SpineJet®
HydroDiscectomy System

SpineJet® MicroResector MicroDiscectomy *Surgical Technique*

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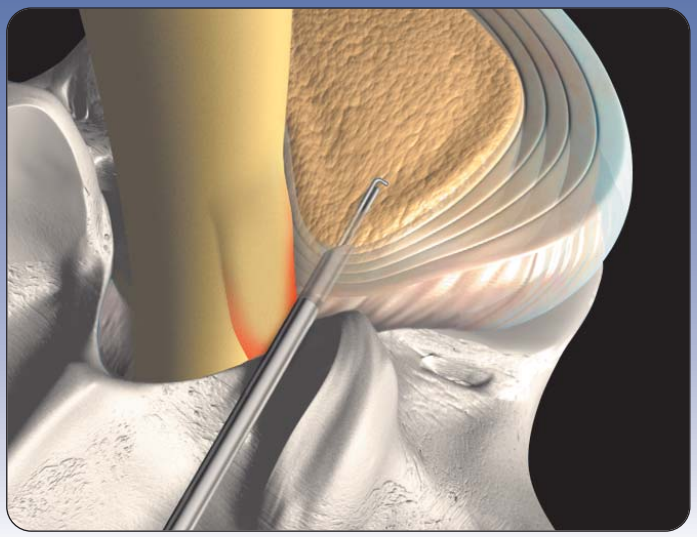
Portsmouth, Virginia

The opinions expressed represent the personal views of the author and do not necessarily represent the views of the Department of the Navy and Department of Defense.



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HydroCision®
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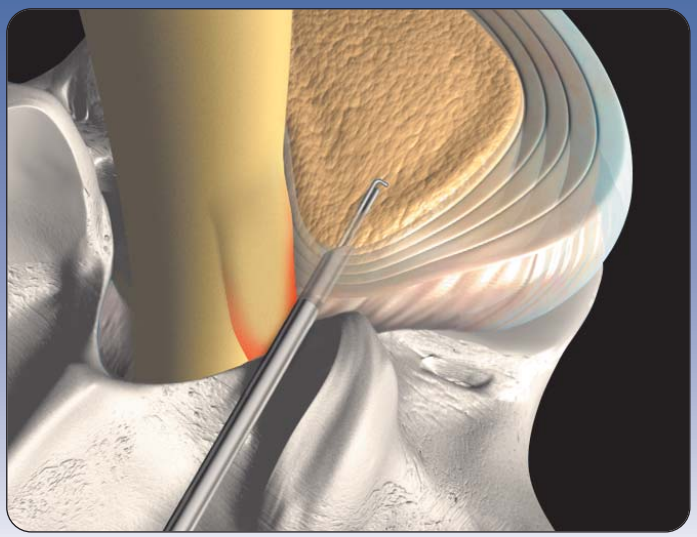

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Introduction

Lumbar microdiscectomy performed using traditional techniques results in 85 to 95% good to excellent results in the immediate post-operative period. However, recurrence rates have been reported as high as 26% within 1 year post-op[1] and radicular pain secondary to epidural fibrosis has been reported as high as 21%.[2] The SpineJet MicroResector System is designed to minimize the approach-related morbidity of the traditional microdiscectomy. The system enables the surgeon to quickly access the disc space and perform a microdiscectomy with minimal manipulation of the nerve root thereby decreasing the incidence of epidural fibrosis. Additionally, the cannulated system can dilate the annular fibers rather than cut them thereby minimizing the size of the residual annulotomy, which can decrease the rate of recurrent herniations.[1]

Patients who are Candidates for Hydrosurgery MicroDiscectomy

Patients with radicular symptoms secondary to herniated nucleus pulposus resulting in nerve root compression of the lumbar spine:

Includes:

- Central, lateral recess (posterior lateral) and foraminal (far lateral) herniations
- Primary or recurrent herniations
- Contained or non-contained subligamentous herniations

Excludes:

- Nerve compression secondary to free fragments
- Nerve root compression caused by substances other than disc such as bone and ligamentus material (hypertrophied facets, ligamentum flavum, etc.)

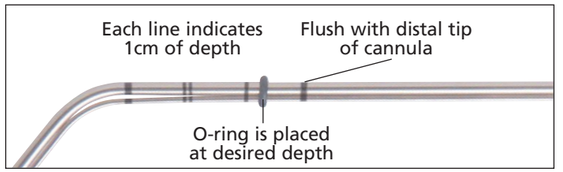
Surgical Technique

Step I - Surgical Approach

The herniated disc can be approached via a midline or a paramedian incision. The cannula system is compatible with most retractor systems. The nerve can be exposed via hemilaminotomy if the herniation is in the lateral recess or via an inter-transverse process approach for far lateral or foraminal herniations.

Step II - Placement of Working Cannula

While leaving the nerve root in its anatomical position, with minimal manipulation, the needle is inserted into the herniation approximately 2-3 mm from the nerve root. The dilator is then passed over the needle into the herniation. Insertion requires firm pressure since the annular fibers are being dilated rather than cut. Next, the working cannula is inserted over the dilator. Minimal force is required for this step. Utilizing the markings on the outside of the surface, the cannula is placed to a depth of approximately 1 cm. The cannula should be placed under direct visualization to ensure that the nerve root is not inadvertently injured during insertion. Lastly, the dilator is removed leaving the working cannula in the herniation with the nerve root safely protected.



Step III - HydroDiscectomy with the MicroResector

With the cannula in place, the HydroDiscectomy can be safely performed. The MicroResector is inserted into the working cannula. The depth of insertion into the herniation is indicated by the rubber O-ring on the shaft of the MicroResector, and is measured by markings etched on the MicroResector. Upon initial introduction into the disc space, the surgeon will encounter resistance. This resistance is a result of pressure from the herniated nuclear material. Depress the foot pedal to run the SpineJet MicroResector. With the fluid jet on, the herniation is resected using a gentle pistoning motion. The initial resistance encountered will quickly dissipate as the nuclear material is evacuated. While continuing to use the pistoning motion, the MicroResector should be rotated 360 degrees and wanded superiorly, inferiorly, medially, and laterally to increase the volume of disc material removed. The amount of disc material removed is determined by the length of time the MicroResector is activated within the herniation.[3] Once complete, the MicroResector and Access Cannula are removed leaving a small annular defect.

Step IV - Assessment of Decompression

Gently examine the nerve root to ensure adequate decompression. Care should be taken to avoid any unnecessary manipulation of the nerve root during inspection. There may be the appearance of a herniation after decompression. However, this does not require resection as long as the nerve root is adequately decompressed.

The wound is irrigated and closed using the surgeon preferred technique.

Post-op Management

Post-op management is the same as decompression performed using the standard technique.

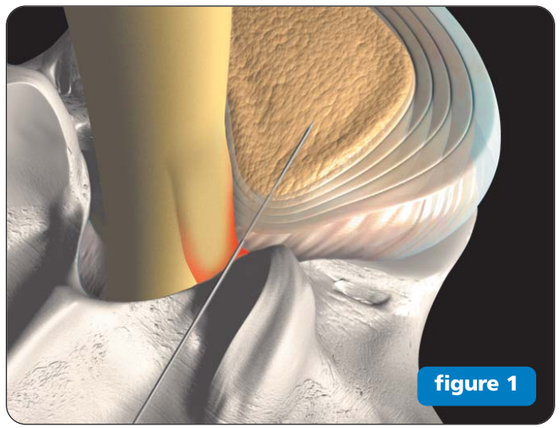


figure 1

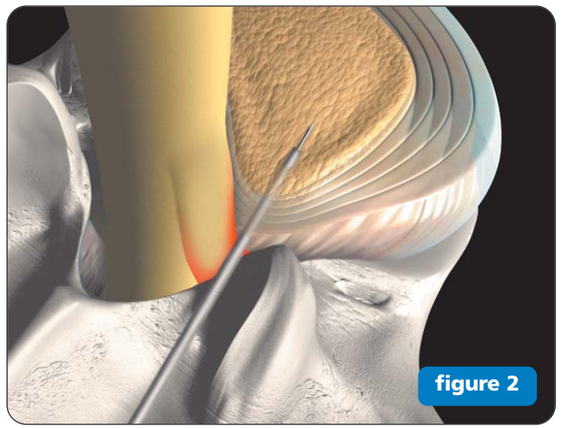


figure 2

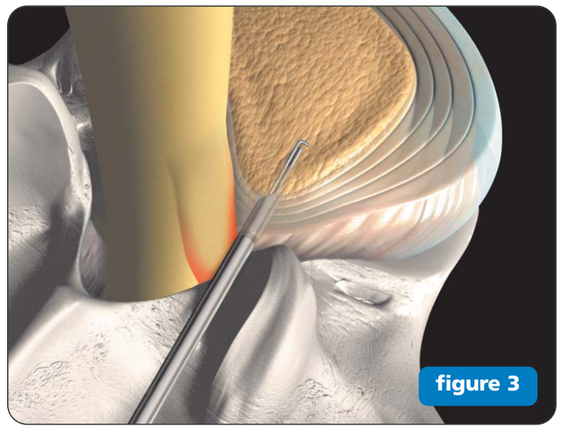


figure 3

Note: 1cm indication on cannula

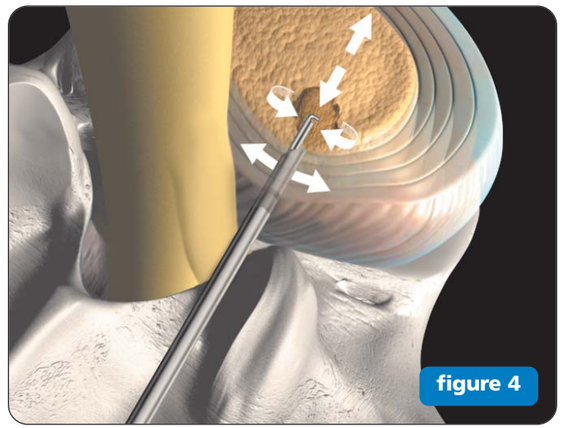
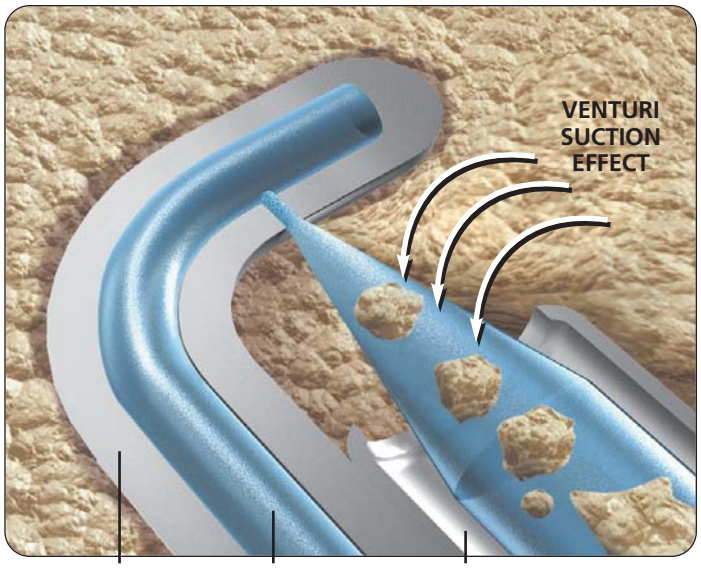
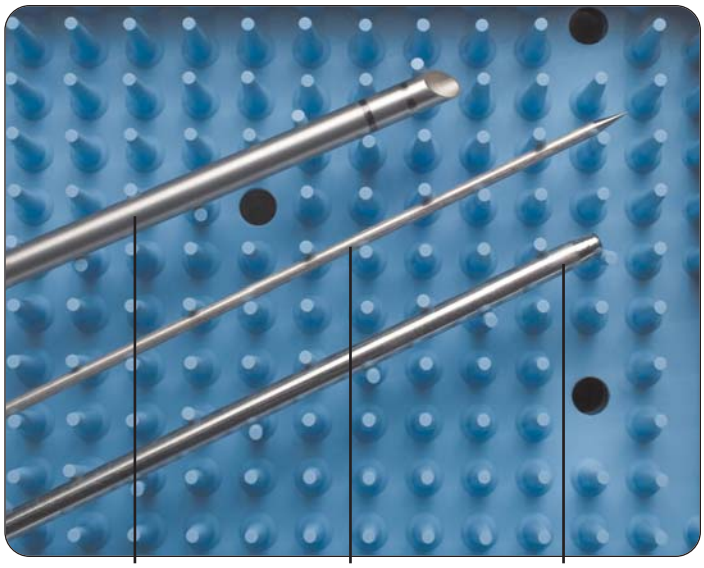


figure 4



SpineJet Fluidjet Technology

The SpineJet fluidjet technology uses a high-velocity water stream to simultaneously cut and aspirate tissue.



HydroDiscectomy Access Cannula Set

HydroCision®
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[1] Carragee et al. *JBJS*, 2003
[2] Hardenbrook et al. *AANS/CNS*, 2007
[3] HydroCision MicroResector Tissue Consumption Study

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