Received: 29 June 2020 | Revised: 18 July 2021 | Accepted: 20 July 2021

DOI: 10.1002/emp2.12532

JACEP OPEN
JOURNAL OF THE AMERICAN COLLEGE OF EMERGENCY PHYSICIANS OPEN
A GLOBAL JOURNAL OF EMERGENCY MEDICINE
Open Access
WILEY

CASE REPORT

Neurology

A rare case of spontaneous spinal epidural hematoma in a 43-year-old man

Shiraz Siddiq Ali MBBS | **Natasha Paramanathan MBBCh BAO** | **Peadar Gilligan MBBCh BAO**

Department of Emergency Medicine, Beaumont Hospital, Dublin, Ireland

Correspondence
Shiraz Siddiq Ali, MBBS, Registrar, Department of Emergency Medicine, Beaumont Hospital, Beaumont Road, Dublin D09 N9W7, Ireland.
Email: shirazsiddiqali@hotmail.com

Funding and support: By *JACEP Open* policy, all authors are required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this article as per ICMJE conflict of interest guidelines (see www.icmje.org). The authors have stated that no such relationships exist.

Abstract

Spontaneous spinal epidural hematoma is a rare neurosurgical condition that is often difficult to diagnose in the emergency department and can cause permanent neurological deficits if diagnosis is delayed or incorrect. We present the case of a 43-year-old man who was initially investigated for cardiac events, suspected posterior circulation stroke, or arterial dissection. All investigations were normal, which led us to perform magnetic resonance imaging of the brain, neck, and cervicothoracic spine, which revealed spontaneous spinal epidural hematoma. Publication of this case raises awareness of this rare neurosurgical emergency and the importance of differential diagnosis to avoid misdiagnosis in patients presenting with sudden-onset cervicothoracic back pain radiating to the upper limbs bilaterally with neurological deficit and a history of discectomy or receiving anticoagulants. Our study highlights the importance of early discussions with the consultant and specialty involvement in such cases.

KEYWORDS
back pain, epidural hematoma, hemorrhage, neurological deficit, spine, spontaneous spinal epidural hematoma, thoracic spine

1 | INTRODUCTION

A spinal epidural hematoma is defined as a collection of blood between the vertebrae and the dura of the spinal cord.[1] These hematomas can be spontaneous or associated with a procedure. Spontaneous epidural hematomas are rare, accounting for less than 1% of all spinal-space-occupying lesions. The incidence of these hematomas is 0.1 per 100,000 people per year and they tend to be associated with coagulopathies or arteriovenous malformations.[2,3] Up to 40% to 50% are idiopathic in etiology.[8] These can cause devastating neurological damage if they are not diagnosed and treated early.

2 | CASE REPORT

A 43-year-old male with a history of 3 lumbar discectomies and hypertension was brought to our emergency department by ambulance at 10:53 am. The patient was cleaning windows at his home at 8 am when he developed a sudden onset of sharp, severe upper back and neck pain. The pain was progressively worsening, radiating to both arms and involved the central chest as well after 20 minutes. He described his chest as tight and heavy. This was associated with lightheadedness. There was no history of trauma, shortness of breath, sweating nausea, vomiting, blurred vision, or headache. No factors aggravating or relieving the symptoms were identified.

Supervising Editor: Bernard Chang, MD, PhD

The patient was administered 1 g paracetamol intravenous, 600 mg ibuprofen orally and intravenous morphine (4 mg) by the ambulance crew. Vitals on arrival were blood pressure (BP), 165/112 mmHg; pulse rate, 78 beats per min; respiratory rate, 16/min; oxygen saturation, 97%; temperature, 36.6°C; glucose, 6.3 mmol/L.

Physical examination on presentation revealed tenderness of the upper thoracic spine from the level of T1 to T8. The Glasgow Coma Scale score was 15/15 with left-sided truncal ataxia, Romberg sign was positive, and power was 5/5. Tone, sensation, and reflexes were intact in all limbs. Examination of the cranial nerves revealed no abnormalities. The patient was negative for the Babinski sign with no radial/radial delays or radial femoral delays. Right-arm BP was 147/95 mmHg and left-arm BP was 167/111 mmHg. Respiratory examination was normal and electrocardiography revealed T-wave inversion in Leads V1 and 3 with normal sinus rhythm. Arterial blood gas analysis showed pH 7.45; carbon dioxide partial pressure, 4.6 kPa; oxygen partial pressure, 9.8 kPa ↓; bicarbonate level, 24.3 mmol/L; and lactate level, 1.2 mmol/L. The presentation was not clear but, based on the history of chest pain, which was radiating to both arms, glycerol trinitrate was administered (2 puffs sublingually) with 5 mg intravenous morphine. Emergent chest and thoracic spine x-rays were normal. Full blood count and blood analysis of urea, electrolytes, calcium, magnesium, liver function, amylase, coagulation profile, and D-dimer level were all within the normal range. At 2 hours after his arrival in the emergency department, the patient developed mild expressive aphasia with mild slurred speech and a stroke call was made. Brain computed tomography (CT), CT angiogram aortic arch, carotids, and intracranial were performed, which were all normal. As the stroke team were still concerned with ongoing symptoms, urgent magnetic resonance imaging (MRI) for brain, neck, and cervicothoracic spine was performed to determine the presence of posterior circulation or spinal stroke. This revealed an epidural hematoma extending from C7 to T3 (Figures 1), which was compressing the ventral aspects of the thoracic cord.

The patient was immediately referred to the neurosurgical team. As the symptoms were improving with no significant cord compression, they admitted the patient with the plan to manage the hematoma conservatively. MRA after 2 weeks revealed near complete resolution of hematoma (Figure 2) and complete neurological recovery. The patient was discharged at this point. A follow-up MRI of the spine after 6 months showed complete resolution and no neurological deficit.

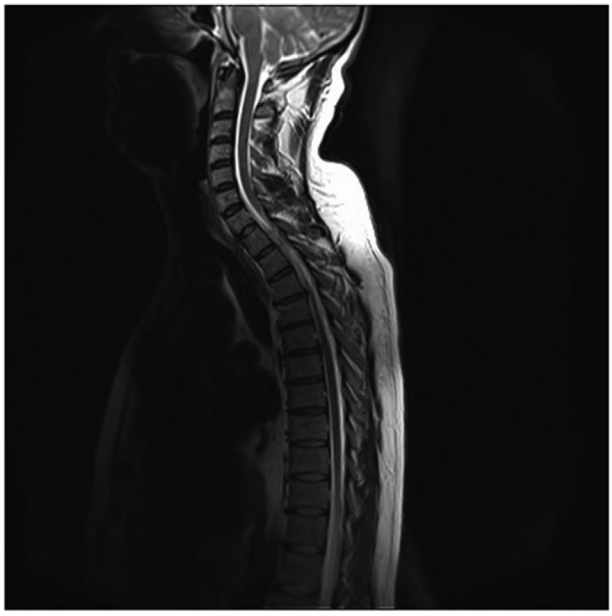

FIGURE 1 Magnetic resonance image of the cervicothoracic spine showing spinal epidural hematoma extending from C7 to T3

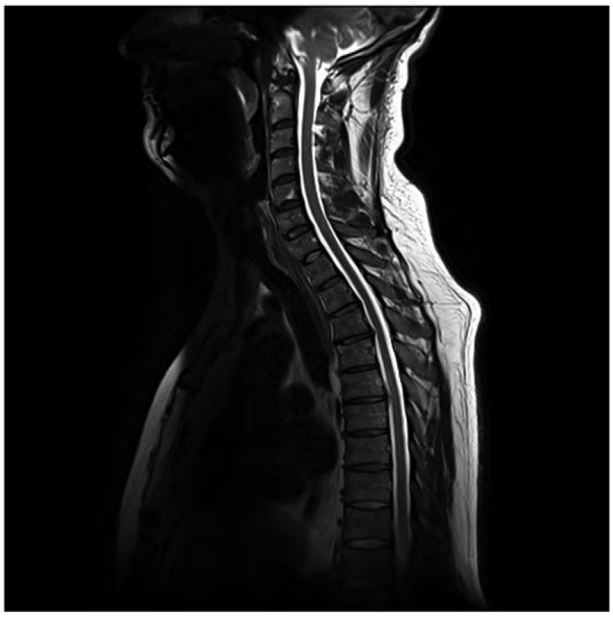

FIGURE 2 Magnetic resonance image of the cervicothoracic spine showing complete resolution of the spinal epidural hematoma

3 | DISCUSSION

This is a challenging diagnosis in a busy emergency department as its very rare. Also, the presentation had a wide differential diagnosis that included acute coronary syndrome, stroke, and vascular dissection. The treatment for all these possibilities can be fatal if the underlying diagnosis is incorrect. Therefore, involving senior help early on is very important so a diagnosis can be made as early as possible in the emergency department.

Spontaneous spinal extradural hemorrhages are more prevalent among men than women, with abrupt onset of symptoms observed mostly in individuals over 40 years of age.[3,5,6] Symptoms typically begin as back pain, which progresses to neurological deterioration over hours, days, weeks, or sometimes longer.[2,6] The spinal pain is sharp and severe and often radiates to the extremities. This can rapidly progress to motor and sensory deficits leading to paralysis and hyporeflexia.[2]

These spontaneous spinal epidural hematomas are thought to be associated with underlying arteriovenous malformations, anticoagulation, coagulopathy, vertebral hemangiomas, or hypertension [2,3] and are believed to originate from ruptured epidural veins, arteries, or vascular

malformations. The internal epidural plexus that drains the abdomen and thorax is a low pressure, valve-less system which may rupture when the pressure increases due to the use of Valsalva maneuvers.[6] Most authors believe that, if symptoms progress rapidly, including neurological decline, then the cause is arterial; otherwise, the cause is likely to be venous.[2,3]

Severe symptoms occurring over a short duration tend to indicate larger hematomas and are typically associated with worse outcomes. A lack of sensory sparing is also associated with poor prognosis. Areas with less cord space, like thoracic spine, are more severely affected by hematomas.[4] Presently, MRI is the preferred investigation for the diagnosis of these bleeds,[6] which require urgent spinal referral upon diagnosis due to the time-critical nature and potentially serious outcomes of cord-compression is time critical, which have been suggested to require draining within 12 to 48 hours.[3] In this case the neurosurgical team decided to manage the patient conservatively. The nonoperative management decision was based on 2 factors. The hematoma was anterior to the cord at the thoracic level. The anterior thoracic spinal approach is more extensive as compared to simple posterior laminectomy. Secondly, the mass effect on the cord was not significant, so the neurosurgical team decided to cautiously observe. A TRICKS MRA (Time Resolved Contrast Enhanced MR Angiography) was done. TRICKS is a confirmatory test when a spinal vascular malformation is suspected on the basis of clinical and conventional MR imaging findings. TRICKS increasingly is used for non-invasive vascular imaging. It increases temporal resolution, permitting hemodynamic assessment of spinal vascular malformations over a relatively large field of view.[7] TRICKS MRA was negative for any vascular malformations, so the final diagnosis was idiopathic spontaneous spinal epidural hematoma.

In conclusion, spontaneous spinal epidural hematoma is a rare neurosurgical emergency. Emergency physicians should consider this as part of their differential in patients presenting with acute spinal pain with neurology. Correct diagnosis and surgical decompression of the hematoma are time critical.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

ORCID

Shiraz Siddiq Ali MBBS https://orcid.org/0000-0002-2814-3922

REFERENCES

1. Gaudet CE, Functional and Clinical Neuroanatomy: A Guide For Health Care Professionals: Moini J, Piran P. *Functional and clinical neuroanatomy: A guide for health care professionals*. London, UK: Elsevier; 2020.
2. Al-Mutair A, Bednar DA. Spinal epidural hematoma. *J Am Acad Orthop Surg*. 2010;18:494-502.
3. Bhat KJ, Kapoor S, Watali YZ, et al. Spontaneous epidural hematoma of spine associated with clopidogrel: a case study and review of the literature. *Asian J Neurosurg*. 2015;10.
4. Bakker NA, Veeger NJ, Vergeer RA, et al. Prognosis after spinal cord and cauda compression in spontaneous spinal epidural hematomas. *Neurology*. 2015;84:1894-1903.
5. Dziedzic T, Kunert P, Krych P, et al. Management and neurological outcome of spontaneous spinal epidural hematoma. *J Clin Neurosci*. 2015;22:726-729.
6. Zhong W, Chen H, You C, et al. Spontaneous spinal epidural hematoma. *J Clin Neurosci*. 2011;18:1490-1494.
7. Amarouche M, Hart JL, Siddiqui A, Hampton T, Walsh DC. Time-resolved contrast-enhanced MR angiography of spinal vascular malformations. *Am J Neuroradiol*. 2015;36(2):417-422.
8. Foo D, Rossier AB. Preoperative neurological status in predicting surgical outcome of spinal epidural hematomas. *Surg Neurol*. 1981;15(5):389-401.

How to cite this article: Ali SS, Paramanathan N, Gilligan P A rare case of spontaneous spinal epidural hematoma in a 43-year-old man. *JACEP Open*. 2021;2:e12532. https://doi.org/10.1002/emp2.12532