Case 13225

Acute spontaneous spinal subdural hematoma in the cervical spine
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 Section: Neuroradiology
 Area of Interest: Neuroradiology spine
 Procedure: Computer Applications-General
 Imaging Technique: MR
 Imaging Technique: CT
 Special Focus: Haemorrhage Case Type: Clinical Cases
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 Patient: 84 years, female

Clinical History:
An 84-year-old woman was admitted to the hospital with sudden onset of neck pain, bilateral upper extremities paresthesia and bilateral lower limbs paraplegia. The symptoms occurred acutely when she was at rest. Deep tendon reflexes were increased at both lower extremities. Bladder and bowel dysfunction was not seen.

Imaging Findings:
On the admission day, Spinal CT showed a right dominant subdural high-density lesion anterior to the spinal cord (Fig. 1).
On spinal MRI, the lesion appeared with iso-intensity on T1-weighted images (T1WI), extending from C3/4 to Th1 (Fig. 2). On T2-weighted images (T2WI), the lesion is difficult to be recognized due to its homogeneous high-intensity similar to the CSF (Fig. 3).
On the 3rd day after admission, the intensity of the mass changed; it showed iso-intensity on T1WI (Fig. 4) and high-intensity with partial low-intensity on T2WI (Fig. 5), in which the lesion is more easily recognized.

Discussion:
An acute spinal subdural hematoma (SSDH) is a rare entity, typically presenting with chest or neck pain radiating to the arms and/or legs, followed by the development of sensorimotor and autonomic disturbances. The main causes of SSDH are major or minor trauma, surgical intervention, and lumbar puncture, etc. It can also occur in non-traumatic patients with or without underlying pathology (i.e. anticoagulant therapy, arteriovenous malformation (AVM), etc.) [1-3].
SSDH is usually located at the thoracic spine, extending over several vertebrae long and ventrally to the spinal cord [1-4]. It appears as a semi-circular or convex-shaped lesion within the subdural space [1, 6]. Our case was relatively exceptional in that the lesion located mainly at the cervical spine.
MRI is the most useful modality for diagnosing SSDH. It can detect the location and extent of the hematoma and underlying lesions such as tumors and AVMs. In addition, the intensity of SSDH on MRI images is variable according to the elapsed time since onset. Our case showed SSDH with iso-intensity on T1WI and high-intensity on T2WI on the 1st day, while it became iso-intense on T1WI and low-intensity on T2WI on the 3rd day. The signal alteration is due to hemoglobin oxidation. It is also previously reported that, at 4-7 days after bleeding, a peripheral high signal appears on T1WI and T2WI as a result of methemoglobin formation [5, 6]. At around one week following the initial hemorrhage, a more diffuse high signal is seen on T1WI and T2WI since dissolved red blood cells contain...
free dilute methemoglobin [5, 6]. The CT scan is other useful imaging modality, as it can demonstrate hematoma as a high-density area in the subdural space [1-3].

Management options for SSDH generally depend on the severity of the neurological symptoms, ranging from conservative management to surgical procedure [1, 7-9]. In our case, follow-up spinal MRI at 6 weeks confirmed spontaneous resolution of the hematoma and no recurrent bleeding.

An acute spontaneous SSDH is relatively uncommon, but radiological assessment plays an import role in diagnosing the condition. Especially, the lesion is difficult to be recognized at hyper-acute stage, as it shows the similar intensity as the CSF on T2WI. Therefore, it is important to be familiar with the sequential MRI signal changes since the onset.

**Differential Diagnosis List:** Acute spontaneous spinal subdural hematoma, spinal epidural hematoma, melanocytoma

**Final Diagnosis:** Acute spontaneous spinal subdural hematoma

**References:**


A spinal CT showed a right dominant subdural high-density lesion anterior to the spinal cord.

**Description:** (Sagittal view)
A spinal CT showed a right dominant subdural high-density lesion anterior to the spinal cord.

**Origin:**
Hiroaki Takahashi M.D Department of neurosurgery, Yokosuka general hospital Uwamachi, Kanagawa, Japan
Description: (Axial view)
A spinal CT showed a right dominant subdural high-density lesion anterior to the spinal cord. Origin: Hiroaki Takahashi M.D. Department of neurosurgery, Yokosuka general hospital Uwamachi, Kanagawa, Japan
Description: On spinal MRI, the lesion appeared with iso-intensity on T1WI, extending from C3/4 to Th1. Origin: Hiroaki Takahashi M.D Department of neurosurgery, Yokosuka general hospital Uwamachi, Kanagawa, Japan
Figure 3

Description: (Sagittal view)
On T2WI, the lesion is difficult to be recognized due to its homogeneous high-intensity similar to the CSF. Origin: Hiroaki Takahashi M.D Department of neurosurgery, Yokosuka general hospital Uwamachi, Kanagawa, Japan
**Description:** (Axial view)

On T2WI, the lesion is difficult to be recognized due to its homogeneous high-intensity similar to the CSF. **Origin:** Hiroaki Takahashi M.D Department of neurosurgery, Yokosuka general hospital Uwamachi, Kanagawa, Japan
Description: On the 3rd day after admission, the mass showed iso-intensity on T1WI. Origin: Hiroaki Takahashi M.D Department of neurosurgery, Yokosuka general hospital Uwamachi, Kanagawa, Japan
Description: (Sagittal view) On the 3rd day after admission, the lesion showed high-intensity with partial low-intensity on T2WI, in which the lesion is more easily recognized. Origin: Hiroaki Takahashi M.D Department of neurosurgery, Yokosuka general hospital Uwamachi, Kanagawa, Japan
Description: (Axial view) On the 3rd day after admission, the lesion showed high-intensity with partial low-intensity on T2WI, in which the lesion is more easily recognized. Origin: Hiroaki Takahashi M.D
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