Lumbar Endoscopic Unilateral Laminotomy

Minimally invasive spinal surgery in particular lumbar endoscopic unilateral laminotomy with bilateral decompression becomes popular as it can be performed with regional anesthesia, soft tissue damages are minimized as endoscopic visualization and instruments can be brought close to operating area bypassing much of the intervening soft tissues for sufficient spinal decompression with ligamentum flavum resection despite less bony resection compared to open surgery. Overall, when well executed, it preserves spinal stability. The outside-in technique of decompression is also known as over-the-top decompression in minimally invasive literature. It involves maintaining a deep layer of ligamentum flavum integrity till satisfactory bony decompression is achieved. A deep layer of ligamentum flavum is removed as final step of decompression. Preservation of the deep layer of ligamentum flavum protects the neural elements, allowing drills and sharp equipment to be used safely to perform bony decompression.In this study, we demonstrate the technical details of the outside-in approach to lumbar endoscopic unilateral laminotomy with bilateral decompression (LE-ULBD). LE-ULBD Outside-in Technique is an effective and safe procedure for relieving lumbar spinal stenosis with favorable results with a follow-up for more than 1 year [1].

Complications

There is limited literature comparing the effect of postoperative epidural hematoma after uniportal endoscopic decompression.

Methods: Magnetic resonance imaging (MRI) and clinical evaluation were performed for patients with single-level uniportal endoscopic Lumbar Decompression Surgery for Spinal Canal Stenosis with a minimum follow-up of 2 years.

A total of 126 patients were recruited with a minimum follow-up of 26 months. The incidence of epidural fluid hematoma was 27%. Postoperative MRI revealed a significant improvement in the postoperative dural sac area at postoperative day 1 and at the upper endplate at 6 months in the hematoma cohort (39.69±15.72 and 26.89±16.58 mm2) as compared with the nonhematoma cohort (48.92±21.36 and 35.1±20.44 mm2), respectively ($p < 0.05$); and at the lower endplate on postoperative 1 day in the hematoma cohort (51.18±24.69 mm2) compared to the nonhematoma cohort (63.91±27.92 mm2) ($p < 0.05$). No significant difference was observed in the dura sac area at postoperative 1 year in both cohorts. The hematoma cohort had statistically significant higher postoperative 1-week Visual Analog Scale (VAS; 3.32±0.68) pain and Oswestry Disability Index (ODI; 32.65±5.56) scores than the nonhematoma cohort (2.99±0.50 and 30.02±4.84, respectively; $p < 0.05$). No significant difference was found at the final follow-up VAS, ODI, and MRI dura sac area.

Epidural fluid hematoma is a common early postoperative MRI finding in lumbar endoscopic unilateral laminotomy with bilateral decompression. Conservative management is the preferred treatment option for patients who do not have a neurological deficit. Symptoms last only a few days and are self-limiting. A common endpoint is a remodeled fluid hematoma and the subsequent expansion of the dura sac area [2].

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Kim HS, Wu PH, Jang IT. Lumbar Endoscopic Unilateral Laminotomy for Bilateral Decompression Outside-In Approach: A Proctorship Guideline With 12 Steps of Effectiveness and Safety. Neurospine. 2020 Jul;17(Suppl 1):S99-S109. doi: 10.14245/ns.2040078.039. Epub 2020 Jul 31. PMID: 32746523;

PMCID: PMC7410378.

2)

Wu PH, Kim HS, Grasso G, An JW, Kim M, Lee I, Park JS, Lee JH, Kang S, Lee J, Yi Y, Lee JH, Park JH, Lim JH, Jang IT. Remodeling of Epidural Fluid Hematoma after Uniportal Lumbar Endoscopic Unilateral Laminotomy with Bilateral Decompression: Comparative Clinical and Radiological Outcomes with a Minimum Follow-up of 2 Years. Asian Spine J. 2022 Jul 4. doi: 10.31616/asj.2021.0366. Epub ahead of print. PMID: 35785910.