

Sahai's Y flap technique for single stage total earlobe reconstruction— Introducing a new method

Rahul Sahai¹, Sudhir Singh^{2*}

¹Ex. HOD & Professor, Dept. of Plastic Surgery, S N Medical college, Agra, ²Hon. IMA Professor (Academy of Medical Specialities-IMA) & Senior Consultant Plastic Surgery, Getwell Hospital, Varanasi Uttar Pradesh, India

***Corresponding Author: Sudhir Singh**

Email: s.sulekha@gmail.com

Abstract

Based on 45 cases of total ear lobe reconstruction with a follow up of more than 20 years, we have come up with a new technique which fulfills the basic criteria of being single stage, simple in execution and aesthetically pleasing in comparison to normal side. We have named this flap as Sahai's Y Flap technique for single stage earlobe reconstruction.

Keywords: Ear lobe aesthetic reconstruction, Y flap.

Introduction

Earlobe reconstruction is very important aspect of restoring ones facial beauty and personality. Lots of methods have been described in the past, single as well as multi staged comprising of local flaps, regional flaps and skin grafts. In the present paper we have tried a new method of single stage earlobe reconstruction with aesthetically good results.

Objective

The purpose of our study is to introduce a new technique of earlobe reconstruction with a good aesthetic result. The study has been done for the last 20 years and has been found simple and easy with good results. We have named this technique as Sahai's Y Flap single stage technique for total earlobe reconstruction.

Patients and Method

This study is a retrospective review of 45 patients of total earlobe loss treated by Sahai's Y Flap technique. Patients age ranged from 4 to 60 years with an average age of 40 years. Females were 75% and males 25%.

In the present study 36 cases were of assault injury, and 9 were of congenital hypoplastic earlobe. All cases were of total earlobe loss. We have not included cases of partial loss of earlobe in the present series. The period between injury and flap reconstruction except the congenital ones ranged from 0 to 4 years. The average follow up was 2 to 12 years. In one case we had 20 years follow up.

We take reverse transparent tracing from normal ear side to ascertain amount of flap tissue required and

then plan the reconstruction on deceased side. (Fig. A, 1).



Fig. A: Diagram showing traumatic injury of ear resulting in to loss of earlobe.

In the present method of earlobe reconstruction a 'Y' shaped flap is raised from pre and post auricular healthy skin. It is an inferiorly based flap in which the length of two limbs of Y are equal and is represented by distance 'l' between the point D and C. The breadth of the flap 'h' is equal to the vertical height of the lobe (this can be measured from the opposite normal ear).

The flaps are raised from pre and post auricular region. These flaps are of skin and subcutaneous tissue with out any fascia or muscle. They are of random pattern type. The preauricular flap forms the anterior surface of the lobule while the posterior auricular flap forms the posterior surface. The secondary defects on pre and post auricular region are closed primarily meticulously.

Geometry of flap

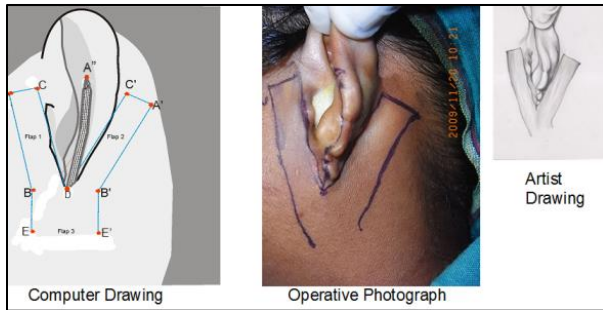


Fig. 1: Diagram showing marking of Y-Flap

1. The Y shaped flap is an inferior based flap which gets its blood supply through its base which is represented by the point EE' in the Figure no. 1.
2. Oblique two limbs of Y are equal in length and breadths and their length corresponds to the transverse length of the earlobe defect 'I', while the breadth corresponds to the vertical height of the lobe 'h' (which is estimated by measuring from the normal ear).
3. Point D is a point at the medial end of the defect of the earlobe. but for all practical purpose we consider it a point on neck just at the medial part of the earlobe defect. This is a common point for the line DC, DC' and DA''.
4. Preauricular flap is shown by line DC, AC, AB and BE. While postauricular flap is shown by line DC', C'A', A'B' and B'E'.
5. Line from DCAB is the marking for preauricular flap while DC'A'B' is the marking for postauricular flap. The pedicle of the flap which is inferiorly placed is represented by BE on anterior side and B'E' on posterior side.

Establishments of points of 'Y' flap

Point D: It is the point on the medial end of the defect of the earlobe.

Point A'': Is a point on the lateral end of the defect of the earlobe.

The distance DA'' is a transverse length of the defect and is represented by distance 'g'.

Point C: Is a point on pre auricular skin just anterior to tragus and is at g distance from point D.

Point A: It is a point on preauricular skin at a distance 'h' from point C and usually at 90 degree to point C.

Point B: It is a point on preauricular skin anterior to point D at a distance 'h'.

Point E: It is a point taken on the neck below point B. It is at a distance 'h' from point B. Point E lies at 'h' distance anterior to the perpendicular line drawn from point D.

Similar marking of the point on post auricular area is done and they are C', A', B' and E'. The DC' lies in the postauricular sulcus and forms the anterior boundary of postauricular flap DC'A'B' which is extended downwards to the point E'.

By these points we mark out pre and post auricular flaps 1 and 2, which is equal to the length and breadth of the defect of the pinna and which forms the anterior and posterior surface of the ear lobule. The flap 3 is equal to the breadth of the earlobe along its line BE and B'E' while the distance EE' and BDB' is equal to the double the breadth of the earlobe.

Usually the length BE is equal to 'h'. But incase depending on the roundness at the medial end of the reconstructed lobule it can be increased or decreased. By increasing the height of pedicle we get more rounded lobule when the point E and E' is stitched at anterior and posterior part of point D on medial side respectively.

Operative Technique

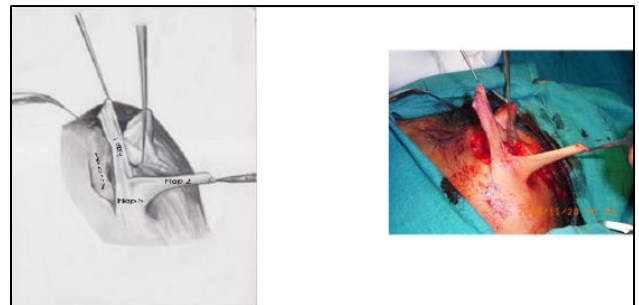


Fig. 2: Diagram showing the Y-Flap harvested from pre and post auricular areas along with its pedicle which is harvested from neck just below the medial attachment of the lobule site.

We prepare two flaps one preauricular and other postauricular as described (Fig.1), with common limb below and are dissected meticulously (Fig. 2,3,4). Both the flaps are folded together on a common pivot axis of DBB' (Fig. 5, 6, 7). So after raising the pre and post auricular long limbs of 'Y' flap and short limb of its pedicle the adjacent site of Y flap are stitched together i.e. length DC is stitched to length DC'. Length AC is stitched to length A'C'. AB is attached to the anterior border of the defect DA'' while the length B'A' is attached to the posterior border of DA''. Point E is lifted up and is stitched along the margin of preauricular defect above the point D on anterior side, while the point E' is attached above the point D on postauricular defect (Fig. 8). This maneuver will give the rounded look to reconstructed earlobe.

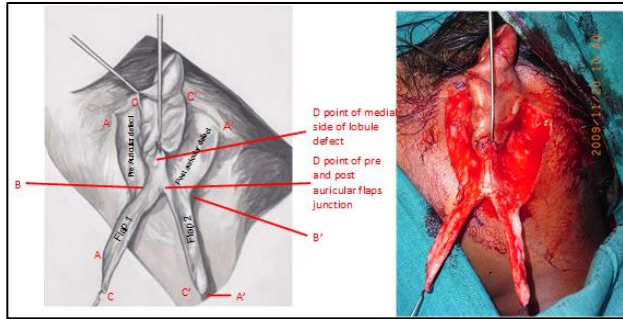


Fig. 3: Showing Pre and Post auricular flaps with the secondary defects

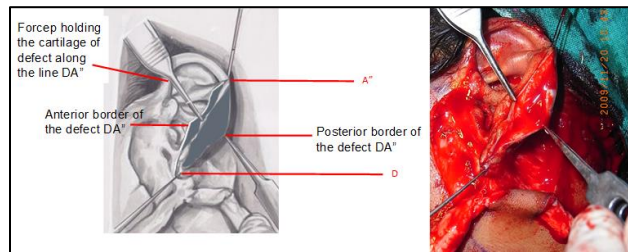


Fig. 4: Showing the earlobe defect split into anterior and posterior layers represented by line of different shades

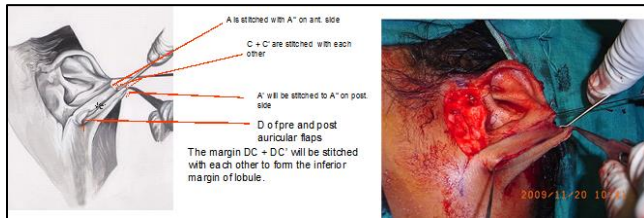


Fig. 5: Showing Pre +Post auricular flaps brought together to from the anterior and the posterior surface of earlobe. The borders BA +B'A will be stitched on the Ant. +Post line DA'', while DC and DC' are stitched together to from the lower border of the lobule.

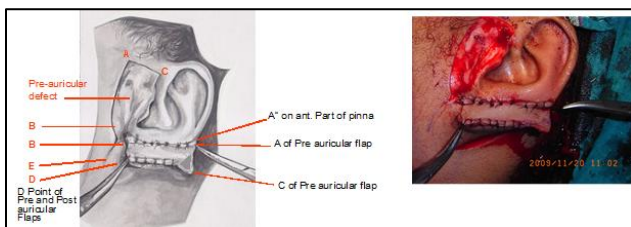


Fig. 6: Showing ant. And post surface of lobule, reconstructed by pre + post auricular flaps. The shaded portion of the lateral part of the lobule which is a lateral end of pre auricular flap will be turned back to give rounded shape to the lateral end of the reconstructed ear lobule.

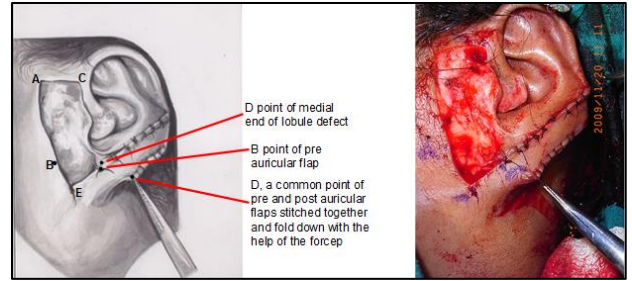


Fig. 7: Showing the reconstructed ant. And post, surface of the ear lobule with a good looking letter curved part of the lobule. The D point of pre and post auricular flap is being pull down with the help of the forcep to facilitate the rotation of point E upward which will be stitched along the line DC at distance above the point D of the medial end of lobule defect.

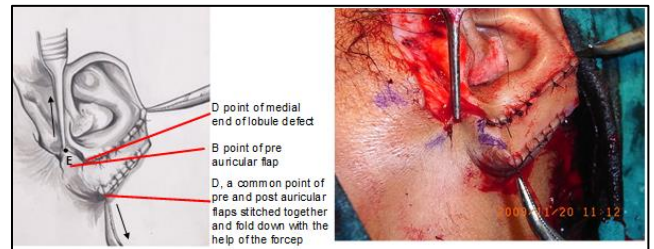


Fig. 8: Showing the important step in the Y flap technique of earlobe reconstruction. The point D of adjacent sides of pre and post auricular flaps is being pulled down with the help of artery forcep, simultaneously the point E is being pulled up to be attached along the line DC anywhere above the point D of the medial and of the earlobe defect, and point E' is stitched to the postauricular line DC'. This maneuver gives the rounded look to the medial part the reconstructed earlobe.

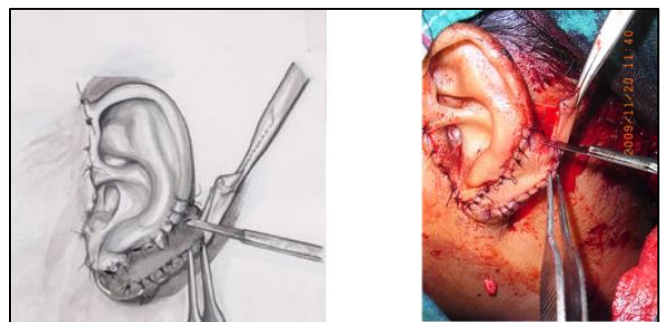


Fig. 9: Showing the pre auricular flap folded back at its lateral part to give rounded appearance of the lateral border of earlobe. The postauricular flap is being shortened in length at its lateral end as shown in the picture. The shortened end will be stitched to the folded back part of preauricular flap.

Adjustments are done to give the natural look of the lateral part of the lobule.

The pre auricular flap at its distal end is freshened and turned back on the posterior surface where it is stitched with the postauricular flap which was cut short by 2-3 mm in length (Fig. 9). This maneuver gives a natural looking lateral part of the reconstructed earlobe.

The pre and post auricular secondary defects are closed primarily and meticulously in a single line. Because of the lax skin we did not face any tension in the suture line (Fig. 10, 11A, 11B).

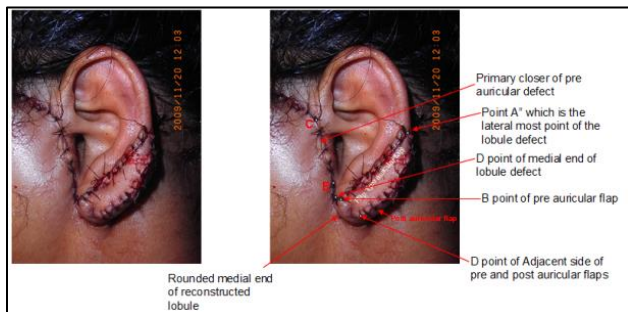


Fig. 10: Showing the final appearance of the reconstructed total earlobe in one stage by sahai's Y flap technique.

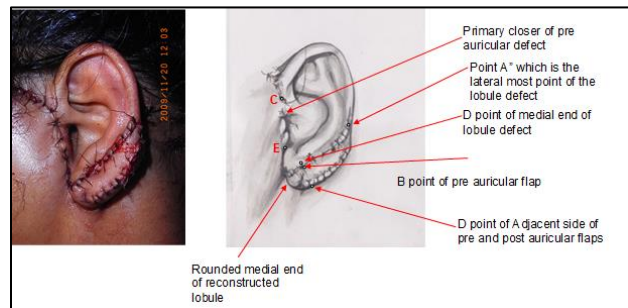


Fig. 11A: Showing the final appearance of the reconstructed earlobe in one stage by Sahai's Y flap technique.

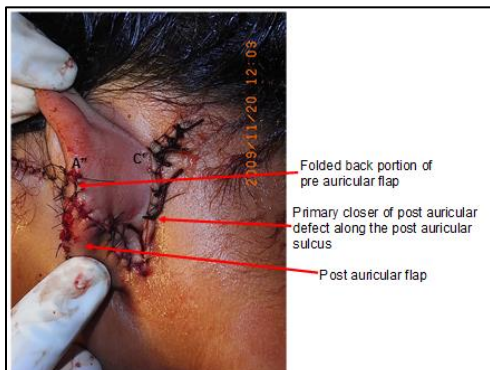


Fig. 11 B: Showing the posterior view of the reconstructed earlobe.

Normal dressing is done after applying local antibiotic neosporin ointment and the stitches are removed after one week.

Dissection

It is a random based flap with length to breadth rarely exceeds 1:4 ratio. The flap consists of skin and subcutaneous tissue and is nourished by cutaneous vessels which richly supply around the ear. The flap's pivot axis is at BB'D at medial margin of the root of the ear.

Results

A Case of traumatic earlobe loss reconstruction.



Fig. 12 A: A case of earlobe reconstruction.



Fig. 12 B: The posterior view of constructed earlobe

Reconstruction of congenital hypoplastic earlobe



Fig. 13 A: Congenital hypoplastic earlobe



Fig. 13 B: More than 6 years follow up of the reconstructed earlobe.



Fig. 13 C: Normal earlobe of the same patient

One more case of reconstruction of traumatic earlobe loss.



Fig. 14 A: One more example of case of traumatic loss of earlobe reconstruction by Sahai's Y flap single stage technique.



Fig. 14 B: After long followup.

Eight patients had marginal necrosis which however healed with in four weeks with out much aesthetic loss. In the rest there was hundred percent excellent result and was aesthetically fantastic in both short term and long term follow up. Some of the photographs are shown here (Fig. 12A, 12B, 13A, 13B, 13C, 14A, 14B).

Discussion

Though functionally ear lobe has less importance but it has an importance in facial aesthetics. We do get traumatic loss of ear lobule, congenital hypoplastic ear lobule and even post burn sequele deformity of ear lobule. They all require reconstruction. In the last fifty years more than twenty techniques are described in the available literature. Reconstruction techniques ranged from multiple staged procedures to single stage procedure. More or less in all the techniques local skin flaps have been used from either pre auricular, post auricular, or from skin below the ear lobule. Even cartilage from other ear or from the same ear have been used by few surgeons with varying aesthetic results. It is challenge to reconstruct new ear lobule matching to normal side ear lobule with minimum residual scarring of the donor area.

1. Gavello in 1970 first described the bilobed technique in which anterior based bilobed flap was taken below the auricular defect.
2. Brent used the cartilage graft in between two flaps.¹⁰
3. Alan's and Okada used two flaps vertically based in which one flap bigger in size than the other.
4. Nelton and Ombredanne reconstructed ear lobule in multiple stages with skin graft for postauricular secondary defect.
5. Seidnan and Novelty described a single stage technique in which U shaped flap was taken from below the defect.
6. Joao reconstructed small ear lobule defect by a vertical pre auricular flap superiorly based in single stage.⁹

7. Singh, A. K. reported a reconstruction with limberg flap from the skin below the defect.⁶

So many types of earlobe reconstruction has been described in the past like Gavello's procedure,¹ combined flap technique for ear lobe reconstruction in one stage by Alconchel et al² or a new technique described by R Kalimuthu in 1984³ etc. The bilobed flap was primarily described by D'Hooghe consisting of two wings, both nourished by an inferior base, located respectively on the pre and postauricular folds. Both wings are raised and brought together to rebuild the new earlobe. However D'Hooghe's bilobed flap with a pre and postauricular lobe allows the reconstruction of small earlobes defects. So the disadvantage of this technique is that it can be applied only for small defects. Earlobe reconstruction by combined Gavello technique and bilobed flap has been described by Ana Rita Cabral et al in 2013.⁴ Still many more techniques are coming as none are giving full aesthetic pleasing earlobe as desired in single stage.¹¹ Stable and satisfactory shape has not always been obtained, mainly because of secondary skin retraction. Few have tried (a) superimposition of two flaps, (b) a single flap with a skin graft or (c) doubled over single or bilobed flaps. JP Van Geertryden even tried earlobe reconstruction with a reverse flow chondrocutaneous flap where no skin graft was needed.⁵ Some even tried limberg flap.⁶

Khaled M Hassan described Infra-auricular flaps for single stage ear lobe reconstruction recently in 2019⁷ but we in contrast evolved another type in which pedicle is below with flaps harvested from preauricular and postauricular skin. Based on our new technique i.e. Sahai's Y flap single stage ear lobe reconstruction with a long study of 20 years on 45 cases, we found that this technique fulfills all criteria of being single stage, simple, easy to master and execute and gives most pleasing aesthetic outlook and compares well with normal side.

In our series we found only marginal necrosis in less than 25 percent of cases which did not much affect the aesthetic outlook. It is a safe flap as we never exceed the dimension of L:B ratio of more than 4:1. For this Y flap we need normal, scar free supple preauricular and postauricular skin. In few cases minor adjustments for roundness of free lower border is required. Colour and texture match is good. Shrinkage in size is not seen. Hair growth was not seen in the reconstructed lobe as the flaps were taken from non hair bearing pre and post auricular skin and secondary

defects were closed primarily. Ear prick for wearing ear ring was recommended after six weeks.

Conclusion

It is a new technique of single stage aesthetic total ear lobe reconstruction in patients with normal preauricular and postauricular skin with good results even after long follow up. It is easy to master.

Source of funding

None.

Conflict of interest

None.

References

1. Emiroglu M, AL-Saedi M, Gavello's procedure: an old earlobe reconstruction method, revisited and touched up. *Aesth Plast Surg* 2001;25:187-8.
2. Alconchal J, Rodrigo GA, Cimorra: A combined flap technique for ear lobe reconstruction in one stage. *JPRAS* 1996;49(4):242-4.
3. Kalimuthu R, Larson BJ, Lewis N, Earlobe repair a new technique; *Plastic Reconstr. Surg* 1984;74(2):299-300
4. Ana Rita Cabral et al: Earlobe reconstruction by the Gavello technique and bilobed flap. *An Bras Dermatol*;2013 March April, 88(2): 272-275.
5. Van Geertryden JP: earlobe reconstruction with a reverse flow chondrocutaneous flap. *Br J Plast Surg* 2002;55(3):253-5.
6. Singh A, Singh G, Earlobe reconstruction using a limberg flap in six ears. *Br J Plast Surg* 2003;56(1):33-6.
7. Khaled M Hasan, Infra-auricular flap for single stage ear lobe reconstruction; *Egypt, J. Plast. Reconstr. Surg.*, Vol. 43, No. 3, October: 441-444, 2019
8. Vujevich J, Goldberg LH, Obagi S, Repair of partial and complete ear lobe clefts: a review of 21 methods. *J Drugs Dermatol* 2007;6(7):695-9.
9. Joao Goulao et al; Total earlobe reconstruction with a superiorly based preauricular flap. *An Bras Dermatol* 2016 May-Jun. 91(3): 372-374.
10. Burt Brent: Microtia repair with rib cartilage grafts A review of personal experience with 1000 cases; *Clin Plastic Surg* 29(2002) 257-271.
11. Ross A Clemons et al: Plastic and reconstructive surgery of the ear lobe: *Facial Plast Surg* 1995;11(4):301-309.
12. Reiter D, Alford EL, Torn earlobe: a new approach to management with review of 65 cases. *Ann Otol Rhinol Laryngol* 1994;103(11):879-84
13. Salem IL, Sectorial reconstruction of auricular helical and lobular defects in a single stage: a clinical experience and appraisal of available techniques. *Egypt J Plastic Reconstr Surg* 2004;28(1):9-14.

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