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Rehabilitation of a partial nasal defect in AML patient with facial prosthesis: A case report

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ABSTRACT

Partial defects of the nose is considered one of the most difficult defects to be restored in the face. This is largely due to the difficulty in camouflaging and hiding the edges of prostheses. The proper configuration and selection of appropriate color is one of the most important criteria to receive prostheses acceptance by the patient. In this clinical report we use RTV silicone material to make nasal prosthesis for partial nasal defect in AML patient. The prosthesis was retained using anatomical undercuts and medical adhesives.

Keywords: Rhinectomy; Nasal prosthetic rehabilitation.

Introduction

Maxillofacial defects define as facial tissue loss caused by trauma, burns, malignant disease, and congenital defects [1]. Loss of portion of the face can severelyimpact functions as speech, eating, and swallowing, as well as esthetics, and psychological well-being and social behavior of patients [2-3].

Surgical reconstruction and prosthetic rehabilitation or a combination of both are the commonly used methods to restore facial disfigurements [4]. The reconstructive options depend on the size, site, etiology of defect, general health status, physical condition and patient's desire and demands [1-2]. Patient acceptance for the facial prosthesis is a challenging issue, substantially due to unrealistic patient expectations.

According to the clinical experiences, the auricular and nasal prosthesis have the highest level of acceptance but the orbital and other facial prosthesis have thelowest acceptance [4-5]. Retention of the facial prosthesis can be achieved by using biocompatible adhesives, engaging a mechanical undercut, osseointegrated implants or attaching the prosthesis to patient's eyeglasses [10-11]. Materials commonly used for fabrication of facial prostheses include acrylic resins, acrylic copolymers, vinyl polymers, polyurethane elastomers and silicone elastomers [6-7]. However, silicones remain the common and widely used materials for facial restorations because of their optimal surface texture and hardness, biocompatibility, flexibility, color stability, light weight and tissue-like appearance [8-9].

Acute myeloid leukemia (AML) is a cancer of the myeloid type of blood cells, characterized by the rapid growth of abnormal white blood cells that build up in the bone marrow and interfere with the production of normal blood cells. AML is the most common acute leukemia affecting adults, and its incidence increases with age. The French-American-British (FAB) classification system divides AML into eight subtypes, M0 through to M7, based on the type of cell from which the leukemia developed and its degree of maturity [12]. In this report, a definitive nasal prosthesis has been used for rehabilitation of a partial nasal defect, using anatomic retentive aids and skin adhesives.

Case Report

A 26-year old male presented to Tehran University of Medical Science (TUMS), school of Dentistry, Department of prosthodontics for prosthetic rehabilitation of his nasal defect (Figure 1). The patient had a history of Acute myeloid leukemia (AML) subtype M1 (whichis a quickly progressing disease in which too many immature white blood cells (not lymphocytes) are found in the blood and bone marrow) 12. He had undergone bone marrow transfer and took 12 sessions of chemotherapy {Methotrexate (MTX) 100 mg/m2/day}. A year before, in an emergency, with the diagnosis of progressive Mucormycosis, surgery was performed due to involvement of his left nasal alar region, lateral nasal cartilages and nasal septum, at the oral and maxillofacial surgery service of Shariati Hospital. He was treated by using antifungal agent (amphotericin B0.7 to 1 mg/kg per day IV for 6 weeks). Extra oral examination revealed no sign of ulceration.The patient had a provisional nasal prosthesis (Figure 2), but he related dissatisfaction with its appearance and color. He indicated that he was especially concerned about attending an upcoming social event because of his facial disfigurement. After consultation with the patient and surgeon, a nasal prosthesis was determined to be the treatment of choice for the reconstruction of the nose.

Clinical Procedure

1. Before the impression, petroleum jelly was applied over the eye lashes and eye brows. Deep undesirable undercuts were blocked with lubricated gauze.Putty VPS Impression Materials was fitted to the patient's face to support the impression material (Figure 3).

2. Impression was taken for the defect and the adjacent tissues using light and medium body vinyl polysiloxane (VPS) from 3M ESPE with the patient in semi-upright position in order to minimize tissue bed distortion. Light body material was used for taking accurate impression of the tissue surface area, and medium body pvs was used to create retentive pins to provide retention for dental stone on the pvs impression. Fast-set plaster was then used to support the impression (Figure 4).

3. The impression was removed and poured with type III dental stone (Moldano, Bayer, Leverkusen, Germany) Figure 5.

4. The pattern of prosthesis was sculpted on the facial cast with baseplate wax (Cavex, Cavex Holland, Haarlem, Netherlands). After completion of the wax pattern, it was evaluated to improve the whole morphology, contour, surface texture and position on the patient's face (Fgure 6).

5. After final try in,separating medium was applied on the surface, thenflasking and wax elimination of extra oral prosthesis was carried out (Figure 7) . Room temperature vulcanizing silicone, Cosmesil RTV M511 (Cosmedica Ltd., Cardiff, UK) was used along with intrinsic coloring incorporated to match the base skin tones (Figure 8). Flasks wereleft at room temperature for 48 hrs. for curing. Prosthesis wasremoved from flasks and edges were finished with sharp surgicalscissors. Silicone gloss was applied over the external surface togive more lifelike appearance.

6. Nasal prosthesis was tried on patient. A medical grade silicone skin adhesive (Cosmesil™ TechnoventLtd, South Wales, UK) was used for additional retention. Extrinsic coloration for the finished prosthesis was done to make it more acceptable (Figure 9-10).

7. After delivering prosthesis home care instructions were given. Periodic recall check-ups were scheduled

after 1 month, 3 months, 6 months, 1 year, and 2 years. To make necessary adjustments. The patient was comfortable and color matching was satisfied.

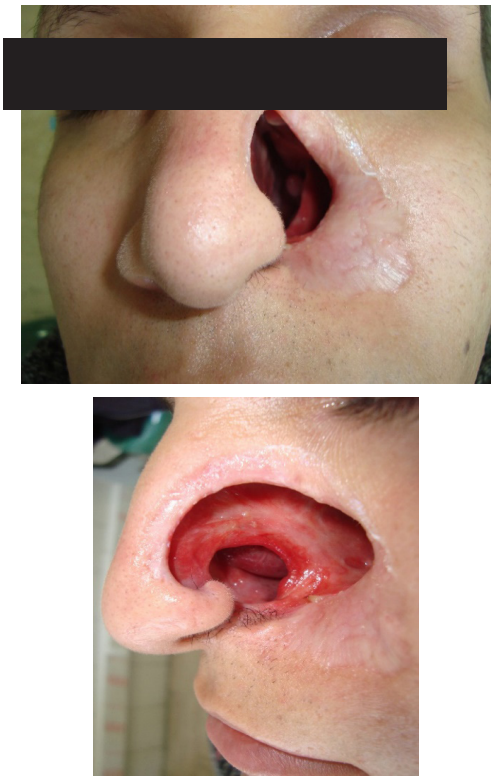
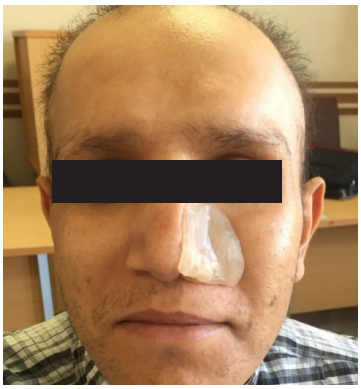


Fig 1.



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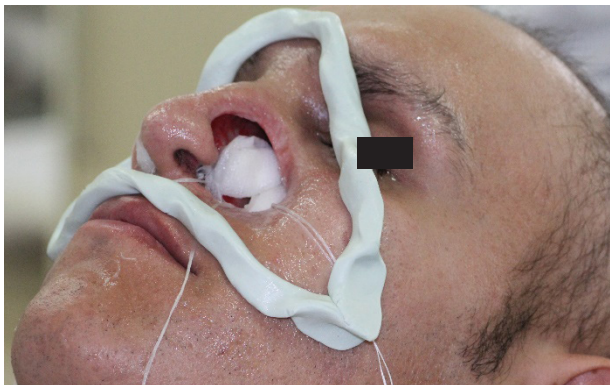


Fig 3.

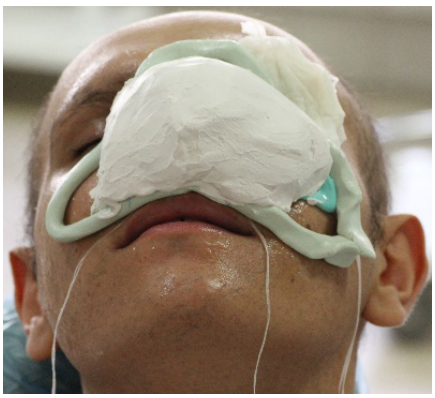
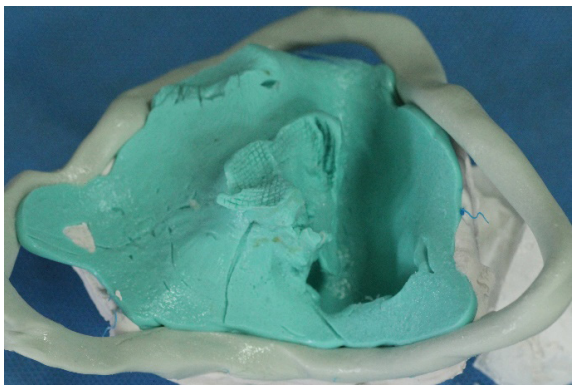
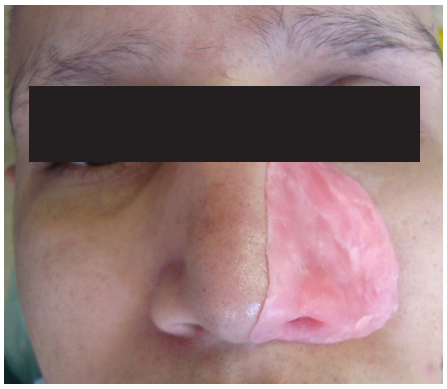
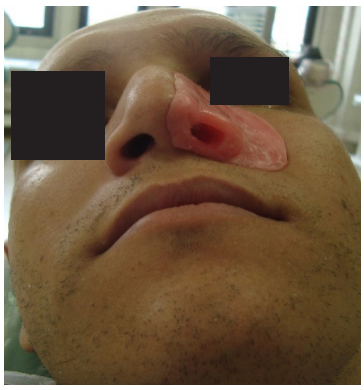


Fig 4.







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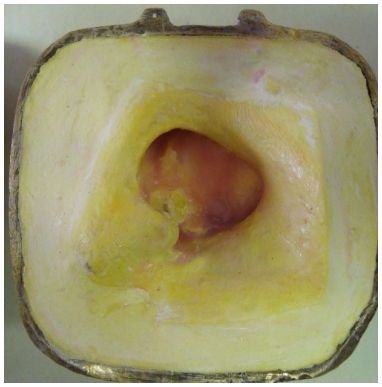
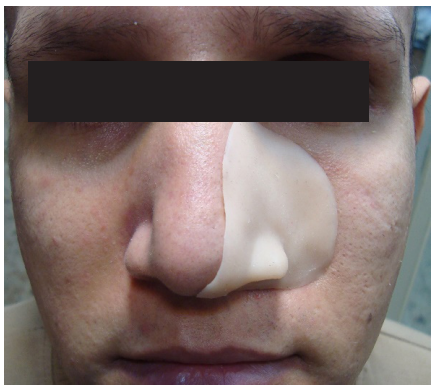


Fig 7.

Fig 8.



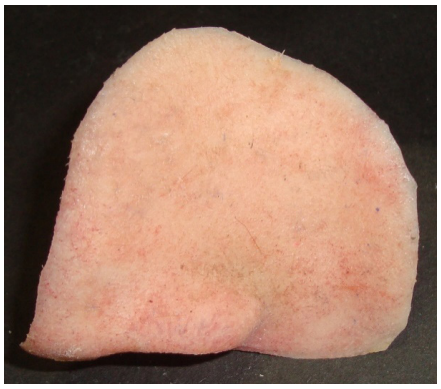
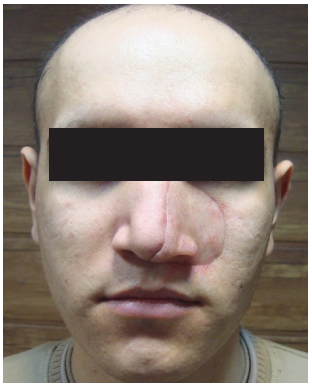
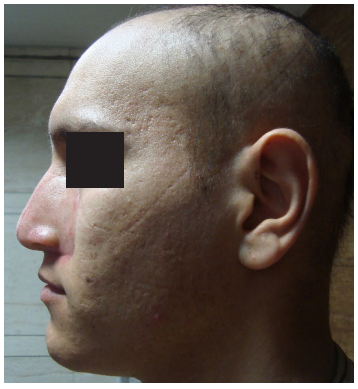


Fig 9.





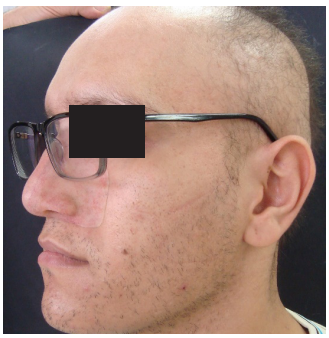


Fig 10.

Discussion

Restoration of the facial defect is usually done by plastic and reconstructive surgeries. However, in certain cases presenting extensive loss of anatomic tissues, or bad medical Status of the patient as in this case, prosthetic rehabilitation is definitely an alternative [13]. Partial defects of nose are considers the most difficult defects to be restored using facial prosthesis because of the difficulty in masking prosthesis borders, and due to being clearly visible in this high-profile region of the face. In this case we use mechanical anatomic means and biomedical adhesivesas retention methods Adhesives are the most commonly used materials for retention especially in low weight prostheses. But, use of adhesives with certain materials such as elastomers results in poor bond strength with unpredictable periods of retention for everyday use. Additionally, adhesives tend to degrade the prosthetic material, especially at the borders, where the material is thinner and eventually necessitate the fabrication of a new prosthesis. When suitable conditions are provided, mechanical retention obtained by anatomical undercuts is the most advantageous.

The conventional method of taking a maxillofacial impression involves the use of irreversible hydrocolloid material reinforced with type lll gypsum. In this case we used light body polyvinyl silicone as an impression materials for accurate capturing of defect details and medium bodyPVS as a retentive agent for the reinforcement layer. For the present case, a silicone material with intrinsic coloring was used and in order to achieve a natural appearance, further extrinsic coloring was applied.

Conclusion

In this report, we used nasal prosthesis to reconstruct partially nasal defects in AML patient. The advantages of this prosthesis were that its fabrication technique was noninvasive, easy and affordable and it provided acceptable esthetics and comfort for the patient.

Conflict of Interest

There is no conflict of interest to declare.

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