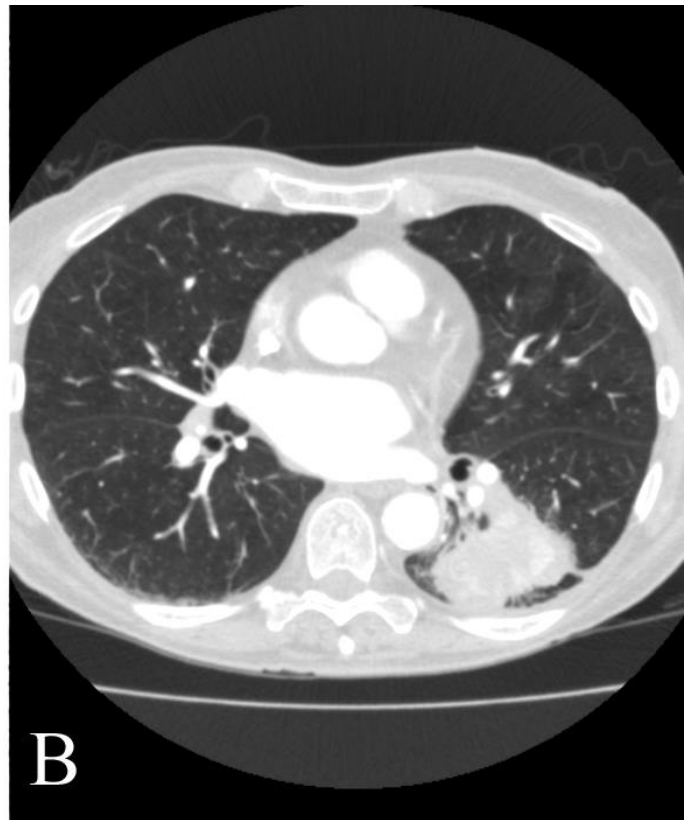
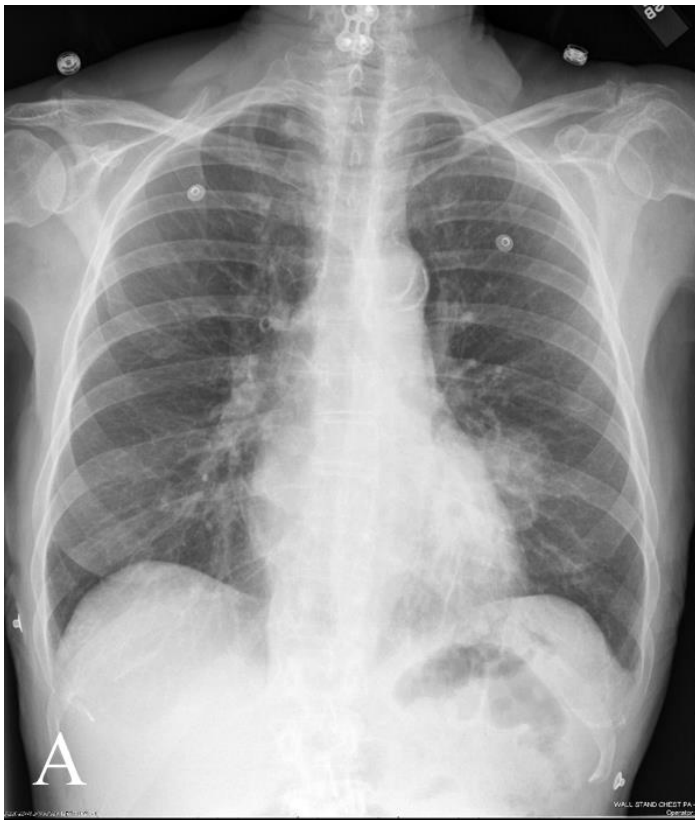


CLINICAL PRESENTATION AND RADIOLOGY QUIZ QUESTION

A 73 year old woman presents with chest pain which came on relatively suddenly and which is intermittently sharp and dull. The patient denies palpitations, diaphoresis, nausea, vomiting, or cough. Her pulse is 78, her blood pressure 128/80, and her temperature 97.7. A plain film was obtained, because of an abnormality on the plain film a chest CT was also performed:

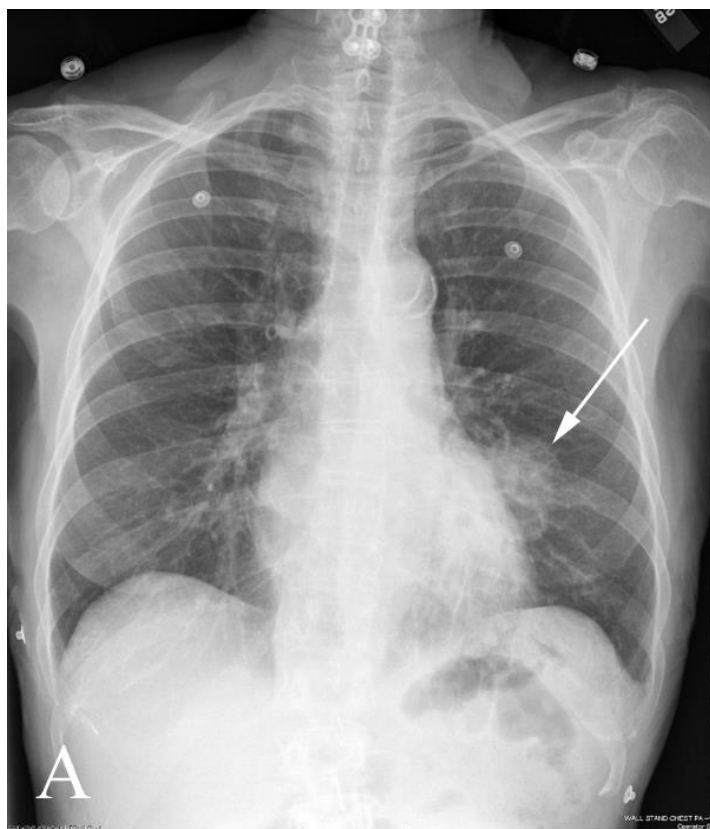


Which of the following steps is *not* appropriate in the evaluation of this patient?

- (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

(For the patient history and question, see Page 1.)



73 year old woman with chest pain. A. PA chest radiograph shows abnormal density in the left lower lobe (arrow). B. Axial contrast-enhanced CT study shows a left lower lobe mass (arrow). There was an additional 10 mm contralateral right upper lobe pulmonary nodule (not shown).

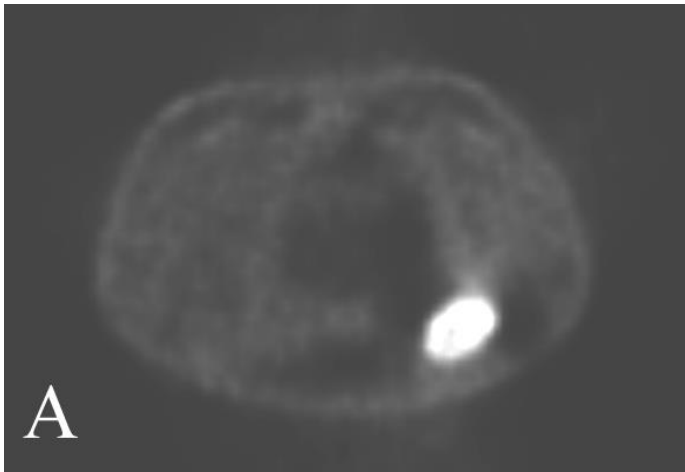
Answer: (d), follow-up CT in 3 to 6 months to document stability of the lesion is *not* an appropriate next step in evaluation of this patient, and thus (d) is the correct answer.

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, 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

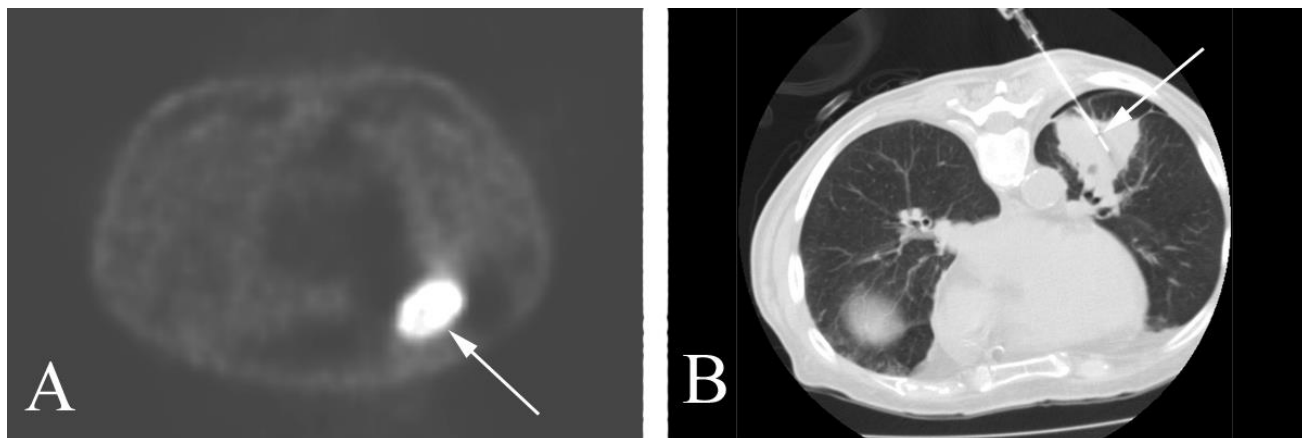
The patient underwent additional imaging and a procedure:



Imaging questions:

- 1) What study is shown in panel A? What procedure is illustrated in panel B?
- 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? Panel A is a PET study, and panel B shows a CT-directed lung biopsy.
- 2) Are there any abnormalities? Yes. Panel A shows marked hypermetabolism at the location of the tumor (arrow). The patient's contralateral right upper lobe nodule showed mild hypermetabolism (not shown). Panel B shows the patient's known lung mass, along with a biopsy needle in the middle of the mass (arrow).
- 3) What is the most likely diagnosis? Lung malignancy.
- 4) What is the next step in management? Await the return of the biopsy results.

PATIENT DISPOSITION, DIAGNOSIS, AND FOLLOW-UP
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The patient had been referred to an oncologist after the plain film and chest CT, and the oncologist ordered the PET-CT and the CT-directed lung biopsy. The biopsy of the lung mass showed “moderately to poorly differentiated adenocarcinoma.” The patient subsequently underwent evaluation by a cardiothoracic surgeon, and the patient’s smaller right apical lung nodule (not easily accessible by percutaneous needle biopsy) was resected using video-assisted thoracoscopic surgery (VATS). The right lung lesion was found to be metastatic disease. The patient refused further work-up and treatment.

SUMMARY

Presenting symptom: The patient initially presented with chest pain. The chest radiograph demonstrated an abnormality that required further evaluation.

Imaging work-up: As noted in Radiology Quiz of the Week #67 and #68, the first imaging study of choice for evaluating ambulatory patients with chest pain 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 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. In patients with a lung mass, Positron Emission Tomography (PET) scanning may be performed to document hypermetabolism of the obvious lesion(s) and to stage the extent of the disease. In smaller (arbitrarily approximately 2.5 cm) pulmonary lesions that do *not* demonstrate hypermetabolism, the lesion may be followed with sequential imaging to document stability.

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

Note the similarity of this case to Radiology Quiz of the Week #59, Recurrent Cough. Chest pain and cough often accompany each other, although in this case the patient specifically denied cough.

FURTHER READING

Meisel JL. Diagnostic approach to chest pain in adults. UpToDate, accessed 10/2/09.

Renfrew, DL. Imaging of chest pain. Chapter 11 of *Symptom Based Radiology*, Symptom Based Radiology Publishing, Sturgeon Bay, WI, 2010, available for no charge at www.symptombasedradiology.com.

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.

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