Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/18818
DOI URL: http://dx.doi.org/10.21474/IJAR01/18818

RESEARCH ARTICLE

PROSTHODONTIC REHABILITATION OF A MAXILLARY DEFECT USING HOLLOW BULB OBTURATOR: A CASE REPORT

Dr. Debabrata Sarkar, Dr. Mousumi Mondal, Dr. Rishi Ray, Dr. Surbhi Yadav and Dr. Tapan Kumar Giri
PGT, Department of Prosthodontics and Crown & Bridge, Dr. R Ahmed Dental College & Hospital.

Manuscript Info

Manuscript History
Received: 30 March 2024
Final Accepted: 30 April 2024
Published: May 2024

Abstract

Inverted papilloma arising from the sinonasal mucosa often necessitates a total or partial maxillectomy, creating a significant palatal and alveolar ridge defect. These defects can lead to sequelae like nasal regurgitation, compromised oral and nasal competence, impaired mastication, and deglutition due to lack of bony support, and altered speech due to changes in oral cavity anatomy. Facial aesthetics can also be negatively impacted with the potential for a sunken malar eminence or collapsed midface. While prosthodontic rehabilitation with obturators aims to restore function and aesthetics, conventional designs can be cumbersome due to their weight and bulk. This case report details the utilization of a hollow bulb obturator, addressing the limitations of traditional obturators and potentially improving patient outcomes.

Introduction:-

Defects in the maxillary region can be either congenital or acquired. The acquired defects are generally because of neoplastic, inflammatory, or infective reasonsamong which neoplasia is a major etiologic factor[1]. When a surgical procedure leads to maxillary defect, potential issues such as nasal regurgitation, inability of proper mastication and deglutition, impaired speech and altered facial appearance may result. In addition, severe psychological challenges may arise as a secondary consequence of thesecomplications.

When the defects of the palatal region are large, it is difficult to restore surgically to normal function. The quality of function obtained with prosthetic rehabilitation makes this the preferred method of treatment for larger defects[2,3].

However, the conventional obturators used to rehabilitate the palatal defects have the disadvantage of having an acrylic bulb, which increases its weight. This can be avoided if the bulb portion which extends into the defect is hollow. It reduces the prosthesis' weight which helps in making it more comfortable and retentive. It also applies less pressure to the surrounding supporting soft tissues[3].

Here, a case report of a hollow bulb obturator which was fabricated using the technique introduced by Chalian& Barnett[7] has been described.

Case report:

A 30 year old male patient was referred to the Department of Prosthodontics and Crown & Bridge in Dr. R Ahmed Dental College & Hospital, Kolkata from Medical College, Kolkata for the prosthodontic rehabilitation of a surgical

Corresponding Author:- Dr. Debabrata Sarkar
Address:- PGT, Department of Prosthodontics and Crown & Bridge, Dr. R Ahmed Dental College & Hospital.

defect in right side of the face. The patient underwent partialmaxillectomy of the right maxilla in January,2024becauseof inverted papilloma of right maxilla. On intraoral examination, the patient had a defect in the right side of his hard palate (Aramany classification: class II) extending anteriorly from lateral incisor region to first molar region posteriorly; medially from 3 mm lateral to the midpalatal suture to buccal mucosa laterally. The patient had a partially dentate maxillary arch with 9 teeth (11 21 22 23 24 25 26 27 28). Extraorally the patient had lack of lip support, depressed nasolabial sulcus, obtuse nasolabial angle and depressed infraorbital region on the right side. The patient had a complete set of teeth in the lower arch.

An interim hollow bulb obturator was decided as a treatment plan for the patient.

Figure 1:- Extraoral view of the patient.

Figure 2:- Intraoral view of the patient.

Procedure:
Prior to taking the preliminary impression, the defect was cleaned of food debris and dried mucus crusts. Sterile gauze was placed in the defect to prevent the inadvertent flow of the primary impression material in the defect. Irreversible hydrocolloid(Alginate) was used to take the primaryimpression and cast was poured.

Figure 3:- Preliminary impression of the maxillary arch and the defect.

Figure 4:- Preliminary impression of the mandibular arch.

1.5 mm thick base plate wax was adapted on the primary maxillary cast as relief and special tray was fabricated using auto polymerizing acrylic resin on the retrieved maxillary primary cast for border moulding and the final impression.

Figure 5:- Special tray.

Bordermoulding was performed with low fusing impression compound (Green-stick compound). Themoulding in the defect region was done with admix (7:3 ratio of low fusing and high fusing impression compound) material. Tray adhesive was applied on the tray. The final impression was taken with light body addition silicone.

Figure 6:- Border Moulding.

Figure 7:- The final impressionof the maxillary arch and the defect.

Cast was poured using type 3 gypsum (Dental stone) material. The record base for the maxillary cast was fabricated using auto polymerizing acrylic resin on which occlusal rim was made. Jaw relation was taken. The casts were mounted in articulator in the proper relationship and teeth-arrangement was perfomed. The try-in was done.

Figure 8:- Jaw relation taken.

Figure 9:- Try-in done.

After try-in, the casts were demounted and Flasking and Dewaxing were done in usual manner..

Figure 10:- Flasking and dewaxing done.

The anterior and medial undercuts of the defect were blocked. One thickness of baseplate wax shim was adapted on both the halves of the flask corresponding to the defect area and tissue stops were added.

Figure 11:- Baseplate wax adapted for relief.

Cold mold seal was applied on the gypsum on both the halves of the flask. A layer of autopolymerizing acrylic resin was added on eachhalves of the flask over the wax shims.

Figure 12:- A layer of auto polymerizing acrylic resinapplied over the waxon the mould.

Figure 13:- A layer of auto polymerizing acrylic resin applied over the wax on cast.

.The flask was then closed and allowed to set for a minimum of 15 minutes.

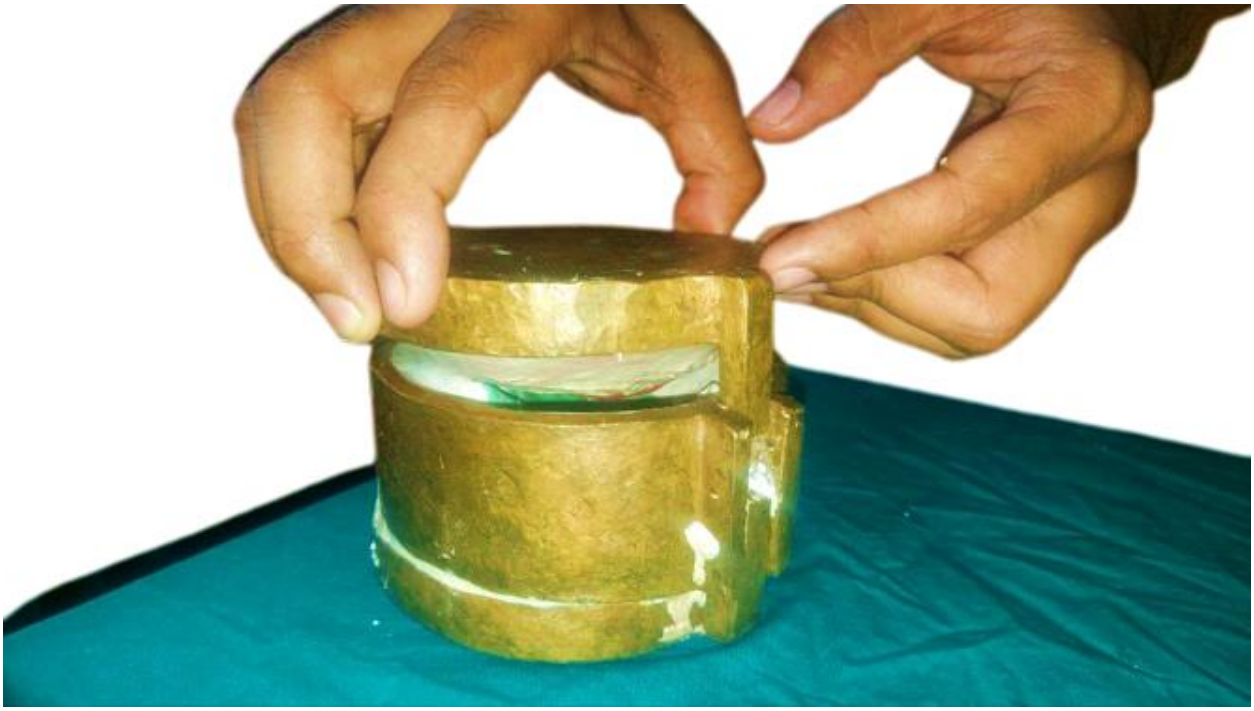

Figure 14:- The flask was closed.

After the curing of autopolymerizing acrylic resin was completed, the flask was opened and the resin bulb was obtained, which was hollow inside.

Figure 15:- The hollow bulb obtained after trimming the flash.

Figure 16:- The hollow bulb floats in water although acrylic of smaller volume sinks.

After the hollow bulb was obtained, the wax shims were removed from the flask. Heat-cure acrylic resin in dough stage was adapted over the defect area on the cast. This area was previously occupied by the wax shim. The hollow bulb was placed on top of the heat cure resin ,over the defect.

Figure 17:- Heat-cure applied in the defect and the hollow bulb is placed over it.

Next, heat cure acrylic resin was adapted in the mold on the other half of the flask and the flask was closed. Curing was done in an acrylizer after bench curing. The obturator thus fabricated had a hollow bulb incorporated in it.

Figure 18:- The processed obturator.

The obturator was delivered to the patient.

Figure 19:- Obturator after delivery to the patient.

Discussion:-

Depending on the magnitude of the defect, Wu and Schaaf discovered that a hollow obturator prosthesis lowered the prosthesis weight by 6.55% to 33.06%[4]. Hollow bulb obturators can again be of two types: Open top and closed top, depending on the design of the obturator.

Although it was found that the open top design helped in achieving better speech, it is more associated with the accumulation of nasal secretions, which compromises hygiene and predisposes the already debilitated patient to more infections.

The fabrication method of a closed top hollow bulb obturator has been described many times in the literature by multiple authors. Generally, the techniques recommended by Chalian and Barnett, Matalon and LaFuente[5] or Parel and LaFuente[6] are recommended. Here we have followed the technique described by Chalian and Barnett[7]. It has the advantages as follows:

1. No lines of demarcation between the bulb and the dentureis leftwhich otherwise could discolor the denture.
2. Enough thickness of heat cure resin in the undercut areas of the defect remains present which allow adjustments during delivery, if required.
3. This technique is easy and not time consuming.

On the follow-up appointment, the patient was satisfied with the prosthesis as it eliminated nasal regurgitation and improved speech, aesthetics & mastication.

Conclusion:-

This article presents a cost-effective, time-efficient, and predictable method for hollowing prosthesis, overcoming the limitations of older methods, ensuring even heat cure acrylic resin thickness over the hollow bulb.

Conflict of interest:
None.

References:-

1. Singh M, Kapoor S, Kumar L, Pal US, Singh A, Anwar M. Prevalence of maxillectomy defects among patients visiting in an institutionalized hospital setting: A prospective, single-institute study. Natl J Maxillofac Surg. 2020 Jul-Dec;11(2):231-235. doi: 10.4103/njms.NJMS_61_20. Epub 2020 Dec 16. PMID: 33897186; PMCID: PMC8051669.
2. Chigurupati R, Aloor N, Salas R, Schmidt BL. Quality of life after maxillectomy and prosthetic obturator rehabilitation. J Oral Maxillofac Surg. 2013 Aug;71(8):1471-8. doi: 10.1016/j.joms.2013.02.002. Epub 2013 Mar 26. PMID: 23540428.
3. Beumer J, Marunick MT, Esposito SJ. Maxillofacial rehabilitation : surgical and prosthodontic management of cancer-related, acquired, and congenital defects of the head and neck. Hanover Park, Il: Quintessence Pub; 2011.
4. 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. doi: 10.1016/0022-3913(89)90317-x. PMID: 2760863.
5. Matalon V, LaFuente H. A simplified method for making a hollow obturator. J Prosthet Dent. 1976 Nov;36(5):580-2. doi: 10.1016/0022-3913(76)90308-5. PMID: 1068294.
6. Parel SM, LaFuente H. Single-visit hollow obturators for edentulous patients. J Prosthet Dent. 1978 Oct;40(4):426-9. doi: 10.1016/0022-3913(78)90126-9. PMID: 279691.
7. Chalian VA, Barnett MO. A new technique for constructing a one-piece hollow obturator after partial maxillectomy. J Prosthet Dent. 1972 Oct;28(4):448-53. doi: 10.1016/0022-3913(72)90250-8. PMID: 4560447.