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CASE REPORT

Prosthetic Rehabilitation of a Patient with Partial Maxillectomy with a Closed Hollow Bulb Obturator : A Case Report

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ABSTRACT

Preservation of remaining structures is a primary goal of prosthetic rehabilitation. Continuously applied stresses on the remaining tissues from a large, heavy obturator jeopardize the health of the tissues, compromise the function of the prosthesis, and affect patient comfort. Various techniques have been described for hollowing the bulb of an obturator after processing to reduce its weight; however, access to the inner aspects of the bulb is limited, preventing adequate control of thickness of the walls. This article describes a double-processing technique for an obturator to optimize the weight and thickness of the bulb.

INTRODUCTION

Ablative surgical therapy is frequently adopted for the control of malignancies and other abnormal growths within the maxillary sinuses. this creates an anatomic defect that allows the oral cavity, maxillary sinus, and nasal cavity to become one compartment.[1] the choice of rehabilitation depends upon the site, size, etiology, severity, age, and the patient's wishes. however, age, general medical condition of the patient, radiation therapy, anatomic complexity, possibility of recurrence, appearance of the area to be rehabilitated, complexity of the surgical procedure, and the patient's refusal to undergo further surgery may contraindicate surgical reconstruction.[2-5] obturator prostheses are fabricated to seal congenital or acquired tissue openings and defects of the maxilla, and depending on the extent of the defect, this type of prosthesis may vary in size and shape.[6,7] the glossary of prosthodontic terms defines an obturator as "a maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/or contiguous alveolar/soft tissue structures.[8] the traditional treatment sequence for a patient requiring 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.[9-10] interim obturator prosthesis is normally placed 7–10 days after surgery. [9-14]as healing progresses, an interim obturator prosthesis is fabricated and extended further into the defect, with subsequent additions to improve the seal and retention.[13]artificial replacement of the teeth And palate aids speech, mastication, esthetics, and morale.[13]

Several methods have been described for open and closed

hollow bulb obturator fabrication. Both of these types of obturators are lightweight prostheses that can be easily tolerated by the patient.[6,15,16] However, open hollowbulb obturators often collect

mucous, food, and fluids and need numerous cleanings or a vent placement to eliminate accumulation in the hollow bulb.[17] Closed hollow bulb obturators, on the other hand, do not pool moisture, while still extending adequately into the defect.18 To obtain a lightweight, closed hollow bulb obturator prosthesis, various materials and methods have been advocated. Some of these materials include light-cured resin,[19,20] auto polymerizing acrylic resin, and silicone rubber. Silicone rubber,

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although advantageous in certain clinical situations, is porous in nature and has poor long-term durability, requiring replacement on a routine basis.[15,21] Visible light-polymerized resin.[22-23]has also been used; however, maximal

strength and long-term durability of these obturators

have not been assessed. Heat-processed acrylic resin has been proven to be one of the most durable, tissue compatible materials to date for the fabrication of this prosthesis.[15]

This clinical report describes a method for prosthetic rehabilitation of a patient with malignant melanoma of the palate following partial maxillectomy with a closed hollow interim obturator

CASE REPORT

A 48-year-old man was referred to the prosthetic department, requesting a obturator prosthesis. He had a history of squamous cell carcinoma of the left maxilla, which invaded the maxillary sinus on the left side. The tumor was resected in 2008 by subtotal maxillectomy. (fig. 1 & 2)

On examination, the maxillary arch was partially edentulous, with a well-healed defect of the maxilla (Armany Class II maxillary defect).

A one-piece interim obturator prosthesis using the remaining natural teeth on the nonresected side for retention, support, and stability was fabricated to restore the physical separation of the oral and nasal cavities and the paranasal sinus. This would facilitate speech, deglutition, esthetics, and masticatory function.

PROCEDURE

1. Maxillary and mandibular diagnostic impressions were made with irreversible hydrocolloid impression material (Zelgan plus- Dentsply) and casts were poured with dental stone (Type-III).(fig 3)

2. Special trays were fabricated on these casts using acrylic resin (DPIcold cure).

3. Border moulding of the defect was done done with green stick compound(dentsply india). (fig 4)

4. Putty viscosity polyvinylsiloxane impression material (3M ESPE, Express, U.S.A.) was used in increments to record the extension of the defect.(fig 5)

5. Then, light viscosity polyvinylsiloxane impression material (3M ESPE, Express, U.S.A.) was used for making the wash impression and the master cast was obtained.(fig 6)

6. For closed hollow bulb double layer thickness modeling wax was adapted to the defect area of the cast and a plaster index was made dewaxing and packing was done with heat cure acrylic resin (DPI).(fig 7)

7. A lid is also prepared with heat cure acrylic resin and the lid is attached to closed bulb with autopolymerized acrylic resin. (fig 8)

8. Base plate and occlusal rims were fabricated on the casts over the closed hollow bulb, Jaw relations was done and casts were articulated on 3 point articulator. (fig 9 & 10)

9. The two parts of the obturator were attached togather with autopolymerized acrylic resin.

10. Denture were processed after try-in of the waxed up dentures. (Fig 11,12,&13)

DISCUSSION

The management of patients with maxillofacial pathologies such as cysts and tumors often involves surgical resection of a substantial part of the jaws and teeth. Prosthodontic rehabilitation of such patients is critical to effectively restore form and function. Patient motivation and education about the type of prosthesis along with its limitations are the first steps toward a successful treatment. Intraoral prostheses for maxillary defects primarily consist of three types of obturators (surgical, interim, definitive) based on their intended use. Ability to reduce the weight of the prosthesis by hollowing the obturator is found to be beneficial[24]. Several techniques have been advocated in the fabrication of hollow obturators. There even exist controversies regarding closed and open hollow obturators. The closed obturator is found to prevent percolation of fluid and decrease air space in the defect, however it is also found that fluids can be absorbed through the porosities in the acrylic resin seal and in such situations, patients are unable to clean the inner surface of the closed system. This unhygienic situation harbours the growth of microorganisms.[25] The material used in the fabrication of obturators should be biocompatible, impermeable, smooth and easily made. Numerous studies have been put forth in the literature for the fabrication of hollow obturator using variety of materials. Hollow obturators are made with acrylic resin in either open or closed configuration.[26]

This case report describes the fabrication of a closed hollow bulb obturator using plaster index and lid for controlling the thickness of hollow obturator walls is important to provide adequate strength and weight of the prosthesis.

CONCLUSION

This clinical report describes a method for prosthetic rehabilitation of a patient with partial maxillectomy with a closed hollow interim obturator. The procedure provides control of the thickness of the obturator section subsequently reducing the overall weight while providing a seamless, virtually water- tight seal of the prosthesis.

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Figures

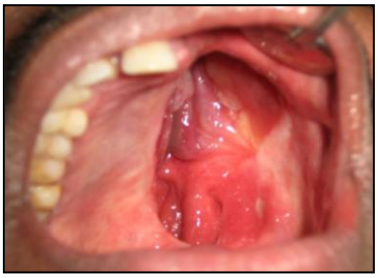

FIG 1: INTRA ORAL DEFECT

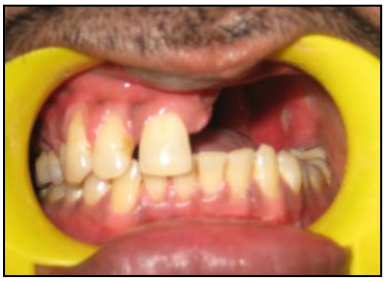

FIG 2: PRE OPERATIVE

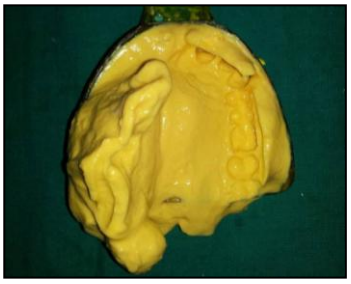

FIG 3: PRELIMINARY IMPRESSION

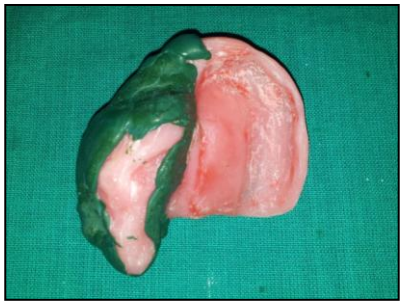

FIG 4: BORDER MOULDING OF THE DEFECT

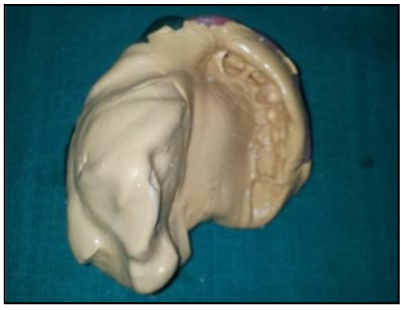

FIG 5: PUTTY IMPRESSION

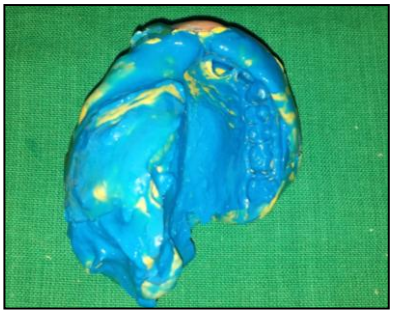

FIG 6: WASH IMPRESSION

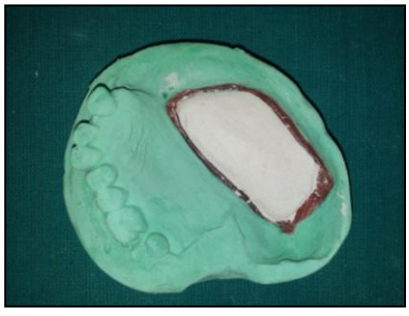

FIG 7: PLASTER INDEX

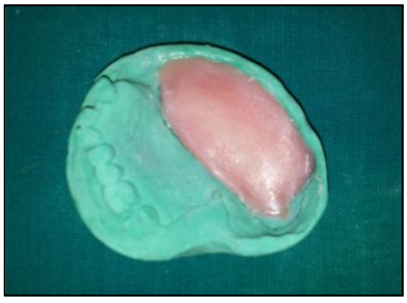

FIG 8: HEAT CURED ACRYLIC

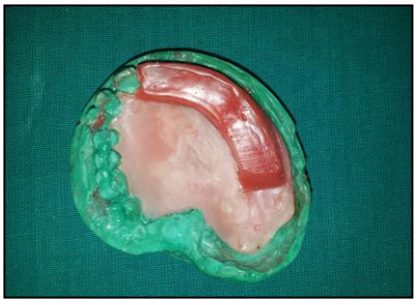

FIG 9: DENTURE BASE WITH

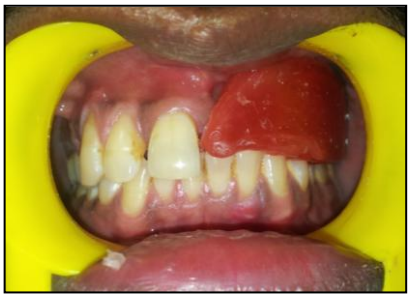

FIG 10: JAW RELATION

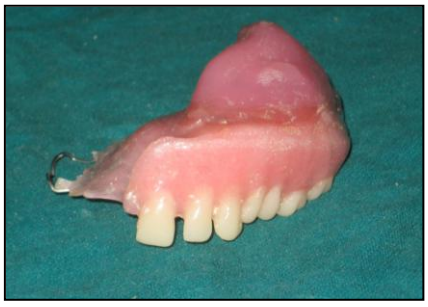

FIG 11: TRY IN

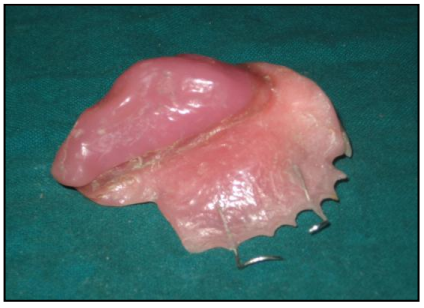

FIG 12: FINISHED PROSTHESIS

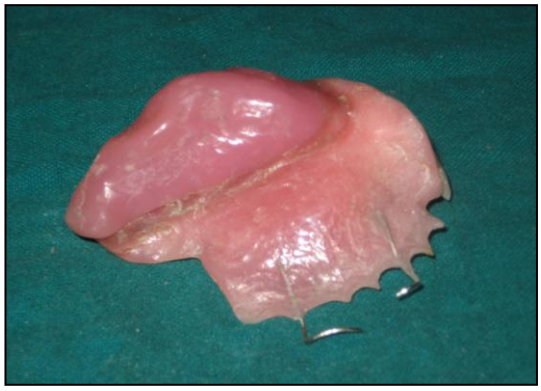

FIG 13: CLOSED BULB

FIG 14: POST OPERATIVE