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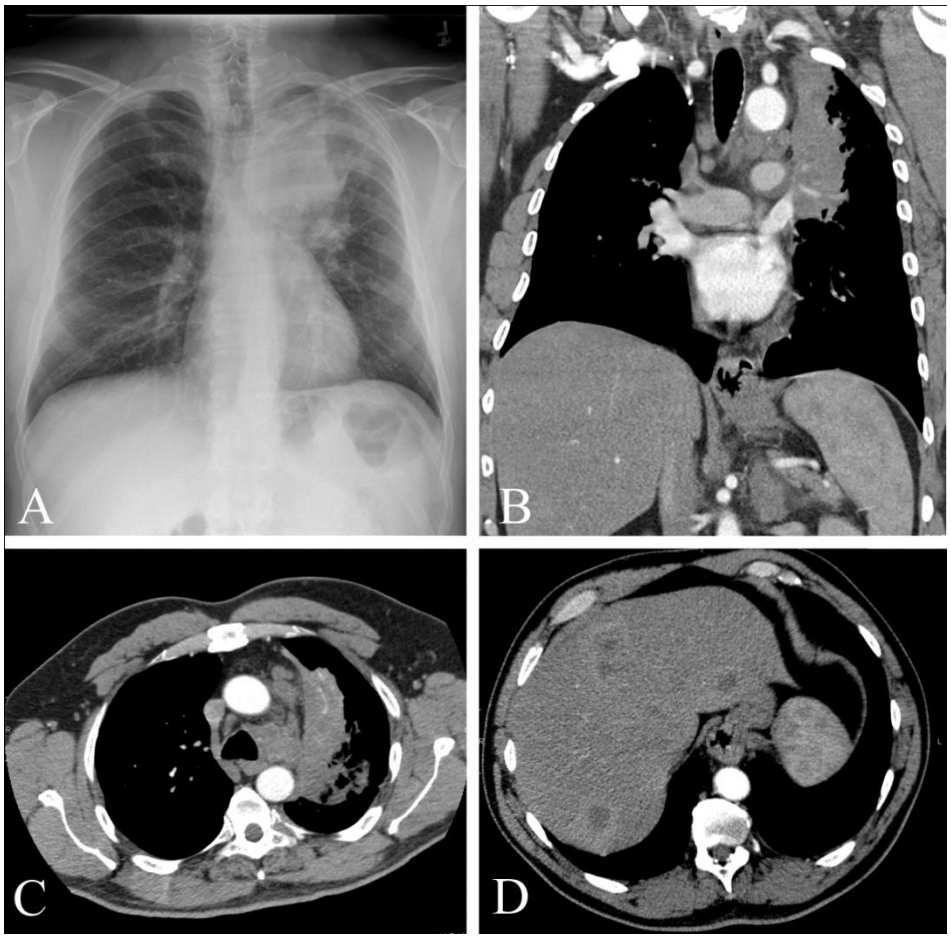
CLINICAL PRESENTATION AND RADIOLOGY QUIZ QUESTION

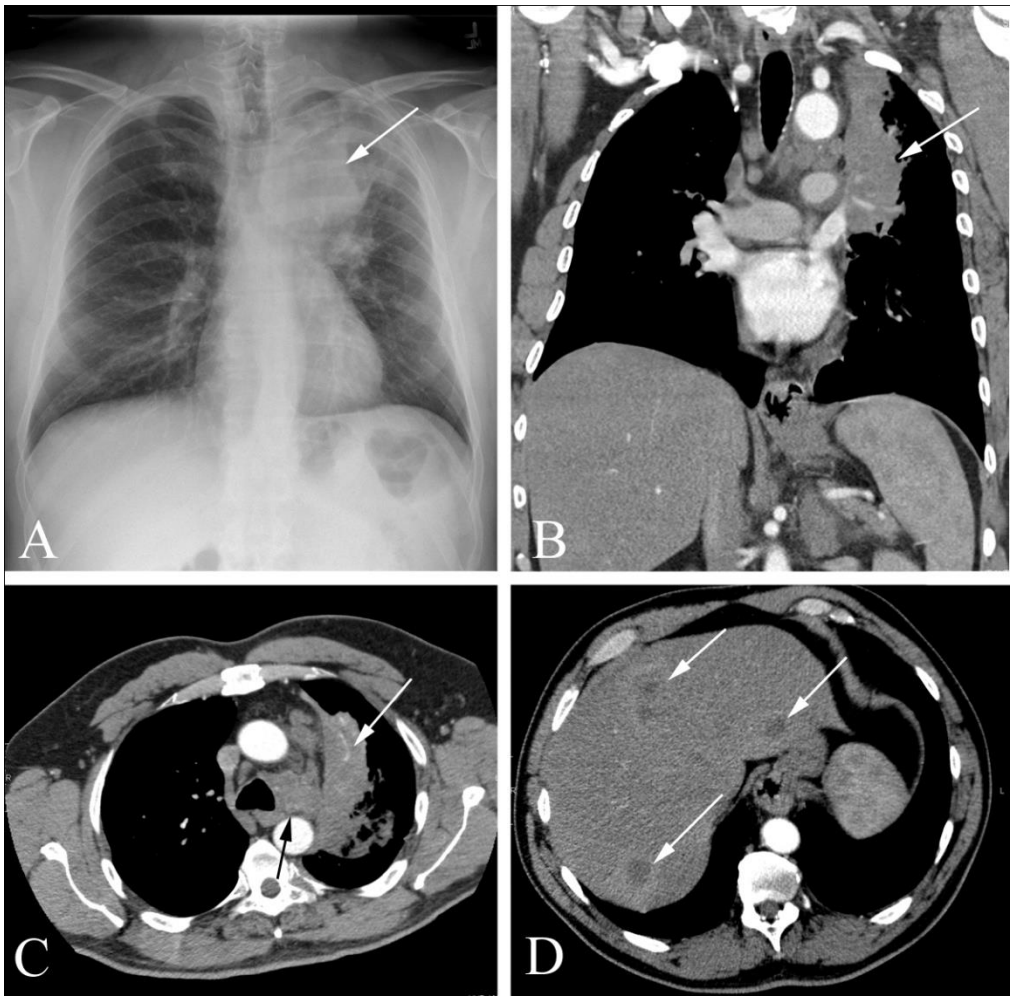
A 57 year old recently retired demolitions worker complains of increasing shortness of breath. The patient was a chronic heavy cigarette smoker through his adult life but quit about a year before presentation. A plain film was obtained, and a chest CT was also performed:



Which of the following steps is *not* appropriate in the evaluation of this patient?

(a) positron emission tomography (PET scan)
(b) bronchoscopy
(c) computed tomography directed biopsy of the lesion
(d) follow-up CT in 3 to 6 months to document stability of the lesion

RADIOLOGY QUIZ QUESTION, ANSWER, AND EXPLANATION



57 year old man with increasing shortness of breath. A. PA chest radiograph shows a large mass in the left upper lobe (arrow). B. Coronal contrast-enhanced CT study shows a left upper lobe lung mass (arrow). C. Axial CT study shows a left upper lobe lung mass (white arrow) and enlarged mediasintal lymph nodes (black arrow). C. Axial CT study shows multiple liver masses (arrows).

Answer: (d), follow-up CT in 3 to 6 months to document stability of the lesion is *not* an appropriate next step in evaluation of this patient, and thus (d) is the correct answer.

Positron emission tomography (PET scan) is an appropriate next step, which would be expected to show hypermetabolism in the lesion as well as any metastatic deposits, and thus (a) is *not* the correct answer. Bronchoscopy with sampling of the lesion is an appropriate next step, and therefore (b) is *not* the correct answer. Computed tomography directed biopsy of the lesion is also an appropriate next step, and thus (d) is *not* the correct answer.

IMAGING STUDY AND QUESTIONS

The patient underwent a procedure:

Imaging questions:

1) What type of study is shown?
2) Are there any abnormalities?
3) What is the most likely diagnosis?
4) What is the next step in management?

IMAGING STUDY QUESTIONS AND ANSWERS

Imaging questions:

1) What type of study is shown? A CT-directed biopsy.
2) Are there any abnormalities? Yes. The patient's left lung mass is shown. There is a biopsy needle in the mass.
3) What is the most likely diagnosis? Lung malignancy, with metastatic liver lesions (as seen on the CT study shown on Page 2).
4) What is the next step in management? Await the return of the biopsy results.

PATIENT DISPOSITION, DIAGNOSIS, AND FOLLOW-UP

The biopsy of the lung mass showed adenocarcinoma. One of the liver lesions was also biopsied and demonstrated metastatic adenocarcinoma with features compatible with a primary location in the lung. Images from the diagnostic CT study also showed destructive change in multiple bones, and a subsequent bone scan showed increased bone turnover in these locations compatible with metastatic deposit. The patient was referred to oncology for further evaluation and treatment.

SUMMARY

Presenting symptom: The patient had increasing shortness of breath but no chest pain or cough.

Imaging work-up: As noted in Radiology Quiz of the Week #61 and #62, the first imaging study of choice for evaluating ambulatory patients with shortness of breath is a chest radiograph. In those cases when the plain film demonstrates an abnormality that needs further characterization, as was the case in this patient, the next step in imaging is usually a CT scan.

Establishing the diagnosis: When the patient has an obvious lung mass, as in this case, diagnosis rests on a microscopic evaluation of tissue. This tissue may be obtained by a CT-directed biopsy, bronchoscopic biopsy, operative biopsy, or operative resection.

Take-home message: When imaging is performed in ambulatory patients with dyspnea, the initial study should be an upright, two-view chest radiograph. If an abnormality is detected that requires further imaging characterization, computed tomography (CT) is almost always the best next step. When the CT shows a mass, further evaluation typically includes tissue characterization.

FURTHER READING

Ravenel, JG. Non-small cell lung cancer. Chapter in Gurney JW, Winer-Muram HT, Stern EJ et al, *Diagnostic Imaging: Chest.* Amirsys, Salt Lake City, Utah, 2006.

Renfrew, DL. Cough, dyspnea, and lung nodules. Chapter 10 of *Symptom Based Radiology*, Symptom Based Radiology Publishing, Sturgeon Bay, WI, 2010, available for no charge at www.symptombasedradiology.com.