

Correlation Between Negative Sagittal Vertical Axis and Neck Pain in Patients with Cervical Spondylotic Myelopathy

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Background: In cervical spondylotic myelopathy (CSM), a considerable body of literature has focused on evaluating alignment through cervical spine X-rays, yet there were few reports evaluated using standing whole-spine X-rays.

Objective: This study endeavors to discern the characteristics of standing whole-spine X-rays in patients with CSM who manifest neck pain.

Methods: This investigation enlisted thirty-six patients who had undergone cervical posterior spine surgery for CSM. The cohort was stratified based on Neck Disability Index (NDI) scores, with those scoring below 18% forming the group without neck pain (NP group), and those scoring 18% or higher constituting the group with neck pain (P group). Alignment assessments were conducted both before and one year after surgery.

Results: The NP group encompassed 12 cases (average age 71 years), whereas the P group comprised 24 cases (68 years). Preoperative measures, including Sagittal Vertical Axis (SVA, NP:P=65:41mm), Cervical Lordosis (CL, 17:14°), C2-7 SVA (21:26mm), Lumbar Lordosis (LL, 35:39°), and Pelvic Tilt (PT, 21:20°), revealed no significant disparities between the two groups. Even at one year postoperatively, there were no substantial differences in SVA (45:43mm), CL (14:10°), C2-7 SVA (28:32mm), LL (32:41°), and PT (21:21°) between the NP and P groups. However, upon scrutinizing cases with negative SVA at one year postoperatively, it was observed that 9 out of 36 cases exhibited Negative SVA (average -35 mm), with 8 cases (89%) reporting an NDI of 18% or higher. In contrast, among cases with Positive SVA, 44% (12/27 cases) reported an NDI of 18% or higher ($P<0.05$).

Conclusions: This study has elucidated a robust association between negative SVA and neck pain. Furthermore, it highlights the limited potential for substantial alterations in spinal alignment, necessitating proactive communication regarding the persistent postoperative neck pain in cases with preoperative negative SVA.