Prosthetic management of atrophic rhinitis

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Abstract Atrophic rhinitis is a form of chronic rhinitis in which the nasal mucosa atrophies and hardens, causing the nasal passages to dilate and dry out. Other prominent findings include bad smell, extensive nasal crusting and bleeding. Surgical and nonsurgical methods have been advocated for its treatment. We describe a prosthetic technique for its management

Keywords Atrophic rhinitis · Prosthesis · Rhinitis sicca.

Introduction

Atrophic rhinitis is a chronic nasal disease characterized by a triad of fetor, crusting, and atrophy of the nasal structures. The findings include squamous metaplasia of mucosa, nasal cavity enlargement, purulent discharge, bleeding, and headache. Fortunately, patients with this condition are anosmic, so they are subjectively unaware of the stench. The disease presents either as a primary condition with periarterial fibrosis and obliterating endarteritis, or secondarily as a result of trauma, nasal surgery, granulomatous disease, infections, or radiation exposure. The main goal of the treatment is to induce reversibility of the nasal mucosa by reducing the size of the nasal cavity, reducing air entry through the nose, increasing the lubrication of the nasal mucosa, and keeping the nasal cavity clean and moist so that it is free from crusts and fetor.

For many years, various medical [1, 2] and surgical [3, 4, 5] methods for the treatment of this slowly progressive and disabling disease were attempted. The medical management includes treatment of infection with antibiotics and regular nasal douching with a solution of diluted sodium bicarbonate, sodium chloride, and sodium borate. Alternatively, application of nasal cotton wool tampons soaked in glycerin containing 25% glucose for 24 hours has also been recommended [2]. Surgical treatment includes the complete closure of anterior nares by surgical intervention (Young's operation), [3] which causes patient discomfort because of the resultant mouth breathing and nasal voice. Surgery can also result in cosmetic nasal deformity. Another surgical approach is partial closure of anterior nares leaving a hole of 3 mm in the nostrils for gentle nasal breathing in patients who object to mouth breathing and nasal voice [4].

Alar stents made of clear heat-polymerized acrylic resin have been used for the treatment of alar collapse and were reportedly well tolerated [6,7]. The advantages of the stent are that the technique is non-invasive, cost effective, tissue tolerant, esthetic to the patient, comfortable to use, easy to

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fabricate, and clean. It maintains the patency and the contour of the nasal cavities.

An effective noninvasive method of treatment by means of intra nasal alar prosthesis made of clear acrylic resin is described in this study.

Clinical report

A 30-year-old woman with atrophic rhinitis was referred to the Department of Maxillofacial prosthodontics. The patient underwent closure of anterior nares by surgical intervention (Young's operation) 3 years ago, to reduce air entry through the nose, thereby allowing the nasal cilia to rest. However, the surgical treatment resulted in patient discomfort, because she became a mouth breather and developed a nasal voice. The patient presented with discharge of greenish crusts from the nose suggesting the presence of infection, foul smell from the nasal cavity, and persistent headache. The headache was likely caused by inflammation of the underlying sinuses. Neurologic or any other medical cause for the headache in the patient was ruled out. Clinical examination revealed enlarged nasal cavities [Fig. 1]. The patient found it uncomfortable to douche the nose and declined further surgery. Hence, an alternative approach with this Alar prosthesis was undertaken.

An impression of the nasal cavity was made with impression compound (Pinacle; Dental Products of India Ltd, Mumbai, India. Plastic impression compound was stiff, mouldable, and did not drop as a result of gravity [8]. The prosthesis did not protrude beyond the cartilaginous pyramid of the nose, which is flexible and can accommodate the rigidity of the prosthesis. However, the impression compound had to be meticulously inserted, taking care not to damage the nasal mucosa.

The compound was softened, moulded into a cylindrical core of approximate length of the nasal cavity, and inserted into each nasal vestibule of the patient [6]. A band of

material was left across the columela to join the both sides. An impression of the external nasal region was made with irreversible hydrocolloid (Alginate) reinforced with dental plaster. The impression was removed [Fig. 2A] and poured in dental stone. The prosthesis was waxed to form and evaluated on the patient to verify the fit [Fig. 2B]. The wax form was processed in heat polymerizing clear acrylic resin (DPI-heatcure; Dental Products of India Ltd). A 3mm hole was drilled through the prosthesis to provide an airway followed by trimming and polishing. The prosthesis was inserted into the nasal vestibule [Fig. 3] and the patient was instructed to wear it continuously, removing it only for a short period of time for cleaning. The prosthesis was designed with a smooth outer surface for comfort and to prevent injury to the nasal mucosa and growth of microorganisms. Hole in the prosthesis provided an airway for the nasal cavity, as bilateral complete nasal closure was not well tolerated by the patient. The device was long enough to cover only the cartilaginous pyramid of the nose. The prosthesis had a bridge across the nasal columela to connect both sides to prevent its accidental posterior

Fig. 2a,b Impression of nasal cavity & Wax pattern fabricated on mould.

Fig. 1 Atrophic nasal mucosa.

Fig. 3 Prosthesis in use.

displacement and possible inhalation. It maintains the patency and the contour of the nasal cavities. Fabrication requirements of the prosthesis were biocompatibility and tissue tolerance, made of inert and nontoxic substances. Easy removal, simple cleaning with soap and water, and durability were essential.

Sedatives and antihistamines prescribed for atrophic rhinitis were discontinued. The patient was examined two months later. The nasal cavities were clean and reduced in size with an absence of crusts and the associated foul odour. Tissue tolerance of the prosthesis was excellent. Patient had relief from nasal blockage and headache. The patient was disease free at 10 months follow-up.

Discussion

Surgery and nasal douching have been advocated as the primary treatment modalities for atrophic rhinitis. Surgical intervention in the event of primary atrophic rhinitis induces the reversibility of the nasal mucosa by reducing the size of the nasal cavity, reducing air entry through the nose, and increasing the lubrication of the nasal mucosa. However, surgery may be contraindicated if the patient is medically unfit for surgery or refuses surgical treatment. If there is recurrence after initial surgery, revision surgery is difficult because of exuberant scar/fibrosis tissue in the nasal vestibule. In the event of secondary atrophic rhinitis, nasal douching with an alkaline solution of diluted sodium bicarbonate, sodium baborate, and sodium chloride is often prescribed [2]. The purpose of douching is to keep nasal cavities clean from crusts. Nasal douching must be performed twice daily for 6 weeks to provide relief and is uncomfortable to the patient. Treatment with intra nasal Alar prosthesis helps to overcome the disadvantages of both surgery and nasal douching. In addition prosthesis reduces

the air entry through the nose, thereby providing rest to the nasal cilia and inducing reversibility of the nasal mucosa. It is easy to make, economical, well tolerated by the patients, and aesthetically made from clear acrylic resin. This stent is designed with a bridge across columela and reinforced with a stainless steel wire to prevent its posterior displacement during inhalation. This prosthetic rehabilitation of patient with atrophic rhinitis resulted in significant relief from symptoms. This can be recommended as an effective alternative form of treatment for atrophic rhinitis.

Acknowledgement We acknowledge for the kind sponsorship of Rev.Fr. Bala (Secretary & Correspondent), St. Joseph Dental College & Hospital, Eluru, India.

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