Alar Crease Creation Suture in Nasal Reconstruction

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Summary: The crescentic alar groove serves as a topographic landmark that frames the ala and separates this convex structure from the surrounding cosmetic subunits. This aesthetic landmark can be attenuated or even obliterated during wound repair in this area. Flaps spanning the alar crease are often noticeably bulky with a pin-cushioned appearance in nasal reconstruction, and it is challenging to reproduce a natural-appearing alar groove. The authors proposed a novel technique with a modified, interrupted inverted horizontal mattress suture to create an alar groove. From March of 2016 to May of 2021, 22 consecutive patients with alar defects who underwent nasal reconstruction with the paramedian forehead flap were identified. All patients underwent the authors' novel technique for the creation of the alar groove. The mean follow-up time was 3 years 7 months (range, 14 months to 5 years). A total of 32 alar crease creation suture operations were performed. All uneven wounds healed uneventfully within 2 weeks. Two cases of postoperative fading alar grooves required alar crease creation sutures to be redone. The authors' novel alar crease creation suture is a safe, straightforward, and reliable technique to create an aesthetic alar groove in forehead flap nasal reconstruction. It can create a medially shallow and laterally deep alar crease without apparent complications. *(Plast. Reconstr. Surg.* 153: 478, 2024.)
CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, IV.

The alar groove represents a critical anatomical transition between the nasal ala and the cheek laterally, the nasal sidewall superiorly, and the nasal tip medially.[1–3] This crescentic groove deepens as it extends laterally,[3] and it can be attenuated or even obliterated during wound repair in the region of the alar groove. Flaps spanning the alar crease are often noticeably bulky with a pin-cushioned appearance, and it is challenging to reproduce a natural-appearing alar groove.

In whole alar replacement or relatively complex nasal defects, such as subtotal or total nasal reconstruction, the tip, ala, sidewall, and even cheek are sometimes all obliterated by the reconstructed flap. The surgeons need to recreate a new alar crease to delineate the adjacent subunits, which can be a unique challenge. In this series, we present a novel method with a modified, interrupted inverted horizontal mattress suture for alar groove creation after forehead flap alar reconstruction.

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PATIENTS AND METHODS

Between March of 2016 and May of 2021, 22 patients were treated with our proposed surgical method. All patients underwent alar reconstruction for unilateral alar (n = 12) and total nasal deformities (n = 10). There were 10 men and 12 women, with a mean age of 39.4 years (range, 19 to 72 years). The cause of alar defects was malignancy (n = 4), congenital deformity (n = 5), trauma (n = 11), and benign neoplasm (n = 2). All patients received alar rim grafts by autogenous costal cartilage (n = 4) and ear cartilage (n = 18).

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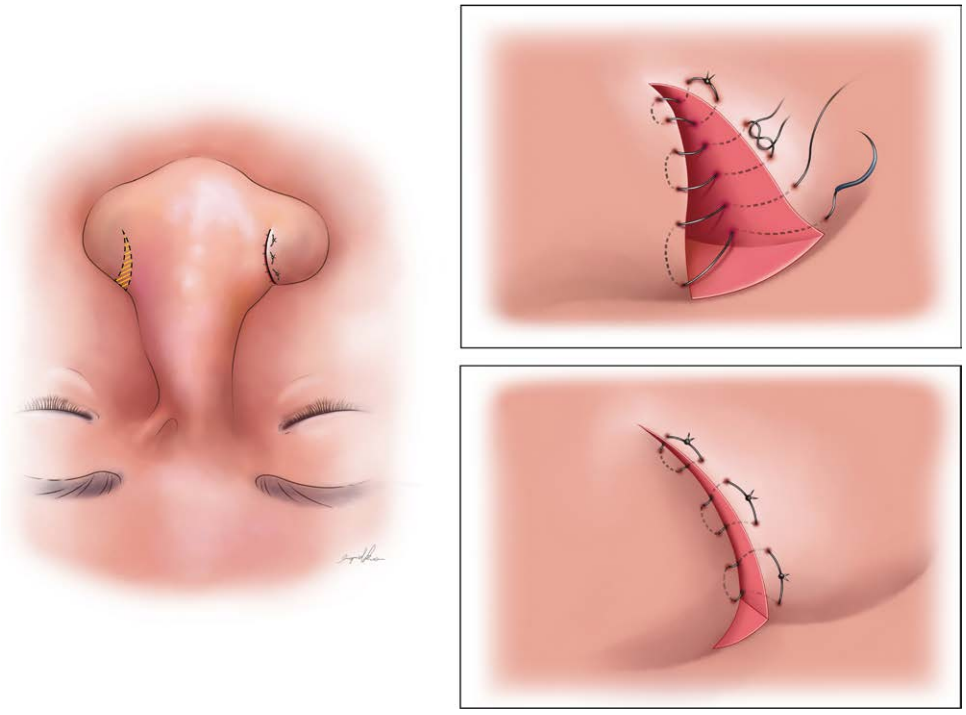

Fig. 1. Demonstration of our novel technique with modified, interrupted inverted horizontal mattress suture for the creation of the alar crease.

Traditional three-stage paramedian forehead flap reconstruction was performed.[4–9] The authors modified the methods to meet Asian features.[10] In unilateral alar reconstruction, a foil template was designed based on contralateral, normal ala. In total alar reconstruction, based on the surgeon's experience with three-dimensional printing techniques[11] to determine the ideal alar crease, a foil template was used to make both creases symmetric. Once the alar crease was determined, a direct incision was made, disregarding old scars. Excessive tissue at the sidewall was excised to sculpt the depression. Fullness at the alar subunit was preserved. Traditionally, anchoring sutures are made at the sidewall and alar flap edges to create an alar crease.[2,12,13] In our method, the suture, 5-0 nylon, starts from the medial part of the alar flap and goes out from the edge of the alar flap. Then, the suture was inserted in and out of the sidewall flap with a gap of approximately 2 mm. Then, the suture is inserted back into the edge of the alar flap (lower than the previous outlet), finishing the first suture for alar crease creation [**See Video (online)**, which demonstrates the procedure of alar crease creation suture.] The same suturing method is used continuously. The outlets and inlets at the alar flap go lower laterally to create natural alar creases that appear shallow medially and deep laterally (Fig. 1). Topical antibiotic ointments are applied to the gap between the alar flap and the sidewall flap. This allows for healing by secondary intention, with reepithelization occurring within 2 weeks.

RESULTS

The mean follow-up time was 3 years 7 months (range, 14 months to 5 years). A total of 32 alar crease creation suture operations were undertaken. All uneven wounds healed uneventfully within 2 weeks. Two cases of postoperative fading of the alar grooves occurred, requiring sutures for alar crease creation to be redone.

A 32-year-old female patient received a staged forehead flap for right alar and sidewall reconstruction because of a congenital melanocytic nevus (Fig. 2, *left*). Our modified, interrupted inverted horizontal mattress suture was used for alar groove creation. The patient was satisfied with the 4-year result (Fig. 2, *center* and *right*),

DISCUSSION

The nasal subunit principle, as put forth by Burget and Menick in 1985, is a well-accepted technique for achieving optimal cosmetic results

Fig. 2. (*Left*) A 32-year-old female patient presented with a right alar and sidewall congenital melanocytic nevus. We used a staged forehead flap and our modified, interrupted inverted horizontal mattress suture for nasal reconstruction and alar groove creation. (*Center* and *right*) Appearance at 4 years postoperatively.

in nasal reconstruction.[4] These principles include dividing the nasal surface into topographic subunits based on adjacent topographic areas with characteristic skin quality, border outline, and three-dimensional contours.[4–9,14] The alar groove represents a unique subunit in which a mildly convex surface of the alar rim and alar sidewall meets an extremely concave surface of the alar groove, just medial to the junction of the cheek.[15] It deepens as it extends laterally and seems to be more defined in black and Asian people than in Caucasian people.[2,3] Effacement of the alar crease is more challenging to reconstruct because of lack of intrinsic osseocartilaginous skeleton and support[3]; susceptibility to distortion and scar contracture[3]; sebaceous, thickened, and less mobile skin[16]; a different quality between the reconstructed flap and surrounding skin; and possibly, creation of an unnatural, webbed appearance.[20]

Previously, some studies have presented methods for restoring the alar groove, and most of the existing methods are related to small alar defect reconstruction.[15–21] However, a few studies have mentioned alar groove recreation in subtotal or extended nasal defects after forehead flap reconstruction. Menick created the alar crease by direct incision and excised the excess soft tissue to sculpt the convexity of the normal ala inferiorly and a flat sidewall superiorly.[12,13] The inferior incision edge is secured to the deep tissue in the alar crease with a fine subcuticular suture during closure.[12,13] The elevated skin is reapproximated to the recipient bed with 5-0 polypropylene quilting sutures.[12,13] Traditionally, quilting or tacking sutures are usually necessary to conform the flaps to the base of the wound in the area of the ideal alar groove.[12,13] Nevertheless, the contracture or relapse of the soft tissue is hard to predict, and it is challenging to create the depth discrepancy of the alar crease directly. There might also be some complications related to the tacking stitches.

Based on Menick's principle,[12,13] we present a novel technique with a modified, interrupted inverted horizontal mattress suture for alar crease creation. The method is straightforward, and the discrepancy in the depth of the original alar groove, which is shallow medially and deep laterally, can be easily reconstituted. We are able to adjust the slope by modifying the placement of any of the stitches during surgery. With careful design and execution, it permits restoration of lateral alar contours. It maintains the definition of the cosmetic boundaries of the alar groove, nasofacial sulcus, and the alar facial sulcus. In addition, the scar is relatively inconspicuous because it is located precisely at the junction of the subunits. The technique yielded a superior aesthetic result, and patients were satisfied with the outcome.

One of the drawbacks of this method is that it leaves a small open wound immediately after the operation, which is left for healing by secondary intention, and it may postpone wound healing or result in crust formation, hypertrophic scars, or invisible alar grooves. In our series, all uneven wounds healed uneventfully within 2 weeks, with satisfactory scarring, even in our Asian population. Relapse is another problem that is difficult to approximate. Two postoperative fading alar groove cases occurred, requiring alar crease creation sutures to be redone. Perhaps we could

combine our suture technique with anchoring sutures in the relapsed cases in the future.

We created the alar groove based on the contralateral side for unilateral alar defects. This is more difficult for bilateral alar defects or total nose reconstruction because of the lack of a landmark reference. Traditionally, the curve was decided based on the surgeon's experience. Currently, we can use three-dimensional printing techniques to assist in designing the location of the alar crease bilaterally.[11]

Our novel alar crease creation suture is a safe, straightforward, and reliable technique to create an aesthetic alar groove in forehead flap nasal reconstruction. It can create a medially shallow and laterally deep alar crease without apparent complications.

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DISCLOSURE

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

PATIENT CONSENT

Patients provided written informed consent for the use of their images.

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