



A hollow definitive obturator for management of partial maxillectomy

Dr. Mayank Aggarwal, Dr. Pankaj Datta, Dr. Swagata Barua, Dr. Jyoti Gupta,
Dr. Kritika Pandey

^{1, 4, 5} Post graduate student Department of prosthodontics, Inderprastha dental college, Sahibabad

² Dean, Professor & Hod Department of prosthodontics, Inderprastha dental college, Sahibabad

³ Senior Lecturer Department of prosthodontics, Inderprastha dental college, Sahibabad

Date of Submission: 09-06-2023

Date of Acceptance: 19-06-2023

ABSTRACT: -In maxillary defects, role of a prosthodontist is to rehabilitate the intra- and extra-oral structures and to endow with the normal function of mastication, speech, deglutition, and esthetics. Malignancies are common in the oral region and are treated usually through surgical intervention. Surgical intervention creates anatomical defects creating communication between oral and nasal cavity. Patients pose difficulties while performing normal functions such as swallowing and speaking, due to this communication. To overcome the problems encountered by the patient, obturators are fabricated. The main problem with rehabilitation of large defect is the weight of prosthesis; the prosthesis becomes very bulky and non-retentive due to its weight. Hollow obturators are fabricated to conquer this tribulation by different techniques. This case report describes a simplified method of fabrication of a definitive hollow bulb obturator for rehabilitation of a maxillary defect (Aramany's class II) by using lost salt technique.

Keywords: Definitive obturators, hollow bulb, maxillary defect

I. INTRODUCTION:

The intra oral defects are due to trauma, disease, pathological changes, radiation burns or surgical intervention, amongst which the most common are in the maxilla which may result in an opening into the antrum or nasopharynx. The defects may involve any portion of hard and soft palate, alveolar ridges and floor of the nasal cavity.

⁽¹⁾Maxillary defects predispose the patient to hyper nasal speech, fluid leakage in to nasal cavity, impaired masticatory function. ^(2, 3)The goals of prosthetic rehabilitation for such patients should

include separation of oral and nasal cavities to allow adequate deglutition and mastication and achieve normal facial appearance for acceptable esthetic results. ^(4, 5, 6) The prosthesis needed to repair such defects is termed as a maxillary obturator. An obturator (latin: obturare, to stop up) is a disc or plate, natural or artificial, which closes an opening or defect of the maxilla as a result of a cleft palate or partial or total removal of the maxilla for a tomograms. ⁽⁷⁾To achieve stability of this type of prosthesis, it is necessary to extend the flanges to the lateral scar band, the mesial wall of the defect, and anatomical undercuts. ⁽⁸⁾

The increased volume and weight of the obturator, however, impairs retention and results in prosthetic loosening. To minimize the weight, a closed or open hollow design is recommended. ⁽⁹⁻¹³⁾ According to Wu and Schaaf, hollowing of the obturator significantly reduces prosthesis weight from 6.55% to 33.06% depending on the size of the defect. ⁽⁹⁾

This case report describes the fabrication of one piece closed hollow bulb definitive obturator prosthesis for a patient with acquired maxillary defect (Aramany's class II) on the right side.

II. CASE REPORT

A 21- year- old male patient was referred to the Department of Prosthodontics with chief Complaints of difficulty in eating, speaking, and deformity of upper midface due to surgical removal of lesion. The patient had history of squamous cell carcinoma on the left maxilla for which hemimaxillectomy of the same side was performed. On intraoral examination, defect was Aramany's class II extending till floor of the orbit



associated (Fig.1). The patient was initially rehabilitated with interim obturator for 6 months and then planned for one piece closed hollow bulb definitive obturator prosthesis.

Technique

- The primary impression was made using irreversible hydrocolloid impression material (Vignette chromatic, Dentsply) by packing the defect area with gauze (Fig. 2).
- The impression was beaded and boxed and the final cast was poured in type III dental stone (Kalrock, Kalabhai International).
- Special tray was prepared on the primary cast (fig.3), border moulding done on right side with green stick compound (DPI) and final impression was made with light body elastomeric impression material (reprosil) (fig:4). Master cast was prepared with type IV dental stone (Kalrock).
- The master cast was made using altered cast technique. After obtaining the cast, record base was made using self-cure acrylic resin and an occlusal rim was fabricated.
- Jaw relation and try-in was done with monoplane dentition taking into consideration the esthetic and phonetic requirements (Fig. 5).
- Waxed-up trial denture was sealed to the master cast (Fig.6) and invested in the flask. All components were covered with investing stone except the waxed-up part and the teeth during the first pour of plaster.
- The second pour was used to fill the hollow wax up. On dewaxing, heat cure acrylic resin packed and cured using the short curing cycle. Deflasking was done and the hollow bulb was inspected.
- Table salt was used to fill the defect and Autopolymerising acrylic resin used to cover the opening and create the hollow bulb. On completion of curing, a small hole (Fig.7) was made on the base of the hollow bulb obturator and it was placed in water to dissolve all the salt. The hollow bulb was washed with water in a syringe to remove the salt completely.
- The small hole was sealed with Autopolymerising acrylic resin. The obturator was finished and polished and inserted in the patient's mouth (Fig.8).
- The post insertion follow up was done after 24 hours, after three days and after one week. A

review after every 10 to 14 days over the next two months period is needed.

III. DISCUSSION

Ambroise Pare was the first to use artificial means to close the palatal defect as early as the 1500s. Steadman described the use of an acrylic resin prosthesis lined with gutta-percha to hold a skin graft with in a maxillectomy defect in 1956. In 1953 Ackerman fabricated hollow obturator prosthesis. Recent investigations have confirmed the effectiveness of obturator prosthesis in terms of speech, masticatory functions, swallowing and appearance. Large maxillectomy defects in edentulous patients are often challenging to manage prosthetically. Maxillary defects predispose the patient to hyper nasal speech, fluid leakage in to nasal cavity, impaired masticatory function. Obturation of the defects minimizes these problems. Obturator retention problems are exacerbated when the characteristics of the defect are unfavourable.

To attain maximum stability and retention, prosthesis must utilize all the retentive areas of the defect and remaining anatomical structures. In solid bulb obturators because of increased weight retention of the prosthesis get effected. Preservation of remaining teeth is particular importance because retention of the prosthesis is far less in the corresponding edentulous patients and proprioceptive ability of the teeth under overdentures might act as a signal against the physiological overload and thereby reduce bone resorption.

In hollow bulb obturator the weight of the prosthesis is reduced, making it more comfortable and efficient and the lightness of the prosthesis changes one of the fundamental problems of retention and increases physiologic function.

The advantages of fabricating one piece obturator are; it is hygienic, more esthetic, simple, and accurate and there are no lines of demarcation between heat cure and auto polymerizing resin. It also improves the speech by adding resonance to the voice.

The disadvantages of one piece obturator are: increased processing time, shim or polyurethane foam increases the weight of the prosthesis.

The advantages of a two piece obturator are; the thickness of the obturator can be controlled thereby reducing the weight of the prosthesis. It

reduces clinical time. It can be used for both completely and partially edentulous arches.

The disadvantages are; additional processing time required to process the lid, acrylic resin may seep into the hollow portion of the obturator, seepage of fluids is possible if the seal is improper. Two piece obturator is mainly used in large defects with more undercuts or in patients with reduced mouth opening.

Among the various techniques, the technique described by Chalian et al. is being

followed for decades due to the advantages described above.

IV. CONCLUSION

Rehabilitation of acquired maxillary defect using definitive closed hollow bulb obturator took care of different domains of care, which improved physical, emotional, functional and social needs.



Figure 1:- PREOPERATIVE INTRORAL VIEW



Figure.2:- PALATAL DEFECT BLOCKED WITH GAUZE PIECE & IMPRESSION MADE WITH IRREVERSIBLE HYDROCOLLOID

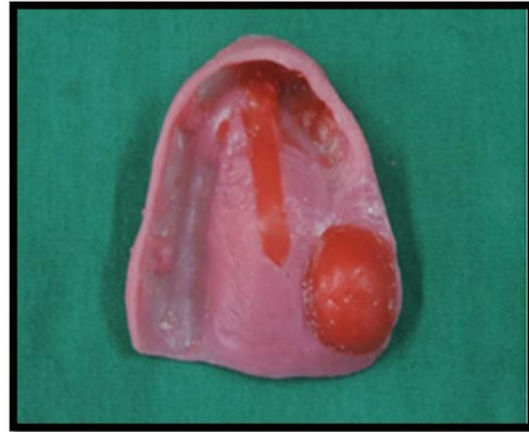
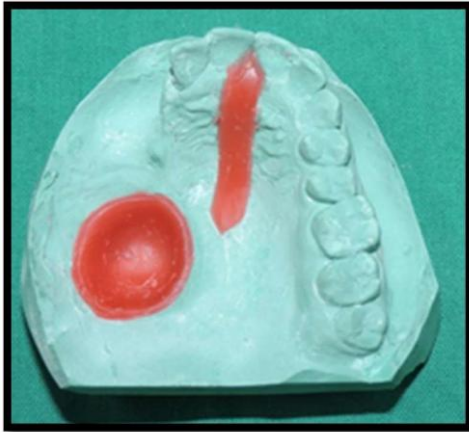


Figure. 3:- Fabrication of custom tray

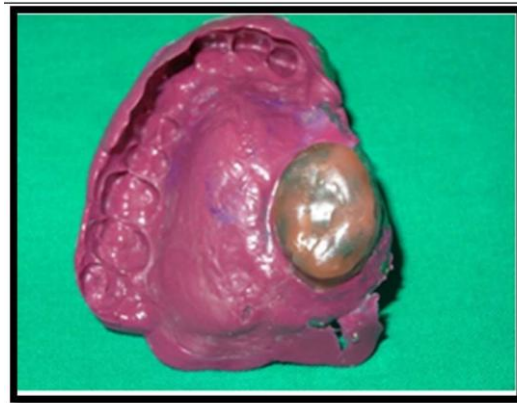


Figure.4:- Secondary impression with elastomeric impression material



Figure. 5:- Try in



Figure.6:- Wax up done



Figure.7:- HOLE MADE TO REMOVE SALT AND MAKE DENTURE HOLLOW



Figure. 8:- Intra oral view post insertion



- [1]. **REFERENCES**
- Chalian VA, Drane JB. Maxillofacial
Prosthetics – Multidisciplinary Practice,
Baltimore: The William and Wilkins Co.;
1972.
- [2]. McAndrew KS, Rothenberger S, Minsley
GE. 1997 Judson C. Hickey Scientific Writing
Awards. An innovative
investment method for the fabrication of a closed
hollow obturator prosthesis. *J Prosthet Dent*
1998;80:129-32.
- [3]. Matalon V, LaFuente H. A simplified
method for making a hollow obturator. *J*
Prosthet Dent 1976;36:580-2.
- [4]. Boucher LJ, Heupel EM. Prosthetic
restoration of a maxilla and associated
structures. *J Prosthet Dent*
1966;16:15468.
- [5]. Iramaneerat W, Seki F, Watanabe A,
Mukohyama H, Iwasaki Y, Akiyoshi K, et
al. Innovative gas injection technique for
closed hollow obturator. *Int J Prosthodont*
2004;17:345-9.
- [6]. el Mahdy AS. Processing a hollow obturator. *J*
Prosthet Dent 1969;22:682-6. Buzayan MM,
Ariffin YT, Yunus N. Closed hollow bulb
obturator – One-step fabrication: A
clinical report. *J Prosthodont*
2013;22:591-5.
- [7]. Asher ES, Psillakis JJ, Piro JD, Wright
RF. Technique for quick conversion of an
obturator into a hollow bulb. *J Prosthet*
Dent 2001;85:419-20.
- [8]. Tanaka Y, Gold HO, Pruzansky S. A
simplified technique for fabricating a
lightweight obturator. *J Prosthet Dent*
1977;38:638-42.
- [9]. [10] Nidiffer TJ, Shipmon TH. The hollow bulb
obturator for acquired
palatal openings. *J Prosthet Dent*
1957;7:126-37.
- [11]. Brown KE. Clinical considerations
improving obturator treatment. *J Prosthet*
Dent 1970;24:461-6.