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Stanford Health Care Now

ORTHOPAEDICS AND SPORTS MEDICINE INNOVATIONS AND ADVANCEMENTS

Reduced Risk of Lumbar Disc Reherniation with Annular Closure Device

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Approximately 2% of adults experience a herniated disc by the time they are in their fifties. The majority of herniations appear in the lumbar vertebrae and present more frequently in men at a 2 to 1 ratio.



Herniated discs can occur from improper lifting and twisting, resulting in debilitating pain from associated nerve compression. Pain can radiate across the buttocks, down the legs, and into the feet. Some patients also experience weakness or numbness. Back pain is not always a symptom.

TREATING LUMBAR DISC HERNIATION

Stanford Medicine physicians take a conservative approach to treating herniated discs. Treatments can include medication and physical therapy, along with rest, back braces or other lumbar support, and injections.

They also advise against excess body weight and improper movement, both of which exacerbate disc problems. If weakness develops, or the pain is not improved by nonoperative options, a microdiscectomy may be recommended.

PERFORMING A LIMITED MICRODISCECTOMY

Preoperative imaging studies are conducted to confirm a pinched nerve due to a herniated disc in the lower lumbar region. If indicated, a limited microdiscectomy is performed to surgically remove the ruptured portion of the disc. A disc herniation leaves an annular defect that does not typically heal, leaving some patients with large defects at higher risk of reherniation.

“Some patients carry a higher risk of reherniation, symptom recurrence and reoperation following a limited microdiscectomy, due to defects left in the disc annulus,” says [John Kleimeyer, MD](#), orthopaedic spine surgeon at Stanford Health Care.

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The International Society for the Advancement of Spine Surgery (ISASS) reported the impact of reherniation on patients and society at large. Their [study](#) included data on 500,000 discectomies conducted in the United States in a single year.

Approximately 150,000 patients within that group were left with large defects in the disc annulus after surgery. Of these patients:

- 10,800 were unable to return to work within two years
- 24,000 needed repeat lumbar disc herniation (LDH) surgery within two years
- 42% of people undergoing a second surgery were unhappy with the results
- 11,040 remained disabled after multiple surgeries

Repeat surgeries represented a cost of \$1.1 billion, including 10.3 million additional hours of lost work. “It is easy to see why any technique that can avoid reherniation following discectomy surgery is so important,” says Dr. Kleimeyer. “The economic and disease burden of recurrence and reoperation is staggering.”

PERFORMING ANNULAR CLOSURE FOR BEST RESULTS

Stanford Medicine orthopaedic spine surgeons use an innovative annular closure device (ACD) to help reduce the chances of repeat LDH in their patients.

This device is the only FDA-approved ACD of its kind: a bone-anchored implant crafted of titanium and polymer fabric mesh. It is implanted during surgery if the defect in the disc annulus meets recommended guidelines which results in that patient having a higher risk of reherniation.

Approximately one-fifth to one-third of discectomy patients will have large annular defects equal to or larger than six millimeters. Approximately 25% of these patients will experience a recurrent herniation if the defect is not repaired. Smaller defects represent a lesser risk and do not need to be closed.

REPAIRING DEFECTS IN THE DISC ANNULUS

Stanford Medicine orthopedic spine surgeons can place the annular closure device during limited microdiscectomy surgery for larger defects. The surgeons anchor the titanium component of the implant to a healthy vertebra and set the polymer flap to cover the hole in the disc annulus. The procedure may also preserve nucleus pulposus tissue in the disc which may also minimize disc height loss. “It is a clever and innovative device that has the potential to help many of these patients avoid having their spine problem recur,” notes [Serena Hu, MD](#), spine surgeon at Stanford Health Care of the ACD.

ANNULAR CLOSURE DEVICE EFFECTIVENESS

The ACD has been implanted in nearly 8,000 patients worldwide. In randomized, controlled trials with large disc annulus defects, ACD use reduced disc reherniation by 52%. There was also a 61% reduction in repeat surgeries at the two-year follow up point.



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ACD CONTRAINDICATIONS

Contraindications to ACD device usage include, but are not limited to:

- Allergies to implant components
- Body mass index (BMI) of 40 or more
- Infection of the disc
- Osteoporosis or osteopenia
- Severe spinal arthritis or listhesis

Referring patients with lumbar disc herniation to Stanford Medicine Spine Center

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