

Case Report

Maxillofacial Rehabilitation of Nasal Defect with Nasal Prosthesis Using Donor Method: A Case Report

MI Mathar, SM Shamsudeen¹

Department of Prosthodontics, Al Rass Dental College, Qassim University, Saudi Arabia,
¹Department of Dental Diagnostic Science and Oral Biology, King Khalid University, Abha, Saudi Arabia

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ABSTRACT

Maxillofacial prosthetics is the branch of prosthodontics which involves rehabilitation of the defects in the maxillofacial region involving the hard and soft tissue with the prosthesis. Facial defects that occur in the midfacial regions are commonly due to trauma and neoplasms like basal cell carcinoma which involves the nose. Reconstruction of the nose is an important esthetic challenge due to its esthetic and retention problems. This article emphasis rehabilitation of the nasal defect of a patient with nasal prosthesis using donor method.

KEYWORDS: Basal cell carcinoma, donor method, maxillofacial rehabilitation, nasal prosthesis

INTRODUCTION

Basal cell carcinoma is a malignant tumor commonly involving the sun-exposed sites predilection to nasal areas. Prosthodontic rehabilitation of facial defect is a definitive treatment of choice where surgical reconstruction is practically impossible. It represents a great challenge to maxillofacial prosthodontics to rehabilitate such defects, especially in the esthetic zone. Correction and rehabilitation of such defects are always challenging because the results are very much limited by materials used in the fabrication of facial prostheses. Acrylic resins, acrylic copolymers, vinyl polymers, polyurethane elastomers, and silicone elastomers can be used in all facial prosthesis. However, silicones are the most acceptable due to their excellent surface texture and strength.^[1]

The ideal characteristics for maxillofacial prosthetic materials should have less viscosity with long working time, the capability of intrinsic and extrinsic characterization, and minimal processing temperature. It should have mechanical characteristics such as good

tensile strength, elastic modulus, percentage elongation, dimensional stability and resistance to chemicals, and ultraviolet light. It should be inexpensive, non-allergic, easily cleansable, lightweight, and biocompatible with skin adhesives.^[2]

The long-term success of facial restoration mainly depends on retention. Retention of the facial prosthesis depends on providing better marginal integrity and maintaining the position of the prosthesis. The retention can be obtained by anatomic retention such as anatomic undercuts or secondary mechanical factors such as implants, magnets, or with mini titanium screws.^[3]

CASE HISTORY


A 60-year-old male patient underwent surgery for basal cell carcinoma 6 months back having a nasal defect

Address for correspondence: Dr. SM Shamsudeen, Department of Dental Diagnostic Science, King Khalid University, College of Dentistry, Abha -62529, Saudi Arabia. E-mail: sshahul@kku.edu.sa

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came for the reconstruction of his nose. The patient had a complaint of esthetics disfigurement, difficulty in breathing due to open defect and draining nasal secretions. On examination, there was a complete absence of the nose [Figure 1]. Reconstruction of his

nose after complete rhinectomy is challenging due to the retention of the prosthesis.

The patient was covered with drape and petroleum jelly was applied to the patient's eyebrows, eyelashes, and



Figure 1: Nasal defect before treatment



Figure 2: Irreversible hydrocolloid impression

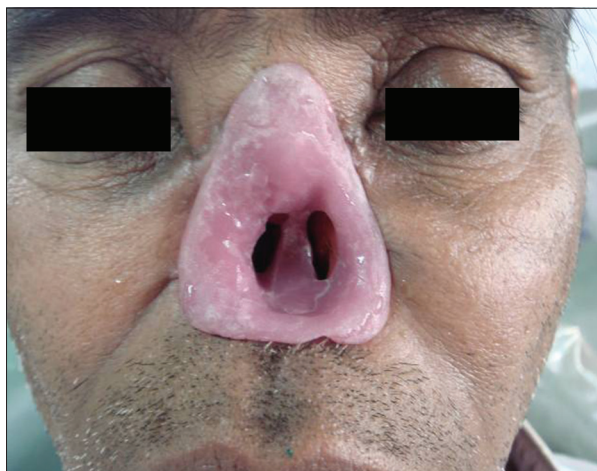


Figure 3: Acrylic record base



Figure 4: Master cast



Figure 5: Wax trial



Figure 6: Nasal prosthesis after treatment

moustache. The nasal defect was packed with moist gauze to prevent impression material entering into the undesired defect areas of the nasal cavity. The patient was informed to breathe through his mouth where two suction tips were placed until impression was made to prevent the difficultness of nasal breathing. Extreme care was taken to maintain the desirable undercuts as they were a source of mechanical retention for the reconstruction of the nasal prosthesis.

The impression of the nasal defect was made with irreversible hydrocolloid impression material (Tropicalgin, Zhermack, Italy) [Figure 2] and supported with Type I impression plaster to provide rigid support of impression. Modeling wax (Hindustan modeling wax no. 2, Hyderabad, India) was adopted on the middle third of the face covering the eyes and nasal defect with the upper lip. Once facial moulage was made, and the cast was poured with Type III dental stone (Kala Bhai Pvt. Ltd., Mumbai, India). The cast was removed carefully after the dental stone has set. A custom acrylic record base was fabricated over this cast to achieve a functional impression of the tissues [Figure 3]. A functional impression was made with polyether elastomeric impression material (monophase) (Impregum, 3M ESPE, USA) by asking the patient to perform various facial movements. This impression was poured using Type III dental stone (Kala Bhai Private Ltd., Mumbai, India) to obtain a master cast [Figure 4] and then permanent acrylic record base was fabricated with heat cure denture base resin (Acryln H, Mumbai, India).

The donor method was carried out in this patient for the fabrication of nasal prosthesis with the help of his son's nose to mimic the natural appearance of the face such that it improves self-esteem and quality of life. Impression was made with polyvinylsiloxane (PVS) elastomeric impression material (Aquasil Ultra, Dentsply, India) from the patient's son nose. Wax pattern was fabricated and wax try-in was done in nasal defect site [Figure 5].

Silicone elastomers (Cosmesil, Room Temperature Vulcanization Silicone, RTV) were used to fabricate for the shade-matching procedure. Color matching was done with oil-based dies as tinting of the prosthesis using oil color is also the most commonly advocated technique for color matching of the extra oral-facial prosthesis. Acrylic record base and silicone prosthesis were bonded with primer. The nasal prosthesis was retained with spectacles using cyanoacrylates to mask the margins of the nasal prosthesis [Figure 6].

DISCUSSION

Nasal defects present as esthetic and faced with psychological difficulties in society for the patient.

The main goal of the maxillofacial prosthodontics should be able to achieve overall rehabilitation of the patient in terms of functional and esthetic sense.^[4] The traditional method of making maxillofacial impression uses the irreversible hydrocolloid material reinforced with Type I gypsum. High viscosity polyvinyl silicone impression material can also be used with a suitable instrument.^[5]

The functional impression technique used in this patient not only records the precise borders of the defect but also helps in obtaining an acceptable marginal seal of the prosthesis with the defect borders. The prosthesis delivered using the functional impression is firm during all the functional movements of the facial muscles. Providing sufficient retention and airway in nasal prostheses should be considered utmost important as it can improve the patient's function and comfort.

Most of the facial prosthesis such as nasal prosthesis is retained with skin adhesives and mechanisms including anatomic favorable undercuts, spectacles, magnets, and endosseous implants. One of the disadvantages with the use of skin adhesives for retention is poor bond strength with prosthetic materials which degrades especially on its border margins where the material is thinner. Another drawback is movements of soft tissues such as facial functions around the midfacial defects during smile which can affect the adaptation of the border margins. Devices like spectacles are feasible in terms of mechanical retention and cost-effective for the patient. These spectacles along with retention also serve the purpose of masking the edges of the prosthesis, thereby making it look more lifelike and esthetic. The main advantages of this prosthesis are low weight, cost-effective, non-invasive, biocompatible and functionally firm, and good appearance.^[6]

Another alternative method to restore extra oral-facial defects is the use of extraoral implants.^[7] The success for the retention of facial prosthesis mainly depends on the presence of adequate quantity and quality of bone. Moreover, in the case of patients with recurrent tumors, more observation and oncologic follow-up period are required before placement of implants.^[8]

Model fabrication can also be simplified by using various latest technologies such as laser scanning, CAD/CAM, and rapid prototyping. Since the whole process can be automated, CAD/CAM procedures can reduce the manual steps.^[9,10]

CONCLUSION

This clinical scenario depicts a simple effective method for maxillofacial rehabilitation of midfacial

region defect with a mechanical retention design using spectacles. The main advantages of this nasal prosthesis are that the technique is non-invasive, cost-effective, tissue tolerant, esthetic, easy to fabricate, and clean. Furthermore, this prosthesis is often preferred by the patients due to its lightweight and cost-effective factor. The extrinsic staining of the prosthesis may be due to the presence of moisture, mobile soft tissues, and secretions from glands. Hence, a simple technique like donor method as presented in this case can be successfully used in conservative management of a maxillofacial defect.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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