

Results of Multilevel Lumbar Fusion for Degenerative Disorder of the Lumbar Spine

Chong Suh Lee, M.D., Sung Su Chung, M.D., Kwang Hoon Chung, M.D.,
Eung Soo Kim, M.D., Hyo Kon Kim, M.D.

*Department of Orthopedic Surgery, Samsung Medical Center, Sungkyunkwan University
School of Medicine, Seoul, Korea*

– Abstract –

Purpose: To investigate the causative factors of the complications and clinical results of 82 patients that underwent multilevel fusion due to degenerative lumbar disease.

Materials and Methods: This was a retrospective study, between October 1994 and July 2001, of 101 patients that had undergone spinal fusion at more than 3 levels, due to degenerative lumbar disease, and excluding 19 patients, which included 8 revisions, 1 postop infection and 10 lost to follow-up. The average age of the 82 patients was 61, ranging from 49 to 81 years. There were 22 men and 60 women, with an average follow up of 35, ranging from 12 to 79 months. Inclusion in the study required a minimum of 1 year of radiographic follow-up, where the lumbar lordotic angle, lateral sagittal angle of the fusion segments, problems associated with instrumentation (screw loosening, breakage and rod breakage), nonunion, fusion level, extension to sacrum, medical comorbidities and their influences on the clinical results were evaluated. Evaluation of the clinical results were quantified using Kirkaldy-Willis' criteria. T-test, Chi-square test and Pearson correlation tests were performed to evaluate the statistical significance, using SPSS version 10.0.

Results: 12, 35, 20 and 15 of the 82 patients declared their outcomes to be excellent, good, fair and poor, respectively. The clinical results were statistically associated with the difference between the postoperative and final sagittal angle in the fusion segments ($p<0.05$). The more fusion segments involved, the more problems associated with the instrumentation occurred. The number of fusion levels affected the clinical results.

Conclusion: It seems to be difficult to reach satisfactory results in the case of multilevel spinal fusion, which was mostly associated with problems of instrumentation and nonunion, which showed poorer clinical results. Maintenance of the sagittal angle in the fusion segments was challenging when the number of fusion levels was increased.

Key Words: Multilevel fusion, Degenerative spinal disease

Address reprint requests to

Chong Suh Lee, M.D.

Department of Orthopaedic Surgery, Samsung Medical Center, Sungkyunkwan University School of Medicine,
50 Ilwon-dong, Gangnam-gu, Seoul, 135-710, Korea

Tel: 82-2-3410-3503, Fax: 82-2-3410-0061, E-mail: csl@smc.samsung.co.kr

4, 5 .

Kirkaldy-Willis⁶⁾ ,

가 (Table 1). SPSS 10.0 (p>0.05).

, T-test, Chi-square test Fisher exact test Pear- 42 6

son correlation test . (14%), 40 13 (33%)

가 (p<0.05).

3.

1. 82 67 (82%) 15

24 ± 16 , .

33 ± 11 , 31 ± 11 67 13 (19%),

9 15 6 (40%) 가

2 ,

7 . (p<0.05).

21 ± 16 , 9 2 (22%),

33 ± 12 , 20 ± 11 73 13 (18%)

12 가 (p>0.05). 73

13 13

3 . 42

6 (13%), 40 9 (23%)

7.9 가 (p>0.05).

17.7 가

(p<0.05)(Table 2).

4.

50

13 (26%), 32 6

(19%) 가

2. . 1 73 26 ,

82 17 (21%) 5 1 ,

29 3 (12%) ,

7 , 4 , 47 10 (21%)가

18 , 20 ,

(69%) 4 .

4 , 2

5.

73 Kirkaldy-Willis

12 (14%), 35 (42.7%), 20

(26%) , 14 가 (24.4%), 15 (18.3%) (Table 2).

9 47 10 (21%),

1 (11%) , 35 9 (26%)

2 5 ,

Table 3. Clinical results and final lordosis in fused area.

Final lordosis in fused area	Final Clinical Result	
	Satisfactory group(N=47)	Unsatisfactory group(N=35)
20 °	44	7
< 20 °	3	28

p<0.05(Chi-square test)

7 (15%), 8 (23%)

3.3 ± 0.6 , 47 가
4.1 ± 1.3 가 (p<0.05). 가
20 31 ,
가 3 , 가 20 가
51 , 가 가 44 가
가 7 가 가
(p<0.05)(Table 3). 가
82 13 (16%) , 가 . Doherty⁷⁾ Har-
13 1 rington
18 , 가
2 , 가
10
2 , 8,9)
3 5 가
, flat back 가
4 flat back
20 18 , 가
11 , 3 2 , 가
1 12 2가 ,
47 , 가
12 8
60 ,
62 가^{10,11)}

5,12) . Pihlajamäki⁴⁾

102 72 가 가

5 1 .

가

8,13)

가

9,14,15)

가 가

2,4,16,17)

가

가

가

6,18)

가

19)

(56.7%) 가

가 가

5 1

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 101 8 , 1 1 가 가 10
 82 49 80 61 가 60 , 22
 12 , 79 35 , , 2 1
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 . Kirkaldy-Willis
 , SPSS 10.0 , T-test, Chi-square test Pearson correlation test .
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