Maxillofacial Prosthesis for Combined Intra and Extra-Oral Defect  
– A Case Report

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INTRODUCTION

Combined intra and extra oral defects can be stated as those facial defects which have an intraoral communicating route. Midfacial defects are aptly classified into 2 major categories by Marunick et al.¹ as midline midfacial defects in which the nose and / or upper lip defects are included; and the second major group was lateral defects in which the cheek and orbital defects are categorized. However, defects which include combinations of the above-mentioned defects are in existence. Midfacial defects which are acquired, present themselves often with severe disfigurement of structures and hence show impaired function. It is a meticulous task to rehabilitate the defects which are caused as a result of cancerous lesion resection as they are huge. Such post resection lesions frequently are rehabilitated by a facial prosthesis to maintain function as well as the appearance in the normal form. In adjunction to the facial prosthesis, an intraoral prosthesis which constitutes of an obturator is also required to regain the natural speech and pattern of swallowing. Fabrication of such facial prosthesis not only requires the artistic capability but also excellent clinical decision making of the prosthodontist. Mode of retention of the combined prosthesis should also be kept in mind while fabricating as it is also a difficult task to retain them because of the size and weight of the same. Moreover the prosthesis should also be secured in its place with these aids which can also prove as a challenge. This case report states rehabilitating a large surgically resected midfacial defect with the assistance of a “3-piece prosthesis” which constitutes a sectional intraoral obturator along with maxillary and mandibular extraoral facial prosthesis.

PRESENTATION OF CASE

A woman aged 55 years with a history of surgical resection of a well differentiated squamous cell carcinoma of left buccal mucosa with extra oral fungation, T4aN2aM0 before 6 months was brought up for definitive prosthetic rehabilitation of the defect. Three reconstructive procedures were carried in a timeline of 3 months which were proven to be unsuccessful. The extra oral defect extends superoinferiorly from ala tragus line to inferior border of mandible and antero-posteriorly from corner of mouth to anterior border of ramus (Fig. 1). Intraorally, in maxilla missing teeth were premolars and molars of left side and rest all teeth were present and in mandible all anteriors and posterior teeth on left side were missing. The majority of the section of the hard palate was surgically removed in the maxilla. The anatomical structures which remained showed minimal area to provide support, along with retention, and to provide stability of maxillary obturator. Hemimandibulectomy was performed for the mandible and the remaining buccal mucosa was attached to the floor of the mouth, so there was no available space for prosthetic rehabilitation in mandible intraorally.
DISCUSSION OF MANAGEMENT

Owing to the large size of the facial defect, history of radiation to the focus area, poor quality of the remaining mucosa, minimal bony supporting structures, and lack of natural dentition, made the prognosis fair for prosthodontic rehabilitation.

Prosthetic rehabilitation commenced with the construction of a partially edentulous maxillary obturator. Impression of the maxillary arch was made (Fig. 2) and working casts of maxillary arch with intraoral defect was obtained (Fig. 3). Corner of mouth and occlusion at right side guide for occlusion rim level of maxillary obturator. The maxillary occlusion rim was contoured in correspond to upper lip contour. The teeth were arranged and try-in done (Fig. 4) and the intraoral prostheses (hollow maxillary obturator) fabricated (Fig. 5.a,b) and insertion done (Fig. 6).

Anatomical undercut and denture adhesive were considered for the proper retention of the obturator. The patient was advised to use gastric feeding tube throughout the prosthetic rehabilitation procedure.

Intermediate Framework
Keeping the obturator in position impression of the face was made and facial moulage was obtained (Fig. 7). This facial moulage helps to determine extend of extra oral defect,
planning and fabrication of extra oral maxillofacial prosthesis. For the fabrication of extra oral maxillofacial prosthesis first clear acrylic maxillary and mandibular template is prepared (Fig. 8. a, b, c, d) of the shape of maxilla and mandibular defect.

Figure 8 C & D.
Evaluation of the Fit of the Maxillary and Mandibular Template on the Stone Model

Facial Prosthesis (Extra Oral Prosthesis)
Retentive holes are made in the template for mechanical retention of prosthesis (Fig. 9 a, b) Over the template wax pattern of maxillary and mandibular extraoral prosthesis prepared and trying of wax pattern done (Fig. 10 a, b).

Wax pattern was used to make silicone prosthesis for which MDX-4210 base silicone was used. Later on the silicone prosthesis was attached to the fabricated acrylic plate with the assistance of adhesives and other mechanical retentive aids. The processing of the prosthesis was carried out at room temperature for about 48 hours and later on it was deflasked, trimmed, cleaned, and bonded to a polyurethane lining with medical adhesive type A (Factor II, Lakeside, Ariz.) under vacuum as described by Lemon et al. Applying polyurethane lining has added benefit of increasing the tear resistance of the prosthesis at its margin. The prosthesis was then trial fit and had extrinsically colored with trichloroethane, medical adhesive type A, oil pigments, and rayon flocking. (Factor II)

Retention of magnets in the silicone prosthesis was carried out by hose made up of nylon as stated by Lemon et al. Maxillary extra oral prosthesis is retained to maxilla with the help of magnetic attachment, in magnet attached to acrylic plate from inner side and magnetic keeper attached to maxillary obturator buccal flange (Fig. 12).

Mandibular extraoral prosthesis was retained with the help of elastic. (Fig. 13). Pretreatment and post treatment view of the patient (Fig. 14 a, b)
Post treatment instructions were given, and maintenance of silicone prosthesis explained to the patient. Patient is recalled after 24 hours, then after one week and then 21 days and thereafter every 3 months.

**DISCUSSION**

Prosthetic treatment was planned to rehabilitate the defect assisted by a "3-piece prosthesis" that included a sectional intraoral obturator, maxillary and mandibular extra-oral maxillofacial prosthesis. First maxillary hollow obturator was fabricated and then facial mould was made by keeping obturator in its intra oral position and then the maxillary and mandibular template was prepared to provide retention, support and stability to extra oral prosthesis. Then wax pattern of the shape of maxilla and mandible prepared over template by using facial mould as a guide and then try in done on patient and after satisfactory try in, wax pattern converted into silicone prosthesis using MDX4-4210 base silicone. Maxillary facial prosthesis retained with magnets and mandibular with elastic. Insertion done and post treatment instruction given and patient kept on periodic recall.

Orofacial defects can be acquired or congenital. The acquired defects are a result of either trauma or surgical resection. These orofacial defects with bigger size lead to severe functional impairment, disability to speak, leads to improper mastication and disturbed swallowing patterns. Along with all these problems, the midfacial deformity also has a significant psychological impact due to its aesthetic considerations. Also successful aesthetic results can still be obtained but the retention of such prostheses poses a severe problem. With a proper knowledge and a comprehension of the anatomic elements which are remaining, intraoral and extraoral prostheses combination that can retain each other with mutual effort is possible to fabricate. Hence for the aid other means of auxiliary retention for facial prostheses have been illustrated in the literature; they include eyepatches,5 extensions from the denture that engage tissue undercuts,6,8 magnets6,9 adhesives,6 combinations of the above,6,8,18 and osseointegrated implants.6,8,11,12 Among all the mentioned types of retention osseointegrated implants provide the best mode of retention but it requires additional surgeries and expenses. Also, patients with inadequate bone, and a history of radiation to the focus area may prove as a contraindication to the implant therapy.13,14

**CONCLUSIONS**

In this case report the definitive prosthetic rehabilitation of a 55-year-old woman, with a history of cancer resection which resulted in a combination of intraoral and extraoral defect is illustrated. A "3-piece definitive prosthesis" which constituted of a denture obturator along with a facial prosthesis (maxillary and mandibular), and an intermediate framework to support the elements was fabricated. Magnet was incorporated into maxillary facial prosthesis and elastics in the mandibular facial prosthesis, in conjunction with the intermediate framework which assisted the retention of each element of the prosthesis. Though it is a proven fact that osseointegrated implants not only restore dentition but also retain extraoral prostheses, but in this case radiation in the focus region ruled out their use in this patient and hence another technique for retention was mandatory. So, the intermediate framework, elastics and magnets helped to achieve satisfactory retention for the prostheses in this particular case. The patient was recommended to remain on a gastric feeding tube for a period of 8 weeks after the prostodontic treatment was finished. The stoppage of the use of feeding tube was aptly approved by otolaryngologists along with speech and swallowing therapists. It was duly checked that the patient is capable enough to carry the whole weight with the supplemented soft diet along with the liquid nutritional ingredients ingested by mouth. With the assistance of this prostheses, it was possible to achieve improvement in aesthetics as well as the capability to speak. The patient was not only able to swallow but also chew to a great extent which overall improved the quality of life of the patient.

A patient reporting for dental treatment also indirectly gets treated for psychological issues in relation.15 Such defects lead to social embarrassment and affect quality of life.16 The definitive rehabilitation of a 55-year aged patient who presented with an intraoral as well as extra-oral defect is introduced. "A 3-piece prosthesis" which constitutes denture obturator, one maxillofacial prosthesis (maxillary and mandibular), with an intermediate framework was made. Magnet was retained in the maxillary facial prosthesis and elastics in the mandibular facial prosthesis, which is associated with the intermediate framework with the purpose of retention of each element present in the combined prosthesis. Though it is a proven fact that osseointegrated implants not only restore dentition but also retain extra oral prostheses, but in this case, radiation in the focus region ruled out their use in this patient and hence another technique for retention was mandatory. So, the intermediate framework, elastics and magnets help to achieve satisfactory amount of retention for the combined prostheses in this particular case.
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