Use of Split Spinous Process Sublaminar Decompression Technique for resecting Intradural Spinal Lesion

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OBJECTIVE

To report an illustrative case of a novel application of a minimally invasive technique for the complete resection of a L2-L4 intradural tumour.

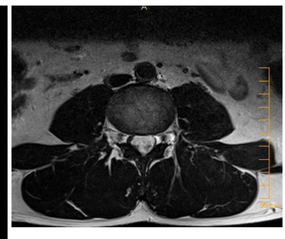
INTRODUCTION

Split spinous process laminectomy is a minimally invasive surgical technique for spinal decompression. Compared to conventional laminectomy which includes stripping the paraspinal muscles from the spinous process, split spinous process laminectomy has the advantage of lesser blood loss, reduced post-operative pain and quicker recovery.

CASE PRESENTATION

A 35-year-old Caucasian male presented with a 3-month history of intermittent low back pain with sciatica, which was intractable to conservative management. MRI LS Spine showed a bright, homogeneously enhancing, well-circumscribed sausage-shaped intradural mass at the L2, L3, and L4 vertebral level with near-obliteration of the spinal canal.

Pre-op MRI: T2 weighted sagittal image highlighting a 3.6cm intradural extramedullary mass posterior to L3 vertebra.



Pre-op MRI: T2 weighted axial image showing lesion at L3 displacing nerve roots outward to the periphery of the thecal sac.

SURGICAL TECHNIQUE

Localization and exposure of L2, L3, L4 spinous process by fluoroscopy, followed by subcutaneous dissection

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Use of Sonopet ultrasonic osteotome to split the spinous processes down the midline with preservation of the interspinous ligament

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The medullary bone and inner table of the laminae were removed using bone scalpel, fine Kerrison punches, and diamond burr

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A lamina spreader was used to bend or fracture the remaining cortical bone of the spinous process and outer table of the laminae to expose the dura. Ligamentum flavum was resected with Kerrison punches and curettes.

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Confirmation of intradural tumour position with intraoperative ultrasonography

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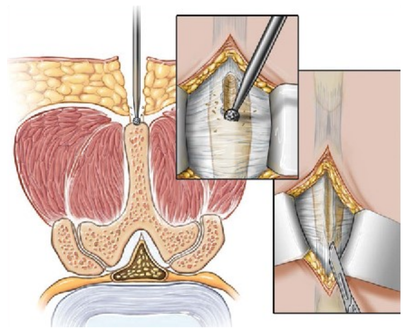
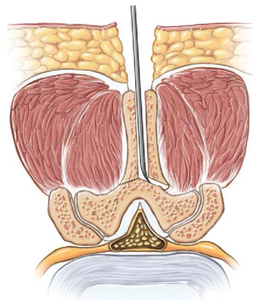
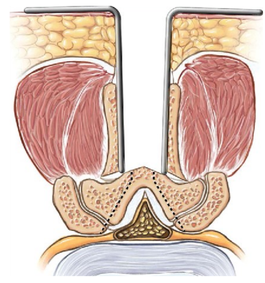
Resection of tumour
Closure of dura
Re-approximation of split spinous process
Closure of skin wound



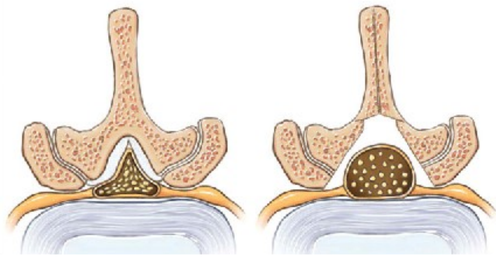
Splitting of the spinous process using a burr and sectioning of the supra and interspinous ligaments.[1]



Osteotomy of the base of the spinous process.[1]



Insertion of a self-retaining retractor to create the working window and planned bony resection.[1]



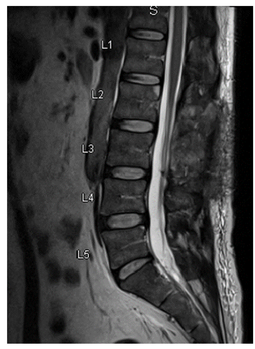
Preoperative and postoperative appearance after central and lateral recess decompression. [1]

OUTCOME

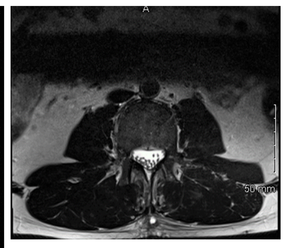
- Patient was neurologically intact, his pain was reported to be 2/10 at rest and 4/10 ambulatory. He was discharged on post-op Day 1.
- Pathology: Myxopapillary ependymoma (WHO Grade 1)
- Imaging confirmed successful resection of the tumour without recurrence.

CONCLUSION

Split spinous process laminectomy technique allows adequate intradural spinal tumour resection, while having the advantage of minimizing injury to the paraspinal muscles thus reducing post-operative pain and aiding in quicker mobilization and recovery.



Post resection MRI: T2 weighted sagittal image shows complete resection of previous lesion without recurrence



Post resection MRI: T2 weighted axial image highlighting subtle enhancement of nerve roots posterior to the L3-4 disc.

1. Mayo Foundation for Medical Education and Research