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Cauda Equina Syndrome caused by an acute spinal epidural haematoma following Low Molecular Weight Heparin therapy : A case report

Introduction

Cauda equina syndrome occurs when the spinal canal below the level of spinal cord becomes narrowed leading to compression of the exiting nerve roots. If not treated promptly, it can lead to significant and irreversible sensory motor deficit and urinary or fecal incontinence(1).

Spinal epidural hematoma is a relatively uncommon etiology of cauda equina syndrome. The majority of reported cases of spinal epidural hematoma have been observed in patients with bleeding diathesis or those who have undergone neuraxial anesthesia or lumbar puncture. The occurrence of acute spontaneous spinal epidural hematoma following the use of Low Molecular Weight Heparin (LMWH) is extremely rare, with only a few cases documented in the existing literature(2). We report a case where a patient was diagnosed with a non-ST elevation myocardial infarction (NSTEMI) and was given LMWH, which resulted in a spinal epidural hematoma that led to a cauda equina syndrome.

Case presentation

A 57-year-old female was admitted to our unit with a one-month history of back pain. The patient had no history of experiencing neurogenic claudication or significant impairment in activities of daily living. There was no nocturnal pain or changes in urinary/ bowel habits. Upon physical examination, there were no remarkable findings, no spi-

nal tenderness was observed. Bilateral lower limb straight leg raise was negative, muscle power and tone in both lower limbs were normal. Sensation in the lower limbs was intact bilaterally. Lumbosacral X-rays were normal.

On the day following admission, the patient experienced chest pain around 6 PM, prompting an urgent electrocardiogram (ECG). The ECG revealed T-wave inversions, and marginally positive troponin I levels indicating a non-ST-segment elevation myocardial infarction (NSTEMI), which was to be managed by the medical team with LMWH 60mg twice a day. The next morning at approximately 5 AM, the patient reported hemoptysis and worsening back pain, leading to withholding of the LMWH. She did not have any complaints of chest pain or difficulty in breathing. Within three hours, she complained of numbness and weakness in both lower limbs, accompanied by a burning sensation of her back. On examination, severe lower back tenderness was noted, and the patient was unable to move her lower limbs, demonstrating a power of 0. The weakness extended downward from the L2 myotome, and she exhibited an L2 sensory level. Reflexes were absent, and anal tone was reduced. Abdominal examination revealed distension and dullness on percussion, indicating a distended bladder.

An urgent MRI scan was planned to investigate the underlying cause of the patient's deteriorating neurological status.

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MRI findings confirmed an acute case of cauda equina syndrome, caused by an epidural hematoma.

Management of the patient involved catheterization and administration of subcutaneous morphine (5mg) and IV paracetamol for pain relief. An urgent clotting profile was done, which was reported as being normal (INR- 1.08, APTT – 34). A decision was made to perform urgent decompression and to evacuate the hematoma. Prior to surgery, the patient was transferred to the Intensive Care Unit (ICU) and received fresh frozen plasma (FFP).

Operative procedure

The patient was taken to the operation theatre within 6 hours of the onset of symptoms. The L4 to S1 levels were marked using an image intensifier, and a laminectomy was performed at the L4, L5, and S1 levels. The underlying hematoma was identified and completely evacuated. Pedicular screws were inserted at the L4, L5, and S1 levels and fixed with rods. Acute bleeding was noted and controlled, achieving hemostasis. A drain was inserted, and routine closure was performed.

Postoperative X-rays were taken, confirming a satisfactory fixation. postoperatively. Intravenous dexamethasone (8mg) was administered three times a day. Postoperative physiotherapy was initiated, starting with passive motion. Bed-to-chair mobilization was performed. During the hospital stay, the patient did not show improvement in her neurological status, the back pain resolved. At the six-week clinic visit, the patient showed slight movement of the lower limbs and had a muscle power of grade 1 in the L2 myotome downwards. Bladder control was not regained. During the three-month clinic visit, it was observed that the patient had not yet regained bladder control. However, there was significant improvement in motor function with a power grade of 4. Currently the patient practices intermittent catheterization as a means of managing urinary retention, while also using diapers to address her fecal incontinence.

Discussion

Cauda equina syndrome is characterized by a sudden and severe back pain, which may or may not radiate, along with motor or sensory weakness of the lower limbs. Patients may also experience disruption of blad-

der contraction and sensation leading to urinary retention and overflow incontinence. Signs include unilateral or bilateral motor weakness and/or sensory changes in the lower limbs, saddle anesthesia in the perineal region, decreased rectal tone upon voluntary contraction, and decreased or absent lower extremity reflexes. It is crucial to document these signs and symptoms, specifically any bladder dysfunction prior to surgery. (1,3,4)

Cauda equina syndrome can be caused by various factors such as trauma, disc herniation, spinal stenosis, tumors, infection, and rarely, spinal subdural and epidural hematoma. (5) Epidural hematoma refers to the accumulation of blood between the dura and the bone. It can be categorized as intracranial or spinal. Spinal epidural hematoma is commonly caused by trauma but can also occur as a result of medical procedures such as lumbar puncture or epidural / spinal anesthesia. Additional factors that contribute to its development may include thrombolysis, anticoagulation medications, thrombocytopenia, blood disorders, tumors, coagulation disorders, and vascular malformations. (3)

When it comes to investigating spinal epidural hematoma and cauda equina syndrome, spinal MRI is considered the preferred neuroimaging technique. This is due to its ability to provide a comprehensive and non-invasive evaluation of the spine, spinal cord, and cauda equina nerves in multiple planes. (2) The treatment of cauda equina syndrome caused by spinal hematoma involves vertebral laminectomy and removal of the hematoma. The main goal is to relieve pressure on the cauda equina nerves by removing the compressing agent and increasing the space in the spinal canal. (3) The severity of symptoms should not bias the decision-making process, with less severe symptoms being managed medically and more impaired patients undergoing surgical intervention. Surgical decompression is considered necessary within 48 hours after the onset of symptoms, and preferably performed within 6 hours of injury as functional outcome is largely dependent on the timing of the surgery from the onset of symptoms.(1,4) However, some reports suggest conservative treatment for minimally symptomatic patients or those who show early spontaneous recovery with small clots.(5)

Apart from the timing of surgical decompression, the other factors that affects the prognosis include the pre-operative neurological status, the speed of developing

the clinical presentation, the segmental localization, the extension of the spinal hematoma and the age of the patient. The time it takes for patients to recover after surgery can vary from several months to several years. While most patients see improvements within the first two years after decompression surgery, some may continue to experience clinical improvements for up to five years post-surgery. (3)

Conclusion

Cauda equina syndrome is a syndrome that can cause neurological impairment and significant disability. Clinicians must be able to recognize the signs and symptoms of this neurological syndrome to diagnose and treat it effectively. One of the rare potential causes of this syndrome is a spinal epidural hematoma. While it is usually caused by iatrogenic means of procedures such as spinal or epidural anesthesia and lumbar puncture, there are rare instances where it can also occur due to non-procedural causes such as the use of LMWH. The most reliable investigation of choice is a MRI. If a diagnosis of Cauda equina syndrome is confirmed, it is crucial to perform surgical intervention immediately in order to prevent the worsening of neurological symptoms and to facilitate the best possible recovery.

Take home message

The presence of a normal clotting profile does not exclude the possibility of an epidural haematoma occurring, when on LMWH therapy

Patients should be advised that though pain relief is achieved consistently following urgent decompression of an epidural haematoma, regaining power can take up to three months and beyond, while return of sphincter control has a poor prognosis (at least in the short term).

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