

Prosthetic Rehabilitation of Oro-Nasal Defect

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Abstract Maxillofacial defects may be due to congenital defect, trauma, tumor or infection. Among infections, fungal head and neck infections are common complication in patients with immunological or metabolic compromise. Cerebral extension of these infections often complicates the treatment plan. Treating these cases requires correction of the compromised state, local and systemic anti-fungal therapy and repeated radical debridement assisted by serial imaging. Following debridement, the resultant deformity can be corrected either surgically or prosthetically. Many factors are to be considered regarding the choice of the treatment. Here is a case report of a 55 year old male diabetic patient with oro-nasal mycosis, where debridement resulted in a gross morbid defect of the dorsum of the nose and the hard palate. Prosthetic rehabilitation was carried out with separate nasal prosthesis and a palatal feeding obturator.

Keywords Nasal prosthesis · Obturator · Anti fungal

Introduction

Any prosthesis used to replace part or all of any stomatognathic system and/or craniofacial structures are called the

maxillofacial prosthesis. These maxillofacial defects may be due any congenital defect, trauma, tumor or infection.

Fungi are common inhabitants of the oral and nasal mucosa, and therefore the differentiation between colonization and pathogenicity in the setting of upper respiratory tract infection symptoms can be difficult. Fungal head and neck infections occur in both immune-competent and immune-compromised persons. Patients with neutropenia, diabetes mellitus, corticosteroid use, and HIV infection are particularly susceptible to serious and potentially life-threatening infections.

The method of rehabilitation depends upon the site, size, etiology, severity, age, economy and the patient's willingness for treatment. However, general medical condition of the patient, age, anatomic complexity, possibility of recurrence, appearance of the area to be rehabilitated and complexity of the surgical procedure may contraindicate surgical reconstruction.

Case Report

A 55 year old male patient was referred to the Department of Prosthodontics, KVG Dental College & Hospital, for prosthetic rehabilitation of the Oro-Nasal defect. The patient presented with perforated dorsum of the nose (2 × 3 cm) and perforated hard palate (2.5 × 4 cm).

History revealed that patient had visited Department of Oto Rhino Laryngology, KVG Medical College, 3 months ago with a chief complaint of intense foul smelling nasal discharge and high grade fever. The lesion started with a small bleb on the dorsum of the nose and gradually increased in size. He also experienced regurgitation of the food through the nose. Personal history revealed that patient was a smoker and an alcoholic. He was also a

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Fig. 1 Pre-operative photograph: extra-oral, nasal and intra-oral; palatal view



Fig. 2 Nasal and palatal defect following debridement

known diabetic, with random blood-sugar level around 590 mg/dl. On examination, fungating mass on the dorsum of the nose and the palate were present (Fig. 1). Following culture, patient was put on antifungal cover and wound was debrided. Removal of sequestrum from the eroded hard palate was done, leading to an oro-nasal fistula and an external nasal communication (Fig. 2). Secondary to this oro-nasal fistula, patient was incapacitated and had nasal twang in his voice and nasal regurgitation of food.

Surgical reconstruction was ruled out looking at the patient's age, general medical condition, appearance of the

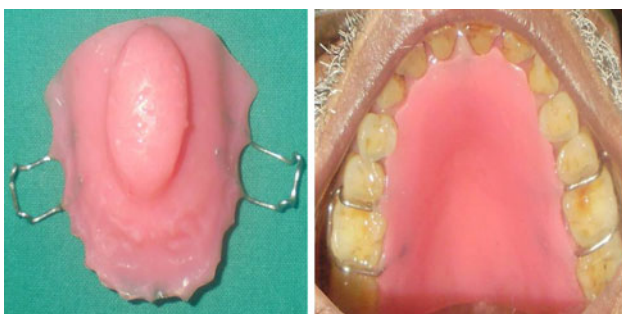


Fig. 3 Palatal feeding obturator retained with Adams clasp



Fig. 4 Mould of the impression and the wax try in

area to be rehabilitated, anatomic complexity, possibility of recurrence, complexity of the surgical procedure and cost required for the treatment. Prosthetic rehabilitation of such patients then has considerable advantages. 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.

The prosthetic treatment plan was as follows:

- (i) Feeding palatal obturator to assist feeding and to correct the nasal twang and
- (ii) Nasal prosthesis to correct the maxillofacial defect.

For the feeding palatal obturator, impression was made using alginate irreversible hydrocolloid impression material. Wax up was done on the master cast and processed with heat cure acrylic resin. Adams clasp on molars enhanced retention of the palatal prosthesis (Fig. 3).

For the nasal defect, facial moulage was made using alginate irreversible hydrocolloid impression material. Petrolatum was applied on the eyebrows and eyelashes to prevent entrapment with alginate material. Hydrated cotton ribbon gauze was placed to confine the impression material. The irreversible hydrocolloid was reinforced with gauze and dental plaster. The impression was poured in type-III dental stone. The wax pattern of the nose was made and characterized with skin creases, sweat pores and esthetic contours. The pattern was tried on the patient (Fig. 4). Marginal adaptation and contours were verified. Heat cure clear acrylic resin with intrinsic oil colour (camel oil colour for artists) dissolved in the monomer was used for the prosthesis. The monomer polymer mixture was matched to the basic skin tone. The prosthesis was processed and finished to blend with the anatomy of the adjacent structures.

Low fusing compound was used to mould the nasal extension of the prosthesis for adequate retention as it is stiff and moldable, does not droop as a result of gravity,



Fig. 5 Low fusing compound molded for retention and the final nasal prosthesis



Fig. 6 Post insertion and the final prosthesis with spectacles

and does not get distorted. Later the compound was duplicated with putty and replaced with self cure auto polymerizing resin of the same colour (Fig. 5). The prosthesis were delivered and instruction was given about the maintenance of the prosthesis. The bifocal spectacles which was advised by the ophthalmologist for better vision also helped to better camouflage the prosthesis (Fig. 6).

Discussion

Invasive fungal head and neck infections generally require extensive surgical debridement and prolonged systemic antifungal therapy, and frequently carry a poor prognosis when the underlying immuno suppression cannot be corrected [1]. In this case, since the fungal infection were extensive, it was treated with surgical debridement, antifungals and with control over blood-glucose levels.

Developing aesthetic qualities in the facial prosthesis forms fundamentally important as this prosthesis will be resource for these ‘facially handicapped’ patients. The

form of the prosthesis depends on the artistic ability of the prosthetist and upon certain characteristics of the human face. Biotypology, anthropology, and prosometry also furnish important information. Characterization can be incorporated by reproducing surface texture, contours, grooves, wrinkles, and by adding moustaches, eye lashes, eye brows wherever needed. The methods of developing retention are based on mechanical, anatomic, or adhesive artifices or tricks [2].

For the purpose of prosthetic rehabilitation for facial defects biomaterials such as polymethyl methacrylate, polyvinyl chloride, polyurethane and silicone have been used [3]. Silicones are generally the preferred materials for fabrication because of lightweight and life-like appearance. 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 [4, 5].

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 [6, 7].

Approaches and techniques that attempt to achieve an accurate skin color match include trial-and-error mixing, shade guides, pigment dispersion systems and color measurements using a colorimeter or spectrophotometre. In this case report trial-and-error method of mixing was done. Initially pre measured colour for known amount of acrylic was processed following standard curing cycle. Approximate quantity of each component required to match the skin shade was determined and final prosthesis was processed. No extrinsic stains were used.

Hollowing the obturator for partial maxillectomy patients significantly decreased the weight of the obturator from 6.55 to 33.06%, depending on the size of the defect [8]. In this case the bulb of the obturator was small and did not significantly contributed to the weight of the prosthesis and hence was not made hollow.

Conclusion

In this case prosthetic rehabilitation of the nasal and the oral defect was carried out with separate nasal prosthesis and a palatal feeding obturator. The benefits of these prosthesis was that the technique followed were noninvasive, economical, tissue tolerant, esthetic to the patient, comfortable to use, and easy to fabricate and clean.

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