

## Case Report

# FABRICATION OF SINGLE PIECE HOLLOW BULB INTERIM OBTURATOR WITH PALATAL RAMP FOR TREATMENT OF HEMIMAXILLECTOMY AND HEMIMANDIBULECTOMY - A CASE REPORT

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## Abstract :

A male patient aged 45 years reported with squamous cell carcinoma of palate. Patient was seen presurgically and an immediate surgical obturator provided followed by an interim maxillary obturator by a novel method wherein hollowing the obturator bulb was planned which also had a palatal ramp to correct jaw relation lost due to hemimandibulectomy. The treatment was done in sequential order to correct the deviation of mandible to provide aesthetics to the subject and also for a comfortable social life with improved mastication and appearance.

Keywords: obturator, palatal ramp, maxillectomy, mandibulectomy, prosthodontic rehabilitation, aesthetic rehabilitation, functional efficiency, prosthesis

## Introduction :

Patients with hemimandibulectomy are affected by many debilitating problems. There is usually a decreased capacity of the masticatory cycle.<sup>1</sup> Most of such subjects are compounded with facial disfigurements causing to feel dismay in public appearance. There is usually a limitation of speech production and drooling of saliva which are seen as a result of lack of support and loss of innervations to certain areas as a consequence of surgical intervention.<sup>2,3</sup> Prosthetic management in patients who have undergone hemimandibulectomy and commando procedures due to radical cancer surgery is frustrating because it involves loss of tissue as well as function. Even the reconstructive surgical procedures cannot improve prosthetic potential.<sup>3</sup> If the same patient has to undergo hemimaxillectomy as well,

he will be desolated. These victims have oronasal separation making intake of liquid and solid food difficult, loss of resonance for production of sound and loss of support to facial structures. They have to be treated as soon as possible to restore esthetics and oral functions like speech and feeding.

A male patient aged 45 years reported with squamous cell carcinoma of the palate requiring an immediate surgical obturator. Patient gave history of hemimandibulectomy (Curtis and Cantor class III) done one year back. The mandibulectomy defect was left aloof without any prosthetic rehabilitation which had disfigured the patient's face and had deviated the jaw to the side of defect. The patient was to undergo hemimaxillectomy (Aramany class I) and had reported presurgically.

Primary impressions of maxilla and mandible were made with irreversible hydrocolloid as the impression material (NEOCOLLOID, ZERMACK CLINICAL, ITALY), during

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Figure 1: Presurgical cast altered and clasps designed for immediate obturator.



Figure 2: Immediate surgical obturator



Figure 3: Immediate surgical obturator in patient's mouth



Figure 4: Post surgical cast for fabrication of interim obturator



Figure 5: Waxed up trial partial denture obturator with impression



Figure 6: Acrylised interim obturator with clear acrylic



Figure 7: Hollow obturator after removal of condensation silicone and before closure with autopolymerising



Figure 8: Deviation of jaw before treatment with palatal ramp



Figure 9: Improved position of mandible in relation to maxilla after treatment with palatal ramp obturator.

impression procedure ,patient was made to sit in an upright position so that soft palate assumed relatively normal and relaxed position. Casts were poured with dental stone.

The planned area of surgery was marked on the cast and the cast was scored to an arbitrary depth to construct an immediate surgical obturator. The obturator required to be stable so clasps of wrought wire were planned, an I- Bar on the maxillary right central incisor and a Continuous clasp on the right first premolar and an Adams clasp to embrace the right second and third molars were planned(fig1)

The cast was then invested and immediate surgical obturator was made with heat polymerizing acrylic resin

material (TREVELON DENTSPLY,GURGAON,INDIA ) fabricated like a denture base with no replacement teeth on the resection side (fig 2). The obturator thus prepared was immersed in disinfectant solution an afternoon prior to surgery. The principle advantage of immediate surgical obturators is support and retention of the surgical packing, reduces oral contamination of wound during immediate post surgical period and decreases local infection. Permits deglutition and eliminates need of nasogastric tube, lessens psychological impact of surgery and reassures patient on beginning of rehabilitation. Enables the patient to speak effectively in the postoperative period if normal palatal contours are reproduced and palatal defects covered .5

Immediately following surgery the obturator was coated with a tissue conditioning material and inserted into the maxilla (fig 3) and patient was recalled after two weeks for fabrication of interim obturator.

Patient reported back after 15 days for interim obturator, impression of the defect was made and cast was obtained (fig 4). The major challenge now was the correction of deviated jaw due to mandibulectomy and reduction of weight of maxillary interim obturator. Periodic addition of interim lining materials increases the bulk and weight of the surgical prosthesis, temporary materials tend to become rough and unhygienic with time, addition of anterior and posterior teeth to the obturator is a great psychological benefit. So an interim prosthesis has to be made for a period of three to six months until the wound completely heals. It can also serve as backup prosthesis when definitive prosthesis needs repair, relining or rebasing.<sup>5</sup>

Occlusal plane was established and an impression compound palatal ramp made to guide the mandible. Teeth were included in the prosthesis for esthetics. Trial of waxed up removable partial denture with palatal ramp was made. Retention was with wrought wire clasps similar to the surgical obturator (fig 5).

Cleanliness, simplicity of construction and light weight are important considerations in construction of obturators. In the present case it was not only the weight of the bulb but the obturator would have a palatal ramp as well which would double up the weight and decrease the retention factor.

A new technique was followed here to hollow the bulb. The trial base with monoplane teeth and impression compound palatal ramp was invested in the flask, dewaxing was done, separating media applied and the palatal ramp area was packed with clear heat polymerising acrylic resin (TREVELON, DENTSPLY, GURGAON, INDIA), over which veined heat polymerising acrylic resin (TREVOLON DENTSPLY, GURGAON, INDIA) was placed to a thickness of 2mm, counter flask with defect was also

packed with 2mm thickness of veined acrylic such that it took the shape of the defect, in between these two layers of acrylic we placed a small ball of condensation silicon with very little catalyst added and the flask was closed and acrylic cured. Once deflasking was done we got a dual coloured obturator where the palatal ramp was clear and hence aesthetic to the patient, and the rest of the obturator was veined, pink acrylic (fig 6).

The bulb part of the obturator was given a small opening using no.10 round bur until the condensation silicon putty material was reached. The material was retrieved through the tiny opening with the help of the rear end of a lackrons carver, the opening (fig 7) was then closed with the help of autopolymerising acrylic resin material.

Patient was recalled once in every week after fit and insertion of the hollow bulb interim obturator with palatal ramp and clear autopolymerising acrylic material was used to adjust the ramp gradually and correct the jaw deviation. There was gradual improvement seen with palatal ramp (fig 8 & 9).

Discussion :

In treating patients with surgical defects, factors of denture retention are compromised. The maxillofacial appearance is marred. Patient is compromised anatomically, physiologically and psychologically. Public denigration keeps them away from socialization, post operative swallowing is temporarily impaired. Speech is disturbed due to denervation or limited tongue mobility as well as due to oronasal communication which leads to absence or decreased resonance. Speech becomes hollow and flat.<sup>3</sup> Occlusal components such as temporomandibular joints and masticatory muscles are involved which leads to dawdling of the treatment progress. Heavy extensions like solid bulb obturators compromise retention by cantilevering the prosthesis. A hollow obturator is better in so many aspects like improved resonance, decreased weight and improved retention. A closed hollow obturator prevents collection of fluid and air space.<sup>8</sup> Frank R Lauciello et al.,<sup>7</sup> used 0.16 inch flexible vinyl resin mouth guard material with which number of obturators could be

fabricated as it stains and distorts easily. Chalian<sup>6</sup> has given a design of making single piece hollow obturator where obturator surrounded a hollow shim of self cure acrylic. The method adapted by us was comparatively easy, time saving and the condensation silicone could be completely and easily retrieved from the obturator.

#### Summary and Conclusion :

Whatever may be the effort put by the clinician, it is

ultimately the will of the patient, prognosis of surgery, the area available for support and retention, size and curvature of the dental arch after surgery and maintenance of hygiene by patient that would make a treatment successful. Ultimately we have to realize that there is no shortcut for success.

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