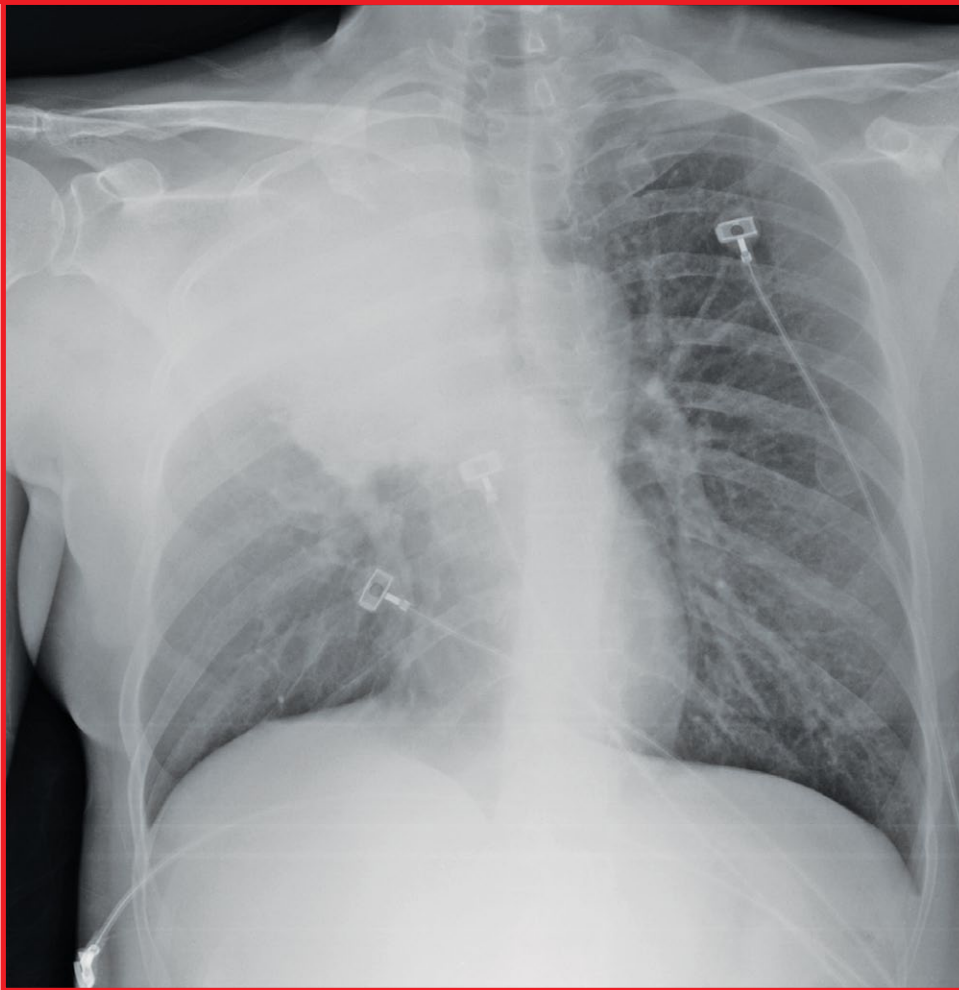


EMERGENCY IMAGING

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FIGURE 1



A 60-year-old woman presents to the ED with cough and hemoptysis. A radiograph is obtained (Figure 1).

What is your suspected diagnosis?

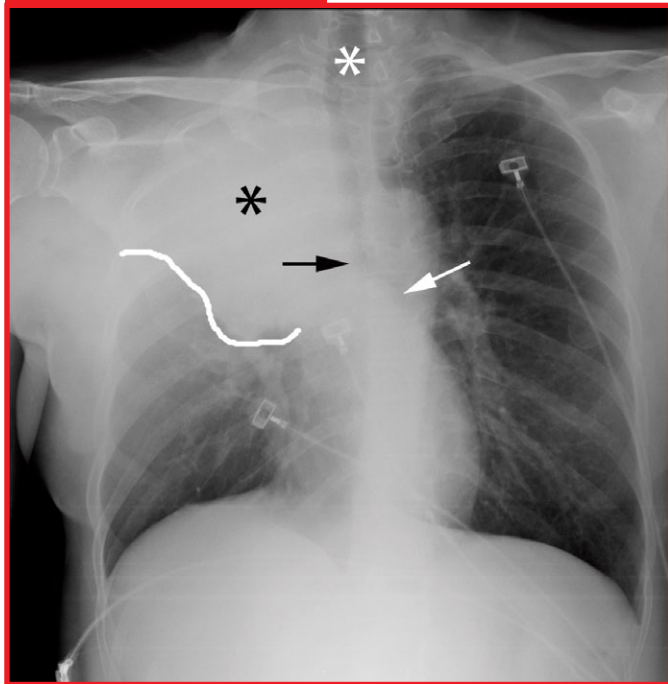
Which imaging examination, if any, should be performed next?

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CONTINUED

ANSWER

FIGURE 2



The radiograph demonstrates dense opacity in the right upper lobe (black asterisk, Figure 2). The differential diagnosis for lobar opacity on radiographs includes collapse (atelectasis) and consolidation (pneumonia, hemorrhage). Lobar consolidation typically results in increased volume of the affected lobe as a result of fluid filling the air spaces. Lobar collapse typically results in volume loss, as the air spaces are not filled. In the case presented, there appears to be mild volume loss, as the trachea (white asterisk, Figure 2) deviates from midline toward the side of the opacity. While the radiograph demonstrates right upper lobe collapse, it also shows two ominous signs suggesting that an underlying mass may have caused the collapse to occur.

The first is the apparent contour of the minor fissure. In right upper lobe collapse, the fissure should be displaced upward and remain concave. In this case, there is bulging of the opacity downward at the central aspect of the lung, and the apparent inferior contour of the right upper lobe assumes a reverse S shape. This has been termed the *Golden S sign* and was first described by R. Golden in 1925.¹ This contour suggests the presence of a central lung mass, and although it was originally described with bronchogenic carcinoma, it may also be seen with metastatic disease and lymphadenopathy.²

The second radiographic sign present on the patient's initial study is the bronchial cutoff sign. On the patient's left side, the bronchus can be seen extending into the left lung (white arrow, Figure 2). On the affected side, however, there is an abrupt cutoff of the right mainstem bronchus (black arrow, Figure 2). This sign indicates the presence of soft tissue within the bronchus, and its etiology may be benign (eg, mucous plug) or malignant (eg, neoplasm). When seen in the presence of the Golden S sign, the bronchial cutoff sign is highly suggestive of malignancy.

With this high suspicion for a mass, the most ap-

FIGURE 3

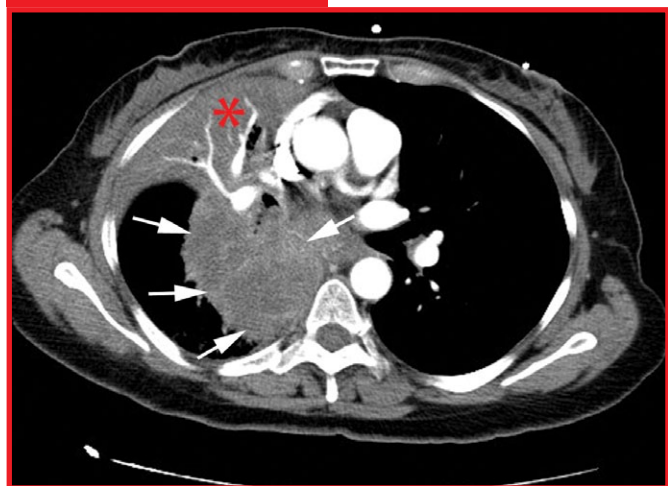
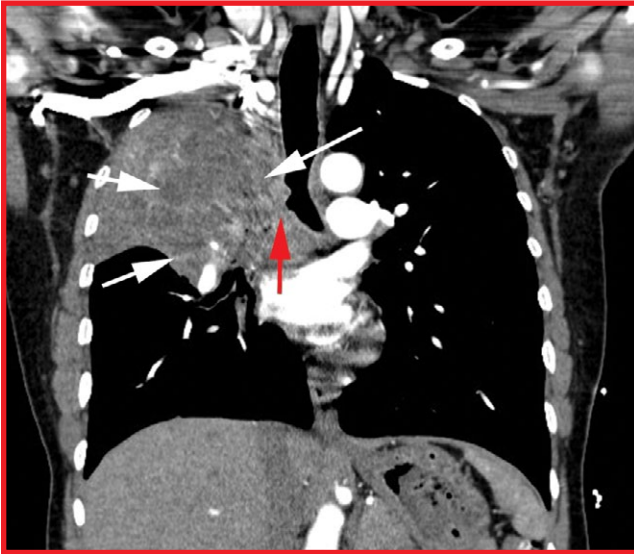


FIGURE 4



appropriate next imaging examination is CT of the chest with IV contrast. It is preferable to obtain images in the venous phase of contrast enhancement (as opposed to the pulmonary arterial phase of CT angiography for

pulmonary embolism) in order to allow optimal assessment of contrast enhancement. Figure 3, an axial image obtained from this patient's contrast-enhanced CT examination, demonstrates a large, peripherally enhancing central mass (white arrows). The collapsed right upper lobe (red asterisk) can be seen as well. The collapsed lung can be distinguished from the mass by the fact that the lung has normal pulmonary vessels and more homogeneous parenchymal enhancement.

Figure 4 is a coronal reformat of the same CT examination. This reformatted image allows the best visualization of the effect of the mass (white arrows) on the right mainstem bronchus resulting in the abrupt cutoff (red arrow) that was also seen on the initial radiograph.

The patient went on to biopsy, which demonstrated a non-small cell lung carcinoma. **EM**

REFERENCES

1. Golden R. The effect of bronchostenosis upon the roentgen ray shadow in carcinoma of the bronchus. *AJR Am J Roentgenol.* 1925;13:21.
2. Gupta P. The Golden S sign. *Radiology.* 2004;233(3):790-791.