
Abstract
The patho-anatomy in an aging spine is partly defined by Rauschning's anatomic cryosections. Theories of pain generation and principles of minimally invasive spine surgery are suggested by close examination of these specimens. If the visualized patho-anatomy can be studied in vivo in a partially sedated patient by spinal probing, spinal pain can be better understood, and national endoscopic treatment options may then evolve. A 1997 IRB-approved study provided evidence that endoscopic transforminal surgery was feasible for the treatment of a wide spectrum of degenerative conditions in the lumbar spine. The technique incorporated evocative chromo-discography to correlate reproduction of pain with in vivo probing of patho-anatomy. Laser and radiofrequency ablation augmented mechanical decompression to obtain pain relief. 

1-3 Endoscopic visualization of patho-anatomy ranging from annular tears to spondylosis thesis and stenosis provided clinical evidence that foraminal decompression, ablation, and irrigation could effectively treat these visualized painful conditions with minimal morbidity. This resulted in a better understanding of the pain generators in the lumbar spine, opening up options for surgical pain management. 1-5 The procedure does not burn any bridges for more traditional surgical techniques. The learning curve may be steep for some and long for others, but results are very good, coexistent with each individual surgeon overcoming his personal learning curve.


Minimal access to the posterolateral lumbar spine.

Abstract
The purported advantages of minimally invasive spine surgery over open microsurgical alternatives for lumbar decompression and fusion are attractive to patients, surgeons, and hospital administrators. Shorter hospital length of stay, less blood loss, shorter operating times, decreased use of postoperative narcotic analgesics, and a more rapid return to work have all been touted as advantages. In this review, we describe step-by-step techniques for minimal access posterolateral lumbar decompression and fusion. Key learning tasks for the introduction of each technique into practice are highlighted. The current quality of evidence for each approach is also critically evaluated.

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Incidental durotomy after spinal surgery: a prospective study in an academic institution.

Abstract
In an academic institution.

PMID:22540168 [PubMed - as supplied by publisher]

Abstract

The minimally invasive lateral interbody fusion of the lumbar spine through a retroperitoneal transpoas approach has become increasingly used. Although preoperative imaging is performed supine, the procedure is performed with the patient in the lateral decubitus position. The authors measured the changes in location of the psoas muscle, aorta, inferior vena cava (IVC), iliac vessels, and kidneys with regard to the fixed lumbar spinewhen moving from a supine to a lateral decubitus position. Methods Unenhanced lumbar MRI scans were performed using a 3T magnet in 10 skeletal mature volunteers in the supine, left lateral decubitus (LLD), and right lateral decubitus (RLD) positions. Positional changes in the aorta, IVC, iliac vessels, and kidneys were then analyzed at all lumbar levels when moving from supine to RLD and supine to LLD. Values are presented as group means. Results When the position was changed from supine to RLD, both the aorta and the IVC moved up to 6 mm to the right, with increased movement caudally at L3-4. The aorta was displaced 2 mm anteriorly at L1-2, and the IVC moved 3 mm anteriorly at L1-2 and L2-3 and 1 mm posteriorly at L3-4. The left kidney moved 22 mm anteriorly and 15 mm caudally, while the right kidney moved 9 mm rostrally. When the position was changed from supine to LLD, the right iliac vein moved posteriorly an average of 1.5 mm behind the anterior vertebral body (VB) line (a horizontal line drawn on an axial image at the anterior VB), while the other vessels stayed predominantly anterior to the disc space. When the position was changed from supine to LLD, the right iliac vein moved to a position 1.4 mm anterior to the anterior VB line. There was negligible movement of the other vessels in this position. Conclusions The authors showed that the aorta, IVC, and kidneys moved a significant distance away from the surgical corridor with changes in position. At the L4-5 level, a left-sided approach may be riskier because the right common iliac vein trends posteriorly and into the surgical corridor, whereas in a right-sided approach it trends anteriorly.


Minimally invasive surgery compared to open spinal fusion for the treatment of degenerative lumbar spine pathologies.

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Abstract

This clinical study prospectively compares the results of open surgery to minimally invasive fusion for degenerative lumbar spine pathologies. Eighty-two patients were studied (41 minimally invasive surgery (MIS) spinal fusion, 41 open surgical equivalent) under a single surgeon (R.J. Mobbs). The two groups were compared using the Oswestry Disability Index, the Short Form-12 version 1, the Visual Analogue Scale score, the Patient Satisfaction Index, length of hospital stay, time to mobilise, postoperative medication and complications. The MIS cohort was found to have significantly less postoperative pain, and to have met the expectations of a significantly greater proportion of patients than conventional open surgery. The patients who underwent the MIS approach also had significantly shorter length of stay, time to mobilisation, lower opioid use and total complication rates. In our study MIS provided similar efficacy to the conventional open technique, and proved to be superior with regard to patient satisfaction, length of hospital stay, time to mobilise and complication rates.


Clinical and radiological outcomes of open versus minimally invasive transforaminal lumbar interbody fusion.

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Abstract

STUDY DESIGN:
Prospective observational cohort study.

OBJECTIVE:
Comparison of clinical and radiological outcomes of single level open versus minimally invasive (MIS) transforaminal lumbar interbody fusion (TLIF) at 6 months and 2-year follow-up. There is recognition that more data are required to ascertain the benefits and risks of MIS vis-a-vis open TLIF. This study aims to report on one of the largest currently available series comparing the clinical and radiological outcomes of the two procedures with a minimum follow-up of 2 years.

METHODS:
From January 2002 to March 2008, 144 single-level open and MIS TLIF were performed at our centre, with 72 patients in each group. Clinical outcomes were based on patient-reported outcome measures recorded at the Orthopaedic Diagnostic Centre by independent assessors before surgery, at 6 months and 2 years post-operatively. These were visual analogue scores (VAS) for back and leg pain, Oswestry disability index (ODI), short form-36 (SF-36), North American Spine Society (NASS) scores for neurogenic symptoms, returning to full function, and patient rating of the overall result of surgery. Radiological fusion based on the Bridwell grading system was also assessed at 6 months and 2 years post-operatively by independent assessors.

RESULTS:
In terms of demographics, the two groups were similar in terms of patient sample size, age, gender, body mass index (BMI), spinal levels operated, and all the clinical outcome measures (p > 0.05). Perioperative analysis revealed that MIS cases have comparable operative duration (open: 181.8 min, MIS: 166.4 min, p > 0.05), longer fluoroscopic time (open: 17.6 s, MIS: 49.0 s, p < 0.05), less intra-operative blood loss (open: 447.4 ml, MIS: 49.0 ml, p < 0.05) and were able to mobilise (open: 3.4 days, MIS: 1.2 days, p < 0.05) and be discharged from hospital earlier (open: 6.8 days, MIS: 3.2 days, p < 0.05). At 6 months, clinical outcome analysis showed both groups improving significantly (>50.0 %) and similarly in measures (p > 0.05). Perioperative analysis revealed that MIS cases have comparable operative duration (open: 181.8 min, MIS: 166.4 min, p > 0.05), longer fluoroscopic time (open: 17.6 s, MIS: 49.0 s, p < 0.05), less intra-operative blood loss (open: 447.4 ml, MIS: 50.6 ml, p < 0.05) and no post-operative drainage (open: 528.9 ml, MIS: 0 ml, p < 0.05) and were able to mobilise (open: 3.4 days, MIS: 1.2 days, p < 0.05) and be discharged from hospital earlier (open: 6.8 days, MIS: 3.2 days, p < 0.05). At 6 months, clinical outcome analysis showed both groups improving significantly (>50.0 %) and similarly in measures (p > 0.05).
Complications of endoscopic microdiscectomy using the EASYGO! system: is there any difference with conventional discectomy during the learning-curve period?

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Abstract

BACKGROUND:
Microendoscopic discectomy (MED) is emerging as a minimally invasive alternative to conventional microsurgical discectomy (MSD). EASYGO! is a new system for spinal endoscopy that claims smooth transition from MSD to MED, with a reduced learning curve period. The aims of this study were to describe the complications that appeared during the learning curve period of MED and to compare their incidence with the rate and type of complications that occurred during a simultaneous non-randomised series of standard MSDs.

METHODS:
Between July 2009 and December 2010, 138 patients underwent scheduled first-time discectomy in our institution, 37 using an MED approach and 101 by a conventional MSD. A MED learning curve was obtained by plotting every case with its respective operative time. Complications, length of hospital stay, need of further surgery and outcome were prospectively recorded in both groups.

RESULTS:
The mean operative time was 66 min for the MSD group and 100 min for the MED group, although for the last 14 cases of the latter group the time was reduced. Curve-fitting techniques showed that the inverse equation, \( f(x) = 122.12x + 73.05 \), had the best correlation between case number and operative time. The learning curve was overcome after the 30th case. Complications occurred in 9.8 % of the MSD group and 8.1 % of the MED group (\( P = 0.49 \)). Average length of hospital stay was 2.36 days for the MED group and 3.36 days for the MSD group (\( P = 0.01 \)). The procedure successfully relieved patient symptoms in 68.63 % of the MSD group and 89.92 % of the MED group. No revision surgery was required in the MED group, but it was necessary in ten patients of the MSD group.

CONCLUSIONS:
Between 25 and 30 cases are needed to reach the learning curve's asymptote of MED. Even during this initial learning period MED is a safe procedure, with comparable results to those obtained with conventional MSD and with a similar complication rate. The key points for reducing intraoperative complications are an adequate expertise in MSD, a precise selection of initial cases, a proper surgical planning and a careful technique, which are mandatory to avoid unnecessary neurological injury in an otherwise secure surgical approach.

Learning Curve and Clinical Outcomes of Minimally Invasive Transforaminal Lumbar Interbody Fusion: Our experience in Eighty-six Consecutive Cases.

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Abstract

Study Design. Consecutive case series with prospective data collection.Objective. To define and analyze the learning curve for minimally invasivetransforaminal lumbar interbody fusion (TLIF).Summary of Background Data. Minimally invasive TLIF using a unilateral approach has recently been gaining popularity because of its potential for minimizing soft tissue damage and reducing recovery time. However, a steep learning curve has been described for surgeons first performing this technique.Methods. Eighty-six consecutive patients with degenerative lumbar diseases who were treated by TLIF were included in the study. Surgeries were performed using a tubular retractor, and a cage was inserted using a unilateral transformamal approach by a single surgeon. The corresponding segments were fixed with percutaneous pedicle screws. Eighty-three patients were followed up for over 1 year, and the average follow-up period was 25 months. Single-level TLIF was performed in 60 cases, single-level TLIF plus adjacent-level decompression was performed in 13 cases, and double-level TLIF was performed in 13 cases. Corrected operative time per level, operative blood loss, postoperative blood drainage, total blood loss, and ambulation recovery time were measured. Transfusion rates and complication incidence were also identified. Clinical results were assessed using the Oswestry disability index (ODI) and a visual analogue scale (VAS). The learning curve was assessed using a logarithmic curve-fit regression analysis. In the single-level TLIF group (\( n = 60 \)), 22 patients were defined as the 'early' group (among the first 30 cases of the series), and the subsequent 38 cases were defined as the 'late' group for comparison.Results. Corrected operative time gradually decreased as the series progressed, and an asymptote was reached after about 30 cases. ODI significantly decreased from an average of 24 at the preoperative stage to 10 at the final follow-up. Average VAS scores for lower back pain and radiating pain also significantly decreased from an average of 5.2 to 1.9 and 6.8 to 0.9, respectively. In the single-level TLIF series, operative time was significantly shorter in the late group (183 ± 23 minutes) compared with the early group (254 ± 44 minutes), and blood loss during the operation was significantly reduced in the late group (292 ± 280 ml) compared with the early group (508 ± 278 ml). Ambulation recovery time significantly decreased from 2.4 ± 0.6 days in the early group to 2.0 ± 0.5 in the late group. ODI and VAS scores for lower back pain and radiating pain did not differ between the two groups.Conclusion. Although it is not easy to master the minimally invasive TLIF technique, the surgeon's experience with this operation correlated with reduced operation time and blood loss during surgery. After the initial learning curve, this technique could be an effective and reliable option for the surgical treatment of lumbar degenerative disease.
Minimally invasive surgery for the lumbar spine.

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Abstract
Minimally invasive spine surgery is a rapidly developing field that has the potential to decrease surgical morbidity and improve recovery compared to traditional spinal approaches. Minimally invasive approaches have been developed for all regions of the spine, but have been best documented for degenerative conditions of the lumbar spine. Lumbar decompression and lumbar interbody fusion are two of the most well-studied minimally invasive surgical approaches. This article will review both the rationale and technique for minimally invasive lumbar decompression and for a minimally invasive transforaminal lumbar interbody fusion (TLIF).

I hope you have enough food for thought

see you in panaji.