

CASE REPORT

Mucormycosis: A case reportAnkit Kalra¹, Praveen Sharma²**ABSTRACT**

Coronaviruses are a group of related RNA viruses that cause respiratory tract infections. Severe coronavirus disease (COVID-19) is currently managed with systemic glucocorticoids. Opportunistic fungal infections are one such concern in these patients. Rhinocerebral or rhino-orbitocerebral (mucormycosis) zygomycosis (ROCZ) usually occurs among patients with comorbidities like poorly controlled diabetes mellitus, malignancies, iron overload or extensive burns, in patients undergoing treatment with glucocorticosteroid agents, or in patients with related to haematologic malignancies. The disease process starts with inhalation of the fungus into the paranasal sinuses. The fungus may spread to invade the palate, sphenoid sinus, cavernous sinus, orbits or cranially to invade the brain. Pain and swelling precede oral ulceration and the resulting tissue necrosis can result in palatal perforation. Infection extends from the sinuses into the mouth and produces painful, necrotic ulcerations of the hard palate. If untreated, infection usually spreads from the ethmoid sinus to the orbit, resulting in the loss of extraocular muscle function. Medical management includes use of amphotericin B and other drugs. Surgical treatment includes the resection of involved tissues of the face, including skin and muscle. The keys to successful therapy include diagnosis and early recognition of the signs and symptoms, correction of underlying medical disorders such as ketoacidosis, and aggressive medical and surgical interventions. We describe a case of maxillary mucormycosis in a 52-year-old man with diabetes and COVID-19. The case was diagnosed with mucormycosis days following admission for severe COVID-19 infection.

Keywords: Mucormycosis, Covid-19, RT-PCR, Prosthesis.

-
1. MDS (OMFS), Clove Dental, New Delhi
 2. Professor And Head, Department of Oral And Maxillofacial Surgery, D.A.V (C) Dental College & Hospital, Yamunanagar

Corresponding Author**Dr. Ankit Kalra**

Consultant Oral surgeon, Clove Dental

Email: ankit.kalra@clovedental.in**INTRODUCTION**

Coronaviruses are a group of related RNA viruses that cause diseases in animals and humans.

In humans they cause respiratory tract infections that can range from mild to lethal. Mild illnesses in humans include some cases of common cold (which is also caused by other viruses, predominantly rhinoviruses), while more lethal varieties can cause SARS, MERS and SARS-COV-2 or COVID-19. The emergence of the severe acute respiratory syndrome (SARS) epidemic in China in 2002–2003 and the Middle East respiratory syndrome (MERS) on the Arabian Peninsula in 2012 show that they can also cause severe disease. From December 2019, the world is fighting another coronavirus. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the virus responsible for the current outbreak of coronavirus disease (COVID-19), which was first identified in Wuhan, China, following reports of serious pneumonia.

Transmission of the virus happens via an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe. These particles range from larger respiratory droplets to smaller aerosols.

- As per the research the virus spreads mainly between people who are in close contact with each other, typically within 1 metre (short-range). A person can be infected when aerosols or droplets containing the virus are inhaled or come directly into contact with the eyes, nose, or mouth.
- The virus can also spread in poorly ventilated and/or crowded indoor settings, where people tend to spend longer periods of time. This is because aerosols remain suspended in the air or travel farther than 1 metre (long-range).

People may also become infected by touching surfaces that have been contaminated by the virus when touching their eyes, nose or mouth without cleaning their hands.

The spike structure of the protein helps the covid virus to attach to the lining of the nasal wall which easily is collected in swab sample and helps us to detect it during RT-PCR (Real Time- Polymerase Chain Reaction).

CASE REPORT

A 52 year male patient reported to the hospital with chief complaint of fever, cough , headache and body ache for one week. His blood pressure and pulse were normal though his oxygen saturation was found out to be 72% on room air. RT-PCR report was positive. Patient was hospitalised and PCM infusion , fluids were given along with oxygen support A routine haematology was carried out where c-reactive protein was marginally raised. Routine RBS report revealed a level of 500mg/dl, and hence oral hypoglycaemic drugs were started. Patient recovered in a week's time and was discharged.

Patient reported back a month later with pain and mobility of upper right quadrant i.e dento- alveolar fragment containing 14,15,16,17 with pus discharge. RT- PCR test was repeated and it was reported positive.



Fig. 1: Partial Maxillectomy (Right Maxillary arch)



Fig. 2: Obturator made of acrylic

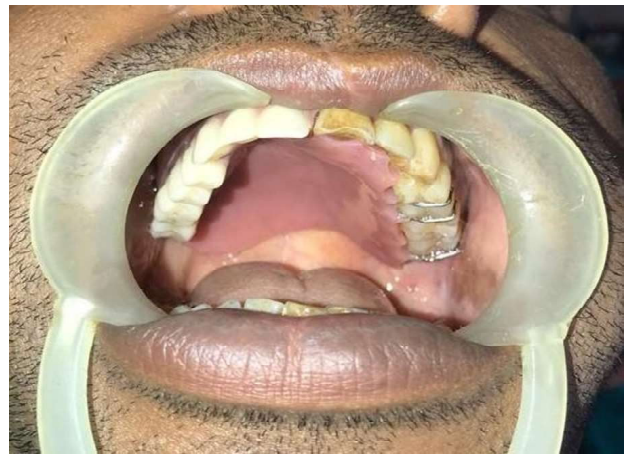


Fig. 3: Obturator in place covering the defect.

Mean while facial CT were obtained and mixed radiolucent lesion was seen in the right maxillary region from 14,15,16,17 and occupying maxillary antrum and involving the nasal cavity of the same side. Incisional biopsy was carried out under antibiotics cover i.e augmentin and metrogyl which was sent for histopathological examination. Histopathology confirmed the diagnosis of Mucormycosis of right maxilla, antrum and nasal cavity. The patient was then explained about the black fungus (Mucormycosis). The treatment plan was to admit the patient and start with amphotericin B infusion and surgical excision of necrotic bone. Consent was obtained and patient was also well informed about adverse side effects of Amphotericin B, also the patient was informed about a residual defect in the upper jaw which will be constructed with a obturator. Patient was and admitted to hospital for Amphotericin B was given intravenously.

Amphotericin B 1mg of test dose iv over 20 minutes was given. Since no reaction occurred, infusion was started with 0.3 mg/kg for 4-8 hourly. 3-4 gm was administered over a period of 1 week of admission. Adverse effects of long term use are nephrotoxicity, Anemia and CNS (only if administered intrathecally).

Patient was posted for right partial maxillectomy along with left nasal endoscopic debridement. Post-operatively, nasogastric tube was inserted for proper diet and nutrition of the patient. Patient was discharged after two weeks when the defect was found to be healing satisfactorily. The patient was discharged and kept on tablet pascopazole 300 MG thrice a day for 1 week duration. After complete healing of maxillary defect and resolution of symptoms of mucormycosis patient was referred for fabrication of obturator.

Patient was then treated jointly by dept of prosthodontics and oral surgery for preparation of

obturator. Obturator was made of acrylic and had presence of dentition from 11 to 17 tooth and it not only restored the deformity but also assisted to establish occlusion. Patient was followed up to rule out any residual necrotic bone and if any ill fitting or loosening of prosthesis.

DISCUSSION

Mucormycosis is a condition with a fulminant course and a high mortality risk. Specially in patients with diabetes mellitus (DM) (60-80%) and other systemic morbidities. Hematologic diseases, neoplasias, chronic renal failure, antineoplastic agents, immunosuppressive therapy, corticosteroid use, protein-calorie malnutrition, organ and bone marrow transplantation, and other conditions resulting in immunosuppression such as AIDS also factor in its etiology¹.

The patients who had a history of covid-19 and returned back with chief complaint of mobile teeth, pus discharge and discolouration of palate etc are a high index of clinical suspicion of mucormycosis. Early diagnosis by radiography, CT scan and endoscopically guided nasal swab, supported by contrast-enhanced MRI or CT scan and establish the final diagnosis and Initiation of treatment with full-dose intravenous (IV) liposomal Amphotericin B. Amphotericin B is the gold standard in the systemic treatment of mucormycosis. Before the use of amphotericin B, the survival rate of mucormycosis patients was just 6%, whereas after the introduction of amphotericin B this rate dramatically increased to the 60% range^{2,3}. Liposomal amphotericin B is the first choice of treatment, as it crosses the blood-brain barrier

more effectively. Another drug that can be used in systemic treatment is posaconazole^{4,5}.

Step-down of oral antifungal is done until their is clinical and radiological resolution of Rhino-orbital Cerebral mucormycosis (ROCM) is observed. Indication for paranasal sinus surgery and orbital exenteration and meticulous post-surgical management is done inculcating a protocol-based strategy by a multidisciplinary team approach may be the key to success.

Treatment alone by medication cannot provide a good acceptable outcome and so a surgical management or approach has to be added so as to treat and reduce chanced of morbidity.

REFERENCES

1. **Ferguson BJ.** Mucormycosis of the nose and paranasal sinuses. *Otolaryngol Clin North Am.* 2000;33:349-365.
2. **Revankar SG, Hasan MS, Smith JW.** Cure of disseminated zygomycosis with cerebral involvement using high dose liposomal amphotericin B and surgery. *Med Mycol.* 2007; 45:183-185.
3. **Petrikos GL.** Lipid formulations of amphotericin B as first-line treatment of zygomycosis. *Clin Microbiol Infect.* 2009;15:87-92.
4. **Ibrahim AS, Avanesian V, Spellberg B, Edwards JE Jr.** Liposomal amphotericin B, and not amphotericin B deoxycholate, improves survival of diabetic mice infected with *Rhizopus oryzae*. *Antimicrob Agents Chemother.* 2003;47:3343-3344.
5. **Fisher EW, Toma A, Fisher PH, Cheesman AD.** Rhinocerebralmucormycosis: use of liposomal amphotericin B. *J Laryngol Otol.* 1991;105:575-577.