

Selected Topics: Neurological Emergencies

A SPONTANEOUS CERVICAL EPIDURAL HEMATOMA MIMICKING A STROKE: A CHALLENGING CASE

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Abstract—Background: A spontaneous cervical epidural hematoma (SCEH) is a rare occurrence, with < 500 cases reported to date. Clinically, it usually presents with quadriparesis, but in extremely rare cases it can present with hemiparesis or hemiplegia, and can easily be misdiagnosed as stroke. The cervical epidural hematoma by itself is an urgent condition that requires a quick and accurate diagnosis and a prompt surgical treatment. **Case Report:** We present a case where an SCEH mimicked the much more frequent condition of a stroke, and discuss the importance of diagnostics procedures that help differentiate SCEH from acute cerebral infarction. The patient's history of neck pain and spondylosis render this case more challenging. **Why Should an Emergency Physician Be Aware of This?:** Considering that the emergency tissue plasminogen activator treatment for acute cerebral infarction can worsen the state of an SCEH patient, or even lead to permanent damage or death, it is of great importance to rapidly and accurately differentiate these two conditions. © 2019 Elsevier Inc. All rights reserved.

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INTRODUCTION

Nontraumatic hemorrhage in the spinal canal is not a common occurrence and is usually secondary to pathological conditions such as tumors, arteriovenous malformations, or coagulopathies (1). The general incidence of spontaneous intraspinal hemorrhage is 0.1/100,000, with a predomination of females of 4:1 (1,2). Spontaneous epidural spinal bleeding, leading to a spontaneous cervical epidural hematoma (SCEH), is even more rare, with < 500 cases reported to date (3). The usual clinical presentation is paraparesis or quadriparesis, but in rare cases, a stroke-like hemiparesis may be seen. Stroke is, on the other hand, the most common cause of hemiparesis (3–7). Therefore, if not recognized promptly, a misdiagnosis may lead to a severe worsening and poor outcome for the patient (8). A posterior internal vertebral venous plexus etiology is widely accepted as the cause of the hemorrhage, although arterial origin is also suggested (2,9,10). Considering the incidence of acute cerebral infarction and SCEH, it is important to have this rare condition in mind to prevent

misdiagnosis and mistreatment in this neurological/neurosurgical emergency.

CASE REPORT

A 72-year-old woman was brought to a local hospital for sudden onset of neck pain and weakness in the right arm and leg, which developed during sleep and woke the patient up. At the initial examination in the local hospital, she was conscious and aware, with a severe hemiparesis of the right side and preserved sensory function during the neurological examination.

Computed tomography (CT) was performed to assess the suspected stroke, which revealed no endocranial ischemic lesion or hemorrhage. The patient was < 3 h from symptoms onset, and was therefore a candidate for intravenous thrombolysis. However, a hyperdense zone was noted just below the craniocervical junction, on the verge of the image, which was suspected of being acute bleeding in the spinal canal. This finding led to the extension of the CT examination to the cervical spine, which revealed signs of bleeding spreading in the epidural space posterolateral to the right and ranging from C2 to C6 levels, with the widest hematoma at the C4/C5 level, including CT signs of acute bleeding in progress (Figure 1). She was immediately referred to our Department for further neurosurgical treatment.

After admission, neurological status was re-evaluated to confirm the previously diagnosed severe hemiparesis. The neck pain was still present. Although we had not assessed pain or temperature sensations, no sensory disturbances were noted, leading us to the conclusion that Brown-Sequard syndrome was not present.

Emergency surgery was performed under general anesthesia, with the patient in a sitting position. The skin incision was made over the spinous processes of the cervical vertebrae C2 to C6, and a common laminectomy of the C4, C5, and C6 vertebrae was performed. The epidural hematoma was evacuated using a vacuum aspirator. There were no signs of structures that could initiate recurrent bleeding (e.g., tumor, arteriovenous malformation, or an aneurysm). Further intradural exploration revealed no signs of any bleeding or lesion. The dura was closed using a continuous silk suture, and the skin incision was closed in the standard manner.

The patient felt well immediately after the surgery, with persisting neurological findings, which did not worsen after the surgery. Antiedematous therapy started immediately after the surgery, with mannitol solution and methylprednisolone 120 mg every 8 h, together with gastric protection. The patient was observed in the intensive care unit overnight.

The same therapy was continued for the next 5 days. The patient felt well, with a slight improvement in the right-sided paresis of the extremities. A cervical spine magnetic resonance imaging scan was performed on the sixth postoperative day, and it revealed only a minimal residual epidural hematoma at the site of the surgery (Figure 2). Also, the spondylotic disease was confirmed. Six days after the surgery the patient was transferred to the local hospital for further rehabilitation treatment. At the follow-up examination 1 month after the surgery, the patient was walking on her own, with no signs of the weakness noted at the moment of the initial neurological examination.



Figure 1. Computed tomography of cervical spine showing an epidural hematoma in the spinal canal. (A) Sagittal view shows hematoma spread from the level C2 to C6 (gray arrows) with signs of bleeding in progress at the level C4 (black arrow). (B) Axial view showing right posterolateral position of the hematoma (arrow).

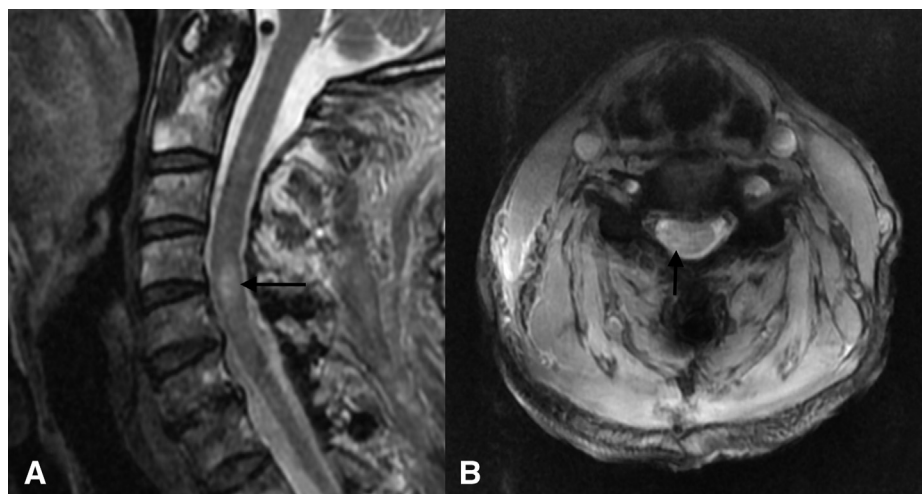


Figure 2. Magnetic resonance of cervical spine showing the state after laminectomy and evacuation of epidural hematoma. (A) Sagittal view shows signs of myelopathy at the C4–5 level (arrow). (B) Axial view showing right posterolateral position of the myelopathy (arrow).

DISCUSSION

A spontaneous cervical epidural hematoma is a very rare condition, usually associated with other pathological conditions of the cervical region in the previously reported cases. In our case of a 72-year-old woman, no cause of SCEH was identified.

The first SCEH was described in 1869 by Robert Jackson, surgeon to the Notting Hill Dispensary, in a 14-year-old girl. He described the progression of the symptoms and a postmortem examination of the brain and spine, which revealed a blood clot outside the membranes filling the whole cervical portion of the spine (11). Since this first reported case, individual case reports and case series were reported (3,12). Depending on the hemorrhage level, SCEH may be divided into two subentities. One includes bleeding below the C3 level, and the other at or above the C3 level. The latter is naturally more severe, and can even lead to a fatal outcome (13,14).

There are only 15 cases of hemiparesis or hemiplegia reported in the literature, including the four cases of Brown-Sequard syndrome caused by the hematoma (8,15–18). Out of all the cases that developed hemiparesis, only one patient was under 60 years of age, which suggests that this condition is much more common in older patients (3,8,12,19–25).

Urgent treatment is of the greatest importance, and mistreatment, in unrecognized cases, may lead to fatal consequences. A history of cervical spondylotic disease warrants additional attention, because this condition may mask the related neck symptoms and mislead the diagnostician.

Neck pain of severe intensity and acute onset also may occur in patients with cervical artery dissection. When leading to transient hemiparesis or stroke, the dissection

might also mask SCEH mimicking a stroke. In these patients, CT of the neck would lead to the correct diagnosis and appropriate subsequent treatment; headache (present in almost all dissection cases) may be a significant differential clinical symptom (26).

According to major acute stroke treatment guidelines, a patient with SCEH-caused hemiparesis or hemiplegia fulfills the inclusion criteria for intravenous thrombolytic therapy (27,28). The thrombolytic therapy for stroke may provoke not only a cervical hemorrhage in patients who suffered ischemic stroke, but also lead to the enlargement of the SCEH when the bleeding is missed (29,30). Urgent surgery must be performed to prevent further neurological worsening, permanent damage, or even death.

WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?

The surgical treatment of a spontaneous cervical epidural hematoma is not a complicated procedure, but the diagnosis of this rare condition could represent a real challenge. This is especially the case when the bleeding mimics a stroke when it is of great importance to rapidly and properly differentiate the SCEH from an acute cerebral infarction, as the urgent tissue plasminogen activator treatment for a stroke can worsen the patient's condition, potentially leading to permanent damage or death.

Emergency physicians need to bear in mind that:

- Acute-onset neck pain and worsening of the neurological state after neck movements may prompt the physician to think of SCEH in patients with acute onset hemiparesis.

- Assessment of the highest cervical spine levels for epidural hematomas requires special attention, as bleeding may lead to a lethal outcome if not recognized, especially in women with a history of spondylosis.
- Patients without a CT-verified ischemic stroke need careful consideration and should undergo further diagnostic procedures for other possible cause(s) of stroke-like symptoms.
- Cervical spine assessment to exclude SCEH is needed for patients whose condition worsens after thrombolytic therapy, to the more typical myelopathy presentation.

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