

Misdiagnosis of Mucormycosis During Post Covid Can Lead to Death: A Case Study Report

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Abstract

Mucormycosis is an angioinvasive disease. The predisposing factors include diabetes mellitus and other conditions causing immunocompromised state of the body. The most common presentation is the maxillary and orbital region in the area of head and neck. Beside these two common location variation is also found in different part of the body. Similarly incidence of lesion along with signs and symptoms of the disease can be different depending on the body type of the individual. Diagnosis of mucormycosis in COVID pandemic became challenge due to the rarity of the disease and the limited awareness of physicians and dentist to diagnose and record these cases. Here, we report a case of mucormycosis involving maxillary and orbital region.

Keywords: Amphotericin B, Black fungus, Diabetic, Immunocompromised, Isavuconazole, Mucormycosis.

INTRODUCTION

Mucormycosis, also known as black fungus, is a rare but common name given to clinical disease caused by fungi of the order Mucoraceae of class Zygomycetes. Mucor is a saprophytic fungus. Mucormycosis is a life-threatening fungal infection which commonly affects the immunocompromised hosts almost uniformly in developing as well as industrialized countries. Mucorales are distributed into six families all of which can cause cutaneous and deep fungal infections. Out of the six families, *Rhizopus oryzae* is the most common cause of infection.

Although it commonly invades the nose and the paranasal sinuses, cutaneous, pulmonary, or gastrointestinal lesions may also be seen and hematogenous spread to other sites can also occur. The predisposing factors include diabetes mellitus and other conditions causing immunocompromised state.^[1]

Immunocompromised patients are especially susceptible, and timely diagnosis as well as intervention are of utmost importance for successful management. Because of atypical initial symptoms, such as facial pain, earache, sinus pain, or odontalgia, patients may seek dental treatment initially. Dental care may also precede such an infection, by means of a creation of a post-extraction or post-curettage wound, which may be susceptible to fungal infection.^[2]

The prevalence of mucormycosis in India is approximately 0.14 cases per 1000 population, about 80 times the prevalence

in developed countries. Mucormycosis is more often seen in immunocompromised individuals, and complications of orbital and cerebral involvement are likely in diabetic ketoacidosis and with concomitant use of steroids. The most common risk factor associated with mucormycosis is diabetes mellitus in India. In the background of the COVID-19 pandemic, only a limited number of cases of mucormycosis have been reported.^[3]

Mucormycosis is an acute infection which can manifest in many forms. The infection begins in the paranasal sinuses which goes on to affect the vasculature and leads to necrosis of hard and soft tissues. The most common presentation is the maxillary and orbital region in the area of head and neck.

CASE REPORT

A 65-year-old male patient reported to the oral and maxillofacial surgery department with a chief complaint of swelling on the right side of his face for 2 months and inability to open his right eye. The patient gave sudden history of itching and water discharge from his right eye for 3 months back for same reason

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patient consulted ophthalmologist next day, antibiotics along with diluted calcium hypochlorite solution were prescribed which worsened the condition as patient started having burning sensation, periorbital edema, and restricted eye opening for which the patient was referred to another ophthalmologist who diagnosed total loss of visibility in affected eye. Further physician was consulted and antibiotics were prescribed for 2 weeks but that were also of no use. Afterward, the patient visited to an ENT doctor who referred him to our college. Detailed history was taken and it was found that the patient was a chronic bidi smoker, smoking one packet of bidi per day was also diabetic for the past 3 years and was on hypoglycemic drugs but had stopped taking medications without proper consultation. Furthermore, the patient also gave a history of fever, cough, and sore throat difficulty in breathing 15 days before consulting ophthalmologist. On extraoral examination, diffuse swelling extending superiorly to the line joining the right lateral aspect of eyebrow to the superior most aspect of helix of the right auricle and inferiorly to the line joining commissure of lip to the tragus of the right side with dimensions of 7 cm anteroposteriorly and 8 cm superoinferiorly, right periorbital edema and clear white watery discharge, right hemiparesis, and ophthalmoplegia, along with deterioration of vision (Figure 1), was also found. On examination of the right eye, it was negative to light reflex test, negative to corneal reflex test, it was pale white in color, dilated, and non-functional.

On palpation, swelling was tender, soft along with local rise in temperature at the right side of cheek region. The right side hypoesthesia of the area of distribution of the maxillary nerve and slurring of speech was also observed.

During intraoral examination, restricted mouth opening, and fetid odor, all existing teeth were Grade III mobile, on palpation, there was severe pain on the right side of maxilla, whole maxillary arch was mobile from side to side with gentle pressure. The patient was advised for cone beam computed tomography (CBCT), RT-PCR, and rapid antigen test along with blood investigation, that is, CBC, LFT, KFT, and for pain control analgesics were prescribed.

Investigation

The patient was advised for CBC, PP and FBS, glycated hemoglobin (HbA1C), HIV, HBsAg, HCV laboratory, investigation, and advised X-ray as orthopantomogram (OPG) and CBCT. The patient fasting glucose (FBS) was 230 mg/Dl. Serum HbA1C was 9.39%. On evaluation of OPG, there is severe interdental alveolar bone loss suggestive of chronic periodontitis present. Missing teeth are 16, 15, 21, 22, 25, 26, and 27 (Figure 2). Cone-beam computed tomography (CT) volumetric scan of 1 mm slice thickness obtained that there is a lateral displacement of the buccal cutaneous plate (Figure 3). There is a hypodense soft-tissue swelling overlying the right maxilla, lesion extending to the right infra temporal region, and the posterolateral aspect of the right maxilla. Maxillary sinus shows thickened sinus mucosal lining. The lateral wall of the right maxillary sinus shows thinning in areas. The right

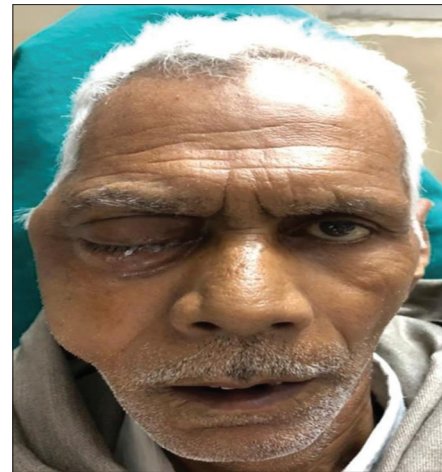


Figure 1: Frontal view

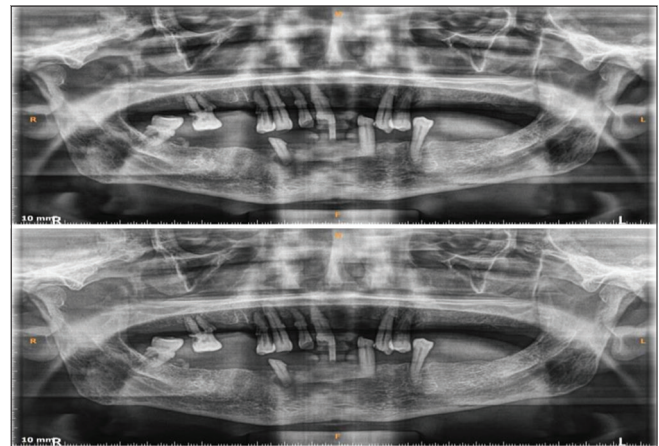


Figure 2: Orthopantomogram

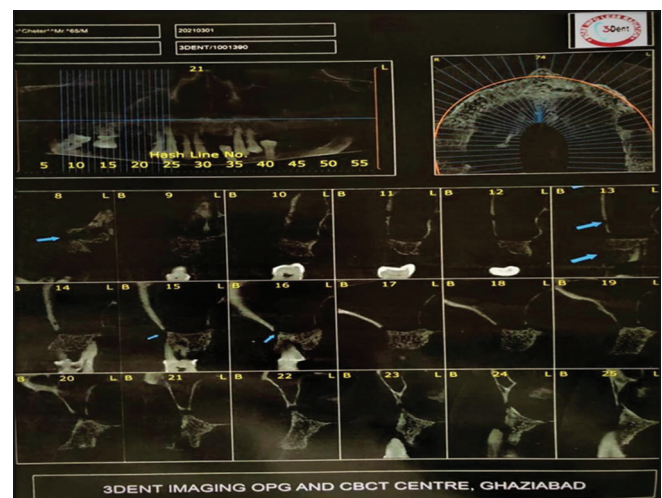


Figure 3: Cone beam computed tomography of buccal cutaneous plate (Maxilla)

orbit shows increased thickness of overlying periorbital soft tissue. Orbital contents not clearly visualized (Figure 4). CBCT reports after correlating with clinical findings, the patient was diagnosed with mucormycosis of the right side of face. In

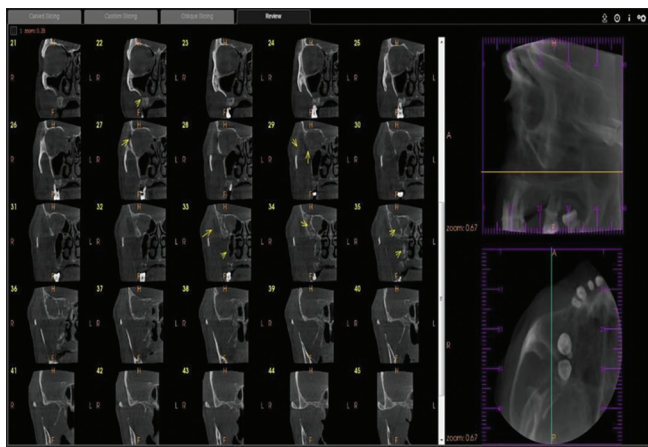


Figure 4: Cone beam computed tomography of right orbital region

treatment complete surgical debridement, hemi-maxillectomy along with complete right eye removal was planned but unfortunately, the patient was not able to survive and died 2 days after reporting to our department.

DISCUSSION

Mucorales are saprophytes found in the soil and decaying organic matter.^[1] Mucormycosis is classified according to the anatomic site of occurrence in (1) rhinocerebral, (2) pulmonary, (3) cutaneous, (4) gastrointestinal, and (5) disseminated. Rhinocerebral or sino-orbital types are common among diabetic patients, especially those who are poorly controlled. The above-mentioned types of infection may present with various and atypical symptoms of sinusitis. Nasal congestion, headache, earache, or facial pain are some of the most common features, which are not at all characteristic.^[2]

Mucormycosis of the temporal bone is rare clinical entity with only a few cases been reported. Mucormycosis is an aggressive, opportunistic fungal infection commonly involving the rhinocerebral site causing sinonasal, orbital, or deep facial infection. It is commonly seen in immunocompromised hosts, for example, diabetics in ketoacidosis typically develop rhino-orbito-cerebral disease than the less common pulmonary and disseminated form.^[1]

Depending on the affected site, adjacent structures such as the orbit or the central nervous system may be involved. Periorbital edema, ophthalmoplegia, or deterioration of vision are of high probability. Similarly, extension to the cavernous sinus may cause cavernous sinus thrombosis affects cranial nerves. Through the cribriform plate of the ethmoid bone or the supraorbital fissure, the infection may spread intracranially and cause abscesses or sagittal sinus thrombosis.

The species of Mucorales invade blood vessels and cause necrosis of vessel walls and mycotic thrombi. While healthy humans are resistant to such an infection, immunocompromised patients are generally much more vulnerable to the angioinvasive hyphal forms of these fungi. Diabetes mellitus, neutropenia,

severe trauma, immunosuppression following transplantation of bone marrow, or solid organs are all predisposing factors for mucormycosis. The host-specific condition may, however, render the host susceptible to different types of the infection.^[2]

Uncontrolled diabetes mellitus can alter the normal immunologic response of patients to infections. Such patients have decreased granulocyte phagocytic ability with altered polymorphonuclear leukocyte response.^[4]

Mucormycosis affects children mainly with malignancies or HSCT and presents as disseminated or pulmonary infection. Mortality is improved when active antifungal therapy and surgery are combined.^[5]

Successful treatment of invasive mucormycosis necessitates prompt and early diagnosis, control of risk factors, surgical debridement of necrosed tissue, and antifungal drugs. Amphotericin B is the antifungal of choice for the treatment of mucormycosis. Nephrotoxicity, however, is a limiting adverse side effect of amphotericin B. In our case, the patient developed deranged renal function tests during the course of treatment with amphotericin B.

Various studies have explained the favorable role of hyperbaric oxygen therapy on presumption that increased the oxygenation of the affected tissues improves the ability of the neutrophils to kill the organisms. Furthermore, high oxygen inhibits the germination of fungal spores and growth of mycelia *in vitro*.^[1]

CONCLUSION

This report will help the practitioners in properly and early diagnosing for mucormycosis. As the black fungus has emerged as a new challenging factor for medical prescriptioner in management of post covid. Early imaging is helpful in assessing the extent of involvement of this lethal disease which requires prompt and aggressive treatment.

Chief complain related to nasal cavity, paranasal sinuses, nasal discharge, ophthalmic pain or vision disturbance, history of COVID 19 infection, requirement of admission, steroid use, and previous history of diabetes should be under careful consideration.

An alteration in the T-cell population in COVID-19 infection is linked to the pathogenesis of fungal infection in cases of post-COVID mucormycosis.

Radiographic evaluation OPG, CBCT, CT, and magnetic resonance imaging are within normal limits initially, which are followed by signs of sinusitis, such as congested sinus or thickened mucosal lining. Repetition of the investigations is necessary for close follow-up of the advancement of the disease. Differential diagnosis mainly includes necrotizing fasciitis especially if facial edema is present, osteomyelitis when severe bone loss is present. As the condition rapidly aggravates, timely diagnosis is crucial. An early diagnosis, control of predisposing factors, early surgical debridement of infective tissue, and administration of antifungals such

as amphotericin B injection and as a second-line drug isavuconazole (injection/tablet) and posaconazole (tablet) are keys to successful therapy. A surgical intervention such as osteotomy is probably needed in advanced and delayed cases.

REFERENCES

1. Singh ID, Galagali JS, Kumar S. Otolaryngeal mucormycosis: A rare case in a diabetic patient with unusual presentation. *J Otolaryngol ENT Res* 2015;2:87-90.
2. Papadogeorgakis N, Parara E. A case of successfully treated rhinocerebral mucormycosis: Dental implications. *Int J Dent* 2010;2010:273127.
3. Revannavar SM, Supriya PS. COVID-19 triggering mucormycosis in a susceptible patient: A new phenomenon in the developing world? *BMJ Case Rep* 2021;14:e241663.
4. Rishi D, Shetty A, Srivastava N, Rajani BC, Anshuman P, Kakkar P. Maxillary osteomyelitis by mucormycosis: A case report and literature review. *Dentistry* 2018;8:501.
5. Zaoutis TE, Roilides E, Chiou CC, Buchanan WL, Knudsen TA, Sarkisova TA, *et al.* Zygomycosis in children: A systematic review and analysis of reported cases. *Pediatr Infect Dis J* 2007;26:723-7.