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How I Do It

A Targeted Problem and Its Solution

An Effective, Inexpensive, Temporary Surgical Obturator Following Maxillectomy

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INTRODUCTION

Restoring the normal separation that exists between the oral cavity and the nasal cavity is critical in allowing a patient to maintain speech and swallowing function after maxillectomy. Failure of adequate separation after maxillectomy will often result in severe oronasal incompetence, which is generally not possible for the patient to overcome without intervention. Two broad categories are available for the rehabilitation of this patient population: prosthetic obturators and flap reconstruction. Obturators have the advantages of shortening operating room time and eliminating flap donor site morbidity (whether regional or distant). Disadvantages include prolonged process and the high cost of obturator fabrication, as well as the need for regular removal and cleaning by the patient. Surgical flap reconstruction provides for immediate and permanent correction of the abnormal oronasal communication, but is associated with increased operating room time, need for technical expertise, and the possibility of donor morbidity at the flap harvest site. We have used both techniques successfully in our practice.

For the patient who will undergo prosthetic rehabilitation, there are three distinct prostheses that will be required: temporary surgical obturator, intermediate obturator, and final prosthesis.[1,2] The temporary surgical obturator is required immediately after surgical resection to allow the patient to communicate and swallow in the early postoperative period, as well as to maintain the maxillectomy packing in position. This packing is required to increase the success of split-thickness graft application to the cheek flap, thus decreasing long-term cutaneous contracture. The temporary surgical obturator is generally kept in situ for approximately 2 to 3 weeks after surgery. The interim obturator is next fabricated by a maxillofacial prosthodontist and modified regularly over the course of 6 to 12 months as the maxillectomy cavity alters shape with the healing process. Once this cavity has stabilized, the final prosthesis is constructed based in large part on the shape and size of the interim obturator. This process requires a large amount of hands-on time expenditure by a skilled prosthodontist, leading to a substantial cost.

In this article, we outline our technique for the construction of an inexpensive, simple, temporary surgical obturator.

Technique

Before completing the oncologic resection of a maxillary sinus or palate cancer, Aquaplast thermoplastic sheeting (3/16 of an inch thickness) (Aquaplast Corp., Wyckoff, NJ) is trimmed to approximate the size of the native palate. It is then heated in water that has been brought to a boil. The polymer will become transparent and moldable at this point. After allowing for excess water to run off, the Aquaplast is molded in situ onto the palate. As it cools, the palate shape

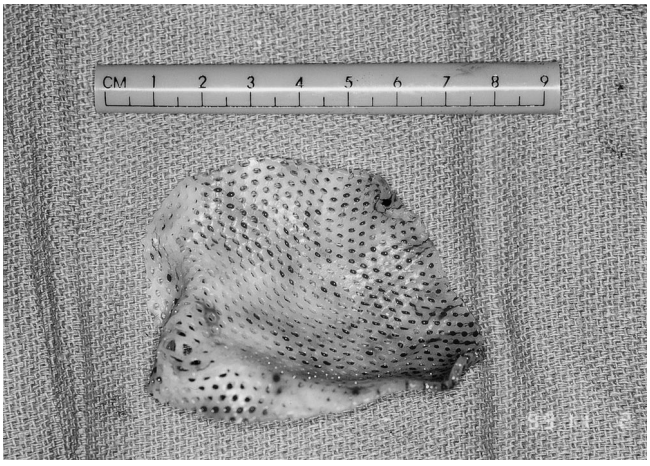

Fig. 1. Aquaplast surgical obturator contoured to native palate.

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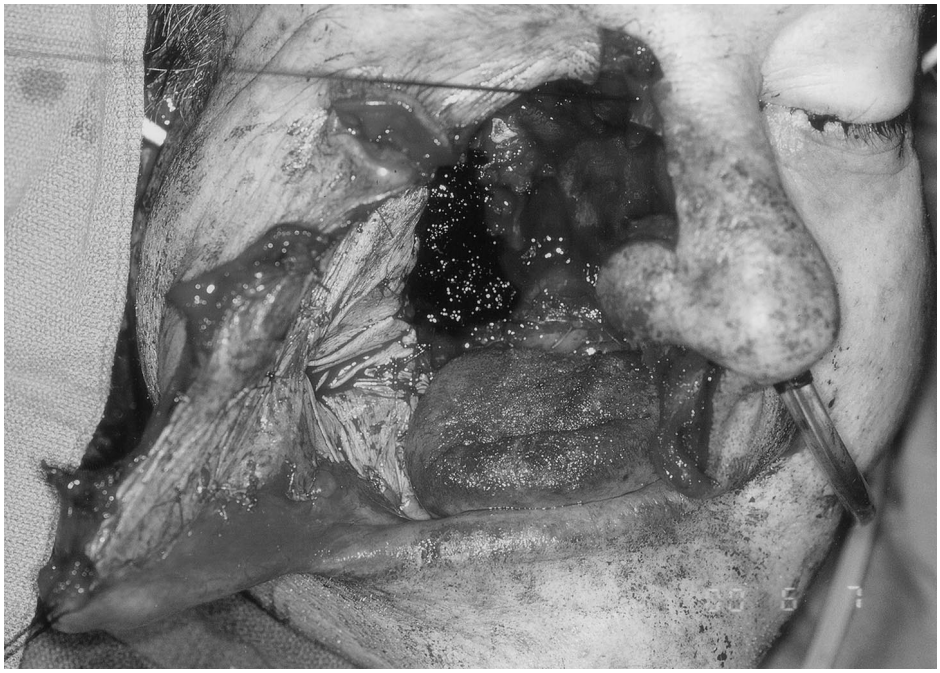

Fig. 2. Application of split-thickness skin graft to a total maxillectomy with orbital exenteration defect.

and size, including alveolar ridge, is transferred onto the Aquaplast (Fig. 1). This is then washed and soaked in Betadine solution or equivalent. Once the oncologic resection is complete, the Aquaplast splint will serve as the temporary surgical obturator. Once the split-thickness skin graft is applied to the maxillectomy cavity (Fig. 2), gauze packing is placed within the defect to fill the surgical void. Next, the Aquaplast obturator is fixated with a series of circumferentially applied 2.0 silk sutures passed between the remaining palatal or peri-palatal soft tissue and the construct (Fig. 3). The prosthesis is also rigidly fixated to any remaining palatal bone with two separate 2.0-mm lag screws. The patient is placed on a fluid diet on the first postoperative day. The splint is removed and the maxillectomy packing changed at 7 to 10 days. If all is healing well, the patient is sent to the prosthodontist at 2 to 3 weeks for the formation of the interim obturator. The Aquaplast splint serves at this point as a valuable impression of the patient's premorbid palatal configuration.

DISCUSSION

Aquaplast thermoplastic is a unique polymer that is malleable at temperatures above 140°F and becomes progressively less flexible as the temperature reaches room temperature.[3] It has been used as an external nasal dressing, allowing it to contour onto the three-dimensional framework of the nose, and as a bolster for split-thickness skin grafts on the face.[3,4] Once hardened at room temperature, it regains a significant amount of tensile strength, as evidenced by its application in preventing wound contractures in burn patients.[5]

We have had a positive experience in the use of Aquaplast as a temporary surgical obturator after palatectomy and maxillectomy (10 patients) as the first step in prosthetic rehabilitation of these patients. We have encountered no adverse outcomes from its fabrication or application. It has obviated the need for both preprosthetic impressions and temporary surgical acrylic splint fabrication, making the entire process of prosthetic rehabilitation less expensive. As with acrylic splints, patients are often able to tolerate a liquid diet on the first postoperative day. As opposed to non-perforated acrylic splints, the holes in the Aquaplast allow for egress of tissue fluid and prevent trapping and subsequent inspissation of oral liquids beneath the prosthesis. These holes also allow for simple suture fixation and/or lag screw application.

This technique appears to represent a safe, rapid, inexpensive technique for the formation of temporary surgical obturators.

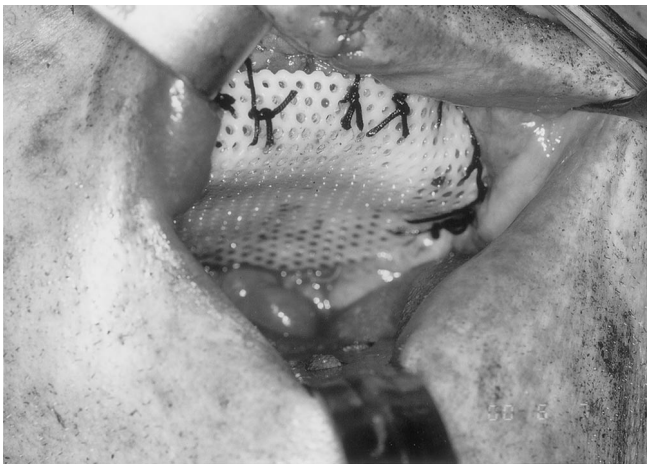

Fig. 3. Aquaplast splint rigidly fixated in situ.

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