

Posterior Mediastinal Mass

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Case Presentation

A 57-year-old woman presented with epigastric pain and cough for a period of 15 days, as well as a history of significant weight loss of 12 kgs in past 2 months. The patient had no significant past medical history. A chest x-ray was performed (**Fig. 1**), which prompted further work-up, consisting of a contrast-enhanced CT (**Fig. 2**) MRI (not shown), and PET-CT (**Fig. 3**). Frontal chest radiograph done as a part of the routine work up, revealed soft tissue opacity in the retrocardiac region, with the left heart border seen separate from the lesion (black arrow). Lateral radiograph confirmed the posterior location of the mediastinal lesion.

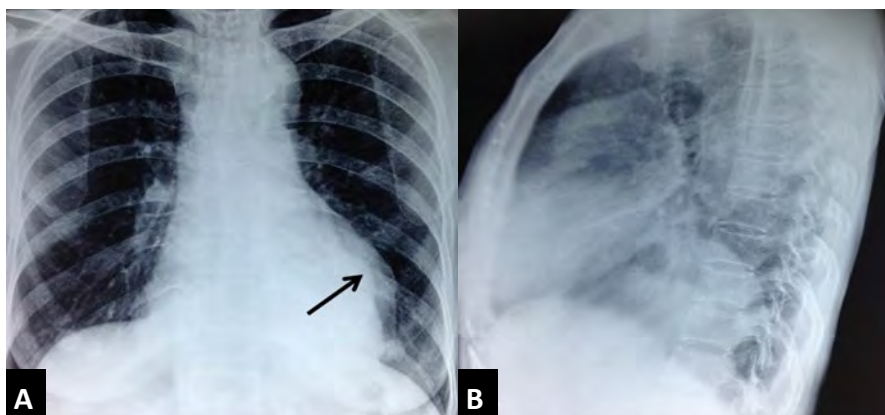


Figure 1. Frontal radiograph (A) reveals a soft tissue opacity in the retrocardiac region with the left heart border seen separate from the lesion (black arrow). Lateral radiograph (B) confirms a posterior mediastinal location. The adjacent vertebral bodies and neural foramina appear normal.

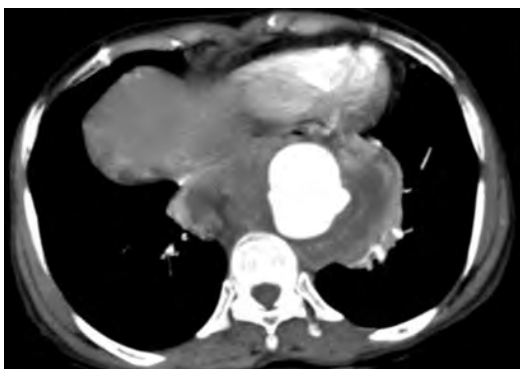


Figure 2. Post-contrast axial MIP CT image shows a heterogeneously enhancing mass in the posterior mediastinum engulfing the descending thoracic aorta, which shows multiple contrast-filled outpouchings. The fat plane with the liver is maintained, and the adjacent vertebral body does not appear to be involved. There is displacement of the esophagus and IVC.

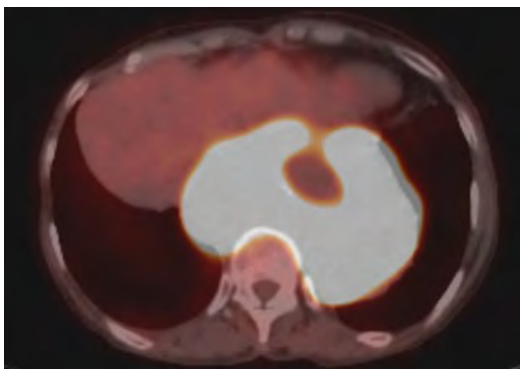


Figure 3. Fused PET-CT image in the axial plane reveals intense uptake by the posterior mediastinal mass (SUV 7.3).

Key Imaging Finding

Posterior mediastinal mass

Differential Diagnoses

Neurogenic Tumors / Peripheral Nerve Sheath Tumors

Foregut Cysts

Lymphoma

Aortic aneurysm

Esophageal neoplasms

Sarcoma

Discussion

The posterior mediastinum is bounded anteriorly by the pericardium and great vessels, posteriorly by the prevertebral fascia, and laterally by the pleura.¹ Its contents include the aorta, esophagus, azygous and hemiazygous vessels, neural structures, and lymph nodes. By convention, the paravertebral space is also included in the posterior mediastinum. Posterior mediastinal masses can arise from any of these structures. Morphological characteristics, enhancement patterns, and relation to surrounding organs as studied on imaging help in determining the organ of origin. Correlation with the clinical profile and histopathology are essential in arriving at the final diagnosis. These studies also play an important role in staging of the disease.

Neurogenic Tumors.

Neurogenic tumors, to include nerve sheath and sympathetic ganglion tumors, represent the most common posterior mediastinal masses. Most lesions, especially if benign, are asymptomatic. Nerve sheath tumors, such as schwannoma and neurofibroma, are most often seen in patients around 20-30 years of age. Frontal and lateral radiographs reveal widening of the neural foramina with splaying of ribs, which can be confirmed on CT. These lesions demonstrate heterogeneous contrast enhancement on CT and appear hypointense on T1 and hyperintense on T2. MRI may show intraspinal extension, which is

characteristic. Necrosis, hemorrhage, and heterogeneous enhancement are more often seen with malignant nerve sheath tumors. Sympathetic ganglion tumors, such as ganglioneuromas, are typically seen in the first decade of life, and are vertically oriented along the lateral aspect of vertebrae, and are less common.²

Foregut Cysts.

Mediastinal foregut cysts result from embryologic aberrations with anomalous budding of the primitive foregut. The spectrum of anomalies includes bronchogenic cysts, esophageal duplication cysts, and neuroenteric cysts. Bronchogenic cysts are most commonly located in the carinal region, while esophageal duplication cysts are most often located along the esophagus in the lower mediastinum. Neuroenteric cysts communicate with the meninges and are usually associated with vertebral anomalies. Foregut cysts usually do not cause symptoms and have similar imaging features.

Frontal radiographs typically reveal sharply marginated areas of increased opacity. CT reveals well-defined fluid density lesions, often with a thin enhancing wall. Occasionally, increased protein content will result in increased attenuation.¹ There is no infiltration or invasion of adjacent structures and no solid tissue enhancement within the lesion. On MRI, foregut cysts appear as well-defined lesions which are hypointense on T1 and hyperintense on T2 weighted images. MR imaging is useful in determining the cystic nature of foregut lesions with an atypical appearance or increased attenuation on CT, since cysts will typically have T2 bright signal intensity, regardless of the nature of the cyst contents.

Lymphoma.

Lymphoma presents as a soft tissue mass with widening of mediastinum, which is often revealed on conventional radiographs. An anterior or middle mediastinal location is more common than posterior. CT demonstrates a lobulated soft tissue density mass with heterogeneous enhancement; regions of calcification may be seen post-treatment but are rare in patients who have not undergone treatment. The margins often conform to surrounding structures. The appearance of lymphoma on MRI varies based upon

the type of lymphoma and whether or not the patient has undergone treatment.³

Aortic Aneurysm.

Patients with descending aortic aneurysms are usually asymptomatic. Frontal radiographs reveal a posterior mediastinal mass with the aortic shadow not seen separately from the lesion. Curvilinear calcification may be seen at the periphery of the lesion. CT and MRA will show contrast enhancement in the arterial phase. Partially thrombosed aneurysms show regions of non-enhancing clot with areas of hemorrhage.

Esophageal Neoplasms.

Patients with esophageal neoplasms generally present with dysphagia to solid food and weight loss. Imaging findings often lag clinical presentation; therefore, radiographs may be normal initially. When large, esophageal tumors present as a posterior mediastinal soft tissue mass. CT shows eccentric or circumferential esophageal wall thickening with dilated proximal fluid and debris-filled esophageal lumen. Exophytic components may show heterogeneous enhancement. Invasion of local structures is common due to lack of a serosa.¹ MRI provides little advantage over CT.

Sarcoma.

Sarcomas are rare in the mediastinum and present as posterior mediastinal masses, which may appear ill- or well-defined on radiographs. Rib erosions may be seen. CT shows a solid mass lesion, often with infiltrative margins and heterogeneous enhancement. MRI will show heterogeneous but predominantly T1 hypointense and T2 hyperintense signal intensity with foci of hemorrhage and necrosis. Neovascularity may be present. It is uncommon for sarcomas to invade the aorta and cause aneurysm formation. No specific imaging findings are known to differentiate the various subtypes of sarcomas. Histopathology is essential for knowing the type of sarcoma. PET imaging helps in grading and staging of the tumor.

Diagnosis

Sarcoma

Summary

Posterior mediastinal masses are usually asymptomatic and are best diagnosed by cross sectional imaging. In this case, imaging findings were of a mass lesion with heterogeneous and delayed enhancement with erosion and aneurysm formation of the descending aorta, thereby favoring a neoplastic etiology. The tumor did not involve the esophagus or vertebral bodies, and there was no intraspinal extension. Sarcoma, therefore, was the most likely diagnosis despite its rarity. A CT-guided biopsy revealed that this was a rare case of pleomorphic undifferentiated sarcoma, formerly referred to as malignant fibrous histiocytomas,^{4,5} with secondary involvement of the aorta. To our knowledge, only 13 cases of pleomorphic sarcoma involving the posterior mediastinum have been described in literature.⁶ Hence, if the imaging findings don't fit in any of the commonly known posterior mediastinal masses, a differential of sarcoma should be kept in mind.

References

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