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# Pleural Aspergillosis Complicating Chronic Cavitary Pulmonary Aspergillosis in a Tuberculosis Sequel: About One Case

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**Abstract** **Case Report**

***Introduction*:** Pleural aspergillosis is a rare pathology; it is defined by an infection of the pleural cavity by an opportunistic fungus of the genus Aspergillus. ***Observation*:** We report the case of a 24-year-old female patient treated for pulmonary tuberculosis complicated by a left pyopneumothorax drained for 5 months. The reason for consultation 3 months after stopping the antibacillary treatment was a purulent bronchial syndrome, left chest pain with a tingling sensation and exertional dyspnea. Clinical examination revealed an aerated effusion syndrome in the left hemithorax. Chest imaging showed a left pneumothorax with thickening of the visceral pleura and a left upper lobar alveolar focus with clearing within it. Aspergillus serology was positive. The patient had undergone video-assisted thoracoscopy, which revealed the presence of false membranes and whitish deposits of mycotic appearance. The biopsy of the pseudomembranes was in favor of pleural aspergillosis. The patient was put under antifungal treatment for 6 months with a good clinical and radiological evolution. ***Conclusion*:** Aspergillus is a mycelial fungus formed by filaments that penetrate the airways by inhalation of its spores. Pleural localizations are rare. Sequelae of tuberculosis, broncho pleural fistulas, pleural drainage and pulmonary resection are considered the main conditions predisposing to infection of the pleural space by aspergillus. The diagnosis is confirmed by pleural fluid culture or pleural biopsy.

**Keywords:** Pleural aspergillosis, pulmonary tuberculosis, pneumothorax, thoracoscopy, antifungal treatment.



## INTRODUCTION

Pleural aspergillosis is an uncommon pathology; only 25 cases have been reported in the literature [1]. The severity of the infection depends on the immunocompetence of the host. Its management is not codified and involves surgery and/or medical treatment [2].

We report the case of a young patient who presented with pleural aspergillosis complicating a chronic cavitary pulmonary aspergillosis on sequelae of tuberculosis.

## OBSERVATION

This was a 24-year-old female patient with no toxic habits treated in January 2020 for pulmonary tuberculosis complicated by a left pyopneumothorax, drained for 5 months and put on 2RHZE/4RH antibacillary therapy for 6 months. Three months after stopping the antibacillary treatment, the patient presented with a progressive symptomatology, consisting of a purulent bronchial syndrome, a tingling left chest pain and exertional dyspnea, all evolving in a context of apyrexia and a decline of the general condition. The general examination revealed a patient in fairly good general condition with a PS (statural performance) of 1. Chest examination revealed a left aeric effusion syndrome.

Frontal chest x-ray (Figure 1) showed a left hydro-pneumothorax with visceral and parietal pleural thickening. Chest CT scan (figure 2) showed a left pneumothorax with thickening of the visceral pleura and a left upper lobar alveolar focus.

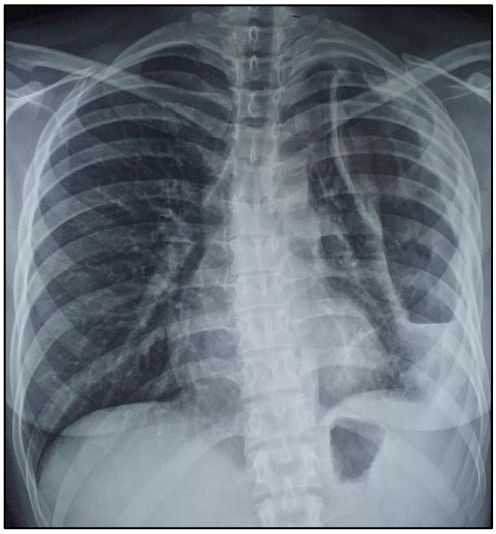


**Figure 1: Frontal thoracic radiograph showing a left hydropneumothorax with thickening of the visceral and parietal pleura**

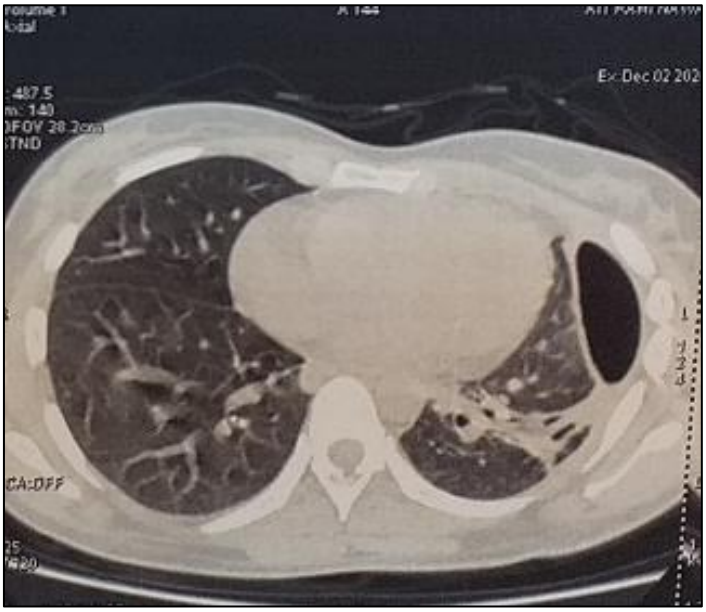


**Figure 2: Thoracic scan showing a left pneumothorax with visceral pleural thickening thickening of the visceral pleura and a left upper lobar alveolar focus with alveolar focus with clearings within it**

Flexible bronchoscopy showed an inflammatory state in the lower lobar region of the left bronchi with thickening of the dividing spurs of the basal pyramid. Bronchial biopsies were in favor of non-specific chronic fibroinflammatory changes, without signs of malignancy. The geneXpert in the bronchial aspiration fluid was negative.

Aspergillosis serology was positive (indirect hemagglutination ≥1/640).

The patient had undergone uniportal video-assisted thoracoscopy (Figure 3) in the face of residual pneumothorax. The endoscopic exploration showed pleuropulmonary adhesions and a pachypleuritis adherent to the wall, purulent fluid, false membranes with whitish deposits of mycotic appearance. The pleural biopsy was bleeding and decortication was impossible in this context because the parenchyma was friable and pathological bleeding on contact. The postoperative chest X-ray (Figure 4) showed the same aspect of the left pneumothorax. Mycological examination of the pleural pus showed the presence of aspergillus fumigatus. Biopsy of the parietal pleura (figure 5) was in favor of suppurative pachypleuritis and biopsy of the pseudomembranes (figure 6) in favor of pleural aspergillosis. The diagnosis was pleural aspergillosis complicating chronic cavitary pulmonary aspergillosis in the aftermath of tuberculosis.

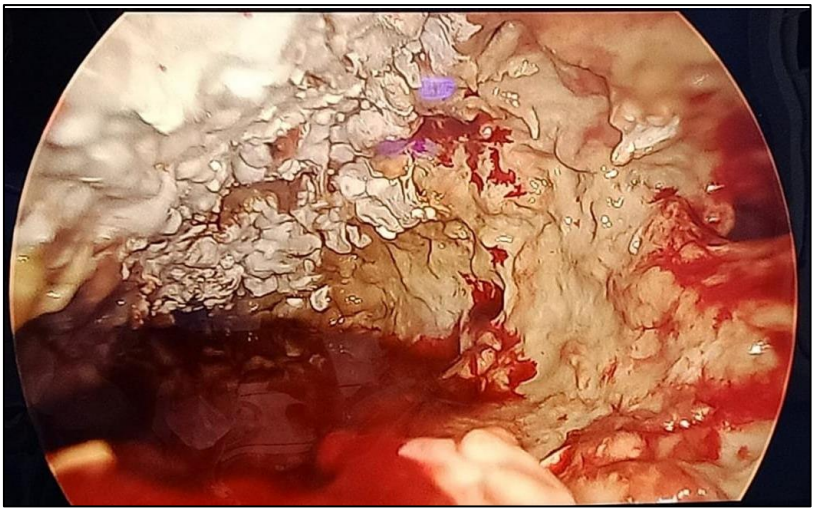


**Figure 3: Video-assisted thoracoscopy showing the presence of false membranes with whitish deposits of mycotic appearance**

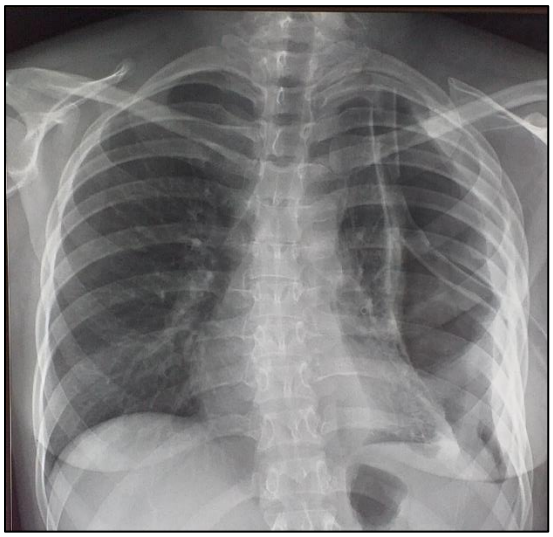


**Figure 4: Postoperative thoracic radiograph showing persistence of left pneumothorax**

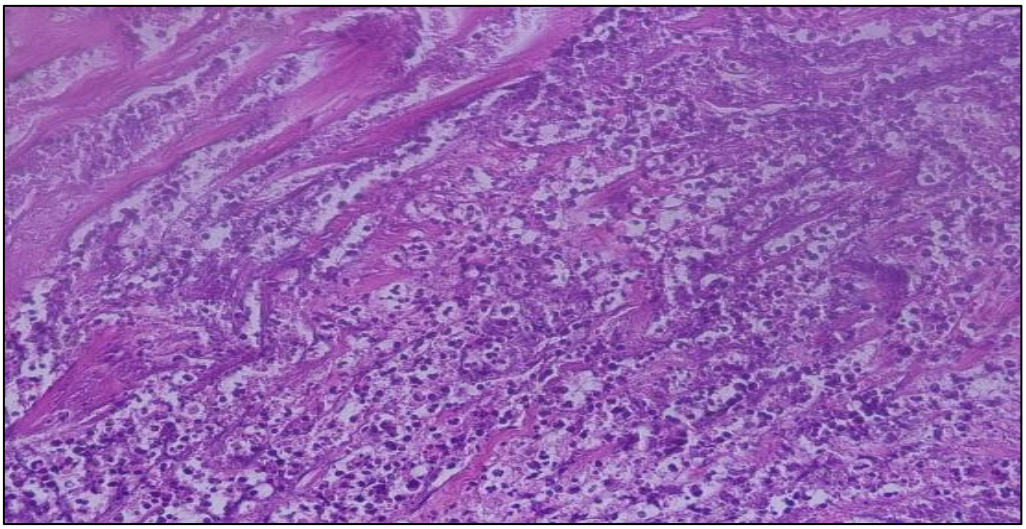


**Figure 5: Histological image showing fragmented biopsy material corresponding to fibrous tissue, very dense and abundant with a diffuse polymorphic inflammatory infiltrate suppurated by with the presence of calcium deposits, in favor of a suppurated suppurative pachypleuritis**

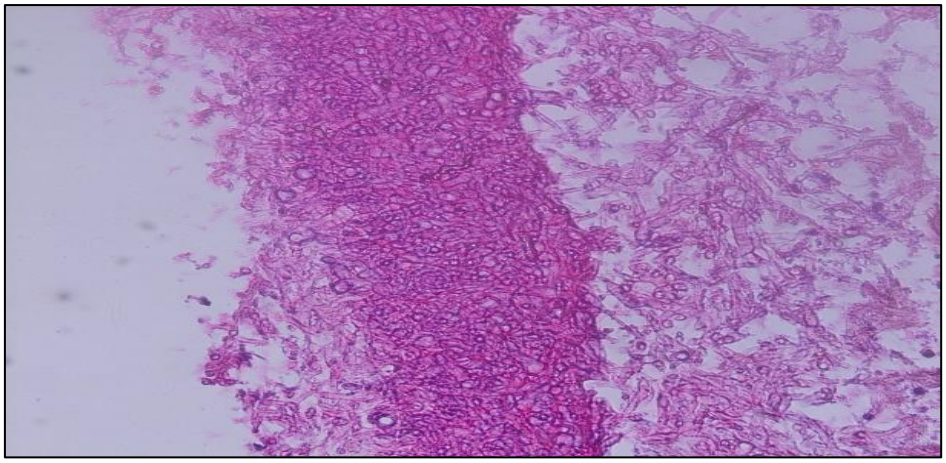
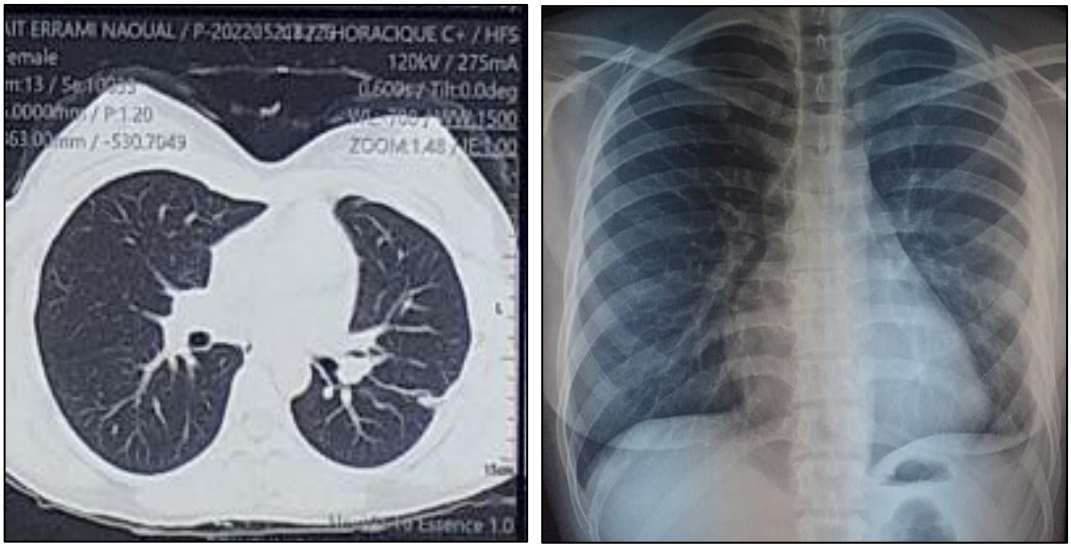


**Figure 6: Histological image showing fragmented biopsy material corresponding to fibrino-leukocytic debris containing numerous numerous aspergillary filaments and spores, in favor of a pleural pleural aspergillosis**

The patient was put on an antifungal treatment with Itraconazole 200mg for 6 months.

The evolution was good with clinical and biological improvement and radiological radiological clearance (Figure 7).




**A** **B**

**Figure 7: Chest imaging (A: X-ray; B: CT scan) showing disappearance of left pneumothorax after 6 months of antifungal treatment**

## DISCUSSION

Pleural aspergillosis is a rare disease. It is defined as an infection of the pleural cavity by an opportunistic fungus of the genus Aspergillus [3]. The most common isolated species are aspergillus fumigatus and aspergillus flavus, which are widely distributed in nature [4].

It was first described in 1847 and is associated with a high risk of mortality due to the often late diagnosis [5]. Unlike the pulmonary forms of the disease, pleural aspergillosis is not common in immunocompromised individuals [6].

The contamination of the respiratory tract is done by inhalation of spores contained in the ambient air, most of which will be eliminated by vibratory cilia and bronchial macrophages. Thus, an immunocompetent subject will not develop an aspergillosis infection under normal conditions [7]. The infection develops in a pathological lung, in a ventilated cavity, classically sequelae of tuberculosis, but also of sarcoidosis, emphysema or bronchial dilatation, most often in favor of an immune deficiency. The pleural cavity will then be secondarily contaminated from the pulmonary focus or when there is a communication between the ambient air and the pleural cavity. Thus, aspergillosis pyothoraxes are frequently secondary to pulmonary tuberculosis, broncho pleural fistula, thoracic drainage, parenchymal resection, or the presence of a pleurocutaneous fistula [8].

There are no specific clinical or radiological signs of pleural aspergillosis [9]. The patient may present with cough, hemoptysis, chest pain or dyspnea [10]. Radiologically, pleural thickening, pneumothorax or pleurisy may be found [11].

This positive diagnosis of pleural aspergillosis is made by isolation of Aspergillus from the pleural space. This can be done either by visualizing characteristic hyphae and/or direct culture of the fungus from pleural fluid or pleural biopsy with supporting cytologic/histologic examination. Pleural fluid is often cloudy, with high protein, low glucose, and predominantly neutrophilic cellularity. The role of serological tests such as Aspergillus/IgG precipitins specific for Aspergillus is disputed since there are reported cases where these have been negative [11]. Galactomannan (Aspergillus antigen) can be detected in pleural fluid, sometimes in high concentrations. In blood, it is not detectable unless pleural aspergillosis is a component of invasive aspergillosis [12].

Several treatment regimens are proposed in the literature. Most of them combine surgery with medical treatment [2]. Surgery is the gold standard of treatment, the main objectives of which are drainage of the pleural cavity, resection of necrotic and infected tissues, obliteration of any residual cavity present and closure of the bronchopleural fistula while protecting adjacent structures [13]. The surgical procedure is based on pleuropulmonary decortication, the success of which is conditioned by a complete pulmonary re-expansion, restoring a sufficient volume to obliterate the pleural space [14]. However, in certain situations, the pulmonary rigidity linked to the underlying disease prevents any filling of the residual cavity, authorizing some authors to propose a thoracoplasty as a first intention [15]. This procedure could be preceded by a thoracostomy in order to sterilize the pleural pouch and to allow the patient a period of renutrition. Shirakusa *et al.*, [16] propose the use of the omentum for the filling of pleural pockets of fungal origin because this procedure is less invasive than thoracoplasty, and because the latissimus dorsi muscle is most often damaged by thoracotomy.

Antifungal therapy can be initiated either systemically or locally [17]. Pleural instillation of the latter is indicated in the case of persistent pleural fungal infection despite optimized systemic treatment and if surgery is not possible. It is generally well tolerated, although a few patients have reported mild coughing during administration. Rare complications of percutaneous administration of therapy into the pleural space include pneumothorax, percutaneous emphysema and hemoptysis [18].

For oral antifungal treatment, Amphotericin B has more side effects including nephrotoxicity, hypokalemia and anemia. Itraconazole, on the other hand, is better tolerated, has fewer side effects and penetrates and sterilizes the pleural cavity better [19].

The duration of treatment depends on the clinical course, the management of toxicities associated with the treatment, the evolution and the recurrence. The duration of treatment is therefore very variable, ranging from 4 to 13 months [20].

## CONCLUSION

Pleural aspergillosis is a rare condition. The majority of cases reported in the literature have been observed in the presence of underlying pulmonary pathology or surgery. The diagnosis is confirmed by the detection of aspergillus in pleural fluid culture or pleural biopsy. Surgical removal of the aspergillus-infected pleura is the treatment of choice.

### CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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