Impact of the Inclusion of C2 in Posterior Cervical Fusions for Cervical Myelopathy on Sagittal Cervical Alignment

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Introduction

The incidence of kyphosis following cervical laminectomy is approximately 20% and is higher in patients with a straight spine. Despite the use of posterior instrumentation and arthrodesis after decompression, loss of lordosis or even the development of kyphosis remains prevalent. Inadequate cervical lordosis and other measures of sagittal cervical alignment have been shown to correlate with disability and general healthy scores, as well as myelopathy severity. The role of C2 in the posterior tension band, which maintains sagittal alignment, differs from the subaxial spine as it is the insertion point for erector spinae muscles that play a critical role in maintaining posture.

Methods

This study compares the radiographic outcomes of sagittal balance between two cohorts of patients who underwent posterior cervical decompression and fusion for cervical myelopathy over a 12 year period at a single institution. Demographic and surgical characteristics were collected using the electronic medical record for patients undergoing posterior cervical fusions including the axis (AF) and those that were subaxial fusions (SAF). Radiographic

Results

After review of the electronic medical records, 229 patients were identified as having posterior cervical fusion and decompression for treatment of myelopathy. 167 patients had AF, while 62 had SAF. Posterior cervical fusion results in loss of CL in both cohorts. While there was no statistical difference in postoperative CL, there was a significant increase in SVA ($p < 0.001$) and T1S ($p < 0.001$) with AF.

Conclusions

Posterior cervical fusion is a procedure that results in loss of CL, and based on the results from this study, the inclusion of the C2 into the fusion construct also results in increased sagittal balance, increasing the SVA and T1S

Learning Objectives

To determine the impact that fusions including C2 have on radiographic parameters of cervical alignment in patients with cervical spondylotic myelopathy.

References

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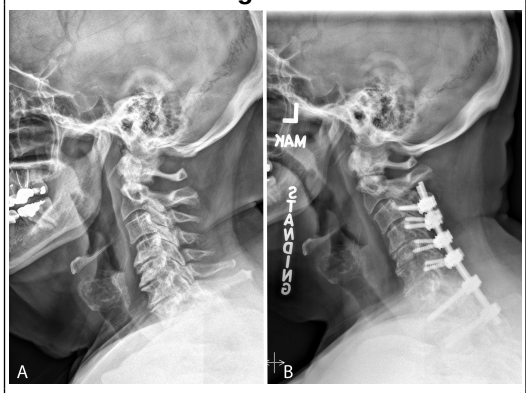
Figure 1



Illustrative case demonstrating sagittal balance parameters in a patient with cervical myelopathy requiring a C3-C7 decompression and C2-T2 posterior fusion. A) Preoperative standing lateral cervical spine radiograph. B) Standing lateral cervical spine radiograph at 6 week follow-up. CL = cervical lordosis, SVA = sagittal vertical axis, T1S = T1 slope.