

Case Report: Fabricating a Nose Prosthesis in a Patient with Total Rhinectomy and Upper Lip Resection Due to Basal Cell Carcinoma-A Case Report



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ABSTRACT

Basal cell carcinoma (BCC) is the most common skin cancer. The nature of BCC is slow growth, locally invasive and rarely impacts other areas of the body. Because exposure to sunlight for a long time is the main cause of BCC, it usually occurs in the head and neck area, and the nose has the highest risk of involvement. Most patients with BCC are treated with surgery, leading to poor cosmetic results. Nasal defects can be reconstructed using flap surgery or using extraoral prostheses or a combination of these two methods. If the lesion is large, surgical reconstruction is limited. In addition, radiotherapy before surgery delays the wound healing process and increases the risk of failure. Therefore, when we cannot use surgical methods for reconstruction, we can use prosthetic reconstruction methods. The advantages of prosthetic reconstruction include better color matching, comfort, no need for a graft donor site, and lower cost. The present report describes the clinical techniques of fabricating a nasal prosthesis in a patient with total rhinectomy and upper lip resection due to basal cell carcinoma.

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Introduction

Many people suffer from facial defects yearly due to malignant diseases, trauma, congenital malformations, and burn injuries (1). Facial defects caused by traumatic injury or neoplasm removal cause cosmetic and functional problems for the patient (2, 3).

Basal cell carcinoma (BCC) is the most common skin cancer (4). BCC's nature is slow growth, locally invasive, and rarely impacts other areas of the body (4). Because exposure to sunlight for a long time is the main cause of BCC, it usually occurs in the head and neck area, and the nose has the highest risk of involvement (4, 5). Most patients with BCC are treated with surgery, leading to poor cosmetic results (4).

After rhinectomy the quality of life is severely compromised (3). Prosthetic management of traumatic or surgical nasal defects by maxillofacial prosthodontics is well documented and allows us to restore lost tissue and helps patients overcome social and psychological problems (2, 6).

The literature showed that we need a period of 3 to 5 months after surgery for tissue contraction and re-formation before the fabrication of final nasal prosthesis (6, 7).

This clinical report aims to describe how to fabricate a permanent silicone nasal prosthesis and a part of the upper lip, retained by tissue undercut and eye glasses.

Case Report

The present report describes the clinical techniques of fabricating a nasal prosthesis. The patient is an 81-year-old man with complete rhinectomy and upper lip resection due to Basal cell carcinoma (BCC) and was referred for reconstruction of the middle part of the face (Figure 1).



Figure 1: Frontal view of patient after rhinectomy

14 months ago, the patient underwent surgery for a tumor in the nose and upper lip due to BCC, and after 6 months, due to the recurrence of the lesion, he underwent surgery again and was immediately treated with radiotherapy. Because of the history of radiotherapy, the patient's age, financial limitations, and the possibility of lesion recurrence, implant-supported prostheses were excluded from the treatment options, and it was decided to make a Silicone removable prosthesis. For better retention, the patient's glasses frame is used together with silicone adhesive.

Initially, the impression was made from the facial defect. First, we matched a cartoon box with the patient's face, and to keep the patient's airway open during the impression procedure, we used a plastic suction tube inside the patient's mouth (Figure 2) and set the chair in semi supine position and obturated the lesion with gauze to avoid from impression material flow to the sinuses then impression of the defect was made with hand mixed irreversible hydrocolloid (Chromatic alginate, Bagno a Ripoli, Tuscany, Italy) with the correct ratio of powder to water and made an impression from the lesion (Figure 3)



Figure 2: matched cartoon box and keep the patient's airway open with a plastic suction tube



Figure 3: Impression was made with alginate impression material

Then we removed the alginate material from the patient's face. After disinfecting the impression (Figure 4), it was poured with hard plaster, type III (Moldano, Kulzer, Germany) to prepare the final cast for the preparation of the prosthesis (Figure 5).



Figure 4: Impression from the lesion



Figure 5 Master cast

Nasal wax (Polywax; Bilkim Co Ltd, izmir, turkey) was prepared using old photos of the patient on the final cast (Figure 6), and a try-in was done on the patient's face (Figure 7).



Figure 6: Wax pattern was adapted on the master cast



Figure 7 Wax pattern try in.

Next, a second plaster mold (or counter-mold) is taken, and the wax is melted off. The final prosthesis was then cast in the counter-mold using colored heat-cured medical silicone (M511, Technovent Ltd., South Wales, United Kingdom). The silicone prosthesis was made, and the initial try-in of the prosthesis was done to evaluate the edge matching and color matching (Figure 8). At the final stage, the color match of the prosthesis was done by using natural pigments mixed in fluid silicone, and finally, it was delivered to the patient (Figure 9).



Figure 8: Initial try in of the prosthesis



Figure 9: Completed prosthesis and final profile

Hygienic instructions to the patient include daily disinfection with neutral soap and water on the prosthesis's external and internal surface. To take care of the surrounding tissues, we advise the patient to remove the prosthesis before going to sleep to avoid trauma and contamination with bacteria and fungi due to the presence of moisture. This also prevents tissue inflammation caused by the continuous presence of the prosthesis. We recommend cleaning the skin with mild soap and water and washing the mucus with normal saline serum. The patient was scheduled for the first post-insertion adjustment 1 day after the insertion to ensure the tissues' health and relieve the prosthesis for pressure areas on the tissues. After 1 month, the patient was recalled for assessment of prosthesis. The patient was advised to visit every three months for follow-up.

Discussion

Facial defects due to the treatment of neoplasms, congenital malformations, and trauma cause functional and psychological problems (8). Surgical reconstruction technique, prosthetic reconstruction, or a combination of both methods are used to reconstruct these deformities (8, 9). Location, size, lesion etiology, age, and medical conditions determine the reconstruction method (8, 10). Replacing the lost parts of the nose due to cancer surgery is never easy for surgical reconstruction, especially when large parts of the nose are removed (8, 11). The advantages of facial prostheses compared to surgical reconstruction include early alloplastic reconstruction of the lesion, early reconstruction of the patient's appearance, fewer treatment costs and treatment time, protection of exposed areas, and improved psychological recovery (11, 12).

Malignancy of the nasal area, especially basal cell carcinoma, tends to localized aggressive growth (13). Adequate removal of the tumor in the form of a partial or even complete rhinectomy is necessary. Still, unfortunately, it causes destructive changes in the person's appearance and psychosocial status (9, 11, 13, 14).

Prosthetic reconstruction in rhinectomy patients should consider the esthetic and functional needs of the patient. Sufficient retention of these prostheses is always a challenge. The retention of most maxillofacial prostheses, especially the nose, is achieved by various methods such as using tissue undercuts, connecting to eyeglass frames, connecting to obturator prostheses, magnets, and connecting to osseointegrated implants (15).

The presence of moisture, the movement of mobile tissues, and the absence of stable supporting tissues affect retention, which are the disadvantages of using tissue undercut. When the remaining tissue is smooth, using mechanical retention, such as eyeglass frames due to gravity, may cause the prosthesis to move vertically. The use of adhesives may cause tissue irritation and damage the thin margin of the prosthesis (8).

Predictable mechanical retention of maxillofacial prostheses has progressed with the introduction of Osseointegrated implants. The advantages of extraoral implants include increased retention, stability, and esthetics due to the better construction of the prosthesis with feather edge borders. On the other hand, radiotherapy, which is usually used in treating head and neck malignancies, increases the risk of implant failure. The prognosis of craniofacial implants in radiotherapy areas depends on the location of the lesion, the dose and mode of radiotherapy, the volume of the tumor mass, the target clinical volume, chemotherapy, and the use of hyperbaric oxygen (HBO). Implants cannot be used in children and unpredictable tumor areas (8, 13, 15-17).

Various impression techniques have been described based on available materials and operator skills (6). The material used for maxillofacial impression is usually irreversible hydrocolloid (alginate) because it is accessible in the office, has low cost, can record details, and has acceptable physical properties. It is also possible to use additive silicone molding materials with high consistency using a suitable carrier (10, 16).

Biomaterials such as polymethyl methacrylate and silicone are used for maxillofacial prostheses. Methyl methacrylate resin is used for maxillofacial prostheses and has advantages such as ease of use, hygiene, resistance, and economical. However, its use has limitations such as being hard, lack of sufficient esthetic features, and inability to match the edges of the prosthesis with the remaining facial tissues (15, 17, 18). Silicone materials are most widely used in maxillofacial prostheses. The factors that cause the choice of silicone include biocompatibility, flexibility, translucency, color stability, and high resistance. The advantages of silicone include ease of construction, desirable esthetics, lightweight, and the ability to use soft, flexible projections that can gently engage minor tissue undercuts to enhance retention and stability. However, silicone materials also have disadvantages, such as difficult to polish and the possibility of microbial growth inside the prosthesis (10, 18).

Conclusion

The prosthesis should be low weight and easily placed without soft tissue irritation. In this case report, a simple and effective method was described for reconstructing mid-face lesions that used glasses for mechanical retention. The advantages of this prosthesis include non-invasive, cost-effective, esthetic, ease of construction, and cleaning.

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Authors' contributions

Jalal Toumaj: Conceptualization, Methodology, Writing - Review & Editing
Hossein Sheikhnejad: Writing - Original Draft, Data Curation, Supervision
Mohammadreza Hezaveie: Resources, Investigation, Visualization

Conflict of Interests

The authors declare no conflict of interest.

Ethical declarations

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Availability of data and material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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