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## **A Prospective Comparison of Surgical Approach for Lateral Retroperitoneal L4-5 Fusion : Laparoscopic Versus Mini-ALIF**

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– Abstract –

**Study Design :** We have analyzed the laparoscopic lateral retroperitoneal approach of the L4- 5 interspace to the miniopen retroperitoneal approach for lateral lumbar interbody fusion.

**Objectives :** To prospectively compare the laparoscopic lateral retroperitoneal approach of the L4- 5 interspace to the miniopen retroperitoneal approach for lateral lumbar interbody fusion

**Summary of Background Data :** The introduction of laparoscopic techniques in 1993 has stimulated a great deal of discussion regarding the risks and benefits of such minimally invasive approaches. In many centers the anterior endoscopic approach to L5- S1 has become routine. However exposure at L4- 5 can be much more difficult.

**Materials and Methods :** From 1997 to 1999 thirty eight patients were entered into a prospective study. These patients were all undergoing anterior interbody fusion at the L4- 5 level. The patients were divided into two groups for analysis. Group I patients underwent anterior interbody fusion utilizing threaded interbody devices placed via laparoscopic lateral retroperitoneal approach. Group II patients underwent anterior lumbar interbody fusion using threaded interbody devices placed via a miniopen retroperitoneal approach.

**Results :** In Group I, Operation time was 48 minutes longer than Group II (p=0.035) but there were no significant statistical differences in bleeding amount and hospitalization period. Paresthesia and tingling sensation of thigh were developed in two cases of Group I patients, one case of Group II patients but they were gradually diminished. In Group I, only one cage was inserted in five cases of patients (28%) who had an inadequate exposure of L4- 5 area. However, all of the patients in Group II (100%) had an adequate exposure of L4- 5 area.

**Conclusion :** The surgical results of laparoscopic technique was not superior to miniopen technique.

**Key Words :** Surgical approach, AIF, L4- 5

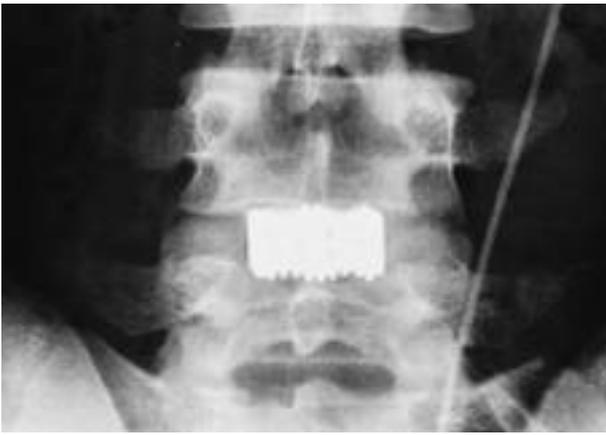
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Foley catheter 가  
500 ml 5 balloon  
CO<sub>2</sub> gas 12 mmHg  
portal cage portal por-  
tal cage portal  
가 cage 가 cage . C-  
cage 5 5 가 가 arm .  
<sup>29)</sup> cage portal . 3  
cage cage cage  
cage , . I 18  
, 8 , 10 43 (35  
~56 ) . 3 가  
18,23,26,27) . 1993 16 가 ,  
1 가 , 1  
가 . 5 - 1 가 . 2 (20 )  
( ) threaded interbody device(BAK cage)  
1 4-5 4-5 7 cm 가  
5~10  
5.16.18.19.22) , 가  
( ) 4-5 C-arm  
4-5 cage  
(reaming)  
1997 1999 38  
. cage 가 . C-arm  
4-5 4-5 portal  
3  
. I (18 ) ( )  
threaded interbody devices(BAK cage) . II 20 9  
, 11 41 (29 ~59 )  
10 5  
axillary line . 17 가 , 2 가  
1~2 cm , 1 가 . I II  
가 18 Fr ,



**Fig. 1.** Plain anteroposterior radiograph showing only one cage insertion due to inappropriate exposure of operation field



**Fig. 2.** Plain lateral radiograph showing only one cage insertion due to inappropriate exposure of operation field

(I ;  
 14.5 II ; 17.2 ). 1  
 cage 5 2 mm  
 가 50%  
 가 3,4,6,25)  
 가 ,  
 SAS

0.5 mm . II  
 3  
 0.68 mm 1  
 SAS  
 Student t 가 p 가  
 0.05  
 48  
 115 cc , I 110 cc, II  
 14.4 , II  
 14.5 가 (p=0.092, p=0.07). I 2 (11.1%)  
 I 2 (11.1%), II 1 (5%)  
 I 5 (28%)  
 1 cage  
 (Fig. 1, 2)  
 2 cages I 72%, , 360  
 II 100%  
 I 13 (72%), II 17 (85%)  
 I  
 5  
 가

8-11,13,17,18,21,23,25,29)

|                   |                  |   |   |                        |                           |       |         |
|-------------------|------------------|---|---|------------------------|---------------------------|-------|---------|
| 6,9,20,26)        | 가                | ,   | ,   | ,                      | (CO <sub>2</sub> tension) | 가     | 12 mmHg |
|                   |                  |   |   |                        |                           |       |         |
|                   |                  |   |   |                        |                           |       |         |
| 2,5,9,12,23,25)   | 1988             | Bagby <sup>2)</sup> 가                     |   | portal                 | portal                    |       | 4       |
|                   |                  | 가   |   | portal                 |                           |       |         |
|                   | 88%              |   |   |                        |                           |       |         |
|                   | cage             |   |   |                        |                           |       |         |
|                   | cage             |   | cage  | cage                   | 26,29), Regan             | 26)   |         |
|                   |                  |   | 가   |                        |                           |       |         |
|                   |                  |   |   |                        | ( )                       |       |         |
|                   |                  |   |   |                        |                           | 1)    |         |
| 5,23,27,29)       | cage             |   | (horizontal cylinder),                      |                        |                           |       |         |
|                   | (vertical ring), |   | (Open Box)                                  |                        |                           |       | 가       |
|                   | 29)              | 1983                                      | Bagby <sup>2)</sup> Kuslich <sup>8)</sup> 가 |                        |                           |       | Dezawa  |
|                   | BAK cage         |   |   | 1)                     | ( )                       |       |         |
|                   | cage             |   |   |                        |                           |       | 22      |
|                   |                  |   |   |                        |                           |       |         |
| 18,23,26,27)      |                  |   | 가   |                        |                           |       |         |
|                   |                  |   | 가   |                        |                           |       |         |
|                   |                  |   |   |                        |                           |       |         |
|                   | -1               |   | 16-20,22,24)                                | 5                      |                           |       |         |
|                   |                  |   |   |                        |                           |       |         |
|                   |                  |   |   |                        |                           | 가     |         |
|                   |                  |   |   | 4-5                    |                           |       |         |
|                   |                  |   |   | Kuslich <sup>18)</sup> | cage                      |       |         |
|                   |                  |   | 69%   | 4-5                    |                           |       | 10      |
|                   |                  |   |   | (left                  |                           |       |         |
| iliac vein),      |                  | (Middle sacral vessel)                    |   |                        |                           |       |         |
|                   |                  | (superior hypogastric sympathetic plexus) |   | . 5                    |                           |       |         |
|                   |                  | (left common iliac vein )                 |   | cage                   |                           |       |         |
|                   |                  |   |   | cage가                  |                           |       |         |
| (iliolumbar vein) |                  |   |   | 가                      |                           |       |         |
|                   | 4-5              |   |   |                        |                           | cage  |         |
|                   |                  |   |   |                        |                           |       |         |
|                   |                  |   |   |                        |                           | cage가 |         |

cage 가  
 cage . ( )  
 가  
 . cage 가  
 가  
 3,4,6) cage 가 Brodke 7)  
 BAK cage - 2  
 TSRH BAK  
 4 가 가  
 cage  
 Tencer 28) Ray cage  
 1997 Glazer 14,15)  
 가 가  
 I 72%, II 100%  
 I 72%, II 85%  
 . cage  
 가  
 가  
 가  
 5 5000 가  
 가 29) cage  
 가 ( )  
 cage  
 ( )

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: 4-5  
:  
4-5  
: 1997 1999 38 4-5  
4-5 .1  
threaded interbody devices 10  
.2 threaded interbody device  
가 SAS  
:  
가 .1 2 ,2 1 48 (p=0.035)  
1 5 1 cage  
2 2 cages 1 72%, 2 100%  
:  
:  
4-5