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Case Report

An unusual case of ventral spontaneous spinal epidural hematoma: Case report with review of literature ☆☆☆

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ABSTRACT

Spontaneous spinal epidural hematoma is a rare predominantly idiopathic entity which can prompt acute neurologic symptoms and if not managed in time can lead to devastating outcomes. High index of suspicion is required for early diagnosis on MRI for a prompt management of patients showing sudden neurologic deficits. Our patient was 42-year-old female who presented with sudden onset of numbness followed by weakness in both lower limbs and urinary retention without any comorbidity or any medication. MRI whole spine done within 14 hours of symptom onset showed ventral epidural hematoma without any vascular malformation. Immediate decompressive laminectomy with evacuation of hematoma improved power in both lower limbs with regaining bowel and bladder function. The key here is timely surgical decompression of the hematoma for a favorable neurosurgical outcome. Although there is a recent development towards non-surgical treatment, it needs to be well established yet and require such approach on case-to-case basis.

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Introduction

Acute Spinal epidural hematoma occurring in the absence of any trauma or iatrogenic procedure is described as spontaneous spinal epidural hematoma (SSEH). When there is no cause identified, it is termed as idiopathic [1]. Both venous and arterial origins are described in the literature, the most widely accepted theory is of the venous origin [1,2]. The exact etiology of SSEH remains unknown in 40%-50% of the patients although coagulopathy, epidural catheter and surgical trauma, use of anticoagulants, and the conditions causing increased intrathoracic-intra-abdominal pressure such as cough and Valsalva maneuver have been reported as the predisposing factors for SSEH [3,4]. Although some studies suggest that SSEH may result from the rupture of the spinal venous system caused by the pressure changes within the posterior epidural venous plexus, some others maintain that SSEH may arise from a minimal impairment or laceration in the epidural artery caused by the low pressure within the venous plexus compared to the intrathecal pressure [5,6]. Treatment options are surgical decompression, percutaneous drainage, or management with conservative therapies. In this report, we present the case of a spontaneous spinal epidural hematoma presenting as upper back pain and later involved the lower back with weakness in both lower limbs ending up having paraplegia in both lower limbs along with urinary retention.

Case history

Patient is 54 years old female presented with history of sudden onset of severe upper back pain, which was sharp, pricking like, initially localized, and later involving the lower back after she woke up from her afternoon nap followed by numbness in both lower limb within 1 hour. After that she developed weakness in both lower limbs ending up having paraplegia in both lower limbs along with urinary retention. She was on clopidogrel for coronary stenosis and hypertension for 5 years. She didn't have any other comorbidities.

MRI was done after 14 hours of symptom onset and within 30 minutes of presentation in emergency department. MRI whole spine was done which showed acute anterior spinal epidural hematoma from C7 to D9 with maximum thickness and cord compression at the level of D2 to D5 and hyperintensity at D4-D5 level on T2WI suggestive of cord edema/contusion. On contrast, there was no abnormal enhancement to suggest any vascular malformation.

Patient was operated urgently (almost after 21 hours of symptom onset) and D2 to D5 laminectomy with partial D2 and D4 Left facetectomy done and hematoma evacuated. The blood clot was solid located anterior to cord and there was diffuse ooze from tissues all around. No vascular malformation found intraoperatively.

Patient started recovering and by post-operative day 6, patient has almost $\frac{3}{4}$ power in both lower limbs and had urinary sensation improving on catheter clamping.

On follow up after 30 days, patient was walking independently with power in both lower limb 5/5 and normal bowel and bladder function. Follow up MRI dorsal spine was sugges-

tive of complete evacuation of hematoma with resolving abnormal cord hyperintensity.

Discussion

Spontaneous spinal epidural hematoma (SSEH) is a rare condition. The cases that occur spontaneously in the absence of an identifiable etiology are considerably less common and remain poorly understood. SSEH can be seen in all age groups, with the highest incidence in males and patients aged over 40-50 years. However, SSEH is very rarely seen in children [18]. Groen found no correlation between age, gender, and postoperative outcomes [5].

In up to 40-50% of cases, no etiologic factor could be identified as the cause of the bleeding. Following idiopathic SEH, cases related to anticoagulant therapy and vascular malformations represented the second and third most common categories. Spinal and epidural anesthetic procedures in combination with anticoagulant therapy represented the other most common etiologic group [7].

SSEH is mostly presented as sudden onset of pain in the neck and back and weakness. This pain usually is of a radicular character and may radiate to the extremities. Within hours or days, due to the compression of the spinal cord, these symptoms may lead to varying degrees of motor and sensory loss. Diagnosis of SSEH is difficult to establish prior to the onset of neurologic deficit.

MRI remains the method of choice in the diagnosis of SSEH. MRI provides useful outcomes in the visualization of the location and the size of the hematoma as well as the presence of the spinal cord compression and edema [8]. SSEH yields an isointense signal change on T1-weighted images within the first 24 hours after bleeding and a hyperintense signal change on T2-weighted images after 24 hours [9]. In our case MRI whole spine was done which showed acute anterior spinal epidural hematoma from C7 to D9 with maximum thickness and cord compression at the level of D2 to D5 and having cord hyperintensity at D4-D5 level on T2-weighted images. On contrast, there was no abnormal enhancement. In a case report by Ayca et al., Cervical, thoracic, and lumbar MRI scans revealed that a hyperintense signal change on T1-weighted and an isointense signal change on T2-weighted images with compression of the spinal cord [8].

Urgent decompression of the spinal cord, regardless of the cause of bleeding, in the SSEH patients with neurologic deficit is the initial step to be performed for the recovery from neurologic deficit and for the classification of the hematoma [10]. Ventral SSEH is highly rare since the dural sac is firmly attached to the posterior longitudinal ligament. Anterior SSEH has also been reported, though very rare [11]. The dorsal aspect of this space is filled with fatty tissue; therefore, posterior SSEH are more common than anterior SSEH. But our patient had anterior source of bleeding. The factors in favor of venous origin are occurrence after strenuous Valsalva maneuvers, thoracic location of hematoma, engorgement of veins in diseases such as cirrhosis, and perioperative demonstration of venous ooze in many cases. The factors in favor of arterial origin are rapid development of spinal cord compression.

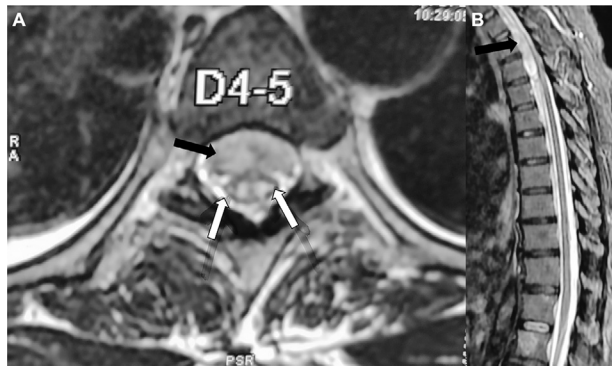


Fig. 1 – Whole body spine MRI in axial T2 weighted sequence at D4-5 level (**Figure 1A**) and sagittal T2 weighted sequence (**Figure 1B**) shows heterogenous T2 hyperintensity in anterior subarachnoid space (black arrow) causing mild mass effect and cord compression on the spinal cord with diffuse spinal cord edema (white arrows) just suggestive of ventral spontaneous spinal epidural hematoma.

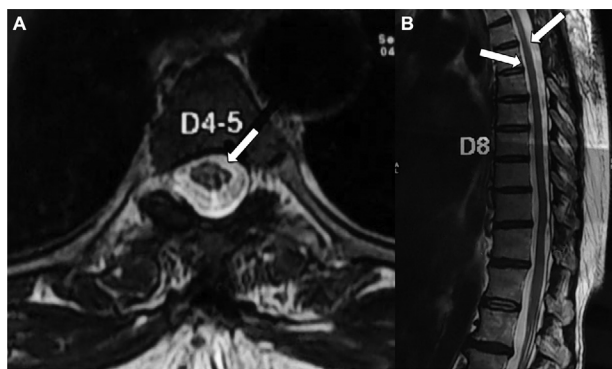


Fig. 2 – Post decompression with hematoma evacuation and laminectomy, whole body spine MRI in axial T2 weighted sequence at D4-5 level (**Figure 2A**) and sagittal T2 weighted sequence (**Figure 2B**) shows complete resolution of hematoma with normal ventral and dorsal epidural space (white arrows) and resolution of spinal cord compression and edema in the same patient.

sion, high mobility of cervical spine, and higher pressure inside theca than veins [12]. Partial or hemilaminectomy is recommended to reduce postoperative instability [12]. Conservative treatment has also been documented, and its only employed when neurologic deficits improved in the early phase or with the coexistence of coagulopathy [13]. The differential diagnosis of spontaneous spinal epidural hematoma includes an acute herniated intervertebral disc, acute ischemia of the spinal cord, epidural tumor or abscess, spondylitis, transverse myelitis, or a dissecting aortic aneurysm, and acute myocardial infarction [14].

In a meta-analysis, by Kreppel et al. the study reported that complete recovery from neurologic deficit may be achieved if the time between the onset of neurologic deficit and operation does not exceed 12 hours [15]. Conversely, Foo and Rossier

suggested that the time between the onset of symptoms and operation has no importance for the treatment [16]. In another study by, Lawton et al. it was highly difficult to define the most favorable time for the application of decompression surgery [17]. In our case, the time between the onset of noticeable symptom and operation was within 21 hours. He was treated with D2 to D5 laminectomy and partial D2 and D4 Left facetectomy and evacuation of hematoma. Clot was solid and there was diffuse ooze from tissues all around the cord. Despite this prolongation, the patient made a complete recovery (**Figs. 1 and 2**).

Conclusion

Spontaneous spinal epidural hematoma (SSEH) is an uncommon idiopathic disorder which can be seen all age groups and gender however predominantly involving males aged over 40-50 years. Early diagnosis and prompt evacuation of hematoma with surgical decompression in timely fashion can alleviate devastating neurologic outcomes.

Financial disclosures

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Ethical statement

The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Patient consent

Verbal consent was obtained from patient during her hospital stay during surgery.

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