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Case Report

Atypical Presentations of Post-Covid Mucormycosis

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I N F O

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A B S T R A C T

Mucormycosis is a rare fungal infection affecting multiple organ systems, most commonly causing invasive fungal sinusitis. In the post covid era it caused a flare-up in a number of cases for a few months in tropical countries of South East Asia causing significant deaths in susceptible subjects. A few abnormal presentations of this infection has been described and discussed below.

Keywords: Mucormycosis, Covid 19, Post Covid Mucor

Introduction

Mucormycosis in the precovid era was a rare Fungal infection caused by the order Mucorales (Mucormycetes). The most common organisms isolated are Rhizopus species mucor species, Syncephalastrum species, Cunninghamella bertholletiae, Apophysomyces species and Lichtheimia (formerly Absidia) species.[1] the pattern of infection, the surgical and antifungal treatments, and survival were described.

Results

The mean age of patients was 38.8 years; 65% were male. The prevalence and overall mortality were 36% and 44%, respectively, for diabetes; 19% and 35%, respectively, for no underlying condition; and 17% and 66%, respectively, for malignancy. The most common types of infection were sinus (39% These are ubiquitous organisms that cause opportunistic infections in the Immuno compromised hosts like uncontrolled diabetes mellitus, immunosuppressant drugs, AIDS, Carcinomas etc.

Sars-Cov-2 infection was shown to cause an immunocompromised state in the affected subjects. This along with indiscriminate use of steroids and/ or other supportive treatments predisposed many to contract Mucormycosis.

Globally, India had the highest burden of mucormycosis in the pre-COVID era. However, during the second wave of Covid-19 the sudden spike of mucormycosis in India wreaked havoc due to a huge number of patients, inadequate healthcare infrastructure, and lack of medicine supply further increasing the mortality, although the reasons are poorly understood. The synergistic interaction of several substrates: host, pathogen and environment have been postulated, which acted together and are predisposed to this phenomenon.[2]

The types of Mucormycosis seen are:

a) Rhino-orbito-cerebral
b) Pulmonary
c) Gastrointestinal
d) Cutaneous
e) Disseminated: Spleen, Heart, Kidney etc

Here some cases of unusual presentations of Mucormycosis are reported during the post-covid spike at Dr. Hedgewar Rugnalaya.

Case 1

A 58 year old diabetic (newly diagnosed) male presented with Black necrosed skin over his penis and scrotum along with black discolouration of Palate since 4 days. He was infected with SARS-CoV-2 one month earlier. (he had CT Severity score of 15/25). He was treated with Methylprednisolone, Ramdesivir and supportive treatment. Nasal endoscopy revelled necrosed devascularised tissue in nasal cavity. MRI and CT PNS was suggestive of invasive fungal sinusitis in all paranasal sinuses including the hard palate of both sides and up to the rostrum. The patient underwent Bilateral FESS + Bilateral total maxillectomy as well as partial Penectomy with debridement of all necrosed penile tissue. Histopathologically both the specimen were proved to be Mucormycosis. He further received Inj. Amphotericin B 50mg (conventional) i.e. every day following which he had deranged KFT. Hence Liposomal 150mg was used. He was discharged on Tab. Posaconazle for a month. On Follow-up patient was doing well and had no recurrences, Defect in the palate was repaired with a prosthetic obturator. Palatal, Penile, Intraoperative images and Contrast enhanced MRI PNS of this patient respectively recurrences, Defect in the palate was repaired with a prosthetic obturator.

Figure 1.A Photograph of the above Mentioned Patient with Necrosis of the Palate Started at Midline due to Thromboembolic Phenomenon in the Greater Palatine Artery as a Result of Disease Progression

Figure 2.A Photograph of the Same Patient Presenting with Necrosis and Blackening of the Penile Skin which was Debrided and Found to be Positive for Presence of Mucormycosis. The Patient also has Unobstructed Bilateral Inguinal Hernia which was Subsequently Operated without any Complications

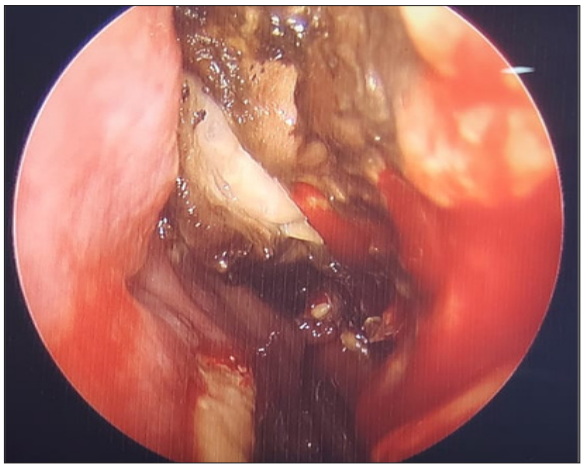

Figure 3.Intraoperative Endoscopic View of this Patient Showing Necrosed Middle Turbinate, Floor of Nose and Uncinate Process. They were Debrided and Sent for KOH Mount and Histopathology where it was Positive for Mucormycosis

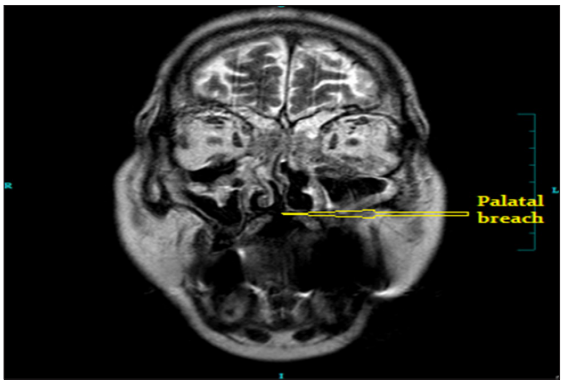

Figure 4.A Radiological Presentation of the Patient (T2 Weighted MRI) Showing Palatal Breach, absent Middle Turbinate and other Intranasal Structures as Compared to the Healthy Side that Correlates with the Clinical Findings of the Patient. There was no Paranasal Sinus Involvement, Intraorbital or Intracranial Spread at this Point of Time

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Case 2

A 34 year old newly diagnosed diabetic male with no previously known comorbidities presented with Left sided facial pain, Left ear pain and Left sided Throat pain. 17 days prior he had suffered from COVID-19 infection following which he received Methylprednisolone, Ramdesivir and supportive treatments. On examination the clinical picture mimicked Left sided Paratonsillar abscess (Quinsy), sticky pus material was aspirated from the abscess as shown in the picture. On KOH mount of the pus, it showed evidence of Mucor. MRI and CT PNS showed features of invasive fungal sinusitis in Left sided Maxilla, Ethmoids and Sphenoid sinuses extending up to the Left Infratemporal Fossa and Left Temporal lobe of the brain. He underwent Left sided FESS and histopathological examination of mucosa from the sinuses showed mucormycosis. He was treated with Inj. Amphotericin B (liposomal) 150mg iv OD x 28 days along with Inj. Vancomycin 1gm iv BD for intracranial extension. He was discharged with Tab. Posaconazole 300mg OD for 1 month. On follow-up he was well, no evidence of recurrence. On follow-up MRI the inflammation of the Temporal lobe was the same extent with no further intracranial extension/ complications.

Figure 5.A Photograph of Paratonsillar Leision Showing Pus Discharge after Drainage. The Pus was Sent for KOH Mount and was Found Positive for Mucormycosis

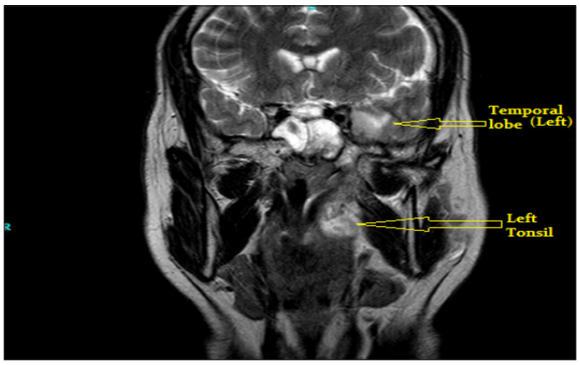

Figure 6.A Radiological Representation (T2 Weighted MRI) of the Same Patient Showing Increased Intensity at Left Paratonsillar Region and Left Temporal Lobe. There was no Palatal or Paranasal Sinus Involvement

Case 3

A 53 year old diabetic male presented with headache and tooth ache. He also had one black patch of skin over the lateral border of Right Thumb. He had a history of COVID-19 infection 22 days prior for which he received Ramdesivir, Methylprednisolone and supportive treatments. The skin was debrided and Histopathologically proved to be Mucormycosis. MRI and CT PNS features were suggestive of Invasive fungal sinusitis. Nasal endoscopy showed devascularised mucosa over middle turbinate and maxillary sinus. FESS was done and unhealthy mucosa removed and proved to be Mucormycosis. He received Inj. Amphotericin B 75mg iv OD for 28 days but during that span of time he developed intractable headache and mobile teeth. Repeat MRI showed extension of disease intracranially and in hard palate. Hence Partial bilateral Maxillectomy was done. Patient was discharged with Tab. Posaconazole 300mg OD for 1 month. On follow-up the patient was well and there was no evidence of recurrence.

Figure 7.A Photograph of the Patient Showing Necrosed Skin over the Right Thumb which was Debrided and Found Positive for Mucormycosis

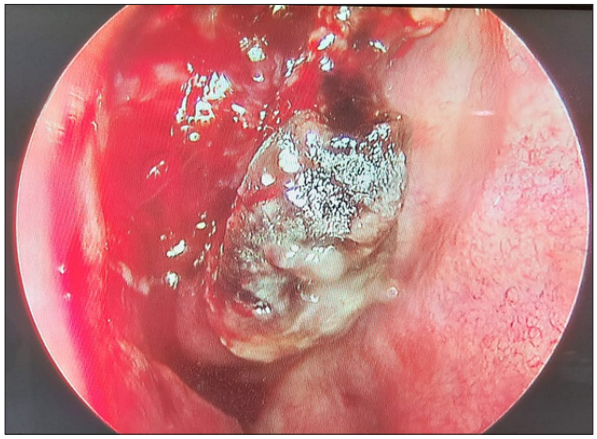

Figure 8.Intraoperative Endoscopic view of this Patient Showing Necrosed Middle Turbinate, Floor of Nose and Septum along with Slough. They were Debrided and Sent for KOH Mount and Histopathology where it was Positive for Mucormycosis

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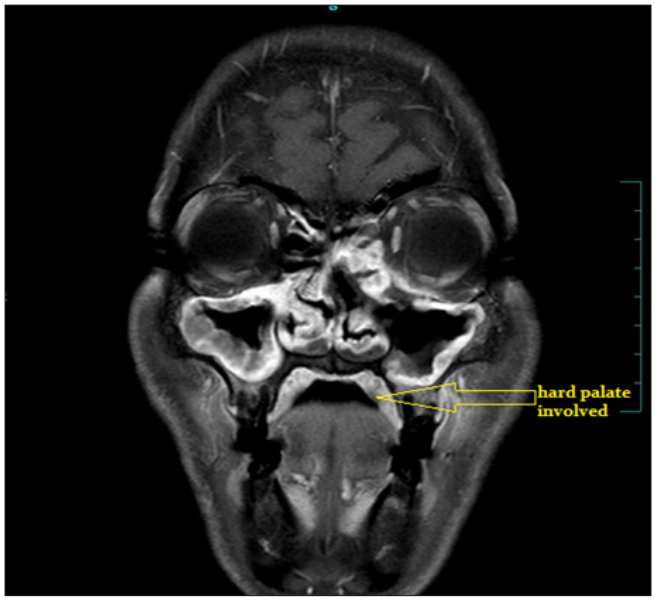

Figure 9.A T2 Weighted Contrast Enhanced MRI of the Same Patient Showing Hyperintense Signals in the Entire Hard Palate, Mucosal Lining of all the Paranasal Sinuses and Left Intraorbital area Suggesting Involvement and Disease Progression in all these Structures

Discussion

The incidence rate of mucormycosis globally varies from 0.005 to 1.7 per million population. The exact incidence of mucormycosis in India is unknown due to the lack of population based studies, but is estimated as 140 per million population, which is about 70-80 times higher than the prevalence in developed countries. (WHO[3])

Mucormycosis has been a rare yet dangerous fungal infection in the precovid era, but in the postcovid era had created a pandemic for a few months causing many deaths, and handicap among the survivors.

COVID-19 is a spectrum of in numerous pathophysiological phenomena. Interplay of various factors like pre-existing co-morbidities, use of immunosuppressive treatments, the systemic immune variations and risk of hospital-acquired infections may give rise to secondary infections. These are increasingly being recognized and acknowledged in view of their impact on morbidity and mortality. Immune dysregulation associated with COVID infection causes decreased numbers of T lymphocytes, CD4+T, and CD8+T cells, that alters innate immunity. In a recent review, 8% of COVID affected patients had secondary bacterial or fungal infections during hospital stay.[4]

Morphologically they are aseptate, broad hyphae (5-50um), that branches at right angles. They are seen histologically with Hematoxillin and Eosin staining, Grocott-Gomori methamine staining, and occasionally Periodic acid Schiff staining.[5] They invade tissues with a particular affinity for Blood vessels, resulting in thrombosis and tissue ischemia.[6] In our Institute preliminary investigation is done by KOH, that is confirmed by Histopathology.

Figure10.A Microscopic Picture of Nasal Crusts on a KOH Mount Showing Sporangium, Sporangiospores, Columnella and Hyphae Suggestive of Mucormycosis

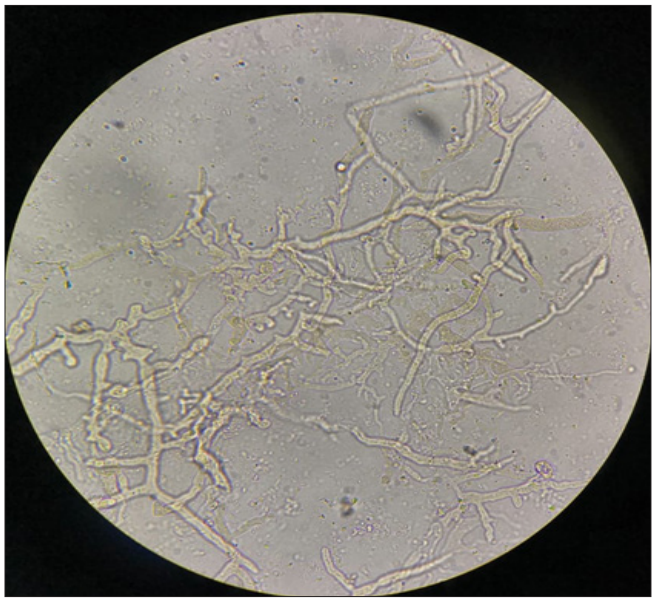

Figure 11.KOH Mount of Nasal Crusts Showing Non Septate Hyphae Branching at Wide Angles under Lower Magnification Suggestive of Mucormycosis

In all the cases, Patients were post covid, diabetic and received Steroids, Ramdesivir and supportive management.

In the 1st case we see a middle aged male presenting with Rhinocerebral and disseminated (Penile) mucormycosis, treated with FESS+Maxillectomy and partial penectomy.

In the 2nd case we see a young male presenting with Paratonsillar and Rhinocerebral mucormycosis, treated

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with unilateral FESS and Paratonsillar Incision & Drainage.

In the 3rd case we see a middle aged male presenting with Rinocerebral and cutaneous mucormycosis, treated with FESS+Maxillectomy and local debridement.

All 3 cases received 28 days of Inj. Amphotericin B according to their respective weights. The treatment was found to be sufficient and on follow-up all 3 patients were doing well.

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Conflict of Interest: None

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