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Spine

Acute traumatic central cord syndrome—experience using surgical decompression with open-door expansile cervical laminoplasty

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Abstract

Background: Open-door expansile cervical laminoplasty (ODECL) is an effective surgical technique in the treatment of multilevel cervical spondylotic myelopathy. In the present study, we reviewed the safety and short-term neurological outcome after expansile cervical laminoplasty in the treatment of acute central cord syndrome.

Methods: We retrospectively reviewed our database over a 3-year period (January 1997-January 2001) and identified 69 surgically treated cervical spinal cord injuries, including 29 cases of acute traumatic central cord syndrome (ATCCS). Fifteen of these patients underwent expansile cervical laminoplasty, whereas 14 did not because of radiographic evidence of sagittal instability. We collected data on the preoperative and the immediate postoperative and 3-month neurological examinations. Neurological function was assessed using the American Spinal Injury Association (ASIA) grading system. We also reviewed the occurrence of complications and short-term radiological stability after the index procedure.

Results: The median age was 56 years. All patients had hyperextension injuries with underlying cervical spondylosis and stenosis in the absence of overt fracture or instability. The average delay from injury to surgery was 3 days. The preoperative ASIA grade scale was grade C, 8 patients, and grade D, 7 patients. There were no cases of immediate postoperative deterioration or at 3 months follow-up. Neurological outcome: 71.4% (10/14) of patients improved 1 ASIA grade when examined 3 months post injury.

Conclusions: Surgical intervention consisting of ODECL can be safely applied in the subset of patients with ATCCS without instability who have significant cervical spondylosis/stenosis. Open-door expansile cervical laminoplasty is a safe, low-morbidity, decompressive procedure, and in our patients did not produce neurological deterioration.

Keywords: Acute traumatic central cord syndrome; Surgical management; Cervical laminoplasty

1. Introduction

Open-door expansile cervical laminoplasty is an effective surgical technique in the treatment of multilevel cervical spondylotic myelopathy [21,25,26]. The use of cervical laminoplasty in the treatment of ATCCS has not been previously described. In Schneider's original description of central cord syndrome, he suggested that this syndrome was associated with a fairly good prognosis and that because of spontaneous improvement, surgery was not recommended. More recent experience with this clinical entity, however, indicates that in selected patients, those with persistent compression, neurological deterioration, or plateauing of neurological function, operative intervention may be of value in improving the rate and degree of motor recovery [3,6,15,35].

Abbreviations: ASIA, American Spinal Injury Association; ATCCS, acute traumatic central cord syndrome; MRI, magnetic resonance imaging; ODECL, open-door expansile cervical laminoplasty; SCI, spinal cord injury.

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Table 1
Patient profile

Patient	Sex	Age	Operative day	Complications
1	M	63	3	Small wound dehiscence
2	M	46	4	No
3	M	72	3	No
4	M	81	3	No
5	M	50	2	No
6	F	62	1	Death respiratory failure
7	M	55	1	No
8	M	45	8	No
9	M	62	7	No
10	M	67	1	No
11	M	44	1	No
12	F	54	1	No
13	M	54	8	No
14	M	43	2	No
15	M	53	1	Wound infection

The question of safety and efficacy of decompressive surgery has been frequently raised in the treatment of acute spinal cord injuries [1,8,9,10,13,14,16-20,23,31,43]. Historically, in a study done in the 1970s, Morgan et al [33] quelled the initial enthusiasm for urgent cervical laminectomy [7] by demonstrating that most patients with SCI deteriorated or showed no neurological improvement after a decompressive laminectomy. In addition, a laminectomy adds the potential risk of destabilizing the spine with a resultant posttraumatic kyphotic deformity [28]. In more recent studies, early surgical intervention in acute SCI has been suggested by some authors to be hazardous or without demonstrated benefit in neurological recovery [20,31,43]. Proponents against a surgical approach have cited that surgical intervention for decompression in the clinical setting may have been too late to avert secondary injury of neural tissue. Others have suggested that secondary injury processes including edema may peak in the 24-hour to 5-day time window, making the spinal cord especially susceptible to further injuries, for example, intraoperative hypotension during this interval. In contrast, some evidence has been published that early surgical decompression is both safe and effective [6]. Papadopoulos et al [35] demonstrated a benefit of early surgery in a group of patients operated on within 24 hours (mean, 12.6 hours) of injury.

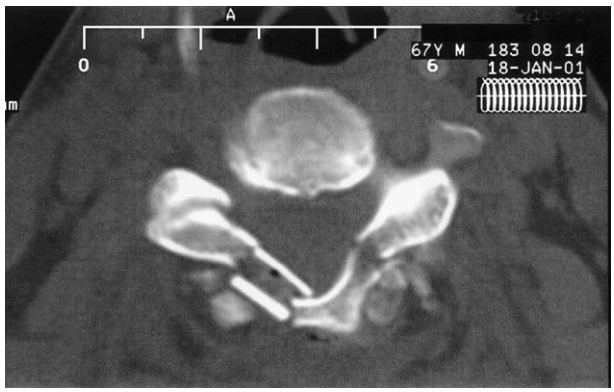

Fig. 2. Postoperative axial computed tomography scan, bone windows, demonstrating the position of the rib allograft with respect to the opened lamina and facet resulting in an increased spinal canal volume.

In our current review, we looked at the safety and short-term neurological results with expansile cervical laminoplasty in the treatment of acute central cord syndrome.

2. Methods

We retrospectively reviewed our database over a 3-year period (January 1997-January 2001). During that period,

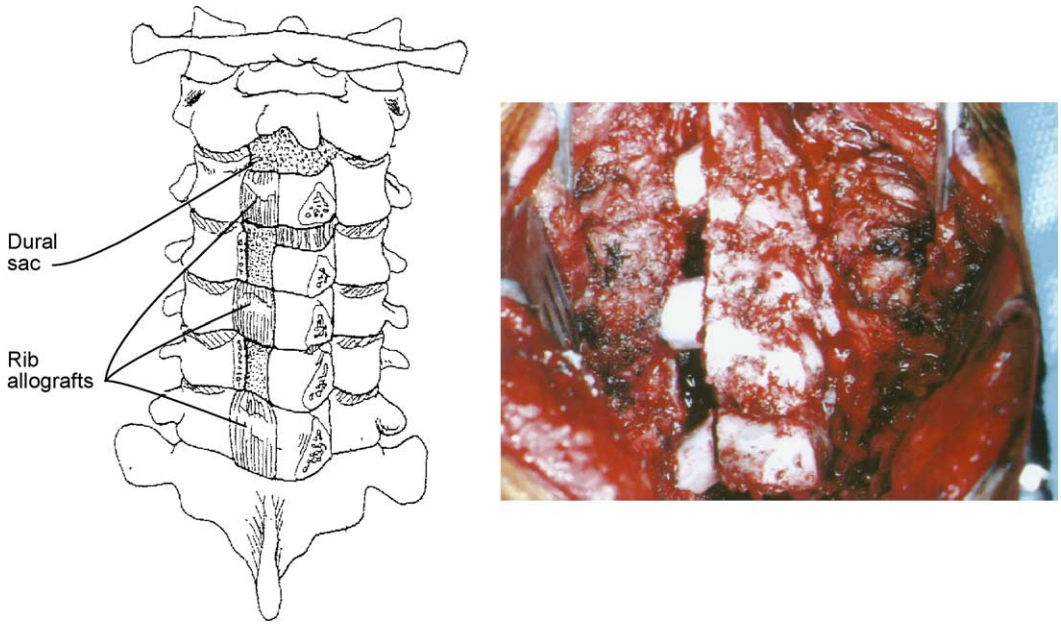

Fig. 1. Schematic drawing (left) and intraoperative photograph (right) of an ODECL, demonstrating the 3 rib allografts that hold the lamina of C3 through C7 open. Reprinted with permission from Vitarbo E, Levi A. Cervical laminectomy and laminoplasty. In: Bajter H, Loftus C, editors. Textbook of neurological surgery. Lippincott Williams & Wilkins; 2002. p. 2066-2073 [chapter 197].