

AMSER Case of the Month

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Pulmonary cystic lesion in a 19 year old female

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Patient Presentation

- 19-year-old Yemeni female with no significant past medical history
- 6-month history of dyspnea, dry cough, intermittent left-sided chest/back pain
- Initially treated as asthma with no relief
- Acute worsening over 2 days → ED visit
- Tachycardic (HR 118), otherwise stable; labs unremarkable

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

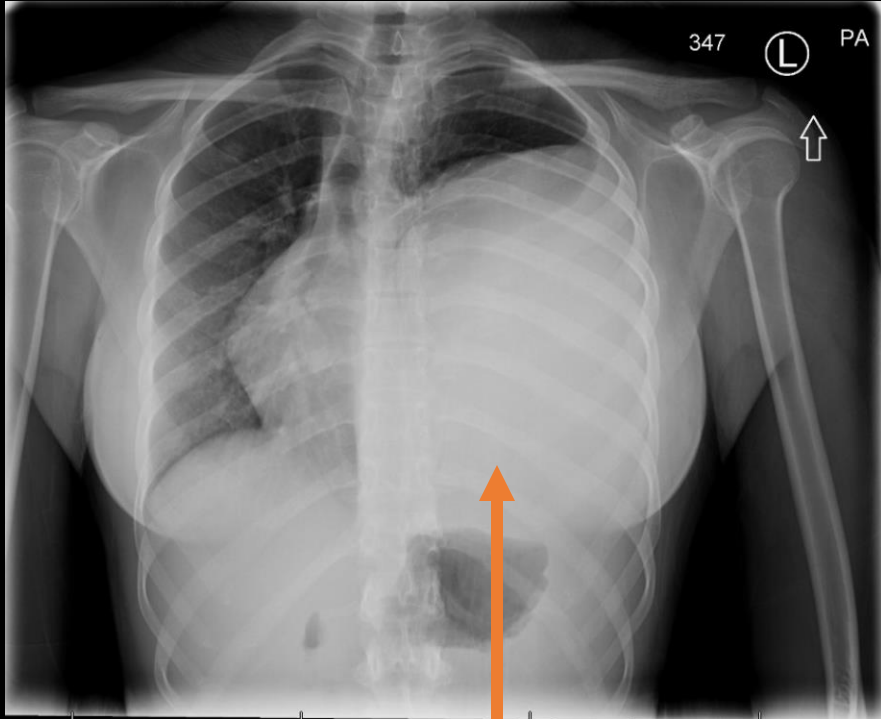
Variants		Documents			
1. Adult, Chronic dyspnea. Suspected disease of the pleura or chest wall. Initial imaging.		Documents Narrative Evidence Table Lit Search Appendix			
Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Dyspnea, chronic, chest wall disease suspected, initial imaging	3148173	● Radiography chest	<0.1 mSv ⊕	<0.03 mSv [ped] ⊕	Usually appropriate
		● CT chest with IV contrast	1-10 mSv ⊕⊕⊕	3-10 mSv [ped] ⊕⊕⊕⊕	Usually appropriate
		● CT chest without IV contrast	1-10 mSv ⊕⊕⊕	3-10 mSv [ped] ⊕⊕⊕⊕	Usually appropriate
		● US chest	0 mSv ○	0 mSv [ped] ○	Usually not appropriate
		● Fluoroscopy chest	1-10 mSv ⊕⊕⊕		Usually not appropriate
		● MRI chest without and with IV contrast	0 mSv ○	0 mSv [ped] ○	Usually not appropriate
		● MRI chest without IV contrast	0 mSv ○	0 mSv [ped] ○	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 ER physician

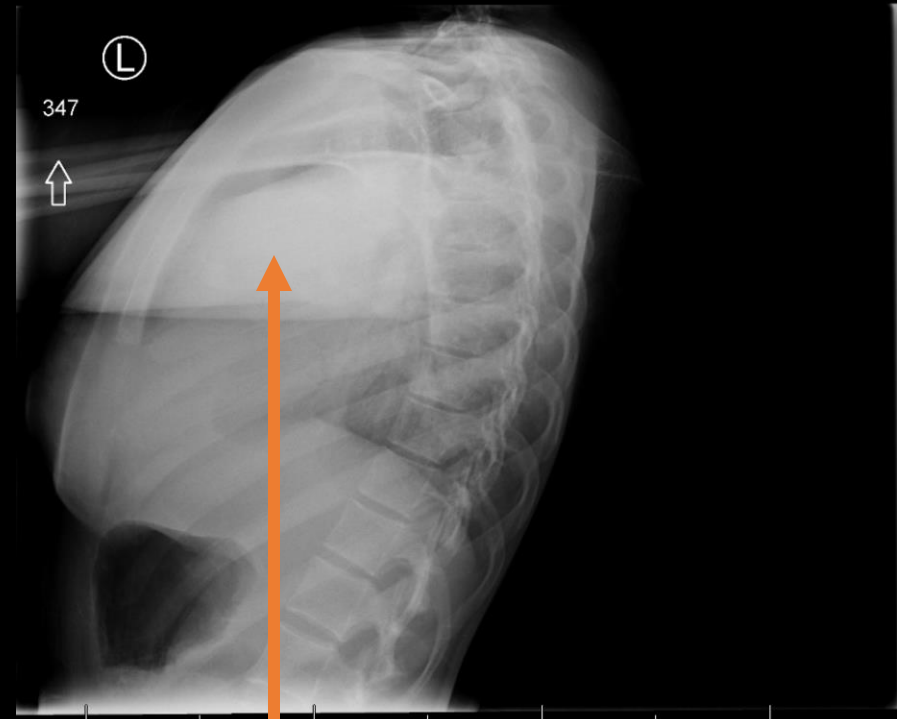
Findings (unlabeled)



Findings (labeled)



Near-complete opacification of mid/lower left hemithorax



Superior convex margin

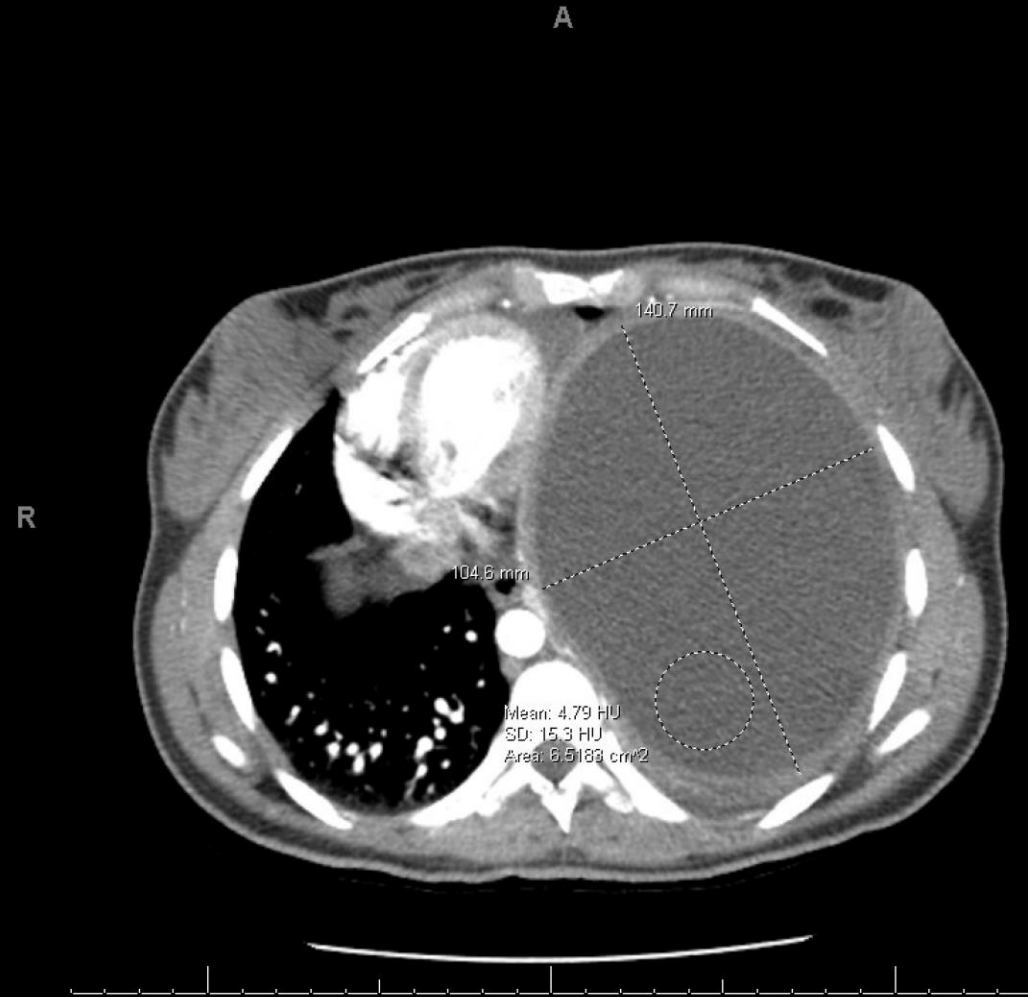
Select the applicable ACR Appropriateness Criteria

Variants		Documents			
1. Dyspnea, cough, or chest pain with suspected pleural effusion, noninfectious. Initial imaging.		Documents Narrative Evidence Table Lit Search Appendix			
Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Pleural effusion suspected, noninfectious, dyspnea, initial imaging	3196700	● Radiography chest	<0.1 mSv ☼	<0.03 mSv [ped] ☼	Usually appropriate
		● CT chest with IV contrast	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼☼	Usually appropriate
		● US chest	0 mSv O	0 mSv [ped] O	May be appropriate (Disagreement)
		● CT chest without IV contrast	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼☼	May be appropriate
		● MRI chest without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● MRI chest without 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
		● CTA chest with IV contrast	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼☼	Usually not appropriate

This imaging modality was ordered by the ER physician



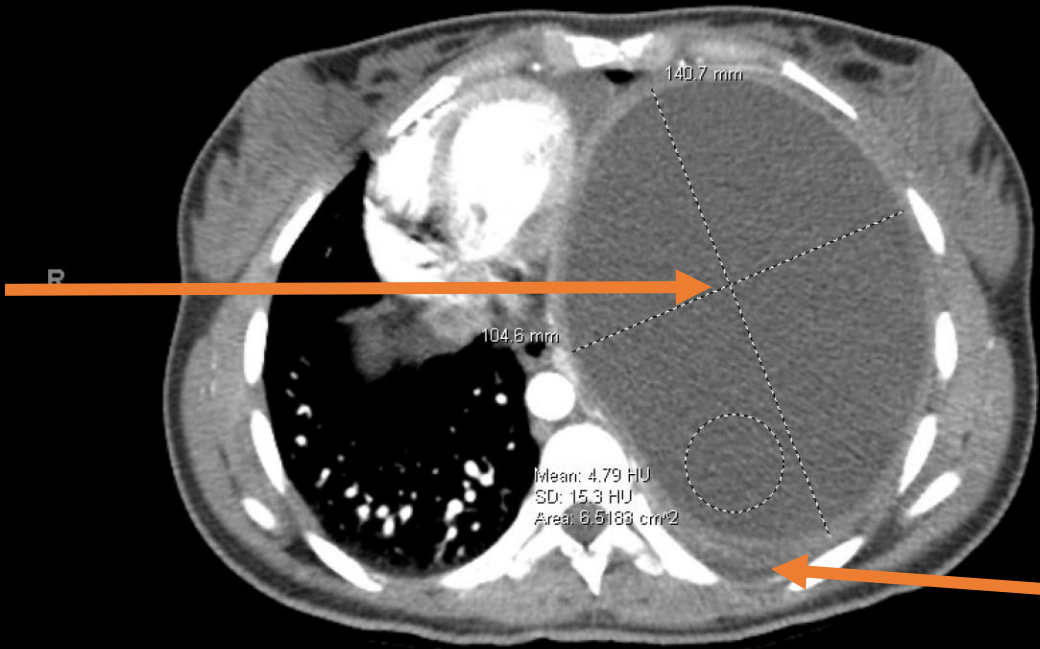
Findings (unlabeled)



Findings (labeled)

A

large unilocular cystic lesion
(14.1 × 10.5 × 17.8 cm)



Differential Diagnosis

- **Pulmonary abscess:** thick-walled cavity with air-fluid level; surrounding consolidation; may show rim enhancement.
- **Empyema:** lenticular pleural collection with enhancing pleural margins; conforms to pleural space.
- **Bronchogenic cyst:** round, well-circumscribed, fluid-attenuation lesion; typically mediastinal or paratracheal; non-enhancing on CT.
- **Congenital Pulmonary Airway Malformation (CPAM):** benign congenital intrapulmonary cystic lesion; unilocular or multilocular; may contain air-fluid levels; classically in lower lobes.
- **Pulmonary Hydatid cyst:** Uncomplicated cysts are generally well circumscribed and round/oval. May be solitary or multiple with lower lobe predominance.

Final DX

- Initial imaging raised concern for empyema or Pulmonary abscess; however, separate trace pleural fluid confirmed the lesion was intrapulmonary (not pleural-based).
- Large, well-circumscribed unilocular cystic lesion with fluid attenuation
- Imaging features favored a benign intrapulmonary process
- Thoracic surgery: robotic-assisted left lower lobectomy with intraoperative drainage
- Pathology: pulmonary echinococcal (hydatid) cyst; no malignancy → CPAM ruled out
- **Final Dx: Pulmonary Hydatid Cyst (Echinococcus granulosus)**

Case Discussion

- Hydatid disease = larval stage of Echinococcus granulosus
 - Canines = definitive hosts; livestock = intermediate hosts
 - Humans = accidental intermediate hosts
 - (ingestion of eggs → hematogenous spread)^{1,2}
- Most common sites: liver (66%), lungs (25%)^{1,2}
- Endemic in Middle East (including **Yemen**, patient's country of origin), South America, Africa, China¹
- Pulmonary hydatid cysts : Often asymptomatic until large
 - Symptoms: cough, chest pain, dyspnea, hemoptysis³
- Radiographic features: round, smooth, unilocular cysts^{4,5}
 - May mimic congenital lesions (e.g., CPAM) when daughter cysts absent

Case Discussion

Imaging & Diagnosis

- **US**

Sensitivity 90–95% for hepatic hydatid cysts⁵

Allows classification of cysts as active, transitional, or inactive, guiding treatment plan^{5,6}

- **CT**

Gold standard pulmonary hydatid cysts with near 100% sensitivity^{5,7}

Detects air within ruptured cysts, small calcifications, and extrahepatic involvement^{5,7}

Case Discussion

Imaging & Diagnosis

- **MRI**

Useful for delineating cyst wall or evaluating complications⁷

Limited added value over CT⁷

- **Serologic Testing**

Supports diagnosis

IgG ELISA = most widely used; sensitivity 78–94%, specificity up to 99%⁷

Pulmonary cysts less serologically reactive than hepatic → false negatives common ($\approx 35\%$)⁷

Case Discussion

Treatment

- **Albendazole** → indicated for uncomplicated cysts <5 cm^{6,7}
- **Surgery (lobectomy/cystectomy)** → for large or complicated cysts^{6,7}
- **Percutaneous drainage (PAIR)**

Selectively used for intermediate-sized hepatic cysts⁷

Not recommended in pulmonary disease (↑ risk of rupture/anaphylaxis/complications)^{7,8}

References

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2. Moro P, Schantz PM. Echinococcosis: a review. *Int J Infect Dis*. 2009;13(2):125-133. doi:10.1016/j.ijid.2008.03.037
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8. Ammann RW, Eckert J. Cestodes. *Echinococcus*. *Gastroenterol Clin North Am*. 1996;25(3):655-689. doi:10.1016/s0889-8553(05)70268-5