



Effects of pain and disability of Chinese patients undergoing lumbar fusion surgery with dynamic devices



¹Meng-Shan Wu Shu-Fen Su^{2*}

¹ RN, MSc, NP, Department of Nursing, Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Taiwan (R.O.C)

² RN, PhD, Associate Professor, Department of Nursing, National Taichung University of Science and Technology, Taichung, Taiwan (R.O.C)

Background

- Studies revealed that posterior lumbar fusion surgery(PLIF) can reduced pain and improved disability, yet it may lead to a pathologic deterioration and increase instability of the adjacent segment, such as adjacent segment disease(ASD).
- The semi-rigid dynamic devices have been developed for preserving lumbar spinal activity and preventing ASD.
- However, the relevant study is lack in Taiwan to compare the effectiveness of lumbar fusion surgery with semi-rigid dynamic device & PLIF.

Objective

To compare pain and disability of patients undergoing lumbar spine fusion surgery with semi-rigid dynamic devices and PLIF.

Table1. Comparison of BPI and ODI levels before and after surgery between dynamic devices and PLIF groups

Group (n)	Worst pain	Average pain	Present pain	Least pain	ODI		
	Pre/Post surgery mean(SD)	Pre/Post surgery mean(SD)	Pre/Post surgery mean(SD)	Pre/Post surgery mean(SD)	p	Pre/Post surgery mean(SD)	p
Dynamic (39)	8.51(1.47)/0.82(0.85)	7.21(1.53)/0.51(0.64)	5.54(2.53)/0.38(0.49)	2.95(2.35)/0.26(0.50)	.000***	51.77(17.88)/1.49(4.17)	.000***
PLIF (20)	8.15(2.11)/1.60(1.35)	6.10(1.86)/0.90(1.02)	4.45(2.11)/0.75(0.79)	3.70(2.52)/0.75(0.72)	.000***	60.78(16.75)/7.88(8.25)	.000***
P	.027*	.197	.085	.004**		.000***	

i SD, Standard deviation; * $p<.05$; ** $p<.01$; *** $p<.001$

Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation

Methods

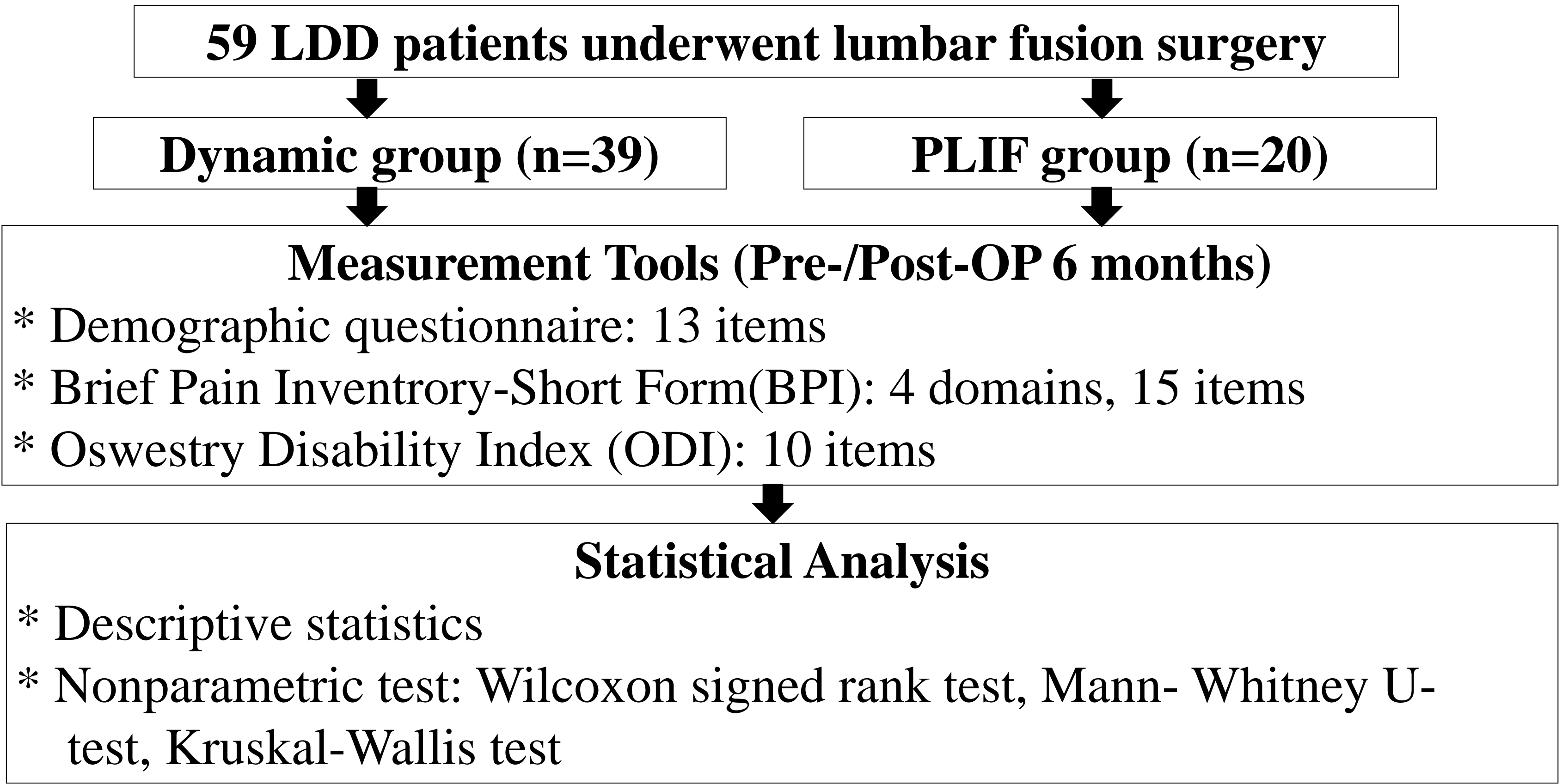


Table2. Demographic stratified according to BPI and ODI levels after surgery

Devices(n)	Dynamic(n=39)		PLIF(n=20)		Dynamic(n=39)		PLIF(n=20)		Dynamic(n=39)		PLIF(n=20)	
	Worst pain	Worst pain	Worst pain	Worst pain	P	Least pain	Least pain	P	ODI	ODI	p	
	Post-surgery	Post-surgery	Post-surgery	Post-surgery		Post-surgery	Post-surgery		Post-surgery	Post-surgery		
	Mean(SD) ⁱ	Mean(SD)	Mean(SD)	Mean(SD)		Mean(SD)	Mean(SD)		Mean(SD)	Mean(SD)		
Sex					.060			.146			.235	
Male	0.53(0.72)	1.20(1.23)		0.30(0.54)		0.60(0.70)			0.47(1.51)	7.50(8.84)		
Female	1.05(0.90)	2.00(1.41)		0.53(0.67)		0.90(0.74)			2.27(5.32)	8.26(8.08)		
Age					.327			.176			.075	
<50 years	0.58(0.67)	1.25(0.96)		0.17(0.39)		0.50(0.58)			0.50(1.73)	0.50(1.00)		
50-65 years	0.81(0.75)	1.50(1.51)		0.13(0.34)		0.80(0.79)			1.75(4.61)	10.24(8.62)		
≥66 years	1.09(1.14)	2.00(1.41)		0.55(0.69)		0.83(0.75)			2.18(5.40)	8.87(8.27)		
Work catagories					.372			.839			.057	
Office worker	0.25(0.50)	1.33(1.16)		0.50(0.25)		0.67(0.58)			1.50(3.00)	1.33(1.16)		
Laborer	0.89(0.92)	1.36(1.29)		0.29(0.54)		0.64(0.67)			1.50(4.73)	8.27(8.77)		
Housekeeper	0.86(0.69)	2.17(1.60)		0.14(0.38)		1.00(0.89)			1.43(2.23)	10.43(8.40)		

ⁱSD, Standard deviation, ^{*} $p<.05$; ^{**} $P<.01$; ^{***} $P<.001$

NATIONAL TAICHUNG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Results

- Both Dynamic and PLIF groups had a significant improvement in pain levels(BPI) and daily function limitation(ODI)(all $p < .01$). (Table 1).
- Dynamic group had less worst pain, least pain and daily function limitation than the PLIF group (all $p<0.05$). (Table 1).
- No significant differences in pain levels and daily function limitation between two groups in gender, age, and work categories (all $p>0.05$). (Table 2).

Conclusions

- Lumbar fusion surgery with semi-rigid dynamic devices and posterior lumbar fusion surgery can both significantly improve pain levels and daily function limitation for patients with lumbar spine degenerative diseases.
- Lumbar fusion surgery with semi-rigid dynamic devices has better efficacy than the posterior lumbar fusion surgery in decreasing pain and daily function limitation.
- Nurses should follow-up postoperative pain and daily function limitation regularly. Also, nurses should provide a proper pain management and discharge plan for LDD patients while they discharge.

References

- Asher, A. L., Chotai, S., Devin, C. J., Speroff, T., Harrell Jr, F. E., Nian, H., ... & Bydon, M. (2016). Inadequacy of 3-month Oswestry Disability Index outcome for assessing individual longer-term patient experience after lumbar spine surgery. Journal of Neurosurgery: Spine, 1-11.
- Gu, R., Zhao, J. W., Zhao, J. H., Liu, J. B., & Sun, Y. F. (2016). Clinical Follow-Up after Treatment of Degenerative Lumbar Disease by Posterior Dynamic Stabilizing Technique. Orthop Muscular Syst, 5(208), 2161-0533.
- Huang, Y. J., Zhao, S. J., Zhang, Q., Nong, L. M., & Xu, N. W. (2017). Comparison of lumbar pedicular dynamic stabilisation systems versus fusion for the treatment of lumbar degenerative disc disease: A meta-analysis. Acta orthopaedica Belgica, 83(1), 180-193.

Corresponding Author

Shu-Fen Su, PhD, MSc, RN

Associate Professor, Department of Nursing,

National Taichung University of Science and Technology, Taiwan, R.O.C

E-mail: sofe6726@yahoo.com.tw