Intraoperative Fabrication of Palatal Prosthesis for Maxillary Resection

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Background: Immediate placement of a palatal prosthesis has become the standard of care after maxillectomy or palatectomy, except when free-flap reconstruction is used. Palatal prostheses are usually fabricated preoperatively. Infrequently, the surgeon may face a situation where upper jaw resection has been performed and a prefabricated prosthesis is not available.

Objective: To describe a method of rapid intraoperative fabrication of a palatal prosthesis, which allows immediate oral intake and excellent speech.

Procedure: Two sheets of thermoplastic dressing (Aqua- plast; WFR/Aquaplast Corporation, Wyckoff, NJ) were immersed in hot water. As they became soft and pliable, they were applied to the remaining hard palate and alveolar ridge. As the material cooled, it hardened, with its shape conforming to the remaining hard palate, alveolar ridge, and teeth. The rigid stent was then removed, trimmed, and fashioned to cover the palatal and maxillary defect. The stent was then wired to the remaining alveolar ridge and to the ipsilateral zygomatic buttress or lateral orbital rim. Removal of the stent was easily accomplished in an office setting.

Patients: Twelve patients required partial upper jaw resection without available prefabricated prostheses. Of these, 3 patients underwent emergency surgery for mucormycosis and 2 for bleeding malignant tumors; 3 underwent bone resection more extensive than that anticipated preoperatively; and 4 did not have prefabricated prostheses for other reasons.

Results: The thermoplastic prosthesis achieved its goals in all 12 patients. Eleven patients achieved oral food intake within 24 hours. One patient remained in a coma after extensive maxillary, orbital, and skull base resection for mucormycosis. The prosthesis was removed after 4 to 12 weeks and replaced with a permanent implant in 11 of the 12 patients.

Conclusions: This simple, quick, and inexpensive intraoperative fabrication of palatal prosthesis requires no special expertise and equipment. It allows immediate oral intake and excellent speech.
MATERIALS AND METHODS

Two sheets of the perforated 0.16-cm-thick thermoplastic dressing material were immersed in hot water. We used 2 sheets to increase the strength and firmness of the stent and to prevent leakage through the perforations, thus providing an effective seal between the oral and nasal cavities. As they became soft and pliable, the sheets were applied to the remaining hard palate and alveolar ridge. As the material cooled, it hardened with its shape conforming to the remaining hard palate, alveolar ridge, and teeth. The rigid stent was then removed, trimmed, and fashioned to cover the palatal and maxillary defect. The stent was then wired to the remaining alveolar ridge and to the ipsilateral zygomatic buttress or lateral orbital rim. The wires were tied within the maxillectomy cavity to prevent irritation and discomfort to the lips, buccal mucosa, or tongue caused by the wire ties. Alternative methods of fixation, such as a screw drilled directly into the alveolar ridge or hard palate, may also be used. If packing was used, it was removed gradually through the nose. Postoperative cavity care, hygiene, and inspection were accomplished transnasally and/or transorally around the stent.

The stent was left in place for 4 to 12 weeks. Removal of the stent was easily accomplished in an office setting. The wire loops on the oral side of the stent were cut first, the stent was removed, and the wires were then removed. Impression for an interim and a future permanent acrylic prostheses was then obtained.

RESULTS

Our series of patients included 3 with mucormycosis and 2 with bleeding malignant tumors who underwent emergent surgery. In another 3 patients, the bone defect was

Figure 1. A, Maxillary, orbital, and skull base resection for a patient with mucormycosis. B, Prosthesis fabricated intraoperatively from thermoplastic dressing (Aquaplast; WFR/Aquaplast Corporation, Wyckoff, NJ) is secured to the ipsilateral zygomatic buttress.

Figure 2. A, Partial palatectomy for a malignant tumor. B, Prosthesis fabricated intraoperatively from thermoplastic dressing (Aquaplast; WFR/Aquaplast Corporation, Wyckoff, NJ) is secured to the alveolar ridge.
different from that anticipated preoperatively. The remaining 4 patients did not have preoperative stents available due to logistic problems.

The following 2 case histories illustrate the effective use of an intraoperatively fabricated palatal prosthesis after palate resection.

PATIENT 1

Patient 1 had extensive mucormycosis and underwent emergent maxillary, orbital, and skull base resection (Figure 1A). The thermoplastic prosthesis was fabricated intraoperatively and secured to the remaining alveolar ridge and the ipsilateral zygomatic buttress (Figure 1B).

PATIENT 2

Patient 2 underwent partial palatectomy for the treatment of a malignant palatal tumor (Figure 2A). The thermoplastic prosthesis was designed and secured to the alveolar ridge by means of dental wires (Figure 2B). The patient regained oral alimentation in 48 hours and had speech quality comparable to her preoperative speech.

The prosthesis achieved its goals in 11 of the 12 patients. These patients were able to achieve physiologic deglutition and phonation within 24 to 48 hours. One patient (patient 1) remained in a coma after extensive maxillary, orbital, and skull base resection for mucormycosis. In 11 of 12 patients, the prosthesis was removed in 4 to 12 weeks and replaced with a permanent implant. One patient with mucormycosis died 4 weeks after surgery with the prosthesis in place.

Both case histories demonstrate the ease and effectiveness of using an intraoperatively fabricated palatal prosthesis. This method is quick, simple, and inexpensive and requires no special expertise and equipment. It allows adequate and rapid oral food intake. The quality of speech achieved is comparable to preoperative speech.

After submitting our manuscript, a recent article in the literature showed a similar technique.6

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REFERENCES