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Post-COVID Pulmonary Mucormycosis - A Case Report

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1. Abstract

Pulmonary mucormycosis, a relatively rare fungal lung disease, is difficult to diagnose. It is increasingly reported immuno-compromised patients that inhale fungal spores in the air or paranasal sinus, resulting in pulmonary mucormycosis. We report a case of 45 years old patient, with a medical history of hypertension and chronic bronchial disease. He was affected with Severe Acute Respiratory Syndrome CoroVirus 2 (SARS-CoV-2) two months ago hospitalized in intensive care for acute respiratory failure with history of dyspnea, fever and hemoptysis for one month.

CT scan revealed a left perihilar excavated opacity exerting a mass effect on the stem bronchus, a second right posterobasal excavated nodule and diffuse ground-glass opacity. Histopathological results showed broad non-septate fungal hyphae with morphology suggestive of mucormycosis. The treatment was based on Amphotericin and the patient died one week later of septic shock with multiple organ failure.

The prognosis of mucormycosis remains poor, namely when associated to a pulmonary location. The precocity of diagnosis and appropriate management is the only guarantor to improve survival.

2. Introduction

Pulmonary mucormycosis usually occurs in uncontrolled, immunocompromised diabetic patients and is an opportunistic and fatal fungal disease [1]. The severe COVID-19, requiring admission to intensive care may be considered as an immunodeficiency situation due to the cytokine storm caused by the SARS CoV-2 virus of part and administrated therapeutics from other parts (Steroids, Anti IL-6 ...) [2].The diagnosis of pulmonary mucormycosis is particularly difficult and it is based on the combination of predisposing factors (immunodepression, diabetes, chronic renal failure, etc.), radiology and mycology tests which leads to an under-estimation of the incidence of this disease [3].

3. Case Report

A 45-year old male, diabetic at the stage of degenerative complications, hypertensive, and chronic bronchial disease. He presented a history of COVID-19 pneumonia with severe acute respiratory distress syndrome (ARDS) two months ago, which required hospitalization in intensive care and which progressed well under medical treatment and optiflow; he received dexamethasone 6mg/d for ten days.

After two weeks, the patient presented dyspnea, hemoptysis and fever for a duration of one month. A thoracic CT scan done showed a 56mm left perihilar excavated opacity exerting a mass effect on the stem bronchus with the presence of a parenchymal focus of atelectasis and homolateral apical retractile alveolar infiltration, a second right posterobasal excavated nodule and a small left pleural effusion (Figure 1). Initially, the diagnosis of pulmonary tuberculosis was evoked but sputum cultures were negative, then the patient received antibiotic treatment.

However, the symptoms not improved, and he developed a severe hypoxemia. Thus, he was admitted in ICU and invasive ventilation was required. Bacteriological results were inconclusive which led to complete with a lung biopsy, which showed broad non-septate fungal hyphae with morphology suggestive of mucormycosis.

This last finding justified the prescription of Amphotericin at a dose of 5mg/kg/d. The outcome was unfavorable with occurrence of a refractory septic shock associated to multiple organ failure in a delay of one week later.

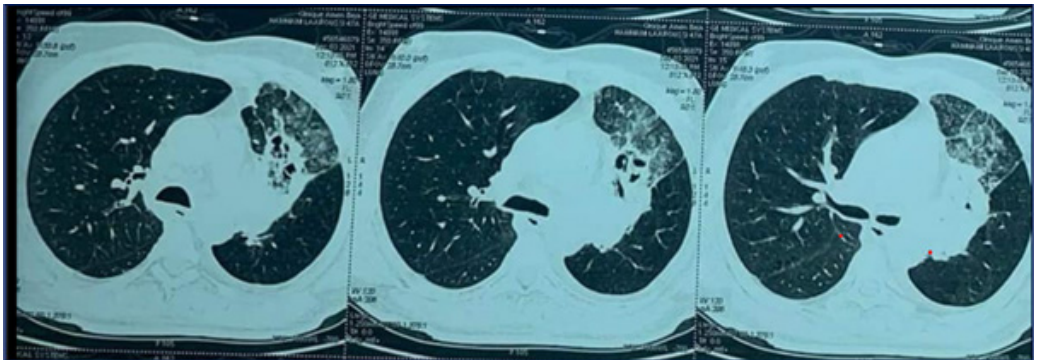

Figure 1: Left perihilar excavated opacity exerting a mass effect on the stem bronchus (Red Arrow), presence of a parenchymal focus of atelectasis and homolateral apical retractile alveolar infiltration (green Arrow), a second right posterobasal excavated nodule (yellow arrow).

4. Discussion

Since emerging cases of COVID-19 pneumonia have spread worldwide, there have been many reports of the occurrence of fungal infections, particularly pulmonary aspergillosis, mucormycoses being less frequent. In most reported clinical cases, pulmonary mucormycosis is a life-threatening fungal infection requiring extensive medical and surgical treatment.

In a review of 101 Mucuormycocis infections associated with COVID-19, 80% of the infected patients had pre-existing diabetes, most of them poorly controlled as in our case [4]. Several different factors in COVID-19 appear to account for the increased incidence of these co-infections. For example, COVID-19 patients who also have a history of diabetes, new-onset hyperglycemia, or steroid-induced hyperglycemia have elevated glucose levels that promote the environment necessary for Mucorales spores to germinate [4].

The clinical manifestations are non-specific and commonly include fever, cough, chest pain, dyspnea and hemoptysis, since these pathogens can erode blood vessels [5]. Radiological manifestations include infiltrates, exudation, consolidation, cavities and nodules, while the disease typically has a predilection for the upper lobes [6].

Early diagnosis and treatment with the antifungal of reference (Amphotericin) are mandatory to improve the prognosis. In our reported case, the fatal outcome is partly related to the delay in diagnosis prior to admission to intensive care.

In the case of antibiotic treatment failure; in the presence of a SARS-CoV-2 history pneumonia and uncontrolled type 2 diabetes, fungal pneumonia must be considered namely the pulmonary mucormycosis. In such cases, urgent bronchoscopy should be performed in order to initiate early appropriate treatment.

5. Conclusion

This case report highlights the need to be aware that pulmonary mucormycosis may present as a secondary complication of COVID-19 co-infection in diabetic patients and to make the diagnosis early in order to improve the prognosis.

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