J Orthop Sci (2012) 17:189–193
DOI 10.1007/s00776-011-0082-y

CASE REPORT

A rare case of spinal injury: bilateral facet dislocation without fracture at the lumbosacral joint

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Received: 22 May 2010 / Accepted: 18 January 2011 / Published online: 11 May 2011

Introduction

Lumbosacral dislocations are rare disorders; since they were first reported by Watson-Jones [1], only 100 cases have appeared in the literature [2]. A traumatic bilateral lumbosacral dislocation is even rarer, with a mere 10 cases reported [3]. Because of its low incidence and atypical location, the lesion may often go unnoticed on initial clinical assessment [4]. Surgical treatment modalities are not defined, but open reduction and internal fixation are often necessary because of a three-column involvement [5]. In this paper, we report on an initially misdiagnosed case of lumbosacral dislocation treated with open reduction and internal fixation.

Case report

An 18-year-old woman was involved in a high-impact motor vehicle accident. She was hit by a truck from her left side and trapped under the vehicle with thighs flexed on to the pelvis. The patient was transported to an emergency hospital, and she was initially diagnosed with unilateral fractures of the transverse processes of the L2 and L3 vertebrae and anterior spondylolisthesis of the L5 vertebra. Conservative treatment was initiated but lumbago did not improve. She consulted our hospital 3 months after the accident. On admission, she complained of low back pain and reduced pinprick sensation in her right gluteal region and left posterior leg. She was unable to extend her hip joint completely and had difficulty extending her lower limbs because pain and muscle contractures. Radiographs of the lumbar spine showed no bony fractures, but anterolisthesis of the L5 vertebra on the S1 vertebra was evident (Fig. 1). Computed tomography (CT) of the lumbar spine revealed locked facets at the L5–S1 level (Fig. 2). Magnetic resonance imaging (MRI) subsequently revealed disruption of the L5–S1 intervertebral disc (Fig. 3). Because she also suffered from severe asthma, surgery was postponed until her respiratory dysfunction had resolved.

Surgery was performed approximately 14 months after the injury. A standard posterior midline approach was used with the patient in the prone position. Bilateral L5 facet dislocation without fracture was intraoperatively confirmed, and, fortunately, the dislocation was easily reduced by manual traction without facetectomy. These findings are consistent with severe instability caused by a three-column injury. After reduction, the severely ruptured intervertebral disc at L5–S1 was removed and spinal fusion performed with pedicle screws. Spinal fusion, including posterior lumbar interbody fusion and posterior lumbar fusion, was performed with autologous bone from the posterior iliac crest. Anatomic alignment was confirmed postoperatively (Fig. 4). At follow-up 2 years after the operation, radiographs showed unaltered reduction and reliable fusion. Hypesthesia of the right gluteal region and left posterior leg, and lumbago had resolved completely; however, hip joint extension was still limited.

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Fig. 1 Anteroposterior radiograph (**a**) of the lumbar spine showing unilateral fractures of the transverse processes of L2 and L3; lateral radiograph (**b**) showing anterolisthesis of L5 vertebra on S1; oblique views (**c**, **d**) do not show bilateral facets dislocation clearly

The patient and her family were informed that data from the case would be submitted for publication and gave their consent.

Discussion

Fracture–dislocations of the lumbosacral spine are rare. Bilaterally locked facet injuries without fracture are even rarer and only 10 cases have been reported in the literature [3]. Traumatic lumbosacral dislocations are produced by high-impact trauma, and, therefore, are rarely found as isolated injuries [6]. Furthermore, many patients die soon after initial trauma, so many cases of traumatic lumbosacral dislocation remain unidentified [4, 7]. According to Watson-Jones, who first described lumbosacral dislocation, hyperextension is the main mechanism of the injury [1]. However, most authors consider a combination of hyperflexion and compression as factors responsible for causing bilateral L5–S1 dislocation [8–11].

In our case, the patient was in a position of lumbar spinal and hip flexion when the trauma occurred (Fig. 5). We believe that hyperflexion rather than hyperextension is the most frequent mechanism of this injury. Initial

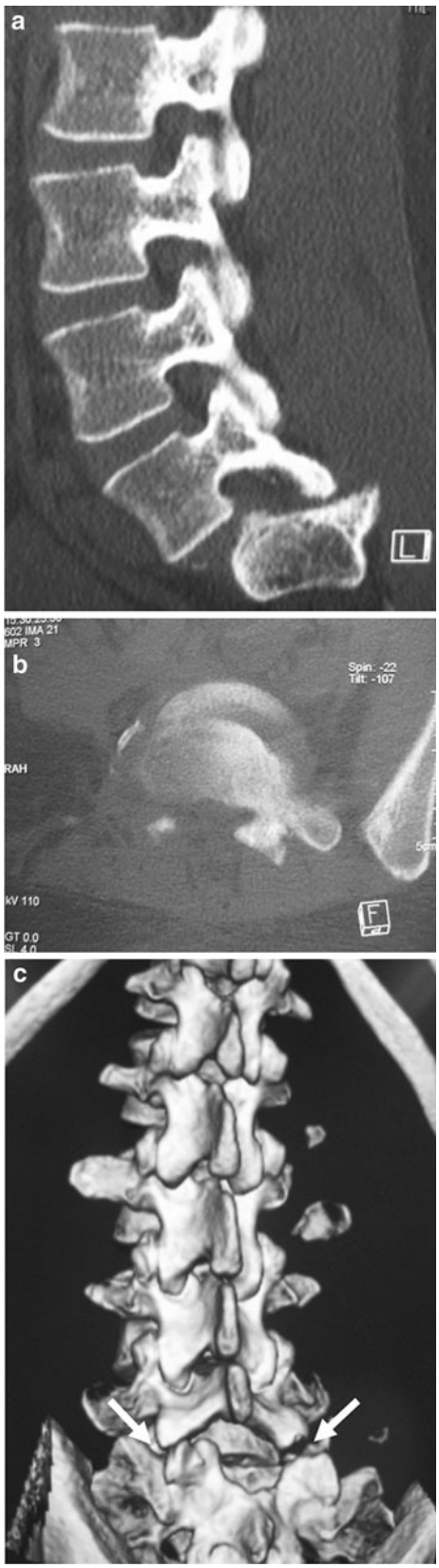

Fig. 2 Sagittal (**a**), axial (**b**) and 3-dimensional CT (**c**) reconstruction showing bilateral locked facets of the lumbosacral joint (*arrows*)

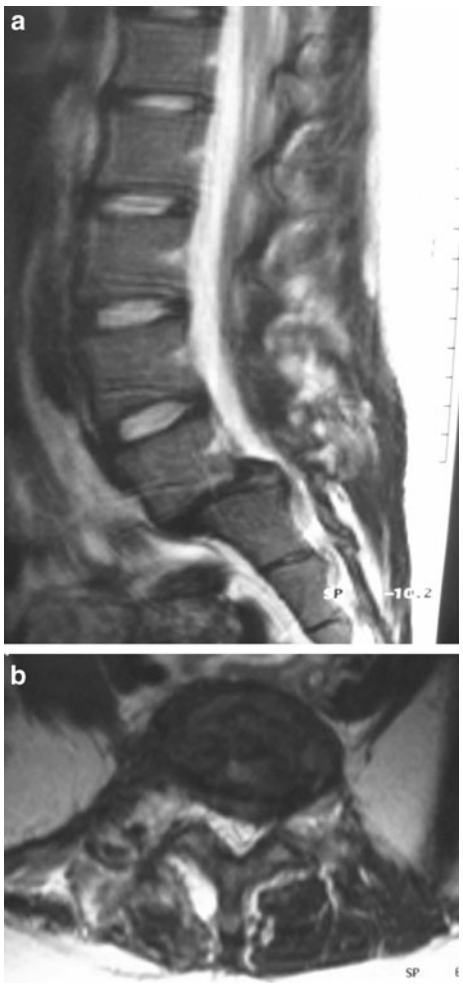

Fig. 3 Sagittal (**a**) and axial (**b**) T2-weighted magnetic resonance imaging (MRI) showing disruption of the L5–S1 intervertebral disc

screening of multiple trauma patients usually includes high-quality anteroposterior and lateral radiographs of the lumbar spine [4, 5, 10]. However, emergency room radiographs are frequently inadequate and can easily be misinterpreted as normal [4, 5]. Therefore, it is important to understand the detailed pattern of the injury. CT scan through the L5–S1 area is necessary to identify the dislocation, because it readily reveals locked or fractured facets, laminar fractures, and sacral fractures. Furthermore, MRI should be performed to assess the L5–S1 disc lesion when the general condition of the patient is stable. The MRI evaluation determines the treatment strategy [12]. Because of severe spinal and ligamentous damage, traumatic fracture–dislocation of the lumbosacral spine is rendered highly unstable [12]. Because it is a three-column injury, open reduction and internal fixation should be recommended [3, 5, 7–9, 12–14]. This injury results in multiple organ injury, and treatment of vital organ lesions undoubtedly remains a priority. However, early surgical

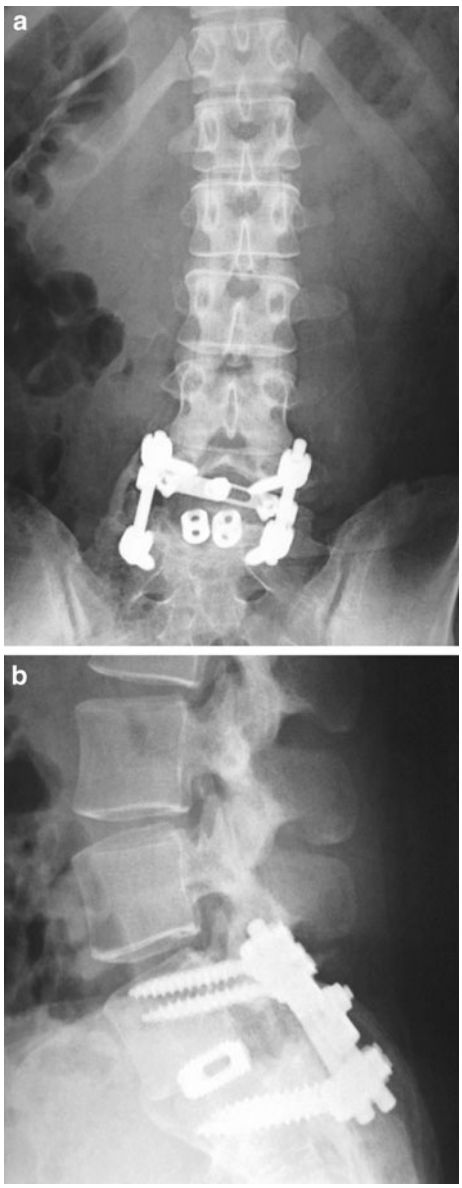

Fig. 4 Anteroposterior (**a**) and lateral (**b**) postoperative radiographs showing corrected anatomic alignment

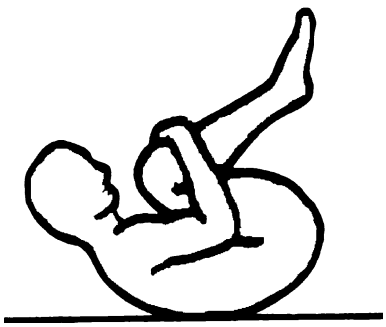

Fig. 5 The position of the patient

treatment is necessary, especially if neurologic signs are found on physical examination [4, 6]. The time interval between trauma and surgery makes reduction difficult and physical symptoms, if present, can also affect the surgical outcome. In this case, to avoid pain prior to surgery the patient remained in the lumbar spinal and hip flexion position, and therefore, contracture of soft tissues and the hip joint had not resolved until the present time.

Most surgeons use the posterior operative approach. To achieve normal sagittal alignment, posterior reduction is required: it enables indirect decompression of the spinal canal and nerve roots, which may improve the neurologic outcome [3, 7]. If the integrity of intervertebral disc is confirmed by MRI, posterolateral fusion, only, is sufficient. However, if intervertebral disc damage is present, interbody fusion should also be performed [12]. In such cases, rigid fixation can usually be achieved by use of pedicle screws, providing immediate stability of the lumbosacral vertebrae.

Conclusion

Bilateral lumbosacral dislocation without fracture is a rare injury. It results from high-energy trauma and multiple injuries are often present. Lumbosacral dislocation can be missed on initial diagnosis; therefore, it is important to understand the detailed pattern of the injury. Because it is a three-column unstable lesion, open reduction and internal fixation are indicated for management of lumbosacral dislocation.

Acknowledgments The authors did not receive and will not receive any benefits and funding from any commercial party related directly or indirectly to the subject of this article.

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