Surgical Reconstruction Of Full Thickness Alar Defects With Auricular Composite Grafts

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During a period of 6 years, we have used auricular composite grafts for reconstruction of full thickness defects of the ala of the nose in 11 patients (follow-up 3 to 84 months; mean 40.5 months). The graft remained completely viable in 10 patients. Donor site scar was minimal and well accepted. It has been observed that a good aesthetic result and anatomical reconstruction of the three structures of the ala of the nose namely, skin cartilage and vestibular lining is achieved in a single operation by using this technique.
Key words: Composite grafts, Alar defects, Alar reconstriction.

A mutilated nose is a severe affliction that impedes normal social contact and creates great self-identity problems. Nasal alar defects can be acquired as a result of trauma, tumours or infection. Through and through defect of the ala of the nose includes loss of skin, fibro-areolar tissue, part of the alar cartilage and vestibular lining. Two methods are available for full thickness alar reconstruction; composite grafts and flaps.

Composite grafts were first described in Germany in 1877 by Koenig[1], but the main emphasis was generated after World War II by Gillies[2] in England and Brown[3] in the United States. The auricle is the most common donor site and provides excellent tissue for restoration of the alar anatomy. The opposite side of the nose may also be used as the donor site[4].

In this paper we discuss our use of auricular composite grafts in repair of full thickness alar defects.

Patients And Methods:
The study was conducted at the Department of Plastic and Reconstructive Surgery, Mayo Hospital, Lahore from January 1, 1991 to December 31, 1996. Isolated full thickness nasal alar defects measuring upto 1.5 cm. were considered for reconstruction with composite grafts. Through and through defects of greater magnitude were repaired with local or regional flaps. The composite graft was obtained from the earlobe or the helical rim. Donor site was primarily closed in all cases.

All reconstructions were carried out as elective procedures under local anaesthesia using lignocaine 2% with adrenaline 1:100,000. Chromic catgut 6/0 was used for suturing the graft on the vestibular side and prolene 6/0 was employed on the skin. Skin stitches on the grafted as well as on the donor site were removed after 5-6 days.
The patients were followed-up initially every month for 6 months and thereafter at 6 monthly intervals. The aesthetic result was assessed subjectively as well as objectively and graded as 'excellent', 'good' or 'poor'.

Results:
During the 6 years period, a total of 51 patients with partial thickness as well as perforating defects of the nasal alar region were offered surgical reconstruction. Out of these, 11 patients with small to moderate sized alar defects (width ranging from 0.5cm. to 1.5cm.) were treated with auricular composite grafts (Table). These include 6 males and 5 females. The minimum age at the time of reconstruction was 11 years and the maximum 60 years (mean 30.2 years). The follow-up ranged from 3 to 84 months (mean 40.5 months). Auricular composite graft was used for alar reconstruction in 9 cases of traumatic defects, 1 case of post-infective defect and in 1 case following tumour excision.

TABLE: Summary of nasal Alar defects repaired with auricular composite grafts

No.	Age/Sex	Aetiology	Size of Defect	Operation Date	Post-op-Complications	Aesthetic Grade
1.	34y/M	Accidental Trauma	1.0 cm.	18.01.90	Marginal graft necrosis	Good
2.	26y/M	Human Bite	1.2 cm.	03.11.90		Excellent
3.	12y/F	Accidental Trauma	0.8 cm.	03.09.91		Excellent
4.	37y/M	Infection	1.0 cm	25.01.93	Marginal graft necrosis/Moderate hyperpigmentation	Good
5	60y/M	Basal Cell Ca.	27.09.93	1.5 cm.	Unsightly scar	Good
6	11y/F	Accidental Trauma (Burns)	0.5 cm.	23.05.94	Marginal graft necrosis/Unsightly scar	Good
7.	16y/F	Accidental Trauma	1.4 cm.	16.06.94		Excellent
8.	30y/M	Accidental Trauma	1.0 cm.	23.01.95	Moderate graft hyperpigmentation	Good
9	40y/M	Accidental Trauma.	1.2 cm	21.08.95	Total graft loss	Poor
10.	36y/M	Dogbite	1.5 cm	04.03.96		Excellent
11.	40y/M	Accidental Trauma	1.4 cm.	29.04.96	Moderate graft hyperpigmentation	Good

The aesthetic results were generally good to excellent both from the patients' as well as from the surgeon's perspective. One patient had total loss of graft; she was successfully reconstructed with another composite graft 8 months later. Marginal graft necrosis was observed in three patients where healing occurred uneventfully. Initially, in majority of the cases a noticeable dissimilarity in colour between the graft and the nasal skin was present for several months. This tended to improve with time, but some degree of flap hyperpigmentation persisted in 3 patients. Dermabrasion to improve the final appearance of scar proved necessary in two cases.

Figure 1(a) shows a patient in profile with left nasal alar defect; the auricular composite graft is also shown prior to insetting. Figures 1(b) and 1(c) are the oblique and chin-up views of the same patient at the time of removal of stitches. Figures 1(d) and 1(e) are the left lateral and inferior view at 6 months.

Figure 2(a) shows 3 months post-operative right lateral view of a patient who had right alar reconstruction with auricular composite graft. Figure 2(b) shows the chin-up view of the same patient. Hyperpigmentation of the graft may be observed.

Discussion:

Closure of full thickness nasal alar defects requires replacement of nasal skin and lining, and frequently the inclusion of cartilagenous support in the reconstructed nostril. The reconstruction should be symmetrical, one-staged, predictable, reliable and have a good colour match with minimal scars. Although many local and regional flaps have been described for alar reconstruction[5] these are likely to produce distortions and visible scars, including scarring of the donor site. Auricular composite grafts can be obtained from the earlobe[6], helical rim[7] or root of the helix[8]. Generally, any grafted tissue more than 5mm. distant from a vascular bed is at significant risk of necrosis. Auricular composite grafts used for alar reconstruction should, therefore, be not larger than 1.5 to 2.0 cm. in diameter, so that centre of the graft is not more than 5 to 8 mm. from a blood supply. According to Young[9] the upper limit in size may approach 2.5 cm.; the use of larger grafts, however, may be hazardous and is not recommended.

Postoperative cooling has been suggested to enhance the survival of auricular composite grafts by decreasing the metabolic rate of the grafted tissue until secondary vascularization takes place[10]. External application of ice compresses to lower the graft temperature by 50C to 100C for a period of 72 hours is reportedly useful[11]. We, however, feel that this manoeuvre would lead to vasoconstriction and may have an adverse effect on graft 'take'. We have not employed post-operative cooling in any of the cases and the results of our study show that it is probably unnecessary. Baker[12] used a turn-down flap of nasal skin for lining and applied a two layer composite of skin and cartilage onto this raw bed thereby increasing the area of vascular contact. We have also successfully used this technique in two of our cases.

Aesthetically, the only significant drawback observed is graft hyperpigmentation. This, however, is a common complication in dark skinned people and has also been seen in skin grafts and even in flaps in our population.

In our opinion, use of auricular composite graft for full thickness alar reconstruction is a simple, one-stage procedure that provides the necessary components of repair while inflicting minimal visible scarring. The obvious limitation is its use in defects of larger magnitude where local or regional flaps may have to be employed for a successful reconstruction.

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