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Three instruments, two hand technique in biportal endoscopic spine surgery

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ABSTRACT

Background- Unilateral biportal endoscopic spine surgery (UBE) is a popular minimally invasive method for various types of spinal disease. This surgical technique has several advantages over conventional spine surgery, including less tissue damage, less blood loss, shorter hospital stays, and faster recovery. We introduce three instruments, two two-hand technique in UBE surgery.

Methods: Using hook dissector for gently teasing out the disc material and retracting the nerve root, and holding the same in non-dominant hand along with endoscope, we can use the instrument in dominant hand with better efficacy.

Results: A hook dissector can both act as a dissector and retractor while mobilising the nerve root and dural sac, and another instrument can be passed through the same portal, mainly a Kerrison punch or disc forceps for a complete decompression.

Conclusion: Use of 3 instruments in two hands of primary surgeon is a wonderful technique in UBE, particularly while achieving the final stages in decompression.

INTRODUCTION

Biportal endoscopic spine surgery or Unilateral biportal endoscopy (UBE) is similar to full percutaneous endoscopic spinal surgery in that it uses endoscopic instruments and similar to microscopic spinal surgery in that it uses a floating technique.^{3,4} UBE is a useful surgical technique in unilateral or bilateral decompression for the treatment of spinal canal stenosis, foraminal stenosis, ossification of the ligament flavum, low-grade spondylolisthesis, and adjacent segment degeneration.

It involves the usage of two portals- the endoscopic portal, through which the endoscope goes in, and the instrument portal, through which the working instruments goes in. the working instruments are typically held in the dominant hand, and at times during simultaneous retraction and dissection, a hook dissector or a ball probe can also be entered through the working portal along with a Kerrison punch or disc forceps for better retraction and dissection.

Keywords
unilateral biportal endoscopy (UBE),
hook dissector,
endoscope



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SURGICAL TECHNIQUE

A 48 years old man presented with low backache with left lower limb radiculopathy since three months. One year back, the patient had right lower limb radiculopathy which had subsided. MRI lumbosacral spine suggested L4/5 ligament flavum hypertrophy with disc protrusion bilaterally.

The patient underwent UBE spine surgery under general anesthesia. Initially drilling of caudal portion of the cranial L4 lamina was performed to separate the insertion margin of ligament flavum cranially, followed by drilling of upper portion of caudal L5 lamina for flavum separation. Excision of ligament flavum was performed and nerve roots freed. Hook dissector was inserted to gently probe the disc area over the shoulder of exiting nerve root, and remove disc fragments. Dissector was placed in position retracting the nerve root, and a disc forceps was inserted simultaneously with the hook through the same instrument portal to remove the disc material. The hook dissector was held in the left hand which is holding the endoscope, and using the thumb, index and middle finger for grip around it.

Complete decompression was performed, nerve roots relieved and closure was done.

Post-operatively, the patient was pain free, mobilized on the same day, and discharged in 24h of surgery.

DISCUSSION

UBE allows visualization of the spinal structures via 2 small incisions on one side of the spine, thus minimizing tissue injury and enhancing postoperative recovery.²

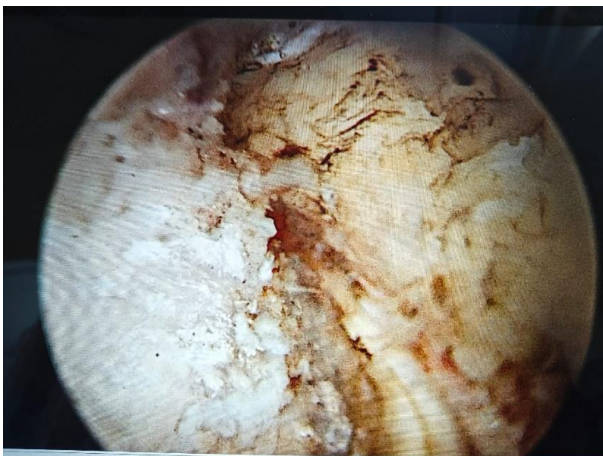


Figure 1. Point of starting drilling at spino laminar junction (12 o`clock- towards spinous process, 9 o`clock- cranial).

The initial docking point of the endoscope and the serial dilator is the location between the pathologic level of the spino-laminar junction and the inferior margin of the caudal lamina. Using the first serial dilator or muscle dissector, the paraspinal muscle should be sufficiently dissected on the lamina around the docking point to ensure sufficient saline patency. (Fig 1)

The laminectomy is started from the lower border of the cranial lamina, using a drill or osteotome until a free margin of LF is obtained. Then, the V-shaped central fissure of the LF is distinguished from the lower border of the cranial lamina, bone work is performed until the cranial, lateral, and caudal sides are freely detached.¹ (Fig 2)



Figure 2. V-shaped central fissure of the LF (12 o`clock- towards spinous process, 9 o`clock- cranial).



Figure 3. Surgeon`s hand showing holding of the three instruments.

In the contralateral sublaminar approach, the LF on the contralateral side and the ventral side of the lamina should be detached using a freer or curette before contralateral decompression.

Usage of a hook dissector can both act as a dissector and retractor while mobilizing the nerve root and dural sac, and another instrument can be

passed through the same portal, mainly a Kerrison punch or disc forceps for a complete decompression. The hook can be held in place using the endoscopic hand, taking the help of thumb, middle and index finger to hold and manipulate the hook, and the other two fingers encircling the endoscope. The dominant hand can then act freely to relieve the decompression. (Fig. 3,4)

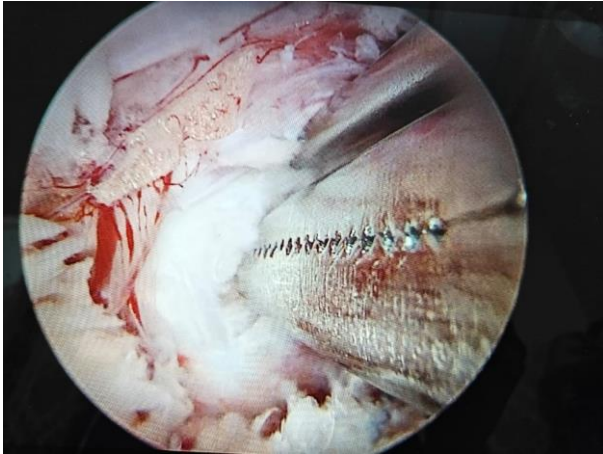


Figure 4. Endoscopic view showing two instruments, hook dissector retracting the nerve root, and disc forceps taking the disc material.

CONCLUSION

The field of UBE has achieved remarkable advancements in recent years, and endoscopic techniques have become common essential spinal surgery procedures. Use of 3 instruments in two hands of primary surgeon is a wonderful technique in UBE, particularly while achieving the final stages in decompression.

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