

## **A SIMPLIFIED NOVEL APPROACH IN THE FABRICATION OF AN INTERIM HOLLOW BULB OBTURATOR**

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### **ABSTRACT:**

In the treatment of maxillectomy patients, the interim obturator plays a brief role of aiding in deglutition and restoring esthetics till the definitive obturator is delivered. In situations where post-operative radiotherapy is involved, the interim obturator is required to serve for a prolonged duration of time till the tissues have adequately healed, making retention of the prosthesis a core importance. Incorporating a hollow bulb would substantially reduce the weight of the prosthesis, ultimately making it more retentive. This article describes an effortless and simplified technique for the fabrication of a hollow bulb interim obturator, alleviating the difficulties in design and processing that are commonly encountered.

**Key-words:** Plaster pillar, Interim obturator, Retention, Hollow bulb, Design.



### **INTRODUCTION:**

Maxillary defects are created by surgical treatment of benign or malignant neoplasms, congenital malformation and by trauma. Of all intraoral defects, maxilla is affected the most, usually in the form of an opening into the antrum and nasopharynx.<sup>[1]</sup> Most tumors occurring in the palatal and paranasal sinus region of maxilla require surgery involving removal of the hard palate, creating an anatomic defect that allows the oral cavity, maxillary sinus, nasal cavity and nasopharynx to become one confluent chamber.<sup>[2]</sup> The usual sequence of treating a patient with maxillectomy is the insertion of surgical obturator at the time of surgery which forms a barrier between the oral cavity and nasal cavity, aiding in deglutition and phonetics during the immediate post-surgical period. Once adequate epithelial healing has occurred and the patient is

totally comfortable, an interim obturator is planned. It may take 6 to 10 weeks for the construction of interim prosthesis. The Interim obturator can be constructed by modifying and converting the existing surgical obturator, with periodic relining with a soft liner to adjust with the healing tissues. However, this increases the bulk and weight of the obturator, and the relining materials used tend to become rough and unhygienic with time. Alternatively, a new interim hollow bulb obturator can be fabricated from a postsurgical impression.<sup>[1-3]</sup> Though the interim obturator is usually used only for a brief period, an extensive defect caused by an aggressive tumor requiring adjunctive radiotherapy, will warrant the obturator to be used for a prolonged period of time till the tissues have completely healed for the definitive obturator to be

delivered.<sup>[4]</sup> In these situations, the interim obturator is required to fulfill its functions for an extended period of time. Though the prime concern for the patient is esthetics, the importance of retention must be realized to aid in comfort of wearing the prosthesis for a longer span of time. Addition of a hollow bulb reduces the weight of the obturator substantially enough to make it more retentive. The conventional method of fabricating a hollow bulb can be followed but since it is technique sensitive and tedious, its application would be justifiable for a definitive obturator, but not for an interim obturator.<sup>[5]</sup> Hence a simple and innovative method of fabrication was envisaged for this purpose. This article discusses a simple approach for the fabrication of a hollow bulb interim obturator, which would enable the operator to design and fabricate the hollow bulb with ease, ultimately making it effective and time saving.

**Technique:** A new post-surgical impression is made with alginate and cast produced in dental stone (Fig 1).

Border molding and final impression is made using special tray. The master cast is poured in dental stone (Fig 2A and 2B).

Undesirable undercuts if any are blocked in the defect area. In the base of the defect, an outline for a pillar is drawn in such a way that it is equidistant from the borders of the defect in all sides by 2 to 3mm.

A plaster pillar is then molded with plaster of paris before it sets, extending it till the height of the palate on the healthy side, and having a uniform distance of 2 to 3 mm from the walls of the defect. The pillar is then sand papered and finished to a smooth and rounded contour (Fig 3A and 3B).

The denture base for jaw relation and wax trial procedures is to be fabricated after blocking the defect area with gauze till the height of palate. A plaster and pumice mix is then used to form a roof over the defect area.

Following wax trial, wax up is completed (Fig 4) and a reverse flasking technique similar to removable partial denture is followed for the flasking step. Separating media is applied and de-waxing is done (Fig 5A and 5B).

During the packing stage, the heat cure material is first packed around the plaster pillar and well adapted to ensure adequate flow into this region. The remaining material is then packed over the denture teeth and palate. The material is then cured.

Following completion of curing, deflasking is carried out and the obturator is retrieved from the cast. Trimming, finishing and polishing is done. The obturator is now ready for insertion (Fig 6A, 6B and 6C).

## **DICUSSION:**

The phases of prosthetic rehabilitation for a maxillofacial patient entails an

immediate surgical obturator to be inserted at the time of surgery. A Definitive obturator is fabricated and inserted after a period of at least three to four months, after the surgical site is completely healed and dimensionally stable.<sup>[6]</sup> The Interim obturator plays the role of bridging the gap between the immediate and definitive treatment modality and thus is not required to completely rehabilitate the patient in all aspects. However, while dealing with aggressive carcinoma's, extensive resection of maxilla and associated structures is required resulting in a large defect. In such defects the duration of healing time depends not only on the nature of the tumor, but also on the post-operative radiotherapy. These situations mandate the interim obturator to be used for a prolonged duration of time, till the tissues have completely healed.<sup>[4,6]</sup> The design of the obturator must hence be modified in order to make it more retentive so as to satisfy the functional and esthetic needs. To improve speech and provide esthetics, denture teeth till the first premolar was added<sup>[2]</sup> without occlusal contact in centric and eccentric movements. Weight reduction becomes essential when an obturator prosthesis is suspended without bony or posterior tooth support on the defect side, as is the case with most maxillary resection.<sup>[6]</sup> A hollow bulb can be incorporated for this purpose. Wu and Schaaf reported that a hollow maxillary obturator prosthesis reduced the weight of the prosthesis from 7% to 33%.<sup>[7]</sup> The

conventional method of fabricating a closed hollow bulb obturator as described by Chalian et al, is a laborious and technically challenging procedure that is more appropriate for a definitive obturator rather than an interim one.<sup>[5]</sup> Modifying the existing surgical obturator with periodic addition of interim lining materials increases the bulk and weight of the prosthesis, and more over these temporary materials tend to become rough and unhygienic with time. An open bulb is preferred to a closed one as it is less heavy, easier to adjust, and speech may be better with this configuration. Oral in his study comprising of 10 patients, concluded that the open configuration resulted in best speech compared to the closed.<sup>[8]</sup> Hence a simple and convenient method of fabricating an open hollow bulb was conceived for this purpose. A plaster pillar of predetermined dimensions was incorporated during the processing stage to create the hollow bulb. This approach provided distinct advantages,

- Control over the exact width and depth of the hollow.
- It is time saving. Since the hollow is included during the fabrication stage itself, the final prosthesis requires only finishing and polishing.
- It alleviates the risk of over trimming while creating the hollow as in the conventional approach.
- It allows the operator to easily enlarge the size of hollow bulb following fabrication if required, with minimum trimming.

- It is not technique sensitive. The additional step of building a plaster pillar during the processing stage is effortless and straight-forward. It does not need an expert hand to incorporate the steps in forming the pillar.

Finally there is no learning curve required for this method as the final laboratory procedures are the same as for traditional method.

### CONCLUSION:

In scenarios where in the interim obturator has to effectively function for an extended period of time, retention of

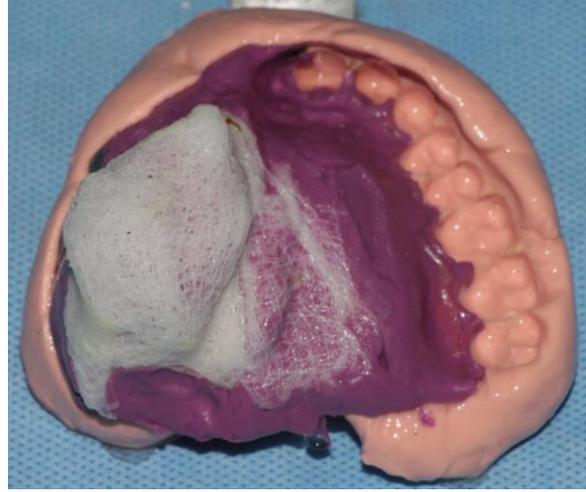
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**FIGURES:**



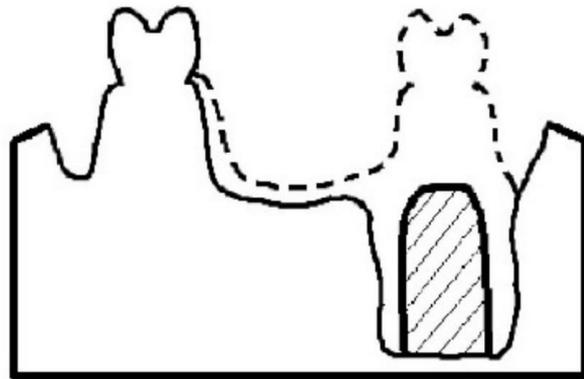
**Fig 1: Primary cast**



**Fig 2A: Final impression**



**Fig 2B: Master cast**



**Fig 3A: Schematic diagram depicting the form of plaster pillar at the center of the defect, equidistant from the walls of the defect by 1.5 to 2mm.**



**Fig 3B: Plaster pillar formed in the base of the defect.**



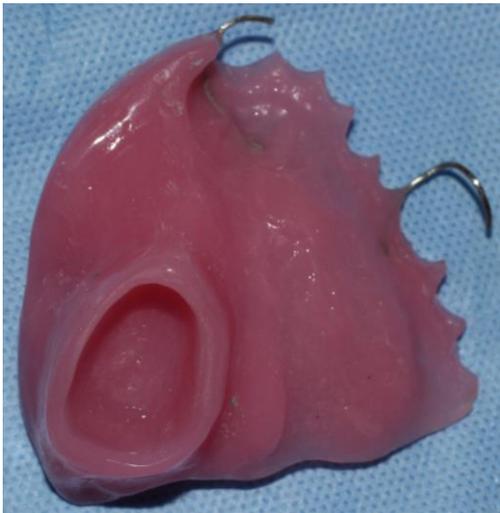
**Fig 4: Wax up completed following wax trial.**



**Fig 5A- Reverse flasking technique.**



**Fig 5B- Reverse flasking technique.**



**Fig 6A- Open hollow bulb interim obturator following trimming and polishing.**



**Fig 6B- Open hollow bulb interim obturator following trimming and polishing.**