Pulmonary Talcosis: A Foreign Body Granulomatous Lung Disease

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Abstract

Pulmonary Talcosis is a rare foreign body granulomatous disease that occurs as a result of exposure to talc either by inhalation of talc particles or via intravascular injection of talc containing medications. Pulmonary Talcosis is often misdiagnosed as pulmonary tuberculosis, atypical mycobacterium infection or sarcoidosis as many of their clinical and radiological findings overlap. We report a case of talcosis mimicking mycobacterial disease which was eventually diagnosed via lung biopsy. A detailed history and high index of suspicion is required for timely diagnosis and appropriate management.

Introduction

Pulmonary talcosis is a rare inflammatory lung disease due to intravenous or inhalational exposure to talc particles. Talcosis is underdiagnosed due to nonspecific clinical presentation. A detailed exposure history with correlation with radiological findings may point towards the diagnosis.

Case Presentation

A 56-year-old man presented to the hospital for medical evaluation prior to housing placement. He complained of occasional nonproductive cough and a 20 lbs. weight loss for past 3 months. He denied dyspnea, chest pain, fever, night sweats or any current illicit drug use. His past medical history included chronic obstructive pulmonary disease, hepatitis C and polysubstance abuse (IV heroin and oral benzodiazepines). He is a former 20-pack-yr smoker and is currently homeless. Current medications included methadone and diazepam. The patient appeared disheveled and lethargic with multiple skin excoriations. His initial vital signs were temperature 98.6°F, heart rate of 94 beats per minute, respiratory rate 27 breaths per minute, blood pressure 124/81 mmHg and oxygen saturation of 74% at room air. Lungs were clear to auscultation. The rest of the physical examination was unremarkable.

His initial blood work showed hemoglobin of 14.6g/dl, white blood count of 25.9 x109/L, platelet count 233 x109/L, Sodium 127meq/L, Chloride 86meq/L and Bicarbonate of 31meq/L. Arterial blood gas on room air revealed a pH of 7.32, pCO2 of 66 and a pO2 of 57. The rest of his comprehensive metabolic panel were within normal limits. T-spot, HIV and urine drug screen tests were negative. Chest X-ray revealed patchy nodular right middle and lower zone densities. CT of the chest revealed several scattered densities in a tree-in-bud pattern with some coalescent areas in right middle and lower lung zones (Figure 1). Initial treatment with noninvasive positive pressure ventilation, antibiotics and steroids were initiated for COPD exacerbation and possible underlying pneumonia.

Figure 1: Showing CT chest showing scattered micronodules in a pattern with some coalescent areas in right middle and lower lung zones.

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tree-in-bud pattern (red arrow) and airspace consolidation (blue arrow)

Bronchoscopy with bronchoalveolar lavage (BAL) and transbronchial biopsies were performed. BAL revealed 70% neutrophils, 29% macrophages and 1% lymphocytes. Routine bacterial, mycobacterial and fungal studies including acid fast bacilli and Pneumocystis jiroveci were negative. Surgical pathology revealed focal interstitial birefringent needle like particles with histiocytic reaction, acute bronchiolitis and chronic peribronchiolitis (Figure 2). Final pathology was negative for granulomas or malignancy.

Figure 2: Histologic sections from the biopsy from right middle lobe of the lung from the patient shows parenchymal acute and chronic inflammation with foreign material deposits consistent with talcosis. The talc crystals appear as birefringent particles (identified by arrows) by polarized light (a); Higher magnification shows acute bronchiolitis and chronic peribronchiolitis (b); with histiocytic reaction around the foreign material deposits (c); AFB stains done were negative for acid fast organisms (d).

Discussion

Pulmonary talcosis is a form of pulmonary foreign body granulomatosis (PFBG) due to exposure to talc. Talc or hydrous magnesium silicate is a natural mineral compound widely used in ceramic, paper, plastic, rubber, paint and cosmetic industries. Talc is also used as a lubricant and glidant in the production of oral medications [1] and it is also routinely used as an intrapleural sclerosant in the management of recurrent pleural effusion and pneumothorax.

Four types of talc-related lung disease are described in literature which includes talco-silicosis, talco-asbestosis, pure talcosis and intravascular talcosis. The first three types occur due to inhalational exposures to talc. Talc-silicosis and talco-asbestosis are both pneumoconiosis associated with inhalational exposures to talc dust with high silica or asbestos content. Pure talcosis occurs from exposures to talc containing cosmetics and from cocaine sniffing [2]. Pulmonary talcosis can occur after a single massive exposure or after prolonged use of cosmetic products [3,4]. Intravascular talcosis occurs in individuals who inject talc-containing oral drugs such as heroin, pentazocine, methadone, methylphenidate, cocaine and amphetamine sulfate [5,6]. In these individuals, talc particles are deposited in the pulmonary vasculature and interstitium resulting in widespread granulomatous inflammation in the lungs [2,3].

The clinical manifestation of talcosis ranges from asymptomatic to nonspecific symptoms such as exertional dyspnea, weight loss, chronic dry cough and night sweats. Chronic advanced disease can lead to pulmonary fibrosis, pulmonary hypertension and right ventricular failure [5,7]. Pulmonary function tests (PFT) often reveals a mixed obstructive and restrictive pattern with low diffusion capacity. Progressive disease can develop severe obstruction with or without air trapping. Initial chest imaging may reveal diffuse micronodular densities but as the disease progresses, coalescence of micronodules into masses occur notably in the perihilar areas similar to progressive massive fibrosis [5,6]. Talcosis is commonly misdiagnosed as other pulmonary conditions including pulmonary tuberculosis, atypical mycobacterial infections, asbestosis, silicosis or sarcoidosis because of the overlap of clinical and radiological findings [2].

Bronchoscopy with BAL may not be diagnostic but is an important part of the evaluation to rule out other entities. A definitive diagnosis requires tissue sampling by transbronchial needle biopsy or open lung biopsy.

Histologic examination reveals talc-containing granulomas which demonstrates birefringence under polarized light. The location of granulomas and size of talc particles may give clues about the source of talc exposure. The presence of talc particles >5μm, with intravascular and perivascular distribution of non-caseating granulomas is suggestive of intravascular talcosis while smaller particle size with peribronchial and alveolar distribution suggests inhalational exposure [2,6,8,9]. Granulomas disappear as the disease advances into fibrosis [10].

No evidence-based guidelines are available for the treatment of these patients. Avoiding further talc exposure is the first step in management. Patients with mild symptoms or chronic stable patients should be given supportive care with oxygen, bronchodilator therapy and pulmonary rehabilitation. For patients with severe acute symptoms or progressive chronic disease, a trial of corticosteroids may be beneficial. Patients who develop pulmonary hypertension may benefit from vasodilator therapy while patients who progress to advanced lung disease may be candidates for lung transplantation [5].

Our patient completed his course of antibiotics and steroids. His hy-
poxic respiratory failure improved and was discharged home on 2 liters of oxygen with plans to continue care as an outpatient. However, the patient lost follow up afterwards.

References


