PRACTICE PEARLS

PHILIPPINE JOURNAL OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY VOL. 38 NO. 2 JULY – DECEMBER 2023

Use of Sail Excision in Alar Morphology Modification of Asian Noses

Joyce Anne F. Regalado-Go, MD[1]
Eduardo C. Yap, MD[2]

[1]*Meraki Esthetique Clinic*
[2]*Belo Medical Group*

Keywords: *alarplasty; alarlift; hanging ala; Asian nose; sail excision technique; nasal alar modification; globular alae; rhinoplasty*

Globular hanging nasal alae, described as convex round shaped alar lobule which may be an aesthetic nuisance in the final result of rhinoplasty, are commonly seen among Southeast Asian noses. Such alar lobule morphology is an important part of nasal aesthetics and should not be disregarded. Surgical techniques used to address a hanging ala include direct external approaches. External rim excision was proposed to address hidden columella, sigmoid alae, small nostrils, dropped rim and foreshortened nose.[1,2] Rim tissue was excised in full thickness fashion and sutured in one layer. Others proposed alar groove excision followed by alar repositioning and full-thickness skin grafting to reposition the alar base and correct hanging alae.[3] Although these approaches have been proven to correct hanging alae, they leave a visible scar and/or permanent alar rim deformity if not done cautiously, especially on thick skinned patients.[1-3] The alar rim may not be natural looking since it is lined by a scar, thus losing the lobular texture of the rim. A vestibular incision has been proposed to correct a hanging ala with unsightly scar.[4] A maximum of 3mm elliptical vestibular skin was recommended to be removed to lift the alar rim with significant results. However, this recommendation was based on estimates and surgeon's experience in western noses and may be insufficient for Asian noses. In addition, performing this technique without specific landmarks is difficult in achieving accurate results, especially when performed by a novice surgeon. Hence, further modification is important to address these concerns.

Attempting to address the hanging alae in Asian noses, the senior author (ECY) modified the vestibular incision and came up with the sail excision technique based on the patient's nasal anatomy.[5] By presenting definite landmarks, the technique resulted in an alar lift procedure with reproducible outcomes. Furthermore, after performing sail excision in several patients, the authors noted the effect of this technique on alar morphology. This procedure is done by excising a precisely marked piece of inner nasal vestibular skin that is shaped like the sail of a boat to achieve a symmetrical and predictable result. This creates a lifting effect and improves the alar columellar disproportion specially when combined with septal advancement techniques.[6,7]

Correspondence: Dr. Joyce Anne F. Regalado-Go
Meraki Esthetique Clinic
Upper Ground, Victoria One Building
Quezon Ave, Quezon City 1103
Philippines
Phone: +63 977 809 3745
Email: jafregalado@gmail.com

The authors declared that this represents original material, that the manuscript has been read and approved by the authors, that the requirements for authorship have been met by the authors, and that the authors believe that the manuscript represents honest work.

Disclosures: The authors signed a disclosure that there are no financial or other (including personal) relationships, intellectual passion, political or religious beliefs, and institutional affiliations that might lead to a conflict of interest.

Presented on 11th International Conference of Pan Asia Academy of Facial Plastic Surgery
Carlton Hotel, Singapore, February 22, 2023.

Philipp J Otolaryngol Head Neck Surg 2023; 38 (2): 52-58

PHILIPPINE JOURNAL OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY VOL. 38 NO. 2 JULY – DECEMBER 2023

Furthermore, limiting the excision along the inner vestibular area and rolling the alar rim skin inwards results in correction of hanging ala (with a hidden scar) without an obvious, external scar. After performing the technique on several patients, we observed that in addition to its effect on lifting a hanging ala, the sail excision technique also changes the alar morphology from a globular-shaped lobule to a more aesthetically pleasing ridge-shaped lobule. To the best of our knowledge, such an effect of sail excision on alar morphology has not been described in the literature.

This article aims to demonstrate the effect of the sail excision technique on alar rim morphology of Asian noses by describing the step-by-step procedure, surgical landmarks, and pearls in performing this technique.

METHODS

Photographic archives of patients who underwent rhinoplasty with sail excision technique in our private practice were reviewed. Those who had globular hanging nasal alae were considered for inclusion. Those with incomplete photographic documentation were excluded. Pre- and postoperative photographs were assessed for the changes in alar morphology using different views to demonstrate the effect of the technique. Photo documentation captured were frontal, oblique, profile, and basal view using Olympus OMD Micro four thirds 45mm fix lens with F6. 3, A 60, ISO 320. Changes in the nasal alar vertical height, orientation and thickness of the alar rim, and shape of the alar lobule, were observed and reported. Representative photographs with patient's consent were selected for this report.

Surgical Technique

The design of sail excision is essentially removal of an asymmetrical, crescent-shaped skin with subcutaneous tissue and muscle resulting in an elliptical defect, which is closed by medial inward flap rotation of the alar rim skin to the vestibular skin. The procedures were performed during the first part of the rhinoplasty to allow unrestricted manipulation. Patients were placed in supine position, sterile drapes were applied, and intravenous anesthesia sedation was administered. Surgical markings were made using a surgical pen. *(Figure 1)* It is important to keep in mind that the markings of the sail excision are composed of 3 corners and 3 borders (*Figure 2)* as follows:

The ***caudal corner*** lies at the junction of the alar rim and nasal sill. It is identified by performing Yap's maneuver *(Figure 3)* wherein the nasal tip is pushed towards the base of the nose creating a notch at the alar-sill border. This should be designed as a curve during incision to simulate an ellipse. This manner of incision and closure will result in better healing.

The ***apex*** corresponds to the peak of the gull's wing in flight and can be identified by performing the "Matias' maneuver" *(Figure 4)*, pinching the nasal tip and alae together laterally away from the midline to create a notch or fold. The apex signifies the point where the hanging alae begins and is important to identify correctly to ensure continuation of the alar rim from the soft tissue triangle.

The ***cephalic corner*** is determined by identifying the end of the groove in the vestibular mucosa. This signifies the junction of the vestibular groove and the nasal floor.

The ***anterior border*** is marked by connecting the lateral corner with the apex following the alar rim lateral to the skin mound of the alar rim.

The ***inferior border*** corresponds to the base of the sail and is marked by connecting the caudal corner to the lateral corner. This border should be at least 1-2mm superior to the nasal floor.

Finally, the ***posterior border*** corresponds to a depression in nasal vestibule called "Yap's groove" that is parallel to the caudal margin of the lower lateral cartilage (LLC) and is the convergence of 2 nasalis muscles of different direction. This groove is a constant landmark to follow when performing this technique. It can be easily located as a depression or groove delineated by the junction of thicker vibrissae from thin vibrissae. Transillumination can be used to confirm the location of the vestibular skin that needs to be removed. *(Figure 5)* This translucency is due to the absence of cartilage and lesser fibrofatty tissue in the subcutaneous substance of the ala.

The inner nasal alar vestibule was visualized by holding the tip of the nose with the thumb and placing the 2nd and 3rd finger on the alar sidewalls and gently pinching it sideways. Markings were placed at the nasal alar skin mound (caudal) and vestibular groove (cephalic), and the inferior border connecting the two, just lateral to the nasal sill. After precise marking, infiltration of the nasal alae was applied along the alar rim to prevent poor visualization caused by blood from the needle puncture if done on the inner vestibular alar skin.

The technique began by performing Matias' maneuver *(Figure 4)* to visualize the area to be incised. The incision started from the posterior corner towards the lateral corner. Once the anterior corner was reached, a curved transition was done towards the lateral border following the markings towards the apex. A separate incision was made from the posterior corner towards the apex. Once the incision was complete, the inner tissue was removed *(Figure 6)* by grasping the medial edge of the sail using Brown Adson tissue forceps, pulling the skin edge outwards to create a countertraction while incising the skin to the desired depth with a Blade 15 until the inner skin was removed. The depth of the excision had to be decided preoperatively based on the thickness of the alar rims. Full layer skin removal, including skin, fat, and muscles, was performed in patients with thick alar rims, whereas only skin was

removed in those who had a thinner alar rim. Both sail excision defects had to be checked for symmetry in both depth and shape. A tru-cut forceps was used to remove remaining tissue to improve symmetry. The alar skin was rolled into the defect and sutured together using Vicryl 6-0 continuous or simple interrupted stiches. Meticulous suturing of the incisions was important to prevent alar notching and trapdoor deformity.

RESULTS

Out of 544 photographs of patients who underwent sail excision from January 2021 to February 2023 that were screened, a total of 474 photographs of patients who met inclusion and exclusion criteria were included in this analysis. There were 69 males and 402 females. Their ages ranged from 18 to 56 years old (median 37 years old). All of them had globular hanging nasal alae.

We had four major observations in all these patients: 1. Reduction in the vertical height of the nasal alae was observed. *(Figure 7)* Although the greatest area of reduction was seen at the level of the nasal floor where the widest vestibular skin was excised, lifting was not limited on the hanging alae but observed throughout the whole nasal alae. 2. The orientation of the alar rim changed from a convex edge to a concave ala rim *(Figure 8)* resulting in improvement of the alar-columellar relationship as well as creation of a continuous alar ridge from the nasal alae to the nasal tip. 3. Furthermore, the roundness of the globular alae decreased, transforming them to a well-defined ridge *(Figure 9)* which helped in the correction of alar flare. 4. The thickness of the alar rim was also decreased, lifting the alar rim base. *(Figure 10)*

DISCUSSION

After studying postoperative photographs of patients who underwent rhinoplasty with sail excision technique, we observed that sail excision does not only address hanging alae but can also change alar lobule morphology. Reduction of nasal alar vertical height, reorientation of the alar rim, change in alar rim thickness and change in overall lobule shape was evident immediately postoperatively. The morphology changed from a globular hanging ala into a thin alar ridge which is aesthetically pleasing.

Alar vertical height is defined using the most superior part of the alar groove and alar base as a reference point on lateral and frontal views.[8] After performing the sail excision technique, reduction of the alar vertical height decreased, creating the desired lifting effect to correct hanging alae. Furthermore, the sail excision technique improves alar-columellar relationship and re-creates the "gullwing in flight" appearance when performed with techniques to correct

Figure 1. Sail excision markings start by identifying the lateral corner at the nasal sill border **(A),** apex **(B, C)** and medial border at the junction of the Yap's groove and nasal floor **(D).** Markings are continued by connecting the corners to create the posterior **(E)**, inferior **(F)** and anterior border **(G)** to complete the sail excision markings **(H)**

PHILIPPINE JOURNAL OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY VOL. 38 NO. 2 JULY – DECEMBER 2023

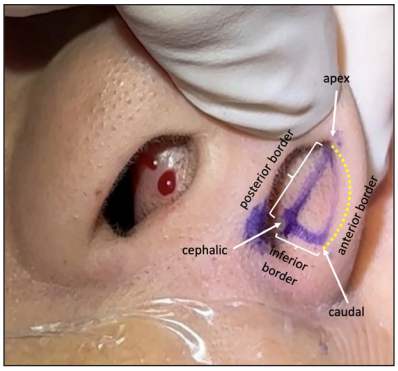

Figure 2. Complete marking of the sail excision technique. Extension of the excision beyond the alar rims (dotted curved markings) are sometimes performed for patients with severely hanging alae

Figure 3. Yap's Maneuver is done by pushing the nasal alae towards the base of the nose creating a notch at the alar-sill border

Figure 4. Matias' Maneuver is done by pinching the nasal tip and alae together laterally away from the midline creating a notch or fold at the apex

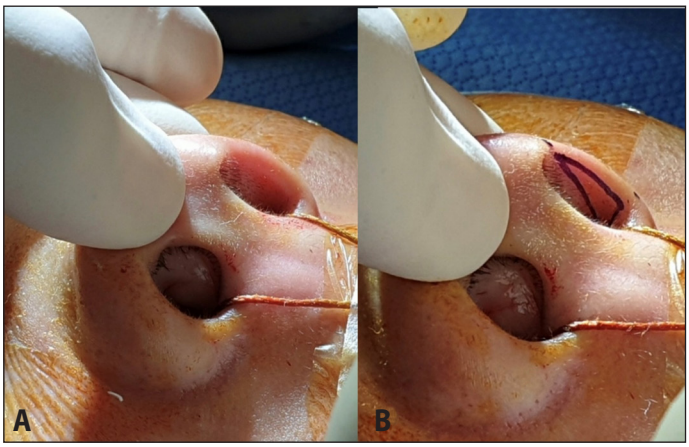

Figure 5. Transillumination used to confirm the location of vestibular excision markings. **(A)** Prior to marking, **(B)** Illumination after marking

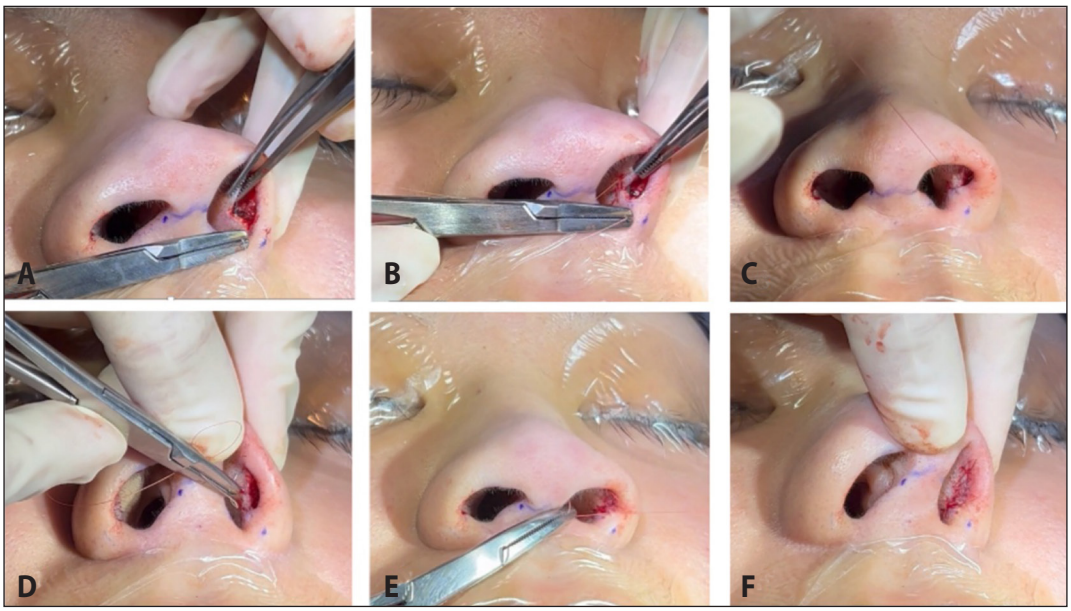

Figure 6. Suturing technique. Closing using Vicryl 6-0 continuous suturing from both ends starting from the medial corner **(A, B)** and apex **(D)** meeting at the midline **(C, E)** and sutured together at the mid-alar rim **(F)**

PHILIPPINE JOURNAL OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY VOL. 38 NO. 2 JULY – DECEMBER 2023

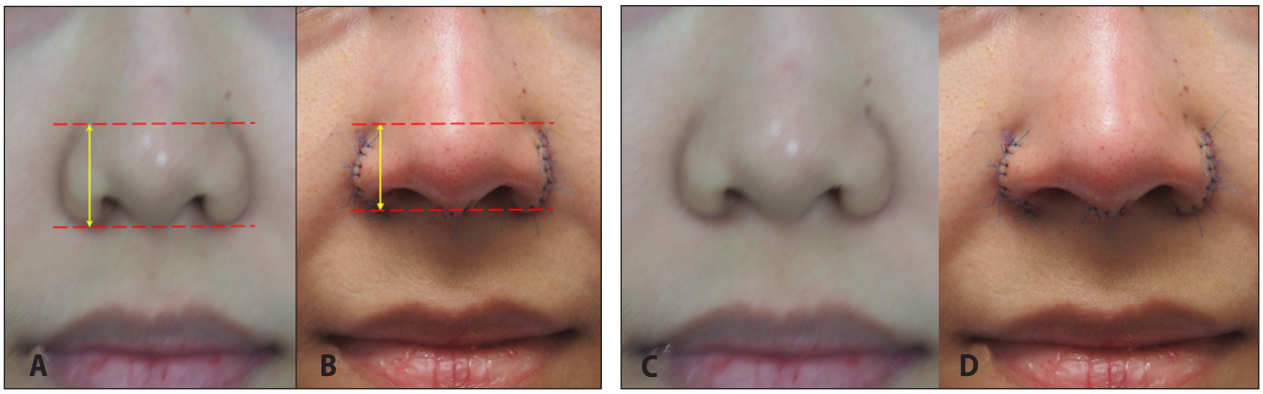

Figure 7. Preoperative **(A, C)** and postoperative **(B, D)** image in frontal view showed decrease in alar rim vertical height which is defined by the most superior part of the alar groove and alar base marked by the parallel broken lines. The decrease in alar rim vertical height is indicated by the decrease in length of the double arrow headed line

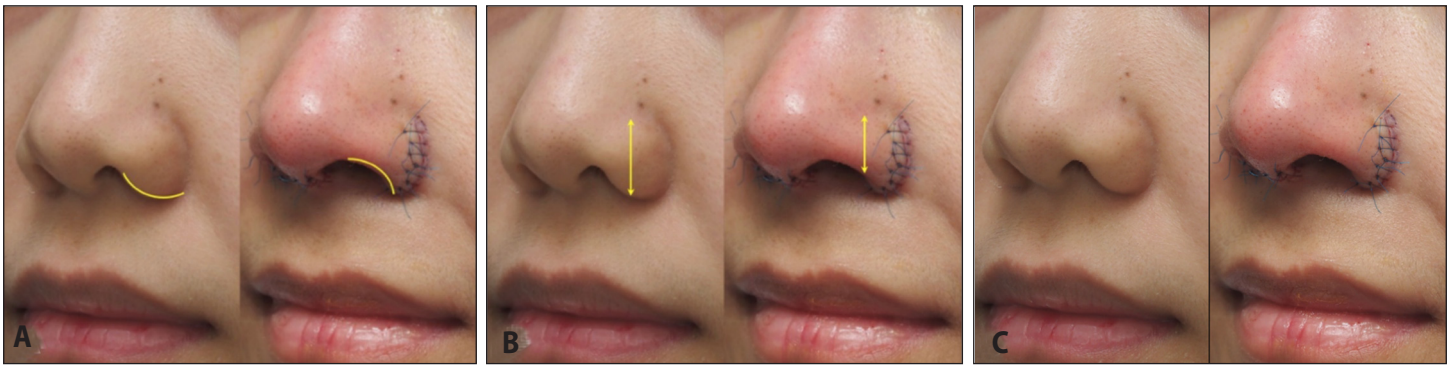

Figure 8. Pre- and postoperative image in oblique view showed decrease in alar rim orientation from hanging to curvilinear seen as reversal in the curvature of the curvilinear line **(A, C)** and change in alar vertical height indicated by the decrease in length of the double arrow headed line. **(B, C)**

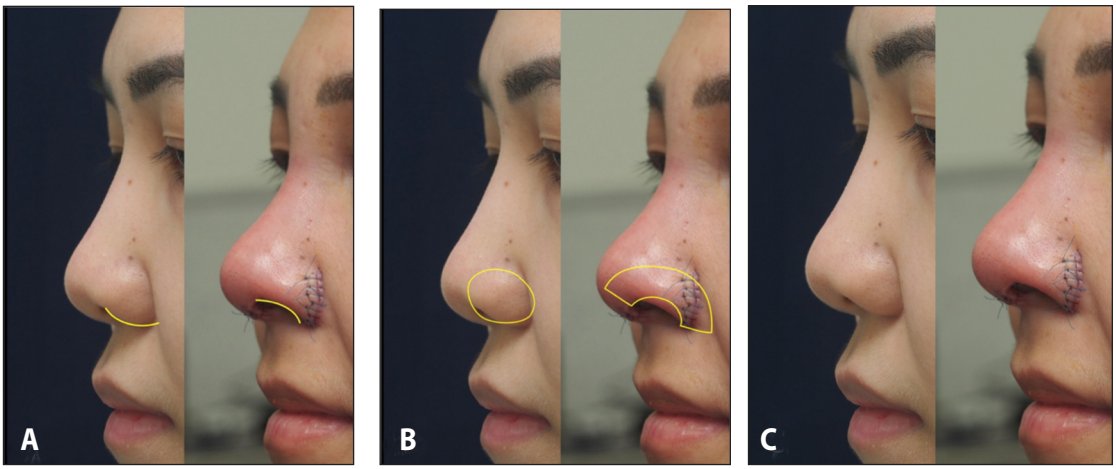

Figure 9. Pre- and postoperative images profile view change in the orientation of the alar rim seen as reversal in the curvature of the curvilinear line **(A, C)** and change in the overall shape of the alar lobule from globular to curvilinear depicted by the shift from oval shape to arc. **(B, C)**

columellar deficiency. The degree of alar vertical height reduction depends on the size of the vestibular incision. It was observed that the estimated size of vertical reduction is equivalent to one half of the maximum vertical length of the excised tissue. *(Figure 11)* Extension of the excision beyond the alar rims are sometimes performed for patients with severely hanging alae. *(Figure 2)*

On lateral view, the alar rim should arch from the soft tissue triangle towards the alar base uninterrupted and should be 2-3mm above the columella. This concave alar rim orientation is commonly seen among western noses. On the other hand, Asians commonly have a

PHILIPPINE JOURNAL OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY VOL. 38 NO. 2 JULY – DECEMBER 2023

Figure 10. Preoperative **(A, C)** and postoperative **(B, C)** image in basal view showing decrease in alar rim thickness (highlighted by the dotted parallel vertical lines) after sail excision depicted by the decrease in length of the double arrow headed line

Figure 11. Maximum vertical effective length of lift by the sail excision defect depicted by the double arrow headed line. The effective length of alar lift is equivalent to one half of the maximum vertical length of the excised tissue

characteristic convex alar rim orientation. It curves downwards towards the alar base either completely or partially, creating a sigmoid ala, and is unappealing, hence, improvement of this feature is important for superior nasal aesthetics. The sail excision technique results in reorientation of a hanging convex alar rim. Following the landmarks, the apex of the vestibular excision corresponds to the beginning of the hanging alae, directly addressing the convexity. After removal of the vestibular skin, the alar rim edge is rolled inwards and reorients due to the elliptical shape of the excision. This changes the alar rim orientation from convex to concave with continuous arching that is more aesthetically appealing.

The sail excision technique can modify alar rim thickness by varying the depth of vestibular excision depending on the patient's alar skin characteristics. Skin, muscle, and subcutaneous tissue are excised in patients with thick alar skin while subcutaneous tissue is spared in patients with thin alar rim. Lateral alar wall collapse is one concern when performing sail excision specially in patients with thin alar rim. This can be observed as alar lobule convexity visible on base view. However, with predicted fibrosis that will occur within the area of the excision, it is assumed that alar stability will be maintained if not improved, after performing the technique. Moreover, in patients with preoperative alar collapse, the vestibular excision can be a space where alar rim graft can be placed, if needed.

Despite the advantages mentioned, the sail excision technique can have an unfavorable outcome if done haphazardly. Although rare, alar asymmetry, keloid formation, nasal stenosis has been described following this technique.[5] Alar lift asymmetry may be caused by incorrect marking and or excision; hence, the advised landmarks must be followed, and symmetry must be ensured prior to excision. Furthermore, meticulous skin closure must be observed to prevent nasal stenosis and keloid formation specially observed among thick skinned patients. Nasal stenting can be used to stop the progression of nasal stenosis, but scar revision is sometimes done in recalcitrant stenosis.[9,10] Accidental full-thickness skin penetration can result in skin retraction and unappealing scar and must be avoided.

In the cases where alar groove incisions were made, it may not be convincing that the difference noticed is a result of the alar resection at the groove, which has classically been described to address alar flaring, or due to the sail incision. However, in doing the sail excision technique, we used the alar groove which we call the "Yap's groove" as a landmark to perform the procedure. It is the posterior border of the sail incision marking that is required to perform the procedure and is not optional. Hence, we believe that the results that we describe in our paper with representative figures are the result of sail excision using that specific groove.

Our present findings are limited by their being solely based on observation and analysis of photographs. It is important to note that these are photographs of the sail excision technique performed together with other rhinoplasty and alar base procedures, and results are based on a combination of these procedures and not on the sail excision technique alone. The aesthetic improvements are based on observations seen by the authors following the standards of a good-looking alar columellar relationship mentioned by Gunter *et al*.[4] Based on the author's observations, significant improvements were observed using this technique, and verbal satisfaction of patients was reported. We noted that when using the sail excision technique, the whole bulky globular ala is transformed into a ridge shaped ala whereas the nasal alar vertical height, which is the distance from the alar rim to the alar furrow, is decreased. Moreover, besides its known lifting effect of the alar rim, the alar rim base was observed to be higher than the columellar base.

Because the results we presented are our subjective descriptions of perceived changes in alar morphology and are not based on objective anatomical parameters, we list this as a limitation of our report. Further studies analyzing the sail excision technique using such clinical parameters is recommended.

Modification of nasal alar morphology is important to achieve superior nasal aesthetics and should not be disregarded. Our experience convinces us that the sail excision technique is effective in modifying alar morphology and that it should be a part of the armamentarium of a rhinoplasty surgeon specifically when managing Asian patients with globular hanging alae. The procedure should be performed first to allow precise marking, proper excision, and meticulous suturing to obtain the best results and minimize complications.

REFERENCES

1. Ellenbogen R, Bazell G. Nostrilplasty: Raising, Lowering, Widening, and Symmetry Correction of the Alar Rim. *Aesth Surg J.* 2022 May 1;22(3):227–237. DOI: https://doi.org/10.1067/maj.2002.124714; PubMed PMID: 19331975.
2. Matarasso A. Alar rim excision: a method of thinning bulky nostrils. *Plast Reconstr Surg.* 1996 Apr;97(4):828-34; DOI: 10.1097/00006534-199604000-00023; PubMed PMID: 8628780.
3. Gan KL, Jung DH. The arrow tip technique for bilateral hanging ala: a 3-year review. *Eur J Plast Surg.* 2020 Apr;43:831-836. DOI: https://doi.org/10.1007/s00238-020-01656-6.
4. Gunter JP, Rohrich RJ, Friedman RM. Classification and correction of alar-columellar discrepancies in rhinoplasty. *Plast Reconstr Surg.* 1996 Mar;97(3):643-8. DOI: 10.1097/00006534-199603000-00026; PubMed PMID: 8596800.
5. Baladiang DEA, Olveda MB, Yap EC. The "Sail" Excision Technique: A Modified Alar Lift Procedure for Southeast Asian Noses. *Philipp J Otolaryngol Head Neck Surg.* 2010 Jun;25(1):31-7. DOI: https://doi.org/10.32412/pjohns.v25i1.659.
6. Hussein W, El-Badan H, Shewel Y, Bazak R. Alar lift: Sail excision technique for alar overhanging in the Middle Eastern Nose. *Egypt J Ear Nose Throat Allied Sci.* 2015 Mar;16(1):13-17. DOI:10.1016/j.ejenta.2014.09.001.
7. Hudise JY, Aldhabaan SA, Alwadani MM, Alqabbani AA, Bafaqeeh SA. Sail excision technique for overhanging thick ala in Saudi Arabia. *Saudi Med J.* 2020 Jun;41(6):635-639. DOI: 10.15537/smj.2020.6.25117; PubMed PMID: 32518931; PubMed Central PMCID: PMC7502936.
8. Gan KL, Jung DH. The arrow tip technique for bilateral hanging ala: a 3-year review. *Eur J Plast Surg.* 2020 Jan;43:831-836. DOI: https://doi.org/10.1007/s00238-020-01656-6.
9. van Schijndel O, van Heerbeek N, Ingels KJAO. Current treatment of nasal vestibular stenosis with CO2-laser surgery; Internatio, prolonged vestibular stenting versus intraoperative mitomycin application. A case series of 3 patients. *Int J Pediatr Otorhinolaryngol.* 2014 Dec;78(12):2308-11. DOI: 10.1016/j.ijporl.2014.09.012; PubMed PMID: 25282303.
10. Menger DJ, Lohuis PJFM, Kerssemakers S, Nolst Trenité GJ. Postoperative Management of Nasal Vestibular Stenosis. *Arch Fac Plast Surg.* Nov 2005;7(6):381-386. DOI: DOI: 10.1001/archfaci.7.6.381; PubMed PMID: 16301457.