

A simplified method for the fabrication of obturator:a case report

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ABSTRACT: Palatal defects of any extent cause multiple problems to the patients, especially psychological. Speech, mastication and esthetics are the main concerns of the patients, restoring of which to its optimum will aid to restore patient's physical and psychological health. Obturator prosthesis creates a great technical challenge to the dentists as there is probably least mechanical retention as underlying tissue and the defect surrounds the denture. A prosthesis used to close the defects of palate in dentulous or edentulous patients is termed as obturator. In the present case, the patient was operated for hemi maxillectomy to remove recurrent fibrous tumor of maxilla. The patient was treated by giving a surgical obturator immediately after surgery, interim obturator and subsequently followed by placement of permanent obturator.

KEYWORDS: obturator, maxillectomy, palatal defect, oral rehabilitation, occlusal rest,

I. INTRODUCTION

Oral rehabilitation of hemimaxillectomy patients presents numerous technical and clinical challenges. Surgical resection of maxilla is followed by difficulty in speech, deglutition as well as esthetics. The Prosthodontist should carry the responsibility of restoring the oral form and function¹. The creation of a physiological barrier between defect and the tissue will help to re-establish patient's health to the optimum. Maxillofacial defects create extra oral asymmetry leading to facial disfigurement hence causing psychological trauma to the patient. This invariably leads to difficulty in accepting the social consequences. The basic principles^{2,3} are followed in making the obturator but utmost care is taken for resilient and unsupported tissue, most probably seen around the defect. Some principles have to be modified according to the defect and condition of the supporting structure. The defect with the remaining structure should be used to provide best retention, stability and support for the prosthesis.

Aim: Aim of this article is to provide the simplified approach in fabrication of surgical, intermediate as well as permanent obturator.

II. METHOD

We describe the construction of an obturator for a 36 years old lady who underwent partial maxillectomy procedure for recurrent fibrous dysplasia who reported to our department for the restoration of palatal defects (Fig.1). Dental cast was obtained prior to surgery and was mounted on semi adjustable articulator. An immediate obturator was then constructed and was inserted a day after surgery (Fig.2). The obturator was constructed using conventional cold cure acrylic resin. Retentive clasps were placed on the opposing unaffected side to obtain an adequate retention. The teeth were not placed, as risk of trauma to the resected healing tissue was difficult to avoid. The patient was recalled for regular surgical and prosthetic follow up at -1st week, 2nd week, 1st month,



fig 1 post operative



fig 2 surgical obturator

3rd and 6th month. (In every follow-up patient is checked for prosthesis compatibility, clasp adjustment, tissue healing and patient comfort etc.). The healing of palatal tissue was satisfactory at the end of 3 weeks, hence an intermediate obturator was planned. This step was taken as special care because fabrication of permanent obturator would have been arduous to the patient immediate after surgery. The impression was made with alginate (TROPICALGIN, normal setting, Zhermach, mfd- Delhi, India) and cast was poured with dental stone (GOLDSTONE, Asian chemicals, Vernal, Industrial area, Rajkot, Gujrat, India). The cast was surveyed and adjusted accordingly to gain favorable undercut area on premolars and molars. The challenge of making permanent obturator lies in its design. As the patient had undergone hemi maxillectomy, it demanded the fabrication of cast partial design with modification of certain principals of design. The rules of cross arch stabilization were born in mind and an important consideration while fabricating such prosthesis where opposing arch has no teeth to stabilize the denture. The distal occlusal rest seat was planned on 1st premolar and 1st molar while mesial occlusal rest seat was planned on 2nd premolar and 2nd molar. Rest seats were prepared using round diamond tip and final impression was obtained using putty- light body double (ZETAPLUS, Condensation silicone, Zhermach, BadiaPolesine (Rovigo), Italy) mix double impression technique. The cast was poured with type 3 dental stone using manufacturer's water: powder ratio. The master cast was duplicated using phosphate bonded investment (WIROVEST, Bego, Germany) material and wax pattern was fabricated using Bego pattern wax (Bego, Germany). Investing was done using Sabathstechnique⁴, which reduces the formation of air bubbles on casted metal. Centrifugal casting machine was used to cast the Co-Cr alloy. The further lab steps were finished and the metal framework was made ready for metal try in (Fig. 3).



fig 3 metal framework

After metal try in, jaw relation and wax bite were registered. There was certain amount of drooping of cheeks on the resected site around the zygomatic buttress region. Hence, we attached an approximately oval shaped wax block near the affected area to enhance the patient's profile. The framework was invested using double pour technique, 1st pour with dental plaster and 2nd with dental stone. The packing was performed with trial and final closure subsequently. The denture was cured using short curing cycle. The final denture was

processed and finished. The oval shaped ball, which was attached to the framework, was fabricated separately with the following easier steps.

- [1] Putty index of the bulb (wax) was taken
- [2] Dental stone was poured in hollow putty
- [3] Cold cure acrylic was adapted on stone in dough stage
- [4] After curing of acrylic, stone was removed from within inside using TC bur
- [5] The hollow bulb was ready to be attached on the finished framework at the predetermined site, which was already encircled on framework
- [6] The bulb was attached to the finished framework by adding cold cure acrylic at the junctions

The final framework was tried in patient's mouth and approval for esthetics was taken (Fig. 4). There was reasonable increase in patients esthetics and facial profile. Patient was explained the postoperative maintenance of the prosthesis as well as its limitations. The prosthesis was retentive and secured well against gravitational forces.



fig 4 post insertion

III. DISCUSSION:

The occurrence of Aramani's class I⁵ type of obturator is not an uncommon phenomenon. The patient visits the doctor with not only physical but also mental trauma due to severely compromised facial appearance. Mere fabrication of obturator is not the role of Prosthodontist; it's our duty to optimize the patient's appearance and function. The case discussed here was more critical as patient had undergone multiple surgeries and was a middle-aged lady patient. The fabrication of surgical, intermediate and permanent prosthesis was a step-by-step phenomenon to restore patient's oral health and also to encourage patient by giving much better treatment, each time the patient visits us. Surgical prosthesis was inserted for 2-3 weeks followed by insertion of intermediate prosthesis. Sufficient time was given to the patient until the fabrication of the permanent prosthesis so that patient could be rehabilitated gradually and also aid in improving her speech and appearance. The design of permanent prosthesis was crucial^{6, 7} to ensure the cross arch stabilization⁸. Alternative retentive and reciprocal arm were designed on premolars and molars respectively on facial side⁹ and vice versa from palatal side for the same reason. The fabrication of hollow bulb separately using putty index of wax template with cold cure resin was new, simplified and time saving method. It restored the patient's appearance without compromising any basic principles. Hollow bulb provides added benefit as it reduces the weight of the prosthesis and even more important, it reduces the cantilever on edentulous site. Use of soft liner on the surgical site would have proved beneficial by providing cushioning effect but this was avoided as it needs repeated maintenance, hence it's better to avoid using them for definitive maxillofacial prosthesis and their use should be limited to recently created defects¹⁰.

Key message: It is easy to process hollow bulb obturator in two parts and joining them together¹¹. The technique used for the fabrication of hollow bulb is new, time saving and also accurate.

IV. CONCLUSION

Definitive prosthodontic treatment is one of the most important therapies, which should be aimed to alleviate any anatomical and functional deficiencies¹². The multi speciality approach¹³ is important in such cases.

Prosthodontist should provide the best possible treatment and should enhance patient's oral condition as well as mental status. Thorough knowledge coupled with a better understanding of the patients need, will surely provide a better prosthesis thereby rehabilitating the patient successfully.

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