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**Comparing of Percutaneous-TLIF, Open-TLIF and PLIF for Treating Two-level Lumbar Disorders**

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**Purpose:** Technologic advances and improvements in our understanding of biomechanical principles have led to a refinement of the indications for and techniques used for the performance of lumbar interbody fusion. Minimally incisional techniques, the use of bone graft substitutes and extenders, and computerized navigation strategies have contributed to decreasing morbidity and generally improving outcomes. The purpose of this study is to explore the curative effect and patient's satisfactory outcome between three methods: PLIF, open-TLIF and p-TLIF of operations treated with two-level lumbar disorder.

**Methods:** This is a prospective study to assess clinical outcome 169 patients lumbar spine disorder treated with lumbar spine fusion from January 2004 to September 2008. We compared the 3 groups: PLIF, open-TLIF and p-TLIF in the patients with setting of 2-level lumbar fixation. The diagnosis was recurrent degenerative disc disease with HIVD, spondylolisthesis, discogenic back pain, et al. Spinal tumor, infection and fracture had been excluded. We compared the blood loss, surgery recovery time, pre- and post-operative Oswestry Disability Index, pain score(VAS) and post-operative analgesic usage of those patients.

**Results:** 169 patients operated by lumbar fixation( 54 patients with PLIF, 37 patients with open-TLIF, 78 patients with p-TLIF) between age groups 25 to 80 years with lumbar disorder were included in this study. The mean postoperative follow-up period was 2.16 years. The improved Oswestry Disability Index of p-TLIF (58.8 to 7.9) significantly decreased than PLIF(59.8 to 25.4) and open-TLIF(61.2 to 15.9), and the improved VAS (8.8 to 1.8) decreased significantly in comparison with PLIF(8.7 to 2.7) ( $P < 0.01$ ). The blood loss of p-TLIF group is small significantly in comparison with PLIF and open-PLIF (PLIF:open-TLIF: p-TLIF = 661.35ml:774.0ml:628.57ml) ( $P < 0.00$ ). There was no morbidity related to instrumentation. Particular postoperative pain (p-TLIF and open-TLIF) was significantly lower the PLIF after the seventhly postoperative day.

**Conclusions:** The initial stability of posterior and transforaminal interbody fusion with PLTF ,open-TLIF or p-TLIF approach is less than that with conventional intact approach. We investigated clinical outcomes after fixation surgery with degenerative lumbar disorders. Percutaneous pedicle screw fixation allows for safe and efficient minimally invasive treatment of degenerative lumbar disorder with good clinical results. P-TLIF and Open-TLIF approach provides safer than PLIF to surrounding tissue and were no screw breakages or screw loosening. P-TLIF correlation to decrease of intraoperative blood loss, shortened hospital stays and decrease of post-operative analgesic usage. In summary, this is in agreement with the extensive worldwide clinical experience showing clinical efficacy of the p-TLIF in the treatment of the degenerating lumbar spine.