

## pulmonary and critical care pearls

### Cough, Fever, and Cavitating Pulmonary Lesions in a 21-Year-Old Construction Worker\*

Guy Dugan, M.D.; Coralie Shaw, M.D., F.C.C.P.; and Richard Matthay, M.D., F.C.C.P.

(*Chest* 1994; 105:591-93)

**A** 21-year-old construction worker presented to his local physician with a 15-lb (6.75-kg) weight loss over 4 weeks and a 2-week history of cough with

puted tomographic (CT) scans (Fig 2) were obtained. *What is the most likely diagnosis?*

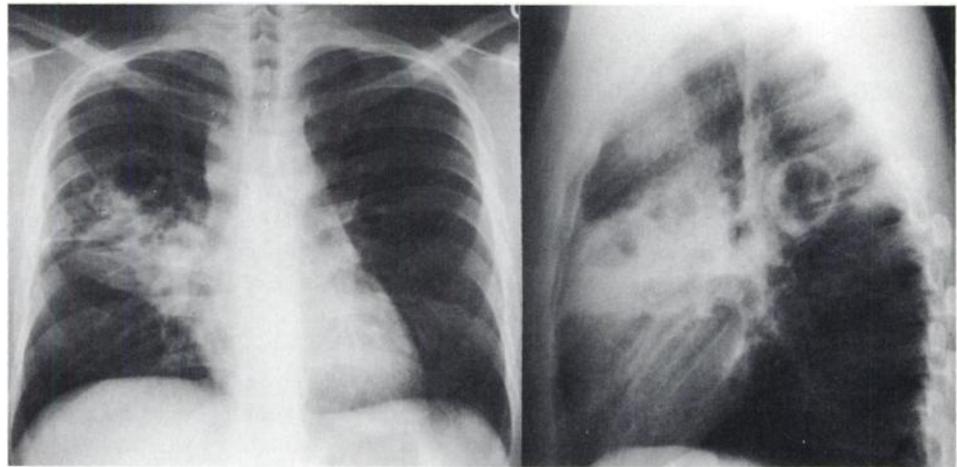


FIGURE 1. Posteroanterior (left) and lateral (right) chest radiographs.

blood-tinged sputum, fevers to 39.4°C, and night sweats. After the patient had been receiving oral erythromycin for 2 weeks without improvement, a chest radiograph prompted referral for further evaluation.

#### Physical Examination

Vital signs: temperature, 38.3°C; pulse, 105 beats/min; respirations, 22/min; BP, 110/70 mm Hg. Chest: clear. Cardiac: normal. Abdomen: soft, nontender, liver and spleen not palpable. Lymph nodes: minimal supraclavicular adenopathy.

#### Laboratory Findings

Hematocrit, 30 percent; WBC, 17,000 (76 percent segmented neutrophils, 4 percent band neutrophils, 13 percent lymphocytes, 7 percent monocytes); platelets, 493,000/ $\mu$ l; erythrocyte sedimentation rate, 113/mm/hr; HIV, negative. Arterial blood gas values (room air): pH, 7.41;  $P_{CO_2}$ , 36 mm Hg;  $P_{O_2}$ , 86 mm Hg. Radiologic: chest radiographs (Fig 1) and chest com-

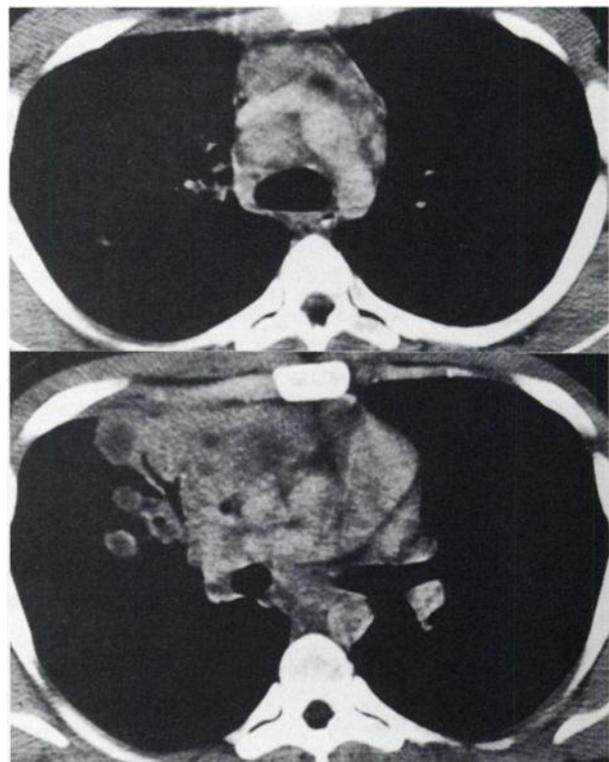


FIGURE 2. Chest CT scans.

\*From the Pulmonary and Critical Care Section, Department of Medicine (Drs. Dugan and Matthay), and the Department of Diagnostic Radiology (Dr. Shaw), Yale University School of Medicine, New Haven, Conn.

*Diagnosis: Hodgkin's disease (nodular sclerosing type), stage IV*

The posteroanterior and lateral chest radiographs (Fig 1) demonstrate superior mediastinal adenopathy in the azygous, aortopulmonary window, and para-aortic locations. There is a large central opacity, which extends from the right hilum into the right upper lobe. There are cavities within this opacity, and cavitary nodules are scattered throughout the right upper lobe. The CT appearance (Fig 2) confirms the plain-film findings and demonstrates anterior mediastinal and subcarinal adenopathy, as well as air bronchograms and necrosis within the dominant parenchymal lesion.

Hodgkin's disease commonly has intrathoracic manifestations at presentation, particularly with the nodular sclerosis subtype. The presence of anterior mediastinal adenopathy assists diagnosis because these nodes are often spared in patients with sarcoidosis. Bulky mediastinal disease, defined as adenopathy involving more than a third of the thoracic diameter on a standard radiograph, represents a special category of Hodgkin's disease. The presence of large mediastinal nodes indicates the probable extension of tumor into the lungs, chest wall, or pericardium, often with an accompanying pleural or pericardial effusion.

Pulmonary parenchymal involvement may result from direct mediastinal extension or from lymphatic or hematogenous dissemination from distant sites or from foci of parenchymal lymphoid tissue, which develop as spontaneous disease. Nodal extension of lymphoma through the bronchovascular bundle occurs most frequently and produces a coarse interstitial reticulonodular infiltrate. Involvement of the interlobular septa can produce Kerley lines. Erosion into the bronchial mucosa can result in airway obstruction with atelectasis and postobstructive or endogenous lipoid pneumonia. A plaque or polypoid mass may rarely be seen during bronchoscopy, and sputum or bronchoalveolar lavage fluid may reveal malignant cells. Lymphomatous infiltration through the alveoli can produce a granulomatous consolidation that can give the appearance of pneumonia or miliary tuberculosis.

Hodgkin's disease of the lung may present radiographically as either solitary or multiple nodules and may simulate primary or metastatic cancer. Cavitation occurs in fewer than 1 percent of patients and may develop initially or after treatment. The presence of cavitary disease in a patient with known lymphoma requires the exclusion of infections, such as tuberculosis and fungal and bacterial infections, particularly by *Staphylococcus* and *Nocardia* organisms.

Tumor infiltration of the pleura has been observed at autopsy in approximately 30 percent of patients with Hodgkin's disease. Pleural effusions usually result from lymphatic obstruction secondary to mediastinal adenopathy and are characteristically unilateral and se-

rous, although chylous and sanguineous effusions may occur. Pneumothorax can develop and may be persistent and recurrent.

Bone involvement can be detected radiographically in approximately 15 percent of patients and is usually a late manifestation of the disease, although bone pain may be the presenting complaint. Most patients with bone involvement have mixed blastic and lytic lesions. Destruction of the ribs, sternum, or vertebrae by direct invasion from contiguous lymph nodes typically results in focal lytic areas. Pure osteoblastic lesions can be observed in the spine and give the appearance of ivory vertebrae. Occasionally, disease may start in the ribs or sternum and invade the lungs secondarily.

While it is almost axiomatic that thoracic Hodgkin's disease presents with adenopathy, there is a rare form of pulmonary Hodgkin's disease called primary pulmonary Hodgkin's disease, which is restricted to the parenchyma at presentation. This form most commonly presents as single or multiple nodules that have a predilection for the upper lobes. There is a higher incidence of bilateral and cavitary disease than with nodal Hodgkin's disease. In a recent review, several patients with primary pulmonary Hodgkin's disease had a normal chest radiograph and came to medical attention for symptoms of bronchial obstruction. At bronchoscopy, endobronchial lymphoma was found. Cough was the most common presenting complaint, and a third had B symptoms (fever, night sweats, and weight loss), which correlated with a poor prognosis. Thoracotomy is usually required for diagnosis.

The present patient underwent bronchoscopy, and the transbronchial biopsy specimen showed interstitial fibrosis and alveolar macrophages including foamy histiocytes, suggesting lipoid pneumonia. Stains and cultures were negative for acid-fast bacilli, fungi, and bacteria. A scalene lymph node biopsy showed Reed-Sternberg cells. The patient was treated with chemotherapy with resolution of the cavitary lesions; however, he suffered a relapse. He underwent bone marrow transplantation but died 15 months after initial presentation. Autopsy showed the presence of active Hodgkin's disease in the right lung with cavitating lesions. Cultures and stains for bacteria, fungi, acid-fast bacilli, cytomegalovirus, and herpes simplex with types 1 and 2 were negative.

#### CLINICAL PEARLS

1. Chest radiographic lesions can occur at any time during the course of Hodgkin's disease and can present with a myriad of patterns suggesting sarcoidosis, primary or metastatic cancer, Wegener's granulomatosis, mycobacterial disease, hamartoma, or bacterial and fungal infections, justifying the appellation of Hodgkin's disease as "the great deceiver in radiologic disease."

2. Anterior mediastinal adenopathy is highly suggestive of lymphoma and is usually not observed in

sarcoidosis.

3. Cavitory Hodgkin's disease is a rare manifestation that may occur at presentation or following treatment.

4. Endobronchial infiltration of tumor or extramural obstruction by lymphadenopathy may result in endogenous lipoid pneumonia.

#### SUGGESTED READING

Granger W, Whitaker R. Hodgkin's disease in bone with special reference to periosteal reaction. *Br J Radiol* 1967; 40:939-48  
Mauch P, Goodman R, Hellman S. The significance of mediastinal in-

volvement in early stage Hodgkin's disease. *Cancer* 1978; 42:1039-45

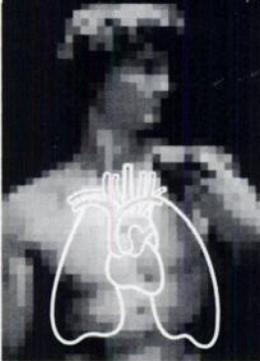
Radin RI. Primary pulmonary Hodgkin's disease. *Cancer* 1990; 65:550-63

Shahar J, Vito AA, Katz D, Moore JA. Recurrent cavitory Hodgkin's disease. *Chest* 1987; 91:273-74

Strickland B. Intra-thoracic Hodgkin's disease: part II. peripheral manifestations of Hodgkin's disease in the chest. *Br J Radiol* 1967; 40:930-38

Vieta JO, Carver LF. Intrathoracic manifestations of lymphatoid disease. *Radiology* 1941; 37:138-58

**MARK YOUR CALENDAR**



**60<sup>th</sup>**  
Annual International  
Scientific Assembly

October 30 –  
November 3, 1994  
New Orleans  
For more information  
call 800 343-ACCP

**AMERICAN  
COLLEGE OF  
CHEST  
PHYSICIANS**