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Pulmonary tuberculosis as a differential diagnosis of a pulmonary nodule: the great masquerader

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ABSTRACT

Tuberculosis is known as one of “the great masqueraders” due to unusual and nonspecific symptoms it presents, which causes a challenge in diagnosis. There are rare radiological pulmonary patterns described in some case reports such as lung mass and bilateral pulmonary nodules similar to primary lung cancer or pulmonary metastases. We present a case of a 42-year-old man who was admitted to the emergency room due to pain and increased testicular volume. His chest tomography revealed a right lung mass and bilateral pulmonary nodules with a diffuse distribution. Therefore, based on clinical and radiological results, we suspected malignancy. His testicular fluid drainage resulted in a positive Ziehl Neelsen staining. The patient received anti-tuberculosis treatment for 1 month showing clinical and tomographic improvement.

Pulmonary tuberculosis can present unusual radiological patterns. Therefore, we suggest that it should be considered in the differential diagnosis of patients with clinical and radiological characteristics of metastatic or primary lung disease. Diagnosis should be aided by invasive interventions.

Keywords: lung mass, male genital tuberculosis, mimics, pulmonary nodule, pulmonary tuberculosis

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Introduction

Tuberculosis (TB) is a public health problem. The World Health Organization (WHO) reported that in 2018 around 10 million people became ill with TB and 1.2 million died, making TB the main cause of death by infection in the world [1]. In Peru, 42 940 TB cases were reported in 2019, which ranked TB eleventh among the causes of death in the general population [2]. Pulmonary TB (PTB) represents 70% of TB cases, from where it can spread to any other organ, with extrapulmonary form reported in 18% of cases. Genital TB is rare, and testicular TB is even rarer, comprising only 3% of genital TB [3, 4].

Pulmonary presentations of TB can be easily diagnosed, but sometimes they have unusual presentations. PTB is known as “a great masquerader” that causes dif-

iculties in diagnosis. The radiological manifestations of PTB are well-known and documented; however, it can have atypical radiological patterns that can be confused with lung malignancies in 3.5% to 4.5% of cases [5].

We present a case of a patient with clinical and radiological evidence suggesting metastatic lung cancer and with the final diagnosis of pulmonary and testicular tuberculosis.

Case report

A 42-year-old male patient, with no pathological history of interest, was admitted to the Emergency Room of the “Dos de Mayo” National Hospital for worsening testicular pain, increased volume in the right testicle,

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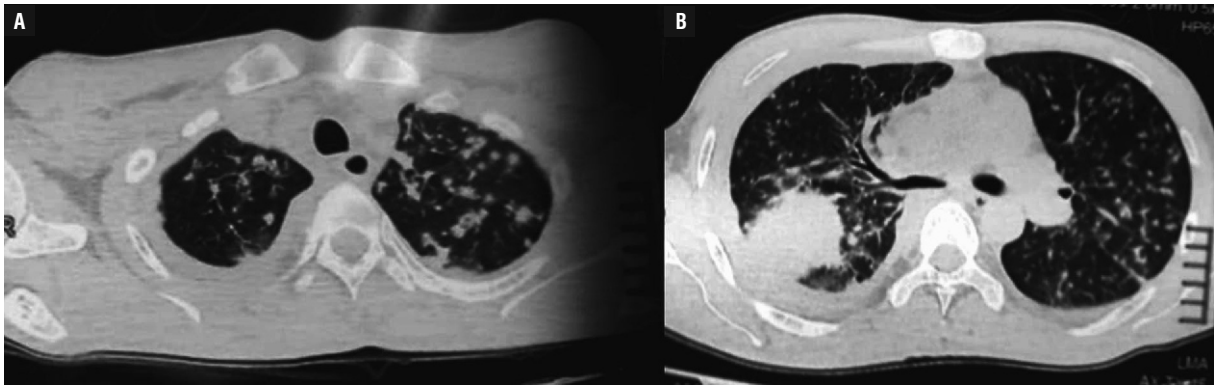


Figure 1. A. Chest computed tomography showing multiple bilateral diffuse pulmonary nodules; B. Lung mass with irregular borders in S6 and adjacent pleural effusion, in addition to the presence of nodules

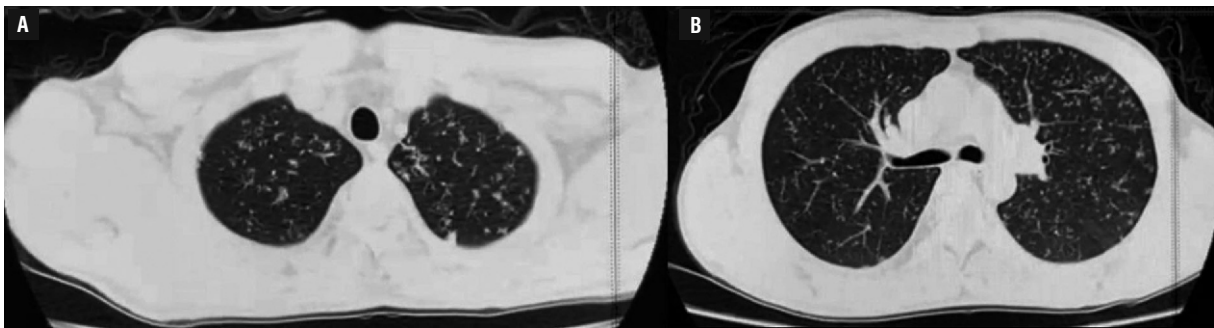


Figure 2A–B. Chest computed tomography performed after one month of treatment. Pictures A and B showing sections equivalent to Figure 1, where improvement of the lesions is observed

and weight loss. He was previously treated in a primary care center where levofloxacin was administered without achieving improvement.

The vital functions on admission were a heart rate of 78 beats per minute, respiratory rate of 20 breaths per minute, oxygen saturation of 92% (FiO₂ 21%), and temperature of 37°C. The clinical examination found abolished vesicular murmur in the lower third of the right hemithorax, and, there was a palpable hard mass in the right testicle without signs of inflammation. The rest of the evaluation was normal.

Blood parameters showed normal white blood cell count (7080 cells/cm³), mild anemia (hemoglobin of 9.50 mg/dL), normal serum creatinine levels (0.90 mg/dL), D-dimer of 11.28 mg/dL, lactate dehydrogenase (LDH) of 270 U/L, Alpha-fetoprotein level was 2.31 IU/mL and beta HCG was less than 2.30 mIU/mL. He tested negative for SARS-CoV-2, human immunodeficiency virus (HIV), and other tumor markers. Ultrasonography revealed the presence of a solid heterogeneous tumor measuring approximately 42 × 35 × 35 mm and signs of infiltration of the regional peritesticular

layers, extending to the subcutaneous plane of the scrotum. A Doppler study showed little internal flow. Other findings included small cysts measuring less than 5 mm in both epididymis.

Chest computed tomography showed a defined mass with heterogeneous density, pleural effusion, multiple nodules in the right lung, a slight left pleural effusion, and nodules in the left lung as well (Fig. 1). During hospitalization, diagnostic thoracentesis was performed that evidenced a predominantly mononuclear exudate, LDH of 320 U/L, adenosine deaminase (ADA) value was 59.47 U/L, and cell block preparation and Pap smear were both negative for neoplasia.

Additionally, testicular fluid drainage was performed, obtaining a positive Ziehl Neelsen staining (paucibacillary tuberculosis), for which an anti-tuberculosis treatment regime with first-line drugs was started with isoniazid (H) 300 mg/d, rifampicin (R) 600 mg/d, ethambutol (E) 1200 mg/d, and pyrazinamide (Z) 1500 mg/d. Afterward, the patient was discharged. After one month of treatment, he was reevaluated and showed clinical and tomographic improvement (Fig. 2).

Discussion

The clinical presentation of pulmonary tuberculosis is easy to diagnose; however, its radiological presentation often simulates other diseases. In this situation, it is necessary to consider other diagnoses and perform invasive procedures to confirm a diagnosis.

The PTB symptoms are often nonspecific, or patients can be asymptomatic in up to 5% of cases. Moreover, symptoms such as cough, hemoptysis, and weight loss can resemble the symptoms of lung cancer [6].

In the presented case, the patient did not report any respiratory symptoms, only weight loss and increased volume at the right scrotal area, which at first supported the diagnosis of malignancy. Isolated cases of testicular tuberculosis have been reported, whose most frequent presentation is painless scrotal edema, with or without discharge, and the palpation of a hard mass that can be often confused with testicular cancer. Thus, finding a hard testicular mass in patients over 60 years can arise testicular cancer suspicion. Nevertheless, in patients between 20 and 40 years of age, testicular tuberculosis as a differential diagnosis should be considered [7, 8].

The common radiological manifestations of PTB are well described in the literature; however, there are unusual patterns that can delay diagnosis and treatment. In areas where tuberculosis is endemic, we suggest that it should be considered in the differential diagnosis of malignancy [4]. Unusual manifestations of PTB occur in up to 6% of cases, and they are characterized by the presence of a solitary nodule that simulates lung cancer [5]. This is called pseudotumoral pulmonary tuberculosis because a small proportion of benign lung masses may present spiculated margins, while about 20% of primary lung cancers can show well-defined margins. In some cases, the diagnosis was based on a therapeutic test showing a spectacular tomographic improvement after receiving anti-tuberculosis treatment [5, 9].

There is a variety of causes associated with bilateral pulmonary nodules, the most frequent being metastatic, as reported in a review in patients aged from 30 to 55 years, where 67% of the pulmonary nodules were metastases frequently secondary to testicular carcinoma [10]. However, another reported unusual PTB manifestation is the presence of multiple bilateral nodules. Despite suggested parameters to differentiate multiple pulmonary nodules related to TB from metastatic ones, they are not definitive [11–13]. In those cases, pulmonary tuberculosis should be considered in the differential diagnosis of multiple pulmonary nodules, which makes performing invasive interventions necessary.

Another tomographic finding described in this case was the presence of pleural effusion. This entity can be seen in 15% of patients with neoplastic diseases

and 40% of cases of extrapulmonary TB. Malignancy and tuberculosis are the two main causes of exudative pleural effusion, representing approximately 50% of all exudates [14]. Both entities have similar biochemical profiles, and it can be difficult to distinguish between them. It has been mentioned that a high level of ADA in the pleural fluid can be useful for differential diagnosis, with sensitivity of 92% and specificity of 90% for tuberculous pleurisy. By contrast, elevated levels of LDH in the pleural fluid of over 722 U/L are more common for malignant etiology [15]. In the reported case, there were elevated levels of ADA concordant with TB, whereas LDH levels were not as high as described in the cases of neoplastic etiology; thus, these results supported the diagnosis of pleural tuberculosis.

Conclusions

Pulmonary tuberculosis is one of “the great masqueraders”, and it can present unusual radiological patterns. We suggest that it should be considered in the differential diagnosis of patients with clinical and radiological suspicion of metastatic or primary lung neoplasia and that diagnosis should be assisted by invasive procedures.

Article Information and Declarations

Ethics statement

Patient informed consent.

Author contributions

All authors have contributed to the conception and realization of the report.

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Conflict of interest

None.

Supplementary material

None.

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