

Management of coronavirus disease (Covid-19) associated mucormycosis with palatal ulcer, dental pain and anterior maxillary teeth mobility- A clinical dilemma of Covid 19 pandemic in India

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ABSTRACT

Mucormycosis represents a group of life-threatening infections caused by fungi of the order mucorales of subphylum mucormycotina. Due to high vascularity, the maxilla rarely undergoes necrosis. Mucormycosis is an opportunistic fulminant fungal infection, which mainly infects immune-compromised patients. Due to the inhalation of fungal spores, the infection may begin in the nose and paranasal sinuses. Necrosis of hard and soft tissues is due to thrombosis of arteries, which is caused by the inhalation of fungal spores. We report a case of maxillary necrosis by mucormycosis in a COVID-19-recovered patient to emphasize the early diagnosis of this potentially fatal fungal infection. We reviewed the current concepts in the management of mucormycosis and different diseases that can lead to maxillary necrosis. The mortality and morbidity of this lethal fungal infection can be successfully reduced by early diagnosis and quick treatment by the general primary care provider, family physicians, and dentists.

Keywords: Anti-fungal drugs, COVID-19 pandemic, immune-compromised patients, maxillary bone necrosis, mucormycosis

Introduction

Mucormycosis is an invasive fungal infection that was first described by Paulltauf in 1885^[1] and the third most common invasive mycosis after candidiasis and aspergillosis.^[2] On the basis of the clinical presentation and site of involvement, six manifestations of the disease can be described: rhinocerebral,

pulmonary, cutaneous, gastrointestinal, disseminated, and localized infections.^[3] There was a high incidence of mucormycosis among those who received steroids, immune-suppressants drugs, and diabetic patients during the COVID-19 pandemic in India. Mucormycosis is associated with a high fatality rate and had led to a shortage of antifungal drugs during the COVID-19 pandemic in India. The prevalence of mucormycosis ranges from 0.005 to 1.7 per million and was approximately 80 times higher (0.14 per 1000) in India compared to developed countries in the year 2019–2020.^[4] These effects were amplified by the use of corticosteroids and immune-suppressants in susceptible hosts. Corticosteroids may cause impairment in neutrophil

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migration, ingestion, and phagolysosome fusion.^[5] In the case of mucormycosis, the palate is the least common site and ulceration with palatal perforation is a late occurrence that challenges the outcome of treatment and causes disability in the patient. Thus, the purpose of this case report is to present a rare case of mucormycosis with palatal ulceration and add it to the literature.

Case Report

A 43-year-old male patient reported pus discharge and mobile teeth in the upper front region of the mouth, ulcer on the palate, progressively increasing headache with pain and swelling on the right side of the face since 20 days. Past medical history revealed he was COVID-positive 1 month ago with medication; tab ofloxacin and ornidazole for 8 days, and intravenous steroids for 5 days. The cone beam computed tomography (CBCT) of the paranasal sinuses and orbits revealed bilateral maxillary and sphenoid sinusitis, blocked osteomeatal complex, and deviation of the septum on the right side. Magnetic resonance imaging (MRI) showed diffuse soft tissue edema anterior to the maxilla, edema, and inflammation of bilateral medial and lateral pterygoid and right temporalis muscles, diffuse subcutaneous edema in the right maxillary region, diffuse mucosal thickening filling the bilateral maxillary, ethmoidal, sphenoidal, and frontal sinuses, and significant parasinusitis. These findings were in favor of the infective/inflammatory etiology of sinonasal mucormycosis.

The patient was informed about his conditions and treatment plan and written consent was obtained. A team of specialists included a dentist, ophthalmologist, neurosurgeon, and maxillofacial surgeon for the management of such patients. The patient was taken up under general anesthesia where a thorough inspection was carried out using an endoscope, followed by the Coldwell LUC approach; maxillary antrotomy, necrotic mucosa, tissue and bone were resected after the extraction of maxillary teeth from the right first premolar to left first premolar [Figures 1 and 2]. The ear–nose–throat (ENT) team shifted to nasal approach, unicinctomy, middle neatal antrotomy, and anterior and posterior ethmoidectomy. Fresh bone with bleeding was achieved [Figure 3], followed by suturing of the buccal vestibule. Postoperative general anesthesia was uneventful. The patient was advised for a soft and liquid diet for 2 weeks, followed by intravenous medication piperacillin–tazobactam, pantoprazole, ondansetron, tramadol hydrochloride, tranexamic acid, amphotericin B liposomal, and betadine gargling. Postoperatively, a routine check-up was done after 24 h, where the patient was recovering well [Figure 4]. Sutures were removed after 10 days. In the future, the missing teeth should be prepared for prosthesis for proper functioning of esthetic, mastication, and phonetics.

Discussion

Opportunistic fungal infections such as mucormycosis usually occur in immune-compromised patients but can infect healthy individuals as well.^[3,6] Our patient was COVID-positive previously and was on corticosteroids for the same which is a



Figure 1: Extraction of mobile teeth

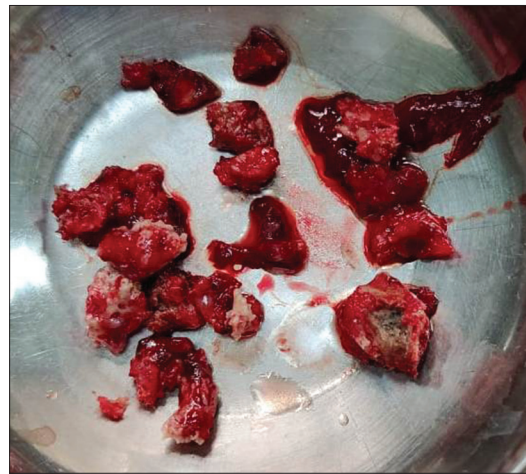


Figure 2: Necrotic bone removed

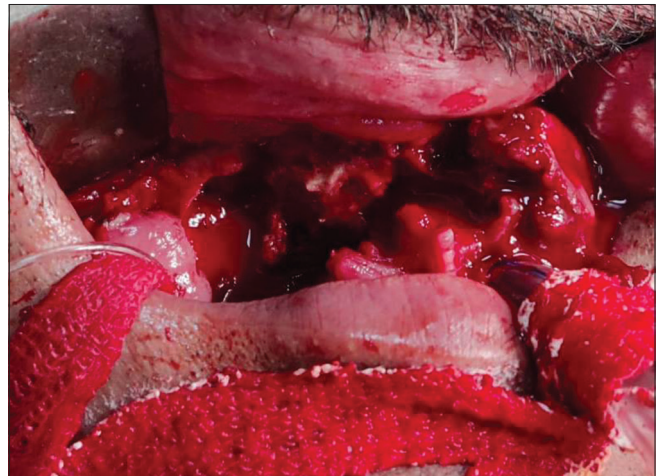


Figure 3: Fresh bone with bleeding induced

well-known predisposing factor for mucormycosis.^[3,7] This fungal infection generally originates from the paranasal sinuses. In our patient, initially, the most probable route of infection was of the maxillary sinus following the fungal spore inhalation that led to the development of mucormycosis causing damage to the nerve plexus innervating the teeth, which may be the original cause of the dental pain. Early symptoms of sinus mucormycosis are



Figure 4: Follow-up after 24 h

consistent with the sign of sinusitis and facial and/or periorbital cellulitis.

Primary care physicians along with the involvement of dental professionals diagnosed this case of palatal involvement at the time of onset of the infection. Ulcer on the hard palate and mobility of anterior maxillary teeth were the first presenting sign that led to the diagnosis of mucormycosis. He did not report any complications or complaints from the sinuses and no such symptoms were obvious. Palatal involvement is a unique sign of sinonasal mucormycosis and it might be possible that more cases exist but this specific sign had been under-reported. As palatal ulcer is easily accessible, it may facilitate an early diagnosis by primary care physicians. In mucormycosis, patients, an early sign of the disease is facial cellulitis, paresthesia, nasal discharge, necrotic turbinate, fever, headache, and lethargy.^[7] However, many of these symptoms were absent in this patient, in contrast to other findings. Squamous cell carcinoma of the maxillary sinus or malignant salivary gland tumor arising from the accessory glands of the palate may be considered as a clinical differential diagnosis in which local pain, swelling, epistaxis, nasal discharge, epiphora, diplopia, and numbness are some of the features. Symptoms of suggestive malignancy were absent in this patient. It is not always possible to perform surgical biopsies for the diagnosis of mucormycosis due to its rapid progression and lack of serology tests. An early diagnosis of mucormycosis is

critical, as treatment should be started immediately to decrease mortality. The mucormycosis has the main sign of typical necrotic ulcer, but in this case, ulcer and anterior maxillary tooth mobility was the first sign, followed by necrosis at a later stage. The short-term corticosteroid administration in COVID-19 patients might be highly likely to be related to the development of the mucormycosis infection.

Conclusion

Increased awareness of primary health professionals and dentists may initiate the early diagnosis of sinus mucormycosis in high-risk patients who present with dental pain and palatal ulcer. This is important in view of the increasing numbers of cases of mucormycosis being reported after being treated for COVID-19 during its second wave in India.

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Conflicts of interest

There are no conflicts of interest.

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