

## Recreating lost smile - A definitive obturator.

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### Abstract

Acquired or congenital maxillectomy defects may cause oroantral communication that leads to nasal regurgitation, difficulty in chewing and swallowing, speech problem, and facial deformities. Obturator prosthesis act as an important mode of rehabilitation for these defects. In this paper, an obturator prosthesis fabrication with a metal framework design, for maxillary defect is discussed. A linear design was formulated as given by Mohamed A. Aramany. Occlusal rests were prepared on the maxillary left premolars and molars. Complete palatal major connector was planned so that maximum amount of the masticatory load would be distributed to the underlying tissues. Direct retention was provided by the embrasure clasps. Thus, this definitive prosthesis helped to restore back the lost structures and function by closing the communication between different cavities.

**Key words-** Acquired defect, Definitive obturator, Maxillectomy.

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### Introduction

Depending on the origin, the maxillary defects are categorised into congenital or acquired. Defects which are acquired in nature are caused due to trauma or surgical excision of lesions involving the paranasal sinus, tumor of palatal region, or minor salivary glands requiring a partial or a radical maxillectomy.<sup>[1]</sup> Presence of oro-nasal communication predispose the patients to the alteration of speech with nasal intonation, efflux of fluid into the nasal cavity, impaired chewing ability, and cosmetic disfigurement to some extent. In most instances obturator prosthesis can minimize or eliminate the discomfort related to the defects.<sup>[2]</sup> Prosthetic rehabilitation is mostly done in a large maxillary defect with remaining teeth for retention, support, and stability, compared to surgical reconstruction. Surgical reconstruction results in a flap often bulky and distorts the contours of the palate and reduces the space for tongue, affecting

speech, articulation, and bolus control. Moreover, a removable partial denture is still required after surgical repair to rehabilitate the missing dentition.<sup>[1]</sup>

The dimension of obturator is depended on the defect size, characteristics of its lining tissue, and functional needs for stabilization. The obturator should extend as far as possible up to the lateral wall of the defect. Extension of the prosthesis in lateral side increases retention, stability and gives support to the cheek and lip.<sup>[1]</sup>

Depending on the timing of treatment, obturator can be three types<sup>[3]</sup>

- a) Surgical Obturator Prosthesis
- b) Interim Obturator Prosthesis
- c) Definitive Obturator Prosthesis

Approximately six months after surgery, the defect size, the healing process, prognosis, the functional ability of the current obturator,

and the number of teeth present, influence the planning of fabrication for a definitive obturator.<sup>[4]</sup>

### Case Report

A female patient of 21 years age came to the Department of Prosthodontics and Crown & Bridge for the restoration of maxillectomy defect. The chief complaint of the patient was nasal regurgitation and nasal intonation. Patient had undergone surgery, from a definitive diagnosis of systemic lupus erythematosus on biopsy, seven months back. After intra-oral examination it was seen that surgical defect was present in the right maxillary region, which involved a part of the hard palate, alveolar ridge, buccal sulcus, and a portion of maxillary tuberosity resulting in an oroantral communication (Figure 1). All the teeth on the right quadrant of the maxilla were extracted. The defect was categorised into Aramany's Class I maxillary defect.<sup>[5]</sup> It was planned to restore the patient with a definitive obturator having a cast metal framework as sufficient teeth were present on the contralateral side for retention, stability, and support of the prosthesis.

- At first, the unwanted undercut area of the defect was blocked with a betadine-soaked gauze piece prior to impression making and was tied with dental floss for easy removal. The primary impression was made using irreversible hydrocolloid (Algitex, DPI) (Figure 2) and was poured with Type IV gypsum material (Kalstone, Kalabhai) for fabrication a primary cast (Figure 3).
- A surveyor (Marathon Surveyor 103) was used for designing the framework on the primary cast (Figure 3). Linear design for Class I defect was considered for this young patient to avoid the unesthetic appearance of clasp on central incisor with complete palatal major connector. Embrasure clasps was planned as direct retention was provided by the buccal

surfaces of the 24, 25 and palatal surfaces of 26,27.

- Rest seat preparation was done on 24,25,26,27.
- Low fusing impression compound (DPI pinnacle tracing sticks) was used for border molding, and medium viscosity addition silicone (Reprosil, Dentsply Caulk, USA) was used for final impression of defect, (Figure 4). The cast pouring was done by type IV gypsum material (Ultrabase, Kalabhai) (Figure 5).
- Master cast was transferred to the surveyor, teeth preparation was checked, metal framework design was drawn and blockout was done for duplication (Figure 6).
- Wax pattern was fabricated on the refractory cast (Wirovest, Bego, Germany) and casting was done. The cast framework was checked intraorally for proper fit and retention (Figure 7 and 8).
- Jaw relation recording was done, and after teeth arrangement try-in was done (Figure 9).
- The prosthesis was fabricated by flasking, dewaxing and finally by heat-cured polymethyl methacrylate resin (DPI, India). After retrieval it was finished and polished adequately.
- After necessary occlusal adjustment, the prosthesis was delivered to the patient. Instructions were given for maintaining oral hygiene and cleaning of the prosthesis (Figure 10, 11, 12 and 13).

### Discussion

All obturator prosthesis must follow the basic prosthodontic principles of wide stress distribution, using a rigid major connector for cross arch stabilization, and stabilizing and minimizing the dislodging functional forces<sup>[6]</sup>

In the present case linear design was selected for cast metal framework. According to Miller <sup>[7]</sup> “a unilateral design requires bilateral retention and stabilization on the same abutment teeth.” Retention and reciprocation system present diagonally was planned here. Retentive component was placed on the buccal surfaces and the palatal surfaces of the premolars the molars respectively and stabilizing components were placed on the vice-versa. The metal framework provides longevity, proper adaptation, and thermal conductivity of the prosthesis.<sup>[6]</sup> Weight and bulkiness of the framework may be a limitation of this case report.

The teeth present intraorally after surgery provides retention, support, and stability to the prosthesis as inadequate retention is the most common problem. <sup>[1]</sup> The teeth present on ridge, lateral side of defect, undercut present in soft tissue and scar band provide retention. In this case report, height of the lateral wall was used for indirect retention as it would prevent the vertical displacement of the prosthesis.<sup>[8]</sup> During the seven months' time the interim obturator was relined few times as the soft tissue of the defect changed rapidly during organization and healing period.

Assessment of the definitive prosthesis was done immediately after delivery by asking the patient to swallow water and checking for nasal regurgitation. No nasal regurgitation was seen and sounds of nasal consonants, i.e., /m/n/, and/ng/ was as low as in normal individuals. <sup>[9]</sup>

Proper occlusion helps to achieve stability. Maximal force distribution is essential to reduce the prosthesis movement during function specially in eccentric jaw position and the resultant forces on the underlying structures. Nonanatomic posterior teeth are preferred on edentulous resected maxilla.<sup>[10]</sup> The prosthesis can be rebased to compensate

for the dimensional changes that occurs due to scar contracture and further wound organization. Therefore, the occlusion and base adaptation should be evaluated frequently.<sup>[5]</sup>

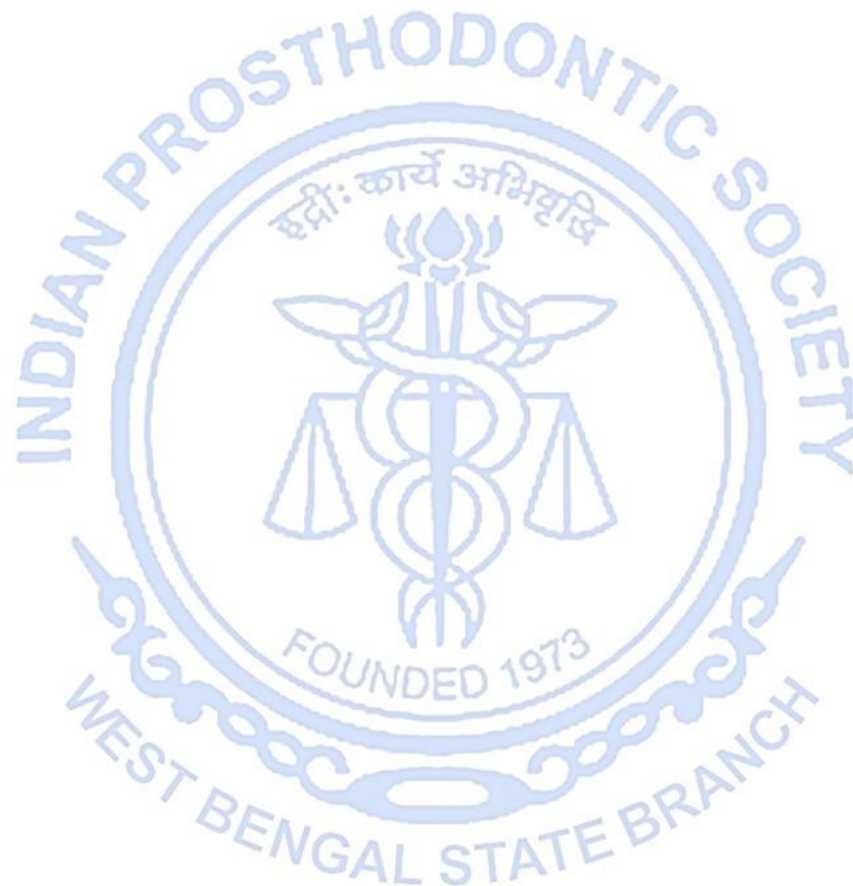
It is a challenging job to provide a better quality of life to the patient of maxillectomy in comparison to conventional prosthesis. These patients should be approached together from the surgical and prosthetic rehabilitation specialists with their skill, knowledge, and experience.

## References

1. Sharma AB, Beumer J. Reconstruction of maxillary defects: the case for prosthetic rehabilitation. *Journal of oral and maxillofacial surgery*. 2005 Dec 1;63(12):1770-3.
2. Rieger J, Wolfaardt J, Seikaly H, Jha N. Speech outcomes in patients rehabilitated with maxillary obturator prostheses after maxillectomy: a prospective study. *International Journal of Prosthodontics*. 2002 Mar 1;15(2):139-44.
3. Beumer III, Curtis TA, Firtell DN. Maxillofacial rehabilitation. Prosthodontic and surgical considerations. St Louis, Toronto, London: The CV. Mosby Co.; 1979. p. 188-243
4. Singh M, Bhushan A, Kumar N, Chand S. Obturator prosthesis for hemimaxillectomy patients. *National journal of maxillofacial surgery*. 2013 Jan;4(1):117-20.
5. Aramany MA. Basic principles of obturator design for partially edentulous patients. Part II: design principles. *The Journal of prosthetic dentistry*. 1978 Dec 1;40(6):656-62.
6. Kumar J, Kandarpale MB, Aanand V, Mohan J, Kalaignan P. Definitive obturator for a maxillary defect. *Journal of Integrated Dentistry*. 2017;2(3):1-4.



7. Miller EL, Grasso JE. Removable partial prosthodontics. Williams & Wilkins; 1981.
8. Keyf F. Obturator prostheses for hemimaxillectomy patients. Journal of oral rehabilitation. 2001 Sep;28(9):821-9.
9. Kumar P, Jain V, Thakar A. Speech rehabilitation of maxillectomy patients with hollow bulb obturator. Indian Journal of Palliative Care. 2012 Sep;18(3):207-12.
10. Aramany MA. Basic principles of obturator design for partially edentulous patients. Part I: classification. Journal of Prosthetic Dentistry. 1978 Nov 1;40(5):554-7.



**FIGURES**



**Figure 1**



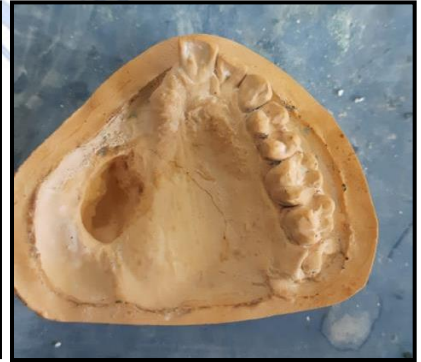
**Figure 2**



**Figure 3**



**Figure 4**



**Figure 5**



**Figure 6**



Figure 7



Figure 8



Figure 9



Figure 10



Figure 11





**Figure 12**



**Figure 13**

