Title: Predictive Value of Sagittal Craniocervical Roentgenographic Parameters for HRQOL scores after Craniocervical and Posterior Upper Cervical Fusion.

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Background: Sagittal spine balance is related with HRQOL parameters. A loss of "physiological" sagittal craniocervical alignment following craniocervical fusion is reportedly complicated by loss of horizontal gaze and dysphagia.
Research Question: To disclose possibly useful roentgenographic predictors for spine surgeons when correcting sagittal cervical spine alignment.
Design: Retrospective study**.** The authors have searched sagittal roentgenographic predictors for HRQOL (SF-36 domains) scores in patients underwent posterior craniocervical fusion CCF (Group A) and those after upper posterior cervical fusion PCF, (Group B) both for fresh cervical trauma. An age-matched healthy age-matched individuals were used as controls (Group C)
Methods: Fifty-three consecutive adult patients aged 51±18 years with fresh cervical trauma were retrospectively selected and divided in two groups: Group A including 22 patients, aged 50± 16 years who underwent CCF for C1 & C2 unstable injuries and group B with 27 patients aged 52±17 years that suffered from fresh subaxial (C2-C4) unstable injuries and underwent PCF. A control group (C) of 50 healthy individuals ages 52 ±12 years were subsequently selected to match to the age of group A & B patients. C_2-C_7 lordosis, cSVA, T_1-Slope, NT, TIA, CT, CrT, C_0C2a, OEAa, C2Ta, nPAS, and PIA were measured in controls and in Group A & B postoperatively. Using stepwise Multiple Regression Analysis the roentgenographic predictors for each of the SF-domains in all three groups were estimated.
Results: Postoperative SF-36 scores did not differ between Group A and C, while they differ in 5/9 domains between group B and C. The sagittal roentgenographic predictors in Group A were: OC_2-angle for 7/9 SF-36 domains, followed by T1-slope and PIA; in Group B the predictors were cSVA (8/9 domains) followed by C_2Ta; and in C group the predictors were ADI & TIA (2 domains each), followed by C_2-C_7 lordosis & SCA.
Discussion: Postoperative OC_2 angle is the most important predictor of HRQOL in Group A; while cSVA was the predictor for HRQOL in Group B. At least theoretically, spine surgeons should correct and stabilize the fresh craniocervical & upper cervical spine taking in consideration these roentgenographic predictors.