

Case Report

Revision surgery after cervical laminoplasty: report of five cases and literature review

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Received 17 June 2013; revised 10 October 2013; accepted 26 November 2013

Abstract

BACKGROUND CONTEXT: Revision surgery after laminoplasty is rarely performed, and there are few reports of this procedure in the English literature.

PURPOSE: To evaluate the reasons why patients underwent revision surgery after laminoplasty and to discuss methods of preventing the need for revision surgery. A literature review with a comparative analysis between previous reports and present cases was also performed.

STUDY DESIGN: Case report and literature review.

PATIENT SAMPLE: Five patients who underwent revision surgery after laminoplasty.

OUTCOME MEASURES: Diagnosis was based on the preoperative computed tomography and magnetic resonance imaging findings. Neurologic findings were evaluated using the Japanese Orthopedic Association score.

METHODS: A total of 237 patients who underwent cervical laminoplasty for cervical spondylotic myelopathy from 1990 to 2010 were reviewed. Patients with ossification of the posterior longitudinal ligament, renal dialysis, infection, tumor, or rheumatoid arthritis were excluded. Five patients who underwent revision surgery for symptoms of recurrent myelopathy or radiculopathy were identified, and the clinical courses and radiological findings of these patients were retrospectively reviewed.

RESULTS: The average interval from the initial surgery to revision surgery was 15.0 (range 9–19) years. The patients were four men and one woman with an average age at the time of the initial operation of 49.8 (range 34–65) years. Four patients developed symptoms of recurrent myelopathy after their initial surgery, for the following reasons: adjacent segment canal stenosis, restenosis after inadequate opening of the lamina with degenerative changes, and trauma after inadequate opening of the lamina. One patient developed new radiculopathy symptoms because of foraminal stenosis secondary to osteoarthritis at the Luschka and zygapophyseal joints. All patients experienced resolution of their symptoms after revision surgery.

CONCLUSIONS: Revision surgery after laminoplasty is rare. Inadequate opening of the lamina is one of the important reasons for needing revision surgery. Degenerative changes after laminoplasty may also result in a need for revision surgery. Surgeons should be aware of the degenerative changes that can cause neurologic deterioration after laminoplasty. © 2015 Elsevier Inc. All rights reserved.

Keywords:

Laminoplasty; Revision surgery; Lamina closure; Adjacent degeneration; Cervical spine; Myelopathy; Radiculopathy

FDA device/drug status: Not applicable.

Author disclosures: **HS:** Nothing to disclose. **MK:** Nothing to disclose. **HM:** Nothing to disclose. **EI:** Nothing to disclose. **TK:** Nothing to disclose. **AO:** Nothing to disclose. **YU:** Nothing to disclose. **YT:** Nothing to disclose.

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Introduction

Because open-door laminoplasty was first reported by Hirabayashi et al. [1], this technique has been widely used for cervical decompression in patients with compressive cervical myelopathy involving three or more levels. Currently, cervical myelopathy resulting from cervical spondylosis or ossification of the posterior longitudinal ligament (OPLL) is commonly treated by laminoplasty. The aim of laminoplasty is to expand the spinal canal while preserving the posterior structures of the cervical spine and to achieve stability and prevent postlaminectomy membrane formation. Although some patients may experience short-term postoperative symptoms such as C5 nerve root palsy [2] or axial pain [3], laminoplasty for compressive myelopathy resulting from cervical spondylosis or OPLL generally has stable results with good long-term resolution of symptoms [4,5]. Few reports have focused on mid- and long-term revision surgery after cervical laminoplasty. The aim of this study was to review our patients who underwent revision surgery after laminoplasty to evaluate the reasons for reoperation and to review the literature and discuss methods of preventing the need for reoperation.

Materials and methods

We reviewed all patients who underwent revision surgery after cervical laminoplasty between 1990 and 2010. Patients with OPLL, renal dialysis, trauma at the time of the initial surgery, tumor, rheumatoid arthritis, and infection were excluded.

Surgical techniques

We used two bilateral open-door laminoplasty techniques. Some patients underwent bilateral open-door laminoplasty with interpositional bone grafting (Fig. 1, Left). The other patients underwent bilateral open-door laminoplasty without interpositional bone grafting, with sutures placed between the ligamentum flavum and the facet capsule to keep the lamina open (Fig. 1, Right, white arrows). Patients with cervical spondylotic myelopathy were randomly assigned to undergo one of these procedures.

We reviewed a total of 237 patients who underwent laminoplasty from 1990 to 2010 and identified five patients who underwent revision surgery. The follow-up period was 2 years or longer in 85.2% (202/237) of these patients. Four patients underwent revision because of recurrent myelopathy symptoms, and the other patient underwent revision because of new radiculopathy symptoms. All revision procedures used the posterior approach (revision laminoplasty or laminectomy in the patients with myelopathy and foraminotomy in the patient with radiculopathy).

We retrospectively reviewed the clinical records and X-ray, computed tomography, and magnetic resonance

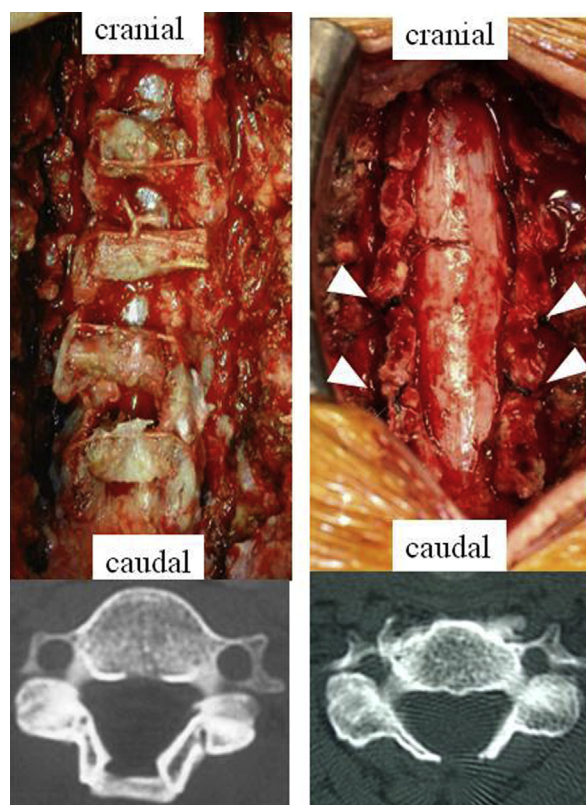


Fig. 1. Our surgical techniques. (Left) Bilateral open-door laminoplasty with interpositional bone grafting. (Right) Bilateral open-door laminoplasty without interpositional bone grafting. Sutures were placed between the ligamentum flavum and the facet capsule (white arrows).

image findings of the patients who underwent revision surgery. The age, sex, interval between initial surgery and revision surgery, neurologic deficit, surgical technique used, and reason for revision surgery were recorded for each patient.

Cases

Patient characteristics

The mean age at the time of the initial surgery was 49.8 (range 34–65) years. The mean interval between the initial surgery and the revision surgery was 15.0 (range 9–19) years. The four patients with recurrent myelopathy underwent laminoplasty or laminectomy during their revision surgery, and the patient with radiculopathy underwent foraminotomy. All patients experienced resolution of symptoms after their revision surgery. The clinical data at the time of the initial surgery are shown in Table 1. The details of revision surgery are shown in Table 2.

Case 1

A man with upper and lower limb numbness and gait disturbance underwent C3–C7 laminoplasty at 34 years of age. His symptoms resolved after surgery. After a traffic accident

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