

磁共振成像

月刊
2010年1月创刊

2021年第12卷第9期
2021年9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 中华人民共和国国家卫生
健康委员会

主办
中国医院协会
首都医科大学附属北京天坛医院

顾问
刘玉清 李果珍 唐孝威
黄其鏊 苏学曾 陈星荣
闵鹏秋 高元桂 王承缘

主编 戴建平
副主编 郭启勇 祁吉 李坤成
贾文霄 赵斌 金征宇
田捷 张宝库 薛敏
卢光明 程敬亮

社长 贺光军
编辑部主任 马军
责任编辑 隋行芳
责任校对 彭如臣 顾立萍
英文编审 薛华丹 王怡宁
出版 《磁共振成像》
杂志社有限公司

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 北京科信印刷有限公司

邮购
磁共振成像编辑部
地址：北京市通州区玉带河大街
358号4号楼3层，邮编：101100

电话 010-67113815
E-mail editor@cjmri.cn
网址 www.chinesemri.com
定价 每册30元 全年360元

中国标准连续出版物号
ISSN 1674-8034
CN 11-5902/R

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

论著

临床研究

- 前庭康复对前庭偏头痛患者大脑自发性神经活动影响的静息态功能磁共振研究
……秦新, 胡晓飞, 陈杰, 王清镇, 刘赫, 王尧, 罗为, 李光建, 王健 (1)
- 酰胺质子转移MRI在鼻咽肿瘤诊断中的初步应用
……杨倩, 邹丽艳, 刘周, 李丽, 肖嘉辉, 王鸣宇, 王思远, 罗德红 (6)
- MR 高清扩散张量成像在甲状腺相关性眼病视神经病变的相关研究
……张小辉, 张志伟, 吕发金, 刘存, 龙建, 郁斌, 李咏梅 (11)
- 心脏磁共振成像评价肥厚型心肌病左心室乳头肌形态学改变的初步研究
……徐森, 孙玉, 侯洁, 李晓岗, 尤红蕊, 张蓉蓉, 齐妙, 张立波, 杨本强 (15)
- 肝脏特异性对比剂MRI优化序列在高风险人群中筛查小肝癌的价值研究
……王聪, 郭然, 师丹丹, 于长江, 周怡然, 朱绍成 (20)
- 基于2018版肝脏影像报告及数据系统评估CT及MRI对小于等于3 cm肝细胞性
肝癌的诊断价值
……姜健, 王维, 崔羽楠, 张茂伟, 陈丹, 方鑫, 刘爱连 (25)
- 心脏磁共振鉴别两种常见类型心肌淀粉样变性的初步探索
……廖旋, 曾牧, 张嘉敏, 刘军 (30)

基础研究

- 网游成瘾者对错失机会更加敏感:基于静息态功能MRI研究
……黄浦江, 巩岳, 张楦瑄, 李爽, 刘志远 (36)
- 重复经颅磁刺激对海洛因成瘾者左侧执行控制网络影响的fMRI研究
……金龙, 付艳文, 王澍, 张微, 魏熠鑫, 王玮, 袁梦晖, 李强, 魏龙晓 (40)
- 下腰痛患者脑灰质体积及结构网络的fMRI研究
……姜健, 杜伟, 崔羽楠, 蒋玉涵, 刘爱连, 苗延巍 (45)

经验交流

- 3.0 T磁共振增强三维翻转恢复快速自旋回波序列对三叉神经颅外分支的成像评价
……刘明, 段庆红, 李德炯, 张国平, 唐修竹 (49)
- 基于T2WI的影像组学模型预测胶质母细胞瘤Ki-67的表达水平
……朱雪超, 何玉麟, 邹莺莺, 黎斌, 万天意, 唐辛, 余秋月 (53)
- 肾透明细胞癌扩散峰度成像与病理学相关性研究
……冯强, 张瑞明, 房伟, 马智军 (57)
- 动态对比增强磁共振成像联合扩散加权成像对前列腺中央腺体癌的诊断价值
……罗拥志, 王习 (61)
- 常规MRI检查及扩散加权成像在直肠癌术前评估中的应用价值
……杨宏宇, 高旭, 沈秀芝, 钟佳利, 彭如臣 (65)

酰胺质子转移加权成像联合 T2 mapping 序列对子宫内膜癌术前风险评估的
价值初探马长军, 刘爱连, 田士峰, 陈丽华, 王楠,
宋清伟, 林良杰, 王家正, 孟醒 (69)

基层论坛

磁共振成像在腹外韧带样型纤维瘤病的诊断价值
.....韩长年 (73)

病例报告

颅内原发性 Rosai-Dorfman 病一例唐玲玲, 赵庆云, 黄小华, 刘念 (75)

肾移植术后狭窄性心包炎多参数心脏磁共振表现一例
.....黄蔚蔚, 张军, 张玲艳, 智琲琲, 罗松 (77)

卵巢子宫内膜样腺纤维瘤复发并蒂扭转 MRI 表现一例
.....马密密, 杨浩然, 曹新山 (79)

讲座

颅内 T2WI 低信号疾病诊断思路分析
.....赵雪梅, 钱银锋 (81)

综述

卷积神经网络在轻度认知障碍中的影像学研究进展
.....李晓陵, 王敬贤, 李昂, 李孟, 曹丹娜,
王丰, 崔璇, 姚春丽, 蔡丽娜 (88)

动脉自旋标记成像对早产儿脑损伤的早期诊断及预后评估研究进展
.....刘颖, 霍然, 王箐, 袁慧书 (91)

高分辨率磁共振血管壁成像在颅内动脉粥样硬化斑块上的研究进展
.....王红茹, 高阳, 吴琼 (95)

多模态磁共振成像技术在脑胶质瘤基因分型及预后评估中的研究进展
.....赵焱, 白岩, 王梅云 (98)

热射病中枢神经系统 MRI 应用进展徐浩然, 李军 (103)

心脏磁共振成像在心肌肥厚病变组织和功能定量评价中的研究进展
.....郭炜, 王晓华 (106)

肝硬化食管静脉曲张及出血风险影像学研究进展
.....刘宏, 刘光耀, 周俊林 (109)

肾癌的多模态 MRI 研究进展余薇, 杨阳, 邬颖华 (113)

化学交换饱和和转移成像技术在肌肉骨骼系统的研究进展
.....王梅, 张晓东 (116)

斜外侧腰椎椎间融合术的术前影像学评估研究进展
.....韩孟龙, 方向军, 贺中云, 颜学亮 (121)

勘误声明(112)

资讯(125)

封面文章

鼻咽癌是我国华南地区最常见的头颈恶性肿瘤之一。尽管鼻咽癌对于放疗非常敏感,病死率呈现逐年下降的趋势,但是仍有高达 20% 的患者由于对放疗敏感性的个体差异出现了治疗失败的情况,因此,如何早期精准地预测治疗失败的患者并进行相应的干预是延长局部进展期鼻咽癌患者生存时间的关键。磁共振检查不仅有多种结构成像可以对病灶形态、范围等进行清晰地显示,而且有多种磁共振功能成像序列从不同功能角度提供反映肿瘤的生物行为、血流动力学、组织微结构、肿瘤代谢等的多种功能信息。因此磁共振成像是头颈部病变,尤其是鼻咽病变影像检查的重要方式之一。

酰胺质子转移(amide proton transfer,APT)作为一种可以进行肿瘤代谢的磁共振分子影像技术受到广泛关注,APT 成像可以通过无创定量组织内的酰胺质子从代谢角度间接地反映不同组织和病灶细胞增殖和蛋白质代谢情况,有望在多种疾病,尤其是肿瘤领域得到广泛应用。目前,APT 技术已经在颅脑、乳腺、子宫等部位疾病的诊断和疗效评价各方面进行了广泛的研究,其临床价值也得到多项研究的证实。但目前鲜有 APT 技术应用于头颈部的报道,原因是头颈部组织结构复杂,易造成磁敏感伪影,易出现呼吸、吞咽等生理运动伪影,且 APT 成像对于磁场均匀性要求比较高,对运动特别敏感。因此,在技术上将 APT 成像应用于头颈部充满挑战。

该研究中,作者使用临床应用的 3.0 T 磁共振扫描仪对鼻咽癌患者进行 APT 扫描,初步探索其在鼻咽部应用的可行性。详见内文第 6~10 页。

CHINESE JOURNAL OF MAGNETIC RESONANCE IMAGING

ISSN 1674-8034, CN 11-5902/R, CODEN CCIHBW, Established in 2010 Monthly Vol. 12, No. 9, Sep 20, 2021

Responsible Institution

National Health Commission of the
People's Republic of China

Sponsor

Chinese Hospital Association
Beijing Tiantan Hospital of Capital
Medical University

International Consulting Editor

E. Mark Haacke, Ph.D. (USA)
Hedvig Hricak, M.D., Ph.D. (USA)
Jürgen Hennig, Ph.D. (USA)
Walter Kucharczyk, M.D. (CA)
William G. Bradley, Jr, M.D., Ph.D. (USA)
Zang-Hee Cho, Ph.D. (KR)

Advisory Members

LIU Yuqing LI Guozhen
TANG Xiaowei HUANG Qiliu
SU Xuezheng CHEN Xingrong
MIN Pengqiu GAO Yuanguai
WANG Chengyuan

Editor-in-Chief

DAI Jianping

Associate Editor-in-Chief

GUO Qiyong QI Ji LI Kuncheng
JIA Wen-xiao ZHAO Bin JIN Zhengyu
TIAN Jie ZHANG Baoku XUE Min
LU Guangming CHENG Jingliang

President

HE Guangjun

Editing

Editorial Office, Chinese Journal of
Magnetic Resonance Imaging

Publishing

Publishing House of Chinese Journal
of Magnetic Resonance Imaging

General Distributor

Domestic: China Post Group
Corporation Beijing Branch
Overseas: China International Book Trading
Corporation, 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

ORIGINAL RESEARCH

CLINICAL ARTICLES

- 1 Effect of vestibular rehabilitation on spontaneous brain activity in patients with vestibular migraine: a resting state MRI study
QIN Xin, HU Xiaofei, CHEN Jie, WANG Qingzhen, LIU He, WANG Yao, LUO Wei, LI Guangjian, WANG Jian
- 6 Preliminary application of amide proton transfer-MRI in diagnosis of nasopharyngeal carcinomas
YANG Qian, ZOU Liyan, LIU Zhou, LI Li, XIAO Jiahui, WANG Mingyu, WANG Siyuan, LUO Dehong
- 11 The study of high-resolution diffusion tensor imaging in thyroid-associated ophthalmopathy
ZHANG Xiaohui, ZHANG Zhiwei, LÜ Fajin, LIU Cun, LONG Jian, YU Bin, LI Yongmei
- 15 Preliminary study on papillary muscle morphology of the left ventricle in patients with hypertrophic cardiomyopathy by cardiac MR imaging
XU Sen, SUN Yu, HOU Jie, LI Xiaogang, YOU Hongrui, ZHANG Rongrong, QI Miao, ZHANG Libo, YANG Benqiang
- 20 Study on the value of liver-specific contrast agent MRI abbreviated sequence in screening small hepatocellular carcinoma in high-risk population
WANG Cong, GUO Ran, SHI Dandan, YU Changjiang, ZHOU Yiran, ZHU Shaocheng
- 25 Diagnostic performance of MRI and CT for hepatocellular carcinoma less than 3 cm based on liver reporting and data system version 2018
JIANG Jian, WANG Wei, CUI Yunan, ZHANG Maowei, CHEN Dan, FANG Xin, LIU Ailian
- 30 Tentative discussion on cardiac magnetic resonance in differentiating common types of cardiac amyloidosis
LIAO Xuan, ZENG Mu, ZHANG Jiamin, LIU Jun

ORIGINAL ARTICLES

- 36 The stronger sensitivity to missed chances in individuals with IGD: a resting-state fMRI study
HUANG Pujiang, GONG Yue, ZHANG Zhenyu, LI Shuang, LIU Zhiyuan
- 40 The effects of repetitive transcranial magnetic stimulation on the left executive control network in heroin dependent individuals: a resting-state fMRI study
JIN Long, FU Yanwen, WANG Shu, ZHANG Wei, WEI Yixin, WANG Wei, YUAN Menghui, LI Qiang, WEI Longxiao
- 45 Brain gray matter volume and functional brain network in patients with lower back pain: a MRI study
JIANG Jian, DU Wei, CUI Yunan, JIANG Yuhan, LIU Ailian, Miao Yanwei

EXPERIENCE EXCHANGES

- 49 Evaluation on the visualization of the extracranial branch of trigeminal nerve using the 3.0 T MR CE 3D-STIR TSE sequence
LIU Ming, DUAN Qinghong, LI Dejong, ZHANG Guoping, TANG Xiuzhu
- 53 Prediction of Ki-67 expression level in glioblastoma by radiomics model based on T2WI
ZHU Xuechao, HE Yulin, WU Yingying, LI Bin, WAN Tianyi, TANG Xin, YU Qiuyue
- 57 The correlation between diffusion kurtosis imaging and pathological condition in clear cell renal carcinoma
FENG Qiang, ZHANG Ruiming, FANG Wei, MA Zhijun

61 Diagnostic value of DCE-MRI combined with DWI for central gland prostate cancer

LUO Yongzhi, WANG Xi

65 Application value of conventional MRI examination and diffusion weighted imaging in preoperative evaluation of rectal cancer

YANG Hongyu, GAO Xu, SHEN Xiuzhi, ZHONG Jiali, PENG Ruchen

69 Preliminary study of APT combined with T2 mapping sequence in preoperative risk assessment of endometrial carcinoma

MA Changjun, LIU Ailian, TIAN Shifeng, CHEN Lihua, WANG Nan, SONG Qingwei, LIN Liangjie, WANG Jiazheng, MENG Xing

PRIMARY MEDICINE FORUM

73 Diagnostic value of MRI in extra-abdominal desmoid-type fibromatoses

HAN Changnian

CASE REPORTS

75 Primary intracranial Rosai-Dorfman disease: a case report

TANG Lingling, ZHAO Qingyun, HUANG Xiaohua, LIU Nian

77 Multi-parameter cardiac magnetic resonance diagnosis of constrictive pericarditis after renal transplantation: a case report

HUANG Weiwei, ZHANG Jun, ZHANG Lingyan, ZHI Beibei, LUO Song

79 MRI findings of recurrent ovarian endometrioid adenofibroma with pedicle torsion: a case report

MA Mimi, YANG Haoran, CAO Xinshan

LECTURE

81 The analysis method of intracranial hypointense disease on T2WI

ZHAO Xuemei, QIAN Yinfeng

REVIEWS

88 Imaging research progress in mild cognitive impairment using convolutional neural networks

LI Xiaoling, WANG Jingxian, LI Ang, LI Meng, CAO Danna, WANG Feng, CUI Xuan, YAO Chunli, CAI Lina

91 Research progress of arterial spin labeling imaging in early diagnosis and prognosis evaluation of brain injury in premature infants

LIU Ying, HUO Ran, WANG Zheng, YUAN Huishu

95 The research progress of high-resolution magnetic resonance vessel wall imaging in intracranial atherosclerotic plaques

WANG Hongru, GAO Yang, WU Qiong

98 Progress of multimodality magnetic resonance imaging in genotyping and prognostic evaluation of gliomas

ZHAO Huan, BAI Yan, WANG Meiyun

103 Application progress of MRI in central nervous system of heat stroke

XU Haoran, LI Jun

106 Research progress of cardiovascular magnetic resonance in quantitative evaluation of tissue and function of myocardial hypertrophy

GUO Wei, WANG Xiaohua

109 Progress in imaging assessment of the risk of esophageal varices and bleeding in cirrhosis

LIU Hong, LIU Guangyao, ZHOU Junlin

113 Research progress of multimodal MRI in renal cell carcinoma

YU Wei, YANG Yang, WU Yinghua

116 Research progress of chemical exchange saturation transfer imaging technology in musculoskeletal system

WANG Mei, ZHANG Xiaodong

121 Research progress in preoperative imaging evaluation of oblique lumbar interbody fusion

HAN Menglong, FANG Xiangjun, HE Zhongyun, YAN Xueliang

About the cover

Nasopharyngeal carcinoma, is one of the most common head and neck malignancies in southern China. Although nasopharyngeal carcinoma is highly sensitive to radiotherapy and chemotherapy and its mortality rate is gradually decreasing year by year, up to 20% of patients still suffer from treatment failure due to individual differences in sensitivity to radiotherapy and chemotherapy. Magnetic resonance imaging not only has a variety of structural imaging techniques that can clearly depict the morphology and scope of the lesion, but also has a variety of functional imaging sequences that could reflect multiple functional information such as tumor biological behavior, hemodynamics, tissue microstructure, tumor microstructure and tumor metabolism. Hence, MRI becomes one of the most important imaging modalities for examining lesions in head and neck, especially for nasopharyngeal lesions.

Amide proton transfer (APT) imaging has attracted wide attention as a new type of magnetic resonance molecular imaging technologies that can be carried out to reflect tumor metabolism. APT imaging can indirectly reflect the proliferation and protein metabolism of different tissues and lesions from a metabolic perspective by non-invasively quantifying the amide protons in the tissue. It is expected to be widely used in a variety of diseases, especially in the field of tumors. At present, APT technology has been extensively studied in the diagnosis and treatment response evaluation of brain tumor, breast cancer, uterus cancer etc, and its clinical value has also been confirmed by a number of studies. However, there are few reports of applying APT imaging in the head and neck, which might be due to the complicated structure composition of the head and neck susceptible to artifacts, physiological movement artifacts caused by breathing and swallowing. In addition, APT imaging is sensitive to inhomogeneity of magnetic field and movement. Therefore, it is technically challenging to apply APT imaging in the head and neck.

In this pilot study, on a clinically 3.0 T magnetic resonance scanner, we intend to preliminarily explore the feasibility of applying APT imaging on patients with nasopharyngeal carcinoma. See text page 6-10.