

## IMAGING IN THORACIC CANCER

# Thymic carcinoma with tumor thrombus protruding into the superior vena cava and the right atrium

Chengtao Sun<sup>1</sup>, Xue Xu<sup>2</sup>, Xingwen Wang<sup>1</sup>, Wei Sheng<sup>1</sup>, Shiling Wen<sup>2</sup> & Junqing Han<sup>1</sup>

<sup>1</sup> Department of Tumor Research and Therapy Center, Provincial Hospital affiliated to Shandong University, Shandong University, Jinan, Shandong, China

<sup>2</sup> Department of Health Care, Shandong Province Qianfoshan Hospital Affiliated to Shandong University, Shandong University, Jinan, Shandong, China

A 49-year-old man presented with superior vena cava syndrome (SVCS) over a period of one month, and intermittent bilateral upper extremities pain. He had been in good health until one month earlier, when he noted facial edema, hyperemia in the jugular and epigastric vein, and shortness of breath. The axial computed tomographic (CT) scan of the chest showed an anterior mediastinal mass with calcification and cyst (Fig 1C, D, red arrows), and filling defects caused by a tumor thrombus measuring approximately 16 cm within the brachiocephalic vein protruding into the superior vena cava (SVC) and the right atrium (Fig 1A to F, green arrows). The coronal and sagittal reformation views of the chest CT displayed the anterior mediastinal mass (Fig 2B, red arrow) and the tumor thrombus (Fig 2A, B, green arrows) clearly. Chest CT scans also demonstrated multiple lung metastases, left pleural metastasis, and left pleural effusion on admission. A transthoracic echocardiogram demonstrated a thrombus in the right atrium. The patient underwent transthoracic CT-guided biopsy, which revealed a poorly differentiated squamous-cell carcinoma consistent with thymic carcinoma. The patient was placed on two cycles of docetaxel and cisplatin, and was considered to have had a partial response to chemotherapy. Two additional treatments of the above-mentioned chemotherapy regimen were subsequently performed. He was also given warfarin to start anticoagulant

therapy. Radiation was not performed in order to avoid thrombus shedding. A follow-up was performed after the therapy, however, the patient died six months after completion of the treatment because of multiple metastases and tumour cachexia.

## Discussion

Thymic carcinoma is a rare tumor of the anterior mediastinum derived from the epithelial cells of the thymic gland, and the clinical behavior and prognosis of thymic carcinoma are reported to be correlated with its morphological features.<sup>1–3</sup>

### Keywords

right atrium; superior vena cava; thymic carcinoma; tumor thrombus.

### Correspondence

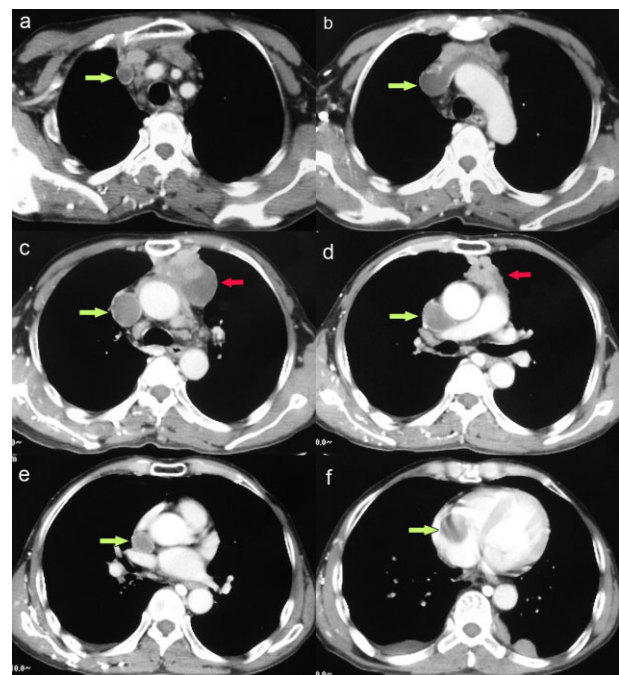
Junqing Han, Department of Tumor Research and Therapy Center, Provincial Hospital affiliated to Shandong University, Shandong University, 324 Jingwu Weiqi Road, Jinan, Shandong 250021, China.  
Tel: +86 531 6877 6100  
Email: hanjq1960@126.com

Chengtao Sun and Xue Xu are co-first authors, they contributed equally to this work.

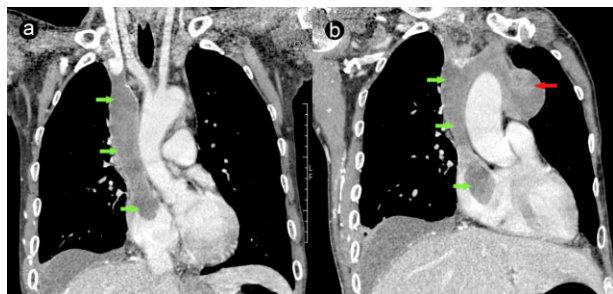
The research findings are presented with the consent of the patient and ethics committee approval.

Received: 4 October 2012; accepted 21 November 2012.

doi: 10.1111/1759-7714.12012



**Figure 1** The axial computed tomographic (CT) scan of the chest. (c) and (d) show a soft tissue mass with calcification and cyst in the anterior mediastinum (red arrows). (a) to (f) demonstrate a tumor thrombus measuring approximately 16 cm within the brachiocephalic vein protruding into the superior vena cava (SVC) and the right atrium causing filling defects (green arrows).



**Figure 2** The coronal and sagittal reformation of the chest computed tomography (CT). **(b)** displays thymic carcinoma in the anterior mediastinum (red arrows). **(a)** and **(b)** reveal a tumor thrombus involving vessels via the thymic vein into the brachiocephalic vein, superior vena cava (SVC), and the right atrium (green arrows).

Konstantinov *et al.* and Thompson *et al.* reported tumor thrombus into the SVC in thyroid tumors and thymoma, respectively.<sup>4,5</sup> However, our case of thymic carcinoma with tumor thrombus protruding into the brachiocephalic vein, the SVC, and the right atrium is very rare. Treatments of thymic carcinoma include surgery, chemotherapy, and radiotherapy. Kamikubo *et al.* successfully treated their patient with removal of the thrombus through simple venotomy, followed by an autologous pericardial patch plasty.<sup>3</sup> In our patient, surgery was not performed because of SVCS, and

radiation was also not performed in order to avoid thrombus shedding. The patient received only chemotherapy and his prognosis was poor. In conclusion, we report a rare finding of a tumor thrombus in the superior vena cava in a patient with thymic carcinoma.

## Disclosure

No authors report any conflict of interest.

## References

- 1 Gubens MA. Treatment updates in advanced thymoma and thymic carcinoma. *Curr Treat Options Oncol* 2012; **13**: 527–34.
- 2 Weissferdt A, Wistuba II, Moran CA. Molecular aspects of thymic carcinoma. *Lung Cancer* 2012; **78**: 127–32.
- 3 Kamikubo Y, Shiiya N, Kubota S, Yasuda K. Thymic carcinoma with tumor thrombus into the superior vena cava. *Jpn J Thorac Cardiovasc Surg* 2001; **49**: 327–9.
- 4 Konstantinov IE, Saxena P, Koniuszko M *et al.* Superior vena cava obstruction by tumour thrombus in invasive thymoma: diagnosis and surgical management. *Heart Lung Circ* 2007; **16**: 462–4.
- 5 Thompson NW, Brown J, Orringer M, Sisson J, Nishiyama R. Follicular carcinoma of the thyroid with massive angioinvasion: extension of tumor thrombus to the heart. *Surgery* 1978; **83**: 451–7.