CASE REPORT

Traumatic lumbosacral lateral dislocation without fracture

Federico De Iure · Stefania Paderni · Alessandro Gasbarrini
Stefano Bandiera · Stefano Boriani

Introduction

Traumatic dislocation of the lumbosacral joint without fracture is extremely rare and it is generally associated with anterior slippage of the upper lumbar spine [1–9], rotation (unilateral lesion) [10, 11] or, exceptionally, retrolisthesis [12–14]. A delayed diagnosis of the lesion is commonly reported in the literature [15, 16]. A lateral dislocation has been reported twice in the literature [17, 18], always associated with fractures. We were not able to find any previously described case of pure L5-S1 traumatic lateral dislocations.

Case report

A 34-year-old cyclist was referred to our hospital after being involved in a high-energy accident (car crash). Severe thoracic and head injury and an open leg fracture were diagnosed at admission. Immediate clinical examination was not possible at the emergency room admittance. After chest drainage and leg external fixation the patient was referred to ICU. Standard X-rays of the lumbosacral spine were taken in the emergency room but were not considered diagnostic (Fig. 1). One week later, while the patient was still in ICU but was also able to cooperate for a physical examination, a left L5 neurological deficit led to a CT scan. The CT scan showed an L5-S1 lateral dislocation without fracture and without signs of anterior slipping, retrolisthesis or rotation (Fig. 2). L3 and L4 left transverse process fractures were also identified. The careful re-examination of the standard radiograph AP view taken in the emergency room showed a lumbosacral spinous process malalignment, but transverse process fractures

Abstract Study design A unique case of lumbosacral lateral dislocation without fracture is reported. Objective To report on the diagnosis and treatment of a traumatic L5-S1 lateral dislocation in a polytrauma 34-year-old male with L5 nerve root paralysis. Method Interbody fusion following decompression, posterior reduction and interbody grafting combined with posterior plating was performed. Results At an early stage the patient was able to return to work and walk without supports. At the 12-month follow-up evaluation no back pain was referred and fusion was achieved. Conclusions Lateral pure dislocation of the lumbosacral joint is very rare and can be easily misdiagnosed. A careful evaluation of the AP standard X-ray can lead to diagnosis and can be confirmed by CT scan. Prompt reduction and fusion is the treatment of choice to allow a quick functional recovery.

Keywords Lumbosacral spine · Fracture dislocation · Surgical treatment
were partly disguised by the considerable meteorism. The patient was then submitted to posterior surgery. Reduction was not easy to achieve and required partial resection of L5 and S1 right articular facets which were reciprocally locked. The disk was found broken and was removed after partial L5 and S1 laminectomy. Posterior interbody fusion was performed by PEEK cages (OIC, Stryker), followed by posterior stabilisation with pedicular instrumentation (Fig. 3). Posterolateral arthrodesis was not performed because of excessive intraoperative bleeding. During surgery no dural tear was found, but L5 left root was found transected. The patient was discharged from hospital one month later. At one-year follow-up, the patient can walk without supports, although neurological damage is obviously unchanged, and he has also returned to his previous work (postman). Leg fracture healing was obtained changing external fixation into intramedullary nailing. Interbody fusion was also achieved.

**Discussion**

The reported injury is extremely rare. It is definitively a three-column lesion but without clear signs of rotation, hyperflexion or hyperextension. Therefore it cannot be classified using the Magerl et al. staging [19]. Furthermore, the lesion does not even fit the classification proposed by Aihara and colleagues [20]. The exact mechanism of the lesion remains unknown. The fracture of the 3rd and 4th lumbar left transverse process can be considered an indirect sign of torsion that, combined with a direct lateral impact (multiple right rib fractures), may have produced a pure lateral dislocation. This type of injury can be easily misdiagnosed with standard X-rays if the patient is not cooperative for clinical examination. In fact, the lateral view shows a lumbosacral column correctly aligned without vertebral body fractures. Only a careful examination of the AP view (not always taken in emergency) shows a malalignment of the sacral and lumbar spinous processes. CT scan is diagnostic. The lesion is not completely unstable because of the inter-

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**Fig. 1a** Lumbosacral AP standard X-rays taken in the emergency room showing spinous process malalignment (arrowheads on lumbar spinous processes; white arrow on sacral spinous process). **b** Lateral view showing correct alignment with no vertebral body fracture.

**Fig. 2a** Standard coronal CT scan showing lateral dislocation of L5 articular facets and right L5-S1 articular facets clasping. **b** Sagittal reconstruction showing a correct lateral alignment. **c** Lateral L5-S1 displacement on transverse reconstruction.

**Fig. 3a, b** Plain AP and lateral radiographs at one-year follow-up.