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Silicotuberculosis: A case report

Silicotuberculosis: A propósito de un caso

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CASE DESCRIPTION

63-year-old man, originally from Potosí (Bolivia), former underground miner with more than 20 years of exposure to crystalline silica (working as a driller). He came to the Emergency Department with a one-month history of mucopurulent sputum associated with grade 2 dyspnea (mMRC), night sweats, asthenia, adynamia, and weight loss. At the time of admission, the patient had been unemployed for 5 years.

Physical examination revealed a baseline oxygen saturation of 65% measured by pulse oximetry on room air, accompanied by tachypnea and use of accessory respiratory muscles. Pulmonary auscultation revealed isolated crackles in both hemithoraces. Chest X-ray showed a tortuous trachea deviated to the right and upper lobes with signs of atelectasis (Image 1). Chest computed tomography (CT) showed solid nodules with conglomerate formations and the development of progressive massive fibrosis in segment 1 bilaterally, with dystrophic calcifications within them, mediastinal lymph nodes measuring 1.2 cm with calcification, and air cysts. These findings suggest a classic presentation of silicosis (Images 2 and 3).

Laboratory findings showed leukocytosis with a left shift and elevated C-reactive protein (151 mg/L). Arterial blood gas analysis revealed type I (hypoxemic) respiratory failure: PaO_2: 38 mmHg, PCO_2: 41 mmHg.

DIAGNOSIS AND CASE DISCUSSION

After admission, a fiberoptic bronchoscopy with bronchoalveolar lavage (BAL) was performed, and the results showed no growth in conventional microorganism cultures. Given the clinical suspicion and a negative sputum bacilloscopy, a GeneXpert MTB/RIF test was requested on the BAL sample as the initial diagnostic test, yielding a "Detected" result for Mycobacterium tuberculosis sensitive to rifampicin. Based on the occupational history, clinical findings, and imaging results, this confirms pulmonary silicotuberculosis. Antituberculous therapy for drug-sensitive TB was initiated with the four-drug regimen (RHZE, rifampicin, isoniazid, pyrazinamide, and ethambutol). Given the good tolerance and clinical improvement, outpatient management with home oxygen therapy was decided.

Silicotuberculosis is the combination of silicosis (a chronic, fibrotic, and irreversible lung disease) and pulmonary tuberculosis (a potentially curable infectious disease). It remains a significant public health problem in countries with high mining activity such as Bolivia.[1] The development of new technological processes has increased the risk of silicosis in various sectors. Silicosis not only affects lung function, but also increases the risk of COPD (chronic obstructive pulmonary disease), lung cancer, and especially tuberculosis.[2]

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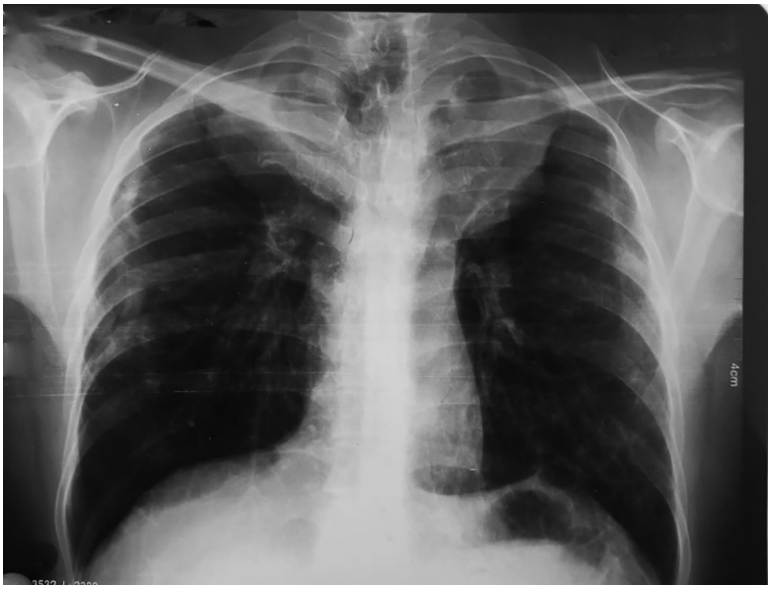

Image 1. Chest X-ray (posteroanterior view) demonstrating a tortuous trachea displaced to the right and signs of volume loss (atelectasis) in both upper lobes.

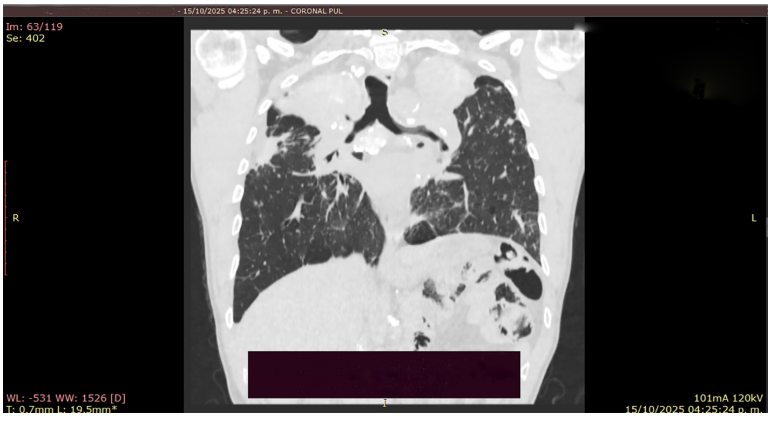

Image 2. Chest CT, coronal reconstruction (lung window), showing solid nodules with a tendency toward coalescence, forming progressive massive fibrosis (PMF) masses in bilateral apical segments. Intranodular dystrophic calcifications, calcified mediastinal lymphadenopathy (1.2 cm), and perilesional air cysts are observed, findings consistent with complicated silicosis.

Image 3. Chest CT, axial view, showing nodular conglomerates and fibrotic masses with associated calcifications, characteristic of progressive massive fibrosis formation in advanced stages of pneumoconiosis.

The treatment duration for silicotuberculosis in Bolivia is significantly longer than the standard regimen. This is because silicosis produces masses of progressive massive fibrosis, which have poor vascularization that may limit the penetration of antituberculous drugs.[2-3] These lesions may act as "niches" where the bacillus remains latent, making eradication more difficult and increasing the risk of relapse.

Treatment follows the National Guidelines of the Bolivian National Tuberculosis Control Program (PNCTB), which establish a prolonged 12-month regimen to ensure bacterial sterilization in this type of patient with prior structural lung damage.[4] This approach aims to maximize the elimination of slowly replicating bacilli in fibrotic tissues. After two months of treatment, the patient shows notable improvement, with a baseline oxygen saturation of 80% on room air and stable laboratory follow-up results. The patient continues under the prolonged treatment regimen until completing 12 months as established by national guidelines.

Conflict of interest
The authors have no conflicts of interest to declare in relation to this publication.

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