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Topic: Minimally invasive spine surgery

Title: Insidious Pneumoperitoneum After Minimally Invasive Oblique Lumbar Interbody Fusion

Abstract

Purpose
Oblique lateral interbody fusion (OLIF) is a surgical technique that approaches the disc space of the lumbar line via anterior oblique retroperitoneal approach. Visceral injury is rare complication of OLIF, and incidence rate is reported to be less than 1%. The purpose of this study is to report on the pneumoperitoneum cases after OLIF.

Materials and methods
This is a retrospective review of 90 patients who underwent an OLIF approach from 2018 to 2019. All operations were performed by two surgeons. Abdominal CT scan was taken in all patients within 3 days after surgery to confirm the visceral injury or pneumoperitoneum.

Results
Among the ninety patients, 5 patients were diagnosed with pneumoperitoneum by abdominal CT. No obvious visceral injury was observed in the CT of five patients diagnosed with pneumoperitoneum. In one patients, CT scan with oral contrast was performed as a recommended by the radiologist, and there was no bowel leak in the GI tract. Of the five patients, one patient had no subjective symptoms and abnormal findings in the physical exam. Other four patients has mild abdominal discomfort, however, no abnormal findings observed in the physical exam. All five patients had improved symptoms without treatment and were discharged.

Conclusion
The occurrence of visceral injury after OLIF has been considered rare. However, in this study, five out of ninety patients were diagnosed with pneumoperitoneum via abdominal CT, and these five patients were not the significantly different from patients who complained of postoperative general pain. These findings suggest that intraoperative unrecognized peritoneal damage may occur with more frequently than has been known. Surgeons should use more caution when exposing the retroperitoneal space and installing a retractor to avoid damage to the peritoneum.

Keywords: OLIF, Complication, Visceral injury, Bowel injury, Pneumoperitoneum
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Topic: Minimally invasive spine surgery

Title: Advantage of Single-Position Oblique Lumbar Interbody Fusion with Percutaneous Pedicle Screw Instrumentation

Abstract

Purpose
To evaluate the technical feasibility and advantage of single-position oblique lumbar interbody fusion (OLIF) and the subsequent clinical and radiologic outcomes.

Materials and methods
Among the 87 patients that underwent OLIF from January 2017 to January 2019, those that with single-level pathology and followed up for at least a year were enrolled. Deformity, stenosis due to trauma, and patients that underwent additional direct posterior decompression were excluded. Patients were divided into those that underwent the whole surgical procedure on lateral position (Group A) and those that underwent cage insertion on lateral position and subsequent percutaneous pedicle screw fixation after changing the patient to prone position (Group B). Demographics, operative and anesthesia time, clinical outcome, and postoperative complication were compared between the two groups.

Results
Total of 30 patients were enrolled in this study, 20 patients in Group A and 10 patients in Group B. The mean age, sex ratio, and index level did not differ between the two groups (p>0.05). The preoperative diagnosis included degenerative and isthmic spondylolisthesis, and foraminal stenosis. The mean operative and anesthesia time were 152.5 and 107 minutes in Group A, and 239.5 and 174.75 minutes in Group B, respectively. Clinical outcome of VAS back and leg did not show significant difference between the two groups. No complication including pedicle screw malposition occurred in both groups.

Conclusion
Single-position OLIF on lateral position is a feasible procedure that can decrease operative and anesthesia time without complication compared to the conventional position changing method.

Keywords: oblique lumbar interbody fusion, pedicle screw, operative time, anesthesia, postoperative complication
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Topic: Minimally invasive spine surgery

Title: Endoscopic Biportal Foraminotomy and Discectomy in Patients with Cervical Disc Disorder

Abstract

Background
There have been considerable attempts at endoscopic approaches for the surgical treatment of cervical spinal stenosis and disc herniation. However, few reports have been existed on the trials of foraminotomy and discectomy using a two-portal endoscopy.

Purpose
This report describes short-term clinical results of posterior percutaneous biportal endoscopic discectomy or foraminotomy in patients with cervical disc herniation.

Materials and Methods
29 patients, who had a diagnosis of herniated disc and related symptom, underwent the operation. This technique was provided with a 30° oblique arthroscope and conventional instruments for cervical spine surgery. Through the dorsal approach, the viewing portal was inserted by 10-20° to facet joint, and a working portal was inserted into it by about 20 degrees. With this method, effective removal of the herniated tissue and sufficient foraminotomy is possible through direct access to the paracentral and subarticular region by cutting the facet joint from medial border of the facet to lateral half via dorsal approach. In a right lesion, standing on the right side of the patient, we gripped the working or distal portal with the left hand to reduce laminar bone loss. We evaluated the short-term results of subjects, about one or two weeks postoperatively. Primary outcome was analyzed by using visual analogue scale (VAS) on posterior neck and upper extremity pain, and secondary outcome measure was a motor power change of affected myotomes.

Results
29 patients (male=18, female=11, median age=55 years) had 11 months symptomatic duration on median value. And the level of disc was C3/4 of one, C4/5 of two, C5/6 of eight, C6/7 of sixteen and C7/T1 of two. The VAS was significantly decreased after the operation: 7 to 1 on posterior neck VAS, and 8 to 1 upper extremity VAS on median value. (p<0.05) The motor power of cervical myotomes improved more than one grade on MRC grading. (p<0.05) No significant complication was found.

Conclusion
Two-portal endoscopic approach can be performed efficiently and safely in patients with cervical disc herniation because of the wide and familiar field of visualization. This technique may be one of the effective and optimal minimal-invasive procedure for cervical disc disorder.

Keywords: Minimal invave, Cervical disc herniation, Biportal endoscopic, Arthroscope
Title: Combination of Oblique Lumbar Interbody Fusion (OLIF) with Biportal Endoscopic Spinal Surgery (BESS) for Lumbar Spinal Stenosis: Comparison with Conventional Open Transforaminal Lumbar Interbody Fusion (TLIF)

Abstract

Purpose
Oblique lumbar interbody fusion (OLIF) decompresses the spinal canal indirectly and effectively by disc height restoration and the unbuckling of ligamentum flavum due to inserting a high profile cage. However, in certain cases of severe central canal stenosis or concomitant disc herniation with stenosis, OLIF alone is not an appropriate procedure to treat. For such cases, we added direct posterior decompression using biportal endoscopic spinal surgery (BESS) selectively depending on the severity of stenosis after OLIF procedure as a combined technique of minimally invasive surgery. We compare the clinical outcome of a combined technique of OLIF with BESS to conventional open transforaminal lumbar interbody fusion (TLIF) for severe lumbar spinal stenosis.

Materials and methods
Forty patients that underwent surgical treatment for lumbar spinal stenosis were enrolled. Patients underwent either combination of OLIF with BESS or open TLIF, and were divided into two groups according to the procedure; Group A for OLIF with BESS and Group B for TLIF. The operative time, estimated blood loss, clinical outcomes, and complication had been evaluated. Clinical outcomes of Visual Analog Scale scores, Oswestry Disability Index, Roland Morris Disability Questionnaire, and modified Macnab criteria were each measured preoperatively and on the final follow-up of at least one year after surgery.

Results
Both groups each consisted of 20 patients. The estimated blood loss per level of Group A was 166.36 ± 93.40 ml, and Group B was 435.15 ± 242.97 ml, and which difference was statistically significant (p=0.028). In Group A, all clinical outcome parameters improved significantly after surgery compared to preoperative status (p<0.05), and which results did not differ significantly compared to Group B. In addition, no complications occurred in both groups.

Conclusion
A combination of OLIF with BESS can be an effective alternative treatment option of TLIF for severe lumbar spinal stenosis.

Keywords: Oblique lumbar interbody fusion, biportal endoscopic spinal surgery, transforaminal lumbar interbody fusion