MEDCO FORUM®
PRESENTING INNOVATIVE PRODUCTS AND SERVICES TO HEALTHCARE PROFESSIONALS
VOLUME 15 NUMBER 37
SEPTEMBER 2008
REPRINT

SPINEJET® HYDROSURGERY SYSTEM WITH PATENTED FLUIDJET TECHNOLOGY

Safer, Faster, and More Effective Disc Preparation and Microdiscectomy

The **SpineJet HydroSurgery System** from **HydroCision® (Billerica, MA),** uses an innovative surgical modality to give physicians consistent and reliable results during spinal surgery procedures. HydroCision's proprietary fluidjet technology uses a hair-thin supersonic stream of water that provides an effective tool for cutting, ablating, and collecting targeted tissue in a precise and controlled manner. The SpineJet HydroSurgery System features the **SpineJet XL® Fusion Preparation System** and the **SpineJet Micro 3.8 System** for microdiscectomy. These tools save the surgeon time in the OR, and may reduce the risk of complications and surgical site infections.

The SpineJet XL Fusion Preparation System allows surgeons to more quickly, safely and effectively prepare the intervertebral disc space for graft implantation during open or minimally invasive lumbar interbody fusion procedures. This all-in-one tool combines the power of fluidjet technology with unique curette designs that can simultaneously cut, ablate and remove hard or soft tissue—such as disc nucleus and endplate cartilage—reducing the need for additional instruments. In addition to the reliable rectangular tip, the new low profile oval tip, with its smooth cutting edges, was specifically designed to enter tight disc spaces. HydroCision's unique tip designs protect against unintended annular penetration. The SpineJet XL provides superior disc preparation, as surgeons can access the entire disc space and remove 95 percent more posterior contralateral nucleus than with conventional devices.[1] The SpineJet XL is designed to work in conjunction with all currently available minimally invasive access systems and is ideal for PLIFs, TLIFs, XLIF and direct lateral procedures.

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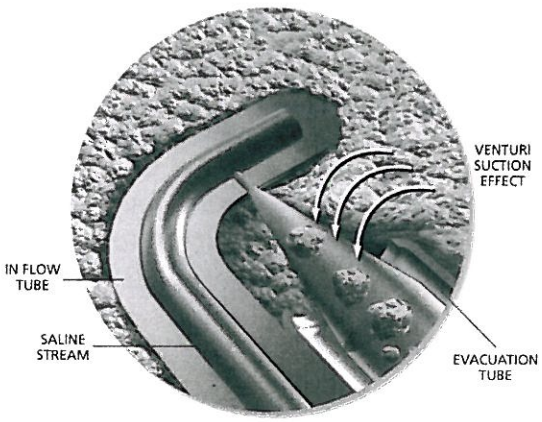
>
> **Stephen I. Ryu, MD**



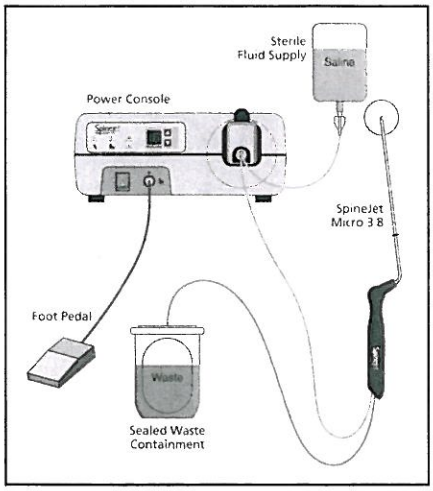
THE SPINEJET TIP

"The SpineJet product is a very useful tool for disc space preparation, which is really the key to successful fusion," notes Stephen I. Ryu, MD, a neurosurgeon at Stanford University Medical Center (Stanford, CA). "With the appropriate SpineJet tip, you can do more of a discectomy because you can work around corners better and achieve improved endplate preparation than with conventional instruments. I can do a more thorough disc space preparation while also reducing my overall OR time." The SpineJet XL has been shown to reduce passes

in and out of the intervertebral space by up to 65 percent.[1] Dr. Ryu believes that this makes for a safer procedure. "You typically have a sequence of passing different instruments in and out of the disc space. Each time you pass an instrument, there is the possibility that this can cause some complication." If the HydroCision tool reduces operative time as well as instrument passes, "in theory, surgical site complications and the risk of infection may also decrease."

Larry T. Khoo, MD, Co-Director, Comprehensive Spine Center, Division of Neurosurgery, UCLA Medical Center—Los Angeles (Los Angeles, CA), says that he has also been able to do a more thorough job, more quickly, with the SpineJet XL. "Without a doubt, I can remove more of the disc material—and I can do it faster. We've done cadaver studies showing disc material removed and it's about 15 to 20 percent more on average per level with the SpineJet as compared to conventional tools without making multiple passes, which reduces the risk of infection as well as the chances of injuring the surrounding neurovascular structures. And further, if you looked at the speed in the OR, I would say I gain about 10 minutes per level, consistently, even up to 15 minutes. This translates into large cost savings as well."

Dr. Khoo also addresses the possibility of reduced risk of infection with use of the HydroCision tool. "The big difference is that before we had to introduce multiple tools, multiple times, to clean out the disc space. By constantly moving tools from outside to inside, you can increase the chance of iatrogenic introduction of infection. With the HydroCision tool, we find we use relatively few passes, thereby decreasing the likelihood of introducing this kind of infection into the disc space." Dr. Khoo also points



HydroDiscectomy utilizes the SpineJet Micro 3.8 System to remove disc material with precisely controlled high pressure water through a cannulated system.

out that SpineJet's high powered stream of water may prevent infection as well. "One of the main ways we fight infection during surgeries, besides our sterile technique, is with a great deal of irrigation. With the SpineJet XL, the disc space is constantly being irrigated by high pressure water, so there is a decreased chance for bacteria to take hold. We are almost treating any infection before it happens."

The **SpineJet Micro 3.8 System** is based on HydroCision's HydroDiscectomy platform. HydroDiscectomy utilizes the SpineJet Micro 3.8 System to remove disc material with precisely controlled high pressure water through a cannulated system. Surgeons can quickly and safely decompress herniated discs, providing relief to patients suffering from chronic back and/or leg pain. The minimally invasive HydroDiscectomy procedure bridges the gap between conservative therapy and conventional open surgery. The smaller annulotomy created with the SpineJet Micro 3.8 System decreases the risk of reherniation[2] and, as the slim cannula is inserted into the disc space over a dilator, there is no need to cut annular fibers. HydroDiscectomy requires fewer instrument passes into and out of the disc space and the nerve root is decompressed with minimal intraoperative manipulation, reducing the incidence of recurrent radicular pain associated with epideral fibrosis,[2] and also minimizing the residual annular defect after decompression. Surgeons can precisely control the amount of disc material removed, making the procedure even more efficient.

Dr. Khoo finds that the main attractive feature of the HydroDiscectomy tool is the small size of the annulotomy it creates. "There are several theoretical benefits gained by this: Keeping the annulotomy small should reduce the recurrent reherniation rate. We also know that by making a large annulotomy, you can influence the long-term biological integrity of the disc itself—the smaller hole should reduce the potential progressive collapse of the disc space, as suggested by growing evidence that annular repair is associated with reduced reherniations and decreased long-term axial back pain. Additionally, with the cannula system, there is less manipulation of the nerve root, thereby less risk of damage."

To Learn More

For more information about the HydroCision SpineJet HydroSurgery Systems, SpineJet XL Fusion Preparation System or SpineJet Micro 3.8 System, visit the company's Web site at www.hydrocision.com, or call 1-888-747-4470.

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References:

1. Araghi, A, *et al.* Disc Space Preparation for Transforaminal Interbody Fusion Using Novel Hydrosurgical Instruments, SAS, 2006.
2. Hardenbrook, M, *et al.* A Novel Approach to Lumbar Microdiscectomy. AANS/CNS Section on disorders of the Spine and Peripheral Nerves, 2007.