Alexandria Journal of Medicine (2016) xxx, xxx–xxx

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Alexandria Journal of Medicine

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Total ear reconstruction: The role of bilateral triangular post-auricular flaps for creation of the cephaloauricular sulcus☆

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Received 30 December 2015; revised 16 February 2016; accepted 24 February 2016

KEYWORDS

Ear reconstruction;
Bilateral triangular flaps;
Cephaloauricular sulcus

Abstract *Introduction:* Auricular reconstruction of congenital or acquired ear defects can provide a realistic good-looking ear and functional cephaloauricular sulcus especially for those who wear eyeglasses. Over the past few years, refinements in the techniques of elevating the buried ear framework in the second stage of ear reconstruction have shifted from simple skin grafting to the use of flaps and cartilage blocks for creation of the cephaloauricular sulcus.

Objective: The aim of the study was to describe useful simple modification using bilateral triangular flaps and full thickness skin graft to create adequately functional cephalo-auricular sulcus especially for patients wearing eyeglasses during the second stage ear reconstruction.

The study design: The described technique was carried out between June 2010 and January 2014, for 37 patients (24 patients with congenital microtia grade III, 7 patients with post-burn ear deformity, and 6 patients with post-traumatic ear defects). During the second stage of total ear reconstruction, the ear framework is separated substantially from the side of the head and positioned at the desired angle by means of a block of cartilage covered with a fascial flap. Then, two local triangular flaps from the adjacent non-hairy skin are created (one is superiorly based and the other is inferiorly based) and inset into the created cephaloauricular sulcus. The rest of the post-auricular defect is covered with a full thickness graft.

Results: The technique was simple and effective with no post-operative complication regarding flaps viability. Patients requiring glasses have worn frames soon after the tie-over was removed and no sulcus problems have resulted.

1. Introduction

Total ear reconstruction using autologous cartilage is usually performed in two stages.[1–4] Creation of cephalo-auricular sulcus is the hallmark of the second stage, and in this stage every

☆ The idea was presented at the 7th IFFPSS Congress "Nose, Face World" in Rome May 9th–12th, 2012, Rome, Italy.

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Peer review under responsibility of Alexandria University Faculty of Medicine.

http://dx.doi.org/10.1016/j.ajme.2016.02.008

effort should be done to produce good-looking ear, normally positioned with sufficient cephalo-auricular sulcus to allow skin care and wearing eyeglasses.

Over the past two decades, the modifications and refinements in ear reconstruction were focused on creating stable elevation of the reconstructed auricle. The technique of elevation has evolved from simple skin grafting[5] to the use of pedicled flaps and cartilage blocks.[4,6–8]

The article presents our clinical experience with a simple and reliable technique for creating a smooth cephalo-auricular sulcus in second stage ear reconstruction.

2. Patients and methods

Between June 2010 and January 2014, the authors performed staged subtotal and total auricular reconstructions, adopting the Nagata technique with modification in the second stage using two triangular skin flaps.

37 patients were included in the study; the patients were 23 males and 14 females. Their ages ranged between 5 and 42 years (mean, 17.22 years) at the time of reconstruction.

Twenty-four (64.86%) cases were grade III microtia (right: 12 cases, left: 8 cases, Bilateral: 4 cases), 7 cases were post-burn deformation, and 6 cases were traumatic amputation of the auricle due to RTA.

The follow-up period ranged from 16 months to 46 months with mean of 36.84 month follow-up.

3. Operative technique

We followed the Nagata principles[1–4] of total ear reconstruction, which are refined by Firmin[9], Siegert[10], and others.[11–13]

For the first stage, the lobule was transposed by W-M skin incision, the remnant cartilage was removed, and a cartilage framework was fabricated from the ipsilateral 6, 7, 8 and 9 costal cartilages and placed in a subcutaneous pocket.

At the second stage, we started the operation by marking of the skin incision half to one cm away from the palpable edge of the cartilage construct, and the incision line was not clear curved line around the construct; instead, we added 2 Y-incision; one at the end (Fig. 1A).

Local injection of Xylocaine with Adrenaline 1:200,000 was done after marking.

The ear construct was elevated by delicate meticulous dissection just underneath the capsule surrounding the cartilage framework, and the construct was kept elevated by placement of a crescent shaped cartilage block, which was covered with an anteriorly based mastoid fascial flap or a posteriorly based periosteal flap (Fig. 1B).

The bilateral (superior and inferior) triangular flaps were carefully incised and dissected, and these flaps were transposed inward and fixed in place by Vicryl 4/0 to create the beginning of the new cephalo-auricular sulcus and interrupt the continuity of the graft behind the reconstructed auricle (Figs. 2 and 3).

The posterior surface of the ear and cephalo-auricular sulcus was covered by a full thickness skin graft (the graft is interrupted by the triangular flap at both ends), and the graft was harvested from the skin just beneath the chest scar that was closed directly after adequate undermining.

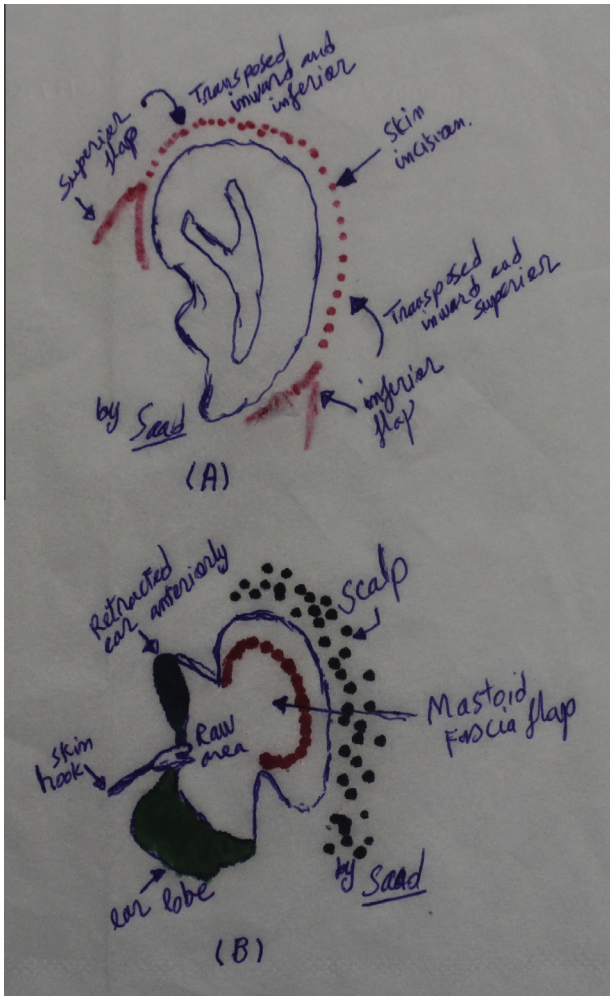

Figure 1 (A) Schematic picture of marking of the triangular skin flaps and skin incision around the reconstructed auricle. (B) Schematic picture of the transposition and the in-sitting of both triangular flaps while retracting the reconstructed auricle.

Figure 2 Elevation of the reconstructed auricle in 23 years old male patient with grade III microtia of the left ear by delicate meticulous dissection just underneath the capsule surrounding the cartilage framework.

Please cite this article in press as: Ibrahiem SMS, Farouk A Total ear reconstruction: The role of bilateral triangular post-auricular flaps for creation of the cephaloauricular sulcus☆, *Alex J Med* (2016), http://dx.doi.org/10.1016/j.ajme.2016.02.008