

## Pre-auricular and ascending helical free composite flap in reconstructing an alar defect resulting from a human bite: a case report

İnsan ısırığından kaynaklanan bir alar defektin rekonstrüksiyonunda pre-auriküler ve çıkan helikal serbest kompozit flep: Olgu sunumu

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Full-thickness defects of the nose result in severe aesthetic and functional problems. Nasal alar defects are frequently caused by trauma, surgical resection or congenital deformities, yet an alar defect due to a human bite is quite rarely seen. For a successful alar reconstruction, selected tissue must be similar to nasal structures in texture, color and thickness. The structural similarities between the nasal alae and auricular helices have allowed the use of free helical composite flaps for the repair of nasal defects. In this article, we report a 36-year-old male patient who had a right alar defect caused by a human bite. The defect was successfully reconstructed with a reverse flow superficial temporal vessel based pre-auricular and ascending helical free composite flap. Since the color and the texture of the flap was compatible with the nose integuments, this flap enjoyed of an optimal integration in the central facial area.

**Key Words:** Alar reconstruction; human bite; pre-auricular flap.

Burunun tam kalınlıklı defektleri ciddi estetik ve fonksiyonel sorunlara yol açmaktadır. Nazal alar defektler sıklıkla travma, cerrahi rezeksiyon ve doğuştan deformiteler sonucu meydana gelmekle birlikte, insan ısırığı kaynaklı alar defekt oldukça nadir olarak görülür. Başarılı bir alar rekonstrüksiyon için seçilen doku, burun ile benzer yapı, renk ve kalınlıkta olmalıdır. Auriküler heliks ve nazal ala arasındaki yapısal benzerlikler, nazal defektlerin onarımında serbest helikal flep kullanılmasına olanak sağlamıştır. Bu yazıda, insan ısırığına bağlı sağ alar defekti olan 36 yaşında erkek bir hasta sunuldu. Defekt ters akımlı süperfisyal temporal damar bazlı pre-auriküler ve çıkan helikal serbest kompozit fleple başarılı bir şekilde onarıldı. Renk ve yapısının burun ile uyumlu olması nedeniyle flep, santral yüz bölgesi ile optimal olarak bütünleşti.

**Anahtar Sözcükler:** Alar rekonstrüksiyon; insan ısırması; pre-auriküler flep.

Full-thickness defects of the nose cause severe aesthetic and functional problems. The unique structure and three-dimensional anatomy of the region render its reconstruction a matter of challenge for surgeons. For a successful reconstruction, selected tissue must be similar to nasal structures in texture, color and thickness.<sup>[1]</sup>

The main causes of alar defects are accidental trauma, surgical procedures such as cosmetic surgery or procedures to treat cutaneous malignant diseases and congenital deformities as cleft lip nasal deformity.<sup>[1-3]</sup> Alar defects due to human bite are rarely seen or reported in the literature.<sup>[4]</sup>

Local flaps are frequently used for reconstruction of such defects but often yield facial scarring and bulky alae that require thinning revisions.<sup>[5]</sup> The concavity of the helix, the skin color, texture and thickness of the auricle give the opportunity to reconstruct the nasal alar component perfectly.<sup>[6-10]</sup>

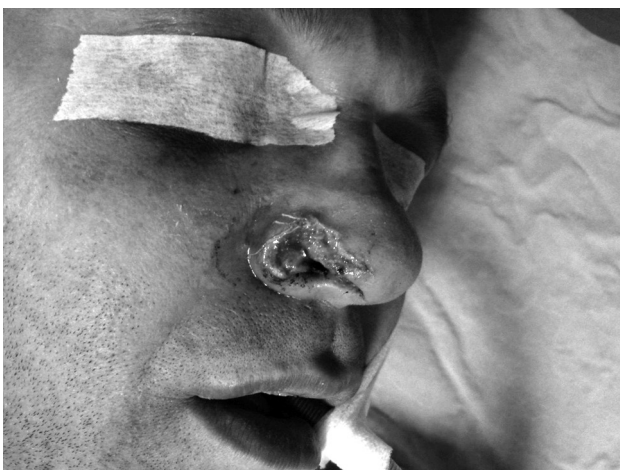
In this case we report for first time the use of a composite free flap from the pre-auricular and ascending helix in reconstructing an alar defect of the nose resulting from a human bite.

### CASE REPORT

A 36-year-old male patient complaining of a traumatic right nasal alar defect was admitted to the emergency department immediately after the insult. Examination revealed that the defect was 2.6x2.1 cm in size and resulted from a human bite (Figure 1). After preoperative preparation informed consent was obtained from the patient for the possible use of his auricular tissue for nasal reconstruction.

Due to the critical alar defect size (i.e. more than 2 cm in diameter), a composite free flap from the pre-auricular and ascending helix vascularized by reverse superficial temporal vessels was planned for microsurgical reconstruction.

From the ipsilateral side, an appropriate-sized flap was designed starting from the root of the helix extending to the pre-auricular skin. By using the facelift incision, the anterior skin flap was elevated and the superficial temporal artery and vein were identified at about 1 cm anterior to the tragus. The vascular pedicle was carefully



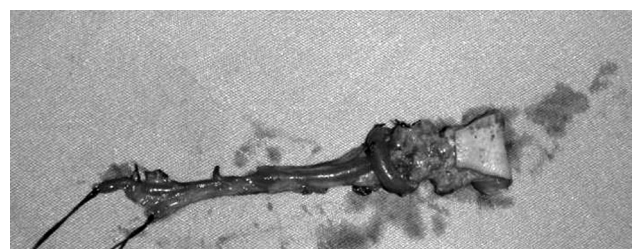
**Figure 1.** Right alar defect 2.6x2.1 cm in size as a result of a human bite.

dissected in cephalic direction to achieve adequate pedicle length. At the level of the helical root, the adjacent pre-auricular skin was dissected on the superficial temporal vessels, the marked helical segment was divided and the fascia underneath was elevated to be included in the vascular pedicle respectively. Finally, the vascular pedicle was traced superiorly and designed in a reverse fashion (i.e. to obtain maximal pedicle length). In this manner an 8.5 cm pedicle length was achieved (Figure 2).

At the recipient site, with aid of a silicone tube a tunnel from the alar defect to the nasolabial fold was prepared. From a 2 cm horizontal incision both facial artery and vein were identified and isolated. In the same manner a second tunnel from the nasolabial fold to recipient vessels was prepared.

A curvilinear incision 2 cm superior to the lateral malleolus was made on the ipsilateral leg and the great saphenous vein was isolated to harvest a 10 cm vascular graft. The donor area was closed primarily. The vein graft was passed through the tunnel to the nasolabial fold, prepared as a loop and both ends were anastomosed to the facial artery and vein respectively. Thereafter, the loop was divided at the nasolabial end and the harvested flap was divided and transferred to the defect area. The flap was adapted to the alar region and the vascular pedicle was passed into the tunnel and pulled out in the nasolabial fold area. The vessels were successfully anastomosed in an end-to-end fashion (Figure 3).

The defect on the donor-site was repaired with an advancement and rotation flap from the helical rim, and the face-lift incision was primarily closed. The contour of reconstructed helical crus was cosmetically acceptable (Figure 4a). No complication was observed postoperatively and flap adaptation was excellent during a follow-up period of two years (Figures 4 b-d).



**Figure 2.** The isolated flap.



**Figure 3.** The flap adaptation to the defect and end to end anastomoses of the pedicle to venous loop in the nasolabial fold.

### DISCUSSION

Due to its three-dimensional anatomy and unique structure, reconstruction of the nose is usually difficult and challenging. There have been several methods offered to restore nasal

defects, including local flaps, auricular composite grafts, and free flaps from the ear.<sup>[1-3]</sup> Local flap techniques require folding to produce a margin, leaving bulky structure that is difficult to thin secondarily. Also the fundamental requirement of “analogous tissue” involves scarring in a visible area of the face.<sup>[5]</sup>

Reconstruction of the nasal ala is a complex task. Burget<sup>[6]</sup> outlined seven principles unique to aesthetic reconstruction of the face. One is the use of cartilage grafts to create contour, prevent collapse, and resist the forces of contraction.

The structural similarities between the nasal alae and auricular helices allowed the use of free helical composite grafts to repair small nasal defects of less than 2.0 cm in size, which is defined as the critical size<sup>[3]</sup> since free composite grafts should be less than 1.0x1.5 cm to be revascularized.<sup>[3]</sup> Because of this, defects more than 2.0 cm in diameter should be reconstructed with vascularized tissue transfer.<sup>[7,5,8-10]</sup>

Recent studies reported the use of superficial temporal vessel based helical free composite flaps for alar reconstruction.<sup>[7-10]</sup> These studies showed



**Figure 4.** (a) The donor site appearance one month after operation; (b) postoperative view, one week; (c) postoperative view, one month; (d) postoperative view, two years after primary surgery.

a successful reconstruction with a perfect tissue matching of the alar-columella complex. Most of the patients had combined defects, often due to traumatic or oncologic etiologies.

Previous anatomic studies have shown the reverse flow characteristic of the superficial temporal vessels.<sup>[7,8]</sup> This fact enabled the idea to harvest the flap on a reverse pedicle to obtain extra length. Thus may obviate the use of vein grafts.

Li et al.<sup>[7]</sup> reported the use of this technique in four patients. But contrary to what is assumed by these studies,<sup>[7,10]</sup> we believe that a vein graft is almost always necessary to ensure a secure tension-free anastomosis, especially in considering the vein, since the fact that it is usually difficult to find a proper receptive vein in the nasal region.<sup>[8]</sup>

Utilization of the saphenous vein as a vascular graft described in this case is the first use of this material unlike other case reports that described use of the femoral system.<sup>[8-10]</sup> The dissection seems to be easier and more didactic; moreover the calibre of the vein resembles that of the superficial temporal vessels.

An isolated nasal alar defect due to a human bite is rarely seen.<sup>[4]</sup> No specific recommendations for such cases are reported in the literature, but to our experience immediate reconstruction was successful and no complications were observed. A similar case in which both the alar nose and collumella were, immediately reconstructed with a retroauricular free flap was previously reported by Wary et al.<sup>[4]</sup>

In conclusion, this article reports the first use of a superficial temporal vessel based pre-auricular

and ascending helical free composite flap for a human bite defect. Although the excellent color and texture match with the nose provided optimal integration of this flap in the central facial area, the short vascular pedicle necessitated preparing it in a reverse pattern, augmented with a vein graft to assure a secure microsurgical anastomosis.

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