



Case Report

Dorsal migration of lumbar disc fragments causing cauda equina syndromes: A three case series and literature review

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ABSTRACT

Background: Dorsal migration of an intervertebral lumbar disc fragment is exceedingly rare and may result in spinal cord or cauda equina compression. Radiologically, these lesions may be misdiagnosed as extradural masses or epidural hematomas.

Case Description: We present three cases involving dorsal migration of sequestered lumbar disc fragments resulting in cauda equina syndromes. A 31-year-old male, 79-year-old female, and 47-year-old female presented with cauda equina syndromes attributed to the migration of dorsal sequestered lumbar disc fragments. Prompt surgical decompression resulted in adequate outcomes. Here, we review the three cases and the current literature for such lesions.

Conclusion: Dorsal migration of sequestered lumbar disc fragments is exceedingly rare, and these lesions are frequently misdiagnosed as extradural masses of other origin or epidural hematomas. Here and in the literature, prompt epidural decompression both confirmed the correct diagnosis and resulted in excellent outcomes.

Keywords: Cauda equina syndrome, Disc, Dorsal, Extruded, Lumbar

INTRODUCTION

Dorsal migration of lumbar intervertebral disc herniations resulting in acute cauda equina syndrome is exceedingly rare. Magnetic resonance imaging (MRI) findings can often be misdiagnosed as extradural masses of other origin or epidural hematomas. Here, we present three cases of dorsal migration of sequestered lumbar discs with posterior migration in patients presenting with cauda equina syndromes (CESs) resolved with posterior decompressions [Table 1] and review the appropriate literature.

CASE PRESENTATION

Case 1

A 31-year-old male presented with 1 week of progressive low back pain, left lower extremity numbness, and weakness after lifting a heavy box. The neurological examination revealed an

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asymmetric CES, 3/5 weakness of the left lower extremity and numbness, and left more than right. The lumbar MRI revealed a posteriorly located extradural lesion at L2–L3 with compression of the thecal sac, thought to represent an extradural tumor [Figure 1]. A L2–L3 laminectomy was performed and revealed an extradural disc herniation that was completely excised. Histopathology confirmed the disc diagnosis. Postoperatively, the patient markedly improved, exhibiting only mild residual left thigh numbness.

Case 2

A 79-year-old female with a history of melanoma presented with the unsteady gait of 4 months duration with urinary urgency. Her only deficit was the weakness of the hip flexors and adductors bilaterally. The lumbar MRI scan demonstrated a dorsal epidural lesion at the L2–3 level with thecal sac compression [Figure 2]. An L2–L3 laminectomy revealed a dark extradural lesion eccentric to the right

eroding into the bone, which histopathology confirmed to be an extruded vertebral disc. Within 3 days postoperatively, she markedly improved and 3 months later was walking independently.

Case 3

A 47-year-old female presented with low back pain and left lower extremity radiculopathy for 2 weeks duration. On examination, she had gastrocnemius weakness, left lower extremity numbness, urinary urgency, and an abnormal gait. The MRI demonstrated a left lateral epidural lesion dorsal to the S1 nerve root with compression of the thecal sac [Figure 3]. An L5/S1 left hemilaminotomy was performed and confirmed that this was an extruded disc. Histopathology was also consistent with a disc herniation. At 2-month follow-up, she had no residual weakness, but only mild residual left lower extremity numbness.

Table 1: Summary table of our presented cases of dorsal disc herniation.

Age/Sex	Clinical symptoms	Level	Follow-up status
31 M	CES (7 days)	L2–L3	Improved with residual left thigh numbness at 3 months postoperatively
79 F	CES (4 months)	L2–L3	Complete resolution of symptoms at 3 months postoperatively
47 F	CES (14 days)	L5–S1	Improved with residual left lower extremity numbness at 2 months postoperatively

CES: Cauda Equina Syndrome. Summary of reported cases of dorsal disc herniation at our institution by age at presentation, gender, clinical presentation, level of disc herniation, and neurologic outcome

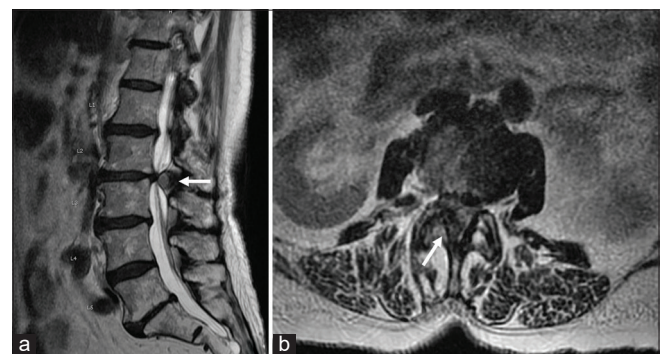


Figure 2: Preoperative sagittal T2-weighted magnetic resonance imaging (MRI) without contrast (a) and axial T2-weighted MRI scan without contrast (b) demonstrate an extradural T2 hypointense lesion in the dorsal epidural space at the level of L2–L3 with severe thecal sac compression (white arrow).

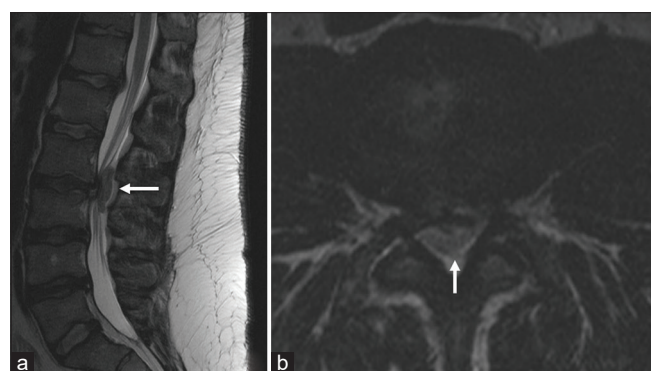


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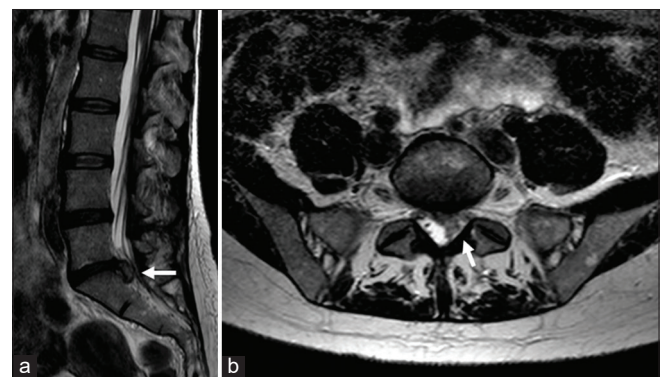


Figure 3: Preoperative sagittal T2-weighted magnetic resonance imaging (MRI) without contrast (a) and axial T2-weighted MRI scan without contrast (b) demonstrate an extradural T2 hypointense lesion in the left dorsal epidural space at the level of L5–S1 with compression of the thecal sac and left S1 nerve root (white arrow).

DISCUSSION

A review of the literature reveals 67 cases of dorsal disc fragment sequestrations, including our three cases.^[1-30] Analysis of the literature revealed that females accounted for only 11 cases of dorsal disc sequestrations out of 67 patients [Table 2].^[1,8,15,16,21,26,30] Males are approximately 6 times more likely to have a dorsally migrated disc as compared to females in our literature review [Figure 4]. The most common location for a posterior epidural disc sequestration was in the lumbar spine at the L3–L4 level [Figure 5]. Patients were mostly in their fifth and sixth decades of life [Figure 6]. Our review of the literature also demonstrated two cases of dorsally located thoracic disc fragments.^[20,28]

Our hypothesis is that a traumatic injury is responsible for the posterior migration of a herniated disc fragment in the lumbar spine. Patients with dorsally migrated lumbar disc fragments most commonly present with cauda equina syndrome (CES), paraparesis, or radiculopathy. The most important diagnostic study for assessing dorsally migrated

lumbar discs is the MRI scan. The lack of continuity of the disc fragment with the intervertebral disc space and the unusual location of the migrated disc fragment can mislead the treating physician and favor the consideration of other differential diagnoses such as epidural tumor or hematoma. Establishing the correct diagnosis with surgical intervention

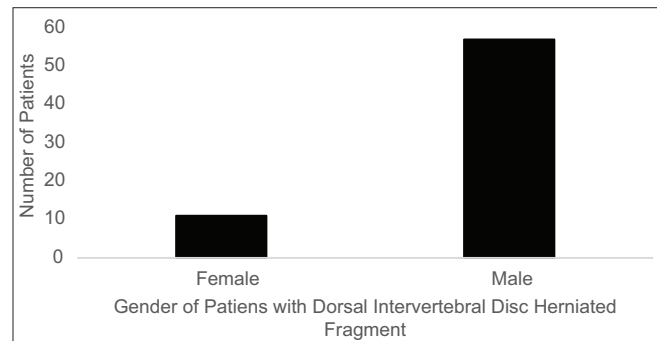


Figure 4: Frequency of dorsally located disc fragment based on gender from literature review.

Table 2: Summary of reported cases of intervertebral dorsal disc herniation.

Author(s)	Number of Patients	Mean age	Gender (M/F)	Radiographic level of dorsal disc herniation
Akhaddar et al., 2011 ^[1]	6	52	5 M; 1 F	1 L2–L3; 3 L4–L4; 1 L4–5
Bonaroti and Welch, 1998 ^[2]	1	51	M	L2–L3
Bouya et al., 2015 ^[3]	1	52	M	L3–L4
Chen et al., 2006 ^[4]	1	75	M	L2–L3
Deroa et al., 2017 ^[5]	3	56.3	3 M	3 L3–L4
Dosoglu et al., 2001 ^[6]	1	47	M	L3–L4
El. Asri et al., 2008 ^[7]	2	39	2 M	2 L5–S1
Eysel and Herbsthofer, 2001 ^[8]	3	41	2 M; 1 F	2 L3–L4; 1 L4–L5
Hawkins et al., 2018 ^[9]	1	40	M	L4–L5
Kil and Park, 2017 ^[10]	1	57	M	L2–L3
Kim et al., 2018 ^[11]	1	76	M	L2–L3
Kim, et al., 2004 ^[12]	1	44	M	L4–L5
Kim, et al., 2010 ^[13]	1	73	M	L4–L5
Kutty et al., 2017 ^[14]	2	48.5	2 M	2 L3–L4
Kuzeyli et al., 2003 ^[15]	3	52.3	2 M; 1 F	1 L1–L2; 1 L2–L3; 1 L4–L5
Lakshmanan et al., 2006 ^[16]	2	43	1 M; 1 F	2 L4–L5
Lichtor, 1989 ^[17]	1	61	M	L2–L3
Lombardi, 1973 ^[18]	2	56	2 M	1 L2–L3; 1 L4–L5
Lutz et al., 1990 ^[19]	1	30	M	L4–L5
Neugroschl et al., 1999 ^[20]	3	55.3	3 M	2 L2–L3; 1 T7–T8
Robe et al., 1999 ^[21]	2	54.5	1 M; 1 F	2 L3–L4
Sakas et al., 1995 ^[22]	1	70	M	L4–L5
Sekerci et al., 1992 ^[23]	1	58	M	L3–L4
Sen et al., 2001 ^[24]	1	36	M	L4–L5
Senel et al., 2003 ^[25]	1	44	M	L3–L4
Sengoz et al., 2011 ^[26]	8	47.9	6 M; 2 F	6 L3–L4; 2 L4–L5
Takano et al., 2017 ^[27]	1	78	M	L3–L4
Tamburelli et al., 2018 ^[28]	2	51	2 M	1 L3–L4; 1 T6–T7
Tatli et al., 2005 ^[29]	2	53.5	2 M	1 L3–L4; 1 L5–S1
Turan et al., 2017 ^[30]	9	49.6	7 M; 2 F	1 L2–L3; 4 L3–L4; 3 L4–L5; 1 L5–S1

Summary of current literature depicting case reports of dorsal migration of extruded lumbar disc herniation by first author, age at presentation, gender, and level of disc herniation

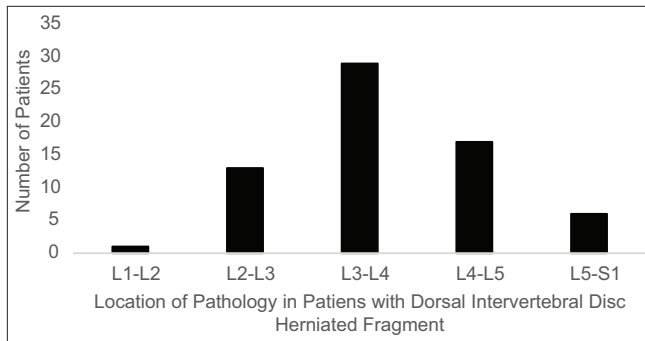


Figure 5: Frequency of dorsally located lumbar disc fragment depending on the lumbar level of pathology from the literature review (excludes two thoracic incidences of dorsal disc fragments at T6/T7 and T7/T8).

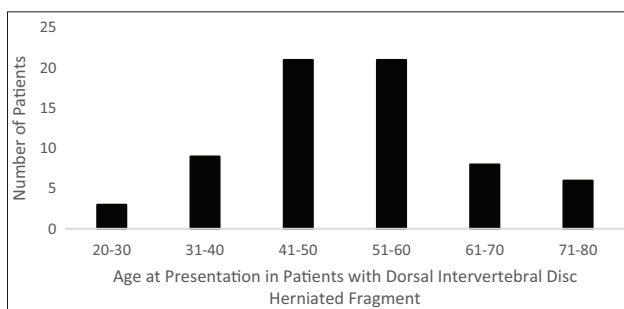


Figure 6: Frequency of dorsally located disc fragment depending on the age of the patient at the presentation from the literature review.

is critical as it also simultaneously provides adequate neural decompression.

CONCLUSION

Dorsal sequestration of lumbar intervertebral discs is rare and may be readily confirmed on MRI studies. As these patients typically present with acute CES or paraparesis, timely decompression is warranted to both confirm the disc pathology and effect neurological recovery.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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