

Post Maxillectomy Defect Reconstruction in Post Covid Mucormycosis Patient

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Abstract: *In our series of five patients with COVID - associated mucormycosis and diabetes as a risk factor, who underwent contrast - enhanced CT face with 3D reconstruction of the bony skeleton to confirm the diagnosis, they were then posted for reconstruction depending on the extent of the defect left behind. Our goal is to advocate for a single - stage reconstruction in cases of post - maxillectomy hemipalatal defect (oro - nasal defect) operated for COVID - associated rhino - maxillary mucormycosis in order to achieve a positive overall outcome in terms of quality of life, speech, deglutition, and prosthetic rehabilitation. With multiple reconstructive options available, we chose to reconstruct the complex defect in our series using a radial artery forearm free flap because it is simple, easy, reliable, thin, pliable and causes less oral cavity obstruction while taking the less amount of time as the standard options.*

Keywords: COVID - associated mucormycosis, diabetes, CT face 3D reconstruction, post maxillectomy reconstruction, radial artery forearm free flap.

1. Introduction

Mucormycosis, also known as zygomycosis, being an old disease, has gained notice in the pandemic. It is an angio - invasive fungal disease spread primarily through spores in a hyperglycemic environment, causing luminal thrombosis, mucosal infarction and necrosis, and bony erosions that rapidly progress into the sino - nasal cavity, orbit, and eventually enter the cranial cavity². It was observed that the patients with diabetes had a higher risk of developing mucormycosis infection in the convalescent phase of COVID disease when compared to non - diabetics. It has a high mortality rate, and management usually prompts surgical intervention, in which the involved sites are thoroughly debrided and no residual disease is left behind. Large volume and area anatomical defects frequently result from these surgical excisions, necessitating difficult reconstructions³.

In this series of five cases, we present patients with a post - maxillectomy hemipalatal defect treated with a single - stage reconstruction for COVID - associated rhinomaxillary mucormycosis and type 2 diabetes.

2. Methods

In our series, five patients diagnosed with mucormycosis who had earlier undergone type 2 maxillectomy (according to Browns classification) were chosen for the study. Their medical charts obtained data on: age, sex, medical co - morbidities, presenting complaints, initial medical treatment, afflicted areas, surgical procedure for reconstruction, and follow - up. The patients were then sent for a CT scan to

confirm the extent of the defect left behind and were subsequently posted for reconstruction.

Institutional ethical committee approval was obtained.

Operative Technique:

The size and orientation of a flap for reconstruction were evaluated and marked preoperatively by assessing the defect on clinical examination and CT scan. The flap marking was confirmed during surgery. Flap was circumferentially marked 2cm larger than the size of the defect and harvested subfascially.

To prevent dehiscence of the suture line at the palatal margin and subsequent formation of oro - nasal fistulas, a turnover flap was created from marginal mucoperiosteum on the healthy side of the palate.

The fascial side of the flap was anchored to the inferior turbinate with vicryl sutures to prevent postoperative hanging and obstruction in the oral cavity by the flap.

Palatal mucosa was reconstructed with the cutaneous side of the flap, and the fascial side of the flap was insetted in the maxillary defect.

The recipient artery was the ipsilateral fascial artery, where end - to - end anastomosis was done in all cases. Recipient veins for the flap were the external jugular vein, the common fascial vein, the retromandibular vein, where end - to - end anastomosis was done, and the internal jugular vein, where end - to - side anastomosis was performed. One artery and two veins were anastomosed in all cases.

Patients were put on Ryle's tube feeding for 3 weeks postoperatively, and clear liquids were allowed during this period orally to maintain deglutition.

3. Observations

S. NO	Palatal Defect	Size of the Defect	External Skin Coverage	Anatomical Outcome	Functional Outcome	Follow Up
1	Right Hemi Palate	5*4 CM ²	Present	flap fully viable	Hypernasality Decreased & Nasal Regurgitation Rectified	4 Months
2	Left Hemi Palate	5*3.5 CM ²	Present	flap fully viable	Hypernasality Decreased & Nasal Regurgitation Rectified	4 Months
3	Right Hemi Palate	4*4 CM ²	Present	flap fully viable	Hypernasality Decreased & Nasal Regurgitation Rectified	5 Months
4	Left Hemi Palate	5*4 CM ²	Present	flap fully viable	Hypernasality Decreased & Nasal Regurgitation Rectified	5 Months
5	Left Hemi Palate	6*4 CM ²	Present	3 * 1 cm ² sized flap necrosis noted at the tip (palatal margin) for which turnover flap was done.	Hypernasality Decreased & Nasal Regurgitation Rectified	6 Months

4. Discussion

In our series of cases, the patients mainly presented with nasal regurgitation for liquids, hypernasality of speech, and palatal defects themselves. These patients had previously been diagnosed with COVID - associated mucormycosis and underwent a Browns classification system - based type 2 maxillectomy^{4,5}. Because of the severity of the epidemic, no reconstruction was planned at the time to decrease the overall exposure of the health care workers; only debridement was done during the epidemic.

The patients are currently presenting to our plastic surgery OPD for the correction of the symptoms due to the post - maxillectomy procedure.

Reconstruction was planned based on history, clinical evaluation, and radiological investigations. In all of our cases, a radial artery forearm free flap was performed, though The standard methods in post - maxillectomy hemi - palatal defect reconstruction include the antero - lateral thigh flap reconstruction, the free fibula flap reconstruction, and the radial forearm free flap reconstruction⁶.

The antero - lateral thigh flap reconstruction provide more volume that causes obstruction of the oral cavity; it is also said to be a perforator - based flap that requiresurgical expertise and more anaesthetic time⁷.

The free fibula flap reconstruction poses a risk of leg morbidity as well as multiple osteotomies and bone inseting with surgical expertise⁸.

Where the radial forearm free flap is a thin, pliable, easy to harvest, less time - consuming procedure with less oral cavity obstruction. At our institute, the patients mainly presented for anatomical and physiological corrections, not aesthetic corrections. Although this method does not restore volume to the maxillectomy defect, it does address a functional rather than an aesthetic deficit. But if the patient is still willing, bone grafting can be planned post - reconstruction⁹.

5. Conclusion

Five cases of post - covid mucormycosis were presented in our series, in which reconstruction was done. In all the cases, radial artery forearm free flap reconstruction were performed with complete flap survival and a mean follow - up of three months. All the donor sites healed uneventfully and were asymptomatic postoperatively and on regular follow - up. We used autologous flaps to perform a single - stage reconstruction in our patients, and the results were positive in terms of quality of life, speech, deglutition, and aesthetics¹⁰.

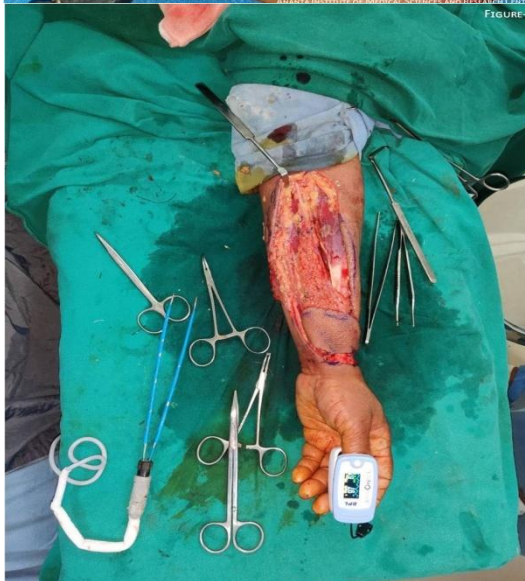
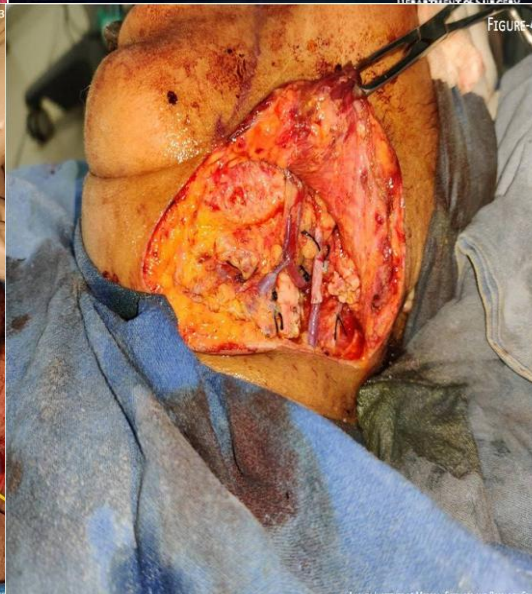
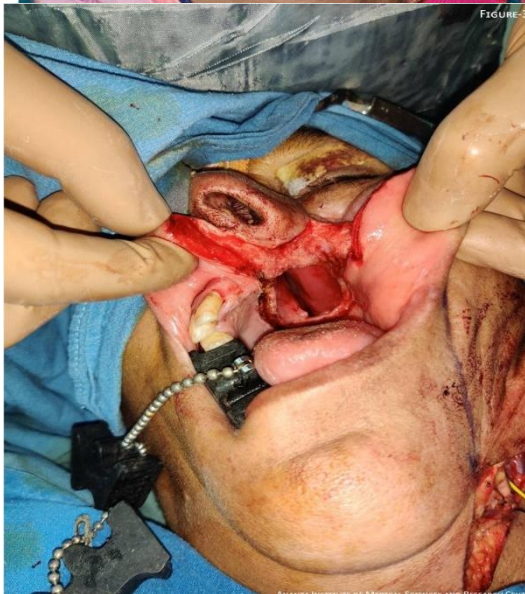
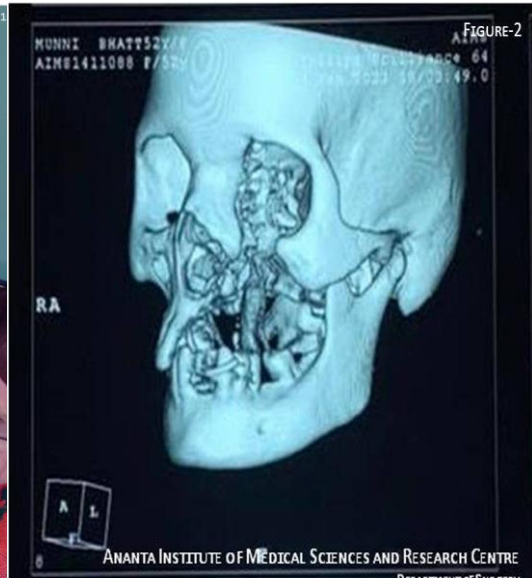




FIGURE-7

FIGURE-8

FIGURE-9

Figure Descriptions:

Figure 1 showing Pre operative picture of the patient showing the palatal defect;
 Figure 2 showing Radiological 3D reconstructive image showing the palatal defect;
 Figure 3 showing Intra operative image before flap insertion;
 Figure 4 showing microvascular anastomosis in the neck vessels;
 Figure 5 showing RAFFF harvested according to the defect size;
 Figure 6 showing RAFFF detached;
 Figure 7 showing RAFFF insetted;
 Figure 8 showing Donor site after wound closure;
 Figure 9 showing Post operative photo of the patient on day 15;

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