

INNOVATIVE TECHNIQUE IN THE FABRICATION OF
HOLLOW CLOSE BULB OBTURATOR: A CASE REPORT

ABSTRACT

Rehabilitation of patients who have undergone excision of neoplasm of the maxillae requires restoration of mastication, speech, and deglutition. Several techniques have been advocated in the fabrication of light weight hollow bulb obturator. The objective of this case report is to follow a simplest technique for better patient comfort and acceptance.

Key Words: obturator, maxillectomy, hollow bulb, cast partial framework.

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INTRODUCTION

Quality of life of a patient is completely hampered when a patient has got congenital or acquired maxillary defects. Maxillary defect leads to oro-antral communication causing difficulty in speech. Speech is a function where respiratory, laryngeal, velopharyngeal and articulatory systems are involved. Disturbance in any one of these systems results in malfunction in speech. At the same time, there will be food regurgitation.

Rehabilitating a patient with maxillary defect requires to fulfill retention, stability, and esthetics of the prosthesis. 1

Maxillary defect patients are rehabilitated with special prosthesis called obturator. 2. The glossary of prosthodontic terms defines an obturator as a "a maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/or contiguous alveolar/ soft tissue structures." 3

Obturator are of several different types, based on the time of fabrication after surgery: immediate, interim and definitive obturator. For an obturator, the undesirable weight of the prosthesis becomes a challenge. There are open and close bulb obturators which will reduce the weight of the prosthesis. 4 Open bulb obturator leads to accumulation of food and nasal secretions which in turn leads to mal odor and bacterial growth.

This paper presents a very simplified and effective technique in the fabrication of a light weight obturator, which will lead to better patient acceptance and comfort.

Case report:

A 35-year-old, male patient reported to the Dept of Prosthodontics, S.D.M. Dental College, Dharwad with the chief complaint of old loose-fitting obturator (Fig 1). History revealed the patient had squamous cell carcinoma of the right palate and had undergone right partial maxillectomy 3 years back, followed by immediate and interim obturator



Figure 1 – Interim prosthesis



Figure 2 – pre-operative view.

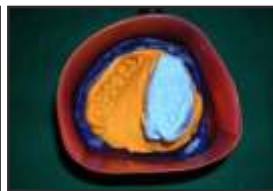


Figure 3 – Final Impression



Figure 4 – Metal framework Try in.



Figure 5 – Split Wax Up.



Figure 6 – Obturator Segment with Nick



Figure 7 – Final Prosthesis with notches.



Figure 8- Obturator bulb fused using nick & notch



Figure 9 – Post operative view



Figure 10 – Smile improving QOL

which has now become loose, worn out and unhygienic.

Extraoral examination revealed no facial deformity. Intraoral examination revealed normal tongue size, position and function. There was partial maxillectomy of the right side, surgical defect was extending from 18 region to mesial aspect of 22. Walls of the defect was lined by healthy mucosa. The defect corresponds to Armany classification IV (resection crossing the palatal midline) (Fig 2). Mandibular teeth were all intact.

A definitive cast partial framework with acrylic hollow bulb was planned for this patient. As the defect was categorized under Armany class IV situation.⁵ linear obturator framework was designed as proposed by Armany. Undercuts of the defect was blocked out with sterile, iodine-soaked gauze which was tied to a thread to prevent its accidental drop.

A preliminary upper and lower irreversible hydrocolloid impression was made (Zelgan 2002, Dentsply, India, Gurgaon, India) and poured with dental stone. Surveying and cast partial framework design was outlined on the diagnostic cast. The necessary mouth preparation was done in the patient. The defect portion was blocked with iodine-soaked gauze and the final impression was made with addition silicon putty impression material (Aquasil, Dentsply/Caulk, Milford, DE) and lined with light body silicone (Reprosil) (Fig3). Beading and boxing of the final impression was made and poured with type IV dental stone (Ultrarock Kalabhai Karson Ltd,

Mumbai, India). The master cast was duplicated for the fabrication of refractory cast. Prefabricated wax pattern was used to fabricate the framework pattern, C-clasp on 24 and 26 regions. Major connector design was of complete palatal plate with loops at the midline, for the retention of the acrylic denture base. After spruing of the framework, it was invested with phosphate bonded investment material (Wirovest, BEGO Germany). Burnout was done and mold was casted with co-cr alloy (Wironium plus, BEGO Germany). After sprue removal, finishing and polishing of the metal framework was

done with seating on the master cast and all the interferences were eliminated. The framework was tried in the patient's mouth (Fig 4). Acrylic resin record base was attached to the loops of the framework on the defect side. The wax occlusal rim was fabricated on the record base and jaw relation was recorded, followed by mounting, teeth arrangement, and try in.

During acrylization, the defect portion of the master cast was completely blocked out with plaster where the notches, both anteriorly and posteriorly were left uncovered. (Fig5). Then flasking, dewaxing and packing with heat cure acrylic resin was done (Trevalon Dentsply India, Gurgaon, India) maintaining the notches. The duplicated master cast was trimmed and only the defect portion was kept intact. Undercuts in the defect was blocked out with plaster. Double thickness of modelling wax was firmly adapted to the surface of defect, three nicks were made corresponding to the notches in the base, blocked out with plaster, flasked and processed with heat cure acrylic resin(Fig6). Later it was retrieved from the flask, finished and polished. This portion had nicks and the prosthesis with the framework had corresponding notches with them(Fig7). Later both nick and notch were oriented to each other and sealed with self-cure acrylic resin and polished(Fig8). The final prosthesis was inserted into the patient(Fig9).

At recall visits obturator bulb modification was done at periodic intervals to maintain patient comfort and function(Fig10).

Discussion:

Prosthetic rehabilitation of an acquired/congenital maxillary defect is through obturator. When the defect is large, restoration of speech, mastication deglutition, and esthetics are important concerns.⁶ since the weight of the obturator is often the most common reason to dislodge a denture, so it should be as light as possible.⁷ An obturator could be organized into 3 phases of treatment. ^{8,9,10,11} Immediate surgical obturator is constructed from an impression obtained prior to the operation day and inserted at the

completion of resection of the maxilla. This is called an immediate denture. An interim obturator is constructed 2 weeks after resection. Definitive obturator is fabricated 3-6 months after surgery and complete healing of the mucosa.^{12,13} Designs of the obturator may vary based on the defect classification. In linear design, support was taken from the remaining teeth and palate, rest seats were placed on the molars, premolar and canine. Many techniques have been proposed in reducing the weight of a prosthesis like ice incorporation¹⁴ salt technique and sugar technique¹⁵, use of vinyl poly silicoxane.¹⁶ There are many disadvantages of the above techniques as in ice and salt/ sugar technique, there is tendency of distortion of the shape due to pressure applied during packing. Vinyl polysilicoxane becomes hard on setting and removing it becomes cumbersome.

The use of the present nick and notch technique, though involves 2 separate steps in the fabrication of the hollow bulb, it's the simplest technique and gives desired results.

Conclusion:

Any prosthesis should be simple and easy to fabricate and should meet all the desired requirements. Nick and notch technique has shown to improve the quality of life of the patient by making it light weight and has also improved the masticatory efficiency, phonetics, esthetics and hygiene maintenance.

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