

A Novel technique for rehabilitation of hemimaxillectomy microstomia patient by sectional metal casted magnet retained obturator - A case report.

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Abstract

Malignancies are more common in oral region; most times they require surgical interventions. This creates a communication between oral cavity, nasal cavity and maxillary sinus, which makes normal functions like

speaking, swallowing and mastication difficult for patient. Rehabilitation of hemi maxillectomy patient can be challenging due to problems in getting retention, stability and support. The size and location of defect also influences the amount of difficulty in prosthetic

rehabilitation. It becomes more challenging task for operator to record impressions and fabricate a prosthesis in presence of reduced mouth opening. The obturator prosthesis is commonly used method for prosthetic rehabilitation in hemimaxillectomy patients. Prosthodontic rehabilitation with obturator helps to replace the missing structures and also acts as a barrier between the oroantral and oronasal communications.

Keywords: Classical hemimaxillectomy, Reduced mouth opening, Sectional obturator, Intraoral magnets, Abgel.

Introduction

Malignancies of oral cavity are commonly seen in Indian population. Surgical excision of lesion is one of the treatment modalities for such patients. Rehabilitation of acquired maxillofacial defects is accomplished either by surgical or prosthodontic rehabilitation. Rehabilitating such patient with reduced mouth opening is a challenging task for prosthodontist. But it is very rightly said that *“Every human has a right to appear human”*. The prosthodontic management of these patients should aim at not only restoring the patient’s functional and esthetic handicaps but also answer their overall psychological well-being.¹

The prosthesis recreates a partition between oro and nasopharynx and facilitates improvement in mastication, deglutition and speech intelligibility. Increased weight of the obturator prosthesis is usually a major concern to the prosthodontist. The obturator should be light in weight to provide favorable retention, stability, support, patient comfort and cleanliness. Also it should be easy to be used by the patient. The cancer surgeries are frequently associated with co-morbidities. One such co-morbidity is microstomia which renders prosthesis difficult to insert and remove due to small size mouth opening.²

The following article is a case report of prosthetically rehabilitating a hemimaxillectomy microstomic patient

with a definitive sectional hollow cast partial obturator using intra oral magnets and Abgel.

Case report

A 62 years old male patient reported to the department of prosthodontics with complaint of missing teeth and difficulty in mastication and swallowing due to a large defect in the right side roof of the mouth. The medical history revealed that the patient had undergone right hemimaxillectomy due to squamous cell carcinoma of the right alveolus **two months** back and was kept under the supervision of the oncologist for recurrence of the lesion. Patient also underwent chemotherapy. No other reported systemic disease. Extra-oral examination revealed obvious unilateral facial disfigurement on the right side and a small opening on right side of face extra orally and severe fibrosis of right buccal mucosa (Fig1). The patient had a severe restricted mouth opening of 12mm. (Fig 2)



Figure 1



Figure 2

Intraoral examination revealed Class 1 Armany's defect involving right side of maxilla (Fig 3). The extension of the defect was difficult to gauge as the patient had reduced mouth opening. However, the defect was confined to the right maxilla with a definite oronasal and oroantral communication. The defect was filled with granulation tissue and necrotic slough. The remaining dentition included the maxillary left anterior and posterior teeth and all teeth in the mandibular arch (Fig 4). During a conversation with the patient, an obvious hyper nasal speech was noted. Diagnosis was Armany's class I Maxillary Defect secondary to squamous cell carcinoma. Treatment plan was decided Initially Hester Mouth Gag advised to improve the mouth opening, interim obturator and definitive obturator after 4-5 months. An informed consent was obtained from the patient after discussing the treatment plan with the patient.



Figure 3



Figure 4

Clinical procedure for interim obturator:

- 1) Impression procedure: cause of limited mouth opening of 12 mm was not able to use any stock tray for recording primary impression of defect with any material.
- 2) After blocking the defect in maxilla (unfavorable undercuts) with gauze soaked in glycerin (Fig 5). Primary impression was tried with impression compound which was supported by plaster spatula and molded to adapt with the defect and maxillary area.

Impression recorded in four sections by making orientation grooves and depth in each segment one after each other (Fig 6,7).



Figure 5



Figure 6



Figure 7

All four segments of impression compound assembled outside mouth with the guidance of orientation grooves. after applying tray adhesive this segments used as special tray relined with light body elastomers to record final impression in sections and all sectioned joined to get a full impression which was poured in class 4 stone to get a final model of obturator to fabricate interim obturator (Fig 8,9,10).



Figure 8



Figure 9



Figure 10

Using lost salt technique sectional interim obturator fabricated with clear transparent acrylic. Two pairs of intraoral magnets used as retentive aid in each segment of obturator and orientation slots made in each segment to orient obturator segment at position intraorally. Interim obturator delivered to patient. All proper instructions about wearing and maintenance of obturator and defect given to patient called for regular follow-up after every 8 days and 15 days .and planned definitive prosthesis after 4 months (Fig 11,12).



Figure 11



Figure 12

Clinical procedure of definitive obturator:

- 1) Four months after giving interim obturator to patient and after discussion with oncologist and after knowing patient positive attitude towards interim sectional obturator case planned for definitive prosthesis.



Figure 13



Figure 14



Figure 15

- 1) By using previous model as a guide sectional tray fabricated with orientation slots in each section for recording final impression.
- 2) After blocking undesirable undercuts in defect area with gauge soaked with glycerin first defect area recorded with putty impression material and the it was lined by light body elastomer and placing this set impression section in mouth

second sectional tray with light body inserted and oriented in mouth and impression recorded (Fig 13,14,15).

- 3) After complete setting of impression material full impression removed from patient mouth and after beading boxing poured in class 4 stone to achieve final master model (Fig 16).
- 4) The metal framework sectional cast partial hollow obturator was designed as class 2 RPD according to Kennedy's classification. Tooth support add the direct retainer near to the extension base, also add the indirect retention after abutment teeth preparation. The frame work design then casted in alloy base metal, this made from chrome cobalt.³(Fig 17)
- 5) Two holes are placed in each section to place the magnets which were used for retention purpose and orientation slots given in fabricated segments of cast partial denture.⁴ (Fig 18,19,20)
- 6) Hollow bulb obturator fabricated on one section by using ABGEL inside the bulb portion while fabrication procedure. (Fig 21)
- 7) Cause of limited mouth opening only anterior teeth including first premolar given in obturator. anterior served as esthetic purpose and premolar as it was occluding with lower one given stability to obturator (Fig 22,23). occlusion adjusted intraorally.
- 8) To match the shade and to improve esthetic with adjacent natural teeth, acrylic teeth were stained using composite stains from visiolign bredent company. (Fig 24)
- 9) After finishing and polishing of obturator magnets are luted in holes in each section with cyanoacrylate and acrylic resin.

10) Final prosthesis delivered to patient and instruction and training given about how to use it. (Fig 25,26)



Figure 16



Figure 17



Figure 18



Figure 19



Figure 20



Figure 21



Figure 24



Figure 22



Figure 25



Figure 23



Figure 26: Pre Treatment



Figure 27: Post Treatment

Post Insertion Instructions

- 1) The patient was instructed regarding insertion and removal of the prosthesis.
- 2) The patient was also instructed regarding the cleaning of the defect with betadine mouthwash and also home care of the prosthesis using water and chlorhexidine.
- 3) The patient was recalled every 2 weeks up to 6 months in view of the continuously changing tissue conformation for regular modification and adjustment. Advised use of mouth gag.

Discussion:

Frequently, the presence of oral cancer necessitates the surgical removal of all or part of maxilla, leaving the patient with a defect that compromises the integrity and function of the oral cavity. The traditional treatment sequence for a patient requiring rehabilitation of a maxillectomy is the initial insertion of an immediate surgical obturator at the time of surgery or soon thereafter, an interim obturator used after initial healing until the tissues are stabilized (approximately 3 months), and a definitive obturator prepared after the tissues have

stabilized, with few appreciable changes. Obturator is a maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/or contiguous alveolar/soft tissue structures. (GPT-7). Microstomia is a term used to describe a small oral aperture. Limited mouth opening could be because of any reason may be congenital or acquired followed by surgery. Patients who are not responding to exercise or expansion prosthesis and who are candidate for removable Prosthesis need special attention and modifications in prosthetic steps such as modified stock trays, sectional custom trays, and collapsible/sectional. In a patient with restricted mouth opening, it is difficult to obtain the “perfect” impression that captures all possible details. Hence, priorities must be established according to the restorative and reconstructive needs of an individual patient. To make an impression, various modification have been suggested. While making primary impression, generally, a stock tray is used. However, a loaded stock tray is the largest item, requiring wide mouth opening during intraoral placement. Many tray less techniques described in literature as Whitsitt and Battle adapted putty directly in mouth with finger without any tray and used same as a tray for taking light body wash impression, whereas Cheng *et al.* used occlusal registration material adapted intraorally again with finger without tray, in which a wash impression was taken later with light body silicon material. In these procedures, plaster index was made before pouring to prevent distortion; however, while removing from mouth, some distortion is normal and unavoidable, as there is no rigid support. A rigid support by use of tongue blade was recommended by few authors.⁵

There are numerous ways of fabricating the open and closed hollow obturator. All these techniques intend to provide a light weight prosthesis that is readily accepted by the patient. The open bulb obturator provides the

advantage of easy cleans ability, but accumulation of moisture necessitates frequent cleaning. Removable lids or the covering of the obturator prosthesis usually reduces this disadvantage. Various methods available to fabricate a hollow bulb obturator include the fabrication of an obturator either as one piece or by processing in two halves and sealing using auto polymerizing resin. One-piece hollow bulb obturator can be fabricated by filling the hollow portion using materials such as sugar, salt, polyurethane foam, sponge and gas injection using argon gas. No detachable screw cap can also be used to cover the opening made to pour out the sugar or salt.⁶

Dhakane et al⁷ described one technique to hollowing maxillary complete denture by using Abgel with single flask technique. It is absorbable gelatin sponge with negligible weight, sterile, economical flexible to adapt any shape, during surgery its used to decrease the blood at surgical site as its biocompatible due to this reason it can be remained in denture. Similar technique was used in fabrication of the hollow bulb of the obturator in our case. Matsamura et al⁴ described fabrication procedure of a removable sectional denture connected by a cobalt-samarium magnetic retention system for a patient with severe maxillary defect. Intraoral magnets have many advantages such as ease of placement, automatic reseating, constant retention with many cycles easy replacement if needed, small size with strong attractive forces, can be placed within the prosthesis, dissipate lateral functional forces, less need for parallel abutments, can be used for implant-supported prosthesis, ease of cleaning but with disadvantages such as low corrosion resistance, cytotoxic effects of the lea chants, high cost, short track record.⁸ In this article we described technique to recording primary impression by using rigid low fusing impression material impression compound in sections by manipulating intraorally using plaster spatula and

definitive hollow sectional metallic cast partial magnet retained obturator.

Acrylic teeth were characterized with composite stains to match the esthetic with remaining natural teeth and an esthetic clasp was given in anterior region which improved esthetic of the patient.

Conclusion

The management of the patient with maxillectomy requires a multidisciplinary approach. The retention and stability of the obturator for the patient who has had a hemi maxillectomy are major problems. Though it is difficult to improve the quality of life for hemi maxillectomy patients compared with patients with conventional prostheses, this can be achieved with skill, knowledge and experience of specialists.

Reference

1. Mantri S, Khan Z. Prosthodontic rehabilitation of acquired maxillofacial defects. Head and neck cancer. Intech. 2012 Mar 14:315-6.
2. Desjardins RP. Obturator prosthesis design for acquired maxillary defects. The Journal of Prosthetic Dentistry. 1978 Apr 1;39(4):424-35.
3. Chaturvedi A, Shah RJ. Cast partial framework obturator-a promising rehabilitation for oral cancer patient: case report. Sch J Dent Sci. 2017;4:246-9.
4. Gurjar R, Kumar MV S, Rao H, Sharma A, Bhansali S. Retentive Aids in Maxillofacial Prosthodontics-A Review. International Journal of Contemporary Dentistry. 2011 Apr 7;2(3).
5. Kumar B, Fernandes A, Sandhu PK. Restricted mouth opening and its definitive management: A literature review. Indian Journal of Dental Research. 2018 Mar 1;29(2):217.
6. Sridevi JR, Kalavathy N, Jayanthi N, Manjula N. Techniques for fabricating hollow obturator: two case

reports. SRM Journal of Research in Dental Sciences.

2014 Apr 1;5(2):143.

7. Dhakne V, Jadhav P, Limaye M, Modgi C, Patil P.
Abgel a way to make light weight maxillary complete denture: An innovative.
8. Bhat V. A close-up on obturators using magnets: part I-magnets in dentistry. The Journal of Indian Prosthodontic Society. 2005 Jul 1;5(3):114.