

Endoscopic Lateral Transpsoas Approach to the Lumbar Spine

Darren L. Bergey, MD, Alan T. Villavicencio, MD, Theodore Goldstein, MD, and John J. Regan, MD

Study Design. A description of a novel surgical approach to the lumbar spine and a prospective evaluation of the early surgical outcomes.

Objectives. Describe the early postoperative results and the operative technique of a new, minimally invasive transpsoas approach for anterior fusion of the lumbar spine that minimizes the risk to large vessels and other critical structures.

Summary of Background Data. Standard anterior endoscopic approaches to the lumbar spine require mobilization of the great vessels and sympathetic plexus. Vascular injury and retrograde ejaculation are complications clearly associated with this approach. A retroperitoneal, transpsoas approach to the lumbar spine may reduce these risks.

Methods. From 1996 to 2002, 21 patients (13 females, 8 males; mean age 50.0 years) underwent an endoscopic, retroperitoneal transpsoas approach for exposure of the lumbar spine. Surgical indications included discogenic pain in 14 patients, spinal instability at a level adjacent to a previous fusion in 3 patients, and progressive degenerative scoliosis in 4 patients. Data were reviewed to document the early postoperative results for this procedure. Illustrations were created to clearly describe this approach.

Results. Average operative time for the single level cases was 149 minutes (range 120–170 minutes); blood loss was 150 cc (range 50–650); postoperative hospital stay was 4.1 days. At long-term follow-up, visual analogue scale scores had decreased an average of 5.9. Mean follow-up was 3.1 years (range 2 months–6.0 years). Six patients (30%) experienced paresthesias in the groin/thigh region. Five of these same patients also complained of groin/thigh pain (27%). Two patients had symptoms that lasted longer than 1 month. One patient was converted to a mini-open lateral approach. There were no vascular injuries.

Conclusions. Early results show the endoscopic lateral transpsoas approach to the lumbar spine to be a safe, minimally invasive method for anterior fusion of the first through the fourth lumbar vertebrae. Although there is a risk of groin/thigh numbness or pain, and these symptoms are mostly transient. This approach allows for exposure of the lumbar spine without mobilization of the great vessels or sympathetic plexus.

Key words: endoscope, fusion, spine surgery, transpsoas. **Spine** 2004;29:1681–1688

Anterior approaches for lumbar interbody fusion have been increasingly utilized in an attempt to lower the incidence of pseudoarthroses and to recreate the patient's normal sagittal alignment.^{1–16} The majority of complications associated with anterior lumbar interbody fusion (ALIF) are associated with the surgical exposure. Most of these techniques usually require the presence of an experienced general or vascular surgeon due to the risk of serious complications.^{17,18} Although low, the incidence of great vessel injury or sympathetic plexus is not negligible, and the consequences of such potential injuries can be debilitating for the patient.⁹

In 1998, McAfee *et al*⁸ described a minimally invasive, endoscopic anterior retroperitoneal approach to the lumbar spine with an emphasis on the lateral BAK. This technique does not require CO₂ insufflations, Trendelenburg positioning of the patient, entrance into the peritoneum, or anterior dissection near the great vessels. Following entry into the retroperitoneal space, the trajectory of McAfee *et al*'s approach is anterior to the psoas muscle, requiring a considerable amount of retraction of the psoas posteriorly. This causes significant muscular swelling and weakness after surgery. The goal of this study was to describe the clinical results of a more direct, minimally invasive route to anterior lumbar interbody fusion through an endoscopic, transpsoas approach to the lumbar spine that has never previously been described.

Materials and Methods

Twenty-one patients underwent lumbar spinal fusion *via* a lateral endoscopic transpsoas approach between March of 1996 and August of 2002. Data were reviewed to determine the early postoperative results. The senior author (J.J.R.) performed all surgical cases. Six patients underwent surgery at the Texas Back Institute in Dallas, Texas, and 15 patients at Cedars-Sinai in Los Angeles, California. The study group consisted of 13 females and 8 males with a mean age of 50.0 years, ranging from 35 to 73 years.

Patient Selection. All patients were referred for lumbar spinal surgery from a multidisciplinary pain clinic having completed at least 6 months of nonoperative management with physiotherapy, pain medications, and epidural injections, in cases with radiculopathy. Routine psychological evaluation was performed in all patients before treatment. Patients with nonphysiological signs at the time of examination, those with drug-seeking behavior, or with secondary gain issues were excluded from treatment until those issues were resolved. Patient data including preoperative and postoperative evaluations were collected on a prospective basis. Any information that was found

From the Cedars-Sinai Institute for Spinal Disorders, Los Angeles, California.

Acknowledgment date: March 29, 2002. First revision date: March 28, 2003. Second revision date: September 24, 2003. Acceptance date: September 29, 2003.

The manuscript submitted does not contain information about medical device(s)/drug(s).

No funds were received in support of this work. No benefits in any form have been or will be received from a commercial party related directly or indirectly to the subject of this manuscript.

Address correspondence and reprint requests to John J. Regan, MD, 444 S. San Vicente Blvd., Suite 800, Los Angeles, CA 90048, USA; E-mail: john.regan@cshs.org