

## Maxillofacial Prosthetic Rehabilitation of a Cancer Patient at Terminal Stage

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**Abstracts:** Face is the forefront of aesthetics. Surgical resection of the maxillae and facial structures for treatment of cancer, trauma, congenital deformities or infection causes maxillofacial defect that has serious impact on the individual's esthetic and has great psychological trauma of social outcast. When the presented defect is extensive and supporting structures is lacking, the rehabilitation and restoring functions is a challenging task. Rehabilitation becomes even more difficult when the problems at defect site are associated with the complications. An attempt has been made to rehabilitate of a patient at terminal stage having extensive maxillofacial defect with inoperable carcinoma, infections, and restricted mouth opening. [ Dupare A et al NJIRM 2012; 3(2) : 173-176]

**Key words:** facial prosthesis, heat cured acrylic resin, obturator prosthesis, rare earth magnet, self cured acrylic resin.

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**Introduction** Maxillofacial prosthetic rehabilitation and restoring function is important as impairments have detrimental effect on the quality of life and self-esteem.<sup>1</sup> When the defect presented is extensive and the supporting bone is lacking, the rehabilitation is a challenging task. Rehabilitation of the defect becomes even more difficult when the defect area is associated with the complications. An attempt has been made to rehabilitate a patient at terminal stage having extensive maxillofacial defect with inoperable cancer, restricted mouth opening, and other complications. Two component light weight prosthesis was fabricated to cover the defect.<sup>2,3</sup> The obturator and facial prosthesis was fabricated with heat cured acrylic resin lighter in weight retained by rare earth magnets and spectacle was delivered to make the remaining life of the patient tolerable.

**Case report :** A 38 year-old male patient was referred from the department of ENT to the Department of Prosthetic Dentistry, at Government Dental College and Hospital Nagpur, for rehabilitation of right side of face. The patient's medical history revealed that he was diagnosed as squamous cell carcinoma of the right maxillary antrum involving the floor of the orbit. To remove the carcinoma maxillectomy and enucleating right eye was done. It was followed by frequent recurrence and surgical procedures. In the frequent surgical procedures he lost his more than half of the

nose including the medial septum, right eye, supraorbital structures, right maxilla, part of zygomatic bone and associated structures. The recurrence was again diagnosed at defect site at lateral supraorbital and zygomatic areas. It was reported that any further surgical attempt to remove the carcinoma can cause serious complications. The defect site was inflamed, infective and extremely sensitive with bleeding spot. Right side corner of lips and part of alae of the nose was intact. (Fig.1) He was reported to be at terminal stage due to faster growth of malignancy near vital structures. There was no history of radiation therapy. He was under cover of chemotherapy.



**Fig.1** Extraoral photograph- before prosthesis

Patient had limited vertical opening. Thorough intraoral examination revealed a total maxillectomy and the muscles of mastication were detached from

maxilla of the right side. The presented defect situation corresponded to a class I situation (resected performed along the palatal midline) according to the Aramany classification of defects.<sup>4</sup> He had difficulty in speech, mastication, swallowing and to maintain oral hygiene. A left side maxilla and the mandibular arch were completely dentulous with healthy teeth and normal occlusion. Tongue size and function was normal, but speech was altered.

**Treatment plan:** A patient was at terminal stage of life. The defect area was extensive with restricted mouth opening. Moreover, intimate contact of the prosthesis to tissue for support and retention cannot be utilized due to presence of malignancy and infected sensitive areas. The bone or teeth on right side to support the large and bulky prosthesis was lacking. Hence prosthetic rehabilitation of a case was challenging. He was very much distressed because of the extensive facial disfigurement and open surgical cavity with bleeding spots. He wanted us to give him some option to cover the defect till his survival.

A case was considered to fabricate two -piece interim prosthesis separately to cover intraoral defects by obturator prosthesis and extraoral defects by facial prosthesis. This two-piece construction makes the insertion of the prosthesis easy and is done piece by piece making it less a struggle for the patient with limited mouth opening. The fabrication of intraoral obturator prosthesis was essential to prevent communication of food between the oral and nasal cavities. Moreover, the most important function this obturator served in the case was to support the facial prosthesis through the healthy teeth and bone present on left side. The extraoral facial prosthesis to fabricate was consisting of cheek, part of nose and eye. The heat cured acrylic resin was used to fabricate these two prostheses. Rare earth magnets were used to link the two portions. The case option of prosthesis was given to the patient that he readily accepted. He was ready to wear spectacle to hold the facial prosthesis.

**Clinical procedure: Fabrication of obturator prosthesis:** A sterilized wet cotton gauze was placed in the operated cavity to prevent flow of the

impression material in throat. An impression of the dentulous and supporting area to prepare obturator was then made with an alginate impression material. Working cast was prepared from this impression. The undercuts present in the defect were blocked out. To reduce weight simple plate type obturator prosthesis was fabricated and was extended on defect side so as to reach to the facial prosthesis. Healthy teeth and bone present on left side were used for retention and support to obturator and also to the facial prosthesis. The extension of the flange of obturator was done on left side in buccal sulcus area and on buccal surface of the teeth.

**Fabrication of facial prosthesis:** Facial moulage was done to obtain a working cast to orient the prosthesis properly to the rest of the face. The obturator prosthesis was inserted in the mouth and the nasal opening was blocked with gauze. Plastic tube was placed in the mouth for air intake. The operated cavity was lined with sterilized cotton gauze. The face was coated with petroleum jelly. An impression for facial defect was made with alginate impression material. Alginate was mixed and applied to skin surface. Gauze squares were placed all over the alginate surface to provide mechanical retention for rigid plaster backing. Dental plaster was then spread over the entire surface to a sufficient thickness. After setting of plaster set impression was removed, grasping it on the sides and lifting it gently. The impression was inspected for any void or distortion. The impression was poured in type-III dental stone of about 5 millimeter thickness and after setting it was retrieved (Fig.2).



**Fig.2** Facial moulage

All the undercuts on affected area of the cast was blocked. A wax pattern for facial prosthesis was

sculpted with required thickness. Over extension on lower side of mandible was given to avoid visibility of the defect while opening of mouth. A prefabricated acrylic eye shell was selected of shape, size and color after matching with left eye. The position of the pupil and the sclera was adjusted to mimic the left eye position while the patient gazes forward. A wax pattern was carved around the acrylic eye shell on the model. Upper and lower eyelids were carved such that the area covered by them on sclera mimicked the left eye (Fig.3).

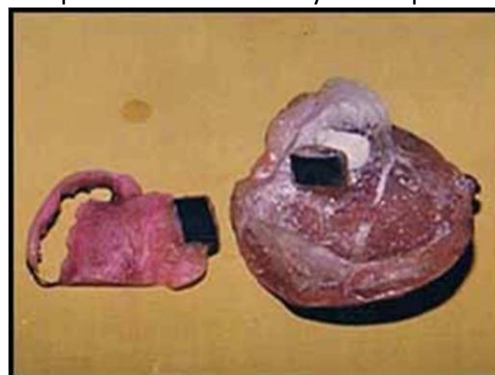


**Fig.3** Waxed-up facial prosthesis

For orientation of the eye, a wax pattern was checked on patient face. This pattern without the eye shell was then invested. Clear heat cured acrylic resin was used for facial prosthesis. Skin matched colored stains were added in heat cured acrylic resin to fabricate facial surface of the prosthesis. Self cured acrylic resin was used to stabilize the eye shell section. The inner surface of the prosthesis after curing was further hollowed and carved to reduce thickness and weight and also to eliminate any contact with infected area. The eye shell was then attached to its position with self cured acrylic resin. Stains were mixed and painted in predetermined sequence and quantity to achieve staining to create lifelike appearance.

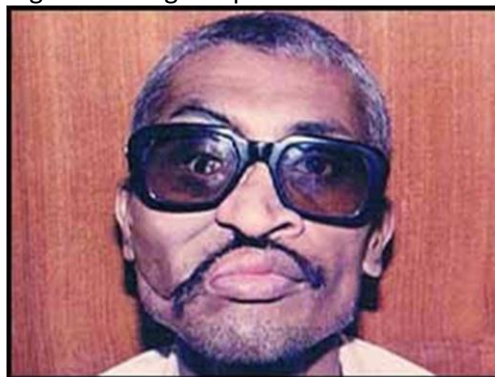
**Attachment of retentive devises:** A projection on inner surface of facial prosthesis and to cover the obturator prosthesis was made with self cured acrylic resin. For attaching the rare earth magnets to this final prosthesis the obturator was first placed in patient's mouth and second magnet was attached to the first magnet on the obturator using self cured acrylic resin (Fig.4). A spectacle with broad frame was used that provided an excellent

means of securing a facial prosthesis. Hooks were placed in the frame of spectacle and the loops in the facial prosthesis for stability and in position.



**Fig.4** Tissue surface of obturator & facial prosthesis with magnet

**Delivery of prosthesis and instructions:** Both the parts of the prosthesis were decided to wear separately for convenience. Patient was trained to insert, to stabilize in position (Fig.5) and also to remove the facial and obturator prosthesis for cleaning and during sleep.



**Fig.5** Extraoral photograph with prosthesis

**Discussion :** The treatment of maxillary defects is always limited by difficulties with retention, movable tissue beds and lack of sufficient bone support.<sup>5</sup> When the defect is large then the solid bulky prosthesis is heavy in weight and to maintain its position is difficult. In case trismus is present, making execution of the procedures extremely cumbersome and for the patient, manipulation of the prosthesis into and out of the mouth becomes a Herculean task, as it requires multiple paths of insertion and removal. To overcome these problems of retention skin adhesives, spectacles, engagements of undercuts using flexible materials and implants have been advocated.<sup>6</sup>

The use of frames by attaching eye prosthesis has advantageous when the patients has undergone maxillectomy in combination with an orbital exenterations as reported by Beumer J et al.<sup>2</sup>

The rare earth magnets have been used in dentistry since 1960 and Federick.<sup>3</sup> in the year 1976 presented a technique for fabrication of a sectional interim maxillary obturator with retention augmented by magnet. The use of rare earth magnet achieves a more life like appearance and keeps facial prosthesis independent to external support.

The fabrication of flexible obturator for patients with severely limited mouth opening using either silicone or even a flexible vinyl resin mouth guard material can be the choice according to Lauciello` et al.<sup>7</sup> However, these materials are far from ideal and in an average maxillectomy case it would be inadequate.

Prosthetic rehabilitation for facial defects has several advantages over surgical reconstruction as it is quite inexpensive, allows for periodic examination and cleaning and is also an alternative to surgery in unsuitable candidates. Acrylic resin was introduced to dental profession in 1937 for both intra and extra oral prosthesis. The fabrication process of acrylic resin is relatively short and the clinician has a lot of control over the color, shape and size of prostheses. Heat cured acrylic resins are routinely used for maxillofacial prosthesis.

In the case heat cured acrylic resin was used to fabricate facial and simple obturator prosthesis. Polymeric coated rare earth magnets (Neodymium-iron-boron) and broad frame spectacle was used for retention and support of this maxillofacial prosthesis.

**Conclusion:** An attempt has been made to rehabilitate a patient at terminal stage associated with extensive maxillofacial defect and complications. A two components, obturator and facial prosthesis fabricated with heat cured acrylic resin lighter in weight retained by rare earth magnets and spectacle was delivered to make the remaining life of the patient tolerable.

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