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Hollow Interim Obturator For A Completely Edentulous Maxillectomy Patient Secondary To Post Covid - 19 Mucormycosis: A Case Report

Case Report

Kirupa Shankar Raj VasanthSekar[1], Kasim Mohamed K[2*]

[1] Post Graduate Student, Department of Prosthodontics and Crown and Bridge, Room No 8, Faculty of Dental Sciences, Sri Ramachandra Institute of Higher Education and Research(DU), Porur,Chennai 600116,Tamil Nadu, India.
[2] Professor and Head, Department of Prosthodontics and Crown and Bridge, Room No 8, Faculty of Dental Sciences, Sri Ramachandra Institute of Higher Education and Research (DU), Porur, Chennai 600116, Tamil Nadu, India.

Introduction

Maxillofacial prosthetics is a branch of dentistry that deals with congenital and acquired defects of the head and neck. Maxillofacial prosthetics integrates parts of multiple disciplines including head and neck oncology, congenital malformation, plastic surgery, speech, and other related disciplines. Maxillofacial defects results due to resection of maxilla and its associated structures secondary to cancer, malformation or infection [1]. Behind candidiasis and aspergillosis, mucormycosis accounts for the third most common angioinvasive fungal infection that leads to resection of the maxilla and the surrounding vital structures. It is also known as phycomycosis orzygomycosis which was first described by Paultauf in 1885 [2]. The disease frequently affects the immunocompromised individuals in which deeper tissues are ensued due to rapid proliferation and invasion of fungal organisms [2, 3]. Often referred to as the so-called black fungus, the incidence of mucormycosis has risen more rapidly in COVID-19 recovered immunocompromised patients. India reports with at least 14,872 mucormycosis cases as of May 28, 2021 [4]. Mucorales, fungi causing the disease are frequently found to colonize the oral mucosa, the nasal mucosa, the paranasal sinuses and the pharyngeal mucosa of asymptomatic patients.

The disease often requires surgical debridement of the involved maxillofacial structures leading to maxillofacial defects. When this involves the palate, patients suffer oronasal communication thereby leading to difficulty in mastication, speech and aesthetic complications [5]. A solution for these defects following maxillectomy is rehabilitation with an obturator prosthesis. This allows restoration of esthetics and function, such as mastication, deglutition, and speech, by creating an anatomic barrier [6]. Obturators can either be an open or a closed hollow obturators and these prostheses vary in size and shape depending on the extent of the defect. The prosthesis should aim to provide retention, stability, and patient comfort. By fabricating a hollow maxillary obturator, the weight of the prosthesis may be reduced by up to 33% thereby enhancing the patient compliance [6, 7].

The major challenge encountered by the Maxillofacial prosthodontist during the fabrication of an obturator lies in attaining adequate retention from the remaining teeth, hard palate, alveolar ridge, soft palate and through utilization of the undercuts post surgery. For a completely edentulous patient, the challenge becomes even trickier after undergoing total/sub-total maxillectomy. This is because; the patient does not have remaining natural teeth which diminish the scope of incorporating clasps for retention. In these types of cases, method of obtaining adequate retention lies in modification of the technique and in the hands of the Maxillofacial Prosthodontist to make use of the existing undercuts post resection.

This case report describes a method of fabricating an interim obturator for a completely edentulous maxillectomy patient secondary to COVID-19 mucormycosis. This report focuses on how the fabrication technique can be modified to obtain adequate retention in the absence of remaining natural teeth.

Case Report

A 50 year old female patient presented with a history of pain and swelling of her upper left maxillary region past 2 months. Patient also complained of foul smell, purulent discharge and black discolouration of her left posterior region of the palate, which worsened over time. Medical history of the patient revealed that the patient had history of COVID-19 infection and was admitted for

***Corresponding Author**:
Dr. Kasim Mohamed K,
Professor and Head, Department of Prosthodontics and Crown and Bridge, Room No 8, Faculty of Dental Sciences, Sri Ramachandra Institute of Higher Education and Research (DU), Porur, Chennai 600116, Tamil Nadu, India.
E-mail: mohamedkasim9@yahoo.com

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a couple of weeks for the same before 6 months. Patient's latest RT-PCR (Real Time – Polymerase Chain Reaction) turned negative for COVID-19 virus. Extraoral examination revealed swelling and asymmetry on the left side. Intraorally, the patient was found to have completely edentulous maxillary arch and a missing 47. Bony specules were observed with dark discolouration and purulent discharge of the left maxilla (Fig 1). Pre-operative diagnosis of mucormycosis was made and the patient was posted for endoscopic Sub-total maxillectomy on left side under general anesthesia. Left zygomatic body including the infra-orbital rim floor, palate, and left side alveoli were excised. The excision spared only the right maxillary posterior region. Post operative diagnosis of the excisional biopsy revealed sinonasal mucormycosis and osteomyelitis of the left maxillary region (fig 2).

Immediate surgical obturator was planned and inserted. Intraoperative and immediate postoperative periods were uneventful. 1 week postoperatively immediate surgical obturator was modified with soft liner(GC dental products Corp. Tokyo, Japan). This assisted the patient to feed on oral fluids andenhanced healing of the wound.A hollow maxillary interim obturator replacing the entire maxillary dentition along with the defect was planned for the completely edentulous maxillary jaw after 3 weeks of surgery. Since, there were no remaining natural teeth in the maxillary arch and the presence of undercuts was not adequate to aid in retention; the process of fabrication was very tricky to attain satisfactory retention.

A perforated stock dentate tray was selected and modified according to the size of the defect and an impression was made using irreversible hydrocolloid (Zelgan 2002, Mumbai, India). Using the attained model, a custom tray was fabricated using auto-polymerising resin (DPI,Mumbai, India). The tray was then used for border molding using green stick compound (DPI, Mumbai, India) and a secondary impression with alginate(Zelgan 2002, Mumbai, India) was made for the same (Fig.3). A stone model (Kalabhaikarson, Mumbai, India) was prepared from the impression to be used as a master cast (Fig.4).

Record base was fabricated using auto-polymerising resin over the master cast after creating a hollow block out around the antral defect [8]. Desirable undercuts were planned to be utilised for retention of the prosthesis and undesirable undercuts were blocked out. Occlusal rim (Hindustan modeling wax, India) was created in accordance to the arch form and the remaining alveolar ridge taking the opposing arch as guide. During the jaw relation appointment, the occlusal rim was adjusted according the patient's vertical dimension and lip fullness. Articulations of the maxillary and mandibular casts were done and teeth setting was carried out for the maxillary arch according the mandibular dentition. During the wax try-in appointment, the retention of the maxillary record base was found be relatively good. The major problem encountered was lack of retention when the patient tried opening her mouth wide and also during closure. The record base kept getting dislodged whenever the patient tried to close her lower jaw. On examination, the reason for dislodgement was found to be due to the pressure exerted by the hypertonic perioral musculature. During closure, when the teeth was set in class I relationship, the

Figure 1. Pre-op.

Figure 2. Post-op.

Figure 3. Secondary impression.

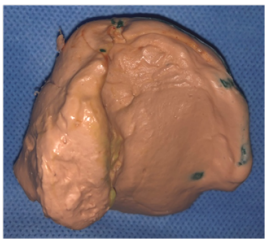

Figure 4. Master cast.

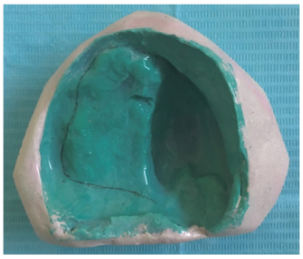

Figure 5. Processed and finished obturator.

Figure 6. Post insertion.

contact of the mandibular dentition also lead to dislodgement of the obturator. Hence, the teeth setting was altered to give a cross bite relationship. The setting was carried out in such a way that the maxillary posterior region alone contacts initially during closure. The maxillary anteriors were retroclined so that the obturator will be stable and dislodgement during closure can be prevented. Baseplate wax was added to the inner slopes of the occlusal rim and center of the palatal plate to get a palate-like contour. Wax try-in procedure was again repeated with the altered position. The record base was found to be retentive enough without dislodgement during closure.

After the try-in procedure, the prosthesis was then processed in heat polymerised denture base resin (Fig.5). The prosthesis was then delivered to the patient after adjustments of the extensions and occlusal corrections (Fig.6). Post insersion instructions were given and follow up appointments were done after 24 hours, 1 week and 2 weeks.

Discussion

The primary source of retention for an obturator is the remaining hard tissue and its undercuts after resection. The anatomical, physiological, physical, mechanical and muscular factors affecting the retention of a conventional complete denture stands good for the retention of an obturator also. Eventhough there are multiple sources of retention; the favourable undercuts post resection, palatal valem and the lateral scar band should be given prime importance for utlisation. Reduction in weight of an obturator is inversely proportional to the retention [9]. Wu and Schaaf demonstrated the procedure to reduce the weight of the prosthesis for partial maxillectomy patients by 6.55% to 33.06% [10]. In post resection patients, the aberrant muscular activity of the perioral musculature; especially orbicularis oris tends to displace the obturator by exerting a downward and backward pressure on it. The retentive factors and the perioral muscle activity have to be taken into consideration throughout the process of interim obturator fabrication for better prognosis.

Conclusion

The importance given for the fabrication of a definitive obturator should be given for the fabrication of an interim prosthesis without any compromises. The major role of the interim obturator is its ability to enhance the process of healing by decreasing the surgical scar contracture post resection; thereby providing a favourable contour and bed for the definitive prosthesis to rest. The process of fabrication of interim obturator should be given prime importance because, this aids in determining the design of the definitive obturator. The meticulous time spent in making the interim obturator retentive not only helps in enhancing the comfort of the patient, but also motivates them psychologically to undergo definitive obturator treatment.

References

[1]. Beumer.J, Curtis TA Acquired defects of the mandible, in Beumer J ID, Curtis TA, Firtell DN (eds): Maxillofacial Rehabilitation: Prosthodontic and Surgical Considerations. St Louis, MO, Mosby, 1979, pp 106-1 12

[2]. Afroze SN, Korlepara R, Rao GV, Madala J. Mucormycosis in a Diabetic Patient: A Case Report with an Insight into Its Pathophysiology. Contemp Clin Dent. 2017 Oct-Dec;8(4):662-666. PubMed PMID: 29326525.

[3]. Naveen S, Subbulakshmi AC, Raj SBS, Rathinasamy R, Vikram S, Raj SG. Mucormycosis of the Palate and its Post-Surgical Management: A Case Report. J Int Oral Health.

[4]. Raut A, Huy NT. Rising incidence of mucormycosis in patients with COVID-19: another challenge for India amidst the second wave? Lancet Respir Med. 2021 Aug;9(8):e77. PubMed PMID: 34090607.

[5]. Pandilwar PK, Khan K, Shah K, Sanap M, K S AU, Nerurkar S. Mucormycosis: A rare entity with rising clinical presentation in immunocompromised hosts. Int J Surg Case Rep. 2020;77:57-61. PubMed PMID: 33152595.

[6]. Padmanabhan TV, Kumar VA, Mohamed KK, Unnikrishnan N. Prosthetic rehabilitation of a maxillectomy with a two-piece hollow bulb obturator. A clinical report. J Prosthodont. 2011 Jul;20(5):397-401. PubMed PMID: 21651640.

[7]. Mani UM, Mohamed K, Krishna Kumar A, Inbarajan A. A modified technique to fabricate a complete hollow obturator for bilateral maxillectomy in a patient with mucormycosis-A technical case report. Spec Care Dentist. 2019 Nov;39(6):610-616. PubMed PMID: 31608482.

[8]. Maheshwaran KS, Mohamed K, Subhiksha R, Kumar VA. A simplified novel approach in the fabrication of an interim hollow bulb obturator. Int J Dent Health Sci. 2017;4(5):1227-32.

[9]. Gurjar R, Kumar MV S, Rao H, Sharma A, Bhansali S. Retentive Aids in Maxillofacial Prosthodontics-A Review. Int J Contemp Dent. 2011 Jul 4;2(3):84-88.

[10]. Wu YL, Schaaf NG. Comparison of weight reduction in different designs of solid and hollow obturator prostheses. J Prosthet Dent. 1989 Aug;62(2):214-7. PubMed PMID: 2760863.