

Rehabilitation of maxillectomy patient using a hollow bulb obturator – A case report

¹Dr. Harshitha Alva, Reader, AECS Maruthi College of Dental Science and Research Centre, Bangalore.

²Dr. Karishma K K, Post-Graduation Student, AECS Maruthi College of Dental Science and Research Centre, Bangalore.

³Dr. Subash M, Professor, AECS Maruthi College of Dental Science and Research Centre, Bangalore.

Corresponding Author: Dr. Karishma K K, Post-Graduation Student, AECS Maruthi College of Dental Science And Research Centre, Bangalore.

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Abstract

Intraoral defect caused due to maxillectomy lead to communication to the nasopharyngeal complex. These defects have a devastating effect on the function and aesthetics of the patients. The fundamental goal of prosthodontic therapy is to provide a comfortable, cosmetically acceptable prosthesis that restores the impaired physiologic activities of speech, deglutition, and mastication. The goal must not only be to replace missing teeth, soft tissue, alveolar ridge and hard palate but also be to preserve remaining structures. The clinician will face numerous challenges in restoring these structures. This paper describes the prosthetic rehabilitation of maxillary necrosis caused by mucormycosis using a hollow bulb obturator.

Keywords: Mucormycosis, Obturator, Maxillary defect, Hollow bulb, Post Covid Mucormycosis.

Introduction

Mucormycosis is an opportunistic fungal infection that primarily affects immunocompromised patients. It starts

from the nose and paranasal sinuses after fungal spores are inhaled. By direct invention or through blood vessels, the infection can travel to orbital and intracranial structures. This fungus then infiltrates the arteries, causing thrombosis and necrosis of the hard and soft palate².

When the maxilla is involved, surgical resection and debridement of the necrosed area can result in a large maxillary defect. This defect can take the form of a small opening allowing communication from the oral cavity to the maxillary sinus, or it can include portions of the hard and soft palate, alveolar ridge, and the nasal cavity floor.²

As the tongue is unable to make any contact with a solid surface during the function, removal of the hard palate may result hyper nasal or unintelligible speech in addition to masticatory problems.²

Rehabilitation of these defects is difficult since it impacts not only the patient's function and aesthetics, but also their comfort and confidence.⁴ Furthermore, the soft

tissues are scarred and tight during surgery, exerting considerable dislodging forces². The prosthesis that replaces all of the missing structures will inevitably be large, and the increased weight and volume will make it more difficult to keep the prosthesis in place.³

To attain this goal, it is critical to choose the right prosthesis. Preservation of residual natural tissue, as well as retention, stability, support, and aesthetics, are the primary principles of every prosthetic design. Depending on the supporting components, prosthodontic rehabilitation might be fixed or removable. Removable prosthesis is advised if the hard tissue support is insufficient to withstand stresses for a fixed replacement.⁴ For patients with maxillary defects, an obturator prosthesis is used to restore masticatory function, improve speech deglutition, and improve cosmetics. A hollow bulb construction minimises the weight of the prosthesis, making it more pleasant and efficient.⁵

This article discusses technique of fabrication of a hollow bulb obturator fabrication technique for a maxillary deformity induced by post-Covid-19 mucormycosis on partially edentulous patient.

Case report

A 70-year-old male patient reported to the Bowring and Lady Curzon Hospital with a chief complaint of pain in right cheek and headache with redness in right eye in the past 3 days. Patient's history reveals post covid mucormycosis. Patient was diagnosed with covid 19 infection and a week later with mucormycosis. Surgical procedures like left hemi-maxillectomy, bilateral sphenoidectomy and orbital compressions were performed. Follow up was done to examine the surgical site every month and after complete healing patient was advised rehabilitation. [Figure 1,2,3]



Fig 1: Facial profile

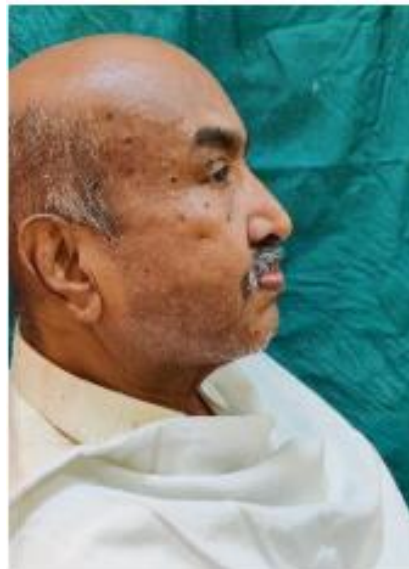


Fig 2: Side profile



Fig 3:

Fabrication of the obturator

In order to make the preliminary impression of the patient's maxillary arch, the openings were first closed

with a gauze that was tied for retrieval. A. The preliminary impression of maxillary and mandibular arch was made with irreversible hydrocolloid (Zhermack Tropic algin Alginate) using a stock try [FIGURE 4]. The impressions were then poured in type II gypsum product and preliminary casts were obtained [FIGURE 5]. Over the maxillary cast, a custom tray was fabricated with auto-polymerizing resin material. (DPI RR Cold Cure; Dental Products of India, Mumbai, India)



Fig 4: Primary impression



Fig 5: Primary cast

Peripheral moulding was done with green stick compound (DPI Pinnacle, Tracing Sticks Dental Products of India, Ltd) and a final impression was made with light body polyvinyl siloxane elastomer. A pick-up impression was then made with alginate to record the existing dentate segment [Figure 6]. A master cast was obtained in type III gypsum product. An auto-polymerizing resin temporary record base (DPI RR Cold Cure; Dental Products of India, Mumbai, India) and occlusal rim from modelling wax was fabricated on it [Figure 7] and bite was recorded. [Figure 8]



Fig 6: Secondary pick-up impression



Fig 7: Secondary cast with occlusal rim

Maxillary and mandibular casts were mounted on the semi-adjustable articulator. Teeth arrangement and try-in were done [figure 9]. Occlusion, aesthetics, and phonetics were evaluated and found to be acceptable. After try in, it was sealed to the master cast, flasking [figure 10] and dewaxing was completed. The defect space was with a layer of heat- polymerizing acrylic material (DPI, packed Mumbai, India). During packing of material, a pouch of salt was used to hollow the bulb by lost salt technique [figure 11]. After the pouch of salt is placed in defect region, it was further completely

packed with heat polymerizing acrylic material. [figure 12]



Fig 8: Jaw relation

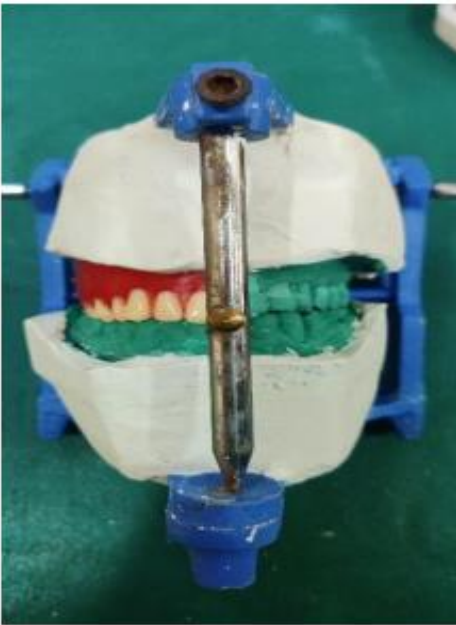


Fig 9: Teeth arrangement.



Fig 10: Flasking



Fig 11: Lost salt technique



Fig 12: Packing

Curing procedures were performed according to the manufacturer's instructions. The cured bulb was then retrieved after de-flasking and the salt was removed by drilling 2 mm holes in the bulb portion. And the holes created were then closed by cold cure acrylic resin. Finishing and polishing was done [figure13], and prosthesis was delivered to patient. [figure 198]



Fig 13: Hollow bulb obturator



Fig 14: Denture insertion



Fig 15: Post insertion profile

Discussion

Our goal in the above-mentioned case was to use an obturator prosthesis to close the Oro-nasal communication and achieve an adequate chewing, swallowing and speaking functions with acceptable cosmetic appearance. Prosthodontic care for the patient with an acquired maxillary deficiency should comprise cautious prosthesis design combined with routine maintenance care. Soft or hard tissue structures provide support for prosthetic rehabilitation.⁴ Retaining the remaining natural teeth not only minimises alveolar bone resorption, but also provides the prosthesis with retention, stability, and support. To lower the weight of

the prosthesis, the bulb or the component of the prosthesis protruding into the defect, is usually made hollow. Because of the reduced weight, a hollow bulb obturator improves retention and stability in individuals with severe maxillary abnormalities¹. To make a hollow bulb obturator, different elements like sugar, salt, and ice can be mixed into the resin during the packing stage. Conclusion The patient's quality of life and confidence will increase as a result of prosthetic rehabilitation.⁴ Acceptable prosthodontic care for the patient with maxillary defect should include to provide comfort, function, cosmetics and minimal change to the compromised remaining structures³. The obturators are hollowed to reduce weight and enhance resonance¹. The advantage of these prosthesis was that the techniques used were non-invasive, cost-effective, tissue-tolerant and simple to build and clean.²

Reference

1. Kalluri Lakshmi Mounika, M Manoj Kumar, M. Suresh Babu, K. Krishna Kishore, M Sanjana Reddy, Gayathri Bandari. Prosthetic Rehabilitation of A Post-Covid Mucormycosis Maxillectomy Defect Using A Fused TwoPiece Hollow Obturator: A Fabrication Technique. EJMCM Volume 07, Issue 11, 2020
2. Rupal J Shah, Manish Khan Katya yan, Preeti Agarwal Katya yan, Vishal Chauhan. Prosthetic Rehabilitation of Acquired Maxillary Defects Secondary to Mucormycosis: Clinical Cases. JCDP 10.5005/jp-journals-10024-1522
3. Leitner C, Hoffmann J, Zebrowski M, Reinert S. Mucormycosis: necrotizing soft tissue lesion of the face. J Oral Maxillofac Surg 2003;61(11):1354-1358.4-1358.
4. Satya Prakash M, Ashok V, Thiyaneswaran Nesappan, Dhanraj M. Ganapathy. Prosthodontic Rehabilitation of Maxillary Defect in a Patient with

Mucormycosis. J Evolution Med Dent Sci. 10.14260/jemds/2020/692

5. CH Vamsi Krishna Jaya Krishna Babu Tanveer Fathima GVK Reddy Fabrication of a hollow bulb prosthesis for the rehabilitation of an acquired total maxillectomy defect BMJ doi 10.1136 bcr 2013 201400

6. Singh AK, Singh R, Joshi SR, Misra A, Mucormycosis in COVID-19: A systematic review of cases reported worldwide and in India, Diabetes & Metabolic Syndrome: Clinical Research & Reviews (2021) doi: j.dsx.2021.05. 019,

7. Treavor T. Riley, Christina A. Muzny, Edwin Swiatlo, Davey P. Legendre. Breaking the Mold: A Review of Mucormycosis and Current Pharmacological Treatment Options. Annals of Pharma cotherapy. DOI: 10. 1177 / 106 002 801 665 5425

8. Pogrel MA, Miller CE. A case of maxillary necrosis. J Oral Maxillofac Surg. 2003; 61:489–93.

9. Rajeev Soman, Ayesha Sunavala Post COVID-19 Mucormycosis - from the Frying Pan into the Fire January – 2021 Volume: 69

10. Aram any MA. Basic principles of obturator design for partially edentulous patients. Part I: classification. J Prosthet Dent 2001; 86:559–61

11. Elan Govan S, Loibi E. Two-piece hollow bulb obturator. Indian J Dent Res 2011; 22:486-8

12. Beumer J, Curtis TA, Marunick MT. Maxillofacial rehabilitation: prosthodontic and surgical considerations. St Louis: Ishiyaku Euro America;1996. p. 225-229.

13. Wang RR. Sectional prosthesis for total maxillectomy patient. A clinical report. J Prosthet Dent 1997;78(3):241-244.

14. Chalian, VA, Drane JB, Standish SM. The evolution and scope of maxillofacial prosthetics. In: Chalian VA, Drane JB, Standers SM editors.

Maxillofacial Prosthetics: Multidisciplinary Practice. Williams and Wilkins Company; Baltimore: USA, 1972

15. Keyf F. Obturator prosthesis for hemi maxillectomy patients. J Oral Rehab 2001;28 (9): 821-829