二维氢质子磁共振波谱分析鉴别胶质瘤术后复发和放射性脑损伤

Differentiation of postoperative recurrent glioma and radiation injury with two-dimensional proton MR spectroscopy

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中文摘要：

　　目的　评价二维氢质子磁共振波谱(2D ^{1}H-MRS)对胶质瘤术后复发和放射性脑损伤的鉴别作用。方法　应用Siemens 3.0T MR对35例脑胶质瘤术后放疗后常规MR检查出现新强化灶患者行2D ^{1}H-MRS分析。观察病变强化区及水肿区主要代谢物,计算代谢物比值(NAA、Cho、Cr、Cho/Cr、Cho/NAA、NAA/Cr)比较各代谢物比值在肿瘤复发和放射性脑损伤患者间的差异。结果 35例中,肿瘤复发20例,放射性脑损伤15例;经组织学证实23例,经临床及影像随访证实12例。肿瘤复发病变强化区平均Cho/Cr和Cho/NAA比值显著高于放射性脑损伤,平均NAA/Cr比值显著低于放射性脑损伤;肿瘤复发病变水肿区平均Cho/Cr和Cho/NAA比值显著高于放射性脑损伤,平均NAA/Cr在两者间的差异无统计学意义。根据病变强化区代谢物比值ROC曲线,将Cho/Cr和Cho/NAA比值中任意一个或两个大于1.77作为肿瘤复发的判断标准,2D ^{1}H-MRS对胶质瘤术后复发的诊断敏感度和特异度分别为90.00%(18/20)和93.33%(14/15),准确率为91.43%(32/35)。结论　2D ^{1}H-MRS对胶质瘤术后复发和放射性脑损伤具有重要鉴别价值。

英文摘要：

　　Objective To evaluate the differentiated effectiveness of two-dimensional proton MR spectroscopy (2D ^{1}H-MRS) to post-operative recurrent glioma and radiation injury. **Methods** Conventional MR and 2D ^{1}H-MRS examinations were performed with Siemens 3.0T MR system for patients with recurrent contrast-enhancing lesions at the site of the treated glioma. The metabolite peaks were measured at the regions of enhanced nodule and edema, including N-acetylaspartate (NAA), choline-containing compounds (Cho) and creatine (Cr), while the Cho/Cr, Cho/NAA, NAA/Cr ratios were calculated. The new lesions were proved with histo-pathologic examination in 23 patients and clinical-imaging following-up in 12 patients. Recurrent gliomas were found in 20 patients, and radiation injury in 15 patients. Each mean metabolite ratio above was compared between two lesion types. **Results** At contrast-enhancing regions and edema regions, the mean Cho/Cr and Cho/NAA ratios were all significantly higher in patients with tumor recurrence compared with those with radiation injury. Tthe mean NAA/Cr ratio was significantly lower in patients with tumor recurrence compared with that with radiation injury at contrast-enhancing regions, but no significant difference was found at edema regions. Taking Cho/Cr and (or) Cho/NAA ratios >1.77 based on ROC curves of metabolite ratios as standards, the diagnostic sensitivity, specificity and accuracy was 90.00% (18/20), 93.33% (14/15) and 91.43% (32/35), respectively. **Conclusion** 2D ^{1}H-MRS is a valuable method to distinguish postoperative recurrent glioma and radiation injury.

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