

CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Medical Imaging Quiz – Case 12

A 33-year-old male with HIV was admitted to the emergency department of our hospital with the following clinical findings: Fever, exertional dyspnea, followed by dyspnea at rest with progression of disease, non-productive cough, pleuritic chest pain, anorexia, weight loss and abdominal pain. Pulmonary findings at physical examination included tachypnea, tachycardia, rales, rhonchi, decreased breath sounds and dullness to percussion.

The following laboratory studies were obtained: WBC count (4000/ μ L), arterial blood gas (ABG) level, and lactate dehydrogenase (LDH) level. Sputum culture, sputum Gram stain, acid-fast bacillus (AFB) smear, and AFB culture were collected with caution in the emergency department. Urinary antigen testing for *Legionella pneumophila* and *Streptococcus* species was performed. PPD test was negative and ECG was normal. Because of the remote suspicion of tuberculosis, patient was placed in isolation. Chest radiograph identified diffuse bilateral infiltrates (fig. 1). Lung CT scan demonstrated bilateral pleural effusion and patchy ground-glass appearance throughout both lungs (figures 2, 3).

Comment

Pneumocystis carinii pneumonia (PCP) is caused by the ubiquitous unicellular eukaryote, *P. carinii*. This organism is a rare cause of infection in the general population, but it is a frequent cause of



Figure 1. Chest radiograph identified diffuse bilateral infiltrates.



Figure 2. Lung CT scan demonstrated bilateral pleural effusion and patchy ground-glass appearance throughout both lungs.



Figure 3. Lung CT scan demonstrated bilateral pleural effusion.

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ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2010, 27(3):566–567

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morbidly and mortality in persons who are immunocompromised, especially patients with acquired immunodeficiency syndrome (AIDS). Although PCP is less common than bacterial respiratory tract infection in patients with AIDS, this condition accounts for more deaths. Initially, 50% of deaths due to respiratory failure in

patients with AIDS were attributed to *P. carinii*; the organism was identified in two thirds of cases.

Pneumocystis carinii pneumonia (PCP) can occur at any level of immune compromise, but this disease is more common in patients who are not receiving PCP prophylaxis and who have CD4 levels less than 200 cells per cubic millimeter (cells/ μ L). PCP is most common in persons with profound levels of immunodeficiency, that is, in those with CD4 levels less than 100 cells/ μ L. PCP usually appears with an insidious onset of malaise, weight loss, and low-grade fever (79–100%) that is associated with a dry cough (59–91%). However, the symptoms may be more severe, and dyspnea (29–95%), cyanosis, and respiratory failure (5–30%) may be present.

Chest radiographs should be included in the initial evaluation for *Pneumocystis carinii* pneumonia (PCP). Frequently, these are the only images required. High resolution computed tomography (HRCT) scanning is useful in symptomatic patients in whom chest x-ray findings are normal or equivocal.

HRCT scan is more sensitive than chest radiography for the detection and exclusion of PCP and HRCT scan results may be positive when chest x-ray findings are normal. The characteristic finding of PCP on HRCT scans is ground-glass attenuation, which is present in more than 90% of patients and represents an exudative alveolitis. The term ground-glass refers to parenchymal opacification, which does not obscure the underlying pulmonary architecture. This usually occurs in a bilateral, symmetric, predominantly perihilar distribution and may be geographic or mosaic in appearance (56%), with areas of normal lung adjacent to areas of affected lung. Furthermore, thickening of interlobular septa (due to edema) and foci of consolidation may be associated. Septal thickening in the subacute stage is usually more extensive and represents organizing inflammatory infiltrate.

Early diagnosis of PCP is important because delays in treatment result in increased hospitalization rates, morbidity, and mortality.

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