Technique for fabrication of interim closed hollow bulb obturator in a patient with Class II Aramany’s defect

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Abstract:

Maxillary defects are prosthetically rehabilitated with obturators which prevent the oro-nasal communication, better speech and deglutition possible. Hollow bulb obturator has the advantage of being light weight and also provides resonance for speech. This article describes a technique for fabrication of an interim acrylic hollow bulb obturator for a patient with class II aramany maxillary defect. The prosthesis is entirely made of heat cure acrylic resin and uniform space is maintained in the bulb portion with the help of custom ice used.

Introduction:

Defects of the maxilla can be congenital or acquired. Acquired defects occur due to trauma, from road traffic accident, gun-shot wound or, surgical resection of the maxilla due to carcinoma. Patients with maxillary defects have problems associated with speech, swallowing and eating due to the presence of oro-nasal communication. Prosthodontic treatment mainly involves separation of the oral and nasal cavities by means of an obturator to prevent the communication, speech, deglutition

“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” (GPT-8). It is of three types: surgical, intermediate and definitive obturator. The definitive obturator can be made hollow in-order to reduce the weight of the prosthesis. Hollow bulb obturator can be of open or closed type. The closed type is advantageous over the open type which tends to accumulate nasal secretions and needs frequent cleaning. The advantage of hollow bulb obturator is the light weight of the prosthesis, which will prevent the dislodgement of the maxillary prosthesis against gravity, better patient comfort.

Various techniques have been proposed by authors for fabrication of hollow bulb obturator. Schneider used crushed ice to create a matrix inside the bulb to maintain the hollowness during processing. Matalon and Parel used sugar whereas Srinivasan et al used lost salt technique for the fabrication of hollow bulb obturator. Other materials were also incorporated to create the
hollowness. Chalian used an acrylic resin shim in the defect area whereas Tanak et al incorporated polyurethane foam. This article describes a technique for fabrication of a closed hollow bulb obturator processed using a single flask with double body pour technique and custom freezed ice for fabrication of the bulb portion.

**Case report:**

A 63 year old male patient reported to the department with the complaint of loose maxillary obturator. History revealed that the patient underwent surgical resection of the maxilla in the right posterior quadrant 6 months before due to oral squamous cell carcinoma. The patient had Aramany’s class II maxillary defect. Patient was planned for an interim acrylic hollow bulb obturator until the complete healing of the defect. Impression was recorded using irreversible hydrocolloid impression material (Algix, DPI). Cast was poured with type III dental stone (Fig. 1). Bite registration was done and wax try in was done. Retentive clasps were given in 13, 25, 26 in the trial denture.

**Technique:**

Flasking and processing was done in two stages but with the same master cast.

1. For the fabrication of the bulb portion, addition silicone Putty (Aquasil, Dentsply) was adapted to the walls of the defect and it was also used to block the tooth portion of the master cast (Fig.2).

2. Flasking of this blocked out master cast was done in the base of the flask with Type II dental plaster and the body pour of the flaking was completed in a routine manner after applying separating medium (Cold mold seal, DPI).

3. Once the plaster was set, the flask was opened and the putty adapted to the walls of the defect was removed.

4. Separating medium was applied on both the halves of the flask and allowed to dry. The flask was packed with heat cure acrylic resin (Heat cure acrylic, DPI) and processing of the bulb portion was done.
5. After processing, the bulb portion was carefully retrieved from the master cast without breaking it from the base pour of the flask (Fig. 3). The bulb portion was filled with water and freezed in a refrigerator.

![Processed Bulb Portion](image1.png)

6. The trial denture was placed back on the master cast in the base pour of the flask and fused to the cast (Fig. 4). After applying separating medium to the base pour, the second pour was carried out and flasking was completed.

![Flasking of Trial Denture](image2.png)

7. After dewaxing, just before packing of the heat cure resin, the bulb portion with the freezed ice was placed back in the defect (Fig. 5). The prosthesis was processed, finished and polished.

![Bulb with Ice Placed Back in the Defect](image3.png)

8. The removal of water from the melted ice in the bulb portion was done with the help of a syringe after which the hole was closed with visible light cure resin (Fig. 6).
Discussion:

Acquired defects of the maxilla are prosthetically managed with obturators. Hollow bulb obturators are preferred because of decreased weight and better speech by adding resonance to the voice. Decreasing the weight may result in increased retention, better patient acceptability and comfort. Wu in his study found that hollow bulb obturators have reduced the weight of the prostheses from 6.55% to 33.06% depending on the size of the defect when compared to solid obturators.

The bulb portion can be processed together with the oral portion or separately and later joined together with auto-polymerizing acrylic resin, light cure resin. Numerous techniques have been described to fabricate the obturator in one piece or two piece. The advantages of one piece obturator are; it is hygienic and there are no lines of demarcation between heat cure and autopolymerizing resin.

In this case, the bulb portion is fabricated first and used as a receiver for the custom ice which was used for creating the hollowness and joined with oral portion with heat cure resin. Making the obturator completely of heat cure acrylic resin minimizes the stain, reduces leakage and also increases the durability and longevity of the prosthesis. The custom ice space created here allows for uniform space to be maintained in the bulb portion unlike the crushed ice which may collapse and get merged with the resin in previous techniques.

Other advantage of this technique is the same base pour of the flask with the master cast was utilised again to fabricate the other part of the obturator. The water in the bulb was aspirated out with a syringe and closed with visible light cure resin avoiding significant damage to the bulb portion.

Summary:
This technique helps in fabricating a lightweight, durable obturator prosthesis made of heat cure acrylic resin using custom ice for creating the hollow bulb portion.

References: