Presentation Abstract

Title: 272 - Glioma Grading: The Role of Combined Perfusion MR Imaging and Single-Voxel MR Spectroscopy Compared to Conventional MR Imaging

Keywords: Glioma; grading; single voxel MRS PWI

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Abstract Body: Purpose
To assess the contribution of combined perfusion MR imaging (MRI) and single-voxel MR spectroscopy (MRS) in grading primary gliomas compared with conventional MRI.
Materials & Methods
Thirty-two patients with primary cerebral glioma underwent conventional MRI, dynamic contrast-enhanced T2*-weighted perfusion MRI and single-voxel proton MRS. Gliomas were graded as low or high based on conventional MRI. The rCBV measurements were obtained from regions of maximum perfusion normalized between tumor and healthy tissue. Metabolite ratios ([Cho]/[Cr], [Cho]/[NAA], [NAA]/[Cr]) were measured with TE: 34 ms. Tumor grade determined with the three methods then was compared with that from histopathologic grading. Logistic regression and ROC analyses were performed to ~~~~~~icity, positive and negative predictive values)
Results
Statistically significant differences were found for rCBV tumor/normal tissue ratio, and NAA/Cr ratio in tumor and Cho/Cr ratio in tumor between low- and high-grade tumors. The best performing single parameter for glioma grading was normalized rCBV value. Combined rCBV tumor/normal tissue ratio and NAA/Cr tumor ratio increased overall accuracy in glioma grading. Receiver operating characteristic curves demonstrated a

rCBV tumor/normal tissue ratio of >1.16 and NAA/Cr tumor ratio of <0.44 has the higher probability for a neoplasm to be a high-grade glioma.

Conclusion

The rCBV measurements and metabolite ratios both individually and in combination can increase the accuracy when compared with conventional MRI alone in determining glioma grade. The best performing parameter was found to be the rCBV measurements. Threshold values can provide a means for guiding treatment and predicting postoperative patient outcome.