PUBLICATION ABSTRACT

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Morphology and clinical relevance of vertebral endplate changes following limited lumbar discectomy with or without bone-anchored annular closure

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A Kuršumović, JC Kienzler, GJ Bouma, R Bostelmann, M Heggeness, C Thomé, LE Miller, M Barth

Abstract

Study Design: Post hoc analysis of a randomized controlled trial.

Objective: To characterize the morphology and clinical relevance of vertebral endplate changes (VEPC) following limited lumbar discectomy with or without implantation of a bone-anchored annular closure device (ACD).

Summary of Background Data: Implantation of an ACD following limited lumbar discectomy has shown promise in reducing the risk of recurrent herniation in patients with large annular defects. However, the interaction between the ACD and the lumbar endplate over time is not well understood.

Methods: Patients undergoing limited lumbar discectomy with large postsurgical annular defects were randomized intraoperatively to receive additional ACD implantation or limited lumbar discectomy only (Controls). VEPC morphology, area, and volume were assessed with low-dose computed tomography preoperatively and at 1 and 2 years follow-up.

Results: Of 554 randomized patients, the as-treated population consisted of 550 patients (267 ACD, 283 Controls). VEPC were preoperatively identified in 18% of patients in the ACD group and in 15% of Controls. At 2 years, VEPC frequency increased to 85% with ACD and 33% in Controls. Device- or procedure-related serious adverse event (8% vs. 17%, P = 0.001) and secondary surgical intervention (5% vs. 13%, P < 0.001) favored the ACD group over Controls. In the ACD group, clinical outcomes were comparable in patients with and without VEPC at 2 years follow-up. In the Control group, patients with VEPC at 2 years had higher risk of symptomatic reherniation versus patients without VEPC (35% vs. 19%, P < 0.01)

Conclusion: In patients with large annular defects following limited lumbar discectomy, additional implantation with a bone-anchored ACD reduces risk of postoperative complications despite a greater frequency of VEPC. VEPC were associated with higher risk of symptomatic reherniation in patients treated with limited lumbar discectomy, but not in those who received additional ACD implantation.