

Microsurgical Reconstruction of the Nasal Ala using a Composite Auricular Graft Based on the Superficial Temporal Vessels

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Abstract. Full-thickness defects of the nasal ala can be challenging to reconstruct. The original texture, color and shape of this specific aesthetic unit requires careful planning of the surgical approach and technique in order to minimize donor-site morbidity and repetitive procedures. We describe the use of the chondrocutaneous composite auricular graft to reconstruct a full-thickness defect of the ala of the nose with a successful and aesthetically pleasing outcome.

Introduction

Reconstruction of full-thickness defects of the ala of the nose has always been a challenge in reconstructive surgery, as (composite) donor tissue needs to have the same colour and texture characteristics. Microsurgery introduced the possibility to perform microsurgical free tissue transfer and even to succeed in doing the most challenging reconstructions. Tissue transfer using microsurgical techniques is often seen as the last step in the reconstructive ladder but in specific cases should be chosen as the preferred strategy in respect of the “replace-like-with-like” principle. We report the reconstruction of the nasal ala using the microsurgical transfer of a composite chondrocutaneous auricular flap based on the superficial temporal vessels.

Case report

A 38-year-old woman has been treated surgically for an arteriovenous malformation of the nasal ala with several, unsuccessful reconstructive attempts. She was referred to our department for a second opinion. Clinical examination revealed a full-thickness defect of the right nasal ala with hypertrophic scar formation (Fig. 1). A one-stage, composite chondrocutaneous free flap transfer was chosen in an attempt to reconstruct the defect. The flap design included the left ascending crus helices and adjacent preauricular skin (Fig. 2). An extensive debridement was performed and the defect pattern was copied to the left ear, positioning the alar margin on the helix (Fig. 2). The distal and proximal superficial temporal vessels were easily identified and the composite graft was transferred to the defect. Both distal and proximal pedicles were included in the flap. Revascularization of the flap was observed after performing an anastomosis using an Ethilon 10/0 suture between the proximal temporal artery and the

distal part of the right facial artery, which has been identified through an incision in the nasolabial fold. Because of problems with surgical exposure, the distal superficial temporal vein was chosen and anastomosed to the facial vein using a vein graft taken from the dorsum of the foot (Fig. 2). The facial vein had been identified at the mandibular margin and the vein graft was tunneled subcutaneously. Flap insertion was done using resorbable vicryl 5/0 sutures with rigorous approximation of the different composite tissue layers. Specific care was taken to position the alar margin correctly. The donor site was closed primarily and did not result in shortening or deformation of the ear. The postoperative course showed some cephalad migration of the alar rim due to scar retraction and an additional lipofilling of alar rim was performed three months after the reconstruction. A total of 3 cc of liposyrate was injected subcutaneously with a stable result at the long-term.

Discussion

Full-thickness defects of the ala of the nose cause considerable disfiguration in an aesthetically important facial unit. A pleasing reconstructive outcome should be achieved with procedures kept to a minimum to avoid further distress. Nasal ala defects have been reconstructed using composite grafts and/or pedicled flaps. The disadvantage of those techniques is that the composite graft can be limited in size, can reabsorb over time or lead to scar retraction. Pedicled flaps often need several stages and do leave unpleasant, visible donor sites (1). With the introduction of microsurgery and the transfer of vascularized free flaps to repair facial defects further refinement in nasal ala reconstruction has been reported (2, 3). The superficial temporal vessels supply the auricle and the adjacent preauricular skin. Anatomical studies have shown that in 97.2% of cases at least one branch of the



Figure 1. Preoperative view on the defect after several surgical interventions and attempts to repair with a skin graft (left). Postoperative view after debridement and reconstruction of the full-thickness defect of the nasal ala with a chondrocutaneous composite auricular free flap.



Figure 2. A print of the defect has been copied to the donor-site which is the ascending helix of the auricle and the preauricular skin (left). Straight forward dissection isolates the distal and proximal pedicle of the superficial temporal vessels (middle). A vein graft has been used to perform the anastomosis between the distal part of the superficial temporal vein and the facial vein (right).

superficial temporal artery (and vein) exists that supplies the tragus directly (4). Composite auricular flaps can be based on those superficial temporal vessels. It has also been reported that the superficial temporal veins have no valves (1, 5). This implies that a venous anastomosis can be performed either on the distal or proximal temporal

vein depending on the positioning of the auricular flap at the recipient site. In our case the anastomosis was performed using a vein graft between the distal pedicle and the facial vein at the mandibular border with good flap survival and no signs of venous congestion. It is important to include sufficient preauricular skin in the flap

design to avoid tissue deficiency at the cranial border of the flap inset which could lead to retraction. In our case, postoperative retraction resulted in cephalad migration of the nasal ala and necessitated a fat grafting procedure to lower the alar rim. Besides the anterior region of the auricle the posterior region can also be chosen as a donor site based on the posterior auricular vascular supply depending on the defect. Final aesthetic result was satisfactory at the donor site as well as the reconstruction itself. The color, texture and shape of the chondrocutaneous flap matches the characteristics of the ala of the nose.

Conclusion

The chondrocutaneous preauricular free flap is a strong reconstructive tool to reconstruct full-thickness defect of the ala of the nose and has an almost constant pedicle from the superficial temporal vessels. Donor-site morbidity is minimal without shortening of the ear and the outcome is aesthetically very pleasant.

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