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RESEARCH ARTICLE

A SIMPLE AND INNOVATIVE TECHNIQUE OF FABRICATION OF A DEFINITIVE CLOSED HOLLOW BULB OBTURATOR

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ABSTRACT

Hollow maxillary obturator prosthesis is an important treatment modality in maxillectomy patients. Reduction in the weight of the obturator is an important factor in improving the retention and stability of the prosthesis. This article describes a simple flasking technique for fabricating a closed hollow bulb obturator that achieves a uniform wall thickness of the hollow bulb.

INTRODUCTION

Large maxillectomy defects are frequently treated with a maxillary obturator prosthesis rather than surgical reconstruction. Such defects result in an oroantral communication causing difficulty in deglutition, swallowing, impaired speech and facial disfigurement (Rieger, 2002). Obturator prosthesis not only helps to seal congenital or acquired defects of the maxilla but also improve masticatory and speech function by replacing the lost anatomical structures. The bulb portion of the obturator must add to the retention and stability by adequate extension into the defect area. However greater extension adds to the weight of the prosthesis reducing its retention and stability (Wu, 1989; Beumer, 1996). Several techniques have been described for the fabrication of open and closed bulb hollow obturator making the prosthesis lightweight. The open hollow bulb obturator often collects fluids, mucous, food and require frequent cleanings or placement of vent holes to prevent fluid accumulation (McAndrew, 1998). On the other hand, closed bulb obturators extend adequately into the defect without fluid accumulation (Phankosol, 1985).

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Among the various materials available for fabrication of obturator prosthesis, heat cure acrylic resin is still considered as one of the most biocompatible and durable materials. Numerous methods have been described in the literature for the fabrication of prosthesis in either one piece or two piece. Two piece obturator prosthesis is fabricated by creating a separate lid for closure of the defect. A one piece obturator is fabricated by incorporating a spacer during packing which is removed following acrylization of the prosthesis⁽⁶⁾ or by fabricating separate components and sealing them together with autopolymerizing resin.^(7,8) This article describes the fabrication of a one piece hollow bulb obturator using an innovative technique.

CASE REPORT

A 65 year old female reported to the Department of Prosthodontics, Goa Dental College and Hospital requesting for a new obturator prosthesis. She gave a history of ameloblastoma of the right maxilla which was resected in 2012 by total maxillectomy. The patient complained that her current definitive obturator was loose. On examination, the maxillary arch was partially edentulous with a well healed defect of the maxilla and the mandibular arch was completely edentulous. A light weight hollow bulb obturator was planned to restore the separation of the oral and nasal cavities and hence facilitate speech, deglutition, mastication and esthetics.

Procedure

- Primary impression of the defect was made with irreversible hydrocolloid (Vignette chromatic, Dentsply) and custom trays were fabricated with autopolymerising acrylic resin.
- Border molding was performed and impression of the defect was registered using low fusing modelling compound. Wash impression was made using light body polyvinylsiloxane (Elite HD+, Zhermack).
- Jaw relation was recorded and try-in was done with monoplane dentition taking into account the esthetic and phonetic requirements.
- Investing and dewaxing was done in the conventional manner.
- Using heat cure acrylic resin 2X2X1 mm pellets were fabricated and placed on the resected part of the master cast on the base unit of the flask with cyanoacrylate adhesive.(Fig.1)
- A layer of modeling wax was adapted over the other half of the flask in the region of the defect to ensure uniform thickness of acrylic all around the planned hollow cavity.(Fig.2)
- A temporary putty spacer (Zeta Plus, Zhermack) was fabricated and adjusted for use uptill the trial closure. The two halves of the flask were reassembled to verify accurate flask closure with the putty spacer in place.
- Jaggery was hand carved using a Le Cron (Hu-Friedy, Chicago, IL) to obtain a replica of the putty spacer.(Fig.3)
- After dewaxing a trial packing was done using the temporary putty spacer and the space obtained was evaluated for even resin thickness all around (Fig.4). The resin was placed in both halves of the flask for the trial packing. The hollow space was then filled with the jaggery spacer and final closure performed.(Fig.5)
- After acrylization the obturator was retrieved in the usual manner. A small opening was made in the palatal aspect of the denture base and the jaggery spacer was removed by immersing it in warm water (Fig.6). The hollow cavity was air dried and the opening was sealed with autopolymerising acrylic resin .
- The closed hollow bulb obturator was finished, polished and delivered to the patient.(Fig.7)



Figure 1. Acrylic resin pellets placed over the region of the defect



Figure 2. Adaptation of modeling wax

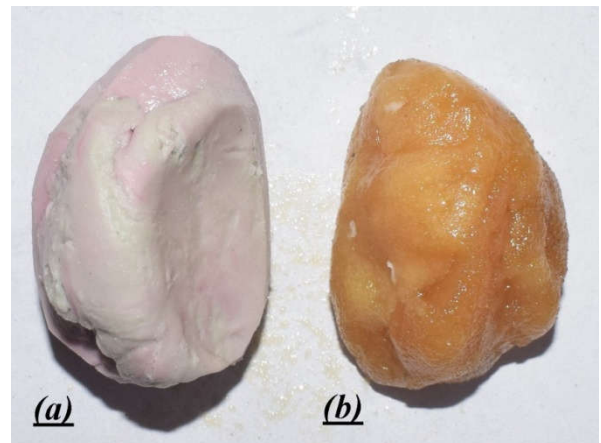


Figure 3a. Temporary putty spacer. (b) Spacer hand carved out of jaggery



Figure 4. Visual assessment of hollow cavity obtained following trial closure using putty spacer

DISCUSSION

The fabrication technique described in this article is simple, economical and time saving. The main advantage is that the use of acrylic resin pellets provides a seat for the spacer while packing, thereby controlling the thickness of the hollow bulb. A uniform hollow cavity was obtained using the acrylic resin pellets. Also it was a single step procedure that reduces the chances of resin distortion. Jaggery is a non-centrifugal cane sugar that is completely soluble in water. The jaggery spacer which has been hand carved in accordance with the putty spacer has been used.

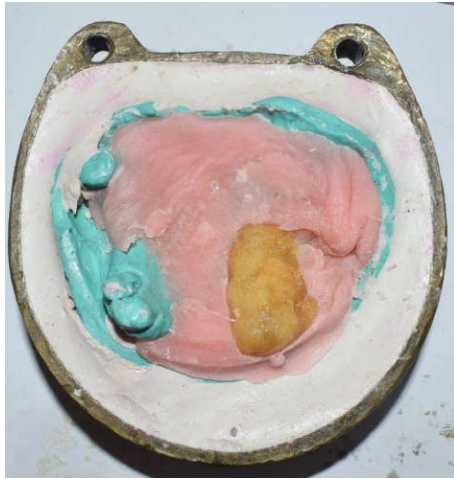


Figure 5. Placement of jaggery spacer



Figure 6. Removal of the jaggery spacer



Figure 7. Finished and polished closed hollow bulb obturator

Advantages of using jaggery spacer are its easy retrievability, it can be shaped as needed, its sufficient rigidity to withstand the force of packing, its non effect on the polymerization of heat cure acrylic resin (an experiment was conducted to verify this), its ready availability and cost effectiveness.

Conclusion

A unique single-flask method of fabricating a closed hollow bulb obturator prosthesis using a jaggery spacer and acrylic resin pellets to control the thickness of the hollow bulb has been described. Advantages include ease of fabrication, reduced laboratory time, cost effectiveness and easy retrievability.

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