

Case Study

Intradural lumbar disc herniation—Is it predictable preoperatively? A report of two cases

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Abstract

BACKGROUND CONTEXT: Intradural disc herniations are thought to be rare events, and there have been relatively few literature reports of intradural disc herniations available with regard to magnetic resonance imaging findings.

PURPOSE: The authors describe two patients with intradural lumbar disc herniations, one with and one without preoperative diagnosis, who had different postoperative outcomes.

STUDY DESIGN: Case study

METHODS: The first patient underwent an extended L3 subtotal laminectomy followed by bilateral medial facetectomy and foraminotomy at L3–L4. A durotomy uncovered large disc fragments comprised of friable disc materials and end plates, after no clear disc herniation was found in the epidural space. The second patient underwent anterior lumbar interbody fusion after a preoperative diagnosis of intradural disc herniation.

RESULTS: The first patient experienced a marked reduction of pain and progressive recovery of sensory disturbance, but neurologic examination showed right foot drop postoperatively. Two years after surgery, she can not walk without a cane because the neurologic deficit of the right ankle has shown no improvement. Two days after surgery, the second patient was allowed to ambulate with a lumbar orthosis. Neurologic examination showed no motor deficit. Twenty-one months after surgery, the patient reports minimal back pain when sitting on a chair for prolonged periods of time.

CONCLUSION: Our cases highlight the importance of preoperative diagnosis in the treatment of intradural lumbar disc herniations. The potential presence of an intradural disc herniation must always be considered preoperatively on a patient whose magnetic resonance imaging study demonstrates the “hawk-beak sign” on axial imaging as well as abrupt loss of continuity of the posterior longitudinal ligament (PLL). This association results in an adequate surgical approach, thereby reducing the chance of postoperative neurologic deficit. Finally, anterior lumbar interbody fusion can be a reasonable alternative in the treatment of intradural lumbar disc herniations. © 2007 Elsevier Inc. All rights reserved.

Keywords:

Intradural lumbar disc herniations; Magnetic resonance imaging (MRI); Preoperative diagnosis; Anterior lumbar interbody fusion (ALIF)

Introduction

Intradural disc herniations are rare. They account for 0.27% of all herniations [1,2]. Only 3% occur in the cervical region, 5% at thoracic levels, and 92% in the lumbar

region [1]. However, as a proportion of disc herniations, thoracic herniations are more likely (12–15%) to be intradural [3].

The term *intradural* remains erroneous. *Transdural* would be the better term for herniations that pierce the dura. However, there is a conventional understanding of the term in the literature, and the authors used the term *intradural* in this report.

Despite advances in neuroradiology imaging, there have been few reports of the magnetic resonance imaging (MRI) features of intradural disc herniations. Moreover, MRI findings for diagnosing intradural herniations are not fully

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understood. Preoperative diagnosis is believed to be essential for an adequate surgical approach to be planned. An intradural examination also may be required to confirm clinical signs and symptoms or previous radiologic studies in the event that no clear disc herniation is found. This report describes two patients with intradural lumbar disc herniations, who had different postoperative outcomes, and discusses therapeutic implications. Preoperative diagnosis was made in only one case.

Case report

Case 1

A 65-year-old woman presented with a 3-month illness characterized by recent onset of severe low back pain followed by pain down both legs along the lateral thigh of 1 month in duration. She could not sleep at night, and at presentation, was not able to walk owing to intractable pain. Clinical examination revealed an incomplete neurologic deficit (Grade IV/V) of the right ankle, together with numbness on both lateral thighs and decreased sensation in the right perianal region. However, no bladder or bowel symptoms were noticed. Both the right patellar and achillean reflexes were absent.

Spinal MRI demonstrated a huge compressing lesion to the dural sac with marked cranial migration at the L3–L4 level on a T2-weighted sagittal image (Fig. 1). Axial images demonstrated an extremely large mass, located centrally to the right, which almost completely compressed the spinal canal at the cranial portion of disc migration (Fig. 2). One of the T2-weighted axial images revealed a sharp beak-like appearance (Fig. 2c). At that point in time, intradural disc herniation was not recognized.

An extended L3 subtotal laminectomy was performed and followed by bilateral medial facetectomy and foraminotomy at L3–L4. Upon gentle palpation, a tense dura could be felt and abnormal swelling of the dural sac and root was noted. Root retraction was tried several times to examine beneath the dura and to expose the disc fragments. However, there was no abnormality in the epidural space and no clear disc herniation was found. At this point, a durotomy was performed, which uncovered large disc fragments comprised of friable disc materials and end plates in a portion of the right intradural space. The indicated disc fragments were compressing the rootlets and displacing them towards the left side within the dural sac (Fig. 3). After removing the disc fragments from within the dura, a hole was discovered in the ventral aspect of the dura. Through this hole, additional loose disc material was found. The dural tissue around the hole was firmly adhered to the posterior longitudinal ligament (PLL). The durotomy, as well as the hole, was closed, and the epidural space was explored on both sides. However, additional fragments were not found.

Postoperatively, the patient experienced a marked reduction of pain and progressive recovery of sensory

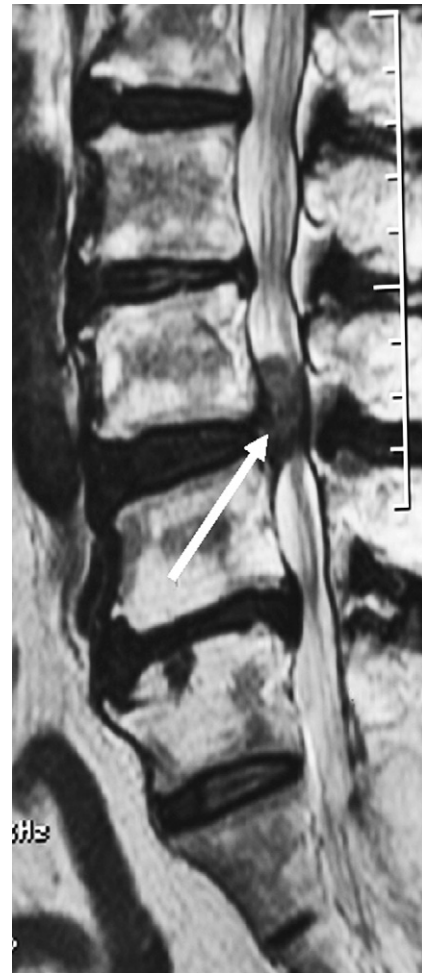


Fig. 1. Spinal magnetic resonance imaging in Case 1 demonstrates a huge compressing lesion to the dural sac with marked cranial migration at the L3–L4 level on a T2-weighted sagittal image. Abrupt loss of continuity of the posterior longitudinal ligament is also noted (arrow).

disturbance, but neurologic examination showed right foot drop. Two years after surgery, the patient reports moderate back pain during exertion and when standing for prolonged periods of time. However, she can not walk without a cane because the neurologic deficit of the right ankle has shown no improvement.

Case 2

A 30-year-old man presented with a sudden onset of low back pain that radiated into both legs along the lateral thigh. His deep tendon reflexes and peripheral circulation were normal, although he had severe tenderness over the midline of the lumbar spine. The patient had a history of lifting a heavy object 2 months ago and began to experience severe low back pain and radicular leg pain from then on. Neurologic examination revealed a decreased sensation in the perianal region combined with numbness on both lateral thighs. The result of a straight leg raising test was positive, but there were no abnormalities in terms of motor strength and bladder or bowel function.

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