称明显高信号，预后差（13 例中 2 例死亡，7 例痊愈、4 例存在神经后遗表现），而模糊的长 T2 信号则预后较好，8 例中 6 例痊愈，2 例有轻微后遗症。
其它少见部位的病变，如海马、小脑齿状核、胼胝体压部等。
结论：脑干是手足口病相关病毒最常侵犯的部位，脊髓前角也是常见受累部位，应注意识别少见部位的病变，如海马、小脑齿状核、胼胝体等，MRI 病变范围及信号特点有助于判断病情及预后。

EPO-2408

体素内不相干运动成像对直肠腺癌术前评估的价值

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目的：探讨体素内不相干运动成像对直肠腺癌术前评估的价值。
方法：收集我院 54 例直肠腺癌患者的直肠 MRI 图像（包括 IVIM 序列）及一般资料。根据肿瘤是否突破固有肌层将肿瘤分为未突破固有肌层组（T1、T2 期）和突破固有肌层组（T3、T4 期），根据术后病理结果将肿瘤分为高、中、低分化三组。测量直肠腺癌组织的 IVIM 相关参数：标准表观扩散系数(ADC)、单纯扩散系数(D)、灌注相关扩散系数(D^*)和灌注分数(f)；比较直肠腺癌不同 T 分期及分化程度间各参数值的差异，分析相关参数与直肠腺癌 T 分期及分化程度的关系。
结果：未突破固有肌层组的 ADC、f 值分别为（1.026±0.070）×10^{-3} mm^2/s、（ 0.358±0.038），突破固有肌层组的 ADC、f 值为（0.959±0.111）×10^{-3} mm^2/s、（0.283±0.034），两组间的 ADC、f 值差异有统计学意义（$P<0.05$）；两组间的 D、D^*值无显著差异（$P>0.05$）。低、中、高分化组的 ADC 值分别为（0.799±0.105）×10^{-3} mm^2/s,（0.978±0.066）×10^{-3} mm^2/s,（1.063±0.059）×10^{-3} mm^2/s；D 值分别为（0.797±0.074） ×10^{-3} mm^2/s,（0.890±0.076）×10^{-3} mm^2/s,（1.050±0.081）×10^{-}

^{3} mm^2/s。ADC、D 值随着肿瘤分化程度的增加呈逐渐升高的趋势且组间两两比较差异均有统计学意义（$P<0.05$）；ADC、D 值与分化程度呈高度正相关（$r^{ADC}=0.676$，$P<0.05$），（$r^{D}=0.722$，$P<0.05$）。三组间的 D^*、f 值无显著差异($P>0.05$)。
结论:ADC、f 值有助于鉴别突破固有肌层组与未突破固有肌层组；ADC、D 值与分化程度呈高度正相关，有助于术前评估直肠腺癌的分化程度。

EPO-2409

肺放线菌病的影像表现

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摘要：目的：通过总结肺放线菌不同临床及影像表现，提高对该病的认识，避免长时间抗结核治疗或被误诊为肺癌切除。
方法：回顾性分析多中心收集的 6 例经病理证实的肺放线菌病的临床表现、实验室检查、影像表现，及明确诊断诊断过程中曲折经历总结包括误诊分析。
结果：6 例肺放线菌病均为男性，年龄 48-66 岁，主要临床表现是咳嗽、咳痰伴或不伴发热、白痰或少许浓痰，咳嗽伴痰中带血丝或单纯咯血，单纯咯血者，量不多，约 5-10ml/日，均有 20-30 年长时间吸烟史，其中 1 例有慢性支气管扩张病史，1 例明显蛀牙牙痛病史。影像表现，局灶病变 4 例，表现为右上肺节段性实变 2 例，左上肺类似肿块样病变 1 例，右下肺 1 例段性实变 1 例，增强表现病灶中心可见低密度不强化区，周边均匀强化伴临近胸膜增厚，1 例左上肺大片实变内多发小空洞，周围磨玻璃影伴右肺多发结节影，1 例左下肺实变，增强后实变内亦见斑片低密度区，内未见气体，周围实变部分均有强化，伴多组纵隔淋巴结肿大及胸腔积液，6 例患者白细胞及中性粒细胞指标总体不高，结核指标阴性，G 实验、GM 实验正常或略偏高，肿瘤指标 CEA、AFP、细胞角蛋白正常，1 例特异性神经烯醇化酶增高，1 例 CA199 增高，6 例均在诊断过程中被抗结核、抗炎治疗 1-6 月，影像复查部分病灶一度略有缩小，再次复查后进展，其中 1 例 MRI 显示病灶内实变内低密度灶 DWI 示弥撒受限，非常独特色征像，1 例 PET-CT 表现为高摄取，误诊为肺癌被切除。
结论：肺放线菌病典型表现为节段性实变内脓腔不伴空洞形成有助于诊断，MRI 的 DWI 序列弥散受限提示脓肿，不典型表现容易被误诊误诊。

EPO-2410

Screening of Tuberculosis in a TB Heavy-burden Large Rural Region in China with Deep Learning Multi-modality Artificial Intelligence

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Purpose A shortage of physicians to interpret radiological and pathological images from digital radiography and sputum smear in TB high-burden (HB) rural areas of China hinders the early diagnosis of TB. We deployed Deep-learning based Multi-modality AI (DMAI) in a TB HB large rural province, Qinhai, to assist physicians in detecting TB

in radiological and pathological images. Our study investigates the efficacy of DMAI to assist physicians in detecting TB at multiple hospitals located in Qinhai. **Material and methods** A DMAI system was installed in a central TB hospital to automatically screen for TB in radiological (DR) and pathological images received from more than 60 local hospitals via secured internet connection. DMAI classified each DR image into high-risk, low-risk, and no-TB and automatically generated heatmaps denoting abnormality in <10 sec. Junior physicians (~12.5 yr-experience) reviewed these cases with DMAI support. Senior physicians (>25 yr-experience) then reviewed results from junior physicians and DMAI to generate final diagnosis. A MRMC study compared diagnoses from DMAI, junior physicians, and senior physicians from multiple hospitals to determine the effectiveness of DMAI. **Results** Within 6 months, our DMAI system processed 105,558 radiographs and classified 77.7%, 6.4%, and 15.9% as no-TB, high-risk, and low-risk, respectively, with heatmaps in each abnormal image (Figures 1 and 2). For the high-prevalence group (age>50), DMAI classified 13% and 20% of the cases as high-risk and low-risk, respectively. DMAI and junior physicians agreed 96.3% on confirmed TB and 90.6% on non-TB cases. Compared to historical data, physicians using DMAI increased the sensitivity by 23% with similar specificity. **Conclusion** This is the first reported large-scale clinical application of DMAI for TB screening in China. DMAI's performance is similar to junior physicians'. DMAI assisted physicians in detecting more TB cases in rural areas in a shorter time period without needing more physicians.

EPO-2411

Ｍｉｋｕｌｉｃｚ病１例

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目的 探讨Ｍｉｋｕｌｉｃｚ病的相关影像表现。 方法 对本院１例Ｍｉｋｕｌｉｃｚ病临床特征及影像表现进行回顾性分析。结果 发现患者左眼上睑肿 4 个月，眼球突出 3 个月，无眼红眼痛；眼科查体：左眼突出下移位，左眼上转及外转受限，余方向不受限。结膜无充血，无水肿，巩膜无黄染，角膜清，KP(-)，前房深浅正常，未见浮游物，房闪(-)，虹膜纹理清，未见新生血管。瞳孔圆，直径 3mm，对光反射灵敏，无后粘连，晶状体核性混浊，玻璃体轻度混浊，眼底视盘边界清，色苍白，C/D=0.5 ,血管走行及比例正常，视网膜未见出血及渗出，黄斑中心凹反光不见。影像学横断面 CT 可见左侧眶内泪腺区不规则团块状肿物，边界欠清，大小约 1.8cm×2.7cm×2.1cm（左右×前后×上下），与邻近上直肌分界较清，骨质未见受压变薄及破坏征象。MR 病灶表现为长 T1、短/等 T2 混杂信号，冠状面显示肿物与上直肌分界清楚，外直肌轻度受压内移；脂肪抑制序列肿块信号更清晰、边界清楚；增强扫描呈较为均匀明显强化，其内可见小斑点状低强化区。结论 熟悉Ｍｉｋｕｌｉｃｚ病的影像学表现，可以提高其检出率，但只能最为诊断的参考指标，最终诊断需要结合临床病史及病理组织学检查。

EPO-2412

皮肤神经纤维瘤病合并肺结核一例

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患者 男 40 岁 因咽痛 1 月发热 20 天入院，喉镜可见喉部糜烂溃疡。既往：皮肤神经纤维瘤 20 年，曾于当地前后 4 次手术切除。17 年前工作时全身约 90%烫伤，于上海某医院植皮治疗 14 次，4 月前右侧颈部肿块手术切除，并左侧再次出现囊性包块。实验室检查：血常规，肝功正常；血糖正常；血沉é；抗 RF，抗 SSA，抗-SSB，抗 JO-1 均阴性；CA125,CA153 升高；曲霉半乳甘露聚糖阴性；抗中性粒细胞胞浆抗体阴性，结核分枝杆菌效应 T 细胞 170（正常 0-6）。胸部 CT：1 双肺弥漫粟粒结节；2 纵隔级右侧腋窝多发结节、团块，双侧胸壁皮下多发结节、包块；3 胸 8、9 骨质局限缺损，周围软组织肿胀。临床考虑：1 粟粒性肺结核；2 喉结核；3 皮肤纤维瘤；4 烧伤植皮后。给予抗结核、保肝治疗，并局部雾化治疗，患者症状减轻，并持续治疗中。

讨论：此患者症状严重，合并有神经纤维瘤及烧伤后植皮，免疫功能低下，易合并细菌、真菌及其他病毒等感染，本例患者经实验室检查肺结核、喉结核诊断明确，并经抗结核治疗后症状好转。

EPO-2413
多层螺旋 CT 在肝包虫病术前诊断中的临床应用价值

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目的：分析研究肝包虫病的多层螺旋 CT 影像学表现及多层螺旋 CT 在肝包虫病术前诊断中的临床应用价值。
方法：收集在我院经手术病理证实的肝包虫患者共 11 例，所有患者术前均行多层螺旋 CT 平扫及动态增强检查，分析肝包虫病的影像学征象及多层螺旋 CT 的临床应用价值。
结果：11 例患者共检出 14 个病灶，其中肝左叶 3 个、肝右叶 11 个，其中 2 例患者同时合并肺包虫；所有患者 CT 平扫均呈低密度，6 例患者囊壁可见薄壳状、弧形钙化，3 例患者囊内容物见无定形的条片状或片状钙化，3 例患者母囊内见大小和数目不一的子囊，4 例患者表现囊内分离征象；所有患者在动态增强检查中均无明显强化征象，肝包虫病的多层螺旋 CT 影像特点典型。利用多层螺旋 CT 多种后处理重建技术，分析研究病变与周围组织及邻近血管走形关系特点，为临床治疗提供参考价值。
结论：多层螺旋 CT 平扫及动态增强检查可明确显示肝包虫的影像特征，并能清晰显示患者病灶的基本情况，同时通过多层螺旋 CT 多种后处理重建技术，明确病变与周围组织及邻近血管走形关系特点，术前可精确定位并指导手术路径，为临床治疗计划提供重要的影像学信息，肝包虫患者术前行多层螺旋 CT 平扫及动态增强检查是可行的。

EPO-2414
在 7.0T 磁共振上研究肌酸化学交换转移加权成像

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目的：化学交换饱和转移（CEST）是基于磁化传递效应基础上发展起来的新的成像技术，能对脑内的代谢物进行成像[1]。肌酸（Cr）是脑内主要的代谢物，传统的 MRS 对肌酸的成像空间分辨率低[2]，本研究运用 CEST 成像方法对 Cr 进行成像。
方法：本研究在 7.0T 动物磁共振扫描仪上完成。配制 Cr 试管模型 （浓度：20 mM，Ph：7.0），并将 C6 胶质瘤细胞接种至 SD 大鼠右侧基底节区制作肿瘤鼠模型，再用连续波预饱和 PRESS 序列及 EPI 序列进行 Cr-CEST 加权成像扫描。
结果：试管 Z 谱结果显示在+2.0ppm 可以观察到 Cr -CEST 效应。大鼠 Z 谱显示在+2.0ppm 附近可以观察到 Cr- CEST 效应，与试管结果一致。Cr-CEST 加权图显示：大鼠胶质瘤肿瘤中心区域 Cr-CEST 效应较对侧正常脑组织低。
结论：本研究运用一种新的成像方法，实现了大鼠胶质瘤脑组织的 Cr 加权成像，得出大鼠胶质瘤肿瘤区域肌酸浓度降低[3]，与传统的 MRS 得出的结论相符合，并进一步获得其在活体组织内的浓度分布图。

EPO-2415

两例奴卡菌肺炎的 CT 表现

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[摘要]目的：分析 2 例奴卡菌肺炎的不常见 CT 表现，提高对该病的影像学表现的认识。**方法：**收集研究 2017 年 3 月-2018 年 12 月我院经细菌学检查证实的奴卡菌肺炎 2 例，采用 GE Optima 680 行胸部常规扫描，GE1.5T 超导磁共振头部扫描。**结果：**2 例奴卡菌肺炎均表现为左肺上下叶大片状实变影，其内可见支气管影，大小不等的无壁空洞，边缘模糊，纵隔内未见明显肿大淋巴结。**结论：**奴卡菌肺部感染发病率近年呈上升趋势，与大叶性肺炎、肺真菌病、肺结核、肺脓肿、肺癌等疾病影像学表现相似，难于鉴别。最终确诊依赖于病原菌的检查。

EPO-2416

ANCA-associated systemic vasculitis in lung: Pulmonary HRCT imaging characteristics.

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Objective To investigate the HRCT characteristics of ANCA-associated systemic vasculitis in lung.
Method Retrospectively analysis of the clinical data and imaging findings of 62 patients with ANCA-associated pneumonia admitted to our hospital from February 2017 to August 2018, including 48 females and 14 males. The median age is 34. All the 62 patients received pulmonary HRCT scan, and image analysis was conducted by two imaging profesors with 10 years of radiological experience.
Result Among the 62 patients, there were 18 cases of Wegener granuloma (WG), 32 cases of multiple vasculitis (MPA) under microscope, and 12 cases of Churg-Strauss syndrome (CSS). The manifestation of multiple organ involvement is accompanied by varying degrees of impaired renal function, clinical symptoms such as fever, cough and

other respiratory symptoms. After 2-8 weeks of treatment, 59 cases of pulmonary lesions were completely absorbed and disappeared, and 3 cases died of multiple organ failure. 47 patients relapsed within 2-6 months.

Conclusions ANCA-associated vasculitis is a rare autoimmune disease that can lead to multiple organ damage. One of the most common organs in the lungs has no specific changes in pulmonary imaging manifestations. For patients with lung involvement, especially those with hemoptysis, if the possibility of this disease is considered, timely diagnosis should be made, hormone shock therapy should be given clinically. In the short term, it improved significantly, but it was easy to relapse.

EPO-2417

ASL 联合 SWAN 在急性期病毒性脑炎诊断中的临床应用

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目的 探讨磁共振动脉自旋标记（ASL）成像与 T2*加权血管成像（SWAN）在急性病毒性脑炎（VE）临床诊断中的应用价值。**方法** 收集研究 2016 年 1 月至 2019 年 5 月经临床证实 22 例病毒性脑炎患者，均采用 GE3.0T 超导 MRI 机行常规序列、ASL 和 SWAN 检查，通过 CBF 伪彩图测量病变区脑血流量（CBF）值，并利用 SWAN 图像观察引流静脉形态学变化。**结果** CBF 伪彩图所测病变区 CBF 值均高于正常区域，SWAN 提示较大病变区域引流静脉呈分布稀疏且管径纤细表现，差异有统计学意义（P<0.05）。 **结论** 急性病毒性脑炎患者行 ASL 及 SWAN 序列检查，可通过量化的 CBF 值以及引流静脉形态学改变反映病变区域组织细胞功能代谢状态，有助于提高急性期病毒性脑炎诊断准确性。

EPO-2418

艾滋病相关原发性中枢神经系统淋巴瘤的 MRI 表现

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目的 探讨获得性免疫缺陷综合征(AIDS)相关原发性中枢神经系统淋巴瘤 (PCNSL)的 MRI 表现。**方法** 回顾性分析 10 例经手术及穿刺活检病理证实的 AIDS 相关 PCNSL 患者的临床及 MRI 影像资料。**结果** 10 例 AIDS 相关 PCNSL 共 17 个病灶，以幕上单发为主，主要分布于中线附近，其中单发病灶 7 例（70%），多发病灶 3 例（30%），位于幕上 8 例（80%），幕下 2 例（20%）；T1WI 为等低信号，T2WI 信号高低不均、5 个（29.4%）病灶周围见低信号环，T2/FLAIR 大部分病灶周围见水肿，增强扫描病灶结节状强化 2 个（11.8%），团状强化 2 个（11.8%），靶状强化 1 个（5.9%），环形强化 12 个（70.5%），15 个（88.2%）病灶出现不同程度坏死，DWI 低信号 2 个（11.8%），等信号 2 个（11.8%），高信号 13 个（76.4%）；2 例患者行 MRS 检查，均显示 NAA、Cho 及 Cr 明显降低，均出现高耸的 Lac、LIip 峰。**结论** AIDS 合并 PCNSL 的 MRI 表现具有一定特异性，仔细分析 MRI 各序列信号特征，结合临床表现、$CD4^+$<50 个/ μl，有助于 PCNSL 的诊断。

EPO-2419

42 例非结核分枝杆菌肺病 CT 表现分析

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目的 探讨非结核分枝杆菌肺病 CT 表现特点，提高对非结核分枝杆菌肺病的认识。**方法** 选取经痰、支气管冲洗液或病变组织培养并进行菌种鉴定确诊的非结核分枝杆菌肺病 42 例为观察组，同期结核菌培养阳性肺结核患者 42 例为对照组，比较两组患者的病灶分布、部位、病灶形态及性质。**结果** 观察组病变分布广泛，非结核分枝杆菌肺病组病灶累及 1 个肺叶率为 21.43%，小于肺结核组 45.24%，差异均有统计学意义（c^2=5.36,P<0.05）；非结核分枝杆菌肺病组病灶累及≥3 个肺叶率为 50.00%，大于肺结核组 26.19%，两组比较差异均有统计学意义（c^2=5.05,P<0.05）；非结核分枝杆菌肺病组病灶在中叶、舌段发现率为 78.57%，多于肺结核组 30.93%，两组比较差异有统计学意义(c^2=19.2，P<0.05)；非结核分枝杆菌肺病组支气管扩张、薄壁空洞、肺气肿肺大疱发生率分别为 54.76%、23.81%、28.57%，分别高于肺结核组 19.05%、7.14%、9.52%，差异均有统计学意义(c^2=11.50、4.46、4.94，P均<0.05)；支气管播散灶、钙化灶、磨玻璃影、胸腔积液及纵隔淋巴结肿大发生率分别为 9.52%、16.67%、9.52%、11.90%、16.67%，分别低于肺结核组 40.48%、40.48%、33.33%、30.95%、35.71%，差异均有统计学意义(c^2=10.73、5.83、7.07、4.53、3.94，P均<0.05)；厚壁空洞、浸润性病灶、增殖性结节、纤维索条两组比较无统计学意义（P>0.05）。**结论** 非结核分枝杆菌肺病的胸部 CT 表现具有分布广，双肺散在柱状扩张的支气管，以右肺中叶及左肺舌段明显，胸膜下薄壁空洞及空洞周围并柱状支气管扩张，肺气肿、肺大疱多见等特点。

EPO-2420

艾滋病合并弓形虫脑炎的 MRI 研究进展

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弓形虫脑炎（TE）是获得性免疫缺陷综合征（AIDS）患者最常见的中枢神经系统机会性感染之一，TE 病死率及复发率较高，早期诊断和及时治疗对 AIDS 患者的预后至关重要。TE 确诊依赖于脑组织活检中找到弓形虫滋养体，但在临床工作中操作性不强，血清学 IgM、IgG 阳性有一定提示意义，但帮助并不大，影像学检查对 TE 的诊断非常重要，尤其是 MRI 具有鉴别不同组织的优越性且有多种特殊成像技术，是 AIDS 合并 TE 最敏感、最重要的检查手段，随着 MR 硬件迅速发展及新技术的不断应用，在提供病变形态学信息的同时还可反映生理学功能信息，对于 AIDS 合并 TE 的诊断具有着较高的优势和潜力。

EPO-2421

经颈静脉肝内门体分流术在肝硬化门脉高压并发症 8 例患者的临床应用分析

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【目的】探讨覆膜支架、DIPS 术在肝硬化门脉高压并发症临床应用效果。
【材料与方法】搜集 2017-6~2019-6 期间 TIPS 或 DIPS 治疗肝硬化失代偿合并并发症的患者 8 例，均为男性，中位年龄 59 岁，其范围 47~76 岁。肝硬化原因为乙肝 5 例，酒精性 1 例，酒精并乙肝 1 例，丙肝 1 例。Child A 级 3 例，ChildB 级 5 例。有出血史或急性出血 6 例；顽固性胸水和/或腹水 2 例。合并门静脉血栓 1 例；脾切除 1 例；合并小 HCC1 例。合并脾肾分流 1 例。术后定期复查肝功能、凝血功能、彩超或肝脏 CT 扫描等，观察支架通畅性、肝性脑病等指标。
【结果】（1）8 例患者均手术成功，DIPS6 例，TIPS1 例，另 1 例行 TIPS 失败，采用 DIPS 成功；（2）均采用 8mm 直径 VIATORR 覆膜支架，其支架长度 6cm（5 例）、7cm（3 例）、8cm（1 例），其中 1 例覆膜支架 2 枚；3 例加用裸支架，其中 1 例应用 2 枚；术前门脉测压中位数为 38（31~43）cmH2O 柱，术后为 23（20~26）cmH2O 柱；胃冠状静脉栓塞 7 例，其中钢圈栓塞 6 例，NBCA 液体胶栓塞 1 例。术后随访 0.5~24 月，其中 2 例发生于 1 月内，1 例因支架成角，降压效果欠佳再次上消化道出血，通过并行 TIPS 改善；另 1 例支架通畅尚可，保守治疗随访近 2 年无再次出血；肝性脑病 1 例，饮食控制后得到改善。
【结论】采用 VIATORR 覆膜支架治疗肝硬化门脉高压并发症取得较好临床效果，特别是结合 DIPS 技术应用，但仍需大量病例进行临床观察。

EPO-2422
肝血管平滑肌脂肪瘤的影像表现与病理对照研究

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目的：通过研究肝血管平滑肌脂肪瘤（HAML）的临床、病理资料，提高对肝血管平滑肌脂肪瘤（HAML）的 CT 和 MRI 诊断能力。
材料与方法：回顾性分析 18 例确诊为 HAML 的临床、病理和影像学资料，男 3 例，女 15 例。年龄 23~76 岁（中位年龄 41 岁）。所有患者均行平扫和增强检查，其中 CT 检查 10 例，MRI 检查 6 例，CT 及 MRI 检查 2 例。影像分析主要包括病变部位、病变直径、早期引流静脉、密度/信号强度等。
结果：所有患者均无肝硬化表现。HAML 病理检测显示病灶包含脂肪 10 例，钙化 2 例，囊性变性 1 例。影像上均表现为清晰的、孤立的肿块，中等大小（平均直径 5.9 厘米）。平均强化程度超过 120 HU11 例（91.7%），外周强化减弱和早期出现引流静脉 15 例（83.3%），早期引流静脉全部为肝静脉，所有患者均见肿瘤迂曲血管。
结论：HAML 在 CT 和/或 MRI 上表现为富血供肿瘤，早期出现引流静脉、外周强化降低和肿瘤包膜的缺失以及甲胎蛋白正常，这些均有助于非肝硬化肝癌的鉴别诊断。

EPO-2423
基于深度学习的多层螺旋 CT 对活动性肺结核的研发与验证

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【摘要】目的:研发在多层螺旋 CT 图像中，基于深度学习人工智能（AI）自动化检测系统来简化活动性肺结核（ATB）的诊断过程并提高诊断的精度。
数据:本研究回顾性收集了河北大学附属医院 2016 年 4 月-2019 年 5 月的 846 例患者（476 例 ATB、150 例非肺结核性肺炎和 220 例正常）的 CT 图像（层厚：5mm），以结核抗酸染色阳性确认 ATB，以影像医生诊断结果确认正常和非结核性肺炎。训练数据采用了 337 例 ATB、110 例肺炎和 120 例正常人的 CT 图像来训练 AI 网络。测试数据采用了 139 例 ATB、40 例肺炎和 100 例正常人的 CT 图像进行测试。训练数据和测试数据都为相互独立样本。另基于文献资料描述耐药结核的影像特征（空洞数量≥3 个，直径≥5mm），从测试数据 ATB 筛选出 64 例可疑耐药结核。
方法:首先采用 LabelImg 软件对 ATB 病灶进行标记，然后采用 U-Net 深度学习对输入图像 ATB 区域进行分割。再采用分类网络（ResNet-50 神经网络）以降低假阳性，对分割的原图进行二次预测。最后结合分割和分类网络对检测结果有≥4 张连续病灶 CT 断层的患者定为 ATB。
结果:测试 ATB 结果准确性为 96.1%，AUC 值为 0.969，显示本算法具有很高的精度。本文还列出更多的评估指标，包括灵敏度(SS)、特异性(SP)、假阳性率(FPR)、阳性预测值(PPV)、阴性预测值(NPV)。最后还用本算法对 64 例可疑耐药结核进行测试，结果敏感度为 0.98。
结论:本研究成功地开发了胸部 CT 自动检测 ATB 的 AI 工具。本研究显示利用分类网络能很好区分开 ATB 和肺炎，并能提高诊断精度。同时，本算法显示出对耐药结核有较高敏感度，这也提示用 AI 检测耐药结核的可行性，下一步我们将用耐药结核为训练数据，进行研发 AI 耐药结核的算法。因此，本算法为下一步 AI 在 CT 诊断 ATB 应用于临床医学和研发 AI 耐药结核奠定了坚实的基础。

EPO-2424
儿童以颅脑症状首发的全身动脉肌纤维发育不良 1 例

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患儿，男，2 岁，主因“抽搐后左侧肢体活动不利 2 年，发现血压升高 2 月”入院，慢性起病过程，既往有癫痫、偏瘫等病史。患儿 5 个月前接种百白破疫苗后出现抽搐，缓解后出现左侧肢体活动不利、口角左歪，当地医院诊断为脑梗死、继发性癫痫。2 月前因呼吸道感染就诊于当地医院，监测血压 222/96 mmHg。查体：患儿左侧肢体较对侧细小，肌力 4 级，肌张力稍弱，左侧肱动脉、桡动脉搏动较对侧稍弱，左侧股动脉搏动弱不可及，左侧足背动脉、胫后动脉搏动未及；右侧肢体未见明显异常。2018-9-18 头颅 MRA：左侧大脑中动脉主干次全闭塞伴分支明显减少，右侧颈内动脉海绵窦段、大脑中动脉重度狭窄伴分支减少；鞍上池及双侧基底节区多发迂曲增多的小血管影，考虑 Moyamoya 综合征。2018-10-28 头颅 MR 平扫：右脑半球及左侧顶叶脑软化、脑萎缩。2018-11-30 全主动脉 CTA 及 2018-12-07 血管造影显示：左肾动脉主干呈串珠样改变，局部扭曲伴轻度狭窄，远端略扩张，分支稀少，多数闭塞，左肾灌注极低；右肾动脉主干未见狭窄，远端分支多处呈局限性 70-90%狭窄，狭窄远端扩张，右肾灌注可；肠系膜上动脉分支呈局限性 90%狭窄；肝动脉分支迂曲狭窄；双侧髂总、髂内动脉未见狭窄，左侧髂外动脉中段呈串珠样改变，最窄处 80%狭窄，狭窄远端管腔扩张，右髂外动脉局部扭曲明显。2018-12-03 肾动态显像 DTPA：左肾血流灌注减低，肾小球滤过功能减低，GFR 19.9ml/min/1.73m2。临床诊断：动脉肌纤维发育不良，累及全身多个动脉，继发高血压，脑萎缩。

EPO-2425

艾滋病合并肺癌的 CT 和临床特征分析

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摘要：目的 分析艾滋病合并肺癌患者的 CT 表现及临床特征，以加深对艾滋病患者伴发肺癌的认识。方法 收集经病理证实的 16 例艾滋病合并肺癌患者的胸部 CT 影像学检查资料及临床指标，并进行回顾性分析。结果 艾滋病患者合并肺癌多见于中老年男性，常伴有肺部感染，外周血 CD4+T 淋巴细胞计数下降，肿块有分叶、毛刺、部分有空洞、增强后不均匀强化。结论 艾滋病患者肺癌的 CT 和临床表现无特异性，当患者出现肿块且抗感染治疗无效时，应警惕肺癌的可能。

EPO-2426

神经梅毒的 MRI 特征分析

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目的 分析神经梅毒 MRI 表现，探讨 MRI 在神经梅毒中的诊断价值。**方法** 回顾性分析临床与实验室检查证实 11 例神经梅毒患者的 MR 资料（包括 MRI 平扫、DWI 及增强扫描）。**结果** 4 例脑实质梅毒树胶肿患者表现为脑内占位性病灶（呈等 T1、稍短 T2 信号，DWI 呈稍低信号）并周围水肿，增强呈结节状、条片状强化；4 例脑膜血管炎梅毒患者表现缺血性脑梗死改变（大片状长 T1、长 T2 信号，DWI 高信号，增强脑回样强化）；1 例脑膜梅毒患者硬脑膜明显增厚强化：1 例脊髓梅毒患者颈髓节段性增粗，髓内异常信号结节并不均匀明显强化；1 例麻痹性痴呆患者示双侧颞叶局部脑萎缩. 伴脑内多发腔梗及缺血灶。**结论** MRI 平扫及增强是神经梅毒患者影像学检查首选技术，不同临床表型神经梅毒在 MRI 上无特征性表现，神经梅毒以脑膜血管炎多见，误诊率高；当年轻患者 M RI 表现缺血性脑梗死、脑萎缩、脑或脊髓内结节样或条片状强化、脑膜异常强化时，应考虑神经梅毒的可能。

EPO-2427

钆塞酸二钠增强 MRI 对肝功能的评估价值

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目的：探讨 Gd-EOB-DTPA 增强 MRI 评估肝功能的价值。**方法**：自 2015 年 8 月至 2018 年 8 月共收集行 Gd-EOB-DTPA 增强 MRI 检查患者 84 例，其中 15 例无慢性肝病肝功能正常者及 69 例乙型肝炎肝硬化肝功能异常者,Child-Pugh A 级（CPA 组）33 例、B 级（CPB 组）26 例、C 级（CPC 组）10 例，所有患者根据临床需要行 Gd-EOB-DTPA 增强 MRI 检查，且获取影像学检查前后一周内血清学检查指标。测得肝脏各肝段增强后 3min、10min、20min 肝脏肌肉信号比增加率（Increase rate of liver-to-muscle ratio,△LMR），肝脏各肝段△LMR 的比较应用单因素方差分析，不同肝段间的比较应用建立只考虑主效应的两因素方差分析模型；采用 ROC 曲线分析△LMR 鉴别 NLF-CPA 和 CPB-CPC 组的诊断效能；△LMR 与 Child-Pugh 评分、MELD 评分、ICG15 的相关性采用 Spearman 秩相关分析。**结果**：不同肝功能组各肝段△LMR 的比较差异均具有统计学意义；NLF、CPA、CPB 组肝脏 8 段间△LMR 的比较差异均具有统计学意义（P 值均小于 0.05），CPC 组段间比较差异没有统计学意

义（P 值均大于 0.05）；△LMR_{10min}对鉴别 NLF-CPA 和 CPB-CPC 组的诊断效能最高。△LMR 与 Child-Pugh 评分、MELD 评分、ICG15 均呈负相关，且 P 值均小于 0.05。**结论：** Gd-EOB-DTPA 增强 MRI 可以描述不同肝段肝功能，注射对比剂后 10min、20min 对不同肝段肝功能的评估效能较好。

EPO-2428

头皮 Marjolin's 溃疡 MRI 影像学诊断与鉴别

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目的 探讨头皮 Marjolin's 溃疡的 MRI 表现，旨在提高对本病的影像学认识。**方法** 回顾性分析 10 例经手术和病理证实的头皮 Marjolin's 溃疡的 MRI 特征及临床资料，并结合相关文献资料对其分析总结。**结果** 10 例均为鳞癌，MRI 表现：T1WI 均呈等、低信号，T2WI 呈高信号为主的混杂信号，边界欠清；6 例见坏死、囊变区，其内 T2WI 呈更高信号，表面见溃疡形成；4 例增强扫描：肿瘤实质明显强化，坏死、囊变区未见强化。4 例累及邻近颅板、静脉窦及硬脑膜。2 例累及颅内脑实质，形成包膜期脑脓肿，病变中心 DWI 呈特征性的高信号。**结论** MRI 是评价头皮 Marjolin's 溃疡可靠影像学方法，尤其是对本病侵犯颅板及颅内包膜期脑脓肿等具有较高临床价值。

EPO-2429

MRI 影像对慢性乳腺炎与乳腺癌鉴别诊断的应用评价

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[摘要] **目的** 评价磁共振成像（Magnetic resonance imaging,MRI）对慢性乳腺炎与乳腺癌诊断中的应用价值。**方法** 收集 2015 年 6 月-2019 年 6 月经本院收治的手术或病理证实的 62 例慢性乳腺炎患者作为乳腺炎组，46 例乳腺癌患者作为乳腺癌组，所有患者均进行了 MRI 检查，比较两组形态学征象及动态增强表现。**结果** 两组病例中，慢性乳腺炎与乳腺癌环形强化、病灶形状及病灶周围水肿征象相比，差异有统计学意义（P<0.05）；病变呈毛刺征、腋窝淋巴结增大、乳头及皮肤增厚征象相比，差异无统计学意义（P>0.05）。慢性乳腺炎组与乳腺癌组的时间-信号曲线（TIC）相比，差异有统计学意义（P<0.05）。两组的早期强化率相比，差异无统计学意义（P>0.05）。**结论** MRI 影像学检查对慢性乳腺炎与乳腺癌的病灶形状、环形强化、病灶周围水肿、TIC 等征象具备有一定特征性，对临床有重要意义。

EPO-2430

肺炎链球菌感染的影像学表现

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目的：探讨肺炎链球菌感染的 X 线及 CT 表现特征，提高临床影像诊断及鉴别诊断的能力。方法：回顾性分析我院经病原学确诊的肺炎链球菌感染患者的胸部 X 线及 CT 的影像学表现，总结其表现特点。结果：X 线表现：当表现为大叶性肺炎时，X 线胸片因其处于不同的病理时期而表现不一；

充血期：通常无异常发现，或仅表现为肺纹理局限性增多，肺野透明度有所降低；实变期：表现为大片状均匀一致的密度增高影。其形态及范围与受累肺叶及肺段一致，大片阴影中可见空气支气管征；消散期：实变区密度逐渐减低，表现为大小不一，分布不规则的斑片状阴影；炎症最终可完全吸收并消散，或仅留少量条索状影。当表现为小叶性肺炎时，X 线胸片可表现为肺纹理增粗、边缘模糊；两侧肺野内结节状、斑片状的密度增高影，沿着支气管分布，病灶大多位于两肺下野内带。CT 表现：表现为大叶性肺炎时，在不同的病理时期表现不同，分别为：（1）充血期：病变呈磨玻璃样密度影，边缘模糊；（2）实变期：可见沿大叶或肺段分布的致密实变影，内可见空气支气管征；（3）消散期：随病变的吸收，实变影密度减低，呈散在、大小不等的斑片状影，最后可完全吸收，或仅留少量条索状影。大叶性肺炎典型的影像学表现为实变起自肺叶外周、紧邻胸膜,然后向肺野中心逐渐扩散。当表现为小叶性肺炎时，由于病灶多以细支气管为中心，病变起始于细支气管，并向其周围所属肺泡蔓延，CT 上可见：沿支气管分布的斑片状、结节状密度增高阴影；阻塞性肺气肿；空洞性病变；胸腔积液。50％或更少的患者可合并脓胸。当形成“球形肺炎”时，表现为边界不清且不光整的球形高密度影，内部可见有充气支气管影。结论：胸部 X 及 CT 对于肺炎链球菌感染具有较高的诊断及鉴别诊断价值，CT 能够提供更多的信息，具有更高的价值。

EPO-2431

肝脏影像报告和数据管理系统 LR-2 类肝硬化相关结节的 MRI 纵向观察分析

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【摘要】目的：探讨肝脏影像报告和数据管理系统（LI-RADS）LR-2 类肝硬化相关结节的 MRI 纵向观察分析。**方法：**回顾性分析 2012 年 9 月至 2018 年 12 月期间本院 MRI 首诊为 LR-2 类肝硬化相关结节，并进行过至少 1 次 MRI 增强随访复查，期间未进行过活检、手术等，共 47 例（105 个病灶）肝硬化患者纳入观察对象。记录随访时长、影像改变及 LI-RADS 分类调整情况。采用 Kaplan-Meier 曲线分析 LR-2 类肝硬化相关结节进展至 LR≥4 的 12、24、36 个月累积发生率。**结果：**105 个 LR-2 类肝硬化相关结节，随访时长 3.0～56.3 个月，平均 20.5 个月。随访期间，5 个上调至 LR-5，1 个上调至 LR-4，3 个上调至 LR-3，78 个保持不变，19 个下调至 LR-1。LR-2 类肝硬化相关结节进展至 LR≥4 的累积发生率为 4.8%，其中 12、24、36 个月累积发生率分别为 0.9%、6.1%、8.6%，演变过程中，均表现为病灶内铁廓清、T2WI 信号增高以及动脉期富血供转变。**结论：**肝硬化背景下约 5.7%的 LR-2 类肝硬化相关结节转归为可能或明确的 HCC，铁廓清、T2WI 信号增高及动脉期富血供转变为病变多步癌演变过程重要的影像征象。

EPO-2432

Reactive Thymic Hyperplasia on CT Following Chemotherapy in Adult Patients with Lymphoma

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OBJECTIVES Reactive thymic hyperplasia (RTH) not only occurred in children but also in older patients receiving regular chemotherapy for lymphoma. This study was aimed to report the specific CT findings of thymic in those patients, to do the follow-up visit, and to summarize the factors to influence lymphoma’s prognosis

METHODS Thirty-five patients with malignant lymphoma presenting with RTH and 43 patients without RTH after treatment were included in the present study. The size and density of the thymus were scored by using a thymic index with a scale of 6. The clinical and CT manifestations of both groups were reviewed retrospectively and analyzed by some traditional statistical methods, such as One-Way analysis of variance, T-test, and the regression analysis.

RESULTS Fourteen patients (14/35, 40%) in RTH group presented thymic atrophy during chemotherapy and showed thymic hyperplasia after chemotherapy withdrawal. The remaining 21 patients (21/35 60%) had not experienced thymic atrophy before RTH arising. RTH occurred in 5 of 21 patients during chemotherapy, and the rest 16 patients showed RTH a median of 6 months (range 1-12 months) after the termination of chemotherapy. There were no statistically significant differences in age, sex, types, and stage of lymphoma (p= 0.096,0.682,0.929,0.323) between patients with RTH and without RTH by univariate analysis. The thymic index was a potential predictor for RTH (P=0.002) in the two groups before therapy. Logistic regression of thymic index showed that patients with a thymic index higher than 0 were more likely to develop RTH after chemotherapy (thymic index = 1, P=0.03, OR=4.96, 95%CI = 1.71-14.38, thymic index ≥ 2, P=0.02, OR=13.95, 95% CI = 2.57-75.59). In addition, the prognosis of the two groups was also statistically different, p=0.037. The survival curve of patients with reactive thymic hyperplasia was higher than that of patients without hyperplasia.

CONCLUSIONS The time for the emergence of RTH in adult patients may be different in accordance with a series of CT follow-up. Some patients will show signs of thymic atrophy before RTH. The thymic index was significantly different before treatment between patients with RTH and without RTH after chemotherapy. Patients with a higher thymic index before treatment were more likely to develop RTH after chemotherapy. Adult lymphoma patients with thymic reactive hyperplasia have a better prognosis.

EPO-2433
钆塞酸二钠增强 T1mapping 成像肝功能评估肝胆期扫描时间的研究

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目的：探讨钆塞酸二钠增强 T1mapping 成像评估肝功能合理的肝胆期扫描时间。**方法：**纳入 124 例肝硬化患者 [LCA 组 63 例、LCB 组 47 例、LCC 组 4 例]及 23 例健康体检者（NLF）。采用 Gd-EOB-DTPA 行上腹部平扫及增强扫描，并采用 Look-Locker 序列分别于平扫、增强后 10min、15min 及 20min 采集 T1mapping 图像。测量肝脏 T1 弛豫时间，并计算增强后 10min、15min 及 20min 肝脏 T1 弛豫时间减低率（ΔT1）及弛豫率增加值（ΔR1）。采用重复测量方差分析比较不同级别肝功能组不同时间 T1、ΔT1 及ΔR1，采用 ROC 曲线评价 T1、ΔT1 及ΔR1 鉴别 NLF-LCA 与 LCB-LCC 组的效能。**结果：**NLF、LCA、LCB 组增强后 10min、15min 及 20minT1 弛豫时间逐渐减低，ΔT1 及ΔR1 逐渐增加，LCC 组增强后 10min、15min 及 20minT1 弛豫时间逐渐增加，ΔT1 逐渐减低。不同时间点 T1 弛豫时间、ΔT1 及ΔR1 差异均有统计学意义（F=23.125，28.061，67.421，P=0.000）。不同组别 T1 弛豫时间、ΔT1 及ΔR1 差异均有统计学意义（F=82.686，49.041，70.963，P=0.000）。增强后 10min、15min 与 20min 的 T1 弛豫时间鉴别 NLF-LCA 与 LCB-LCC 组的 ROC 下面积分别为

0.959、0.949、0.952。ΔT1 鉴别两者的 ROC 下面积分别为 0.880、0.879、0.894。ΔR1 鉴别两者的 ROC 下面积分别为 0.942、0.934、0.939。增强后 10min、15min 与 20min 的 T1 弛豫时间、ΔT1 及ΔR1 ROC 下面积差异均无统计学意义（$P>0.05$）。**结论：**采用钆塞酸二钠增强 T1mapping 成像评估肝功能时，于增强后 10min 采集肝胆期图像可满足诊断需求。

EPO-2434
多模态磁共振新技术联合应用在前列腺良恶性结节鉴别诊断的作用

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目的:探讨动态增强 MRI (DCE-MRI)和读段扩散加权成像(RESOLVE-DWI)在前列腺炎性结节和前列腺癌结节鉴别诊断中的应用价值。
方法:对 26 例前列腺癌患者和 29 例前列腺增生结节患者进行 dce 和 dwi 检查。计算时间信号强度曲线(TIC)类型、峰间时间(TTP)、增强峰(EP)、最大对比度增强比(MCER)、 表观扩散系数(ADC)和相对 ADC (rADC)值。两组间进行统计学分析，确定各参数的统计学意义。采用受试者工作特性(ROC)曲线分析和二元 logistic 回归分析，评价单指标和综合指标区分鉴别诊断能力。
结果:前列腺癌与前列腺增生结节的 TTP、EP、MCER、ADC、rADC 差异有统计学意义(p < 0.05)。其中 ADC 表现出最可靠的诊断性能，其次为 rADC、TTP、MCER、EP。此外，DCE-MRI 联合参数的诊断效率高于单纯 TTP、MCER 和 EP。此外，所有 DCE-MRI 和 DWI 参数联合使用，诊断效率最高(曲线下面积= 0.961)。
结论:DCE-MRI 联合 RESOLVE-DWI 对前列腺癌及前列腺增生结节有较好的鉴别效果。

EPO-2435
基于 DEC-MRI 和磁共振高分辨弥散(RESOLVE-DWI)在鉴别恶性和良性乳腺病变中的价值

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基于 (DCE-MRI),和磁共振成像(RESOLVE-DWI) 区分恶性和良性乳腺病变。本回顾性分析纳入 2018 年 1 月至 2019 年 4 月在福建某医院就诊的乳腺病变女性患者。根据病理诊断将患者分为良性组和恶性组。所有患者均行常规 MRI、分辨率 dwi、EPI-DWI、TWIST DCE-T1WI 检查。变量测量包括量化参数(K,篮子和 Ve),半定量的参数(速度的对比度增强对比剂流入[w],对比衰变率的对比剂流出(W-out)和 time-to-peak 增强对比剂注射后(TTP))和表观扩散系数(ADC)值 RESOLVE-DWI 。应用 ROC 曲线分析评价各参数对乳腺良恶性病变的诊断价值。共纳入 43 例患者(良性，n = 18;恶性，n = 26)。恶性组与良性组相比，K、Kep、win 显著升高，wout、TTP、ADCe、ADCr 显著降低(均 P < .05); Ve 组间差异无统计学意义。分辨率 dwi 在显示病灶边界及形态方面优于常规的 EPI-DWI，而 ADCr 在所有患者中均明显低于 ADCe。Kep、W-out、ADCr、ADCe 对良恶性病变的鉴别诊断效率最高(基于 AUC 值)。结合 3 个参数(Kep、W-out、ADCr)的诊断效率(AUC, 0.965)高于任何单个参数，区分良恶性病变的敏感性高(92.0%)，特异性高(96.0%)，准确率高(91.9%)。结合 Kep、W-out 和 ADCr 的指标有望用于乳腺病变的鉴别诊断。

EPO-2436

重症甲型 H1N1 流感的影像学表现及动态观察

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摘要 目的：探讨重症甲型 H 1N1 流感的胸部影像学表现。方法：回顾性分析 76 例重症甲型 H1N1 流感的影像学资料，将所有病例根据临床特点和病程分为三组：第 1 组（ n= 50）：门诊病例或是住院时间很短的病例；第 2 组（ n= 14）：临床上有急性呼吸衰竭但未用机械通气的病例；第 3 组（ n= 12）：急性呼吸衰竭同时需要机械通气的病例。观察所有患者平片、CT 表现，并对病变的大小、形态、数目和分布加以分析。结果：重症甲型 H 1N1 流感的主要影像学表现为双侧或单侧的磨玻璃样改变、实变或混合型病变，第 1 组以磨玻璃样改变为主，病变一般多发，可侵及所有肺叶，但主要发病部位为双肺下叶，多呈周围性分布；第 2 组以实变为主，可合并磨玻璃样改变或局灶性实变，恢复期可有少数病例呈纤维性修复；第 3 组以实变为主，可合并间质性改变，单纯磨玻璃样改变少见；少数病例可合并胸腔积液、心包积液和肺不张；第 3 组部分病例可伴有继发性气胸、纵膈气肿、皮下气肿以及霉菌感染，继发肺动脉高压、右心衰竭、肝脾淤血。结论：在不同的临床病程中患者有不同的影像学表现。轻症病例影像学表现比较轻微，恢复也比较彻底，一些重症病例可呈纤维性修复，而危重病例，尤其是需要机械性通气的病例其并发症尤其是气胸的发生概率较高，且病情变化比较反复，在病变进展期及时复查 X 线胸片以了解影像的变化，对于正确地评估病情、采取积极恰当的治疗措施将起到重要的指导作用。

EPO-2437

感染性脊柱炎的影像表现

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目的：探讨感染性脊柱炎的影像学征象，提高该病的影像学诊断及鉴别诊断水平。方法：回顾性分析 33 例经临床确诊的感染性脊柱炎病例资料，并对其特异性影像学征象进行分析、总结。结果：所有 33 例病例中，结核性脊柱炎 15 例、化脓性脊柱炎 11 例、布氏杆菌脊柱炎 7 例；其中 16 例行 DR 检查， 28 例行 CT 检查， 31 例行 MRI 检查。DR 可显示脊柱炎椎体终板缘骨质破坏同时伴有明显的骨质增生、硬化，相邻椎间隙改变；CT 除显示 DR 的表现外，可显示较早期的微小骨质破坏；MRI 在病变早期就可显示椎体、椎间盘及周围软组织内的异常信号，并可显示微量椎旁及腰大肌脓肿，且增强扫描可显示椎旁条状及环状强化，但对骨质增生硬化显示不敏感。脊柱结核椎体骨质破坏类型以局限性脓肿、溶通性脓肿较多见，而非特异性化脓性脊柱炎和布氏杆菌性脊柱炎椎体骨质破坏类型以肉芽肿较多见；脊柱结核多伴有椎间隙明显狭窄，而非特异性化脓性脊柱炎和布氏杆菌性脊柱炎一般椎间隙狭窄少见或仅有轻度狭窄。脊柱结核椎间盘破坏较严重，而后两者一般表现为椎间盘无或者轻度破坏。脊柱结核椎旁病变蔓延性脓肿较多见，后两者以局限性肉芽肿、局限性脓肿较多见。脊柱结核椎体塌陷较严重，而后两者一般表现为椎体无或者轻度塌陷。

结论：提高对感染性脊柱炎的特异性影像学征象的认识，结合患者的生活史、工作史以及相关实验室检查，对感染性脊柱炎的诊断及鉴别诊断具有重要的价值。

EPO-2438
初治无耐药 HIV/AIDS 合并纵隔淋巴结结核短期抗结核治疗疗效观察

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摘 要： **目的** 对比分析初治无耐药 HIV/AIDS 与非 HIV/AIDS 合并纵隔淋巴结结核患者抗结核过程中淋巴结大小变化，探寻 CT 扫描对 HIV/AIDS 合并纵隔淋巴结结核疗效评价价值。**方法** 本文搜集 2016 年 1 月-2018 年 6 月南宁市第四人民医院初治无耐药艾滋病合并纵隔淋巴结结核患者的临床及 CT 扫描资料作为观察组，搜集同时期初治无耐药非艾滋病纵隔淋巴结结核患者的临床及 CT 资料作为对照组，淋巴结结核治疗采用 3HRZE/15HRE 方案。对比分析两组淋巴结结核患者化疗前临床表现及抗结核过程中（1M、2M、4M、6M、8M、12M 及以上）疗效差异。**结果** 两组纵隔淋巴结结核患者性别、年龄、治疗前痰涂片阳性率、结核分枝杆菌符合群阳性率、咳嗽、咳痰及发热差异均不具有统计学意义（P>0.05）。观察组治疗前 $CD4^+$T 淋巴细胞显著低于对照组（t=-5.965，P<0.000），治疗后观察组 $CD4^+$T 淋巴细胞上升，差异具有统计学意义（t=-5.011，P<0.000）。两组患者首次住院时间差异不具有统计学意义，观察组 7 例因发生免疫重建炎性综合征而重复住院治疗，对照组 1 例因病情变化而重复住院治疗，两组患者总住院时间差异具有统计学意义（t=3.204，p=0.004）。两组患者抗结核治疗 1M、2M、4M、6M、8M、12M 以上后疗效差异均不具有统计学意义（Fisher 精确检验，P>0.05），但观察组患者在抗结核治疗 1-2M 后淋巴结增大（38.89%，7/18）。**结论** 初治无耐结核药的 HIV/AIDS 与非 HIV/AIDS 合并纵隔淋巴结结核患者抗结核短期疗效无显著差异，但推荐 CT 扫描用于评估 HIV/AIDS 合并纵隔淋巴结结核抗结核疗效，特别是 HAART 的早期，有助于临床尽早对 TB-IRIS 作出诊断。

EPO-2439
Investigation of Zero TE MR in preoperative planning in dentistry

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Purpose:
To investigate the feasibility of using zero TE (zTE) imaging as an alternative to cone beam CT(CBCT) imaging for preoperative planning in dentistry.
Methods:
This prospective study was approved by the ethical committee in our hospital, and all participants gave written informed consent prior to the study. Twenty-two patients with the need of tooth extraction or planting (11 males, 11 females, age 26~65) from Zero TE imaging at 3.0T. The performance of zTE imaging was assessed by two dentists using CBCT as a gold standard in preoperative planning for tooth extraction

(qualitative classification) and implanting (quantitative dimensional measurement). Two way random intraclass correlation coefficient (ICC) with absolute agreement was used to assess the consistency between the measurements of zTE and CBCT, and the measurements between the two reviewers. ICC reflects the level of inter-observer variance to the total variance and a high ICC level (close to 1) indicates high consistency. A P<0.05 was considered as statistically significant.

Results:

Zero TE imaging showed clear delineation of the teeth and mandible, and showed better depiction of the mandible canal as compared to CBCT. In assessing the spatial relationship between the third molar and the mandibular canal, identical results were obtained from two readers based on zTE and CBCT images; in spatial measurements related to second premolar, high intraclass coefficient was obtained in all the performed measurements between zTE and CBCT (0.782 to 0.921) and in between reviewers (0.812 to 0.958). The results of Bland Altman analysis also indicated low level of bias (max -1.8%) and disagreements (max -15.1% to 11.3%) between the results of zTE and CBCT.

Conclusion:

zTE MR imaging method has been investigated for the needs of preoperative planning in dentistry for the first time. Side-by-side comparison with CBCT allowed its clinical utility to be assessed. Preliminary results were promising and with the widespread of zTE techniques, its use in dentistry imaging area may be considered in circumstances when CT imaging is undesirable. Zero TE imaging may be a potential imaging tool in preoperative planning in dentistry when CBCT is undesirable.

EPO-2440

双分支深度网络 CT 计算机辅助诊断技术对特发性肺间质纤维化蜂窝影体积量化评估的临床应用

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目的：探讨双分支深度网络 CT 计算机辅助诊断(CAD)技术定量测量特发性肺间质纤维化患者肺部蜂窝影体积的临床应用价值。

材料与方法：收集 30 天内行胸部 HRCT 和肺呼吸功能检查的 IPF 患者 33 例（男性 27 例，女性 6 例；平均年龄 75 岁）；平均吸烟指数（支/年）284；身体质量指数:22kg/m^2。超过 80%HRCT 图像于双源 64 排 CT 机采集，取仰卧位，双手过头，深吸气后屏气。扫描范围自肺尖至肺底。扫描参数：管电压 120KV；管电流 150mAS；层厚 1mm；层间距 1mm。肺窗：窗宽 1200HU，窗位-600HU；纵隔窗：窗宽 400HU，窗位 40HU。两名放射科医生利用 PACS 手动测量气管隆突层面、右下肺静脉层面及其中间层面上蜂窝影和相应肺野面积，计算各肺野蜂窝影面积之比的平均值（MHA%）及总面积之比（HA%）。软件运用半自动切分算法，提取双肺、切除肺内支气管，切分出肺内蜂窝影，计算双肺蜂窝影与相应肺体积之比（HV%）。肺功能记录相对完善的 FVC%pred、FEV_1%pred、FEV_1/FVC、DLco%pred、DLco/VA%pred 值。用 SPSS 24.0 统计分析数据。

结果：两位放射科医生的数据之间具有较强一致性，Weighted Kappa 系数为 0.717。HV%与 MHA%、HA%具有显著正相关性（p＜0.001），与 FVC%pred（%）、FEV_1%pred（%）及 DLco%pred（%）、DLco/VA%pred 具有负相关性（P＜0.05）；HV%与 FEV_1/FVC（%）、CPI 无明显相关性（p＞0.05）。

结论：该网络 CTCAD 技术定量测量蜂窝影的体积之比与手动测量的面积之比存在显著的正相关性，具有很高的准确度。该技术定量测量蜂窝影的体积之比与 FVC%、FEV_1%、DLco%、DLco/VA% pred（%）存在负相关性，有助于评估患者的病情、治疗疗效和预后。

EPO-2441
脾脏炎性肌纤维母细胞瘤的 CT 和 MRI 特征分析

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目的 分析脾脏炎性肌纤维母细胞瘤（SIMF）的 CT 和 MRI 影像特征，提高对该病诊断的准确性。**方法** 回顾性分析 6 例 SIMF 患者的 CT 或 MRI 影像资料。分析指标包括病灶形态、大小、边界、包膜、密度/信号特点和强化方式等，对各影像特征进行归纳和统计。**结果** 6 例患者中行 CT 检查 5 例（增强扫描 3 例，平扫 2 例），MRI 检查 2 例（MRI 增强扫描 1 例，平扫 1 例），同时有 CT 和 MRI 两种检查 1 例。6 例 SIMF 均为单发病灶（6/6，100%）；平均直径（3.9±0.9）cm；病灶圆形或类圆形 5 枚（5/6，83.33%），葫芦状 1 枚（1/6，16.67%）；病灶边界清晰 5 枚（5/6，83.33%），边界不光整 1 枚（1/6，16.67%）；平扫密度不均匀 4 枚（4/5,80.0 %），信号不均匀 2 枚（2/2,100%）。MRI 上 3 例病灶的实质部分 T1WI 呈稍低信号，T2WI 不均匀低信号，2 例出中心现中心液化坏死区，T1WI 呈低信号，T2WI 呈高信号。CT 或 MRI 增强后病灶渐近性强化 3 枚（3/3，100%）；低密度包膜环 3 枚（3/3，100%）。6 例患者仅 1 例术前诊断正确（1/6，16.67%）。结论 SIMF 以单发病灶为主，类圆形外观、边界清晰为其常见大体表现，渐近性强化伴地图样未强化区为其主要强化特点，掌握以上征象有利于提高诊断准确率。

EPO-2442
肝硬化背景下肝细胞癌 Gd-DTPA 和 Gd-EOB-DTPA 表现：基于 LI-RADS（ 2018 版）分类标准的对照研究

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【摘要】目的基于肝脏影像报告和数据系统（LI-RADS）2018 版评分系统，探讨马根维显 MRI（Gd-DTPA-MRI）与钆塞酸二钠 MRI（Gd-EOB-MRI）对肝硬化背景肝细胞癌（HCC）分类诊断中的个体内对照研究。**方法** 2014 年 2 月至 2018 年 6 月共 70 例（81 个 HCC 病灶）经病理证实的慢性肝硬化患者入组本研究，均行 Gd-DTPA 和 Gd-EOB-DTPA 检查（两项检查间隔时间＜1 个月）。由 2 位高年资放射科医师对 HCC 主要征象共同分析，参照 LI-RADS 分类标准，对 Gd-DTPA-MRI 和 Gd-EOB-MRI 分别进行评分；调整 LI-RADS-EOB 分类标准（增加 HBP 低信号为主要征象，LI-RADS-EOBa1；HBP 低信号环视为包膜，LI-RADS-EOBa2；TP 低信号视为廓清，LI-RADS-EOBa3），并重新进行评分。比较 Gd-DTPA-MRI、Gd-EOB-MRI 以及调整后的评分诊断为 LR-5 的敏感性。**结果** Gd-EOB-MRI 对廓清征象(p=0.012)和包膜征象(p=0.036)的显示率较低。在诊断 LR-5 敏感性上，LI-RADS-DTPA 高于 LI-RADS-EOB(p=0.013)和 LI-RADS-EOBa2(p=0.037)，低于 LI-RADS-EOBa1(p=0.005)，而与 LI-RADS-EOBa3(p=1)相当。**结论**调整后的 LI-RADS-EOB，如增加 HBP 低信号（主要征象）或 TP 低信号（视为廓清）能有效提高 HCC 诊断敏感性。

EPO-2443
肝硬化背景下 MRI 肝脏影像报告和数据管理系统 LR-2、LR-3、LR-4 类结节的纵向观察及分析

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目的探讨肝硬化背景下 MRI 肝脏影像报告及数据系统（LI-RADS v2018）LR-2、LR-3、LR-4 类结节的纵向观察分析。**方法**回顾在本院进行过至少 1 次肝脏 MRI 增强随访复查，首次 MRI 评价为 LR-2、LR-3、LR-4 类病变，且未进行过活检、手术等的 158 例（245 个病灶）肝硬化患者。LR-2 结节 105 个、LR-3 结节 97 个、LR-4 结节 43 个。记录随访时长及 LI-RADS 分类调整情况。单因素方差分析比较 LR-2、LR-3、LR-4 类病变的随访时间，Kaplan-Meier 曲线分析 LR-2、LR-3、LR-4 结节分类上调发生率，采用 Log-Rank 检验比较。**结果** LR-2、LR-3、LR-4 类病变的随访时间分别为（20.5±11.4）、（18.1±10.5）和（13.8±9.9）个月，差异有统计学意义（F=6.58，P=0.002）。LR-2 结节中，4 个进展至 LR-5，2 个上调至 LR-4，4 个上调至 LR-3，72 个保持不变，23 个下调至 LR-1。LR-3 结节中，15 个上调至 LR-5，6 个上调至 LR-4，57 个保持不变，6 个下调至 LR-2，13 个下调至 LR-1。LR-4 结节中，15 个上调至 LR-5，其中 5 个显示阈值增长，7 个显示亚阈值增长；2 个因门脉癌栓进展为 LR-TIV；23 个保持不变；3 个下调至 LR-1。LR-4 结节上调至 LR-5/-TIV 的发生率较 LR-2、LR-3 结节高（P均＜0.01），其中 3、6、12 个月进展至 LR-5-TIV 的累积发生率 LR-4 结节分别为 4.7%、11.6%、31.2%，LR-3 结节分别为 0、4.2%、6.6%，LR-2 结节均为 0。LR-3 结节进展至 LR≥4 的累积发生率高于 LR-2 结节（P＜0.01）。**结论**肝硬化背景下 LR-2、LR-3、LR-4 结节呈现不同的自然病程及转归，LI-RADS 分类较高结节进展至 LR-5/-TIV 的累积发生率越高。

EPO-2444
钆塞酸二钠增强 STIR-DWI 与 CHESS-DWI 对肝细胞癌检出价值的比较

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目的 比较 STIR-DWI 和 CHESS-DWI 在钆塞酸二钠(Gd-EOB-DTPA)增强 MRI 中对肝细胞癌(HCC)的检出价值。 **方法** 前瞻性纳入 37 例经病理证实的 HCC 患者,所有患者均行上腹部 Gd-EOB-DTPA 增强 MRI 扫描,并于增强后 13-15min 采集 STIR-DWI 和 CHESS-DWI 图像。测量 STIR-DWI 和 CHESS-DWI 序列肝实质的信号强度(SI)、标准差(SD)、ADC 值及 HCC 的 SI、ADC 值,计算 2 个序列肝脏的信号噪声比(SNR)、HCC 的对比噪声比(CNR),记录 STIR-DWI 和 CHESS-DWI 序列 HCC 病灶和肝脏解剖结构的显示情况。采用配对样本 t 检验或 Wilcoxon 秩和检验比较 STIR-DWI 和 CHESS-DWI 序列肝脏的 SNR、HCC 的 CNR、肝脏和 HCC 的 ADC 值、HCC 病灶的显示程度及肝脏解剖结构显示的清晰程度。 **结果** STIR-DWI 序列肝脏的 SNR(14.93±4.79)低于 CHESS-DWI 序列(22.84±7.07),STIR-DWI 序列 HCC 的 CNR(37.02±19.31)高于 CHESS-DWI 序列(30.43±21.62),差异均有统计学意义(P均<0.05)。肝脏及 HCC 的 ADC 值 STIR-DWI < CHESS-DWI,HCC 病灶的显示程度 STIR-DWI > CHESS-DWI,肝脏解剖结构的清晰程度 STIR-DWI < CHESS-DWI,差异均有统计学意义(P均<0.05)。 **结论** Gd-EOB-DTPA 增强 MRI 中,STIR-DWI 比 CHESS-DWI 更有助于 HCC 的检出。

EPO-2445
Gd-EOB-DTPA 增强 T1 mapping 成像对肝纤维化分期的评估价值

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目的 探讨 Gd-EOB-DTPA 增强 T1mapping 成像对肝纤维化分期的评估价值。 **方法** 共 99 例患者纳入此项研究，其中对照组健康志愿者 23 例，慢性乙型肝炎肝纤维化 S1 期 13 例，S2 期 13 例，S3 期 26 例，S4 期 24 例。检查采用 Look-Locker 序列于 Gd-EOB-DTPA 增强前及增强后 20 分钟（肝胆期）采集 T1mapping 图像，并测量肝组织 T1 弛豫时间，同时计算肝胆期 T1 弛豫时间减低率。采用单因素方差分析比较增强前及增强后 20 分钟不同组别之间肝脏 T1 弛豫时间减低率及 T1 弛豫时间，并使用 ROC 曲线分析肝脏 T1 弛豫时间减低率及 T1 弛豫时间对相邻肝纤维化级别的诊断效能。 **结果** S0 组肝 T1 pre、T1HBP、ΔT1 分别为（ 777.70 ±72.40）ms、（ 230.09 ± 37.73）ms、（ 70.06 ± 6.61）% ，S1 组为（ 860.69 ± 90.14）ms、（ 310.62 ± 104.49）ms、（ 64.42 ± 13.80）% ，S2 组分别为（ 903.15 ± 80.01）ms、（ 316.38 ± 115.41）ms、（ 63.44 ± 13.56）% ，S3 组分别为（ 822.92 ± 104.59）ms、（ 554.54 ± 86.7）ms、（ 39.18 ± 11.57）% ，S4 组分别为（ 924.16 ± 99.98）ms、（ 558.69 ± 101.00）ms、 （ 38.93 ± 12.41）% 。S0、S1、S2、S3 与 S4 组 T1pre 及 T1HBP 差异均有统计学意义（ P ＜ 0.05）； T1 pre、T1HBP、ΔT1 鉴别 S0 与 S1 的 AUC 分别为 0.771、0.771、0.629，鉴别 S2 与 S3 的 AUC 分别为 0.582、0.933、0.913。 **结论** Gd-EOB-DTPA 增强 T1mapping 成像对肝纤维化的评估有一定的价值。

EPO-2446
Gd-EOB-DTPA 增强 T1 mapping 成像及扩散加权成像对肝纤维化分期的评估价值

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探讨 Gd-EOB-DTPA 增强 T1mapping 成像及 DWI 对肝纤维化分期的评估价值。方法 ：共 99 例患者纳入此项研究，其中对照组 23 例，肝纤维化 S1 期 13 例，S2 期 13 例，S3 期 26 例，S4 期 24 例。检查采用 Look-Locker 序列于增强前及 Gd-EOB-DTPA 肝胆期采集 T1mapping 图像，并测量肝组织 T1 弛豫时间，同时计算肝胆期 T1 弛豫时间减低率（ΔT1）。测量 ADC。比较不同组别 ADC 值、肝脏 ΔT1 及 T1HBP。以肝纤维化 S≥2 和 S≥3 为阳性标准，分别对 ADC、T1HBP、ΔT1 采用受试者工作特征曲线 ROC 分析其诊断效能。采用 Spearman 相关分析评价各参数值与肝纤维化分期的相关性。结果：S0 组 ADC、T1HBP、ΔT1 分别为（1.57±0.16）×10-3 mm2/s、（ 239.08±20.63）ms、（ 69.24±4.64）% ，S1 组为（ 1.44±0.12)×10-3 mm2/s、（ 273.57±53.75）ms、（ 64.27±9.94）% ，S2 组分别为（ 1.31±0.12)×10-3 mm2/s、（ 375.74±97.86）ms、(61.14±5.61）% ，S3 组分别为（ 1.18±0.09)×10-3 ms、（ 561.59±56.55）ms、（ 38.76±6.08）% ，S4 组分别为（ 1.03±0.08)×10-3 mm2/s、（ 564.69±68.62）ms、（ 37.01±6.80）% 。诊断≥S2 期肝纤维化 ADC 值、 ΔT1 及 T1HBP 的 AUC 面积分别是 0.903,0.984,0.987；诊断≥S3 期肝纤维化 ADC 值、 ΔT1 及 T1HBP 的 AUC 面积分别是 0.817,0.847,0.930.结论： Gd-EOB-DTPA 增强 T1mapping 成像及磁共振扩散加权成像对肝纤维化的评估有一定的价值。

EPO-2447

先天性无痛无汗症一例

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患者，男，11 岁，发现左足脓疱形成，破溃后出现左足红肿，活动障碍，肿胀逐渐加重，家属诉患儿既往因无痛感反复外伤，自小发现无汗，具体时间不详。
先天性无痛无汗症(congenial insensitivity to pain with anhidrosis，CIPA)Y. 称遗传性感觉和自主神经障碍Ⅳ型. 是一种罕见的常染色体隐性遗传病。
本病的临床及 X 线表现与夏科氏关节相似，但在儿童中发生夏科氏关节并有明显骨折、脱位，或有广泛性感染时应考虑本病。

EPO-2448

艾滋病颈部淋巴结结核的 CT 诊断与鉴别诊断

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目的 探讨艾滋病（AIDS）患者颈部淋巴结结核（CTL）的 CT 诊断及鉴别诊断。**方法** 回顾性分析经颈部淋巴结取材活检证实病因的 AIDS 并颈部淋巴结肿大患者的颈部 CT 资料，总结 AIDS 并 CTL 的 CT 特征，提高对其 CT 诊断与鉴别诊断能力。**结果** 70 例患者中 CTL 39 例，马尔尼菲蓝状菌（TM）病 4 例，AIDS 相关性淋巴结病 4 例，慢性淋巴结炎 1 例，AIDS 相关性淋巴结病合并 CTL、TM 病 1 例，淋巴结转移瘤（LNM）10 例，非霍奇金淋巴瘤（NHL）10 例，卡波西肉瘤 1 例。AIDS 并 CTL 的病人 CT 表现多样，表现为均匀稍低密度 2 例，均匀软组织密度 8 例，均匀与不均匀共存 8 例，不均匀密度 21 例，3 例 CTL 出现钙化，2 例颈部皮肤破溃并窦道形成；增强扫描以环形强化多见，表现为均匀强化与环形强化共存 4 例，环形强化 15 例，不均匀强化 1 例，不均匀强化与环形强化共存 2 例。4 例 TM 病均表现为稍低密度淋巴结肿大，1 例患者增强扫描呈轻度均匀强化。10 例 LNM 表现为均匀软组织密度 2 例、均匀与不均匀密度共存 6 例、不均匀密度 2 例，出现均匀软组织密度淋巴结肿大较 CTL 多见（fisher 精确检验，P=0.02）；6 例行增强扫描表现为均匀强化 1 例、不均匀强化 3 例、不均匀强化与环形强化共存 2 例。10 例 NHL 表现为均匀软组织密度 2 例、不均匀密度 6 例、两者共存 2 例，6 例行增强扫描表现为均匀强化 2 例、不均匀强化 3 例，不均匀强化、环形强化共存 1 例。LNM 及 NHL 淋巴结最大径较 CTL 大，环形强化率较 CTL 低（fisher 精确检验，P＜0.01）。**结论** AIDS 并 CTL 的 CT 表现多样，增强扫描多为环形强化；肿大淋巴结的 CT 表现对 AIDS 并 CTL 的诊断及鉴别诊断具有重要作用。

EPO-2449

Gd-EOB-DTPA 增强 MR 胆管成像定量评估肝脏储备功能的价值

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目的探讨钆塞酸二钠（Gd-EOB-DTPA）增强 MR 胆管成像对乙肝肝硬化患者肝脏储备功能的定量评估价值。**方法**回顾性分析 115 例乙肝肝硬化患者。根据肝功能 Child-Pugh 分级分为 3 组：Child-Pugh A 级组 55 例、B 级组 50 例和 C 级组 10 例；根据 MELD 评分分为 2 组：MELD 评分≤10 组 70 例和 MELD 评分＞10 组 45 例；根据吲哚氰绿 15min 滞留率（ICG-R15）分为 2 组：ICG-R15≤20%组 63 例和 ICG-R15＞20%组 52 例。所有受试者行上腹部增强 MR 扫描。采用单因素方差分析比较不同 Child-Pugh 分级组患者的胆总管相对信号强度（RSI），相关分析采用 Spearman 秩相关分析。采用独立样本 t 检验分别比较不同 MELD 评分和不同 ICG-R15 组患者的胆总管 RSI，相关分析采用 Pearson 相关分析。采用 ROC 评价胆总管 RSI 鉴别肝功能 Child A 级与 Child B-C 级组、MELD 评分≤10 与＞10 组及 ICG-R15≤20%与＞20%组患者的效能。采用回归分析观察胆总管 RSI 与相关实验室检查结果的关系，采用多元逐步回归筛选胆总管 RSI 的重要预测因素。**结果** Child-Pugh A 级、B 级与 C 级组胆总管 RSI 为 4.26±0.94、2.57±1.23 和 1.90±1.10, 差异有统计学意义（P＜0.01）。MELD 评分≤10 与＞10 组胆总管 RSI 为 4.10±0.95、2.10±1.15，差异有统计学意义（*P*＜0.01）。ICG-R15≤20%与＞20%组胆总管 RSI 为 4.22±0.93、2.23±1.11，差异有统计学意义（*P*＜0.01）。ICG-R15 和 MELD 评分是胆总管 RSI 的重要预测因素（*P*值＜0.01）。**结论** Gd-EOB-DTPA 增强 MR 胆管成像可以定量评估乙型肝炎肝硬化患者的肝脏储备功能，胆总管 RSI 对鉴别轻度肝功能损伤与中重度肝功能损伤有一定价值。

EPO-2450

艾滋病合并脑内弓形虫感染的影像学表现

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摘要:依据弓形虫脑炎病灶发生的部位影像学可分为脑室型、脑实质型和混合型。影像学特点为双侧多发病灶为主，单发病灶较少见。病灶直径一般在 0.4-3.0cm 之间。病灶的好发部位以基底节区(70%-75%)多见，也可累及小脑、脑干和皮髓交界区，脑室和后颅凹亦可受侵。在头颅 CT 平扫时约 80%的病灶表现为低密度，该低密度不能明确区分感染灶和其外周水肿。ＣＴ增强后病灶呈境界清晰的环状强化，少数呈结节状，位于室管膜下，酷似浸润性病变。大剂量增强扫描 ，能发现更多结节状病灶。MRI 对艾滋病合并弓形虫脑病的诊断具有更高的敏感性 。MRI 表现特点主要有：①弓形虫脑病的发病部位以额叶、基底节及丘脑和脑干为主，而脑室、脑室管膜很少受侵；②)颅内见多发病灶，其形态以类圆形或结节状为主；③病灶的 MRI 信号主要表现为 T1WI 低信号，如果病灶 T1WI 出现高信号，考虑为病灶内少量出血的可能；T2WI 多为高信号；增强后病灶的强化形式主要表现为环形强化、花瓣样和结节样强化； MRI 病灶未见明显强化也占一定比例（大约 36%）。磁共振 T1WI 增强后的“靶征”具有一定的诊断意义，病灶的“靶征”通常至少有 3 个不同的层面组成，最内层是有强化的中心，中间是低信号的一层，最外层是高信号强化层，但是经常内层的高信号欠完整；偶尔 T1WI 上的“靶征”只有两个层面组成，内层表现为等或低信号，外层为环形强化带。利用磁共振波谱成像(MRS)、扩散加权成像(DWI)以及灌注成像(PWI)这些新技术来研究寻找弓形虫脑病的影像诊断特点有意义。有学者发现弓形虫脑病局部脑组织发生凝固性出血性坏死，病灶内的液化坏死区主要成分为炎症细胞、弓形虫及蛋白质，水分子弥散受限，ADC 值有降低。

EPO-2451

PET/CT 在肺外结核诊断中的应用价值

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目的 探讨肺外结核 PET-CT 影像表现及诊断方法。**方法** 回顾性分析 46 例肺外结核的 PET-CT 影像学资料，总结病变的影像学特点并结合文献复习。**结果** 46 例均经病理诊断。所有病灶均表现为 ^{18}F-FDG 不同程度摄取，SUVmax 范围为 1.3-30.0。按照发病部位大致可分为 4 大类：(1)淋巴结结核 24 例，表现为不同程度增大淋巴结影，7 例淋巴结融合，5 例见中心坏死，3 例 CT 增强可见环形强化。(2)膜性结核 14 例。累及腹膜、心包及脑膜。表现为不同程度、不均匀增厚，并伴有不同程度腹腔积液。 (3)脏器结核 13 例。累及脾，肝脏，胰腺，肠道，前列腺及精囊腺，卵巢。实质脏器主要表现为低密度影，前列腺及精囊腺 ^{18}F-FDG 异常浓聚。仅 3 例为单纯脏器结核，其它均合并其它肺外结核。(4)骨关节结核 8 例。3 例为脊柱结核，2 例累及腰椎，1 例累及胸椎，均表现为溶骨性骨质破坏，椎间隙狭窄，椎旁软组织肿胀及肿块。1 例为尺骨远端膨胀性骨质破坏，伴周围软组织肿胀。4 例为全身多发骨质破坏，软组织肿块不明显。**结论** 肺外结核的 PET-CT 表现多样化， PET-CT 对肺外结核具有一定的价值。淋巴结结核和骨结核的环形摄取为 PET 图像较为特征性表现。熟悉其 PET-CT 表现有助于该病的诊断、鉴别诊断与疗效观察，确诊仍须依靠临床病史、实验室检查及病理检查。

EPO-2452

WHO 全球结核报告：全球与中国关键数

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摘要:结核病是十大死因之一。2017 年，结核病在非艾滋病人中导致 130 万人死亡，在艾滋病毒抗体阳性者中估计有 30 万人死于结核病。在全球范围内，2017 年有 1000 万人患上了结核病。而耐药结核病仍然是结核病疫情中较难控制的一环。2017 年，全世界有 55.8 万人患上了耐多药和耐利福平的结核病，其中 82% 为耐多药结核病。印度、中国和俄罗斯联邦的总和几乎占世界耐多药耐多药病例的一半。虽然在全球所有 WHO 区域和大多数国家中，结核病造成的疾病负担正在下降，但速度不够快，无法达到《终结结核病战略》的 2020 的第一个里程碑。结核病人的诊断和成功治疗每年可避免数百万人死亡 (2000-2017 年期间估计有 5400 万人)，但在检测和治疗方面仍然存在巨大的缺口。新病例的最新治疗结果数据显示，2016 年全球治疗成功率为 82%。如果不加强研究和开发，就无法实现 2035 年结束结核病战略的目标。

EPO-2453

耐药肺结核的分类与分型及影像表现

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摘要:耐药结核病是由耐药结核分枝杆菌所引起的结核病,是目前威胁人类健康的主要呼吸道传染病。在全球范围内，2017 年 WHO 报告了 160 684 例耐多药结核病和利福平耐药结核病(MDR/RR-TB)，接受治疗的人数有 139 114 例。约有 47%的耐药结核病来自印度（24%）、中国（13%）和俄罗斯（10%）。同时，约有 23 万耐多药/利福平耐药患者死亡。为了有效地规范耐药肺结核预防、诊断和治疗，临床上依据实验室细菌学及耐药产生的原因等对结核分枝杆菌耐药分为新发耐药结核和复治耐药结核两大类，依据耐药数量和种类分为单耐药、多耐药、耐多药、广泛耐药和利福平耐药五型。本文主要就利福平耐药、耐多药和广泛耐药肺结核的影像表现进行描述，并附典型病例胸

片和 CT 图，三种耐药肺结核分别具有一些影像学特点，主要表现为肺内多发性厚壁空洞、大小不等的结节影、斑片状实变影、纤维条索状影及部分表现为淋巴结肿大和胸腔积液。病变累及范围广泛、迁延时间长并可出现毁损肺。掌握耐药肺结核的发病率、病死率、临床分型及分类，了解主要类型耐药肺结核的影像学表现特点，有利于指导临床诊断、治疗和疗效评价，降低其发病率和病死率。

EPO-2454

艾滋病合并肺部卡波西肉瘤的临床影像分析

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目的：为进一步认识艾滋病合并肺部卡波西肉瘤的影像表现。
材料与方法：收集中国七家传染病专科医院确诊的艾滋病合并肺部卡波西肉瘤的相关资料，根据纳入标准及排除标准，对满足要求的 34 例患者进行临床及影像资料整理分析,男性 33 例，女性 1 例，年龄在 20-50 岁。
结果：34 例艾滋病合并肺部卡波西肉瘤患者，79%患者的 CD4+细胞计数低于 100 个/UL，HAART 治疗有效。肺部表现肺部结节影 30 例（88%），斑片影 18 例（53%），磨玻璃影 11 例（32%），小叶间隔增厚 14 例（41%），动态观察发现 HAART 治疗前肺部结节边缘由光整到不光整、火焰状/星星状、斑片影。同时合并 5 例肝脏卡波西肉瘤，影像表现为结节、肝内胆管扩张，甲状腺 1 例表现为低密度结节，1 例肋骨及 1 例上颌骨均为溶骨性骨质破坏并周围软组织结节。

结论：艾滋病合并肺部卡波西肉瘤的影像表现主要是多形性结节病灶，即结节侵润或结节合并线性侵润进展的不同阶段的表现，同时合并的肝脏、甲状腺 KS 影像表现也是结节病灶。

EPO-2455

脑实质结核的 MRI 影像学分型及其治疗后演变规律的 MRI 研究

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目的 分析脑实质结核的 MRI 特点，探讨脑实质结核抗结核治疗中的 MRI 影像学演变规律。**材料与方法** 对 28 例脑实质结核患者行 MRI 检查，分析脑实质结核的 MRI 表现特点；动态观察治疗前后不同时期结核病灶的 MRI 影像学特点及演变过程，采用卡方检验比较不同类型结核病灶的消失率。**结果** 脑实质结核 28 例 337 个病灶，实性均匀强化病灶 102 个，约 69.6%≤3.0mm，25.5%在 3.0mm 与 10.0mm 之间；环形强化病灶 235 个，环壁厚薄均匀、光整，约 32.34%在 3.5mm 至 5.0mm 之间，45.53%在 5.0mm 与 10.0mm 之间，22.13%≥10.0mm。治疗后 1 个月内直径≤3.0mm 病灶及直径为 3.0mm 与 10.0mm 之间病灶的消失率分别为 41.0%、15.5%，治疗后 3 个月内病灶消失率分别为 79.9%、38.4%，治疗后 6 个月内病灶消失率分别为 97.1%、52.9%。治疗不同时间段的直径≤3.0mm 病灶的消失率均高于直径为 3.0mm 与 10.0mm 之间病灶的消失率（x^2值分别为 46.130、96.156、131.856，P<0.05）；且实性强化结节的消失率高于环形强化结节（x^2值分别为 5.344、20.318、24.673，P<0.05）。治疗中 3 例出现新发病灶。**结论** 结合脑实质结核的病灶大小及强化特点可分为粟粒型（病灶直径≤3.0mm）、多发结节型（病灶直径为 3.0mm 与 10.0mm 之间）及结核瘤型（病

灶直径≥10.0mm），较符合结核结节的病理特征。准确分析脑实质结核不同 MRI 影像学分型病灶的动态变化，有利于预测及评估抗结核药物的疗效。

EPO-2456
Gd-EOB-DTPA 在无周围胆管扩张的肿块型肝内胆管癌诊断中的应用

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【摘要】 目的 探讨钆塞酸二钠（Gd-EOB-DTPA）增强 MRI 在不伴有局灶胆管扩张的肿块型肝内胆管癌（MICC）诊断中的应用价值。**方法** 回顾本院 17 例经术后病理确诊为 MICC，MRI 图像未见周围胆管扩张并且行 Gd-EOB-DTPA 增强扫描的患者资料。由 2 位高年资 MR 诊断医师观察病灶影像特征，包括 T2WI、DWI、动态增强及肝胆期。**结果** 17 例均为中、低分化腺癌，其中 1 例为胆管细胞癌和肝细胞混合，6 例伴微血管浸润（MVI）。根据动脉期强化模式，将 MICC 分为两组：典型 MICC 组（n=15），动脉期表现为环形或周边强化，过渡期呈向心性延迟强化；非典型富血供 MICC 组（n=2），动脉期表现为全瘤或近乎全瘤强化，过渡期呈持续性强化。58.8%（10/17）DWI 显示“靶征”（典型 MICC 组 8 个，富血供 MICC 组 2 个）；70.6%（12/17）肝胆期病灶中央出现云絮状或片状稍高信号，即“EOB 云（EOB cloud）或假摄取现象”（典型 MICC 组 10 个，富血供 MICC 组 2 个）。**结论** 动态增强结合 DWI“靶征”或肝胆期“EOB 云”对诊断无周围胆管扩张的 MICC 尤其不典型富血供 MICC 具有重要的价值。

EPO-2457
磁共振肝胆期对乙肝相关性肝癌的诊断价值分析

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目的：探讨肝胆期相低信号在乙肝相关性肝细胞癌的临床诊断价值。
材料与方法：本研究纳入 235 例行上腹部 GD-BOPTA 增强 MRI 的慢性乙肝患者（乙型肝炎病毒感染患者或肝硬化），共 251 个病灶（113 例肝细胞癌，138 例非肝细胞癌）。以下影像标准被用于肝细胞癌的诊断：1. 动脉期高信号+门静脉期低信号；2. 动脉期高信号+门脉期和/或平衡期低信号；3. 动脉期高信号+门脉期和/或平衡期和/或肝胆期低信号；4. 标准 3+LR-1/2/M，LR1/2/M 是根据最新版 LI-RADS 对病灶进行分级得到的。计算所有标准的诊断敏感性、特异性、阳性预测值、阴性预测值、准确性，并比较这些标准的敏感性和特异性。
结果：在肝细胞癌的诊断标准中，标准 3 和标准 4 的敏感性(分别为 99.1%和 96.5%)均显著高于标准 1 和标准 2(分别为 69.9%和 87.6%)(均 $p < 0.001$)。与标准 3(54.3%)相比，标准 4(89.9%)的特异性明显提高($p < 0.001$)。此外，标准 4 的特异性与标准 1 相当(94.9%，$p = 0.065$)，并且标准 4 在这些成像标准中有最高的准确度(92.8%)。
结论：磁共振成像肝胆期低信号结合辅助征象对乙肝相关性肝细胞癌诊断具有明确的临床价值，能提高肝细胞癌诊断的敏感性和特异性。

EPO-2458

肺内淋巴结 HRCT 特征分析

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目的 探讨肺内淋巴结的多层螺旋 CT 影像特征，提高肺内淋巴结的诊断水平。
方法 回顾性分析 2015 年 1 月—2019 年 6 月经手术及病理检查确诊的 36 例肺内淋巴结患者的影像与临床资料。其中男 17 例,女 19 例;年龄 28 ~74(53.36 ±12.51)岁。36 例患者均行肺结节薄层 CT 扫描。观察肺内淋巴结的位置、数目、大小、影像学特点。
结果 36 例多层螺旋 CT 检查共发现 42 枚肺内淋巴结,直径 3.10 ~12.30(6.52±2.01)mm。34 枚肺内淋巴结位于右肺,其中右上叶 7 枚,中叶 15 枚,下叶 12 枚;8 枚肺内淋巴结位于左肺,均在下叶。21 枚肺内淋巴结发生在肺外带或叶间胸膜附近,病灶距离相邻胸膜的垂直距离 1-16 mm,平均 3.4 mm;21 枚紧贴胸膜。40 枚边界清晰、锐利，1 枚部分边缘毛糙。,40 枚肺内淋巴结密度为实性密度，1 枚为亚实性密度，1 枚为磨玻璃密度。其中实性密度肺内淋巴结中 3 枚可见钙化，3 枚内部可见空泡。轴位图像上 16 枚呈三角形, 14 枚肺内淋巴结呈类圆形,8 枚呈不规则形,3 枚椭圆形，1 枚半圆形。40 枚肺内淋巴结在轴位或冠矢状面重建图像上可见一条或多条均匀致密线状影与病灶相连,2 枚肺内淋巴结未见致密线状影与病灶相连。3 例肺内淋巴结有血管集束征象，39 例未见此征象。1 例肺内淋巴结有邻近胸膜凹陷，41 例未见此征象。所有肺内淋巴结均无卫星灶、毛刺及支气管截断征征象。
结论 肺内淋巴结的多层螺旋 CT 表现有一定的特征性,熟悉这些表现特点,多数可在术前做出诊断。

EPO-2459
钆塞酸二钠增强磁共振肝胆期瘤周低信号预测肝细胞癌微血管侵犯的价值研究

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目的 探讨钆塞酸二钠（Gd-EOB-DTPA）增强 MRI 肝胆期瘤周低信号预测肝细胞癌（HCC）微血管侵犯（MVI）的价值。**方法** 回顾性分析术前行肝脏 Gd-EOB-DTPA 增强 MRI 检查的 102 位 HCC 患者的影像资料，共 102 个病灶，均由手术病理证实。两名放射科医师在对病理结果不知情的情况下评估肝胆期是否存在瘤周低信号，并采用 Kappa 检验分析其一致性。采用卡方检验分析肝胆期瘤周低信号与 HCC MVI 的关系。计算肝胆期瘤周低信号预测 HCC MVI 的灵敏度、特异度、准确度、阳性预测值（PPV）及阴性预测值（NPV）。根据肿瘤直径将病灶分为≤3cm 组及>3cm 组，采用卡方检验分析肿瘤大小与肝胆期瘤周低信号的关系。**结果** 102 个 HCC 病灶中，31 例有微血管侵犯（30.4%），存在肝胆期瘤周低信号的 26 个病灶中 20 例有微血管侵犯。57 个≤3cm 的病灶中，4 例存在瘤周低信号，其中 3 例 MVI 为阳性，45 个>3cm 的病灶中，22 例存在瘤周低信号，其中 17 例 MVI 为阳性。两名放射科医师判断肝胆期瘤周低信号时的 Kappa 值为 0.817。存在肝胆期瘤周低信号的病灶更易发现微血管侵犯，差异具有统计学意义（P<0.01）。肝胆期瘤周低信号预测 HCC MVI 的灵敏度、特异度、准确度、PPV 及 NPV 分别为 64.5%、91.5%、83.3%、76.9%及 85.5%。当肿瘤直径≤3cm 时，肝胆期瘤周低信号预测 MVI 的灵敏度、特异度分别为 37.5%、98.0%，当肿瘤直径>3cm 时，肝胆期瘤周低信号预测 MVI 的灵敏度、特异度分别为 73.9%、77.3%。当肿瘤直径大于>3cm 时，肝胆期发现瘤周低信号的可能性增加，差异具有统计学意义（P<0.01）。**结论** Gd-EOB-DTPA

增强 MRI 肝胆期瘤周低信号预测肝细胞癌微血管侵犯具有一定的价值；当肿瘤直径较大时，肝胆期更易发现瘤周低信号。

EPO-2460

多发胸膜孤立性纤维瘤一例

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孤立性纤维瘤(solitary fibrous tumor,SFT)属于纤维母细胞/肌纤维母细胞来源的肿瘤,是一种少见的软组织肿瘤。多见于胸膜及腹膜，也发生于浆膜腔以外的部位，如纵隔等处，肺部较少见。本病例病灶定位于肺外胸膜处多发，即低度恶性多发胸膜孤立性纤维瘤。多发的胸膜孤立性纤维瘤属实罕见，而部分肿瘤可因肿瘤中心退变或坏死而呈减小趋势，此例右肺动脉下方处肿瘤体积逐年减小，系上述原因所致。

EPO-2461

儿童肺炎影像诊断思路

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1、新生儿床边片—肺透明膜病、肺水肿 肺出血
2、喘鸣（喉喘）--气道软化症、异物
3、各类感染—支原体、腺病毒、流感
4、先天性支气管肺发育异常
5、免疫类/遗传类—川崎病、Alagille 综合征
6、肿瘤样及肿瘤--郎格汉斯细胞组织细胞增生症（LCH）、淋巴瘤、转移

肺透明膜病

1、呼吸窘迫：青紫鼻扇、三凹征胸廓塌陷 、呼吸音减弱、细湿啰音、出生时多正常
2、 生后 2～6h 出现（严重者生后即刻）
3、呼吸急促（>60 次/分）,呼气呻吟.进行性加重
4、12h 后出现，一般不考虑本病
5、病情 2、3 天病情最重，3 天后病情明显好转，3 天后 PS 的合成和分泌自然增加。
6、恢复期可能会有动脉导管开发→心力衰竭
7、常见并发症：脑室出血、肺炎，有并发症者病程长。**支原体肺炎**
1、3-5 岁好发，秋冬之交多
2、临床症状轻：干咳、肺部体征轻、生化抗支 原体抗体可阳性、冷凝集 1:3
3、影像特征—症征不符
（1）节段性肺不张（支气管充气
征）

（2）肺纹理增粗模糊-“轨道征” 、“袖口征”
（3）单侧为主，右侧为主（右：左 2:1），两 中 内带为主、两下为主，
（4）胸膜反应：胸水 30%

腺病毒感染

1、6 月-2 岁好发，母体 2 岁内抗体为主

2、临床症状重：干咳、肺部体征咳、喘、持续高热，

一般 5 天以上，累及多系统如神经、循环、消化 病毒以 3 型、7 型为主

3、影像特征—症征相符

（1）“四多”：融合灶多、大片灶多、肺气肿多、 肺纹理多

（2）“三少”：圆形灶少、肺大泡少、胸腔积液少

EPO-2462

儿童腺病毒影像诊断

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目的 分析儿童腺病毒肺炎的临床特征及其 X 线、CT 影像学表现。提高对本病的认识.
方法 回顾性分析本院腺病毒肺炎的儿童临床资料,分析研究其胸部 X 片和胸部 CT 影像学表现。
结果 儿童腺病毒以冬季为主；年龄多在 4 月-2 岁，其中病毒类型以 III 型、VII 型为主；病理改变以肺实质呈灶性或大片灶，广泛凝固性坏死为特点。X 线改变早于肺部啰音，后期肺部啰音加重，病变以两下肺多见（130 例：左下肺 76%，右下肺 55%，右上肺 43%，极少单独出现于左上肺）；
结论 儿童腺病毒肺炎临床特征及其影像学表现有一定特点，临床可据此对腺病毒肺炎患儿进行鉴别诊断，以提高对本病认识，减低患儿死亡率。

EPO-2463

Testicular injection of lipopolysaccharide may be a more effective mice model of orchitis

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Male infertility is a major health problem for men in clinics and its morbidity is still rising. This study was to observe the success rate of some orchitis models in Kun Ming (KM) mice and to provide a reliable model for the development of male infertility. In our study, forty adult male KM mice were randomly divided into four groups: a control group, an intraperitoneal injection of lipopolysaccharide (LPS) group, a glacial acetic acid operation group, and an LPS operation group. The changes in sperm concentration and motility were captured by using computer assisted sperm analysis (CASA), and the pathological changes of the testis were observed by hematoxylin and eosin (HE) staining. On the basis of this, the expression of caspase-1 and interleukin (IL)-1β was detected by Western blot. Compared with the control group, the activity of the spermatozoa in the experimental groups was significantly lower ($P<0.05$), with the LPS operation group having the lowest activity. Using a light microscope, we observed that the testicular morphology of the experimental groups was

distinctly changed, with the LPS operation group being the most significant. Western blot analysis showed that the expression of caspase-1 and interleukin-1 (IL-1β) in the experimental groups were up-regulated($P<0.05$), and the LPS operation group remained the most remarkable. In summary, in the three modified orchitis models, the LPS operation group was the most effective model, followed by the glacial acetic acid operation group. the inflammation mechanism of which is associated with activation of the NLRP3 inflammasome.

EPO-2464

骶髂关节结核的影像学表现（附 20 例报告）

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目的 探讨骶髂关节结核的影像学表现特征，以提高对该病的诊断水平 。**方法** 收集 20 例经临床抗结核治疗有效及手术病理证实的骶髂关节结核患者的资料，对其影像学表现进行分析。**结果** 20 例中，其中 14 例均行 CT 及 MRI 扫描，2 例只行 MRI 扫描（其中 1 例行 MRI 平扫+增强扫描），4 例只行 CT 扫描；男性 11 例，女性 9 例；左侧 6 例（60%），右侧 11 例（55%），双侧 3 例(15%）。主要影像学表现：骶髂关节骨质破坏 11 例，脓肿形成 10 例，关节间隙变窄 10 例，关节间隙变宽 2 例，关节面毛糙、模糊 15 例，合并结核性腹膜炎 1 例，合并肺结核 5 例。**结论** 骶髂关节结核的影像学表现有一定特征性， 骶髂关节 CT 结合 MRI 能提高其诊断率，必要时结合增强扫描及其他部位检查可提高骶髂关节结核的诊断率。

EPO-2465

Advances in research on the regulation of tumor cell cycle by abnormal expression of NPM

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The cell cycle is a process in which the mother cell divides into two daughter cells and the genetic material is equally distributed. Nucleophosmin (NPM/B23) is a multifunctional protein that shuttles between nucleolus, nucleoplasm and cytoplasm. Nucleophosmin is involved in the synthesis of ribosomes, takes control of centrosome duplication and regulates cell proliferation and apoptosis through a variety of signaling pathways, participating in tumorigenesis. The abnormal expression of NPM includes such three forms as gene mutation, overexpression and silencing expression. This article mainly demonstrates the effect of NPM on cell proliferation or apoptosis under different forms of expression.

The results of previous studies have shown that NPM plays an important role in regulating the cell cycle. NPM mutations affect the drug resistance of tumor cells. High expression of NPM often attenuates the inhibition function of tumor cells and thus causes abnormal proliferation, suggesting the effectiveness of detecting NPM protein expression during the early period of examination, diagnosis and prognosis. Controlling the down-regulation of NPM or the knockout of NPM genes can

cause apoptosis in cancer cells or damaged cells. In addition, some new studies have shown that in response to tissue injury-induced nucleolar stress, NPM will relocalize and trigger apoptosis, similar to research findings about tumors. Moreover, in the study of the regulatory mechanisms of NPM abnormal expression on the proliferation and apoptosis of cells, we also found that the role of P53 pathway cannot be ignored, which provides ideas for controlling the process of the proliferation of cancer cells with NPM.

EPO-2466

Tumor Surveillance of RP-Mdm2-P53 Pathway

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Compared with normal cells, the prominent features of tumor cells are mainly active and sustained proliferation, evasion of growth inhibitory factors, induction of angiogenesis as well as invasion and metastasis. Among hundreds of cancers, the complexity is self-evident, but they all have one thing in common: the synthesis of proteins promoted by ribosomes is too active, which promotes tumor growth. Therefore, the ribosomal protein synthesis must be strictly monitored by cells in terms of quality and quantity. Otherwise, it can lead to tumor development and progression. With the deeper research of the structure and dynamic regulation of nucleoli, it has been widely studied in biological inheritance, central nervous system and cancer. In addition, people have begun to use nucleolar stress to fight lung cancer, breast cancer and liver cancer. Compared with articles of the same kind, this review, focusing on RP-Mdm2-P53 axis, systematically expounds the function of each RP, clarifies the mutual regulation relationship in the pathway with the reference of a large number of experimental articles and discusses the dual effects of P53. This review will contribute to provide the research direction of this pathway in the future

EPO-2467

艾滋病合并颅内结核的 MRI 表现

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目的 分析艾滋病（acquired immune deficiency syndrome , AIDS）合并颅内结核分枝杆菌(mycobacterium tuberculosis, MTB)感染的磁共振成像（magnetic resonance imaging , MRI）及临床表现特征。**方法** 对 35 例 AIDS 合并颅内 MTB 感染患者行 MRI 平扫及增强扫描，所有病例均行 $CD4^+$细胞计数检测与脑脊液检查，回顾性分析所收集病例的 MRI、临床及实验室检查资料。**结果** 35 例 AIDS 合并颅内结核患者中单纯累及脑膜 3 例（8.6%），累及脑实质 25 例（71.4%），同时侵及脑膜与脑实质共 7 例（20.0%）。伴发脑积水 6 例（17.1%），脑梗死/脑缺血灶 8 例（22.9%）。本组病例累及脑实质的病灶主要分布于脑皮质、皮质下白质、深部白质以及脑深部灰质，以幕上脑实质居多，共 26 例（74.3%），幕下脑实质 9 例（25.7%），基底节区 12 例（34.3%）。单发病灶为 8 例（22.9%），多发病灶为 27 例（77.1%）。所有病例均行脑脊液（cerebrospinal

fluid ,CSF）涂片查找 MTB，抗酸杆菌染色阳性者 2 例（5.7%）；12 例行脑脊液 MTB 培养，无 1 例（0.0%）阳性者；25 例行 MTB 抗体检测，8 例（32.0%）为阳性；23 例行 MTB-DNA 检测，5 例（21.7%）为阳性。$CD4^+$细胞计数＜50cell/μL 17 例（48.6%），50～100cell/μL 11 例（31.4%），＞100cell/μL 7 例（20.0%）。**结论** AIDS 合并颅内 MTB 感染的 MRI 主要表现为结核性脑膜炎、脑炎及脑膜脑炎，以结核性脑炎为主。颅内结核病变以多发、环形强化为主，“靶征”是脑结核瘤的特征性表现。AIDS 合并颅内结核诊断需结合临床表现、实验室检查以及 MRI 表现进行综合分析，以提高临床诊断准确率。

EPO-2468

艾滋病合并弓形虫脑病的 MRI 诊断及临床特征

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目的 分析艾滋病（acquired immune deficiency syndrome , AIDS）相关性弓形虫脑病(Toxoplasmosis encephalitis , TE)的磁共振成像（magnetic resonance imaging , MRI）及临床表现特征。**方法** 对 27 例 AIDS 合并弓形虫脑病患者行 MRI 平扫及增强扫描，所有病例均行 $CD4^+$细胞计数检测、脑脊液检查及弓形虫抗体检测，回顾性分析所收集病例的 MRI、临床及实验室检查资料。**结果** 27 例 AIDS 合并弓形虫脑病患者中表现为单发病灶 4 例（14.8%），多发 23 例（85.2%），累及大脑皮层 20 例（74.1%），皮层下 15 例（55.6%），灰白质交界区 15 例（55.6%），基底节 14 例（51.9%），丘脑 7 例（25.9%），小脑 15 例（55.6%）以及脑干 4 例（14.8%）；平扫 T2WI 表现为“靶征”的共 17 例（63.0%），增强强化环壁光整 10 例（37.0%），表现为圆环状（类圆环）强化 18 例（66.7%），花环状强化 5 例（18.5%），小结节状强化 6 例（22.2%），不规则斑点或斑片状强化共 10 例（37.0%），伴发脑积水 8 例（29.6%）。所有病例均行血、脑脊液弓形虫抗体检测，其中弓形虫抗体 IgG 阳性者 12 例（44.4%），IgM 阳性者仅 2 例（7.4%）。$CD4^+$细胞计数＜50cell/μL 18 例（66.7%），＜100cell/μL 20 例（74.1%），＜200cell/μL 7 例（25.9%）。**结论** AIDS 合并弓形虫脑病的好发部位主要是大脑皮层、皮层下、灰白质交界区、基底节区以及小脑，发生于脑干少见。弓形虫脑病 MRI 主要表现为环状强化，以多发圆环或类圆环状强化为主，部分可出现花环状强化。平扫 T2WI“靶征”在一定程度上有助于提示弓形虫脑病的诊断。

EPO-2469

胸部低辐射剂量 CT 扫描肺结核价值的探讨

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目的：探讨胸部 CT 低辐射剂量扫描的临床价值。方法：收集 187 例继发性肺结核患者，分别采用 A、B 两种不同扫描参数行胸部 CT 扫描，对比分析其图像质量（密度分辨率、信噪比、图像清晰度、病变检出率等）以及患者接受的 X-线辐射剂量。A 组管电压 120KVe ，自动管电流技术 SmartmA, mA 量 50-400mA，剂量减少 20%，噪声系数 10，ASIR 设置 20-30%； B 组管电压 100KVe ，自动管电流技术 SmartmA, mA 量 50-400mA，剂量减少 20%，噪声系数 15，ASIR 设置 40-60%。结果：与 A 组相比，B 组 CT 剂量加权指数（CTDIvol）减少约 52.71%，剂量长度乘积（DLP）减少约 52.75%，有效剂量(ED)减少约 59.11%（P 值均＜0.05），有统计学意义。B 组图像信噪比略低于 A 组，但依然能清晰地显示病灶，图像清晰度和病灶检出率与 A 组无明显差异，A、B 两组图

像质量评分均在 4.5 分以上。结论：胸部低辐射剂量 CT 扫描有很大的临床价值，值得推广，特别是对于需要短时间内频繁复查的肺结核患者减少辐射剂量尤其重要，减少了患者因过多接受 X-线照射对身体产生的危害。

EPO-2470
原发性闭角型青光眼基于体素形态学的 3.0T MRI 研究

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目的：采用基于体素形态学测量（VBM）方法在比较原发性闭角型青光眼患者与正常视力组间全脑灰质体积（GMV）之间改变。
方法：选取 47 名 PACG 患者（20 名男性和 27 名女性）和 47 名正常视力对照者（20 名男性和 27 名女性）接受静息状态磁共振成像扫描。核磁共振数据是基于 SPM8 软件使用 VBM 分析方法分析。
结果：与正常视力对照组相比，PACG 患者双侧小脑后叶、左侧岛叶、右侧颞上回、左侧颞中回、右侧额中回灰质体积减小，右侧岛叶、右侧额中回灰质体积增加。
结论：PACG 患者在视觉、情感认知、情绪脑区表现出不同程度的脑结构改变，为理解 PACG 患者视功能丢失及情感、认知功能障碍神经机制提供了帮助。

EPO-2471
瑞金医院 2018 年 IBD-MDT 中 35 例中老年 CD 患者临床诊治经验初探

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【目的】总结 2018-3-1~2018-12 -31 在上海交大医学院附属瑞金医院炎症性肠病-MDT 中确诊的 36 例中老年 CD 患者的临床资料、临床诊治经验及教训。【材料及方法】通过 MDT 会诊收集门诊患者病史及外院影像资料，其中部分在我院住院患者由 PACS 住院信息系统完成。【结果】1、临床资料：35 例患者，男 15 例，女性 20 例，男女之比 1： 1.33，年龄 50~71 岁，平均年龄 59.31 岁，发病年龄半年~20 年不等。2、临床表现：主要为腹痛 3 例，腹泻伴肛瘘 2 例，30 例表现为小肠不全梗阻，一例反复肝功能异常，入院证实合并自身免疫性硬化性胆管炎（PBC），此病人有甲状腺癌手术病史。2 例合并强直性脊柱炎伴关节疼痛，1 例左肺上叶错构瘤术后，1 例外院卵巢肿块误诊为肠道内瘘包块形成，类克治疗期间出现大量胸腔积液伴包块。本组 12 例患者有 CD 肠道手术病史，各有 3 例阑尾及肛瘘手术病史。3、影像学表现：全部患者均行小肠 CT 检查，其中 5 例表现为克罗恩病慢性伴部分活动期改变，无内瘘及渗出，20 例合并肠管及腹腔相邻脏器间隙内瘘包块形成，病变管腔纤维性狭窄，1 例表现为盆组回肠节段性炎症伴溃疡，2 例回结肠静脉血栓形成，一例合并胆道 PBC 改变。4、诊断及治疗：本组 2 例外院诊断溃结，经我院 MDT 会诊纠正。本组 4 例行类克治疗，三例治疗后病情缓解，其中一例为术后患者；2 例每周一次甲氨蝶呤 Bid 治疗有效，病情缓解控制；10 例多次手术患者术后长期不规则或中断治疗，造成病情复发、加重。【结论】中老年 CD 在我院发病率呈上升趋势，临床及影像学医师应熟悉本病常见及不典型表现，尽早给与患者个性化治疗，类克治疗前重视排除禁忌症，建议胸腹部 CT 检查。类克及或甲氨蝶呤治疗有助于中老年 CD 患者减缓病情进展，长期疗效有待进一步结合临床、内镜及影像观察。IBD-MDT 治疗模式有助提高炎症性肠病患者精准诊治。

EPO-2472
5 例累及全身多脏器感染病例的影像学及临床分析

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[目的]分析我院 2012-2018 年 5 例累及全身多脏器感染病住院患者的临床及影像学资特点，提高对此类疾病临床诊治水平。[材料和方法]通过全院 PACS 系统回顾性分析上述病例的临床及影像学资料。[结果]1.临床资料（1）本组 5 例病例，男女之比 3：2，包括有 1 例老年女性糖尿病伴反复胆道感染手术后患者，1 例老年女性特发性血小板减低激素治疗患者，一例酗酒，生食猪血及生鱼片并旋毛虫感染病史，1 例糖尿病伴养殖家禽及蔬菜病史。（2）感染部位包括胸部 3 例，腹部 2 例，神经系统脑炎改变 2 例，全身骨骼感染 3 例，软组织 2 例，肾上腺 1 例。（3）影像学表现包括上述感染部位各种表现：肺结节、双侧肾上腺明显增粗伴中央坏死，右侧额叶见小斑片状异常信号灶；颈部脓肿 腹壁脓肿、示多发骨质破坏伴髂骨旁软组织肿块；肝脓肿及多发骨骼感染；右肺门淋巴结肿大，查 PET-CT 显示右侧颈深上下间隙、锁骨上、纵膈及胰头周围，腹膜后广泛肿大淋巴结并 FDG 摄取增高。双侧大脑半球、小脑、脑干内多发强化灶，两肺粟粒性改变，脾肿大。腹膜后、脾门、胰尾周围、肠系膜间多处淋巴结显示，左侧膝关节各骨骨质疏松，软组织肿胀明显；右足内外踝软组织内不均质团块，部分囊性变。（5）微生物检验证实 1 例播散性隐球菌感染、1 例粗球孢子菌感染、2 例非结核分枝杆菌感染，其中 1 例患者治疗后骨盆脓肿穿刺证实合并马尔尼菲蓝状菌感染。（6）病理：肺结节手术、肾上腺穿刺组织证实隐球菌感染，1 例脓液培养证实丝状菌生长，脓液外送 NGS 测序检出粗球孢子菌和藤黄微球菌。骶骨、髂骨病灶”活检病理证实化脓性炎伴坏死。[结论] 全身多脏器感染病例发病与某些基础疾病及免疫力下降相关，其累及各脏器影像学有一定特异性表现，建议通放射介入方法对累及胸部、骨骼及软组织病变进行病理及微生物学及体液新一代测序（NGS）检查，有力于临床提高此类病变的精准诊断水平。

EPO-2473
14 例输入结节型肺组织胞浆菌病的临床和 CT 及病理特征

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【摘要】 **目的：**探讨肺组织胞浆菌病的流行病学、临床、CT 及病理学特点，提高对该病的认识。**方法：**回顾性分析 14 例患者的临床、影像及病理资料，阐述肺组织胞浆菌病的流行病学特征、诊断和治疗措施。**结果：**14 例患者均为青壮年男性，免疫功能正常，在圭亚那有蝙蝠栖息的隧道内工作。12 例有流感样症状。14 例均行胸部 CT 平扫检查，5 例行胸部 CT 增强检查，14 例双肺共 233 枚结节，直径 4-15mm，边缘模糊，以下叶最多，增强结节轻度强化。14 例均行支气管镜检查术（TBLB），9 例行肺泡灌洗术（BALF），支气管粘膜均有炎症反应，3 例行六胺银染色（GMS）及 PAS 染色，均为阴性。3 例行骨髓穿刺活检，HE 染色骨髓内单核巨噬细胞增生活跃，多发肉芽肿形成，细胞内见直径 2 - 5μm 的圆形或卵圆形组织胞浆菌；PAS（+）示菌丝和孢子被染为品红色；GMS（+）示菌丝和孢子被染为黑褐色；免疫组化 CD68（+）证实病菌被单核巨噬细胞吞噬。14 例均口服伊曲康唑，症状逐渐减轻、消失，胸部 CT 复查肺内结节逐渐缩小、减少、边缘变清晰。**结论：**结节型肺组织胞浆菌病有疫区接触史，流感样症状，双肺多发结节，诊断性治疗效果好，可作出初步诊断；但病原学和病理学检查是诊断金标准。

EPO-2474
上海交大医学院附属瑞金医院 34 例 Castleman 病的 CT、MRI 特点分析

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目的：回顾性分析 34 例 Castleman 病的临床表现、病理类型及 CT、MR 表现，分析其影像特点，以期提高对该病的影像诊断水平。材料与方法：通过住院 PACS 系统回顾性分析 2007.04~2019.01 经病理证实的 34 例患者的临床及影像学资料，其中男 13 例，女 20 例，年龄 13~75 岁，中位年龄 41.3 岁。病灶位于腹盆部 27 例，胸部 5 例，颈部 1 例，多部位 1 例。8 例表现为副肿瘤性天疱疮，3 例表现为局部压迫症状， 1 例位表现为血尿；2 例表现为脾亢症状；其余 20 例体检发现。34 例术前均行 CT 平扫及增强扫描；8 例行 MR 平扫及增强扫描。结果：经病理证实,透明血管型 28 例，浆细胞型 4 例，混合型 2 例。临床单中心型（UCD） 32 例，多中心型（MCD） 2 例。对 UCD 中孤立或较大病灶进行统计，单发孤立病灶 24 例，单发病灶伴周围子灶 5 例，多发结节病灶 3 例。圆形或椭圆形 23 例、不规则形 9 例； UCD 中，14 例病灶内见钙化，包括透明血管型 12 例和浆细胞型 2 例。5 例病灶内部可见低密度区，病灶强化方式为均匀型 7 例，延迟均匀型 19 例，不均匀型 5 例。MCD 主要表现为多部位淋巴结肿大，未见明确融合征象，增强扫描轻度均匀。8 例行 MR 检查的病灶主体表现为 T1WI 等信号或稍低信号，T2WI 高信号，DWI 呈高信号； 5 例病灶信号不均，其中 2 例病灶伴 T2WI 条形低信号，1 例伴小片状出血信号，2 例伴 T2WI 高信号囊变； MR 增强扫描均表现为明显强化。结论：CD 的影像表现与临床分型密切相关。MR 对于病灶内出血、囊变及纤维成分等的显示优于 CT，而 CT 对钙化的显示更有优势。多中心 CD 的影像表现则无特异性，常为多系统累及，预后较差。

EPO-2475
Radiographic features of Bone involvement in disseminated cryptococcosis

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Objective To study the clinical and imaging characteristics of disseminated cryptococcosis with bone involved and to improve diagnostic accuracy of these diseases. **Method** The clinical material and imaging findings of 5 patients(4male,1female) with disseminated cryptococcosis proved clinically were analysed retrospectively which the target tissue or organs of bone, lung and brain were involved. **Result** in 5 cases, 2 cases were confirmed by blood cryptococcus latex agglutination test which was positive. 2 cases were confirmed by lymph node biopsy and 1 case were confirmed by cerebral lesion biopsy . The CT findings in pulmonary consisted of diffuse miliary micronodules in both lungs, irregular nodules in the apical segment of the superior lobe of the left lung and patch effusion

shadow in the inferior lobe of the left lung,while 2 cases had not obvious active lesions in lung. Brain MRI showed 2 cases of soft meninges enhancement (one with hydrocephalus and a history of tuberculous meningitis 10 years ago), 1 case with multiple rim enhancementand surrounding edema in the bilateral frontal lobe and right temporal lobes which MRS hint tumor lesions that misdiagnosed as metastases,while the other case had not obvious lesions intracranial. However, the cervical spinal cord was slightly swollen with the enhancement of pia mater.Involvement of the Spinal skeletal: The vertebrae and the adjacent attachment, disc were involved with the formed of surrounding soft tissue mass in 2 patient.Two cases showed abnormal signal in the marrow of bilateral femoral .While the other case showed multiple enlargemen ring-enhanced lymph node of bilateral neck and polynodules of parotid and subcutaneous. These lesions were reduced and improved in continued treatment and still in follow-up. **Conclusion** disseminated cryptococcal can involve a wide range of whole body while patients had nomal immune function the bone was rarely affected.The radiographic appearance manifestations were diversity and lack of specificity.The misdiagnosisration is high.They should be differentiated from other neoplasms or non-neoplastic lesions such as infections. However, clinical and pathology is mandatory to confirm the diagnosis. The analysis of radiological features were helpful for the diagnosis improve the level of diagnosis and differential diagnosis. that can provide image evidences for the assessment of treatment results.

EPO-2476

淋巴结包虫病的 CT 影像表现

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C **目的：**通过对肝泡型包虫病淋巴结转移途径和 CT 影像表现特点探讨分析，进一步增进对包虫病的生物学特点认识。**资料与方法：** 回顾性分析 30 例肝泡型包虫病淋巴结转移的 CT 影像资料，观察淋巴结转移分布规律和影像特点。**结果：**泡型包虫病肝外淋巴结转移以肝十二指肠韧带淋巴结转移最常见,转移率 76.7%（23/30），其次为肝总动脉旁和肝门淋巴结转移，分别为 36.7%（11/30）和 23.3%（7/30）。90.4%的转移淋巴结内可见砂粒、结节样或环形钙化，14.8%出现液化坏死。增强 CT 扫描 84.2%转移淋巴结不强化，其中 27.8%可见“壳样”强化的炎性包膜；14.8%不均匀强化。**结论** 包虫病淋巴结转移是肝泡型包虫病血行转移外的另一种肝外转移方式，影像表现特点与肝泡型包虫病相似。

EPO-2477

肩部韧带样纤维瘤一例

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韧带样纤维瘤（DF）是少见的成纤维细胞克隆性增生性病变，又称为硬纤维瘤、侵袭性纤维瘤，发病率低。病变侵袭性强，术后易复发，但是不发生转移。称为交界性软组织肿瘤。DF 按着发病部

位可分为腹内型、腹壁型及腹外型。CT、MRI 主要表现为软组织肿块，CT 软组织分辨率较低，诊断价值有限。MRI 对该病的诊断有很大价值。T2 序列及 T2 压脂序列可见病灶呈明显高信号。在 MRI 各个序列中肿块内均可见到条带状低信号是该病的影像学特点。增强扫描后该病呈明显持续强化，此外,DWI 序列为该病的正确诊断提供帮助。

EPO-2478

The Value in Differential Diagnosis of Atypical Pulmonary Tuberculoma and Small Peripheral Lung Cancer by Magnetic Resonance Imaging

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【Abstract】**Objective** The aim of this study was to investigate if magnetic resonance imaging(MRI) can be used to differentiate atypical pulmonary tuberculoma from small peripheral lung cancer. **Materials and Methods** In the study, both plain and muitiphasic contrast-enhanced MRl and DWI were performed preoperatively on a 1.5T scanner(Siemens 1.5T Avanto) in 20 patients with APT and 20 patients with SPLC. MR features were examined in detail. **Results** Atypical PT lesions accompanied by many MRI signs including: lobulation sign, vascular convergence sign and pleural indentation are 1, 2, 4. which in SPLC lesions are7, 13, 11, and the difference was statistically significant (P＜0.05). In atypical PT group, 9 cases showed isointense in T1-weighted images, 7 cases showed slightly hypointense and 4 cases showed the surrounding hyperintense, hypointense in the central area. 11 cases showed isointense in T2-weighted images, 5 cases showed hyperintense, and 4 cases showed the surrounding hyperintense, hypointense in the central area. DWI imagse showed hyperintense 13 cases and isointense 7 cases. In SPLC group, 15 cases showed slightly hypointense in T1-weighted images and 5 cases showed isointense. 12 cases showed hyperintense in T2-weighted images, 7 cases showed isointense, and 1 case showed the surrounding hyperintense, hypointense in the central area. DWI imagse showed hyperintense 15 cases and isointense 5 cases. The mean values of T2WI, ADC, peak height and enhanced increment in atypical PT(243.99±95.34, (1.616±0.422)× 10-3mm/s2, 319.13±57.16 and 92.97±65.33, respectively) were both different from the SPLC (303.98±52.41, (1.141±0.150)×10-3mm/s2, 428.11±72.95 and 224.63±47.66, respectively), and the difference was statistically significant(P＜0.05). T1WI had no significant difference (P=0.096, P>0.05). APT showed characteristic ringlike enhancement, SPLC showed homogeneous or inhomogeneous obvious enhancement. **Conclusions** MRI morphologic features, signal intensity and enhancement characteristic were contributed to differential diagnosis of APT and SPLC.

EPO-2479

3.0T 磁共振成像诊断偏早期 Budd-Chiari 综合征 1 例

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目的　进一步探讨总结 3.0TMR 对 Budd-Chiari 综合征的诊断价值。 方法　回顾性分析总结 1 例经介入造影治疗术证实的 Budd-Chiari 综合征患者的影像资料，对其磁共振检查的平扫+ 增强扫描，对各序列和各方位和图像后处理，对 3D LAVA　FLex 动态各期进行观察分析对比。结果　3.0TMR T1WI T2WI 压脂 DWI　DIXIN　IDEAL-IQ　3D　LAVA FLEX　对肝脏、胆囊、脾脏胰腺、肝静脉、下腔静脉及周边血管显示清楚，腹腔显示情况满意度达 100%。 结论　3.0T 磁共振对 Budd-Chiari 综合征的早期诊断有重要的价值。

EPO-2480
初治痰涂阴性肺结核与非结核分枝杆菌肺病的 CT 影像对比分析

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目的　探讨初治痰涂阴性肺结核（PTB）以及非结核分枝杆菌（NTM）肺病的 CT 影像学表现特点，提高对该病的鉴别诊断水平。**方法**　选取我院 2013 年 1 月—2018 年 12 月确诊为 NTM 肺病的患者（NTM 肺病组）53 例及同期痰涂阴性 PTB 初治的患者 60 例（PTB 组）的 CT 影像资料，比较 2 组影像学表现及病变部位的差异。**结果**　痰涂阴性 PTB 患者病灶好发于两肺上叶尖后段及下叶背段，弥漫分布者少见，病灶呈多形性改变，可见小空洞、多为单发，胸腔积液多见。NTM 肺病病灶好发于多肺段，呈簇状聚集的实性结节，并可伴有支气管扩张以及胸膜下的空洞（单发或多发），少见胸腔积液。**结论**　痰涂阴性 PTB 与 NTM 肺病的胸部 CT 影像表现相似，但亦存在差异，细致分析影像特征可为临床鉴别诊断提供一定的依据。

EPO-2481
儿童脊髓炎性病变的 MRI 诊断

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脊髓炎性病变包括脱髓鞘性脊髓炎、感染性脊髓炎和横贯性脊髓炎。

脱髓鞘性脊髓炎

1、急性播散性脊髓炎（ADEM）：常为单相病程，常为病毒感染、预防接种后 3 周发病，25-30%患儿脊髓受累，颈胸段多见，侵犯脊髓白质，病变范围至少超过一个椎体，脑内病变位于灰白质，多发、不对称。

2、多发性硬化（MS）：多相性病程，进行性加重，反复恶化与缓解，脊髓病变多位于脊髓周边，小于 1/2 横截面积，长度多小于 2 个椎体，与脊髓长轴一致。脑部病变位于脑室周围，多发，易累及大脑皮层。

3、视神经脊髓炎（NMO）：可表现单相病程，更多表现为复发、缓解交替的多相性病程，先后或同时出现视神经炎和横断性脊髓炎。颈胸段多见，主要累及脊髓灰质，范围常超过 3 个椎体；累及单侧或双侧视神经，常见视交叉，次为视神经，长度超过视神经眶内段 1/2；脑内病变分布在 AQP4 高表达区如下丘脑、3、4 脑室周围和脑干，不累及大脑皮层。血清中 NMO-IgG 抗体（+）。

4、格林巴利综合症 （GBS）：儿童常见周围神经病，常为单相病程，多数可完全恢复，**60%**发病前 6 周内有明显前驱感染史，双侧脊神经、马尾神经呈对称性增粗、强化；脑内常无异常表现。

感染性脊髓炎

1、手足口病脊髓炎

2、脓肿

急性横贯性脊髓炎

1、疾病相关性急性横贯性脊髓炎：主要包括脱髓鞘性疾病如 ADEM、MS、、NMO、SD、PI、副肿瘤综合征等。

2、特发性急性横贯性脊髓炎：没有明确病因。

EPO-2482

淋巴结结核 18F-FDG PET/CT 表现及误诊分析（附 7 例报告）

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目的：探讨淋巴结结核的 ^{18}F-脱氧葡萄糖(FDG)PET/CT 表现，并分析其误诊原因。 **资料与方法：**回顾性分析 7 例经病理证实的淋巴结结核患者的临床及 ^{18}F-FDG PET/CT 资料，进行视觉及半定量分析。 **结果：**7 例均为多发淋巴结结核，均累及颈部、纵隔，其中 4 例累及腹腔，表现为多发肿大淋巴结，部分相互融合，密度均匀或不均匀，边界欠清。^{18}F-FDG PET/CT 表现摄取呈均匀或环形浓聚，SUVmax 为 16.5-21.6。术前误诊为淋巴瘤 5 例，误诊为结节病 1 例，误诊为转移 1 例。 **结论：**^{18}F-FDG PET/CT 可以准确、灵敏反映淋巴结病变的全身分布及病灶的 ^{18}F-FDG 代谢情况，但对于鉴别高 ^{18}F-FDG 摄取的淋巴结性质需结合临床相关检查。

EPO-2483

艾滋病合并肝癌的 CT 分析

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[摘要] 目的 探讨艾滋病合并肝癌的临床及 CT 表现特点，提高对艾滋病合并肝癌的认识。方法 回顾性分析 31 例 AIDS 合并肝癌患者的临床及 CT 资料。结果 31 例患者，艾滋病合并肝癌以中年男性多见，其中 25 例为巨块型肝癌（80.64%），5 例为结节型肝癌（16.13%），1 例为弥漫性肝癌（3.23%），29 例患者合并乙型肝炎（93.55%），2 例患者合并丙型肝炎（6.45%），31 例患者均为肝硬化（100%），22 例 AFP 升高（70.97%），20 例出现子灶、门静脉或肝静脉癌栓、肝动脉-门静脉瘘、淋巴结转移或远处转移（64.52%）。结论 艾滋病合并肝癌，主要发生在合并乙型肝炎或丙型肝炎感染及肝硬化基础之上，主要表现为巨块型及中、大肝癌为主，容易合并肝内子灶、门静脉或肝静脉癌栓、肝动脉-门静脉瘘、淋巴结转移或远处转移。

EPO-2484

肺结核的临床诊断及进展

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据 WHO 报道，全球将有 1/3 的人群感染结核杆菌，是发展中国家的高发传染病，肺结核是我国常见传染病之一。由于近来人口流动性大，药物的滥用及不合理的治疗，对于结核病的控制并不理想，但随着多排螺旋 CT 容积扫描和薄层重建等技术的广泛应用，不仅能够清楚显示肺结核的不同表现形式，还能够从血供和代谢方面显示病变的病理生理特点，从而能够使人们提高对肺结核的临床诊断水平。

EPO-2485

MRI Diagnosis of Candida Albicans Encephalitis in Premature Infants

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Objective: To explore the diagnostic value of MRI in premature infants with candidal albicans encephalitis. **Methods**: Three premature infants with Candida albicans encephalitis confirmed by blood culture and clinical treatment were summarized and analyzed retrospectively. **Results**:Premature infants aged 31-34 weeks with birth weight of 1500-1900g. One case was the size of test tube triplets, one case was the size of twins, and two cases were cesarean section.Three cases of blood culture were infected by Candida albicans.3 patients with NRDS at birth had a history of mechanical ventilation.3 patients presented with brain abscess, including 1 case of pulmonary Candida albicans infection with meningitis, 1 case of venous cerebral infarction and subdural hemorrhage, and 1 case of subdural effusion.Three cases of brain abscess showed diffuse miliary or nodule shadow in bilateral cerebral hemisphere with a diameter of 1-10 mm and uneven distribution, mainly in paraventricular white matter. Two cases involved cerebellum. One case involved brain stem at the same time. The lesion showed a slightly short T1 signal T2 signal, FLAIR sequence showed a slightly high signal, and a slightly larger lesion showed a long T1 and long T2 in the center. After enhancement, the signal was markedly enhanced in punctate and circular shape.**Conclusion**:MRI can well display the pathological features of premature infants with Candida albicans encephalitis, and provide objective basis for its early diagnosis and evaluation of treatment outcome.

EPO-2486

艾滋病合并胸部常见真菌感染的临床 及 CT 表现分析

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目的 通过对艾滋病（AIDS）合并肺部常见真菌感染的临床及影像学分析，探讨 AIDS 患者合并不同真菌感染时的胸部影像表现及特征，提高对艾滋病合并不同真菌感染的诊断，降低真菌感染的病死率。**研究对象与方法** 回顾性分析 2014 年 1 月至 2016 年 12 月广州市第八人民医院感染科收治的 AIDS 患者共 4102 例，筛选出经肺泡灌洗液及组织病理学证实合并真菌感染的患者共 642

例；所有患者均行胸部 CT 检查，比较分析 AIDS 合并不同真菌感染的临床及胸部影像学表现。**结果** （1）144 例 AIDS 合并常见真菌感染的患者以中壮年发病为主，临床表现多以发热、咳嗽、咳痰、体重下降为主；其中 AIDS 合并马尔尼菲蓝状菌感染的患者出现皮肤损害的概率最高；（2）AIDS 合并真菌感染的患者多发生在 CD4+T 细胞＜50/μl；（3）AIDS 合并 PM、PC、PA 的影像表现以肺内多发斑片影、结节影、团片实变影、粟粒、磨玻璃影、胸腔积液及纵隔淋巴结增大为主，部分可有空洞形成、心包积液、胸膜增厚等，（4）AIDS 合并不同真菌感染胸部 CT 的影像学表现与 CD4+T 细胞水平之间差异无统计学意义。**结论** AIDS 合并常见真菌感染多发生在 CD4+T 细胞计数＜50/μl，在 AIDS 合并马尔尼菲蓝状菌感染的患者中尤为显著。（2）艾滋病合并肺部常见真菌感染临床症状大多相似，主要表现为发热，伴或不伴畏寒、咳嗽、咳痰、体重下降；（3）艾滋病合并肺部真菌感染的影像表现复杂多样，病变范围广，多表现为 2 种或多种病变同时出现，常伴有胸腔积液
及纵隔淋巴结增大。（4）艾滋病合并真菌感染的影像表现相似，具有统计学意义的是心包积液、肺内团片状实变影及胸膜增厚；（5）CD4+T 细胞水平对肺部真菌感染损害的病理类型不会造成明显的影响。

EPO-2487
儿童闭塞性细支气管炎伴机化性肺炎的临床及影像学特点

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目的：探讨闭塞性细支气管炎伴机化性肺炎的临床及影像学特点，提高临床医师及放射科医师对该病的诊疗水平。闭塞性细支气管炎伴机化性肺炎(bronehiolitis obliterans with organizing pneumonia，BOOP)是一种以闭塞性细支气管炎、机化性肺炎和间质性肺炎、肺纤维化为主要病理特征的临床病理综合征，细支气管腔、肺泡管以及一些肺泡有肉芽组织形成，伴有间质和气管腔内淋巴细胞不同程度的浸润，受累部位Ⅱ型肺泡上皮细胞增生[1-2]。BOOP 可分为原因不明的特发性 BOOP 和继发性 BOOP。2002 年美国胸科协会和欧洲呼吸协会将特发性 BOOP 归于隐源性机化性肺炎(cryptogenie organizing pneumonia，COP)。隐源性机化性肺炎(cryptogenic organizing pneumonia，COP)是特发性间质性肺炎(idiopatic interstitial pneumonia，IIP)中的一种类型。
方法：回顾 2 例儿童患者的临床资料、影像学表现、实验室检查及诊治过程，结合文献资料总结特点。
结果：2 例患者均以咳嗽气促起病，肺功能检查表现为限制性通气功能障碍。HRCT 扫描表现为多发斑片实变影和磨玻璃影，未见结节。病变弥漫分布于双肺，胸膜下和沿支气管血管束分布。病程中复查 X 线胸片呈多发斑片实变影，肺纹理增多增粗。2 例患者肾上腺皮质激素治疗均有效。
结论： BOOP 的临床及影像特点不具有特异性，HRCT 对早期诊断及治疗随访具有价值，病理组织学检查是确诊的依据，需结合临床及影像资料达到早诊断早治疗。

EPO-2488
细支气管炎的影像学表现

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目的 探讨细支气管炎的病理类型及其影像学表现，为临床诊治提供依据。方法 回顾性分析经临床资料证实的 50 例细支气管炎的影像学资料，记录各型细支气管炎的临床及影像学特点，结合文献讨论。 结果 病理上分为一、细胞性细支气管炎（47 例）和二、缩窄性细支气管炎（3 例），以前者多见。一、1、感染性细支气管炎，是最常见的类型，本组 11 例。急性主要由病毒（如呼吸道合胞体病毒、副流感病毒）、细菌（如金黄色葡萄球菌、肺炎支原体）引起；慢性常由分枝杆菌（结核性或非结核性）、细菌（如铜绿假单胞菌）引起。CT 表现为小叶中心实性或磨玻璃密度微结节、树芽征、支气管壁增厚、扩张等直接征象，间接征象为马赛克密度，呼气末屏气扫描显示典型的空气潴留。2、吸入性细支气管炎，居第二位，常误诊为感染性细支气管炎。危险因素：精神病者、神经系统疾病（脑卒中、脑损伤、帕金森病）、食管异常（如贲门失弛缓症、反流性食管炎）、胃蠕动减弱等，识别这些危险因素的影像学表现，有助于影像诊断。3、呼吸性细支气管炎，是吸烟者常见的组织学改变。大多数无症状。CT 表现：小叶中心磨玻璃密度结节，细小、淡，模糊影，MIP 有助于结节的显示。4、过敏性肺炎，临床多以胸闷、气急、哮喘等症状为主，病灶可呈一过性、游走性；嗜酸性粒细胞明显升高是其主要特征。CT 表现为广泛、弥漫小叶中心磨玻璃密度微结节，或表现为“头肉冻征“。5、滤泡性细支气管炎，是一种淋巴组织增生性疾病，多合并胶原血管性疾病，CT 表现小叶中心结节，或局限性沿着支气管血管束周围分布。6、泛细支气管炎，多见于东亚地区，尤其日本人，CT 表现无特异性。二、缩窄性细支气管炎，见于胶原血管性疾病患者，有毒气体吸入、肺移植、骨髓移植等患者，CT 表现为支气管管壁增厚、磨玻璃影和空气潴留等，而树芽征和小叶中心结节相对少见。结论 多排螺旋 CT 扫描是诊断细支气管炎最优秀的影像学检查方法。

EPO-2489

左膝关节钙化性纤维性肿瘤 1 例

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女，16 岁，发现左膝肿块 14 年。患儿 2 岁时家长无意发现左腘窝有一肿块，约核桃大小，无疼痛、发热等症状，当时未予重视和特殊处理，随着患儿年龄长大，肿块逐渐增大。查：左侧腘窝见一核桃大小的肿块，质地稍硬，边界清楚，无触痛、局部无红肿，关节活动正常。平片表现为左膝关节内侧后方多个软组织肿块和结节，内见不规则条片状钙化，形态不规则，其一呈分叶状，边界清楚，MRI 信号不均匀，以长 T1 短 T2 信号为主，抑脂序列以低信号为主，内见小点片状稍高信号影，边缘见弧形钙化样信号影，增强扫描呈轻度不均匀强化，未侵及邻近骨质，未见关节囊和关节腔积液。手术见肿块位于膝关节的后内侧，拉开腓肠肌及比目鱼肌肌腱于膝关节后关节囊之间，见一枚 4cmx4cm 以及三枚 1cmx2cm 黄色质韧软组织肿块，包膜完整，与膝关节后关节囊以及周围腱膜紧密相连，质地韧，局部可扪及质硬如骨的结节。术后病理诊断为钙化性纤维性肿瘤

讨论：钙化性纤维性肿瘤（CFT）是一种罕见的良性纤维性肿瘤，为纤维母细胞 / 肌纤维母细胞肿瘤的一个新类型。其病因和发病机制尚不明了，可能与外伤或炎症反应有关。病理上多为界限清楚的肿块，表面光滑但无包膜。大小不等，切面呈灰白、实性、质韧，可有钙化伴有砂砾感，部分质硬如骨。镜下主要由大量玻璃样变的胶原纤维和少量梭形纤维母细胞组成，常含有大量的砂砾体或营养不良性钙化灶。可发生在任何年龄，男女发病率相似，大多数发生在软组织者多见于儿童及青年，而发生在内脏者一般见于成年人。多为缓慢生长无痛性肿块，较大时引起局部不适或其他检查时偶然发现，少数位于实质性或空腔脏器内病变可有相应症状。本例为 16 岁女性，病变位于左膝关节周围，平片显示多个伴钙化软组织肿块，MRI 能较好显示肿瘤软组织成分，增强后轻度不均匀强化提示肿瘤内乏血供。

鉴别诊断包括炎性肌纤维母细胞瘤、钙化性腱帽纤维瘤、纤维瘤病、色素沉着绒毛结节性滑膜炎等。

EPO-2490
艾滋病合并马尔尼菲蓝状菌的胸部空洞 CT 表现

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目的 探讨艾滋病合并马尔尼菲蓝状菌感染的胸部空洞 CT 影像表现。**方法** 回顾性分析我院 2009 年 1 月-2015 年 12 月经临床及病理学、细菌学证实合并 PM 感染的 AIDS 患者，分析其胸部 CT 的空洞表现特征；**结果** 空洞发生于单侧肺部 53 例，双肺 10 例。发生于右肺上叶前段 4 例、尖段 13 例、后段 5 例；右肺中叶 1 例；右肺下叶背段 13 例、前基底段 2 例、外基底段 3 例；左肺上叶尖后段 13 例、舌段 3 例；左肺下叶背段 12 例，外基底段段 3 例、后基底段 2 例。空洞壁规则 40 例、不规则 34 例；厚壁空洞 66 例、薄壁空洞 8 例；内壁光整 69 例、模糊 5 例；外壁光整 6 例、模糊 68 例，所有洞壁均未见钙化；液气平 1 例。空洞直径≥1cm 的 10 例、直径≤1.0cm 有 53 例。**结论** 艾滋病合并 PM 感染的 CT 空洞表现复杂多样，以单发厚壁的小空洞多见，肺段的分布具有一定的特征性。

EPO-2491
AIDS 合并肺癌的影像表现分析

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【摘要】 **目的** 探讨 AIDS 合并肺癌患者的 CT 影像学表现。**方法** 收集我院 2010 年 1 月至 2016 年 8 月间，共约 11000 名艾滋病病毒感染者的临床数据，进行回顾性分析，对其中 21 例病理确诊 AIDS 合并肺癌患者的临床资料及胸部 CT 影像表现进行分析。**结果**艾滋病合并肺癌患者中腺癌 13 例、鳞癌 3 例，小细胞癌 2 例、3 例病理未分型。CT 影像表现见实性肿物或结节 21 例；淋巴结肿大 19 例，远处转移 12 例，胸膜受侵 12 例，胸腔积液 14 例。**结论**艾滋病合并肺癌患者，肺部感染常见，易造成漏诊，CT 影像常见实性肿物或结节，胸膜受侵及淋巴结肿大较具特征性，胸膜明显增厚且合并肿块时需考虑肺癌可能。

EPO-2492
AIDS 合并卡波西肉瘤的影像表现

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【摘要】 **目的** 探讨艾滋病合并卡波西肉瘤患者的 CT 影像学表现。**方法** 回顾性分析,12 例艾滋病合并卡波西肉瘤患者的 CT 影像学表现。结果 CT 显示肺内结节灶 9 例，累及胸膜及胸腔积液 6 例、纵隔淋巴结肿大 8 例，1 例可见骨破坏，1 例肝内见多发占位。**结论**艾滋病合并卡波西肉瘤累及肺部常见影像表现为肺内可见沿肺支气管血管周围分布的多发结节灶，可同时合并胸腔积液，纵隔淋巴结及腋窝淋巴结肿大；累及肝脏可见肝内多发低密度占位病变。

EPO-2493
艾滋病患者肺部弥漫性结节的 HRCT 诊断与鉴别诊断

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目的 探讨艾滋病患者肺部弥漫性结节的 HRCT 影像学表现。方法 回顾性分析我院 2017.1-2019.6 收治的 87 例 AIDS 并发肺部弥漫性结节患者的影像资料，分析不同病原感染的肺部弥漫结节的 HRCT 特点，分析其病变分布、形态及伴发征象。结果 90 患者中结核分枝杆菌 45 例、真菌 38 例(马尔尼菲青霉菌 22 例、曲霉菌 8 例、肺组织胞浆菌病 7 例、毛霉菌 1 例),细菌 7 例。45 例结核病例中 37 例弥漫结节表现为随机分布，6 例为小叶中心分布,其中 4 例为随机分布与小叶中心分布并存；32 例伴纵隔淋巴结肿大，15 例并发胸腔积液。真菌感染的弥漫结节分布类型:31 例随机分布,4 例为小叶中心分布,其中 3 例为随机分布与小叶中心分布并存；肺组织胞浆菌病 7 例均为小叶中心分布，表现为结节伴周围晕征，5 例伴纵隔及肺门淋巴结肿大。6 例细菌感染的弥漫结节为小叶中心分布。22 例马尔尼菲青霉菌病中 17 例伴有腹腔淋巴结肿大，4 例纵隔淋巴结肿大。结论 艾滋病患者肺弥漫性结节可为多种病原菌感染，根据 HRCT 表现及并发征象对其诊断有一定帮助。

EPO-2494
结核性腹膜炎的影像诊断

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目的:分析结核性腹膜炎的多排螺旋 CT 特征与其他类型腹膜炎的诊断与鉴别诊断水平。
方法:选取 2-70 岁经穿刺活检、实验室检查、病理及临床诊断为结核性腹膜炎患者 23 例，分析其多排螺旋 CT 平扫与增强影像特征,并与化脓性腹膜炎、肿瘤性腹膜炎影像特征比较。
结果:23 例结核性腹膜炎 CT 平扫与增强主要有以下表现，大量腹水 11 例；腹膜内钙化斑 15 例；腹膜均匀增厚并较均匀强化 5 例；腹膜非均匀增厚 8 例，增强扫描非均匀增厚均匀强化 3 例，非均匀强化 5 例；腹膜及肠系膜多发结节 7 例，增强扫描结节均匀强化 3 例，非均匀强化 4 例；腹膜及肠系膜内均匀分布索条与粟粒结节 3 例，增强扫描呈较均匀强化；回盲部及邻近腹膜肿块 3 例，盆腔肿块 4 例，增强扫描均呈非均匀强化，均表现为壁厚薄不均及边缘不规整之中央坏死区；腹膜及肠系膜内脂肪间隙腹膜脂肪间隙污迹样改变 13 例，增强扫描呈非均匀稍弱强化；肠系膜上动脉分支栓塞 1 例；腹膜及肠系膜内淋巴结肿大 19 例，腹膜后淋巴结肿大 17 例，上述肿大淋巴结多为椭圆形，或多个（3-5 个）椭圆形相互融合，其中 11 例中部分肿大或融合淋巴结表现为环形强化，中央坏死区无强化；腹膜或肠系膜淋巴结钙化 7 例。
结论：结核性腹膜炎是结核杆菌所致的腹膜慢性弥散性感染，主要由肺结核、泌尿生殖道结核、肠结核、和阑尾结核等通过血行或淋巴播散形成腹膜、肠系膜及淋巴结广泛感染，是较常见的肺外结核病之一。本组病例中腹水、腹膜结节与肿块、腹膜增厚、腹膜及系膜内索条及粟粒结节和污迹样改变、腹膜及系膜和腹膜后淋巴结肿大、坏死与钙化均具一定特征，具有与非特异性腹膜炎及肿瘤性腹膜炎不同 CT 平扫与强化特征，熟悉其 CT 表现，有助于提高其影像诊断准确率。

EPO-2495
卵巢扭转的 CT、MRI 影像表现与病理对照研究

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目的 观察卵巢扭转的 CT、MR 表现，与病理结果进行对照，以提高术前影像诊断的准确性。
方法 回顾性分析 2014 年以来 34 例经手术与病理证实的卵巢扭转病人，回顾性分析卵巢扭转的 CT、MRI 资料，与手术病理结果为对照，分析卵巢扭转后 CT、MRI 表现及强化特点。
结果:
1，34 例病均有腹痛病史，其中 31 例为有较为明确的突发急性腹痛病史，本组病例平均年龄 34.09±11.50 岁，以中、青年患者居多，最小年龄 12 岁，最大年龄 63 岁。
2，手术显示，本组 34 例均合并有盆腔积液，其中 3 例为积血，5 例为积脓。卵巢扭转从 180 度到 1440 度不等，其中扭转 180 度 3 例，360 度 9 例，520 度 15 例，720 度 6 例，1440 度 1 例。术中均可见扭转的输卵管成团状以及增大淤血的卵巢呈紫褐色或黑褐色。术后病检提示单钝扭转 12 例，合并卵巢原发病变 22 例。
3，影像检查：（1），本组检查中，CT 检查 10 例，合并 CT 增强 3 例，MRI 检查共 26 例，合并增强 14 例，同时行 CT 增强及磁共振增强病例共 2 例。（2），卵巢改变：单纯卵巢增大时，CT、MRI 均可见增大的卵巢 100%，在卵巢边缘可见多发大小接近的卵泡 100%，合并原发病变时，在近输卵管侧可以显示较多的实性成份 72.7%，CT 平扫卵巢均呈高密度显示，CT 值 58±6.8，T2 加权实性部分整体或大部分呈极低信号 80.8%，相应区域，弥散及 ADC 均呈低信号。（3），输卵管改变：在增大的卵巢边缘可见扭转团块 82.35%，CT 扫描显示为高密度 80%，T2 显示为主体低信号改变 78%，内部可夹杂线样高信号，T1 扫描可见小点片样高信号 14.3%。（4），CT 还是 MR 增强扫描后发现，增大卵巢、卵巢原发合并病灶均无明显强化 88.2%，扭转成团状的输卵管有小片状强化改变 85.7%。
结论 卵巢扭转是较少见的妇科病变，在临床工作中结合病史，当出现较有特征的影像表现时，应想到输卵管扭转的可能。

EPO-2496

肾综合征出血热胸部并发症的 CT 表现分析

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目的：总结肾综合征出血热(EHF)胸部并发症的 CT 表现和探讨胸部 CT 表现对肾综合征出血热的诊断价值。**方法**: 分析我院收治经 HFRS-IgM 阳性确诊的 6 例出血热合并肺部并发症的胸部多层螺旋 CT 表现。**结果**: 6 例肾综合征出血热胸部并发症病例中，肺水肿 4 例，胸腔积液 3 例，心包积液 3 例，肺水肿、胸腔积液、心包积液三者均有的 2 例，肺水肿并有肺部感染者 2 例，胸腔积液合并下肺局部膨胀不全 2 例。**结论**:出血热的胸部并发症 X 线表现主要以肺水肿、胸腔积液、心包积液为主，胸部的 CT 检查能清楚显示出血热的肺部并发症的性质及程度，对出血热病情评估及治疗方案的制定有重要价值。

EPO-2497

实验兔经淋巴结淋巴管造影与 MR 淋巴管造影的成像比较

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目的 对照研究正常实验兔经淋巴结淋巴管造影与 MR 淋巴管造影对中央淋巴管的成像效果，以便更全面理解淋巴管造影的正常影像表现。 **方法** 正常实验兔 10 只，随机等分为 2 组，经两侧腘窝淋巴结分别予经淋巴结淋巴管造影（Intranodal lymphangiography, INL 组）或 MR 淋巴管造影（MR lymphangiography, MRL 组）；分别评价腰淋巴干及胸导管的显示情况。 **结果** MRL 组 5 例腰淋巴干显影优秀 3 例，显影较好 2 例；5 例胸导管均显影较差。INL 组 5 例腰淋巴干及胸导管均显影优秀。腰淋巴干及腹段胸导管全程显示所需时间分别为 5.80±1.92min 和 4.60±2.75min；胸段胸导管全程显示所需时间为 1.00±0.50min；胸段胸导管全程显示所需时间与前两者存在统计学差异。胸导管管径 0.3mm~1.6mm。INL 组 5 例均有肠淋巴干返流。**结论** 经腘窝淋巴结 INL 可清晰显示正常实验兔淋巴管系统，俯卧位检查可见肠淋巴干显影。经腘窝淋巴结 MRL 对实验兔腰淋巴干显示良好，对胸导管显示欠理想；还需继续研究。

EPO-2498

TB-IGRA 阴性活动性肺结核患者肺部 HRCT 特征分析

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[摘要]目的 TB-IGRA 阴性活动性肺结核患者肺部 HRCT 特征分析。**方法**（1）选取 2017 年 2 月至 2018 年 10 期间入住我院活动性肺结核患者 64 例，其中 TB-IGRA 阴性 23 例作为观察组，TB-IGRA 阳性 41 例作为对照组，其对照组γ-干扰素（IFN-γ）值中位数为 140.9pg/ml，将 FN-γ值＜140.9pg/ml 的划分为低值组 20 例，将 FN-γ值＞40.9pg/ml 的划分为高值组 21 例。入组标准：初治经痰菌检查涂片阳性的活动性继发性肺结核患者，其他类型肺结核或复治肺结核、合并糖尿病及其他系统免疫缺陷患者除外，且符合 TB-IGRA 判定标准，TB-IGRA 检测与 CT 扫描检查间隔时间＜1 个月。（2）根据结核感染 T 细胞检测试剂盒（体外释放酶联免疫法，北京万泰生物药业股份有限公司）的说明书进行 ELISA 检测。（3）对三组病例进行肺叶病灶分布、肺段病灶评分及 CT 影像征象评定及汇总，其影像征象分为肺实质病变征象（包括节段性小叶中心结节、树芽征、小叶样实变、大片状干酪性病变、空洞）、肺间质病变征象（包括小叶内间质增厚、小叶间隔增厚、以气道壁增厚为主的轴心间质改变）。（4）使用 SPSS22.0 软件进行统计学分析，对三组病例采用卡方检验进行两两比较得出 P 值，P＜0.05 为差异有统计学意义。**结果** 病灶呈全肺叶分布特点、大片状干酪性病变及小叶间隔增厚影像影像在观察组中均显著高于高值组，两组差异均有统计学意义（P＜0.05）；以气道管壁增厚为主的轴心间质改变在观察组中显著高于低值组及高值组，组间两两比较差异有统计学意义（P＜0.05）。**结论** 本文表明活动性肺结核患者 TB-IGRA 病灶呈广泛肺叶分布、大片状干酪性病变、小叶间隔增厚、以气道壁增厚为主轴心间质改变具有相关性，但全部病例均为痰涂片阳性肺结核患者，病灶影像学特点差异相对较小，观察组选例困难致入组人数偏少，还需扩大样本量进一步探讨。

EPO-2499

ASL 联合 SWI 对大面积脑梗死患者溶栓治疗后出血转化的预测价值的研究

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目的：探讨磁敏感加权成像（SWI）联合动脉自旋标记成像（ASL）在急性大面积缺血性脑卒中溶栓治疗后出血转化（HT）预测中的临床应用价值。

方法：分析 2017 年 12 月至 2019 年 3 月经临床和影像学证实的 42 例急性大面积缺血性脑卒中患者，采用西门子 3.0T 磁共振扫描仪进行常规序列、磁敏感(SWI) 和 ASL 检查，通过软件后处理获取 SWI 最小密度投影及 CBF 伪彩图。分别于溶栓治疗 3 天及一周复查头颅 CT，判断有无 PH 型脑出血。依据头颅 CT 结果分为两组，PH 型 HT 组及非 PH 型组，通过分析 SWI 最小密度投影及 CBF 伪彩图，对比两组患者大面积脑梗死区微出血点、异常静脉有无及灌注高低情况。

结果：入组患者 42 例。其中 PH 组 15 例，溶栓前经 SWI 检查发现存在异常静脉影或脑微出血点 10 例，梗死区存在高灌注区域 8 例，两者均存在 6 例。非 PH 组 27 例，梗死区域存在脑出血点或异常静脉影 7 例，存在高灌注区域 6 例，两者均有 3 例。SWI 预测 PH 型 HT 灵敏度约 67%，特异度约 74%，ASL 高灌注区域预测 PH 型脑出血灵敏度约 53%，特异度约 78%。两者联合诊断，灵敏度约 80%，特异度约 63%。两组差异均具有统计学意义（P<0.05）。

结论：急性大面积脑梗死患者溶栓治疗后 PH 的发生与梗死区高灌注状态、微出血点、异常静脉影具有相关性，SWI 与 ASL 联合应用能够提高 PH 型 HT 预测的灵敏度，更好的预测 PH 型 HT 的发生，对于临床制定合理治疗方案及预后评估具有重要价值。

EPO-2500

Gd-EOB-DTPA 增强 MR 评估肝脏储备功能初步研究

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目的 探索钆塞酸二钠（Gd-EOB-DTPA）增强 MRI 评价肝功能储备的价值。**方法** 回顾性分析我院 78 例接受 Gd-EOB-DTPA 增强 MRI 检查的患者的临床及影像资料。测量容积式内插值法屏气检查序列（3D-VIBE）肝胆期肝实质各叶和全肝 SNR 强化率和 CNR 强化率。依据 Child- Pugh 分级将患者分为 A 级和 B 级，依据终末期肝病模型（MELD）评分将患者分为 MELD≤10 和＞10。比较组间 SNR 强化率与 CNR 强化率差异、分析强化率与肝功能评分之间的关系。**结果** 肝脏各叶及全肝 SNR 强化率、CNR 强化率差异均无统计学意义（P 均＞0.05）。Child- Pugh 分级 A 级患者全肝 SNR 和 CNR 强化率显著高于 B 级患者（P＜0.05）。MELD≤10 患者全肝 SNR 和 CNR 强化率显著高于 MELD＞10 患者（P＜0.05）。SNR 强化率、CNR 强化率与 MELD 分值均呈负相关（r＝－0.29、0.32，P＝0.02、0.01）。**结论** 肝细胞对 Gd-EOB-DTPA 摄取量随着肝功能损害程度增加而下降，通过测量 Gd-EOB-DTPA 增强 MRI 肝胆期分叶或全肝实质强化率，可以在一定程度上反映肝功能储备情况。

EPO-2501

布氏杆菌性脊柱炎的影像学表现分析

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摘要：目的 探讨布氏杆菌性脊柱炎的影像学表现特征，以提高对该病的认识水平及诊断率。**方法** 回顾性分析我院收治的 19 例经病理或实验室检查确诊的布氏杆菌性脊柱炎患者的影像学资料，所有患者均行 DR 检查，其中 15 例加行 CT 检查，17 例加行 MRI 检查，12 例加行 SPECT/CT 检查。**结果** 19 例中腰椎受累占 89.5%（17/19），以 L4/L5 椎体发病率最高。DR 显示，椎体骨质密度增高，椎体缘骨质增生，相应椎间隙变窄，部分可见骨桥形成。CT 显示，15 例均可见椎体边缘类圆形或

刀锯样骨质破坏，周围骨质增生硬化，7 例见典型的“花边椎”，3 例累及椎小关节。MRI 显示，15 例椎体边缘明显骨质破坏，呈均匀或不均匀的长 T1 长 T2 信号，脂肪抑制序列 T2WI 呈不均匀高信号，椎体缘见骨质增生硬化及周围骨髓水肿信号，椎间盘呈长 T1 信号，椎间隙变窄，其中 5 例椎旁软组织内可见局限性的脓肿，无钙化及流注现象，脓肿呈长 T1 长 T2 信号，边界清晰，脓肿壁厚薄不均，2 例椎体仅见骨髓水肿，未见明显骨质破坏。SPECT/CT 显示，12 例 SPECT 均可见病变椎体呈弥漫性放射性核素浓聚，融合后显示椎体缘骨质增生硬化，并可见破坏区显著的放射性核素浓度，椎间盘轻度浓聚。**结论** 布氏杆菌性脊柱炎的影像学表现具有一定的特征性，临床上需结合病史、实验室检查及流行病学特征进行综合诊断，以提高其诊断率。

EPO-2502
肝内胆管脓肿与非胆源性肝脓肿的影像鉴别

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目的：分析肝内胆管脓肿及非胆源性肝脓肿的 CT、MRI 表现特征，评价影像学检查对肝内胆管脓肿的检出效能。
方法：对我院 2018.06.01 至 2019.05.31 经手术及临床抗炎治疗后复查证实的 45 例肝脓肿 CT 或 MRI 图像进行回顾性分析。其中包括各种原因引起的肝内胆管脓肿及非胆源性肝脓肿。所有影像学资料均从胆源性征象、肝脓肿征象及反映两者关联性或特异性的征象进行分析。
结果：45 例肝脓肿患者包括肝内胆管脓肿病人为 28 例，非胆源性肝脓肿 17 例，所有病例均可见肝内脓影像学特征表现（45/45，100%）。肿肝内胆管脓肿影像学表现包括肝内脓肿及各种病因（肝内胆管结石 17/28,60.7%；手术 10/28,35.7%；既往胆系炎症迁延 1/28,3.6%）引起的胆道异常，包括肝内胆管扩张（24/28,85.7%）、扩张的胆管与脓肿相通（8/28,28.6%）或相邻（10/28,35.7%）、胆道积气（3/28,10.7%）。其中，肝脓肿与胆源性征象相关的影像学表现包括肝脓肿肝脓肿与近侧扩张胆管相一致（18/28,64.3%）,肝脓肿发生于有（2/28,7.1%）或无（5/28,17.9%）胆道扩张的肝段。非胆源性肝脓肿影像学表现包括肝脓肿及各种病因的特征表现，包括经门脉感染（2/17,11.8%）、开放性损伤（2/17,11.8%）等。非胆源性肝脓肿患者有 3 例表现为脓肿远端胆系轻度扩张，近端胆管无扩张。
结论：肝内胆管脓肿影像学表现包括肝脓肿征象、胆源性征象，非胆源性肝脓肿影像学表现为肝脓肿及各种病因特征表现，肝内胆管脓肿与非胆源性肝脓肿影像学表现具有一定相关性，胆源性征象有助于二者的鉴别诊断。

EPO-2503
耐多药与药物敏感性肺结核患者肺部空洞 CT 特征分析

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目的 对比耐多药肺结核与药物敏感肺结核的空洞 CT 征象，以提高对耐多药肺结核的认识。**方法** 回顾性分析 2017 年 4 月 1 日至 2018 年 11 月 1 日在我院治疗的共 95 例 MDR-TB 患者，其中发生空洞的 67 例(70.5%)。另选取同期 DS-TB 患者 92 例，发生空洞的 59 例(64.1%)。比较两组患者空洞 CT 特征。**结果** （1）MDR-TB 组空洞形态上结节或肿块空洞+实变影内空洞与 DS-TB 组存在显著差异。MDR-TB 组实变影内空洞例数明显低于 DS-TB 组，差异有统计学意义（x^2=3.86，$0.01<P<0.05$）。两组间空洞数量、肺叶分布及结节或肿块内薄壁、厚壁空洞例数均未见统计学差异。

（2）MDR-TB 组薄壁空洞位于胸膜下及形态不规则者多于 DS-TB 组且差异有统计学意义（ x^2=4.40，0.01＜*P*＜0.05； x^2=3.88，0.01＜*P*＜0.05）。（3）MDR-TB 组厚壁空洞外侧壁多发粗长毛刺或浅分叶征多于 DS-TB 组且差异有统计学意义（ x^2=3.92，0.01＜*P*＜0.05）。（4）MDR-TB 组多发虫蚀样空洞患者例数较 DS-TB 少见，差异有统计学意义（x^2=8.00，0.01＜*P*＜0.05）。MDR-TB 组毁损空洞例数明显高于 DS-TB 组，差异有统计学意义（x^2=6.97，0.01＜*P*＜0.05）。MDR-TB 组多房硬壁空洞与 DS-TB 组比较无统计学意 DS-TB 组，但例数高于高于 DS-TB 组。**结论** 结节或肿块内空洞+实变影内空洞、胸膜下形态不规则薄壁空洞、边缘多发粗长毛刺或浅分叶厚壁空洞及多房硬壁空洞、毁损空洞常见于 MDR-TB 患者，巨大毁损空腔为 MDR-TB 患者特征性表现。

EPO-2504

肠结核并发结核性腹膜炎 CT 特征分析

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目的 探讨肠结核（ITB）并发结核性腹膜炎（TBP）的 CT 表现，以提高 ITB 并发 TBP 的诊断准确性，减少严重并发症的发生。**方法** 回顾性分析 2017 年 1 月～2018 年 12 月我院收治的 29 例 ITB 并发 TBP 患者的临床资料及 CT 扫描图像资料，观察 CT 影像特征。**结果** （1）21 例肠管壁节段性增厚 ITB 并发 TBP 患者，ITB 发生在回盲部 14 例，多节段肠管病变 4 例，小肠 3 例，肠管壁均呈不规则增厚，其中分层增厚 15 例，单层增厚 6 例。行 CT 增强扫描的 6 例患者中 4 例增强扫描动脉期肠壁呈“环形”强化。2 例不规则增厚肠壁增强后不均匀强化。21 例患者肠管壁增厚，并肠腔狭窄 18 例，并肠腔扩张 3 例。肠管壁增厚大肠平均厚度为 1.36± 0.39cm，小肠平均厚壁为 0.88±0.33cm。2 例回盲部肠管增厚并急性肠穿孔。并发 TBP 以渗出型、粘连型为主，12 例伴腹、盆腔积液，积液量较少，15 例网膜增厚、21 例系膜增厚呈“污迹”征，程度较轻。（2）8 例肠管壁无局限性增厚 ITB 并发 TBP 患者，肠管无局限性增厚，8 例均伴发慢性肠穿孔，腹、盆腔内见巨大包裹性气液平脓肿，5 例脓肿范围从肝下达盆腔，脓肿壁厚，其内液体密度较高，并见多发小气泡影。邻近肠管受压、推移。3 例脓肿较小局限于下腹部，脓肿壁较厚，与邻近组织分界欠清。8 例患者均可见网膜、系膜区、肠间隙见多发小气泡征。并发 TBP 以粘连型、干酪型为主，8 例见腹、盆腔积液，3 例见包裹性密度较高液体影。8 例均见网膜增厚，其中 5 例见“网膜饼”形成。8 例系膜增厚呈“污迹”征。4 例伴小肠梗阻。**结论** ITB 并发 TBP，二者可相互累及，互为因果，影像表现多样，CT 扫描能够清楚显示肠管、肠周围结构、网膜、系膜及腹腔其他脏器，为 ITB 并发 TBP 的诊断提供重要信息。

EPO-2505

脊柱结核的影像学诊断价值及临床分析

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摘要 ：目的 探讨脊柱结核的影像学（CR 或 DR、CT 及 MRI）诊断价值并进行临床分析。 **方法** 对 68 例经临床手术或病理证实且影像学资料完整的脊柱结核进行分析。 **结果** CR(DR)显示：椎体骨质破坏 55 例；椎间隙变窄 60 例；椎旁梭形软组织密度影 22 例；脊柱后突畸形 31 例。CT 显示：椎体穿凿样骨质破坏 46 例；椎旁软组织块影 46 例；MRI 显示：椎体呈斑片状或弥漫性长 T1、长 T2 信号影 38 例；椎旁软组织块影 38 例；椎间隙变窄 32 例；脊柱后突畸形 30 例,脊髓水肿 12 例。 **结论** 影像学对脊柱结核的诊断具有特征性，对临床治疗、评价疗效具有重要价值。

EPO-2506

恶性疟疾的 CT 表现及其受累组织器官的分布特点

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目的：探讨恶性疟疾的 CT 表现与其受累组织器官分布特点。
材料方法：回顾性分析经临床证实的恶性疟疾 25 例，观察分析各组织器官的 CT 表现，并评价其关系。
结果:肝脾最易受累，包括脾大 12 例、巨脾 7 例、脾梗死 3 例、肝脏肿大 7 例和肝内淋巴瘀滞 1 例。肺受累居第 2 位，肺水肿 8 例、其中肺泡性水肿 6 例（实变 4 例和磨玻璃密度影 2 例）和间质性肺水肿 2 例，增殖性炎变 2 例和双侧胸腔积液 10 例。脑受累居第 3 位，水肿 5 例、侧脑室出血 1 例和脑内多发低密度灶 2 例。肠道受累居第 4 位，结肠壁水肿 1 例、小肠壁水肿 2 例和腹水 3 例。肾脏受累 2 例，表现为双肾密度减低、皮髓质分界不清、实质内低密度灶。淋巴结肿大和广泛皮下水肿各 1 例。
结论：恶性疟疾的 CT 表现主要是组织器官水肿和缺血性改变，且受累气管优势分布顺序为肝脾、肺、脑、肠、肾、淋巴结和皮下组织。

EPO-2507

Deep learning with full convolutional neural network (FCNN) for diagnosis of liver masses at computed tomography images in the patients with liver cirrhosis induced by hepatitis B virus

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Purpose: The purpose of this study was to research the diagnostic efficiency by utilizing a deep learning approach with FCNN for differentiation of liver masses at pre-contrast and post-contrast enhancement CT images.
Materials and Methods: Data of 53 patients (male 29, female 24) with liver cirrhosis induced by hepatitis B virus were retrospectively study by a deep learning with FCNN. Sixty-four nodules were detected at the pre-contrast and post-contrast enhancement CT images by using liver biopsy as the reference standard, including benign nodule (BN), regenerative nodule (RN), dysplastic nodule (DN), and hepatocellular carcinoma (HCC). We proposed a deep learning approach for evaluation of the liver nodules and a random data augmentation strategy to reduce the training time and the problem of overfitting. Forty-five nodules were used for training, and nineteen nodules were used for validation and testing. Analysis of receiver operating characteristic (ROC) curves were performed to assess the accuracy of a deep learning approach with FCNN, the area under ROC curves (AUCs) were also calculated in this study.
Results: AUCs of deep learning with FCNN for HCC vs. ≤ DN were 0.95 (95% confidence interval [CI] 0.90 to 0.99), 0.89 (95% CI 0.81 to 0.95) for ≥ DN vs. ≤ RN , 0.92 (95% CI 0.88 to 0.96) for ≥ RN vs. BN.

Conclusion: A deep learning approach revealed a high accuracy for diagnosis of liver nodules, which means that it is valuable and promising for the non-invasive accurate diagnosis of nodules in the patients with liver cirrhosis induced by hepatitis B virus.

EPO-2508

AIDS 和非 AIDS 患者并发肺孢子菌肺炎的 CT 对比分析

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目的：探讨 AIDS 和非 AIDS 患者并发肺孢子菌肺炎的 CT 表现特点。
方法：回顾性分析 50 例经实验室检查确诊的肺孢子菌肺炎患者的 CT 表现，其中 AIDS 组 32 例，非 AIDS 组 18 例。
结果： 肺孢子菌肺炎常见的 CT 表现有双肺磨玻璃样密度影，小叶间隔增厚，肺气囊等，重症患者可发生气胸、纵隔气肿。AIDS 组以肺门为中心双肺对称分布的样密度影最为多见（26/32），其中 14 例可见月弓征；小叶间隔增厚 18 例，其中 8 例出现碎石路征；条索影 9 例；肺气囊 6 例；肺门、纵隔淋巴结肿大 5 例；实变和气胸各 4 例；纵隔气肿和胸腔积液各 3 例。非 AIDS 组主要表现为双肺弥漫分布磨玻璃样密度影（13/18）；实变 8 例，其中 3 例可见空气支气管征；条索影 7 例；小叶间隔增厚 5 例；肺门、纵隔淋巴结肿大 3 例；气纵隔气肿 2 例，气胸 1 例。
结论：肺孢子菌肺炎的 CT 表现多种多样。AIDS 和非 AIDS 患者均以双肺磨玻璃样密度影最为多见，空气支气管征仅见于非 AIDS 组。

EPO-2509

慢性结核性脓胸并发恶性肿瘤的临床及 CT 表现分析（附 3 例报告）

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目的 探讨慢性结核性脓胸并发恶性肿瘤的临床特点及 CT 表现特征。**方法** 回顾性分析我中心经病理证实的 3 例慢性结核性脓胸并发恶性肿瘤病例的临床及 CT 表现，并对相关文献进行复习。**结果** 3 例患者均为男性，平均年龄 63.7 岁，均有慢性结核性胸膜炎病史，平均病程 10.3 年；临床表现均为胸痛，平均病程 2.67 个月；两例患者可触及胸壁包块。2 例患者行胸部 CT 平扫检查，1 例患者示胸部 CT 平扫+增强扫描检查。胸部 CT 示 3 例患者均为右侧胸膜增厚、钙化及包裹性脓胸，脓胸侧胸膜下出现软组织肿块，最大层面大小分别为：2.06x3.49cm，3.1x3.9cm，2.9x6.3cm，CT 值分布为 31HU，46HU，36-49HU；2 例患者出现肿块与脓胸壁连续移行，突向侧胸壁；1 例患者出现患处钙化影移位、散开；肿块密度较均匀(1 例)、欠均匀(2 例)，出现邻近肋骨破坏 2 例；3 例患者均出现胸膜下脂肪界面不清；增强扫描显示：结节影呈边缘强化。3 例患者双肺表现为斑点、结节影，边界清晰，部分病灶呈钙化改变。**结论** 慢性结核性脓胸并发恶性肿瘤的临床及 CT 表现有一定特征性，出现胸痛表现，伴脓胸侧软组织块影、胸膜钙化影形态、位置改变，邻近肋骨骨质破坏；胸膜下脂肪层界面不清，对诊断有重要提示作用。

EPO-2510

AIDS 合并肝脏结核 CT 影像学表现

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目的 回顾性分析 AIDS 合并肝脏结核增强 CT 的表现特点，以提高其诊断的准确性。**方法** 对重庆市公共卫生医疗救治中心经病理证实的 8 例 AIDS 合并肝脏结核患者的增强 CT 检查结果进行回顾性分析，观察病灶的形态、密度、数量、病灶边界、病灶 CT 增强后的表现 。**结果** 8 例 AIDS 合并肝脏结核表现为浆膜型 2 例，结节型 3 例，混合型 3 例，其中单发 3 例，多发 5 例，形态不规则 6 例；CT 平扫表现为低密度 7 例，钙化 1 例，边界均与正常肝组织分界不清，伴有腹腔其他脏器结核及结核性腹膜炎 5 例，8 例均伴有腹腔外结核；CT 增强表现为不均匀轻度强化 2 例，渐进性强化 2 例，边缘轻度强化 4 例，病灶内分隔征 6 例。**结论** AIDS 合并肝脏结核少见，易漏诊误诊，增强 CT 能显示肝脏结核病灶的一些特征性表现 。

EPO-2511
DCE-MRI 及 DWI 在输卵管结核中的诊断价值

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目的：分析输卵管结核的动态增强 MRI 及 DWI 影像特点，并与病理结果进行对照，以提高对输卵管结核的认识和鉴别诊断能力。方法：对 32 例经临床手术病理证实为输卵管结核患者行 DCE-MRI 及 DWI 检查，分析图像特点。结果：其中 18 例渗出型输卵管结核为单侧，14 例为双侧，MRI 表现为输卵管增粗、边缘毛糙、呈混杂信号的 c 形及 s 形弯曲并管腔狭窄 32 例(100%)；18 例(56%)呈多房厚壁囊实、性肿块；增殖粘连型输卵管结核多见输卵管增粗，管壁肥厚，周围明显粘连，部分伴腹膜增厚黏连并腹水。MR 输卵管迂曲增粗如拇指或腊肠样 32 例(100%)，22 例(68%)有盆腔积液。病理：输卵管迂曲并扩张，可见溃疡、干酪型、粟粒结节型炎变。结论：输卵管迂曲增粗及囊壁不全间隔的囊实性肿块是输卵管结核的 MRI 特征性表现，DCE-MRI 及 DWI 检查对于输卵管结核具有较高的临床诊断价值。

EPO-2512
HIV 阳性和 HIV 阴性肺隐球菌病患者的临床及胸部 CT 表现对比分析

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目的 对比分析 HIV 阳性 HIV 阴性患者肺隐球菌病的临床及胸部 CT 表现。方法 回顾性分析重庆市公共卫生医疗救治中心 2015 年 01 月至 2016 年 12 月收治的 22 例经证实的肺隐球菌病的临床及胸部 CT 影像学资料，其中 HIV 阳性 17 例，HIV 阴性 4 例。从临床表现、胸部 CT 表现、预后等方面，分析两者之间的差异性。结果 临床症状方面：HIV 阴性患者临床表现轻微：无症状 1 例，咳嗽、胸痛 3 例。HIV 阳性患者临床表现较重：头痛 13 例，发热 9 例，咳嗽、咳痰 6 例，呕吐 5 例。胸部 CT 表现： HIV 阳性患者：斑片浸润型：15 例；弥漫混合型 2 例；出现囊腔影 15 例；5 例伴发胸腔积液和纵隔淋巴结肿大；15 例同时合并隐球菌性脑膜炎征象。HIV 阴性患者：结节或肿块型 4 例，病灶周围出现晕征 3 例。预后方面：HIV 阳性患者好转 12 例，无效 2 例，放弃治疗 3

例。HIV 阴性患者均好转。结论 HIV 阳性与 HIV 阴性肺隐球菌患者的临床及胸部 CT 表现存在一定差异，这些特征与它们的自身免疫功能活性有密切关系。

EPO-2513

乳腺结核的 CT 表现分析

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目的 分析乳腺结核的 CT 征象，探讨其 CT 的诊断价值。**方法** 回顾分析重庆市公共卫生医疗救治中心 20 例经病理证实的乳腺结核病例。分析病变的 CT 表现及邻近组织及器官受累情况。**结果** 20 例乳腺结中 12 例发生于右乳，8 例发生于左乳。13 例为单发，7 例为多发；16 例呈类圆形结节，1 例呈团块状，3 例呈片状；病灶大小 1.0cm×1.5cm～5.1cm×3.2cm。结节型、脓肿型分别各 13、7 例。CT 平扫 11 例为等密度，9 例为稍低密度，4 例病灶内见斑点状钙化，17 例边界模糊；12 例邻近皮肤均匀增厚。增强扫描 20 例均表现为环形强化，2 例伴窦道形成；其中 13 例伴有同侧或双侧腋窝淋巴结肿大伴环形强化，5 例伴有同侧胸壁包块伴边缘强化，10 例伴肺结核。**结论** 乳腺结核的特征性 CT 表现为**环形强化，**同时常伴有同侧腋窝淋巴结及胸壁结核。

EPO-2514

艾滋病并发新型隐球菌脑膜炎临床及影像学表现分析

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目的：分析艾滋病并发隐球菌脑膜炎患者的临床及影像学表现，提高对该病的认识，为临床医师的诊疗工作提供依据和帮助。方法：对重庆市公共卫生医疗救治中心 2015 年 01 月至 2016 年 12 月收治的 34 例艾滋病并发隐球菌脑膜炎患者的临床及影像学资料进行回顾性分析。结果：34 例艾滋病并发隐球菌脑膜炎患者中头痛 34 例、发热 18 例、呕吐 15 例。首次脑脊液检查中：氯化物水平降低 15 例、葡萄糖水平降低 10 例、蛋白定性阳性 11 例。首诊颅内压大于 200（mmH_2O）31 例，颅内压水平正常 3 例。CD4 T 淋巴细胞计数均低于 200（cells/ul），其中低于 50（cells/ul）28 例、50~99（cells/ul）4 例、100~199（cells/ul）2 例。头颅 CT、MRI 表现主要为脑膜脑炎型 15 例、类梗塞型 8 例、梗塞型 6 例、肉芽肿型 1 例。易合并其他机会性感染，其中真菌性肺炎 17 例、细菌性肺炎 10 例、口腔念珠菌病 9 例。结论：艾滋病并发隐球菌脑膜炎患者多以颅内压增高相关症状就诊，免疫力普遍低下，易并发多种机会性感染。头颅 CT、MRI 检查在其诊疗过程中具有重要价值，确诊仍需依靠实验室病原学检查。

EPO-2515

艾滋病相关弓形虫脑炎的影像学表现及动态观察

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目的 弓形虫是条件致病菌，易发生在免疫抑制和免疫低下者，最常累及中枢神经系统。其临床表现及影像表现与其他颅内感染有一定的相似之处，为提高对艾滋病弓形虫脑炎的影像表现的认识，为临床早诊断早治疗提供影像学依据。**方法** 回顾性分析 2018.1-2019.4 重庆市公共卫生医疗救治中心收治的 32 例弓形虫脑炎患者，分析其 CT 及 MRI 影像表现，主要观察内容有病变部位、形态、大小、密度、有无水肿、占位效应、有无脑膜改变，增强后强化特点、抗弓形虫治疗效果。**结果** 32 例患者中男性 25 例，女性 7 例，年龄 21-68 岁，平均 42 岁。CT 表现：病变位于额叶 17 例，顶叶 15 例，基底节区 16 例，颞叶 9 例，枕叶 7 例，半卵圆中心 9 例，脑干 6 例。平扫呈低密度 24 例，有高密度 7 例，病灶周围水肿 32 例，增强后发现病灶 85 个，病灶最大者 34mm×19mm，最小 4mm×3mm，环形强化 15 例，结节状强化 11 例，有壁结节 10 例，靶环征 6 例，半靶征 1 例，开环靶征 1 例，环中环征 2 例。脑膜增厚 5 例。MRI T1WI 表现为等及稍低信号,T2WI 表现为高或等低信号,增强 MRI 病灶呈环形强化及结节状强化，其中 15 个病变表现为"靶环征"，周围水肿无强化。抗弓形虫药物治疗 12-118 天后 15 例进行了 CT 复查，19 例吸收好转，6 例病灶增多，1 例治疗后无变化。**结论** 艾滋病相关弓形虫脑病在颅内分布广泛，多位于大脑半球及基底节区，病灶多为环形强化，周围水肿广泛。壁结节及靶环征是其特征表现，MRI 对疗效观察有重要作用。

EPO-2516
艾滋病合并肺结核与正常免疫肺结核的 CT 影像表现

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目的 探讨艾滋病合并肺结核与正常免疫肺结核的临床影像表现，提高对艾滋病合并肺结核的认识。方法 回顾分析 2011 年 10 月～2012 年 9 月本院诊治的 142 例艾滋病合并肺结核(观察组)及 150 例非艾滋病患者肺结核（对照组）临床及胸部影像表现。结果 观察组在发热 93.7%、呼吸困难 36.6%、乏力 78.9%、纳差 79.6%、体质量下降 74.6%、头痛 18.3%、腹泻 14.8%、视物模糊 7.7%、尿路刺激征.7%，合并其他肺部感染 35.9%，合并肺外结核 29.6%，均多于对照组，两组比较差异有统计学意义<0.05）。痰图片及痰培养阳性率 16.9%，PPD 试验阳性率 10.6%，对照组分别为 38%、78.7%，两组比较差异有统计学意义（*P*<0.05）。观察组死亡率为 8.5%，对照组 2.7%，两组比较差异无统计学意义（*P*>0.05）。影像表现：观察组以 II 型（14.8）、IV 型（44.4%）、V 型（29.6%）较多，病灶位于中下肺 62.0%，累及 3 叶以上 51.4%，均多于对照组（*P*<0.05）。观察组肿大淋巴结增环形强化 35.7%（10/28），对照组环形强化 70.6%（12/17），两组比较差异有统计学意义（*P*<0.05））。结论 艾滋病合并肺结核患者病情严重，临床表现不典型，容易合并多种机会性感染，抗酸杆菌检查机 PPD 试验阳性率低，临床诊断困难，影像表现复杂多样，当艾滋病患者出现全身多发症状，CT 表现为大片实变、空洞、粟粒结节、淋巴结肿大及胸腔积液时应考虑到艾滋病合并肺结核的可能。

EPO-2517
杭州地区 5 岁以下儿童麻疹合并下呼吸道感染的多因素分析：基于胸片分级

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目的
分析杭州地区麻疹患儿合并下呼吸道感染危险因素以及易合并感染的病原菌类型，分析不同病原菌对麻疹患儿下呼吸道感染严重程度分级的影响，并分析胸片能否鉴别麻疹患儿肺部合并的病原菌类型。
方法
选取 187 例符合条件的麻疹患儿，根据胸片表现将下呼吸道感染的严重程度分为 3 级（正常胸片为 0 级；轻-中度异常者，包括支气管壁增厚，轻微的肺部渗出改变，为 1 级；重度异常者，包括大片渗出实变、网状影，中度/重度肺不张、支气管扩张、囊腔或空洞、胸腔积液，为 2 级），并将下呼吸道感染的分级结果作为因变量，以性别、年龄（月）、生活环境、病程中最高体温、入院前病程、首发症状、喂养史、生产方式、有无早产、接种情况、有无诱因、BMI、有无合并其它疾病、有无合并其它病原菌感染 14 个临床因素作为自变量，先进行单因素分析，将 $p \leqslant 0.1$ 的临床因素进行多项有序 *logistic* 回归分析进行统计学分析。
结果
187 例麻疹患儿中合并 0 级下呼吸道感染者 74 例（39.57%），1 级下呼吸道感染者 77 例（41.18%），2 级下呼吸道感染者 36 例（19.25%）；经单因素分析，入院前病程、性别（男性）、喂养史（非母乳喂养）、首发症状（呼吸道症状）、下呼吸道合并其它病原菌感染、未接种麻疹疫苗 6 项临床因素的 $p \leqslant 0.1$，并纳入多项有序 *logistic* 回归分析，最终入院前病程（OR=1.110，95%CI：1.022～1.141）、未接种麻疹疫苗（OR=1.799，95%CI：1.060～3.053）、下呼吸道合并其它病原菌感染（OR=1.629，95%CI：1.080～2.457）具有统计学差异。
结论
影响杭州地区 5 岁以下麻疹患儿感染不同级别下呼吸道感染的危险因素有入院前病程较长、未接种麻疹疫苗、下呼吸道合并其它病原菌感染。

EPO-2518
DWI 和 MR 增强对软组织脓肿的诊断价值比较

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目的：对比分析 DWI 和 MR 增强联合常规 MR 扫描对软组织脓肿的诊断价值。
方法：对 119 例临床怀疑软组织脓肿患者（男性 72，女性 47， 56±16.1 岁），均行常规 MR 扫描、MR 增强扫描及 DWI（b=800）。将图像随机分为 2 组，常规 MR 扫描联合 DWI 组以及常规 MR 扫描联合 MR 增强扫描组；由 2 名副高及以上医生共同阅片，对每组图像进行单独分析。比较常规 MR 扫描联合 DWI 及常规 MR 扫描联合 MR 增强扫描对软组织脓肿的诊断价值。采用 McNeMar 检验及 AUC 曲线分析，分别获得两种方法在诊断软组织脓肿中的敏感性及特异性。
结果：119 例中 40 例证实为软组织脓肿。医生 1：常规 MR 扫描联合 DWI 诊断的敏感性和特异性分别为 90.0%和 88.6%；常规 MR 扫描联合 MR 增强扫描诊断的敏感性和特异性分别为 82.5%和 89.9%。医生 2：常规 MR 扫描联合 DWI 诊断的敏感性和特异性分别为 77.5%和 88.6%，常规 MR 扫描联合 MR 增强扫描诊断的敏感性和特异性分别为 80.0%和 84.8%。常规 MR 扫描联合 DWI 和常规 MR 扫描联合 MR 增强扫描在敏感性和特异性上没有明显的区别（医生 1：P=0.453，P=0.999，医生 2：P=0.999,P=0.453）。AUC 曲线分析常规 MR 扫描联合 DWI 和常规 MR 扫描联合 MR 增强扫描敏感性及特异性也没有明显区别（医生 1 中 P=0.53，医生 2 中 P=0.97）。2 种方法在疾病的诊断一致性方面基本相同：常规 MR 扫描联合 DWI 为 0.80；常规 MR 扫描联合 MR 增强扫描为 0.76。
结论：常规 MR 扫描联合 DWI 和常规 MR 扫描联合 MR 增强扫描在诊断软组织脓肿方面具有类似诊断价值。

EPO-2519

HIV/AIDS 患者合并肺结核的胸部影像表现

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目的 探讨 HIV 感染者和艾滋病患者（HIV/AIDS）合并肺结核的胸部影像表现特征。方法 回顾性分析 48 例 HIV/AIDS 合并肺结核的影像征象。结果 HIV/AIDS 患者肺结核的表现为：继发型肺结核 19 例（39.6%），病变形态以斑片状阴影为主，10 例可见融合成大片的实变影；血行播散型肺结核 17 例（35.4%），其中急性粟粒型肺结核 7 例，表现为大小、分布均匀的粟粒影，而亚急性血行播散型 10 例，表现为大小、分布不均匀的粟粒、小结节影；多种征象混合表现 10 例（20.8%），表现为双肺斑片状渗出病灶与弥漫分布的粟粒、小结节灶相混杂。纵隔淋巴结肿大 36 例（75.0%），胸腔积液 13 例（27.1%），心包积液 10 例（20.8%）。结论 HIV/AIDS 合并肺结核的胸部影像学特征为局灶性肺实质病变较少而弥漫性的病变较多，主要表现为不典型浸润、粟粒性病灶、纵隔淋巴结肿大和胸腔积液。

EPO-2520

双能 CT 虚拟平扫在诊断泌尿系统结石并感染中的价值

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泌尿系结石（简称尿石病 Urinary stones disease）是泌尿外科最为常见的疾病之一，可发生于泌尿系的不同部位。因 CTU 直观、准确显示泌尿系结石的部位、大小、周围情况及肾脏的分泌、代谢功能等而广泛用于临床。但凡事有利有弊，扫描范围过大（肾脏上极达盆腔底部）和扫描次数过多（常规平扫、肾实质期和排泄期扫描）以致于辐射剂量过大是 CTU 的主要弊端，同时也是制约其发展的主要因素。

如何在保证图像质量的前提下降低辐射剂量已成为当前的研究热点。近年来在 CTU 检查时采取了一系列减少辐射剂量的扫描方法。其中成效最好的便是 DSCT(dual source CT，DSCT）双能量虚拟平扫(Virtual non-contrast，VNC)技术。

随着人们对 X 线辐射危害意识的提高，如何降低患者的 X 线吸收剂量成为人们越来越关注的问题。常用的降低辐射剂量的方法有降低管电压和管电流，但 CT 图像质量和 X 线吸收剂量之间存在着矛盾关系，降低管电压或管电流势必在一定程度上影响图像质量。第二代 DSCT 利用锡过滤板技术，把低能量的光子从高能量的 X 线中去除，从而提高了射线的利用率，使高能谱射线纯化，显著提高了碘成份的区分能力；而且其 B 球管直径由第一代 DSCT 的 26cm 增加到 33cm，能覆盖更大范围的腹盆部脏器，这些特性为虚拟平扫取代常规平扫提供了理论上的可能性。如果虚拟平扫能代替常规平扫，患者就可减少一期检查受照，从而降低辐射剂量。

目前双源 CT 虚拟平扫技术已经比较成熟，国内外的一些学者对虚拟平扫在颈部、胸腹部及心血管的应用进行了初步的研究，证实虚拟平扫技术有广阔的应用前景；在神经系统方面，有学者发现虚拟平扫能准确的诊断蛛网膜下腔出血；而对于利用虚拟平扫诊断泌尿系结石的研究报道较少。

EPO-2521

指状突树突细胞肉瘤一例

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目的 探讨指状突树突细胞肉瘤(interdigitating dendritic cell sarcoma，IDCS)的临床特点、病理学、影像学特征、治疗及预后。**方法** 报道 1 例发生于腹膜后 IDCS 的临床资料及文献复习。**结果** 免疫组织化学显示瘤细胞阳性表达 CD68、S-100、CD163，CD1a、CD10、Catenin-b（-），CD10（-），CK(AE1/AE3)(-)，cyclin D1(-),Galectin-3(-),Vimentin(-)均阴性。**结论** 指状突树突细胞肉瘤是一种罕见的的恶性肿瘤，病理学免疫表型是诊断本病的重要依据，完整切除肿瘤可能是治疗 IDCS 的有效手段。

EPO-2522
人感染 H7N9 禽流感的临床及影像学特征(附 1 例分析)

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目的:是提高对人感染 H7N9 禽流感的认识，早期诊断，早期治疗，提高患者的生存率。方法：临床疑及人感染 H7N9 禽流感患者进行 CT 扫描并段时间内 CT 复查对比分析。结果：肺部磨玻璃影 3 短时间内复查病灶明显增多，并新增加另一侧肺部病灶，最后导致白肺，双侧胸腔积液从没有增加。结论：根据临床病史和影像学表现特点，早期提出疑似改变诊断，并尽早进行相关的实验室检查做出诊断，早期治疗，有利于患者的预后及早期康复。

EPO-2523
布鲁氏菌性骨关节炎的 CT 表现

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目的 探讨布鲁氏菌性骨关节炎的 CT 表现。**方法** 回顾性分析 6 例布鲁氏菌性骨关节炎的 CT 表现。**结果** 6 例布鲁氏菌性骨关节炎的 CT 表现：（1）脊椎炎 3 例；$L_{4、5}$病变 2 例，$L_{4、5}$及 L_5、S_1病变 1 例。CT 表现为椎体边缘见多发不规则形骨质破坏、病灶周边增生硬化，椎间隙变窄，椎体边缘骨质增生，椎旁软组织肿块、椎旁脓肿、腰大肌脓肿形成。（2）脊椎外骨关节炎 3 例；骶髂关节炎 1 例，CT 表现为髂骨关节面骨质破坏，关节面毛糙，关节间隙变窄；髋关节炎 1 例，CT 表现为关节囊肿胀、关节腔积液；踝关节炎 1 例，CT 表现为内踝、外踝和距骨骨质密度减低，周边软组织肿胀。**结论** 骨关节炎是布鲁氏菌病的常见并发症，影像检查对布鲁氏菌性骨关节炎的诊断和治疗具有重要意义。

EPO-2524
支气管和空洞收缩率鉴别肺部良恶性空洞的价值

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【摘要】 目的 探讨使用双气相 CT 扫描测量支气管和空洞收缩率鉴别肺部良恶性空洞的价值。 方法 对 42 例空洞患者使用双气相 CT 扫描，分别测量空洞和空洞端支气管最大直径，再计算出空洞和支气管收缩率，对比良恶性空洞的差别，采用 t’检验比较空洞和支气管收缩率的差异，通过诊断试验 ROC 曲线，得出良恶性空洞鉴别最佳诊断临界点。 结果 良性空洞端支气管收缩率 1.504±0.349，恶性空洞端支气管收缩率 1.082±0.164，t’=4.935,P<0.001，差异有统计学意义;良性组空洞收缩率（1.29±0.25），恶性组空洞收缩率（1.02±0.06），差异有统计学意义（t’=4.603，P<0.001）。利用受试者工作特征 ROC 曲线分析，选择 Youden 指数最大值作为良恶性空洞鉴别最佳诊断临界点时，当支气管收缩率的最佳诊断临界点为 1.111 时，敏感度为 90.50%，特异度为 86.40%。当空洞收缩率的最佳诊断临界点为 1.08048 时，敏感度为 90.50%，特异度为 90.90%。 结论 使用双气相 CT 扫描支气管和空洞收缩率可以鉴别良恶性空洞。

EPO-2525

MR 表观扩散系数在评价腰椎结核治疗效果中的价值

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目的 测量腰椎结核患者椎体结核病灶的 MR 表观扩散系数(ADC 值)，比较治疗前后的 ADC 值变化情况,探讨 ADC 值在疗效评估中的应用价值。
方法 选择 2018 年 10 月 01 日至 2019 年 07 月 01 日期间至山东省胸科医院住院治疗，经外科术中病理检查确诊为腰椎结核的患者，共 47 例，年龄 13—72 岁，男性 34 人，女性 13 人。采用 GE 3.0T 超导型磁共振扫描仪，扫描序列包括 T1WI、T2WI、FLAIR、 扩散加权成像(diffusion-weighted imaging,DWI) 序列(b＝0,1000 mm^2/sec)，经静脉团注钆喷替酸葡甲胺(Gd-DTPA) 行 T1 轴位、冠状位、矢状位增强扫描，重点观察椎体结核病灶及周围脓肿的强化区域，区分脓肿中心（无明显强化区域）及壁（强化区域），DWI 数据通过工作站表观扩散系数(ADC)分析软件进行后处理生成 ADC 图，每一病灶分为中心及周边区域，分别取 3 个直径约为 3mm 的感兴趣区，测量 ADC 值并取其平均值。经系统抗结核治疗，患者相应系统症状明显减轻后，进行复查，再次测量病灶相同部位灶的 ADC 值。将两次测量的值与正常成人相同部位 ADC 值进行对照分析。
结果 治疗前椎体结核病灶平均 ADC 值为 1.43±0.25X$10^{-3}mm^2/sec$，周围脓肿壁 ADC 值为 1.89±0.30X$10^{-3}mm^2/sec$，正常椎体平均 ADC 值为 0.48±0.16X$10^{-3}mm^2/sec$；经系统抗结核治疗后及痊愈的患者椎体 ADC 值接近正常值。
结论 MR 表观扩散系数(ADC)值可以对腰椎结核的治疗情况进行评价，为临床制定及调整更合理的治疗方案提供充分的影像学依据。

EPO-2526

MSCT 对颈淋巴结结核的诊断价值

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目的探讨颈部淋巴结结核的 CT 表现。方法回顾性分析 2015 年 12 月至 2019 年 5 月 98 例术后经病理检查证实为颈部淋巴结结核患者的 CT 影像学资料。结果 98 例患者中Ⅰ型(CT 平扫表现为密度均匀肿大淋巴结,增强后强化方式与邻近肌肉组织相近)24 例,Ⅱ型(CT 平扫也表现为密度均匀,增强后

强化不均匀、周围脂肪间隙清晰)67 例,Ⅲ型(CT 平扫密度不均匀,增强后表现为环形强化、周围脂肪间隙清晰)57 例,Ⅳ型(CT 平扫密度不均匀,增强后可见分隔样及环形强化、周围脂肪间隙消失)68 例。病灶分区:Ⅰ区 22 例 ,Ⅱ区 59 例 ,Ⅲ区 58 例 ,Ⅳ区 64 例 ,Ⅴ区 23 例 ,Ⅵ区 13 例 ,Ⅶ区 17 例 ,锁骨上区 52 例 ,共 324 个淋巴结区受累。结论颈部淋巴结结核的 CT 表现有较典型特异性改变,CT 检查能清晰显示病变部位、形态、大小和邻近结构等情况,但三维后处理同时进行更能显示病灶分布及整体情况。

EPO-2527

气道复发性多软骨炎的胸部 CT 表现

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目的：探讨累及气道的复发性多软骨炎 CT 影像学表现。方法：对 26 例经临床及病理确诊的复发性多软骨炎患者进行 CT 扫描，并对气道进行多种技术 CT 三维重建，包括 minMIP（最小密度投影）、MPR（多平面重建）及 CPR（曲面重建）。26 例患者中 16 例出现耳廓软骨炎其中 4 例经耳廓软骨活检，8 例出现鼻软骨炎，2 例出现喉部软组织增厚，经喉镜活检证实，另有 8 例出现多关节炎，2 例出现眼炎。实验室检查：18 例患者出现红细胞沉降率(ESR)增快加快，15 例患者 C 反应蛋白(CRP)升高。全部病例符合 1976 年 McAdam 的诊断标准，同时符合 2011 年复发性多软骨炎诊断和治疗指南。结果：1.病变基本 CT 表现：气管及主支气管壁广泛均匀增厚 16 例，不均匀增厚 10 例，气道狭窄 14 例（其中气道闭塞 1 例）,气道壁钙化 2 例，气管呈刀鞘状 2 例，气道塌陷 2 例，阻塞性肺炎 2 例。2.不同呼气/吸气时相 CT 扫描对照：8 例病情严重患者，由于气管软骨破坏严重，呼气相对照吸气相气道出现塌陷，管径明显减小。3.气道三维重建检查 16 例患者，10 例表现为气管及支气管壁广泛的弥漫性增厚，5 例表现为气管-支气管不均匀增厚，另 1 例表现为局部管壁增厚，管腔闭塞。4.各种 CT 三维重建图像的比较：minMIP 可以清晰显示气管及主支气管管腔狭窄长度及范围，但无法显示管壁的增厚，并且对细小支气管显示欠佳；MPR 可以同时显示管壁增厚及管腔狭窄，但气道呈曲线，无法在一张图像上显示气道全貌。CPR 图像可以显示气管至某一支支气管的全程，但曲面重建将气管、支气管拉直，导致失真。需将 3 种重建方式结合才能全面的评估气道改变。结论：气道复发性多软骨炎 CT 表现具有一定的特征性，大多表现为较广范围的均匀或不均匀气道管壁增厚及管腔狭窄，当患者临床出现多个部位的慢性炎性反应时，应考虑复发性多软骨炎的诊断的可能，吸气/呼气相对照扫描及多种方式 CT 重建有助于全面评估气道改变。

EPO-2528

糖尿病患者合并肺结核的 CT 表现与血糖水平的关系

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目的 探讨糖尿病患者合并肺结核在不同血糖水平下的 CT 表现。**方法** 回顾性分析 2014 年 4 月—2015 年 3 月住院诊断的糖尿病伴发肺结核患者 78 例，均无 HIV 感染、使用糖皮质激素及免疫抑制剂及其他免疫低下情况。按最近三月平均空腹血糖＜10mmol/L 及≥10mmol/L 分为甲乙两组，分别为 37 例、41 例，其中男性 47 例，女性 31 例，年龄 17-78 岁，平均 53±11 岁，两组在性别及年龄差异无统计学意义（P＞0.05）。对两组患者的 CT 表现进行对比分析。主要观察两组病变分型，病灶分布部位、病变形态及合并肺外结核的表现情况。用统计软件 SPSS19. 0 对数据进行统计分析。**结果** 甲乙两组 III 型分别为 21 例、35 例（P＜0.05），V 型分别为 4 例，15 例（P＜

0.05）。其余各型两组差异无统计学意义（P＞0.05）（I 型分别为 3 例、5 例，II 型分别为 5 例、7 例。IV 型分别为 10 例，13 例）。 两组病变分布 3 叶以上分别为 17 例、31 例（P＜0.05），累及下叶基底段 13 例、40 例（P＜0.05）。实变分别为 15 例、34 例（P＜0.05），干酪病灶 3 例、27 例（P＜0.05），空洞 8 例、22 例（P＜0.05），结节 21 例、8 例（P＜0.05），钙化 6、3 例（P＞0.05），胸腔积液 8 例、12 例（P＞0.05），肿块 4 例、3 例（P＞0.05），树芽征 9 例、17 例（P＞0.05），纵膈淋巴结肿大 9 例、11 例（P＞0.05），肺外结核 4 例、15 例（P＜0.05）。**结论** 糖尿病合并肺结核 CT 表现与血糖水平有关，血糖越高，病变分布越广泛，非好发部位发生率越高、病变播散越多，干酪病灶、空洞及肺外结核越多。

EPO-2529
动态 MRI 联合 MRS 及 PWI 对艾滋病局灶性脑损伤病变的鉴别

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目的：艾滋病患者局灶性脑损伤的原因主要有弓形虫脑炎、原发性中枢神经系统淋巴瘤、进行性多灶性白质脑病，通过 MRI 平扫及增强联合波普分析进行鉴别。
方法：使用 GE3.0MRI 进行颅脑平扫及增强扫描并进行 MRS 及 PWI 分析，分析病变不同特点。
结果：弓形虫脑炎为脓肿性改变，多发，易发生在皮髓交界区、基底节区、小脑，T1WI 呈低信，T2WI/T2WIflair 为高、混杂信号，水肿较轻，DWI 为低信号，MRS 表现为 NAA、cho 减低，lip 峰稍高，增强呈环形强化及靶征表现，PWI 为低灌注。原发性中枢神经系统淋巴瘤，多位于幕上，胼胝体，脑室周围，室管膜周围，沿血管间隙生长，呈“袖套状”改变，T1WI 等、低信号，T2WI/T2WIflair 等、高信号，DWI 高信号，MRS 为 NAA 下降，cho 升高，lip 峰高耸，增强为“尖角征”“脐凹征”“握拳征”“裂隙征”“蝶翼征”，PWI 为低灌注。进行性多灶性白质脑病，好发于大脑皮质下白质，小脑脚，T1WI 低信号,T2WI/T2WIflair 高信号，DWI 中央低信号，周边高信号，MRS 为 NAA 下降，Cr 增高，增强不强化。
结论：MRI 联合 MRS 及 PWI 在鉴别弓形虫脑炎、原发性中枢神经系统淋巴瘤及进行性多灶性白质脑病有一定的优势。

EPO-2530
T1mapping on Gd-EOB-DTPA-enhanced MR Imaging has perfect delay time in Predicting Liver Fibrosis Levels

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Purpose: To investigate perfect delay time of T1mapping on Gd-EOB-DTPA-enhanced MRI in predicting liver fibrosis levels.
Methods: 158 patients with chronic hepatitis B who accepted liver biopsies were enrolled. Liver pathological diagnosis referred to Scheuer-Ludwig scoring system. Non-

enhanced and Gd-EOB-DTPA-enhanced MRI by Look-Locker sequences were performed pre and post-contrast at 5, 10, 15, 20 minute after Gd-EOB-DTPA administration. The reduction rate of T1 value (ΔT1%) was measured at 5, 10, 15 and 20 minute ($\Delta T1_{5min}$%, $\Delta T1_{10min}$%, $\Delta T1_{15min}$%, $\Delta T1_{20min}$%), respectively. ROC curve was used to evaluate the performance of the ΔT1% at different time points in predicting liver fibrosis levels.

Results: ΔT1% correlated significantly with fibrosis stages (all $P<0.001$), no significant difference was found at each scanning time. ΔT1% at each scanning time significantly decreased between S1 and S2, S2 and S3, S3 and S4. AUCs of ΔT1% for diagnosing ≥ S2 were 0.907, 0.913, 0.910, 0.916, and for diagnosing ≥ S3 were 0.912, 0.920, 0.923, 0.938, and for diagnosing ≥ S4 were 0.943, 0.944, 0.947, 0.952, respectively. No significant difference was found in $\Delta T1_{10min}$% as well as $\Delta T1_{5min}$%, $\Delta T1_{15min}$%, $\Delta T1_{20min}$% for diagnosing ≥ S2, ≥ S3, ≥ S4. The Bland-Altman diagrams of $\Delta T1_{10min}$% and $\Delta T1_{5min}$%, $\Delta T1_{15min}$%, $\Delta T1_{20min}$% were 5.06%, 6.33%, 4.43% outside the 95% consistency limit, respectively.

Conclusion: To diagnose liver fibrosis of chronic hepatitis B with Child-Pugh score < 7, the result of $\Delta T1_{10min}$% is more accurate than that of $\Delta T1_{5min}$%, and more efficient than those of $\Delta T1_{15min}$%, $\Delta T1_{20min}$%. Comprehensively consider efficient and accuracy, the perfect delay time is close to 10 minute.

EPO-2531

螺旋 CT,MRI 及 MRS 对颅脑结核的诊断价值

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目的
颅脑结核是由原发性结核经血缘传播所致，临床表现不典型，
易与胶质瘤相混淆。探讨螺旋 CT，MRI 以及 MRS 对病变的诊断价值。
方法
采集我院 2017 年 06 月误诊为占位性病变的患者进行回顾性分析。采用飞利浦 64 排螺旋 CT 及 GE3.0T 磁共振头颅线圈常规 propeller 序列轴位 T2WI，轴位 T1WI flair;flair 序列轴位 T2WI，失状位 T1WI;b 值为 1000 的轴位 DWI 检查。
结果
患者男性，73 岁，2017-06-14 以“颅脑占位”入住我院，查体未见阳性体征。CT 示右额叶区低密度影；MRI 平扫示颞顶叶交界区见斑片状长 T1，长 T2 信号影，T2flair 高信号， DWI 高信号；MRS 示 NAA 波峰明显降低，Cho 峰明显升高；无结核中毒症状。10-04 出院。2018-10-09 再次以“肺癌”入住我院，病理示右肺下叶肉芽肿性炎，可见干酪样坏死；痰抗酸染色阳性。抗结核治疗后，颅内病变好转。
结论
颅脑结核没有较为典型的外在表现，不易准确诊断，行螺旋 CT，MRI 及 MRS 检查，可以为诊断及鉴别诊断提供重要的依据，有助于颅脑结核的早期发现。

EPO-2532

Standardized Training of Radiology Residents in Imaging Diagnosis: Exploration of the Training Effect Based on Structured Reporting

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Object: We hypothesized that structured reporting would be an effective tool for standardized training of radiology residents, and in this paper, we explored the training effect of imaging diagnosis based on structured reporting in a radiology residency training program. **Methods:** The radiology residents were recruited for the 3-month training program. They were divided into a junior (training <1 year, 9 residents) and a senior (training ≥1 year, 13 residents) group. The training covered imaging diagnosis of 22 diseases (classified as vascular evaluation, descriptive diagnosis, diagnosis for classification and preoperative staging evaluation of neoplastic diseases), with 3 types of imaging modalities (X-ray, CT, and MRI). The residents were asked to attend multiple training courses and were given many cases for self-practice. At the end of the program, the residents were tested and evaluated. **Results:** The average reporting score was 74.9±8.3, and the overall pass-rate of residents was 86.4%. There was no significant difference in reporting score between the junior and senior residents (76.5±9.2 to 73.2±10.4, $P>0.05$), as well as the pass-rate (88.0% to 84.7%, $P>0.05$). The average reporting score of X-ray, CT, and MR was 62.7±10.7, 76.4±10.0 and 76.7±6.0 with significant difference ($P<0.001$); and the pass-rate was 68.2%, 88.9% and 88.2% with significant difference ($P<0.05$). The average reporting score of the 4 categories was 78.3±18.8, 76.1±18.6, 74.2±14.1 and 72.9±17.1 with no significant difference ($P>0.05$); and the pass-rate was 92.6%, 88.5%, 79.4%, and 89.5% respectively ($P>0.05$). **Conclusions:** Structured reporting was an effective tool for standardized training of radiology residents covering various diseases, suitable for both senior and junior residents, and the junior residents progressed remarkably after training.

EPO-2533
优化对比剂注射方案对头颈部 CTA 图像质量的影响

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目的：比较相同碘浓度下，不同的对比剂注射方案在第二代双源 CT 血管造影(CTA)中对颅脑 CTA 图像质量的影响。
方法：将 100 例拟行颅脑 CTA 患者随机分为 2 组，A 组以 4ml/s 的速率将 60mL 对比剂一次性注入，再以相同速率注入 20ml 生理盐水。B 组以第一期 4ml/s 的速率注射 40mL，第二期以 4ml/s 的速率注入混合 50%生理盐水与 50%对比剂共 20ml，第三期以 4ml/s 的速率注入 20ml 生理盐水。两组扫描方案均采用 80KV，250mAs，螺距 Pitch0．6 。分别分析其横断位图像，MPR 图像，分别测

量主动脉弓层面，左锁骨下动脉，右颈总动脉分叉段，基底动脉，右侧大脑中动脉，窦汇的 CT 值，同时结合 VR 图像观察颈静脉的显示情况。
结果：A 组窦汇的 CT 值明显高于 B 组，(P＜0.05)各组间 CT 值存在显著差异。两组在各动脉的 CT 值无明显差别(P＞0.05)。
结论：双期混合注射碘对比剂在头颈部 CTA 扫描中静脉的干扰低于单期注射法，图像质量优于单期注射法，同时也减少了对比剂用量。

EPO-2534

The Mechanisms of Contrast-Induced Acute Kidney Injury and Its Association with Diabetes Mellitus

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Abstract:
Contrast-induced acute kidney injury (CI-AKI) is the third most common hospital-acquired AKI after AKI induced by renal perfusion insufficiency and nephrotoxic drugs, taking great adverse effects on the prognosis and increasing hospital stay and medical cost. Diabetes mellitus (DM) with or without diabetes nephropathy (DN) is an independent risk factor for CI-AKI. The incidence of CI-AKI significantly increases in patients with renal injury, especially in DM-related nephropathy.The etiology of CI-AKI is not fully clear and researches on how DM becomes a risk factor of CI-AKI is limited.

This review describes the mechanism from three aspects. **① Pathophysiological changes of CI-AKI in kidney under high-glucose status (HGS).** HGS can improve the oxidative stress and increase ROS. It causes stronger vessel constriction and insufficient oxygen supply in kidney via vasoactive substances. HGS also aggravates some ion pump load and the latter increases oxygen consumption. CI-AKI and HGS are mutually causal, making the kidney function continue to decline. **② Immunological changes of DM promoting CI-AKI.** Some innate immune cells and pattern recognize receptors (PRRs) in DM and/or DN may respond to some damage associated molecular patterns (DAMPs) formed by CI-AKI. These effects overlap with some pathophysiological changes in hyperglycemia.**③ Signaling pathways related to both CI-AKI and DM.** These pathways involved in CI-AKI are closely associated with apoptosis, inflammation and ROS production, and some studies suggest that these pathways may be potential targets for alleviating CI-AKI.

In conclusion, the pathogenesis of CI-AKI and the mechanism of DM as a risk factor for CI-AKI, especially signaling pathways, need further investigation to provide new clinical approaches to prevent and treat CI-AKI.

EPO-2535

学龄儿童腹部能谱检查中肝实质单能量图像的评估

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目的：对儿童肝实质的能谱 CT 的单能量图像进行评估，得到显示正常肝脏实质的最佳单能量水平。
方法：收集 26 名因其他疾病需做腹部增强检查且肝脏正常的儿童（13 名女童和 13 男童；年龄范围 5-13 岁；平均年龄 6.85±1.97 岁）的能谱 CT 图像数据，并在 40-75keV 范围里重建了以 1keV 为间隔和在 75-140keV 的范围里重建了以 5keV 为间隔的单能量图像。测定记录肝脏实质和同层面的竖脊肌的 CT 值和标准差，并得出其信噪比和肝脏实质的噪声。首先以肝 CT 值为标准对单能量图像进行筛选；其次以噪声和信噪比为客观评估参数筛选出信噪比噪声最佳的单能量图像；最后让两位资深的诊断医师运用 5 级量表对相当于儿童 120kvp 的 65keV 单能量图像和最佳信噪比的单能量图像进行主观评估。
结果：肝脏的 SNR 从 140KeV 到 40KeV 逐渐降低（SNR:9.31-6.92）。噪声从 40KeV 到 140KeV 逐渐降低(噪声：33.33-8.22)。由于增强后的肝脏实质的 CT 值至少大于 116HU，所以根据信噪比和噪声，得出肝脏的最佳单能量为 68kev。68kev 的最佳单能量图像的主观图像质量评分、噪声和信噪比都优于相当于儿童的 120kvp 的 65keV 单能量图像(依次为：$p=0.048, p<0.05; t=-22.857, p<0.001; t=8.061, p<0.001$)。
结论：儿童腹部 GSI 增强检查中，观察肝实质的最佳单能量为 68keV。

EPO-2536
APP/PS-1 转基因小鼠病理学改变及其对行为学的影响

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目的 观察 APP/PS-1 转基因阿尔茨海默病(Alzheimer’s Disease, AD)小鼠模型脑部β-淀粉样蛋白（β-Amyloid Protein, Aβ）沉积、神经元缺失以及胶质细胞的活化、增生等情况；并比较不同月龄的 APP/PS-1 转基因小鼠和对照组学习记忆能力的差异，及其与病理学改变之间的关系。
方法 3、6、9 个月龄的 APP/PS-1 转基因小鼠各 6 只作为实验组，同龄野生型小鼠做为对照组；应用 Morris 水迷宫对小鼠进行学习与记忆能力的检测；取小鼠脑组织切片经尼氏染色、Aβ免疫组织化学染色以及铁蛋白-Aβ和神经胶质纤维酸性蛋白（Glial Fibrillary Acidic Protein, GFAP）-Aβ免疫荧光双标记；数据分析软件：采用 SPSS12.0 统计分析相关数据。
结果 6 月龄的 APP/PS-1 转基因小鼠脑部 Aβ斑块形成，而 9 月龄的 APP/PS-1 转基因小鼠皮质和海马内 Aβ沉积斑块数量增多；6、9 月龄的 APP/PS-1 转基因小鼠脑部出现神经元缺失，胶质细胞的活化、增生；随着月龄的增加，6、9 月龄 APP/PS-1 转基因小鼠的学习记忆能力下降（$p<0.01$）。
结论 Aβ的表达在 APP/PS-1 转基因小鼠的病理过程中起了重要作用；沉积的 Aβ斑块使得胶质细胞活化增生，引起神经元的缺失，由此导致了 6、9 月龄 APP/PS-1 转基因小鼠的学习记忆能力出现下降。

EPO-2537
婴幼儿磁共振头颅检查中亲属陪护方式的优化

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目的：探究婴幼儿 MRI 检查中亲属陪同方式的优化。**材料与方法：**收集 2017 年 12 月～2019 年 3 月到我院行头颅磁共振检查的婴幼儿 229 例，常规行口服水合氯醛镇静。按检查时亲属陪同方式可分为三组： A 组：怀抱陪护方式，亲属怀抱婴幼儿同床进入磁体；B 组：足侧陪护方式，亲属俯在婴幼儿足端与婴幼儿同床一同进入磁体；C 组：传统陪护方式，即婴幼儿单独放在检查床上，亲属站在磁体旁边监护。记录受检婴幼儿首次检查的成功率，并评价检查成功的婴儿头颅图像的优片率。采用多样本率的卡方检验与 Cruskal-Wallis 秩和检验法，比较三种陪同方式在成功率及图像质量方面的差异。**结果：**①各组的成功的率为：A 组（90.69%）及 B 组（83.72%）均高于 C 组（58.13%）（P＜0.05），但 A、B 两组之间没有统计学差异。②优片率的比较：B 组（75.3%）、C 组（88.1%）的优片率均高于 A 组（51.6%）（P ＜0.05），但 B 组与 C 组之间优片率无统计学差异。**结论：**亲属俯卧在婴幼儿足端进入磁体的方式能提高婴幼儿头颅 MRI 检查的成功率，且图像质量高，可作为常规首选。个别依赖性强的婴幼儿则可尝试怀抱陪护式。

EPO-2538
胸腹部联合扫描在降低 CT 辐射剂量中的临床应用研究

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胸腹部联合扫描在降低 CT 辐射剂量中的临床应用研究

吴畅

【摘要】
目的：探讨胸腹部联合扫描在降低 CT 辐射剂量中的应用价值。
方法：回顾性分析 130 例胸部、130 例腹部及 120 例胸腹部 CT 扫描患者的临床及影像资料，分析并比较胸腹部拆分扫描与联合扫描在 CT 辐射有效剂量中的差异。
结果：针对年龄无统计学显著差异（T-test, P＞0.05）的三组 CT 扫描患者：130 例胸部、130 例腹部及 120 例胸腹部患者，其 CT 检查总 DLP 分别是 369.52±63.09、340.28±65.62、481.05±60.12。利用欧盟委员会(CEC) 关于 CT 质量标准指南 [6] 中不同部位的转换系数乘以剂量长度乘积得出有效剂量，计算得出胸腹部拆分扫描有效剂量之和与联合扫描所受辐射有效剂量分别为 11.38604±2.05683，15.3936±1.92384。在辐射有效剂量的对比上差异具有统计学意义（T-test, P＜0.05）。
结论：胸腹部 CT 联合扫描较拆分扫描可明显降低患者所受辐射有效剂量，在此类检查中采用拆分扫描不符合辐射防护要求。
【关键词】体层摄影术； X 线计算机；辐射剂量；

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的平均年龄分别为 57.56±10.87、59.34±11.62、62.01±11.37；

EPO-2539
增强磁共振神经成像与常规磁共振在腰神经根受压的对比研究

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目的：比较常规腰椎磁共振平扫和增强磁共振神经根成像对腰神经根各段受压检出率的差异及评价受压等级的一致性。
方法：回顾性分析行常规腰椎磁共振平扫及增强磁共振神经根成像扫描的 67 例患者的临床及影像学资料，所有患者均行常规腰椎磁共振平扫、增强 T2 3D-STIR-SPACE 序列扫描。应用改良 Pfirrmann 分级系统，将神经根受压评分为 0 分、1a 分、1b 分、2 分、3 分，受压等级为 0 等级、2 等级、3 等级。将神经根分为三段进行评估，分别是神经根节前段（I 段）、神经根节段（II 段）、神经根节后段（III 段）。采用配对 x 2 检验比较两种成像方法的腰神经根分段受压检出率，Kappa 检验评价应用两种方法所得的受压等级的一致性，并进行统计学分析，P<0.05 为差异具有统计学意义。
结果：1. 应用常规腰椎磁共振平扫和增强磁共振神经根成像分别评估 L3-S1 共 1116 段神经根，左右两侧神经根受压无统计学差异（p<0.05）。两种***方法***对腰神经根各段受压检出率的比较，S1 神经根 I 段，检出率差异无统计学意义（P>0.05），L3-L5 神经根节段检出率差异均具有统计学意义（p<0.05）。常规磁共振检查受压检出率在 L3-L5 神经根 I 段和 II 高于增强磁共振神经根成像；增强磁共振神经根成像受压检出率在 L3-L5 神经根 III 段神经根高于常规磁共振检查。2. 应用两种方法评价 L3-S1 神经根各节段受压等级的一致性，差异均具有统计学意义（P<0.05），且一致性 I 段>II 段>III 段，增强磁共振神经根成像能够更好地区分受压 2 等级和 3 等级。
结论：常规腰椎磁共振平扫和增强磁共振神经根成像均能够评价腰神经根各段受压情况。两种方法结合能够更全面评估腰神经根各节段受压情况，为临床诊治提供更准确的影像学信息。

EPO-2540

脑卒中 MR 筛查方案浅析

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目的：探讨 MR 新技术在脑卒中筛查的应用可行性。
方法：初级脑卒中 MR 筛查方案包括常规结构成像（T1WI、T2WI、T2 FLAIR，以横断位为主，必要时辅于矢状位和/或冠状位。）和功能与血管成像（DWI、3D TOF MRA、PLD=1.5s 的 ASL）；高级脑卒中 MR 筛查方案是在初级脑卒中 MR 筛查方案的基础上，增加观察血供代偿情况的 PLD=2.5s 的 ASL 和观察出血情况的 SWI、所有受检者均采用 GE Discovery Silent（750W） 3.0T MRI 仪进行检查。
本研究项目经过医院的伦理学委员会审查通过，所有受检者均在检查前了解了检查内容并签署了知情同意书。
结果：初级脑卒中 MR 筛查方案的特色，包括 DWI 结合 FLIAR 序列，脑脊液抑制，早期筛查小卒中；3D TOF 序列，2 分 25 秒血管成像，快速脑血管筛查；3D ASL 不打药全脑灌注成像。其优势在于经济快速，可排除大部分的脑血管病变；临床有症状，而常规结构成像、DWI 及血管成像无明显特征性病灶，PLD=1.5 ASL 可早期筛查卒中前兆病变，如：TIA 等。
高级脑卒中 MR 筛查方案特色，包括：与 PLD=1.5 的 3D ASL 对比，可有效判定血供代偿情况；SWAN 可早期筛查颅内微出血，如：脑白质淀粉样变等。其优势在于全面放心，可发现 TIA 及早期脑出血；有效地进行干预性治疗方案制定及预后评估。
结论：初、高级脑卒中 MR 筛查方案可以区分正常、隐匿性病变、慢性血管狭窄或闭塞、侧枝循环评估、TIA、脑小血管病，且可规范地为人工智能在脑卒中的应用提供数据库，将为脑卒中筛查提

供详尽的结构与功能影像信息，为临床治疗方案的制定与预后评估提供准确依据，对于脑卒中的早期筛查具有重要意义。

EPO-2541
MBIR 在 CT 血管成像中的价值：体模和临床应用研究

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目的 比较自适应统计迭代重建(ASIR)和基于模型的迭代重建(MBIR)2 种迭代重建对 CT 血管成像（CTA）质量的影响。
方法 （1）体模研究：CT 扫描静止状态下容纳 9 支试管的血管模型,试管内分别填满纯水、1mgI/ml、2mgI/ml、5mgI/ml、10mgI/ml、20mgI/ml、30mgI/ml 溶液（两支,一支置于中央）和 30 mgCa/ml 钙溶液,得到原始扫描数据后分别使用标准算法 ASIR40(40%ASIR 与 FBP 混合)和 MBIR 算法重建层厚 0.625 mm 的图像后进行对比分析。选取 5 个固定层面在试管中心及周围酯性基质放置感兴趣区(ROI)测量其 CT 值与标准差值(SD）,SD 代表噪声。比较各重建算法图像各支试管内不同浓度碘溶液噪声和以酯性基质为背景的对比噪声比(CNR)。（2）临床应用研究：搜集超声诊断头颈部及下肢动脉粥样硬化并行 CTA 进一步检查病例 24 例(头颈部 14 例、下肢 10 例)，客观方面通过放置 ROI 测量三种算法重建图像血管内及周围肌肉 CT 值及 SD 值，比较各重建算法图像血管内噪声和以肌肉为背景的 CNR，主观方面在图像噪声、血管分支、斑块分析方面对图像进行 4 分法主观评价。
结果 体模研究中，相比 ASIR40，MBIR 噪声下降 45.56%,CNR 升高 124.27%,差异具有统计学意义（P＜0.05），且对比剂密度越大，其噪声及 CNR 改善越明显。在头颈部及下肢 CTA 临床应用研究中，相比 ASIR,MBIR 图像噪声减低，CNR 增大,差异具有统计学意义（P＜0.05）。两位医师对临床图像主观评分一致性好（kappa 值＞0.7），MBIR 图像主观评分明显高于 ASIR,差异具有统计学意义（P＜0.05）。
结论 相比于 ASIR 重建，MBIR 有助于降低 CTA 图像噪声、提高 CNR 和粥样斑块成像质量，可为降低 CTA 辐射剂量或对比剂用量提供潜能。

EPO-2542
3.0T 弥散加权成像 ADC 值对评价肾盂癌侵袭性的价值

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目的 探讨 3.0T 磁共振弥散加权成像对肾盂癌的诊断价值及其表观弥散系数（apparent diffusion coefficient，ADC)值与病理分级及分期的关系。

方法 回顾性分析 29 例肾盂癌的临床资料，行常规 MRI 扫描及 b 值=0、800s/mm^2DWI 检查，分析并记录病灶的 DWI 信号特点，病灶区域选择一大一小 2 个感兴趣区（ROI），比较发生部位（左右）与性别间 ADC 值的差异，比较正常肾实质、尿液及病灶的 ADC 值，利用独立样本 t 检验分析比较两组不同大小 ROI 的 ADC 值的差异，分析不同病理分级、分期的 ADC 值的差异。并采用免疫组织化学方法检测 Ki67 标记指数（label index，LI）在肾盂癌的表达及其与 ADC 值的关系。

结果 b 值为 800s/mm^{2}时，利用 DWI 诊断肾盂癌的敏感性为 96.6%，特异性 89.3%，准确率 93.0%，阳性预测值 90.3%，阴性预测值 96.2%。肾盂癌与正常肾实质及尿液差异均有统计学意义（P<0.05）。不同大小 ROI 的 ADC 值间差异无统计学意义。低级别(G1-2)肿瘤的 ADC 值较高级别（G3 级）高，差异有统计学意义（P<0.01），局限于肾盂及输尿管的（Ta-2 期）较有局部侵犯（T3-4 期）及以上分期的 ADC 值高，差异有统计学意义（P<0.01），低级别(G1-2)及局限性肾盂及输尿管癌的 ADC 值较高级别及晚期（T3-4 期）的 ADC 值高（P值均为 0.000）。ADC 值与 Ki67 的表达量呈反相关(r=−0.87, P=0.000)。

结论 ROI 的大小对于尿路上皮癌的鉴别可能意义不大，在不使用造影剂的情况下，DWI 有利于术前评估肾盂及输尿管癌的组织学分级及 T 分期。

EPO-2543

儿童放射技术及诊断的质量控制人工智能系统

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目的

本研究围绕儿童放射技术及诊断的质量控制，构建数据集并运用机器学习、深度学习、自然语言处理等技术，对儿童放射的检查前问询、影像、诊断报告、放射防护进行质量控制，构建儿童放射技术及诊断的质量控制人工智能系统。

方法

（1）构建检查前问询、影像、诊断报告、放射防护参数数据库

搜集 1000 例儿童 DR 正位胸片的临床资料，包括检查前问询、影像、诊断报告、DR 设备相关参数（如，体重(公斤数)、mAs、kV）。由具有资质的医生给出不同的检查前问询结果对应的质控方案，勾画影像中肺、脊柱、锁骨的轮廓，给出诊断报告的标准格式，以及 DR 设备相关参数的合理性。

（2）提出检查前问询、影像、诊断报告、放射防护的质控方案

基于步骤（1），制定质控方案：通过构建检查前问询质控模型、影像质控模型、诊断报告质控模型、放射防护质控模型完成上述环节的质量控制。

（3）基于人工智能技术构建儿童放射技术及诊断的质量控制人工智能系统

通过机器学习、深度学习、自然语言处理等技术实现步骤（2）提出的方案，并基于步骤（1）构建的数据库训练各模型。将训练完毕的模型集成为儿童放射技术及诊断的质量控制人工智能系统。

上述模型采用 K-Fold 交叉验证法进行训练，其中 K 分别取 3、5、10。训练数据集为 1000 例儿童 DR 正位胸片的临床资料：检查前问询、影像、诊断报告、DR 设备相关参数。当 K=3 时，总训练时间约为 300 个小时；当 K=5 时，总训练时间约为 230 个小时；当 K=10 时，总训练时间约为 210 个小时。

结果

K=5 时训练的模型最优，由此构建的系统可以甄别出检查前问询、影像、诊断报告、放射防护等环节的质量控制问题，并给出对应的提示，提高了医疗服务质量，有效地保护了患者的诊疗安全。

结论

本研究创新提出儿童放射技术及诊断的质量控制人工智能系统，国内尚无此类报道。首次提出了检查前问询、影像、诊断报告、放射防护的深度学习质控模型。

EPO-2544

Utilizing Perfusion CTP Software to Measure Infract Core and Penumbra Volume in Acute Ischemic Stroke

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Purpose: To evaluate the accuracy of the various commercial computed tomographicperfusion (CTP) software packages in predicting the ischemic core and mismatch volume of patients with acute stroke.
Materials and Methods: 311 patients with acute strokes treated using CTP software between September 2017 and December 2018 were retrospectively analyzed. All CT scans were performed using a 256-slice CT scanner and CT perfusion images were processed using three different software packagesincluding Brain CT Perfusion package of IntelliSpace Portal (ISP), RAPID and F-STROKE. The ischemic core and penumbra volume were calculated and recorded by the three commercial software packages. Wilcoxon test for paired differences was used as a nonparametric test. P values of <0.05 were considered statistically significant. A volumetric agreement comparison between infarct core and penumbra volume was performed for each software using Bland-Altman plots and intra-class coefficient (ICC). Linear correlation and Bland-Altman analysis with 95% limits of agreement were used to examine the agreement of each two methods.[1]
Results:295 patients met the inclusion criteria.The infarct core volumes from ISP software were significantly larger than that from the other two software ($p<0.001$). F-STROKEyields significantly lowered infarct core volume and penumbra volumescompared with RAPID ($p<0.01$), and the infarct core volumes and penumbra volumes in RAPID were 3% and 8% larger than those in F-STROKE respectively. As the linear correlation analysis shown in Figure-1, RAPID and F-Stroke gave significant linear correlation to infarct core volume ($R^2= 0.942$) and penumbra volumes ($R^2= 0.935$). The Bland-Altman analysis shows that the infarct core and the penumbra volumes from any two of the three methods are mostly within limits of agreement. The ICC's for F-Stroke and RAPID in measuring the infarct core and the penumbra volume were 0.972 and 0.971, respectively.
Conclusion: High precision and accuracy were key characteristics for the F-STROKE and RAPID software. However, F-STROKE software had better accuracies in the removal of the cerebrospinal fluid and brain sulci, compared with the RAPID software.

EPO-2545

3.0T MRI 扩散加权成像及灌注加权成像在肾脏良恶性肿瘤鉴别诊断中的价值

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目的 评价 3.0T MRI 扩散加权成像(DWI)和灌注加权成像(PWI)在肾脏肿瘤良恶性及不同病理组织学类型间鉴别诊断的价值。

方法 15 例正常志愿者及 46 例经病理证实的肾脏肿瘤患者（肾透明细胞癌 18 例，乳头状肾细胞癌 8 例，肾嫌色细胞癌 7 例，肾血管平滑肌脂肪瘤 13 例）行 3.0T MRI DWI 及 PWI 扫描。采用单因素方差分析方法比较 PWI 所得 Ktrans、Kep、Ve，以及 DWI 所得 ADC 值在不同病理类型肾脏肿瘤之间的差异。应用 ROC 曲线比较 DWI 及 PWI 对于鉴别肾脏肿瘤良恶性的诊断价值。

结果 正常肾实质与各病理类型肾脏肿瘤之间 ADC 值、Ktrans、Kep 及 Ve 值差异均有统计学意义(P＜0.05)。肾脏良性肿瘤的 ADC 值高于各组恶性肿瘤；恶性肿瘤中，肾透明细胞癌的 ADC 值高于乳头状细胞癌及嫌色细胞癌(P＜0.05)。肾脏各组恶性肿瘤的 Ktrans 值及 Ve 值均高于良性肿瘤(P＜0.05)，恶性肿瘤中，仅肾透明细胞癌的 Kep 值高于良性肿瘤(P＜0.05)。肾透明细胞癌、肾乳头状细胞癌及肾嫌色细胞癌的 Ktrans 值逐渐减低，差异均具有统计学意义(P＜0.05)。肾透明细胞癌的 Ve 值高于肾乳头状细胞癌 Ve 值（P＜0.05)。ROC 曲线鉴别肾脏肿瘤良恶性的诊断价值，Ktrans AUC=0.937 ，灵敏度和特异度分别为 87.9%和 85.7%，临界值为 0.38/min；ADC AUC=0.823，灵敏度和特异度分别为 72.7%和 92.9%，临界值为 1.40×10-3mm2/s；Ve AUC=0.803，灵敏度和特异度分别为 78.8%和 71.4%，临界值为 0.29/min；Kep 则表现出较低的鉴别诊断价值。

结论 3.0T MRI DWI 及 PWI 能有效鉴别肾脏肿瘤良恶性及不同病理组织学类型。其中 Ktrans 值的诊断价值最高，但 ADC 值所提供的信息也是不可替代的。

EPO-2546
比较双源双能 CT（DECT）及单源双能 CT（SDECT）对于痛风患者痛风结节的显示能力

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背景和目的

痛风是一种炎症性的关节病，早期表现为急性关节炎，晚期可能引起痛风结节形成、运动障碍、肾功能不全甚至心血管疾病。双能 CT 已用于痛风的诊断，并具备潜在的应用优势。既往所谓的双能 CT 是具备两个球管的双源双能 CT（DECT）。近年来，已经有研究利用传统的单球管 CT 进行双能量扫描，其发电机在单循环 0.5 毫秒内进行高低管电压的快速切换，从而获取双能量数据，即所谓的单源双能 CT（SDECT）。本研究使用双源双能 CT（DECT）及单源双能 CT（SDECT）对同一批痛风病人进行扫描，比较这两种成像方法对于痛风结节的显示能力。

资料和方法

收集 2016 年 10 月至 2017 年 2 月在复旦大学附属中山医院就诊的确诊为痛风的 21 例患者，入选者符合 2015 年 ACR/EULAR 痛风分类标准。所有病人在急性发作的一周内行 DECT 及 SDECT 的双足、踝关节/双膝关节/双腕关节扫描，两次扫描间隔时间不超过两天，无降尿酸药物影响。2 位放射科主治医师对临床数据和诊断设盲，独立阅读所有病人的 DECT 及 SDECT 图像并给予诊断。观察有无痛风结节沉积，记录痛风结节沉积部位、大小、病变关节痛风结节内的尿酸盐含量及检查的辐射剂量，当最初意见不同时，通过协商达到一致。采用 SPSS 19.0 软件,将患者的两组影像学表现进行卡方检验,P<0. 05 被认为统计学意义。

结果

两组检查对 N（痛风结节总量）的检出，尤其是 Nb1（斑点状）及 Nb2（结节状）具有统计学差异（P<0.001,P=0.038），两组检查 DLP 均值差异具有统计学意义（P<0.001）。

结论

对于痛风结节的检出，尤其是 d＜1.0cm 的痛风结节，DECT 优于 SDECT，适用于进行降尿酸治疗病人的临床监测；SDECT 辐射剂量较 DECT 小，适用于一般情况差、检查次数多等对辐射剂量有特殊要求的人群。

EPO-2547

A Non-interventional Study of Coronary and Craniocervical CT Angiography Image Quality with Different Contrast Medium Injection Protocols Using Low Tube Voltage at 80 or 100-kV in MDCT(RIGHT)

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Abstract:
Objective: We compared 80-kV protocols with reduced iodine delivery rate (IDR) with a standard protocol at 100-kV in coronary and craniocervical computed tomography angiography (CTA) for image quality and radiation dose.

Methods: This was a prospective, phase IV, observational, multicenter study of 1,214 patients scheduled for coronary CTA or craniocervical CTA in 10 centers of China. All sites used the same dual-source scanner. There were 4 protocols: one at 100-kV using iopromide 370 mg I/ml with IDR of 1.48 gI/s and other three at 80-kV using iopromide 370 mg I/ml at IDR of 1.2 gI/s or iopromide 300 mg I/ml at IDRs 1.2 gI/s or 0.96 gI/s. CT values, image quality, contrast-to-noise ratio (CNR) and signal-to-noise ratio (SNR), radiation and iodine dose were compared among protocols.

Results: The 80-kV protocol with an IDR of 1.2 gI/s had the highest mean attenuation among all. All 80-kV protocols produced images of diagnostic quality, despite CNR and SNR being higher. Reduction of IDR to 0.96 gI/s at 80-kV did not lead to further enhancement in CT value and had inferior image quality. The average radiation dose and iodine dose of all 80-kV protocols was significantly lower compared to 100 kV protocol in both coronary and craniocervical CTA.

Conclusions: Coronary and craniocervical CTA at 80-kV with low IDR can obtain diagnostic image quality with lower radiation and iodine dose without significant change in SNR and CNR. A further reduction of the IDR was not beneficial. This trial is registered with ClinicalTrials.gov, number NCT02840903.

EPO-2548

血吸虫肠病合并结直肠癌的计算机 X 线断层扫描影像学表现

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目的 回顾性分析血吸虫肠病合并结直肠癌的 CT 表现，提高对该病诊断的准确性。
方法 2007 年 1 月至 2012 年 12 月同济大学附属同济医院和昆山市中医院收治的 80 例经病理学检查证实为血吸虫肠病合并结直肠癌患者，均行腹部 CT 平扫十增强扫描，由两名放射科医师采用盲法阅片，对病灶部位、形态、大小，钙化特点及强化方式，有无转移进行评估；同时收集同一地区非血吸虫结直肠癌患者 20 例作为对照。
结果 80 例血吸虫肠病合并结直肠癌患者的肿瘤以降结肠、乙状结肠和直肠为主，表现为管壁不规则增厚，伴软组织团块，累及肠管长度为(21.35±4.50)cm；其中单发病灶 68 例，多发病灶 12 例，表现为多节段肠管受累；肿瘤组织均可见不同形态的钙化灶，钙化发生比例为 100.0%，主要表现为线状、斑点状及小斑片状钙化影，其中 59 例钙化边缘模糊，21 例钙化边缘较清晰；增强早期 68 例病灶明显强化，均匀强化 45 例，不均匀强化 23 例，增强晚期 73 例持续强化，坏死少见；仅 2 例伴发肝脏转移瘤，均无淋巴结转移。20 例非血吸虫结直肠癌患者肿瘤均为单发病灶，表现为肠壁不规则增厚，伴局部溃疡形成，累及肠管长度为(6. 90±3. 40)cm；肿瘤组织内均未见钙化影；均表现为增强早期病灶明显不均匀强化，可见低密度坏死区存在，增强晚期不同程度降低；4 例伴发肝脏转移瘤。与非血吸虫结直肠癌患者比较。血吸虫肠病合并结直肠癌患者多发病灶的比例较高(P=0.000)，病变管壁长度较长(P=0.000)，钙化灶发生比例较高(P=0.000)，增强早期病灶明显不均匀强化比例较低(P=0. 000)，晚期病灶持续强化比例较高(P=0.000)；肝脏转移发生比例较低(P=0.014)。
结论 血吸虫肠病合并结直肠癌在 CT 上特征性表现为瘤组织内不同形态钙化影，钙化边缘模糊，并累及多节段肠管；血道转移及淋巴道转移均少见。

EPO-2549

The impact of adaptive statistical iterative reconstruction presets for scanning on radiation dose and image quality in chest CT: a chest phantom study

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Purpose The use of adaptive statistical iterative reconstruction (ASiR-V) presets change the requirement for x-ray dose. The purpose of this study was to evaluate the effect of ASiR-V presets on radiation dose and image quality in chest CT.
Methods A chest phantom was scanned on a GE Revolution CT with tube voltage of 120kVp, automatic tube current modulation for obtaining a noise index of 14HU. The ASiR-V preset weights were 0, 20%, 40% and 60%. Images were reconstructed using ASiR-V weightings corresponding to the presets (for example, 40% ASiR-V reconstruction for scans with 40% ASIR-V preset). The dose length products of all scans were recorded, and the effective doses (ED) were calculated and compared. The CT and standard deviation (SD) values of lung tissue, paraspinal soft tissue, aorta and vertebral body were measured and used as objective indicators. Subjective evaluation included the contrast, noise and sharpness of mediastinal and chest wall structures displayed in the mediastinal window and bronchovascular bundles displayed in the lung window.

Results With the increase of the ASiR-V preset (0%-60%), ED (in mSv) decreased progressively and significantly (5.88, 4.01, 2.5 and 1.47 for presets of 0, 20, 40 and 60%, respectively). However, the SD values of the different tissues (lung tissue, paraspinal soft tissue, aorta and vertebral body) did not change significantly (P>0.05). For the subjective image quality evaluation, the scores in the lung and mediastinal windows stayed the same statistically with presets from 0 to 40% and began to decline after 40%. The subjective image scores with 60% preset at the lung (4.2±2.98) and the mediastinum window (3.2±1.76) were significantly lower than the values of (4.7±4.34 and 4.4±2.13) with 40% preset (P<0.05). ED with 40% ASiR-V preset (2.56mSv) was 56.46% lower compared with 0% ASiR-V preset (5.88mSv).
Conclusion The ASiR-V presets can be selected before CT scans to reduce radiation dose without significantly affecting image quality. ASiR-V with 40% preset was determined to ensure diagnosis needs, and reduce dose by more than 50% at the same time in chest CT.

EPO-2550
16cm 宽体探测器 CT 单次轴扫模式在成人急性脑出血患者检查中的应用

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目的：探讨 16cm 宽体探测器 CT 单次轴扫模式在成人急性脑出血患者检查中的优势。
方法：前瞻性登记 90 例成人急性脑出血患者（发病时间 1.5-10 小时），随机分为两组，第 1 组 45 例（29 名男性，16 名女性，年龄范围为 40-90 岁），在 256 排 16cm 宽体探测器 CT 上进行单次轴扫，扫描条件为 120kVp / 120mA、1.0s / r，使用 70％的 ASIR-V 重建。第 2 组 45 例（25 名男性和 20 名女性，年龄范围 41-80 岁），在 64 排 4cm 探测器 CT 上以多重轴扫扫描，条件为 120kVp / 180mA、0.5s / r，使用常规滤波反投影重建。比较两组的扫描参数（曝光时间和辐射剂量），定量图像质量（出血灶、小脑半球、半卵圆中心（背景）的 CT 值和 SD 值、信噪比（SNR）、对比噪声比（CNR））和主观图像质量。使用 SPSS 2.0 软件进行统计分析，使用独立样本 t 检验评估连续变量，使用 Mann-Whitney 秩和检验来评估图像质量。
结果：第 1 组的曝光时间为 1.0s，第 2 组的曝光时间为 10.9±1.14s，第 1 组比第 2 组曝光时间快了 90.8％；两组出血灶的 CT 值相似（p> 0.05）。第 1 组和第 2 组的辐射剂量无差异（240.82±12.33mGy vs. 233.96±21.94mGy，p> 0.05），而第 1 组的图像噪声比第 2 组明显较低（3.70±0.57HU vs. 6.35±0.58HU，半卵圆中心层面），SNR 和 CNR 值高于第 2 组（均 p <0.001）。所有图像均可用于诊断，但在运动伪影、硬化伪影、大脑灰白质的对比度、出血灶和外周水肿的对比度、整体图像质量方面，第 1 组均优于第 2 组（p <0.05）。此外，第 1 组无重复扫描病例，而第 2 组有 5 例（45 例中）由于运动伪影而重复扫描。
结论：与 64 排 CT 4cm 探测器相比，256 排 CT 16cm 宽体探测器单次轴扫可缩短急性脑出血患者的检查时间，并提高检查成功率，提高图像质量。

EPO-2551

Gemstone spectral CT imaging in the maxillofacial and neck region: Initial Results of scanning dose and image quality compared with conventional CT

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Purpose: To compare radiation dose and image quality between gemstone spectral imaging (GSI) at 70kev monochromatic image and conventional CT imaging at 120kV polychromatic image in the maxillofacial and neck region.
Method: 40 patients who underwent maxillofacial and neck region non-enhanced CT imaging on Discovery CT750HD were included in this study. These patients were randomly assigned to group A and B with 20 patients in each group. Group A underwent GSI scan and thenobtained70kev monochromatic images, and group B underwent conventional CT scanned obtained 120kV polychromatic images. The other scanning parameters were consistent with the same tube current (375mA), rotation time(0.7s), Scan Type (Helical) , ASIR(ss30 slice 30%);Pitch (0.984:1) and slice thickness/interval(1.25mm/1.25m).The CT attenuation values and noise of cervical muscle at the hyoid bone level were measured for 3 times with the region of interest (ROI) of 100 square mm. And the noise of the air was also measured. According to the Dose Report, Scan range(mm), CTDIvol (mGy), and DLP (mGy-cm) were recorded, and the ED was calculated by 0.059*DLP. A senior radiologist in the maxillofacial and neck region subjectively evaluated image quality. Using statistical analysis, image quality and dose were compared between group A and B by two independent samples t test.
Results: The noise of neck muscle in group A and group B respectively were6.82±1.00Hu and 5.98±1.44Hu.And the noise in group A was higher than that of group B (P<0.01). There was no significant difference in background noise of air for two groups(P>0.05). There was also no significant difference between the subjective evaluations of image quality(P>0.05). There was no significant difference in the scanning range between group A and B(P>0.05). But the CTDIvol, DLP and ED of group A were lower than those of group B. And CTDIvol in group A and group B respectively were36.73±0.00mGy and 45.69±0.49 mGy(P<0.01),DLP were 902.43±139.40mGy*cm and 1141.71±237.69mGy*cm （P<0.01）,and ED were5.32±0.82mSv and 6.74±1.40mSv（P<0.01）.
Conclusion: GSI can effectively reduce 19.6%of the radiation dose without affecting imaging diagnosis, compared with the conventional imaging.

EPO-2552

能谱不同虚拟单能量图像影像组学对鉴别肾透明细胞癌 WHO/ISUP 分级的影响

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目的：探讨能谱不同虚拟单能量图像影像组学对鉴别肾透明细胞癌 WHO/ISUP 分级的影响
方法：回顾性收集经手术或穿刺证实的肾透明细胞癌并经能谱成像增强扫描的患者图像 99 例，根据 2016 版肾癌 WHO/ISUP 病理分级标准重新诊断并分级，其中低级别 68 例（I 级及 II 级），高级别 31 例（III 级及 IV 级）。将增强扫描皮质期图像重建为 40-140keV（间隔 10keV）11 组单能量图像。手动勾画 3D-ROI 后提取影像组学特征。以 WHO/ISUP 简化分级为金标准，采用 LASSO 回归数据降维，构建每组单能量水平鉴别高低级别的影像组学风险评分。根据该风险评分绘制受试者工作特征曲线（ROC），计算曲线下面积（AUC）用于评价影像组学风险评分的区分度。采用 Hosmer-Lemeshow 检验评价各虚拟单能量图像鉴别肾透明细胞癌组织分级的校准度。采用决策曲线分析基于 11 组单能量图像鉴别模型的患者净获益情况。
结果：40-140keV 不同虚拟单能量图像鉴别高低级别 ccRCC 均有较高的区分度，各 ROC 曲线下面积（区分度）均大于 0.920。Hosmer-Lemeshow 检验显示虚拟单能量图像影像组学评分的 *p*-value 均大于 0.05，即校准度均较好。决策曲线分析中，40-140keV 虚拟单能量图像影像组学评分均在较大概率阈值范围内使患者净获益，优于将所有患者认为高级别，也优于将所有患者认为是低级别，各决策曲线走行趋势近似，并在一定保持范围内。
结论：能谱不同单能量图像影像组学对鉴别高低级别 ccRCC 无太大影响。

EPO-2553
2018 年南通市第一人民医院影像科 PI-RADS v2 成像的质量控制

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目的：回顾 2018 年南通市第一人民医院影像科按 PI-RADS v2 行前列腺 MR 检查的病例，发现存在的问题并改进，提高前列腺 MR 检查水平。**材料方法：**在 PACS 中检索 2018 年 1 月-12 月行前列腺 MR 平扫+增强患者的影像资料；排除标准：无病理或非首诊者。共纳入 144 例患者。将负责 MR 采集的技师按工龄分为低年资(7 人，工龄<5 年)、高年资组(4 人，工龄≥5 年)。由 2 名诊断医/技师(10 年以上 MR 诊断/采集经验)从序列完整性(0-2 分)、图像质量(0-2 分/序列，共 16 分；<11 分为不合格，11-15 分为中等，≥15 分为优秀)、准确性、诊断信心(3 分信心较强，2 分一般，1 分较差)对前列腺影像进行评分。以病理结果为“金标准”，比较不同年资技师采集图像质量的差异及不同图像质量对诊断信心、准确性的影响。**结果：**入组影像中，缺 T_1 Tra 8 例，缺 T_2 Sag、T_2 Tra、FS-T_1、DCE 各 3 例。图像质量优秀 107 例，中等 29 例，不合格 8 例；总体均分 15.53 分，高、低年资技师均分为 15.88 分、14.95 分，两者间无统计学差异(*P*=0.11)；两者间 DW、T_2 Tra 序列的均分间无统计学差异(DW：1.94 vs 2.00，*P*=0.26；T_2：1.97 vs 1.67，*P*=0.53)。共诊断正确 110 例(76.4%)，错误 34 例(23.6%)；信心较强 60 例(41.7%)，一般 58 例(40.3%)，较差 26 例(18.0%)。诊断错误病例的图像质量均分(15.00)低于诊断正确(15.69)及总体均分(15.53)，但不同图像质量间诊断信心和准确性无统计学差异(*P*=0.53、0.67)。不同年资技师采集图像对诊断信心、诊断准确性间的差异无统计学意义(*P*=0.92、0.66)。**结论：**正确理解 PI-RADS v2 中各序列的意义和价值，严格执行扫描规范，有利于提高不同年资 MR 技师间检查质量的同质性。

EPO-2554
探讨自适应统计迭代重建（ASIR）结合自动管电流调制技术在降低胸部 CT 辐射剂量中的能力

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目的：探讨自适应统计迭代重建（ASIR）结合自动管电流调制技术在降低胸部 CT 辐射剂量中的能力。**方法：**采用 4 种不同噪声指数（14HU、16HU、18HU、20HU）对胸部模型进行 CT 扫描，使用 GE Discovery CT750HU 机型进行扫描。扫描参数包括管电压 120 kVp，自动管电流调制，噪声指数为 14HU，16HU，18HU 和 20HU，转速 0.6 s，螺距 1.375：1，层厚 5 mm，重建厚度 0.625mm。在扫描之后，用滤波反投影法（FBP）重建（NI=14HU）的图像作为常规剂量组，用 ASIR 重建（NI=16HU、18HU、20HU）的图像作为低剂量组，ASIR 的权重使用 20％、40％、60%和 80%。测量肺实质、主动脉和背部肌肉的 CT 值和标准差（SD）值。计算每个器官的信噪比（SNR = CTartery / SDmuscle）和对比噪声比（CNR =（CTartery-CTmuscle）/ SDmuscle）。记录不同噪声指数的 CT 剂量容积指数（CTDIvol）、剂量长度乘积（DLP），并计算有效剂量（ED = k×DLP，k = 0.017）。采用单因素方差分析用于不同重建方式间 CT 值、SD、SNR 和 CNR 的比较，P <0.05 具有统计学意义。主观评分为两名经验丰富的医生使用 5 盲法进行评分，并通过 Kappa 检验比较评分的一致性。**结果：**与常规剂量相比较，低剂量组（ASIR,NI20HU）平均 ED 降低约 40.7％。在所有重建组中，当 NI 不变时，ASIR 越大，SD 值越低。当 ASIR 百分比不变时，随着 NI 的增加 SD 值增加而 SNR 值降低。当参数设置为 NI 18HU 和 ASIR 60％时，SD 值为最小，SNR 值为最高。在主观图像质量评价方面，各组差异无统计学意义（P> 0.05）。**结论：**当 NI 设定为 18HU 且 ASIR 百分比为 60％时，图像质量最佳，不仅可以满足临床诊断要求，而且还可以减少 40%的辐射剂量。

EPO-2555

Effect of optimized CT acquisition windows on image quality and radiation dose in coronary computed tomography angiography

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Purpose: To determine the optimal cardiac phase for reconstruction with respect to heart rate (HR) in coronary CT angiography (CCTA) and to evaluate the dose-saving potential using the optimized acquisition windows.
Materials and Methods: Retrospectively analyzed 400 CCTA exams using full acquisition windows (group A). Optimal reconstruction phases were determined for the best CCTA image quality. Based on the findings, an optimized acquisition window was centered at the mean of the optimal reconstruction phase ± 2 standard deviation (95% confidence interval). Another 400 exams were performed using the optimized acquisition windows (group B). The heart rate, signal-to-noise ratio, image quality and radiation dose were compared between the two groups. Image quality scores were defined as 1 (excellent), 2 (good), 3 (adequate), and 4 (poor).
Results: The optimized acquisition windows were at the 76±3%, 48±5% and either 44±3% or 76±3% of the R-R intervals for low HR (<61bpm, group A1), high HR (>75bpm, group A3) and intermediate HR (61-75bpm, group A2), respectively, resulted in acquisition windows of 70-82% of the R-R interval for group B1 (<61bpm), 38-58% for B3 (>75bpm), and both 38-50% and 70-82% for B2 (61-75bpm). The HR (70.54±13.06bpm in group A vs. 70.38±13.05bpm in group B), SNR (16.55±4.65 in group A vs. 15.61±3.79 in group B) and image quality (1.52±0.65 in group A vs. 1.51±0.63 in group B) were not significantly different between the two methods (P>0.05). Radiation dose were

reduced by 81% for the low HR, 70% for the high HR, and 56% for the intermediate HR patients compared with acquisitions using the entire R-R interval.
Conclusion: For low HR, optimized acquisition window was at mid-end diastole; for high HR, at end systole; and for intermediate HR, at both mid-end diastole and end systole. With optimized acquisition windows, radiation exposure to patients can be significantly reduced with preservation of image quality.

EPO-2556
磁共振前列腺波谱扫描技术及其质量控制

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目的：探讨磁共振前列腺波谱成像技术，分析影响前列腺波谱成像质量的因素，提出质量控制措施，提高前列腺波谱检查的成功率和波谱成像质量。
方法：回顾性分析 2009 年 10 月至 2015 年 12 月间 1255 例前列腺 MRS 患者资料，所有患者均有前列腺疾病临床症状，检查资料齐全且经病理证实。MRS 扫描采用多体素 3D 化学位移成像技术。扫描结束后使用 Spectroscopy 前列腺波谱专用后处理软件对 MRS 进行规范化后处理，观察 MRS 波谱质量，分析、归纳及总结前列腺波谱检查失败及波谱成像质量不满足诊断要求的原因，提出提高检查成功率及波谱成像质量的质量控制措施。
结果：1255 例患者中 1218 例患者前列腺 MRS 病人准备充分，定位准确，参数设置合理，后处理过程规范，所得谱线基线平稳，化合物位置准确。37 例患者因多种原因导致 MRS 失败或成像质量不满足诊断要求，具体为：因扫描床位模式不正确导致检查失败 1 例；因病人准备不充分，未能排尿、排便导致谱线基线不稳、波谱谱线形态差 9 例；因匀场效果不好导致谱线基线不稳、谱线杂乱 26 例；因后处理不规范导致良性疾病谱线出现恶性疾病的代谢产物 1 例。在总结失败的原因后并提出了前列腺波谱检查的质量控制措施。
结论：病人准备充分、定位规范准确、参数设置合理、匀场效果佳及规范的后处理是保证前列腺 MRS 扫描成功及结果可靠的关键，对于提高前列腺 MRS 的质量有重要意义。

EPO-2557
口腔金属固定器伪影范围对 3D-ASL 中大脑皮层 CBF 测值影响的技术研究

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目的 研究在三维动脉自旋标记灌注成像（3D-ASL）技术中，不同口腔金属固定器伪影范围与大脑皮层 CBF 测值间的相关性。
方法 8 名健康成年人口含金属试件前行 1 次全脑 3D-ASL 扫描，分别口含 10 个不同大小金属块（左右各一次）后各进行 1 次全脑 3D-ASL 扫描，共计 168 次扫描，并对双侧大脑皮层的 CBF 测值及计算 rCBF；统计分析采用配对 t 检验、对数曲线回归以及 ROC 曲线分析。
结果 当一侧口含金属后，同侧脑叶皮层 CBF 值较对侧相应脑叶皮层 CBF 值不同程度减低，$p<0.05$，差异有统计学意义。对侧脑叶皮层 CBF 值较未含金属前相同脑叶的 CBF 值相近，$p>0.05$，差异无统计学意义。利用对数曲线回归分析显示当口腔有金属时，同侧脑叶皮层 rCBF 呈曲线相关；随着 $D_{伪影}$减小，同侧脑叶皮层 rCBF 值相应减低，$p<0.05$，差异有统计学意义；当 $D_{伪影}$大于一

定距离时，同侧脑叶皮层 rCBF 值趋于稳定；对侧相应脑叶皮层 CBF 值未受影响。左、右侧口含金属时，ROC 曲线示 $D_{伪影}$最佳临界点分别为 18.05mm、18.1mm，曲线下面积（Az）分别为 0.972、0.978，$p<0.05$，差异均有统计学意义。

结论 口腔金属固定装置对同侧脑叶皮层 CBF 测值的影响与金属伪影边缘到同侧颈内动脉间最短距离呈曲线性相关,当 $D_{伪影}$达到一定程度时，同侧脑叶皮层 CBF 值不受影响；而无论金属伪影多大，对侧脑叶皮层 CBF 值都未受影响，故 3D-ASL 技术在有口腔金属固定装置的患者上有很大的应用价值。

EPO-2558

iCT 在袖状胃切除术前规划和术后疗效价值关系初探

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摘要：

目的：探讨 256 层 iCT 在腹腔镜胃袖状切除术前规划及剩余胃容积的预估的操作方法及其价值进行研究和分析。

方法：选择 50 例袖状胃切除术患者，术前行常规上腹部 CT 扫描。检查前禁食 6 小时以上，扫描前 10min 内服用 1000ml 水作为阴性对比剂，使胃尽量充盈，行常规上腹部 CT 薄层扫描，扫描完成后将图像传至 EBW 图像后处理工作站，利用三维重建，多平面重组，曲面重建等功能，将图像调整至可显示胃小弯最大层面，并测量其胃小弯长度。通过其胃小弯长度，及植入 FR36 胃管（）的半径可估算出剩余胃容积。本研究通过此法测量 50 名肥胖患者行腹腔镜下袖状胃切除术后袖状胃容积的大小，然后观察这些患者术后第 6 月的净体重变化，进而寻找出袖状胃的大小与肥胖患者术后体重变化的相关性，以期对腹腔镜下袖状胃切除术中袖状胃大小的选择以及肥胖患者术后体重的管理提出积极的指导意见。

结果：入选患者男性 17 例，女性 33 例，平均年龄 30±2.69 岁，术前平均体重 110±7.19Kg，经测算，50 例患者胃小弯的长度平均值为 172.25±8.27mm，患者术后第 6 个月平均体重下降 40.25±5.78Kg，经 logestic 回归分析，相关系数为 0.975，标准系数—0.682，P 值为 0.025（＜0.05），胃小弯的长度与患者术后第 6 个月的体重变化呈负相关。

结论：通过 ICT 术前对胃小弯的测值，可初步判定腹腔镜袖状胃术后残胃的容积，可协助外科医生完成固定容积残胃的制作。

EPO-2559

医联体内放射科托管的实践和探索—以南京鼓楼医院高淳分院为例

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本实践通过医联体中采取技术支持的分院形式（南京鼓楼医院高淳分院，对南京高淳医院放射科实行托管，利用三级甲等医院的影像技术，管理经验，品牌效应等优势 ， 实行同质化管理，能迅速提升托管科室的管理及医疗技术及服务能力 ，取得良好的经济效益和社会效益。

EPO-2560
人工智能对肺部结节 CT 后处理质控应用价值分析

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目的：探讨人工智能系统对肺部结节 CT 后处理质控的应用价值及效果。
方法：选取胸部 CT 发现肺部结节患者 60 例，分为实验组和对照组两组，每组 30 例，分别用人工智能和人眼观察对图像进行后处理以显示肺部结节情况，将后处理图像打印胶片经资深影像技师、诊断医师及呼吸科医师分析判断其后处理效果。
结果：实验组在显示肺部结节数目、大小、面积及发现细小结节能力、与诊断准确性均明显优越于对照组，差异有统计学意义(P<0.05)。
结论：人工智能的引入不仅能提高诊断效率，还能提高后处理质控，特别是在肺部结节 CT 后处理质控应用中具有较高的实用价值。

EPO-2561
Roles of miRNAs in the damage and repair mechanisms of X-rays

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Background or Purpose
From the point of view of the post-transcriptional regulation of miRNAs, This study was to explore the damage and repair mechanisms of cell lines at cellular and molecular levels when they were irradiated by X-rays, so as to bulid and perfect models of restoration following injury and provide theoretical support for radiological protection.
Methods
We selected two lymphocytoblast cell lines –T2 and TK6 which are highly sensitive to X-rays. After irradiated by X-rays of different dose, the cytobiological alterations of the two cell lines were detected with MTT and FCM assay. Then we could establish a time-dependent model of cell cycles, proliferation and apoptosis of cells under graded dosage of X-rays. Meanwhile, irradiation-related miRNAs would be screened through miRNA expression arrays and RT-PCR. And with the help of dual-luciferase reporter gene system and Western Blot, we could consrtuct the ideography of feedback regulation between miRNAs and the related target genes regarding to radiation damage.
Results
The expressions of let-7 family miRNAs, miR-103b, miR-142, miR-143, miR-146ap，miR-155，miR-15a，miR-16，miR-181a，miR-19b，miR-21，miR-22，miR-26a，miR-378，miR-423，miR-92a，miR-93 were repressed after radiation (P value≤0.05) (0 h). While, many hours later(8h, 24h, 48h, 72h), they were time-dependently overexpressed (P value≤0.05). What’ more, there were positive correlation between a group of miRNAs’ variations, such as let-7 family miRNAs, miR-143, miR-19b, etc. , and the chages of cell cycles and apotosis (P value≥0.05). Besides, the let-7 family miRNAs modulated

the process of damage and the subsequent restoration through the HIFs signaling pathway, miR-92a by means of VEGF/CD31/Tie2 pathway, miR-143 by CD44v3/HGF pathway, miR-19b with PGC-1a.

Conclusions

Many kinds of miRNAs may regulate different proteins or signaling pathways to control the restoration following injury after X-ray raditaion in our bodies.

EPO-2562

The value of exposure index in quality control of cervical spine digital radiography

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Purpose: 1) To investigate the correlation between exposure index (EI) and digital X-ray image quality of cervical spine; 2) to explore the range of reasonable exposure index of cervical spine anteroposterior (AP) and lateral (LAT) radiography; 3) to analyze the effect of mAs on EI value.

Materials and Methods: This study collected patients retrospectively, who underwent digital X-ray examination of the cervical spine AP and LAT. The clinic information including gender, age, neck thickness, and the imaging data including kVp, mAs, physical EI, clinical EI, dose area product (DAP) and image quality score were collected. Afterwards, according to the evaluation criteria, the images were scored and classified into three groups: Good (5 scores), Satisfactory (3-4 scores), and Poor (1-2 scores). Then, to analyze the effect of various factors on image quality and to explore the reasonable exposure index range of the cervical spine AP and LAT position radiography. In phantom study, the cervical spine AP and LAT position protocols (under the tube voltage of 68kv and 70kv) were selected respectively. The mAs was exposed according to the series of points, and the EI value displayed on the device was recorded after each exposure. Based on the phantom data, the theoretically effect of mAs on the EI value was analyzed. Finally, the clinic information and imaging data were used to analyze the effect of mAs on the actual work of EI value.

Results: A total of 767 patients who underwent digital X-ray examination of the cervical spine were enrolled in this study, including 300 males and 467 females. The average age of the patients was 49.17±12.75 years old (range 6~86 years old). The age, neck thickness, mAs and DAP were statistically significant in different image quality scores of cervical spine AP images. Gender, neck thickness, mAs and DAP had significant differences in different groups of images quality scores of cervical spine LAT images. The value of physical EI and clinical EI were statistically significant in different image quality scores of cervical spine AP and LAT (all $P<0.001$). The 95% confidence intervals for the physical EI and clinical EI value of the cervical spine AP good image quality group were 519.18 to 545.43 and 151.44 to 156.71, respectively. The 95% confidence intervals for the physical EI and clinical EI values of the cervical spine LAT good image quality group were 581.48 to 605.39 and 90.91 to 94.85, respectively. The logistic regression analysis showed that the physical and clinical EI had a high normalization coefficient, which were 0.57 and 1.36 for cervical spine

AP (P＜0.001), 0.82 and 2.45 for cervical spine LAT (P＜0.001). In the phantom study, the linear regression model of the effect of mAs on physical and clinical EI values was statistically significant (all P＜0.001, r=1.000). In clinic information and imaging data analysis, the effect of mAs on physical EI had a poor linear relationship in the cervical spine AP (P=0.005, r=0.101) and LAT (P=0.004, r=0.104), respectively. The effect of mAs on clinical EI had a good linear relationship in the cervical spine AP (P＜0.001, r=0.404) and LAT (P＜0.001, r=0.770), respectively.
Conclusion: The value of physical and clinical EI are important parameters for the evaluation of the image quality of cervical spine digital radiography. Moreover, the clinical EI value has better practicability, and the reasonable clinical EI values of cervical spine AP and LAT were 151.44 to 156.71 and 90.91 to 94.85, respectively. In addition, the exposure parameter mAs can be quantified modify according to the clinical EI value.

EPO-2563

Feasibility of high concentrated contrast media combined with monochromatic images to improve image quality with tri-low scanning in dual-layer spectral coronary CT angiography

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Purpose:
To evaluate the feasibility of high concentrated contrast media combined with monochromatic images to improve image quality with tri-low scanning in dual-layer spectral coronary CT angiography
Methods:
Fifty-six patients with suspected coronary artery disease was enrolled and randomly separated into two groups. All patients were scanned at 120kVp in step-and-shoot mode using a dual-layer detector CT (IQon CT, Philips). Patients were either injected with 18 ml high concentration contrast medium(400mgI/mL) at 2ml/s (group A) or 45 ml contrast medium (370mgI/mL) at 4ml/s (group B). Monoenergetic images (group A1) (40 to 100 keV with 10 keV increment) and conventional image (group A2)were reconstructed for group A, conventional polyenergetic images was reconstructed for group B. Region of interest was placed on aorta root (AO), left main artery (LM), middle segment of left anterior descending (LAD), left circumflex (LCX) and right coronary artery (RCA) to measure the attenuation and noise, contrast-to-noise ratio (CNR) and signal-to-noise ratio (SNR) were calculated. Image quality was assessed by two reviewers independently with a 4-point scale (1--undiagnostic,4 excellent).
Results:
In group A, the CT Value, CNR and SNR on 40keV were significantly higher than the other keV sets and conventional images(P<0.001), which also were superior to group B

(738.95±184.70HU vs 408.95 ± 57.92HU; 29.29±8.00 vs 14.41 ± 2.56 and 23.32±7.32vs11.30 ± 2.33) (each P<0.001). In group A, the image noise on 40keV monochromatic images was superior to group B (32.70 ± 6.64 vs 36.96±4.52, P=0.014). There is no significant difference between group A and group B on the subjective image quality (*P*>0.05).The volume CT dose index, dose length product and effective dose had no significant difference between two groups (each P>0.05).

Conclusion:

40 keV low monochromatic images derived from dual-layer spectral detect CT combined with high concentrated contrast media can provide superior image quality with 0.8mSv radiation dose in CCTA study.

EPO-2564

高权重迭代重建技术在 CTU 成像中的应用

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目的 Revolution CT 机(80%ASIRV)与 HD750CT 机(30%ASIR)对比，探讨高权重 ASIRV 在 CT 尿路造影(CT urography, CTU)中的应用价值。**方法**回顾性分析 2017 年 5 月和 10 月 Revolution CT 机进行 CTU 检查的患者，为 A 组；以及同时期在 HD750 CT 机进行 CTU 检查的患者，为 B 组。所有入组病例均未发现器质性病变。两台 CT 机扫描层厚/层间隔 5mm，重建层厚/层间隔 1.25mm。由两位医师(分别工作 5 年，3 年)分别选择 1.25mm 图像进行数据测量，包括两组图像的膀胱 CT 值、SD 值，两侧臀大肌 CT 值、SD 值。计算对比噪声比(CNR)、信噪比(SNR)和有效辐射剂量(effective dose, ED)，记录容积 CT 剂量指数(volume CT dose index, $CTDI_{vol}$)及平脐层面图像的长径（a）、短径（b）。由两位医师(分别工作 5 年，3 年)共同对两组图像进行主观评价。采用组内相关系数(ICC)比较两位观察者所测量数据的一致性，选择高年资医师所测数据进行后续统计学分析。膀胱 SD 值、有效辐射计量的比较采用独立样本 *t* 检验，臀大肌 SD 值、SNR、CNR 的比较采用 Mann-Whitney U 检验，*P*<0.05 具有统计学差异。**结果**两位医师测量数据一致性良好(ICC 均>0.8)。A 组的 CNR 及 SNR 均高于 B 组，差异具有统计学意义(*P*<0.05)；A、B 组的膀胱 SD 值及 $CTDI_{vol}$ 无统计学差异(*P*>0.05)。**结论** 80%ASIRV 能够保证同等辐射剂量条件下，提高 CTU 图像质量。

EPO-2565

Evaluate Upper Extremity Deep Venous Thrombosis Through Direct CT Venography in Patients with Hemodialysis

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Purpose: To explore the diagnostic value of direct CT venography (CTV) for the evaluation of upper extremity deep venous thrombosis (UEDVT) in patients with hemodialysis.

Materials and Methods: Thirty-three patients with severe renal insufficiency and hemodialysis either through central venous catheters or autologous arteriovenous fistula underwent direct CTV. The contrast medium (CM) of 350 mgI/mL was diluted with saline in a 1:3 or 1:4 fashion. Forty to 80 milliliter (mL) diluted CM was injected into the superficial venous cannulas of both forearms simultaneously or each forearm respectively. CT scan was performed once or twice according to the CM injection pattern. Direct and indirect signs indicating UEDVT including luminal stenosis, heterogeneous intraluminal density, chest wall or paraspinal collateral vessels and early visualization of azygos vein (AV) were evaluated. Receiver operating characteristic curves were used to evaluate the diagnostic efficiency of every sign.
Results: The mean iodine load for direct CTV was 8.02±2.13 gram. Digital subtraction venography (DSV) of upper extremity was performed in 13 patients. Final diagnosis of UEDVT was determined according to the symptoms of reflux obstruction and DSV. Fifteen out of 33 patients (45.5%) were diagnosed as UEDVT positive, with subclavian vein thrombosis (SVT) in 4 cases, brachiaocephalic vein thrombosis (BVT) in 11 cases and superior vena cava thrombosis (SVCT) in 10 cases. Chest wall or paraspinal collateral vessels were observed in 13 cases and early visualization of AV were observed in 14 cases. The AUC, sensitivity and specificity of collateral vessels and early visualization of AV for the diagnosis of UEDVT were 0.933, 86.7%, 100% and 0.906, 86.7%, 94.4% respectively (Figure 1). As for specific subsegments, the diagnostic performance of indirect signs with collateral vessels and early visualization of AV for the diagnosis of SVT, BVT and SVCT were better than that of direct signs with luminal stenosis and heterogenous intraluminal density (Table 1). Spearman analysis showed there was no correlation between the diameter of AV and the duration of symptoms.
Conclusion: With extremely low iodine load in patients with severe renal insufficiency and hemodialysis who underwent direct CTV, the indirect signs of chest wall or paraspinal collateral vessels and early visualization of azygos vein (AV) evaluate UEDVT better than direct signs of luminal stenosis and heterogenous intraluminal density.

EPO-2566

Direct CT Venography Through Two Arms with Extremely Low Iodine Load in Patients with Renal Failure Who Underwent Hemodialysis

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Purpose: To determine the feasibility and superiority of direct CT venography (CTV) with extremely low iodine load through two arms in patients with renal failure who underwent hemodialysis when compared with indirect CTV.
Materials and Methods: Ten and 9 patients underwent indirect CTV, direct CTV with once scan and simultaneous injection on both arms respectively. The contrast medium (CM) of 350 mgI/mL was diluted with saline in a 1:3 for direct CTV. The injection rate was 5mL/second. Both arms were raised up for direct CTV and put on the abdomen for

indirect CTV. CT scan was calculated to begin so that CT scan and CM injection ended at the same time for direct CTV. Venous CT phase began 50 seconds after the injection for indirect CTV. Total dose length product (DLP) was recorded. Image quality comparison was performed on both axial and volume rendering (VR) images. Lumen depiction of subclavian, brachiocephalic vein and superior vena cava was evaluated by using a five-point scale. The uniformity of intraluminal density was measured by signal noise ratio (SNR) with intraluminal CT value divided by corresponding standard deviation. The contrast to noise ratio (CNR) between deep vein and adjacent muscle was also calculated. Lumen depiction scores, lumen SNR and CNR were compared between direct and indirect CTV groups by using a Mann-Whitney U test.
Results: The mean iodine load, total DLP, lumen depiction scores, lumen SNR and CNR for the direct and indirect CTV groups were 6.81±0.58g, 588.2±167.0mGy*cm, 4.29±0.76, 18.5±14.5, 53.4±32.6 and 27.0±1.88g, 1054.6±248.3mGy*cm, 4.18±0.48, 7.73±3.01, 6.46±4.00 respectively. The p value of Mann-Whitney U test of them between the two groups were .000, .000, .720, .008 and .000 respectively.
Conclusion： Compared with indirect CTV, direct CTV with 75% iodine load and 45% radiation dose reduction provides better image quality in patients with renal failure who underwent hemodialysis.

EPO-2567
低 keV 单能量图像结合 ASIR-V 技术在提高下肢静脉 CTV 图像质量的应用研究

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目的 通过应用低 keV 单能量图像提高 CT 值，结合 ASIR-V 技术降低背景噪声，以期指导低浓度、低对比的下肢静脉在能谱成像 CTV 中的应用。
方法 收集于我院 2019 年 1 月至 4 月因怀疑下肢静脉疾病行下肢静脉 Revolution CT 的患者 30 例，使用能谱扫描模式，注射 150ml 浓度为 350mgI/ml 对比剂后 200s 进行下肢静脉扫描。将图像（1.25mm）载入能谱成像分析软件，测量髂总静脉（CIV）、髂外静脉（EIV）、股静脉（FV）、腘静脉（PV）、肌肉背景（B）下述组合 CT 值及肌肉背景 SD 值：70keV+40%ASIR-V（A 组），55keV+80%ASIR-V（B 组）。计算各静脉不同组合 CNR。使用配对样本 t 检验比较各静脉不同组合间 CNR 及 CT 值、肌肉背景 SD 值差异，$p<0.05$ 有统计学差异。
结果 A、B 两组合间静脉 CNR 有统计学差异（$p<0.001$），其中 B 组 CIV、EIV、FV、PV-CNR 平均值分别为 7.08±1.97、6.81±1.83、6.02±1.58、4.92±1.94，皆高于 A 组 3.08±0.78、2.95±0.78、2.66±0.69、2.13±0.84。B 组 CIV、EIV、FV、PV、B-CT value 平均值（HU）分别为 239.54±33.04、234.84±31.57、219.4±27.17、197.42±37.4，皆高于 A 组 157.87±17.97、154.87±19.83、147.4±17.09、134.17±21.68，差异有统计学意义（$p<0.001$）。B 组 B-SD 平均值（HU）为 20.64±4.09，低于 A 组 26.27±3.54，差异有统计学意义（$p<0.001$）。
结论 使用 55keV+80%ASIR-V 组合图像相对于 70keV+40%ASIR-V 组合图像，下肢静脉 CT 值及对比度可明显提高，背景噪声下降，可获得较优的下肢静脉显影。

EPO-2568

Clinical Application of Adaptive Filter Combined with Iterative Reconstruction to Reduce CT Artifacts in Emergency Patients

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Objective: To study the effects of Adaptive Filter (AF) combined with iterative reconstruction on eliminating streak artifacts in thoracic and abdominal CT imaging of emergency patients who cannot lift upper limbs.
Methods: 128-layer UIH uCT760 spiral CT was used (United-imaging, Shanghai, China), the imaging data of patients who could not lift upper limbs were selected, including 60 thoracic cases and 60 abdominal cases of CT examination. Scanning parameters: in thoracic scanning, tube voltage was 100kV, average tube current was 80mAs; in abdominal scanning, tube voltage was 100kV, average tube current was 200mAs. Tube current automatic modulation was used, tube rotation speed was 0.5s/r, pitch was 0.938.Four different reconstruction methods were used for the raw data of the same patient :(1) AF combined iteration reconstruction (KARL 3D) was used in group A;(2) AF reconstruction was used in group B;(3) iterative reconstruction was used in group C;(4) neither AF nor iterative reconstruction were used in group D. The image quality of four groups were compared by subjective score and objective indexes. The subjective score was 5 points (1 point for maximum artifact, 5 points for minimum artifact), and the display effect of lesions were compared of four groups. Objective evaluation indexes included the CT value, noise (SD) of lung tissue and descending aorta in the chest, the SNR, CNR of liver, spleen, pancreas and abdominal aorta in the abdomen.
Results :(1) Both the score of image quality in chest and abdomen were statistically different ($P<0.05$), group A> group B> group C> group D; (2) The number of lesions which was displayed clearly in group A was higher than that in group B, group B was higher than that in group C, group C was higher than that in group D in both thoracic and abdominal imaging. (3) Objective evaluation of image quality :there was no statistically significant difference in CT values among the four chest groups ($P>0.05$).The difference of SD value was statistically different ($P<0.05$), in pulmonary parenchyma group A < group B= group C=group D, in descending aorta group A<group B<group C<group D. (4) SNR in abdominal image were statistically different ($P<0.05$): liver, pancreas and abdominal aorta were group A> group B=group C > group D. The CNR values of abdominal liver, spleen, pancreas and abdominal aorta showed no significant difference in the four groups ($P>0.05$).
Conclusion: When emergency patients who cannot lift upper limb perform thoracic and abdominal CT examination, the combination of adaptive filtering and iterative reconstruction in the circumstances of low tube voltage (100kV), can effectively reduce steak artifacts, improve image quality and avoid repeated scanning.

EPO-2569

Effects of adaptive statistical iterative reconstruction-V technology on the image quality and radiation dose of unenhanced and enhanced CT scans of the piglet abdomen

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Purpose: In order to clarify the best AsiR-V level in children's abdomen enhanced CT, we discuss the adaptive statistical iterative reconstruction-V (ASiR-V) in piglet abdominal computed tomography (CT) volume scanning, and determine the optimal low dose needed to maintain image quality and optimize the percentage of ASiR-V pre-scanning combined with post-reconstruction. **Methods:** A total of 10 standard piglets were selected and scanned to obtain unenhanced and enhanced images under different pre-ASiR-V conditions. The corresponding images were obtained using post-ASiR-V technology. CT values, noises, the contrast noise ratio (CNR), subjective scores, and radiation doses of unenhanced and enhanced abdominal tissues were analyzed. **Results:** With the increase of pre-ASiR-V, the radiation dose in piglets gradually decreased ($P < 0.05$). In the same pre-ASiR-V group and with an increase of post-ASiR-V, the image noise was gradually reduced ($P < 0.05$). There was no statistical difference between CNR values. In unenhanced CT images, the subjective score of the images with 40% pre-ASiR-V combined with 60% post-ASiR-V levels had no statistical difference compared to 0% pre-ASiR-V combined with 60% post-ASiR-V levels, while the radiation dose decreased by 31.6%. In the enhanced images, the subjective score of the images with 60% pre-ASiR-V combined with 60% post-ASiR-V levels had no statistical difference compared to 0% pre-ASiR-V combined with 60% post-ASiR-V levels, while the radiation dose was reduced by 48.9%. **Conclusion:** ASiR-V technology significantly reduced the radiation dose without affecting image quality. The optimal level for unenhanced scans is 40% pre-ASiR-V combined with 60% post-ASiR-V, while that for enhanced scans is 60% pre-ASiR-V combined with 60% post-ASiR-V.We believe that these Asir-V levels can be used in children of abdominal CT enhancement.

EPO-2570

Image quality assessment and coronary calcified plaque stenosis quantification by virtual monoenergetic images from a dual-layer spectral detector CT

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Purpose

To investigate the image quality of different virtual monoenergetic images (VMI) and the diagnostic performance of spectral coronary CT angiography (CCTA) on calcified plaques or mixed plaques and the best keV level using invasive coronary angiography (ICA) as reference.

Methods and Materials

72 consecutive patients with known CAD or suspected CAD who underwent both coronary CTA and ICA were enrolled. CCTA images were acquired on a dual-layer spectral detector CT. Monochromatic CT images were reconstructed from 70 to 140 keV with 10 keV increment. The image quality was qualitatively evaluated on per-vessel basis using the Likert 4 stage score. Score 1: nondiagnostic, poor image quality that precluded appropriate evaluation of the coronary arteries due to severe artifacts; score 2: adequate, reduced image quality because of artifacts but sufficient to rule out obstructive CAD; score 3: good, minor artifacts but image quality was adequate for diagnostic evaluation; and score 4: excellent, absence of artifacts and no structural discontinuity. Subjective and objective evaluation were performed for each calcified or mixed lesion for all keV levels. Optimal subjective keV level was selected and recorded by an experienced reader. The degree of stenosis was quantitatively measured at each keV level. Bland-Altman analyses were used to assess agreement of the result between different monochromatic series and ICA.

Results

122 lesions of 72 patients (49 men and 23 women; 63.7±10.2years) were analyzed. The mean image quality score of conventional 120kVp and 70 to 140 keV VMI were 3.68±0.42, 3,69±0.41, 3.69±0.4, 3.71±0.38. 3.71±0.37, 3.66±0.41, 3.6±0.43, 3.52±0.46, 3.49±0.47, respectively，there were no statistical difference. The subjective optimal keV was selected at 100 keV for 64 times (52%) and 90 keV for 39 (32%) times. The quantitative stenosis evaluation showed 100 keV images were the best keV for 50 times, which accounts for 41% of all stenosis. There was good agreement between the stenosis degree measured with 100keV and the result of ICA. Using a cut off at ≥50%, the sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of 100 keV VMI were 83%, 80%, 74%,73% and 78% respectively.

Conclusion

Our results showed 100 keV monochromatic images slightly improve the image quality and improved diagnostic accuracy of coronary stenosis with calcified and mixed plaque on CCTA images.

EPO-2571

AI 评价冠脉 CTA 图像质量的应用

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目的：利用 AI 测评系统对冠脉 CTA 图像质量进行评价，结合医师主观评价，找出不足之处及原因，提出改进措施，以全面提高冠脉 CTA 图像质量。材料和方法：CT 机型：飞利浦

briliance 64 排 128 层纳米 CT ,从我科 2019 年 5 月 1 日-2019 年 6 月 30 日间的 330 例冠脉 CTA 图像中随机抽取 30 例，其中 50-70 岁 12 例，70-90 岁 18 例。先利用数坤科技公司冠脉 CTA 成像 AI 影像系统（冠脉智能辅助诊断系统 V1.4-0665）对所抽取的病例图像质量进行智能测评。结果：评测统计，病例总数 30，后处理合格 26，后处理合格率 86.7%，不合格原因 ：伪影，噪声导致血管不能全面识别。1、后处理不合格原因占比，主要是图像分割不全 75%（3 例）；数据不全 25%（1 例）。2、图像质量等级及汇总（1-5，差-优），具体标准请参考 Likert 图像质量评分标准。其中 1 级 3.3%（1 例），2 级 10%（3 例），3 级 33.3%（10 例），4 级 46.7%（14 例），5 级 6.7%（2 例）。Likert 图像质量评分标准：1 分：差，图像质量过度受损；2 分：中，图像质量低，血管边界不清晰或噪声过大，对比度分辨率低；3 分：好，存在一定图像噪声，血管边界较清晰；4 分：良，血管边界和血管壁清晰，噪声很小，对比度分辨率高；5 分：优，管壁清晰，分辨率好，无噪声。其中：3-4 分者图像略有噪声和伪影，致 LCX、LAD、RCA 某一支或两支远端显示欠佳，2 分者图像噪声和伪影较重，致 LCX、LAD、RCA 某一整支或中远端无法显示，1 分者图像完全模糊不清，严重呼吸伪影。再请两位经验丰富的诊断医师结果一致认为：1 例 2 分者可以达到 3 分的级别，2 例 3 分者可以达到 4 分的级别，其余均与 AI 吻合。结论：AI 测评系统基本能代替医师对冠脉 CTA 图像质量进行快

EPO-2572
品管圈在提高冠状动脉 CTA 图像优良率中的应用

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目的：探讨品管圈（QCC）在提高冠状动脉 CT 血管成像（CCTA）图像优良率中的作用。**方法：**成立 QCC 活动小组，确立活动主题，回顾性分析 2016 年 7 月-2016 年 10 月南京鼓楼医院 CCTA 图像优良率情况，分析其原因、设立目标并分析可行性、制定有效整改措施，与 2017 年 3-6 月开展 QCC 活动后的 CCTA（QCC 活动后组）图像优良率进行比较。**结果：**CCTA 图像优良率由 QCC 活动前的 63%，提高到活动后的 84.5%，差异有统计学意义。**结论：**QCC 活动提高了 CCTA 图像优良率，同时使圈员掌握了质量管理工具的应用技巧。

EPO-2573
肝脏双层光谱探测器 CT 多期虚拟平扫图像质量评价

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目的 评价双层光谱探测器 CT（DL-CT，IQon Spectral CT）肝脏三期增强扫描的虚拟平扫（VNC）图像质量，探讨 VNC 代替真实平扫（TNC）的可行性。**方法** 回顾性分析 36 例肝脏 TNC 及三期增强扫描的 DL-CT 影像学资料。后处理获得动脉期、门脉期、平衡期的 VNC 图像（VNC^a、VNC^p 和 VNC^e）。联合虚拟单能量（MonoE）图，测量 TNC 和 VNC 图像中肝脏和竖脊肌的 CT 值和噪声值（SD 值），计算信噪比（SNR）和对比噪声比（CNR），测算受检者有效剂量（ED）。采用 5 分法评价各期图像质量。通过单因素方差分析比较 TNC 和 VNC 图像的定量参数，采用 Bland-Altman 图评估 TNC 和 VNC 图像 CT 值的一致性。**结果** 相比于 TNC 相应参数，VNC 的 SD 值较低，而 SNR 值较高（P均＜0.05）。肝实质 VNC 与 TNC 图像 CT 值一致性良好（平均差值＜2Hu），病灶均显示清晰，肝脏 VNC^a 图像质量最佳（P＜0.05）。VNC 图像显示了 5 例 TNC 图像中的隐匿性病灶，采用

“VNC+直接增强”方案约可降低 24.65%的辐射剂量。**结论** DL-CT 三期 VNC 图像质量均符合诊断需求，具有更低的噪声、更高的 SNR 值和良好的病灶显示能力，并可替代 TNC 图像，实现影像科的“节能减排”。

EPO-2574

Size-specific dose estimation of CT radiation dose in children patients with different age

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Purpose
To evaluation the radiation dose of CT scan between children of different age groups and adult patients by traditional radiation dose assessment parameters (volume CT dose Index, CTDIvol) and size specific dose estimates (SSDE).
Methods
A total of 406 cases who underwent lung CT examination were collected in this study from the Union Hospital. The cases were divided into six groups according to age (0-2 years old, 3-6 years old, 7-10 years old, 11-14 Aged, 15-18 years old, 18 years old or older). The CTDIvol and DLP values were extracted from the dicom data by an in-house software based on the MATLAB platform. The size specific dose estimation and water equivalent diameter were also calculated according to the American Association Physicists in Medicine (AAPM) 220 report. The difference of the radiation dose of CT lung scan between children and adult patients by the two means was evaluated.
Results
The CTDIvol values of all age groups were significantly lower than the SSDE values. The paired t-test results showed that the differences were statistically significant ($t=-36.36, -32.83, -30.36, -28.74, -23.89$, $P<0.05$). The SSDE value is about 137%, 94%, 79%, 57%, and 42% higher than the CTDIvol value, respectively. The CTDIvol value of the adult group was also lower than the SSDE value, and the difference was statistically significant ($t= -21.92$, $P<0.05$), and the SSDE value was about 41% higher than the CTDIvol value. With the increase of age, the CTDIvol value, DLP value, Dw value and SSDE value of children of all age groups gradually increased, and were significantly smaller than the adult group. The difference was statistically significant ($F=63.39, 203.28, 89.27, 103.44$, $P < 0.05$). The conversion coefficient f of all age groups decreased significantly with age, which was significantly higher than that of the adult group, and the difference was statistically significant ($F=109.83$, $P<0.05$).
Discussion and Conclusion
In lung CT scans, the CTDIvol value severely underestimates the radiation doses of children compared to adults. The younger patients are, the worse the situation were. The SSDE method allows for more accurate reflection of the radiation doses of different patients, taking into account differences in the subject's body size.

EPO-2575

Study of reduced field-of-view diffusion-weighted imaging (DWI) on the diagnosis of gallbladder disease.

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Objective: To compare image quality of reduced field-of-view (r-FOV) and full FOV(f-FOV) diffusion-weighted imaging(DWI) sequences at 3T,with apparent diffusion coefficient(ADC) values in the diagnosis of gallbladder disease .
Materials and Methods:Our study collected 511 patients with gallbladder disease who had undergone DWI scan for preoperative evaluation in Tongji Hospital from July2017 to December2018,and finally 61 patients were enrolled after excluding unqualified cases.Preoperative DWI images,including both r-FOV and f-FOV DWI sequences, of 61 patients with gallbladder disease confirmed by surgery or puncture pathology were measured by two radiologists. The ADC values of diseased region were measured , and the resolution, signal-to noise ratio(SNR) , contrast-to-noise ratio(CNR) were calculated by two radiologists independently. Meanwhile, two radiologists independently assessed subjective image quality parameters, including image sharpness, distortion, artifacts, lesion conspicuity with a 4-point scale. The weighted-K test was used to examine the consistency of the results measured by the two radiologists. Comparisons of these parameters between two groups were made by Wilcoxon's rank sum test,including image sharpness, distortion, artifacts, lesion conspicuity.Paired t-test were used to analyze differences between two groups about SNR、CNR and ADC,and then Spearman test was used to correlate the three types of gallbladder disease with ADC.
Results: 1.There was good agreement of both dates measured and image quality between two radiologists in both r-FOV DWI and f-FOV DWI(P>0.05).
Subjective score: The subjective score of image quality of r-FOV DWI was 13.84±1.10, which was higher than that of f-FOV DWI(10.36±1.13) significantly.The resolution, deformation, artifacts, and lesion conspicuity of r-FOV were 3.41, 3.36, 3.67 and 3.39, respectively, both higher than f-FOV.
3.Objective score: The CNR score of r-FOV is higher than f-FOV, and the SNR score of r-FOV is lower than f-FOV. The spatial resolution of the r-FOV image (1.56mm*1.56mm) is twice that of the f-FOV image (2.25mm*2.25mm). Comparing the two DWI images, it can be found that r-FOV can effectively reduce the deformation and artifact of f-FOV images, and has higher definition and better lesion display effect.
4.There was no difference in the ADC values measured between the r-FOV and f-FOV groups, but the ADC values of different gallbladder diseases were significantly different. (P<0.05)
Conclusions: Compared with f-FOV DWI, r-FOV DWI had a higher spatial resolution and lesion conspicuity, that also can significantly reduce susceptibility artifacts as well as image distortions.

EPO-2576

Impact of an Artificial Intelligence-based Noise Reduction Algorithm on Image Quality in Low-dose Coronary CT Angiography of Obese Patients

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This study aims to assess the impact of artificial intelligence (AI)-based noise reduction algorithm on image quality (IQ) in low-dose (LD) coronary CT angiography (CCTA) for obese patients. Forty consecutive patients with BMIs ≥ 25 kg/m^2 underwent clinically indicated CCTA examinations on a NeuViz 128 CT scanner using a step-and-shoot mode with 100 kV and automatic current modulation. Images were reconstructed with an iterative algorithm (group A) and an AI-based noise reduction algorithm (group B), respectively. Image noise, signal-to-noise ratio (SNR) and contrast-to-noise ratio (CNR) were calculated on the aortic root (AO), left main artery (LM), left anterior descending artery (LAD), left circumflex artery (LCX), and right coronary artery (RCA) to evaluate IQ objectively. Subjective IQ scores were graded on a four-point scale (1: excellent, 4: poor). Image subtraction was used for judging the difference between FBP images and processed AI images. Compared to group A, group B yielded statistically significant reductions in image noise in the AO, LM, LAD, LCX and RCA of 63.97%, 38.63%, 21.29%, 24.38% and 29.99%, respectively. SNR and CNR both significantly increased in group B compared to group A (all $P < 0.001$). The subjective IQ scores in group B were superior to those in group A (1.57 ± 0.67 vs. 1.71 ± 0.67, $P < 0.001$). The effective dose was 2.3 ± 0.1mSv. The processing of AI did not change any details in images and had better efficiency in time consuming. Therefore, the AI-based noise reduction algorithm is an innovative and promising method that could effectively improve the IQ in LD CCTA for obese subjects.

EPO-2577
乳腺钨靶 X 线摄影条件对不同厚度标准型乳腺患者辐射剂量及图像质量的影响

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目的：探讨数字钨靶乳腺 X 线摄影条件对于不同厚度标准型乳腺患者辐射剂量和图像质量的影响

方法：用不同厚度的甲基丙烯酸甲酯有机玻璃模体（PMMA）模拟标准乳腺。采用钨-铑（W-Rh）、钨-银（W-Ag）不同的靶-滤过方式对厚度不同的标准型乳腺模体分别进行手动曝光、自动曝光、半自动曝光。记录乳腺腺体压迫厚度、管电压、管电流、平均腺体剂量（AGD）、入射表面剂量（ESD）、对比噪声比（CNR）并计算品质因数（FOM）及 ESD/ASD。采用 Pearson 相关分析评价不同管电压、管电流对 AGD、ESD、ESD/AGD、CNR、FOM 的影响，采用单因素方差分析评价不同厚度模体采用 2 种不同靶-滤过组合产生的 AGD、ESD、ESD/AGD、CNR、FOM 的影响。

结果：2 种靶-滤过条件下：随管电流和管电压的增加，CNR 及 FOM 均呈不同程度的增加（P≤0.05）；在一定范围内，AGD、ESD 随管电压和管电流的增大而增大（P≤0.05）。

结论：手动曝光及半自动曝光时，可适当调整管电压和管电流，可以有效降低 AGD、ESD 并且保证图像质量。W-Rh 组合比 W-Ag 组合对标准型乳腺模体在保证图像质量的前提下降低辐射剂量。

EPO-2578
FORCE CT 大螺距模式联合双低技术在左心房肺静脉成像中研究

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目的 探讨 FORCE CT 大螺距模式联合双低技术在左心房肺静脉成像（CTPV）中的可行性。
方法 将 50 例行左心房肺静脉成像（CTPV）检查的患者随机分为 2 组：A 组（25 例）采用常规模式扫描，管电压为 100kV，螺距 1.2，对比剂采用碘普罗胺（370mg/ml）；B 组（25 例）采用大螺距模式扫描，管电压为 70kv，螺距 2.0，对比剂采用碘克沙醇(320mg/ml)，两组对比剂用量均为 20ml；计算出两组患者的碘摄入量；记录两组患者扫描时的 CT 剂量指数（CTDIvol）与剂量长度乘积（DLP），计算得出有效辐射剂量（ED）；分别测量左心房最大层面、肺静脉各分支及左心房最大水平背部肌肉的 CT 值和 SD 值，计算出图像信噪比（SNR）、对比信噪比（CNR）。由两位诊断医师共同对肺静脉分支显示情况进行主观评价。采用 SPSS22.0 统计软件对计量和计数进行分析。
结果 两组图像各个感兴趣区的 CT 值差异无统计学意义(P>0.05)，各个感兴趣区 SNR 和 CNR 差异有统计学意义(P＜0.05)，B 组左心房及肺静脉的 SNR 与 CNR 均较 A 组明显提高；A 组对比剂中碘摄入量平均为 7.4g，B 组对比剂中碘摄入量平均为 6.4g，B 组碘摄入量较 A 组降低约 13.51%；两组间图像主观评分差异无统计学意义（P>0.05），A、B 两组有效辐射剂量分别为(1.920.43) mSv、（0.770.20) mSv，B 组辐射剂量较 A 组降低约 53.89%。
结论 FORCE CT 大螺距模式联合双低技术下行 CTPV 检查可以降低辐射剂量及对比剂碘摄入量，并且获得满足诊断的图像质量，值得临床推广。

EPO-2579
锡板能谱纯化技术联合高级迭代算法降低胸部 CT 辐射剂量的应用价值

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目的： 探讨 Force CTSn150kV 锡板能谱纯化技术联合 ADMIRE 高级迭代算法降低胸部 CT 辐射剂量的应用价值。
方法： 前瞻性收集初诊考虑肺部感染性病变的患者 50 例，治疗前后分别采用不同管电压行胸部 CT 检查，治疗前（A 组）：管电压 100kV，采用 FBP 重建；治疗后（B 组）：管电压 Sn150kV，采用 ADMIRE 重建；其余扫描参数相同，参考管电流 50mAs，开启 CARE Dose 4D，螺距 1.2。分别测量气管分叉水平气管内、升主动脉和脊柱旁肌肉的 CT 值及噪声，并且记录两次扫描的 CTDI、DLP。比较 A、B 两组方案的辐射剂量、图像质量以及诊断效能。
结果： 治疗前后两次扫描有效辐射剂量 ED 分别为（1.61±0.12）mSv、（0.86±0.07）mSv，B 组 ED 较 A 组减低约 46.6%，差异有统计学意义（P<0.05）；B 组图像的噪声、SNR、CNR 均大于 A 组，其中噪声、SNR 有统计学意义（P<0.05），两组间 CNR 及主观评分比较无明显统计学差异（P>0.05）；两组扫描方案所得图像的诊断效能无明显统计学差异（P>0.05）。

结论： 应用 Sn150kV 能谱纯化技术联合高级迭代算法行胸部 CT 扫描，保障图像质量的基础上明显降低了辐射剂量，推荐该方案常规应用于肺部疾病的筛查。

EPO-2580
双低扫描方案结合迭代重建在主动脉狭窄患者术前评估应用价值

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目的 探讨双源炫速 CT-flash 低剂量扫描技术及低对比剂注射方案结合迭代重建 CT 血管成像在主动脉狭窄患者术前评估应用价值
方法 收集 2018 年 5 月至 2019 年 3 月在本院行 DSCT 全身血管扫描的主动脉瓣重度狭窄的患者 40 例，随机分为实验组（20 例）与对照组（20 例），分别采用双低扫描方案与常规扫描方案，记录两组患者的对比剂用量，容积 CT 剂量指数（CTDIvol）和剂量长度乘积（DLP），计算有效辐射剂量（ED）；由 2 位经验丰富的放射医师独立诊断并采用 4 分法对图像质量进行评估，对结果一致性评价采用 Kappa 检验；测量两组图像的信噪比（SNR）及对比度噪声比（CNR）。
结果 双低实验组患者的 ED 为 3.80±0.19mSv，对照组患者 ED 为 4.97±0.21mSv，差异有统计学意义（$p<0.01$）；对比剂注射剂量分别为 68.01±4.56ml 和 83.04±2.17ml，差异有统计学意义（$P<0.05$）;实验组图像质量评分 3.7±0.28，优于对照组 3.0±0.75，两组图像均符合诊断要求，差异有统计学意义（$p<0.05$）；两组图像 CNR 差异有统计学意义；实验组与对照组的诊断敏感度分别为 98.1%和 97.8%，特异度分别为 99.1%和 96.7%，诊断准确率分别为 97.8%和 96.9%，差异无统计学意义。
结论 双低扫描方案结合迭代重建技术可大大降低患者的 CT 辐射剂量与对比剂注射剂量，图像质量优于常规扫描方案，适合在临床扫描中推广运用。

EPO-2581
胸部增强 CT 扫描及重建的质量控制规范与优化

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目的：提高胸部增强 CT 检察图像质量，减少漏诊与误诊。减少病人辐射剂量。
方法：将胸部增强 CT 检查分为体位设计 25 分、参数设计与扫描 45 分、图像后处理重建 30 分 总分 95 以上为优
体位设计：1.呼吸训练（最为重要） 2.去除金属异物 3.体位居中左右对称 4.定位准确（减少重复扫描率，降低辐射剂量）5.病人防护（如定位足够准确，定位像中不应出现铅皮）
参数设计与扫描：1.病人闭气情况(如不能配合应再次训练) 2.扫描视野与范围 3.肺动脉 CT 值（必须超过 250，超过 300 为优） 4.降主动脉 CT 值 （大于 300 为优）5.锁骨下静脉 CT 值（分为四级） 6.图像噪声（小于 15 为最佳）
图像后处理重建：1.图像视野与范围 2.图像左右对称 3.特殊重建（小结节、纵膈病变、VR、MIP 等）
结果： 优片率极低体位设计主要问题：病人呼吸训练不足，体位随意，定位不准确。
参数设计与扫描主要问题：满足肺动脉 CT 值得同时锁骨下静脉 CT 普遍过高，病人闭气无法配合的情况依然存在。
图像重建主要问题：图像不对称，特殊疾病重建不足（申请单阅读不够，对图像理解不够）

结论：胸部平扫与增强检察作为最为常规的检查，加强质量控制后，能使我院放射科图像整体质量明显提高。
体位摆放、病人配合、重建图像规范是主要问题。大多可以通过耐心沟通，仔细看图，认真重建来解决肺动脉 CT 值不达标的人有少部分存在，但基本得到解决。
由于肺动脉达峰时间过早，降低锁骨下静脉 CT 值也过高。其解决的方案仍在研究。

EPO-2582
探讨双源 CT 下肢动脉血管造影扫描技术优化方案

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目的:探讨西门子第二代双源 CT 下肢动脉血管造影扫描技术优化方案,以实现最佳图像质量。方法:将本院 40 例因下肢血管疾患行双源 CT 下肢动脉血管造影患者,随机分配到 A,B 两组;用相同对比剂用量和注射速率，在相同扫描条件下，A 组监测腹主动脉，B 组监测腘动脉平面进行检查,扫描延迟时间采用 Siemens bolus tracking 自动触发跟踪技术,图像重建用最大密度投影(MIP),多平面重建(MPR),和容积再现(VR)等. 分别测量髂总动脉起始段,腘动脉段及胫前动脉下端平均 CT 值、噪声(SD),计算信噪比(SNR)及腘动脉对比噪声比(DNR)并进行统计学分析. 结果:B 组图像各感兴趣区平均 CT 值、SNR 及腘动脉 DNR 高于 A 组,差异有统计学意义(P<0.05). 结论:双源 CT 下肢动脉 CTA 成像,监测腘动脉层面对显示下肢动脉图像质量更佳。

EPO-2583
脑肿瘤综合评估行 MR 检查时患者舒适度对诊断图像质量的影响：临床工作流程管理的定量调查研究

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MR 检查为临床常规实践中的重要的成像模式。脑肿瘤综合评估行 MR 检查通常需要 50-70 分钟才能完成，在此期间，一些因素可能会导致患者不适并进一步导致图像质量下降。本报告的目的是调查患者对成像过程的感知及其与图像质量的相关性。
方法：收集 2018 年 1 月～2019 年 7 月 50 名患者（23 名男性和 27 名女性，平均年龄 51.3 岁，被招募 22-70 岁范围患者已经被诊断患有癌症或既往有癌症史，并行 MR 系统扫描。在行 MR 扫描后回顾性地对所有患者进行问卷调查，这有九个问题来评估患者对李克特量表评分系统的扫描感觉（1-5,1 最满意）。所有行 MR 扫描图像也由两位专家独立地视觉检查以评估图像的质量。评估了六个身体部位，并使用李克特量表评分系统评估每个位置（1-5,5 为最佳质量）。Mann-Whitney U-test 用于统计分析，以检查图像质量与患者感知之间是否存在显著相关性。结果：共有 50 名患者，填写了 48 份问卷并返回进行分析。患者的特征总结在表 4 中。患者在问卷中的感知统计数据在表 5-7 中说明。MR 图像质量与患者特征/感知之间存在统计学显著相关性。
结论:我们的结果显示 MR 扫描对大多数患者来说通常是安全和舒适的。统计分析不支持不良患者的感知导致图像质量下降的假设。

EPO-2584

Investigation of Dacomitinib onReducing Cell Necrosis and Enhancing Cell Apoptosisin C6 Glioma Rat Model by MRI

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Background:Gliomais one of the mostepidemic and obstinate types ofcancer in the central nervous systemwith poor survival rate.Dacomitinibinhibited cell viabilityand proliferationof *EGFR*-amplified glioma.In the present study, the regional effects of Dacomitinibon tumor necrosis was investigated.
Methods: A C6 rat gliomamodel was evaluated using proton magnetic resonance spectroscopy (1H-MRS), diffusion weighted imaging(DWI), morphological T2-weighted imaging (T2W).The effects ofDacomitinib on glioma cells were investigated usingmethods of immunohistochemistryand H&E staining.
Results: The obtained data indicatedthatmetabolite ratioswere significantly decreased (all $P<0.05$) in the Dacomitinib treated group compared with C6 gliomacontrol group. The ADC value of necrotic core in Dacomitinib group was significantly lower than that in controlgroup. In addition, the expression of Ki-67 in Dacomitinib-treated group (50.32±5.61) was significantly lower than that in controlgroup ($P<0.05$).The apoptotic index (AI) (28.01±2.37) in Dacomitinib-treated group was significantly higher than that in controlgroup (11.58±3.17).
Conclusion: Theresults demonstrated that theDacomitinibcould suppress gliomacell necrosis andproliferation.

EPO-2585

CT 门静脉血管成像监测法 ROI 的选取

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目的 相对准确获取 CT 门静脉血管成像达峰时间，提高图像质量，突出目标血管密度(HU)。
方法 本研究为回顾性临床和影像资料分析。搜集我院 2018 年 8 月 1 日至 2019 年 7 月 1 日的 90 例关于西门子双源 CT 门静脉血管成像监测不同感兴趣区的临床影像资料。其中监测门静脉为 30 例 ，监测门静脉属支脾静脉为 30 例，监测门静脉属支肠系膜上静脉为 30 例。患者年龄为 26-75 岁之间，男性 50 例，女性 40 例。由一名影像技师和一名影像医师分别独立对 90 例监测图像进行评判，观察是否能在呼吸运动以及监测层面噪声和其他动脉血管的干扰下准确迅速找到目标血管。
结果 在监测门静脉的一组中，技师和医师能共同准确判断为 10 例。其中技师单独准确判断为 13 例，医师为 14 例; 在监测脾静脉的一组中，技师和医师能共同准确判断为 24 例。其中技师为 24 例，医师为 25 例； 在监测肠系膜上静脉的一组中，技师和医师能共同准确判断 为 6 例。其中技师 6 例，医师 8 例。门静脉一组中能共同判断的准确率为 33%（10/30），脾静脉一组中能共同判断的准确率为 80%（24/30）,肠系膜下静脉一组中能共同判断的准确率为 20%（6/30）,结果有统计学意义。

结论 CT 门静脉血管成像选取脾静脉为感兴趣区（ROI）能更加准确高效找到目标血管从而提高图像质量。

EPO-2586
PDCA 循环模式在改善腹部磁共振图像质量中的应用研究

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目的 探讨计划、执行、检查、处理(PDCA)循环模式改善腹部磁共振图像质量的运用效果。**方法** 回顾性分析腹部磁共振图像质量共 2835 例，对每例图像按优秀、良好、及格进行质量评分。其中 2018 年 1-4 月图像例数作为对照组，2019 年 1-4 月图像作为干预组，干预组应用 PDCA 循环法，即对产生图像质量差的原因进行分析、总结，并落实相应质量干预措施。最终对两组图像质量进行干预前后的分析，比较两组图像质量的优秀率、良好率、及格率及每个月的优秀率，以评估 PDCA 循环管理对腹部磁共振图像质量的改善效果。**结果** 执行 PDCA 循环法后，腹部磁共振图像优秀率从 74.56%提升到了 94.62%，差异有统计学意义（χ^2=227.896，p<0.001）。腹部磁共振图像质量及格率由 0.92%下降到 0.32%，差异有统计学意义（χ^2=222.053，p<0.001）。腹部磁共振图像质量良好率由 24.52%下降到 5.06%，差异有统计学意义（χ^2=4.302，p<0.05）。每个月的腹部磁共振图像质量的优秀率较同期未执行前比较均有统计学差异（p<0.001）。**结论** 通过实施 PDCA 循环模式，可有效改善腹部磁共振图像质量，提高诊疗效果，值得临床推广应用。

EPO-2587
“三低”在 640 层 CT 肺动脉 CTA 成像中的应用价值

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目的：采用低注射速率、低对比剂总量、低管电压技术在肺动脉 CTA 成像中的应用，评价其可行性。 **材料与方法**：采集我院自 2017 年 32 月到 2019 年 2 月的肺动脉 CTA 检查者 40 例。入组标准：体重<75Kg,静脉回流无严重受阻，心功能严重不全的除外。分为 A、B 两组，每组 20 人。采用双筒高压注射器，A、B 两组对比剂和注射用水注射速率分别为 4.5mL/s、3.0mL/s，对比剂总量分别为 30mL、20mL。注射生理盐水总量均为 20mL.对比剂为碘海醇 350。采用东芝 640 层螺旋 CT 扫描，准直宽度 0.5*160，螺距 129，机架转速为 0.5 秒，扫描条件 A 组为 120kV，B 组采用 80kV,mA 均为自动调剂,采用 Surestart 软件智能触发，将两个监测点分别设在肺动脉主干的中远端，CT 值达到 70HU 后改为连续监测，A、B 两组的触发阈值为 110HU、90HU，扫描方向为自肺底向肺尖。测量肺动脉主干、右下肺动脉、左心房、背肌及上腔静脉的 CT。两位高年资医师按双盲法对图像进行评分，肺动脉图像质量分为优（0）、良（1）、中（2）、差（3），肺静脉显影分为轻微（0）、轻度（1）、中度（2）、重度（3），上腔静脉伪影分为轻微（0）、轻度（1）、中度（2）、重度（3）。评分 0-2 为优，3-4 为良，5-6 分为中，7-9 分为差。**结果**：A 组体重 62.00±9.55 公斤，BMI23.37±3.27。B 组体重 56.21±7.38 公斤，BMI21.82±3.10。两组 CT 值的比较均无统计学意义（P>0.05）。两组的优良率分别为 83%、85%，评分的一致性较好（kappa=0.894）。上腔静脉的硬化伪影 B 组明显优于 A 组。**结论**：在无严重心功能不全的情况下，静脉回流回路无严重狭窄的情况下，对于手臂静脉情况不佳的病人采用低速率的注射速度，低的对比剂总量和低管电压技术能取得较为满意的肺动脉 CTA 图像，值得推广使用。

EPO-2588
CT Bone-Reading 软件肋骨曲面重建技术在创伤患者快速检测肋骨骨折的应用价值

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目的：为了评估放射科医师读取 CT 曲面建图（CPR）相比读取标准的 MPR 的肋骨图像在肋骨骨折的检出率。
方法：回顾性分析 200 位（126 位男性，74 位女性）创伤患者的经软件处理为肋骨曲面重建的 CT 资料。患者分为两组，A 组 103 名患者中和 B 组 97 例。 两个放射科医师分别阅片，A 组使用 CPR 图，B 组使用标准 MPR 图。最终由两位资深放射科医生创建一个参考标准。
结果：参考标准为 61 个病例包括 361 处肋骨骨折；A 组 CPR 阅片方案检出率 80.9 %（292/361），B 组 MPR 阅片方案 71.5 % (258/361)，A 组方案显示出显著更高的骨折检出率，P <0.001；A 组平均读片时间 31.3 s，B 组平均读片时间 60.7s；A 组阅片时间显著短于 B 组，P＜0.001。
结论：应用 CPR 曲面重组技术检测肋骨骨折可加快创伤患者胸部 CT 的阅读速度，同时与传统的 MPR 相比具有更高的整体敏感性。

EPO-2589
基于 CT 增强图像的纹理分析对术前胰腺癌分化程度的预测价值

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目的 增强 CT 扫描是目前诊断胰腺癌常用的检查方法，但对胰腺癌的诊断仍属于较主观的经验性诊断，而图像纹理分析可以提供客观、定量的图像描述特征，本研究旨在探讨基于 CT 增强扫描的纹理分析（CT texture analysis，CTTA）预测胰腺癌病理分化程度的可行性。**方法** 选取安徽医科大学附属省立医院经术后病理证实为胰腺癌的 83 例患者的 CT 增强图像，其中病理为中分化者 34 例，低分化者 13 例，中低分化者 36 例，选取 3 组病例 CT 增强扫描动脉期及静脉期图像肿瘤病灶最大层面，利用 ITK-Snap 软件进行手动勾画感兴趣区（Region of Interest，ROI），GE 公司 A.K 软件（GE healthcare, AnalysisKit，Version：3.2.0.R）提取 ROI 影像资料中隐藏数据生成纹理特征并进行纹理分析，进行各分化组之间的判别。**结果** 利用 AK 软件提取的 83 例患者 CT 增强图像动脉期及门静脉期的纹理特征，对提取的特征进行方差分析+相关性研究+规范化的逻辑回归 lasso 进行特征选取，得到 8 个最优特征，并得到受试者工作特征曲线曲线下面积（Area Under Curve，AUC）为 0.691；对不同病理分级的病灶将数据按照 7：3 的比例分为训练集与测试集，训练集的数据用于特征筛选，模型构建，得到的 AUC 曲线下面积动脉期分别为低分化为 1，中分化为 0.71，中-低分化为 0.71；静脉期分别为低分化为 1，中分化为 0.69，中-低分化为 0.70。**结论** 基于 CT 增强扫描图像的纹理分析可以作为胰腺癌术前评估病理分化程度的辅助手段，尤其是对低分化胰腺的评估具有较优异的评估效能。

EPO-2590
人工智能在冠状动脉 CTA 辅助诊断中的应用价值

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目的
探讨人工智能(artificial intelligence，AI)在冠状动脉 CTA 诊断中的应用价值。
方法
对 90 例临床疑似冠心病的患者，经 Philips 256 层 iCT 冠状动脉 CTA 扫描，将所有患者的 CTA 扫描数据分别传至 Philips Workstation 后处理工作站及数坤科技冠状动脉智能辅助诊断系统处理器,分别由两位经验丰富的高年资医生使用 Philips Workstation 提供的冠状动脉分析软件对所有 CTA 扫描图像行冠状动脉各支血管后处理并作出诊断报告，同时使用数坤科技冠状动脉智能辅助诊断系统软件对 CTA 数据行冠状动脉自动识别处理并生成诊断报告；将二者分析结果进行对比，评价 AI 对冠状动脉病变的诊断价值。
结果:
与经验丰富的高年资医生相比，AI 对冠状动脉斑块诊断的阳性预测值为 93.2%,阴性预测值为 87.3%,敏感度为 88.5%,特异度为 85.3%；AI 对冠状动脉病变定位的敏感度和特异度分别为 86.7%、81.4%；AI 对冠状动脉病变斑块定性的敏感度和特异度分别为 74.6%,86.1%；在冠状动脉斑块处管腔狭窄程度的诊断中,AI 与高年资医生对冠状动脉狭窄的总检出率分别为 36.5%、34.1%,差异无统计学意义(P＞0.05)；AI 对冠状动脉斑块管腔狭窄程度判断的敏感度和特异度分别为 60.87%,80.77%；AI 与高年资医生对冠状动脉心肌桥的检出率分别为 7.7%、0%,差异有统计学意义(P＜0.05)；AI 与高年资医生对冠状动脉发育异常的检出率分别为 3.3%、0%,差异有统计学意义(P＜0.05)。
结论
AI 辅助诊断冠状动脉斑块的准确率较高，具有很高的临床应用价值，能协助临床医师极大的提高工作效率；但 AI 对冠状动脉心肌桥及冠状动脉发育异常的检出率低，需要临床医师结合 CTA 图像自行作出诊断。

EPO-2591
基于影像组学评估结直肠癌肝转移联合贝伐珠单抗化疗后的治疗反应

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目的：建立并验证预测结直肠癌肝转移联合贝伐珠单抗化疗后的治疗反应的 CT 影像组学模型，比较化疗前后 CT 纹理参数的变化。
材料和方法：纳入 50 名（18 例应答组和 32 例无应答组）结直肠癌肝转移且接受联合贝伐珠单抗化疗的患者，总共选取 141 个肝转移灶，每个患者分别提取动脉期和门脉期化疗前、后的 792 个纹理特征。依次用方差分析、Spearman 相关性检验和 LASSO 回归选择纹理参数，分别用 SVM、Logistic 回归建立所选择参数的影像组学模型并验证。影像组学模型通过准确度、灵敏度、特异度、精确度及 ROC 曲线下面积进行评价。化疗前、后的 135 个病灶进行配对 t 检验，比较 CT 纹理参数的变化。
结果：12 个纹理特征的建立的 SVM 模型、Logistic 回归模型具有较高的准确度、灵敏度、特异度、精确度。两种模型的结果如下：SVM 的训练集：0.95、0.98、0.89、0.83；验证集，0.84、0.93、 0.67、0.83；Logistics 回归模型训练集：0.88、0.96、0.74、0.79；验证集 0.84、0.89、0.73、0.79。两种模型训练集的 ROC 曲线下面积分别为：0.90、0.79。化疗后应答组的 211

个纹理参数显著变化，无应答组 130 个纹理参数显著变化，其中有 62 个相同的显著变化的纹理参数。

结论：影像组学模型可以预测结直肠癌肝转移患者联合贝伐珠单抗化疗后的治疗反应，纹理分析能够评估化疗前、后的肝转移灶内部结构的变化，可以作为联合贝伐珠单抗的化疗过程的监测。

EPO-2592
基于影像组学的前列腺癌 Gleason 评分无创性评估

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研究目的
本研究的目的是将影像组学和前列腺磁共振图像结合，构建前列腺癌 Gleason 评分影像组学模型，在术前通过无创性的方法得到前列腺癌患者的病理评分。
方法与材料
本研究回顾性纳入 2008 年至 2018 年于我院就诊的前列腺癌患者，筛选后共 410 名患者入组。随机选取 328 个样本作为训练集，其他样本验证集，所有患者均有 T2 加权成像、DWI 序列、ADC 图三类磁共振图像[1]及 Gleason 评分结果。在每个序列图像上对前列腺腺体进行逐层分割[2]。利用类内相关系数(ICCs)评价特征提取的观察者内部和观察者之间的一致性，大于 0.75 的 ICC 被认为具有良好的一致性[3]。利用多元线性回归(MLR)方法[4]保留了关键的影像组学特征，并进一步建立了 Gleason 评分的预测模型。采用 ROC 曲线对预测性能进行评估，P <0.05 为差异有统计学意义。
结果：
最终共计提取 4176 个影像学特征，通过层层特征选择筛选得到三个关键特征，进一步构建了 Gleason 评分预测模型。对于亚组(GS6 vs. GS7&8)的预测，Gleason 评分预测模型在训练集和验证集中 AUC 分别为 0.827 (95% CI, 0.758-0.899)和 0.742(95% CI, 0.695-0.928)。对于亚组(GS6&7 vs. GS8)的预测，Gleason 评分预测模型在训练集和验证集中 AUC 最大，分别为 0.853 (95% CI, 0.812-0.893)和 0.888 (95% CI, 0.816-0.960)。
结论
结果表明，基于磁共振图像的影像组学特征具有潜在的前列腺癌 Gleason 评分分级能力。不同 Gleason 评分水平的患者无需进行侵入性病理检查即可得到及时、恰当的治疗，如主动监测、术前新辅助治疗等，不仅能避免有创性检查带来的不良后果，还能够改善患者的预后。

EPO-2593
基于钆塞酸二钠增强 MRI 影像组学在肝切除术前定量评估肝硬化患者肝脏储备功能的应用价值

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1.目的：本研究探讨 Gd-EOB-DTPA 增强 MRI 肝胆期图像的 Radiomics 特征与临床用于评估肝脏储备功能的 Child-Pugh 评分系统的相关性，并开发了预测模型来预测 Child-Pugh 评分级别并进行量化验证，旨在探讨其无创性精准评估肝脏储备功能的可行性及临床价值。2.**方法：**纳入本研究的肝硬化患者共 100 例，按照 7:3 的比例随机分成训练集和验证集，并应用 GE 的 AI-Kit 软件对 Child-Pugh 分级 A 级、Child-Pugh 分级 B+C 级两组患者的增强 MRI 肝胆期图像数据进行图像分割、纹理特征提取、Radiomics 特征筛选和 Radscore 评分系统构建，并创建列线图（nomogram）预测模型。利用 ROC 曲线分析其泛化效能。**3.结果：**将纳入研究的 52 例 Child-Pugh A 级患者和 48 例 Child-Pugh B+C 级患者分别按照 7:3 的比例随机分成训练集和验证集。使用 ITK-SNAP 软件将 100 例图像分割好的 ROI 文件导入 AK 软件进行纹理特征分析，共提取 396 个纹理特征参数。对训练集中 71 例患者进行 LASSO 降维筛选出 7 个有较大价值的纹理特征。使用单个 LASSO 模型通过所选择的 7 个特征的线性组合来建立 Radscore 评分系统，根据 Radscore 评分系统创建用于区分 Child-Pugh A 级和 Child-Pugh B+C 级的 nomogram 预测模型，经过 ROC 曲线分析得出：训练集中 AUC：0.88；Sensitivity：0.78；Specificity：0.97；验证集中 AUC：0.86；Sensitivity：0.80；Specificity：0.93。**4.结论：**Child-Pugh A 级和 Child-Pugh B+C 级肝硬化患者的肝胆期图像的影像组学特征之间具有显著性差异；建立 nomogram 预测模型，可以作为肝脏储备功能的准确可靠的检测工具。

EPO-2594

基于多示例学习方法的多模态 MR 影像的 GBM 预后预测

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目的：针对胶质母细胞瘤(GBM)异质性分析及预后预测，结合机器学习方法建立一种瘤内分割模式。但是获得的单个肿瘤的子区域数目不一定相同，导致传统预测分析方法无法建模，因此采用多示例学习(MIL)方法，通过预测 GBM 中各个子区域的标签，定位“高危”区域，实现预后预测。
方法：首先从癌症基因组图谱(TCGA)中挑选出共 104 名 GBM 患者的影像数据(57 长生存期患者和 47 名短生存期患者，包含 T1、T1 增强、T2、FLAIR 序列)作为样本集进行配准、勾画肿瘤区域、标准化等预处理操作。其次，不同于传统的肿瘤分割方法，基于 kmeans 的肿瘤异质性瘤内分割模式利用 MR 影像的多模态数据获取子区域，将所有样本的体素共同聚类，并将结果映射回独立样本的肿瘤空间，获得子区域。然后，提取子区域的影像特征包括(GLCM、GLRLM、GLSZM 和直方图特征)构建多示例包，将肿瘤区域视作“包”，其子区域视为包中的“示例”，预后好坏作为各个子区域危险程度的评价标准。最后，使用示例及示例标签训练 SVM 分类器，采用 MIL 方法更新示例标签，重复训练和更新过程直至迭代结束。利用训练好的分类器预测示例标签，依据“正包中至少含有一个正示例，负包中所有示例均为负”的原则，确定包标签，实现预后预测。
结果：结果表明，相比于仅使用 SVM 实现 GBM 预后预测的研究(准确性、灵敏度和特异性分别为 80.67%、78.45%和 83.33%)，基于 MIL 方法的预测性能可以达到较高的预测效果 (准确性、灵敏度和特异性分别为 81.82%、76.92%和 85.00%)。
结论：证明了使用 kmeans 瘤内分割方法的可行性，以及多实例学习(MIL)方法进行肿瘤预后预测的有效性。此外，较好的包预测结果可以在一定程度上表征较为准确的示例预测，预测为正的子区域隐含对预后起决定作用的“高危”因子，对 GBM 异质性分析具有一定的研究价值和临床意义。

EPO-2595

基于 CDG 新技术结合 CTA 及 DSA 对比筛检急性心肌缺血与梗塞的探讨

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1.目的　基于动力学建模与深度学习，探讨 CDG 及 CTA/DSA 对急性心肌缺血筛检及随访的应用价值，构建 CDG 评价分析系统。
背景：传统 ECG 对急性心肌缺血与梗塞检测效率与准确性比较低，容易导致漏诊及误治。CDG 飞机发动机故障检测技术移植到人体的生物心脏领域。核心技术：心电动力学建模与特征提取，标准 12 导联心电图 ST-T 段信号建模。提取心动 ST-T 段动态特征。三维可视化显示。确定学习算法并行化分解，实现 CDG 建模快速计算。
2.材料与方法
2.1 技术路线：1.心电动力学建模与特征提取；2. 心肌缺血与猝死检测动物实验；3. 大样本检测心肌缺血与猝死临床试验；4. 心肌缺血检测与虚拟心脏仿真；　5.心肌缺血与猝死检测机理研究包括：心肌缺血及猝死与复极时空不一致性；T 波变异性与复极时空不一致性；心电动力学图对 T 波变异性检测能力；提出 CDG 诊断机理科学解释。
2.2 时间：　2015 年 3 月-2017 年 5 月，收集临床可疑心肌缺血与急性心肌梗塞 3260 例 CDG 病例，年龄 38-78 岁，其中 126 例急性心梗与心肌缺血治疗前后,经过 CTA、CDG、DSA、CDG 对照检测。
2.3 分组：1.CTA-CDG 组；2.CTA-CDG-DSA 组;3.CDG-DSA-CDG 组;4.CTA-CDG-ECT-CDG。
3.结果　　CDG 无创检测与“预警”急性心肌缺血与梗塞：CDG 敏感度 95%、特异度 90%、准确率 88%、检出率 95%。各组别之间差异显著有统计学意义（$P<0.05$）。
4.结论：基于 CDG 与 CTA/DSA 对急性心肌缺血与梗塞对照，提示 CDG 能准确的筛检急性缺血与梗塞的三维可视化的定量方法，临床应用前景广阔。
*CDG（心电动力学图）研究获 2015 年国家重大科学仪器专项资助（编号 61527811）。

EPO-2596
急危重症的精神心理压力定量数学建模及评价系统研究

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目的 研制急危重症的精神心理压力的定量评价系统装备，构建定量精神心理压力（PSA）数学建模，建立国人精神心理量化评价标准，旨在提供术后病人康复的个性化定量评价与临床指导。
背景 急诊危重症术后人体处于高应激状态、释放儿茶酚安、肾上腺素等、身心严重打击与创伤、易合并手术后并发症。干预依赖量化证据支持，相反，导致家庭、医疗和社会问题，因此，压力定量设备的研制与评价系统构建，对于指导医学康复有临床意义。
2.材料与方法
2.1 病人分组：1.胸疼三联症病人；2.腹部重大手术者；3.严重的外伤病人；4.先天性心脏病人组；5.胸部重大手术者。

2.2 方法分组：1.PSA-CDG;2.PSA-CDG-CTA;3.PSA-CDG-PSA。定量指标的计算机分析判断动态个体化指标，图像显示分类。
2.3 压力分级：1.正常；2.轻度压力；3.中度压力；4.重度压力。
2.4 平衡类型：1.交感神经平衡型；2.副交感神经平衡型；3.交感与副交感神经平衡型。
2.5 无线传输、信息采集、数学建模、个体化指标等设备与指标研究。
3.结果
1.严重胸腹部手术前后 PSA 显著升高；2.先天性心脏病手术后 PSA 稳定型；3.严重外伤 PSA 无反应型；4.PSA-CDG-PSA 组评价结果优于 PSA-CDG 组；5.交感与副交感神经平衡型组，不易在 CDG 检测急性心肌缺血改变（$p<0.05$）。
4.结论 PSA 即构建急危重症病人的精神心理压力定量评价系统，提供临床康复个性化动态数据，实现综合评价病人康复过程决策指导。
*PSA 获 2016 年广州市重大协同创新专项基金（编号 201604020107）

EPO-2597
基于非增强磁共振影像组学特征预测术前肝细胞肝癌微血管浸润的价值

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目的：术前预测肝细胞癌（HCC）患者微血管侵犯（MVI）具有重要意义。我们的目的是建立并验证基于非增强磁共振影像组学特征对术前肝细胞肝癌微血管侵犯（MVI）的预测价
值。
方法：收集我院自 2012 年至 2016 年 175 例经组织学证实的伴或不伴 MVI 的肝细胞肝癌患者进行研究，其中 120 例为训练组，55 例为验证组。所有患者均有完整术前磁共振（MRI）图像，且图像清晰，满足分析要求。人工勾画 T1 加权像（T1WI）和 T2 加权像（T2WI）图像中三维肿瘤区域，并从中提取和分析影像组学特征。在训练组中，采用 MATLAB 对于所提取的特征进行降维和特征选择，并用于验证组进行验证。
结果：训练组和验证组 MVI 阳性患者比例分别为 38.5%和 40.6%，二者差异没有统计学意义（$P>0.05$）；T1WI 和 T2WI 筛选出 16 个特征来建立 MVI 的预测模型。在训练组和验证组中，受试者操作特征曲线（AUC）下的面积、预测模型的敏感性、特异性分别为 0.87（95%可信区间（CI），0.75－0.92）、88.7%、76.5%和 0.82（95%CI，0.73－0.94）、89.1%，
74.8%。
结论：基于非增强磁共振的影像组学特征为肝癌患者 MVI 的预测提供了一个有效的模型，因此可能有助于临床医生对手术前的治疗做出精确的决定。

EPO-2598
A CT-based radiomics nomogram for differentiation of focal nodular hyperplasia from hepatocellular carcinoma in the non-cirrhotic liver

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Purpose: The purpose of this study was to develop and validate a radiomics nomogram for preoperative differentiating focal nodular hyperplasia (FNH) from hepatocellular carcinoma (HCC) in the non-cirrhotic liver.
Methods: A total of 156 patients with FNH (n=55) and HCC (n=101) were divided into a training set (n=119) and a validation set (n=37). Radiomics features were extracted from triphasic contrast CT images. A radiomics signature was constructed with the least absolute shrinkage and selection operator algorithm and a radiomics score (Rad-score) was calculated. Clinical data (age, gender, HBV and HCV infection, and AFP level) and CT findings (maximum diameter, shape, central scar, degeneration, fat deposition, calcification, capsulelike rim, dysmorphic vessels, and enhancement pattern) were assessed to build a clinical factors model. Combined with the Rad-score and independent clinical factors, a radiomics nomogram was constructed by multivariate logistic regression analysis. Nomogram performance was assessed with respect to discrimination and clinical usefulness.
Results: 4227 features were extracted and reduced to 10 features as the most important discriminators to build the radiomics signature. The radiomics signature showed good discrimination in the training set (AUC [area under the curve], 0.964; 95% confidence interval [CI], 0.934-0.995) and the validation set (AUC, 0.865; 95% CI, 0.725-1.000). Age, HBV infection and enhancement pattern were the independent clinical factors. The radiomics nomogram, which incorporated the Rad-score and clinical factors, showed good discrimination in the training set (AUC, 0.979; 95% CI, 0.959-0.998) and the validation set (AUC, 0.917; 95% CI, 0.800-1.000), and showed better discrimination capability (P<0.001) compared with the clinical factors model (AUC, 0.799; 95% CI, 0.719-0.879) in the training set. Decision curve analysis showed the nomogram outperformed the clinical factors model in terms of clinical usefulness.
Conclusions: The CT-based radiomics nomogram, a noninvasive preoperative prediction tool that incorporates the Rad-score and clinical factors, shows favorable predictive efficacy for differentiating FNH from HCC in the non-cirrhotic liver, which might facilitate clinical decision making process.

EPO-2599
基于对比增强 CT 列线图对于肝细胞肝癌术前病理分级的预测价值

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目的：研究基于对比增强 CT 列线图对于肝细胞肝癌术前病理分级的预测价值。
方法：对 165 例经组织学证实的肝癌的患者进行研究，其中 112 例为为训练集，53 例为验证集。所有患者术前均有完整的增强 CT 图像，包括动脉期（AP）、门静脉期（PVP）和延迟期（DP），术后均有详细的病理分级信息；分别从患者术前 AP、PVP 和 DP 中提取记录和放射特征，并记录患者的临床信息。放射分析包括肿瘤分割、特征提取、模型构建和模型评价，建立预测肝癌病理分级的最终列线图，并通过校准和鉴别统计对列线图的性能进行评估。
结果：在放射组学特征中，4 个 AP 特征、6 个 PVP 特征和 9 个 DP 特征对肝癌的病理分级预测有效。在验证数据集中，PVP 放射组学特征的性能优于 AP 和 DP 放射组学特征，AUC 为 0.786。在临

床模型中，肿瘤最大直径、甲胎蛋白和乙肝感染是有效的预测因子。最后的列线图集成了 PVP 放射组学签名和三个临床特征。训练数据集和验证数据集的列线图均得到了较好的校准，c 指标分别为 0.813 和 0.818。决策曲线分析表明，所提出的列线具有临床应用价值，净效益为 0.357。

结论：上述放射组学列线可以在术前预测 HCC 患者的病理分级，可能成为指导后续个性化治疗的有效临床工具。

EPO-2600
多参数磁共振成像在鉴别前列腺良恶性结节方面的影像组学初步研究

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目的

应用影像组学提取、分析前列腺多参数 MRI 图像的纹理特征，探讨其在鉴别前列腺良恶性结节中的价值。

方法

回顾性收集我院 2016 年 01 月 01 日至 2018 年 11 月 30 日进行 MRI 检查并且通过病理证实的前列腺癌患者和前列腺增生患者 70 例，其中前列腺癌 40 例，良性 30 例，所有患者包括完整的轴位 T2WI、DWI 和 DCE 动态增强序列。从 PACS 系统（Picture Archiving and Communication Systems）导出患者数据，包括完整的 T2WI 横轴、DWI 轴位、DCE 轴位图像。在 ITK-SNAP 软件上进行 ROI 的绘制，由两名五年以上工作经验的放射科医生根据每一病例的前列腺系统穿刺活检详细记录和病理诊断结果，对照前列腺解剖分区，在图像的穿刺活检取材位置相应部位进行感兴趣区勾画，逐层沿癌灶边缘进行勾画（尽量包括整个癌灶，但不超出癌区范围）。将勾画好的图像导入 Artificial Intelligence Kit software 软件，自动提取 396 个纹理特征。采用秩和检验进行特征数降维，相关性检验的相关程度选择 90%。建立模型，将所有收集的病例数按照 70%比 30%比例随机分成训练集和测试集，训练集用于指导 Logistic 回归模型学习，训练集随机分成十组，采用重复十次的十折交叉验证方法对分类器进行训练，得到机器学习模型。用测试集对其进行验证，得到准确率、敏感性、特异性、ROC 曲线下面积（AUC）。

结果

秩和检验分析后，前列腺癌组和前列腺增生组的 T2WI 图像有 237 个影像组学参数有明显差异，相关性筛选后剩余 17 个。Logistic 回归模型鉴别分析前列腺癌组和前列腺增生组的 AUC 值为 0.696，敏感性为 89.5%、特异性为 69.4％、准确性为 68.0％。

结论

本研究中可以看出，前列腺癌组和良性增生组间的多参数 MRI 图像纹理分析定量参数存在差异，有助于鉴别前列腺癌与良性增生。

EPO-2601
glszm 纹理特征评估纯磨玻璃 IA 的 p-53、ki-67

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目的 探讨利用 glszm 纹理分析评价纯磨玻璃 IA 的 p-53、ki-67 情况。**方法** 回顾性收集 2015 年 1 月至 2018 年 1 月期间于大连医科大学附属第一医院经手术病理证实为肺浸润性腺癌（IA），同时薄层 CT 上呈现为肺纯磨玻璃结节（pGGN）的患者总计 40 例。所有病例均为单发 IA 病灶，总计 40 个 pGGNs。回顾性采集所有研究对象的免疫组化情况：p53 突变率，ki-67 增殖指数，观察并测量薄层 CT 上 pGGN 的 glszm 纹理特征：ZoneVariance，GrayLevelNonUniformity，LargeAreaEmphasis，SmallAreaHighGrayLevelEmphasis，ZonePercentage，LargeAreaLowGrayLevelEmphasis，LargeAreaHighGrayLevelEmphasis 等。将所有患者的免疫组化指标与 glszm 纹理特征做相关性分析。**结果** p53 突变率与 glszm 纹理特征均无相关性；ki-67 增殖指数与 ZoneVariance（p=0.000，r=0.619）、LargeAreaEmphasis（p=0.000,r=0.619），LargeAreaHighGrayLevelEmphasis（p=0.001，r=0.578）呈正相关。 ki-67 增殖指数与 ZonePercentage（p=0.040，r=-0.378），LargeAreaLowGrayLevelEmphasis（p=0.003，r=-0.532）呈负相关。**结论** ki-67 增殖指数与 glszm 纹理特征具有一定相关性，其中 ZoneVariance 和 LargeAreaEmphasis 相关性最强，分析薄层 CT 上 pGGN 的 glszm 纹理特征，对评价患者肿瘤 ki-67 增殖活性有一定的临床价值。

EPO-2602

CT 影像组学对肾透明细胞癌凝固性坏死的预测研究

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目的 探讨 CT 影像组学对术前肾透明细胞癌凝固性坏死的预测价值。
方法 分别回顾性收集贵州省人民医院肾透明细胞患者 123 例，遵义医科大学附属医院肾透明细胞患者 130 例，以贵州省人民医院病例作为训练集，遵义医科大学病例作为验证集。采用开源 pyradiomics 平台对每一个样本进行特征提取，首先过滤掉低方差和高共线性的特征，然后采用最大相关最小冗余算法（mRMR）对特征进一步筛选，最后使用 T 检验筛选出与凝固性坏死最大相关性的特征，最终建立影像组学标签。最后使用多元逻辑回归模型结合影像组学标签建立了影像组学模型，并使用受试者工作者曲线（ROC）评估该模型对肾透明细胞癌凝固性坏死的预测性能。
结果 每个病人共提取出 1479 个特征，然后使用“care”包过滤掉低方差和高共线性的特征，特征数缩减到 120 个，然后通过最大相关最小冗余算法筛选出 13 个特征，最后使用 T 检验进一步筛选，得到 1 个最有意义的特征并建立影像组学模型。影像组学模型在训练集上的 AUC=0.78，测试集的 AUC=0.85。
结论 CT 影像组学可对术前肾透明细胞癌凝固性坏死进行较好的预测，有助于肾透明细胞癌术前个性化的诊疗。

EPO-2603

CT 影像组学对肾透明细胞癌肉瘤样变的预测研究

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目的 探讨 CT 影像组学对术前肾透明细胞癌肉瘤样变的预测价值。

方法 分别回顾性收集贵州省人民医院肾透明细胞患者 123 例，遵义医科大学附属医院肾透明细胞患者 130 例，以贵州省人民医院病例作为训练集，遵义医科大学病例作为验证集。采用开源 pyradiomics 平台对每一个样本进行特征提取，首先过滤掉低方差和高共线性的特征，然后采用最大相关最小冗余算法（mRMR）对特征进一步筛选，最后使用 T 检验筛选出与肉瘤样变最大相关性的特征，最终建立影像组学标签。最后使用多元逻辑回归模型结合影像组学标签建立了影像组学模型，并使用受试者工作者曲线（ROC）评估该模型对肾透明细胞癌肉瘤样变的预测性能。
结果 每个病人共提取出 1479 个特征，然后使用“care”包过滤掉低方差和高共线性的特征，特征数缩减到 88 个，然后通过最大相关最小冗余算法筛选出 14 个特征，最后使用 T 检验进一步筛选，得到 1 个最有意义的特征并建立影像组学模型。影像组学模型在训练集上的 AUC=0.72，测试集的 AUC=0.62。
结论 CT 影像组学可对术前肾透明细胞癌核肉瘤样变进行较好的预测，有助于肾透明细胞癌术前个性化的诊疗。
[**关键词**] 肾透明细胞癌；影像组学；肉瘤样变

EPO-2604
CT 组学在预测乳腺癌同时性肺结节治疗转归中的研究

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目的：探讨 CT 组学预测乳腺癌患者同时性肺结节在乳腺癌治疗后转归的可行性。
方法：回顾性收集我院 2013.1.1 至 2016.11.31 期间由病理证实为乳腺癌且同时胸部 CT 发现肺结节（≥5mm，数量少于 5 个）的患者。患者均接受手术切除，术后行内分泌治疗及放化疗。以治疗前胸部 CT 为基线，根据 CT 随访结果将肺结节转归分成稳定组及变化组，变化组进一步分为进展组及改善组，稳定组随访时间需超过两年。通过对肺结节基线 CT 行组学特征分析建立模型，预测肺结节在乳腺癌标准治疗后的转归。
结果： 共 80 例女性入组，中位年龄 52 岁（28-81 岁），肺结节中位大小 6mm（5-24mm）。稳定组 54 例，中位随访时间 27 个月（24-48 月）；变化组 26 例，中位变化时间 12 个月（3-36 月）。据肺结节基线 CT 图像共提取 105 种组学特征。稳定组与变化组间有 60 个组学特征有统计学差异（p<0.05），择出 90 Percentile、MA、Correlation 及 JE 四种组学特征，利用 23 种分类器建立模型，以 CGSVM 建立的模型具有最大曲线下面积，以此模型预测肺结节转归的特异度、敏感性、精准度及 AUC 分别为 100%、42%、81.3%及 0.87。变化组中有 40 个组学特征可以区分进展组与改善组，择取一种组学特征，以 CGSVM 分类器建立的模型具有最佳 AUC，预测变化组肺结节转归的特异度、敏感性、精准度及 AUC 分别为 54%、92%、71.3%及 0.88。
结论：CT 组学在预测乳腺癌同时性肺结节的治疗转归中具有一定意义，可以为临床制定个体化治疗方案提供影像学依据。

EPO-2605
Application of Radiomic features as biomarker used for distinguishing EGFR DEL19 and L858R sensitizing mutation subtype of non-small cell lung cancer

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Abstract

Purpose: The aim of this study was to establish a prediction model based on features extracted from CT images to differentiate the EGFR DEL19 and EGFR L858R sensitizing mutation in non-small cell lung cancer(NSCLC) patients.
Material: A total number of 396 CT-based phenotypic characteristics were extracted according to the intensity, shape, and texture from NSCLC preoperation images of 149 patients. A CT-based phenotypic signature was proposed using Cox regression model with LASSO penalty for the prediction of EGFR mutation. Furthermore, a joint prediction model incorporating the CT based image radiomics features and clinicopathologic characteristics was proposed for EGFR sensitizing mutation subtype prediction.
Results: Of 396 radiomic features, 4 rad-score features were generated as independent features by using cox regression with lasso penalty. Cox regression was applied and 4 clinical features were selected. We found the radiomics signature showed good discrimination performance in validation cohorts. In training set, the radiomics signature successfully discriminated the EGFR DEL19 and EGFR L858R sensitizing mutation (AUC=0.698, P<0.0001). Combining the imaging signature with a clinical feature model of EGFR status (AUC=0.778, P=0.0143) significantly improved prediction accuracy (AUC=0.874, P<0.0001). Furthermore, the intergration prediction model showed significant difference when compared to radiomic signature model alone (P=0.0041, 95%CI: 0.0558-0.296) and with good calibration.
Conclusion: Radiomics features have the potential to predict the EGFR sensitizing mutation subtype between EGFR DEL19 and EGFR L858R from CT images of non-small lung cancer cell patients . and the performance of radiomic features model are improved when combined with clinical features.
A clinical relevance statement: The imaging-based biomarkers can be used as a potential tool for differentiating EGFR DEL19 and EGFR L858R mutation subtype with high sensitivity, specificity and accuracy.

EPO-2606

CT high resolution images-based radiomics analysis for differentiating lung cancer from tuberculosis

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PURPOSE

To establish and validate a CT high resolution images-based radiomics model for differentiating lung cancer from tuberculosis

METHOD AND MATERIALS

Two hundred and forty-three patients with lung cancer and 243 patients with tuberculosis who underwent CT examinations one month before pneumocentesis biopsy were respectively included in this study. The pneumocentesis biopsy was regarded as the golden standard. ITK-SNAP was used to segment draw the region of interest and generate the 3D volume of lesion. All data was divided into training cohort (ncancer=ntuberculosis=170) and validation cohort (ncancer=ntuberculosis=73) by using

stratified sampling and 10-fold cross-validation with proportion 7:3. The texture features extracted by Artificial Intelligent Kit (A.K.) were selected by using Spearman and Support vector machine recursive feature elimination feature selection method. The remaining features were included in the model developed by logistic regression analysis and presented with a radiomics nomogram. The receiver operator characteristics (ROC) analysis was performed to validate the radiomics model curves.

RESULTS
There were a total of 696 features extracted. After data redundancy and dimension reduction, 17 features were used to develop the prediction model. A nomogram for distinguishing these two diseases, with an AUC of 0.894 (Accuracy, 0.826; Precision, 0.81; SE, 85.3%; SP, 80%) for training set and 0.856 (Accuracy, 0.767; Precision, 0.767; SE, 76.7%; SP, 76.7%) for the validation data was successfully plotted.

CONCLUSION
A CT high resolution image -based radiomics has the potential for distinctions between lung cancer and tuberculosis, indicating the radiomics could play an important role in before pneumocentesis biopsy.

EPO-2607

End-to-end screening for osteoporosis and osteopenia using deep learning applied to lumbar spine X-ray images: A retrospective, multicohort, diagnostic study

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Background: Low bone mineral density (BMD) is well-known to contribute to increased fracture risk, which is a major source of associated morbidity and mortality, particularly in postmenopausal women. The objective of this study was to use deep convolutional neural network (DCNN) models as a tool to evaluate BMD in postmenopausal women by analysing lumbar spine X-ray images.
Methods and findings: We performed a retrospective, multicohort, diagnostic study using lumbar X-ray image sets from three hospitals in China. We developed and validated the DCNN models on the training cohort, comprising 1310 lumbar spine X-ray images from 655 postmenopausal women (aged ≥ 50 to ≤ 92 years). The lumbar spine BMD measured via a dual energy X-ray absorptiometry (DXA) device was used as a reference standard. We categorized patients into three groups according to BMD T-score: normal (T ≥ -1.0), low bone mass (-2.5 <T < -1.0), and osteoporosis (T≤ -2.5). Two models were trained to perform classification (Model 1: osteoporosis vs normal and low bone mass; Model 2: normal vs low bone mass). Each model' s diagnostic performance was validated in an internal cohort (144 images from 72 patients) and two external cohorts (362 images from 181 patients; and 148 images from 74 patients). Model classification performance was assessed by receiver operating characteristic (ROC) curve analysis. We compared the performance of models based on the anteroposterior images, lateral images, and their combination. The models achieved high performance in evaluating lumbar spine

BMD in the validation cohorts tested. When tested in the internal validation cohort, Model 1 yielded area under the curves (AUCs) of 0.860 (95% confidence interval [CI]: 0.759, 0.931), 0.835 (95% CI: 0.729, 0.912), and 0.867 (95%CI: 0.766, 0.935) based on the anteroposterior, lateral, and combined images, respectively; while AUCs for Model 2 were respectively, 0.819 (95% CI: 0.695, 0.907), 0.788 (95%CI: 0.660, 0.885), and 0.828 (95%CI: 0.694, 0.921). In the Guangzhou external validation cohort, Model 1 yielded AUCs of 0.860 (95%CI: 0.759, 0.931), 0.835 (95% CI: 0.729, 0.912), and 0.867 (95% CI: 0.766, 0.935) based on the anteroposterior, lateral, and combined images, respectively; while model 2 yielded AUCs of 0.868 (95%CI: 0.810, 0.914), 0.855 (95%CI: 0.796, 0.903), and 0.910 (95%CI: 0.858, 0.947), respectively. In the Zhongshan external validation cohort, Model 1 yielded AUCs of 0.828 (95%CI: 0.723, 0.906), 0.863 (95%CI: 0.763, 0.932), and 0.841 (95%CI: 0.737, 0.915) based on the anteroposterior, lateral, and combined images, respectively; while AUCs for Model 2 were respectively 0.806 (95%CI: 0.697, 0.888), 0.793 (95%CI: 0.683, 0.878), and 0.894 (95%CI: 0.800, 0.953). No significant differences were observed between AUCs of models 1 and 2 in different image projections across different centres (for all, $P > 0.05$). Study limitations include the retrospective nature of the data collection as well as the opaque black box nature of deep learning networks.

Conclusions: Deep learning diagnostic networks can be trained to accurately assess BMD on lumbar spine radiographs with high classification performance. It is valuable and practical as a non-invasive screening tool for BMD in postmenopausal women.

EPO-2608
基于 CycleGAN 网络模型将下肢骨肉瘤 CT 图像生成伪 MRI 图像的方法及质量评价

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目的：和 CT 图像相比，MR 图像具有更高的软组织对比度，但其价格昂贵，采集时间长，检查禁忌症多。本文旨在研究基于 CT 图像转化成伪 MRI（sMRI）的方法，以帮助有需要的患者无需进行 MR 扫描便可获取 MR 图像，辅助临床诊疗。

方法：数据来自中科大附属第一医院西区的 24 例下肢骨肉瘤患者。首先对原始 CT 和 MR 图像进行预处理：去噪并结合 Canny 边缘检测算子和 Otsu 阈值算法获得 ROI（Region of Interest），校正偏差场，重采样体素大小至 0.8×0.8×5mm^3，并以参考病例为基准进行直方图标准化，重设图像分辨率至 256×256；然后采用 CycleGAN 网络模型，生成器为 ResNet 网络，鉴别器为 PatchGAN 网络，使用 18 例病人的 CT 和 MR 图像进行训练，学习两者之间的映射关系。通过设置循环一致性损失，判断由输入 CT 生成的 sMRI 是否可以再转回成原输入 CT，从而增强输入 CT 与输出 sMRI 间的结构相似性，减少无效输出图像的产生；最后使用另外 6 例病人的 CT 图像进行测试。以两名主治以上高年资医师在不知 MR 真伪的情况下进行主观评分，分别评价健侧下肢解剖结构的显示以及患侧骨肉瘤瘤体信号的显示，评分标准均采取 5 分制（1 分：极差；2 分：差；3 分：一般；4 分：良好；5 分：优秀）。

结果：使用 CycleGAN 网络模型成功将 6 例测试病人的下肢 CT 图像转化成 sMR 图像，健侧下肢解剖结构显示的得分为（3.83±1.03）分，骨-软组织对比度较好，层次分明；患侧骨肉瘤瘤体信号显示的得分为（2.05±0.63）分，骨肉瘤病变能够辨识，瘤体内部信号对比度差。
结论：CycleGAN 网络模型可以有效地根据下肢骨肉瘤的 CT 图像生成质量较高的 sMRI 图像，能够帮助无法进行 MR 图像采集的患者得到更好的影像诊断及相应治疗。未来增大训练集的数量以及改进网络，可能进一步提高 sMRI 的质量以及瘤体的显示，以满足临床需求。

EPO-2609
人工智能辅助诊断在胸部影像教学实践中的初步探讨

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目的：探讨人工智能辅助诊断在胸部影像教学实践中的价值。方法：将实习生及住培医师随机分为人工智能辅助诊断组与传统阅片诊断组，采用阅片报告评分及问卷调查方式，评估两组的教学效果及教学满意度。结果：人工智能辅助诊断组的报告描述总分及报告建议总分较传统阅片组高，差异有统计学意义（p<0.05）；两组在结论准确性上无明显统计学差异（p>0.05）。教学满意度评估问卷显示教学内容、教学方法及教学效果人工智能辅助诊断组评分均高于传统阅片组，差异有统计学意义（p<0.05）；教学态度两组评分无明显统计学差异（p>0.05）。结论：使用人工智能辅助诊断系统进行胸部影像教学，有助于提高学生学习积极性，在短期内掌握影像专业基本临床技能。

EPO-2610
Noninvasive imaging biomarkers predicting radiation-induced xerostomia in patients with nasopharyngeal carcinoma using multiparametric MR radiomic features

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Purpose: To predict the radiation-induced xerostomia prior or at the early phase of RT in patients with NPC. To investigate the value of radiomic features from multimodal MRI as noninvasive imaging biomarkers (IBMs) assessing salivary gland function.
Methods: 23 NPC patients treated with parotid-sparing RT were enrolled. Clinical xerostomia measured by RTOG criteria in all patients and salivary function was assessed by multimodal MRI prior RT (PRT), one-week post-RT (DRT) and one-year post-RT (ART) respectively. For each MR, the 3D segmentations from three different sequence images together with their original images were loaded for further texture analysis and 321 high-throughput features were extracted to construct a classification model. Finally 1605 time series related features were obtained integrating the three-time MR images.Texture extraction was applied to the multiparametric images using PyRadiomics package in Python software. All the machine learning models were conducted using the 5-fold cross validation, whereby 20% of the data were used to test the model created by the other 80% of the data. ROC analysis was employed to assess the efficiency for identifying the level of radiation-induced xerostomia.

Results: 12 patients showed mild radiation-induced xerostomia and the other 11 were severe one-year post-RT. Clinical xerostomia measured by RTOG criteria was Grade 0 before RT and Grade 2 at 1 week post-RT in all patients. In PRT group, the optimized predictive model of severe xrostomia were established using 37 features with accuracy of 84.78% (AUC=0.809) by applying quadratic discriminant, logistics regression, fine Gaussian SVM, cosine KNN or subspace discriminant. 22 or 17 features can be used to predict salivary gland function in DRT or ART group, respectively. Logistics regression, medium KNN or cubic SVM yielded the highest accuracy of 78.26% (AUC=0.746 or 0.706). The 15 time series features [including 3 first order features, 7 shape features, 2 GLSZM features, 2 NGTDM features, and 1 GLDM feature reflected the changes of salivary gland.
Conclusion: The optimal MR radiomic features extracted from multiple MR sequences can be used as the promising IBMs for predicting radiation-induced xerostomia. The time series features can describe the changes of salivary gland function during RT.

EPO-2611

Accuracy in Predicting Nodule Consistency and Risk of Malignancy Using an AI System

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PURPOSE

To evaluate the accuracy of an artificial intelligence platform (InferRead CT Lung research, ICLR) in determining property of pulmonary nodules on 490 pathologically confirmed pulmonary nodules.

METHOD AND MATERIALS

A retrospective analysis was performed on 411 subjects with 490 pulmonary nodules that underwent surgical resection in our hospital from September 2015 to November 2018. There were 92 nonsolid, 84 part-solid, 312 solid, and 2 calcified nodules in the study, including 7 AAH, 1 AIS, 17 MIA, 297 invasive adenocarcinoma, 40 other malignancy, 55 metastases, 73 benign lesions. Overall size of nodules was 20.6 mm ±13.7mm (2-78.7 mm). All cases were reviewed independently by 2 experienced radiologists (K.L., and M.L, with 17 years and 12 years of experience) to assess nodule location and consistency. For each, we recorded location, consistency, size, and the probability of malignancy, malignancy risk category (low <50%, moderate 50%~70%, high >=70%) obtained from ICLR (InferRead CT lung research). The platform applies 3D convolutional neural network (3D CNN) with DenseNet architecture as backbone to get the malignant probability of pulmonary nodules. The accuracy of determination of consistency, location, and degree of malignancy risk was calculated.

RESULTS

There were 162 sub-solid, 314 solid, and 14 calcified nodules identified by ICLR among these confirmed nodules. The accuracy of determination of non-solid, part-solid, solid and calcified nodules were 100%, 78.6%, 94.9% and 100%, respectively. Four hundreds and eigthy three nodules were available for determination of location. The accuracy of determination of location was 84.3% (407/483) with 58 misallocated segments and 18 misallocated lobes. There were 80 low-risks, 39 moderate-risks, 371 high-risk lesions identified by ICLR. Total benign and malignant predictive accuracy was 37.5% and 88.9%, respectively. The accuracy of risk determination of benign lesions, AAH, AIS, MIA, invasive adenocarcinoma, metastases and other malignancy were 41.1%, 0%, 100%, 76.5%, 95.9%, 50.9% and 95.0%, respectively.

CONCLUSION
Now available ICLR has high accuracy in determination on nodules' consistency and location. The accuracy of risk determination on adenocarcinoma and other primary lung malignancies is high, but it is low on benign lesions and metastases prediction.

EPO-2612

Prognostic Value of Preoperative MRI Texture Features in Breast Cancer Brain Metastasis Treated with Gamma Knife Radiosurgery

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Objectives To investigate the prognostic value of preoperative magnetic resonance imaging (MRI) texture features in patients with breast cancer brain metastasis (BCBM) treated with gamma knife radiosurgery (GKS).
Methods The clinical and imaging data of 60 BCBM lesions in 34 patients who received GKS therapy were retrospectively reviewed. Radiomic features were extracted from preoperative contrast-enhanced T1-weighted images (CE-T1WIs), T2-weighted images (T2WIs) and apparent diffusion coefficient (ADC) maps. Univariate and multivariate Cox proportional hazard analyses were performed to identify independent factors for progression-free survival (PFS). Furthermore, a prognostic nomogram was constructed, and its calibration ability was assessed using the bootstrap method.
Results Kurtosis derived from CE-T1WI [hazard ratio (HR), 0.707; 95% confidence interval (CI), 0.538-0.930; P = 0.013] and age (HR, 1.034; 95% CI, 1.008-1.061; P = 0.008) were independent predictors for PFS. The combination of CE-T1WI-based Kurtosis with age displayed a higher C-index (adjusted C-index, 0.684) than did CE-T1WI-based kurtosis (adjusted C-index, 0.665) or age (adjusted C-index, 0.613) alone. The nomogram based on the combinative model provided a better prognostic performance over age (P = 0.045). The calibration curve elucidated good agreement between prediction and observation for the probability of 6 -and 12-month PFS.
Conclusions Preoperative CE-T1WI-based kurtosis combined age improved prognostic ability in BCBM patients with GKS therapy.

EPO-2613

Radiomics features for prediction of lymphovascular invasion in rectal cancer

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Abstract

Purpose

To investigate the value of radiomics for prediction of lymphovascular invasion (LVI) status in rectal cancer based on MRI.

Materials and methods

The retrospective study included 188 patients with histologically confirmed rectal cancer and evaluated LVI status. Clinical factor and image data were collected, and radiomics features were extracted from multi-region on T2WI and DWI. Radiomics analysis included segmentation, feature extraction, model construction, and model evaluation.

Results

14 radiomics features were effective for LVI prediction in rectal cancer by Spearman correlation analysis and the LASSO algorithm to construct a predictive model. The Linear Support Vector Classification was performed best. The mean AUC in 5-fold validation dataset is 0.71, and the AUC in training dataset is 0.78.

Conclusion

The radiomoics model which we developed to demonstrate that multiregional radiomics features base on MRI is useful for preoperatively predicting lymphovascular invasion in patients with rectal cancer.

EPO-2614

Artificial intelligence in action: binary classification of non-contrast head computed tomography(CT) scans

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Purpose

To develop a fully automated deep learning framework that could detect and distinguish normal head CT images from abnormal ones based on cross sectional CT images.

Materials and methods

9350 head CT images (abnormal images:3546; normal images:5786) were retrospectively collected from 2014－2017 from our hospital. A deep convolutional neural network(CNN) was trained on 6545 images and subsequently validated on 1870 images, finally tested on 935 unseen images. The proposed algorithm first extracts features using squeezenet and then detects brain abnormality using the logistic function as the last layer of the network. Original clinical radiology report and consensus of three

independent radiologists were considered as gold standard for algorithms developing. Area under receiver operating characteristics curve (AUC) for each finding was primarily used to evaluate the algorithms discriminative performance.

Results

After training the algorithm on 6545 head CT images, the receiver operating characteristic (ROC) curve was generated using the 1870 validating datasets and 935 unseen testing datasets. Respectively, the AUC of the model was 0.976 and 0.960 for predicting the normal or abnormality. where the overall specificity and sensitivity were 0.857 and 0.965.

Conclusion

Our results show that deep learning algorithms can be trained to detect critical findings from head CT scans with good performance. The powerful performance hints the positive impact of advanced deep learning in radiology workflow optimization especially in emergency room.

EPO-2615

A new method using radiomics and machine learning to predict EGFR mutations in NSCLC patients

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Purpose:

Identifying epidermal growth factor receptor (EGFR) mutation status is crucial for treatment decision making in non-small cell lung cancer (NSCLC) . Our purpose was to design and validate an efficient method combining radiomics and machine learning method to predict EGFR mutations in NSCLC patients.

Method and Materials:

A dataset consisting of 472 lung cancer patients with matching EGFR mutation status were retrospectively collected. Pulmonary lesions of them were labeled and segmented by experienced radiologists based on preoperative non-contrast chest CT. According to inclusion criteria, 381 cases were selected to train and validate our method. All selected samples were randomly split into the training and the validation cohort without patient overlap. 1132 radiomics features were extracted from the segmented tumor regions. All processes in our approach are based on the LightGBM framework. Exclusive Feature Bundling was used to automatically merge extracted feature, not lower their dimensions. Based on the use of Tree Ensemble to avoid over-fitting problem, a predictive model was built from the training cohort. The predictive performance of the model was evaluated by sensitivity, specificity, F1 Score and AUC using ROC curve analysis.

Results:

381 patients were divided into the training cohort with 301 cases (137 EGFR mutants and 164 EGFR wild types) and the validation cohort with 80 cases (39 EGFR mutants and 41 EGFR wild types). The sensitivity, specificity, F1 Score and AUC of the model predicting EGFR mutations in the training cohort were 0.766, 0.902, 0.814,

and 0.922, respectively. And those of the validation cohort were 0.743, 0.756, 0.743, and 0.748, respectively. In addition to the process of manual segmentation, the average time required to analyse one case in the training cohort was 0.1200044 seconds, and the average time required for the validation cohort was about 0.1200049 seconds.

Conclusion:

Our method combining radiomics and machine learning showed good performance on predicting EGFR mutant, providing an efficient, stable and non-invasive way to detect gene mutations.

EPO-2616

Exploration of AI-assisted diagnostic system on the detection efficiency of long-axis diameter <4 mm pulmonary nodules in fatigued intern in Radiology Department.

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PURPOSE: Previous studies have demonstrated that radiologists experience increased fatigue and decreased diagnostic accuracy for detecting pulmonary nodules after their usual workday especially for smaller nodules[1]. To explore the diagnostic efficiency improvement for fatigued intern after daily work with the help of AI-assisted pulmonary nodule detection software for small nodules less than 4mm.

METHOD AND MATERIALS: A total of 179 patients were collected. One senior radiologist with more than 10 years' experience read CT images based on the initial diagnosis of another senior radiologist with similar experience and a final decision was subsequently conducted by deputy chief radiologist with more than 15 years' experience to determine the ground truth lung nodules. Three readings were conducted by an intern (with 4 months' chest CT experience) using different methods under different conditions: an intern in daily work (not fatigued) without AI (group A) , the same fatigued intern (after routine 8 hours' working time) without AI (group B) and the fatigued intern with AI (group C).All three reading sessions had an inter-washout period of more than 15 days. The number of nodules, long-axis diameter and location were recorded. The performance of three readings regarding lung nodule detection was assessed by using sensitivity and false positive rate.

RESULTS: A total of 995 long-axis diameter <4 mm nodules were confirmed to be gold standard nodules. Group A detected 658 nodules including 525 true positive nodules and 233 false positive nodules with a sensitivity of 42.71% and a false positive rate of 1.30 per CT scan (233/179). Group B detected 531 nodules including 363 true positive nodules and 168 false positive nodules with a sensitivity of 36.48% and a false positive rate of 0.94 per CT scan (168/179). Group C detected 847 nodules including 763 true positive nodules and 84 false positive nodules with a sensitivity of 76.68% and a false positive rate of 0.47 per CT scan (84/179). Group A achieved the 6.23% higher sensitivity (42.71%) than group B (36.48%) and lower false positive rate

(p<0.05). Group C achieved the highest sensitivity (76.68%) compared with group A (42.71%) and B (36.48%) while the false positive rate is lowest (p<0.05). **CONCLUSION:** Fatigue can reduce the intern detection efficiency of long-axis diameter <4 mm pulmonary nodules. However, fatigued intern with AI could achieve much higher diagnostic efficiency than intern in daily work (not fatigued). Fatigued intern aided with AI-assisted lung nodule detection system could achieve desirable detection rate for long-axis diameter <4 mm pulmonary nodules which are easily missed due to excessive workload.

EPO-2617
利用级联 3D U-Net 自动分割 MRI 增强扫描延迟期图像中肝脏的研究

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目的 开发一种在 MRI 增强扫描延迟期图像上分割正常及肝硬化肝脏的算法。**材料与方法** 回顾性收集从 2017 年 6 月至 2018 年 6 月期间于我院行腹部 MR 检查并包含正常肝或诊断为肝硬化的图像。将图像分成两组：训练数据集（100）和测试数据集（30），内含等比例的正常肝或肝硬化肝的图像。所使用的图像都是增强扫描延迟期图像，并由两位经验丰富的放射科医师进行标记。算法由两个级联的 3D U-Net 构成，第一步：用原始降采样的 MR 图像训练 3D U-Net 来定位肝脏，得到肝脏所在区域。第二步：根据第一步所得肝脏分割结果对 MR 图像裁剪，得到肝脏局部图像，训练 3D U-Net 对肝脏精确进行分割。以 dice 系数来评估两步肝脏分割算法的性能。考虑到模型的大小和肝脏的形状，本研究将输入图像的大小设置为 128 * 128 * 64，以尽可能减少重采样的精度损失。**结果** 在测试集上评估正常和肝硬化肝脏的分割性能，平均骰子系数分别为 0.96 和 0.95。**结论** 构建了自动分割 MRI 增强扫描延迟期图像中正常及肝硬化肝脏的级联算法，可用于后续肝脏疾病自动分类的研究。

EPO-2618
医院 PACS 平台上基于人工智能骨龄检测系统的初步临床应用

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目的：探讨基于 PACS-RIS 工作流的人工智能骨龄检测系统的临床应用及效果。**材料与方法**：完成自主研发的 2 套人工智能骨龄检测系统（CHBoneAI1.0/2.0）模块嵌入、上线医院网络后，分别对 2018 年 3 月 15 日-2019 年 3 月 20 日间我院 PACS 数据库中 14117 例骨龄 DR 影像资料进行自动评估，分析其骨龄预测数值的准确性、系统稳定性及误差原因。**结果**：CHBoneAI 实现了一键式实时快速自动化骨龄评估（点击模块按键的同时输出结果、几无时间差），参照儿科放射科医生读数，误差 1.0 岁及 1.5 岁以内（3 岁时 SD 男 6 月、女 5.6 月，5.5 岁时 SD 男 9.1 月、女 8.9 月，年龄越大 SD 越大）的准确率 CHBoneAI1.0 为 93.26%及 97.52%、CHBoneAI2.0 为 94.17%及 98.63%，CHBoneAI2.0 准确率明显高于 CHBoneAI1.0（X^2=9.855，p=0.001）。CHBoneAI 在院内 PACS-RIS 工作流中运行顺畅，但 RIS 信息错误（男女、年龄、“骨龄片-腕关节”登记错误等）、曝光不足的 DR 影像、患有系统性疾病手腕部 DR 影像尤其先天或后天原因导致塑形异常的骨龄 DR 影像、“骨龄片-腕关节”目录下混有骨龄图像外的其他图像或无骨龄影像、左手腕部置位（方向如横位、姿

势如未展开 or 过度张开）及 FOV 等不同程度影响 AI 骨龄预测数值。**结论**：基于 PACS-RIS 工作流的人工智能骨龄检测系统成功实现了线上临床应用，初步运行结果表明其骨龄预测效果较为准确，可望成为骨龄检测自动化智能诊断的良好工具。

EPO-2619
基于深度学习建立气象因素相关模型预测放射科急诊检查数量

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目的：为了有效地预测气候因素对放射科日急诊检查数量的影响，提取气象中与放射科日检查数量高相关特征因素，利用 DecompositionNet（分解网络）模型构建气候对放射科日检查数量影响的预测模型。

方法：收集自 2017 年 1 月到 2019 年 4 月我院放射科急诊检查数量及相应时间的气象因素。采用 Pearson 相关性计算放射急诊检查数量与相应时间的气象因素（包括季节、气温、天气、风力和空气质量）相关性，并分析具有高相关性特征与急诊检查人次分布的关系。将 2017 年 1 月到 2019 年 3 月的数据作为训练集，将 2019 年 4 月的数据作为测试集，把单位小时内急诊检查数量时序分解成趋势、周期及残差三部分，考虑到气象特征的滞后效应对急诊人数影响，利用提取的高相关特征及其滞后特征，采用深度学习方法 DecompositionNet 对分解时序进行预测。

结果：放射科急诊数量与季节、空气质量及气温有关。我院放射科急诊检查数量与季节有关，春冬季节人数较秋夏季节人数明显增多约 4 人(p<0.0001)，空气重度污染情况较无污染情况急诊人数增加约 6 人（p<0.006），气温低于 6℃较气温高于 30℃急诊人数明显增加约 8 人（p<0.00014），基于 DecompositionNet 方法，建立与气象因素相关模型，我们能够预测我院放射科单位小时内急诊检查数量误差在 2 人次以内，每天的预测的总人数误差在 5%的误差以内。

结论：放射科急诊检查数量与季节、空气质量及气温变化有显著关系。基于深度学习网络的预测模型能够很好预测单位时间段内急诊检查人数，将来可能为临床医疗管理决策提供潜在价值。

EPO-2620
基于机器学习算法完成腹部增强 CT 脾脏自动分割及体积计算

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目的 基于机器学习完成腹部增强 CT 图像中脾脏的自动分割及体积自动计算。
方法 回顾性收集自 2016 年 1 月 1 日~2019 年 3 月于北京大学第一医院就诊并行腹部或腹盆部增强 CT 扫描的患者基本人口学信息及扫描图像共 75 例，原始图像分辨率为 1024×1024，重建层厚为 1mm。将原始数据导出为 DICOM 文件，转化至 NiFTI 格式，调整图像的窗宽为 30HU，窗位为 300HU，应用 ITK-Snap（3.6.0）由影像科医生进行边界勾画，所有被认为是脾组织的体素均被激活，包括副脾结节；可分辨的脾门血管、膈肌及其他毗邻脏器均未被标注。通过预测结果的平均 Dice 值来评价脾脏分割模型的效果，同时由 2 名影像科医生对训练及预测结果进行再评价，主要

评价指标为医学知识角度出发判定为分割结果是否符合人眼视觉解剖学定义，包括是否标注其他脏器上的体素，边界差异是否可接受，是否有较大范围的缺损等。通过算法对计算机自动分割结果及人工标注结果进行分析，输出脾脏三维径线及总体素体积。应用 spss 20.0 软件进行统计，对比自动分割结果和人工标注结果的差异。

结果 共 75 例腹部 CT 增强扫描，包括 29918 张轴位图像，其中 6805 张为有脾实质标注的图像。分割模型的 DICE 值为 0.97，预测结果共 6840 张有脾实质标注，其中 6809 张（99.55%）无医学逻辑错误。人工标注结果计算所得的脾实质体积为 208±75.8（cm^3），模型分割结果所得为 210±75.5（cm^3），$p<0.05$，无统计学差异。

结论 通过应用传统 2D 分割模型对 75 例共 29918 张轴位增强 CT 门脉期图像及相应标注的监督学习，本研究完成了一项脾脏分割模型的训练，其 DICE 值达到 0.97，以影像科医生为基准，预测结果中 99.55%的图像无医学逻辑学错误，自动分割与人工标注的脾脏体积并无统计学差异，为脾脏相关疾病进一步研究打下了模型基础。

EPO-2621
基于 CT 图像的影像组学对肾下盏结石行输尿管软镜术后无石率的预测价值

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目的：探讨基于肾脏 CT 图像的影像组学特征用于预测输尿管软镜(*flexible ureteroscopy, fURS*)治疗肾下盏结石术后无结石状态（Stone-free, SF）的临床价值。

材料和方法：回顾性地分析 2014 年至 2018 年行 fURS 治疗的肾下盏结石患者 142 例，根据患者术后三个月的 KUB 复查结果分为成功组和失败组，收集每位患者的基本临床信息，包括年龄、性别、结石的负荷等。所有患者均使用 64 层 MDCT 扫描仪进行非对比增强 CT 扫描。此研究主要分为五个步骤：1）数据的预处理，应用 3D-Slicer 图像分割软件对感兴趣区域（ROI）进行逐层勾画并融合成为感兴趣区容积（VOI）； 2）特征提取，由 MATLAB 商业数学软件自动提取出 604 个纹理特征，包括直方图、灰度游程矩阵等；3）按照训练集比验证集为 7:3 的比例，将 99 例患者纳入训练集，利用 R 语言统计分析软件，经 LASSO 回归分析方法进行数据降维及特征选取，并通过所选特征的线性组合计算每个患者的放射评分（Rad 评分）；4）建立 Logistic 回归模型，放射特征累加手术者经验、患肾的积水程度以及结石的体积，绘制诺模图。5）将剩下的 43 例患者纳入验证集，用于模型诊断，ROC 曲线评价 logistics 回归模型的诊断效能。绘制校准曲线和决策曲线评估诺模图的临床应用价值。

结果：Logistic 回归模型预测 SF 的 ROC 曲线下面积在训练组和验证组分别为 0.949 和 *0.962*，敏感度分别为 93.9%和 1、特异度分别为 85.7%和 91.6%。校准曲线及决策曲线分析结果显示结合临床指标后建立的影像组学诺模图具有良好的临床应用价值。

结论：基于肾脏 CT 平扫图像的影像组学方法提取的特征，能够较好地预测单发肾下盏结石行 fURS 术后的 SF，结合临床相关指标的诺模图可以客观、定量评估手术的成功率，有望成为一种无创性的临床决策工具。

EPO-2622
基于深度学习的前列腺增生自动识别模型的初步建立

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目的：利用深度学习，初步建立良性前列腺增生（BPH）和正常前列腺的自动二分类模型。**方法：**回顾性整理 2018 年 3 月 1 日至 2018 年 6 月 10 日于我院行前列腺多参数磁共振成像（mpMRI）患者的图像和报告资料，收集报告结果为“良性前列腺增生”和“前列腺未见异常”的患者资料并入组，共收集 BPH44 例和正常前列腺 29 例。利用本科室已实现的前列腺 U-Net（U 形全卷积神经网络）分割模型在 T2 加权图像（T2WI）上自动分割前列腺区域，一名影像专家对每一层图像进行分类，共得到 BPH412 层和正常前列腺 292 层为金标准，序贯进行二分类研究。基于一个 2D 分类的卷积神经网络，Cls2D，我们对 T2WI 图像进行预处理、扩增和标准化处理，把原像素为 512×512 图像统一处理为原图像正中 1/4 且像素为 256×256 图像。将 704 层随机分成训练集（包括训练 569 层、内部验证 67 层）和测试集 68 层，训练循坏次数为 130 次，以自动分割得到的前列腺为 mask，进行二分类模型训练。运用训练过程的损失函数（loss）曲线和外部测试集的混淆矩阵、准确性、灵敏度和特异度对此分类模型的效果进行评价。**结果：**对于训练集，loss 曲线显示训练曲线逐步收敛并稳定。测试集 68 层中：存在 BPH40 层，此分类模型成功检出 30 层；正常前列腺为 28 层，此分类模型将 4 层误判为 BPH，有 2 层未给予分类。以单层图像为单位进行评价，该模型的分类准确率为 76.5%，灵敏度和特异度分别为 75.0%和 78.6%。以每例患者为单位时，测试集共 11 例，其中金标准 BPH 为 5 例。规定每 1 例中所有层面均被模型判为正常时，此例才判为正常，此模型正确分类 10 例，只有 1 例假阳性，准确率、灵敏度和特异度分别为 90.9%、80.0%和 100.0%。**结论：**基于深度学习的良性前列腺增生和正常前列腺的自动二分类模型已建立，初步测试结果可满足临床需求。

EPO-2623
不同人工智能肺结节筛查分类模型对磨玻璃结节检出效能的影响

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目的 探索人工智能肺结节筛查系统中不同分类模型对磨玻璃结节检出效能的影响，进而筛选出适合临床检测磨玻璃结节的分类模型。

方法 回顾性收集 117 例胸部 CT 平扫病例数据，均为层厚为 1 至 1.25mm 的薄层扫描序列。本研究使用的金标准磨玻璃结节数由两位拥有超过 15 年胸部 CT 阅片经验的放射科专家共同制定，共 147 个。基于深度学习的 AI 肺结节筛查系统（北京推想科技有限公司）用于磨玻璃结节检测，分别记录不同分类模型 AI 系统检测到的磨玻璃结节数。模型一是在深度神经网络（CNN）基础上自主研发的算法，模型二是在模型一基础上优化、减少假阳性结节的算法，模型三则是模型二基础上优化增强磨玻璃结节敏感性的算法。通过与金标准对比，分析不同分类模型的 AI 系统检测到的真阳性结节，假阳性结节和假阴性结节的数量，计算模型检测敏感性和假阳性率（假阳性结节数/CT）。卡方检验用于比率指标的统计分析，$P<0.05$ 具有统计学意义。

结果 模型一检测到 402 个磨玻璃结节，其中 133 个是真阳性结节，假阴性结节为 14 个，检测敏感性为 90.48%；假阳性率为 2.3/CT。与此同时，模型二检测到的结节数有所减少，降至 366 个，主要体现在假阳性结节数的减少，真阳性结节没有变化仍为 133 个，检测敏感性相同，但假阳性率降低到 1.91/CT。当利用模型三进行肺结节检测时，387 个磨玻璃结节被检出，包含 136 个真阳性结节，假阴性结节数为 11 个，检测敏感性为 92.52%（$p>0.05$），假阳性率为 2.15/CT。通过比较

三组结果不难发现，三个模型间检测敏感性无显著差别，但模型二假阳性结节数较少，模型三假阴性结节（漏诊）数目较少。

结论 对比分析不同模型间敏感性，假阳性率和漏诊数的差异，模型二的综合表现最佳，因此更适合临床进行磨玻璃结节筛查使用。

EPO-2624
基于常规磁共振成像的纹理分析预测低级别胶质瘤早期恶性转换

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目的：基于 MRI 常规成像的纹理分析可以提供额外的肉眼不可见的定量信息。本研究的目的是评估基于术前常规 MRI 图像的纹理分析是否可以预测低级别胶质瘤（WHO II 级）早期转化为高级别胶质瘤（WHO III、IV 级），并与直方图分析进行比较。
材料和方法：共 68 例低级别胶质瘤（low grage glioma, LGG）纳入本研究，经 2-12 年的随访其中 15 例转化为高级别胶质瘤（high grade glioma, HGG）。病人随机分为训练组（60%）及测试组（40%）。纹理分析同时应用于训练组及测试组的常规 MRI 图像（T2w FLAIR, ADC,T1w 及 T1w + Gd）来获得最大鉴别因子（most discriminant factor，MDF）。受试者特征曲线分析（Receiver operating characteristic，ROC）应用于训练组的 MDF 及 9 个直方图参数，获得预测低级别胶质瘤恶性转化的最佳截断值（cutoff value），并用此截断值得到其预测测试组恶性转化的准确率。
结果：对 MDF 的 ROC 分析结果显示，T2w FLAIR 的曲线下最大面积（area under the curve，AUC）为 0.90（敏感度 85%, 特异度 84%），ADC 为 0.92（86%, 94%），T1w 为 0.96（97%, 84%），T1w + Gd 为 0.82（78%, 75%）；并在测试组中分别成功预测了 93%, 100%, 93%, 92%的病例。在对星形细胞瘤的亚组分析中，T2w FLAIR 的 AUC 为 0.92(88%, 83%)，T1w + Gd 为 0.90（92%, 74%），并成功预测了测试组中 100%、92%的病例。MDF 的结果优于其它所有 9 个直方图参数。
结论：作用于术前常规 MRI 图像的纹理分析可以准确预测低级别胶质瘤向高级别胶质瘤的恶性转化，可以指导临床治疗决策。

EPO-2625
提升小波变换和 PCNN 的医学图像融合算法研究

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目的：随着医学影像工程技术的迅速发展，近年来许多医疗成像设备提供了一个广泛临床诊断的多种模态影像信息。通过对多模态的医学图像进行融合，对多项医学影像进行人工处理和综合分析，重现出全新的、高品质的医学影像。实际临床的价值主要体现在三个方面：医学影像诊断方面，融合图像可以清楚地显示检查部位和相邻部位的解剖结构关系，特别是早期微小、不明显的病变，避免漏诊；在手术治疗方面，医学图像融合利用三维立体定向和图像重建技术，充分表现出组织结构的完整形态和病灶的空间相对位置，同时清晰地显示病变组织与周围正常组织的关系，对临床手术方案制定、实施手术以及手术后的观察起了重要作用；在科研方面，医学影像融合收集了多种医疗设备的特征，也反映出病理特征、解剖结构，以及功能和形态的变化，并对影像信息做出定量、定性分析，进一步为临床疾病相关研究提供了完整的医学影像数据。

方法：利用对小波变换、PCNN 和提升小波变换的医学图像融合算法，以 C T 图像和 M R I 图像为例进行医学图像融合算法的研究。主要包括以下三个部分 ： 首先，介绍了小波变换基本理论、提升小波变换的原理以及 PCNN 的基本模型；其次，经过多项资源材料的收集，介绍了多种基于小波变换和 PCNN 的不同医学图像融合的算法比较；最后，通过对各种融合算法的比较，结果表明该模型的有效性和实用性。
结果：采用图像的信息熵、交叉熵、标准差和平均梯度作为评价指标对融合图像进行客观地比较，该算法得到的融合图像的信息熵和平均梯度都是最大的。由此知本算法的融合图像携带的信息量较大，边缘细节信息较丰富，可得到更好的融合效果。
结论： 具有生物学背景的 PCNN 模拟人类视觉系统，将多个图像包含的不同特征融合与最终得到的图像中，对于图像识别具有非常重要的意义。利用小波变换和 PCNN 模型相结合可以较好地保留原始 CT 和 MRI 的边缘细节信息。是一种有效的医学图像融合方法，其有效性和实用性可见一斑。

EPO-2626

Influences of the tube voltage on pulmonary lesion benign/malignant classification using deep learnging (DL)-based computer aided diagnostic system at dual-energy contrast-enhanced CT

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OBJECTIVE: Different tube voltages were often used to achieve the improved image qualities for diagnostic decision. The aim of the study was to evaluate the influence of different tube voltages in the detection of malignancy/benign of pulmonary nodules using a available diagnostic image processing software at dual-energy contrast-enhanced CT.

METHOD AND MATERIALS:
A total of 44 patients (mean age 60.61±11.72 years, range 37-80 years) underwent routine chest dual-energy contrast-enhanced CT scans were retrospectively collected from May 1, 2018 to February 27, 2019. 45 nodules (35 malignant and 10 benign nodules) were confirmed pathologically and reviewed by board-certified expert panel, serving as gold standard. Different tube voltages: 100kV and 140kV, were applied to produce images that were subsequently used as inputs into a DL-based diagnostic image processing system to predict the malignancy of pulmonary nodules. Receiver operation characteristic, with area under the curves (AUC) were calculated to differentiate malignant from benign nodules. Chi-square tests and Kappa score were performed to compare the difference in detection and prevision rate between 100kV and 140kV.
RESULTS:
Diagnostic accuracy for nodule characterization was higher using tube voltage of 100 kv (AUC = 0.834), compared to 140 kv (AUC = 0.740).
Tube voltage of 100kV achieved detection and precision rate of 95.6% and 86.7% (lesion-wise), while 140kV achieved detection and precision rate of 97.8% and 82.2%, respectively. However, there is no significant statistical difference between these two tube voltage (p = 0.5, kappa score = 0.831).

In addition, lesion characterization (benign or malignant) demonstrated an effect in detection and prevision rate under different tube voltage, that the system showed an improved performance in detection malignant nodules compared with benign nodules, regardless of the tube voltage.

CONCLUSION

Tube voltage of 100kV demonstrated a imporved overall performance in lesion-wise detection and classifying lesion characterization compared with 100kV at dual-energy contrast-enhanced CT, while increased sample size is needed for any statistical difference assessment.

CLINICAL RELEVANCE/APPLICATION

While DL-based computer aided diagnostic system excels at recognizing nodules in imaging data, different imaging settings like tube voltage as well as nodule characteristics could have an influence on the performance of the system that need to be addressed in the future study.

EPO-2627

基于深度检测网络对脑出血类型自动判断的研究

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目标 探索基于深度学习算法实现对脑出血类型（脑室内出血、脑实质内出血、蛛网膜下腔出血、硬膜下出血、硬膜外出血）进行自动智能诊断，从而节约医生出报告时间及辅助医生进行治疗方案的制定。**方法** 收集符合纳入标准的脑出血患者的出血 CT 切片 3000 张，切片的出血类型金标准来自专业医生的标注，其中 2400 张用来训练，600 张用来测试。对输入图像进行预处理之后，利用 Mask R-CNN 检测算法实现对图像中出血区域的检测，其次将检测网络得到的出血区域输入到分类网络，从而实现对该图像的出血类型进行判断。**结果** 目前算法在测试样本上对五种类型的脑出血表现如下：脑室内出血准确性 92.1%，敏感性 82.6%，特异性 94.0%；脑实质内出血准确性 85.2%，敏感性 92.7%，特异性 81.6%；蛛网膜下腔出血准确性 94.1%，敏感性 63.5%，特异性 96.6%；硬膜下出血准确性 90.6%，敏感性 82.5%，特异性 94.8%；硬膜外出血准确性 89.9%，敏感性 87.4%，特异性 91.2%。**结论** 基于深度检测网络对脑出血类型进行判断的方法准确、快捷，能够辅助临床医生的日常工作。

EPO-2628

ADC 值联合基于常规 MRI 图像纹理特征分析鉴别良恶性软组织肿瘤的价值

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摘要：目的 探讨 MR 扩散加权成像（DWI）表观扩散系数(ADC)值联合纹理特征鉴别良、恶性软组织肿瘤的应用价值。 **方法** 回顾性分析经病理证实 94 例软组织肿瘤 MRI 及 DWI 图像，其中恶性 44 例，良性 50 例；扩散敏感因子（b 值）取（0，1000 s／mm^2），尽量避开坏死、出血、钙化、瘢痕及肌间隙等部位，获取病灶的 ADC 值。在 MRI 图像上使用 ITK-SNAP 软件在 T_2WI 脂肪抑制图像

上选取显示肿瘤最大层面为中心，沿病灶边缘勾画 ROI，ROI 包括肿瘤内部的坏死、囊变及出血成分，要避开周边水肿区域；利用美国 GE 公司 A.K 软件，进行纹理分析，获得部分纹理参数。比较良恶性肿瘤的 ADC 值及纹理参数的差异，并对有统计学意义的参数绘制 ROC 曲线，分析其预测软组织良恶性肿瘤的效能。**结果** 恶性肿瘤 ADC 值（1.12±0.38）×$10^{-3}mm^2/s$ 低于良性肿瘤（1.54±0.27）×$10^{-3}mm^2/s$，差异具有统计学意义($P<0.05$)，以 ADC 值 1.46××$10^{-3}mm^2/s$ 为阈值，DWI 诊断恶性肿瘤的敏感度为 0.86，特异度为 0.83。2 组间纹理特征比较，偏度（Skewness）和频率大小（Frequency Size）具有统计学差异($P<0.05$)，且偏度（Skewness）AUC 为 0.739，灵敏度 0.818，特异度 0.68；频率大小（Frequency Size）AUC 为 0.825，灵敏度 0.745，特异度 0767，两者均有良好诊断效能；而联合纹理特征分析及 ADC 值对诊断软组织良恶性肿瘤效能最好。**结论** ADC 值联合纹理特征可以提高在术前评估软组织良恶性肿瘤的效能。

EPO-2629

基于多参数磁共振的肾纤维化评估模型

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目的：建立多参数磁共振肾纤维化评价模型。慢性肾病病情不断进展，最终发展为终末期肾病，这个过程中最关键的驱动因素是肾纤维化。但是目前肾纤维化的诊断及评估只能依靠穿刺活检，这种检查有创并且出血风险大，且取样单一。临床常用超声、CT 等组织分辨率差，诊断困难；磁共振组织分辨率高，但多为结构成像，而功能成像可以间接反映纤维化，但是通常只能进行定性，不能定量。因此，我们想要通过数据融合，构建一个基于多参数磁共振的肾纤维化定量模型，对肾纤维化负荷进行评估。

方法：将 32 只 SD 大鼠随机分为 4 组，分别为对照组(n=8)，阿霉素肾病(ADR)组(n=12)，ADR 组分为 ADR4w，ADR8w 和 ADR8w-p38 抑制剂治疗组，每组各 8 只。ADR 组通过尾静脉注射阿霉素建立肾纤维化模型，分别在注射后第 4、8 周末，进行磁共振 T1rho, ASL, BOLD, DTI, IVIM 成像。MR 扫描结束后，收集血尿标本进行实验室检查，随后切除左肾进行病理学染色。分别在各序列图像中测量相对应的参数，使用基于 R 语言的 glmnt, SIS, rms, Hmisc 等工具包与“金标准”—纤维化特异性染色（Masson 及 Sirius red 染色）所得到的纤维化面积区域百分比做回归，得到各参数的相关性，筛选其中相关性高的，建立肾纤维化定量模型，并利用 ADR8w 药物治疗组进行验证。

结果：在回归分析结果中，T1rho、RBF 及 FA 与纤维化面积百分比具有显著相关。用这 3 个参数建立了一个肾纤维化评估公式，与三个参数分开建立的公式比较，发现模型的效能更优。
以对照组、ADR4w 和 ADR8w 组为训练组，训练样本集 C-index=0.723；ADR8w-p38 抑制剂治疗组为验证组，验证样本集 C-index=0.698。

结论：建立了多参数肾纤维化评价模型，并进行独立验证，模型和金标准显著相关。

EPO-2630

膝关节炎患者 MR 影像用于预测 1-2 年后膝关节功能水平

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目的：目前临床上主要采用 WOMAC 和 KOOS 量表对膝关节炎患者功能水平进行评估。对评估结果进行预测有助于医生提前判断患者病情的进展，为其预后及治疗方案的制定提供更多的参考依据。本文主要研究了膝关节 MR 图像与其功能水平之间关系，建立对应的模型用于患者 1-2 年后功能水平变化的预测。
方法：本文工作基于 NIH 公开数据库 Osteoarthritis Initiative 中的 Osteoarthritis Biomarkers Consortium FNIH Project 项目。我们提取了该项目中 600 例膝关节炎患者初次入组时（baseline）的 MR 影像数据以及 12/24 个月后患者功能评分指标（WOMAC 和 KOOS）。预测模型采用深度卷积神经网络。模型的输入为患者初次入组时膝关节 MR 图像，输入前对所有图像进行灰度归一化处理；模型输出为 1-2 年后患者功能水平评分指标（WOMAC 和 KOOS）。模型的损失函数采用均方误差，训练方法采用误差反向传播算法。400 例数据用于模型的训练，200 例数据用于模型的测试，均从 600 例数据中随机选择。反复测试 100 次，取其平均值用于评估预测模型的优劣。
结果：在 400 例的训练集和 200 例测试集数据上，针对 WOMAC/KOOS 功能指标，建立的预测模型分别获得了 1.36/3.41 和 2.22/4.75 的平均均方误差（N=100）。
结论：膝关节 MR 图像可用于评估和预测膝关节炎患者功能水平。采用深度卷积神经网络对膝关节 MR 图像进行深度挖掘后，可有效地用于预测 1-2 年后膝关节炎患者功能水平的变化。

EPO-2631
基于磁共振成像影像组学方法评估肝细胞肝癌患者病理分级

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目的：采用 MRI 影像组学技术构建肝细胞癌患者病理分级评估模型，并联合临床因素和传统影像特征构建列线图。
方法：回顾性收集 2016 年 9 月 1 日至 2018 年 9 月 1 日期间浙医一院术前 1 个月内接受过 MRI 检查的肝细胞癌患者 271 例，划分为训练集 200 例和测试集 71 例。利用美国 GE Analysis Kit(AK)软件对术前 MRI 图像逐层勾画靶区，利用 MATLAB 2017a 软件自手动勾画的肿瘤边界自动向外侧延伸 10mm，形成一个外周环。从整个肿瘤和瘤周区域提取组学特征。应用最小冗余最大关联(mRMR)算法选择特征参数和利用支持向量机 SVM 构建放射组学模型。利用多变量 logistic 回归分析分别建立临床参数模型和联合临床参数的放射组学模型，利用 Delong 检验比较三个模型的对病理分级的预测能力。最后绘制列线图，并利用校正曲线和决策曲线分别对列线图进行评估。
结果：放射组学模型具有良好的病理分级预测性能：在训练集中，AUC 为 0.798；在验证集中，AUC 为 0.731。联合临床因素后，放射组模型的预测性能有所提升，在训练集中，AUC 为 0.803；在验证集中，AUC 为 0.742。校准曲线显示拟合良好(p>0.05),决策曲线证实了其临床效用。
结论：基于 MR 图像的放射组学模型可以有效预测 HCC 患者的病理分级。结合临床参数和放射组学特征的联合模型列线图实现了较为满意的预测效果，可以帮助临床医生制定最佳治疗方案。

EPO-2632
深度学习对 LDCT 图像检测肺结节的研究

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目的

NCCN 指南推荐低剂量计算机断层扫描（LDCT）用于肺癌筛查。然而，LDCT 中的噪声和伪影可能会影响放射科医师对于结节的检出。在本文中，我们训练了深度学习（DL）模型来检测 LDCT 扫描中的肺结节。

方法和材料
我们的训练数据集包括来自 LIDC-IDRI 数据库的 888 个样本和来自中国三级甲等医院的 1,000 个扫描样本。在 1888 个样本中，超过一半是 LDCT 扫描。测试数据集由从同一家医院收集的 xxx LDCT 样本组成。与 LIDC-IDRI 数据集类似，三位放射科医师独立地标记了收集样本中的病变，最终的金标准标签遵循多数规则。测试组中共有 267 个肺结节分为以下类别：6mm 以下的实性结节，6mm 以上的实性结节，6mm 以下的亚实性结节，6mm 以上的亚实性结节和钙化结节。我们的深度学习模型通过基于区域的完全卷积网络（R-FCN）以 ResNet-101 为主来检测结节。我们测试了模型对另外两名放射科医师的检测灵敏度，他们在 LDCT 肺结节筛查方面有超过 3 年的经验。

结果
我们的模型比不同结节类型的个体放射科医师具有更高的灵敏度，特别是亚实性结节。此外，综合判断医生和模型的检测灵敏度显着高于单独任何一方的结果。最后，模型的平均检测速度为每次扫描 30 秒，这比医生快得多。

结论
通过系统比较，我们通过比较我们的 DL 模型和放射科医师，证明了机器在不同类型和大小的肺结节中的速度和灵敏度优势。此外，放射科医师的判断结合机器输出实现了最高的灵敏度，这表明结合计算机辅助诊断可以提高肺癌筛查的准确性和效率。

临床相关/应用
我们开发了一种新的深度学习方法来检测 LDCT 扫描中的肺结节，以帮助放射科医师阅读 LDCT 并缩短其阅读时间。

EPO-2633
两种不同人工智能肺结节检测系统对肺结节 Lung-RADS 分类的表现评价

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目的：随着肺癌低剂量 CT 筛查的普及胸部 CT 检查数量的增多，肺结节的检出随之增加，为了对肺结节进行科学规范的处理，美国放射学院 2014 年发表了肺影像报告和数据系统（Lung Imaging Reporting and Data System，Lung-RADS）。本研究的目的在于，评价两种不同的人工智能肺结节检测系统对肺结节 Lung-RADS 分类的表现。
方法：从本院病例库随机选取 2015 年 4 月至 2019 年 1 月 85 例肺癌患者的胸部 CT，标记 104 个肺结节，由两名经过 Lung-RADS 分类训练的放射科医生对每个肺结节分别进行分类（注：这两名放射科医生事先不知道所有病例的病理结果），结果不一致时，请另外一名高年资胸部放射学专家协同得出最终分类结果，作为参考标准。将这 85 例胸部 CT 图像导入两种不同的人工智能肺结节检测系统（编号为 A 和 B）中进行运算处理，得出分类结果。其中有 2 个结节 A 系统漏检，2 个结节 B 系统漏检，由于本研究不关注对肺结节的检出率而只关注分类，因此排除这 4 个结节，最终进行统计学分析的肺结节个数为 100 个。使用 SPSS24.0 统计学软件，采用平均加权 Kappa 法分别将两种人工智能肺结节检测系统的分类结果与放射科医生的分类结果进行一致性检验。

结果：A 系统和放射科医生对 74 个肺结节的分类结果一致，加权 Kappa 系数为 0.618（95%CI 为 0.466-0.711），P 值＜0.001；B 系统和放射科医生对 27 个肺结节的分类结果一致，加权 Kappa 系数为 0.544（95%CI 为 0.433-0.656），P 值＜0.001。
结论：A 系统和 B 系统均与放射科医生比较，结果显示对于肺结节 Lung-RADS 分类，A 系统与放射科医生相比一致性较强，B 系统与放射科医生相比一致性中等。人工智能肺结节检测系统能较为可靠的进行 Lung-RADS 分类，且 A 系统的表现优于 B 系统。

EPO-2634
基于薄层 CT 的三维影像组学在预测亚厘米磨玻璃样肺腺癌浸润程度的价值

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目的　探讨基于术前薄层 CT 的三维影像组学在预测亚厘米磨玻璃样肺腺癌浸润程度的价值。方法　回顾性分析华东医院 2013 年　1 月-2017 年 7 月病理证实为亚厘米肺腺癌的患者 394 例，共 446 个结节。每名患者均具有完整的术前肺部薄层 CT 影像和完整的临床资料。选取 2013 年 1 月-2015 年 12 月 253 名患者的 286 个结节为验证集；2016 年 1 月-2017 年 7 月 141 名患者的 160 个结节为训练集。所有病例参照病理金标准分为浸润前病变和浸润性病变，且所有结节均具有像素级标注的体积感兴趣区 (VOI)。采用 Matlab 2016b 软件从每个 VOI 中提取 475 个影像组学特征，利用最小绝对收缩和选择算子　(LASSO)进行特征筛选，随后建立影像组学标签。采用单因素及多因素分析训练集中两组间有统计学意义的变量并建立模型，在验证集上进行模型验证。采用 ROC 曲线评价模型的预测效能。结果　经可重复分析及 LASSO 降维，最终 13 个影像组学特征被选出以建立影像组学标签。多因素分析后，影像组学标签和 CT 值被证实为预测浸润程度的独立危险因子。模型在训练集的 AUC 为 0.785，在验证集中 AUC 为 0.704。结论　基于薄层 CT 的三维影像组学特征联合临床资料建立的多因素 logistic 回归模型在预测亚厘米磨玻璃结节样肺腺癌浸润程度上具有很好的临床应用价值及发展前景。

EPO-2635
Feasibility Study of Magnetic Resonance Compressed Sensing Image Restoration Based on Denoising Convolutional Neural Network (DnCNN)

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Purpose
Magnetic resonance compression sensing technology can significantly reduce image acquisition time. However, when the compression factor is too large, the captured image may have artifacts due to signal loss. This study explores the feasibility of

reconstructing high compression perceptual magnetic resonance images based on denoising convolutional neural networks (DnCNN).

Methods

Using the Philips 3T magnetic resonance Ingenia CX, 30 brain images of 3D-MSDE sequences with different compression perception coefficients (cs=6, 8, 10, 12, 14, 16, 18) were collected, 100 layers per person, for a total of 3000 layers. At the same time, 3D-MSDE sequence brain magnetic resonance data without using any acceleration algorithm was collected as a reference image. The mean square error, signal-to-noise ratio, and image structure similarity coefficient between the image acquired under different compression perception coefficients are calculated, and the image noise severity under different compression perception coefficients is evaluated. The denoising convolutional neural network[1] is constructed, and the 3000 layer image is divided into a 2000 layer training set, a 1000 layer test set, and the denoising convolutional neural network parameters are trained. The noise level of the image after denoising relative to the reference image is also evaluated using the mean square error, the signal to noise ratio, and the image structure similarity coefficient. Statistical analysis of the differences between the three evaluation indicators between different groups.

Results

With the increase of compression coefficient, the mean square error of the image increased significantly, and the signal-to-noise ratio and image structure similarity decreased significantly ($p<0.05$). After the compression perception coefficient reaches 10, the image quality is seriously degraded, which affects the image detail observation. The images processed by the denoising convolutional neural network were compared with the corresponding image pairs. The signal-to-noise ratio and image structure similarity were significantly increased, and the image mean square error was significantly reduced ($p<0.05$). Horizontal comparison, using the denoised convolutional neural network to process the image, even when the compression perception coefficient reaches 18, can still maintain a higher signal-to-noise ratio and structural similarity.

Discussion and Conclusion

The denoising convolutional neural network can effectively remove the magnetic resonance image noise introduced by the excessive compression perception coefficient. The denoising convolutional neural network combined with the compressed sensing technology can reduce the scanning time while ensuring the quality of the magnetic resonance image.

EPO-2636
迭代重建技术在低管电压肾动脉血管成像中的可行性研究

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目的：探讨基于多模型迭代重建（ASIR-V）技术在 80kV 低管电压肾动脉成像中的可行性。

方法：收集我院肾动脉 CT 血管成像患者 50 例并随机分为 A、B 两组，A 组采用 120kV，对比剂用量 600mgI/kg，滤波反投影法（FBP）重建；B 组采用 80kV，对比剂用量 350mgI/kg，80%ASIR-V 重建。扫描后分别测量右肾动脉、左肾动脉及同层面右侧竖脊肌 CT 值和 SD 值，并计算肾动脉信噪比（SNR）和对比噪声比（CNR）。由两名具有五年以上工作经验的影像科医师对肾动脉图像质量采用五分法进行双盲法主观评分。分别记录两组对比剂总量，并计算有效辐射剂量（ED）。
结果：两组患者人口学特征（性别、年龄、体重、身高、BMI）间差异无显著统计学意义（P＞0.05）。B 组对比剂总量（21.10±2.86g）和有效辐射剂量（2.07±0.21mSv）较 A 组（38.50±4.14g 和 6.69±1.83mSv）分别降低约 45.2%和 69.1%，且差异均具有显著统计学意义（P＜0.05）。A 组肾动脉 CT 值稍高于 B 组，但 CT 值差异无统计学意义（P＞0.05）。A 组肾动脉 SD 值显著低于 B 组（P＜0.05），A 组 SNR 值和 CNR 值显著高于 B 组（P＜0.05）。两名医师对肾动脉图像质量主观评分具有很好一致性（kappa＞0.75，P＜0.05），B 组肾动脉图像质量主观评分显著高于 A 组（P＜0.05）。
结论：基于多模型迭代重建（ASIR-V）技术在 80kV 低管电压肾动脉成像中可以显著减少对比剂总量和有效辐射剂量，且 ASIR-V 联合 80kV 可以显著提升肾动脉血管成像图像质量。

EPO-2637
基于多模态 MRI 放射组学特征和术前鉴别非小细胞肺癌组织学亚型的临床因素的 nomogram 模型的开发和验证

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背景:术前无创、准确鉴别肺鳞状细胞肺癌(LUSC)和腺癌(LUAD)是非小细胞肺癌(NSCLC)的关键用于患者的临床管理。
目的:建立一种基于多模态 MRI 放射学特征和临床的 nomogram 术前因素、个体化鉴别 LUSC 与 LUAD。
评价:共从多模态 MRI 图像中提取 1404 个放射组学特征。与训练队列(n=100)联合使用学生 t 检验和基于支持向量机的递归特征消除方法确定最优特征，并通过训练和验证队列(n=48)估计性能。生成的 Radscore 当时使用逻辑回归算法与这些最优特性,其次是进一步结合的主要临床因素,如年龄、性别、吸烟、肿瘤位置、表观形态、长轴直径,短轴直径和癌胚抗原,radiomics-clinical 诺模图发展。利用这两组数据估计了所提出的 nomogram 的总体性能。
统计学检验:学生 t 检验、单变量和多变量回归分析、Hosmer-Lemeshow 检验。
结果:经过特征选择，13 个最优特征在训练和验证队列中都取得了良好的识别性能，曲线下面积(AUC)分别为 0.819 和 0.824。将 Radscore 与独立的临床预测因子相结合，放射学-临床 nomogram 显示出更好的鉴别能力，AUC 分别提高到 0.901 和 0.872。Hosmer-Lemeshow 检验和决策曲线分析结果进一步表明，nomogram 具有良好的预测精度和临床应用价值。
结论:所提出的放射学-临床 nomogram 方法可作为诊断本病的有效工具非小细胞肺癌(NSCLC)术前非侵袭性 LUSC 和 LUAD 的鉴别。

EPO-2638
基于血管提取技术的人工智能对冠状动脉疾病的诊断准确性研究

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目的：探索基于血管提取技术的人工智能评估冠状动脉疾病的诊断准确性
材料和方法：回顾性分析 124 名可疑冠状动脉狭窄患者的 CTA 图像，以 DSA 为金标准，分别评估人工智能和医生的诊断准确性。直径≥1.5mm 的分段被纳入评估。直径≥50%认为阻塞性冠状动脉疾病。分别从患者水平、血管水平、分段水平对人工智能及医生的诊断能力进行评估，运用诊断研究指标敏感度、特异度、阳性预测值、阴性预测值对诊断能力进行评估，运用 ROC 曲线下面积对诊断准确性进行定量分析。
结果：从患者水品分析，人工智能和医生诊断阻塞性冠状动脉疾病的敏感性分别 94%(95%可信区间：87 到 97)、97%(95%可信区间：92 到 99)，特异度分别为 63%(95%可信区间：36 到 84)、50%(95%可信区间：26 到 74)，阳性预测值分别为 94%(95%可信区间：88 到 98)、 93% (95%可信区间：86 到 97)，阴性预测值分别为 59%(95%可信区间：33 到 81)、73% (95%可信区间：39 到 93）,ROC 曲线下面积分别为 0.780、0.736。血管水平，ROC 曲线下面积分别为 0.868、0.913。分段水平，ROC 曲线下面积分别为 0.844、0.892。人工智能和医生完成一名患者所有分段的诊断需要的时间分别为 29.65 分钟、0.50 分钟(t=-153.46，p＜0.001)。
结论：人工智能对冠状动脉疾病有较高的诊断准确性，将诊断时间缩短至半分钟，未来将会是一种很有前途的诊断工具。

EPO-2639

Radiomics Signature: A Biomarker for the Preoperative Distant Metastatic Prediction of Stage I Non-Small Cell Lung Cancer

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Objectives: To evaluate the predictive value of radiomics features on the distant metastasis of stage I non-small cell lung cancer (NSCLC) preoperatively, by comparing with clinical characteristics and CT morphological features, and to screen the important prognostic predictors.
Methods: 194 stage I NSCLC patients were retrospectively enrolled, distant metastasis free survival (DMFS) was evaluated. The consensus clustering analysis was used to build the radiomics signatures in the primary cohort and validated in the validation cohort. The univariate survival analysis was performed in clinical characteristics, CT morphological features and radiomics signatures, respectively. Cox model was performed and C-index was calculated.
Results: There were 25 patients (12.9%) with distant metastasis. The median DMFS was 15 months. 313 radiomics features were selected, then classified into 5 groups, two subtypes (I and II) with each group. The RS1 showed the best prognostic ability with C-index of 0.355(95% CI, 0.269~0.442; p < 0.001). The histological type exhibited a good prognostic ability with C-index of 0.123 (95% CI, 0.000-0.305; p < 0.001) for DMFS. Cox model showed RS1(HR 18.025, 95% CI 2.366~137.340), pleural indentation sign (HR 2.623, 95% CI 1.070~6.426) and histological type (HR 4.461, 95% CI 1.783~11.162) were the independent prognostic factors (P<0.05).
Conclusions: Radiomics provided a new modality for the distant metastatic prediction of stage I NSCLC. Patients with type II of RS1, pleural indentation sign and non-adenocarcinoma indicated the high probability of postsurgical distant metastasis.

EPO-2640
人工智能在脑实质出血诊断中的初步应用

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目的：研究 AI 检测脑实质血肿，测量体积，判断脑室狭窄、破入脑室、中线偏移的准确性。
方法：连续收集 2019 年 4-5 月因疑似脑血管意外在我院急诊颅脑 CT 检查诊断为脑出血病例，排除近期有相关脑外伤史，蛛网膜下腔、硬膜下或硬膜外血肿等。常规头颅 CT 平扫，层厚层距 5mm，使用北京推想科技脑卒中 2.0 模型，以两名高年资医师的联合诊断结果为金标准，计算 AI 检测脑实质血肿并测量血肿体积的准确性，AI 检测血肿是否破入侧脑室、是否中线偏移的准确性，AI 对出血脑区定位的准确性。采用 SPSS 21.0 进行统计分析，两组计量资料比较采用配对 t 检验，多组计量资料比较采用单因素方差分析，多组间两两比较采用 LSD 法，所有检验均为双侧假设检验（α =0.05 或 0.001）
结果：共有 304 个病例纳入研究，两名医生的诊断结果，血肿 69 例，阴性或其他非高密度病变如梗塞、软化 235 例，AI 检测血肿的灵敏度 97.10%，特异度 94.89%，准确率达 95.39%；AI 判断是否存在中线偏移的灵敏度 68.97%，特异度 69.82%，准确率仅 69.74%；AI 正确区分了所有左（n=28）、右（n=30）大脑半球和幕下（n=9）血肿，AI 判断侧脑室是否受压的灵敏度 58.33%，特异度 84.21%，准确率 65.67%，AI 判断血肿是否破入侧脑室的灵敏度 61.29%，特异度 100%，准确率 80.59%。AI 与金标准差值对比零差值没有显著差异 (P>0.05)，多田公式计算结果差值对比零差值有显著差异 (P<0.001)
结论：AI 检测血肿、测量血肿体积的准确率很高，能准确区分血肿位于左右大脑半球还是小脑幕下，但具体脑区与医生诊断的一致性较差，AI 测量血肿体积的误差率明显比多田公式小，且不受血肿形状和大小影响，AI 对血肿是否压迫侧脑室，有没有破入侧脑室以及中线偏移的判断准确性则有待提高。

EPO-2641
基于 DCE-MRI 后处理纹理分析在预测结直肠癌肝转移瘤疗效的应用价值

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目的:本研究的目的是确定 DCE-MRI 后处理纹理分析特征是否可以作为结直肠肝转移治疗(CRLMs)中预测化疗后反应的指标。

材料方法：研究患者包括 2015 年 7 月至 2018 年 5 月随机选取 68 例经组织学确诊的结直肠癌肝转移（CRCLM）患者，均为首次接受 FOLFOX 治疗。患者在入组前均签署知情同意书。所有患者在化疗前 1-3 天内进行 DCE-MRI 检查，根据化疗疗效分为两组：反应组或无反应组。在 slice 和 Ktrans 彩图上进行定量纹理分析，手动绘制感兴趣区域，包含病变最大横截面积。纹理分析包括五个直方图特征和五个灰度共生矩阵特征。纹理参数通过统计分析，找出两组之间的差异，以及潜在的预测参数来区分反应组和不反应组，随后进行多变量测试及逻辑回归分析。

结果　共有 47 人有反应，21 人没有反应。方差、熵、对比、ASM 与是否有反应相关性较低，IDM (P ＜ 0.05)与是否有反应具有相关性，对应 ROC 下区域化疗反应曲线(AUCs)为 0.613-0.762。当使

用多变量检测病变时逻辑回归分析时，方差(P < 0.001)及 ASM (P = 0.001)仍具有潜在的预测价值来区分反应性病变和无反应性病变。

结论 DCE-MRI 的后处理 MR 纹理特征图像具有预测结直肠肝转移治疗效果反应的潜力。

EPO-2642
胰腺神经内分泌肿瘤：基于 3.0 T 磁共振的影像表现及纹理分析预测肿瘤分级

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目的：本研究的目的是评估 3.0 T 磁共振影像表现及纹理参数在神经内分泌肿瘤分级预测中的价值。
病人与方法：神经内分泌肿瘤可根据有丝分裂指数与 Ki-67 指数分为 G1、G2 与 G3 三级。77 例经病理证实的神经内分泌肿瘤病人符合纳入标准。对 T2 加权与弥散加权成像图像进行纹理分析。利用 Fisher 检验或 Kruskal－Wallis 检验对 3 种不同组织病理亚型的神经内分泌肿瘤病在人口统计学资料、影像学参数及纹理参数方面进行对比分析。然后，采用逻辑回归分析预测肿瘤级别。采用受试者工作特性曲线及曲线下面积来评估磁共振表现及纹理分析参数在预测肿瘤分级中的价值。
结果：共有 31 例 G1、29 例 G2 及 17 例 G3 患者。与 G1 级神经内分泌肿瘤比，G2/3 级内分泌肿瘤出现边界不清、以实性为主、局部侵犯或转移、动脉期表现为乏血供及弥散受限的频率更高。T2 加权成像的 4 个参数（逆差矩, 能量，相关性，差分熵）及弥散加权成像（相关性，对比度，逆差矩，最大密度值，熵值）的 5 个参数在神经内分泌肿瘤分级中具有显著差异性。
结论：我们的结果显示肿瘤的边界、肿瘤质地、肿瘤的强化、局部侵犯或转移以及弥散受限在内的磁共振影像表现可以帮助预测肿瘤的分级。此外，纹理参数也有助于神经内分泌肿瘤的分级。

EPO-2643
推想科技和依图科技的肺结节良恶性评估的对照性研究

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目的:利用推想和依图评估肺结节的良恶性质进行预测性诊断,并与穿刺活检或手术病理证实，比较两种方法的诊断效能。
方法:胸部 CT 发现肺结节患者 43 例, 223 个肺结节,全部肺结节均经过手术病理证实、穿刺活检或临床治疗随访证实,其中恶性结节 154 个(占 69.1%),良性结节 69 个(占 30.9%)。男性 26 例(占 60.5%),女性 17 例(占 39.5%),年龄范围 63.2±15.2 岁。用两种方法评价所有肺结节进行 AI 自动识别，并给出结节位置、大小和良恶性百分比，与高年资影像诊断医师的阅片结果对照。结果: 推想科技与依图科技评价结节的位置、大小和良恶性概率有很好的一致性和相关性（r=0.96、0.94、0.95 偏差, -0.4、0.6、6.3%），推想科技与高年资医师评价结节的位置、大小和良恶性概率有较好的一致性和相关性（r=0.93、0.91、0.87 偏差, 0.6、0.8、13%），依图科技与高年资医师评价结节的位置、大小和良恶性概率有很好的一致性和相关性（r=0.94、0.92、0.91 偏差, 0.56、0.72、9.8%）。154 个恶性结节中, 11 个推想科技误诊为良性（7.1%），10 个医科科技误诊为良性（6.5%），3 个高年资医师误诊为良性（2.0%）；良性结节 69 个中，24 个推想科技误诊为恶性（15.6%），18 个医科科技误诊为恶性（11.7%），6 个高年资医师误诊为恶性（8.6%）。以病理结

果为金标准，推向科技、依图科技和高年资医师诊断准确率为 82.3%、84.6%、89.8%,精确度为 81.9%、83.9%、88.6%,敏感度 89.9%、91.2%、93.2%，特异度为 69.8%、70.6%、74.6%,假阳性率为 36.2%、35.9%、21.3%, AUC 值为 0.79、0.81、0.88。结论:两种 AI 方法均可以肺结节的筛查，两种方法假阳性率均高于高年资医师。

EPO-2644

肺结节规范性靶重建的应用价值

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目的
随着 CT 扫描的不断普及，越来越多越来越小的肺结节病变能被发现，医生不得不面对评估 CT 偶然发现的肺结节进行重视，因为发现早期恶性结节可大大改善患者预后，鉴别良恶性结节可避免患者接受不必要的诊疗。
采用薄层 CT、增强 CT 和对小结节病变进行靶重建可提供结节很多重要信息，医生常根据结节形态、随访过程中的大小改变、结节边缘、钙化情况、增强方式判断良恶性。

方法 收集总结自 2018 年 7 月至 2019 年 7 月在我院进行肺部扫描检查发现有肺部病变＜3cm 的 150 病例进行 0.625mm 薄层层厚和 FOV=150mm 的靶平滑重建和高分辨肺窗重建并进行三维重组，在轴位、冠状位、矢状位选择病变位置，在该位置的最大层面平均测量长轴和短轴，最终取平均值。对其进行图像质量分析总结。
结果
所有照片都经过我科室经验丰富的副教授以上及临床医生对照片进行阅片诊断分析.
150 例病例中发现实性结节 60 例，部分实性结节 35 例，纯玻璃样结节 55 例，所有病例的图像对比常规大 FOV 均能对其病灶均能更详细的显示其大小形态及其实性密度以及周边的晕征，模糊征和通过血管和周边小支气管能够更好的显示。
结论 小结节病变经过靶结节薄层重建可以更加清晰的显示常规模糊的病变特征，结节实性成分能够较好地区分 AIS、MIA 和 IAC，为患者术前评估及手术方式的选择提供参考，同病人固定 FOV 和固定滤过函数重建和相同的窗宽窗位和固定层厚层距的后处理能对病变的实性成分大小和密度随访变化提供更好的依据。并且固定的图像数据处理能更好的应对当今智能 AI 的普及应用提供更优质的图像数据。

EPO-2645

Radiomics model of magnetic resonance imaging for predicting differentiation degree and lymph node metastases of extrahepatic cholangiocarcinoma

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Purpose: To evaluate diagnostic performance of radiomics models of MRI in the detection of differentiation degree(DD) and lymph node metastases(LNM) of extrahepatic cholangiocarcinoma (ECC).
Background: The use of traditional techniques to evaluate ECC is limited by subjective assessment, variation across radiologists, and restricted data. Radiomics models may provide more accurate prediction for assessing DD and LNM ECC.
Materials and Methods: We retrospectively enrolled 100 patients with ECC confirmed by pathology from January 2011 to December 2018. Apparent diffusion coefficient (ADC) values for all lesions were measured and recorded through using the MRI workspace. Radiomics features were extracted from T1-precontrast (T1WI), T2-weighted imaging (T2WI) and diffusion weighted imaging (DWI) using imaging software (MaZda). We extracted 300 radiomics features from each region of interest(ROI), and we used MaZda to obtain 30 optimal features. Two radiomics models (model A and B) were developed by incorporating the optimal radiomics signatures, pathological characteristics and ADC values, and we used them to predict DD and LNM of ECC respectively by using random forest(RF) algorithm. The performance of the radiomics models were evaluated through the analysis of the receiver operating characteristic (ROC), positive predictive value (PPV), negative predictive value (NPV), sensitivity and specificity.
Results: The radiomics model A showed better performance in both training and testing cohorts to discriminate high and medium-low differentiation groups of ECC, with an average AUC of 0.78 and 0.80 respectively. The model B also yielded the good average AUC of 0.80 and 0.90 to predict the lymphatic status of ECC in training and testing cohorts respectively, with classification accuracy of 81.4% and 83.3% respectively.
Conclusions: The radiomics models based on MRI performed well in predicting DD and LNM of ECC and have significant potential in clinical noninvasive diagnosis and prediction of ECC.

EPO-2646

Diagnosis of Cancer: Based on Radiomic Features in Psoas Muscle and Adipose Tissue

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Purpose: To identify the occurrence of cancer based on the characteristics of the psoas muscle and fat radiology.
Patients and Methods: The study involved 43 cases of lung cancer, 13 cases of pancreatic cancer and 50 normal cases. The two cancer patients were classified into one class, and the normal control group was used as a class (81 in the training sets and 35 in the validation sets, and the ratio of the two types in the data sets is close to 1:1. The automatic segmentation method was used to outline the the psoas muscle and the abdominopelvic fat. 91 imaging features were extracted from the psoas muscle, subcutaneous adipose tissue and visceral adipose tissue. The feature selection and classification of the three segmented images are respectively performed, and the

selected features are combined and classified and compared. During the experiment, the random forest model was selected to evaluate the feature importance, and the feature set under the better classification was selected as the selection feature set, logistic regression (LR) was used as classifier. Finally, the three image features are combined to obtain classification results.

Results: Nineteen features in the psoas muscle were selected to obtain better classification results. Accuracy was 84.38%. 28 and 17 characteristics were selected for subcutaneous fat and whole fat, respectively. The accuracy of classification was 75.0% and 56.25%. Selecting 11 features with higher importance evaluation into the selected feature set, the radiomic signatures showed accuracy was 96.88%.

Conclusion: The occurrence of cancer can be judged by the radiomic signature of the psoas muscle and fat.

EPO-2647

DCE-MRI combined with texture features based on T2WI in prediction of stage Ⅱ cervical cancer with parametrium invasion

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Purpose To explore the prediction value of DCE-MRI combined with texture features based on T_2WI of stage Ⅱ cervical cancer with parametrium invasion.

Meterials and Methods Eighty-four patients with stage Ⅱ cervical cancer confirmed by surgerical pathology were enrolled in our hospital, containing parametrium invasion (n=38) and parametrium non-invasion (n=46). Plain MRI and DCE-MRI were preoperatively scaned. The optimal maps were reconstructed of DCE-MRI parameters (K^{trans}, K_{ep}, V_e) and texture feature histogram (kurtosis, skewness) and gray level co-occurrence matrix (angular second moment energy, contrast, entropy value) based on T_2WI. All parameters of the two groups were analyzed by one-way anaylsis variance. The optimal cut-off values of parameters with statistical significance were acquired by receiver operator characteristic curves (ROC). Combined diagnostic prediction of DCE-MRI parameters combined with histogram parameters (D-H), DCE-MRI parameters combined with gray level co-occurrence matrix parameter (D-G), and DCE-MRI parameters combined with histogram parameters, gray level co-occurrence matrix parameters (D-H-G) with ROC curves were established.

Results There were significant differences of K^{trans}, K_{ep} and V_e values of the two groups (F=45.20, 125.42 and 85.32, $P<0.05$). Areas of K^{trans}, K_{ep} and V_e values under ROC curves in the diagnosis of cervical cancer with vaginal fornix invasion were 0.696, 0.764 and 0.785, respectively. The diagnostic threshold of them were 0.272 mm^2/s (specificity=74.2%, sensivity=75.3%), 0.554 (specificity=67.8%, sensivity=69.4%), and 0.558 (specificity=80.3%, sensivity=77.3%), respectively. There were significant differences in kurtosis, skewness, angular second moment energy, contrast, entropy value between the two groups (F values were 30.487, 6.752, 58.723, 13.931 and 8.983 respectively, $P < 0.05$). Areas of the five values under ROC curves in the diagnosis of

cervical cancer with vaginal fornix invasion were 0.694, 0.680, 0.732, 0.773 and 0.745, respectively. The diagnostic threshold of them were 4.903 (specificity=73.5%, sensivity=81.7%), 0.221 (specificity=70.7%, sensivity=82.3%), and 0.004 (specificity=77.4%, sensivity=79.4%), 16.70 (specificity=70.7%, sensivity=82.3%), 6.915(specificity=70.7%, sensivity=82.3%), respectively. Areas of the combined diagnosis of D-H, D-G, and D-H-G under ROC curves in the diagnosis of cervical cancer with vaginal fornix invasion were 0.692, 0.758 and 0.965, respectively. The specificity and sensivity of them were 74.2% and 85.7%, 67.7% and 72.4%, 97.3% and 93.6%, respectively..

Conclusion The combined prediction method of DCE-MRI parameters and texture features is helpful for the diagnosis of stage II cervical cancer with parametrium invasion, and auxiliary conventional MRI.

EPO-2648
基于 DCE-MRI 的影像组学联合机器学习 预测前列腺癌的侵袭性

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目的：研究基于多期动态增强（*Dynamic contrast-enhanced, DCE*）MRI 原始图像的影像组学联合机器学习以预测前列腺癌的侵袭性。

方法：收集 2016 年 1 月至 2019 年 5 月在本平台进行磁共振检查并经活检证实为前列腺癌的 60 位患者，每位患者的活检均在磁共振检查后 4 周内进行。根据时间-信号强度曲线，在原始 DCE-MRI 图像上肿瘤强化的第一期和最强一期上逐层勾画病灶，自动计算出每个病灶的 1000 个定量影像组学特征（一阶特征、形状大小特征、纹理特征及高阶特征）并构成三个数据集：数据集-F（基于肿瘤强化的第一期提取）、数据集-S（基于肿瘤强化的最强一期提取）和数据集-FS（基于第一期及最强一期提取）。然后，依次采用方差选择法、单变量选择法及最小绝对收缩和选择算子算法进行特征降维，筛选出每个数据集的最优特征子集。最后，使用 5 种分类器：逻辑回归（Logistic regression, LR）、随机森林、决策树、k-近邻和支持向量机利用 5-折交叉验证法建立预测模型，通过曲线下面积（Area under the curve, AUC）评估每个模型的预测性能。将具有最佳分类性能的特征子集与前列腺癌灶的 GS 评分（Gleason score, GS）之间进行相关性分析。

结果：经过特征降维过程，数据集-F，-S 和-FS 中分别得到了 8、4 和 16 个特征作为最优子集。在三个数据集中，基于数据集-FS 的 LR 具有最佳的预测性能（AUC = 0.93）。并且该数据集中的 10 个特征与 GS 呈正相关。同时，基于数据集-F 模型的预测性能普遍优于数据集-S。

结论：基于 DCE-MRI 肿瘤强化的第一期及最强一期原始图像的影像组学联合机器学习可以无创、准确且自动地预测前列腺癌的侵袭性。

EPO-2649
医学影像人工智能技术评价脑出血准确性研究

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目的 探讨医学影像人工智能技术在脑出血定量方面的准确性。**方法** 回顾性分析我院 2018.11-2018.12 月 50 名行头部 CT 检查确诊脑出血患者的影像资料。通过使用 PACS 系统的手动容积测量及推想公司的人工智能技术作对比研究，主要测量的指标有：脑出血部位、脑出血体积、颅脑中线结构偏移程度、最大面积的长短径、侧脑室的受压情况以及得出具体数据所花费的时间。**结果** 与 PACS 容积测量相比，AI 识别脑出血部位的准确率为 56%。PACS 容积测量脑出血体积为 15.47（7.67,33.05）ml，中线结构偏移为 0(0,5.88)mm，AI 测量脑出血体积为 12.94(6.33,31.35)ml，中线结构偏移为 0(0,2.9)mm，两者差异均有统计学意义（P＜0.001，P=0.002）。最大层面长短径的测量，PACS 容积测量与 AI 测量差异无统计学意义。脑室受压情况，PACS 容积测量显示受压者 27 例，未受压者 23 例；AI 显示受压者 18 例，未受压者 32 例，差异有统计学意义（P＜0.001）。PACS 容积测量脑出血体积时间为：112.38±113s，AI 测量为：5.27±0.71s。 **结论** 对于脑出血定量分析，AI 测量简便、快捷，但仍有较大提升空间。AI 进行脑出血定量分析后仍需诊断医师进一步审核，尤其是在脑出血部位、体积、中线结构偏移程度及脑室是否受压几个方面。

EPO-2650

CT 纹理特征结合机器学习对膀胱尿路上皮癌 T 分期及病理级别的诊断价值

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摘要 目的 探讨影像组学鉴别胖膀胱癌 T 分期及病理分级的可行性。方法 回顾分析经术后病理证实的膀胱癌患者 55 例。T 分期中非肌层浸润性膀胱癌（NMIBC）31 例，肌层浸润性膀胱癌（MIBC）24 例。此外，根据病理级别分为高级别尿路上皮癌（HGUC）34 例及低级别尿路上皮癌（LGUC）21 例。运用 Mazda 软件沿 CT 增强图像病灶最大层面边缘勾画感兴趣区，通过 B11 数据包的 Fisher 系数提取特征参数。对连续变量行两独立样本 t 检验或 Wilcoxon 秩和检验。应用随机森林、支持向量机、朴素贝叶斯算法及神经网络四种不同学习算法，联合十折交叉验证进行模型构建。结果 动脉期图像纹理参数诊断效能整体优于静脉期图像。其中，朴素贝叶斯算法诊断效能最好，鉴别 NMIBC 和 MIBC 的准确率、敏感度及特异度分别为 81.73%、70.83%、84.65%。同时，该算法鉴别 HGUC 和 LGUC 的准确率、敏感度及特异度分别为 86.70%，88.24%、74.34%。结论 CT 纹理组学能有效诊断膀胱尿路上皮癌 T 分期及病理级别，动脉期图像纹理参数联合朴素贝叶斯算法诊断效能最佳

EPO-2651

肝细胞外基质体积分数与 APRI、Forns 指数诊断肝纤维化临床价值对比研究

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目的 对比研究肝细胞外基质体积分数（hepatic extracellular volume fractions，fECVs）、APRI、Forns 指数诊断肝纤维化的临床价值。**方法** 回顾性调阅肝纤维化患者 152 例，无肝纤维化患者 161 例，通过常规平扫和三期动态增强 CT 数据计算 fECV 值：fECV(%)=E_{liver} [100-Hct(%)]/E_{aorta}。基于临床常见生化指标，通过以下公式计算 APRI 和 Forns 指数：APRI=[AST(U/L)/正常值上限/PLT(10^9/L)]×100，Forns 指数=7.811-3.131×ln[PLT 计数

（×10^9/L）]＋0.781×ln[GGT（U/L）]＋3.467×ln[年龄（yrs）]－0.014×TC（mg/dL）。通过 Spearman 相关分析 fECV 值与 APRI、Forns 指数模型之间的相关性，采用受试者工作特征(ROC)曲线比较 fECV 值、APRI、Forns 指数诊断肝纤维化的临床价值。**结果** fECV 值与 APRI、Forns 指数模型之间具有相关性，相关系数分别为 0.430、0.315（P 值均小于 0.01）；fECV 值、APRI、Forns 指数诊断肝纤维化的界值、敏感性、特异性、受试者工作特征曲线下面积分别为（31.07%、0.816、0.609、0.77），（10.3, 0.757、0.776、0.83），（0.86、0.776、0.901、0.90）。**结论** 利用常规肝脏三期动态增强 CT 检查及血常规检查换算得到的 fECV 值可以无创性评估肝纤维化，fECV 值、APRI、Forns 指数诊断肝纤维化的临床应用价值为 fECV<Forns 指数<APRI，初步评估提示 fECV 可能具有中度偏下的诊断价值。

EPO-2652
基于深度学习对急诊外伤肋骨骨折检出最佳重建算法的探讨

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目的：探讨人工智能（AI）诊断系统在不同重建算法下对急诊肋骨骨折检出效能的差异，寻求基于深度学习下肋骨骨折检出中的最佳重建算法。
资料与方法：收集急诊胸部外伤的 43 例患者，所有患者均利用 256 层螺旋 CT（Revolution，GE healthcare）进行胸部 CT 成像，管电压 100kV，扫描结束后，所有患者均利用 standard /lung/bone/soft 进行图像重建，层厚 1.25mm，利用深度学习的人工智能（AI）诊断系统（InferRead CT Bone research，Infervision, Beijing）在不同重建算法下进行肋骨骨折的检出。由两位有 15 年以上胸部诊断经验的医师结合 AI 共同讨论最终做出肋骨骨折的金标准。记录人工智能在不同算法下检出肋骨骨折的总数、真阳性数、假阳性数，计算并比较人工智能在不同重建算法下对肋骨骨折识别灵敏度及假阳性率的差异。
结果： 43 例患者中共有 1030 根肋骨（其中两根肋骨发育不全），金标准中肋骨骨折共有 202 处，AI 在 standard /lung/bone/soft 算法下分别检出骨折 170/203/195/161 处，其中真阳性骨折 158/170/176/152 根，假阳性 12/33/19/9 根。standard /lung/bone/soft 四种算法下对骨折检出的灵敏度分别为 78.22%/84.16%/87.13%/75.25%，差异均有统计学意义（P=0.009）。四种算法下的假阳性率分别为 1.45%/3.99%/2.29%/1.09%，差异有统计学意义（P<0.05）。Lung and bone 算法下 AI 对肋骨骨折检出的灵敏度高于 standard and soft。
结论：人工智能在不同重建算法下对急诊外伤骨折具有不同的诊断效能，Lung 算法和 Bone 算法对急诊外伤骨折检出的灵敏度优于 standard 算法和 soft 算法。

EPO-2653
基于深度学习的 CT 肺腺癌病理分类诊断价值研究

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目的：分析基于深度学习的人工智能辅助诊断系统对直径≤3cm 肺腺癌病理分类的应用价值及预测表现。
方法：回顾性分析 713 例经病理证实且病灶直径≤3cm 的肺腺癌患者的 CT 图像，按照 2：1 的比例随机分为训练组和验证组，采用一种融合全卷积网络、端到端的目标检测模型与长短期记忆网络模型的深度学习模型，由 2 名以上高年资影像医师采用盲法共同标注训练组病例，详细记录每例病灶

的边缘特征（分叶征、毛刺征）、内部特征（空泡征）、与周围组织的关系（血管集束征、胸膜凹陷征）,将数据输入模型反复训练，并根据肺腺癌浸润程度划分 5 个等级，构建模型结构。然后利用验证组数据测试该模型.按照病理结果分为浸润前病变(AAH 及 AIS)、微浸润腺癌(MIA)及浸润性腺癌(IAC)三组，分析验证组病灶的形态学征象，并自动测算出病灶的 CT 定量参数，按 1-5 级评分对肺腺癌病理类型进行预测，比较各组间参数差异。

结果：在模型判断的 CT 定量参数中，三组间三维最大长短径、体积、最大 CT 值、平均 CT 值及预测得分差异均有统计学意义（P＜0.05）；形态学征象中，分叶征、毛刺征、血管集束征、胸膜凹陷征差异均有统计学意义（P＜0.05）；最小 CT 值及空泡征差异均无统计学意义（P＞ 0.05）；以得分＞3.5 分作为诊断浸润性病变的临界点，曲线下面积（AUC）=0.873，诊断敏感度 81.9%，特异度 84.4%。

结论：基于深度学习的人工智能辅助诊断系统对鉴别≤3cm 肺腺癌的病理类型具有一定预测价值，且具有较好的可重复性，可有效提高肺腺癌病理分类的准确性。

EPO-2654
基于肺部 CT 灰度共生矩阵预测放射性肺炎的初步研究

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目的：探讨纹理分析技术在肺癌放疗后预测放射性肺炎发生的初步研究；方法：回顾性收集肺癌患者接受放疗后在三个月内发生急性放射性肺炎患者 24 例，分为无肺炎组（放疗前）和肺炎组（放疗后），将放疗前 CT 肺窗图像以及放疗中、后发生放射性肺炎的图像以 DICOM 格式导出，利用画图软件（ITK-SNAP ）人工勾画 ROI（发生肺炎区域最大处），保存好 ROI，导入纹理分析软件美国 GE 公司 AI-Kit（Artificial Intelligence Kit），进行 GLCM（灰度共生矩阵）特征纹理计算（步长为 1、4、7，角度分别为 0、45、90、135），共有 146 个纹理特征，对两组图像纹理特征进行独立样本 t 检验，找出有差异的纹理参数，对有差异的参数行 ROC 曲线分析；结果：两组有差异的纹理参数主要有三类，集群突出（Cluster Prominence）、Haralick 相关（Haralick Correlation）、惰性（Inertia），三类纹理参数各方向角度比较都有差异；ROC 曲线下的面积最大的为 Haralick 相关，面积为 0.944,敏感度为 100%、特异度为 87.5%；结论：肺癌放疗后是否发生放射性肺炎可以利用纹理分析软件进行有效预测，主要纹理参数为 Haralick 相关（Haralick Correlation），给临床提供了新的监测指标，提早干预治疗。

EPO-2655
深度卷积神经网络在精神分裂症诊断中的应用

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【目的】 深度学习，特别是深度卷积神经网络在医学图像识别领域取得了突破性的进展。然而却极少有利用深度学习对精神疾病进行诊断的研究报道。本研究的目的是探索深度卷积神经网络对精神分裂症的诊断价值。

【方法】 本研究从两个中心共纳入 586 名被试（380/206，其中 380 数据集中有 191 个患者及 189 个正常对照，206 数据集有 106 个患者及 100 个对照）。我们采集了所有被试的静息态功能磁共振的影像数据。然后，提取每个患者 114 个脑区的平均的磁共振时间序列，并计算所有脑区间的

Pearson 相关系数，得到 114*114 的相关系数矩阵，即功能连接矩阵。我们从 380 数据集中随机选择 304 个被试（80%）作为训练集，剩下 76 个（20%）为验证集，并把另一个中心的 206 个被试作为测试集，以无偏的测试模型的泛化能力。我们设计一个 10 层的卷积神经网络。我们定义损失函数为交叉熵，并应用 Adam 优化器来更新模型参数。我们将这个对称矩阵做为卷积神经网络输入层的输入数据。

【结果】 我们发现训练出的深度卷积神经网络模型能以较高的分类性能诊断出同一中心的精神分裂症患者（76 验证集）。其精确度、敏感度、特异度以及 ROC 曲线下面积分别为：0.7895, 0.82, 0.76 以及 0.8466。将验证集最佳阈值应用于另一中心测试集，其精确度、敏感度以及特异度分别为：0.7379, 0.74 以及 0.74。

【结论】 深度卷积神经网络结合功能连接特征能以较高的分类的性能诊断精神分裂症患者。由于我们的测试集来自另一个中心，因此我们的结果也提示深度卷积神经网络有着良好的泛化能力。随着未来更多中心的数据集获取以及深度学习模型改善，有望能将机器学习早日应用于精神疾病的临床应用。

EPO-2656
CT 定量技术在慢性阻塞性肺疾病不同临床表型患者中的应用价值

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[摘要] 目的 探讨 CT 定量技术在慢性阻塞性肺疾病（chronic obstructive pulmonary disease,COPD）不同临床表型患者中的应用价值。**方法** 回顾性收集处于稳定期的 COPD 患者，包括支气管炎型 128 例、肺气肿型 120 例，所有患者行胸部 CT 检查和肺功能检查，依据《2018 年慢性肺疾病诊断、治疗及预防全球策略》GOLD 分级标准将所有患者分成 4 级。利用“数字肺”CT 定量软件测量两型 COPD 患者的肺体积、肺血管体积、%LAA-950 和平均肺密度，比较两型 COPD 患者的肺功能和 CT 定量指标的差异，并进行相关性分析。**结果** 肺气肿型 COPD 患者 BMI 值随着 GOLD 分级升高而降低，支气管炎型 COPD 患者不同 GOLD 分级间 BMI 值无明显差异。两种临床表型 COPD 患者的 FEV_1%pred、FEV_1/FVC、平均肺密度及肺气肿型患者的肺血管体积随着 GOLD 分级升高而下降，两型患者的%LAA-950 随着 GOLD 分级升高而增加。两型各 GOLD 分级患者的%LAA-950 仅与 FEV_1/FVC 紧密相关。**结论** CT 定量分析可直观显示不同临床表型不同 GOLD 分级 COPD 患者的肺气肿程度、肺小血管定量指标变化情况。肺气肿型 COPD 患者随着肺功能的不断下降对肺小血管损害程度逐渐增大，而支气管炎型 COPD 患者肺小血管受影响相对较小。

EPO-2657
现代 CT 技术及临床应用高效下沉及推广于基层医疗机构：国家重点研发项目“云影像平台”实践经验

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目的：探讨 CT 设备在基层医疗机构的普及现状与相应人才的紧缺矛盾以及探讨如何进行社区卫生服务中心 CT 技术的临床应用、专业培训及远程诊断与管理。
方法：基于一项国家重点研发项目的子课题“远程影像诊断平台的建设”（2017YFC0114300）的实践经验，探讨以何种网络连接形式最合适远程影像诊断平台的建设从而缓解基层技术人才匮乏的问题；采用现场培训、学术交流与远程网络等形式，探讨如何将现代 CT 技术如何进行高效地下沉到基层医疗机构中。问卷与实践教学相结合，了解基层影像科最需要什么形式的培训及知识点训练。
结果：1.采用“基于 Web 模式+云存储”的远程云影像平台可实现多中心基层单位共享一平台的无缝对接，达到实时的移动阅片、核报、会诊的目的，且具有性价比的“投入与产出”效果。2.共有 5 个省市的 16 家医院实现 PACS 的云平台互联互通，包括对口支援的陕西、青海等县级医院。3.危急值及肺结节的 CT 诊断与处置策略以及 CT 增强扫描技术与对比剂使用要点是基层单位首要的训练内容，而这些知识点的 PPT 实例分析是最受欢迎的内容之一。
结论：基层单位的影像诊断人才紧缺现状是暂时难以解决的问题，但可通过 Web 模式的远程云影像平台等形式实现高端人才资源的高效下沉、实时服务基层；通过远程云影像平台可实现基层影像诊断人才的高效培训，实现现代 CT 技术在基层的普及与生根。

EPO-2658
人工智能冠状动脉 CT 血管成像在检出及评价冠状动脉血管狭窄中的应用

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目的 探讨人工智能（artificial intelligence，AI）冠状动脉 CT 血管成像（CCTA）在检出及评价冠状动脉血管狭窄中的应用。**方法** 回顾性分析 2018 年 3 月至 2019 年 3 月 110 例同时行 CCTA 及冠状动脉造影（DSA）的冠心病患者。患者纳入标准为 CCTA 图像血管边缘清晰，无伪影，主动脉根部噪声＜30HU；CT 检查图像包含 0.75mm 薄层图像；AI 软件能自动计算完成的病例。排除标准为冠状动脉支架置入术后及（或）搭桥术后；冠状动脉起源异常。按照美国心脏病学会冠状动脉树 15 段改良分段法，选取左主干、前降支近中远段、右冠状动脉近中远段、回旋支近远段、第一对角支、后降支共 11 个主要节段，对冠状动脉管腔直径≥1.5mm 节段进行冠状动脉狭窄节段检出及狭窄程度的评价，其中管腔狭窄程度分为无狭窄 0%、轻度狭窄（＞0%，＜50%）、中度狭窄（≥50%，＜70%）、重度狭窄及闭塞（≥70%）。AI 软件单独对冠状动脉狭窄节段检出及狭窄程度进行评价。以两位工作 5 年以上心内科导管医师对冠状动脉造影图像进行评价的结果作为金标准。最终 AI 软件诊断结果与金标准对比。**结果** ①AI 检出冠状动脉狭窄节段总敏感性、特异性、阳性预测值、阴性预测值分别为 88.78%、93.81%、88.36%、94.43%，与 DSA 比较一致性极好（Kappa 值 0.82），其中 AI 对 LM、mLAD、dLAD、pRCA、mRCA、pCX、dCX 节段狭窄的检出与 DSA 一致性极好（Kappa 值均大于 0.75），对 pLAD、dRCA、PDA、D 节段狭窄的检出与 DSA 一致性较好（Kappa 值分别为 0.70、0.70、0.75、0.71）。②AI 评价冠状动脉不同狭窄程度与 DSA 一致性一般（Kappa 值 0.62）。**结论** AI 对冠状动脉狭窄节段的检出与 DSA 具有较好一致性，但在评价狭窄程度上与 DSA 一致性一般。

EPO-2659
云胶片在新形势下放射诊疗工作中的应用

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目的：探讨云胶片在新形势下放射诊疗工作中的应用。方法：回顾分析铜仁市人民医院 2018 年 4 月正式启动云胶片以来，将所检对象的医学影像数据通过云影像服务平台上传到云端，医生或所检对象均可采用手机扫描“二维码”获得影像报告及所有图像信息，并可在手机上采用相关图像处理功能进行影像基本后处理、调节窗宽窗位、CT 值测量、病灶大小测量、原始影像数据三维处理（MPR、3D）等。结果：2018 年 5 月至 2019 年 4 月（12 个月）均全面采用云胶片共 184677 人次，节约成本近 600 万元，杜绝了患者排队取片流程，方便患者就医，减轻了放射科医务人员的工作量，实现院外专家会诊。结论：采用的云胶片是基于贵州省安全可靠的卫生数据网络传输服务体系（卫生专网）储存在省卫健委影像云平台，保证了数据的保密性与安全性。在新形势下，放射科云胶片也是国家“互联网+医疗健康”的组成部分，也为实现影像检查结果互认奠定坚实的基础，值得推广使用。

EPO-2660
基于磁共振 T2WI 影像组学在前列腺癌诊断中的价值

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目的 探讨前列腺 T2WI 影像组学预测模型在前列腺癌中鉴别癌灶与非癌组织的价值。
材料与方法 收集经手术或穿刺病理证实的前列腺癌患者 60 例，将 T2WI 图像进行标准化处理，影像科 2 名经 PI-RADS V2 培训的医师运用 ITK-SNAP 3.6 软件根据多参数磁共振（包括 T1WI、T2WI、DWI、DCE-MRI）及病理结果在标准化后的 T2WI 上进行 ROI 勾画，ROI 放置于癌灶面积最大层面并在镜像区勾画 ROI 进行对照，其中一名医师 1 周后再重新勾画 ROI，共得到 120 个目标区域，按 7：3 分为训练集和验证集。运用美国 GE Analysis Kit（AK）软件进行影像组学特征提取，随后进行观测者间与观测者内一致性检验。保留一致性较高（ICC＞0.75）的影像特征,采用 spearman 相关分析和 LASSO 方法进行特征降维。在训练集中构建癌灶与非癌组织的诊断模型，在验证集中评估模型效能。
结果 共提取 396 个定量影像特征参数，经降维和去冗余后，剩余影像特征 9 个，构建基于 T2WI 的前列腺癌诊断模型。训练集的准确度为 0.7143（95% CI,0.6053-0.8076），敏感度为 0.8095，特异度为 0.6190，阳性预测值为 0.68，阴性预测值为 0.7647。验证集的准确度为 0.7222（95% CI,0.5481-0.8580），敏感度为 0.6667，特异度为 0.7778，阳性预测值为 0.75，阴性预测值为 0.7。训练集诊断前列腺癌的 ROC 曲线下面积为 0.76(0.60-*0.92)*；验证集为 0.77(0.67-*0.87)*。
结论 运用磁共振 T2WI 影像组学预测模型诊断前列腺癌的准确性较高。

EPO-2661
磁共振影像组学对直肠癌 KRAS/NRAS/BRAF 基因突变的预测价值

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目的：探讨基于磁共振高分辨 T2 加权成像的影像组学在预测直肠癌 KRAS/NRAS/BRAF 基因突变的应用价值。

方法：回顾性分析 2018 年 6 月至 2019 年 6 月期间，在上海长海医院经手术病理证实，术前接受 3T 磁共振成像的直肠癌患者，记录术后病理 KRAS/NRAS/BRAF 基因状态。在术前的高分辨 T2WI 图像上手动勾画病灶 VOI 后提取影像组学特征，之后采用 LASSO（least absolute shrinkage and selection operator）算法进行特征值降维，选择出对 KRAS/NRAS/BRAF 基因突变最有价值的特征。使用降维后的特征样本随机分为训练集（80%）与测试集（20%）进行机器学习，建立极限梯度增强树（extreme gradient boosting, XGBoost）分类器模型，获得 ROC（receiver operating characteristic）曲线，计算曲线下面积（area under the curve，AUC）、敏感度、特异度及 95%置信区间。
结果：纳入 190 例直肠癌患者，其中男性 114 例，女性 76 例，年龄 15～78 岁，平均年龄 57±11 岁。KRAS 基因突变型 46 例(24.2%)，NRAS 基因突变型 42 例(22.1%)，BRAF 基因突变型 28 例(14.7%)。提取得到 1409 个影像组学特征，LASSO 降维得到与基因突变相关的特征 4 个。XGBoost 分类器模型测试集对三种基因突变的 AUC 分别为：0.772、0.728、0.712 。
结论：基于磁共振高分辨 T2WI 的影像组学 XGBoost 模型对预测直肠癌 KRAS/NRAS/BRAF 基因的状态具有一定的价值。

EPO-2662
基于深度学习的胸片心脏增大判定研究

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目的 利用深度学习自动测量心胸比率（CTR）， 探讨肉眼观察、自动测量及手动测量 CTR 判定心脏增大的差异性。**方法** 回顾性选取胸部 X 线体检人群影像资料 1312 例。采用 Mask R-CNN 深度卷积网络分割肺野和心脏，基于分割结果自动测量 CTR 判定心脏增大，放射医师依次通过肉眼观察、手动测量 CTR 判定心脏增大。对数据进行统计分析。**结果** Pearson 相关分析显示自动测量与手动测量 CTR 具有强相关性（r=0.976，P<0.001），Bland-Altman 分析显示自动测量与手动测量 CTR 的差值很小（差值均数=0.008）。Kappa 检验显示肉眼观察与手动测量判定心脏增大的一致性中等（κ=0.667，P<0.001），而自动测量与手动测量判定心脏增大的一致性较好（κ=0.895，P<0.001）。以手动测量为心脏增大判定标准，自动测量判定心脏增大的灵敏度、特异度及准确度分别为 99.03%、90.65%、94.76%，均高于肉眼观察。**结论：**基于深度学习自动测量与手动测量 CTR 具有强相关性和较好的一致性，可在胸部 X 线体检时快速、准确地判定心脏增大。

EPO-2663
探讨 CT 影像组学在评估胰腺癌生物学行为中的价值

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【摘要】目的 探讨 CT 影像组学术前无创性评估胰腺癌肿瘤生物学行为。
资料与方法 回顾性收集 2014 年 1 月至 2018 年 11 月期间我院手术病理证实的 94 例胰腺癌患者的 CT 及临床资料，将所有病例随机分为训练组和验证组。在 MaZda 软件中手动勾画肿瘤体积（VOI），并基于肿瘤体积提取 3D 影像组学特征。对影像组学特征参数进行降维，分别建立起反映肿瘤生物学行为（胰腺癌分化程度、淋巴结转移）的影像组学预测模型并计算每位患者的影像组学模型评分（Rad-score）。采用受试者操作特性曲线（ROC）评估模型的诊断效能。**结果** 年龄、性

别在胰腺癌分化程度间及淋巴结转移情况间差异均无统计学意义（P 值均>0.05），肿瘤位置在淋巴结转移阳性与阴性两组间差异具有统计学意义（P=0.02）。经特征筛选，基于 7 个影像组学特征建立的影像组学模型术前预测胰腺癌分化程度的 ROC 曲线下面积（AUC）在训练组和验证组分别为 0.78、0.64。基于 6 个影像特征建立的影像组学模型术前预测胰腺癌淋巴结转移的 AUC 在训练组和验证组分别为 0.77、0.74。**结论** CT 影像组学在无创性评估胰腺癌生物学行为中具有较大的应用前景，对术前评估胰腺癌恶性程度，进而协助临床胰腺癌的治疗决策具有一定的参考意义。

【关键字】 胰腺癌；影像组学；CT；生物学行为；淋巴结转移；分化程度

EPO-2664
机器学习分析扩散峰度成像参数直方图在诊断前列腺癌及判定其恶性程度中的应用

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目的：本文通过扩散峰度成像参数直方图的机器学习分析，找出最合适的特征及分类算法，达到提高分类效能的目的。

材料与方法：通过文献数据[2]，得到 3 类数据（BPH 37 例，低级别 PCa 37 例，高级别 PCa 37 例），包括 10 种描述 DKI 成像质量的特征参数，D_{app}和 K_{app}参数分别求得了中值、均值、标准差、偏度和峰度。根据文献的初始结论，得出 D_{app}和 K_{app}部分直方图参数对 PCa 的诊断以及其高低级别的判定有重大相关性，故选择五种参数进行分析。使用的软件为基于 python 语言的数据处理软件 sklearn[3]。将五种特征分别用 K 邻域（KNN），支持向量机（SVM），决策树和随机森林四种机器学习算法对其进行分类。对数据进行了 10 次分类，得到的平均特异性，敏感性，准确率和 ROC 曲线下面积（AUC）。

结果：D_{med}和 D_{mean}表现普遍好于 K_{med}，K_{mean}和 K_{sd}。而随机森林和决策树的效果也要好于 K 邻域和 SVM。诊断 BPH 和 PCa 的最佳分类方法是 D_{med}的随机森林分类，可以达到 0.933 的特异性和 0.953 的敏感性，此时准确率和 AUCs 达到最大值；诊断高低级别 PCa 的最佳分类方法是 D_{mean}的随机森林分类，可以达到 0.911 的特异性和 0.881 的敏感性，且此时准确率和 AUCs 也达到最大值。在用 SVM 对 K_{med}和 K_{mean}进行分类时，出现了较为严重的分类错误，这说明 SVM 对该组数据并不适用。诊断 PCa 和高、低级别 PCa 的最优分类器均为 D_{med}+D_{mean}的决策树，诊断 BPH 和 PCa 的特异性和敏感性分别为 0.973 和 0.981；诊断高低级别 PCa 的特异性和敏感性分别为 0.995 和 0.962。分类效能均比文献[2]有所提高。

结论：D_{app}与 K_{app}特征融合模型的分类效能比单个特征有显著提高，同时诊断 BPH 和 PCa 的准确率可以显著提高。决策树和随机森林在该数据集的效能要明显优于 K 邻域和 SVM。

EPO-2665
基于基于深度学习的计算机辅助诊断系统评估脑内血肿体积

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目的：探索基于深度学习的计算机辅助诊断系统对脑出血各种类型血肿体积测量的准确性与实用性的临床观察。

方法：收集符合纳入标准的脑出血患者 160 例，每位患者颅脑 CT 图像采用 itk-snap 软件手工勾画和计算机辅助诊断系统进行血肿体积测量，以 itk-snap 软件手工勾画作为血肿体积的金标准，采用配对 t 检验比较各种方法测量血肿体积及判定计算机辅助诊断系统对脑内血肿体积评估的误差。

结果：120 例患者中 101 例脑内血肿（其中规则形高血压性出血 37 例，不规则形高血压性出血 58 例，脑挫裂伤后血肿 26 例），硬膜下血肿 21 例，硬膜外血肿 18 例。2 种方法对各种类型血肿的测量结果比较差异均有统计学意义（$P<0.05$）。相对于 itk-snap 软件手工勾画测得血肿的平均体积，规则高血压性脑出血测量平均误差为 0.86%，不规则高血压性脑出血测量平均误差为 7.31%，脑挫裂伤后血肿测量平均误差为 8.34%；硬膜下血肿测量平均误差为 33.58%，硬膜外血肿测量平均误差为 0.59%。

结论：基于深度学习的计算机辅助诊断系统对颅内规则形血肿及硬膜外血肿体积测量较为准确，但血肿类型影响测量误差，不规则脑内血肿及硬膜下血肿经计算机辅助诊断系统测量误差略大。

EPO-2666

神经退行性疾病的影像组学研究

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目的 常规影像学方法在神经退行性疾病的检查中表现不明显，新兴的影像组学能够定量识别、分析疾病的影像学特征，并建立疾病预测模型，其有望进一步成为提升对神经退行性疾病的诊断、鉴别诊断、疾病进展和预后预测。本文就影像组学在神经系统退行性疾病诊断的研究进展予以综述。**方法** 进入 PubMed、知网、万方等数据库检索系统，采用“影像组学”、“阿尔茨海默病，影像组学或纹理分析”、“帕金森病，影像组学或纹理分析”、“亨廷顿病、肌萎缩侧索硬化，影像组学或纹理分析”为主要检索关键词，检索文献经筛选后纳入分析 31 篇，文献时间范围到从 2010 年至 2019 年。**结果** 医学影像图像蕴含着丰富的疾病相关信息，影像组学作为一个新颖的研究热点，能够高通量的提取并定量分析与疾病相关的影像图像特征，有助于提高疾病诊断准确性，其为医学影像的进一步发展注入了新的能量。目前，影像组学在肿瘤性病变中的研究广泛，发展迅速，方兴未艾，但在神经退行性疾病中鲜有研究。**结论** 影像组学在无创性研究神经退行性疾病方面具有良好的临床价值和应用前景。

EPO-2667

气管软化实验与 CT 仿真内窥镜的应用

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目的：探讨气管软化实验与 CT 仿真内窥镜技术（CT virtual endoscopy,CTVE）结合对比普通 CTVE 影像差异及临床意义。
方法：扫描前训练患者深吸气后做呼气动作但不呼气，使气管支气管尽量扩张，采用 64 排 Philips 螺旋 CT 对 36 例肺部进行扫描并进行 CTVE 重建技术。选取该机型数据中 50 例已有的肺部影像进行 CTVE 重建技术并对比。
结果：采用气管软化实验后气管直径为 1.8—2.4CM，主支气管直径为 1.3—2.2CM，叶支气管直径为 0.6—1.3CM，段支气管直径为 0.3—0.8CM，而未采用气管软化实验的气管直径为 1.2—2.0CM，

主支气管直径为 0.7—1.8CM，叶支气管直径为 0.4—1.0CM，段支气管直径为 0.2—0.6CM。采用气管软化实验后小支气管可重建 CTVE 影像为 34 例（可重建率约为 94.44%），未采用器官软化实验的小支气管可重建 CTVE 影像为 42 例（可重建率约为 84.00%）。
结论：气管软化实验与 CTVE 结合后可以更好的显示气管与支气管内部情况，对显示小支气管的能力也有提升，故器官软化实验与 CTVE 的应用对气管壁和小支气管病变更敏感。

EPO-2668
基于深度残差神经网络的磨玻璃肺结节浸润性风险预测

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目的：为了预测 CT 影像中磨玻璃肺结节的肺腺癌发病风险，本研究设计和开发一种基于深度学习算法的计算机辅助诊断模型。
方法：首先，本研究从 648 个患者中回顾性地搜集和整理了 826 个经病理证实的磨玻璃肺结节样本。其中，409 个病理证实为原为腺癌，290 个为微浸润性腺癌，208 个为浸润性腺癌。然后，选用一系列图像预处理技术，包括：图像重采样、尺度变换、ROI 区域剪切和数据增强等，对原始 CT 影像进行处理，生成训练样本集和测试样本。其次，运用残差学习结合和批归一化技术建立一个深度卷积神经网络模型，并利用训练集数据训练模型。最后，为了测试和评价模型地性能，本研究随机选取了 128 个磨玻璃肺结节样本，建立一个独立的测试数据集对模型进行测试，对比和分析了构建模型与两名放射科医生的诊断效果。
结果：通过实验分析，本研究所提出的深度学习模型准确率为 82.29%、F1 值为 71.05%，加权平均 F1 值为 82.29%，Matthews 相关系数为 59.69%，各项评价指标高于两名放射科医生的诊断结果。同时，与未采用残差网络的深度学习模型（AUC: 0.856）对比，新模型的曲线下面积（0.866）更高。
结论：本研究表明，基于深度残差学习的 AI 系统能够提高肺腺癌浸润性预测的准确率，在未来可以辅助医生进行快速、精准的诊断。

EPO-2669
基于三维卷积神经网络肺结节深度学习算法模型临床效能初步评估

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目的：为评价人工智能模型的应用价值，本研究在专家共识的基础上建立了肺结节标准测试集，对前期建立的一种基于三维卷积神经网络肺结节深度学习算法模型进行验证，评价该模型的临床效能和限度。
方法：基于胸部 CT 肺结节数据标注与质量控制专家共识建立标准测试数据集，对前期建立的基于三维卷积神经网络的肺结节深度学习算法模型及传统 CAD 系统（Siemens syngo.via VB 3.0 和 Philips ISP V8）进行检验，在肺结节检出灵敏度、精准度以及平均每例假阳性个数等多个指标方面进行优效验证。
结果：针对测试数据集中的肺结节，Syngo.via 工作站检出灵敏度 36%，精准度 69%，平均每例假阳性 1.2 个；Philips ISP 工作站肺结节检出灵敏度 34%，精准度 73%，平均每例假阳性 0.9 个；

三维卷积神经网络的肺结节深度学习算法模型检出灵敏度 90%，精准度 71%，平均每例假阳性 2.8 个。
结论：该三维卷积神经网络算法模型相较于传统 CAD 系统，在肺结节检出灵敏度上有显著提升。由于训练数据集的偏倚等问题，灵敏度仍然有进一步提升的空间。后期通过针对性地补充训练数据集，比如增加磨玻璃结节的比重，可以进一步提升肺结节检出灵敏度。改进之后的模型有望成为影像医生肺癌筛查工作的得力助手。

EPO-2670
基于 CT 平扫纹理特征参数鉴别股骨上段肿瘤良恶性研究

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目的：探讨基于 CT 平扫的纹理特征参数对股骨上段骨肿瘤进行良恶性鉴别诊断的价值。
方法：收集并纳入 43 例股骨上段骨肿瘤患者，均具备完整的临床病理资料及 CT 平扫图像，其中 30 例病理结果证实为良性，13 例为恶性。21 例作为训练组，22 例作为验证组，模型构建步骤为：首先通过分层抽样的方式，将数据分为训练集和测试集，所有数据采用 A.K（Artificial Intelligence Kit）进行特征提取，进一步分别采用 Spearman（SPM)、Lasso（least absolute shrinkage and selection operator）及主成分分析法（principal component analysis，PCA）三种特征选择方式进行参数降维，最后利用 logistic 回归分别构建骨肿瘤的影像组学标签，并结合临床信息进行多元分析，构建预测模型，采用 ROC 曲线下面积（ACU 值）评价模型预测效能。同时利用诺模图（nomogram）对模型进行可视化分析。
结果：利用 Lasso 回归降维并构建影像组学模型的 AUC 值最大。三种选择方式在训练组中曲线下面积分别为 0.992、0.933、0.878，敏感度分别为 86.7%、73.3%、73.3%，特异度分别为 83.3%、100%、100%。在验证组中曲线下面积分别为 0.676、0.838、0.838，敏感度分别为 40.0%、66.7%、86.7%，特异度分别为 100%、100%、71.4%。利用 nomogram 分析得到训练组良、恶性误诊率分别为 0%和 16.7%，验证组良、恶性误诊率分别为 6.7%和 0%.
结论：基于术前 CT 平扫纹理特征参数可用于鉴别股骨上段良恶性肿瘤，且利用 Lasso 回归降维并构建影像组学模型的诊断效能综合评价最佳。同时基于 Lasso 回归降维构成的诺模图（nomogram），可用于鉴别股骨上段骨肿瘤良恶性。

EPO-2671
基于 MSCT 数据的 CAS 三维重建胰胆管合流部及毗邻结构在 Roux-en-Y 术前初步研究

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目的 先天性胆总管囊肿是一种罕见的先天性胆道发育畸形,手术切除是胆总管囊肿的唯一根治方法，我们研究的目的是探讨海信计算机辅助手术系统（Hisense CAS）在胆总管囊肿患儿胰胆管合流部及毗邻结构的三维重建结果，提高患儿 Roux-en-Y 手术的精准性。
方法 回顾性分析 2016 年 1 月至 2019 年 5 月苏州大学附属儿童医院收治的 20 例先天性胆总管囊肿患儿的肝脏 CT 增强影像资料，利用海信计算机辅助手术系统（Hisense CAS）对患儿肝脏增强 CT 图像进行 CT 三维重建，根据三维重建结果分析胆总管囊肿类型、胰胆管合流部及其与毗邻结构的关系，从而制定个体化最佳手术方案。

结果 三维重建结果清晰显示胆总管囊肿的类型、胰胆管合流部及其毗邻结构的关系，可以多角度观察肝脏及其脉管系统、胆总管囊肿及胰腺的空间位置关系。20 例患者中，男童 5 例，女童 15 例，年龄 16 月至 12 岁，其中有 6 例为 Ia 型胆总管囊肿，3 例为 Ic 型胆总管囊肿,11 例为 IVa 型胆总管囊肿；1 例患儿胆总管囊肿较大，2 例患儿胰管扩张，胰胆管共同管明显增长，1 例患儿肝右动脉在囊肿前壁走行并形成压迫。
结论 海信计算机辅助手术系统（Hisense CAS）有助于研究小儿复杂的肝脏解剖，可以从任意的角度对胆总管囊肿、胰胆管合流部及其毗邻结构进行观察，了解胆总管囊肿与肝脏及其脉管系统的空间关系，使影像诊断更加精准，并且能够为手术者提供直观的解剖结构信息，从而制定个体化最佳手术方案，提高小儿 Roux-en-Y 手术的精准性。

EPO-2672
多中心磁共振影像数据标准化技术研究

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目的：多中心影像数据的多态性限制医学影像计算的发展。针对此问题，提出一套针多中心数据预处理流程，并在脑胶质瘤磁共振影像上验证。
方法：回顾性收集本院经病理证实的脑胶质瘤患者 215 例（高级别 153 例，低级别 62 例），另纳入公开的多中心数据库 Brats2017 的 285 例脑胶质瘤患者（高级别 210 例，低级别 75 例），共计 500 例患者组建全新的多中心数据集，通过脑胶质瘤分级准确率验证本文提出的多中心预处理流程的有效性。选择 CET1 序列影像数据作为实验序列。经预处理流程的 CET1 数据做验证组，未做预处理的相同数据为对照组。影像组学方法用于实验检验。采用交叉验证、分组验证检验分级准确率的稳定性。本文提出的预处理流程包括：（1）统一数据格式；（2）由经验丰富的影像科医生做感兴趣区分割；（3）本院影像数据去颅骨；（4）所有数据统一体素范围；（5）执行基于直方图规定化的数据重映射。
结果：交叉验证中，验证组准确率、灵敏度、特异性分别为：0.9260、0.9339、0.9051，对照组准确率，灵敏度，特异性分别为：0.7760、0.7824、0.7591。分组验证中验证组准确率、灵敏度、特异性均值分别为 0.9143、0.9180、0.9050，对照组准确率，灵敏度，特异性均值分别为 0.6472、0.6509、0.6373。
结论： 多中心数据预处理流程能够有效缓解数据间差异，提高脑胶质瘤分级准确率。该流程可扩展到基于磁共振影像数据的其他疾病，对临床研究具有一定的实用价值。

EPO-2673
基于支持向量机的脑出血 CT 影像的人工智能辅助预测模型研究

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研究目的：在解决脑出血 CT 影像中不规则、不明显出血区域分割问题的基础上，提出基于 FCM 算法分割的脑出血量计算方法，通过支持向量机 SVM 建立血肿预测机器学习模型，评估血肿再扩大的风险因素。
研究方法：联合不同的分割方法得到出血区域，区域生长法在血肿区域选取一生长种子点，若邻接点灰度值与初始生长点灰度值差小于生长阈值，则该像素点属于颅内出血区域，该邻接点被合并。

合并后的像素点作为新的“生长起始点”，继续考察其邻接的四个点，依次类推，直至识别出整个出血区域。模糊 C-均值(FCM)聚类算法以图像像素点作为样本集，根据类内相似性、类间相离性准则对图像像素点划分归类，通过不断迭代使代价函数最小化完成聚类，本研究 FCM 聚类算法引入了成员 Unm 函数表示,第 n 个像素值与第 m 个聚类中心的模糊隶属度，通过 Matlab 工具箱函数 Zeros 生成隶属度矩阵 U,再用 rand 函数随机生成隶属度矩阵 U,利用 sum 函数计算 U 中每列元素和，然后对隶属度矩阵 U 进行归一化处理，最后调用 FCMstep 函数不断迭代，直到代价函数值接近极小值，停止迭代，根据隶属度大小，将每个像素点最终归类。将 FCM 算法分割后的脑出血 CT 影像二值化；通过 Matlab 工具箱函数 bwarea 计算出血区域像素点个数 num，再利用 Matlab 工具箱函数 numel 计算二值化后 CT 图像中所有像素点个数 total,则求得出血区域占比为：R=num/total。通过二元 logistic 分析患者血压、出血部位、血肿体积/占比、中线移位等得到血肿吸收速度快慢预测模型，再将筛选出的特征值输入 SVM 模型，采用留一法的交叉验证通过训练集建立预测模型。

结论：血肿平均吸收率预测模型 logit(P 平均率)=1.230×L1-0.057×V-1.422。SVM 预测是否再出血:Total accuracy:70%,class accuracy：68.97，70.97%。

EPO-2674

Image Quality Evaluation using a New Low-Dose Fluoroscopy Algorithm Based on a Deep-Learning Approach

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PURPOSE

Interventional treatment is widely used in clinical practice and the augmented role of these procedures raises concerns about the radiation dose to patients and operators. Howerer, dose reduction may cause the increased noise, which impacts the image quality. We aim to develop a new low-dose fluoroscopy algorithm based on a deep-learning approach to improve image quality using an in-vitro model and in-vivo patient groups.

METHOD AND MATERIALS

All image acquisitions were performed on a DSA machine (Angio30C, Neusoft, Shenyang, China). The proposed network combined De-noising Convolutional Neural Networks (DnCNN) and Visual Geometry Group (VGG)-19 architecture.The radiation dose of the low dose regimen was half that of the conventional dose. We obtained 200 noisy-free phantom images as label via averaging 100 frames in one stable sequence. Noise was added artificially to these labels with specified range of our fluoroscopy to get noisy images. Thus we used these label and noisy images as our training set. Testing set included 20 phantom images for quantitative analysis and 100 clinical patient images for subjective evaluation. Mean squared error(MSE), peak-to-noise ratio(PSNR) and structural similarity(SSIM) were determined for quantitative analysis. The image quality of subjective evaluation was graded (1, excellent; 3, poor). The results were compared with conventional model-based de-noising approaches (temporal recursive filter,TRF), which is commonly used in fluoroscopic noise reduction.

RESULTS

For the quantitative analysis of 20 phantom images, image quality was significant better based on a deep-learning approach (PSNR, SSIM, MSE) than that based on TRF. For subjective evaluation of 100 clinical patient images, image quality was also significant better based on a deep-learning approach.
CONCLUSION
Compared with traditional method, deep learning based noise reduction method showed great improvement of image quality.

EPO-2675
计算机辅助检测与量化评价急性肺栓塞栓子形态学与疾病严重度：一项可靠性研究

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目的 评估基于几何的计算机辅助检测和量化急性肺栓塞栓子形态和栓塞严重程度的可靠性。**方法** 对 30 例疑似急性肺栓塞患者分别采用人工判读和计算机辅助判读进行血管阻塞指数计算，并对计算机辅助栓塞定量指标进行分析。分别对人工判读和计算机辅助判读 Qanadli 和 Mastora 阻塞指数的可靠性进行分析。**结果** 人工判读和计算机辅助判读时间花费具有统计学差异（374.90±150.16 s vs.121.07±51.76 s, P<0.001）。人工判读和计算机辅助判读 Qanadli 阻塞指数的差异为 1.83±2.19；96.7%（29/30）的测量值在 95%置信区间内（ICC=0.998）。人工判读和计算机辅助判读 Mastora 阻塞指数的差异为 1.46±1.62；96.7%（29/30）的测量值在 95%置信区间内（ICC=0.997）。栓子定量指标与 Qanadli 和 Mastora 阻塞指数呈中度相关（P 均<0.001）。**结论** 计算机辅助检测和量化有助于提高血管阻塞指数的时效性和可靠性，为疾病评估提供额外的、重要的定量指标。

EPO-2676
基于 U-Net 对前列腺 MR 图像中腺体的自动分割和径线的自动测量：临床植入验证研究

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目的：评价基于 U 形全卷积神经网络（U-Net）的前列腺分割和径线自动测量的准确性，探索其植入临床工作流程的可行性。**方法：**回顾性收集 2018 年 10 月 7 日到 2019 年 4 月 28 日连续病例的前列腺 MR 影像和报告资料，排除前列腺癌治疗后、经尿道前列腺切除术后和数据导出失败的病例，总共纳入 129 例数据进行研究。运用前列腺 U-Net 分割模型在 T2WI 自动分割前列腺轮廓。运用最小体积包围盒的算法规则，测得前列腺的左右、前后和上下径。将实际临床工作中使用的前列腺 MR 结构式报告内医师测量的前列腺径线数据作为金标准，用配对样本 t 检验和 Bland-Altman 散点图比较分析软件自动测量和医师手工测量的前列腺径线结果。**结果：**U-Net 分割和径线测量结果可自动地返回到结构式报告中，并自动填写到报告内。运用 Bland-Altman 散点图分析显示两种测量方法得到的前列腺各经线一致性高，只有不到 5%的数据位于 95%置信区间之外。对于前列腺左右

径，软件自动测量和医师手工测量结果之间的差异无统计学意义(t=-0.637,P>0.05)，而于前列腺前后径和上下径，两种测量方法结果之间的差异均有统计学意义（前后径：t=12.248,P<0.001；上下径：t=-2.172,P=0.032）。**结论：**基于 U-Net 的前列腺分割和径线自动测量模型植入临床工作流程是可行的，其测量结果的准确性符合临床需求。

EPO-2677
应用基于增强 CT 的放射组学模型鉴别高低级别肾透明细胞癌的研究

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【摘要】目的：基于增强 CT 建立放射组学模型，并评估模型鉴别低级别和高级别肾透明细胞癌的能力。**方法：**回顾性分析河北大学附属医院 106 例经病理证实的增强 CT 肾癌病例，其中低级别肾透明细胞癌 68 例，高级别肾透明细胞癌 38 例，并应用图像分割软件对感兴趣区（ROI）进行逐层勾画并融合成为感兴趣区容积（VOI）；首先对图像进行预处理，提取 1298 个组学特征，再经过降维最终保留 15 个特征，对样本按 7：3 的比例采用分层抽样方式分为训练集和测试集，基于保留的 15 个特征建立逻辑回归(Logistic Regression,LR)模型，将此模型在训练集和测试集分别进行 ROC 曲线分析。**结果：**LR 模型在训练集 AUC 为 0.829，敏感度为 0.741,特异度为 0.792；在测试集 AUC 为 0.832，敏感度为 1，特异度为 0.75。**结论：**基于影像组学特征的逻辑回归模型在鉴别低级和高级肾透明细胞癌方面有良好的区分效能。

EPO-2678
CT 纹理分析在肾脏透明细胞癌分级的临床应用

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目的：探讨 CT 增强图像纹理分析为肾透明细胞癌（ccRCC）术前预测提供新的客观定量参数。方法：本文回顾性分析了 2016 年 1 月至 2018 年 12 月间我院医学影像科经病理证实的 63 例 ccRCC CT 图像。应用软件勾画出肿瘤的感兴趣区，然后计算图像纹理参数。采用两个独立的样本 t 检验（错误发现率校正）比较了 Fuhrman 低（I-II 级）和高（III-IV 级）ccRCC 的纹理特征值，并用受试者操作特征曲线（ROC）评价利用纹理特征预测 Fuhrman 高、低等级 ccRCC 的效果。
结果：熵值在皮质期和髓质期对高级别组与低级别组 ccRCC 有统计学意义（P＜0.05）；相关性在髓质期对高级别组与低级别组 ccRCC 有统计学意义（P＜0.05）；熵值在 ROC 曲线在高、低两组 ccRCC 中皮质期和髓质期的曲线下面积分别为 0.727 和 0.824；相关性在髓质期曲线下面积为 0.872；高级别组 ccRCC 病灶大小大于低级组 ccRCC，有统计学意义（*P =0.007*）。结论：CT 纹理分析特征可以预测术前患者的 Fuhrman 分级，熵、相关性是临床应用最重要的影像指标。

EPO-2679
采用自动选择参照图校正兔肝超声造影图像呼吸运动研究

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目的：呼吸运动校正是肝结节超声造影(contrast-enhanced ultrasound, CEUS)定量分析的关键步骤。超声造影机主要分为提供双模和单模造影图像。双模造影图像具有造影图像和灰度图像，大多数超声造影图像呼吸运动校正方法都是针对该模式的图像。由于呼吸运动影响，所获取的 2D 超声序列会显示平面外结节和平面内结节。基于平面外图像序列校正是无效的。校正 CEUS 序列通常选取参照图作为标准来删除平面外结节图像，具有主观性。因此，基于双模式的超声造影序列定量选择最佳参照图的方法值得探索。材料和方法：采用拉普拉斯特征映射法降维和 K-means 聚类。根据聚类图像数量较多且接近超声造影强度达到峰值的类心图像作为最佳参照图像，并从原始图像序列中选择与参照图像相近的图像校正呼吸运动，最后在 18 例兔肝 VX2 肿瘤超声造影病例上验证并评价该方法有效性。结果：校正后从各造影图像序列的感兴趣区域 ROI 中提取的时间强度曲线(TIC)变得较平滑，更利于根据血流灌注模型曲线拟合。校正前图像序列的平均结构相似度（TMSSIM）和平均互相关系数(MCC)均值分别为 0.45±0.11 和 0.67±0.16，校正后两者均明显增加（$P<0.001$），分别为 0.59±0.11 和 0.81±0.11。校正前图像序列的偏差值（DV）均值为 92.16±18.12，校正后均值下降到约为原值的 1/3。采用基于平均帧作为参照图(MBMFRI)的校正方法校正序列的 TMSSIM 和 MCC 平均值均低于所提出的校正方法($P<0.001$)，且该法的 DV 平均值明显增高($P<0.001$)。结论：兔的呼吸频率比人快的多，然而本文提出的呼吸运动校正方法能减少超声造影图像序列的呼吸影响。本文提出的呼吸运动校正方法能提高传统依靠人工选择参照面和基于 MBMFRI 方法进行超声定量分析方法的准确性。这种简单操作的方法能潜在性应用于动物研究和临床应用中。

EPO-2680

脑胶质瘤多中心数据集消歧及预处理

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目的

优质的训练数据是研究的基础，由于脑胶质瘤发病率低，单个医疗机构的数据量往往难以满足模型训练的要求，通过多中心数据共享是解决数据量问题的最有效解决方案。但由于各医疗机构采用的磁共振采集设备各有不同，受到扫描参数、扫描技能以及扫描过程等多方因素的影响，获得的影像在分辨率、亮度范围、对比度等方面存在较大差异，难以直接使用。为了更好的发挥多中心数据共享的优势，本文设计了一整套针对多中心脑胶质瘤磁共振影像的消歧和预处理方法。

方法

该方法包括数据消歧和预处理两大步。数据消歧是去除影像数据形式上的差异，使消歧后的数据具有统一规格，影像预处理是缓解影像间的亮度分布差异，提升影像的可比较性。

数据消歧具体包括统一采用 NIfTI 格式进行数据存储、去除患者的隐私信息、将坐标系统同一为左后上（LPS）坐标系统、采用 FSL 的 BET 工具去除颅骨、多序列统一配准到 T1 解剖学模板、统一影响分辨率和起始位置。

数据预处理时，首先由两名经验丰富的影像科医生共同精心挑选具有代表性的影像作为参照，根据研究目标分别选择四张低级别脑胶质瘤影像和四张高级别脑胶质瘤影像，预选 30%训练数据分别根据选出的影像进行直方图规定化，选择模型性能最好的参考影像作为参考帧对训练集中所有数据进行直方图规定化，对于新到样本采用同样的参数进行规定化。

结果

对消歧和预处理前后的数据分别计算特征并进行脑胶质瘤分级模型训练，以评价消歧和预处理算法的有效性。采用九种分类器和其中特征选择算法，采用十折交叉验证进行模型训练。实验结果表明，对影像进行预处理能提升模型的预测性能，曲线下面积（AUC）、精确度、敏感性、特异性、阳性预测值和阴性预测值均能普遍提升 7%到 15%。

结论

本文提出的数据消歧方法可以统一数据规格，提高多中心数据共享的效率；通过脑胶质瘤影像结合医生经验进行直方图规定化，使得所有影像的宏观亮度分布一致，提升了影像特征的可对比性。

EPO-2681

基于 MRI 增强扫描纹理分析评价脑膜瘤的异质性

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目的：基于 MRI 增强扫描纹理分析评价脑膜瘤异质性、评估纹理分析鉴别 I/II 级与 III 级脑膜瘤的效率。

材料与方法：55 位病人行 MRI 增强扫描检查（I 级 30 个，II 级 19 个，III 级 10 个），由两位放射科医师在 MRI 增强轴位图像上逐层勾画感兴趣区，以获得整个肿瘤体积内的数据，用组内相关系数检验两位医师测量的一致性，纹理分析的相关参数用 firevoxel software 导出。异质性的相关参数“熵、峰度、偏度及不均匀性值”用单因素方差分析进行检验，最后用单样本 t 检验比较两组间的差异。

结果：两位影像科医师的异质性参数一致性较好。III 级脑膜瘤的熵和不均匀性参数值明显高于 I/II 级脑膜瘤。I 级和 II 级脑膜瘤之间的的不均匀性参数有显著性差异（$P<0.05$）。当熵值为 5.58 时，鉴别 I/II 级与 III 级脑膜瘤的灵敏度、特异性和准确性分别为 81.8%、83.3%和 83.1%。当不均匀性值为 0.192 时，鉴别的敏感性、特异性和准确性分别为 90%、77.6%和 72.9%。

结论：基于 MRI 增强扫描纹理分析可用于评价脑膜瘤的异质性，熵与不均匀性参数值和肿瘤分级有很高的相关性。

EPO-2682

基于自适应超像素的脑胶质瘤自动分割方法

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目的

脑胶质瘤感兴趣区的自动分割对脑胶质瘤分级模型的临床应用非常重要，基于自动分割才能够先于医生实现对脑胶质瘤的辅助分级，进而为医生提供决策建议。本章提出了一种基于超像素技术的自动分割方法，通过对每个超像素计算特征并进行分类实现对脑胶质瘤的自动分割。

方法

在磁共振序列中，T2 序列主要反映水肿区，对应的感兴趣区范围往往能够囊括其他区域，因此本文选用 T2 序列作为分割目标。该方法分为两步：

首先利用影像中左右脑大致对称的原理，以块为单位寻找疑似肿块，在影像上放置 16*16 的网格，对左右脑对应的网格计算网格相似度，通过阈值评价网格是否为肿瘤区域，通过左半脑疑似区域计算肿瘤面积比，通过疑似区域边界与面积的壁纸计算肿瘤边界复杂度，然后利用随机森林算法对超像素个数 K 进行预测，并利用 SLICO 算法进而获得高质量的超像素图；

然后针对每个超像素计算特征和标签，超像素特征包括统计学特征、纹理特征、曲率特征和分形特征四类，然后计算超像素与手工标注对应区域的 Dice 相似度系数，通过相似度系数与阈值比较来设置超像素的标签。最后，将超像素特征和标签灌入 SVM 分类器进行模型训练，针对新样本时，通过对超像素进行模型预测的方法实现对感兴趣区的分割。

结果

超像素个数 K 的预测是本方法的关键，经实验发现，拟合回归预测的 K 与手工选择的 K 的决定系数为 0.9719。经 BraTS2017 数据集测试结果表明，算法具有较好的分割性能，评价指标 Dice、Hausdorff 距离、敏感性和特异性分别为平均 0.8492、3.4697、81.47%和 99.64%；算法具有较好的稳定性，在高级别脑胶质瘤和低级别脑胶质瘤具有类似的性能指标。

结论

算法具有较好分割进度和分割稳定性，能够作为一种全自动脑胶质瘤分割算法集成到各类脑胶质瘤计算机临床辅助诊断应用中。

EPO-2683
深度学习技术对基层医院影像科医生筛查肺结节的辅助价值初步研究

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目的：探究基层影像医生结合人工智能软件对厚层胸部 CT 中 4mm 以上结节检出效能的差异。

材料与方法:前瞻性收集 2019 年 3 月 1 日至 2019 年 3 月 31 日在大连大学附属中山医院接受常规胸部 CT 检查的 132 例患者并进行 5mm 层厚骨算法重建.由两名十年以上诊断经验主治医师和一名十五年以上诊断经验副主任医师借助人工智能软件（InferRead CT_Lung 6.0，Infervision，Beijing，China）对 132 例病例图像的肺结节制定金标准。分俩组对 132 例图像中 4mm 以上结节查找：A 组（两位基层医疗机构影像医生）和 B 组（两位基层影像医生借助 AI）。记录结节数、长轴直径、位置和标记时间。将 A 组和 B 组的正确结节、假阳性结节和假阴性结节的数量与金标准进行比较，计算敏感度、假阳性率、准确度和假阴性率。最后，采用配对样本 t 检验比较两组敏感度、假阳性率、准确度、假阴性率和标记时间的差异。并比较 A 组和 B 组之间的统计差异。P＜0.05 为有统计学差异。

结果：A 组和 B 组 4mm 以上肺结节检出总数为 172 和 293 个。其中正确结节为 112 和 171 个，假阳性结节为 60 和 122 个。敏感度分别为 0.462±0.408、0.639±0.392 ，假阳性率分别为 0.561/CT、1.140/CT ，准确度分别为 65.12%、58.36%，假阴性率分别为 0.538±0.408、0.361±0.392.B 组的敏感度高于 A 组。P＜0.05 差异有统计学意义。

结论：

与无人工智能辅助相比，配备人工智能的基层影像医生对厚层图像 4mm 以上肺结节的标记时间更短，诊断敏感度更高。

EPO-2684
基于深度学习的人工智能诊断系统对低剂量与常规剂量 CT 扫描中实性肺结节识别研究

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目的：观察基于深度学习的人工智能（AI）诊断系统对低剂量与常规剂量 CT 扫描中实性肺结节识别能力有无差异。
方法：收集 2018 年 11 月—2019 年 2 月在我院常规胸部 CT 扫描 82 例及低剂量 CT 扫描的 83 例患者，然后用标准算法（B31）进行重建。由 3 名工作满五年以上医生结合 AI 识别结果进行标注，讨论意见一致作为金标准。用人工智能（AI）肺结节诊断系统分别对常规剂量及低剂量 CT 扫描图像进行肺结节识别。分别记录实性肺结节金标准数、真阳数、假阳数，并计算 AI 对常规剂量及低剂量 CT 扫描下实性肺结节识别的敏感度，假阳比（假阳性结节数/金标准结节数）。使用 MeDcalc17.0 软件比较两组间敏感性有无统计学差异。
结果：低剂量 CT 扫描中实性肺结节金标准总数为 120 个，AI 识别实性肺结节数为 331 个，真阳数 112 个，敏感性为 88.9%，假阳比为 1.82。常规剂量 CT 扫描中实性肺结节金标准总数为 176 个，AI 识别实性肺结节数为 238 个，真阳数 165 个，敏感性为 93.8%，假阳比为 0.41。两者之间敏感性比较，P＞0.05。
结论：在低剂量与常规剂量 CT 扫描中 AI 识别实性肺结节敏感度无差别。由于低剂量扫描中 AI 识别假阳比较高，因此患者在低剂量常规检查中需加强医生筛查。

EPO-2685
基于深度学习的人工智能诊断系统在不同重建参数下对肺结节的识别研究

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目的：本研究旨在评估重建算法对 AI 识别肺结节的影响。
方法：收集 2018 年 11 月—2019 年 2 月我院行常规 CT 扫描的胸部病例 82 例，然后用 3 种不同重建算法（软组织算法 B10、标准算法 B31、高分辨率算 B70）获得 3 组数据。由 3 名工作满五年以上医生在标准算法（B31）的图像中参考人工智能识别结果进行结节标注，讨论意见一致作为金标准。用人工智能（AI）肺结节诊断系统分别对 3 种重建算法的图像进行肺结节识别并记录结节层数、部位、大小、密度。记录不同重建算法下肺结节总数、真阳数并计算 AI 对肺结节识别的敏感度，假阳性比（假阳性结节数/金标准结节数）。使用 MeDcalc17.0 软件比较各组间敏感性有无统计学差异。
结果：金标准肺结节总数为 276 个，B10、B31、B70 算法下识别结节总数分别 324、487、365 个，实性结节、非实性结节、钙化结节金标准分别为 176、55、46 个。AI 在 B10 算法中识别实性结节、非实性结节、钙化结节敏感度，假阳比分别为 65.3%、0.625； 58.2%、0.291； 87.0%、0.196。B31 算法下识别实性结节、非实性结节、钙化结节敏感度，假阳比分别为 93.8%、0.415；87.3%、0.691；91.3%、0.413。B70 算法下识别实性结节、非实性结节、钙化结节敏感度，假阳比分别为 72.2%、0.693；60.0%、0.436；71.7%、0.522。AI 在 B31 重建算法下识别实性肺结节的敏感度较高，达 91.3%，与 B10、B70 相比，P＜0.05. 在 B10 算法下 AI 对钙化结节识别的假阳比最低。在 B31 算法下 AI 识别≤4mm、>4mm 肺结节的敏感性与 B10、B70 之间相比，P＜0.05.
结论：基于深度学习的人工智能检测软件，对肺结节识别具有较高敏感性。不同重建算法对 AI 识别不同密度结节具有差异性。

EPO-2686

基于 CT 的影像组学方法预测膀胱癌病理分级的初步研究

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目的：本研究评价基于 CT 的影像组学预测模型诊断膀胱癌病理分级的可行性。**方法：**回顾性收集 2014.10-2017.09 于本院行 CT 泌尿系成像（CTU）检查、且经术后病理证实为膀胱尿路上皮癌的患者 145 例，其中男 109 例，女 36 例，患者平均年龄 64.0±11.9 岁，将患者随机分为训练组（108 例）和测试组（37 例）。对图像进行滤波处理后进行特征提取，用单因素方差分析来识别与病理分级相关的最佳特征，采用 Logistic 回归模型进行统计分析，并计算敏感性、特异性、阳性预测值（PPV）、阴性预测值（NPV）、准确性和曲线下面积（AUC）等诊断效能指标。**结果：**在训练组和测试组中，该预测模型诊断膀胱癌病理分级的 AUC 分别达到 0.950 和 0.860，在测试组中，该预测模型诊断膀胱癌病理分级的敏感性、特异性、PPV、NPV 和准确性分别为 0.885、0.727、0.885、0.727 和 0.838。**结论：**基于 CT 的影像组学预测模型可以在术前准确诊断膀胱癌病理分级，为膀胱癌的诊疗提供参考，有重要临床意义。

EPO-2687
基于整张手腕骨影像深度学习的骨龄人工智能模型的临床应用

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【摘要】目的：探讨基于整张手腕骨影像深度学习探测骨龄的临床应用，为骨龄的人工智能模型应用于临床提供理论依据。**材料与方法：**建立基于整张手腕骨影像深度学习的骨龄人工智能模型，在实验室完成训练、测试及验证，并不断优化模型，使其准确率达 94.73%，将模型在医院的 PACS 上线，对我院 2014 年 3 月 1 号-2016 年 1 月 30 号 10608 例骨龄影像资料进行评估，对其准确性、系统稳定性及前后一致性、系统的兼容性以及存在的各种误差的原因进行分析。**结果：**参照儿科放射科医生基于 GP 图谱和 TW3 综合评估的读数，误差在±1.0 岁以内 15 岁及以下儿童模型读数的准确率 97.65%，误差在±1.0 岁以内 15-18 岁的准确率为 83.01%；模型在院内 PACS 能顺畅运行，骨龄序列内有骨龄图像外的其他图像、图像曝光度以及手腕部方向、姿势、FOV 影响模型的准确读数。**结论：**基于整张手腕骨影像深度学习的骨龄人工智能模型能很好地应用于临床，有较高的准确性及兼容性，可以作为骨龄读数的工具。

EPO-2688
基于 MRI 直方图纹理组学特征对子宫内膜癌病理分级的预测价值初探

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目的 探讨基于 MRI 病灶全域直方图纹理组学特征对子宫内膜癌术前分级诊断的价值
方法 回顾性分析 2015 年 1 月至 2017 年 12 月安徽省肿瘤医院经手术病理证实为子宫内膜癌患者，符合入组患者 100 例。按低级别（包括 1、2 级）与高级别（3 级）分为 2 组，低级别组 67 例（1 级 19 例、2 级 48 例）、高级别组 33 例（3 级）。应用 GE Analysis Kit（AK）软件在 MRI 增强动

脉期手动逐层勾画病灶 ROI 后融合，获取病灶全域灰度直方图参数。数据预处理后按训练组数据占比为 0.69 随机分配训练组与验证组。应用 Lasso 法筛选特征参数，采用 Bayes 法构建预测模型，使用验证集数据在诊断模型上的准确性评估模型效能。
结果 训练组 69 例（低级别 46 例，高级别 23 例），验证组 31 例（低级别 21 例，高级别 10 例）。AK 软件提取病灶全域灰度直方图特征参数共 42 个，采用 Lasso 法筛选后特征参数为 6 个，分别为 uniformity、Percentile10、Percentile75、histogramEnergy、Range、Variance。基于上述 6 个直方图参数，用 Bayes 法构建评估子宫内膜癌分级的预测模型。该模型的训练集敏感性、特异性、准确性分别为 0.739、0.826、0.797，验证集敏感性、特异性、准确性分别为 0.700、0.905、0.839。
结论 基于 MRI 直方图纹理组学特征对于术前预测高、低级别子宫内膜癌有一定价值，验证集数据准确性达 83.9%。

EPO-2689
用深度学习和阈值算法自动检出 CT 平扫图像中肾结石的研究

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目的 验证 CT 平扫图像中自动检出肾结石级联模型的准确性。**方法** 回顾性搜集从 2018 年 1 月到 2018 年 7 月在我院行泌尿系 CT 平扫并诊断为肾结石的病例。图像分为两组：30 例训练数据集和 29 例测试数据集，用于级联建模。建模分为三个步骤，第一步是肾脏分割的模型训练，第二步是肾结石检出；第三步是肾结石测量并将结果返回到报告。第一步： 训练用于肾脏分割的 U-Net 神经网络算法，以 dice 系数评估肾脏分割算法的性能。第二步：在肾脏分割的基础上，用阈值算法和区域生长算法检出所得肾脏区域里的结石。第三步：使用包绕结石的最小椭球体测量结石径线，得到 CT 值，并将测量结果返回到结构化报告中。以医生检出结果为金标准，计算软件自动检出结石的灵敏度和精确度。**结果** 在训练数据集和测试数据集上，肾脏分割模型的平均 dice 系数分别为 0.95 和 0.94。在测试数据集上，肾结石检出算法的灵敏度和精确度分别为 100％（56/56）和 96％（56/58）。**结论** 肾结石检出级联算法可以在 CT 平扫图像中自动检出肾结石，并自动返回结构化报告提高临床工作效率。

EPO-2690
直肠癌淋巴结转移磁共振影像组学模型的建立及比较

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目的：通过两种特征筛选方法建立直肠癌淋巴结转移患者磁共振影像组学模型，以期辅助临床诊疗方案的制定。
材料与方法：回顾性纳入 2016 年 2 月-2018 年 2 月在我院进行术前基线磁共振扫描的患者。获取其高分辨 T2 加权(T2 weighted imaging, T2WI)、高分辨弥散加权成像(diffusion weighted imaging, DWI)和表观弥散系数图(apparent diffusion coefficient, ADC)影像。直肠癌诊断、分期及判断淋巴结是否转移的金标准为术后病理。由超过 5 年直肠癌诊断经验的医师使用 ITK-SNAP 软件勾画兴趣区(region of interest, ROI)，通过 Artificial Intelligent Kit(A.K.)软件提取影像组学特征。提取的影像组学特征通过 Spearman 和差异性检验进行数据降维和去冗余后，

剩余的特征分别使用支持向量机(support vector machine, SVM)和随机森林法建立影像组学模型。受试者特征曲线(receiver operator curve, ROC)用于评价模型准确性。
结果：本研究纳入 385 位直肠癌患者，病理组织结果证实淋巴结转移 129 位，非淋巴结转移 256 位。每位患者每个序列图像提取 396 个组学特征，共计 1188 个特征。经过特征筛选后，SVM 共选择 28 个特征、随机森林法选择 14 个特征用于模型构建。所构建的模型的 ROC 曲线下面积分别为 SVM 训练集 0.86，在测试集 0.62；随机森林法训练集 0.96，测试集 0.60。
结论：磁共振影像组学模型的建立，有助于对直肠癌淋巴结转移的评估。模型的选择对评估的准确性有一定的影响。

EPO-2691

Develop CT-based Radiomics Model to Automatically Identify Acute Cholecystitis

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PURPOSE
Acute cholecystitis (AC) has a high prevalence and accounts for a large proportion of emergency patients in China. This paper proposes a binary radiomics model aiming to identify AC from CT images.
METHOD AND MATERIALS
1. We selected 100 abdominal CT scan images from the emergency patients as a binary predictive model training data set, including cholecystitis, simple gallstones, gallbladder adenomyosis, and normal gallbladder. These cases were classified into two groups of acute cholecystitis and non-acute cholecystitis based on the diagnosis in the previous reports. These reports were completed by two experienced radiologists. 2. Label each layer of gallbladder on thin-slice abdominal CT images using post-processing station (IntelliSpace Discovery, Philips, Best, The Netherlands) to determine the region of interest. Delineated areas include edema of the gallbladder wall and gallstones. 3. Extracting and selecting radiomics features from CT images by using Relief (Relevant Features) filter feature selection algorithm. It was designed for application to binary classification problems with discrete or numerical features. Relief calculates a feature score for each feature which can then be applied to rank and select top scoring features for feature selection. Alternatively, these scores may be applied as feature weights to guide downstream modeling. Radiomics model performance is evaluated by calculating AUC in the training test data set.
RESULTS
The model achieved an AUC of 0.89. Sensitivity=0.82, Specificity=0.89, Accuracy=0.82.
CONCLUSION AND CLINICAL RELEVANCE/APPLICATION
The established radiomics model based on small samples basically achieves the expected performance. The model can improve performance and test by further increasing training data. The final model can be used for the diagnosis of acute cholecystitis.
AC accounts for a large proportion of emergency patients in China. Automatic diagnosis and reporting of acute cholecystitis can reduce patient waiting time while reducing the pressure on the radiologists. Establishing a group model is an important part of it. Combined with the automatic segmentation algorithm of the gallbladder, artificial

intelligence can realize the automatic delineation of gallbladder on CT images, further automatically identify cholecystitis, and calculate the gallbladder, providing more information for clinical treatment.

EPO-2692

Automated Pancreas Segmentation Based on Multi-modal Fusion of Dual-energy CT Images

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Purpose:
Accurately segmenting pancreas from CT images remains highly challenging even using advanced deep learning techniques due to the extremely high variability in pancreas' shape and volume among patients. Our study aims to investigate the feasibility of fusing multimodal images as an effective mechanism for improving the accuracy of deep learning based pancreas segmentation.

Methods:
We collected 73 dual-energy CT scans of both the arterial and portal venous phase. For each CT scan, we generated 11 sets of portal venous phase recombinant monochromatic images from 40keV to 180keV. For those smaller than 100keV, the reconstruction stride was set to 10keV, and for those greater than 100keV the stride was 20keV. We refer to the images of different contrast as modalities. We employed the Recurrent Saliency Transformation Network (RSTN), which is a state-of-the-art deep learning network for automated pancreas segmentation. RSTN adopts a two-stage network to realize coarse-to-fine segmentation. The first-stage identifies a ROI containing the pancreas, and the second stage aims to produce accurate pancreas segmentation within the ROI. We trained the RSTN model using the 82 portal vein CT volumes from the NIH Pancreas-CT Dataset. We registered our CT images of the arterial and the venous phase via the non-rigid registration method. We applied the segmentation model to each portal venous registered CT volume of our dataset and obtain the corresponding segmentation result. We fused the segmentation results from different modalities to obtain the final results.

Results:
The average accuracy (DSC) of our conventional portal vein dataset is 81.03%. Modalities of arterial phase and 50keV, 60keV, 70keV, 80keV are found to yield more complementary information for portal vein than other keVs. By fusing portal vein and the five modalities, the accuracy of the RSTN segmentation model increases to 88.31%, which is 7.29% higher than the result of the portal vein.

Conclusion:
Multi-modalities fusion can obviously improve the segmentation accuracy of pancreas and the improvement mainly lies in the miss segmented region of the portal vein, such as the head and tail of pancreas.

EPO-2693

Prediction of pretherapeutic differentiation degree of cervical cancer using DCE-MRI radiomics model

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Objective To explore the value of radiomics features based on DCE-MRI in Predicting the differentiation degree of cervical cancer before treatment.
Methods 97 patients pathologically confirmed cervical cancer from March 2017 to December 2018 were analyzed retrospectively.54 cases were selected as training group,including 9 cases with high differentiation,20 cases with moderate differentiation, and 25 cases with poor differentiation.The other 43 patients were included in the validation group,including 7 with high differentiation, 17 with moderate differentiation, and 19 with poor differentiation. Routine MRI and DCE-MRI scans were underwent by all patients, and the largest level measurement of the penultimate phase in the original image of DCE-MRI was selected..ITK-SNAP and R language software were used for radiomics features extraction.The LASSO regression analysis was used for features selection.Logistic regression was performed to develop models and validation.The prediction performances were evaluated with ROC analysis and AUC curve.
Results A total of 945 features were obtained and reduced to six features as the most important discriminators for differentiation degree of cervical cancer.The prediction model was developed with maximum2DDiameterRow,glcm-ClusterShade,glszm-GrayLevelVariance,wavelet.LHL-Texture-ngtdm-Busyness,wavelet.HLL-FisrtOrder-Skewness and wavelet.LLL-FisrtOrder-Kurtosis.The radiomics features of the training group were tested by the verification group. The specificity of the specific-sensitivity curve obtained by logistic regression was 71.2%, the sensitivity was 65.8%, the positive predictive value was 0.762, and the negative predictive value was 0.684. The obtained characteristics were verified by the high, middle and low differentiation groups of the validation group. The area under the ROC was 0.896, 0.700, 0.716, the average AUC was 0.765, and the specificity was 86.4%, 69.2%, 76.1% respectively , sensitivity is 68.6%, 79.5%, 81.2%.
Conclusion Radiomics features based on DCE-MRI have good repeatability and are of high value for predicting pre-treatment differentiation of cervical cancer.

EPO-2694

application of pixel-shift technique for Cerebral Digital Subtraction Angiography Motion artifacts correction

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Purpose:
Interventional Digital Subtraction Angiography (DSA) is a subspecialty of radiology in which minimally invasive procedures are performed with imaging guidance, and cerebral DSA is the golden standard for diagnosis of cerebral vascular diseases. Cerebral vascular anatomy is complicated which needs high image quality of cerebral angiography for diagnosis, but during this examination process motion artifact is common due to the uncompliant patients. This study was to evaluate the application of pixel-shift technique in the cerebral digital subtraction angiography for motion artifact correction.
Method:
This study was performed in an Artis zee floor Interventional Angiography System from Siemens (German). In the study, angiography images from fifteen cases of cerebral digital subtraction angiography (DSA) examination were retrospectively collected from the PACS system of our hospital for the studies; and in all these cases, there are occurrence of motion artifact in the angiography images, include angiography of carotid or Vertebral artery. Region based automatic Pixel-shift function was used to correct the motion artifact of angiography. Region based automatic Pixel-shift function need to put a region of interest (ROI) in the image before the process. During the study we put the ROI in two different places, a: the target artery and b: region outside the target artery. Group a and group b was evaluated by two experienced radiologist respectively, and the assessing results was compared. Besides, these two groups were also compared to the original images.
Results:
The angiography image with best image quality was the group a, all the image with no motion artifact of target artery, with statistical significant. Although image quality of group b is not as good as group a, it is better than the original image, with statistical significant.
Conclusion: region based automatic pixel -shift method is a feasible tool for Motion artifact correction of Cerebral Digital Subtraction Angiography, and put the region of interest in the target artery is suggested to further improve the image quality.

EPO-2695

Radiomics analysis of gadoxetic acid-enhanced MR imaging for early recurrence and microvascular invasion prediction in hepatocellular carcinoma: comparison of tumor, penumbra and liver parenchyma

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Purpose
We aimed to evaluate and compare the ability of gadoxetic acid-enhanced MRI-based radiomics features, derived from intratumor, peritumoral, and background liver parenchyma, for preoperative prediction of early recurrence (<1year) and microvascular invasion (MVI) in HCC patients.
Method
46 patients with surgically confirmed HCC were enrolled in this IRB-approved prospective study. Tumor segmentation was performed on multiple phases (T2-weighted, non-enhanced T1-weighted, arterial phase, portal venous phase and hepatobiliary phase images). Three different regions of interests were delineated on each phase with the combination of automatic and manual approach: 1) a region of the entire tumor (ROI_{tumor}); 2) a 1cm-wide radius surrounding the tumor boundary ($ROI_{penumbra}$); and 3) a region of liver parenchyma excluding intratumor and peritumoural region (ROI_{liver}). The least absolute shrinkage and selection operator (LASSO) regression analysis was used to select radiomics features for building radiomics model (Rad-score). Then, a radiomics nomogram incorporating the radiomics features and subjective imaging findings was constructed using multivariable logistic regression analysis. Receiver operation characteristic (ROC) analysis and Delong's test were performed to evaluate and compare the discriminative performance.
Results
For early recurrence prediction, the highest area under receiver operating characteristic curve (AUC) with a value of 0.966 were obtained from Rad-score ($ROI_{penumbra}$), followed by the Rad-score (ROI_{liver}) (AUC=0.919) and Rad-score (ROI_{tumor}) (AUC=0.865). For predicting MVI, the AUC values of Rad-score (ROI_{tumor}), Rad-score ($ROI_{penumbra}$) and Rad-score (ROI_{liver}) were 0.950, 0.944 and 0.877, respectively. The Rad-score ($ROI_{penumbra}$) (odds ratio[OR]=2.72, 95%CI[1.5,4.93]; $p=0.009$), AFP level(OR=6.8, 95%CI[1.84,25.19]; $p=0.007$) and multifocality (OR=4.5,95%CI[1.17,17.3]; $p=0.050$) were identified as independent predictors for early recurrence. After comprising three predictive factors, the integrated radiomics nomogram showed an improved predictive performance compared to the Rad-score ($ROI_{penumbra}$) (AUC, 0.972 vs.0.966, $p<0.05$).
Conclusion
Peritumoral radiomics features along with clinical-radiological features had the potential of predicting early recurrence and MVI in HCC patients, which may assist in preoperative clinical treatment decision-making.

EPO-2696

Radiomics Features of Multiparametric MRI for Prediction of Progression-Free Survival in bone metastases from prostate cancer

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PURPOSE
To identify MRI-based radiomics features as prognostic factors in patients with bone metastases from prostate cancer.

METHOD AND MATERIALS
Ninety-eight patients with bone metastases from prostate cancer were enrolled,and the data was gathered from January 2010 to January 2018. A total of 976 MRI-based texture features were extracted from axial T2-weighted (T2-w) and dynamic contrast-enhanced T1-weighted (DCE T1-w) MRI. Step regression, ridge regression and logistic regression method model was applied to select features and develop the predicting model for progression-free survival (PFS). The predictive performance of the model was evaluated in the training cohort and validated in the validation cohort using 10-fold cross-validation. The risk score was calculated, the patients were divided into low-risk and high-risk groups according to median risk score. Stratified Kaplan-Meier survival analysis was performed to estimate PFS in low-risk group and high-risk group. Nomogram discrimination was evaluated. The relative hazard ratio (HR) of MRI-based texture features and clinical data as risk factors of PFS was calculated in Cox proportional hazards model. We built clinical and MRI-based texture features nomogram to predict PFS. C-index was obtained from Cox proportional hazards regression analysis.
RESULTS
The MRI-based radiomics signatures, which consisted of 6 selected features, were significantly associated with PFS(P<0.01). The predictive performance of logistic regression model in the training cohort (accuracy=0.93) and validation cohort (accuracy=0.87) using 10-fold cross-validation showed a good agreement. Kaplan-Meier survival analysis showed that PFS was significantly lower in high-risk patients than low-risk patients(P<0.01). The MRI-based texture features derived from T2-w images yielded a C-index of 0.713. The MRI-based texture features derived from DCE T1-w images yielded a C-index of 0.658 . The nomogram integrated the radiomics signature with clinical data yielded the highest C-index, which was 0.785(95% CI:0.679-0.891). Cox proportional hazards regression analysis identified MRI-based radiomics signature as an independent risk factors (HR:1.190, 95%CI:0.602-2.351).
CONCLUSION
Multiparametric MRI-based radiomics nomograms provided improved prognostic ability in patients with bone metastases from prostate cancer.

EPO-2697

Between-network resting state functional connectivity for diagnosis of major depressive disorder with multivariate pattern analysis

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Aim: The individual diagnose of patients with major depressive disorder (MDD) with multivariate pattern analysis (MVPA) method based on resting-state fMRI has attracted

increasing attention. However, few reports aimed at the classification between first-episode, drug-naïve MDD patients and healthy controls. The aim of the current study was to investigate the resting-state functional connectivity in first-episode, drug-naïve MDD patients for diagnosis. **Methods:** We analyzed resting state fMRI data from 31 MDD and age- and gender-matched 31 healthy controls. Then MVPA was employed to classify MDD patients from healthy controls. **Results:** The experimental results exhibited a correct classification rate of 82.25% ($P < 0.001$) with sensitivity of 83.87% and specificity of 80.64%. The consensus connections used to distinguish MDD were mainly located in between-network resting state functional connectivity in the default mode, affective, executive, visual cortex and cerebullum network. Moreover, the right supramarginal exhibit high discriminative power in classification. **Conclusions:** The current study provided evidence that between-network resting-state functional connectivity can be used as an effective tool for MDD clinical diagnosis, which may reveal the potential pathological mechanism for major depression.

EPO-2698
人工智能肺结节技术联合肺结节 Lung-RADS 分级在孤立性肺结节中的诊断价值

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目的：探讨如何利用人工智能（artificial intelligence ，AI）肺结节技术联合肺结节 Lung-RADS 分级、CT 征象的方法提高孤立性肺结节的诊断效能。方法：回顾性分析 65 例经病理结果定性的孤立性肺小结节（良性 13 枚、恶性 52 枚），所有病灶的影像图象由两名高年资影像医生分步进行不同方式的阅片，第一步由第一名医生对每位患者的所有影像图象进行正常阅片，从阅片中寻找病灶并进行时间记录，之后由第二位医生利用人工智能肺结节技术进行寻找病灶（排除假阳性病灶）并记录所需时间，得出相应数据后进行数据对比；第二步由第一名正常阅片的医生在其筛查出的病灶中，采用肺结节 Lung-RADS 分级标准对肺结节进行良、恶性的诊断，第二位医生利用人工智能肺结节技术在人工智能肺结节系统上对筛查后的病灶智能诊断结果联合 Lung-RADS 分级对病灶良、恶性进行判断；最后在对照病理结果后对比两组数据的差异性。结果：第一组数据中，测试共 65 枚孤立性肺结节，高年资训练有素的医生共检查出 55 枚结节，其中真阳性结节 55 枚，假阳性结节 0 枚，耗时 3 小时 20 分；高年资医生在人工智能肺结节系统上检查出 65 枚结节，其中真阳性结节 65 枚，假阳性结节 0 枚，耗时 9 分 46 秒。第二组数据中，高年资训练有素的医生所检出 55 枚阳性结节中判定为良性数目为 15 枚、恶性数目为 40 枚；高年资医生在人工智能肺结节系统上所检出 65 枚阳性结节中判定为良性数目为 14 枚、恶性数目为 51 枚。结论：人工智能肺结节系统能够有效降低漏诊风险和减轻日常工作中的数据测量等负担，在结合肺结节 Lung-RADS 分级后，可明显提高孤立性肺结节的诊断效能，使我们能够有更多的精力为临床医生及患者提供更加优质、更高水平的服务。

EPO-2699
基于公共免费软件技术的医学影像远程传输系统的时效测试

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目的 应用大众化的网络设备及资源，快捷地建立医学影像远程“点对点”传输系统，并测试稳定性及传输速率。**方法** 分别在两台便携式电脑上安装 Merge eFilmWorkstation 软件及蒲公英 VPN 软件，通过 Internet 建立 DICOM 远程传输系统，选取 DR 及 CT 检查各 30 例，共 1190 副图像，以天津市-天津市、天津市-临沂市、天津市-乐山市分别进行稳定性、传输速率测试。**结果** 共进行 10 次传输实验，均未出现中断及延迟。天津市-天津市、天津市-临沂市、天津市-乐山市平均每幅 DR 图像传输耗时分别为 7.3 秒、10.3 秒和 32.6 秒；平均每幅 CT 图像的传输耗时分别为：0.4 秒、0.4 秒和 1.6 秒。**结论** 本研究中的基于软件 VPN 技术的医学影像远程传输系统可稳定实现医学影像图像的远程“点对点”传输。传输速率随传输终端距离的加大而降低。

EPO-2700

增强 CT 对基于深度学习的计算机辅助诊断系统（DL-CAD）检测肺结节长径和体积的影响

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目的：探讨增强 CT 对对基于深度学习的计算机辅助诊断系统（DL-CAD）检测肺结节长径和体积的影响。

方法：回顾性分析 40 例良恶性肺结节患者的平扫及双期增强 CT 图像，扫描方法为：管电压=120kVp，管电流使用自动调节技术，NI=14，药量根据患者体重调节，动脉期、实质期分别于开始注射对比剂后 30s、60s 扫描。使用标准卷积核重建层厚为 1.25mm CT 图像。使用经过大量训练的基于深度学习的人工智能诊断系统（InferRead CT lung research, Infervision, Beijing）检测平扫、动脉期、实质期重建 CT 图像上结节的体积和最大径。采用配对 t 检验比较三组间肺结节的最大径、体积。

结果：相对于平扫 CT 图像，人工智能检测增强扫描图像上肺结节长径及体积增大（P＜0.05）（图 1），且实质期肺结节长径及体积大于动脉期，差异有统计学意义（P＞0.05）。平扫、动脉期、实质期 CT 图像经深度学习的人工智能诊断系统检测得到的结节长径和体积如表 1、图 2 所示。

结论：增强 CT 影响人工智能检测肺结节体积和最大径和体积。相对于平扫，增强扫描 CT 图像经 DL-CAD 检测得到的结节长径及体积均增大，且实质期肺结节长径及体积大于动脉期。

EPO-2701

Automated Lesion Detection for ASPECTS assessment in Acute Ischemic Stroke using Deep Neural Network

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PURPOSE

The Alberta Stroke Program Early CT score (ASPECTS) is applied to assess severity of early ischemic changes (EICs) in pre-defined regions of acute ischemic stroke (AIS). However, brain atrophy and pre-existing infarcts increase the difficulty for clinicians in image interpretation. This study aimed to develop an artificial intelligence-assisted system (D-ASPECTS),and to validate its performance for detecting EICs,compared with experts.

METHOD AND MATERIALS

The admission NCCTs of 255 patients within 24 hours of stroke onset were used for this study. A convolutional neural network (CNN), 3D U-net model was trained to segment the lesions on 7 consecutive slices, which included 51 pre-set points in ASPECTS subregions at basal ganglia and supra-ganglionic levels. The numbers of EIC (multiple EICs in the same region counted as one) were subtracted from the initial score of 10 to compute final ASPECTS. All patients were randomly divided into a training set (n=141) and a test set (n=114, group A). In the test set, three subgroups were divided according to normal brain (n=53, group B), pre-existing infarcts (n=37, group C) and brain atrophy (n=46, group D). Each ground truth ASPECTS was rated by a neuroradiologist and a stroke neurologist with consensus achieved. The performance of D-ASPECTS dichotomy (score >=6 and <6) was evaluated by Matthews correlation coefficient (MCC) and Cohen's kappa, and the concordances between D-ASPECTS and experts in different subgroups were measured using interclass correlation coefficient (ICC).

RESULTS

In total, 2280 ASPECTS regions of 114 patients were evaluated. Comparing with the ground truth, D-ASPECTS showed the best MCC of 0.80 in group B, while 0.62, 0.36 and 0.37 in group A, C and D, respectively. The dichotomy (ASPECTS ≥6 and <6) subgroup analysis showed kappa coefficient of group A, B, C and D was 0.60, 0.78, 0.36 and 0.37, respectively. The ICC between D-ASPECTS and experts in the group A, B, C and D was 0.77, 0.88, 0.54 and 0.65, respectively.

CONCLUSION

D-ASPECTS had substantial consistency and high reliability with experts, especially in the patients without pre-existing brain changes. Brain atrophy and pre-existing infarcts can confound the detection of true EICs, thus reducing overall scoring accuracy.

EPO-2702

深度学习模型对纯磨玻璃结节肺腺癌病理亚型的预测分析

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目的 利用深度学习对 CT 上表现为纯磨玻璃密度结节（pure ground-glass nodule, pGGN）的肺腺癌进行分型，并与手术病理结果对比，探讨其对病理亚型的预测价值。**方法** 收集 219 例（共 240 病灶）经病理证实且 CT 上表现为 pGGN 的肺腺癌患者的 CT 影像与病理资料，根据病理分型，将其分为 2 组：第 1 组为非浸润性腺癌组，包括浸润前病变（不典型腺瘤样增生和原位腺癌）以及微浸润腺癌；第 2 组为浸润性腺癌组。首先对 pGGN 进行勾画与标记，然后将标记好的数据按照病理类型分组随机分为两组，学习训练组（80%）及验证测试组（20%）。同时，验证测试组中的数据结果

还需与两位胸部影像专家的评估结果进行对比。**结果** 深度学习模型对 pGGN 肺腺癌病理亚型的预测取得了较高的性能。深度学习诊断的准确性、特异性（83.3%、92.9%）均高于专家组（54.2%、28.6%）（P<0.05）。专家个人前后两次诊断的一致性 Kappa 值分别为 0.939 和 0.799；专家间的一致性 Kappa 值为 0.667。**结论** 深度学习模型能相对准确地判别 pGGN 的病理类型，诊断效能优于专家组判断。

EPO-2703
基于 CT 影像组学分类器对 Borrmann IV 型胃癌与原发性胃淋巴瘤的鉴别诊断价值

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目的 探讨基于 CT 图像的影像组学标签鉴别原发性胃淋巴瘤与 Borrmann IV 型胃癌的可行性。**方法** 回顾性分析 2009 年 1 月至 2017 年 4 月中南大学湘雅三医院经病理证实为原发性胃淋巴瘤或 Borrmann IV 型胃癌患者，且术前进行过腹部 CT 增强扫描的 71 例患者。其中原发性胃淋巴瘤患者 28 例，Borrmann IV 型胃癌患者 43 例。采用基于 Matlab 2017a 软件的特征提取算法提取影像组学特征，并利用 logistic 回归模型进行特征筛选以建立影像组学标签。通过纳入胃周脂肪浸润、胃壁柔软性、腹部淋巴结及周围脏器转移、腹水，黏膜白线征及病灶厚度等征象，构建 CT 征象诊断模型，应用 ROC 评估两模型的分类性能。**结果** 从每个患者 CT 扫描的肿瘤区域中提取 32 个三维特征，[D1] 通过降维发现 2 个特征是最重要的鉴别诊断因子并建立了影像组学标签；CT 征象诊断模型由腹水、胃周脂肪浸润、胃壁柔软性及黏膜白线征组成。放射组学标签和 CT 征象诊断模型的 AUC 值分别为 0.964 和 0.867；准确性分别为 94.4%和 80.2%；敏感性分别为 93.0%和 74.4%；特异性分别为 96.4%和 89.3%。经 Delong 检验，影像组学标签的诊断效能（AUC=0.964）高于 CT 征象诊断模型（AUC=0.867，P<0.001）。**结论** 基于 CT 图像的影像组学标签能够较准确地鉴别 Borrmann IV 型胃癌与原发性胃淋巴瘤，为临床辅助诊断提供有利的手段。

EPO-2704
计算机辅助检测系统在 HRCT 筛查不同密度肺结节中的应用

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目的：探讨计算机辅助检测系统（computer-aided detection, CAD）作为阅片工具，帮助低年资影像医生在筛查不同密度肺结节中的能力和价值。
方法：纳入 60 例 HRCT 检查有肺部结节的患者。由 2 名具有 8 年以上诊断经验的高年资影像医生同时阅读肺部 HRCT 图像，以 2 人一致性意见为标准在 *miPlatform* 系统上标注结节，在此基础上，CAD 阅片进行二次结节标注，随后由 2 名具有 15 年以上诊断经验的影像医生对上述标注的结节进行评价，2 位医生都认为是结节的最终定义为真性结节。根据密度将结节分为实性、部分实性和非实性结节，记录每种密度真性结节的个数。由 1 名低年资（3 年诊断经验）影像医生在不知道已确定的真性结节的情况下，独立阅读 HRCT 图像，记为方法 A；然后参照 CAD 标记结果修正方法 A 中的标记结果，记为方法 B，记录两种方法检出不同密度结节的个数。分别计算 A、B 方法检出结节的敏感度和假阴性率（漏检率）。

结果：共检出真性结节 292 个（实性 149 个、部分实性 45 个、非实性分别 98 个）。低年资医生使用两种方法误诊结节的个数分别为 116 个、53 个；实性结节、部分实性结节、非实性结节的误诊率分别为 18.10%、28.45%、53.45%和 30.19%、28.30%、41.51%。
结论：CAD 作为阅片工具，对于低年资影像医生检出肺结节有帮助，可以降低结节的误诊率，尤其是非实性结节的误诊率，有较大的临床应用潜能。

EPO-2705

Can metabolic features of magnetic resonance spectroscopy predict Neuropsychiatric Systemic Lupus Erythematosus Patients?

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Objectives:
To diagnose Neuropsychiatric systemic lupus erythematosus (NPSLE) early, creating a new deep learning model of multivoxel proton magnetic resonance spectroscopy (^{1}H-MRS).
Methods:
The retrospective study included 23 confirmed NPSLE patients and 16 healthy controls (HCs), who underwent 3.0T MRI with multivoxel magnetic resonance spectroscopy. 117 metabolic features were extracted from the multivoxel ^{1}H-MRS image. Initially, the Mann-Whitney U test picked out the diverse features between NPSLE and HCs. Then, for constructing a novel support vector machine (SVM) -based Deep Stacking Network (SVM-DSN) of multivoxel^{1}H-MRS, reselection of features was fulfilled by the Recursive Feature Elimination algorithm. Considering there were a little metabolite concentration value SD >20%, but the SNR of spectra ≥10 among the 39 subjects, we removed these values and replaced with null values. Furthermore, to ensure the accuracy of our mode, all the results were under the 10-fold cross-validation.

Results:
Thirty-three metabolic features from results of the Mann-Whitney U test were considered as a statistically significant difference (p<0.05). However, the Recursive Feature Elimination algorithm sampled 26 metabolic features which were considered respective for the prediction of NPSLE. Interestingly, not all of the 26 metabolic features came from the 33 with a statistically significant difference. Although individual feature does not manifest statistics significant, the SVM-DSN can still learn to distinguish the NPSLE patients from the control one, because multiple kernels map the features into higher dimensional Hilbert space to empower the SVMs to split the samples linearly. Using the extracted features by classier, the area under the receiver operating characteristic curve (AUC), sensitivity, specificity of the SVM-DSN model in predicting NPSLE was 97.5%, 100%,95% respectively.

Conclusion:

Metabolic features of multivoxel proton magnetic resonance spectroscopy (MRS) can be used to predict NPSLE, by establishing an SVM-DSN model. Moreover, not only did the deep learning model differentiate the NPSLE patients from the control one well, but also equipped good robust, which overcame the presence of spectral artifacts, indicating it could be used as a helpful non-invasion computer-aided diagnostic tool for NPSLE.

EPO-2706

利用 U-Net 模型在 CT 图像上实现肾实质和肾窦的分割及体积测量

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目的 利用 U-Net 模型实现 CT 图像上肾脏分割，测量肾实质和肾窦的体积。 **方法** 回顾性收集本院 PACS 中 365 个连续病例，均为腹部 CT 增强动脉期薄层图像。根据影像和临床资料，均为“正常肾脏”者。其中 93 例用于建模，272 例用于模型效能评价。全部 365 例用于体积测量。训练用于肾实质和肾窦分割的 U-Net 模型。由两位影像专家检查模型返回的分割结果，评价结果是否可用于体积测量。以最小体积包围盒算法测量双侧肾实质、肾窦径线。以去除最小连通域方法处理图像，保留像素数计算双侧肾实质和肾窦的体积。将测量结果自动填写到结构化报告中，完成肾脏大小的定量评估。计算肾实质、肾窦体积及三维经线的 95%参考值范围，应用多元线性回归方法分析年龄、性别、身高、体重与肾实质和肾窦体积的关系。**结果** 专家评价 U-Net 模型可很好地完成双侧肾实质和肾窦的分割。测试集中分割右肾实质的 DICE 值为 0.97，分割左肾实质的 DICE 值为 0.97，分割右肾窦的 DICE 值为 0.88，分割左肾窦的 DICE 值为 0.84，总 DICE 值为 0.98。多元回归分析显示不同侧别的肾实质体积和肾窦体积均与性别、年龄、身高、体重有一定关联。模型测量结果可自动填写入结构化报告中。 **结论** 基于 U-Net 可以有效分割 CT 图像上肾实质和肾窦，并测量及径线及体积，自动完成影像报告中双肾大小的定量评估。

EPO-2707

Use case of Critical Value- Register and Report Tuberculosis Automatically Based on Tuberculosis Structured Report

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Objective Tuberculosis (TB) is a chronic infectious disease that threatens human health seriously. Chest X-ray and CT are the main source of information for

TB. Active TB is a critical value that needs to be treated immediately. Registering and reporting active TB promptly is important for the prognosis and helps collect the temporal and spatial distribution of TB incidence and prevalence. An automated platform is needed to accomplish this task. **Method** The TB structured report is applied to detection, classification, infection assessment, and prognosis assessment of TB. The TB structured report contains 4 sections. First, clinical evaluation such as symptomatic consultation or reexamination of active TB. Second, technical evaluation, to decide whether the image quality is eligible. Third, lesion evaluation, which begins with the measurement,counting, localization of lesions in two lungs such as nodules, fibrosis, infiltration, cavity. The edge of the lesion and the satellite lesion need to be evaluated. For diffuse lesion, the size, density, and distribution should be evaluated. Besides, the hilum, heart, pleural effusion, diaphragm and costodiaphragm angle will be evaluated in turn. Fourth, the final diagnosis which will be generated automatically based on the findings chosen before, which can be edited to adjust or add words to make the report perfectly and smoothly. Eventually, the data fortress machine packages the data and uploads it to the cloud server, and then releases it to the professional staff of the infection control center who followed the WeChat Official Aaccount. **Result** Thanks to standardized lexicon and exhaustive report elements, the TB structured report can detect infectious active TB perfectly. Registering and reporting active TB automatically can provide real-time and structured data of active TB and contribute to management of healthcare data. **Conclusion** We constructed a TB structured report that can automate the registration and reporting TB with high quality and high efficiency.

EPO-2708
不同人工智能肺结节筛查分类模型检测实性结节的效能对比研究

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目的 探索不同人工智能肺结节筛查分类模型对实性结节检出效能的影响，从而遴选适合临床检测实性结节使用的模型。**方法** 回顾性收集内蒙古自治区人民医院影像医学科 117 例胸部 CT 平扫病例数据，均为层厚为 1 至 1.25mm 的薄层扫描序列。本研究使用的金标准由两位拥有超过 15 年胸部 CT 阅片经验的放射科专家共同制定，共计标注 310 个实性结节。利用基于深度学习的不同 AI 肺结节筛查系统（北京推想科技有限公司）检测入组病例中的实性结节，模型一是在深度神经网络（CNN）基础上自主研发的算法，模型二是在模型一基础上优化、减少假阳性结节的算法，模型三则是模型二基础上优化增强磨玻璃结节敏感性的算法，分别记录不同分类模型检测到的结节数。通过与金标准对比，分析不同模型检测到的真阳性结节，假阳性结节和假阴性结节的数量，计算模型检测敏感性和假阳性率（假阳性结节数/CT）。卡方检验用于统计分析，$P<0.05$ 时具有统计学意义。**结果** 在入组的 117 个病例数据中，模型一检测到 798 个实性结节，仅 274 个是真阳性结节，假阴性结节为 36 个，检测敏感性为 88.39%；假阳性率高达 4.48/CT。与针对假阳性结节改进优化的模型二相比，模型二检测到的实性结节数显著减少，降至 626 个，减少的部分主要是假阳性结节，真阳性结节为 270 个，假阴性结节为 40 个，检测敏感性为 87.1%（$p>0.05$），假阳性率降至 3.04/CT。对比模型三的效果，597 个实性结节被检出，266 个是真阳性结节，假阴性结节数为 44 个，检测敏感性为 85.81%（$p>0.05$），假阳性率为 2.83/CT。可见，三个模型在检测敏感性上无显著差别，但模型二可以在保持较高敏感性，较少漏诊的情况下，有效减少假阳性结节数。**结论** 通

过对比不同模型间检测实性结节敏感性，漏诊数和假阳性率的差异，我们发现模型二更适用于临床进行实性结节筛查。

EPO-2709
采用 CALCNET(CNN)模型对乳腺 X 线图像进行钙化检出

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目的：
乳腺钙化是指在女性乳腺组织上的微小钙沉积。乳腺钙化非常常见且通常为良性。但有些类型的钙化则可能与早期乳腺癌相关。因此，检出钙化区域并进行研究就显得非常重要。

方法：
乳腺 X 线影像共有 782 张影像有钙化病灶。每张影像由该医院医生标注出钙化区做为真值，以黑白二值图形式保存。图片大小为 4096*3328。由每张影像提取大小为 112*112 的小图片。含有钙化病灶的小图片和纯背景（不含钙化病灶）小图片有各自的位置。该位置是由医生提供的真值信息中得到的。

我们设计的 CALCNET 是一种串联模型，分两步实现钙化预测。第一步是离散小波转换（DWT）。然后执行后处理操作以检测及分类兴趣区（ROI）。在第二步中，我们训练了两个 CNN 模型将每个兴趣区归类为钙化或非钙化区。第二个分类器用背景小图片中比较难于判断的那部分做为训练数据，即在第一个分类器中误判为钙化区的那部分小图片（假阳性分类）。CNN 用不同类型的钙化兴趣区和背景区小图片训练。在进行预测时，整张的钼靶图片要切割为小图片送入 CNN。

结果：
第一个分类器对小图片分类时 F1 值为 0.95。第二个分类器对小图片分类时 F1 值为 0.92。按整张钼靶图片计算时，F1 值为 0.75，precision 值为 0.7，recall 值为 0.85。

结论：
该流程提高了钙化检查处理时间，帮助医生更快更高效地筛查乳腺 X 线影像。该新方法可以同时检测微小钙化和大钙化。尽管钙化与图片相比非常小，CALCNET 能准确地检测到并最小化假阳性。

EPO-2710
Clinical Implementation of Chest-X-ray Models - Based on Structured Report

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Objective In recent years, deep learning has been widely used for the detection and classification of abnormalities in chest X-rays. Several chest X-ray models at good performance have been developed and published in medical journals. Prospective data from real clinical practice is the best approach to validate and iterate models. So we

build a clinical data platform- chest X-ray structured report which can integrate the clinical information , model predicting result and diagnosis of radiologists. **Method** The model we developed includes a binary classification model to distinguish normal from abnormal, and a multi-classification model to detect abnormal or pathologic features showed in the following picture. Before writing the structured report, the predicting results and heat map have been automatically integrated into the structured report. Two radiologists will evaluate the chest X -ray and decide to accept , modify or reject the predicting results. Eventually, a semi-automatic and radiologist-verified chest X-ray structured report with key images is issued to the patient and clinician. **Result** For model optimization, images with radiologists' feedback and annotation will be collected in the structured database in real clinical practice, so we can retrieve and extract data easily from the structured database and added to the training set to optimize the model constantly. For radiologists, they can generate a standardized, accurate and efficient report by easy-clicking with the assistant of models. For clinicians and patients, the report with key images can eliminates the drawback of separating image and data.Thus, X -ray structured reporting facilitates communication between radiologists, clinicians, and patients. **Conclusion** We construct a chest X-ray structured report that can facilitate the clinical implementation of deep learning model.AI results and heat maps are integrated into the structured report. Radiologists accept, modify or reject the results.All feedback will be used to train the model.

EPO-2711

The effects of image thickness on the accuracy of deep learning-based computer aided system in measuring pulmonary nodule diameter and volume : a phantom study

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Objective: To investigate the effects of image thickness on the accuracy of deep learning-based computer aided diagnostic system (DL-CAD) for pulmonary nodule diameter and volume measurements.

Materials and Method: In this phantom study, a total of 15 artificial pulmonary nodules with different diameters and densities (Simulated Tumors, Kyoto Kagaku, Tokyo, Japan) were randomly placed in a chest phantom (Multipurpose Chest Phantom N1 "LUNGMAN", Kyoto Kagaku, Tokyo, Japan). CT scans were then acquired on a spiral CT system (Revolution, GE healthcare) with 120 kVp and constant noise index of 14 HU. Images of each scan were reconstructed with different thicknesses, including 0.625mm, 1.25mm, and 2.5mm slice thickness. A DL-CAD system was then used to measure the diameters and volume of the nodules in the chest phantom on images of different thicknesses. In order to evaluate the measurement accuracy, the absolute percentage measurement error (APE) for measured diameters and volume were calculated by $APEd=100*(D_m-D_r)/D_r$ and $APEv=100*(V_m-V_r)/V_r$, respectively, where D_m, V_m, D_r, and

V_r represented the measured and actual values of diameters and volume. Paired t-test was used to examine the significant difference.

Result: In terms of the measurement accuracy for nodule diameters and volume, APEd and APEv were compared between images of varied thicknesses and no statistically significant difference was found among them ($p_{diameter}$=0.282, p_{volume}=0.090).

Conclusion: The measurement accuracy of DL-CAD for nodule diameters and volume was robust on image of different thicknesses.

Clinical Application: With the decent measurement accuracy for nodule diameter and volume, DL-CAD might be used to detect nodules from images of different thicknesses in lung cancer screening.

EPO-2712

The effect of tube voltage on deep learning-based computer aided system in nodule diameter and volume measurement accuracy: a phantom study

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Objective: To investigate the effects of different tube voltages on the accuracy of deep learning-based computer aided diagnostic system (DL-CAD) in measuring the pulmonary nodule diameter and volume.

Materials and Method: In this phantom study, a total of 15 artificial pulmonary nodules with different sizes (5 mm, 8mm, 10mm, and 12mm in diameter) and densities (Simulated Tumors, Kyoto Kagaku, Tokyo, Japan) were randomly placed in the chest phantom (Multipurpose Chest Phantom N1 "LUNGMAN", Kyoto Kagaku, Tokyo, Japan). The chest phantom were scanned on spiral CT system (Revolution, GE healthcare) with a constant NI (12HU) and different tube voltages (100 and 120 kVp); images sequences of each scan were reconstructed with a 1.25mm slice thickness. The maximum diameter and volume of the nodules in the chest phantom were measured on both 100 kVp and 120 kVp CT images by an DL-CAD system. In order to evaluate the measurement accuracy, the absolute percentage measurement error (APE) of the measured diameter and volume was calculated by APEd=100*(D_m-D_r)/D_r and APEv=100*(V_m-V_r)/V_r, respectively, where the D_m, V_m, D_r, and V_r represented the measured and actual values of diameter and volume. Paired t-test was used to examine the significant difference.

Result: In terms of the measurement accuracy, all the APEd and APEv values of groups with different diameters were slightly greater in 120 kVp images compared with the 100 kVp images, but no statistically significant difference was found between them ($p_{diameter}$=0.885, p_{volume}=0.995).

Conclusion: The measurement accuracy of DL-CAD for nodule diameter and volume was robust in images of different tube voltages.

Clinical Application: With the decent measurement accuracy for nodule diameter and volume, DL-CAD is robust and might be applied to lung cancer screening in the future.

EPO-2713
基于 CT 影像组学术前预测≤5cm 单发肝细胞癌微血管侵犯

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目的 探讨 CT 影像组学术前预测≤5cm 单发肝细胞癌微血管侵犯(microvascular invasion; MVI)的价值。**方法** 回顾性收集我院经手术病理证实为肝细胞癌且有术前完备 CT 增强图像的患者共 185 例，按 2:1 的比例随机将病人分为训练组（n=124）和验证组（n=61）。每位患者基于肿瘤体积提取 1351 个影像组学特征。基于训练组采用 LASSO-logistics 回归进行特征筛选并构建影像组学模型，运用 Delong 检验对比影像组学模型与常规形态学参数的诊断效能。在验证组对影像组学模型的效能进行验证。**结果** 最终筛选出 10 个最优特征用于构建影像组学模型。该影像组学模型在训练和验证组中均表现出较好的辨别效能，AUC 分别为 0.724（95% CI：0.584～0.863），0.745（95% CI：0.655～0.834））；而且，其预测性能明显高于形态学特征（*P*均<0.05）。**结论** 影像组学模型在术前预测≤5cm 单发肝细胞癌微血管侵犯方面有一定价值，且预测效能高于传统形态学参数。

EPO-2714
基于 MRI 影像组学对舌鳞状细胞癌病理分化程度的预测研究

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[摘要] 目的 通过影像组学的纹理分析深度解读舌鳞状细胞癌 MRI 图像，并与病理学结果进行对照分析，从而对舌鳞状细胞癌病理分化程度进行预测，指导临床选择合理的治疗方式，并最大程度上改善患者预后。**方法** 搜集吉林大学中日联谊医院 2016 年 5 月至 2018 年 5 月 40 例经病理证实为舌鳞状细胞癌的临床及影像资料（包括低、中、高分化），对所有患者的 MRI 图像进行高通量的数据采集，提取病灶的一阶特性、形状特征、纹理特征、亮度特征、灰阶运行长度矩阵、灰阶判断矩阵及相邻的灰度级，并使用树模型默认参数进行特征选择，选择后的特征再进行 Logistic 多元回归相关性分析，从而筛选出具有诊断价值且与肿瘤分化程度显著相关的影像组学特征，运用受试者工作特征（ROC）曲线对特征参数的诊断效能进行分析，最后在数据集上使用五折交叉验证对模型的预测能力进行验证。**结果** 对 MRI T2 加权成像特征选择后经 Logistic 多元回归分析筛选出影像组学相关特征，本研究预测模型最终获得 13 个特征。模型的敏感度为 87.5%，特异度为 66.7%，曲线下面积（AUC）为 0.9398。**结论** 本实验通过提取 MRI T2 加权成像中病灶的纹理特征并进行分析，具有无创、计算速度快、正确率高等优点，同时与术后病理组织学特征进行对照，找到二者之间相关性，有望对舌鳞状细胞癌病理分化程度预测提供辅助手段。

EPO-2715
Clinical Application of Artificial Intelligence in Detecting Pulmonary Nodules on Chest CT

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Purpose：To evaluate the application performance of artificial intelligence (AI) for lung nodule detection on chest CT .

Methods：The subject included 45 patients who underwent the non-enhanced chest CT on revolution CT from February 8, 2019 to February 17, 2019(20 males, 25 females; mean age, 64.9±15.5 years, range age, 27~93years). All the cases were subjected to AI system for automatic lung nodule detection. Meanwhile, each case was identified by3 senior thoracic radiologists. Calculating the detection accuracy and sensitivity of AI.

Results: In 45 patients, AI detected a total of 251 nodules in the right lobe (51 calcified nodules, 175 high-density nodules, and 25 ground-glass nodules).Compared with gold standard, AI misdiagnosed 47 pulmonary nodules, 11 pulmonary nodules were mislocated and 15 pulmonary nodules were not detected. AI detected a total of 176 nodules in the left lobe (36 calcified nodules, 124 high-density nodules, and21 ground-glass nodules).Compared with gold standard, AI misdiagnosed 31 pulmonary nodules, 9 pulmonary nodules were mislocated and 11 pulmonary nodules were not detected.The sensitivity and accuracy of AI in detecting pulmonary nodules were 92.7% and 72.6% respectively.

Conclution：Artificial Intelligence has extremely high sensitivity and medium accuracy in the detection of pulmonary nodules. It can be used as an auxiliary tool for detecting pulmonary nodules, thus reducing the working pressure of radiologists.

EPO-2716
基于纹理特征客观评价 X 线双下肢拼接全长图像拼接质量的新方法

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目的：X 线双下肢拼接全长影像是骨性或风湿性关节炎等疾病的重要诊治依据，其拼接质量直接影响到医生对疾病的诊断、治疗方案的制定以及疗效的监测等。临床上 X 线长骨拼接图像的质控常规采用主观评价法。为解决主观评价法效率低、量化难、主观性高等问题，本文创新性地提出基于纹理特征客观评价 X 线双下肢拼接全长图像拼接质量的新方法。
方法：研究素材为一例从湘雅医院 PACS 系统上抓取的 X 线双下肢拼接全长影像，其中有三幅分段式原始图像和一幅拼接图像。为考察结构错位，以拼接图像为中心，横纵坐标各自分别向正负方向错位 1~12 个像素得到一系列错位拼接图像；为考察亮度突变，以拼接图像为中心，亮度突变量以 5%为步长，分别改变至±60%，得到一系列亮度突变程度不同的拼接图像。首先运用本团队所改进的基于图像 Canny 边缘的 Harris 特征点匹配的图像配准算法计算拼接前分段式图像与拼接图像之间的变换矩阵，得到拼接前图像在拼接图像上的对应位置及重叠区域，基于以上位置标记在拼接图像上选取感兴趣区域（记为 ROI1），并对 ROI1 的图像拼接质量进行主观评分；其次，对 ROI1 分别进行逆变换得到其在原始图像上的相应位置（记为 ROI1_1 和 ROI1_2）；再次，对以上 ROI 区域分别计算灰度共生矩阵 GLCM 和等灰度游程长矩阵 GLRLM 纹理特征值及其差值；最后，以主观评分为目标变量，以标准化后的各纹理特征差值为自变量进行曲线拟合得到目标评分模型。
结果：成功构建了图像拼接质量评分的多指数模型。进一步的仿真测试结果表明，该模型的评分结果与主观感受符合度较高。

结论：本文基于纹理特征客观评价 X 线双下肢拼接全长图像拼接质量新方法的实现，进一步拓宽了纹理特征在医学影像领域的应用，且有利于 X 线长骨（含双下肢）拼接全长图像拼接质量评价的模块化、自动化和标准化，可大大节约医疗成本。

EPO-2717

T2-Weighted Image-Based Radiomics Signature for Discriminating between Seminomas and Nonseminomas

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Objective: To evaluate the performance of a T2-weighted image (T2WI)-based radiomics signature for differentiating between seminomas and nonseminomas.
Materials and Methods: Thirty-nine patients with testicular germ-cell tumors (TGCTs) confirmed by radical orchiectomy were enrolled, including 19 cases of seminomas and 20 cases of nonseminomas. All patients underwent 3T magnetic resonance (MR) imaging before radical orchiectomy. Eight hundred fifty-one radiomics features were extracted from the T2WI of each patient. The intra- and interclass correlation coefficient was used to select features with excellent stability and repeatability. Then, we used the minimum-redundancy maximum-relevance (mRMR) and the least absolute shrinkage and selection operator (LASSO) algorithms for feature selection and radiomics signature development. Receiver operating characteristic curve analysis was used to evaluate the diagnostic performance of the radiomics signature.
Results: Five features were selected to build the radiomics signature. The radiomics signatures were significantly different between the seminomas and nonseminomas ($p<0.01$). The area under the curve (AUC), sensitivity, and specificity of the radiomics signature for discriminating between seminomas and nonseminomas were 0.979 (95% CI: 0.873 - 1.000), 90.00 (95% CI: 68.3 - 98.8), and 100.00 (95% CI: 82.4 - 100.0), respectively.
Conclusion: T2WI-based radiomics features have the potential to noninvasively discriminate between seminomas and nonseminomas.

EPO-2718

B1-mapping 技术算法在磁共振电解质成像中的应用

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目的：探讨 B_1-mapping 技术在磁共振电解质断层成像（MREPT）中的应用。方法：射频场 B_1 的均匀性关系到磁共振图像的对比度、信噪比等信息，B_1-mapping 技术是在传统的磁共振成像技基础上，通过检测包含射频场空间分布信息的磁共振信号[1,2]，来计算得到人体组织各处 B1 场分布的成像技术。人体组织在电磁场的作用下，会呈现出一些电磁特性，电特性指的是介电常数 ε 和电导率 σ，磁特性指的是磁导率 μ。人体组织的电特性在正常组织和肿瘤组织之间差异较大，可以作为肿瘤早期诊断的有效手段。人体组织电特性磁共振断层成像（magnetic resonance electrical

properties, MR EPT）技术是在传统的质子磁共振成像技术的基础上，通过检测能够反映人体组织非均匀电特性（electrical properties, EPs）的分布的磁共振射频场（B1 场），来计算得到人体组织各处的 EPs 分布的新兴的 MR 成像技术。从麦克斯韦方程出发，可以推导出在磁共振成像模式下，人体组织介电特征与射频场之间的关系为： ，其中，B 为复数射频场， 为拉普拉斯算子，K 为复介电常数， 为劈形算子； 为角频率， 为磁导率。求该方程的解是关键问题[3,4]。本文对西门子 3.0T 的机器上 B1-mapping 序列进行改进，并用 MATLAB 编写计算 B1maps 值的程序和 EPT 算法程序，在特殊的水膜上分析了 EPT 算法的误差。结果：改进的序列和算法均可以达到实验要求，在水膜上分析，产生的误差比较小。结论：B1-mapping 技术在 MREPT 成像中起到了非常重要的作用，通过进一步算法和序列的改进，有应用于临床的潜力。

EPO-2719

基于深度学习及 MRI 影像的腹部脂肪精准定量研究

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目的：肥胖症表现为体内脂肪异常储积，可累及心血管、呼吸、骨骼、肌肉、内分泌、生殖等系统。脂肪最易贮存在腹部，腹部脏器也可见脂肪附着。磁共振成像(MRI)可以很好的显示腹部脂肪的分布，但却无法精确定量腹部脂肪。因此，本研究利用腹部 MRI 影像构建和验证用于定量计算腹部脂肪的深度学习系统，并将这些结果与人体测量学和实验室参数相关联。
方法：本研究回顾性研究包括肥胖患者 50 例（BMI＞28）和正常成年人 50 例（18.5＜BMI≤23.9），平均年龄约为 45.21 岁，其中训练组为 75 例（肥胖：正常≈1:1）,验证组 25 例（肥胖：正常≈1:1），两组病人均于 2013-2018 年接受腹部 3.0TMRI 检查，扫描范围从膈下至盆底，收集 MRI 轴位 T1 加权图像，层厚及层间距均为 5mm。以一名拥有 5 年以上腹部 MRI 诊断经验的影像医师手动勾画特定层面的内脏脂肪与皮下脂肪轮廓为金标准，基于 U-Net 架构，开发了一种用于分割内脏和皮下脂肪的深度学习方法。以 DICE 评分、根-均值误差(RMSE)评价深度学习自动定量腹部脂肪的结果与人工勾画测得腹部脂肪含量的相关性。用 Student t 检验及 Pearson 卡方检验评价皮下脂肪、内脏脂肪与腰围、甘油三酯、总胆固醇/高密度脂蛋白比值之间的相关性。
结果：DICE 评分、根-均值误差(RMSE)和相关性分析表明，通过我们的方法测量的皮下和内脏脂肪的体积与手动测量结果是高度相关的。在两组人群中，腰围与内脏脂肪体积相关（P=0.01 和 P=0.001），甘油三酯含量与脂肪百分比相关（P=0.036 和 P=0.070），在肥胖组中，总胆固醇/高密度脂蛋白比值与内脏脂肪体积百分比相关（P=0.005）。
结论：基于深度学习系统的腹部脂肪定量方法有较高的准确性较高。结果表明，腰围是肥胖患者内脏脂肪的一个较好的预测因子，内脏脂肪体积与总胆固醇/高密度脂蛋白比值相关。

EPO-2720

Value of Radiomics Based on DCE-MRI in Predicting Luminal and non-Luminal Breast Cancer

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Objective: To investigate the value of radiomics based on dynamic contrast enhanced magnetic resonance imaging (DCE-MRI) in predicting luminal and non-luminal breast cancer. Methods: We retrospectively analyzed images of breast DCE-MRI of 42 patients with breast cancer confirmed by pathology. The lesions were outlined by manual segmentation in the strongest enhancement phase of DCE-MRI, and radiomic features were

extracted. Then the least absolute shrinkage and selection operator (LASSO) was used to select the most important features and construct the radiomics label. All cases were divided into luminal group and non-luminal group according to the expression of estrogen receptor (ER) and progesterone receptor (PR). Classifiers were constructed based on logistic regression (LR), random forest (RF), K nearest neighbor (KNN) and support vector machine (SVM), and their prediction performance were verified by 5-fold cross validation. Results: 4 optimal features, including 1 shape feature and 3 features based wavelet, were statistically significant in separating luminal from non-luminal cancers, and 3 features, including the Original_Shape_Maximum 2D Diameter Row, Wavelet-LLH_GLCM_Idn and Wavelet-HHH_GLCM_Correlation had significant correlations with ER and PR levels. RF-based classifier has the best performance in prediction of luminal and non-luminal breast cancer, the sensitivity, specificity, accuracy, and area under curve (AUC) were 0.838, 0.900, 0.853 and 0.876, respectively. Conclusion: Radiomics based on DCE-MRI has a good application value in prediction of luminal and non-luminal breast cancer, and the RF-based classifier has the best performance.

纸质壁报

PO-001

Brain perfusion alterations on 3D pseudocontinuous arterial spin labeling MR imaging in patients with autoimmune encephalitis

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Abstract
Background and purpose
Early diagnosis of autoimmune encephalitis (AE) still remains challenging as patients present with insidiously neurological symptoms. The diagnostic assessment for AE using three dimensional pseudocontinuous arterial spin labeling (3D pCASL) MR imaging has seldom been described previously. The purpose of this study was evaluate the utility of 3D pCASL in AE.
Materials and methods
The conventional MRI and 3D pCASL of 8 autoimmune encephalitis admitted to our hospital between 2015 and 2019 were retrospectively reviewed and compared to matched controls. Meanwhile, brain 18F-FDG PET/CT was also obtained in conjunction with whole-body PET in 2 cases. Clinical manifestation, neurological imaging, and follow-up feature were retrospectively analyzed.
Results
Autoantibody testing was detected in all case, including 2 with anti-NMDAR, 1 with anti-GABAaR, 1 with anti-GABAbR and 4 with anti-LGI 1. The lesions were distributed bilaterally (n=5) and unilaterally (n=3), with the most common site being hippocampus(n=7) and temporal lobe (n=5). Among these patients, on initial conventional MRI, images were shown to normal cases (n=2), minimal abnormal cases (n=2), and marked abnormal cases (n=4). Compared with control groups, all patients with AE showed remarkedly increased cerebral perfusion (Figure 1). 18F-FDG PET/CT was also viewed as having abnormal metabolism in two cases. Both 3D pCASL and PET/CT showed perfusion reduction in one case after therapy (Figure 2).
Conclusion
3D pCASL may be useful adjunct to provide valuable diagnostic information in early detecting AE when conventional MRI yields equivocal results, and it is also useful in the evaluation of the therapeutic effect of AE.

PO-002

大鼠 CO 中毒脑内谷氨酸代谢变化的 7.0T 磁共振 GluCEST 及 MRS 研究

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目的：利用谷氨酸化学交换饱和传递（GluCEST）技术及磁共振波谱（1H-MRS）技术，定量分析急性 CO 中毒后大鼠脑内谷氨酸含量的变化，结合血液中 HbCO 饱和度变化、动物行为学试验及相关病理组织学变化，探讨 GluCEST 成像技术在 CO 中毒相关神经精神病变机制研究中的应用价值。
方法：成年健康大鼠随机分为模型验证组、行为学分析组和磁共振数据采集组。各组按需随机分为染毒鼠和对照鼠，染毒鼠予以腹腔注射纯 CO 气体，对照组予以腹腔注射等剂量空气处理。模型验证组用于测定染毒前后血液中 HbCO 饱和度及制作脑切片。行为学分析组行 Morris 水迷宫实验。磁共振数据采集组于染毒前后在 7.0T 动物磁共振机上行磁共振数据采集；采集的数据主要包括 T2WI、GluCEST 及 MRS。以上所有定量结果均进行统计学分析。
结果：1.染毒大鼠的双侧海马、顶叶皮层及丘脑的 GluCEST 浓度均较对照大鼠相应部位升高（p＜0.05），且差异至少持续 21 天；1H-MRS 结果提示双侧海马、顶叶皮层的谷氨酸及其复合物浓度均较对照大鼠升高（p＜0.05），但丘脑的变化无统计学意义。
2.腹腔注射法可维持大鼠血 HbCO 浓度大于 50％约 3 小时。
3.染毒组大鼠第 2 天的平均潜伏时间和平均潜伏距离明显延长（p＜0.05）。
4.H-E 和尼氏染色均显示染毒大鼠脑内感兴趣区发生了神经细胞变性、凋亡的现象。
结论：1.结合血 HbCO 含量、水迷宫实验、脑切片的 HE 及尼氏染色结果综合分析，腹腔注射法具有一定的可靠性。
2.染毒大鼠在海马区、顶叶皮层、丘脑均发生谷氨酸含量的升高，并在组织病理学上可观察到明确的细胞变性和坏死，提示谷氨酸可能可以作为一种脑内损伤标志物。
3.GluCEST 成像能无创监测活体脑内谷氨酸含量的变化趋势，其敏感性及空间分辨率均优于 1H-MRS 技术，为 CO 中毒相关 DNS 的机制研究提供了新的影像学研究方法和研究思路。

PO-003
急性缺血性脑卒中出现 FLAIR 血管高信号征的临床及影像因素分析

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【摘要】 目的：探讨大脑中动脉供血区急性缺血性脑卒中（Acute ischemic stroke，AIS）患者液体衰减反转恢复序列血管高信号征（FLAIR vascular hyperintense，FVH）出现的临床及影像因素。**方法：**回顾性分析 276 例 MCA 区域 AIS 患者的临床及影像资料。按是否存在 FVH 分为 FVH 阳性组和阴性组，FVH 阳性组根据 FVH 的分布情况分为 3 个级别。采用 X^2 检验和 Fisher’s 精确检验分析 FVH 发生及 FVH 级别与临床及影像因素的关系。临床因素包括年龄、性别、高血脂、高血压、高血糖、房颤、既往卒中史及出现临床症状-MR 检查时间，影像因素包括血管狭窄部位、程度、Willis 环类型及梗死面积。**结果：**FVH 阳性组和阴性组两组之间患者年龄、性别、高血脂、高血压、高血糖、房颤、既往卒中史及 Willis 环类型差异无明显统计学意义。患者出现临床症状-MR 检查时间、血管狭窄部位、程度及梗死面积差异具有统计学意义（P=0.011,P=0.011，P=0.000，P=0.000），结果显示 FVH 常见于颈内动脉颅内段、MCA 的 M1、M2 段重度狭窄及闭塞的大面积脑梗死患者，FVH 的出现率随着患者出现临床症状-MR 检查时间的延迟而逐渐下降。FVH 阳性组不同级别间患者出现临床症状-MR 检查时间、血管狭窄部位及程度差异不具有统计学意义（P=0.269，P=0.108，P=0.518），不同级别间梗死面积差异具有统计学意义（$c^2=7.026$，P=0.030），FVH 级别越高，大面积梗死患者占比越大。**结论：**患者出现临床症状-MR 检查时间、血管狭窄部位及程度是影响 FVH 出现的重要因素。出现临床症状-MR 检查时间越短、血管狭窄部位发生在颅内动脉近端及血管狭窄程度越重，FVH 发生率越高。大面积梗死患者 FVH 阳性率显著高于小面积梗死患者。

PO-004

Comparison of CT angiography collaterals for predicting target perfusion profile and clinical outcome in patients with acute ischemic stroke

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Objectives: To compare collateral status on single-phase CT angiography (sCTA) and multiphase CT angiography (mCTA) and their ability to predict a target mismatch on CT perfusion (CTP) and clinical outcome in patients with acute ischemic stroke (AIS).
Methods: 73 AIS patients with stroke onset between 5 and 15 hours or with unclear onset time and occlusions in the M1/M2 segment of middle cerebral artery and/or intracranial internal carotid artery underwent head non-contrast CT and CTP. Simulated sCTA and mCTA were reconstructed from CTP data and were compared for collaterals assessment. The ability to predict target mismatch on CTP (an ischemic core < 70 ml, a mismatch ratio ≥ 1.8, and an absolute difference ≥ 15 ml) and 90-day modified Rankin Scale (mRS) score of 0-2 were compared between sCTA and mCTA by using receiver operating curve analysis.
Results: sCTA underestimated the collateral status when compared with mCTA ($P < 0.01$). The ability of mCTA to predict target mismatch (AUC = 0.902, 95% confidence interval [CI]: 0.809, 0.959) and clinical outcome (AUC = 0.771, 95% CI: 0.655, 0.864) was better than that of sCTA ($P < 0.05$ overall). A mCTA collateral score of > 3 best identified the target mismatch (sensitivity, 78.4%; specificity, 90.9%) and predicted 90-day mRS score of 0-2 (sensitivity, 84.8%; specificity, 69.4%).
Conclusions: The collaterals were better estimated by mCTA compared with sCTA. A mCTA collateral score of > 3 optimized the prediction of a target mismatch on CTP and a good clinical outcome in patients with AIS.

PO-005

酰胺质子转移成像在缺血性脑卒中的应用

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目的：探究酰胺质子转移成像在缺血性脑卒中不同时期的变化规律，并初步探索脑缺血不同时期的分子变化机制。方法：纳入本研究的缺血性脑卒中患者 37 例，其中急性期 7 例，亚急性期 19 例，慢性期 11 例，最早为发病后 1 天内接受检查，最晚为 28 天内。所有的研究对象均行常规 T1WI，T2WI，DWI 扫描，在 DWI 梗死最大面积行 CEST-APT 扫描。经手动勾画 ROI 及后处理软件计算 APTW 值及 MTR 值，用独立样本 t 检验比较缺血性脑卒中不同时期的差异，采用配对 t 检验比较相同时期梗塞侧和对侧正常脑白质的差异。结果：缺血性脑卒中发生后，APTW 值较对侧显著降低（梗塞侧：0.58±0.07，正常侧：1.43±0.04，P<0.05），在急性期、亚急性期和慢性期，APTW 值逐渐升高（三个时期 APTW 值分别为-0.21±0.15，0.68±0.05，1.34±0.11），急性期及亚急性期低于对侧正常脑实质，慢性期较对侧无明显差异，部分出现 APTW 值高于对侧正常组织。MTR 值在不同

时期的变化中无差异，但在不同时期，其值均低于正常对照组(梗塞侧/正常侧：急性期：32.16±0.4/36.18±0.54；亚急性期：30.53±0.42/34.68±0.32；慢性期：31.19±0.61/37.78±0.43)，差异均有统计学意义。结论：在脑梗塞的不同时期，尤其是急性后期，DWI 常仍表现为高信号，而 APT 变化则较 DWI 更敏感。本研究还发现，仅在慢性期部分患者会出现 APT 值高于对侧正常组织，因此在发病时间不明确的缺血性脑卒中患者或再发卒中的患者，DWI 上均表现为高信号而 APT 值与正常组织相同或略高时，可推测其处于慢性期以及鉴别同一个病人的新发梗塞灶与慢性期梗塞灶。结合 APT 值及 MT 值的变化，可反映不同时期缺血性脑卒中的变化，揭示内源性蛋白质及 PH 值在脑卒中发生后的变化规律。

PO-006

Risk factors for the growth of asymptomatic, unruptured intracranial aneurysms followed by computed tomography angiography

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Object: The growth of an unruptured intracranial aneurysm (IA) is associated with a higher rupture risk. The aim of this study was to identify the risk factors of the growth of asymptomatic, unruptured IAs.
Methods: Two-hundred consecutive patients with 228 asymptomatic, unruptured IAs being followed with computed tomography angiography (CTA) were reviewed retrospectively from August 2011 to December 2017. Follow-up images of the IAs were used to determine changes in IA size or shape. Patients and IAs were divided into nongrowth and growth groups. In addition to the clinical characteristics of the patients, the features of IAs (e.g., size and shape) were evaluated by CTA. Independent risk factors for IA growth were studied using multiple logistic regression analysis. The Kaplan-Meier growth-free survival curves were used to calculate the cumulative risk rates of IA growth.
Results: The average follow-up time was 16.5 (range, 3.0-72.2) months. There were 20 IAs growth events, accounting for 10% (20/200) of all the patients. The multivariate logistic regression model revealed that IA size and patients' clinical characteristics were not correlated with growth, and only irregular shape (odds ratio 6.429) influenced IA growth. Overall, the cumulative growth rates of 1, 2, and 3 year were 34.5%, 65.1%, 82.5% for IA with irregular shape, and 1.4%, 5.0%, 21.9% without irregular shape, respectively.
Conclusions: Irregular shape is a significant risk factor for IA growth. Increased attention should be paid to IAs with an irregular shape during follow-up.

PO-007

脑实质出血体积测量：ABC/2 公式与计算机辅助多层面分析技术对比

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目的：脑实质内出血（Intracerebral hemorrhage, ICH）的出血量多少是早期血肿扩大、神经功能恶化与不良预后的独立风险因素之一，正确的测量脑出血的量有助于评价出血的严重程度，选择治疗方法，评价预后等。本研究旨在比较两种不同的 ICH 体积测量方法：椭圆公式（ABC/2，A 和 B 代指血肿最大层面最大横径与垂直最大纵径，C 代指厚度）与计算机辅助多层面分析。
方法：本研究回顾性分析了 176 例原发性 ICH 患者。两名放射科医师分别使用 ABC/2 和计算机辅助多层面分析（IntelliSpace Discovery，Philips，Best，The Netherlands）测量体积，比较两种方法所测得的体积。如果同时合并脑室内出血，则脑室内出血体积不计入血肿体积内。此外，ICH 的形状评估并记录为规则或不规则，其评估指标参考既往研究中的标准。对于体积测量和 ICH 形状的评估，利用统计学方法评估读者间的一致性， P <.05 被认为有统计学意义。
结果：与 ABC/2 方法（20.11±18.51 mL）比较，计算机辅助多层面分析所得血肿体积明显更大（23.88±21.14 mL），P <.001。 ICH 的形状在 89 名患者中是规则的，在 87 名患者中是不规则的。在具有规则形状 ICH 的患者中，通过计算机辅助多层面分析所测量的体积（15.39±14.03mL）略大于 ABC/2 方法（12.57±12.05mL），P <.001。在 ICH 形状不规则的患者中，通过计算机辅助多层面分析所测量的体积（32.57±23.61 mL）显著大于 ABC/2 方法（27.81±20.73 mL），P <.001。无论哪种测量方法形状不规则的血肿体积明显大于规则的血肿（所有 P <.001），一致性均较好。
结论：两种测量方法结果均稳定，不规则血肿体积明显大于规则血肿。 ABC/2 方法测量的血肿体积小于使用计算机辅助多层面分析所测量的血肿体积。

PO-008

Comparison of time‐of‐flight MR angiography with sparse under-sampling with TOF-MRA in Evaluation of Intracranial Aneurysm: digital subtraction angiography as a reference standard

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Purpose
To compare the performance of time-of-flight with sparseunder-sampling MRA (TOFu-MRA) with time-of-flight MRA (TOF-MRA) in the evaluation of aneurysms' morphologic parameters, with digital subtraction angiography as the reference standard.
Method and materials
Twenty-four consecutive adult patients with suspected intracranialaneurysms were perspectively enrolled and underwent TOF-MRA and TOFu-MRA within one week before DSA. The signal intensities of the aneurysms ($SI_{anuerysm}$), background noise (SD) and the signal intensities of the adjacent brain tissue (SI_{brain}) were measured in the same slice of the original images and calculated the contrast-to-noise ratio (CNR) and signal-to noise (SNR).The neck, height and width of aneurysms were measured and compared on maximum intensity projection (MIP) and volume rendered (VR) images of both TOF-MRA and TOFu-MRA, respectively. With DSA as the reference, the absolute difference between TOF-MRA and DSA (dl_{neck}, dl_{height}, dl_{width}), as well as TOFu-MRA and DSA

($d2_{neck}$, $d2_{height}$, $d2_{width}$) were calculated and compared, respectively.The subjective image quality was assessed using a 4-point score scale by an experienced observer used.

Results

There were a total of 27 aneurysms. When using same acquisition time, the SNRs (155.2±90.8 vs. 45.8±10.1) , CNRs (116.6±72.0 vs. 38.6±10.1) values and noises (22.36±4.40vs.21.03±6.02) of TOFu-MRA were significantly higher than those in TOF-MRA (all P<0.01). . There were significant differences between d1 and d2 (neck: 0.68±1.00vs. 0.58±1.05, height:0.85±1.34 vs.0.81±1.22, width:2.91±3.19vs.1.74±2.49, respectively; all p＜0.05). Good interobserver agreement (κ values=0.87) was obtained between the two radiologists.The subjective image quality of was significantly improved when the sparse TOF was used (p＜0.05).

Conclusion

Compared with conventional TOF, sparse TOF could assess intracranial aneurysms more accurately with a better image quality and same acquisition time.

PO-009

Quantitative analysis of the heterogeneity of "island sign" based on non-contrast CT for predicting the early hematoma expansion

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Objective: Based on the Radiological sign of non-contrast CT hematoma——"island sign", the hematoma morphology and density were quantitatively analyzed to predict the values of early hematoma expansion in patients with spontaneous intracerebral hemorrhage (ICH).

Methods: Consecutive adult patients (>18 years) with spontaneous ICH who had undergone baseline CT within 6 hours after ICH symptom onset in Xiangyang Central Hospital between June 2017 and June 2019 were enrolled for inclusion into this study, and patients with hemorrhage were screened for "island sign". According to the hematoma of island sign, morphological heterogeneity was divided into three categories: rule, irregularity and separation, which were recorded as 1 point, 2 points and 3 points respectively. Hematoma density heterogeneity was divided into 1 to 5 grades. Grade 1 was uniform hematoma density, recorded as 1 point; grade 2 was extremely uneven density, recorded as 5 points; and grade 2-4 were recorded as 2-4 points based on density differences. A follow-up CT scan was performed within 24 hours after the initial CT scan. The time to baseline and follow-up CT scan and baseline clinical and radiological variables were recorded for each participant. We defined hematoma growth as a 33% increase in hematoma volume or >6 mL at the time of the follow-up CT scan, and the hematoma expansion group and non-hematoma expansion group were respectively

evaluated. Logistic regression analysis was performed on the influencing factors of early hematoma expansion. Receiver Operating Characteristic Curve (ROC) were tested for morphology heterogeneity, density heterogeneity, and combined morphology and density heterogeneity to predict early hematoma expansion.

Results: Of the 370 patients with acute cerebral hemorrhage, 123 (33.2%) cases had "island signs", including 75 cases with hematoma expansion group (61.0%) and 48 cases with non-hematoma expansion group (39.0%).Multivariate logistic regression analysis found that island sign (OR=9.749, 95% CI=2.390-39.765, P=0.001) was an independent risk factor for early hematoma expansion. Area Under Curve (AUC) of the "island sign" hematoma morphological heterogeneity score was 0.774 (95% CI: 0.689-0.860, P < 0.001). When the hematoma morphological heterogeneity score was 2 points, the "island sign" had the highest diagnostic value (sensitivity= 0552, specificity=0.875, Youden index= 0.395). ROC analysis indicated hematoma density heterogeneity was demonstrated of the greatest AUC (0.922, 95% CI: 0.874 - 0.970, P < 0.001), the cutoff point was 2 (sensitivity= 0.880, specificity=0.875, Youden index =0.755). However, ROC analysis combined with hematoma morphology and density was demonstrated of the greatest AUC (0.951, 95% CI: 0.916 - 0.987, P < 0.001), the cutoff point was 5 (sensitivity= 0.827, specificity = 0.979, Youden index=0.801).

Conclusion: "Island sign" is an independent radiological marker based no non-contrast CT for predicting the early hematoma expansion. When the combined hematoma morphology and density heterogeneity score is 5 points, "island sign" predicts the highest values of early hematoma expansion.

PO-010

Evaluation of diffusion kurtosis imaging of leptin intervention in early hypoxic-ischemic brain edema

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abstract

Purpose: This study aimed to explore the diffusion kurtosis imaging (DKI) related parameters to evaluate the effect of leptin on newborn piglet hypoxic ischemic encephalopathy (HIE) model and its temporal evolution.

Materials and methods: Thirty-five healthy Yorkshire piglet born within 3-5 days were randomly divided into 3 groups: HIE group (15), leptin group (15) and control group (5). The HIE group and leptin group were ligated with bilateral common carotid artery and put into hypoxic chamber for 30 minutes. In the control group, only bilateral carotid artery dissection was performed. Leptin group was intraperitoneally injected with leptin (4mg/kg) immediately after the establishment of the model. DKI scanning

was performed in each group at different time points of 3h, 6h, 9h, 12h, 16h and 24h. After scanning, Arterial blood was extracted from 5 pigs in each group to measure Neuron-Specific Enolase (NSE) and S100 calcium-binding protein beta (S100β), 3 pigs in each group were selected for brain pathology examination.
Results: In the HIE group and leptin intervention group, DKI related parameters (mean kurtosis MK, radial kurtosis Kr, axial kurtosis Ka) in lesion area demonstrated irregular high signal, whereas relative homogeneous low signals were revealed by DTI related parameters (mean diffusion coefficient MD, radial diffusion coefficient Dr, axial diffusion coefficient Da). Compared with the control group, MK, Kr, Ka in the lesion area increased aggressively; MD, Da, Dr decreased gradually from 0.5 to 72 h ($P<0.05$) and all parameters in leptin group were significantly different from those in HIE group ($P<0.05$). Serum NSE concentration in Leptin group was lower than that in HIE group ($P<0.05$). Pathological results showed that the level of organelle injury in Leptin group was lower than that in HIE group.
Conclusion: Leptin can effectively reduce newborn piglet hypoxic ischemic cerebral edema, and DKI were found to be more sensitive than conventional diffusivity metrics to microstructural changes of HIE.

PO-011
抗 NMDA 抗体阳性重叠其他自身抗体阳性的免疫相关性脑病 7 例

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目的：观察抗 NMDA 抗体阳性重叠其他自身抗体阳性的免疫相关性脑病的临床及影像表现，加深对其理解。
方法：2014 年 3 月-2019 年 6 月间因不明原因脑病住我院且采集血清及脑脊液行多项抗体检测后抗 NMDA 抗体阳性的 75 例患者中 7 例出现重叠其他自身抗体阳性，回顾性分析该 7 例患者的临床资料、MRI 表现，观其特点。
结果：7 例患者男：女=1：6，年龄 5-28（18±7）岁，均无合并肿瘤证据。1 例合并 AQP4 抗体和抗 GD1b 抗体、GM1 抗体阳性，1 例合并 AQP4 抗体、MOG 抗体阳性，1 例合并 MOG 抗体阳性，1 例多次复发后寡克隆区带和 TPOAb、TGAb 阳性，1 例合并 TPOAb、TGAb 阳性，1 例合并抗蛋白酶 3(PR3)抗体阳性，1 例合并抗 SSA 弱阳性、抗 Ro-52 阳性。自身免疫性脑炎与 CNS 特发性炎性脱髓鞘病重叠 4 例，其中神经元表面抗体与胶质细胞表面介导抗体重叠 3 例。7 例均于首次发病时行 MRI 平扫增强，其中 6 例有随访 MRI。2 例首次 MRI 阴性，其中 1 例在 MRI 随访中新发病灶，病情进展。5 例首次 MRI 阳性，仅 1 例出现病灶环形强化，为抗 NMDA 抗体阳性合并 PR3 抗体阳性患者，后行穿刺活检术、病理证实为血管炎。5 例首次 MRI 阳性及 1 例 MRI 首次阴性、随访复查新发病灶的患者中：累及幕上 4 例，其中累及皮层 3 例、白质 1 例、基底节 3 例；累及幕下 2 例；累及脊髓 1 例；双侧受累 4 例。4 例自身免疫性脑炎与 CNS 特发性炎性脱髓鞘病重叠中 2 例在首次 MRI 出现小脑、脑干病灶，2 例在随访中均进展，并出现脑干、脊髓病灶。7 例均行免疫治疗；其中有随访 MRI 的 6 例中，3 例缓解无复发，3 例出现进展或复发-缓解。
结论：多重抗体阳性的免疫相关性脑病的临床及影像表现可变异与叠加，需结合具体情况分析。神经元表面抗体与胶质细胞表面介导抗体重叠、MRI 提示脑干、小脑、脊髓受累时，需考虑自身免疫性脑炎与 CNS 特发性炎性脱髓鞘病重叠综合征。

PO-012
脑结核治疗前后演变规律的 DCE-MRI 量化分析

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目的 探讨 DCE-MRI 量化指标在动态评价脑结核治疗前后病灶的演变规律中的应用价值。材料与方法 收集脑实质结核病患者 39 例，按照颅内结核诊疗常规对本组病例进行抗结核治疗，并予抗结核治疗前、治疗后 1 个月内、治疗后 6 个月内行 DCE-MRI 检查，选取 39 例脑结核患者中直径≥10.0mm，且在随访期间未消失的病灶进行 K^{trans} 等定量参数值的测量，并动态观察各定量参数值的变化情况；同时影像学检查前后三天内收集患者脑脊液行细胞因子 IFN-γ 含量、VEGF、MMP-9 水平测定，上述 DCE-MRI 定量指标与相关酶联免疫检查结果行相关性分析。结果 29 例患者临床表现及影像学检查趋向好转，可测量病 83 个，10 例患者临床实验室或影像学提示病情恶化，可测量病灶 56 个。 病情好转组中 K^{trans}、K_{ep}、Ve 值在治疗后≤1 个月逐渐下降，而病情恶化组中结核病灶的 K^{trans}、K_{ep} 值较治疗前有所增高，具有统计学差异；K^{trans}、K_e 值与脑脊液内细胞因子 IFN-γ 含量、VEGF、MMP-9 水平均具有相关性，Ve 值与细胞因子 IFN-γ 含量具有相关性。结论 DCE-MRI 功能成像技术中的定量指标 K^{trans}、K_{ep}、Ve 有利于反映脑结核的活动性及监测抗结核药物的效果。K^{trans} 的减低表明脑结核病灶造成血脑屏障的渗透性逐渐降低，水肿范围缩小，提示炎性反应逐渐减轻，对抗结核药物的反应逐渐增加；而在病情恶化组中，由于血脑屏障持续破坏，细胞因子表达上调可能会导致 K^{trans} 等定量参数的增加。

PO-013
DTI 对非压迫性腰椎间盘突出症所致神经根炎诊断价值

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目的 探讨 DTI 对非压迫性腰椎间盘突出症所致神经根炎的诊断价值及感兴趣区域选择对病变神经根诊断的影响。 **方法** 前瞻性收集 2017 年 12 月至 2019 年 7 月南方医科大学珠江医院微创治疗后神经根病理转归的单侧非压迫性腰椎间盘突出症所致 L5 神经根炎患者 38 例（试验组）及健康志愿者 30 例（对照组）纳入研究。患者及健康志愿者均行常规 MRI、DTI 及 FFE 检查。采用 2 种方法选取 ROI，分别为全神经根法 **（图 1A）**和神经根中心法固定面积 6mm^2 **（图 1B）**。2 名放射科医师分别测量神经根 ADC 值、FA 值取 2 名医师测量结果的平均值作为最终结果。采用配对样本 *t* 检验评价两侧神经根测量值是否存在统计学差异，采用折线图比较患者（试验组）患侧神经根与健侧神经根椎间孔内、椎间孔处、椎间孔外测量值变化趋势。采用 ROC 曲线分析两种 ROI 方法对病变神经根检出效能的影响，采用组内相关系数（*ICC*）评价 2 名医师测量结果的一致性，Bland-Altman 法评价 2 名医师测量结果的可重复性。**结果** 患者（试验组）患侧与健侧神经根测量值存在统计学差（P=0.001）**（图 2）**，健康志愿者（对照组）两侧神经根无统计学差异（P=0.277），2 种 ROI 方法测得患者（试验组）患侧神经根椎间孔内、椎间孔处、椎间孔外 ADC 值、FA 值变化趋势较健侧更明显**（图 3）**。2 种 ROI 方法下，全神经根法的曲线下面积较大，灵敏度、特异度更佳（AUG 为 0.858，灵敏度为 80.5%，特异度为 83.3%）**（图 4）**。2 名医师采用 2 种 ROI 方法测得的 ADC 值、FA 值一致性均较好，其中全神经根法测得结果的一致性佳，*ICC* 值为 0.975。2 名医师采用全神经根法测得差值的 95%可信区间分别为-0.027~0.034，提示全神经根法的可重复性好**（图 5）**。**结论** DTI 对非压迫性腰椎间盘突出症所致神经根炎具有重要早期诊断价值，且 ROI 选择方法影响 DTI 对病变神经根的诊断。

PO-014

Non-invasive prediction of MGMT promoter methylation states by development and validation of an MRI radiomics signature in lower-grade gliomas

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Purpose: Oxygen 6-methylguanine-DNA methyltransferase (MGMT) promoter methylation is a significant prognostic biomarker in lower-grade gliomas (LGGs), especially for temozolomide (TMZ) chemotherapy. This study was to non-invasively predict MGMT methylation status based on magnetic resonance imaging (MRI) radiomics.
Methods: This retrospective study included 206 patients histopathologically diagnosed with lower-grade gliomas from The Cancer Genome Atlas/The Cancer Imaging Archive (TCGA/TCIA) dataset (n=122) and our institution (n=84). Radiomic features (n=988) were extracted from the tumor area on both post-contrast T1-weighted (CE-T1) and T2-weighted fluid attenuation inversion recovery (T2FLAIR) MR images. The least absolute shrinkage and selection operator (LASSO) method was used to select effective features. The clinical model consisted of pertinent clinical factors, and was built using a logistic regression algorithm. A combined model, incorporating both the radiomics signature and related clinical factors, was also constructed. The receiver operating characteristics curve was used to evaluate the predictive performance.
Results: The radiomics signature was constructed as an independent predictor for differentiating MGMT promoter methylation states, which demonstrated superior performance on both the training and validation cohorts with areas under curve (AUCs) of 0.862 and 0.846, respectively. These results outperformed the clinical model (AUCs of 0.725 and 0.732 on training and validation cohorts). The AUCs of the combined model were 0.906 and 0.896 on training and validation cohorts, respectively.
Conclusion: Our study highlighted that an MRI radiomics signature can effectively identify the MGMT promoter methylation states in histopathologically diagnosed LGGs, thereby offering the potential for individualized diagnosis and treatment decision-making of LGGS.

PO-015

胶质母细胞瘤 IDH1 突变与血脑屏障破坏程度相关性的功能 MRI 评估

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目的：对胶质母细胞瘤患者进行 DCE-MRI、DWI，计算肿瘤的 K^{trans} 值、Ve 值、CBV 值、CBF 值、ADC 值，分析 IDH1 突变型与 IDH1 野生型胶质母细胞瘤的各参数差异，探讨功能 MRI 评估胶质母细胞瘤 IDH1 突变与血脑屏障破坏程度的相关性。**方法：**应用 3.0T-MR 扫描仪对 55 例胶质母细胞瘤患者（均为手术后病理证实，其中男 34 例，女 21 例；年龄 24－70 岁，平均 51.3 岁）进行常规 MRI、

DWI、DCE-MRI 检查。测量每例胶质母细胞瘤的 K^{trans}、Ve、CBV、CBF、ADC 值，应用免疫组化测定胶质母细胞瘤的 IDH1 基因类型。应用 Mann－Whitney U 检验分析 IDH1 突变型与 IDH1 野生型胶质母细胞瘤的 K^{trans}值、Ve值、CBV 值、CBF 值、ADC 值的差异。应用 ROC 曲线分析各个参数值在鉴别 IDH1 突变型与 IDH1 野生型胶质母细胞瘤的最佳切峰值及敏感性与特异性。P<0.05 具有统计学意义。**结果：**1. IDH1 突变型的 K^{trans}值、Ve 值、CBV 值、CBF 值小于 IDH1 野生型胶质母细胞瘤，差异均具有统计学意义（P<0.05）；IDH1 突变型的 ADC 值大于 IDH1 野生型胶质瘤，差异具有统计学意义（P<0.05）。4.ROC 曲线显示 K^{trans}值的切峰值鉴别 IDH1 突变型与 IDH1 野生型胶质母细胞瘤具有较高的敏感性与特异性（P<0.05）。**结论：**DCE-MRI 与 DWI 有助于鉴别 IDH1 突变型与 IDH1 野生型胶质母细胞瘤，可以无创地评估胶质母细胞瘤的 IDH1 突变与血脑屏障破坏程度的相关性，对胶质母细胞瘤患者的诊疗与预后评估具有重要的参考价值。

PO-016

Noninvasively evaluating the grading and IDH mutation status of gliomas by multimodal magnetic resonance imaging

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Objective: To investigate the performance of multimodal magnetic resonance imaging (MRI) for glioma grading and noninvasive assessment of IDH mutational status.
Materials and methods: Seventy consecutive patients with histopathologically confirmed glioma were retrospectively evaluated by dynamic susceptibility-weighted contrast enhanced (DSC), diffusion kurtosis imaging (DKI), intravoxel incoherent motion diffusion-weighted imaging (IVIM DWI), and conventional MR imaging. One-way analysis of variance and Independent sample t test were used to compare the MR parameter values of between low and high grade as well as between mutant and wild-type IDH1 gliomas. Receiver operating characteristic analysis, Spearman’s correlation analysis, and Binary logistic regression analysis were used to assess their diagnostic performances.
Results: The best diagnostic performance was achieved with normalized relative cerebral blood flow (rCBV) (threshold, AUC, sensitivity, and specificity: 2.240 ml/100g, 0.844, 87.8%, 75.9% ; 3.738ml/100g, 0.734, 62.2%, 90.9%), mean kurtosis (MK) (threshold, AUC, sensitivity, and specificity: 0.471, 0.873, 92.7%, 79.3% ; 0.518, 0.794, 81.1%, 75.8%), and water molecular diffusion heterogeneity index (α ; threshold, AUC, sensitivity, and specificity: 1.064, 0.847, 79.3%, 78.0% ; 0.998, 0.771, 93.9%, 51.4%) for glioma grading and assessment of IDH mutational status. There were positive correlations between rCBV, MK, and tumor grade, and negative correlations between α and tumor grade (P<0.01), There were negative correlations between rCBV, MK, and IDH mutational status, and positive correlations between α and IDH mutational status (P<0.01). IVIM DWI had the best diagnostic accuracy; the combination of DKI and IVIM yielded a diagnostic accuracy of 91.4%; and the combination of DSC, DKI, and IVIM DWI was more accurate at predicting tumor grade and assessment of IDH mutational status.
Conclusion: The most accurate parameters were mean rCBV, MK, and α in DSC, DKI, and IVIM DWI for glioma grading and assessment of IDH mutational status. Multimodal MRI

can increase the diagnostic accuracy of differentiating low- and high- grade gliomas and assessment of IDH mutational status.

PO-017

Application Value of Radiomics Approach in Predicting Chromosomal Arms 1p/19q in Low-Grade Gliomas

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Objective: To evluate the value of radiomics in predicting the 1p/19q status of Low-Grade Gliomas (LGG) based on T2-weighted MR images.
Methods: All study patients (n=159) from the Cancer Genome Atla (TCGA) data portal who had pre-operative MRI images and biopsy proven 1p/19q status consisting either no deletion (n=85) or co-deletion (n=74) were included. Patients were divided into training (n=111) and validation cohorts (n=48) in a ratio of 7:3. T2-weighted images were imported into the ITK-SNAP to manually delineate volume of interest (VOI) of the entire-tumor. Each VOI produced 396 radiomics features including Histogram, GLCM, GLSZM, RLM, Form Factor and Haralick. LASSO regression was used for feature screening. A formula was generated using a linear combination of selected features that were weighted by their respective LASSO coefficients. A radiomics score was calculated for each patient by the formula to reflect the 1p/19q status. The predictive accuracy of radiomics was quantified by the area under curve (AUC) of a ROC curve in both cohorts. The calibration degree (CD) of the radiomics was evaluated by Hosmer-Lemeshow test. The clinical usefulness of the radiomics signatures was assessed by decision curve analysis (DCA).
Result: Seven radiomics features with non-zero coefficients were chosen to build a radiomics label that that significantly correlated with the 1p/19q status with an AUC, sensitivity, specificity and CD of 0.754, 79%, 74% and 0.647 in the training cohort; and 0.757, 80%, 71% and 0.731 in the validation cohort. DCA for the radiomics label showed that if the threshold probability was between 0.14 and 0.90, using the radiomics label to predict 1p/19q status added more benefit than treating either all or no patients.
Conclusion: The radiomics label can be used as a noninvasive method to predict the 1p/19q status of LGG for clinical decision optimal therapy options.

PO-018

Comparing the values of MRI ultra-high-b-value DWI and standard DWI in grading cerebral astrocytomas and their association with aquaporin-4

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Objective: To compare the value of MRI ultra-high-b-value DWI (UHBV-DWI) and conventional DWI in grading cerebral astrocytomas, and to analyze the correlation of

respective parameters with aquaporin (AQP).**Methods:** Forty patients with cerebral astrocytoma, including low-grade (LGA, N=15) and high-grade astrocytomas (HGA, N=25) were studied. UHBV-DWI (ultra-high-b-value apparent diffusion coefficient) parameter, conventional DWI (apparent diffusion coefficient) parameter values in the solid parts of the tumors and peritumoral edema, were compared. ADC maps were calculated from standard b-values (1000s/mm^2), while UHBV-DWI was quantified by fitting the signals at ultra-high b-values (1800-4000s/mm^2) to the mono-exponential equation. Real time PCR was used to analysis for AQP1, AQP4 and AQP9 mRNA. Receiver operating characteristic (ROC) curves were used to identify the better parameter. Spearman correlation analysis was performed to assess the correlation of AQP mRNA level with each parameter value.**Results:** ADC value was significantly lower in the solid parts of HGA, as compared to those of LGA. UHBV-ADC value was significantly higher in the solid parts of HGA than those of LGA ($P<0.01$). UHBV-ADC (0.833) had the larger area under the curve (AUC) than ADC (0.713). The level of AQP4 mRNA in the solid parts of the tumors was significantly higher in HGAs than LGAs ($P<0.01$); there was less AQP9 mRNA and had no statistical significance between two groups ($P>0.05$); there was no AQP1 mRNA in two groups. ADC negatively correlated with the level of AQP4 mRNA ($r=-0.357$; $P=0.024$). UHBV-ADC positively correlated with the level of AQP4 mRNA ($r=0.646$; $P<0.01$).**Conclusion:** Use of UHBV-DWI improved grading of cerebral astrocytomas when compared with DWI. UHBV-DWI parameters appeared to reflect the level of AQP4 mRNA in astrocytomas.

PO-019

A Promising sequence applied in diagnosis of pituitary microadenoma

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Objective: *ZOOMit is a brand-new sequence in MagnetomPrisma 3.0T which can achieve small range scanning to get more detailed and higher resolution images. The advantages of this technology include less distortion and blurred effects, less motion and flow artifacts, increased spatial resolution, and shortened scanning time. This research was presented to evaluate the value of ZOOMit T2 MRI in the diagnosis of pituitary microadenomas patients.*

Materials and methods: *T2 weighted, T1 enhanced and ZOOMit T2 scan of pituitary gland were performed on 21 patients with evidence of microadenomas. The evaluation of Images was interpreted in a randomized, blinded method. Notation was made of signal intensity and lesion boundary.*

Results: *For the 12 T2 hyperintensity lesions*, Zoomit T2 sequence showed better ability. 10 of 12 patients lesions(83.3%) appeared clear boundary while only 8 of 12 lesions(66.7%) was clear under standard T2 scanning. The lesions identified only on Zoomit T2 sequence in 1 patient. The Zoomit T2 demonstrates better in the smaller lesion group (<5mm) than larger lesion(>5mm) group, clear lesion boundary is observed in 5 of 11 patients (45.4%) by T2 sequence, and here this number in Zoomit T2 is 8(72.7%).

Conclusion: The ZOOMit T2 sequence was judged to be better than the standard T2 sequence for depicting T2 hyperintensity pituitary microadenomas. ZOOMit T2 MRI method is more sensitive and promising to improve the rate of lesion detection of pituitary microadenomas.

PO-020

能谱 CT 鉴别鼻腔鼻窦良恶性肿物的研究

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【摘要】目的：探讨双源 CT 最佳单能量 CT 值及能谱曲线斜率对鼻腔鼻窦良恶性肿物的鉴别诊断价值。
方法：收集 60 例经病理证实且直径≥1cm 的鼻腔鼻窦肿物，术前均行常规 CT 平扫及双能量 CT 双期增强扫描。根据病变的常规形态学表现判断良恶性。测量病灶实性部分的最佳 CNR 单能量 CT 值（CTose）及能谱曲线斜率（K），另测量双期融合图像病灶实性部分的 CT 值。根据病理结果分为良性组（34 例）和恶性组（26 例），评价常规形态学分析的诊断效能。比较良性组与恶性组病灶 CTose 值、K 值、CT 值，并绘制各参数的 ROC 曲线，比较曲线下面积（AUC），评估其诊断效能。结果：常规形态学诊断的敏感度、特异度及准确度分别为 61.5%、88.2%、76.7%。动脉期：良性组的 CTose 值、K 值、CT 值分别为 61.91±25.62、0.92±0.69、56.56±16.67，恶性组分别为 80.16±16.07、1.97±1.18、67.85±11.41；静脉期：良性组的各参数分别为 68.25±26.60、1.26±0.78、62.57±19.98，恶性组分别为 95.31±16.72、2.50±0.95、79.08±12.61；双期恶性组 3 参数均高于良性组（P 均＜0.05）。动脉期病灶 CTose 值、K 值、CT 值的 AUC 分别为 0.813、0.883、0.736，静脉期分别为 0.841、0.885、0.777；其中静脉期病灶 K 值的 AUC 最大（0.885），以 K=1.77 为诊断阈值，其诊断敏感度、特异度及准确度分别为 88.5%、88.2%、88.3%。 结论：双源 CT 的最佳单能量 CT 值及能谱曲线斜率可更准确的反映病变血供情况及组织差异，有助于鼻腔鼻窦良恶性肿物的鉴别诊断。

PO-021

The feasibility of Integrated PET/MR and Comparison between PET/MR and PET/CT in Assessment of Hypopharyngeal Cancer

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Purpose: Our objectives were to assess the feasibility of integrated 18F-FDG PET/MR compared with 18F-FDG PET/CT regarding to image quality, lesion manifestation, and FDG quantification in patients with hypopharyngeal cancer.
Materials and methods:18F-FDG PET/CT and integrated 18F-FDG PET/MR examinations were performed in the same day in 20 patients with hypopharyngeal cancer after a single-injection dual-imaging protocol. Fused 18F-FDG PET/CT and fused 18F-FDG PET/MR images were analyzed by two independent readers in separate sessions in random order. The score of PET/CT and PET/MR was compared by Mann-Whitney U test. The image

manifestation of primary hypopharyngeal lesions and metastatic cervical lymph nodes was qualitatively compared between PET/CT and PET/MR by McNemar test. Kappa test was adopted for the consistency test. SUVmax (standard uptake value) of the lesion was obtained in the PET images derived from PET/CT and PET/MR respectively. SUVs from the two modalities were analyzed by Spearman correlation analysis.

Results: *All PET/MR images had good or excellent quality and deemed to be clinically acceptable. Two radiologists had a good consistency in terms of the scores of PET/CT and PET/MR (Kappa=0.792 for PET/CT, and 0.765 for PET/MR). PET/MR could identify more structures in the invasion extent than PET/CT, but our study found no significant difference between them (P=0.442, 0.442). There was moderate agreement in the diagnosis of invasion extent in two radiologists (Kappa =0.694 for PET/CT, and 0.696 for PET/MR). PET/MR showed more cervical metastatic lymph nodes than PET/CT, but there was no statistically significant difference between them (P=0.754, 0.508). There was perfect agreement in the diagnosis of metastatic lymph nodes in two radiologists (Kappa=0.911 for PET/CT, and 0.978 for PET/MR). SUVmax quantification exhibited an excellent correlation on both modalities with a Spearman correlation coefficient of 0.725 (P < 0.000).*

Conclusions: *Our study illustrates the feasibility of PET/MR in patients with hypopharyngeal cancer. PET/MR provides comparable results in image quality and lesion manifestation in comparison to PET/CT. A strong correlation was observed for SUVmax between two modalities.*

PO-022
联合应用 DWI、PWI 在评价 III 期鼻咽癌立体定向放疗疗效中的应用价值

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目的 探讨磁共振弥散加权成像(DWI)、灌注成像(PWI)联合应用在评价 III 期鼻咽癌立体定向放疗疗效中的应用价值。

方法 回顾性分析我院 2018 年收治的 89 例首诊 III 期鼻咽癌患者，入院后先行常规 MR、MR-DWI 及 MR-PWI 检查，然后行 4 周期立体定向放疗，放疗周期完成后再行一次常规 MR、MR-DWI 及 MR-PWI 检查，对比分析放疗前、后鼻咽部肿块在不同 MR 成像方法中的不同表现。所有数据均采用 SPSS 1 8.0 软件包处理，重点对放疗前、后肿块在增强 TWI、DWI 中的 ADC 图及灌注 BV 伪彩图像上最大层面面积变化进行分析，计量资料对 比采取卡方检验，P < 0.05 认为差异有统计学意义。

结果 放疗前鼻咽肿块在 DWI 弥散受限(ADC 值较高)，PWI 血流灌注较丰富(血容量 BV 较高)，图像上显示的弥散受限区域及高灌注区域最大层面面积，均小于放疗前压脂 T1WI 增强序列肿块强化面积(P < 0.05) ，且弥散受限区域面积稍大于高灌注区域(P > 0.05)。放疗后，敏感组鼻咽肿块弥散受限区域、高灌注区域面积均明显下降，与压脂 T1WI 增强序列相比，下降更明显(P <0.05) 。同时，肿瘤放疗后复发病灶表现为弥散受限、血容量 BV 值升高，而坏死或纤维化病灶表现为弥散不受限、血容量 BV 下降(P < 0.05)。

结论 在反映鼻咽癌患者立体定向放疗前后肿瘤形态及生物学变化方面，常规 MR 结合 DWI 及 PW I 更敏感；在评价 III 期鼻咽癌放疗疗效、鉴别肿瘤放疗后进展、坏死或纤维化中，ADC 值、BV 值具有较重要的参考价值。

PO-023

A comparison of readout-segmented echo-planar (RESOLVE) DWI with delayed gadolinium-enhanced T1-weighted MRI in detecting cholesteatoma

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Purpose
The purpose of this study was to retrospectively compare the value of readout-segmented echo-planar (RESOLVE) diffusion-weighted imaging (DWI) with delayed gadolinium-enhanced T1-weighted magnetic resonance (MR) imaging in detecting cholesteatoma. The apparent diffusion coefficient (ADC) values for cholesteatoma and non-cholesteatoma were also measured.
Methods
In total, 531 patients suspected to have middle ear cholesteatoma were enrolled, 59 of whom had previous surgery for cholesteatoma and were suspected to have recurrent cholesteatoma.
The overall sensitivity, specificity, negative predictive value (NPV), and positive predictive value (PPV) were assessed. Moreover, the ADCs of cholesteatoma and non-cholesteatoma were measured. Furthermore, a possible ADC cut-off value was also discussed. Receiver operating characteristic (ROC) curve analysis was utilized to examine the accuracy of the ADC values.
Results
The sensitivity, specificity, NPV, and PPV of RESOLVE DWI were higher than those of delayed gadolinium-enhanced T1-weighted MRI. The ADC of cholesteatoma (852.67×10^{-6} mm^2/s) from RESOLVE DWI is significantly lower than that of non-cholesteatoma (1529.78×10^{-6} mm^2/s). The area under the ROC curve of the mean ADC is 0.98, and the optimal cut-off point is 1195×10^{-6} mm^2/s.
Conclusions
The ADC value can be used as a diagnostic tool for differentiating middle ear cholesteatoma from non-cholesteatoma. The sensitivity and specificity of the RESOLVE DWI sequence for diagnosing cholesteatoma are significantly higher than that of enhanced T1-weighted MRI. RESOLVE DWI can be an excellent tool for detecting primary cholesteatoma, is better than delayed enhanced T1-weighted imaging alone and can be used as an alternative to second-look surgery to detect residual cholesteatoma.

PO-024

CT value of papillary thyroid carcinoma combined with morphological characteristics to predict central lymph node metastasis

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Purpose: explore the value of using the CT value of papillary thyroid carcinoma combined with morphology to predict central group lymph node metastasis , measuring and analyzing the plain scan and enhanced CT value of single papillary thyroid carcinoma (PTC) lesions and the morphology of lesion.
Methods :340 cases of patients with single PTC and central lymph node dissection ,and the CT values of the PTC lesions in the plain, arterial and venous phases of the enhanced cervical CT scan were measured, calculate the net CT values and standardized CT values in the arterial and venous phases of the lesions.The difference of data between the group with central lymph node metastasis and the group without metastasis was compared, the ROC curve was drawn, the AUC was calculated, and the critical value of optimal sensitivity and specificity was selected.χ^2 test was used to compare the imaging morphology of PTC lesions in the central lymph node metastasis group and the non-metastasis group.
Results :postoperative pathology confirmed the central group of lymph node metastasis patients 178 cases, 162 cases of patients with central group of lymph node metastasis and venous phase of the tumors CT value, net CT value and standardized CT value differences between the central lymph node metastasis group and metastasis group were statistically significant, the critical value were107.5 HU , 53 HU, 0.761, sensitivity and specificity were 71.4%, 81.8%;76.2%, 59.1%;71.4%, 72.7%;There were statistically significant differences in the distribution of lesion diameter and capsular contact range between the two groups, and specificity of diameter >2cm and the capsular contact range ≥1/2 to predict central lymph node metastasis were highest(86.4%, 81.5%) .The sensitivity, specificity and accuracy of CT value parameters in venous phase of PTC lesion combined with image morphology to predict CLNM were 75.3%, 78.4% and 76.8%.
Conclusion:enhanced CT scan of PTC lesion in venous phase has certain value in the prediction of central lymph node metastasis.

PO-025

CT 三维重建在垂体瘤手术治疗中的应用

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目的：构建垂体瘤可视化 3D 打印模型，术前精准、全面地了解肿瘤生长方式及其与周围组织的关系，为垂体瘤的精确诊断及手术方式的选择提供临床依据。

方法:对垂体瘤患者进行全脑计算机断层扫描（CT），利用相关软件对采集的图像进行三维重建。将 3D 图形经打印系统生成三维甚至四维可视化模型。根据可 3D 视化模型选择手术方式，之后并随访患者术后并发症发生率、治愈率及复发率。

结果：CT 三维重建的垂体瘤 3D 模型可很好的展示肿瘤生长方式及其与周围组织的关系，手术过程安全，成功率高

结论：CT 三维重建技术能明显优化垂体瘤患者疗效，降低术后并发症发生率及复发风险。

PO-026
多参数 MRI 纹理分析结合机器学习预测口腔和口咽鳞状细胞癌组织学分级

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目的 探讨常规 MRI（T2WI、增强 T1WI）及 ADC 图纹理分析结合机器学习在术前预测口腔和口咽鳞状细胞癌（OOSCC）病理分级中的价值。
方法 回顾性分析 2011 年 1 月至 2015 年 4 月本院具有明确术后病理分级资料且于 1.5T MRI 行术前检查的 25 例低级别（I 级）及 78 例高级别（II、III 级）OOSCC 患者。使用 3D 全瘤分割，从各序列中分别提取 504 个纹理参数，包括直方图、灰度共生矩阵及灰度游程矩阵特征。使用观察者间测量可重复性评估及共线性分析降低特征维度。基于原始样本及通过数据生成的合成抽样方法（SMOTE）获取的平衡样本，分别使用支持向量机结合递归特征消除（SVM-RFE）对单独及联合的三个序列特征进行机器学习。通过十折交叉验证评估不同分类器的预测效能。
结果 T2WI、增强 T1WI 及 ADC 图上分别 456 个（90%）、441 个（88%）、288 个（57%）测量可重复性极好（ICC>0.8）的特征用于机器学习。三个序列联合较各单独序列选择的最佳特征集预测 OOSCC 病理分级表现更佳，其包含 9 个特征参数（3 个 T2WI、3 个增强 T1WI 及 3 个 ADC 参数）。在原始样本中，联合模型的 AUC 值为 0.78，精确度为 0.73，灵敏度为 0.72，特异度为 0.76。在 SMOTE 获取的平衡样本中，联合模型的 AUC 值为 0.83，精确度为 0.82，灵敏度为 0.74，特异度为 0.90。
结论 多参数 MRI 纹理分析结合机器学习可较为精确的术前评估 OOSCC 病理分级。

PO-027
高场磁共振中上睑退缩的 Graves 眼病患者眼外肌与强的松治疗效果相关性研究

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目的 研究在高场（3.0T）磁共振（MRI）中上睑退缩的 Graves 眼病（GO）患者强治疗前后各眼外肌的变化，探讨其与疗效的相关性。**方法** 以上睑退缩为症状就诊的 Graves 眼病患者 41 例，在 3.0T 眼眶增强 MRI 检查结束后进行眶内强的松注射治疗，定期随访，并复查 MRI，根据上睑退缩的恢复程度将治疗效果分为 2 组：有效组、无效组。治疗前后分别在冠状位平扫 T1WI-fs、T2WI-fs 及 T1WI-fs+C 序列的图像上分别测量上睑提肌、内直肌及外直肌信号最亮处的厚度（T）及信号强度（SI），并测量同侧颞肌的信号强度，然后计算三条眼外肌的的信号强度比值 SIR（眼外肌信号强度/同侧颞肌信号强度），对两组眼外肌厚度及 SIR 进行统计学分析。**结果** 在配对 t 检验分析中，有效组中各序列中治疗前后的上睑提肌厚度差异具有统计学意义（P=0.000，P=0.000，P=0.000），有效组中 T2WI-fs 及 T1WI-fs+C 序列中治疗前后上睑提肌 SIR 差异具有统计学意义（P=0.000，P=0.000），；无效组中各序列中治疗前后上睑提肌厚度差异具有统计学意义（P=0.048，P=0.049，P=0.001），无效组中 T2WI 序列中治疗前后上睑提肌 SIR 差异具有统计学意

义（P=0.049）。**结论** 在以上睑退缩为主要症状的 GO 患者中，上睑提肌是主要有变化的肌肉；高场磁共振眼眶增强中上睑提肌的信号强度变化能更准确地反映 GO 患者强的松治疗效果。

PO-028

Establishment and Evaluation of Chronic Obstructive Pulmonary Disease Rat Models

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Objective To evaluate and compare the COPD rat models, established by smoking, protease instillation and the combination of them, in terms of inflammation, imaging and pathology.
Methods Rat models of COPD were established with smoking, protease instillation and the combination of the two methods. There were 60 rats in the smoked group, 30 rats in the protease group, 30 rats in the protease combined smoke group and 20 rats in the control group. Rats' body weight was measured every week. At particular time points, 5 rats in the smoked group, the protease group and the protease combined smoke group and 2 rats in the control group were executed and then subjected to cytokines detection, micro-CT scanning and pathological examination, respectively.
Results The weight gain of rats in the smoked group and the protease combined smoke group was slower than that in the control group since the 7th week ($P<0.05$). The levels of IL-10 within 4 weeks of modeling were lower in the protease group and the protease combined smoke group than the control group ($P<0.05$). The concentration of MMP-9 at the 24th hour was higher in the protease group and the protease combined smoke group than the control group ($P<0.05$). Emphysema was observed for the first time on the micro-CT and pathological images at the 4th week in experiment groups.
Conclusion The rat models of COPD can be successfully established by smoking, protease instillation and the combination of them. Micro-CT can reflect the changes of lung with high sensitivity and validity.

PO-029

18F-FDG PET/CT 非典型结节病与恶性肿瘤及结核的鉴别

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结节病是原因不明的肉芽肿性疾病；结节病的诊断通常需要满足三个条件：临床和放射学表现，非干酪性肉芽肿和没有替代疾病的证据。影像表现和临床表现共同构成结节病的临床表型，为诊断提供线索和依据；但结节病的影像表现是多种多样的，影像表现不典型者可与肺癌、转移瘤、淋巴瘤、结核相互混淆而误诊。我们选取 10 例易误诊病例进行回顾分析，从中探讨结节病与肺癌、转移瘤、结核的鉴别诊断要点，旨在提升对结节病的非典型 FDG PET/CT 表现的认识。

病例资料：不典型结节病 3 例（II 期 2 例，III 期 1 例）；临床隐匿性肺腺癌 2 例；胃低分化腺癌术后 4 年，肺及纵隔淋巴结多发转移瘤 1 例；宫颈低分化鳞癌术后 3 年，胸部淋巴结、腹膜后淋巴结转移瘤 1 例；淋巴结结核伴血行播散肺结核 1 例；单纯胸部淋巴结结核 1 例；左肺下叶肺结核伴胸部淋巴结结核 1 例。

讨论：双肺门、纵隔多组淋巴结对称性肿大，是结节病的经典表现，但结节病也可表现为不对称的淋巴结肿大、胸外淋巴结及器官的累及。淋巴结结核、淋巴瘤、来源于肺或胸外恶性肿瘤的转移瘤也可表现为双肺门、纵隔多组淋巴结肿大伴代谢增高。恶性肿瘤、淋巴结结核的 FDG 摄取强度、淋巴结的大小、形态、密度、分布，都与不典型结节病类似。不对称的淋巴结肿大，恶性肿瘤病史，肿瘤标志物检测结果阳性，都是非结节病的重要提示；活检是排除恶性肿瘤的最有效手段。

结节病肺部累及的经典表现为局限/弥漫分布的间质/淋巴管周围小结节，在 HRCT 影像上表现为支气管血管束增粗、串珠征、袖口征、胸膜下片状细密小结节；但不典型的弥漫性表现与癌性淋巴管炎不可区分，散发的结节或团块与肺转移瘤、肺结核、肺癌不可区分，相关鉴别诊断必不可缺。

结论：结节病的诊断思路，既要有正向归纳证明，又要有反向排除，二者不可偏废。在影像表现符合结节病之后，仍需组织学检查和恰当的实验室检查，以排除其他类似表现的良恶性疾病。

PO-030
双源 CT 在肺栓塞与下肢深静脉血栓形成联合成像中的应用价值

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目的 探讨第二代双源 CT 一次性造影在肺栓塞（PE）与髂股深静脉血栓形成（DVT）联合成像中的应用价值。**方法** 共 185 例临床疑诊 PE 的患者进行了双源 CT 肺动脉造影和深静脉造影联合成像检查。肺动脉扫描采用单能量大螺距采集模式，髂股静脉扫描采用双能量技术。**结果** 185 例中 28 例（15.14%）患者同时患有 PE 及 DVT，8 例（4.32%）患者仅有 PE 而没有 DVT，7 例（3.78%）患者仅有 DVT 而没有 PE。PE 的直接征象表现为肺动脉管腔内大小不等、形态多样的充盈缺损和管腔完全阻塞影像。DVT 表现为管腔中央类圆形、长条形不均匀低密度性充盈缺损。**结论** 双源 CT 一次性联合成像在肺栓塞与髂股深静脉血栓形成中具有较高价值，适用于伴有下肢静脉循环障碍的可疑肺栓塞患者。

PO-031
下腔静脉先天变异的 CT 表现

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目的 通过回顾下腔静脉的胚胎发育特征、分析其临床 CT 表现，提高对下腔静脉先天变异的认识。**材料与方法** 回顾性收集 2015 年 1 月---2019 年 6 月因各种原因于本院行下腔静脉 CT 检查的患者，收集下腔静脉变异的患者共 21 例，男 16 例，女 5 例，年龄 7 个月~ 75 岁，所有患者均行腹部 CT 平扫及增强扫描或者胸腹部联合 CT 平扫及增强检查，于门静脉期或延迟期观察下腔静脉的走形及连接，回顾性学习下腔静脉的胚胎发育特征，分析本组病例下腔静脉先天变异的类型以及是否合并其他脏器的畸形。**结果** 下腔静脉的先天变异是由卵黄静脉、后主静脉、下主及上主静脉的

异常永存、退化和连接导致的，典型多见的先天畸形包括下腔静脉缺如、重复畸形、左侧异位、下腔静脉延续为胸部静脉和下腔静脉后输尿管等，以上变异可单独或联合存在。本组 21 例患者中，下腔静脉肝段缺如 8 例，表现为下腔静脉肝段缺如，经左下腔或奇静脉、半奇静脉回流；双下腔静脉 3 例，表现为肾静脉水平以下层面腹主动脉两侧走形下腔静脉，肾静脉水平以上下腔静脉位于脊柱右侧；左位下腔静脉 11 例，表现为肾静脉水平以下下腔静脉走形于脊柱左侧；下腔静脉延续为胸部静脉 8 例，表现为左侧下腔静脉穿膈肌延续为奇静脉，与左无名静脉汇合入上腔静脉；其中部分病例为几种变异联合存在，本组未收集到下腔静脉后输尿管病例。下腔静脉发育异常合并其他系统异常，共 10 例（10/21），其中 6 例合并先天性心脏病，另 4 例分别合并迷走右锁骨下动脉及夹层、永存左上腔静脉、多脾综合征、脾静脉与肠系膜上静脉于胰腺前方汇合形成门静脉；其他 11 例下腔静脉异常患者是因其他原因行 CT 检查偶然发现下腔静脉变异。**结论** 识别下腔静脉变异对临床操作及治疗，如静脉滤器放置的选择、介入插管等具有重要意义；因此，对影像诊断医生而言下腔静脉的观察与评价应该成为日常诊断观察模式的基本组成部分。

PO-032

慢性 Leriche's 综合征侧枝动脉开放类型的 CT 分析

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目的：分析慢性主髂动脉阻塞（Leriche’s 综合征）的 CT 表现，总结该病侧枝动脉开放类型，提高对慢性 Leriche’s 综合征的认识。
方法：收集本院 2016 年 1 月-2018 年 9 月临床确诊为慢性 Leriche’s 综合征患者 36 例。36 例患者治疗前均行主动脉 CTA 检查。24 例行主动脉-股动脉人工血管旁路移植术和 6 例行介入治疗（球囊扩张和/或支架成形术）；6 例内科治疗。
结果：36 例主髂动脉 CTA 均表现为腹主动脉-髂总动脉分叉口闭塞，根据闭塞近心端（上端）位置分 3 型:①近肾动脉旁型 16 例，②肠系膜下动脉上型 8 例，③肠系膜下动脉下型 12 例。全部病例闭塞或次全闭塞远端（下端）达单侧或双侧髂内、外动脉水平。36 例慢性 Leriche’s 综合征侧枝动脉开放类型有 5 种：①A 型（Winslow’s 路径出现率 100%，36/36），开放侧枝为双侧腹壁上动脉，通过胸廓内动脉与腹壁下动脉吻合，连接于髂外动脉。②B 型（出现率 92%，33/36）：开放侧枝为双侧下肋间动脉、肋下动脉/腰动脉，通过旋髂深动脉连接髂外动脉或股动脉。③C 型(出现率 50%，18/36）：开放侧枝为肠系膜上动脉分支（中结肠动脉），通过 Riolan 弓连接肠系膜下动脉或其分支直肠上动脉。④D 型（出现率 36%，13/36）：开放侧枝为双侧或单侧肋下动脉，通过髂腰动脉连接髂内动脉，单侧 9 例。⑤E 型（出现率 53%，19/36）：开放侧枝为直肠上动脉，通过骶动脉丛/直肠下动脉连接髂内动脉。A 型和 B 型侧枝动脉的开放可提供下腹壁和下肢动脉的血供。C 型出现于栓塞水平位于肠系膜下动脉以上的患者，以代偿肠系膜下动脉供血区的血运。D 型和 E 型为少见类型。
结论 慢性 Leriche’s 综合征侧枝动脉开放有多种类型，侧枝动脉开放与主髂动脉闭塞范围相关；正确识别和描述侧枝动脉有助于为临床提供更全面的诊断信息。

PO-033

Patients-specific computational fluid dynamics simulation in valve-related ascending aortic disease: comparison with 4D-flow MRI

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Purpose:
All arteries grow and remodel to establish mechanical homeostasis in response to changing hemodynamic conditions. As a common and highly prevalent disease process, aortic valve disease is the main cause that seriously affects the hemodynamics of blood flow in the aorta. The resulting hemodynamic changes plays important role in the progression of valve-related ascending aortic disease. A more rapid and user-friendly hemodynamic analysis of aortic is necessary.
Materials and Methods:
Total of 20 patients were included in this study: tricuspid aortic valve(TAV) patients without valvular disease (n=5) or with aortic valve stenosis (n=5), BAV patients (n=10). Flow stream pattern, wall shear stress (WSS) map were calculated during one cardiac cycle using four-dimensional flow magnetic resonance imaging (4D flow MRI) and a patients-specific simulate method using computational fluid dynamic analysis (CFD). Patient-specific geometries and boundary conditions derived from CTA and phase contrast MRI (PC MRI) respectively. PC-MRI planes were placed at the level of the aortic annulus and pulmonary bifurcation with velocity encoding in RL, FH and AP directions. And the results were compared with 4D-flow MRI which enables a comprehensive assessment of vascular hemodynamics.
Results:
The new method only requires three times of MR scanning each lasting 2 minutes. While the 4D flow MRI sequence scan time lasting about 10 minutes which could not be interrupted. Model-simulated flow patterns agree qualitatively with those derived from 4D-flow MRI data both in TAV or BAV group. The patients with BAV showed large scale helical flow structure forms in the ascending aorta and moves through the arch. The distribution of areas with increased WSS is consistent with the result of 4D-flow MRI.
Conclusion:
The new hemodynamic analysis method used here can reproduce the flow characteristics in patients with valve-related ascending aortic disease as measured using 4D-flow MRI. What counts is that the new method can significantly shortens the time of a patient receives imaging examination and is suitable for those whose who impatient the long-time of MR scanning.

PO-034
磁共振心肌组织追踪技术评估二尖瓣反流相关的左室心肌应变率研究

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【摘要】 目的 通过组织追踪技术评估二尖瓣反流和健康人间左心室的应变率变化。**方法** 回顾性分析我院进行过心肌磁共振（Cardiac magnetic resonance，CMR）电影成像检查并经超声证实的二尖瓣反流的患者 22 例（以轻度反流为主）以及健康对照组 38 例，分别在 cvi42 软件上对短轴位、长轴位四腔心切面及长轴位三腔心切面对两组所有人的左心室心内膜及心外膜进行半自动勾

画，运行软件得出常规左心室心功能参数及 3D 全局周向、全局径向及全局纵向应力值。并对所得的数据进行统计学分析，比较两组之间的各向应力数据是否具有统计学意义。并对各个应力参数与左心室功能参数进行相关性分析。**结果** 3D 全局径向峰值应变率（Globle peak strain radia，GPRS）、全局周向峰值应变率（Globle peak strain circumf，GPCS）及全局纵向峰值应变率（Globle peak strain rate long，GPLS）在两组间具有统计学意义（P＜0.001）。**结论** 3D 全局周向、径向及纵向峰值应变率这三个心肌力学指标对于区分瓣膜病及正常人左心室心肌功能变化具有识别意义。

PO-035

Quantification of myocardial interstitial space using dual source CT after bolus contrast injection: comparison between first pass perfusion imaging and dual energy analysis

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Purpose:
Both of extracellular extravascular volume (EEV) and extracellular volume (ECV) were proposed to quantify enlargement of myocardial interstitial space due to myocardium loss or fibrosis. This study was designed to investigate feasibility of EEV derived with only first pass perfusion imaging and ECV based on dual energy iodine quantification.
Methods:
15 patients at average 8 weeks after revascularization therapy were enrolled. After a bolus injection of contrast at 5ml/s and 0.7ml/kg followed by saline flush, all the patients underwent a low dose first pass dynamic perfusion with a SIEMENSE Somatom Force CT scanner. Before and 8min after bolus contrast injection, a standard dose scan was performed (CaScore adapSeq,120KV), immediately after delayed scan, a dual energy scan was performed(150Sn/90KV),the slice thickness of all scan protocols was 3mm . VPCT software based on Tofts model was used to calculate EEV and Heart PBV was used to calculate iodine concentration in myocardium and left ventricle, ECV by dual energy was defined as ratio of iodine concentration in myocardial and left ventricle and corrected by (1-Hematocrit). ECV by standard single energy scan was derived by conventional subtraction method:ECV=($\Delta HU_{myo}/\Delta HU_{LV}$)*（1-Hematocrit）,which was served as a reference standard.
Results:
Mean EEV within infarcted myocardium segment and remote was 14.03 ml/100ml and 15.45 ml/100ml respectively, there was no statistics significance and no significant linear correlation with conventional ECV. However, the difference of ECV derived by dual energy between myocardial infarction and remote was significant , the value has good linear relationship with conventional ECV(r=0.43,P＜0.05).
Conclusion:
Our study showed EEV using first pass perfusion data failed to differentiate myocardial infarction and remote although which has potential to shorter examine time

and obtain perfusion parameter as well, however, Dual energy CT was much more similar to conventional ECV assessment.

PO-036

探究人工智能辅助诊断系统对厚层胸部 CT 图像中＞4mm 肺结节的检出效能

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目的 由于医院 PACS 系统存储容量有限，基层医院常使用厚层胸部 CT 图像（如 5mm/7mm）进行日常影像诊断。因此，本研究探讨人工智能辅助诊断系统对厚层胸部 CT 图像中＞4mm 肺结节的检出效能。**方法** 使用第 2 代双源 CT 前瞻性收集行常规胸部 CT 检查的门诊患者共计 118 例，将扫描图像进行厚层（5mm/7mm）图像重建，利用人工智能辅助诊断软件建立的厚层（5mm/7mm）模型，检测 2 组层厚 CT 图像中＞4mm 肺结节的数目。由 1 名影像诊断专家及 2 名高年资放射科医师通过 1mm 薄层 CT 图像及人工智能辅助诊断软件最终确定＞4mm 肺结节金标准数目。使用灵敏度及假阳性率评估人工智能辅助诊断系统对厚层胸部 CT 图像中＞4mm 肺结节的检出效能。**结果** 人工智能辅助诊断软件分别在 5mm，7mm 层厚的胸部 CT 图像中检测到 318、265 个大于 4mm 的肺结节。 其中分别有 164、143 个与金标准一致，假阳性结节数分别为 154、122 个。结节检出的敏感度分别为 0.609±0.398, 0.551±0.412，差异有统计学意义（p <0.01）。 两组间假阳性率为 1.305/CT、1.034 /CT.。**结论** 人工智能辅助诊断系统对 5mm 层厚图像中＞4mm 的肺结节检出敏感度优于 7mm 组，提示对于有临床随访意义的肺结节（＞4mm），5mm 层厚图像可以实现较好的检出效能。

PO-037

原发性肺黏液腺癌 CT 表现再认识

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目的 探讨原发性肺黏液腺癌（Primary Pulmonary Mucinous Adenocarcinoma,PPMA）CT 诊断及鉴别诊断。 方法 回顾性分析经穿刺及手术病理证实的 22 例 PPMA 患者（男 10，女 12，年龄 54.5±11.9 岁），均行胸部 CT 平扫及增强检查，分析其 CT 表现，观察病灶形态（分为肿块型和肺炎型，CT 图像上表现为软组织肿块者称为肿块型；表现为片状渗出实变者称为肺炎型）、位置（按其发生部位分为中央型和周围型）、病灶内及周边情况（浅分叶、毛刺、空洞、晕征、蜂窝征、枯枝征、血管漂浮征、空泡征及卫星灶等）、增强表现及有无淋巴结转移等。其中晕征是指病灶周围环绕的磨玻璃影；蜂窝征是多个密集的泡状或囊状低密度腔聚集在一起宛如蜂窝样改变；枯枝征是指于病灶内走行僵直、狭窄的支气管影；血管漂浮征是增强扫描时病灶内的血管在低密度背景下呈漂浮样改变。结果 22 例患者中肿块型 18 例（周围型 15 例，中央型 3 例）。4 例多发（22.2%），其中 1 例为原发灶旁出现类圆形空泡样卫星灶，其它为实性小结节灶；3 例伴发空洞（16.7%）；16 例有浅分叶（88.9%）；4 例合并短毛刺（22.2%）；4 例周围见晕征（22.2%）；增强表示 5 例无强化（27.8%），13 例轻度强化（72.2%）；7 例合并淋巴结转移（38.9%）。4 例肺炎型均可见蜂窝征、枯枝征、血管漂浮征及晕征（100.0%）。2 例主支气管管壁明显增厚（50.0%）；病灶平扫 CT 值约 10-50Hu 不等，增强扫描轻度强化 3 例（75.0%），不强化 1 例（25.0%）。说明 PPMA 平扫多呈低或等低密度，部分多发、合并空洞形成，周围多见晕征，增强无强化或轻度强化，部分合并淋巴结转移。CT 主要分两种类型，其中肺炎型易误诊，但蜂窝征、枯

枝征、血管漂浮征是诊断较具特异性征象。结论 PPMA CT 表现具有一定特异性，可为临床诊断和治疗提供依据。

PO-038
CT 动态能谱一站式扫描在肺癌病理分型中的应用

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目的　通过 CT 动态能谱一站式扫描对肺癌不同病理类型中血供特征的评价，探讨东芝 640 层 CT 动态能谱一站式扫描对肺癌不同病理类型中血供特征的差异，以期为临床诊断及预判提供指导。
方法　对 51 例肺癌患者进行前瞻性能谱 CT 与灌注 CT 一站式扫描，最后经病理证实鳞癌 13 例，腺癌 27 例，小细胞癌 11 例。将扫描图像在副台 Dual Energy 能谱处理程序中处理每一组能谱数据得到动态碘图，通过动态碘图测得肿瘤的碘分布值峰值；用 Dual input perfusion 程序进行肺双入口灌注分析，得到病灶的支动脉血流 AF、肺动脉血流 PF、和血流灌注指数 PI 值［PI = PF/(PF + AF)］。 采用独立样本 t 检验以及秩和检验比较定量参数，以 P ＜0.05 为差异具有统计学意义。
结果　鳞癌与腺癌之间的灌注值 AF 差异有统计学意义，P<0.05（P=0.010），灌注值 PF、PI 差异均无统计学意义。腺癌与小细胞癌之间的灌注值 AF 差异有统计学意义，P<0.05（P=0.004），灌注值 PF、PI 差异均无统计学意义。鳞癌与腺癌之间的碘值峰值差异有统计学意义，P<0.05（P=0.029），腺癌与小细胞癌，鳞癌与小细胞癌之间碘值峰值差异无统计学意义。患者的有效辐射剂量为 6.81mSv。
结论　通过 CT 动态能谱成像得到的 AF 值与碘值峰值对于肺癌分型具有临床价值，有助于对肺癌病理类型进行预判。

PO-039
CT 灌注成像在 NSCLC 中的应用及与其血管生成及淋巴结转移情况的相关性研究

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目的 探讨 CT 灌注成像在 NSCLC 中的应用及与其血管生成及淋巴结转移情况的相关性。**方法** 选取我院 2013 年 1 月～2018 年 1 月期间收治的 100 例非小细胞肺癌患者作为研究对象，所有患者入组后，均进行 CT 灌注成像检查。分析不同血管生成情况、不同病理状态患者的 CT 灌注成像参数之间的差异以及相关性。**结果** 不同组织类型患者的 CT 灌注成像参数之间的差异不存在统计学意义，淋巴结转移患者的 BF 显著高于非淋巴结转移患者，淋巴结转移患者的 BV、PEI 低于非淋巴结转移患者，不同淋巴结转移患者的 MTT 之间的差异不存在统计学意义。Ⅰ-Ⅱ期患者的 BF 显著高于Ⅲ-Ⅳ期患者，其余指标之间的差异不存在统计学意义（*P*＜0.05）；不同病理组织以及淋巴转移情况患者的 MVD 之间的差异存在统计学意义（P＜0.05），不同 TNM 分期患者的 MVD 之间的差异不存在统计学意义（P＞0.05）。**结论** 患者淋巴结转移情况以及 MVD 分别与患者的 CT 灌注成像指标 BF、BV、PEI 分别呈现负相关，CT 灌注成像技术可在一定程度上反映患者的肺部毛细血管的形成情况以及肿瘤病灶的转移播散能力。

PO-040

卷积核对磨玻璃结节特征显示的影响-体模研究

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目的 探讨不同卷积核对肺磨玻璃结节特征显示的影响，从而寻找能显示磨玻璃结节特征的最佳卷积核。**方法** 用高分子材料按照不同比例制成 CT 为-450HU— -650HU 的肺磨玻璃结节。其中直径为 10mm 的纯磨玻璃结节 5 枚；直径为 10mm，内含空泡征的磨玻璃结节 5 枚；直径为 10mm，内含宝石症的磨玻璃结节 5 枚；最大直径为 10mm，表面分叶的磨玻璃结节 5 枚；最大直径为 10mm，表面为毛刺的磨玻璃结节 5 枚，共 25 枚。把 25 枚结节置入日本 Kyoto Kagaku 公司生产的 Lungman N1 型多用途男性胸部仿真体模内，采用 SOMATOM Perspective 128 层螺旋 CT 对该体模进行常规剂量扫描和低剂量扫描。分别采用 ADMIRE 和 FBP 两种重建方式进行重建，重建层厚均为 1.0mm。ADMIRE 迭代级别选择 3，卷积核分别为;I30、I40、I50、I70、I80；FBP 卷积核分别为;B30、B40、B50、B70、B80。将 10 组数据传入 MMWP4 后处理工作站进行数据测量。**结果** 随着卷积核增大、图像对比度会提高，但是图像噪声也会增加；随着卷积核减小，图像噪声会降低、但是图像对比度会降低、塑化感增加。主观评分显示：常规剂量扫描时，I80 得分最高，能清晰显示磨玻璃结节的边缘、毛刺征、空泡征和宝石征；低剂量扫描时，I50 得分最高，能清晰显示磨玻璃结节的边缘、毛刺征、空泡征和宝石征。常规剂量组得分高于低剂量组。客观测量显示：ADMIRE 迭代重建图像信噪比、对比噪声比均优于对应 FBP 重建，I30 具有最佳信噪比和对比噪声比。虽然 I30 具有最佳信噪比和对比噪声比，但是图像塑化感太明显，磨玻璃结节对比度较差。**结论** 通过本次实验我们发现常规剂量扫描时，I80 具有最佳图像质量。低剂量扫描时，I50 具有最佳图像质量。

PO-041

shape、glcm 及 firstorder 纹理特征评估纯磨玻璃 IA 的 p-53、ki-67

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目的 探讨利用形态（shape）、灰度级共生矩阵（glcm）及一阶纹理（firstorder）纹理分析评价纯磨玻璃 IA 的 p-53、ki-67 情况。**方法** 回顾性收集 2015 年 1 月至 2018 年 1 月期间于大连医科大学附属第一医院经手术病理证实为肺浸润性腺癌（IA），同时薄层 CT 上呈现为肺纯磨玻璃结节（pGGN）的患者总计 40 例。所有病例均为单发 IA 病灶，总计 40 个 pGGNs。回顾性采集所有研究对象的免疫组化情况：p53 突变率，ki-67 增殖指数，观察并测量薄层 CT 上 pGGN 的 shape（Maximum3DDiameter、Sphericity、Elongation、Volume、SurfaceVolumeRatio、Flatness）、glcm（SumAverage、MaximumProbability、Idmn、JointEnergy、Contrast、Idn、Idm、Correlation）及 firstorder（Skewness、Uniformity、Energy、TotalEnergy、Maximum、90Percentile、10Percentile、Mean）纹理特征。将所有患者的免疫组化指标与 shape、glcm 及 firstorder 纹理特征做相关性分析。**结果** p53 突变率与 shape、glcm 及 firstorder 纹理特征均无相关性；ki-67 增殖指数与 Volume（p=0.016，r=0.437）、Idm（p=0.048，r=0.364）、TotalEnergy（p=0.007,r=0.482）呈正相关 **结论** ki-67 增殖指数与 shape、glcm 及 firstorder 纹理特征具有一定相关性，其中 TotalEnergy 相关性最强，分析薄层 CT 上 shape、glcm 及 firstorder 纹理特征，对评价患者肿瘤 ki-67 增殖活性有一定的临床价值。

PO-042

A new score system to predict recurrent laryngeal nerve lymph node metastasis in patients with esophageal squamous cancer

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Objective: To investigate the value of CT combination clinical results to predict recurrent laryngeal nerve (RLN) lymph node metastasis in patients with esophageal squamous cancer (ESC)
Methods:
75 patients who underwent laryngectomy nerve lymph nodes dissection in ESC between 2014-2018 were retrospectively analysis. We evaluated possible related factors for lymph node metastasis: age, gender, tumor differentiation, tumor location, tumor size(length and thickness) and the larger short and long diameter of the largest RLN node, then we calculated the ratios of the tumor (length/thickness diameters, LTR) and RLN node(short/long diameters, SLR).Univariate and multivariate logistic regression analysis were used to identify independent risk factors for predicting RLN node metastasis.
Result:
RLN metastasis were positively correlated with tumor length, LTR, RLN node size, SLR (all $p<0.01$) on univariate analysis. Based on the results of logistic multivariate analysis, we constructed a new scoring system that included tumor length, short diameter and SLR.
The total risk score system was 0 to 10. The area under the receiver operating characteristic curve for predicting RLN node metastasis was 0.919(95% confidence interval, 0.860-0.978). The high-risk group (risk score>3) exhibited a significantly higher risk of RLN node metastasis than the low-risk group (risk score ≤3). The sensitivity, specificity, positive predictive value, negative predictive value were respectively 71.0%,95.4%,91.7%,82.4%.
Conclusion: We developed a risk score system which has the potential to facilitate the identification of patients with a high or low risk of RLN node metastasis in ESC patients.

PO-043

肺浸润性腺癌的能谱 CT 定量参数与 EGFR 突变相关性分析

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目的：探讨肺浸润性腺癌的能谱 CT 定量参数与 EGFR 突变相关性分析
方法：回顾性分析经病理证实的 98 例肺浸润性腺癌患者临床资料，所有患者均行 EGFR 基因检测，并且于术前行能谱 CT 增强扫描，包括动脉期及静脉期，分别延迟 25 s、65 s。能谱定量参数包括

标准化碘含量，标准化水含量，能谱曲线斜率，将患者分为 EGFR 突变组及 EGFR 野生组，采用 Spearman 相关法分析能谱定量参数及结节类型与 EGFR 突变的相关性。
结果：所有病例中，EGFR 突变占所有病例 66.33%，EGFR 突变与动脉期标准化碘含量及动脉期能谱曲线斜率呈正相关（P＜0.05），EGFR 突变与动脉期及静脉期的标准化水含量呈负相关（P＜0.05），磨玻璃成分与 EGFR 突变呈正相关（P＜0.05）
结论：肺浸润性腺癌能谱 CT 定量参数及磨玻璃成分与 EGFR 突变具有良好的相关性，可间接反映肿瘤细胞的增殖、分化和肿瘤血管生成情况,为肺浸润性腺癌生物学行为的术前评价提供有价值的信息
关键词：肺腺癌；EGFR；能谱 CT

PO-044
长径 5-15mm 孤立性肺结节的良恶性预测模型建立及验证

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目的 通过分析长径 5-15mm 孤立性肺结节（*solitary pulmonary nodule, SPN*）患者的临床、实验室检查及影像学征象等资料，建立并验证其良恶性预测模型。**方法** 回顾性入组本院经手术切除且病理诊断明确的长径 5-15mmSPN 病例共 958 例，分析患者的临床特征（年龄、性别、体质指数、吸烟史、呼吸系统疾病史、恶性肿瘤病史、家族肿瘤史），实验室检查（癌胚抗原、糖类抗原 *CA125*、*CA724*、中性粒细胞淋巴细胞比值（Neutrophil to lymphocyte ratio，NLR））和影像学征象（结节位置、最大径和最小径、边缘、含 GGO 成分、空洞、空泡、空气支气管、血管集束、胸膜牵拉、钙化、肺气肿背景）。采用随机分组将患者分为训练集 670 例和验证集 288 例。通过单因素及多因素 logistic 回归分析筛选出与长径 5mm-15mmSPN 良恶性相关的独立危险因素，构建列线图预测模型。将验证集数据代入该模型进行验证，绘制受试者工作特征曲线（ROC 曲线）和校准曲线，评估模型预测价值。**结果** 分析显示年龄、空泡、血管纠集、空气支气管、胸膜牵拉、含 GGO 成分及 NLR 与长径 5mm-15mmSPN 良恶性相关（P＜0.05），用以构建的预测模型为：P=ex/（1+ex），x=-3.14282 +（0.03737×年龄）+（0.51374×空泡）+（1.87897×血管纠集）+（0.90573×空气支气管）+（1.15055×胸膜牵拉）+（1.57413×含 GGO 成分）-（0.84182×NLR）。该模型 ROC 曲线下面积为 0.860，敏感度 90.8%，特异度 68.4%，准确度 80.3%。**结论** 患者的年龄、NLR、空泡、血管纠集、空气支气管、胸膜牵拉、含 GGO 成分是预测长径 *5-15mmSPN* 良恶性的独立预测因子。本研究构建的模型具有良好的诊断效力，对临床医生判断长径 *5-15mmSPN* 的良恶性有一定帮助。

PO-045
系统性轻链型淀粉样变性心脏受累病人中 CEST 与 T1 mapping 相关性研究

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目的：探究在系统性轻链型淀粉样变性心脏受累病人中心肌 CEST 值与 T1 mapping 的相关性。

方法：40 例接受了心脏增强磁共振扫描的系统性轻链型淀粉样变病人中，将结果显示存在左心室心肌延迟强化的 28 例患者纳入此项研究，进行 CEST 磁共振扫描并测定平均心肌信号强度。

结果：CEST 值与 ECV 存在明显的相关性(R=-0.485, p=0.009)，而与 native T1 mapping 没有明显的相关性 (R=-0.253, p=0.170)。

结论：在系统性轻链型淀粉样变心脏受累的病人中，心肌 CEST 值减低与 ECV 升高有明显的相关性；CEST 心脏磁共振有望可以反映心肌疾病负荷。

PO-046

磁共振弥散加权成像全病灶直方图及纹理分析鉴别肉芽肿性小叶炎及浸润性乳腺癌

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目的：探讨磁共振弥散加权成像全病灶直方图及纹理分析在鉴别肉芽肿性小叶炎及浸润性乳腺癌中的价值。材料及方法：回顾性分析 27 例病理证实的肉芽肿性小叶炎及 31 例浸润性乳腺癌患者的乳腺磁共振资料（所有病灶磁共振上均呈非肿块强化，且无环状强化病灶）。磁共振检查使用西门子 1.5T 及 3.0T 扫描仪，弥散加权成像使用 3 个 b 值（50，400 或 500，800s／mm2）。ADC 图上将整个病灶逐层勾画、分割，并提取 11 个纹理特征。单因素及多因素分析 ADC 直方图及纹理特征在两组病灶中的差别，并绘制 ROC 曲线。结果：5%ADC 值、熵、熵差在两组间有差异。使用这三个参数绘制 ROC 曲线的 AUC 值为 0.778（95%可信区间：0.648-0.908），准确率为 79.3%，敏感度为 87.1%。多因素分析两组间各特征值未发现有差异。结论：磁共振弥散加权成像全病灶直方图及纹理分析可为肉芽肿性小叶炎及浸润性乳腺癌的鉴别诊断提供无创、可靠的方法。

PO-047

哺乳期乳腺癌 MRI 表现

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［摘要］ **目的** 探讨乳腺动态增强 MRI 检查在哺乳期乳腺癌的诊断价值。**方法** 回顾性分析 12 例经病理证实的哺乳期乳腺癌 MRI 影像学表现，分析其特征，提高诊断率。**结果** 本组 12 例哺乳期乳癌患者中，9 例有明显哺乳期乳腺背景。10 例为浸润性导管癌（83.33%，10/12）,1 例为高级别导管内癌伴小叶癌化（8.33%，1/12），1 例为中级别导管内癌伴小叶癌化（8.33%，1/12），7 例有腋窝淋巴结转移（58.33%，7/12）。其中 4 例（33.33%，4/12）术前做钼靶检查，2 例（16.67%，2/12）漏诊；10 例（83.33%，10/12）术前做超声检查，3 例（25%，3/12）漏诊，1 例（8.33%，1/12）误诊。12 例（100%，12/12）术前均行 MRI 检查，9 例（75%，9/12）BI-RADS5 类，3 例（25%，3/12）BI-RADS4 类，其中 2 例（16.67%，2/12）倾向乳癌，1 例（8.33%，1/12）倾向炎症。7 例呈肿块样强化（58.33%，7/12），5 例呈非肿块样强化（41.67%，5/12），其中非肿块样强化病例中 2 例（16.67%，2/12）段样分布，1 例（8.33%，1/12）区域分布；2 例（16.67%，2/12）多区域分布；9 例（75%，9/12）呈不均匀强化，3 例（25%，3/12）呈簇状环形强化。DWI12 例（100%，12/12）呈均呈高信号，ADC 值均小于 1.00×10^{-3}mm/s。TIC 曲线 1 例（8.33%,1/12）呈Ⅱ型曲线，11 例（91.67%，11/12）呈Ⅲ曲线。**结论** 哺乳期病史对乳腺癌诊断有一定干扰，MRI 对其诊断均有较大优势。

PO-048
初探基于 ADC 图肿瘤全域纹理分析鉴别乳腺导管原位癌（DCIS）和 DCIS 伴微浸润的价值

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目的 探讨基于表观扩散系数（ADC）图肿瘤全域的纹理分析鉴别乳腺导管原位癌（ductal carcinoma in situ，DCIS）和乳腺导管原位癌伴微浸润（ductal carcinoma in situ with microinvasion，DCIS-MI）的价值。**方法** 回顾性分析经手术病理证实的 10 例 DCIS 和 14 例 DCIS-MI 的患者资料，患者术前均行乳腺 DWI 序列扫描（b 值为 1000 s/mm^2），经后处理获得 ADC 图，采用 Omni-Kinetics 软件，在包含肿瘤实质的图像上沿肿瘤边缘逐层勾画 ROI，融合后获得肿瘤全域纹理参数，包括中位数、平均值、标准差、偏度、峰度、均匀性、能量、熵、惯性矩、相关性和逆差距。采用独立样本 t 检验（正态分布）或 Mann-Whitney 秩和检验（偏态分布）比较 DCIS 和 DCIS-MI 各纹理参数的差异，采用 ROC 曲线评价有统计学差异的纹理参数对 DCIS 和 DCIS-MI 的鉴别效能。**结果** DCIS 组的标准差、熵、相关性、逆差距小于 DCIS-MI 组，均匀性、能量、惯性矩大于 DCIS-MI 组，差异具有统计学意义（P 均<0.05）。两组之间的中位数、平均值、偏度、峰度差异无统计学意义（P 均>0.05）。标准差、均匀性、能量、熵、惯性矩、相关性、逆差距鉴别两组病灶的 AUC 分别为 0.993、0.986、0.857、0.936、0.736、0.736、0.836。**结论** 基于 ADC 图的肿瘤全域纹理分析有助于鉴别 DCIS 和 DCIS-MI，具有一定临床应用价值，标准差、均匀性、能量、熵、逆差距是有效鉴别参数。

PO-049
Radiomics analysis of dynamic contrast-enhanced magnetic resonance imaging for the prediction of sentinel lymph node metastasis in breast cancer

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Purpose: To investigate whether a combination of radiomics and automatic machine learning applied to dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI) of primary breast cancer can noninvasively predict axillary sentinel lymph node (SLN) metastasis.

Methods: Forty-two patients who received a DCE-MRI breast scan were enrolled. A total of 1029 imaging features were extracted from each volume of interest (VOI) .The least absolute shrinkage and selection operator was used to select the optimal features. Three classification models based on the logistic regression (LR), random forest (RF) and support vector machine (SVM) classifiers were constructed. Receiver operating curve (ROC) analysis and fivefold cross-validation were used to illustrate the prediction performance of the models. Spearman correlations were performed between the optimal features and the levels of estrogen receptor (ER), progesterone receptor

(PR), human epidermal growth factor receptor-2 (HER2), and proliferation marker Ki-67 of the breast tumors.

Results: Twelve optimal features were obtained for model construction. The area under the curve (AUC) values of the LR, RF and SVM models were 0.923, 0.744 and 0.914, respectively, and the mean AUC values of the fivefold cross-validation were 0.937±0.097, 0.786±0.094, and 0.934±0.073, respectively. The sensitivity, specificity, accuracy, positive predictive value (PPV) and negative predictive value (NPV) for the LR, RF and SVM models were 0.818, 0.850, 0.833, 0.857, 0.810; 0.682, 0.750, 0.714, 0.750, 0.682; and 0.864, 0.850, 0.857, 0.864, 0.850, respectively. With respect to the accuracy, sensitivity, PPV and NPV, the SVM demonstrates the highest performance. Four features, including the original_shape_Major Axis, wavelet-LLL_glcm_Correlation, wavelet-HLL_glszm_Grey Level Non Uniformity and logarithm_firstorder_Minimum, had significant correlations with the ER, PR, HER2 and Ki-67 levels.
Conclusions: We demonstrated the feasibility of combining artificial intelligence and radiomics from DCE-MRI of primary tumors to predict axillary SLN metastasis in breast cancer. This noninvasive approach could be very promising in application.

PO-050
MRI 多参数联合诊断乳腺环形强化病变的良恶性的价值

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[摘 要] 目的 探讨 MRI 多参数联合对乳腺动态增强扫描（DCE MRI）内部强化方式表现为环形强化病变的诊断价值。**方法** 回顾性分析经手术病理证实为乳腺病变患者行 DCE MRI、DWI 检查，参照 MRI 乳腺影像报告和数据系统对 DCE MRI 内部强化方式表现为环形强化的 67 例纳入研究。根据病理结果将 67 例病变分为良、恶性两组，采用 χ^2 检验比较两组病变在 DCE 整体形态学指标、“强化环”形态学指标、时间信号强度曲线类型、DWI 扩散受限分布位置指标的差异性。采用独立样本 t 检验比较两组病变 DCE 半定量参数指标、“强化环”多点 ADC 值的差异性。以病理结果为应变量，自变量采用上述具有统计学差异的指标，建立 Logisitc 回归模型构建新的联合参数并对参数逐步联合评价其诊断效能。**结果** 良、恶性病变在“环形强化”环壁形态（χ^2=14.19，P=0.001）及是否具有壁结节（χ^2=12.48，P=0.001）差异有统计学意义;良、恶性病变在 DWI 扩散受限分布位置指标差异有统计学意义（χ^2=19.60，P=0.003）。良、恶性病变在半定量参数早期强化率（t=2.35，P=0.02）及峰值达峰时间（t=4.66，P=0.007）差异具有统计学意义;良、恶性病变在 $ADC_{环内}$(t=1.35,P=0.001)、$ADC_{环壁}$值（t=1.05,P=0.30）差异具有均统计学意义。新构建 “强化环”形态学指标+DWI 扩散受限分布位置+Tmax+$ADC_{环内}$参数联合诊断的约登指数最高为 0.75，ROC 曲线下面积为 0.87[95% CI(0.82,0.91）]，诊断敏感度及特异度分别为 91.96%和 91.31%。**结论** 乳腺 MR 多参数信息对乳腺环形强化病变具有较高的诊断效能。

PO-051
基于 MRI 影像组学诺莫图预测乳腺癌腋窝淋巴结转移

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目的：建立并验证术前预测乳腺癌腋窝淋巴结转移的影像组学诺莫图。
材料与方法：148 名符合条件的乳腺癌患者被分为训练组（n=100）和验证组（n=48）。从每个病人的磁共振图像中提取影像组学特征。然后在训练集中用 LASSO 算法建立影像组学标签。结合独立的危险因素，采用多元 Logistic 回归模型建立诺莫图。诺莫图的效能在训练集中进行评估，并在验证集中进行验证。最后，结合训练和验证集进行决策曲线分析，以评估诺莫图的临床实用性。
结果：由 9 个淋巴结状态相关特征组成的影像组学标签，具有良好的预测效果。包括影像组学标签和磁共振报告的淋巴结状态的诺莫图在训练集（AUC 0.79；95%CI，0.73-0.85）和验证集（AUC 0.76；95%CI，0.69-0.84）中也显示出良好的效能。决策曲线表明了我们列线图的临床实用性。另外，诺莫图在 MR 报告的淋巴结状态为阴性的亚组（AUC 0.88；95%CI，0.83-0.94）也显示出良好的鉴别能力。
结论：影像组学诺莫图是一种非侵入性术前预测工具，结合影像组学特征和磁共振报告的淋巴结状态，对乳腺癌患者淋巴结转移具有较好的预测效能，具有良好的应用前景，需要大数据进一步提高模型的效能和多中心验证获得临床应用的高水平证据。

PO-052
基于磁共振成像乳腺癌远处转移预测模型的研究

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目的： 建立基于平扫磁共振成像（magnetic resonance imaging，MRI）和动态对比增强（dynamic contrast enhanced ，DCE）-MRI 影像特征参数的乳腺癌远处转移预测模型。**方法：**回顾性分析 2011 年 1 月至 2016 年 12 月 3 032 例于天津医科大学肿瘤医院行乳腺 MRI 检查并经病理证实为乳腺浸润性癌患者的临床资料，根据纳入标准筛选出转移组 93 例和非转移组 186 例。分析转移组远处转移部位与分子分型的关系，同时对两组 MRI 影像特征进行单因素分析及多因素 Logistics 回归分析，获得独立预测因子并建立预测模型。**结果：**转移组中 Luminal 型、HER-2 过表达型、三阴性乳腺癌最常见远处转移部位分别为骨、肝脏、肺脏。单因素分析结果显示，两组间的病变类型、是否多发、T_1WI 和 T_2WI 信号均匀度及病灶最大径进行比较差异具有统计学意义（P<0.05）。多因素 Logistics 回归分析结果显示，病变类型、是否多发、T_2WI 信号均匀度及病灶最大径为独立预测因子。根据独立预测因子建立的预测模型准确率、敏感度、特异度和 AUC 分别为 82.8%、85.7%、75.0%和 0.801。**结论：**基于 MRI 影像特征的模型对预测乳腺癌远处转移具有潜在价值。

PO-053
乳腺癌新辅助化疗后 MRI 不同退缩模式对疗效评估的价值

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目的：分析新辅助化疗（NAC）后磁共振(MRI)上乳腺肿瘤的不同退缩模式，探讨不同退缩模式对化疗疗效的评估价值。**方法**：回顾性分析本院 2016 年 8 月至 2019 年 5 月经病理证实为单侧乳腺癌，且 NAC 前及手术前均进行了 MRI 检查的 50 名女性患者。2 名医生分别阅片分析肿瘤退缩模式，退缩模式分为 3 型：向心性退缩；碎片样退缩；混合型退缩。根据病理结果，将患者分为病理完全缓解（pCR）组和非 pCR 组。记录 NAC 前经穿刺检测 ER，PR 和 HER2 和 Ki-67 的表达情况。采用 χ^2 检验及 Wilcoxon 秩和检验比较 pCR 组及非 pCR 组临床资料的差异，采用 Kappa 检验评价 2 名医师对退缩模式分类评价的一致性，χ^2 检验比较 4 种分子分型肿瘤强化模式及退缩模式是否存在差异，且比较 NAC 前肿瘤不同强化模式与 NAC 后退缩模式是否存在差异，采用 Binary logistic 回归分析疗效的相关因素。**结果**：NAC 后经病理证实，pCR 组 16 例，非-pCR 组 34 例。pCR 和非 pCR 组间，年龄、绝经状态、病灶最大径、淋巴结，T 分期，钙化，分子分型，ER,PR,Ki-67 状态、MRI 强化方式及 NAC 前 BPE 情况差异均无统计学异常（P 均>0.05）； HER2 状态及退缩模式差异有统计学意义（P 均<0.05）。2 名医师对化疗后肿瘤退缩模式评估 Kappa 值为 0.719，一致性为中等。4 种分子分型的肿瘤退缩模式及 NAC 前 MRI 肿瘤强化方式差异均无统计学意义（P 均>0.05）。不同退缩模式 NAC 前 MRI 肿瘤强化方式差异有统计学意义（P<0.05）。Logistic 多因素回归模型显示，NAC 后肿瘤退缩模式及 HER2 状态是影响疗效达到 pCR 的独立因素。**结论**：NAC 后退缩模式及 HER2 状态可作为 NAC 疗效评估的独立因素。HER2 受体阳性更容易达到 pCR，碎片样退缩及混合型退缩难达到 pCR，达 pCR 患者中更大概率为向心性退缩。

PO-054

Diagnostic and Prognostic Value of Quantitative Gaussian and Non-Gaussian Diffusion MR Imaging Parameters in Breast Lesions

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Objective: To evaluate the potential association between various diffusion parameters obtained from both Gaussian and non-Gaussian diffusion models, including diffusion-kurtosis-imaging (DKI) stretched-exponential model (SEM), and intravoxel incoherent motion (IVIM) and Diffusion weighted imaging (DWI) and breast cancer clinical-pathologic factors.
Methods: Diffusion sequences were performed in 94 patients with pathologically proven breast lesions using a 1.5 T MR scanner. The apparent diffusion coefficient (ADC), diffusion coefficient (D), pseudo-diffusion coefficient (D*), perfusion fraction (f), molecular water diffusion heterogeneity index (α), distributed diffusion coefficient (DDC) mean diffusivity (MD) and kurtosis (MK) were calculated. T-test, ROC curves and Spearman correlation were used for statistical analyses.
Results: The ADC, D, DDC and MD were significantly lower in malignant lesions than in benign lesions (P<0.0001). The α and MK were significantly higher in malignant lesions than in benign lesions (P<0.0001). In invasive breast cancer, α was positively correlated with Ki-67 (r = 0.45), whereas negatively correlated with ER and PR expression (r = -0.28 and -0.41). MK was positively correlated with Ki-67 expression and histologic grade (r = 0.62 and 0.52), MD was negatively correlated with Ki-67 expression and histologic grade (r = -0.47 and -0.30). DDC (r = 0.29) was positively correlated with tumour size, whereas negatively correlated with ER

expression (r = -0.31). D (r = 0.33) was positively correlated with c-erb-B2 expression, whereas negatively correlated with ER expression (r = -0.35).
Conclusion: Both Gaussian and non-Gaussian diffusion model could be used for breast cancer diagnosis. Non-Gaussian parameters which correlated with prognostic factors could be used to predict the aggressiveness of breast cancer.

PO-055
组织学分级 3 级的浸润性导管癌：影像学特征与病理的相关性研究

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目的：研究组织学分级为 3 级浸润性导管癌的影像学特征，并探讨与病理之间的关系。
方法：回顾性分析自 2010 年至 2015 年 76 例通过手术病理证实为浸润性导管癌，组织学分型为 3 级病例的乳腺 X 线、MRI 特点，并与免疫组化指标对照分析。
结果：76 例病例平均年龄为 48 岁，确诊时临床分期为：I 期（34 例）、II 期（39 例），III 期（3 例）。乳腺 X 线上 59 例表现为肿块，17 例表现为非肿块，共 17 例伴有可疑钙化。4 例在乳腺 X 线与 MRI 上均表现为边缘光整的肿块。在乳腺 X 线上 35 例表现为边缘浸润，在 MRI 上为 40 例；在乳腺 X 线上 12 例表现为分叶状肿块，在 MRI 上为 32 例。肿块在乳腺 X 线上呈高密度者占 61.8%。在 MRI 上，毛刺长度小于 5mm 者占 77.6%，大于 1cm 者占 1%；毛刺所占比例不超过肿块边缘 1/2 者占 73.7%。肿块毛刺的长度与 Her-2 水平相关，与 ER、PR 水平及病变确诊时临床分期不相关。肿块毛刺所占比例与 ER、PR、Her-2 水平及病变确诊时临床分期均不相关。
结论：组织学分级为 3 级的浸润性导管癌在病理上多呈膨胀性生长，在影像学上有一定特征性，肿块毛刺的长度与 Her-2 水平相关，影像学在一定程度上能够在术前预测患者 Her-2 水平。

PO-056
Correlation of Perfusion parameters on Dynamic Contrast Enhanced MRI With Biomolecular Factors and Subtypes of Breast Cancers

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Objective This study aimed to investigate the correlation between the enhancement parameters of dynamic contrast-enhanced magnetic resonance imaging (DCE- MRI) and the molecular biological expression of breast cancers.
Material and Methods: This prospective study enrolled a total of 67 consecutive patients with breast carcinomas. DCE-MRI and routing MRI were performed in all patients before surgery.Correlations among perfusion parameters and prognostic factors, including tumor size, estrogen receptor (ER), progesterone receptor (PR), Ki67, human epidermal growth factor receptor 2 (HER-2), epidermal growth factor receptor (EGFR) expression, CK5/6 and subtypes of breast cancer were analyzed.

Results: Among these 67 lesions, the mean diameter of tumor was 4.48±1.73cm. There was no correlation between perfusion parameters and lesion size; K^{trans} and Kep were positively correlated with Ki67;The Vp values in negative and positive expression of CK5/6 were statistically different; the mean K^{trans} value of HER-2 overexpression was higher than that of Luminal A and Luminal B; The mean Kep value of HER-2 overexpressing lesions was higher than that of Luminal A.The mean Ve value of triple negative lesions was higher than that of HER-2 overexpression, Luminal A and Luminal B;The TTP value of HER-2 overexpressing lesions was lower than that of Luminal A and Luminal B; The mean MAX Conc value of triple negative lesions was higher than that of Luminal B,and the mean MAXSlope of HER-2 overexpressing was lower than that of Luminal A and Luminal B;**Conclusion:** Perfusion parameters of DCE-MRI can non-invasively evaluate the molecular biological expression and molecular subtype of breast cancer.

PO-057
乳腺癌治疗后高骨松患病率及相关因素分析

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目的 探索绝经后乳腺癌患者治疗后的骨质疏松患病率及相关影响因素。**方法** 对 147 例绝经后的乳腺癌患者的临床据资料进行回顾性分析，采用 DXA（Dual-energy x-ray absorptiometry 双能 X 线骨密度吸收仪）进行骨密度检测（包括腰椎正位(L1 -L4) 、股骨颈以及全髋的 BMD 测定），按乳腺癌受体不同表达（ER、PR、her-2）、年龄、BMI、绝经时间、术后时间、治疗方法进行分组，对影响骨密度减低的相关因素进行单因素分析及多因素 Logistic 回归分析。**结果** 147 例乳腺癌患者治疗后的骨质疏松患病率为 40.8%；年龄、BMI、绝经时间、治疗（内分泌治疗+化疗）、术后时间与骨密度减低呈显著相关（$P<0.05$），多因素 Logistic 回归分析显示年龄、BMI、术后时间是骨密度减低的主要影响因素（$P<0.05$）。**结论** 乳腺癌患者具有较高的骨质疏松患病率，乳腺癌治疗的多种因素都能够减低骨密度。雌激素是 BMD 与乳腺癌之间的关键，因为它在调节骨转换中的作用及其对乳腺癌细胞的作用。绝经后发生的生理雌激素剥夺破坏了破骨细胞-成骨细胞的活性，促进了骨密度的丧失，从而增加了骨质疏松和脆性骨折的风险，这与本次研究中绝经年限对骨质疏松的影响结果是一致的。术后化疗后的乳腺癌患者具有高骨质疏松患病率（40.8%），其影响因素与年龄、术后时间、手术时是否绝经、内分泌治疗具有相关性；雌激素与孕激素在维持女性正常骨量和骨代谢中起着很大的作用，雌激素与雌激素受体（ER）相结合，直接调节成骨细胞的骨形成和破骨细胞的骨吸收。本研究发现乳腺癌受体不同表达（ER、PR、HER-2）差异无显著性差异。因此对于治疗后的乳腺癌患者，都应当早期进行骨密度检查，定期监测骨密度，尽早对骨量丢失及骨质疏松进行干预，降低骨质疏松的患病率，提高乳腺癌患者的生活质量及生存率。

PO-058
对比分析不同类型乳腺病变钙化特征在 DBT 和 FFDM 的表现

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目的 对比分析不同类型乳腺病变 DBT 与 FFDM 的良、恶性钙化特征。**资料与方法** 回顾性分析 1263 例同时行乳腺 DBT 与 FFDM 检查的患者，统计两种检查方法下不同类型乳腺良、恶性钙化的检出率及诊断效能，对恶性钙化形态、分布特征情况进行组间对比分析。**结果** 1263 例患者非致密型乳腺 240 例，良性钙化 56 例，恶性钙化 13 例；致密型乳腺 1023 例，良性钙化 356 例、恶性钙化 63 例。非致密型乳腺中，DBT 与 FFDM 对良性钙化检出率分别为 22.9%(55/240)、21.7%（52/240），χ^2值：0.108，p=0.826;恶性为 5.0%（12/240）、4.6%（11/240），χ^2值：0.046，p=1.000，差异均无统计学意义。恶性钙化形态、分布特征比较，差异均无统计学意义。致密型乳腺中，DBT 与 FFDM 对良性钙化检出率分别为 34.2%（350/1023）、31.9%（326/1023），χ^2值：1.273，p=0.280；恶性为 6.0%（61/1023）、5.2%（53/1023），χ^2值：0.595，p=0.441），差异均无统计学意义；恶性钙化的形态、分布特征比较均无统计学差异，成簇分布、细小多形性钙化检出率 DBT 高于 FFDM。乳腺钙化诊断效能比较，非致密型乳腺 DBT 模式下 ROC 曲线下面积 0.993，FFDM 模式下为 0.992，两者比较 Z=0.2，p=0.984，致密型乳腺 DBT 模式下 ROC 曲线下面积为 0.987，FFDM 模式下为 0.964，两者比较 Z=1.716，p =0.085，差异均无统计学意义。**结论** 乳腺 DBT 技术比较 FFDM，对乳腺钙化的诊断效能比较无明显差异，但在致密型乳腺中，对良性钙化及恶性钙化中的细小多形性钙化、成簇分布钙化的检出具有一定优势，可提高对乳腺钙化 BI-RADS 分类的准确率。

PO-059

Preoperative Prediction Value of Multidetector Computed Tomography for HER2 Status in Patients with Breast Cancer: Combination Analysis of Deep Learning and Handcrafted Radiomics

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Objectives: To investigate whether handcrafted radiomics features and deep learning features combined model based on multidetector computed tomography (MDCT) can preoperatively predict the human epidermal growth factor receptor 2 (HER2) status in breast cancer.
Methods: This retrospective study enrolled 339 female patients (primary cohort, n =177; validation cohort, n =162) with pathologically confirmed breast cancer. Patients underwent immunohistochemistry (and fluorescent in situ hybridization) tests for HER2 status and contrast-enhanced MDCT before treatment. Deep and handcrafted radiomics features were extracted from arterial phase CT images. After the feature selection procedures, deep and handcrafted radiomics signatures were built. The combined model was built using multivariable logistic regression analysis. The performance of model was assessed by measures of discrimination, calibration and clinical usefulness. Finally, an independent validation cohort was used to confirm the combined model's predictive performance.
Results: The handcrafted radiomics signature demonstrated the discrimination ability with a C-index of 0.739 (95% confidence interval [CI]: 0.661-0.818) in primary cohort and 0.695(95% CI: 0.609-0.781) in validation cohort. The deep radiomics signature demonstrated discrimination ability with a C-index of 0.760(95% CI: 0.690-0.831) in primary cohort and 0.777(95% CI: 0.696-0.857) in validation cohort. The combined model

which incorporated the handcrafted radiomics features and deep radiomics features showed good discrimination ability by achieving a C-index of 0.829(95% CI: 0.767-0.890) in primary cohort and 0.809(95% CI: 0.740-0.879) in validation cohort.
Conclusions: The proposed MDCT-based combined radiomics model for HER2 status in breast cancer using the incorporation of handcrafted and deep radiomics signatures showed good predictive performance.

PO-060
影像组学：基于 BI-RADS 分类标准图像特征建立乳腺肿块型病变良恶性鉴别模型的临床应用探讨

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目的：本研究利用 BI-RADS 分类标准图像特征建立有效的特征提取器来进一步提高影像组学模型在全视野数字乳腺 X 线摄影（Full Field Digital Mammography FFDM）区分良恶性肿块型病变的能力。
材料与方法：目前，影像组学特征提取及分析已被广泛应用于全视野数字乳腺 X 线摄影中乳腺癌的诊断或者分类，但由于缺乏高特异性的临床特征和致密型乳腺腺体的影响，导致影像组学模型在分类或诊断乳腺癌病变时效能不高。为了更好的找出临床特征与影像组学特征之间的量化关系及提取更多有意义的临床相关特征，我们设计一个影像医师经验相关性高的特征提取器。首先，让 3 名高年资的乳腺影像诊断医师根据 BI-RADS 分类标准，提取每个患者图像中肿块病灶的影像学特征，分别为①形状（圆形、椭圆形、不规则形），边缘（清晰、遮蔽、模糊）、密度（高、等、低、脂肪密度）。然后，利用五种量化的质量相关特征训练了改进的深度神经网络，并在此基础上建立了临床图像特征提取器。将包含肿块的区域输入提取器，在每个肿块提取 128 维的临床-图像特征。本研究收集 220 个患者的图像，年龄 23-73 岁，2014-2017 年内进行乳腺 X 线摄影，通过病理组织学证明的单侧乳腺肿块型病变，最后共纳入 108 例良性、112 例恶性病例进行回顾性分析。我们使用两组影像组学方法对比研究（逐步回归及线性判别分析），分别对病变进行分类。对两组方法的诊断效能进行分析，获取其 AUC 值及 ROC 曲线。
结果：通过十组交叉验证，运用临床-图像特征及传统模型诊断能力较单纯传统模型的强，且有明显统计学意义，AUC = 0.95 ±0.03 vs 0.91±0.03, $p < 0.05$。
结论：利用 BI-RADS 分类标准的临床-图像特征能有效提高影像组学模型在乳腺肿块型病变的诊断能力。

PO-061
Radiomics Analysis on Cone-Beam Breast CT: Prediction of Breast Cancer Immunohistochemical Subtypes

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Purpose: To investigate the feasibility of Cone-Beam Breast CT (CBBCT) - based radiomics features predicting the immunohistochemical (IHC) subtypes of invasive breast cancer.
Materials and Methods: In this retrospective study, we collected female patients, aged 30 to 75 years, who underwent pretreatment CBBCT with satisfying image quality and were pathologically confirmed invasive breast cancers carrying IHC result. 866 features were extracted from each volume of lesion. Multinomial LASSO minimizing misclassification error was used to fit the optimal prediction model after removing highly colinear features. The performance of model was assessed through confusion matrix followed by accuracy, sensitivity and specificity.
Results: Of 133 lesions (28 luminal A, 71 luminal B, 21 HER-2-enriched, and 13 triple-negative) included in this study, discovering cohort was composed of 112 subjects with 28 lesions per subtype which was resampled and augmented by synthetic minority oversampling technique on account of data imbalance. The model eventually comprised 49 selected features and yielded an overall accuracy of 0.759 (95%CI: 0.677-0.829), with sensitivity of 0.9643, 0.6761, 0.7619, 0.7692, and specificity of 0.8286, 0.9032, 0.9911, 0.9417 for each subtype validated by original cohort.
Conclusion: Based on pre-treatment CBBCT data, we developed a radiomics model preforming well in breast cancer subtype prediction. Thereby, CBBCT-based radiomics signature could be an underlying IHC subtype predictor of breast cancer. As a new CT equipment, CBBCT has potential in assisting individualized treatment strategy selection and clinical outcome predicting for breast cancer patients.

PO-062
数字乳腺断层摄影（DBT）和 2D 乳腺 X 线摄影对乳腺“结构扭曲”病变诊断的对比研究

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目的 比较乳腺数字断层摄影（DBT）和 2D 乳腺 X 线摄影对结构扭曲的显示，并确定 DBT 在鉴别结构扭曲良恶性的价值。**方法** 回顾性分析 58 例（21 例恶性和 37 例良性）乳腺 X 线摄影表现为结构扭曲的病变。比较 DBT 影像和 2D 乳腺 X 线摄影对结构扭曲的可见性，并分析结构扭曲病变的中心密度、周围纠集条索成分及钙化来鉴别良恶性，同时对乳腺 X 线摄影中乳腺密度对结构扭曲可见性的影响进行评价。**结果** 与 2D 乳腺 X 线摄影相比，DBT 对结构扭曲发现率为 100%，且不受乳腺腺体密度的影响。2D 乳腺 X 线摄影发现率为 56.7%。相较于 2D 乳腺 X 线摄影，DBT 显示结构扭曲病变中心密度的准确性提高，DBT 显示病灶中心高密度与恶性病变密切相关，二者差异有统计学意义。结构扭曲周围纠集条索的长短与病变的良恶性差异无统计学意义，但是 DBT 显示周围纠集条索明显优于 2D。2D 乳腺 X 线摄影显示结构扭曲受周围腺体密度影响，但差异无统计学意义，评价病灶中心密度较 DBT 假阳性率高。**结论** 与 2D 乳腺 X 线摄影相比，DBT 能更好地显示结构扭曲。DBT 评价结构扭曲病变的良恶性准确性明显高于 2D 乳腺 X 线摄影，DBT 能够更好的显示病变的细节，有利于良恶性病变的鉴别。

PO-063

Background Parenchymal Enhancement on Contrast-enhanced Spectral Mammography

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Objectives: To assess the background parenchymal enhancement (BPE) at contrast material–enhanced spectral mammography (CESM) by category and quantitative, and evaluate how these relate to age, breast density, menopausal status and menstrual cycle timing.
Methods: This was a retrospective, institutional review board–approved study. 265 subjects who underwent CESM and had menopausal status records from July 2017 to March 2019 were included. Categorize assessment of BPE level was performed subjectively. Quantitative enhancement degree was measured using a region of interest (ROI). The univariate and multivariate associations between BPE and age, breast density, menstrual status, menstrual cycle timing was examined by using corresponding statistical analysis methods.
Results: 265 subjects were included in age and breast density analysis; in which 208 subjects were included in the menopausal status analysis. The BPE categorical analysis showed a negative correlation between category and age (Kendall’s tau-b=-0.138, p =0.004), menstrual status (rs = -0.333, p < 0.001), but no correlation between breast density (p =0.586), menstrual cycle timing (p =0.094). Ordered logistic regression showed BPE category was not associated with age (p =0.406), but associated with breast density and menstrual status. The BPE quantitative analysis showed a negative correlation between age and difference value in ROI (rs=-0.157, p=0.010), a statistically significant difference between the menstrual status (U=2850, Z=-3.850, p <0.001), but no significant difference in the breast density (H= 4.869, p =0.088), menstrual cycle timing (H = 7.175, p = 0.067). The multiple linear regression results showed the difference value in ROI was related to menstrual status (p =0.001), but not related to age (p =0.486) and breast density (p =0.463).
Conclusion: BPE on CESM is higher in premenopausal than postmenopausal women, and negative correlation with age, no significantly correlation with breast density and menstrual cycle timing.

PO-064

The feasibility and capability of CT-based radiomics nomogram in predicting disease-free survival for patients with pancreatic ductal adenocarcinoma following curative resection

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Purpose: The aim of this study is to develop and validate a nomogram model combining radiomics features and clinicopathological characteristics to preoperatively predict disease-free survival (DFS) for patients with pancreatic ductal adenocarcinoma (PDAC) following curative surgery.
Methods: A total of 255 PDAC patients who underwent contrast enhanced CT in Fudan university Shanghai cancer center were enrolled in this study. 147 patients were divided into the training cohort and 88 patients were divided into the validation cohort. The portal venous phase CT image was selected for radiomics features extraction. The least absolute shrinkge and selection operator (LASSO) regression was applied to features selection and radiomics score construction. The Kaplan-Meier (KM) analysis was used for subgroups survival analysis, including different TNM stage subgroups and single agent gemcitabine adjuvant chemotherapy subgroup. The multivariate Cox proportional hazards model incorporating radiomics score and clinicopathological factors was developed and was presented as the nomogram. The utility of the proposed model was evaluated by the concordance index, calibration curve, and decision curve analysis.
Results: A total of eight radiomics features were selected by LASSO regression and the radiomics score was calculated by a linear combination of selected features. The DFS prediction nomogram incorporating radiomics score and clinical data showed the better performance (training cohort: C-index = 0.78, validation cohort = 0.73) compared with the TNM staging system and clinicopathological model. The calibration curve and DCA demonstrated the clinical usefulness of the proposed nomogram.The KM analysis showed a significant difference between the survival in most of the TNM stage subgroups and gemcitabine adjuvant chemotherapy subgroup.
Conclusions: The radiomics based nomogram model could be useful in improving postoperative individualized DFS estimation in PDAC patients and to guide personalized care.

PO-065
Nonrigid subtraction technique in Multiphase enhancement liver CT

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Objective To evaluate the quality and clinical value of nonrigid subtraction in Multiphase enhancement of liver CT. **Methods** The image data of 50 patients underwent Multiphase enhanced liver CT examination were retrospectively collected, and the subtraction images were obtained by nonrigid subtraction technique. Qualitative evaluation included image artifacts and anatomical mismatch degree. The CT values of each blood vessel (abdominal aorta, right hepatic artery, left hepatic artery, portal vein trunk, right portal vein branch, left portal vein branch) before and after the subtraction were measured quantitatively in the arterial and portal vein phases, and the dynamic change curve of the CT values was drawn to evaluate the fitting degree of the CT values between the arteries and portal veins before and after

the subtraction. **Results** The consistency of the three observers was high (ICC=0.844, P<0.001). CT value of each blood vessel before subtraction was slightly higher than that after subtraction. The 95% confidence intervals of the slopes of the two lines intersect, and the slopes of the two lines are consistent. There were no obvious artifacts caused by anatomical mismatch in the images after subtraction. The CT value curves of the arteries and portal veins before and after subtraction were consistent. **Conclusion** Nonrigid subtraction technique can be applied to Multiphase enhancement of liver CT and obtain high quality images.

PO-066

基于 ADC 和 FA 信号强度图的全肿瘤纹理特征对肿块型肝内胆管细胞癌和单发少血供 肝转移瘤的鉴别价值

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目的 探讨弥散张量成像（DTI）的表观扩散系数（ADC）和各向异性分数（FA）的全肿瘤纹理特征鉴别肿块型肝内胆管细胞癌（IMCC）和单发少血供肝转移瘤（SHHM）的价值。**材料与方法** 回顾性收集 53 例经病理或随访证实为 IMCC 或 SHHM 的患者（24 例 IMCC，29 例 SHHM）。所有患者均进行了术前 MRI 检查，包括常规扫描（T_1WI、T_2WI 和动态增强扫描）和 DTI 序列（b 值=0, 600 s/mm^2）。在 GE AW 4.6 工作站，使用 Functool 软件重建 DTI 图像，生成 ADC 及 FA 图，将其导入 Omni-Kinetics 软件（GE Healthcare）。在 ADC 和 FA 信号强度图上手动勾勒出病变各层面的感兴趣区域（ROI），自动生成覆盖全肿瘤的 ADC 和 FA 信号强度的纹理特征，包括 GLCM（能量值、熵值、惯性、相关性、逆差分矩（IDM））和 GLRL（灰度不均匀性、游程长度不均匀性）。采用 Mann-Whitney U 检验比较两组间纹理特征，采用 ROC 分析评估诊断效能。**结果** IMCC 组和 SHHM 组 ADC 信号强度的惯性、相关性、IDM、灰度不均匀性和游程长度不均匀性差异有统计学意义（*P*=0.032, 0.002, 0.038, <0.001, <0.001），两组间 FA 信号强度的能量值、灰度不均匀性和游程长度不均匀性差异有统计学意义（P=0.037, <0.001, <0.001）。其余参数差异无统计学意义。ADC 和 FA 信号强度的灰度不均匀性鉴别 IMCC 和 SHHM 的诊断效能最高，AUC 分别为 0.820 和 0.787，灵敏度和特异度分别为 79.2%（86.2%）和 70.8%（82.8%）。**结论** 基于 DTI 的纹理特征可用于术前鉴别 IMCC 和 SHHM。

PO-067

An uncommon hepatic cystic lesion: mucinous hepatic neoplasm and a review of the literature

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Background
Hepatic cysts are increasingly found on abdominal imaging techniques, among which simple cysts are common, while the complex hepatic cystic lesions often present a diagnostic challenge. The differential diagnosis of complex cystic lesions includes

hepatic mucinous neoplasm, biliary intraductal papillary mucinous neoplasm, atypical simple cyst, hepatic hydatid cyst, hepatic abscess, etc. Hepatic mucinous cystic neoplasm is a rare benign lesion, with propensity for local recurrence and malignant transformation.

Case presentation
A 59-year-old woman was diagnosed to have a hepatic cystic neoplasm, with enlargement in the last 2 years. Abdominal computed tomography revealed a multilocular cystic lesion of 14X11 mm in size with internal septal formoation, calcification, minimal wall thickness and a nodular component in segment IV of the liver. Magnetic resonance imaging demonstrated multiple well-defined cystic lesions with low signal intensity on TIWI and high signal intensity on T2WI inside, and septal and mural calcifications showed low signal intensity on T1WI and T2WI, while mural nodule showed high signal intensity on T2WI. The entire tumor was successfully resected with a laparoscopic approach. Histological study confirmed a mucinous hepatic cystic neoplasm.

Discussion
Complex Hepatic cysts usually present with wall thickening or irregularity, septations, calcification, mural nodule or enhancement. While ultrasonography and abdominal CT can confidently diagnose benign simple cysts, MRI can fully evaluate complex cystic lesions; however, it is difficult to make a definitive diagnosis preoperatively. Histological examination is the only way to differentiate between benign and malignant lesions.

Conclusion
We report a case of a patient diagnosed with hepatic mucinous neoplasm. The following brief review describes the radiologic features of the broad spectrum of cystic hepatic lesions.

PO-068

Early- and late-phase vascular involvement associated with acute pancreatitis: initial findings and follow-up by magnetic resonance imaging

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Purpose To investigate MRI findings of early- and late-phase vascular abnormalities in acute pancreatitis (AP) and correlate the prevalence of vascular involvement with AP severity based on MR severity index (MRSI) and Acute Physiology and Chronic Health Evaluation (APACHE) II score. **Methods** Retrospectively studied 301 consecutive AP patients admitted to our institution and underwent initial MRI during the early-phase of pancreatitis and one or more following MRI in the late-phase. Peripancreatic vascular conditions and pancreatitis were assessed on T1-/T2-weighted imaging and

dynamic-enhanced MRI. The association between prevalence of vascular involvement and AP severity graded by the MRSI or APACHE II was respectively analyzed by Spearman's rank correlation. **Results** Based upon initial MRI, 176 (58.5%) had edematous pancreatitis, whereas 125 (41.5%) had necrotizing pancreatitis. Mean MRSI score was 3.8 points (range, 1-10) for the 301 patients, 2.7 points for edematous pancreatitis, and 5.3 points for necrotizing pancreatitis. According to MRSI, the mild, moderate, and severe pancreatitis was 46.8% (141/301), 44.6% (134/301), and 8.6% (26/301). Among 301 AP patients, 75 (24.9%) had at least one MRI-detected vascular abnormalities. The prevalence of vascular involvement was higher in necrotizing pancreatitis than in edematous pancreatitis (43.2% [54/125] vs. 11.9% [21/176] , $x^2 = 38.2$, $p < 0.001$). The prevalence of splenic vein phlebitis, portal vein phlebitis, and splenic arterial arteritis was 24.9%, 22.3%, and 19.9% on MRI in the early-phase. Of the 75 patients with splenic vein phlebitis, 44% (33/75) of them had splenic vein stenosis with a mean diameter of 3.5 mm (range, 2-5.5 mm). Depending on MRSI, the prevalence of splenic phlebitis, portal vein phlebitis, and splenic arterial arteritis, respectively correlated with the severity of pancreatitis ($r = 0.532$, 0.487, and 0.456; all $p < 0.01$); According to APACHE II scores, the prevalence of vascular involvement significantly correlated with AP severity ($r = 0.335$, $p < 0.05$).**Conclusion** Vascular abnormalities (especially in splenic vein phlebitis and splenic arterial arteritis) on MRI are common in the early-phase of AP, which may be supplementary indicators in reflecting the severity of AP.

PO-069

Clear cell myomelanocytic tumor of the falciform ligament/ligamentum teres

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Clear cell myomelanocytic tumors (CCMTs) of the falciform ligament/ligamentum teres are extremely rare. CCMTs are a variant of perivascular epithelioid cell tumors. We present a case of hepatic CCMT in a 54-year-old woman with abdominal pain. The patient had an 8.8 cm well-demarcated tumor in the right lobe of the liver. Contrast-enhanced computed tomography showed a heterogeneous mass that enhanced significantly in the arterial and portal venous phases, and was less enhanced in the delayed phase. The patient underwent a right hemihepatectomy and cholecystectomy. The tumor cells had clear to slightly eosinophilic cytoplasm, vesicular nuclei, and were positive for HMB-45 and smooth muscle actin. The patient had no recurrence after 36 months follow-up. A review of the literature identified 10 hepatic CCMTs. Hepatic CCMTs are usually benign tumors of young women that present as large masses located in the right lobe of the liver.

PO-070

Deep Learning-Based Radiomics Model for Predicting Early Recurrence of Hepatocellular Carcinoma

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Purpose:
To propose a deep-learning-based radiomics approach for predicting early recurrence of hepatocellular carcinoma using multi-phase CT images.

Methods and Material:
Consecutive 167 surgically resected and pathology confirmed HCC patients were enrolled in this retrospective study. Among them, 65 patients were early recurrence (ER) within 1 year after surgery and 102 patients were non-early recurrence (NER). The bounding box of tumor is manually outlined on non-contrast, arterial phase and portal venous phase CT images at ITK-SNAP by a 3-year experienced radiologist. In addition, traditional clinical indicators such as gender, age, tumor number, tumor size, portal vein invasion, HBV infection, ALT, AST, AKP, NLR, cirrhosis, BCLC stage, AFP level were also included in this study. We randomly divided 167 patients into 10 groups to train and test the model using 10-fold cross-validation. Four deep learning-based combined models with radiomics signatures and clinical data were built to evaluate the predictive performance. The area under ROC curves (AUC) were analyzed to compare the radiomics model and clinical model, as well as combined models A, B, C, D.

Results:
The AUCs of radiomics model with or without fine-tuning were 0.723 and. 0.678, which was inferior to the clinical model as 0.7044 for SVM and 0.7532 for random forest. Furthermore, deep radiomics model is superior than the conventional radiomics model based on hand-crafted low-level features (AUC=0.825vs.0.765). And the AUCs of combined models from A to D were 0.788,0.805,0.765,0.825, respectively.

Conclusion:
Deep learning-based radiomics model was helpful for the preoperative prediction of early recurrence of HCC. Incorporating radiomics signature and clinical factors performed better than radiomics or clinical model alone.

PO-071
钆塞酸二钠肝脏增强多动脉期 DISCO 成像技术评价动脉晚期采集和图像质量与单动脉期对比研究

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目的 探讨基于笛卡尔采集的 K 空间共享三维容积快速动态成像（DISCO）多动脉期成像技术在钆塞酸二钠肝脏增强 MRI 上的应用价值。

方法 前瞻性收集 2017 年 9 月至 2018 年 3 月四川大学华西医院经超声或 CT 检查怀疑恶性局灶性肝脏病变的 56 例患者，术前均行钆塞酸二钠肝脏增强 MRI 检查。采用随机数字表法将患者分组，A 组 29 例，采用 DISCO 技术行肝脏多动脉期成像；B 组 27 例，采用 LAVA-Flex（liver acquisition with volume acceleration-flex，肝脏容积快速采集联合两点法水脂分离技术）序列行单动脉期成像，评价动脉晚期图像的显示率和动态增强图像的呼吸运动伪影。分类变量间比较采用 x^2检验，单动脉期与多动脉期间呼吸运动伪影的比较采用 Mann-Whitney U检验，多动脉期各时相间伪影评分的比较采用 Kruskal-Wallis H检验。

结果 A 组患者的 DISCO 序列中，96.6%（28/29）的患者观察到动脉晚期，高于采用 LAVA-Flex 采集的单动脉期成像[74.1%（20/27）]，差异有统计学意义（x^2=5.77，P=0.016）。在呼吸运动伪影的评价中，LAVA-Flex [3（3，4）]获得的动脉晚期图像的运动伪影较 DISCO 序列[2（2，3）]更严重，差异有统计学意义（Z=－3.250，P <0.01）。DISCO 序列 6 个期相运动伪影的评分中，第 1、2、3、4、5 和 6 期的伪影评分分别为[3（3，4）]、[2（2，3）]、[2（2，3）]、[3（2，3）]、[3（3，4）]和[3（3，4）]分，第 2、3、4 期的伪影评分明显优于第 1、5、6 期，差异有统计学意义（P＜0.05），但第 2、3、4 期间差异均无统计学意义（P＞0.05）。

结论 相较于单动脉期成像，钆塞酸二钠肝脏增强 DISCO 多动脉期采集可提高动脉晚期采集效率并减少运动伪影。

PO-072

T1 mapping on gadoxetic acid-enhanced MR imaging for preoperative prediction of microvascular invasion in hepatocellular carcinoma

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Purpose

The aim of our study was to explore the ability of T1 mapping on gadexetic acid-enhanced MR imaging in predicting MVI and early recurrence of HCC after curative resection.

Methods

79 patients with surgically confirmed HCC (27 MVI-positive lesions and 52 MVI-negative lesions) were prospectively examined and followed up for at least 1 year after resection. Freehand region of interests (ROIs) were outlined around the largest cross-sectional area of the tumor on pre-enhancement and hepatobiliary phase (HBP)T1 maps. Pre- and postcontrast T1 relaxation time, reduction rate of T1 relaxation time (△%), and radiologic findings (tumor margin, corona enhancement, peritumoral hyperintensity on HBP, and the signal intensity on HBP images) were then assessed. Univariate and multivariate logistic regression analyses were performed to identify the independent predictors of MVI and early recurrence. The diagnostic ability of these parameters was evaluated by receiver operation characteristic (ROC) analysis.

Results

Peritumoral hypointensity on HBP (Odds Ratio [OR]=0.308, 95% confidence interval [CI]: 0.094-1.016; p=0.053), pre-contrast T1 relaxation time (OR=1.048,95%CI: 1.001-1.070; p=0.032) and reduction rate of T1 relaxation time (OR=0.238,95%CI: 0.068-0.814; p=0.005) were independently related to MVI. Reduction rate of T1 relaxation time showed the highest area under the receiver operating characteristic curve (AUC) value of 0.702 for predicting MVI, followed by pre-contrast T1 relaxation time and peritumoral hypointensity on HBP (AUC=0.678 and 0.639, respectively). Incorporating all these independent factors, the AUC of 0.825 (95%CI: 0.727-0.923) was obtained, with sensitivity of 74.1% and specificity of 80.8%.
For early recurrence, only radiologic findings, corona enhancement (p=0.013) and signal intensity on HBP images (p=0.015), were identified as independent predictors.

Conclusion
Combined with the presence of peritumoral hypointensity on HBP, T1 mapping on gadoxetic acid enhanced MRI demonstrated great potential in the preoperative prediction of MVI.

PO-073

Spectral CT imaging of splenic arteriography and venography by using a low injection velocity and low dose contrast medium protocol before laparoscopic gastrectomy during the patients of gastric carcinoma with poor vascular condition

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Objective To investigate the value of splenic arteriography and venography by using spectral CT imaging with a low injection velocity and low dose contrast medium protocol before laparoscopic gastrectomy during the gastric cancer patients who had relatively poor vascular condition and could not afford high injection velocity and high dose contrast medium.
Methods Totally eighty patients of gastric carcinoma weighing between 50 to 70 kg in our hospital referred to upper abdominal routine contrast-enhanced CT scans (50 mL of 320mgI and 30 mL of saline at 2 mL/s) were selected in this study. Forty cases were used GSI mode(single source dual energy fast 80/140kVp switching) and the other forties were used 120KVp scan with automatic mA modulation. All the data of arterial and venous phase were transmitted to AW4.5 workstation and optimal KeV of splenic artery was selected by using optimal CNR tool. CT value and SD value of proximal splenic artery and erector spinae were measured in every data set of keV and 120KVp images. CT values and CNRs of splenic artery and vein were calculated and compared by independent-sample t test separately. CTA images in the arterial and venous phase (3D CT arteriography) were reconstructed using the volume-rendering technique. The VR(volume rendering, VR) images quality of optimal KeV and 120 KVp data sets were evaluated by two experienced CT radiologists independently. The visibility of the

splenic artery and vein were evaluated and recorded on a five-point scale (1 for poor and 5 for excellent). And then average image score at optimal keV and 120KVp were calculated and compared by independent-sample t test.

Results The optimal keV of splenic artery enhancement was 50.85±4.04keV. The CT value and CNRs of images from optimal keV were both significant higher than those of 120KVp scan CT values were 352.99±108.03 HU(optimal keV) vs 179.63±41.49HU(120KVp) (t=8.42,P=0.00<0.05) and CNR were 12.38±6.22(optimal keV) vs 9.50±5.64(120KVp) (t=10.88, P=0.00<0.05). The VR image score of visibility of splenic artery at optimal keV(3.96±0.67) was significant higher than 120KVp(2.15±0.81) ,(t=8.72,P=0.00 <0.05). The optimal keV of splenic vein enhancement similar with routine 120KVp upper abdominal contrast-enhanced CT was 49.40±5.08keV. The CT value and CNRs of images from optimal keV were both significant higher than those of 120KVp scan CT values were 279.22±106.86 HU(optimal keV) vs 279.22±106.86HU(120KVp) (t=7.52,P=0.00<0.05) and CNR were 8.05±3.12 (optimal keV) vs 5.80±2.72HU(120KVp) (t=6.63,P=0.00<0.05). The VR image score of visibility of splenic vein at optimal keV (3.45±0.76) was significant higher than 120KVp(1.65±0.88), (t=11.57,P=0.00 <0.05).

Conclusion Monochromatic images at 50.85±4.04 and 49.40±5.08 keV provided the best visibility of splenic artery and vein than conventional 120 KVp in upper abdominal contrast-enhanced CT scan during the patients with poor vascular condition before laparoscopic gastrectomy. 50keV monochromatic images could be used routinely for reconstruction of both splenic artery and vein.

Clinical relevance /application:

Spectral monochromatic imaging is a promising method to reduce contrast dose and injection velocity substantially and provides good image quality of artery and vein especially during the gastric carcinoma patients with poor vessel condition before laparoscopic gastrectomy.

PO-074

Intravoxel incoherent motion (IVIM) imaging for differential diagnosing hepatocellular carcinoma (HCC), hepatic hemangioma (HHA) and hepatic metastasis (HM)

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OBJECTIVE To compare the pure molecular diffusion, D, perfusion-relate ddiffusion, D^*, and perfusion fraction, f of the intravoxel incoherent motion(IVIM) theory in differentiating hepatocellular carcinomas (HCCs), hepatic hemangiomas (HHAs) and hepatic metastasis (HMs), for providing a valuable method for the differential diagnosis of these three parenchyma tumors of liver.

SUBJECTS AND METHODS This retrospective study was approved by our Institutional Review Board and written informed consent was waived. Seventy-one patients (40 men vs. 31 women, mean age 62 years old) with 33 hepatocellular carcinomas (HCCs), 24 hepatic hemangiomas (HHAs) and 14 hepatic metastasis (HMs) were enrolled in this study and inspected conventional MR and IVIM-MR examination with 1.5-T MR imager from January 2015 to October 2015. MRI protocol containing the routine T1WI, T2WI and 19 b values

(0, 10, 30, 50, 80, 100, 120, 150, 180, 200, 300, 500, 800, 1000, 1200, 1500, 2000, 2500 and 3000 s/mm^2) were used to evaluate diffusion and perfusion characteristics of IVIM. IVIM parameters (ADC, D, D*, and f) of HCCs, HHAs and HMs were measured by using the FuncTool on GE AW4.6 workstation. The MR images were blindly reviewed and analyzed by two observers who have 3 and 10 years' experience of MR diagnosis respectively. The SPSS17.0 statistical software has been used for the data analysis, p value less than 0.05 was considered statistically significant. Intraclass correlation coefficient (ICC) test was applied to test the consistency of two observers; compared the ADC, D, D*, and f of the three groups by Mann-Whitney test, respectively.

RESULTS The ICC values of the IVIM parameters (ADC, D, D*, and f were all greater than 0.75 in the three groups, exhibiting an amenable consistency; The ADC, D and f of the HHAs were significantly higher ($p < 0.05$) than the HMs. But the D* did not show any statistically significant difference between the HHAs and the HMs ($p > 0.05$); The ADC, D and f of HHAs were significantly higher ($p < 0.05$) than HCCs, while the D* of HHAs were significantly lower ($p < 0.05$) than HCCs; The ADC, D, D*, and f did not show any statistically significant difference between the HCC and the HMs ($p > 0.05$).

CONCLUSION According to our study, the HHAs, HCCs and HMs showed different IVIM parameters (ADC, D, D*, and f values). D and f were significantly decreased in malignant tumors. The reduction in D* reflects tumors decreased perfusion in HCCs. IVIM imaging facilitates understanding of tumor tissue characteristics of perfusion and diffusion, and it may provide more useful information to distinguish HHAs from other two malignant tumors.

PO-075

CT 影像征象及组学特征在鉴别不同分化消化系统神经内分泌肿瘤肝转移中的价值

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目的：探讨 CT 影像学征象及组学特征在鉴别不同分化消化系统神经内分泌瘤肝转移中的价值。**方法**：收集 2010 年 5 月至 2018 年 6 月北京大学肿瘤医院消化系统神经内分泌肿瘤肝转移患者，经病理证实且疗前有增强 CT，由两名影像医师评价 CT 征象（肝转移灶分布、形态、病灶动脉期边缘、肝动脉期强化、增强类型、囊变坏死、瘤内新生血管、瘤周动脉期一过性强化灶、血管侵犯、淋巴结转移及腹水），应用 Logistic 回归分析确定独立危险因素，计算 AUC；并用 3D Slicer 软件在门静脉期 CT 图像上勾画最大病灶的 ROI 区，应用 Radiomics 模块提取特征，包括：一阶统计特征、几何特征及纹理特征三类共 841 个，采用元转换器（Meta-transformer ）基于重要性权重（importance weights）筛选特征，利用 XGBoost 模型计算 AUC。**结果**：入组患者共 123 例，其中 G 1 与 G 2 患者 44 例，G 3 患者 79 例。CT 影像评价结果：G3 型肝转移灶动脉期边界不清比例高于 G1/2 型［83.5%（66 / 79）vs 63.6%（28 / 44），$x^2=6.22$，$P=0.01$］;G1/2 型肝转移伴淋巴结肿大比例低于 G3 型［34.1%（15 / 44） vs 75.9%（60 / 79），$x^2=20.81$，$P<0.01$］；Logistic 回归分析结果：病变动脉期边缘、瘤内新生血管、瘤周动脉期一过性强化灶及肿大淋巴结是 G3 组独立预测危险因素，具有鉴别价值（P 值分别＜0.01、＜0.01、0.03、＜0.01），根据预测值勾画 ROC 曲线，AUC 为 0.86；将临床信息、主观评价指标及 841 个影像特征纳入特征筛选，筛选出 305 个特征用于训练 XGBoost 模型，AUC 为 0.90。**结论**：CT 影像特征及组学特征联合应用在不同病理类型消化系统神经内分泌肿瘤肝转移鉴别中具有较高能力，具有临床应用价值。

PO-076

Magnetic resonance imaging for preoperative staging of pancreatic cancer based on the 8th AJCC guidelines

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Purpose: To determine the staging accuracy and evaluate the resectability of magnetic resonance imaging (MRI) about pancreatic cancer compared with intraoperative or pathological findings according to the 8th edition of the American Joint Committee on Cancer (AJCC) TNM staging system.
Methods: One hundred and thirty-two patients with a pathological diagnosis of pancreatic cancer underwent preoperative MRI were identified. The clinical data, MRI findings, intraoperative or pathological findings were analyzed respectively. Preoperative MRI staging and resectability evaluation compared with intraoperative or pathological findings. The accuracy of MRI for preoperative T and N stage were evaluated, the sensitivity, specificity and accuracy of MRI in evaluating the resectability were assessed. All the staging and resectability according to 8th edition of the American Joint Committee on Cancer (AJCC) TNM staging system.
Results: Analysis showed the accuracy of MRI for evaluation the T and N stages were 82.6% (109/132) and 74.2% (98/132) respectively. The sensitivity and specificity of MRI in assessment the resectability were 94.2% and 71.4% respectively. Integrated the 8th edition of the AJCC TNM stage, no significant differences were identified between the preoperative MRI findings and pathological results for the staging of pancreatic cancer (p=0.805).
Conclusions: MRI is highly accurate for T staging and moderately accurate for N staging; MRI provides important pre-operative evaluation about staging and resectability for pancreatic cancer based on the 8th edition of the AJCC TNM staging system.

PO-077

CT and MR imaging features of pancreatic adenosquamous carcinoma and their correlation with prognosis

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Purpose: To retrospectively investigate the computed tomography (CT) and magnetic resonance (MR) imaging features of pancreatic adenosquamous carcinoma (PASC) and the association between imaging findings and prognosis.
Material and methods: CT, MR images of 26 patients with PASC were analyzed. Clinical symptoms, tumor markers, and patients' survival were recorded. Tumor attenuation,

enhancement pattern and degree, vessel involvement, adjacent tissue invasion and metastasis were evaluated. The association between imaging features and overall survival (OS) were also assessed by using Cox proportional hazards ratios model.
Results: Fourteen masses were found in the head of the pancreas and 12 in the body/tail. The mean tumor size was 4.47 ± 1.76 cm. PASC usually showed ill-defined (96.2%), lobulated (76.9%) and predominantly solid mass (92.3%). Ring enhancement in the peripheral area of the tumor was commonly seen (76.9%). Vessel invasion was seen in 17 cases (65.4%), encasement of adjacent arteries in 7 cases (26.9%), upstream main pancreatic duct (MPD) dilatation in 16 cases (61.5%) and double duct sign in 9 cases (34.6%). Multivariate Cox proportional hazards model demonstrated that patients with vessel invasion may predict a poor prognosis ($p = 0.037$).
Conclusion: PASC tends to be an ill-defined solid mass with peripheral ring enhancement, and relatively poor enhancement in the central area. PASC may also show vessel invasion, vessel encasement and upstream MPD dilatation. Vessel invasion may indicate a poor prognosis.

PO-078

Image features of splenosis

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TEACHING POINTS
To delineate the imaging features of splenosis mimicking primary neoplasms when presented throughout different locations.
TABLE OF CONTENTS/OUTLINE
Splenosis are rare conditions of implantation of spleen in unusual anatomical sites, which may attribute to splenic trauma or splenectomy. Most of them can be diagnosed according to a similar imaging characteristics of native spleen when realized, whereas confounded diagnosis may occur in the situation of absence of native spleen or spleen under pathological condition. A serial of patients confirmed with splenosis was reviewed to specify CT and MRI imaging characteristics of splenosis. Implantation of ectopic spleen should be considered to avoid unnecessary surgical treatment or intervention.

PO-079

Preoperative prediction of hepatic malignancies with highly aggressive characteristic based on quantitative parameters derived from hepatobiliary phase

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Objective
To investigate the preoperative predictive performance of quantitative parameters based on hepatobiliary phase (HBP) in hepatic malignancies with aggressive characteristic.

Material and methods
This prospective study was approved by institutional review board and informed consent were obtained from all patients. 118 patients with surgery-proven hepatic malignancies [103 patients with hepatocellular carcinoma (HCC) and 15 patients with intrahepatic cholangiocarcinoma (ICC)] were included. The signal intensity (SI) of liver, tumor and muscle were measured and termed as L_0, T_0 and M_0 on pre-contrast image and L_{20}, T_{20} and M_{20} on HBP, and quantitative parameters were calculated accordingly. The aggressive characteristic of hepatic malignancy was identified by Ki-67 labeling index(LI) and classified into low aggressive (Ki-67 LI $\leqslant$ 10%) and high aggressive (Ki-67 LI $>$ 10%) groups. Difference of quantitative parameters between the two groups were assessed and correlation between quantitative parameters and Ki-67 LI was explored. Receiver operating characteristic (ROC) analyses with area under ROC curves (AUC) were used to evaluate the predictive performance of significant parameters and combinations.

Results
The value of tumor to liver contrast ratio (TLR, T_{20}/L_{20}), tumor enhancement index [TEI, $(T_{20}/L_{20})/(T_0/L_0)$] and relative enhancement ratio [RER, $(T_{20}-T_0)/(L_{20}-L_0)$] were significantly lower in high aggressive hepatic malignancy and HCC($p<0.05$). TLR and RER were also significantly different between low and high aggressive ICC groups ($p<0.05$). The parameters that showed the best predictive performance of aggressive characteristic were TLR (AUC=0.749, 95%CI: 0.660-0.824; sensitivity=86%; specificity=56%) in hepatic malignancy, TLR+TEI (AUC=0.758, 95%CI: 0.664-0.837; sensitivity=67%; specificity=76%) in HCC and TEI(AUC=1.000, 95%CI:0.782-1.000; sensitivity=100%; specificity=100%) in ICC, respectively. Significant negative correlation was found between Ki-67 LI and TLR and RER in patients with hepatic malignant tumors, and between Ki-67 LI and TLR, TEI and RER in HCC patients.

Conclusion
Quantitative parameters based on the SI measurement of HBP could preoperatively and noninvasively predict the aggressive characteristic of hepatic malignancies.

PO-080

Study of reduced field-of-view diffusion-weighted imaging (DWI) on the diagnosis of gallbladder cancer.

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Objective: To compare image quality of reduced field-of-view (r-FOV) and full FOV(f-FOV) diffusion-weighted imaging(DWI) sequences at 3T,with apparent diffusion coefficient(ADC) values in the diagnosis of gallbladder disease .

Materials and Methods: Our study collected 511 patients with gallbladder disease who had undergone DWI scan for preoperative evaluation in Tongji Hospital from July2017 to December2018,and finally 61 patients were enrolled after excluding unqualified cases.Preoperative DWI images,including both r-FOV and f-FOV DWI sequences, of 61 patients with gallbladder disease confirmed by surgery or puncture pathology were measured by two radiologists. The ADC values of diseased region were measured , and the resolution, signal-to noise ratio(SNR) , contrast-to-noise ratio(CNR) were calculated by two radiologists independently. Meanwhile, two radiologists independently assessed subjective image quality parameters, including image sharpness, distortion, artifacts, lesion conspicuity with a 4-point scale. The weighted-K test was used to examine the consistency of the results measured by the two radiologists. Comparisons of these parameters between two groups were made by Wilcoxon's rank sum test,including image sharpness, distortion, artifacts, lesion conspicuity.Paired t-test were used to analyze differences between two groups about SNR、CNR and ADC,and then Spearman test was used to correlate the three types of gallbladder disease with ADC.

Results: 1.There was good agreement of both dates measured and image quality between two radiologists in both r-FOV DWI and f-FOV DWI(P>0.05).

Subjective score: The subjective score of image quality of r-FOV DWI was 13.84±1.10, which was higher than that of f-FOV DWI(10.36±1.13) significantly.The resolution, deformation, artifacts, and lesion conspicuity of r-FOV were 3.41, 3.36, 3.67 and 3.39, respectively, both higher than f-FOV.

3.Objective score: The CNR score of r-FOV is higher than f-FOV, and the SNR score of r-FOV is lower than f-FOV. The spatial resolution of the r-FOV image (1.56mm*1.56mm) is twice that of the f-FOV image (2.25mm*2.25mm). Comparing the two DWI images, it can be found that r-FOV can effectively reduce the deformation and artifact of f-FOV images, and has higher definition and better lesion display effect.

4.There was no difference in the ADC values measured between the r-FOV and f-FOV groups, but the ADC values of different gallbladder diseases were significantly different. (P<0.05)

Conclusions: Compared with f-FOV DWI, r-FOV DWI had a higher spatial resolution and lesion conspicuity, that also can significantly reduce susceptibility artifacts as well as image distortions.

PO-081

Arterial and delayed MRI enhancement well predicts the prognosis of intrahepatic mass-forming cholangiocarcinoma.

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Purpose

This retrospective cohort study was to explore the value of arterial and delayed enhancement MRI in predicting the prognosis of intrahepatic mass-forming cholangiocarcinoma (IMCC).

Materials and methods
Two hundred and thirty-two patients of IMCC from January 2011 to December 2015 with pre-operative contrast enhanced MRI were analyzed. Follow up recurrence and death data were recorded until October 2018. We defined a three-point scoring system for assessing arterial enhancement degree (0: no or slight enhancement, 1: intermediate, 2: hyper or dense enhancement) and delayed enhancement uniformity (0: hypo-signal over two thirds of lesion, 1: intermediate, 2: uniformly hyper or iso enhancement over two thirds of lesion). Patients were classified into two groups according to the sum of arterial and delayed scores (Group A: score<3, Group B: score >=3) . Kaplan-Meier Curve was applied for prognosis analysis. Imaging features as well as clinical-pathological data were also compared between the groups.

Results
Median recurrence/death time were 7(95%CI: 5.7,8.3) / 36(95%CI: 16.6,55.4) months (P=0.000) and 51(95%CI: 33.5,68.5) / 82 months (P=0.000) in A and B groups respectively. Group B had significantly higher 2-year event-free survival rate (17.8% vs. 69.6%) as well as 5-year survival rate (41.1% vs. 78.0%) compared with Group A.

Conclusion
Arterial and delayed MRI enhancement can well predict the prognosis of intrahepatic mass-forming cholangiocarcinoma.

PO-082

Prediction of Histopathological Growth Patterns of Colorectal Liver Metastasis by Noninvasive Imaging Method

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Objective: To predict histopathological growth patterns (HGPs) in colorectal liver metastases (CLRMs) by a **noninvasive** radiomics model.
Material and Methods:patients who had Chemo-naive CLRMs and underwent abdominal ceMDCT followed with partial hepatectomy were included in this retrospective study between Jan 2007 and Jan 2018. H&E stained histopathologic sections of CRLMs were reviewed and HGPs were defined according to the international consensus. Radiomic features were extracted from pre- and post-contrast arterial and portal venous phases MDCT images focusing on the segmented tumor-liver interface (TLI) zones of CRLMs. Minimum redundancy maximum relevance (MRMR) and decision tree (DR) were constructed for radiomics modeling. Multivariable logistic regression analyses and the receiver operating characteristics (ROC) curves were used to assess the predictive performance of those models in differentiation of HGPs.
Results: Eighty-two CLMRs with histopathologic proved desmoplastic (n=54) and replacement (n=28) HGPs were included. The radiomics signature, which consisted of 20 selected features of each phase, was significantly associated with HGPs. The fused arterial phase with portal venous phase radiomics signature ($Signature^{AP+PP}$) showed the best predictive performance in distinguishing replacement and desmoplastic HGP, with the AUC of 0.962 and 0.870 in the training and validation cohort. The radiomics model showed good discrimination with C-index of 0.974 and 0.765 in the training and validation cohort. However, combined model with the qualitative and clinical features did not show significant improvement for the prediction.
Conclusion:radiomics model derived from MDCT could effectively predict HGPs of CRLMs, and provide basis for prognostic stratification and therapeutic strategy making.

PO-083

Liver fibrosis detection and staging: a comparative study of T1 rho MR imaging and 2D magnetic resonance elastography

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Purpose: To compare the results of T1 rho MR imaging and 2D magnetic resonance elastography (MRE) for liver fibrosis detection and staging.
Methods: 120 rabbit models of CCl4-induced liver fibrosis(HF) were established and thirty untreated rabbits served as controls. Carbon tetrachloride (CCl4) injection was performed once a week at 0.1ml/kg-0.2ml/kg for 16 weeks (week 4－16) in the HF group which was divided into 5 subgroups and underwent MR examinations at weeks 4, 8, 12 and 16 respectively post the first CCl4 injection (week 1). T1 rho values and liver magnetic resonance stiffness (LS) values were measured. According to METAVIR scoring system., the stage of HF of all rabbits was classified as F0－F4. Blood samples were taken to assess the ELF score. Hepatic hydroxyproline was measured photometrically in

liver hydrolysates. All variables were checked for normal distribution. Interobserver agreement for measurement of the T1rho and LS was determined. ANOVA test was performed to compare the T1ρ values, LS values and METAVIR scoring, $p<0.05$ was considered statistically significant. Variable between two groups were compared by using the unpaired Student t test. Correlation analysis was performed among T1rho values, LS values, and fibrosis stage by using Spearman rank correlation coefficient. Pearson correlation coefficients were calculated to evaluate the relationship between T1rho values, LS values and ELF score, Hepatic hydroxyproline.For multiple comparisons, Receiver operating characteristic (ROC) analysis was performed for assessing diagnostic performance of T1rho ,LS value ELF score, Hepatic hydroxyproline in detection of substantial fibrosis (<F2) vs severe fibrosis (≥ F3).
Results: There was high positive correlation between METAVIR scoring and T1rho values (r = 0.876; 95% CI 0.291－0.754; P < 0.0001), and LS value (r = 0.816; 95% CI 0.521－0.851; P = 0.003). T1rho values showed moderate positive correlations with LS values [Spearman r = 0.693; 95% confidence interval (CI) 0.472－0.832; P < 0.0001]. ELF score was weakly correlated with native T1 rho (r = 20.36; P = .005) . No significant correlation was found between ELF score and MRE values (r = 20.11; P = .409). T1 rho values showed moderate correlations with hepatic hydroxyproline content and MRE showed no correlation with hepatic hydroxyproline. Pearson correlation coefficients were 0.645 and 0.57 between T1 rho with ELF score and hepatic hydroxyproline. Areas Under ROC (AUROCs) were 0.86 (95% CI 0.705－0.953) for MRE and 0.91 (95% CI 0.698－0.950) for T1 rho (P = 0.940), 0.67 (95% CI 0.762－0.978) for ELF and 0.849 (95% CI 0.691－0.946) for Hepatic hydroxyproline (P = 0.414) when diagnosing substantial fibrosis (<F2) vs severe fibrosis (≥ F3).Interobserver agreement was always greater than 0.70.
Conclusion: T1rho imaging has potential for liver fibrosis detection and staging with better diagnostic capability than that of magnetic resonance elastography. MR T1rho can be an imaging biomarker for monitoring liver activated hepatic stellate cells by hepatic hydroxyproline.

PO-084
脾硬化性血管瘤样结节性转化的 MRI 影像征像分析

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目的：分析脾脏硬化性血管瘤样结节性转(sclerosing Angiomatoid nodular transformation，SANT)的 MR 信号及动态增强强化特征。
方法：
回顾性分析经行 MRI 检查，经手术病理证实的 9 例脾脏硬化性血管瘤样结节性转化影像特点，男性 6 例，女性 3 例，年龄 23~56 岁，平均 41 岁。MRI 扫描序列包括轴位 T1WI、T2WI，T1WI、T2WI 脂肪抑制序列，T
分析病灶的形态、大小、平扫信号特点、扩散加权成像信号特征，以及动态增强动、静脉、平衡各期的信号强化特征及强化方式。
结果：
单发 7 例，6 例为圆形、1 例类圆形肿块，边缘呈浅分叶状；多发 2 例。7 例单发病例，T1WI 呈等或低信号；T2WI 呈不均匀低信号；DWI(b=800)呈低信号，ADC 均呈不均质低信号。动态增强扫描均

见向心性、渐进性强化。其中，辐条轮状强化 4 例、结节样强化 3 例、条索状强化 2 例，内均见裂隙。2 例多发病灶，T1WI 呈略低信号；T2WI 呈低信号；DWI(b=800)呈略低信号，ADC 均呈低信号。动态增强扫描呈渐进性强化。
结论：
脾脏硬化性血管瘤样结节性转化以脾内单发肿块为主，MRI 影像特征为类圆形略长 T1WI、短 T2WI 信号结节，DWI(b=800)呈略低信号，ADC 均呈低信号。强化特点为向心性渐进性强化及辐条轮状强化，内可见星芒状裂隙。

PO-085

基于磁共振成像术前预测原发性肝癌微血管侵犯

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目的：探讨 MRI 一般影像特征与弥散加权成像（DWI）表观扩散系数（ADC）术前预测原发性肝癌微血管侵犯的价值。**材料与方法**：回顾性分析本院 2017 年 1 月至 2019 年 1 月经外科切除的 82 例单发性原发性肝癌（HCC）患者 MR 影像学征象、ADC 值及临床资料，根据病理结果将其分为微血管侵犯阳性组和微血管侵犯阴性组，采用独立样本 t 检验比较两组患者的年龄、甲胎蛋白(AFP)水平及肿瘤最大直径，ADC 值采用 x^2 检验比较两组患者的性别、乙肝表面抗原、肝功能分级、肿瘤包膜、瘤周异常强化、瘤内动脉、肿瘤是否贴近肝包膜。应用 logistic 回归分析一般临床资料及影像学资料预测 MVI 的独立预测因子。**结果**：微血管侵犯 42 例，非微血管侵犯 40 例，两组间肿瘤的最大直径、肿瘤包膜是否完整、瘤内动脉、瘤周异常强化、ADC 值具有统计学意义（P<0.05）；而两组在年龄、性别、乙肝表面抗原、肝功能分级、AFP 水平、肿瘤是否贴近肝包膜比较，差异无统计学意义(P >0.05)；肿瘤最大直径、瘤周异常强化、ADC 值作为术前预测肝细胞癌 MVI 风险预测的独立预测因子［HR (95%CI) P：(> 5 cm) 1. 67 (1.22-2.25) 0.003、1.66 (1.26-2.42) 0.015 、1.95 (1.25-2.88) 0.002）、1.83（1.31-2.36）0.013］**结论**：磁共振成像术前预测肝细胞癌微血管侵犯有一定价值。

PO-086

The Utility of Apparent Diffusion Coefficient in Assessing Low-Risk Endometrial Cancer

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Objective: low-risk stage I endometrial cancer(EC) patients are not recommended to undergo lymphadenectomy. The aim of this study was to investigate the diagnostic value of ADC values for assessing low-risk EC and to identify an optimum ADC measurement for preoperative assessment.
Materials and method: our study consisted of 60 patients with EC who underwent unenhanced contrast MRI and diffusion-weighted imaging (DWI) procedures. The minimum and mean ADC values (minADC, meanADC) of tumors were obtained, and the relative ADC (rADC) were calculated with the equation of ADC (cancer)/ADC (reference) by using the obturator internus muscle as reference. Forty stage I EC patients were divided into

low-, intermediate- and high-risk group based on ESMO-ESGO-ESTRO classification. Mann-Whitney U test, Kruskal-Wallis test and receiver operating characteristic (ROC) were performed for statistical analysis.
Result: The meanADC、minADC and rADC for low-risk group were significantly higher than the values for intermediate-to-high risk group(1.126 versus 0.888×$10^{-3}$$mm^2$/s, 0.806 versus 0.668×$10^{-3}$$mm^2$/s，0.768 versus 0.611×$10^{-3}$$mm^2$/s, respectively). In assessments of low-risk EC patients, the AUC for meanADC, minADC and rADC were 0.872, 0.724, 0.875, respectively. The best cut-off rADC value for prediction was 0.676, the maximum Youden index, sensitivity, specificity and accuracy were 0.794 , 0.843, 0.952 and 0.900, respectively.
Conclusion: rADC is superior to meanADC and minADC measurements for preoperative evaluating the risk of stage I EC and it is presented as a useful additional method to aid in low-risk EC patients avoiding unnecessary lymphadenectomy.

PO-087
磁共振 IVIM 成像在大鼠肾脏冷缺血再灌注损伤的研究

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目的
探讨体素内不相干运动 IVIM 技术评价大鼠肾脏冷缺血再灌注损伤程度的价值，进一步认识其病生理机制。
方法
选取健康雄性 SD 大鼠 40 只，随机分为两组，假手术组 20 只，和冷缺血-再灌注损伤组 20 只，分别于术后 1h、1d、2d、5d 随机选取 5 只，采用 Siemens Prisma 3.0T 磁共振扫描仪和 8 通道老鼠线圈，对大鼠左肾行冠状位扫描。在工作站上对图像进行测量分析，观察部位是皮层（CO）、外髓外带（OSOM）和外髓内带（ISOM），于肾脏上极、下极及肾门平面分别放置 3 个 ROI，各区域 ROI 大小、形状保持一致。定量测量各参数值，包括 ADC 值、D 值、D^*、f 值，取平均值作为最终结果。使用 SPSS 22.0 软件进行统计学分析。对数据进行正态性检验，以均数±标准差表示。采用两独立样本 t 检验比较同一时间点两组各部位的参数值的差异。采用单因素方差分析比较各组内不同时间点各部位参数值的差异，再用 LSD-t 检验进行组间两两比较。
结果
假手术组术后 1h 的皮质、外髓外带、外髓内带的 ADC、D 值最低，显著低于 1d、2d、5d（*P* 均<0.01）。术后 1h 的皮质及外髓外带的 f 值最低，第 1d 显著升高（*P*<0.05），第 2d 较第 1d 明显减低（*P*<0.05），第 5 天略升高。冷缺血再灌注损伤组术后 1h 的皮质的 ADC 值最低，第 1d 明显升高，与第 1h 相比有统计学差异（*P*<0.01），第 2、5d 呈增高趋势。术后 1h 的皮质的 D 值最低，第 1d 稍升高（*P*>0.05），第 2d 仍升高，与第 1d 相比无显著差异，但是与第 1h 相比差异有统计学意义(*P*<0.05)。外髓外带、外髓内带的 ADC 值、外髓外带的 D 值较假手术组差异显著（*P*<0.01）。外髓内带的 D 值较假手术组有差异（*P*<0.05）。
结论
IVIM 技术能够动态监测肾脏冷缺血再灌注损伤，ADC 值和 D 值随不同时间点变化明显,损伤后皮层恢复较快，外髓外带恢复较慢。

PO-088

Noninvasive evaluation of early diabetic nephropathy using diffusion kurtosis imaging: an experimental study

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Aim: To evaluate the value of renal diffusion kurtosis imaging (DKI) in the diagnosis of early diabetic nephropathy (DN) in a rat model.
Materials and Methods: Forty male Zucker diabetic fatty (ZDF) rats which spontaneously develop T2DM were served as experimental group, and 20 age-matched control lean Zucker rats (LZR) with nondiabetic were served as the control. Kidney DKI scan and renal histology were performed to the rats in batches at the end of 4th, 8th, 12th, 16th and 20th week after the T2DM model were built. Based on the different renal histopathological appearance, the including animals were divided into three groups: control group with nondiabetic, DM group with non-DN, and early DN group with DN which were classified as Class I and II. The renal diffusion and kurtosis parameters were assessed statistically to show their associations with the renal damage.
Results: FA values and kurtosis values (MK, Ka, Kr) of the renal cortex in the control, DM and early DN group were significantly lower than in the medulla, respectively (all $P<0.05$), while the diffusion values (MD, Da and Dr) of the cortex were higher than in the medulla, respectively (all $P<0.05$). Furthermore, the kurtosis values (MK, Ka, Kr) of the renal cortex and medulla tended to increase from the control group to the early DN group, respectively, while some diffusion values (FA, MD and Dr) tended to decrease. The cut-off FA, MD, Dr, MK, Ka and Kr values of renal cortex and medulla showed different values in discriminating early DN from the controls with nondiabetic and DM with non-DN (range of Az: 0.69-0.92). Among them, the cut-off FA value of medulla of 0.36 with a sensitivity of 95.7% and a specificity of 82.4% achieved the largest Az which made it become the best parameter for discrimination of the early DN, followed by the cut-off value of medullary MK.
Conclusion: MR DKI may be valuable for noninvasive detection of early DN and monitoring the progress of DN which can provide significant benefits to guide the therapeutic strategy and get the disease under control.

PO-089
应用 Synthetic MRI 弛豫定量图对前列腺癌鉴别诊断的研究

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目的：本研究旨在以病理诊断为参考，初步探讨应用 synthetic MRI 弛豫定量图对前列腺癌（prostate cancer, PCa）鉴别诊断的价值。
材料与方法：本研究连续纳入于 2018 年 4 月至 10 月于我院进行前列腺 MRI 检查的 55 名临床可疑 PCa 患者。排除标准为:(1) MRI 检查后没有经穿刺或手术取得病理结果；(2)MRI 检查前接受内分泌或放射性治疗；(3) MR 检查与活检或手术间隔时间>3 个月。所有前列腺 MRI 检查均在 GE SIGNA

Pioneer 3.0T 磁共振扫描仪进行。首先进行常规前列腺 MRI 序列扫描，之后进行 synthetic MRI 序列扫描。根据穿刺或手术病理结果，在 T2WI 和 DWI 图像确定感兴趣区（region of interest, ROI）。将 ROI 放置于定量图测得组织的 T1、T2 和 PD 值。对于 PCa 患者，ROI 置于 PCa 区域。对于非 PCa 患者，ROI 放置于前列腺增生和前列腺炎区域。按照腺体成分含量将前列腺增生结节分为间质增生结节（stromal hyperplasia, SH）和腺体增生结节(glandular hyperplasia, GH)。采用 SPSS 20.0 软件进行统计学分析。应用单因素方差分析比较 PCa、SH、GH、前列腺炎的 T1、T2、PD 值的差异。

结果：最后纳入 14 例 PCa 患者和 22 例非 PCa 患者。共计 18 处 PCa 病灶、26 处 SH、25 处 GH、以及 21 处前列腺炎。PCa 的 T1 和 T2 值明显低于 GH 和前列腺炎组($p < 0.001$)。PCa 的 PD 值显著低于 GH($p < 0.01$)。但 PCa 组与前列腺炎之间 PD 值无显著统计学差异。SH 与 PCa 之间 T1、T2 及 PD 值无显著统计学差异。

结论：Synthetic MRI 驰豫定量图对前列腺癌的鉴别诊断具有一定的作用。

PO-090

Comparison between Magnetic Resonance Hysterosalpingography and Conventional Hysterosalpingography: Direct Visualization of the Fallopian Tubes Using a Novel MRI Contrast Agent Mixture

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Background: Magnetic resonance hysterosalpingography (MR-HSG) is a promising imaging approach for tubal patency evaluation but is still limited for tubal visualization.
Purpose: To evaluate the feasibility of MR-HSG for direct visualization of the fallopian tubes and demonstration of tubal patency as an alternative to conventional HSG.
Material and Methods: This study included 33 infertile women who completed pelvic MR scanning, HSG, and MR-HSG in that order. A traditional HSG-contrast agent (iohexol) and a high viscosity MRI-contrast agent (1mL Gadopentetate dimeglumine (Gd-DTPA) blended with 100mL iohexol) were used to achieve image enhancement. Interobserver and intermodality agreements of HSG and MR-HSG exams were assessed. The results were calculated by using the kappa test. Three radiologists who were blinded to the clinical data independently reviewed MR images. Extratubal abnormalities were analyzed.
Results: A total of 62 fallopian tubes of 33 subjects were included in the study. MR-HSG imaging findings to depict tubal patency were similar to these of HSG (AUC=0.911, sensitivity=0.821, specificity=1.000, positive predictive values=1.000 and negative predictive values=0.872). Pairwise interobserver agreement among three observers, and intermodality agreement of the diagnosis were excellent (mean kappa=0.863, 0.835 respectively). In addition, 29 extratubal abnormalities in 21 patients were found on pelvic MR scanning.
Conclusion: MR-HSG and HSG demonstrated similar results in assessing tubal patency. Because it offers the comprehensive assessment of female pelvic structures, and avoids ionizing radiation, MR-HSG may be used as an alternative imaging technique for evaluation of female infertility.

PO-091

The Diagnostic Performance of new DWI models (IVIM, DKI) in Prostate Cancer in the Transtion Zone

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Objective To explore the clinical value of quantitative parameters derived from intravoxel incoherent motion (IVIM) and diffusion kurtosis imaging (DKI) models in differentiating benign and malignant prostate lesions in the transitional zone (TZ) and identifying clinical significant prostate cancer. Further analysis was performed to evaluate the association between parameters and Gleason score (GS) of prostate cancer.

Materials and Methods A retrospective analysis was conducted on clinical data of 55 patients, whose lesions were pathologically confirmed in the prostate TZ by MRI-TRUS targeted fusion biopsy, and all cases were examined with traditional DWI (b = 0, 1400 s/mm^2), IVIM (b = 0, 50, 100, 150, 200, 700, 1400, 2100s/mm^2), and DKI (b = 0, 700, 1400s/mm^2) on a 3T scanner(MAGNETOM Skyra, Siemens Healthcare, Erlangen, Germany) before biopsy. Each lesion was manually extracted with a 3D ROI. Quantitative values of the ADC, IVIM and DKI parameter maps were measured. For diffusion parameter estimation, the generated IVIM maps, namely perfusion fraction (f), diffusivity (D) and pseudo-diffusivity (D*), were calculated using MITK (http://www.mitk.org/wiki/The_Medical_Imaging_Interaction_Toolkit_(MITK). The mean apparent diffusion for Gaussian distribution (MD), apparent kurtosis coefficient (MK) and fractional anisotropy (FA) maps were calculated by using DKE (http://academicdepartments.musc.edu/cbi/dki/results.html). Data satisfying the normal distribution assumption were subjected to independent sample t- test. Conversely, data not satisfying the assumption were analyzed using the Mann- Whitney U test. Receiver operating characteristic analysis was performed for IVIM and DKI parameters. AUC were compared using the Z-test. The correlations between the quantitative parameters and Gleason score were assessed with Spearman correlation.

Results Among the 55 patients, there were 27 cases of PCa (36 focus) in the transitional zone and 28 cases of benigh prostatic hyperplasia (BPH) (40 focus). Twenty-seven cases of PCa in TZ with age of 58-81 years (mean 69±1.54 years) and a mean prostate-specific antigen (PSA) level of 72.13±26.93 ng/ml. BPH with of 51-80 years (mean 63±1.47 years) and a mean PSA level of 12.90 ± 1.13 ng/ml were confirmed. The ADC and D of IVIM differed significantly between PCa and BPH in TZ ($p<0.05$, $p=0.007$). ADC exhibited a higher area under the curve (AUC, 0.863) compared with D with an AUC of 0.833; however, the difference was not significant ($p=0.8706$). The difference between D* and f was not significant ($p>0.05$). Values of MD, MK and FA of DKI models were significantly different ($p<0.05$, $p=0.01$, $p<0.05$) .The highest classification accuracy was achieved by the mean MD (AUC, 0.742). The AUC was 0.892, 0.884 and 0.897 for the combination of mean ADC and D, combination of mean ADC and MD, and combination of ADC, D and MD, respectively. The last 3 parameter combination showed significant higher AUC than the other two combinations. In the group of GS≧7

and BPH+(GS=6), ADC and D of IVIM model showed a significant difference ($p<0.05$, $p=0.017$), ADC had a higher AUC (0.826); the difference of D* and f was not significant ($p>0.05$). All the parameters of the DKI models were significantly different between the two groups, MD showed a higher AUC than others (AUC, 0.742). The AUC was 0.851, 0.846 and 0.856 for the combination of mean ADC and D, combination of mean ADC and MD, combination of ADC, D and MD. The last 3 parameters combination showed significant higher AUC than the other two combinations. ADC and MD showed relatively higher negativity correlations ($r=-0.586$, $r=-0.489$) with GS of PCa in TZ.

Discussion & Conclusion The IVIM and DKI models can be used to differentially diagnose prostate cancer in TZ and clinically significant prostate cancer; however, the diagnostic performances of IVIM and DKI did not perform better than the traditional ADC. Further, it is feasible to stratify the pathological grade of prostate cancer in TZ by mean ADC and MD independently.

PO-092

The Diagnostic Value of PI-RADS V2 Scoring System Combining with MRI-TRUS Fusion Targeted Biopsy for Detecting the Clinical Significant Prostate Cancer

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Synopsis

Transrectal ultrasound-guided systematic (TRUS) biopsy is commonly used in clinical practice to detect clinically significant prostate cancer (PCa). In this study, a more advanced biopsy, MRI-TRUS fusion targeted biopsy, is used together with MRI-derived PI-RADS V2 scoring system for the diagnosis of clinical significant PCa. The values of the two biopsy methods are compared.

Objective To evaluate the combination of multi-parametric MRI (mpMRI) derived PI-RADS V2 scoring system and MRI-TRUS fusion targeted biopsy in the diagnosis of clinical significant prostate cancer.

Materials and Methods A prospective analysis was performed in 168 patients with suspected prostate cancer from September 2015 to June 2018. Suspicious areas on mpMRI were defined and graded using PI-RADS score. The T2WI, DWI, ADC data and dynamic contrast enhancment (DCE) quantitative maps were used, and the data acquisition was performed on a 3T MR scanner (MAGNETOM Skyra, Siemens Healthcare, Erlangen, Germany). All the patients received a transrectal ultrasound-guided systematic (TRUS) biopsy, 108 patients with PI-RADS V2 scores $\geqslant$ 3 had additional MRI-TRUS targeted biopsies. The detection rate of TRUS biopsy and suspicious MRI targeted biopsy in PCa and clinical significant cancer were tested by χ^2 test on the results of MRI-TRUS fusion guided biopsy.

Results All the 168 patients underwent TRUS biopsy, and 108 patients, whose PI-RADS V2 scores were $\geqslant$ 3, had MRI-TRUS fusion guided biopsy to confirm their diagnosis (two examples are shown in Figures 1 & 2). Prostate cancer was detected in 86 of 168 patients (51.19%, 86/168), and no prostate cancer were detected in the rest 82 patients (48.81%, 82/168). 78 (46.43%, 78/168) cases of PCa were detected by TRUS

biopsy, and 63(58.33%, 63/168) cases of PCa were detected by MRI-TRUS fusion guided biopsy, the difference was statistically significant between TRUS biopsy and MRI-TRUS fusion guided biopsy (χ^2=3.73, p=0.035). Further, the 168 patients were biopsied with a total of 2300 cores, including TRUS biopsy 2016 cores and MRI-TRUS fusion targeted biopsy 284 cores. Additionally, the detection rate per core obtained from MRI-TRUS fusion targeted biopsy (51.76%, 147/284) was significantly better than that from TRUS biopsy cores (19.64%, 396/2016; χ^2=142.38, p<0.05). Among patients with a positive biopsy for PCa, the number of biopsy cores for conventional TRUS biopsy and MRI-TRUS was 1032 and 214 cores, respectively. The suspicious MRI-TRUS fusion-targeted biopsy (68.69%, 147/214) detected more prostate cancers which had statistical differences compared with TRUS biopsy (38.37%, 396/1032; χ^2=66.27, p<0.05). Last but not least, MRI-TRUS fusion targeted biopsy (69.74%, 106/152) showed more significant cancer cores than that of TRUS biopsy (54.50%, 351/644; χ^2=11.67, p<0.05). *Conclusions* MRI-TRUS fusion targeted biopsy increases the positive rate markedly and improves the detection rate of clinical significant PCa in comparison with TRUS biopsy.

PO-093

380 例原发性腹膜后肿瘤的 MSCT 评估价值

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目的 总结原发性腹膜后肿瘤 MSCT，提高临床对其的识别能力。 **资料与方法** 分析经病理证实的 380 例原发性腹膜后肿瘤的常见类型、好发部位、MSCT 特点，Fishers 检验。 **结果** 380 例腹膜后肿瘤，良性 149 例：神经源性 59 例（39.6%），纤维瘤或纤维样病变 33 例，间质瘤（GIST）20 例，畸胎瘤 16 例，脂肪瘤 8 例，Castleman 病 5 例，其他 14 例（4 例血管平滑肌脂肪瘤、4 例侵袭性血管瘤、3 例间皮瘤、2 例血管瘤、1 例颗粒细胞瘤）；恶性肿瘤 231 例：脂肪肉瘤 138 例（59.7%），37 例平滑肌肉瘤，14 例淋巴瘤，6 例恶性神经源性肿瘤，6 例骨源性肿瘤（骨肉瘤和软骨肉瘤各 3 例），其他 24 例（5 例腺癌、4 例横纹肌肉瘤、3 例恶性间质瘤、3 例癌肉瘤、3 例滑膜肉瘤、2 例 MFH、2 例精原细胞瘤、1 例鳞癌和 1 例恶性间皮瘤）。MSCT MPR 对原发性腹膜后肿瘤定位准确性高（95.7%）。好发部位：73 例脂肪肉瘤在肾周间隙，占 76.8%（73/95），65 例神经源性肿瘤位于脊柱旁，占 90.3%（65/72）。MSCT 对原发性腹膜后肿瘤良恶性判断，敏感性 87.2%，特异性 82.7%，准确率 84.5%。139 例恶性肿瘤为不规则形，54 例良性肿瘤为不规则形，两者差异有统计学意义（χ^2=20.251，P＜0.001）；密度及有无强化在良恶性中差异无明显统计学意义；所有良性肿瘤对周围器官表现为推压（图 1）,82.7%（191/231）恶性肿瘤与周围器官粘连或受侵，差异有统计学意义（χ^2=247.702，P＜0.001）。MSCT 特点：脂肪瘤为低密度，病灶无强化；脂肪肉瘤内见脂肪和软组织影，除脂肪外其他成份有强化；畸胎瘤内见脂肪、软组织和钙化；神经源性肿瘤多在脊柱旁。 **结论** MSCT 对腹膜后肿瘤定位准确性非常高，在术前或穿刺活检前定性诊断符合率较高。高分化脂肪肉瘤、神经源性肿瘤、畸胎瘤、脂肪瘤 MSCT 表现有一定特征

PO-094

R2*值评价Ⅰ期子宫内膜癌脉管侵犯的价值

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子宫内膜癌是女性生殖系统常见的恶性肿瘤。目前 I 期子宫内膜癌患者是否行淋巴结清扫存在争议[1]。淋巴结清扫术不能提高子宫内膜癌患者的生存率反而导致一系列并发症。脉管侵犯是子宫内膜癌患者淋巴结转移重要的预测因素[2]，但传统的 MR 成像无法评价脉管侵犯。

目的

探讨增强 T2* 加权血管成像（ESWAN）序列的 R2* 值评价 I 期子宫内膜癌脉管侵犯的价值。

材料与方法

搜集 2013 年 1 月至 2018 年 12 月大连医科大学附属第一医院行 ESWAN 检查并经手术病理证实的子宫内膜癌患者 20 例。测量脉管侵犯组与无脉管侵犯组病灶实性成分的 R2* 值。图 1 和图 2 显示脉管侵犯组和无脉管侵犯组病灶情况。采用两独立样本 t 检验比较脉管侵犯组与无脉管侵犯组 R2* 值的差异。

结果

子宫内膜癌脉管侵犯组的 R2*值为（17.62±8.70）Hz，高于无脉管侵犯组（10.75±3.25）Hz，脉管侵犯组与无脉管侵犯组 R2*值差异有统计学意义（P<0.05），如表 1 所示。R2*值预测子宫内膜癌脉管侵犯的曲线下面积为 0.780。

结论

R2*值可作为评价子宫内膜癌脉管侵犯的定量指标，ESWAN 对术前诊断子宫内膜癌脉管侵犯有重要的补充价值。

PO-095

Wash-out 指标联合形态学特征评估嗜铬细胞瘤和副神经节瘤的 CT 诊断价值

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目的：利用中间期（IP）及 3-min 延迟期（DP-3）的 wash-out 指标联合形态学特征对嗜铬细胞瘤和副神经节瘤 CT 诊断价值进行评估。

材料方法： 收集 2012 年 1 月 1 日至 2019 年 6 月 1 日术后病理证实并有增强 CT 资料肾上腺嗜铬细胞瘤（Ad-Phe）80 例、肾上腺腺瘤（Adeno）59 例、肾上腺转移瘤（Meta）7 例及腹膜后副神经节瘤（Re-Phe）33 例。测量、记录病灶平扫&各期 CT 值、位置、大小、轮廓、边界、囊变及坏死、钙化、出血、肿瘤血管及强化方式，并从动静脉期中选取 CT 值大的为 IP。计算绝对 wash-out 百分数（APW）及相对 wash-out 百分数（RPW），描述性分析上述影像特征并统计 APW<60%及 RPW <40%阳性率。再采用单因素 Logistic 回归分析影像特征及 APW、RPW 对 Ad-Phe 诊断预测能力，并在此结果上采用二元 Logistic 回归筛选 Ad-Phe 独立影像特征指标，建立多因素诊断模型。此外用单因素分析比较 Ad-Phe 与 Re-Phe 影像特征相似性。

结果：上述四类肿瘤形态学特征及 wash-out 指标结果见表 1，单因素分析结果见表 2。Ad-Pheo 较 Meta、Adeno 体积更大，易出现囊变坏死、出血、钙化、肿瘤血管及充填样强化，平扫&增强各期 CT 值更高，RPW 出现率高于 Meta，低于 Adeno。DP、RPW、大小、囊变坏死及充填样强化为 Adeno 影像诊断独立预测因子，且此五项联合指标诊断敏感性及特异性均为 100%（ROC 曲线见图 1）。单因素分析比较 Adeno 与 Re-Phe 影像特征的相似性无统计学差异，但 Re-Phe 体积大、形态不规则、易出血。

结论：以 DP、RPW、大小、囊变坏死及充填样强化为基础建立的多因素预测模型能有效鉴别 Adenoma 与其它肾上腺常见肿瘤。Adenoma 与 Retro-Pheo 具有相似的形态学特征及 wash-out 指标。

PO-096

A machine learning-based approach for predicting the malignant potential of T2-hyperintense uterine mesenchymal tumors by fusing T2WI features and clinical information

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Objective: This study aims to develop a machine-learning method to predict the malignant potential of T2-hyperintense uterine mesenchymal tumors by fusing T2WI features and clinical information
Methods: First, we retrospectively collected 111 patients involving 64 benign leiomyomas and 47 malignant mesenchymal uterine tumors, exhibiting predominantly hyperintense (mass with >50% of its area) relative to the myometrium on T2-weighted images from Fudan university Shanghai cancer center. After segmenting tumors depicting on T2-weighted MR images, we computed and extracted radiomics features to character the tumor imaging features. Then, we used SVM machine-learning classifier to build two models by using selected imaging features and clinical features, respectively. Finally, to improve the classification performance, we fused the prediction scores generated by two models. We calculated the areas under the curve (AUCs) using receiver operating characteristic curve (ROC) to assess the performance for each model, and compared with two radiologists.
Results: The fusion model achieved the highest AUCs and can significant improve the model performance (0.87 ± 0.03, $p<0.001$), compared with T2 MR image based model (0.78 ± 0.04) and clinical information based model (0.74 ± 0.05), respectively. When two radiologists individually reviewed and diagnosed these tumors, they achieved no significant difference in AUC values (0.85 and 0.82, p=0.37). In a comparison, the fusion method based scheme yields significant higher performance comparing with the AUC values obtained by two radiologists ($p<0.001$).
Conclusions: Machine learning by fusing T2WI features and clinical information can improve the performance in predicting malignant potential of T2 hyperintense uterine mesenchymal tumors, and outperformed experienced radiologists.

PO-097

基于 MRI 评分系统诊断胎盘植入及分类的价值

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方法：回顾广西医科大学第一附属医院 2015 年 1 月-2018 年 3 月 43 例临床怀疑胎盘植入患者的 MRI 影像资料及临床资料；由 2 名不知晓手术与病理结果放射科医师进行诊断，确定有无植入及其分型。重点观察胎盘位置（有无完全性前置胎盘）、胎盘形态（有无结节状、浅弧形突出）、胎盘

信号（有无明显不均质）、胎盘内有无异常增多迂曲血管影、胎盘内 T2 暗带（有无形状、大小不规则低信号）、子宫下段形态（是否膨出）、有无胎盘-子宫界面低信号带消失、中断及宫旁临近器官（膀胱、直肠、腹壁等）侵犯等征象。按其有无此征象分别评 0、1 分，再综合临床指标，有无≥2 次剖宫产，最后计算总分值。
结果：本组共 43 例患者，经临床或病理诊断无胎盘植入 12 例，胎盘植入 31 例（13 例胎盘粘连 12 例胎盘植入，6 例胎盘穿透），其中 14 例经病理证实。MRI 初步诊断胎盘植入 27 例，无胎盘植入 9 例，漏诊 4 例，误诊 3 例，整体准确率、敏感度、特异度、阳性预测值、阴性预测值分别是 83.72%，87.09%，75.00%，90.00%，69.23%；粘连型敏感度 46.15%，植入型敏感度 75.00%，穿透型敏感度 66.67%。运用 MRI 评分系统，正常胎盘评分为 2.08±1.50；粘连性评分 3.38±0.74，植入型 5.16±0.99，穿透性 7.00±1.15，重型胎盘植入（胎盘植入+胎盘穿透）评分 5.78±1.36。绘制 ROC 曲线，计算各组间不同类型的评分界值；分析正常胎盘及粘连型胎盘，当评分≥2．5 分时，敏感度为 92.3%，特异度为 66.7%；分析粘连型及重型胎盘植入时，当评分≥4．5 分时，敏感度为 88．9%，特异度为 92.3%。
结论：MRI 诊断胎盘植入具有较好的诊断价值，运用 MRI 评分系统对于诊断胎盘植入具有一定的价值，有助于区分胎盘植入的类型并增加胎盘植入的诊断效能。

PO-098

Noninvasive evaluation of renal oxygenation in primary nephrotic syndrome with Blood Oxygen Level-Dependent MR imaging: initial experience

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Objective: To evaluate the renal oxygenation in patients with primary nephrotic syndrome (PNS) using Blood Oxygen Level-Dependent (BOLD) MRI and determine the feasibility of BOLD MRI in assessing the renal function, tubulointerstitial alterations and the prognosis of PNS.
Methods: Twenty patients at the onset of PNS for the first time were selected to undergo BOLD MRI before treatment. Blood and urine samples were obtained on the day of the MRI. The pathologic grading of renal tubulointerstitial alterations was performed by using the Katafuchi criteria. All patients received corticosteroids therapy within 7 days after the MRI and followed up through 12 months.
Results: Medullary R2* (MR2*) values in PNS patients significantly decreased compared to the controls. MR2* values in PNS patients were negatively correlated with estimated glomerular filtration rates (eGFR) and positively correlated with tubulointerstitial damage scores. There was a slight tendency for higher MR2* values in individuals with poor prognosis.
Conclusion: The medullary oxygen concentration of patients with PNS compared to the controls. BOLD MRI proved to be a noninvasive method for the evaluation of renal function and tubulointerstitial impairment, as well as initial prediction of the prognosis for PNS patients.

PO-099

T2* mapping 定量评估肾脏缺血再灌注损伤动态变化的实验研究

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目的 通过 T2*mapping 技术对肾脏内髓、外髓和皮质进行量化分析，探索其评价肾脏缺血再灌注损伤后不同时间点的动态变化的可行性。**方法** 选取新西兰大白兔 18 只，采用无创血管夹夹闭左侧肾蒂 60 min 后松开建立 IRI 模型。分别于建模前、建模后 1 h、12 h、24 h、48 h 行左肾 MRI 扫描（包括轴位 T2WI 和 T2* mapping），在建模后 1 h、12 h、24 h 随机选取 2 只兔处死，余 10 只兔在 48 h 后处死，对病理分级进行评分。同时测量左肾内髓、外髓和皮质的 T2*值值，用重复测量方差分析比较肾脏各部位 5 个时间点间 T2*的差异，并对各时间点 T2*值与对应的病理评分进行 Spearman 相关分析。**结果** 建模前和建模后 1 h、12 h、24 h、48 h 内髓及外髓的 T2*值不同时间之间 T2*值的差异均有统计学意义（F 值分别为 3.93、5.97，P 均 < 0.05）。而皮质不同时间点之间的 T2*两两比较，建模前与 24h、48h，12h 与 48h 差异有统计学意义（P < 0.05），其余差异无明显统计学意义（P > 0.05）。细胞坏死、间质炎症和管型评分则随着 IRI 的发展逐渐增长， IRI 后外髓的 T2*值的变化与对应区域的细胞水肿、间质炎症及管型评分均呈正相关（r = 0.57、0.38、0.33；P < 0.05）；外髓 R2*值的变化与对应区域的细胞水肿呈负相关（r = -0.52；P< 0.05）。**结论** T2* mapping 可反映肾脏 IRI 后不同区带、不同时间点的动态变化，其中以外髓带最为明显，并与病理评分存在较好的一致性

PO-100

Utilization of CT-based Radiomics Random Forest Model to Predict Lymph Node Metastasis in Epithelial Ovarian Cancer

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PURPOSE
Lymph node metastasis (LNM) of ovarian cancer is an important factor related to tumor staging, patient survival and disease recurrence. In this study, the purpose was to developed and validate a CT-based radiomics random forest model to predict LNM for pathologically proven ovarian cancer patients.
METHOD AND MATERIALS
A total of 101 patients with clinicopathologically confirmed epithelial ovarian cancer who underwent cytoreductive surgery were retrospectively enrolled in this study. Fifty patients were pathologically proven to have LNM, and 51 patients were negative of LNM. Radiomic features were extracted from portal phase computed tomography (CT) of primary ovarian cancer from a dedicated Radiomics Prototype (Siemens syngo.via Frontier). Two experienced radiologists double-blinded segmented the entire volume of primary ovarian cancer semi-automatically. Due to the status unbalancing for LNM, patients were first down-sampled to equivalent ratio and then divided into training (n=71) and validation cohorts (n=30). Only high producible features (ICC>0.8) were used to build the random forest method. The performance of the radiomics model was evaluated using the area under curve (AUC) of receiver operating characteristic curve within training and validation cohorts.

RESULTS
The radiomics model showed good and discrimination in the training cohort, with an AUC of 0.815 (95% CI: 0.715-0.915), sensitivity of 66.4%, specificity of 89.3% and Brier score 0.193. In the validation cohort, AUC was 0.804 (95% CI: 0.637-0.972), sensitivity, specificity and Brier score were 86.7%, 80.0% and 0.207.
CONCLUSION
This CT-based radiomics model can be used as a noninvasive method to preoperatively predict LNM in patients with epithelial ovarian cancer.

PO-101
MRI 纹理分析预测宫颈癌新辅助化疗疗效的研究

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目的 探讨 MRI 纹理特征分析对宫颈癌新辅助化疗疗效的预测价值。
材料和方法 回顾性分析 2014 年 7 月至 2018 年 11 月经我院病理证实为宫颈癌，行术前新辅助化疗的晚期局限性宫颈癌患者 31 例。新辅助化疗前及化疗后各行 1 次盆腔 MRI 检查，根据实体瘤的疗效评价标准（RECIST），将患者分为有效组（包括完全缓解和部分缓解）及无效组（包括疾病稳定和疾病进展）。测量新辅助化疗前 MRI 常规参数及纹理参数，常规参数包括肿瘤长径及 ADC 值，106 个纹理特征被采集，包括 13 个形状特征，14 个灰度相关矩阵特征，24 个灰度共生矩阵特征，18 个一阶特征，16 个灰度游程矩阵特征，以及 5 个相邻灰度差矩阵的特征。采用独立样本 t 检验及非参数 Mann-Whitney U 检验比较两组之间参数的差异，并通过绘制受试者工作特征曲线（ROC）得到最佳预测参数及其诊断价值。
结果 两组之间常规参数（肿瘤长径及 ADC 值）均无显著差异（P>0.05）。6 个灰度共生矩阵特征（包括 JointEntropy, Idmn, DifferenceEntropy, Idm, SumEntropy and Id）、1 个一阶特征（Entropy）、1 个相邻灰度差矩阵的特征（Contrast）在两组之间具有统计学差异（P值均小于 0.05）。JointEntropy, Idmn, DifferenceEntropy, Idm, SumEntropy, Id, Entropy, and Contrast 的 ROC 曲线下面积分别为 0.779, 0.229, 0.779, 0.236, 0.764, 0.229, 0.771, 0.857。
结论 MRI 纹理分析对宫颈癌新辅助化疗疗效具有较好的预测价值。

PO-102
磁共振动脉自旋标记（ASL）评估血清肌酐（Scr）正常水平的糖尿病患者肾功能价值

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目的 探讨应用 1.5T 磁共振动脉自旋标记技术（ASL）评估血肌酐（Scr）正常水平的糖尿病患者肾功能的价值。
材料与方法 本院行 1.5T 磁共振成像 ASL MR 检查的 63 例患者（男 38 例，女 25 例，平均年龄 67 岁），其中 20 例糖尿病患者（糖尿病组）和 43 例健康对照组（对照组），所有检查者均进行血清肌酐检查在正常水平。MRI 使用 1.5-T MR 成像仪（GE Siga HDXT）在包含常规 T1WI、T2WI 的协议中进行，ASL 技术使用单次快速自旋回波流敏感的交替反转恢复（SSFSE-FLAG）。采用 GEOW AW 4.6 工作站对糖尿病组和对照组的 ASL 参数（肾血流量、RBF）进行测量。采用 SPSS17.0 统计软件

进行数据分析，P 值小于 0.05 被认为有统计学意义。通过 Mann Whitney 试验比较糖尿病组和对照组的 RBF 值。绘制并分析了 RBF 值的 ROC 曲线。ICC 试验检测两个观察者之间的一致性，ICC＞0.75 为好，0.75＞ICC＞0.40 为一般，ICC＜0.4 为“坏”。
结果 两组 ASL 参数的 ICC 值均大于 0.75，显示出一致性。对照组的 RBF 值（149.14±22.77 mL.100-1·min -1）显著高于糖尿病组（119.91±13.54 mL·100-1·min -1）。ROC 分析表明，RBF 值的 AUC 为 0.859，当 RBF 值为 127.4 mL·100-1·min -1 时，其敏感性和特异性分别为 86%和 80%。
结论 ASL 对非侵袭性糖尿病患者肾功能的评价是敏感的，RBF 值有助于提高其敏感性和特异性。

PO-103

Texture Analysis based on quantitative magnetic resonance imaging for evaluation of renal function

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Purpose: To investigate the feasibility of using texture analysis based on diffusion weighted imaging (DWI), T1 and T2 mapping to evaluate renal function.
Methods:A total of 116 candidates (94 patients and 22 healthy volunteers, mean age 37.9 ± 14.9 years) underwent axial renal DWI, T1 and T2 mapping at 3T. Based on their estimated glomerular filtration rate (eGFR), the candidates were classified into normal renal function group (nRF, eGFR≥90 mL/min/1.73 m^2, n=46), mildly (mi-IRF, 60≤eGFR<90 mL/min/1.73 m^2, n=14), moderately (mo-IRF, 30≤eGFR<60 mL/min/1.73 m^2, n=27) and severely (se-IRF, eGFR<30 mL/min/1.73 m^2, n=29) impaired renal function groups. Texture features were quantified and selected to build models for classification between nRF and IRF, mi-IRF and mo-IRF, mo-IRF and se-IRF with receiver operating characteristic (ROC) analysis performed and the area under the ROC curve (AUC) calculated for each comparison.
Results: Mean, mpp, skewness and kurtosis were correlated with eGFR decline. Ten texture features were selected and combined for differentiation of nRF and IRF producing an AUC of 0.914, accuracy of 88.1%, sensitivity of 93.3%, specificity of 80.5%, negative predictive value (NPV) of 89.2% and positive predictive value (PPV) of 87.5%. Eight texture features were selected and combined for classification between mi-IRF and mo-IRF and yielded an AUC of 0.910 (95% CI: 0.846-0.962), accuracy of 87.1%, sensitivity of 87.8%, specificity of 86.5%, NPV of 88.2%, PPV of 86.0%. Fifteen texture features were selected and combined to differentiate mo-IRF and se-IRF and reached an AUC of 0.928 (95% CI: 0.845-0.990), accuracy of 87.8%, sensitivity of 96.3%, specificity of 77.3%, NPV of 94.4%, PPV of 83.9%.
Conclusions: Texture analysis based on ADC, T1 and T2 values can noninvasively evaluate renal function.

PO-104

能谱 CT 在鉴别肾癌侵犯肾盂及肾盂癌侵犯肾脏中的初步研究

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目的：探讨 CT 能谱成像在鉴别肾癌侵犯肾盂和肾盂癌侵犯肾脏中的应用价值。
方法：回顾性分析我院行肾脏宝石 C T 扫描患者 4 0 例，男性 22 例、女性 18 例，平均年龄 52 岁（ 2 4-78 岁），其中肾癌 30 例、肾盂癌 1 0 例，均经病理证实。增强扫描采用 GSI 扫描模式。采用 2 组重建模式，第 1 组为常规混合能量 140kvp，图像层厚和层距均为 5.00ｍｍ，第 2 组为 70keV 单能量图像， 层厚和层距均为 1.25ｍｍ，图像重建均采用标准算法。
结果：肾癌动脉期的 NIC 明显高于肾盂癌的 NIC（分别为 0.49mg/ml±0.08 和 0.23mg/ml±0.18，P<0.05），但肾癌和肾盂癌在静脉期的 NIC 没有统计学差异（分别为 0.55mg/ml±0.15 和 0.44mg/ml±0.25，P>0.05）。肾癌静脉期的 LNR 为 0.29±0.50，明显低于肾盂癌 0.70±2.29,（P<0.01）。但肾癌和肾盂癌在动脉期的 LNR 没有统计学差异（分别为 0.42±0.18 和 0.44±0.38，P>0.05）。
结论：肾癌与肾盂癌具有不同的能谱特征，我们采用 C T 能谱分析技术对肾癌及肾盂癌进行研究，发现肿瘤基物质(水与碘)散点图的分布模式、7 0keV 单能量 C T 值(HU)分布直方图模式以及能谱曲线形态差别较大，这些信息对于患者术后随访和治疗可能提供帮助。

PO-105

Quantitative assessment of diffusion kurtosis imaging depicting deep myometrial invasion: A comparative analysis with diffusion-weighted imaging

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Abstract:
Purpose: To investigate histogram analysis of diffusion kurtosis imaging (DKI) and conventional diffusion-weighted imaging (DWI) to distinguish between deep myometrial invasion and superficial myometrial invasion in endometrial carcinoma (EC).
Methods: A total of 118 pathologically confirmed EC patients with preoperative DWI were included. The data were postprocessed with a DKI (*b* value of 0, 700, 1400, and 2000 s/mm^2) model for quantitation of apparent diffusion values (D) and apparent kurtosis coefficient values (K) for non-Gaussian distribution. The apparent diffusion coefficient (ADC) was postprocessed with a conventional DWI model (*b* values of 0 and 800 sec/mm^2). A whole-tumor analysis approach was used. Comparisons of the histogram parameters of D, K and ADC were carried out for the deep myometrial invasion and superficial myometrial invasion subgroups. Diagnostic performance of the imaging parameters was assessed.
Results: The D_{mean}, D_{10th}, and D_{90th} in deep myometrial invasion group were significantly lower than those in superficial invasion group (p<0.001, <0.001 and =0.023, respectively), as well as the ADC_{mean}, ADC_{10th}, and ADC_{90th} (p=0.001, 0.001 and 0.042, respectively). The K_{mean} and K_{90th} were significantly higher in deep invasion group than those in superficial myometrial invasion group (p=0.002, and 0.026, respectively). The

D_{10th}, K_{mean}, and ADC_{10th} had a relatively higher area under the curve (AUC) (0.72, 0.66, and 0.71, respectively) than other parameters did for distinguishing deep myometrial invasion of EC. D_{10th} showed a relatively higher AUC than ADC_{10th} did for the differentiation of lesions with deep myometrial invasion from those with superficial myometrial invasion (0.72 vs 0.71), but the variation was not statistically significant (p=0.35).
Conclusions: Distribution of DKI and conventional DWI parameters characterized by histogram analysis may represent an indicator for deep myometrial invasion in EC. Both DKI and DWI models showed relatively equivalent efficacy.

PO-106

Application of low-dose CT scanning technique in right adrenal vein imaging

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Objective To analyze the value of low-dose CT scanning in right adrenal vein imaging. **Methods** A total of 123 patients who was suspected as primary aldosteronism and requiring a contrast enhanced CT examination on adrenal glands were enrolled in the study. Three patients were excluded according to the exclusion criteria, so that the rest 120 patients were averagely divided into 3 groups. Group A was a control group with conventional tube voltage of 120kV and automatic mA. It was divided into A_1, A_2 and A_3 groups according to arterial phase,venous phase and parenchymal phase. Group B was a experimental group with conventional tube voltage of 120kV and automatic mA. The arterial phase, the late arterial phase, and the portal venous phase were divided into B_1, B_2, and B_3 groups.Group C was a low-dose experimental group with a tube voltage of 100kV and a tube current of 150mA. It was divided into C_1, C_2, and C_3 groups according to the arterial phase, late arterial phase, and portal venous phase. The subjective scores of the images of groups A, B, and C were statistically analyzed, and the CT values of the right adrenal vein, the right adrenal gland, and the fat of anterior abdominal wall at different scan periods were measured, and the CT dose index (CTDIvol) and the dose length product (DLP) were recorded.Calculating and comparing the signal-to-noise ratio (SNR), contrast-to-noise ratio (CNR), and effective radiation dose (ED). **Results** The subjective scores of the two observers were consistent (*Kappa* value = 0.629); the subjective scores of the B_2 images were statistically significant (H=7.182, P<0.05). There was statistically significant difference between the B_2 and A_2 subjective scores (P<0.001 after adjustment).The CT values of RAV, SNR, and CNR of the B_2 group were higher than those of the A_2 group (t=-66.98, - 6.92, -9.02, P<0.05), and there was no significant difference in CT value of RAG and background noise between the two groups (P>0.05). The radiation dose comparison showed that the effective radiation dose (ED) was 45.52% lower in the low-dose group than the conventional dose group,which the difference was statistically significant (t=12.19, P<0.001). **Conclusion** Using MDCT scanning technique with low tube voltage and low tube current of 100kV-150mA, the detection rate of right adrenal

vein can reach 95% in the late arterial phase, and the effective radiation dose can be reduced about 45.52% on the basis of ensuring image quality.

PO-107

Diagnosing prostate cancer using Ultrafast DCE-MRI with Low-Dose Gadolinium: Observer study

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Purpose: This study investigates whether administration of low doses of Gadolinium imaged using ultrafast dynamic contrast-enhanced (DCE) MRI can be as effective as a standard dose and resolution DCE-MRI in the diagnosis of prostate cancer (PCa) based on an observer study.

Material and method: Patients (n = 30) with histologically confirmed PCa underwent preoperative 3T MRI. DCE-MRI. Low dose (0.015 mmol/kg Gd) and standard dose (0.085 mmol/kg Gd close to clinical value). DCE-MRI images were acquired at ~2.2 and ~8.2 s temporal resolution using gadobentate dimeglumine bolus injection. Low dose ultrafast images were acquired for 3.5 minutes, followed by a 5-minute gap before acquiring standard dose images for 8.3 minutes. The data were analyzed qualitatively by 3 radiologists (15, 2 and 5 years' experience) to investigate whether lesions could be detected based on early focal enhancement. A confidence score (1-5) was assigned based on the confidence in accurately detecting cancer, with 5 being the highest confidence. Diagnostic performance was calculated for all cancer lesions and index lesions only.

Results: 57 PCa lesions and 30 index lesions were found. Diagnostic performance for low dose DCE-MRI was nominally lower than for standard clinical dose DCE-MRI. Low dose DCE-MRI showed lower but statistically similar diagnostic performance for detecting all PCa lesions compared to standard dose with similar sensitivity (55 vs 63%, p=0.34) and PPV (76 vs 82%, p=0.37) with similar lower confidence score (3.7±0.7 vs 3.8±0.8, p=0.417).

Low dose DCE-MRI showed similar diagnostic performance for detecting index lesions compared to standard dose with similar sensitivity (70 vs 80%, p=0.38) and PPV (70 vs 78%, p=0.51), but with lower confidence score (3.8±0.8 vs 4.1±0.6, $p<0.05$). The sensitivity and PPV was similar for 2/3 radiologists, with one even reporting confidence score using low dose images.

Conclusions: PCa diagnosis may be feasible using ultrafast DCE-MRI with lower dose of Gadolinium based on its performance to detect index lesions. However, further studies to determine optimal dose and temporal resolution DCE-MRI protocol for PCa diagnosis.

Clinical relevance: There is clinical potential application of using ultrafast DCE-MRI to diagnose PCa, which makes DCE-MRI a safer examination to patients with PCa.

PO-108

Clinical Value of CT Texture Analysis in Differentiation of Urothelial Carcinoma Based on Multi-phase CT images

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Objective To explore the value of computed tomography (CT) texture analysis for the differentiation of low grade urothelial carcinoma (LGUC) and high grade urothelial carcinoma (HGUC) and their invasive property.
Methods The radiological data were analyzed retrospectively in 94 patients with urothelial carcinomas who had pathologically proven from November 2016 to April 2019. Pathological examination demonstrated that the tumors were high-grade in 43 cases and low-grade in 51cases; non-muscle-invasive (NMI) in 37 cases and muscle-invasive (MI) in 37 cases. The maximum diameter of the tumor in CT images was outlined as ROI. Three-phasic CT images were used to measure the texture parameters and compared with postoperative pathological grading and invasive results. The independent sample *t* test or the Mann-Whitney U test was used to compare the difference of the parameter. AUC (area under curve) for statistically significant parameters were used to confirm their efficacy in predicting the preoperative grade and invasive property of UC.
Result Of the 78 features were extracted from each phase CT images, with 26 (33%), 20 (26%) and 22 (28%) texture parameters were significant for differentiating LGUC from HGUC while 19 (24%), 16 (21%) and 30 (38%) texture parameters identified as being significant for differentiating non-muscle-invasive urothelial carcinoma (NMIUC) from muscle-invasive (MIUC), respectively. The optimal performance for differentiating the grading and invasive property were obtained by the Variance and Correlation on venous phase CT images, respectively.
Conclusion Texture analysis can provide more quantification information, which can be more accurately distinguishing LGUC and HGUC or NMIUC and MIUC.

PO-109

Preoperative prediction of parametrial invasion in early-stage cervical cancer with MRI-based radiomics nomogram

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Purpose: To develop and identify a magnetic resonance imaging (MRI)-based radiomics nomogram for the preoperative prediction of parametrial invasion (PMI) in patients with early-stage cervical cancer (ECC).
Methods and Materials: All 106 patients with ECC underwent T2-weighted imaging (T2WI) and diffusion-weighted imaging (DWI) scans before radical hysterectomy surgery. The

radiomics signature was calculated with the radiomics features selected by the least absolute shrinkage and selection operation regression from total features extracted from T2WI and DWI. A support vector machine (SVM) model was built using a radiomics signature to evaluate the performance of the radiomics signature for distinguishing patients with PMI and non-PMI. To predict the risk probability of PMI for the individual patient, a radiomics nomogram was drawn based on the radiomics model built using the multivariable logistic regression method, which was integrated with radiomics signature and patient age. The discrimination and calibration performance of the radiomics nomogram was estimated.
Results: The radiomics signatures from joint T2WI and DWI performed well for distinguishing PMI and non-PMI groups and yielded an AUC of 0.923 (95% CI, 0.860-0.986) and 0.938 (95% CI, 0.858-1) in the primary and validation cohorts. The radiomics nomogram integrating the radiomics signature with age showed excellent discrimination, with C-index values of 0.947 (95% CI, 0.899-0.995) and 0.911 (95% CI, 0.806-1) being obtained in the primary and validation cohorts, respectively. The calibration curve for the radiomics nomogram showed good agreement.
Conclusions: The radiomics nomogram integrating radiomics data from T2WI and DWI and clinical factors performed well for the preoperative prediction of PMI in patients with ECC and may be used as a supplementary tool to provide individualized treatment plans for patients with ECC.

PO-110

Correlations among Ki67 index, CT features, and risk stratification in gastrointestinal stromal tumors.

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Objective: To investgate the performance significance of CT and Ki-67 index in gastrointestinal stromal tumours (GISTs),and to explore the correlation among CT subgective features, the Ki67 index, and risk stratification in gastrointestinal stromal tumours (GISTs)
Materials and Method: A total of 225 patients with postoperatively pathologically diagnosed GISTs from Febuary 2010 to April 2019 in our hosipital were enrolled. These patients had underwent surgical resection within one month after contrast-enhanced CT examination.Correlations among CT subgective features, the Ki67 index,and malignancy risk were analysed with Spearman's correlation test.
Results: The Ki67 index was positively correlated with risk stratification (r = 0.472) or mitotic index (r = 0.524). CT imaging features including size,heterogeneous enhancement, mucosal ucelration, and necrosis＞50% were associated with the Ki67 index (r = 0.349,0.217, 0.222, and 0.252, respectively). The presence of size, heterogeneous pattern of enhancement,irregular tumor contour and and necrosis＞50% were associated with risk stratification (r = 0.796,0.408, 0.318,and 0.311, respectively).
The percentage of Ki67 index>5% group was 61.3%(n=138),the percentage of Ki67 index≤5% group was 38.7%(n=87) .The multivariate logistic regression analysis

revealed that mixed growth pattern [P = 0.022 Exp (B) = 0.072] ,direct organ invasion [P = 0.014, Exp (B) = 0.095],lymphadenectasis[P = 0.018, Exp (B) = 0.076] were effective variables in distinguishing between the groups with Ki67≤5% and>5%. **Conclusions:** Our findings suggest that the Ki67 index is an effective complementation in predicting the prognosis of GISTs, and CT features may provide evidence to support the importance of preoperative assessment.These subjective CT features include size, heterogeneous enhancement, mucosal ucelration, necrosis＞50% and so on.

PO-111

CT and MRI features and diagnostic value of patients gastrointestinal stromal tumors in different risk degrees

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Objective To investigate the CT and MRI features of gastrointestinal stromal tumors (GIST) and their diagnostic value. **Methods** CT and MRI scanning features of 26 cases with GIST confirmed by surgery and pathology were retrospectively analyzed. **Results** Fourteen cases suffered from the tumors originated from stomach, with 4 high-risk cases, accounting for 28.6%; 10 cases suffered from the tumors originated from duodenum and small intestine, with 3 high-risk cases, accounting for 30%; 2 cases suffered from the parenteral tumors, with 1 high-risk case, accounting for 50%. Tumor location, strengthening degree and MRI signal characteristics showed non- specific in assessing the risk of GIST. The average diameters of tumors were respectively (3.37 ± 1.27) cm, (7.60 ± 3.71) cm, (11.15 ± 3.88) cm, and the intra- tumor necrosis conditions were respectively 0/10, 5/8, 7/8, and the apparent diffusion coefficients were respectively (1.78±0.24)×10- 3 mm2/s, (1.72±0.23)×10- 3 mm2/s, (1.24±0.11)×10- 3 mm2/s in low-risk, moderate-risk and high-risk groups. Significant differences were found in the tumor diameter, intra-tumor necrosis and apparent diffusion coefficients (P<0.05). **Conclusion** CT and MRI examination contributes to the evaluation of the predilection site of GIST and the diagnosis of benign or malignancy, instructing clinical treatment and estimating prognosis.

PO-112

Quantitative evaluation of extraserosal/mesangial infiltration in mid-lower rectal cancer with single-source dual-energy CT multi-parameter imaging

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Purpose: To investigate the value of single-source dual-energy CT multi-parameter imaging in evaluating the status of extraserosal/mesangial infiltration in middle and lower rectal cancer.
Materials and Methods: Thirty-eight cases of histopathologically proven middle and lower rectal adenocarcinoma underwent preoperative dual-energy enhanced CT scans and were retrospectively analyzed. Patients were divided into T2 (without infiltration, n=17) and T3 (with infiltration, n=21) groups based on the status of extraserosal / mesangial infiltration. Iodine concentration (IC), effective atomic number (Eff-Z) and the slope of energy spectral CT curve (K) (K=CT(40)-CT(100)/60)) were measured in the arterial phase (AP) and venous phase (VP) on the fat tissue surrounding the diseased intestinal segment. Measurements were averaged over 3 consecutive slices and analyzed using independent samples t-test between the two groups. The receiver operating characteristic curve (ROC) was used to evaluate the differential diagnostic efficacy of spectral CT parameters.
Results: The IC, eff-Z and K values of the fat tissue surrounding the diseased intestinal segment in the T2 group were statistically lower than those in the T3 group in both AP (IC: -4.50±9.63mg/ml vs. 7.38±12.72mg/ml, P<0.001), (eff-Z: 6.97±0.88 vs. 7.92±0.87, P<0.001), (K: -0.61±1.30 vs. 1.00±1.73, P<0.001), and VP (IC: -3.06±6.87mg/ml vs. 3.90±8.51mg/ml, P<0.001), (eff-Z: 7.19±0.61 vs. 7.75±0.62, P<0.001), (K: -0.42±0.92 vs. 0.54±1.18, P <0.001). In the arterial phase, the area under the ROC curve (AUC), sensitivity and specificity of using IC, eff-Z and K values were (0.924, 90.5% 88.2%), (0.941, 90.5%, 88.2%) and (0.927, 90.5%, 88.2%) with cutoff values of -1.29mg/ml, 7.34 and -0.16, respectively. In the venous phase, these values were (0.887, 81.0%, 87.5%), (0.896, 81.0%, 87.5%) and (0.860, 76.2%, 87.5%) with cutoff values of 1.98mg/ml, 7.64 and 0.23, respectively.
Conclusion: The multi-parameters (IC, eff-Z and K) in spectral CT imaging provide high diagnostic accuracy in evaluating the extraserosal/mesangial infiltration in middle and lower rectal cancers.
Clinical Relevance: The significance of single-source dual-energy CT multi-parameter quantitative imaging evaluate of extraserosal/mesangial infiltration in mid-lower rectal cancer is to guide clinical treatment and provide new quantitative methods.

PO-113
“起源胃壁强化征”辅助 CT 诊断胃外生型胃肠间质瘤

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目的：探讨肿瘤起源胃壁强化特征及坏死囊变成分的极性分布情况在胃外生型胃肠间质瘤（Gastrointestinal Stromal Tumor, GIST）鉴别诊断中的意义。**方法：**回顾分析经手术病理证实的胃外生型（III型）GIST 病例 18 例，对照组设置与胃壁脂肪间隙消失的邻近脏器起源肿瘤 16 例（胰腺神经内分泌肿瘤 6 例，胰腺实性假乳头状瘤 8 例,肝癌 2 例），观察记录与肿瘤贴邻的胃壁是否存在 CT“起源胃壁强化征”及“坏死囊变极性”分布的情况。同时测量肿瘤长径及动静脉期 CT 值。**结果：**GIST 肿块相邻胃壁局限高强化比例（9/15）高于其他脏器来源肿瘤（0/16），差异具有统计学意义（P＜0.05）。肿瘤坏死囊变极性分布情况，GIST 较其他脏器来源肿瘤更多偏离胃

壁侧分布，但统计学差异未出现显著性（P=0.051）。两组肿瘤的长径、动脉期及静脉期平均 CT 值差异均无统计学意义（P＞0.05）。**结论：**起源胃壁强化征可辅助 CT 鉴别诊断胃外生型胃肠间质瘤。

PO-114
单源双能 CT 能谱分析定量参数预测胃间质瘤 Ki-67 表达的可行性研究

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目的 探讨单源双能 CT 能谱综合分析平台多定量参数预测胃间质瘤（，GST）增值抗原 Ki-67 表达的可行性。**方法** 回顾性分析 28 例行单源双能 CT 三期增强能谱扫描，并经手术病理（免疫组化含 Ki-67）证实为 GST，按照 Ki-67 表达指数（＞6%为高表达，≤6%为低表达），将患者分为高表达组（n=11）和低表达组（n=17）。由两名观察者分别测量两组病灶实质区各期 40~70 keV 下 CT 值、碘浓度（IC）值，并计算标准化碘浓度（NIC）值。采用组内相关系数（ICC）检验两位观察者测量结果的一致性；采用独立样本 *t* 检验或 Mann-Whitney U 检验比较各参数间的差异；采用 ROC 曲线评估有统计学意义参数的鉴别诊断效能；采用 Pearson 相关分析评价有统计学差异的参数与 Ki-67 表达指数的相关性。**结果** 两位观察者测量结果的一致性均良好（ICC>0.75）。Ki-67 高表达组的动脉期 40~70 keV CT、IC、NIC 值均高于低表达组（*P*<0.05），动脉期 40~70 keV 的 CT、IC、NIC 值诊断高表达组的 AUC 分别为 0.807、0.807、0.818、0.807、0.824、0.866，与 Ki-67 表达指数呈中高相关（r=0.471、0.466、0.458、0.442、0.459、0.738；Ki-67 高表达组的静脉期 40~70 keV CT、IC、NIC 值均高于低表达组（*P*<0.05），静脉期 40~70 keV CT、IC、NIC 值诊断高表达组的 AUC 分别为 0.781、0.765、0.749、0.717、0.840、0.904，与 Ki-67 表达呈中高相关（r=0.585、0.570、0.552、0.503、0.660、0.860）。**结论** 单源双能 CT 能谱成像动、静脉期 40~70 keV CT、IC、NIC 值与 GST Ki-67 表达呈正相关，可反映 GST 肿瘤细胞增殖程度，其中静脉期的 NIC 为最佳参数。

PO-115
CT 纹理分析与淋巴结阴性结直肠癌患者伴同时性远处转移的相关性分析

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目的：探讨 CT 纹理分析能否诊断淋巴结阴性的结直肠癌患者同时性远处转移的可行性研究。方法：回顾性分析 82 例淋巴结阴性结直肠癌患者的 CT 图像，12 例伴同时性远处转移，70 例不伴同时性远处转移，使用 TexRAD 软件对平扫及门脉期图像上病灶的最大层面进行分析，空间缩放因子 SSF 取 0 和 2～6 时获得 6 个纹理参数，比较两组之间各纹理参数值的差异性。结果：CT 平扫图像上，SSF=3 时的偏度值具有统计学意义（P=0.031）；CT 增强图像上，SSF=2、3、5、6 时的熵值具有统计学意义（P=0.048、0.027、0.016、0.017），SSF=2 的峰度值具有统计学意义（P=0.026）。综合分析这 6 组数值可以得出当界值取 0.636 时，诊断的敏感性为 75%、特异性为

89%。结论：CT 纹理分析技术对于诊断淋巴结阴性结直肠癌患者是否伴有同时性远处转移具有一定临床价值。

PO-116

Application of ADC maps combined with histogram analysis in mid-low risk rectal cancer

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Objectives: The purpose of this study was to explore the feasibility of apparent diffusion coefficient (ADC) map combined with histogram analysis, to compare the differences between different stages and grades of mid-low risk rectal cancer by quantitative ADC, and to investigate the role of histogram analysis in evaluating biological behavior of mid-low risk rectal cancer.

Materials and methods:A total of 245 patients were enrolled from January 2016 to December 2018, who received rectal MRI examination and underwent operation without any neoadjuvant therapy, including 144 males and 101 females. The patients were divided into different groups according to the pathological results and MRI, including TN stage, histopathological tumor differentiation grade, perineural invasion and lymphovascular invasion (LVI). Histogram analysis was performed on MR multi-parameter analysis software. The ROI was delineated manually along the border of the low signal part of the rectal lesion on ADC image. The software automatically calculated the histogram analysis results. Thirty patients were randomly selected to test the consistency of image segmentation for rectal cancer lesions.

Results: Nine out of twelve indicators' correlation coefficients obtained from the histogram analysis were higher than 0.7. ADC histogram generated mean values were 973.22, 957.78 and 894.96 in D1, D2 and D3, respectively (P=0.025). The median values were 1035.25, 937.08 and 933.54 in T1, T2 and T3, respectively (P=0.013), and they were 958.60, 941.04 and 873.24 in D1, D2 and D3, respectively (P=0.015). The $ADC_{95\%}$values were 1272.71, 1269.34 and 1177.96 in D1, D2 and D3, respectively (P=0.038).The skewness values were 0.17, 0.54 and 0.53 in T1, T2 and T3, respectively (P=0.002). The entropy values were 2.72, 2.85 and 2.88 in T1, T2 and T3, respectively (P=0.044). The contrast value were 7.16, 6.84 and 4.79 in N0, N1 and N2, respectively (P=0.031). The tumor volume were 1.94, 4.90 and 5.47 in T1, T2 and T3 (P<0.001). In addition, $ADC_{5\%}$, Entropy and Contrast were different in LVI, they were 744.13, 2.79 and 5.87 in the LVI+ group and 701.94, 2.88 and 7.22 in the LVI- group (P=0.021, 0.022 and 0.016, respectively).

Conclusions: Whole-tumor ADC maps combined with histogram analysis can obtain a number of indicators, and distinguish the differences of different stages, grades and prognostic factors of mid-low risk rectal cancer.

PO-117

MR Enterography in Different-BMI Patients with Inflammatory Bowel Disease

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PURPOSE
To evaluate the application of MR enterography in Different-BMI patients with IBD when using the first joint ESGAR/ ESPR consensus statement on the technical performance of cross-sectional small bowel and colonic imaging.
METHOD AND MATERIALS
A total of 108 consecutive cases with IBD performed with MR enterography from our institution were retrospectively analyzed. The patient preparation and acquisition protocols were executed according to the first joint ESGAR/ ESPR consensus statement on the technical performance of cross-sectional small bowel and colonic imaging. These 108 cases were divided into three groups according to their BMI: Group A (<18.5kg/m², low-BMI),Group B (18.5-23.9kg/m², normal-BMI) and Group C (>23.9kg/m², high-BMI). Group A was subdivided into two groups according to the real ingested volume of oral contrast agent : Group A1 (1000-1200ml, low-ingestion) and Group A2 (1200-1500ml, normal-ingestion). Results were independently reviewed by two radiologists. The degree of bowel distention and the image quality were qualitatively scored on a four-point scale. Differences were evaluated by using the Kruskal-Wallis H test.
RESULTS
Distension scores of all the bowel segments between any two groups in Group A, Group B, and Group C showed no statistical difference (P>0.05). Distension scores of all the bowel segments between Group A1 and Group A2 showed no statistical difference (P>0.05).
CONCLUSION
The expert consensus recommendations are applicable in different-BMI patients with inflammatory bowel disease. For the low-BMI, ingest the lower oral contrast volume (1000-1200ml) and the bowel distension showed no significant differences compared with normal ingestion.

PO-118

MR 扩散峰度成像对 CD 活动性分级定量评估的价值

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目的：探讨扩散峰度成像（diffusion kurtosis imaging, DKI）评估克罗恩病（Crohn's disease, CD）炎症活动性的可行性。
材料与方法：总共有 51 例进行连续的肠镜、MR 及 DKI（b 值= 0-2000mm2/s）CD 患者纳入研究。小肠镜检查根据克罗恩病简化内镜活动性评分（SES-CD）将 CD 患者分为非活动组（0 - 2）、轻微活动组（3-6）及中重度活动组（≥7）。比较 DKI 和 DWI 参数区分不同活动性病变中的准确性。

结果：共 127 段肠管纳入研究，包括非活动组 15 段，轻微活动组 45 段，中-重度活动组 67 段。ADC、D_{app}、K_{app} 与 SES-CD 的相关性分别为 -0.627(P <0.001)，-0.381（P <0.001），0.641（P <0.001）。ADC、D_{app}、K_{app} 在不同活动组间均存在显著差别（所有 P 值均小于 0.001）。ROC 分析发现，当临界值为 0.865×10-3 mm2/s 时，ADC 值区分活动组与非活动组的 ROC 曲线下面积（Area under curve, AUC）最大为 0.884(P < 0.001)；当 K_{app} 临界值为 0.645 时，区分活动组与非活动组的 AUC 最大为 0.867(P < 0.001)；D_{app} 区分活动组与非活动组的最大 AUC 为 0.726（P = 0.005）。ADC 值区分非活动-轻微活动组与中重度活动组的 AUC 为 0.846（P < 0.001）;K_{app} 为 0.695 时，区分非活动-轻微活动组与中重度活动组的 AUC 为 0.843（P < 0.001）;D_{app} 的 AUC 值为 0.690（P < 0.001）.

结论：DKI 可用于评估 CD 病变活动性，与常规 DWI 的准确率方面相似。

PO-119

骨质疏松椎体血流灌注的 MRI 研究

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目的：利用定量动态增强 MRI（dynamic contrast-enhanced magnetic resonance imaging, DCE-MRI）、显微 CT（microcomputed tomography, micro-CT）以及质子 MR 波谱（proton magnetic resonance spectroscopy, ^{1}H-MRS）探讨去卵巢大鼠骨质疏松模型的腰椎椎体血流灌注、骨量与脂肪之间的时序关系。

方法：去卵巢组（n = 35）和假手术组（n = 35）大鼠在术后 0，2，6，10，14，18 以及 24 周进行腰椎椎体的 ^{1}H-MRS、定量 DCE-MRI、micro-CT 影像学检查以及腰椎椎体骨髓 CD34 免疫组化染色分析以及透射电镜观察，同时进行血清血管内皮生长因子检测。采用独立样本 t 检验比较相同时间点两组大鼠各种检查参数的差异。

结果：与假手术组比较，去卵巢组出现容积转运参数（K^{trans}）（2 周，P=0.036）和血管外细胞外容积分数（V_e）（10 周，P=0.014）下降、骨量下降（2 周，P=0.014）以及脂肪分数增加（6 周，P=0.036），同时，血清血管内皮生长因子（18-24 周，P=0.005）和骨髓微血管密度（14-24 周，P=0.018）下降。透射电镜显示去卵巢组骨髓血管内皮细胞间隙更紧密且骨髓纤维化更明显。

结论：定量 DCE-MRI 能直接反映骨髓血流灌注。K^{trans} 有望用于早期发现骨髓血流灌注降低。血管收缩活性增强和血管内皮细胞间隙紧缩可能是骨质疏松早期血流灌注下降的原因，而骨髓脂肪增多、微血管密度降低以及骨髓纤维化增多可能在骨质疏松晚期加重骨髓缺血。

PO-120

使用少量对比剂确认肩关节 MR 造影穿刺成功的 X 线征象分析

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目的：本研究旨在通过对直接法肩关节 MR 造影过程中注射少量对比剂时，对比剂在 X 线下的分布征象进行分析，明确哪些 X 线征象对判断穿刺是否成功有更高的准确性，以避免因错误判断引起不必要调针或再穿刺。

方法与材料：研究对象为于我院放射科进行肩关节造影检查的患者。采用前方入路穿刺，记录在肩关节造影前方入路关节腔穿刺过程中，在注射约 1-2ml 对比剂时进行 X 线投照观察到的对比剂分布

征象，随后进行 MR 检查以判断是否成功。评价各 X 线征象的一致性，并计算穿刺成功病例中各征象分布情况，作为该征象判断穿刺成功的准确率。

结果：共计 669 例受试者，经 MR 证实全部穿刺成功。注射少量对比剂的 6 种 X 线征象分布（肱骨头重叠处不与针尖相连的对比剂-66.82%、腋隐窝内-64.72%、盂肱关节间隙内-93.87%、肩胛下滑囊内-69.81%、肱二头肌长头腱腱鞘内-1.94%、肱二头肌长头腱-冈上肌腱间-17.19%）一致性差（kappa＜0.2），其中“肱骨头重叠处见不与针尖相连的对比剂”与“盂肱关节间隙见对比剂”一致性最差（kappa=-0.115，p<0.01）。以“肱骨头重叠处见不与针尖相连的对比剂”或“盂肱关节间隙见对比剂”为标准时，判断准确率为 100%，高于既往文献中中作为标准的征象或征象组合（65.47%-97.01%）。

结论：在直接法前方入路肩关节造影过程中，少量注射对比剂时的各 X 线征象一致性差，临床工作中不能混淆使用。其中采用“肱骨头重叠处见不与针尖相连的对比剂”或“盂肱关节间隙见对比剂”作为注射少量对比剂时提示穿刺成功的证据，较既往文献中使用的标准准确率更高，更能有效避免不必要的调针或再穿刺，推荐在临床工作中使用。

PO-121
慢性腰腿痛患者静息脑连接组的局部连接改变：基于多尺度频率相关的 KCC-和 Cohe-ReHo 的研究

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越来越多的增加表明中枢神经系统的可塑性在非特异性下腰痛患者的维持和发展中起到重要作用。然而，并不清楚中枢系统的局部或短程功能相互作用在椎间盘所致的腰腿痛患者症状维持中的作用。特别是，局部连接的多尺度自然属性在患者中的情况不清楚。因为，本研究使用体素水平的肯德尔和谐系数(KCC)和一致性(Cohe)局部一致性(ReHo)的方法，分别在典型频段(0.01 - 0.1 Hz)和 5 个特定的亚频段(slow-6 to slow-2)分析 25 例下腰腿疼患者(*duration: 36.7±9.6 months*)和 26 例健康对照组个体的全脑静息态功能磁共振扫描数据。组间比较差异证实患者组在典型频段和 5 个特定的亚频段(slow-6 to slow-2)的 KCC-和 Cohe- ReHo 显著改变分别位于右侧小脑后叶、脑干、左侧前额中部和双侧楔前叶；而疾病状态和 5 个特定亚频段的交互作用存在于包括疼痛矩阵和默认网络内数个区域(*P<0.01, Gaussian random field theory 校正*)。偏相关分析发现 5 个特定亚频段存在改变的 ReHo 和疼痛存在的时间、两点辨识度存在显著相关。这些结果将患者特定亚频段局部连接属性联系到疾病病程。在将来的疼痛相关局部脑连接组的研究中，是需要考虑整合频率段和分析方法用于更好的显著疼痛的中枢机制。

PO-122
单指数、双阶指数、拉伸指数模型 DWI 和 DKI 用于实性软组织肿瘤诊断价值的比较研究

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目的：探讨单指数模型、双阶指数模型、拉伸指数模型 DWI 和 DKI 技术用于术前判断实性软组织肿瘤良、恶性的应用价值，并比较那种技术对肿瘤良、恶性鉴别最优越。

材料与方法：收集发生于四肢、躯干及腹盆部的 sSTT 患者 30 例，术前均行常规 MRI、DWI、DKI 及增强检查，手动勾画 ROI，测得单指数模型 DWI Standard ADC 值；双阶单指数模型 DWI D-mono、D^*-mono、f-mono 值、双阶双指数模型 DWI D-Bi、D^*-Bi、f-Bi 值；拉伸指数模型 DWI DDC、α 值；DKI MK、MD、FA 值。采用软组织肿瘤 MRI-病理对照方法，获取病理结果。
结果：30 例 sSTT 独单指数模型 DWI Standard ADC、双阶单指数模型 DWI D-mono、拉伸指数模型 DWI DDC、DKI MD、MK 值在良恶性组间差异具有显著性（$P<0.05$）。采用 ROC 分析，单指数模型 DWI Standard ADC、双阶指数模型 DWI D-mono、拉伸指数模型 DWI DDC、DKI MK 及 MD 值的曲线下面积（AUC）分别 0.806、0.824、0.852、0.907、0.810；最佳诊断阈值分别为 $1.382\times10^{-3}mm^2/s$、$1.256\times10^{-3}mm^2/s$、$1.405\times10^{-3}mm^2/s$、0.518、$1.717\times^{-3}mm^2/s$，其鉴别良、恶性软组织肿瘤的敏感度分别为 100%、89%、100%、75%、100%，特异度分别为 67%、67%、75%，100%、67%。
结论：单指数模型 DWI Standard ADC、双阶指数模型 DWI D-mono、拉伸指数模型 DWI DDC 及 DKI MD、MK 均能鉴别良、恶性 sSTT；其中 DKI MK 值鉴别良、恶性 sSTT 的诊断效能最高。在 sSTT 的良、恶性诊断中，DKI 序列要优于单指数、双阶指数及拉伸指数模型 DWI 序列。

PO-123

Clinical-radiomics Nomogram Based on Radiographic Features to Assess Pulmonary Metastasis of Osteosarcoma of Extremities

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Background: Osteosarcoma (OS) is the most common primary malignant bone tumor in adolescents. Pulmonary metastasis (PM) occurs in more than half of patients at different stages of the disease course, which is one of the important factors affecting the long-term survival of OS.
Purpose: To develop and validate a clinical-radiomics nomogram based on Radiographic and clinical features that could predict PM of OS of extremities.
Materials and Methods: 1100 patients (PM=418, non-PM=682) with histologically proven OS of extremities were retrospectively analyzed and divided into a training set (n=770) and a validation set (n=330). Radiographic features and risk factors (sex, age, type, grade, treatment, etc.) associated with PM were evaluated. We compared the performance of models based on radiographic features, clinical data and their combination. The area under the receiver operating characteristic curve (AUC) and accuracy (ACC) were used to evaluate different models.
Results: Combined model had a relatively higher performance than individual one. Clinical-radiomics nomogram based on combined features achieved an AUC of 0.873 and ACC of 0.842, followed by radiomics model (AUC=0.821, ACC=0.790) and clinical data (AUC=0.762, ACC=0.706) in the validation set.
Conclusions: The clinical-radiomics nomogram had a good performance in predicting PM of OS of extremities, which would be helpful in clinical decision-making.

PO-124

Analysis of Histograms of ADC and Enhanced-T1WI in Differentially Diagnosing of Osteosarcoma and Ewing's sarcoma.

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Objective: To determine if histograms of ADC and enhanced-T1WI can be used to differentiate osteosarcoma and Ewing's sarcoma.

Materials: 52 patients with confirmed histologically osteosarcoma in 32(61.54%) patients,and Ewing's sarcoma in 20(38.46%) patients were enrolled in the study,accepting MRI at 3T. The ROIs were drawn on the maximum level of ADC and enhanced-T1WI,and the histogram analysis were performed using the software named Mazda. The statistical analysis was performed on the nine histogram parameters to find out the different characteristics and the ROC curve was drawn to evaluate the diagnostic efficacy.

Results:Using ADC histogram,histogram metrics derived from Perc.01% were significantly lower in osteosarcoma than Ewing's sarcoma. Osteosarcoma was significantly higher variance,Perc.90% and Perc.99% than Ewing's sarcoma.Optimal diagnostic performance to predict Ewing's sarcoma from osteosarcoma (AUC= 0.855, sensitivity = 81.30%, specificity =82.40%) was obtained when setting variance= 391.63 as the threshold value.
Using enhanced-T1WI histogram,histogram metrics derived from mean,Perc.01%,Perc.10% and Perc.50% were significantly lower in osteosarcoma than Ewing's sarcoma. Osteosarcoma was significantly higher variance than Ewing's sarcoma. Optimal diagnostic performance to predict Ewing's sarcoma from osteosarcoma (AUC= 0.787, sensitivity = 70.60%, specificity =79.30%) was obtained when setting Perc.10%= 120.00 as the threshold value.

Conclusions:The histograms of ADC and enhanced-T1WI may help to discriminate Ewing's sarcoma and osteosarcoma and ADC histogram showed better efficacy compared to histogram of enhanced-T1WI.

PO-125

扩散张量成像在腰椎间盘突出症中的临床应用价值初步研究

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[摘要]目的 利用 3.0T MRI 扩散张量成像（DTI）定量分析单纯受压而无临床压迫症状腰 5 脊神经根和伴有临床压迫症状腰 5 脊神经根，以期为临床诊断腰椎间盘突出症患者问题脊神经提供影像参考。**方法** 对 25 例（50 侧）正常对照组志愿者、14 例腰 5 脊神经压迫症状组患者、9 例腰 5 脊神经无压迫症状组患者行 3.0T 核磁共振 3D 水激发多回波合并成像序列（MEDIC）冠状位扫描和单次激发自旋回波平面成像序列（SS SE-EPI）扫描，评估腰 5 脊神经根的受压情况，测量腰 5 脊神经根的 ADC 值，均值的比较采用单因素方差分析。**结果** 腰 5 脊神经压迫症状组 ADC 值为（1.576±0.130）×$10^{-3}mm^2 \cdot s^{-1}$，小于腰 5 脊神经受压无症状组 ADC 值（1.761±0.249）×$10^{-3}mm^2 \cdot s^{-1}$及正常对照组 ADC 值（1.665±0.130）×$10^{-3}mm^2 \cdot s^{-1}$，差异有统计学意义。腰 5 脊神经受压无症状组 ADC 值与正常对照组 ADC 值差异无统计学意义。**结论** 腰椎间盘脱出症患者中腰 5 脊神经根 ADC 值大小的改变能反映腰 5 脊神经的压迫症状，并不能反映腰 5 脊神经根单纯的形态学改变。

PO-126

3.0T 磁共振扩散张量成像技术应用于腰椎间盘突出症患者的临床诊断价值

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目的 探究磁共振扩散张量成像技术（Diffusion Tensor Imaging，DTI）应用于腰椎间盘突出症患者的临床诊断价值。
方法 回顾分析 80 例腰椎间盘突出症患者。术前详细询问病史并进行临床查体，均行 DTI 及常规腰椎 MR 检查，术前分别记录 DTI 及 MR 的影像学诊断，根据 DTI 技术 3D MR 序列突出或脱出髓核与椎管内神经根的具体解剖关系分为肩上型，腋下型及腹侧型，根据神经纤维束成像图(Diffusion Tensor Tractography ,DTT)的神经根损伤情况分为神经根完好无损伤，神经根纤维束各向异性（FA）值降低无明显稀疏，神经根纤维束稀疏及神经根纤维束截断。术中影像结合临床查体情况验证影像学检查结果，采用 ROC 曲线分析常规 MR 检查及 DTI 技术对于神经根损伤诊断的曲线下面积（AUC）。采用卡方检验分析髓核与椎管内神经根的解剖关系与神经根损伤程度分级的具体关系。
结果 DTI 技术 3D MR 序列可显示突出或脱出髓核与神经根的具体关系，其中肩上型占 20%（16/80）,腋下型占 46.2%（37/80）,腹侧型占 33.8%（27/80）。ROC 曲线分析显示 DTI 技术对于神经根损伤诊断的 AUC 面积为 0.972，大于常规 MR 对于神经根损伤诊断的 AUC 面积 0.888，二者 ROC 曲线对比分析存在明显差异（P<0.05）。髓核与椎管内神经根的解剖关系与神经根损伤程度分级的卡方检验显示二者间差异不明显（P＞0.05）。
结论 DTI 技术相比于常规 MR 检查对于神经根损伤的诊断效能更高，不仅能明确突出或脱出髓核与椎管内神经根的具体解剖关系，有利于指导术中定位，还能对神经根损伤程度进行评估。然而髓核与神经根的具体位置关系与神经根损伤的程度无明显相关性，其损伤程度可能与具体的受压程度相关。

PO-127

多模态脊髓 MRI 在骨折伴脊髓损伤患者术前评估价值探讨

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目的：急性脊髓损伤致死致残率高，早期诊断和早期手术治疗是关键，MRI 在评价脊髓损伤方面具有极大优势。本研究结合多模态 MRI 技术，综合评估急性脊髓损伤患者脊髓损伤情况，指导制定最佳临床治疗方案。

实验方法：本研究数据收集平台为 Philips Ingenia，3.0T，采集数据包括常规 T2,T1, DTI, mFFE, T2mapping 等。目前已收纳患者为 22 例，其中有骨折损伤患者 8 例（2 例颈椎，5 例胸椎，1 例腰椎，本研究主要探讨重点），无骨折脊髓损伤患者 14 例。常规 T2，T1 一般只可评估脊髓有无水肿、挫裂等情况，mFFE 作为多回波 T2*序列，可准确评估脊髓损伤及出血情况，DTT 纤维束可视化可观察纤维束稀疏、移行及断裂情况。
结果：8 例骨折脊髓损伤患者中，1 例 C5 向前滑脱损伤 A 级患者因挫裂伤及脊髓出血严重放弃手术治疗；1 例 C7 骨折患者，术前评估脊髓挫伤及微出血但纤维束连续，术后 4 月由术前 B 级恢复至 D 级；1 例 T3-4 骨折患者术前评估脊髓挫伤及出血，但纤维束连续，术后三月由 A 级转为 C 级；1 例 T5 骨折患者，术前评估无显著挫裂伤及出血，纤维束连续，只存在骨性压迫，术前术后评级均为 E 级；1 例 T12-L1 爆裂骨折患者，术前评估为脊髓挫伤及出血，但纤维束未完全离断患者，以右侧为著，术前评估 A 级，术后运动功能部分恢复，左侧恢复较好；1 例 L1 爆裂骨折患者，术前评估为脊髓挫伤，无明显出血，纤维束大部分离断，术前评估 A 级，术后 A 级，暂未恢复（随访时间较短）；2 例 T5 及 T12 骨折患者术前评估挫伤及出血，并纤维束完全中断，患者术前 A 级，术后暂未见明显恢复。
结论：急性脊椎骨折患者严重程度与脊髓挫伤及出血情况极大关联，脊髓纤维束的保留对术后功能恢复至关重要。术前准确评估脊髓损伤（有无水肿、挫裂伤、出血）、纤维束走形及连续情况，不仅为临床医生提供准确诊断信息，指导治疗方案，并可提供前瞻性术前预后量化指标。

PO-128
联合应用髋关节斜位扫描及 T2 Mapping 序列对髋臼早期软骨损伤的诊断价值

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目的： 探讨联合应用髋关节斜位扫描及 T2 Mapping 序列对早期髋臼软骨损伤的诊断价值。 方法： 选取 2018 年 4 月 -2019 年 4 月本院收治的因髋关节骨性关节炎或外伤 30 例患者，分别采用核磁共振髋关节斜位联合 T2 Mapping 以及常规序列对髋关节进行诊断，将所得数据传输到工作站，进行图像后处理， 得到 30 例疑似软骨损伤患者的 T2mapping 伪彩图，调节阈值使得正常髋臼软骨的蓝色色阶，临近关节腔积液为灰色色阶，当软骨内出现损伤时呈现绿色-黄色色阶，所有 MR 图像均由两位高年资放射科医师一同阅片诊断， 测量感兴趣区的 T2 值。结果：髋臼正常软骨 T2 值及髋臼疑似软骨损伤病变区 T2 值的比较：正常平均 T2 值为 30. 755±3.321，损伤病变区 T2 值为 42.653±5.8532 ；T2 值随着软骨损伤而增高（P＜ 0.05）；结论： 在针对髋臼关节软骨损伤诊断方面，髋关节斜位扫描显示软骨更加清晰，T2 Mapping 序列的灵敏度更高，因此在髋臼早期软骨损伤的诊断中可以广泛应用斜位扫描及 T2 Mapping。
序列。

PO-129
Study on normal range of GSI energy spectrum analysis of children's pancreas based on contrast agent fixed-time injection method

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PURPOSE
This study used a fixed-time injection of iodine contrast agent based on the body mass of the child to evaluate the normal range of the analysis of the pancreatic energy spectrum of the children in the GSI spectrum enhancement examination.
METHOD AND MATERIALS
Thirty children with a body mass greater than 20 kg and a non-pancreatic lesion with abdominal CT enhancement were selected from 2019.1 to 2019.2. All patients underwent GSI spectroscopy CT enhancement examination using GE revolution CT. Four scan protocols (four groups) were scanned according to body weight , and a uniform contrast protocol was used: 300 mgI was given according to the weight of the child per ml Iodine contrast agent 1.5ml/kg, and use 24s fixed contrast injection time method. All patients underwent an image evaluation of the portal vein phase. The phase delay time was 56s after the contrast agent injection. The ROI of the head, body and tail of the pancreas was selected , and the four energy spectrum analysis values of 70KeV, iodine water value, water iodine value and atomic number were measured. The single sample statistics were drawn using SPSS software..
RESULTS
This indicates that the four energy spectrum analysis values of 70KeV, iodine water value, water iodine value and atomic number obtained are relatively fixed in children with pancreatic energy spectrum GSI enhanced CT examination using fixed-time injection of iodine contrast agent.
CONCLUSION
Contrast fixed injection time method according to different body weight to give different doses of iodine contrast agent, can ensure that children of different body weight under the contrast agent program and relatively fixed weight of iodine contrast agent, iodine contrast agent dose absorbed by human tissue Not affected by weight. Under the scanning scheme and the contrast agent scheme, the iodine dose is relatively constant, and is not affected by body weight, and the energy spectrum analysis value is relatively fixed, and the result has credibility under the scheme.
CLINICAL RELEVANCE/APPLICATION
Therefore, under this method, the energy spectrum analysis value can be used as a reference value for the normal energy spectrum analysis of the GSI enhanced CT examination of the pancreatic energy spectrum for the clinician to perform functional and component diagnosis based on the numerical value.

PO-130
能谱 CT 在儿童肾积水和单纯性肾脏囊性病变鉴别诊断中的价值

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目的 ：初步探讨能谱 CT 扫描在儿童肾积水与单纯性肾脏囊性病变鉴别诊断中的应用价值。**方法：**回顾性分析 2018 年 1 月至 2019 年 6 月在我院行能谱 CT 扫描的肾积水和单纯性肾脏囊性病变 30 例(肾积水 20 例，单纯性肾脏囊性病变 10 例，肾积水合并单纯性肾囊性病变 5 例)。所有患儿行能谱 CT 扫描，数据传入图像后处理工作站，获得两组病例的混合能量图像、40-140 keV 单能量图像、能谱衰减曲线图、钙-水基图、水-钙基图，比较两组病例混合能量及不同 keV 水平

下单能量图像的 CT 值差异。所得数据均进行独立样本 t 检验，绘制 ROC 曲线，比较各参数鉴别肾积水和单纯性肾脏囊性病变的敏感性和特异性。**结果**：肾积水混合能量 CT 值(9.80±2.80)HU，略大于单纯性肾脏囊性病变 CT 值(9. 55±2.56)HU，但差异无统计学意义(t =1.452，P =0. 078)。肾积水单能量图像 CT 值在低能量端(40-70Kev)大于单纯性肾脏囊性病变，差别有统计学意义，在 40 Kev 时，单能量 CT 值差别最大。肾积水的能谱曲线斜率(0.69±0.15)明显大于单纯性肾脏囊性病变(0. 28±0. 21)，差异有统计学意义(t =4.89，P =0. 000)。肾积水组水-钙浓度值(979. 30±8. 28)g/L 低于单纯性肾脏囊性病变(1000. 36±5. 81)g/L，差异无统计学意义(t = －1. 658，P =0. 059)。肾积水组钙-水浓度值(7. 76 ±2. 26)g/L 明显高于单纯性肾脏囊性病变(4.65±2. 18)g/L，差异有统计学意义(t =3. 231，P =0. 001)。**结论**：肾积水与单纯性肾脏囊性病变具有不同的能谱曲线和 CT 能谱特征参数，能谱 CT 为鉴别肾积水和单纯性肾脏囊性病变提供了一种新的、有价值的影像学检查方法。

PO-131
儿童肾母细胞瘤 Hedgehog 通路相关分子表达的临床意义及 CT 影像特征

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目的 探讨 Hedgehog 信号通路相关分子 BMI1 和 Gli1 在儿童肾母细胞瘤（NB）组织中的表达情况及其与 CT 影像、预后的关系。**方法** 收集 37 例 NB 患儿的 NB 组织及其癌旁正常组织的病理切片标本，通过免疫组织化学染色法观察 BMI1 和 Gli1 蛋白在肿瘤组织中的表达，分析其与 NB 患儿临床病理、CT 影像特征以及血清肿瘤标志物的关系。利用公共数据库，分析 BMI1 和 Gli1 mRNA 表达与 NB 患儿预后的关系。**结果** 纳入 37 例患儿，男 14 例、女 23 例，中位年龄 2 岁（3 个月~6 岁）。NB 组织中 BMI1 和 Gli1 蛋白表达均较癌旁正常组织增高，差异有统计学意义（P<0.01）。BMI1 阳性细胞在 37 例患儿肿瘤组织均被观察到，而 Gli1 阳性细胞在 16 例患儿肿瘤组织中未被检测到。22 例 BMI1 高表达的 NB 患儿更容易出现 CT 影像能观察到的远隔转移，且血清甲胎蛋白、糖类抗原-125（CA-125）表达增高，同时总体生存期也更短，差异均有统计学意义（P<0.01）；Gli1 表达增高则与 NB 患儿临床病理及 CT 影像特征或预后无相关性。**结论** Hedgehog 通路相关分子 BMI1 和 Gli1 在 NB 肿瘤组织中表达增高，BMI1 高表达患儿更早出现 CT 影像学上的远隔转移，并与预后不良正相关，可能是 NB 发展的一个重要影响因素。

PO-132
戈谢病肝脾定量影像学研究

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目的 采用定量磁共振成像对戈谢病（Gaucher disease, GD)[1]肝脾系统病变进行研究，探讨肝脾系统定量成像的变化。
方法 对 40 例正在接受酶替代疗法治疗的戈谢病患者及 30 例健康者进行磁共振检查，检查采用定量非对称回波的最小二乘估算法迭代水脂分离(IDEAL-IQ)技术[2]和肝脏容积加速法(LAVA)。统计学采用双样本 t 检验，P＜0.05 代表有统计学意义。**结果** 戈谢病患者组肝脾脂肪含量分别为（3.07±3.06）%、（2.01±0.77）%，正常对照组肝脾脂肪含量为（2.87±1.37）%、（1.79±0.34）%；戈谢病患者组肝脾铁含量分别为（54.18±24.13）Hz、（39.17±26.32）Hz，

正常对照组肝脾铁含量为（49.45±7.96）Hz、（42.32±19.84）Hz。以上两组之间均没有统计学差异（P＞0.05）。戈谢病患者组和正常组的平均肝脏体积分别为（1498.34±452.94）cm³（1308.20±320.23）cm³。组间肝容积差异有统计学意义（P=0.044）。戈谢病患者组和正常组脾脏平均体积分别为(411.46±228.01)cm ^{3}和（218.74±88.57）cm ^{3}。两组脾脏体积差异有统计学意义（P<0.001）。

结论 治疗后 GD 患者肝脾体积仍略大于正常人。GD 患者肝、脾脂肪分数略高于正常组，但仍在正常范围内。ERT 对肝脾损害有一定改善作用。

PO-133

儿童 Kasabach-Merritt 现象的影像学诊断价值

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【摘要】目的：分析 Kasabach-Merritt 现象（Kasabach-Merritt phenomenon, KMP）的临床资料及影像学特点，以提高对本病的认识。**方法：**回顾性分析 19 例 KMP 病例的临床资料和影像学表现。男 14 例，女 5 例，年龄 0 天-12 月，平均 3 月。临床表现主要包括进行性增大的软组织肿胀/肿块共 10 例，皮肤瘀点瘀斑 5 例，黄疸 3 例，胸痛 1 例。治疗前 14 例病例给予 MRI 检查，5 例病例给予 CT 检查。**结果：**所有 19 例病例实验室检查均提示不同程度的血小板减少和凝血功能异常，同时发现全身不同部位有血管性病变：（1）病灶部位：胸壁、腹壁或盆壁局限或弥漫性病灶 8 例（42.1%），胸腰段脊柱旁局限或弥漫性病灶 4 例（21.0%），腹腔实性病灶 4 例（21.0%），四肢弥漫性病灶 2 例（10.5%），颈部病灶 1 例。（2）影像学特点：MRI 和 CT 能清晰显示病变，所有病灶平扫 MRI 表现为 T1W 等或者低信号，T2W 为高信号，CT 表现为等或者低密度影，增强后 CT 或 MRI 均呈明显均匀或不均匀强化。（3）16 例病例接受药物治疗，3 例为手术与药物联合治疗，经 18 个月的治疗、随访，整组病例存活率为 84.2%（16/19）。**结论：**KMP 是一种少见但致命的疾病，临床和实验室数据可以提示本病但并不能确诊，必须发现血管性病变才能诊断，MRI/CT 对病变的显示、性质的确定和范围的明确有独特的优势，并且在指导治疗和随访起了十分重要的作用。

PO-134

MRI 脂肪定量技术在 Duchenne 型肌营养不良患儿骨骼肌脂肪浸润评估的应用价值

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【摘要】 目的 分析 Duchenne 型肌营养不良患儿骨骼肌脂肪浸润特点及其与临床的关系，探讨 HISTO、qDixon 脂肪定量技术在该疾病中的应用价值。**方法** 共 25 例经临床、病理免疫组化及基因检测确诊的 Duchenne 型肌营养不良患儿，激素治疗前均行临床肌力评分、CK 检测以及行臀部、大腿共计 19 块肌肉 MRI 检查，并采用 T1WI 脂肪浸润分级、HISTO 及 qDixon 脂肪定量技术评价肌肉脂肪浸润程度，并与肌力和 CK 值进行相关性分析。**结果** Duchenne 型肌营养不良患儿的 19 块骨骼肌中臀大肌、臀中肌、大收肌脂肪浸润程度较重，闭孔内肌、闭孔外肌、长收肌、缝匠肌、股薄肌及半腱肌相对较轻，呈回避现象。Spearman 秩相关分析显示，大收肌脂肪浸润分级与 HISTO-FF 值、qDixon-FF 值均呈显著正相关（r=0.94，P＜0.01、r=0.91，P＜0.01）；HISTO-FF 值与 qDixon-FF 值呈显著性正相关（r=0.98，P＜0.01）；部分肌肉与肌力评分呈负相关，但均无统计

学意义（r＜-0.3，P＞0.05）；CK 值与部分肌肉脂肪分数呈中度正相关性，但无统计学意义（r＞0.5，P＞0.05）。**结论** Duchenne 型肌营养不良患儿骨骼肌脂肪浸润有一定的分布特点，可为临床肌肉活检及基因检测的选择提供参考。HISTO、qDixon 脂肪定量技术可用于监测 Duchenne 型肌营养不良患儿肌肉脂肪含量，为临床治疗随访提供无创性检查手段。Duchenne 型肌营养不良患儿临床肌力评分和 CK 值与骨骼肉脂肪含量存在一定相关性。

PO-135
基于中华 05 计分法西安地区 3～12 岁汉族女童骨龄图谱的研究

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目的：目前国际公认的骨龄评价方法是计分法和图谱法，两者结合使用可提高骨龄评估的准确性。我国最新的骨龄标准中华 05 只有计分法，无对应的图谱法。本研究基于中华 05 计分法制定西安地区 3～12 岁汉族女性儿童的骨龄图谱，以弥补计分法的不足，并通过分析该图谱与 G-P 图谱、顾氏图谱的差异，了解现阶段西安地区女性儿童的生长发育变化特点。
方法：采用方便抽样的方法选取 2014～2019 年西安地区 3～12 岁正常汉族女性儿童手腕部 DR 片 6800 例，经中华 05 计分法统一判读后，选取所有整岁和半岁组的骨龄样片共 19 组，每组样本量为 50 张，筛选各组的中位数片与众数片，从中选出最能代表该骨龄段各骨骺发育水平的 DR 片作为标准骨龄片，制作出基于中华 05 计分法的西安地区汉族女童骨龄图谱。通过该图谱与 G-P 图谱以及顾氏图谱相同骨龄标准片的对比分析，总结它们之间的差异。
结果:（1）制作出基于中华 05 计分法的西安地区 3～12 岁汉族女性儿童骨龄图谱标准片，并详细解释每张标准片的手腕骨发育特征。（2）在青春期生长突增之前，本研究图谱的手腕骨发育水平落后于 G-P 图谱，腕骨和尺骨尤为明显，并且随着年龄的增长差距逐渐变小，至骨龄 10.0 岁时基本一致。（3）本研究图谱几乎所有的手腕骨发育水平均高于顾氏图谱，尤其腕骨和尺骨均提前 1 岁左右。
结论：（1）制定出基于中华 05 计分法的西安地区 3～12 岁汉族女童骨龄图谱。（2）现阶段西安地区的女性儿童在青春突增期前骨发育速度落后于美国女性儿童，而在此之后，骨发育速度又快于美国女性儿童。（3）现阶段西安地区的女性儿童随着生活水平的改善，骨发育呈长期加速的趋势。（4）骨龄标准在不同时期，不同区域是有变化的，与之相配的骨龄图谱也应该根据实际情况而制定，本研究制作的骨龄图谱经统计学检验，适合于西安地区的 3～12 岁汉族女性儿童。

PO-136
首发 1 型糖尿病儿童基于静息态功能磁共振的功能连接研究

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目的　本研究通过比较首发 1 型糖尿病儿童与正常对照儿童之间全脑功能连接密度有无差异，并对功能连接密度与临床及认知数据进行相关性分析，以功能连接密度差异脑区作为种子点，与全脑体素做功能连接，分析两组间功能连接改变。
材料与方法　本研究共纳入首发 1 型糖尿病儿童 35 例和年龄、性别相匹配的正常对照儿童 33 例。收集人口社会学资料、临床资料及智力测评资料。所有被试的静息态功能磁共振图像采用全脑平面回波成像序列采集。同时通过 3D T1-BRAVO 序列采集高分辨三维结构图像。使用 SPM8 和 DPARSF 软

件对静息态功能磁共振成像数据进行预处理，计算每个被试全脑功能连接密度，选择具有功能连接密度组间差异结果的脑区作为种子点进行全脑功能连接计算。功能连接密度或功能连接图上体素的组间比较采用两样本 t 检验，并进行多重比较校正。人口统计学和临床资料采用两样本 t 检验进行检验。对 1 型糖尿病组提取的功能连接密度值与临床资料进行偏相关分析。P ＜ 0.05 认为具有统计学差异。 结果 糖尿病组和对照组间在年龄、性别、智商上均无统计学差异。 糖尿病组 HbA1c 和血糖水平均高于对照组，差异有统计学意义。与对照组相比，糖尿病组右侧颞下回及右侧后扣带回功能连接密度值降低。在糖尿病组，右侧颞下回及右侧后扣带回功能连接密度值与 HbA1c、检查前血糖及总智商均不相关。在糖尿病组，右侧颞下回与左侧眶部额下回间的功能连接增加，右侧后扣带回于双侧楔叶的功能连接降低。 结论 本研究发现即使在疾病起始阶段，1 型糖尿病儿童静息时部分脑区功能连接就已发生改变。1 型糖尿病儿童的行为（情绪）及认知功能（记忆力、注意力、执行功能）损伤可能与右侧颞下回、右侧后扣带回、两侧楔叶功能连接异常有关。本文从功能体系的角度为探索 1 型糖尿病行为认知损伤的神经病理生理机制提供了一个新的途径。

PO-137

DWI 对儿童不同级别脉络丛肿瘤的鉴别诊断价值

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目的 探讨 DWI 对于不同级别的儿童脉络丛肿瘤（CPT）的鉴别价值。
材料与方法 回顾性分析经手术病理证实的 39 例儿童 CPT 的 DWI 表现及由其产生的相对 ADC 值（rADC，肿瘤实性部分最大层面 ADC/同层面脑脊液 ADC），其中脉络丛乳头状瘤（ CPP，WHO Ⅰ级）15 例，非典型脉络丛乳头状瘤（ APP，WHO Ⅱ级）16 例，脉络丛乳头状癌（ CPC，WHO Ⅲ级）8 例。
结果 15 例 CPP，女:男为 8:7，年龄 2~48 月、中位年龄 8.5 月；16 例 APP，女:男为 8:8，年龄 3~120 月、中位年龄 11.5 月；8 例 CPC, 女:男为 3:5，年龄 4 ~80 月、中位年龄 12.5 月。三组发病年龄无统计学差异（P=0.451）。
在 DWI 及 ADC 图上，CPT 实性部分信号多变。在 DWI，将高或略高信号作为一组，其余为一组，CPP 为 3:12，APP 为 3:13，CPC 为 5:3；1-2 级为一组与 3 级信号差异有意义（p=0.028），余各两级之间均无统计学差异。在 ADC，将低或略低信号作为一组，其余为一组，CPP 为 4:11，APP 为 4:12，CPC 为 5:3。各两级之间、1-2 级与 3 级之间均无统计学差异。
在 rADC 值，CPP 为 0.4470±0.1116，APP 为 0.4291±0.1017，CPC 为 0.3355±0.0747；1 级与 2 级之间无统计学差异（P=0.624）；1 级与 3 级、2 级与 3 级，以及 1-2 级与 3 级之间均有统计学差异（P= 0.016, 0.040, 0.014）。对于区别出 3 级与 1-2 级，ROC 曲线分析提示界值为 rADC≤0.3838，曲线下面积为 0.806，计算出的敏感性、特异性、阳性预测值及阴性预测值分别为 87.5%, 64.5%, 38.9%, 95.2%。
结论 在儿童脉络丛肿瘤，3 级的 rADC 值小于 1 级或 2 级，3 级绝大多数 rADC≤0.3838；在 DWI 上，3 级比 1-2 级更多地表现为高或略高信号。

PO-138

粘多糖贮积症的颅脑 MRI 表现

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目的 总结粘多糖贮积症（MPS）患儿的颅脑病变的 MRI 表现，并探讨不同病变与患儿智力水平的相关性。建议 MPS 患儿颅脑 MRI 检查的优化序列。方法 回顾性分析 19 例临床确诊 MPS 患儿的临床和颅脑 MRI 影像资料，对 MRI 图像中的血管外间隙增宽、脑白质异常信号、蛛网膜下腔增宽、脑室扩张、蝶鞍形态异常、枕大池增大、齿突发育不全、齿突周围软组织增厚、椎管狭窄、颈髓异常和颈椎椎体形态异常进行半定量评价。利用 t 检验探讨智力落后组与智力正常组间 MRI 征象的差异，对 MRI 各征象之间、以及各征象与患儿年龄的相关性采用 Spearman 相关分析法进行探讨。结果 19 例 MRI 图像中，各征象发生率如下：血管外间隙增宽(57.9%)、脑白质异常信号(47.4%)、蛛网膜下腔增宽(73.7%)、脑室扩张(52.6%),、蝶鞍形态异常(73.7%)、枕大池增大(52.6%)、齿突发育不全(68.4%)、齿突周围软组织增厚(26.3%)、椎管狭窄(57.9%)、颈髓异常(10.5%)和颈椎椎体形态异常(36.8%)。智力正常与落后组间白质异常信号（t=1.962, P=0.049）和脑室扩张（t=2.181,P=0.045）两个征象具有统计学差异。MRI 各征象与年龄均无显著相关性。白质异常信号与血管间隙增宽之间存在正相关（r=0.6，P=0.007），蛛网膜下腔间隙增宽分别与脑室扩张（r=0.719,P=0.001）和枕大池增大（r=0.478, P=0.038）存在正相关。而椎管狭窄与齿突发育不全和齿突周围软组织增厚之间均无显著相关性。结论 MPS 的颅脑 MRI 改变涉及范围广泛，需要进行全面评估。脑白质异常信号和脑室扩张的程度与临床智力状态相关，有助于评估病情。矢状位 T2WI 对显示脊髓受累情况具有优势。

PO-139

3.0TMRI 在胎儿后颅窝病变中的诊断探讨

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目的 探讨 3.0TMRI 在胎儿小脑病变中的诊断价值。方法 回顾性分析胎儿小脑病变的 MRI 表现，并与超声相对比。131 例孕妇年龄 18-34 岁，平均 28 岁；孕龄 22-38 周，平均 27 周。产前常规超声检查后 24 小时内行 3.0TMR 检查，T2WI 采用半傅立叶单激励快速自旋回波序列及 T2-真快速成像，T1WI 采用二维快速小角度激励序列，行胎儿头颅三平面扫描，将产前 MRI 与超声进行对照。结果 131 例孕妇共检出胎儿 131 例。包括后颅窝池增宽 45 例，经典型 Dandy-Walker 畸形 22 例，Joubert 综合征 3 例，小脑蚓部发育不良伴旋转 6 例，Chiari 2 型 2 例，后颅窝蛛网膜囊肿 15 例，小脑脑干发育不良 3 例，阴性结果 35 例。131 例孕妇 MRI 结果进一步完善产前超声诊断 87 例，纠正超声诊断 19 例，一致 25 例。结论 MRI 在胎儿后颅窝病变诊断方面具有一定的应用价值，特别复杂畸形或合并出血时能够提供超声以外的额外信息，甚至能更正超声的诊断。目前我院正中矢状位半傅立叶单激励快速自旋回波序列约于 28 周可较明确分辨小脑原裂，这与文献报道 21 周可以分辨仍存在一定差距，需要进一步对参数进行优化。

PO-140

The testicular descent on prenatal 1.5T magnetic resonance imaging

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Objective: To evaluate testicular descent in relation to gestational age in normal male fetuses on prenatal MRI.
Methods: A total of 1095 cases of male fetuses from July 2016 to March 2019 who received 1.5T fetal brain MRI examination and were diagnosed as normal or slightly congenital abnormality (mild Ventriculomegaly33.8%,mega cisterna magnal2.2%,enlargement or narrowing of the cavum septi pellucidi (CSP) 3.9%,combined with two or more minor abnormalities4.4%) in West China Second University Hospital, Sichuan University were selected, it includes 53 male fetuses from twins. The gestational age of the included fetus ranges from 19 to 38 weeks of gestation. Fetal testicular descent was evaluated on prenatal 1.5T MRI, unilateral descent and bilateral descent according to gestational age were analyzed, and the testicular descent curve based on gestational age was drawn.
Results: Testis was not observed in scrotum on prenatal 1.5T MRI prior to 23 weeks' gestation. Unilateral testicular descent was firstly observed at 24+1 weeks of pregnancy, and the earliest bilateral testicular descent showed at 25+3 weeks. The descent of testicles mainly occurred in the gestation of 25-28 weeks, 82.6% of 28-week fetuses showed bilateral descent and 93.0% showed the descent of at least one side. Bilateral descent was observed in 100% of cases at 33 weeks.
Conclusions: The time course of testicular descent evaluated by prenatal MRI is useful for prenatal diagnosis of relevant male congenital abnormalities, especially for early detection of cryptorchidism.

PO-141
1.5T 磁共振成像评价胎儿内耳发育： BTFE 序列参数优化的初步研究

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目的：探讨评价胎儿内耳发育的最佳 BTFE 序列参数。
方法：选取来我院行胎儿脑部 MRI 检查的孕妇 5 例，孕周大于 29 周。在常规检查的基础上，对每 1 例胎儿双侧耳部采用 BTFE 序列，进行横断位和冠状位的薄层负间隔扫描，对薄层数据进行 MIP 后处理。5 例胎儿的扫描层厚和层间隔分别如下——（1）3mm、-0.5mm，（2）3mm、-1mm，（3）3mm、-2mm，（4）3mm、-2.5mm，（5）2mm、-1mm。请有经验的从事胎儿 MRI 诊断的高年资医师来评价图像质量和内耳的显示情况。
结果：（3）对胎儿内耳耳蜗的走行显示优于（1）（2），（4）（5）图像质量下降，反而干扰了内耳的显示。通过 MIP 得到的 3D 影像可以大致显示半规管的空间结构，但清晰度欠佳。
结论：BTFE 序列层厚、层间隔分别为 3mm、-2mm 时，能清晰显示胎儿内耳耳蜗走行，同时图像质量满足诊断要求。

PO-142
儿童大前庭导水管综合征伴内淋巴囊扩大的 3.0TMRI 与 256 排 CT 的应用价值的分析

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目的 儿童大前庭导水管综合征伴内淋巴囊扩大的 3.0TMRI 与 256 排多层螺旋 CT 影像表现特点及在临床中的应用价值的分析
方法 回顾性分析我院大前庭导水管综合征 30 例共 60 耳的 MRI 及 CT 影像表现，对不同程度病例的影像特点进行分析总结，所有病例均采用 Philips 公司生产的 3.0T 超导型核磁共振仪器进行 T2WI 3D DRIVE 内耳水成像扫描.并且所有病例均进行 GE 256 排多层螺旋 CT 薄层高分辨率扫描检查。
结果 单纯前庭导水管扩张 22 例，其中一侧前庭导水管扩张 4 例，双侧前庭导水管扩张 18 例。单纯内淋巴囊扩张 6 例，其中一侧淋巴囊扩张 1 例 ，双侧内淋巴囊扩张 5 例。前庭导水管及内淋巴囊均扩张 8 例。 影像表现：MRI 在前庭导水管扩张中可清晰显示内淋巴囊与前庭的交通，呈明显细管样高信号。扩大的内淋巴囊成囊袋状高信号匍匐于岩骨内侧缘，部分病例内淋巴囊的信号不均匀，呈高及稍高的分层状信号特点。同一病例的 MRI 成像特点与 CT 进行比较发现：扩张的前庭导水管在 CT 上呈现左右对称喇叭口状表现，可实际测量前庭导水管开口的大小，与在 MRI 成像上细管状高信号所对应。扩大的内淋巴囊在 CT 显示不够理想，因与周围脑脊液的 CT 值差别不大，与 MRI 成像呈明显囊袋状高信号有所区别，但可以清晰显示扩大内淋巴囊对岩骨的压迫情况。
结论：MRI 对大前庭导水管综合征及内淋巴囊扩大病变情况均可以清晰的显示，并且可以对前庭导水管扩张的程度更清晰的显示，而 CT 对前庭导水管扩张的程度显示亦很好，但对内淋巴囊扩大的显示略逊于 MRI。综上所述，MRI 及 CT 对大前庭导水管综合征伴内淋巴囊扩大病变均可以进行准确诊断，但是如果将二者结合起来将更为准确，能够为临床提供精确的诊断依据。

PO-143
儿童鳃器畸形的影像诊断与临床对照分析

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目的：对照和分析影像学检查在儿童鳃器畸形术前分型诊断的价值。方法：回顾性研究。选择昆明市儿童医院 2017 年 1 月至 2018 年 12 月收治的 53 例儿童鳃器畸形患儿临床资料、术前影像学（CT、MRI、X 线造影检查及造影后 CT 检查）检查结果，根据影像学检查结果对所有鳃器畸形患儿进行术前分型，对比手术诊断及术后病理检查结果，采用 Kappa 一致性检验对术前影像检查结果与手术及术后病理结果进行一致性比较。结果：第 1 鳃器畸形 5 例，第 2 鳃器畸形 25 例，第 3 鳃器畸形 7 例，第 4 鳃器畸形 16 例。影像表现为囊肿、窦道和瘘管，伴感染时可见病灶壁增厚、环形强化及周围组织间隙内渗出，第 4 鳃器畸形病灶内可见气体及合并甲状腺左叶感染。X 线造影及造影后 CT 检查可显示瘘管及窦道的形态、位置及走行。53 例鳃器畸形患儿中有 5 例患儿术前影像检查分型与手术结果不相符，Kappa 值为 0．780。结论：术前多种影像学检查方法可清晰显示鳃器畸形的位置、结构特点及其与毗邻结构的关系，以及有无窦道和瘘管形成，并提示是否合并感染，对手术完整切除病灶、避免复发具有重要的价值。

PO-144
坏死型视网膜母细胞瘤伴眼眶蜂窝织炎的 MRI 表现

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目的 探讨肿瘤坏死型视网膜母细胞瘤伴眶周蜂窝织炎的 MRI 影像表现。
方法 收集我院 2015 年-2019 年经病理证实的 14 例视网膜母细胞瘤伴眼眶周蜂窝织炎的 MRI 及病理资料，回顾性分析其影像学特征。
结果 坏死型视网膜母细胞瘤在所有视网膜母细胞瘤中发病率为 2.6%（14/539），14 例病例中，双眼发病 3 例，单眼发病 11 例，平均发病年龄 22.8 个月，临床表现为白瞳症伴眼睛发红或眼睑肿胀。MRI 表现：眼球增大 11/14(78.6%)，青光眼 5/14(36.4%)，白内障 10/14(71.4%)，晶状体剥落 10/14(71.4%)，所有眼内病灶平均最大长径为 19.75±3.69 mm；所有眼内肿瘤灶 T1WI 表现为混杂高信号、等信号为主，T2WI 表现为混杂低信号为主；T1WI 增强后所有病灶均无强化，均伴有眼环明显增厚伴强化明显，DWI 表现为高信号或部分高信号 8 例、条索状混杂高信号 3 例、低信号 3 例，平均 ADC 值为（0.974±0.263）$\times 10^{-3}mm^2/s$。球后表现：视神经增粗 2 例，视神经周围鞘膜明显强化不伴视神经增粗者 12 例；所有患眼均出现眶周斑片状、条片状强化影，伴眼睑明显肿胀。42.9% (6/14)患眼肿瘤侵犯并穿透筛板，浸润筛板后视神经。
结论：坏死型视网膜母细胞瘤伴眼眶蜂窝织炎发病率较低，其眼内表现及肿瘤影像特征与经典型不同，具有较特征的影像表现。坏死型视网膜母细胞瘤大多伴有眼内蜂窝织炎，筛板后视神经浸润发生率较高。

PO-145
第 2 代心脏运动伪影矫正算法对高心率儿童心脏增强 CT 成像效果的优化

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目的：
评价第 2 代心脏运动伪影矫正算法对高心率先天性心脏病儿童增强 CT 心脏及大血管成像效果的改善能力。
资料与方法：
连续选取 42 例高心率先心患儿入组，心率 122.6±18.8 (78-151)，年龄 5d-6y，中位年龄 8m，全部患儿接受 256 排心脏增强 CT，自动选择扫描时像，回顾性心电门控自动选择最佳心动周期，重建为常规图像（standard，SD），第 1 代心脏运动伪影矫正算法图像（first-generation motion correction image，MC1），以及第 2 代心脏运动伪影矫正算法图像（second-generation motion correction image，MC2）。2 名影像医师独立应用 4 分制（1 分：无法诊断；2 分：可以观察；3 分：可以测量；4 分：完美）分别评价左侧冠脉、右侧冠脉、主动脉瓣、肺动脉瓣、二尖瓣、三尖瓣、主动脉根部、肺动脉根部、室间隔、房间隔，应用非参数检验分析比较三组图像之间的差异，以及不同方法间两两差异。
结果：
三组图像组间比较显示，除三尖瓣、室间隔、房间隔外，所有其它结构均具有组间差异，MC2 图像质量最好，MC1 次之，SD 最差。两两比较结果显示，室间隔图像质量两两比较无统计学差异，其余各项结果显示 MC2 图像质量优于 MC1 及 SD ，MC1 与 SD 比较，仅左冠、右冠、二尖瓣显示效果优化，余各项无统计学差异。
结论：
MC2 可以减少心脏运动伪影，较 MC1 可以提高冠脉图像质量外，同时大幅提高心脏、瓣膜、大血管根部的图像质量，有利于提升高心率先心病患儿心脏增强 CT 图像质量。

PO-146

儿童良性心脏肿瘤的 MRI 分析

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目的：研究儿童心脏良性肿瘤的心脏磁共振特征及心脏磁共振对儿童良性肿瘤的诊断价值。
方法：回顾性分析 2006 年 9 月至 2018 年 3 月至我院进行心脏磁共振（CMR）检查的心脏良性肿瘤病例，按照纳入排除标准筛选病例。所有病例图像采集使用 1.5T 扫描仪扫描。收集整理研究病例的人口学及临床资料，并分析肿瘤在 CMR 上的特征，包括位置、大小、范围、信号特点、血流动力学改变等以及是否伴发心包、胸腔积液。
结果：研究期间共 121 例连续病例进行 CMR，纳入有病理结果的良性肿瘤或临床确诊结节性硬化伴心脏横纹肌瘤的病例 38 例。患儿年龄 0.2 个月至 155.3 个月（中位年龄 13 个月）；男孩 21 例，女孩 17 例。肿瘤发生部位多种多样，大小不一，各类肿瘤具有一定的影像学特征。所有的心脏肿瘤均能被 CMR 清晰显示，与病理结果相符的例数为 32 例， 诊断的准确性为 84.21 %。
结论：CMR 能够同时提供心脏良性肿瘤的形态学特征及组织学信号特征，对心脏良性肿瘤诊断的敏感性及准确性均较高，是评估心脏肿瘤的重要检查方式，为临床诊治提供参考价值。

PO-147

儿童难治性支原体肺炎的 CT 表现及预测

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目的：探讨儿童难治性支原体肺炎的胸部 CT 表现、并利用其 CT 征象进行预测，以便及早及合理诊治。
材料与方法：自 2014 年 1 月 1 号至 2018 年 12 月 30 号，我院收治了 7654 名上呼吸道感染或肺炎患儿，经血清学支原体 IG M 抗体阳性或咽拭子支原体 DNA 扩增阳性证实支原体肺炎 2565 例。最后 366 例患儿行胸部低计量 CT 检查并全部入组。根据难治性支原体肺炎的定义，分为普通型支原体肺炎 159 例、难治性支原体肺炎 209 例。分析其临床资料，实验室检查及胸部 CT 特征并进行了单因素分析。利用多因素分析获取有统计学价值的难治性支原体肺炎胸部 CT 征象和原始及优化模型. 利用 ROC 曲线比较模型间的诊断效能以及模型与实验指标诊断效能。最终根据优化回归模型 CT 评分对难治性支原体肺炎的患儿进行危险分组。
结果:儿童难治性支原体肺炎具有统计学价值的 CT 征象包括实变的个数、无支气管充气征的实变，双侧肺炎和胸水. 根据以上参数我们得到诊断效能高度一致原始回归模型及优化回归模型，并且原始回归模型的诊断效能明显优于实验室指标。利用优化回归模型的 ROC 曲线分析得到诊断儿童难治性支原体肺炎的准确性高达 86.6%。具有无充气管充气征实变、双侧肺炎、胸水征象患儿视为低危组，具有多叶实变征象患儿视为中危组， 具有无充气管充气征实变、双侧肺炎、胸水及多叶实变征象患儿视为高危组。
结论: 基于 CT 征象及分值，优化回归方程及危险分组能够准确诊断及预测儿童难治性支原体肺炎。CT 检查对预测儿童难治性支原体肺炎非常有价值。

PO-148
3T 磁共振运动矫正相位敏感反转恢复序列在儿童自由呼吸下心肌延迟成像中的应用价值

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目的：对比 3.0T 磁共振相位敏感反转恢复序列（PSIR）与运动矫正相位敏感反转恢复序列（PSIR MOCO）在儿童自由呼吸下心肌延迟增强中的应该价值。
方法：选择 2018 年 10 月-2019 年 6 月在我院放射科行心脏磁共振增强扫描的患儿 58 例，采集自由呼吸下相位敏感反转恢复序列（PSIR）与运动矫正相位敏感反转恢复序列（PSIR MOCO）延迟图像。对比分析两组图像的主观质量评分（5 级），并配对对比分析两组中正常心肌、异常强化心肌及左心室腔内图像的信噪比和相对信噪比。
结果：所有患儿 PSIR 序列图像质量主观评分结果：5 分、4 分、3 分、2 分和 1 分组依次占 15.5%、32.8%、37.9% 、12.1%和 1.7%。患儿 PSIR MOCO 序列图像质量主观评分为 5 分比例为 25.9%，4 分为 50.0%，均显著高于 PSIR 序列（all P <0.001）， 3 分占 20.7%，2 分占 1.7%，1 分占 1.7%。PSIR MOCO 组图像异常强化心肌与正常心肌的相对信噪比（P =0.36）、异常强化心肌与左心室血池的相对信噪比（P =0.63）及左心室血池与正常心肌的相对信噪比（P =0.76）。PSIR 序列短轴扫描时间约 17s，PSIR-MOCO 序列短轴扫描时间约 1min30s。
结论：在儿童自由呼吸下心肌延迟增强图像采集中，与 PSIR 序列相比，PSIR MOCO 序列的图像信噪比和相对信噪比没有显著差异，但图像主观质量评分，PSIR MOCO 序列的高质量图像比例比 PSIR 序列更大。但是 PSIR-MOCO 序列扫描时间较 PSIR 明显增加。因此在临床运用中，可以首先选择时间较短的 PSIR 序列扫描，如果得到的图像可以满足诊断要求，可不进行 PSIR MOCO 序列；如果 PSIR 序列扫描得到的图像质量较差，可进行 PSIR MOCO 序扫描，以获得更高质量的图像。

PO-149
肿瘤性急性胰腺炎的 CT 和 MRI 特征分析

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目的:提高对肿瘤所致急性胰腺炎 CT 和 MRI 影像特征的认识。材料与方法：对 2013 年至 2018 年住院收治的经手术及病理学检查证实的肿瘤所致急性胰腺炎（21 例）和胆源性急性胰腺炎（21 例）病人的临床和影像资料进行回顾性分析。结果：肿瘤性急性胰腺炎的疾病谱包括胰腺癌、IPMN、十二指肠乳头癌、胆管癌及胰腺神经内分泌肿瘤。肿瘤性急性胰腺炎的影像学特征如下：胰管不规则扩张、胰管截断、胆总管扩张、胆总管狭窄等。本组肿瘤所致急性胰腺炎可能的发病机制包括（1）肿瘤阻塞胰管或压迫胰管导致胰管压力升高，胰液排出受阻；（2）肿瘤细胞生长引起胰腺局部组织缺血及组织坏死，胰液与消化液渗入胰腺间质；（3）肿瘤组织激活胰酶。结论：由肿瘤引发的急性胰腺炎的 CT 和 MRI 表现具有一定特征，认识这些特征可提高对肿瘤性急性胰腺的诊断水平。

PO-150

宫颈微偏腺癌的 MRI 表现

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目的 探讨宫颈微偏腺癌的磁共振成像（MRI）特点，以提高对宫颈微偏腺癌诊断的准确性。**方法** 回顾性收集 8 例确诊为宫颈微偏腺癌的 MRI 影像学资料，对肿瘤的 MRI 图像进行分析，包括肿瘤大小、肿瘤部位、肿瘤成分、信号特点、强化特点及侵犯范围。**结果** 宫颈微偏腺癌最大径为（4.36±1.46）cm，其中肿瘤最大径＞4cm 共 5 例，肿瘤最大径≤4cm 共 3 例。6 例肿瘤表现为囊实性，2 例表现为实性，弥散加权成像（DWI）肿瘤实性成分扩散受限 6 例，扩散受限不明显 2 例。多期动态增强扫描，肿瘤实性成分强化曲线表现为速升平台型共 3 例，表现为缓升型共 5 例。肿瘤局限于宫颈管 3 例，肿瘤侵犯宫颈基质深度＞1/2 共 7 例，肿瘤侵犯宫颈基质深度≤1/2 共 1 例。侵犯宫体 4 例，侵犯阴道穹窿 4 例，发生双侧卵巢转移 4 例，发生淋巴结转移 5 例。**结论** 宫颈病变 MRI 表现为多房囊性并实性成分强化，临床症状大量阴道排液，应警惕宫颈微偏腺癌，宫颈活检宜深取组织，必要时锥切，有利于早期诊断、治疗，改善预后。

PO-151

Correlation between Zonal Oblique Multislice Intravoxel Incoherent Motion and Dynamic Contrast Enhanced Magnetic Resonance Imaging parameters in endometrial cancer

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Purpose: To investigate the correlation between parameters of Zonal Oblique Multislice (ZOOM) Intravoxel Incoherent Motion (IVIM) and Dynamic Contrast-Enhanced Magnetic Resonance Imaging (DCE-MRI) in patients with endometrial cancer.
Materials and Methods: Institutional review board approval and informed consents were obtained. Between December 2017 and September 2018, 36 patients pathologically confirmed of endometrial cancer were included in this prospective study. Pelvic examinations were performed in a 3.0 T MR scanner (Ingenia CX, Philips Healthcare, the Netherlands), including ZOOM IVIM with 8 b values and DCE-MRI with 3 different flip angles (5° and 15° initially; and 8° sequentially afterwards). IVIM parameters (D, Dstar, and f) and DCE-MRI parameters (time to peak, wash-in rate, wash-out rate, Ktrans, Kep) were blindly measured by two radiologists via Intellispace Portal (version 10.1.0.64190, Philips Healthcare, the Netherlands). Spearman correlation was performed and a p-value <0.05 was considered statistically significant.
Results: Interobserver measurement reproducibility was good to excellent. A moderate correlation was found between f and wash out rate (r=0.500, p=0.0019). Mild correlations were found between D and Ktans (r=0.329, p=0.0498), D and Kep (r=0.411, p=0.025), f and time to peak (r=-0.358, p=0.0319), f*Dstar and wash in rate (r=0.345, p=0.0423), and f*Dstar and wash out rate (r=0.377, p=0.0255).

Conclusion: ZOOM IVIM perfusion-related parameters demonstrated moderate-to-mild correlation with DCE-MRI quantitative parameters in endometrial cancer.

PO-152

Noninvasive assessment of Liver Fibrosis Using multi-parametric MRI and Serum Markers

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Purpose:
Liver MR elastography (MRE) and serum markers have diagnostic value for non-invasively staging liver fibrosis in patients with chronic liver diseases. To explore the diagnostic value of multi-parametric fusion model including liver and spleen stiffness measured by MR Elastography, serum markers(APRI,FIB-4) for the assessment of liver fibrosis.
Methods:
A total of 120 patients with chronic liver diseases were consecutively enrolled. All patients underwent liver and spleen MR elastography simultaneously (Discovery 750w; GE Medical Systems 3.0T). 2 independent radiologists drew regions of interest to measure liver and spleen stiffness, then to calculate the mean stiffness of liver and spleen. Using liver biopsy to staging fibrosis grade by an experienced liver pathologist blinded to the patients' clinical and radiology information in 1 week after the MR scan. Reference Standard was METAVIR system(F0-4). Collecting laboratory examination results to calculate APRI and FIB-4. The differences among different fibrosis stage were analyzed using one-way Anova. the correlation of different parameters and fibrosis stages were analyzed by Spearman coefficients and multiple regressions, ROC analysis was performed to assess the performance of liver and spleen stiffness, serum markers in different fibrosis stage.
Results:
All measurements were successful (F0: 23 F1: 22 F2:24 F3: 23 F4:28).Mean stiffness of liver and spleen in different grade were 3.09kPa/6.44 kPa , 3.29kPa/6.45 kPa, 4.37 kPa /7.64 kPa, 5.46 kPa /7.84 kPa, 7.72 kPa /9.45 kPa. The significant difference was found among the parameters in different fibrosis stage($p<0.001$). Spearman coefficients of liver stiffness, spleen stiffness, FIB-4, APRI were 0.87,0.64,0.65,0.51 respectively($p<0.001$).Compared the AUCs of the frontal four parameters and their combined models for staging F1-4, F2-4, F3-4(advanced fibrosis), F4 (cirrhosis) , combined model had highest diagnostic performance (AUC=0.91 $p<0.05$) for detecting F1-4,liver stiffness and FIB-4 also shew high performance (AUC=0.89,0.83 $p<0.05$); liver stiffness and combined model had highest diagnostic performance in stagingF2-4,F3-4,F4 (AUC=0.97,0.95,0.96 respectively $p<0.05$); spleen stiffness also showed high accuracy in staging F4 (AUC=0.87,p=0.03).
Conclusion:
Liver and spleen stiffness measured by MR elastography and FIB-4 had high correlation with liver fibrosis stage, liver stiffness had best diagnostic performance for fibrosis staging. For stage F4, spleen stiffness had high diagnostic efficacy.

PO-153

Blood Oxygen Level-Dependent Imaging and Intravoxel Incoherent Motion MRI of Early Contrast-Induced Acute Kidney Injury in a Rabbit Model

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Background: To evaluate the application of blood oxygenation level-dependent (BOLD) imaging
and intravoxel incoherent motion (IVIM) magnetic resonance imaging (MRI) on assessing early contrast-induced acute kidney injury (CIAKI). Materials: Sixty rabbits were randomly
chosen to undergo iohexol (1.0, 2.5, and 5.0 [gI/kg], respectively; n = 15 for each group) or
saline injection (n = 15). In each group, 6 rabbits underwent MRI at 24 h before injection and
after injection of iohexol or saline (1 h and 1, 2, 3, and 4 days); meanwhile, out of the remaining
9 rabbits, 3 were chosen for MRI acquisition, and then they were killed at specific time
points (1 h, 1 day, and 3 days, respectively). Results: The strong attenuation of pure molecular
diffusion (D), apparent diffusion coefficient (ADC), and perfusion fraction (f) was observed
at 1 day, while pseudodiffusion coefficient (D*) showed a significant decrease at 1 h after iohexol
injection. A distinct elevation of apparent transverse relaxation rate (R2*) reached the
maximum levels on day 1, which was consistent with the expression of hypoxia-inducible factor-1α and vascular endothelial growth factor. ADC, D, and R2* correlated well with histopathological
parameters and biochemical parameters. Conclusion: B OLD c ombined w ith
IVIM is effective to monitor renal pathophysiology associated with CIAKI.

PO-154

Using radiomics nomogram to assess the risk stratification of endometrial cancer

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Abstract
Purpose: To evaluate the preoperative diagnostic performance of multi-parametric magnetic resonance imaging (MRI) combined with clinical parameters in endometrial cancer (EC) risk stratification by using radiomics nomogram, and the application of high-risk EC radiomics nomogram in diagnosis deep myometrial invasion (DMI), high-grade tumor (HGT), lymphovascular space invasion (LVSI), cervical invasion (CI) and lymphnode metastasis (LM).
Materials and Methods: Two hundred histopathologically confirmed EC patients were retrospectively included into the primary cohort (A hospital); 80 clinical diagnosis EC patients were prospectively included into the internal validation cohort (A hospital); 172 (n=43 B, n=129 C) histopathologically confirmed EC patients from another 3 multi-center were retrospectively included into the external validation cohort. All the patients underwent MR examination within 30 days before hysterectomy. A binary least absolute shrinkage and selection operator (LASSO) logistic regression method was used to select the radiomics features in diagnosis of high-risk EC, which was performed and extracted after manual delineation the tumor volume in muti-parametric MR images (T2-weighted, diffusion weighted, apparent diffusion coefficient maps and contrast enhanced images). A high-risk EC radiomics nomogram was generated by combining the selected radiomics features (radiomics signatures) with age, reproductive history and metabolic syndrome. Decisive curve and receiver operating characteristic (ROC) curve were used to evaluate the radiomics nomograms' clinical usefulness and compared with the radiologists' performance. Finally, the high-risk EC radiomics nomogram was further used to assess the DMI, HGT, LVSI, CI, and LM.
Results: From the 4728 MRI features extracted, 8 features were ultimately selected for the diagnostic of high-risk EC, using LASSO regression method. The area under curve (AUC) of primary, internal and external validation of radiomics signatures were 0.78 (A hospital), 0.73 (A hospital), 0.86 (B hospital) and 0.74 (C hospital), and for radiomics nomogram were 0.81 (A hospital), 0.76 (A hospital), 0.96 (B hospital), and 0.75 (C hospital), respectively. The diagnostic performance of high-risk EC radiomics nomogram applied in DMI, HGT, LVSI, CI, LM, with the AUC of 0.79, 0.70, 0.75, 0.70 and 0.68, respectively. The clinical decisive curves showed good clinical application of radiomics nomogram with higher diagnostic performance in DMI, CI, LM than the radiologists.
Conclusion: Multi-parametric MRI based radiomics had good diagnostic performances in assessing high risk EC. When radiomics signatures combined with clinical parameters, a more powerful radiomics nomogram could be generated to assess the high risk of EC patients with the decisive curve to justify the usefulness in clinical. And the high-risk EC radiomics nomogram shows great application in DMI, HGT, LVSI, CI, and LM.

PO-155
基于 MR 抑脂（FS）T2WI 序列的纹理分析技术在软组织肿瘤良恶性的鉴别以及复发检测中的价值

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目的 通过构建并验证基于 MR T2WI 脂肪抑制序列纹理特征的软组织肿瘤良性与恶性、复发与术后改变的预测模型，探讨纹理分析技术在软组织肿瘤良恶性鉴别以及复发性检测中的价值。
材料与方法 回顾性收集 2015.07.01-2015.12.31 因疑是软组织肿瘤或肿瘤复发或术后随访而行 MR 检查的病例。比较良性组与恶性组、复发组与术后改变组的 MR FS T2WI 纹理特征参数的差异。（按 7：3 比例）将各组样本随机分为训练集及测试集，利用 Lasso-Logistic 回归对纹理特征进行降维及筛选，构建良性与恶性软组织肿瘤、复发性肿瘤与肿瘤术后改变的预测模型；利用受试者工作曲线（ROC）及决策曲线分析（DCA）验证模型的效能。
结果 共收集病理证实原发性软组织肿瘤 160 例（手术 150 例，穿刺 10 例），其中良性 83 例，恶性 77 例；复发性肿瘤 58 例，术后改变 66 例（22 例病理证实，44 例超过两年 MR 随访无变化）。良性与恶性软组织肿瘤的 FS T2WI 的纹理特征之间有 14 个纹理特征参数存在显著的统计学差异，而复发性软组织肿瘤与术后改变间有 32 个纹理特征参数存在显著的统计学差异。Lasso-Logistic 回归模型预测良性及恶性的 AUC 分别为：0.65（训练集）、0.75（测试集）；预测测试集良恶性的敏感性、特异性、准确性分别为 55%、96%、76.6%。模型预测肿瘤复发与术后改变的 AUC 分别为：0.91（训练集）、0.73（测试集）；预测测试集复发与术后改变的敏感性、特异性、准确性分别为 55%、94.1%、73%。决策曲线分析显示良性与恶性预测模型、复发与术后改变的预测模型是有价值的。
结论 基于 MR FS T2WI 纹理特征的 Lasso-logistic 回归预测模型可以用来鉴别软组织肿瘤的良性与恶性、复发与术后改变。纹理分析技术可以定量的鉴别软组织肿瘤的良恶性以及检测肿瘤的复发。

PO-156
基于磁共振神经成像的椎间盘与腰骶神经解剖关系的研究

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背景
腰骶丛是神经病变的好发部位，并且是高致残率的疾病过程，该区域神经病变的病程和预后依赖于病因的识别和恰当的临床干预，但该区域的解剖结构复杂，依靠传统的检查手段很难对病变的位置、范围、起源等信息作出准确判断。在微创脊柱手术中，在放射控制下直接进入椎间盘。对椎间盘与神经根解剖关系不明确。
方法
纳入本院因椎间盘突出导致腰骶神经根症状病人 85 例，常规 MR 确诊椎间盘突出；根据以往研究，腰椎间盘突出最易发生于 L4/5 及 L5/S1，针对经内镜椎板间入路椎间盘切除术（PEID，Percutaneous Edoscopic Interlaminar Discectomy），利用 3.0T 高分辨率磁共振成像方法，研究 L5、S1 神经与其对应椎间盘 L4/5、L5/S1 的解剖关系。
结果
共收集 L3/4 椎间盘高度 82 例，平均高度 10.36±1.77mm；L4/5 椎间盘高度 85 例，平均高度约 10.47±2.41，L5/S1 椎间盘高度 85 例，平均高度约 9.72±2.67mm；
测得 L5 左右侧神经根自脊髓发出角度 sig0.579，＞0.05，没有统计学差异；S1 左右侧神经根自脊髓发出角度 sig0.518,＞0.05，没有统计学差异；L5 左、右侧神经根与 L5 上终板距离（正值代表神经根起自 L5 上终板上方，负值代表神经根起自 L5 上终板下方），双侧无统计学意义，sig=0.679; S1 左、右侧神经根与 S1 上终板距离（正值代表神经根起自 SI 上终板上方，负值代表神经根起自 S1 上终板下方），双侧有统计学意义，sig=0.014.
结论

正常情况下，自下位胸椎起，椎间隙有向下椎间增宽的趋势，以 L4/5 间隙最宽，而 L5/S1 间隙有变窄，我们的研究结果也证实这一结论；二是不论椎间盘突出方向如何，在本研究中，L5、S1 神经根自脊髓发出角度无统计学差异；三是存在脊神经自脊髓发出位置与相应椎间盘关系存在变异，这种变异可能是由腰椎间突出造成的。

PO-157

Three-dimensional Intra- and Extracranial Arterial Vessel Wall Joint Imaging in Patients with Cerebrovascular Disease

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Purpose: To evaluate the clinical potential of a newly developed three-dimensional (3D) intra- and extracranial arterial vessel wall joint imaging technique at 3 Tesla using T1-weighted 3D variable-flip-angle turbo spin-echo sequence with improved cerebrospinal fluid suppression in patients with cerebrovascular disease

Materials and Methods: One hundred and twenty-two consecutive patients with clinically confirmed recent cerebrovascular symptoms were imaged using a 3D intra- and extracranial arterial vessel wall joint imaging sequence with and without contrast enhancement on a 3T magnetic resonance system. The number of plaques and culprit plaques were evaluated. The image quality score, percent stenosis, remodeling ratio, and plaque burden were measured and compared between intracranial and carotid arterial plaques, and between non-culprit and culprit plaques.

Results: Except for 23 patients (seven dissection, six Moyamoya, three vasculitis, and seven with no obvious cause of atherosclerotic plaque formation), there were 322 plaques and 111 culprit plaques detected in 96 patients with large artery atherosclerosis. Of the plaques, 278 (96 culprit plaques) and 44 (15 culprit plaques) plaques were identified in intracranial and extracranial arteries, respectively. Image quality did not differ significantly between pre- and post-contrast vessel wall magnetic resonance images. There were also no significant differences in the percent stenosis, remodeling ratio, and plaque burden between intracranial and carotid arteries, and between non-culprit and culprit plaques. The enhancement rate of culprit plaques was significantly higher than that of non-culprit plaques.

Conclusions: The described joint imaging is a promising vessel wall magnetic resonance imaging method for comprehensive diagnosis of cerebrovascular symptoms and investigation of etiology. The imaging technique is a potentially valuable means to optimize treatment.

PO-158

Prospective study of dynamic contrast-enhanced MRI on prediction of carotid artery in-stent restenosis

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目的：探索 3.0 T 动态增强磁共振成像（dynamic contrast-enhanced MR imaging, DCE-MRI）预测颈动脉支架置入术后再狭窄发生的能力。**材料和方法：**2016 年 6 月至 2018 年 12 月，前瞻性分析 40 位拟行颈动脉支架置入术的颈动脉粥样硬化斑块患者，术前一周内完成颈动脉血管壁磁共振成像（vessel wall MR imaging, VW-MRI）及 DCE-MRI 扫描，术后第六个月行脑血管造影复查支架位置、狭窄度等。采用单因素和多因素 Logistic 回归分析 DCE-MRI 药代动力学参数与支架内再狭窄的相关性。**结果：**该组病例支架内再狭窄发生率为 20%，再狭窄患者组 K^{trans} 和 v_p 显著高于无再狭窄组（0.14 ± 0.04 min^{-1} vs. 0.06 ± 0.26，p=0.000；7.21 ± 4.35 min^{-1} vs. 3.88 ± 2.19，p=0.037），K^{trans} 可独立预测支架内再狭窄（HR：1.12；95%CI：1.02～1.23；p=0.02），预测值为 0.09 min^{-1}（敏感性 100%, 特异性 87.5%）。**结论：**斑块内的炎症活动可能引起支架置入后的内膜过度增生，K^{trans} 可独立预测颈动脉支架术后再狭窄的发生，可作为预测支架内再狭窄的有效标记物。

PO-159

大脑深静脉系统磁共振血管成像技术对比分析

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目的 评估 ESWAN 技术对大脑深静脉系统的显示能力，对比、分析不同大脑深静脉磁共振血管成像技术的差异。方法　通过四种磁共振静脉成像技术（2D-TOF-MRV、3D-PC- MRV、3D-CE-MRV 及 ESWAN）对 35 例受检者的双侧大脑深部静脉进行成像，比较基底静脉、大脑内静脉、丘脑纹状体静脉、膈静脉、尾状核头静脉、尾状核静脉的显示率的差异；通过对丘脑纹状体静脉显示完整性进行评分，分析不同扫描技术的差异。测量 ESWAN 扫描所得的双侧大脑内静脉和丘脑纹状体静脉的直径，将测量值与“金标准”——DSA 所测直径值对比分析。结果　在 35 例受检者双侧大脑深静脉血管中，2D-TOF-MRV、3D-PC-MRV、3D-CE-MRV 及 ESWAN 对大脑内静脉的显示数目分别为：68 支(97.14%)、69 支(98.57%)、70 支(100%)和 70 支(100%)；对基底静脉的显示数目分别为：54 支(77.14%)、67 支(95.71%)、70 支(100%)和 70 支(100%)。

PO-160

中枢神经系统脱髓鞘性假瘤 MRI 特征与诊断价值

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摘要：目的探讨中枢神经系统脱髓鞘性假瘤磁共振成像(MRI)特征及诊断价值。方法对 2013 年 5 月-2018 年 5 月收治的 15 例中枢神经系统脱髓鞘性假瘤(均经临床或病理证实)患者的 MRI 影像学资料进行回顾性分析,总结其 MRI 平扫及增强扫描图像特征。结果 MRI 平扫特征:颅内病变 12 例(其中单发 7 例,多发 5 例),C2-C5 层面颈髓病变 3 例;单发病变直径平均(3.89±1.45)cm,颈髓病变均为条带状;不规则形态 10 例,类圆形或卵圆形 2 例;边界清晰 9 例,边界不清 6 例;病灶周边轻微水

肿 12 例。MRI 信号及增强扫描特征:长 T1 长 T2 信号 12 例,等 T1 长 T2 信号 3 例;均不存在囊变及钙化;增强后环状强化 4 例,半开环状强化 2 例("开环征"、"垂直征")。结论 "开环征"等中枢神经系统脱髓鞘性假瘤 MRI 增强扫描典型特征对疾病诊断有一定的价值。

PO-161

治疗前 MR 影像组学预测鼻咽癌无进展生存期

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目的：探讨用治疗前 MRI 影像组学预测鼻咽癌 2 年无进展生存期的可行性。
方法：共计 358 例鼻咽癌患者(训练组：239 例，验证组：119 例)进行回顾性分析。肿瘤图像分割中每一个勾画的断面为一个样本；从 T2W 和增强 T1W 图像中提取肿瘤的 2246 个影像组学特征.利用 LASSO 回归筛选组学特征。构建临床资料、影像组学、TNM 总分期、影像组学+TNM 总分期四个模型。采用 COX 风险回归进行生存分析。采用 Harrell 一致性指数(C-index)评价预后，各组间的差异比较采用对数秩和检验。
结果：临床资料、影像组学、TNM 总分期、影像组学+TNM 总分期四个模型中训练组和验证组人口学特征无统计差异，四个模型训练组 C-index 分别为 0.558(95%CI:0.473-0.642)，0.683(95%CI:0.597-0.767)，0.682(95%CI:0.604-0.761)、0.729(95%CI:0.644-0.813)；验证组 C-index 分别为 0.497(95%CI:0.385-0.610)、0.664(95%CI:0.551-0.777)、0.664(95%CI:0.563-0.766)、0.717(95%CI:0.604-0.830)。影像组学+TNM 总分期预测 2 年无进展生存期最优。
结论：治疗前 MRI 影像组学可以预测鼻咽癌 2 年无进展生存期，影像组学+TNM 总分期模型预测 2 年无进展生存期最优。

PO-162

磁共振含钆造影剂脑沉积的现状及进展

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[摘要] 含钆造影剂是目前临床应用最广泛的磁共振造影剂，近年来大量证据表明脑深部核团的磁共振信号改变 与重复注射含钆造影剂有关，尤其是在齿状核和苍白球组织，钆沉积现象最为明显。本文主要综述了含钆造影剂脑
部沉积现象的研究现状，分析了脑部钆沉积与含钆造影剂类型的关系，并对相关政策进展进行介绍。

PO-163

主观认知下降人群脑内 β 淀粉样蛋白沉积及葡萄糖代谢改变

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目的：本研究拟通过对主观认知下降（subjective cognitive decline, SCD）人群 ^{18}F-Florbetapir（AV45）和 ^{18}F-氟代脱氧葡萄糖（fluorodeoxyglucose, FDG）数据的分析，分别观察 SCD 人群的淀粉样蛋白沉积及葡萄糖代谢改变的特点。
材料与方法：对 44 名 SCD 患者及 13 名年龄、性别匹配的健康老年人组进行 ^{18}F-AV45 和 ^{18}F-FDG 正电子发射断层扫描（positron emission tomography，PET）数据采集。对 PET 数据进行预处理后，以全小脑为参考区，分别计算 ^{18}F-AV45 和 ^{18}F-FDG 的标准摄取值比率（standardized uptake value ratio, SUVR）值。采用双样本 t 检验对 SCD 组和健康老年人组 PET 数据进行统计学分析。
结果：SCD 组与健康老年人组相比，客观认知功能检查均无统计学差异。与健康老年组比较，SCD 组在左侧楔前叶 AV45 的 SUVR 值明显增高（$p<0.05$, FDR 校正）；在双侧楔前叶，左侧旁中央小叶及左侧枕叶 FDG 的 SUVR 值明显增高（$p<0.05$,FDR 校正）。
结论：SCD 人群脑内发现局部 β 淀粉样蛋白沉积，并且与代谢增高的区域分布一致，提示早期淀粉样蛋白沉积与脑局部代谢活动升高具有相关性。虽然 SCD 人群的认知功能尚未明显受损，但已检测到阿尔兹海默早期的病理改变，将 SCD 人群作为未来 AD 早期筛查及干预的目标人群具有可行性。

PO-164
基于 MRI 的影像组学在脑成人胶质瘤分级及异柠檬酸脱氢酶分型的初步研究

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目的 探讨基于磁共振的影像组学在脑胶质瘤分级及异柠檬酸脱氢酶(IDH)分型的应用价值。
方法 回顾性分析 2016 年至 2018 年 66 例经手术病理证实为成人脑胶质瘤患者的 MRI 图像和临床资料，获取 T2WI 图像，病理分级和分子病理结果。在 MRI 的 T2WI 图像逐层勾画肿瘤实质部分，获得感兴趣区，对感兴趣区进行高通量数据特征采集。将 66 例数据以 7：3 随机分为训练集和测试集，分别对训练集和测试集的特征进行标准化，进行组内相关系数（ICC）分析，对相关系数高的特征进行降维处理，最后构建逻辑回归模型，采用受试者工作特征（ROC）曲线、混淆矩阵等进行模型诊断。
结果 在纳入的 66 例数据中，每例数据提取 396 个特征，筛选出 ICC≥0.75 的特征 162 个。分级应用：利用 spearman 相关性分析，在余下的 162 个特征中，去除特征间的相关系数≥0.9 的特征，剩余 44 个特征，接着 lasso 降维，剩余 12 个特征；结合筛选出来的 12 个特征，采用 softmax 构建预测模型，最后混淆矩阵进行模型诊断：准确性为 0.830。IDH 分类应用：利用 spearman 相关性分析，在余下的 162 个特征中，去除特征间的相关系数≥0.9 的特征，剩余 45 个特征，接着 lasso 降维，剩余 8 个特征；结合筛选出来的 8 个特征，采用 logistic 回归构建预测模型，采用 ROC 曲线、混淆矩阵进行模型诊断；其结果如下：ROC 曲线，截断值取 0.303，训练集的曲线下面积（AUC）为 0.872，测试集的 AUC 为 0.800；混淆矩阵，训练集的准确性、灵敏性、特异性分别为 0.787、0.724、0.889，测试集的准确性、灵敏性、特异性分别为 0.737、0.600、0.889。
结论 基于 MRI 的影像组学能够提高脑成人胶质瘤分级及 IDH 分型的预测效能，对于制定脑成人胶质瘤的诊治方案及随诊策略具有一定的临床价值。

PO-165
儿童幕上脑实质室管膜瘤 MRI 影像表现及误诊分析

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目的：探讨儿童幕上脑实质室管膜瘤的 MRI 与临床表现并分析误诊原因，旨在提高对其影像诊断的准确率。方法：回顾性分析我院 8 例经病理证实的儿童幕上脑实质室管膜瘤患儿的临床及 MRI 影像资料，8 例全部行 MRI 平扫及增强检查。结果：男 2 例，女 6 例，年龄 4 月~6 岁，平均年龄及中位年龄均 2 岁；病灶位于额颞顶叶 4 例，顶叶 2 例，颞叶 1 例，丘脑 1 例；主诉抽搐入院 4 例，头痛、呕吐 2 例，偏瘫 1 例，无症状来诊 1 例；病灶最大体积 15.0cm×10.2cm×7.1cm，最小体积 4.3cm×4.3cm×4.0cm，平均直径约 8cm。8 例肿瘤病灶中，4 例为囊实性肿块，实性为主 2 例，囊性为主 2 例；病灶实性部分表现为 T1WI 等或稍低信号，T2WI 等或稍高信号，FLAIR 及 DWI 信号较高，增强扫描多表现为花环状、明显强化，强化不均；囊性部分信号均匀，T1WI 信号略高于脑脊液、T2WI 呈高信号；其中 2 例可见囊性分隔，2 例病灶内并发出血、坏死，1 例病灶可见壁结节，增强扫描囊壁、分隔及壁结节明显强化。8 例病灶均有不同程度占位效应，同侧脑室均伴不同程度扩张，5 例病灶周围水肿明显，呈指压状。MRI 诊断为 PNET3 例，胶质瘤 1 例，毛细胞性星形细胞瘤 1 例，血管畸形 1 例，AT/RT1 例，诊断先天性颅内感染伴大脑半球皮层发育不全 1 例；病理诊断为间变性室管膜瘤Ⅲ级 7 例，室管膜瘤Ⅱ级 1 例。结论：对于儿童发生于幕上脑实质的囊实性占位，MRI 表现为实性部分为混杂信号，增强呈花环状强化，周围伴指压状水肿改变，囊壁、分隔及壁结节明显强化，需考虑幕上脑实质室管膜瘤的可能。

PO-166

Characterization of brown adipose tissue in PCOS patients by MR Z-Spectrum Imaging (ZSI)

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PURPOSE: Given that the majority of patients with polycystic ovary syndrome (PCOS) demonstrate obesity and chronic insulin resistance and targeting brown fat represents a novel treatment strategy for metabolic diseases, the purpose of the study is to characterize brown adipose tissue (BAT) in PCOS patients in comparison to healthy subjects using MR Z-spectral imaging (ZSI).

METHODS: ZSI data were collected on 19 normal control females (NCF, 24-34 years old), 17 males (NCM, 22-35years old), and 13 PCOS patients (female, 20-33 years old) with a CEST saturation pulse of 1 μT, 200 ms long and fast spin echo readout. Z-spectral data were fitted with multiple Lorentzian curves to quantify the direct saturation of water and fat. Fat water fraction (FWF) maps were then computed based on the fitted amplitudes of water and fat direct saturation. FWF thresholds were prescribed for the differentiation and segmentation of white adipose tissue (WAT), BAT, or Muscle (Figure). At last, two parameters were extracted from the analysis: the average FWF value within the segmented BAT (FWF(BAT)) and the fraction of BAT over the total fat depot, defined as BATf=BATarea/ (BATarea+WATarea). The two parameters were compared among the 3 study groups and correlated to subjects' BMI.

RESULTS: FWF(BAT) correlated linearly with BMI in healthy subjects, whereas there was an inverse correlation between BATf and BMI (Figure). The PCOS group had higher FWF(BAT) than the NCF group (P<0.001), while the BATf of the PCOS group was smaller than the controls (P<0.001). The FWF(BAT) of the NCF group was found to be higher than the NCM group (P<0.05), while there was no significant difference between male and female in BATf (Figure).
CONCLUSION: Normal subjects with higher BMI show less BATf and have increased FWF(BAT), indicating relatively higher level of metabolic passive WAT depot and relatively reduced metabolism in their BAT depots. PCOS patients have the least BATf and the highest FWF(BAT), suggesting decreased BAT mass and function in PCOS.
CLINICAL RELEVANCE/APPLICATION: MR Z-spectral imaging has been demonstrated to noninvasively identify and characterize BAT mass and function in PCOS patients, providing insights on the comorbidities mechanism, diagnosis, and treatment of PCOS.

PO-167

MRI 在非 ST 段抬高型心肌梗死患者 PCI 术前综合评估的临床应用和研究进展

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经皮冠状动脉介入/支架植入术是非 ST 抬高型心肌梗死患者（NSTEMI）的主要临床治疗手段，冠状动脉微血管阻塞（CMVO）是患者 PCI 术围术期常发生的不良事件，是临床要解决的重点和难点问题。心脏 MR 的 cine 模式及心肌应变评估心肌的解剖，功能；延迟成像和 T1mapping 评估心肌纤维化；心肌应激首过灌注评估心肌整体/局部心肌的血流信息，对 NSTEMI 患者 PCI 术前评估尤为重要。另外 T1mapping 也开始用于心肌应激评价冠脉微循环的研究中。总之，MR 能够提供 NSTEMI 患者 PCI 术前重要的心脏的综合参数，为临床医生在 PCI 术不同过程中的药物控制提供重要的理论支持，为改善 PCI 术疗效以及患者预后方面具有重要的临床价值和应用前景。

PO-168

The Influence of the Spatial Smoothing of Data on Small-world Properties in Patients with Alzheimer's Disease

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OBJECTIVES：This study aims to probe whether the small-world properties of brain functional networks in patients with Alzheimer's disease (AD) are influenced by spatial smoothing in data preprocessing.
METHODS：Thirty-three individuals with AD (AD group) and 20 individuals with normal cognition (NC group) were included in this study. Blood-oxygen-level-dependent functional magnetic resonance imaging (BOLD-fMRI) data from each individual were subjected to two types of preprocessing: with smoothing and without smoothing. The full-width half-maximum (FWHM) of the Gaussian kernel was separately set at 4 mm, 6 mm, 8 mm, 10 mm, 12 mm, and 16 mm in the smoothing process. The brain functional connectivity matrices were constructed for the 7 sets of preprocessed data. Then, two-sample t-tests were conducted to explore the changes in the relevant small-world parameters in patients with AD. A general linear model univariate analysis was carried out to explore the interactive effects of spatial smoothing and disease status on each small-world parameter.
RESULTS：The results showed that the clustering coefficient (Cp) and average shortest path (Lp) in the AD group were significantly higher than those in the NC group ($P<0.05$), regardless of whether the spatial smoothing process occurred. Furthermore, the Cp and Lp increased as the smoothing FWHM increased in both groups. These increasing trends in the AD patients were not markedly affected by spatial smoothing in the FWHM range of 0~8 mm.
CONCLUSIONS：Our results show that within approximately three voxels, the small-world properties of brain functional networks in AD patients are not affected by smoothing.

PO-169
MRI 纹理分析对治疗前鼻咽癌（III-IVb 期）患者无进展生存期的预测价值

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目的：探讨基于 MRI 纹理分析对治疗前鼻咽癌(III-IVb 期)患者无进展生存期(PFS)的预测价值。**方法**：本研究采用回顾性分析方法，收集了 2014~2015 年经病理诊断为 III—IVb 期鼻咽癌的病例共 206 例。由一位有经验的放射科医生在开源的 ITK-SNAP 软件上勾画感兴趣区（ROI），再由另一位高年资的放射科医生检查图像分割的准确性，无异议之后使用 MATLAB 2014b 软件对感兴趣区进行组学特征的提取。我们选取了熵、均匀度、方差、偏度、峰度等 5 个直方图特征，2 个 GLCM 特征比如聚类突出度、聚类阴影以及 1 个 GLSZM 特征——灰度不均匀性（GLN）。采用 Cox 比例风险模型分析肿瘤组织纹理特征、肿瘤体积和 TNM 分期与 PFS 的关系。找到肿瘤体积和 GLSZM-GLN 的最佳切点值并分为两组绘制 Kaplan-Meier 生存曲线以比较两组生存率的差异。最后，运用受试者工作特征(ROC)分析和 C-index 评价不同生存模型的预后预测性能。**结果**：T 分期、总分期、肿瘤体积及基于 CE-T_1WI 的 GLSZM-GLN 与 PFS 相关。在调整了可能会影响 PFS 后的多因素 Cox 回归分析显示总分期、肿瘤体积和基于 CE-T_1WI 的 GLSZM-GLN 是 PFS 的独立预测因子。Kaplan-Meier 曲线显示，肿瘤体积小于 6.587 cm^3 和基于 CE-T_1WI 的 GLSZM-GLN 小于 79.539 与 PFS 的改善有关，具有统计学意义。基于 CE-T_1WI 图像提取的 GLSZM-GLN 预测 PFS 的性能优于肿瘤体积和总分期。而基于 CE-T_1WI 的 GLSZM-GLN 与肿瘤体积及总分期三者相结合的生存模型的预测性能高于与肿瘤体积或总分期二者联合的生存模型。**结论**：对于治疗前晚期鼻咽癌患者在参考肿瘤体积及 TNM 分期的基础上，结合基于 CE-T_1WI 中提取的纹理特征 GLSZM-GLN，可提高 PFS 的预测性能。

PO-170
肺癌患者鼻粘膜上皮细胞基因表达差异的 WGCNA 探讨与实验验证

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背景与目的：肺癌是全球范围内癌症死亡的主要原因，加权基因共表达网络分析(WGCNA)研究支持利用鼻基因表达进行肺癌早期检测，并进行部分肺癌相关基因进行定量实验研究与验证。
材料与方法：
1.基于公共微阵列数据集进行 WGCNA 分析，使用 Limma 软件包中的 RMA、SVA 和 T-test 来筛选差异表达基因。选择不同样本表达数据，获取特征基因模块，并计算提取 10 个以上枢纽基因。
2．利用 SYBR GREEN I 法对 80 例鼻粘膜拭子的 WGCNA 分析的 12 个相关基因的表达进行定量研究，实验分为三组：正常对比组 30 例，肺癌组 32 例，肺癌术后组 18 例。获取的实验数据进行方差不齐、welch 校正与 Tamhane's T2 检验。
结果：WGCNA 数据构建了四个特定的 LC 模块，其中蓝色和棕色模块特征基因在各自模块内显示出很强的关联性。发现 HCK，NCF1，TLR8，EMR3，CSF2RB 和 DYSF 基因是棕色模块中最重要的中枢基因，而 SPEF2，ANKFN1，HYDIN，DNAH5，C12orf55，CCDC113 基因分别是按照等级排列的顶级枢纽基因。鼻粘膜荧光定量 PCR 验证显示具有显著性差异（0.05%），分布在肺癌与对照组间有 6 个基因（HCK、 NCF1、TLR8、EMR3、CSF2RB、DYSF），肺癌术后与对照组有 4 个基因（HCK、CSF2RB、SPEF2、C12orf55）；肺癌与肺癌术后组有 2 个基因（EMR3、C12orf55 ）。
结论：WGCNA 能够发现具有生物学意义的基因模块，并挖掘枢纽基因。WGCNA 与 PCR 验证基因表达量的结果具有一致性。鼻粘膜上皮细胞 HCK、NCF1、TLR8、EMR3、CSF2RB、DYSF 、SPEF2、C12orf55 八个基因表达异常可能成为肺癌检测的非侵入性生物标记物；其中 EMR3、C12orf55 二个基因表达异常可能用来观察术后肺癌的疗效。

PO-171
科学标识在 CT 增强检查护理中的运用

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摘要：目的　探讨 CT 增强检查过程中科学地应用提示标识的效果，以提高工作效率，保证影像图像高质量。方法 从 2018 年 1 月至 12 月,随机抽取 200 名患者，口头征求：是否同意在手臂黏贴标识，经同意后，在患者预留留置针一侧的手臂上,规范性的使用各种颜色带文字的提示标识，用于提醒患者、家属及机房工作人员该患者检查前、检查中需关注的事项，检查完毕后，评估检查图像质量。结果　规范 CT 检查提示标识管理后，增强患者的检查安全得到了保证，影像图像质量及服务满意度有了较大提高。结论　　规范的标识管理，能提高护理工作效率，确保影像检查图像质量，提高服务满意度。
关键词：科学；标识；CT；增强；护理；运用

PO-172
集束化护理措施在预防影像检查中非计划性拔管的效果分析

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目的 探讨集束化护理措施在预防影像检查中非计划拔管的应用效果。 **方法** 回顾分析 2017 年 7 月-2018 年 6 月行影像检查的住院带管患者 1334 例，其中 2017 年 7 月至 12 月中的 664 例带管患者为对照组，2018 年 1 月至 6 月 670 例为观察组，对照组实施常规的导管受检护理方法，观察组实施集束化导管受检护理措施，比较两组患者发生非计划拔管率。**结果** 对照组与观察组非计划性拔管率分别为 1.4%，0.3%，P=0.033(P<0.05)差异有统计学意义。**结论** 集束化护理措施有效预防影像科检查期间的非计划拔管的发生，提高影像检查患者的护理质量，可在影像检查科室广泛应用。

PO-173
含碘对比剂静脉外渗风险因素 logistics 分析

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目的 分析含碘对比剂静脉外渗的风险因素，为临床预防和管理提供可靠的参考依据。**方法** 回顾性收集 2017 年 5—7 月在我院放射科接受 CT 增强检查的门诊和住院患者 5837 例，发生了明显的对比剂静脉外渗的患者为外渗组，未发生对比剂静脉外渗的为非外渗组，通过医院信息中心数据库提取相关信息，比较两组患者一般情况、患者疾病情况、注射信息和注射护士情况，并对收集的因素进行非条件 logistic 回归分析。**结果** 两组患者年龄、性别、体质指数、手术史、化疗治疗史、放疗治疗史等因素差异均无统计学意义（P 均>0.05）。两组患者的年龄划分的比较，差异有统计学意义（P<0.05）。两组患者对比剂注射情况的比较，对比剂的品牌、患者穿刺部位、注射速率、造影剂剂量、盐水量等差异均无统计学意义（P 均>0.05）。留置针规格、患者血管评估之间差异有统计学意义（P<0.05）。logistic 回归分析显示，年龄划分（中年，OR=0.152，95%*CI*：0.040～0.576）为发生外渗的保护因素；有手术史（OR=3.514，95%*CI*：1.026～12.034），血管评估（差，OR=13.039，95%*CI*：1.399～121.483），留置针规格（24G，OR=9.170，95%*CI*：1.474～57.047），为发生外渗的危险因素。**结论** 患者年龄、自身静脉条件、留置针的粗细、手术史均可成为对比剂静脉外渗发生的风险因素。

PO-174
大型综合性医院影像检查专科护理质量指标构建

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目的:在最新颁发的《全国护理事业发展规划(2016-2020 年)》中明确指出,“提高护理服务质量”是当前护理学科发展的主要任务之一,目前国内外都相继以专科或病种为对象构建护理质量评价指标体系,但尚无影像检查专科护理质量指标,因此建立切实可行的影像检查专科护理质量指标至关重要。
方法： 1.建立初步框架:成立研究小组，采用文献分析、理论研究及质性访谈法,以三维质量评价模式为指导,编制初步指标框架。2.德尔菲专家咨询:(1)函询专家入选标准：①有丰富的影像护理管理实践经验；②副高级及以上；③大专及以上；④对本研究有较高的积极性。(2)拟定函询表:包

括致专家信、专家基本信息及调查问卷 3 部分。调查问卷涵盖的影像检查专科护理质量指标分三级,一级 3 项,二级 14 项,三级 49 项。(3)函询实施:采用电子邮件形式进行两轮专家咨询。专家按 Likert5 级评分法对各级指标的重要程度和权重进行评分、赋值；对不合理的描述内容进行修改。(4)资料收集统计:采用 SPSS18.0 统计软件进行数据统计。对同时满足重要性赋值均数>4.0、变异系数<0.25 的条目予以保留，根据数据统计结果以及专家意见,对部分条目进行删除、合并、修改。

结果:(1)积极系数:两轮函询后,有效回收率分别为 92.7%和 100%。(2)权威系数:两轮分别为 0.863 和 0.889。(3)协调程度:各级指标的变异系数 CV 为 0.021-0.154。(4)修改建议:第 1 轮专家函询后，删除 1 个选择率低于 70%的二级指标和 3 个与之相对应的三级指标；修改 2 个二级指标和 4 个三级指标的表述方式。(5)最终指标体系:两轮函询后,最终形成包含 3 个一级指标、13 个二级指标和 46 个三级指标的影像检查专科护理质量指标体系。

结论：建立大型综合性医院影像检查专科护理质量指标体系,可避免长期以来护理质量评价凭经验的不合理现象,实现影像检查专科护理质量评价科学化、数据化。

PO-175

乳腺 MR 专用检查服对提高患者满意度的影响研究

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摘要：［目的］ 探讨使用乳腺 MR 专用检查服对提高乳腺增强 MR 患者对检查满意度的影响。 ［方法］ 选取解放军总医院放射诊断科门诊 MR 室乳腺增强检查患者 80 例，随机分为研究组和对照组各 40 例。对照组病人接受常规健康教育并使用总医院常规病号服， 研究组病人在常规健康教育的基础上使用乳腺 MR 专用检查服，检查后对两组患者满意度进行比较。 ［结果］常规病号服由于设计不符合 MR 检查需求，无法充分暴露检查部位，乳腺 MR 专用检查服根据检查需求合理设计，既能充分暴露检查部位，又能很好的保护患者隐私，提高患者的舒适度，使研究组患者满意度高于对照组，差异有统计学意义（Ｐ＝0.002 ）。 ［结论］使用乳腺 MR 专用检查服可以提高患者满意度。

PO-176

影像护理在急诊绿色通道构建中的作用

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目的：绿色通道患者病情危重，治疗受时间窗限制，医院建立健全救治绿色通道体系尤为重要，以便优先处理和收治绿色通道患者，为绿色通道患者的早诊断、早评估、早治疗奠定基础。通过对比分析采用规范化护理措施前后，对绿色通道患者完成影像检查的时间，静脉溶栓治疗 DNT 中位数，并发症等，检验规范化影像护理的效能。**方法：**收集我院放射科 2015 年 1 月至 2019 年 1 月绿色通道患者资料，所有患者资料均录入放射科信息化系统汇总分析。我院放射科 2017 年 1 月 1 日全面实施绿色通道患者规范化护理，通过评估优化护理流程后绿色通道患者完成影像检查的时间。静脉溶栓治疗 DNT 中位数，并发症等，分析可行性及科学性。**结果：**我院放射科 2017 年 1 月至 2019 年 1 月绿色通道患者共 632 人，绿色通道患者完成影像检查的时间均少于 25 分钟，静脉溶栓率≥4%，发生并发症者 1 例，总体发生率为 0.01%。**结论：**建立规范的影像科护理流程，加强质量控

制和管理，能够大大缩短绿色通道患者影像检查时间，有效预防和控制绿色通道患者影像检查不良事件的发生和提高检查安全。

PO-177

肝硬化 CT 灌注成像的临床应用研究

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【摘要】目的 探讨不同程度肝硬化患者的 CT 灌注参数与肝硬化程度的关系，寻找能反映肝硬化程度的灌注参数，以期建立不同程度肝硬化的定量诊断指标。**方法** 选取 2015 年 8 月至 2017 年 12 月间接受多层螺旋 CT 肝脏灌注扫描者。其中 22 例为正常对照组，男 15 例，女 7 例，年龄 25～70 岁；25 例为肝硬化组，男 17 例，女 8 例，年龄 35～75 岁。根据肝病严重程度的 Child - Pugh 分级方法，将肝硬化病人进行分级：其中 Child-Pugh A 级 11 例；Child-Pugh B 级 10 例；Child-Pugh C 级 4 例。用肝脏灌注分析软件取得不同病变阶段肝实质的灌注参数。对所得结果采用 SPSS11.5 统计学软件进行统计学分析，对于正态分布、方差齐性的计量资料，两组间比较采用 t 检验法(配对 t 检验)，多组间比较采用单因素方差分析的方法，而后采用 SPK-q 检验法进行均数间多重比较。数据以平均值±标准差形式表示。参数间相关分析采用 Pearson 法。以 $P<0.05$ 为差异有统计学意义。**结果** 正常组与不同程度肝硬化的各灌注参数(HAP、HPP、HBF、MTT)比较，差异均存在统计学意义。**结论** MSCT 灌注成像可定量测量肝脏血流灌注参数。肝脏血流灌注参数能够反应肝硬化的程度。

PO-178

走进小儿肠套叠

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肠套叠是婴幼儿期最常见的外科急腹症之一，家长们要是能掌握一些科普常识并警觉它，将对宝宝健康有益，有时甚至可以救宝宝一命呢。
那么，肠套叠到底是怎么回事呢？杭州市儿童医院放射科劳群主任及团队带您一起走进它。
肠套叠是指一段肠管套入与其相连的肠腔内，导致肠内容物通过障碍，引起肠梗阻。该病好发于 4 个月到 2 岁的小儿，80%的好发 1 岁以内，尤以 4-10 个月最常发生，男孩比女孩多见。由于患儿年纪小，不能表达，往往会耽误病情。

PO-179

兔非酒精性脂肪肝 IVIM 及 IDEAL-IQ 的实验研究

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目的：使用高脂高胆固醇饲料饲养实验兔，模拟人体非酒精性脂肪肝病的病理生理改变。探讨 IDEAL-IQ 及 IVIM-DWI 参数对兔模型非酒精性脂肪肝的定性定量诊断价值。方法：选取健康新西兰大白兔 40 只，随机分为为对照及实验组，实验组再平均分为高脂 4 周组（G-4w）、8 周组（G-

8w）、12 周组（G-12w）、16 周组（G-16w）。饲养对应时间，实验组每只兔均进行核磁 IDEAL-IQ 及 IVIM-DWI 扫描。结果：IDEAL-IQ:对照组与实验各组 FF 值的组间差异均有统计学意义。两两比较，对照组（3.55±0.79）%分别与 G-8w 组（13.00±2.86）%、G-12w 组（13.31±2.02）%、G-16w 组（21.09±7.73）%差异有统计学意义。通过 FF 值诊断的脂肪肝分度与病理分度一致性检验，kappa 值为 0.764，有较好一致性。IVIM-DWI:随脂肪肝程度的加重,D、D^*、f 呈现不同程度的下降。将 FF 值与 D、D^*、f 值分别进行 Spearman 秩相关分析，得到 D^*与 FF 值相关性最好（r=-0.824）。结论：1、IDEAL-IQ 对于对肝脏脂肪定量诊断准确度高，与病理具有较好一致性。2、IVIM-DWI 对于反映 NAFLD 肝脏微循环灌注改变有意义，D、D^*、f 值均随其严重程度增高而降低，其中 D^*、f 值的变化较为明显。3、D^*值与 FF 值有较好的相关性。

PO-180

视神经脊髓炎谱系疾病诊断思路

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●视神经脊髓炎（neuromyelitis opyica NMO），是一组主要由体液免疫参与的抗原-抗体介导的 CNS 炎性脱髓鞘疾病谱。表现为：视神经+脊髓，急性 or 亚急性
●该病由 Devic 医生于 1894 年首次报道，本病又称 Devic 病或 Devic 综合征
●2004 年梅奥医学中心 Lennon 首次发现了 NMO 特异性的水通道蛋白 4 抗体（AQP4-IgG）后，进一步的深入研究扩展了 NMO 的临床特征及其相关疾病
●2007 年 Wingerchuk 等把 NMO 及其相关疾病统一命名为视神经脊髓炎谱系疾病（neuromyelitis optica spectrum disorders，NMOSD）
●2015 年国际 NMO 诊断小组（IPND）制定了新的 NMOSD 诊断标准，取消了 NMO 的单独定义，将 NMO 整合入更广义的 NMOSD 疾病范畴中。NMO + NMOSD →→ NMOSD
Neuromyelitis Optica Spectrum Disorder (NMOSD)
2015 年版诊断标准 NMO-IgG 阳性的视神经脊髓炎谱系疾病诊断标准：
（1）至少具备 1 项核心临床特征
（2）血清 NMO-IgG 阳性
（3）排除其他诊断
●发病率：单时相：女 ≈男；复发型：女：男= 9-12 : 1；东方人 > 西方人
发病年龄：平均 30-40 岁，30% ≤ 18 岁

PO-181

探讨运动平板单次点片摄影模式在婴幼儿双下肢全长摄影的优势

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摘要：目的 ：探讨婴幼儿患者，使用运动平板进行双下肢摄影，采用单次点片式摄影，相对与 slot 全景摄影在降低辐射剂量及图像质量方面的优势。
方法：选取 50 例需进行双下肢全景摄影，1 至 2 周岁的婴幼儿患者为研究对象。采用岛津 SHIMADZU，Sonialvision Safire II，其中 25 例采用 SLOT HSfront 序列 .摄影条件 55-65kv，250mA ,摄影距离 120cm .25 例患采用单次点片摄影，摄影条件 55-65kv，250mA ,摄影距离 120cm .患者均成标准摄影体位： 患者呈站立位，两侧髂前上棘基本位于同一平面，髌骨应该置于膝关节

正中，双侧踝关节内旋 10 到 15°。均由家属陪同患者进行检查。并做好非摄影部位的辐射防护。摄影范围包括双侧髂前上棘至双足底。进行 2 组投照方式下的辐射剂量及图像质量的对比分。
结果： 采用单次点片摄影的婴幼儿患者的图像优良率（p＜0.05）明显高于 slot 摄影方式，其所接受的剂量条件也明显低于 soLt 摄影模式.
结论 ：婴幼儿患者，在双下肢摄影检查中，因自主配合差。在检查过程中，可能出现肢体移动。当采取 slot 双下肢拼接摄影，因其摄影方式为连续多次摄影，如果摄影过程中 出现肢体移动，最终经过后处理拼接合成的图像中会出现错层伪影。为医生的诊断及治疗带来困扰。而采取单次点片摄影模式，因起曝光时间短，其采集的图像可有效避免因患者不配合所造成的图像运动伪影。同时患者只需接受单次的辐射剂量摄影。采取 solt 全景摄影拼接模式，因其连续扫描方式，患者所接受的剂量条件明显高于单次摄影。因此，在婴幼儿的双下肢全景摄影检查的模式选择中，采用单次点片模式相对于连续拼接摄影模式，不仅可有效提升图像质量，在患者的所需接受的摄影剂量条件方面也得到有效降低。

PO-182
磁共振氢质子波谱成像在帕金森病早期诊断中的价值研究

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帕金森病(Parkinson’s disease，PD)是中老年人常见的神经系统变性疾病，以静止性震颤、动作迟缓及减少、肌张力增高、姿势不稳等为主要特征。目前对于本病的诊断主要是靠患者的临床表现，其准确性约为 82%；当患者出现临床症状时，已经 60%～70%的黑质神经元变性，80%的纹状体多巴胺减少。如何早期诊断 PD 显得尤为重要，MR 的问世及发展为早期诊断 PD 提供了可能性。**目的**：探讨磁共振波谱成像（MRS）在帕金森病诊断中的价值。**方法**：对 2017 年 12 月至 2018 年 8 月期间在我院确诊的 20 例早期帕金森病患者（研究组）和 20 例正常志愿者（对照组）行 3.0T 磁共振氢质子波谱成像（^{1}H MRS），采用单体素空间频谱点分辨自旋回波波谱法（PRESS）扫描双侧基底节区，采用 Philips Achieva 3.0T 自带的波谱软件生成感兴趣区代谢物谱线。观察 ^{1}H MRS 谱线基线稳定性、信噪比等，选择基线平稳且信噪比较好的波谱线进行分析，比较两组 NAA、NAA/Cr 比值及 Cho/Cr 比值，探讨磁共振波谱成像在帕金森病诊断中的价值。**结果**：早期帕金森病组 NAA、NAA/Cr、Cho/Cr 比值低于正常对照组。**结论**：磁共振波谱成像对帕金森病的早期诊断有一定参考价值。

PO-183
腹腔及腹膜后富血供占位影像学诊断与鉴别诊断

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目的：探讨腹腔及腹膜后富血供肿瘤与肿瘤样病变的影像学特征以及鉴别诊断
材料与方法：分析 10 类腹腔与腹膜后占位包括神经源性肿瘤（神经鞘瘤、副节瘤） 、孤立性纤维瘤、巨淋巴结增生症（透明血管型） 、韧带样瘤 、炎性肌纤维母细胞瘤、肉瘤（平滑肌肉瘤、多形性未分化肉瘤）、脉管瘤（血管瘤、静脉瘤、AVM）、神经内分泌肿瘤、异位种植脾 及转移瘤的影像学表现，概况总结其各自的 CT、MRI 特征及相应鉴别诊断。
结果：
神经鞘瘤：肾门水平椎旁或骶前、类圆形、囊变钙化、靶征、渐进性强化 。鉴别：副神经节瘤。

副神经节瘤：高血压、椎旁、极富血供伴出血、坏死囊变。鉴别：神经鞘瘤、巨淋巴结增生症。
孤立性纤维瘤：非椎旁、T2WI 低信号、极富血供、灶周及灶内粗大血管。鉴别：副神经节瘤、巨淋巴结增生症、异位副脾。
巨淋巴结增生症：女性、淋巴链、分支状钙化、极富血供、无明显坏死及裂隙征、镶边征、条纹征 。鉴别：副神经节瘤、孤立性纤维瘤、淋巴瘤。
韧带样瘤：手术史、家族性息肉、T2WI 低信号及局部轻度浸润性生长。鉴别：肉瘤、炎性肌纤维母细胞瘤。
炎性肌纤维母细胞瘤：女孩、局部病灶边缘模糊、钙化、T2WI 低信号。鉴别： 韧带样瘤、淋巴瘤。
神经内分泌肿瘤及类癌：可极富血供、小肠肿块钙化累及肠系膜及肠壁缺血水肿。鉴别：
肉瘤：平滑肌肉瘤常与下腔静脉有关；多形性未分化肉瘤-腹膜后巨大肿瘤伴坏死并累及邻近骨质。鉴别： 神经源性肿瘤
脉管瘤：动静脉瘤与相应血管相同影像特征，AVM-粗大供血动脉及引流静脉，血管瘤-静脉石及渐进性强化 。鉴别：鉴别： 神经源性肿瘤。
异位种植脾：脾切除史、脾脏相似影像特征。鉴别： 转移瘤。
转移瘤：原发富血供恶性肿瘤、多发病灶。鉴别：异位种植脾。
结论：腹腔与腹膜后富血供占位多有一定影像学特征，一般能作出明确诊断 。

PO-184

提高患儿 X 线检查成功率的探讨

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目的：近年来由于空气质量下降等因素，导致多数幼儿在疾病高发季节相继生病、相互传染，儿科门诊患儿居高不下，儿科住院部床满为患。X 线做为一项必要的辅助检查，每天接待近百名的患儿，由于 1~3 岁的患儿处于似懂非懂的阶段，对陌生环境及医院、医护人员产生排斥而表现为哭闹不止、拒绝检查，从而导致影像的运动伪影比较严重，进而导致影像分辨率下降，影像诊断效果。灌肠做为辅助患儿完成检查的一种方式也会给患儿带来胃肠道紊乱等风险，如何在患儿不灌肠的基础上，既能减轻小患者及家属痛苦的同时，又能提高工作效率以及影像质量是我们一直研究的方向。
方法：从 2019.7.1.开始至 2019.7.10 日，每天随机选取做胸部正位 X 线摄影的患儿 20 名，一共 200 名，年龄段在 1~3 岁之间，在不对幼儿灌肠麻醉的前提下，应用西门子 X 线诊断机进行前后位摄取影像，在家属的辅助下，能达到较好的体位拍摄，固定管电压 90kv、管电流 1.0mAs，拍摄有延迟 2S。随机分成两组，100 名做为对照组，正常拍摄。100 名做为实验组，选择呼气末吸气初拍摄。记录每个小患者的拍摄时间及图像质量，最后由两名技术员及两名医生进行分析与评估。
结果：
对照组：最短拍摄时间为 1.5min，最长拍摄时间为 5min，平均拍摄时间为 3.1min。
最少拍摄次数为 1 次，最多拍摄次数为 3 次，平均次数为 1.9 次。
实验组：最短拍摄时间为 1.6min，最长拍摄时间为 4.5min，平均拍摄时间 2.5min。
最少拍摄次数为 1 次，最多拍摄次数为 2 次，平均次数为 1.3 次。

图像质量：实验组＞对照组
结论：针对 1~3 岁幼儿哭闹会产生运动伪影的情况，选择哭闹间歇的呼气末吸气初时机进行拍摄，会减少患儿的运动伪影，进而提高影像质量，提高完成 X 线检查的质量及速度。

PO-185
联影 1.5T 磁共振 T1 quick3D 和 T1 FSE 序列对盆腔肌肉增强效能对比

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目的：通过比较盆腔增强后肌肉的信噪比（SNR）和对比噪声比（CNR），探讨联影 1.5T 磁共振常规 T1 加权成像（T1 FSE）和三维容积内插快速扰相序列（T1 quick3D）对盆腔肌肉增强成像的效果，帮助选取相对最佳序列。**方法：**选取我院 2018 年 10 月至 2019 年 2 月间行盆腔磁共振增强的 120 例患者，按随机数字表法将患者分为两组，分别接受 T1 quick3D 增强扫描（n=60）和 T1 FSE 序列增强扫描（n=60）。确定增强成功后，由两位高级职称影像诊断医生运用感兴趣区（ROI）技术测量图像的信噪比、对比噪声比。采用两独立样本 t 检验进行统计学分析。**结果：**两组受检者均配合良好，分别采用 T1 quick3D 和 T1 FSE 序列扫描，增强成功率百分之百。T1 quick3D 和 T1 FSE 序列图像盆腔臀大肌的 SNR 分别为 109.87±6.65、134.31±7.53（P ＜ 0.05），T1 FSE 增强序列的 SNR 明显高于 T1 quick3D 增强序列；T1 quick3D 和 T1 FSE 序列图像盆腔臀大肌的 CNR 分别为 89.18±8.09、82.51±8.83（P ＜0.05），T1 FSE 增强序列的 CNR 略低于 T1 quick3D 增强序列。**结论：**采用两种序列对盆腔肌肉增强扫描时，增强成功率都比较高，均可获得满足临床诊断的图像质量，但 T1 quick3D 增强序列扫描无层间距，采集速度更快。

PO-186
根据腰围个体化设置腰椎间盘 CT 扫描参数的必要性

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目的 评价采用 CT 管电流自动曝光控制技术时是否需要根据患者的腰围个体化设置参考管电流时间乘积。**方法** 回顾性搜集 2018 年 7 月到 12 月期间 117 例临床上因腰腿部不适行腰椎间盘 CT 扫描的患者，根据腰围大小分为小腰围组（*n*=57）和大腰围组（*n*=58），比较在相同参考管电流时间乘积（190mAs）条件下不同腰围组患者的图像质量、辐射剂量以及观察者间的一致性。**结果** 大、小腰围组间性别构成无显著性差异（*P*>0.05），大腰围组年龄及腰围显著大于小腰围组（*P*<0.001），小腰围组腰 3 椎体、腰 3-4 椎间盘、硬膜囊、椎旁软组织客观图像噪声均小于大腰围组（*P*<0.001），主观图像噪声、腰 3-4 椎间盘与椎旁软组织边缘锐利度均优于大腰围组（*P*<0.05），诊断可用性均为完全能够满足诊断需要，观察者间的一致性较好或很好（kappa 值 0.795-0.930）。小腰围组的容积 CT 剂量指数、剂量长度乘积及有效辐射剂量显著低于大腰围组（*P*<0.001）。**结论** 小腰围组的图像质量较高，适当降低后仍然能够满足诊断需要，应该根据患者的腰围个体化设置参考管电流时间乘积，以减少不必要的辐射剂量。

PO-187
256 层螺旋 CT 在胸痛三联征一站式检查中的应用

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目的：探讨 Philip 256 层 iCT 在胸痛三联 CTA 一站式检查对急性胸痛患者肺动脉、主动脉及冠状动脉病变的显示能力，以评估胸痛三联 CTA 一站式检查在急性胸痛患者中推广应用的可行性。**方法：**50 例急性胸痛患者行 256 排螺旋 CT 三联 CTA 检查，对患者原始图像进行后处理，包括多平面重建(MPR)、曲面重建(CPR)、容积再现(VR)及最大密度投影(MIP)等方法显示冠状动脉、胸主动脉及肺动脉，由 2 名以上高年资放射科医师对图像进行观察、诊断。具体方法：患者右侧上肢肘正中静脉穿刺留置静脉通道，使用非离子性对比剂欧乃派克（含碘率 350mg I/ml），采用双筒高压器注射，对比剂注射速率为 4.0~5.0ml/s，对比剂总量为 1.0~1.5ml/kg，一般注射时间为 20s，对比剂注射后以相同速率注射生理盐水 30~40ml。正确合理连接电极导线，根据患者心率及心律情况，选用前瞻性心电门控或回顾性心电门控的方法。根据患者情况，检查前使用药物适当控制心率和血压。设置扫描参数：管电压 100kV 或 120kV，管电流采用自动管电流调制技术，层厚<1mm，螺距 0.2，转速 0.27s 或 0.33s，扫描范围自胸廓入口至膈下 2cm，监测降主动脉，阈值设为 120HU，达到阈值后自动触发扫描，诊断延迟时间 5.0s。使用 EBW 后处理工作站对扫描数据进行三维 VR、MIP、CPR、MRP 及二维冠状面、矢状面等图像后处理。**结果：**患者注射一次碘对比剂、一期扫描可显示冠状动脉、胸主动脉、肺动脉主干及其主要分支，并能观察肺窗、纵隔窗图像。其中肺动脉栓塞 9 例，冠状动脉斑块形成、管腔狭窄 28 例,主动脉夹层 6 例，7 例未见异常。**结论：**Philip 256 层 iCT 可用于胸痛三联征 CTA 一站式检查，即注射一次碘对比剂、一期扫描能显示冠状动脉、肺动脉以及胸主动脉，是急性胸痛病因诊断无创、可靠的检查方法。

PO-188

256 排螺旋 CT 在高心率下冠状动脉成像的研究

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目的：探讨应用 GE 256 排螺旋 CT 在患者高心率下冠状动脉成像效果。**方法：**选取 30 例心率大于 110 次/分且小于 140 次/分行冠状动脉 CTA 检查的患者，使用美国 GE Revolution 256 排螺旋 CT 机，设置扫描参数为管电压 100KV，自动管电流 400～650 mAs，噪声指数 NI 为 12，扫描层厚 0.45mm，层间距 0.45mm，螺距为 0.16，旋转时间为 0.28s/转，探测器为 256×0.625mm，重建矩阵 512×512。患者保持双手举过头顶，仰卧位足部先进，先进行正侧位定位像及冠状动脉钙化积分扫描，再记录最近心电图变化情况，最后采用阈值触发法行冠状动脉 CTA 扫描，动态监测感兴趣区为患者主肺动脉窗层面降主动脉区域内，设置触发阈值为 150HU，达到阈值之后，患者吸气后屏气，延时 5 秒自动启动一个轴位扫描，曝光时间在 0.3～0.7s。使用双筒高压注射器, 通过右侧肘前静脉留置针将碘对比剂碘海醇 (350 mgL/ml) 注入 70ml（1.0ml/kg）左右，注射速度 5.0～6.0ml/s，后以相同流率注射 40ml 的生理盐水。将图像数据传送到 AW4.7 工作站，利用 SSF 自动冻结后处理软件，重建一期最优图像，用于冠状动脉血管图像重组。如对其核心分支血管利用容积再现 (VR) 、最大密度投影 (MIP) 、多平面重建 (MPR) 、曲面重建 (CPR)等技术分析处理图像。**结果：**升主动脉 CT 值均在 300HU 以上但 8 例小于 400HU，左主干、右冠状动脉、左前降支、左回旋支显示均较清晰且均能给出明确诊断，各支成像质量由高到低为左主干、左前降支、右冠状动脉、左回旋支。**结论：**当心率为大于 110 次/分且小于 140 次/分的高心率患者，应用 GE 256 排螺旋 CT 行冠状动脉 CTA 成像可以得到满足诊断要求的图像。

PO-189

基于相对封闭 linux 系统配置开源 pacs 的 DSA 数据库管理

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【摘要】目的：通过在群晖 dsm 系统配置开源 pacs，并设置主机及三维重建工作站，对 dsa 手术室 dicom 数据进行存储并调取及后处理，方便管理病人术前术后及随访的影像学资料，并可进行多融合的三维重建。**方法**：搭建开源 dicom 服务器，并配置 dsa 主机三维工作站，使 dicom 数据可便捷上传及下载回 dsa 主机或 dicom 浏览器，从而进一步进行病情的术前术后随访之比较，亦可在 dicom 浏览器上进行三维重建以观察病灶。 **结果**：通过设置好的 pacs 系统和 dsa 机器的连接，可以方便快速的备份及读取资料，便于对病人进行术前术后或随访病例进行比较及制定更优的手术方案。 **结论**：该系统在 dsa 数据的保存和读取上便捷有效，使 dsa 资料得以妥善保存并可与术前术后直观对比，有助于数字化管理病人资料并进行进一步研究应用。

PO-190
研究能谱 CT 在不同 GSI 序列下图像 CT 值与碘基值的稳定性

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目的：探讨常规剂量和低剂量的能谱（GSI）扫描是否会对 CT 值的测量和碘基值的计算产生影响。
方法：取经消毒灭菌后的试管 9 支，分别注入蒸馏水和不同浓度的碘对比剂，分别编号 1（水）、2（1.25mgI/ml）、3（2.5mgI/ml）、4（5mgI/ml）、5（10mgI/ml）、6（15mgI/ml）、7（20mgI/ml）、8（40mgI/ml）、9（40mgI/ml），其中 9 号试管为对照试管。采用 GE Discovery 750 HD CT 机宝石能谱（GSI）GSI-44 及 GSI-15 两次扫描，重建 1.25mm 图像。分别在 S14.25、S3、I8.25、I19.5、I30.75 五个层面测 40kev-140kev 的 CT 值和碘基值，用测得的 CT 值和碘基值与试管内碘浓度做比较。采用 Pearson 相关分析及散点图相关性进行分析。
结果：两组不同能谱序列扫描的图像，CT 值的测量及物质分离计算所得碘含量与真实值之间均具有明显相关性(GSI-15 组 r=1.000，GSI-44 组 r=1.000)。GSI-15 所测得平均 CT 值（319.541±25.511），平均碘含量（13.382±2.073），GSI-44 所测得平均 CT 值（328.395±26.088），平均碘含量（14.028±2.157）.碘含量值随着碘浓度增大，差距逐渐变大；CT 值在碘浓度较低时，差别不大，随着碘浓度升高，差距逐渐变大，随着 keV 增大，CT 值差距逐渐减小。
结论：常规剂量和低剂量的能谱（GSI）扫描协议测得的 CT 值和碘基值都具有良好的线性关系，使用 GSI-15 及 GSI-44 分别重建 40-140keV 单能量图像,其所测得的 CT 值及碘基值数值相差不大，且和对应浓度碘含量的变化一致。和高剂量扫描协议相比，使用低剂量扫描，在物质浓度较低时，对 CT 值的影响不显著；随着 keV 的增大，对 CT 值的影响逐渐减小。

PO-191
非线性融合技术在穿支皮瓣术前下肢 CTA 中的应用价值

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目的：探讨双源双能量 CT 非线性融合技术在穿支皮瓣术前下肢 CTA 中的应用价值。方法:回顾性分析 200 例接受双源 CT 双能量下肢 CTA 扫描的需采用游离股前外侧皮瓣行修复术患者,分别比较 80kV(A 组)、140kV(B 组)、线性融合 0.3LB(C 组)及非线性融合 NLB(D 组)4 组图像中腹主动脉、髂外动脉、股前外侧穿支动脉 3 个部位的 CT 值、SNR、CNR,比较 4 组图像的背景噪声。主观评分比较 C、D 两组对股前外侧穿支动脉的显示情况。结果 C 组与 D 组背景噪声差异无统计学意义(P=0.67),

小于 A、B 两组;A 组与 D 组腹主动脉、髂外动脉及股前外侧穿支动脉的 CT 值差异无统计学意义(P=0.59、0.09、0.09),大于其他两组。C、D 两组股动脉及髂外动脉 SNR 差异无统计学意义(P=0.26),均大于 A、B 组(P 均<0.05);D 组股前外侧穿支动脉的 SNR 及 CNR 大于其他 3 组(P 均<0.05)。C、D 两组图像的主观评分分别为 3.49±0.38、4.57±0.63,D 组优于 C 组(P=0.02)。结论：非线性融合可提高下肢 CTA 图像质量,更清晰地显示股前外侧穿支动脉,对采用游离股前外侧皮瓣行修复术前评估血管有一定的临床价值。

PO-192

1H-MRS 及行为学综合评价神经干细胞与脑源性神经营养因子联合治疗 APP/PS-1 转基因 AD 小鼠的疗效

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目的 既往研究主要依赖实验动物的行为学改变来评判神经干细胞(NSCs)移植对于阿尔茨海默病(AD)的影响，但主观性较大。本实验利用 7T 高场强 1H-磁共振波谱（1H-MRS）观察 APP/PS-1 转基因 AD 小鼠 NSCs 与脑性神经营养因子(BDNF)联合治疗后海马区的神经代谢改变，并结合行为学综合评价 NSCs 移植治疗 AD 疗效。

方法 获取胎鼠海马区的 NSCs，贴壁法体外扩增培养，增强型绿色荧光蛋白（EGFP）转染。36 只 12 月龄的 APP/PS-1 转基因 AD 小鼠分为 3 组，每组 12 只，（1）联合组：移植转染 EGFP 的 NSCs 至双侧海马 CA1 区，经侧脑室注射 BNDF；（2）NSCs 组：移植转染 EGFP 的 NSCs 至双侧海马 CA1 区；（3）对照组：注入 PBS 至海马 CA1 区。移植后 6 周，应用 7.0T 磁共振仪进行小鼠脑部海马的 1H-MRS 检测；同时应用 Morris 水迷宫定航实验测定各组小鼠的逃避潜伏期。取小鼠脑组织切片经 EGFP-Aβ 免疫荧光双标记染色。

结果 移植后联合组及 NSCs 组小鼠海马 CA1 区的 NAA/Cr 值、MI/Cr 值较对照组升高（$p<0.05, p<0.01$），并且联合组的 NAA/Cr 值亦高于 NSCs 组（$p<0.01$）。
定位航行试验中，联合组、NSCs 组及对照组小鼠逃避潜伏期差异均有差异（$p<0.05, p<0.01$），三组的逃避潜伏期逐渐延长。各组小鼠的平均逃避潜伏期与 NAA/Cr 值呈负相关（Pearson 相关系数为-0.906，$p<0.01$）。联合组、NSCs 组小鼠海马区可见移植细胞，部分分化为神经元，部分分化为胶质细胞。

结论 NSCs 和 BDNF 联合治疗较单独使用 NSCs 能更好地改善转基因 AD 小鼠的学习记忆能力。7T 高场强 1H-MRS 作为一种活体、无创的检查方法可以检测转基因 AD 小鼠的 NSCs 移植治疗后的代谢改变，结合行为学检查能够对其疗效作出更客观、有效的评价。

PO-193

The diagnostic value of 3.0T MR DWI sequences in renal masses

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Objective To evaluate the differential diagnostic value of renal masses on 3.0 T DWI .
Methods The MRI information,139 patients with renal tumors received breath hold DWI with b value=0,800s/mm^2 at a 3.0T scanner,were analyzed retrospectively.All tumors

were confirmed by pathology except for benign renal cystic lesion.The imaging findings of renal tumors were analyzed and compared:we calculated the sensitivity、specificity、the accurate rate、positive predictive value and negative predictive value of ADC value in differentiating benign from malignant tumors and analyzed DWI features of all lesions.ADC value of all lesions、around lesions and contralateral side of the renal parenchyma were compared.

Results LSD test showed there were significant statistical differences in ADC values among Renal cell carcinoma，renal angiomyolipoma and carcinoma of renal pelvis(P<0. 01).ADC values of Renal cell carcinoma and carcinoma of renal pelvis were significantly different from benign tumors (P<0.01), renal pelvis carcinoma had the lowest ADC value and renal angiomyolipoma had the highest value. The ADC values of benign renal cystic lesions and cystoid variation in renal cell carcinoma were significant different。LSD test showed there were significant differences among phase I and III、 IV，phase II and III、IV (P<0.01)，phase III and IV had the lowest value.

Conclusions Our preliminary results shows that DWI has high accuracy rate for differentiating benign from malignant urothelial carcinoma with high b value.The quantitative analysis ADC value could show the lesions more accurately and maybe helpful in differential diagnosis and evaluation of malignancy.

PO-194

Intravoxel incoherent motion diffusion-weighted imaging in assessing Bladder Cancer invasiveness and cell proliferation

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Purpose: To investigate whether intravoxel incoherent motion (IVIM) diffusion-weighted imaging (DWI) could differentiate non-muscle invasive bladder cancer (NMIBC) from muscle invasive bladder cancer (MIBC) and to assess whether there were correlations between IVIM parameters and the Ki-67 labeling index (LI).

Materials and Methods: Thirty-six patients diagnosed with bladder cancer confirmed by histopathological findings underwent magnetic resonance imaging including DWI with 8 b-values ranged from 0 to 1000 s/mm2 before transurethral resection (TUR). Molecular diffusion coefficient (D), perfusion-related diffusion coefficient (D*), perfusion fraction (f), and apparent diffusion coefficient (ADC) were calculated by bi-exponential and mono-exponential model fits respectively. Comparisons were made between the MIBC and NMIBC group. Differences in these values were analyzed by

comparing the areas under the receiver operating characteristic curves (AUC). The correlations between these parameters and Ki-67 LI were also analyzed.
Results: ADC and D value were significantly lower in patients with MIBC compared to those suffering NMIBC ($p<0.01$). The AUC of D value (0.894) was significantly ($p<0.05$) larger than those of ADC value (0.786). The sensitivities and specificities of D and ADC value were 95% and 87.5% and 80% and 68.7%, respectively. In addition, there was a negative correlation between D value and Ki-67 LI ($r=-0.785$, $p<0.01$).
Conclusions: D value obtained from IVIM could provide better performance than conventional DWI in distinguishing NMIBC from MIBC and serve as an imaging biomarker reflecting the invasive and proliferative potential of bladder cancer.

PO-195
分段定位像配合 CARE Dose 4D 技术对 PET/CT 检查者辐射剂量的控制

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摘要:[目的] 在采集方式不变的情况下，比较一体式定位像（双上肢上举贴近耳侧，采集前后位定位相，长度颅顶至股骨中断）与分体式定位像（双上肢上举贴近耳侧，采集前后位定位相，长度额窦至股骨中断+双上肢置于躯干两侧，采集前后位定位相，长度颅顶至下颌）结合自动管电流调节技术(combined application reduce exposure,CARE)Dose 4D 患者单次检查所受 CT 辐射剂量的差异；[方法] 选取 2018 年 7 月---2018 年 12 月在我院 PET/CT 中心复查的患者 20 例。将 20 例患者首次检查采用一体式定位像指导采集时所受的辐射剂量作为对照组：此次复查采用分体式定位像指导采集时所受的辐射剂量作为观察组，以剂量长度乘积（DLP）和容积 CT 剂量指数（CTDIvol）作为辐射剂量评价指标，利用 t 检验比较患者两次检查所受辐射剂量的差异。[结果] 观察组患者容积 CT 剂量指数为 54.09±5.82mGy，剂量长度乘积为 1365.34±118.55mGy·cm；对照组患者容积 CT 剂量指数为 91.52±9.65mGy，剂量长度乘积为 2130.17±224.42mGy·cm。两项观察指标差异均有统计学意义，P<0.05. [结论] 分段式定位像配合 CARE Dos4D 技术能有效降低 PET/CT 全身检查者的 CT 辐射剂量。

PO-196
The texture characteristics of liver MR-enhanced three-phase images predicts microvascular invasion in hepatocellular carcinoma

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Background and purpose: Microvascular invasion (MVI) is one of the important risk factors of postoperative recurrence of hepatocellular carcinoma(HCC),at present, as one of the predictors of recurrence of HCC, MVI is diagnosed only by postoperative pathology. In the current study, the sensitivity and specific degrees of predict MVI by conventional methods of imaging examination and serological laboratory examination

are low. So if we can predict and assess MVI before operation, It will provide important reference value for clinical decision-making of HCC treatment and prognosis evaluation of patients. In recent years, due to the rapid development of magnetic resonance imaging technology and new type of contrast agent, the early diagnosis of HCC, and evaluate the prognosis of patients with postoperative efficacy, forecasting is a hotspot of current research. A series of studies by using magnetic resonance imaging technology and a new contrast agent to predict and evaluate MVI of hepatocellular carcinoma have been carried out. The common methods including morphology evaluation, texture analysis, diffusion weighted imaging, dynamic enhancement imaging, fat analysis, liver cell function imaging and comprehensive analysis.etc.

Different MRI methods have different sensitivity and specificity in evaluating MVI, and the combined application of MR has great potential in comprehensively predicting MVI of HCC. There are studies using the quantitative Apparent Diffusion Coefficient (ADC) of Diffusion Weighted Imaging (DWI) to evaluate the MVI of hepatocellular carcinoma, and there are also studies using the new diffusion model, such as intravoxel incoherent motion (IVIM) and Diffusion Kurtosis Imaging (DKI) to evaluate MVI. In terms of new contrast agents, there are studies by analyzing the magnetic resonance imaging and gadoxetic acid disodium enhanced MR to preoperative predict microvascular invasion and recurrence of HCC. These studies indicate that the development of MR imaging techniques and application of new type of contrast agent are able to provide valuable information for predicting MVI, and can further evaluate the risk of postoperative recurrence and metastasis of hepatocellular carcinoma, predict the prognosis of patients. Preoperative diagnosis of MVI will provide important reference value for surgery or other clinical treatment options.

In recent years, many researches have been made on the qualitative diagnosis of diseases through the quantitative analysis of medical images, which has gradually formed the new research field and direction—Radiomics. Texture analysis, as a research hotspot in radiomics, uses mathematical methods to analyze the gray’s quantitative value and distribution of medical images, for quantifying the heterogeneity of tissues. At present, many studies have applied it to liver fibrosis, diagnosis and differential diagnosis of liver nodule lesions, the prediction of the malignant degree of liver tumors. The purpose of this study was to investigate the feasibility of predicting microvascular invasion in hepatocellular carcinoma by analyzing the texture features of liver MRI-enhanced three-phase images.

Methods: A total of 127 patients who underwent MR-enhanced examinations at West China Hospital of Sichuan University from July 2015 to September 2018 and confirmed by surgery and pathology as HCC were retrospectively included. Subjects were excluded if they had performed interventional therapy before surgery(n=4), poor images quality with obvious artificial interference(n=5), tumor diameter less than 1 cm(n=4),imperfect pathological report, or unknown MVI status(n=4), totally 17. Consequently, 110 patients remained in the study. The postoperative pathological results were regarded as the gold standard. Patients were divided into MVI-positive group (n=52) and MVI-negative group (n=58) according to the gold standard. We collected clinical and pathological data (tumor location, tumor size and the degree of histopathological differentiation), and preoperative MR imaging signs (tumor signal, tumor capsular, Peritumoral enhancement, tumor margins). The texture characteristics of liver MRI-enhanced three-phase images of the two groups of HCC patients were

analyzed. Eleven texture parameters including mean value, standard deviation (SD), skewness, kurtosis, variance, energy, entropy, correlation, inertia, inverse difference moment, and contrast were selected from the gray histogram and the gray level co-occurrence matrix. The texture analysis software was used to calculate the above texture parameter values of the MR-enhanced images, and the obtained data were statistically analyzed.

Results: Of the 110 patients with HCC, 94 were male and 16 were female, aged from 34 to 76 years, with a median age of 52 years. Fifty-two patients with MVI-positive and 58 patients with MVI-negative were confirmed by postoperative pathology. There were statistically significant differences in tumor size, location and the degree of histopathological differentiation between the MVI positive group and the MVI negative group ($P<0.05$). The MVI positive group had larger tumor diameter, more lesions in the right lobe and caudal lobe of the liver, and lower degree of tumor differentiation. There were statistically significant differences between the MVI positive group and the MVI negative group in tumor signal on T2WI, tumor capsular, peritumoral enhancement on arterial phase and tumor margins ($P<0.05$). The MVI positive group had more heterogeneous tumor signals, with no capsule or incomplete capsule, more cases with multiple nodules type and peritumor enhancement on arterial phase. The texture characteristics of MR images after contrast enhanced showed that the entropy, correlation and inverse difference moment of MVI-positive group were significantly higher than MVI-negative group, while energy, inertia and contrast were significantly lower than MVI-negative group in T1 weighted imaging (T1WI) ($P<0.05$). In arterial phase, the kurtosis, entropy, correlation and inverse difference moment of the MVI-positive group were obviously higher than that of MVI negative-group, while the energy, inertia and contrast were obviously lower than MVI-negative group($P<0.05$). In the portal phase, the MVI-positive group had markedly higher kurtosis, entropy and inverse difference moment than the MVI-negative group, and the mean value and inertia were markedly lower than the MVI-negative group ($P<0.05$). On T1WI unenhanced scan, the area under curve (AUC) of texture parameter entropy, inverse difference moment, correlation, energy, inertia and contrast with statistical differences were 0.264, 0.301, 0.306, 0.736, 0.747 and 0.747, respectively. In arterial phase, the AUC values of texture parameters correlation, inverse difference moment, entropy, kurtosis, energy, inertia, and contrast with statistical differences were 0.241, 0.253, 0.269, 0.306, 0.773, 0.784 and 0.784, respectively. In portal venous phase, the AUC values of texture parameters inverse difference moment, entropy, peak, mean value, inertia with statistical differences were 0.259, 0.302, 0.413, 0.604 and 0.756, respectively. The AUC value of combining the signs of MR images prediction of MVI was 0.693, with sensitivity and specificity 53.8% and 82.8%, respectively. The AUC value of combining texture parameters of three-phase enhanced MR images diagnosis of MVI was 0.797 with sensitivity and specificity of 88.2% and 62.7%, respectively.

Conclusion: Signs of MR-enhanced images and texture characteristics of MR enhanced images have certain predictive effect on MVI of HCC. MR images texture analysis technology can help for diagnosis and contribute to the choice of personalized treatment plans in clinical practice.

PO-197

Noise-optimized virtual monoenergetic imaging of dual-energy CT: effect on contrast agent artifacts reduction on cervical CTA examination

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Purpose: Artifacts, produced by contrast agent in the subclavian vein on cervical CTA examination, often affect the show of cervical arteries at the corresponding level. In many previous studies, although 40keV has been recommended as the best energy level on the noise-optimized virtual monoenergetic imaging (VMI+) reconstructions for computer tomography angiography (CTA) in dual-energy CT (DECT), it often interferes with the display of calcified plaques on the wall of arteries because of the high iodine contrast. We aimed to evaluate the effects of VMI+ reconstructions on reducing the contrast agent artefacts in the vascular region of the neck, compared to traditional virtual monoenergetic imaging (VMI) and linearly blended (M_0.6) reconstructions in patients underwent the examination of CTA of cervical arteries in DECT, and recommend a suitable energy level to better show calcified plaque.
Methods: Ten patients who underwent cervical CTA in DECT were evaluated in this retrospective study. Images were reconstructed with M_0.6 and with VMI+ and VMI at 20-keV intervals from 40 keV to 140 keV. Attenuation and noise were measured in the cervical arteries at the worst level obstructed by the contrast agent artefacts of each patient. The artefact index (AI) and signal-to-noise ratio (SNR) were calculated.
Results: The AI values for the cervical arteries were lowest in the 140keV VMI+ series, which were lower compared to all the VMI and F_0.6 image (all $p<0.029$), but showed no significant differences compared to the 120keV VMI+ series ($p=0.684$). The SNR was highest in the 40keV VMI+ series, and there were no significant differences compared to the highest SNR in the VMI images and F_0.6 image ($P\geq0.529$), even compared to the 60-120keV VMI+ series ($p\geq0.052$).
Conclusions: DECT with 120keV VMI+ efficiently reduces contrast agent artefacts without affecting image quality in patients underwent the examination of CTA in neck. And the 120keV can be used as an additional energy level in the VMI+ reconstruction to better show calcified plaques in the cervical arteries affected by artifacts.

PO-198

高清 T2WI 结合 CS 在健康志愿者肾脏的应用

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目的：研究高清 T2WI 结合 CS 应用于健康志愿者肾脏，对图像质量的影响。
方法：前瞻性收集 10 名健康受试者（年龄 22-35 岁，平均年龄 28.7±2.15 岁;男性 5 名，女性 5 名），所有受试者行 3.0T MR 扫描（Ingenia CX，Philips）。使用高清 T2WI 结合不同加速因子（SENSE 2，CS-SENSE 2，CS-SENSE 3.5）的序列对右侧肾脏进行扫描。三种方案的扫描时间分别

为 357 秒，357 秒和 231 秒，而所有其他参数保持相同（TR / TE 1490/90 ms，FOV 140x140 mm2，分辨率 0.6x0.6 mm2，切片厚度 4 mm）。所有图像分析均在 IntelliSpace Portal（Philips）上进行。两名放射科医师分别将 ROI 分别置于右肾的上，中，下极的肾皮质和髓质以及相同水平的腰大肌（图 1），计算信噪比(SNR)和对比噪声比(CNR)。此外，两位放射科医师根据 Likert 5 方法进行了图像质量评分。使用 Friedman 检验分析来自不同序列的图像之间的 SNR 和 CNR 值。使用 Kappa 系数分析图像质量评分的一致性。
结果：不同扫描序列间，各肾区域 SNR，CNR 和主观评分没有统计学上的显着差异（表 1 和 2）。
结论：不同加速倍数（SENSE 2，CS-SENSE 2，CS-SENSE 3.5）结合高清 T2W，对图像信噪比无影响。

PO-199

Reducing Radiation Dose and Improving Image Quality in CT Portal Venography for Thin Patients using 100kV Tube Voltage and Adaptive Statistical Iterative Reconstruction-V Algorithm

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Objective: To explore the feasibility of reducing radiation dose and improving image quality in CT portal venography (CTPV) for thin patients using 100kV tube voltage and adaptive statistical iterative reconstruction-V (ASIR-V) algorithm.
Methods: Sixty patients for abdominal enhanced CT were randomly collected and divided into group A and group B. Group A was scanned with conventional 120kV tube voltage, 450mgI/kg contrast agent and reconstructed with 40%ASIR, while Group B was scanned with 100kV tube voltage, 350mgI/kg contrast agent and reconstructed with ASIR-V from 40% to 100% with interval at 10%. The CT values and standard deviation (SD) of the main portal vein, left branch and right branch of portal vein were measured to calculate the signal to noise ratio (SNR) and contrast to noise ratio (CNR). The subjective scores of image quality was performed double-blindly by two experienced radiologists using a five-point system. The radiation dose, contrast agent were recorded and calculated.
Results: There was no significant difference in the patient characteristics between the two groups (P>0.05). The effective radiation dose and contrast agent in group B were significantly reduced by 46.7% and 21.2% than those in group A (P<0.05). In group B, with the increase of ASIR-V percentage, the CT values showed no significant difference, the SD values decreased gradually, while the SNR values and CNR values increased accordingly. Compared with 40%ASIR in group A, the CT values were similar between two groups with different reconstructions, while the 70%-100%ASIR-V in group B had lower SD values and higher SNR values and CNR

values(P<0.05). The subjective scores showed excellent consistency between two radiologists for CT portal venography (Kappa>0.75, P<0.05), the subjective scores with 70%-100%ASIR-V in group B were significantly higher than those of 40%ASIR in group A(P<0.05), in which 80%ASIR-V provided the highest subjective score for CTPV. **Conclusion**: In CT portal venography, 100kV tube voltage and ASIR-V algorithm can reduce radiation dose by 46.7% and contrast agent by 21.2% and improve image quality for thin patients compared with 40%ASIR using conventional 120kV, while the 80%ASIR-V provides the best image quality of portal vein.

PO-200

论影像质量控制在放射科质控工作中的实际开展

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图像质量评价开展
图像质量评价来自四个方面：
临床反馈：通过临床医师的反馈，记录图像质量存在的问题，扫描方案是否存在问题等，我们的初衷即是为临床解决问题，其要求是我们最终的目标，严格重视，定期组织开展“医师、技师下临床”工作，了解其需求，积极配合。解决问题，满足其要求。
诊断医师登记记录：所有的图像都经诊断医师书写报告。在书写、审签报告过程记录存在问题项目。
质控成员每月定期抽查：针对不同检查类型，X 线平片、CT、MR、后处理等，以技术检查规范为标准，具体落实到检查前准备，检查时数据采集阶段，检查后图像处理阶段。详实抽查，多人审核。
科内定期的质控总结：每季度一次，总结抽查，统计分析。以 PDCA 循环为流程，持续改进。
如何开展持续改进：
以 PDCA 为流程，计划：在抽查登记，质量评价过程中发现问题，拟定改进计划。改进实施：以计划为标准，具体实施改进，如对技师进行规范化扫描培训，扫描计划的修订，提高技师责任心教育等，根据问题，逐项改进实施。检查：对改进后的图像进行抽查，对问题登记当事人的跟踪反馈。
总结：总结经验，对存在问题的升华认识，积极主动改进，杜绝此类问题的再发生。
科室如何深化质量控制：
提高认识，在图像质量为放射科生命线上的重视上，要求人人重视，以得到优质图像为自己的使命。
全员参与，这不是部分人的工作，需要所用人参与进来，共同协作，持续改进。
抓规范化培训：①扫描标准化培训（全体人员参与）；②特色技术开展，专人负责，团队攻关，集体学习；③科内讲座培训，每周的图像质量评价会议等；④外出学习：进修+学术会，把人家的优势学习回来。
抓质量缺陷管理：有执行，才有进步，发现问题后，组织学习改进方案，定期抽查改进情况。
抓量化考核管理：①科学建立不同岗位量化等值比例关系、相对倾斜技术难度高的岗位，基本做到多劳多得，按劳分配原则；②奖惩分明，质量控制与绩效挂钩。

PO-201

Effects on Radiation Dose, Contrast Agent and Image Quality in Renal CT Angiography: The combination of 80kV

Tube Voltage and Adaptive Statistical Iterative Reconstruction-V Algorithm

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Objective: To investigate the effects of using 80kV tube voltage and adaptive statistical iterative reconstruction-V algorithm in renal CT angiography for reducing radiation dose and reducing contrast agent and improving image quality compared with conventional 120kV.

Methods: Fifty patients with renal CT angiography in our hospital were prospectively collected and randomly divided into group A and group B. Group A was scanned with 120kV tube voltage, 600mgI/kg contrast agent and was reconstructed with 40%ASIR. Group B was scanned with 80kV tube voltage, 350mgI/kg contrast agent and was reconstructed with 80% ASIR-V. The CT values and standard deviation (SD) values of right renal artery, left renal artery and right erector spinae at the same level were measured, and the SNR values and CNR values of renal arteries were calculated. The image quality of renal arteries was subjectively scored by two experienced radiologists blindly using a 5-point system.

Results: There was no significant difference in population characteristics between the two groups ($p>0.05$). The effective radiation dose (2.07 ± 0.21mSv) and the total contrast agent (21.10 ± 2.86g) in group B were significantly lower than those in group A (6.69 ± 1.83mSv and 38.50 ± 4.14g) by 69.1% and 45.2% ($P<0.001$). The CT values of renal arteries between the two groups were similar and there was no significant difference in CT values ($P>0.05$). Compared with 40%ASIR reconstruction in group A, the SD values of renal arteries in group B were significantly lower ($P<0.001$), and the SNR values and CNR values in group B were significantly higher($P<0.001$). The subjective scores on image quality of renal arteries by two radiologists had excellent agreement (Kappa>0.80, $P<0.05$), and subjective scores in group B were significantly higher than those of group A,

Conclusion: The combination of 80kV tube voltage and adaptive statistical iterative reconstruction-V algorithm can provide better image quality with reducing radiation dose and reducing contrast agent in renal CT angiography compared with the conventional 120kV.

PO-202

Diagnostic Value of Stress Dynamic Myocardial CT Perfusion for Symptomatic Patients with Intermediate to High Risk of Coronary Artery Disease: Absolute Versus Relative Myocardial Blood Flow

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PURPOSE
To compare the diagnostic efficiency of absolute and relative myocardial blood flow (MBF) on dynamic myocardial CT perfusion (CTP) in detecting hemodynamically significant coronary artery disease (CAD) for intermediate- to high-risk symptomatic patients.
METHOD AND MATERIALS
Sixty consecutive symptomatic patients (43 men and 17 women; 61.38±8.01 years old) who met the criteria for intermediate to high CAD risk were prospectively recruited. All patients underwent adenosine triphosphate-stress dynamic myocardial CTP examinations using third-generation dual-source CT. Polar maps with data of the endocardial layer, based on the 17-segment American Heart Association (AHA) myocardial model, were used for ischemia evaluation. Absolute and relative parameters were generated and compared through a semiautomatic quantitative analysis of the MBF value. Invasive coronary angiography and fractional flow reserve (ICA/FFR) was used as the reference standard for myocardial ischemia. Areas under the receiver operating characteristic (ROC) curves and cutoff values were calculated and compared.
RESULTS
There were 151 vessels in 60 patients finally enrolled for analysis. The sensitivity, specificity, PPV, NPV and diagnostic accuracy for the absolute MBF value and relative MBF ratio were 82.76%, 98.92%, 97.96%, 90.20%, and 92.72% and 74.14%, 93.56%, 87.76%, 85.29%, and 86.09%, respectively. The absolute MBF value was better than the relative MBF ratio in detecting ischemia (AUC, 0.955 [95% CI: 0.919-0.990] vs. 0.906 [95% CI: 0.857-0.954]) (P=0.02). For territories with both sensitivity and specificity ≤90%, the diagnostic accuracy increased from 79.1% to 88.4% when the specific data were assessed using the absolute MBF value instead of the relative MBF ratio.
CONCLUSION
A semiautomatic, quantitative assessment using the absolute MBF value from the endocardial myocardium on stress dynamic myocardial CTP showed superior diagnostic performance compared with the relative MBF ratio on the detection of myocardial ischemia for intermediate- to high-risk, symptomatic patients. The absolute MBF value provides an incremental benefit toward diagnostic performance compared with the relative MBF ratio evaluation.

PO-203
MRI 多模态成像技术在肾透明细胞癌分级诊断中的应用价值

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目的 评价 3.0T MRI 扩散加权成像(DWI)、灌注加权成像(PWI)及磁敏感加权成像(SWI)在肾透明细胞癌(ccRCC) Fuhrman 核分级诊断中的应用价值。
方法 选取 35 例经手术病理证实为 ccRCC 并进行 Fuhrman 核分级患者，均行 3.0T MRI DWI、PWI 及 SWI 扫描。采用 ANOVA 比较 DWI 所得 ADC 值、PWI 所得 Ktrans 值及 SWI 所得 ITSS 评分在 ccRCC 不

同核分级之间的差异，采用 Pearson 相关性比较 DWI、PWI 及 SWI 三种检查方法之间相关性，同时应用 ROC 曲线评价三者对于 ccRCC 高、低级别鉴别诊断的价值。
结果 35 例经病理证实 ccRCC 患者 Fuhrman 核分级(其中Ⅰ级 6 例、Ⅱ级 17 例、Ⅲ级 8 例、Ⅳ级 4 例)， III 级与 IV 级间 ADC 值差异不具有统计学意义，其他各组间差异均具有统计学意义(P＜0.05)；Ktrans 值和 ITSS 评分随着肿瘤分级的升高而逐渐增高(P<0.05)，其中 III 级与 IV 级间 ITSS 评分差异不具有统计学意义，其他各组间差异均具有统计学意义(P＜0.05)。Pearson 相关性比较发现 K^{trans} 与 ADC 之间呈强负相关(r=0.64)，K^{trans} 与 ITSS 之间呈中等正相关(r=0.55)，ADC 与 ITSS 之间呈中等负相关(r=0.57)(P＜0.05)。运用 ROC 曲线比较 ccRCC 高(I 和 II 级)、低(III 和 IV 级)级别的诊断价值， K^{trans} AUC=0.857，灵敏度和特异度分别为 89.9%和 85.7%；ADC AUC=0.723，灵敏度和特异度分别为 72.7%和 92.9%；ITSS 评分 AUC=0.763，灵敏度和特异度分别为 78.8%和 71.4%。**结论** 3.0T MRI DWI、PWI 及 SWI 分别从不同角度反映 ccRCC 的血供及细胞结构特征，三者联合为 ccRCC 的 Fuhrman 核分级诊断提供有利价值。

PO-204
A Pilot Study of Four-dimensional Flow MRI Detection of Renal Artery Hemodynamics

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Purpose: To assess the feasibility of using four-dimensional (4D) flow MRI sequence as a noninvasive measuring method for renal artery (RA) hemodynamics.
Materials and Methods: Ten healthy subjects were involved in the study and underwent MR exam at 3.0 T scanner (Ingenia CX, Philips Healthcare, the Netherlands) with a 16-channel abdominal array coil. The MR protocol included a 2D quantitative flow sequence (axial, PC direction=RL, PC velocity=200cm/s) to measure the flow velocity in the bilateral RA as a reference for velocity encodings (VENC) and a 4D flow sequence (axial, PC direction=RL-AP-FH, SENSE =5.04) for hemodynamics quantification. VENC was set to 45 cm/s for the 4D flow sequence to slightly surpass the measured velocity and avoid phase wrapping. We performed axial scan for RA in 4D flow sequence instead of coronal view to put the entire bilateral RA trunks and branches into the FOV. The acquired images were processed in CVI42 (Circle Cardiovascular Imaging, Calgary, Canada) by a single radiologist to obtain a 3D angiogram, where three measuring planes (P1: within 5mm to the aorta, P2: the middle, P3: within 5mm to the branch) were manually placed to the initial region of right RA by two radiologists independently to measure the flow velocity, volume rate and axial-wall shear stress (WSS).We placed P1 and P3 to measure pressure changes. The intra-class correlation coefficients (ICC) for each measurement between the two radiologists was tested.
Results: The consistency of all parameters obtained by the two observers were good (0.802 to 0.977).
Conclusion: Using 4D flow MRI to detect renal artery hemodynamics is feasible.
Clinical application: 4D flow MRI sequence provides a noninvasively method to detect and evaluate vessel hemodynamics change for diseases involving cardiovascular system.

PO-205
估算儿童胸部 CT 扫描中体型特异性辐射剂量的简易方法

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目的：比较基于患者体重及容积 CT 剂量指数（$CTDI_{vol}$）计算的体型特异性辐射剂量（$SSDE_{weight}$）和基于水当量直径的扫描范围内的平均 $SSDE_{mean}$ 在估算儿童胸部 CT 辐射剂量中的差异，以求提供一种简单的 SSDE 计算方法。**方法：**回顾性选取 2019 年 1 月至 3 月在我院行胸部平扫的 80 例儿童患者，均采用 GE Revolution CT 进行扫描，使用 ICRP 认可的儿童胸部扫描协议进行平扫。记录每例患者的体重、$CTDI_{vol}$ 值。回归分析患者体重与水当量直径的关系，参考 AAPM 204 提供的方法，利用公式计算 $SSDE_{weight}$ 。平均 $SSDE_{WED}$ 则由商业软件 Radimetrics™ 自动计算。采用 SPSS 22.0 软件进行 Bland-Altman 分析，比较 $SSDE_{weight}$ 与 $SSDE_{mean}$ 之间的差异。**结果：**儿童胸部 CT 扫描患者的 $SSDE_{weight}$ 与 $SSDE_{mean}$ 分别为 4.44±0.30 mGy、4.75±0.30 mGy。$SSDE_{weight}$ 与 $SSDE_{mean}$ 的相关系数为 0.96。 Bland-Altman 分析，$SSDE_{weight}$ 与 $SSDE_{mean}$ 的偏倚均值为 0.30mGy，均方根差为 0.08mGy，可以忽略不计。LOAs 为 0.14 ~ 0.47mGy，超过 95%的数据点在此范围内，$SSDE_{weight}$ 与 $SSDE_{mean}$ 一致性较高。**结论：**利用患者体重及 $CTDI_{vol}$ 计算的 $SSDE_{weight}$ 与商业软件计算的 $SSDE_{mean}$ 相比，二者间的一致性较好。在没有自动软件计算 $SSDE_{mean}$ 的情况下，$SSDE_{weight}$ 能用于估算儿童胸部 CT 扫描患者的辐射剂量，有利于临床 SSDE 的计算与推广。

PO-206

颈椎双斜位透照技术的探讨

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目的:探讨颈椎双斜位最佳的投照方法，对颈椎退行性骨关节病的诊断提供可靠依据。
颈椎退行性骨关节是危害中老年人生命健康的常见病症之一，X 线是诊断该病的重要方法， 临床上常因出现相应症状而投照颈椎 X 线片，而 X 线片的质量是影响诊断的重要资料。颈 椎退行性骨关节病又以“脊神经根型”最为常见，X 线表现为椎间孔的狭窄和所属小关节的增 生性改变，临床上出现神经根受压之症状。所以，颈椎平片除常规的正侧位外，加拍颈椎双 斜位显得相当重要，重要观察、确定是否椎间孔狭窄、狭窄程度及周围结构的关系,以及增 生变形等一些病变情况，为临床治疗提供重要的参考。 颈椎常规检查临床上以颈椎正、侧、双斜位为诊断依据，常规双斜位的投照方法其效果不佳。 平常工作中不断探索和实践，采用立位颈椎左右后斜位，使颈椎椎间孔在 X 线胶片上显示 更清晰，效果更佳。
投照方法:1 患者站立或坐于立式摄影架前，双肩尽量下垂，面对 x 线球管，右或左后背靠近摄影架，被检查躯体正中矢状面与胶片成 45 度角，头转向对侧，使头部的矢状面和暗盒平行，这样才能使颈椎一二节椎间孔显示清楚，下颌略抬高，防止下颌升之支与椎体重叠。中心线向足 侧倾斜 10—20 度，对准 C4 射入胶片中心。2 投照条件:用胶片(8*10)直放，用滤线栅(+)，焦片距 150cm，条件 60—72KV,用 100mA，时间 0.8~1.0s,大小焦点均可，最好用小焦点。3.显示位置:颈椎左后斜位显示右侧椎间孔，相反颈椎右后斜位显示左侧椎间孔. 结果:经过 120 例双斜位的观察，椎间孔显示很满意，能清楚显示颈椎钩突关节骨质增生 情况，椎间孔狭窄程度和周围邻近结构的关系。合理选择大焦—片距 150cm，可以避免重 叠，使图像放大失真度变小，可提高影像清晰度。影像质量以不出现“双弧征”及“双边征”， 能清楚显示椎体及周围软组织及舌骨为佳。

PO-207

容积螺旋穿梭技术在危重患者 CT 肺动脉成像中的安全和质量控制

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目的：探讨容积螺旋穿梭技术在危重患者 CT 肺动脉成像中的应用价值。 资料与方法：选取 CT 肺动脉成像危重患者 38 例为研究组（A 组）：采用容积螺旋穿梭（VHS）技术扫描，管电压 80kVp，对比剂 25mL，流速 4mL/s，于注射对比剂 6S 后扫描 4 个 pass，无法行呼吸配合者在自由呼吸状态下完成扫描，扫描结束后 4 个 pass 分别重建层厚 1.25mm、stnd、60%ASiR 图像，评估每个 pass 的价值，RLPA 、LLPA 的 CT 值＞250Hu、无明显呼吸运动伪影为可评价期相，选取一个最佳 pass 为诊断图像。常规 CT 肺动脉成像患者 38 例为对照组(B 组)：管电压 120kVp，对比剂 60mL。流速同 A 组，采用团注追踪触发技术，吸气后屏气开始扫描。扫描后重建层厚 1.25mm、stnd、40%ASiR 图像。测量 MPA 、RPA、 LPA、 RLPA 、LLPA 及竖脊肌的 CT 值及 SD 值，计算 SNR、CNR 值；上腔静脉伪影程度根据腔静脉伪影最大处 CT 值范围分类；计算成像密度差评价肺静脉污染；记录 CTDIvo、DLP，计算有效剂量(ED)。采用独立样本 T 检验对两组图像的 CT 值、SD 值、SNR、CNR、成像密度差及 ED 进行统计分析，双盲法进行主观评分。结果：A、B 组辐射剂量差异无统计学意义；A 组对比剂量较 B 组降低 58%；A 组目标血管 CT 值和 SD 值均高于 B 组（P<0.05），两组的 SNR 和 CNR 值相似（P>0.05），但 B 组 MPA 和 RPA 的 CNR 值较高（P<0.05）；两组图像质量主观评分差异无统计学意义；成像密度差及上腔静脉伪影 A 组优于 B 组（P<0.05）；A 组的可多期相诊断率为 94.7%。结论：低 kVp 容积螺旋穿梭技术 CT 肺动脉成像能够减少对比剂用量、提高安全性，并能获得多期相、宽峰值平台诊断，减轻运动伪影保证检查成功率和成像质量，适宜危重患者检查时应用。

PO-208
医学影像技术实习教学中实行“导师轮转制”的探讨

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目的：为了提高医学影像技术实习生的工作实践能力和科研学习能力，我院放射科根据现有的教学资源和基本条件，对其展开了“导师轮转制”的新型教学模式。
方法：导师轮转制就是不同的导师“围绕学生轮转”的教学模式，我科技术组分为 MRI、CT、DSA 和普通放射四个组，每个实习生在每个组按月轮转，每个实习生当月在该组由一位导师一对一带教，负责该实习生的学习、工作等多方面的教学，下个月在下一个组又由该组的一位导师一对一带教。影像技术专业实习生进入科室后，由教学秘书按照教学大纲负责统一安排 教学工作，根据技术各小组工作岗位实行每月依次轮转，平均分配实习生人数。实习生采取自由组合原则，教学秘书安排一切教学事由。教学实习具体工作分为：理论教学、工作指导、科研能力指导和评价考核。
结果：“一对一”的导师轮转制中，影像技术专业实习生的跟班学习，能够在最短的时间内掌握各小组大型设备的性能，了解工作流程和最快速进入工作状态，贴近一线值班，面对突发状况及时处理，在导师指导下也能独当一面，成为导师的得力助手。实习生在导师指导下可以查阅文献，充实自身，随时掌握影像技术新动态，提高了自己的科研素质。同样，对导师来说，对学生的督促作用，增强了导师的责任心，不断改进了教学方法。
结论：导师轮转制是对医学影像技术实习系统培养的一条有针对性的较好的途径。导师轮转制实现了实习生到准技师的顺利转换，提高实习生的综合素质。但是，由于导师轮转制是一种新型的教学

模式，仍需做好以下几点：（1）、进一步完善教学大纲和制度；（2）、加强实习生教学管理，提高对临床工作的认知；（3）、壮大和发展师资力量和队伍。

PO-209
成人急性阑尾炎 MSCT 平扫影像特征与病理对照研究

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目的：术前精准诊断急性阑尾炎并为临床提供有更多有价值的影像资料，减少误漏诊，使患者受益。
材料与方法：搜集 2017 年 1 月至 2018 年 12 月在我院急诊外科住院治疗的急性阑尾炎患者 89 例（均经手术及病理证实）；年龄（19-83 岁，平均 42.15±18.12），男 53 例、女 36 例；另外，搜集 30 例正常阑尾进行对照，男 19 例、女 11 例，年龄（21-79 岁，平均 47.80±16.45）。所有扫描均在 Philips MX 16 Slice 扫描仪上完成，患者取仰卧位，头先进，屏气，扫描范围从膈顶至耻骨联合，所有病例均未进行肠道准备。所有图像行薄层重建，重建层厚为 1 mm，重建间隔为 1 mm，并行多平面重组(MPR) 及曲面重组(CPR)等图像后处理。阅片者对影像资料进行全面观察、测量、分析，做出诊断，并与术后病理进行对照。
结果：急性阑尾炎组阑尾显示清楚者为 77/89 例，，MSCT 正确诊断/病理结果：急性单纯性阑尾炎 19/23 例，急性化脓性阑尾炎 48/57 例，急性坏疽及穿孔性阑尾炎 3/7 例，阑尾脓肿 1/1 例，急性阑尾炎伴低级别阑尾粘液性肿瘤 0/1 例，总体符合率为 79.78%（ 95% CI，0.703-0.868）。MSCT 平扫与术后病理在阑尾腔内粪石、阑尾周围炎中差异无统计学意义；在局限性腹膜炎中差异有统计学意义，c2=13.149，P=0.000。急性阑尾炎组与正常组对照，阑尾直径、阑尾管壁厚度、阑尾腔内积液、阑尾腔内积气、周围肠系膜淋巴结增大差异均有统计学意义。
结论：成人急性阑尾炎 MSCT 平扫影像学表现具有一定的特征性，与术后病理一致性较高；MSCT 平扫结合 MPR、CPR 等图像后处理对成人急性阑尾炎有着较高的诊断价值。
【关键词】 急性阑尾炎，MSCT 平扫，病理

PO-210
胸痛三联征一站式 CT 检查中固定注射时间的碘对比剂优化方案与图像质量关系的研究

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目的探讨胸痛三联征（TRO）一站式 CT 检查中使用固定注射时间的碘对比剂优化方案与图像质量的关系.**方法**选择我院行 TRO 一站式 CT 检查的患者。按体重指数分为 BMI≤23kg/m^2和 BMI>23kg/m^2组;每组患者按随机数字表分两组，分别给予固定注射时间的不同对比剂注射方案进行检查，对各组不同节段血管图像质量进行主观和客观评价,记录主观评分及肺动脉、主动脉、冠状动脉 CT 值和对比噪声比；同时记录检查的总体有效辐射剂量。**结果**共 92 例患者纳入分析:(1) BMI≤23kg/m^2组 44 例,接受方案 1 和方案 2 者各 22 例,BMI>23kg/m^2组 48 例，接受方案 1 和方案 2 者各 24 例.不同 BMI 组内接受不同注射方案两个亚组间有效辐射剂量比较差异无统计学意义,均 P＞0.05。(2)在 BMI≤23kg/m^2组,接受方案 2 患者肺动脉图像的 CT 值、CNR 及主观评分均明显高于接受方案 1 者,均 P＜0.05;而两种方案冠状动脉及主动脉图像质量的主观和客观评价结果比较差异无统计学意义。

（3）在 BMI>23kg/m²组,接受方案 2 患者冠状动脉及主动脉图像的 CT 值、CNR 和主观评分均明显高于接受方案 1 者,均 P＜0.05；而两种方案肺动脉图像质量的主观和客观评价结果比较差异无统计学意义。**结论**应用 RevolutionCT 完成 TRO 一站式检查有效辐射剂量相对较低。固定注射时间的小剂量对比剂应用方案可满足 TRO 一站式 CT 检查诊断需要,适用于急性胸痛患者。对于 BMI≤23kg/m² 的患者,两种均可获得优良的图像质量,为避免上腔静脉伪影的影响,推荐使用 55 mL 对比剂注射方案;对于 BMI>23kg/m²的患者,应用 60 mL 对比剂注射方案可以获得稳定优质的图像,更适合临床应用。

PO-211
不同注射速率对肝脏磁共振普美显成像检查的影响分析

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目的 普美显是近年研发的新型肝细胞特异性 MRI 对比剂，诊断过程中能准确提供肝脏病灶血供信息，同时具有非特异性肝细胞外对比剂和肝胆特异性对比剂的特点。普美显越来越多应用于临床，提高了肝脏病灶的检出率和诊断正确率。在肝脏普美显成像检查中，各医院常应用不同的注射流速（1.0ml/s，1.5ml/s，2.0ml/s）。本研究目的为探讨不同注射速率是否对检查过程及结果产生影响。

材料和方法 回顾性分析 132 例接受肝脏普美显检查患者临床、MRI 检查资料。按照注射速率将研究对象分为三组 1.0ml/s 44 人，1.5ml/s 44 人，2.0ml/s 44 人。所有患者进行肝脏 MRI 平扫及普美显 MRI 检查。经肘正中静脉团注，注药后进行肝动脉期（16-25s）、门静脉期（46-55s)、肝静脉期（86-100s）、动态晚期（150-180s）和肝细胞期（20min）多期动态扫描。结合最终病理结果，进行如下分析：（1）分析三组研究对象药物不良反应的发生情况(2)对获取的 MRI 图像质量进行评分(3)对 MRI 图像的伪影评估（4）分析肝脏病变检出和正确定性病变的敏感性、特异性、诊断效率、阳性预测值、阴性预测值、约登指数。统计学方法：应用 SPSS18.0 软件包进行统计学分析，分析三组研究对象药物不良反应的发生情况应用 x 检验，对获取的 MRI 图像质量进行评分应用多个样本均数比较的方差分析，对 MRI 图像的伪影评估应用多个样本比较的 Kruskal-Wallis H 检验。最终对所得全部数据进行 Topsis 法综合评优。

结果 三组普美显不同注射速率组在造影剂反应、MRI 图像质量及图像伪影显示方面无明显统计学差异，在肝脏病变检出和正确定性病变显示方面均明显优于平扫，1.5ml/s、2.0 ml/s 组发现肝脏病灶并正确诊断病灶较好且综合评价最优。**讨论** 普美显检查 1.5ml/s、2.0 ml/s 注射速率综合优于 1.0ml/s。

PO-212
Machine learning based framework for differential diagnosis between mild cognitive impairment and Alzheimer's disease using structural MRI features

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Background and objective: Mild cognitive impairment (MCI) and Alzheimer's disease (AD) could be characterized by the same syndrome of dementia. This study aims to assess whether multi-parameter features derived from structural MRI can serve as the informative biomarker for differential diagnosis of MCI and AD using machine learning.
Methods: A total of 112, of which 90 had 60 AD and 30 MCI, confirmed by two chief physicians were recruited in this study. Automated brain tissue segmentation was performed by AccuBrain tool to extract multi-parameter volumetric measurements from different brain regions. Then, totally 62 structural MRI biomarkers were addressed by dimensionality reduction and feature selection. All significantly different features between MCI and AD were selected using least absolute shrinkage and selection operator and genetic algorithm to find the optimal feature subset. Finally, differential diagnosis was carried out by employing support vector machine (SVM) classifier with linear or radial basis function (RBF) kernels to differentiate between MCI and AD. The performance of diagnostic model was validated through ten-fold cross validation.
Results: The experimental results demonstrate that SVM with RBF model achieved an encouraging performance with sensitivity (SEN), specificity (SPE) and accuracy (ACC) values of 83.33%, 85.00% and 82.22% (AUC=0. 842, 95% CI = 0.748-0.935) for the differential diagnosis between MCI and AD. It outperforms the recently reported biochemical marker such as tau protein phosphorylated at threonine 231.
Conclusions: The proposed computer-aided diagnosis method highlights the potential of combing structural MRI and machine learning to support clinical decision making in distinction of MCI vs. AD.

PO-213

基于 DL 模型检测肺结节的临床效能评估

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摘要
目的:
比较深度学习(DL)模型与放射科医生使用不同患者群体和扫描参数检测肺结节的敏感性，评估在辅助使用 DL 模型时能否提高放射科医生的检测效能。
材料与方法:
采用基于 dlbased 的人工智能诊断系统(InferRead CT Lung Research, Infervision, Beijing, China)回顾性分析 2018 年 11 月至 2019 年 4 月 100 例胸部薄层 CT 扫描资料，薄层厚度为 0.625-2mm，同时 3 名 15 年以上资深影像专业医生独立对每个序列图像结果进行确认作为金标准。测试数据集根据层厚和 CT 制造商分为两组。利用 ROC 曲线分析了 DL 模型的检测性能。从这些扫描肺结节分为四种类型:实性，磨玻璃，钙化和胸膜，通过探索性数据分析比较 DL 模型与放射科医师对结节检出以及不同性质结节的敏感性。比较每个队列中 DL 模型的假阳性检出率。利用 ROC 曲线分析结节检出效能，比较了同一放射科医生在使用 DL 模型和不使用 DL 模型时的检测性能。
结果:
基于 DL 诊断系统检测到肺结节 627 个，分类阈值 0.8，其中 TP 结节 270 个，FP 结节 357 个，FN 结节 15 个，敏感性 94.7%。与手工检查肺结节相比，DL 模型显示出更高的整体敏感性。在不同层厚或 CT 制造商方面均无显著相关性。当放射科医生使用 DL 模型进行辅助时，他们的表现得到了改善，阅读时间也缩短了。
结论:

DL 对提高肺结节的鉴别和治疗有一定的价值。

PO-214
基于放射组学预测肺腺癌 EGFR 基因突变状态的研究

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目的：基于薄层计算机断层扫描（TSCT）建立一种预测肺腺癌表皮生长因子受体（EGFR）突变状态的放射组学模型并评估其有效性。
方法：该研究包括 284 例肺腺癌患者（141 例 EGFR 突变型和 143 例 EGFR 野生型）。通过使用半自动方法（ITK-SNAP3.6.0）对每个肿瘤的感兴趣区域（ROI）进行分割，即利用阈值分割法计算机自动生成 ROI，并且放射科医师可以逐层改变病灶轮廓以精确其边界。通过使用放射组学软件 Analysis-Kit(GE Healthcare，Life Science，China)提取 396 个放射组学特征。用于建立放射组学模型的临床信息及影像特征包括性别、年龄、吸烟状况、症状以及肿瘤直径、部位、充气支气管征、胸膜牵扯征、空洞 / 空泡共 9 个特征。将 284 例患者随机分为训练组（n=199）和测试组（n=85）。通过 Multi information 法对组学特征降维、临床特征筛选后再分别对放射组学特征、临床特征、结合组学与临床特征建立模型，对比了 Logistic Regression 和 Random Forest 两种模型，最后总共得到 6 个模型。通过受试者操作特征（ROC）曲线下面积（AUC）、准确度、灵敏度、特异度、精确度、F1 及 Brier 分数对 6 个模型进行比较，并使用 ROC 曲线、混淆矩阵、DCA 曲线三种指标评估模型效能。
结果：EGFR 突变与女性、吸烟、充气支气管征显著相关（$P<0.05$），通过特征降维得到 4 个放射组学特征，均为灰度游程矩阵。使用放射组学与临床特征结合的模型预测效能高于仅用组学特征、仅用临床特征建立的模型，并且 Random Forest 模型显示 AUC 为 0.841， Logistic Regression 模型显示 AUC 为 0.729。
结论：采用 Random Forest 方法建立放射组学和临床特征结合的综合模型可以预测肺腺癌 EGFR 突变状态，改善临床实践中对患者治疗计划的管理。

PO-215
Radiomics nomogram for prediction recurrence-free survival and adjuvant chemotherapy benefits in patients with resected stage I lung adenocarcinoma: A retrospective, multicenter, cohort study

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Objective: To develop and validate a radiomics nomogram for predicting the recurrence-free survival (RFS) of patients with resected stage I lung adenocarcinoma, and further identifying the patients benefit from adjuvant chemotherapy (ACT).
Methods and materials: Using radiomics approach, we analyzed 805 patients' computed tomography images from four cohorts. Prognostic features were selected using LASSO-Cox

regression model to build a signature for RFS stratification, and a nomogram incorporating clinicopathologic factors were developed in the training cohort (n=238). We further analyzed the biological basis of the radiomics signature in the Radiogenomics cohort by gene set enrichment analysis (n=91). The prognostic accuracy of the nomogram was evaluated in the internal (n=237) and external validation cohorts (n=239). Finally, the predictive value of the nomogram for ACT benefits was evaluated.
Results: In the training cohort, the radiomics signature consisting of 9 features was generated to stratify patient's survival (hazard ratio [HR]; 95% CI, 3.606-14.636; p<0.001). The C-index of the signature of 0.782 was improved to 0.804 (p<0.001) when integrating with the clinicopathologic factors to develop the nomogram. In the validation cohorts, the nomogram also showed good performance for RFS prediction. A significant better RFS outcomes (p=0.0025) was observed in the stage IB patients with high points (>7.1) calculating by the nomogram after ACT, while patients with low points showed no significant survival benefit.
Conclusions: The constructed radiomics nomogram for patient with resected stage I lung adenocarcinoma may be used to prognostic prediction and ACT benefits identifying.

PO-216
一种新的乳腺钼靶良恶性分类深度学习模型

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目的：设计一种新的神经网络模型，用深度学习的方式对乳腺钼靶片进行自动的良恶性诊断。
材料与方法：我们收集了含有 1225 张乳腺钼靶片的数据集来训练和验证我们的模型。所有的病例都来自于亚洲人。数据集包括 1912 例有征象结果标注的病灶，其中病灶类型含有不对称、钙化、肿块和结构扭曲四种，分别有 328 例、501 例、1021 例和 62 例。数据集中病理为良性的病例有 1081 例，病理为恶性的病例有 831 例。我们在保证正负样本比相同的情况下按 8:1:1 的比例将数据集分为训练集、验证集和测试集。
我们提出了一种新的深度神经网络，通过学习患侧病灶征象并结合对侧特征来判断乳腺钼靶良恶性。网络结构分为两个分支，一个分支用来学习病灶的征象，比如病灶类型、钙化形态、钙化分布、肿块边缘特征、肿块密度、肿块形态等。征象是判断乳腺钼靶良恶性的重要依据，征象的学习可以有效地提高良恶性的分类效果；另一个分支用于提取健侧图像的特征，然后结合两个分支提取到的特征计算该钼靶片的良恶性概率。每个分支都以 Resnet50 网络为主干，并且提取带有丰富信息的 7x7 大小的局部特征。
结果：传统模型采用经典的深度卷积神经网络，仅利用患侧图像，以 Resnet50 网络为主干，再经过全连接层直接得到良恶性的分类结果。传统模型的分类准确率为 79.04%，AUC 为 81.46%。而我们的新模型分类准确率为 84.43%，AUC 为 86.96%。
结论：我们提出一种新的用于乳腺钼靶良恶性分类的深度模型。模型利用双侧信息和征象学习来提高分类的准确率，在私有数据集上有非常明显的效果。

PO-217
利用 MRI 动态增强纹理分析评估不同分子亚型乳腺癌异质性

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目的 利用磁共振纹理分析来评估不同分子亚型乳腺癌的异质性。方法 回顾性分析 353 例经病理证实为乳腺浸润性导管癌患者的临床资料及 MRI 图像，根据免疫组化或荧光原位杂交结果分为 Luminal A 型、Luminal B 型、人类表皮生长因子受体 2(human epidermal growth factor receptor-2，HER-2)过表达型与三阴型(triple-negative breast cancer,TNBC)四型，利用第三方软件手动勾画病灶所有层面融合为三维感兴趣区并提取纹理特征（18 种），采用 2 检验、秩和检验、单因素方差分析及 LSD-t 检验进行统计学分析。结果 Luminal A 型 90 例，Luminal B 型 115 例，HER-2 过表达型 66 例，TNBC 型 82 例。四种亚型中发病年龄、标准差、方差、范围、偏度、峰度、均匀性、能量、熵、惯性矩、聚类萌、聚类突、总均值、最小强度、最大强度、表面积体积比的差异均有统计学意义（P＜0.05）。两两比较 Luminal A 型与 HER-2 过表达型、TNBC 型均有 14 个特征差异具有统计学意义，Luminal B 型与 HER-2 过表达型、TNBC 型分别有 12、11 个特征差异具有统计学意义， Luminal A 型与 Luminal B 型、HER-2 过表达型与 TNBC 型间均有 6 个特征差异具有统计学意义。结论：基于动态增强 MRI 纹理分析证实不同亚型乳腺癌具有异质性，纹理特征能够很好地区分 HR+与 HR-型乳腺癌，纹理特征是潜在评估乳腺癌异质性的一种方法。

PO-218
基于多模态磁共振参数构建胶质瘤分级的列线图预测模型

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背景：胶质瘤分级对于脑肿瘤患者治疗和评估预后至关重要。我们旨在利用多参数 MRI 开发影像学列线图预测胶质瘤级别。
方法：本研究涉及 182 例患者（训练组：n = 91;验证队列：n = 91），病理学检查为金标准。研究参数包含增强的 T1 加权，MRS 和 DWI 序列。提取了总共 602 个影像学征象。 统计检验：我们利用放射学特征，患者的年龄和性别，作为进行逻辑回归分析的潜在预测变量，并设计胶质瘤分级的预测模型，并使用列线图来呈现。分别用一致性系数(C-index)和校准曲线评估模型的预测性能和符合度。
结果：在试验组和验证组中，影像学特征与神经胶质瘤分级显着相关（P <0.001）。与单独采用 T1WI 增强，MRS 或 ADC 在胶质瘤分级比较，一致性系数在试验组中为 0.91,0.71,0.86，在验证组中为 0.82,0.60,0.69；而结合三个影像学特征一致性系数分别为 0.98 和 0.95。列线图模型拟合度检验和分类器校准图均显示拟合较好。
结论：我们创建并评估了一种基于多参数 MRI 的影像学学列线图，结合三个序列列线图比单一序列列线图具有临床预测价值，可以帮助临床医生更准确地对胶质瘤进行分类。

PO-219
Sports modify the trajectory of gray matter development in young divers detected by three different tools

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Objective: To investigate the features of gray matter (GM) in young divers with three different tools: voxel-based morphometry (VBM), FreeSurfer and Accubrain respectively.
Methods: A total of 20 diving athletes (DA) and 24 control subjects (NC) were collected and T1 BROVA data were acquired. After image preprocessing, GM analyses were conducted by VBM, FreeSurfer and Accubrain™ respectively.
Results: The results of VBM showed that lower GMV mainly in the bilateral superior frontal cortex, anterior cingulated gyrus (ACG), posterior cingulated gyrus (PCG), transverse temporal gyrus, insula, hippocampus etc., and the higher GMV in the bilateral cerebellum posterior lobe in the DA group ($P < 0.001$, FDR correction). The gyrification of GM in the right middle temporal gyrus (rMTG) decreased significantly, meanwhile, the GM thickness in the right middle frontal gyrus (rMFG) reduced and positively correlated with training time in the DA group ($P < 0.05$, Alphasim correction), which detected by FressSurfer. While there was no positive finding with Accubrain.
Conclusion: The reduction of GMV in multiple brain regions may be due to synaptic proliferation and pruning since they are at the age when cortex is getting thinner, and it is the professional training that might accelerate the process. Meanwhile, the decreased gyrification of GM in the rMTG might also contribute to diving training promote cortical thinning. Accubrain is considered as an automated brain structure volumetry tool and provides accurate segmentation and measurement of 40 GM brain regions, herein the GM volume did not indicate significant difference in corresponding 40 brain regions between two groups. These three tools explore features of GM from different points. Overall, professional sports training play a certain impact on the trajectory of adolescent brain development.

PO-220

Exploration on the detection capability alteration of AI assisted software in detecting pulmonary solid nodules by resident in radiology department

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MOTIVATION: To evaluate the detection capability of artificial intelligence (AI) assisted lung nodule diagnostic software in the detection of pulmonary solid nodules by resident .
METHOD AND MATERIALS: A total of 159 patients were collected in our hospital. One senior radiologist with more than 10 years' experience read CT images based on the initial diagnosis of another senior radiologist with similar experience and a final decision was subsequently conducted by deputy chief radiologist with more than 15 years' experience to determine the ground truth lung nodules. All readings were

performed on 1 mm slice thickness CT images with the assistance of AI software (InferRead CT Lung Research,Infervision, Beijing, China).One resident read the images without AI software (group A) and the same resident read CT images with AI software (group B) after two weeks' washout period. The number of pulmonary solid nodules and location were recorded. The number of true positive nodules and false positive nodules in group A and B were compared with the gold standard nodules to calculate sensitivity and false positive rate.

RESULTS: Group A detected 487 nodules, including 401 true positive nodules and 86 false positive nodules, with a sensitivity of 0.473±0.33. Group B detected 692 nodules, including 652 true positive nodules and 40 false positive nodules with a sensitivity of 0.721±0.37. The sensitivity of group B was 24.8% higher than that of group A($p<0.001$).The false positive rate (per CT scan) of group A (0.484,77/159) was considerably higher than that of group B(0.252,40/159)($p<0.001$).

CONCLUSION: Compared with resident without AI software, the AI-assisted resident achieved higher detection sensitivity and greatly reduced false positive rate for solid pulmonary nodules.

CLINICAL RELEVANCE/APPLICATION:

It is recommended to use AI to assist resident who are inexperienced to achieve desirable detection rate for solid pulmonary nodules.

PO-221

肠管周围爬行脂肪 CT 值变化对克罗恩活动性的诊断价值

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摘要：目的：探讨克罗恩病活动性病变患者系膜根部爬行脂肪 CT 值变化的特点。方法：选取 2016 年 1 月至 2019 年 3 月上海市静安区中心医院收治的 31 例克罗恩病活动期患者为研究对象，同时随机选取年龄、性别相匹配的克罗恩病非活动期患者/健康人群作为对照。收集临床资料包括小肠 CT 增强检查、小肠镜检查及其病理结果、临床免疫抑制治疗疗效。结果：克罗恩病活动期患者 31 例（男 26 例，女 5 例），对照组 31 例（男 22 例，女 9 例）。与对照组相比，克罗恩病活动期患者系膜根部爬行脂肪密度增高，增强后随时间延长可出现持续轻度强化。结论：克罗恩病病变肠管周围的爬行脂肪于疾病活动期可出现密度增高、持续性强化的特点，因此肠管周围爬行脂肪的 CT 值变化对克罗恩病的活动性具有诊断价值。结论：克罗恩病病变肠段系膜根部的爬行脂肪于疾病活动期可出现密度增高、持续性强化，因此爬行脂肪的 CT 值变化是疾病活动期的一项重要依据。

PO-222

Evaluation of Pelvic Lymph Nodes on MR Diffusion-weighted images of Patients with PI-RADS 5 lesion Using U-Net Segmentation Algorithm

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Purpose: To detect enlarged LNs on DWI images of suspected patients with PCa upon the application of U-Net segmentation algorithm.
Materials and methods: Pelvic DWI images of 62 patients with PI-RADS 5 lesion from two indepent MR scanners were retrospectively collected for development of U-Net model in automated LNs segmentation from January 2017 to June 2018. The LNs with short diameter over 8mm were annotated by 2 radiologists. 40 participants from August 2018 to June 2019 were automatically predicted to evaluate the accuracy of U-Net model. For the annotated areas by radiologists, DICE coefficient were adopted to evaluate U-Net segmentation performance, LNs short diameter and volume were computed to estimate segmentation accuracy by comparison with manually annotated labels.Area under the receiver operating characteristic curve (AUC) was used to assess U-Net model for per-patient in algorithm evaluation. Quantitative LNs short diameter and volume were compared between automated and manual segmentation by using Pearson correlation and Bland-Altman statistics.
Results: 62 men (mean age ± standard deviation (SD), 70.9 years ± 9.1) and 40 patients (mean age ± SD, 70.1 years ± 8.2) with PI-RADS 5 lesion were enrolled in algorithm development and evaluation respectively. The average DICE coefficient produced by U-Net segmentation model was 0.74 (95% CI: 0.61 - 0.87) in testing dataset. The LNs short diameter and volume measured with manual and automated segmentation showed a high correlation (r= 0.87 and 0.98, respectively) and close agreement. The AUC in the algorithm evaluation 0.78(95% CI:0.62-0.89).
Conclusion: The deep learning-based U-Net algorithm can achieve fully automated and accurate LNs segmentation on DWI images of patients with PI-RADS 5 lesions.

PO-223

Predicting outcomes after uterine fibroid embolization with deep learning based on MRI

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PURPOSE
To develop and validate a deep learning model based on routine pre-procedure MRI to predict volume reduction and clinical outcome of uterine fibroid embolization.
METHOD AND MATERIALS
Clinical data were collected on patients treated with uterine artery embolization for fibroids at a large academic center from 2007 to 2018. Only patients with both pre and post-procedure MRI were included. The fibroids for each patient was manually segmented by an abdominal radiologist on T2-weighted and post-contrast T1-weighted sequence of pre and post-procedure MRI, and fibroid size reduction was calculated as percentage change in fibroid volume after uterine fibroid embolization. A residual convolutional neural network model to predict fibroid volume reduction and clinical outcome was trained using pre-procedure magnetic resonance images.
RESULTS

The inclusion criteria were met by 727 fibroids in 409 patients. The average clinical follow up time was 116 days. Of the 727 fibroids, 76.2% (n=554) had a volume reduction of 10% or more, and 23.8% (n=173) had a volume reduction under 10% or increased in size. At clinical follow-up, 85.6% (n=350) of the 409 patients (590 of 727 fibroids, 81.1%) experienced symptom resolution or improvement, and 14.4% (n=59) patients (137 of 727 fibroids, 18.9%) no improvement or worsening symptom. The final ensemble model combining T2-weighted images, post-contrast T1-weighted images and clinical variables achieved a test accuracy of 78.1%, F1 score of 0.875, and area under the precision-recall curve of 0.865 in predicting volume reduction and a test accuracy of 84.7%, F1 score of 0.912, and area under the precision-recall curve of 0.916 in predicting clinical outcome.

CONCLUSIONS

Deep learning based on routine pre-procedure MRI has potential in predicting outcomes post uterine fibroid embolization. This will help clinicians identify patients who benefit the most from this therapy.

PO-224

Convolutional neural network for predicting postoperative liver metastasis and local recurrence in pancreatic neuroendocrine tumor based on CT imaging

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To establish and validate a deep convolutional neural network (DCNN) model in prediction of liver metastasis and local recurrence after surgery for pancreatic neuroendocrine tumors (PNETs) from CT imaging.

Preoperative CT imaging was acquired from 57 patients with surgical and pathologic proved PNETs. The data of liver metastasis and local recurrence was confirmed by follow up imaging from 3 months after surgery until December 2018. DCNN was performed based on CT images including arterial phase, artery and venous phase. The DCNN algorithm was evaluated by 5-fold cross-validation and the validation of the two type phases were compared. The optimal phase of DCNN model were selected to compare with CT visual findings evaluated by radiologist (location, maximum diameter, cystic component, calcification, CT ration, enhanced ratio, boundary, shape, vessel involvement, pancreatic duct dilated or cut, pancreatic atrophy, lymph node size and enhancement, fatty liver and hepatic benign lesions, splenomegaly) in predicting liver metastasis and local recurrence after surgery of PNETs.

With the DCNN model, the accuracy, sensitivity and specificity of predicting liver metastasis and local recurrence after surgery achieved 76.79%, 100%, 71.74% (AUC=0.93) in arterial phase, and 83.93%, 60.00%, 89.13% (AUC=0.77) in artery and venous phase, respectively. By CT visual findings, univariate analysis showed that the maximum diameter increased significantly in patients with liver metastasis and local recurrence after surgery ($p<0.05$). CT ratio and enhanced ratio decreased significantly in patients with liver metastasis and local recurrence after surgery ($p<0.01$). Pancreatic duct dilated or cut and pancreatic atrophy were more likely to

occur in patients with liver metastasis and local recurrence after surgery ($p<0.05$). The AUC of predicting liver metastasis and local recurrence after surgery with CT visual findings evaluated by radiologist were 0.86.
DCNN model showed high predictive performance in liver metastasis and local recurrence of PNET from CT imaging, superior to CT visual findings evaluated by radiologist.

PO-225
Radiomics Signature as a Diagnostic Factor in predicting malignant testicular lesions

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Purpose: To evaluate the performance of a MRI-based radiomics signature for discriminating between benign and malignant testicular lesions.
Materials and methods: Seventy-seven patients with 62 testicular lesions were consecutively enrolled. Eight hundred and forty-one features were extracted from T2WI image for each patient. The minority group was balanced via the synthetic minority over-sampling technique (SMOTE) method. The maximum relevance minimum redundancy (mRMR) and least absolute shrinkage and selection operator (LASSO) logistic regression model were implemented for feature selection. Radiomics signatures were obtained with the LASSO logistic regression model. Receiver operating characteristic analysis was used to evaluate the diagnostic accuracy of the radiomic signatures. The classification performance of the radiomics signature for benign and malignant testicular lesions was evaluated by receiver operating characteristic curve analysis.
Results: Significant differences in the radiomics signature existed between the benign and malignant testicular lesions ($p<0.01$). The performance of the radiomics signature for discriminating between benign and malignant testicular lesions was good, with an AUC of 0.866, sensitivity of 0.940, and specificity of 0.660.
Conclusion
MRI-based radiomics signature have the potential to noninvasively discriminate between benign and malignant testicular lesions.

PO-226
Three-dimensional CT texture analysis to differentiate colorectal signet ring cell carcinoma and adenocarcinoma

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Purpose:The objective of this research was to validate the diagnostic value of texture parameters and clinical characteristicsin the differentiation of colorectal signet ring cell carcinoma (SRCC) and adenocarcinoma (AC).

Methods: We retrospectively analyzed data from 102 patients with SRCC or AC confirmed by pathology, including 51 SRCCand 51 ACpatients (from January 2010 to July 2019). CT findings and Clinical data, including age, gender, clinical symptoms, serological biomarkers, tumor size, and tumor location, were compared between SRCC and AC. CT texture features were quantified on portal phase images using three-dimensional analysis.A list of texture parameters was generated with MaZda software for the classification of tumors. The texture features, clinical data and CT findings were statistically analyzed for the discrimination ability of SRCC and AC, and the potential predictive parameters that may be used to differentiate the two groups were subsequently tested using the least absolute shrinkage and selection operator (LASSO) and logistic regression analyses. The receiver operating characteristic curve (ROC) provided a range of values for establishing the cutoff value, as well as the sensitivity and specificity of prediction for each significant variable.
Result:SRCC occurred more often in men than AC did (80.39% vs. 49.02%, P < 0.01). The patients were younger in the SRCC group than in the AC group, without a statistically significant difference(55.84 vs. 59.20 years, P = 0.216).There were no significant differences in the clinical symptoms, tumor size, or tumor location between the two groups (P=0.505, P=0.19, P=0.843, respectively). The elevation of serological biomarker CA724 was more common in SRCC than in AC (P< 0.001). Perc.01%3D, Perc.10%3D and s(1,0,0) SumAverg were lower in the SRCC group than in the AC group during the portal phase, with the areas under curve (AUCs) of 0.892-0.929, sensitivity of 76.5-84.3% and specificity of 88.2-96.1%. In the differentiation between SRCC and AC, the 1-NNminimal classification error (MCR)was 29.41%.
Conclusion: Three-dimensional texture parameters, including Perc.01%3D, Perc.10%3D and s(1,0,0) SumAverg exhibited favorable discriminatory ability to distinguish SRCC from AC.

PO-227

Building CT Radiomics-Based Models for Preoperatively Predicting Malignant Potential and Mitotic Count of Gastrointestinal Stromal Tumors

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PURPOSE: To build radiomic prediction models using contrast-enhanced computed tomography (CE-CT) to preoperatively predict malignant potential and mitotic count of gastrointestinal stromal tumors (GISTs). PATIENTS AND METHODS: A total of 333 GISTs patients were retrospectively included in our study. Radiomic features were extracted from the preoperative CE-CT images. According to postoperative pathology, patients were categorized by malignant potential and mitotic count, respectively. The most valuable radiomic features were chosen to build a logistic regression model to predict the malignant potential and a random forest classifier model to predict the mitotic count. The performance of radiomic models was assessed with the receiver operating characteristics curve. Our study further developed a radiomic nomogram to preoperatively predict malignant potential in a personalized way for patients with

GISTs. RESULTS: The predictive model was built to discriminate high- from low-malignant potential GISTs with an area under the curve (AUC) of 0.882 (95% CI 0.823-0.942) in the training set and 0.920 (95% CI 0.870-0.971) in the validation set. Moreover, the other radiomic model was built to differentiate high- from low-mitotic count GISTs with an AUC of 0.820 (95% CI 0.753-0.887) in the training set and 0.769 (95% CI 0.654-0.883) in the validation set. CONCLUSION: The radiomic models using CE-CT showed a good predictive performance for preoperative risk stratification of GISTs and hold great potential for personalized clinical decision making.

PO-228

The evaluation of a deep learning bone age model in Chinese children based on GP atlas and data from North America

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Background: The Greulic-Pyle (GP) method is a popular and wide application to assess skeletal maturation and diagnose endocrine disorders using x-ray images of the left hand. However it is based primarily on a white population and is not necessarily generalizable children of other ethnicities.

Purpose: To compare the performance of a deep-learning bone age assessment model using data from the 2017 Radiological Society of North America (RSNA) Pediatric Bone Age Machine Learning Challenge with that of Chinese radiologists.

Materials and methods: A total of 538 clinical hand radiographs and corresponding radiological reports were obtained from Children's hospital of Fudan University in China to test the model. The bone age estimates difference between the model from American children's hospital data and the radiology reports from Chinese children's hospital was evaluated by comparing the root mean square (RMS) and mean absolute difference (MAD). The difference of normal, advanced and delayed bone age assessment between the model and the radiologists was evaluated to assess the clinical significance in diagnosis change. The data were statistically analyzed by Independent-Sample T test and Chi-square test.

Results: It showed difference between AI model and radiology report in bone age estimates (AI model vs radiology report: 10.66 years vs 10.25 years, p=0.02). The mean difference between bone age estimates of model and Chinese radiologists was 0.41 years, with a mean RMSE and MAD of 1.10 years and 0.78 years, respectively. The analysis of different diagnosis (normal, advanced or delayed bone age) showed significant difference ($p<0.05$).

Conclusion: Compared with bone age estimates of Chinese radiologists, AI model from RSNA data slightly overestimate age. The difference may affect clinical diagnosis in China.

PO-229

Preliminary study of using Radiomcis to differentiate metastatic and non-metastatic lymph nodes in rectal cancer

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Objective:To explore the use of Radiomcis in differentiating metastatic and non-metastatic lymph nodes of rectal cancer in high-definition axial T2WI images and build prediction models.
Methods: Forty-five patients with rectal cancer (29 males and 16 females, aged 45-91 years, with an average of 61+10.2) were retrospectively collected. All patients had pathological results of lymph node metastasis after operation. All patients underwent high-definition axial T2WI(GE HD750 3.0T, TE=102ms, TR=auto, FOV=18cm, matrix=320*288) scan within two weeks before operation, and the lymph nodes on T2 images were compared with pathological results. A total of 153 lymph nodes, 75 metastatic lymph nodes and 78 non-metastatic lymph nodes were obtained. Radcloud (Huiying Medical Technology Co., Ltd.) was used to select ROI along lymph node contour in T2 images. Two levels with the largest cross section were selected for each lymph node, and the shortest path of each lymph node was recorded. Each ROI extracts 1029 eigenvalues, and variance threshold method, K-best and LASSO were used gradually to reduce the dimension of eigenvalues. The eigenvalues obtained after dimensionality reduction were fitted to KNN, SVM and Logistics models respectively. When fitting, 80% of the samples were randomly used as training set and the remaining 20% as verification set. The prediction efficiency of the model was evaluated by ROC, AUC, sensitivity and specificity. The shortest paths of metastatic and non-metastatic lymph nodes were compared by independent sample t-test. The software used was SPSS V19, and $P < 0.05$ was considered to have statistical difference.
Results: 1. There was no significant difference in the shortest path between metastatic and non-metastatic lymph nodes ($P > 0.05$); 2. After three times of dimension reduction, the eigenvalues gradually decreased from 1029 to 612, 246 and the final 15 eigenvalues, which included Minimum, Median, Maximum 3D Diameter, GrayLevel NonUniformity, Minimum, Skewness, Entropy, Median, Kurtosis, RunLength Nonuniformity. Ity, Cluster Prominence, Flatness, SmallArea High GrayLevel Emphasis, LongRunLowGrayLevel Emphasis and Interquartile Range; 3,3 kinds of model fitting results:
For KNN training set, AUC = 0.87, 95% = 0.80-0.94, sensitivity = 0.72, specificity = 0.89; verification set, AUC = 0.82, 95% = 0.67-0.98, sensitivity = 0.73, specificity = 0.75.
For SVM training set, AUC = 0.92, 95% = 0.85-0.99, sensitivity = 0.77, specificity = 0.89; verification set, AUC = 0.81, 95% = 0.66-0.97, sensitivity = 0.73, specificity = 0.75.

For Logistic training set, AUC = 0.88, 95% = 0.81-0.96, sensitivity = 0.78, specificity = 0.82; verification set, AUC = 0.84, 95% = 0.68-0.98, sensitivity = 0.8, specificity = 0.63.
Conclusion: Using Radiomcis to analyze high-definition axial T2 lymph node images of rectal cancer, and using the obtained eigenvalues to establish KNN, SVM and Logistic models, with Logistic as the best, can make a good differential diagnosis between metastatic lymph nodes and non-metastatic lymph nodes, assist radiologists in N staging of rectal cancer, and better formulate treatment plans.

列

题

LT-001

急性胰腺炎伴肺炎的 CT 表现及其与临床相关性分析

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肝癌微血管侵犯在 MRI 上的定量评价

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成人肝未分化肉瘤腹壁切口缘种植转移合并右心室癌栓一例

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特发性非肝硬化性门脉高压一例

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肝硬化背景下富血供结节的螺旋 CT 增强扫描表现分析

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结石性胆囊炎症对胆囊管成像的影响

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王爽, 雷盛, 谷涛, 文利
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冯吉贞,凌春香
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赵瑞琛,高雪梅,陈晨
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陈阳,彭卫军
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肝脏粘膜相关淋巴组织结外边缘区 B 细胞淋巴瘤

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下腔静脉平滑肌肉瘤一例报道

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普美显对肝腺瘤的诊断价值

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肝硬化门脉高压影像诊断研究新进展

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探讨子宫输卵管造影在女性不孕不育中的诊断价值

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心脏介入治疗的护理

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磁共振肩关节间接造影的护理体会

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探究双源 CT 低剂量扫描鉴别肺小结节和早期肺腺癌的价值

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