

Posterolateral migration of a sequestered disc: magnetic resonance imaging findings demystified

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Introduction

Sequestered discs can migrate away from the parent disc and be located within the epidural or even subdural spaces. These free fragments can cause back pain or sciatica when there is impingement and compression of the spinal cord and/or nerve roots.

In the absence of characteristic imaging features, the diagnosis of a sequestered disc can be difficult and may be misinterpreted as other intraspinal lesions such as a spinal tumour, abscess or haematoma. This case report highlights the magnetic resonance imaging appearance of sequestered discs and discusses features useful for differentiating these from other intraspinal lesions.

Discussion

Magnetic resonance imaging is the preferred imaging modality in the workup of patients presenting with lower back pain, radiculopathy or cauda equina syndrome. Despite

Case report

A 62-year-old man presented with a 2-week history of severe low back pain with radiation to the gluteal region and posterior thigh on both sides. He also complained of numbness and weakness involving the left lower limb. Physical examination revealed weakness in the left L2 and L3 myotomes, with preserved sensation bilaterally. His anal tone was intact.

Lumbar spine X-ray showed degenerative changes, with mild retrolisthesis and end plate osteophytes at multiple levels. The heights of the vertebral bodies and intervertebral disc spaces were maintained.

Magnetic resonance imaging showed a lobulated lesion in the left posterolateral epidural space from the level of the mid L2 vertebral body to the superior endplate of the L3 vertebral body. No susceptibility artefact was seen on the gradient echo sequences to suggest an epidural haematoma (Figure 1a). On the post-contrast T1-weighted sequences, there was peripheral enhancement with no internal enhancement, which excludes enhancing intraspinal tumours (Figure 1b). No restricted diffusion was seen which excludes an epidural abscess or acute haematoma (Figure 2a). The lesion caused severe stenosis of the spinal canal with crowding and likely compression of the cauda equina. In addition, there were severe stenoses of bilateral lateral recesses, with impingement of bilateral descending L3 nerve roots. The overall imaging features of the lobulated lesion were in favour of a sequestered disc. Degenerative discovertebral and facet joint changes were also seen at multiple levels on magnetic resonance imaging.

Owing to the severity of low back pain with neurological symptoms and impending cauda equina compression, the patient underwent left L2 hemi-laminectomy. A large dorsal epidural fragment was seen compressing the cauda equina, with macroscopic features compatible with a sequestered disc. This fragment was removed and sent for intraoperative frozen section. Further inspection revealed a small fissure at the caudal aspect of the L2–L3 intervertebral disc. Partial L2–L3 discectomy was performed and all loose fragments were removed.

Intraoperative frozen section showed cartilage with adjacent inflamed adipose tissue. The final histopathological analysis of the excised specimen showed degenerate fragments of vertebral disc fibrocartilage with surrounding inflamed granulation tissue (Figure 2b).

The patient had an uneventful postoperative course and was discharged on the fourth postoperative day. On discharge, there was improvement of left lower limb weakness, with mild residual weakness in the left L2 myotome. At 2 months follow up, there was complete resolution of back pain and neurological symptoms.

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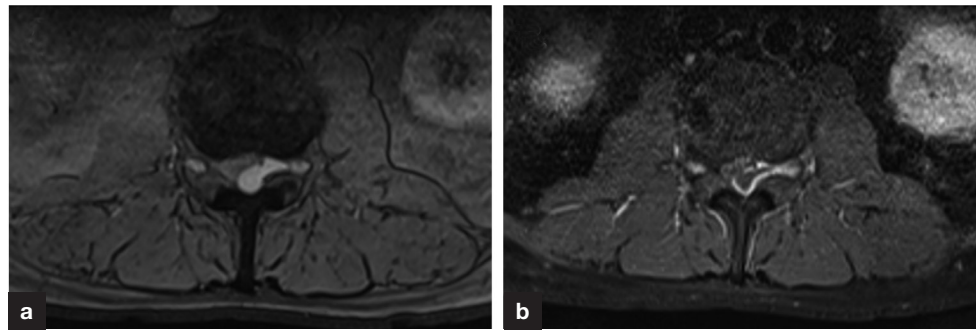


Figure 1. Magnetic resonance images of the lumbar spine. a. Axial multiple echo data image combination (MEDIC) and (b) post-contrast T1-weighted fat suppressed images at the level of the L2 vertebral body.

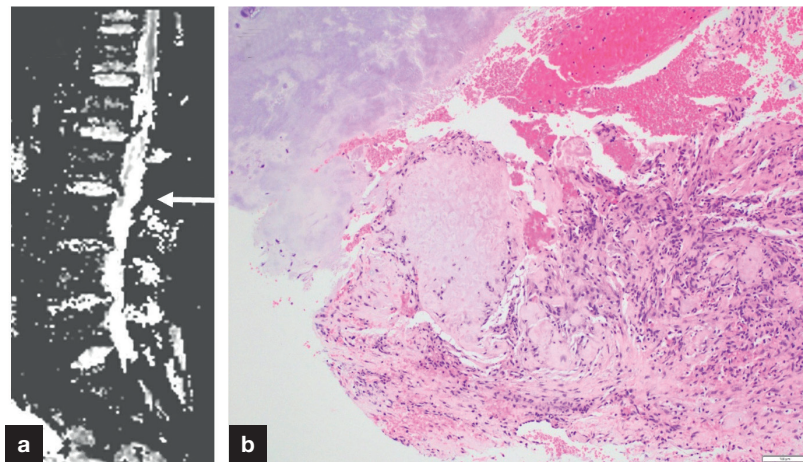


Figure 2. a. Sagittal apparent diffusion coefficient image of the lumbar spine at the midline shows no restricted diffusion. b. Histology shows degenerate fragments of vertebral disc fibrocartilage with granulation tissue (haematoxylin and eosin stain, $\times 10$).

improvements in imaging techniques, sequestered discs, specifically those in the posterior or posterolateral epidural spaces, remain a diagnostic challenge. As a result of its unusual location, the diagnosis of a sequestered disc may not be considered (Akhaddar et al, 2011). In addition, the variability of imaging features can compound the difficulty in diagnosing a sequestered disc, with common misdiagnoses including abscesses, haematomas, synovial cysts and neoplasms such as schwannoma, meningioma or leptomeningeal metastasis (Bonaroti and Welch, 1998; Derinkcek et al, 2009). The absence of accompanying disc protrusions may also result in these alternative diagnoses being favoured.

On magnetic resonance imaging, sequestered disc fragments typically retain similar signal characteristics to the donor intervertebral disc. The diagnosis of epidural haematomas can usually be excluded based on the absence of susceptibility on gradient-echo sequences (Donahue et al, 2018). Sequestered discs commonly demonstrate peripheral rim enhancement (Kim et al, 2010; Akhaddar et al, 2011), which was also seen in this patient (Figure 1b). On histology, this area of enhancement corresponds to the development of inflammatory granulation tissue around the avascular disc fragment (Ajayi et al, 2016). Although this feature can help exclude lesions that show central contrast enhancement, such as schwannomas or meningiomas (Koeller and Shih, 2019), peripheral rim enhancement can also be seen in epidural abscesses (Chao and Nanda, 2002).

Diffusion-weighted imaging is not well described in the literature for the characterisation of sequestered discs. Diffusion-weighted imaging can help to differentiate mimics such as abscesses (Eastwood et al, 2002) and acute haematomas (Fujiwara et al, 2005), which typically demonstrate restricted diffusion, unlike sequestered discs. In this patient, no restricted diffusion was seen in the left posterolateral epidural space lesion (Figure 2a).

Learning points

- Sequestered discs can pose diagnostic difficulties because of their low incidence and an absence of characteristic radiological features.
- Differentials of sequestered discs include abscesses, haematomas and neoplasms.
- In addition to standard magnetic resonance imaging sequences, diffusion-weighted imaging can be helpful to support the diagnosis of a sequestered disc.
- Unlike abscesses and haematomas, sequestered discs do not show restricted diffusion.

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References

- Ajayi O, Shoakazemi A, Tubbs RS et al. Atypical presentation of a sequestered posterolateral disc fragment. *Cureus*. 2016;8:8–11. <https://doi.org/10.7759/cureus.502>
- Akhaddar A, El-Asri A, Boucetta M. Posterior epidural migration of a lumbar disc fragment: a series of 6 cases. *J Neurosurg Spine*. 2011;15(1):117–124. <https://doi.org/10.3171/2011.3.SPINE10832>
- Bonaroti EA, Welch WC. Posterior epidural migration of an extruded lumbar disc fragment causing cauda equina syndrome. Clinical and magnetic resonance imaging evaluation. *Spine (Phila Pa 1976)*. 1998;23(3):378–381. <https://doi.org/10.1097/00007632-199802010-00018>
- Chao D, Nanda A. Spinal epidural abscess: a diagnostic challenge. *Am Fam Physician*. 2002;65:1341–1346
- Derinkcek A, Ozalay M, Sen O, Pourbagher A. Posterior epidural mass: can a posteriorly migrated lumbar disc fragment mimic tumour, haematoma or abscess? *Acta Orthop Belg*. 2009;75(6):423–427
- Donahue JH, Nacey NC, Quirk CR et al. Spinal hematomas: what a radiologist needs to know. *RadioGraphics*. 2018;38(5):1516–1535. <https://doi.org/10.1148/rg.2018180099>
- Eastwood JD, Vollmer RT, Provenzale JM. Diffusion-weighted imaging in a patient with vertebral and epidural abscesses. *AJNR Am J Neuroradiol*. 2002;23:496–498
- Fujiwara H, Oki K, Momoshima S, Kuribayashi S. PROPELLER diffusion-weighted magnetic resonance imaging of acute spinal epidural hematoma. *Acta Radiol*. 2005;46(5):539–542. <https://doi.org/10.1080/02841850510021553>
- Kim J, Lee S, Arbatti NJ. Dorsal extradural lumbar disc herniation causing cauda equina syndrome: a case report and review of literature. *J Korean Neurosurg Soc*. 2010;47(3):217–220. <https://doi.org/10.3340/jkns.2010.47.3.217>
- Koeller KK, Shih RY. Intradural extramedullary spinal neoplasms: radiologic-pathologic correlation. *RadioGraphics*. 2019;39(2):468–490. <https://doi.org/10.1148/rg.2019180200>