



CAUDA EQUINA SYNDROME DUE TO POSTERIOR SEQUESTERED LUMBAR DISC HERNIATION: A RARE CASE REPORT AND MRI FINDINGS

POSTERİOR SEKESTRE DİSK HERNİASYONU'NUN NEDEN OLDUĞU KAUDA EKİNA SENDROMU: NADİR BİR OLGU VE MRG BULGULARI

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SUMMARY

Posterior epidural disc migration is a very unusual event. Cauda equina syndrome resulting from a posterior epidural disc migration is also quite uncommon. Diagnosis of a posterior migrated disc fragment can be easily made by magnetic resonance imaging. In this report, a patient is described who presented with acute cauda equina syndrome after a massage with hot water. An immediate MRI revealed L2–3 disc herniation with posterior epidural disc migration. A decompressive total L2 laminectomy was immediately performed, and two unattached disc fragments were observed and removed just underneath the lamina. The patient was free of pain postoperatively. After 12 months, the patient had slight paraparesis and urinary incontinence. Diagnosis of a posterior migrated disc fragment with magnetic resonance imaging is very favorable, although cases have been reported where migrated disc fragments were not seen by magnetic resonance imaging. Neurosurgeons should keep this unique situation in mind, especially in symptomatic cases.

Key words: Cauda equina syndrome, epidural lumbar disc herniation, magnetic resonance imaging, massage, sequestered lumbar disc.

Level of evidence: Case report, Level IV

ÖZET

Posterior epidural disk migrasyonu oldukça nadir bir olaydır. Posterior epidural disk migrasyonunun kauda ekina sendromu ile sonuçlanması çok daha nadirdir. Manyetik rezonans görüntüleme ile posteriora migre disk herniyasyonlarının tanısı oldukça kolaydır. Sıcak su ile masajı takiben gelişen akut kauda ekina sendromu gelişen bir hastayı bu çalışmada sunulmuştur. Acil manyetik rezonans görüntüleme, L2-L3 düzeyinde, disk fragmanın posterior migrasyonu olmaksızın disk herniyasyonunu gösterdi. Acil olarak L2 dekompresyon amaçlı, L2 total laminektomi yapıldı. Hemen laminanın altında, çevre dokulara yapışık olmayan, iki adet serbest fragman çıkartıldı. Postoperatif dönemde hastanın ağrı yakınması geçti. 12 ay sonraki muayenesinde hafif düzeyde paraparezisi olduğu ve üriner inkontinansının devam ettiği görüldü. Posteriora migre disk fragmanlarının tanısında manyetik rezonans görüntüleme oldukça yararlıdır.

Nadirde olsa serbest fragmanlarının manyetik rezonans görüntüleme ile tespit edilemediği vakalar mevcuttur. Özellikle semptomatik olgularda, bu durumun cerrahlar tarafından bilinmesi gerekir.

Anahtar Sözcükler : Epidural disk migrasyonu, kauda equine sendromu, masaj, manyetik rezonans görüntüleme, sekestre lumbar disk

Kanıt Düzeyi: Olgu sunumu, Level IV

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Received: 20th November, 2012
Accepted: 25th December, 2012

INTRODUCTION

A sequestered disc fragment is a very common spinal condition, and accounts for 28.6% of all disc herniations¹². Disc fragment migration is commonly seen in the anterior epidural space, which is restricted by the posterior longitudinal ligament and lateral membrane. On the other hand, posterior epidural disc migration is extremely rare^{3,4,11}. Herniation of the nucleus pulposus usually presents with radiculopathy, but rarely with cauda equina syndrome (CES)¹.

CES is a serious neurological disorder. Its clinical features can include extreme lower back pain, bilateral or unilateral sciatica, saddle anesthesia, motor weakness, sensory deficit and urinary incontinence. Posterior disc migration causing CES is exceptionally rare^{1,2}.

Magnetic resonance imaging (MRI) is an excellent diagnostic tool for symptomatic patients. Sequestered disc fragments can be recognized easily by MRI^{3,6}. Surprisingly, in the case presented here, while there was a slight protrusion and right foraminal stenosis at the L2–3 level, no posterior sequestered disc fragments were seen on MRI scans. This unique and interesting situation is discussed in light of the literature.

CASE REPORT

A 55-year-old man complained of bilateral leg and lower back pain for two years. He had been examined several times previously. He was given non-steroidal anti-inflammatory and muscle relaxant drugs and bed rest for 12 days, but his symptoms did not subside and grew worse. He had a massage with hot water, after which his condition suddenly deteriorated, and he applied to our emergency service with severe bilateral leg pain, muscle weakness and urinary incontinence. On admission, neurological examination revealed diminished pinprick and light touch sensation below the L2 dermatome bilaterally, and bowel and bladder retention. The Laseque test was positive at 20° on the right side. Motor strength was +2/5 (5/5) proximally and +1/5 (5/5) distally in both lower extremities. Bilateral deep tendon reflexes at the knee and ankle were absent. MRI of the lumbar spine showed L2–3 broad-based disc protrusion at the right side, and bilateral foraminal stenosis. The dural sac was minimally compressed on the antero-lateral side by disc prolapse (Figure-1.a,b).

Because of the acute symptom onset, the patient received urgent surgery. The patient underwent total laminectomy and flavectomy at the L2 level and discectomy at L2–3. Amazingly, a ruptured fragment was recognized along the right lateral recess to the posterior epidural space (Figure-2.a,b) that had not been seen by MRI. The fragment was not adhered to the dura and was easily dissected and removed.

Histopathological findings of the surgical specimen revealed degenerated fibrocartilage and increased lymphocytes at the edge of the disc materials (Figure-3).

The postoperative course was uneventful, and he was free of pain. After 12 months, the patient had slight paraparesis and urinary incontinence. He is now part of the rehabilitation program.

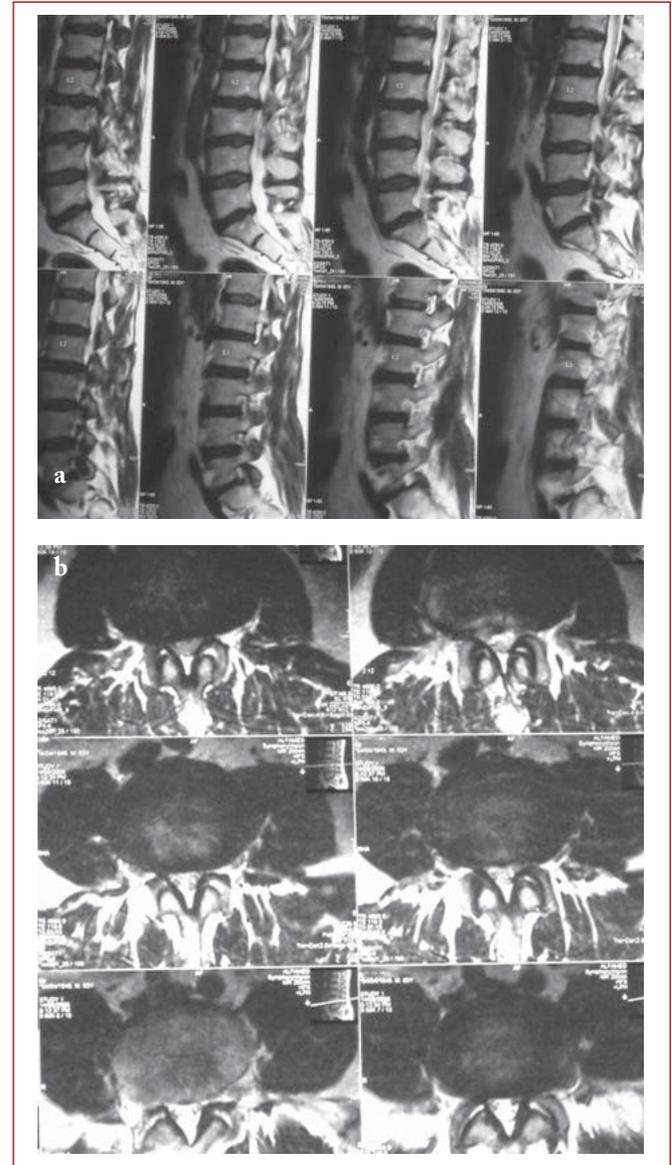


Figure-1. T2-weighted serial (a) sagittal lumbar MRI with contrast revealing L2–3 broad-based disc protrusion, (b) axial lumbar MRI with contrast revealing L2–3 right side broad-based disc protrusion and bilateral foraminal stenosis with no sign of any posterior migration of a disc fragment.

DISCUSSION

The majority of lumbar disc herniations are noted to be in a lateral position with resultant nerve root irritation. The migration patterns are generally limited by the attachments of the posterior longitudinal ligament and its association with the midline and lateral membranes^{1,3,8}. Although caudal, rostral, and lateral migration of disc fragments are frequent events, the posterior epidural migration of a sequestered disc fragment has seldom been reported^{1,5,13}.



Figure-2. (a) Macroscopic appearance of the disc fragment after total removal, (b) Intraoperative photograph showing the surgical view after L2 total laminectomy and total removal of the disc fragments from the posterior epidural area.

Most of the reported cases have involved the lumbar region, and a few cases with cauda equina syndrome have been described^{1,5}. MRI, especially with contrast administration, appears to be the method of choice for diagnosis. Sequestered fragments usually show high signal intensity in T2-weighted images (80%) and low signal intensity in T1-weighted images, relative to the degenerated disc^{7,9,10}. The high signal intensity in T2-weighted images can be explained by either the herniated material having a higher water content than an intact disc, or a reparative process leading to a transient water gain^{9,10}.



Figure-3. Histopathological findings of the surgical specimen showing degenerated fibrocartilage.

The remaining 20% have isointense intensity relative to the degenerated disc on T2-weighted images. Most disc fragments show peripheral contrast enhancement, attributed to an inflammatory response with granulation tissue and newly-formed vessels around the sequestered tissue^{8,13}, but we saw no similar findings in our patient.

Most migrations occur on the left side. In previously reported cases, one study reported a lesion that displayed low signal intensity on T2-weighted and T1-weighted images, and showed rim enhancement after administration of gadolinium¹. The disc fragments measured up to 2.5 cm, and most gave a low signal intensity on T1-weighted images and a moderately high signal intensity on T2-weighted images, and had a rim contrast enhancement on gadolinium-enhanced images^{4,7,10,13}. MRI with gadolinium did not result in similar signal intensity in our case. In addition, a tract-like structure was identified, with enhancement from the site of the ruptured disc to the posterior epidural space, suggesting the route of migration of the sequestered disc.

Most of the previously reported cases of posterior epidural disc migration presented with symptoms of radiculopathy and muscle strength deficits of the affected limb of a relatively

short duration, in middle-aged individuals^{1,4,10,13}. Posterior disc migration causing cauda equina syndrome is exceptionally rare^{1,2}. Our patient presented with CES. Migrated disc fragments were not seen by MRI. Neurosurgeons should keep this unique cause of CES in mind, especially in symptomatic cases. Urgent decompressive surgery is the best treatment choice for similar cases.

REFERENCES

1. Bonaroti EA, Welch WC. Posterior epidural migration of an extruded lumbar disc fragment causing cauda equine syndrome: clinical and magnetic resonance imaging evaluation. *Spine* 1998; 23: 378-381.
2. Carvi Y, Nievas MN, Hoellerhage HG. Unusual sequestered disc fragments simulating spinal tumors and other space-occupying lesions: clinical article. *J Neurosurg Spine* 2009; 11: 42-48.
3. Chen CY, Chuang YL, Yao MS, Chiu WT, Chen CL, Chan WP. Posterior epidural migration of a sequestered lumbar disk fragment: MR imaging findings. *AJNR Am J Neuroradiol* 2006; 27: 1592-1594.
4. Dosoglu M, Is M, Gezen F. Posterior epidural migration of a lumbar disc fragment causing cauda equine syndrome: case report and review of the relevant literature. *Eur Spine J* 2001; 10: 348-351.
5. Ebeling U, Renlen HJ. Are there typical localisations of lumbar disc herniations? A prospective study. *Acta Neurochir* 1992; 117: 143-148.
6. Eksi MS, Yener U, Akakin A, Konya D. Posterior epidural disc herniation at L3-L4 mimicking a spinal tumor: a case report. *J Neurosurg Sci* 2010; 54: 71-76.
7. Hwang GJ, Suh JS, Na JB. Contrast enhancement pattern and frequency of previously unoperated lumbar discs on MRI. *J Magn Reson Imaging* 1997; 7: 575-578.
8. Kim SS, Choi JH, Kim MS, Chang CH. A ganglion cyst in the second lumbar intervertebral foramen. *J Korean Neurosurg Soc* 2011; 49: 237-240.
9. Masaryk TJ, Ross JS, Modic MT. High-resolution MR imaging of sequestered lumbar intervertebral discs. *AJNR Am J Neuroradiol* 1998; 9: 351-358.
10. Neugroschl C, Kehrli P, Gigaud M. Posterior extradural migration of extruded thoracic and lumbar disc fragments: role of MRI. *Neuroradiol* 1999; 41: 630-635.
11. Rope P, Martin D, Lenelle J, Stevenaert A. Posterior epidural migration of sequestered disc fragments: report of two cases. *J Neurosurg* 1999; 90: 264-266.
12. Schellinger D, Manz HJ, Vidic B. Disk fragment migration. *Radiology* 1990; 175: 831-836.
13. Sekerci Z, Ildan F, Yüksel M, Gül B, Kiliç C. Cauda equine compression due to posterior epidural migration of extruded lumbar disk. *Neurosurg Rev* 1992; 15: 311-313.
14. Wasserstrom R, Mamourian AC, Black JF. Intradural lumbar disk 155 fragment with ring enhancement on MR. *AJNR Am J Neuroradiol* 1993; 14: 401-404.