

## PROBLEM

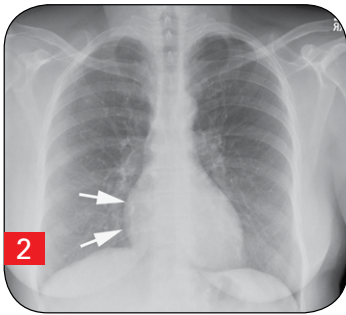


>> A 30-year-old man presents to the ED with fever and cough. Figure 1 shows the chest radiograph that is obtained.

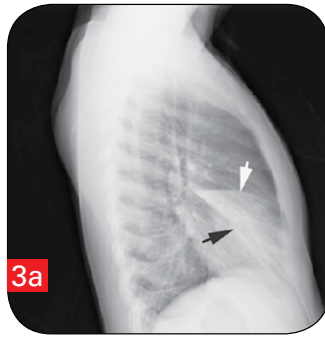
**What is the abnormality, and what is the differential diagnosis?**

*Turn page for answer >>*

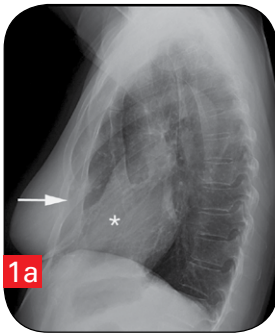
## ANSWER



>>The abnormality illustrated by the radiograph is the loss of the right heart border. On a frontal view of the chest (posteroanterior or anteroposterior), the heart should have a clear, sharp interface with the aerated lung (white arrows, Figure 2). When this interface is absent, one should first consider the possibility that material with radiographic density similar to that of the heart—such as pus from pneumonia—is replacing the air within the right middle lobe. As an interface between the air and heart is no longer present, the heart border will become less well defined or will not be visualized. Figure 3, the radiograph of another patient with suspected

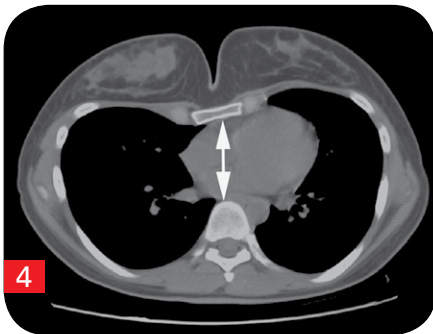


right middle lobe pneumonia, illustrates this lack of sharp interface, or “the silhouette sign.” The right middle lobe pneumonia is confirmed on the lateral view (Figure 3a) as an area of increased opacity between the minor fissure (white arrow)—which appears bulging upward, indicating a space-occupying process—and the major fissure (black arrow).



However, when a lateral view was obtained in the case patient, no increased opacity was identified in the region of the right middle lobe (white asterisk, Figure 1a). Instead, there was a deformity of the anterior chest wall (white arrow), consistent with a pectus excavatum deformity. Pectus excavatum, also referred to as *funnel chest*, is the most common congenital malformation of the sternum, seen in one in 400 patients; it occurs secondary to abnormal development of the lower costal cartilages.<sup>1</sup> The sternum is displaced posteriorly, resulting in reduced prevertebral space and rotation and leftward displacement of the heart (accounting for the loss of right heart border on the frontal radiographs), as well as decreased space in the left hemithorax. There is a strong hereditary predisposition for pectus excavatum; the deformity may also occur spontaneously or in association with connective tissue disease. While often

apparent on physical exam and chest radiographs, pectus excavatum is best evaluated with CT (Figure 4), which allows direct assessment of the decreased anteroposterior diameter (white arrows).



Although pectus excavatum is most commonly asymptomatic, it is important to recognize this abnormality and to include it in the differential diagnosis for right middle lobe consolidation, which includes pneumonia, pulmonary hemorrhage, and even atypical edema. This case demonstrates the importance of the lateral view in evaluation for suspected pneumonia.

### REFERENCE

- Restrepo CS, Martinez S, Lemos DF, et al. Imaging appearances of the sternum and sternoclavicular joints. *Radiographics*. 2009;29(3):839-859.

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