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Case Report

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A Case of Mucormycosis with Covid-19 with a Conservative Medical Management, a Rare Management Approach

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ABSTRACT

Mucormycosis is an infection caused by fungi belonging to the order Mucorales. It has been reported in many patients following COVID-19 infection, particularly in those with Diabetes Mellitus and in those treated with steroids. The most common type in patients with diabetes, rhino-orbito-cerebral mucormycosis, is associated with various neurological complications. In this report, we describe the case of a 71-year-old female with diabetes and hypertension, who presented one week after recovering from Covid-19 infection, with symptoms of severe headache and, right eye ptosis, ophthalmoplegia and decreasing visual aquity.

Brain CT scan showed features of maxillary sinusitis. Nasal biopsy and cultures revealed mucormycosis. She was managed with Amphotericin-B with improvement in headache and persistence of eye complications. Three months after discharge, she presented to the emergency department complaining of left-sided weakness. Brain MRI showed an acute ischemic infarction with totally occluded right internal carotid artery, progressive boney destruction of the right maxillary sinuses, and inflammation of the right orbit and cavernous sinus. As she refused surgical debridement, she was admitted and managed conservatively with Amphotericin-B.

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Introduction

Mucormycosis is a fatal angio-invasive fungal infection associated with high rates of mortality and morbidity. It can occur as rhino-orbital cerebral mucormycosis (ROCM), which is commonly seen in diabetic patients, as well as pulmonary and cutaneous infections, which are associated with hematological malignancies and trauma, respectively [1]. Incidence of ROCM is rising in people with a history of Covid-19 infection, particularly diabetic patients treated with corticosteroids, which are risk factors for infection [you need to put the actual incidence according to the epidemiological evidence] [2].

Common clinical manifestations of ROCM include rhinitis, periorbital and facial swelling, facial and mucosal necrosis, ophthalmoplegia, multiple cranial nerve palsies, facial pain, and headache [3].

Nine cases of cerebral spreading of mucormycosis with nerve involvement have been reported after Covid-19 infection [4]. A multicenter, retrospective observational study from India showed cerebrovascular involvement in the form of ischemic stroke, intracranial hemorrhage, and subarachnoid hemorrhage in 11.8% of patients with mucormycosis infection. Ipsilateral stroke is the most common stroke type associated with ROCM, and the cavernous sinus is the most common site of intracranial vascular involvement [5].

High clinical suspicion is needed to ensure timely diagnosis of mucormycosis infection, particularly in cases with nonspecific symptoms such as fever and malaise, which can be early signs. Depending on histopathology findings, culture and microscopy studies are the main tools for diagnosing ROCM. Radiological tests (e.g., sinus CT scan, brain MRI) also aid in diagnosis. Successful treatment of ROCM requires a multimodal approach to prevent and treat risk factors, remove necrotic tissue, and administer appropriate antifungals such as amphotericin B [6].

In this report, we describe a 71-year-old female patient with a medical history of hypertension and diabetes mellitus who presented to our hospital with complete ptosis of her right eye at 1 week after COVID 19 infection. Upon admission, she complained of severe right-sided headache, vision loss and excessive tearing of her right eye, and a runny nose with watery discharge. She had no history of fever, motor, or sensory deficit. After medical therapy with antifungal she presented 3 months later with symptoms of left sided CVA due to occlusion of internal carotid artery.

Case Presentation

A 71-year-old female patient with hypertension and diabetes mellitus presented to our hospital with complete ptosis of her right eye. The patient had a history of Covid-19 infection 1 week prior to the hospital visit. [Covid course] she complained of severe right-side headache, vision loss and excessive tearing in the right eye, and a runny nose with watery discharge. She reported no history of fever or motor or sensory deficit.

On examination, her vital signs were within the reference ranges. Her general examination was unremarkable.

Focused facial examination showed redness and bullae involving the right side of the face and around the eye were observed. An ophthalmic examination of the right eye revealed a swollen eyelid, complete ptosis, axial proptosis, conjunctival chemosis, limitation of extraocular muscles in all gaze directions, and a fixed dilated pupil. Visual acuity was 6/60. The cornea was clear with a deep and functional anterior chamber and a well-defined optic disc margin and pseudophakia lens. Examination of the left eye revealed normal results.

The ear, nose, and throat examination revealed seromucinous discharge but no polyps or signs of fungal infection in the patient's nasal airway.

All laboratory investigations were within the reference range include the complete blood count, the kidney and the liver function tests ,coagulation profile- PT, PTT, INR, fibonegen, as well as the ESR,D Dimer and the CRP.

Radiological images included a brain. With IV contrast and magnetic resonance venography (one with IV contrast and one time-of-flight). No evidence of intracranial venous system thrombosis, intracranial arterial system stenosis, dilatation, or occlusion was observed. A dominant right transverse sinus and hypoplastic left transverse sinus was observed. The brain MRI with IV contrast was not fully evaluated and covered the paranasal sinus; however, an air-fluid level sign was observed in the frontal sinus and right maxillary sinuses in addition to mild periventricular and subcortical white matter ischemia (Figure 1 and Figure 2).

Figure 1: Brain MRI T2 showing no inflammatory process in the cavernous sinus or orbit

Figure 2: Brain MRI T2 showing air-fluid level of both maxillary sinuses

The patient was discharged from the internal medicine ward and treated for acute sinusitis by the ENT team. He was prescribed ceftriaxone, dexamethasone, nasal decozal don't use generic names spray, nasal flixonase spray, and nasal normal saline douches. A nasal biopsy of mucosal fragments showed severe active chronic inflammation that caused by an infestation by broad, non-septate, ribbon-like hyphae branching at 90 degrees. Periodic-acid Schiff (PAS) staining was positive for fungal forms. Based on these radiological and histopathological findings, the final diagnosis was mucormycosis sinusitis complicated with multiple cranial nerve palsy.

The patient was then treated with amphotericin B for 20 days. Upon follow-up, her symptoms improved, but her right extra-ocular movement and vision remained impaired. The patient was discharged without surgical debridement and was clinically well. After 3 months, she presented to the ER with left-side weakness. A brain and orbital MRI showed an acute ischemic infarction in the right frontal paraventricular area and right basal ganglia, total occlusion of the right internal carotid artery, and inflammation of both right ethmoid air cells and right maxillary sinuses with extensive osteomyelitis. This inflammatory process extended to the hard palate and right orbit with involvement of the orbital apex extending to the cavernous sinus and total occlusion of the right internal carotid artery (see Figure 3 and Figure 4).

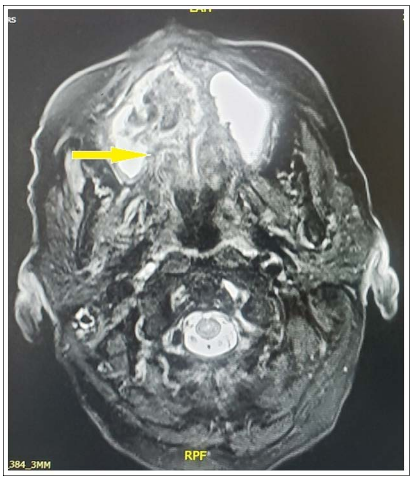

Figure 3: T2 Brain and orbital MRI, inflammatory process of superior medial aspect of orbit with involvement of the orbital apex and cavernous sinus causing total occlusion of the right internal carotid artery

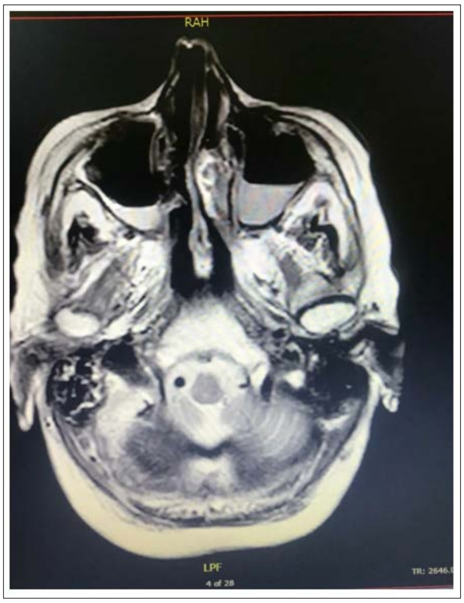

Figure 4: T2 Brain and orbital MRI, inflammatory process of the right anterior ethmoid air cells with inflammation of the right maxillary sinus and hard palate with bony destruction and osteomyelitis

Six months later, on follow up the patient was doing well regarding to radiological findings new brain CT and MRI do not show any changes in compared to previous study.

Discussion

Mucormycosis is a fatal and fulminating infection in humans. It enters blood vessels via an angioinvasive mechanism and can affect virtually any system. ROCM is the most common variety seen in medical practice worldwide. Put the citation here.

The area of ROCM involvement depends on risk factors such as diabetes status, steroid use, and history of Covid-19 infection, though the relationship between mucormycosis and Covid-19 infection in relation to corticosteroids is unclear. Corticosteroids can trigger hyperglycemia and diabetic ketoacidosis, which in turn creates an ideal low-PH environment for Mucor spp. Steroids also decrease phagocytic activity of white blood cells and impair phagolysosome function. Thus, in diabetic patients who use steroids, Covid-19 infection can predispose them to secondary or opportunistic fungal infection due to reduced CD4 and CD8 T cells, which further weakens their immune systems [2].

Mucormycosis can invade the blood vessels and enter the palatine and internal maxillary arteries, where it reduces blood flow, leading to possible tissue necrosis. Many cases of Covid-19 complicated with ROCM are associated with thrombosis events due to high levels of a prothrombotic agent known angiotensin II, which is increased in mucormycosis infections. Citation

High clinical suspicion is needed for prompt diagnosis of mucormycosis infection. Nonspecific symptoms, such as fever and malaise, can be early symptoms. Because mucormycosis can spread to the orbit via the ethmoidal foramen or nasolacrimal gland, patients also may develop orbital cellulitis, orbital apex syndrome, and cavernous sinus thrombosis. Mucor fungi can reach intracranial structures via the orbital apex or orbital veins. Thus, mucormycosis can manifest with mental state changes, hemiparesis, and seizures.

MRI is more sensitive than CT for detecting ROCM. The definitive diagnosis is biopsy of the sinus mucosa or thickened extraocular muscles revealing fungal hyphae. Treatment requires controlling diabetes, managing diabetic ketoacidosis, and avoiding blood transfusions. In addition to administering antifungal medication such as amphotericin B, posaconazole, or isavuconazole, surgical debridement also is crucial to preserve tissue perfusion and facilitate delivery of antifungals to the site of infection [6].

Conclusions

We report a case of rhino-orbital cerebral mucormycosis in a 71-year-old female patient with multiple cranial nerve palsy after Covid-19 infection. She was treated with medical therapy without surgical debridement. Three months later, she developed left-side weakness due to complete occlusion of the right internal carotid artery. Although surgical debridement has not done, patient dose not report any further clinical.or radiological changes. This case report highlights on possibility of survival of patient after mucormycois infection who treated with antifungal alone.

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