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Rhino Maxillary Mucormycosis During the Covid-19 Third Wave: A Case Report

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Abstract:- With the surge of cases during the third wave of COVID-19, India faced a number of Mucormycosis cases, a rare but potentially fatal fungal infection, caused by the mucormycetes. The increased prevalence of Mucormycosis among COVID-19 patients may be associated with increased use of steroids, or the possible immunocompromised state caused by SARS-CoV2 or co-existing conditions such as diabetes mellitus. Presenting a case of Rhinomaxillary Mucormycosis where patient presented with a complaint of ulcerative lesion on palate. A diagnosis of Mucormycosis was established after Contrast Enhanced Computed Tomography (CECT) and cytology. Management was planned with antifungal therapy and surgical intervention. Due to immunocompromised state patient couldn't survive.

Keywords*: COVID-19, Mucormycosis, Immunocomprised, Diabetes.*

I. INTRODUCTION

With the onslaught of COVID-19 cases, a number of opportunistic infections, specially Mucormycosis have come to our attention. An aggressive infection caused by Rhizopus first described as Phycomycosis or zygomycosis by Paltauf,[1], was later coined as Mucormycosis by an American pathologist Baker in 1957.[2] Mucormycosis, an aggressive, deadly angioinvasive fungal disease is caused by mold fungi of the genus Rhizopus, Mucor, Rhizomucor, Cunninghamella and Absidia of order- Mucorales and class-Zygomycetes.[3] The most common type is Rhizopus Oryzae which is accountable for nearly 60% of Mucormycosis cases in humans and is also responsible for 90% of the Rhino orbital-cerebral (ROCM) form.[4] Inhalation of fungal spores is the main mode of contamination. The prevalence of Mucormycosis ranged from 0.005 to 1.7 per million population worldwide. In India, its prevalence is 0.14 per 1000, which is nearly 80 times higher as compared to other developed countries.[5,6,7] Here we present a case of Rhinomaxillary Mucormycosis in a patient with a history of Hypothroidism and Hypertension who was later found to be Diabetic too.

II. CASE REPORT

A 50 year old female presented to the Department of Oral Medicine And Radiology, K.D Dental College And Hospital, Mathura with a complaint of ulcerative lesion on palate since 1 month. Patient had history of Hypothroidism and Hypertenison since 7 years and was under medication for the same. She also gave history of fever 2 months back which led to suspicion of COVID but there was no proper documentation of medications and hospitalization. Her dental history revealed extraction of right upper posterior teeth 1 month back and avulsion of maxillary central incisors after 10 days of extraction. After that swelling developed extraorally and she started noticing ulcerative lesion on palate which progressively increased in size and associated with pain initially but with no pain at present. Patient also complained of numbness on bilateral face since 10 days.

On extraoral examination, diffuse swelling was present on bilateral middle and lower third of face. Visible epistaxis was present wrt left nostril. On intraoral examination, Maxillary teeth were mobile. Ulcerative lesion was seen on palate. Necrotic exposed bone overlying palatal mucosa along with unhealed socket wrt maxillary anterior was evident. Numbness was present in bilateral infraorbital region. With the history and clinical findings, provisional diagnosis of Osteomyelitis involving alveolar bone of Maxilla and palate was made. Fungal infections was kept as differential diagnosis. CECT of face showed changes of skull base Osteomyelitis with abscess formation in left infratemporal fossa, pan sinusitis and bilateral otomastoiditis.

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Patient was found to be Diabetic with Random blood sugar 278mg/dl and Glycosylated hemoglobin 9.8 for which physician consulatation was advised. Histopathological studies showed aseptate fungal hyphae scattered at new foci in a blood mixed proteinaceous background, mild mixed inflammatory infiltrate and degenerating epithelial cells, suggestive of Mucormycosis. RT PCR was found to be negative. The patient was administered Liposomal Amphotericin B 5 mg/kg/day under close monitoring of renal and liver functions. Maxillectomy was planned for the patient after obtaining physician, ophthalmologist and neurologist consultation. Unfortunately, on the third day of surgery, she lost her life.

Fig 1 Extra Oral Picture Showing Diffuse Swelling on Middle and Lower Half of Face Bilaterally

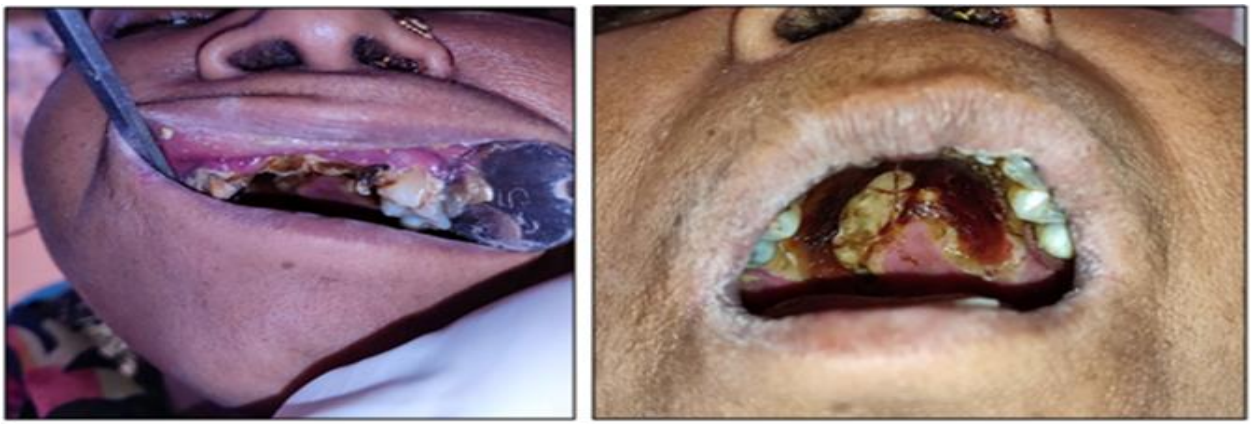

Fig 2 Intraoral Picture Showing Necrotic Exposed Bone Overlying Palatal Mucosa

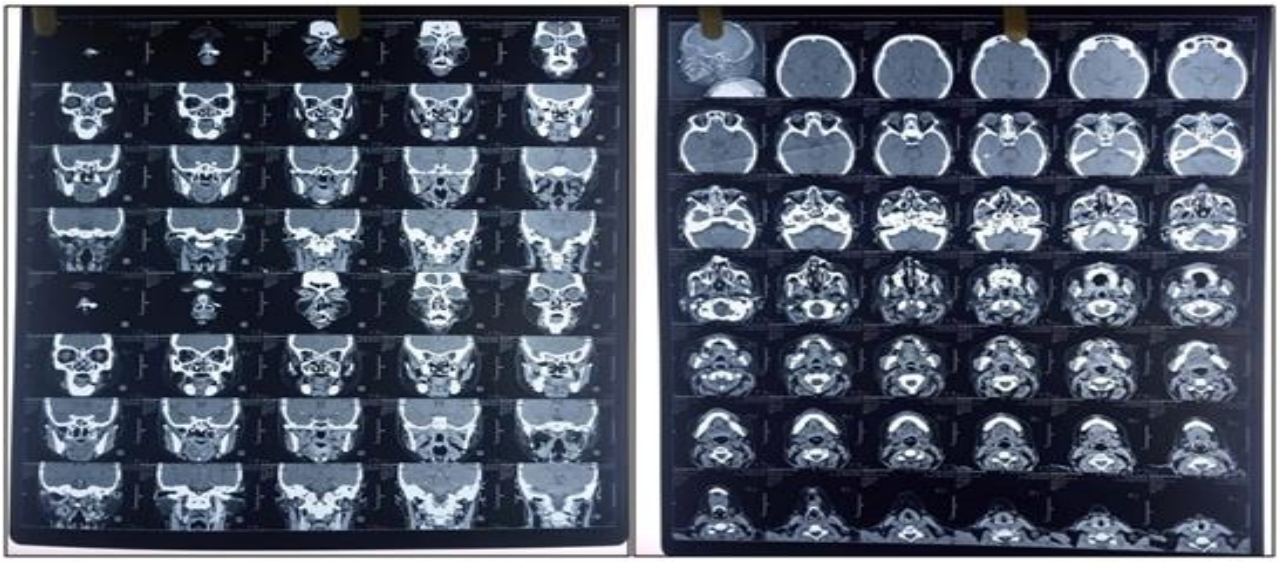

Fig 3 CECT Scan of Face Showing Multilple Focal Lytic Lesions Involving the Body and Greater Wings of Sphenoid, Bilateral Medial and Lateral Pterygoid Plates and Alveolar Sockets of both Maxilla.

III. DISCUSSION

The abrupt increase in Mucormycosis cases in India appears to be multifactorial in nature with several hypothesis linking mucormycosis to Covid-19 patients who are immune compromised and/or have associated co-morbidities. Despite the fact that Mucormycosis is extremely uncommon in healthy individuals however several immunocompromised conditions predispose it which includes uncontrolled DM with or without DKA, hematological and other malignancies, organ transplantation, prolonged neutropenia, immunosuppressive and corticosteroid therapy. Besides these other risk factors associated includes iron overload or hemochromatosis, deferoxamine or desferrioxamine therapy, voriconazole prohylaxis for transplant recipients, severe burns, acquired immunodeficiency syndrome (AIDS), intravenous drug abusers, malnutrition and open wound following trauma.[8] Diabetes Mellitus has been the most common risk factor linked with Mucormycosis in India, although hematological malignancies and organ transplant takes the lead role in Europe and USA. Diabetes Melllitus remains the leading threat associated with Mucormycosis globally, with an overall mortality of 46%.

Mucormycosis can affect nose, sinuses, orbit, central nervous system (CNS), lung (pulmonary), gastrointestinal tract (GIT), skin, jaw bones, joints, heart, kidney, and mediastinum (invasive type).[8] Mucormycosis can be categorized into 6 forms on the basis of clinical presentation and affected structure: Rhinocerebral, pulmonary, gastrointestinal, cutaneous, disseminated and miscellaneous, out of which Rhinocerebral accounts for the highest percentage.[9] Most common clinical manifestation of Mucormycosis in immunocompromised patient is the Rhino-orbitocerebral form which refers to the entire spectrum ranging from limited sino-nasal disease (sino-nasal tissue invasion), limited rhino-orbital disease (progression to orbits) to rhino-orbital-cerebral disease (CNS involvement).[10]

Pathogenesis of this disease starts with the inhalation of the fungus by a susceptible individual. These microorganisms usually gain entry into the host through the respiratory tract and have potent affinity for arteries and spread alongside internal elastic lamina causing thrombosis followed by infarction. Progression of this disease is from nose, sinuses or direct through vascular occlusion.[11,12] The symptoms of fungal invasion to oronasal cavity or paranasal sinuses includes: sinusitis or periorbital cellulitis, facial numbness, conjunctival suffusion, blurry vision, soft tissue swelling followed by eschar formation and necrosis of nasofacial region.[13,14] As the infection advances, it habitually spreads from the ethmoid sinus to orbit causing loss of extraocular muscle function, proptosis, chemosis leading to cavernous sinus thrombosis, carotid artery, or jugular vein thrombosis and mortality.[15]

Diagnosis is classically based on detailed case history, clinical features, histopathological findings, culture and imaging modalities. Serum investigations include Complete Blood Count (CBC), blood sugar test. Radiographic investigations include CECT and CBCT Cytohistopathological investigations include KOH mount and culture media. Confirmatory investigation in today's scenario includes Polymerase Chain Reaction (PCR). Control of underlying systemic disease, prompt systemic antifungal therapy mainly Liposomal Amphotericin B on a dose of 5 mg/kg/day along with other antifungal chemotherapeutic agents such as: Posaconazole and Capsofungin and surgery are essential for the successful management of Mucormycosis. Surgical intervention includes repeated surgical debridement of necrotic tissue and Maxillectomy followed by prosthetic obturator placement.

IV. CONCLUSION

Mucormycosis, a rare and ubiquitous fungal infection, causes necrosis of orofacial tissues and the affected region in susceptible host. Although several factors may contribute towards the development of Mucormycosis, incidence of mucormycosis secondary to COVID-19 infection is extremely high in immunocomprised patients, resulting in significant morbidity and mortality. With irrational use of steroids in COVID-19 patients, hyperglycemia has been severely aggravated with a parallel increase in fungal infections for which emphasis must be given on the judicious use of immunomodulators.

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