

## Fabrication of conventional complete dentures for a left segmental mandibulectomy patient: A clinical report

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Without preprosthetic reconstructive surgery, denture fabrication for mandibulectomy patients becomes extremely difficult. Implant-assisted overdentures may improve denture retention and stability, but some patients cannot afford this treatment. For the segmental mandibulectomy patient described in this report, properly fabricated conventional complete dentures provided comfort and sufficient function. (*J Prosthet Dent* 2001;86:582-5.)

Tumors in and around the mandible usually require surgical removal of the lesion and extensive resection of the bone. Smaller lesions removed without discontinuity of the bone are relatively simple to restore with a prosthesis. Larger lesions that extend into the floor of the mouth may be more difficult to restore with a prosthesis even though the continuity of the mandible is maintained.<sup>1</sup>

The prognosis for edentulous segmental mandibulectomy patients becomes less favorable as the size of the resection increases.<sup>2</sup> Success of the edentulous mandibular resection prosthesis is related directly to the amount of the remaining bone and soft tissue.<sup>3-8</sup> If the tongue is broadly resected or used for mandibular closure, valuable vestibule extension regions may be obliterated after surgery.<sup>9</sup> Prosthetic rehabilitation for such patients is a challenge for clinicians. Frequently, the edentulous mandible requires reconstructive plastic surgery to create a buccal or lingual sulcus to provide a suitable tissue foundation for an acceptable mandibular denture.<sup>10</sup>

Without preprosthetic reconstructive surgery, denture fabrication for mandibulectomy patients becomes extremely difficult. After reconstructive surgery, implant-assisted overdentures may improve denture retention and stability, but some patients cannot afford this treatment. This article describes the fabrication of conventional complete dentures for a patient who had undergone left segmental mandibulectomy.

### CLINICAL REPORT

A 66-year-old man with squamous cell carcinoma of the left mandible was examined in 1998 at



**Fig. 1.** Panoramic radiograph of patient after left segmental mandibulectomy. Dynamic plate was used to connect left mandible. Remaining teeth were unrestorable.

National Taiwan University Hospital. Wide excision of the lesion (including left segmental mandibulectomy, partial glossectomy, and modified radical neck dissection) and iliac osteocutaneous free flap reconstructions were performed (Fig. 1). The remaining unrestorable retained roots were extracted, leaving the patient completely edentulous. After surgery, prosthetic rehabilitation was made difficult by thick soft tissue with scar formation, the presence of freely movable soft tissues, the loss of alveolar ridge, and the loss of buccal and lingual sulcus in the left mandibular region (Fig. 2).

Surgical reconstruction of the defect and implant-assisted overdentures were suggested as the treatment of choice. However, the patient refused any further surgical intervention because of financial problems and a fear of surgery. Therefore, it was decided that conventional complete dentures would be fabricated for this patient. Further surgical treatment was expected.

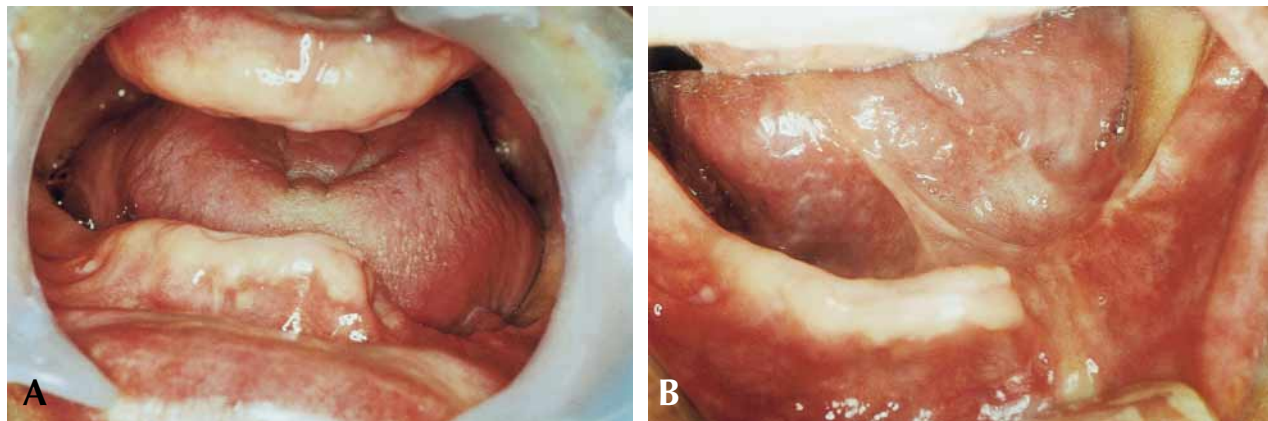
From preliminary impressions, study casts and custom trays were fabricated. A functional impression technique that made use of polyether provided the final impression. Record bases were made with the sprinkle-on technique with autopolymerizing orthodontic acrylic resin (Hygenic Orthodontic Resin; The

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**Fig. 2.** **A**, Intraoral frontal view of patient before restoration. **B**, Edentulous mandibular arch. Note loss of alveolar ridge on left side with vestibular obliteration.

Hygenic Co, Akron, Ohio). The position of the mandibular record base and occlusal rim were evaluated and modified in the mouth until stability during functional movements was achieved.

After registration of the centric jaw position, face-bow transfer, and articulator mounting, several notches were carved on the mandibular master cast. A silicone putty index (Coltene Rapid Base, Knetmasse Putty Material; Coltene/Whaledent Inc, Mahwah, N.J.) was used to register the position of the left mandibular occlusal rim and record base. Zero-degree acrylic resin denture teeth were used in this treatment. After tooth arrangement and festooning, the silicone putty index was repositioned and used to verify the position of denture teeth and polished surface (Fig. 3). The mandibular wax denture was evaluated again for denture stability during speech and eccentric jaw movement and then was processed with the conventional technique (Figs. 4 and 5).

Several postinsertion denture evaluations and adjustments were performed. During these evaluations, the patient complained of food accumulation under the left mandibular lingual flange. This was thought to be related to the thick soft tissue, which moved during function, and the effect of partial glossectomy.

To improve the tissue contact situation, denture soft tissue conditioner (Visco-gel; Dentsply Ltd, Surrey, England) was used to reline the mandibular denture and at the same time served as a diagnostic tool for the cause of food accumulation. Before the conditioner was applied to the tissue surface of the denture, sufficient denture base material was trimmed to provide at least 0.5 mm of space for the lining material.<sup>11</sup> The conditioner was used to register the amount of soft tissue displacement that caused denture sinking during function, especially in the resected left mandibular region. After application of the denture soft tissue conditioner for 1 week, the patient indicated that the food accumu-

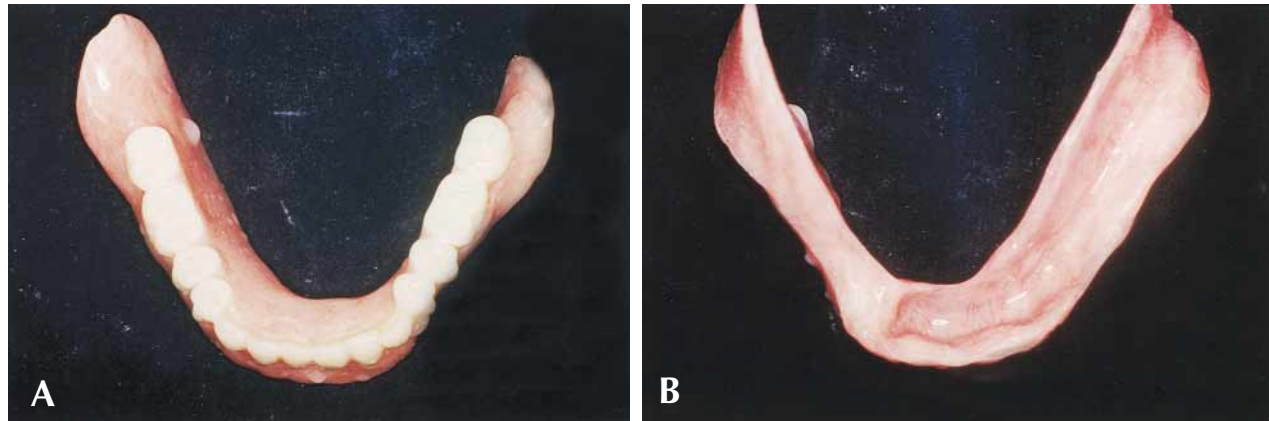


**Fig. 3.** Silicone putty index used to verify position of denture teeth and polishing surface contour.

lation problem had been eliminated. The mandibular denture then was ready to be relined.

The occlusion of the dentures was adjusted intraorally at the maximum intercuspation position before the tissue conditioner was replaced with chairside relining resin. A thin layer of resin at the denture tissue surface was trimmed. Venting holes were provided on the buccal and lingual flanges of the denture without damaging the border and denture teeth. Denture base relining material (Tokuso Rebase; Tokuyama Co, Tokyo, Japan) was applied to the denture base chairside. While the resin was polymerizing, the patient's mandible was guided into the centric relation position, which was also the maximum intercuspation position.<sup>12</sup>

After the relined resin had polymerized, denture occlusion at centric and eccentric positions was evaluated and adjusted intraorally. The operator held the denture base with the thumb and index finger while



**Fig. 4. A,** Polishing surface of mandibular denture. Note thin denture base over scar area with narrow occlusal table. **B,** Tissue surface of mandibular denture. Note lingual extension of denture base.



**Fig. 5.** Intraoral frontal view of completed dentures.

using his remaining fingers to hold the mandible of the patient.<sup>13</sup> Interfering contacts on the denture teeth were removed.

## DISCUSSION

With the loss of buccal and lingual sulcus and the presence of scar tissue, denture stability was extremely difficult to achieve. Displacement of the scar by the denture base needed to be avoided. Proper border extension of the denture and correct denture polishing surface contours were important for denture stability (Fig. 4). In patients with unfavorable edentulous tissue support, the neutral zone impression technique should be used to register the soft tissue contour and the denture polished surface.<sup>14,15</sup> The obliteration of the mandibular sulcus often requires a skin graft and an immediate stent prosthesis to stabilize and maintain the graft during the healing period.<sup>1</sup>

The autopolymerizing resin used in this treatment is

a direct chairside reline resin that produces only minor heat during polymerization and is similar in composition, surface reproduction, and dimensional change to heat-polymerizing acrylic resins. The procedure described is fast and less costly than the laboratory reline method and does not result in substantial oral tissue change.<sup>16</sup> Occlusion change was minimal because the denture was correctly positioned and venting holes were provided for the escape of excessive relining material. Occlusion could easily be adjusted in the mouth when the base was stable and jaw closure performance was correct.<sup>13</sup>

The patient was instructed to chew only on the nonresected side to avoid denture instability. Occlusal ramps or platforms may be placed on the opposing maxillary prosthesis to guide the mandible into a more desirable maxillomandibular relationship and provide a broad area of occlusal contact.<sup>17</sup>

It may be necessary to accept an occlusion that is not bilaterally balanced in eccentric occluding positions for an edentulous resected maxilla or mandible.<sup>2</sup> Changes in tissue beneath a maxillofacial prosthesis may be more rapid than in those beneath an ordinary complete prosthesis. Therefore, the occlusion and base adaptation must be reevaluated frequently.<sup>2</sup>

## SUMMARY

For the segmental mandibulectomy patient described in this report, properly fabricated conventional complete dentures provided comfort and sufficient function.

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