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目次

论著

临床研究

- DKI及DTI在鉴别诊断低级别胶质瘤与脑炎中的价值
.....赵镨, 马潇越, 程敬亮, 高安康, 白洁,
王沛沛, 赵国桦, 高而远, 齐金博 (1)
- 颞下颌关节盘前移位患者盘-髁复合体MRI特征及盘周附着半量化评级研究
.....张国来, 廖彦阳, 吴美娜, 郑屏萍, 潘在兴, 严金柱 (7)
- 基于4D Flow MRI评估颈动脉狭窄及卒中相关血流动力学危险因素的研究
.....卢菲, 孙梦瑶, 马越, 江岳雯, 孙洋, 佟丹 (14)
- CMR特征追踪成像是鉴别心脏淀粉样变性亚型中的价值研究
.....庄白燕, 李爽, 王辉, 张宏凯, 徐磊 (23)
- 心脏磁共振影像组学对肥厚型心肌病的价值研究
.....吕静, 朱永琪, 朱彦芳, 何瑛, 王艺霖, 王霁, 朱力, 刘云 (30)
- 表观扩散系数鉴别肺癌脑转移瘤组织学分型及其与Ki-67增殖指数的相关性
.....周凤瑜, 张斌, 董文洁, 张鹏, 薛彩强, 刘显旺, 韩涛, 周俊林 (42)
- 乳腺癌患者化疗早期大脑皮层表面形态学改变和癌症相关疲劳变化的关系:基于
表面形态测量方法.....周燕飞, 李竞, 伏晓, 袁文娟,
王宏志, 杨立状, 李海 (48)
- δ -连环蛋白高表达状态对乳腺癌患者化疗后短期脑认知功能影响的静息态功能
MRI研究.....薛明团, 杜伟, 曹家骏, 宋段, 张俊毅, 苗延巍 (56)
- 基于瘤周肝组织DWI列线图模型预测肝切除术后复发性肝细胞癌局部进展研究
.....王晶, 曾朝强, 汤梦月, 许敏, 张小明, 陈天武 (63)
- ^{18}F -PSMA-1007 PET/CT与mp-MRI对前列腺癌的检测效能及与病理分级的
相关性研究.....周云舒, 陈晓华, 陈志强, 张若弟, 刘世莉,
王卓, 张少茹, 李鹏, 李艳梅 (71)
- 磁共振表观扩散系数鉴别诊断移行带高危前列腺癌及与病理分级分组的相关性
.....李鹏, 李艳, 徐洁, 景丽 (77)
- 基于不同扩散模型参数图的影像组学分析磁共振早期诊断临床显著性前列腺癌的价值
.....杜兵, 戚轩, 杨宏楷, 齐东, 何永胜 (83)
- 基于双参数MRI的深度学习-临床混合模型对临床显著性前列腺癌诊断价值的研究
.....胡尘翰, 乔晓梦, 胡冀苏, 包婕, 曹昌浩, 王希明 (90)
- DWI联合T2 mapping序列鉴别前列腺癌与前列腺增生价值评估
.....李茜玮, 陈丽华, 王楠, 林良杰, 刘爱莲 (97)
- 基于半月板MRI的3D卷积神经网络模型预测膝关节关节炎发生的研究
.....蒋可欣, 谢雨含, 李勉文, 张志勇, 陈少龙, 丘昌镇, 张晓东 (103)

基础研究

- 基于多变量模式分析的飞行学员脑功能连接的识别研究
.....叶露, 刘孟轩, 闫东峰, 陈曦, 马姗 (108)
- 双耳分听模式下汉语语言信号和韵律信号的处理:一项 fMRI 研究
.....徐紫薇, 莫茵, 史尧平, 蔡希睿 (115)
- 磁共振髓鞘探针 Gd-DTDA 在多发性硬化大鼠髓鞘损伤模型中的实验研究
.....刘彩云, 邵翠杰, 翁娜, 李国栋, 黄丹琪, 刘珈, 宾莉, 王旭 (122)

技术研究

- VMHC 与 ReHo 在评价 tDCS 改善脑卒中后认知障碍中的应用价值
.....钟佳利, 景小珊, 梁莹 (129)
- 人工智能-压缩感知技术在颅脑 3D T2-FLAIR 序列采集及脑白质高信号评价中的应用
.....曹家骏, 刘娜, 钟美梦, 袁畅, 张煜堃, 苗延巍, 宋清伟 (135)
- 心脏磁共振对比增强电影序列对合并微血管阻塞 STEMI 患者的诊断价值
.....胡莹莹, 郭勇, 孙峥, 赵丽, 刘志, 陈楠, 卢洁 (140)
- 不同翻转角和延迟时间对 Gd-BOPTA 增强肝胆期肝脏和胆道系统图像质量的影响
.....任雪, 赵莹, 周丽萍, 左桀, 王楠, 宋清伟, 林良杰, 王家正, 刘爱莲, 刘宇卉 (147)
- 压缩感知联合并行采集技术的屏气 3D LAVA FLEX 序列在肝脏磁共振快速成像中的应用
.....方子榕, 陈秋雁, 叶灵, 余波, 陈志健 (155)

病例报告

- 脾脏高分化神经内分泌肿瘤 MRI 表现一例
.....王煜轩, 曹云太, 谭华清, 龙昌友, 张宇萌, 高旭坤 (162)
- 原发性肠系膜神经内分泌肿瘤 MRI 表现一例
.....张翼飞, 鲍海华, 龙昌友, 田鹏启 (164)

综述

- 特发性全面性癫痫动态功能连接的应用及进展
.....张家仁, 顾晓瑜, 何莲, 马文敏, 伍光榕, 李栋学, 江林 (167)
- 多参数 MRI 和机器学习在脑小血管病相关认知功能障碍中的研究进展
.....黄晶, 罗天友 (172)
- 基于多模态 MRI 在帕金森病冻结步态的研究进展
.....侯钧宝, 史奇叶, 王杨, 彭晓涵, 曹丹娜 (178)
- 神经黑色素敏感磁共振成像在帕金森病中的应用进展
.....王晓然, 张福兰, 马景旭 (183)
- 脊髓损伤后神经性疼痛的神经影像研究进展
.....孙楚楚, 陈楠, 贺珣 (188)
- MRI 影像组学在脑胶质瘤中的研究进展
.....梁倩, 张辉 (192)
- 磁共振成像人工智能技术在垂体神经内分泌肿瘤治疗中的研究进展
.....武佳磊, 王宇博, 李晓凡, 李燕, 田旭兵, 张益松, 严勋, 罗达, 杨斌 (198)
- 脑震荡后综合征的磁共振成像研究进展
.....严家豪, 黄文静, 张静 (202)

封面文章

心脏淀粉样变性 (cardiac amyloidosis, CA) 是一种罕见的心脏疾病, 其主要特征是淀粉样胶原纤维在心肌细胞外间隙沉积, 导致心肌功能异常。CA 的最常见类型分别为转甲状腺素相关淀粉样变性 (cardiac transthyretin-related amyloidosis, ATTR-CA) 和免疫球蛋白轻链淀粉样变性 (cardiac light-chain amyloidosis, AL-CA) 两种。这两种类型疾病的预后存在明显差异, AL-CA 患者的生存率较低, 而 ATTR-CA 患者的预后相对较好, 此外治疗方法也各不相同, 因此, 及早识别分型对于制订有效治疗方案至关重要。目前, 临床上对 CA 的分型主要依赖于免疫组化、蛋白质组谱以及闪烁成像等有创或有辐射的检查, 存在需要心内膜活检以及费用较高等一定的局限性。因此, 寻找一种新的无创方法来鉴别两种类型的 CA 显得尤为迫切。

近年来, 心血管磁共振作为一种非侵入性成像技术, 已被广泛应用于心脏疾病的诊断和评估中。磁共振心肌特征追踪技术 (cardiovascular magnetic resonance-feature tracking, CMR-FT) 是一种新兴的后处理技术, 可以从多个维度对心肌应力进行定量分析, 反映心肌细胞的收缩性, 且无需使用对比剂。然而, 针对 CMR-FT 在 CA 分型中作用的研究相对较少, 尤其是在 AL-CA 和 ATTR-CA 的应力分析方面。

本研究利用 CMR-FT 技术对 ATTR-CA 和 AL-CA 进行心肌应力分析, 并通过受试者工作特征 (receiver operating characteristic, ROC) 曲线评估应力参数对 CA 分型的价值。研究结果显示, ATTR-CA 组的应力参数显著低于 AL-CA 组, 通过 ROC 曲线分析发现, 多个应力参数对 CA 分型具有一定的准确性, 特别是心外膜下全局纵向应力被发现是鉴别两种类型的独立因素。这些结果为早期识别和区分 AL-CA 和 ATTR-CA 患者提供了重要依据, 对于改善 CA 患者的管理和预后具有积极的意义。详见内文第 23 页。

CMR在高血压心脏病中的应用进展
成长鑫, 王波, 张艳, 陈琳玉, 撒璐, 张应从, 李琛蓉 (208)

肝细胞癌微血管侵犯的影像学研究进展
史佳丽, 徐媛, 郭钰, 杨新梅, 刘建莉 (213)

人工智能在肝纤维化影像学中的研究进展
李富恺, 刘建莉 (219)

磁共振脂肪定量技术在肝脏肿瘤中的应用
夏娟, 李梁, 余成新, 潘君龙, 胡军 (224)

磁共振多模态功能成像在膀胱癌分期及分级中的应用研究进展
郭俊婷, 王效春 (229)



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Contents

ORIGINAL RESEARCH

CLINICAL ARTICLES

- 1 The value of DKI and DTI in the differential diagnosis of low-grade gliomas and encephalitis
ZHAO Kai, MA Xiaoyue, CHENG Jingliang, GAO Ankang, BAI Jie, WANG Peipei, ZHAO Guohua, GAO Eryuan, QI Jinbo
- 7 Study on MRI features of disc-condylar complex and semiquantitative evaluation of peridisc attachment in cases of temporomandibular joint disc displacement
ZHANG Guolai, LIAO Yanyang, WU Meina, ZHENG Pingping, PAN Zaixing, YAN Jinzhu
- 14 Assessment of carotid artery stenosis and hemodynamic risk factors related to stroke based on 4D Flow MRI
LU Fei, SUN Mengyao, MA Yue, JIANG Yueluan, SUN Yang, TONG Dan
- 23 Value of CMR feature-tracking imaging in discriminating subtypes of cardiac amyloidosis
ZHUANG Baiyan, LI Shuang, WANG Hui, ZHANG Hongkai, XU Lei
- 30 Study of the value of radiomics based on cardiac magnetic resonance in hypertrophic cardiomyopathy
LÜ Jing, ZHU Yongqi, ZHU Yanfang, HE Ying, WANG Yilin, WANG Pei, ZHU Li, LIU Yun
- 42 Apparent diffusion coefficient distinguishes histologic typing of lung cancer brain metastases and its correlation with the Ki-67 proliferation index
ZHOU Fengyu, ZHANG Bin, DONG Wenjie, ZHANG Peng, XUE Caiqiang, LIU Xianwang, HAN Tao, ZHOU Junlin
- 48 Surface-based morphological study on the relationship between cortical surface morphological changes and cancer-related fatigue changes in early chemotherapy for breast cancer
ZHOU Yanfei, LI Jing, FU Xiao, YUAN Wenjuan, WANG Hongzhi, YANG Lizhuang, LI Hai
- 56 Resting MRI study on the effect of δ -catenin over expression on short-term brain cognitive function in breast cancer patients after chemotherapy
XUE Mingtuan, DU Wei, CAO Jiajun, SONG Duan, ZHANG Junyi, MIAO Yanwei
- 63 Development of a nomogram based on diffusion weighted imaging of peritumoral liver tissue to predict local progression of recurrent hepatocellular carcinoma after hepatectomy
WANG Jing, ZENG Chaoqiang, TANG Mengyue, XU Min, ZHANG Xiaoming, CHEN Tianwu
- 71 Study on the detection efficiency of ^{18}F -PSMA-1007 PET/CT and mp-MRI in prostate cancer and its correlation with pathological grade
ZHOU Yunshu, CHEN Xiaohua, CHEN Zhiqiang, ZHANG Ruodi, LIU Shili, WANG Zhuo, ZHANG Shaoru, LI Peng, LI Yanmei

- 77 Differential diagnosis of MRI apparent diffusion coefficient for high-risk prostate cancer in the transition zone and its correlation with pathological grading group
LI Peng, LI Yan, XU Jie, JING Li
- 83 To analyze the value of radiomics based on different diffusion model parameter maps in the early diagnosis of clinically significant prostate cancer by magnetic resonance imaging
DU Bing, QI Xuan, YANG Hongkai, QI Dong, HE Yongsheng
- 90 The utility of deep learning-clinical combined model based on bi-parametric MRI for diagnosis of clinically significant prostate cancer
HU Chenhan, QIAO Xiaomeng, HU Jisu, BAO Jie, CAO Changhao, WANG Ximing
- 97 Evaluation of the value of DWI combined with T2 mapping sequences to identify prostate cancer and benign prostatic hyperplasia
LI Xiwei, CHEN Lihua, WANG Nan, LIN Liangjie, LIU Ailian
- 103 Predicting the occurrence of knee osteoarthritis based on MRI meniscus 3D convolutional neural network model
JIANG Kexin, XIE Yuhan, LI Mianwen, ZHANG Zhiyong, CHEN Shaolong, QIU Changzhen, ZHANG Xiaodong

ORIGINAL ARTICLES

- 108 Research on the recognition of brain functional connections in flight students based on multivariate pattern analysis
YE Lu, LIU Mengxuan, YAN Dongfeng, CHEN Xi, MA Shan
- 115 Processing of Chinese linguistic and prosodic signals in dichotic listening conditions: A fMRI study
XU Ziwei, MO Yin, SHI Yaoping, CAI Xirui
- 122 Experimental study of magnetic resonance targeted myelin probe Gd-DTDAS in multiple sclerotic rat myelin injury model
LIU Caiyun, SHAO Cuijie, WENG Na, LI Guodong, HUANG Danqi, LIU Jia, BIN Li, WANG Xu

TECHNICAL ARTICLES

- 129 Application value of VMHC and ReHo in evaluating tDCS in improving cognitive impairment after stroke
ZHONG Jiali, JING Xiaoshan, LIANG Ying
- 135 Application of artificial intelligence-assisted compressed sensing technology in brain 3D T2-FLAIR sequence acquisition and evaluation of white matter hyperintensity
CAO Jiajun, LIU Na, ZHONG Meimeng, YUAN Chang, ZHANG Yukun, MIAO Yanwei, SONG Qingwei
- 140 Diagnostic value of cardiac magnetic contrast-enhanced cine sequences in STEMI patients with microvascular obstruction
HU Yingying, GUO Yong, SUN Zheng, ZHAO Li, LIU Zhi, CHEN Nan, LU Jie
- 147 Effects of different flip angles and delay times on image quality of liver and biliary system in hepatobiliary phase images of Gd-BOPTA-enhanced magnetic resonance images
REN Xue, ZHAO Ying, ZHOU Liping, ZUO Can, WANG Nan, SONG Qingwei, LIN Liangjie, WANG Jiazheng, LIU Ailian, LIU Yuhui
- 155 Application of compressed sensing combined with parallel acquisition technique of breath-holding 3D LAVA FLEX sequence in rapid magnetic resonance imaging of liver
FANG Zirong, CHEN Qiuyan, YE Ling, YU Bo, CHEN Zhijian

About the cover

Cardiac amyloidosis (CA) is a rare heart condition characterized by the deposition of amyloid-like collagen fibers in the extracellular space of myocardial cells, leading to abnormal cardiac function. The most common types of CA are cardiac transthyretin-related amyloidosis (ATTR-CA) and cardiac light-chain amyloidosis (AL-CA). These two types exhibit significant differences in prognosis, with AL-CA patients having lower survival rates compared to those with ATTR-CA. Additionally, treatment methods vary between the two types, making early identification and classification crucial for effective treatment planning.

Currently, the clinical classification of CA relies primarily on invasive or radiation-based examinations such as immunohistochemistry, protein mass spectrometry, and scintigraphy. However, these methods have limitations, such as the need for endomyocardial biopsy and high costs. Therefore, there is an urgent need to find a new non-invasive method to distinguish between the two types of CA.

In recent years, cardiovascular magnetic resonance (CMR) imaging has been widely used as a non-invasive imaging technique for the diagnosis and assessment of heart disease. Cardiovascular magnetic resonance-feature tracking (CMR-FT) is an emerging post-processing technique that quantitatively analyzes myocardial strain from multiple dimensions, reflecting myocardium contractility, without the use of contrast agents. However, there is relatively limited research on the role of CMR-FT in the classification of CA, particularly in strain analysis for AL-CA and ATTR-CA.

This study utilized CMR-FT to analyze myocardial strain in ATTR-CA and AL-CA and evaluated the value of strain parameters for CA classification using Receiver operating characteristic (ROC) curves. The results showed that strain parameters in the ATTR-CA group were significantly lower than those in the AL-CA group. ROC curve analysis revealed that multiple strain parameters had a certain accuracy in CA classification, with subepicardial global longitudinal strain being identified as an independent factor for distinguishing between the two types. These findings provide important evidence for the early identification and differentiation of AL-CA and ATTR-CA patients, with positive implications for the management and prognosis of CA patients. Please see text page 23.

CASE REPORTS

- 162 A case of MRI manifestation of highly differentiated neuroendocrine tumor in spleen
WANG Yuxuan, CAO Yuntai, TAN Huaqing, LONG Changyou, ZHANG Yumeng, GAO Xukun
- 164 Primary neuroendocrine tumor of the mesentery: A case report
ZHANG Yifei, BAO Haihua, LONG Changyou, TIAN Pengqi

REVIEWS

- 167 The application and progress of dynamic functional connectivity in idiopathic generalized epilepsy
ZHANG Jiaren, GU Xiaoyu, HE Lian, MA Wenmin, WU Guangrong, LI Dongxue, JIANG Lin
- 172 Advances of multiparametric MRI and machine learning in cognitive impairment related to cerebral small vessel disease
HUANG Jing, LUO Tianyou
- 178 Research progress on freezing of gait in Parkinson's disease based on multimodal MRI
HOU Junbao, SHI Qiye, WANG Yang, PENG Xiaohan, CAO Danna
- 183 Application progress of neuromelanin-sensitive MRI in Parkinson's disease
WANG Xiaoran, ZHANG Fulan, MA Jingxu
- 188 Progresses of neuroimaging research on neuropathic pain after spinal cord injury
SUN Chuchu, CHEN Nan, HE Xun
- 192 Research progression of MRI radiomics in glioma
LIANG Qian, ZHANG Hui
- 198 Research progress of magnetic resonance imaging artificial intelligence technology in the treatment of pituitary neuroendocrine tumors
WU Jialei, WANG Yubo, LI Xiaofan, LI Yan, TIAN Xubing, ZHANG Yisong, YAN Xun, LUO Da, YANG Bin
- 202 The progress and status of MRI in post concussion syndrome
YAN Jiahao, HUANG Wenjing, ZHANG Jing
- 208 Progress in the application of cardiac magnetic resonance in hypertensive heart disease
CHENG Changxin, WANG Bo, ZHANG Yan, CHEN Linyu, SA Lu, ZHANG Yingcong, LI Chenrong
- 213 Radiographic progress of microvascular invasion in hepatocellular carcinoma
SHI Jiali, XU Yuan, GUO Yu, YANG Xinmei, LIU Jianli
- 219 Research progresses of artificial intelligence in imaging of liver fibrosis
LI Fukai, LIU Jianli
- 224 Application of magnetic resonance fat quantification technique in liver tumors
XIA Juan, LI Liang, YU Chengxin, PAN Junlong, HU Jun
- 229 Research progress in multimodal function magnetic resonance imaging in staging and grading of bladder cancer
GUO Junting, WANG Xiaochun