AMSER Case of the Month: August 2018

29-year-old female with shortness of breath

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Patient Presentation

- HPI: 29-year-old female with a one-month history of progressively worsening dyspnea on exertion. During the past two weeks, dyspnea resulted after only minimal exertion, and during the past week she has been experiencing right shoulder and pleuritic chest pain. She saw her PCP for a routine visit in the morning, who sent her to the ED.
- Physical exam: within normal limits
  - Vital signs: BP: 134/85, Pulse 84, Respirations: 18, Temperature: 97.9, O_2 Saturation: 99%, BMI: 38.06
- Medical History: Depression, migraines, hypertension
- Surgical History: Colposcopy, wisdom tooth extraction
- Medications: oral contraceptive (OCP), fluoxetine, naratriptan, amlodipine, propranolol, tempazepam

Pertinent Labs

- D dimer: **10.59 µg/mL**
- Troponin I: <0.03 ng/mL
- BNP: 14 pg/mL
- CBC and CMP within normal limits

What Imaging Should We Order?

ACR Appropriateness Criteria for Pulmonary Embolism

Variant 2: **Suspected pulmonary embolism. Intermediate probability with a positive D-dimer or high pretest probability.**

Radiologic Procedure	Rating	Comments	RRL*
X-ray chest	9		☢
CTA chest with IV contrast	9	This procedure should be optimized for pulmonary circulation.	☢☢☢
CT chest with IV contrast	9	This procedure should be optimized for pulmonary circulation. This procedure may be an alternative to CTA, but both should not be performed.	☢☢☢
Tc-99m V/Q scan lung	7	This procedure may be an alternative to CTA, but both should not be performed.	☢☢☢
US duplex Doppler lower extremity	7	This procedure may be an initial study prior to CTA.	O
MRA chest without and with IV contrast	6		O
CTA chest with IV contrast with CT venography lower extremities	5		☢☢☢
Arteriography pulmonary with right heart catheterization	3		☢☢☢☢
US echocardiography transthoracic resting	3		O
CT chest without IV contrast	2		☢☢☢
CT chest without and with IV contrast	2		☢☢☢
MRA chest without IV contrast	2	This procedure has limited sensitivity and may be indicated for rare situations or certain contraindications for a specific patient.	O
US echocardiography transesophageal	2		O

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

*Relative Radiation Level

This imaging modality was ordered by the physician

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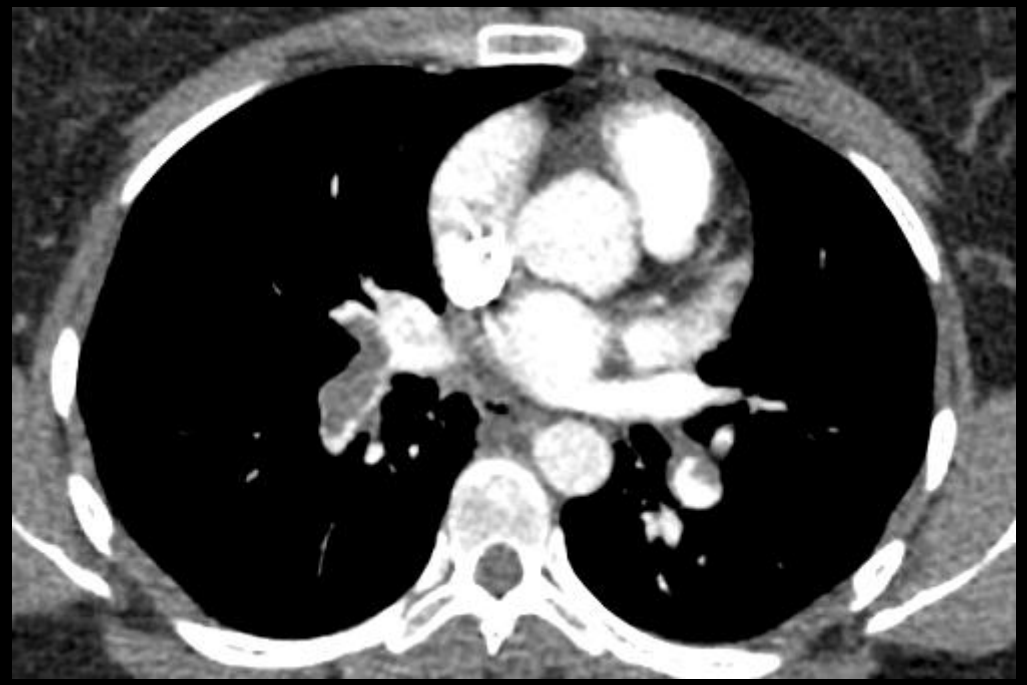

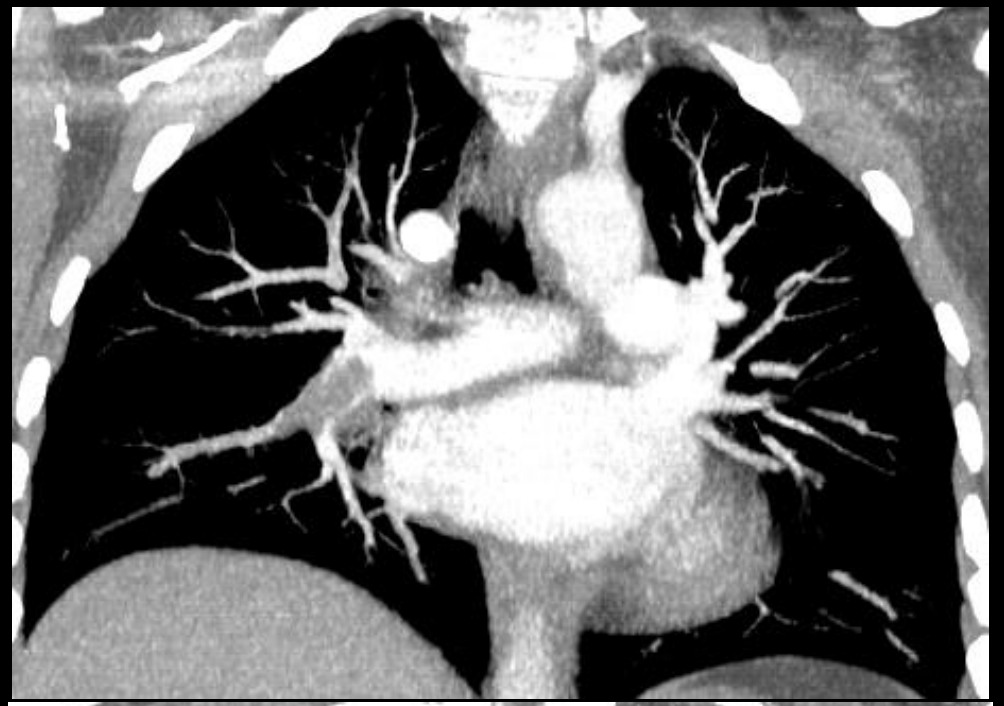

CTA Results

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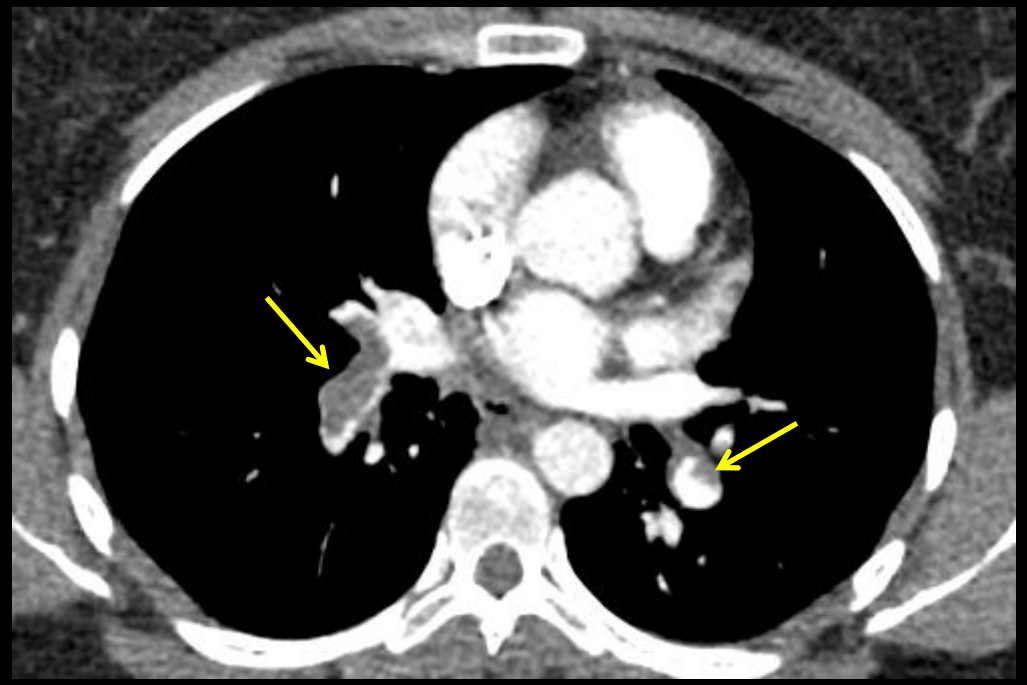

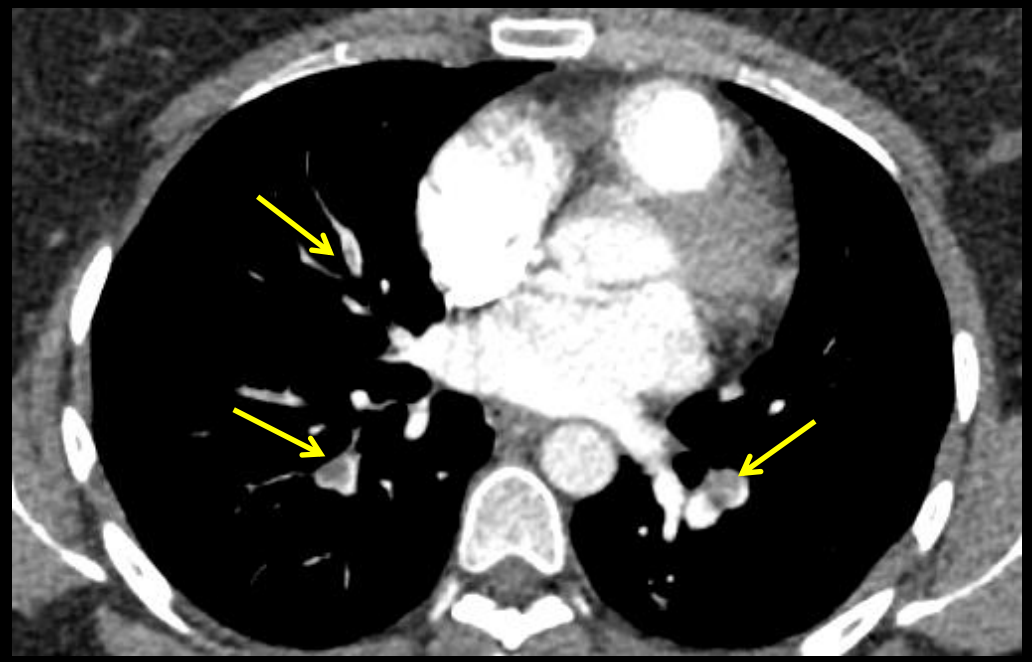

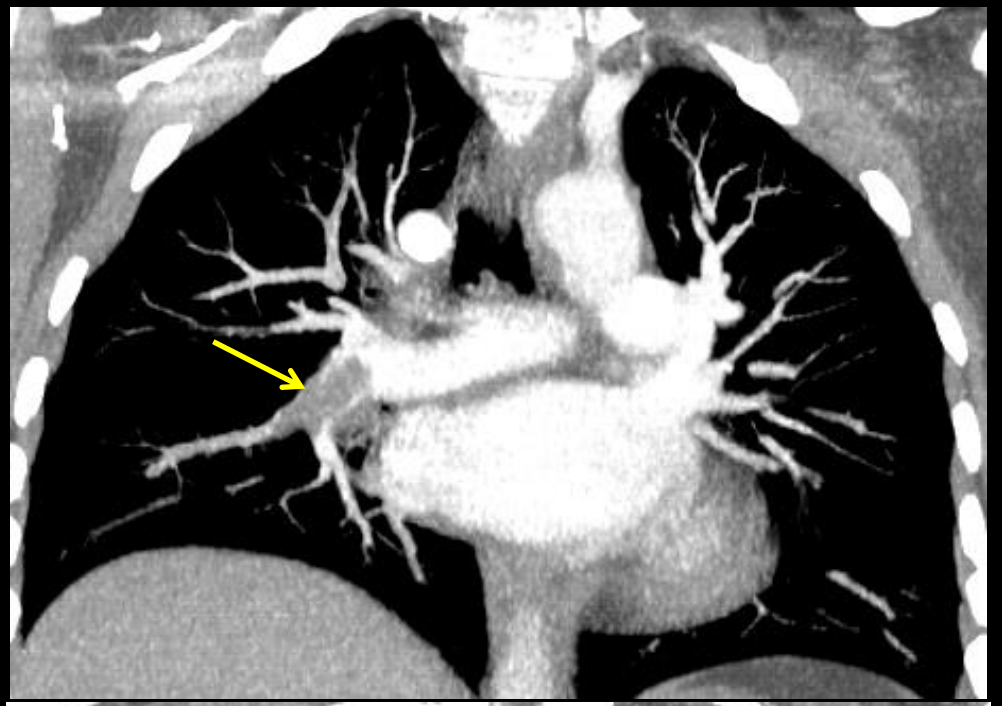

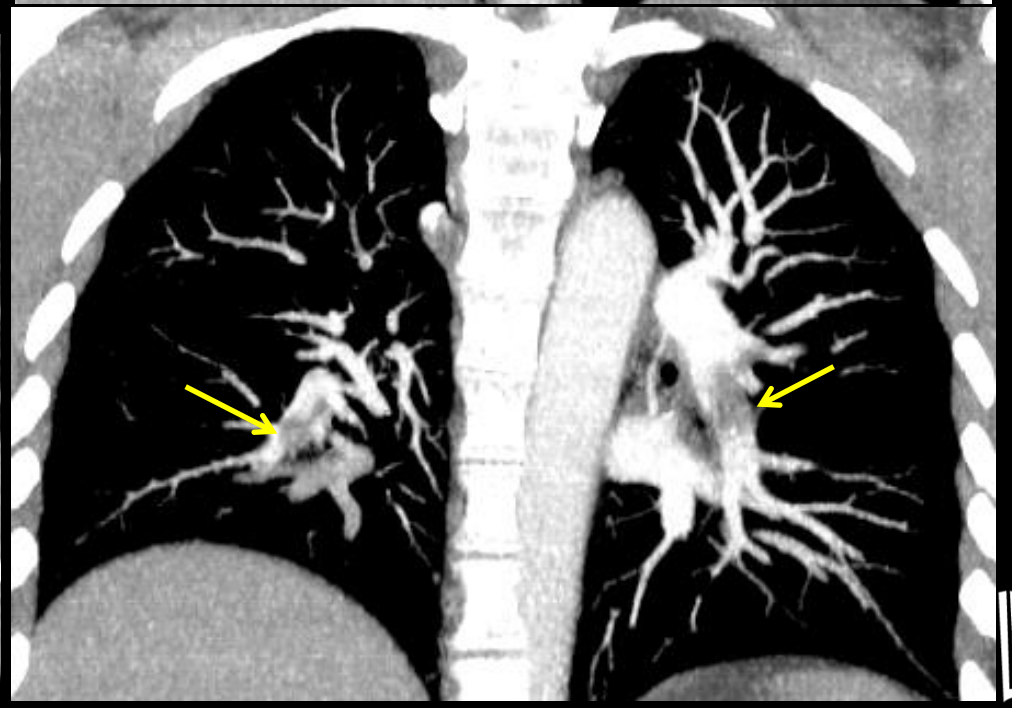

CTA Results

Bilateral acute pulmonary emboli extending into the right lung upper and lower lobes and the lower lobe of the left lung

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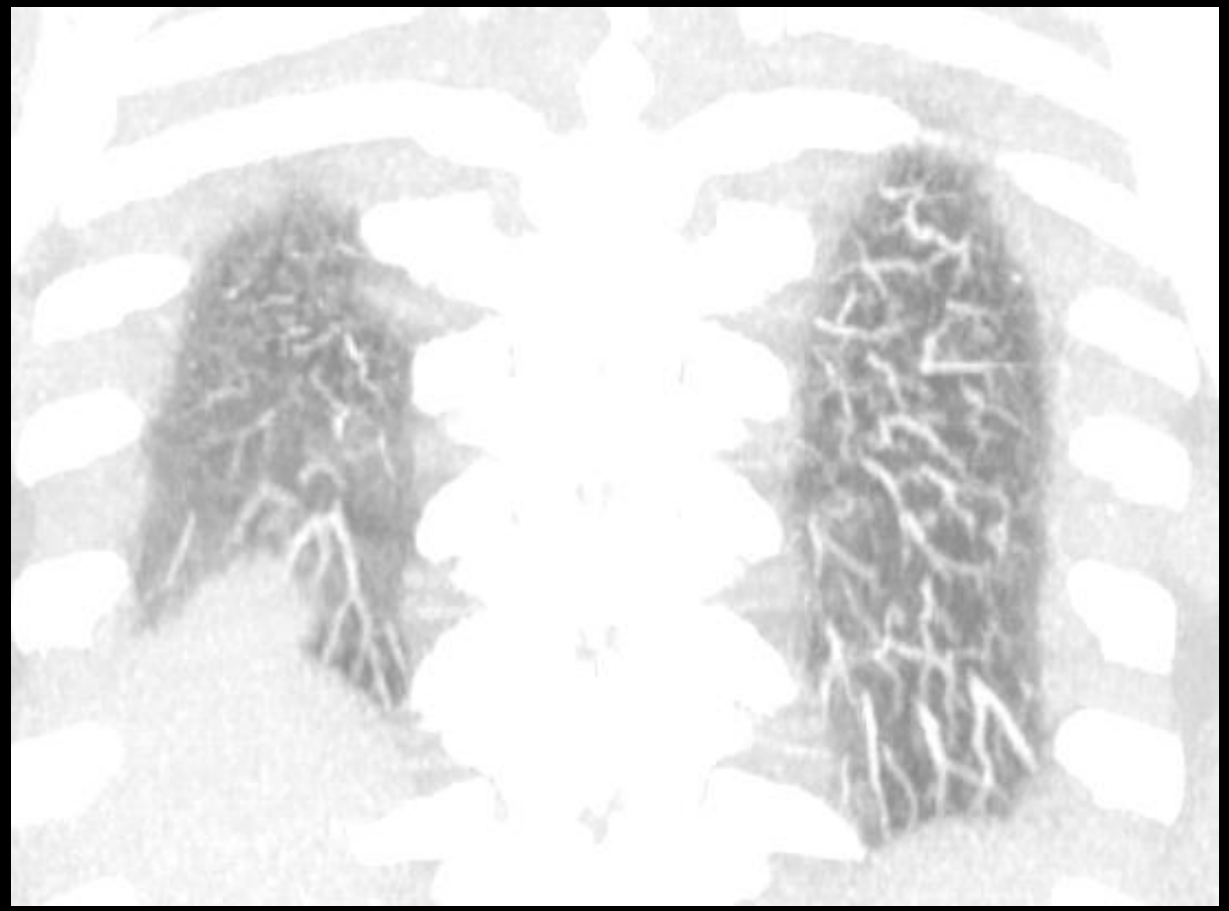
CTA Results



CTA Results

Rounded area in lower lobe of right lung likely representing infarction

Final Diagnosis:

Subacute Bilateral Pulmonary Embolism (PE)
Likely secondary to obesity, oral contraceptive use, and sedentary lifestyle

The patient was treated initially with enoxaparin and then was transitioned to rivaroxaban for maintenance anticoagulation

Pulmonary Embolism

- Risk Factors: inherited thrombophilias, malignancy, trauma, pregnancy, medications (including **OCPs**), immobilization, **obesity**, smoking
- Commonly presents with dyspnea, pleuritic chest pain, cough, and symptoms of deep vein thrombosis (DVT)
- Laboratory tests such as D dimer can be used in initial evaluation when likelihood of PE is low, as it has a high negative predictive value. If the value is elevated, a CT angiogram can be done.

Pulmonary Embolism

- Pulmonary infarction is a possible complication of PE
  - More common in small thrombi in distal vessels
  - More likely in patients with comorbidities such as heart failure
  - Radiographically, it is a triangular or rounded opacity with adjacent pleural thickening
- Treatment: stable patients with low risk of bleeding should be started on anticoagulation therapy as soon as possible
  - Maintenance anticoagulation typically lasts 3 months, but this may be extended to 6 or 12 months

References:

- https://www.uptodate.com/contents/clinical-presentation-evaluation-and-diagnosis-of-the-nonpregnant-adult-with-suspected-acute-pulmonary-embolism?search=pulmonary%20embolism&source=search_result&selectedTitle=3~150&usage_type=default&display_rank=3
- https://www.uptodate.com/contents/overview-of-the-causes-of-venous-thrombosis?topicRef=8253&source=see_link#
- https://pubs.rsna.org/doi/full/10.1148/radiographics.20.2.g00mc17491
- https://www.uptodate.com/contents/treatment-prognosis-and-follow-up-of-acute-pulmonary-embolism-in-adults?search=pulmonary%20embolism&source=search_result&selectedTitle=2~150&usage_type=default&display_rank=2#H348157817

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