

# Does Concave Versus Convex Approach Matter When Using Lateral Lumbar Interbody Fusion For Adult Scoliosis?

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#### Introduction

Minimally-invasive (MIS) lateral lumbar interbody fusion (LLIF) is an effective adjunct in adult degenerative scoliosis (ADS) surgery. LLIF approaches from the concavity or convexity have inherent approach-related risks and benefits. We analyzed LLIF approach-related complications and radiographic and clinical outcomes in patients with ADS.

### Methods

A multicenter retrospective review of a MIS adult spinal deformity database with the following inclusion criteria: age>18 years, and one of the following: coronal Cobb angle (CCA)>20, SVA>5 cm, PI-LL>10 and/or PT>20. Patients were divided into two groups determined by LLIF approach: concave or convex.

420 patients met inclusion criteria of the database, of those, 165 had complete 2-year data. Of these, 63 patients underwent MIS reconstruction (cMIS: LLIF alone and LLIF + MIS pedicle screws), 40 from the concavity and 23 from the convexity side. No differences between groups were noted in demographic, and preop or post op radiographic parameters. EBL, length of stay and, and OR time were similar. Both groups equally treated L4-5 via LLIF and chose a similar LIV. Overall complications were similar between groups. There were no significant differences in neurologic, vascular, or visceral complications. There were 8 (3 major) neurologic complications in the concavity group of which 1 required reoperation for decompression and one revision of a pedicle screw. One (minor; LFCN palsy) neurologic complication occurred in the convexity group (p=0.09). Both groups experienced significant improvement in ODI, VAS back and leg (all p<0.05), with no difference between groups.

## Conclusions

Results

Patients undergoing cMIS surgery for adult degenerative scoliosis had equivalent complication rates, clinical and operative, with concave or convex LLIF approaches.

# Learning Objectives

1. Equivalent operative and clinical complication rates, were noted for convexity and concavity approaches. 2. Similar radiographic and clinical outcomes reported for both approaches as well.

#### Concave vs Convex - Table 1.

	Convex	Concave	p-value
N	23	40	
Age	63.8	62.3	0.742
Females	15 (65.2%)	35 (87.5%)	0.035
Levels Treated	5.2	6.1	0.158
LIV			
L5	13 (56.5%)	16 (40.0%)	0.205
S1	8 (34.8%)	18 (45.0%)	0.428
Illium	1 (4.3%)	6 (15.0%)	0.195
L4-L5 LLIF	16 (69.6%)	29 (72.5%)	0.804
PREOPERATIVE			
PT	24.6	25.3	0.962
PI-LL	14.2	17.8	0.612
LL	38.7	35.6	0.268
SVA	29.3	46.4	0.177
Max Cobb	34	35	0.907
ODI	48.3	49.1	0.83
VAS Back Pain	6.3	6.7	0.762
VAS Leg Pain	4.9	6	0.196
POSTOPERATIVE			
PT	24.9	25.1	0.800
PI	53.1	53.4	0.951
PI-LL	11.3	13.4	0.484
LL	42	40.4	0.677
SVA	37.1	45.5	0.5
Max Cobb	6.3	11.6	0.397
ODI	28.9	28.6	0.936
VAS Back Pain	3.1	3.5	0.617
VAS Leg Pain	1.5	2.3	0.215