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Early Results of a Delayed Decompressive Laminectomy for Severe Acute Cauda Equina Syndrome in a 24-Year-Old Man Due to Traumatic Prolapse of Intervertebral Disc at L4/L5 Disc Space in Irrua: A Case Report

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Abstract

Background: Cauda equina syndrome (CES) is an uncommon but potentially devastating neurological condition caused by compression of the lumbosacral nerve roots. It constitutes a spinal surgical emergency because delayed diagnosis and decompression may result in permanent neurological deficits, including bladder, bowel, and sexual dysfunction, as well as lower-limb paralysis.

Case Report: A 24-year-old single man, a fashion designer presented with a one-day complaints of acute inability to walk, urinary retention, bowel dysfunction, saddle anaesthesia, and bilateral lower limb weaknesses following a domestic fall onto his lower back. Clinical examination revealed bilateral lower-limb weaknesses, reduced reflexes, saddle anaesthesia, and absent anal, bulbocavernosus and Babinski reflexes. Magnetic resonance imaging obtained 5 days after the request owing to financial constraints, demonstrated severe canal compromise with near-complete obliteration of the thecal sac due to massive prolapse at the L4/L5 disc space. He was diagnosed of severe acute CES secondary to traumatic lumbar disc prolapse and he underwent urgent open decompressive noninstrumented laminectomy and limited posterolateral fusion at L4/L5 after one week of injury. Immediate postoperative recovery was dramatic in terms of motor and sensory recovery in the lower limbs, and there was no infection; but there was persistent saddle anaesthesia, absent anal and bulbocavernous reflexes, and weakness in plantar flexion and dorsiflexion at the ankle joints. At 8 weeks follow-up, he attained vertebral fusion and demonstrated progressive neurological recovery and was able to ambulate on a Zimmer frame in spite of the residual sacral neural deficits.

Conclusion: Severe acute cauda equina syndrome secondary to traumatic lumbar disc prolapse is rare and a devastating lesion in a young man, which requires prompt recognition and urgent surgical decompression. This case demonstrates that early useful neurological recovery is achievable despite one-week delay in the timing of surgical intervention in a young man.

Keywords: Severe Acute Cauda Equina Syndrome, Traumatic Lumbar Disc Prolapse, Delayed Open Decompression, Noninstrumented Laminectomy, Limited Posterolateral Spinal Fusion, Young Man, Spinal Emergency, MRI, Rural Setting, Early Results.

1. Introduction

Cauda equina syndrome results from compression of multiple lumbar and sacral nerve roots in the thecal sac within the vertebral canal, producing characteristic neurological manifestations, including bilateral lower-limb weakness, saddle anaesthesia, urinary retention, and bowel dysfunction. It remains one of the most important emergencies in spinal surgery because prolonged compression may lead to irreversible neurological impairment.

Lumbar disc prolapse is the most common cause of cauda equina syndrome, although trauma-induced acute disc extrusion resulting in CES is relatively uncommon. The incidence of CES is estimated at approximately 1-3 cases per 100,000 individuals annually, although the true incidence varies among populations [1,2].

The diagnosis of CES is primarily clinical and is supported by urgent magnetic resonance imaging (MRI), which remains the gold-standard investigation for identifying compressive pathology [3,4,5]. Early surgical decompression has been advocated by many authors, particularly for patients presenting with progressive neurological deterioration and bladder dysfunction [6,7,8,9].

This case report describes the management of a young man who developed acute cauda equina syndrome following a fall, with severe traumatic L4/L5 prolapsed intervertebral disc. The condition was managed successfully with urgent open decompressive noninstrumented laminectomy and posterolateral fusion in a rural tertiary healthcare setting.

2. Case Report

A.F, a 24-year-old single man, fashion designer, who resides at Ihumundumu, Ekpoma in Esan West Local government Area of Edo state, Nigeria.

He was brought to the accident and emergency unit of Irrua Specialist Teaching Hospital on the 7th of June 2026 with one day complaints of inability to walk, pass urine and control bowel

movement following a domestic fall. He was said to have slipped off a wet floor while separating a fight and he fell on his lower back. Immediately, he developed severe low back pain that radiates to both lower limbs. This was followed with progressive weakness of both lower limbs, which made him subsequently not to walk, developed urinary retention and loss of anal control. He also noticed numbness over the perineal area and lower limbs. He had no other associated injuries. Following the injuries, he was taken to a peripheral hospital where he had urethral catheterization, and had other initial treatment, before he was referred verbally to our facility.

On getting to our facility, after above history, he was examined and found to be a young man, lying supine in bed with urethral catheter insitu draining clear urine, he was afebrile, not pale, anicteric, acyanosed and he was not dehydrated. He couldn't ambulate or perform straight leg raises in both lower limbs. Sensation was patchy on both lower limbs, sparing L4 and L5 dermatomes. Motor on both right and left (L2-L5 and S1) lower limbs were 1/5 on the right and 2/5 on the left. Had hypotonia on both lower limbs, knee reflexes were equivocal, ankle reflexes were absent, Babinski reflexes were absent and had no clonus. He had saddle anaesthesia, absent anal and bulbocavernous reflexes. He was diagnosed of severe acute CES secondary to traumatic lumbar disc prolapse and the differential diagnosis of Conus Medullaris Syndrome (CMS) was not entertained based on the clinical findings. He was advised to do urgent magnetic resonance imaging of the lumbosacral spine at the nearby health facility in Benin City, and he left in a private vehicle, but did not return until after five days because of financial constraints. The magnetic resonant imaging (MRI) findings are as shown in figure 1 with severe thecal compression at L4/L5 disc space.



Figure 1: The MRI of the lumbosacral spine done reveal severe compression on L4/L5, nearly obliterating the thecal sac with mild disc prolapse at L3/L4 and L5/S1 disc spaces

He was subsequently booked for emergency open decompressive noninstrumented laminectomy and limited posterolateral fusion of L4/L5 as shown in figure 2. Intraoperative findings were massive disc prolapse tissues at L4/L5 disc space forming a constriction band and compressing the thecal sac at that level, which were excised to free the sac.

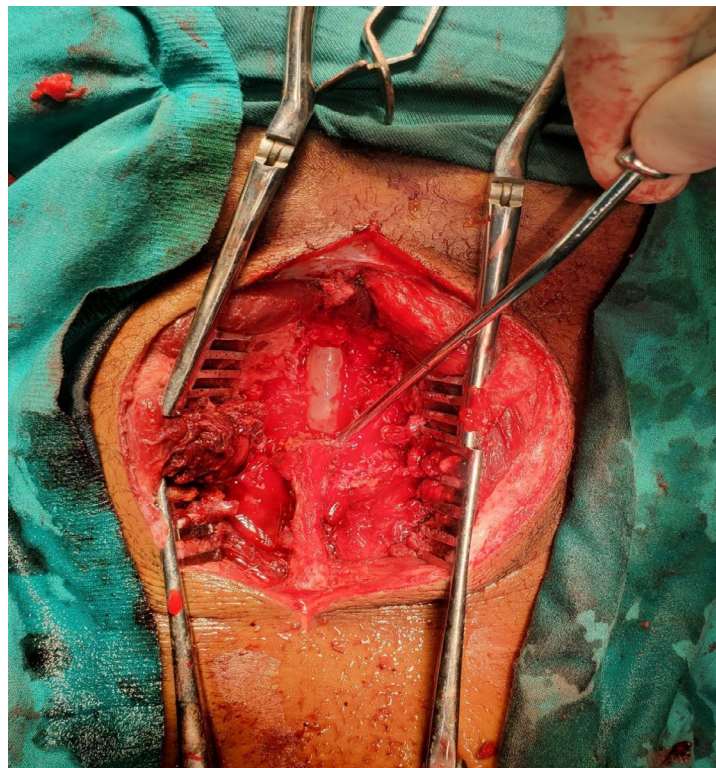


Figure 2: Open decompressive noninstrumented laminectomy and posterolateral fusion for acute CES due to traumatic lumbar disc prolapse at L4/L5 disc space

He was placed on Intravenous antibiotics, analgesics, and intravenous fluids postoperatively on water bed. His surgical wounds and vertebral fusion healed satisfactorily and was discharged to follow up after eight weeks of bed rest and physiotherapy. He left for home ambulating with Zimmer frame after successful bladder training and has gradually started regaining full power of both lower limbs 8 weeks postoperatively. However, the residual sacral neural deficits persist including bilateral weaknesses in ankle dorsiflexion and planterflexion, sacral anaesthesia, absent anal and bulbocavernosus reflexes. He is doing well on adult pampers. He is happy and satisfied with the early results of management.

3. Discussions

Cauda equina syndrome remains a challenging spinal emergency because neurological outcomes depend on the severity and duration of nerve-root compression. The present case demonstrates a classical presentation of CES, characterized by acute and progressive bilateral neurological deficits in the lower limbs, urinary retention, saddle anaesthesia, and bowel dysfunction in a young man. These clinical findings have consistently been recognized as important diagnostic indicators of CES in previous studies [1,10-16].

The mechanism in this patient was unusual because CES developed following a relatively low-energy trauma. Most traumatic cases of CES are associated with vertebral fractures, dislocations, or high-energy trauma. However, acute traumatic disc extrusion may occur when a sudden axial load or flexion injury causes extrusion of a previously vulnerable disc, resulting in rapid neurological compromise [17,18]. In this patient, MRI demonstrated severe L4/L5 compression with associated adjacent-level disc prolapses, supporting acute disc-related neural compression as the underlying cause.

MRI remains the investigation of choice in suspected CES because it accurately identifies the level and severity of compression and facilitates operative planning. Todd emphasized that urgent MRI should be obtained in patients with symptoms suggestive of CES to minimize delays in diagnosis and treatment [3]. However, in the index case, lack of MRI services in the rural health facility and financial constraints in the resource-limited setting contributed to further delay in surgical intervention. Albeit, current clinical guidance recommends urgent assessment and imaging when red-flag symptoms, such as urinary retention, saddle anaesthesia, or progressive neurological deficits, are present [4,5]. In the present case, MRI demonstrated almost complete obliteration of the neural canal at L4/L5 disc space, supporting the need for urgent decompression.

The timing of decompression in CES has been extensively debated. Earlier literature advocated decompression within 24-48 hours to optimize neurological recovery, particularly bladder function [6,7,15,18]. More recent systematic reviews and meta-analyses indicate that early surgery remains desirable, although the strength of the evidence is limited by heterogeneity in definitions, timing, symptom duration, and preoperative bladder function may

also influence outcomes [16,19,20]. The improvement observed in this patient, despite the delay in doing MRI, demonstrates that useful recovery may still occur when definitive decompression is achieved within one week in young patients.

The surgical procedure performed was an open decompressive noninstrumented laminectomy and limited posterolateral fusion of L4/L5 vertebrae in a young man. This remains an accepted approach for lumbar disc-related CES because it provides rapid neural decompression and permits removal of the offending disc materials. Ahn et al. reported improved outcomes following surgical decompression for CES secondary to lumbar disc herniation, particularly with respect to pain relief and neurological recovery [6]. Other studies have similarly reported gradual postoperative improvement in motor, sensory, bladder, bowel, and sexual function, although recovery may be incomplete and prolonged [15,18-20]. An important aspect of this case is the setting in which management occurred.

Delayed surgery owing to limited access to MRI services remains a significant challenge in many rural healthcare environments. Nevertheless, recognition of red-flag symptoms, timely imaging, and surgical intervention contributed to a favourable outcome. This underscores the importance of developing and strengthening emergency imaging capacity, and improving spinal emergency services in resource-limited regions. Standardized clinical assessment may also facilitate early recognition and referral, although the reliability of individual clinical findings varies [13,14].

The neurological improvement at 8 weeks, including assisted ambulation and recovery of lower-limb power, compares favourably with published outcomes in which early decompression resulted in gradual recovery of motor and bladder function [8,9,19]. However, long-term follow-up remains necessary because recovery of bowel, bladder, and sexual function may continue for several months or even years after decompression. Patients would therefore continue to receive structured rehabilitation, urological review when indicated, with the ongoing neurological assessment.

4. Conclusions

Acute severe cauda equina syndrome secondary to traumatic lumbar disc prolapse is uncommon but constitutes a true spinal emergency. Though, early recognition of neurological warning signs, urgent MRI evaluation, and prompt surgical decompression remain essential principles of management; the index case demonstrates that favourable neurological recovery can be achieved in young adults with appropriate diagnostic evaluation despite delayed timing of the operative treatment.

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