

---

## CASE REPORT

---

# Mycotic Aneurysm of an Intercostal Artery: a Rare Cause of Haemothorax

WP Chu, LF Cheng

Department of Radiology, Princess Margaret Hospital, Laichikok, Kowloon, Hong Kong

### ABSTRACT

*Causes of haemothorax include trauma, pulmonary or pleural neoplasm, pulmonary infarction and coagulopathy. Mycotic aneurysm of an intercostal artery is a rare cause of haemothorax. We report on a 60-year-old man who had a mycotic aneurysm of the right 12th thoracic (T12) intercostal artery, which was shown by computed tomography of the thorax and subsequently confirmed by angiography.*

*Key Words: Aneurysm, false; Aortic coarctation; Hemothorax; Thoracic arteries*

## 中文摘要

### 肋間動脈霉菌性動脈瘤：血胸的一個罕見病因

朱惠邦、鄭力暉

血胸的病因包括創傷、肺部或胸膜腫瘤、肺梗塞及凝血性疾病。肋間動脈霉菌性動脈瘤是血胸的一個罕見病因。本文報告一名60歲男性，經胸部電腦斷層造影發現其右側12肋間動脈霉菌性動脈瘤，其後經血管造影進一步確診此症。

### CASE REPORT

A 60-year-old man was admitted to our hospital because of back pain and fever for 1 week. The patient had a history of old pulmonary tuberculosis and was also an active intravenous drug abuser. There was no history of trauma or a recent operation. On admission, he had a leukocytosis ( $26.4 \times 10^9/l$ ), high erythrocyte sedimentation rate of 120 mm/h and his haemoglobin level decreased rapidly from 132 g/l to 100 g/l within 10 days. Serial chest radiographs showed a rapidly enlarging right pleural effusion and progressive multilobar consolidation (Figure 1). Magnetic resonance imaging performed for suspected septic spondylitis showed an epidural abscess extending from mid 12th thoracic (T12) to upper second lumbar vertebral (L2) level (Figure 2). Computed tomographic

images obtained before and after intravenous injection of contrast showed a large right haemothorax (Figure 3), a 1-cm intensely enhancing right para-vertebral lesion suggestive of an aneurysm near the medial end of the right 12th rib (Figure 4), and a right psoas abscess (Figures 5 and 6). Conventional angiography of the right T12 intercostal artery confirmed the presence of an aneurysm (Figure 7). Embolisation using two 2-mm and 3-mm diameter steel coils was performed. Post-embolisation angiography showed complete obliteration of the aneurysm (Figure 8).

A chest drain was inserted and microbiological culture of fluid collected from the right pleural cavity yielded methicillin-sensitive *Staphylococcus aureus*. The patient continued to deteriorate despite intensive medical

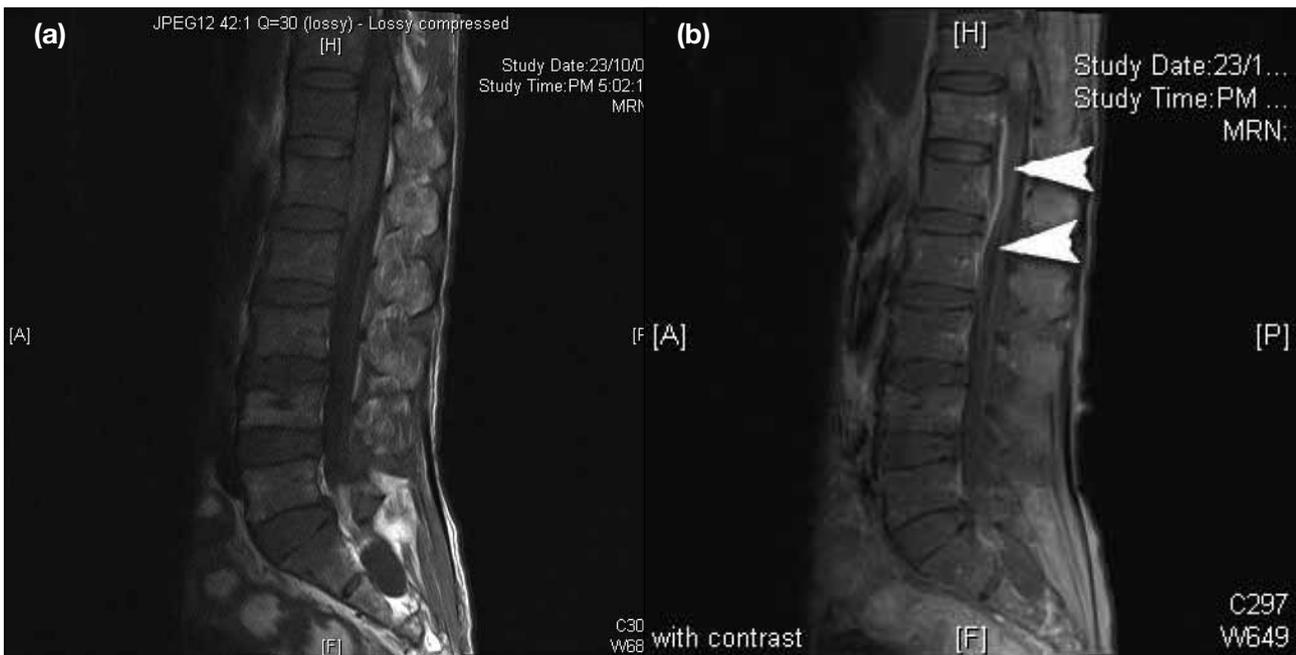
---

*Correspondence: Dr WP Chu, Department of Radiology, Princess Margaret Hospital, Laichikok, Kowloon, Hong Kong. Tel: (852) 2990 1357; Email: drvictorchu@yahoo.com*

Submitted: 22 Jul 2010; Accepted: 30 Aug 2010.



**Figure 1.** A frontal chest radiograph taken (a) upon admission showing right pleural effusion and consolidation over the lower zone of the right lung, and (b) 10 days after admission showing a rapidly enlarging right pleural effusion and new consolidation over the mid and upper zones of the left lung.



**Figure 2.** Sagittal T1-weighted magnetic resonance images of the lumbar spine obtained (a) before and (b) after intravenous injection of gadolinium showing an anterior epidural abscess (arrowheads) extending from mid T12 to upper L2 level. The epidural abscess mildly impinged the thecal sac and conus medullaris.

care and intravenous antibiotic therapy and finally succumbed around 1 month after admission.

## DISCUSSION

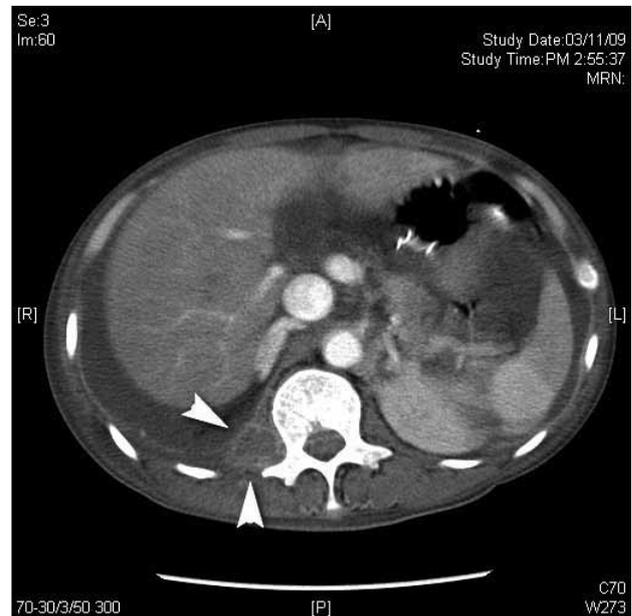
Diagnosis of an aneurysm of an intercostal artery requires a high index of suspicion, as the patient may be asymptomatic or have non-specific symptoms and signs.

Mycotic intercostal artery aneurysm is extremely rare. To our knowledge, only 3 cases have been reported in the English literature.<sup>1-3</sup> Other causes of intercostal artery aneurysms include trauma,<sup>4,5</sup> an interventional procedure,<sup>6</sup> surgery,<sup>7,8</sup> and coarctation of the aorta.<sup>9</sup>

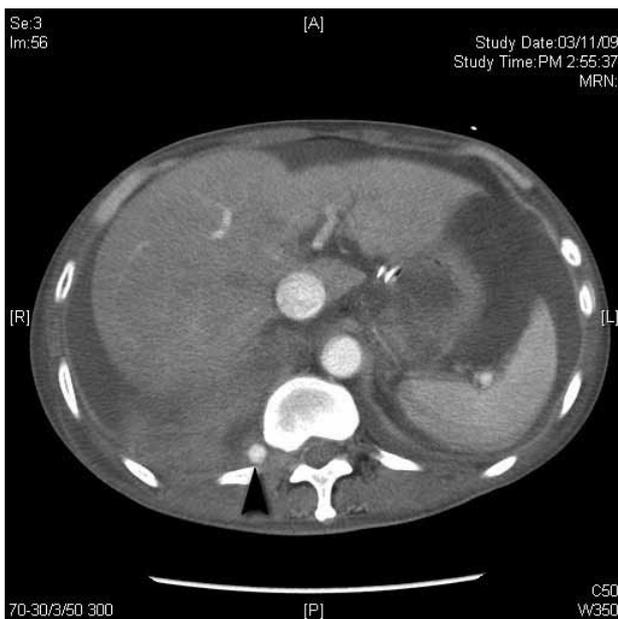
Definite diagnosis of a mycotic aneurysm of the



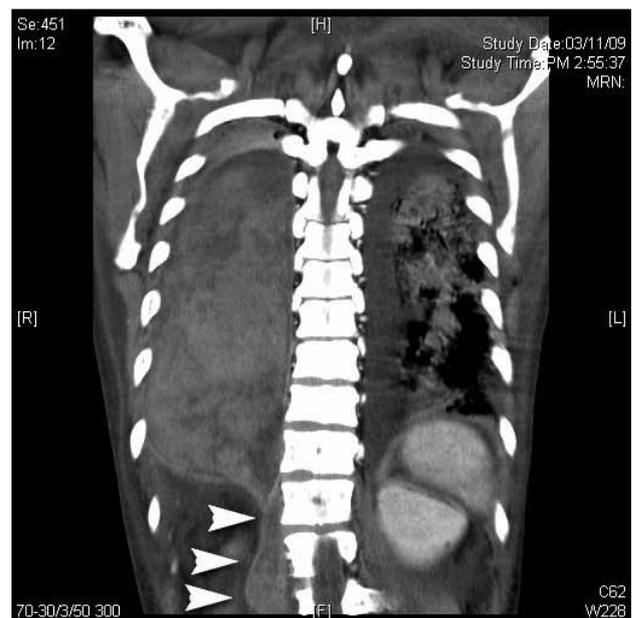
**Figure 3.** Pre-contrast computed tomographic thorax showing right haemothorax and small amount of left pleural effusion.



**Figure 5.** Post-intravenous contrast computed tomography of the upper abdomen showed a rim-enhancing lesion suggestive of an abscess over the right psoas muscle (arrowheads).



**Figure 4.** Post-intravenous contrast computed tomography showed a 1-cm oval enhancing lesion suggestive of an aneurysm over the right para-vertebral region just adjacent to the medial end of the right 12th rib (arrowhead).



**Figure 6.** Sagittal reformatted computed tomographic image showing the craniocaudal extent of the right psoas abscess (arrowheads).

intercostal artery requires histological examination and microbiological culture. In our patient, there was no positive history of trauma or recent operation, diagnosis of aneurysm of an intercostal artery was made as a result of the imaging and microbiological culture findings. The side and site predilection for such aneurysms are not well established. This is most likely due to the rarity of this entity. We speculated that in our patient, involvement of the medial right 12th intercostal artery was due to its close proximity to an ipsilateral infected pleural collection, psoas and epidural abscesses. Multi-detector computed tomography has facilitated the diagnosis, which could be valuable in planning the treatment.

Many investigators agree that coils constitute the most appropriate embolic materials for treating visceral non-aortic pseudoaneurysms or aneurysms.<sup>10-13</sup> Selective transarterial embolisation with gelatin sponge has also been described in a patient suffering from mycotic intercostal artery aneurysm.<sup>2</sup> Spinal cord ischaemia is a serious potential complication related to embolisation of intercostal artery aneurysms. Knowledge of normal anatomy of the anterior medullary spinal artery is essential before proceeding to the interventional procedures on intercostal arteries. The artery of Adamkiewicz or greater anterior medullary artery reinforces the circulation of the lumbar enlargement of the spinal cord. This artery has been observed to

arise from T9 to T12 levels in 75% of cases.<sup>14</sup> Anterior medullary arteries form characteristic hairpin loops on the angiogram. Recognition and protection of these vessels from inadvertent embolisation is essential.

In summary, we report a case in which the patient has suffered from mycotic aneurysm of an intercostal artery. This is a rare cause of haemothorax and requires a high index of suspicion to make an accurate diagnosis.

## REFERENCES

1. Wallace RB, Nast EP. Postcoarctation mycotic intercostal arterial pseudoaneurysm. *Am J Cardiol.* 1987;59:1014-5.
2. Muthuswamy P, Samuel J, Mizock B, Dunne P. Recurrent massive bleeding from an intercostal artery aneurysm through an empyema chest tube. *Chest.* 1993;104:637-9.
3. Lifshultz BD, Leestma JE, Stryker S. Multiple mycotic aneurysms and transverse myelopathy complicating repair of aortic coarctation. *Ann Thorac Surg.* 1982;33:192-6.
4. Aoki T, Okada A, Tsuchida M, Hayashi J. Ruptured intercostal artery pseudoaneurysm after blunt thoracic trauma. *Thorac Cardiovasc Surg.* 2003;51:346-7.
5. Sekino S, Takagi H, Kubota H, Kato T, Matsuno Y, Umamoto T. Intercostal artery pseudoaneurysm due to stab wound. *J Vasc Surg.* 2005;42:352-6.
6. Casas JD, Perendreu J, Gallart A, Muchart J. Intercostal artery pseudoaneurysm after a percutaneous biliary procedure: diagnosis with CT and treatment with transarterial embolization. *J Comput Assist Tomogr.* 1997;21:729-30.
7. Atherton WG, Morgan WE. False aneurysm of an intercostal artery after thoracoscopic sympathectomy. *Ann R Coll Surg Engl.* 1997;79:229-30.
8. Bluebond-Langner R, Pinto PA, Kim FJ, Hsu T, Jarrett TW.



**Figure 7.** Selective cannulation of the right T12 intercostal artery confirmed the presence of an aneurysm (arrow).



**Figure 8.** A post-embolisation angiogram shows absence of blood flow inside the aneurysm.

- Recurrent bleeding from intercostal artery pseudoaneurysm after retroperitoneal laparoscopic radical nephrectomy. *Urology*. 2002;60:1111
9. Yamaguchi T, Stanford W, Lang EV. Intercostal artery aneurysm associated with coarctation of the aorta: specific finding on MR imaging. *Int J Card Imaging*. 1997;13:357-8.
  10. Reber PU, Baer HU, Patel AG, Wildi S, Triller J, Büchler MW. Superselective microcoil embolization: treatment of choice in high-risk patients with extrahepatic pseudoaneurysm of the hepatic arteries. *J Am Coll Surg*. 1998;186:325-30.
  11. Boudghène F, L'Herminé C, Bigot JM. Arterial complications of pancreatitis: diagnostic and therapeutic aspects in 104 cases. *J Vasc Interv Radiol*. 1993;4:551-8.
  12. Okazaki M, Ono H, Higashihara H, et al. Angiographic management of massive hemobilia due to iatrogenic trauma. *Gastrointest Radiol*. 1991;16:205-11.
  13. de Baere T, Ousehal A, Kuoch V, Sapoval M, Lagrange C, Roche A. Endovascular management of bleeding iliac artery pseudoaneurysms complicating radiation therapy for pelvic malignancies. *AJR Am J Roentgenol*. 1998;170:349-53.
  14. Rosenthal D. Spinal cord ischemia after abdominal aortic operation, is it preventable? *J Vasc Surg*. 1999;30:391-7.