

## Case Report

# Unilateral Lumbosacral Facet Interlocking without Facet Fracture

Sang Woo Ha, M.D.,<sup>1</sup> Chang Il Ju, M.D.,<sup>1</sup> Seok Won Kim, M.D.,<sup>1</sup> Chang Su Um, M.D.<sup>2</sup>

Department of Neurosurgery,<sup>1</sup> School of Medicine, Chosun University, Gwangju, Korea

Department of Neurosurgery,<sup>2</sup> Sun-Cheon Han Kook Hospital, Suncheon, Korea

Acute traumatic spondylolisthesis at L5-S1 level is a rare condition, almost exclusively the result of major trauma, frequently associated with transverse process fractures and severe neurologic deficits. Recently, open reduction and internal fixation with posterior stabilization has been the method of treatment most frequently reported. We report a rare case of traumatic L5-S1 spondylolisthesis with a unilateral facet locking with a review of literatures.

**KEY WORDS :** Traumatic spondylolisthesis · Unilateral facet interlocking.

## INTRODUCTION

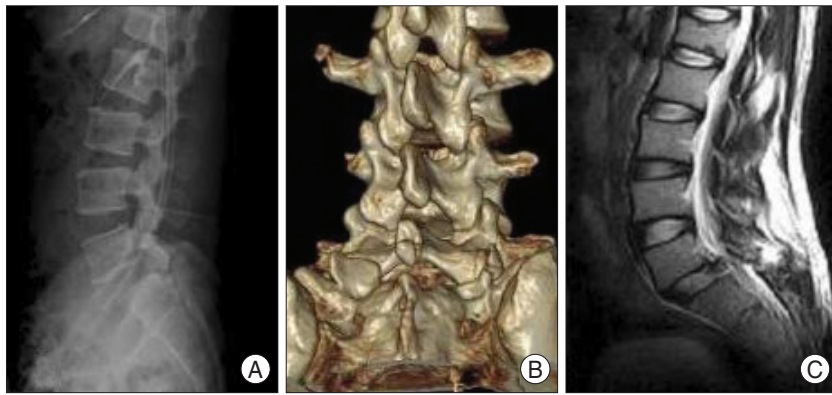
Acute traumatic spondylolisthesis is a rare condition<sup>3,4</sup>. It usually involves subluxation or fracture-dislocation of the facet joints, which may be unilateral or bilateral. It can also involve bilateral fracture of the pars interarticularis<sup>8-10</sup>. We report a rare case of traumatic L5-S1 spondylolisthesis with a unilateral facet locking. The mechanisms of injury, treatment, and complications are discussed.

## CASE REPORT

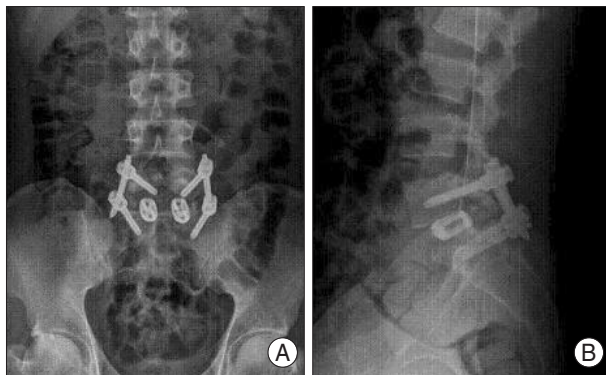
A 32-year-old man was referred to our hospital. He was an unrestrained backseat passenger of a car, and thrown out of the car due to traffic accident. He was a healthy worker and he didn't lose his consciousness. On admission to our emergency department, the patient complained of chest pain, dyspnea, abdominal pain and low back pain. On physical examination, he scored 15/15 on the Glasgow Coma Scale. Multiple bruises and superficial lacerations on most parts of the body were noted, as well as tenderness of

the left side of his chest and of the lower lumbar spine. A chest radiograph showed multiple rib fractures and a hemopneumothorax on the left side. A computed tomography (CT) scan of the chest showed multiple contusions of the lung bilaterally. The chest injuries were treated with a chest tube. A CT scan of the abdomen revealed a small amount of hemoperitoneum and liver contusion. But, the hemorrhage itself wasn't increased and he was hemodynamically stable. A conventional lumbar radiographs showed a marked spondylolisthesis at L5-S1 level (Fig. 1A). Neurologic examination revealed numbness of the right L5 dermatome but his motor power was intact. Normal rectal examination with normal sphincter tone was found. A CT scan of the lumbosacral spine showed multiple transverse process fractures at L3, L4 and L5 levels and unilateral lumbosacral facet interlocking without facet fracture (Fig. 1B). Magnetic resonance imaging (MRI) scan verified the lesion and showed rupture of the intervertebral disc and posterior longitudinal ligament (Fig. 1C). The patient underwent surgery through a posterior approach 6 days after the accident. Partial resection of the superior facets of S1 was performed to facilitate reduction. When approximately 50% of the superior facets were resected with a burr, spontaneous reduction occurred. Decompression of the L5 and S1 nerve roots following L5 laminectomy was performed. After L5-S1 discectomy, interbody fusion using interbody cages with

• Received : April 1, 2008 • Accepted : February 22, 2009  
• Address for reprints : Seok Won Kim, M.D.  
Department of Neurosurgery, School of Medicine, Chosun University,  
588 Seoseok-dong, Dong-gu, Gwangju 501-717, Korea  
Tel : +82-62-220-3120, +82-62-220-3126, Fax : +82-62-227-4575  
E-mail : chosunns@hanmail.net



**Fig. 1.** A : Lateral radiograph of the lumbar spine shows forward dislocation of the fifth lumbar vertebral on the sacrum. B : Three dimensional computed tomography reconstruction reveals unilateral lumbo-sacral facet interlocking. C : Magnetic resonance imaging shows disruption of L5-S1 disc and posterior longitudinal ligament.



**Fig. 2.** Postoperative antero-posterior (A) and lateral (B) radiographs shows good sagittal alignment with well positioned interbody cages.

local bone chips was performed to provide anterior column support. Percutaneous pedicular screws were inserted under C-arm guide (Fig. 2). The pain in the low back disappeared after surgery. He could walk by himself and had no difficulties in urinary, bowel and erectile functions.

## DISCUSSION

Acute traumatic spondylolisthesis at L5-S1 level is almost exclusively the result of major trauma. The forces producing the lesion have been postulated to be hyperflexion for the pure dislocations and hyperflexion in combination with compression or axial translation in cases with significant fractures of the fifth lumbar vertebrae. It is frequently associated with neurologic deficit, although total cauda equina lesion is rarely found<sup>1,4,5,10,11</sup>. The current premise in the management of traumatic fracture dislocation of the lumbo-sacral junction is to restore the normal alignment and stabilize these highly unstable injuries, by open reduction of the dislocation and rigid fixation of the affected segment<sup>3,12</sup>. Our patient had a concomitant multiple fractures of the transverse process. Fifty to 88% of cases previously reported have L5 transverse process

fracture—a sign that should lead to a more thorough investigation of the lumbo-sacral region in patients with major trauma<sup>8</sup>. Aihara et al. have proposed an new classification of fracture-dislocation of the fifth lumbar vertebrae. The types are as follows : type 1 : unilateral lumbo-sacral facet dislocation with or without facet fracture; type 2 : bilateral lumbo-sacral facet dislocation with or without facet fracture; type 3 : unilateral lumbo-sacral facet dislocation and contralateral lumbo-sacral facet fracture; type 4 : dislocation of the body of L5 with bilateral fracture of the pars interarticularis; type

5 : dislocation of the body of L5 with fracture of the body and/or pedicle, with or without injury of the lamina and/or facet<sup>1</sup>. Irrespective of type of injury, traumatic spondylolisthesis at L5-S1 is a three column injury, so conservative treatment is not effective in adults because of severe instability. The pedicle screw system is useful for posterior reduction and fusion<sup>5,8</sup>. The present case belongs to type 1. Because of the instability of this lesion, we performed posterior lumbar interbody fusion with percutaneous screws fixation by one stage operation. This has been done in only a few of the formerly reported cases and then mostly as a two-stage procedure because of concomitant lesions<sup>2,6,7,9</sup>. Because MRI showed posterior longitudinal ligament disruption and severe disc injury, we decided to perform circumferential fusion rather than only a posterior short segment fixation. The circumferential fusion provides higher degree of stability compared with posterior instrumented fusion alone allowing immediate unrestricted mobilization without a brace. Circumferential instrumented lumbar fusion has been shown to have a high fusion rate and to result in a high degree of patient satisfaction for reconstructive surgery in patients with pseudoarthrosis and spondylolisthesis. Because of the anterior support, the risk of implant failure is reduced and a more complete decompression of the neural structures can be performed.

## CONCLUSION

We successfully treated a unilateral lumbo-sacral facet interlocking by posterior interbody fusion and percutaneous pedicular screws fixation. It allowed early mobilization of the patient and resulted in an excellent functional and radiologic outcome.

## References

1. Aihara T, Takahashi K, Yamagata M, Moriya H : Fracture-dislocation

- of the fifth lumbar vertebra. A new classification. **J Bone Joint Surg Br** 80 : 840-845, 1998
2. Carlson JR, Heller JG, Mansfield FL, Pedlow FX Jr : Traumatic open anterior lumbosacral fracture dislocation. A report of two cases. **Spine** 24 : 184-188, 1999
  3. Cruz-Conde R, Rayo A, Rodriguez de Oya R, Berjano P, Garate E : Acute traumatic lumbosacral dislocation treated by open reduction internal fixation and fusion. **Spine** 28 : E51-53, 2003
  4. Fabris D, Costantini S, Nena U, Lo Scalzo V : Traumatic L5-S1 spondylolisthesis : report of three cases and a review of the literature. **Eur Spine J** 8 : 290-295, 1999
  5. Herron LD, Williams RC : Fracture-dislocation of the lumbosacral spine. Report of a case and review of the literature. **Clin Orthop Relat Res** 186 : 205-211, 1984
  6. Hodges SD, Shuster J, Asher MA, McClarty SJ : Traumatic L5-S1 spondylolisthesis. **South Med J** 92 : 316-320, 1999
  7. Kaplan SS, Wright NM, Yundt KD, Laurysen C : Adjacent fracture-dislocations of the lumbosacral spine : case report. **Neurosurgery** 44 : 1134-1137, 1999
  8. Roche PH, Dufour H, Graziani N, Jolivet J, Grisoli F : Anterior lumbosacral dislocation : case report and review of the literature. **Surg Neurol** 50 : 11-16, 1998
  9. Steinitz DK, Alexander DI, Leighton RK, O'Sullivan JJ : Late displacement of a fracture dislocation at the lumbosacral junction. A case study. **Spine** 22 : 1024-1027, 1997
  10. Van Savage JG, Dahners LE, Renner JB, Baker CC : Fracture-dislocation of the lumbosacral spine : case report and review of the literature. **J Trauma** 33 : 779-784, 1992
  11. Veras del Monte LM, Bago J : Traumatic lumbosacral dislocation. **Spine** 25 : 756-759, 2000
  12. Verlaan JJ, Oner FC, Dhert WJ, Verbout AJ : Traumatic lumbosacral dislocation : case report. **Spine** 26 : 1942-1944, 2001