Tragus Reconstruction using an ear lobe rotational flap

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Abstract

Tragus absence due to auricular trauma, tumor resection and as a consequence of excessive tension after aesthetic facial lifting gives a strange looking to the individual face. The tragus strategic position also deviates airflow helping the mechanism of hearing. The aim of this paper is to demonstrate an arterialized axial ear lobe rotational flap to tragus reshape. Seven patients underwent surgical ablation of the external ear tragus due to skin cancer involvement and were selected for this study. A 2-5mm flap ear lobe based on common perforating branches of the superficial temporalis artery was rotated 180° to the defect. The ear lobe rotational flap perfectly matched original tragus color and diameter, and could be customized according to the tragus size.

Key words: skin cancer, ear reconstruction, cosmetic surgery.
**Introduction**

Normal auricular appearance contributes to a more pleasant aesthetic looking to the individual face. Auricular framework is composed of three parts: conchae and pavilion, tragus, and ear lobe. Cavum conchae and pavilion are continuous and next to the cartilaginous portion of the external auditory meatus. The tragus is a dome shaped anterior projection of the pavilion that positions itself vertically in relation to the entrance of the external ear. Next to the tragus, there is the ear lobe, a soft, fleshy, pendulous part of the external ear that becomes more prominent with the aging process (1).

The auricular tragus blocks partially the entrance to the external auditory meatus and helps deviating airflow while contributing to the normal mechanism of hearing (2). Absence of tragus may interfere with the physiologic mechanism of hearing and gives a strange look to the face.

Alternatives to tragus reconstruction are those also applied to complex reconstructive procedures (2,3). In fact, tragus may be rebuilt using related elements of conchae or chondrocutaneous flaps (4,5). We believe that a single unit reconstruction should be planned in this circumstance, with more conspicuous scars at the donor region. The aim of this paper is to demonstrate a simple arterialized axial ear lobe rotational flap to tragus reconstruction.
Patients and Methods

Seven patients were submitted to tragus reconstruction after coetaneous malignancies ablation. The skin cancer ablation included the tragus whole extension – including the cartilage – and sometimes part of the skin coverage in the preauricular region. Defect reconstruction was planned according to the aesthetic zones of the face. In all cases, anatomopathological exam confirmed complete eradication of the neoplasm prior to reconstruction. Table 1 shows the clinical and demographic characteristics of the seven patients.

The transposition of the arterialized ear lobe rotational flap from the ipsilateral lobe to replace the tragus is described as follows. Tragus area is measured from the helix root, being this measurement marked at the medium portion of the lobe of the auricular pavilion. The navicular flap measured 2 to 5 mm and was drawn based on a branch of the superficial temporal artery. The dissection begins on the lateral area adjacent to the lobe, which has 50% of its width preserved, minimizing the sequel at the donor site. Care is taken to preserve part of the subcoetaneous tissue in the axis from the ear lobe donor site to the recipient site: the flap remains fixed by the subcutaneous tissue to the origin on the lobule, what guarantees the vascular viability. Maintaining subcutaneous attached to the flap assures in and outflow to this flap. The ear lobe flap is then transposed 180 degrees toward the recipient site and sutured in place. The donor site is then closed primarily with separate stitches. (Figures 1-7)
Results

The tragus was successfully reconstructed in all cases, being the flaps adapted to the recipient site (Figures 5 and 6). Donor site was closed primarily in all cases. There was no evidence of flap congestion. Patients were followed for up to 24 months in order to assess preservation of shape. Figure 7 shows correct positioning of the new tragus what partly blocks ear conduct entrance.
Discussion

Absence of small anatomic elements may give a strange look to the individual face. Auricular reconstruction techniques often make use of local flaps from neighborhood, specially the conchae, what changes the pavilion and allows for visible scars. Those techniques are more appropriate to complex reconstructive procedures. The technique described here is for single tragus reconstruction while other ear elements are still present. The ear lobe rotational flap is a variation of that flap described by Park et al (6), based on the inversion of part of the lobe next to the recipient site. This flap is arterialized provided by superficial branches of the superficial temporal artery. In order to preserve outflow of the flap, it is recommended that portion of subcoetaneous tissue should be preserved attached to the flap.

One peculiar aspect of auricular reconstruction is the concern on function (hearing, glasses support) aside aesthetic appearance. With the early diagnosis of skin cancer, patients are now demanding more pleasant results after tumor surgical ablation. Earlier alternatives for single tragus reconstruction are composite grafts, skin flaps with secondary cartilage or alloplastic material inclusion, and the conchal flaps (7). Composite grafts do not match the recipient region color and has a tendency to shrink. Postoperative routine of care for at least two weeks and epidermolysis may also difficult clinical application of those grafts. Local flaps such, as the auricular lobe flap is easy to accomplish.
Skin flaps could also be used. Skin laxity in the elderly helps to pull back the relaxed skin in direction of the defect. After facial lifting, however, common skin laxity is not seen. Tragus prominent position may be vanished when the posttragus incision is used.

Conchal flaps are often incorporated to partial auricular reconstruction. For those patients, a step-by-step routine of ear reconstruction may be accomplished even with more conspicuous scars. The ear lobe rotational flap leaves no obvious scar at the donor site and does not require more than one surgical step. Great attention should be taken to the auditory canal while adapting the flap. Bulky flaps should be avoided. The axial ear lobe rotational flap may be customized according to the aspect of the area to be reconstructed. As it has an independent pedicle, it could also be incorporated to other partial auricular reconstruction procedures that use autogenous cartilage grafts to rebuild the entire ear pavilion.
Conclusion

The ear lobe rotational flap perfectly matches tragus' color and shape, and it may be customized according to the tragus size. The flap is easy to be obtained from the ear lobe and the vascular system works well, with no evidence of venous congestion. This option for isolated tragus reconstruction may be incorporated to the current techniques of partial ear reconstruction.
References


Table 1. Clinical and demographical findings.

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<th>Sex</th>
<th>Age</th>
<th>Aethiologic agent</th>
<th>Size of the defect</th>
<th>Time before tragus excision</th>
<th>Follow-up in months</th>
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<td>1</td>
<td>F</td>
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<td>Basal cell carcinoma</td>
<td>Tragus + pre-auricular skin</td>
<td>2 years</td>
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<td>1 year</td>
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Figure 1
Legends for the figures:

Figure 1: absence of tragus- wide opening to the external auditory canal.

Figure 2: ear lobe rotational flap rotated to defect.

Figure 3: ear lobe moved replacing tragus.

Figure 4: anatomic dissection of subcoetaneous ear lobe rotational flap.

Figure 5: identical defect with absent tragus.

Figure 6: tragus replaced.

Figure 7: result after 12 months.