Mediastinal hemangioma presenting with a characteristic feature on dynamic computed tomography images

Sheng-Min Li¹, Hsian-He Hsu¹, Shih-Chun Lee², Hong-Wei Gao³, Kai-Hsiung Ko¹

¹Department of Radiology, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan; ²Division of Thoracic Surgery, Department of Surgery, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan; ³Department of Pathology, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan

Correspondence to: Kai-Hsiung Ko, MD. Department of Radiology, Tri-Service General Hospital, 325, Cheng-Kung Road, Sec. 2, Taipei, 114, Taiwan. Email: m860818@mail.ndmctsgh.edu.tw.

Abstract: Hemangiomas are uncommon benign tumors of the mediastinum. The definite diagnosis is sometimes difficult to make because of usually nonspecific features on single-phase contrast-enhanced computed tomography (CT) images. We described a 60-year-old woman suffering from a neck mass with progressive enlargement. On the dynamic CT study, the tumor showed peripheral nodular enhancement on early phase images and progressive centripetal fill-in on delayed phase images. Hemangioma was preoperatively diagnosed on the basis of this characteristic CT appearance.

Keywords: Mediastinal hemangioma; hypervascular mass; dynamic computed tomography (CT)

Submitted Nov 15, 2016. Accepted for publication Mar 14, 2017.

doi: 10.21037/jtd.2017.03.165

View this article at: http://dx.doi.org/10.21037/jtd.2017.03.165

Introduction

The computed tomography (CT) features of the mediastinal hemangioma are nonspecific and are often described as an enhancing mass or associated with calcified phleboliths (1). This might be attributed to the histological varieties of hemangiomas which are classified into cavernous, capillary and venous types according to the size of their vascular spaces. More than 90% cases are composed of cavernous or capillary types (2). Dynamic CT images may play an important role in diagnosis and are rarely mentioned in the literature (3). We reported a patient presenting with a superior mediastinal mass. The dynamic CT images made the correct diagnosis of hemangioma before operation based on the characteristic enhancement pattern.

Case presentation

A 60-year-old woman presented with a right neck mass showing gradual enlargement for half a year. The physical examination revealed no other remarkable abnormality. Initially, a thyroid lesion was suspected. The laboratory data including thyroid functions were within normal limits. The chest radiograph showed a bulging mass in right superior mediastinum causing left-sided tracheal deviation (Figure 1). The pre-contrast CT scan showed a low attenuation and...
circumscribed mass in right superior mediastinum. The interface between the mass lesion and the thyroid gland was clear. A bronchogenic cyst was initially suspected according to its location and low attenuation on the pre-contrast images. However, due to a few peripheral enhancing foci seen on the post-contrast images, the possibility of a bronchogenic cyst was unlikely. In order to evaluate the nature and enhancing pattern of the mass, we performed a dynamic CT study with intravenous administration of 100 mL contrast medium at the rate of 3.5 mL/s by the powerful injector. Spiral scanning of the mediastinal mass was done repeatedly at 30 seconds, 1 minute and 3 minutes after injection. The mass revealed initially peripheral nodular enhancement with gradually central fill-in on the delayed phase images (Figure 2). The mediastinal hemangioma was first considered based on its enhancing pattern. Biopsy was not warranted due to high risk of major bleeding. The median sternotomy was performed for tumor resection. Grossly, the tumor revealed a well-circumscribed and hypervascular appearance (Figure 3). Pathological findings showed proliferation of small to medium-sized vessels with variable anastomosing channels (Figure 4). The cavernous hemangioma was confirmed.

**Discussion**

Hypervascular mediastinal masses may show strong enhancement after contrast media administration. They are divided into anterior, middle and posterior according to their location. Each compartment of mediastinal mass contains different differential diagnoses (4). Several entities such as Castleman disease, paraganglioma, vascular malformation, ectopic parathyroid adenoma and hypervascular metastasis should be taken into account as hypervascular anterior mediastinal masses are mentioned.

Mediastinal hemangiomas are very rare and consist of only 0.5% of mediastinal masses (5,6). According to International Society for the Study of Vascular Anomalies (ISSVA) classification, hemangiomas are classified into benign vascular tumors. They occur more frequently at the
They also have a higher incidence before the age of 35 (5,7). At the histological examination, these tumors consist of interconnecting vascular spaces interposed with various stromal elements such as fat, myxoid and fibrous tissues. Organized thrombi in hemangiomas are frequent and may calcify as phleboliths that are a potentially diagnostic feature on radiograph or CT images (8). On single-phase contrast-enhanced CT scans, the patterns of contrast enhancement are usually nonspecific and include central, peripheral and mixed type (1). In a review of literatures, there are a few articles mentioning the mediastinal hemangioma diagnosed by dynamic CT scans. Cheung et al. reported that a mediastinal hemangioma showed heterogeneous enhancement on early images with persistently and gradually increasing enhancement on delayed images (3). In our case, the hemangioma showed no calcified phlebolith but a typical feature of early peripheral nodular enhancement and progressively centripetal fill-in. These characteristic features just resembled those in most hepatic hemangiomas seen on dynamic CT scans.

Yamashita et al. explained that the different vascular size of cavernous hemangiomas of the liver might attribute to the imaging characters on dynamic CT study (9). The peripheral early enhancing area had the smaller vascular size that made enhancement quickly. The central fill-in region had larger vascular size than those at the peripheral region; hence, slower enhancement would be observed. The most central region that did not enhance might have cyst, bleeding or scar. Therefore, we assumed that the radiological and pathological correlations of our case were similar to those of hepatic cavernous hemangiomas. Its typical imaging features let us make the precise diagnosis before the operation to avoid unnecessary invasive diagnostic procedure. Furthermore, based on its benign nature, if the tumor shows stable appearance and does not cause any symptoms, careful follow-up might be warranted, just like general recommendations for a hepatic hemangioma.

In conclusion, hemangiomas are uncommon benign tumors of the mediastinum and must be taken into a differential diagnosis as a hypervascular mass is seen. Dynamic CT study is helpful to make a precise diagnosis of cavernous hemangioma when the mass shows characteristic features of peripheral nodular enhancement and progressively centripetal fill-in.

Acknowledgements
None.

Footnote
Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: Written informed consent was obtained from the patient’s relative for publication of this manuscript and any accompanying images.

References


Cite this article as: Li SM, Hsu HH, Lee SC, Gao HW, Ko KH. Mediastinal hemangioma presenting with a characteristic feature on dynamic computed tomography images. J Thorac Dis 2017;9(5):E412-E415. doi: 10.21037/jtd.2017.03.165