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### **Overview of mediastinal masses:**

#### **What are the four divisions of the mediastinum?**

Superior, anterior, middle and posterior mediastinum. Note that although there is a superior mediastinum there is no inferior mediastinum.

#### **What are common differential considerations for anterior mediastinal masses?**

Common differential considerations include lymphoma, thymic hyperplasia and other thymic processes, germ cell tumor, lymphangiomas, pericardial cysts, and thyroid processes.

#### **What are common differential considerations of middle mediastinal masses?**

Lymphadenopathy including granulomatous disease, metastatic disease and lymphoma/leukemia. If calcified consider tuberculosis, fungal etiologies, osteosarcoma, sarcoidosis, histoplasmosis, coccidiomycosis. Foregut duplication cysts are also a differential consideration.

#### **What are common differential considerations for posterior mediastinal masses?**

Think neurogenic processes. In the 1<sup>st</sup> decade of life posterior mediastinal masses are most suspicious for neuroblastoma on board exams. Posterior mediastinal masses in the 1<sup>st</sup> decade are most commonly malignant. In the 2<sup>nd</sup> decade of life, posterior mediastinal masses are most commonly benign and differential considerations include neurofibromas, ganglioneuromas, extramedullary hematopoiesis and schwannomas.

#### **What is the hilum overlay sign and how can this help you localize masses in the mediastinum?**

The hilum overlay sign is the concept that a hilar mass will obliterate the silhouette of the pulmonary vessels on an AP or PA chest radiograph. If you can see the edges of the pulmonary vessels on the chest radiograph the mass is less likely to be hilar and would be favored to be in the anterior or posterior mediastinum.

Note that additional signs to consider on chest radiographs are obliteration of the retrosternal clear space, effacement of the ascending aorta, and displacement of the anterior junction line for anterior mediastinal masses.

#### **What are common differential considerations for mediastinal masses that invade the lung, pleura or chest wall?**

Differential considerations include malignant entities such as esophageal carcinoma, lymphoma, malignant germ cell tumor, or metastatic disease. Lung masses that invade the mediastinum include primary lung malignancies. Note that pleural masses that invade the lung and/or mediastinum include pleural metastases in addition to malignant mesothelioma.

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**True or false? Mucoepidermoid carcinoma of the trachea is more likely to invade the mediastinum versus adenoid cystic carcinoma of the trachea?**

False. Adenoid cystic carcinoma of the trachea is more likely to invade the mediastinum compared to mucoepidermoid carcinoma.

**Anterior mediastinal masses:**

Structures in the anterior mediastinum include thymus, lymph nodes, thyroid, and ascending aorta and pulmonary arteries. The thymus and lymph nodes are the tissues that give rise to the most anterior mediastinal masses.

**What is the four T's mnemonic for anterior mediastinal masses?**

Thymoma, Teratoma, Thyroid and Terrible Lymphoma.

**Is thymoma or lymphoma more common in young females with a large anterior mediastinal mass? What about in females > 40 years of age?**

In young females a large anterior mediastinal mass is lymphoma until proven otherwise. If > 40 years of age thymoma becomes a top differential consideration. Note that thymoma classically does not cross the midline and only occurs in 1 lobe of the thymus.

**Are germ cell tumors of the mediastinum more common in males or females?**

Mediastinal germ cell tumors are more common in males. Note that anterior mediastinal germ cell tumors are most commonly teratomas (something like 75% of cases).

**From what anterior mediastinal tissue do germ cell tumors derive from?**

Germ cell tumors arise from the thymus which has pluripotent cells.

**How can one tell the difference between thymic rebound and lymphoma on MRI?**

Classically, thymic rebound will show drop of signal on out of phase imaging as is fat containing whereas lymphoma will not have signal drop on out of phase images. Note that both thymic rebound and lymphoma can have abnormal increased uptake on FDG-PET/CT although lymphoma overall tends to have a higher degree of uptake compared to thymic rebound.

**What are some common etiologies of thymic cysts?**

Thymic cysts can be congenital or acquired. A classic association is development of thymic cysts after thoracotomy and acquired thymic cysts can also occur with HIV or chemotherapy. Note that thymic cysts tend not to have associated solid components. If see mixed cystic and solid components think thymoma, lymphoma, or germ cell tumor. If there are cystic components with septae that clearly enhance think germ cell tumor.

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**Does calcification of a thymic mass typically denote more benign or more aggressive disease?**

Calcifications involving a thymic mass typically denote a more aggressive disease process. Note that thymomas can be benign (non-invasive), invasive, or malignant. Thymic carcinomas tend to be invasive and occur in middle age to older individuals most commonly. However, note that curvilinear calcifications along the capsule of the lesion is most associated with a calcified thymoma whereas stippled calcifications diffusely through the mass are more associated with thymic malignancies. Malignant thymomas calcify more commonly than benign thymomas.

**Why might a radiologist suggest imaging of the abdomen in cases of malignant thymoma?**

In addition to pleural metastases, malignant thymomas also can have drop metastases to the retroperitoneal space. Therefore, abdominal imaging may be of benefit.

**What is a very classic association with thymomas and a specific neurologic autoimmune illness?**

Remember the classic association between Myasthenia Gravis and thymomas. If you have a thymoma there is an up to 50% chance that you also have Myasthenia Gravis. However, only something like 15% of patients with Myasthenia Gravis will also have a thymoma.

**What are characteristic imaging features of a thymolipoma?**

Thymolipomas have lots of fat with the abundant fat interspersed between soft tissue components. These are often asymptomatic large anterior mediastinal masses with very prominent fatty components.

**Klinefelter syndrome has a classic association with what mediastinal mass?**

Klinefelter syndrome is commonly associated with mature teratomas in the mediastinum. Note that immature teratomas are more common in males but mature teratomas are equal between the sexes and associated with Klinefelter syndrome.

**What thyroid processes can be included in the differential considerations of anterior mediastinal masses?**

Thyroid cancer and thyroid goiter can both occur in the anterior mediastinum. Remember that thyroid processes can involve the anterior mediastinum.

**What is the most common location of a pericardial cyst?**

The most classic location of a pericardial cyst is the right anterior cardiophrenic angle. Pericardial cysts can involve the anterior or middle mediastinum.