A Simplified Approach to The Fabrication of A Maxillary Resection Obturator: A Clinical Report

Dr. Himanshu Aeran
Director Principal
Professor & Head

Dr. Varun Kumar
Reader

Dr. Rahul Dhami
P. G. Student

Dr. Gagan Sharma
P. G. Student

Corresponding Author:
Dr. Himanshu Aeran
Director Principal
Professor & Head, Department of Prosthodontics
Seema Dental College & Hospital
Rishikesh
drhimanu@yahoo.com

Abstract:
Restoration of maxillectomy defect is a difficult task for the maxillofacial prosthodontist. For a prosthesis to be retentive and stable in function comfortably requires multidisciplinary treatment planning. Technical procedures can be simplified to secure the desired result without compromises. The objective of presenting this case report is to produce a obturator prosthesis that is simple to execute, accurate and improved in its potential for retention.

Key words:
Maxillectomy, Obturator, Rehabilitation.

Introduction

Special precautions are needed during fabrication of a prosthesis to seal congenital or acquired tissue openings of the palate and/or contiguous structures. Congenital defects are due to malformation and acquired is due to injury or surgical excision of tumor. Acquired followed by surgical resection of carcinomas in the oral region can cause tremendous psychological or functional effects on human being. This creates an anatomic defect that allows the oral cavity, maxillary sinus, and nasal cavity to, become one compartment[1].

The goals of prosthetic rehabilitation for total and partial maxillectomy patients include separation of oral and nasal cavities to allow adequate deglutition and articulation, possible support of the orbital contents to prevent enophthalmos and diplopia, support of the soft tissue to restore the midfacial contour, and an acceptable aesthetic results(Wang 1997)[2].

In the successful rehabilitation of the maxillectomy patient, the maxillofacial-prosthodontist has two primary objectives i.e. Restoration of the functions of mastication, deglutition, and speech and to achieve normal oro-facial appearance (Beumer III et al., 1979)[3]. Obturator (Latin: obturare,to stop up) is that component of a prosthesis which fits into and closes a defect within the oral cavity. It is basically a covering prosthesis that re-establishes the oral - nasal partition. The extension of the obturator superiorly into the defect provides the basis for retention, stability and support for the prosthesis[4]. The bulb of the obturator can be solid or hollow, depending on the extent of defect. If the defect is extensive, solid bulb is contraindicated as it leads to increased weight of the prosthesis, unnecessarily stressing upon the teeth and supporting tissues. The hollow bulb obturator improves retention and also aids in speech resonance. Reduced weight of the hollow bulb makes it comfortable and also reduces the consciousness of wearing a prosthesis and possibly enhances the lost facial esthetics[5].
The superior surface of the bulb can be left open as a reservoir to collect the nasal secretions that can be drained from time to time, but it can lead to accumulation of nasal secretions, bad odour, difficulty in polishing and cleaning the internal surface and lack of support from the superior aspect of the defect. A closed bulb obturator, however more often indicated is advantageous if the subject demonstrates normal secretory output.

Various materials like vulcanized and pre vulcanized rubber, acrylic resin, silicone rubber, poly urethane etc. are used for fabrication of obturator prosthesis. Silicone rubber, although advantageneous in certain clinical situations as porous in nature and has long term durability, requiring replacement on a routine basis but considering the feasibility, durability, tissue compatibility and ease of manipulation acrylic resin still is a good option for the fabrication of this prosthesis.

This article describes a procedure in which fabrication of a close bulb obturator can be carried to completion on clinical verification of the wax trial denture. Ease of fabrication while controlling the thickness of bulb portion and discoloration are several advantages of this technique while minimizing laboratory and clinical appointment time.

Case report

A 62 year old, female patient reported to our department with the chief complain of difficulty in speech and swallowing after extensive resection of maxilla for prosthodontic rehabilitation of a right maxillectomy that was done 2 months ago for removal of basal cell carcinoma. The patient also reported complaints in difficulty in feeding, nasal regurgitation and nasal twang in her voice. Intraoral clinical examination revealed healthy post maxillectmy defect on the right side of hard and soft palate communicating superiorly to the naso pharynx. No surgical reconstruction or graft for the defect had been applied. A light weight closed bulb definitive obturator was planned for rehabilitation.

Procedure

1. The defect was analysed (Figure 1) and lined with sterile gauge pieces to prevent excessive flow of material into the defect. The maxillary and mandibular preliminary impression were made using irreversible hydrocolloid (Plastigin, Septodont Inc, USA) in a stock tray after the modification (Figure 2). The impressions were poured using dental stone (Ultrastone, Kalabhai, India) and cast were obtained.
2. The dentulous portion of the maxillary

cast was lined with two thickness of base plate wax spacer (Hiflex Modelling Wax, India) and a special tray was constructed using chemically activated Auto Polymerizing resin (Pyrax, Rapid Repair, India) that covered the teeth and the defect area (Figure 3). The tray was checked in patients mouth for proper extension and border moulding was performed with special attention in the posterior palatal seal area.

3. Medium body poly vinyl siloxane material (3m, ESPE, Impregnum, Penta, USA) was used to record the final impression after blocking the medial, anterior and unwanted portion of the lateral undercuts (Figure 4). The final impression was analysed and poured in die stone (Ultrarock, Kalabhai, India) and master cast was prepared (Figure 5).
4. The trial denture base was fabricated using autopolymerising resin (Pyrax, Rapid Repair, India) over which wax occlusal rims were fabricated. After recording the jaw relation (Figure 6), the casts were transferred to a semi adjustable (Hanau O2, Whipmix Inc, USA) articulator using face bow transfer. After completing the teeth arrangement, the trial denture base was inserted onto the patients mouth and try in was completed.
5. After the Try in stage adams clasp and pin head clasps were prepared on the cast for adequate retention of the prosthesis.Teeth setting was finished and the cast was invested in a flask. The flask was dewaxed and carefully retrieved and opened. After dewaxing, seperating media (Seperating medium,DPI, india) was placed all over except for the resin teeth.
6. Recomended monomer polymer ratio was mixed and after reaching on the dough stage(DPI, Heat Cure, India), was packed into the flask. A trial closure was performed to check the proper flow of material into the mould. The obturator was cured in usual manner as any other conventional denture cycle. After curing, the partial denture prosthesis was removed and finishing and polishing was done (Figure 7).
7. After finishing and polishing the prosthesis was inserted into the patients mouth and the necessary minor adjustments were done. Patient was educated and motivated to maintaine proper oral hygine, and also a traning was given for removal and insertion of the prosthesis (Figure 8, 9). A periodic recall in 10-15 days for the next 6 months was scheduled.

Discussion

The design considerations of an obturator should be kept in mind before the starting of the surgical procedure. Immediately following the surgical procedure the patient is provided with a surgical obturator which is simply a plate to cover the oro-nasal opening. The surgical obturator is essential for the patient to prevent regurgitation of fluids, speech defects and to make the patient accustomed to future definitive prosthesis. The interim obturator is provided to the patient in a period of 2-4 months after surgery, when the patient is undergoing healing phase. This type of obturator is relined periodically to adapt to the underlining healing tissues.The definitive or the final obturator is fabricated 3-4 months after the healing is completed. The bulb portion of the definitive obturator can be solid or hollow depending on the extent of the defect. The solid bulb is advocated in small defects whereas the hollow bulb is advocated when the defect is large. Wide surgical resections for the control of malignancies frequently result in a small number of remaining, unilaterally clustered teeth. These remaining teeth serve as abutments for the obturator and are subjected to constant, nonaxial, cantilever forces[6].

Rehabilitation with an obturator prosthesis is functional, reliable/safe, easy to build and has a low level of invasiveness. Three-dimensional reconstruction, on the other hand, is complex as it requires longer operations given the invasive nature of reconstruction methods with lower patient tolerance, a high risk of systemic complications or very poor prognosis of the donor site[7].

The method described in this procedure for the fabrication of closed bulb interim obturator prosthesis can be applied to completely or partially edentulous state. Undercuts within the defect are easily managed without the risk of damaging the final cast and results in an accurate prosthesis. Relatively small defects or partial denture frameworks often provide the stability needed for maxillo mandibular relation record. It allows for complete processing of the prosthesis, is less time consuming while providing the patient with a light weight obturator prosthesis. Movement of the obturator varies and creates soreness and discomfort for the patient after insertion. These pressure sores are adjusted at the post insertion appointments.

The patients ability to handle the oral secretions was improved, acceptible esthetic result was achieved and no breathing problems were achieved with the use of obturator prosthesis which had a positive psychological effect on the patient thereby improving the patients acceptibility in the society[8].

Conclusion

A technique has been described for construction of a closed bulb interim obturator for a patient who has undergone partial maxillectomy. A closed bulb was chosen because of a smaller defect of the patient. Procedure was performed by giving utmost importance to functional, aesthetic and psychological needs of the patient. After insertion of the prosthesis nasal regurgitation was corrected and there was marked improvement in mastication, speech, esthetics and social acceptance/self confidence of the patient.

References

References are available on request at editor@healtalkht.com

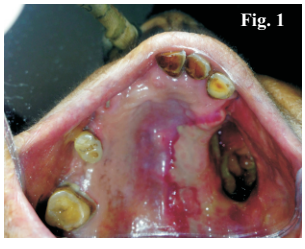
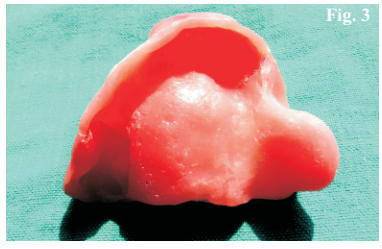


Fig. 1


Fig. 2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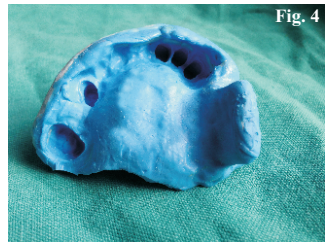
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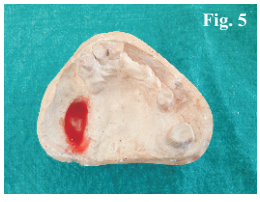
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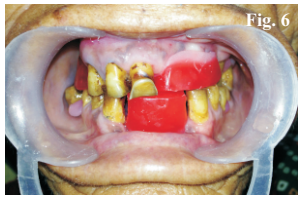
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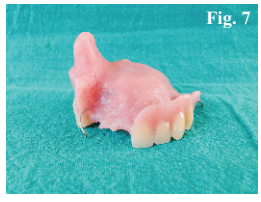
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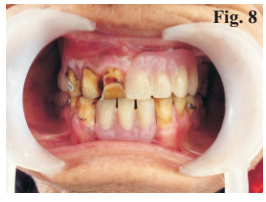
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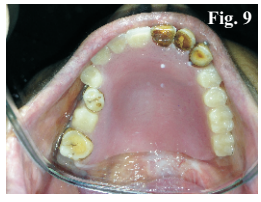
Fig. 9