Initial Experience with Unilateral Biportal Endoscopic TLIF Utilizing Dual Direction Expandable Cages: A Preliminary Case Series

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Introduction

Minimally Invasive Approach
UBE-TLIF minimizes surgical trauma, reduces recovery periods, and enhances patient satisfaction. The dual-portal endoscopic technique, coupled with expandable cages, aims for optimal fusion while preserving minimally invasive advantages.

Innovative Expandable Cages
A novel dual-direction expandable titanium TLIF cage has been developed, capable of medial-to-lateral and height expansion. This unique design enhances surface area contact, potentially reducing subsidence and restoring lumbar lordosis.

Objective

Presenting an initial case series on UBPE-TLIF with expandable cages, focusing on safety, feasibility, and early clinical outcomes. Evaluating potential benefits compared to static cages and traditional approaches.

Methods

Study Design and Patient Selection
Retrospective case series investigating UBE-TLIF with Dual Direction Expandable Cages. Inclusion criteria: lumbar degenerative conditions requiring surgery. Exclusion criteria: revision surgery, infections, trauma, multilevel disease. Data collected from 01/05/2023 to 29/07/2023.

Data Collection
Clinical data, surgical details, and outcomes recorded. Radiological evaluations included pre/postoperative imaging. Follow-up data extended to 24-36 weeks post-surgery. Statistical analyses employed Wilcoxon signed-rank and Kruskal-Wallis tests.

Tables and radiology

Clinical results

Variable	Preoperative	Postoperative
VAS back	7.7±1	4±2
VAS leg	8.2±0.9	3±2.1
ODI	59±5.8	27.5±15

Radiological results

Variable	Preoperative	Postoperative
Disc height of operative segment(mm)	5.6±1.5	15.8±0.6
Neural foraminal height (mm)	8.8+-4	16.8+-3.4

Results

- Six patients underwent UBE-TLIF with promising outcomes. Significant pain reduction and improved function were observed. Preliminary results include:
- VAS for back pain decreased from 7.7±1 to 4±2.
- VAS for leg pain improved from 8.2±0.9 to 3±2.1.
- ODI improved from 59±5.8 to 27.5±15.
- Radiological improvements in disc height ($p<0.05$) and neural foraminal height ($p<0.05$).
- Satisfactory fusion rates.

Conclusion

Preliminary Experience
UBE-TLIF using Dual Direction Expandable Cages shows promise in surgical success, radiological improvement, pain alleviation, and functional enhancement.

Continued Research
Larger cohorts and extended follow-ups are essential to substantiate long-term benefits and refine this innovative technique in spinal surgery.