Lumbar degenerative disease

- Optimizing TLIF Approach Selection: An Algorithmic Framework with Illustrative Cases
- Finite Element Analysis of Biomechanical Assessment: Traditional Bilateral Pedicle Screw System vs. Novel Reverse Transdiscal Screw System for Lumbar Degenerative Disc Disease
- Stand-Alone Lateral Lumbar Interbody Fusion at L3-L4 with 3D-Printed Porous Titanium Cages: A Safe and Effective Alternative in the Treatment of Degenerative Disc Disease (DDD)
- A PEEK-Based Pedicle Screw System for One-Level Lumbar Spinal Canal Stenosis: An Appraisal at a Five-Year Follow Up
- Surgical Management of Lower Back Pain: Is Optimizing Spinopelvic Alignment Beneficial for Patient Outcomes?
- Correlation and risk factor analysis of multifidus muscle atrophy in degenerative lumbar spondylolisthesis
- Comparison of the Biportal Endoscopic Versus Tubular Approach for the Treatment of Lumbar Degenerative Disease: A Systematic Review and Meta-Analysis
- A study on the correlation between preoperative vitamin D levels and postoperative pain and quality of life in middle-aged and young patients with lumbar degenerative diseases

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Spine biomechanics, particularly sagittal balance and spino-pelvic angulation are determinant factors in the understanding of lumbar degenerative disease. These concepts translated into objective measurements are progressively being integrated into clinical practice.

Lumbar degenerative disease is a common and debilitating ailment, causing pain and disability in patients and burdening the healthcare system and economy with high and ever-increasing costs. The prevalence of low-back pain due to lumbar spondylosis is estimated at 3.6% worldwide, and 4.5% in North America [1)]

Degenerative disease of the lumbar spine can be considered a progressive, age-, and stress-related process that has its primary cause in the dehydration and degeneration of the intervertebral disk [2)].

Lumbar degenerative spine disease is the most common etiology of low back pain and can have profound effects on functionality and quality of life. It is a highly debilitating condition and the biggest contributor to missed work days with far-reaching consequences on our health care system.

Direct medical costs due to back pain in the US have doubled from $52 to $102 billion in only 7 years, with a 65% increase in national expenditure on back-related issues from 1997 to 2005 [3)].

Classification

Lumbar degenerative disease classification

Case series

Clinical data from 50 patients with lumbar degenerative disease who underwent MIS-TLIF between January 2019 and September 2020 were retrospectively analyzed. The group included 29 males and 21 females aged from 33 to 72 years old, with an average age of (65.3±7.13) years. Twenty-two patients underwent unilateral decompression, and 28 underwent bilateral decompression. The side(ipsilateral or contralateral) and site(low back, hip, or leg) of the pain were recorded before surgery, 3 days after surgery, and 3 months after surgery. The pain degree was evaluated using the visual analogue scale(VAS) at each time point. The patients were further grouped based on whether contralateral pain occurred postoperatively (8 cases in the contralateral pain group and 42 in the no contralateral pain group), and the causes and preventive measures of pain were analyzed.

All surgeries were successful, and the patients were followed up for at least 3 months. Preoperative pain on the symptomatic side improved significantly, with the VAS score decreasing from (7.00±1.79) points preoperatively to (3.38±1.32) points at 3 days postoperatively and (3.98±1.17) points at 3 months postoperatively. Postoperative asymptomatic side pain (contralateral pain) occurred in 8 patients within 3 days after surgery, accounting for 16% (8/50) of the group. The sites of contralateral pain included the lumbar area (1 case), hip(6 cases), and leg (1 case). The contralateral pain was significantly relieved 3 months after surgery.

More cases of contralateral limb pain occur after unilateral decompression MIS-TLIF, and the reason may include contralateral foramen stenosis, compression of medial branches, and other factors. To reduce this complication, the following procedures are recommended: restoring intervertebral height, inserting a transverse cage, and withdrawing screws minimally [4].

From November 2016 to December 2018, 84 elderly patients (>70 years old) of single-level LDD with neurologic symptoms underwent surgical treatment. 45 patients were treated using PTES under local anesthesia in group 1 and 39 patients were treated using MIS-TLIF in group 2. Preoperative, postoperative back, and leg pain were evaluated using a Visual analog scale (VAS) and the results were determined with the Oswestry disability index (ODI) at a 2-year follow-up. All complications were recorded.

Results: PTES group shows significantly less operation time (55.6 ± 9.7 min vs. 97.2 ± 14.3 min, $P < 0.001$), less blood loss [11(2-32) ml vs. 70(35-300) ml, $P < 0.001$], shorter incision length (8.4 ± 1.4 mm vs. 40.6 ± 2.7 mm, $P < 0.001$), less fluoroscopy frequency [5(5-10) times vs. 7(6-11) times, $P < 0.001$] and shorter hospital stay[3(2-4) days vs. 7(5-18) days, $P < 0.001$] than MIS-TLIF group does. Although there was no statistical difference of leg VAS scores between the two groups, back VAS scores in the PTES group were significantly lower than those in the MIS-TLIF group during follow-ups after surgery ($P < 0.001$). ODI of the PTES group was also significantly lower than that of the MIS-TLIF group at the 2-year follow-up (12.3 ± 3.6% vs. 15.7 ± 4.8%, $P < 0.001$).

Conclusion: Both PTES and MIS-TLIF show favorable clinical outcomes for LDD in elderly patients. Compared with MIS-TLIF, PTES has advantages including less damage to paraspinal muscle and bone, less blood loss, faster recovery, and a lower complication rate, which can be performed under local anesthesia [5]

1)

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