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目 次

特别关注

- 精准医疗驱动下磁共振成像技术在胰腺癌诊疗中的应用与价值
.....陈荷冰, 薛华丹 (1)
- 平扫MRI对胰腺导管内乳头状黏液性肿瘤良性壁结节的诊断价值
.....方旭, 边云, 陆建平 (8)
- 三维磁共振弹性成像评价进展期胰腺癌化疗反应及生存期
.....杜柏, 石喻 (14)
- 基于多模型DWI的胰腺癌组织学表征研究:动物-临床联合验证
.....李佳丽, 吕晨晰, 马思源, 李震 (22)
- 基于mDixon-Quant定量参数术前无创预测胰腺导管腺癌病理分化及Ki-67
表达的研究
.....陈坤, 阮志兵, 石仕吟, 陈慧淋, 文凤, 徐茂丽, 唐戈雅 (30)
- 扩散峰度成像定量参数预测胰腺导管腺癌HIF-1 α 的初步研究
.....王方青, 陈颖慧, 孙阳, 王勇, 于德新 (37)
- 磁化传递成像评价胰腺导管腺癌纤维化的可行性研究
.....沈志秋, 杨明明, 吕俊馨, 张京刚, 陈杰 (44)

论 著

临床研究

- 广泛性焦虑症双侧杏仁核静息态和动态功能连接特征的功能磁共振成像研究
.....张磊, 王小玲, 孙继飞, 曹久冬, 洪洋, 罗萍, 孙黎,
吕学玉, 刘军, 赖菁玲, 方继良, 郎学森 (49)
- 基于T1W-MRI影像组学脑网络的多动症注意力缺陷症状评估
.....赵磊, 王训恒, 范明, 厉力华 (54)
- 注意力缺陷多动障碍儿童白质微结构特征的扩散峰度成像分析
.....刘世鹏, 程美英, 鲁钰, 李思柯, 王长浩,
沈艳勇, 周梁, 冯刘娟, 赵鑫 (62)
- 有氧运动对失独父母影响的多模态磁共振研究及中介分析
.....严佳琪, 罗一烽, 曹志宏, 葛纪元, 兰青悦,
戚荣丰, 卢光明, 张丽, 钱超颖 (68)
- 基于多模态磁共振对终末期肾病患者脑结构-功能耦合与认知功能的相关性研究
.....周宇, 王海宝, 齐向明, 李大山, 方杰, 邹帆, 汪海龙, 郭玲玲 (74)
- 基于海马体MRI影像组学模型预测2型糖尿病患者认知功能障碍的价值
.....尹磊, 许志高, 曹米兰, 王强 (80)

失眠障碍患者脑类淋巴功能磁共振成像指标与睡眠状态的相关性研究 及重复经颅磁刺激治疗对其的影响张正楠, 程诗涵, 王惠晓, 周金丽, 朱一飞, 耿左军, 杨海庆 (88)	
基于磁共振成像技术的社交隔离大脑变化研究:一项激活似然估计法的 Meta分析褚者者, 张建平, 樊梦雅, 陈双红 (96)	
首发单侧基底节卒中后抑郁与非抑郁患者局部一致性和低频振幅的差异研究许天骄, 陆梦馨, 李媛媛, 张慕昭, 邹忆怀, 方继良 (102)	
磁共振动脉自旋标记成像在热性惊厥局灶性评估中的价值初探杨洋, 张顺, 石妍, 覃媛媛, 徐三清 (108)	
全面发育迟缓儿童脑灌注异常的三维准连续动脉自旋标记成像研究周梁, 赵鑫, 程美英, 王长浩, 刘世鹏, 杨金泽, 李思柯, 鲁钰, 张小安 (113)	
基于多模态MRI的栖息地局部熵值预测成人型弥漫性胶质瘤IDH分子状态的 相关性研究胡明雪, 王鹏, 刘岩昊, 谢生辉, 何金龙, 吴琮, 高阳 (120)	
基于多模态MRI的影像组学模型对自身免疫性与单纯疱疹病毒性脑炎的 鉴别诊断研究刘煥, 戴健, 刘先平, 李郁欣, 吴昊, 耿道颖 (127)	
弥散峰度成像联合常规MRI在甲状腺良恶性结节鉴别诊断中的价值唐启瑛, 刘信攸, 姜秋利, 朱柳红, 周建军 (136)	
心脏磁共振特征追踪技术对非扩张型左室心肌病的诊断价值研究颜春龙, 庄白燕, 徐磊 (143)	
基于心脏磁共振特征追踪技术评价冠心病患者左室心肌纤维化对 双心室功能的影响泥鲁莹, 张前, 鲍长金, 于蒙蒙, 张迪, 姜兴岳 (149)	
动态对比增强磁共振结合瘤内瘤周影像组学在预测乳腺非肿块强化病灶 良恶性中的价值研究杨亭, 刘雪雯, 刘瑶, 白芙蓉, 姚娟 (157)	
磁共振高分辨率延迟期的可解释性机器学习模型术前预测浸润性 乳腺癌组织学分级匡静, 黄松涛, 黄小华, 胡云涛 (164)	
基于多参数MR生境成像鉴别Luminal型和非Luminal型乳腺癌程卫群, 戚轩, 杨宏楷, 段绍峰, 何永胜, 佟金颖, 潘书雅, 刘光竹 (170)	

病例报告

联合多b值DWI及DCE分布式参数模型辅助诊断放射性坏死一例雷艳, 周佳南, 朱正阳, 张鑫, 张冰 (181)	
---	--

综述

基于深度学习的多模态磁共振成像技术及其在抑郁症诊疗中的研究进展王子豪, 宋育儒, 苏红晓, 孙进楠, 伊伟, 任瑞 (184)	
烟雾病影像学研究进展陈佳璐, 欧阳烽, 吴钦, 曾献军 (190)	
磁敏感血管征在急性缺血性脑卒中疾病中的研究进展耿悦, 陈雨昂, 张蜜, 李俊晨, 谈炎欢 (198)	

封面文章

胰腺导管内乳头状黏液性肿瘤 (intraductal papillary mucinous neoplasm, IPMN) 是胰腺最常见的囊性肿瘤, 具有潜在恶变风险, 准确区分其良恶性对临床决策至关重要。肿瘤内形成乳头状赘生物, 即壁结节, 是 IPMN 主要病理学特征。目前国际指南将壁结节作为评估 IPMN 良恶性的最关键因素之一, 其中影像学表现强化壁结节 ≥ 5 mm 是恶变的高危征象, 然而部分良性 IPMN 中亦可存在 ≥ 5 mm 的强化壁结节, 因此存在过度诊断的风险。

基于 MRI 对囊液的高敏感性和对囊内成分的高分辨率, 使其成为胰腺囊性病变更首诊和随访的首选影像学检查方式。虽然诊疗指南中强调了增强检查后观察强化壁结节的重要性, 但是对于肾功能不全或对比剂过敏患者无法应用增强检查, 亟需探索基于平扫 MRI 的无创评估方法。因此, 尝试采用相对简便的平扫 MRI 检查评估壁结节, 实现一种便捷、准确、经济且完全无创的影像学评估方式。

本研究根据 IPMN 病理学分级标准, 将患者分为壁结节良性组 (轻度异型增生) 和壁结节恶性组 (重度异型增生和浸润性癌), 分析平扫 MRI 图像的影像学特征, 两组的定量资料采用独立样本 t 检验或 Mann-Whitney U 检验进行比较, 定性资料采用卡方检验进行比较, 将所有差异有统计学意义的因素纳入多因素 logistic 回归分析, 筛选出 IPMN 壁结节恶性组的独立预测因素, 进一步建立诊断预测模型, 并通过 ROC 曲线评估诊断效能。结果显示联合独立预测因素的诊断模型具有良好的预测效能, 证明了平扫 MRI 检查对胰腺 IPMN 良恶性评估的可行性。详见内文第 8 页。

颈动脉粥样硬化型卒中风险预测的MRI研究进展		贾魁元, 张家瑞, 于洋, 孙洪赞 (204)
多参数CMR评估肝硬化心肌病患者心肌损伤的研究进展		蒋林岚, 谢明国, 付兵, 唐思诗, 杨智, 苏春艳 (210)
肝细胞癌血管包绕肿瘤团簇组织学和影像学研究进展		杨志轩, 朱绍成 (217)
酰胺质子转移成像在子宫内膜癌中的研究进展		曾莹婷, 宁清灵, 方斌, 钟俭平, 钟俊远 (223)
磁共振波谱在血液系统疾病中的研究及应用进展		闫红敏, 高明洁, 陈涛, 付卿桦, 张牛霖, 岳辛如, 任小云, 刘旭, 王金环 (229)



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Contents

SPECIAL FOCUS

- 1 Application and value of magnetic resonance imaging techniques in the diagnosis and treatment of pancreatic cancer driven by precision medicine
CHEN Hebing, XUE Huadan
- 8 Diagnostic value of non-contrast MRI in evaluating benign and malignant mural nodules of intraductal papillary mucinous neoplasms of the pancreas
FANG Xu, BIAN Yun, LU Jianping
- 14 Three-dimensional magnetic resonance elastography for evaluating chemotherapy response and survival in advanced pancreatic cancer
DU Bai, SHI Yu
- 22 Multiparametric diffusion models for histological characterization of pancreatic cancer: Insights from animal and clinical studies
LI Jiali, LÜ Chenxi, MA Siyuan, LI Zhen
- 30 Non-invasive preoperative prediction of histological differentiation and Ki-67 expression level in pancreatic ductal adenocarcinoma based on mDixon-Quant sequence
CHEN Kun, RUAN Zhibing, SHI Shihan, CHEN Huilin, WEN Feng, XU Maoli, TANG Geya
- 37 A preliminary study on quantitative parameter prediction of HIF-1 α in pancreatic ductal adenocarcinoma using diffusion kurtosis imaging
WANG Fangqing, CHEN Yinghui, SUN Yang, WANG Yong, YU Dexin
- 44 A feasibility study of magnetization transfer imaging on the evaluation of fibrosis in pancreatic duct adenocarcinoma
SHEN Zhiqiu, YANG Mingming, LÜ Junxin, ZHANG Jinggang, CHEN Jie

ORIGINAL RESEARCH

CLINICAL ARTICLES

- 49 Study on the characteristics of resting-state and dynamic functional connectivity of the bilateral amygdala in generalized anxiety disorder: A functional MRI research
ZHANG Lei, WANG Xiaoling, SUN Jifei, CAO Jiudong, HONG Yang, LUO Ping, SUN Li, LÜ Xueyu, LIU Jun, LAI Jingling, FANG Jiliang, LANG Xuesen
- 54 Assessment of attention deficit symptoms in ADHD based on T1W-MRI radiomics brain network
ZHAO Lei, WANG Xunheng, FAN Ming, LI Lihua
- 62 The diffusion kurtosis imaging analysis of white matter microstructural features in children with attention deficit hyperactivity disorder
LIU Shipeng, CHENG Meiyang, LU Yu, LI Sike, WANG Changhao, SHEN Yanyong, ZHOU Liang, FENG Liujuan, ZHAO Xin
- 68 Effects of aerobic exercise on parents who lost their only child: A multimodal magnetic resonance imaging and mediation analysis
YAN Jiaqi, LUO Yifeng, CAO Zhihong, GE Jiyuan, LAN Qingyue, QI Rongfeng, LU Guangming, ZHANG Li, QIAN Chaoying

- 74 Study on the correlation between brain structure-function coupling and cognitive function in end-stage renal disease patients using multimodal magnetic resonance imaging
ZHOU Yu, WANG Haibao, QI Xiangming, LI Dashan, FANG Jie, ZOU Fan, WANG Hailong, GUO Lingling
- 80 The value of hippocampal MRI-based radiomics modelling for predicting cognitive dysfunction in patients with type 2 diabetes mellitus
YIN Lei, XU Zhigao, CAO Milan, WANG Qiang
- 88 Association of MRI indexes of brain glymphatic function with sleep status in insomnia patients disorders and the effects of repetitive transcranial magnetic stimulation treatment on them
ZHANG Zhengnan, CHENG Shihan, WANG Huixiao, ZHOU Jinli, ZHU Yifei, GENG Zuojun, YANG Haiqing
- 96 Research on brain changes in social isolation based on magnetic resonance imaging technology: A Meta-analysis based on activation likelihood estimation
CHU Zhezhe, ZHANG Jianping, FAN Mengya, CHEN Shuanghong
- 102 Study on rs-fMRI imaging features of depression patients with unilateral basal ganglia stroke based on local consistency and low-frequency amplitude
XU Tianjiao, LU Mengxin, LI Yuanyuan, ZHANG Muzhao, ZOU Yihuai, FANG Jiliang
- 108 Preliminary exploration of the value of magnetic resonance arterial spin labeling imaging in the focal evaluation of febrile seizures
YANG Yang, ZHANG Shun, SHI Yan, QIN Yuanyuan, XU Sanqing
- 113 Three-dimensional pseudo-continuous arterial spin labeling reveals cerebral perfusion abnormalities in children with global developmental delay
ZHOU Liang, ZHAO Xin, CHENG Meiyang, WANG Changhao, LIU Shipeng, YANG Jinze, LI Sike, LU Yu, ZHANG Xiaolan
- 120 Correlation study of local habitat entropy based on multimodal MRI for predicting IDH molecular status in adult-type diffuse glioma
HU Mingxue, WANG Peng, LIU Yanhao, XIE Shenghui, HE Jinlong, WU Qiong, GAO Yang
- 127 Differential diagnosis of autoimmune encephalitis and herpes simplex virus encephalitis using radiomics models based on multimodal MRI
LIU Huan, DAI Jian, LIU Xianping, LI Yuxin, WU Hao, GENG Daoying
- 136 Value of diffusion kurtosis imaging combined with conventional MRI in the differential diagnosis of benign and malignant thyroid nodules
TANG Qiyang, LIU Xinyou, JIANG Qiuli, ZHU Liuhong, ZHOU Jianjun
- 143 Diagnostic value of cardiac magnetic resonance feature tracking technique in non-dilated left ventricular cardiomyopathy
YAN Chunlong, ZHUANG Baiyan, XU Lei
- 149 Evaluation of the influence of left ventricular myocardial fibrosis on biventricular function in patients with coronary artery disease based on cardiac magnetic resonance feature tracking
NI Luying, ZHANG Qian, BAO Changjin, YU Mengmeng, ZHANG Di, JIANG Xingyue
- 157 Value of dynamic contrast-enhanced magnetic resonance imaging combined with intratumoral peritumoral radiomics in predicting benign and malignant non-mass enhanced breast lesions
YANG Ting, LIU Xuwen, LIU Yao, BAI Furong, YAO Juan
- 164 Interpretable machine learning model for predicting preoperative histological grade of invasive breast cancer based on high resolution delay period of magnetic resonance imaging
KUANG Jing, HUANG Songtao, HUANG Xiaohua, HU Yuntao

About the cover

Intraductal papillary mucinous neoplasm (IPMN) of the pancreas is the most common cystic tumor of the pancreas, with a potential risk of malignant transformation. Accurately distinguishing between benign and malignant IPMN is critical for clinical decision-making. A key pathological feature of IPMN is the formation of papillary proliferations, known as mural nodules. Current international guidelines identify mural nodules as one of the most critical factors for evaluating malignancy in IPMN. Specifically, imaging findings of enhancing mural nodules ≥ 5 mm are considered high-risk indicators for malignant transformation. However, enhancing mural nodules ≥ 5 mm may also occur in some benign IPMNs, leading to a risk of overdiagnosis.

Due to its high sensitivity to cystic fluid and superior resolution for intracystic components, MRI has become the preferred imaging modality for the initial diagnosis and follow-up of pancreatic cystic lesions. Although guidelines emphasize the importance of contrast-enhanced imaging to assess enhancing mural nodules, patients with renal insufficiency or contrast allergies cannot undergo contrast-enhanced examinations. This necessitates the exploration of non-invasive evaluation methods based on non-contrast MRI. Therefore, this study aimed to develop a convenient, accurate, cost-effective, and entirely non-invasive approach for evaluating mural nodules using non-contrast MRI.

Based on the pathological grading criteria for IPMN, patients were classified into a benign mural nodule group (low-grade dysplasia) and a malignant mural nodule group (high-grade dysplasia and invasive carcinoma). Imaging features on non-contrast MRI were analyzed. Quantitative data between the two groups were compared using independent sample *t*-tests or Mann-Whitney *U* tests, while qualitative data were analyzed using chi-square tests. Statistically significant factors were incorporated into multivariate logistic regression analysis to identify independent predictors of malignant mural nodules. A diagnostic prediction model was subsequently constructed, and its performance was evaluated using ROC curves. Results demonstrated that the combined diagnostic model incorporating independent predictors exhibited strong predictive efficacy, confirming the feasibility of non-contrast MRI in distinguishing benign from malignant IPMN. Please see text page 8.

- 170 Identification of type Luminal and non-type Luminal breast cancers based on multiparametric MR habitat imaging

CHENG Weiqun, QI Xuan, YANG Hongkai, DUAN Shaofeng, HE Yongsheng, TONG Jinying, PAN Shuya, LIU Guangzhu

CASE REPORT

- 181 Combined multi-b-value DWI and DCE distributed parameter model in diagnosing radiation necrosis: One case report

LEI Yan, ZHOU Jianan, ZHU Zhengyang, ZHANG Xin, ZHANG Bing

REVIEWS

- 184 Deep learning-based multimodal magnetic resonance imaging techniques and their research progress in depression diagnosis and treatment

WANG Zihao, SONG Yuru, SU Hongxiao, SUN Jinnan, YI Wei, REN Rui

- 190 Advances of medical imaging in Moyamoya disease

CHEN Jialu, OUYANG Feng, WU Qin, ZENG Xianjun

- 198 The recent research development of susceptibility vessel sign in acute ischemic stroke

GENG Yue, CHEN Yuang, ZHANG Mi, LI Junchen, TAN Yanhuan

- 204 Recent advances in MRI for risk prediction of carotid atherosclerotic stroke

JIA Kuiyuan, ZHANG Jiarui, YU Yang, SUN Hongzan

- 210 Research advances in multiparametric CMR assessment of myocardial injury in patients with cirrhotic cardiomyopathy

JIANG Linlan, XIE Mingguo, FU Bin, TANG Sishi, YANG Zhi, SU Chunyan

- 217 Advances in histology and imaging studies of vascular encroachment of tumor clusters in hepatocellular carcinoma

YANG Zhixuan, ZHU Shaocheng

- 223 Progress of amide proton transfer imaging in endometrial cancer

ZENG Yingting, NING Qingling, FANG Bin, ZHONG Jianping, ZHONG Junyuan

- 229 Research progress on the application of magnetic resonance spectroscopy in hematological diseases

YAN Hongmin, GAO Mingjie, CHEN Tao, FU Qinghua, ZHANG Niulin, YUE Xinru, REN Xiaoyun, LIU Xu, WANG Jinhuan

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