

## Posterolateral Fusion for Unstable Thoracolumbar Junction

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### – Abstract –

**Study Design:** A retrospective study of patients with a posterolateral spinal fusion for an unstable thoracolumbar junction.

**Objectives:** To evaluate the efficacy of a posterolateral spinal fusion for an unstable thoracolumbar junction.

**Summary of Literature Review:** Posterolateral spinal fusions are well documented for their efficacy in the lumbar and lumbosacral spine, and have also been applied to the thoracolumbar junction in the lumbar area. The thoracolumbar junction, however, is a little different from the lumbar spine, in its anatomical and biomechanical aspects, and posterolateral fusions have not been well evaluated in these respects.

**Materials and Methods:** Fourteen consecutive patients, who had posterolateral spinal fusions, with instrumentation for an unstable condition, including T12-L1 segment, and followed for more than one year, were included. In 11 patients, all the fractures had been decompressed posteriorly, for degenerative conditions in 2, and for a neoplastic pathology in the other one. The radiographs concerning the lateral fusion mass were reviewed according to Lenke's classification, the change in the segmental sagittal angle of the fused segment and the fixation failure of the instrumentation. The medical records relating to the neurological recovery were reviewed using the modified Frankel grading, and the overall clinical results of treatment by the Kirkaldy-Willis criteria.

**Results:** All patients disclosed big, bilateral and solid fusion masses, with the exception of one patient who revealed a big, solid fusion mass on one side, and small, thin fusion mass on the other. No patient revealed more than 3 degrees of mobility on flexion-extension lateral radiographs, any evidence of fixation failure of the instrumentation. The neurological recovery, by the modified Frankel grading system, showed an average 1.3 improvement. The clinical results were excellent in 6, good in 6 and fair in 2 patients, with no poor results.

**Conclusions:** A posterolateral spinal fusion can be effectively applied in an unstable thoracolumbar junction, such as in the lumbar and lumbosacral spine, provided there is precise preparation of the graft beds, enough bone grafts and correction of the excessive kyphotic angle by the compression fixation of the posterior instrumentation.

**Key Words:** Thoracolumbar junction, Posterolateral fusion, Posterior decompression

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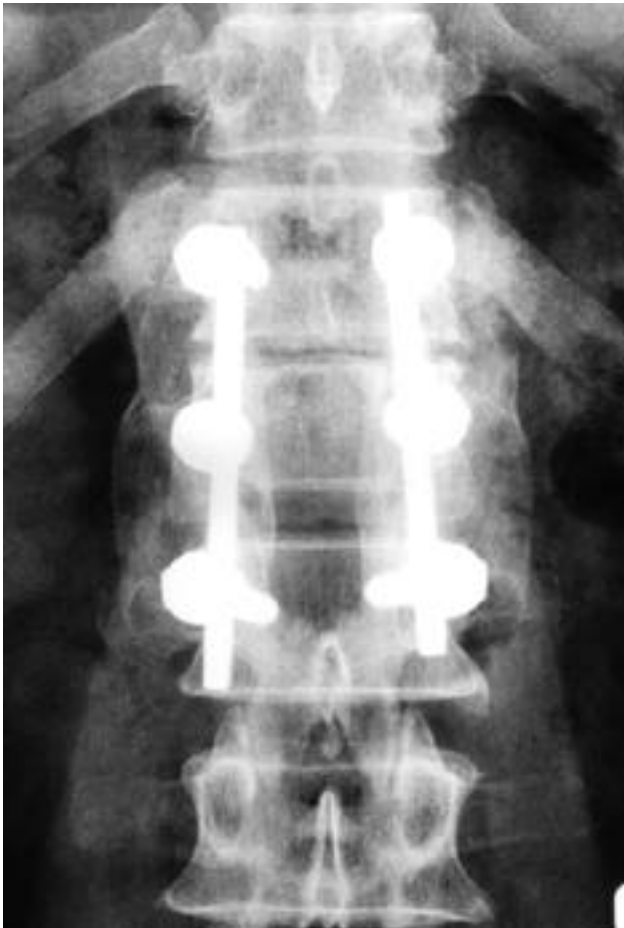
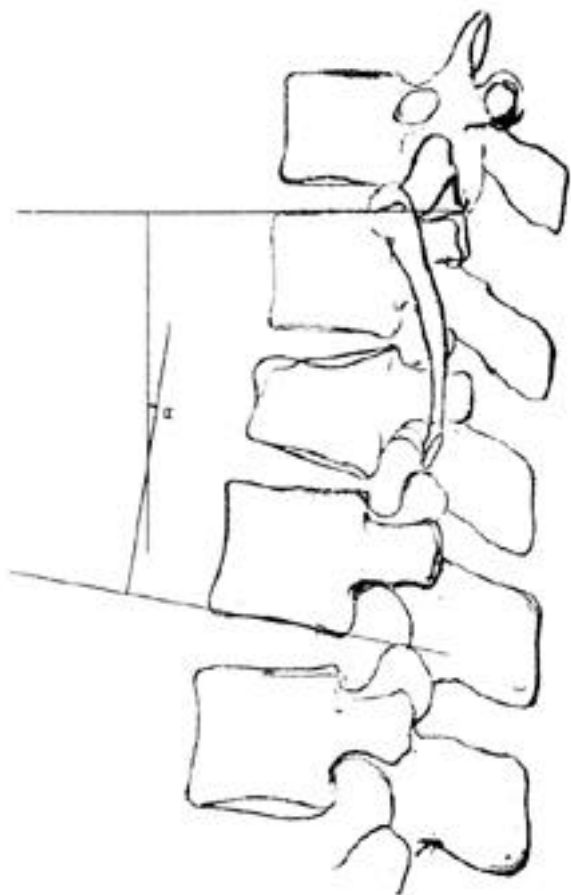
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가 B 4 , D 4 , E 3 , 2 , 6 , 6  
가 modified Frankel grading<sup>4)</sup> C가 2 , D1 3  
1953 Watkins<sup>24)</sup> , D3가 2 , 4  
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가 (Fig. 1),  
A B Lenke<sup>18)</sup> A,B,C,D ,  
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1998 2001 12 - grading<sup>4)</sup> ,  
1 Kirkaldy- Willis criteria<sup>14)</sup> .  
가 가 가 14  
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1 , Denis<sup>6)</sup> Lenke<sup>18)</sup>



**Fig. 1.** Segmental sagittal angle of the fused segment.  
Measured from the superior endplate of the most cranial vertebra to the inferior endplate of the most caudal vertebra in the fusion segment.

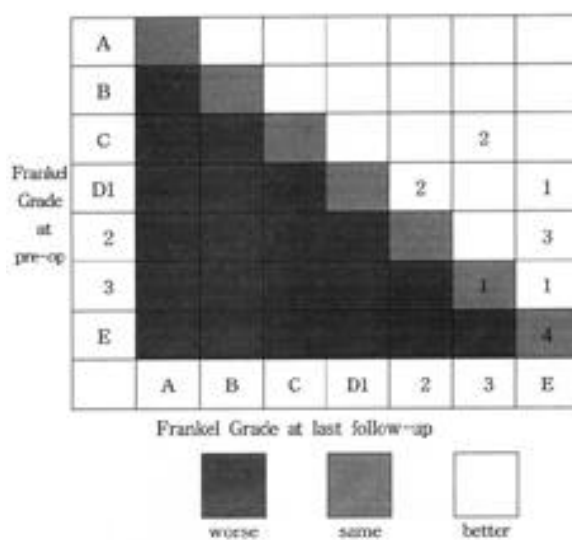
**Fig. 2.** A patient showing Lenke classification A.  
Solid, big trabeculated fusions bilaterally.

13  
A(solid, big trabeculated fusions bilaterally) (Fig. 2), 1  
B(solid, big fusion mass unilaterally with a small fusion mass on the contralateral aspect) (Fig. 3)  
, C(small, thin masses bilaterally)  
D(graft resorption bilaterally)

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가 3  
(Fig. 4),

3.  
(43%), 가 6 (43%), 2 (14%) ,

4.  
modified Frankel grading<sup>4)</sup>  
C 2 D3  
, D1 3 2 가 D2 , 1 가 E  
, D2 3 E , D3  
2 1 1 E  
(Fig. 5).  
4  
. Kirkaldy-Willis criteria<sup>14)</sup>  
가 6 (43%), 2 (14%) ,



**Fig. 5.** Diagram showing change in modified Frankel grades between the preoperative status (vertical axis) and the status at last follow-up (horizontal axis)



**Fig. 4.** The change of segmental sagittal angle of the fused segment on last follow-up flexion and extension view.

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3,7,9,12)

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1,15)

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7,22,23)

Oda Panjabi<sup>20)</sup>

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14

11,17)

13 (93%)

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가 가

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9,12)

가

가

가

5,22,23)

, 1

가

14

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11,17)

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 Lenke  
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