AMSER Case of the Month November 2023

63-year-old male presents to clinic with chronic cough, shortness of breath, and decreased endurance

Courtney J. Burns, MS4
University of Michigan

Elizabeth Lee, MD
University of Michigan

Patient Presentation

- 63-year-old male with a past medical history of hypertension, cervical spine spontaneous epidural hematoma, and H1N1 viral pneumonia complicated by sepsis, ARDS requiring 8 weeks of mechanical ventilation, and critical illness neuropathy
- Presented to ICU follow-up clinic 8 months after hospital discharge with chronic cough, shortness of breath, and decreased endurance
- Vitals: BP 123/75, HR 90, SpO2 96% on RA, Temp 96.6F
- Physical exam: Lungs clear to auscultation bilaterally

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Scenario	Scenario Id	Procedure	Adult RRL	Peds RRL	Appropriateness Category	
Diffuse lung disease, no acute clinical deterioration, routine follow up imaging	3194244	CT chest without IV contrast	1-10 mSv ☢☢☢	3-10 mSv [ped]..	Usually appropriate	
		Radiography chest	<0.1 mSv ☢	<0.03 mSv [ped]..	May be appropriate	
		CT chest with IV contrast	1-10 mSv ☢☢☢	3-10 mSv [ped]..	May be appropriate	
		MRI chest without IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate	
		MRI chest without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate	
		CT chest without and with IV contrast	1-10 mSv ☢☢☢	3-10 mSv [ped]..	Usually not appropriate	
		FDG-PET/CT skull base to mid-thigh	10-30 mSv ☢☢☢☢	3-10 mSv [ped]..	Usually not appropriate	

This imaging modality was ordered by the intensivist

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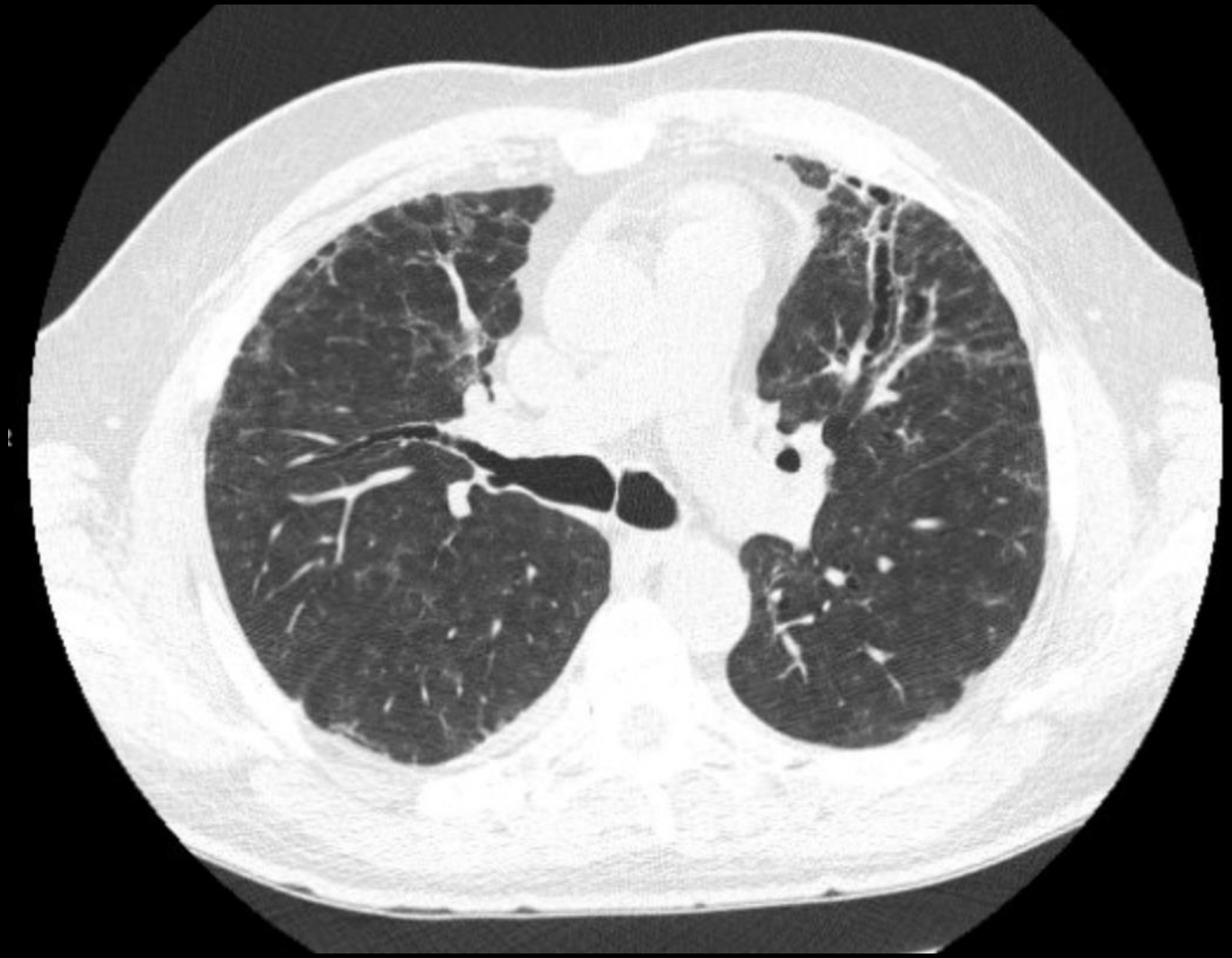
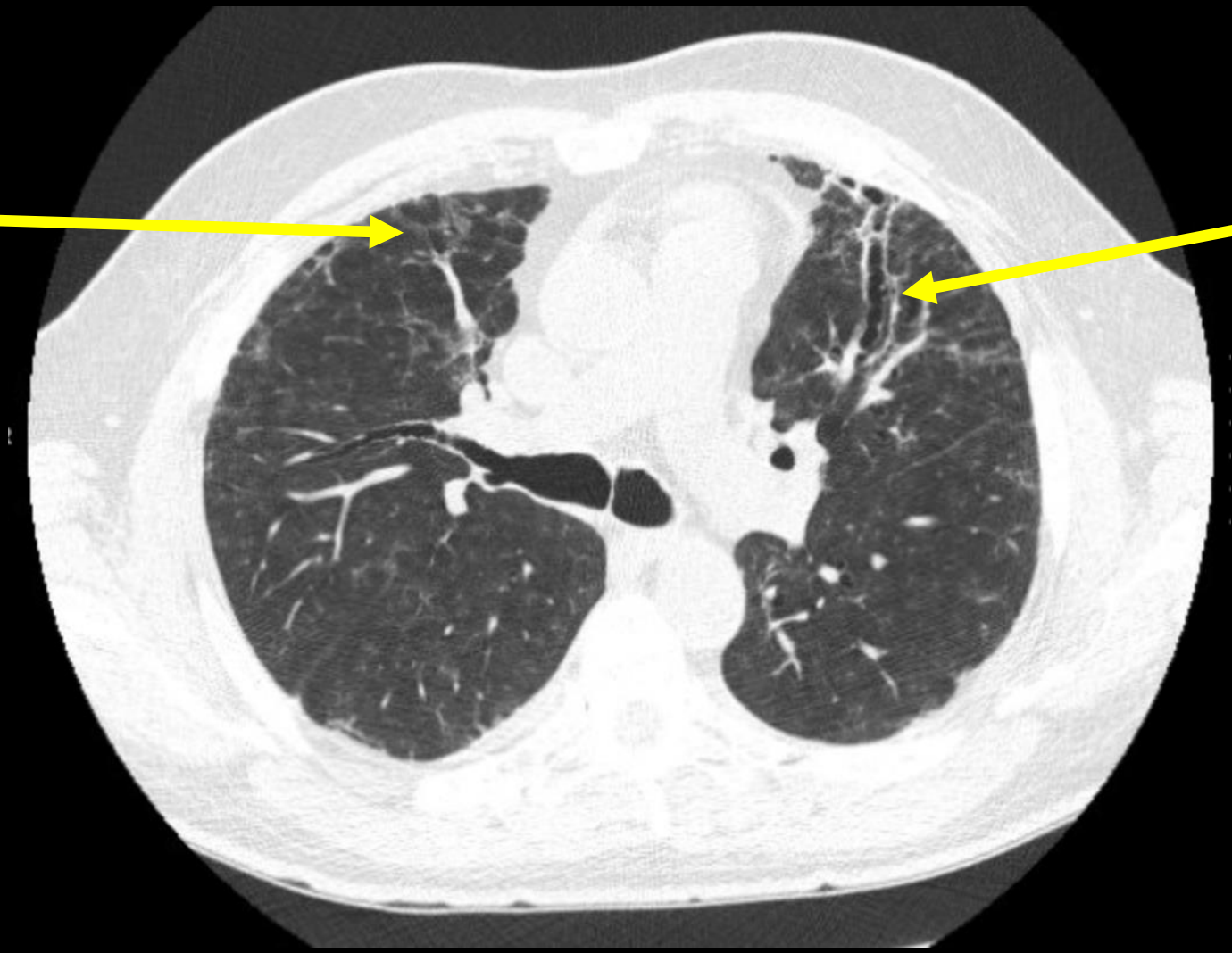
Findings (unlabeled)



Findings (labeled)



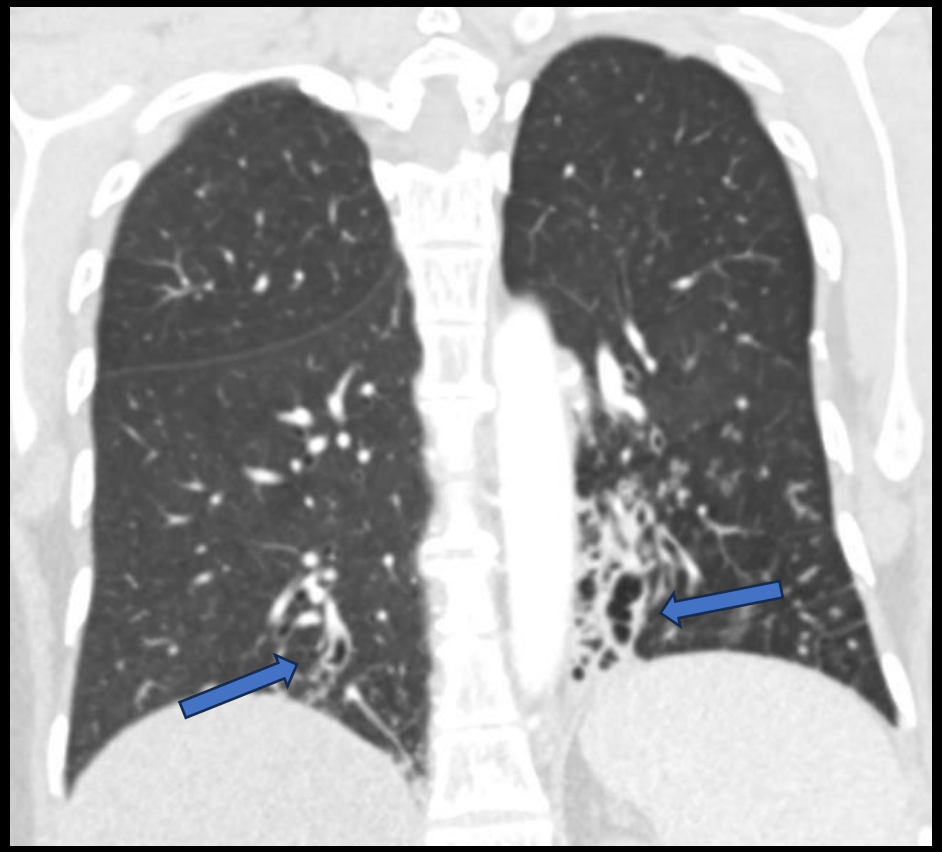
Notice the anterior distribution of findings

Final Dx:

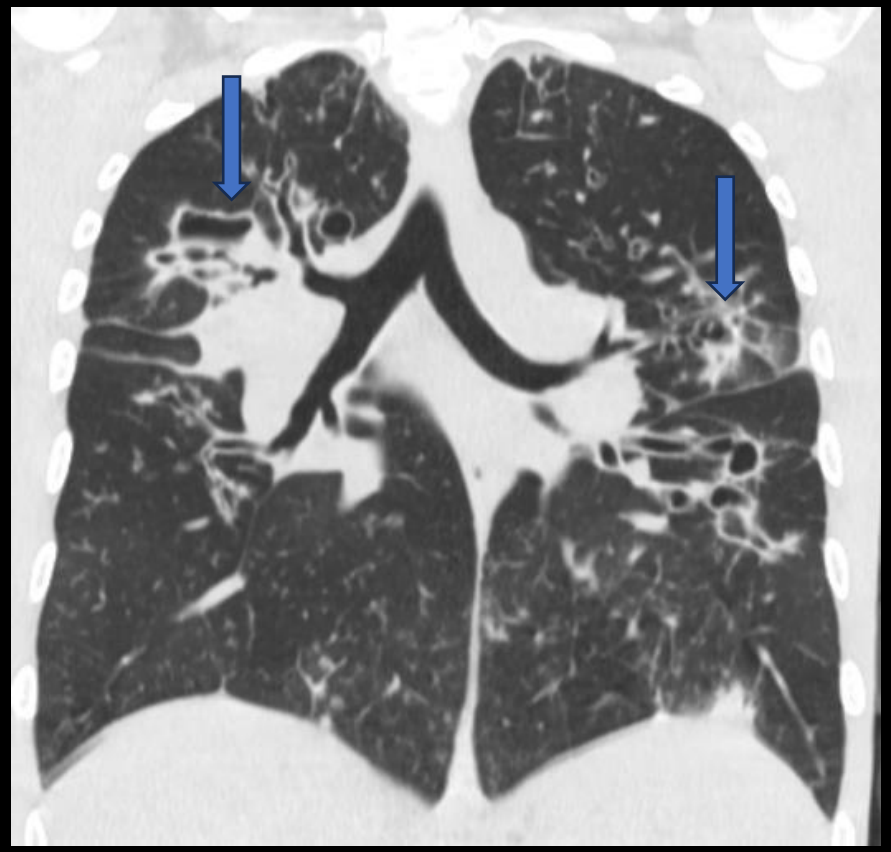
Mechanical Ventilation-Associated Pulmonary Fibrosis in ARDS

Case Discussion

The location and associated lung findings can help identify a cause of bronchiectasis



Lower lung: Ciliary dyskinesia, infection/impaired immunity, aspiration



Upper lung: Cystic Fibrosis, Sarcoidosis, Allergic pulmonary aspergillosis

Anterior with tree in bud: Mycobacterial infection

Case Discussion

- Pulmonary fibrosis/bronchiectasis due to ARDS
  - 3 phases of ARDS: Acute (exudative) → Intermediate (Proliferative) → Late (Fibrotic)
  - In mechanical ventilation, alveoli are recruited along craniocaudal and ventrodorsal axes
    - The ventral and cranial areas often experiencing overdistension/barotrauma leading to anterior predominance of fibrosis

Progression of patient's radiographs from the acute phase (A) to intermediate (B) and late (C) phases over an 8 month period.

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References

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