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**Scientific Abstract**

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**Role of Diffusion Tensor Imaging (DTI) Parameters in Evaluating Clinical Severity of Cervical Spondylotic Myelopathy**

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Background and Objectives: Conventional MRI sequence has not been able to demonstrate a consistent association with neurologic function in patients with cervical spondylotic myelopathy. Thus, the purpose of this study is to prove diffusion tensor imaging (DTI) technique is useful to characterize microstructural integrity and functional impairment in patients with cervical spondylosis.

Methods: 25 cervical spondylosis patients with or without spinal cord signal change underwent MRI-DTI using 3.0T SIEMENS Magnetom Prisma along with functional assessment based on modified Japanese Orthopedic Association (mJOA) scoring system during their first visit and 6 months' follow-up. Fractional anisotropy (FA), axial diffusion coefficient (ADC), radial diffusion (RD) and axial diffusion (AD) were evaluated at the pre-stenotic, maximal stenotic and post-stenotic segments.

Results: FA, ADC and AD values differed significantly ( $p < 0.03$ ) between the pre-stenotic, maximal stenotic and post-stenotic segments. There is a statistically significant difference between the FA values and grades of cervical canal stenosis; FA values decreases as the grades of cervical canal stenosis increases ( $p = 0.009$ ). Significant correlation ( $p = 0.002$ ) between spinal canal AP diameter at stenotic level and mJOA scores at first visit ( $r = 0.605$ ,  $p = 0.001$ ) and at 6 months' follow-up ( $r = 0.582$ ,  $p = 0.002$ ).

Conclusion: DTI is capable of detecting cervical spinal cord neuronal microstructure complementing conventional MRI assessment. However, no significant association between DTI parameters and severity of cervical spondylotic myelopathy demonstrated in this study.