Dorsal migration of prolapsed intervertebral disc causing cauda equina syndrome

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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 dural mater, 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 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 dorsolateral and most of the canal space pushing the dural mater 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 ambulator 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.8 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’.9 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
al described an intradural extension of the dorsally migrated disc. A ‘hawk-beak sign’ on an axial sections MRI and a ‘Y sign’ on sagittal cuts of MRI are specific for these rare situations. Other differential diagnosis includes the facetal/meningeal/ligament/perineural cyst. These shall appear isointense to the cerebrospinal fluid. Clinically these present with severe neurological symptoms with 50% of them have the CES at presentation.

Nevertheless, timely surgery can have a good prognosis in more than 70% of patients as found by Akhaddar et al.

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. These shall appear isointense to the cerebrospinal fluid. Clinically these present with severe neurological symptoms with 50% of them have the CES at presentation.

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).

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 catastrophe.
► Cauda equina 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.

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