

Rhinomaxillary Mucormycosis in a Healthy Individual

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Received: October 01, 2021; **Published:** February 26, 2022

Abstract

Mucormycosis is an angioinvasive opportunistic fungal infection most commonly associated with diabetic, immunocompromised, haematological malignancies, chronic steroid use and intravenous drug abusers. Mucorales is ubiquitous filamentous fungi found on decaying matter.

Recently there has been an increasing trend in fungal infections in post covid 19. Pre existing diabetes, unhygienic oxygen administration, unjustified steroid and antibiotic usage in COVID 19 patients can be the etiological factors. Mucormycosis affecting young healthy individuals is extremely rare. Here we present a non diabetic 25 year male patient who recovered from SARS CoV-2 infection came with a complaint of swelling in right cheek region and diagnosed with mucormycosis. The current report highlights the management of a post covid 19 patient in otherwise healthy with rhinomaxillary mucormycosis.

Keywords: Case Report; Mucormycosis; Aggressive Fungal Sinusitis; Covid 19

Introduction

The Covid 19 pandemic has become a major burden to the world. The SARS COV 2 pandemic was emerged in Wuhan province of China and has spread all over the world. The symptomatic treatment includes oxygen administration and corticosteroids among others [1]. In about 10 - 30% of Covid 19 affected individuals secondary co infections are seen and fungal infections are about 10 times higher. The Government of India has taken the cognizance of the issue and has made mucormycosis as a notifiable disease as per the Epidemic Diseases Act 1897 Govt. of India [2]. Corticosteroids such as methylprednisolone, dexamethasone and hydrocortisone are commonly used drugs in patients affected with SARS COV 2. These drugs also present with secondary infections, immune suppression, dizziness, weight gain, and etc [3].

Clinical mucormycosis occurs in six forms and Rhino cerebral mucormycosis is common among types of mucormycosis [4]. Recently there has been an increasing trend in mucormycosis in post covid 19 subjects. The prevalence of mucormycosis in India's pop-

ulation is 0.14 per 1000 which is 80 times higher than the world (0.005 to 1.7 per million population) and the mortality ranges from 40% to 80%. Mucormycosis affecting young healthy individuals is extremely rare [5]. Here we present 25 year old post covid patient otherwise healthy individual diagnosed with rhinomaxillary mucormycosis.

Case Report

A 25 year old male patient came with a complaint of unilateral right facial swelling with unilateral headache and nasal discharge since 15 days associated with an extra-oral swelling on right middle third of the face. Previous medical history revealed covid 19 infection, one month back for which he was he was admitted elsewhere and was administered Tab. Methyl prednisolone 20 mg OD for 15 days. Clinical examination revealed a 6*6 cm swelling over right infra orbital region with no paraesthesia, obliterated nasolabial fold and skin over the swelling is taut with no sinus or fistula (Figure 1). On intraoral examination, diffuse swelling noted over right buccal

mucosa extending from canine to second molar. No carious tooth noted and on palpation the lesion is non tender with both anterior and posterior margins felt. No mobile teeth noted and all were vital. The blood parameters follows as table 1.

Diagnostics	Value
BP (Blood Pressure)	124/84 mmHg
Creatinine	0.8 mg/dL
FBS (Fasting Blood Sugar)	90 g/dL
Hb (Haemoglobin)	14.2 g/dL
HbA1C (Haemoglobin A1C)	5.5%
HBsAg (Hepatitis B Surface Antigen)	negative
HCV Ab (Hepatitis C Antibody)	negative
Lymphocytes	33 %
Neutrophils	63 %
Platelet count	25800 cells/mm [^]
Potassium	3.3 mmol/L
PT (Prothrombin Time)	15.5 second
PTT (Partial Thromboplastin Time)	34.8 seconds
Sodium	132 mmol/cc
Urine ketone bodies	negative

Table 1

also there is erosion of lateral wall of right maxillary sinus and right zygoma noted with extensions into soft tissue of prenasal and retro-antral space with oedematous and bulky muscles of right masticator space (Figure 2 and 3). Based on the clinical and radiological findings a provisional diagnosis of aggressive fungal sinusitis was made. The KOH mount was negative for fungal elements.

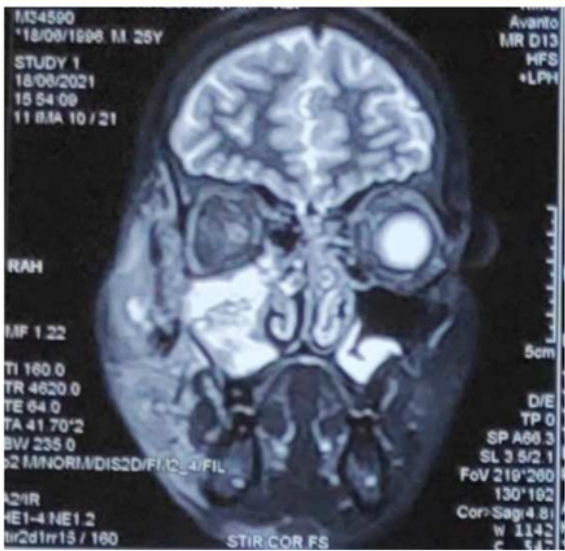


Figure 2



Figure 1

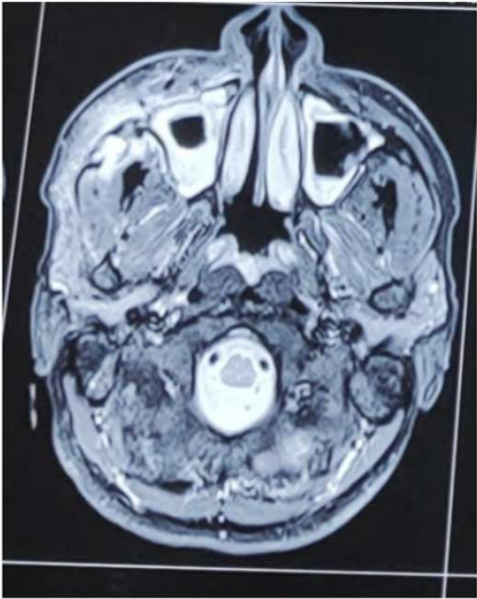


Figure 3

The MRI scan shows mucosal thickening with collections in bilateral maxillary and anterior ethmoidal sinuses with destruction of right uncinate process and widening of right infundibulum. And

The functional endoscopic sinus surgery was performed and the tissue sample was sent for histopathology which came as suspecting for fungal sinusitis due to *Curvularia* species. As. It was not confirmatory and due to lack of intraoral symptoms and signs of Mucormycosis, a conservative maxillary sinus debridement (Figure 4) was performed with Caldwell Luc approach and the tissue sample was sent for histopathology (Figure 5) which showed numerous aseptate hyphae branching at 90 degrees and confirmatory of rhinomaxillary mucormycosis. The patient was started on IV Liposomal Amphotericin B 1.0 mg/kg/day, Tab Posaconazole, intravenous antibiotics and analgesics over a period of three weeks. The swelling and facial pain gradually decreased (Figure 6 and 7) and the overall general condition of the patient improved. The patient was discharged with oral antibiotics and analgesics.



Figure 4



Figure 5



Figure 6



Figure 7

Discussion

Mucormycosis was first described by Paultauf in 1885. After candidiasis and aspergillosis, mucormycosis is the third invasive mycosis caused by fungi of class zygomycetes. *Rhizopus arrhizus* (oryzae) is the most important species in frequency [6]. The main risk factors are ketoacidosis, immunosuppression, corticosteroid use, haematological cancers, deferoxamine use. The fungi invade tissue by inhalation of airborne species, percutaneous inoculation and ingestion. They live as commensals in large population but produce diseases only immune altered individuals. Mucormycosis affect sinuses (39%), lungs (24%), skin (19%), brain(9%), gastro-

intestinal tract (7%), disseminated form (6%) and in other sites (6%) [6]. Mucormycosis treatment includes rapid diagnosis, correction of underlying co-morbidity, surgical enucleation or resection with appropriate anti fungal therapy. Liposomal Amphotericin B along with surgical intervention is the first line of treatment for this condition. Itraconazole was tried in some studies but has high failure rates and Voriconazole is not active against mucorales *in vitro*. Posaconazole and Ravuconazole have showed good promise *in vitro*. The overall mortality rate ranges from 40% to 80% based on involvement of vital structures [7,8].

High number of covid 19 patients are affected to mucormycosis either in duration of hospitalisation or after the discharge. These patients are administered steroid for SARS-CoV-2 infection, most of them had pre-existing diabetes and more prone to fungal infections. The symptoms and treatment of COVID-19 can create a perfect environment for the growth and development of Mucorales. The acidic environment and free ferric ion in circulation during diabetic ketoacidosis support the growth of Mucorales. These conditions also favours invasion and attachment to human body [9].

The COVID 19 subjects are treated with heavy steroids, extreme oxygen masks or ventilator use. Corticosteroid use reduces both inflammation and immune system activity by decreasing white blood cell, T- helpers cell production, causing neutropenia making human body susceptible for foreign body invasion and infections. The corticosteroids can cause a hyperglycaemic state in human body which can favour invasion and growth of Mucorales species at a rapid rate [10].

According to a retrospective study conducted by Mulakavalupil, *et al.* there were zero mucormycosis case among the included sample of 4221 (1027 - ICU stay and 67 patients on immunomodulatory drugs) patients admitted for treatment of COVID 19 between March 2020 to May 2021. There was zero cases of Mucormycosis seen in admitted patients or on their post discharge follow up of six months. Thus following a strict low dose steroid protocol, strict glycemic control and proper nursing care can reduce the incidence of Mucormycosis in the COVID 19 pandemic times [11].

Conclusion

The unjustified prescription of corticosteroids in Covid 19 patients can lead to serious opportunistic infections. To reduce the mortality and morbidity, steroid and antibiotic overuse need continuous reappraisal in covid 19 treatment protocol.

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Volume 5 Issue 3 March 2022

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