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Research paper

Pneumomediastinum Secondary to Pneumocystis jirovecii Pneumonia Revealing a Diagnosis of HIV Infection: A Case Report

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Abstract

Pneumomediastinum refers to the presence of air in the mediastinum. It can arise from various etiologies, including trauma, esophageal perforation, infections, medical procedures, or underlying lung diseases. Pneumocystis jirovecii pneumonia (PJP) is a Common opportunistic infection seen in immunocompromised individuals, especially those with HIV/AIDS. Pneumomediastinum is a rare but serious complication of PJP that occurs in immunosuppressed patients, leading to significant morbidity and mortality. We present a rare case of pneumomediastinum caused by P. jirovecii in a patient discovered newly to have an HIV infection.

Keywords: *Pneumomediastinum; Pneumocystis Jirovecii Pneumonia; HIV.*

1. Introduction

Pneumocystosis is an opportunistic fungal infection caused by Pneumocystis jirovecii, it can lead to a pneumomediastinum a potential life-threatening complication that occurs in HIV-positive and HIV-negative patients [1].
Spontaneous pneumomediastinum is a rare condition that occurs mainly in adolescents and young adults, with a favorable prognosis in most cases. A few cases were described in literature. We report a particular case of pneumomediastinum associated with subcutaneous emphysema complication of Pneumocystis jirovecii pneumonia in a patient found to be HIV positive. The aim of our study is to investigate the specific characteristics of pneumomediastinum secondary to Pneumocystis jirovecii pneumonitis in a patient discovered newly to have an HIV infection [2].

2. Methods

We report herein, a 41-year-old mal patient sexually active with multiple partners, not known to have any comorbidities and not on immunosuppressive therapy admitted to pulmonology department for dyspnea.
The patient reported two weeks before admission, he developed exertional progressively worsening dyspnea, associated with moderate retrosternal pain and tightness. He denied any cough or other extra-respiratory signs. The patient reported also constitutional syndrome; asthenia and weight loss of two kilograms last month.
On admission, the patient was afebrile and desaturating Spo2 84% on room air, slightly tachycardiac and tachypneic, with normal blood pressure. Physical examination was remarkable for a subcutaneous cervicothoracic emphysema with snow crackling sensation. Chest X-ray showed bilateral reticular-micro nodular opacities with pneumomediastinum, without pneumothorax and sub cutaneous cervicothoracic emphysema.
Chest computed tomography (CT) confirmed the diagnosis of pneumomediastinum and disclosed a bilateral reticular-micronodular interstitial syndrome associated with ground-glass opacities and emphysema of the cervicothoracic soft tissues (Figure 1). The broncho alveolar lavage (BAL) was positive to Pneumocystis Jirovecci. HIV ELISA and confirmatory western blot were positive.CD4: 86 cells/mm^3, RNA HIV: 27900 copies /ml.
Our patient was managed with cotrimoxazole 15 mg per kg IV infusion for 3 weeks, with steroid (methylprednisone 40 mg IV Q12h) for 10 days, and oxygen supplementation, with excellent outcome. The antiretroviral therapy was started after the end of the antimicrobial course in addition of a secondary prophylaxis by cotrimoxazole 480 mg tab OD for at least 6 months.

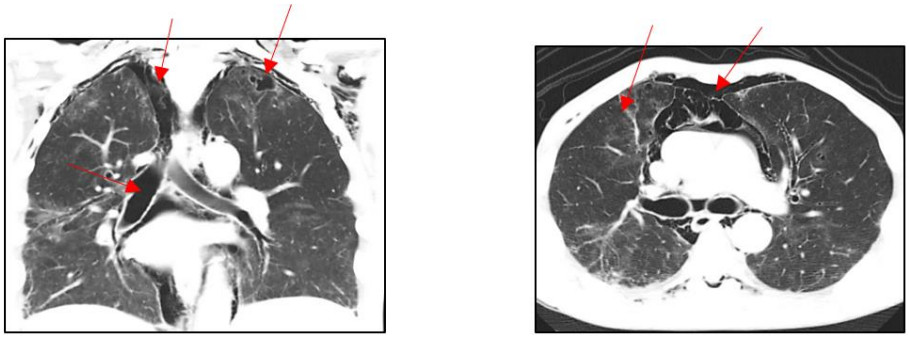

Fig. 1: The Chest CT Scan Showed Reticular Opacities, Mosaic Ground Glass Opacities, and Extensive Bilateral Pneumomediastinum with Subcutaneous Emphysema.

3. Discussion

Pneumomediastinum is defined by the presence of free air in mediastinum, which is thought to arise from free air leaking from ruptured alveoli. There are two mechanisms, spontaneous pneumomediastinum without any obvious primary cause, or secondary pneumomediastinum with a specific responsible aetiology such as pulmonary or mediastinal infection due to gas forming organisms, trauma or esophageal rupture [1].

It is well known that spontaneous pneumothorax can occur in up to 36 % of patients with Pneumocystis jirovecii pneumonia. However, spontaneous pneumomediastinum is an un- common complication with no reported incidence rates [3], [4]. Pneumomediastinum is a rare complication of PJP and the prevalence ranges from 0.4% to 3.3% [5].

The mechanism of spontaneous pneumomediastinum can be explained by the existence of a decreasing pressure gradient between the alveoli and the lung interstitium that can result in alveolar rupture [3], [4]. This leads to the accumulation of air in the interstitium that circulates centripetally through the venous sheaths to the hilum and mediastinum as the pressure in the mediastinum is lower than that of the lung periphery [4], [6] The air leak is presumably originated from the pneumatoceles formed as a result of proteases released by activated macrophages and/or overdistention resulting from localized inflammation caused by Pneumocystis jirovecii [6].

The mechanism of spontaneous pneumomediastinum is still poorly understood, and the most commonly reported hypothesis in the literature is that of endobronchial hyperpressure with closed glottis, due to Valsalva maneuvers [1], [7]. A second mechanism of spontaneous pneumomediastinum involves direct damage to the alveolar walls [8, 9]. This is the case with bacterial pneumonia, mainly caused by Staphylococcus aureus, viral pneumonia (influenza, measles, whooping cough) and parasitic pneumonia, which is the case with our immunocompromised patient [10].

Although pneumomediastinum is benign and self-limiting, the risk of tension pneumomediastinum or pneumothorax justifies close clinical observation. Pneumopericardium may also occur, with complications such as air tamponade and cardiac herniation [4,6]. The most common complaints are chest pain and dyspnea; chest pain is commonly pleuritic and retrosternal [5], [11].

CT of the chest is the gold standard for diagnosis. If suspicion for aerodigestive tract perforation is high, a barium swallow, esophagoscopy, or bronchoscopy may be performed [6]. The management of patients with spontaneous pneumomediastinum is conservative, it includes supportive care consisting of rest, analgesics, and close observation. with oxygen supplementation, pain management, and treatment of the underlying infection [6], [11]. In severe cases, surgical intervention may be required. The prognosis depends on the severity of the underlying lung disease and the timely recognition and management of complications like pneumomediastinum [11].

4. Conclusion

Pneumomediastinum is a serious complication of pneumonitis due to Pneumocystis jirovecii that requires early diagnosis, extremely urgent management and identification of risk factors and comorbidities such as HIV infection; to ovoid the worsening of the acute respiratory failure. The sudden onset of symptoms prompts the search for these complications.

The particularity of our case is that the patient was young, not aware about his HIV status. Thus, had delayed the diagnosis and this late presentation led to a very rare complication. The diagnosis was suspected based on clinical and radiological findings; progressive dyspnea, ground glass opacities in CT and the presence of air in the mediastinum the patient was managed successfully conservatively and did not need any invasive ventilation.

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