FDG-PET/CT of invasive thymoma extending into the superior vena cava and right atrium

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We present FDG PET/CT findings of a rare case of invasive thymoma with intraluminal growth into the superior vena cava (SVC) and right atrium (RA).

Key Words: FDG • PET/CT • invasive thymoma • superior vena cava • right atrium

CASE PRESENTATION

A 68-year-old man, with a history of reduced exercise tolerance for 2 years, presented to the emergency department because of hemoptysis. Physical examination revealed dilated veins over the chest wall. An x-ray of the chest revealed mediastinal widening (Figure 1).

18F-FDG PET/CT showed invasive tumor with intraluminal growth into the superior vena cava and right atrium (Figure 2). The patient underwent surgery; the tumor and left brachiocephalic vein were resected, and the tumors in the SVC and RA were removed (Figure 3A). Postsurgical pathology revealed a mixed type B1/B3 thymoma (Figure 3B, C) protruding into the SVC and RA.

One month after surgery, the patient underwent four courses of chemotherapy (ifosfamide and cisplatin). Pulmonary metastasis were found one year after surgery (Figure 4A). The nodules increased during the next 3 years of follow-up (Figure 4B). No recurrence has been detected for 4 years postoperatively (Figure 5).

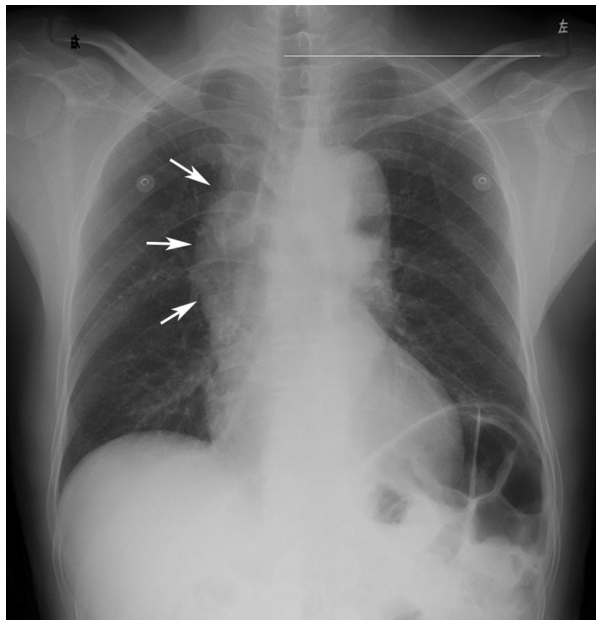

Figure 1. x-ray of the chest (AP view) reveals mediastinal widening (arrow).

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◀**Figure 2.** The attenuation-corrected maximum intensity projection PET image (**A**) revealing curved FDG uptake in mediastinum with maximum standardized uptake value of 5.6 which is significantly higher than the hepatic SUVmax of 1.7. The sagittal CT (**B**), coronal CT (**C**), sagittal fused PET/CT (**D**), coronal fused PET/CT (**E**) images show that the increased FDG uptake is in the contrast defects of SVC and RA. The transaxial CT (**F**) and transaxial fused PET/CT (**I**) images show the high FDG uptake in the contrast defect of LBCV (arrows). The transaxial CT (**G**) and transaxial fused PET/CT (**J**) images show the high FDG uptake in the contrast defect of SVC. The transaxial CT (**H**) and transaxial fused PET/CT (**K**) images show the high FDG uptake in the contrast defect of RA (arrows). The transaxial mediastinal window (**L**), lung window CT (**M**), and transaxial fused PET/CT (**N**) show the high FDG uptake in the left anterior mediastinal mass (arrowheads).

DISCUSSION

Thymoma is the most common tumor in the anterior mediastinum. However, intraluminal venous extension is very rare.[1] The goal of surgery in such cases is to restore the blood flow and to completely resect the tumor.[2] ^{18}F-FDG PET-CT scan in the evaluation of thymic tumors has been reported in several studies. The SUVmax of ^{18}F-FDG PET-CT reflects WHO classification of thymic epithelial tumors.[3] This report illustrates that the ^{18}F-FDG PET-CT was valuable in differentiating the thymoma's malignancy grade, and making a reasonable surgical plan in the perioperative management.

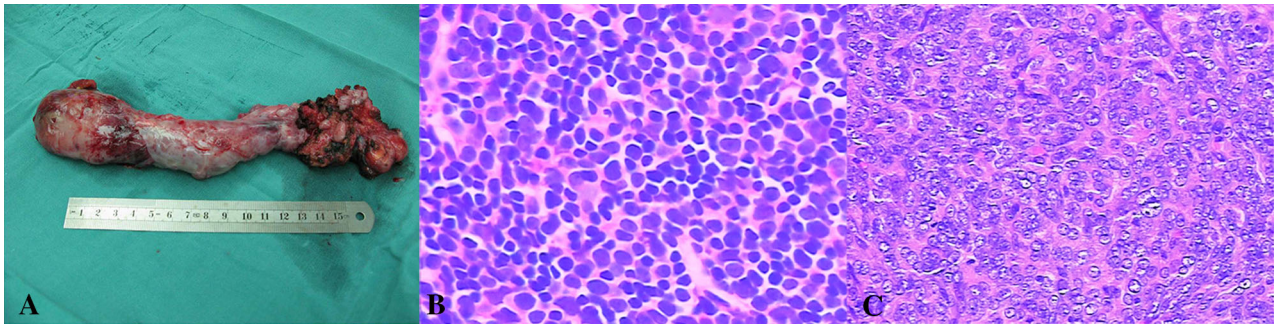

Figure 3. A The surgical excision specimen of the mediastinal tumor and the tumor in the SVC and RA. The pathological examination shows that the tumor is composed of two forms. **B** First, epithelioid cells with small nucleolus scattered in the background of diffuse small lymphocytes (**B**, HE × 100). C Another form showing that epithelioid cells are arranged in solid nests with part of vesicular nuclei; lymphocytes are rare (**C**, HE × 100). These findings are consistent with mixed type B1/B3 thymoma.

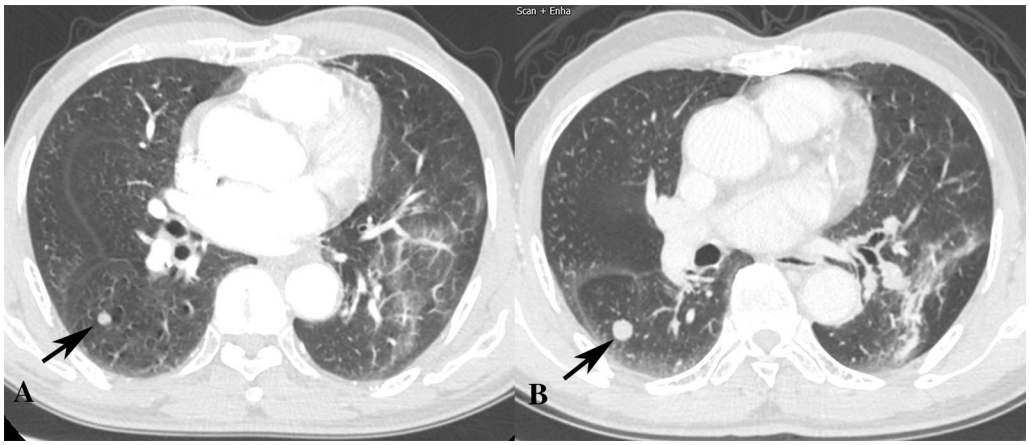

Figure 4. The transaxial lung window CT of 1 year after surgery (**A**) showing pulmonary metastasis. The largest node's diameter is 0.6 cm in the right lower lobe nodule(**A**, arrow). The nodules increased during the next 3 years of follow-up. The largest node's diameter is 1.1 cm (**B**, arrow).

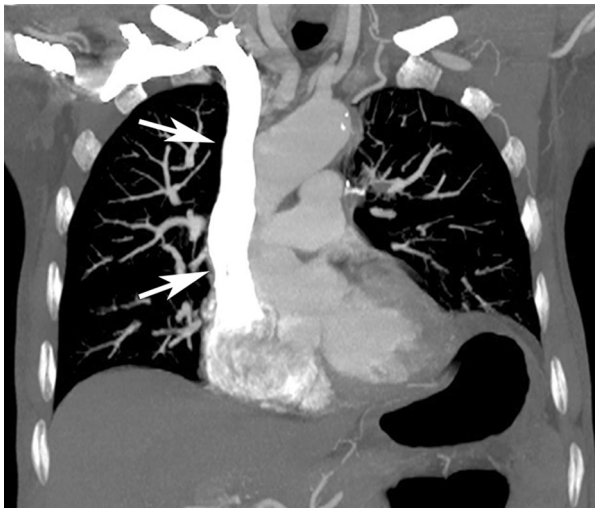

Figure 5. The coronal mediastinal window CT 4 years postoperatively. No recurrence has been detected in both SVC and RA (arrows).

Disclosure

None of the authors have any conflicts of interest.

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