

Introduction

To the best of our knowledge, no study reporting the outcomes of lateral lumbar interbody fusion with posterior fixation using cortical bone trajectory (CBT) screws has been reported. This technique can be used to treat a range of conditions including but not limited to lumbar spondylosis, lumbar spondylolisthesis, lumbar herniated disc, lumbar spinal stenosis, and lumbar radiculopathy. The purpose of this study was to determine the clinical and radiological outcomes of this treatment.

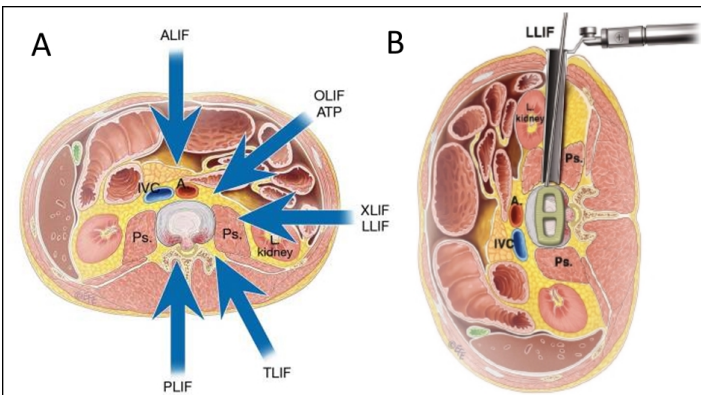


Figure 1: The left schematic (A) shows the five primary approaches to lumbar interbody fusion surgery. Relevant anatomy will determine the approach at the various levels. The left image (B) shows the lateral lumbar interbody fusion (LLIF) approach, which allows the surgeon to access the disc space through a lateral retroperitoneal, transpsoas corridor. (Mobbs et al)

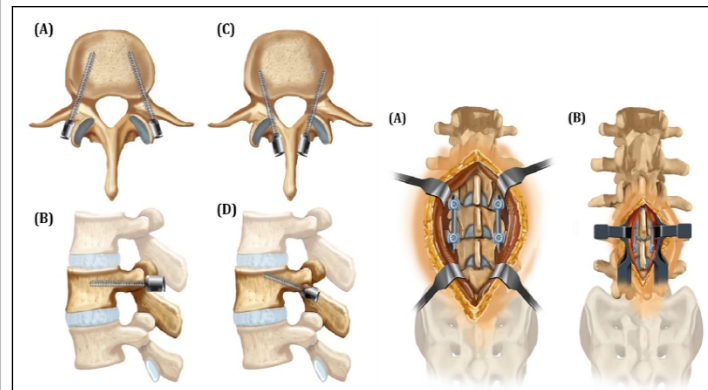


Figure 2: The left diagram details the anatomical differences between traditional pedicle (A&B) and CBT (C&D) screws. The right diagram illustrates the differences in access for traditional pedicle screw placement (A) and CBT screw placement (B). (Chen et al)

Results

Patient ages ranged from 34-79 years old with 31 males and 29 females in the study. Nine patients had two-level fusions while the remaining fifty-one had just one level. The mean operative time and intraoperative blood loss was 226 minutes and 135 mL respectively. Postoperative pain was improved in 88.3% of patients. Bony union occurred in 95% of cases. There was one case of incisional infection, and symptomatic adjacent segment disease developed in 4 patients.

Conclusions

Combined lateral lumbar interbody fusion with posterior fixation using CBT screws is safe and highly effective in treating a variety of conditions affecting the lumbar spine. This technique significantly improved patient pain scores and resulted in high rates of bony union.

Methods

The study included 60 consecutive patients over a 3 year period who received lateral lumbar interbody fusion as well as posterior fixation using CBT screws. Patients with one or two level fusion were included in the study. Operative duration and blood loss as well as complications related to surgery and were noted. Clinical symptoms were evaluated in office prior to surgery and after surgery at follow-up. Pain was measured using a traditional scale of 1 to 10 scoring. Fusion was assessed radiologically with x-ray and CT scan.

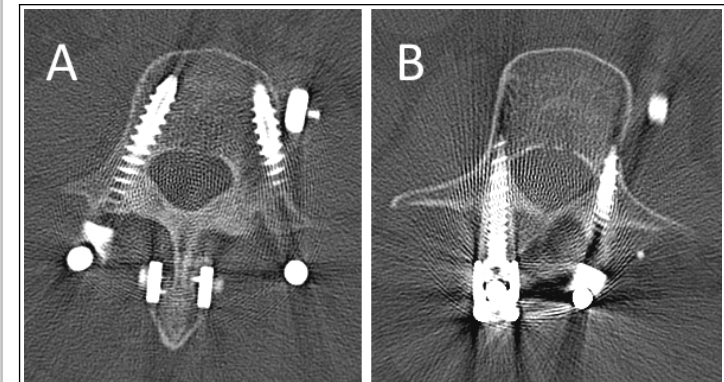


Figure 3: These are CT images obtained at follow-up of a patient who has had multiple lumbar interbody fusion operations. The left image (A) displays traditional pedicle screws that were placed in an earlier procedure, while the right image (B) shows CBT screws placed in a more recent operation.

Learning Objectives

1. Evaluate the operative efficacy and safety of lateral lumbar interbody fusion with posterior fixation.
2. Assess the long term outcomes for patients receiving this treatment.
3. Describe some of the conditions that can be treated using this approach.

References

Mobbs RJ, Phan K, Malham G, Seex K, Rao PJ. Lumbar interbody fusion: techniques, indications and comparison of interbody fusion options including PLIF, TLIF, MI-TLIF, OLIF/ATP, LLIF and ALIF. *J Spine Surg.* 2015 Dec; 1(1): 2-18. doi: 10.3978/j.issn.2414-469X.2015.10.05

Chen YR, Deb S, Pham L, Singh H. Minimally Invasive Lumbar Pedicle Screw Fixation Using Cortical Bone Trajectory – A Prospective Cohort Study on Postoperative Pain Outcomes. *Cureus.* 2016 Jul; 8(7): e714. Published online 2016 Jul 26. doi: 10.7759/cureus.714