磁共振成像

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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。

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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.

CASE REPORT

REVIEWS