



Research Article

A CUSTOMIZED EXTRA -ORALLY RETAINED DELAYED SURGICAL OBTURATOR FOR A BILATERAL MAXILLECTOMY PATIENT HAVING MUCORMYCOSIS

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ABSTRACT

The primary goal of prosthodontic rehabilitation of a bilateral maxillectomy patient during interim period is to close the oro-antral communication with a retentive and stable prosthesis which allow the patient to meet his nutritional and communication needs. Due to absence of any intra oral supporting and retentive structures, it was planned to restore the patient's functional needs with a customized extra orally retained prosthesis. Headgear (elastic straps and stainless- steel hooks), 19-gauge wire and auto polymerizing acrylic resin plate were used to fabricate the prosthesis. This treatment option was a viable approach in total maxillectomy patient particularly in those cases where other intra oral aids were not possible. Patient gave positive functional result with the prosthesis like did not interfere with normal mandibular movements, speech improved over time, convenience of altering the retention, quick evaluation of recurrences as well as economical to the patient. So, this extra orally retained prosthesis would be a good alternative to retain the obturator in the bilateral maxillectomy patients.

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INTRODUCTION

Mucormycosis is an angioinvasive, rapidly progressing, fatal, opportunistic infection which is caused by saprophytic aerobic fungi called Phycomycetes or zygomycetes. Majorly six clinical forms are identified- rhinocerebral, pulmonary, gastrointestinal, central nervous system, cutaneous and disseminated, out of which rhinocerebral is most common which usually involves the nose and paranasal sinuses of head and neck region. Although fungal infection can occur in healthy individuals but most commonly seen in immunocompromised patients such as uncontrolled diabetic ketoacidosis, immunosuppressive drugs, degenerative diseases, prolonged antibiotic, abnormal metabolic states, malignant diseases, major burns, acquired immunodeficiency syndrome and neutropenia.¹

Bilateral total maxillectomy patients are undergone extensive surgical resection of maxilla, in which both right and left side of maxillae bone has been removed. These patients present multiple problems such as major communication between oral and sino nasal cavities, nasal escape of food and liquids, impaired mastication, hypernasal and unintelligible speech and changes in their appearance due to collapse of mid face. This results in suboptimal quality of life which has detrimental influence on their social and psychological functions. Management of such extensive maxillary defects require a multidisciplinary approach.

Various treatment modalities available to restore these patients are surgical reconstruction,²⁻⁴ prosthesis wired or pinned to the available bony structure,^{5,6} implanted retained obturator⁷⁻¹¹ and spring appliances.^{12,13}

Prosthetic rehabilitation is quite challenging in bilateral total maxillectomy patients due to absence of hard and soft tissues which immensely affect the retention, stability and support of the prosthesis. These parameters (retention, stability, support) are very important for patient acceptance and functionally successful outcome of the prosthesis. This article mentions a simplified innovative technique for the fabrication of delayed surgical obturator which is extra-orally retained in total bilateral maxillectomy patient having post covid mucormycosis.

Case report

A 55 yrs old female patient presented to the department of prosthodontics with the chief complain of inability to chew food and regurgitation of food in the nasal cavity. Medical history revealed that patient develop mucormycosis after having covid and she was immunocompromised due to uncontrolled diabetes. On intra oral examination found that hard and soft tissue of the maxilla on both the right and left side was removed except slight soft tissue in the left tuberosity area was left (fig-1). In the mandible teeth missing were- 35, 46, and 47.

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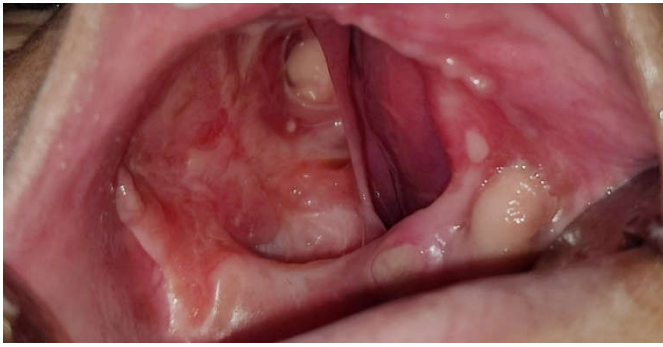


Figure 1 bilateral total maxillectomy

Clinical procedure

Maxillary and mandibular primary impression were made in irreversible hydrocolloid impression material in perforated stock trays (fig-2) and then impressions poured in type 3 dental stone. An auto-polymerizing acrylic resin plate was fabricated to cover the maxillary defect post-operatively. Due to large surgical defect and absence of undercut it was difficult to retain the prosthesis by intra-oral means. So, a customized extra orally retained delayed surgical obturator was planned.



Figure 2 upper and lower alginate impression

For extra oral retention we used thick rectangular elastic straps and stainless-steel retentive hooks for headgear, 19-gauge wire, and 5/16-inch orthodontic elastics. On the maxillary acrylic resin plate occlusal rim was fabricated at correct vertical dimension and there should be even contact of lower teeth on the maxillary rim in centric position. 19-gauge straight wire was fixed on the posterior wax occlusal rim and V-shape bend was given in the wire such that the wire exit from the oral cavity at the corner of mouth so, that there should be no lip entrapment at the rest position as well during functional movements (fig-3). After that wire was contoured according to the patient's face and at the end of wire bend was given in the form of hook to give attachments to the orthodontic elastics. Occlusal rim in the anterior region was completely removed and the wax in the posterior region was replaced by auto polymerizing acrylic resin. The head gear was made using thick rectangular straps which cut into two pieces according to the shape and contour of patient's head and then were stitched together. For exceptional demand of retention, multiple stainless steel sleeve retention hooks were sewed both in vertical and horizontal direction in the zygomatic and temporal layer of head gear on both the sides to hold the elastics. The function of these multiple slots was to alter the retention whenever necessary. Then, 5/16-inch orthodontic elastics were used to connect the

hook in the 19-gauge wire and the stainless-steel slots in the head gear. The force vector of the elastics was in such a way that it adapts the prosthesis more into its desired position, prevent anterior rotation of the prosthesis as well as maintain adequate retention during function (fig-4). To evaluate the prosthesis extensions, retention and further adjustment was required or not, patient was asked to drink water and speak some random sentences. Post insertion instructions were given regarding usage and cleanliness of prosthesis, to have liquid or semi-solid food which does not require mastication and change of elastics to increase or decrease the retention. The patient was advised not to wear the appliance during sleeping, clean it after every meal. Patient was kept on regular follow up to check any type of discomfort to the patient in the form of soreness, numbness and ulceration due to prosthesis, oral hygiene and healing status of the defect so, that final prosthesis would be planned in the future.



Figure 3 Autopolymerizing acrylic plate with 19 gauge wire bending which was used to hold the headgear



Figure 4 showing custom made extra orally retained delayed surgical obturator.

DISCUSSION

Rehabilitation in bilateral maxillectomy patient is quite challenging for both reconstructive surgeons as well to the prosthodontics. In such patients the most immediate matter of concern after post-surgery is the maintenance of adequate nutrition in the interim phase. When surgical reconstruction for these patients is excluded by the surgeon, then it is more important to intervene by prosthetic mean rather than to allow patient to be on feeding tube for the whole interim period. In addition, very less literature is available for rehabilitating bilateral maxillectomy patient during the interim period.

Closure of maxillary defect by surgical reconstruction is a complex treatment option which require multiple surgeries, associated with morbidities at the donor as well as recipient site and also has an uncertain functional outcome.¹⁴ Implant treatment in these patients also difficult because of limited availability of native bone, require additional implant surgery,

chances of misangulation of implant, subsequent oral hygiene, financial constraint, time consuming for complete rehabilitation and higher chances of implant failure. For spring retained prosthesis, basic requirement is intact mandibular arch with healthy dentition which help in retention and stabilization of the mandibular retention plate.¹²

In this case report, no surgical reconstruction was undertaken in interim period. Due to patient's economic status and apprehension with another surgical procedure implant supported prosthesis was ruled out in the interim period. Spring appliance was also not taken into consideration due absence of posterior teeth in the mandibular arch. In this patient where all intra oral means of providing viable treatment failed, it became essential to explore an alternative option for retaining the prosthesis so that patient was able to meet his nutritional and communication needs in the interim period.

A customized extra orally retained delayed surgical obturator was planned for this patient. This prosthesis not only provides adequate retention but also gave liberty to alter the retention of the prosthesis as per patient comfort.

Dhiman M et¹⁵ al used orthodontic head gear and face bow assembly for rehabilitating the bilateral total maxillectomy patients. The main drawback with this orthodontic headgear and facebow assembly was patient's discomfort which is caused by lip entrapment by the inner bow of the face bow which leads to continuous force on the lip in rest as well as in functional position. In this case report, instead of face bow we had used 19-gauge wire which emerges from the corner of the mouth so, no lip entrapment during rest and function. So, this extraorally retained prosthesis was more comfortable, aesthetically acceptable and more economical to the patient as compared to the prosthesis where orthodontic face bow assembly was used.

CONCLUSION

This customized extra-orally retained delayed surgical obturator is a practical approach to retain the prosthesis in the bilateral maxillectomy patients especially in those situations where other intra-oral aids are not feasible. Benefits of this prosthesis is economical, no need for additional surgery, convenience of altering retention, ease of fabrication, amenable to need based adjustment. This treatment option improves the patient quality of life because patient is comfortable and able to meet this functional requirements.

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