

# VALUE-BASED HEALTHCARE CONFERENCE 2024

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Changi  
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## Single Position Lateral Lumbar Interbody Fusion with Navigated Percutaneous Pedicle Screw Fixation: Technique Modification with Resultant Resource Usage Optimization

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### Background

Elective lumbar fusion surgeries are increasingly in demand, prompting the exploration of various techniques. However, limited research exists on the comparative costs of different lumbar fusion methods. SP LLIF and DP LLIF are two such techniques, with SP LLIF involving a single surgical position and DP LLIF involving multiple positions during the procedure. Understanding the resource utilization differences between these approaches is crucial for healthcare resource allocation.

### Aim

This study aims to compare the resource utilization of single-position (SP) lateral lumbar interbody fusion (LLIF) with dual-position (DP) LLIF, addressing the current gap in literature regarding cost comparisons between these surgical techniques.

### Methods

This retrospective study analyzed patients who underwent anterior to psoas (ATP) LLIF with navigated percutaneous pedicle screw (PPS) fixation by the senior author between September 2020 and September 2023. Data on demographics, operative variables, complications, and resource utilization metrics, including length of stay and various fees, were collected. The Mann-Whitney U test compared quantitative outcomes between SP and DP groups. Additionally, generalized linear model analysis and quantile regression analysis were conducted to assess the impact of SP LLIF on resource utilization.

### Results

	All n (%)	Dual Position (n=14, 70%)	Single Position (n=6, 30%)	p-value
<b>Age</b>				
mean, SD	66.2 (7.5)	65.4 (8.1)	68 (6.4)	0.488
median, IQR	66 (62, 71.5)	66 (58, 71)	67 (62, 72)	0.710
min, max	51, 78	-	-	-
<b>Sex</b>				
Female	6 (30%)	5 (35.7%)	1 (16.7%)	0.613
Male	14 (70%)	9 (64.3%)	5 (83.3%)	
<b>Single Position</b>				
No	14 (70%)	-	-	-
Yes	6 (30%)	-	-	-
<b>Levels</b>				
1	9 (45%)	5 (35.7%)	4 (66.7%)	0.571
2	7 (35%)	6 (42.9%)	1 (16.7%)	
3	4 (20%)	3 (21.4%)	1 (16.7%)	
<b>CCI</b>				
0	9 (45%)	8 (57.1%)	1 (16.7%)	0.273
1	5 (25%)	3 (21.4%)	2 (33.3%)	
2	6 (30%)	3 (21.4%)	3 (50%)	
<b>Post-op complication</b>				
DVT/PE	0 (0%)	0 (0%)	0 (0%)	-
MI	0 (0%)	0 (0%)	0 (0%)	-
Pneumonia	1 (5%)	1 (7.1%)	0 (0%)	1.000
UTI	0 (0%)	0 (0%)	0 (0%)	-
Delirium	0 (0%)	0 (0%)	0 (0%)	-

GLM model							
Resource Usage	Coefficient	95% CI	P value	Adjusted Coefficient	95% CI	P value	
Length of stay, days **	-0.50	(-1.09, 0.09)	0.098	-0.59	(-1.09, -0.08)	0.023	
Operative time, minutes **	-0.09	(-0.14, -0.04)	<0.0001	-0.08	(-0.12, -0.04)	<0.0001	
Implant cost, SGD **	-0.02	(-0.04, 0.01)	0.254	-0.001	(-0.02, 0.02)	0.909	
Consumables fee, SGD **	-0.06	(-0.08, -0.03)	<0.0001	-0.05	(-0.08, -0.03)	<0.0001	
Anaesthetist fee, SGD	-0.09	(-0.19, -0.004)	0.039	-0.05	(-0.16, 0.07)	0.430	
Facility fee, SGD **	-0.04	(-0.13, 0.04)	0.307	-0.007	(-0.08, 0.07)	0.850	
Sum of consumables, anaesthetist and facility fees, SGD **	-0.03	(-0.05, -0.001)	0.028	-0.01	(-0.03, 0.01)	0.238	

Generalised linear model with a negative binomial distribution and log-link function for length of stay

Generalised linear model with a gamma distribution and log-link function for operative time, implant cost, consumables fee, anaesthetist fee, facility fee and sum of consumables, anaesthetist and facility fees

### Conclusion

SP LLIF with navigated PPS insertion appears to be a minimally invasive technique associated with reduced resource utilization compared to DP LLIF. These findings underscore the potential benefits of SP LLIF in terms of efficiency and cost-effectiveness. Further research is warranted to validate these results and explore their implications for clinical practice and healthcare resource management.