

# New Technique to Fabricate an Immediate Surgical Obturator Restoring the Defect in Original Anatomical Form

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Frequently, the presence of oral cancer necessitates the surgical removal of all or part of the maxilla, leaving the patient with a defect that compromises the integrity and function of the oral cavity. The maxillofacial prosthodontist, as a member of the surgical team, is able to aid in the recovery and rehabilitation of the maxillectomy patient by fabricating and placing a surgical obturator. The immediate postoperative restoration of esthetics, deglutition, and speech shortens recovery time in the hospital and expedites the patient's return to the community as a functioning member. Immediate obturators support soft tissues after surgery and minimize scar contracture and disfigurement, providing a positive effect on the patient's psychology. Artificial replacement of the teeth and palate aids speech, mastication, esthetics, and morale.<sup>1,2</sup> The friability of tissue after radiation therapy, if it has been used, usually allows use of only the simplest type of prosthesis.<sup>2</sup> In the dentate patient, surgical obturator designs may vary from a prosthesis using an acrylic resin record base bearing no teeth,<sup>3</sup> with or without wrought-wire clasps,<sup>4</sup> to a clasped acrylic resin prosthesis that restores the dental arch form.<sup>5</sup> It is recommended that posterior occlusal contacts not be established on the resected side until the surgical wound is healed.6,7

This article describes a simple technique to fabricate an immediate surgical obturator by restoring the patient's original dentition and facial and palatal tissue form.

# Technique

1. Examine the oral cancer lesion carefully prior to surgery and discuss the planned treatment with the surgeons with

### Abstract

The presence of oral cancer can necessitate the surgical removal of all or part of the maxilla, leaving the patient with a defect compromising the oral cavity's integrity and function. The immediate postoperative restoration of esthetics, deglutition, and speech shortens recovery time in the hospital and expedites the patient's return to the community as a functioning member. This article describes a simple technique to fabricate an immediate surgical obturator by restoring the patient's original dentition and facial and palatal tissue form. An immediate obturator fabricated with this technique supports soft tissues after surgery and minimizes scar contracture and disfigurement and thus may have a positive effect on the patient's psychology.

regard to the proposed line of incision and amount of resection (Fig 1).

- 2. Make a presurgical impression of the maxillary arch with irreversible hydrocolloid (Dentalgin; Prime Dental Products, Mumbai, India). Pour the impression with type III gypsum material (Kalstone; Kalabhai Karson, Mumbai, India) to obtain a working cast and outline the anticipated line of resection on the maxillary working cast (Fig 2A). Review the design with the surgeon to verify the anticipated scope of the planned resection.
- 3. Modify the cast (in the areas of the lesion) to obtain normal anatomical contours (Fig 2B). Note that the swollen areas of the lesion can be scraped, and the defect (ulcer) areas can be built up with dental stone to create the normal anatomical tissue form on the cast.
- 4. Manipulate 19-gauge hard round stainless steel orthodontic wire (3M Unitek, Monrovia, CA) to fabricate 'C clasps' that engage the labial infrabulge retentive areas of the remaining healthy teeth on the nonresected and/or resected side.
- 5. Fabricate a processed prosthetic base incorporating the clasps with heat-polymerizing acrylic resin (DPI Heat Cure; Dental Products of India, Mumbai, India) in the conventional manner. Finish and polish the processed prosthetic base in the usual manner (Fig 3).
- 6. Reseat the processed prosthetic base on the maxillary cast and make an over-impression of the whole cast (along with the seated processed prosthetic base) with poly(vinyl siloxane), a putty impression material (Exaflex; GC America, Chicago, IL), in a perforated stock metal tray to form a



Figure 1 Intraoral photograph of the patient showing cancer swelling in right labial vestibule.

putty impression index (PII) (Fig 4A). Note that the facial surface on the defect side of the cast should be completely recorded in the over-impression to the border areas.

- 7. After setting, retrieve the impression from the cast. Pick up the processed prosthetic base from the cast and transfer it in to the PII (Fig 4B).
- Section the definitive cast according to the anticipated line of resection and separate the sectioned portion of the cast (Fig 5). Use the remaining portion (of normal structures) of the cast to fabricate the prosthesis.
- 9. Reseat the PII (along with the processed prosthetic base) onto the remaining part of the cast (Fig 6A).
- Create prosthetic teeth by incrementally adding toothcolored autopolymerizing acrylic resin (Unifast II; GC America) onto the impression areas of teeth in the PII. Also



Figure 3 Maxillary processed prosthetic base with incorporated C clasps.

create the facial flange (uniformly 2 to 3 mm in width) by adding pink-colored autopolymerizing acrylic resin (DPI Cold Cure; Dental Products of India) using the sprinkle-on technique (Fig 6B).

- 11. After complete polymerization, carefully remove the PII with the prosthesis from the cast. Remove the prosthesis from the PII carefully. Trim the excess acrylic resin of the facial flange and finish and polish the prosthesis in the conventional manner (Fig 7).<sup>8,9</sup> Trim the occlusal surfaces of the posterior teeth (approximately 2 mm) to make them out of occlusion.<sup>6,7</sup>
- 12. Disinfect the prosthesis in 2% glutaraldehyde solution (Sekucid; Paragerm Lab, Carros, France).



Figure 2 (A) Maxillary working cast with anticipated line of resection marked. (B) Scraping of the cast to achieve the normal anatomical contours in the labial vestibule.



Figure 4 (A) Fabrication of the putty impression index. (B) Processed prosthetic base transferred onto the putty index.

13. Make minor adjustments to fully seat the prosthesis in position immediately after the surgery (Fig 8). Place a surgical pack in the defective area before placement of the obturator if necessary.

## Discussion

Avoiding immediate obturator construction may cause serious facial appearance problems due to soft tissue contracture. This article describes a new technique to fabricate an immediate surgical obturator by restoring the patient's original dentition and facial and palatal tissue form. An immediate obturator fabri-



Figure 5 Maxillary cast sectioned according to the preplanned line of resection.

cated with this technique supports soft tissues after surgery and minimizes scar contracture and disfigurement, and may have a positive effect on the patient's psychology. The other advantages are the following: (1) immediate esthetic improvement following the resection, (2) retention and enhanced bracing effect provided by wire clasps, thereby reducing obturator movement in the horizontal plane, (3) the same surgical obturator can later serve as an interim obturator following modification of the tissue surface, and (4) cost effectiveness, as only one obturator is prepared. Most authors suggest that posterior teeth should not be added to a surgical obturator prosthesis since these may impose excessive stress on the wound and delay the healing process.<sup>2</sup> This technique describes replacement of dentition that would be missing followed by grinding occlusal contacts of posterior teeth (at least 2 mm) to position them out of occlusion. Keeping the occlusal surfaces of posterior teeth in infraocclusion and maintaining intact axial surfaces serves the purpose of facial soft tissue support as well as esthetics without disturbing the healing process. Anterior teeth should not be altered unless the incisal contacts hinder the healing tissues. Adding missing teeth (anterior or posterior) may prevent significant psychological trauma to the patient and help prevent scar contracture and subsequent disfigurement. The developed facial flange also helps to support the facial soft tissues, which can maintain the patient's original facial esthetic appearance. The space automatically formed between intaglio surfaces of the facial flange and palatal plate can easily be used for placement of the surgical pack immediately after the surgery. Thus, the obturator can provide a supporting and stabilizing medium for the surgical pack. Interim obturators with teeth may be made using several methods, including using a celluloid matrix,<sup>1</sup> modifying a surgical obturator,<sup>5</sup> using a denture duplicator,<sup>10</sup> or using light-<sup>8,11</sup> or heat-polymerized acrylic resin.<sup>9</sup> The obturator fabricated with this technique uses the PII of the patient's original tissue form, duplicated partly in auto- and partly



Figure 6 (A) Reseating of the putty index along with the processed prosthetic base onto the sectioned cast. (B) Creation of the prosthetic teeth and facial surface in tooth- and pink-colored autopolymerizing acrylic resin, respectively.



Figure 7 (A) Palatal view of finished immediate surgical obturator. (B) Finished surgical obturator in relation to remaining normal structures on the cast. Note the space available to place the surgical pack.



Figure 8 (A) Surgical defect immediately after maxillectomy. (B) Immediate surgical obturator in place.

in heat-polymerizing acrylic resin. The only concern of this technique is that it leaves teeth and facial flanges created in autopolymerizing acrylic resin. Light-polymerizing acrylic resin can be used alternatively to solve this problem provided the combinations of the light-polymerizing acrylic resins and the methylmethacrylate-based denture base resins were selected carefully to ensure sufficient bond strength.<sup>8,11-13</sup>

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