

FABRICATION OF CLOSED HOLLOW BULB OBTURATOR USING LOST SALT TECHNIQUE: A CASE REPORT

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Abstract:

Obturator is given for patient with maxillary defect which occurred either due to trauma or congenitally. They are generally classified into three that is immediate, interim and definitive obturator. Immediate obturator is the type of obturator that is given immediately after surgery. Fabrication of this type of obturator is done on pre-surgical cast. It is a base plate type of obturator. Interim obturator is the obturator given after surgery and before proper healing. This case report deals with the fabrication of definitive obturator, an obturator that is given after proper healing. Fabrication of obturator can be done in different ways. They differ in the mode of acrylisation. Acrylisation can be done by two methods, single piece and two piece type of Acrylisation. This case report describes the use of two piece type of acrylisation by lost salt technique.

Key words: Palatal Obturator, Congenital Defect, Acquired Defect, Prosthesis, Cystectomy.

Introduction

The term obturator has its origin from a Latin verb "obturare" which means to close or to shut off. Boucher in 1982 defined obturator as a prosthesis used to close a congenital or an acquired opening in the palate. According to GPT 9, Obturator is defined as prosthesis used to close a congenital or an acquired tissue opening, primarily of hard palate and or contiguous alveolar structures.

Ambroise Pare was the first person to use an obturator in the year 1541. He used it for closing a perforation of the hard palate. Sir Pierre Fouchard, father of scientific dentistry, described two types of palatal obturators in 1728. First type had wings in the form of propellers whereas the second type had retaining feature in the form of butterfly wings. These wings could be folded together while being inserted and could be spread out with a special key after insertion. William Morton in 1869 treated palatal defect with a gold plate to which missing teeth were soldered.¹

Primitive man used wood, cotton, gum or stone to close a defect. However, the material of choice in today's scenario is polymeric in nature. These include vinyl chloride polymer and copolymers, acrylic types and silicone rubbers, among which the silicone rubbers are mostly used.

Functions of an obturator are beyond imagination. They play a major role in increasing the confidence of an individual by reshaping and reconstructing the defect. They aid in keeping the wound and defective area clean and enhance the healing of traumatic or post surgical defects. They play a vital role in improving the speech or at some instances by making speech itself possible. Lip and cheek positions are often corrected by an obturator. They help in improving the impaired mastication and deglutition functions. Flow of exudates into

mouth is often reduced by an obturator. They even act as a stent to hold dressing or packs post surgically².

There are mainly three types of obturator; surgical, intermediate and definitive obturator. They are classified based on the time of fabrication. Surgical obturator is given immediately after the surgery. Intermediate obturator is given two weeks after resection and definitive obturator is given after complete healing of mucosa and other oral structures.^{3,4}

Now a days, technology has evolved so well which enables better use of obturators. Stereophotogrammetry enables the soft tissue analysis. CBCT and MRI has their role in advancing the procedures. Thus technology plays its own role and make the clinical works a little easier.



Fig. 1. Pre-operative condition

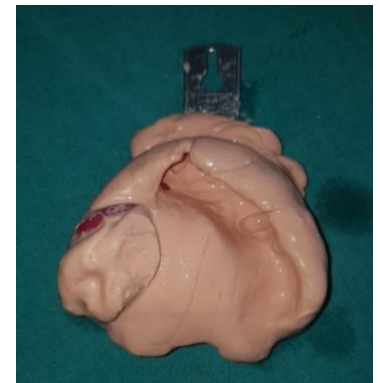


Fig. 2. Preliminary impression using alginate



Fig. 3. Secondary pick up impression



Fig. 4. Jaw relation recorded



Fig. 5. Trial insertion done

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Case Report

A 40 year old female patient reported to the department of Prosthodontics and Crown & Bridge with left maxillary defect. She had undergone maxillectomy 4 years back due to squamous carcinoma. She had a large defect of size 3 cm length 2 cm broad and 4 cm depth and defect will come under type 1 Aramany defect (fig1). Intra orally patient had the following missing teeth: 13 14 16 17 22 23 24 25 26 27 35 36 46 47 and 43 44 45 were root canal treated teeth. Since high end treatment such as implant supported prosthesis or cast partial obturator were not feasible for the patient due to their economic status, a conventional acrylic obturator on upper arch and acrylic RPD and

joint crown irt to 43 44 and 45 in lower arch were planned as treatment.

Procedure

Maxillary and mandibular preliminary impression was made using alginate (Fig.2). Impression was poured with dental stone and custom tray was fabricated on the upper arch. Using this custom tray border moulding and posterior palatal seal area was recorded. Impression compound was then used to record the defective area of maxilla. Secondary impression was recorded using alginate as it helps in easy removal of impression from the undercut of defective area (Fig 3). Secondary cast was poured using dental stone.



Fig. 6. Wax adapted on roof of the defective area.



Fig. 7. Acrylised portion on master cast



Fig. 8. Salt added to the defective area



Fig. 9. Obturator after finishing and polishing

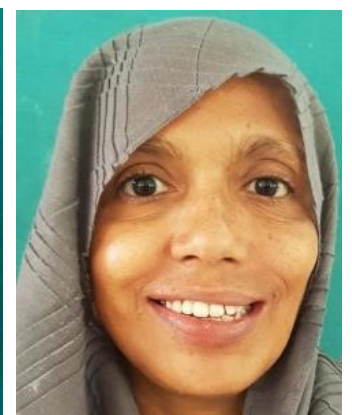


Fig. 10. Post operative photograph

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Cast was duplicated using agar agar and kept, shellac base plate was adapted on master cast and occlusion rim was fabricated. Jaw relation was recorded (Fig 4) and transferred to mean value articulator and then teeth arrangement was done. A clinical trial insertion was done (Fig 5).

Until now, the laboratory procedures for the fabrication of a complete denture and an obturator remain the same. The difference lies in the acrylisation procedure.

Retentive clasp is fabricated using orthodontic wire on the abutment as it enables easy insertion and removal without compromising the retentive features.

Waxing up, investing and dewaxing of the trial denture was done. In the mean time wax is adapted on the roof of the defective area on the previously duplicated cast and is acrylised in another flask for fabrication roof of the bulb (Fig 6).

The acrylised portion will act as the roof of hollow bulb obturator and this was then placed in the defective area of the dewaxed master cast. Then salt was filled into the acrylised portion (Fig 8) and Acrylisation was done as usual.

After retrieval of the acrylised portion, a small hole was put on the intaglio surface in bulbous portion of the obturator and salt was removed by injecting water into it. Once the salt was completely removed, the hole was closed by auto polymerised acrylic resin. Finishing polishing was done. Final insertion of the obturator was done (fig 9).

Discussion

A palatal defect which may be congenital or acquired is of great concern as it affects speech, mastication, and deglutition and to a great extent, aesthetics. They can be prosthetically rehabilitated by an obturator. Fabrication of

obturator and its retention and stability while placed in mouth is really important.⁵ The weight of the obturator is one of the main reasons for the dislodgement of obturator. Thus making it light will enhance the stability.⁶ Obturators can be given at three different stages and are named accordingly as immediate, surgical and definitive obturators.^{7,8} A surgical obturator is given during surgical phase. It can be immediate surgical obturator or delayed surgical obturator. An immediate surgical obturator is inserted at the time of surgery whereas a delayed surgical obturator is inserted when another surgery is to be carried out 1-2 weeks after the removal of the defect. This obturator can be given either for partially or totally edentulous patients. No teeth will be present on the obturator. During healing phase, an interim obturator is given. They are given to make sure that the wound contraction is minimized and ideally advised after 3-4 weeks of surgery. They can also be immediate or delayed. Immediate interim obturator can be modified from an immediate surgical obturator, by adding teeth and bulb relined with tissue conditioner onto it. When other procedures like radiation or improvement in mastication or deglutition is to be carried out, an interim obturator is given at a later stage and is called delayed interim obturator. A definitive obturator is given at the healed phase when the surgical wound is completely healed. Prior to the placement of a definitive obturator, thorough examination of the oral cavity is to be done. All the carious teeth should be restored; those with poor prognosis should be carefully extracted, keeping in mind regarding osteoradionecrosis.⁴

Patients diagnosed with large cystic defects usually undergo enucleation or marsupialisation. Post marsupialisation, bone defects are quite common and mostly results in clot dislodgement and improper healing. In such scenario, obturator turns out to be the best choice as they stabilize the defective area and aid in easy recovery. Mostly a partial acrylic denture obturator is used in restoring

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function and aesthetics.

Design of the obturator depends on the defect and the classification to which it belong. Minimizing the weight of the prosthesis was essential and various techniques were employed. This included ice incorporation salt technique and sugar technique, use of thermoplastic method to get hollow bulb.^{9,10} The disadvantage of ice and salt/ sugar technique is the tendency of distortion of the shape due to pressure applied during packing.

Conclusion

Obturator has been used for prosthetic rehabilitation from early 16th century. As years roll down, the material of choice may differ, the methods of fabrication get advanced, and the ease and convenience of use get improved. The defect differs from person to person and so is the design of the obturator. Various designs were put forward and it is the clinician who should choose them wisely and make it more user friendly for the patient.

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