Prosthetic rehabilitation of a patient after partial rhinectomy: A clinical report

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Carcinoma of the nasal vestibule often requires radical surgical excision, which results in total or partial loss of the nose followed by radiation therapy. A noninvasive, cost-effective technique for rehabilitation of a patient with squamous cell carcinoma of the nasal vestibule following partial rhinectomy and radiation therapy using heat-polymerizing clear acrylic resin is presented. (J Prosthet Dent 2005;93:125-8.)

A considerable number of people each year acquire facial defects as a result of malignant disease, trauma, and congenital deformity. Malignancies of the nasal vestibule are rare and account for only 9% of all cancers of the nasal cavity.[1] Most of these tumors of the nasal vestibule are squamous cell carcinoma.[2-4] If not diagnosed and treated early, these tumors are often fatal.[5] Treatment options for nasal vestibule carcinoma are surgery, radiation therapy, and chemotherapy.[1-5]

In recent years, newer treatment options such as cryotherapy, immunotherapy, cytotoxic treatment, photodynamic treatment, and hypothermal treatment have been used in conjunction with conventional treatment methods for head and neck cancers.[6] However, most of these methods result in unwanted or incapacitating defects requiring immediate short- or long-term management and rehabilitation procedures.

Rehabilitation can be accomplished either surgically or prosthetically.[2-5,7] The method of rehabilitation depends upon the site, size, etiology, severity, age, and the patient's wishes. However, age, general medical condition of the patient, radiation therapy, anatomic complexity, possibility of recurrence, appearance of the area to be rehabilitated, complexity of the surgical procedure, and the patient's refusal to undergo further surgery may contraindicate surgical reconstruction,[4,7] resulting in a major defect. Prosthetic rehabilitation of such patients then has considerable advantages, in that a prosthesis offers the clinician and the patient the means to observe the healing wound for recurrence of the disease, esthetic improvement, technical simplicity, and inexpensive care.

For several decades, a number of biomaterials and techniques have been used in the fabrication of nasal prostheses. Each material has advantages and shortcomings. Silicones are generally the preferred materials for fabrication because of lightweight and life-like appearance.[8] However, silicone materials fall short of an ideal maxillofacial prosthetic material as adhesives do not work well with silicones, and silicones are difficult to polish, have low tear resistance, and have microbial growth–promoting characteristics.[8, 9]

Methyl methacrylate resin has been used as a maxillofacial material because it is easy to work with, hygienic, durable, and economical. Also, it can be satisfactorily colored to match individual skin tone. However, its use is limited by its rigidity. Although attempts have been made to greatly improve the properties of various maxillofacial materials, there is still no ideal material that resembles or duplicates human skin.[10,11] This clinical report describes a simple and economical method for prosthetic rehabilitation of a patient with squamous cell carcinoma of nasal vestibule after partial rhinectomy.

CLINICAL REPORT

A 69-year-old woman diagnosed with squamous cell carcinoma of the nasal vestibule (Fig. 1) had undergone a partial rhinectomy (Fig. 2) and was referred to the Department of Prosthodontics, Manipal College of Dental Sciences, Mangalore, India. Immediate surgical reconstruction was not recommended due to the need for further treatment with radiation therapy. The patient received postoperative external beam radiation therapy to the nose by anterior direct beam on a telecobalt machine with a total dose of 60 Gy in 30 fractions over a period of 6 weeks. The patient tolerated the radiation well and was subsequently referred for possible prosthetic restoration of the nasal defect after radiation therapy. On examination of the defect, it was noted that the right side of the nose and part of the nasal septum were removed. Various modalities of prosthetic reconstruction were discussed with the patient and the patient indicated a desire for an economical solution. Hence, a heat-polymerizing acrylic resin nasal prosthesis was planned, and the expectations of this prosthesis were explained to the patient.

The boundary for the external nasal impression was outlined on the face using softened modeling plastic impression compound (Pinacle; Dental Products of India Ltd, Mumbai, India) to confine the impression material. A plastic tube was placed in the nostrils to allow the patient to breathe. To prevent the intrusion of the material

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Fig. 1. Patient's face with carcinoma of nasal vestibule.

Fig. 2. Patient's face with defect after partial rhinectomy.

into the nasal cavity, moist gauze was packed into the nasal defect. The impression of the defect was obtained with irreversible hydrocolloid (Imprint; Dental Products of India Ltd). The impression was removed (Fig. 3) and poured in Type III dental stone (Dentstone; Pankaj Industries, Mumbai Maharashtra, India) (Fig. 4). The prosthesis was waxed to form (Fig. 5). A hole was made through the defect area to fabricate a hollow prosthesis that would reduce the weight of the nose prosthesis and allow for breathing.[12,13]

On completion, the wax prosthesis was verified at the trial insertion appointment (Fig. 6). The wax prosthesis was invested and the wax was eliminated. A mold was prepared and packed. The wax form was processed in heat-polymerizing clear acrylic resin (DPI-heatcure; Dental Products of India Ltd). An oil-based paint (Tri-Star Colman; Tri-Star Creative Products Private Ltd, Noida, Uttar Pradesh, India) was mixed on a ceramic slab to match the skin color of the patient. The paint was then incorporated into the heat-polymerizing acrylic resin monomer, and polymer powder was mixed. The material was polymerized in a water bath at 74°C for 8 hours.[14] The prosthesis was recovered after polymerization and rinsed with water to eliminate all residues. Feather-edged borders were developed using an acrylic bur (No. 180-203; Dentaurum, Ispringen, Germany) to blend with the surface of the skin. The prosthesis was evaluated on the patient. The prosthesis was held in position on the face with an eyeglass frame.[15] The frame and prosthesis were oriented with the help of modeling plastic impression compound. The assembly was removed, and the prosthesis was firmly fitted to the spectacle frame with autopolymerizing acrylic resin (DPI-RR; Dental Products of India Ltd). The prosthesis provided a life-like appearance and matched skin color and texture. To improve the retention further, a bridge of heat-polymerized acrylic resin (DPI-Heat Cure; Dental Products of India Ltd) reinforced with the 21-gauge stainless steel wire (Ever Bright Dental Stainless Steel Wire; Comet, Mumbai, India) along the columela of the nose, engaging the medial wall of the left nostril, was used. To enhance esthetics, some extrinsic water-resistant coloration to break the monochromic appearance was required. The prosthesis was further characterized to simulate the surface texture of the skin. To obtain a matte finish the surface of the prosthesis was coated with a thin layer of autopolymerizing acrylic resin (DPI-RR; Dental Products of India Ltd).

The prosthesis was inserted into the defect (Fig. 7), and the patient was instructed on home care and prosthesis maintenance. To sanitize the wound, the patient was instructed to gently remove any exudates with a

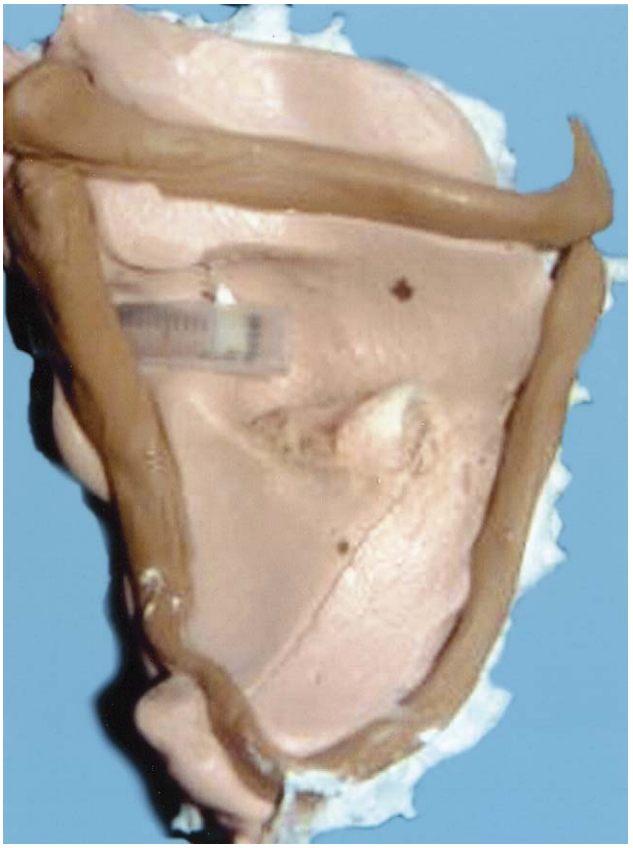

Fig. 3. Retrieved impression of defect.

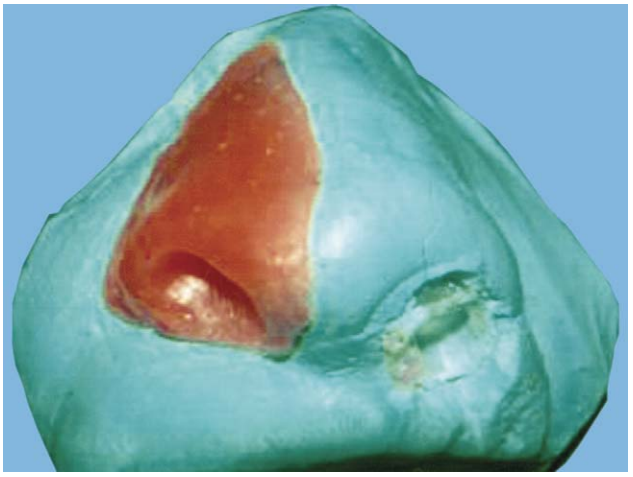

Fig. 5. Wax pattern adapted to definitive cast.

Fig. 4. Dental stone cast of defect.

Fig. 6. Evaluation of wax pattern on patient.

wet cotton tip soaked with a 5% Betadine solution (Win-Medicare, New Delhi, India) and to clean the intaglio surface of the prosthesis once a day. The patient was scheduled for the first post-insertion adjustment 3 days after the insertion. At the first post-insertion appointment the surgical wound was observed to ensure health of the tissues, to relieve the prosthesis for pressure areas on the tissues to compensate for processing changes, and to emphasize hygiene and home care. The patient was placed on a 3-month recall for evaluation and observation of any recurrence.

SUMMARY

Squamous cell carcinoma of the nasal vestibule is rare. The lesions require combined modality treatment with

Fig. 7. Nasal prosthesis in situ.

radiation therapy and aggressive excision of all or part of the nose. This clinical report describes an effective, noninvasive method for prosthetic rehabilitation of a nasal defect with a mechanical retention design using an eyeglass frame. The advantages of this prosthesis are that the technique is noninvasive, cost-effective, tissue tolerant, esthetic to the patient, comfortable to use, and easy to fabricate and clean.

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