
Methods: In our institution, the Vall d’Hebron University Hospital in Barcelona (Spain), we have been performing conventional MRI and advanced MRI with Diffusion-Weighted Image (DWI), Perfusion-Weighted Image (PWI), MR Spectroscopy (MRS), Diffusion-Tensor Image (DTI) in all the infratentorial tumors in children (0-16 year-old) since the last 5 years, from may 2010 to nowadays. Functional-MRI (fMRI) has been also done when we have had to deal with supratentorial tumors.

Spine imaging is made in all suspected High Grade tumors with both postcontrast T1-weighted image and DWI in sagittal plane.

All these tumors have a first follow-up MRI in the first 72 hours after surgery for quantifying residual tumor and detecting surgical complications.

Result: As previously reported, grade tumor cellularity inversely correlates with apparent diffusion coefficient (ADC) value. However, there is some overlap between high and low grade tumors according to their ADC values. ADC is also useful to evaluate the therapeutic response and therapy-related tumor changes.

MRS results do not differ from previously reported. High Cho/NA A and Cho/Cr ratios are usually associated with faster growth and high grade, but nevertheless there is no established cutoff because of overlapping between high and low grade tumors. The presence of lipids reflects tumor necrosis and aggressiveness, almost exclusively of High-Grade gliomas. Choline reduction has been observed after chemotherapy treatment.

All the 3 perfusion techniques are complementary. Arterial-spin labeling (ASL) is acquired before gadolinium injection, whereas dynamic susceptibility contrast-enhanced magnetic resonance imaging (DSC) and dynamic contrast-enhanced magnetic resonance imaging (DCE) are performed after the administration of contrast media. Increased tumor vascularity is not synonymous with malignancy. In the follow-up of these tumors, PWI helps differentiating radionecrosis from tumor recurrence.

DTI, MRS and fMRI may serve as a surgical guide to biopsy.

Conclusion: Integration of anatomical and advanced MRI techniques is the best approach in high grade CNS children’s tumors management and monitoring.

CNSTUMORS,ADVANCEDMRI,CHILDREN

EPO:077

CHEMICAL SHIFT GRADIENT ECHO IN- AND OPPOSED-PHASE SEQUENCES IN 3 T MRI FOR THE DETECTION OF H-MRS VISIBLE LIPIDS AND GRADING OF GLIOMAS

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Purpose: In this study, we investigated the chemical shift gradient echo in- and opposed-phase sequences in phantom to clarify lipids component detected by the in-oppose phase. We then performed clinical study in patients with different grades of glioma with the aim of proposing this technique for accurate classification of grades in glioma.

Methods: A phantom using dilutions of SMOFLipid® 20% ranging from 1-20%; and a clinical study of 18 patients with glioma (grade II n=9, Grade III n=3, Grade IV n=6) were carried out using single voxel spectroscopy (SVS) using LC model to correctly classify and quantify the different component of lipids. Chemical shift gradient echo in- and opposed-phase imaging was also performed on the phantom as well as the 18 patients in a 3 T MRI. Signal loss ratios (SLR) were obtained from the in-oppose phase images using region of interest method.

Result: The phantom study showed strong positive linear correlation between lipid 0.9 ppm and 1.3 ppm lipid concentration with signal loss ratios (SLR) obtained from the in-oppose phase (r=0.72 to 0.96, p<0.001) (Figure 1). The clinical study, using three group ROC analysis based on volume under the receiver operating characteristic surface (VUS), to evaluate the discriminative ability of the SVS and SLR in differentiating the tumour grades found that SLR at solid tumour portions was the best measure for differentiation and was more reliable than SVS (highest VUS value of 0.889, 100% correct classification probabilities of grade II and IV respectively and 67% of grade III).

Conclusion: This in-oppose sequence (with a much shorter acquisition time then MRS) through lipid concentration, have the ability to grade glioma

In- and opposed-phase sequence, Lipid, Glioma grading

EPO:078

SIH AND MENINGIOMA, ASSOCIATION OR COINCIDENCE?

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Purpose: To present 2 cases of meningioma associated with radiologic signs of SIH (Dural Hyperintensity on FLAIR, and small ventricles and sulci).

SIH occurs after spontaneous CSF leak, usually from a dural tear in the spinal canal.

Methods: Retrospective review of 2 cases.

Result: One of the patients had symptoms consistent with SIH, and brain and spinal MRI were solicited. A meningioma in the posterior fossa was under medical followup. The patient had orthostatic headache. Multiple radiologic signs of SIH were present intracranially and multiple radicular cysts were detected in the cervical and dorsal spine. The patient improved with medical treatment and MRI normalized.