

Post-Auricular Flap Reconstruction for Partial Ear Defect: A Promising Solution

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Submitted: 2024, Feb 01; Accepted: 2024, Mar 10; Published: 2024, Apr 05

Citation: Garg, P., Vashistha, A., Gupta, P., Khushalani, A. (2024). Post-Auricular Flap Reconstruction for Partial Ear Defect: A Promising Solution. *J of Clin Med Dia Research*, 2(1), 01-04.

Abstract

Background: Auricle is a technically difficult structure due to its thin and tightly adherent skin over underlying cartilage with complex convexities and concavities. Auricular defects can be due to trauma, dog bite, human bite, post-oncological resection, or post cellulitis.

Material and method: This was a prospective observational study. The study was done over 2 years and included 20 patients. Patients with partial ear defects including helical rim, conchae, and lobule were included in this study.

Result: A total of 20 participants were enrolled in this study; out of which 15 were male and 5 were female. The mean age was 23 years. 10 were upper helical rim defects; 7 were mid helical defects; 1 was lobular and 2 were conchal defects.

Conclusion: Ours is a two-staged procedure that holds the advantage of being simple, and reliable with a short learning curve.

Keywords: Post-Auricular Flap, Partial Ear Defects

1. Introduction

Auricle is a technically difficult structure due to its thin and tightly adherent skin over underlying cartilage with complex convexities and concavities [1.] Auricular defects can be due to trauma, dog bite, human bite, post-oncological resection, or post cellulitis. Auricle defect reconstruction aims to achieve a structurally and aesthetically ideal ear that maintains balance and symmetry with the contralateral ear. The ear can be divided from medial to lateral into conchae, antihelix, and helical rim with the lobule [1,2].

Auricle is supplied by the posterior auricular artery and superficial temporal artery. It is the anastomotic network between these arteries through the superior auricular artery and perforating branched from the same that forms the basis for the post-auricular flap [3,4]. Post auricular flap can be based superiorly, inferiorly, or in the middle. It can be used as fascio-cutaneous or in combination with a conchal cartilage graft from the contralateral ear or a costochondral cartilage graft in a staged manner as was originally proposed by Dieffenbach [3,5].

2. Material and Method

This was a retrospective observational study. The study was done over 2 years and included 20 patients. Approval from the

medical and ethics committee of the institute was taken. Written and informed consent was taken from all the participants to participate in the study and for taking and using the pictures for the same. Patients with partial ear defects including helical rim, conchae, and lobule were included. Patients not fit for general anesthesia, patients having previous scars over the postauricular region of the injured ear, and patients not willing for a two-staged reconstruction were excluded from this study. Patients were assessed for the mode and site of injury.

3. Results

A total of 20 participants were enrolled in this study; out of which 15 were male and 5 were female. 1 patient was between the age 0-20 years; 09 were 21-30 years; 06 were 31-40 years; 3 were 41-50 years and 1 patient was 51-60 years. 12 patients suffered an injury due to road traffic accidents; 4 patients were post-dog bites; 2 were post-human bites and 2 were post cellulitic. 10 were upper helical rim defects; 7 were mid helical defects; 1 was lobular and 2 were conchal defects. Costochondral cartilage graft was used in 8 patients. 1 patient suffered flap necrosis at the tip; 1 had donor site morbidity in the form of partial graft loss but no patient had hematoma or infected graft-related complication. There were no costochondral graft donor site complications either.

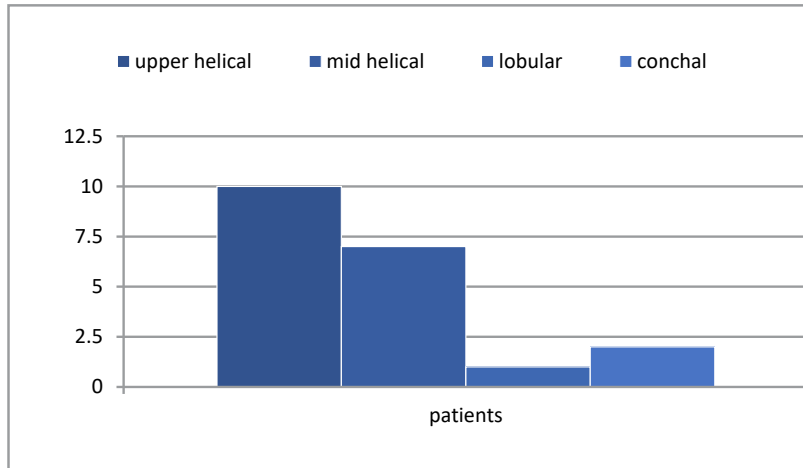


Figure 1: Zone of ear involved

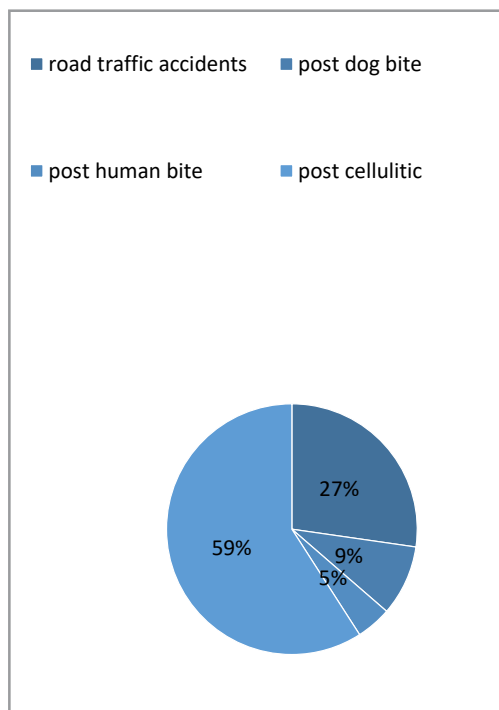


Figure 2: Etiology



Figure 3: Post dog bite helical rim defect reconstructed with post auricular flap



Figure 5: Post cellulitis conchal defect reconstructed with superiorly based post auricular flap



Figure 6: Post traumatic upper and middle helical rim defect reconstructed with cartilage graft and superiorly based post auricular flap

4. Discussion

Reconstruction was done in two stages and defects were categorized as upper, middle, and lower ear defects. The flaps were either superiorly or inferiorly based. In the first stage of reconstruction; under general anesthesia after cleaning and draping template for the defect was made keeping in mind the need for the anterior and posterior inset of the flap after comparing with the non-traumatized ear. The postauricular

flap was marked as slightly bigger in length and width than the template after confirming the reach of the flap to the defect accounting for the primary contraction following flap harvest. A faciocutaneous flap was harvested (superiorly or inferiorly based) and hemostasis was achieved at the donor site. Defect margins were de-epithelized for flap inset. Flap inset was done using a 4.0 nylon suture.

The conchal defect was reconstructed using the same technique but during flap inseting de-epithelization of the flap was done at the anterior and posterior inset interface Figure 1. In two other cases, costochondral graft was used after carving out over the template followed by postauricular flap inseting for helical rim defects. The donor site was closed either primarily or a split-thickness skin graft was used to cover the donor area. The patient was asked to follow up after 3 weeks for the second stage of reconstruction. In the second stage of reconstruction the flap was divided after assessing the extra length of flap required for inseting if required and the rest of the flap was re-insetted at the donor site.

There are two types of reconstruction for auricular margin defects. The first involves rearranging local tissue and compromising ear size, whereas the second involves employing regional tissue as flaps and focusing on keeping normal ear size [3]. Antia-Buch helical advancement is a popular single-stage local flap. It is most suited for problems involving the superior and intermediate helix that are less than 3 cm in length. The benefits of this approach include good cosmesis, retained anatomical landmarks of the ear, and flap dependability [6]. The main downside of this technique is that it usually results in a reduction in the size of the ear and necessitates wedge excision of the normal ear to gain symmetry in the event of greater abnormalities. Millard chondro-cutaneous flaps and post-auricular advancement flaps are two other single-stage reconstructive procedures. Nonetheless, these flaps are not very effective in providing a helix with a natural border with neighboring scapha [7, 8].

Sinha, et al. have described the post-auricular flap as a tubed flap in 8 patients for lobule and helical rim defects [6]. They performed a three-staged procedure in which the flap was tubulized in the first stage and insetted over the defect in subsequent stages.

Ali E, et al. described the use of pre and post-auricular skin for anterior auricle defects post-oncological resection [9]. He tunneled these flaps through a cartilaginous framework as a pull-through flap and insetted them at the defect site. This technique was performed for small defects only involving the anterior conceal defects.

None of these techniques mentions upper helical rim defects or the use of cartilage graft for composite ear defects. In our study, upper, middle, lobular, and conchal defects were reconstructed using retro auricular skin. A costochondral cartilage graft was used to reconstruct composite defects with

simultaneous coverage with a post-auricular flap. Reconstruction was done in two stages. Larger defects could be reconstructed as the donor site is relatively concealed and can be grafted if not closed primarily.

5. Conclusion

The post-auricular flap is a workhouse to reconstruct partial ear defects. They can be folded or used in addition to costochondral cartilage to give a good aesthetic outcome. Multiple staged techniques have been described for the reconstruction of auricular defects. Ours is a two-staged procedure that holds the advantage of being simple, and reliable with a short learning curve.

Conflict of interest

There is no conflict of interest.

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