

P02

Impact of T1 pelvic angle improvement on cervical lordosis: A retrospective analysis of postoperative outcomes in patients undergoing deformity correction

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Background: Cervical lordosis (CL) plays a critical role in maintaining sagittal balance and spinal function.

Research question: Investigate the change in cervical lordosis (CL) after significant T1 Pelvic Angle (TPA) improvement ($\geq 10^\circ$) and to assess the impact of demographic factors (age, sex), preop TPA, and CL on postop CL outcomes.

Design: Retrospective study

Methods: Patients who underwent deformity spinal surgery with preop and postop measurements of TPA and CL were studied.

Results: 167 patients, of which 65.3% were females and 34.7% were males. Mean age of patients was 67 years. The preop CL was more negative in females (-24.6°) than in males (1.47°), suggesting greater preop cervical kyphosis in females. At 6 months postop, patients with a TPA improvement of $\geq 10^\circ$ experienced a significant improvement in CL, with an average change of 7.17° (p-value = 0.004). In contrast, patients with $< 10^\circ$ TPA improvement exhibited a worsening in CL by an average of -3.61° . Sex and age had minor effects on CL improvement. Females showed a greater improvement (7.70°) compared to males (4.37°), though this difference was not statistically significant (p-value = 0.591). Age-wise, patients over 65 years exhibited a greater improvement in CL (8.86°) compared to younger age groups, though the age-related differences were also not statistically significant (p-value = 0.206). A linear regression model demonstrated a weak but statistically significant relationship between TPA improvement and CL change ($R^2 = 0.094$, p-value = 0.004).

Discussion: Patients with a TPA improvement of 10° or more demonstrated a significant improvement in cervical lordosis, confirming the importance of achieving optimal sagittal alignment. Moderate TPA improvement (5 - 10°) had the most significant effect on CL improvement, while larger improvements ($>15^\circ$) had a reduced impact. Age and sex had minor influences on CL improvement, but these factors were not statistically significant.