



PROSTHODONTIC MANAGEMENT OF HEMIMAXILLECTOMY WITH HOLLOW CAST PARTIAL DENTURE - A CASE REPORT

Dental Science

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ABSTRACT

Elimination of carcinoma in the maxilla by surgical resection leaves behind a large tissue defect. Restoring optimum function and esthetics in such patients is a challenging task for the maxillofacial prosthodontist. The success of treating such patients depend largely on the amount of restorative space available, the condition of the abutment, soft tissue undercuts and scar band. This case report presents a case of hemimaxillectomy rehabilitated using cast partial denture with a hollow cavity to lighten the weight of prosthesis.

KEYWORDS

cast partial prosthesis, hemimaxillectomy, hollow denture.

INTRODUCTION:

The maxilla forms the part of midfacial elements, which are the orbit, the zygomatico-maxillary complex, the nasal unit and the stomato-maxillary complex.[1] Maxillary defects may result from congenital malformations or may be acquired following surgery of oral neoplasms. Surgical intervention for treating maxillary neoplasms frequently involve maxillectomy or removal of a part of maxillary bone and contiguous structures, which results in a large defect with oro-nasal/antral communication.[2,3]

The fundamental goals of prosthetic obturation are closure of the maxillectomy defect, separation of the oral cavity from the sinonasal cavities,[4] to restore physiologic functions and the aesthetic appearance.[5] Restoring the maxillectomy defect with an obturator has a large number of benefits. Apart from reestablishing the missing soft and hard tissues, it permits swallowing, mastication, and speech relatively in the normal way. Also, the obturator is a removable appliance, so it enables early detection of recurrent tumors occurring in the underlying tissues; and provides a better facial appearance by supporting the denture bearing tissue and associated structures.[6,7,8]

This case report presents a case of hemimaxillectomy rehabilitated using cast partial denture with a hollow cavity to lighten the weight of prosthesis.

CASE REPORT:

A 20 years old male patient reported to the Department of Prosthodontics, Government Dental college & hospital, Ahmedabad, presenting with chief complaint of ill-fitting upper denture for past two months. He presented with history of right side hemimaxillectomy done 5 years ago, after being diagnosed with angiofibroma. His past dental history revealed that he has been wearing a removable maxillary partial denture of polyetheretherketone (PEEK) material since last three years which has become ill-fitting. On extra oral examination, cheek and lip appeared unsupported with deepened nasolabial fold on the affected side. On intra oral examination a defect was found extending from right lateral incisor till third molar anteroposteriorly and a small oro-antral communication was seen in molar region on the resected side measuring about 10mm x 6mm. The restorative space was large.[figure 1 & 2]



FIGURE 1



FIGURE 2

The teeth present in maxillary arch were central incisor on right side and central incisor to 3rd molar on left side. The buccal sulcus was obliterated, with scar tissue. It was identified that the denture was ill fitting owing to over extension in buccal sulcus region. Radiographic interpretation suggested an intact orbital floor. Cast partial denture as definitive prosthesis was planned. The upper and lower primary impressions were taken with condensation silicone putty (Speedex putty C-silicone, Coltene, Ohio). The diagnostic cast was surveyed.

DESIGNING OF CAST PARTIAL DENTURE:

Designing was based on Parr et al [9] and Aramany. [10]

1. Bilateral tripodal design was used with embrasure clasps between left first and second molars, left first and second premolars and I bar clasp on right central incisor. This assembly provided direct retention.
2. Support was provided by occlusal rests of embrasure clasps. Guide plane was located on distal surface of right central incisor. Indirect retention was provided by rests of embrasure clasp provided between first and second premolars.
3. A complete palate major connector was chosen to supplement retention.
4. Mesh type minor connector was selected.

A special tray was fabricated on the diagnostic cast. Tooth preparation was carried out according to the design proposed. Border molding was done, final impression was made with addition silicone regular body (Affinis, Coltene, Mumbai, India). Master cast was made with Type IV dental stone. (Uni-base 300, Model plaster, Type 4, Dentona AG, Germany) The framework was cast using cobalt-chromium alloy over the duplicated refractory cast. [figure 3]



FIGURE 3

Using the framework, jaw relation was recorded and try-in was completed.

Procedure For Fabrication Of Hollow Prosthesis:

Owing to large restorative space, a hollow denture was planned by following double flasking technique as described by Fattore et al [11] using two flasks with interchangeable lid.

1. Waxed up denture was flasked in the cope covering the metal framework and the remaining natural teeth.
2. Dewaxing was done in usual manner.[12]
3. Two layers of 1.2 mm thickness wax (Y Dents Modelling wax, MDM corporation, Delhi, India) were adapted in the cope containing the teeth (covering all surfaces except superior surface) and on the exposed metal framework in the drag.
4. Cope of the second flask was fitted to the drag of the first flask. The drag of the second flask was inverted onto the cope of the first flask. Dental plaster (Plaster of Paris, Kalabhai, Mumbai, India) was poured into both flasks.
5. Dewaxing was done and denture was fabricated in two separate parts using heat cure denture base resin (SR Triplex Hot, Ivoclar, Germany).
6. The first flask was reassembled and a rope of heat cure resin was packed along the periphery of processed resin in either mold and cured according to manufacturer instructions.
7. Deflasking was done. Finishing and polishing was completed. [figure 4]

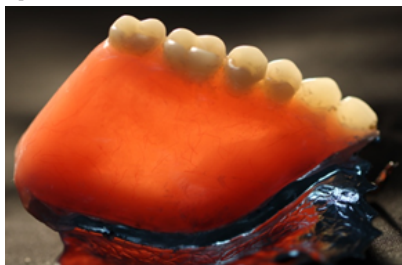


FIGURE 4

8. Denture insertion was done and post-insertion instructions were given.[figure 5]



FIGURE 5

DISCUSSION:

Prosthodontic management of patients with oral cancer following surgery is clinically challenging. Most often, the surgery involves removal of all or part of maxilla, creating an intra oral defect that compromises the integrity and function of the oral cavity. The treatment protocol for a patient requiring rehabilitation of maxillectomy is carried out in three stages: immediate surgical obturator, which is inserted soon after surgery; an interim obturator used after approximately 3 months of initial healing until the tissues are maintained stable; and a definitive obturator fabricated after the tissues have undergone appreciable changes.[13,14]

The obturator prosthesis helps in maintenance of speech, limits regurgitation of fluids, and provides psychological comfort.[15,16] In addition, the maxillary obturator prosthesis enhances the cosmetic appearance of the patient by providing support for the maxillary lip and cheek.[13]

Brown KE and Taicher S suggested the use of silicone rubber for fabrication of obturator.[17,18] Similarly, Benington IC and Polyzois GL used light cured resins to fabricate obturator.[19,20] The use of fluid resin was advocated by Browning and Kinderknecht.[21] This case report presents rehabilitation of patient with Aramany class II

maxillary defect with a definitive cast partial prosthesis.

Over years of wearing the prosthesis, tissue changes are inevitable. To compensate for these changes the cast partial prosthesis can be relined frequently.[22] The metal framework improves the longevity of the prosthesis and is sensitive to thermal changes.[23,24]

Deterioration of retention is one of the most common trouble related with cast partial obturator due to plastic deformation caused by repeated insertion/removal of the prosthesis. This causes food lodgment and discomfort to the patient.[25] If the remaining natural teeth are not sound to provide support for the bracing components of the framework, the prosthesis will have a questionable prognosis.[26]

Hollow denture can be used when a large restorative space exists between the ridges. The resultant denture becomes lightweight and augments the clinical outcome of the prosthesis. Jhanji, Stevens and O'Sullivan used the single flask technique, whereas Holt Jr, Fattore, Radke used double flask technique to construct a hollow prosthesis.[11,27] Various materials like dental stone, cellophane-wrapped asbestos, silicone putty, light-body coated gauze, salt, modelling clay, caramel, thermocol, glycerine soap, 3D printed dental SG resin have been used to create a void in the prosthesis.[27] As suggested by El Mahdy, we have adopted to double flask technique and have joined the two portions of denture using heat cure acrylic resin. This overcomes shortcomings such as discoloration, fluid seepage and breakage but possess troubles of double processing.[28]

CONCLUSION:

This case report illustrates the procedure for fabrication of a cast partial denture with a hollow cavity to rehabilitate a patient of hemimaxillectomy. The treatment improved the function, aesthetics and psychology of the patient and provided him a better quality of life.

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