CASE REPORT

Hemangioma Mimicking Left Atrial Mass in the Posterior Mediastinum
A Case Report with Literature Review

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Summary
Primary hemangioma of the mediastinum is extremely rare. Herein, we present a unique case of hemangioma mimicking left atrial mass in the posterior mediastinum. We reviewed the literature and found 17 other hemangiomas in the posterior mediastinum. Herein, we summarize the age, gender, symptoms, diagnostic methods, image diagnosis, size, treatments, histologic features, outcomes, and follow-up of 17 cases. Most of the cases were asymptomatic and were accidentally detected in chest radiographs. Diagnostic methods mainly included chest X-ray, computed tomography (CT), and magnetic resonance imaging (MRI). All patients underwent surgical resection, recovered well, and had no recurrence during follow-up.

Key words: Primary, Echocardiography, Computed tomography

Primary vascular tumors of the mediastinum are rare, especially in the posterior mediastinum. Hemangiomas account for approximately 0.5% of all mediastinal tumors. They originate from vascular endothelium, probably caused by the proliferation of normal vascular cells. They contain different amounts of stromal elements. According to the size of vascular spaces, they are traditionally classified as capillary, cavernous, or venous hemangiomas. Nearly 90% of cases are cavernous hemangiomas or capillary hemangiomas. The times of diagnosis greatly varied (26 days to 76 years), but 75% of cases are first diagnosed before the age of 35 without gender predilection. They can occur in any area of the mediastinum, mostly in the anterior mediastinum (70%), and then in the posterior mediastinum (20%); the middle mediastinum is even rarer (10%). In most cases, surgical radical resection is the preferred treatment.

Case Report
A 75-year-old man with heart discomfort lasting more than 10 years was admitted to our hospital. Physical examination was unremarkable. Laboratory examination showed a red blood cell count of 2.97 × 10^12/L, the hemoglobin content was 78 g/L, and the white blood cell count was 2.77 × 10^9/L. Electrocardiogram revealed sinus rhythm. Transthoracic echocardiography in apical five-chamber and two-chamber view showed a 4.8 × 4.3 cm soft tissue mass with a clear boundary and regular shape in the left atrium (Figure 1A, B). Transesophageal echocardiography facilitated clear visualization of the smooth edge and integrated membrane of the mass, and the internal echoes were heterogeneous (Figure 1C). Chest computed tomography (CT) revealed a 5.1 × 4.4 cm, well-defined, and homogenous soft tissue mass (+35 HU) with marginal scattered calcification in the left inferior middle mediastinum, and the left atrium was compressed and displaced forward (Figure 2A, arrow). No area of fat or unusual fluid density was found. Contrast-enhanced CT showed no enhancement in the mass (Figure 2B). A hemangio- mma was suspected based on these image findings. After a multidisciplinary discussion, the patient decided to undergo thoracotomy to remove the mass. During the operation, the mass was located in the posterior mediastinum. It had a clear boundary with the surrounding tissues. After careful separation, the mass was completely resected and measured. It was 5.0 × 4.0 cm in size (Figure 3A). The final pathological diagnosis was hemangioma (Figure 3B, microscopic view showing vascular structures of different sizes, hematoxylin and eosin stain, original magnification ×40). The postoperative course of the patient was uneventful, and he was discharged home 8 days after surgery. As of one year after the operation, there has been no sign of chest pain or recurrence.

Discussion
Mediastinal hemangioma (MH) is a rare disease in which mediastinal benign lesions originate from abnormal proliferation of vascular cells or vascular dysplasia during

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the embryonic period. The first case of MH was reported by Shannon in 1914. Only 17 well-documented cases of hemangioma in the posterior mediastinum have been reported in PubMed between January 1, 2000, and May 31, 2020. Herein, we report the only case of hemangioma mimicking left atrial mass in the posterior mediastinum. The ages, gender, symptoms, diagnostic methods, image diagnosis, size, treatments, histologic features, outcomes, and follow-up of the 18 cases (including our case) are shown in the Table. The average age was about 49.3 years, and there were more females than males (66.7% versus 33.3%, respectively). The difference from previous reports may be related to the fact that we only studied cases involving the posterior mediastinum. Eight cases

**Figure 1.** A: Echocardiography showed a large left atrial mass with a clear boundary in the apical five-chamber view (arrow). B: The internal echo of the mass was homogeneous, and it measured 4.8 × 4.3 cm in the apical two-chamber view (arrow). C: Transesophageal echocardiography facilitated clear visualization of the smooth edge and integrated membrane of the mass (arrow). LA indicates the left atrium, and LV indicates the left ventricle.

**Figure 2.** A: Chest computed tomography displayed a well-defined and homogenous soft tissue mass with marginal scattered calcification in the left inferior middle mediastinum (arrow). B: Contrast-enhanced chest CT showing the mass was unenhanced, and the left atrial was compressed and displaced forward (arrow). LA indicates the left atrium.

**Figure 3.** A: Photograph of the gross specimen showed the dark red tumor with a smooth surface. B: Histopathological section confirming that the tumor was a hemangioma.
(44.4%) were incidentally discovered and involved no symptoms; others presented with nonspecific clinical symptoms: dyspnea in three cases, chest/back pain in two cases, cough in one case, dysphagia in one case, tetralogy of Fallot in one case, dilated cardiomyopathy in one case, and heart discomfort in one case. These clinical symptoms may be related to the sizes, locations, and invasion with adjacent structures of lesions.

The diagnostic methods included chest X-ray, echocardiography, CT, magnetic resonance imaging (MRI), and positron-emission tomography (PET). Among the 17 cases, different degrees of CT enhancement were reported in 8 cases, involvement of the spine and the area surrounding the larger vessels in 5 cases, involvement of the intercostal artery blood supply in 3 cases, and causing a giant abdominal hemangioma in 1 case; there was no enhancement in 6 cases; there was calcification in 1 case, pleboliths in 3 cases, and fat components in 1 case. MRI
reports were available in only five cases, and these were incomplete and manifested limited features, including low intensity on T1WI, high intensity on T2WI, and enhancement. One case was confirmed to be benign because there was no uptake of 18F-fluorodeoxy glucose on PET. Eight cases were given suspected diagnoses of the neurogenic tumor, and one case was hamartoma by preoperative CT. All patients underwent total resection, and no recurrence was observed during follow-up in 11 cases. Histopathological examinations suggested cavernous hemangiomas (n = 5), hemangiomata (n = 7), cystic hemangiomata (n = 2), venous hemangioma (n = 1), capillary hemangioma (n = 1), hemolympangioma (n = 1), and hemangioendothelioma (n = 1).

The preoperative diagnosis of MH is quite difficult because it lacks specific imaging findings. On chest X-ray, tumors usually appear as rounded or lobulated mediastinal masses with smooth margins but have nonspecific enhancement, and calcification or phleboliths are only seen in 10% of cases.9 Echocardiography can delineate the morphological features, location, and relationship with the surrounding structure of tumors. However, it is affected by penetration, alveolar gas, and detection window. CT and MRI are strong techniques that can provide more valuable information before surgery. CT has high sensitivity in the detection of calcification and phleboliths, and contrast-enhanced CT can show the degree of enhancement of the mass, feeding arteries, and adjacent relationship with the surrounding structures.10 Calcification and phleboliths are a characteristic manifestation.10 MRI can indicate the different components and vasculature of the mass, and it often appears hypointense on T1-weighted images and hyperintense on T2-weighted images. The high intensity of fat suppression T2-weighted images is considered to be a characteristic manifestation.10 PET can distinguish benign from malignant tumors by whether it uptakes 18F-fluorodeoxy glucose. Overall, calcification and phleboliths, pampiniform growth pattern (invasive biological behavior) but limited aggressiveness, heterogeneity on CT or MRI, progressive centripetal fill-in enhancement pattern, draining veins and feeding arteries, and concomitant hemangioma of other organs are highly indicative of MH and are useful in its diagnosis.11 The differential diagnoses of posterior mediastinal tumor include neurogenic tumor, bronchogenic and esophageal cyst, lymphoma, cardiac tumors (especially left atrial mass), germ cell tumor, diaphragmatic hernia, and paravertebral abscess.10

The optimal treatment of MH is radical resection, even in asymptomatic patients, given the risk of complications.12 For large, diffuse masses, incomplete resection is acceptable given its low rate of recurrence. Incomplete resection can reduce tumor volume and the risk of hemorrhage and decrease associated clinical appearance, but careful follow-up is necessary.12 No malignant transformation or recurrence was reported in our statistics. Biopsy is not recommended for pure diagnosis because it increases the risk of bleeding and obtains negative results.46

In conclusion, MH can be detected using multiple imaging methods. Radical resection can achieve a good therapeutic outcome. The case shown here was unusual due to its presentation as a left atrial mass and location in the posterior mediastinum.

Disclosure

Conflicts of interest: All of the authors have no conflicts of interest.

References