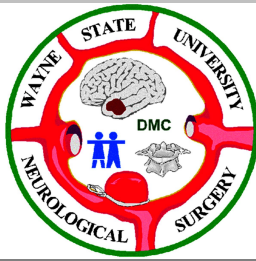




Efficacy of Operative Nuances and Degree of Spinal Canal Expansion on Long-term Outcomes of Patients undergoing a Stabilizing Laminoplasty Augmentation Procedure

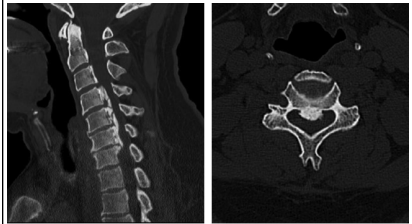
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Introduction

- Spinal canal expansion via open-door-laminoplasty (ODL) is an alternative to multilevel cervical laminectomy, with or without instrumented fusion.
- Increasing sagittal-cervical-canal-diameter contributes significantly to patient outcome.
- Our investigation reviewed long-term outcomes related to the degree of spinal canal expansion and techniques that help maintain stable canal dimensions.
- We present operative nuances of an ODL technique utilized at our institution.

Preoperative CT Cervical Spine - OPLL



54 year old male with severe canal stenosis from OPLL and cervical myelopathy

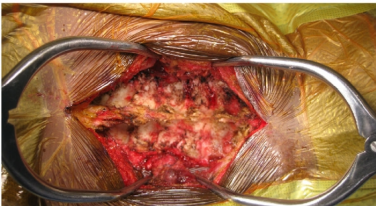
Methods

- Retrospective cohort study of 30 patients undergoing a refined ODL technique (2006 -2013).
- Preoperative and postoperative spinal canal dimensions were measured at each cervical level.
- Long-term clinical outcomes were assessed using Nurick myelopathy classification and neck disability index.

OPERATIVE TECHNIQUE:
Surgical nuances include the use of a B1 drill bit and footplate on the “open-door” side, to make a full thickness groove through bone and ligamentum flavum in a single maneuver. Titanium mini-plates are bent at ~110-degree-angles at each end (Z-shape), and secured to connect the lamina and facet, stabilizing posterior elements with canal expansion.

- Bone loss minimized with this technique
- No need for bone graft for reinforcement
- Spinous processes kept intact

Exposure for Cervical Laminoplasty



Intraoperative photo showing laminoplasty exposure. Following midline dissection along the avascular subperiosteal plane, paraspinal muscles are retracted laterally until medial aspect of the facets are exposed.

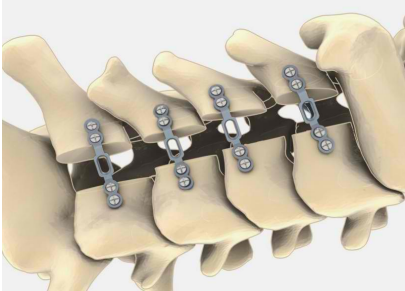
Results

- All patients treated with this technique had multilevel cervical canal stenosis secondary to spondylosis or ossified posterior longitudinal ligament (OPLL).
- n=30, Mean follow-up: 34 -months.
- # of segments: 1 single-segment, 10 three-segment, 18 four-segment, and 1 five-segment case.

Results (CONTINUED)

- Average sagittal-canal-diameter was increased by 30-50% at each surgical level.
- Postoperatively, all patients experienced clinical improvement long-term; however, OPLL patients had more acute improvements in clinical condition than cervical spondylosis patients.
- No patients required re-operation, or experienced restenosis of the canal, re-closure of the lamina, or failure of mini-plate constructs.

"Open-Door" with B1 bit and Footplate

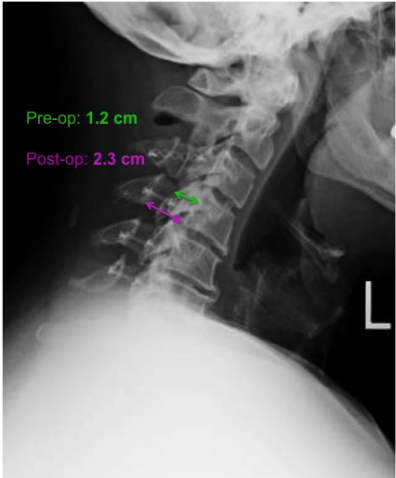


Full thickness groove through ligamentum flavum and lamina. Secured with titanium mini-plates.

Conclusions

- *Canal expansion is maximized with the use of the B1 drill bit and footplate by minimizing bone loss, thereby augmenting the canal perimeter created with the use of mini-plates.*
- *Use of titanium mini-plates stabilizes posterior elements and maintains dimensions of the decompressed spinal canal long-term.*

Postoperative Upright Lateral Radiograph



Cervical laminoplasty from C3-C6. Cervical conal reconstructed with mini-plates, demonstrating nearly 2-fold increase in canal diameter