Role of diffusion tensor imaging in predicting post-operative outcome in cervical degenerative pathologies: A systematic review of the literature

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Abstract

*Objective:* Diagnosis of cervical spondylotic myelopathy (CSM) and prediction of post-operative recovery is challenging. The authors performed a systematic review of the literature evaluating the diagnostic ability of DTI in CSM, and its ability to predict postoperative outcome.

*Methods:* A systematic PubMED search adherent to PRISMA guidelines included relevant clinical studies reporting use of DTI in adult humans undergoing operative management for CSM from 1990 to 2015. Available data on preoperative clinical status and imaging and postoperative clinical outcomes were abstracted.

*Results***:** Sixof 562 studies were eligible for detailed review. There were 112 cases with CSM and 45 healthy controls. Seventy-three (59.8%) underwent operative management with mean follow-up time 269.9 (SD ±67.7) days. Fractional anisotropy (FA) was significantly lower in cases versus controls across multiple studies, and correlated with preoperative assessment (modified Japanese Outcome Assessment). FA and fiber tractography ratio (FTR) correlated with postoperative clinical assessments, with FA independently predicting surgical need and good outcome post-operatively.

*Conclusion:* DTI may be a valuable tool in diagnosing patients with CSM, identifying patients in need of surgical decompression, and predicting postoperative outcome. Future prospective studies are required for choosing optimal DTI parameters, anatomic levels and acquisition techniques.