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**Prospective, Randomized Controlled Study of Repairing the Anulus Fibrosus after Lumbar Discectomy: A Single Surgeon's Experience**

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**Introduction:** Lumbar micro-discectomy is considered to be a relatively safe and successful surgery. The current practice of leaving an open defect in the anulus fibrosus at the conclusion of a lumbar discectomy may lead to an increased potential for re-herniation which may result in additional surgery. Repair of the defect in the anulus appears to be a reasonable and logical approach to mitigate this outcome and possibly reduce the incidence of reoperation for recurrent herniated nucleus pulposus.

**Study purpose:** This prospective, randomized, controlled study from a single surgeon investigates the perceived benefits of repairing the anulus fibrosus.

**Materials and methods:** Sixty-six patients were screened for enrollment into this prospective study. Patient informed consent allowed for intra-operative randomization at the conclusion of standard discectomy techniques in 2:1 manner, anular repair with Xclose Tissue Repair System (Anulex Technologies Inc, Minnetonka MN) vs no repair, respectively. In this ongoing study, patient outcomes are determined pre-operatively as well as 2 weeks (n= 63), 6 months (n= 47), 12 months (n= 34) and 18 months (n= 7) using the Oswestry Disability Index, the SF-12 and visual analog scales (VAS) for both low back and leg pain. Average time from surgery was 14.6 months (range: 2.3 to 23.8 months). All complications, including the need for additional surgery, are also noted.

**Results:** Of the 66 patients screened for enrollment, 3 were excluded intra-operatively (due to concerns of poor tissue quality); in three others, anular repair was unsuccessfully attempted (attempt to treat group). Randomization resulted in 44 patients receiving anular repair (AR group) and 16 patients receiving no anular repair (NAR group). Patient outcomes showed a similar improvement in both groups immediately after surgery that was maintained throughout the follow-up periods. There were a total of seven cases that required additional surgery (11.1%). The attempt-to-treat group had one reoperation (33.3%), and the NAR group had two reoperations (12.5%). In the attempt to treat group and the NAR group, all reoperations were for recurrent herniated nucleus pulposus; same level, same side, and same location (true recurrent herniation). Four patients in the AR group required additional surgery (9.1%). The AR group had two reoperations for recurrent herniated nucleus pulposus (4.5%). One additional patient developed a far lateral herniation remote from previous herniated disc and repair and the other patient required fusion for post-laminectomy syndrome/degenerative disc disease. The reduction in incidence of surgery for true recurrent herniations was 64.0%. Using the most conservative methods, the reduction in additional surgery, regardless of reason, was 27.2%.

**Conclusions & discussion:** Anular repair using Xclose Tissue Repair System can be successfully accomplished in greater than 90% of cases if the discectomy is performed with the ultimate goal of repair being appreciated. Repairing the anulus fibrosus was shown to be beneficial by reducing the need for additional surgery, in particular those re-operations for true recurrent herniation.