Fever, Multiple Pulmonary Nodules, and Ulcerated Skin Lesions in a Patient With AIDS*

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A 35-year-old man with human immunodeficiency virus (HIV) infection, known for the last 5 years, was admitted to the hospital because of multiple bilateral pulmonary nodules seen on chest radiograph. He presented with increase in weakness, fatigue, low-grade fever, chills, night sweats, and loss of appetite. Although he had chronic diarrhea, he denied any dysphagia, abdominal pain, nausea, vomiting, headache, or confusion. An episode of Pneumocystis carinii pneumonia occurred 15 months earlier. At another institution, he was told of multiple spots on his lungs, and he had undergone fiberoptic bronchoscopy about 6 months earlier with no diagnosis. He also had multiple skin lesions for several months. He was seen in the Infectious Disease Clinic approximately 1 week before hospital admission. He had an unremarkable physical examination except for multiple skin lesions which looked like chronic folliculitis, CD4 count <10 cells/mm³, and an abnormal chest radiograph. His medications included dapsone for Pneumocystis prophylaxis, zidovudine (AZT), fluconazole, and loperamide. He denied smoking and use of alcohol or intravenous drugs.

On admission, he had a temperature of 38.2°C, which increased to 39.4°C over the next 24 h, pulse of 90/min, respiratory rate of 24 to 26/min, and blood pressure of 115/68 mm Hg. The patient appeared ill, and was in mild distress. The heart sounds were normal with no murmur. The lungs were clear to auscultation. The skin examination showed multiple poplar ulcerated lesions with necrotic centers mainly on his extremities. The remainder of the physical examination was unremarkable.

Admission laboratory data revealed a hemoglobin value of 10.7 g/dL, white blood cell count of 1,330/mm³, and platelet count of 203,000/mm³. The BUN, creatinine, electrolytes, prothrombin time, and partial thromboplastin time were normal. The serum lactate dehydrogenase was 1,623 U/L (313 to 618), alkaline phosphatase 147 U/L (38 to 126), aspartate aminotransferase 255 U/L (5 to 60), and serum albumin was 3.2 g/dL. The arterial blood gas on room air was pH, 7.54; PO₂, 73 mm Hg; PCO₂, 29 mm Hg; and 96% oxygen saturation. A chest radiograph showed multiple bilateral pulmonary nodules (Fig 1), which had increased in size when compared with previous chest radiograph done 1 week before. A computed tomography scan of the chest (Fig 2) showed bilateral ill-defined pulmonary nodules of varying sizes. No mediastinal lymphadenopathy, pulmonary parenchymal infiltrates, or pleural effusion were noted. After blood, urine, stool, and sputum cultures were obtained, the patient was placed in respiratory isolation to rule out tuberculosis. Broad spectrum antibiotics (ticarcillin-clavulanate and gentamicin) were empirically administered.

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Diagnosis: Staphylococcal pneumonia caused by Staphylococcus aureus

This patient underwent a CT scan guided fine-needle aspiration of a nodule in the right upper lung field. Fine-needle aspirate stains were negative for acid fast bacilli, fungus, or P carinii. Gram stain showed Gram-positive cocci in clusters. The culture from fine-needle aspirate grew Staphylococcus aureus sensitive to nafcillin. The cultures from sputum, stool, and blood also grew S aureus. The patient was initially given vancomycin, which was later switched to nafcillin after sensitivities were available. He improved clinically, and a follow-up chest radiograph showed complete resolution of pulmonary nodules. A transthoracic echocardiogram did not show any vegetations on heart valves. The pulmonary nodules in this patient were probably due to metastatic spread of infection, with skin being the primary source of infection. Subsequently, this patient developed overwhelming Pseudomonas infection and died.

The pattern of multiple noncircumscribed pulmonary lesions is a common roentgenographic presentation in a variety of cases. The possible causes for this can be divided into the following six categories: developmental, infectious, immunologic, neoplastic, traumatic, and idiopathic disorders. In many patients, presence of an extrapulmonary malignant process and growth of pulmonary nodules suggest metastatic lung tumor.

Opportunistic pulmonary diseases are the most common cause of acute illness and death in patients with HIV infection. These patients have chest radiographic findings of normal appearance, focal or diffuse interstitial infiltrate, pleural effusion, and mediastinal adenopathy. Bilateral multiple pulmonary nodules are not a well recognized pattern of specific respiratory disease in patients with AIDS. There are several case reports describing P carinii, tuberculosis, cryptococcosis, cytomegalovirus pneumonia, Kaposi’s sarcoma, and non-Hodgkin’s lymphoma presenting as multiple bilateral pulmonary nodules with or without cavitation on chest radiograph. Among pyogenic bacteria, Streptococcus pneumoniae and Haemophilus influenzae are the most common etiologic agents for community-acquired pneumonia. These pneumonias usually present as lobar or segmental consolidation. Polsky et al. reported 18 episodes of community-acquired bacterial pneumonia in 13 out of 336 patients with AIDS. Their radiographic appearances were acute diffuse infiltrate, patchy lobar infiltrate, and lobar consolidation. None of these patients had pneumonia due to S aureus. Witt et al. reported one case of community-acquired staphylococcal pneumonia in 59 patients with AIDS and AIDS-related complex and bacterial infection over a 2-year period. Nosocomial pneumonias in patients with very low CD4 counts are usually caused by Gram-negative organisms and are associated with unfavorable outcomes.

Staphylococcus aureus is the most common bacterial pathogen in HIV-infected persons. The most common infections are bacteremias, catheter infections, endocarditis, and soft tissue infections. Metastatic complications including pneumonia may occur in up to 25% of patients with staphylococcal bacteremia. In a review of the literature of 130 cases of S aureus infection, only 7 cases (5.3%) had pneumonia. Most often pneumonia due to S aureus occurs in association with other opportunistic infections. Whimbey et al. reported three cases of S aureus pneumonia in association with P carinii pneumonia and pulmonary Kaposi’s sarcoma, but whether either or both were predisposing factors for S aureus pneumonia is unclear. Levine et al. noted concomitant infection with P carinii, cytomegalovirus, aspergillus, Candida, and/or pulmonary Kaposi’s sarcoma in six of seven patients with S aureus pneumonia.

The establishment of a specific etiologic diagnosis in a patient with multiple lesions may be extremely difficult, and at times impossible. Sputum specimens are often unrevealing, and a positive sputum culture may be of unclear significance. In a retrospective review of 129 episodes of respiratory illness in patients with HIV infection, S aureus was recovered in 30 episodes from respiratory tract cultures but only 8 cases had proven pneumonia. Fiberoptic bronchoscopy and bronchoalveolar lavage and biopsy may give a clue to the etiology of the nodules. In some patients, however, a transthoracic needle aspiration biopsy or even exploratory thoracotomy may be needed. Gruden et al. reported 32 patients with HIV infection (31 AIDS) who underwent fine-needle aspiration biopsy (27 CT-guided, 5 fluoroscopy-guided) for focal parenchymal or mediastinal abnormality. The biopsy helped to obtain a specific diagnosis in 27 patients (84%). Sputum samples were obtained in 24 patients and were negative in 21 patients. Transthoracic needle biopsy resulted in a specific diagnosis in 18 of these 21 patients. Bronchoscopy with bronchoalveolar lavage was done in 12 patients and did not result in specific diagnosis in 7 patients (1 patient later grew mycobacteria). Transthoracic needle biopsy obtained specific diagnosis in all these patients. Seven patients out of 32 had small pneumohoraces, and only 1 needed chest tube drainage. One patient had large intrapleural hemorrhage requiring blood transfusion. In fact, Gruden et al. are doing transthoracic needle biopsy as an initial diagnostic procedure in place of fiberoptic bronchoscopy in many patients with focal pulmonary disease.
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