



3T磁共振氢质子波谱在骨与软组织肿瘤诊断中的应用价值

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Application Value of 3T 1H-Magnetic Resonance Spectroscopy in Diagnosing Tumors of Bone and Soft Tissue

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摘要

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摘要 目的 应用超高场3T磁共振机对良、恶性骨与软组织肿瘤进行磁共振氢质子波谱(¹H-MRS)研究,探讨¹H-MRS对骨与软组织肿瘤的成像特点,及对良、恶性骨与软组织肿瘤鉴别诊断的应用价值。**方法** 选取活检和病理证实的骨与软组织肿瘤49例,在治疗前用点分辨波谱技术进行¹H-MRS检查,观察¹H-MRS对骨与软组织肿瘤的成像特点,比较良、恶性肿瘤波谱图有无差异。¹H-MRS的单体素氢质子波谱脑检查直接出现波谱,观测胆碱复合物峰相对于肌酸峰的高低或有无胆碱峰,并计算胆碱复合物/肌酸(Cho/Cr)值,依Cho/Cr值判断骨与软组织肿瘤的良、恶性。**结果** 骨与软组织肿瘤的¹H-MRS波形与正常肌肉明显不同,骨与软组织肿瘤中恶性肿瘤Cho峰明显高于Cr峰;良性肿瘤中见Cho峰消失或极低的Cho峰。恶性与良性肿瘤的Cho/Cr比值分别为 3.13 ± 0.97 与 1.34 ± 1.02 ,差异具有统计学意义($P=0.02$),以1.79为阈值,Cho/Cr比值应用于诊断恶性肿瘤的敏感度为94%、特异度为80%、准确率为90%。**结论** ¹H-MRS测得的Cho水平的增高与骨、软组织恶性肿瘤相关,Cho/Cr值在骨与软组织肿瘤的鉴别诊断中发挥重要作用,¹H-MRS是常规磁共振影像的重要补充。

关键词: 骨肿瘤 软组织肿瘤 磁共振波谱

Abstract: Objective To study benign and malignant bone and soft tissue tumors with 1H-magnetic resonance spectroscopy (1H-MRS) at 3 Tesla MR scanner and assess the value of 1H-MRS in diagnosing bone and soft tissue tumors and distinguishing benign from malignant tumors. Methods Totally 49 patients with clinically and pathologically confirmed bone and soft tissue tumors were enrolled in this study. 1H-MRS was performed before treatment with point-resolved spectroscopy sequence. The imaging characteristics of 1H-MRS for bone and soft tissue tumors were observed and the possible differences between benign and malignant tumors was compared. Since spectra were directly found under single-voxel proton MRS brain examination, the peak height of choline containing compounds (Cho) opposite to the creatine (Cr) and the Cho peak were observed, and then the malignancies of the tumors were judged. Cho/Cr value was calculated and used to distinguishing benign tumors from malignancies. Results 1H-MRS spectra of bone and soft tissue tumors were different from those of the normal muscles, and such difference also existed between benign and malignant tumors. The Cho peak disappeared or was extremely low among benign tumors. The Cho/Cr values of malignant tumors and benign tumors were 3.13 ± 0.9 and 1.34 ± 1.02 , respectively ($P=0.02$). Using 1.79 as the threshold value, the Cho/Cr value had sensitivity, specificity, and accuracy of 94%, 80%, and 90%, respectively, in diagnosing malignancies. Conclusions The increased Cho level, as measured by 1H-MRS, is related with the bone and soft tissue malignant tumor. Cho/Cr value is useful in distinguishing benign tumors from malignancies. 1H-MRS can be an important supplement to the conventional magnetic resonance imaging.

Keywords: bone tumors soft tissue tumors magnetic resonance spectroscopy

Received 2011-03-10;

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引用本文:

齐滋华,李传福,马祥兴,李振峰,张凯,于德新.3T磁共振氢质子波谱在骨与软组织肿瘤诊断中的应用价值[J] 中国医学科学院学报, 2011,V33(5): 504-510

QI Zi-hua, LI Chuan-fu, MA Xiang-xing, LI Zhen-feng, ZHANG Kai, YU De-xin.Application Value of 3T 1H-Magnetic Resonance Spectroscopy in Diagnosing Tumors of Bone and Soft Tissue[J] CAMS, 2011,V33(5): 504-510

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