

## Treatment of Posterior Facet Fracture-Dislocation in Lumbar Spine

Heui-Jeon, Park, M.D., In-Gu, Kim, M.D., Wan-Ki, Kim, M.D.

*Department of Orthopaedic Surgery, Wonju College of Medicine, Yonsei University, Wonju, Korea*

### – Abstract –

**Study Design :** Retrospective study.

**Objectives :** The purpose of this study is to compare the outcomes of short segment fusion and long segment fusion in posterior facet fracture- dislocation in the lumbar spine.

**Summary of Literature Review :** There are many controversies exist about the treatment of fracture- dislocation in lumbar spine.

**Material and Methods :** Sixteen patients with lumbar fracture- dislocation were studied retrospectively. The patients divided two groups; group one treated with one level above and below the fracture segment fixation, group two treated with two level above and below the fracture segment fixation. Two groups were compared with neurologic recovery, bladder function recovery and radiologic changes of deformities.

**Results :** The neurologic deficit in two groups was improved more than one Frankel grade at last follow up. Patients who showed intact dura were neurologically improved significantly than the patients whose dura was ruptured. Radiologic changes were not a significant difference in two groups.

**Conclusion :** In lumbar fracture- dislocation treatment, one level above and below the fracture segment fixed with pedicle screw fixation system was an effective treatment method which preserved the mobile segment lumbar spine.

**Key Words :** Lumbar spine, Fracture- dislocation, Posterior fixation, Fusion level

rington

Dick<sup>8)</sup>

- 3

가

<sup>19)</sup>

Har-

Address reprint requests to

**Heui-Jeon, M.D.**

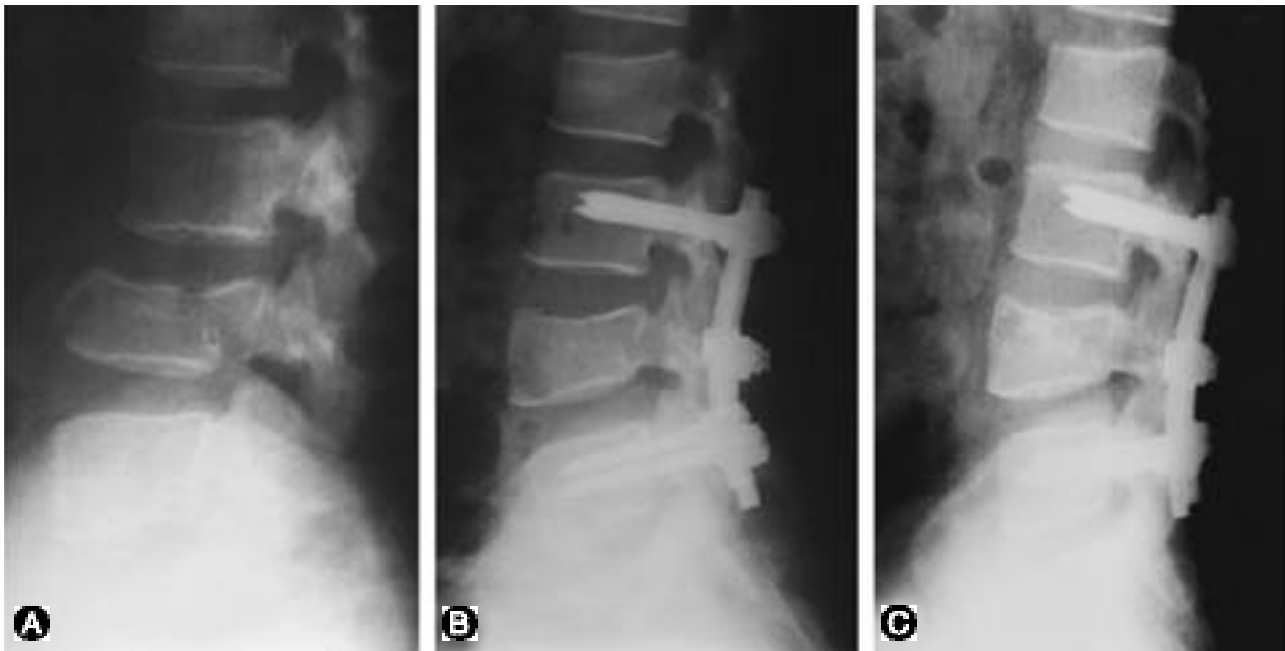
Department of Orthopaedic Surgery, College of Medicine, Wonju Yonsei University  
#162 Ilsan-dong Wonju, Kangwon-do 220-701, Korea

Tel : 82-33-741-1352, Fax : 82-33-741-1538, E-mail : par73@wonju.yonsei.ac.kr

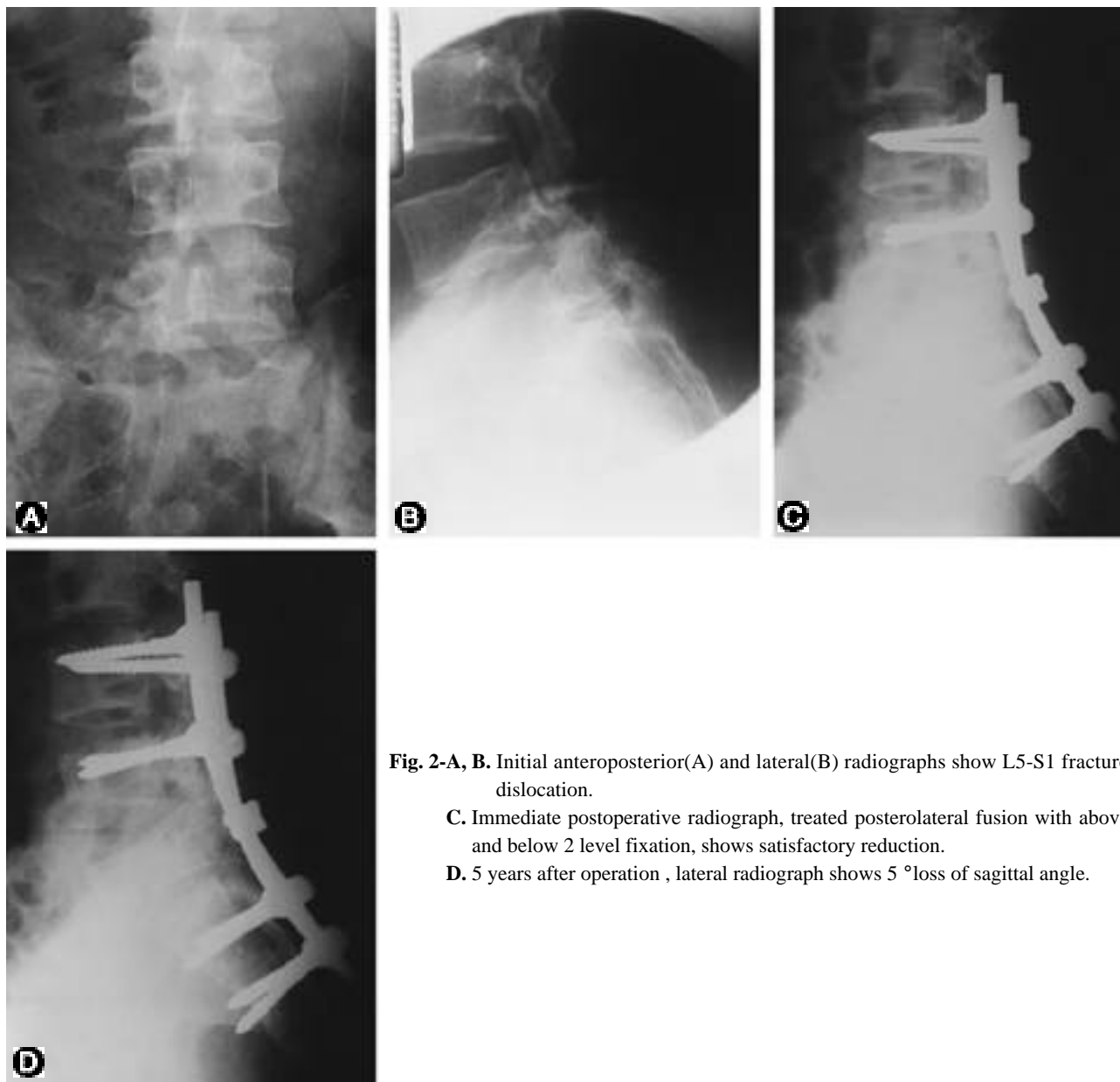
가 (Table 1), reduction clip, towel clip  
Harrington spreader  
가 (1, Fig. 1),  
가 가  
2 (2, Fig. 2).  
AO internal fixator  
(Fixature Interna) 12, Moss-Miami 2, Diapason  
Cotrel-Dubousset 가 1,  
1992 3 2000 3 4  
2 120 , 가  
- 가 72 1 (1) 3  
16 (13.3%) , (2 ) ,  
36.8 (Frankel ) ,  
(12 -111 ) , 34.5 (17 -48  
) , 10 (62.5%), 6 (37.5%)  
8 (50%), 가 5  
(31.3%), 가 3  
(18.7%) , 11 (68.8%)  
, 5 (31.3%)  
4-5 가 가

**Table 1.** Level of Fracture-Dislocation

Level	No (%)
L2/L3	3(18.75)
L3/L4	4(25.00)
L4/L5	6(37.50)
L5/S1	3(18.75)



**Fig. 1-A :** Initial lateral radiograph shows L4-5 fracture dislocation.  
**B :** Immediate postoperative radiograph, treated posterolateral fusion with above and below 1 level fixation, shows satisfactory reduction.  
**C :** Twelve months after operation, lateral radiograph shows 3 loss of sagittal angle



**Fig. 2-A, B.** Initial anteroposterior(A) and lateral(B) radiographs show L5-S1 fracture dislocation.  
**C.** Immediate postoperative radiograph, treated posterolateral fusion with above and below 2 level fixation, shows satisfactory reduction.  
**D.** 5 years after operation , lateral radiograph shows 5 °loss of sagittal angle.

가 ,

, ,

, ,

, Denis <sup>6)</sup>

. 1 2

1.

Paired-sample T test ,

Mann-Whitney U test

.

10

6

Frankel <sup>12)</sup>

가 , 1

1

. 2

4

1

,

(Group 1; P=0.045 < 0.05,  
Group 2; P=0.012 < 0.05)(Table 2).

1.0  
,  
(P=0.008 < 0.05)(Table 3).

2.

5 (31.3%)

5

1 2 , 2 3

2 1

4

4.

1 16.3

1.5 14.8 가

4.5 3.0 , 2

11.4 , 0 11.4 가

2.0 2.0

가

(P=0.269, 0.395>0.05).

3.

6 (37.5%)

, 6

4

0.8

10 (62.5%)

5.

1 12.0 , -8.7

20.7 가 , -5.0 3.7

, 2 -11.2 ,

-23.8 12.6 가 ,

-20.7 3.1

가 (P=0.312, 0.812>0.05).

**Table 2.** Neurologic deficit (Frankel grade system)

		Initial	F/U
Group 1*	A	2	2
	B	2	1
	C	1	1
	D	3	2
	E	2	4
Group 2†	A	1	1
	B	0	0
	C	2	0
	D	2	1
	E	1	4

**Table 3.** Neurologic recovery compared dura tear and non-dura tear

		Initial	F/U
Tear(6) *	A	1	0
	B	0	1
	C	2	0
	D	3	3
	E	0	2
Non-Tear(10)†	A	2	0
	B	1	0
	C	0	1
	D	4	3
	E	3	6

\* P=0.099 > 0.05

† P=0.008 < 0.05

6.

1

가 65.7%, 91.5% 25.7%가 ,

87.6% 3.9%

가 65.2%, 96.4%

31.2%가 , 93.6% 2.8%

(P=0.583, 0.706>0.05).

7.

1 2.8 mm, 2

9.4 mm , 1 0

mm 2

1.4 mm

(P=0.160, 0.273 > 0.05).

1

8.0 mm , 1.8 mm

6.2 mm가 , 2.3 mm 0.5 mm

. 2 9.8

mm, 4.0 mm 4.8 mm가 ,

4.4 mm 0.4 mm

가 (P=0.927, 0.686 > 0.05).

8. 가<sup>14,15)</sup>.
- 1 . Farcy<sup>11)</sup> Cotrel-Dubousset
- 1 15.6 , 2 20.8 1 19.3 3.7 , 2 25.3 4.5 1 (P=0.721 > 0.05), 가 2
- 16.4 2.9 , 2 17.5 - 2
- 7.8 가
- (P=0.137 > 0.05).<sup>2,5)</sup>, Fixture-Intern(F-I)
- <sup>17)</sup>.
- 70%
- 가 3 ,<sup>16)</sup>.
- 가 , , 4
- 가 가<sup>2)</sup>. . Dick<sup>7)</sup> 8
- 30 , , AO internal fixator -
- 75% , - 가 가 , - 1<sup>3)</sup>.
- <sup>1,13)</sup>. - 5 - 1
- 1
- <sup>18)</sup>, Dick- - 가 .
- son<sup>9)</sup> Harrington 가 . Harrington
- Edward
- Levine<sup>10)</sup> rod sleeve
- 
- 1
- 가 , 가 , 가
- ,
- <sup>18)</sup>.
- 3 가 가
- , 가 ,

## REFERENCES

- 1) **Bohlman HH** : *Treatment of fracture and dislocations of the thoracic and lumbar spine. J Bone Joint Surg*, 67-A: 165-169, 1985.
- 2) **Chapman JR and Anderson PA** : *Thoracolumbar spine*

- fractures with neurologic deficit. *Orthop Clin North Am*, 25: 595-597, 1994.
- 3) **Choi WS, Baik CH, Cho SS, Park HJ and Koh DH** : Clinical analysis of unstable thoracolumbar fractures and fracture-dislocation using transpedicular screws. *J Korean Ortho Surgery*, 26: 719-727, 1991.
  - 4) **Denis** : The three column spine and its significance in the classification of acute thoracolumbar injuries. *Spine*, 8: 817-831, 1983.
  - 5) **Denis F and Barkus JK** : Shear fracture dislocation of the thoracolumbar spine associated with forceful hyperextension. *Spine*, 17: 156-161, 1992.
  - 6) **Denis F, Ruiz H and Searls K** : Comparison between square-ended distraction rods and standard round-ended distraction rods in the treatment of thoracolumbar spinal injuries. *Clin Ortho*, 189: 162-167, 1984.
  - 7) **Dick W** : Internal fixation of thoracic and lumbar spine fractures. 1st ed, Toronto, Hans Huber Co: 75-86, 1989.
  - 8) **Dick W, Kluger P and Margel F** : A new device for internal fixation of thoracolumbar and lumbar spine fracture. *Paraplegia*, 23: 225-232, 1985.
  - 9) **Dickson JH, Harrington RP and Erwin WD** : Harrington instrumentation in the fractured unstable thoracic and lumbar spine. *J Bone Joint Surg*, 55-A: 422-426, 1973.
  - 10) **Edward CC and Levine AM** : Early rod sleeve stabilization of the injured thoracic and lumbar spine. *Orthop Clin North Am*, 17: 121-145, 1986.
  - 11) **Farcy J, Weidenbaum M, Michelson CB, Hoeltzel DA and Athansiou KA** : A comparative biomechanical study of spinal fixation using Cotrel-Dubousset instrumentation. *Spine*, 12: 877-881, 1987.
  - 12) **Frankel HL, Hancock DO, and Hyslop G** : The value of postural reduction in the initial management of closed injuries of the spine with paraplegia and tetraplegia. *Paraplegia*, 7: 179-192, 1969.
  - 13) **Gertzbein SD** : Multicenter spine fractured study. *Spine*, 17: 528-539, 1992.
  - 14) **Krag MH** : Biomechanics of thoracolumbar spinal fixation. *Spine*, 16: S84-S99, 1991.
  - 15) **McLain RF, Sparling E and Benson DR** : Early failure of short-segment pedicle instrumentation for thoracolumbar fractures. *J Bone Joint Surg*, 75-A: 162-167, 1993.
  - 16) **Shaffrey CJ, Saffrey ME, Whitehill R and Nockels RP** : Surgical treatment of thoracolumbar fractures. *Neurosurgery Clin North Am*, 8: 519-540, 1997.
  - 17) **Stauffer ES** : Internal fixation of fracture of the thoracolumbar spine. *J. Bone Joint Surg*, 66-A: 1136-1138, 1984.
  - 18) **Stauffer ES** : Thoracolumbar spine fractures without neurologic deficit. AAOS monography series, 49-80, 1993.
  - 19) **Tasdemiroglu E and Tibbs PA** : Long-term follow-up results of thoracolumbar fractures after posterior instrumentation. *Spine*, 20: 1704-1708, 1995.

: - 가 가 -  
 : 16 - , 1  
 (1 ) 3 (2 ) (Frankel grade) , ,  
 , , , ,  
 : 1 (P<0.05),  
 (P<0.05). , ,  
 , 1 2 .  
 : - 가 , 1  
 가 가 .  
 : , - , ,

:

162

Tel : 82-33-741-1352, Fax : 82-33-741-1538, E-mail : par73@wonju.yonsei.ac.kr