

Rehabilitation of Disfigurement Associated with Maxillectomy by a Cheek Plumper Prosthesis

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Abstract Patients having undergone maxillectomy as a result of carcinoma in the region or facial trauma are left with severe facial disfigurement that is associated with long term psychosocial effects. As one side of the face loses the crucial support from the maxilla, innovative customized treatment options become the choice of rehabilitation. Ideally, such treatment should be preceded by consultation with a prosthodontist which unfortunately most of the times is not the case. Rehabilitation of maxillectomy patients is not possible without incorporating the dynamics of facial expression. This article discusses a patient having undergone maxillectomy who was successfully rehabilitated with an obturator that had an additional lip/cheek plumper incorporated in its design.

Keywords: carcinoma, sarcoma, facial disfigurement, cast partial denture

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1. Introduction

Excavating lesions anywhere on the body leave a scar that not only leaves the body disfigured, but also affect the person psychologically. When present on the face, the problem becomes complex as the visible disfigurement affects and alters social response. Some people whose faces have been disfigured can suffer a so-called 'social death'. Unless they are given psychotherapeutic and social help in time, 'social death' may instigate death by suicide. [1] Besides a few exceptions, maxillectomy is one such surgical procedure which leaves behind the disfigurement of the human face that qualifies for serious psychosocial considerations. Prosthetic rehabilitation through the use of obturator since earliest scripted attempts [2,3,4] has led to the development of the specialty of maxillofacial prosthetics especially since the formation of the American academy of maxillofacial prosthetics. [5-15] Maxillectomy defects present challenges in total closure of the defect within functional limits, [16,17,18] mastication, swallowing, speech intelligibility besides facial aesthetics'. [19-23] Development of a classification system [24,25] of obturator defects and obturator framework design has greatly eased the problems associated with designing like retention, [27,28,29,30] occlusion, [31] stability and aesthetics [32,33,34,35].

Many authors have discussed conventional removable partial denture designing [36-42] but very few have addressed the problem of framework design for maxillary obturator when a lip/cheek plumper has to be designed along with the prosthesis in relation to maxillectomy. This

article in the form of a clinical case report is an attempt to understand the biomechanical factors involved in designing the plumper prosthesis that is retained using a framework of a cast partial denture.

2. Clinical Case Report

A male patient in his early forties was referred to the department of Prosthodontics with chief complaint of loose existing maxillary treatment partial denture made 2 years back. History of present illness revealed that the patient was diagnosed with a tumor in the maxilla and had undergone maxillectomy about 5 years back.



Figure 1. Extra oral view showing depressed cheeks, raised lips and asymmetric face

Medical and dental histories were nonsignificant. Extra oral examination revealed bilaterally asymmetric faces with right side cheek and molar contours affected and

severely depressed (Figure 1). Intra oral examination disclosed the absence of natural dentition on affected side along with an opening present about 4 centimeters by 2.5 centimeters in size (Figure 2). The soft tissue around the opening was inflamed with highly sensitive mucosa. Radiographic investigations were carried and evaluation of future abutments was done. Treatment plan included oral prophylaxis, followed by the fabrication of a definitive obturator holding a lip/cheek plumper supported through a cast partial denture.



Figure 2. Intra oral view of the opening between the oral and nasal cavity



Figure 3. Try in of the trial denture with cast framework



Figure 4. Fabrication of hollow bulb obturator using silicone rubber as separator

Preliminary impressions using irreversible hydrocolloid (CA 37; Cavex, Haarlem, Holland) were made on the day of the first appointment and patient was advised to discontinue wearing old dentures to allow inflamed tissue to revert back to normal. After surveying the diagnostic casts, the design of cast partial denture framework was

finalized following all the basic principles of partial denture designing. After fabricating a special tray on a duplicated diagnostic cast, the mouth preparation was completed in the next appointment following which a final impression was made using medium body and light body addition silicone elastomer (Reprosil, Dentsply/Caulk; Milford, DE, USA) that included the impression of the defect also. The cast framework was then tried in the patient's mouth after which jaw relations were recorded and the cast framework with occlusal rims were mounted on a semi adjustable articulator (Artex; Girrbach Dental) using an arbitrary face bow (Artex Rotofix-Facebow; Girrbach Dental, Pforzheim, Germany). After the arrangement of teeth, denture trial was done (Figure 3) and at these stages the necessary amount of support that the overlying tissues would require was determined with the addition of a lip plumper in the form of stainless steel orthodontic wire around which self-cure acrylic could be added or removed at will. After approval of aesthetics and denture trial the entire cast partial denture was processed with fabrication of a hollow bulb first, followed by the rest of the partial denture (Figure 4). During the trial and making of the lip/cheek plumper, amount of wax was added and/or reduced so that facial expressions do not compromise the retention and stability of the prosthesis. This was achieved by incorporating a roll of wax over a stainless steel wire that was incorporated in the denture on the buccal flange of right side (Figure 5). After necessary adjustments in relation to the bulb and occlusion the cast partial denture with hollow obturator carrying a lip plumper was delivered to the patient and the patient was put on regular follow up (Figure 6).



Figure 5. Cast partial denture with hollow obturator and lip/cheek plumper

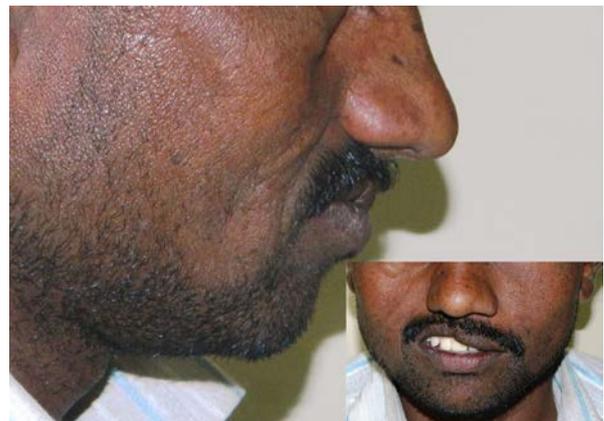


Figure 6. Post prosthetic insertion (Frontal and lateral view)

3. Discussion

Rehabilitating a maxillectomy patient is complex simply because of the fact that designing a partial denture framework in such situations has its limitations, especially the factors that are related to designing of the prosthesis.

Because one arch is not present, therefore one should not only rely on remaining natural teeth, but the basic principles of prosthesis making should be strictly followed. Favorable undercuts on the buccal surfaces of abutment teeth allow utilization of embrasure clasp to attain maximum retention. The soft tissues over the slope of the hard palate were recorded in the function so that horizontal movements of the prosthesis would be minimized. This in turn increases the effectiveness of reciprocation arms that was provided in this case by extension, of major connector to the height of contour on the palatal surfaces of remaining natural dentition. Overall retention of the prosthesis was also increased by utilizing the undercuts present within the defect without any portion of the bulb contacting the septum or the turbinate's, extending the obturator onto the nasopharyngeal side of the soft palate to provide posterior palatal seal and extending into the lateral wall of the defect for indirect retention. Besides, the bulb was made hollow with closed end to aid in speech resonance, reduce weight on unsupported side, reduce the self-consciousness of the patient and also enhance esthetics by allowing the addition of lip plumper.

Lip plumper for the prosthesis was designed to allow additions and /or subtractions during treatment and follow up. For this a simple approach was used in which an orthodontic stainless steel wire of 0.19 gauge was used to hold and support the plumper. An arbitrary position was established which was lower than the one that would support the cheeks, from here the rest of the support was built by adding a roll of self-cure acrylic. This innovative design allows the patient to judge whether adequate satisfactory support is established and later modified easily.

Maxillectomy patients have been successfully treated in the recent years with the combination of implants especially zygomatic implants, first introduced by branemark, [43] which are fixtures having an extended length [44,45].

4. Conclusion

A complex rehabilitation of maxillectomy as described in this article includes designing of cast partial denture framework on one side, hollow obturator and finally a lip/cheek plumper. The success of such rehabilitation depends on basic principles of designing prosthesis.

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