Dorsal migration of prolapsed intervertebral disc causing cauda equina syndrome

Mantu Jain ¹, Sunil Doki,¹ Barun Patel,¹ Nerbadyswari Deep Bag²

¹Orthopaedics, All India Institute of Medical Sciences Bhubaneswar, Bhubaneswar, Orissa, India
²Radiodiagnosis, All India Institute of Medical Sciences Bhubaneswar, Bhubaneswar, Orissa, India

Correspondence to
 Dr Mantu Jain;
 montu_jn@yahoo.com

Accepted 30 August 2020

DESCRIPTION

Disc herniation is a common presentation to a spinal surgeon. Sometimes the disc becomes sequestered when it 'breaks' from its parent body and migrates into the ventral epidural space (28%).¹ A posterior migration of a disc fragment is a rare occurrence with 0.27% of incidences and a handful of reports.² There are several anatomical barriers which restrict such relocation which includes the duramater, posterior longitudinal ligament, septum posticum, peridural membrane of Fick, the Hoffmann ligament and most importantly the other contents which fill the epidural space.³ Clinically these present with high neurological deficits including cauda equine syndrome (CES) and thus identifying and picking them early for an emergent surgery is paramount to prevent long term sequela.⁴ MRI is the investigation of choice and contrast-enhanced give the pathognomonic findings.^{5 6} However, in most set up where this is not ordered routinely and it is the onus of radiologist and treating surgeons to recognise them.

A 39-year-old woman daily labourer by profession presented with 2 weeks duration of back pain, bilateral radicular pain and weakness of lower limbs and incontinence of the bladder. Neurological examination revealed the weakness of lower limbs including ankle flexors, toes flexors and extensors, hamstring and hip abductor weakness spreading more on the left than right side. Sensory was

Figure 2 (A)- Intraoperative findings showing the sequestered disc dorsal to the duramater (arrow pointed); (B) disc fragments being pulled by the pituitary forceps and (C) the removed disc pieces.

diminished again more on the left lower limb than right leg in L5 to all sacral dermatomes, including perianal sensation. The bladder had been catheterised for a week at some other place. The rectal tone was also decreased. Her MRI suggested a huge migrated disc from L4 to L5 level occupying dorso-lateral and most of the canal space pushing the duramater ventrolaterally towards right side (figure 1). A contrast-enhanced MRI was not ordered in view of the CES findings and emergent situation even though the patient had presented late. With a clinical diagnosis of CES retention type (CES-R),⁷ a wide conventional laminectomy was done and the disc fragment could be seen dorsally (figure 2) there were two large fragments: one was free fragment and other was a continuous with the intervertebral disc space. After a thorough search for any other loose pieces, the wound was washed and closed. Postoperatively, she had some improvement in her motor and sensory power and became an independent ambulatory although she is catheterised. At her 3 months follow-up, the pain has subsided and she has progressive improvement in her motor functions but there is still there is complete loss of perianal sensation and she passes stool involuntarily and is catheterised grossly limiting her daily life.

Dorsally migrated disc incites an inflammatory response and gets walled off by a vascular epidural fat.⁵ This can be seen as 'peripheral rim enhancements' on a contrast-enhanced MRI.⁶ Otherwise, disc fragments are hypointense on T1WI and isointense on T2WI MRI. In some cases, a fragment travelling laterally and connecting to the parent disc ventrally may be found. This will push the dural component laterally and on gadolinium enhancement appear as a 'tract like'.⁸ Important differential diagnosis includes the epidural infections or tumour. Abscess have a hypointense T1 and hyperintense T2 signals with peripheral contrast enhancement.⁶ If associated with discitis, then typical changes may be seen in the disc space. Tumours will enhance uniformly with contrast.⁶ Viswanathan *et*

Figure 1 (A) T2 weighted axial cuts at L4-5 level showing migrated disc pushing the duramater laterally to right in a, obliterating the canal (B). T2 weighted sagittal sections showing a large dorsally extruded disc (C, D).

© BMJ Publishing Group Limited 2020. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Jain M, Doki S, Patel B, *et al.* *BMJ Case Rep* 2020;**13**:e238017. doi:10.1136/bcr-2020-238017

Images in...

al described an intradural extension of the dorsally migrated disc.⁵ A 'hawk-beak sign' on an axial sections MRI and a 'Y sign' on sagittal cuts of MRI are specific for these rare situations.^{9 10} Other differential diagnosis includes the facet/joint/meningeal/ligament/perineural cyst.⁴ These shall appear isointense to the cerebrospinal fluid. Clinically these present with severe neurological symptoms with 50% of them have the CES at presentation.^{11 12} Nevertheless, timely surgery can have a good prognosis in more than 70% of patients as found by Akhaddar *et al.*¹³

The prognosis of cauda equina syndrome retention type (CESR) and delayed cases are guarded. Delgado-López *et al* found that only pain was improved in patients with CESR.¹⁴ In another landmark study, Dhatt *et al* have found a positive correlation between the time taken for recovery and delay in surgery even though the time difference in delay had not significance in final outcome (recovery vs non-recovery).¹⁵

Like our case, in most instances, a contrast MRI may be not ordered in the first place and urgency of situation will demand an emergent surgery. Hence surgeons must be tuned to read the findings in the routine MRI.

Learning points

- ▶ Dorsal migrated disc is rare and can be catastrophic.
- ▶ Cauda equine syndrome is a common presentation requiring emergent surgery.
- ▶ Gadolinium enhanced MRI can help to delineate it but my not ordered in first instance.
- ▶ Surgeons, radiologists must be tuned to reading the conventional MRI findings.

Contributors MJ, SD and BP were the operating surgeons. NDB provided the radiological inputs. MJ and SD wrote up the paper. All authors have read and agree to the content.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iD

Mantu Jain <http://orcid.org/0000-0003-3848-4277>

REFERENCES

- 1 Sengoz A, Kotil K, Tasdemiroglu E. Posterior epidural migration of herniated lumbar disc fragment. *J Neurosurg Spine* 2011;14:313–7.
- 2 Lichtor T. Posterior epidural migration of extruded lumbar disk. *Surg Neurol* 1989;32:311–2.
- 3 Gonçalves FG, Hanagandi PB, Torres CI, *et al.* Hérnia discal lombar com migração posterior - dilema em diagnóstico por imagem devido a contra-indicação ao uso de contraste: Relato de um caso. *Radiol Bras* 2012;45:170–2.
- 4 Kim J-S, Lee S-H, Arbatti NJ. Dorsal extradural lumbar disc herniation causing cauda equina syndrome : a case report and review of literature. *J Korean Neurosurg Soc* 2010;47:217–20.
- 5 Viswanathan V, Shetty A, Kanna R, *et al.* Dorsally migrated epidural disc herniation with intradural extension: a rare clinical entity. *Indian Spine J* 2018;1:16–64.
- 6 Turan Y, Yilmaz T, Gocmez C, *et al.* Posterior epidural migration of a sequestered lumbar intervertebral disc fragment. *Türk Neurosurg* 2017;27:85–94.
- 7 Gleave JRW, Macfarlane R. Cauda equina syndrome: what is the relationship between timing of surgery and outcome? *Br J Neurosurg* 2002;16:325–8.
- 8 Chen CY, Chuang YL, Yao MS, *et al.* Posterior epidural migration of a sequestered lumbar disc fragment: MR imaging findings. *AJNR Am J Neuroradiol* 2006;27:1592–4.
- 9 Sasaji T, Horaguchi K, Yamada N, *et al.* The specific sagittal magnetic resonance imaging of intradural extra-arachnoid lumbar disc herniation. *Case Rep Med* 2012;2012:1–3.
- 10 Choi JY, Lee WS, Sung KH. Intradural lumbar disc herniation—is it predictable preoperatively? A report of two cases. *Spine J* 2007;7:111–7.
- 11 Tamburrelli FC, Perna A, Oliva MS, *et al.* Unusual posterior epidural migration of intervertebral herniated disc: a report of two cases. *Malays Orthop J* 2018;12:47–9.
- 12 Rahimizadeh A, Soufiani H, Rahimizadeh A. Posterior epidural migration of sequestered lumbar disc fragment causing cauda equina syndrome. *Coluna/Columna* 2013;12:78–80.
- 13 Akhaddar A, El-Asri A, Boucetta M. Posterior epidural migration of a lumbar disc fragment: a series of 6 cases. *J Neurosurg Spine* 2011;15:117–28.
- 14 Delgado-López PD, Martín-Alonso J, Martín-Velasco V, *et al.* Cauda equina syndrome due to disk herniation: long-term functional prognosis. *Neurocirugia* 2019;30:278–87.
- 15 Dhatt S, Tahasildar N, Tripathy SK, *et al.* Outcome of spinal decompression in cauda equina syndrome presenting late in developing countries: case series of 50 cases. *Eur Spine J* 2011;20:2235–9.

Copyright 2020 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <https://www.bmj.com/company/products-services/rights-and-licensing/permissions/> BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

Customer Service

If you have any further queries about your subscription, please contact our customer services team on +44 (0) 207111 1105 or via email at support@bmj.com.

Visit casereports.bmj.com for more articles like this and to become a Fellow