Pulmonary Mucormycosis



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Pulmonary mucormycosis (PM)

is an uncommon fungal infection most often seen in immunocompromised patients

Risk Factors PM

uncontrolled diabetes mellitus,

hematologic malignancy (acute leukemia in particular),

stem cell transplant,

solid organ transplant,

neutropenia,

deferoxamine therapy,

corticosteroid use

Some risk factors are more closely associated with specific sites of involvement.

solid organ transplant is more uniquely associated with lung infection,

whereas diabetes mellitus is more closely associated with the rhinocerebral form

Intrapulmonary Imaging Manifestations

Nonspecific Signs

CXR:lobar and segmental consolidation is the most common imaging finding, and imaging in some patients shows a multilobar distribution (6). Unilateral infection can progress quickly to the contralateral lung if left untreated (Fig 3). A multifocal pneumonia pattern with bilateral consolidation has a high correlation with increased mortality (7). Single or multiple nodules and masses are also common features (6).

CT features of infection

a perivascular ground-glass lesion prior to the development of more extensive imaging findings

Ground-glass lesions usually progress to consolidation, nodules, or masses

Occasionally, a cavity can appear at imaging as the initial manifestation

Other vascular findings that have been described include pseudoaneurysm formation and abrupt termination of a pulmonary artery branch, which appears with the vascular cutoff sign

Infection can spread to the pleura, chest wall, mediastinum, diaphragm, and heart

Pleural thickening or effusion may indicate pleural infection.

Air in the intercostal space or subcutaneous soft tissues usually indicates chest wall spread

Rarely, patients may present with an invasive endobronchial or endotracheal mass

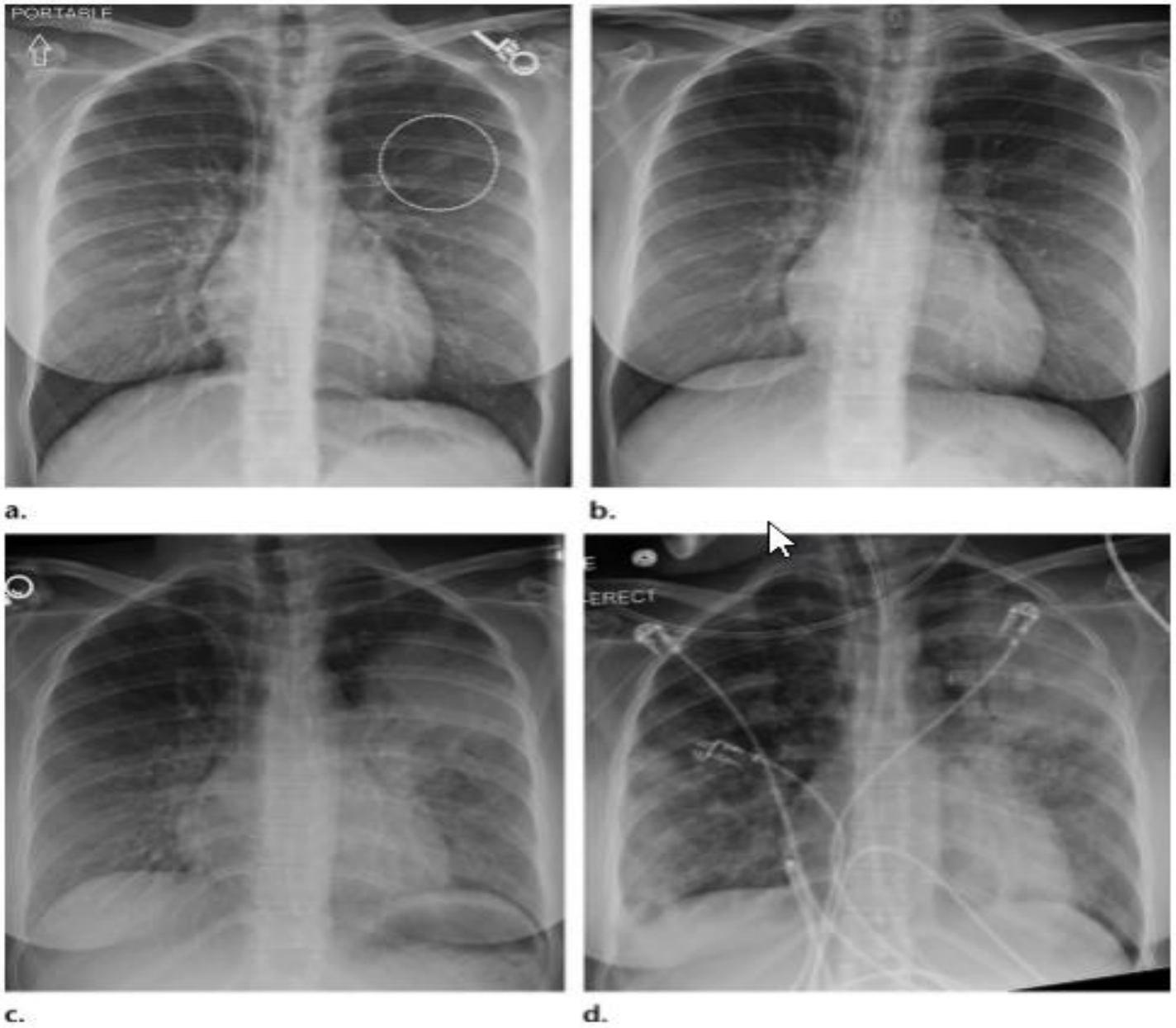
However, because of the central location, the lesions can invade the central vasculature and cause fatal hemoptysis

diagnostic challenges in patients PM with IPA

clinical clues that suggest PM rather than IPA include:

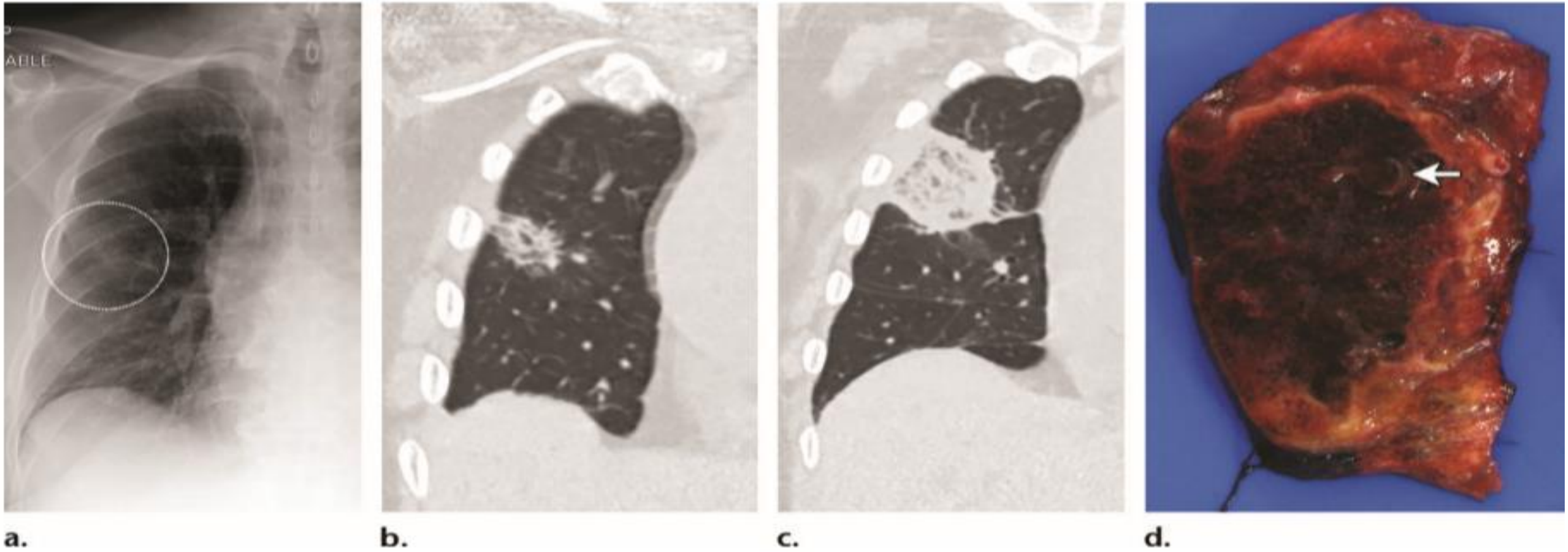
concurrent sinus infection and previous voriconazole therapy

Imaging findings that are more suggestive of PM than IPA include the presence of more than 10 lesions and the presence of pleural effusion

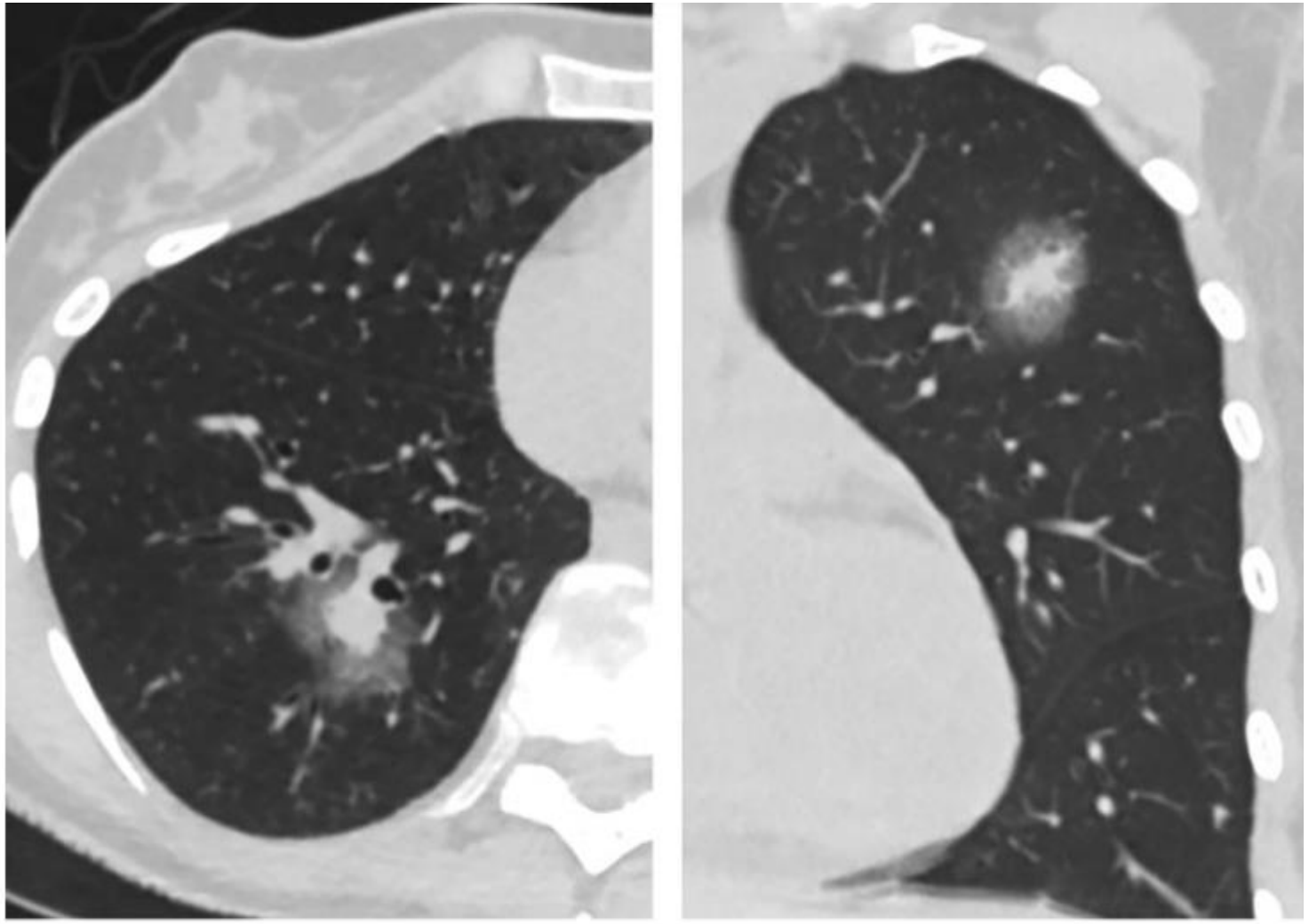


Unilateral PM progressing to infection of the contralateral lung in a 35-year-oldwoman who recently underwent stem cell transplant for multiple myeloma. (a) Frontal radiograph shows a nodular opacity (dotted circle) in the left upper lung. (b) Frontal radiograph obtained on day 2 shows enlargement of the nodular opacity.

(c) Frontal radiograph obtained on day 4 shows marked enlargement of the left upper lobe lesion with a masslike consolidation. (d) Frontal radiograph obtained on day 7 shows progressive consolidation in the left upper lobe and new airspace disease in the right lung. The patient died 2 days later



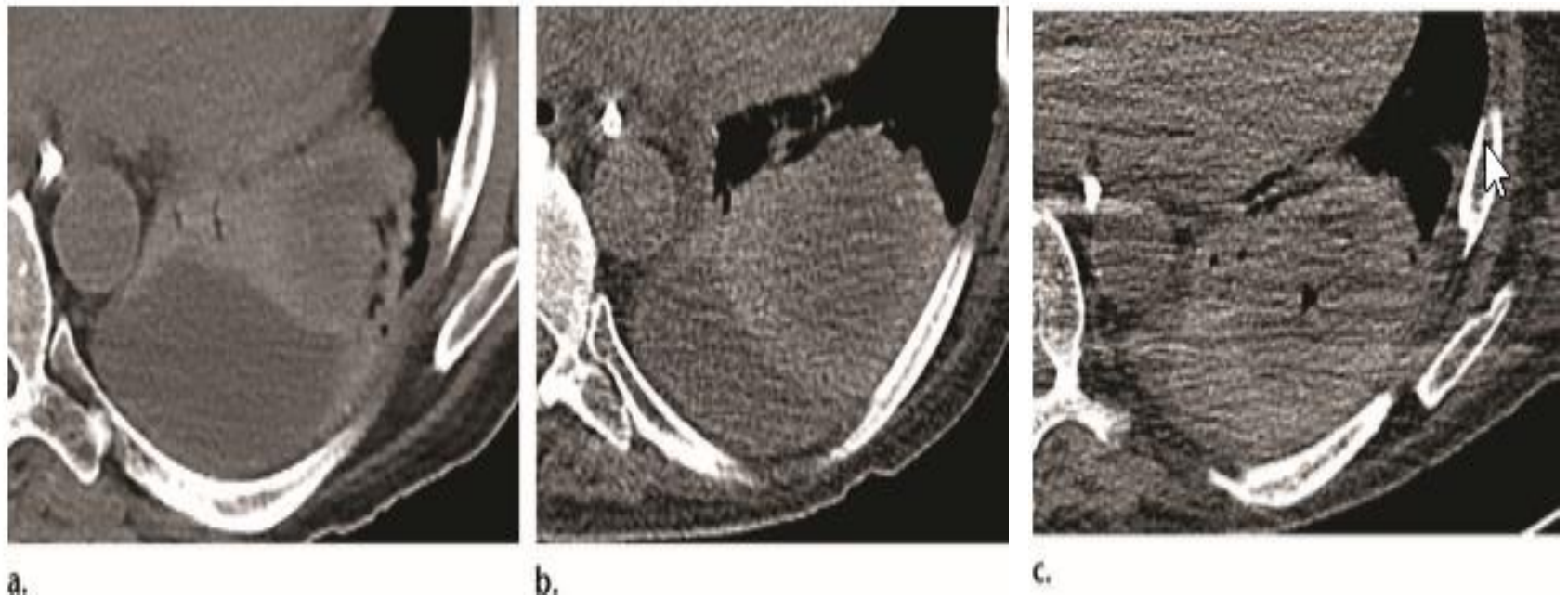
Ground-glass opacity progressing to an enlarged lesion in a 66-year-old man who underwent recent stem cell transplant for aplastic anemia. (a) Frontal radiograph of the right lung shows a faint area of ground-glass opacity (dotted circle) in the right midlung. (b) Coronal CT image obtained on day 2 shows an area of nodular ground-glass opacity. (c) Coronal CT image obtained on day 12 shows enlargement of the lesion with development of the reverse halo sign. (d) Lobectomy specimen shows an area of necrosis with a thick wall. Note the thrombosed vessel (arrow).



a.

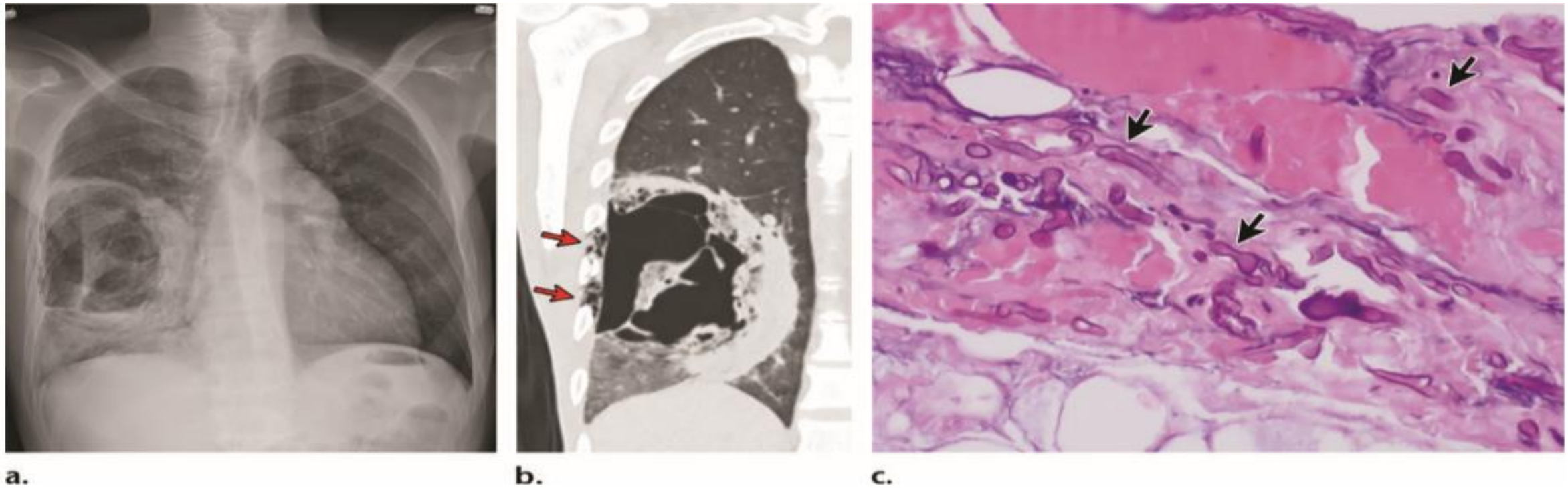
b.

CT halo sign. Axial CT image in a patient with IPA (a) and coronal CT image in a patient with PM (b) depict a central solid nodule surrounded by an area of ground-glass opacity.

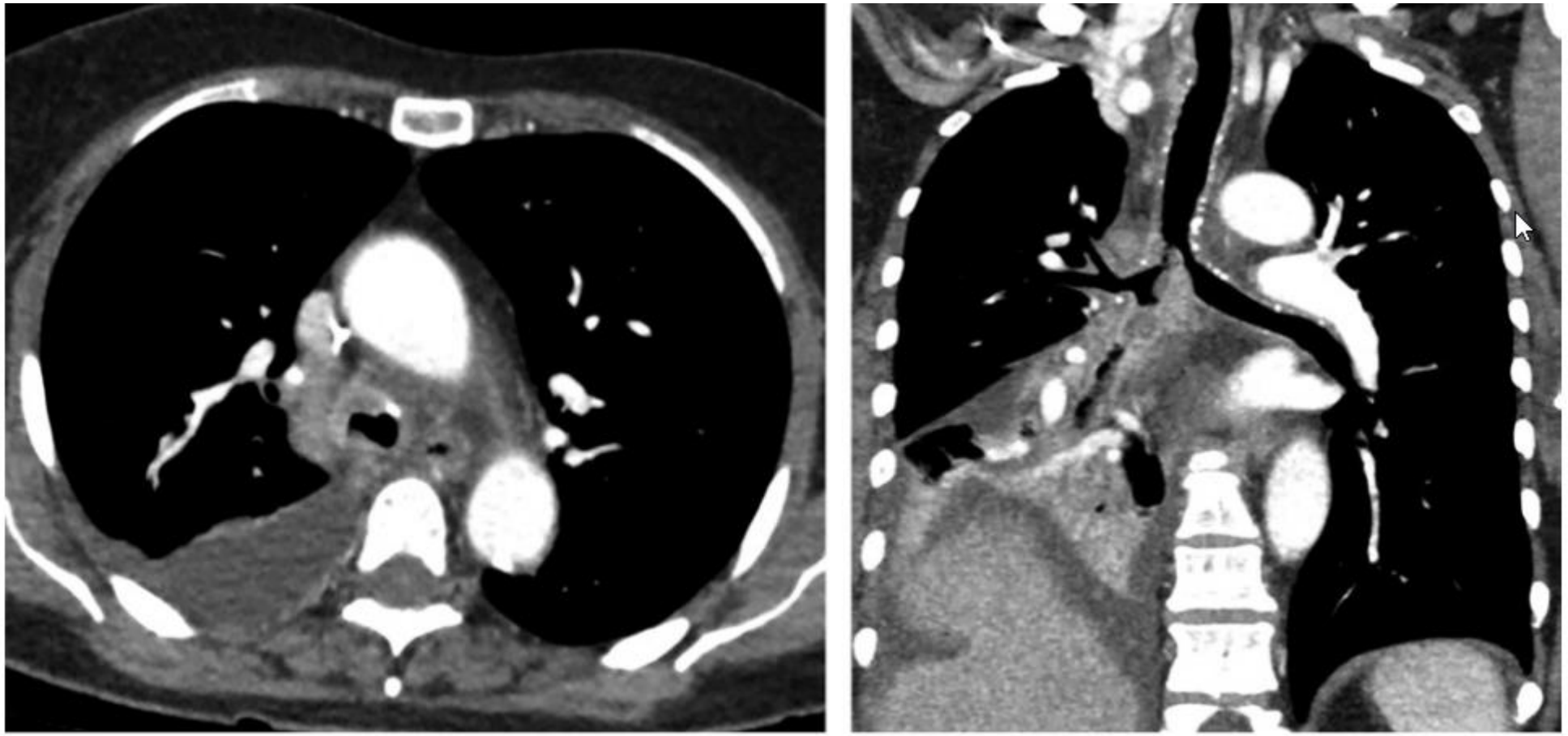




Necrosis in a 59-year-old man who underwent renal transplant. (a) Axial CT image demonstrates a necrotic consolidation in the left lower lobe with adjacent pleural effusion. (b) Axial CT image depicts enlargement of the consolidation after 20 days with new pleural thickening. (c) Axial CT image shows central cavitation in the left lower lobe lesion. (d) Gross photograph shows the left lung with the necrotic cavity exposed



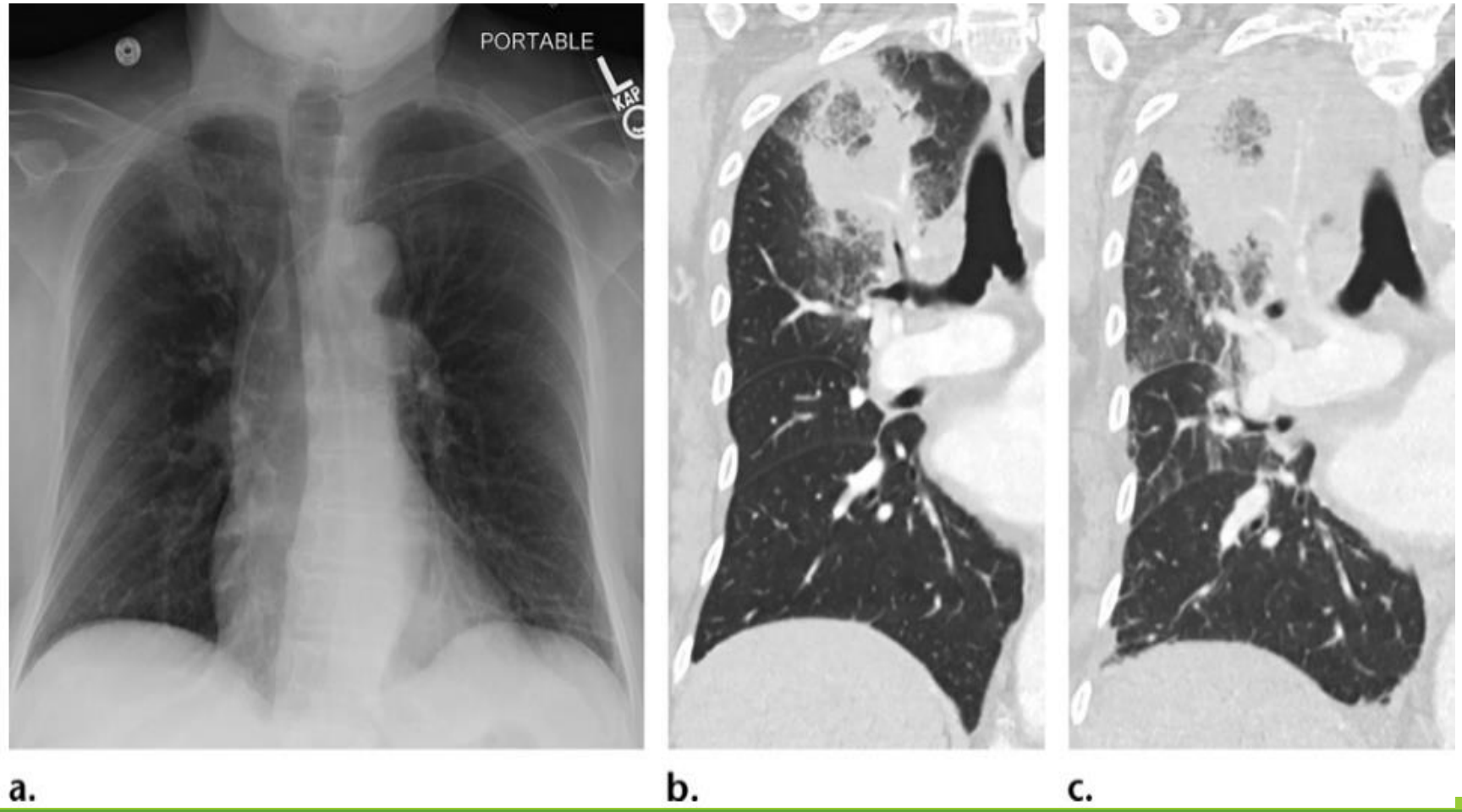
Chest wall spread of PM in a 44-year-old man who underwent renal transplant. (a) Frontal radiograph shows a large cavity with an air-fluid level in the right lower lung. There is subcutaneous emphysema in the adjacent right chest wall. (b) Coronal CT image shows right lower lobe consolidation and air (arrows) in the adjacent intercostal spaces. (c) Photomicrograph of a biopsy specimen shows Mucorales hyphae (arrows) interspersed in muscle tissue



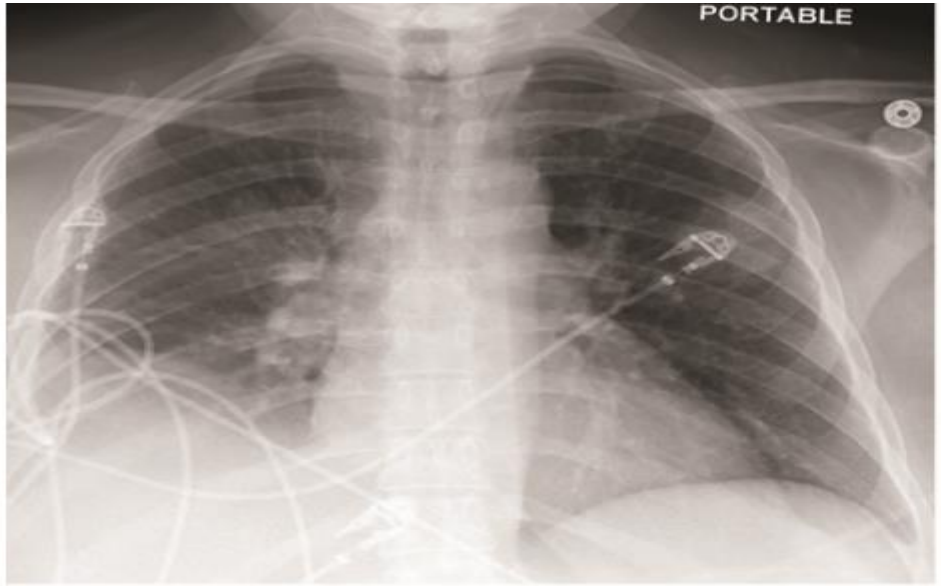
a. b.

Endobronchial mucormycosis. (a) Axial CT image shows soft-tissue thickening of the lateral and anterior trachea with ill definition of the surrounding fat. (b) Coronal multiplanar curved reconstruction from CT of the tracheobronchial tree shows extensive soft tissue in and around the carina and right main bronchi ,with occlusion of the bronchus intermedius and right lower lobe collapse. (Case courtesy of Cameron Hassani, MD, University of California, Los Angeles, Los Angeles, Calif.).

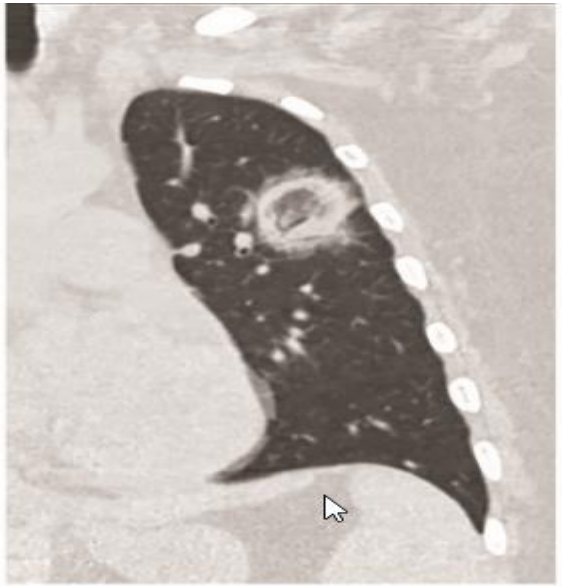
The reverse halo sign is defined as a ground-glass lesion with a peripheral rim of consolidation



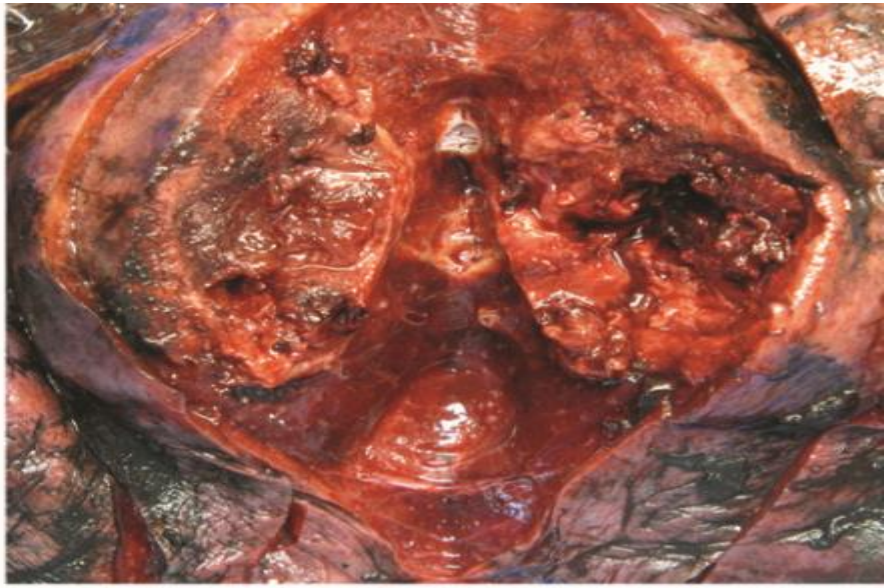
PM appearing with the reverse halo sign in a 68-year-old woman with acute myeloid leukemia. (a) Frontal radiograph shows a right upper lobe consolidation. (b) Coronal CT image obtained 1 day later shows a right upper lobe consolidation with an area of central ground-glass opacity (reverse halo sign). (c) Coronal CT image obtained on day 5 shows progressive consolidation occupying greater than half of the right upper lobe.



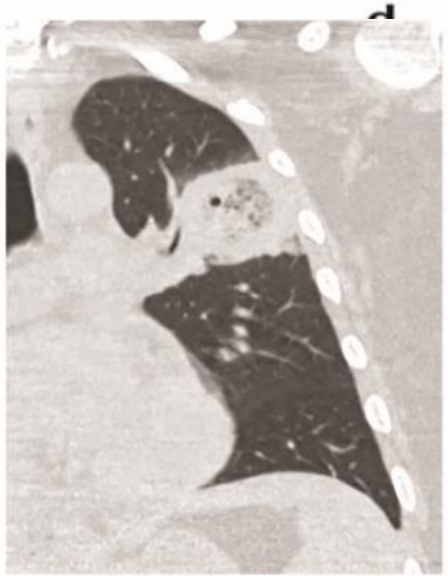
a.



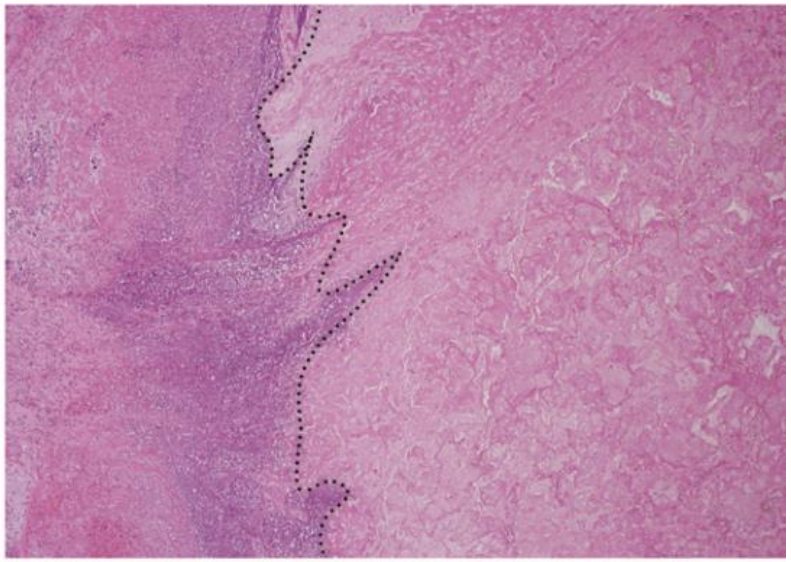
b.



d

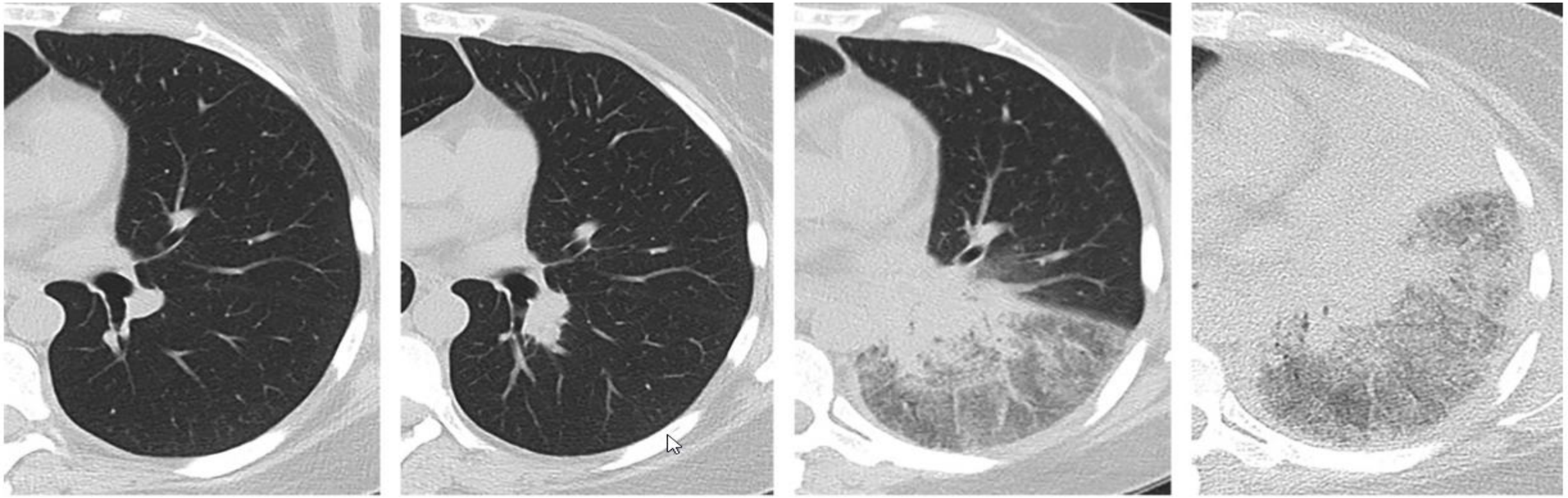


c.



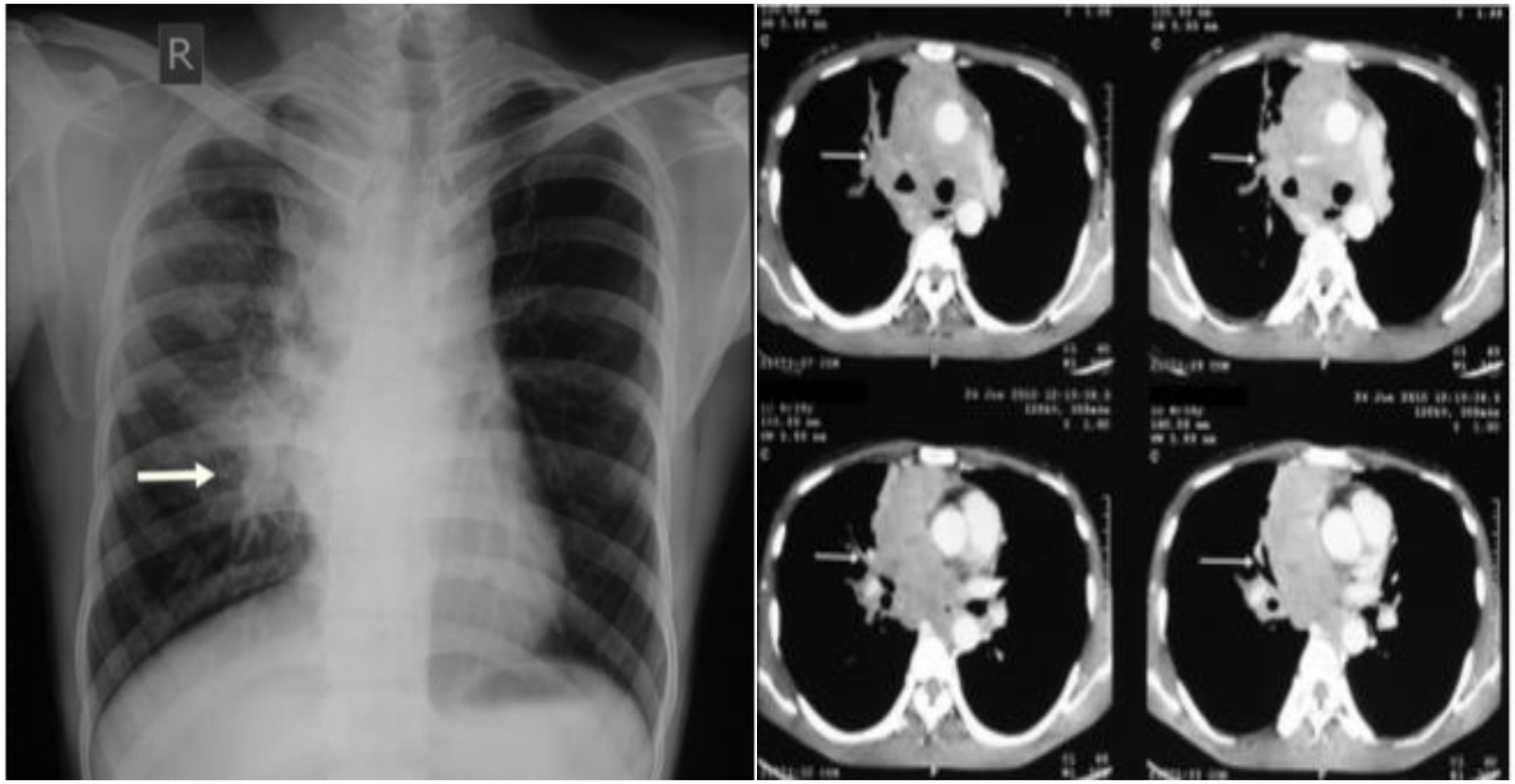
e.

PM appearing with the reverse halo sign in a 35-year-old man with multiple myeloma. (a) Frontal radiograph shows a nodular consolidation in the left upper lobe. (b) Coronal CT image obtained on the same day shows a lesion with a reverse halo sign. (c) Coronal CT image obtained 7 days later shows enlargement of the lesion. (d) Cut surface of the lobectomy specimen shows a cavitary mass with central necrosis and hemorrhage. (e) Photomicrograph of the lesion margin shows an area of necrosis (right of dotted line) with a zone of transition (left of dotted line) containing inflammatory cells and variable fibrosis



Rapid progression of PM in a 41-year-old woman who underwent stem cell transplant for acute myeloid leukemia. (a) Axial CT image of the left lung is clear on day 1. Note the patent superior segmental left lower lobe bronchus. (b) Axial CT image obtained on day 12 shows a new nodule in the left lower lobe abutting the superior segmental bronchus. (c) Axial CT image obtained on day 21 shows increased consolidation and complete lobar ground-glass opacification. The superior segmental bronchus is now occluded. (d) Axial CT image obtained on day 23 shows left upper lobe collapse and continued complete ground-glass opacification of the left lower lobe.

Mediastinal Zygomycosis (Mucormycosis): an Unusual Manifestation of Invasive Zygomycosis (Mucormycosis), Presenting as a Mediastinal Mass in an Immunocompetent Adult Male



CT Scan chest revealed a soft tissue infiltrative mass in anterior, superior and posterior mediastinal compartment with compression and displacement of superior vena cava and arch of aorta. Bilateral Hilar Lymph adenopathy with few nodular lesion in upper and middle lobe of right lung with involvement of pericardium.

Pulmonary Mucormycosis: Risk Factors, Radiologic Findings, and Pathologic Correlation

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Mediastinal Zygomycosis (Mucormycosis): an Unusual Manifestation of Invasive Zygomycosis (Mucormycosis), Presenting as a Mediastinal Mass in an Immunocompetent Adult Male

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