

Endplate changes after lumbar discectomy with and without implantation of an annular closure device

Acta Neurochirurgica 2017

<https://doi.org/10.1007/s00701-017-3463-y>.

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Abstract

Background: The implantation of a bone-anchored annular closure device (ACD) might be associated with the developed new endplate changes (EPC) after surgery.

Methods: A post hoc analysis has been done in patients from a prospective randomized multicenter study. All patients underwent limited lumbar discectomy with intraoperative randomization into the groups limited lumbar discectomy alone or additional ACD implantation. Low-dose lumbar computed tomography (CT) and clinical investigations were performed preoperatively and 12 months after the operation.

Results: A total of 554 patients were randomized. After exclusion of dropouts, the per-protocol population included 493 patients (251 in the control group and 242 in the ACD group); the follow-up rate was $\geq 90\%$. The number of patients showing EPC at baseline was similar in both groups. The number of patients showing EPC and the total EPC lesion area significantly increased in both groups over time, but significantly increased more in the EPC group for the superior and inferior endplate (all $P < 0.0001$). There was no association of pre-existing number and size of EPC with sex, age, or smoking habits. Correlation of clinical variables showed no relation with number, size, and increase of EPC area after surgery.

Conclusions: Patients with primary lumbar disc herniation show EPC in the corresponding segments. There is a significant increase of lesion number and size within 12 months after discectomy. This increase is significantly more pronounced in the ACD group. Presence and growth of EPC is not correlated with low-back pain or ODI.

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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.

Financial disclosure:

One or more authors have received financial compensation from Intrinsic Therapeutics. Full financial disclosures can be found in the respective manuscript.

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