An ubiquitous entity of post-COVID rhinomaxillary mucormycosis

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ABSTRACT

Introduction: Coronavirus disease-19 (COVID 19) has left a trail of morbidity and mortality on a global scale because of the nature of the disease and its sequelae. One of the earliest drugs used to prevent the spiralling down of patients with the effects of cytokine syndrome were corticosteroids, reducing mortality. However, with the unfortunate injudicious use of steroids, opportunistic infections have created havoc even in recovered patients. COVID-associated rhino mucormycosis has seen a sudden spike in its prevalence presenting as an endemic in the midst of a pandemic. Case Presentation: Our paper reports a case of a COVID-recovered patient who presented with bilateral disease involving the maxillary sinus and palate on one side and the zygoma and orbit on the other. Discussion: Diagnosing and treating maxillary or orbital or cerebral extensions of rhino mucormycosis requires a thorough judicious approach. Imaging, meticulous intra-operative evaluation, and aggressive medical and surgical treatment are necessary. Conclusion: This case report highlights a peculiar case of an asymmetrical bilateral presentation of post-COVID mucormycosis involving different anatomical spaces.

Keywords: COVID 19, endoscopic sinus surgery, maxillectomy, mucormycosis, zygoma

Introduction

Invasive rhino or pulmonary fungal infections have seen a steep rise in India during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic.¹ The susceptibility of patients succumbing to this disease is because of the immuno-compromised status, hyperglycemic state, excessive use of steroids, prolonged humidified oxygen support, etc. Patients, even those who have recovered from COVID 19 with complaints of facial pain or swelling, nasal stuffiness or discharge, teeth mobility, palatal swelling, impaired vision, and headache, are highly likely to have this super-added fungal infection.² It is imperative for physicians and healthcare workers attending all COVID 19 patients to look out for the risk factors and signs for COVID-associated fungal infections as the second wave has shown its deadly nature with up to 70% mortality.

The most commonly identified species affecting paranasal sinuses are the mucoraceae family. With the entry of spores through the nasal or oral cavity in compromised patients, a destructive chain of events occurs, leading to necrosis of mucosa and facial bones because of angioinvasion.³ Early diagnosis, aggressive immediate intervention by administration of anti-fungals and surgical debridement with diabetic control are crucial in the management of this disease. Even with such protocols, rates of recurrence and deaths are high.⁴

We describe a unique case of rhino maxillary mucormycosis with bilateral disease presentation involving different anatomical entities.
Case Report

A 47 year old diabetic male reported to our tertiary teaching hospital with complaints of right eye swelling, nasal blockage, and mobility of the left upper teeth for over a week. He gave a history of being diagnosed and hospitalized with COVID 19. The patient was administered supplemental oxygen, oral steroids, and antibiotics for a week because of mild hypoxia and was discharged after resolution of symptoms. After 15 days of discharge, the symptoms of facial swelling, nasal blockage, and mild left headache had developed.

On examination, 3 × 2.5 cm soft tender swelling was seen infero lateral aspect of the right eye [Figure 1]. The vision chart was normal. Intra-oral examination revealed root stumps with respect to 26,27 and 25,28, which were mobile associated with gingival swelling.

Based on history, suspicion of sinusal pathology was raised. Diagnostic nasal endoscopy was done, which showed suspected areas of necrosis and swab taken for KOH mount identified fungal elements.

Magnetic resonance imaging (MRI) was suggestive of irregular T2, short tau inversion recovery hyperintensity with collection measuring 2.4 × 2.5 cm in the cheek region involving lateral and inferior aspects of the orbit on the right side and the masticatory space on the left side. Enhancement was also seen in the left temporal region. Computed tomography (CT) paranasal sinuses revealed lytic destruction of the zygomatic bone and inferior and lateral aspects of the right orbit and left upper alveolus [Figure 2].

The patient was counselled and admitted for further management. Intravenous (IV) amphotericin was administered. Endoscopic sinus surgery was done clearing the necrotic lining with respect to the left maxillary sinus, the sphenoidal sinus with middle meatal antrostomy, and the right maxillary sinus with orbital decompression. Left pterygopalatine fossa was explored. This was followed by left partial maxillectomy with adequate margins. The right orbital region was addressed next. An incision was placed in the dependent area to drain the pustulous collection. This was followed by extending the incision laterally to reach the zygomatic bone and lateral and inferior orbital walls [Figure 3]. Necrotic foci were identified and removed.

The patient was put on IV liposomal amphotericin B (3 mg/kg/day) for over a period of 10 days with adequate monitoring of blood parameters and the glycemic status. In addition, under antibiotic cover, irrigation of nasal cavities with saline and oral cavity rinsing with chlorhexidine was done in the post-operative period. Oral posaconazole tablets were advised for 2 months on discharge. The histopathological evaluation of the linings and specimen showed fungal hyphae [Figure 4].

In the follow-up period of up to 3 months, serial Diagnostic Nasal Endoscopy (DNE) examinations showed the healthy nasal mucosa and the surgical sites intra-orally and extra-orally were healed [Figure 5]. Oral rehabilitation was done.

Discussion

Rhinomaxillary mucormycosis had stormed as an endemic in the midst of the COVID 19 pandemic.[5,6]

Generally, patients undergo endoscopic sinus surgeries with or without maxillary, orbital, and neurosurgical procedures depending on the extent. In bilateral disease, total maxillectomy is carried out apart from endoscopic sinus surgery (ESS).[7] In our
patient, the presentation of the disease was strikingly different on both sides. The disease was more lateral and superior on the right-side zygoma and orbital wall with no involvement of the inferior maxilla, whereas on the left side, only the inferior maxilla was involved.

This varied path could be explained by the superior and lateral spread of mycosis from the right maxillary sinus toward the orbital floor and inferior spread of the disease from masticatory space toward the maxilla on the left side. Aggressive ESS with removal of necrotic bony foci under the cover of anti-fungals and anti-diabetic drugs sufficed to treat such an extensive disease.

Cerebral extension was thus prevented. No revision surgeries were required in the follow-up period with complete resolution of symptoms.

Even though mucormycosis is a well-documented disease, it posed a significant therapeutic challenge, and any delay in the intervention would have caused severe morbidity and even mortality.

**Conclusion**

The COVID 19 virus and associated opportunistic infections have affected the population in a multi-factorial way. The lack of awareness, patients’ disregard to symptoms, diagnostic neglect by the burdened attending clinicians, and inefficient management often caused patients presenting at late stages.

The prediction of the fungal invasion process in the anatomical spaces is difficult. Early recognition of symptoms, imaging, and more importantly intra-operative evaluation before debridement is essential to achieve a disease-free state while trying to preserve structures. Haphazard asymmetrical involvement can be challenging to surgeons, and such patients need to be closely monitored and be administered adequate anti-fungals in order to prevent any further pathological process.

The pandemic has taught that it is necessary to keep in mind the sequelae of immuno-modulating diseases such as SARS-CoV-2 and to not disregard opportunistic infections as they require immediate identification and management to prevent mortality at a national scale.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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