A technique for the fabrication of a more retentive nasal prosthesis

Clinical Report

Gelareh Asadi, Ali Mirfazaelian, Amir A. Mangoli

ABSTRACT

Retention is one of the most important considerations in fabricating a successful facial prosthesis. This article presents a technique using two acrylic resin extensions to provide more retention for a nasal prosthesis.

KEY WORDS: Nasal, prosthesis, retention

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INTRODUCTION

Providing adequate retention and airway in nasal prostheses should be considered as it can improve the patient's function and comfort. Most facial prostheses such as nasal prostheses are retained with adhesives and mechanisms including anatomic undercuts, eyeglasses, attachments and magnets.[1-5] In the last two decades, osseointegrated implants have been used for improving support and retention of the facial prostheses.[6-11] Each of these methods has its own advantages and disadvantages. Mechanical devices such as eyeglass frames are not useful in patients with a flat residual tissue bed and gravity may cause vertical displacement. Adhesives may be irritating and damage the thin margins of the prosthesis during removal. Implants cannot be used in children and unpredictable tumor sites so practitioners should consider other methods to improve retention.[4,12]

The use of anatomic undercuts for retaining a facial prosthesis reduces the need for other mechanical retentions or adhesives. The prosthesis should be lightweight with airway space in order to be used as a functional part of breathing.

A nine-year-old girl suffering from total rhinectomy following surgical treatment of rhabdomyosarcoma was referred to the maxillofacial clinic. Chemotherapy and radiotherapy had been completed two years ago [Figure 1]. Two acrylic resin extensions that enter and touch the nasal cavity floor were used to improve retention. The prosthesis stayed comfortable in place without using adhesives and no evidence of irritation was found at the one-year follow-up.

TECHNIQUE

After blocking out the undercuts by filling the nasal cavities with lubricated gauze, an impression was made of the defect and adjacent tissues using an irreversible hydrocolloid impression material (Ariadent, Asia Chemi Teb Co., Tehran, Iran) in a semi-upright position in order to minimize tissue bed distortion. Plaster (or casting tape) was used to support the impression.[13] The impression was then poured with the material of choice to achieve a cast and the pattern was sculpted on the facial cast with baseplate wax (Cavex, Cavex Holland, Haarlem, The Netherlands).

The wax pattern adaptation on the patient's face was checked especially in the border areas. In order to get the maximum adaptation with the underlying tissues, functional wax (Correcta wax; Kerr Corp, CA) was added to the borders.

Two rolls of functional wax with the approximate size of 20 mm (length) and 6 mm (diameter) were attached to the inner side of the wax pattern near the nasal holes and molded into the nasal cavity floor. We intended the extensions to touch the nasal floor for adequate support.

Department of Prosthodontic, Dental Faculty, Tehran University of Medical Sciences, Tehran, Iran

Address for correspondence: Dr Gelareh Asadi, Prosthodontics Department, Dental Faculty, Tehran University of Medical Sciences, Ghods St, Enghelab Ave. Tehran, Iran. E-mail: asadigla@sina.tums.ac.ir

Figure 1: Initial view of the patient

Figure 2: Impression of the tissue side of wax pattern

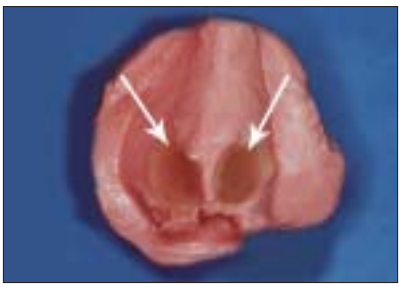

Figure 3: Filling the impression holes with clear acrylic resin

Figure 4: Make undercut around acrylic resin extensions

Figure 5: Wax pattern in the lower part of the flask

Figure 6: Injection of elastic impression material around the extensions

Figure 7: Separated flask. Consider the acrylic resin extensions inserted into the holes

Figure 8: Final nasal prosthesis

Figure 9: Patient with the definitive prosthesis

An eyeglass frame was used as an additional retentive device (if necessary) and adapted on the wax pattern to prevent over contouring. The wax pattern was hollowed to provide an airway and reduce its weight.[14,15] An impression was made from the internal surface of the wax pattern with irreversible hydrocolloid material [Figure 2] and the holes (negative imprints of the extensions) were filled with auto-polymerizing clear acrylic resin (Acropars, Marlic co, Tehran, Iran) and put into a pressure pot to be polymerized under pressure

and reduce porosities [Figure 3]. The acrylic resin extensions were pulled out of the impression, the flashes were removed and an undercut was made in each acrylic resin extension to increase its retention to the definitive prosthesis and then polished [Figure 4].

The wax pattern was put in the lower part of a flask with the tissue side up [Figure 5]. For the upper part of the flask, an elastic impression material (e.g. Impregum F; ESPE America Inc, Norristown, Pa) was injected around the extensions and the remaining part was filled with gypsum [Figure 6]. After setting the gypsum in the flask, the two parts of the flask were separated and the wax pattern was removed. The acrylic resin extensions were inserted into the holes [Figure 7], a layer of silicon/acrylic primer (Priciplity Medical LTD, South Wales, UK) was applied as recommended by the manufacturer and the flask was filled with intrinsically colored silicon material (Cosmesil®, Priciplity Medical LTD, South Wales, UK). The manufacturer's instructions for silicon processing were followed, the definitive prosthesis deflasked, excesses removed, colored extrinsically and delivered to the patient [Figures 8, 9]. Any pressure points on the nasal extensions were checked and removed.

DISCUSSION

To construct a satisfactory facial prosthesis, the material, retention and esthetics should be considered. Retention is one of the most important considerations in fabricating a successful facial prosthesis. Different methods based on mechanical devices or adhesives have been discussed in literature. The use of anatomic undercuts for retaining a facial prosthesis reduces the need for mechanical retention such as elastic straps and in some instances adhesives may be eliminated. This is advantageous as adhesives are irritating to some patients and damage to the thin margins of the prosthesis can occur during adhesive removal. The prosthesis must be lightweight with airway space in order to be used as a functional part for breathing. The nasal prosthesis described in this article was hollow, with two nasal holes for respiration and two acrylic internal extensions as a retentive and supportive device. The extensions were made of clear acrylic resin to simplify its maintenance. The prosthesis stayed comfortably in place without using adhesive and no evidence of irritation was found at the one-year follow-up.

CONCLUSION

In patients with a flat tissue bed and insufficient anatomic undercuts, using two acrylic resin extensions into the nasal floor can provide more retention and support for the nasal prosthesis. The method decreases the need for adhesives and mechanical retention and can be used for patients in whom implants and other advanced treatments are not recommended.

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