

Hollowbulb Obturator with Cast Retainers: A Case Report

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ABSTRACT

One of the most rapidly growing areas of dentistry from the stand point of both interest and need is maxillofacial prosthetics. The research of cancer has made understanding and treatment of this dreadful disease a possibility. Still the rehabilitation of these patients is a daunting job. The factors which determine the prognosis of prosthetic reconstruction are size of the defect, ability of the hard and soft tissues in defect area, proximity of vital structures, systemic conditions and the most important of all, patients attitude and temperament. This article presents case of a hemimaxillectomy patient, where rehabilitation is carried out with a simple hollow bulb obturator, which is light in weight and aids in better retention and comfort of the patient.

Key Words: cast retainers, hemimaxillectomy, hollow bulb obturator prosthesis, prosthetic rehabilitation.

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Introduction

The name obturator is derived from the latin verb "Obturare" which means to close. The most common defects in the maxillary arch can be either congenital or acquired. Acquired defect are due to surgical resection of the tumors. The defect frequently is complex and involves the skin, bone, muscle, cartilage and multilayers of mucosa.¹ Therefore reconstruction of such defect is often challenging. Maxillectomy affects a variety of functions like mastication, speech, olfactory and gustatory sensation. Speech is usually unintelligible. Patients also have seepage of nasal secretions in the oral cavity, poor lip seal, xerostomia, exophthalmoses and diplopia.²⁻⁵

Obturator is that component of a prosthesis which fits in to and closes a defect within the oral cavity or other body defect.² In edentulous or partially edentulous patients, support, stability, and retention of the

obturing removable prosthesis depends on the remaining teeth, hard and soft tissues.³ The larger the defect, greater the loss of mucogingival support.^{4,5} This article describes the clinical and laboratory procedures involved in the rehabilitation of the patient with hemimaxillectomy defect, using a simple closed bulb obturator.

Case Report

A 73- year -old male patient reported to the clinic with chief complaint of missing upper jaw and teeth since 9 months.

The patient was using an obturator since 8 months which was not comfortable for the patient. The patient's dental history revealed that the left maxillectomy was done for squamous cell carcinoma affecting the left region of maxilla passing the midline extending to the right canine region, including the left

maxillary sinus. (Figure 1). His medical history also revealed hypertension and bronchial asthma for which he was under medication.



Fig. 1: Shows intraoral view of the defect.



Fig. 2: Final impression after border.

On extra oral examination, gross facial asymmetry with collapsed left maxillary region was revealed. His intraoral examination was significant for the following findings. His left maxilla corresponding to the alveolar ridge with teeth, and anterior wall of maxillary sinus, were found to be involved along with the right maxillary ridge till the canine region which were found to be resected, leaving behind the residual portions of the soft palate. On the right side the patient had first and second premolars, along with the second and third molars which were periodontally strong. These teeth were used to provide retention for the prosthesis, by preparing rest seats to receive cast retainers for providing better retention for the prosthesis. The lower arch was dentulous, except with attrition of lower

anterior teeth in their incisal area. The lower teeth were periodontally strong. The patient maintained a good oral hygiene status.

The treatment objective was to provide prosthesis to obturate the defect to improve the speech, deglutition and mastication, to restore facial contour and to replace the missing teeth. Hence a multidisciplinary approach was required. To begin with supra and sub gingival scaling, glass ionomer fillings for upper right second and third molars in their cervical areas, and composite build up the of lower anteriors were done to improve speech, esthetics and to improve function of future prosthesis. Occlusal rest seats were prepared on the upper right first and second premolars and second and third molars. This improved the retention of the definite hollow bulb obturator and provided antirotational feature, along with stabilizing the remaining teeth.

Procedure

- The primary impression of the upper arch is made with irreversible hydrocolloid, after blocking the defect area using wet cotton. The lower impression is also made at the same appointment using the same material. Primary cast is made for custom tray fabrication with autopolymerizing resin (Acralyn "R" -Asian Acrylates).
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- Border molding was done to record the functional depth and width of the labial and buccal soft tissues, surrounding the defect using green stick compound. The final impression was made with soft putty (Aquasil-Dentsply) and light body material (Aquasil LV -Dentsply-USA- Figure 2). The master cast was poured in type IV stone (Figure 3). The block out of the master cast is done using wax. This will provide sufficient thickness of the acrylic material for the strength of the obturator and makes the mold space for construction of the future prosthesis.
- The invested cast is dewaxed and packed using heat cure resin (DPI- Heat cure acrylic material).
- The castings of the cast partial clasps are done separately with a meshwork extending only a

minimum area, to keep the obturator and denture light weight.(Figure 4)

- The try- in of cast partial frame work with clasps and hollow bulb obturator were done separately.
- Once the fit and retention are found be satisfactory, the jaw relation is recorded. Teeth selection was done by taking lower natural teeth as guide. The denture try-in is done which was found satisfactory, and the final processing of the denture is carried out.
- During the final insertion of the prosthesis, it was found that the esthetics, mastication, swallowing and speech were improved and the patient was very much satisfied with the results of the new prosthesis. The occlusion was checked for any premature contacts with the lower teeth during various mandibular movements and the adjustments required were done. The anti-rotational feature was improved by the proper extension of the prosthesis and the retention provided by the clasps.
- Hygiene maintenance of the prosthesis was emphasized by home protocol instituted by the patient.
- The patient is recalled after 24 hours after insertion of the prosthesis, after one month, then after three months and later six months after insertion. The patient was comfortable and was satisfied with results of the prosthesis.

Discussion

Basically, prosthetic reconstructions have to satisfy three major aspects:

- Health of the remaining tissues
- Esthetics and function
- Retention and stability of the prosthesis.

Health of the remaining tissues: - It is obvious that maintaining health for the remaining tissues must be the primary goal of the therapist.⁶ It is the prosthodontist's responsibility to incorporate the prosthesis on to healthy abutments and healthy tissues.⁷ Before starting with the fabrication of the definite prosthesis, it is mandatory that the remaining soft and hard tissues must be free of infection, caries, calculus etc. In this case before starting with the



Fig. 3: The final prosthesis with cast retainers.



Fig. 4: The final prosthesis after insertion.

primary impression making, we completed the routine oral prophylaxis, restoration of cervical areas of upper right second and third molars and composite buildup for the attrited lower anterior teeth.

Esthetics and function: - It is very difficult to meet the esthetic requirements since esthetic demands may vary greatly from one person to another.⁸ Here in this case, the shade selection for the denture teeth was easy since patient had full complement of lower teeth. To improve esthetics and function, composite buildup of lower anterior teeth were done, which was appreciated by the patient. Again when the final prosthesis was given to the patient, his speech, mastication, deglutition, facial profile etc were found to be improved.

Retention and stability of the prosthesis: - In the case of an obturator, attaining retention is comparatively easy if the operator could exactly record the adjacent soft and hard tissues which forms the boundary of the

defect⁹⁻¹⁰. Here in this case, the anti-rotational property and retention of the prosthesis was improved by the cast retainers which were given on the premolars and molars on the opposite side. Again by making the prosthesis light weight, the retention and stability are improved.

Various techniques for making hollow bulb obturators have been suggested and many materials for obturation of the defect have been tried. Parel and La Fuente¹¹ filled the hollow part of the obturator with sugar and covered it with acrylic resin. The sugar was later removed by making an opening in the acrylic lid. Elliotts¹² used clay instead of sugar, which was later removed in the same fashion. El Mahdy¹³ introduced fabricating of hollow bulb obturator using two flasks technique. Chalian and Barnett¹⁴ used a double flask technique to construct one piece hollow obturator.

Aaron Schneider¹⁵ used crushed ice to fill the defect, which was covered by acrylic resin. Once the resin was processed, openings were made on acrylic lid to drain the water, which were later sealed with autopolymerizing resin. Ashok Jhanji and Steve T Stevens¹⁶ resented a technique to make a one- piece obturator using silicone putty. LaDeane Fattore and Louis Fine¹⁷ suggested a method for fabrication of a light weight hollow denture that can be used for patients with advanced atrophy of the maxillae.

Maxillectomy defects are created by surgical treatment of benign or malignant neoplasms, congenital malformations and by trauma. The size of the maxillectomy defect and its extent is one of the main factor governing the prognosis for the treatment.

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