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GANGA OPERATIVE SPINE COURSE

Lumbar spinous process split decompression

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Ajoy Prasad Shetty MD, Rishi Mugesh Kanna MD, Ashwin Avadhani MD and S. Rajasekaran MD

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Introduction

Conventional laminectomy or midline microdecompression for lumbar canal stenosis involve detachment of the paraspinal muscles from the spinous process and laminae with resection of the supra- and interspinous ligaments. This can lead to atrophy and weakness of paraspinal muscles and persistent back pain [1, 2].

The lumbar spinous process splitting decompression involves exposure of the lamina by longitudinally splitting the spinous process into two halves, leaving its muscular and ligamentous attachments undisturbed [3]. This is followed by standard decompression with minimal muscle dissection from the lamina. This procedure allows for better exposure of neurological structures comparable with conventional laminectomy, while minimizing damage to posterior supporting structures [4].

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Case description

The patient was a 55-year-old manual labourer with predominantly neurogenic claudication symptoms involving the lower lumbo-sacral nerve roots. His symptoms worsened during the course of conservative treatment. Radiographs and MRI showed a degenerative canal and foraminal stenosis at the L4–L5 level. Since his symptoms were predominantly radicular with no instability symptoms, a microdecompression through the spinous process splitting approach was planned.

Surgical procedure

For an L4–L5 decompression, the L4 spinous process needs to be split and hence the incision is centered over the L4 spinous process. A posterior midline skin incision was made between the L3 and L5 spinous processes to expose the tip of the L4 spinous process. After incising the skin and subcutaneous tissue, the level was reconfirmed by placing a needle along the wall of the spinous process till it touches the lamina. This also helps in identifying the depth of the spinous process.

Using a high speed 2-mm Rosen burr, the spinous process was split longitudinally exactly in the middle, up to just proximal to the spino-laminar junction. A curved osteotome was then used to divide the spinous process at its base from the L4 lamina, leaving the paraspinal muscles attached to the lateral aspect of the split spinous process. The supra and interspinous ligaments between L3–L4 and L4–L5 vertebrae were also split longitudinally using a scalpel. The muscles attached to the caudal one-third margin of the L4 lamina were gently elevated. Adequate working space for decompression was obtained by retracting the split spinous processes laterally together with

their attached paraspinal muscles. The caudal margin of the L4 lamina was removed with a Kerrisons rongeur up to the attachment of the ligamentum flavum. The L4–L5 ligamentum flavum was then excised in a cranial to caudal and medial to lateral manner. "Trumpeted" under cutting preserves the lamina and pars, and decreases the incidence of inadvertent iatrogenic instability. The cephalad one-third of the L5 lamina removed, if required. The traversing root was then decompressed up to the foraminal zone.

If foraminal stenosis is encountered, a foraminotomy with 1-mm Kerrison's rongeur is performed. The end-point of decompression is achieved when the lateral margin of the cephalad and caudal nerve roots at the operative level are seen to be free of compression and exiting freely into their foramen. After the affected nerve roots and the thecal sac were decompressed, each half of the split L4 spinous process was reapproximated using a strong nonabsorbable suture. This was facilitated by making drill holes with a 2 mm burr in the spinous processes. Thus, a one-level posterior L4–L5 decompression was accomplished by splitting the L4 spinous process and preserving the supra- and interspinous ligaments of L3–L4 and L4–L5, as well as the L4 spinous process, with minimal damage to the paraspinal muscles.

Post-op procedure

The patient can be mobilized from the first postoperative day depending on the comfort levels. A lumbar sacral belt is given to support the back.

Discussion and conclusion

The lumbar spinous process splitting decompression enables better visualization of the neural structures through a wider working space and obviates the need for a complete laminectomy. This technique ensures thorough decompression with minimal injury to the posterior midline ligamentous and muscular structures and hence a quicker postoperative rehabilitation.

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