

Posttraumatic Acute Spinal Subdural Hematoma of the Spine

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Abstract

Keywords

- ▶ acute spinal epidural hematoma
- ▶ spinal subdural hematoma
- ▶ spinal cord compression
- ▶ spinal injury

Acute spinal subdural hematoma (ASSH) is a rare cause of spinal cord compression and neurologic deficits. The authors report a case of 23-year-old male patient who developed ASSH following spinal injury and discuss the characteristic imaging findings of ASSH. Magnetic resonance imaging (MRI) of the spine showed hypointense collection on T2W images seen posteriorly extending from inferior endplate of C5 to superior endplate of D3 with preservation of the epidural fat signal. The patient underwent surgical evacuation of the hematoma and made a good recovery in his neurological functions.

Introduction

Acute spinal subdural hematoma (ASSH) is a rare cause of spinal cord compression and resultant neurological deficits.^{1–5} The ASSH has the potential to expand rapidly and the clot can extend over multiple levels, and if left untreated, the patient may develop compression of the neural structures and irreversible neurologic deficits.^{2–5} In this case, the authors report an uncommon case of ASSH following spinal injury; the patient was treated in emergency and made a good recovery in his neurological functions.

Case Report

A 23-year-old male patient presented with the history fall from height (electric pole). There was no history of loss of consciousness; vomiting; ear, nasal, or oral bleed; or convulsions. The patient was complaining of the weakness of the lower limbs and did not pass urine after the injury. At the time of examination in the emergency room, he was conscious; alert; and oriented to time, place, and person. He

had weakness of the lower limbs of grade 2/5 with sluggish reflexes. Plantar reflex was not elicitable bilaterally. Cranial nerves were normal. Motor and sensory examination in the upper limbs was normal. Reflexes were normal in the upper limbs. He had tenderness over the upper dorsal spine level. Chest compression was positive. Pelvic compression was negative. He had reduced air on left side of the chest. His other general and systemic examination was normal. Radiograph of the chest showed multiple rib fractures on left with evidence of hemo-pneumothorax. Lateral radiograph of the dorsal spine showed fracture of the D6 vertebral body. Magnetic resonance imaging (MRI) of the dorsal spine showed compression fracture of the D5, D6, and D7 vertebral body. MRI of the spine showed mild anterior wedging of D3, D4, and D5 with vertebral body hypointense signal and severe effacement of the anterior thecal sac. There was hypointense collection seen posteriorly, which was extending from inferior endplate of C5 to superior endplate of D3 (▶ **Fig. 1**). There was preservation of the epidural fat dorsally. The patient underwent decompressive laminectomy and spinal fixation

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Fig. 1 Sagittal T2-weighted image of lumbar spine showing mild anterior wedging of D3, D4, and D5 with vertebral body hypointense signal. There is severe effacement of the anterior thecal sac. Hypointense collection is seen posteriorly extending from inferior endplate of C5 to superior endplate of C3. Note the preservation of the epidural fat dorsally.

in emergency. The patient made an uneventful recovery after surgery, and his power improved to grade 4/5 on sixth postoperative day. He is doing well at follow-up.

Discussion

The exact mechanism responsible for the formation of the ASSH remains unclear, but the most common causes for the development of ASSH include trauma, coagulation disorders, vascular malformations, and iatrogenic procedures,^{6–9} and, in rare cases, the intracranial blood can trickle into the spinal subdural space.¹⁰ The clinical features for the spinal hematomas depend on the size and location of the hematoma and the rapidity of the development of the hematoma (acute, subacute, and chronic).^{11,12} The main clinical features include pain (local due to fracture and radiating due to nerve root involvement) and clinical features of neurologic deficits (depending on the site and size of the hematoma).^{1,5,13,14}

In the setting of trauma, ASSH needs to be differentiated from acute spinal extradural hematoma and spinal abscess.^{15–20} The most appropriate imaging modality for this is MRI of the spine, which delineates the lesion, extent of the lesion, details of the associated lesions (such as vertebral fractures), and compression of the spinal cord.^{5,15,16,21,22} ASSH appears heterogeneous on MRI T1 images and ranges from isointense to slightly hyperintense and also hypointense

signals in appearance.²³ On T2-weighted and gradient echo images, it has hypointense, isointense, and hyperintense areas.²³ MRI appearance can also help in differentiating between the acute spinal extradural hematoma and ASSH. Characteristically on T1-weighted sequences in cases of acute spinal EDH, there is loss of normal epidural fat signal while the epidural fat signal is preserved in cases of ASSH (as in present case) with a thin hypointense dural line between the ASSH and normal high epidural fat signal.^{16,23} Symptomatic ASSH is a neurosurgical emergency that needs an urgent evacuation of the blood clot and decompression of the neural structures to avoid irreversible deficits.^{8,15,23–27} However, in selected cases with smaller size of the clot and no mass effect, a conservative management has shown favorable outcome.^{15,28}

Conclusion

ASSH is an uncommon complication of the spinal injury. The diagnosis of traumatic ASSH needs high index of suspicion, and in symptomatic cases, an urgent evacuation of the clot and decompression of the neural structures result in favorable outcome.

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