

Title: Atlantoaxial stenosis after muscle-preserving selective laminectomy

ABSTRACT

[Objective]

This study aimed to clarify risk factors for atlantoaxial stenosis after muscle-preserving selective laminectomy.

[Methods]

A total of 1205 patients who underwent muscle-preserving selective laminectomy due to cervical disorders were included in this study. Postoperative atlantoaxial stenosis, which needed decompression, appeared in 4 cases, and 30 patients did not have radiological stenosis for more than 10 years after surgery. Twenty healthy volunteers were also used as controls. The radiographic parameters measured were C2-C7 angle, C2-C7 sagittal vertical axis (SVA), C2 slope, C7 slope, C2-C5 angle, C5-C7 angle, C1-C2 angle, and atlantodental interval (ADI).

We measured the anterior-posterior (AP) diameters of the spinal cord (SC) and dural tube (Dura) at C1/C2 with sagittal MRI.

[Results]

In the cases of atlantoaxial stenosis, the AP of SC and Dura at C1/C2 were smaller preoperatively, and the residual space for SC (SAC) was also smaller. The preoperative ADI was significantly higher in patients with atlantoaxial stenosis, suggesting preoperative instability at C1/C2. Analysis of the ROC curve showed that patients with a preoperative SAC of less than 3.6 mm and an ADI of more than 1.35 mm were more likely to develop postoperative atlantoaxial stenosis.

[Conclusions]

In the cases of atlantoaxial stenosis after muscle-preserving selective laminectomy, the spinal canal was narrowed at C1/C2 preoperatively, and instability was also observed. When we perform a muscle-preserving selective laminectomy, decompression of C1/C2 is suggested when the SAC at C1/C2 is less than 3.6 mm and the ADI is more than 1.35 mm.

