

ACUTE TRAUMATIC L5-S1 SPONDYLOLISTHESIS. A CASE REPORT

AKUT TRAVMATİK L5-S1 SPONDİLOLİSTEZİS. BİR OLGU SUNUMU

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SUMMARY:

Acute traumatic spondylolisthesis occur rarely after high energy injuries. It may be missed because its commonly seen with other system injuries. Good quality radiographies are very important in order to establish the diagnosis. Here, the treatment and clinical results in a 15-year-old case with L5-S1 spondylolisthesis diagnosed on 10th day after injury involved in a traffic accident was discussed. The patient who was first treated in another hospital was referred to our institution due to persistent pain with analgesic and bed rest. He was performed reduction with posterior instrumentation, stabilization and posterolateral fusion. The follow-up examination done at 24th month showed that he had no complaint.

Key Words: Acute traumatic spondylolisthesis, diagnosis, surgical treatment.

Level of Evidence: Case Report, Level IV

ÖZET:

Akut travmatik L5-S1 spondilolistezis yüksek enerjili yaralanmalar sonucu nadiren görülür. Çoğunlukla diğer organ yaralanmaları nedeni ile gözden kaçırılabilir. Tanı koymada iyi kalitede çekilmiş radyograflerin önemi büyüktür. Bu çalışmada, trafik kazası sonucu 10. günde tespit edilen L5-S1 spondilolistezisli 15 yaşında bir erkek olguda uygulanan tedavi ve klinik sonuçları tartışıldı. İlk tedavisi başka bir merkezde yapılan hasta analjezik ve yatak istirahatine rağmen geçmeyen bel ağrısı nedeni ile kliniğimize sevk edildi. Hastaya posterior enstrümantasyon ile redüksiyon, stabilizasyon ve posterolateral füzyon uygulandı. Ameliyat sonrası 24. ayda yapılan kontrolde hastanın şikayeti olmadığı tespit edildi.

Anahtar Kelimeler: Akut travmatik spondilolistezis, tanı, cerrahi tedavi

Kanıt Düzeyi: Olgu Sunumu, Düzey IV

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INTRODUCTION:

Acute traumatic spondylolisthesis is an extremely rare condition with few reports in the literature. Watson-Jones^[6] was the first author who described this type of lesion in 1940. The dislocation can be unilateral or bilateral and hyperflexion of the lumbar spine is considered to be the most common mechanism of injury. Clinically, the lesion is characterized by a dislocated lumbar spine that has slipped to a position that is anterior to the sacrum. In every case, the lesion gives rise to anterolisthesis of L5 on S1. Few cases have been reported in childhood and adolescence^[2-5]. Here, we report a 15-year-old boy with acute traumatic L5-S1 spondylolisthesis involved in a traffic accident.

CASE REPORT:

A 15-year-old boy was hit by a tractor on his back while riding a bicycle in a rural area. His first aid was done in a district hospital. His initial evaluation showed no abnormality with vital signs. He only complained mild lumbosacral pain with a normal neurological examination. His lumbosacral radiographies were misdiagnosed as normal. After hospitalization for 3 days for observation he was discharged and prescribed analgesics and bed rest. After 10 days, his pain worsened and he was referred to our institution. Radiographs of lumbosacral region were reexamined and revealed fracture of L4 spinous process, right transvers processes of L2, L3, L5 and anterolisthesis of L5 on S1 (Fig.1A,B). Computed tomography (CT) confirmed bilateral facet dislocation, so-called 'naked' facet sign, with an anterior displacement of L5 on S1 and small particles of bone on the left side (Fig.2). Magnetic resonance imaging (MRI) showed rupture of the posterior longitudinal ligament and avulsion of posterior part of L5-S1 disc on S1 superior end plate (Fig.3). The diagnosis was established as Grade II L5-S1 spondylolisthesis. The patient was otherwise healthy.

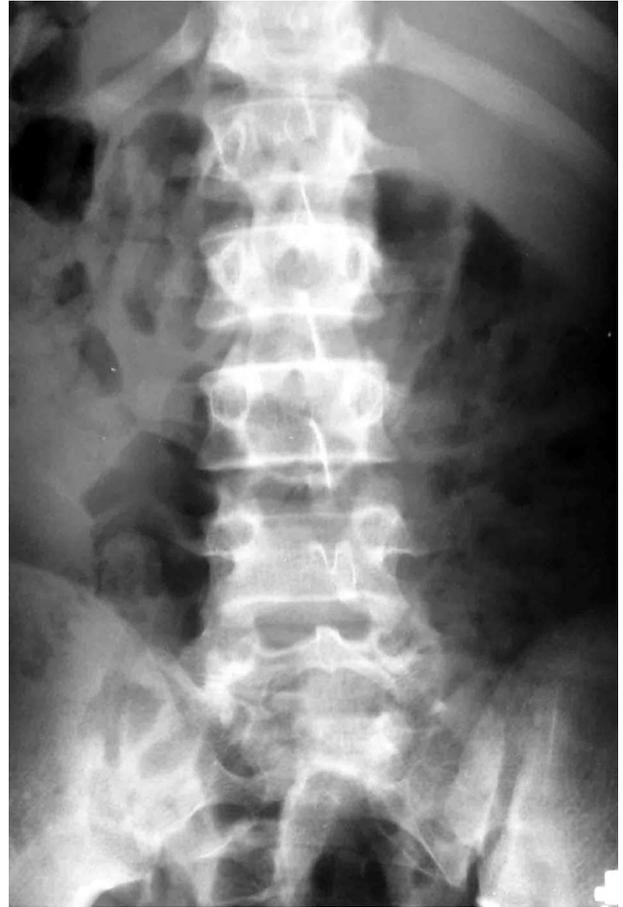


Figure-1. a. Anteroposterior radiography shows L2, L3 and L5 right transverse process fracture. **b.** Lateral radiography shows Grade 2 anterolisthesis of L5 on S1 and L4 spinous process fracture.

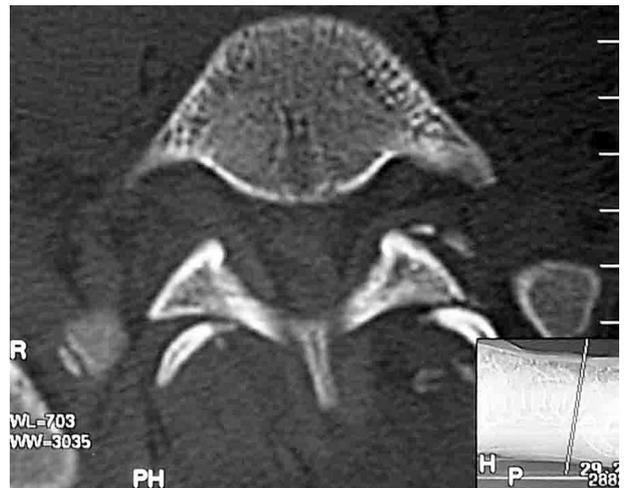


Figure-2. Computed tomography (CT) shows bilateral facet dislocation, so-called 'naked' facet sign, with an anterior displacement of L5 on S1 and small particles of bone on the left side.



Figure-3. Magnetic resonance imaging (MRI) showed rupture of the posterior longitudinal ligament and avulsion of posterior part of L5-S1 disc on S1 superior end plate.

The patient was surgically treated through a posterior approach 20 days after the index injury. During surgery, contusion in paravertebral muscles was noticed and right-sided L5-S1 facet dislocation and fractured pars on the left side were detected. After laminectomy of L5, dura was examined and seen to be intact. Bilateral facetectomy of L5-S1 was done. A reduction of the dislocation was carried out by inserting pedicular screws in L4, L5 and S1 with a MOSS MIAMI (DePuy, AcroMed, Johnson&Johnson) system that allowed us to perform reduction with its

specially designed spondylolisthesis screws inserted into L5 pedicles. Two short rods were bent to be suitable with physiologic lordosis in L4-L5-S1 region. While inner nuts were being fixated, olisthetic L5 was indirectly reduced on S1. Nerve roots and neural foramens were intact. Autologous cancellous bone grafts harvested from iliac crest were used for posterolateral fusion. Postoperative radiographs showed a good reduction (Fig.4). The patient remained uneventful at 24 months follow-up period.



Figure-4. Postoperative 24th month lateral radiography shows reduced L5 on S1 and good alignment.

DISCUSSION:

Aihara et al.^[1] reviewed 7 patients with fracture-dislocations of the fifth lumbar vertebra and analyzed 50 previously reported cases. They proposed a classification system with the aim in planning operative management. According to this system, our patient would be categorized to have a type 2 injury.

Radiologic diagnosis of this injury is dependent upon good quality radiographs demonstrating the altered association of the lumbosacral facet joints. But, emergency room X-Rays can be easily misdiagnosed as normal so as in this case. Despite our patient had Grade II L5-S1 spondylolisthesis, the diagnosis was missed at first intervention. We think that the normal neurological examination just after index injury had contributed the false negative diagnosis. Worsening of lumbosacral pain in our case made his parents seek further research and they admitted to our institution. We think that careful examination of X-Rays are very important to make the diagnosis.

Beguiristain et al.^[3] treated a 5-year-old boy with pure bilateral traumatic lumbosacral dislocation conservatively and concluded that closed reduction should be attempted even if neurologic deficit is present. Carlson et al.^[4] treated an open lumbosacral dislocation in a 15-year-old girl driver involved in a traffic accident. After initial treatment of open wound they attempted anterior fusion ending up with fibular graft failure. They then managed the case with posterior instrumented fusion and offered posterior that type of approach. Atanasiu et al.^[2] in their report with a 14-year-old girl who was rear-seated, shoulder and lap strap seat-belted passenger in a car hidden behind by a truck. She was multiply injured. After the initial urgent partial resection of the

small intestine due to devascularization, she started complaining of constant low back pain. Imaging evaluation with plain radiographs, computed tomography of the lumbar spine and magnetic resonance imaging she was diagnosed having a Grade I L5-S1 spondylolisthesis and prescribed a rigid lumbar corset and discharged from hospital. Eleven months postoperatively, due to persisting pain and with the addition of radiation to the left leg with associated numbness in the calf they performed anterior and posterior fusion. At the last follow-up 3 year postoperatively, the patient was pain free. Vialle et al.^[5] also treated a 14-year-old girl through posterior instrumentation and fusion only. At first, she was diagnosed to have brain contusion and hemorrhage, a right temporoparietal fracture, right otorrhagia, right facial paralysis, left hemiplegia, reactive coma, thoracic trauma including costal fractures and pulmonary contusion, lumbar trauma including retroperitoneal hematoma and fractures of the right transverse processes from L1 to L5. Because of these severe life-threatening injuries she was missed the diagnoses of traumatic L5-S1 spondylolisthesis. Three months after the index injury she repeatedly complained right lateral lumbosacral pain. After imaging evaluation she was diagnosed having unilateral L5-S1 facet joint dislocation and a left anterior lateral calcification without neurologic symptoms. They performed surgery but achieved only partial reduction due to consolidation occurred during 3 months and applied posterior instrumentation and posterolateral fusion. We also performed posterior instrumentation, reduction and posterolateral fusion in our case and he was pain free and had no complaint at last follow-up. We offer posterior approach in this type of pathology.

Different treatment options such as conservative management, posterior decompression, instrumentation with reduction circumferential fusion and only posterior instrumentation with reduction and posterolateral fusion were reported with successful outcome [2-5]. Beguiristain et al. [3] suggested conservative treatment in a 5 year-old boy even if neurological deficit was present. Contrary to that, there are reports of cases who were treated conservatively eventually managed surgically because of progressive back pain, increasing listhesis and worsening neurologic deficit [3-5]. Addition of anterior fusion is dependent on the injury in the disc [5]. Because of that, preoperative MRI should be investigated for disc damage. The L5-S1 disc in our case was not injured and we did not add anterior fusion.

Regarding the successful outcome in our case we offer surgical treatment in traumatic spondylolisthesis. Because these injuries arise commonly in high energy violent traumas, one must keep in mind that treatment of vital lesions should be done first. The diagnosis may be easily missed in those high energy injuries and is dependent upon careful investigation of good quality roentgenographies.

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