

Transforaminal Endoscopic Lumbar Discectomy Using the Outside-In Technique with Foraminoplasty for Migrated Extruded Lumbar Disc Herniation

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Abstract:

Background: Migrated extruded lumbar disc herniation remains challenging for minimally invasive spine surgery due to limited access to displaced disc fragments. Transforaminal percutaneous endoscopic lumbar discectomy (PELD) using the outside-in technique combined with foraminoplasty has been proposed as an alternative to conventional open surgery.

Objective: To evaluate the clinical outcomes of transforaminal PELD with additional foraminoplasty in patients with migrated extruded lumbar disc herniation.

Methods: A retrospective analysis was conducted on patients who underwent PELD with foraminoplasty between January 2015 and January 2017 at the Department of Spine Surgery, The Affiliated ZhongDa Hospital of Southeast University, Nanjing, Jiangsu, China. Sixty-eight patients with MRI- and CT-confirmed migrated lumbar disc herniation were included (52 males, 16 females; mean age 37.3 ± 12.4 years). Disc migration was classified as low, high, or very high grade in cranial or caudal directions. Clinical outcomes were assessed using the Visual Analog Scale (VAS) for leg and back pain, Oswestry Disability Index (ODI), operative time, and modified MacNab criteria. Follow-up evaluations were performed at 1, 3, 6, and 12 months postoperatively.

Results: All procedures were completed successfully using the outside-in approach with foraminoplasty at levels L3–4 to L5–S1. The mean operative time was 80.9 ± 29.8 minutes. Significant improvements were observed between preoperative and final follow-up scores for VAS leg pain (6.07 ± 1.21 to 0.49 ± 1.29), VAS back pain (3.97 ± 2.53 to 0.76 ± 1.37), and ODI (35.31 ± 9.63 to 3.10 ± 6.75) ($p < 0.05$). Based on modified MacNab criteria, outcomes were rated excellent in 66.2%, good in 25.0%, fair in 2.9%, and poor in 5.9% of patients.

Conclusion: Transforaminal PELD using the outside-in technique with foraminoplasty is a safe and effective minimally invasive option for treating migrated extruded lumbar disc herniation at one-year follow-up.

Keywords:

PELD, Lumbar discectomy, migrated lumbar disc herniation, Extrusion.