Case Report

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Management of a cauda equina syndrome in a 24 years old military person: a case report

Sabin Poudel, MBBS*, Samikshya Adhikari, MBBS, Aashutosh Pokharel, Anup Mishra, Mrigank Pratik

Introduction: Cauda equina syndrome (CES) is a rare condition that arises due to various underlying conditions and comprises pentad back pain, saddle anesthesia, bowel bladder disorder, sensory and motor dysfunction, and sexual dysfunction.
Case presentations: The authors hereby present a case of CES in a 24 years old military person who was actively involved in exercise and heavy weight lifting. He was received at the emergency department with symptoms of low back pain with bladder and bowel incontinence, diagnosis of CES was made based on history, clinical examination, and radiological assessments. He was treated under expert surveillance. After the initial treatment he was admitted in the ward for almost a month due to intolerable low back pain. However currently he is showing good signs of recovery in 6 months follow-up.
Clinical discussion: Early diagnosis of CES is likely to be beneficial as it helps delay deterioration, prevents further complications and improve the quality of life of patients but the diagnosis of this syndrome is usually delayed due to unavailability of diagnostic facilities in every health care center. So, assessment of this syndrome should be made among patient presenting with suggestive symptoms for timely diagnosis and better outcome.
Conclusion: CES is a surgical emergency requiring early diagnosis and early intervention to prevent further complications.

Keywords: cauda equina syndrome, laminotomy, low back pain, radiculopathy

Introduction

Cauda equina syndrome (CES) is a surgical emergency condition which often presents with a constellation of symptoms like saddle anesthesia, lower back pain, bowel and bladder dysfunction, loss of sensory-motor function of lower extremities[1]. It is due to compression of lumbosacral nerve at or below the level of conus medullaris due to herniated disc, trauma, spinal stenosis, spinal tumors, primary and metastatic neoplasm, inflammatory and infectious conditions or due to accidental intervention[2]. CES is clinically diagnosed with complete history, thorough physical examination and is confirmed by magnetic resonance imaging and computed tomography imaging[3]. Treatment modality includes symptomatic management followed by laminotomy and microdiscectomy to prevent catastrophic complications like permanent incontinence and paraplegia[4,5]. Here, we present a case report with detailed follow-up who underwent laminotomy and microdiscectomy for CES within 48 hours of presenting symptoms in a 24 years old military person. This case report has been reported in line with SCARE 2023 criteria[6].

and Nepalese Army Institute of Health Sciences, Kathmandu, Nepal

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*Corresponding author. Address: Nepalese Army Institute of Health Sciences, Kahmandu 44600, Nepal. Tel.: +977-9868611378. E-mail: sabin.poudel08@naihs.edu.np (S. Poudel).

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Case presentation

A 24 years old male, known case of prolapse of intervertebral disc at L5-S1 (bilaterally) with right sided radiculopathy presented to the emergency department of Shree Birendra Hospital with lower back pain and bowel, bladder incontinence. According to him the lower back pain started 1 year back while he was lifting heavy weight in army training. Pain was gradually progressive with shooting character over the right lower limb, aggravated during movement and relieved on rest. Since last month, lower back pain has been increasing in severity. He also mentioned difficulty while standing and walking. There was also numbness and decreased fine touch and prick sensation in the right lower limb. He is a known case of Prolapsed Intervertebral Disc with right sided radiculopathy for which he was admitted in Shree Birendra Hospital for 17 days 2 months prior for which micro lumbar discectomy was planned but he refused for surgery and was discharged on pregabalin, painkiller and lumbar belt and was also advised for physiotherapy. There were no any significant history of fever, burning micturition, and hematuria and no any significant past surgical or family history.

On examination, the patient was alert and oriented and had stable vital signs. On examination, there was paraspinal tenderness, bowel and bladder incontinence along with normal anal tone on DRE, intact perianal sensation and positive bulbocavernosus reflex. Straight leg raise test, Bryant and Bow-string test was negative on examination. On sensory and motor examination his bilateral lower limb was intact.

X-ray of spine on anteroposterior view and lateral view showed loss of lumbar lordosis and decreased space between L4 and L5 as shown in Fig. 1. The findings of MRI of L-S spine were Lumbar spondylosis, Loss of Lumbar lordosis, Schmorl's nodes were seen at end plates of L2 and L3 vertebral bodies. Disc desiccation was seen at L4-L5 and L5-S1 disc levels. At L4-L5 level: Diffuse disc with indentation of right L5 traversing nerve root and bilateral ligamentum flavum hypertrophy was seen.

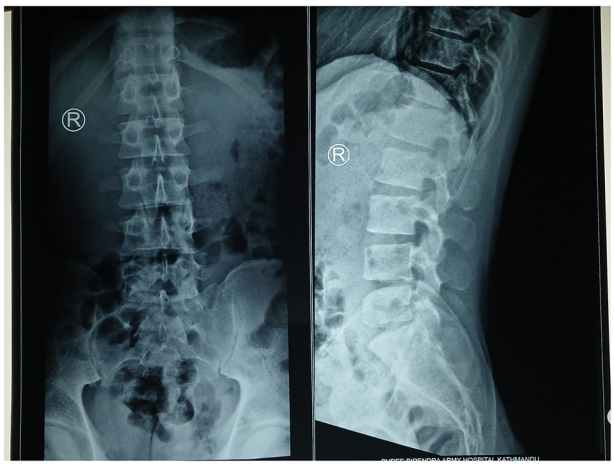

Figure 1. X-ray of L-S spine AP and lateral view.

Table 1

Laboratory Investigations

Test	Results	Reference value
TLC	6.1×10^3	4000–11 000 cells/cumm
Hb	17.1	M: 13–17 g/dL F: 12–15 g/dL
Platelets	252×10^3	150 000–400 000 cells/cumm
PT/INR	15/1.2	Control: 11.8 Second: 1.2
Urea	19.2	13–43 mg/dL
Na^+/K^+	142/3.7	Na^+: 136–145 meq/L K^+: 3.5–5.1 meq/L
Urea/creatinine	19.2/1.27	Urea: 13–43 mg/dL Creatinine: M:0.9–1.3 mg/dL F: 0.6–1.1 mg/dL
ALP	79	Up to 46 U/l
Amylase	87	Up to 90 U/l
Total bilirubin	0.74	0.3–1.2 mg/dL
Direct bilirubin	0.34	<0.2 mg/dL

At L5-S1: Diffuse disc bulge, left paracentral disc protrusion with indentation of bilateral S1 traversing nerve roots and Left L5 exiting nerve root was seen. Bilateral ligamentum flavum hypertrophy with Secondary Spinal canal stenosis was detected as shown in Fig. 2. USG was done to see any residual volume of urine in post-voiding. There were no significant findings in Ultrasonography of Abdomen and Pelvis with prevoid volume of 32 cc and nil post voidal residual urine.

Routine investigations revealed no abnormal findings as shown in Table 1.

Following the investigation, microdiscectomy with L5 laminectomy was done within 48 hours of presentation. Following his treatment, the patient was kept on close observation. Patient complained of back pain and there was an increased CRP level. Following normal CRP levels on the 10th day, the patient was discharged. After 3 days of discharge was admitted again with a diagnosis of persistent spinal pain syndrome.

Currently, the patient is recovering and is under regular physiotherapy such as Knee to chest, Lumbar rotation, Bridging etc. He doesn't have any complaints of bladder, bowel incontinence or sexual dysfunction. However, his back pain still persists which increases on walking for a long distance and heavy exercise.

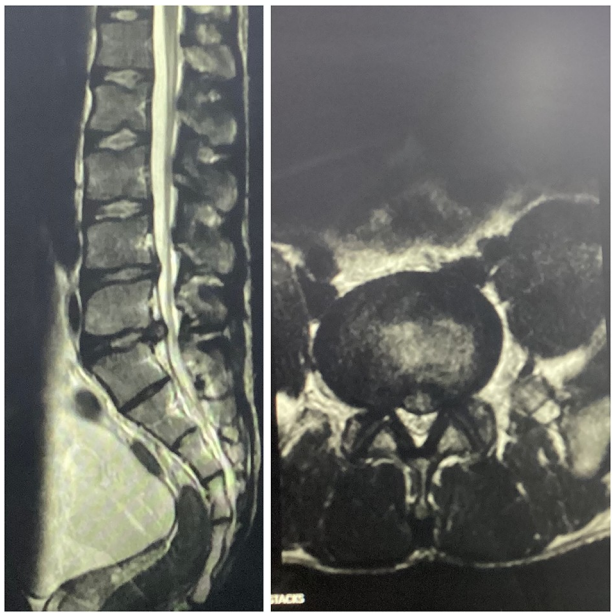

Figure 2. Sagittal and axial MRI images at the level of CE compression.

Discussion

CES is a syndrome resulting due to compression of cauda equina group of nerves originating from L1 to L5 and axons of nerves that provide sensory and motor innervation to legs, bladder, anus, perinium which generally presents as a neurological emergency with symptoms like back pain radiating to the legs, motor and sensory dysfunction of lower extremities, bowel and bladder dysfunction, sexual dysfunction and saddle anesthesia[7]. It is caused due to trauma, spinal stenosis, herniated disc, spinal tumors, primary and metastatic neoplasm, inflammatory and infectious conditions or due to accidental intervention[2]. CES has an incidence rate of 2.7 per 100 000 person-year in the non-military population however the incidence is higher in military personnel of 7 per 100 000 person-year[8,9]. Woodfield *et al* have also mentioned that the majority of people fall under below 50 years old age category which is in line with our young patient.[8] Our patient also presented with lower back pain along with numbness and decreased sensation in the right lower limb with bowel and bladder dysfunction.

CES can be diagnosed through a detailed history, physical examination, and diagnostic imaging. Imaging includes magnetic resonance imaging (MRI), computed tomography, myelography (CTM), ultrasonography and conventional radiography of which MRI is considered as gold standard[10]. In our case detailed history, physical examination, X-ray and MRI were done to make diagnosis of CES.

Our hospital being a tertiary care center had all the necessary equipment and manpower to do rapid and prompt diagnosis however the scenario might not be the same everywhere mostly in the rural areas where even X-ray is not available. In such cases due to lack of equipment or manpower, diagnosis of CES may not be easy leading to delay in treatment which may hamper the outcome for the patient lifelong.

Treatment modality includes symptomatic management followed by Laminotomy or total laminectomy/hemilaminectomy and MicroDiscectomy of the extruded intervertebral disc (IVD) which has to be done within 48 hours for best result[11,12]. Microdiscectomy has a general success rate of 75–80%[3]. An article by Todd *et al* mentions that three factors determine the outcome in CES that includes the degree of neurological deficit, the duration of decompression and the speed of onset[13]. True recovery is confirmed by doing cystometry which can have diagnostic as well as prognostic value[14].

In our case laminotomy and microdiscectomy was done within 48 hours of onset of symptoms.

A study done by Sangondimath *et al*[15] showed that 34.88% people had backache, 16.27% people had leg pain, 60.46% had perineal numbness, 62.79% had lower limb numbness in mean 2.94 years follow up after surgery. Whereas our patient complained only of low back pain and leg pain in 6 months.

A study done by Dhatt *et al*[14] has found a strong positive correlation between delay in surgery with duration taken for total recovery. Here we have a case of a male patient who presented with symptoms of CES who underwent surgery within 48 hours of initial symptoms. Our patient is showing a good sign of recovery with just back pain and leg pain remains while all other symptoms like bowel and bladder incontinence, and sexual dysfunction have been solved which is in accordance with the findings of Dhatt *et al*. In a developing country like ours, obtaining a quick and precise diagnosis is often not feasible which will delay the diagnosis and necessary intervention leading to worse prognosis. Our case report shows that a good outcome can be achieved with proper observation, a good multi-disciplinary team and prompt intervention which could be crucial for developing countries like Nepal.

Conclusions

We present the case of 24-year-old-military person with CES whose diagnosis was based upon history, clinical finding and radiological examination. This is a rare condition which if not treated timely can create a permanent catastrophic damage to a patient's health. Timely treatment, regular follow-up to health care providers, lifestyle modification is necessary to adapt and prevent further complications in these patients.

Ethical approval

This is a case report; therefore, it did not require ethical approval from ethics committee.

Consent

Written informed consent was obtained from the patient for publication of this case report. A copy of the written consent is available for review by the editor-in-chief of this journal on request.

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Author's contribution

All authors: writing the paper, collection of data, revising it critically for important intellectual content, review, and editing

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We the undersigned declare that this manuscript is original, has not been published before and is not currently being considered for publication elsewhere. We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us. We understand that the Corresponding Author is the sole contact for the Editorial process. He/she is responsible for communicating with the other authors about progress, submissions of revisions and final approval of proofs.

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