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Rhino-Orbital Mucormycosis Associated with Diabetes Mellitus - A Case Report

Divya Parimi *[1], Siva Bharani[2], Kiran Hy[3]

2.3, Department of Oral and Maxillofacial Surgery, College of Dental Sciences, Davanagere.

Corresponding Author: Divya Parimi, Oral and Maxillofacial Surgery, Rajiv Gandhi University of Health Sciences, Bangalore, Karnataka.

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Introduction

Mucormycosis, commonly known as the black fungus, caused by the mucorales group is an opportunistic, debilitating fungal infection, notorious for its aggressive spread and predilection toward immunocompromised and diabetic individuals. Although relatively uncommon, this dangerous disease, specifically the rhino-orbital variant, has now crept up the ladder on account of the COVID-19 pandemic, thereby making its thorough knowledge an indispensable necessity for the present-day maxillofacial surgeon and dentist.

Key Words: Mucormycosis, Fungal Osteomyelitis, Black fungus.

Case Report

A 56-year-old female patient, reported to the Department of Oral and Maxillofacial surgery, with newly diagnosed type II Diabetes Mellitus and a complaint of severe headache, pain in the right eye and swelling over the right side of face, post a recent tooth extraction in the same region. Local examination revealed a firm, tender, diffuse swelling over right side of face and slight redness of conjunctiva of right eye. Intraoral examination revealed an unhealed, infected extraction socket with active pus discharge in the right upper premolar region with positive water holding test. A yellowish-white necrotic patch in midline of hard palate measuring 2*1cm in size was also noticed. Blood investigations revealed RBS 322mg/dl, CRP 250.2mg/liter and Total count of 19,930 cells/cumm. Radiographic investigations **(**PNS, CECT face**)** revealed inflammatory mucosal thickening of the right maxillary sinus along with an obvious Oro-antral communication, via the extraction socket. A provisional diagnosis of fungal infection was made based upon above findings. Patient was taken up for one cycle of aggressive local debridement and antral lavage under local anaesthesia and 2 phases of surgical removal of necrosed maxilla, lateral nasal wall, zygomatico-maxillary complex and orbital floor under general anaesthesia. This was also coupled with medical management of the blood sugar levels with insulin and higher antibiotics **(**Piperacillin 4.5gm TID, Amikacin 500mg BD, Ornidazole 500mg BD**)**, over a period of 2 weeks. The sinus soft tissue as well as bone samples were sent for fungal culture which revealed Rhizopus species and histopathological examination, which revealed non-septate fungal hyphae, confirming the diagnosis of mucormycosis. Post-operatively, there was partial gaping of the intraoral wound posteriorly inspite of repeated closures. A palatal feeding plate was then fabricated along with nasogastric tube feeds to facilitate healing. This was done by the

Department of Prosthodontics. No antifungal was administered as per the advice of the physician, but recovery was uneventful and satisfactory, nonetheless.

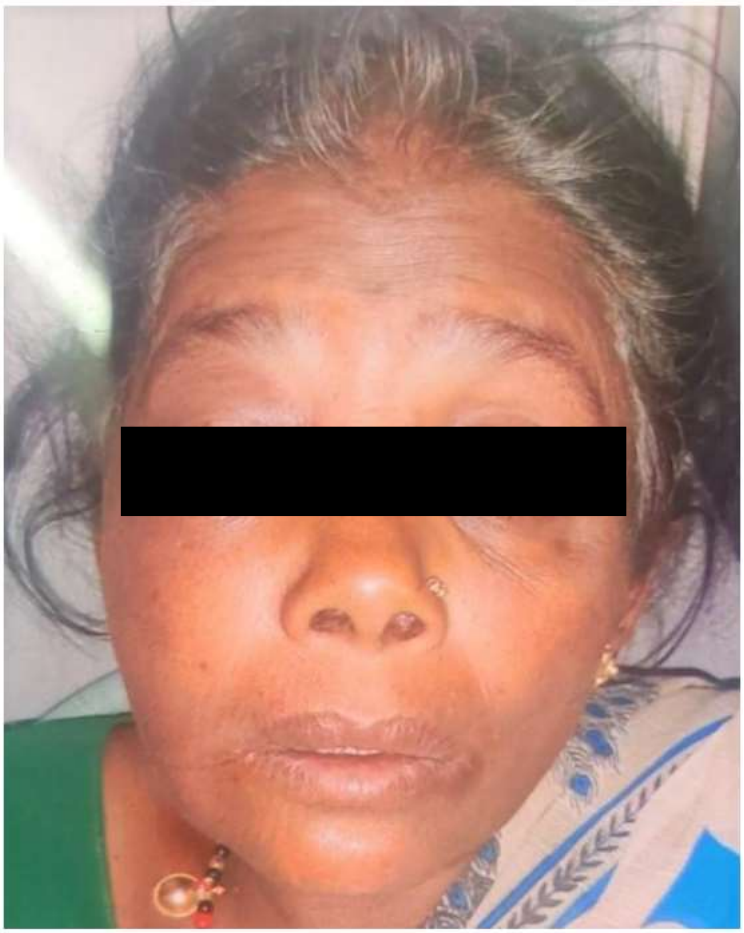

Figure 1 Initial Presentation with Facial and Orbital Swelling

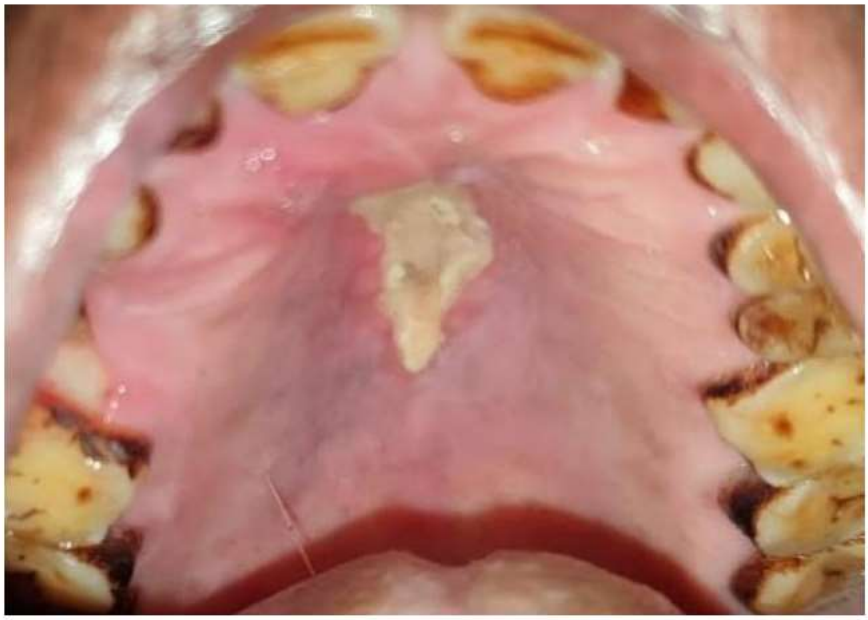

Figure 2 Presence of A Palatal Eschar in the Midline

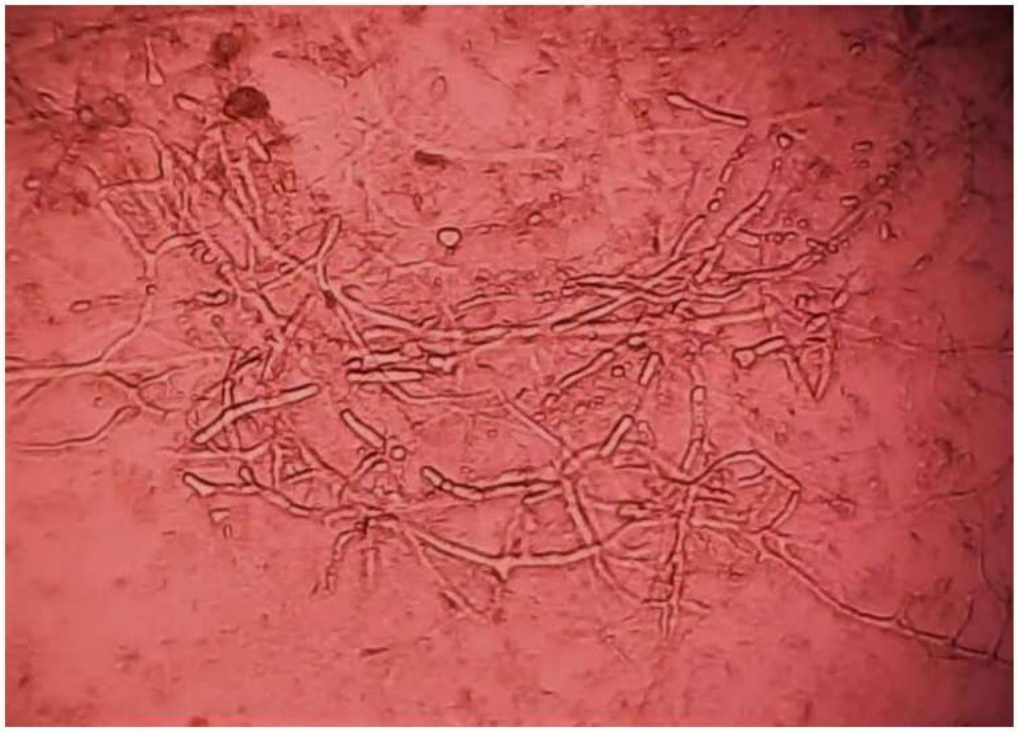

Figure 3 Presence of Characteristic Fungalhyphae on Hitological Examination

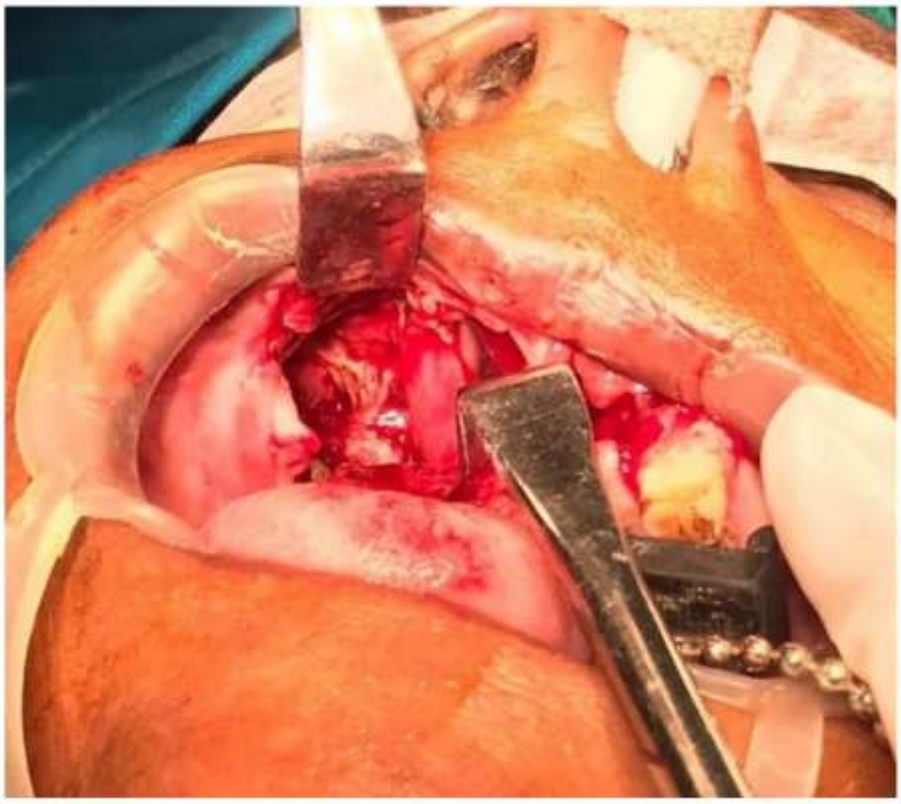

Figure 4 Intraoperative View Post Maxillectomy

Discussion

Mucormycosis is a life-threatening infection that occurs in immuno-compromised patients. These infections are becoming increasingly common in the present COVID-19 era, yet survival remains poor. Species belonging to the family Mucoraceae are isolated more frequently, among which Rhizopus oryzae is by far the most common cause of infection. **(**1**)** Diabetic patients are predisposed to mucormycosis because of the decreased phagocytic ability and endothelial adherence of their neutrophils. Furthermore, the acidosis and hyperglycaemia provide an excellent environment for the fungal growth. **(**2**)** COVID-19 is associated with a significant incidence of secondary infections, both bacterial and fungal, due to immune dysregulation and use of steroids/broad spectrum antibiotics **(**3,4**)**

A pathognomonic sign of invasive mucormycosis is extensive angioinvasion with eventual tissue necrosis and thrombosis. Mucormycosis is classified as one of the following 6 major forms: rhino-cerebral, pulmonary, cutaneous, gastrointestinal, disseminated, and uncommon, rare forms, such as endocarditis, osteomyelitis and renal infection, based on anatomic location. **(**5**)**

As per a review study carried out by Rodroguez et al in 2014, the most common symptoms were fever, rhinorrhoea, headache and vision loss. **(**6**)** This very well correlates with the symptoms and signs exhibited by our patient.

A case study reported by PK Pandilwar et al, also showed the classical picture of unhealed extraction sockets and palatal eschars, similar to that seen in our patient. **(**7,8**)**

As per a study conducted by Lackhner et al, on account of the non-specificity of clinical and radiographic features, direct examination of fungal hyphae in culture is the gold diagnostic standard. **(**9,10**)** Although evidence of infection was seen in blood cultures, it was the fungal culture and histopathological examination that cemented our diagnosis.

In our case, antifungals were not administered as per the advice of the physician, on account of the patient's altered renal status, substantial improvement after surgical debridement, and achievement of excellent glucose control. But our case was a less aggressive variant of mucormycosis. Given the financial burden placed by the antifungal medication that is faced by the low-income population of India, area of usage of this drug should be limited to only life saving situations, and situations where the benefits outweigh the risks. Further studies regarding the same should be carried out in the future.

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