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ORIGINAL ARTICLE

Otoplasty: Incisionless Suture Versus Open Technique

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Objectives: to compare the result of surgery for correction of bat ear using two techniques (incisionless suture and open technique).

Design: Prospective study

Setting: Otolaryngology department, Mansoura University hospital, Egypt

Participants: All operations were done by the first author.

Main outcome measures: Success is considered when there is satisfactory anti-helix, acute auriculo-cephalic angle and the distance between the helical rim and the scalp is less than 2 cm. with symmetry between both ears and patients and parents satisfaction.

Results: Satisfactory results were obtained in 32 cases in both groups Asymmetry between both sides was found in 3 cases, 1 patient in the first group and 2 patients in the second group.

Recurrence occurred in 2 patients (one in each group). There was keloid formation in one patient in the first group. There was no post-operative infection, hematoma of both groups.

Conclusions: Both Mustarde technique and the incosionless suture technique provide satisfactory results, however, the incisionless suture technique appears to be more easy with minimal complications.

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Introduction

The prominent ears affect approximately 5% of the population. They represent the most common congenital deformity of the external ear. It is inherited as autosomal dominant trait[1,2].

The prominent ear results from two basic causes: underdevelopment of the antihelix, and a large conchal bowl. Normal posterior folding of the scapha–helical unit on the concha produces the antihelix and a conchoscaphal angle of 90° or less. The acuity of this angle places the helical rim closer to the scalp. Obtuse angles represent poor development of the antihelix, promoting lateralization of the helix, i.e., prominence.

Prominence of the ear is also promoted by the presence of a deep conchal bowl (>1.5 cm) or anterior rotation of the conchal bowl. Prominent ears are commonly marked by various degrees of both deformities[3].

More than 200 procedures have been described in the literature to treat patients with prominent ears. The majority of procedures available accomplish the most important goal of the patient "reducing ear prominence"[1,2].

Mc dowell (1968)[5] enumerated the goals of the surgery as follow: the helix should be visible behind the antihelical fold, the helix and the antihelical fold should be anatomically corrected in there place and should have smooth and rounded contours.

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The distance from the helix to mastoid should be 10-15 mm at the superior helix, 16- 18 mm at the midpoint and 20-22 mm at the lobule. The auriculo-cephalic angle should be less than 35^{o} with female less projection in general. Both ears should be symmetrical[4].

As 90% of the adult dimensions of the ear are established by the age of 3 years, many surgeon recommend operation for the prominent ear when the child reach 3-6 years before start of the school age. This early intervention will avoid the psychological and social problems that may occur to these children[5].

Different techniques have been described to correct prominent ears. Some use no sutures and some modified suturing to keep the antehelical fold.

The aim of this study is to compare the result of incisionless suture technique with the usual open technique (Mustarde technique) regarding the results and complications.

Materials and Methods

This study was conducted on 38 patients suffering from bat (protruding) ears, from January, 2008 to January 2011,

All operations were done at the Otolaryngology department, Mansoura University Hospital.

Two surgical techniques were used, the Mustared technique (first group) and incisionless suture technique (second group). From the beginning of the study till May 2009 the Mustared technique was used while the incisionless suture technique was used after this time. Demographic data are shown in Table 1.

Pre-operative counseling:

Preoperative evaluation of the patients with measurement of the depth of the conchal bowel and the auriculocepharlic distance were done. The type of the cartilage was also evaluated

Counseling of the patients and parents about the surgery and its expectation is very important as they should understand that failure may occur due to knot or suture breakage and in such cases replacement stitch may be necessary.

Preoperative photos should be obtained to provide photo documentation of the ears. Ethical considerations:

Informed consent had been obtained prior to each procedure. This study was performed fulfilling the local ethics committee of faculty of medicine, mansoura university.

Surgical techniques:

Mustarde technique6 was done in 18 cases and incisionless suture technique was done in 20 cases. Thirty six patients were done under general anesthesia and 2 operations were done under local anesthesia one in each group.

Incisionless technique:

Methylene blue makes are fashioned to demarcate the new antihelix. This step is usually done before injection of the local anesthesia as the bulge result from the injection may be misleading during fashioning the antihelix.

Lidocaine 2% with 1:100,000 epinephrine is injected. Care is taken to avoid injury of the small vessels and causing echymosis. Peri-operative antibiotics are used as a prophylaxis against perichondritis.

A 20 gauge needle is used to produce multiple scores along the anterior surface of the cartilage for the length of the newly created antihelical fold when the cartilage is rigid. The needle is placed through the skin in only 2 or 3 places.

Bilateral series of percutaneous retention permanent sutures (proline 3/0) are placed using incisionless technique. The incisionless stitch technique requires that the needle re-enter the skin through exactly the same puncture site and needle tract as it exited.

The stitches are fashioned as mattress sutures in which the horizontal limbs are placed as deep under the skin as possible while the vertical limbs should include the cartilage with great care not to pierce the anterior skin**.** Each suture loop is pulled tight to achieve the desired antihelical fold. We usually use 2 to 3 stitches. Symmetry is assessed using a measuring ruler.

After all knots are tied, a skin hook is used to help pull the skin over each individual knot. If a retracted, buried knot appears through the needle hole, a 5/0 silk suture is placed through the needle hole and removed after 1 week. The stitches sites are covered by steristrips for one week. The patient is allowed to return home at the same day of operation.

Results

Demographic data of both groups were presented in table 1.

Satisfactory results were obtained in 32 cases in both groups (Satisfactory anti-helix- Acute auriculo-cephalic angle- The distance between the helical rim and the scalp is less than 2 cm and patients and parents satisfaction.) (Fig.1 and Fig. 2 showed pre and postoperative photo of both groups, respectively).

Asymmetry between both sides was found in 3 cases, 1 in the first group and 2 patients in the second group.

Recurrence occurred in 2 patients (one in each group). The patient of the second group gave history that his friend pulled his ear vigorously after one week of the surgery and for this patient revision was done in one ear while the other patient refused revision surgery. There was keloid formation in one case in the first group.

There was no post-operative infection, hematoma of both groups. All patients in the second group were discharged in the same day of surgery without dressing of the ears while patients in the first group remained in the hospital for 48 hours and discharged with dressing of their ears.

Discussion

More than 200 procedures have been described in the literature to treat patients with prominent ears. Many techniques have been published in an attempt to improve the cosmetic outcome of correction and reduce the postoperative morbidity[1,2].

These can be basically categorized into three groups:

1) Leaving the cartilage intact and using only sutures to reconstruct the ear, as used in the permanent suture insertion of the Mustarde technique[6] and the incisionless otoplasty of Fritsch[7].

2) Incising the cartilage in order to make it more pliable, without resecting it (e.g., the Converse's cartilage incision technique[8] and the anterior approach technique described by Chongchet[9] and Stenstrom.[10]

3) A technique that includes excision of the cartilage.

There is also a relatively new nonsurgical approach that is effective when prominent ears are noted in infancy. The use of external temporary appliances to set the ears in a

Figure 1. Open technique

Figure 2. Incisionless suture technique

Table 1. Demographic data

	First group (Mustardé technique)	Second group (Incisionless suture technique)
Number	18 patients	20 patients
Age	mean 5.9 years (4-16) (DS 3.18)	mean 6.1 years (3- 12) (DS 2.6)
Sex	10 males- 8 females	12 males- 8 females
Side	17 Bilateral- 1 unilateral	19 bilateral- 1 unilateral
Anesthesia	17 general- 1 local	19 general- 1 local
Follow up	3-24 months (mean 15.1 months, SD 4.7)	3-22 months (mean 12.4 months, SD, 5.1)

correct position for several months results in a successful permanent correction.[11-13]

Scoring techniques can be further subdivided into those that just superficially score the cartilage and those that score deep enough to actually cut through the newly created antihelix. Furthermore, the scoring can be accomplished on either the anterior or the posterior surface of the cartilage. In general, however, full-thickness penetration of the cartilage usually results in a sharper antihelical fold, which is undesirable.[14-15]

In these study, satisfactory results (satisfactory anti-helix-Acute auriculo-cephalic angle- The distance between the helical rim and the scalp is less than 2 cm.) were obtained in 32 cases in both groups (84.2%).

The incisionless suture technique appears to be easier with less surgical time and no hospital stay as all patients were discharged at the same day of the operation.

Complications of otoplasties are very rare, the most common complications are hematoma and immediate postoperative infection. In the late postoperative period, there may be extrusion of sutures and/or more significant complications such as hypercorrection or contour irregularities.[16]

The incisionless suture technique, did not allow any potential dead space, so there was less chance of any collection or any swelling. Also as there was no skin suture used so the chances of foreign body reaction, protrusion, and wound breakdown or keloid formation was minimal.

Conclusions

Early correction of the prominent ear will avoid the psychological and social problems that may occur to the affected children. Both Mustarde technique and the incosionless suture technique provide satisfactory results, however, the incisionless suture technique appears to be easier with minimal complications.

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