TRANSFACET SCREW FIXATION AND INTERBODY FUSION IN DEGENERATIVE LUMBAR SPONDYLOLISTHESISWAEL

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Introduction

Transfacet screw fixation has been used since Boucher has introduced its technique in 1959 and several studies have claimed its biomechanical stability and its safety in degenerative lumbar pathologies. No prior research has been conducted to evaluate the efficacy of transfacet screw fixation in conjunction with interbody fusion in lumbar degenerative spondylolisthesis.

Aim of the work

This study's objective is to evaluate the short-term radiological and clinical results of patients who undergo laminectomy, transfacet screw fixation combined with interbody fusion for single level lumbar degenerative spondylolisthesis.

Patients and Methods

We performed a prospective study on sample of 20 patients with degenerative lumbar spondylolisthesis treated in Alexandria Main University Hospital for a period from November 2023 to December 2024. After obtaining a written consent for research and surgery, a spinal decompression and interbody fusion, instrumented by a single level transfacet screw fixation were performed on every patient. Clinical (Visual Analog System VAS) and radiographic (CT, MRI, and dynamic radiographies) data were gathered and examined before and after surgery, as well as at six-months.

Results

46.10 ± 3.45 years was the average age, female-male ratio was 4:1, L4/L5 motion segment was affected in all patients (100%). The average surgical time was 71.90 ± 4.66 minutes, and the average blood loss was 242.00 ± 67.25 ml. The mean hospital stay was 3.20 ± 0.89 days. Change in Visual Analog System (VAS) showed a statistically significant improvement in pain at 6th month follow up ($p < 0.05$) and successful outcome was attained at 80%. Obesity was related to bad outcome and high reoperation rate.

Table (1):General characteristics of the study group (n = 20)

Demographic data	No.	%
Gender		
Male	4	20.0
Female	16	80.0
Age (years)		
Min. – Max.	36.0 – 51.0	
Mean ± SD.	46.10 ± 3.45	
Median (IQR)	46.50 (44.0 – 48.50)	
Body mass index (kg/m^2)		
Min. – Max.	22.0 – 38.0	
Mean ± SD.	27.70 ± 4.70	
Median (IQR)	26.50 (24.50 – 28.50)	
Segment affected		
L4 – L5	20	100.0
Degree of slippage Grade 1(0-25% of the superior endplate)	20	100.0

Table (2): Surgical characteristics of the studied group (n = 20)

	Min. – Max.	Mean ± SD.	Median (IQR)
Length of surgery (minutes)	65.0 – 80.0	71.90 ± 4.66	70.0 (70.0 – 75.0)
Blood loss (ml)	180.0 – 400.0	242.0 ± 67.25	210.0 (200.0 – 250.0)
X-ray exposure time(seconds)	2.0 – 3.0	2.05 ± 0.22	2.0 (2.0 – 2.0)

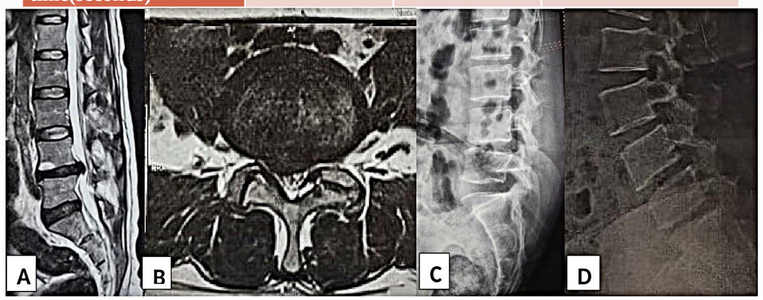

Fig (1): Preoperative images: A. T2 weighted sagittal lumbar MRI showing L4/5 degenerated and herniated disc. B. T2 weighted axial lumbar MRI showing right posterolateral disc herniation and facet tropism. C. Lumbar lateral x-ray in flexion showing L4/5 instability. D. Lumbar lateral x-ray in extension

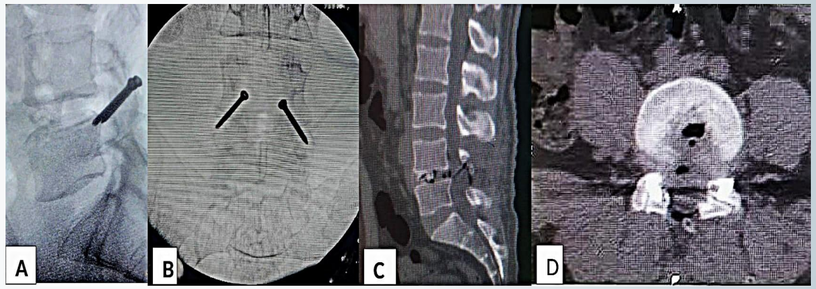

Fig (2): Intraoperative and postoperative images. A: Lateral lumbar fluoroscopic intraoperative image showing L4/5 transfacet screw fixation. B. Antero-posterior lumbar fluoroscopic image showing L4/5 transfacet screw fixation. C. Sagittal lumbar CT scan, bone window showing L4/5 transfacet screw fixation and interbody fusion.: D. Axial lumbar CT scan demonstrating L4/L5 transfacet screw fixation.

Table (3):Relation between outcomes with demographic data (n = 20)

	Radiographic stability				Test of Sig.	P
	Good outcome (Stability) (n = 16)		Bad outcome (Instability) (n = 4)			
	No.	%	No.	%		
Gender						
Male	4	25.0	0	0.0	$\chi 2$= 1.250	FEp= 0.538
Female	12	75.0	4	100.0		
Age (years)						
Min. – Max.	36.0 – 51.0		43.0 – 49.0		t= 0.541	0.595
Mean ± SD.	46.31 ± 3.66		45.25 ± 2.63			
Median (IQR)	47.0(44.50 – 48.50)		44.50(43.50 – 47.0)			
Body mass index (kg/m2)						
Min. – Max.	22.0 – 29.0		34.0 – 38.0		t= 9.047*	<0.001*
Mean ± SD.	25.63 ± 2.09		36.0 ± 1.83			
Median (IQR)	26.0 (23.50 – 27.0)		36.0(34.50 –37.50)			

Conclusion

Transfacet screw fixation and interbody fusion in low grade lumbar degenerative spondylolisthesis is a safe and effective technique in well selected patients. Its length of surgery and blood loss are minimal. Obesity is strongly correlated to bad outcome and high reoperation rate.

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