Blind Spots and Pitfalls in Chest Radiographs and CT

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Objectives

- To review common locations of missed abnormalities on chest radiography and CT
- To discuss common pitfalls encountered during interpretation of chest radiography and CT

Blind Spots on Frontal CXR

- Central Airways
- Lung Apices
- Mediastinum
- Hila
- Retrocardiac Region
- Lung Bases
- Thoracic Skeleton
- Upper Abdomen

Blind Spots on Lateral CXR

- Central Airways
- Infra-hilar Region
- Sternum
- Vertebral Bodies
- Retrocardiac Region

Chest CT

- Pathology can hide in the anatomically busy supraclavicular region
- Artifact due to contrast in the subclavian vessels
- Nodes larger than 5-7 mm in short-axis are considered enlarged
- Asymmetry & loss of fat planes helpful in detecting adenopathy

No relevant financial disclosure
### Chest CT

- Small nodules along the bronchovascular bundles difficult to perceive
- Being familiar with the normal bronchovascular anatomy can help avoid missing lesions
- Maximum Intensity Projection (MIP) images helpful

### Chest CT

- An avidly enhancing lesion in the breast should prompt further evaluation with mammography
- Also need to check axillary region for lymph nodes
- Quick look at the chest wall for symmetry and subcutaneous lesions, particular in patients with melanoma or other malignancy

### Chest CT

- Collapsed lung should be homogeneous in density
- Heterogeneous enhancement may signal underlying nodules/masses or consolidation
- Tumor may also produce a bulge in contour of collapsed lung
- When you see large effusion, check pleural surface for nodules

### Chest CT

- Incidental cardiac findings are common.
  - 78% of PE CT studies w/ at least one incidental cardiac finding
- Cardiac structures should be interrogated on every chest CT to exclude visible coronary artery disease, thrombus, myocardial infarction, fatty infiltration or aneurysm.

### Chest CT

- Most cancers missed at CT were endobronchial in location
- Tracheal or bronchial lesions may appear as nodular or smooth wall thickening, sessile or pedunculated luminal lesions

### Chest CT

- On non-contrast CTs, thrombus or mass can be hyper- or hypoattenuating
- Check for incidental PE
  - A retrospective study has shown that only 25% of incidental PE were initially reported
Chest CT

- Check all vessels for filling defects on contrast-enhanced CT
  - Venous thrombus – IJ, subclavian, SVC, IVC
  - Tumor thrombus or tumor emboli
- Contrast enhancement not optimal for evaluation of abdominal lesions
- Abdominal abnormalities can cause symptoms such as chest discomfort or shoulder pain
- Remember to check each abdominal organs carefully

Blind Spots on CT

- Cardiac abnormality: masses, thrombi, infarct
- Vessels: thrombi, emboli, tumor, dissection
- Airways: intraluminal lesions or wall thickening
- Collapsed lung: underlying lesion or consolidation
- Nodal stations: supraclavicular, internal mammary, cardiophrenic angle, retrocrural, paraesophageal and axillary
- Pleura: nodularity or thickening
- Upper abdomen: masses or adenopathy
- Chest wall: lytic/sclerotic lesions, fractures, muscular/subcutaneous lesions

Summary

- Blind spots exist on chest radiography and CT where perceptual errors commonly occur
- Normal structures can mimic pathologic processes, leading to interpretation errors

References

- Wu CC, Khorashadi L, Abbott GF, Gilman MD. Common blind spots on chest CT: where are they all hiding? Part I-airways, lungs, and pleura. AJR 2013;201(4):W533-538