

The Pain Journal

A Medical Newsletter Providing Current and Cutting-Edge Information Regarding the Treatment of Pain and Spine Disorders

Non-Surgical Treatment of Disc Disorders

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The intervertebral disc is believed to be the source of pain in as many as 40% of patients with chronic low back pain. The process is commonly referred to as Intervertebral Disc Disruption (IDD) or discogenic pain. The pathophysiology and origins of low back pain of discogenic origin are incompletely understood. Small, traumatic or non-traumatic, peripheral tears of the annulus fibrosus lead to an acceleration in the dehydration of the intervertebral disc, with resultant fraying of the nucleus pulposus.

The patient will typically present with complaints of lower back pain only, but can also experience radiation into the gluteal region, groin, or proximal thighs. This pain is often made worse by sitting and relieved with recumbence. Activity may actually provide some relief but certain tasks such as lifting will exacerbate the symptoms. Women may experience increased pain just prior to their menstrual cycle.

The intervertebral disc is surrounded by an external continuous plexus of interlacing nerve fibers. The sinuvertebral nerves are recurrent branches of the ventral rami that reenter the intervertebral foramina to be distributed within the vertebral canal. These nerves are mixed nerves, formed by a somatic root from a ventral ramus and an autonomic root from a gray ramus communicans. The sinuvertebral nerve supplies the posterior margin of the annulus fibrosus. Vascular ingrowth also has been observed in peripheral tears of the annulus. Nociceptors may accompany this vascular growth and account for the presence of sensory nerve supply in the inner annulus.

The results from conservative therapies, such as physical therapy, chiropractic, massage therapy, and acupuncture, are modest at best. Likewise, the results of aggressive surgical intervention, such as interbody fusion, posterolateral fusion, microdiscectomy, arthroscopic discectomy, as well as

other procedures, involve an extremely invasive approach with long term effects comparable to more conservative interventions.

Fortunately, there are minimally-invasive intervention procedures that have been shown to be both safe and effective in patients with IDD. They include Intradiscal electrothermal annuloplasty (or IDET), Disc Peripheral Nerve (DPN) ablation, and Discal Biacuplasty.

Inclusion Criteria:

- Criteria for discogenic pain satisfied
 - Predominant axial/mechanical pain
 - Demonstration of positive concordant pain of intensity >6/10 during provocative lumbar discography at 1 or 2 disc levels at low pressures (<50 psi) with negative control disc at one and preferably two adjacent levels and sham pressurization
 - Physical examination
- Chronic pain (>6 months)
- Age greater than 18 years
- At least 50% preserved disc height
- Failure to achieve adequate improvement with comprehensive non-operative treatment including: non-steroidal anti-inflammatory drugs, physical therapy, and fluoroscopically guided epidural steroid injection in and around the area of pathology
- Other possible causes of low back pain have been ruled out

Exclusion Criteria:

- Neurological deficit
- Intervertebral disc herniations greater than 4mm
- Extruded/sequestered intervertebral disc herniations
- Spinal pathology that may impede recovery (e.g. spina bifida occulta, spondylolisthesis at the painful segmental level, or scoliosis)
- Moderate to severe foraminal or central canal stenosis
- Pregnancy
- Existing endplate damage or Schmorl's nodes
- Greater than grade 4 annular tear (Modified Dallas Grading)
- Systemic infection or localized

infection at the anticipated introducer entry site

- History of coagulopathy or unexplained bleeding

Relative Contraindications:

- BMI greater than 29.9 (obese)
- Irreversible psychological barriers to recovery
- Prior lumbar spine surgery
- Radiculopathy
- Immunosuppression (e.g. AIDS, cancer, diabetes, other surgery within last 3 months)

Prior to any disc procedure, it is common practice to perform a Discogram. This test is used to determine which disc has structural damage and whether it is causing pain. A discogram can show if a disc has begun to rupture and if it has tears in the tough outer annulus. By injecting fluid (Dye) into the disc to increase pressure, the physician can tell if it is painful, and be confident that this type of structural damage is a primary cause of pain within a damaged disc. Normal discs, and even those that are severely degenerated, do not usually cause pain. Additionally, a post-discogram CT scan is often performed to assess the dye patterns and further reinforce pathologic disruption of the intervertebral disc. Once it has been determined that the patient's source of back pain is indeed discogenic, i.e. from an IDD, the minimally-invasive interventional procedures mentioned above may be performed.

IDET uses a probe inserted into the disc to heat the tissues within the affected disc. The probe is positioned in a circle around the inside of the disc and is slowly heated to about 194 degrees F (90 degrees C). The

heat is meant to coagulate and destroy any pain fibers and toughen the outer layers of disc tissue, sealing any small tears.

DPN block involves using an approach similar to IDET, however, the target tissue is specifically the posterior outer annular fibers. These pain-generating fibers are specifically innervated by the sinuvertebral nerve bilaterally. Accordingly, it is often necessary to have two successive procedures performed to ablate the nerve on both sides in order to achieve complete and adequate pain relief. This is a relatively new procedure; however, it has shown extremely promising clinical results. It is also quite cost effective as the electrothermy probes used are the same ones that are used for medial branch ablations.

Finally, Disc Biacuplasty, meaning "two needle treatment of the disc", also involves the same physical properties and mechanisms of action as IDET and DPN. The difference is it involves an internal water-cooling system in the probes which, in theory, allows for temperature moderation designed to protect surrounding tissues. The major disadvantage of this procedure is it is extremely expensive as the probes used can cost an exorbitant amount of money.

Non-surgical interventional techniques designed to treat discogenic back pain, or Internal Disc Disruptions, are a safe and effective option for this patient population. They are more aggressive treatments than conservative therapies yet much less invasive than traditional surgeries. §

May/June 2008 § Volume 4, Issue 3

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Self-Help Pain Relief

At Mid Atlantic Spine, we want to help not only relieve your pain but provide you with the information and resources to stay informed about your condition and for a better quality of life.

Condition: Discogenic Low Back Pain

Did you know?

Disc degeneration occurs as our bodies gradually age. These gradual changes affect the intervertebral discs. Usually there are no symptoms or pain caused by the degeneration until it reaches more advanced stages. Once in the advanced stages patients may notice the following symptoms:

- Intradiscal pressure/pain may be felt when sitting, bending forward, coughing and sneezing.
- Leg pain (radiculopathy) may occur from pinched nerves especially when sitting, standing or walking.
- Discogenic low back pain is usually chronic.

For more information:

- Spine Universe
www.spineuniverse.com/displayarticle.php/article3342.html
- About.com
<http://orthopedics.about.com/od/backneck/a/discpain.html>
- Katz, Jeffrey. *Heal Your Aching Back*. McGraw-Hill; 2007.
- Vad, Vijay. *Back Rx: A 15 minute a day yoga and pilates based program to end low back pain*. Gotham Books; 2004.
- Schatz, Mary. *Back Care Basics: A Doctor's Gentle Yoga Program for back and neck pain relief*. Rodmell Press; 1992.
- Rosenblatt, Marc. *Low Back Pain: What You Need to Know*. Center Path Publishing; 2008.

Questions:

Email your questions to the medical librarian at Mid Atlantic Spine, Stephanie Erhart, MLIS: serhart@midatlanticspine.com.

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About Mid Atlantic Spine

Mid Atlantic Spine is a well-recognized physical medicine and rehabilitation group practice specializing in the treatment of spine and pain related disorders since 1995. The practice is staffed with a team of board certified physiatrists, chiropractors, and licensed practitioners who provide individualized treatment for patients in a very compassionate and caring setting. The group is the main training site for a large metropolitan university teaching hospital ACGME accredited pain medicine fellowship and is actively involved in ongoing clinically oriented research. The group has office locations in Delaware and Maryland, provides radiology imaging services, and has a separate ambulatory surgery center.

Conditions we treat include:

- Neck Pain
- Sports Injuries
- Migraine Headaches
- Radiculopathy
- Facet Syndrome
- Arthritis
- Sciatica
- Low Back Pain
- Disc Herniations
- Sacroiliac Joint Syndrome
- Spasticity
- Osteoporosis
- Facial Pain
- Trigeminal Neuralgia
- Carpal Tunnel Syndrome
- Peripheral Neuropathy
- Reflex Sympathetic Dystrophy
- Osteoarthritis
- TMJ Syndrome
- Interstitial Cystitis
- Cancer Pain
- Fibromyalgia
- Other Painful Disorders

Services we offer include:

- Pain Management
- Rehabilitation
- Spine Injections
- Kyphoplasty
- Discography
- Imaging (CAT Scan, MRI, X-Ray)
- Radiofrequency
- Cryoablation
- Botox Injections
- IDET
- Nucleoplasty
- Electrodiagnostics
- Nerve Conduction Studies
- EMG
- Tumor Ablation
- Percutaneous Discectomy
- Vertebroplasty
- Osteoplasty
- Spinal Cord Stimulation
- Intrathecal Pump Therapy
- Physical Therapy
- Chiropractry
- Other Interventional Treatments

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