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SHORT REPORT



Acute bilateral foot drop due to lumbar disc herniation treated by bilateral interlaminar approach: case report and literature review

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ABSTRACT

Foot drop due to lumbar disc herniation (LDH) is a relatively common finding in spinal practice. Bilateral foot drop (BFD) due to LDH is an extremely rare condition with only a few reported cases. We describe the case of a middle-aged man presenting with a rapid onset BFD with back and leg pain. Urgent MRI revealed an L4-L5 centrally located LDH with bilateral compression of the L5 nerve roots and the cauda equina centrally. About 4 h after presentation surgery was performed adopting a bilateral L4-L5 interlaminar approach and the prolapsed disc was removed. Nine months after surgery, the patient showed a complete recovery of his deficit. We discuss the advantages of this approach in this urgent situation and we compare it with other techniques.

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bilateral foot drop;
minimally invasive surgery;
microdiscectomy

Introduction

Unilateral foot drop due to lumbar disc herniation (LDH) is a well-known entity, and surgery may provide satisfactory results.¹ Bilateral foot drop (BFD) is a severe condition as it completely compromises the patient's ability to walk. Different causes of BFD are reported in the literature.²⁻¹⁰ BFD due to LDH is extremely rare. We present the case of a man with acute BFD due to an L4-L5 LDH treated by a bilateral interlaminar approach.

Case report

A 54-year-old man presented with mild back and buttock pain radiated to the L5 dermatomes bilaterally (worse on the left side) for 2-3 weeks. About 5 d prior to the pain got worse, and he noticed difficulty walking. Medical history included impaired fasting glycemia for the last 3 years that was partially controlled with metformin (pre-prandial blood glucose 6.7 mmol/L). He had no signs or symptoms of peripheral neuropathy. On neurological examination, bilateral weakness of ankle dorsiflexion (2/5 on the left side, 1/5 on the right side) and hallux extension (0/5) was documented. A bilateral weakness in ankle plantar flexion was noted too (4/5). No sensory disturbances were documented. Deep tendon reflexes were normal and no upper motor neuron signs were noted. There were no signs or symptoms of cauda equina syndrome. An MRI revealed an L4-L5, centrally located disc herniation with evidence of compression of both L5 lateral recesses. A small, herniated fragment had migrated cranially to the right (Figure 1). The AP diameter of his spinal canal at the narrowest level was 11.7 mm, giving a picture of relative spinal stenosis.¹¹ The patient agreed to have surgery, 4 h from the presentation he underwent a lumbar L4-L5 bilateral interlaminar

decompression. A herniated disc fragment was removed and a discectomy performed (Figure 2). The patient had no postoperative complications and 4 d after surgery he had partially recovered the weakness on the left to 3/5. He was discharged with an ankle orthosis. The patient completed 4 weeks of intensive rehabilitation and 9 months after surgery had completely recovered his motor deficit bilaterally.

Discussion

BFD due to LDH is an extremely rare condition with only a few cases reported (Table 1). Mahapatra *et al.* reported a young man presenting with acute BFD and cauda equina syndrome due to an L3-L4 prolapsed disc. The patient recovered well after an L3-L4 laminectomy.¹² Oluigbo *et al.* reported BFD in 81 years old man with an L3-L4 and L4-L5 lumbar stenosis, in the absence of any prolapsed disc. The patient completely recovered his deficit after an L3-L5 decompressive laminectomy.¹⁴ Ramnaryan and Palnikumar reported a 72 years old lady with BFD caused by an L4-L5 LDH who completely recovered ankle dorsiflexion after laminectomy.¹³ Kertmen *et al.* reported the first BFD without cauda equina syndrome due to L4-L5 LDH and the first due to D12-L1 LDH with intradural extension. Both patients were treated by laminectomy a few hours after symptoms' onset and both recovered well in the postoperative period.¹⁵ Adsul was the first to adopt a minimally invasive approach for this condition. A 46 years old man presented with an acute BFD due to and L4-L5 LDH in an L2-L3 and L5-S1 canal stenosis. After an endoscopic percutaneous interlaminar and transforaminal decompression and discectomy, the patient completely recovered his strength.¹⁶ In most of the described cases, a laminectomy was the adopted surgical technique.¹²⁻¹⁵ For our patient we preferred an interlaminar bilateral approach.¹⁷ We believe this high recovery rate

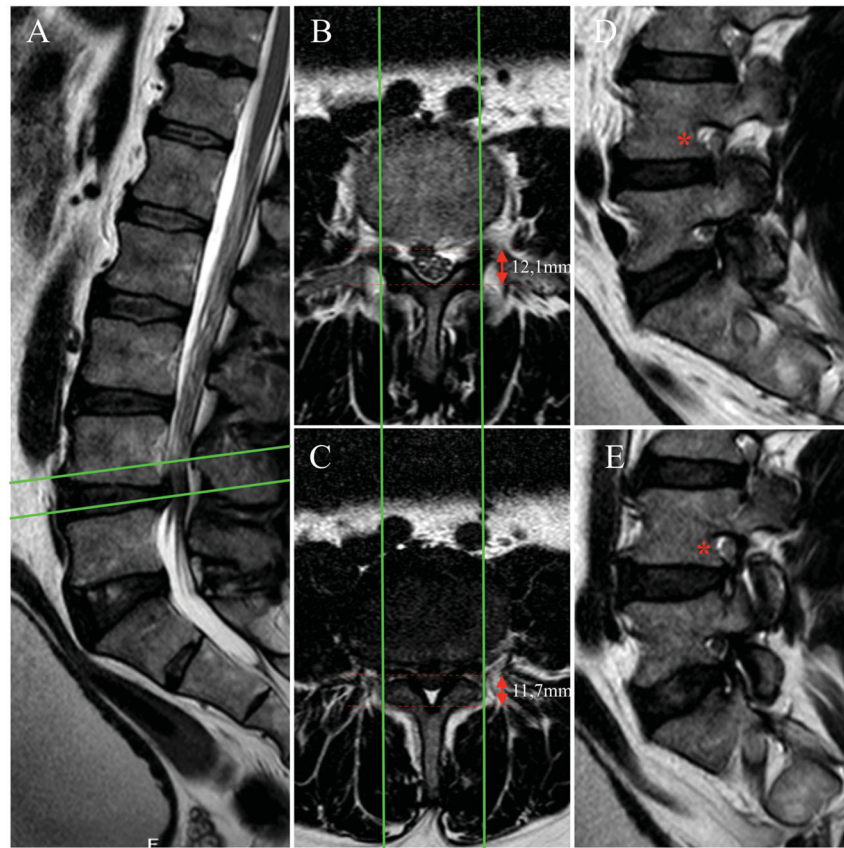


Figure 1. Pre-operative lumbar T2 MR sequences. A centrally located LDH is seen on a medial sagittal plane at L4-L5 (A); a fragment is cranially migrated on the right side (B). On the axial planes (horizontal lines) an L4-L5 centrally located LDH is seen with evidence of compression of the L5 lateral recesses bilaterally and the cauda equina roots. The AP diameter of the spinal canal is reduced, without evident signs of ligamentum flavum hypertrophy (B,C). The left (D) and right (E) L4-L5 foramina (*) on sagittal planes (vertical lines) do not appear significantly narrowed.

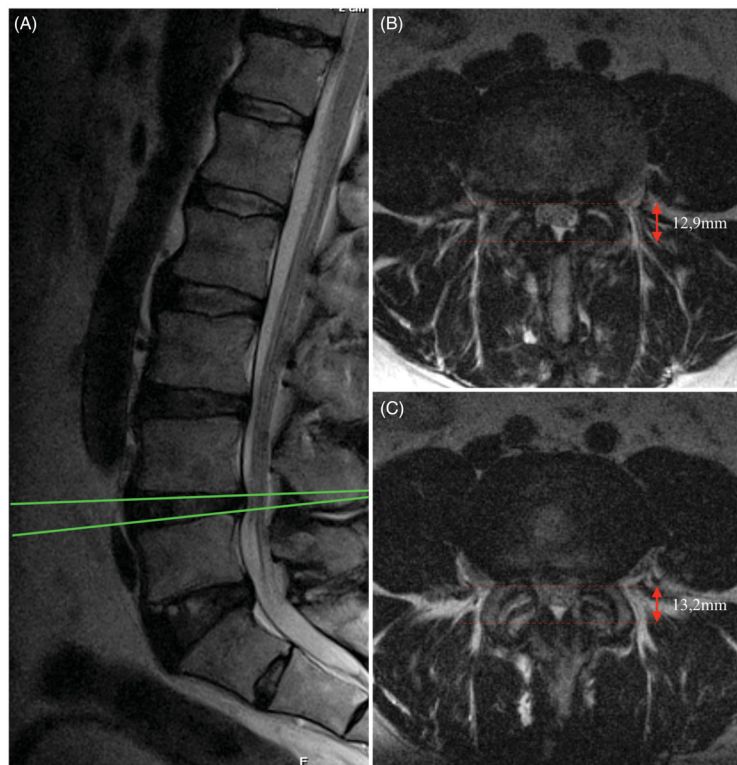


Figure 2. Post-operative lumbar T2 MR sequences. The spinal canal appears decompressed both on the sagittal (A) and axial planes (B,C). The cauda equina roots appear less engulged and the AP diameter of the canal is wider. The signs of surgical manipulation are minimal with complete preservation of the spinous processes, of the posterior ligamentous complex and of the articular facets.

Table 1. Previously reported cases of BFD due to LDH and/or lumbar stenosis.

Authors	Age, sex	Symptoms	R/L	Onset	Onset to surgery	Level	LDH/stenosis	Technique	f/u (m)	Outcome (R/L)
Mahapatra <i>et al.</i> ¹²	30, M	Bp, Lp, CE	0/0	6 h	~6 h	L3–L4	LDH/stenosis	La + H	3	4+/4+
Ramnaryan <i>et al.</i> ¹³	72, F	Bp	1–2/1–2	Sudden	ns	L4–L5	LDH/stenosis	La + H + D	1	5/5
Oluigbo <i>et al.</i> ¹⁴	81, M	Bp, Lp	3 (2 hall)/3 (2 hall)	24 h	32 d	L3–L4, L4–L5	Stenosis	La	6	5/5
Kertmen <i>et al.</i> ¹⁵	45, M	Bp	1/1	Sudden	4 h	L4–L5	LDH	La + H	1	5/5
	50, M	Bp	1/1	Sudden	6 h	D12–L1	LDH (intradural)	La + H	1	4+/4+
Adsul <i>et al.</i> ¹⁶	43, M	Bp	1/1	Sudden	1 d	L4–L5, L5–S1	LDH/stenosis	En + H	3	5 (4 hall)/5
This study	54, M	Bp, Lp	1(0 hall)/2 (0 hall)	~1 d	5 d	L4–L5	LDH	I + E + D	9	5/5

M: male; F: female; Bp: backpain; Lp: legpain; CE: cauda equina symptoms; R: right; L: left; all: hallux; ns: not specified; La: laminectomy; H: ernictomy; D: discectomy; En: endoscopic; I: interlaminar.

could be due to the short interval between the onset of symptoms and the surgery as bilateral foot drop is much more disabling than unilateral and so presents early.

Conclusions

Bilateral foot drop caused by Lumbar Disc disease responds unexpectedly well to decompression.

Written, informed consent was obtained from the patient for his information to be included in our manuscript. His information has been deidentified to the best of our ability to protect his privacy.

Disclosure statement

No potential conflict of interest was reported by the authors.

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