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(CASE REPORT)

Partial post-traumatic Otopoiesis: A case report

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Abstract

Traumatic loss of substance in the auricle requires rigorous reconstruction to restore anatomical contours and ensure a satisfactory aesthetic result.

We report the case of a young patient treated at the Department of Plastic, Reconstructive, and Aesthetic Surgery at the Tangier University Hospital who presented with loss of substance in the upper pole of the auricle following a human bite. The patient was treated with a single-stage reconstruction using a sculpted costal cartilage graft and a local postauricular flap.

The postoperative course was favorable, with a stable, symmetrical, and aesthetically satisfactory result.

This case illustrates the importance of autologous cartilage-based reconstructive techniques in complex ear tissue loss.

Keywords: Ear; Trauma; Costal Cartilage; Ear Reconstruction; Post-Auricular Flap.

1. Introduction

Partial ear tissue loss poses a challenge in plastic and reconstructive surgery due to the complex three-dimensional structure of the auricle and its important aesthetic role.

These injuries are usually secondary to trauma, bites, burns, or tumor resection.

Reconstruction of the helix rim requires restoration of the cartilaginous framework and thin skin coverage.

When the cartilage deficit is significant, local ear cartilage is not sufficient to restore the rigidity and architectural continuity of the auricle. Autologous rib cartilage grafting remains the gold standard solution due to its strength, sculptability, and long-term stability.

Skin coverage can be obtained from several local sources, in particular local flaps, for which various retroauricular methods ensure reliable vascularization and a similar skin texture, thus allowing harmonious restoration of the ear contour.

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2. Case presentation

This article reports the case of a 30-year-old male patient with no particular medical history who suffered a human bite to his right ear, resulting in partial amputation of the upper pole of his right ear.

Initial treatment in the emergency department consisted of surgical debridement and suturing of the tissue loss.

The patient presented to our department two years later for secondary reconstruction of the auricular defect.

The preoperative examination revealed a loss of skin and cartilage in the upper third of the right auricle, affecting the helix and the scaphoid fossa, with preservation of the free edge of the auricle and the retroauricular sulcus. The defect was linear, clinically measured at 37 mm x 20 mm, with preservation of the concha.

The surrounding post-auricular skin was of good quality and the hairline was high.

Examination of the opposite ear was unremarkable and hearing was not impaired.

The indication was a single-stage reconstruction using a rib graft and a local retroauricular advancement flap.

Figure 1 Human bite injuries involving the superior helix

Surgical management:

- A template was drawn based on the healthy contralateral ear (the left ear).
- The surgery was performed under general anesthesia with the patient in the supine position.
- A rib cartilage graft was harvested from the seventh rib on the side of the ear to be reconstructed, then sculpted using a template and respecting the helical shape of the missing helix.
- At the level of the pinna, the scar edges were smoothed and a stable recipient bed was prepared.
- The cartilage graft was attached to the residual cartilage with separate stitches, restoring the projection and morphology of the upper third of the helix.
- To cover this cartilage graft, a local retroauricular advancement skin flap was performed, and the adjacent retromastoid skin was incised and mobilized forward to cover the cartilage framework.
- The sutures were made without tension, and no other skin grafts were necessary.
- A retroauricular suction drain and a compression dressing were applied.

Figure 2 Harvesting a segment of costal cartilage (seventh costal cartilage) required for auricular reconstruction.

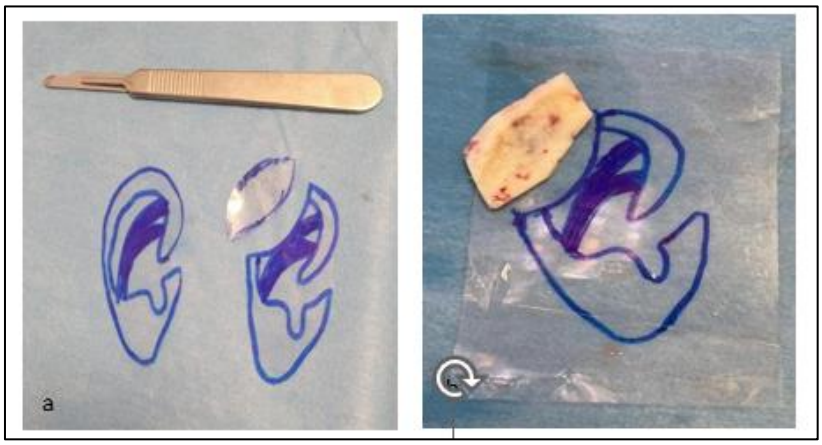

Figure 3 The harvested costal cartilage (b) is sculpted using a curved blade, based on a template drawn from the contralateral healthy ear (a)

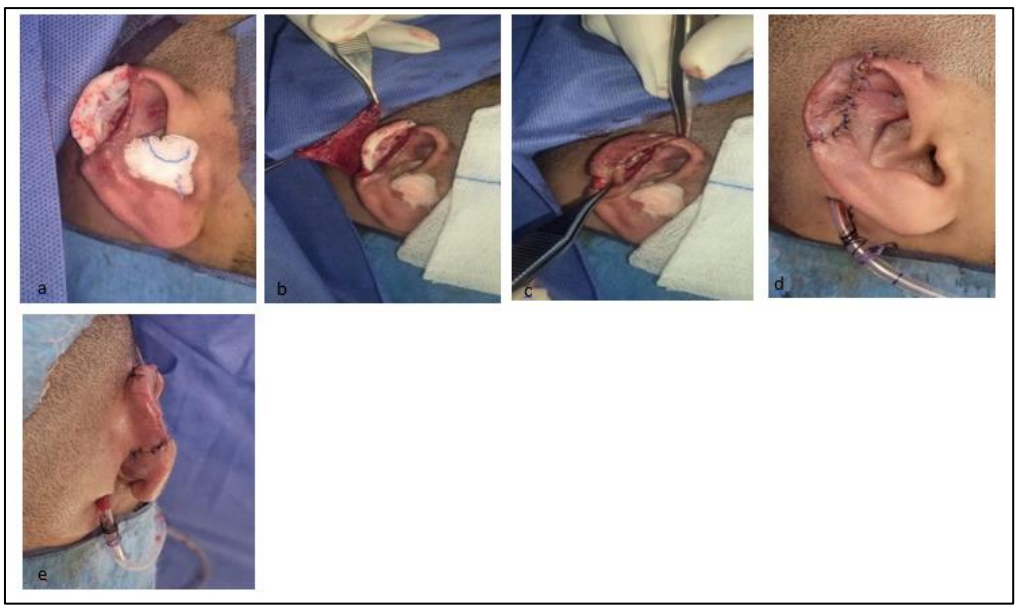

Figure 4 Staged retroauricular advancement flap. (a) Placement of the assembled framework into a subdermal pocket over the mastoid region. (b, c) Placement of the harvested cartilage at the site of the auricular defect. (d, e) Appearance at the end of the procedure with suction drains in place

The postoperative course was uneventful.

No infectious complications or flap damage were observed.

In the long term, the result was considered satisfactory from an aesthetic point of view, with restoration of the ear contour and improved facial symmetry.

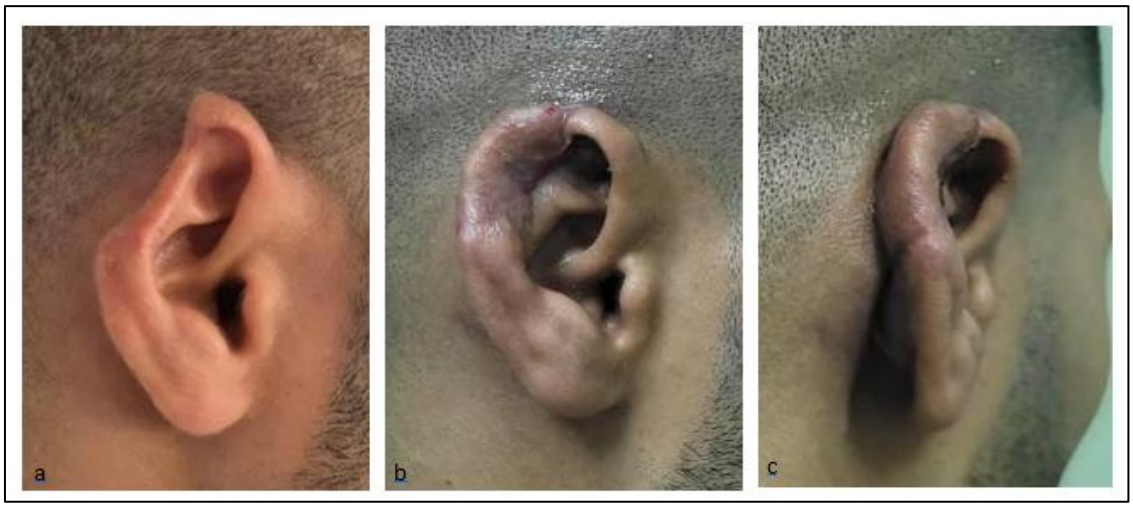

Figure 5 (a) Before surgery: Human bite to the upper pole ear (b;c). 1 month after reconstruction with a costal cartilage framework and local skin

3. Discussion

Although ear reconstruction was mentioned in ancient Indian medical texts, the first use of costal cartilage for auricular reconstruction was described by Gillies in 1920.[1] This approach was later developed by Tanzer[2], who popularized the use of autologous cartilage frameworks, primarily for the management of congenital ear deformities.

A high proportion (66%) of partial ear amputations resulting from human bites was reported in the series by Robert A. Pearl[3], compared with 42% in the study by Bardsley[4] and 51% in the series of Harris et al.[5] It is difficult to determine whether this reflects a true increase in the incidence of bite-related ear amputations or merely a change in referral patterns of patients and physicians due to increased awareness of auricular reconstructive surgery. Several studies, however, have emphasized that such bite-related ear amputations are becoming increasingly common in violent assaults, often linked to modern patterns of excessive alcohol consumption.

In secondary reconstructions, Watson D.[6] described various reconstructive options depending on the size, location, and depth of the defect. For defects limited to the skin, simple local flaps may be sufficient. In contrast, when the defect involves both skin and cartilage, as in our case, reconstruction requires a rigid cartilaginous framework to restore the shape and projection of the auricle.

The use of autologous costal cartilage remains a reference standard in auricular reconstruction, particularly in complex or long-standing defects. Brent (and Byrd) [7], Nagata[8], and Firmin[9] have extensively described its advantages, including excellent biocompatibility, mechanical strength, and low long-term resorption. Compared with conchal or septal cartilage grafts, costal cartilage allows the creation of sufficiently sized and appropriately shaped grafts, which was particularly relevant in our case.

Regarding skin coverage, the retro auricular flap is widely recognized as a reliable option for reconstruction of the upper third of the auricle. Initially described by Antia and Buch[10] and subsequently modified by several authors, this flap offers excellent color and texture match, reliable vascularity, and minimal donor-site morbidity. Preservation of the retroauricular sulcus and the good quality of the posterior skin observed in our patient were favorable factors supporting this reconstructive choice. David G.[11] and Yotsuyanagi[12] reported satisfactory aesthetic outcomes with reconstructions combining cartilage grafts and local flaps, while also reducing the overall duration of treatment and the psychological impact on the patient.

Several studies have shown that single-stage reconstruction is feasible when local conditions are favorable and the scar environment is stable. [13] [14] [15]

In our case, preservation of the concha and the free margin of the auricle limited the extent of reconstruction and maintained essential anatomical landmarks. The choice of a single-stage reconstruction using a costal cartilage graft combined with a retroauricular advancement flap is therefore consistent with the literature recommendations for upper-third auricular defects, offering a favorable balance between reliability, aesthetic outcome, and technical simplicity.

4. Conclusion

Partial otopoiesis represents a reliable and effective solution for reconstructing tissue loss of the superior pole of the auricle following human bite injuries. The combination of autologous costal cartilage and a retroauricular advancement flap allows durable restoration of auricular contours with a satisfactory aesthetic outcome. When local conditions are favorable, delayed single-stage reconstruction fully aligns with current recommendations in auricular reconstructive surgery.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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