

# Spontaneous Atraumatic Mediastinal Hematoma

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**S**pontaneous atraumatic mediastinal hematomas are rare. Mediastinal hematomas are usually caused by thoracic trauma, cardiac and great vessel aneurysm or rupture, or iatrogenic factors associated with invasive procedures and surgery. Anecdotal reports of coagulation abnormalities and neoplasms causing mediastinal hematomas have also been published.<sup>1-4</sup> This report reviews an unusual case of a spontaneous atraumatic mediastinal hematoma in a symptomatic young man and discusses potential causes of mediastinal hematomas as well as various diagnostic modalities.

## CASE PRESENTATION

### Initial Presentation and History

A 30-year-old man with a 3-day history of right-sided precordial chest tightness with associated dyspnea on exertion reported for an examination. The patient had smoked a pack of cigarettes daily for the past 9 years and had a 2-month history of night sweats and a cough productive of yellowish sputum. He also experienced a 5-lb weight loss over the past 2 months. His medical history included hypertension and asthma, but he reported no history of trauma. Results of recent tests for HIV and tuberculosis were negative.

### General Physical Examination

Physical examination revealed a well-developed, well-nourished man in no acute distress. He was afebrile and had a blood pressure of 118/82 mm Hg, pulse of 98 bpm, respiratory rate of 14 breaths/min, and pulse oximetry measurement of 98% on room air. His trachea was midline. There was no jugular venous distension or lymphadenopathy. Breath sounds revealed mild expiratory wheezes and rhonchi over the right lung field. There was no evidence of chest wall abnormalities, masses, deformities, or trauma.

### Cardiovascular Studies

The cardiovascular examination was unremarkable. Heart sounds were normal. Peripheral pulses were 2+, regular, and equal. Results of coagulation studies were normal. An electrocardiogram revealed normal sinus rhythm with voltage changes consistent with left ventricular hypertrophy. A chest radiograph showed a large mediastinal mass. A chest computed tomography (CT) scan showed a 7.5-cm right anterior mediastinal mass with calcifications (**Figure 1**).

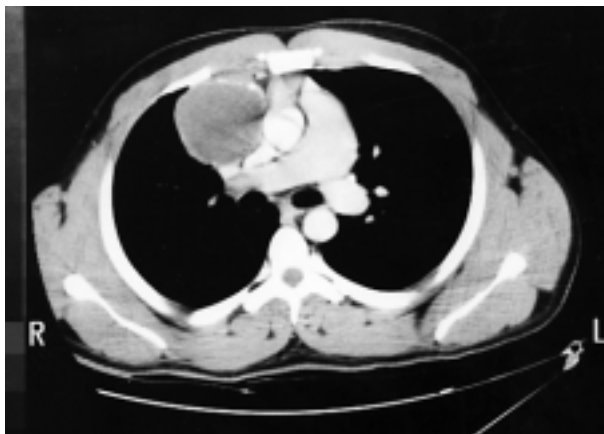
### Surgical Intervention and Patient Outcome

The patient underwent a median sternotomy for exploration. An 8-cm extrapericardial ovoid-shaped firm hemorrhagic mass was identified. The mass was totally excised off the pericardium without difficulty. The pericardium and the adjacent surrounding vital structures appeared normal. No active bleeding, gross thymus gland masses, or other masses were identified. An anterior mediastinal fat pad that appeared normal was also excised.

Histopathologic examination revealed a benign calcified, fibrotic organizing hematoma. Normal lymphoid and adipose tissues were identified. No evidence of thymic tissue or malignancy was observed. The patient's postoperative course was uneventful. At a 6-month outpatient follow-up examination, his

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**Figure 1.** Chest computed tomography scan showing a 7.5-cm right anterior mediastinal mass with calcifications.

symptoms were gone, and there was no recurrence of a mass.

## DISCUSSION

### Etiology

The majority of mediastinal masses occur in the anterior mediastinum. The most common causes are thymoma, lymphoma, and germ cell tumors. Spontaneous atraumatic mediastinal hematoma is a rare cause of a mediastinal mass. In general, hemorrhagic causes are uncommon but typically involve traumatic cardiac or blood vessel rupture.<sup>1,3</sup> Life-threatening cardiovascular causes of mediastinal hematomas, such as cardiac aneurysm, tamponade, blood vessel rupture, great vessel aneurysm, and dissection, should be suspected first and promptly treated. Other causes such as sneezing, coughing, emesis, bleeding diathesis, uremia, and renovascular hypertension have also been implicated.<sup>1-3,5,6</sup>

### Literature Review

Twelve anecdotal cases of spontaneous atraumatic mediastinal hemorrhage have been reported in the literature.<sup>1-6</sup> All of the patients had mediastinal widening on chest radiographs. The most common symptom was dyspnea. Other presenting symptoms included neck and chest wall ecchymoses, dysphagia, dysphonia, chest pain, tachycardia, and neck pain. The patients were mostly middle aged or elderly and were mostly male. Six patients had hemorrhagic pleural effusions.

Radiologic diagnostic studies were usually limited to chest radiographs and chest CT scans. An aortogram was obtained in 5 patients with suspected aortic aneurysm/rupture but showed no abnormalities. Ten

patients underwent surgical exploration. Two patients were treated conservatively. One patient had precipitating heparin therapy discontinued. Ten patients were alive following therapy. Two patients died because of mediastinal hemorrhage complications.

### Diagnosis

The gold standard diagnostic modalities are angiography and surgical exploration. The diagnosis of malignancy requires a tissue specimen for histopathologic examination. Investigating a hematoma suspected of being associated with a neoplasm by using minimally invasive techniques such as percutaneous needle biopsy or cervical mediastinoscopy with biopsy is precarious, especially if the suspicion is incorrect, the hematoma ruptures, or uncontrollable exsanguination ensues. Because of limited surgical exposure, vascular hemostasis and control would be technically difficult while attempting to obtain immediate cardiopulmonary bypass cannulation.

Diagnosing mediastinal hematoma without histopathologic examination can be accomplished by using the noninvasive techniques of echocardiography, CT scanning, magnetic resonance imaging (MRI), and positron-emission tomography (PET) scanning. Previous studies have shown that the sensitivity and specificity of CT scanning or transthoracic echocardiography are lower and variable compared with MRI or transesophageal echocardiography.<sup>7-9</sup>

Kodolitsch and colleagues have demonstrated that combined modalities can detect an aortic dissection hematoma in a manner that reduces the limitations of each individual modality. They have shown that the combined modality of transthoracic echocardiography and CT scanning has a sensitivity of 75% and a specificity of 99%. The combined modality of transesophageal echocardiography and MRI has a sensitivity of 92% and a specificity of 97%.<sup>10</sup> There are no definitive data comparing PET scanning to the other modalities to detect mediastinal hematomas and their causes. Preliminary results suggest that a PET scan using <sup>11</sup>C-methionine can differentiate intracerebral hematomas from neoplastic and nonneoplastic masses, as opposed to CT scans or MRI.<sup>11</sup> More studies using PET scans for examining mediastinal pathologies are needed for further validation.

Calcification associated with a hematoma may be caused by dystrophic sources from tissue necrosis or cardiovascular intimal injuries or by metastatic sources from hypercalcemic conditions such as malignancy, hyperparathyroidism, or sarcoidosis. We surmised that the case patient developed his spontaneous atraumatic

mediastinal hematoma from a thymic fat pad vascular rupture precipitated from repeated shearing forces created during chronic coughing.

#### CONCLUSION

Asymptomatic mediastinal hematomas can be diagnosed by using noninvasive modalities and may be appropriately treated conservatively, with a period of observation for hematoma progression or regression. For uncommon, suspicious, or symptomatic mediastinal hematomas, surgical intervention using median sternotomy for adequate surgical exposure, greater cardiovascular control, and hemostasis is safer, more diagnostic, and therapeutic and is thus recommended. **HP**

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