A Novel Technique for Single Step Fabrication of an Interim Hollow Bulb Obturator: A Case Report

***Sheetal Jain[1], Vibha Shetty[2], Anubhav Koul[3] and Priyanka Aiyer[4]**

*Corresponding Author E-mail: jainsheetal950@gmail.com

Contributors:

[1,3,4] Post Graduate Student, [2]Professor and Head, Department of Oral Implantology, Department of Prosthodontics and Crown & Bridge, M.S. Ramaiah University of Applied Sciences, Bangalore, Karnataka.

Abstract

Total or partial maxillectomy as a result of carcinoma leaves patients with facial disfigurement. These acquired surgical defects may affect the patient's quality of life and are often associated with long term psychosocial effects. Rehabilitating maxillofacial defects is a complex procedure and these are often treated with various types of obturators. This article describes a technique that provides a simplified single step procedure for the fabrication of interim hollow bulb obturator.

Keywords: *Hollow Bulb, One Piece Obturator, Maxillectomy*

1. INTRODUCTION

Defects after maxillectomy are often associated with oro-nasal communication due to which speech, mastication and deglutition can be hampered. Obturators are prostheses that are fabricated to seal maxillary defects. An obturator is defined as a maxillofacial prosthesis that replaces part or all of the maxilla and associated teeth lost due to surgery or trauma[1]. Several techniques have been proposed for fabrication of open and closed hollow bulb obturator. This article describes a technique for single step fabrication of an interim closed hollow bulb obturator using glycerine soap.

2. CASE REPORT

A 65 year old male with a history of leomyosarcoma of the right side of maxilla had undergone partial maxillectomy.

1. A preliminary impression was recorded using stock impression tray immediately after surgical resection with addition silicon putty (Aquasil, Dentsply, Germany). Impression was poured with type III dental stone (Goldstone, India)
2. Custom tray was fabricated for the final impression (figure 1). 10 days after surgery, the undercuts were blocked with gauze. Maximal extensions were recorded in the impression made with addition silicon putty and monophase (Aquasil, Dentsply). Beading and boxing was done and the impression was poured with type III dental stone (Goldstone, Rajkot, Gujarat, India)
3. Undesirable undercuts on the defect area on the master cast (figure 2) were blocked out with type II dental plaster (Goldstone, Rajkot, Gujarat, India)
4. Wax pattern of the prosthesis was made and flasking was done using type II dental plaster (Goldstone, Rajkot, Gujarat, India)
5. 5.After dewaxing, defect was coated with one layer of heat cure denture base resin (Acralyn-'H', Mumbai, India) and packed with glycerine soap (Savlon, Haridwar, Uttarakhand, India) (Figure 3) for maintaining space and another layer of heat cure denture base resin was packed onto the defect area and the rest of the denture bearing and processed
6. The prosthesis was carefully retrieved from the master cast, trimmed and polished (Figure 4)
7. To remove soap, a small hole was made on the bulb of the obturator and the prosthesis was immersed in a bowl of water. To ensure complete removal a fine instrument was used and traces of soap were removed using a water spray. The hollow bulb cavity was air dried, and the bulb opening was sealed with self-cure acrylic resin (DPI-RR Cold Cure, Mumbai, India)

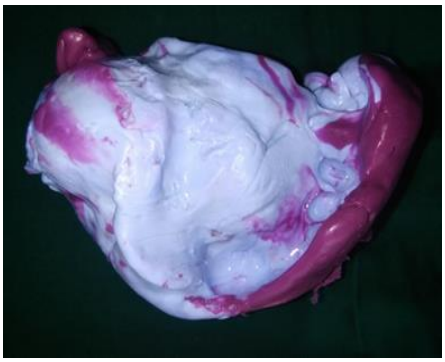

Fig. 1 Final impression

Fig. 2 Master cast

Fig. 3 Packing with glycerin soap

Fig. 4 Finished prosthesis

3. DISCUSSION

Rehabilitation of patients after maxillectomy has always been a challenge for the prosthodontist due to decreased support, stability and retention. The fabrication of obturators for such defects should strictly follow basic prosthodontic principles. The bulb component of the prosthesis could be closed or open type. It is preferably hollow to ensure lightness of an otherwise bulky prosthesis and also helps in better retention. WU in his study found that hollow bulb obturators had reduced weight of the prosthesis from 6.55% to 33.06% depending on the size of the defect when compared to solid obturators[2]. The closed type hollow bulb obturator do not allow pooling of nasal secretions unlike the accumulation of secretions seen within an open bulb obturator. Several techniques have been proposed for fabrication of open and closed hollow bulb obturator. Kunwarjeet et al fabricated flexible open hollow bulb obturator[3]. Buzayan et al fabricated closed hollow bulb obturator using hard thermoforming splint material and heat cure acrylic resin[4]. Schneider used crushed ice, Matalon and Parel used sugar, Srinivasan et al used salt, Mawani used potassium alum crystals, Amar et al used thermocol, Charles et al used custom ice, Chalian used an acrylic resin shim whereas Tanak et al incorporated polyurethane foam as matrices inside the bulb for the fabrication of hollow cavity[5-13]. Few other methods include fabrication of hollow bulb obturators in separate segments and then luting them with autopolymerising acrylic resin[14-17]. However, these methods create a line of demarcation between heat cure and autopolymerising resin which may be a potential site of discoloration or leakage. The main advantage of the present technique is the uniform space in the bulb which may collapse in previously described techniques. In double flask technique, interchangeable counters were used[18]. Here, the accuracy of interchangeable counters is

critical as inaccuracy may lead to altered vertical dimension. In this case report, in an attempt to avoid two step fabrication or double flask technique, conventional method was followed where small opening was made and glycerine soap was removed. Hand carved glycerine soap spacer can sustain curing temperatures of acrylic (boiling point of glycerine is 290°C) and doesn't interfere with the polymerization of heat cure acrylic resin. Additionally, it does not leave any residue inside the hollow bulb cavity[19,20]. The ample working time and good control over the soap allowed for application of uniform thickness of heat cure resin all around the hollow bulb cavity. This single flask technique allows fabrication of hollow bulb obturator as a single unit by eliminating the extra laboratory steps for processing.

4. CONCLUSION

The simple, time saving single step fabrication technique with glycerine soap spacer is a predictable method of fabricating a hollow bulb obturator while minimizing laboratory steps. Glycerine soap is easily controlled, has high boilng temperature and is eliminated completely without residue from within the hollow bulb.

REFERENCES

1. Glossary of Prosthodontic Terms. J Prosthet Dent 2005; 94:10-92.
2. Wu YL, Schaaf NG. Comparison of weight reduction in different designs of solid and hollow obturator prostheses. J Prosthet Dent 1989; 62:214-7.
3. Kunwarjeet et al., Modification of existed prosthesis into a flexible wall hollow bulb obturator by permanent silicon soft liner for a hemimaxillectomy patient with restricted mouth opening. Journal of Prosthodontic Research. Article in press.
4. Buzayan et al., Closed hollow bulb obturator-One step fabrication: A clinical Report 2013. Journal of Prosthodontics; 22:591-595.
5. Charles P et al., Technique for fabrication of interim closed hollow bulb obturator in a patient with class II Aramany's defect. Karnatala Prosthodontic Journal 2017; 1(3):6-12.
6. Schneider A. Method of fabricating a hollow obturator. J Prosthet Dent 1978; 40:351.
7. Matalon V, LaFuente H. A simplified method for making a hollow obturator. J Prosthet Dent 1976; 36:580-2.
8. Parel SM, LaFuente H. Single-visit hollow obturators for edentulous patients. J Prosthet Dent 1978; 40:426-9.
9. Srinivasan J, BabuRajan K, Suresh V. Fabrication of interim hollow bulb obturator using lost salt technique – A Case report. Journal of Scientific Dentistry 2011; 1(1):37-40.
10. Dipal P. Mawani et al., Flasking technique with alum crystals for fabricating definitive hollow bulb obturators. The Journal of Prosthetic Dentistry. Article in Press.
11. Amar Bhochhibhoya, Suraj Mathema, Brijesh Maskey. International journal of Dentistry and oral health 2016; 3.1:1-3.
12. Chalian VA, Barnett MO. A new technique for constructing a one-piece hollow obturator after partial maxillectomy. J Prosthet Dent 1972; 28:448-53.
13. Tanaka Y, Gold HO, Pruzansky S. A simplified technique for fabricating a lightweight obturator. J Prosthet Dent 1977; 38:638-42.
14. Barry H. Habib. Fabrication of a closed hollow obturator. The journal of Prosthetic Dentistry 2004; 91(4):383-385.
15. Karen S, Sandra Rothenberger, Glenn E. Minsley. The Journal of Prosthetic Dentistry 1998; 80(1):129-132.
16. Kenneth E. Brown. The Journal of Prosthetic Dentistry 1969; 21(1):97-103.
17. Brown KE. Clinical considerations improving obturator treatment.J Prosthet Dent 1970; 24:461-6.
18. Browning JD, Kinderknecht J. Fabrication of a hollow obturator with fluid resin. J Prosthet Dent 1984; 52:891-5.
19. El Mahdy AS: Processing a hollow obturator. J Prosthet Dent 1969; 22:682-686.
20. Anchal Qanungo, Meena Ajay Aras, Vidya Chitre, Ashwin Mysore, and Godwin Clovis Da Costa. An innovative and simple technique of hollow maxilaary complete denture fabrication. J Clin Diagn Res. 2016;10 (8): ZD23–ZD25.