

## Laparoscopy Assisted Miniopen Lateral Approach for Anterior Lumbar Interbody Fusion

Chong-Suh Lee, M.D., Sung-Soo Chung, M.D., Kwang-Hoon Chung, M.D.

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

### – Abstract –

**Study design :** A new approach to anterior lumbar interbody fusion (ALIF).

**Objective :** To investigate the advantages, technical pitfalls and complications of the laparoscopy assisted miniopen lateral approach.

**Summary of literature review :** Several kinds of miniopen approach or laparoscopy are now used for ALIF.

**Materials and Methods :** Thirty-five patients with various disease entities were included. Blood loss, operation time, incision size, postoperative time to mobilization, length of hospital stay, technical problems and complications were analyzed.

**Results :** Using this approach, T12 to L5 can be reached sub-diaphragmatically. Blood loss and operation time were 45.7 cc and 82.8 minutes for 1 level, 103.2 cc and 107.6 minutes for two levels, 272.5 cc and 150 minutes for three levels, and 520 cc and 190 minutes for four-level-fusion, respectively. The incision sizes were on average 4.1cm for 1 level, 6.2 cm for 2 levels, 8.2 cm for 3 levels and 10.1 cm for four-level-fusion. Complications were retroperitoneal hematoma in 2 cases, pneumonia in 1 case and transient lumbosacral plexus palsy in 3 cases.

**Conclusion :** The laparoscopy assisted miniopen lateral approach is an advantageous approach with a very short learning curve. However, special attention is required if complications such as transient lumbosacral plexus palsy are to be avoided.

**Key Words :** Lumbar spine, Laparoscopy, Miniopen lateral approach, Interbody fusion

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Address reprint requests to

**Chong-Suh Lee, M.D.**

Department of Orthopaedic Surgery, Samsung Medical Center

50 Il Wong-dong, Gang nam-gu, Seoul 135-710, Korea

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

chain<sup>7)</sup>  
Mathews<sup>3)</sup>

Oben- 1 , 4 , 7 ,  
(junctional kyphosis) 3 , 1 ,  
Charcot 1 ,  
(postdiscectomy syndrome) 1 ,  
1 , Scheuermann 1 .  
Schmorl , ,  
4) . , Scheuermann  
가 , 1 17  
paramedian<sup>1)</sup>  
4) .  
6 , 10 , 1 , Charcot  
1 , 18  
18  
13  
5  
10  
가 가

1.  
2000 9 2002 7  
35  
15 13 , 5 , 2  
(Table 1). 가 18 17 , 10 ,  
42.6 , 53.4 .  
Schmorl 2 , 7 ,  
3 , 3 ,

**Table 1.** Fusion levels and Number of cases

	Fusion level	Number
1 Level (15 cases)	L1-2	3
	L2-3	3
	L3-4	2
	L4-5	7
2 Levels (13 cases)	T12-L2	3
	L1-3	4
	L2-4	2
	L3-5	3
3 Levels (5 cases)	L1-2, L4-5	1
	T12-L3	1
	L1-4	2
4 Levels (2 cases)	L2-5	2
	L1-5	2

2.

(Fig. 2)

가 cage 가 , 15 mm , 14 mm (Table 3).

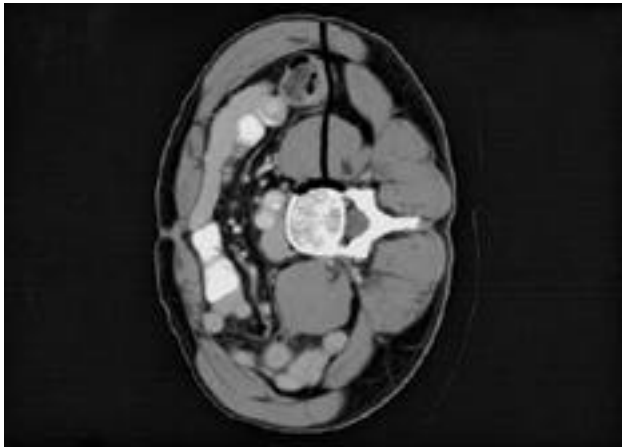
가 titanium cage 가

1.

45.7cc 82.8 , 103.2cc 107.6 (Table 2).



**Fig. 1.** Incision line between the center of upper vertebral body and center of lower vertebral body under fluoroscopic guided



**Fig. 2.** Abdominopelvic CT demonstrating the planes of minimally open lateral approach

가 가가

2.

4.1 cm(3.4~5.1), 6.2 cm(5.1~7.2), 8.2 cm(7.0~9.4) 4 10.1 cm(9.7~10.5)

5 1.2 2 6.8

**Table 2.** Blood loss & OP time (In simple ALIF)

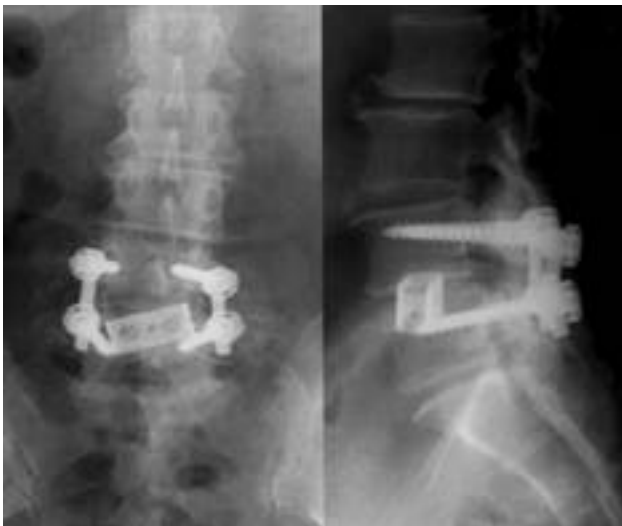
	EBL* (cc)	OP time (min)
1 level (9) <sup>†</sup>	45.7	82.8
2 levels (5)	103.2	107.6
3 levels (4)	272.5	150
4 levels (1)	520	190

\* : estimated blood loss ( )<sup>†</sup> : number of cases

**Table 3.** Blood loss & OP time (Additional debridement and corpectomy)

	EBL* (cc)	OP time (min)
1 level (6) <sup>†</sup>	385	108
2 levels (8)	470.5	122.6
3 levels (1)	420	240
4 levels (1)	1300	230

\* : estimated blood loss ( )<sup>†</sup> : number of cases



**Fig. 3.** Malpositioning of cage due to obstruction of high iliac crest

가 16.7%~29.4%

3. , 4~5

2 , 1 , 5 -1

가 3 , 1 , 6,11)

4-5 2 cage 10% 9).

가 1 (Fig. 3) .

1 1 가 가

4 1 가 가

8).

1 2

Leverant 2)

2 , 124 79

1 3

60 . 4~5 (retrograde ejaculation) 가 5%

10).

1 cage

가 가

4-5

(Fig. 3).

5).

가 가

4. 가 가

12

1 가 1

12

가

가

4~5

12

-1 1~2

가

가

4,6).

11)

. Zdeblick

가 4~5

2,3,5,6,8-11)

20%

4%

cage 가

2

16%

가 Regan<sup>9)</sup>  
2~3  
가 12 -1  
가  
가 4~5  
가 1 232.3 cc 134.4 cc ,  
147.9 223.6 4.1 3.2  
cage가 가 Zdeblick<sup>11)</sup>  
가 , , 가  
4  
5 -1  
4~5  
4~5  
cage가 가 2  
가  
1~2 12 -1  
11 10 가  
가 가  
3 12 5  
3 가 , , 가  
1/3  
가  
가

1~2  
가<sup>9,11)</sup>  
가  
가  
flatback  
1 10 cm  
가

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