

:

Cage

Surgical Treatment of Isthmic Spondylolisthesis: Pedicle Screw Fixation, Posterolateral Fusion, and Posterior Lumbar Interbody Fusion with Cage after Wide Decompression

Hwa-Yeop Na, M.D., You-Young Jeong, M.D.,
Woo-suk Kim, M.D., Hyung-Wook Cho, M.D.

*Department of Orthopedic Surgery, Pundang Jesaeng Hospital,
DaeJin Medical Center, Sunnam, Gyeonggi, Korea*

– Abstract –

Study Design: A retrospective study.

Objectives: To verify the advantages of adding gentle reduction and posterior lumbar interbody fusion (PLIF), using a cage to the usual posterolateral fusion (PLF), with pedicle screw instrumentation, in the surgical treatment of spinal stenosis with isthmic spondylolisthesis.

Summary of Literature Review: The stabilization of isthmic spondylolisthesis, following decompression, is difficult. The PLIF, with a cage, offers anterior column support, reduction and a broad fusion base.

Materials and Methods: 31 patients were treated with wide decompression, pedicle screws fixation, PLF and PLIF, and followed up for more than 1 year. The degrees of slippage were grades I and II in 20 and 11 patients, respectively. The grade I patients were treated with gentle reduction of the slippage in the disc space, using a leverage maneuver with a Cobb's spinal elevator. The grade II patients were treated with the insertion of a pedicle screws, fixation of rods, reduction and distraction, and then insertion of a cage. After the procedure all the patients were evaluated for the reduction of spondylolisthesis, restoration of the disc space, radiological bony union and clinical results.

Results: Ninety percent of the patients were rated as excellent or good. Fusion of the PLIF occurred in all patients. The average reduction in the spondylolisthesis was 42.6 and 47.8% in the grade I and II patients, respectively. The average restorations of the disc spaces were 46.9 and 100.2% in the grade I and II patients, respectively. The maintenance of the reduction and disc height were excellent in the final follow-up radiographs.

Conclusions: Adding gentle reduction and PLIF, using a cage, to the usual posterolateral fusion, with pedicle screw instrumentation, in the surgical treatment of spinal stenosis, with isthmic spondylolisthesis, showed satisfactory results in the reduction of

Address reprint requests to

Hwa-Yeop Na, M.D.

Department of Orthopedic Surgery, Pundang Jesaeng General Hospital
#255-2, Seohyun-dong, Pundang-gu, Seongnam-si, Gyeonggi-do, 463-774, Korea
Tel: 82-31-779-0175, Fax: 82-31-779-0176, E-mail: hyna@dmc.or.kr

the spondylolisthesis, the restoration of the disc height, the bony union and clinically.

Key Words: Isthmic spondylolisthesis, Reduction, Posterior lumbar interbody fusion, Posterolateral fusion

2.

가 , 6 , 30 (96.7%), 31 (100%), 24 (77.4%), 15 (48.3%)

가 7 , 가 6 .

3.

4, 5 10 , 5 1

16 , 3, 4, 5 2 , 4, 5

3 Meyerding

grade I (1) 20 , grade II (2)가 11

가 . Cloward⁴⁾

4.

31 , (Fig. 1), (Fig. 2).

17).

5.

Gill (floating lamina) (towel clip)

(Cobb 's spinal elevator) (en block)

1.

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grade I 1

cage

가 가 31 , 38

69 52.3 , 26 , 5

가 , 12 36 2 grade II

25 . cage



Fig. 1. Preoperative flexion-extension lateral radiographs of 59-year-old female shows grade II isthmic spondylolisthesis at L4-5 level.



Fig. 2. Magnetic resonance imaging in sagittal plane shows angulated and compressed dural sac and severely compressed nerve root at L4-5 intervertebral foramen.

1
(reamer)
1
(curet)
cage 1
90
(Sofamor Danek, Novus cage) 4
OIC cage) 27
가
(Fig. 3).
6.
3
3
(TLSO)
2
, 6, 3, 6

1
7.
Kirkaldy-Willis¹¹⁾ 가
(excellent),
(good),
(fair),
(poor)

가
가
cage 가

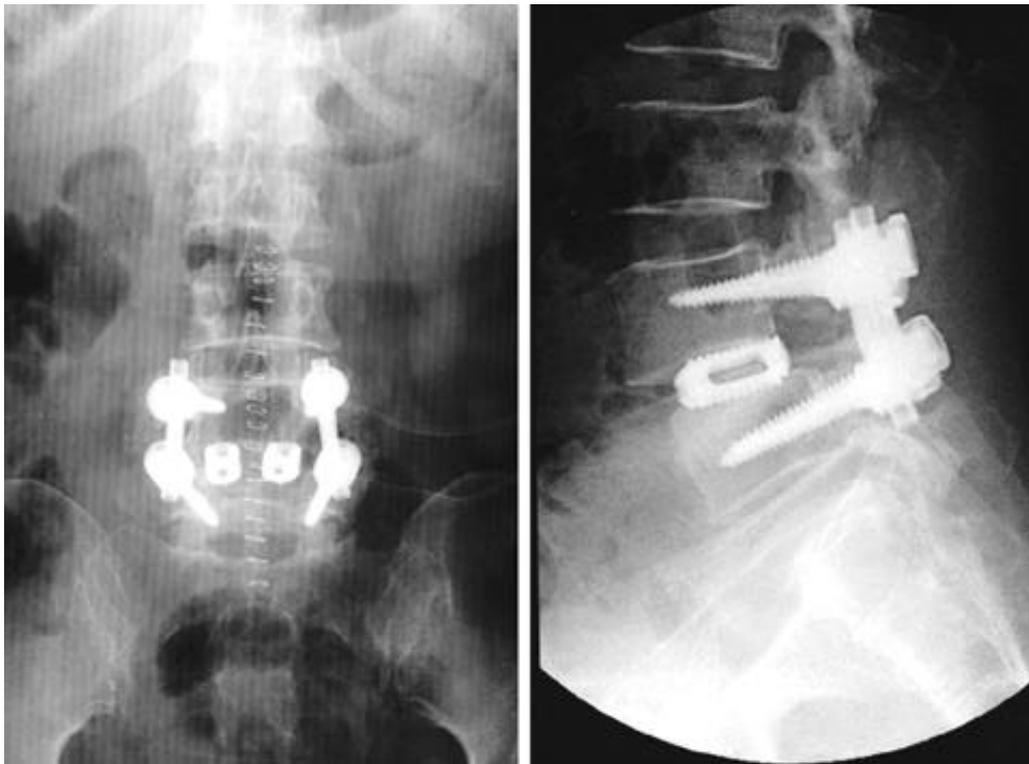


Fig. 3. After wide decompression, reduction, PLIF with cage, pedicle screw instrumentation and PLF were done.

4-5%

23)

1 11 , 7 ,
2 , 2 7 , 3 , 1

1 42.6 % , 2 47.8 %
(P=0.11).

1 46.9 % , 2 100.2 %
가 가

1 , 2 31
(Fig. 4). 2
가 2 가

situ

in

가

가

가

6,16)

가

12,13,14,17,20)

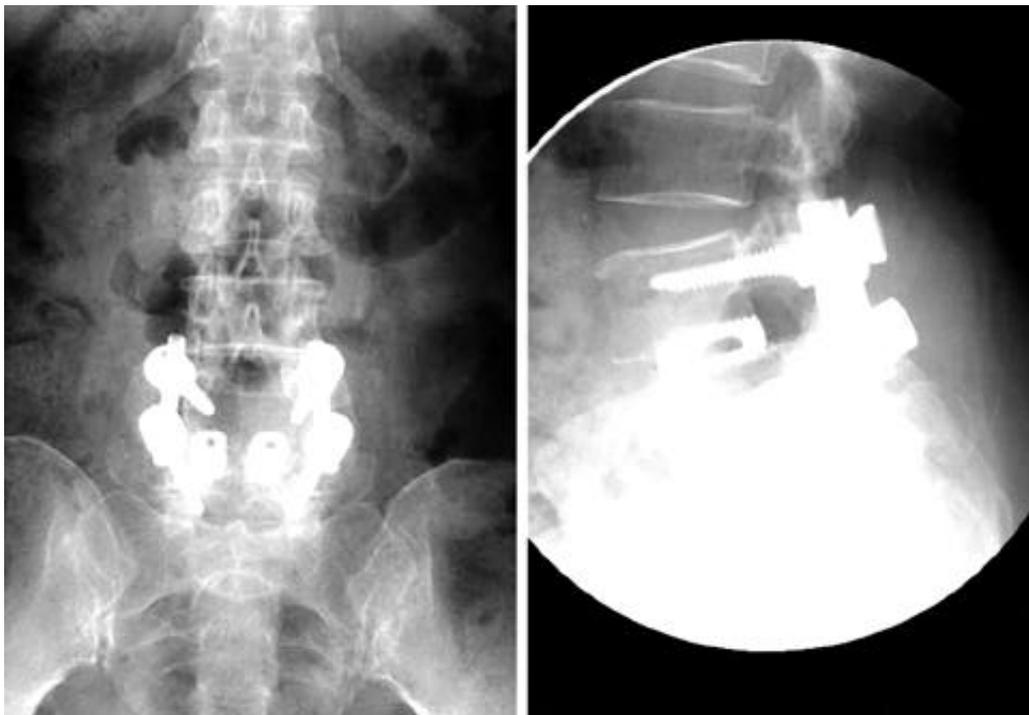


Fig. 4. Radiograph at 12 months follow-up examination shows reduction and restoration of disc height was well maintained with solid bony union.

가 가

load-sharing mechanism

tension-band mechanism cage 4

cage , cage cage

9,10,15,22) 18) , cage ,

가 cage

24) cage 가

. Goh⁸⁾ cage

가

가 , 가

가 , 가

cage ,

3,20) .

가 , cage

가 , 6) ,

3,4,5,6,19) .

가

31

가 grade I

가 , 가 ,

grade II cage

cage , grade I

cage

, grade II

가 cage ,

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 cage 31
 Kirkaldy-Willis 가 , ,
 , Meyerd-
 ing grade I 20 , grade II가 11 . Gill , grade I
 (1) cage
 , grade II (2)
 cage
 : 18 , 10 , 3
 1 42.6%, 2 47.8% 2
 가 1 46.9%, 2 100.2% 가 ,
 31 ,
 :
 cage
 :

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Tel: 82-31-779-0175, Fax: 82-31-779-0176, E-mail: hyna@dmc.or.kr

