

Abstract #1292.doc

Increased C2-C7 SVA (sagittal vertical axis) after laminoplasty causes axial neck pain

Introduction

There were some reports concerning axial pain after laminoplasty, but the pathomechanism is uncertain. Sagittal malalignment of spine has been linked to disability and unfavorable health-related quality-of-life scores in previous studies. The purpose of this study was to investigate the influence of the change of sagittal alignment on axial pain after laminoplasty.

Methods

One hundred sixteen patients (77men and 39women) who underwent double-door laminoplasty were followed up in the mean of 3.5years. The mean age was 66.5years. Axial pain during the first year after surgery was graded by Denis pain scale as P1: no pain, P2:occasional minimal pain, P3: moderate pain with occasionally medication, and P4: severe pain with occasionally absent from work. We investigated the change of sagittal alignment between pre-operation and the follow-up by measuring C2-C7angle and C2-C7SVA with radiograph, and explored the relationship between the change of alignment and incidence of axial pain.

Results

Preoperative and postoperative C2-C7angles were $12.1\pm 13.9^\circ$ and $11.4\pm 16.0^\circ$ respectively without statistical difference. Preoperative and postoperative C2-C7SVAs were $18.5\pm 14.3\text{mm}$ and $23.3\pm 16.7\text{mm}$ respectively, showing statistically significant increase of 4.8mm at follow-up ($P=0.004$). The group of involving-C7 laminoplasty showed more increase of C2-C7SVA (+5.6mm) after surgery than that of the group of C7-perserving laminoplasty (-0.3mm) ($p=0.001$). Evaluation of postoperative axial pain one year after surgery showed that P1 in 52, P2 in 22, P3 in 24, and P4 in 18. The patients were divided into two groups. Group P (-) comprises 74 patients of P1 and P2, and Group P (+) comprises 42 patients of P3 and P4. Most patients (79%) in the Group P(+) were categorized into the group of involving-C7 laminoplasty. The mean increase of C2-C7 SVA of group P (+) was 8.7mm, which was significantly larger than group P (-) (+1.8mm) ($P=0.001$).

Conclusion

This study indicates that involving-C7 laminoplasty increases C2-C7SVA despite maintaining C2-C7angle. C2-C7SVA is another important measurement to evaluate the cervical alignment. Moreover we demonstrate the relationship between axial neck pain and increased C2-C7SVA after involving-C7 laminoplasty. These results suggest that preserving C7 is important to maintain the cervical alignment and to decrease axial neck pain after laminoplasty.