



Comparison of lumbar fusion surgery with/without ISOBAR device among patients with lumbar spine degeneration

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Background

1. Studies revealed that lumbar fusion surgery may decrease pain and improve disability, but it may also induce adjacent segment disease (ASD), whereby segments at the upper and lower borders of the surgical site develop instability.
2. The ISOBAR device has been developed and used in the lumbar fusion surgery for preserving postoperative lumbar spinal activity and preventing ASD.
3. However, the relevant study is lack in Taiwan to compare the effectiveness of lumbar fusion surgery with ISOBAR device & PLIF (traditional fusion surgery without ISOBAR device).

Objective

Compared efficacy of lumbar spine fusion surgery with ISOBAR and PLIF.

Table1. Comparison of JOABPEQ and ODI levels before and after surgery between ISOBAR and PLIF groups

Devices(n)	Lower back pain	Lumbar function	Walking ability	Social life function	Mental health	ODI
	Pre/Post surgery	Pre/Post surgery	Pre/Post surgery	Pre/Post surgery	Pre/Post surgery	<i>p</i>
	mean (SD) ¹	mean (SD)	mean (SD)	mean (SD)	mean (SD)	mean (SD)
ISOBAR (23)	31.8(22.7)/85.7(0.0)	35.5(31.5)/99.2(3.3)	25.4(19.2)/100.0(0.0)	22.4(16.1)/88.1(10.6)	49.9(18.3)/83.1(10.9)	.000***
PLIF (21)	33.0(19.7)/79.1(12.5)	31.4(27.0)/98.1(3.7)	24.7(13.6)/97.8(3.4)	23.7(8.1)/76.7(4.2)	48.5(14.7)/66.8(11.2)	.000***
<i>p</i>	.005**	.327	.001**	.001**	.000***	.000***

¹ SD, Standard deviation; **p*<.05; ***p*<.01; ****p*<.001

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Methods

ISOBAR group (n=23)

PLIF group (n=21)

Complete questionnaires (Pre-/Post-OP 6 months)

- * Demographic questionnaire:13items
- * Oswestry Disability Index (ODI): 10items
- * Back Pain Questionnaire (JOABPEQ):5 domains, 25items

Statistical Analysis

- * Descriptive statistics
- * Nonparametric test: Wilcoxon signed rank test 、Mann- Whitney U-test 、Kruskal-Wallis test

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

Devices (n)	ISOBAR (n=23)	PLIF (n=21)	ISOBAR (n=23)	PLIF (n=21)	ISOBAR (n=23)	PLIF (n=21)
	Social life function	Social life function	Mental health	Mental health	ODI	ODI
	Post-surgery mean (SD) ¹	Post-surgery mean (SD) ¹	Post-surgery mean (SD) ¹	Post surgery mean (SD) ¹	Post-surgery mean (SD) ¹	Post-surgery mean (SD) ¹
Sex						
Male	92.1(8.8)	80.4(8.3)	87.4(10.1)	74.0(16.4)	0.1(0.5)	8.9(9.4)
Female	87.7(11.1)*	77.2(5.9)	79.6(10.5)*	68.7(10.7)	1.5(4.4)	8.2(8.9)
Age						
<50 years	92.5(7.2)	82.7(10.1)	86.4(8.2)	79.9(15.9)	0(0)	.40(.89)
50-65years	90.0(10.2)	78.4(6.0)	83.9(11.3)	64.5(13.4)	0.3(0.8)	13.7(7.9)
≥66 years	80.8(11.3)	75.1(3.0)	78.5(12.3)	75.0(8.5)	2.7(5.9)	9.4(9.4)
Work categories						
Office worker	97.3(0)	75.7(0)	97.4(2.2)	73.8(2.7)	0(0)	1.0(1.4)
Laborer	89.2(9.6)	80.5(8.9)	82.7(10.4)	71.3(15.5)	1.0(3.7)	8.7(9.1)
Housekeeper	74.3(9.0)	76.2(1.2)	74.8(7.9)	70.1(13.4)	1.0(1.2)	11.2(8.4)

¹ SD, Standard deviation; **p*<.05; ***p*<.01; ****p*<.001

Results

1. Both ISOBAR and PLIF groups had improvement in back pain (JOABPEQ) and disability (ODI).(all *p* < .01). (Table 1).
2. ISOBAR group had better improvement than PLIF group in lower back pain, walking ability, social life function, mental health and disability, (all *p*<0.05) , but did not appear better improvement in the domains of lumbar function (*p*=.135).
3. In the ISOBAR group, female patients had better improvement in social life function and mental health than the male, (all *p*<0.05) .
4. The ISOBAR group had better improvement in social life function and ODI than the PLIF group in all age brackets and work; ISOBAR group had better improvement than PLIF group in in mental health in work categories (Table 2).

Conclusions

- 1.Both surgery both can significantly improve back pain and daily disability for LDD patients.
- 2.Lumbar fusion surgery with ISOBAR device helped significant improvement of social life function and mental health of LDD patients, especially in female and work categories.
- 3.Using ISOBAR in the lumbar fusion surgery can have better improvement in social life function and daily function limitation.

References

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