Unilateral Lumbosacral Facet Interlocking without Facet Fracture

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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. 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. 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
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\(^1,4,10,11\). The current premise in the management of traumatic fracture dislocation of the lumbosacral 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\(^3,12\). 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 lumbosacral region in patients with major trauma\(^9\). Aihara et al. have proposed a new classification of fracture-dislocation of the fifth lumbar vertebrae. The types are as follows: type 1: unilateral lumbosacral facet dislocation with or without facet fracture; type 2: bilateral lumbosacral facet dislocation with or without facet fracture; type 3: unilateral lumbosacral facet dislocation and contralateral lumbosacral 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\(^1\). 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\(^5,8\). 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\(^2,6,7,9\). 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 lumbosacral 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**

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