POCUS Conference

Samuel Freedman

Dr. Todd Cutler

Case

- Patient is an 83-year-old male with chronic lymphocytic leukemia (not currently on treatment) and recurrent aspiration pneumonia over the past two years presenting with fever, cough, and weakness
- Over the past two years, he has had over 6 episodes of aspiration pneumonia—most recently hospitalized about 6 months ago.

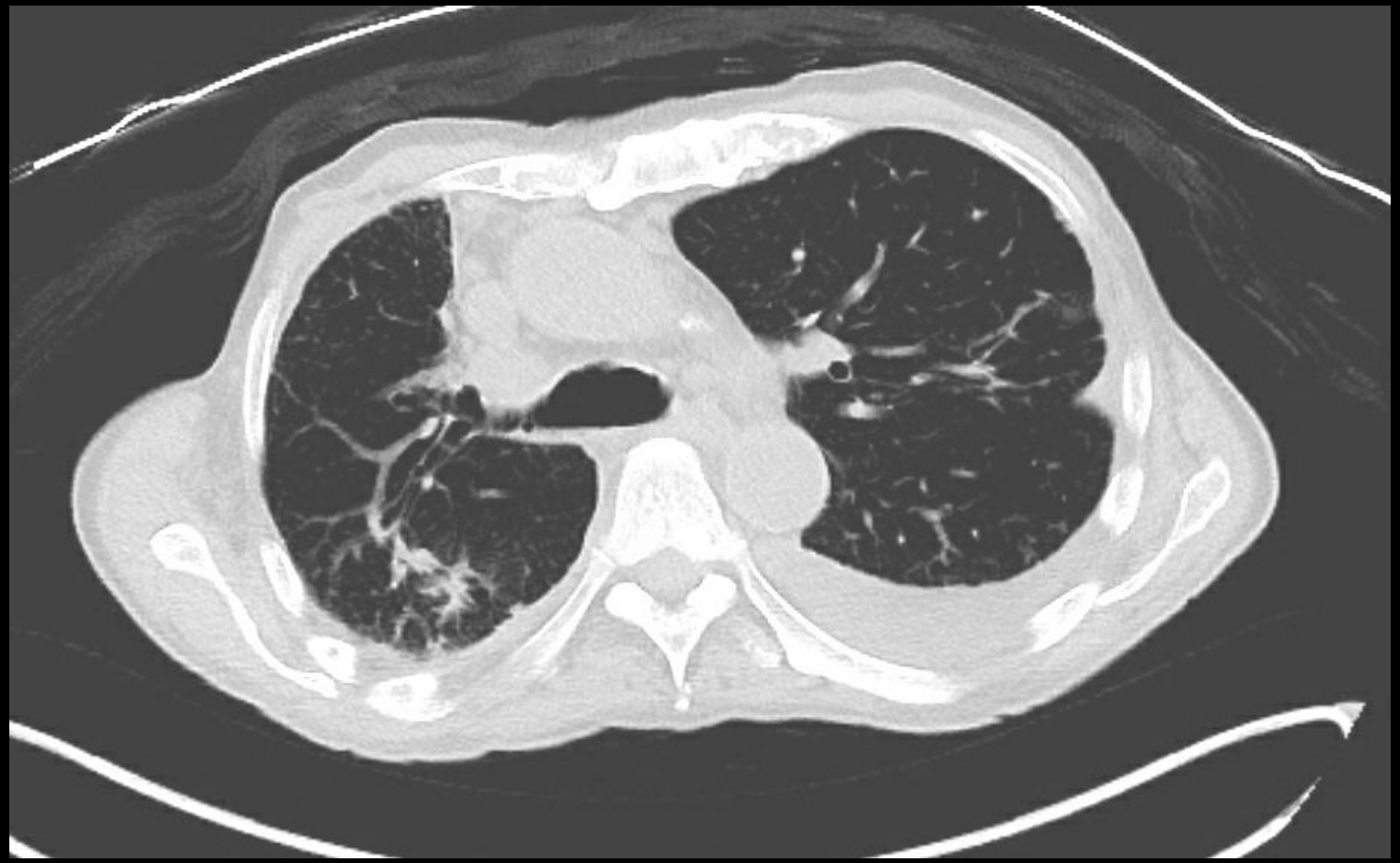
Case

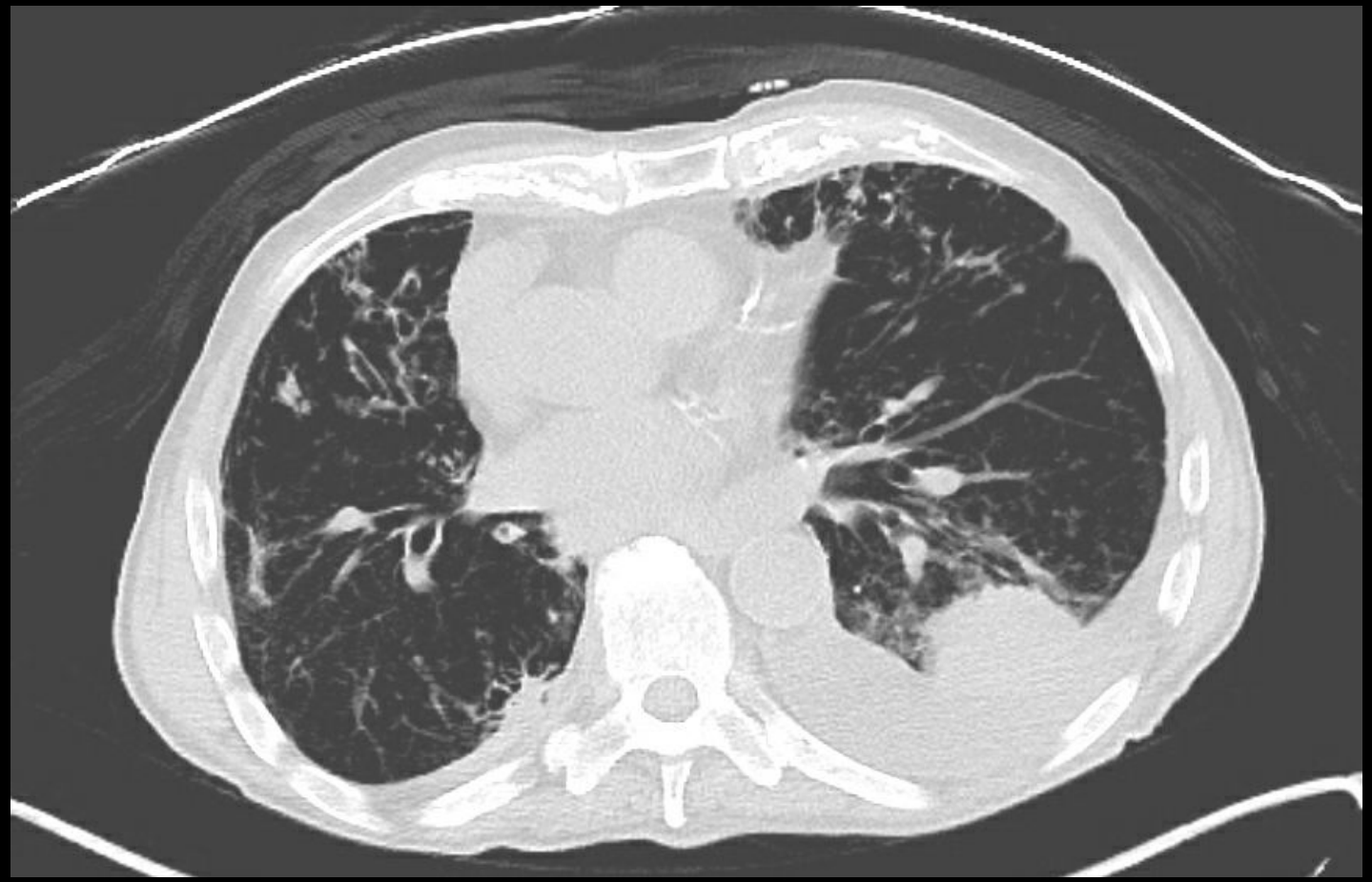
- One month prior to presentation, he presented to clinic with weakness, weight loss, and cough
- He was treated with moxifloxacin
- CT chest, abdomen, and pelvis were ordered for workup of CLL/concern for transformation
- Non-contrast CT chest showed a left lower lobe consolidation with possible abscess
- Patient was started on moxifloxacin

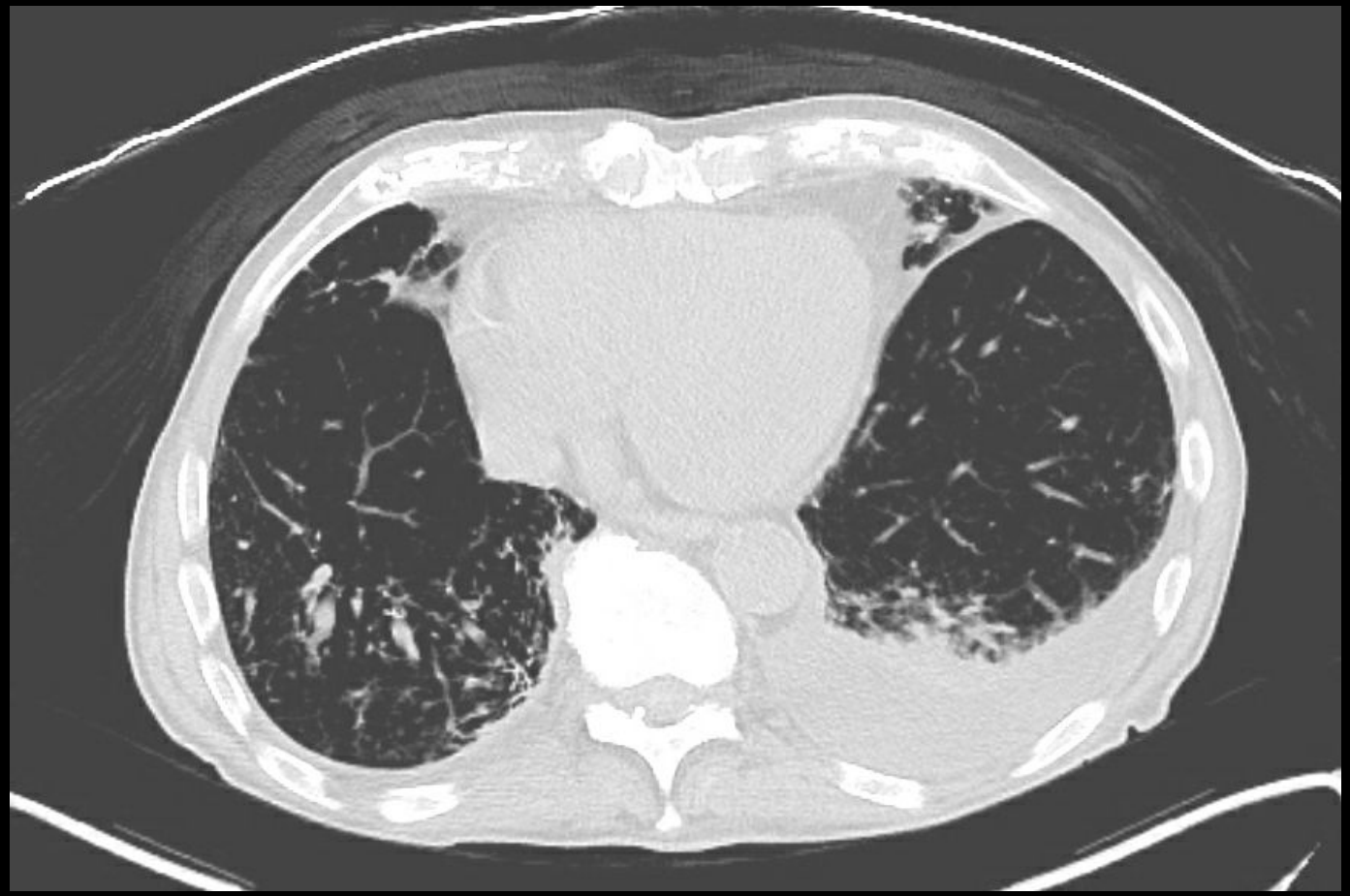
Case

- A repeat CT (7/3) showed no improvement with an enlarging left pleural effusion

CT chest without contrast (7/3)





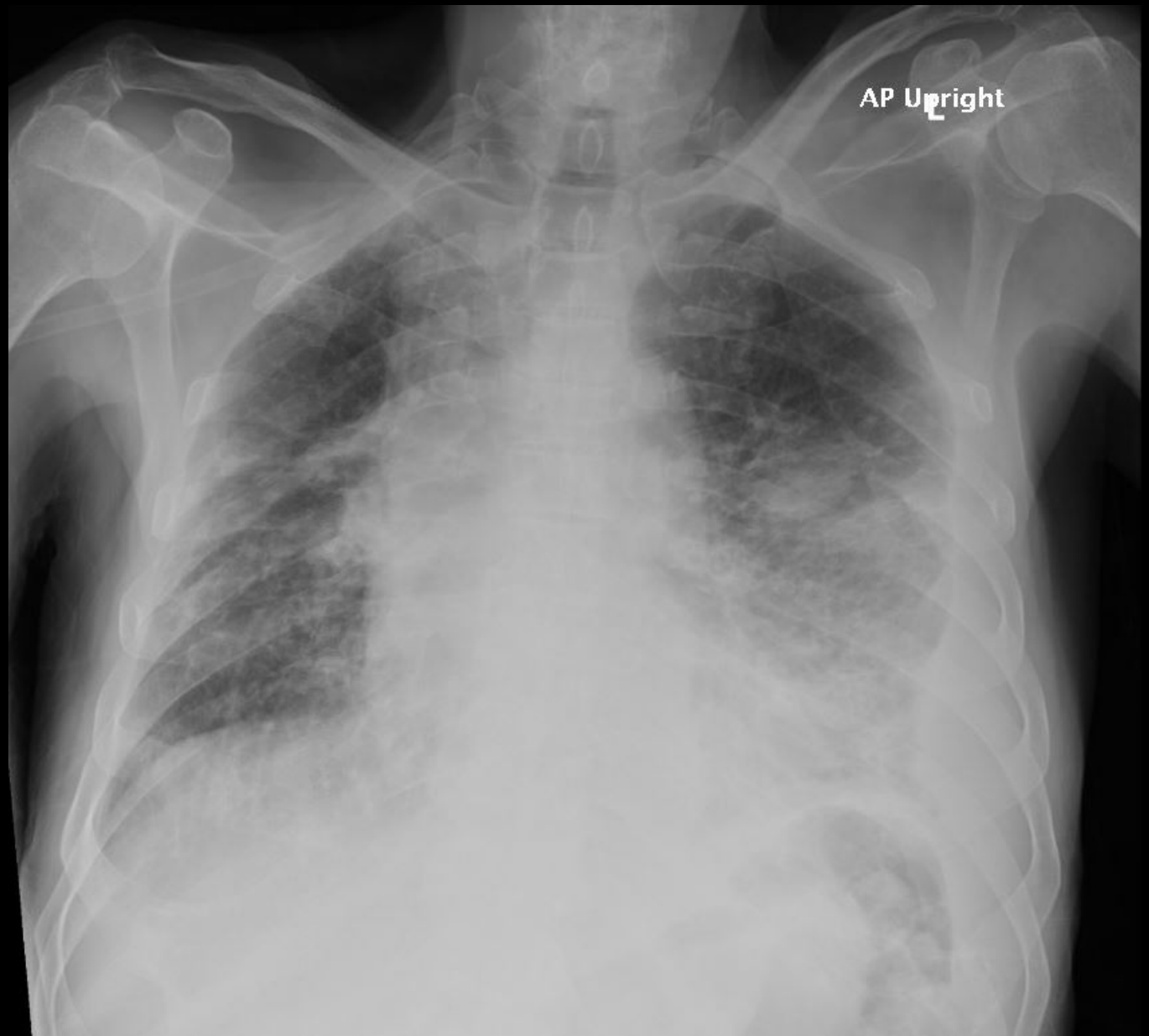


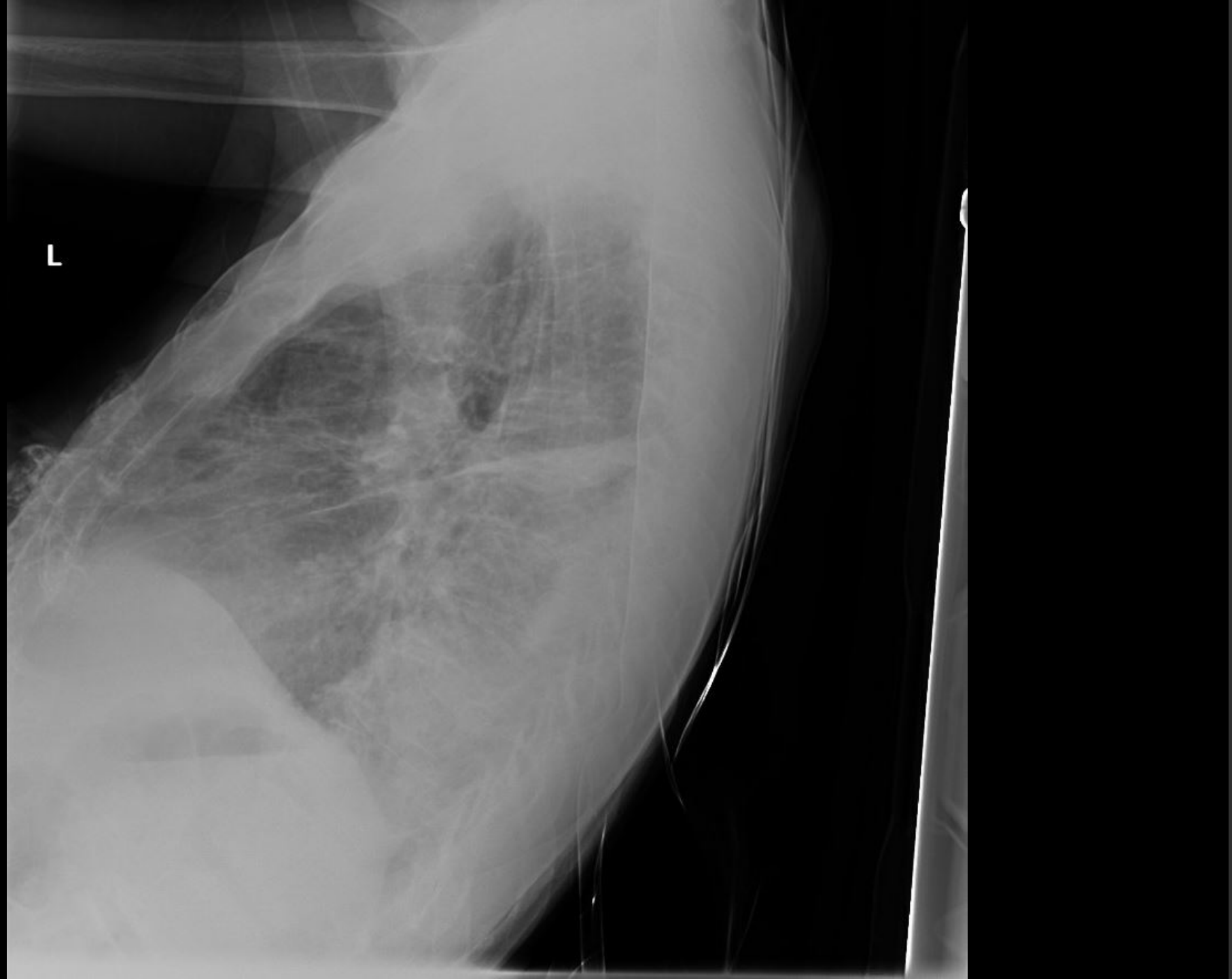
1. Multiple bilateral areas of lung consolidation, some slightly increased, some slightly decreased in size, remain compatible with infectious etiology.
2. Extensive bilateral bronchiectasis and scarring similar to prior studies.
3. Mildly enlarged thoracic lymph nodes unchanged
4. Left pleural effusion slightly increased from prior study.

Case

- He was transitioned to amoxicillin/clavulanate to further cover anaerobes given the abscess
- Sputum culture grew Pseudomonas aeruginosa (pan-sensitive) and he was switched to ciprofloxacin the day prior to admission
- Admitted on 7/6 for worsening cough, shortness of breath, confusion—started on piperacillin-tazobactam and vancomycin

Chest x-ray on admission (7/6)

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Hospital course

- Pulmonology consulted on 7/6 for evaluation of parapneumonic effusion
- Performed ultrasound that evening and noted “simple appearing left sided pleural effusion” with plan to manage conservatively with serial ultrasounds given recent frequent antibiotic changes concerning for likely incomplete antibiotic course
- On 7/8, repeat POCUS performed by primary team

POCUS anterior apical chest (7/8)


07/08/19 04:56:39PM ADM 070719-064053PM
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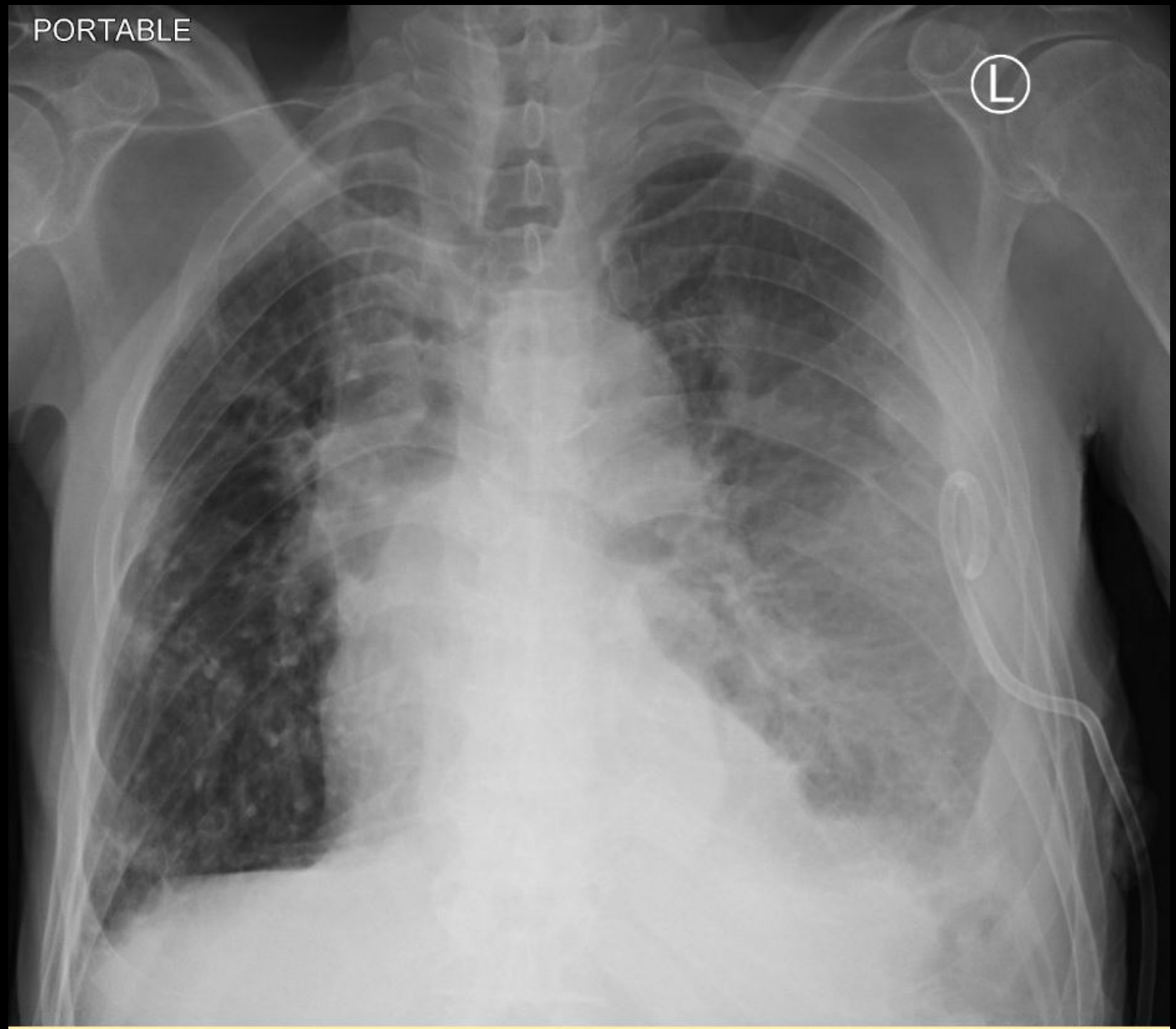
Hospital course

- Chest tube was placed 7/8 with removal of 425 cc exudative fluid—gram stain and culture negative

Chest x-ray after L chest tube (7/8)

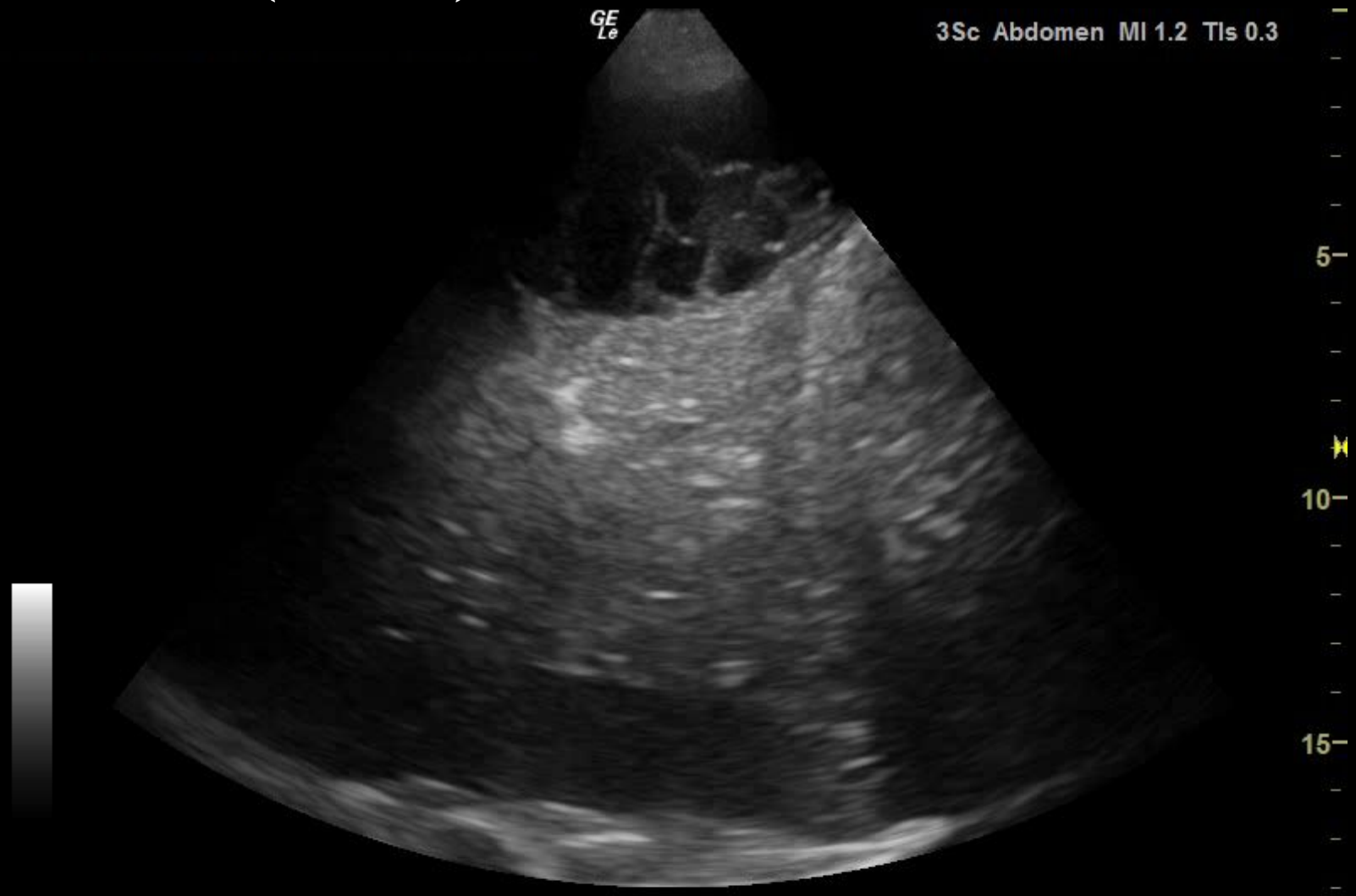


Hospital course

- Chest tube output was decreasing despite alteplase and dornase—repeat CT and US ordered

CT chest (7/11)

POCUS (7/11)

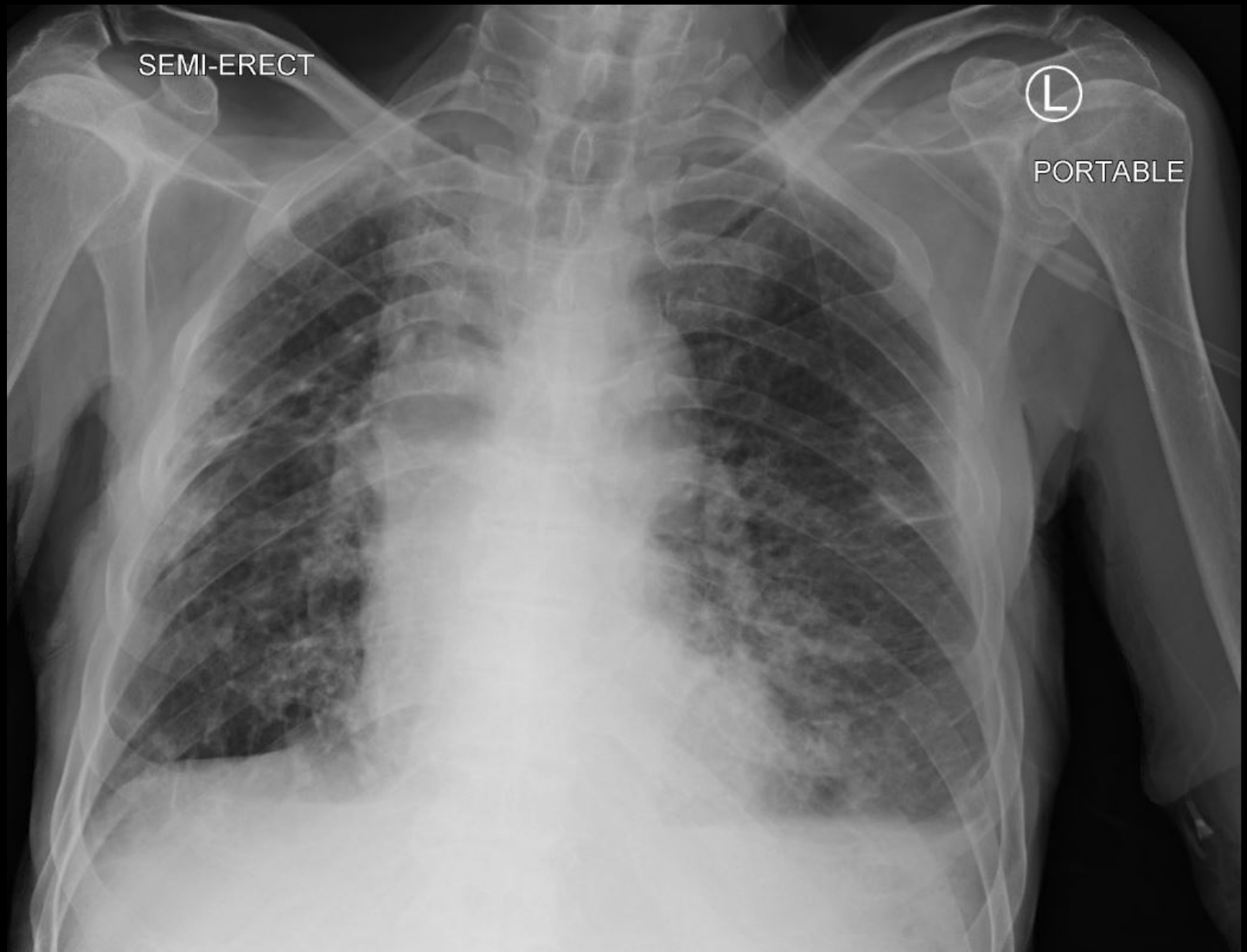


Hospital course

- Second chest tube placed to inferior collection on 7/11 with removal of 20 cc purulent fluid

Chest x-ray after 2nd chest tube (7/11)

Chest x-ray after removal of chest tubes (7/19)



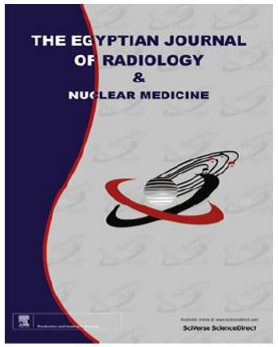
Question

- What is the utility of ultrasound (versus CT) for evaluating complicated parapneumonic effusions?

Egyptian Society of Radiology and Nuclear Medicine

The Egyptian Journal of Radiology and Nuclear Medicine

www.elsevier.com/locate/ejrnm
www.sciencedirect.com



ORIGINAL ARTICLE

Chest ultrasound in the evaluation of complicated pneumonia in the ICU patients: Can be viable alternative to CT?

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- Population: ICU patients (48) with complicated pneumonia as their discharge diagnosis
- Intervention: US for evaluation of parapneumonic effusions (prospective)
- Comparison group: CT for evaluation of parapneumonic effusions
- Outcome: Ability to diagnose complicated parapneumonic effusions

Benefits of US over CT

- Used for thoracentesis, which is often required for the final diagnosis of complicated parapneumonic effusions/empyema
- Serial monitoring of effusion during treatment
- Can be performed on unstable patients
- No radiation

Results

Table 1 US and CT findings of all 48 patients.

Findings	Number of patients	
	US chest $N = 48$	CT chest $N = 48$
Pleural findings		
Pleural effusion	46	48
Loculation	19	22
Fibrin strands	31	8
Parenchymal findings		
Consolidation	46	48
Necrosis	2	3
Abscess	3	2

Conclusion

- Chest ultrasound provided an accurate evaluation of abnormalities associated with complicated pneumonia in ICU patients and was superior in detection of fibrin strands

Comparison of Ultrasound and CT in the Evaluation of Pneumonia Complicated by Parapneumonic Effusion in Children

- Retrospectively compared US to CT in 19 children with complicated parapneumonic effusions. When VATS was performed, this was compared to findings on US/CT
- Chest ultrasound and chest CT were similar in their ability to detect loculated effusion and lung necrosis or abscess resulting from complicated pneumonia.
- Chest CT did not provide any additional clinically useful information that was not also seen on chest ultrasound
- Conclusion: For pediatrics, reserve chest CT for cases in which chest ultrasound is technically limited or discrepant with the clinical findings

Kurian et al. American Journal of Roentgenology 2009

Conclusion

- Ultrasound of the chest should be considered an alternative first line for evaluation of parapneumonic effusions
- If technically difficult study, CT chest is indicated
- Serial scans should be done, as effusions change throughout the course

Questions?

- Ultrasound of the chest should be considered an alternative first line for evaluation of parapneumonic effusions
- If technically difficult study, CT chest is indicated
- Serial scans should be done, as effusions change throughout the course