

A comparative study of centerpiece micro-plate fixation and suture suspension fixation in unilateral open-door laminoplasty surgery

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Introduction

Lamina closure is the most common reason for failure of unilateral open-door laminoplasty. Centerpiece micro-plate fixation is design to solve the problem. We assessed its effectiveness by comparing it with suture suspension fixation.

Methods

90 patients with multi-segment cervical spondylotic myelopathy were included between January 2008 and December 2010. 66 patients underwent laminoplasty by centerpiece micro-plate fixation (centerpiece group) and the others underwent laminoplasty by suture suspension fixation (traditional group). Neurological recovery was measured by Japanese Orthopedic Association (JOA) score. The spinal canal expansive was evaluated by X-ray film, MRI, and CT scan.

Results

There were no significant difference in gender ($\chi^2=1.168, p=0.271$), age (60.7 ± 1.5 vs. $62.1\pm 2.2, p=0.625$), preoperative JOA score (7.5 ± 3.4 vs. $7.8\pm 2.8, p=0.325$), preoperative Pavlov's ratio (0.47 ± 0.2 vs. $0.44\pm 0.2, p=0.318$), blood loss (272 ± 22 vs. $219\pm 39, p=0.218$) between centerpiece group and traditional group. The mean follow-up time was 23(6-38) months. Postoperative JOA score in centerpiece group was 12.7 ± 4.1 and in traditional group was 12.1 ± 4.4 . They were all significantly higher than the preoperative scores ($P<0.001$). But there was no significant difference between them ($P=0.371$). The centerpiece group had a significant higher Pavlov's ratio than traditional group after operations (0.89 ± 0.2 vs. $0.80\pm 0.3, p=0.016$). The expansive rate of spinal canal between 2 groups didn't have significant difference ($122\pm 10\%$ vs. $99\pm 11\%, P=0.247$) after operation immediately, but had significant difference at the end of follow-up ($117\pm 8\%$ vs. $83\pm 11\%, p=0.025$). In centerpiece group, this didn't happen. 3 patients were observed lamina closure; they were all in traditional group. The rate of complications in centerpiece group (18.2%, 12/66) was lower than that in traditional group (37.5%, 9/24) significantly ($\chi^2=4.420, p=0.038$).

Conclusions

Laminoplasty by centerpiece micro-

plate fixation maintain the expansive stability, bring fewer complications and avoid lamina closure effectively.

Learning Objectives

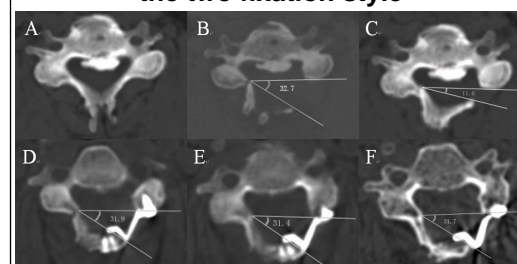
By the conclusion of this session, participants should be able to:

- 1) Describe the technique of unilateral open-door laminoplasty with centerpiece micro-plate fixation;
- 2) Identify the effectiveness of centerpiece micro-plate fixation comparing with the traditional fixation method in laminoplasty

References

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The comparison of CT scans images of the two fixation style



A-C show the lamina closure of C5 with suture suspension fixation of a 68-years old man, the cervical at the level of C5 was stenosis duo to Ossication of the Posterior Longitudinal Ligament (A); the cervical canal was expanded and the open angle was 32.7 degree 1 week after the operative (B); but the open angle had decreased to 11.6 degree 6 month after the operative (C). D-F show the cervical canal expansion of C4 with centerpiece plate fixation of a 70-years old female, and the open angle maintain nearly unchanged 1 week (D), 3 month (E) and 2 years (F) after the surgery.