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胃癌作为全球第五大癌症,在亚洲地区的发病率和死亡率均处于较高水平,每年新发病例逾100万例。现有研究证实脉管侵犯(lymphovascular invasion, LVI)与淋巴结转移密切相关,且LVI阳性患者预后较差,建议将LVI阳性病例升级为淋巴结转移阳性,以指导治疗方案调整。然而,依赖术后病理检查来判断是否发生脉管侵犯具有一定的滞后性,因此本研究旨在通过影像学手段对胃癌患者是否存在脉管侵犯进行术前评估。

近年来,尽管基于CT的影像组学及深度学习特征在预测脉管侵犯方面具有一定效能,但实际操作较为复杂,临床实用性有待提高。相比之下,MRI具有出色的图像质量,对胃癌的诊断和分期具有重要价值。特别是弥散加权成像(diffusion weighted imaging, DWI)作为MRI的功能成像序列,利用水分子扩散差异产生对比度,可反映肿瘤微观结构和组织微循环相关信息,其定量参数在胃癌的诊断、分期及疗效评估方面展现出独特优势。

本研究通过分析胃癌患者术前的MRI相关参数及DWI定量参数,根据术后病理结果将患者分为LVI阳性组和阴性组,采用逻辑回归分析筛选LVI阳性的独立危险因素后建立联合预测模型。受试者工作特征(receiver operating characteristic, ROC)曲线分析显示,扩散峰度成像(diffusion kurtosis imaging, DKI)的平均峰度(mean kurtosis, MK)及联合模型(DKI_MK联合影像N分期)具有良好的预测效能。DeLong检验表明,两种模型的预测效能差异无统计学意义($P>0.05$),故推荐采用DKI_MK在术前进行LVI状态评估,为临床治疗策略的制订及预后分析提供精确依据。详见内文第88页。

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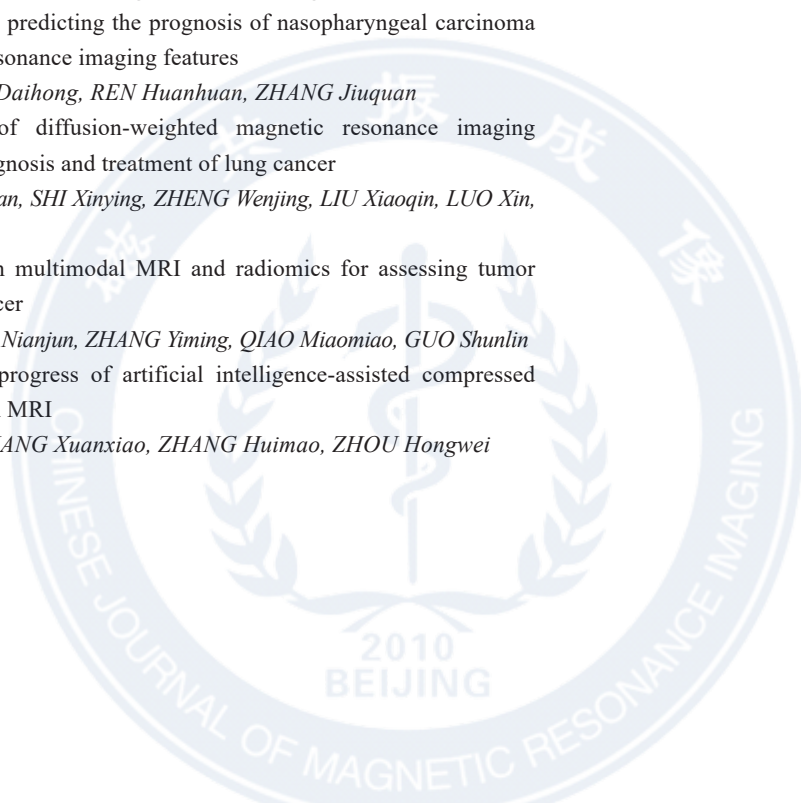
About the cover

Gastric cancer ranks as the fifth most prevalent malignancy worldwide, with particularly high incidence and mortality rates in Asia, accounting for over 1 million new cases each year. Current evidence confirms that lymphovascular invasion (LVI) is closely related to lymph node metastasis and LVI-positive patients demonstrate poorer prognosis, and recommend upgrading LVI-positive cases to lymph node metastasis-positive status to optimize treatment strategies. However, relying on postoperative pathological examination to determine whether there is LVI has a certain lag. Therefore, this study aims to evaluate the presence of LVI in gastric cancer patients by imaging methods before surgery.

In recent years, although CT-based radiomics and deep learning features have certain efficacy in predicting LVI, the practical operation is relatively complex, and the clinical practicability still needs to be further improved. By contrast, previous studies have confirmed that MRI has excellent image quality and great value in the diagnosis and staging of gastric cancer. Especially diffusion weighted imaging (DWI), as a functional imaging sequence of MRI, uses the difference of the diffusivity of water molecules to produce contrast, reflecting the microstructure of the tumor and the information related to tumor tissue microcirculation. Its quantitative parameters have shown unique advantages in the diagnosis, staging and efficacy evaluation of gastric cancer.

In this study, preoperative MRI related parameters and DWI quantitative parameters of gastric cancer patients were analyzed. According to postoperative pathological results, patients were divided into LVI-positive group and LVI-negative group. Logistic regression analysis was used to screen the independent risk factors of LVI, and a joint prediction model was established. Receiver operating characteristic (ROC) curve showed that the mean kurtosis (MK) of diffusion kurtosis imaging (DKI) and the combined model (DKI MK + image N-staging) had good prediction efficiency, and Delong test showed that there was no statistical difference in prediction efficiency between the two models. Therefore, DKI MK is recommended to assess the status of LVI of gastric cancer before surgery. It provides accurate basis for the formulation of clinical treatment strategies and prognosis analysis. Please see text page 88.

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