



An Introduction to TB Radiology

Megan Devine, MD

June 5, 2024

Comprehensive TB Nurse Case Management

June 5 – June 6, 2024

San Antonio, Texas

Megan Devine, MD has the following disclosures to make:

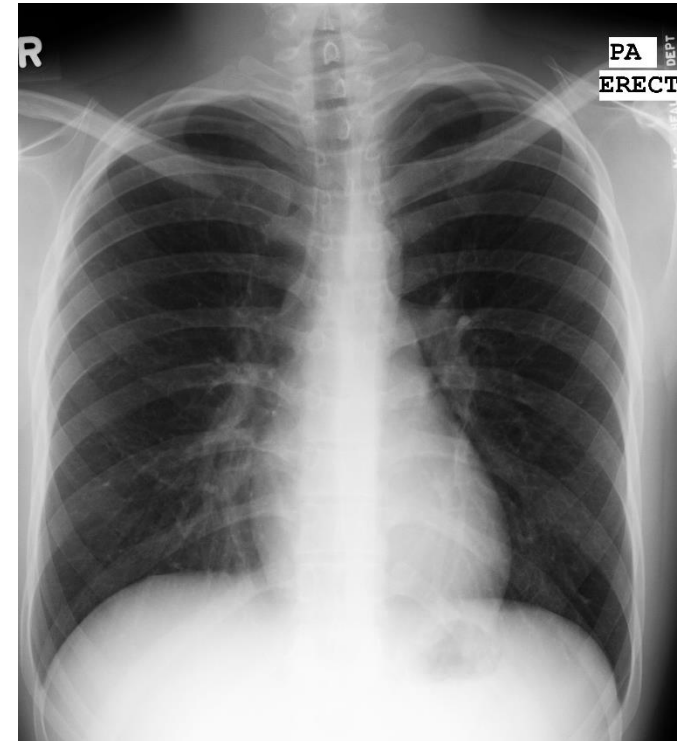
- No conflict of interests
- No relevant financial relationships with any commercial companies pertaining to this educational activity



An Introduction to TB Radiology

Megan Devine, MD
Pulmonary Medicine

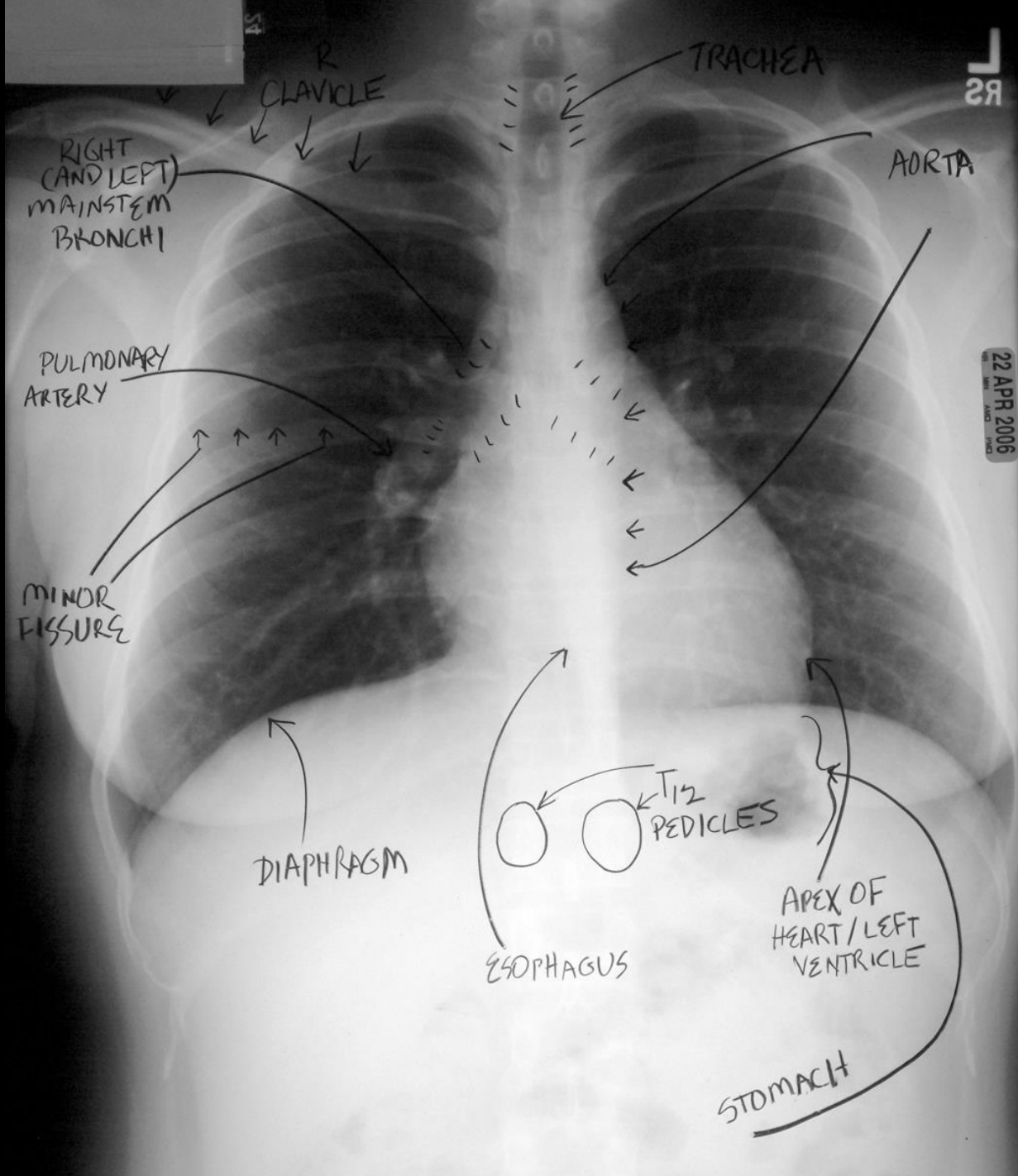
Associate Professor of Medicine
UT Health Science Center Tyler



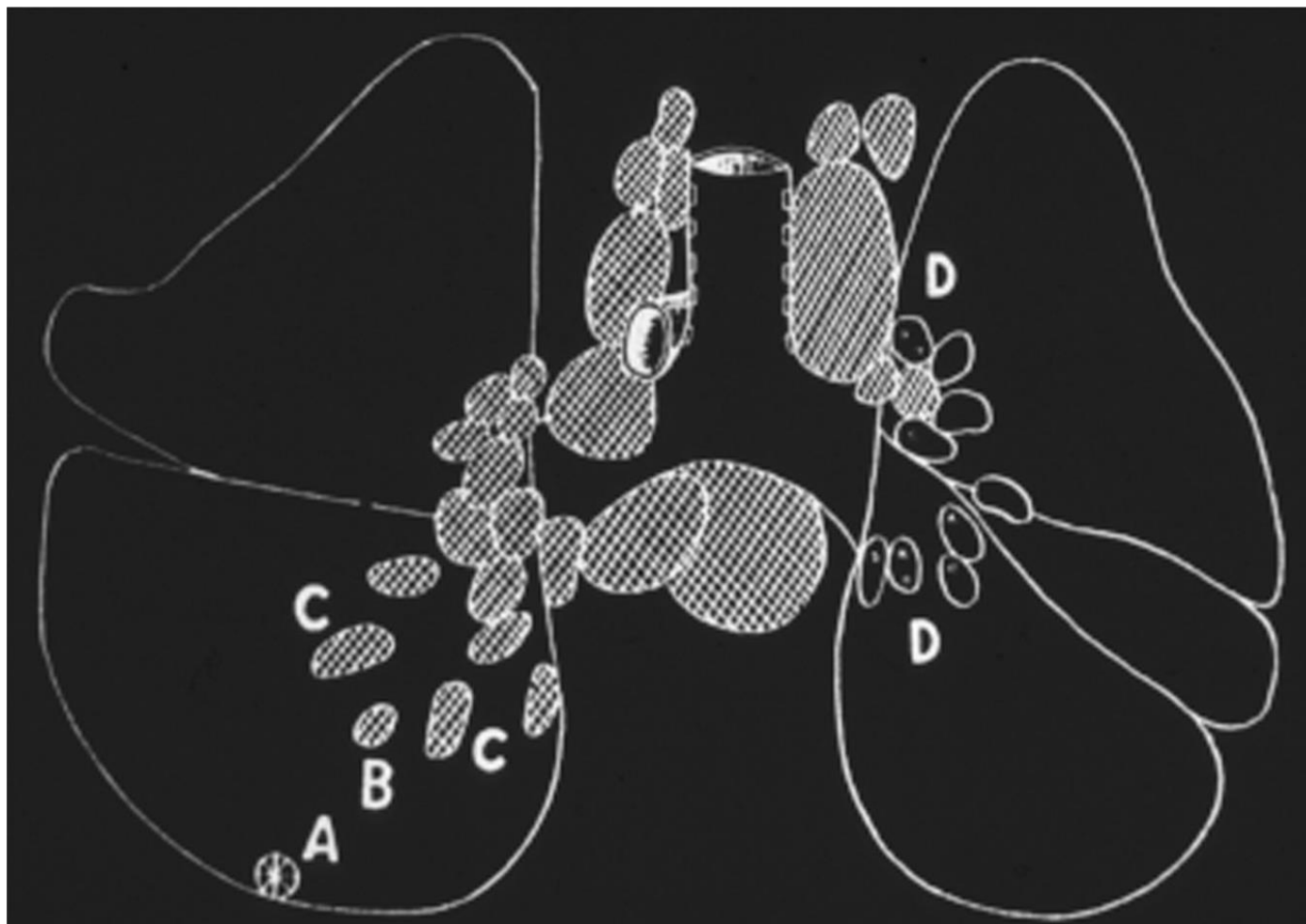
Chest Radiology in TB

- X-Rays penetrate air, absorbed by fluids/solids
 - Dark = Air
 - Dense White = Calcium (Bone Density)
 - White = Water Density (Everything else)
 - Water
 - Blood
 - Fat
 - Tissue
 - Pus
- Chest radiographs are just shadows
- Interpretation of a chest radiograph is pattern recognition that requires clinical correlation for diagnosis

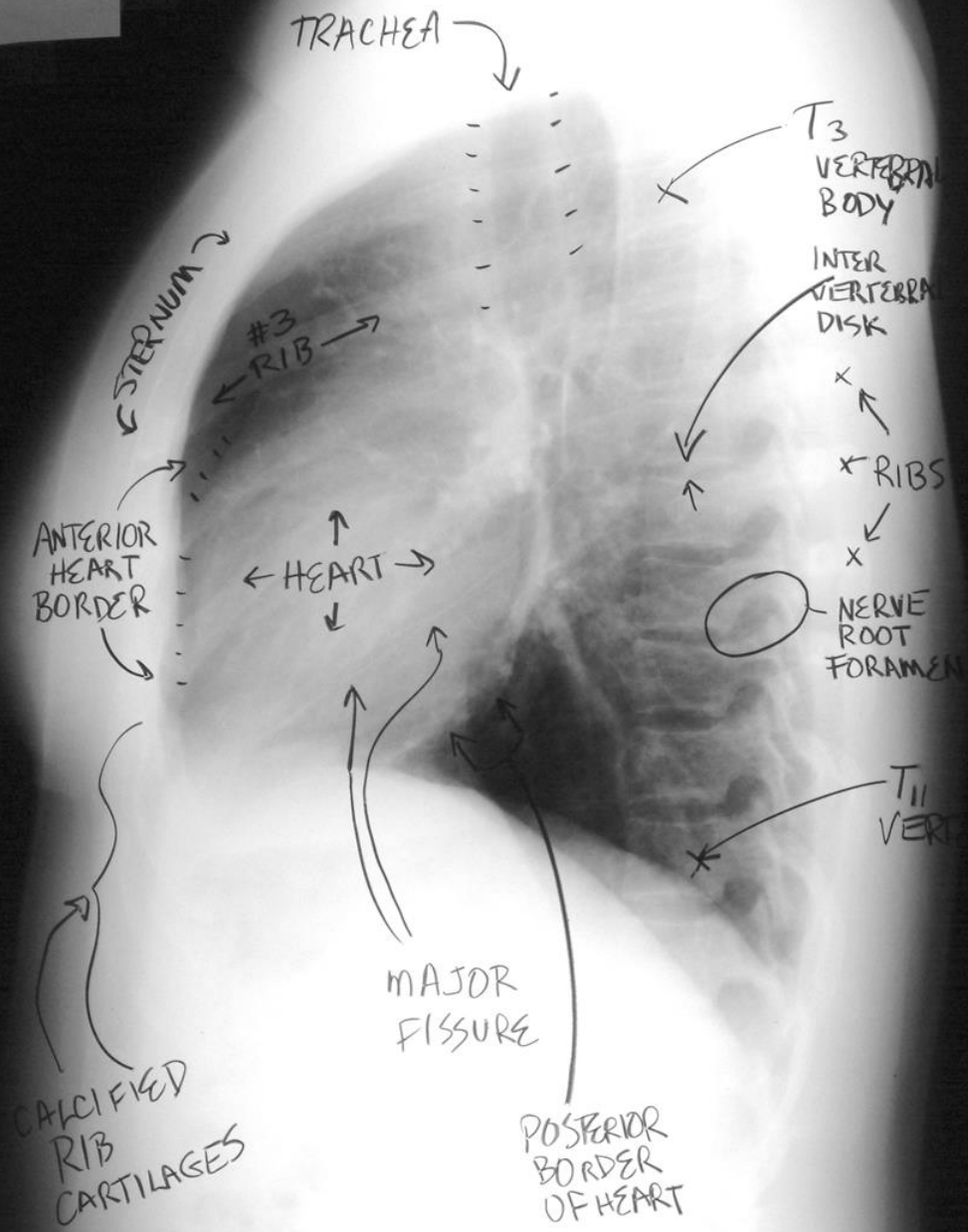




Thoracic Lymph Nodes



22 APR 2006



Normal CXR Child



Role of CT in the Diagnosis of TB

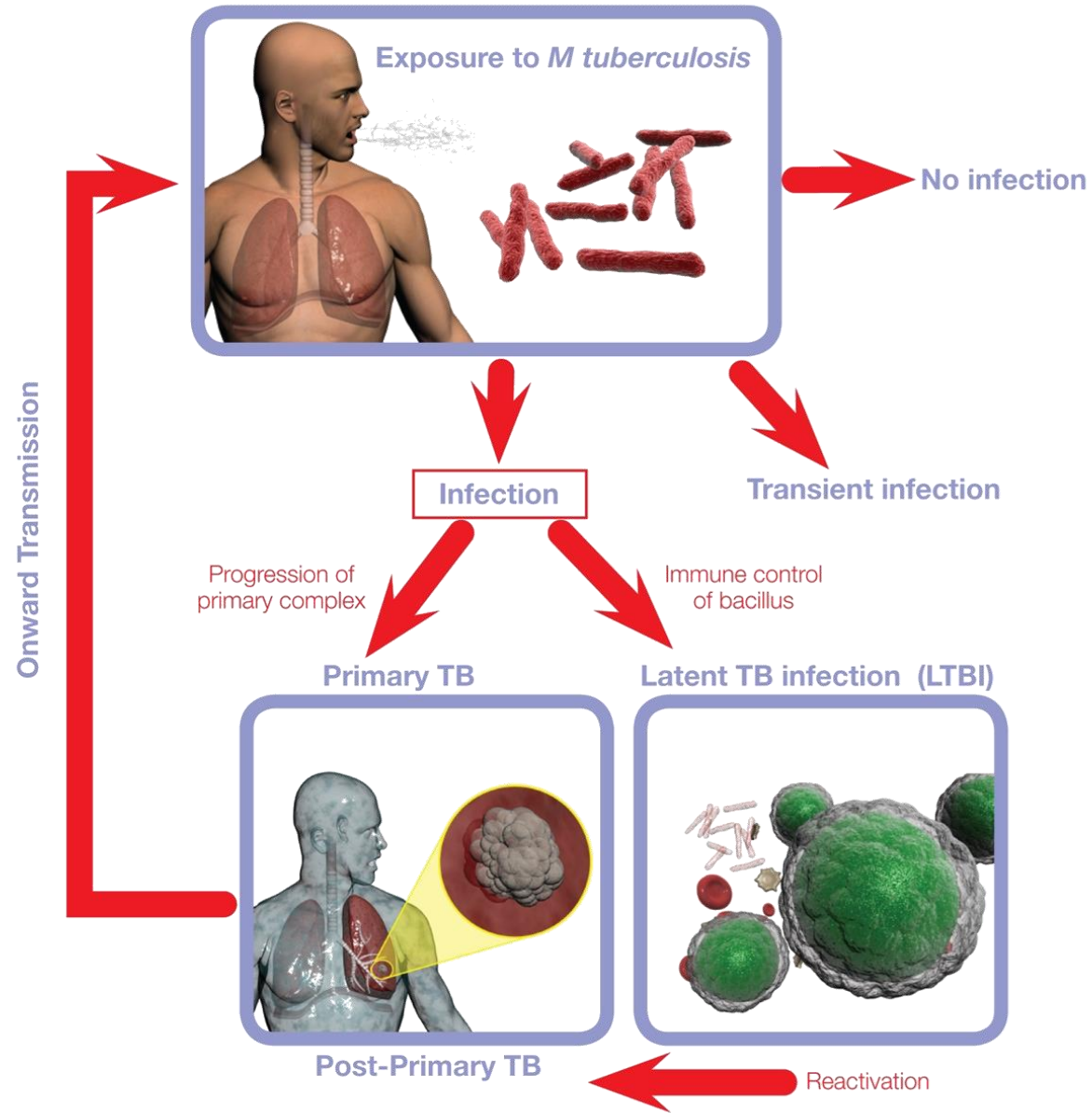
- CT is not the primary radiologic diagnostic test for TB (CT is overused in the US)
- Usually don't need CT for cavitory consolidation
- If TB is a possible diagnosis, sputum for AFB should be obtained prior to CT
- In most instances, CT should be reserved for patients in whom the diagnosis is unclear



Role of CT in the Diagnosis of TB

- Reveals occult lung disease in patients with pleural effusion, pericarditis, etc.
- Reveals intra-thoracic lymphadenopathy (children, HIV co-infected)
- Can suggest miliary disease
- Can suggest alternative diagnoses (lung cancer)

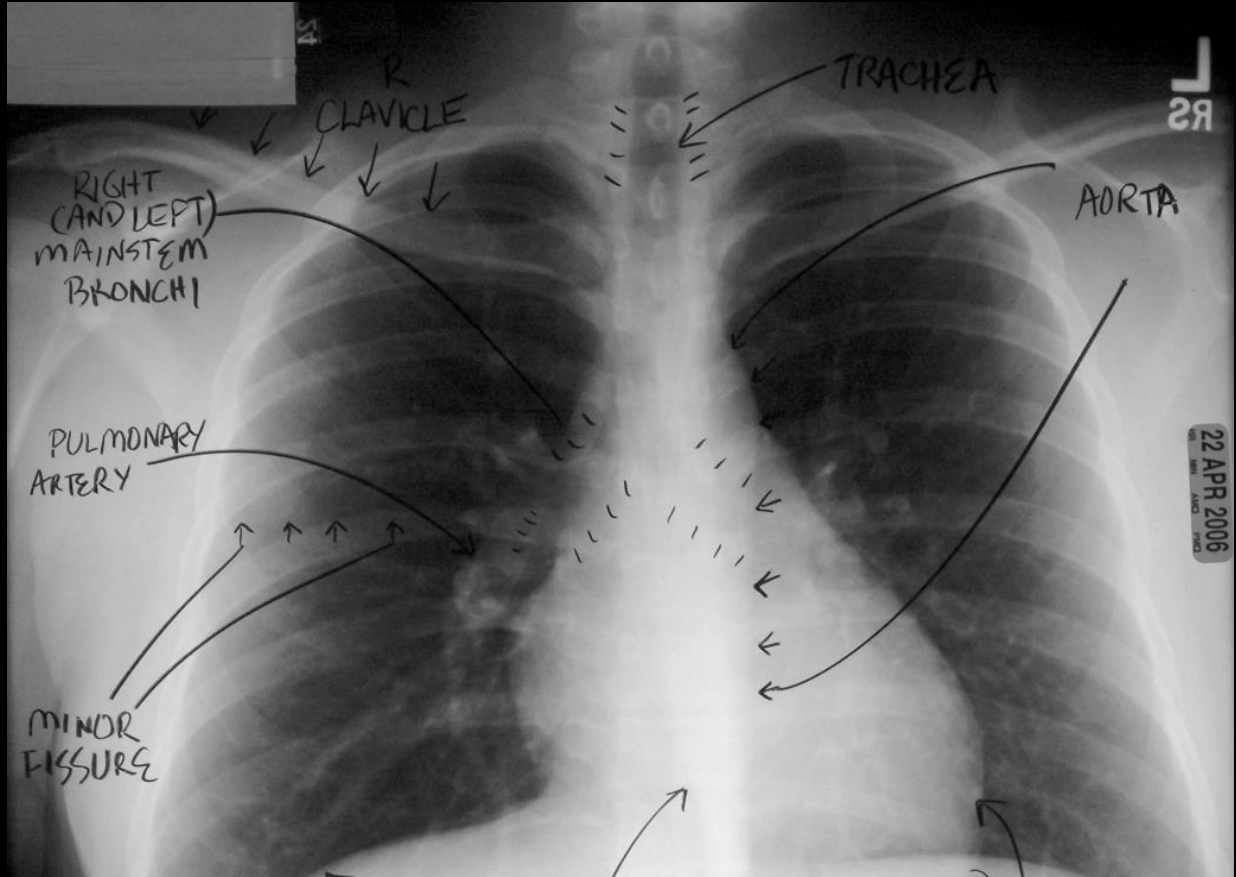
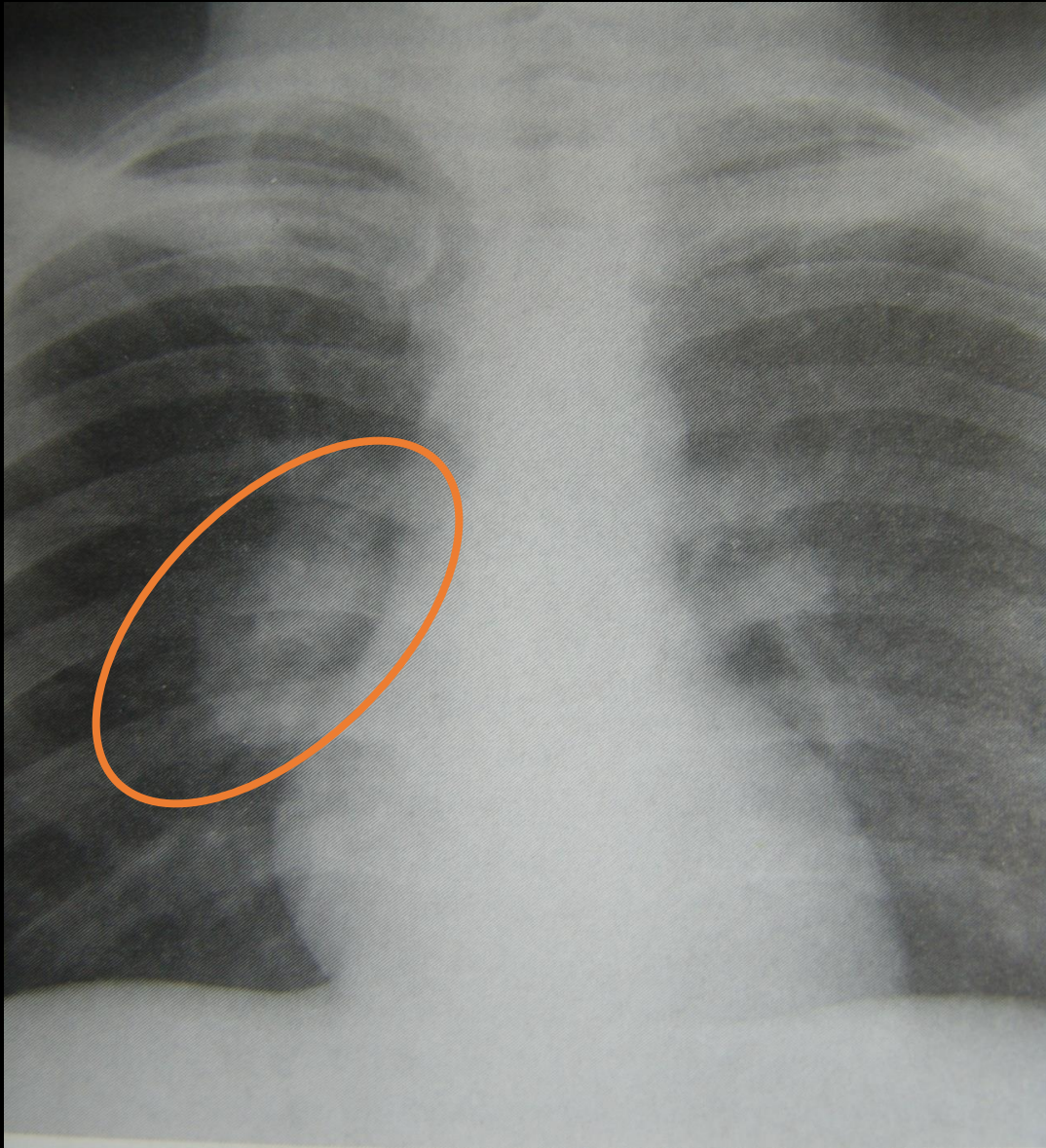


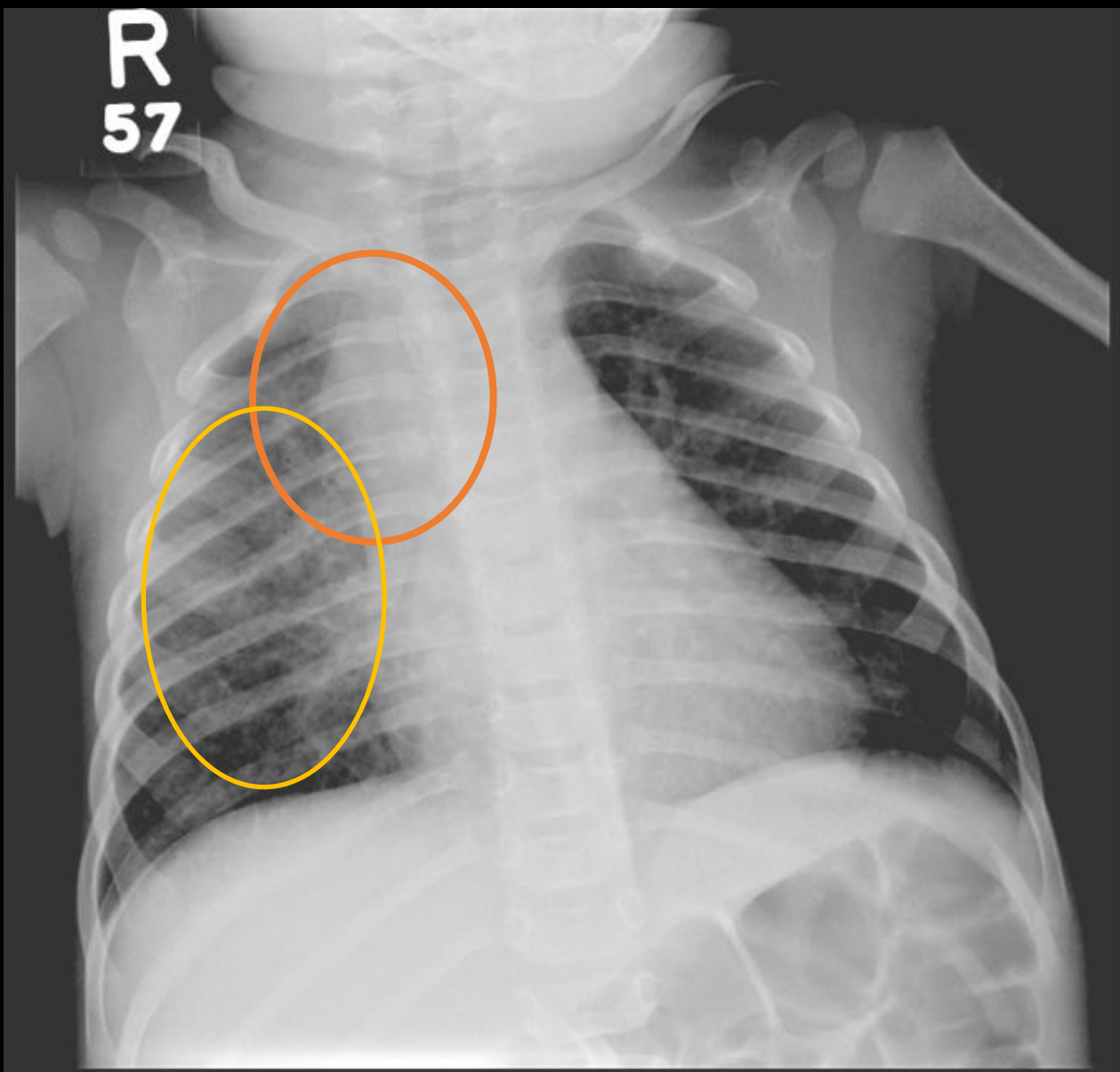


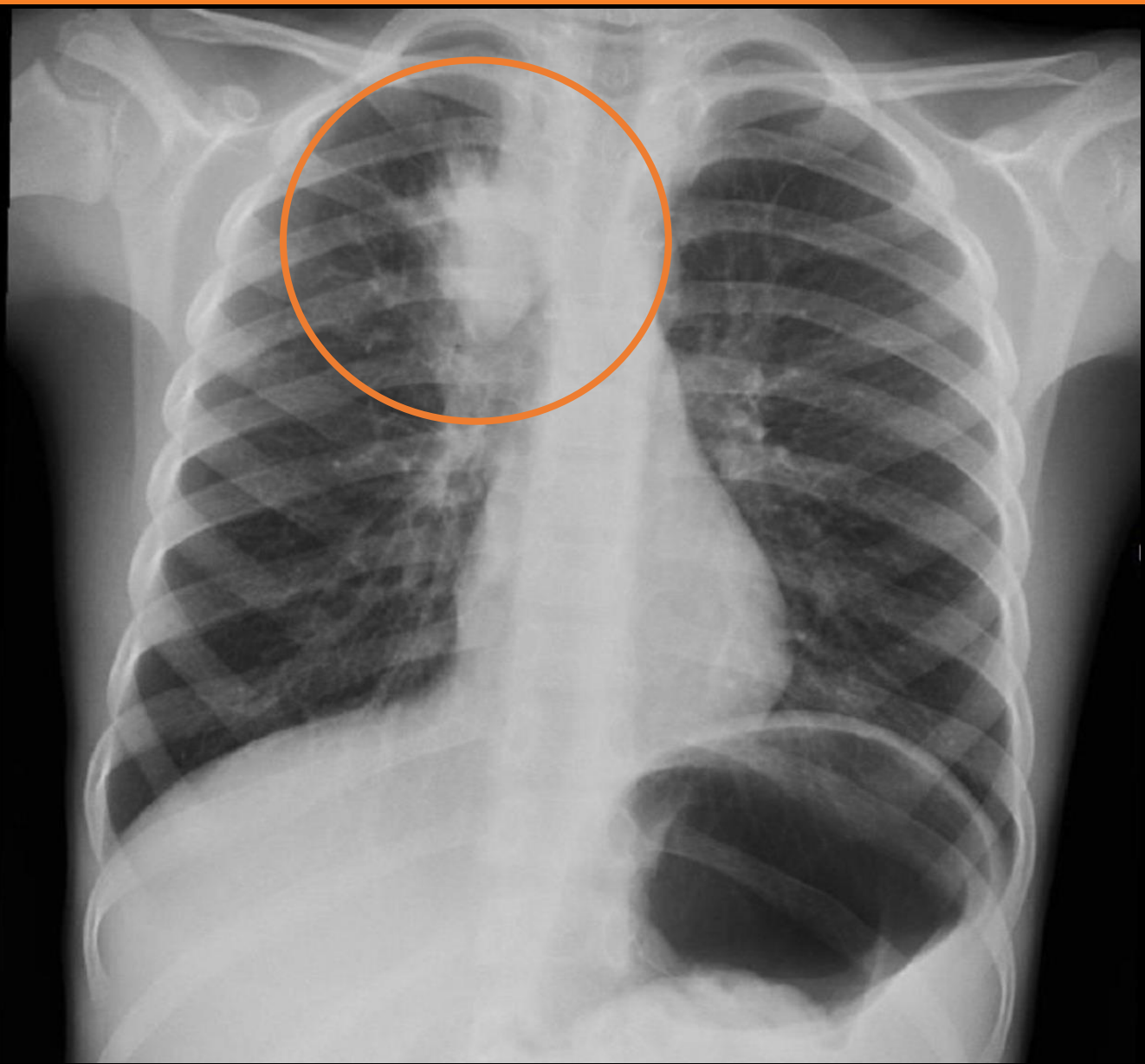
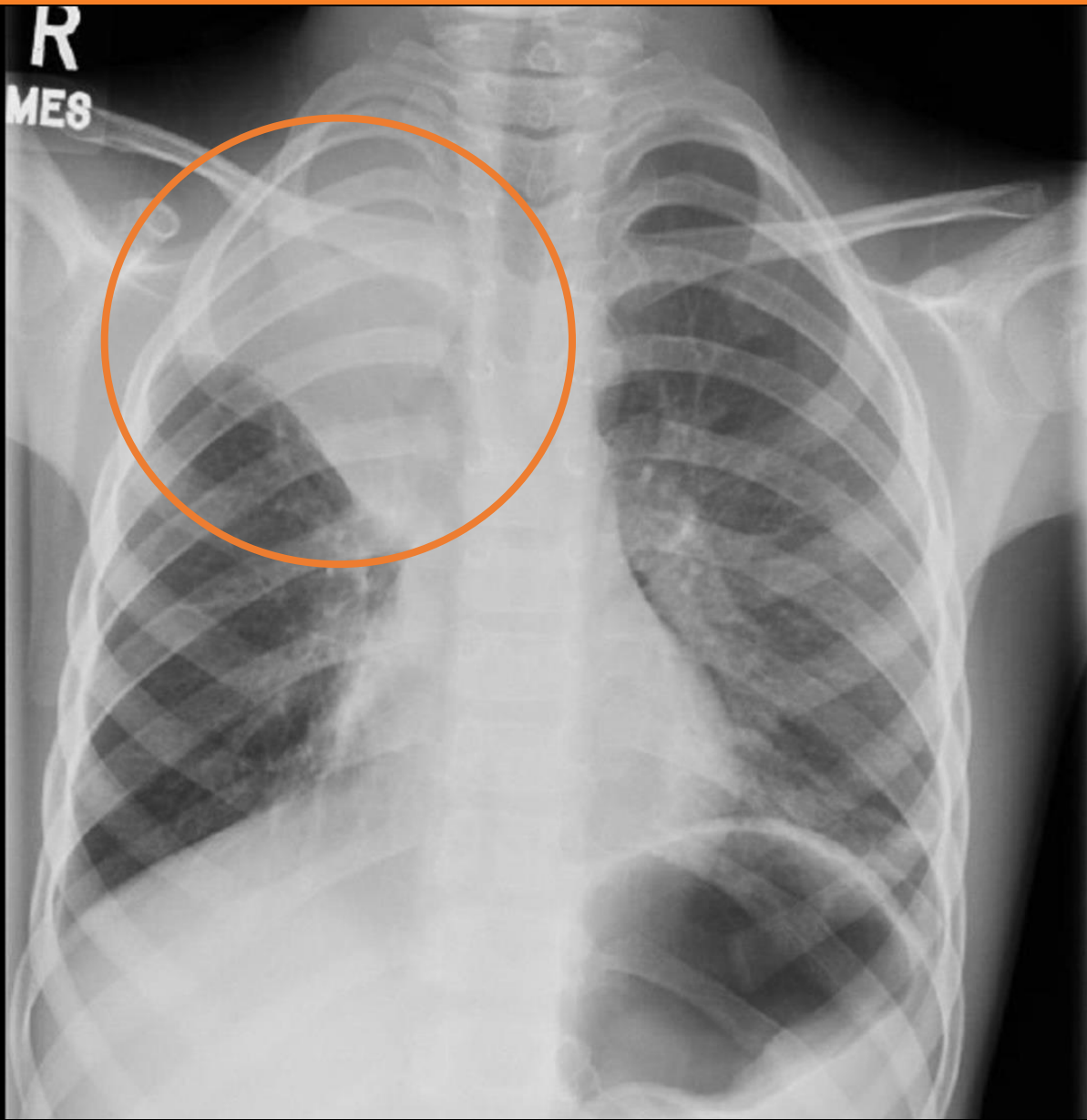
Primary Tuberculosis

- Most commonly in children and immune compromised patients
- Opacities are seen the in middle and lower lungs
- Commonly unilateral, bilateral 15%
- Lymph node enlargement often occurs, and may cause bronchial compression
- Hilar or paratracheal lymphadenopathy with or without infiltrates is characteristic.

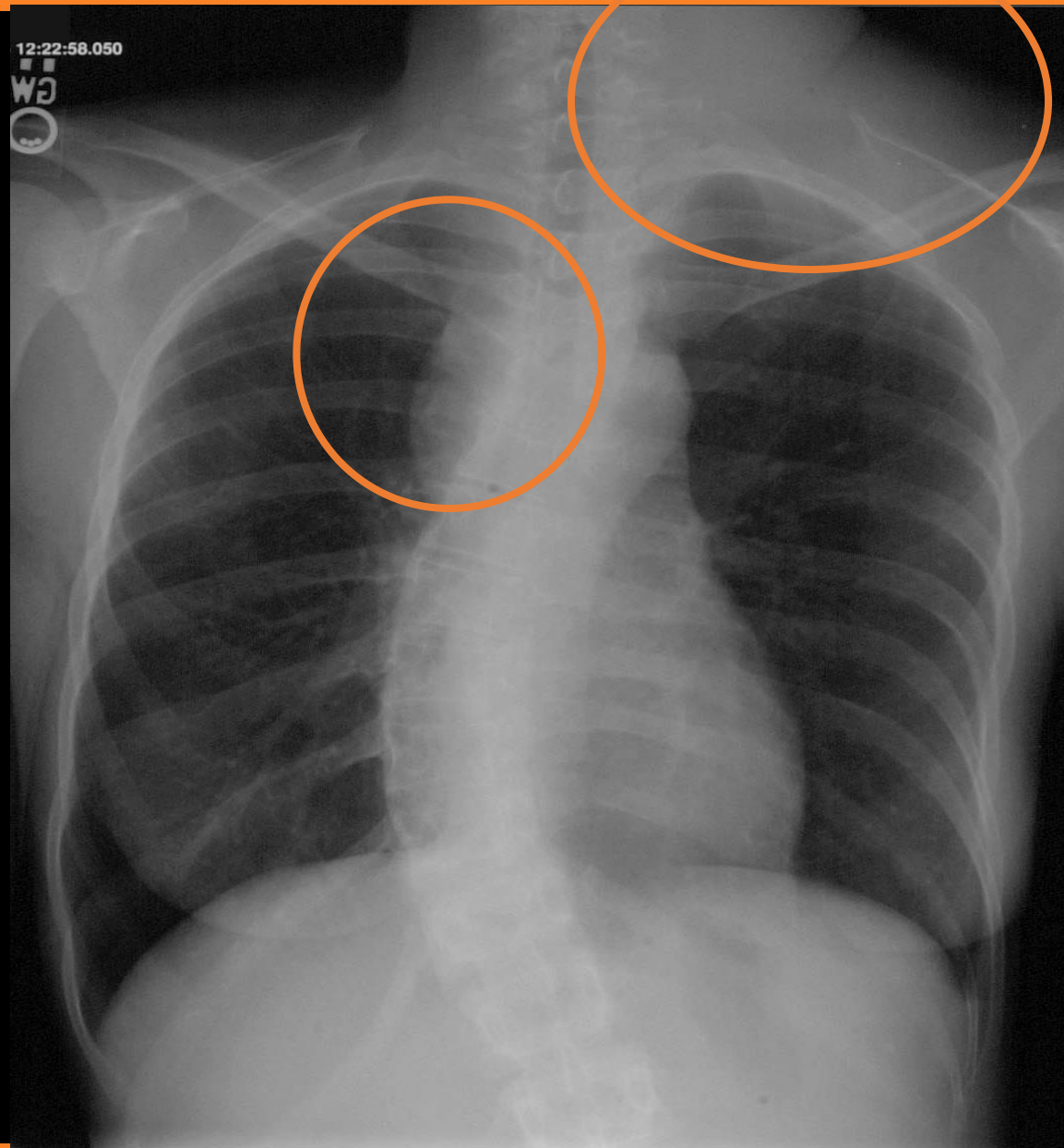


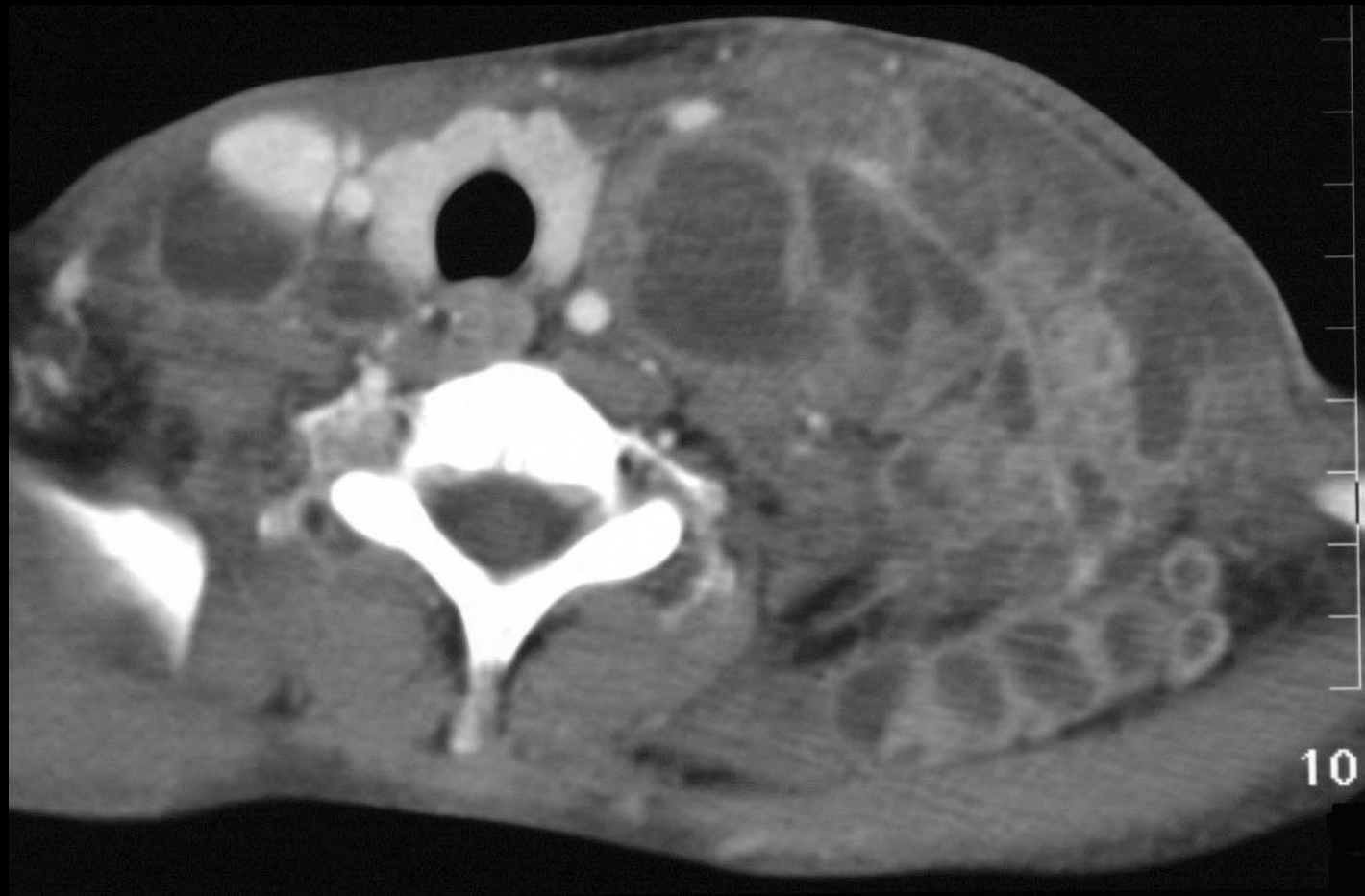






Where is the Adenopathy?





Post Primary, Reactivation Tuberculosis

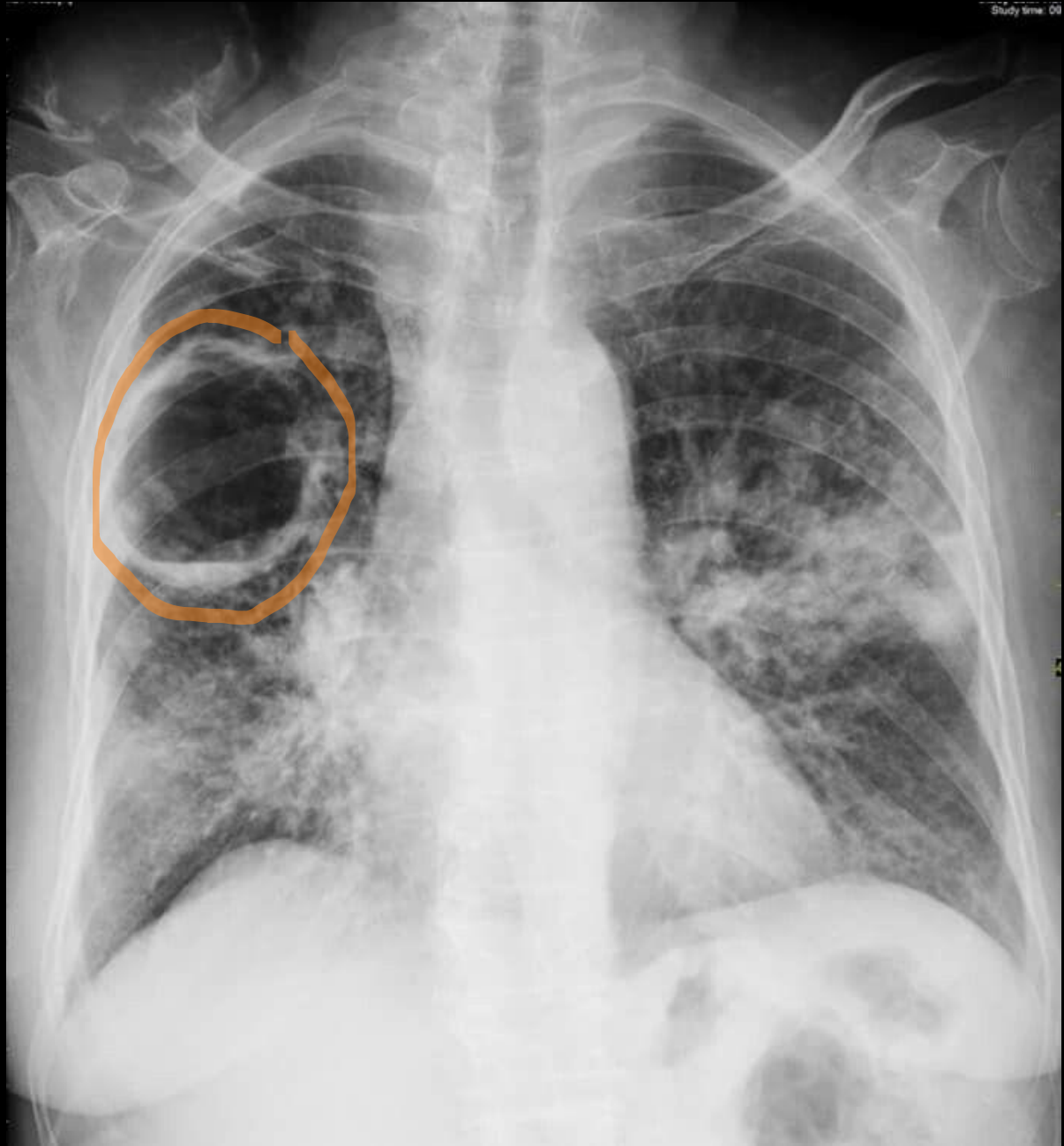
- Characterized by upper lobe predilection, cavitation and absence of lymphadenopathy.
- Cavitation is the hallmark; can also see parenchymal disease (consolidation), hematogenous dissemination (miliary), bronchogenic spread (tree-in-bud) and pleural disease.
- Fibrosis and calcification are seen after healing.

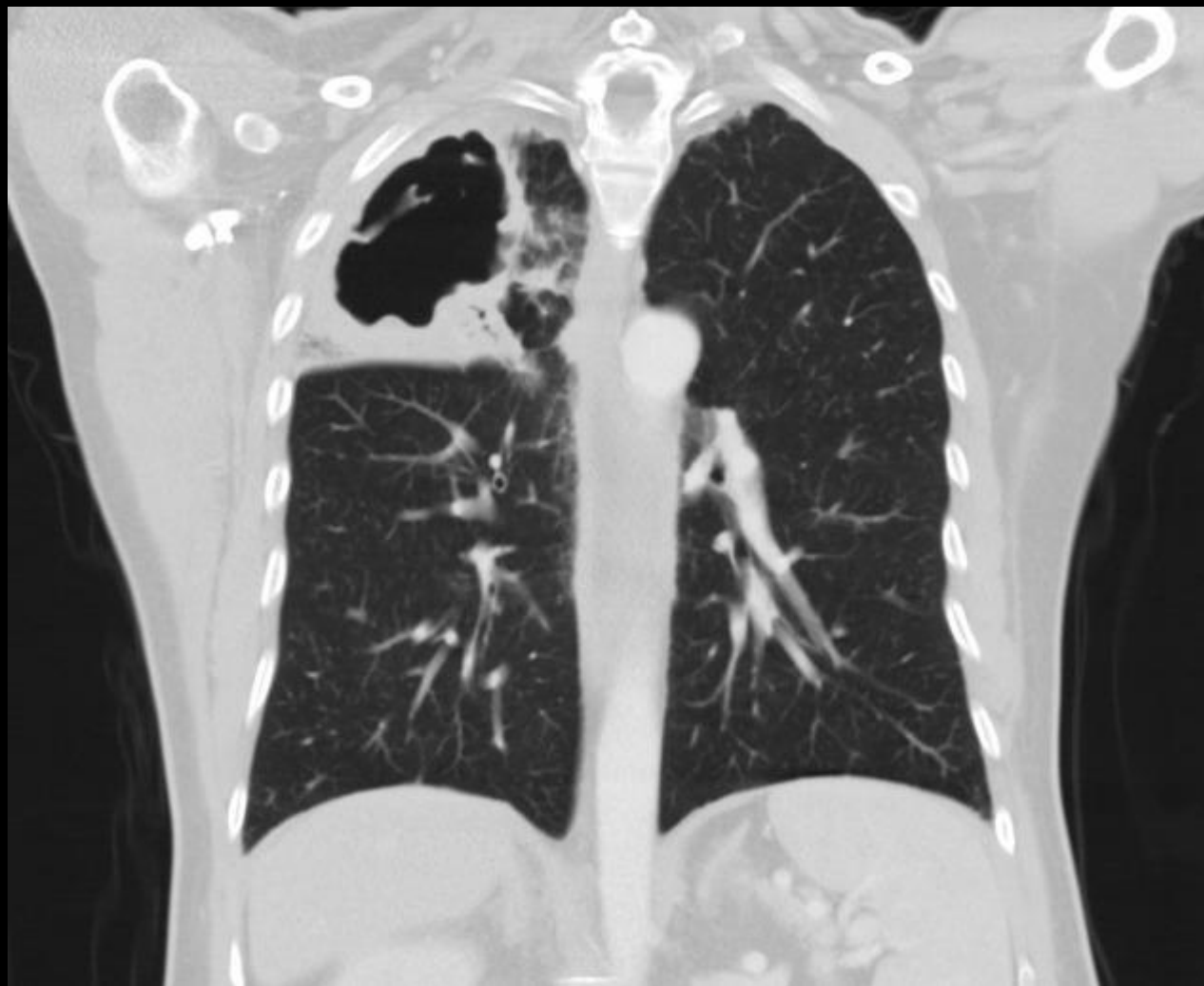


Tuberculous Cavities

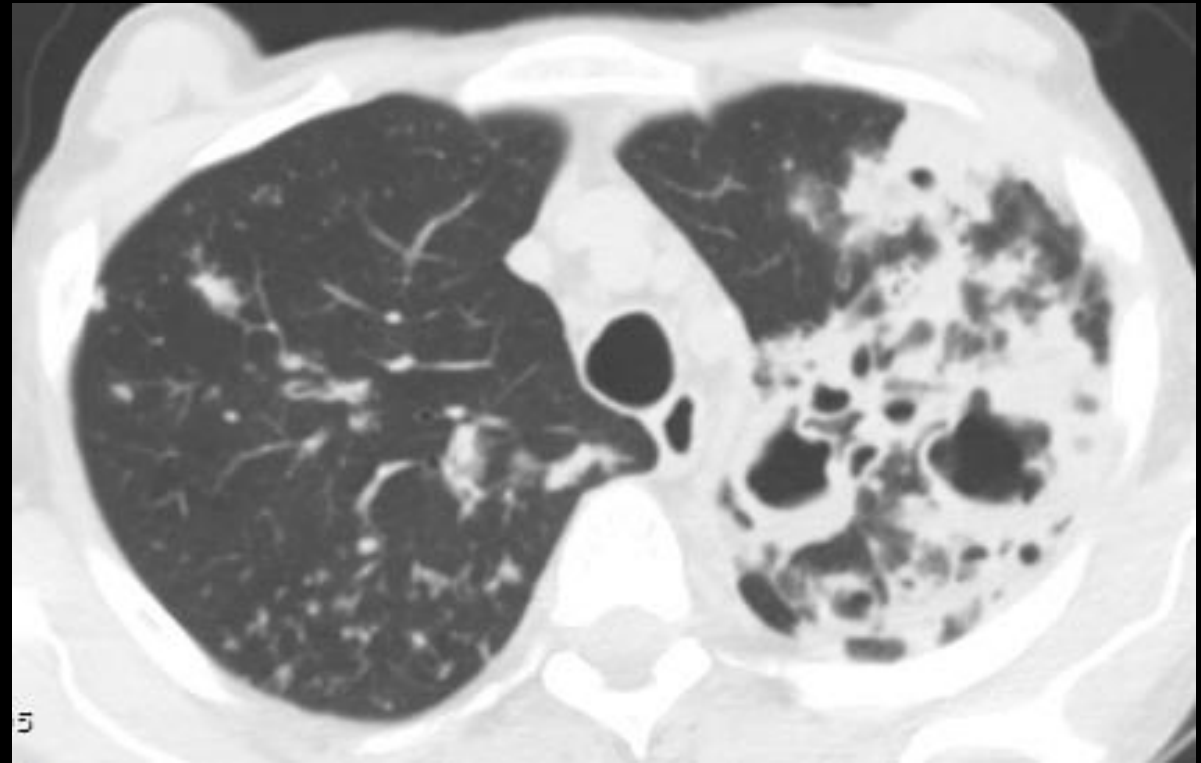
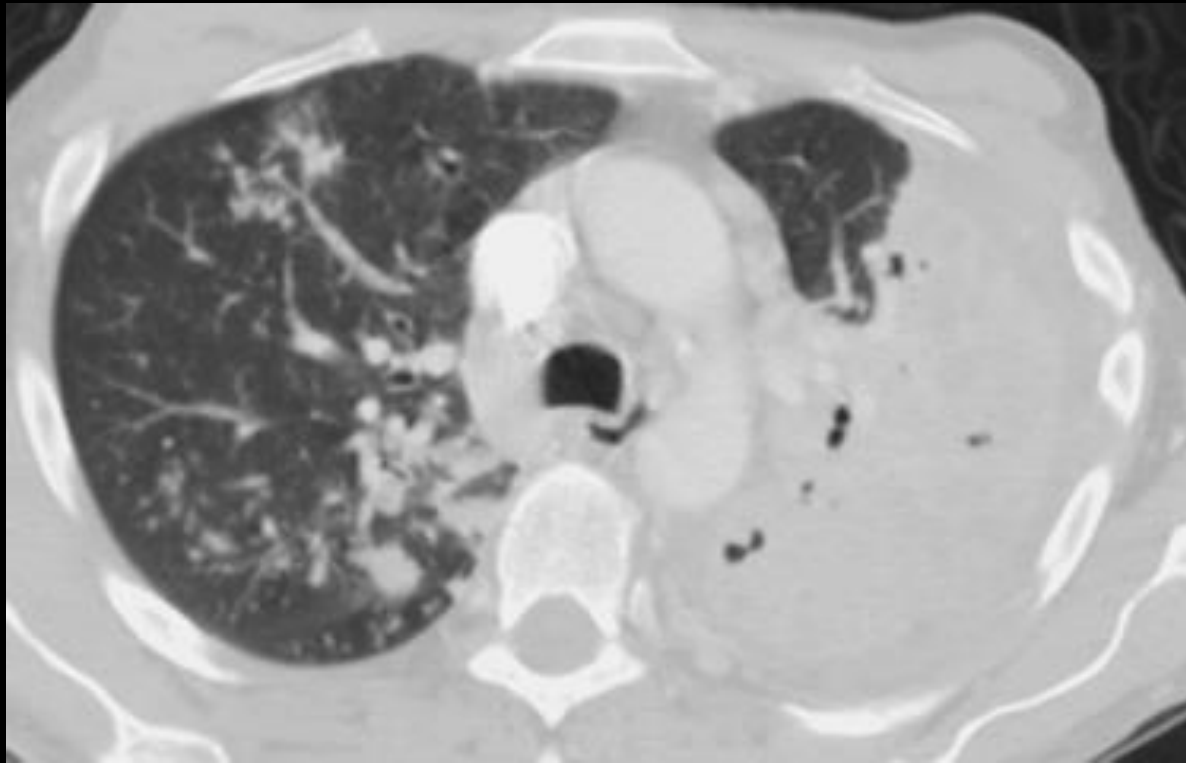
- Usually have thick, irregular walls
- With treatment, walls thin and cavity shrinks and usually collapses

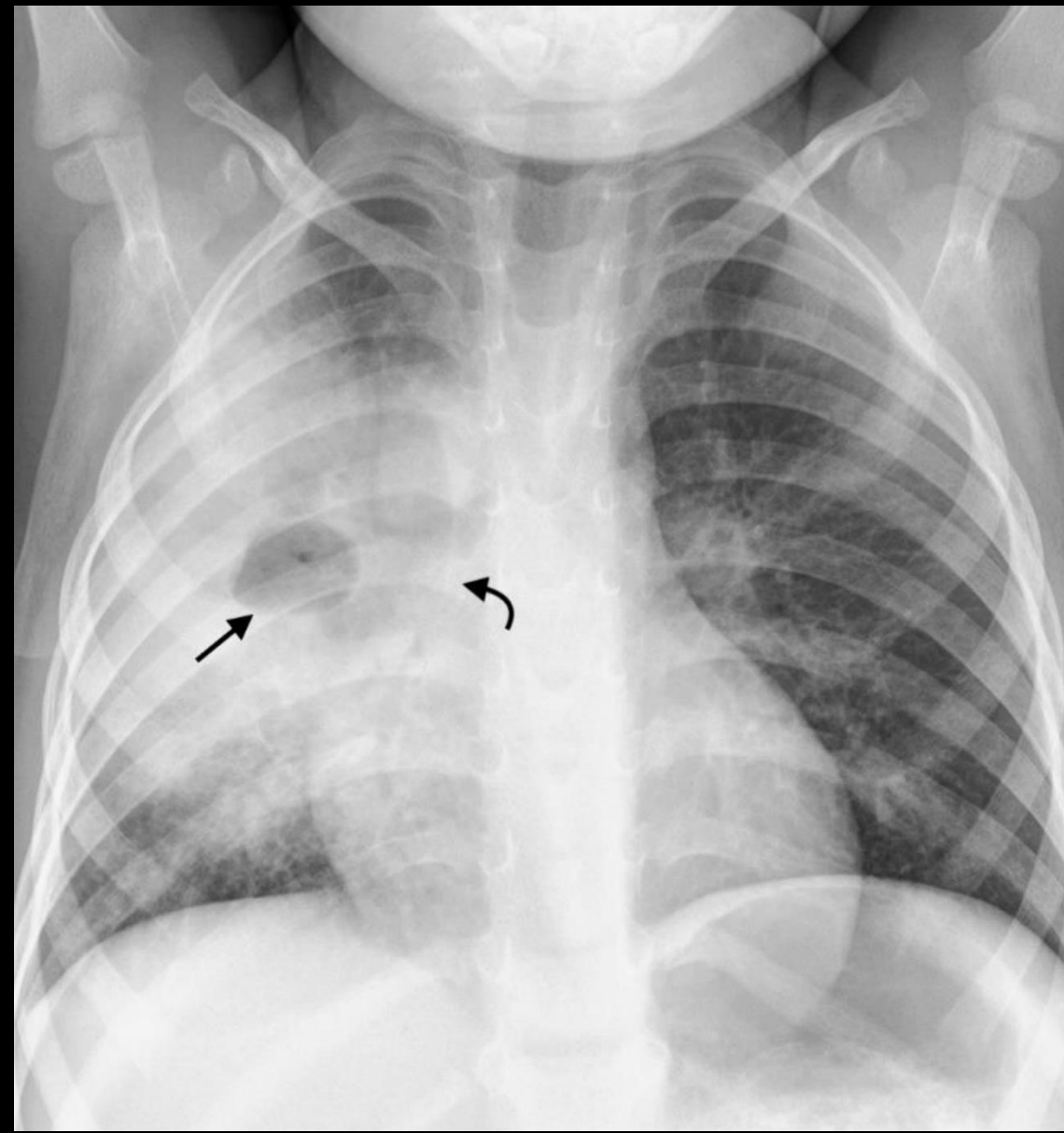
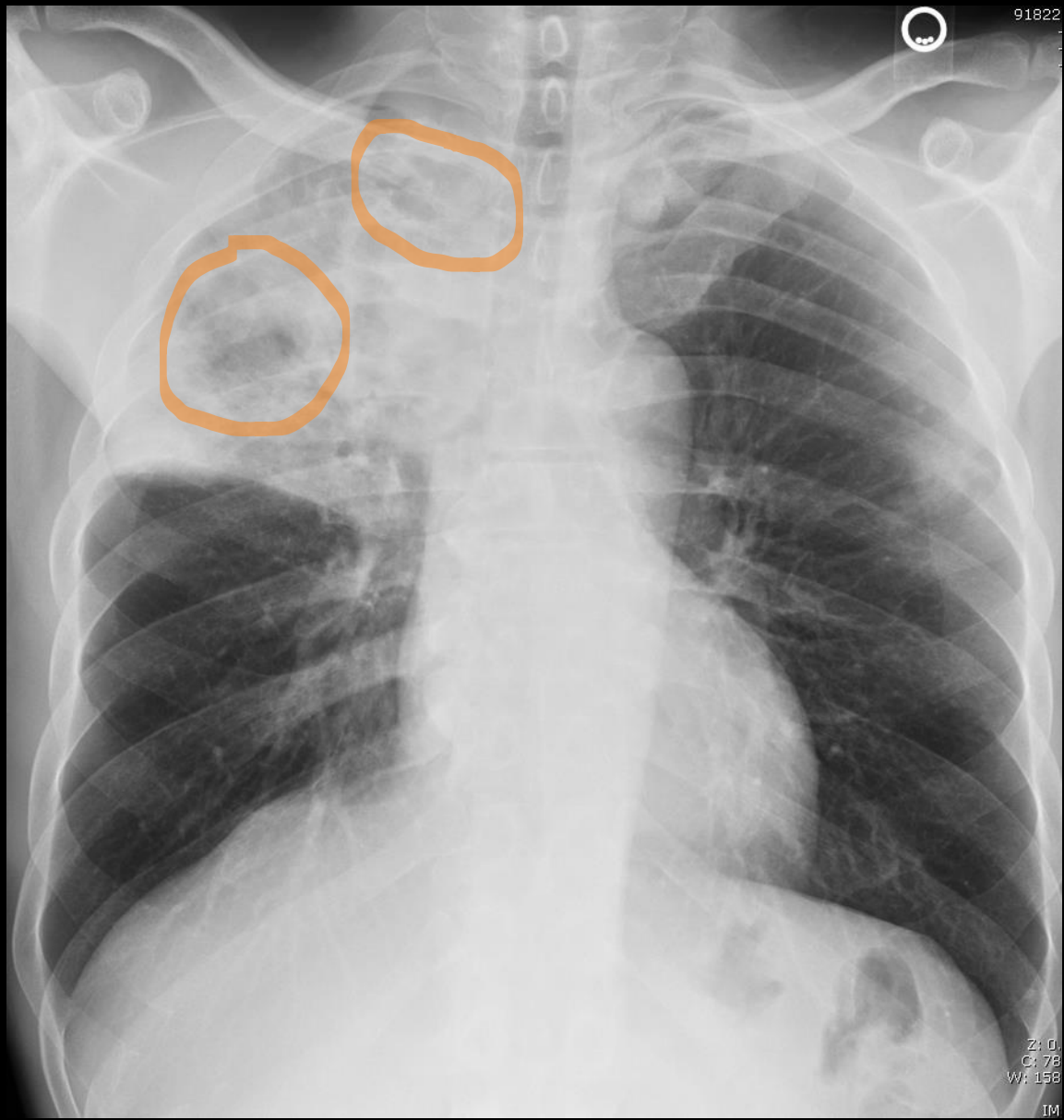






Cavitary Consolidation



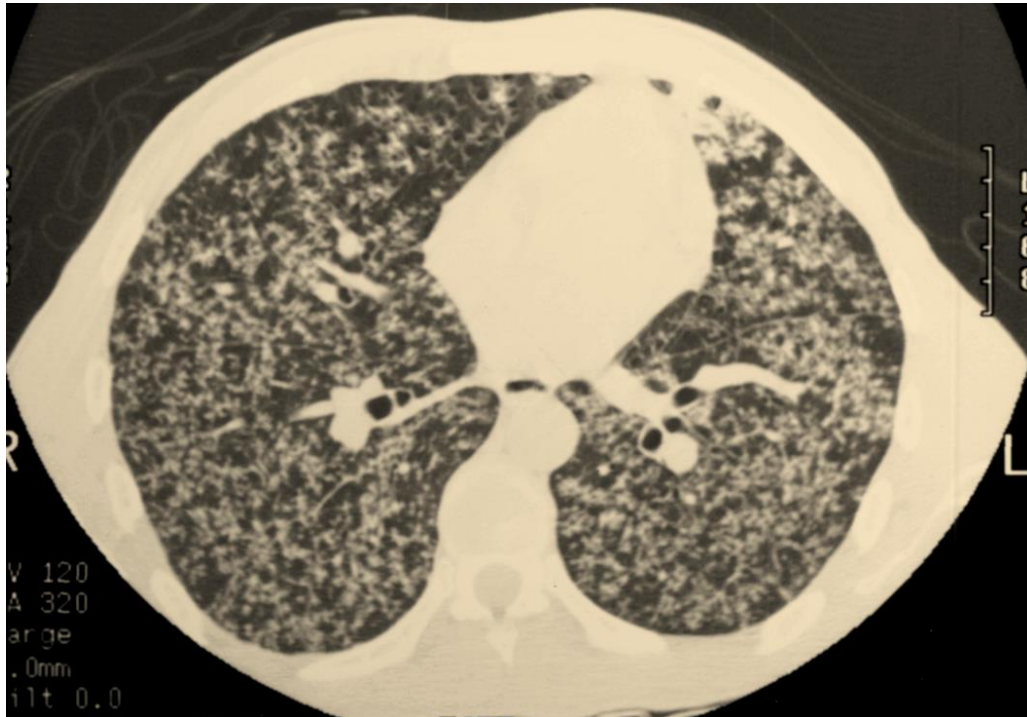


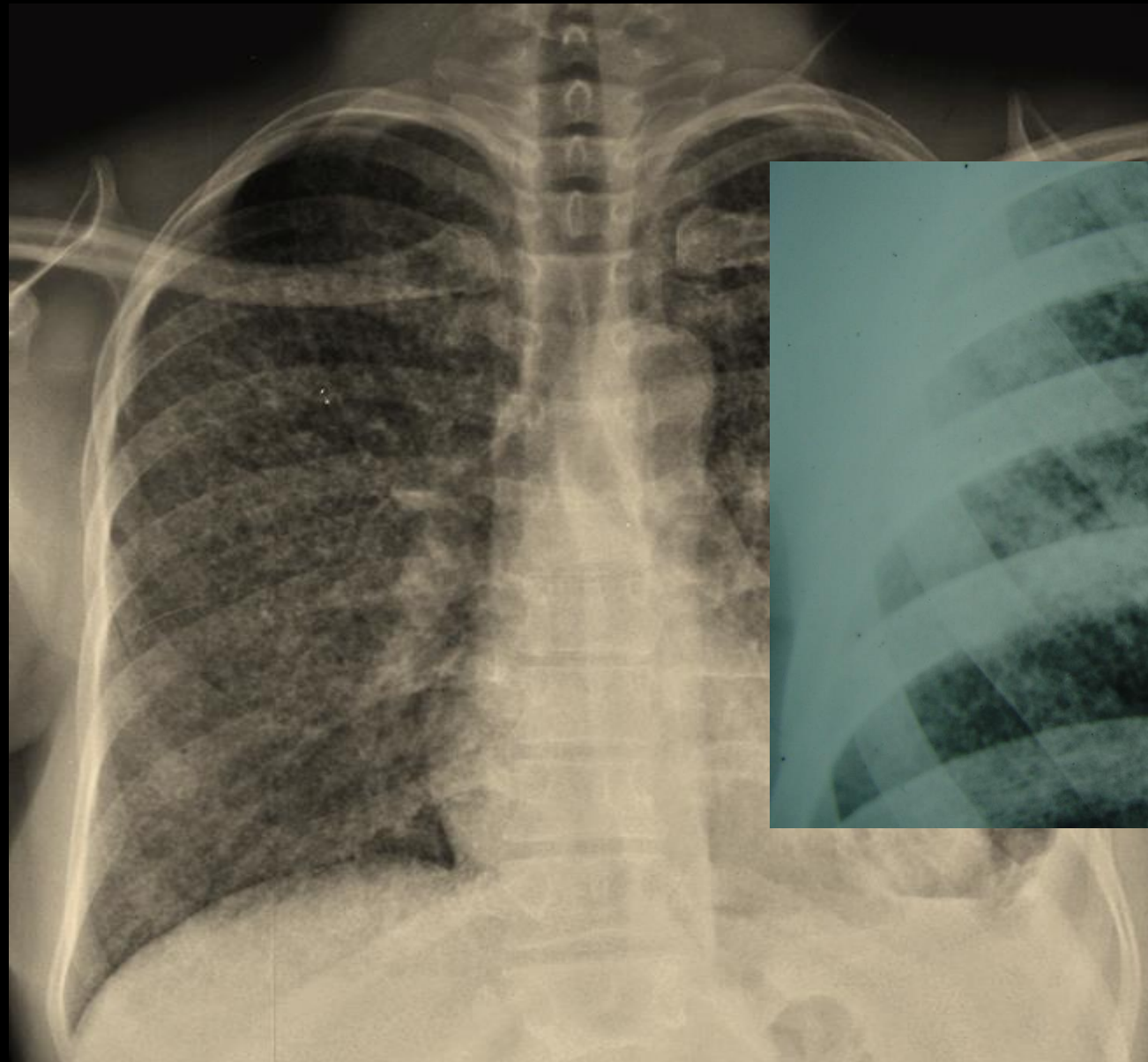
Millet Seeds

Slender plant, 1-15 feet
Seeds ~ 2 mm in diameter
1/3 of grain for 3rd world
Africa and India
Producer: India



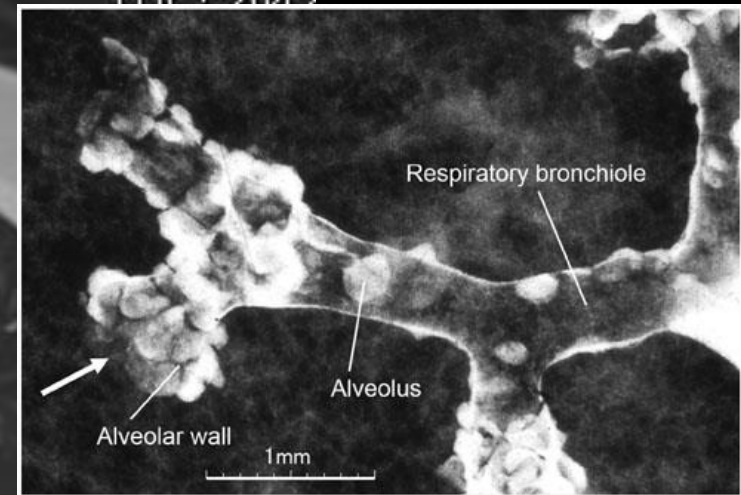
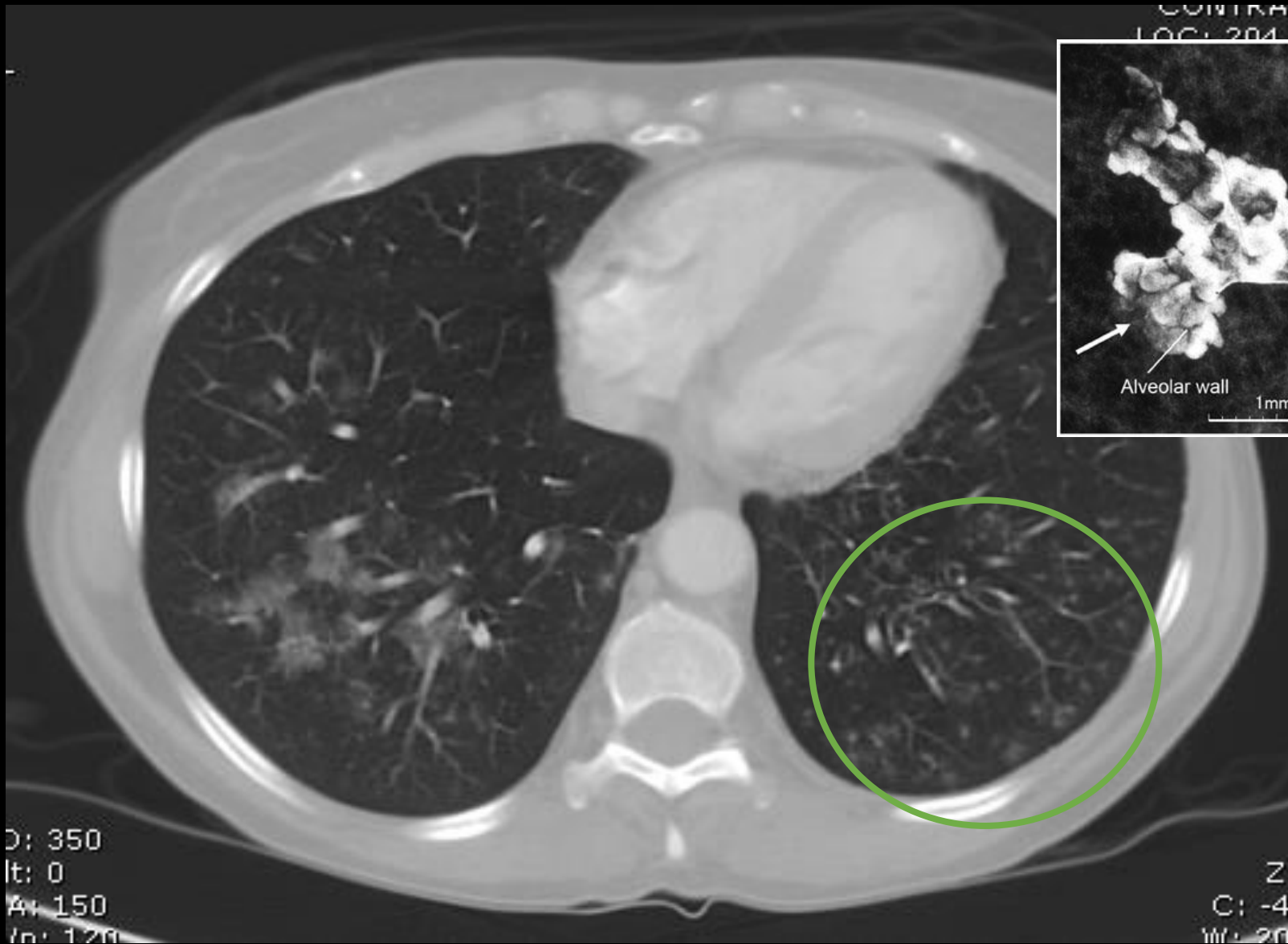
Miliary Tuberculosis

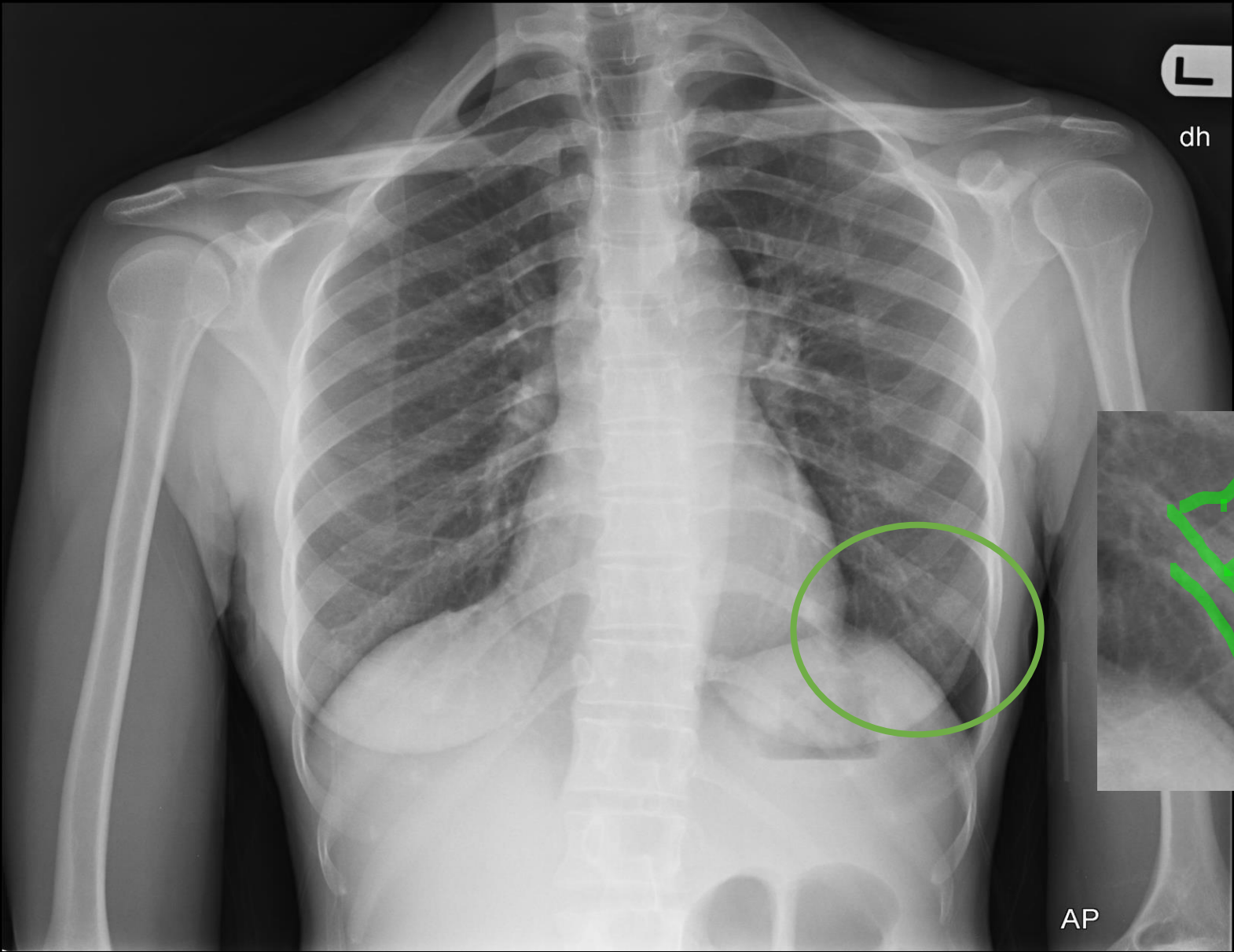




Tree in Bud.....



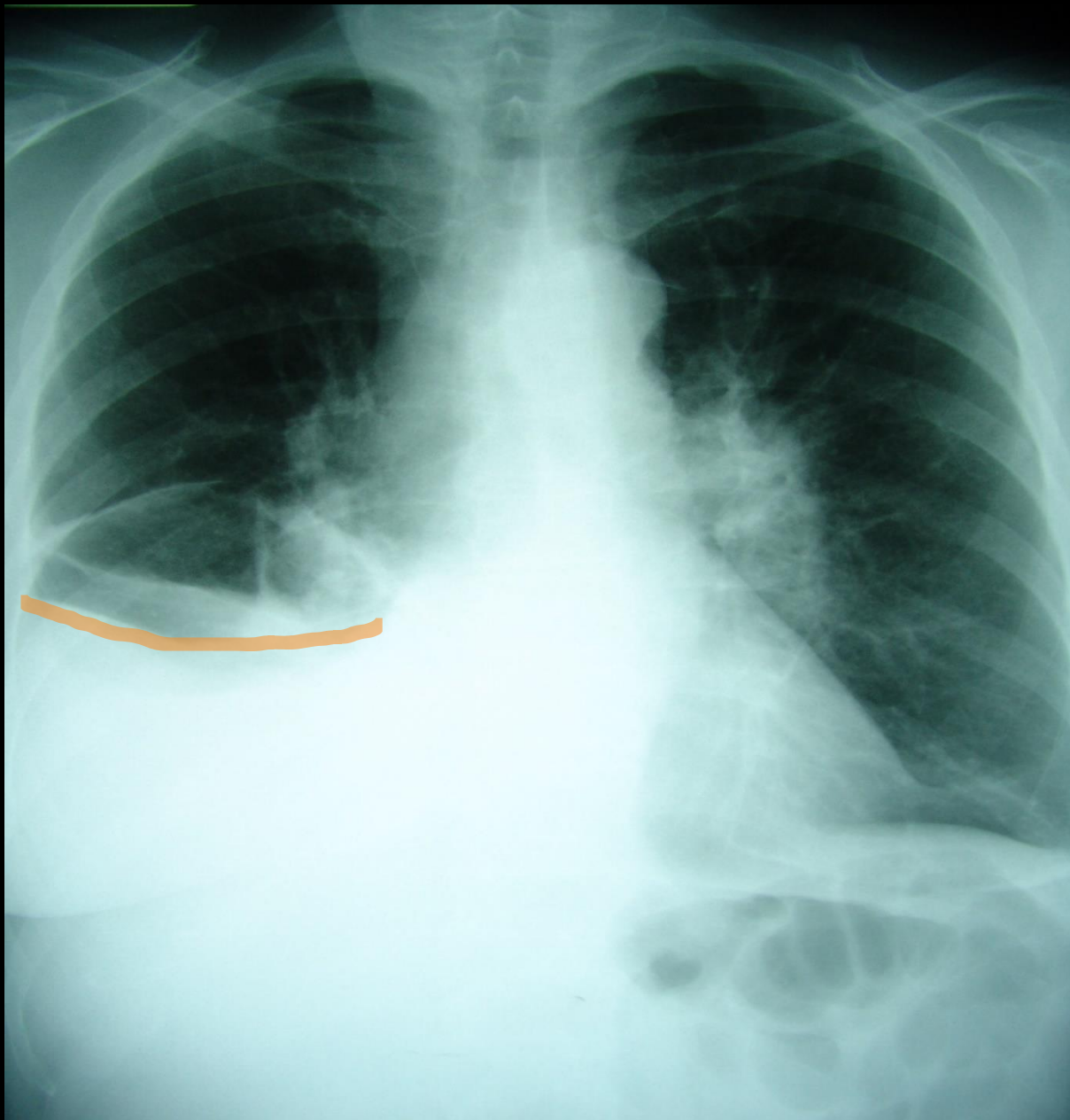
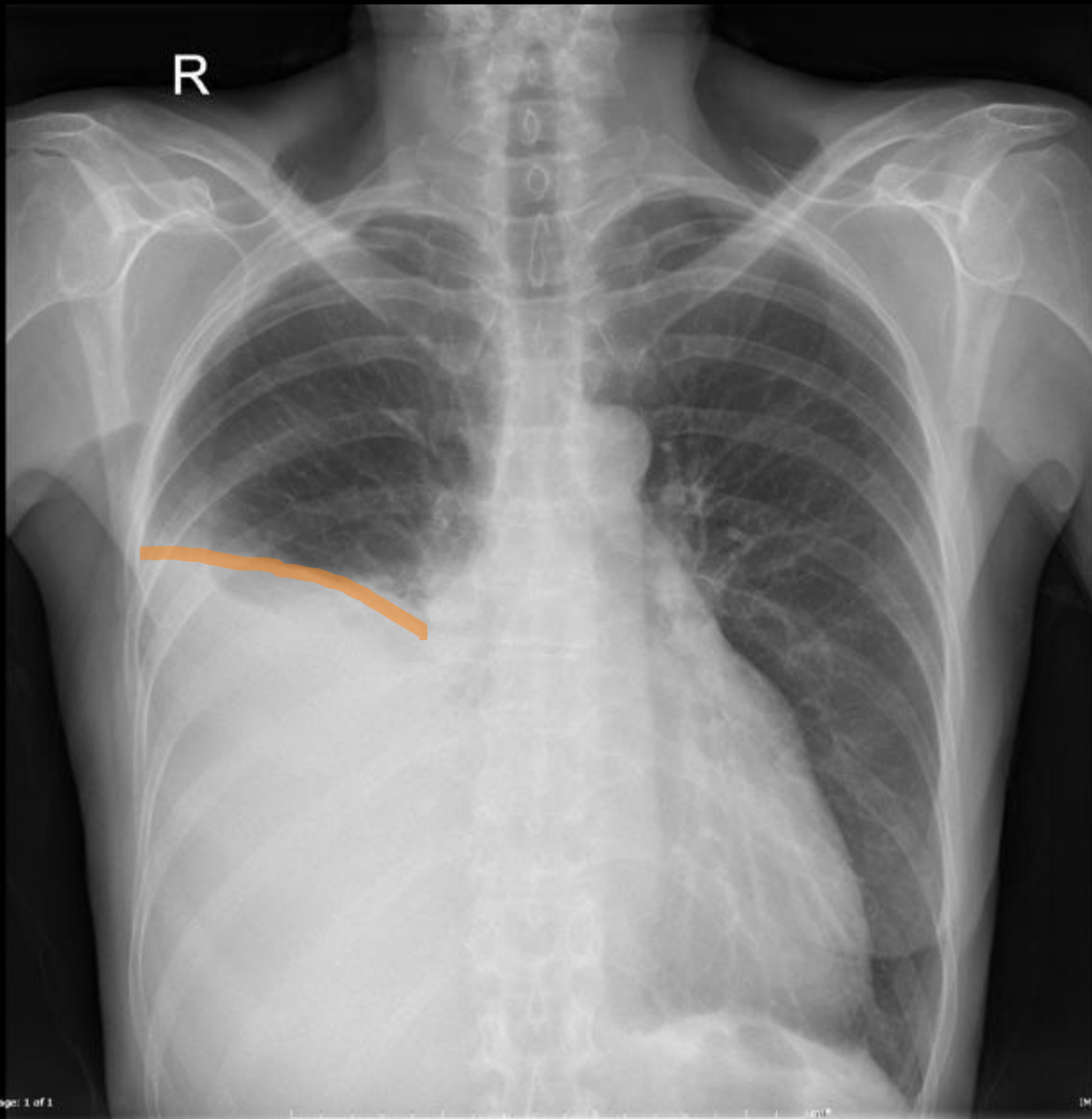


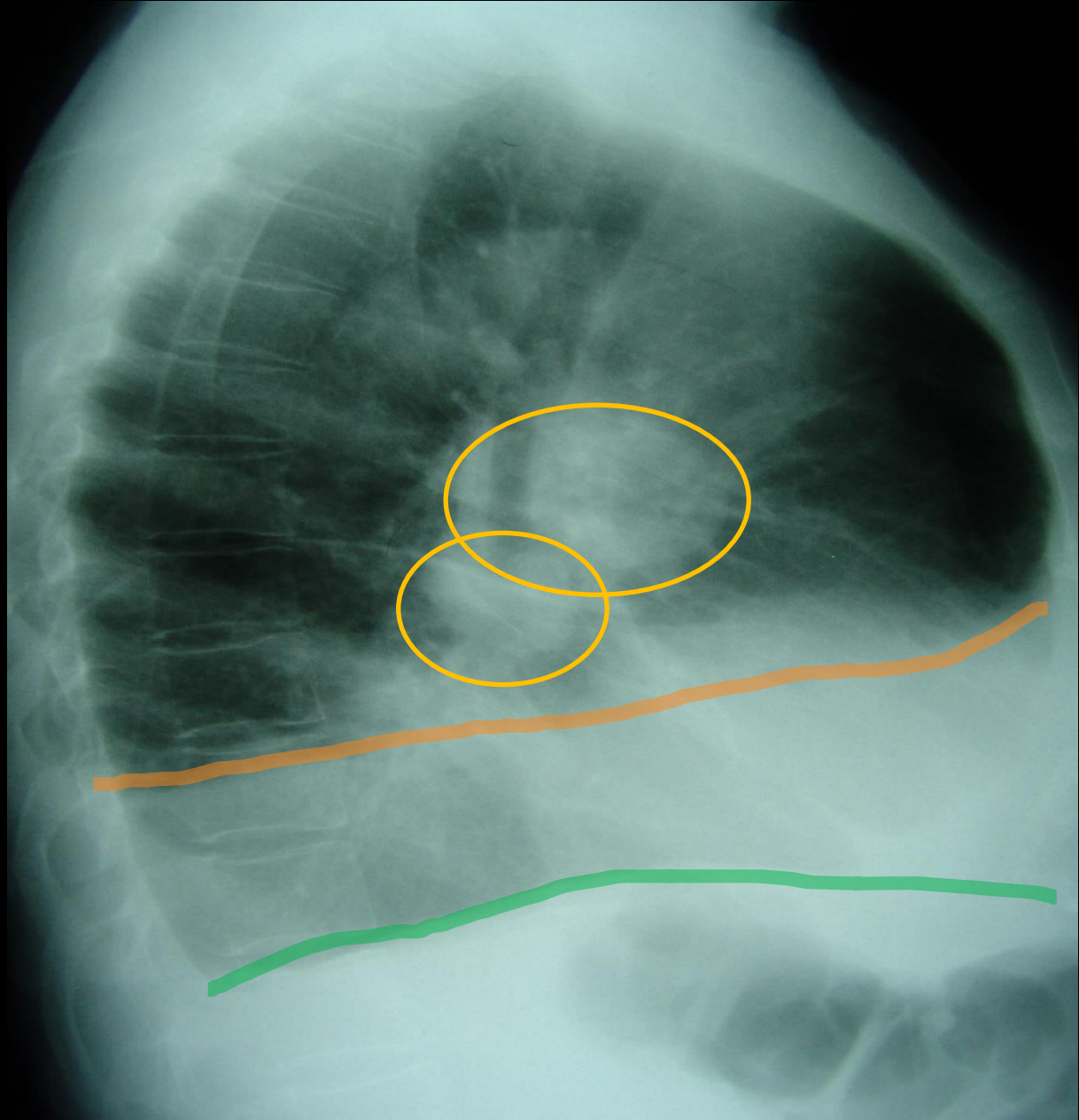


Pleural Effusions

- Primary TB (25%)
- Hypersensitivity reaction to TB proteins
- Organisms uncommonly isolated from fluid
- May not be associated with obvious parenchymal disease on CXR

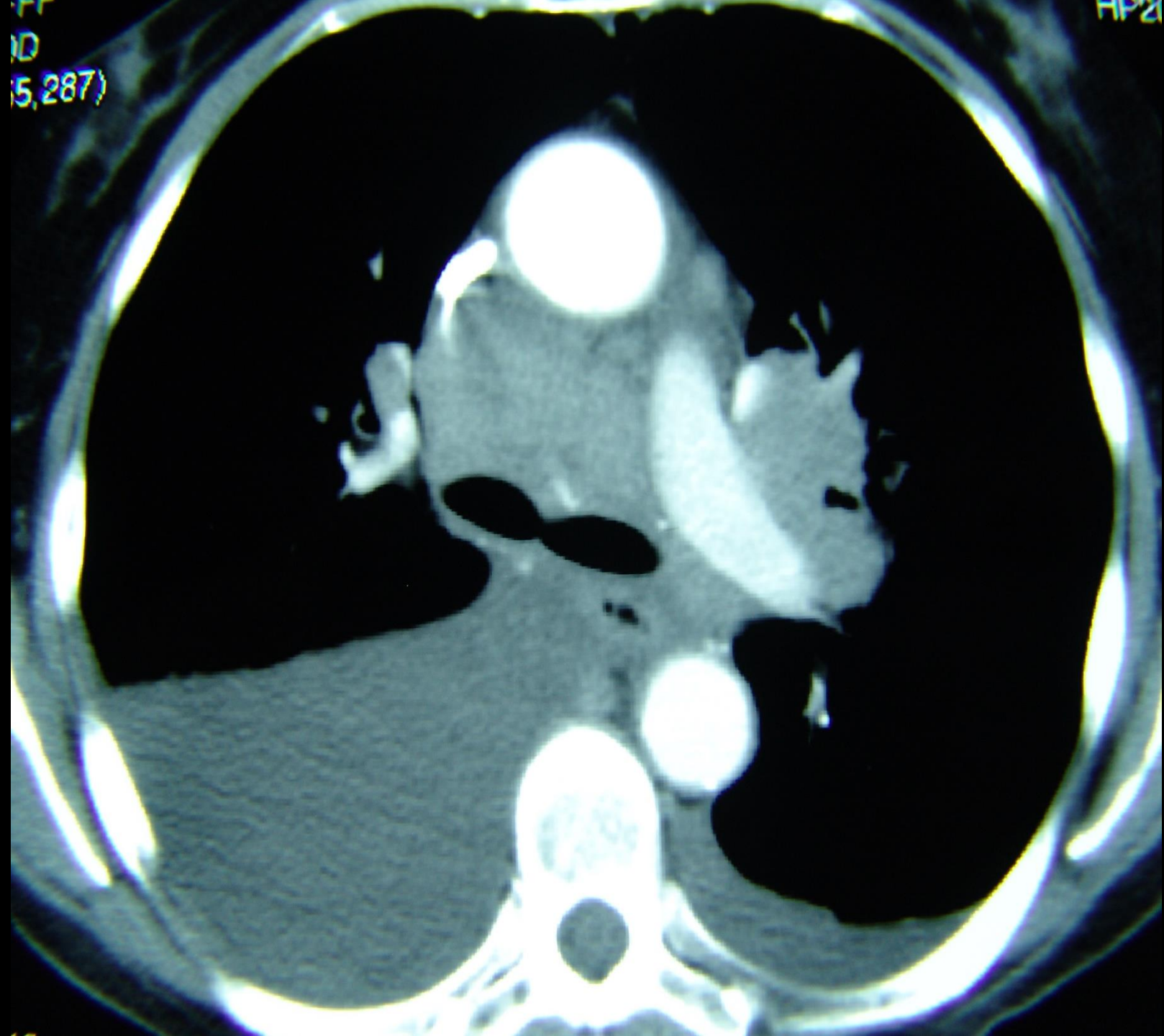






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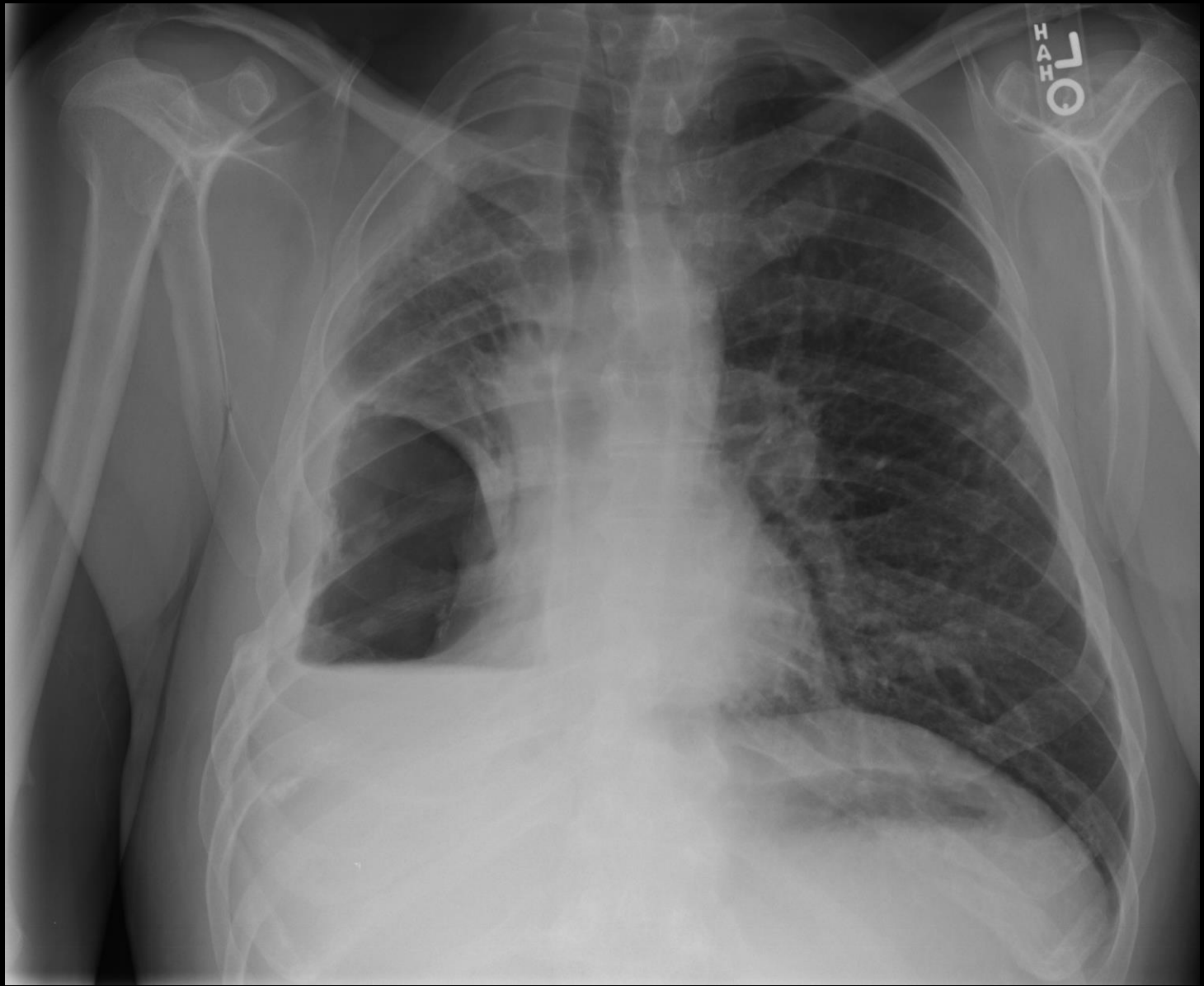
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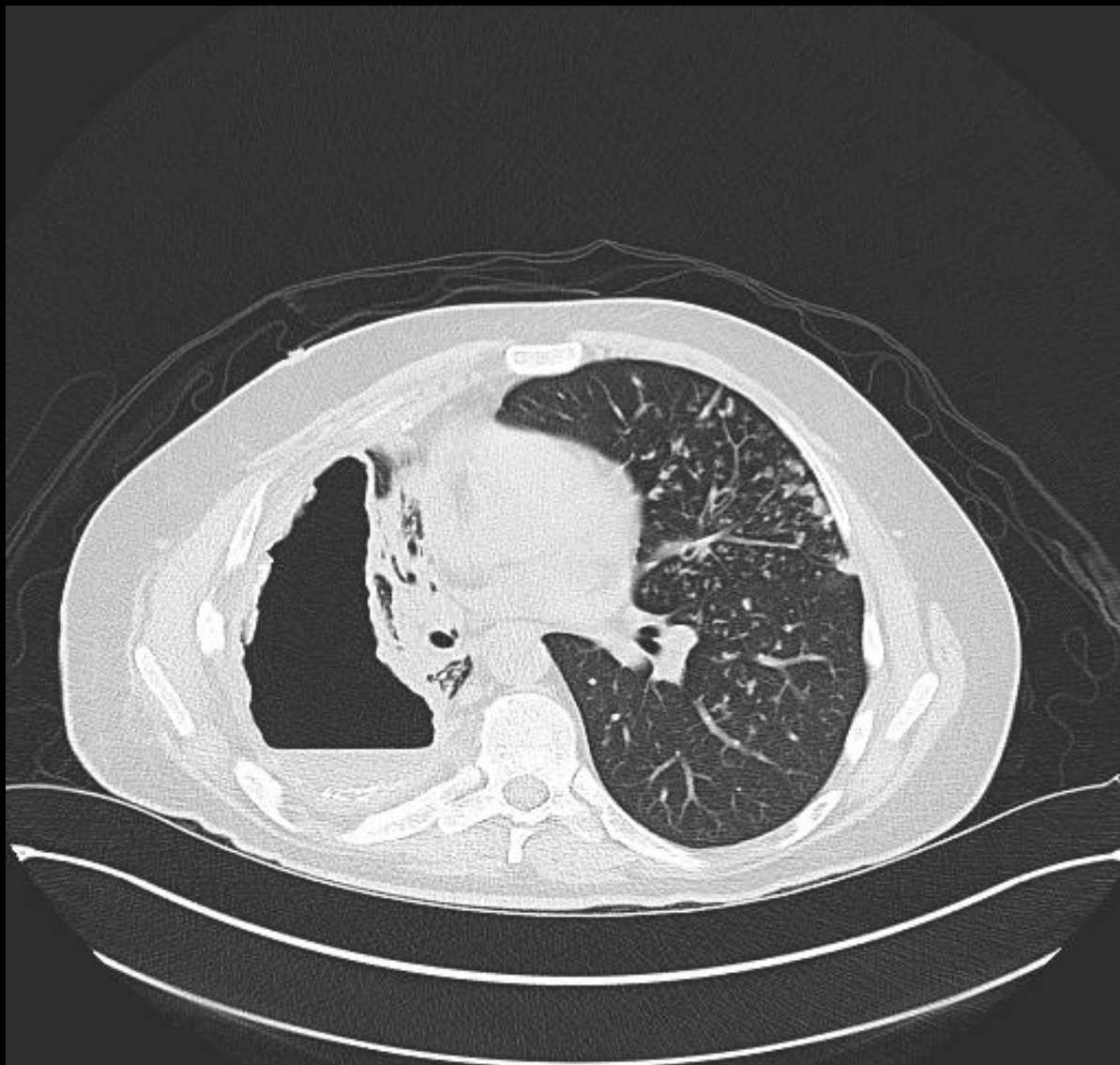


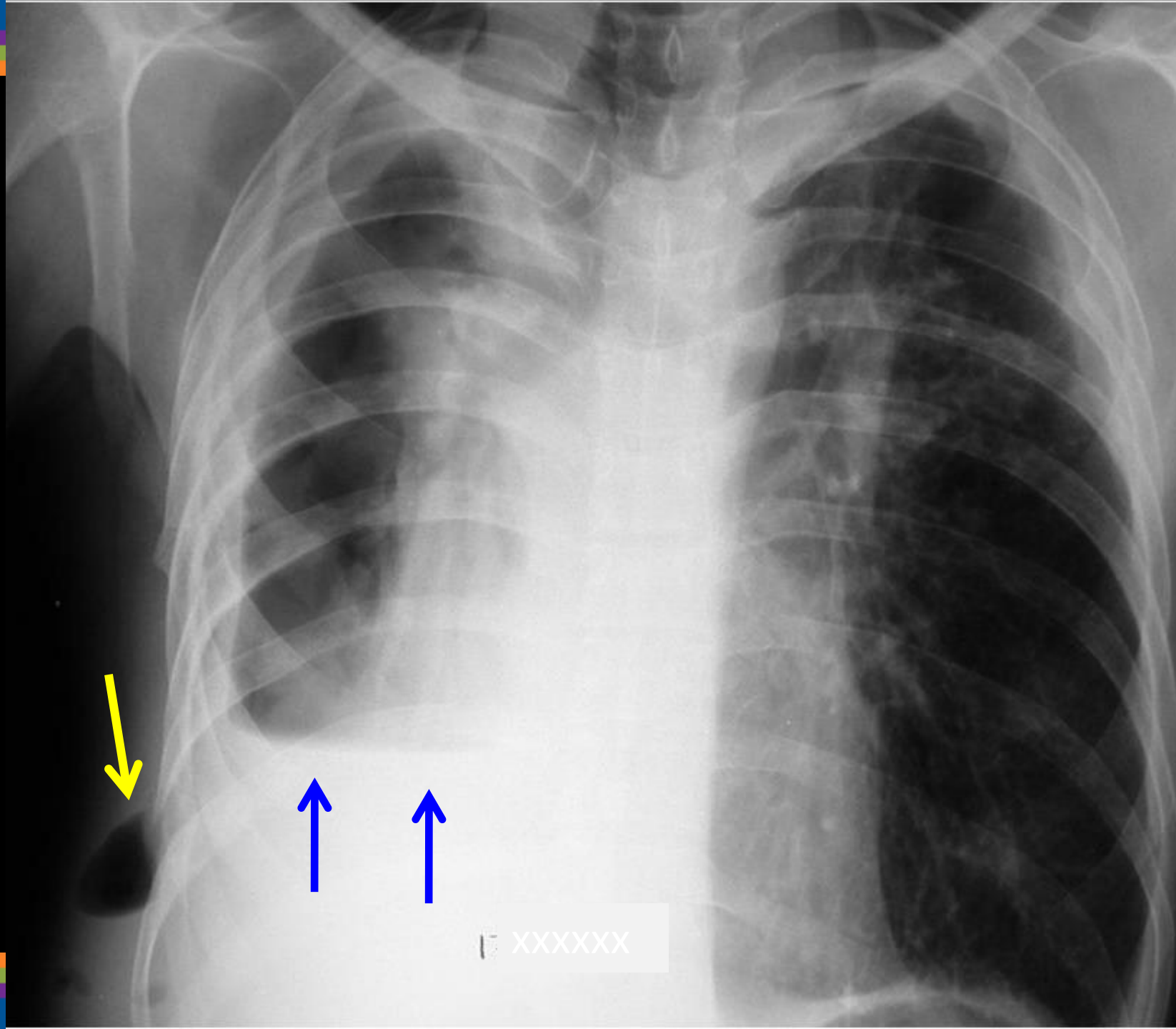
Pleural Effusions

- Post primary TB (20%)
- Caused by rupture of a tuberculous cavity into the pleural space, causing empyema
- May cause bronchopleural fistula with air fluid levels
- Often results in irreversible pleural thickening and calcification









Tuberculosis and Immunocompromised Persons

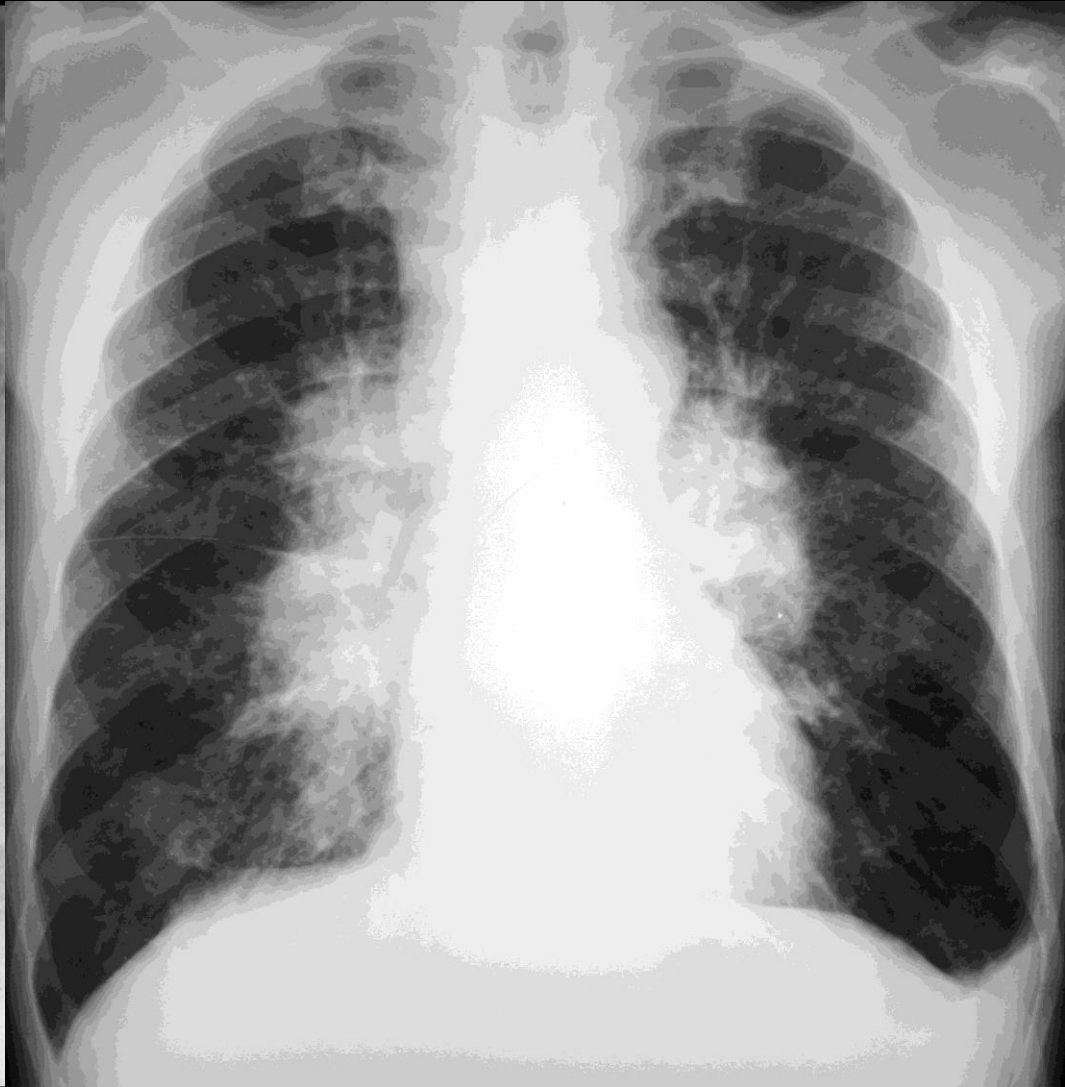
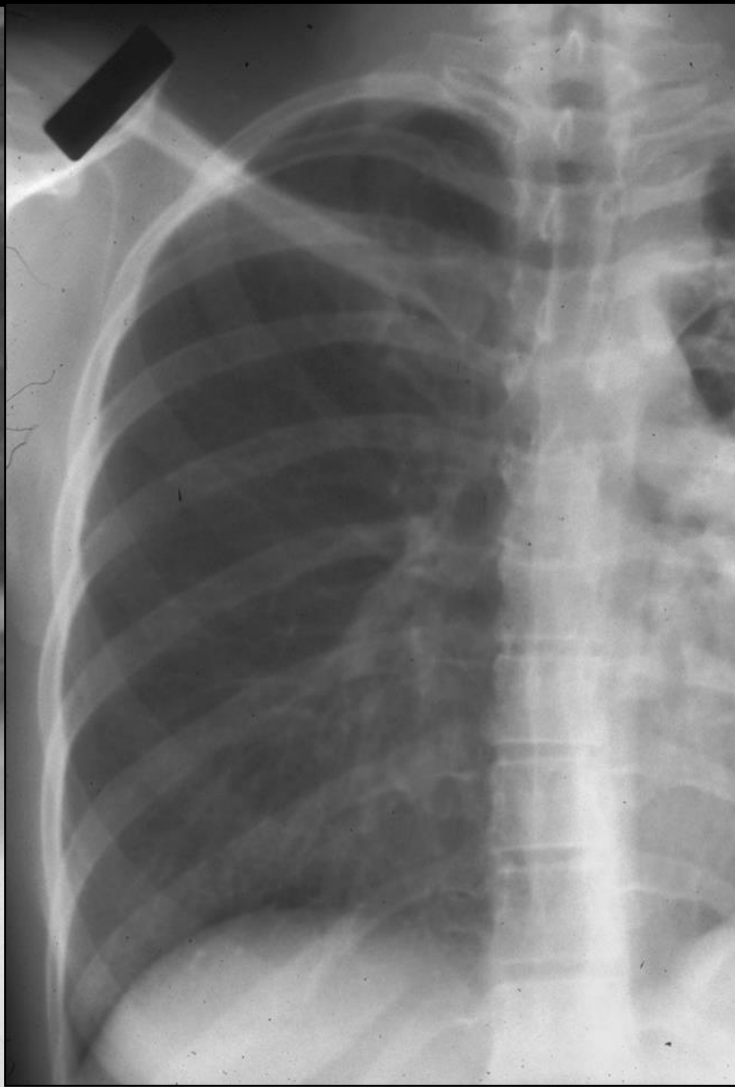
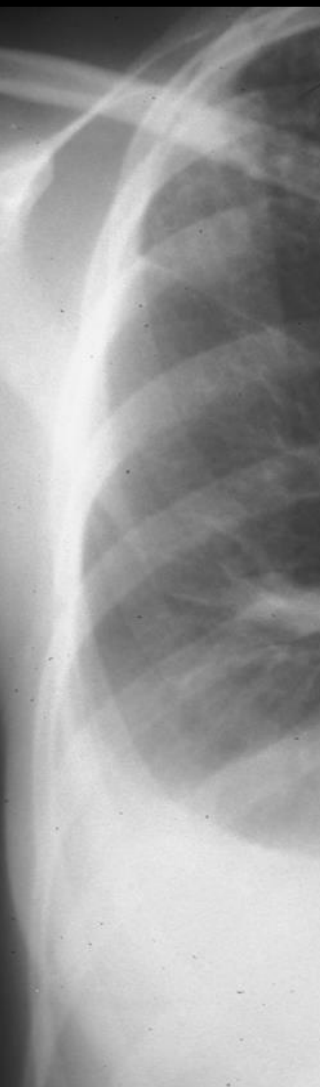
- Higher prevalence of extra-pulmonary involvement
- 38% of immunocompromised patients with TB have pulmonary involvement only, but up to 30% have only extrapulmonary involvement
- May have a normal chest radiograph due to limited immune response



Tuberculosis and HIV

Any combination of the previously mentioned patterns!





Questions ?

