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Reconstructive

Nasal Retainer 2.0: A New, Cheap, and Reliable Method to Prepare Custom-made Nostril Retainer for Nasal Reconstruction

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Summary: Total nasal reconstruction always represents a challenge for the plastic surgeon, who must deal both with the reconstructive procedure and compliance of the patient. This kind of reconstruction often requires more than one step. Therefore, more prolonged and emphasized scarring than normal can occur, thus resulting in a higher risk of nostril stenosis. Although several nasal retainers have been described, traditional premade retainers could be poorly tolerated by patients and need to be adequately customized to improve patient compliance. Herein, the authors propose a new, cheap, and reliable method to prepare customized nasal retainers which can be used after every step of nasal reconstruction.
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INTRODUCTION

Nasal retainers may be used after nasal reconstruction to keep airways open, maintain and support tissues, and resist against tissue contraction. Nasal reconstruction after wide tumor excision or posttraumatic defect may be a multistep procedure, thus requiring high patient compliance. Moreover, the several surgical steps may be associated with a more prolonged and emphasized scarring than normal, thus resulting in a higher risk of nostril stenosis. Therefore, patients may need to use retainers for long periods. In this scenario, nostril retainers should be customized to each patient to support surgical reconstruction and to be as comfortable and functional as possible. Several custom-made retainers made from various materials such as suction tube,[1] naso-gastric tube,[2] silicone urinary catheter,[3,4] the rubber from an infusion set,[5] or a syringe[6] have already been reported. Nevertheless, the rigidity and firmness of these materials could lead to reduced use of the device due to poor patient tolerance, or they could cause pressure or friction injuries on the reconstructed tissues.

We describe an easy and cheap way to prepare customized nasal retainers, which could be used after every step of nasal reconstruction. This is a modification of a previously described method to make retainers as comfortable as possible.

IDEA

A 58-year-old female patient was referred to our clinic with a large squamous cell carcinoma of the nose measuring 5×4 cm. She underwent total nasal amputation, sparing the nasal bones and a portion of septal cartilage, and a tissue expander was implanted on the forehead area. Three months later, the patient underwent nasal reconstruction with an expanded forehead flap and costal cartilage graft, and silicone premade nasal retainers were applied postoperatively.

Nevertheless, the device appeared to be excessively rigid and did not perfectly fit the nasal cavity, thus resulting in frequent displacement and recurrent friction injuries with consequent poor patient compliance. Therefore, we attempted to create a custom-made device in order to keep airways open, without causing pressure wounds and maximizing patient compliance (Fig. 1).

A neoplex urinary catheter (Mercier type) was cut with a n°21 scalpel to create two rigid supports (length

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about 2.5 cm). In the same way, the polyurethane foam dressing was tailored to obtain two plates measuring about 3 × 4 cm. Each support was then closely wrapped with a rolled polyurethane foam plate with the absorbent side facing out. Finally, the foam was sealed with a 2-0 silk suture thread and the two retainers were secured to each other with a further silk suture of about 1.5 cm. The so-fashioned retainers measured about 3 cm long with a diameter of about 0.8 cm. (**See Video [online]**, which demonstrates how to make a nostril retainer.)

Takeaways

Question: We aimed to improve patient compliance with nasal retainers in the case of complex nasal reconstruction.

Findings: The authors propose a simple, low-cost, and customizable new method to prepare nasal retainers made of a urinary catheter coated with polyurethane foam.

Meaning: Customized retainers improve patient compliance and assist nasal reconstruction through the several surgical steps.

Fig. 1. Postoperative photographs (3-month follow-up) showing patient wearing retainers and without retainers with preserved nostril dimension. A-B, Frontal view. C-D, Bottom view.

DISCUSSION

The ideal nostril retainer should be rigid enough to keep the reconstructed nose open and stable; it should conform to the irregularities of the nasal cavity and maintain enough grip to avoid unfavorable displacement; and it should resist adherence to the wounds of the nasal lining so it can be easily removed. It should be nonirritating, antiseptic, cost-effective, and last but not least, it should be well tolerated by the patient.

Our custom-made retainers seem to fit several of these requirements. Oh et al[7] previously described a custom-made nasal retainer using a latex nelaton urinary catheter after a cheiloplasty. These authors illustrated the several benefits of their method, including the adjustable size, the suitable structural features of the latex nelaton catheters and the affordable costs. Nevertheless, they needed to customize their retainers as a transcolumellar bridge. In fact, the bridge part of the retainer should be adequately folded in 180° and trimmed, as the retainer tends to return to its original straight position due to elasticity, and the two tips of the retainer could point toward the lateral nasal mucosa with consequent mucosal injuries and nostril collapsing.

Our custom-made retainers could be considered an "updated" version of these retainers. We have exploited the favorable characteristics of urinary catheters while making them more comfortable. We maintained a central "core," which is form-stable and keeps airways open, coated by a rolled polyurethane foam. This is a sterile, flexible and highly conformable dressing which could be easily shaped to fit challenging areas, and it helps to minimize the risk of infection and maceration as it absorbs secretions. It could stop bleeding, acting as an internal splint; it does not adhere to the wound, although it maintains a slight grip with the surrounding tissues, thus avoiding displacement of the device. The retainers have to be changed on a regular basis, especially in the early postoperative period, to reduce the risk of contamination. When nostril retainers are used immediately after nasal reconstruction, a polyurethane foam soaked with a hemostatic agent could be useful to optimize hemostasis. Furthermore, polyurethane foam is useful for an adequate load distribution over the entire support surface, thus preventing pressure injuries to reconstructed tissues. Contrary to the transcolummelar bridge retainers, which must be applied to both nasal cavities, our custom-made retainers can be used individually with higher patient compliance. Finally, these materials are readily available, can be frequently changed, and are cost-effective (Table 1).

Table 1. Estimated Costs of Nostril Retainers

	Material Cost (Single Piece)	Single Retainer Cost
Polyurethane foam dressing, 10×10 cm*	0.88$	0.22$
Sofsilk silk suture 2-0†	0.94$	0.47$
Urinary catheter Mercier Neoplex 18 CH, 40 cm‡	5.29$	0.38$
Single-use scalpel n°21	0.16$	
Stertile gloves	0.52$	
Sterile drape 75×90 cm	0.32$	
Total cost		1.07$

*Four pieces of polyurethane foam can be obtained from a single dressing.
†Two retainers can be obtained from a single suture.
‡Fourteen pieces can be obtained from a single catheter (excluding 5 cm of catheter tip).

CONCLUSIONS

We have described a new, simple, and cheap method of creating a nasal retainer using a urinary catheter. These easily available and comfortable materials make these devices useful after challenging nasal reconstruction and represent a valid alternative to conventional premade retainers.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

PATIENT CONSENT

The patient provided written informed consent for use of her image for academic and study purposes.

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