

Dorsal Epidural Migration of Lumbar Disc Fragment Causing Cauda Equina Syndrome- A Case Report

VIJAYANAND BALASUBRAMANIAN¹, KEVIN DHAS², RAJAVEL KALIRAJAN³

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ABSTRACT

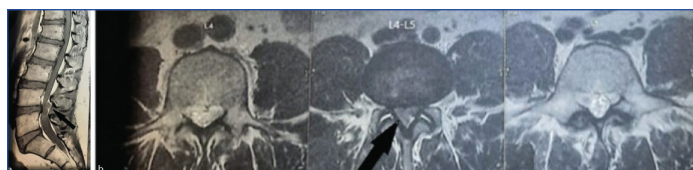
Several anatomic factors like midline septum, lateral peridural membrane and epidural fat prevent dorsal migration of disc fragment. Hence, dorsal epidural migration of lumbar disc has a rare occurrence. It has a propensity to present with cauda equina syndrome. Epidural disc fragments mimic benign masses and hence poses a diagnostic challenge. The prognosis is good compared to other types of disc prolapse when surgical decompression is done early. A 45-year-old male labourer presented with chronic lower back pain with recent onset of motor weakness in right lower limb and bladder disturbance. Magnetic Resonance Imaging (MRI) showed a huge sequestered L4-L5 disc. Emergency decompression with laminectomy was done and a large fragment of sequestered disc found in posterior epidural space was removed. Symptoms improved dramatically following surgery within 10 days. Awareness about this rare disc prolapse is important for timely diagnosis and management of it.

Keywords: Emergency decompression, Low back pain, Posterior epidural space

CASE REPORT

A 45-year-old male labourer presented with history of lower back pain since four years, which aggravated in the last three weeks after lifting a heavy rice bag. He experienced weakness in right lower limb and difficulty in initiating micturition for five days. On examination, tenderness was noted over L4-L5 spines and straight leg raising test was normal. He had motor weakness of 2/5 corresponding to L4 to S1 nerve roots on right side. Ankle reflex was absent on right side. Saddle anaesthesia was present. His anal wink and bulbocavernosus reflex were preserved.

The MRI done showed a heterogenous mass appearing hypointense in T1 and isointense in T2 weighted image behind the dura. This led to the suspicion of L4-L5 sequestered disc fragment with dorsal migration [Table/Fig-1]. Contrast MRI was not done.

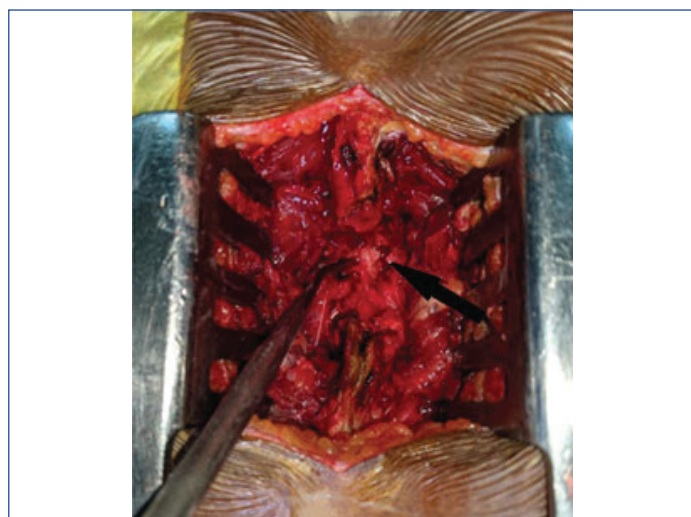


[Table/Fig-1]: a) Sagittal view b) Axial view showing L4-L5 dorsally migrated disc (black arrow).

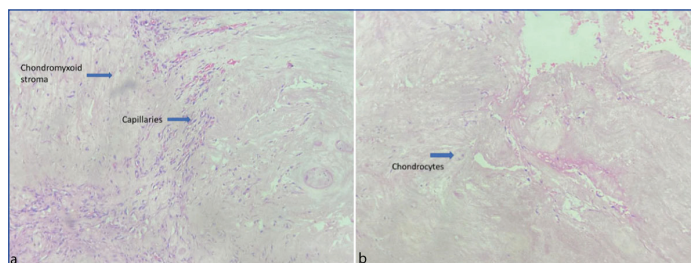
Due to the acute onset of a massive neurological deficit, emergency laminectomy was done. Disc material was found dorsal to the dural sac immediately after flavectomy [Table/Fig-2]. After removing the sequestered disc, we found a deficiency in the posterior longitudinal ligament through which the disc could have migrated. Additional disc fragments were removed through the defect in the posterior annulus. The peroperative specimens were sent to histopathology which confirmed it to be disc material [Table/Fig-3]. At two weeks follow-up, the motor power had improved to 5/5 and bladder disturbance had subsided.

DISCUSSION

Sequestered disc fragments are known to migrate to ventral, superior, inferior and rarely to dorsal epidural space. The restraints for dorsal migration of a disc are posterior longitudinal ligament, midline septum, peridural membrane and Hoffmann's ligament [1]. Dorsal migration can pose diagnostic challenges in differentiating radiologically from infectious or neoplastic aetiologies.



[Table/Fig-2]: Intraoperative picture showing the dorsally migrated disc material (black arrow).



[Table/Fig-3]: Histopathological pictures of disc material (Haematoxylin and Eosin stain; 4x10 magnification).

Lombardi was credited with the first report of a posterior epidural migration of a disc fragment in 1973 [2]. These fragments were previously thought of as benign extradural masses [3]. It needs to be recognised as a special category because of its propensity for presenting as cauda equina syndrome [4].

The five subtypes described in a lumbar disc herniation are bulge, focal protrusion, broad based protrusion, extrusion and sequestration. The sequestered disc accounts for 3% of all lumbar disc herniations. It can migrate laterally, caudally and rostrally. Usually, they lie ventral to the dura and nerve root. The dorsal

S. No.	First author	Patient demographics	Level	Presentation	Special procedure	Recovery
1.	Rai SS et al., [8] 2020	31/M 79/F 47/F	L2-L3 L2-L3 L5-S1	CES (7 days) CES (4 months) CES (14 days)		3 months 3 months 2 months
2.	Jain M et al., [9] 2020	39/F	L4-L5	CES		3 months (sensory only)
3.	Tamburrelli FC et al., [10] 2018	53/M 49/M	L3-L4 T6-T7	Paraparesis Paraparesis		1 month
4.	Kim H et al., 2018 [11]	76/M	L2-L3	Weakness in both lower limbs		3 rd day
5.	Hawkins JC et al., 2018 [4]	40/M	L4-L5	Lower limb weakness		6 weeks
6.	Deora H et al., 2017 [5]	52/M 60/M 57/M	L3-L4 L3-L4 L3-L4	CES (20 Days) CES (7 Days) B/L Foot drop	Contrast MRI done- rim enhancement No enhancement Thick peripheral enhancement	Power improved in all 3 cases
7.	Kil JS and Park JT [12] 2017	57/M	L2-L3	Lower limb weakness following epidural injection for back pain		2 weeks
8.	Turan Y et al., 2017 [13]	Total 9 patients	L3-L4-3 cases L4-L5-3 cases L2-L3-1 Case L5-S1-1 Case	6 cases with CES		Excellent results in 2 cases, good in 4 cases, fair in 2 cases and poor in 1 case.
9.	Takano M et al., 2017 [14]	78/M	L3-L4	Lower limb weakness	L3-L4 Discography done	3 months
10.	Kutty RK et al., 2017 [15]	48/M 49/M	L3-L4 L3-L4	CES CES		No bladder recovery Partial recovery
11.	Bouya SM et al., 2015 [16]	52/M	L3-L4	Weakness ankle and foot		2 months
12.	Akhaddar A et al., [7] 2011	Total 6 patients	L2-L3-1 case L3-L4-3 cases L4-L5-1 case L5-S1-1 case	Paraparesis	Contrast MRI done in 4 cases- showed peripheral rim enhancement	3 months
13.	Present case	45/M	L4-L5	Paraparesis		2 weeks

[Table/Fig-4]: Showing last 10 years published articles with Dorsal Epidural migration [4,5,7-16].

CES: Cauda equina syndrome

epidural migration of a sequestered disc is rarely seen due to the various anatomical restraints like the sagittal midline septum, the lateral peridural membrane, epidural fat and nerve root itself. A posterior migration of disc produces a range of clinical symptoms, from low backache and radiculopathy to cauda equina syndrome, similar to any other lumbar disc herniation. However, neurological deficits related to cauda equina compression are common.

The investigation of choice was contrast MRI with gadolinium enhancement even though the findings are non specific. The sequestered disc fragment produces an inflammatory response and gets sealed off by epidural fat. It appears hypointense in T1 weighted image and iso or hyperintense in T2 weighted image due to increased blood perfusion locally. This produces peripheral ring enhancement in contrast MRI [5]. They may have a communicating track with the native disc. The suspicion of disc fragment compressing the dural sac radiologically can be confirmed definitively only by direct visualisation of it during decompressive surgery and the subsequent histopathological examination.

Radiological differential diagnosis includes facet joint cysts, infections producing epidural abscesses, space occupying lesions like meningioma, lipoma, lymphoma, metastasis and haematoma. Discitis also shows diffuse enhancement of disc space along with peripheral rim enhancement. Tumours show solid homogenous enhancement with contrast. Facet joint cysts are isointense to Cerebrospinal Fluid (CSF), and requires the surgeons to be well trained to read the MRI findings.

The relation between timing of surgery and duration of symptoms is controversial. Early surgical decompression is advocated in these patients. Unilateral hemilaminectomy or total laminectomy can be done depending on the size of the lesion. We concur with Elsharkawy AE et al., that a laminectomy gives a wider exposure,

reducing the chances of dural tear and traction injury to nerve roots [6]. Removal of the sequestered fragment produces significant clinical improvement. Additional fragment removal from disc space is indicated in the presence of a defect in Posterior Longitudinal Ligament (PLL) as proposed by Akhaddar A et al., [7].

Better prognosis is seen in patients with incomplete cauda equina syndrome and early surgery within first three days of onset of symptoms. Faster recovery is seen in these individuals than usual disc herniation surgeries as evidenced in our case. The postoperative recovery was independent of the size of the fragment removed as well as the duration of the compression. A summary of last 10 years published articles with the Dorsal Epidural Migration of disc and recovery pattern given in [Table/Fig-4] [4,5,7-16].

CONCLUSION(S)

In patients presenting with cauda equina syndrome, possibility of dorsal epidural migration of disc material should be kept in mind. It poses a diagnostic challenge and has to be differentiated from neoplastic or infective aetiology. Wider surgical exposure is preferred to avoid iatrogenic damage to neural structures. Timely diagnosis and surgical intervention gives excellent results in this rare occurrence.

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PARTICULARS OF CONTRIBUTORS:

1. Professor, Department of Orthopaedics, SRM Medical College, Chennai, Tamil Nadu, India.
2. Postgraduate, Department of Orthopaedics, SRM Medical College, Chennai, Tamil Nadu, India.
3. Associate Professor, Department of Orthopaedics, SRM Medical College, Chennai, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Rajavel Kalirajan,
SRM Medical College and Hospital, Kattankulathur, Chennai, Tamil Nadu, India.
E-mail: rajavelk@srmist.edu.in

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