

Proton magnetic resonance spectroscopy-guided biopsy for cerebral glial tumors

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摘要

Abstract

BACKGROUND AND PURPOSE: Although application of proton magnetic resonance (MR) spectroscopy in the diagnosis of brain tumors has been reported, the role of this technique as guidance for targeting biopsy of brain tumors is not well established. The usefulness and limitations of predicting tumor proliferative activity and pathological grading of brain gliomas based on samples obtained from proton MR spectroscopy-guided stereotactic biopsy also remains unclear. The purpose of this study was to evaluate the usefulness of single-voxel MR spectroscopy-guided stereotactic biopsy for cerebral gliomas and to correlate the findings of MR spectroscopy with proliferative activity (measured by Ki-67 labeling index) of tumors and pathological diagnosis.

METHODS: Localized proton spectra were obtained before stereotactic/surgical biopsy in 7 patients with glioma (8 lesions). Metabolic values in the spectra were measured semiquantitatively and correlated with the Ki-67 labeling index and pathological grade of each surgical specimen.

RESULTS: MR spectroscopy-guided biopsy was effective in obtaining a representative specimen for accurate pathological diagnosis in all patients, including 1 patient with multifocal glioma and 2 with diffusely infiltrated gliomas (gliomatosis cerebri). Those lesions with higher choline complex/creatine ratio (Cho/Cr) and lower N-acetyl-L-aspartate/creatine values in MR spectroscopy were higher grade tumors. Higher Ki-67 labeling index (indicating higher proliferative activity of tumor) with higher Cho/Cr ratios in MR spectroscopy were significantly correlated with tumor grade.

CONCLUSIONS: MR spectroscopy-guided biopsy was effective in obtaining a representative specimen for accurate pathological diagnosis, and the Cho/Cr ratio of MR spectra and Ki-67 labeling index were reliable predictors of glioma grade.