



Palatal Flap: An Optimistic Salvagable Option to Negate the Maxillectomy Defects in COVID Related Rhino-Orbito-Cerebral Mucormycosis

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Abstract We present three cases diagnosed with COVID-19 associated Rhino-orbito-cerebral mucormycosis, managed by aggressive debridement and resection of the involved maxilla, followed by primary closure with preserved palatal flap, thus trying to establish its versatility for the closure of the maxillectomy defects.

Keywords Mucormycosis · Palatal flap · Maxillectomy · Reconstruction

Dear Sir,

It is a known fact that the tentacles of the pandemic corona virus have engulfed the humanity in all spheres of life. The Post-COVID period has become eventful by the unfortunate involvement of the various organ systems and its sequelae. The most debilitating one is the mucormycosis with its rhino orbital involvement [1]. Aggressive debridement or resection leave the scar of maxillectomy with its open sino-maxillary compartment making the individual embarrassed. In search of an ideal option for primary closure before definite reconstruction, we landed at the usage of palatal flap based on greater palatine and descending palatine arteries.

Arterial thrombosis, occlusion and vascular extension of the disease in mucormycosis may affect the versatile use of flaps for reconstruction [2]. Definite guide or protocol for reconstruction of maxillary defects in the management of mucormycosis does not exist in literature. However, reconstructive techniques commonly used for oncologic

resection of maxilla can be applied to the defects after maxillectomy for mucormycosis [3]. Although some prefer delayed reconstruction after resection of the involved maxilla [3], closure of the defect remains cumbersome as it is challenging in terms of restoring the form and function. Based on the algorithm for reconstruction of maxillectomy defects by Davison et al. the options extend from prosthesis, skin graft and local flaps to free vascularised flaps [4]. Reconstruction options include local flaps such as nasolabial flap, forehead flap, tongue flap, distant flaps such as temporalis and pectoralis flap and free flaps such as radial forearm, fibula and latissimus dorsi flaps [4].

Preservation of the palatal soft tissue after debridement and debulking if hypertrophied, can act as a vital option in the primary closure of maxillectomy defects, provided the vascular supply is not violated and infrastructure maxillectomy is carried out. Careful dissection and preservation of the greater palatine vessels and descending palatine vessels are pivotal in maintaining the viability of the palatal flap [5].

The advantages of preserving the palatal flap are,

1. Simple technique.
2. Aids in primary closure of the maxillectomy defect.
3. Abundant blood supply [6].
4. Need for a second incision to harvest a graft or flap for closure is eliminated, thus eliminating donor site morbidity.
5. Obturator may not be required.
6. Adequate closure of the oral cavity from the nasal cavity is obtained.
7. Liquid or soft oral diet can be re-started immediately.

The disadvantages include,

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1. Can be used dependably only for inferior maxillectomy defects.
2. Can be used only if palatal soft tissue is unaffected by the disease.
3. Palatal sagging due to gravity may be present.
4. Principle of replacing like with like, is not maintained.
5. Flap dehiscence, if oral hygiene is not maintained properly.
6. Can be used only for primary closure and not as a definite reconstruction option.

Here, we discuss three cases which portray the versatile use of the flap in Table 1 and Figs. 1, 2, 3 and 4. All the patients who underwent closure with the palatal flap were reviewed every day post-operatively until discharge, and at the end of the first month. The antibiotic-soaked gauze packs were removed on the fifth post operative day, and the opening closed with 3-0 resorbable sutures under local anesthesia. Two patients had satisfactory healing whereas one patient had flap dehiscence on the fifth post operative day, which required re-suturing with 3-0 resorbable sutures under local anesthesia. Subsequent follow up at the end of the first month showed a good take-up of the flap and no further complications in any of the three patients. No oro-nasal regurgitation was present in any of the patients after the primary closure of the defect with the palatal flap, thus serving its functionality.

Conclusion

The preservation of soft tissue palatal flaps with careful handling of the vessels, thus maintaining viability, provides an excellent option at disposal for primary closure of the



Fig. 1 Palatal incision for preservation of palatal soft tissue

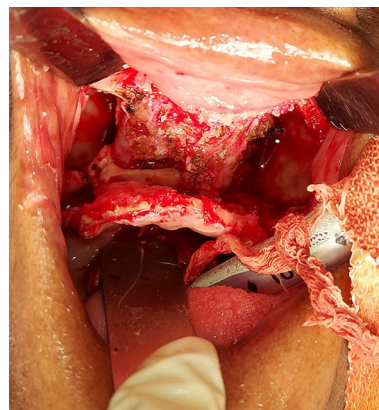


Fig. 2 Inferior sub-total maxillectomy with preservation of posterior most hard palate, debridement and curettage of bilateral maxillary sinuses and debulking of hypertrophic palatal flap

oro-nasal defects after unilateral or bilateral inferior maxillectomy, in the surgical management of COVID associated mucormycosis thus reducing the need for second incision and operative time drastically.

Table 1 Summary of the three cases of ROCM treated surgically, followed by primary closure of the defect with the palatal flap

Case	Age	Sex	Complaints	Evaluation	Diagnosis	Management
1	30	F	Mobile teeth, swelling over the right cheek	Magnetic resonance imaging (MRI)–Paranasal sinus (PNS) view, Biopsy, and direct nasal endoscopy (DNE)	Stage 2 ROCM [7]	Right inferior partial maxillectomy + extraction of mobile teeth + aggressive debridement of maxillary sinus followed by 1% soframycin cream + 2% metronidazole gel—soaked gauze pack + primary closure with palatal flap under General Anaesthesia (GA)
2	42	M	Mobile teeth, discharging fluid from buccal vestibule	Contrast enhanced computed tomography (CECT)-PNS, Biopsy, DNE	Stage 2 ROCM	Bilateral inferior maxillectomy + aggressive debridement and curettage of maxillary sinus followed by packing with 1% soframycin cream + 2% metronidazole gel—soaked gauze + primary closure with palatal flap under GA
3	53	F	Running nose, swelling over the right nasolabial region	MRI-PNS, Biopsy, DNE	Stage 2 ROCM	Bilateral inferior sub-total maxillectomy + aggressive debridement of maxillary sinus followed by packing with 1% soframycin cream + 2% metronidazole gel—soaked gauze pack + primary closure with palatal flap after debulking (Figs. 1, 2, 3 and 4) + endoscopic debridement of the ethmoid sinus under GA

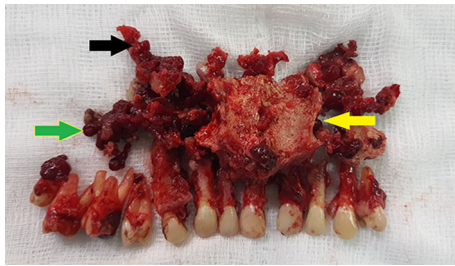


Fig. 3 Resected specimen showing palatal bone (yellow arrow), alveolar process (green arrow) and the anterior wall of maxilla (black arrow)

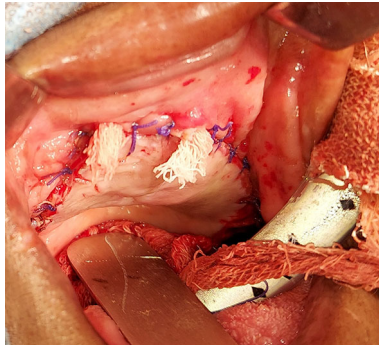


Fig. 4 Primary closure of maxillectomy defect with palatal flap after placing amphotericin-soaked gauze packs in the bilateral maxillary sinuses

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Declarations

Conflict of interest The authors declare no conflict of interest.

Ethical Approval This is a case report study. The Institutional Review Board has confirmed that no ethical approval is required.

Informed Consent Written, informed consent has been obtained from the patients for their participation and publishing.

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