

MRI

ISSN 1674-8034

CN 11-5902/R

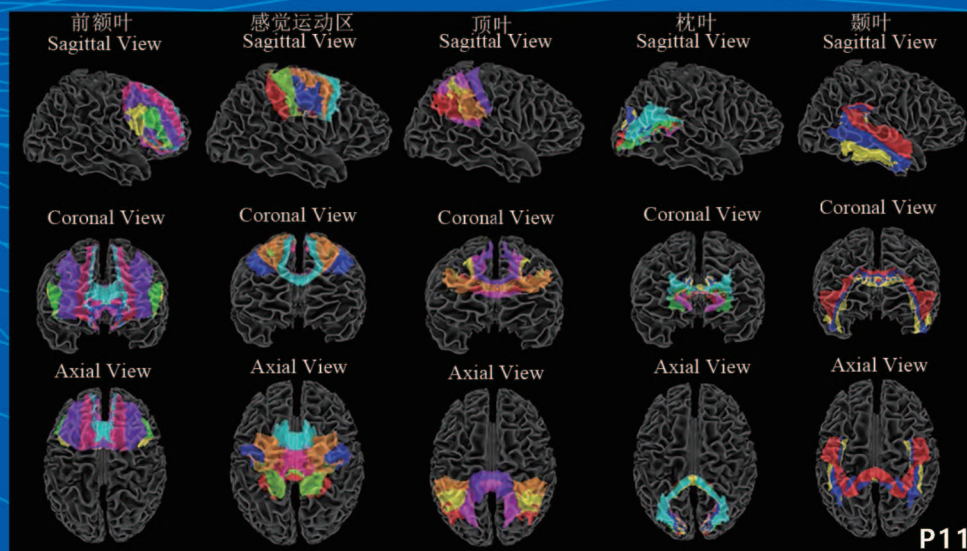
CODEN: CCIHBW



磁共振成像

CIGONGZHEN CHENGXIANG

CHINESE JOURNAL OF MAGNETIC RESONANCE IMAGING



中国科技核心期刊数据库 源期刊 美国《化学文摘》(CA) 源期刊
 中国学术期刊网络出版总库 源期刊 波兰《哥白尼索引》(IC) 源期刊
 中文科技期刊数据库 源期刊 美国《乌利希期刊指南》 源期刊
 中国科技论文统计源期刊 《中文核心期刊要目总览》 入编期刊
 中文生物医学期刊文献数据库源期刊 中国生物医学期刊引文数据库源期刊
 中国科学引文数据库 (CSCD) 核心期刊 北大核心期刊 中国科技核心期刊
 荣获2015年“中国医药卫生媒体最佳实践创新奖”

主管单位：中华人民共和国国家卫生健康委员会
 主办单位：中国医院协会 首都医科大学附属北京天坛医院

第14卷
第6期
 2023年6月
 总第132期

磁共振成像

二〇二三年

第十四卷

第六期

总第一百三十二期

《磁共振成像》杂志社有限公司

磁共振成像

月刊
总第132期
2010年1月创刊

2023年第14卷第6期
2023年6月20日出版

刊名题写：时任第十一届全国人大常委会副委员长韩启德

主管单位 中华人民共和国国家卫生健康委员会

主办单位
中国医院协会
首都医科大学附属北京天坛医院

终身名誉主编 戴建平

主编 金征宇
副主编 陈敏 程敬亮 付海鸿
贺光军 洪楠 刘士远
马林 宋彬 田捷
王梅云 鲜军舫 严福华
赵心明

社长 贺光军
编辑部主任 王志强
责任编辑 顾立萍 王婷
王志强
责任校对 张琴 江俊
学科编辑 陈佳杰 徐臣
韩小伟 胡磊
出版单位 《磁共振成像》
杂志社有限公司

发行范围 公开
发行单位 本刊发行部

国内发行 中国邮政集团有限公司
北京市报刊发行局
邮发代号 2-855
国外总发行 中国国际图书贸易集团有限公司
国外发行代号 M 8958
印刷单位 北京科信印刷有限公司

电话 010-67113815
E-mail editor@cjmri.cn
网址 www.chinesemri.com
定价 每册30元

国内统一连续出版物号
CN 11-5902/R

国际标准连续出版物号
ISSN 1674-8034

广告发布登记证号 京西市监广登字20170242号
本刊刊出的所有论文不代表本刊编委会的观点，除非特别声明

目次

临床指南·专家共识

胎儿疾病大孔径MRI临床应用专家共识
……………湖北省医学会放射学分会儿科学组,《磁共振成像》编委会 (1)

论著

临床研究

阿尔茨海默病和轻度认知障碍的大脑半球间结构连接异常:一项基于DTI的研究
……………刘凡, 宁瑞鹏, 余秋蓉, 尹大志, 李倩文,
刘灵, 李任任, 张卫, 李云霞, 范明霞 (9)

基于静息态fMRI区分健康老年人认知水平的MVPA方法研究
……………汪方毅, 唐杰庆, 刘倩, 余成新, 李博, 丁帆 (18)

癫痫神经影像学研究的文献计量学分析
……………高璐, MUSTAFA Salimeen Abdelkareem Salimeen, 王小珩,
张纳, 张华, 李焕发, 孙亲利, 张卫善, 杨健 (26)

重离子疗法治疗肝细胞癌的MRI影像评估价值
……………赵致平, 关钊钰, 王建花, 张雁山, 王慧娟 (32)

原发性痛经多频段的脑区域一致性改变:一项静息态功能磁共振研究
……………刘妮, 张亚男, 戴娜, 霍健伟, 张磊, 黄怡然, 刘军莲 (39)

基于T2WI和CE-T1WI影像组学集成模型在预测HIFU消融子宫肌瘤疗效中的
价值……………李承蔚, 肖智博, 何智敏, 吕发金 (45)

致密性骨炎与ax-SpA骶髂关节骨髓T2WI-FS高信号MRI征象分析
……………刘超然, 李文娟, 祝云飞, 何小俊, 张珂, 洪国斌 (52)

技术研究

磁共振波谱联合减影技术在高级别胶质瘤影像组学分级预测的研究
……………宋静, 宗会迁, 张娅, 柳青, 魏昊业, 杨存, 解立志 (59)

超高场7 T MRI对三叉神经及邻近血管的显示的应用研究
……………毕京凤, 刘欣瑶, 张喆, 荆京, 隋滨滨 (66)

压缩感知技术三维MRI矢状位T2加权频率衰减反转恢复序列显示
距腓前韧带的价值探索……………张小艳, 马培旗, 袁玉山,
王仲秋, 彭彬, 张宗夕 (71)

经验交流

病理性乳头溢液:乳腺导管造影与MRI的对比研究
……………申霞, 莫荣广, 周志琴, 蒋国元 (75)

病例报告

双胎妊娠完全性葡萄胎与胎儿共存伴肺转移一例
.....梁莉, 陈瑞蓉, 徐生芳 (82)

综述

化疗相关认知障碍磁共振成像研究进展
.....陈晴晴, 沈晶, 朱贞洋, 姜斌, 伍建林 (85)

基于MEGA-PRESS的 γ -氨基丁酸定量在神经系统疾病中的临床研究进展
.....符晓娜, 汪晶 (89)

酰胺质子转移磁共振成像在帕金森病中的研究进展
.....米日班·买买提库尔班, 张树贤, 马景旭, 王红 (94)

基于弥散张量成像及图论分析法的孤独症谱系障碍患者脑结构网络研究进展
.....褚瑶, 陈森森, 于昊, 陈月芹 (99)

疼痛-抑郁症共病患者脑功能磁共振成像研究进展
.....田雨, 彭娟, 刘松江, 陈昆涛 (103)

功能磁共振成像在中西医治疗睡眠障碍中的应用进展
.....伍伦鑫, 王欧成, 刘勇 (108)

4D-ASL在脑血管疾病中的应用研究进展
.....林小翼, 张宗利 (113)

椎动脉发育不良及其与后循环缺血性脑卒中关系的影像学研究进展
.....苏慧荣, 宋建勋, 黄腾达 (119)

影像组学和深度学习在脑膜瘤中的研究进展
.....杨慧敏, 李文鑫, 刘艳美, 禹雯婧, 王倩倩, 姜兴岳, 刘新疆 (124)

MRI影像组学在肺癌中的研究进展
.....尹猛, 秦文恒, 孙占国 (129)

2022年心脏磁共振研究进展
.....张华莹, 朱乐怡, 赵世华, 陆敏杰 (133)

生成对抗式网络在心脏磁共振中的应用
.....刘维肖, 方进, 王莹, 莫笑开, 张水兴 (139)

磁共振T2 mapping技术在心脏疾病中的应用研究进展
.....贾斯齐, 颜春龙, 金字华, 齐先龙 (145)

多参数MRI影像组学在乳腺癌诊疗中的研究进展
.....黄晓妮, 江远亮, 黄文才 (151)

MRI及影像组学评估不同分子亚型乳腺癌新辅助治疗疗效的研究进展
.....陈淑奎, 车树楠, 李静 (156)

增殖型肝细胞癌的MRI特征与研究进展
.....吕园园, 于长江, 朱绍成 (161)

mpMRI影像组学在前列腺癌诊疗中的研究进展
.....吴春梅, 李思琪, 杨存霞, 殷小平 (166)

基于多参数MRI的影像组学在子宫内膜癌淋巴血管间隙侵犯中的研究进展
.....赵纪福, 曹新山 (171)

影像组学预测高级别浆液性卵巢癌异质性与预后的研究进展
.....胡鹤, 张瞳, 杨姣, 高凯华, 吴慧 (176)

卵巢肿瘤ADNEX MR评分系统的应用解读及研究进展
.....朱华东, 崔磊, 印洪刚, 陆炯, 张勤 (182)

封面文章

阿尔茨海默病(Alzheimer's disease, AD)是一种中枢神经系统原发性、进行性发展的退行性疾病,目前已上升为常见死亡原因的第四位。由于目前对于AD的治疗仍缺乏有效的方法,越来越多的研究更加关注其前驱阶段——轻度认知障碍(mild cognitive impairment, MCI)。但对于AD和MCI的脑结构异常的差异及其与临床表现的关系仍不明确。

胼胝体是脑内最大的、连接两个半球的神经纤维束,它是脑半球间信息交流和协调的结构基础。已有磁共振弥散张量成像研究显示AD和MCI胼胝体纤维束的具体受累部位和严重程度尚存很大争议,这可能与所采用的胼胝体区段划分方法不够精细有关。最近的研究提出高分辨胼胝体纤维束模板(trancallosal tract template, TCATT),依据胼胝体纤维束连接半球间不同的同位脑区,将其划分为32条。TCATT模板克服了难以将胼胝体纤维束与所连接的脑区进行准确对应的不足,为进一步明确AD和MCI经胼胝体神经纤维束受损位置提供了有效工具。

本研究采用TCATT模板对比分析了AD组、MCI组和健康对照组的胼胝体纤维束精细微结构,计算弥散张量成像的水弥散指标——分数各向异性(fractional anisotropy, FA)和平均弥散率(mean diffusivity, MD)。组间比较采用单因素方差分析ANOVA,然后进行事后比较(LSD-*t*),最后利用Pearson相关性分析分别计算AD组和MCI组的差异脑区的经胼胝体神经纤维束的水弥散指标值与蒙特利尔认知评估基本量表(Montreal Cognitive Basic Assessment, MoCA-B)评分和日常生活活动能力(Activities of Daily Living, ADL)评分的相关性。研究结果显示,AD组比MCI组的胼胝体结构损伤更严重且区域更为广泛;AD组的半球间微结构损伤(FA值降低和MD值升高)与日常生活活动能力(ADL评分)下降显著相关,表明大脑半球间多个同位脑区的经胼胝体纤维束结构完整性损伤或许可作为评估AD患者日常生活活动能力减退程度的重要参考指标。详见内文第9页。








脊髓型颈椎病脑影像学改变的MRI研究进展
吴开富, 王翔 (187)

MRI深度学习在膝关节骨性关节炎中的研究进展
高曦, 谢希, 王文韬 (192)

磁共振报告基因成像原理及应用进展
孙君, 郭轶 (198)

磁共振成像

办精品期刊 促学科发展 惠百姓健康

 官方网站	 在线投稿	 知乎平台	 官方微博	 搜狐平台	 网易平台	 哔哩哔哩	 企鹅号	 微信平台
--	--	--	--	--	--	--	---	--

CHINESE JOURNAL OF MAGNETIC RESONANCE IMAGING

CHINESE JOURNAL OF MAGNETIC RESONANCE IMAGING

ISSN 1674-8034, CN 11-5902/R, CODEN CCIHBW, Established in 2010 Monthly Vol. 14, No. 6, Jun 20, 2023

Responsible Institution

National Health Commission of the
People's Republic of China

Sponsor

Chinese Hospital Association
Beijing Tiantan Hospital of Capital
Medical University

Lifetime Honorary Editor-in-Chief

DAI Jianping

Editor-in-Chief

JIN Zhengyu

Associate Editor-in-Chief

CHEN Min	CHENG Jingliang
FU Haihong	HE Guangjun
HONG Nan	LIU Shiyuan
MA Lin	SONG Bin
TIAN Jie	WANG Meiyun
XIAN Junfang	YAN Fuhua
ZHAO Xinming	

President

HE Guangjun

Editing

Editorial Board of Chinese Journal of
Magnetic Resonance Imaging

Publishing

Publishing House of Chinese Journal of
Magnetic Resonance Imaging

General Distributor

Domestic: Beijing Newspaper and
Periodical Distribution Bureau of China
Post Group Co., Ltd.
Postal Code: 2-855
Overseas: China International Book
Trade Group Co., Ltd., P.O. Box 399,
Beijing, China
Code No.: M 8958

Mail Order

Third Floor, Building 4, No. 358,
Yudaihe East Street, Tongzhou District,
Beijing 101100, China

Tel & Fax 8610-67113815

E-mail editor@cjmri.cn

Website www.chinesemri.com

Price: USD 30.00

Contents

CLINICAL GUIDELINES & EXPERT CONSENSUS

- 1 Expert consensus on the clinical application of large bore MRI in fetal disease
*Pediatric Group of Radiology Branch of Medicine Society of Hubei Province,
Editorial Board of Chinese Journal of Magnetic Resonance Imaging*

ORIGINAL RESEARCH

CLINICAL ARTICLES

- 9 Interhemispheric structural connectivity abnormalities in Alzheimer's disease and mild cognitive impairment: A DTI-based study
LIU Fan, NING Ruipeng, YU Qirong, YIN Dazhi, LI Qianwen, LIU Ling, LI Renren, ZHANG Wei, LI Yunxia, FAN Mingxia
- 18 MVPA method study for distinguishing the cognitive level of healthy elderly people based on resting-state fMRI
WANG Fangyi, TANG Jieqing, LIU Qian, YU Chengxin, LI Bo, DING Fan
- 26 Bibliometric analysis in neuroimaging of epilepsy research
GAO Lu, MUSTAFA Salimeen Abdelkareem Salimeen, WANG Xiaoyu, ZHANG Na, ZHANG Hua, LI Huanfa, SUN Qinli, ZHANG Weishan, YANG Jian
- 32 MR imaging evaluation of heavy-ion therapy for hepatocellular carcinoma
ZHAO Zhiping, GUAN Zhaoyu, WANG Jianhua, ZHANG Yanshan, WANG Huijuan
- 39 Brain regional homogeneity alterations in multi-frequency bands in primary dysmenorrhea: A resting-state functional magnetic resonance imaging study
LIU Ni, ZHANG Ya'nan, DAI Na, HUO Jianwei, ZHANG Lei, HUANG Yiran, LIU Junlian
- 45 Value of radiomics stacking ensemble learning model based on T2WI and CE-T1WI in predicting the efficacy of HIFU ablation of uterine fibroid
LI Chengwei, XIAO Zhibo, HE Zhimin, LÜ Fajin
- 52 MRI features of sacroiliac joint bone marrow fat-saturated T2WI high signal in osteitis condensans ilii
LIU Chaoran, LI Wenjuan, ZHU Yunfei, HE Xiaojun, ZHANG Ke, HONG Guobin

TECHNICAL ARTICLES

- 59 MRS combined with subtraction technique in the prediction of high grade glioma radiomics grading
SONG Jing, ZONG Huiqian, ZHANG Ya, LIU Qing, WEI Haoye, YANG Cun, XIE Lizhi
- 66 The visualization of trigeminal nerve and its adjacent vessels using ultra-high field 7 T MRI
BI Jingfeng, LIU Xinyao, ZHANG Zhe, JING Jing, SUI Binbin
- 71 The Value of compressed sensing 3D MRI sagittal T2 weighted imaging-spectral attenuated in-version recovery to display the anterior talofibular ligament
ZHANG Xiaoyan, MA Peiqi, YUAN Yushan, WANG Zhongqiu, PENG Bin, ZHANG Zongxi

EXPERIENCE EXCHANGE

- 75 Pathological nipple discharge: A comparative study of galactography and MRI

SHEN Xia, MO Rongguang, ZHOU Zhiqin, JIANG Guoyuan

CASE REPORT

- 82 Complete hydatidiform mole and coexisting fetus with pulmonary metastases: One case report

LIANG Li, CHEN Ruirong, XU Shengfang

REVIEWS

- 85 Advances in multimodal MRI research on chemotherapy-related cognitive impairment

CHEN Qingqing, SHEN Jing, ZHU Zhenyang, JIANG Bin, WU Jianlin

- 89 The clinical research progress of gamma-aminobutyric acid quantification based on MEGA-PRESS in neurological diseases

FU Xiaona, WANG Jing

- 94 Research progress of amide proton transfer magnetic resonance imaging in Parkinson's disease

MIRIBAN-Maimaitikuerban, ZHANG Shuxian, MA Jingxu, WANG Hong

- 99 Progress in the study of brain structural network in patients with autism spectrum disorder based on diffusion tensor imaging and graph theory

CHU Yao, CHEN Miaomiao, YU Hao, CHEN Yueqin

- 103 Research progress of brain function magnetic resonance imaging in patients with pain-depression comorbidity

TIAN Yu, PENG Juan, LIU Songjiang, CHEN Kuntao

- 108 Application progress of functional magnetic resonance imaging in the treatment of sleep disorder with traditional Chinese and western medicine

WU Lunxin, WANG Oucheng, LIU Yong

- 113 Research progress on the application of 4D-ASL in cerebrovascular disease

LIN Xiaoyi, ZHANG Zongli

- 119 Advances in imaging research of vertebral artery hypoplasia and its relationship with posterior circulation ischemic stroke

SU Huirong, SONG Jianxun, HUANG Tengda

- 124 Research progress of deep learning and radiomics in meningioma

YANG Huimin, LI Wenxin, LIU Yanmei, YU Wenjing, WANG Qianqian, JIANG Xingyue, LIU Xinjiang

- 129 Research progress of MRI radiomics in lung cancer

YIN Meng, QIN Wenheng, SUN Zhanguo

- 133 Research progresses of cardiac magnetic resonance in 2022

ZHANG Huaying, ZHU Leyi, ZHAO Shihua, LU Minjie

- 139 Application of generative adversarial networks in cardiac magnetic resonance

LIU Weixiao, FANG Jin, WANG Ying, MO Xiaokai, ZHANG Shuixing

- 145 Research progress on the application of magnetic resonance T2 mapping technology in heart disease

JIA Siqu, YAN Chunlong, JIN Yuhua, QI Xianlong

- 151 Research progress of multiparametric MRI radiomics in breast cancer

HUANG Xiaoni, JIANG Yuanliang, HUANG Wencai

- 156 Progress of MRI and Radiomics in predicting the response to neoadjuvant therapy for breast cancer in different molecular subtypes

CHEN Shuluan, CHE Shu'nan, LI Jing

- 161 MRI features and research progress of proliferative hepatocellular carcinoma

LÜ Yuanyuan, YU Changjiang, ZHU Shaocheng

About the cover

Alzheimer's disease (AD) is a primary, progressive degenerative disease of the central nervous system, and has been currently considered the fourth-leading cause of death. As lacking of effective treatments for AD, a growing body of studies have focused on the precursor stage of AD—mild cognitive impairment (MCI). However, the differences of brain structural abnormalities between AD and MCI and their relationship with clinical manifestations are still largely unclear.

The corpus callosum, which is the largest nerve fiber bundle in human brain, connects the two cerebral hemispheres. It is the structural basis of information exchange and coordination between the two hemispheres. The specific regions and severity of the corpus callosum damage in AD and MCI remain controversial, which may be attributed to the insufficient segmentation of the corpus callosum in previous diffusion tensor imaging studies. A recent study created a high-resolution trancallosal tract template (TCATT), which identified 32 trancallosal tracts connecting the interhemispheric homologous brain areas. The TCATT template overcomes the difficulty of accurately mapping the corpus callosum fiber bundles to the connected brain regions, providing an effective tool for precisely identifying the damaged locations of the corpus callosum in AD and MCI.

This study used TCATT template to analyze and compare the fine microstructure of the 32 trancallosal tracts in AD, MCI and healthy control groups. The commonly used diffusive metrics, i.e. fractional anisotropy (FA) and mean diffusivity (MD) were calculated based on diffusion tensor imaging. One-way analysis of variance (ANOVA) was used for comparison between groups, followed by post hoc comparison (LSD-*t*). Finally, in the AD and MCI groups, Pearson correlation analysis was performed between the diffusive metrics (FA and MD) of trancallosal tracts with Montreal Cognitive Basic Assessment (MoCA_B) scores and Activities of Daily Living (ADL) scores. The results showed that structural damage of the corpus callosum was more severe and extensive in AD group than that in MCI group. In AD group, interhemispherical microstructure damage (decreased FA values and increased MD values of trancallosal tracts) was significantly associated with the ADL scores, suggesting that the severity of the trancallosal tracts damage may be used as an important reference index to assess the ability of living activities in AD. Please see text page 9.

- 166 Advances in multiparametric magnetic resonance imaging radiomics in the management of prostate cancer
WU Chunmei, LI Siqi, YANG Cunxia, YIN Xiaoping
- 171 Research progress of radiomics based on multi-parameter MRI in lymphatic space invasion of endometrial cancer
ZHAO Jifu, CAO Xinshan
- 176 Radiomics predicts the heterogeneity and prognosis of high-grade serous ovarian cancer
HU He, ZHANG Tong, YANG Jiao, GAO Kaihua, WU Hui
- 182 Application interpretation and research progress of ADNEX MR scoring system for ovarian tumors
ZHU Huadong, CUI Lei, YIN Honggang, LU Xian, ZHANG Qin
- 187 Research progress of MRI on brain in patients with cervical spondylotic myelopathy
WU Kaifu, WANG Xiang
- 192 Research progress of osteoarthritis of the knee using MRI: based on deep learning
GAO Xi, XIE Xi, WANG Wentao
- 198 Principle and application progress of magnetic resonance reporter gene imaging
SUN Jun, GUO Yi

磁共振成像

办精品期刊 促学科发展 惠百姓健康

官方网站	在线投稿	知乎平台	官方微博	搜狐平台	网易平台	哔哩哔哩	企鹅号	微信平台

CHINESE JOURNAL OF MAGNETIC RESONANCE IMAGING