Preliminary application study of MR perfusion imaging and diffusion tensor imaging in tumor like lesions in the cervical spinal cord.

X. Liu[1], W. Tian[1], Y. Ohgiya[2], S. Ekholm[1], P-L. Westesson[1]

[1]Department of Radiology, University of Rochester School of Medicine & Dentistry, Rochester, NY, United States, [2]Department of Radiology, University of Rochester School of Medicine & Dentistry, Rochestrer, NY, United States

Purpose: To evaluate the application of MR perfusion weighted imaging (PWI) and diffusion tensor imaging (DTI) in tumor like lesions of the cervical spinal cord.

Method and materials: Cervical dynamic susceptibility contrast(DSC)-GRE-PWI and cervical DTI(EPI sequence TR/TE=10000/85, b-value 1000s/mm^2, 25 directions; field of View was 20, slice thickness 4 and gap 0) scan were done on 8 patients with GE 1.5T MR scanners using 8 channel neurovascular coils. One patient accepted repeated cervical MR PWI; and one patient was with repeated cervical DTI examination. Trace apparent diffusion coefficient (trace ADC) and Fractional anisotropy (FA),of DTI and relative cerebral blood volume (rCBV) in the PWI were calculated by Functool on a GE workstation.

Results:

There are 4 patients whose cervical spinal cord lesions were with decreased rCBV comparing with the contralateral side. One patient was with radiation injury for medulloblastoma which was confirmed by progressive decreased perfusion of a follow-up PWI examination. 3 patients were with myelomalacia including one was because of post cervical meningioma resection; the other 2 were sequela of demyelinating disease.

There are 4 patients whose lesions were with increased rCBV comparing with the contralateral side. One patient was with ependymoma, one with meningioma; one with sarcoidosis, one patient with recovering Brown-Sequard syndrome after trauma.

Four the cervical DTI data analysis, mean FA value of all these lesions were lower than the contralateral side, paired t test, $P<0.01$.

Conclusions:

PWI of the cervical spinal cord could detect perfusion changes of cervical spinal cord lesions, while DTI showed decrease in anisotropy of these lesions. Combining cervical PWI and DTI could supply more information about the clinical diagnosis of tumor like lesions in the spinal cord.

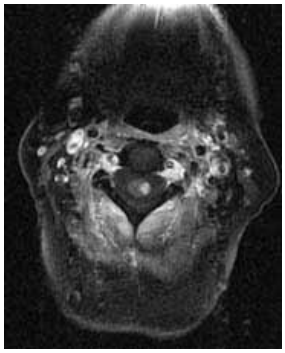

Figure 1

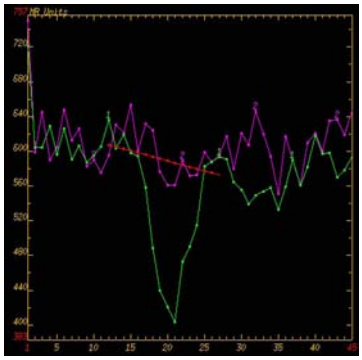

Figure 2

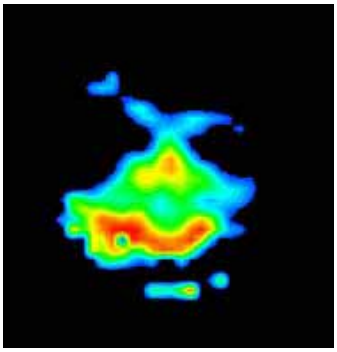

Figure 3

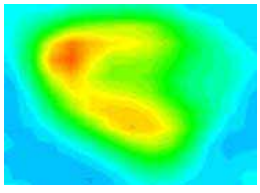

Figure 4

Figure 1: Post contrast T1WI of a patient who after radiation treatment for medulloblastoma, there is enhanced lesion in the left C3 level. Figure 2: Dynamic time-signal of cervical MR PWI shows that the curve of the lesion(curve 2) is flatter than the contralateral side. Figure 3: The rCBV map reveals decreased perfusion of the lesion comparing with contralateral side. Figure 4: FA map detected decreased anisotropy of the left side spinal cord.