

considered significant). Paired two-tailed Student t-tests were used to assess for postoperative changes in metabolite levels. **Results:** Postoperatively, we observed a statistically significant ($p < 0.05$) negative correlation ($r = -0.44$) between the N-acetylaspartate-to-creatine ratio (NAA/Cr) and GRASSP-M dexterity scores. There was no significant difference in NAA, Cr, or NAA/Cr postoperatively. **Conclusions:** These findings demonstrate that patients with lower postoperative NAA/Cr usually have better recovery of dexterity. This link between the myelopathic metabolite profile and clinically meaningful dexterity values requires further investigation to understand the role of both NAA and Cr in mechanisms of postoperative recovery from myelopathy.

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Diffusion MRI characteristics change in select cerebral white matter tracts after decompressive surgery for degenerative cervical myelopathy

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Background: Degenerative cervical myelopathy is characterized by progressive compression of the spinal cord resulting in debilitating loss of dexterity, independent ambulation, and sphincter control. Diffusion tensor imaging (DTI) has shown that, compared to healthy controls, myelopathy patients have decreased integrity of the corticospinal tracts and corpus callosum (Bernabeu-Sanz et al, 2020). **Methods:** Twenty-six myelopathy patients consented to cerebral diffusion tensor imaging (3 Tesla, 32 directions, $b = 1000$) preoperatively, as well as 6-weeks, 12-weeks, and 6-months postoperatively. Average mean diffusivity (MD), fractional anisotropy (FA), radial diffusivity (RD), and axial diffusivity (AD) were measured in the corticospinal tracts, forceps major, and forceps minor. **Results:** Both MD and RD decreased from 6-12 weeks postoperatively in the right corticospinal tract. The forceps major of the corpus callosum showed an initial postoperative increase in MD followed by a subsequent increase in FA and decrease in RD 3-6 months postoperatively. The AD of the forceps major increased both immediately and 3-6 months postoperatively. **Conclusions:** Changes in microstructural integrity of the corticospinal tract and forceps major over the postoperative recovery period suggest a pattern of recovery in myelopathy patients. This study is the first to report postoperative DTI changes in myelopathy-relevant white matter tracts in the brain.

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Evaluation of Arterial Spin Labeling (ASL) Perfusion Imaging in Poorly-Defined Focal Epilepsy in Children

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Background: Poorly-defined cases (PDCs) of focal epilepsy are cases with no/subtle MRI abnormalities or have abnormalities extending beyond the lesion visible on MRI. Here, we evaluated the utility of Arterial Spin Labeling (ASL) MRI perfusion in PDCs of pediatric focal epilepsy. **Methods:** ASL MRI was obtained in 25 consecutive children presenting with poorly-defined focal epilepsy (20 MRI-positive, 5 MRI-negative). Qualitative visual inspection and quantitative analysis with asymmetry and Z-score maps were used to detect perfusion abnormalities. ASL results were compared to the hypothesized epileptogenic zone (EZ) derived from other clinical/imaging data and the resection zone in patients with Engel I/II outcome and >18 month follow-up. **Results:** Qualitative analysis revealed perfusion abnormalities in 17/25 total cases (68%), 17/20 MRI-positive cases (85%) and none of the MRI-negative cases. Quantitative analysis confirmed all cases with abnormalities on qualitative analysis, but found 1 additional true-positive and 4 false-positives. Concordance with the surgically-proven EZ was found in 10/11 cases qualitatively (sensitivity=91%, specificity=50%), and 11/11 cases quantitatively (sensitivity=100%, specificity=23%). **Conclusions:** ASL perfusion may support the hypothesized EZ, but has limited localization benefit in MRI-negative cases. Nevertheless, owing to its non-invasiveness and ease of acquisition, ASL could be a useful addition to the pre-surgical MRI evaluation of pediatric focal epilepsy.

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Accuracy of pedicle screw placement with X-ray versus O-arm image-guided navigation

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Background: Image-guided navigation is routinely used in spine surgery to improve placement of pedicle screws. However, most reports have relied on two-dimensional X-ray evaluation to determine accuracy of screw positioning. In this study, computed