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Parenchymal Pseudotumoral Tuberculosis

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Abstract **Original Research Article**

Worldwide, tuberculosis (TB) remains an important public health problem and one of the main causes of death. Pseudotumoural pulmonary TB is a rare radiological manifestation of pulmonary TB, mimicking lung carcinoma. Herein, we report four immunocompetent adults who presented with large masses and were diagnosed to have parenchymal pseudotumoral tuberculosis, followed at the Pneumology Department of University Hospital Center Mohammed VI of Marrakesh in Morocco between April 2019 and January 2022. five cases were included in the study. All patients initially presented with general and respiratory symptoms, with radiological findings simulating lung carcinoma. Tuberculosis was diagnosed from microbiological testing and/or histological examination results. All patients were immunocompetent. All patients were treated successfully with antimycobacterial therapy.

Keywords: Tuberculosis, Pseudotumoral, Pulmonary mass, Lung carcinoma.

INTRODUCTION

Every day, over 4100 people die from tuberculosis and nearly 30 000 people fall ill with TB disease, according to WHO. The radiological manifestations are easily recognized. Primary tuberculosis presents as consolidation with or without lymphadenopathy. Atelectasis, pleural effusions and miliary pattern are other presenting features of primary tuberculosis. Post-primary tuberculosis presents with non-homo- genous opacities or cavities in the apical or posterior segment of the right upper lobe or apical segment of lower lobe. Several unusual radiographic features are well described [1, 4]. In primary disease, these include lymphadenopathy without infiltrates; lower lobe infiltrates without adenopathy or effusion; solitary tuberculoma and occurrence of primary disease in patients aged more than 40 years [1, 3]. In post-primary disease, nonhomogeneous opacities in the lower lobes or anterior segment of upper lobes, mass lesions simulating neoplasms, isolated bronchopleural fistula and normal radiographs are atypical [4]. Pseudotumoural pulmonary TB (PTPT) is a rare radiological manifestation of pulmonary TB, mimicking lung carcinoma. Thus, the diagnosis can be delayed and lead to surgical resection [4].

MATERIALS AND METHODS

Retrospective study including patients who presented with large masses and were diagnosed to have parenchymal pseudotumoral tuberculosis. Followed at the Pneumology Department of University Hospital Center Mohammed VI, of Marrakesh in Morocco between April 2019 and January 2022. Collecting data was performed using a questionnaire filled in by the investigator including the following items: general characteristics clinical, radiological, microbiological, and histological. The statistical analysis uses the methods of descriptive analysis which consisted in the calculation of averages and standard deviations and percentages for the various quantitative and qualitative variables.

RESULTS

Five cases have been collected in the study. The average age of our patients was 55 years, mal predominance was noted (4/5, 80%), a low socioeconomic level was noted in 60%. Active smoking was present in 60 % of cases (3/5) and passive smoking in 20% of patients (1/5). Exposure to wood smoke was found in 20 % of patients (1/5) (Table 1). All patients had presented respiratory signs at the time of diagnosis, these were dominated by cough and hemoptysis in 80% of cases each one (Table 2).

Table 1: The exposures

Exposures	Active smoking	Passive smoking	Wood Smoke
	60%	20%	20%

Table 2: Symptoms revealing the disease

Symptoms	Cough	Hemoptysis	Chest Pain	fever
	80%	80%	40%	40%

The average time to consultation was 8 months. All patients were immunocompetent. There were a total of eight masses, four on the right and one on the left side. The anterior segment and the apical segment of the right upper lobe were the most common site for pulmonary mass (60%, 3/5 each), followed by the apical segment of right lower lobe (40%, 2/5). Centrilobular nodules were seen along with the mass on high-resolution computed tomography (60 %, 3/5). Lymphadenopathy was frequent (3/5, 60%). Cavitation was seen in 60% (3/5) of the masses. Sputum was positive for AFB in two patients (40%) (fig. 1A , fig. 1B, fig. 1C, fig. 1D).

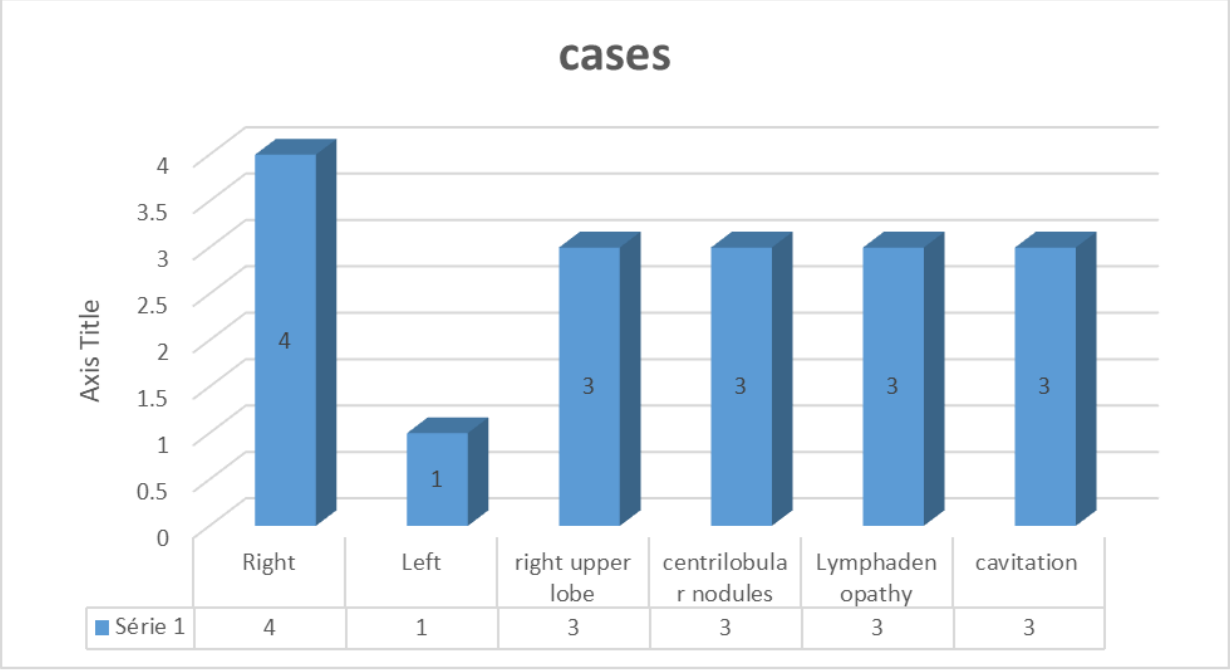

Fig. 1A: Site of mass

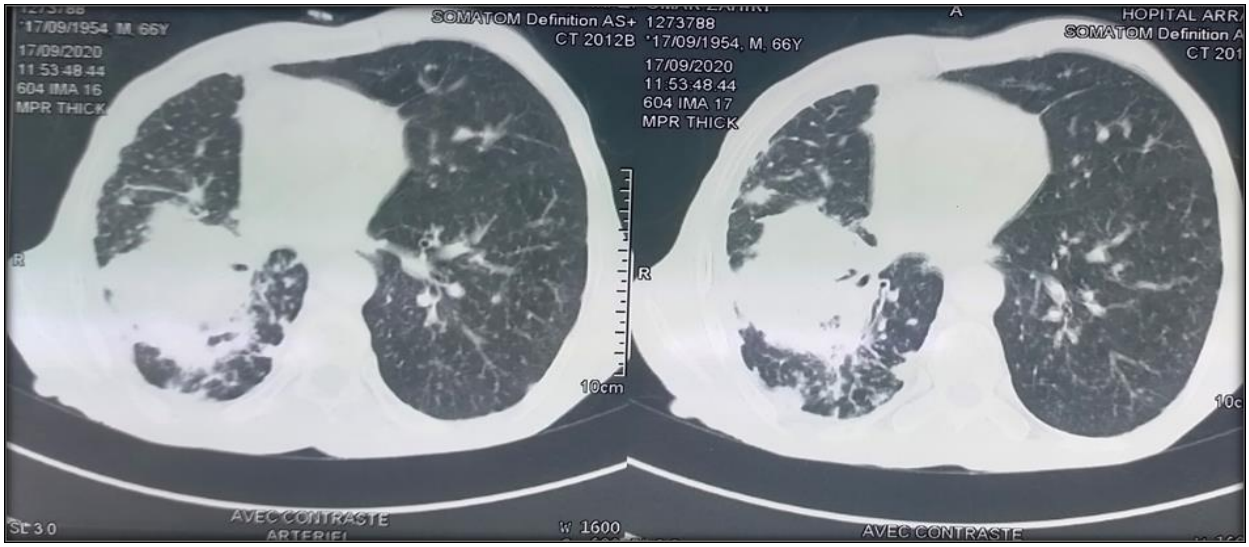

Fig. 1B: Chest scan shows a large mass 120 mm with areas of cavitation occupying the middle lobe and the apical segment of the right lower lobe

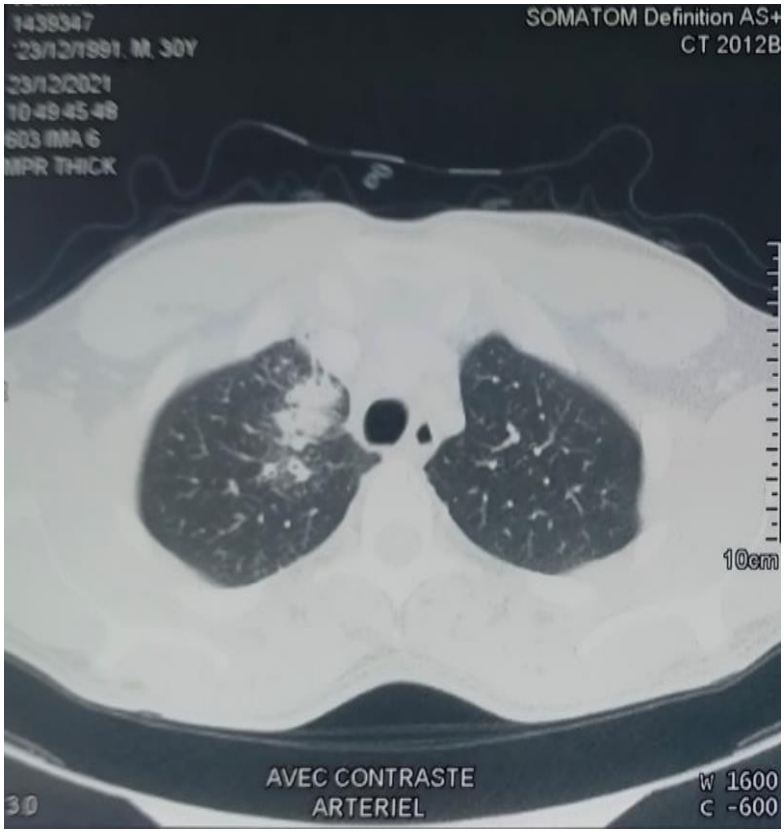

Fig. 1C: Chest scan shows a right apical mass 53 mm with areas of cavitation

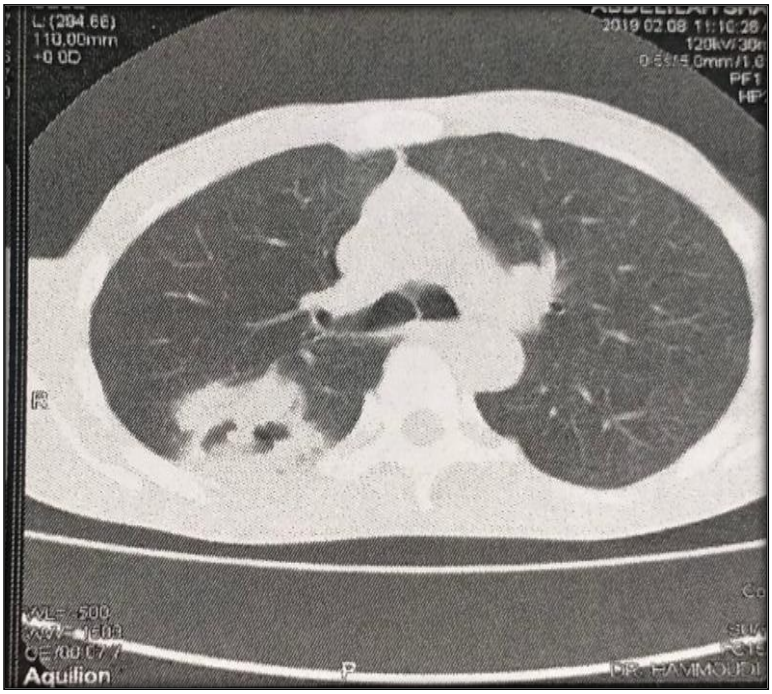

Fig. 1D: Chest scan shows excavated image in the upper right dorsal segment of 48 mm

Bronchoscopy was abnormal in 60% (3/5), she yielded the diagnosis in two patients (2/5, 40%). 2 patients tested positive for AFB in bronchial aspirates. Percutaneous transthoracic lung biopsy confirmed the diagnosis in 2 patients. One patient was recognized to have this rare presentation only after the surgical biopsy specimen showed follicular epithelial giant cell with caseous necrosis, and no suspicious cells (fig. 2).

All patients received antimycobacterial therapy (isoniazid 5mg/kg , rifampicin 10mg/kg, pyrazinamide 25 mg/kg and ethambutol 15mg/kg for 2 months, followed by isoniazid 5mg/kg and rifampicin 10mg/kg

for 4 months) administered as directly observed therapy under the revised national tuberculosis control program. The evolution was good in all patients, without any side effects.

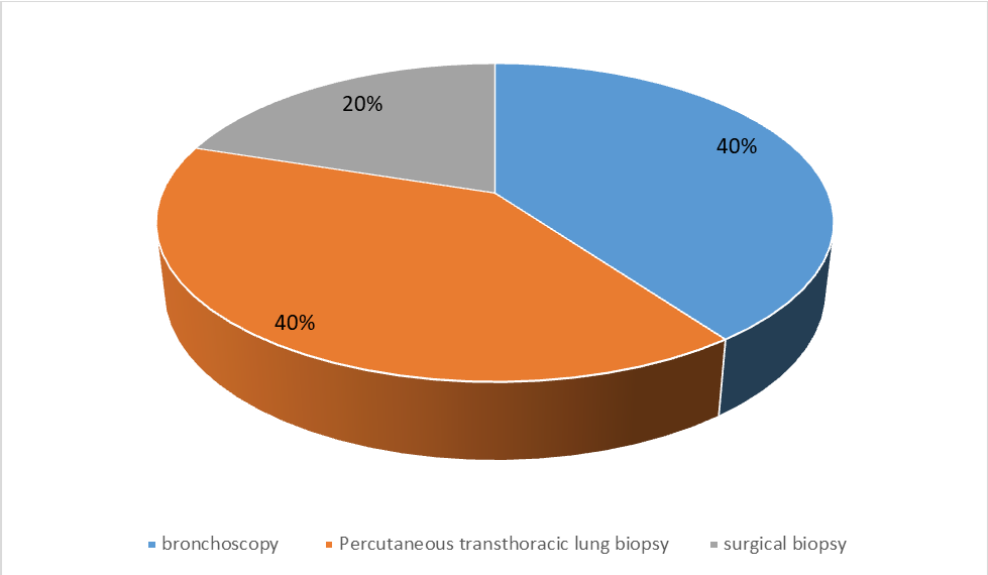

Fig. 2: Means of diagnosis

DISCUSSION

In Morocco, a total of 29,327 cases of tuberculosis, have been notified and put on treatment in 2021, within the framework of the National Tuberculosis Control Programme, and it is clear that the young population, aged between 15 and 45, remains the most exposed.

The manifestation of PTB as a lung mass is quite rare in immunocompetent individuals and differentiation from a primary lung cancer becomes challenging especially when repeated negative sputum smears for acid – fast bacilli, sputum culture for MTB and GeneXpert occurs. Conversely, lung cancer can also be misdiagnosed a s PTB, particularly in the regions of the world where tuberculosis is endemic with a very high burden.

Pseudotumour bronchopulmonary tuberculosis (PTBT) remains a rare entity. in Indian study involving 1286 (822 male and 464 female patients) patients, 8 (3.4%) patients identified with histopathologically confirmed diagnosis of parenchymal pseudotumoral tuberculosis [4]. the retrospective study by Chaouch *et al.*, 341 cases of pulmonary tuberculosis collected over a period of 11 years retained 12 patients, with a frequency of 3.5% [5]. Andian study found that of the 234 admissions with tuberculosis, we identified 8 (3.4%) patients with histopathologically confirmed diagnosis of parenchymal pseudotumoral tuberculosis [6].

The median age median age varies according to the literature, with an average of 40 years (19-64 years) according to Snene *et al.*, [4], 45 years (20-62 years) according to Chaouch *et al.*, [5], 36 years with a range of 20–55 years according to Agarwal *et al.*, [6]. The average age of our series is in line with the median age reported in literature (55 years). A male predominance is noted in the different studies as well as in our study [4-6]. Smoking intoxication is often found in patients [4-6]. The symptoms of PTPT are not specific; the most prevalent are cough, chest pain and haemoptysis [6], which is also reported in our series.

The location of parenchymal masses has been variably reported as upper lobe or lower lobe predominant earlier [7, 8]. This disparity is likely to represent masses developing as a complication of progressive primary or post-primary tuberculosis. The preference of primary tubercular infection for the lower lobes is because of greater ventilation therein; impaired lymph drainage and better oxygenation in the upper lobes favor re-activation tuberculosis. The upper lobe predominance of most cases is obvious. Primary PTB, common in children, is usually seen as dense, homogeneous, segmental, lobar, or multifocal unilateral consolidation associated with ipsilateral lymphadenopathy (TB lymphadenitis) on chest x-ray [9]. Other findings may include right – sided atelectasis, unilateral pleural effusion and miliary nodules. In contrast, post – primary pulmonary tuberculosis, common in the adult population, may manifest radiologically as patchy, heterogeneous consolidation involving the apical and posterior segments of the upper lobes and superior segments of the lower lobes with ill – defined borders and small satellite nodules [9]. Cavitations, calcifications, nodular or linear opacities, miliary nodules and unilateral loculated pleural effusion are also common findings in post-primary TB [10]. It has been estimated that about 3 – 6% of pulmonary TB may present as non-calcified mass lesions which are

best characterized on chest CT-scan usually [9]. Similarly the cases presented here were both immunocompetent individuals who presented unusually with lung masses of 12 mm and 120 mm with spiculated margins raised the suspicion of a malignant lung mass.

Concerning microbiological confirmation, M. tuberculosis culture was positive in BAL specimens but not in sputum specimens in two of the five cases in this series. In another case series, Agarwal *et al.*, [6], concluded that sputum specimens were positive for AFB in 25% of patients with parenchymal PTPT. This can be explained by the solid and poorly oxygenated nature of the lesions. Fibroscopy (with bronchial aspiration and/or BAL) specimens seem to be the gold standard examination for this TB entity. With high culture sensitivity, this procedure can identify smear-negative patients and reduce time to diagnosis [10]. It can also identify the neoplastic-like presence of a bud or lung infiltration, leading to diagnosis from biopsy [11, 12].

Finally, therapy and treatment duration are the same for PTPT as for common forms of TB. In the case of TB– HIV co-infection, ART should ideally be initiated within the first 2 weeks of TB treatment for patients with CD4 cell counts <50/mm3 to avoid a paradoxical reaction or immune reconstitution inflammatory syndrome [13].

CONCLUSIONS

In conclusion, parenchymal pseudotumoral tuberculosis is a rare entity Pulmonary, it should always be a differential diagnosis until proven otherwise when mass lesions are observed on chest imaging regardless of the radiographic features and clinical history, especially in TB endemic areas.

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