Mediastinum and Pleura

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Case 1. Left paratracheal mass pushing trachea to the right

What next?
- CT with IV contrast
- CT without IV contrast
- Esophagram
- Iodine-131 study
Case 1. Next study should be CT without IV contrast.
DX: Thyroid goiter
DDX for CXR: Thyroid tumor, lymphoma, metastasis, duplication cyst

CT should be without IV contrast. For a thyroid mass, radioiodine might be given. If the mass is not in thyroid, IV contrast can be given. Goiter enhances heterogeneously, some areas intensely; prolonged enhancement (longer than muscle) reflects iodine trapping. There may be cystic, solid, or calcified components. Goiters have clear surrounding fat planes.

Case 2. Bronchogenic cyst, typical subcarinal location. Attenuation is higher than water because of protein or blood. MRI may show high signal intensity on T1 images.
Case 3. Atypical chest pain

Case 3a. Right cardiophrenic angle mass

DDX: Pericardial cyst, Morgagni hernia, lymphadenopathy (various causes), mediastinal fat pad, fibrous tumor of pleura.

DX: Pericardial cyst
Case 3b. Morgagni hernia containing colon

Case 3c. Right cardiophrenic angle (CPA) lymphadenopathy
Case 3c. Right CPA lymphadenopathy

Tumors that involve CPA (aka diaphragmatic) nodes include lymphoma and tumors of the breast and upper abdomen.

Case 4a. Paraspinal mass: neurofibroma.
Case 4b. Paraspinal mass(es)
Extramedullary hematopoiesis in thalassemia

[Images of chest X-rays and CT scans showing paraspinal masses]
Case 4b. Paraspinal mass(es)  
Extramedullary hematopoiesis in thalassemia

Case 5a. Azygoesophageal recess (AER) mass  
Traumatic aortic pseudoaneurysm
Case 5a. Azygoesophageal recess (AER) mass
Traumatic aortic pseudoaneurysm

Case 5b. Low azygoesophageal mass (with fluid levels)
Paraesophageal hiatal hernia with gastric volvulus
Cases 5c. Other low azygoesophageal masses

Varices  Pancreatic pseudocysts

Case 6a. Breast cancer follow-up

Baseline
Case 6b. Hoarseness

Case 6b. AP window mass. DDX: lymphadenopathy, ductus aneurysm, traumatic aortic pseudoaneurysm, foregut duplication cyst
Case 6c. Cough

Baseline

Case 6c. Mass in AP window and left hilum, obscured descending aorta and left pulmonary artery; DDX: Lung cancer, lymphadenopathy, aneurysm

Note: portion of ascending aortic interface is still visible (green arrow)
Case 6c. Mass fills AP window and obscures top of left PA

Ascending AO interface is preserved

DX: lung cancer

Case 7. Right paratracheal mass in 31-year-old woman

DDX: lymphadenopathy, foregut duplication cyst, lymphangioma; less common location for thymoma, bronchogenic cyst
Infiltrating mass lacks sharp borders. attenuation = 8-14 HU (near water)

DX: Lymphangioma; DDX: pericardial cyst
**Case 8. New mass**

This anterior interface is lost when mass appears.

**Baseline**

**Case 8. Mature teratoma**
Case 9. Anterior mass(es)

Anterior junction line displaced to right

Posterior aortic arch visible

Anterior masses displace trachea posteriorly

Multiplicity of masses fits best with lymphoma.
Case 10a. Thymoma - loss of SVC/RA border indicates anterior position

Case 10b. Thymic carcinoma
Case 10b. Thymic carcinoma with pleural metastases

Pitfalls

- Not considering vascular “masses”
Right aortic arch with aberrant left subclavian artery
Dilation of main pulmonary artery from congenital pulmonic stenosis and post-operative pulmonary regurgitation

Pitfalls

• Not considering vascular “masses”
• Not considering anatomic variants (including fat)
Pitfalls

- Not considering vascular “masses”
- Not considering anatomic variants (including fat)
- Mistaking hilar nodes and hilar vessels
Pulmonary hypertension

Sarcoidosis

Pitfalls

• Not considering vascular “masses”
• Not considering anatomic variants (including fat)
• Mistaking hilar nodes and hilar vessels
• Missing AP window lesions
Case 6a. Breast cancer follow-up

Baseline

Pleura
Pleural Effusion in Heart Disease

CHF \textit{right effusion > left}

Post cardiac injury
- Dressler’s syndrome
- Postcardiotomy
  - pleuritic pain, fever, rub, pericardial and pleural effusion, atelectasis

Pericardial disease \textit{left effusion > right}

Unilateral or Selective Left Pleural Effusion

TB
Tumor
Pulmonary embolism
Pericardial disease
Pancreatitis, subphrenic abscess
Splenic abscess, infarction, hematoma
**Bronchopleural Fistula**

Gas is rare in ordinary empyema.
Fluid level in pleural space suggests BPF.

*NB: rule out iatrogenic cause*

Gas enters pleural space via:
- defect in visceral pleura
  - *infection, tumor, infarction, trauma*
- leaking bronchial stump after lobectomy or pneumonectomy

**Empyema-BPF vs Lung Abscess**

Lenticular, elongated shape
Enhancing, smooth wall < 5 mm
Compression of adjacent lung with displacement of bronchi and vessels
Obtuse angle with chest wall
Separation of pleural layers
Pleural Thickening

Pleural plaque
   Almost always caused by asbestos exposure
   Discrete, sharply marginated

Diffuse pleural thickening
   Caused by infection, inflammation, or hemothorax
   Fading edges, no sharp margins

Symmetric
   favors 4th-8th ribs and diaphragm
   spares CP angles and apices

DDX:
   extrapleural fat
diffuse pleural thickening

Calcification
dystrophic
   progresses with time
   linear in profile
   “maple leaf” en face

Asbestos pleural plaque
Asbestos Pleural Plaque

Parietal
Does not fuse to visceral pleura

Asbestos pleural plaque with calcification
Asbestos Pleural Plaque

Most frequent manifestation of asbestos exposure
Not a precursor to mesothelioma
10 - 15 year latency
Parietal, favors diaphragm, mostly posterolateral, rarely visceral--can be in fissure

Benign Asbestos Pleurisy

Incidence up to 7%; may recur
Most common early manifestation of asbestos exposure (< 10 years)
Diagnosis of exclusion
  Exposure history
  No other cause
  No evidence of malignancy within 3 years
Asbestos Pleurisy & Diffuse Pleural Thickening

Diffuse Pleural Thickening

*(with or without calcification)*

- Often follows pleural effusion
- Caused by infection, inflammation, or hemothorax
- Affects parietal *and* visceral layers
- Lacks sharp margins (vs plaque)
- Obliterates costophrenic angle
- Associated with lung bands and round atelectasis
Diffuse pleural thickening with lung bands

Lung transplant

Pleural thickening and effusion with lung bands and round atelectasis
Round atelectasis enhances with IV contrast.

Tuberculous pleural thickening with calcification.
Pleural Tumors

Margin partly sharp, partly fading
Distinguished from chest wall masses by lack of rib involvement
Secondary Pleural Tumors

Hematogenous metastases
  breast, lung, unknown primary

Thymoma
Lymphoma

Metastatic Melanoma
Primary Pleural Tumors

Solitary fibrous tumor (SFT)

Mesothelioma
Solitary Fibrous Tumor

No relationship to asbestos exposure
Most benign, but 15-20% malignant
3/4 arise from visceral pleura
1/2 asymptomatic; others cause:
  pain, cough, hypoglycemia,
  hypertrophic osteoarthropathy

Solitary fibrous tumor (large!)
Solitary fibrous tumor

SFT with enhancing vessels
Solitary fibrous tumor

Intrapulmonary SFT
Benign SFT with enhancing blood vessels and pleural effusion

Benign SFT with calcification and inhomogeneous enhancement
Recurrent malignant SFT

Mesothelioma

Epithelial, sarcomatous, or mixed
Associated asbestos exposure in 50%, most related to chrysotile
Latency 20 - 40 years
Symptoms--SOB, chest pain, cough, dyspnea, weight loss
Mesothelioma
Mesothelioma, also pleural plaque
Mesothelioma

Effusion and nodular thickening

*likes to extend into fissures, little mediastinal shift*

Plaque found in only 58% of mesotheliomas

Local invasion *(11% at presentation)*

*chest wall, mediastinum, diaphragm*

(Rare) lymphatic & hematogenous spread

DDX: metastatic adenocarcinoma, benign asbestos pleurisy