

Effect of alar rim graft on external nasal valve collapse and alar contour

Original Article

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ABSTRACT

Background: Alar rim collapse is an agonizing problem that has both cosmetic and functional sequelae. It has been usually addressed with batten grafts. In this study, we are describing a simple technique for insertion of alar rim grafts to fix external nasal valve collapse.

Patients and Methods: Between January 2018 and October 2020, eighteen patients with alar rim collapse or deformities were addressed using alar rim septal cartilage grafting.

Results: All patients who underwent alar rim grafting for external nasal valve collapse were evaluated functionally and aesthetically with post-operative follow up ranging from 12 to 24 month. During which, they showed marked improvement in their nasal airway patency with complete satisfaction for the aesthetic outcome. No complications were encountered.

Conclusion: Alar rim grafting is a simple and effective approach to provide support for the external nasal valve and alar contour. In cases of malpositioned lower lateral cartilage, alar flaring, nasal tip deformities, mild retraction, or contour asymmetries, these cartilage grafts showed good outcomes in primary or revision cases.

Key Words: Alar rim collapse, alar rim grafts, external nasal valve, lower lateral cartilage.

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INTRODUCTION

The nasal cavity has a rigid bony framework except for its most anterior part at the nasal alar rim and valve area. The nasal valve is formed by the caudal aspect of both the upper lateral cartilages, with connections to the septum and piriform aperture, and the lower lateral cartilages, with attachment to the upper lateral cartilage by the scroll. The nasal alar support is composed of the lateral crura of the lower lateral cartilages with medial crura extension, ligamentous connections to the nasal septum, and the attachment to the upper lateral cartilages^[1].

Nasal airway obstruction is a multifactorial common problem. It may result from medial displacement of the lateral wall of the weak anterior part of the nose during moderate to deep inspiration through the nose. This paradoxical movement mostly occurs at the level of the alar rim or external nasal valve area causing what is called alar rim or external nasal valve collapse^[2]. This may occur as a result of congenital weakness or malpositioning of the lower lateral cartilage, aggressive cephalic trimming of lower lateral cartilage during rhinoplasty or post traumatic^[3].

Correction of alar rim collapse is generally managed by the placement of an alar rim graft, as described by Troell *et al* 1 in 2000. Alar rim graft also allows for elongation

of the short nostril, correction of alar concavity, widening of the nostril, and slight caudal transposition of the alar rim^[4].

Here, we report a simple procedure that is both effective and safe for correction of alar rim collapse using alar rim septal cartilage grafting.

PATIENTS AND METHODS

The study utilized a retrospective cohort design, which was approved by the Ethics Committee, College of Medicine, Misr University for science and technology, Egypt. Confidentiality of the patients' data was warranted. Each patient signed a preoperative consent including approval of using their clinical photos for scientific publication.

This study was conducted between January 2018 and October 2020 in the departments of Otolaryngology and plastic surgery of Misr University for Science and Technology and Zayed specialized hospital. Eighteen patients presenting with alar rim/external nasal valve collapse as the primary cause of nasal airway obstruction were included in this study.

Full clinical assessment of the nasal function and appearance was performed through external examination of the nose, Cottle maneuver, manual dilation of the alar

rim with cotton tipped applicators, and nasal endoscopy with and without topical decongestion.

Patients were asked to rate their nasal airway patency preoperatively through a scale of 1-5 with 1 being poor nasal patency and complete nasal obstruction and 5 being complete patency with no obstruction. Preoperative photographic documentation was done for all patients during both quiet breathing and at maximum nasal inspiration.

Graft insertion was done either through an open or closed rhinoplasty technique according to the case. If the graft is being inserted during a closed technique, we start with infiltration of 1: 100,000 adrenaline/ 2% Lidocaine along the alar margin which helped with dissection, then making marginal infracartilagenous incision over alar margin that was exposed using a wide ala retractor. The incision begins anteriorly at the cartilaginous border and follows the cartilaginous border until the border starts to move away from the rim. At this point we stop the incision leaving an intact area of approximately 6 mm between the cartilaginous border and the nostril rim. Rim eversion was done and dissecting a precise tunnel along alar margin starting from marginal incision to alar base with meticulous care to avoid any damage to alar skin.

Small tapered pieces of rigid cartilage (8-10 mm long, 2-3 mm wide) are placed subcutaneously along alar rim. The graft was harvested from septal cartilage. Septal cartilage should be thinned to fit ideal thickness of 0.5mm to avoid visibility, bulk, and irregularities. Insertion of alar rim graft was made medially from infracartilagenous marginal incision. The subcutaneous pocket is made 2-3 mm back and paralleling the alar rim. The graft is slipped into the pocket and there is usually immediate improvement in the shape and strength of the alar rim (Figure 1). The cephalic end of the graft towards the tip is always checked to avoid future bossa formation or distortion of soft tissue facet. The infracartilagenous incision is closed in a standard fashion.

In open rhinoplasty cases, the alar graft was put in a pocket that was created caudal to lateral end of the infracartilagenous limb of the inverted V incision descending down to the alar sill and was secured with vicryl rapide suture to the vestibular skin.

Patients were followed up postoperatively every 6 months for a period ranging from 12 to 24 months. During follow up visits, functional and aesthetic outcome was evaluated (Figures 2,3). Patients were asked to re-rate their nasal airway patency postoperatively using the same scale and results were compared with the preoperative numbers. Aesthetic outcome was evaluated using a visual analog scale by both patients and surgeon.

RESULTS

The study included 7 male and 11 female patients aged between 19 and 56 years with a mean age of 36.6 years. External nasal valve collapse was due to iatrogenic cause in 7 patients, traumatic cause in 2 patients and congenital

cause in 9 patients. It was the first rhinoplasty for 10 patients and a secondary rhinoplasty for 8 patients. Closed rhinoplasty approach was adopted in 16 patients while the remaining 2 cases underwent an open rhinoplasty because they had bilateral asymmetry of the lower lateral cartilage.

Regarding the functional outcome, improvement of nasal patency according to subjective scale assessment was excellent in 17 patients and good in 1 patient. The aesthetic result was assessed by the surgeon as excellent in 15 patients and good in 3 patients for each score given by the surgeon the patient's assessment was the same or even better. No complications were encountered during the study, there were no infections, irregularities, graft resorption, or migration in any patient.



Fig. 1: Alar Rim graft insertion via an infracartilagenous incision.

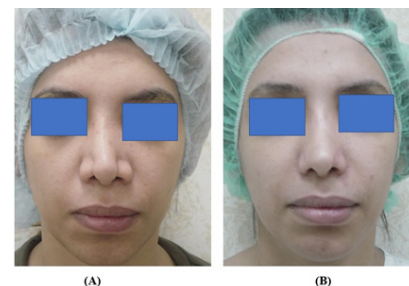


Fig. 2: Frontal view of 30 Y/O lady with alar collapse. A: Before alar rim graft, B: 3 months after insertion of alar rim graft.

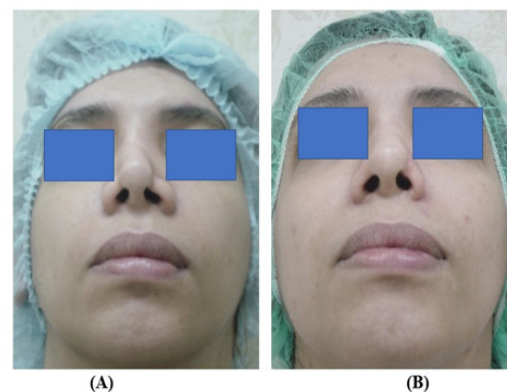


Fig. 3: Basal view of the same patient. A: Before, B: after left alar rim grafting

DISCUSSION

Ideally, the alar rim has a smooth contour with an arch that has its vertical peak halfway between tip and columellar lobular angle, not more than 2mm above the long axis of nostril^[5]. Alar deformities like asymmetry, collapse, flaring, retraction, notching and malpositioning of lateral cartilage upwards or downwards can occur as result of congenital hypoplasia of lower lateral cartilage or iatrogenic weakness following previous trauma or surgery^[6]. Alar rim grafts have been used in treatment of alar deformities^[5,7]. The alar batten grafts was first described primarily for correction of nasal valve dysfunction in 1997^[8]. Troell *et al.* first described and recommended the use of alar rim grafts in 2000^[1].

The use of alar rim grafts has gained an increasing popularity over the years. Alar rim grafts are now frequently used to correct iatrogenic concavity caused by several maneuvers including placement of transdomal sutures, spanning suture of lateral crura, and cephalic trimming of the lower lateral cartilage. Also, Some patients may have preexisting alar concavity or tendency for it especially in middle eastern noses with thick skin and weak cartilage whereby use of any of the techniques that may weaken the lower lateral cartilage will produce more concavity and retraction of the ala with subsequent collapse of the external valve 4

Several techniques have been proposed for placement of alar rim grafts, most of them is done through creation of a tunnel along vestibular skin. grafts can be harvested as a piece of septal or auricular cartilage that is inserted in a pocket along alar margin to reinforce the ala to provide support for the external nasal valve and increase alar harmony^[9].

CONCLUSION

Alar rim grafting is a simple and effective approach to provide support for the external nasal valve and alar contour. In cases of malpositioned LLC, alar flaring, nasal tip deformities, mild retraction, or contour asymmetries,

these cartilage grafts showed good outcomes in primary or revision cases.

CONFLICT OF INTERESTS

There are no Conflicts of Interest.

REFERENCES

1. Troell RJ, Powell NB, Riley RW, Li KK. Evaluation of a new procedure for nasal alar rim and valve collapse: nasal alar rim reconstruction. *Otolaryngol Head Neck Surg.* 2000;122(2):204-11.
2. Kalan A, Kenyon GS, Seemungal TA. Treatment of external nasal valve (alar rim) collapse with an alar strut. *J Laryngol Otol.* 2001;115(10):788-91.
3. Jang YJ, Kim SM, Lew DH, Song SY. Simple correction of alar retraction by conchal cartilage extension grafts. *Arch Plast Surg.* 2016;43(6):564-9.
4. Guyuron B, Bigdeli Y, Sajjadian A. Dynamics of the alar rim graft. *Plast Reconstr Surg.* 2015;135(4):981-6
5. Unger JG, Rooštaeian J, Small KH, Pezeshk RA, Lee MR, Harris R, *et al.* Alar contour grafts in rhinoplasty: A safe and reproducible way to refine alar contour aesthetics. *Plast Reconstr Surg.* 2016;137(1):52-61.
6. Ellenbogen R, Bazell G. Nostrilplasty: Raising, lowering, widening, and symmetry correction of the alar rim. *Aesthet Surg J.* 2002;22(3):227-37.
7. Orticochea M. A new method for total reconstruction of the nose: The ears as donor areas. *Clin Plast Surg.* 1981;8(3):481-505
8. Toriumi DM, Josen J, Weinberger M, Tardy ME Jr. Use of alar batten grafts for correction of nasal valve collapse. *ArchOtolaryngol Head Neck Surg.* 1997;123:802–808.
9. Fallahi HR, Keyhan SO, Fattahi T, Zandian D: Transcutaneous alar rim graft: an effective technique to manage alar deformity *J Oral Maxillofac Surg.* 2020 May;78(5):821.e1-821.e8.