Research Paper

Volume : 4 | Issue : 3 | March 2015 • ISSN No 2277 - 8179

Chairside Fabrication of Immediate Surgical Obturator for a Hemimaxillectomy Patient.

Medical Science

KEYWORDS : Surgical Obturator, Hemimaxillectomy, Putty Index, Acrylic Teeth Template.

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ABSTRACT

Maxillary carcinoma treatment often involves the surgical removal of all or part of the maxilla. This resection is often accompanied by dysfunction and disfigurement affecting the speech, esthetics, deglutition and mastication of the patient. The surgical treatment involves reconstruction of the region of the oral cavity from which the tumour is removed at the same time of the resection. The immediate surgical obturator is a proven treatment option in such situations. This article describes a simple chairside technique to fabricate a surgical obturator which replicates the patient's original teeth and palatal tissue forms using silicone putty index. Replication of the patient's original tooth colour, size and shape in the surgical obturator helps overcome the immense postsurgical psychological trauma the patient undergoes. This maxillofacial prosthesis devoid of occlusal contact helps restore phonetics, esthetics, mastication, better provision for soft diet, minimizes scar contracture and aids in soft tissue support during the healing phase; thereby impacting patient's postsurgical quality of life.

INTRODUCTION

Maxillary cancer treatment involves the surgical removal of whole or part of the maxilla, leaving the patient with a defect that compromises the integrity and function of the oral cavity. (Shambharkar VI et al 2011) The prostheses needed to repair this defect are termed as maxillary obturator. An obturator (Latin: obturare, to stop up) is a disc or plate, natural or artificial, which closes an opening or defect in the maxilla as a result of a cleft palate or partial or total removal of the maxilla for a tumour mass. (Chalian VA et al 1971)

The maxillofacial prosthodontist, as an integral part of the multidisciplinary team aids in the rehabilitation of the maxillectomy patient by fabricating and placing a surgical obturator. But this is challenging due to the absence of normal hard and soft tissue. Successful obturator depends on the volume of the defect, and the positioning of remaining hard and soft tissues to be used to retain, stabilize, and support the prosthesis. (Watson RM & Gray BJ 1985)

Surgical obturator for patient requiring maxillectomy offers distinct advantages regarding immediate rehabilitation of facial contours, speech, and swallowing. (Huryn JM & Piro JD. 1989) Patient motivation can be best achieved by replicating the exact anatomical tooth form of the patient to improve esthetics and function.

This article describes a chairside technique wherein the patients original tooth morphology, contours and alignment are replicated in the surgical obturator by obtaining a putty index made from patient's preoperative stone casts; which can be carried out by a technician or clinician within a few hours.

CASE REPORT

A 21 year-old male reported to the outpatient department of dental college with a chief complaint of recurrent mild intraoral palatal swelling in the premolar-molar region of right maxilla. Intraoral periapical radiographic examination revealed periapical radiolucency in relation to right maxillary first and second premolar which was endodontically treated 2 months ago, followed by an apicectomy. The soft tissue swelling was 3x5 cm in dimension. An excisional biopsy was performed which revealed adenoid cystic carcinoma of the right maxilla.

A partial maxillectomy was planned followed by restoration of the defect with surgical obturator prosthesis. The patient's intraoral hard and soft tissue contours were planned to be replicated in the surgical obturator using a silicone putty index.

Technique for Fabrication of Surgical Obturator:

- An impression of the maxillary and mandibular arches of the patient are made using irreversible hydrocolloid (Tropicalgin, Zhermack). The casts are obtained using type III dental stone.
- The maxillary cast is duplicated using reversible hydrocolloid duplicating material (Wirogel M). The area to be surgically resected is outlined on the duplicated cast (Figure 1).
- The marked area is then hollowed out on the duplicated cast using a rotary cast trimmer.
- The occlusion on the resected site is planned to be restored. For this purpose a silicone putty impression material (Aquasil soft putty/regular set, Dentsply) is adapted over the teeth and adjoining hard tissues on the preoperative stone cast to obtain an index replicating the patients original teeth size, shape, form and alignment (Figure 2).
- Tooth moulding powder, (DPI) (shade -A) simulating patients tooth colour is selected. Self-curing monomer and polymer is mixed in the ratio of 1:2 by volume in a glass bowl until all the polymer particles are thoroughly wetted and a homogenous mix is obtained. This mix is then poured into the imprint of teeth in the silicone putty index to obtain an acrylic teeth template. After complete polymeriza-

tion, the acrylic teeth template is retrieved and checked for any voids and nodules. The acrylic teeth template is trimmed using acrylic stone trimmers and sand papered with emery paper (fine grit No.270). The acrylic teeth template is polished using a woollen buff and polishing cake.

- The trimmed cast is coated with a layer of separating medium (cold mould seal) and allowed to dry. Auto polymerizing pink acrylic resin is mixed and adapted over the trimmed cast. The acrylic teeth template is then placed over the pink acrylic resin and adapted to produce proper hard and soft tissue contours. It is aligned 1 mm short of the patient's occlusal plane so as to avoid any deleterious force acting on the surgical site leading to its impaired healing. The prosthesis is then placed in a hot water bath at 60^0 Celsius at 30 psi pressure for 15 minutes, to prevent residual polymerization and the prosthesis is then carefully removed from the cast.
- Two holes are placed in the anterior and posterior ends of the obturator using a round bur; which is designed to act as retentive holes for circumferential wiring.
- Excess flash from the acrylic resin on the facial flange is trimmed, finished and polished.
- The obturator is disinfected using 2% gluteraldheyde (Cidex) solution 2 hours prior to surgery. Following surgery minor adjustments are carried out to fully seat the prosthesis in position. Further retention is achieved by circum-wiring the anterior and posterior holes in the obturator to their adjacent natural teeth (Figure 3). The patient is instructed about maintenance of the surgical obturator and reviewed after a week for further treatment.

DISCUSSION

Effective obturation of a partial maxillectomy defect presents a challenge for the maxillofacial prosthodontist. A literature search revealed various techniques to fabricate a surgical obturator (Shambharkar VI et al 2011, Farias A et al 2013, Singh M et al 2013, Patil PG, & Parkhedkar RD, 2009, Jadhav P et al 2011, Naveen BH et al 2011, Singla V et al 2014). This article describes a simpler technique to replicate the patient's original tooth morphology, contours and alignment in the surgical obturator using silicone putty impression material; which has better dimensional accuracy.

The acrylic teeth template was positioned 1 mm above the patient's occlusal plane on the resected side to promote faster healing of the surgical site. Stability of the obturator was achieved by the circumferential wiring to the adjacent natural teeth. This surgical obturator allowed the patient to take nourishment without a nasogastric tube, thus enabling the patient to speak normally. It prevented nasal regurgitation hence preventing any respiratory tract infections. The surgical obturator minimized the scar contracture and disfigurement which created a positive effect on the patient's psychology. Hence this technique describes a cost-effective, less time consuming and easy alternative in fabrication of surgical obturator.

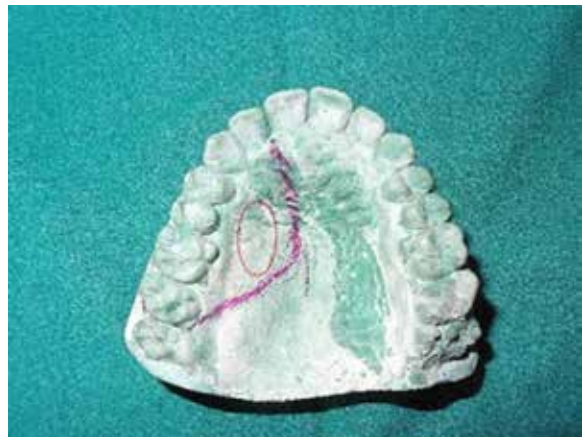

FIGURE 1: Planned resected area marked using a colour pencil. (Red circle represents the intraoral lesion).

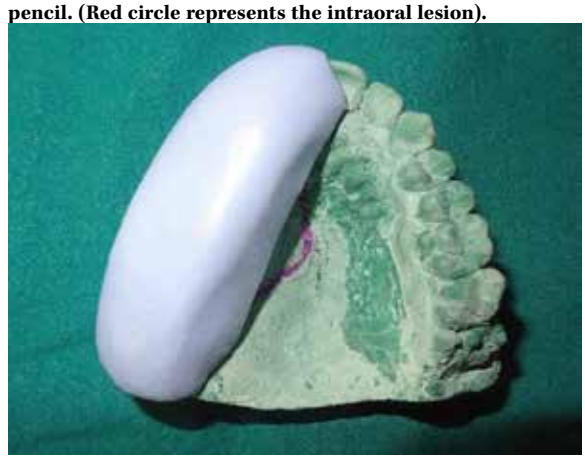

FIGURE 2: Putty index adapted to the cast.

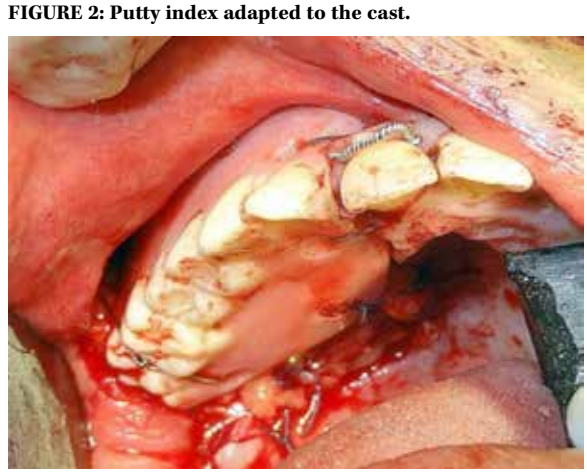

FIGURE 3: Postsurgical obturator positioned in place.

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