

## Odontogenic Origin Of Mucormycosis Of Maxillary Sinus Post Covid 19 Infection: A Case Report

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### Abstract

Mucor is a saprophytic organism and commonly invades the nose and paranasal sinuses of immunocompromised & diabetic patients. Mucormycosis is characterized by rapid development of tissue necrosis as a result of vascular invasion. Diagnosis based on strong clinical suspicion with radical debridement under amphotericin cover offers a good management option. A 39 year old male presented with complaint of loose upper teeth, swelling of left cheek and facial pain since 3 months. He was COVID 19 positive 3 months back. Patient is a known case of uncontrolled type 2 DM. On examination multiple pus draining sinuses were observed in left upper gingivae, pus culture sensitivity, KOH mount and fungal culture was sent. Fungal culture revealed growth of aseptate hyphae (Mucor). He was posted for FESS and surgical debridement of left maxillary sinus. Pre-operatively patient was started with Tab. Itraconazole 200 mg BD and was under cover of Inj Liposomal Amphotericin B with nasal douching post-operatively. Post-operative period remained uneventful, and on routine endoscopic examination healthy mucosa of maxillary sinus was noted. Mucormycosis is a severe fungal infection encountered in a recent COVID recovered patient. This case highlights that COVID infection can impair the immune response thus exposing patients to higher risk of developing opportunistic infections with worst outcomes. Mucormycosis is a serious opportunistic fungal infection caused by fungi from the Mucorales family, with *Rhizopus* species being the most prevalent causal pathogen. Immunocompromised patients, particularly those with uncontrolled diabetes mellitus or haematological malignancies, are the most susceptible to infection. It is known to be one of the most rapidly progressing forms of fungal infection in humans, with a high fatality rate. Patients infected with the coronavirus 2 of the severe acute respiratory syndrome (SARS-CoV-2) develop coronavirus disease (COVID-19), which is associated with significant and long-term lymphopenia, affecting the immune system. Although the link between COVID-19 and Mucormycosis is unexpected, it is not shocking. Because down-regulation of the immune system, particularly in uncontrolled diabetes mellitus, is a key risk factor for Mucormycosis and is also a high-risk factor for COVID-19. Second, steroids, which are known to inhibit immunity, are a therapy option that has been demonstrated to reduce COVID-19 mortality. As a result, the combination of COVID-19, reduced immunity, and steroids is likely to predispose a patient to Mucormycosis. We present six cases of paranasal mucormycosis associated with previous Covid-19 infection who presented to the Department of ENT. Mucormycosis is caused by fungi of the Zygomycetes class

and is the third most common invasive mycosis after candidiasis and aspergillosis. *Rhizopus arrhizus* is the most important species in terms of frequency. The rhino-maxillary type of the disease, which is a subgroup of the rhino-cerebral form, begins with a susceptible individual inhaling the fungus. The spores are met by the first line of defence, mononuclear and polynuclear phagocytes, once they have penetrated the lungs or subcutaneous tissues. Mucorales spores can be killed by the phagocytes of a healthy host by producing oxidative metabolites. Because of ketoacidosis, uncontrolled diabetes mellitus might affect a patient's normal immune response to infections. Patients with this condition have a lower granulocyte phagocytic ability and a different polymorphonuclear leukocyte response. Consistent symptoms, sinusitis or periorbital cellulitis, and facial numbness are caused by fungus invading the oro-nasal cavity or paranasal sinuses of a susceptible host, followed by conjunctival suffusion, blurry vision, and soft tissue swelling, followed by eschar formation and necrosis of the naso-facial region. Histopathological investigation, ideally a CT scan of the maxilla and orbit, is required to confirm a clinical suspicion of mucormycosis, which should indicate membrane or periosteal thickening and bone disruption. COVID-19 infection causes immune system dysregulation, resulting in a decrease in T lymphocytes, CD4 + T cells, and CD8 + T cells. A multifactorial picture of pre-existing Diabetes mellitus and systemic immunological alterations as a result of COVID-19 infection, leading to subsequent infections and increased mortality and morbidity. SARS-CoV and SARS-CoV 2 are from the same species, with similar biological characteristics and prevalence, according to studies. Infected patients with SARS (2003) had a fungal infection rate of 14.8–27 percent, while very ill patients had a rate of 21.9–33 percent [16,17,17]. Fungal infection was a major cause of death for SARS patients, accounting for 25–73.7 percent of all deaths. Fungal infection was a major cause of death for SARS patients, accounting for 25–73.7 percent of all deaths. An association of Mucormycosis with poorly managed diabetes mellitus and COVID-19 cannot be missed in any of the patients mentioned in this research. The global case fatality rate for mucormycosis is 46%. Rapid diagnosis and treatment with surgical debridement and antifungal medication allows for a quick recovery. A clinical suspicion must now be confirmed by histological testing. The medicine of preference is liposomal amphotericin B; additional antifungal drugs utilised include Posaconazole and Itraconazole. When surgical and antifungal therapy are paired with effective blood sugar management, the prognosis is favourable. It has been observed that COVID-19 individuals had co-existing bacterial and fungal illnesses, forming a trio. Inflammatory cytokines were overexpressed in Covid-19 patients, and the cell-mediated immune response was compromised, with lower CD4 + T and CD8 + T cell counts, indicating a high sensitivity to fungal co infection. The use of broad-spectrum antibiotics in combination with steroids,

which is the mainstay of treatment for Covid-19 infection in order to limit mortality, works as an aggravating factor, suppressing the immune response even more. Another key risk factor is diabetes mellitus, and the presence of both has extra implications in producing secondary fungal infections. In a diabetic and COVID-19 patient, foul-smelling nasal discharge

with headache and foul breath should be considered extremely suspect of mucormycosis. Early detection, effective therapy, and surgical debridement can help patients recover faster. Rapid diagnosis, timely care, and the reversibility of underlying risk factors can increase recovery and survival rates to a greater extent.

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