

AMSER Case of the Month

November 2025

86 year-old male presenting with cough

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Patient Presentation

- HPI: 86 year-old male w/ past medical history of transfusion-dependent myelodysplastic syndrome complicated by iron overload, BPH, hypothyroidism, GERD, HTN, and T2DM. He presented with subacute productive cough, dyspnea, subjective low-grade fevers, and occasional hemoptysis. He endorsed SOB upon a few steps. He denied orthopnea, PND, worsening lower extremity edema, headache, abdominal pain, n/v, dysuria, or diarrhea. He had no recent travel or sick contacts.
- Vitals: Afebrile, BP within normal limits
- Physical Exam:
 - General: Coughing
 - Cardiovascular: Bradycardia w/ irregularly irregular rhythm, no murmurs, rubs, or gallops
 - Pulmonary: Crackles over R lung base w/ decreased breath sounds over R region, clear L lung

Pertinent Labs

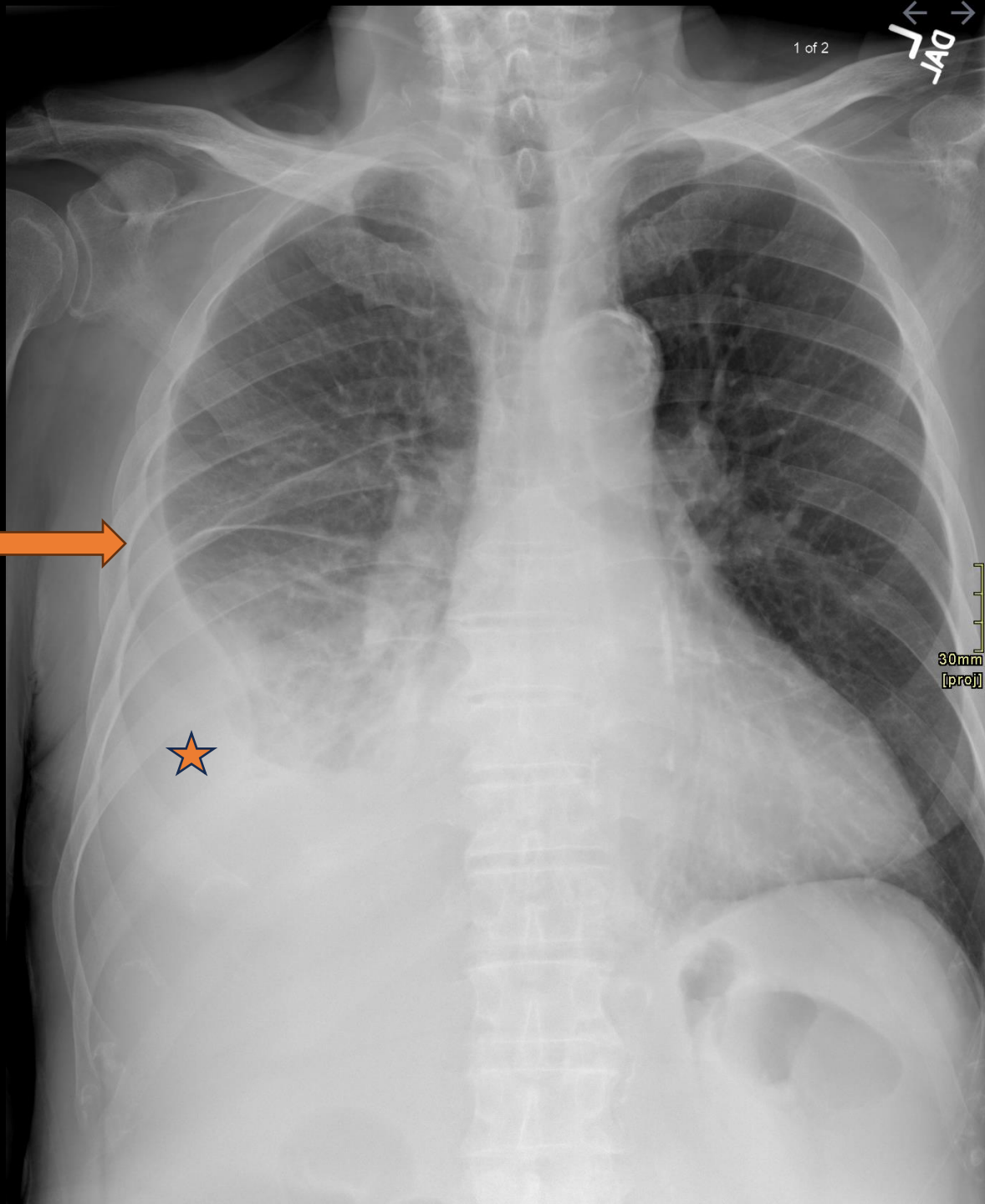
- CBC: 5.05 WBC, 2.81 RBC, 7.4 Hgb, 21.8 Hct, 29 Plt
 - Seg 82.5%, Lymph 0.8%
- BNP: 137 Na, 3.8 K, 102 Cl, 19 HCO₃, 53 BUN, 1.73 Cr, 157 Glu

Initial Imaging

CXR 9/8/25



CXR 9/8/25



Bulging
fissure

Large right
pleural effusion
with basilar
consolidation

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

American College of Radiology
 ACR Appropriateness Criteria®
 Workup of Pleural Effusion or Pleural Disease

Variant 1: Recent pneumonia with suspected parapneumonic effusion or empyema. Initial imaging.

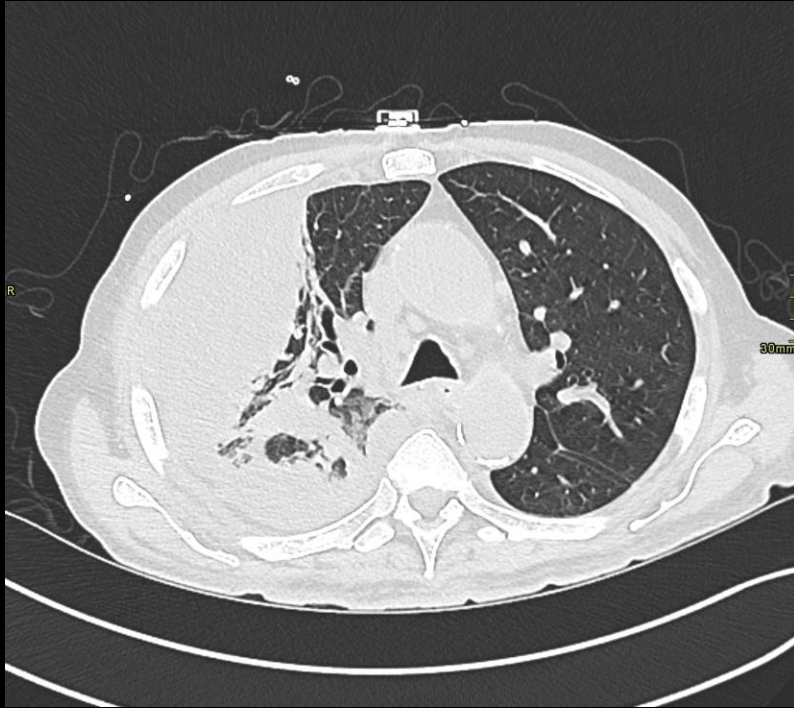
Procedure	Appropriateness Category	Relative Radiation Level
Radiography chest	Usually Appropriate	☼
CT chest with IV contrast	Usually Appropriate	☼☼☼
US chest	May Be Appropriate (Disagreement)	○
CT chest without IV contrast	May Be Appropriate	☼☼☼
MRI chest without and with IV contrast	Usually Not Appropriate	○
MRI chest without IV contrast	Usually Not Appropriate	○
CT chest without and with IV contrast	Usually Not Appropriate	☼☼☼
CTA chest with IV contrast	Usually Not Appropriate	☼☼☼

This imaging modality was ordered by admitting physician



CT w/o con
9/9/25

Axial
Lung Window



Findings:

Axial
Soft Tissue Window



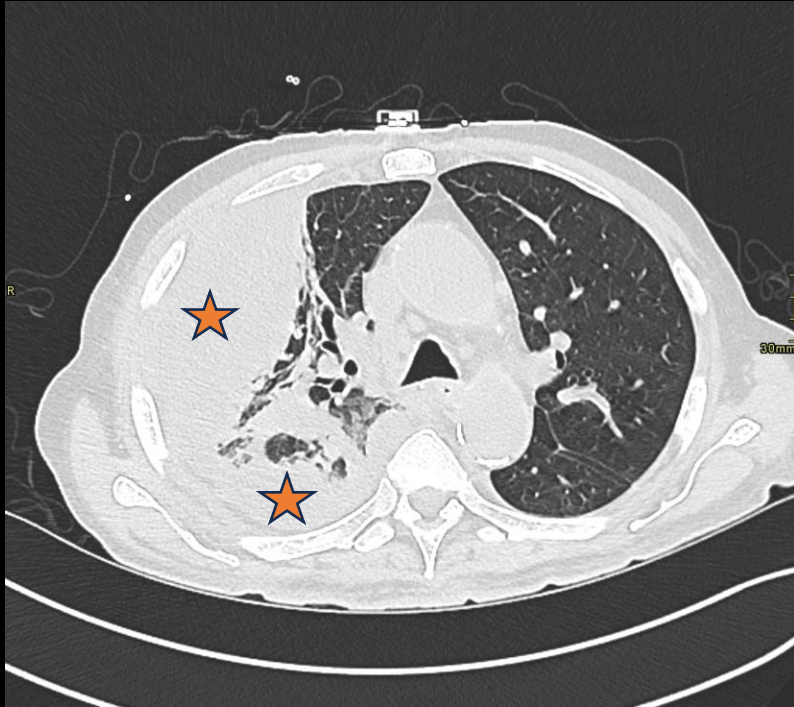
Coronal
Soft Tissue Window



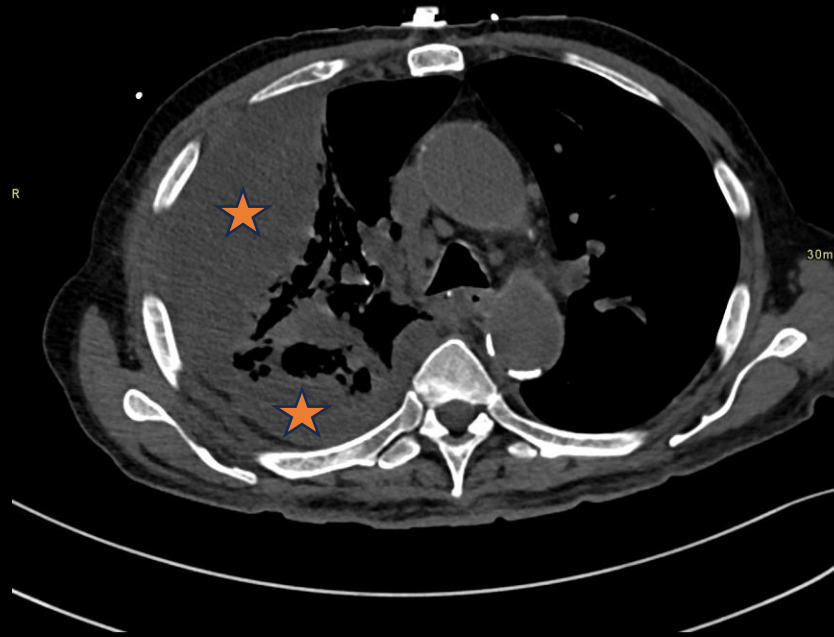
CT w/o con
9/9/25

Findings:

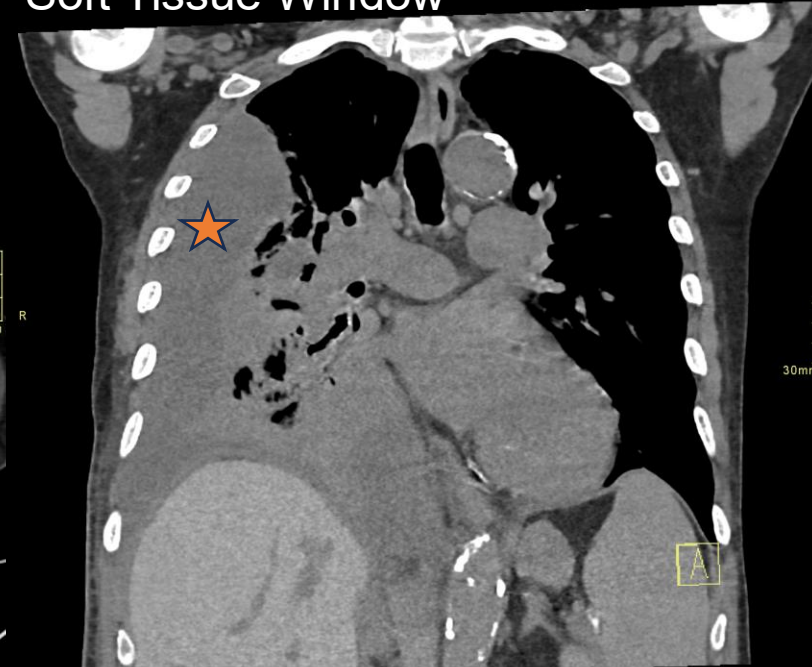
Axial
Lung Window



Axial
Soft Tissue Window



Coronal
Soft Tissue Window



Large loculated right pleural effusion and right lung consolidation

Follow Up Labs

- 9/9/25 Thoracentesis
 - Pleural Fluid Analysis:
 - Appearance: Yellow, hazy
 - LDH: 1046 U/L
 - Glucose: <12 mg/dL
 - Albumin: 1.9
 - Protein: 5.8 g/dL
 - Cholesterol: 67 mg/dL
 - Culture: *Klebsiella*

Final Dx:

Klebsiella Empyema

Case Discussion

- Pathophysiology and Risk Factors^{1,2}
 - The patient's history of regular transfusions increases his risk for nosocomial infections
 - Immunocompromised, it was likely that an infection triggered an inflammatory response in his pleura causing fluid accumulation eventually infected by *Klebsiella*

Case Discussion

- Imaging^{2,3}
 - Radiographs screen for pathology to prompt further investigation
 - May show lenticular pleural-based opacity
 - CT w/ IV contrast
 - Differentiate pleural membranes from parenchyma
 - Distinguish empyema from lung abscess
 - Split pleura sign: enhancing thickened rim of parietal and visceral pleura
 - **In this case, a CT w/o IV contrast was ordered likely in the setting of the patient's AKI. Although the CT demonstrated significant findings, a CT w/ IV contrast would have been better to demonstrate the enhancing pleura and split pleura sign.*

Case Discussion

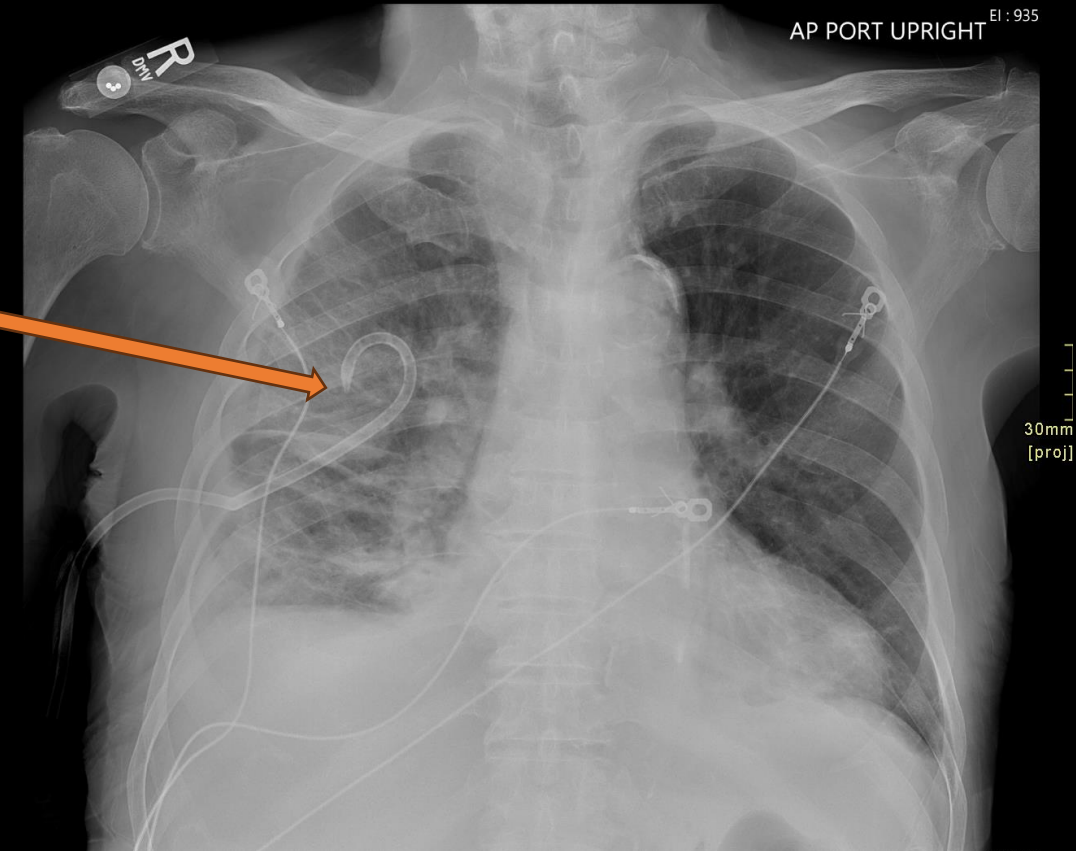
CXR 9/10/25

- Treatment²

- Broad-spectrum antibiotics
- Pigtail catheter placement
 - Post-procedure CXR
 - Confirm tube placement
 - Assess for complications:
 - Pneumothorax
 - Hemothorax
 - Re-expansion pulmonary edema

- Key Takeaways⁴:

- Radiographs are nonspecific
 - Ddx: pleural effusion, abscess, empyema, lung pathology
- CT is more sensitive and specific
 - Split-pleura sign



References:

1. Taylor, R. W., O'Brien, J., Trottier, S. J., Manganaro, L., Cytron, M., Lesko, M. F., Arnzen, K., Cappadoro, C., Fu, M., Plisco, M. S., Sadaka, F. G., & Veremakis, C. (2006). Red blood cell transfusions and nosocomial infections in critically ill patients. *Critical care medicine*, 34(9), 2302–2309.
<https://doi.org/10.1097/01.CCM.0000234034.51040.7F>
2. Iguina MM, Sharma S, Danckers M. Thoracic Empyema. [Updated 2024 Dec 24]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK544279/>
3. John E. Heffner, Jeffrey S. Klein, Christopher Hampson. Diagnostic Utility and Clinical Application of Imaging for Pleural Space Infections. *CHEST*. 2010/02/01. DOI: 10.1378/chest.08-3002.
4. Yigal Abramowitz. et al. *American Journal of Roentgenology*. 2012-11-23. DOI: 10.2214/AJR.08.1286.