O-7-3

Does Cervicothoracic Flexibility Affect Clinical Outcomes in Patients Undergoing Multi-Level Posterior Cervical Fusions?

Rory Mayer[1], Devender Singh[1], Ashley Duncan[1], Cortney Matthews[1], Matthew Geck[1], John Stokes[1], Eeric Truumees[1]

[1]*Ascension, Spine, Austin, United States*

Background: Standing multi-view X-rays and MRIs/CTs are standards of care in preoperative planning for patients undergoing cervical fusions. However, positioning of patient varies between the two different types of imaging.

Research question: Compare the imaging measurements between the two imaging modalities and determine if cervicothoracic flexibility had an impact on cervical alignment or clinical outcome.

Methods: 227 patients who underwent a three or more level posterior cervical fusion were assessed. Visual Analog Scale (VAS) and Oswestry Disability Index (ODI) were collected.

Results: 53.7% were female with a mean age of 63 ± 13 years. Median Δ T1 Slope was 9°. T1 Slope cohorts: Group I with a Δ of <4°; Group II ≥4° to <15°; Group III ≥15°. Significant differences between Group I and Group III existed in VAS (4.19 and 6.59) and ODI (35.4 and 45.9). For Δ C2-C7 Lordosis, median Δ value was 4°; Group I had a Δ lordosis of <2°; Group II ≥2 to < 7°; Group III ≥7°. Significant differences between Group I and III existed in VAS (4.6 and 6.3) and ODI (36.7 and 45.5). Median Δ C2-C7 SVA was 14.37mm. SVA Group I had a Δ of <7.87mm; Group II ≥7.87mm to <27.82mm; Group III ≥27.82mm. There were significant differences between Group I and Group III in VAS (4.8 and 6.4) and ODI (34 and 45.6). Revision and complication rates positively correlated with increased Δ measurement. Age had a significant effect on Δ C2-C7 SVA.

Conclusions: Larger Δ or cervical and upper thoracic flexibility between XR and MRI/CT measurements are positively correlated with higher complication and revision rates. In those patients in whom the Δ between the simulated T1 slope from supine studies and the upright T1 slope was higher were found to have much greater postop cSVAs and reported significantly higher pain and disability scores. Upper thoracic flexibility should be considered in selecting fusion levels and alignment goals in patients undergoing posterior cervical fusion surgery.