

INNOVATIONS

IN SPINE & BRAIN TREATMENT

Shekhar A. Dagam, MD
Neurosurgery
Compassion, commitment
& leading-edge solutions for the spine & brain

VOLUME 1, NUMBER 1

Why conventional, 'open' spine surgery may not be the best option for your patients

In a cohort of 100 sciatica patients selected at random, 85 of them theoretically can be expected to experience a significant reduction in back pain following spine surgery using minimally invasive techniques (assuming that all 100 are appropriate candidates for such procedures), suggests new research conducted at the Medical College of Georgia.

This finding was presented in April 2006 at the 44th Annual Meeting of the American Society of Neuroradiology in San Diego, Calif.

The research supports the view that certain minimally invasive approaches to reducing pressure and inflammation in herniated discs of the lumbar spine – in this instance, percutaneous discectomy – result in good outcomes for patients with sciatica.

A better way

The relationship between disc herniation and sciatica was formally established nearly 80 years ago. In 1934, the first successful attempt at correcting lumbar disc herniation with surgery was made – and since then, it has become well-recognized that “open surgery of the spine is appropriate and effective when conservative treatment of sciatica induced by lumbar disc herniation proves ineffective.”

The “gold standard” in open surgical treatment of lumbar disc herniation is the unilateral transflavial discectomy. This procedure delivers relief through retrieval of herniated disc fragments and decompression of the spinal nerve at its root.

Increasingly, though, the medical field is coming to appreciate that there is a better way to go about this.

The better way is composed of a number of minimally invasive spine surgery techniques, all of them made possible by rapid technological advances over the past two decades. These

strides in technology include development of microscopy, laser technology, endoscopy and video and image guidance systems, which today permit facile and cost-effective performance of endoscope-assisted transoral surgery, decompressive laminectomy, cervical laminotomy, corpectomy and foraminotomy, according to a 2004 report published in *Neurosurgical Focus*, the journal of the American Association of Neurological Surgeons.

Faster recovery

One of the newest technologies for minimally invasive surgery is a system known as METRx™, which, like conventional open surgery, has as its goal nerve root decompression. It employs some of the same techniques as open surgery except that they are performed via a tubular retractor under microsurgery visualization.

By using METRx, a surgeon can perform discectomy surgery while minimizing the amount of muscle damage inherent to locating the herniated disk and safely removing the fragments. From the patient's perspective, that translates into a hospital stay reduced by half compared to that involved in a traditional open surgery – many patients are in and out the same day rather than in one to three days as is required with open surgery.

Moreover, absence from work is shortened by about 50% – an open-surgery patient might be off the job anywhere from 14 to 45 days, depending on the type of toil involved (the more manual and exerting the labor, the longer the recovery period), whereas the METRx'ed patient's return to work can occur in seven to 15 days (or 15 to 21 days for a manual laborer).

This type of surgery also makes rehabilitation and physical therapy after spine surgery much easier because of the minimized damage inflicted upon the muscles of the spine. Specifically, less muscle damage means less scar tissue formation.

Small incision

The advantages of METRx are attributable to several factors, not the least of which is the smaller incision (approximately 2.5 cm long).

Discectomy employing the METRx system begins with the surgeon precisely localizing the level of the herniated disc. To do this, a needle is inserted through the muscles of the back down to the area where the disc fragments are located.

Positioning of this needle is critically important, which is why it is guided into place with the aid of a fluoroscope. Once its position is confirmed as correct by the fluoroscope, a series of soft-tissue dilators are used to tunnel through muscle tissue and create a 16 mm diameter corridor through which a tubular retractor can be inserted.

Next, the tubular retractor is positioned at the same depth as the spinal cord. The surgeon visualizes the area where the herniated disc is located, selects an appropriate fragment removal instrument, channels it through the tubular retractor and begins removing pieces of the herniated disk.

Bone regrowth

As an adjunct to minimally invasive spine surgery, leading-edge practices now incorporate use of recombinant human bone morphogenetic protein-2 (rhBMP-2), such as the INFUSE® product from Medtronic Sofamor Danek (the same company that makes METRx). The bone morphogenetic protein

added to the surgery site along the spine promotes natural bone growth. This causes the disc space to join or fuse the vertebra. The result is a more quickly stabilized spine along with a reduction in postoperative back pain.

Bone morphogenetic proteins – or BMPs – have been studied for decades. Approximately 20 BMPs have been discovered, but only six appear capable of initiating bone growth. Of these, rhBMP-2 has been studied more than any other BMP and is FDA-approved for use in certain spinal and tibial surgeries.

In operating room use, rhBMP-2 is soaked onto a bovine-derived absorbable collagen sponge. Near the end of the spine surgery, the sponge is placed in contact with the spine and remains there. The incision is closed. The sponge is designed to resorb over time; as this transpires, the release of rhBMP-2 stimulates the cells to produce new bone and, ultimately, to heal.

Conclusions

Minimally invasive spine surgery has made tremendous advances in recent years.

Thanks to the advent of improved optics and video equipment, retractor and instrumentation systems, image guidance systems and new biological agents, most traditional “open” spine procedures can now be performed in a minimally invasive fashion. Procedures include decompressive laminectomy, cervical laminotomy, corpectomy and foraminotomy.

For patients, the benefits of minimally invasive spine surgery are shorter hospital stays, less postoperative pain, earlier and better rehabilitation and faster return to activities of daily living – including work and sports.

In my practice, the goal is to use minimally invasive spine surgery in every warranted and appropriate case because the benefits to patients are so significant.

As a Mayo Clinic-trained neurosurgeon with years of experience involving these cases, I believe that minimally invasive spine surgery should be performed in a hospital setting (rather than in an outpatient facility) for the reason that the hospital affords the highest level of quality control for these delicate procedures.

Growing numbers of referring physicians in Milwaukee, Waukesha and neighboring Wisconsin communities are discovering that my private practice offers their patients academic-level spine surgery care, with preoperative evaluations conducted in a conveniently accessible and comfortable setting. The capabilities of my practice derive

from utilization of state-of-the-art technologies and techniques, anchored by a commitment to provide treatment that is fully tailored to the unique circumstances facing each individual patient.

It is for these and many other reasons that you can refer to me with confidence for help in managing these challenging patients. In addition to being responsive and accessible to you, it is customary for me to keep you informed of your patients' progress, beginning with a detailed report sent to you after the initial consult and continuing with a letter following each successive visit. You can also expect a phone call from me after surgery to apprise you of the results and discuss any pertinent details. Additionally, I take the time to inform patients and answer all their questions in terms they can understand.

Satisfied by the services and support I can provide, your patients will return to you more willing than ever to continue entrusting their care to you.

For further information about minimally invasive spine surgery and my other neurology-specific surgical services, call me at (262) 717-9850.



Shekhar A. Dagam, MD

FELLOWSHIP: Stereotactic Radiosurgery, Mayo Graduate School of Medicine / University of Pittsburgh, PA

RESIDENCY: Neurological Surgery, Mayo Graduate School of Medicine, Rochester, MN

MD: With Distinction, George Washington University School of Medicine, Washington, DC

BS: Chemistry, University of California at Berkeley, CA

Advanced, comprehensive solutions for...

- Chronic & acute neck & back pain
- Arm & leg pain
- Spine disorders & degenerative conditions
- Cervical & lumbar radiculopathy
- Spinal stenosis
- Herniated disc
- Compression fractures
- Spinal-cord tumors & AVMs
- Brain tumors, aneurysms & AVMs
- Microvascular nerve-compression disorders
- Epilepsy & Parkinson's disease
- Hydrocephalus ■ Stroke
- Carpal tunnel syndrome

Leading-edge spine & brain procedures...

- All minimally invasive & open spine surgeries
- Complex spine reconstruction
- Surgery for relief of spine pain
- Craniotomy
- Removal/resection of spine & brain tumors
- CyberKnife® & Gamma Knife® radiosurgery
- AVM & aneurysm repair
- Epilepsy & Parkinson's surgery
- Awake brain mapping
- Nerve decompression
- Pain pumps & nerve stimulators
- Carotid endarterectomy
- Shunt insertion & revision

Committed, caring & convenient...

- Friendly, caring doctor & staff
- Individualized care & attention
- Detailed & frequent physician-to-physician communication
- Early morning appointments available
- Appointments seen promptly
- Most insurance accepted & filed

20700 W. Watertown Road, Suite 101
(Off the Barker Road Exit)
Waukesha, WI 53186

(262) 717-9850 | Fax: (262) 717-9851

2900 W. Oklahoma Avenue
(In Aurora St. Luke's Medical Center Hospital)
Milwaukee, WI 53215

(262) 717-9850 | Fax: (262) 717-9851

www.dagamneurosurgery.com