

CASE REPORT

Lung cancer mimicking aortic dissecting aneurysm in a patient with situs inversus totalis

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Keywords

Aortic dissecting aneurysm; lung cancer; situs inversus totalis; surgery.

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Received: 11 March 2015;

Accepted: 8 April 2015.

doi: 10.1111/1759-7714.12273

Thoracic Cancer 7 (2016) 254–256

Introduction

Lung cancer as a common malignant tumor is rarely found in patients with situs inversus totalis (SIT); no more than 30 cases have been reported worldwide to date. We report here a case of lung cancer in a mediastinal location mimicking aortic dissecting aneurysm (ADA) occurring in a patient with SIT. The patient underwent successful surgical treatment with a satisfactory treatment outcome.

Case report

A 50-year-old man presented to our hospital with a three-month history of intermittent chest pain. The patient had no previous medical history. Physical examination revealed that the apex beat was located in the fifth intercostal space at the right midclavicular line and in the liver located in the upper left abdomen. Vital signs, including blood pressure and heart rate, were normal. Enhanced computed tomography (CT) of the chest showed typical radiographic features of SIT and a round mediastinal mass with uneven density embracing the thoracic aorta, which presented a “fried-egg” shape (Fig 1). The results of routine laboratory studies, respiratory function, electrocardiogram, and head and abdominal CT were normal.

Abstract

Lung cancer and situs inversus totalis are two completely irrelevant conditions. The likelihood of both conditions occurring simultaneously in one person is very rare. We report here a case of a 50-year-old man who presented with intermittent chest pain. Enhanced computed tomography of the chest showed situs inversus totalis and a round mediastinal mass embracing the thoracic aorta. The primary diagnosis was suggested as pseudo aortic dissecting aneurysm. However, a tumor in the right lower lung was discovered during surgery, which enclosed and invaded the thoracic aorta. Finally, the patient successfully underwent right lower lobectomy accompanied by lymph node excision and partial replacement of the thoracic aorta with an artificial vascular graft under cardio-pulmonary bypass.

The primary diagnosis was suggested as pseudo ADA, and an emergency thoracotomy was performed after systemic evaluation. During surgery, however, a 6 × 5 × 5 cm mass was discovered in the right lower lung, which enclosed and invaded the thoracic aorta. The malignant nature of the lung mass was verified via fast frozen section examinations. Finally, the patient underwent a right lower lobectomy accompanied by lymph node excision and partial replacement of the thoracic aorta with an artificial vascular graft under cardio-pulmonary bypass (CPB). The mass was verified as squamous cell carcinoma stage T4N0M0 via pathological examination (Fig 2). The postoperative process was uneventful, without severe surgical complications. The patient was discharged on the tenth day after surgery. No evidence of tumor recurrence was observed during 10 months of follow-up after surgery. Follow-up of the heart and thoracic aorta three-dimensional reconstruction images indicated successful vascular anastomosis between the aorta and artificial vascular graft (Fig 3).

Discussion

Lung cancer is a common malignant tumor occurring in the elderly, while SIT is a rare autosomal recessive disease probably associated with an X chromosome defect.^{1,2} Reports

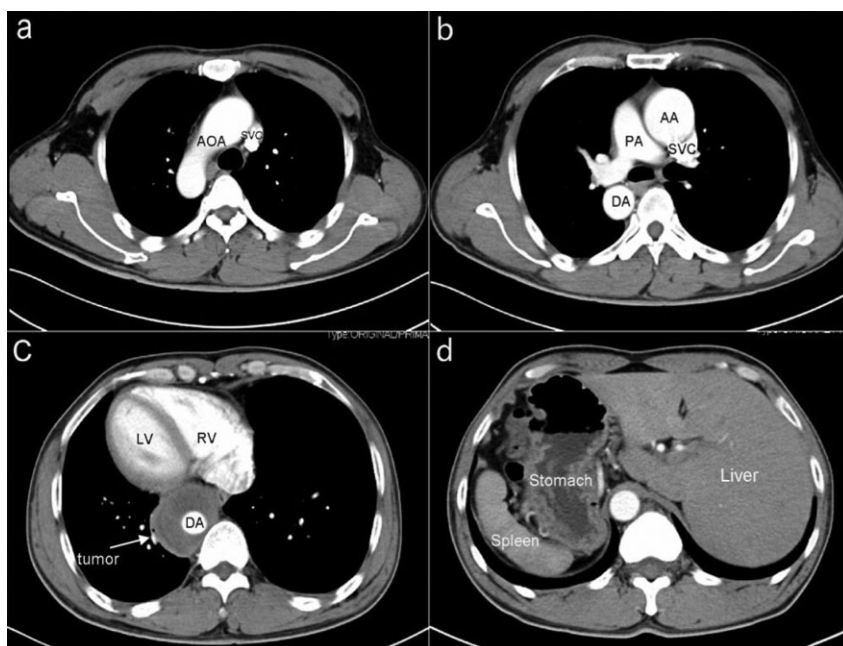


Figure 1 (a-d) Enhanced chest computed tomography showed typical radiographic features of situs inversus totalis. **(b)** A posterior mediastinal mass with uneven density embraced the thoracic aorta, which presented a “fried-egg” shape (arrow). AOA, arch of aorta; AA, ascending aorta; DA, descending aorta; PA, pulmonary artery; SVC, superior vena cava; LV, left ventricle; RV, right ventricle.

detailing lung cancer occurring in patients with SIT are very rare. To date, only 30 cases have been published worldwide. Among them, about 15 patients, including our case, underwent surgical treatment.^{3,4}

A review of the literature revealed that cases of thoracic mesothelioma mimicking ADA have been reported; however, few reports of lung cancer presenting with symptoms suggestive of ADA have been documented.^{5,6} In our case, this tumor presented unique growth by surrounding the aorta and symptoms of intermittent chest pain, which resulted in a false preoperative diagnosis because of similar clinical characteristics to ADA.

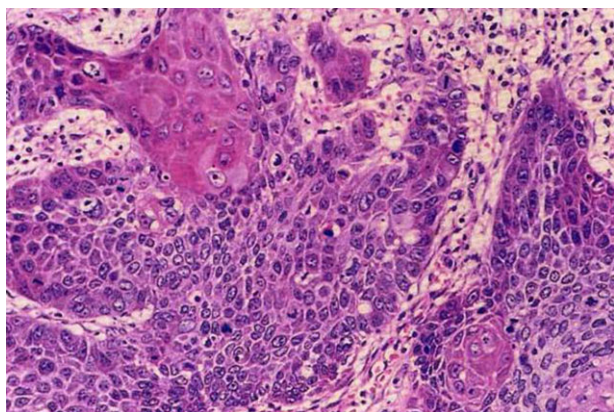


Figure 2 The diagnosis of squamous cell carcinoma of the lung was pathologically verified.

Differentiating ADA from a lung tumor is best determined using computed tomography angiography (CTA) or magnetic resonance imaging (MRI). CTA can demonstrate aortic wall integrity and find the false lumen of ADA, while an MRI possesses optimal soft tissue resolution. It can also accurately detect aortic dissection, including delineation of the extent of the dissection, and demonstrate the site of the tear.⁷

Lung cancer infiltrating a great vessel has a poor prognosis; however, surgical resection still plays an important role in the treatment of these patients and may provide a chance of cure. The application of CPB as an assist in surgical resection has extended the indications of surgery and improved survival in carefully selected patients.^{8,9} In our case, although the lung cancer was in stage IV, neither significantly enlarged mediastinal lymph nodes nor lesions in other parts of the body were detected on preoperative CT. Thus, an extended resection of the right lower lobe was performed.

In conclusion, we report a very rare case of a lung cancer of mediastinal location mimicking ADA occurring in a patient with SIT. To the best of our knowledge, this particular case has not been reported to date. Although this condition is rare, it should be considered in the differential diagnosis of an unexplained posterior mediastinal mass.

Disclosure

No authors report any conflict of interest.

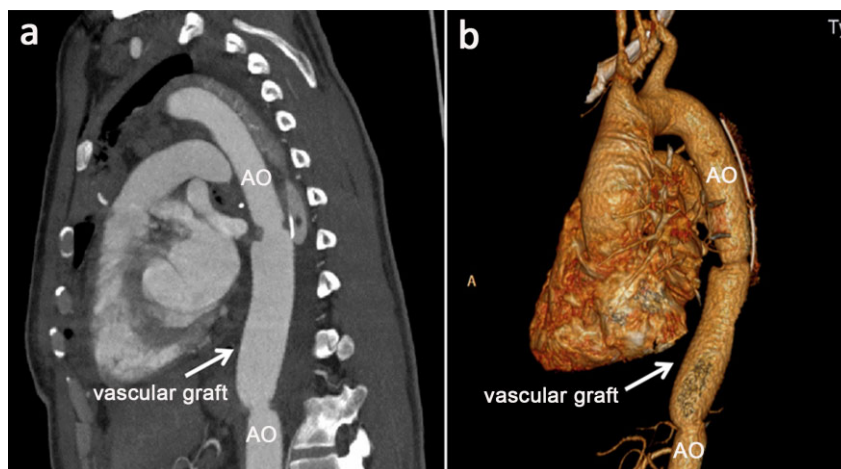


Figure 3 Postoperative heart and thoracic aorta three-dimensional reconstruction images showed a well vascular anastomosis between aorta and artificial vascular graft. AO, aorta.

References

- 1 Casanova MS, Tuji FM, Yoo HJ, Haitei-Neto F. Kartagener syndrome. *Dentomaxillofac Radiol* 2006; **35**: 386–9.
- 2 Rott HD. Kartagener's syndrome and the syndrome of immotile cilia. *Hum Genet* 1979; **46**: 249–61.
- 3 Divisi D, De Vico A, Ferrari V, Crisci R. Management of lung cancer in a situs viscerum inversus patient. *Eur J Cardiothorac Surg* 2014; **45**: 197–8.
- 4 Wójcik J, Grodzki T, Bielewicz M *et al.* Lung cancer in situs inversus totalis (SIT)—literature review. *Adv Med Sci* 2013; **58**: 1–8.
- 5 Pankhania M, Hardiment K, Marathe M. Advanced, recurrent mesothelioma growth mimicking an aortic dissection. *BMJ Case Rep* 2011; **2**: 2011.
- 6 Mouawad NJ, Daniel VC, Starr JE. Advanced malignant mesothelioma mimicking acute contained thoracic aortic rupture. *Interact Cardiovasc Thorac Surg* 2014; **18**: 242–4.
- 7 Khan IA, Nair CK. Clinical, diagnostic, and management perspectives of aortic dissection. *Chest* 2002; **122**: 311–28.
- 8 Park BJ, Bacchetta M, Bains MS *et al.* Surgical management of thoracic malignancies invading the heart or great vessels. *Ann Thorac Surg* 2004; **78**: 1024–30.
- 9 Byrne JG, Leacche M, Agnihotri AK *et al.* The use of cardiopulmonary bypass during resection of locally advanced thoracic malignancies: A 10-year two-center experience. *Chest* 2004; **125**: 1581–6.