

## Traumatic Lumbosacral Spondylolisthesis: A Case Report

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**Introduction:** Traumatic lumbar spondylolisthesis is rare disease and in the literature, different surgical approaches, including anterior, posterior, or combined approaches (posterior and anterior) are used to treat the lesion.

**Case Presentation:** We treated a case of traumatic lumbosacral spondylolisthesis using posterior approach and the patient showed a satisfactory outcome. At the final follow-up, he was completely asymptomatic, and radiographic images revealed normal lumbar alignment and a solid interbody fusion.

**Conclusions:** Traumatic lumbosacral spondylolisthesis can be treated using posterior approach alone to obtain reduction, decompression, and solid fusion.

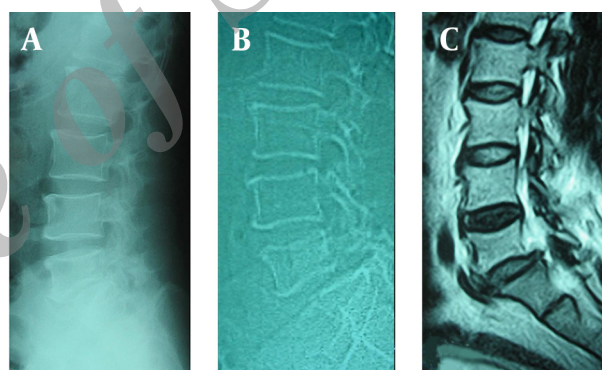
**Keywords:** Traumatic; Lumbosacral Spondylolisthesis; Anterior Approach; Posterior Approach; Combined Anterior

### 1. Introduction

Traumatic lumbosacral spondylolisthesis is a rare injury (1-3); most of the cases were published as case reports in the literature. The injury results from a complex and high-energy mechanism (4) or forces, including hyper-extension stress; hyperflexion and compression stress; or tangential force (5). In addition, the optimal treatment for this lesion is controversial (6). Most surgeons believe that the injury should be treated surgically, and in this regard different surgical approaches are used in Spine Departments. We report a case of traumatic lumbar spondylolisthesis, which was treated using posterior approach to realize the stable 3-column fixation and solid interbody fusion. Finally, the patient discharged with a satisfactory outcome.

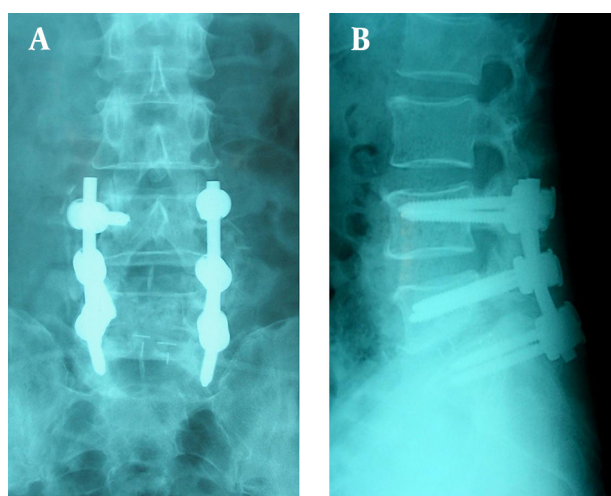
### 2. Case Presentation

A 38-year-old man was referred to the affiliated hospital of Jinan University, Guangzhou, China due to injury in a motorcycle accident on July 25, 2011. He was conscious with stable vital signs, but complained of pain in his back and right thigh, numbness and weakness in both lower extremities. Upon physical examination, grade 4 power was found in both lower limbs, and the perianal sensation and anal tone were normal too. X-radiographs showed a grade 2 spondylolisthesis of L5 on S1 (Figure 1), fracture of the left transverse process of L4 as well as the fracture of right femur. MRI demonstrated traumatic lumbar spondylolisthesis of L5 on S1, avulsion of the L5 intervertebral disc and compression of the cauda equina (Figure 1).



**Figure 1.** Preoperative X-Radiograph (A), Computed Tomography (B) and Magnetic Resonance Images (C) Displaying Traumatic Lumbosacral Spondylolisthesis

Five hours after admission, the patient was taken to the operating room. First, open reduction and internal fixation were performed for the fracture of right femur, and then a posterior approach surgery was performed for the traumatic lumbosacral spondylolisthesis using a standard posterior midline incision. During operation, bilateral fracture of the pars interarticularis, disruption of interspinous ligament and flaval ligaments of L5-S1, and disruption of L5 annulus fibrosus were found. Decompression and reduction were done followed by internal fixation using pedicle screws and rods from L4 to S1. Posterolateral fusion was performed at L4-5 level; L5 disk was excised and 2 PEEK cages were inserted posteriorly with autologous bone grafts. The procedure lasted 145 minutes with intraoperative blood loss of 400 mL, without intraoperative complications.



**Figure 2.** Postoperative Anteroposterior (A) and Lateral (B) X-radiographs Revealed Normal Lumbar Alignment and a Solid Interbody Fusion

Postoperatively, no complications occurred and functional exercises were implemented. Four weeks later, his strength and cutaneous sensation in both lower extremities recovered completely. One and a half year after surgery, at the final follow-up, the patient was completely asymptomatic and radiographs revealed normal lumbar alignment and a solid interbody fusion (Figure 2). In addition, the fracture of right femur obtained bony union and he could stand and walk without any support, and resumed his previous level of physical activities.

### 3. Discussion

In the English literature, some cases of traumatic spondylolisthesis were reported, which were treated successfully using conservative methods (7, 8), but the non-surgical treatment may result in posttraumatic translational instability or chronic low back pain (1, 3). Moreover, the rare lesion belonged to a 3-column injury (9) and need a solid internal fixation. As a result, surgical treatment was a better choice for the injury (1-3, 9).

In the literature, this kind of injury was treated using different surgical approaches, including anterior (10), posterior (1, 2, 9), or combined approach (anterior and posterior) (11, 12), but there is not a decisive criterion to determine which surgical approach to select. In this case, the lesion included a traumatic disruption of the intervertebral disk material, dislocation of L5 vertebral body and bilateral fracture of the pars interarticularis.

Therefore, excision of intervertebral disc and reduction of L5 vertebral body as well as interbody fusion were needed (1). In addition, decompression and internal fixation to avoid further injury to the nerve system, stabilize the spine, and promote the recovery of the nerve system was necessary.

Compared with anterior or combined approach, the posterior approach is safe, easy, and with minimum complication. Moreover, the pedicle-rod system can result in perfect reduction of vertebral body and 3-column fixation. Consequently, decompression, fixation, and interbody fusion can be achieved using posterior approach alone. At the same time, the higher risk of blood loss, longer hospital stay and the high cost which is associated with anterior or combined approach can be avoided or decreased. In the present case, a satisfactory result was obtained at the last follow-up. This kind of case is rare, and it is difficult to compare different surgical approaches using a large scale, or a clinical controlled trial, but we believe the posterior approach alone may be an optimal selection for this rare injury.

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