

# Nasal reconstruction with silicone using customised impression technique

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## Abstract

Facial defects can result from a variety of reasons including trauma, burns, infections, congenital disorders, and neoplasms which require surgical correction or prosthetic rehabilitation or both. Prosthetic replacement using various materials is the treatment of choice when other surgical options are not possible. This report presents a case of acquired nasal defect secondary to a surgically operated adenoid cystic carcinoma using silicone as the material of choice.

**Keywords:** Adenoid cystic carcinoma, maxillofacial prosthesis, nasal prosthesis, silicone prosthesis

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## INTRODUCTION

Adenoid cystic carcinoma (ACC) is the most common malignant tumor of the minor salivary glands. The sinonasal tract is a common site of ACC occurrence, second only to the oral cavity. Of all cases of sinonasal ACC, a minority (22%–35%) arise in the nasal cavity.<sup>[1]</sup> These cases are usually treated with surgery in which total or partial rhinectomy is done. The quality of life after rhinectomy is severely compromised if an efficient surgical reconstruction or a prosthetic replacement is not provided. Prosthetic restoration of facial defect is a treatment of choice where surgical reconstruction is not possible. It presents as a great challenge to maxillofacial prosthodontists to rehabilitate such defects which are present in the esthetic areas.

The ideal properties for facial prosthetic materials are (1) processing characteristics that include low viscosity, extended working time, capability of intrinsic and extrinsic

colorization, low processing temperature, and ease of molding during use of reusable investments; (2) mechanical or performance characteristics such as high tensile strength, high percent elongation, elastic modulus, dimensional stability, and resistance to chemicals and ultraviolet light; and (3) patient accommodation properties that ensure that a product is nontoxic, nonallergenic, easily cleansible, lightweight, and compatible with adhesives.<sup>[2,3]</sup>

Materials commonly used for fabrication of facial prostheses are acrylic resins, vinyl polymers, polyurethane elastomers, and silicone elastomers, with none of them fulfilling all the requirements for a satisfactory prosthesis.<sup>[4]</sup> However, silicones remain the more widely used materials for facial restorations because of their good surface texture and hardness.<sup>[5]</sup>

The purpose of this clinical report is to describe the prosthetic rehabilitation of a patient who was surgically operated for ACC resulting in resection of the lateral part

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of the nose with a midline shift, using a silicone-based nasal prosthesis.

### CASE REPORT

A 56-year-old male patient reported to Yenepoya Dental College, Mangalore, who had been surgically operated for ACC in which partial rhinectomy on the right side was done, and adenoids were removed along with adjacent cheek tissue. The scar band formation postsurgery led to nasal septum deviation on the right side [Figure 1].

#### The patient had the following major complaints

1. Nasal secretions seeping externally
2. Esthetics
3. Difficulty in breathing due to open defect
4. Skin irritation due to the scar band.

#### Procedure

1. The patient was draped and petroleum jelly was applied to the patient's eyebrows and eyelashes. Moist gauze was packed to prevent the flow of material into the undesired areas of the defect. Care was taken not to block the desirable undercuts as they were a source of mechanical retention for the prosthesis which was to be fabricated. An impression was made of the defect and adjacent tissues using irreversible hydrocolloid impression material (Tropicalgin, Zhermack, Italy). Paper clips were attached on the wet surface of impression material on the face, and dental plaster was applied over it so as to provide a rigid support for the impression that was made [Figure 2]
2. This impression was then carefully removed and poured using Type III dental stone (Kala Stone; Kala Bhai Pvt. Ltd., Mumbai, Maharashtra, India) to obtain a cast
3. A custom acrylic tray was fabricated over this cast so as to achieve a functional impression of the tissues. Obtaining a functional impression was of utmost importance in this case as the defect borders were partly on the nose extending to the medial canthus of the eye and partly on the cheek which had functional movements despite scarring of the tissues
4. A functional impression was made with polyether (monophase) (Impregum, 3M ESPE, USA) impression material, by asking the patient to do various facial movements [Figure 3]
5. This impression was poured using Type III dental stone (Kala Stone; Kala Bhai Pvt Ltd., Mumbai, India) to obtain a final cast [Figure 4]
6. A wax-up of the final prosthesis was done on the cast using modeling wax (Hindustan Dental Wax, HDP,



Figure 1: The nasal defect on the right side of the face



Figure 2: Impression of the face made with irreversible hydrocolloid and covered with dental plaster



Figure 3: Functional impression of the defect using polyether in a custom acrylic tray

Hyderabad, India), taking into account the patient's facial symmetry [Figure 5]

7. The wax pattern adaptation on the patient's face was checked especially in the border areas by asking the patient to do functional movements. Skin color, texture, and relevant contours were evaluated on the

face of the patient that was to be replicated in the final prosthesis

The wax pattern was secured back onto the final cast and was flaked [Figure 6]. After dewaxing, the nasal prosthesis was processed using medically graded silicone prosthesis material (MP Sai Enterprises, Mumbai). Intrinsic staining was done using the intrinsic stains provided by the silicone manufacturer based on trial-and-error method and cured. After curing, deflasking was done and the prosthesis was retrieved

8. The prosthesis was evaluated on the patient's face. Excess silicone extending beyond the borders was removed and extrinsic coloration was done to further match with the skin color of the patient [Figure 7]
9. After the final contouring and matching, the superior and medial borders were adapted as closely as possible to the point of contact with the eyeglass frames. Retention for this prosthesis was obtained by two methods:
  - a. By the use of favorable retentive undercuts which were present in the defect
  - b. With the use of spectacles that the patient was already using with a prescription by the

ophthalmologist and these spectacles were used for support as well to mask the margins of the prosthesis [Figure 8]

10. The placement of the prosthesis was demonstrated to the patient and was then delivered. Detailed instructions regarding care and use were provided to the patient. The patient was reviewed after a follow-up period of 1 month.

## DISCUSSION

Facial defects present as esthetic and psychosocial difficulties for the patient. Here, the goal of the prosthodontist should be overall rehabilitation of the patient in terms of function and appearance.

The various maxillofacial impression methods used and described in literature have been based on the materials available and the dexterity of the operator, making fabrication of an extraoral facial prosthesis more art than science.<sup>[6]</sup> The conventional method of



Figure 4: Final cast obtained using Type III dental stone



Figure 5: Wax pattern for the final prosthesis



Figure 6: Flasking of the cast with the wax pattern



Figure 7: Prosthesis evaluated on the patient's face



**Figure 8:** Final prosthesis retained with spectacles

making maxillofacial impression involved the use of irreversible hydrocolloid material reinforced with Type II gypsum.<sup>[7]</sup> Alternatively, high-viscosity polyvinyl silicone impression<sup>[8]</sup> material was used with the help of a suitable carrier.

The functional impression technique used in this case not only records the accurate borders of the defect but also helps in achieving a satisfactory marginal seal of the prosthesis with the defect borders. The prosthesis delivered using the functional impression is stable during all the functional movements of the facial muscles.

Providing adequate retention and airway in nasal prostheses should be considered as it can improve the patient's function and comfort. The prosthesis should be lightweight. Most facial prostheses such as nasal prostheses are retained with adhesives and mechanisms including anatomic undercuts, eyeglasses attachments, magnets, and endosseous implants. Each of these methods has its own advantages and disadvantages.<sup>[9]</sup> Devices such as eyeglasses are better in terms of mechanical retention as well as economical for the patient. These eyeglasses not only provide retention but also help in masking the borders of the prosthesis, thereby making it look more lifelike and esthetic.

The main advantages of this prosthesis are that it is lightweight, inexpensive, noninvasive, biocompatible, and

functionally stable and esthetic. Hence, a simple technique as presented in this case report can be used successfully in conservative management of a maxillofacial defect without aggressive side effects which will be enthusiastically accepted by the patients.

#### **Declaration of patient consent**

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

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#### **Conflicts of interest**

There are no conflicts of interest.

#### **REFERENCES**

1. Perez AJ, Goyal P. Adenoid cystic carcinoma of the nasal cavity: A case report. *Ear Nose Throat J* 2012;91:E22-4.
2. Lewis DH, Cowper DR, Castleberry DJ, Fischer TE. New and improved elastomers for extraoral maxillofacial prostheses. *J Dent Res* 1977;56:174.
3. Lewis DH, Castleberry DJ. An assessment of recent advances in external maxillofacial materials. *J Prosthet Dent* 1980;43:426-32.
4. Goiato MC, Pesqueira AA, dos Santos DM, Antenucci RM, Ribeiro Pdo P. Evaluation of dimensional change and detail reproduction in silicones for facial prostheses. *Acta Odontol Latinoam* 2008;21:85-8.
5. Mortellaro C, Garagiola U, Lucchina AG, Grivetto F, Milone G, Pappalardo S, et al. The use of silicon elastomer in maxillofacial rehabilitation as a substitute for or in conjunction with resins. *J Craniofac Surg* 2006;17:152-62.
6. Vibha S, Anandkrishna GN, Anupam P, Namratha N. Prefabricated stock trays for impression of auricular region. *J Indian Prosthodont Soc* 2010;10:118-22.
7. Andres CJ, Haugh SP. Facial prosthesis fabrication: Technical aspects. In: Taylor TD, editor. *Clinical Maxillofacial Prosthetics*. Illinois: Quintessence Publishing Co. Inc.; 2000. p. 233-44.
8. Alsiyabi AS, Minsley GE. Facial moulage fabrication using a two-stage poly (vinyl siloxane) impression. *J Prosthodont* 2006;15:195-7.
9. Jain S, Maru K, Shukla J, Vyas A, Pillai R, Jain P, et al. Nasal prosthesis rehabilitation: A case report. *J Indian Prosthodont Soc* 2011;11:265-9.