EDITORIAL

Use of anterior lumbar discectomy and interbody fusion in the management of recurrent lumbar disc herniation and cauda equina syndrome

Paul M. Arnold, MD
Department of Neurosurgery, University of Kansas, Kansas City, Kansas

Tan et al. present a small case series of 3 patients who had previously undergone lumbar discectomy and now present with recurrent herniation and cauda equina syndrome (CES). All 3 patients were treated with an anterior lumbar discectomy and fusion (ALDF). The patients experienced a nice recovery of their symptomology, with resolution of their bowel and bladder dysfunction and improvements in lower-extremity radiculopathy. The authors noted that the anterior approach was not detrimental to visualizing and decompressing the nerve roots, and scar tissue that would have been encountered via a posterior approach was avoided.

While the patients in this limited series fared well with this surgical treatment, it is not clear whether ALDF should be adopted for widespread use for this clinical problem. Most patients can be adequately treated for recurrent herniation, even in the setting of CES, with a posterior approach. While scar tissue is often present, the disc material can usually be adequately resected. There is certainly a higher risk of durotomy in cases of revision lumbar discectomy, but this is far from a given, and it is usually a manageable problem. In the setting of CES, the disc is often herniated centrally or may migrate beyond the disc space, and the anterior approach may be inadequate for allowing visualization and retrieval of the disc and achieving adequate neural decompression.

There are several other issues to consider when deciding on a surgical approach for this particular clinical scenario. An anterior approach virtually necessitates the use of a fusion, while this is not necessarily true with a laminectomy or laminotomy. The posterior approach allows for this option without committing the surgeon to this step. In fact, most studies advocate a repeat discectomy without fusion when performing a second lumbar discectomy. Performing a fusion compels the surgeon to follow the patient for a longer period after surgery, reviewing periodic radiographs to assess fusion status and being on the lookout for the development of adjacent-segment disease.

Complications from both anterior and posterior approaches are well known, although those from an ALDF are often more serious. These include ureteral or vascular injury, which can have more dire consequences than a durotomy or excessive nerve root retraction. Managing complications arising from an anterior approach often requires significant medical resources, and it is often associated with both increased length of stay and increased costs. However, a recent study consisting of 6 patients undergoing ALDF for recurrent herniation (in a non-CES situation) showed no complications and successful disc removal and fusion. Total disc replacement has also been advocated as treatment for recurrent herniated lumbar disc.

Finally, an anterior approach usually requires the services of an access surgeon; contacting one may delay care in this emergency situation. It is also likely that some patients may have had previous abdominal surgery, making the technical aspects of the procedure more complicating, obviating the potential advantages of this approach.

There are several reasons why laminectomy with or without fusion remains the preferred approach, including predictable complications; surgeon familiarity; ability to achieve decompression, even with disc migration; no automatic fusion; and no need for an access surgeon. While an ALDF may be the optimal approach in certain instances, at this time it should not be considered to of-
fer clinical equipoise to a posterior operation, a point with which the authors of the current series are in agreement.

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References

Disclosures
Dr. Arnold reports the following. Evoke Medical: intellectual property rights and interest (patents, copyrights, royalties, or license income), equity (stock, stock options, or other ownership interest), position of responsibility; Z-Plasty: equity (stock, stock options, or other ownership interest); AOSpine North America: sponsored or reimbursed travel (for Dr. Arnold only); Medtronic Sofamor Danek: remuneration (salary and any payment for services not otherwise identified as salary such as consulting, fees, honoraria, paid authorship, etc., or other payments for services); Spine Wave: remuneration (salary and any payment for services not otherwise identified as salary such as consulting, fees, honoraria, paid authorship, etc., or other payments for services); and Stryker Spine: sponsored or reimbursed travel (for Dr. Arnold only) and remuneration (salary and any payment for services not otherwise identified as salary such as consulting, fees, honoraria, paid authorship, etc., or other payments for services).

Response
Daniel Chan, FRCS, Kimberly-Anne Tan, MBBS, Oliver M. Stokes, FRCS, Andrew J. Clarke, FRCS, Mathew D. Sewell, FRCS, and Yma Markmann, MD
Exeter Spine Unit, Princess Elizabeth Orthopaedic Centre, Royal Devon and Exeter NHS Foundation Trust, Exeter, United Kingdom

The points cited by Dr. Arnold are well taken. We would like to stress that we are not advocating the wide-spread use of ALDF for the treatment of acute CES due to recurrent disc herniation. The usual treatment option for first-time recurrent disc herniation is indeed a standard posterior revision discectomy. It can be argued that even with additional recurrences, further revision posterior discectomy remains feasible. Although the results of revision discectomy for recurrent disc herniation can be comparable to primary discectomy, inferior results in patients undergoing repeated discectomies for recurrent disc herniation have also been reported. Dr. Arnold acknowledges that there is certainly a higher risk of durotomy with revision posterior discectomy. While durotomies can be managed uneventfully, they can also lead to suboptimal outcomes. Dissecting through scar tissue within the spinal canal, particularly in the context of multiple recurrences, would be increasingly difficult and pose a higher risk of neural injury.

Osterman et al. showed that patients who have one re-operation after anterior discectomy are at greater risk of requiring further spinal surgery. With each subsequent recurrence, the risk of segmental instability increases, and therefore fusion may be a worthwhile consideration. We suggest that if one has opted for fusion of the pathological segment in recurrent disc herniation, and, as in our report, in cases of acute CES due to massive recurrent disc herniations, ALDF may be a very good option. Anterior discectomy also removes the risks associated with retraction and handling of the cauda equina. While a successful revision posterior discectomy has the advantage of a shorter follow-up period, it can also be said that a successful fusion eliminates the possibility of further recurrence at the involved segment. If a posterior fusion is performed, the need for radiological follow-up is the same as that of an ALDF.

We certainly do not underestimate the potential for complications in anterior lumbar surgery, especially since not all spine surgeons are familiar with the anterior approach. However, our small case series suggests that surgeons experienced with anterior lumbar surgery can achieve good outcomes in this context with minimal risk. We have acknowledged that in units where anterior lumbar approaches are not frequently performed, access surgeons may be required, making this method less feasible in the emergency situation requiring acute cauda equina decompression. This, however, is an unlikely problem in units where anterior lumbar approaches are frequently carried out. The Nottingham experience and the senior author’s experience in this regard concur with the experiences of Vishteh and Dickman and Choi et al. Nevertheless, it is important to choose the appropriate case in which to apply this surgical option.

Dr. Arnold rightly points out that sequestered fragments may be a problem. However, in the senior author’s experience, sequestered or extruded fragments can usually be extracted through the annular defect from within the disc space. The herniated disc fragment can be extracted without entering the scarred canal. The main exception, when this technique would be unsuitable, is when the fragment extends right behind the vertebral body. This is easily determined by assessing the preoperative MR images.
References