Clinical Spotlight

Unusual Presentation of Pneumocystis Pneumonia in an Immunocompetent Patient Diagnosed by Open Lung Biopsy

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Pneumocystis pneumonia (PCP) is the most common opportunistic infection in acquired immune deficiency syndrome (AIDS) patients. It is a fungal infection with *Pneumocystis jiroveci* which can be isolated from bronchoalveolar lavage of healthy subjects. The infection occurs mainly in HIV patients; with CD4 lymphocyte count drop to less than 200 cells/μL. PCP has been reported in non-HIV patients with other risk factors such as immunosuppressive medications, malignancies, and other inflammatory conditions. PCP has been rarely reported in immunocompetent subjects. However, in most of these patients, PCP occurred after a period of acute illness with bacterial pneumonia and antibiotic therapy. In this report, we describe a case of PCP in an immunocompetent patient with nonreactive HIV and no immunosuppressive risk factors. The patient had large pulmonary nodules discovered incidentally on chest film as preoperative evaluation for hip surgery. Bronchoalveolar lavage, transbronchial biopsies (TBB), and computed tomography (CT) guided needle biopsy were all negative for *P. jiroveci*. PCP diagnosis was made after open lung biopsy and wedge resection. To our knowledge, this is the first case of PCP in immunocompetent patient with negative BAL, TBB and CT guided biopsy. The diagnosis of PCP required open lung biopsy and the patient recovered without complications.

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Keywords. Pneumocystis; Pneumonia; Immunocompetent; Biopsy; Bronchoscopy

Introduction

Pneumocystis jiroveci pneumonia (PCP) is the most common opportunistic infection in acquired immune deficiency syndrome (AIDS) population in the United States. It accounts for nearly two-thirds of AIDS-defining diagnoses during the early HIV epidemic [1]. Classically, patients with PCP present with shortness of breath, cough and chest X-ray findings consistent with pneumonia. This is often the case in HIV patients who has CD4+ lymphocyte count of less than 200 cells/μL. In addition to CD4+ lymphocyte count of less than 200 cells/μL, underlying malignancies, organ transplantation or immunosuppressive medications are amongst the risk factors for the development of PCP. PCP without predisposing factors is an extremely rare condition [2]. In this report, we describe a case of PCP infection in an immunocompetent patient. The patient presented with incidental lung nodules in association with mediastinal lymphadenopathy and without any identified risk factors. His HIV test was nonreactive and CD4 lymphocyte count was normal. He was diagnosed with PCP with open lung biopsy, after negative bronchoalveolar lavage (BAL).

Case Report

A 51 year-old male presented for evaluation of a right upper lung nodule discovered incidentally on a chest film as part of preoperative hip surgery evaluation (Fig. 1). The patient was asymptomatic with no respiratory symptoms. He is a 40 pack-years smoker with past medical history of depression, peripheral vascular disease and hepatitis C secondary to intravenous drug use at younger age. He denies alcohol or current illicit drug use. No environmental or occupational exposures. The patient never received corticosteroids or other immunosuppressive therapy. He never received treatment for his hepatitis C infection and he was considered a chronic carrier. Laboratory data showed an aspartate transaminase (AST) level of 30 IU/L, alanine transaminase (ALT) of 25 IU/L, alkaline phosphatase (ALP) of 56 IU/L, serum albumin of 4.3 g/dL, and total bilirubin of 0.7 mg/dL. The partial thromboplastin time (PTT) and the prothrombin time (PT) were normal.

Prior to this presentation, he never had pneumonia or other significant respiratory illnesses. His physical examination was unremarkable and vitals were within normal limit. A chest computed tomography (CT) scan

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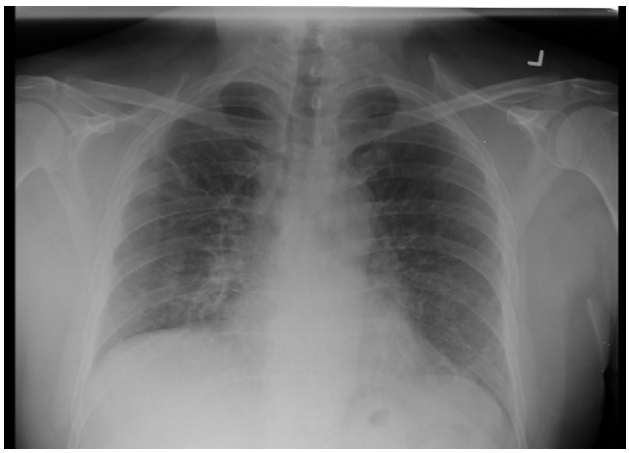

Figure 1. *Plain chest film showing a 2.5 cm × 1.7 cm right upper lobe nodule.*

showed multiple subcentimetre nodules with larger irregular 2.0 cm nodule in the right upper lobe, and right hilar and mediastinal lymphadenopathy suspicious of neoplastic process (Fig. 2). There was no evidence of emphysema, cysts or bullous lung disease. Positive emission tomography (PET) scan showed two irregularly high standardised uptake value (SUV) right upper lobe nodules of 2.1 cm × 1 cm and 1.5 cm × 1.3 cm in size. In addition, there were right hilar (1.1 cm), and paratracheal (1.2 cm) enlarged PET positive lymph nodes. Laboratory data, including rheumatology workup, were all in the normal range. Tuberculin skin test (PPD) was negative. Consequently, the patient underwent flexible bronchoscopy with endobronchial ultrasound transbronchial needle aspiration (EBUS-TBNA) of the mediastinal lymph nodes and transbronchial biopsies (TBB) of the right upper lobe, in addition to right upper lobe BAL and bronchial washing. Histology, cytology showed no signs of malignancy. Cultures, fungal and acid-fast bacillus stains (AFB) were all negative.

A follow up chest CT one month later revealed slight right upper lobe nodule enlargement. Therefore, CT guided FNA biopsy followed by mediastinoscopy were performed. Yet again, cytology and cultures were negative. The histopathologic examination of the right paratracheal lymph nodes that were excised during mediastinoscopy showed sinus histiocytosis and focal anthracotic pigment deposition, and no malignant cells.

Subsequently, the patient underwent right thoracotomy, with wedge resection of the right lower and upper lobe. There were no signs of malignancies but giemsa stain (GMS) revealed organisms consistent with *P. jiroveci* within the necrotic areas of the granulomas. The alveolar tissues adjacent to these granulomatous lesions were also positively stained for PCP (Fig. 3). Flexible bronchoscopy was repeated with BAL that was positive this time for *P. jiroveci*. Lactate dehydrogenase (LDH) was 170 IU/L and CD4 count was 1510 cells/μL. Bactrim intravenous form

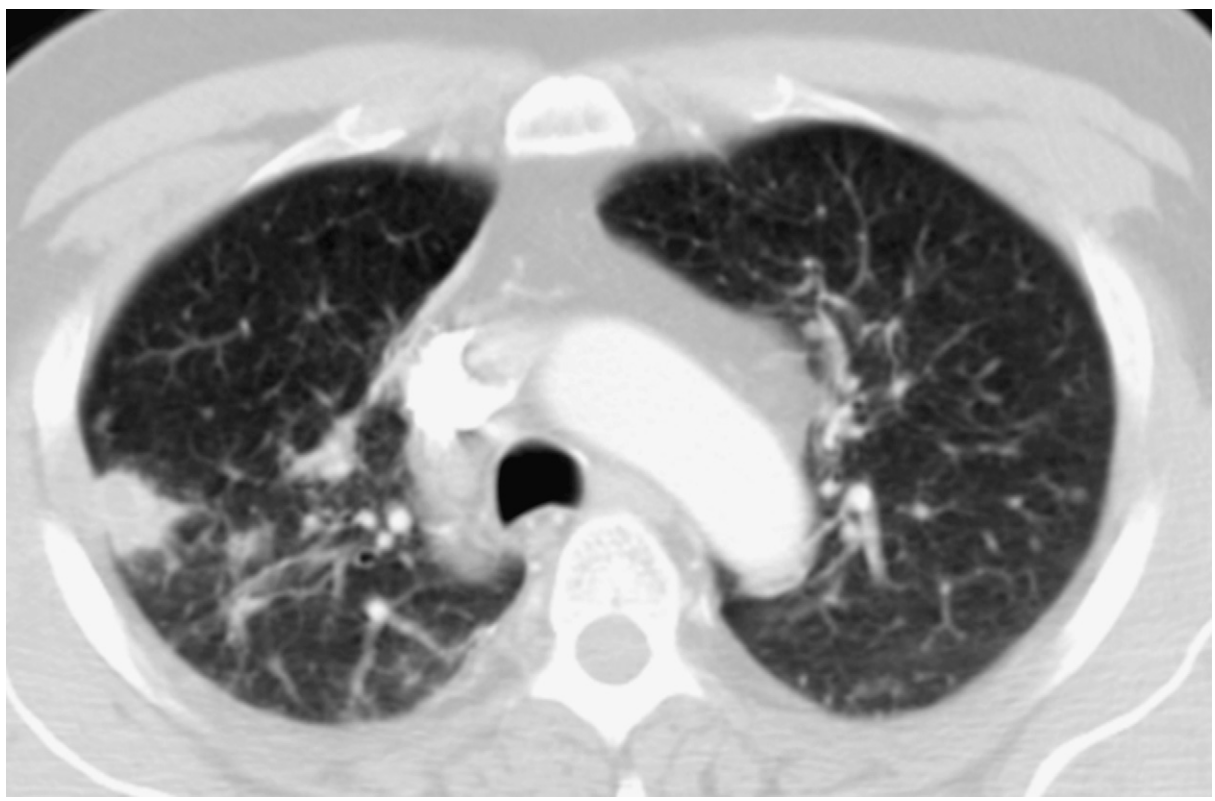

Figure 2. *Chest CT showing a 2 cm × 1.3 cm irregular nodule in the right upper lobe. There are innumerable bilateral subcentimeter parenchymal nodules.*