



# Complete Anatomic Reduction And Monosegmental Fusion Using Minimally Invasive Technique For Lumbar Spondylolisthesis Of Grade 2 And Above

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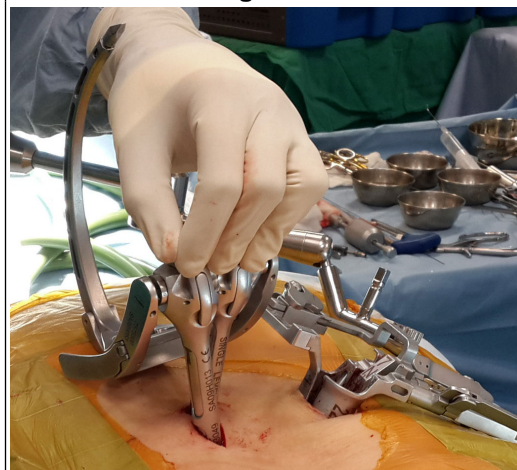
## Introduction

Various surgical approaches have been described previously for spondylolisthesis including in situ fusions, partial reduction as well as fusion of healthy adjacent segments. To our knowledge, there have been no reports describing complete reduction and monosegmental transforaminal lumbar interbody fusion for spondylolisthesis especially using minimally invasive technique.

## Methods

A prospective cohort of 20 consecutive patients over a period of 5 years with minimum of 2 years follow up. Patients with varying grades of lumbar spondylolisthesis (Meyerding II – IV: 14 grade II, 5 grade III & 1 grade IV) were treated with operative reduction via minimally invasive transforaminal lumbar interbody fusion. Clinical outcomes measured using the Visual Analog Pain Scale and Oswestry Disability Index (for low back pain/dysfunction) scoring. Radiographic parameters of Whole lumbar lordosis, Slip angle, Grade and Sacral slope assessed to measure radiological outcomes.

**Figure 1**



Minimally Invasive TLIF technique

**Figure 2**



Complete anatomical reduction of listhesis

## Results

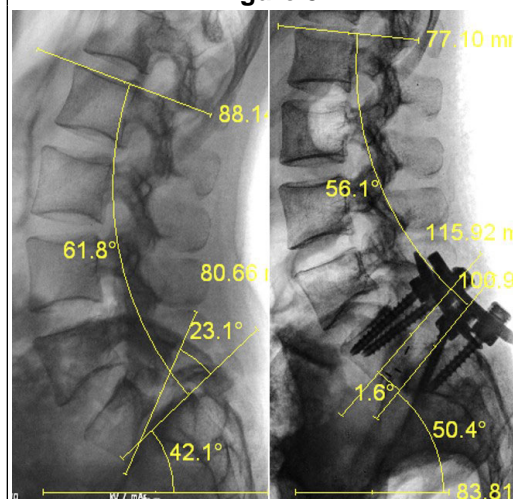
At most recent follow-up, most patients were pain free, with an improvement in pain scores ( $p < 0.05$ ). All radiographic parameters improved and good fusion achieved with implants in-situ at 2 year follow up. 100% complete reduction of all grades of spondylolisthesis was achieved. The overall sagittal profile improved dramatically. No major perioperative complications encountered.

**Table 1**

(in degrees)	Pre operative		Post-operative		p value (paired t-test)
	Mean	SD	Mean	SD	
Cobb's angle	52.9	13.9	42.5	11	0.001
Sacral slope	41.8	10.9	32.8	10.9	0.001
Slip angle	1.8	8.5	10	3.7	<0.001

Radiological Outcomes

**Figure 3**



Pre-operative and Post-operative measurements on Lateral X-ray

**Table 2**

	Pre-operative		Post-operative		p value (Wilcoxon test)
	Mean	S.D.	Mean	S.D.	
ODI	53.7	13.1	22.5	15.5	<0.05
VAS	6.5	1.5	1.6	1.3	<0.05

Clinical & Functional Outcomes

## Conclusions

Listhesis reduction with minimally invasive monosegmental transforaminal lumbar interbody fusion is an effective technique for the treatment of various grades of spondylolisthesis with faster recovery, early ambulation & minimal blood loss. Complete reduction of listhesis as well as excellent correction of overall sagittal profile can be achieved.

## References

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3. Labelle, Hubert, et al. Spino-pelvic alignment after surgical correction for developmental spondylolisthesis. Eur Spine J 2008;17:9:1170-1176.

