

### **Prosthodontic Rehabilitation Of A Patient With Acquired Maxillary Defects Using Different Obturator Prosthesis: A Clinical Case Report.**

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#### **Abstract**

*Maxillary defects can be congenital or acquired. Congenital defects include trauma, infection or surgical treatment of benign or malignant neoplasm. The maxillary defects affect the swallowing, mastication and speech thereby reducing the quality of life. Prosthodontists play an important role in rehabilitating maxillary defects. These defects can be rehabilitated using simple conventional obturator or by surgical reconstruction. This case report describes step by step clinical lab procedure for fabrication of surgical, interim and definitive obturator prostheses for rehabilitation of a patient with maxillary defects.*

**Keywords: Delayed surgical obturator, interim obturator, definitive obturator, maxillectomy, rehabilitation, closed hollow bulb obturator.**

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#### **Introduction**

Obturator prosthesis plays an important role in the recovery of oral function in post surgical maxillectomy patients.<sup>[1]</sup> It also helps in restoring masticatory function and improving speech, swallowing, deglutition and esthetics.<sup>[2-5]</sup> The Glossary of Prosthodontic Terms defines an obturator as “A maxillofacial prosthesis used to close a congenital or acquired tissue opening,

primarily of the hard palate and/or contiguous alveolar or soft tissue structures”.<sup>[6]</sup> The primary goal of a prosthetic obturator is closure of maxillectomy defect and separation of oral cavity from sinonasal cavities.<sup>[7]</sup> Prosthodontic management of patients with acquired surgical defects can be classified into 3 phases based on treatment.<sup>[8,9,10]</sup>

- a) Surgical obturator: Immediate Surgical obturator and Delayed Surgical obturator
- b) Transitional obturator or Interim obturator or Post surgical obturator
- c) Definitive obturator

Surgical obturator: This prosthesis allows patient to take nourishment without nasogastric tube, enables patient to speak normally and promote healing of the surgical wound. Delayed surgical obturators are prostheses that are placed 6 to 10 days postsurgically.<sup>[11]</sup>

Interim obturator: This obturator is given after initial healing period and is fabricated from the post surgical impression cast. The patient is recalled every 2 weeks for relining or changing of the prosthesis because rapid soft tissue changes occurs within the defect.

Definitive obturator: It has to be fabricated after complete healing of the surgical wound. Fabrication can be carried out at

around 6 months after surgery. Timing will vary dependent on the size of the defect.

This article illustrates a step wise method of rehabilitating a patient with acquired maxillary defect using surgical, interim and definitive single piece closed bulb obturator prosthesis.

### Case Report

A 65 year old female patient, who had undergone surgery for a maxillary tumor (squamous cell carcinoma) on the left side of the maxilla reported to the Department of Prosthodontics, postsurgically after 7 days for rehabilitation. Patient had undergone maxillectomy a week ago and was fed through naso gastric tube (Fig1).

Patient complained about



Figure 1: Extra oral pre - treatment

nasal regurgitation of fluids, difficulty in chewing, speaking and compromised esthetics. Extra oral examination revealed the presence of nasogastric tube, depressed philtrum and cheek areas on the left side that restricts mouth opening. On intra oral examination, defect was noticed on the left side of the maxilla involving alveolar ridge, anterior and posterior part of hard palate and some parts of the soft palate (Fig 2).



Figure 2: Intra oral view of the defect

The defect was classified as Aramany's class IV defect.<sup>[12]</sup> Missing teeth were 11,21,22,23,24,25,26,27 and 28. All the teeth in the right quadrant were intact. Surgical site was inflamed and not healed. OPG was taken (Fig 3).

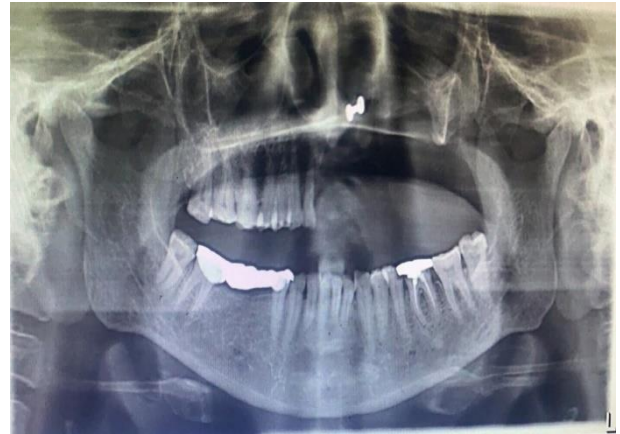


Figure 3: OPG showing the extent of maxillary defect.

A delayed surgical obturator was planned followed by interim and definitive obturator.

### Procedure

#### 1) First visit

After thorough clinical examination, Delayed surgical obturator was planned. Surgical defect was closed using gauze piece coated with petroleum jelly and Impression was made using irreversible hydrocolloid. Cast was poured using Type III gypsum product. Undercut areas in the casts were blocked with dental plaster. Circumferential clasp on premolar and Adams clasp on molars were given on

the non resective side for retaining the prosthesis (Fig 4).

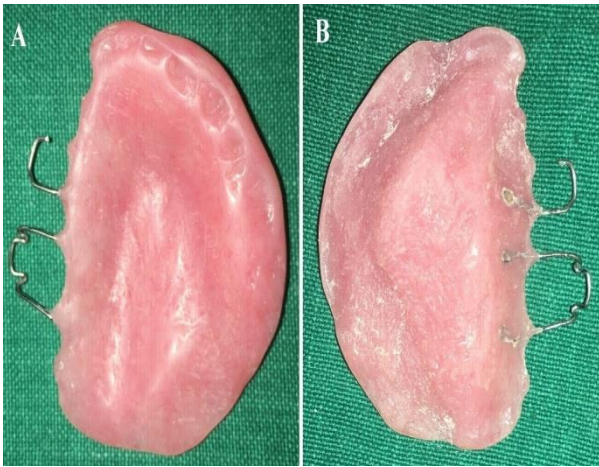


Figure 4: Delayed surgical obturator.

Prosthesis was delivered and post insertion instructions were given to the patient regarding its hygiene and maintenance. Patient referred back to department of Oncology for removal of nasogastric tube and for radiation therapy. Patient was recalled after 10 days.

## 2) Second visit

Patient reported back after radiation therapy. Surgical defect was examined and healing was satisfactory and was suitable for the fabrication of Interim obturator. Restricted mouth opening was noted (Fig 5).



Figure 5: Restricted mouth opening.

Primary impression of maxillary arch along with defect was made using irreversible hydrocolloid using custom made acrylic tray. A wrap around clasp was adapted on the remaining teeth of the non resective side (Fig 6).



Figure 6: Primary cast with wrap around clasps.

Jaw relation was carried out followed by try in and insertion of interim obturator prosthesis (Fig 7).





Figure 7: Insertion of interim obturator prosthesis.

Patient recalled every 2 weeks for periodic evaluation and relining.

3) **Third visit**

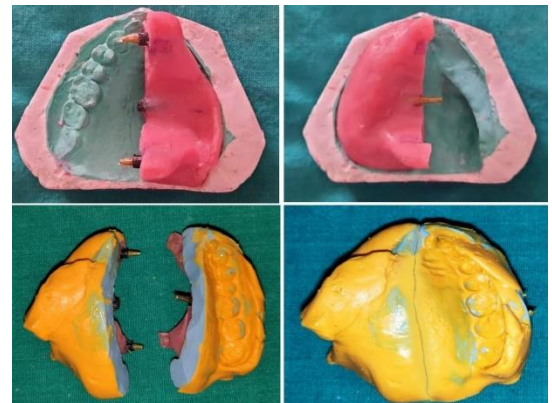
Definitive obturator was planned after 6 months. Surgical site was evaluated for satisfactory healing (Fig 8).



Figure 8: Intra oral view of defect after 6 months.

Since restricted mouth opening (23mm) was observed, sectional

custom impression tray was fabricated using dowel pin and sleeves and impression was taken using elastomeric impression material (Fig 9).



Master cast was poured and cast partial

Figure 9: Sectional custom tray with dowel pins and sleeves and custom tray impression.

denture framework was planned using 3D printing technology. Framework was tried in patient's mouth followed by jaw relation (Fig 10).

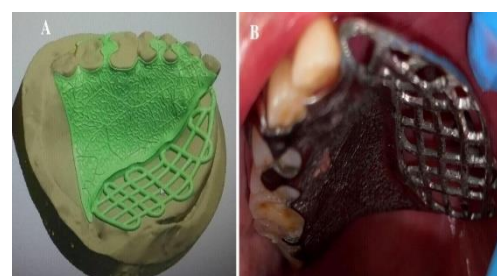


Figure 10: 3D design of framework & cast partial metal framework

Try in was done followed by insertion of definitive obturator prosthesis (Fig 11).

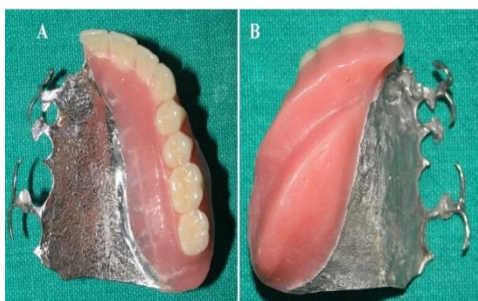


Figure 11: Definitive obturator prosthesis.

Post insertion instruction were given and patient recalled for regular check up (Figure 12).



Figure 12: Pre and Post - operative view.

## Discussion

In patients with surgically defective maxilla, the most common prosthesis of choice for rehabilitation is the obturator. The degree of obturator extension in to the

defect varies according to its configuration, characteristics of lining tissue, and functional requirements for stabilization, support and retention of the prosthesis.<sup>[13]</sup> Fabrication of prosthesis in case of post surgery of maxillary defect is extremely important for restoring mastication, speech, respiration and esthetic when large amount of oro-facial structures are lost.<sup>[14]</sup>

It has been reported that patient has undergone maxillectomy, radiotherapy, trauma, burns etc may present with limited mouth opening<sup>[15,16]</sup>. In this present clinical report patient had restricted mouth opening and it was difficult to make impression using metal stock tray. Sectional custom impression tray with dowel pin attachments were used.<sup>[17]</sup> Advantage of sectional custom tray is that it can be removed as two separate segments and externally assembled as one. Dowel pins are economical and are easily available.

Mainly two types of obturator prosthesis are available: open and closed hollow bulb. In this present case closed hollow bulb

obturator is used as it prevents water retention and food accumulation, it is also easy to clean and has reduced weight. Open bulb obturator tends to accumulate food, debris and mucous inside the hollow part increasing its heaviness and also difficult to clean and polish.

In this present case, delayed surgical, Interim obturator and cast partial denture framework attached definitive obturator were fabricated. Park and Kwon suggested the use of delayed surgical obturator as an alternative to immediate surgical obturator during the initial healing phase after maxillectomy, with out increasing patients discomfort.<sup>[18]</sup> It was fabricated to create a barrier between oral and nasal cavity, and also enable the patient to start with an oral diet. Major limitation of delayed surgical obturator was lack of esthetics during early rehabilitative phase and this was overcome by the second phase of rehabilitation i.e, Interim obturator.<sup>[19]</sup> Interim obturator was fabricated 20 days postsurgically. Interim obturator was used to protect post surgical

defect from fluid contamination and resultant infection till complete closure of the defect occurs<sup>[20]</sup>

Definitive obturator was fabricated with cast partial metal framework. The advantages of the cast metal framework are the longevity of the prosthesis and thermal conductivity which made it sensitive to temperature changes. <sup>[21]</sup>

### **Conclusion**

The challenges faced in rehabilitating a hemi-maxillectomy patient is to fulfill the basic requirements of adequate retention, stability and support. Prosthodontist play a vital role in complete rehabilitation of the palatal defect. In this present case report deals with oral rehabilitation of palatal defects with delayed surgical, interim and definitive obturator has not only improved the psychological health and esthetic of the patient but also uplifted the quality of life.

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