

## Case Report

# Rehabilitation of Phonetic, Esthetics and Function in Subtotal Maxillectomy Defect by Cast Partial Obturator: A Case Report

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### To cite this article:

Nancy Raj, Rajesh Bansal. Rehabilitation of Phonetic, Esthetics and Function in Subtotal Maxillectomy Defect by Cast Partial Obturator: A Case Report. *International Journal of Clinical and Developmental Anatomy*. Vol. 5, No. 2, 2019, pp. 8-10.

doi: 10.11648/j.ijcda.20190502.11

Received: January 24, 2019; Accepted: March 28, 2019; Published: December 24, 2019

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**Abstract:** Rehabilitation of hemimaxillectomy defects with prosthetic obturator can be challenging in term of providing adequate retention, support and stability to the prosthesis and expected outcome. Nasal reflux and hypernasal voice are the two major sequel after surgery that can affect patient social involvement and can have great psychological impact. The prosthodontist is limited by the properties of the materials available for facial restorations, the mobility of soft tissue surrounding the defects, the difficulty of establishing retention for large prosthesis, and the patient ability to accept the outcome. The outcome of prosthesis can be improved remarkably due to better coordination between surgeon and prosthodontist and careful designing of prosthesis. Dramatic improvement in the acceptance of prosthesis is seen if the prosthodontist participation can begin early in the course of patient care which ultimately will increase the quality of life (QOL) of the patient.

**Keywords:** Subtotal Maxillectomy, Obturator, Cast Partial, Phonetics, Quality of Life

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## 1. Introduction

Rehabilitation of patient with congenital or acquired defect can be challenging depending on aetiology of defect. Among all the intraoral defects, maxillary defects are most common with predictable prosthetic outcome. Depending upon aetiology these defect can be congenital or acquired like trauma or due to surgery. Most of the surgical defects accounts due to malignant tumours and very few are acquired due to trauma. Depending upon site and size of defect it can lead communication to nasal cavity, nasopharynx or antrum. Maxillary defect may produce anatomical and functional deformity problem related to mastication, articulation, deglutition and fluid secretion to nose, which might affect quality of life [1]. The prosthesis use to create rigid platform between two cavities is called obturator. The goal of prosthetic rehabilitation is to allow mastication and adequate articulation,

support of the soft tissue to restore midfacial contour and acceptable esthetic result.

## 2. A Case Report

A 37 year old male patient reported to the department of oral surgery with the chief complaint of swelling and difficulty in deglutition. The patient was referred from oral surgery to department of prosthodontics for surgical obturator [2]. He had undergone surgery for squamous cell carcinoma of maxilla. After 10 days of surgery patient come for interim obturator. Intraoral examination of the patient showed subtotal maxillectomy of the right side which could be categorized under Aramany class II situation [3, 4]. The tooth missing were 13, 14, 15, 16, 17. There was slight gingival recession on 33 and 43 but no mobility or pockets were present (Figure 3). Patient showed difficulty in speech, deglutition with reduced mouth opening.

### 3. Treatment Plan

The initial treatment was to deliver interim obturator along with mouth gag which facilitate maximum mouth opening and improves the quality of life [5]. After every 2 weeks patient was recalled for relining as there occurs soft tissue changes during healing. 6 months after surgery when surgical site has healed and tissue become dimensionally stable, a definitive hollow cast partial obturator considering support, stability, retention and longevity was fabricated [6]. A gauze piece was packed in the defect and impression was made with irreversible hydrocolloid. Custom tray fabricated was fabricated. Impression was boxed and then poured in type III stone. Stone cast is made and acrylic resin custom tray is fabricated on it (Figure 1).

Tray is border molded in mouth with wax and rubber base impression made of intact maxilla. The cast was then surveyed. It was designed to give a full coverage palatal strap framework. In the present case, arch form is square which is conducive for support and the remaining posterior teeth and palatal tissues provides stability for the prosthesis. Fixed splinting of all remaining teeth done to dissipate the stresses directed to primary abutment teeth. Retention was achieved by use of simple circlet clasp on first premolars and embrasure clasp on molars and partially by anatomic undercuts. Indirect retention was given on cingulum of canine and occlusal rest distooocclusal surface on first premolar and on molars to minimise movement of prosthesis towards the tissue (Figure 2).



Figure 1. Cast with maxillary defect.



Figure 2. Metal framework with teeth setting.

1. To remove the prosthesis several times a day to wash the

prosthesis and rinse the mouth.

2. Prosthesis to be cleaned thoroughly every evening.
3. Patient advised not to wear prosthesis while sleeping.



Figure 3. Obturator insertion.



Figure 4. Right side occlusion view.



Figure 5. Left side occlusal view.

### 4. Discussion

For reconstruction of surgical acquired defect, several treatment approaches have been advised, including prosthetic obturators, non-vascularised grafts and free tissue transfer. Definitive correction of the abnormal oronasal or oroantral communication can be done by reconstructive surgery with surgical flap, but requires technical expertise and is associated with possibility of donor morbidity at the flap harvest site and increased procedure time [7].

In contrast, immediate and adequate dental rehabilitation can be done with fabrication of an obturator and it also reduces the procedure time. Most important advantage of obturator prosthesis is surgical site can be easily examined after removing the prosthesis and recurrence of tumour may be detected in a timely manner.

Depending upon timing at which obturator has been delivered maxillary obturators can be divided into:

1. Surgical obturator- use just immediately after surgery
2. Interim obturator- usually two week after surgery

3. Definitive obturator- generally six month after surgery. Time may vary according to site and size of defect.

Commonly used materials for the fabrication of obturator prostheses are silicon, polymethylmethacrylate (PMMA), titanium and cobalt chrome alloy [8].

For prosthodontic rehabilitation, retention and stability of maxillofacial prosthesis is prime concern as distal most abutments near the defect has more rotational forces which leads to dislodgement of obturator. Designing of obturator must be done carefully as preservation of what left after surgery is prime concern to the prosthodontist.

All rule of RPD designing are followed, in addition, many unique considerations involved in the design are provided by the nature of the problem and the treatment required [7]. Among these are (a) the location and size of the defect, relates to the remaining teeth; (b) the importance of the abutment tooth adjacent to the defect, (c) the usefulness of the lateral scar band, which flexes to allow insertion of the prosthesis but tends to resist its displacement; and (d) the use of the surveyor to examine the defect for the purpose of locating and preserving useful undercuts or eliminating undercuts. The bony margin of the surgical defect often becomes an important fulcrum when the obturator is fully seated and loaded [9].

The prognosis of the obturator will improve with (a) the size (amount remaining after surgery) and curvature of the arch; (b) the quality of the tissue covering the ridge and lining the defect; (c) an abutment alignment that is curved instead of linear; and (d) the availability of teeth on the defect side for support and retention.

Many designs require full coverage of the remaining palate for maximum support. In all instances, the gingival margins should be relieved when they are crossed by the major connector to avoid impingement during function [10]. The uncovering of the gingival margins in such a design should be discouraged because it is not a replacement for good oral hygiene and is probably not necessary for tissue stimulation if good hygiene is practiced.

However, introduction of dental implant which has dramatically improved the retention and esthetic that result from accurate and repeatable positioning of the implant, and the ease of maintenance

The prosthetic rehabilitation may improve function and self-esteem of patients after the re-establishment of facial deformations. A surgical reconstruction is generally very difficult and often fails to provide satisfying results. Facial prostheses have the advantage of not only improving the patient's appearance, but also enabling early rehabilitation, making it possible for the inspection of the affected area, shortening surgery and hospitalisation time, lowering

treatment cost and allowing the patient early psychosocial re-integration [10].

## 5. Conclusion

Subtotal and total bilateral maxillectomy defects represent a complex challenge for the maxillofacial prosthodontist. A preplanned multidisciplinary approach is required for the success of the treatment.

In this clinical report, preoperative treatment planning involving the head and neck surgeon, the maxillofacial prosthodontist, and the speech pathologist resulted in a delayed/interim obturator that enabled the patient to speak and swallow successfully. The technique described in this report could be performed chairside on a definitive obturator in situations in which access to critical anatomical structures is adequate.

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