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Preliminary Report of Temporary Posterior Instrumentation in Stable Thoracolumbar Burst Fractures

Ho-Guen Chang, M.D., Young-Woo Kim, M.D., Jong-Churel Jung, M.D.,
Hyeong-Su Kim, M.D.*, Kee-Byoung Lee, M.D.

Department of Orthopaedic Surgery, Hallym University Sacred Heart Hospital, Anyang, Korea
*Department of Preventive Medicine, Kon-kuk University, Chungju, Korea**

– Abstract –

Study Design : A prospective study of posterior instrumentation without fusion for the stable thoracolumbar fracture.

Objectives : To confirm vertebral body collapse by roentgenography and computerized tomography after removing posterior instrumentation at 6 months postoperatively in stable thoracolumbar burst fractures.

Summary of literature review : Many authors have reported that vertebral body collapse occurs after instrumentation removal.

Materials & Method : Sixty patients admitted between March 1999 and March 2001 with thoracolumbar junction fractures were included. Patients were divided into 3 groups: Group I - the Conservative management group (20 patients), Group II - Reduction and posterior fixation with fusion group (20 patients), Group III - Reduction and temporary posterior fixation group (20 patients). The patients were aged between 21 and 49 years (mean 38), and the follow-up period exceeded 1 year (mean 13.3 months). We studied vertebral height, kyphotic angle, disc height and facet hypertrophy by roentgenography, and the continuity of the anterior cortical connection, cavity formation, sclerotic bone formation and new bone formation by CT.

Results : The loss of vertebral height was 7.9% (from 21.5 to 29.4%) in Group I, 3.7% in Group II (preop 35%, postop 12.7%, postop 1Yr. 16.4%), and 3.5% in Group III (preop. 35.2%, postop 5.6%, postop 1Yr. 9.1%). Loss of angulation was 4.2° (from 9.6° to 13.8°) in Group I, 3.0° in Group II (preop 15.3°, postop 7.2°, postop. 1Yr. 10.2°), and 3.0° in Group III (preop 14.6°, postop. 5.9°, postop 1Yr. 8.9°). Loss of disc height was not statistically different for the 3 groups. Degenerative changes of the posterior facet were seen 3 patients of Group I, 11 patients of Group II, and in 5 patients of group III. On CT scan of Group III, all cases showed cavity formation and sclerosis, and continuity of the anterior cortical connection and of new bone formation into the cavity were seen in 18 cases.

Conclusions : Vertebral body collapse were not observed by roentgenography by computerized tomography after removing the posterior instrumentation at 6 months postoperatively in stable thoracolumbar burst fractures.

Key Words : Thoracolumbar spine, Burst fracture, Posterior fixation, Temporary

Address reprint requests to

Ho-Guen Chang, M.D.

Department of Orthopaedic Surgery, Hallym University Sacred Heart Hospital

#896 Dongan-gu, Anyang city, Kyounggi-do 431-070, Korea

Tel : 82-31-380-1814, Fax : 82-31-382-1814, E-mail : hgc2000@dreamwiz.com

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21,25,31,32)

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6 21.5%, 1 29.4% 7.9% II 35%, 12.7%, 1 16.4% 3.7% III 35.2%, 5.6%, 1 9.1% 3.5% (Fig. 1,2). 가 가

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(Table 1).

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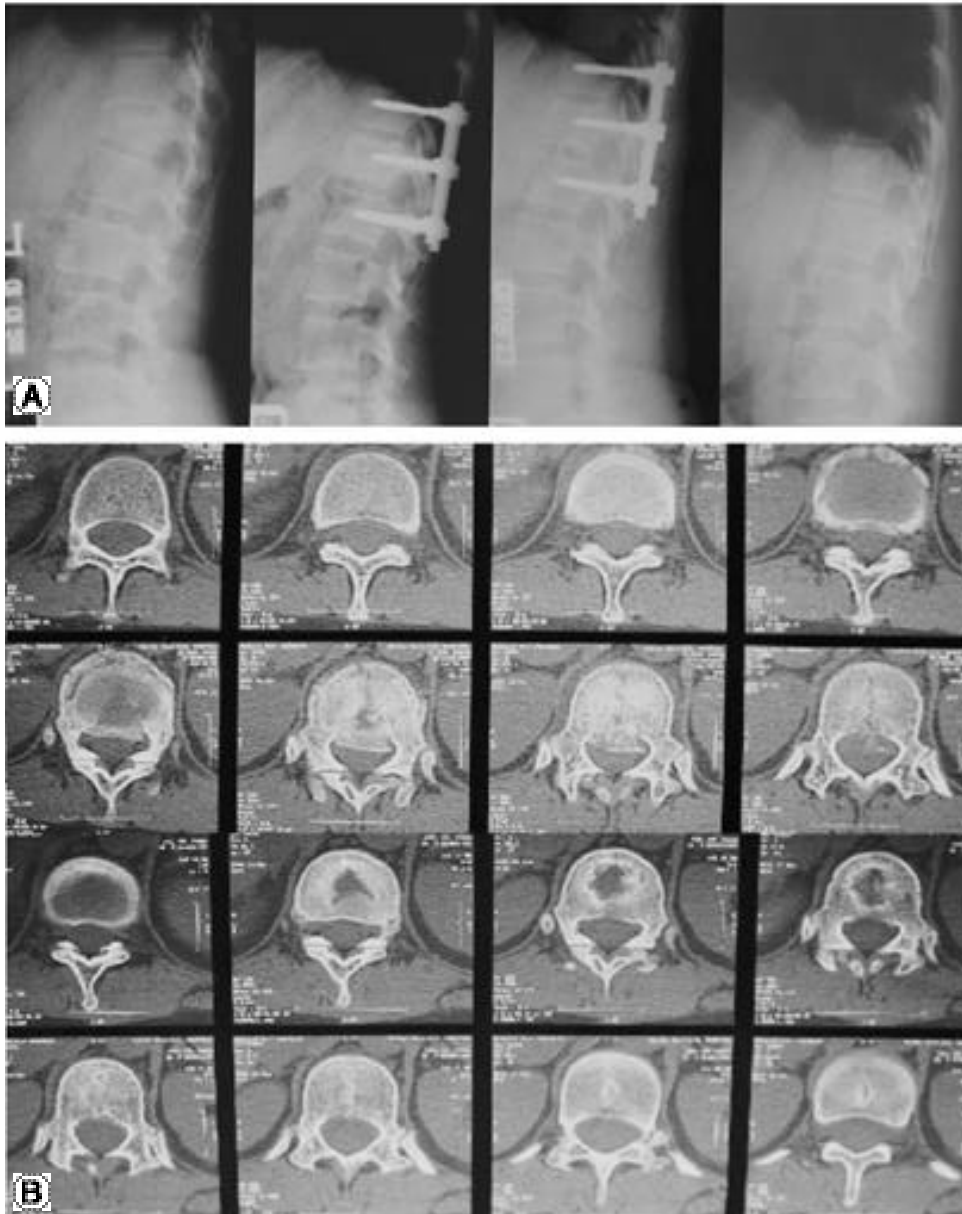


Fig. 1. A. Case1: Simple radiograph of a 31 years old female. From the left, at injury, at Postop., at POD 6M., at POD 1Yr. degrees of comperssion was 45.5%, 2%, 3%, 5% respectively. The angle of kyphosis was 22°, 5°, 7°, 8° respectively. At POD 1Yr, the loss of reduction was 2%, and the loss of kyphosis was 3 degrees.
B. CT findings at injury (above) & POD 1Yr. (below). Removal of instrumentation at 7 months. With Preop. CT, burst fracture was seen. At POD 1Yr., cavity formation, sclerosis around the cavity, new bone formation in the cavity, and boney connection of anterior vertebral body are seen.

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4.

I 92.4%, 1
87.3% 5.1% . II
91.5%, 1 86.9%
4.6% . III 87.6%, 1
92.9% 4.7%

(Table 3).

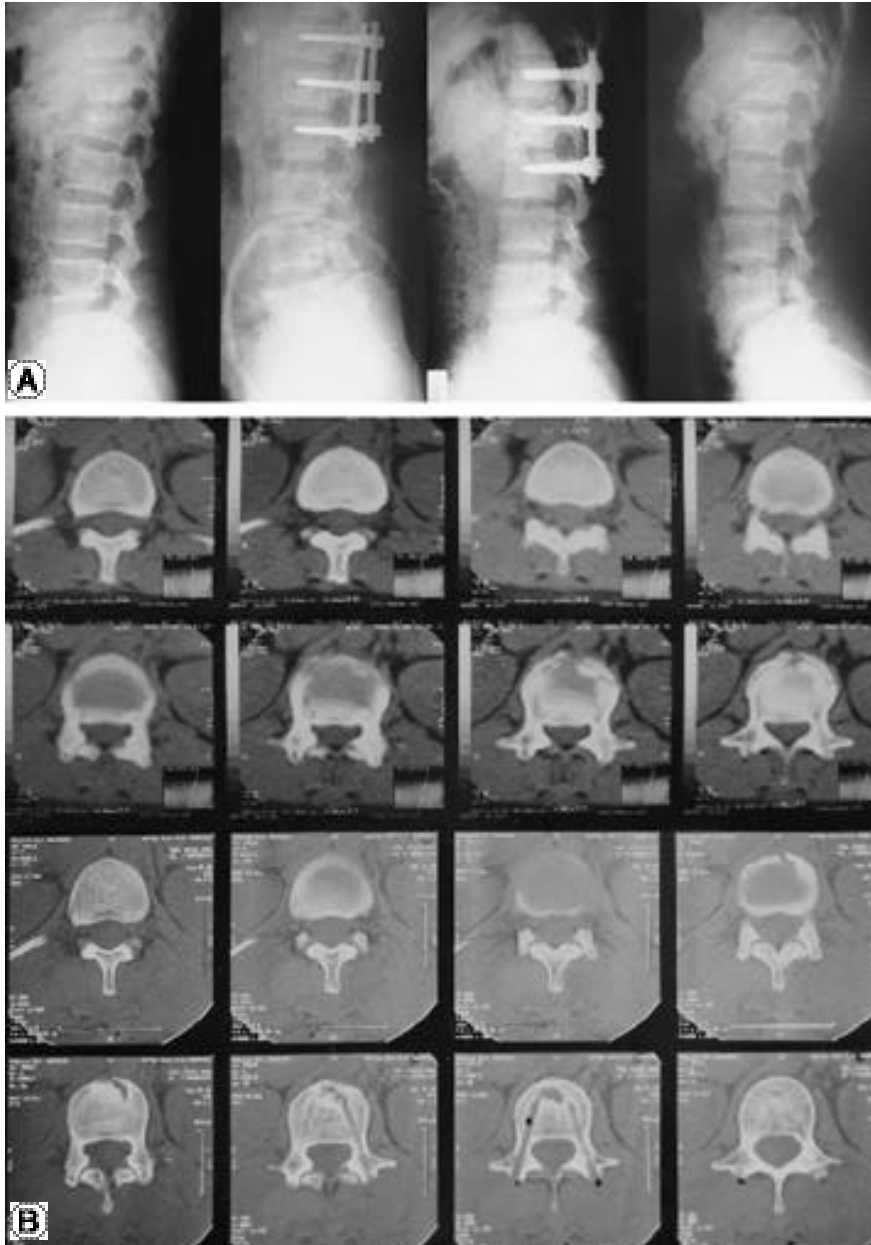


Fig. 2. A. Case2: Simple radiograph of a 41 years old female with 48.7% compression & 20° kyphosis. From the left, at injury, at Postop., at POD 6M., at POD 1Yr. degrees of compression was 48.7%, 3%, 4%, 6% respectively. The angle of kyphosis was 20°, 6°, 8°, 11°, respectively. At POD 1Yr., the loss of reduction was 3%, and the loss of kyphosis was 5 degrees.

B. CT findings at injury (above) & POD 1Yr. (below). Removal of instrumentation was done at postop.6 months. Collapse of vertebral body is prevented.

Table 1. Height of vertebral body : degrees of compression (%):P-value >0.05

	At trauma	Postop.	F/U 1Yr.	Loss of reduction
Conservative	21.5		29.4	7.9
Post.instrumentation with fusion	35.0	12.7	16.4	3.7
Temporary fixation	35.2	5.6	9.1	3.5

Table 2. Angles of kyphosis (degrees):P-value >0.05

	At trauma	Postop.	F/U 1Yr.	Loss of angle
Conservative	9.6		13.8	4.2
Post.instrumentation with fusion	15.3	7.2	10.2	3.0
Temporary fixation	14.6	5.9	8.9	3.0

Table 3. CT findings after removal of temporary posterior instrumentaion (person)

Formation of the cavities	20/20 (100%)
Sclerosis around the cavities	20/20 (100%)
Bony connection of anterior spinal body	18/20 (90%)
New bone formation in the cavities	18/20 (90%)

Table 4. Hight of intervertebral disc (%):P-value >0.05

	At trauma	F/U 1Yr.	Loss of height
Conservative	92.4	87.3	5.1
Post.instrumentation with fusion	91.5	86.9	4.6
Temporary fixation	87.6	82.9	4.7

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40% , 15 가 ²⁵⁾ (ligamentotaxis) (sagittal index),

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17 가 가 54% 가 10% 가 5, 10 가 가 34% 15% , 가 37% 8% 가 18) 가 가 가 12) 가 가 18,26,27) 가 가 가 2,22) Bradford 가 116 5 14 가 2 36% 4 가 2 13) Sanderson 28 6) Sjostrom 21 (83) 3.1 62% 16 , 14% 7.2 28) 가 가 14) 가 가 90% 19) 가 30~50% 가 17) 16 11 T-2 2 5 가 30) 60 14 6 6 가 6 , 18% 5) 가 75% 25% , 가 69% 31% 22) 가 가

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3.5%(35.2%,

5.6%, 1 9.1%)

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3.0 (15.3 , 7.2 1 8.9),

3.0 (14.6 , 5.9 1 8.9)

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Tel : 82-31-380-1814, Fax : 82-31-382-1814, E-mail : hgc2000@dreamwiz.com