EMERGENCY IMAGING

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FIGURE 1 A

FIGURE 1 B

A 28-year-old man presents to the emergency department with fever and cough. Radiographs are obtained (Figures 1A and 1B).

What is the abnormality?

What is the differential diagnosis?

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ANSWER

FIGURE 1 C

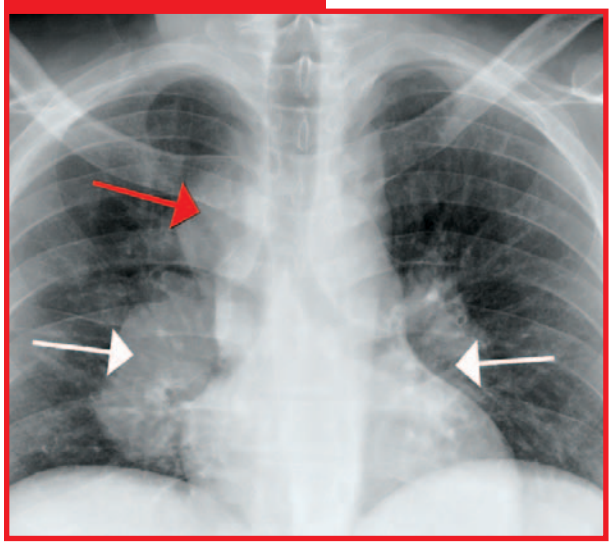
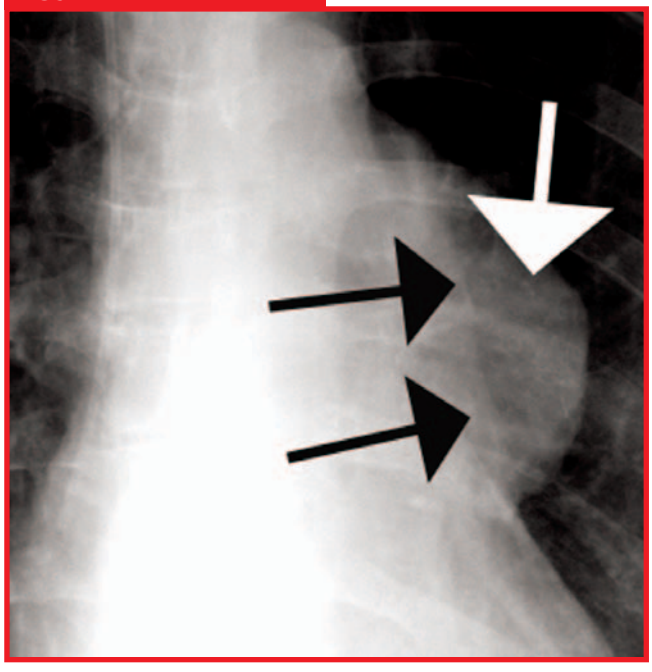


FIGURE 2



The posteroanterior view of the chest (Figure 1C) demonstrates increased soft tissue masses within the bilateral hilar regions (white arrows) and the right paramediastinal region (red arrow). On a frontal view of the chest, it can be difficult to identify the mediastinal compartment (anterior, middle, or posterior) in which these masses are located. However, localization is important, as the differential diagnosis varies according to the compartment. In the case presented, the normal hilar vessels (ie, pulmonary arteries) cannot be identified. Therefore, it can be assumed that the masses are in the middle mediastinal compartment, which is where the normal hilar vessels are located. If the hilar vessels were visualized in addition to the masses, then the masses would be located in the anterior or posterior compartment. As an example, a radiograph from a different patient (Figure 2) demonstrates a left-sided mediastinal mass (white arrow) with preserved contour of the left pulmonary artery (black arrows). This mass was later determined to be in the anterior compartment. This localization principle is known as the *hilum overlay sign*.[1,2]

The differential diagnosis for middle mediastinal lesions includes lymph node disorders (lymphoma, metastatic disease, sarcoid, Castleman disease), foregut duplication cysts (esophageal, bronchogenic, neurenteric), pericardial cysts, tracheal lesions, and vascular lesions (aortic aneurysm, enlarged pulmonary artery).[2,3]

The lateral view of the chest in the case patient (Figure 1D) demonstrates a second radiographic sign—the *doughnut sign*. The appearance of a ring of soft tissue (white arrows) constitutes this sign, which results from middle mediastinal masses surrounding the airways (white asterisk).[1] As this is typically due to lymphadenopathy, the differential diagnosis in this case can be further narrowed to the lymph node disorders.

CT of the chest was performed (Figure 1E), confirming the presence of lymphadenopathy (white arrows) and also revealing the presence of small bilateral pleural effusions (red asterisks). Note that CT with contrast would typically be the choice to evaluate a suspected

FIGURE 1 D

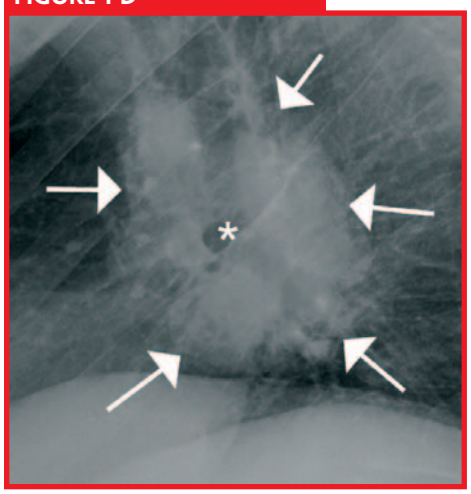
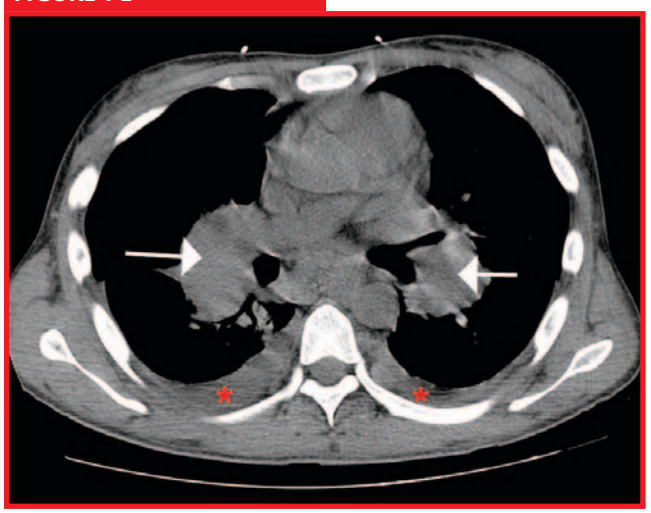


FIGURE 1 E



mass. However, contrast was not used in this case because initial laboratory results had suggested renal dysfunction.

The patient was admitted and underwent transbronchial biopsy, which provided the diagnosis of non-Hodgkin lymphoma. **EM**

REFERENCES

1. Algin O, Gökalp G, Topal U. Signs in chest imaging. *Diagn Interv Radiol.* 2011;17(1):18-29.
2. Whitten CR, Khan S, Munneke GJ, Grubnic S. A diagnostic approach to mediastinal abnormalities. *Radiographics.* 2007;27(3):657-671.
3. Kim Y, Lee KS, Yoo JH, et al. Middle mediastinal lesions: imaging findings and pathologic correlation. *Eur J Radiol.* 2000;35(1):30-38.