AMSER Case of the Month November 2025

54-year-old man presents with worsening flu-like symptoms and dyspnea

Eman Sharif, MS4- University of Illinois College of Medicine-Chicago

Anugayathri Jawahar, MD
Associate Program Director, Diagnostic Radiology Residency
Assistant Professor of Radiology (Body Imaging)
Northwestern University - Feinberg School of Medicine
Northwestern Memorial Hospital, Chicago

UIC UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE

Northwestern Medicine

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Patient Presentation

Clinical history: 54-year-old male patient with PMH of HTN, presented to the ED for 3 weeks of worsening flu-like symptoms and dyspnea.

Social History: Nonsmoker, no alcohol or drug use.

Vitals: T: 100.3F, HR: 120, BP: 93/63, RR: 20, SpO2: 86% on RA.

Physical Exam: Respiratory Exam- Absent breath sounds over right lung fields and diminished breath sounds over left lung base.

Lab Studies: No leukocytosis (WBC: 4.6), negative RVP (including Covid), D-Dimer: <0.27 (normal).

Clinical Question and/or Clinical Differential Diagnosis

- What could explain this patient's 3-week history of worsening flu-like symptoms, dyspnea, and decreased breath sounds on auscultation?

- **Differential diagnosis:**

  - Primary or Metastatic Bronchogenic Carcinoma- most common cause of cancer mortality in adults, often leading to bronchogenic obstruction and pleural effusion.

  - Lymphoma: possible cause of post-obstructive pneumonia or atelectasis.

  - Pneumonia- in the setting of worsening flu-like symptoms, possibly complicated by a mucus plug or parapneumonic effusion.

  - Pulmonary Embolism: important to consider, and can cause subacute dyspnea and effusion.

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 2: **Adult. Acute respiratory illness in immunocompetent patients with positive physical examination or abnormal vital signs or organic brain disease or other risk factors for poor outcome. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
Radiography chest	Usually Appropriate	☢
US chest	Usually Not Appropriate	O
MRI chest without and with IV contrast	Usually Not Appropriate	O
MRI chest 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	Usually Not Appropriate	☢☢☢
V/Q scan lung	Usually Not Appropriate	☢☢☢

This imaging modality was ordered by the ER physician

https://acsearch.acr.org/docs/69446/narrative/

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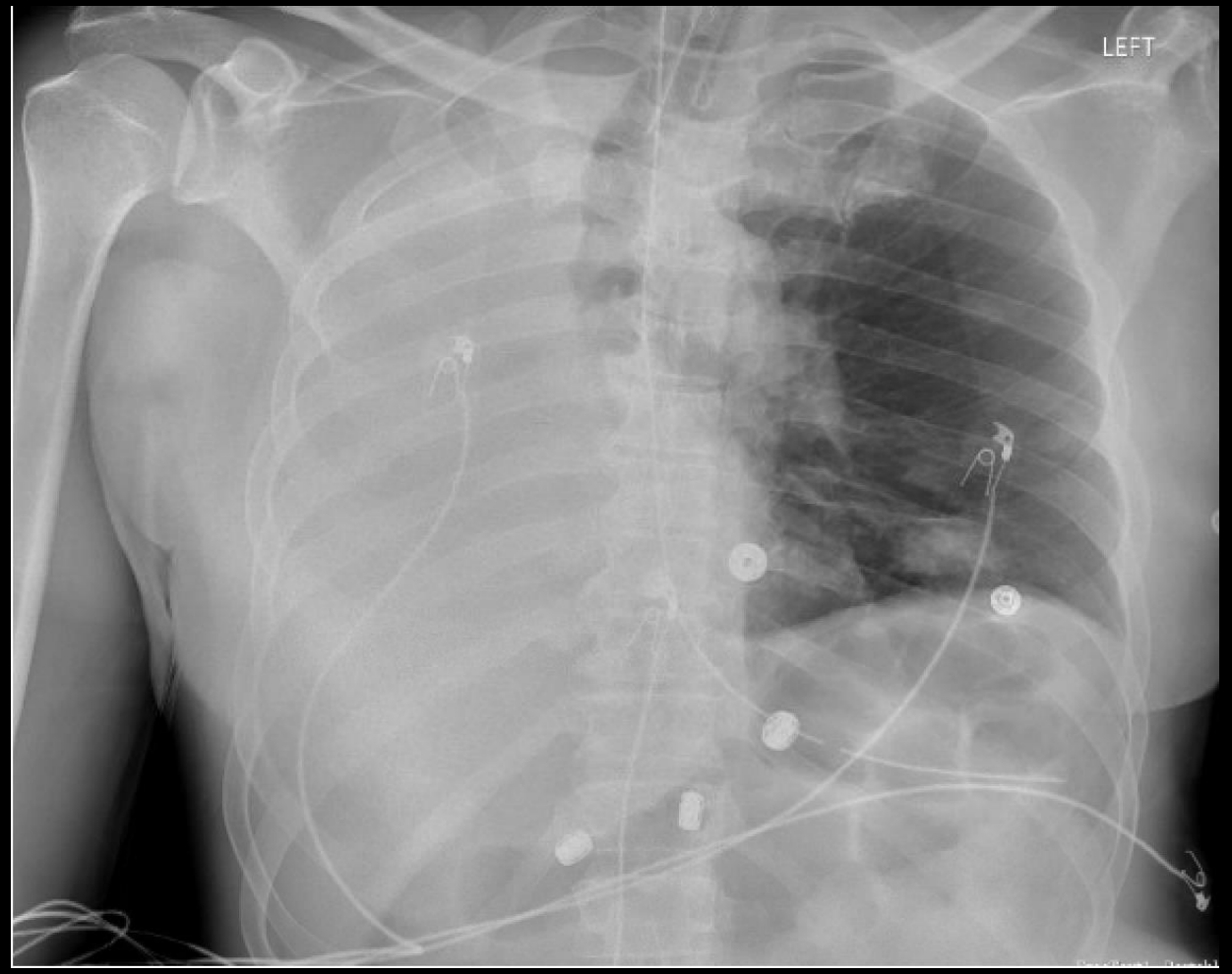
Findings (unlabeled)

Chest X-Ray



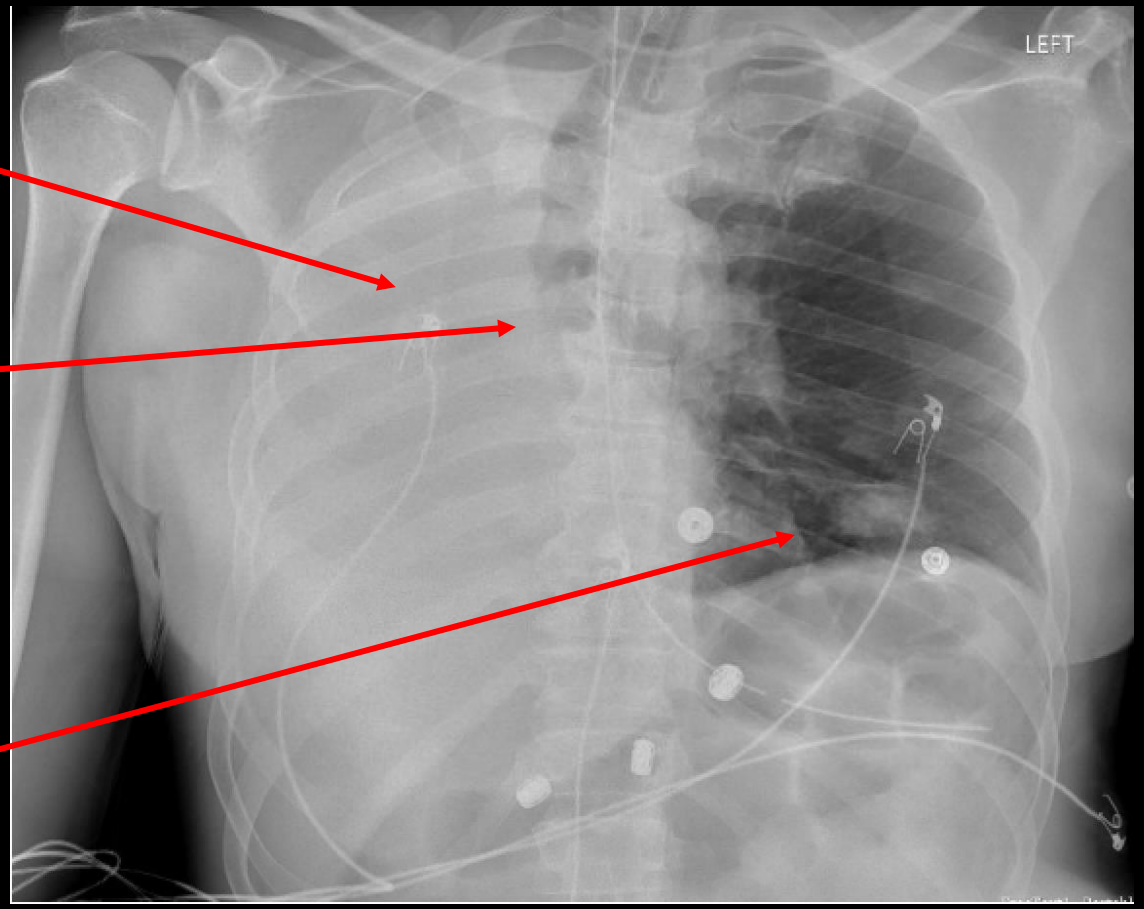
Findings: (labeled)

Chest X-Ray

1. Right hemithorax opacification

2. Rightward mediastinal shift with abrupt cutoff of the right mainstem bronchus suspicious for centrally obstructing endobronchial mass and post obstructive atelectasis

3. Left lower lobe nodular opacity



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What Imaging Should We Order Next?

Select the applicable ACR Appropriateness Criteria

American College of Radiology
ACR Appropriateness Criteria®
Noninvasive Clinical Staging of Primary Lung Cancer

Variant 1: **Noninvasive initial clinical staging of non–small-cell lung carcinoma.**

Procedure	Appropriateness Category	Relative Radiation Level
CT chest with IV contrast	Usually Appropriate	☢☢☢
FDG-PET/CT skull base to mid-thigh	Usually Appropriate	☢☢☢☢
MRI head without and with IV contrast	Usually Appropriate	O
CT chest without IV contrast	Usually Appropriate	☢☢☢

These imaging modalities were ordered by the ER physician

https://acsearch.acr.org/docs/69456/Narrative/

- **CT chest** and **bronchoscopic biopsy** are advised and performed to assess for suspected underlying neoplasm, likely non-small cell lung cancer, which needs to be excluded.

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Findings (unlabeled)

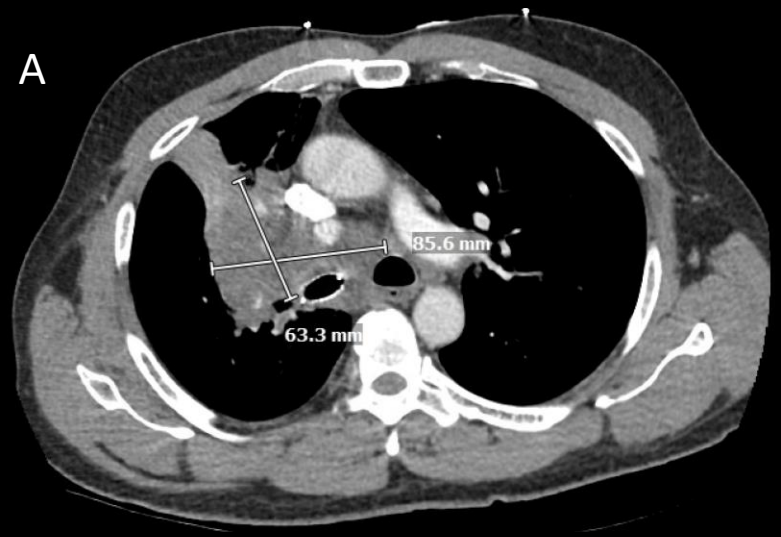
Chest CT without Contrast

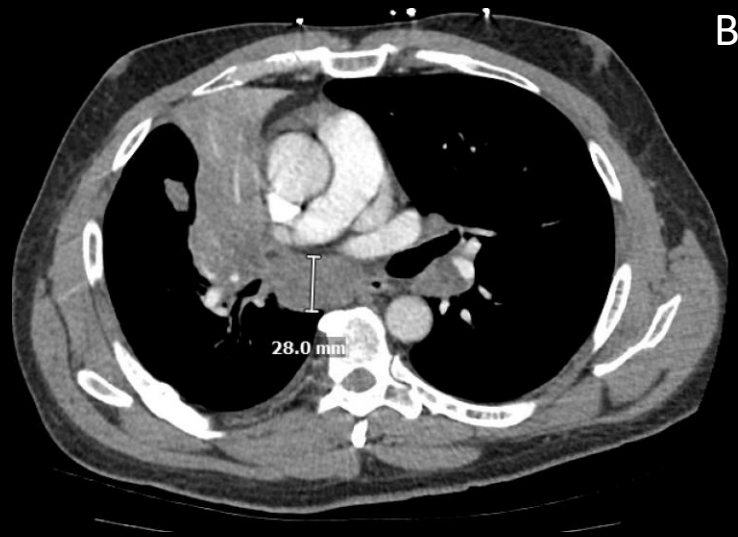
Mediastinum Window

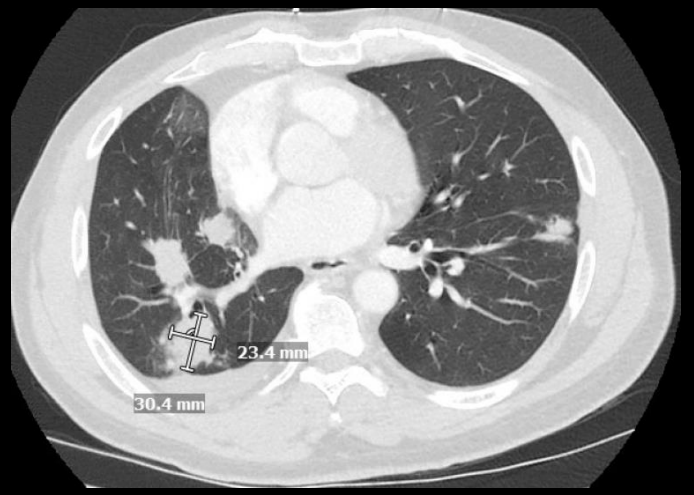
Lung Window

Findings (unlabeled)

Chest CT with Contrast







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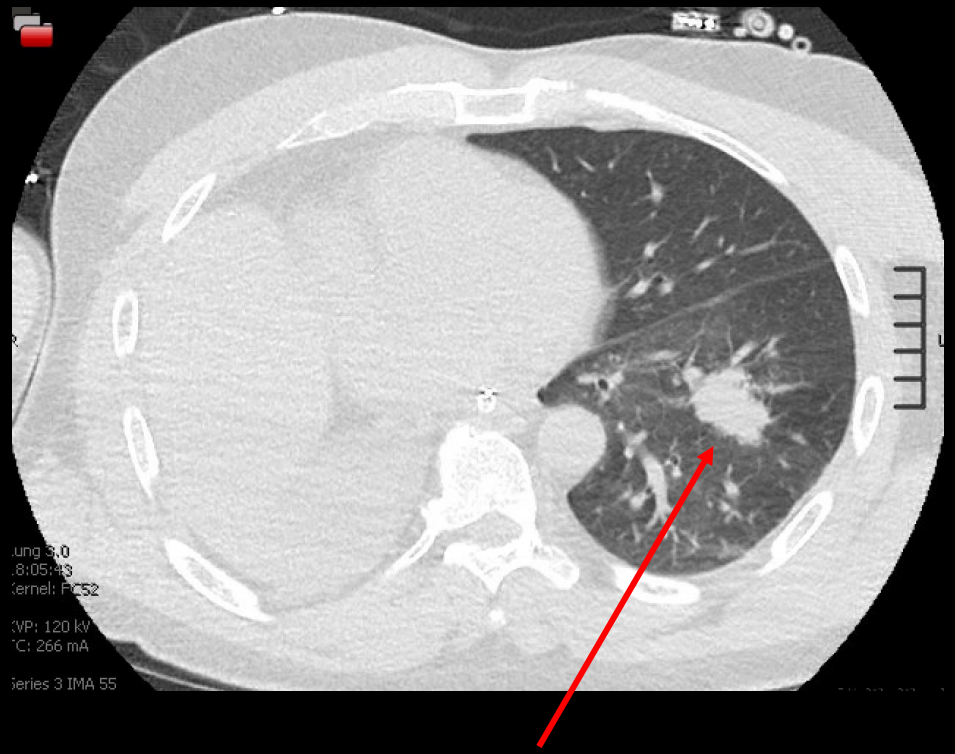
Findings (labeled)
Chest CT without Contrast

Mediastinum Window

- Right hilar soft tissue mass with endobronchial extension and occlusion of right mainstem bronchus and post obstructive right lung atelectasis. Associated right paratracheal adenopathy

Lung Window

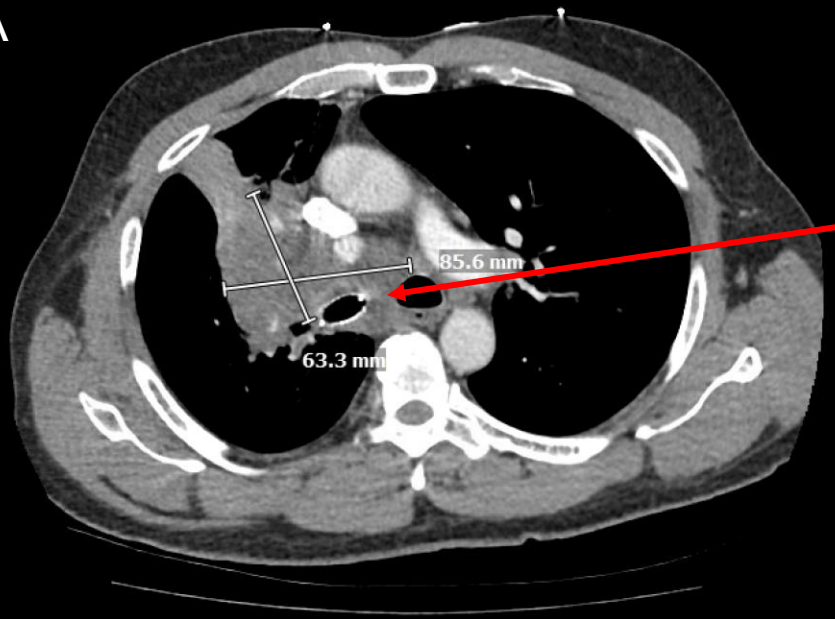


- Left lung pulmonary nodule measuring 3.0 x 2.1 cm.

Findings (labeled)

Chest CT with Contrast

A



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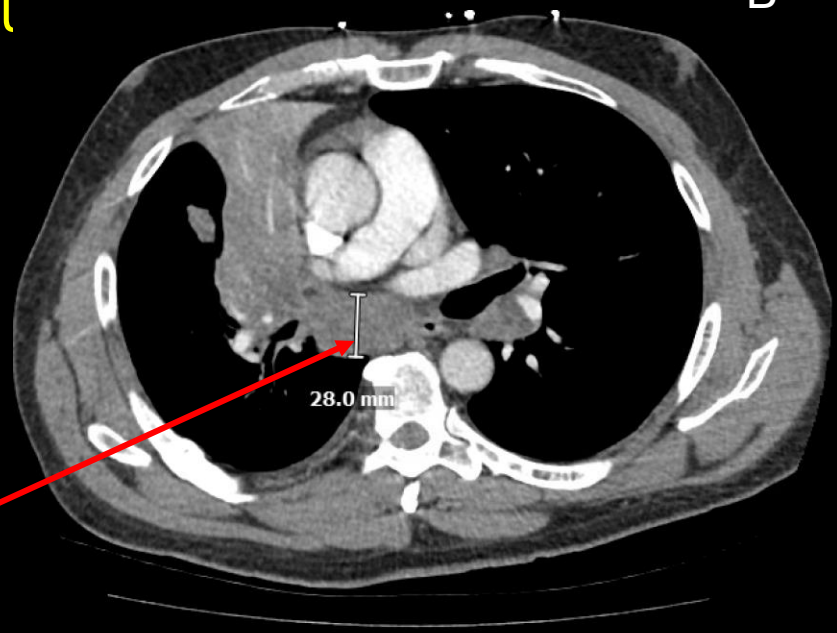

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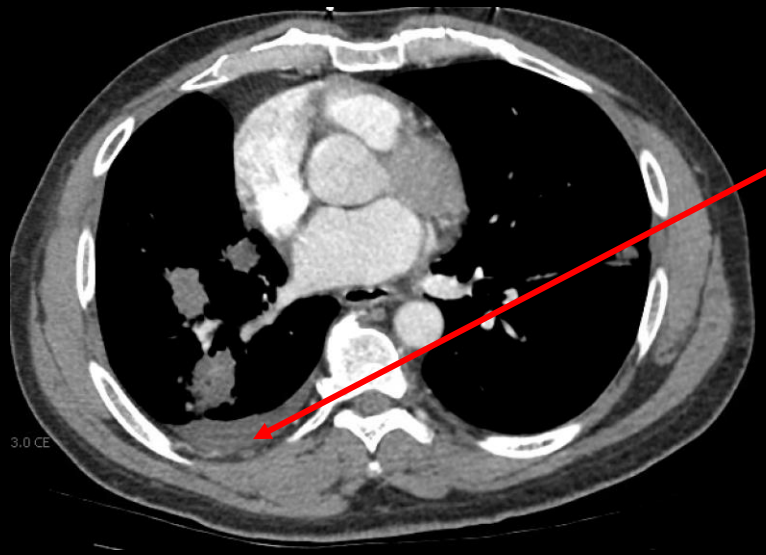

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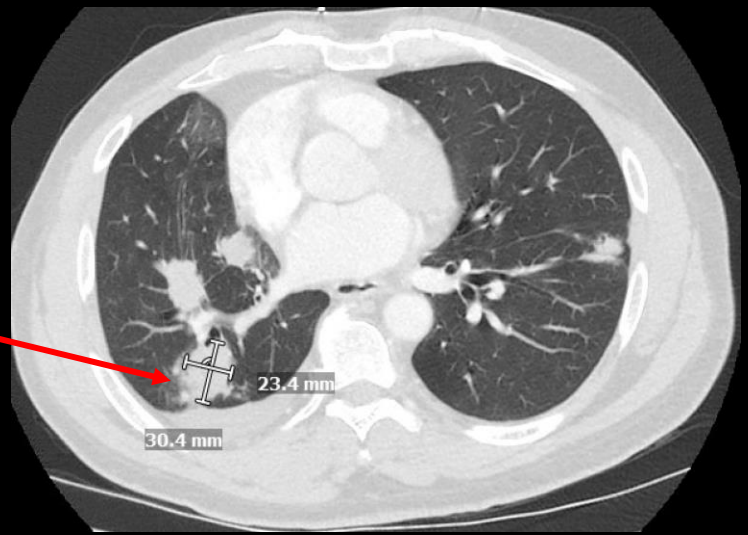

Heterogenously attenuating confluent right hilar mass , predominantly low attenuation (8.6 x 6.3 cm extending into right paratracheal region with interval placement of right mainstem bronchus stent

Additional left hilar and subcarinal lymphadenopathy, latter measuring 2.8 cm in short axis

Small right-sided pleural effusion with no nodular pleural thickening

Multiple bilateral pulmonary nodular densities, for reference , right lower lobe nodule measuring 3.0 x 2.3 cm.

Final Pathology Report is Ready…

- Bronchoscopic Biopsy Results:
  - Microscopic: atypical epithelioid cells, necrosis, gland-like structures, and increased mitotic activity are suggestive of malignancy (as initially suspected).
  - Immunohistochemistry (IHC): +ER (100%, strong), and +PR (100%, strong), indicating primary breast cancer (rather than our original suspicion for NSCLC).
- This led to a mammography with tomosynthesis, which was ***negative*** despite confirmation of distant metastasis.

What Imaging Should We Order Next?

Select the applicable ACR Appropriateness Criteria

Variant 11: **Suspected distant recurrence of breast cancer based on symptoms, physical examination, or laboratory value. Regardless of clinical stage at time of original presentation.**

Procedure	Appropriateness Category	Relative Radiation Level
MRI head without and with IV contrast	Usually Appropriate	O
Bone scan whole body	Usually Appropriate	☢☢☢
CT chest abdomen pelvis with IV contrast	Usually Appropriate	☢☢☢☢
FDG-PET/CT skull base to mid-thigh	Usually Appropriate	☢☢☢☢
MRI head without IV contrast	Usually Not Appropriate	O
CT chest abdomen pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
CT chest abdomen pelvis without IV contrast	Usually Not Appropriate	☢☢☢☢

This imaging modality was ordered by the interventional pulmonologist

https://acsearch.acr.org/docs/3186697/Narrative/

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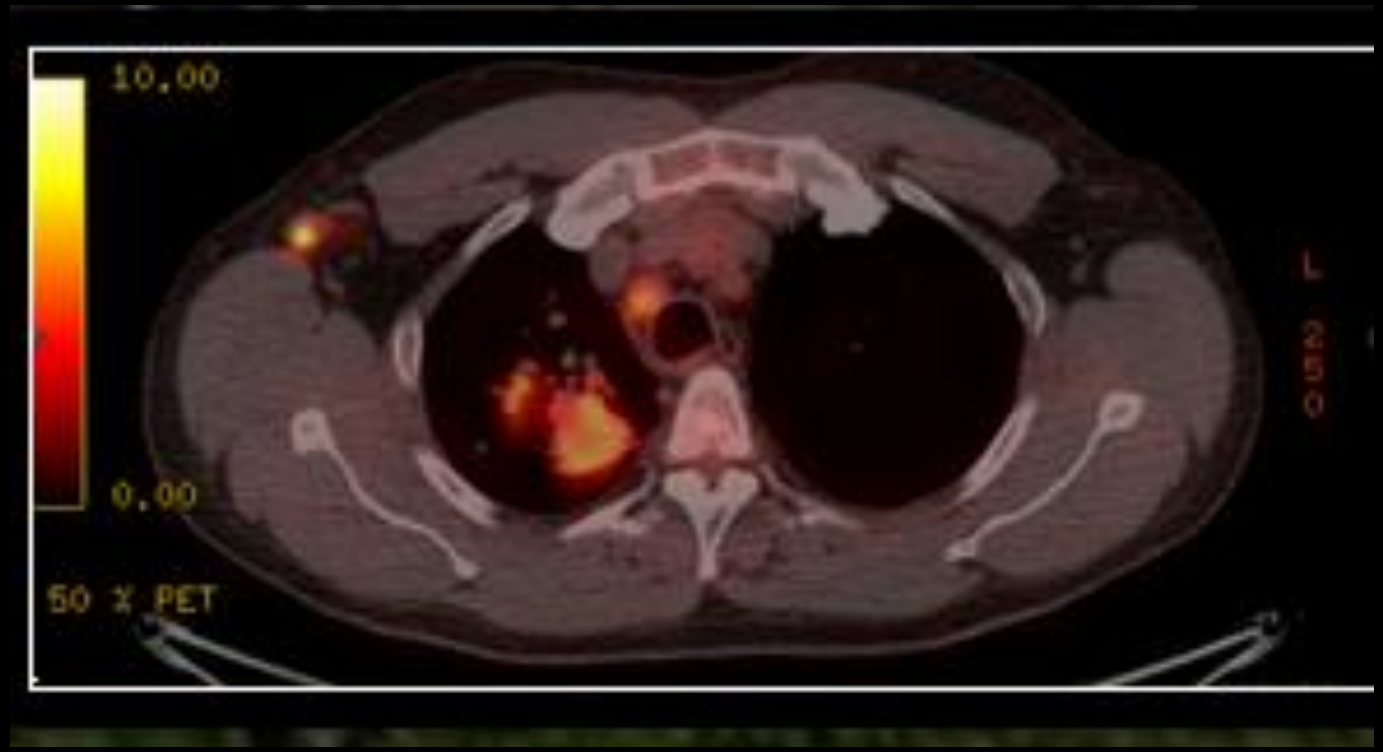
Findings (unlabeled)

PET-CT

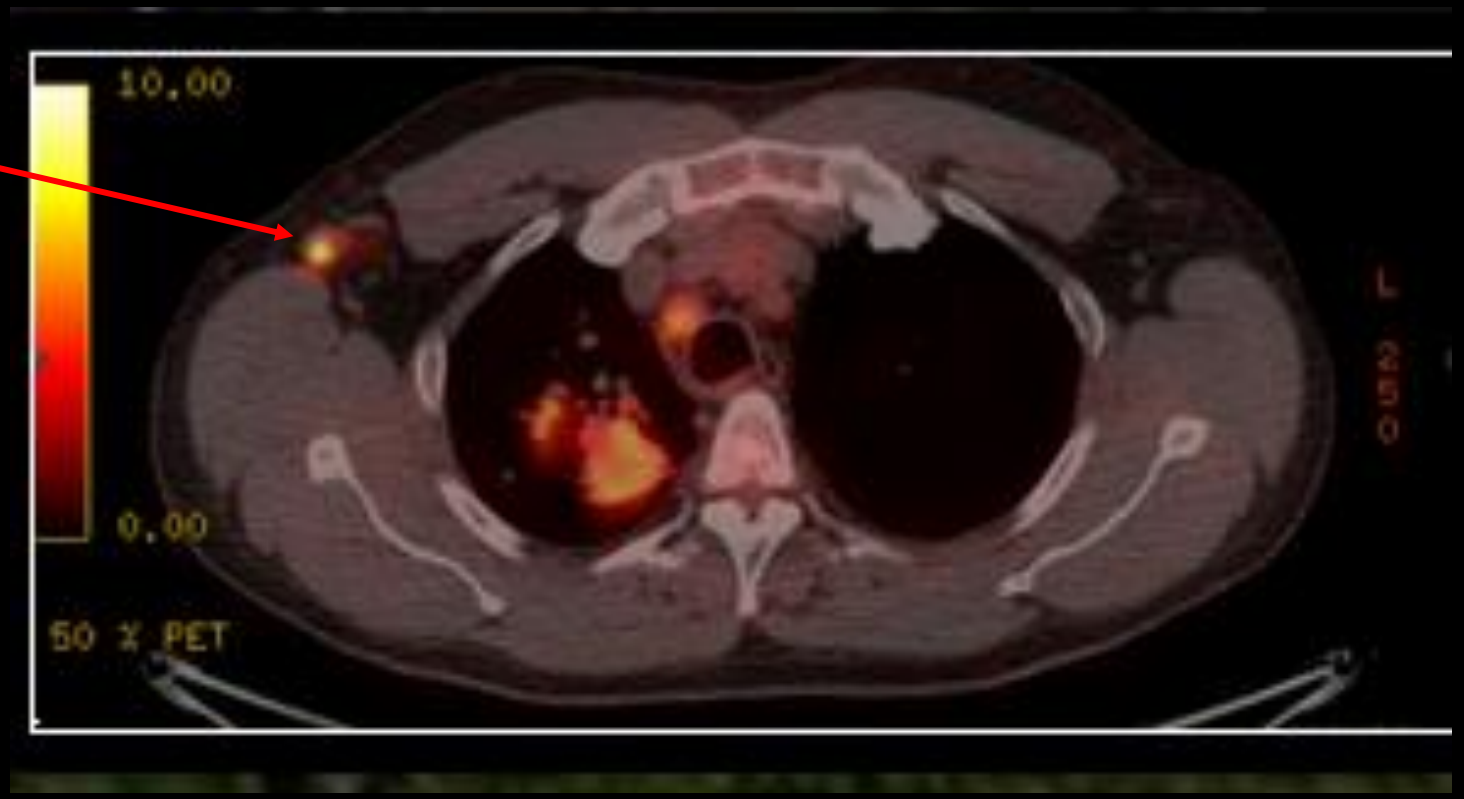


Findings (labeled)

PET-CT

- Hypermetabolic right axillary lymph nodes.

- PET-CT detected right axillary findings suggestive of the origin of primary breast cancer, which were <u>not discovered on prior imaging.</u>



Final Diagnosis:

Primary Breast Cancer: Stage IV Disease

with lung and intrathoracic nodal metastases

Case Discussion

- **Chest X-ray** initially raised concern for a central obstructing mass with post-obstructive changes, suggestive of primary lung cancer.
- **Non-contrast CT** confirmed centrally obstructing hilar mass, additional thoracic lymphadenopathy, post obstructive atelectasis, and pulmonary nodules.
- **Contrast-enhanced CT** further characterized vascularity and distinguished between central tumor and post obstructive atelectasis. Contrast aids in assessment of pulmonary vascular involvement.

Case Discussion Continued…

- **Bronchoscopic biopsy pathology** revealed positive IHC favoring primary breast cancer.
    - Despite initial imaging and morphological findings that were highly suggestive of our original suspicion of primary lung cancer.
- **PET-CT** confirmed hypermetabolic activity in right axillary lymph nodes (after a negative mammogram and tomosynthesis), suggesting the origin of the breast cancer that metastasized to the lungs bilaterally.
- This complex oncologic case underscores the value of ACR-guided multimodality imaging in uncovering an uncommon presentation of metastatic breast cancer, which initially resembled primary lung cancer in a male experiencing common URI symptoms.

References:

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