



A STUDY ON FEASIBILITY AND OUTCOME OF USE OF COSTAL CARTILAGE FRAMEWORK IN RECONSTRUCTION OF SEVERELY DAMAGED POST BURN EAR DEFORMITY

Plastic Surgery

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ABSTRACT

To a plastic surgeon reconstruction of post burn deformity is a real challenge. Burn injury of ear can lead to cosmetic deformity which can vary from minor to severe. Correction of those deformities and giving a normal shape to the ear can be a daunting task because of the intricacies involved in framing the cartilage and inadequate soft tissue availability in the surrounding area. We have studied the various problem associated with a post burn scar. In many cases acceptable result can be achieved with fairly simple procedures which involve repositioning and/or unfolding a deformed ear. In this study we have shown feasibility of use of costal cartilage framework in reconstruction along with different coverage option like post auricular pocket and temporoparietal fascia wherever indicated.

KEYWORDS

Post burn ear. Costal cartilage framework. Ear reconstruction

INTRODUCTION

Reconstruction of human ear, be it in congenital deformity or in traumatic damage is a formidable job for a plastic surgeon. When it comes to reconstruction of an ear ravaged by burns injury the difficulty increases manifold.¹ This is because of scarring and paucity of skin available in the auricular region following burns.² Besides skin cover, ear framework is another important factor that decides the final outcome. While in minor or partial damage a reasonably good result can be given, in reconstruction of complete post burn ear deformity one has to frequently take resort to usage of temporoparietal fascia or expander owing to paucity of healthy skin in post auricular region. This study aims to assess the feasibility and outcome of total ear reconstruction in post burn deformity.

MATERIAL AND METHODS:

The study was conducted in Department of Plastic & Reconstructive surgery, SSKM Hospital and IPGME&R, Kolkata between March 2016 to December 2017 on 11 patients in the age group of 10 to 60 years having complete loss or damage of ear by burn injury.

After assessing the nature and extent of deformity possible donor site was determined. In all patients complete reconstruction with use of cartilage framework was done.

When cartilage framework was used it was either placed in post auricular pocket or TP fascia was used for its coverage. When post auricular pocket was used it was essentially multi-staged surgery while in those cases where TP Fascia was used it was generally a single staged surgery.

Assessment was made in terms of position of the reconstructed ear, axis, auriculocephalic angle in addition to shape and features of the reconstructed ear.

Though there is an existing scoring system of objective analysis of ear reconstruction by Mohit Sharma et al.³ However this scoring system is based on weightage given to each individual feature like helix, antihelix, lobule etc We used a simple method of assessment based on patients satisfaction level and categorized them into two broad categories as Satisfactory and Unsatisfactory

If the patient were happy with the result and did not wish for any further modification/ corrective surgery we labeled the result as Satisfactory. On the other hand, when the patient was dissatisfied with the result or wished for further modification, we labeled them as Unsatisfactory.

RESULT

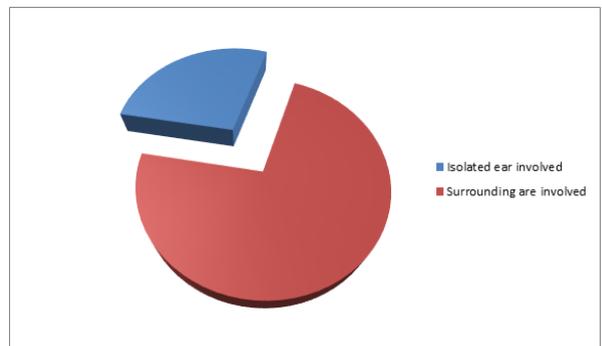
Out of 11 patients age distribution was as follows

Age Group	Male	Female
10-19 years	0	1
20-29 years	1	4
30-39 years	1	3
40-49 years	1	0
50 years & above	0	0

Male 3, Female 8

Surrounding area involvement

In our study we found only 4 (12%) of patients with isolated ear involvement. Rest all the other patients (88%) had surrounding area involved



In all 11 cases cartilage framework was used. In 6 of these 11 patients, single stage surgery was performed using TP fascial flap while in remaining 5 cases; post auricular pocket was used for framework insertion.

Hospital stay

We have categorized the patients based on their hospital stay into 2 groups. Six patients who underwent single stage surgery belonged to 6 to 10 days category whereas the remaining (6) cases had a hospital stay of 16 to 20 days.

DISCUSSION

Age Distribution:

The average age of the patients included in our study sample were of marriageable age of 27.1 years.

Sarabhai et al⁴ stated in the year 2012, "it is very uncommon to find isolated burns of the ear. They are most commonly associated with facial burns either due to thermal burns or chemical or electrical

contact injury.” Out of 11 patients, 8 patients had surrounding area involvement.

Choice Of Material For Framework

As recommended by Nagata autologous costal cartilage was used as the material of choice for framework construction.

Soft Tissue Cover

we faced several challenges to achieve good skin coverage for the cartilage framework. The primary reason being, paucity of a good quality skin envelope in post burn ear patients.

One patient was treated with tissue expansion. Literature report suggests that Tissue expansion does not appear to have been adopted as a technique of choice in ear reconstruction.⁹ However this statement has not been regarded as absolute and tissue expansion has been used successfully with good results by several surgeons including J S Chana et al⁷ and Park C et al.⁸

Our decision to use tissue expanders was due to the presence of considerably good quality but inadequate skin adjacent to the area of reconstruction. However our experience with tissue expanders in post burn ear reconstruction was not satisfactory.

Sculpting a tridimensional autologous rib cartilage framework is essential to restore a natural ear shape, the curves, the folds, the shape and the placement gives it a complexity, grace and elegance which is a challenge for the Plastic Reconstructive and Aesthetic Surgeons (Firmin).⁹ In our patients we did not encounter any difficulty with cartilage framework as far as shape was concerned which was more or less satisfactory except in one case where the helical rim was sharply angulated in the upper part. Auriculocephalic angle and feature definition was better when TP fascia. Here a good suction catheter was of immense value, as it also helps better adherence of the cover (skin or fascia) to the framework. The authors B Brent, Walton et al, Sharma et al, Bhandari and Nagata have all stressed the importance of the use of adequate post operative suction drainage.^{3,6,10,11}

CONCLUSION

The reconstruction of the burnt ear involves a number of techniques and stages placing it in the higher echelons of reconstructive surgical procedures. This multi staged approach combined with high level of aesthetic requirement suggest that these types of reconstruction should be performed by surgeons familiar with the techniques. However with regular training and practice excellent results are achievable and reproducible. Autologous cartilage frameworks, despite their potential for donor site complications remain the accepted standard for external ear reconstruction. It is necessary that extreme care and precaution at every stage of ear reconstruction is ensured to avoid complications. It goes without saying, that no matter how sophisticated the technique is, the results of total ear reconstruction in post burn patients leaves much to be desired in terms of aesthetics.

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