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## Post-COVIDPulmonaryMucormycosis-ACaseReport

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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 chronicbronchialdisease. Hewasaffected with Severe Acute Respiratory Syndrome Coro Virus 2 (SARS-CoV-2) two months ago hospitalized in intensive careforacute respiratory failure with history of dyspnea, fever and hemoptysis for one month.

CTscanrevealedaleftperihilarexcavatedopacityexertingamass effectonthestembronchus,asecondrightposterobasalexcavated noduleanddiffuseground-glassopacity. 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 guarant or to improve survival.

#### 2. Introduction

Pulmonary mucormycosis usually occurs in uncontrolled, immunocompromiseddiabetic 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 the rapeutics 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

A45-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; here ceived dexame thas one 6 mg/d for tendays.

After two weeks, the patient presented dyspnea, hemoptysis and feverforadurationofonemonth. Athoracic CTs candoneshowed 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 secondright posterobasal excavated nodule and as mall left pleural effusion (Figure 1). Initially, the diagnosis of pulmonary tuberculosis was evoked but sputum cultures were negative, then the patient received antibiotic treatment.

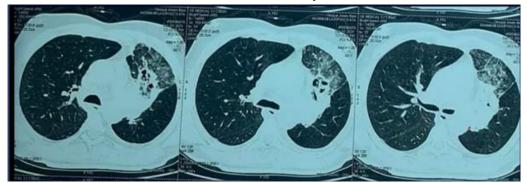
However, the symptoms not improved, and he developed as evere hypoxemia. Thus, he was admitted in ICU and invasive ventilation was required. Bacteriological results were inconclusive which led to complete with a lung biopsy, which showed broad non-septate fungal hyphae with morphology suggestive of mucormy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

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Thislastfindingjustified the prescription of Amphotericinata dose of 5 mg/kg/d. The outcome was unfavorable with occurrence

of arefractorysepticshockassociatedtomultipleorganfailurein a delay of one week later.



**Figure1:**Leftperihilarexcavatedopacityexertingamasseffectonthestembronchus(RedArrow),presenceofaparenchymalfocusofatelectasisand homolateral apical retractile alveolar infiltration (greenArrow), a second right posterobasal excavated nodule (yellow arrow).

#### 4. Discussion

Since emerging cases of COVID-19 pneumonia have spread worldwide, therehave been many reports of the occurrence of fungalin fections, particularly pulmonary as pergillosis, mucormy coses being less frequent. In most reported clinical cases, pulmonary mucormy cosis 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 thempoorly controlled as in our case [4]. Several different factors in COVID-19 appear to account for the increase dincidence of the seco-infections. For example, COVID-19 patients who also have a history of diabetes, new-on sethyper glycemia, or steroid-induced hyperglycemia have elevated glucose levels that promote the environment necessary for Mucoraless por estogerminate [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. Insuchcases, urgentbronchoscopyshould be performed in order to initiate early appropriate treatment.

#### 5. Conclusion

This case report highlights the need to be aware that pulmonary mucormycosismaypresentasasecondarycomplicationofCOV- ID-19 co-infection in diabetic patients and to make the diagnosis early in order to improve the prognosis.

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