Kinetic magnetic resonance imaging of the cervical spine

The use of flexion-extension MRI may demonstrate true pathology that contributes in the pathogenesis of cervical spinal degenerative disease (CDD). Higher stages in spinal cord compression were found in extension position than in flexion position. However, higher stages in spinal cord compression in extension position did not necessarily cause severe myelopathy. This finding is an important evidence for conservative therapy on patient neck position education [1].

The purpose of a study is to compile and review the body of literature related to kinetic magnetic resonance imaging (kMRI) of the cervical spine.

A review of literature related to kMRI was performed using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.

Lord et al. included 16 prospective and retrospective studies of symptomatic and asymptomatic patients who underwent kMRI of the cervical spine.

Data suggest that kMRI is able to provide meaningful information regarding changes in the cervical spine in both normal and pathologic segments. A prospective study comparing magnetic resonance imaging and kMRI is needed to confirm clinically utility of this technology [2].

Two hundred fifty-seven symptomatic patients (129 men; 128 women) underwent kMRI in neutral, flexion, and extension positions. Midsagittal images were digitally marked and electronically analyzed by spine surgeons. Thickness of ligamentum flavum (LF) in the cervical region from C2-3 to C7-T1 was measured in all three positions. LF at C7-T1 was significantly thicker than C2-3 to C6-7 in neutral, flexion, and extension positions ($p < 0.05$). LF was significantly thicker in extension than in flexion at C3-4 to C6-7. LF thickness increases with extension and decreases with flexion. LF is uniquely thick at C6-7 and at C7-T1 in the extension position, which may predispose these levels to cord compression syndromes and associated neuropathies [3]

1)
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2)
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3)
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