B-1015 14:27
Longitudinal DTI changes in multiple sclerosis patients with different cortical reorganisation patterns
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Purpose: To investigate longitudinal changes of diffusion-tensor imaging (DTI) data in relapsing-remitting multiple sclerosis (RRMS) patients with different cortical reorganisation patterns.

Methods and Materials: 25 patients with RRMS (7 men), all right-handed, aged 19-50, underwent MRI (Avanto 1.5 T, Siemens) during relapse with unilateral light hand palsy, in three and twelve (20 of 25 patients) months after it. Scanning protocol included functional MRI (fMRI) and DTI sequences. FMRi was performed using simple movement paradigm for both hands. DTI data were assessed in regions of interest-corticospinal tract (CST) - pons, peduncles and internal capsules (IC) level; spenium (SCS) and motor area of corpus callilsum (MACC).

Results: Differently directed changes of primary sensorimotor cortex (SMC) functional activity during relapse allowed us to divide all patients into two groups: the first one with decrease of SMC activation on palsy-corresponding side, which corresponds to CST palsy, and the second one with the increase (VR range 0.22-0.79). During relapse these groups differed by DTI indices in CST on the pons level, the first one also had asymmetrical decrease of deep sensitivity on palsy hand (Mann-Whitney U test, p < 0.05). In the follow-up, the first group was characterised by DTI changes in palsy-corresponding medial lemniscus, CST on IC level and SCC, the second one by CST-IC level and ppedulcuses variances and pedulcuses (repeated measures ANOVA; Newman-Keuls post-hoc test, p < 0.05).

Conclusion: RRMS relapse with similar palsy but different sensitivity impairment is characterised by contrary cortical reorganisation patterns, which are associated with different specific longitudinal structural changes, probably due to initially different pathologic mechanisms.

B-1016 14:36
Update on CNS complications after allogeneic bone marrow transplant
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Purpose: To stand out the importance to know the different states of immunosuppression after a bone marrow transplant (BMT), in order to establish a proper clinical-radiological correlation. 2. To review the main neuroringing findings of CNS complications observed after BMT.

Methods and Materials: We review the neurological complications in 935 patients who had received an allogeneic bone marrow transplantation at our hospital in the past 12 years. We analysed the neuroringing findings (CT and MRI) of forty-three patients with neurologic complications and their clinical and autopsie correlation.

Conclusion: The main neurologic CNS complications observed were: a) infections: including viral (12 patients: EBV, CMV, HHV6), bacterial caused by Pneumococcus in 3 cases, Toxoplasmosis in 2 cases, fungal (2 patients with Aspergillus, Scedosporium); b) neoplasm recurrence (9 patients); c) toxic (3 patients); d) vascular complications in 6 patients including viral (12 patients: EBV, CMV, HHV6), bacterial caused by Aspergillus in 2 cases, fungal (2 patients with Candida, 1 with A. niger) and parasites (1 patient with Toxoplasmosis) and in MACC (repeated measures ANOVA; Newman-Keuls post-hoc test, p < 0.05).

B-1017 14:45
Evaluation of brain vascularity and perfusion in TB meningitis using MRA/MR perfusion imaging
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Purpose: Cerebral vasculitis is one of the complications of tuberculous meningitis (TBM). Central artery (volume ratio (VR) range 0.22-0.79) and the second one with the increase (VR range 1.17-16.19). During relapse these groups differed by DTI indices in CST on the pons level, the first one also had asymmetrical decrease of deep sensitivity on palsy hand (Mann-Whitney U test, p < 0.05). In the follow-up, the first group was characterised by DTI changes in palsy-corresponding medial lemniscus, CST on IC level and SCC, the second one by CST-IC level and ppedulcuses variances and pedulcuses (repeated measures ANOVA; Newman-Keuls post-hoc test, p < 0.05).

Conclusion: RRMS relapse with similar palsy but different sensitivity impairment is characterised by contrary cortical reorganisation patterns, which are associated with different specific longitudinal structural changes, probably due to initially different pathologic mechanisms.

B-1018 14:54
Diffusion-weighted tractography to reconstruct the optic radiation in support of temporal lobe epilepsy surgery

Purpose: Surgical resection of drug-resistant temporal lobe epilepsy (TLE) leads most of the patients to seizure relief. However, disruption of the optic radiation (OR) leads to a visual field deficit (VFD). Diffusion-weighted tractography was applied to reconstruct the OR and pre-operatively predict the VFD. Methodological improvements were made to provide the most reliable reconstruction and its plausibility was evaluated.

Methods and Materials: Diffusion tensor imaging (DTI) is of limited use due to its inability to resolve crossing fibers. Constrained spherical deconvolution (CSD) can describe multiple orientations from the fiber orientation density function. To correct for echo-planar imaging (EPI) distortions, an unwarping method using two-phase encoding directions was evaluated against the fieldmap method for healthy volunteers (n=4). The post-operative damage to the OR in relation to the resection area was compared to pre-operative reconstructions for TLE surgery candidates (n=3).

Results: Reconstructions of the OR with CSD were better described by the underlying diffusion data. The estimated EPI distortions using the two-phase encoding direction method showed a shift of distance of the temporal pole to the anterior extent of the OR in the order of 1 mm. Pre- to post-operative comparisons indicated a good correlation between expected and observed damage to fibers. The presented results are visualized using a 3D smart image.

Conclusion: Significant shifts due to distortions were observed, demonstrating the importance of correction. In the absence of a ground truth, pre- to post-operative comparison allows validation of the reconstruction of the OR, useful for preoperative prediction of VFD.

B-1019 15:03
Comparative evaluation of fungal and pyogenic brain abscesses with susceptibility-weighted imaging
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Purpose: Conventional MRI techniques are inadequate to determine the causative agent of brain abscesses. We investigated the value of susceptibility-weighted imaging (SWI) in the differentiation of fungal and pyogenic brain abscesses and the effect of field strength (1.5 T versus 3 T) in SWI for the detection of specific imaging characteristics of brain abscesses.

Methods and Materials: MRI studies of 10 patients with pyogenic and 6 patients with fungal brain abscesses were reviewed. Ten patients underwent examinations on a 3 T scanner and six patients on a 1.5 T scanner. Imaging characteristics on conventional MRI, diffusion-weighted imaging (DWI) and SWI were recorded in all abscesses. All lesions were assessed for the presence of a "dual-rim sign" on SWI.

Results: Homogeneous hypointensity on DWI was present in 88% of pyogenic abscesses, but in only 7.1% of fungal abscesses. On SWI, 94% of pyogenic abscesses had a complete low signal intensity rim, while 17.9% fungal abscesses showed a complete low signal rim. On a 3 T scanner, the "dual-rim sign" was apparent in all pyogenic abscesses. None of the pyogenic abscesses or any of the fungal abscesses were positive for a "dual-rim sign" on a 1.5 T scanner.

Conclusion: In fungal abscesses, the "dual-rim sign" is not present, but rather, a prominent peripheral rim or marked central susceptibility effects will be seen. The appearance of pyogenic abscesses on SWI depends on the field strength, with the "dual-rim sign" a specific feature of pyogenic brain abscesses on a 3 T scanner.