

## Case Report

# Herniated intervertebral disc mimicking intraspinal tumor

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Received July 13, 2016; Accepted October 19, 2016; Epub November 15, 2016; Published November 30, 2016

**Abstract:** Lumbar disc herniation is a relatively common disease. Magnetic resonance imaging (MRI) is the first-used diagnostic tool for evaluating spinal pathologies and represents adiagnostic gold standard. However, the diagnosis of intervertebral disc herniation can still be very difficult in some cases, even in this MRI era. Considering that little is known about this area, and to share our experience, we present here a special case of a herniated intervertebral disc mimicking an intraspinal tumor. A 43-year-old female patient presented to our hospital with a history of low back pain and right limb numbness and pain for 60 days. Physical examination showed tenderness and percussion pain in her lower back, and decreased myodynamia of her right limb (Grade 2). Hypoaesthesia was detected below the distribution of L4 while the sensation in the saddle area was not damaged. MRI provided evidence for a herniated intervertebral disc at L5/S1 but also revealed a strong signal in the spinal canal at the level of the L5 vertebra. The diagnosis: "intraspinal occupying lesion: neurofibroma?" was made before performing surgery. To our surprise, a lump of white tissue similar to nucleus pulposus was found in the spinal canal during surgery. Postoperative pathological hematoxylin and eosin staining confirmed its character to be that of nucleus pulposus. Herniated intervertebral discs generally produce signals of low intensity in T1-weighted images but high intensity in T2-weighted images. Gadolinium-enhanced MRI can be used to differentiate a tumor from a herniated intervertebral disc. Differential diagnosis is important when making surgical plans but the final, definitive, diagnosis depends on pathological examination.

**Keywords:** Intraspinal tumor, differential diagnosis, intervertebral disc herniation

## Introduction

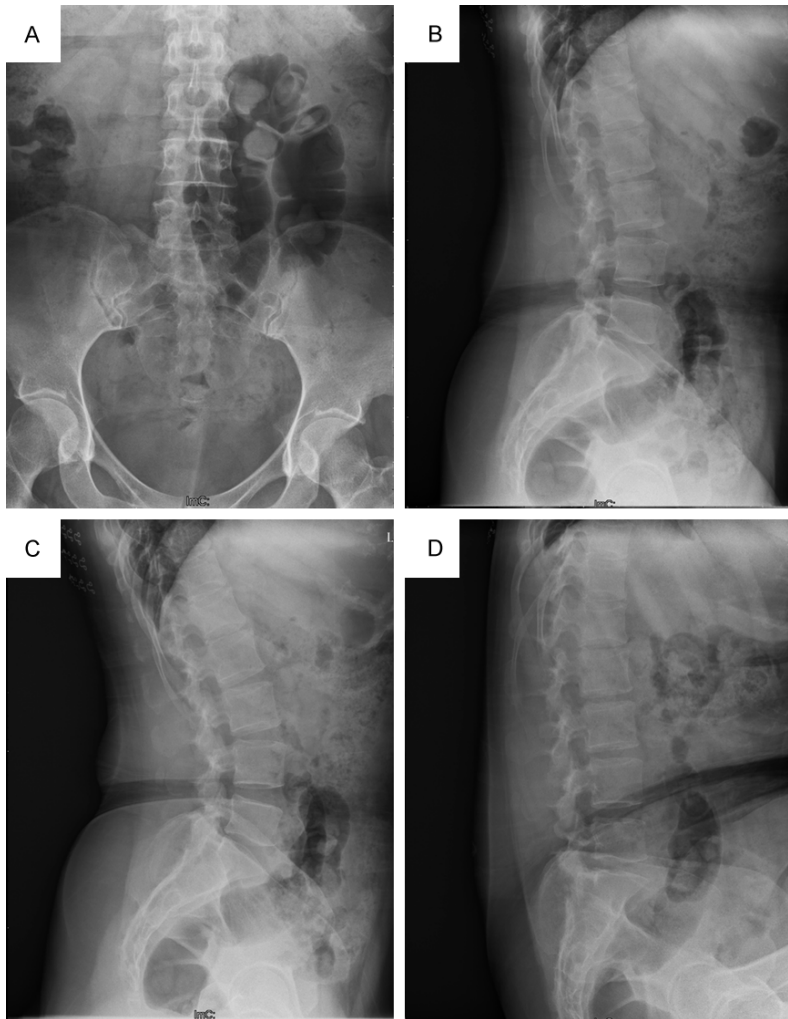
Herniation of an intervertebral disc is characterized by displacement of the disc material beyond the anatomical disc space. In contrast, disc sequestration is defined as perforation of the fibrous ring and posterior longitudinal ligament, and migration of the fragment to the epidural space [1]. Magnetic resonance imaging (MRI) is the first-call diagnostic tool and gold standard for evaluating spinal pathologies [2]. However, in some cases, diagnosis of intervertebral disc herniation can still be very difficult, even in the MRI era, as the radiological appearance associated with the condition is similar to other common epidural lesions, e.g. synovial and ligamentum cysts, cystic neurinomas, tumors, hematomas, and abscesses [3, 4].

Considering the relatively small amount of knowledge available on this area, we present herein a special case of a herniated intervertebral disc mimicking an intraspinal tumor in order to share our experience.

## Case description

The patient provided informed consent for the publication of her clinical and radiological data. This study was approved by the Medical Ethical Committee of West China Hospital, Sichuan University.

A 43-year-old female patient presented to our hospital with a history of low back pain and right limb numbness and pain for 60 days. Physical examination revealed tenderness and



**Figure 1.** The preoperative lumbar anterior-posterior, lateral, extension, and flexion X-rays revealed no obvious abnormalities.

percussion pain in her lower back, and decreased myodynamia of her right limb (Grade 2). Hypoaesthesia was detected below the distribution of L4 while the sensation in the saddle area was not impaired. Lumbar anterior-posterior, lateral, extension, and flexion X-rays showed no obvious signs of abnormality (**Figure 1**). MRI revealed evidence of a herniated intervertebral disc at L5/S1 but there was also a strong signal in the spinal canal at the level of the L5 vertebra (**Figure 2**). The radiologists in our hospital returned a radiological diagnosis of “intra-spinal occupying lesion: neurofibroma”? A discussion between the surgeons in our department was in favor of this diagnosis. Intraspinal tumor resection surgery was planned. To our

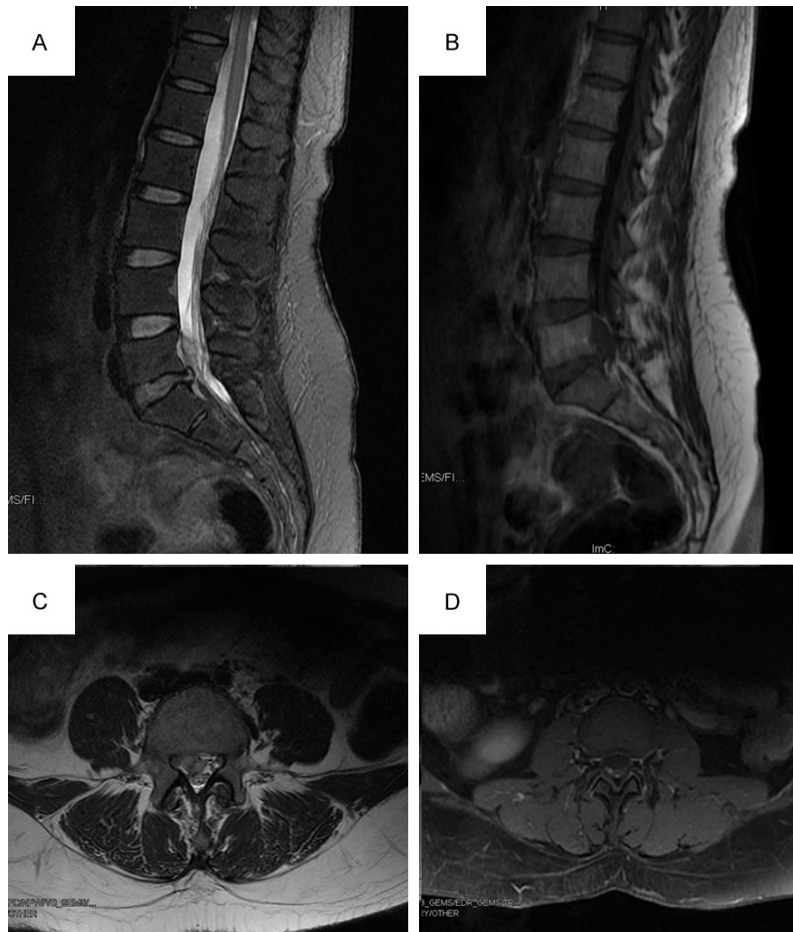
surprise, a lump of white tissue similar to nucleus pulposus was found in the spinal canal during surgery. The surgery was subsequently changed to resection of the nucleus pulposus (**Figure 3**). Postoperative pathological hematoxylin and eosin (HE) staining confirmed its character to be that of nucleus pulposus (**Figure 4**).

## Discussion

Lumbar disc herniation is a relatively common cause of lower back pain and sciatica [5]. It occurs due to the degeneration of the nucleus pulposus and annulus fibrosus, resulting from lifting injuries or trauma. The bulging out of the nucleus pulposus and annulus fibrosus from the lumbar intervertebral disc, especially when they compress the nerve root, can cause lower back pain. The effects of the lumbar disc herniation characteristically radiate to the lower legs and cause numbness. Radiological examinations (X-ray, computed

tomography, and MRI scans) can be helpful in making the right diagnosis of lumbar disc herniation. Radiological results that are consistent with a neurological examination are regarded as necessary to make a diagnosis. However, in some cases, it is very difficult to make a definitive diagnosis, as in the case in hand.

Herniated intervertebral discs generally produce signals of low intensity in T1-weighted images (T1-WIs) and high intensity in T2-weighted images (T2-WIs) due to the matrix qualities of fibrocartilage. Most of the tumors observed intradurally (meningiomas, neurinomas, and ependymomas) appear hypointense in T1-WIs



**Figure 2.** Magnetic resonance image showing evidence for a herniated intervertebral disc at L5/S1. Note also the strong signal in the spinal canal at the level of the L5 vertebra.

but hyperintense in T2-WIs [6, 7]. Metastatic tumors are usually associated with adjacent bone destruction [8]. In some cases, gadolinium-enhanced MRI can be used to differentiate a tumor from a herniated intervertebral disc [9]. Herniated intervertebral discs demonstrate peripheral enhancement following administration of the contrast medium. In general, a malignant tumor will show homogeneous or heterogeneous enhancement, but rarely rim enhancement. Abscesses produce high signal intensities with homogeneous or peripheral contrast enhancement [10, 11]. Differential diagnosis is important when planning surgery, but a final and definitive diagnosis depends on pathological examination [12, 13].

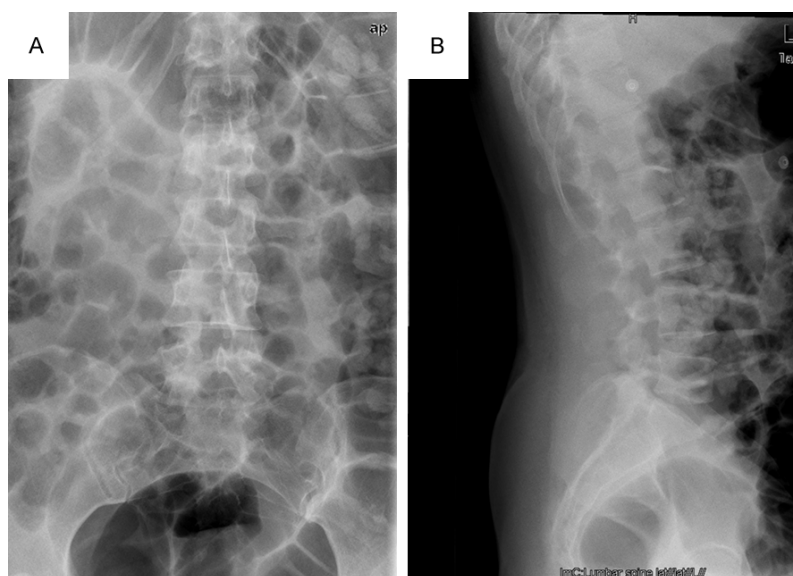
#### Disclosure of conflict of interest

None.

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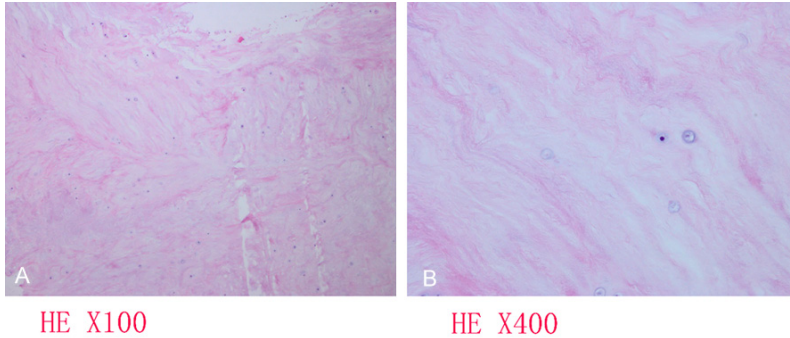
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**Figure 3.** Postoperative lumbar anterior-posterior, lateral X-rays.

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**Figure 4.** Postoperative pathological HE staining confirming the character of the tissue to be nucleus pulposus.

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