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FOCAL AND DYNAMIC CERVICAL ALIGNMENT PATHOLOGY CORRELATES WITH MYELOPATHY SEVERITY IN CERVICAL DEFORMITY PATIENTS

Introduction
While there are numerous studies that discuss cervical sagittal alignment, few studies actually report HRQOL correlations. This study investigates the correlations between established cervical outcomes and regional, focal and dynamic alignments.

Methods
In a retrospective review of prospectively collected CD patients, bi-variable correlations were calculated using both the entire cohort and the driver of deformity (C=cervical, CT=cervico-thoracic), and HRQOL scores were compared with radiographic parameters. Radiographic parameters included cervical global alignment parameters (C2-C7 angle, cSVA, TS-CL, C0-C2 angle), focal parameters (number of kyphotic levels>5° (nK), maximum segmental kyphosis (maxK), number of listhesis>4mm (nL), maximum lysthesis (maxL)) and dynamic parameters (C2-7 range of motion (ROM), kinematic area (kArea), C0-C2 ROM).

Results
62 patients were included (mean 61±7yo, 60%F, 32C and 29CT). Mean sagittal parameters for the cervical alignment were C2-C7 -5±30°, cSVA 47±34mm, TS-CL 35.9±26.7°, C0-C2 40± 11.6°, nK 1.9±1, maxK -13.4±8.5°, nL 0.8 ±1.2, maxL 6±8mm. Mean HRQOL scores included NDI 48±18, mJOA 13.5±2.4, EQ5D 9.9±2.2 and VAS 61±24. There was no correlation between regional parameters and HRQOL, but mJOA correlated significantly with maxK (0.324, p=0.017) and kArea (0.321, p=0.023). The stratification by deformity driver revealed significant correlations between maxK and mJOA in the C patients, and between nK and mJOA in CT patients. In addition, radiographic parameters correlated with individual mJOA, EQ5D and NDI questions. (Table).

Discussion
In cervical deformity patients, focal and dynamic parameters correlated more with mJOA than did regional cervical alignment. This suggests that focal and dynamic parameters play a larger role in the quality of life of these patients than regional cervical alignment. The NDI total score did not correlate with any cervical parameters. This makes it fair to question how applicable it is in the cervical deformity setting.

Conclusions
In a prospective cervical deformity cohort, focal alignment parameters such as the maximum kyphosis and dynamic parameters such as the kinematic area were more highly correlated with myelopathy severity than were regional cervical parameters like cSVA. The NDI does not correlate with any cervical alignment parameters, which makes it fair to question its utility in the setting of cervical deformity.