Can We Add Auricular Composite Graft to Our Rhinoplasty Armamentarium?

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ABSTRACT

BACKGROUND

The ala of the nose, with its particular texture and characteristics, poses both aesthetically and functionally intriguing challenges and is rather problematic regarding choices for reconstructive methods. Both flaps and grafts have been used to restore natural structure of nasal ala. The present study summarizes a ten-year experience of reconstructive surgery using small composite grafts from non-cartilage bearing tissues, and large composite grafts, containing cartilaginous tissue, with a mean follow-up of 4 years and 8 months.

METHODS

Cumulatively 56 patients were reported. Some of them required surgery due to previous cosmetic rhinoplasty. In 47 of the cases, a small graft from the non-cartilage bearing junction of ear lobule to helical rim sufficed. Nine patients had rather large defects for which grafts were harvested from the helical root. Donor sites were primarily closed and grafts were implanted in place in a single, rapid session.

RESULTS

All small grafts had excellent take. Of 9 large grafts, 5 had excellent take, three had acceptable, and one, in a male smoker, failed to take. During follow-up, no gross deformity or poor scar was detected in either donor or recipient site.

CONCLUSIONS

We have demonstrated that using both large and small auricular composite grafts has favorable long term results for reconstruction of alar rim deformities. However, use of small grafts seems more beneficial and applicability of large grafts requires further studies.

KEYWORDS

Auricular composite; Graft; Armamentarium; Alar rim; Reconstruction; Rhinoplasty

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INTRODUCTION

Aesthetic rhinoplasty is considered as one of the most common surgeries in Iran. Cosmetic nose surgery or nasal beautification
is still the most common surgical operation of
the authors. Secondary rhinoplasty comprises
about 40% of these operations. Many of these
secondary cases were shown to have radical
alar base resection which may compromise
external nasal valve function.1

The alar rims are fragile and complex struc-
tures. Their unique size, height, thickness and
symmetry form the natural nasal appearance
and function. The specialized skin which sup-
ports and supplies these complex structures
provides competence of the external nasal
valves and patency of the inlets to the nasal
airways.1,3 The most common causes of alar
rim distortion include trauma, congenital mal-
formations, anatomical variations such as alar
cartilage malposition,4 surgical interventions
and cosmetic rhinoplasty. All these factors
might alter the symmetry and contour of alar
rims and prevent their ability to perform their
role as external valve stabilizers.4 Skin re-
placement5 and cartilage or bone grafts6-9 have
been used successfully for reconstructive op-
erations in many instances. However, as the
alar rims provide both skin cover and external
valvular support, preservation of both func-
tions is required. Therefore, autologous grafts
that simultaneously replace both the cutaneous
and cartilage deficiencies are often required for
replacing the alar rim. Composite
skin/cartilage grafts and skin/dense subcutane-
ous tissue/skin grafts harvested from the ear
provide an ideal material for such reconstruc-
tive surgeries. Patients with abnormality of alar
rims or excessive alar base resection are chal-
lenging cases to reconstruct.

We present a decade-long experience with
composite grafts, consisting of skin/ dense
subcutaneous tissue/ skin from non-cartilage
bearing pinea between the helical rim and lob-
ule of the auricle, to restore the normal appear-
ance and function of the alar rim.

MATERIALS AND METHODS

This prospective case-series study was perti-
nent to 56 patients with alar rim malformation,
who presented between 2001 and 2011. The
major causes of alar rim malformation in the
study population were iatrogenic causes and
trauma, that is, small and stenotic nostrils due
to extensive alar base resection during previ-
ous rhinoplasty. Mean length of follow-up was
4 years and 8 months, with a maximum of ten
years in some cases. All reconstructive proce-
dures were performed using open approach. In
47 patients who had undergone previous rhino-
plasty and needed small grafts, a wedge shape
composite graft was harvested from the junction
of the ear lobe to helix, as shown in Figure 1.
The graft was used in conjunction with second-
dary rhinoplasty techniques for reconstruction
of the whole nasal deformity.

As demonstrated, the site of previous inci-
sion in alar base was incised with a Number 15
blade to the required extent (Figure 1-a). The
donor site was primarily closed. The graft was
placed in position and sutured to the recipient
site (Figure 1-e) In order to achieve both aes-
thetic and functional improvement of alar
structure and shape. In the remaining 9 pa-
tients, a large graft was required and the com-
posite grafts were harvested from the helical
root. The composite grafts were implanted in
either the alar rim defect or in the site of previ-
ous extensive alar rim resection, as well as the
missing part of the alae.

RESULTS

Fifty six patients with a mean age of 22 years
(range between 17 and 62 years) made up our
study population. All small grafts had excellent
take and satisfying appearance for patients
without obvious deformity of donor site. Five
of the large grafts had excellent take, 3 of them
had acceptable take and one failed to take. The
pre-operative and post-operation pictures of
four patients were shown in Figures 2-5.

DISCUSSION

The ala is an important component of nasal
anatomy, both aesthetically and functionally.
Prior to attempting to re-establish the anatomy
and functions of lost skin and skeletal struc-
tures, these defects should be carefully as-
sessed. This approach may be beneficial for
not only attaining desired results in surgery,
but also for preventing fibrosis and contrac-
ture. Composite grafts are complexes of full
thickness skin and surrounding periosteum and
cartilage or skin/dense subcutaneous tis-
sue/skin.10-12 Composite graft from either the
helical rim or the root has been recommended
for reconstruction of alar rim defects.13
Sangavi presented a case report of a 16 year-old girl with isolated congenital alar defect who underwent reconstruction with auricular composite graft. Composite auricular graft resulted in an excellent nasal contour correction without healing abnormality or any obvious deformity in the donor site. Coban and his colleague used the root of helix as the composite graft donor site for reconstruction of post-burn alar rim defect. Constantian used auricular composite graft reconstruction in 100 secondary and tertiary rhinoplasty patients. In his series, 99% of the grafts survived in their entirety and only two patients had partial unilateral graft loss. Moreover, Klinger and colleagues reported reconstruction of a full-thickness alar wound in a 20 year-old man using an auricular conchal composite graft which resulted in a complete repair of the defect with excellent wound healing as well as good functional and aesthetic results. However, the basis of treatment in these cases is resection of scar tissue or deformed ala, then grafting a piece of tissue with a 3-dimensional shape similar to normal anatomy to the alar area defect. These procedures are complicated and time-consuming, require a great deal of expertise, and it is not always feasible to harvest tissue with such characteristics. Moreover, there are challenges such as failure to take and...
healing abnormalities at the donor as well as recipient site. In the present series of 56 patients, we evaluated long term results of composite graft take in patients undergoing alar rim reconstruction. Our results demonstrated that composite graft has favorable results in alar rim reconstruction. In the present study, we utilized two different sets of grafts. For small defects or for individuals with congenital or acquired nostril stricture, a small wedge-shaped part of (non-cartilage bearing) helicolar junction, consisting of dense subcutaneous tissue in the middle and skin on both sides was used. This composite graft had excellent take in all 47 patients who needed small grafts. Due to limited manipulation, injury of donor site was very limited and no gross deformity or scar was observed in any of these patients. The other type of graft was harvested from the helix root. It was similar to the more traditional composite grafts in that it contained cartilaginous tissue. These grafts were...
Fig. 3: A lady who complained of asymmetric nostrils and other deformities following rhinoplasty. Images (a) and (b) show her on frontal view, before and after tertiary rhinoplasty and surgical correction with small composite grafts on the right alar rim, respectively. Figures (c) and (d) show the same patient, on three-quarters view. Figure (e) shows a close-up view of the same patient 10 days after surgery. The site of graft is indicated by an arrow. Figures (f) and (g) show basal view (h) and (i) show profile view.
Fig. 4: A lady presenting with asymmetry in nostrils in addition to dissatisfaction with previous rhinoplasty and face-lift, (a) before, and (b) after secondary rhinoplasty, reconstruction with a small composite graft, face-lift and lipoplasty, on frontal view. Additional images show frontal views of her, when presenting for the first time (c), after secondary rhinoplasty and face-lift (d), and three months after lipoplasty and implementing a composite graft on the right ala (e). Images (f), (g) and (h) show the same individual on profile view.
needed to reconstruct alar rims in 9 patients who had relatively larger defects. We observed that in 5 cases the grafts had excellent take. In 3 individuals the grafts had acceptable take but in one patient, who was a male smoker, the graft failed to take. It has been suggested by other authors that auricular composite graft used for reconstruction of the alar rim should not be larger than 1.5 to 2 centimeters in diameter to ensure reliable revascularization. This supports our results which showed that in 9 patients who needed large composite grafts, only 5 patients had excellent graft take. Where as all 47 patients with small grafts had excellent graft take. The main advantage of composite graft is that it can be performed in a single, fast surgical procedure with excellent contour correction. The main disadvantage of composite graft is that its use for large defects (larger than 2 centimeters) has not been recommended, and other therapeutic modalities such as nasolabial or forehead flap can be performed for these defects. Moreover, the final color of composite graft may not be very satisfying. In conclusion our results demonstrated that using auricular non-cartilage bearing composite grafts has favorable long term results in reconstruction of alar rim deformities. Although this holds true for both large and small grafts, it seems that there is the possibility of further improving the results of large grafts.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

REFERENCES
Alar reconstruction with composite graft