

AMSER Case of the Month: May 2025

Tuberculosis

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Patient Presentation

- 35 y/o male with PMHx of Crohn's disease s/p ileocecal resection and appendicitis.
- Presents with 3 months of cough productive of green non-bloody sputum, SOB, pleuritic right sided flank pain, night sweats, and unintentional weight loss of 8kg.
 - Occasional emesis induced by hard coughing.
- Denies fevers, chills, nausea, abnormal bowel movements, and urinary symptoms.
- History of tuberculosis and smoking.

Pertinent Labs

- WBC: 11.2
 - Hgb: 12.6
 - Hct: 38
 - PLT: 493
 - Neutrophils: 82
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- Quantiferon TB Gold: **Positive**
 - Acid Fast Stain: Many acid fast bacilli found on smear
 - Mycobacterium tuberculosis complex found on culture

What Imaging Should We Order?

ACR Appropriateness Criteria

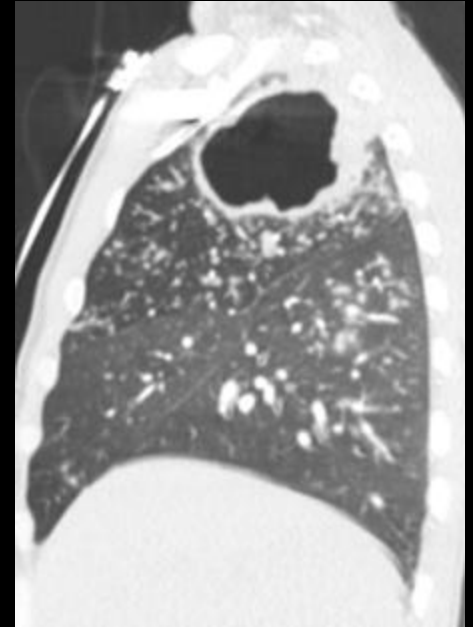
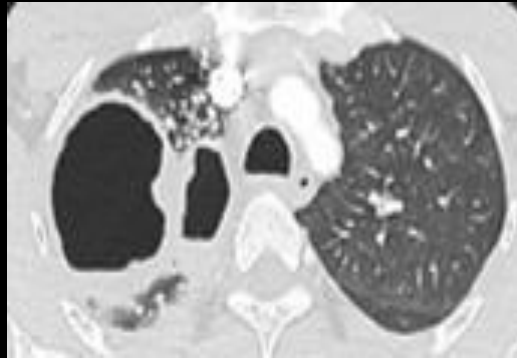
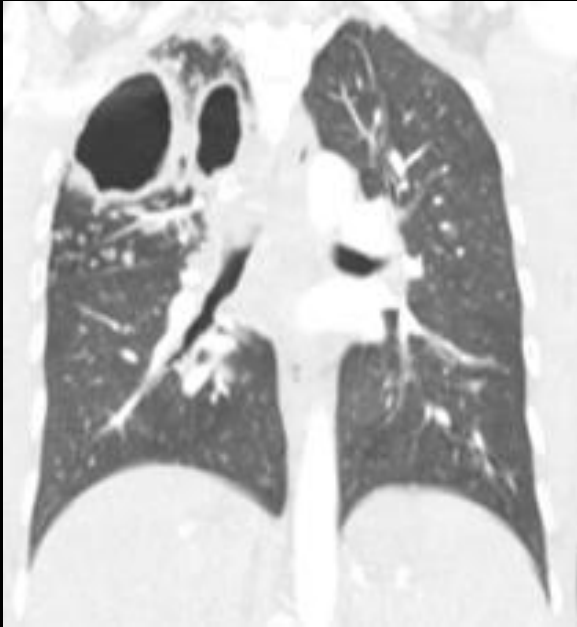
American College of Radiology ACR Appropriateness Criteria® Imaging of Possible Tuberculosis

Variant 1: Suspect active tuberculosis.

Radiologic Procedure	Rating	Comments	RRL*
X-ray chest	9		☼
CT chest without IV contrast	7	This procedure is recommended if x-ray is equivocal.	☼ ☼ ☼
CT chest with IV contrast	6		☼ ☼ ☼
CT chest without and with IV contrast	3		☼ ☼ ☼
MRI chest without IV contrast	3		O
MRI chest without and with IV contrast	3		O
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

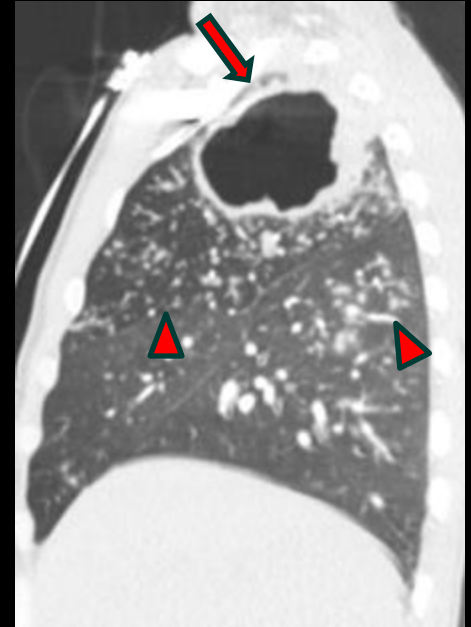
This imaging modality was ordered by the physician

Findings: Unlabeled

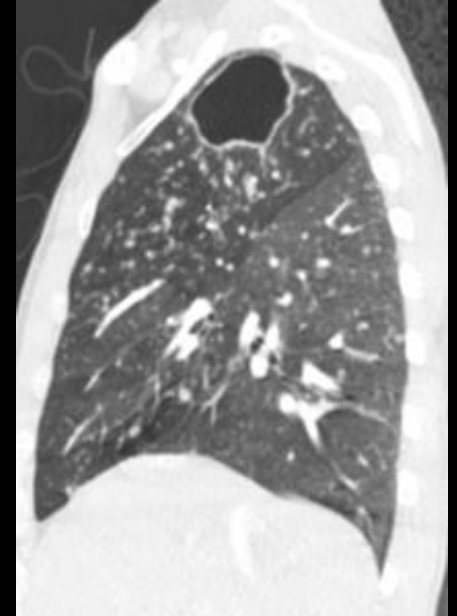
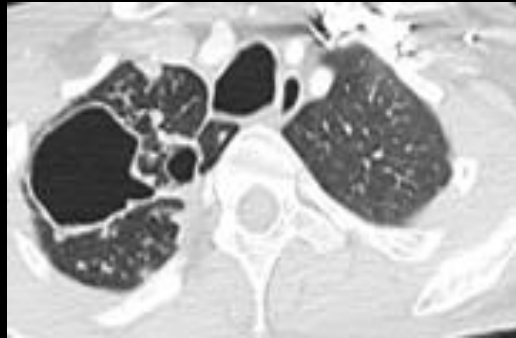


Findings: Labeled

Large thick walled cavitary consolidation (arrow) in the right upper lobe. Associated centrilobular nodules and tree-in-bud opacities (arrowhead)



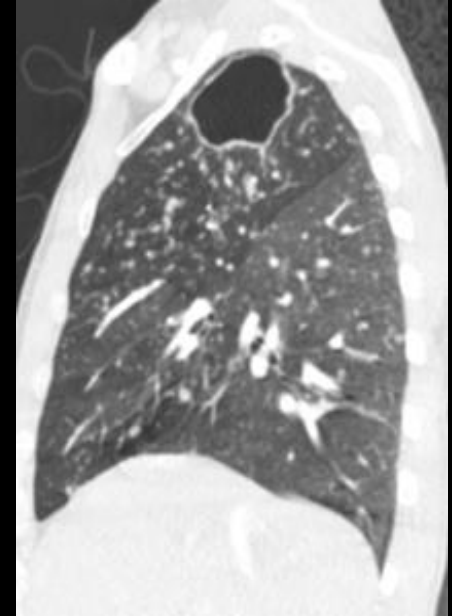
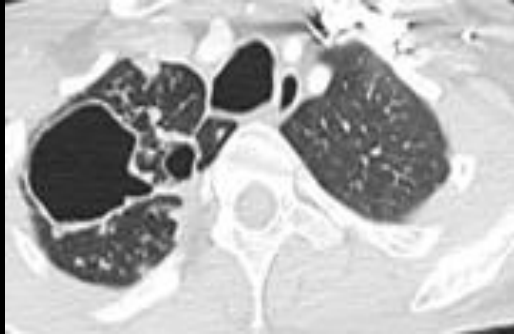
Post-Treatment Findings: Unlabeled



Post-Treatment Findings: Labeled



Decreased wall thickness and size of the Right upper lobe cavitory consolidation with improvement of centrilobular and tree-in-bud nodules in right lung.



Final Dx:

Active Tuberculosis

Case Discussion

- Tuberculosis (TB) is a bacterial infection that predominantly affects the lungs but can manifest in multiple organ systems.
 - Primarily caused by *Mycobacterium tuberculosis*, a slow growing, acid fast, aerobic bacillus
- Epidemiology:
 - An estimated 10.8 million people worldwide were infected with TB in 2023
 - 6 million were men, 3.6 million were women, 1.3 million were children
 - 1.25 million people died from TB, including 161,000 people who were HIV+
 - TB is the leading cause of death in people with HIV

Case Discussion

- Clinical presentation:
 - Chronic cough
 - Productive with blood or sputum
 - Chest pain
 - Night sweats
 - Weight loss
 - Fever
 - Fatigue

Case Discussion

- Imaging:
 - Chest radiograph with clinical evaluation has high sensitivity for diagnosis.
 - Consolidation with cavitation , micronodular pattern, pleural effusions and lymphadenopathy can be seen
 - CT has increased specificity, distinctly shows cavitation or endobronchial spread, and is useful when chest radiograph is inconclusive, especially in immunocompromised patients.
 - Consolidation with cavitation (latter seen in 10-30% patients with primary TB), centrilobular nodules with tree-in-bud opacities s/o endobronchial spread, necrotic and rim enhancing lymphadenopathy, and pleural effusions (30-40% adult cases)
 - Miliary nodules suggestive of hematogenous dissemination , carries poor prognosis
- Treatment:
 - RIPE: rifampin, isoniazid, pyrazinamide, ethambutol
 - Taken daily for 4-6 months

References:

- Natarajan A, Beena PM, Devnikar AV, Mali S. A systemic review on tuberculosis. Indian J Tuberc. 2020;67(3):295-311. doi:10.1016/j.ijtb.2020.02.005
- Nachiappan AC, Rahbar K, Shi X, et al. Pulmonary Tuberculosis: Role of Radiology in Diagnosis and Management. Radiographics. 2017;37(1):52-72. doi:10.1148/rg.2017160032
- Skoura E, Zumla A, Bomanji J. Imaging in tuberculosis. Int J Infect Dis. 2015;32:87-93. doi:10.1016/j.ijid.2014.12.007
- “Tuberculosis (TB).” World Health Organization, www.who.int/news-room/fact-sheets/detail/tuberculosis. Accessed 26 Mar. 2025.
- ACR Appropriateness Criteria, American College of Radiology, 2016, gravitas.acr.org/ACPortal/GetDataForOneTopic?topicId=234. Accessed 24 Mar. 2025.