AMSER Case of the Month October 2024

44 yo M presenting with right chest and scapular pain

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Patient Presentation

- PMH:
  - 15 pack year smoking history; scoliosis
- HPI
  - Well until 4 days ago when he noted abrupt onset fever, chills, and non-productive cough. One day later had onset of right sided chest, shoulder, and upper back pain.
  - Denies weight loss, hemoptysis. No international travel, incarceration, homelessness, IVDU, recent surgery, or trauma.
- Vitals
  - BP 127/84 | HR 105 | RR 20 | SpO2 99% on room air | Temp 37 C
- Labs
  - WBC: 10.2, Hgb: 14, Platelets: 283

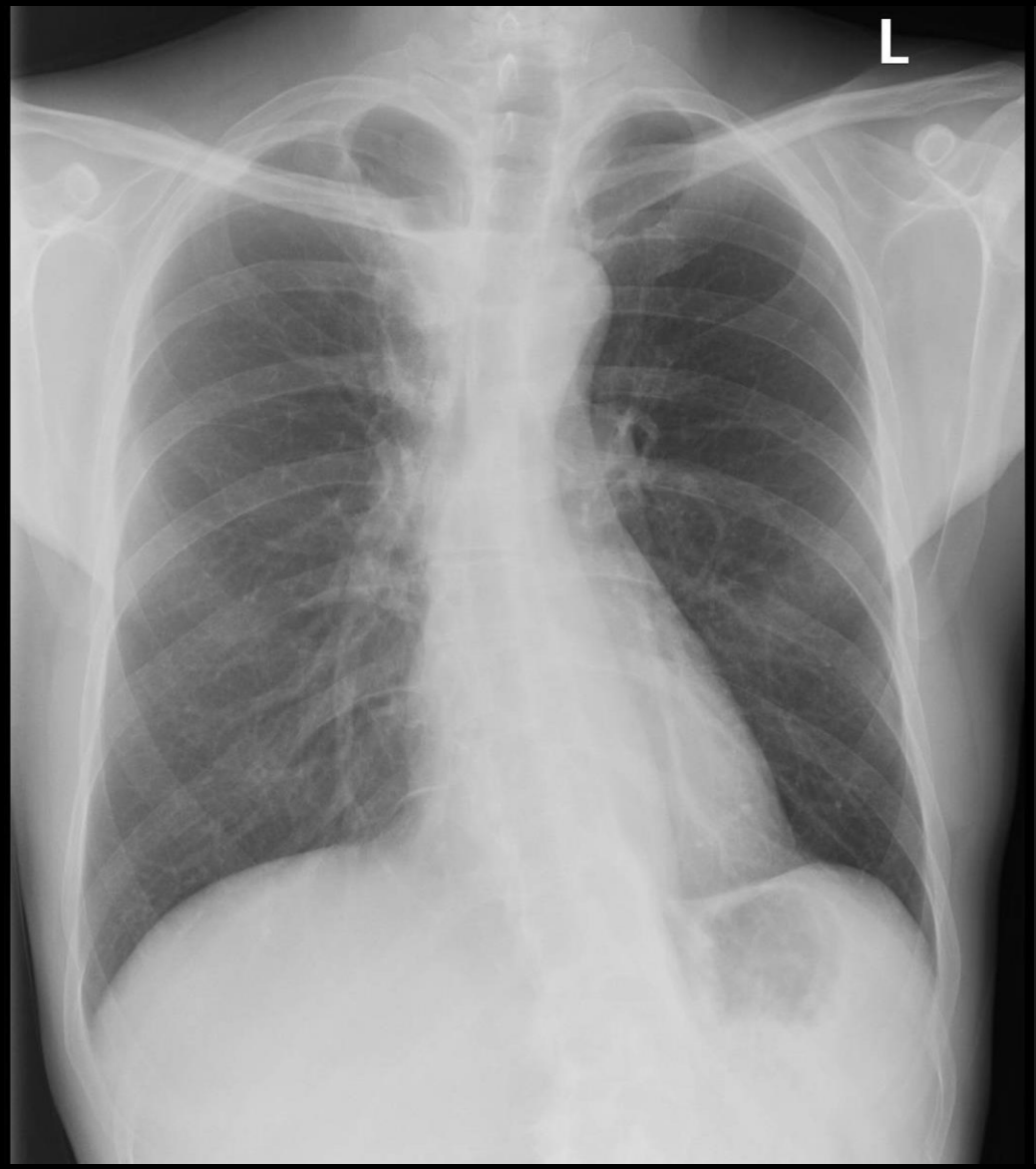
What Imaging Should We Order?

ACR Appropriateness Criteria

Variant 1: **Nontraumatic chest wall pain. No history of malignancy. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
Radiography chest	Usually Appropriate	☢
US chest	May Be Appropriate	O
Radiography rib views	May Be Appropriate	☢☢☢
MRI chest without and with IV contrast	Usually Not Appropriate	O
MRI chest without IV contrast	Usually Not Appropriate	O
Bone scan whole body	Usually Not Appropriate	☢☢☢
CT chest with IV contrast	Usually Not Appropriate	☢☢☢
CT chest without and with IV contrast	Usually Not Appropriate	☢☢☢
CT chest without IV contrast	Usually Not Appropriate	☢☢☢
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	☢☢☢☢
WBC scan chest	Usually Not Appropriate	☢☢☢☢

Findings: (unlabeled)



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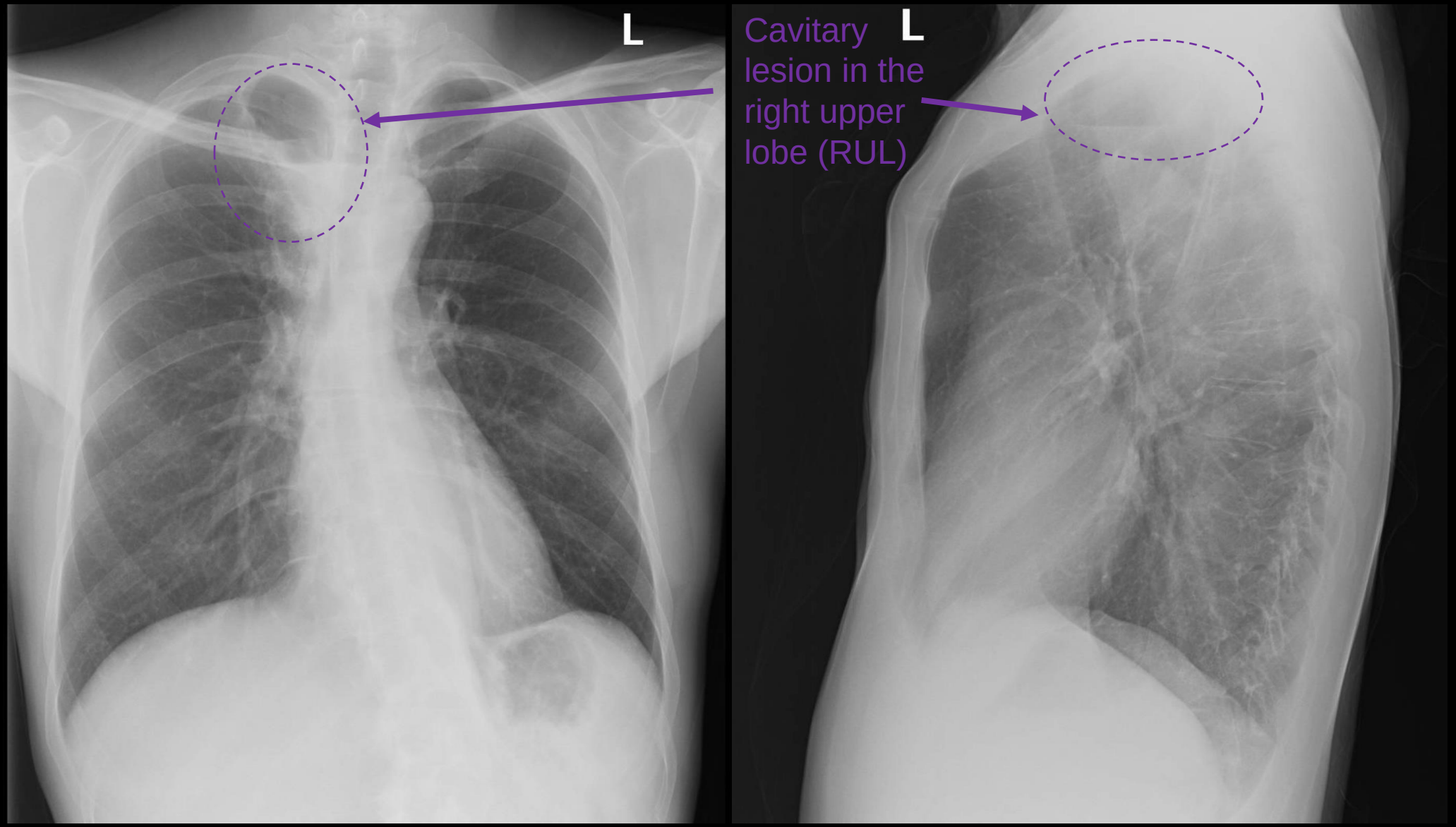


Provisional Dx:

Large thin-walled cavitary lesion

What Additional Imaging Should We Order?

ACR Appropriateness Criteria

Imaging of Possible Tuberculosis

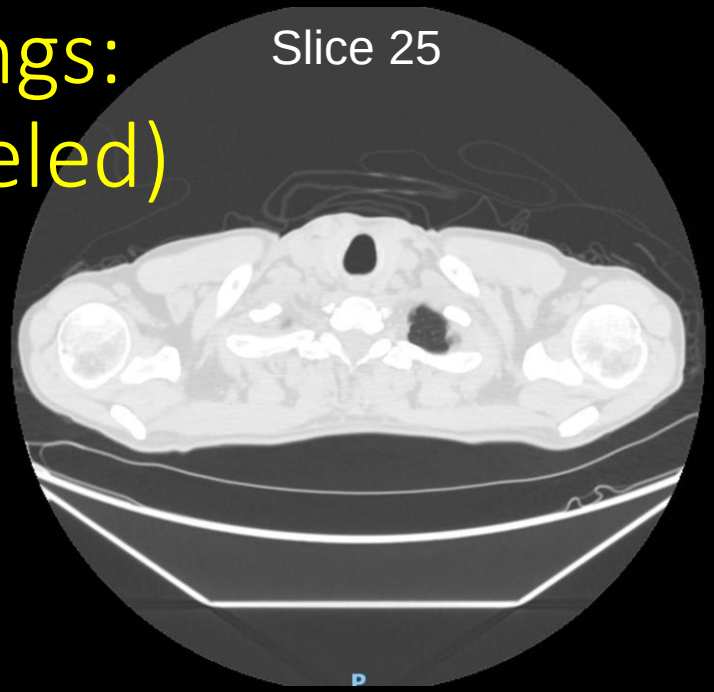
Variant 1: **Suspect active tuberculosis.**

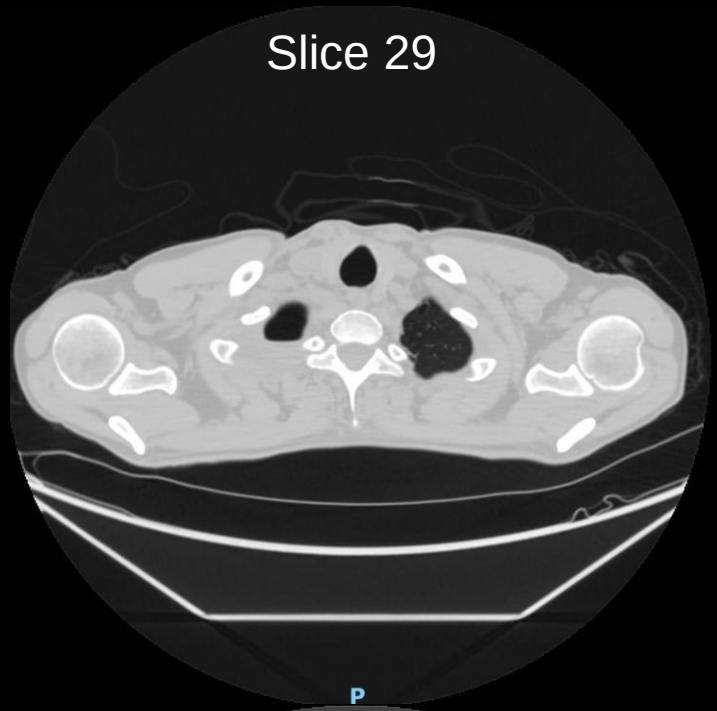
Radiologic Procedure	Rating	Comments	RRL*
X-ray chest	9		☢
CT chest without IV contrast	7	This procedure is recommended if x-ray is equivocal.	☢ ☢ ☢
CT chest with IV contrast	6		☢ ☢ ☢
CT chest without and with IV contrast	3		☢ ☢ ☢
MRI chest without IV contrast	3		O
MRI chest without and with IV contrast	3		O

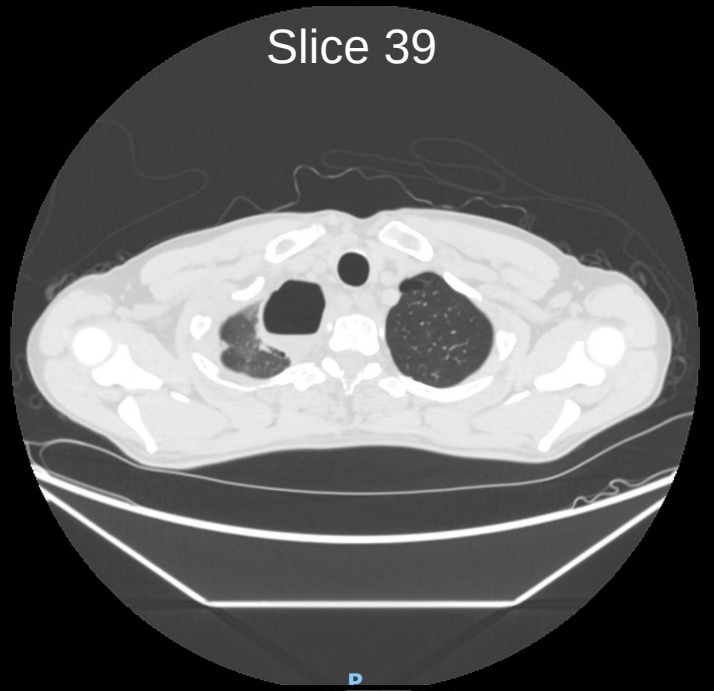
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

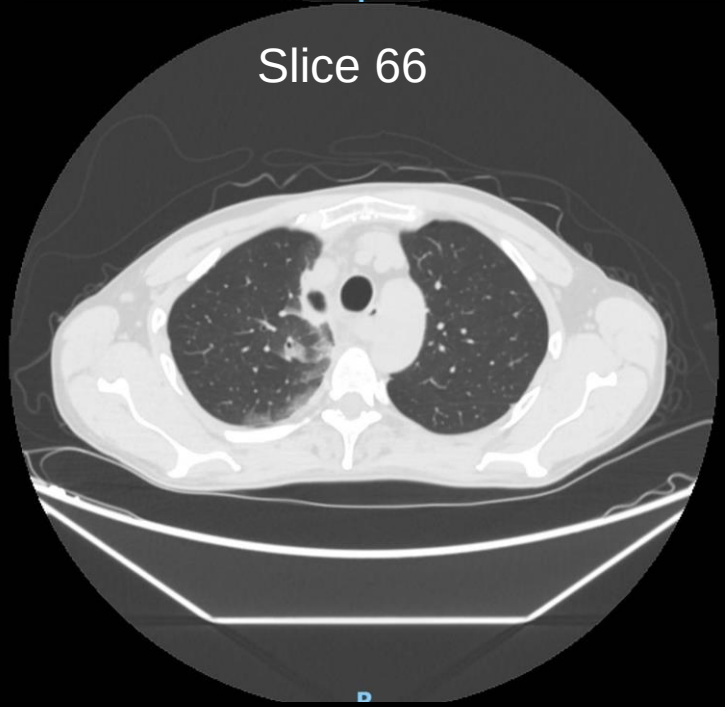
*Relative Radiation Level

Findings: (unlabeled)









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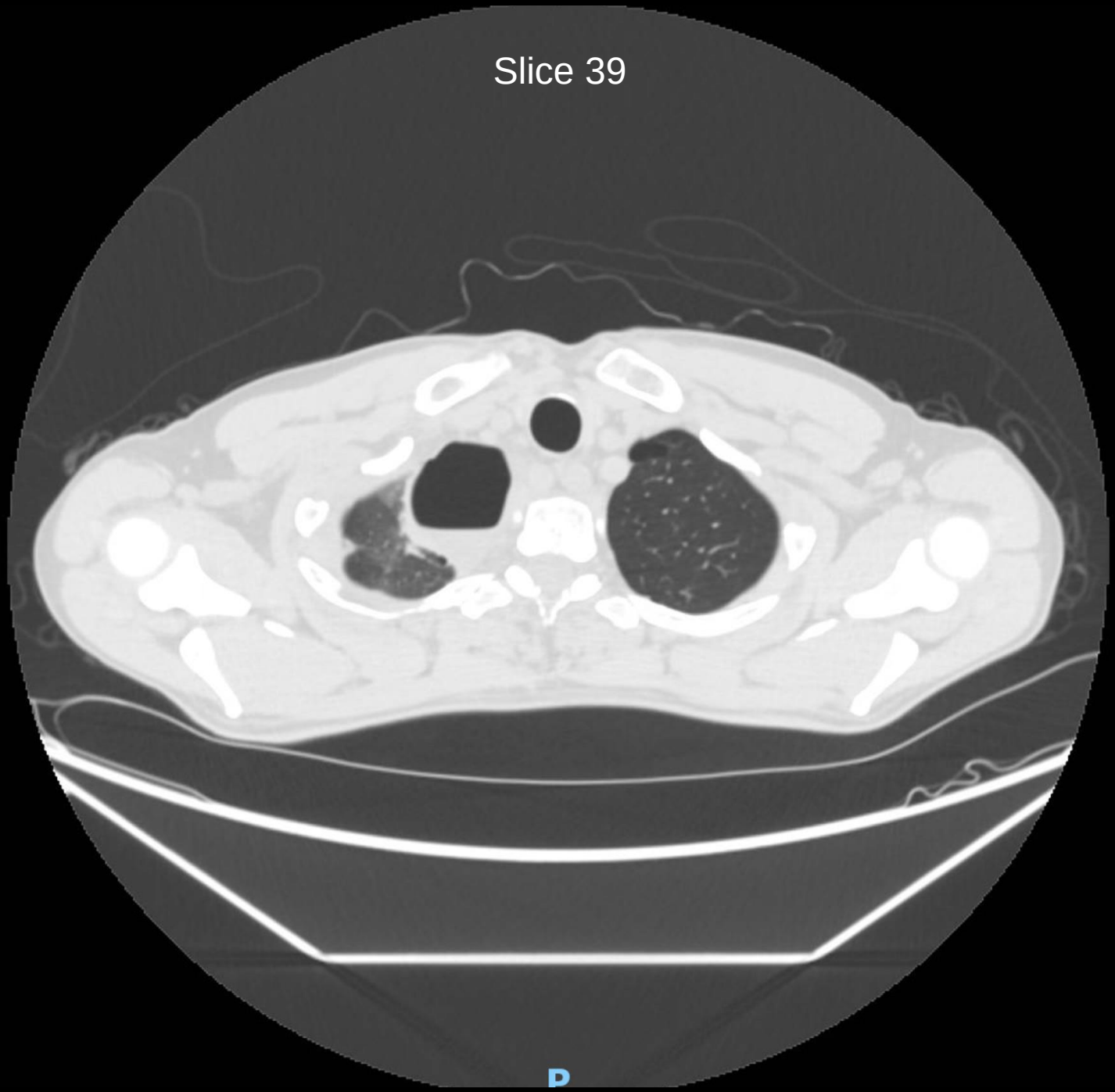

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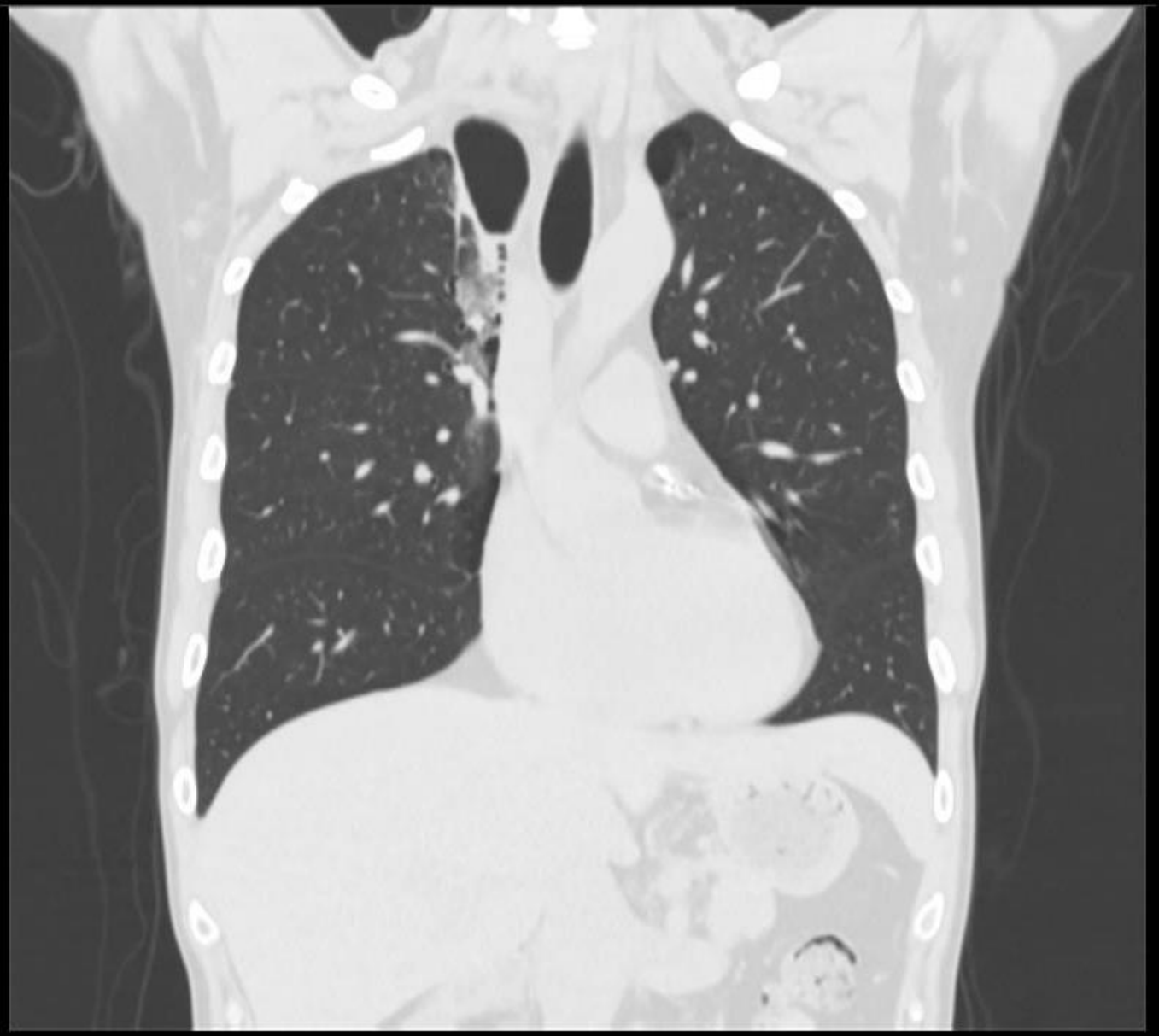

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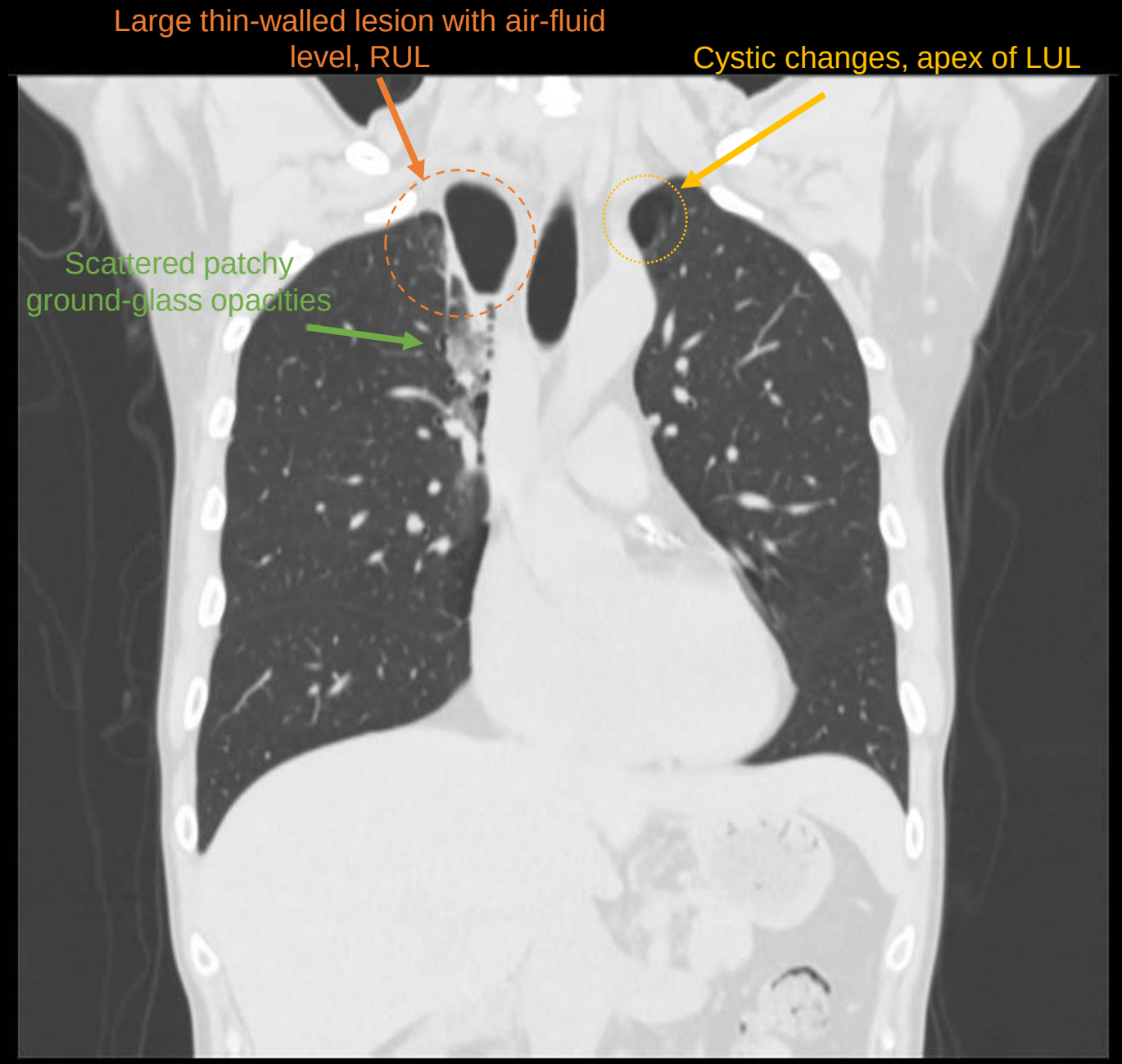

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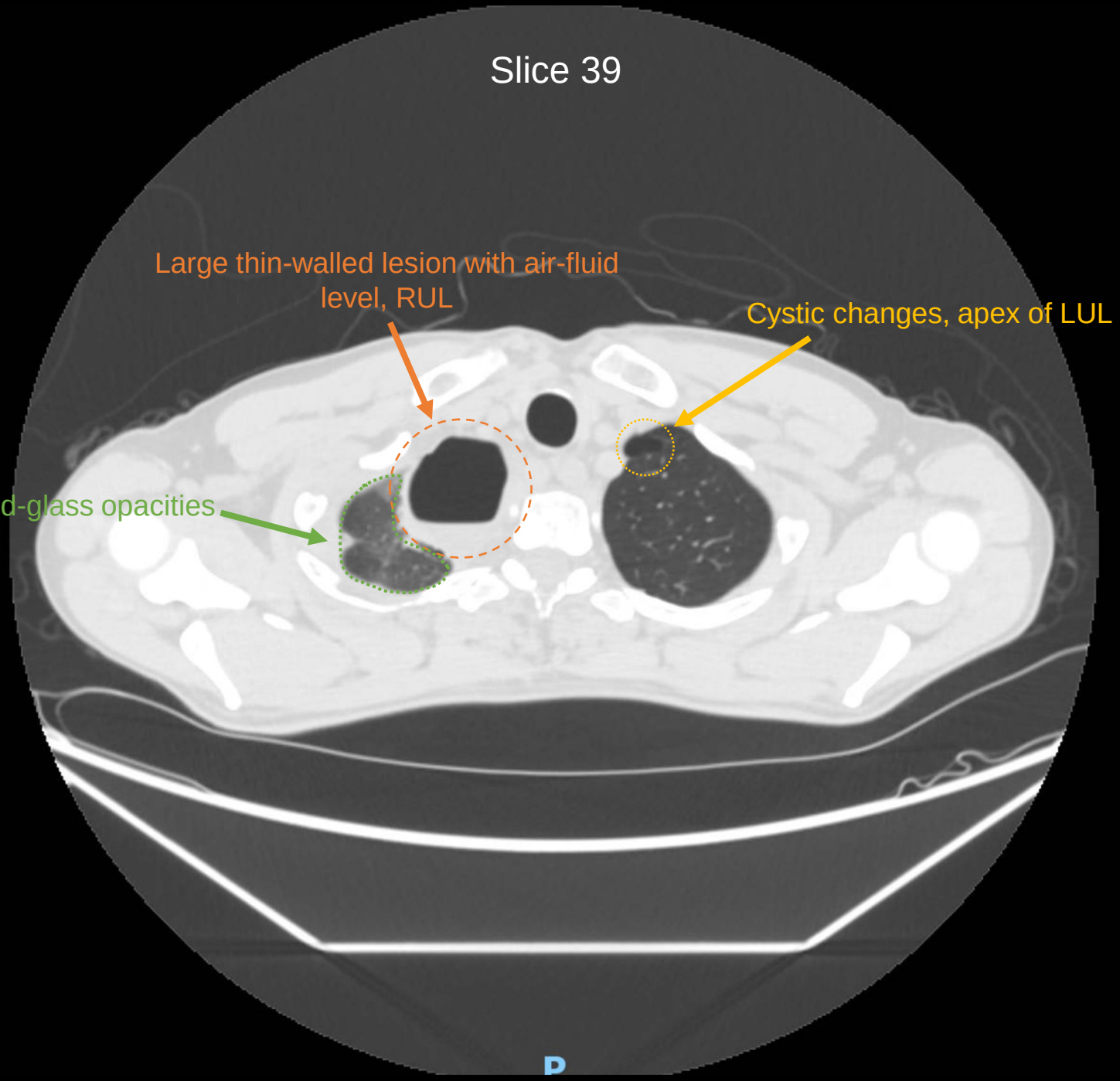

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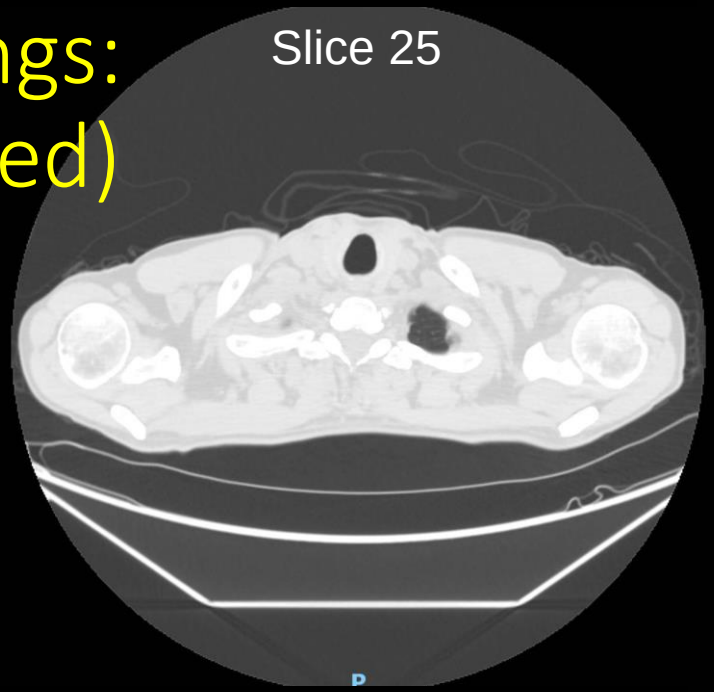

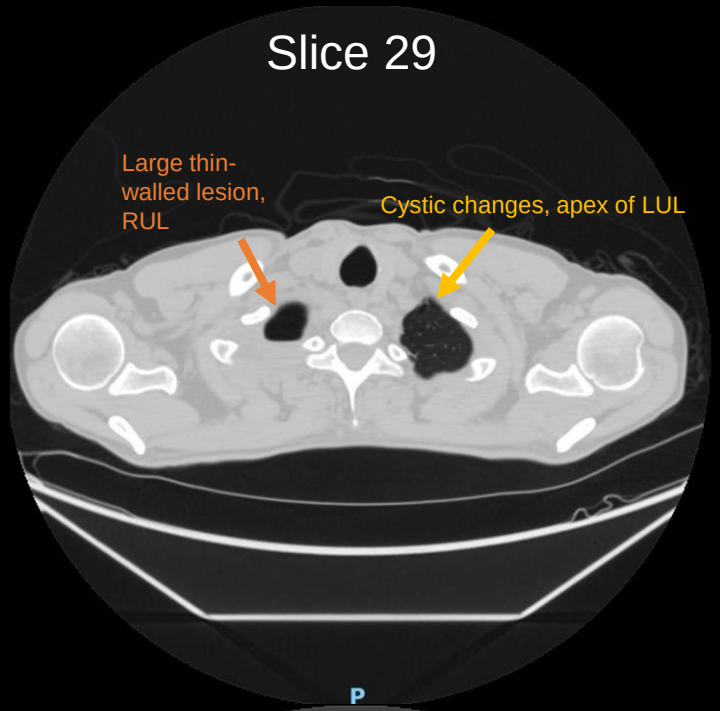

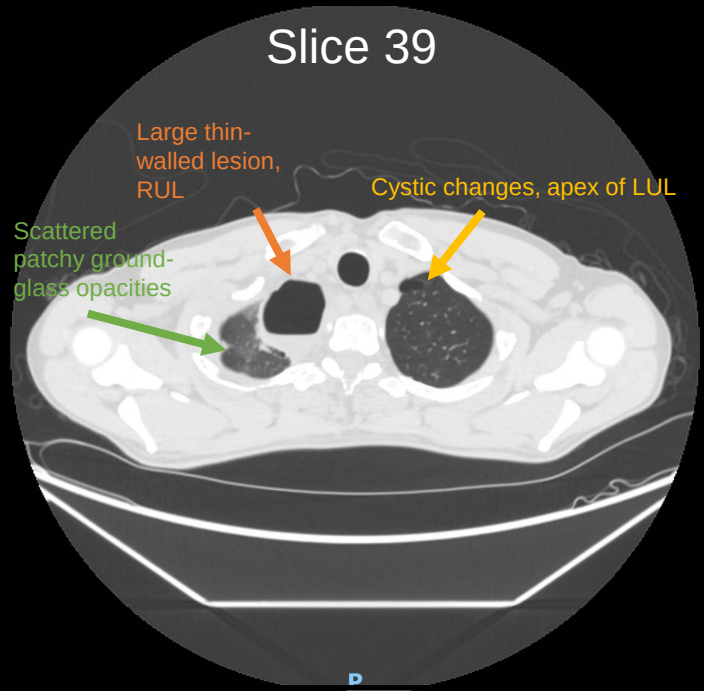

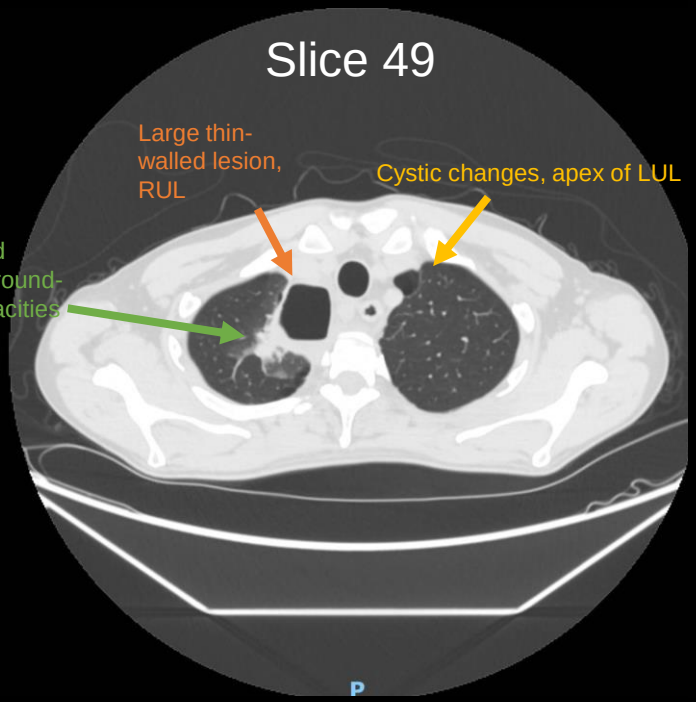

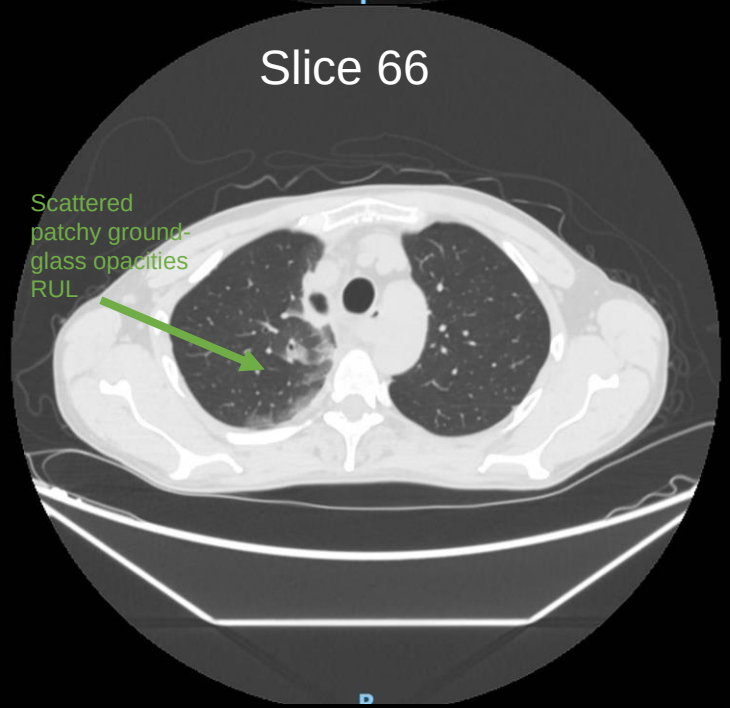

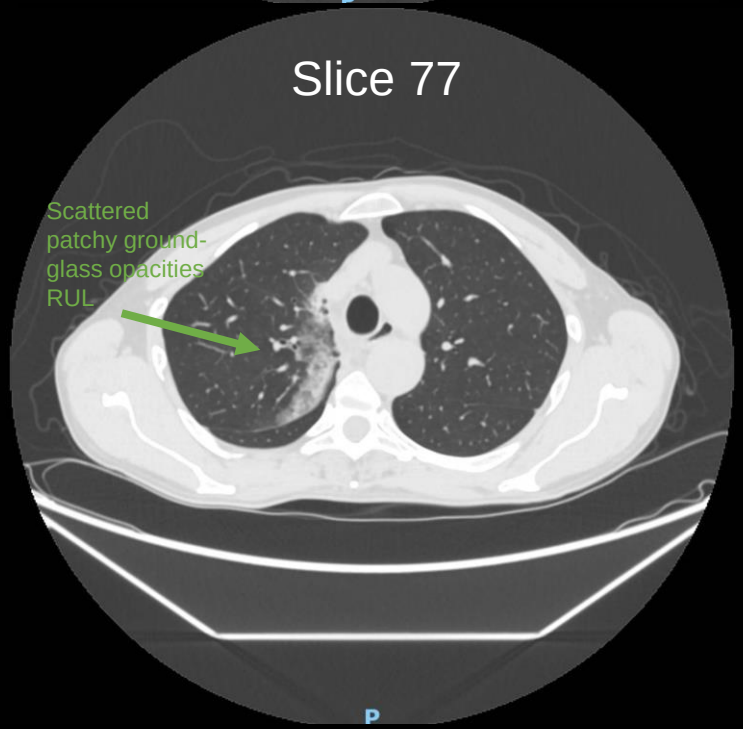

Final Dx:

S. aureus necrotizing pneumonia with cavitary lesion

Case Discussion

- 44 yo M with 15 pack year smoking history presents with chest pain, found to have large cavitary lesion on CXR
- Acute infectious symptoms (fever, cough) with CXR demonstrating cavitary lesion raises concern for active TB → further evaluation with CT + TB rule out (AFB + NAAT on sputum culture)
- CT demonstrated RUL/R mediastinal thin-walled lesion with air fluid level and cystic changes of left lung
- Subsequent sputum culture & BAL revealed methicillin-sensitive *Staphylococcus aureus* (MSSA)

Case Discussion

- DDx Discussion:
  - Less typical presentation for a cavitary lung nodule given proximity to mediastinum/apex of lung with cystic changes, however…
  - → *MSSA* on BAL with prior imaging findings makes necrotizing pneumonia with cavitary lesion *most likely*.

  - Cavitary lesion differential diagnosis includes:
    - Infectious - tuberculosis, fungal infection (*Aspergillus*), septic embolus
    - Malignancy - bronchogenic carcinoma, squamous cell carcinoma (SCC)
    - Systemic diseases - Interstitial (pulmonary Langerhans cell histiocytosis, granulomatosis with polyangiitis, rheumatic nodules) or congenital cystic lung disease (alpha-1 antitrypsin deficiency)
      - Less likely without prior rheumatologic history and lack of diffuse cystic changes in multiple lobes
    - Smoking related bullous emphysema with superimposed infection

References:

- American College of Radiology. ACR Appropriateness Criteria®. Available at https://www.acr.org/Clinical-Resources/ACR-Appropriateness-Criteria. Accessed March 18, 2024.
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