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Abstract-Title:

CLINICAL UTILITY OF FUNCTIONAL MAGNETIC RESONANCE IMAGING (fMRI) FOR PRESURGICAL MOTOR AND LANGUAGE MAPPING: USING A FAST VISUAL ANALYSIS PROTOCOL ON A 3-TESLA SCANNER

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Abstract-Text:

Purpose:

Functional magnetic resonance imaging (fMRI) for motor and language mapping are used for presurgical planning of resective surgery adjacent to eloquent brain areas. However, conventional postprocessing of the fMRI data is time-consuming. Therefore, we used an analysis software installed on the MRI console of a 3-tesla scanner for direct data analysis and investigate the utility for clinical routine. Methods:

In twenty-one patients with brain tumors adjacent to eloquent areas, fMRI was performed prior to planned resective surgery. Functional magnetic resonance images (fMRI) was performed on a 3-tesla scanner for identification of motor and/or language areas. Analysis software directly installed on the MR console computer was used for image analysis and visualization. The activation results of fMRI were integrated to T1-weighted anatomical MR images and transferred to the operating room for presurgical Planning. Results:

In all cases, functional magnetic resonance images (fMRI) allowed identification of motor and/or language area for individualized planing of resection. Data analysis and visualization was possible less than 10 minutes using the analysis software directly installed on the MR console computer. Conclusion:

Functional magnetic resonance images (fMRI) with direct fast visual analysis of the images is a useful method for clinical routine and reliable identification of eloquent brain areas prior to surgery. This method allows direct monitoring of the data quality and visualization without being time consuming. Knowledge about the relation of functional areas to the brain lesions improves the safety during surgery and enhances the surgeon's orientation and confidence.