

AMSER Case of the Month

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31 Year-Old Female with Massive Hemoptysis

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Patient Presentation

- **HPI:** 31-year-old female with past medical history of IV-drug use presents to the ED from a correctional facility due to fever, hypotension, and diffuse pain and is admitted to the ICU for treatment of tricuspid valve endocarditis and septic shock. After many days in the hospital, the patient develops massive hemoptysis, loses the ability to protect her airway and is subsequently intubated.
- **Meds:** Norepinephrine, Vasopressin, Nafcillin
- **Vitals:** BP 120/96, HR 155
- **Physical Exam:** Intubated. Tachycardic. Coarse breath sounds throughout, with decreased sounds in right lower lung field.

Pertinent Labs

ABG:

pH: 6.99

pCO₂: 93

Complete Blood Count:

WBC: 21.5

Hgb: From 7.5 → 6.0 after hemoptysis

PT: 17.4

Fibrinogen: 718

Lactate: 12.9

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 1: Massive (life-threatening) hemoptysis. Initial imaging.

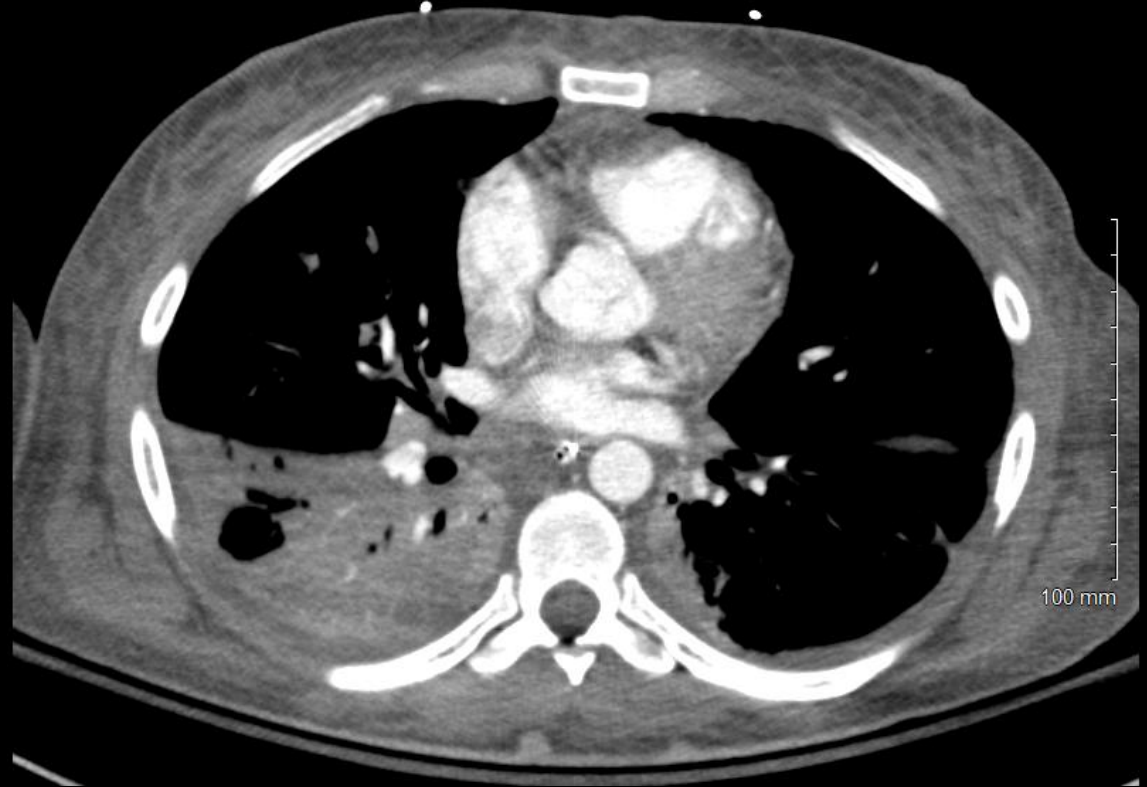
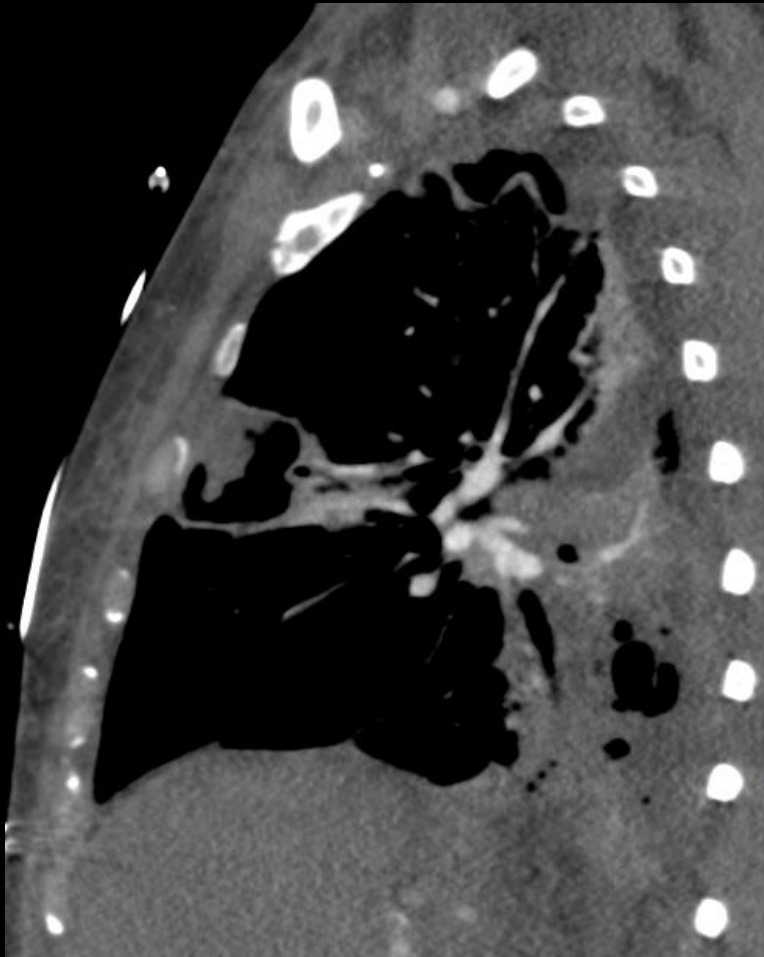
Procedure	Appropriateness Category	Relative Radiation Level
Arteriography bronchial with embolization	Usually Appropriate	☼☼☼☼
CTA chest with IV contrast	Usually Appropriate	☼☼☼
Radiography chest	Usually Appropriate	☼
CT chest with IV contrast	Usually Appropriate	☼☼☼
CT chest without IV contrast	May Be Appropriate	☼☼☼
CT chest without and with IV contrast	Usually Not Appropriate	☼☼☼

Performed in artery of interest at time of treatment by IR

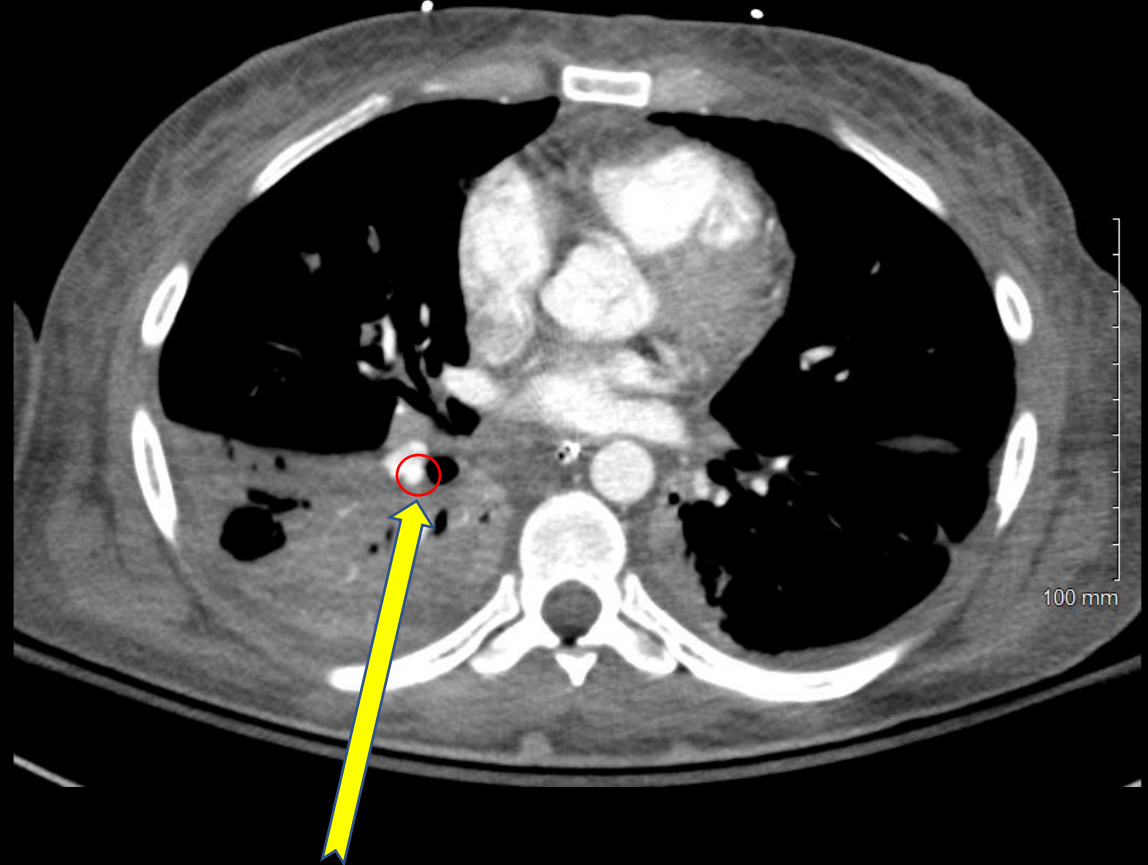
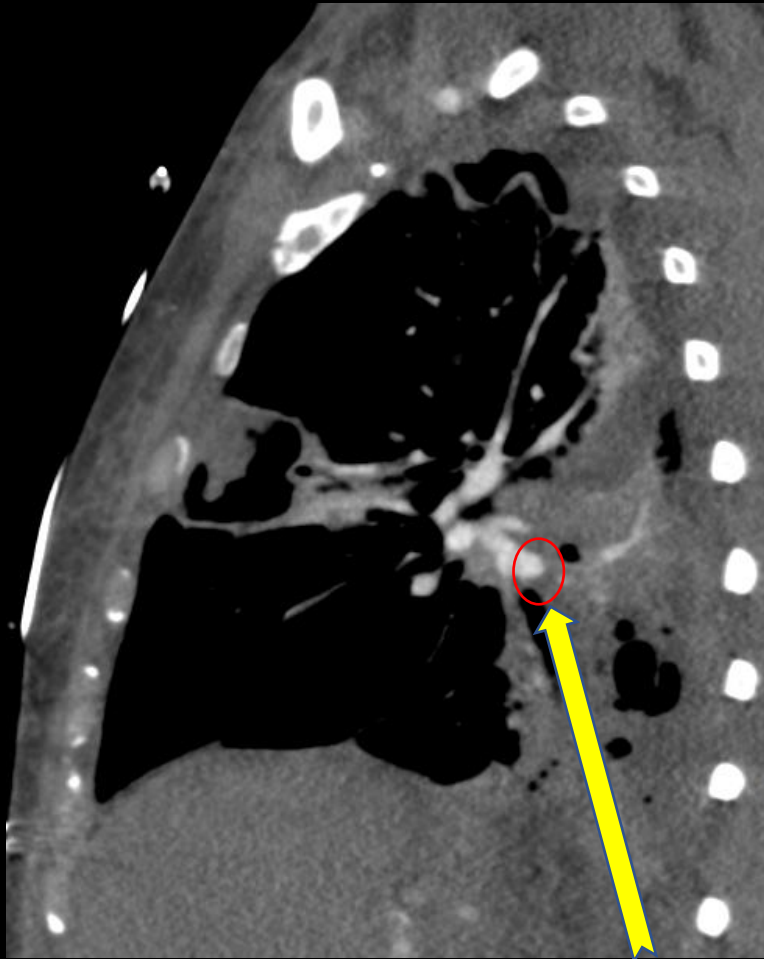
This imaging was ordered by a Radiology provider after clot removal was performed by bronchoscopy.

This imaging modality was ordered by the ICU provider for initial evaluation.

Findings (unlabeled)



Findings (labeled)

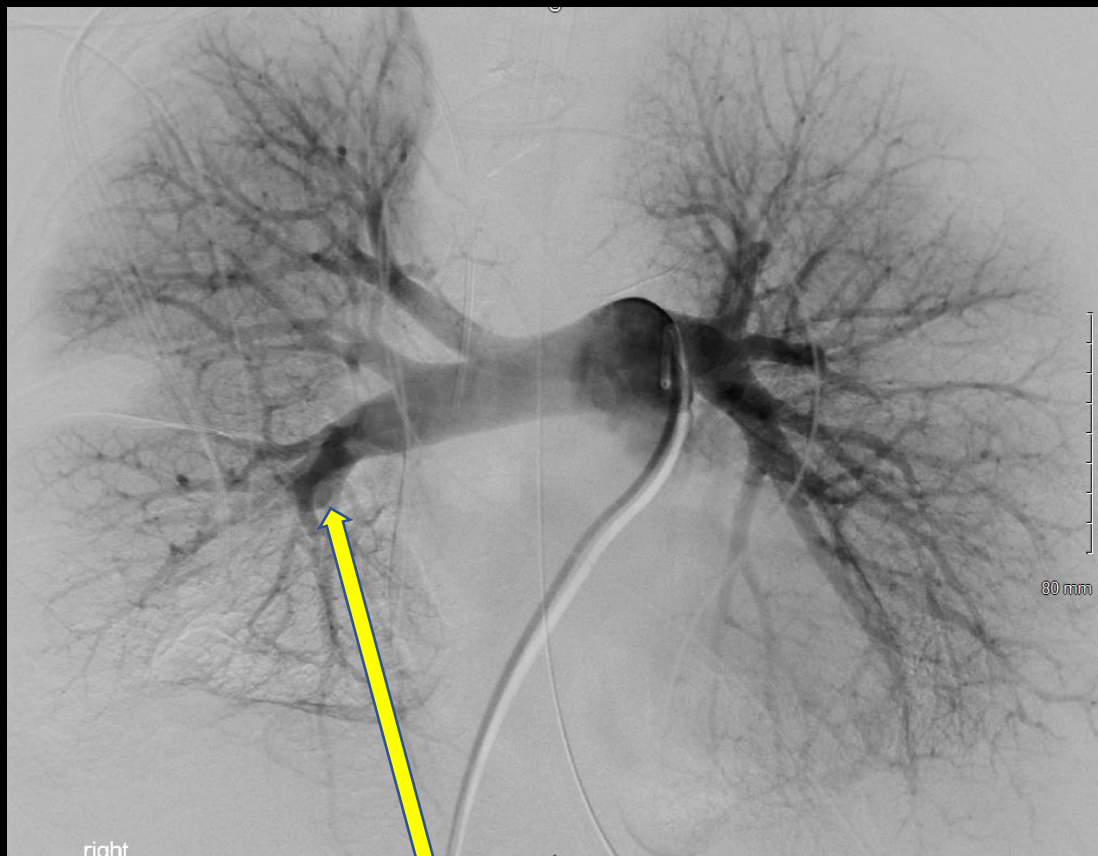


6.6 mm pseudoaneurysm arising from a segmental branching point of the right lower lobe pulmonary artery

Findings (unlabeled)



Findings (labeled)



Pulmonary artery arteriogram showing pseudoaneurysm



Successful right lower lobe pseudoaneurysm embolization, requiring embolization of 2 separate branches.

Final Dx:

Rupture of Pulmonary Artery Pseudoaneurysm
(PAP)

Pulmonary Artery Pseudoaneurysm

Pulmonary artery pseudoaneurysms (PAPs) are uncommon but potentially fatal. They are defined as the focal dilatation of a segment of a pulmonary artery. PAPs have a higher risk of rupture than true aneurysms due to support by only one layer of the blood vessel.

- **Etiology:** The most common causes of PAP are trauma and infectious disease. Other less common causes include vasculitis, neoplasm, congenital disease and pulmonary hypertension.
- **Clinical Presentation:** The presentation can range from asymptomatic to life-threatening hemoptysis. If large enough, patients can present with tracheal compression resulting in dyspnea and cough. It is important to detect PAPs as early as possible in order to improve the prognosis.

Pulmonary Artery Pseudoaneurysm (contd.)

- **Diagnosis:**

- In practice, CT angiography is considered a better first diagnostic test than pulmonary angiography as it provides more information about surrounding anatomy and can help to visualize peripheral PAPs more effectively. CTA will typically reveal a smooth-walled sacular outpouching contiguous with the artery.
- Imaging findings can also provide clues to the etiology of the PAP. For example, in this case of tricuspid valve endocarditis with pulmonary septic emboli, cavitary/necrotizing lesions can be identified close to the pseudoaneurysm.
- Chest X-ray can also be used as an initial test. A PAP may be demonstrated as hilar enlargements or well-circumscribed nodules by this modality.

- **Management:**

- The current treatment for PAPs involves endovascular occlusion using coils, plugs or stents. The vessels proximal and distal to the PAP should be occluded. Surgery is rarely indicated but can be an option if endovascular therapy fails.

Outcome & Significance

- After embolization and transfusion this patient's clinical status and Hgb improved. She has since been extubated and continues to receive treatment for additional sequelae of endocarditis.
- PAPs are rare entities but can be fatal if left untreated with a clinical presentation ranging from asymptomatic to severe bleeding.
- CTA is used for diagnosis and treatment planning, followed by pulmonary angiography for embolization.
- The management of PAPs should be a collaborative effort between the intensivist, pulmonologist, interventional radiologist and thoracic surgeon.

References:

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