AMSER Case of the Month September 2023

88-Year-Old Female Presents to the ED Hypotensive with Left Side Chest Pain

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Patient Presentation

- HPI: Patient with a PMHx of HFpEF presents to the ED with a BP 90/60's experiencing mild abdominal pain and nonradiating left sided chest pain under her breast that has persisted since this morning. Pt describes the pain as "throbbing" and worse with deep inspiration.
- PMHx: Heart failure with preserved ejection fraction (HFpEF);Dementia
- SHx: Former Smoker (.2/PPD)

Pertinent Labs

- Vitals: BP 106/58, HR 67, RR 18, SPO2 90%,T 98.7
- Labs: ProBNP 904, HsTroponin Negative, Lipase Negative, CBC Negative, CMP Negative, D-Dimer Not Ordered
- EKG: Normal Sinus Rhythm, 67 BPM, No Acute ST Changes
- Modified Well's Criteria: 3 (Intermediate Probability)

What Imaging Should We Order?

ACR Appropriateness Criteria; Suspected Pulmonary Embolism

Variant 2: **Suspected pulmonary embolism. Low or intermediate pretest probability with a positive D-dimer. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
CTA pulmonary arteries with IV contrast	Usually Appropriate	☢☢☢
V/Q scan lung	Usually Appropriate	☢☢☢
MRA pulmonary arteries without and with IV contrast	May Be Appropriate	O
CTA triple rule out	May Be Appropriate (Disagreement)	☢☢☢
US duplex Doppler lower extremity	Usually Not Appropriate	O
US echocardiography transesophageal	Usually Not Appropriate	O
US echocardiography transthoracic resting	Usually Not Appropriate	O
Arteriography pulmonary with right heart catheterization	Usually Not Appropriate	☢☢☢☢
MRA pulmonary arteries without IV contrast	Usually Not Appropriate	O
CT chest with IV contrast	Usually Not Appropriate	☢☢☢
CT chest without and with IV contrast	Usually Not Appropriate	☢☢☢
CT chest without IV contrast	Usually Not Appropriate	☢☢☢
CTA chest with IV contrast with CTV lower extremities	Usually Not Appropriate	☢☢☢

This imaging modality was ordered by the ER physician

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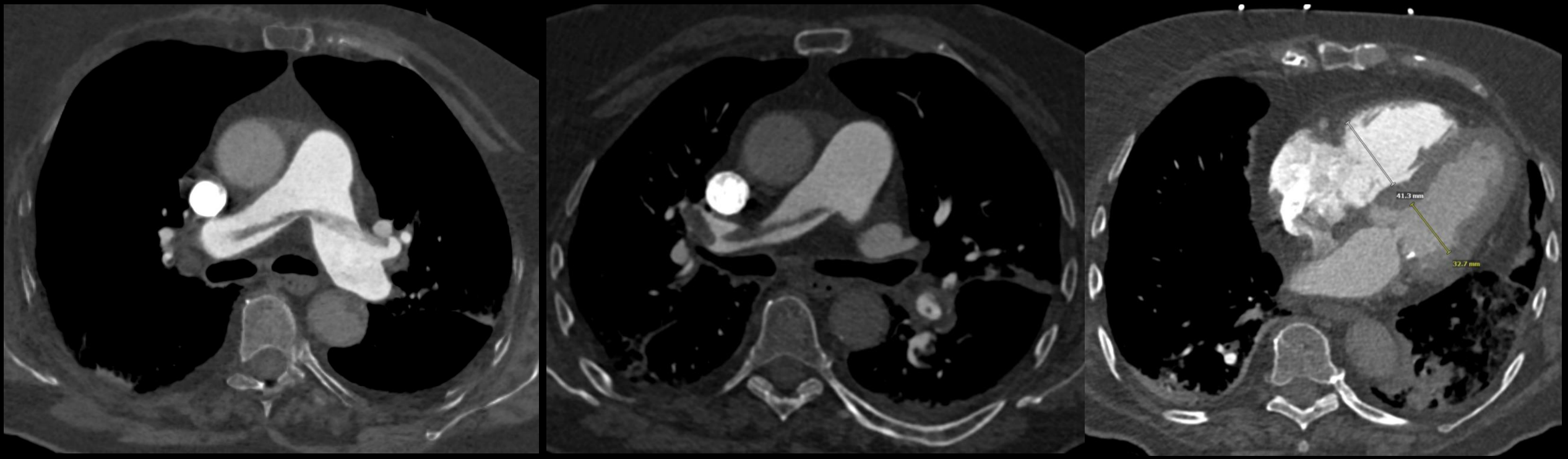
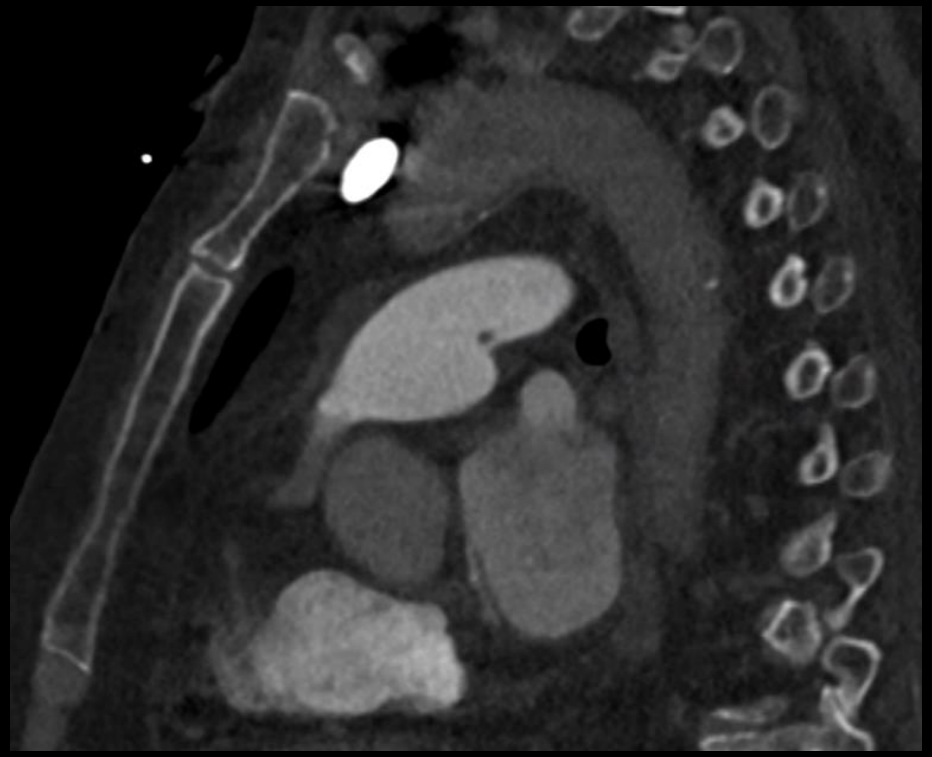
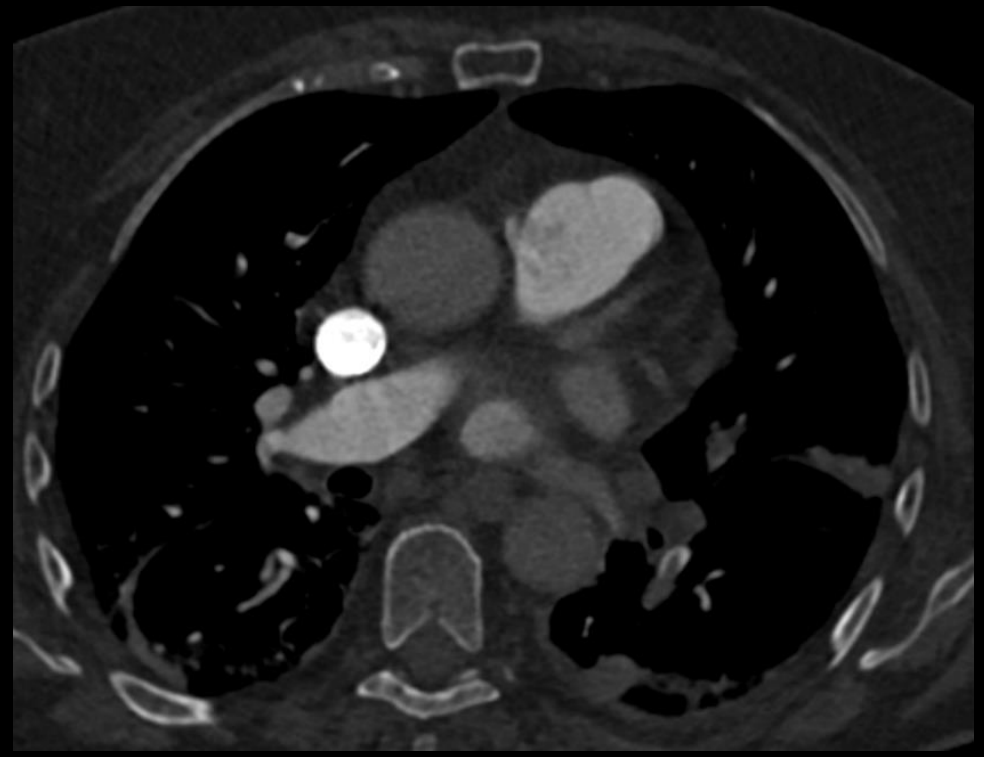
Findings (unlabeled)



Exam: Axial CTA of the Chest

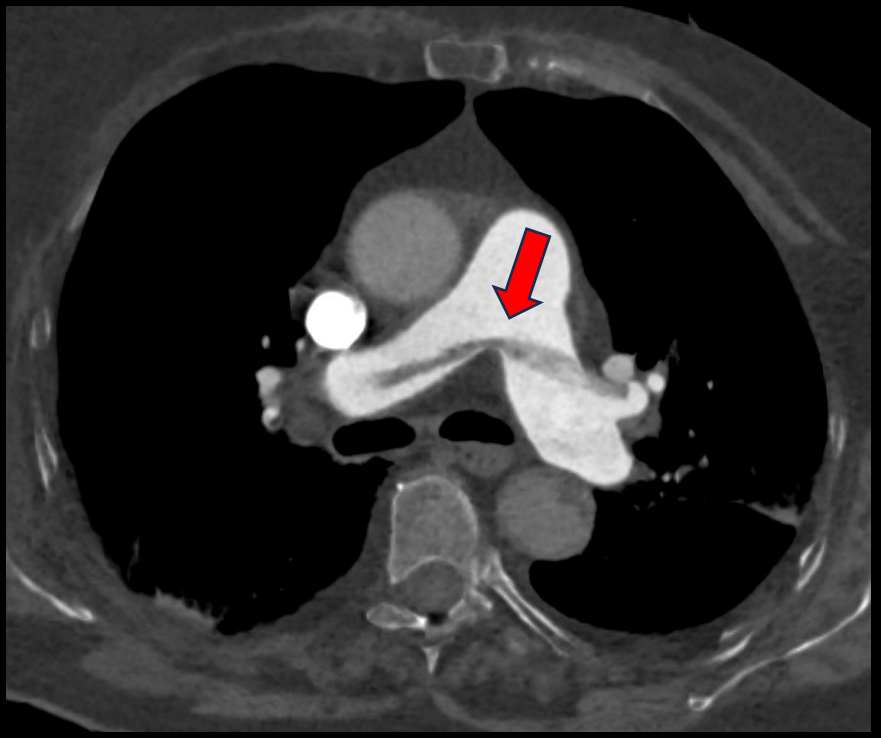
Findings (unlabeled)



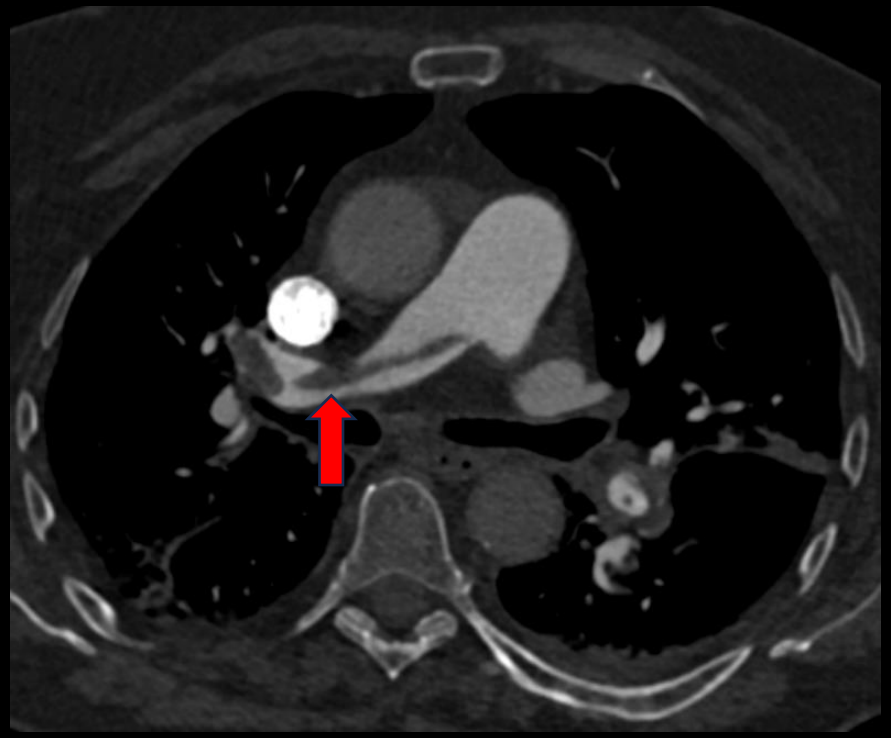


Exam: Sagittal and Axial CTA of the Chest

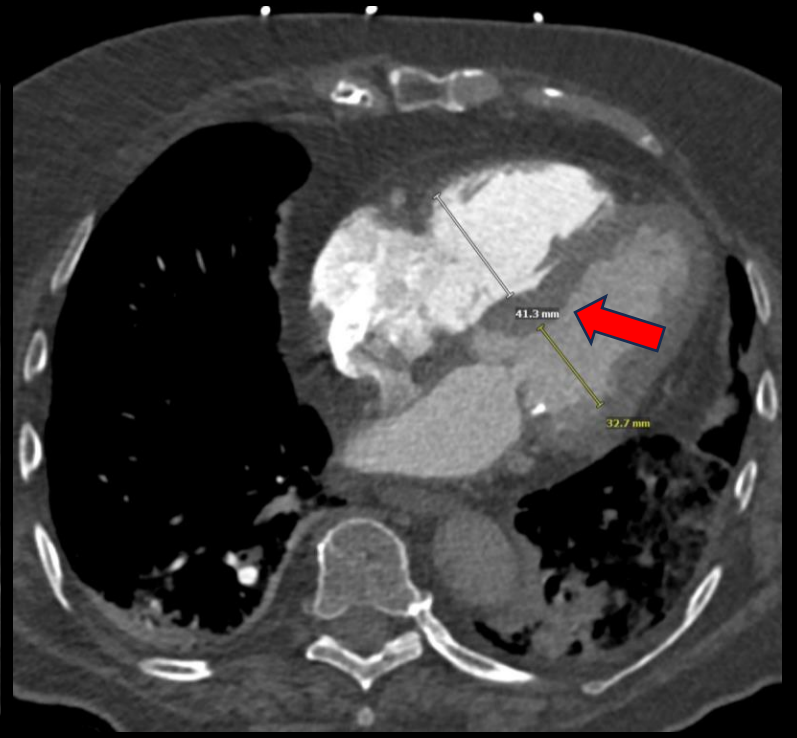
Findings (labeled)



Demonstration of large filling defect straddling the bifurcation of the pulmonary trunk.

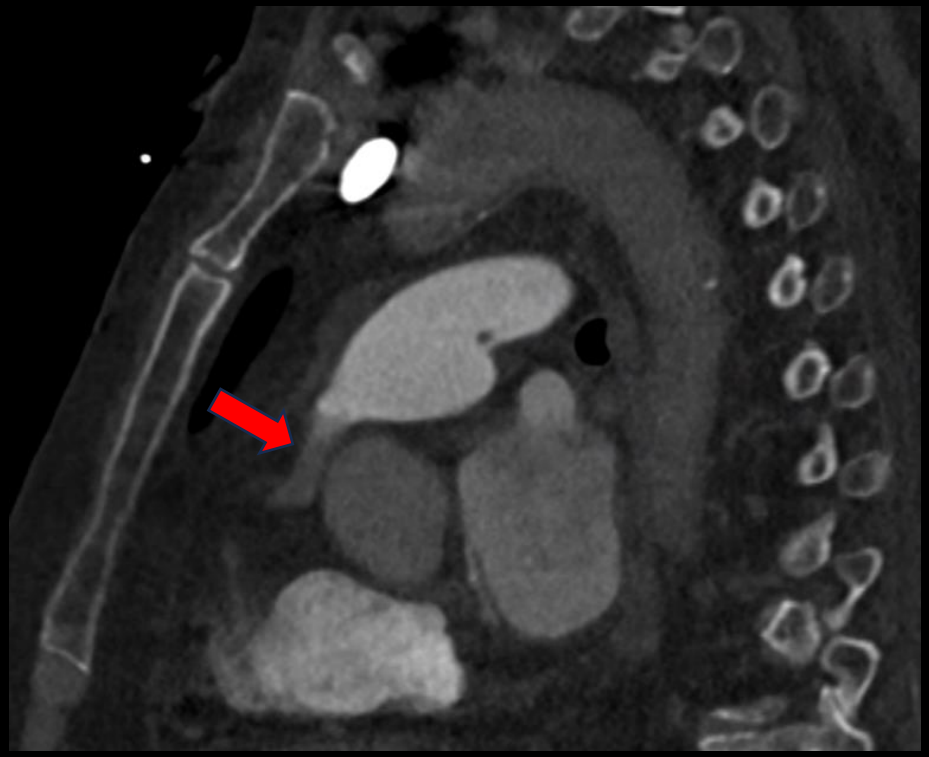


Demonstration of filling defects in the R. Interlobar artery and its branches extending from the R. Pulmonary artery.

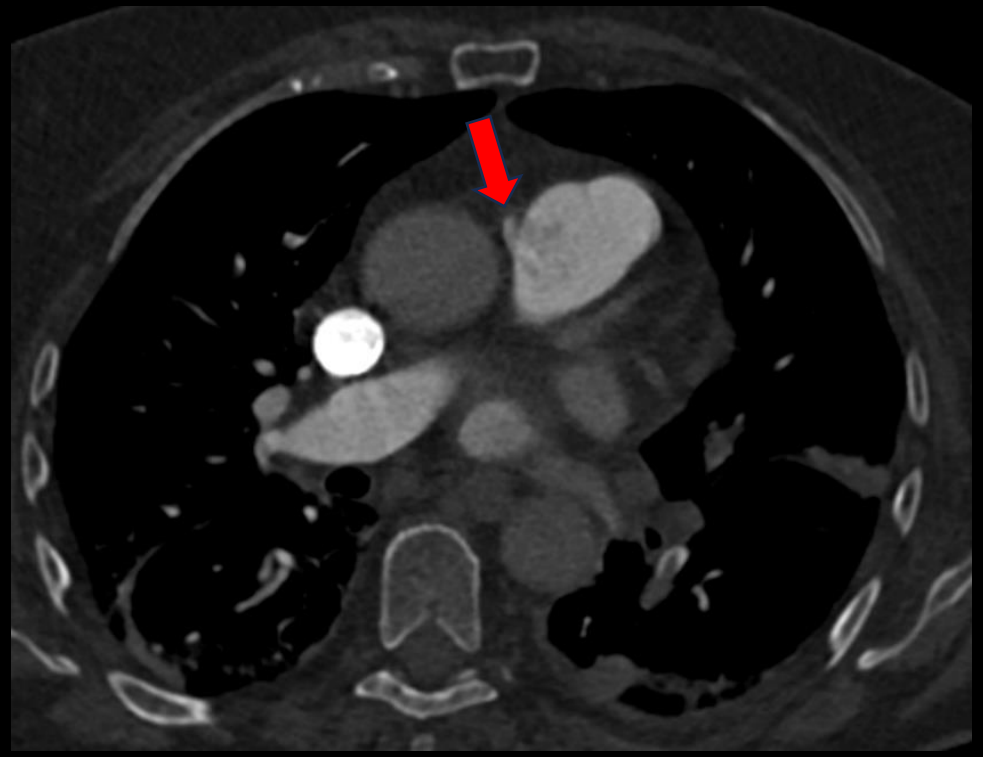


Right Heart Strain demonstrated by a RV/LV ratio of 1.2 (Normal < 0.9) and bowing of the Interventricular Septum

Findings (labeled)



Sagittal CTA demonstrates anomalous RCA originating from the proximal Main Pulmonary artery.



Axial CTA redemonstration of anomalous RCA.

Final Dx:

Saddle Pulmonary Embolism with an Anomalous Right Coronary Artery from Main Pulmonary Artery

Case Discussion

- Epidemiology: An isolated anomalous right coronary artery originating from the pulmonary artery(ARCAPA) is a very rare coronary anomaly. The prevalence is estimated at about 0.002% of the general population. This anomaly is generally asymptomatic and discovered incidentally compared to anomalous pulmonary origin of the left coronary artery (ALCAPA) which typically presents with symptoms of left ventricular ischemia and CHF during infancy. Although ARCAPA may present with a murmur, CHF, or chest pain during infancy as well.

- Sequalae: Pulmonary Embolism in the setting of ARCAPA is especially concerning due to the possibility of thromboembolic occlusion of the RCA resulting in a coinciding Acute Coronary Syndrome in the distribution of the anomalous artery.

References:

Kajihara N, Asou T, Takeda Y, Kosaka Y. Surgical treatment of an infant with myocardial ischemia due to an anomalous origin of the right coronary artery from the main pulmonary artery: report of a case. *Surg Today.* 2009;39:969–971.

Williams, I. A., Gersony, W. M., & Hellenbrand, W. E. (2006). Anomalous right coronary artery arising from the pulmonary artery: A report of 7 cases and a review of the literature. *American Heart Journal*, *152*(5). https://doi.org/10.1016/j.ahj.2006.07.023

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