

A Case of Delay in Diagnosis of Cauda Equina Syndrome along with Complications; Ideally, A Surgical Emergency

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Abstract

Cauda equina syndrome is a clinical syndrome characterized by low back pain, unilateral or bilateral sciatica, motor weakness of lower extremities, saddle anesthesia, bowel and bladder dysfunction and occasionally paraplegia—resulting from cauda equina compression. It can be described in two forms based on the onset of signs and symptoms—if symptoms appear within 24 hours then it is acute in onset and if patient develops symptoms after several weeks or months then it is gradual in onset. The sooner it can be diagnosed, the better is the chance that the patient makes a better recovery from symptoms of nerve damage. We present a case of a 24-year old male with history of fall 6 months back who was treated outside with simple analgesics without any surgical intervention. The case was clinically diagnosed in the Emergency Department (ED) as CES and an MRI was ordered which confirmed the diagnosis. The patient was referred to the Neurosurgery Department and operated the next day with good clinical outcome.

Keywords: Prolapsed Inter Vertebral Disc (PIVD); Cauda Equina Syndrome (CES); Microdiscectomy; Saddle Anesthesia; Magnetic Resonance Imaging (MRI); Anal Wink; Anal Sphincter Tone; Bladder and Bowel Disturbances; Red Flag Signs.

Introduction

Cauda equina syndrome is a clinical manifestation resulting due to compression of the nerve roots below the termination of the spinal cord (conus medullaris). The cauda equina contains nerve roots from L1-L5 and S1-S5.

Causes of cauda equina syndrome include:

1. Central disc prolapse
2. Tumour
3. Spinal stenosis (e.g. osteoarthritis, ankylosing spondylitis)
4. Epidural haematoma (e.g. post-spinal anaesthesia or lumbar puncture)
5. Trauma (blunt or penetrating)
6. Spinal epidural abscess [1]

The following are the Red flags signs for back pain [2].

Possible Diagnosis	Red flags
Vertebral Fractures	History of trauma (might be minimal in the elderly or those with osteoporosis) Prolonged steroid use
Tumor	Age <20 or > 50 years Malignancy history Non-mechanical pain Thoracic pain Systemically unwell patients Weight loss
Spinal Infection	Fever Systemically unwell patients i.v. drug use Immunosuppression HIV infected patients Patients with recent bacterial infection Non-mechanical pain Pain worsening at night

Cauda Equina Syndrome	Patients with saddle anesthesia Bladder or bowel dysfunction Gait disturbance Widespread / progressive motor weakness Bilateral sciatica in patients
AAA	Systemically unwell patients Cardiovascular compromise Pulsatile abdominal mass
Inflammatory rheumatic disease (e.g. ankylosing spondylitis)	Age <20 years Structural deformity of the spine Systemically unwell patients

It is of two types based on onset; acute and gradual. If symptoms occur within 24 hours then it is acute in onset and if patient develops symptoms after several weeks or months then it is gradual in onset. MRI (magnetic resonance imaging) is the standard method of confirming the presence of CES and for planning surgical treatment. The sooner it can be diagnosed, the better is the chance that the patient makes a better recovery from symptoms of nerve damage. It generally requires prompt surgical decompression in order to decrease or eliminate pressure on the affected nerves. Surgical decompression is advocated as soon as possible,

within about 8 hours of the onset of symptoms if symptoms develop suddenly. Next to surgery, the extent of recovery is uncertain. Patients may continue to experience low back or leg pain, bladder or bowel dysfunction, and other physical problems depending on the duration of nerve compression and the severity of symptoms at the time of surgery. If patients with cauda equina syndrome do not receive treatment quickly, adverse results can include paralysis, impaired bladder and/or bowel control, difficulty walking, and/or other neurological and physical problems.

Case Study

A 24-year old male farmer of Indian origin with a history of fall from a tractor 6 months back was brought to the emergency department at around 05:00 pm by his relatives with complaints of exacerbation of lower backache since one day.

The patient gave history of falling from a tractor 6 months back after which he has had complaints of lower backache on and off, post voidal retention, urinary hesitancy, difficulty in passing stools, difficulty in walking, saddle anaesthesia since then.

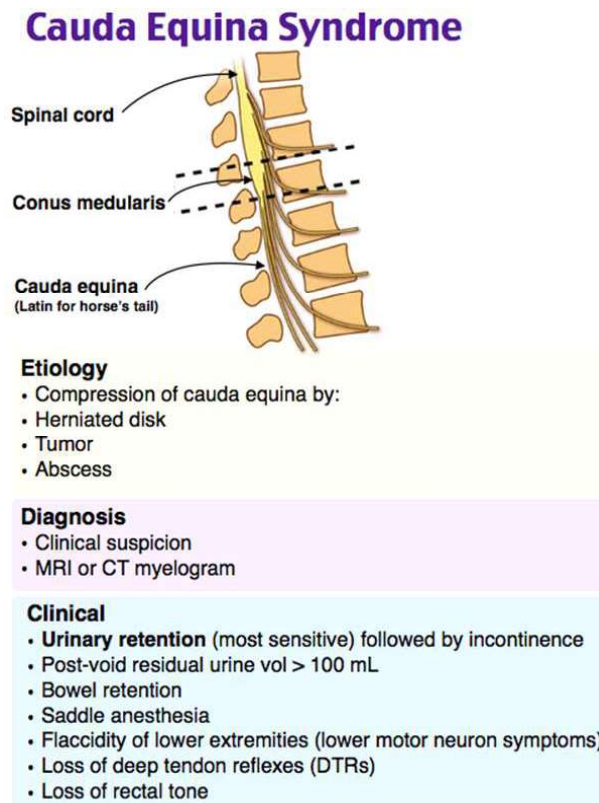


Fig. 1:

He had multiple visits to other numerous hospitals with similar complaints where he was prescribed simple analgesics without a proper diagnosis.

Physical examination revealed the patient was conscious and cooperative. His respiratory rate was 18/min. His pulse rate was 80/min, BP was 120/80mmHg, RBS was 119mg/dL, His SpO₂ was 99% on room air.

He didn't have any pallor, icterus, cyanosis, jugular venous distention, pedal edema or lymphadenopathy.

Cardiovascular, respiratory and per abdominal examinations were insignificant. His GCS was 15/15. On perineal examination anal wink was absent, anal sphincter tone was reduced and saddle anesthesia was present. Left straight leg raising was painfully limited to 30 degrees and on the right to 40 degrees. Bowstring and Braggards tests were positive on the left. Valsalva's maneuver produced low back and left leg pain.

A large IV. cannula was inserted in left cubital vein and samples were taken routine investigations like CBC, LFT, KFT.

I.V. analgesics were started to manage pain and MRI L-S Spine was ordered in the Emergency Department and Neurosurgery consultation was sought.

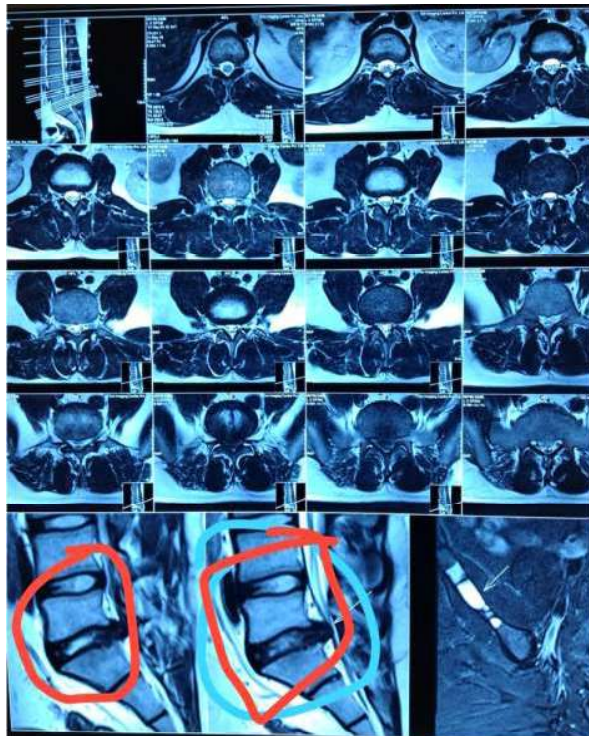


Fig. 2:

Course in the Hospital and Outcome

A provisional diagnosis of L5/S1 PIVD with cauda equina syndrome was made which was later confirmed by MRI reports.

The patient was planned for microdiscectomy the next day after pre-anesthetic assessment.

Microdiscectomy was performed the next day by the neurosurgery team in general anesthesia in prone position via median approach.

Patient tolerated the procedure well. Post-operative period was uneventful. Patient was discharged in stable condition the next day after procedure with the following discharge advice:

Tab. Ceftum 500 mg BD for 10 days

Tab. Rantac 150 mg BD for 10 days

Tab. Flexon MR BD for 3 days then SOS for pain

Tab. Dexam 2 mg BD for 3 days

Tab. Nuhenz OD for 10 days

Tab. Bifilac OD for 10 days

Stitch removal after 2 weeks.

Patient was followed by the primary author over telephonic conversation for 8 weeks and the patient's symptoms gradually improved over this period and the patient is symptom free at the end of 8 weeks.

Discussion and Therapeutic Considerations

Several case series have been reported with varied clinical manifestations like unilateral leg symptomatology [3,4], saddle anesthesia with or without leg symptoms and CES with complete absence of signs and symptoms in the lower limbs. O'Laoire reported CES with acute bladder retention and lack of sensory deficit in 2 out of his 29 patients [5].

Two features make cauda equina susceptible to the effects of compressive and tensile forces. First, the nerve roots have no Schwann cell covering; second, cauda equina lacks a regionalised segmental blood supply with relative hypovascularity in the central portion of the nerve root, making it vulnerable to ischaemia from compression [6].

If compression of the cauda equina develops slowly over a period of weeks, months or years, patients will present with the history, signs and symptoms of slow onset CES. Typically, each episode increases in severity and duration and becomes more resistant to conservative

management. In its early phase, presenting signs and symptoms may vary considerably depending on the size and position of the disc herniation. Evidence of early sacral nerve root involvement may be present, including unilateral or bilateral saddle paresthesia, urinary frequency, urgency and incontinence. In some cases, patients may experience bowel incontinence and impotence. Some patients may exhibit early lumbar radicular signs such as lower limb weakness, sensory deficits along dermatomal distributions, diminished deep tendon reflexes and referred pain patterns. As the disc herniation enlarges, both the lumbar and sacral roots become compressed and the "classical" presentation of CES develops.

The slow development of cauda equina compression may be a consequence of progressive degenerative change of the disc.

The disc herniations occur, not only from sudden, excessive hyperflexion injuries, but also as a result of cumulative trauma combined with flexion and compression over weeks and months [7,8].

People with infections or tumors (infectious or neoplastic causes) causing cauda equina syndrome should receive the appropriate antibiotics or chemotherapy for treatment of the underlying cause.

In most cases, treatment with medications alone is not indicated because of a need for emergent release of the nerve compression (surgical decompression) of the spinal canal [9].

In many cases of cauda equina syndrome, emergency decompression of the spinal canal is the best treatment option. The goal is to relieve pressure on the nerves of the cauda equina by removing the compressing structures and increasing the space available for the nerves in the spinal canal. Traditionally, cauda equina syndrome has been considered a surgical emergency, with surgical decompression considered necessary within 48 hours of the onset of symptoms [9].

For people with a herniated disk as the cause of cauda equina syndrome, removal of a portion of the bone surrounding the nerves (laminectomy) is performed and the disk material compressing the nerves is removed (discectomy). Many clinical and experimental reports have presented data on the functional outcome based on the timing of surgical decompression. Some investigators have reported no significant differences in the degree of functional recovery as a function of the timing of surgical decompression. Even with these findings,

however, most investigators recommend surgical decompression as soon as possible following onset of symptoms to offer the greatest chances of complete neurologic recovery [9].

Conclusion

Cauda equine syndrome (CES) is a potentially debilitating syndrome. Emergency physicians often evaluate patients for low backache but should be aware of signs and symptoms of CES and if any suspicion of such a diagnosis, MRI should be urgently undertaken for confirmation. Surgical decompression is the treatment of choice. Early diagnosis and timely management will give a better outcome of the patient. The more the delay in treatment, the worse is the clinical outcome.

In our case report, the diagnosis was missed by many physicians and his symptoms kept worsening until he was properly diagnosed and managed in our hospital.

If the patient was diagnosed early for CES signs it would have helped him with a better and earlier clinical improvement. The purpose of this case report is to make the emergency physicians aware of the causes and signs and symptoms of CES.

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