

Clinical Implications of Vertebral Endplate Disruptions After Lumbar Discectomy: 3-Year Results from a Randomized Trial of a Bone-Anchored Annular Closure Device

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Abstract

Objective: Vertebral endplate disruptions (VEPD) are common findings on imaging after lumbar surgery. The objective of this study was to explore the clinical implications of VEPD development following lumbar discectomy with or without implant with a bone-anchored annular closure device (ACD).

Methods: This was a multicenter randomized controlled trial of patients with large postsurgical annular defects after limited lumbar discectomy who were randomized to additionally receive an ACD or no additional treatment. VEPD were identified on computed tomography and confirmed by an imaging core laboratory. Clinical outcomes included recurrent herniation, reoperation, Oswestry Disability Index, leg pain, and back pain. Patient follow-up in this study was 3 years.

Results: In the ACD group (n=272), the risk of reoperation was lower in patients with vs without VEPD (8% vs 24%, $p < 0.01$), but no other clinical outcomes differed when stratified by VEPD prevalence or size. In the Control group (n=278), the risk of symptomatic reherniation was higher in patients with VEPD (41% vs 23%, $p < 0.01$) and patients with the largest VEPD had the highest reoperation rates. Patient-reported outcomes were not associated with VEPD prevalence or size in the Control group.

Conclusion: VEPD had no significant influence on patient-reported outcomes at 3 years after lumbar discectomy. VEPD increased the risk of recurrence in patients treated with lumbar discectomy only, but had no negative influence in patients treated with the ACD.

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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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