Bilateral Locked Facets at Lower Lumbar Spine Without Facet Fracture: A Case Report

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Bilateral locked facets at L4-5 without facet fracture is a rarely known disease. We present a case of a 37-year-old male patient diagnosed as traumatic L4-5 bilateral facets dislocation without facet fracture. We carried out open reduction, epidural hematoma removal, posterior interbody fusion. After surgery, we attained rapid improvement of the neurologic deficits and competent stabilization.

Key Words: Lumbar spine • Facet dislocation • Locked facet • Bilateral

INTRODUCTION

Bilateral locked facets are relatively common traumatic injuries of the cervical spine, but they are extremely rare in the lumbar spine. This is attributable to lumbar vertebrae having larger vertebral bodies and firm paraspinal muscle supporting them. In locked facet syndrome of lumbar vertebrae, in contrary to cervical lesion, a tremendous external force is needed to occur and fracture of facet is a common finding. This article contains a case of L4-5 locked facet. Discussing the clinical features and injury mechanisms of the lumbar locked facet through reviewing several relevant literatures.

CASE REPORT

A 37-year-old male welder with lower back pain and weakness in both lower extremities after being held down by an iron plate weighing 2,000 kg. Neurologic examination revealed numbness in his right posterolateral thigh dorsiflexion and strength of both ankles and bigtoes was decreased (grade IV).

Radiograph of the lumbar spine revealed anterior slippage of the 4th lumbar vertebra (Fig. 1). A computed tomography (CT) scan found a bilateral L4-5 facet dislocation in which

the L4 inferior articular process was located to the anterior of the L5 superior articular process (Fig. 2, 3). On T2-weighted magnetic resonance (MR) imaging, a high signal epidural hematoma was found at the L2 to L5 level and L4-L5 disc was disrupted (Fig. 4).

We proceeded open reduction and stabilization in which during surgery, we found that the interspinous ligaments and ligament flavum were partially torn and the L4-5 facets were locked bilaterally at the same time. The epidural hematoma at the anterior epidural space compressing the dura matter was removed.

The dislocation was reduced by resecting the superior facet

Fig. 1. (A) Anteroposterior lumbar radiograph shows lateral displacement of the L4 on L5. (B) Lateral lumbar radiograph shows bilateral locked facet at L4-5.

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Fig. 2. Computed tomography (CT) scan reveals the L4-5 facet dislocation.

Fig. 3. Axial CT scan demonstrates the relationship between the inferior articular process of L4 and the superior articular process of L5.

Fig. 4. Sagittal T2 weighted magnetic resonance (MR) imaging of the sagittal section shows a high signal epidural hematoma at L2 to L5 level and disruption of the intervertebral disc at L4-5.

of L5 and laminectomy of L4 was carried out. We then performed a posterior interbody fusion with cages, reinforced by a bilateral posterior rod and pedicle screw fixation. After surgery, rapid improvement of the neurologic deficits occurred. Six months later, he reported neither low back pain nor neurological deficit. Attached radiographs show satisfactory alignment (Fig. 5).

DISCUSSION

Fracture-dislocations of the lumbosacral spine are rare. Bilaterally locked facet injuries without fracture are even less common with only 11 cases of literature¹⁾. The majority of

Fig. 5. (A), (B) Follow-up radiographs 6 months after surgery show satisfactory alignment.

dislocations involving the lumbar spine occur at the thoracolumbar junction, with decreasing frequency at the lower lumbar levels^{2,14)}. Anatomically, lumbar facet joints are arranged in the sagittal plane weak for hyperflexion yet strong for rotation. In 1940, Watson-Jones described one patient with a lumbosacral fracture-dislocation and considered the mechanism of injury to be forcible hyperextension¹⁰⁾. However, hyperflexion with varying degrees of distraction is the most frequent mechanism of facet dislocation in the lumbar spine^{4,5,7,8,10,15)}. Hyperflexion alone is incapable of producing either pure dislocation or fracture-dislocation in the lumbar spine¹⁰⁾. Therefore, in this case, we consider the mechanism of injury was a combination of hyperflexion, distraction, and rotation.

Radiologic diagnosis of this injury is dependent on initial good quality radiographs, which will demonstrate the altered associated of lumbar facet joints^{14,16)}. But careful assessment of the CT and MRI studies demonstrated facet dislocation and disruption of soft tissues. The MRI allows assessment of the ligamentous and muscular structures, as well as the contents of the central canal and intervertebral neural foramen¹⁴⁾. A complete disruption of both joints in conjunction with avulsion of the interspinous ligaments and disc injury are expected to be highly unstable. CT examination proved to be extremely useful. The non-articular convex sides of the articular facets were shown to be in contact. Reconstruction in the sagittal plane can elegantly demonstrate the alignment of the vertebral bodies and facet joints and assess foraminal stenosis. In the coronal plane, lumbar spine alignment and asymmetry of the disc space can be assessed¹⁴⁾.

A previous study showed the lumbar facet orientation in a normal lumbar spine, and noted that the facet joint and laminae are more sagittally oriented at the L4-5 level, while at

L5-S1 they are more frontally oriented^{8,17}. In addition, a normal lumbar spine has the greatest flexion at L4-5 level^{8,10}. Taking these findings into consideration, facet dislocation may occur more easily at L4-5 than L5-S1, though the sacrum has good stability, it is fixed tightly to the pelvis by a sacro-iliac ligament.

Few authors have reported cases of bilateral dislocation successfully reduced with external reduction maneuvers^{3,6,9,19}. However, there is high risk of secondary neurological impairment. Therefore surgical treatment should be performed for all type of lumbosacral dislocation¹⁸. The selection of anterior or posterior fusion may be chosen based upon the proficiency and experience of the surgeon as well as the instability of the injury¹³. The presence of an anterior slip, even if moderate, indicates a severe disc injury. Disc assessment is mandatory in all cases because severe disc injuries requiring fusion may be found even in the absence of an anterior slip¹⁸.

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