

Case Report

# Nasal Stent Fabrication for Post Traumatic Unilateral Nasal Stenosis Patient: A Simplified Technique

Talib Amin Naqash<sup>1\*</sup>, Ashfaq Yaqoob<sup>2\*</sup>, Samrina Gulzar<sup>3</sup>, Sheema Bashir<sup>3</sup>

<sup>1</sup>Resident, <sup>2</sup>Senior Lecturer,

<sup>\*</sup>Department of Prosthodontics, Government Dental College, Srinagar

<sup>3</sup>House surgeon, Government Dental College, Srinagar.

Corresponding Author: Talib Amin Naqash

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## ABSTRACT

Nasal stenosis subsequent to trauma is a common phenomenon which leads to difficulty in breathing and thus affecting the patient's life expectation. Even after surgical correction, a nasal stent is needed to hold the valve area. This article presents a simple method for the fabrication of a customized nasal stent for a patient with post-traumatic unilateral nasal stenosis. The method yields a surgical stent that fits accurately into place, allows nasal breathing and is retentive and esthetic.

**Key words:** Customized acrylic stent, Nasal stent, Nasal stenosis

## INTRODUCTION

A stent is a tube inserted into a natural passage in the body to prevent or counteract a disease, to temporarily hold a natural conduit open to allow access for surgery or to restore normal physiology and anatomy of the opening.

Trauma to the nose may result in nasal deformity and nasal obstruction that can have a long-term negative impact on patient quality of life. The correction of fixed nasal obstruction requires surgical intervention that aims to widen and strengthen areas of anatomic narrowing.<sup>[1-2]</sup>

If nasal patency is not maintained by a stent, chances of recurrences are there even after successful surgical correction of the obstruction. Nasal stents are routinely

used to maintain nasal cavity space during the initial healing period. Definitive or interim stents may be needed after the initial healing period to prevent collapse of the nasal air space from the weight of the flap. The purpose of the nasal stent is to reshape the outer nasal passage over a period of months. Duration of using nasal stent varies from individual to individual depending on the severity and extent of the obstruction. This article presents a simple method for the fabrication of a customized nasal stent for a patient with post-traumatic unilateral nasal stenosis. The method yields a nasal stent that fits accurately into place, allows nasal breathing and is retentive and esthetic.

## CASE REPORT

A 24-year-old male patient reported in the post graduate department of Prosthodontics, Government Dental College and Hospital, Srinagar with the surgical correction of the nasal obstruction done approximately 1 week before (Fig 1). The patient was referred by a plastic surgeon,



Figure 1: Patient with post traumatic nasal stenosis.

**Procedure:** The inner surface of the left nostril was lightly coated with petroleum jelly. A hot water bath was used to soften and temper medium fusing impression compound to fabricate a custom tray for additional silicone impression material. First, a base of compound was shaped to make impression of the columela and ala of nose and then a thin cylinder of compound was attached to the base for insertion into the nostril. The tray was inserted into the nostril keeping in view that it was loose fitting and could be easily inserted and removed from the nostril. Tray adhesive material was applied on the surface of the cylindrical portion for retention of light body additional silicone material. The impression was made with light body additional silicone material (Fig. 2). Impression was invested in dental stone using three pour technique, each increment was separated from each other

with the packed gauze piece in the left nostril. A nasal stent had to be fabricated for maintaining the patency of the nostril. On examination, healing wound was seen with no active site of inflammation and thus it was decided to make the impression of nostril at the same time.

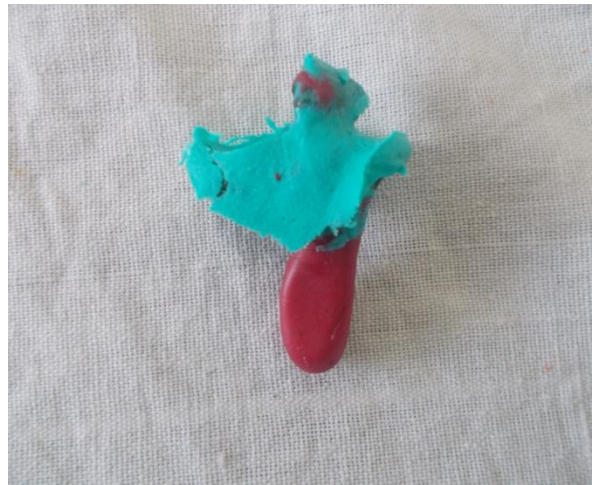


Figure 2: Impression.

using separating medium to allow easy removal of impression. The mould cavity was filled with molten wax. The wax pattern thus formed was flaked, dewaxing was done and heat cure transparent acrylic resin was polymerized. After the acrylic got polymerized, the stent was removed from the cast and number 8 round bur was used to drill a hole for normal inhalation and exhalation. Final finishing and polishing was done (Fig 3). The stent was kept in hot water at 50°C for at least 60 minutes and then checked in the patient's nasal cavity. The accuracy and patency of the stent was checked by asking the patient to close his right nostril and breathe forcibly through the left nostril. The stent was well-retained and patient could perform the inhalation and exhalation process (Fig.4). Instructions were given regarding the use and maintenance of the nasal stent.



Figure 3: Polished Nasal Stent.



Figure 4: Prosthesis in situ.

## DISCUSSION

Static narrowing or obstruction of the internal nasal valve area is caused by crowding of its anatomic components. This involves mal position, hypertrophy or deviation of the nasal septum, upper lateral cartilages, lateral nasal walls, inferior turbinates or nostril floor. The goal of surgery is to widen and strengthen the portion of the airway that is liable to collapse during inspiration. The use of nasal stent to prevent nasal scar contracture and postoperative narrowing has been used for a very long time. A number of materials are used for this purpose, which include ribbon gauze, fingerstall packing, cellulose packs, foam packs, catheters and Argyle nonconductive connective tubing.<sup>[3-8]</sup> These materials keep the wound surfaces apart, prevent formation of hematoma and prevent restenosis due to scarring. Eventually, epithelization occurs around them, securing the long-term patency of the surgically established airway.<sup>[3,9]</sup> The length of time of packing or surgical stenting varies from 2 weeks to 6 months.<sup>[3-8]</sup> The customized acrylic stent described was a superior alternative to other stenting methods.<sup>[10]</sup> Essentially, these devices have been used to support collapsed ala nasi in order to reduce

nasal obstruction and improve cosmetic appearance.

In the present article, a customized medium fusing impression compound was used to provide a rigid support for the additional silicone material. Impression compound tray can be easily customized according to individual shape and size of the nose and thus has the advantage of ease in manipulation and also cost-effectiveness. A transparent acrylic resin was used for esthetic purpose and to make the stent non distinguishable. The stent was placed in 50°C hot water to reduce its cytotoxic potential by leaching out of the monomer.<sup>[11]</sup> The use of nasal stents made from acrylic resin is a safe, convenient and economic treatment for the prevention of contracture after surgical correction of nostril stenosis or nasal valve insufficiency. This technique has advantages over other methods, previously described in the literature.<sup>[3-8]</sup> The treatment procedure is customized according to individual's nostril, easy to must balance the seemingly disparate goals of reestablishing structure, improving contour and esthetics as well as restoring the nasal airway. The surgical stent is relatively inconspicuous and allows the patient to return to normal activity as soon as the patient is released from the hospital fabricate and a chair-side

procedure. There is no risk for dislocation and aspiration of the nasal stent. The nasal airway is secured with a patent stent, and the patient can immediately return to nasal respiration. The risk of night-time breathing disturbances and decrease in nocturnal arterial oxygen partial pressure is, therefore, prevented. Treatment must balance the seemingly disparate goals of reestablishing structure, improving contour and esthetics as well as restoring the nasal airway.

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