

## Case Report

### **Rehabilitation of Hemimaxillectomy Defect due to Orofacial Mucormycosis**

**Bilal Ahmed**

Associate Professor, Department of Prosthodontics/ AFID, Army Medical College, National University of Science & Technology (NUST) Islamabad, Pakistan

#### **\*Corresponding author**

Bilal Ahmed

**Email:** [drbilalahmed79@amcollege.nust.edu.pk](mailto:drbilalahmed79@amcollege.nust.edu.pk)

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**Abstract:** Prosthodontic rehabilitation of congenital or acquired maxillofacial defects is always a challenging clinical scenario. These defects pose a major physiological and psychological threat not only to the patients, but to the entire family. A multidisciplinary team approach, thorough investigation, long term follow up, proper counselling and sympathetic attitude may help to bring these suffering patients back to normal life stream. Recent advancements in Dental Materials, CAD CAM and Laser Technology and Osseointegrated Implants have revolutionized the treatment outcomes. However, Conventional Prosthodontic Principles are still the gold standards. This case reports the rehabilitation of a hemi maxillectomy patient using removable complete overdentures supported by metallic copings on the existing teeth. The difficulties encountered were to manage the bio mechanics and esthetics with the prosthesis because of the facial soft tissue contractures. However, our patient was very satisfied with results and was following up all the instructions.

**Keywords:** Mucormycosis, Hemimaxillectomy, Prosthodontic Rehabilitation

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#### **INTRODUCTION**

Mucormycosis is an opportunistic fungal infection affecting orofacial region and may spread to orbital and intracranial structures in immunocompromised patients [1]. In advanced stages persistent ulceration, epistaxis, localized pain, epiphoria, diplopia may resemble the features of malignancy [1]. Mucormycosis is regarded as a fatal infection but early medical and surgical intervention has now resulted in survival rates upto 80% [2].

Surgical reconstruction of defects may be carried out using wide range of microvascularized flaps but in compromised patients with poor prognosis, palatal obturators are the treatment option [3]. Males are predominantly affected as they are at greater risk of exposures [4, 5]. The term 'obturator' is derived from the Latin word 'Obturare' means to Stop Up [6] and can be fabricated in Acrylic Resins, Silicon rubbers, cast metals [7, 8].

#### **CASE REPORT**

A 56 years old diabetic male was referred to our department by our oral surgical colleagues with history of surgical resection of left maxilla few months back due to palatal necrosis as a result of mucormycosis.

On extra oral examination, there had been collapsed facial profile with intelligible speech and complaints of

compromised masticatory efficiency. On intra oral examination, the patient had poor oral hygiene with multiple unrestorable teeth and broken dental roots (Fig. 1.2). There was a big deep defect on the left side of the maxillary edentulous area with only two teeth standing on the right side. There were yellow plaques retained on the adjacent soft tissue but there was no pain, infection or signs of recurrence (Fig. 1.1). There were complaints of oro-nasal communication with intra oral nasal discharge. On radiographic examination, there was a big discontinuity defect on left side along with compromised dentition (Fig. 2).

After a detailed discussion with the patient, it was decided to proceed with a conservative prosthodontic treatment plan. The aims of the treatment planning were to restore oro dental health, to restore function to improve the quality of life and to restore aesthetics & phonetics. A Removable prosthesis was designed as the treatment of choice considering the extent of maxillary defect, medical and dental status of the patient and the long term prognosis of the existing teeth. Complete overdentures were planned in both arches due to lack of bio mechanically strong abutment teeth and due to Patient's main consideration of restoration of functional integrity and esthetics in the earliest time possible without implying any further surgical procedures. Teeth # 17, 32, 36, 37, 38, 41, 42, 43, 44, 47, 48 were extracted under local anaesthesia on different

appointments and Teeth preparation with feather edge gingival margins was done for teeth # 15, 16, 33, 34, 35, 45. Impressions were recorded using Vinyl Polysiloxane elastomers implying a two step Putty Wash technique (*Reprosil® Dentsply Caulk Milford, DE USA*). These impressions were sent to the Dental Labartory for fabrication of metallic coping prostheses on teeth # 15, 16, 33, 34, 35, 45. The metallic copings were cemented using Type I Luting Glass Ionomer cement (*Fuji I GC CORP. JAPAN*). Final Impressions were recorded again using Vinyl Polysiloxane elastomers implying a two step Putty Wash technique (*Reprosil® Dentsply Caulk Milford, DE USA*). Final cast metal plates were fabricated with metallic meshwork on the edentulous areas. These were tried in the patient's mouth and interferences were recorded. Jaw relations were recorded after fabrication of wax

occlusal rims on these metallic plates. These plates were then transferred to the Semi Adjustable Hanau Articulator using a Face Bow and teeth arrangement was performed. After verification of inter occlusal check records, a final functional impression of the maxillary defect was done using low viscosity Vinyl Polysiloxane elastomer (*Reprosil® Dentsply Caulk Milford, DE USA*). Master cast was altered and final prosthesis was processed using a Hollow Bulb Obturator Technique (Fig.4). After finishing and polishing, these prostheses were inserted in the patient's mouth (Fig.3 and Fig. 5). The patient was explained the post treatment care and oral hygiene management. The patient was then followed up after 24 hours to check any inconvenience or interferences and then scheduled for a regular follow up management protocol.



Fig. 1.1: Maxillary Arch



Fig. 1.2: Mandibular arch

Fig. 1: Pretreatment intraoral views

## DISCUSSION

Rehabilitation of these patients after surgical removal of malignant lesions is one of the most difficult therapies of stomatognathic system. Significant deformation of tissues, dysfunction of stomatognathic system with concurrent biological imbalance of the oral cavity frequently affect the treatment strategies [2]. Scars and contraction of oral crevice may cause serious pshchological deficiencies that are another aspect of the treatment schedule [3].

These patients require a multidisciplinary team approach with thorough patient evluation and management protocoles considering the functional and psychosocial requirements. A comprehensive long term treatment planning, family and patient counselling and a sympathetic consideration can dramatically affect the treatment outcomes and these patients can become a usefull part of the society. Rehabilitation of these intra oral maxillofacial defects always pose clinical challenge to the prosthodontists as these clinical scenarios always present unpredictable treatment outcomes [4].

The primary objective of oral surgeons and prosthodontists is to eliminate disease and to improve the quality of life including the facial contours which influences the psychological condition of the patient [9]. Neglecting immediate obturator construction may

cause serious facial disfigurement due to soft tissue contractures.

Restoration of maxillofacial defects can be accomplished either surgically, prosthetically or a combination of both. Prosthetic restoration is always attempted where surgical correction is not feasible. Pre surgical records like Mounted Casts, photographs etc are extremely valuable in fabrication of prosthesis. There are undoubtedly great benefits of presurgical prosthodontic evaluation and fabrication of immediate surgical prosthesis.

The Prosthodontic end results mainly depend on the physical and mechanical properties and quality of materials used. The materials commonly used for fabrication of these maxillofacial prosthesis are Acrylic Resin, Acrylic Co polymers, Vinyl polymers, Poly urethane elastomers, Silicone Elasmers with cast or wrought metallic alloys. Unfortunately, none of these materials fulfill all the requirements of an ideal prosthesis. However, Acrylic Resins are most widely used materials as they are cost effective, easy to fabricate, have color stability and remain serviceable for many years. In addition, they are easily adjustable, repairable and replaceable if required. Recently, CAD CAM Technology is gaining popularity in the fabrication of Maxillo Facial Prosthesis, but its use is

limited due to its complexity, Increased Cost and non availability at many centers in the under developed countries [7, 8].

Retention in these maxillo facial prosthesis is aided by Direct Retainers in the form of Clasp Assemblies, Precision attachments, Magnets, engaging soft & hard tissue undercuts, osseo integrated implant retained abutments or by the use of bio compatible adhesives. Hollow bulb appliances help to reduce the weight of the obturator, thus indirectly aid in the retention [4].

The difficulty in rehabilitation of these cases is a compromise between esthetics and functional efficiency and therefore, patients are the best judge that what aspect improves their quality of life [9]. The main objective in management of such patients is to restore the lost natural anatomy and morphology immediately or later after surgery to maintain appearance, morale and confidence of these patients and to facilitate the social acceptance among their peer group, which simple templates or dressings can not achieve. The extensive prosthesis many a times result in gag reflexes, but with reassurance and standard precautions, this can always be managed.

These patients also suffer compromised adaptability to prosthodontic appliances because they have been reported to have reduced values of oral stereognostic abilities (OSA) and oral motor abilities (OMA). 10 These sensory and motor sensations are compromised in Maxillectomy patients because of disturbed morphology of the palatal vault, that had to work as a platform against the sensory tongue [10].

One of the important clinical features of these subjects is compromised speech efficiency [11]. These problems get aggravated specially in those cases which remain untreated for longer periods after loss of natural tissues. However, properly placed prosthesis with effectively sealed soft tissue margins can produce dramatic improvements [11].

Unfortunately, this patient was referred six months after the surgical resection, so the benefits of earlier prosthodontic intervention were already lost. There were tight strictures on the affected side with collapsed profile. The patient also had to bear a difficult and problematic healing phase. However, Prosthodontist,

surgeons and patients jointly can overcome this problem. Our patient was happy with the restoration. He was quickly adapting to the prosthesis and its maintenance protocols.

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