

# Prosthetic Rehabilitation of a Patient with a Large Mid Face Defect Secondary to Basal Cell Carcinoma

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**Abstract** The art of maxillofacial prosthetics restores esthetics and function in patients with gross developmental or acquired defects of face and helps them to restore hope and ambition to lead a useful life. This valuable service provided by maxillofacial prosthodontist lifts the morale of the patient and thus aids in physical well being and quality of life. Diagnosis and treatment planning should include attention to each detail prior to rehabilitation process. This paper describes a clinical case of mid face defect due to basal cell carcinoma, rehabilitated with facial prosthesis and intraoral obturator.

**Keywords** Acquired mid face defect · Basal cell carcinoma · Orbital prosthesis · Nasal prosthesis · Lip prosthesis · Obturator

## Introduction

Advanced tumors of the mid facial region, although slowly and locally invasive, occasionally require extensive

surgical removal to eradicate the disease. The resulting surgical defect may involve loss of both extraoral and intraoral structures, including portions of the nose, upper lip, cheek, and orbital contents. The functional impairment produced by such extirpative procedures may be severe [1].

Basal cell carcinoma, also known as rodent or mariner's ulcer is the most common malignancy in humans. BCC occurs most frequently in persons in the fourth decade of life or later the male-to female ratio is approx. 3:2. Mortality rates are reported low. It develops most frequently on the exposed surface of the skin, the face and the scalp in middle aged or elderly persons. BCC is never seen in the oral cavity unless it arrives there by invasion and infiltration from a skin surface. The commonest area is the face above a line drawn from the angle of the mouth to the lobe of the ear. It is a slow growing and rarely metastasizes, but it can cause significant local destruction and disfigurement if neglected or treated inadequately [2]. Recurrence is a frequent problem with basal cell carcinoma of the skin, especially in the nose and ear regions.

## Etiology

1. Ultraviolet radiation (most common)

Chronic sun exposure is important in the development of BCC.

A long patency period of 20–50 years is typical between the time of UV damage and clinical onset of BCC.

2. Chemicals such as arsenic.
3. Immunosuppression (oncogenic types of human papilloma viruses).
4. Syndrome like xeroderma pigmentosum (due to an inability to repair UV-induced DNA damage)

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Wide surgical excision of basal cell carcinoma is generally the treatment of choice for most lesions about the face since irradiation, especially in the vicinity of the eye, tip of the nose, or ear, often causes complication. These tumors frequently manifest an *iceberg* behaviour in which the skin appearance does not denote the true lateral and deep expansion. This is followed by functional and cosmetic repair to restore the patient more quickly to an acceptable role in society [3].

#### Requirements for the Materials Used for Facial Prostheses

1. *Esthetics* The completed facial prostheses should be unnoticeable in public, faithfully reproducing lost structures in the finest detail. Its color, texture, form and translucence must duplicate that of missing structures and adjacent skin.
2. *Fabrication* Materials that can be processed with readily available instrumentation, provide sufficient working time and should be adaptable to intrinsic as well as to extrinsic coloration.
3. *Physical properties* The prostheses should possess sufficient flexibility for comfortable use on movable tissue beds, should be dimensionally stable, light in weight, and possess suitable edge strength to permit thinning or feathering of margins.
4. *Biologic and chemical properties* The materials should remain stable when exposed to environmental insults such as ultraviolet rays, oxygen, secretions, and adhesives. It should not be toxic, allergic, or carcinogenic, and it must be biocompatible. Resistance to stains is a distinct advantage, for it allows use of cosmetics to camouflage margins. It is highly desirable that the prostheses be durable and has the capability of being used without significant compromise of esthetics and physical properties for at least 6 months.

#### Clinical Report

A 28-year-old male patient reported to the department of prosthodontics with a large mid face defect involving the left eye, nose, upper lip and premaxilla (Fig. 1). A review of the medical and dental history revealed that the patient was operated for basal cell carcinoma of nose. There was history of repeated surgeries (eight times) to excise the recurrent basal cell carcinoma. Extensive pigmentation and multiple scar marks with variable degree of tissue bed mobility were encountered in these defects. The functional disabilities, in combination with the accompanying cosmetic disfigurement had a poor psychological impact on the patient.



**Fig. 1** Extra oral view of defect

The intraoral examination revealed a total maxillectomy of the anterior maxilla. The presented defect situation corresponds to a Class VI situation according to the Aramany classification of defects [4, 5]. Teeth present in the maxillary arch were 15, 16, 17, 24, 25, 26, and 27. Mandibular arch was fully dentate. Mandibular movements were within the normal range. Tongue function was normal and speech was altered due to oro-antral communication.

#### Treatment Plan

A planned and cost effective protocol was adopted to restore cosmetic appearance and function. The decision was made to rehabilitate the patient with a nose and eye prosthesis attached by means of screws to spectacles. The lip prosthesis was fabricated in conjugation with the intraoral obturator using metal studs.

#### Procedure

The impression of the face was made using impression compound followed by a corrective impression using alginate (Fig. 2). The impression was poured in dental stone to fabricate orbital and nasal prosthesis (Fig. 3).

A complete arch impression was then made with elastomeric impression material. The master cast was duplicated and a wax pattern for cast metal framework was fabricated. Regular casting and polishing procedures were followed. The cast metal framework was checked intraorally for retention and fit. The framework was used to make a functional impression of the defect using polyvinyl siloxane silicone impression material. With the conventional method jaw relation and teeth arrangement were done. Try in of the obturator with metal studs was done.



**Fig. 2** Compound impression of the defect



**Fig. 4** Intra oral obturator with clips to retain lip prosthesis



**Fig. 3** Stone model of the defect



**Fig. 5** Intra oral obturator and lip prosthesis

(Fig. 4). Metal studs were incorporated in the wax pattern to retain lip prosthesis (Fig. 5).

Wax pattern of the lip prosthesis was checked. Acrylic resin was used to fabricate the prosthesis and intrinsic stain used to make it look natural. To mask the border discrimination it was decided to incorporate artificial moustache in the final prosthesis.

The wax pattern for nose and eye prosthesis was checked on the face. The prostheses were processed with acrylic resin. Artificial eyelashes were used to impart a natural look. The prostheses were stained intrinsically. Since the retention of the prosthesis was poor it was decided to use

spectacles and screws to retain the two prostheses to the eyeglass frame. The prosthesis was finished and polished (Figs. 6, 7, 8). The patient was given training and post insertion instructions for maintenance. The post insertion follow up and patient care was carried out at prescribed intervals of time. The patient was found to be satisfied with the function and esthetics of the prosthesis.

### Discussion

To construct a satisfactory facial prosthesis, the material, retention, and esthetics should be considered. Retention is one of the most important considerations in fabricating a successful facial prosthesis. Different methods based on mechanical devices or adhesives have been discussed in literature. Mechanical devices such as eyeglass frames are not useful in patients with a flat residual tissue bed and gravity may cause vertical displacement. Adhesives may be



**Fig. 6** Orbital and nasal prosthesis attached to eye glass frame



**Fig. 7** Try in of orbital and nasal prosthesis



**Fig. 8** Extra oral view of orbital, nasal and lip prosthesis

irritating and damage the thin margins of the prosthesis during removal. In the last two decades, osseointegrated implants have been used for improving support and retention of the facial prostheses. However, they can not be used in children and unpredictable tumor sites so practitioners should consider other methods to improve retention.

In the present case the tumor had invaded the nasal bone, left eye, the upper lip, and premaxilla. There is evidence that speech can be restored to a pre-operative level with the maxillary obturator prosthesis [6]. Retention of the eye and nasal prosthesis was accomplished using eyeglass frames and metal studs for lip prosthesis. The effectiveness of the nasal prosthesis was compromised due to large extent of the lesion that resulted in exposure of the lines of juncture. This was partly masked by the spectacles. Providing adequate retention and airway in nasal prostheses should be considered as it can improve the patient's function and comfort.

The eye prosthesis was designed with utmost care to make it look natural because conversation with others is initiated with eye contact; slight discrepancies in position of the eye, lid contour, and color of the prosthesis are immediately noticed by the observer. The patient was made to relax and sculpting of the periorbital tissues was carefully carried out. The lid contours and periorbital tissues were made to mimic those of the contra lateral eye. The lines of juncture were feathered and ended beneath the eyeglasses. The prosthesis stayed comfortably in place and no evidence of irritation was found at three-year follow up.

Since the patient had history of frequent relapse and multiple surgeries, it was necessary to do diagnostic MRI at regular intervals. Hence, osseointegrated implants were not the preferred treatment option for this case because of possible distraction of image.

## Conclusion

The prosthetic restoration of large facial defects is a challenge towards achieving pleasing esthetics and function. However, if attention is paid to the proper sequencing and details of treatment, it can be one of the most satisfying procedures. Patients should be made aware of the benefits and limitations of the prosthesis at the stage of preoperative consultation.

**Conflict of Interest** None.

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