

MANAGEMENT OF ORAL MUCORMYCOSIS IN A DIABETIC PATIENT: A CASE REPORT

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ABSTRACT

Mucormycosis is a fulminant opportunistic fungus that primarily affects immunocompromised persons. Inhalation of fungal spores causes infection in the nose and paranasal sinuses. The fungus infiltrates the arteries, causing thrombosis and necrosis of the hard and soft tissues of maxillary region. We present a case of mucormycosis-induced maxillary necrosis in a diabetic patient and patient was on amphotericin B for past few days. Early diagnosis and prompt surgical approach like maxillectomy was performed can reduce the mortality and morbidity of this lethal fungal infection.

Keywords: Maxillary bone necrosis, mucormycosis, uncontrolled diabetes.

INTRODUCTION

Mucormycosis is a fungal infection that usually starts in the nose and paranasal sinuses and progresses rapidly. Mucormycosis is an infrequent opportunistic infection which often affects immunocompromised people. A saprophytic fungus, primarily rhizopus or mucor, is suspected of causing mucormycosis. It is the most lethal and quickly progressing fungal illness that affects people¹. The coronavirus disease 2019 (COVID-19) infection, which is caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), can induce a variety of symptoms, from moderate to life-threatening pneumonia. There are a variety of bacterial and fungal co-infections that can be related with pre-existing morbidity (diabetes, lung illness) or arise as a hospital-acquired infection, such as ventilator-associated pneumonia. Mucormycosis has a variety of clinical manifestations depending on the microbe's and the organ systems involved. Rhinocerebral is the most prevalent type, affecting the nose, paranasal sinuses,

orbits, and central nervous system. Mucormycosis can also be cutaneous, gastrointestinal, pulmonary, or disseminated². To avoid the spread of such illnesses, it is critical to maintain good dental health. The most frequent type of mucormycosis is rhino-maxillary disease, which causes people to seek treatment from a dentist for complaints about their oral cavity. This case report presenting case of rhino maxillary mucormycosis with oroantral fistula and non-healing extraction socket in diabetic patients.

CASE REPORT

A 45-year-old male patient presented to the Department of Oral surgery with pain and swelling on the right side of his face for the last seven days, ulcerative development on the right side of his palate for the past four days, and headache, earache, and vomiting for the past two days. The pain was sudden, sharp, throbbing, and constant. An extraoral swelling on the right middle third of the face was linked to an intraoral ulcerative growth on the right side of the

palate (Figure-1). This ulcer's growth was associated with earaches, headaches, and eventually vomiting. Past medical history revealed that the patient was a known case of type II diabetes mellitus and was on medication like Amphotericin B for past few days. A widespread swelling in the middle third of the face was found to be warm, painful, and firm on extraoral inspection. The lymph node in the right submandibular region was palpable, tender, and mobile. A foul-smelling reddish discharge from the right nostril was detected during a nose inspection. To evaluate the maxilla and the maxillary antrum, a water's view radiograph was recommended. The radiograph revealed that the right maxillary bone had been destroyed, with damage extending superiorly to the infraorbital rim and laterally to the zygomatic bone. The right maxillary antrum has areas of radiopacity, which could indicate sequestrum. Biopsies of the gingiva and bone incisions were collected for histological analysis. Within the necrosed bone region, microscopic examination revealed wide and aseptate fungal hyphae. A final diagnosis of maxillary osteonecrosis secondary to mucormycosis was derived from the findings. After serum urea and creatinine levels were found to be within normal range, the patient was admitted to the hospital and started on intravenous antifungal therapy (amphotericin B; 0.8mg/kg/day for 4 weeks). Routine blood tests, such as serum glucose and a complete haemogram, revealed no abnormalities. There was no evidence of an underlying immunological deficiency. Under general anaesthesia, the patient was prepared for surgical debridement and sequestrectomy, as well as the closure of the oroantral fistula. Buccal mucoperiosteal flap was raised after excision of the fistula lining. The necrosed maxillary bone and the sequestrum removed (Figure 2). Debridement of maxillary antrum was done to remove the inflamed sinus lining, followed by copious irrigation with antiseptic solution. Pedicled buccal fat pad was mobilized by blunt dissection and used to close the defect posteriorly. The buccal mucoperiosteal flap was then advanced palatally over the buccal fat pad to attain two layered closure of oroantral communication. The patient's recovery was uneventful, and he was scheduled for regular follow-up appointments. At the 6-month follow-up, the patient's condition had not show any progression.



FIGURE 1-PRE-OPERATIVE PHOTOGRAPHS



FIGURE 2-Intra operative photographs shows maxillectomy



Figure 3-post operative photographs

DISCUSSION

Mucormycosis is a quickly progressing and frequently fatal opportunistic infection caused by fungi of the Zygomycetes/Phycomycetes class of the order Mucorales^{3,4}. The most common form of this disease in the craniofacial area is rhinocerebral mucormycosis. Cutaneous, Gastrointestinal, Pulmonary, and Disseminated Mucormycosis are some of the other types of Mucormycosis^{5,6}. Mucormycosis has an unfavorable prognosis, with a death rate of 17–54 percent⁷. These fungi can be found in a variety of places in the natural world, including soil, air, food, composite piles, and animal excrement, and they aid in decomposition. These fungi can be inhaled, eaten, or enter the human body through an open wound. Mucorales were isolated from the oral cavity,

nasal passage, and pharynx of healthy people who showed no indications of illness. When organisms infect immunocompromised patients, this disease most often appears. Angioinvasion of mucorales and its spores into blood arteries promotes thrombus development, which leads to gradual necrosis of the related hard and soft tissues.

Diabetes mellitus that is uncontrolled might affect a patient's normal immune response to infections. Patients with this condition have a diminished granulocyte phagocytic ability as well as a different polymorphonuclear leukocyte response. According to reports, immunocompromised patients' serum has a lower ability to suppress *Rhizopus* *invitro*, making them vulnerable to opportunistic fungal infections⁷. Due to the obvious disease's progression, early diagnosis is crucial. It is based on clinical symptoms, radiographic evaluation, organism identification by culture, and histologic study of the biopsy specimen. Although Sabouraud's dextrose agar culture is preferred, histological analysis of the biopsy specimen, which reveals long, broad, branching, and nonseptate hyphae, is definitive. The diagnosis was verified by histological evaluation of the biopsy specimen using H and E, PAS, and later GMS stains after the culture yielded no growth⁸.

In this case, surgical debridement of the affected tissue was performed using a nostril endoscope, and Amphotericin-B (alternate day therapy) and insulin therapy were used. Throughout this treatment, the patient's BUN, creatinine, and blood sugar levels were evaluated

daily for evidence of Amphotericin-induced renal toxicity. The patient's rehabilitation, or closure of the palatal perforation, can be done surgically with free flaps or with the creation of a prosthetic appliance. Muthu et al. stressed the importance of liposomal Amp-B given at 3 mg/kg/day since it is vasoocclusive in nature and has similar efficacy and safety as the 10 mg/kg/day dose of Amphotericin-B medication. Liposomal Amphotericin B is currently used in combination with either an Itraconazole or an Echinocandin in a unique therapeutic regimen^{10,11}. Posaconazole, a novel triazole derivative, has recently been investigated as an oral antifungal drug. It has an 80% cure rate when taken alone or in combination with Amphotericin-B¹¹. Mucormycosis has long been thought to be a deadly disease with a poor prognosis. Survival rates are currently expected to approach 80% with early medical and surgical intervention. Because of an early diagnosis and appropriate treatment, this

patient was able to survive¹².

CONCLUSION

COVID-19 is linked to a high rate of secondary infections, both bacterial and fungal, most likely as a result of immunological dysregulation. Furthermore, the widespread use of steroids, monoclonal antibodies, and broad-spectrum antibiotics as part of the COVID-19 armamentarium may result in the development or worsening of pre-existing fungal illnesses. Early detection of the disease process, as is typically the case, is critical to the efficacy of subsequent treatment. Dentists, as oral physicians, frequently have the ability to diagnose or refer patients to a specialist early in the course of a systemic disease, lowering the mortality and morbidity rates associated with systemic disorders.

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