

# Reduction of direct costs in high-risk lumbar discectomy patients during the 90-day post-operative period through annular closure

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## Abstract

**Purpose:** Despite being an extremely successful procedure, recurrent disc herniation is one of the most common post-discectomy complications in the lumbar spine and contributes significant health care and socioeconomic costs. Patients with large annular defects are at a high risk for reherniation, but an annular closure device (ACD) has been designed to reduce reherniation risk in this population and may, in turn, help control direct health care costs after discectomy.

**Patients And Methods:** This analysis examined the 90-day post-discectomy cost estimates among ACD-treated (n=272) and control (discectomy alone; n=278) patients in a randomized controlled trial (RCT). Direct medical costs were estimated based on 2017 Humana and Medicare claims. Index discectomies were assumed to occur in an outpatient (OP) setting, whereas repeat discectomies were assumed to be 60% in OP and 40% in inpatient (IP). A sensitivity analysis was performed on this assumption. The device cost was not included in the analysis in order to focus on costs in the 90-day post-operative period.

**Results:** Within 90 days of follow-up, post-operative complications occurred in 3.3% of the ACD patients and 8.6% of the control patients (P=0.01). The average 90-day cost to treat an ACD patient was \$10,257 compared to \$11,299 per control patient for a 80:20 distribution of Commercial:Medicare coverage (\$1,042 difference). This difference varied from \$687 with 100% Medicare to \$1,132 with 100% Commercial coverage. Varying the IP vs OP distribution resulted in a cost difference range of \$968 to \$1,156 with the ACD.

**Conclusion:** Augmenting discectomy with an ACD in high-risk patients with a large annular defect reduced reherniation and reoperation rates, which translated to a reduction of direct health care costs between \$687 and \$1,156 per patient during the 90-day post-operative period. Large annular defect patients are an easily identifiable high-risk population. Operative strategies that reduce complication risks in these patients, such as the ACD, could be advantageous from both patient care and economic perspectives.

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Reducing the incidence of reherniation and reoperation in skeletally mature patients with radiculopathy (with or without back pain) attributed to a posterior or posterolateral herniation, and confirmed by history, physical examination and imaging studies which demonstrate neural compression using MRI to treat a large annular defect (between 4-6 mm tall and between 6-10 mm wide) following a primary discectomy procedure (excision of herniated intervertebral disc) at a single level between L4 and S1.

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