

Perioperative risk factors related to lumbar spine fusion surgery in Korean geriatric patients

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Introduction

Life expectancy for humans has increased dramatically and with this there has been a considerable increase in the number of patients suffering from lumbar spine disease. Symptomatic lumbar spinal disease should be treated, even in the elderly, and surgical procedures such as fusion surgery are needed for moderate to severe lumbar spinal disease. However, various perioperative complications are associated with fusion surgery. The aim of this study was to examine perioperative complications and assess risk factors associated with lumbar spinal fusion, focusing on geriatric patients at least 70 years of age in the Republic of Korea.

Methods

We retrospectively investigated 489 patients with various lumbar spinal diseases who underwent lumbar spinal fusion surgery between 2003 and 2007 at our institution. Three fusion procedures and the number of fused segments were analyzed in this study. Chronic diseases were also evaluated. Risk factors for complications and their association with age were analyzed.

Results

In this study, 74 patients experienced complications (15%). The rate of perioperative complications was significantly higher in patients 70 years of age or older than in other age groups (univariate analysis, $p=0.001$; multivariate analysis, $p=0.004$).

Concomitant disease in 218 patients who underwent surgery for spinal fusion

Condition.	% Patients.
Heart disease.	19.
Coronary artery disease.	8.
Congestive heart failure.	11.
Pulmonary disease.	10.
Chronic obstructive pulmonary disease.	10.
Renal disease.	9.
Chronic renal failure.	7.
Renal cyst.	2.
Liver disease.	13.
Hepatitis.	4.
Fatty liver.	7.
Liver cyst.	2.
Endocrine disease.	33.
Diabetes mellitus.	24.
Hyperthyroidism.	3.
Hypothyroidism.	6.
Rheumatoid arthritis.	3.
Hypertension.	13.
Multiple.	31.

Demographic & procedural details

Parameter.	No. of patient (%)
Sex.	.
male.	197(40).
female.	292(60).
Age.	.
≥ 70 .	197(40).
<65 .	292(60).
Comorbidity.	.
exist.	218(45).
none.	271(55).
ASA class.	.
I.	342(70).
II.	126(26).
III.	21(4).
Operation procedure.	.
PLIF.	95(19).
TPSF.	287(59).
Combined app.	107(22).
Fusion segment.	.
1 level.	242(49).
2 levels.	190(39).
3 levels.	47(9).
4 levels.	8(2).
5 levels.	2(0.5).
Complication.	.
occur.	74(15).
none.	415(85).

Univariate analysis between age and concomitant disease

Variable.	Concomitant disease.		p value.
	exist.	none.	
Age.	.	.	.
≥ 70 .	99.	98.	0.038.
<65 .	119.	173.	

Results of univariate & multivariate analysis

Variable.	Complication (%).	p value.	
		Univariate.	Multivariate.
Age.	.	.	.
≥ 70 .	44(9.0).	0.001.	0.004.
<65 .	30(6.1).		
Sex.	.	.	.
male.	30(6.1).	0.961.	0.862.
female.	44(9.0).		
Comorbidity.	.	.	.
exist.	31(6.3).	0.998.	0.758.
none.	43(8.8).		
Operation procedure.	.	.	.
PLIF.	11(2.3).	0.282.	0.456.
TPSF.	29(5.9).		
Combined app.	34(6.9).		
Fusion segment.	.	.	.
1 level.	26(5.3).		
2 levels.	39(8.0) (RR=0.609).	0.343.	0.281.
3 levels.	6(1.2) (RR=0.445).		
4 levels.	2(0.4) (RR=0.445).		
5 levels.	0(0).		

Conclusions

Increasing age was an important risk factor for perioperative complications in patients undergoing lumbar spinal fusion surgery whereas other factors were not significant. We recommend good clinical judgment and careful selection of geriatric patients undergoing lumbar spinal fusion surgery.

Univariate analysis of age and sex related with bone mineral density

Variable.	T-score (mean).	p value.
Sex.	.	.
male.	-0.29.	0.021.
female.	-1.50.	
Age ≥ 70 .	.	.
male.	-0.76.	0.011.
female.	-2.09.	
Age <65 .	.	.
male.	+0.01.	0.042.
female.	-1.10.	
Age.	.	.
≥ 70 .	-1.55.	0.046.
<65 .	-0.61.	