Lateral Interbody Fusion Training Comes to Birmingham

Jane Ehrhardt

Donald A. Deinlein, MD

This August, ten more Alabama surgeons walked out of the Sheridan knowing how to perform the direct lateral interbody fusion (DLIF) technique. The training on this procedure to treat degenerative disc disease had been taught by Donald A. Deinlein, MD,associate professor of orthopedic surgery at UAB and, until this event, the only physician in Birmingham trained in the approach.

Two years ago, Deinlein had been intent on learning a lateral approach, so he traveled to three U.S. sites for training — Emory University, University of Maryland, and San Diego. Now, by offering the cadaver training on DLIF in Birmingham, he hopes to make it easier for other Alabama surgeons to offer the procedure to their patients.

Prior to the lateral approach, access to the spine had been through anterior or posterior incisions. But the new approach avoided the major muscle groups in the back and the major organs and blood vessels in the abdomen.

Deinlein first heard about the lateral access approach, known then as the alpha approach, in 2002 at a medical conference in France. The presenter spoke of a safe conduit to the discs through a patient's side between the nerves and blood vessels.

Though the open procedure had been performed in Europe since the '90s, it was difficult to reproduce accurately. "There was no special equipment to help with the surgery at that time," Deinlein says. So it required a large incision and skilled precision to avoid the nerves associated with the psoas muscle.

Then in 2004, Luiz M. Pimenta, a Brazilian neurosurgeon, revealed the extreme lateral interbody fusion® (XLIF) technique in collaboration with NuVasive. Using Pimenta's breakthrough equipment and instruments, surgeons could now electronically detect nerves in real-time, overcoming a major obstacle to the lateral approach and making the procedure easily reproducible.

With the XLIF dilators and retractor, surgeons could enlarge a one-inch incision to 18mm for clear viewing and entrance to the disc. "This changed the lateral approach from an open procedure to minimally invasive," Deinlein says. "With the dilators, there's minimal tissue destruction and blood loss, so patients are usually home the next day."

To perform either the XLIF or DLIF, the surgeon threads an EMG-based probe between the fibers of the muscle and down to the disc. The probe alerts the surgeon to nearby nerves by sounding an alarm. The surgeon then inserts a small guide wire through the probe, then wider and wider dilators are placed over the wire to enlarge the opening.

The retractor, placed over the final dilator, locks to the table and the patient's spine to create a large, stable opening. "The placement of the dilators and retractor is done with the aid of a fluoroscope, but the surgery is done with direct vision," Deinlein says.

The small incision enlarges enough to allow surgeons access to three levels of the spinal column. Deinlein adds that the fusion procedure can be backed up with posterior percutaneous screw fixation, also accomplished through the small incision. "Plates work too, but for multiple levels, it's easier to use screws," he says.

The greatest risk with the lateral approach, according to Deinlein, is injury to the bowel. "With the incursion of the retractor, it's possible at the higher levels to trap the bowel in the retractor, but fortunately this is not a common occurrence," he says.

In 2007, Medtronic released a new retractor, slightly altering the procedure, and calling it the direct lateral interbody fusion (DLIF) approach. Their retractor fixes to the spine with a pin, whereas the XLIF retractor fixes to the disc. "The fixation is more rigid with the DLIF, and I think it's a safer placement for the pin in my hands," Deinlein says. "I have done both procedures and prefer the smaller DLIF retractor. But this is purely a preference."

Neither the DLIF nor the XLIF approaches can be utilized below the 4th lumbar disc because of the pelvic crest. "You can go higher if you go between the ribs, but the implant which induces fusion is not yet approved at higher levels," Deinlein says.

So far, Deinlein has performed the DLIF on about 15 patients, covering 20 or more levels, with most of the multi-disc procedures being two or three levels. "When you do multiple levels, you have to move the retractor from one disc to the other, but you can still retract through the same incision," he says.

For Birmingham surgeons looking to learn the DLIF approach and percutaneous screw fixation, Medtronic hopes to hold a training seminar in Birmingham in about six months. For more information, contact Medtronic at Medtronic.com. For the XLIF training, surgeons travel to NuVasive headquarters in San Diego. For their schedule, visit nuvasive.com (www.nuvasive.com/surgeons/mvp.htm) or email mvp@nuvasive.com.