

Treatment of Alar Deformity After Cosmetic Surgery

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Background: Nasal alar deformity after cosmetic surgery, including nostril sill notching, alar flattening, and a shallow and indistinct alar-facial crease, commonly results from overresection. We developed revision methods for postoperative alar deformity, and applied them from 2016 to 2022 to the revision of 16 cases, consisting of 1 male and 15 female patients, with a median age of 28.5 years.

Methods: Auricular cartilage grafting was used as the main technique to improve alar flattening and notching without risking a poor color match as is seen in composite grafting. Notching was also improved by adding an alar lobule island flap if there was usable excess tissue on the lateral side of the ala. Two cinching sutures were used to define the alar-facial crease.

Results: Median follow-up was 9.25 months (range, 0.5–96 mo). All lobule flaps survived. Cartilage graft infection occurred in 1 case, requiring removal of the graft.

Conclusions: Alar flattening and other deformities often result from too-aggressive nasal cosmetic surgery. These can be corrected using lobule flaps and auricular cartilage grafts, which, unlike composite grafts, do not undergo degeneration with the associated risk of ischemia or discoloration. (*Plast Reconstr Surg Glob Open* 2024; 12:e6327; doi: [10.1097/GOX.00000000000006327](https://doi.org/10.1097/GOX.00000000000006327); Published online 20 November 2024.)

INTRODUCTION

The nasal interalar distance tends to be wider than the intercanthal distance in Asian noses.¹ Marked alar flare and horizontally oriented nostrils are common reasons for cosmetic surgery.^{2–5} When significant interalar distance narrowing is needed, more aggressive techniques, such as alar base excision,^{1,4–6} are often combined with alar flare reduction,^{3–5,7} which may increase the risk of overresection, with associated new deformity or loss of structural stability.^{6,8,9} This may include alar base notching,^{1,4,6,9,10} alar lobule flattening,⁴ and an indistinct alar-facial crease.⁸

Deformities after cosmetic surgery, unlike major defects such as trauma or tumor resection, do not require large tissue transplants with their associated differences in texture or color. Although not as severe as a major deformity, the patient's distress is often increased by the fact that the deformity is easily recognizable as a result of cosmetic surgery. These are difficult areas to

treat, and there are very few reports of effective techniques.¹¹ Here, we report on our alar correction revision methodology.

MATERIALS AND METHODS

This retrospective study was performed at the Primo Azabujuban Clinic in Tokyo. Between May 2016 and September 2022, we treated 16 cases of alar postoperative deformity (2 unilateral, 14 bilateral) with corrections for alar asymmetry, nostril narrowing, alar flattening, and nostril margin notching. The patients were 15 women and 1 man, with a median age of 28.5 years (range, 22–51 y). (See **table, Supplemental Digital Content 1**, which shows the demographics and characteristics of the patients. <https://links.lww.com/PRSGO/D639>.) All had undergone cosmetic alar reduction procedures.

We practiced according to the Declaration of Helsinki, and preoperative consent forms were obtained from all patients. In the 2 cases with figures in this study, consent to use images was obtained separately.

Surgical Technique

All procedures were performed under general anesthesia. We made incisions through previous scarring. After

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Received for publication May 15, 2024; accepted September 18, 2024.

Presented at the 105th Congress of Japan Society of Aesthetic Surgery and the 111th Congress of Japan Society of Aesthetic Surgery.

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DOI: [10.1097/GOX.00000000000006327](https://doi.org/10.1097/GOX.00000000000006327)

Disclosure statements are at the end of this article, following the correspondence information.

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the incision locations were marked, 1% lidocaine with 1:100,000 epinephrine was injected for anesthesia and hemostasis in the areas to be incised. Incisions were made using a no. 15 blade. Pockets for cartilage grafting were then created with scissors.

To approximate the desired morphology of the nasal ala, an auricular cartilage graft was performed at the previous scar, fixing the graft so as to improve notching and add roundness to the flat nasal ala (Fig. 1). The auricular cartilage graft was created using a piece of curved cartilage taken from the conchal cavity and transplanting it into a subcutaneous pocket created in the nasal ala. The size and position of the grafted cartilage was then fine-tuned to be appropriate in each case (mean, 10.3 mm × 6.0 mm). If the curve of the auricular cartilage did not match the curve of the ala, or if a thin piece of auricular cartilage from the conchal cymba was used, a 5-0 nylon mattress suture was used to create a curve in the graft.

When excess skin was observed on the lateral nasal ala, a crescent-shaped island flap was created along the skin of the ala in the alar-facial crease. The island flap was elevated and transposed into the notched area (Fig. 2). The flap should be wide enough to correct the nostril notching, but approximately 2–3.5 mm was the maximum width, depending on the excess alar skin. The grafted cartilage was fixed with 5-0 poly(lactic-co-ε-caprolactone) threads, and the skin flap was sutured with 7-0 nylon.

Takeaways

Question: Nasal alar deformity after cosmetic surgery, including nostril sill notching, alar flattening, and a shallow and indistinct alar-facial crease, commonly results from overresection. We developed revision methods for postoperative alar deformity.

Findings: Auricular cartilage grafting and alar lobule island flap addition were used to improve alar flattening and notching without risking a poor color match as is seen in composite grafting. All lobule flaps survived a median follow-up of 9.25 months. Cartilage graft infection occurred in 1 case.

Meaning: Postoperative alar deformities can be corrected using alar lobule island flaps and auricular cartilage grafts.

If necessary, two cinching sutures were placed with 3-0 poly(lactic-co-ε-caprolactone) (Fig. 3). (See Video 1 [online], which demonstrates the alar lobule island flap.) (See Video 2 [online], which demonstrates the cartilage graft technique.)

Four days of oral cefaclor were prescribed, and a nostril retainer was used in all patients postoperatively for 6 months.

To evaluate nostril morphology, the notching point was used as the pivot, and the angle between the top of the medial crural footplate and the point where the

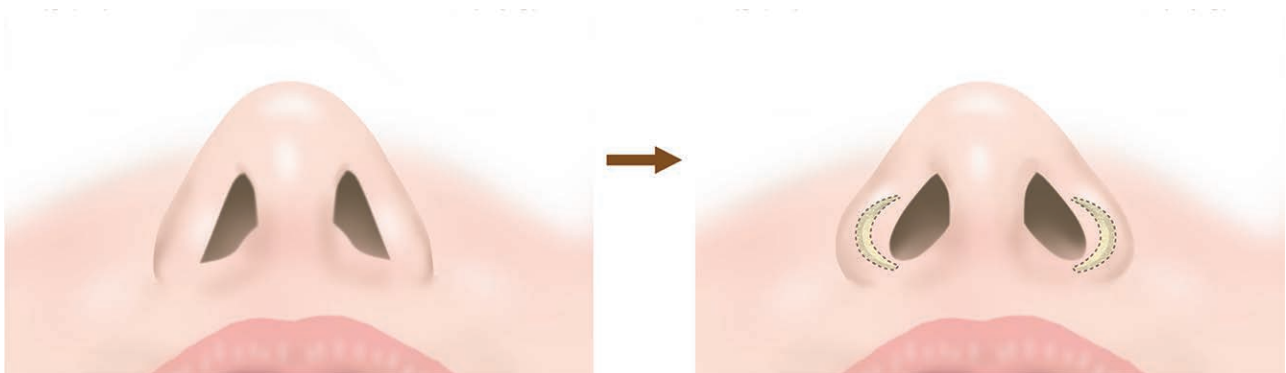


Fig. 1. Diagram of auricular cartilage grafting.

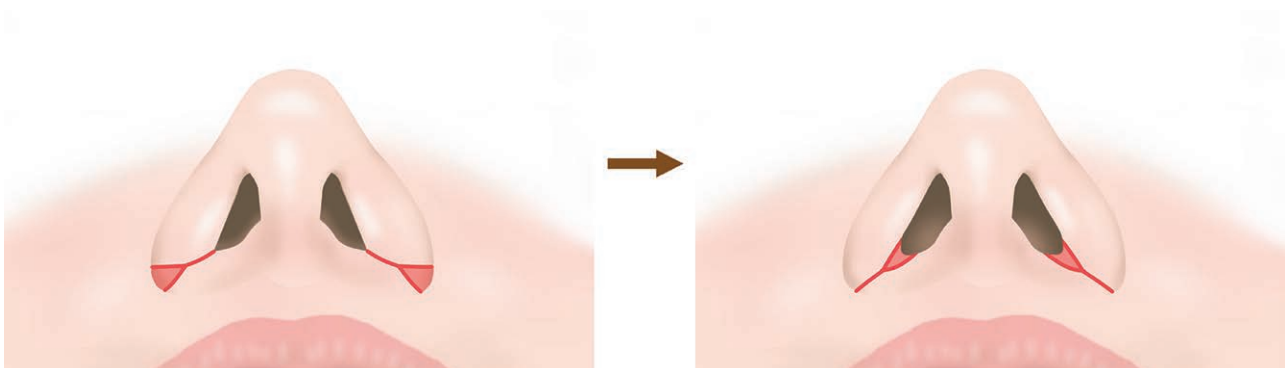


Fig. 2. Diagram of the alar lobule island flap.

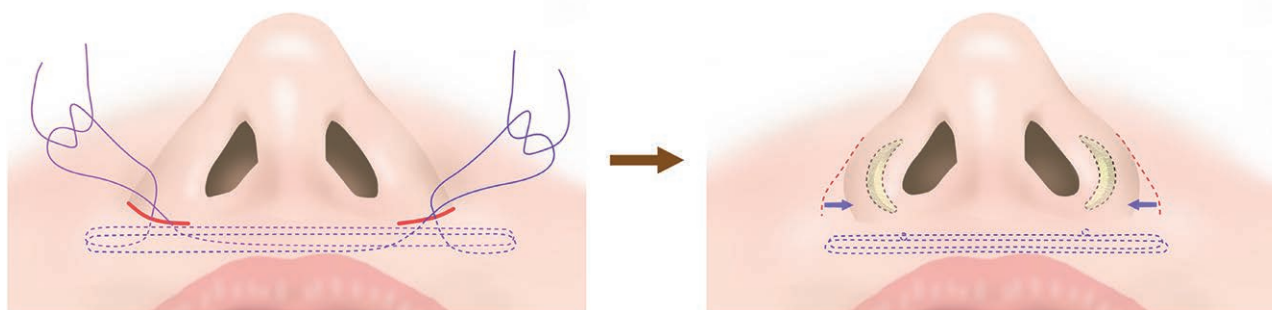


Fig. 3. Diagram of cinching sutures.

line connecting the top of the medial crural footplate intersects the lateral nostril was measured. (See **figure, Supplemental Digital Content 2**, which displays the evaluation of nostril morphology. The notching point was used as the pivot, and the angle of the top of the medial crural footplate and the point where the line connecting the top of the medial crural footplate intersects the lateral nostril was measured before and after revision surgery. <http://links.lww.com/PRSGO/D640>.) Measurements were made with a free software tool (<https://www.vector.co.jp/soft/winnt/util/se345469.html?ds>) using basal view photographs taken just before starting the revision surgery (presurgery measurement) and at the final follow-up visit after the revision surgery (postsurgery measurement).

Statistical Analysis

Differences between presurgery and postsurgery measurements were analyzed using the paired Student *t* test. This test was chosen to account for the paired nature of the data, as each subject had measurements taken both before and after the surgery. A *P* value of less than 0.05 was considered statistically significant. Statistical analysis was conducted using GraphPad Prism version 5.01.

RESULTS

Supplemental Digital Content 1 (<http://links.lww.com/PRSGO/D639>) shows the procedures and the results. All alar lobule flaps survived. Infection occurred in 1 case, requiring removal of the graft. The median follow-up was 9.25 months (range, 0.5–96 mo). The measured angles increased postoperatively in all cases, resulting in improved notching deformity of the nostril margin and improved flattening of the nasal ala.

The Student paired *t* test was conducted to compare the mean angle measurements before and after surgery for both the left and right sides. For the left side, the presurgery measurements (mean = 45.2, SD = 13.7) were significantly different from the postsurgery measurements (mean = 60.9, SD = 5.9, *t*(12) = 5.89, *P* < 0.0001). Similarly, for the right side, the presurgery measurements (mean = 51.6, SD = 27.5) were significantly different from the postsurgery measurements (mean = 66.9, SD = 26.8, *t*(12) = 6.57, *P* < 0.0001). These results indicate a

statistically significant difference in the measurements following surgery for both sides.

Case 1

A 40-year-old woman had undergone alar base reduction, but flattening of the alar lobules and indistinctness of the alar-facial creases were noted after surgery (**Figs. 4A–C**). She underwent a simple auricular cartilage grafting procedure and was left with a good result that persisted at 9.5-month follow-up (**Figs. 4D, E**).

Case 2

A 28-year-old woman had also undergone alar base reduction, but teardrop deformity of the nostrils with flattened alar lobules had resulted (**Figs. 5A–C**). Alar revision surgery was performed using alar lobule island flaps, auricular cartilage, and 2 cinching sutures, along with septal extension grafting and nasal prosthesis replacement. Postoperatively, 18-month follow-up showed improvement in nasal alar morphology. The teardrop deformity was corrected and the curves of the nasal alae were restored (**Figs. 5D, E**). The patient was satisfied with the aesthetic result.

All alar lobule flaps survived. Infection occurred in 1 auricular cartilage graft, requiring removal.

DISCUSSION

Too-aggressive alar resection can result in deformity,^{3,4} with varying degrees of nostril-alar disproportion and asymmetry.^{1,7} These include notching of the nasal sill,^{1,4,7,9,10} flattening of the alar lobule,⁴ and a shallow and indistinct alar-facial crease.⁸ A correction method using paranasal augmentation and skin-cartilage composite grafts for nostril contractures after cosmetic surgery has been used,¹¹ albeit mainly to improve airway obstruction.

Composite cartilage grafts are often used for reconstruction of the ala after tumor resection, and for treatment of defects.^{12–14} Over time, however, these grafts may shrink, and become small nodule-like plaques.^{11,15,16} Viability of a composite graft is at risk due to ischemia,¹⁷ and pigmentation irregularities may occur.¹⁵

Alar morphology is dependent on the strength and anatomical position of the lateral crus.¹⁸ The alar lobule



Fig. 4. Case 1. A 40-year-old woman with overresection during alar lobule reduction resulting in flattening of the alar lobules and indistinct alar-facial creases (arrows). She underwent a simple auricular cartilage grafting procedure. A, Prerevision basal view. B, Prerevision frontal view. C, Prerevision oblique view. D, 9.5-month postrevision basal view. E, 9.5-month postrevision frontal view. F, 9.5-month postoperative oblique view.

has no hard tissue support¹⁹; it can be reshaped by cartilage grafting.^{20–22} Alar contour grafting is useful for correcting the morphology of the upper half of the ala.^{18,19} We used cartilage grafts to restore the alar curve and reinforce the nostril margin, resulting in a smoother alar base contour.

Correction of nostril stenosis and alar base malposition with an alar base flap has been reported.²³ A method of implanting a composite graft from the alar lobule for nostril stenosis has shown good aesthetic results,²⁴ as has alar reconstruction with an inferiorly based alar groove flap to improve congenital anomalies.²⁵ Flaps are also used where the contralateral alar tissue was reconstructed as an island flap to correct a traumatic alar deformity.²⁶ Local tissue is recommended whenever possible for color and texture match.²⁶ If there is excess skin on the outer ala, an alar lobule island flap is effective in improving notching.

Our standard procedure for alar-facial crease blunting is to cut the piriform ligament and pull in the alae using cinching sutures to define the alar-facial crease. Conversely, in cases performed to widen the interalar

distance, we cut the piriform ligament and use a cartilage graft to expand the alae outward and restore the roundness of the lobules.

This series is limited by the small number of patients and short follow-up in some cases. Cosmetic surgery patients tend not to revisit their surgeon postoperatively, hindering long-term follow-up. In the case of the patient with postoperative infection, the nostrils were very small; the smallest retainer was used but was still tight and may have caused poor tissue circulation. In such cases, it may be better not to use a retainer.

We conclude that postoperative alar deformities present a challenge because of the difficulty of re-establishing a natural contour. In our patients, auricular cartilage grafting improved alar flattening and notching. An alar lobule island flap was used only when there was excess tissue on the lateral side of the ala. Where necessary, 2 cinching sutures were used to define the alar-facial crease. Most patients had satisfactory aesthetic outcomes, except for 1 case in which the grafted cartilage was infected and required removal.



Fig. 5. Case 2. A 28-year-old woman with overresection during alar base reduction resulting in teardrop deformity of the nostrils, flattening of the alar lobules. Alar revision surgery was performed using alar lobule island flaps, auricular cartilage, and two cinching sutures. A, Prerevision basal view. B, Prerevision frontal view. C, Prerevision oblique view. D, Eighteen-month postrevision basal view. E, Eighteen-month postrevision frontal view. F, Eighteen-month postrevision oblique view.

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DISCLOSURES

Dr. Ohba is the director and founder of Primo Azabujuban Clinic. Drs. Ohba and Takahashi are employees of Primo Azabujuban Clinic. Dr. Haraoka is a consulting employee of Primo Azabujuban Clinic.

ACKNOWLEDGMENT

The authors would like to thank Libby Cone, MD, MA, from Dmed (www.dmed.co.jp) for editing drafts of this article.

HELSINKI DECLARATION

This study followed the principles of the Declaration of Helsinki.

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