



CAST HOLLOW BULB OBTURATOR PROSTHESIS FOLLOWING A MAXILLECTOMY: A CASE REPORT

Dental Science

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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. Prosthetic intervention with maxillary Obturator prosthesis is necessary to restore the contours of resected palate and to recreate the functional separation of the oral cavity and sinus and nasal cavity. 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 definitive cast hollow bulb obturator, which is light in weight and aids in better retention and comfort of the patient.

KEYWORDS

Hollow prosthesis ,Obturator, Maxillectomy

INTRODUCTION

Numerous epithelial subtypes of malignancies are found on the maxillary sinus: Adenocarcinoma, squamous cell carcinoma (SCC), adenoid cystic carcinoma, malignant melanoma, or salivary gland carcinoma. In SCC cases, concurrent chemoradiation along with debulking can be considered.^{1,2} A surgical treatment alone without reconstruction or obturation of the defect will result in air, food, and liquid escaping into the sinus and nasal cavities, leading to severe dysfunction of speech and deglutition with significant reduction in quality of life of the patient'. Post-surgical maxillary defects predispose the patient to hypernasal speech, fluid leakage into the nasal cavity, and impaired masticator function. The prosthesis needed to repair the defect is known as a maxillary obturator. An obturator (Latin: *obturare*, to stop up) is a disc or plate, which closes and opening or defect of the maxilla as a result of a partial or total removal of the maxilla³.

Indications for the use of an obturator are:

- To serve as a temporary prosthesis during the period of surgical correction
- To restore the esthetic appearance of the patient rapidly for social contact
- When surgical primary closure is contraindicated
- When the age of the patient contraindicates surgery
- When the size and extent of the deformity contraindicates surgery
- When the local avascular condition of the tissues contraindicates surgery
- When the patient is susceptible to recurrence of the original lesion which produced the deformity³.

The patient is first treated with an interim obturator prosthesis, which is usually placed 7 to 10 days after surgery. A definitive obturator is fabricated approximately 3 to 4 months after surgery when the healing is complete. The definitive obturator impression should include the skingraftmucosal junction, lateral aspect of the orbital floor, and the velopharyngeal area depending on the extent of the defect.^{4,5,6,7} This case report describes the prosthetic rehabilitation of a maxillectomy patient with a cast hollow obturator.

CASE REPORT

A 67-year-old male patient was referred from the Regional Cancer Centre, Thiruvananthapuram, to the Department of Prosthodontics, Government Dental College, Thiruvananthapuram, for prosthetic rehabilitation of a maxillectomy defect on left side. The patient had undergone surgical maxillectomy 18 months back for the treatment of SCC. The chief complaints reported by the patient were

nasal regurgitation of food and fluids while eating along with difficulty in speaking. An extraoral examination revealed facial asymmetry, with a lack of support for the lips and cheek on the right side (Fig. 1). Mouth opening of the patient was slightly restricted, with defective hypernasal speech. Intraoral examination revealed an Aramany type II palatal defect involving the left side of the arch (Fig. 2).



FIG 1 Pre operative



FIG 2: Intra oral view

Impressions were made using irreversible hydrocolloid impression material. The maxillectomy defect was outlined and the cast was surveyed for designing the metal framework. Rest seats were prepared on disto-occlusal of 14 and mesio-occlusal of 15, disto-occlusal of 17 and mesio-occlusal of 18, to receive rests of embrasure clasp. Rest seat was also prepared for 13 and 23. After completion of the mouth preparation, the extension into the defect was moulded using admix of impression compound and greenstick in ratio of 3:7 (fig 3) and alginate impression was made. The design was transferred onto the master cast. A refractory cast was made by duplicating the blocked-out master cast using reversible hydrocolloid. An inlay wax pattern of the frame work was made on the refractory cast. The wax pattern was cast in cobalt chromium (Fig. 5). The try-in of the metal framework was done in patient's mouth (Fig. 4). The master cast was mounted on to a semiaadjustable articulator using the jaw relation record. The try-in of the prosthesis was done after teeth setting (Fig 6).

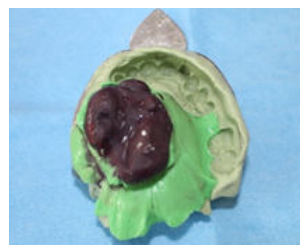


FIG 3 Impression



FIG 4: Metal frame work insitu



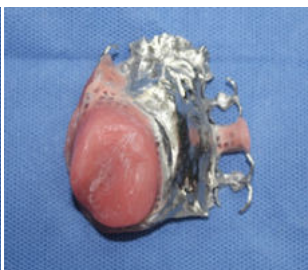
FIG 5: Metal frame work on cast



FIG 6: Try in



FIG 7: cast hollow obturator



The try-in prosthesis was then acrylized keeping the bulb hollow to reduce the weight of the obturator. The hollow bulb was made by making an acrylic shim from the duplicated cast and then fusing it with the acrylized obturator (Fig.7).



FIG 8: cast hollow obturator insitu



FIG 9: Post operative

After finishing and polishing procedures, the prosthesis was inserted (Fig.8,9).

The patient showed considerable improvement in phonation, and the obturator was very effective in preventing nasal regurgitation of food and fluids. The patient was very much satisfied with the prosthesis. Periodic recall appointments were scheduled for the evaluation of the prosthesis. The follow-up appointments showed satisfactory results with no deterioration of comfort and function with the prosthesis.

DISCUSSION

Prosthodontic management of palatal defects has been employed for many years. Ambroise Pare was the first to use artificial means to close a palatal defect as early as the 1500s. The early obturators were used to close congenital rather than acquired defects. Claude Martin described the use of a surgical obturator prosthesis in 1875. Fry described the use of impressions before surgery in 1927, and Steadman described the use of an acrylic resin prosthesis lined with gutta-percha to hold a skin graft within a maxillectomy defect in 1956.^{8,9} In the total rehabilitation of the maxillectomy patient, the maxillofacial-prosthodontist has two primary objectives:

- (i) to restore the functions of mastication, deglutition, and speech and
- (ii) to achieve normal oro-facial appearance.⁷

In this case, the support was gained from the remaining teeth and palate. Complete coverage of the remaining palate was planned to ensure maximum distribution of the load during function. Successful obturation of the maxillectomy defect is guided by the volume of the defect, and the positioning of postsurgical hard and soft tissues to be used for retention, stabilization, and support of the obturator.¹⁰ The weight of the prosthesis must be reduced to increase the retention of the obturator.¹¹ Here the obturator was made hollow thus reducing its weight.

The advantages of a hollow bulb obturator¹

- (i) The weight of the obturator is reduced, making it more

comfortable and efficient.

- (ii) improves one of the fundamental problems of retention and increases physiological function so that teeth and supporting tissues are not stressed unnecessarily.
- (iii) The decrease, in pressure to the surrounding tissues aids in deglutition and encourages the regeneration of tissue.
- (iv) The light weight of the hollow bulb obturator reduces the self-consciousness of wearing a denture.

Referral to a speech pathologist will contribute to its success by improving the ability of the patient to adequately speak and swallow.¹²

CONCLUSION

Although it is difficult to improve the quality of life for maxillectomy patients compared with patients with conventional prostheses, this can be achieved with the skill, knowledge, and experience of specialists. A proper diagnosis and a well-designed treatment plan will result in pleasant outcomes. Rehabilitation with obturator prosthesis appears to be a functional and effective treatment modality. The problem experienced by maxillectomy patients are reduced if a team approach is adopted, and specialists are careful to apply skill and experience at all stages and keep the patient under regular review.

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