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Primary Limited Lumbar Discectomy with an Annulus Closure Device: One-year Clinical and Radiographic Results from a Prospective, Multi-Center Study

Korean Journal of Spine 2012; 9(4):340-347. doi: 10.14245/kjs.2012.9.4.340.

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Article summary

Background Context: Lumbar discectomy is the most common surgical treatment for persistent pain associated with lumbar disc herniation (LDH). Despite a high rate of safety and efficacy, approximately 10–30% of discectomy patients are unsatisfied with the treatment and experience significant post-operative pain. In addition, as many as 27.3% of discectomy patients with large (≥6 mm) post-discectomy annular defects experience recurrent herniation. As a result, an annular closure device (ACD) was developed to occlude large annular defects and reduce the risk of reherniation.

Objective: This study evaluated 1-year clinical and radiographic results of limited discectomy plus ACD implantation.

Study Design: Multicenter, single-arm prospective cohort study.

Patient Sample: All included patients (n=45) had sciatica that failed nonsurgical care and had disc herniations confirmed using noninvasive imaging. Patients were treated with discectomy with limited nucleus pulposus removal followed by ACD implantation. No cases involved annular defects >6 mm high or >10 mm wide.

Outcome Measures: Clinical outcome measures were assessed preoperatively and at follow-up visits that occurred at 6 weeks, and 3, 6, and 12 months after surgery. Clinical outcomes were evaluated using the visual analog scale (VAS) for low back or leg pain as well as the Oswestry Disability Index (ODI) questionnaire. Radiographic outcome measures (i.e. disc space height, evidence of vertebral body changes, and device condition) were evaluated using computed tomography (CT) and magnetic resonance (MR) images.

Results:

- Low back pain, leg pain, and disability scores were significantly improved 6 weeks after surgery and throughout the 1-year follow-up period.
- At 1 year follow-up, average disc height was 92.8% of the preoperative height.
- Of the patients that completed all follow-up visits, symptomatic reherniation occurred in 1 patient (2.4%), which required implant removal and spinal unit fusion.
- No cases of device migration, loosening, or fracture were reported.

Conclusion: Discectomy plus ACD implantation was associated with improved pain, reduced disability, maintained disc height, and a low reherniation and reoperation rate of 2.4% by 1 year.

Key implications of results

- This prospective cohort study was one of the first to demonstrate that discectomy plus Barricaid implantation led to improved back pain, leg pain, and disc height maintenance 1 year after surgery.
- Demonstrated low rates of reherniation and reoperation as well as device-related complications.

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