

Rehabilitation of a Aramany Class III Maxillary Defect by Fabrication of a Single Piece Hollow Bulb Obturator

Poonam R. Kulkarni^{1*} Rahul S. Kulkarni²

¹Senior Lecturer, Department of Prosthodontics, Sri Aurobindo College of Dentistry and PG Institute, Indore, Madhya Pradesh, India.

²Senior Lecturer, Department of Prosthodontics, Index Institute of Dental Sciences, Index City, Indore, Madhya Pradesh, India.

ABSTRACT

Background: Intraoral defects are seen in the maxilla, in the form of an opening into the maxillary sinus and nasopharynx. These defects of any extent cause surfeit of tribulations affecting speech, mastication and esthetics. Most acquired maxillary defects occur due to surgical resection of tumours. A prosthesis used to close a palatal defect in dentulous or edentulous mouth is correctly referred to as an obturator. Prosthetic rehabilitation with obturator provides both physiological and psychological benefits along with restoration of masticatory function and improvement of speech and aesthetics. One of the main objectives in the fabrication of hollow bulb obturators is to minimize weight to optimize retention and stability as well as patient comfort. This article describes simple method for the fabrication of one piece hollow obturator for a patient with right side partial maxillectomy.

Keywords: Partial maxillectomy, Oral rehabilitation, Hollow bulb obturator.

INTRODUCTION

Maxillofacial prosthetics is the branch of prosthodontics concerned with the restoration and/or replacement of the stomatognathic and craniofacial structures with prostheses that may or may not be removed on a regular or elective basis¹. The most common of all intraoral defects are seen in the maxilla which includes hard and soft palate, maxillary sinus, floor of the nasal cavity, and the alveolar ridges². Tumors of the maxilla can cause abnormal and malignant changes to the tissues, which may require surgical excision. This result in an anatomic defect establishing a connection between the oral cavity, maxillary sinus and the nasal cavity³. These defects may occur due to surgical resection of benign and malignant tumors, congenital malformation, and trauma². The size and shape of the palatal defect will have a significant influence on the speech, mastication and esthetics. Rehabilitation of these defects with an obturator is a predictable intervention as it creates an

anatomical barrier which facilitates restoration of function such as deglutition, mastication, speech, and esthetics. Weight of the obturator is always an area of concern for the dentist as it jeopardizes the retention of the prosthesis. Reduction in the weight of the obturator is attained by hollowing the prosthesis which optimizes retention and stability and also increases the patient comfort. This case report describes the fabrication of single piece hollow bulb obturator for rehabilitation of a patient who had undergone wide excision sequel to squamous cell carcinoma using a cut down technique.

CASE REPORT

A 58-year-old male patient referred from GCRI (Gujarat Cancer Research Institution) to the prosthodontic department of GDCH (Government Dental College and Hospital), Ahmedabad, Gujarat, for restoration of maxillary defect created after surgical intervention. His chief complaint was

Received: June. 17, 2015; Accepted: Oct. 11, 2015

*Correspondence Dr. Poonam R. Kulkarni.

Department of Prosthodontics, Sri Aurobindo College of Dentistry and PG Institute, Indore, Madhya Pradesh, India.

Email: poonamrahulkulkarni@gmail.com



Fig 1: Intra-oral view of the maxillary defect.



Fig 4: Final cast with defect.



Fig 2: Impression of the defect with putty body of rubber base impression material.



Fig 5: Heat cure hollow bulb fabrication.



Fig 3: Impression of the defect with light body of rubber base impression material.



Fig 6: Removal of salt after hollow bulb fabrication.

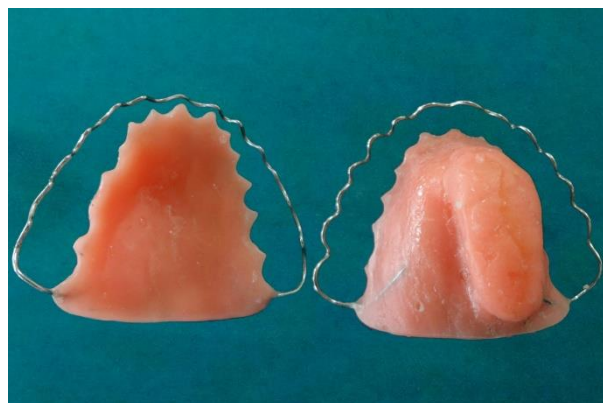


Fig 7: Final definitive hollow bulb obturator with continuous clasp.



Fig 8: Final hollow bulb obturator in patient's mouth.

difficulty in swallowing food, liquid, and food escaping into the maxillary sinus and nasal cavities. The patient had a history of squamous cell carcinoma of right maxilla and sinus. The patient underwent right partial maxillectomy 3 years back along with postoperative radiation therapy. Intraoral examination revealed maxillary surgical defect on patient's right side, which was extending anteriorly up to the midline and posteriorly up to the posterior extent of hard palate, superiorly almost to the floor of the orbit, mesially to the nasal septum and laterally, to the palatal margin of the teeth. Teeth were present from right second molar to the left second molar and all teeth were intrinsically stained, mouth opening was average. Patient's oral hygiene was poor. On extra-oral examination, patient's right side of the face was disfigured and the skin below the infra-orbital margin was depressed with scar. Patient was

experiencing difficulty in mastication and deglutition due to nasal reflex of food and also complained of hyper nasal speech. On the basis of extent of the defect as per Aramany class III, a hollow bulb obturator was planned for this patient. In this patient Aramany class III design was not followed because the condition of the remaining teeth was not favorable to follow the design. So, definitive single piece hollow bulb obturator with continuous clasp on remaining teeth was planned for the retention and stability of the prosthesis.

Procedure

1. Impression of the defect in maxilla was made in the putty and light body of rubber base impression material with the help of the stock metal tray, during impression care was taken to block the undercut with moisten gauze, and dental floss was tied to the gauze to avoid intrusion of the impression material and further injuries. (Figure – 2 and 3)
2. Final cast with accurate reproduction of defect portion was retrieved out. (Figure-4)
3. Minor undercuts in the defect were blocked out using the modeling wax and a wax up of 2 mm thickness was done on the bottom and periphery of the defect, then the entire assembly was flaked and dewaxed.
4. Heat polymerized acrylic resin was mixed and a small amount of dough was pressed on to the bottom and periphery of the defect and the curing was done in the conventional manner, by this method a heat cured inner surface of the defect was fabricated. (Figure-5)
5. Flask was opened and then a separating media was applied around the walls of the defect and a thick mix of the plaster was filled up to the level of the remaining palate.
6. After setting of the plaster, Before commencing with wax up procedure a continuous clasp of 19 gauge wire adapted around the teeth from right second molar to the left second molar for the retention of the prosthesis in the mouth.
7. A wax up of 2 mm thickness was done to contoured to the shape of the palate on the non defect side and, again the entire assembly was

flasked and dewaxed, after that flask opened and plaster removed from the defect area.

8. Base of the defect filled with the table salt and covered with a cellophane sheet. (Figure-5)
9. Then a heat polymerized acrylic resin was mixed and a small amount of dough was placed on to the counter portion of the flask, and again a curing was done in the conventional manner.
10. Deflasking was done and a hole was made with the help of the bur in defect area of the cured prosthesis, removal of cellophane sheet and table salt was done and this was followed by closure of the hole area with the self cure resin. (Figure -6)
11. Finishing and polishing of the prosthesis was done. (Figure-7)
12. Patient was happy with the improved swallowing efficiency and the quality of speech instantaneously. (Figure -8)
13. Necessary instructions were given on technique of placement, removal and maintenance of the prosthesis. Post-insertion follow-up and patient care was carried out at the regular intervals of time.

DISCUSSION

Obturator prosthesis plays an important role in the recovery of oral function in postsurgical maxillectomy patients⁴. Lack of support, retention, and stability are common prosthodontic treatment problems for patients who have had a maxillectomy. Factors that affect the prosthetic prognosis for these patients are the size of defect, number of remaining teeth, amount of remaining bony structure, quality of existing mucosa, radiation therapy, and patient's own ability to adapt to the prosthesis⁵. Rehabilitation of palatal deficiency patients requires restoration of mastication, deglutition and speech. Considering the patient's condition and economic background, the prosthesis was fabricated according to his needs. The weight of prosthesis was often a dislodging factor that has to be considered^{6,7}. Weight reduction was prime when the obturator prosthesis was suspended without bony or posterior tooth support on the defect side⁸. The weight of the prosthesis can be reduced up to

33% when obturator is fabricated hollow⁹. Pertaining to the fabrication of obturators, controversies do exist between the closed and open hollow bulb obturators. The closed hollow bulb obturator prosthesis can prevent food and fluid collection; minimizes the air space and favors for maximum extension¹⁰. The open hollow bulb obturator has the problem of collecting mucous and fluids and need frequent cleanings or a vent placement to eliminate accumulation in the bulb¹¹. A hollow bulb obturator is a better choice, as it is lighter in weight and more hygienic. Several techniques have been advocated in the fabrication of hollow obturators. Controlling the thickness of the hollow obturator walls is important to provide adequate strength and weight of the prosthesis. Materials such as ice¹², sugar¹³ and putty¹⁴ have been used in the defect portion during processing and then removed through holes after processing.

This case report describes the fabrication of hollow bulb obturator using salt to fill the defect. The advantage of using salt as filling material in the defect is its easy confiscation subsequent to acrylization through the vent created in the obturator¹⁵.

CONCLUSION

The rehabilitation of patients with congenital or acquired palatal defects of the maxilla with hollow bulb obturators requires a thorough knowledge and skills coupled with better understanding of the needs of the patient. A cut down method of fabricating a hollow light weight obturator has been presented. Hollow bulb obturators enhance the retention, mastication, speech and esthetics in the post-operative period providing a functional solution to the compromised state of the patient.

ACKNOWLEDGEMENTS

The authors are very thankful for Support from The Department Of Prosthodontics, Government Dental College and Hospital, Ahmedabad , Gujarat.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. "Glossary of postodontic terms," Journal of Prosthetic Dentistry, vol. 94, pp. 10-92, 2005.
2. Deogade SC et al. A direct investment method of closed two- piece hollow bulb obturator. Case reports in dentistry 2013;1:1-5.
3. Spiro RH, Strong EW, Shah JP: Maxillectomy and its classification. Head Neck 1997;19:309-314.
4. Curtis TA, Beumer J, Rehabilitation of acquired hard palate defects. In: Beumer J, Curtis TA, Marunick MT (eds). Maxillofacial Rehabilitation, Prosthodontic and Surgical Considerations, ed 1. St. Louis: Ishiyaku Euro- America, 1996:225-284.
5. Russell R. Wang, Sectional prosthesis for total maxillectomy patients: A clinical report. J Prosthet Dent 1997;78:241-4.
6. Beumer J, Curtis TA, FirtellDN (1979) Speech, palatopharyngeal function, and restoration of soft palate defects. In: Maxillofacial rehabilitation—Prosthodontic and surgical considerations. C. V. Mosby Company, St Louis, pp 249, 267.
7. V.A. Chalian and M.O. Barnett J. A new technique for constructing a one-piece hollow obturator after partial maxillectomy Prosthet Dent Oct1972;vol 28(4) 448- 453.
8. Parr GR, Tharp GE, Rahn AO. Prosthodontic principles in the framework design of maxillary obturator prostheses. J Prosthet Dent. 1989; 62:205-212.
9. Martin JW, King GE. Framework retention for maxillary obturator prostheses. J Prosthet Dent. 1984; 51:669-672
10. Barry H. Habib, DMD, MS, and Carl F. Driscoll, DMDFabrication of a closed hollow obturatorJ Prosthet Dent 2004; 91:383-385.
11. McAndrew KS, Rothenberger S, Minsley GE: An innovative investment method for the fabrication of closed hollow obturator prosthesis. J Prosthet Dent 1998; 80:129-132.
12. Schneider A. Method of fabricating a hollow obturator. J Prosthet Dent 1978;40:351.
13. Parel SM, LaFuenta H. Single visit hollow obturator for edentulous patients. J Prosthet Dent 1978;40(4):426-9.
14. Alva H et al. Prosthodontic rehabilitation of a patient with hollow bulb obturator: A case report. NUJH 2012;2(2):60-2.
15. Singh BK. A simplified technique for constructing one piece hollow obturator after partial maxillectomy. International Journal of Prosthodontics and Restorative Dentistry, July-September 2011;1(2):118-122. Schneider A. Method of fabricating a hollow obturator. J Prosthet Dent 1978;40:351.