

Case report: thoracic spinal epidural haematoma – an unusual cause of chest pain

個案報告：胸椎硬膜外血腫——一個罕有的胸痛成因

KM Chan 陳家滿, KL Law 羅金亮, CH Chung 鍾展鴻

Chest pain is a common presentation to the emergency department. Aetiologies to be considered are usually cardiac or pulmonary in origin. We reported a rare case of thoracic spinal epidural haematoma initially presenting to the emergency department with chest pain. The patient re-attended the emergency department four hours after discharge with symptoms of cord compression. Magnetic resonance imaging of the thoracic spine showed an epidural haematoma causing cord compression. Surgical decompression was performed with gradual resolution of symptoms. Simply ruling out acute coronary syndrome may not be sufficient in patients presenting with chest pain. (*Hong Kong j.emerg.med.* 2006;13:217-220)

胸痛是急症室常見的求診原因，通常考慮源於心或肺的病因。我們報告一個罕有的胸椎硬膜外血腫個案，起初因胸痛到急症室求診，在離院四小時後，病者有脊髓受壓的症狀而再到急症室求診。胸椎磁力共振造影顯示硬膜外血腫引致脊髓受壓。進行外科減壓後，症狀逐漸消退。對胸痛病者而言，只排除急性冠狀動脈綜合症是不足夠的。

Keywords: Anticoagulation, chest pain, magnetic resonance imaging, spinal epidural haematoma

關鍵詞：抗凝血、胸痛、磁力共振造影、脊椎硬膜外血腫

Case report

A 45-year-old man presented to the emergency department in April 2006 with chest pain for one day. There was no pain radiation, shortness of breath or palpitation. The patient also complained of numbness of both feet after jogging for one hour, but no noticeable history of trauma. He had a history of recurrent atrial fibrillation despite cardioversion and

radiofrequency ablation was done three years ago. He was taking warfarin for anticoagulation. He also had history of thyrotoxicosis in remission and obstructive sleep apnoea.

The physical examination at the initial presentation showed an ambulatory man with a blood pressure of 166/97 mm Hg. The chest and cardiovascular examinations were unremarkable. There was no documentation on neurological examination of the lower limbs. Electrocardiogram showed normal sinus rhythm with no evidence of acute ischaemia. Chest radiography was not ordered. Blood tests including complete blood picture, liver and renal function and cardiac enzymes were normal. The patient was given a stat oral dose of panadol, ibuprofen and Gastrocaine with a provisional diagnosis of costochondritis. He was discharged three hours later with an oral analgesic.

Correspondence to:

Chan Ka Moon, MBBS(HK), MRCSEd
North District Hospital, Accident & Emergency Department,
9 Po Kin Road, Sheung Shui, N.T., Hong Kong
Email: drkmchan@netvigator.com

Law Kam Leung, FRCSEd, FHKCEM, FHKAM(Emergency Medicine)
Chung Chin Hung, FRCS(Glasg), FHKAM(Surgery), FHKAM(Emergency
Medicine)

The patient returned to the emergency department four hours after discharge. He complained of increasing cramps and pain over both legs. Chest pain was not documented at the return visit. The patient was resting on a stretcher during examination. The blood pressure was 142/82 mmHg. The cardiovascular, chest and abdominal examinations were normal. Both calf muscles were not swollen, and there was no evidence of deep vein thrombosis. Distal pulses of the lower limbs were palpable. The muscle power of the legs was Medical Research Council (MRC) grade 4. The deep tendon reflexes were normal and symmetrical.

The chest and lumbosacral radiographs were unremarkable. The electrocardiogram was again normal. Blood tests for complete blood picture, liver and renal function tests and clotting profiles were unremarkable. The patient complained of numbness below the rib cage down to the toes and urinary retention during the period of observation. A Foley's catheter was inserted and the residual urine volume was 400 ml.

The patient was admitted to the orthopaedics unit of the hospital with a provisional diagnosis of acute cord compression. Magnetic resonance imaging (MRI) of the thoracic spine was done 15 hours after admission and showed an extramedullary extradural mass lesion extending from T2 to T4 levels, measuring 53 mm long, 11 mm deep and 16 mm wide (Figure 1). There was severe cord compression at the T2 and T3 levels of approximately 4 mm anteroposteriorly. The mass lesion showed isointense T1W and heterogeneous T2W intensity. A diagnosis of thoracic epidural haematoma was made.

Emergency laminectomy for decompression was performed 21 hours after admission. Intra-operatively, there was a haematoma measuring 5 cm in length extending from T1 to T4 causing compression of the spinal cord at the corresponding levels. There was also a few connecting epidural veins with the haematoma. No active bleeding was found. The postoperative course was uneventful. The patient gradually regained full power of the lower limbs and was able to walk independently on level ground. However, the patient had to bear with a neurogenic bladder requiring self-catheterisation.

Discussion

The first case report of spinal epidural haematoma was described by Jackson in 1869. Spinal epidural haematoma is a rare condition, and about 300 cases have been reported in the international literature.¹ It may be due to trauma, blood dyscrasia, anticoagulation therapy, arteriovenous malformation, cavernous haemangioma, spinal anaesthesia or lumbar puncture.² Spinal epidural haematoma can occur during pregnancy³ and in patients with chronic renal failure undergoing haemodialysis.⁴ A case associated with cocaine injection was reported.⁵ The term spontaneous spinal epidural haematoma is given if no cause can be identified, which occurs in 40-50% of the cases.⁶

The underlying pathology of spinal epidural haematoma remains controversial. The spinal epidural venous plexus has been commonly postulated to be the origin of the haematoma.⁷ A sudden increase in intra-thoracic or intra-abdominal pressure induced by,



Figure 1. MRI thoracic spine showing epidural haematoma from T2 to T4 causing significant cord compression at T2 and T3.

for example, pregnancy or straining raises the plexus pressure, and may lead to the rupture.

The clinical presentation of spinal epidural haematoma is typically a sudden onset of severe spinal pain with or without radiation to the limbs. Sometimes, radicular pain may be the first symptom. Neurological symptoms may then develop within hours with variable degrees of motor and sensory loss and bladder involvement.⁸ Retrospectively, our patient's first symptom of chest pain may be the manifestation of nerve root irritation of the T2 to T4 dermatomes which innervate the anterior chest and the inter-scapular region. Upon further compression of the cord, the neurological symptoms of urinary retention, progressive paraesthesia and paraplegia developed 13 hours after the first presentation to the emergency department.

Spinal epidural haematoma is a neurological emergency, as it requires urgent investigation and treatment. Magnetic resonance imaging has been used to diagnose spinal epidural haematoma since 1987. On sagittal sections, the haematoma appears as a biconvex mass, dorsal to the thecal sac, and clearly outlined with tapering superior and inferior margins. The dura mater is seen as a curvilinear low signal separating the haematoma from the cord. Within 24 hours of onset, the haematoma is isointense with the cord on T1-weighted images and heterogenous on T2-weighted images.^{1,9} By 48 hours, due to the accumulation of methaemoglobin, the haematoma will give an increased signal on T1 weighted images but will remain hyperintense on T2 weighted sequences.¹⁰ This case had compatible findings.

Laminectomy for the release of cord compression and clot evacuation is the surgery of choice. It has been found that a delay of more than 36 hours before decompressive laminectomy and evacuation of clot was associated with a poor prognosis.¹¹ However, there were reports of spontaneous resolution of spinal epidural haematoma with conservative treatment.¹²⁻¹⁴ Improving clinical condition, extensive haematoma, age, and poor medical condition of the patient might be the reasons for pursuing conservative treatment.¹⁵ Fresh frozen plasma, vitamin K, and monitoring

of INR (international normalised ratio) have been the mainstay of conservative treatment in patients on anticoagulants.¹⁶ Observation in a hospital with urgent neurosurgical and MRI services is essential for conservative treatment.

In summary, simply ruling out acute coronary syndrome may not be sufficient in patients presenting with chest pain, as in this case. With the increasing number of patients taking anticoagulants for cardiovascular diseases, patients may present to the emergency department with atypical complications. There should be high vigilance on subtle neurological symptoms such as the lower limb numbness in this case. A period of observation may be the minimal requirement in patient management.

References

1. Kong JK, Mak KH. Spontaneous spinal epidural haematoma--an unusual cause of spinal cord compression. *Hong Kong Med J* 2003;9(1):55-7.
2. Lawton MT, Porter RW, Heiserman JE, Jacobowitz R, Sonntag VK, Dickman CA. Surgical management of spinal epidural hematoma: relationship between surgical timing and neurological outcome. *J Neurosurg* 1995; 83(1):1-7.
3. Mahieu X, Kridelka F, Pintiaux A, Hans P, Brichant JF, Born J, et al. Spontaneous cervical extradural hematoma in a pregnant woman. *J Gynecol Obstet Biol Reprod (Paris)* 1994;23(1):99-102.
4. Takahashi K, Koiwa F, Tayama H, Satomi A, Akizawa T, Ideura T. A case of acute spontaneous epidural haematoma in a chronic renal failure patient undergoing haemodialysis: successful outcome with surgical management. *Nephrol Dial Transplant* 1999;14(10): 2499-501.
5. Huff JS. Spinal epidural hematoma associated with cocaine abuse. *Am J Emerg Med* 1994;12(3):350-2.
6. Groen RJ, Ponsen H. The spontaneous spinal epidural hematoma. A study of the etiology. *J Neurol Sci* 1990; 98(2-3):121-38.
7. Pear BL. Spinal epidural hematoma. *Am J Roentgenol Radium Ther Nucl Med* 1972;115(1):155-64.
8. Markham JW, Lyngne HN, Stahlman GE. The syndrome of spontaneous spinal epidural hematoma. Report of three cases. *J Neurosurg* 1967;26(3):334-42.
9. Holtas S, Heiling M, Lonntoft M. Spontaneous spinal epidural hematoma: findings at MR imaging and clinical correlation. *Radiology* 1996;199(2):409-13.
10. Lovblad KO, Baumgartner RW, Zambaz BD, Remonda L, Ozdoba C, Schroth G. Nontraumatic spinal epidural

- hematomas. MR features. *Acta Radiol* 1997;38(1):8-13.
11. McQuarrie IG. Recovery from paraplegia caused by spontaneous spinal epidural hematoma. *Neurology* 1978;28(3):224-8.
 12. Saito S, Katsube H, Kobayashi Y. Spinal epidural hematoma with spontaneous recovery demonstrated by magnetic resonance imaging. *Spine* 1994;19(4):483-6.
 13. Wagner S, Forsting M, Hacke W. Spontaneous resolution of a large spinal epidural hematoma: case report. *Neurosurgery* 1996;38(4):816-8.
 14. Jamjoom ZA. Acute spontaneous spinal epidural hematoma: the influence of magnetic resonance imaging on diagnosis and treatment. *Surg Neurol* 1996;46(4):345-9.
 15. Kumar R, Gerber C. Resolution of extensive spinal epidural haematoma with conservative treatment. *J Neurol Neurosurg Psychiatry* 1998;65(6):949-50.
 16. Boukobza M, Guichard JP, Boissonet M, George B, Reizine D, Gelbert F, et al. Spinal epidural haematoma: report of 11 cases and review of the literature. *Neuroradiology* 1994;36(6):456-9.