International Journal of Otorhinolaryngology and Head and Neck Surgery
Harish MO et al. Int J Otorhinolaryngol Head Neck Surg. 2018 Jan;4(1):154-158
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

Original Research Article

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20175617

Step advancement flap technique of ear lobe repair

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Received: 15 September 2017
Revised: 30 October 2017
Accepted: 31 October 2017

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ABSTRACT

Background: Ear piercing and ornament wearing is a historical tradition. Dilated ear lobe and torn earlobe usually results from sudden trauma or continuous use of heavy earrings. Various surgical techniques have been described for the correction of the same. Each procedure has its own pros and cons. The choice will depend on individual preferences and the defect, partial or total, and should offer a lower chance of recurrence. The corrections can be made with or without preservation of the earring orifice. The aim and objectives of this study was to present and discuss a novel technique of repairing the partial and complete cleft ear practiced at Karwar Institute of Medical Sciences Hospital, Karnataka, India.
Methods: A prospective study was done on the use of a novel technique "Step advancement flap" in the repair of partial and complete cleft ear lobe in 18 patients.
Results: A good post-operative results were achieved in all the patients with maintained ear lobe thickness and a sutured skin scar away from the center.
Conclusions: Our technique has an advantage of maintaining the normal ear lobe thickness and the sutured skin scar away from the center on either side of the ear lobule compared to other techniques. Thus the neo piercing can be done at a fresh central skin avoiding the skin scar.

Keywords: Ear, Skin flap, Ear lobe repair, Neo-piercing, Dilated ear lobe

INTRODUCTION

Wide aperture/dilated ear lobe and torn ear lobe usually results from sudden trauma or continuous use of heavy earrings. The incidence rate of torn earlobes in patients wearing earrings is variable, depending on the ethnicity, culture and country.[1,2] Sharma et al have classified split earlobes into congenital and acquired clefts, of which acquired clefts can be sub classified into partial or complete defects on the basis of the completeness of the lobe margins.[3] There are several surgical techniques to correct the defect, and the correction depends on the existing deformity. Defects can be either partial (wide aperture) or total, which is the occurrence of lobe splitting.

In the conventional repair with or without preserving earring orifice the skin scar either forms the center of the lobule or lies just beneath it. In other flap techniques the central connective tissue and fat is deficient forming a dimple in the center. So the future ear ring has to be placed in the deficient central lobule or in the scar if the patient wants it to be in the center or away from the center to avoid the scar which is not aesthetically pleasing. In "Step advancement flap" technique we elevate the flap and advance it either anteriorly or posteriorly thus moving the scar away from the center maintaining the thickness of the lobule. The future ear ring can now be placed in the center avoiding the skin scar and lowering the chances of recurrence.

METHODS

This study was conducted in the department of ENT at Karwar institute of medical sciences, Karwar. The period of study was from February 2016 to July 2017. Eighteen patients who attended our department during the study period for cleft ear lobe repair were included in this study. All the patients were selected after routine blood investigations which included complete blood picture, renal function test, random blood sugar, HIV and HbsAg.

A written and informed consent was taken from all of them before surgery.

Operative procedure

The procedure is done under local anesthesia using 2% lignocaine with adrenaline (1 in 2 lakh).

Surgical marking is done before infiltration. The flap can be advanced either anteriorly or posteriorly on the lateral side; correspondingly it is advanced vice versa on the medial side. For advancing flap anteriorly on the lateral side, the marking is done as shown in Figure 1 and 2. The first marking is done 2 mm anterior and parallel to the cleft. A horizontal marking is done superiorly and inferiorly from the first marking running posteriorly up to 2 mm from the cleft. A marking along the margin of the posterior lip extending from superior and inferior marking forms the free end of the flap. A marking of an equilateral triangle with a 2 mm base on the horizontal marking with 2 mm sides is done superiorly and inferiorly. For complete cleft, the vertical incisions are extended to the rim.

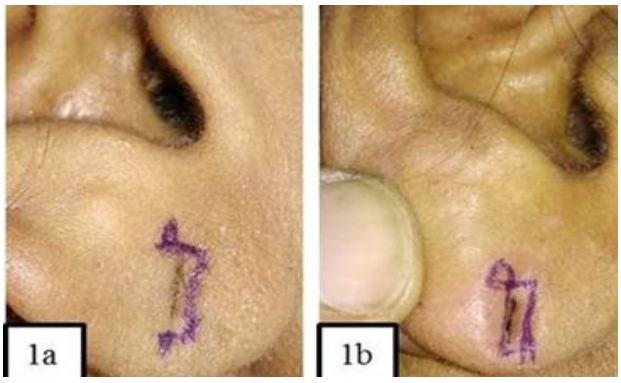

Figure 1: Surgical marking on the lateral side. a: surgical marking for partial cleft; b: surgical marking for thin inferior margin, converted to complete cleft.

The incisions are given along the markings (Figure 3a and 3b); 2 mm of skin is excised from anterior lip of cleft preserving lobular fat as much as possible. Preservation of the lobular fat as much as possible will maintain the thickness of the lobule. Superior and inferior triangular skin is excised as marked. Posterior incision is given along the cleft and a flap is elevated. Undermining is done at the triangular excision of the skin at about half the thickness of the lobe so as to step advance the flap anteriorly. The flap is of 2 mm in length and contains entire thickness of the posterior lip except the skin on medial surface which is excised to accommodate the flap from the other side (Figure 4). Similarly, on the medial side the flap is advanced posteriorly. The skin flaps are sutured with 5.0 ethilon (Figure 5a and 5b) and a dressing is applied. All the patients were put on oral antibiotic and pain killer for five days. Patients were reviewed after 7 days and the sutures removed.

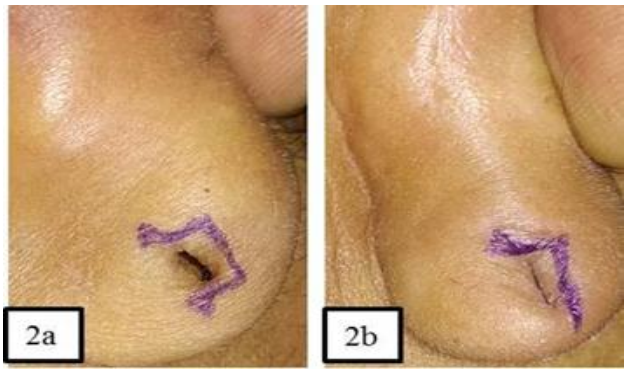

Figure 2: Surgical marking on medial side. a: surgical marking for partial cleft; b: surgical marking for thin inferior margin.

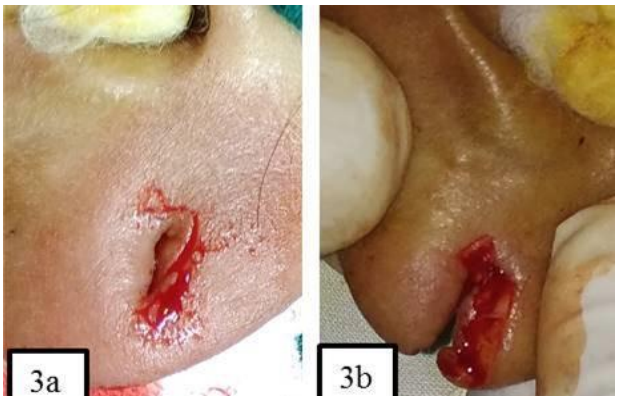

Figure 3: Incisions. a: incision for partial cleft; b: incision for complete cleft.

Figure 4: Medial aspect of the flap.

Figure 5: Sutured skin flaps. a: suturing after partial cleft repair; b: suturing after complete cleft repair.

RESULTS

All the eighteen patients were adult females aged between 21 years to 67 years with the mean age of 49 years (Figure 6). Of the eighteen patients, four patients (22%) had unilateral partial cleft, six patients (33%) had bilateral partial clefts, three patients (17%) had bilateral complete clefts and five patients (28%) had mixed clefts, one sided partial with other sided complete clefts (Figure 7). Thus totally we had thirty two ears, of which twenty one ears had partial cleft and eleven ears with complete clefts.

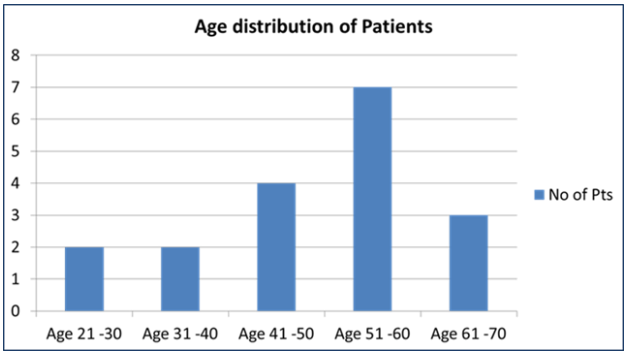

Figure 6: Age distribution of patients.

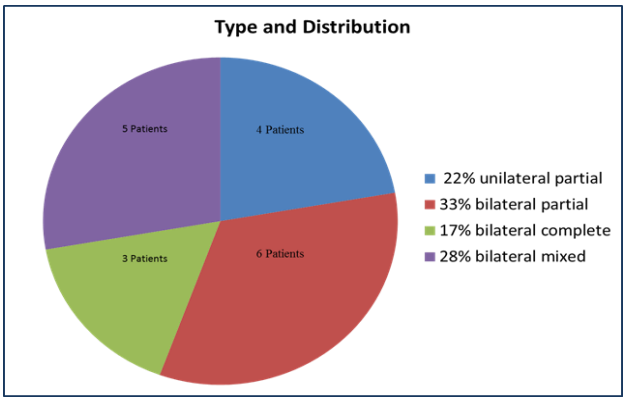

Figure 7: Type of cleft ear lobe and distribution.

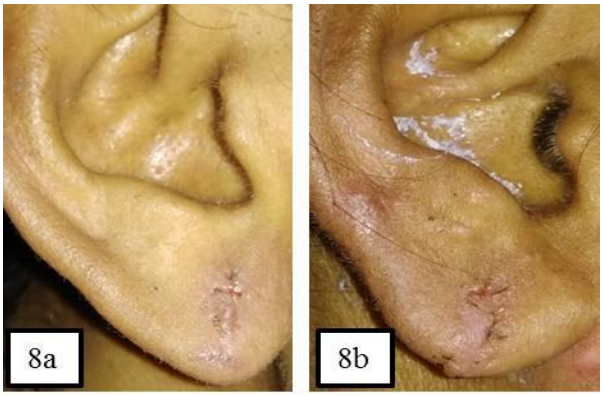

Figure 8: After suture removal. a: after suture removal in partial cleft repair; b: after suture removal in complete cleft repair.

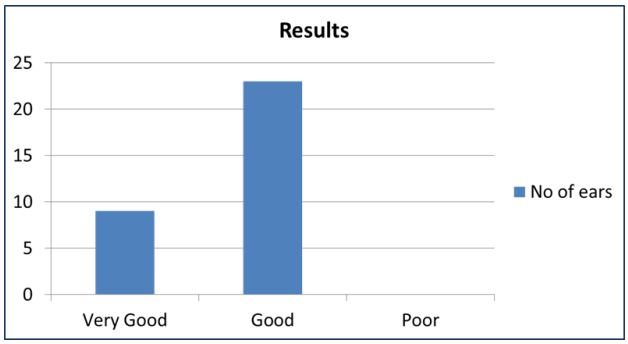

Figure 9: Results at six weeks.

After the suture removal patients were asked to come after 6weeks to assess adequate healing (Figure 8a and 8b). At six weeks the results were graded as very good if the scar was not visible from a distance of one meter, good if a thin scar was visible from a distance of 1 meter and poor if the scar was grossly visible. Of the thirty two ears, nine had very good results and twenty three had good results (Figure 9). There was no postoperative scar contracture, notching or any other complications. Once the adequate healing was confirmed neo-piercing was done in the fresh center on the ear lobule which avoids both lateral and medial skin scars. At 3 months to 1year follow up the results were good and all the patients were satisfied with no recurrence or complications. The patients were advised not to use heavy ear rings for prolonged period.

DISCUSSION

Cleft ear lobe and torn ear lobe have been known since ancient times. Egyptian pharaoh Tutankhamen was one of the earliest known to have stretched ear lobe.[4] Various surgical procedures have been described in the literature for the repair of partial and total ear lobe cleft ranging from simple scar excision with reapproximation to use of different types of flaps and closure. Each procedure has its own merits and demerits. Some are simple to perform and others little complicated and time consuming.

Many techniques have been described to repair partial cleft earlobe. McLaren in 1954 first described repair of partial earlobe clefts using a simple linear closure by de-epithelializing the partial cleft scar with a scalpel and closing the margins in a straight-line.[5] One shortcoming of a simple repair of partial cleft is reduction of the antero-posterior diameter, which appears like a elongated ear lobule. In small tears this may be negligible; however, in a longer partial tear the repair may cause a visible elongation of the lobule.

To avoid the reduction in antero-posterior diameter and apparent elongation of ear lobule, Reiter and Alford described a technique called "parallel opposing flaps".[6] The flaps have created pedicles along the edge of the slit, one in front at the right side and another in the back at the left side of the lobe. The flaps are rotated as saloon doors and each one will cover the raw area of the other when sutured, making the cleft disappear.

Abenavoli described a half-Z-plasty technique preserving the orifice.[7] Once the limbs of the Z-plasty are made, the inferior margins of the cleft are freshened, and the flaps are transposed onto one another. In this the staggered suture line is away from the line of gravity.

Justin Vujevich described use of a purse-string suture technique in repair of partial cleft.[8] He used a running 5-0 Prolene or Ethilon suture after excising the rim of the partial cleft in a purse string fashion. The purse string repair avoids elongation of the ear lobule and a linear scar. The scar usually would be star shaped; with the use of ear rings it may get camouflaged.

Several techniques have been described for repair of total cleft without preserving the orifice. The simplest way to repair a complete cleft earlobe is to incise the cleft with an inverted V-shaped excision as described by Apesos and Kane.[9] Other methods include Z-plasty, partial Z-plasty, L-shaped flap, V-flap and rotational flaps.[10-15]

Techniques that describe the repair of complete cleft with preservation of orifice include side to side closure with preservation of apical skin, side-to-side closure with apical-lateral flap with Z-plasty, side-to-side closure with posterior-lateral based flap with Z-plasty, side-to-side closure with posterior-lateral based flap with Z-plasty, side-to-side closure with lap-joint flap, side-to-side closure with superior-based flap and side-to-side closure with rectangular flap.[16-23]

The basic concept of our technique is to get a robust ear lobule for future neo-piercing. In all the above mentioned technique the future earring either has to be placed in the healed scar or in certain techniques with preserved orifice the scar is just below the earring. The tissue just adjacent to the cleft ear lobe is deficient in connective tissue and fat, thus it is thin. If this tissue (about a millimeter from the cleft) is not excised during repair the resulting central part of the ear lobe remains weak and prone for recurrence. In technique described by Reiter and Alford for partial cleft repair, as mentioned above does not address the weakness of tissue adjacent to the cleft margin.[6] Our procedure differs from Zoltie's technique which prefers to preserve the earring orifice.[23] In a technique by Rich et al, the tissue on the anterior face of one of the borders is excised, and then the same amount of tissue was removed from the posterior face of the other without preserving the lobe orifice.[24] The resultant scar would have a puckering in the superior and inferior edges. In our procedure we could address the problems of thickness of ear lobule and the scar. We could also get a fresh skin for neo-piercing.

CONCLUSION

We conclude that our technique of cleft ear repair helps to restore the integrity of the ear lobe without causing significant scarring or notching. Initially though it appears to reduce the antero-posterior diameter and apparent elongation of the ear lobe, over a period of time with adequate healing it usually is not significant. Major advantage of our technique is that it maintains the normal thickness of the ear lobe with fresh skin for neo-piercing and is relatively easy to perform.

To summarize, cleft ear lobe, whether it is partial or complete can be corrected using the above mentioned variety of techniques. The procedure can be done under local anesthesia except in paediatric patients who may require a short general anesthesia. The surgeon needs to understand the advantages and disadvantages of each technique and apply accordingly in individual case. Patient education on preventing future clefts is also important. They should be advised not to wear heavy, pedunculated earrings and to remove the earrings during sleep.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Harish MO, Chethana R. Step advancement flap technique of ear lobe repair. Int J Otorhinolaryngol Head Neck Surg 2018;4:154-8.