

# POST COVID RHINOORBITAL MUCORMYCOSIS (ROM) - OUR EXPERIENCE IN MANAGEMENT OF DISEASE, ON A SIX MONTH FOLLOWUP OF 60 PATIENTS

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## ABSTRACT:

### AIM:

Observe the treatment outcome of the patients treated for Post COVID ROM in a tertiary care hospital with 6 month follow up.

### MATERIALS AND METHODS

All patients diagnosed for Post COVID ROM were included in this study. All these patients were subjected to surgical debridement and anti-fungal treatment. The patients were followed up for a period of 6 months and outcome was evaluated based on the postoperative morbidity.

### RESULTS

60 patients were included in the study. 44 patients had limited disease. 16 patients had extensive disease. All patients underwent surgical debridement and anti-fungal treatment. Repeat imaging was done 3 months to assess the treatment outcome. A complete 6 month follow up was done.

### CONCLUSION

In the early stage of the pandemic, patients who presented very late with extensive disease and were subjected to radical surgical debridement which included orbital exenteration. Later ROM was identified earlier and early surgical intervention was started. Early suspicion and aggressive surgical debridement not only had good outcome, but also reduced the post-operative morbidity. In early disease presentation significant reduction in morbidity and reduced recurrence was observed in patients who have undergone Caldwell Luc surgery to examine the maxillary sinus cavity along with endoscopic debridement for disease clearance in the maxillary sinus floor and anterolateral wall.

In delayed presentation and in patients needing Maxillectomy, preservation of mucosa of hard palate had significant reduction in postoperative morbidity without increasing the recurrence rate.

**KEYWORDS:** Mucormycosis, invasive fungal sinusitis, rhino orbital mucormycosis, Acute fungal sinusitis, Fungal sinusitis, Management of Mucormycosis, Treatment of Mucormycosis, Acute sinusitis, Orbital apex syndrome, Maxillectomy, Orbital exenteration, COVID 19 related Mucormycosis, Mucormycosis epidemic.

### INTRODUCTION:

Mucormycosis is a life threatening fungal infection of the sinuses. It is a type of invasive fungal sinusitis affecting the immunocompromised individuals. These individuals include diabetic ketosis, patients on immunosuppressants, post transplantation and haematological malignancy [1]. Patients with COVID also were immunocompromised and have higher chances of developing Rhino Orbital Mucormycosis (ROM) [2]. The presenting symptoms were based on the extension of the disease. Early disease presentation was nasal stuffiness, nasal crusting, epistaxis, facial numbness, facial pain and swelling [3,4] Later stages of presentation were orbital and intra cranial extension and patients presented with symptoms like ptosis, chemosis, proptosis, ophthalmoplegia, headache and various neurological signs [5-7]. On examination, nasal endoscopy showed black eschar over the nasal mucosa with extensive destruction. Hard palate erosion was also noted in patients presenting with oronasal and oroantral fistula [8-10]

Here, we bring about our experience in treatment of ROCM, with an emphasis upon early surgical intervention, importance of Caldwell Luc surgery and preservation of palatal flap in improving the morbidity and reducing the recurrence rate.

### MATERIALS AND METHODS

All patients with COVID in our tertiary care hospital or within a week of discharge from hospital with suspicion of ROM were evaluated. Evaluation included Nasal endoscopy with nasal swab for fungal smear, CT and MRI imaging of the Paranasal sinus. Baseline blood investigation was done for all the patients during the time of presentation. Nasal smear was sent for 10% KOH mount which usually confirms the report of invasive fungal sinusitis. In case of negative smear but strong clinical and radiological suspicion of Invasive fungal sinusitis, surgery was proceeded with for histopathological correlation.

With the confirmation of diagnosis, these patients were subjected to controlled aggressive surgical debridement. All patients needed multiple surgical debridement. With limited disease involving the nose and para nasal sinuses, Endoscopic debridement with

Caldwell Luc surgery was done. In case of extensive disease involving the floor of maxilla, palate and orbital involvement, radical surgery like Maxillectomy and orbital exenteration was performed.

A cumulative dosage of 2.5 grams (3-5 mg/kg/day) of liposomal Amphotericin B was administered to all the patients. Patients were discharged with oral Posaconazole at a dosage of 300 mg/day for 3 months. All of these patients were subjected to repeat MRI imaging after 3 months to reassess the disease. All patients were followed up for a period of 6 months.

Limitation of study – 60 patients. Reason: Post covid Rhino orbital mucormycosis (ROM) only is included in the study

### **OBSERVATION AND RESULTS:**

60 Post COVID patients with ROM who underwent treatment in our Center were included in the study. Out of this 37 patients were male and rest 23 patients were female “chart 1”. The youngest age of presentation was 32 and the oldest was 68 and the mean age of presentation was 56. All patients had an RTPCR report of COVID positive. 49 patients were on steroid treatment either in oral or intravenous form during active COVID infection. 11 patients did not receive any form of steroids. 56 out of 60 patients were diabetic, of which 4 were newly diagnosed diabetic patients. Facial pain and swelling was the most common symptom present in all the patients treated by us. 9 patients presented with orbital complications and 13 patients presented with hard palate ulcer. 3 patients had oro-antral fistula.

Loosening of tooth was present in 5 patients. Radiological evaluation showed 7 patients with orbital extension in the form of Lamina papyracea erosion and orbital muscle involvement. 44 patients had disease limited to the nose and paranasal sinus and 16 patients had extension beyond the paranasal sinuses. “Chart 2”, “Table 1”

All patients underwent nasal endoscopic examination with nasal swab for 10% KOH smear and imaging which included CT and MRI. Nasal swab for fungal smear showed broad aseptate fungus for 56 patients and negative for 4 patients. In the negative 4 patients because of high clinical and radiological suspicion for Mucormycosis surgery was proceeded. “Fig 1” Histopathological examination and Fungal culture was positive for all 60 patients with the causative organism being Rhizopus species.

44 patients who had disease limited to the nose and paranasal sinus underwent primary endoscopic debridement and Caldwell Luc surgery via sublabial approach “Fig 2”. Of the 44 patients, 3 patients had further spread of disease and underwent Inferior partial maxillectomy.

16 patients with extensive disease and palatal involvement underwent radical surgeries. 12 patients underwent inferior partial maxillectomy, 4 patients underwent total maxillectomy. Two patients had orbital exenteration and 6 patients underwent orbital decompression “Fig 3”. Multiple debridement was needed for all patients with an average of 2 procedures per patient. Of the 16 patients who undergone maxillectomy, palatal flap was preserved for 5 patients.

Post-operative intravenous Amphotericin B was administered for a cumulative dose of 2.5 grams. Renal parameters and electrolytes were monitored periodically. At the time of discharge all patients were started on Oral Posaconazole at a dosage of 300 mg/day for a period of 3 months. Repeat imaging was done after 3 months to reassess the treatment outcome.

All the patients were followed up for a period of 6 months.

### **DISCUSSION:**

ROM is an aggressive disease with the pathology being angioinvasion causing infarction and necrosis. [5] Immunocompromised individuals are commonly affected. [11,12] The commonest predisposing factor being uncontrolled diabetes mellitus. [13-15] 93% of our patients who were diagnosed with ROM were diabetic.

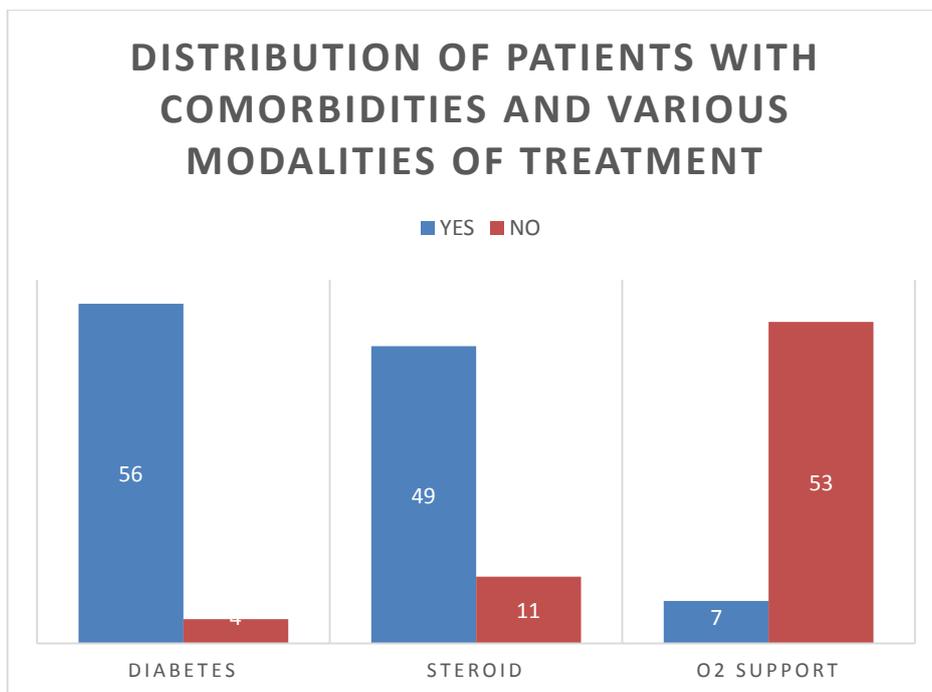
With minimal disease, Caldwell Luc surgery in addition to endoscopic debridement was done for 44 patients. 2% of the patients ended up with Inferior partial maxillectomy due to further spread of osteomyelitis. 98% of patients did not need any radical procedure and thus had a significant reduction in reducing the morbidity. After a complete 6 months follow up, none of the patients had any signs of recurrence of disease.

With extensive disease, where maxillectomy was indicated, preservation of palatal flap had significantly reduced the morbidity in terms of speech and swallowing post-surgery.

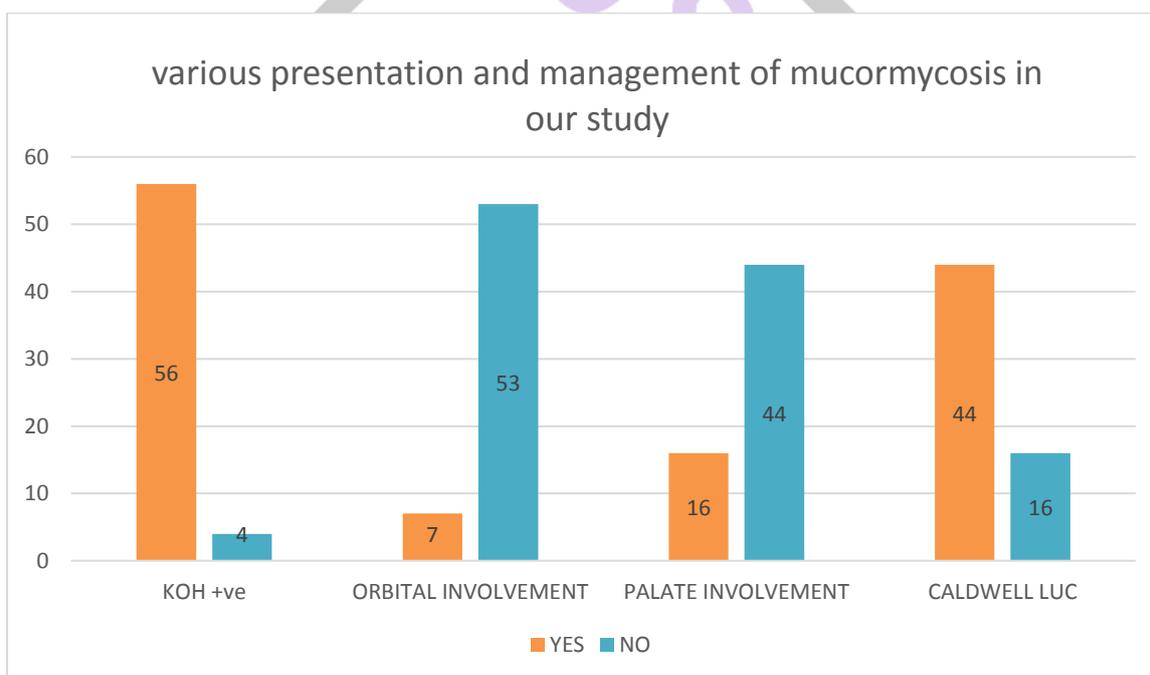
16 patients had undergone Maxillectomy involving excision of floor of the maxilla. Among them, 5 patients had palatal flap preserved “Fig 4”. At the end of 6 months, no recurrence of disease and significant reduction in morbidity was noted in patients with palatal flap preservation. Even in case of existing fistula, where palatal flap was preserved, overall outcome improved in terms of postoperative morbidity.

### **CONCLUSION:**

In the series of cases studied, the following observations were made. In majority of the patients the maxillary sinus was observed to be the primary focus. Hence early Caldwell luc clearance of maxillary sinus along with endoscopic debridement had reduced the spread of disease. Palatal flap preservation during maxillectomy had reduced morbidities in terms of speech and swallowing without affecting the recurrence rate. 300 mg/day of oral Posaconazole for a period of 3 months in op basis is given to all patients which showed reduced recurrence rate.



**Chart 1:** showing the distribution of patients with comorbidities and various other modalities of treatment



**Chart 2:** showing various presentation and management of mucormycosis in our study

**Table 1:** showing various presentation of rhino orbital mucormycosis and its management in our study

VARIOUS PRESENTATION AND MANAGEMENT IN PERCENTAGE		YES	NO	%
1.	ORBITAL INVOLVEMENT	7	53	11.6
2.	PALATE INVOLVEMENT	16	44	26.6
3.	CALDWELL LUC	44	16	73.3
4.	MAXILLECTOMY	16	44	26.6
5.	PALATAL FLAP PRESERVATION	5	11	31.2



**Figure 1:** Patient presenting with left rhino orbital mucormycosis.



**Figure 2:** Immediate post-operative Endoscopic sinus surgery combined with Caldwell Luc clearance of left maxillary sinus under Liposomal Amphotercin B coverage in the above patient



**Figure 3:** Patient with orbital apex syndrome with loss of vision, post orbital exenteration



**Figure 4:** showing post right inferior partial maxillectomy with palatal flap preservation (6 months post op)

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