



## Case Report

### Cervical spinal epidural hematoma mimics acute ischemic stroke<sup>☆</sup>

#### Abstract

Spinal epidural hematoma is an accumulation of blood in the epidural space that can mechanically compress the spinal cord. It is an uncommon condition, and most cases occur spontaneously. Detailed evaluation of neurologic deficit and detailed history taking are important tools for early diagnosis, and magnetic resonance imaging is currently the diagnostic method of choice. Prompt surgical intervention is important in achieving positive clinical outcomes. Spinal epidural hematoma usually comes with acute, severe pain with radiation to the extremities and may be accompanied with severe neurologic deficit. Common neurologic signs include paraparesis and quadriparesis. Here, we report 2 cases of cervical spinal epidural hematoma with sudden onset of neck pain, followed by the development of unilateral limbs weakness and respiratory distress. Both patients were initially suspected to have acute ischemic stroke and were considered using intravenous thrombolytic therapy with recombinant tissue plasminogen activator as treatment. Cervical spinal epidural hematoma was confirmed after obtaining magnetic resonance imaging. Patients with this uncommon presentation must be carefully distinguished from acute stroke. This article aimed to highlight the potential pitfalls in diagnosing acute hemiparesis with no cranial nerves deficits and the importance of clinical suspicion.

A 60-year-old woman presented to the emergency department (ED) with sudden onset of headache, neck pain, and dizziness. She started to feel neck pain after a chiropractic spinal manipulation therapy few hours before the visit. Upon arrival to the ED, her blood pressure was 218/100 mm Hg, heart rate was 100 beats per minute, and respiratory rate was 20 breaths per minute with oxygen saturation of 100% on room air. The complete blood cell count, international normalized ratio, partial thromboplastin time, and blood

chemistry analysis were all normal. She soon presented with right-side weakness in our ED. Neurologic examination demonstrated intact mentality and cranial nerves function; decreased right limbs muscle power; and preservation of sensation to light touch, pin prick, and vibration. Bilateral deep tendon reflexes were 2+, and Babinski signs were negative. Cranial computed tomographic (CT) scan showed no obvious abnormality. The patient was suspected to have acute ischemic stroke, and treatment with intravenous thrombolysis was considered. However, sudden onset of apnea happened soon after CT scan. She regained consciousness after resuscitation and endotracheal intubation. Further examinations demonstrated quadriparesis and still no cranial nerve deficits. Under the suspicious of cervical spine lesion, magnetic resonance imaging was performed, which revealed C2–6 spinal epidural hematoma (Fig. 1). The patient received emergent surgical decompression to evacuate the hematoma. However, her symptoms did not show significant improvement after surgical intervention. She now received long-term care in respiratory care center.

The other case is a previously healthy 58-year-old woman who presented to the ED with sudden onset of neck pain and right limbs weakness during a chiropractic spinal manipulation. Initial neurologic examination demonstrated right hemiparesis and neck rigidity without impairment of mental status or cranial nerve dysfunction. Administration of intravenous thrombolytic therapy was considered for this patient on suspicion of acute ischemic stroke since she presented to our ED within the time frame. Cranial CT was unremarkable. However, the right-side hemiparesis soon disappeared, and slight left-side hemiparesis developed. She complained of severe neck pain with rapid and shallow breathing and impending hypercapnic respiratory failure. The unusual clinical presentation urged us to consider other possibilities. Cervical spine magnetic resonance imaging demonstrated C2–5 spinal epidural hematoma (Fig. 2). She did not undergo surgical intervention because of relatively mild symptoms and stable condition. After conservative treatment with megadose steroid therapy, she recovered almost completely at the time of discharge.

Most spinal epidural hematomas occur spontaneously, and they have been documented to be caused by exercise, trauma, surgery, lumbar puncture, coagulopathy, vascular malformation, and chiropractic spinal manipulation [1–6]. The incidence of nonspontaneous spinal epidural hematoma

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**Fig. 1** Sagittal T2-weighted magnetic resonance scan shows high signal intensity in the dorsal epidural space from the C2 to the level of C6 consistent with acute hemorrhage.

is rare [7]. Typical neurologic deficits of spinal epidural hematoma (SEH) are quadriparesis and paraparesis. Atypical SEH may present with chest pain, flank pain, monoparesis, or hemiparesis and is sometimes misleading [3,8-14]. Clinical suspicion and prompt imaging are keys for proper diagnosis. Early surgical intervention is usually mandatory for good outcome [15-17]. Conservative treatment may be

considered in patients with early and rapid improvement in neurologic function [18].

In our cases, the initial presentation of neurologic deficit, hemiparesis was falsely attributed to ischemic stroke. Ischemic stroke is the most common cause of acute hemiparesis, which requires emergent stabilization and possible thrombolytic treatment. However, intravenous



**Fig. 2** Sagittal T2-weighted magnetic resonance scan shows evidence of spinal epidural hematoma from C2 to C5.

thrombolysis therapy is absolutely contraindicated in patients with SEH and may have devastating outcomes. This article emphasizes the pitfalls in evaluating acute hemiparesis. The neck pain, alternating hemiparesis, quadriplegia, absence of cranial nerve signs, and negative brain CT are clues that lead us to cervical lesions. The outcome of the disease depends on the prompt diagnosis and management.

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## References

- [1] Abe T, Nagamine Y, Ishimatsu S, et al. Spinal epidural hematoma after stretch exercise: a case report. *Am J Emerg Med* 2009;27:e901-2.
- [2] Chen CL, Lu CH, Chen NF. Spontaneous spinal epidural hematoma presenting with quadriplegia after sit-ups exercise. *Am J Emerg Med* 2009;27:1170.e3-7.
- [3] Dimou J, Jithoo R, Bush S. A patient with delayed traumatic cervical spinal epidural haematoma presenting with hemiparesis. *J Clin Neurosci* 2010;17:404-5.
- [4] Lidder S, Lang KJ, Masterson S, et al. Acute spinal epidural haematoma causing cord compression after chiropractic neck manipulation: an under-recognised serious hazard? *J R Army Med Corps* 2010;156:255-7.
- [5] Solheim O, Jorgensen JV, Nygaard OP. Lumbar epidural hematoma after chiropractic manipulation for lower-back pain: case report. *Neurosurgery* 2007;61:E170-1 [discussion E171].
- [6] Vitali AM, Steinbok P. Spontaneous spinal epidural hematoma following weight lifting. *Can J Neurol Sci* 2008;35:262-4.
- [7] Liu Z, Jiao Q, Xu J, et al. Spontaneous spinal epidural hematoma: analysis of 23 cases. *Surg Neurol* 2008;69:253-60 [discussion 260].
- [8] Hsieh CF, Lin HJ, Chen KT, et al. Acute spontaneous cervical spinal epidural hematoma with hemiparesis as the initial presentation. *Eur J Emerg Med* 2006;13:36-8.
- [9] Kato Y, Takeda H, Furuya D, et al. Spontaneous spinal epidural hematoma with unusual hemiparesis alternating from one side to the other side. *Intern Med* 2009;48:1703-5.
- [10] Labeodan OA. Spinal epidural haematoma mimicking spontaneous subarachnoid haemorrhage. *Emerg Med J* 2005;22:606-7.
- [11] Lin HL, Kuo LC, Cheng YC, et al. Traumatic cervical spinal epidural hematoma mimics brachial plexus injury. *Am J Emerg Med* 2010;28:e983-5.
- [12] Miller JB, Khalsa G, Vohra T. Spontaneous spinal epidural hematoma presenting as flank pain and constipation. *Am J Emerg Med* 2010;28:e533-5.
- [13] Panciani PP, Forgnone S, Fontanella M, et al. Unusual presentation of a spontaneous spinal epidural haematoma. *Acta Neurol Belg* 2009;109:146-8.
- [14] Wang CC, Chang CH, Lin HJ, et al. Misdiagnosis of spontaneous cervical epidural haemorrhage. *Eur Spine J* 2009;18(Suppl 2):210-2.
- [15] Groen RJ, van Alphen HA. Operative treatment of spontaneous spinal epidural hematomas: a study of the factors determining postoperative outcome. *Neurosurgery* 1997;39:494-504.
- [16] Lawton MT, Porter RW, Heiserman JE, et al. Surgical management of spinal epidural hematoma: relationship between surgical timing and neurological outcome. *J Neurosurg* 1995;83:1-7.
- [17] Shin JJ, Kuh SU, Cho YE. Surgical management of spontaneous spinal epidural hematoma. *Eur Spine J* 2006;15:998-1004.
- [18] Duffill J, Sparrow OC, Millar J, Barker CS. Can spontaneous spinal epidural haematoma be managed safely without operation? A report of four cases. *J Neurol Neurosurg Psychiatry* 2000;69:816-9.